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AND TRADEMARK OFFICE. PATENTS.

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Vol. 1085 Number 1

OFFICIAL GAZETTE

of the
UNITED STATES PATENT AND TRADEMARK OFFICE



Route to:

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DEPARTMENT
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Patent
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Trademark
Office

PATENT
December 1, 1987

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.
DONALD J. QUIGG,
Assistant Secretary and
Commissioner of Patents
and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without A Hearing as of Oct. 30, 1987.

Chemical Discipline	September 29, 1986
Mechanical Discipline	November 29, 1985
Electrical Discipline	March 28, 1986

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of Oct. 30, 1987.

Chemical	July 24, 1985
Electrical	January 14, 1985
Mechanical	November 21, 1984

Board of Patent Appeals and Interferences
Decisions Rendered in Ex Parte Appeals
During the Month of Oct. 1987.

Affirmed	202
Affirmed-in-Part	44
Reversed	123
Total Decided	369

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 27, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,484,359 through 4,485,488

Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . \$ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) \$ 225.00
By other than a small entity \$ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 \$ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) \$ 55.00
By other than a small entity \$ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is

shown to the satisfaction of the Commissioner to have been unavoidable \$ 500.00"

Notice of Expiration of Patents
Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 13,
1987, DUE TO FAILURE TO PAY
MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,403,355	06/390,999	9/13/83
4,403,358	06/328,602	9/13/83
4,403,362	06/222,007	9/13/83
4,403,368	06/347,573	9/13/83
4,403,370	06/295,093	9/13/83
4,403,375	06/395,621	9/13/83
4,403,384	06/223,950	9/13/83
4,403,390	06/234,345	9/13/83
4,403,397	06/282,783	9/13/83
4,403,398	06/328,926	9/13/83
4,403,401	06/296,387	9/13/83
4,403,407	06/270,616	9/13/83
4,403,409	06/235,260	9/13/83
4,403,415	06/263,554	9/13/83
4,403,417	06/385,063	9/13/83
4,403,426	06/287,306	9/13/83
4,403,433	06/334,434	9/13/83
4,403,438	06/264,102	9/13/83
4,403,441	06/284,942	9/13/83
4,403,443	06/425,449	9/13/83
4,403,444	06/327,975	9/13/83
4,403,446	06/282,946	9/13/83
4,403,451	06/323,561	9/13/83
4,403,453	06/313,577	9/13/83
4,403,454	06/259,300	9/13/83
4,403,455	06/252,923	9/13/83
4,403,457	06/232,399	9/13/83
4,403,459	06/228,815	9/13/83
4,403,461	06/235,994	9/13/83
4,403,469	06/365,282	9/13/83
4,403,478	06/362,355	9/13/83
4,403,480	06/231,018	9/13/83
4,403,483	06/339,364	9/13/83
4,403,487	06/308,063	9/13/83
4,403,488	06/263,707	9/13/83
4,403,491	06/317,131	9/13/83
4,403,492	06/330,937	9/13/83
4,403,499	06/319,253	9/13/83
4,403,503	06/319,260	9/13/83
4,403,506	06/310,933	9/13/83
4,403,507	06/297,639	9/13/83
4,403,509	06/275,874	9/13/83
4,403,521	06/277,457	9/13/83
4,403,532	06/305,126	9/13/83
4,403,543	06/374,354	9/13/83
4,403,545	06/337,581	9/13/83
4,403,548	06/295,572	9/13/83
4,403,550	06/291,182	9/13/83
4,403,552	06/328,932	9/13/83
4,403,554	06/259,276	9/13/83
4,403,556	06/269,409	9/13/83
4,403,564	06/239,382	9/13/83
4,403,569	06/335,372	9/13/83
4,403,570	06/338,469	9/13/83
4,403,571	06/328,893	9/13/83
4,403,573	06/363,338	9/13/83

Patent Number	Serial Number	Issue Date	4,404,058	06/366,974	9/13/83
4,403,574	06/272,673	9/13/83	4,404,061	06/293,752	9/13/83
4,403,575	06/293,884	9/13/83	4,404,069	06/358,771	9/13/83
4,403,577	06/217,993	9/13/83	4,404,077	06/355,853	9/13/83
4,403,580	06/218,427	9/13/83	4,404,078	06/349,764	9/13/83
4,403,595	06/269,698	9/13/83	4,404,094	06/394,718	9/13/83
4,403,600	06/327,955	9/13/83	4,404,100	06/374,973	9/13/83
4,403,602	06/355,977	9/13/83	4,404,101	06/376,103	9/13/83
4,403,604	06/378,004	9/13/83	4,404,104	06/301,154	9/13/83
4,403,615	06/330,568	9/13/83	4,404,113	06/301,735	9/13/83
4,403,616	06/271,984	9/13/83	4,404,135	06/405,975	9/13/83
4,403,638	06/370,304	9/13/83	4,404,152	06/431,484	9/13/83
4,403,640	06/282,728	9/13/83	4,404,156	06/289,117	9/13/83
4,403,641	06/296,430	9/13/83	4,404,165	06/253,806	9/13/83
4,403,643	06/276,431	9/13/83	4,404,184	06/458,892	9/13/83
4,403,644	06/419,728	9/13/83	4,404,190	06/341,437	9/13/83
4,403,646	06/415,588	9/13/83	4,404,191	06/322,557	9/13/83
4,403,669	06/340,275	9/13/83	4,404,208	06/393,803	9/13/83
4,403,672	06/269,783	9/13/83	4,404,209	06/393,804	9/13/83
4,403,674	06/321,068	9/13/83	4,404,228	06/341,184	9/13/83
4,403,675	06/416,506	9/13/83	4,404,243	06/404,766	9/13/83
4,403,697	06/220,828	9/13/83	4,404,244	06/437,092	9/13/83
4,403,701	06/249,080	9/13/83	4,404,250	06/422,041	9/13/83
4,403,703	06/231,901	9/13/83	4,404,267	06/371,879	9/13/83
4,403,714	06/329,305	9/13/83	4,404,286	06/351,073	9/13/83
4,403,716	06/382,129	9/13/83	4,404,298	06/337,020	9/13/83
4,403,724	06/252,414	9/13/83	4,404,305	06/349,214	9/13/83
4,403,725	06/241,009	9/13/83	4,404,307	06/396,257	9/13/83
4,403,730	06/270,889	9/13/83	4,404,313	06/297,549	9/13/83
4,403,731	06/357,648	9/13/83	4,404,320	06/292,187	9/13/83
4,403,734	06/227,521	9/13/83	4,404,360	06/317,119	9/13/83
4,403,740	06/261,062	9/13/83	4,404,368	06/234,788	9/13/83
4,403,743	06/270,124	9/13/83	4,404,370	06/323,576	9/13/83
4,403,747	06/233,920	9/13/83	4,404,371	06/334,590	9/13/83
4,403,760	06/272,657	9/13/83	4,404,382	06/362,447	9/13/83
4,403,763	06/293,584	9/13/83	4,404,386	06/272,865	9/13/83
4,403,764	06/309,711	9/13/83	4,404,387	06/362,446	9/13/83
4,403,765	06/264,365	9/13/83	4,404,391	06/249,983	9/13/83
4,403,767	06/220,453	9/13/83	4,404,396	06/338,492	9/13/83
4,403,771	06/258,798	9/13/83	4,404,397	06/221,130	9/13/83
4,403,774	06/277,861	9/13/83	4,404,399	06/431,532	9/13/83
4,403,776	06/257,920	9/13/83	4,404,432	06/299,482	9/13/83
4,403,782	06/229,694	9/13/83	4,404,433	06/253,107	9/13/83
4,403,784	06/227,418	9/13/83	4,404,435	06/328,379	9/13/83
4,403,790	06/230,232	9/13/83	4,404,450	06/338,391	9/13/83
4,403,797	06/355,980	9/13/83	4,404,453	06/300,991	9/13/83
4,403,798	06/273,998	9/13/83	4,404,465	06/292,016	9/13/83
4,403,811	06/220,700	9/13/83	4,404,472	06/334,845	9/13/83
4,403,815	06/224,305	9/13/83	4,404,515	06/278,451	9/13/83
4,403,851	06/293,539	9/13/83	4,404,526	06/230,397	9/13/83
4,403,856	06/413,977	9/13/83	4,404,533	06/362,997	9/13/83
4,403,864	06/369,149	9/13/83	4,404,543	06/289,480	9/13/83
4,403,876	06/304,527	9/13/83	4,404,550	06/251,931	9/13/83
4,403,879	06/261,324	9/13/83	4,404,564	06/346,766	9/13/83
4,403,880	06/243,624	9/13/83	4,404,585	06/309,721	9/13/83
4,403,881	06/283,879	9/13/83	4,404,604	06/254,326	9/13/83
4,403,883	06/301,182	9/13/83	4,404,606	06/259,624	9/13/83
4,403,903	06/303,727	9/13/83	4,404,607	06/265,076	9/13/83
4,403,914	06/282,524	9/13/83	4,404,619	06/349,827	9/13/83
4,403,919	06/306,953	9/13/83	4,404,622	06/355,844	9/13/83
4,403,923	06/262,925	9/13/83	4,404,629	06/228,441	9/13/83
4,403,929	06/229,852	9/13/83	4,404,634	06/257,921	9/13/83
4,403,940	06/315,843	9/13/83	4,404,669	06/341,144	9/13/83
4,403,948	06/243,335	9/13/83	4,404,674	06/282,319	9/13/83
4,403,957	06/375,766	9/13/83			
4,403,961	06/339,004	9/13/83			
4,403,962	06/329,762	9/13/83			
4,403,966	06/252,671	9/13/83			
4,403,967	06/304,262	9/13/83			
4,403,979	06/268,426	9/13/83			
4,403,992	06/307,386	9/13/83			
4,404,019	06/328,719	9/13/83			
4,404,021	06/399,550	9/13/83			
4,404,027	06/350,439	9/13/83			
4,404,028	06/257,778	9/13/83			
4,404,038	06/319,909	9/13/83			
4,404,045	06/261,940	9/13/83			
4,404,055	06/259,761	9/13/83			

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,538,872, Re. S.N. 053,657, Filed May 26, 1987, Cl. 339/97P. ELECTRICAL CONTACT FOR TERMINATING INSULATED CONDUCTORS, Weldon L. Brubaker, et al., Owner of Record: Molex, Inc., Lisle, Ill., Attorney or Agent: Louis A. Hecht, Ex. Gp.: 322

4,546,048, Re. S.N. 047,238, Filed May 7, 1987, Cl. 428/460, COMPOSITE THERMAL SHIELD FOR ENGINE COMPONENTS, William D. Guenther, Owner of Record: Dana Corp., Toledo, Ohio, Attorney or Agent: Frank B. McDonald, Ex. Gp.: 154

4,548,375, Re. S.N. 102,400, Filed Sept. 29, 1987, Cl. 248/205.2, HOLDER FOR ALL ITEMS AND THE LIKE, Ernest Moss, Owner of Record: Inventor, Attorney or Agent: Edwin D. Schindler, Ex. Gp.: 355

4,548,449, Re. S.N. 110,375, Filed Oct. 20, 1987, Cl. 439/641, LAMP SOCKET ATTACHMENT, John A. Corsetti, Owner of Record: Dennis L. Johnson, Jensen Beach, Fla., Attorney or Agent: John A. Clifford, et al., Ex. Gp.: 322

4,574,975, Re. S.N. 105,122, Filed Oct. 6, 1987, Cl. 220/306, RESEALABLE CONTAINER CLOSURE, Robert L. Taylor, et al., Owner of Record: Reynolds Metals Co., Richmond, Va., Attorney or Agent: Robert C. Lyne, Jr., et al., Ex. Gp.: 241

4,577,956, Re. S.N. 043,400, Filed Apr. 28, 1987, Cl. 355/40, PROCESS FOR THE CHAOTIC FILMING OF DOCUMENTS AND DEVICE FOR THE COMPLETION THEREOF, Rolf Klosterhuber, et al., Owner of Record: Inventor, Attorney or Agent: John H. Mion, et al., Ex. Gp.: 211

4,583,978, Re. S.N. 108,768, Filed Oct. 15, 1987, Cl. 604/208, SYRINGE, Michael Porat, et al., Owner of Record: Inventor, Attorney or Agent: Donald L. Dennison, et al., Ex. Gp.: 336

4,608,344, Re. S.N. 107,763, Filed Oct. 9, 1987, Cl. 436/34, METHOD FOR THE DETERMINATION OF SPECIES IN SOLUTION WITH AN OPTICAL WAVE-GUIDE, Timothy J. N. Carter, et al., Owner of Record: Battelle Memorial Institute, Geneva, Switzerland, Attorney or Agent: Herbert Dubno, et al., Ex. Gp.: 134

4,617,419, Re. S.N. 108,436, Filed Oct. 14, 1987, Cl. 568/464, PROCESS FOR PREPARING NATURAL BENZALDEHYDE AND ACETALDEHYDE NATURAL BENZALDEHYDE AND ACETALDEHYDE COMPOSITIONS PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC UTILITIES THEREFOR, Charles Wiener, et al., Owner of Record: Interntional Flavors and Fragrances, Inc., New York, N.Y., Attorney or Agent: Harold Haidt, et al., Ex. Gp.: 126

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,942,680, Reexam. No. 90/001,362, Requested: Oct. 28, 1987, Cl. 220/324, SPRAY PAINT CONTAINER AND ATTACHMENT THEREFOR, Larry E. & Edward H. Seeley, Owner of Record: Inventors, Binghamton, N.Y. & Great Bend, Pa., Attorney or Agent: Unknown, Ex. Gp.: 240, Requester: Owners

4,433,446, Reexam. No. 90/001,364, Requested: Oct. 30, 1987, Cl. 4/378, FLUSH VALVE ATTACHMENT SYSTEM, Ronald N. Grimstad, Owner of Record: Kohler Co., Kohler, Wis., Attorney or Agent: Quarles & Brady, Ex. Gp.: 240, Requester: Owner

4,480,214, Reexam. No. 90/001,359, Requested: Oct. 26, 1987, Cl. 315/290, STARTER FOR GASEOUS DISCHARGE LAMP, Gregory L. Sodini, Owner of Record: FL Industries, Livingston, N.J., Attorney or Agent: Carella, Byrne, et al., Ex. Gp.: 260, Requester: Owner

4,602,648, Reexam. No. 90/001,360, Requested: Oct. 28, 1987, Cl. 132/007, PRE-SHAMPOO NORMALIZER FOR A HAIR STRAIGHTENING SYSTEM, Ali N. Syed, et al., Owner of Record: Soft Sheen Products, Inc., Chicago, Ill., Attorney or Agent: Allegretti, Newitt, et al., Ex. Gp.: 330, Requester: Owner

4,654,007, Reexam. No. 90/001,361, Requested: Oct. 26, 1987, Cl. 433/236, PORCELAIN DENTAL RESTORATION METHOD, Roger M. Sigler, et al., Owner of Record: Myron International, Inc., Kansas City, Kans. Attorney or Agent: John M. Collins, Ex. Gp.: 330, Requester: Owner

4,680,836, Reexam. No. 90/001,363, Requested: Oct. 30, 1987, Cl. 24/150 OFF, ONE-PIECE PLASTIC FASTENER, David R. Wisecup, Owner of Record: Monarch Marking Systems, Inc., Dayton, Ohio, Attorney or Agent: Joseph J. Grass, Ex. Gp.: 350, Requester: Dennison Mfg. Co., Framingham, Mass.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Executive One, Inc., Seal Beach, Calif., Reg. No. 1,255,173, for the mark "SCREEN-PAINTER", Canc. No. 15,881.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Public Evaluation of PTO Automated Patent Searching

The PTO plans to conduct a limited public evaluation of its Automated Patent System (APS) text and image searching capabilities from Jan. 1988 to June 1988. The Office will make available to selected participants, access to APS search system capabilities in its facilities at Arlington, Va. Participants will be selected by the PTO based upon frequency of use of the PTO's patent Public Search Room; variety of searches performed (e.g., pre-application, validity, infringement, state-of-the-art, and applied technology); familiarity and expertise in using commercial automated text search systems; ability to take a 12 to 16 hour training course in APS search techniques, willingness to complete data collection forms and participate in debriefing interviews; and willingness to use APS search capabilities in the course of their day-to-day work.

Persons who wish to be considered for participation in the evaluation should complete a Nomination Form,

available from the Manager of the patent Public Search Room, or from the address given below. Completed Nomination Forms should be sent to the following address, and must be received within two calendar weeks of the date of this publication, or by Dec. 11, 1987, whichever is the later date. Participants will be notified of their selection by Jan. 1, 1988, if possible. APS training classes are scheduled to begin on Jan. 4, 1988 and Jan. 11, 1988. Approximately 20 participants will attend each training class.

Request for additional information and/or Nomination Forms should be directed to:

L. Liddle
Office of the Administrator for Automation
U.S. Patent and Trademark Office
Crystal Park 2, Suite 1002
Washington, D.C. 20231

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Washington, D.C. 20231
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CP2-6C07

The request must contain the following information about each allowed application for which simultaneous issue is requested:

- (1) serial number
- (2) filing date
- (3) name(s) of inventor(s)
- (4) title of invention
- (5) date of allowance
- (6) batch number

Separate copies of the request must accompany each Issue Fee Transmittal (PTO-85b).

Questions concerning this practice may be directed to Mr. Stanley J. Bania, Director, Office of Publications, Area Code (703) 557-3794.

This notice supersedes the notice published on Aug. 25, 1978, at 974 O.G. 16.

Nov. 9, 1987.
THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 1, 1987

Re. 31,144	4,642,567	4,668,987	4,680,440
Re. 32,447	4,642,632	4,669,211	4,680,943
D. 291,125	4,642,721	4,669,512	4,681,052
4,266,985	4,643,058	4,670,039	4,681,101
4,351,396	4,644,032	4,670,125	4,681,322
4,361,060	4,646,030	4,670,293	4,681,351
4,459,677	4,647,437	4,670,802	4,681,424
4,486,750	4,649,160	4,670,879	4,681,582
4,513,272	4,650,547	4,670,984	4,681,698
4,526,988	4,652,168	4,671,370	4,681,902
4,539,393	4,652,454	4,672,533	4,682,037
4,551,239	4,653,328	4,673,758	4,682,186
4,575,029	4,654,422	4,674,226	4,682,247
4,583,391	4,655,193	4,674,280	4,682,668
4,594,529	4,656,207	4,674,331	4,682,897
4,596,567	4,656,467	4,674,373	4,682,933
4,601,234	4,657,649	4,674,509	4,683,050
4,604,382	4,657,744	4,674,789	4,683,219
4,605,602	4,657,915	4,674,991	4,683,496
4,606,726	4,658,373	4,675,133	4,683,524
4,612,880	4,659,135	4,675,176	4,683,550
4,616,594	4,659,373	4,675,491	4,684,035
4,622,427	4,659,380	4,675,532	4,684,080
4,623,531	4,659,561	4,675,595	4,684,123
4,624,255	4,660,032	4,675,946	4,684,155
4,627,268	4,660,322	4,676,049	4,684,392
4,629,090	4,661,323	4,676,101	4,684,457
4,629,610	4,661,640	4,676,794	4,684,458
4,629,739	4,664,557	4,676,899	4,684,789
4,630,941	4,664,676	4,677,109	4,685,256
4,631,063	4,664,997	4,677,291	4,685,355
4,631,362	4,665,055	4,677,387	4,685,733
4,633,912	4,665,699	4,677,445	4,685,755
4,634,276	4,665,937	4,678,014	4,685,856
4,634,277	4,665,983	4,679,492	4,686,065
4,637,403	4,666,636	4,679,644	4,686,170
4,639,256	4,667,798	4,679,771	4,686,658
4,639,518	4,668,342	4,679,784	4,687,088
4,641,865	4,668,382	4,680,034	4,687,505
4,642,545	4,668,947	4,680,330	4,687,879

SPECIAL BOXES FOR MAIL

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RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 24, 1987

PATENT EXAMINING GROUPS

Actual Filing Date of Oldest
New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director 9-11-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director 2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director 1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director 1-29-86

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director 2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director 10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director 2-05-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director 5-24-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director 9-06-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director 5-02-86
DESIGN, GROUP 290—K. L. CAGE, Director 1-18-85

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director 10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director 10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director 2-06-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director 1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during October 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents Numbers 3,531,806 to 3,537,106, inclusive
Plant Patents Numbers 2,991 to 2,995 inclusive

1085 OG 10

STATUTORY INVENTION REGISTRATIONS

PUBLISHED DECEMBER 1, 1987

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H376

DEGRADATION MONITOR FOR LASER OPTICS

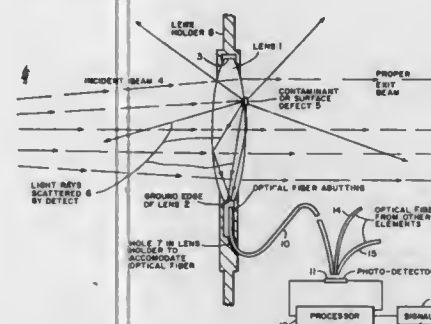
James C. Bremer, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 7, 1985, Ser. No. 784,902

Int. Cl.⁴ G01N 21/32

U.S. Cl. 356—239

6 Claims



1. A system for detecting degradation of an optical element comprising an optical detector for detecting optical emission in an area of said optical element where optical emissions are normally not present except under conditions of degradation of the optical element, and first coupling means coupling optical emissions from said area to said optical detector.

H377

RELEASEABLE ADHESIVE PADS

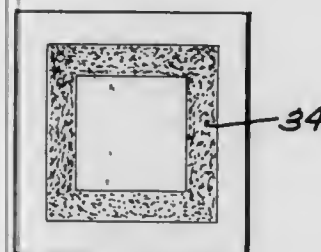
Walter G. Greig, Lewiston, N.Y., assignor to Moore Business Forms, Inc., Glenview, Ill.

Filed May 13, 1986, Ser. No. 862,825

Int. Cl.⁴ B42D 1/00

U.S. Cl. 281—2

6 Claims



1. A pad comprising:
a plurality of sheets adhered to one another by releasable adhesive, each of the plurality of sheets having the adhesive placed in more than one striplike position distributed over an underside of each sheet but which adhesive nevertheless leaves at least a portion of at least one edge of each sheet free of adhesive to facilitate removal of each sheet from the pad.

H378

SPIKED BUMPER

Isao Matsumoto, Koganei, Japan, assignor to Kioritz Corporation, Mitaka, Japan

Continuation of Ser. No. 662,499, Oct. 18, 1984, abandoned.

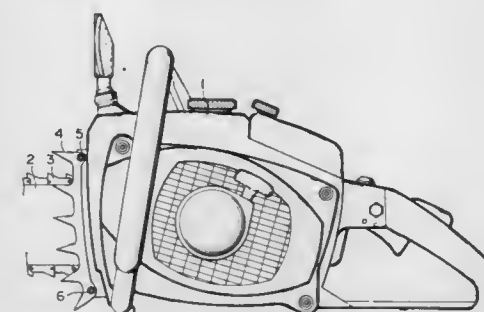
This application Jul. 18, 1986, Ser. No. 888,105

Claims priority, application Japan, Nov. 7, 1983, 58-172150[U]

Int. Cl.⁴ B23D 57/02

U.S. Cl. 30—382

5 Claims



1. An elongated spiked-bumper mounted to a forward end portion of a main body of a chain saw in a position adjacent and transverse to a guide bar for guiding a saw chain in its movement around an outer periphery of the guide bar, comprising:
a mounting reference hole formed at one longitudinal end portion of the spiked-bumper for securing the spiked-bumper to the forward end portion of the main body of the chain saw beyond one edge of the guide bar; and
at least one mounting adjusting hole formed at a lower longitudinal opposite end portion of the spiked-bumper, positioned beyond the other edge of the guide bar, said at least one mounting adjusting hole effectively extending on a short arc constituting a part of an imaginary circle which is centered at the center of the mounting reference hole for adjusting the position in which the spiked-bumper is secured to the forward end portion of the main body of the chain saw;
wherein said spiked-bumper is rotably adjustable to move said lower longitudinal opposite end portion forward for sawing smaller trees.

H379

STRAIN RELIEF AND GROUND CONNECTOR FOR SHIELDED CABLE

Harry B. Alexander, Jr., Harrisburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 24, 1986, Ser. No. 911,224

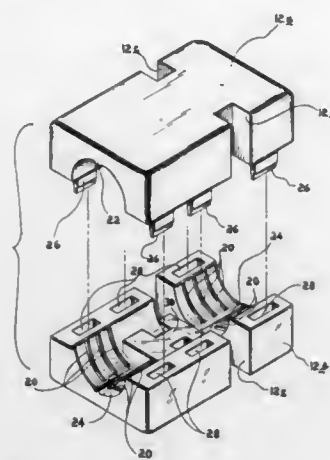
Int. Cl.⁴ H01R 13/648

U.S. Cl. 439—610

1 Claim

1. A strain relief connector for establishing an electrical connection between a grounded chassis and a location on an insulated cable having a flexible conductive shield beneath an outer layer of insulation said insulation being removed at said location said connector comprising: an electrical conductive contact engaging said shield and having a deflectible finger extending therefrom; upper and lower housing of electrical insulating material, having longitudinal and spaced radial clamping ribs with sharp edges and a raised platform in said lower housing for engaging said contact, said housings being ultrasonically bonded to each other at said location in a closed position and forming an exterior channel on opposite sides into

which said contact finger extends and a notch in said chassis for receiving the channel and positioning the upper and lower housings with respect to the chassis, the sharp edges of the ribs projecting into the insulation to secure the housings to the



cable and the platform pressing against the contact holding it against the flexible conductive shield to form an electrical contact, said finger being in contact with said chassis within said notch.

H380 TRIMMER

Yoetsu Yokocho, Ome, Japan, assignor to Kioritz Corporation, Tokyo, Japan
Continuation of Ser. No. 733,482, May 13, 1985, abandoned.
This application Sep. 30, 1986, Ser. No. 913,594
Claims priority, application Japan, May 25, 1984, 59-75930[U]

Int. Cl.⁴ B26B 7/00
U.S. Cl. 30—276

3 Claims

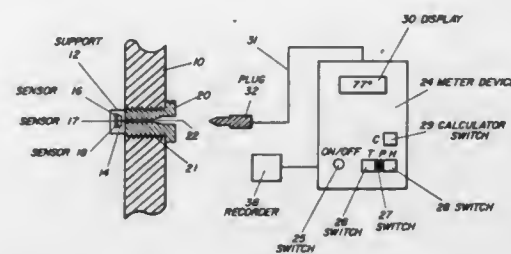


1. A trimmer comprising:
 - a hollow straight operation rod;
 - a prime mover supported at an upper end of said hollow operation rod;
 - a gear chamber supported at a lower end of said hollow operation rod to drive a cutter blade when a cutting operation is performed;
 - a flexible shaft extending through the interior of said hollow rod along substantially the full length thereof for transmitting driving power from said prime mover to said gear chamber;
 - a straight liner fitted along substantially the full length of said flexible shaft over an outer peripheral surface of said flexible shaft, said liner being spaced apart from an inner peripheral surface of said hollow operation rod by a suitable clearance along substantially the full length thereof and fixed to the hollow operation rod at both ends thereof.

H381 CONDITION MONITORING DEVICE

Stanley G. Pounds, Budd Lake, and Daniel Ramer, Kinnelon, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 16, 1986, Ser. No. 942,555
Int. Cl.⁴ G01K 1/14, 13/00; G01L 5/14
U.S. Cl. 374—142

11 Claims



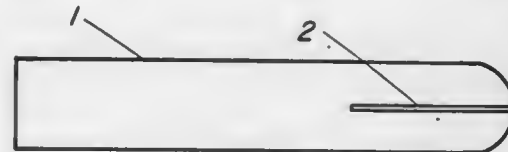
1. A multiple sensor condition monitoring device, for use with an enclosed container, comprising:
 - a sealed container;
 - a plurality of passive sensors positioned within said sensor and adapted to measure temperature, pressure, and relative humidity within said container;
 - means for inductive transmission for the activation and response of the measurement sensors;
 - meter means connected to said sensor for operating said sensors and receiving measurements therefrom; and
 - means for enabling the calculation of specific quantities of moisture in said container using the measurements from said sensor.

H382 LONG ROD PENETRATOR

William P. Keown, West Milford, N.J., and Peter N. Jones, Seven Oaks, England, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 2, 1987, Ser. No. 24,098
Int. Cl.⁴ F42B 11/14
U.S. Cl. 102—517

5 Claims



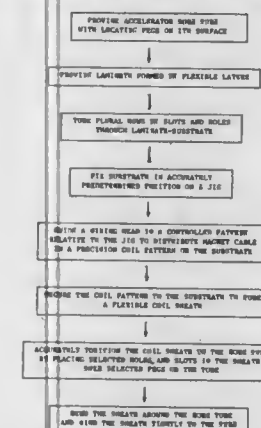
1. A penetrator for a kinetic energy projectile comprising a penetrator rod, having embedded therein, as a central core rod within said penetrator rod, a lubricator rod for providing lubrication to the penetrator as it impacts and penetrates a target.

H383
LAMINATED MAGNET FIELD COIL SHEATH
John R. Skaritka, Coram, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 15, 1987, Ser. No. 49,909
Int. Cl.⁴ H01L 39/24

- U.S. Cl. 29—599
1. A method of making a superconductor magnet trim coil assembly mounted on a bore tube for use in a superconductor supercollider particle accelerator, comprising the steps of:
 - providing a particle accelerator bore tube having a generally cylindrically outer surface for supporting thereon selected patterns of coiled superconductor magnet cable,

providing a laminated substrate formed of a layer of B-grade epoxy resin, a layer of fiberglass cloth and a layer of insulating resin tape, all of which are compatible with a cryogenic environment, forming a plurality of rows of generally circular holes through said substrate, at locations precisely predetermined thereon, and forming a plurality of rows of generally rectangular slots through said substrate, at locations precisely determined thereon, positioning precisely a predetermined number of coils of insulated superconductor cable in a selected pattern on the substrate with a substantially uniform spacing being maintained between adjacent turns of the coils, and with a precisely predetermined reference relationship being established between each coil and said holes and slots,



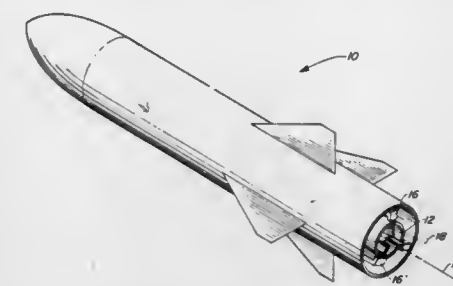
- pressing a layer of resin insulating tape over the coil pattern to secure the respective turns of the coils in the pattern in position relative to one another and to the substrate, positioning precisely a number of locating pegs at selected points on the surface of the bore tube and fastening said pegs to the bore tube surface at said points, respectively, placing the substrate on said bore tube, with the respective locating pegs being positioned through predetermined holes or slots in the substrate, thereby to precisely position the substrate and coil pattern relative to the pegs and to the bore tube,
- wrapping a layer of resin insulating tape around the substrate and the bore tube, and heating the resin tape and bore tube sufficiently to bond the substrate to the tape and aid in securing the predetermined alignment of the turns of the coil pattern with respect to the bore tube.

H384 STOWABLE THREE-AXIS REACTION-STEERING SYSTEM

Robert B. Dillinger, and Arnold O. Danielson, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 28, 1987, Ser. No. 55,810
Int. Cl.⁴ F02K 1/00

- U.S. Cl. 60—230
1. A thrust vector control apparatus for a rocket motor having an exhaust nozzle discharging an exhaust stream, said exhaust nozzle having a longitudinal axis, the apparatus comprising:
 - a vane;
 - means for mounting said vane on said exhaust nozzle for pivotal movement between a retracted position without said exhaust stream and an inserted position within said exhaust stream and for rotational movement about a rota-

tional axis generally perpendicular to said longitudinal axis;



means for pivoting said vane between said retracted position and said inserted position; and
means for rotating said vane about said rotational axis.

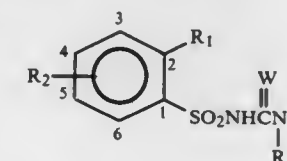
H385 SHALE COAGULATING LOW SOLIDS DRILLING FLUID

Gerard M. Bol, GD Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.
Filed Jul. 22, 1985, Ser. No. 757,236
Claims priority, application United Kingdom, Sep. 11, 1984, 8422912

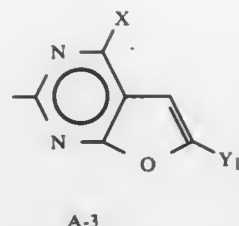
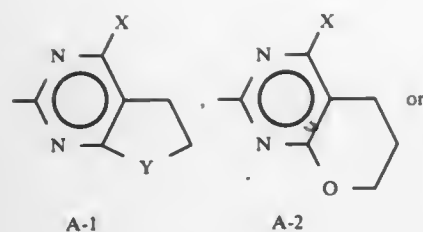
- Int. Cl.⁴ C09K 7/02
- U.S. Cl. 252—8.51
1. An aqueous drilling fluid for use in an environment in which fines are suspended therein, the drilling fluid comprising:
 - at least one polymeric component effective to increase the viscosity of the drilling fluid;
 - at least one polymeric component effective to reduce fluid loss from the drilling fluid; and
 - at least one organic polycationic polymeric component having a molecular weight in the range from 500,000 to 15,000,000 which is effective to from discrete aggregates of the fines in the drilling fluid.

H386
HERBICIDAL SULFONAMIDES
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 27, 1985, Ser. No. 769,686
Int. Cl.⁴ A01N 43/54; C07D 239/80, 491/048, 491/052
U.S. Cl. 71—92

1. A compound of the formula



wherein
W is O or S;
R is H or CH₃;
A is



X is H, CH₃, C₂H₅, OCH₃, OC₂H₅, Cl, OCF₂H, SCH₃ or N(CH₃)₂;
Y is O or CH₂;
Y₁ is H, CH₃ or C₂H₅;
R₁ is QR₃, —C≡CR₄, N₃, P(W₁)R₅R₆, —CR₇R₈R₉ or C₂—C₄ alkenyl substituted with CN, OH, NO₂ or S(O)_nR₁₀;
R₂ is H, F, Cl, Br, CF₃, CN, NO₂, C₁—C₂ alkyl, C₁—C₂ alkoxy, C₁—C₂ alkylthio, C₁—C₂ haloalkyl, C₁—C₂ haloalkoxy, C₁—C₂ haloalkylthio, C₁—C₂ alkylsulfinyl, C₁—C₂ alkylsulfonyl, CH₂OCH₃, CH₂SCH₃, C₃ alkenyloxy or C₃ alkynyloxy;
Q is O, S, SO or SO₂;
R₃ is C₁—C₄ alkyl substituted with C₁—C₂ alkoxy, C₁—C₂ alkylthio, C₁—C₂ alkylsulfinyl, C₁—C₂ alkylsulfonyl, C₁—C₂ haloalkoxy, C₁—C₂ haloalkylthio, C₁—C₂ haloalkylsulfinyl, C₁—C₂ haloalkylsulfonyl, OH, CN, NH₂, C₁—C₂ alkylamino, di(C₁—C₂)alkylamino or phenyl; or R₃ is C₂—C₄ alkenyl [optionally] substituted with the substituents mentioned above; or R₃ is C₂—C₄ alkynyl;
R₄ is H or C₁—C₂ alkyl optionally substituted with halogen, OH, C₁—C₂ alkoxy, C₁—C₂ alkylthio, C₁—C₂ haloalkoxy, CN, C₂—C₃ alkoxy carbonyl, cyclopropyl or phenyl; or R₄ is C₃—C₆ cycloalkyl or phenyl;
W₁ is O or S;
R₅ and R₆ are independently C₁—C₂ alkyl, C₁—C₂ alkoxy or C₁—C₂ alkylthio;
R₇ is H, CH₃ or halogen;
R₈ is H or CH₃;
R₉ is C(O)R₁₁ or C₁—C₂ alkyl substituted with one or more groups selected from C(O)R₁₁, CN, NO₂, C₁—C₂ haloalkoxy or C₁—C₂ haloalkylthio;
R₁₀ is C₁—C₂ alkyl;
R₁₁ is H or C₁—C₂ alkyl; and
n is 0, 1 or 2;
and their agriculturally suitable salts; provided that when R₃ is substituted with OH or NH₂, said substituents must be separated from Q by at least two carbon atoms.

H387

WAVELENGTH FILTER FOR MARINE SEISMIC CABLES

Vitold R. Kruka, and Edward R. Cadena, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1981, Ser. No. 333,524

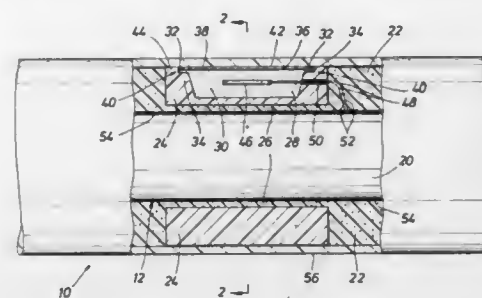
Int. Cl.⁴ H04R 1/22; G01V 1/16

U.S. Cl. 367—154

14 Claims

1. A marine seismic cable comprising: a core; a housing coupled to said core and having a cavity adapted for holding a hydrophone, said cavity being located on a first side of said housing; elastic material positioned in said cavity and extending beyond the boundary of said cavity; a hydrophone posi-

tioned in said elastic material in said cavity; and a wavelength filter positioned adjacent said elastic material to attenuate flow



noise signals having shortwave lengths relative to the wavelengths of seismic signals.

H388

APPARATUS AND METHOD FOR LOCATING TOWED SEISMIC FLOATS

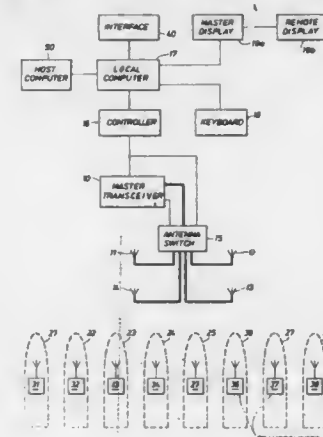
Joseph P. Lloyd, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1984, Ser. No. 687,630

Int. Cl.⁴ G01V 1/38; G01S 3/80

U.S. Cl. 367—19

5 Claims



1. A method of locating a towed object relative to a towing vessel, comprising:
independently determining a plurality of individual ranges from corresponding known preselected locations on said vessel to said towed object; and
determining the point of intersection of said plurality of ranges.

H389

FLUID REFRACTION OPTICAL PATH PHASE CORRECTION

Lamar F. Moon, Agoura, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 6, 1986, Ser. No. 816,610

Int. Cl.⁴ H01S 3/22, 3/095

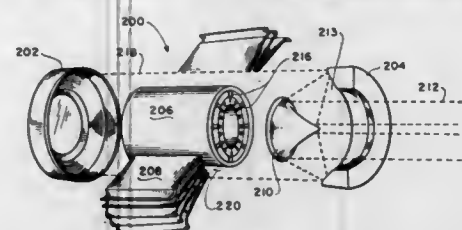
U.S. Cl. 372—58

43 Claims

1. A method for correcting phase aberrations across the spatial distribution of a stimulated emission optical energy beam comprising the steps of:

transmitting said energy beam through a flow of mixed high optical refraction first gas and lower optical refraction second gas, having spatially distributed regions of differing thickness each proportional to the amount of phase correction needed at the corresponding spatial regions of a cross-section of said energy beam; and

selecting the amount of said first gas and the amount of said second gas in said flow of mixed gases in response to the



amount of phase correction needed in a predetermined portion of said beam cross-section.

H390

SELF-ALIGNED GATE MESFET AND THE METHOD OF FABRICATING SAME

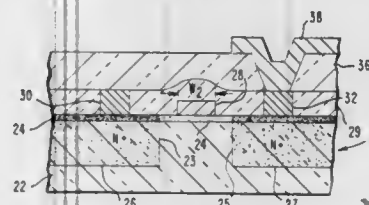
Robert E. Lee, Thousand Oaks, and Harold M. Levy, Los Angeles, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 505,148, Jun. 17, 1983. This application May 28, 1986, Ser. No. 869,854

Int. Cl.⁴ H01L 29/80, 29/36, 29/48

U.S. Cl. 357—22

8 Claims



1. A MESFET device comprising:
a substrate of semi-insulating III-V semiconductor material;
a doped active channel layer of III-V semiconductor material containing impurities of a selected conductivity type formed in a surface portion of said substrate;
first and second doped regions containing a heavier concentration of impurities of said selected conductivity type formed in said substrate at respective locations adjacent opposite ends of said channel layer;
a gate electrode contacting at least a portion of said active channel layer and positioned on said substrate surface between said first and second doped regions, the edges of said gate electrode being spaced from the respective edges of said first and second doped regions by a distance of from about 1000 Å to about 2000 Å, whereby a selected optimal ratio of parasitic source resistance to parasitic gate capacitance is achieved;
a layer of dielectric material formed on the surface of said substrate and overlying said gate electrode and said first and second doped regions; and
first and second ohmic contacts extending through said dielectric layer and electrically contacting said first and second doped regions.

H391

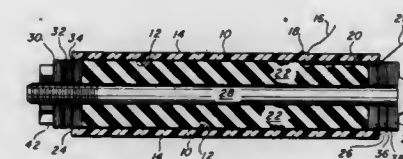
PIEZOELECTRIC POLYMER HYDROPHONE

Theodore A. Henriquez, and Allan C. Tims, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Continuation of Ser. No. 526,252, Aug. 25, 1983, abandoned.
This application Jun. 23, 1986, Ser. No. 877,708

Int. Cl.⁴ H04R 17/00

U.S. Cl. 367—159

1 Claim



1. A hydrophone, comprising:
a tube of outside diameter of approximately 1.2 cm comprising piezoelectric polyvinylidene, the wall thickness of which is substantially 0.05 cm;
an electrode of copper metal deposited on the exterior surface of said tube;
an electrode of copper metal deposited on the interior surface of said tube;
an elastomeric core with a central axial passage fitted within said tube, which core is composed of neoprene with Shore A hardness not exceeding 90 durometer; and
means for axially compressing said core to cause radial compression of said core against said tube.

H392

MICROWAVE WAVEGUIDE MANIFOLD AND METHOD

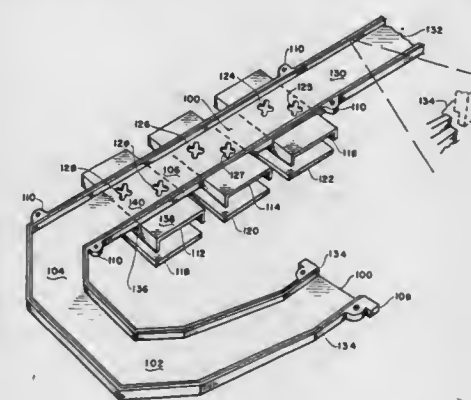
John H. Staehlin, Lutherville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 9, 1987, Ser. No. 36,524

Int. Cl.⁴ H01P 5/12

U.S. Cl. 333—114

10 Claims



1. Microwave radio frequency waveguide manifold apparatus comprising the combination of:
a first microwave energy transmitting metallic waveguide member having a first unitary metal body portion of predetermined first cross sectional shape and a first metal closure member matable with said first body portion to form a first closed cross section waveguide;
a second microwave energy transmitting metallic waveguide member having a second unitary metal body portion of predetermined second cross sectional shape disposed adjacent and angularly crossover intersecting of said first waveguide first cross sectional shape, said second waveguide member also including a second

metal closure member matable with said second body portion to form a second closed cross section waveguide; and aperture means, of predetermined shape, size and waveguide residence location, communicating between said first and second waveguide cross sectional shapes through a crossover region common to each said waveguide for conveying microwave energy of predetermined electrical signal relationship between said waveguides; said first and second waveguide body portions and said crossover region common thereto comprising a unitary single common piece of electrically conductive metal; whereby said predetermined electrical signal relationship within said waveguides is achieved and maintained free of inter-waveguide mechanical dimension variables including fitting tolerances, joining technique allowances, fillet variations, and fusing metal gaps.

H393

TELEVISION TEST SIGNAL GENERATOR

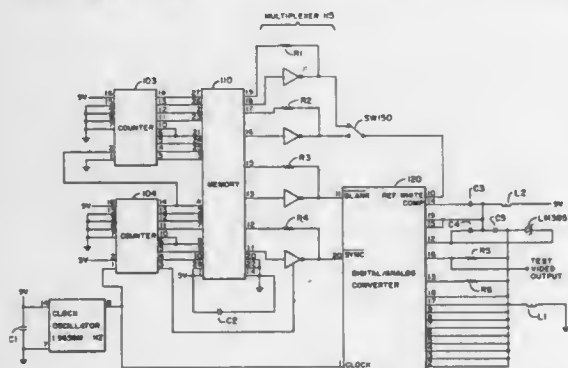
Carolyn S. Burt, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 18, 1987, Ser. No. 57,134

Int. Cl.⁴ H04N 17/00

U.S. Cl. 358—139

3 Claims



1. A television test generator comprising a clock means having an output, a counter having an input and an output, said input of said counter being connected to the output of the said clock means, and Erasable Programmable Read Only Memory (EPROM) having inputs and outputs, said EPROM having its inputs connected to the outputs of said counter means, a digital to analog converter having inputs connected to the outputs of the said EPROM whereby outputs of said converter will generate test video signals.

H394

FLEXIBLE COUPLING DEVICE WITH ELECTRICAL BONDING FOR METALLIC DUCTS

Neil J. Cleaton, St. Charles, Mo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 12, 1987, Ser. No. 68,000

Int. Cl.⁴ H05F 3/02; F16L 11/12

U.S. Cl. 361—215

4 Claims

1. A fluid coupling and electrical bonding device for joining sections of metallic ducting, said device comprising: a sleeve having a cylindrical wall formed of flexible elasto-

meric material, said sleeve having a predetermined length and defining a lumen for receiving ends of duct sections to be joined;

a strip of electrically conductive wire mesh, said strip being longer than said predetermined length and having its



central portion embedded in said material so that extra length portions of said strip extend beyond said central portion at each end of said sleeves; and said extra length portions of said strip being adapted to be bent inwardly of said lumen for engagement with the duct ends when joined by said device.

H395

PROCESS FOR MEASURING THE ELECTRICAL PROPERTIES OF LIQUIDS AND GRANULAR SUBSTANCES

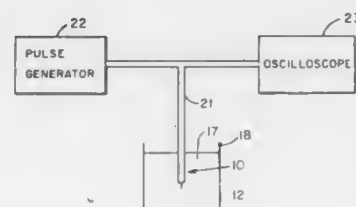
Thomas F. Nash, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 24, 1987, Ser. No. 70,770

Int. Cl.⁴ G01R 27/04, 27/26

U.S. Cl. 324—58.5 B

3 Claims



1. A process for determining the electrical characteristics of a material, comprising

- inserting a probe into the material, said probe being made up of a tubular outer conductor and an inner conductor coaxial with the outer conductor, said conductors being separated by a layer of insulating substance, said outer conductor and insulated substance terminating short of the end of the inner conductor to leave a portion of the inner conductor exposed;
- transmitting an electrical pulse along the probe to establish an electrical field between the exposed portion of the inner conductor and the outer surface of the outer conductor and generate a reflected wave attenuated by the electrical characteristics of the material, and
- displaying the reflected wave to observe said attenuation.

REISSUES

DECEMBER 1, 1987

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,551

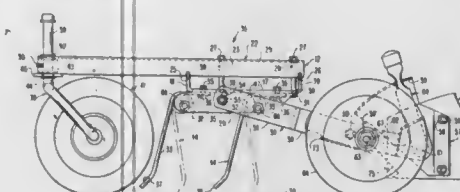
PUSHED DETHATCHING UNIT

Charles W. Doering, Louisville, Ky., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.
Original No. 4,317,327, dated Mar. 2, 1982, Ser. No. 189,030, Sep. 22, 1980, Application for reissue Jul. 15, 1983, Ser. No. 513,821

Int. Cl.⁴ A01D 7/06, 76/00

U.S. Cl. 56—396

60 Claims



1. A pushed dethatching unit for removing thatch material from a layer of thatch and including:

- frame means;
- wheel means supported adjacent the front end of said frame means to support said frame means;
- said frame means having at least one row of tines mounted thereon, each of said tines in each of said rows being non-rotary;
- each of said tines in each of said rows of said tines being offset in the direction of motion of said dethatching unit from each of said tines in each of said other rows of said tines when there is more than one of said rows of said tines;
- each of said tines having a lower portion terminating in a tip for engaging the material to be thatched;
- and support means supported adjacent the rear end of said frame means to attach said frame means to pushing means, said support means and said wheel means cooperating to suspend the [bottom] tip of said lower portion of each of said tines above the ground so that no weight is applied to any of said tines when said dethatching unit is at rest, and each of said tines having the [bottom] tip of said lower portion beneath the point of attachment of said support means to the pushing means at all times [];
- said tines extending downwardly and forwardly from said frame means with each said tip disposed above the ground such that forward motion of said pushed dethatching unit causes said tine tips to deflect downwardly and rearwardly, upon contact with grass, and into contact with thatch material to tear contacted material loose from a layer of thatch. 30

The questions raised in reexamination request No. 90/000,405, filed 06/20/83, have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 U.S.C. 307 as provided in 37 CFR 1.570(e).

Re. 32,552

GASEOUS IMPURITY DETECTOR EMPLOYING CORONA DISCHARGE PHENOMENON

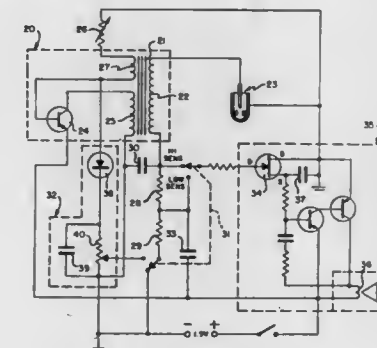
Leonard Lieberman, 2644 Ellentown Rd., La Jolla, Calif. 92037, and Stanley H. Lai, 4164 Hill St., San Diego, Calif. 92107

Original No. 3,742,475, dated Jun. 26, 1973, Ser. No. 124,794, Mar. 16, 1971, Application for reissue Nov. 14, 1980, Ser. No. 206,727

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340—632

5 Claims



10. Apparatus for detecting halogen impurities in an ambient atmosphere comprising:

- an asymmetrical electrode pair disposable in such ambient atmosphere;
- a source of voltage pulses connected to the electrode pair, the voltage of said pulses being sufficient to cause a negative corona discharge across the electrode pair in the continuous corona region; and
- means for indicating the mean corona current of said discharge, which is representative of the concentration of such impurity; wherein
- said indicating means includes an R-C circuit in series with the electrode pair for providing an output voltage proportional to the time-average discharge current, said source of voltage pulses being connected to the electrode pair to produce a negative corona discharge thereacross;
- said asymmetrical electrode pair includes a pointed electrode disposed opposite a substantially hemispherical electrode provided with openings to admit the atmosphere under test into the corona region; and
- said source of voltage pulses includes a blocking oscillator having an output transformer, said output transformer including an output winding, one side of said output winding being connected in circuit with the pointed electrode and the other side of said output winding being connected in circuit with the substantially hemispherical electrode through said R-C circuit.

PLANT PATENTS

GRANTED DECEMBER 1, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,047

VARIETY OF NAVEL ORANGE TREE

Hermias C. Nieuwoudt, The Farm Korhaanshoogte, Citrusdal,
Cape Province, South Africa

Filed Apr. 13, 1983, Ser. No. 484,597

Claims priority, application South Africa, Apr. 13, 1982, PT
263

Int. Cl.⁴ A01H 5/03

U.S. Cl. Plt.—45

1 Claim

1. A novel variety of navel orange tree substantially as shown and described, characterized by a firm, late-ripening fruit of slightly lighter than normal color with a thin peel which is not prone to splitting.

6,048

ALSTROEMERIA NAMED STALSAM

Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staaven B.V., Aalsmeer, Netherlands

Filed Dec. 6, 1985, Ser. No. 806,264

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. The new and distinctive Alstroemeria plant, substantially as herein shown and described, distinguished by its unique color combination of its large lower petals and the contrasting coloring and the short pencil stripes spread over the length of its upper petals.

6,049

CARNATION NAMED "ELINOR"

Giacomo Nobbio, San Remo, Italy, assignor to Klemm & Sohn,
Stuttgart, Fed. Rep. of Germany

Filed Nov. 1, 1985, Ser. No. 794,223

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—72

1 Claim

1. A new and distinct variety of carnation plant, substantially as herein shown and described, characterized by its high productivity of deep pink flowers supported singly on a sturdy, upright peduncle, flowers being characterized by having a deep pink color.

6,050

CHRYSANTHEMUM PLANT NAMED KARDO

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers,
Inc., Barberton, Ohio

Filed Oct. 10, 1985, Ser. No. 786,001

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct Chrysanthemum plant named Kardo,

as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; yellow-orange ray floret color; diameter across face of capitulum of up to 11 cm at maturity; uniform nine week photoperiodic flowering response to short days; tall plant height when grown single stem; 18 to 33 cm peduncles on open, normally terminal sprays; slow development of green discs; and 13° C. minimum temperature tolerance for initiation and development of flowering buds with a 12 to 13 hour continuous dark period.

6,051

CHRYSANTHEMUM PLANT NAMED CALVEX

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers,
Inc., Barberton, Ohio

Filed Oct. 10, 1985, Ser. No. 786,000

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—79

1 Claim

1. A new and distinct Chrysanthemum plant named Calvex, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; greyed-orange ray floret color; diameter across face of capitulum of up to 9 cm at maturity; uniform nine to ten week photoperiodic flowering response to short days; tall plant height when grown single stem; 20 to 25 cm peduncles on open, normally terminal sprays; and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

6,052

CHRYSANTHEMUM PLANT NAMED ZILCON

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers,
Inc., Barberton, Ohio

Filed Oct. 10, 1985, Ser. No. 786,002

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—80

1 Claim

1. A new and distinct plant of *Dentranthema morifolium*, Ramat., named Zilcon, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; very light red-purple ray floret color; diameter across face of capitulum ranging from 6 to 8 cm. at maturity; uniform nine week flowering response; tall plant height when grown single stem; 25 to 30 cm. peduncles on open, normally terminal sprays; and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

PATENTS

GRANTED DEC. 1, 1987

ERRATA

For CLASS	See PATENT NO.
437-005	4,709,466
437-030	4,709,467
437-209	4,709,468
437-063	4,709,469
109-021	4,709,659
439-078	4,709,973
439-345	4,709,974
439-350	4,709,975
439-350	4,709,976
065-004	4,710,216
437-040	4,710,234
437-162	4,710,241
437-228	4,710,264
437-029	4,710,265
512-020	4,710,316
437-235	4,710,398
437-245	4,710,399
379-424	4,710,596
238-380	4,710,614
382-056	4,710,938

PATENTS

GRANTED DECEMBER 1, 1987

GENERAL AND MECHANICAL

4,709,419

COVER GARMENT WITH INNER GARMENT ACCESS OPTION

Lynn E. Heyn, Woodstock; Malcolm L. Johnson, Atlanta, and Daniel O. Fischer, Waleska, all of Ga., assignors to Kimberly-Clarke Corporation, Neenah, Wis.

Filed Aug. 27, 1984, Ser. No. 644,297

Int. Cl.⁴ A41D 27/12, 27/20

U.S. Cl. 2-46

7 Claims



1. A cover garment with inner garment access option means comprising,

- (a) a cover garment adapted to be worn over inner, clothing to which access may be required, said garment providing protection against contamination, and
- (b) means in said cover garment for forming hand holes in said cover garment adjacent at least one area of said inner garment to which access may be desired, said means comprising a weakened line of dimensions to allow the wearer's hand to pass through when opened, whereby the wearer may have the option of either maintaining the garment substantially free from access openings or, by applying stress to the weakened line, providing access to said inner garment.

4,709,420

SHAMPOO CAPE WITH SPLASH GUARD

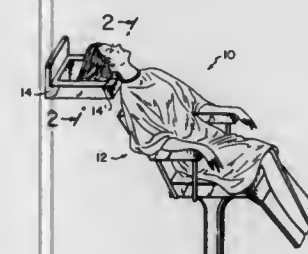
Lillian Gettinger, Boca Raton, Fla., assignor to Andre Fantasies, Inc., Ft. Lauderdale, Fla.

Filed Feb. 9, 1987, Ser. No. 12,289

Int. Cl.⁴ A41D 13/04

U.S. Cl. 2-50

11 Claims



1. A shampoo cape comprising a panel made of water impermeable material and having a neck opening surrounded by a neckband having an extension at one end thereof, said panel defining a front portion and a rear portion including right and left shoulder portions draping the user when the user's neck is received through said neck opening, said right and left shoulder portions defining a parting or separation line; and a capelette made of water impermeable material attached to said panel in the region of said neck opening and to said neckband including its extension and generally extendable over at least portions of said rear right and left shoulder portions to bridge said parting or separation line and substantially overlap said rear right and left shoulder portions, said capelette being adapted to be received within sink into which the user's hair is placed to be washed or shampooed when the user sits in a chair and reclines rearwardly to place the hair into the sink to thereby deflect water from the hair directly into the sink and substantially prevent water from impinging on said rear right and left shoulder portions, said front portion and the user's chair.

4,709,421

FIREFIGHTER'S COAT

William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417

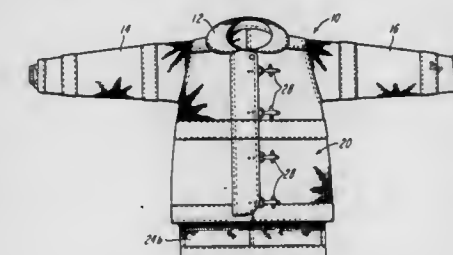
Continuation of Ser. No. 733,195, May 13, 1985, Pat. No. 4,627,112. This application Dec. 1, 1986, Ser. No. 936,620

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.⁴ A41D 1/02, 13/00

U.S. Cl. 2-81

3 Claims



1. An improved firefighter's coat adapted for use with firefighter's pants extending downwardly from the waist of the firefighter to provide for full protection of the firefighter while also providing for less weight and improved freedom of movement and ventilation to reduce stress, comprising a jacket constructed of heat, flame and water resistant materials, the jacket including full length sleeve portions connected by a neck portion, a front portion and a rear portion, the front and rear portions being joined by opposing side portions, the front portion and side portion extending downwardly from the neck portion and having a lower edge disposed below the firefighter's waist and adjacent the upper part of the firefighter's legs, the rear portion extending between the side portions and extending downwardly from the neck portion and having a lower edge disposed significantly below the lower edge of the front portion and side portions and the lower edge being substantially above the knees of the firefighter to form a limited tail extension covering the lower rear part of the torso of the firefighter, the front portion and side portions thus being significantly shorter than the rear portion to provide the firefighter's legs with freedom of movement while crawling and climbing, in addition to improved ventilation under the front portion and side portions, the limited tail extension of the rear portion of the jacket protecting the lower rear part of the torso of the firefighter especially during forward bending or crawling, and the combined portions of the jacket also providing for reducing the total weight of the firefighter's coat.

4,709,422

SNAP ACTION HINGED SUPPORT FOR A COLLAPSIBLE TOP HAT

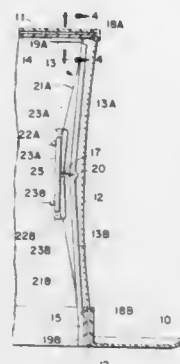
Engelbert J. Peham, 1302 Eleanor Ave., St. Paul, Minn. 55116

Filed Oct. 14, 1985, Ser. No. 918,083

Int. Cl.⁴ A42B 1/20

U.S. Cl. 2-180

8 Claims



1. In a collapsible top hat having a flat generally oval shaped top or crown, an oval shaped annular brim and a collapsible riser between the outer edge of the crown and the annular edge of the brim;

- (a) a thin, generally oval shaped plate stiffener in the crown of the hat;
- (b) a narrow, thin, stiff retainer band resting on edge along the inner annular edge of the hat brim;
- (c) a plurality of extendible and foldable snap-action support members attached between said crown stiffener and said retainer band spaced apart around the hat riser, each of said support members comprising a pair of identical elongated leg members hingedly attached together at one end and each having a hingedly attached foot member at the other end;
- (d) means for attaching the foot on one of said legs to said stiffener plate;
- (e) means for attaching the foot on the other of said legs to said retainer band; and
- (f) resilient means coupled to each of said legs across said first mentioned hinge attachment for holding the ends of said legs at said hinge attachment abutting one another when the hat riser is extended and for holding said legs folded together when said hat riser is collapsed.

4,709,423

TOILET TANK DISPENSER

Randall G. Richards, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Continuation of Ser. No. 608,672, May 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 440,126, Nov. 8, 1982, abandoned. This application Dec. 10, 1986, Ser. No. 939,271

Int. Cl.⁴ E03D 9/02

U.S. Cl. 4-228

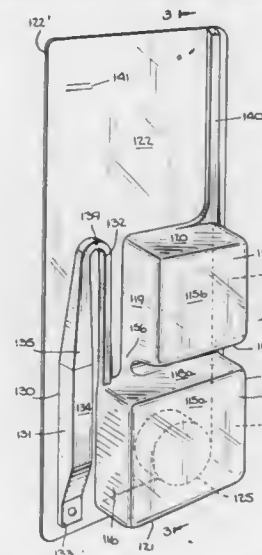
14 Claims

1. An in-tank toilet dispenser adapted to dispense a disinfectant aqueous solution into a toilet when the toilet is flushed, the dispenser comprising:

- (a) a product chamber containing a disinfectant agent that releases as a function of time gaseous by-products from said aqueous solution, the product chamber having a lower portion and an upper portion;
- (b) baffle means normal to the vertical plane of the product chamber and separating said lower and upper portions, there being a channel for fluid communication between said lower and upper portions in the vicinity of said baffle means;
- (c) the cross-sectional area of the lower portion in a plane horizontal thereto being larger than a similar cross-section

of the upper portion thus forming a shoulder at the interface of said portions;

- (d) an inlet/outlet pathway in the form of an inverted U-shaped conduit having an exterior leg and an interior leg, the uppermost portion thereof wherein the legs are joined being arcuate in shape and having a volume of less than 0.50 cubic centimeter, gaseous by-product collecting in said uppermost portion during the time period between



two flushes of the toilet to isolate the lower chamber from ambient, said conduit being in fluid communication with said lower portion at the shoulder of the product chamber, where said upper portion does not overlie said lower portion, the cross-sectional area of the interior leg normal to flow being less than that of the exterior leg; and

(e) vent means proximate the top of the upper portion of the product chamber.

4,709,424

AUTOMATIC TOILET BOWL CLEANER DEVICE

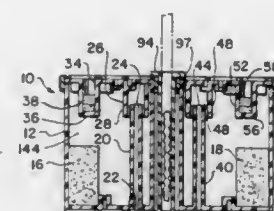
John E. Dolan, 15 New Main St., Haverstraw, N.Y. 10927

Filed May 10, 1985, Ser. No. 732,715

Int. Cl.⁴ E03D 9/02

U.S. Cl. 4-228

1 Claim



1. A toilet bowl dispenser comprising:

a container for dispensing a cleaning solution in flush water of a toilet tank, means for mounting said container in said tank below the water level of said flush water, said container including at least a bottom wall, a horizontal top wall in the form of a cover member having a planar upper surface; and a side wall; further including an opening in the bottom wall of said container, and a chamber for holding a cake of bleach or the like;

means for providing intake and discharge of flush water at the bottom of said container, responsive to the variation in the level of the flush water in said tank, said means including a first, straight conduit extending from said opening in the bottom wall of the container to a point near the top of

said container, said first conduit having an outer periphery and terminating in a first opening at said point;

a vent opening through said horizontal top wall;

a second straight conduit depending from the inner surface of said top wall and having an inner periphery larger than the outer periphery of said first conduit, said second conduit being of such length that its bottom end defines an overlap which surrounds the top end of said first conduit, said second conduit terminating in a second planar opening at said bottom end; the two conduits thus defined constituting an interrupted siphon within said chamber;

means for limiting the flow of cleaning solution from said vent opening, said means including the air space at the interior of said second conduit above said first conduit, which air space constitutes an air trap; said means for limiting further including the defined overlap of said second conduit with respect to said first conduit, which overlap extends approximately 0.100 inches;

whereby, when flush water rises in said toilet tank, it initially flows through said first conduit and into said chamber without significant counterpressure to restrict the flow, until said chamber is completely filled and the level of tank water rises above the level of said vent opening such that the downward pressure acts to equalize the pressure of the rising water through said first conduit, air becomes trapped in said interior space, and flow from said container through said vent opening is halted; and, when said flush water drops within said toilet tank, the cleaning solution formed in said chamber is siphoned therefrom until a level is reached at the end of such second conduit.

4,709,425

HOLDER FOR A TOILET CLEANING PRODUCT ASSOCIATED WITH AN AIR DEODORIZER

Tristan Bavaveas, Paris, France, assignor to Eparco, Paris, France

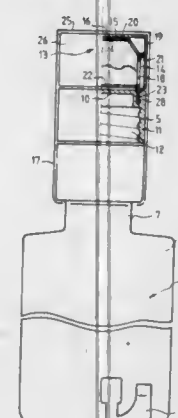
Filed Oct. 15, 1986, Ser. No. 919,329

Claims priority, application France, Oct. 16, 1985, 85 15358

Int. Cl.⁴ E03D 9/02; B65D 53/06

U.S. Cl. 4-228

7 Claims



1. A holder for a toilet cleaning product comprising: a container for the cleaning product; a pre-use and pre-assembly closure member for the container; and a member for securing the container to the toilet; said closure member of the holder including an air deodorizer including a receptacle for a deodorizing substance and adhesive means for releasably securing the deodorizer to the closure member, said deodorizer being physically separable from the holder but adapted to operate in conjunction therewith such that approximately the same amount of cleaning product and deodorizing substance are discharged over the same period of time; the closure member

is adapted to integrally seal both the container and the deodorizer to define an inoperative state of the deodorizer; the closure member having on its transverse end walls a plurality of grooves which cooperatively engage projections extending downwardly from the deodorizer thereby retaining the deodorizer on the holder closure member in its desired position.

4,709,426

MEANS FOR PRODUCING A WATER SPLASH SHIELD FOR COMMUNES, URINALS OR THE LIKE

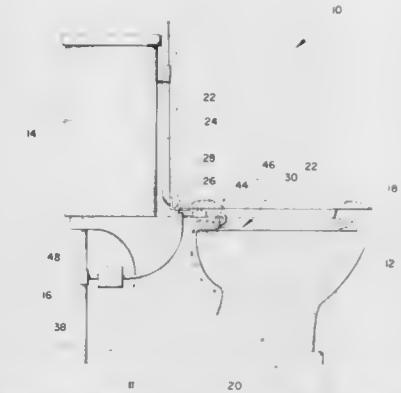
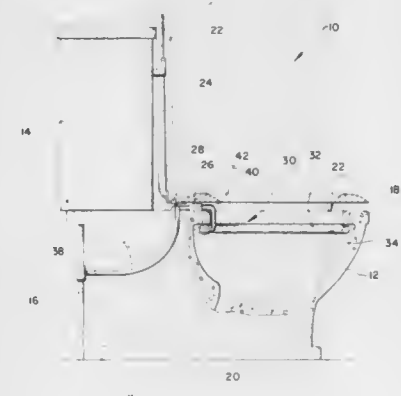
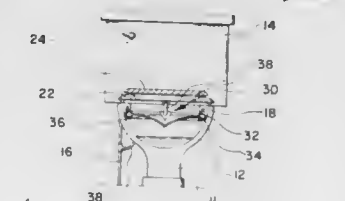
Oliver W. Godwin, Jr., Lakeshore Dr., Dunn, N.C. 28334

Continuation of Ser. No. 92,490, Nov. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 16,188, Feb. 28, 1979, abandoned. This application Feb. 21, 1984, Ser. No. 582,055

Int. Cl.⁴ E03D 9/00; F15D 1/00

U.S. Cl. 4-300.3

16 Claims



1. A sit down type water closet having a fluid urine splatter shield for preventing the splatter of urine, comprising a toilet bowl having a bottom that normally contains a volume of standing water having an upper surface, a side containing wall structure, and an opening formed about the top of said toilet bowl overlying said standing water, an outlet for urine and flush water to exit said toilet bowl, and a fluid urine splatter

shield producing apparatus operatively associated with said water closet and toilet bowl for generating a generally horizontal sheet-like continuous shield of water between said toilet bowl opening and the upper surface of said standing water for preventing urine from splattering back upwardly from said standing water and out of said toilet bowl, said fluid urine splatter shield apparatus including an inlet fluid line communicatively connected to a fluid source; means communicatively connected to said fluid line for forming a fluid urine splatter shield between said toilet bowl opening and the upper surface of said standing water contained within the bottom of said toilet bowl, said means for forming said fluid urine splatter shield being disposed within said toilet bowl and extending at least partially around the opening intermediate the opening therein and the upper surface of said standing water and including means for spraying a generally horizontal sheet of water over and above the upper surface of said standing water and wherein the generally horizontal water shield substantially covers the opening formed within said toilet bowl so as to prevent urine from splattering back upwardly from the surface of said standing water as the fluid from said urine splatter shield mixes with urine being directed downwardly through the opening of said toilet bowl wherein the fluid urine splatter shield itself acts to intercept urine splattering upwardly from the surface of said standing water when one is urinating into said toilet bowl; and valve means operatively interconnected between said source of fluid and said fluid urine splatter shield means for selectively directing fluid from said fluid source through said inlet fluid line into said urine splatter shield means for producing the fluid urine splatter shield while one is urinating in said toilet bowl.

4,709,427

DISABLER SYSTEM FOR PLUMBING FIXTURE

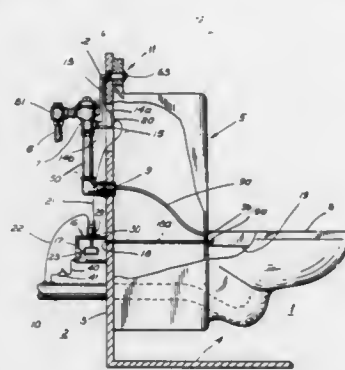
Martin J. Laverty, Jr., Earlyville, Va., assignor to Coyne & Delany Co., Charlottesville, Va.

Filed Sep. 30, 1985, Ser. No. 781,944

Int. Cl. E03D 11/00

U.S. Cl. 4-427

39 Claims



1. In a toilet having a flush valve operating arrangement, including: toilet fixture for holding water; a flush valve connected to said fixture; a flush valve actuator assembly associated with said flush valve; a remotely controlled operated unit; a pair of tubes extending between said flush valve actuator assembly and said remotely controlled operated unit; a third tube under water supply line pressure connected between said flush valve and said remotely controlled operated unit, means in said remotely controlled operated unit for connecting the water supply line pressure from said third tube with said pair of tubes for actuating said actuator assembly; water level sensor means hydraulically connected with at least one of said pair of tubes and hydraulically connected with said fixture to be flushed; said water level sensor means being responsive to water

level in the fixture and including means for relieving water supply line pressure in said at least one of said pair of tubes when a predetermined water level is sensed for prevention of actuation of said flush valve actuator assembly by said remotely located operated unit to thereby prevent overflow of the fixture and flooding of a surrounding area; and means between said fixture and said tubes for isolating said tubes from said fixture; said isolating means being separate and apart from said fixture and preventing access to said tubes.

4,709,428

SOAP HOLDER COVER

Steven A. Garcia, 1729 Procyon, Rio Rancho, N. Mex. 87124

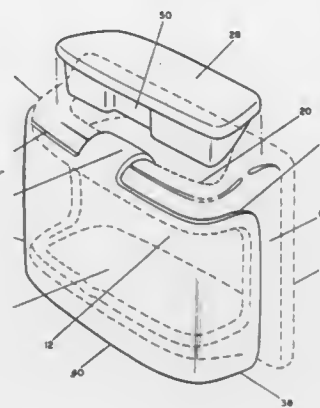
Continuation of Ser. No. 767,762, Aug. 21, 1985, Pat. No.

4,654,901. This application Oct. 27, 1986, Ser. No. 924,204

Int. Cl. A47K 5/00

U.S. Cl. 4-605

1 Claim



1. A soap holder cover for a conventional built-in, bathtub/shower soap-holding fixture for preventing water from spraying or splashing on soap contained in said fixture, said fixture generally containing a bottom tray for holding soap, and a U-shaped support having two arms which extend outwardly from and are perpendicular to the bathtub/shower wall and which connect to a front-facing portion which is parallel to the bathtub/shower wall, said soap holder cover comprising:

(a) A shield comprising a curved, channel-shaped member, said curved shield having a front face which when positioned on a conventional bathtub/shower soap holding fixture, when provided, is generally parallel to the bathtub/shower wall, and further comprising two side faces which are generally perpendicular to the front face of said shield, said shield wrapping around the exterior of said soap-holding fixture with the upper edge of said shield being positioned generally at the U-shaped support of the soap-holding fixture and the lower edge of said shield being positioned generally at the soap tray level of said soap-holding fixture when said shield is seated in a closed position, and whereby the upper edge of the front face of the shield pivots about the front-facing portion of said U-shaped support which is parallel to the bathtub/shower wall; and

(b) Attachment means for attaching the upper edge of the front face of said shield to the front-facing portion of said U-shaped support, said attachment means enabling said shield to be rotated upwards and away from said soap tray to an open position to gain access to soap contained in said soap-holding tray, and further enabling said shield to be rotated downwards towards said soap tray to be seated in a closed position to prevent water from spraying or splashing into said soap-holding fixture; said attachment means is a strip which is made of the same material and integrally formed with said shield as a single unit and said strip being formed into a curved shape so as to wrap

around the U-shape support and retain the cover thereto in said upwardly and downwardly rotated positions; whereby when said cover is positioned on the soap-holding fixture, the U-shaped support is exposed and may be utilized as a hand-hold for a bather.

4,709,429

BATHTUB SPOUT COVER

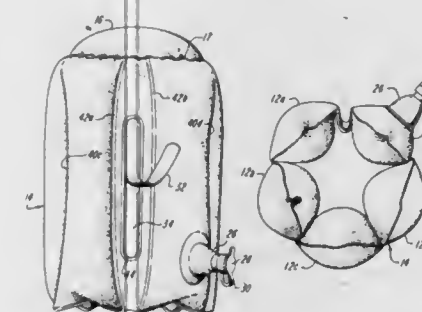
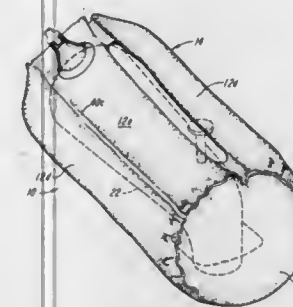
Michael Lerner, Brookline; Michael Bernstein, Natick, and Robert Selame, Brookline, all of Mass., assignors to Safety 1st, Inc., Chestnut Hill, Mass.

Filed Aug. 13, 1986, Ser. No. 896,656

Int. Cl. A47K 17/00, 13/00

U.S. Cl. 4-661

6 Claims



1. A bathtub spout cover comprising:

a cover body for cushioning the bathtub spout including a plurality of inflatable side compartments attached along their edges to form a protective sleeve and an inflatable end compartment closing one end of said protective sleeve, the other end of said protective sleeve being open to permit the cover to be slipped over said bathtub spout, said side compartments having relatively small interconnecting air passages to enhance the impact cushioning ability of said bathtub spout cover; means permitting inflation and deflation of said inflatable compartments; and an opening in said protective sleeve for discharge of water from the end of said bathtub spout.

4,709,430

WEIGHTED BEACH BLANKET

Douglas E. Nicoll, 4637 Merrimack Ln., Virginia Beach, Va. 23452

Filed Dec. 8, 1986, Ser. No. 938,995

Int. Cl. A47G 9/06

U.S. Cl. 5-417

15 Claims

1. A multi-purpose weighted blanket for covering an area, comprising:

(a) a main body including a first flexible cloth panel, (b) said first flexible cloth panel having a border formed in at least a portion of the outer perimeter thereof,

(c) means for removably anchoring said main body to a ground area, (d) said anchoring means including a sealed continuous impermeable tubular member positioned within said border for maintaining said border in an elevated position at all times when said tubular member is not under a substantial pressure, (e) said tubular member being formed from a non-rupturable heat resistant plastic material having a memory,



(f) said tubular member having a liquid weight means contained therein for removably anchoring said main body to a ground area, (g) said liquid being returnable, upon removal of said substantial pressure, to any portion of the tubular member which may have collapsed due to said substantial pressure, and (h) said tubular member, when not acted upon by said pressure, having a substantially constant cross-sectional area either when the liquid weight means is contained therein or drained therefrom.

4,709,431

DUAL CROWNED HEMORRHOID SUPPORT SEAT CUSHION

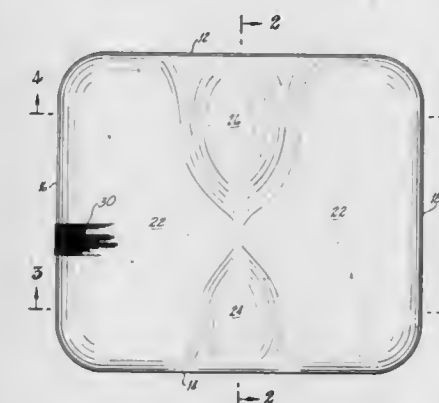
Donald H. Shaktman, 1800 NE. 114th St., Apt. 910, Miami, Fla. 33181

Filed Dec. 2, 1985, Ser. No. 803,483

Int. Cl. A47C 27/14, 27/22; A61F 5/34; A61G 7/04

U.S. Cl. 5-481

12 Claims



1. A hemorroid relief cushion comprising a pressure-compensating fitting pad of a resilient, solid cellular composition capable of exerting a slight but effective pressure on hemorroids that counteracts the pressures applied to said hemorroids by veins in the vicinity of the anus of a user, said pad having an essentially rectangular outline including a pair of side edges free of cut-out portions and a contoured major surface, said contoured major surface including first and second elongated, continuously curved, convexly elevated portions, said first portion having a first elevational contour and being of relatively lesser size than said second portion and whose length extends transversely inwardly from adjacent the central portion of one of said side edges toward the other of said side edges, said second elongated, continuously curved, convexly elevated portion having a second elevational contour and being of relatively greater size than said first portion and

whose length extends transversely inwardly from adjacent the central portion of the other of a said side edges toward said first elongated, continuously curved, convexly elevated portion, said first elongated, continuously curved, convexly elevated portion being constructed and arranged to relieve hemorrhoids within the creased of a first person having a relatively small crease and said second elongated, continuously curved, convexly elevated portion being constructed and arranged to relieve hemorrhoids within the crease of a second person having a relatively large crease.

4,709,432

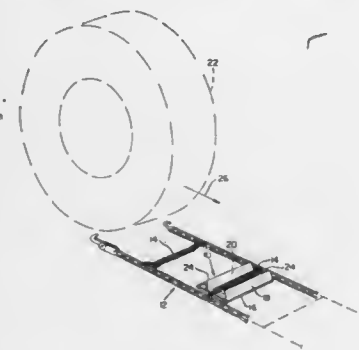
COMBINATION DEVICE FOR APPLYING TIRE CHAINS AND MOUNTING A JACK

Fred A. Barrick, 2091 SW. Tegar, Gresham, Oreg. 97030
Continuation of Ser. No. 656,743, Oct. 1, 1984, abandoned. This application Apr. 24, 1986, Ser. No. 858,571

Int. Cl.⁴ B25F 1/00; B60T 3/00

U.S. Cl. 7-100

1 Claim



1. An apparatus for mounting tire chains on a tire having a predetermined tread diameter, comprising:

a rectangular flat, rigid base having parallel opposite edges; a single pair of elongated parallel members, each parallel member extending along one of the parallel opposite edges and projecting upward from one side of the base, each of the members defining, in cross-section, a triangular shape in combination with the base;

the parallel members being of a height and spaced apart to support the tire at an elevation above the base such that a cross-linking member of a tire chain can be movably positioned between the pair of parallel members, the tire chain being spread on a support surface also supporting the base and an approaching tire;

the parallel members each having an upwardly-projecting angular apex of a predetermined height from the base and the base having a predetermined thickness providing a combined height from the support surface such that the tread of the tire approaching one of the parallel members transversely of the length thereof initially engages the apparatus in the area generally at the apex of said one member, said one member being oriented so that the apex grips the tire tread and frictionally engages the apparatus against the support surface to fix the apparatus in place so that the tire can roll onto the apparatus and be elevated and supported by the two parallel members above the base, the cross linking member of the tire chain remaining movable therebetween;

the parallel members being so disposed that the parallel members will nest together when a pair of apparatus are placed together with the one sides of their bases in facing relation with one parallel member of one of the pair of apparatus disposed between and adjacent to the two parallel members of the other of the pair of apparatus; and means for mounting a jack on the other side of the base.

4,709,433

HEEL MOLDER FLANGER

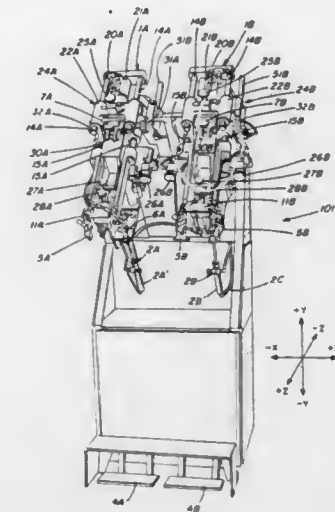
William Walega, Hollis, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Apr. 4, 1986, Ser. No. 848,174

Int. Cl.⁴ A43D 21/00, 11/12, 21/12

U.S. Cl. 12-12.5

18 Claims



16. A method of molding and flanging the heel region or portion of a footwear upper that includes a material that is flaccid above room temperature but is relatively rigid at room temperature, which method comprises:

stretching the heel region or portion about a mold shaped to the contour of the heel region or portion while simultaneously withdrawing heat energy from the heel portion or region;

providing a height gaging device to assure proper vertical positioning of the upper with respect to the mold, said height gaging device being movable from a spaced position relative to the mold to a position wherein it is in spring-loaded contact with the mold, the spring loading serving to permit the height gaging device to be moved to permit the upper to be mounted on the mold; and flanging the margin of the upper at the heel region or portion.

4,709,434

DEVICE FOR CONTROLLING MOVEMENT OF A COPYING ROLLER

Josef Bis, and Antonin Petrzalka, both of Gottwaldov, Czechoslovakia, assignors to Tovarny Strojirenske Techniky Koncern, Prague, Czechoslovakia

Filed Jun. 13, 1986, Ser. No. 874,130

Claims priority, application Czechoslovakia, Jun. 13, 1985, 4261-85

Int. Cl.⁴ A43D 95/00; C14B 1/44

U.S. Cl. 12-77

3 Claims

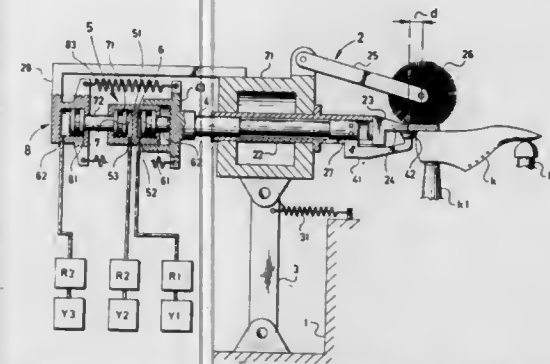
1. A device for controlling movement of a copying roller of a roughing machine relative to a treating brush for roughening a lasting margin of a tightened shoe upper, comprising a holder for the copying roller, which is slidably seated in a basic body of a treating head;

the basic body of the treating head being connected by means of a swing arm to a machine frame and the holder of the copying roller being terminated by a head, in which head there is seated a cylindrical body with two pressure cylinders with pistons,

the piston of the first of said two pressure cylinders being connected by means of a common piston rod to a piston of a third pressure cylinder, the piston of the second of said two pressing cylinders being in contact with said head by means of a piston rod, the third pressure cylinder piston is connected by means of a yoke to the basic body;

each of said pressure cylinders being individually connected to a distributor of a pressure medium, each distributor being controlled by an electromagnetic valve, each valve being electrically connected to each of four code switches;

two of said four code switches each being connected by input through a changeover switch to first outputs of respective flip-flops and controlled by selecting switches through an RS circuit, and the other two of said four code switches each being connected by inputs directly to first outputs of respective flip-flops, all of said flip-flops being connected to form a common shift register, the set input of one flip-flop being parallelly connected to reset inputs of the other flip-flops by means of an input branch, to which



input branch there is connected an output of a first product gate, the inputs of said first product gate being connected both to outputs of the selecting switches and to outputs of the RS circuit;

clock inputs of said flip-flops being interconnected to a collecting branch, to which there is connected an output of a shaping circuit, an input of said shaping circuit being connected to an output of a second product gate;

inputs of said second product gate being connected to position switches, said position switches being activated by corresponding position elements arranged on bars of a carriage of the tightened shoe upper, whereby the pressure cylinders may be selectively actuated singly or in combination so as to control the displacement of the copying roller relative to the treating brush.

4,709,435

BRIDGE DECK SYSTEM

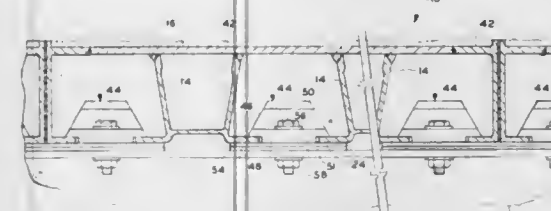
J. Robert Stemler, Murrysville; James D. Klingensmith, Apollo; Craig C. Menzemer, Murrysville; John M. Kulicki, Mechanicsburg, and Nicholas D. Theofanis, Camp Hill, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 4, 1987, Ser. No. 10,785

Int. Cl.⁴ E01D 19/12

U.S. Cl. 14-73

6 Claims



1. A bridge deck system, comprising:

a bridge structure which includes spaced apart parallel members;

a rectangular deck panel having a deck plate attached to parallel spaced apart lineal ribbed members spanning the spaced apart members of the bridge structure and with the

ribbed members having flanges extending outwardly from each side thereof; and a bracket attached between adjacent ribbed panel members to each of at least two of the parallel members of the bridge structure for connecting the deck panel thereto and having means for allowing movement of the deck panel in a lengthwise and sidewise direction independent of the bridge structure.

4,709,436

DEBRIS PAN FOR ROTARY BRUSH SWEEPER

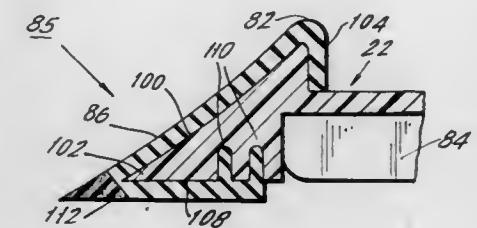
Robert C. Berfield, Jersey Shore; Craig A. Seasholtz, Avis, and Richard M. Fegan, Cogan Station, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Continuation-in-part of Ser. No. 826,545, Feb. 2, 1986, abandoned. This application Oct. 16, 1986, Ser. No. 919,856

Int. Cl.⁴ A47L 11/22

U.S. Cl. 15-79 R

23 Claims



1. A debris pan for a sweeper, comprising a pan body including an inlet portion for receiving debris propelled into the pan by the sweeper, the inlet portion being configured to be moved over a surface to be cleaned in close proximity thereto for normal cleaning operation; the inlet portion including a scoop with a first surface inclined upwardly and rearwardly, with respect to forward sweeper movement, for directing debris into the pan, and a second surface beneath the first surface and facing downwardly at any surface to be cleaned; the first and second surfaces of the scoop being provided with a covering of low friction material configured to mechanically grip onto the inlet portion.

4,709,437

COMPACT DISC CLEANER

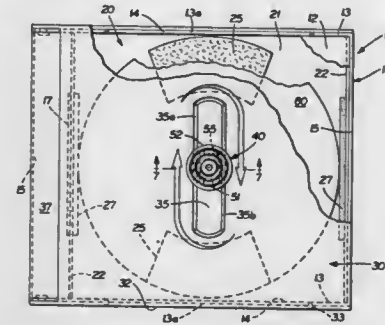
Bruce A. Hehn, Massillon, and James K. Sankey, Lynhurst, both of Ohio, assignors to Alpha Enterprises, Inc., Canton, Ohio

Filed Apr. 23, 1986, Ser. No. 854,905

Int. Cl.⁴ B08B 7/00

U.S. Cl. 15-97 R

18 Claims



1. A device for cleaning a compact disc, comprising: a housing, said housing having a bottom wall, and an optional pair of spaced end walls, at least one cleaning pad, said cleaning pad located on said housing bottom wall,

a cover, said cover having an elongated slot therein, and a post assembly, said post assembly transversely and longitudinally mounted in said cover slot, and said post assembly having a first post end insertable into the central opening of a compact disc.

4,709,438

TOOTHBRUSH WITH GRAVITY SWITCH

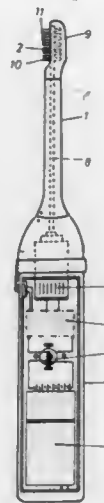
Joaquim de Tavares, No. 35, Lehmweg, 2000 Hamburg 20, Fed. Rep. of Germany

Filed Mar. 31, 1986, Ser. No. 846,452

Int. Cl.⁴ A46B 13/02

U.S. Cl. 15—167 A

6 Claims



1. A toothbrush provided with a headpiece carrying a brush and with a handle accommodating an electric motor with a battery and switching elements, the brush being formed cylindrically and performing a rotational movement about a rotational axis via a driving shaft extending between said brush and said electric motor for the purpose of dental care, wherein the cylindrical brush is provided with a protecting cap which is stationary with respect to said handle and, at a distance from the rotational axis of the brush, has an opening forming a free working region, the electric motor and thus the direction of rotation of the brush being reversible, a gravity switch, and first and second electrical circuit means connecting said motor to said switch, said gravity switch being arranged to close said first electrical circuit means and open said second electrical circuit means to drive said motor in one direction when said handle is in one position and to open said first electrical circuit means and close said second electrical circuit means to drive said motor in the opposite direction when said handle is turned about said axis from said one position to a further position such that the surface of said brush is automatically caused to move in a direction from the gums to the crown of each tooth by controlling the position of said handle.

4,709,439

MOUNTING DISK FOR A FLOOR POLISHER

William L. Warren, Rte. 4 - Steeleberry La., and Mark V. Warren, 5808 Piney Top Dr., both of Charlotte, N.C. 28208

Filed Jul. 14, 1986, Ser. No. 885,858

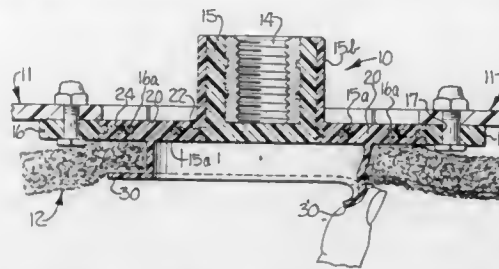
Int. Cl.⁴ A47C 11/14

U.S. Cl. 15—230.16

12 Claims

1. A floor polisher mounting disk for mounting a floor polisher pad and the like for rotation from a motorized floor polisher, said mounting disk being characterized in that outer peripheral portions thereof may readily flex to facilitate accommodation of the polisher across thresholds and other raised portions along a floor, said mounting disk comprising a relatively stiff and hard hub portion, a relatively stiff and hard rim portion encircling said hub portion in spaced relation

thereto, and resilient plastic means interconnecting said hub portion and said rim portion for providing a pliable interconnection between said hub portion and said rim portion, said plastic interconnecting means being formed of different and



less stiff material than said hub and rim portion and having a resilient lip extending from and positioned on the opposite side of the disk from said hub portion and adapted for mounting of inner peripheral portions of a polisher pad thereon.

4,709,440

MOBILE CLEAN-UP DEVICE

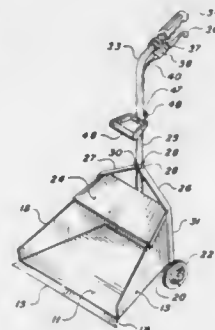
Elizabeth Y. Conelly, 2601 E. Lee St., Tucson, Ariz. 85716

Filed Apr. 8, 1987, Ser. No. 36,010

Int. Cl.⁴ A47L 13/52; A01K 29/00

U.S. Cl. 15—257.3

19 Claims



1. A mobile clean up device comprising a wheeled base member having a leading edge, a trailing edge and first and second side edges; a first and second side member attached to said first and second side edges, respectively; a lip member secured to said leading edge and inclined downwardly therefrom; a rear plate secured to said trailing edge and extending upwardly therefrom; said rear plate having an upper portion rigidly secured to said side plates, a lower portion pivotally secured to said side plates, and hinge means operatively interposed between said upper portion and said lower portion to pivot said lower portion between an open position and a closed position against said base member; latch means attached to said base member to secure said lower portion of said rear plate in said closed position; handle means detachably secured at one end thereof to said upper portion of said rear plate and extending upwardly therefrom; lever means secured to said handle means remote of said rear plate; and cable means operatively interconnected between said lever means and said latch means and responsive to movement of said lever means to disengage said latch means and permit said lower portion to move away from said base member in free pivotal movement about said hinge means in response to gravity thereupon and discharge trash from within said device.

4,709,441

ESCALATOR SWEEPING MECHANISM

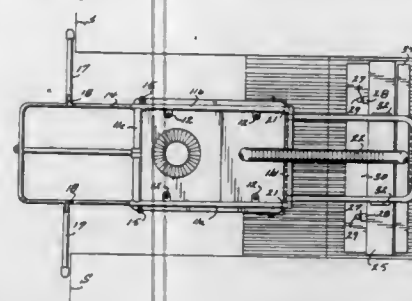
Gene R. Center, San Diego, Calif., assignor to R. E. Baker Company, Inc., Santa Ana, Calif.

Filed Nov. 24, 1986, Ser. No. 934,684

Int. Cl.⁴ A47L 5/38

U.S. Cl. 15—301

4 Claims



1. A sweeper conformed for cleaning the moving surfaces of an escalator comprising:
a frame assembly;
a vacuum cleaner attached to said frame assembly;
a pivoted support structure pivotally mounted at one end of said frame assembly;
a transverse weighting element fixed across said support structure proximate the free end thereof;
a polishing pad mounted on said weighting element and conformed to rest on said moving surfaces of said escalator upon the pivotal deployment of said support structure;
a bristle element attached to said weighting element adjacent said pad; and
nozzle means deployed between said pad and said bristle element and connected for suction to said vacuum cleaner.

4,709,442

PORTABLE EXTRACTOR

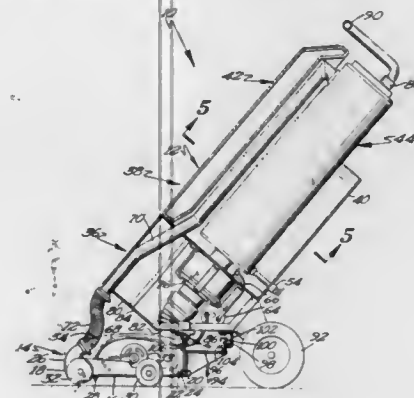
William C. Sletten, II, Eden Prairie, Minn., assignor to Advance Machine Company, Plymouth, Minn.

Filed Oct. 21, 1986, Ser. No. 921,629

Int. Cl.⁴ A47L 11/30

U.S. Cl. 15—320

30 Claims



14. Apparatus for cleaning a surface comprising, in combination: a tool assembly having a front end and a rear end; means located adjacent the front end of the tool assembly for performing at least one cleaning process to the surface; means for providing mobility of the tool assembly upon the surface, with the mobility providing means located intermediate the rear end of the tool assembly and the cleaning process means; a body assembly having a bottom end; means for providing mobility of the body assembly upon the surface; and means for pivotally mounting the rear end of the tool assembly to the body assembly about an axis generally parallel to and spaced from the

mobility providing means, with the axis of the pivotally mounting means being located so that the tool assembly pivots about the tool assembly mobility providing means into a transport mode of operation such that the cleaning process means is spaced from the surface when the tool and body assemblies are moved along the surface in a first direction and so that the tool assembly pivots about the tool assembly mobility providing means into a working mode of operation such that the cleaning process means engages the surface when the tool and body assemblies are moved along the surface opposite the first direction.

4,709,443

APPEARANCE FABRIC PANEL WITH IN SITU MOLDED FRAME

James E. Bigley, Warren, Ohio, assignor to The Scott & Fetzer Company, Twinsburg, Ohio

Filed Jun. 20, 1986, Ser. No. 877,005

Int. Cl.⁴ A47L 9/00

U.S. Cl. 15—339

23 Claims



1. In a vacuum cleaner having a housing, a vacuum motor unit for drawing dirt laden air into the housing, and an air permeable cover on the positioned on the outside of said for diffusing air exhausted from the vacuum motor unit, the cover comprising a porous fabric carried on a rigid framework, the framework being injection molded of polymeric material in situ on the fabric, the framework being molded in such a manner being sufficiently rigid to maintain said fabric in a generally taut condition and reduce any tendency for ballooning, puckering, sagging or the like without separate fasteners or adhesives, the cover being of sufficient size in relation to the remainder of the vacuum cleaner to contribute to its appearance.

4,709,444

WHEEL BRACKET MOUNTING STRUCTURE

John W. Black, Hickory Corners, Mich., assignor to Standex International Corporation, Salem, N.H.

Continuation of Ser. No. 875,523, Jun. 19, 1986, abandoned, which is a continuation of Ser. No. 541,599, Oct. 13, 1983, abandoned. This application Jan. 28, 1987, Ser. No. 9,019

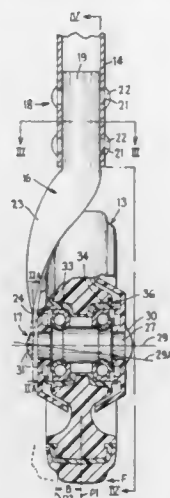
Int. Cl.⁴ B60B 33/00

U.S. Cl. 16—31 A

23 Claims

1. A wheel bracket mounting structure, comprising:
a unitary elongated bracket member including a single axle mounting section to secure only one end of an axle member and a stem mounting section at generally opposite ends thereof, said axle mounting section including first means defining a generally flat, platelike portion vertically and horizontally offset from said stem mounting section, said axle member being rigidly secured and cantilevered to said flat, platelike portion, the axis of said axle member extending generally perpendicularly to the plane of said flat, platelike portion, said stem mounting section including second means defining an elongate stem means gener-

ally arcuate in cross-section adapted to be directly attached to a support member on a wheeled vehicle, said bracket member further including a first bulbously shaped structure means intermediate said first and second means for providing a smooth transition therebetween for resisting lateral elastic flexing so that said stem mounting section and said first bulbously shaped structure means are resistant to relative lateral elastic flexing, said stem mounting section and said first bulbously shaped structure means



consisting of a majority of the length of said bracket member, and third means defining a region at the juncture between said flat, platelike portion and said first bulbously shaped structure means for allowing the material of said bracket in said region at said juncture to elastically flex relative to said first bulbously shaped structure means and said stem mounting section, said first bulbously shaped structure means and said stem mounting section having a greater resistance to lateral elastic flex characteristic than said region.

4,709,445

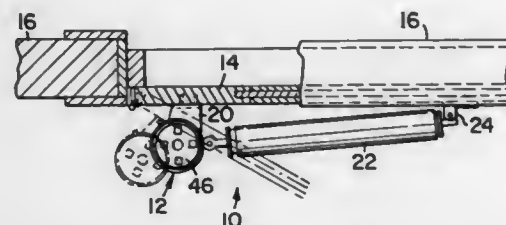
METHOD AND APPARATUS FOR CLOSING A DOOR
Russell W. Waldo, Mendota Heights, Minn., and Cardell E. Miller, Hudson, Wis., assignors to Ideal Security Hardware Corporation, Saint Paul, Minn.

Filed Aug. 13, 1985, Ser. No. 765,360

Int. Cl.⁴ E05F 1/08

U.S. Cl. 16—300

8 Claims



1. A door closer suitable for operatively connecting to first and second door assembly portions, wherein the first door assembly portion can assume first, second and third positions relative to the second door assembly portion, said door closer comprising:

- (a) a first component;
- (b) a second component, wherein said first component is movable between a first state and a second state relative to said second component;

(c) means for operatively connecting said first component to the first door assembly portion;

(d) means for operatively connecting said second component to the second door assembly portion, wherein said first component is movable from said first state to said second state relative to said second component in response to movement of the first door assembly portion from its first position to its second position relative to the second door assembly portion when said door closer is operatively connected to the first and second door assembly portions;

(e) means for applying a closing force between said first and second components comprising means for changing said closing force from a first closing force to a second closing force upon movement of said first component from said first state to said second state relative to said second component;

(f) means operatively connected to said first and second components for selectively locking said first component in said second state relative to said second component, thereby storing said second closing force by substantially eliminating relative movement between said first and second components;

(g) means operatively connected to said second component and said second component connecting means for selectively allowing relative movement therebetween, wherein the first door assembly portion can be selectively freely moved from its second position to its third position relative to the second door assembly portion when said door closer is operatively disposed relative to the first and second door assembly portions;

(h) means operatively connected to said first and second components for selectively unlocking said first and second components, thereby selectively allowing relative movement therebetween and restoring said second closing force, wherein said second closing force can be selectively associated with the third position of the first door assembly portion relative to the second door assembly portion when said door closer is operatively disposed relative to the first and second door assembly portions, the first door assembly portion comprising a door and the second door assembly portion comprising a door frame; and

(i) said door closer being a torsional door closer; wherein said closing force applying means comprises a torsional spring having a longitudinal axis and first and second ends; wherein said first component comprises a first housing assembly and said second component comprises a second housing assembly; said first and second housing assemblies are coaxially aligned with and substantially encase said torsional spring; said first end of said torsional spring operatively engages said first housing assembly and said second end of said torsional spring operatively engages said second housing assembly; wherein said first and second housing assemblies are slidably engaged and normally rotatable with respect to one another and said first housing assembly comprises a first substantially cylindrical housing coaxially aligned with said torsional spring, and said first housing forms a plurality of locking slots and a first spring aperture suitable for receiving the first end of said torsional spring; said second housing assembly comprises a second substantially cylindrical housing and a sleeve operatively connected to said second housing, wherein said sleeve is fixed against rotation relative to said second housing and forms a second spring aperture suitable for receiving the second end of said torsional spring; said locking means comprises said sleeve and a locking ear extending therefrom; and wherein said first and second housings are selectively locked by operatively engaging said locking ear and one of said locking slots.

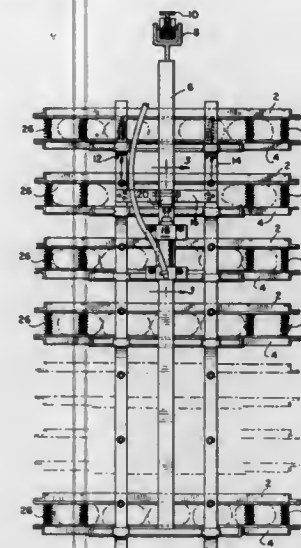
4,709,446

SMOKE HOUSE TREE

Leo Feauto, P.O. Box 12, Jackson, Nebr. 68743, and Harold Gill, 316 W. 15th, South Sioux City, Nebr. 68776
Filed Mar. 4, 1986, Ser. No. 836,112
Int. Cl.⁴ A22C 7/00

U.S. Cl. 17—1 R

4 Claims



1. A smoke house tree for pressing and shaping meat during a curing or smoking process:

- a. a multiplicity of pairs of racks with each pair comprised of a fixed rack in a parallel plane with a movable rack;
- b. a multiplicity of springs located between each of said fixed and movable racks which pull each of said movable racks toward its corresponding fixed rack independently of other pairs of racks;
- c. a frame by which said smoke house tree is suspended, and to which said fixed rack of each of said pairs of racks is attached;
- d. a member which is capable of displacement in a parallel fashion relative to said frame to which each of said movable racks is attached so as to displace said movable racks parallel to and away from said fixed racks in unison as said member is displaced;
- e. means for displacing said member.

4,709,447

ENCASED PRODUCT AND METHOD AND APPARATUS FOR ENCASING SAME

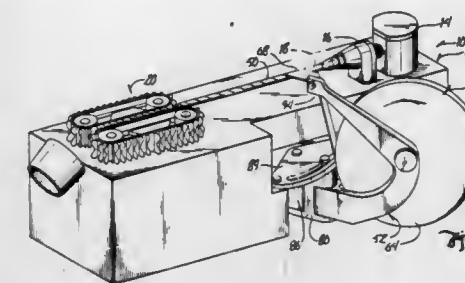
Ray T. Townsend, Des Moines, David W. Smith, West Des Moines, and Robert M. Dykes, Urbandale, all of Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa
Division of Ser. No. 731,995, May 8, 1985, Pat. No. 4,660,255.
This application Dec. 12, 1986, Ser. No. 941,083
Int. Cl.⁴ A22C 13/00

U.S. Cl. 17—1 F

5 Claims

1. An encased product comprising:
- an elongated flexible casing being cylindrically shaped substantially along its length and having opposite end closures, said casing forming an enclosed product cavity;
 - a product material filling said cavity and maintaining said casing in said cylindrical shape;
 - said cylindrical casing being formed from an elongated strip of flexible material having opposite side edges, said strip being formed into a plurality of helical revolutions with said side edges of said strip within each one of said helical revolutions frictionally engaging and overlapping the said side edges within those of said helical revolutions adjacent said one revolution;

said side edges being sufficiently overlapped to create enough frictional cohesiveness to maintain said strip of



flexible material in a self-contained flexible casing to contain said product material.

4,709,448

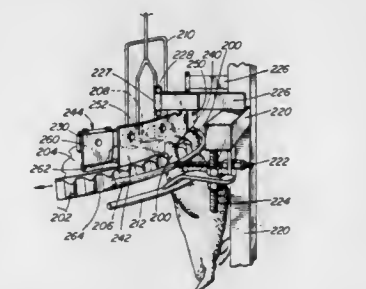
HOCK CUTTING MECHANISM

Bernie McGuire, Robert S. Innes, and Stefan Pagowski, all of Hamilton, Canada, assignors to Canadian Bird Equipment Limited, Ontario, Canada

Continuation-in-part of Ser. No. 617,550, Jun. 5, 1984, Pat. No. 4,660,256. This application Dec. 17, 1986, Ser. No. 942,980
Int. Cl.⁴ A22C 21/00

U.S. Cl. 17—11

14 Claims



1. A knife mechanism for severing the lower legs from a poultry carcass at the hock joint as the knife mechanism and carcass are moved relative to each other with the lower legs oriented generally normal to the working edges of the knife mechanism and fixed against movement normal to the relative movement, the knife mechanism comprising:

- (a) a first knife means having a blunt working edge, that blunt working edge being adapted to extend into the hock joint of each leg to increase the spacing between the ball and the socket of the joint, connective tissue at the joint being thereby pressed between the ball and the socket of the joint;
- (b) a second knife means having a sharp working edge, that sharp working edge being positioned so as to be in the path of the hock joint and being oriented generally parallel to the working edge of the first knife means, the sharp working edge of the second knife means being adapted to sever at least a portion of the connective tissue; and
- (c) a third knife means having a working edge oriented to press the connective tissue in a direction opposite to that in which that tissue is pressed by the working edges of the first and second knife members, at least a portion of the working edge of the third knife member being sharp and acting to sever any connective tissue not severed by the second knife means.

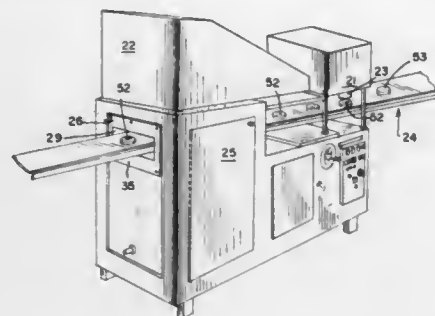
4,709,449
PASS-THROUGH PROTEINACEOUS PATTY MAKING APPARATUS
 Alvin Borsuk, Madison, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Feb. 13, 1986, Ser. No. 829,581

Int. Cl.⁴ A22C 7/00

U.S. Cl. 17-32

6 Claims



1. A pass-through proteinaceous patty making apparatus, comprising:

proteinaceous patty forming means for forming proteinaceous patties and depositing same on a moving conveyor belt assembly, said proteinaceous patty forming means being located substantially above the conveyor belt assembly, and wherein said proteinaceous patty forming means includes a mold plate and pusher assembly having a mold plate member with at least one mold cavity for forming a proteinaceous patty therewithin;

a cabinet having a generally horizontally oriented tunnel assembly through at least a portion of the horizontal longitudinal extent of the cabinet, wherein said cabinet houses at least a portion of an assembly for driving said proteinaceous patty forming means, wherein said assembly for driving said proteinaceous patty forming means includes a transverse shaft in operative engagement with said mold plate member and two drive arms, each drive arm being mounted onto opposite ends of said transverse shaft, and wherein said drive arms are engaged by drive means for moving said drive arms with back-and-forth motion, whereby said mold plate member oscillates between an orientation thereof for forming and for depositing the patties;

said conveyor belt assembly includes an elongated endless belt member which traverses a path substantially throughout the horizontal longitudinal extent of the cabinet, including through said tunnel assembly and under said patty forming means; and

timing means associated with said conveyor belt assembly and with said proteinaceous patty forming means, said timing means being for depositing a proteinaceous patty from said proteinaceous patty forming means onto an item that had been deposited onto the elongated endless belt member upstream of said tunnel assembly.

4,709,450
APPARATUS AND METHODS OF STUFFING FOOD CASINGS TO PROVIDE DIMENSIONALLY UNIFORM PRODUCTS

Thomas R. Stanley, Downers Grove, and Mark R. Zeleznik, Oak Forest, both of Ill., assignors to Teepak, Inc., Oak Brook, Ill.

Filed Jan. 13, 1987, Ser. No. 2,831

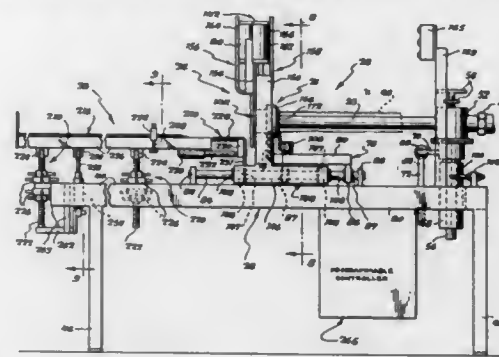
Int. Cl.⁴ A22C 11/02

U.S. Cl. 17-49

12 Claims

1. A food casing stuffing apparatus comprising a stuffing horn with an inlet for receiving a pressurized food material, an outlet downstream from said inlet for delivering the food material to a casing thereon and a shaft intermediate to said inlet and outlet; means for engaging the casing against said shaft for restricting the rate of release of casing therefrom;

carriage means for translating said casing engaging and restricting means along the axis of said stuffing horn; said casing engaging and restricting means including means for preventing the backflow of food material over the stuffing horn when said backflow preventing means is removed from the shaft by said carriage means; means for closing off filled casing, and means for controlling the length of the interval from actuation of said closing off means to actuation of said carriage means for removing said backflow preventing means from said shaft.



10. A method for stuffing a strand of food casing, which comprises the steps of loading a strand of casing for stuffing at a filling station; stuffing the casing with the food material at said filling station while applying a force to restrict the rate at which unfilled casing is released for stuffing; closing the trailing end of the filled casing at a clipping station, and controlling the interval for withdrawing said force restricting the rate of release of unfilled casing at the filling station when the trailing end of the filled casing is closed so that the length of the interval is directly proportional with the viscosity of the food material.

4,709,451
METHOD AND APPARATUS FOR FEEDING A FIBER TUFT OPENER OR CLEANER
 Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany

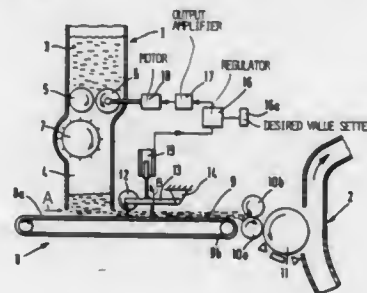
Filed Oct. 3, 1986, Ser. No. 915,128

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1985, 3535684

Int. Cl.⁴ D01G 15/40

U.S. Cl. 19-105

10 Claims



1. A method of feeding a fiber lap to an opening roller of fiber processing machine, comprising the following steps:

- delivering fiber tufts by discharge rollers forming part of a fiber tuft feeder;
- forming a loose fiber tuft mass from the fiber tufts delivered by the discharge rollers;
- forming a thin fiber lap from the loose fiber tuft mass by depositing the loose fiber mass on a traveling conveying surface;

- advancing the fiber lap by the conveying surface to said opening roller;
- sensing fluctuations in quantity characteristics of the running fiber lap at a location situated upstream of the opening roller as viewed in the direction of fiber lap advance;
- generating electric signals representing said fluctuations; and
- varying the rpm of said discharge rollers as a function of the electric signals for maintaining quantity characteristics of said fiber lap uniform.

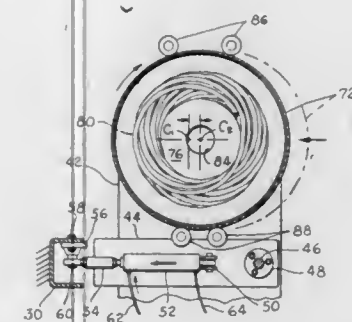
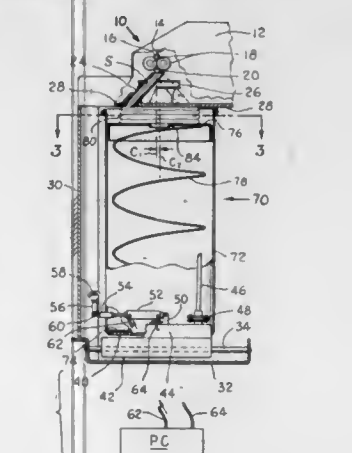
4,709,452
METHOD AND MEANS OF COILING START-UP WHICH PREVENTS SLIVER SLINGOVER

Edward J. Cooley, Easley, and Franklin D. Shaw, Seneca, both of S.C., assignors to Platt Saco Lowell Corporation, Easley, S.C.

Filed Jun. 6, 1985, Ser. No. 742,165

Int. Cl.⁴ B65H 54/80

U.S. Cl. 19-159 R



1. In an apparatus for filling a cylindrical can with coils of sliver, including means for receiving strand sliver, means for coiling said strand sliver to form a coiled sliver by passing it through a rotating inclined tube having a fixed tube axis of rotation, means for depositing said coiled sliver in coils atop a spring biased false bottom of a cylindrical sliver can, and means for rotating said can upon a platform therefor about a platform axis of rotation for said platform, the improvement comprising:

means for shifting the position of said platform and said platform axis of rotation between an initial position wherein said platform axis is aligned parallel to said fixed tube axis at a prescribed and predetermined distance of separation therebetween, and a second position wherein said platform axis is aligned parallel to said fixed tube axis at a second predetermined and prescribed distance of separation therebetween, and wherein said second dis-

placement of separation is greater than said first distance of separation by a prescribed amount; and control means for controlling said means for shifting, including measuring means for measuring the delivery of strand sliver deposited as coils, powering means for powering said shifting means, and actuating means for actuating and deactuating said measuring means and for actuating and deactuating said powering means; whereby, upon said measuring means being actuated, or deactuated, said means for shifting is powered by said powering means and shifts said platform from said second position to said first position, and then upon said actuating means actuating said measuring means and said measuring means measuring out a predetermined amount of sliver for delivery to said can, said means for shifting again is powered by said power means to shift said platform from said initial position to said second position.

4,709,453
SEPARABLE FASTENING DEVICE

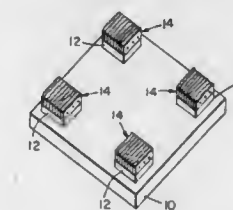
Andrew C. Harvey, Waltham; William A. Ribich, Lexington; Paul J. Marinaccio, East Orleans, all of Mass., and Bernard E. Sawaf, Nashua, N.H., assignors to Foster-Miller, Inc., Waltham, Mass.

Filed Oct. 14, 1986, Ser. No. 918,777

Int. Cl.⁴ A44B 13/00

U.S. Cl. 24-442

25 Claims



1. A separable fastener device comprising a fastener member that includes a series of metal hook sheets disposed in stacked relation,

each said hook sheet having a planar body portion and a series of hook elements disposed along one edge of said body portion, each said hook element having a stem portion and a head portion that includes a deflecting surface for deflecting a fastener portion of a cooperating fastener member and a latch portion for engaging a portion of a cooperating fastener member in fastening relation.

4,709,454
AXIAL LOCKING DEVICE
 Austen B. Barnes, 5040 Coronation Road, RR2 Whitby, Ontario, L1N 5R5, Canada

Filed Dec. 13, 1985, Ser. No. 808,724

Claims priority, application United Kingdom, May 29, 1985, 8513474

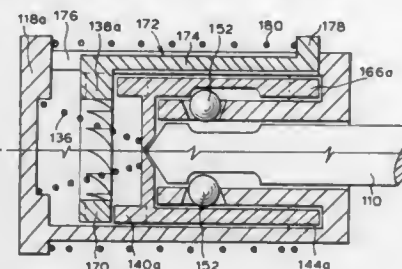
Int. Cl.⁴ A44B 19/00

U.S. Cl. 24-590

8 Claims

1. A releaseable axial locking device comprising two separable members adapted to be locked together and unlocked by relative axial movement of either of said two separable members in one direction, a slider juxtaposed one of said two separable members, said slider being movable axially relative to said one of said two separable members, resilient means interposed said slider and said one of said two separable members such that when the two members are moved axially relative to one another in said one direction said slider engages the other of said two separable members, and means for displacing said slider in an angular direction as it is moved axially against said resilient means so that the angular displacement of said slider which occurs when said two separable members are moved

relative to each other in said one direction results in said two separable members being locked relative to one another and subsequent angular displacement of said slider which occurs



when the two locked members are again moved relatively to one another in said one direction results in said members being unlocked and thereby axially separable in a direction opposite to said one direction.

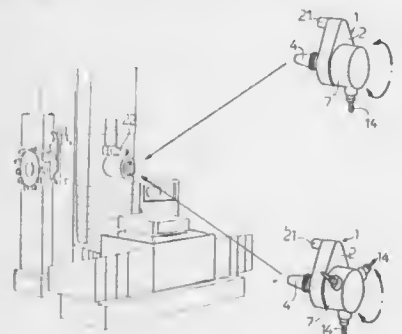
4,709,455

MILLING AND DRILLING HEAD FOR A MACHINE TOOL

Ermanno D'Andrea, and Nicola D'Andrea, both of Lainate, Italy, assignors to D'Andrea S.p.A., Lainate, Italy
Filed Oct. 15, 1985, Ser. No. 787,307
Int. Cl.⁴ B23B 43/00; B23C 3/34

U.S. Cl. 29—40

8 Claims



1. A milling and drilling head, in combination with a machine tool that has a master spindle, a control spindle and a numerical-control unit; said head comprising:

- a stationary case portion;
- an input shaft rotatably mounted to the stationary case portion and adapted for coupling with the master spindle of the machine tool to receive mechanical rotation therefrom;
- a movable case portion mounted to the stationary case portion for substantially continuous rotation;
- at least one bit-holding spindle rotatably mounted to the movable case portion for rotation at an angle to the rotation of the input shaft so that the bit-holding spindle is substantially continuously adjustable in disposition relative to the input shaft;

first rotation-transmitting means interconnecting the input shaft and the at least one bit-holding spindle, to transmit rotation from the input shaft through said angle to the bit-holding spindle;

a control shaft rotatably mounted to the stationary case portion, and adapted for coupling to the control spindle of the machine tool to receive substantially continuous adjustment rotationally therefrom;

second rotation-transmitting means interconnecting the control shaft and the movable case portion, to transmit substantially continuous adjustment from the control shaft to the movable case portion rotationally, to substantially

continuously adjust the disposition of the bit-holding spindle relative to the input shaft;

the numerical-control unit of the machine tool, in use, controlling the master-spindle rotation to supply cutting rotation to the bit-holding spindle and simultaneously controlling the control-spindle rotation to substantially continuously adjust the disposition of the bit-holding spindle during cutting;

whereby the machining tool and said head in combination provide machine at angles which vary continuously, including formation of compound shapes in curved surfaces.

4,709,456

METHOD FOR MAKING A PRESTRESSED COMPOSITE STRUCTURE AND STRUCTURE MADE THEREBY

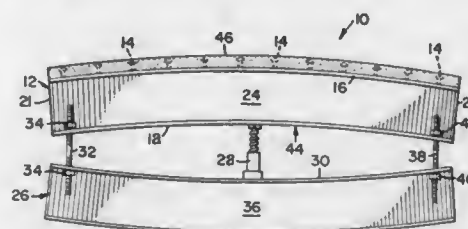
Srinivasa L. Iyer, Rapid City, S. Dak., assignor to Stress Steel Co., Inc., Rapid City, S. Dak.

Continuation-in-part of Ser. No. 585,824, Mar. 2, 1984. This application Mar. 4, 1986, Ser. No. 836,018

Int. Cl.⁴ B23P 17/04

U.S. Cl. 29—155 R

20 Claims



1. A method for rehabilitating a ferroconcrete bridge girder having a concrete layer and a steel beam, the steel beam having a center region and the girder being attached at its ends to attachment points, the method comprising the steps of:

- (a) positioning a crane lifting apparatus proximate the center region of the steel beam;
- (b) operatively attaching the lifting apparatus to the center region of the steel beam;
- (c) lifting the girder by operating the lifting apparatus, thereby bending the steel beam and causing the concrete layer to crack;
- (d) removing the cracked concrete layer from the steel beam;
- (e) adding shear connectors to the steel beam;
- (f) casting a new layer of concrete on the steel beam, with the steel beam remaining bent while the new layer of concrete is cast thereon;
- (g) curing a new layer of concrete to the point that it can absorb compressive stresses created by the steel beam; and
- (h) removing the lifting apparatus from out of contact with the steel beam, thereby causing the steel beam to no longer remain bent after the lifting apparatus is removed, wherein the rehabilitated bridge girder is prestressed and can carry greater loads than the former girder.

4,709,457

PROCESS FOR MANUFACTURING A TURBINE OR COMPRESSOR WHEEL MADE OF COMPOSITE MATERIAL AND WHEEL THUS OBTAINED

Bernard Broquere, Bordeaux, and Jacques Etienne, Le Taillan-Medoc, both of France, assignors to Societe Europeenne de Propulsion, Puteaux, France

Filed Aug. 9, 1985, Ser. No. 764,662

Claims priority, application France, Aug. 13, 1984, 84 12740

Int. Cl.⁴ B21K 3/00

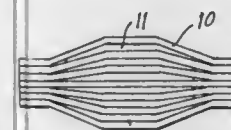
U.S. Cl. 29—156.8 R

4 Claims

1. A process for manufacturing a turbine or compressor

wheel made of composite material, said process comprising the following steps of:

- making at least two helicoidal textures each formed by weaving a spiral band with helicoidal warp yarns and weft yarns which are substantially perpendicular to the axis of the texture,



assembling the helicoidal textures by "screwing" them in each other and stacking them by mutually approaching their interlaced turns, and densifying the stack thus made to obtain a preform of a turbine or compressor wheel.

4,709,458

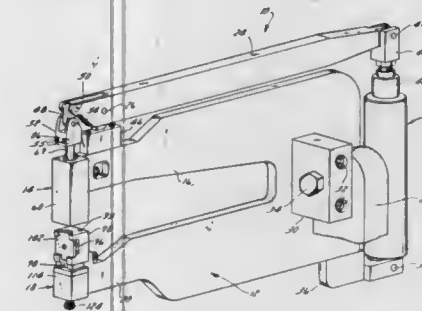
FASTENING OVERLAYING SHEETS BY PUNCH AND DIE APPARATUS

Mark C. Peters, 1357 Meadowcreek, Pewaukee, Wis. 53072
Filed Oct. 11, 1985, Ser. No. 786,680

Int. Cl.⁴ B23P 11/00

U.S. Cl. 29—243.5

17 Claims



1. A punch and die assembly for forming a spot clinch joint between two or more laminated sheets, said assembly comprising a frame, a die cartridge mounted on said frame, said die cartridge supporting said laminated sheets and including an anvil mounted in said die cartridge, means for biasing said anvil toward said laminated sheets, adjusting means for limiting the motion of the anvil to correspond to variations in the thickness of the laminated material and moveable means on one side of said anvil for providing room for expansion of the spot clinch joint on one side of said anvil; a punch cartridge mounted on said frame in a spaced relation to said die cartridge, said punch cartridge including a punch mounted in said cartridge for reciprocal motion toward and away from said anvil; and a power source mounted on said frame and being operatively connected to move said punch through a continuous cycle of motion whereby a spot clinch joint will be formed in the laminated sheet material in each cycle of motion of the punch.

4,709,459

ASSEMBLY DEVICE FOR AXLE BEARINGS AND/OR WHEEL FLANGE HUBS OF MOTOR VEHICLES

Horst Klann, Terra Wohnpark 12, 7730 Villingen-Schwenigen 24, BRD, Fed. Rep. of Germany

Filed Aug. 26, 1986, Ser. No. 900,369

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1985, 3530983

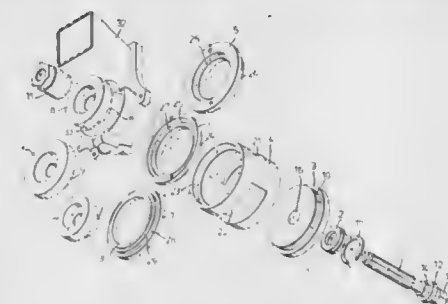
Int. Cl.⁴ B23P 19/04

U.S. Cl. 29—263

12 Claims

1. An assembly device for pressing a first member into the opening of a second member, in particular for axle bearings

and/or wheel flange hubs of a motor vehicle, comprising a threaded spindle having an axis, an axial support bearing concentric with said axis, said axial support bearing having a hole therethrough for closely receiving a portion of said threaded spindle for centering said threaded spindle with respect to said axial support bearing, a tubular spacer concentric with said axis, said tubular spacer having a bore with said threaded spindle extending centrally through said bore, said tubular spacer having a face wall on one end thereof adjacent said axial support bearing, said axial support bearing being concentrically engaged with said face wall, said face wall partly closing said bore and having a hole therethrough axially aligned with said hole of said axial support bearing, an annular pressure transmitting part concentric with said axis, said pressure transmitting part having a hole therein for receiving said threaded



spindle, said hole of said pressure transmitting part being axially aligned with said hole of said axial support bearing, said pressure transmitting part having an annular disc portion and at least one annular centering pilot portion extending axially of said disc portion in a direction toward said axial support bearing, said tubular spacer having at least one annular support shoulder at an end of said tubular spacer opposite from said face wall thereof, said annular support shoulder being disposed around said bore for engaging the second member, said pressure transmitting part being engageable with the first member, and a nut threaded to said threaded spindle near an end of said spindle opposite from said axial support bearing for pressing said pressure transmitting part toward said annular support shoulder for pressing the first member into and out of the second member.

4,709,460

PANEL INSTALLATION TOOL AND METHOD

Vladimir Luhovyy, 2209 W. Erie, Chicago, Ill. 60612

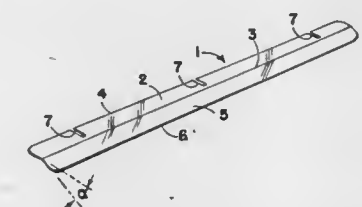
Continuation of Ser. No. 742,904, Jun. 10, 1985, abandoned.

This application Dec. 10, 1986, Ser. No. 939,273

Int. Cl.⁴ B25B 11/00

U.S. Cl. 29—271

10 Claims



1. A combination support and guide tool for installing rectangular, flat ceiling or wall panels by a single person onto regularly spaced, parallel structural members of a building, such as ceiling joists or wall studs, said tool comprising: support and guide plate means for supporting one of said panels as the one panel is installed against said parallel structural members, said means comprising

- (a) an elongated rigid support plate with a length defined by a longitudinally extending front leading edge and back trailing edge, and a width much smaller than its length defined by two side edges, said length being sufficient to transversely span a plurality of said parallel structural members, said support plate containing a plurality of slot openings which start at its trailing edge and which are spaced along its length for alignment with at least two of said parallel structural members, said slot openings having side edges extending forwardly from said trailing edge toward the leading edge in order to receive a fastening element, and further comprising
- (b) an elongated rigid guide plate connected to the leading edge of said support plate such that the guide plate forms an acute angle of substantially less than 45° with reference to a planar extension of the support plate beyond its leading edge.

4,709,461

METHOD OF FORMING DENSE INGOTS HAVING A FINE EQUIAXED GRAIN STRUCTURE

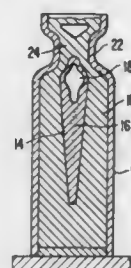
William R. Freeman, Jr., Easton, Conn., assignor to Howmet Turbine Components Corporation, Greenwich, Conn.

Filed Feb. 10, 1986, Ser. No. 827,541

Int. Cl.⁴ B23P 17/00

U.S. Cl. 29—526.3

16 Claims



1. A method of casting a metal ingot having a substantially equiaxed grain, cellular, nondendritic microstructure uniformly through said ingot, said method comprising the steps of:

- melting a metal to form a molten metal;
- reducing the temperature of said molten metal to remove almost all of the superheat in said molten metal to form a molten casting metal consisting of liquid metal;
- placing said molten casting metal in a mold, said mold including a mold cavity and means for accelerating solidification of metal at the entrance to said mold cavity;
- blocking the entrance to said mold by solidifying said molten casting metal in said entrance before solidification is complete in the remainder of said mold cavity;
- solidifying said molten casting metal in said mold by extracting heat therefrom at a rate to solidify said molten casting metal to form said ingot having said microstructure, said ingot having a shrinkage void beneath the blocked entrance to said mold; and
- hot isostatically pressing said ingot to eliminate voids within said ingot.

4,709,462

METHOD FOR ASSEMBLING A WELL DRILLING TOOL

Gregg S. Perkin, Kingwood, Tex., and Duane D. Papke, Didsbury, Canada, assignors to Oil Patch Group, Inc., Canada

Filed Aug. 4, 1986, Ser. No. 892,315

Int. Cl.⁴ B23P 11/00; E21B 9/22, 17/10

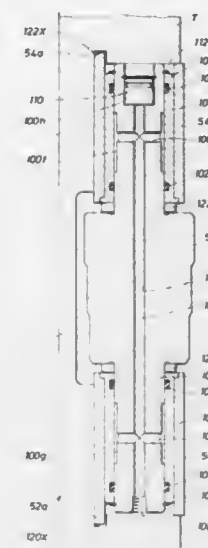
U.S. Cl. 29—434

5 Claims

1. A method of assembling a roller cutter on a drilling tool including the steps of:
- mounting a roller cutter on a shaft;
 - placing a bearing block on each end of the shaft;
 - positioning the bearing blocks and mounted shaft and roller cutter on a drilling tool;
 - sliding each of the bearing blocks axially on the shaft to

position a portion of the bearing block in bearing block recesses formed by the drilling tool;

securing the bearing blocks with the drilling tool; and



installing at least one resilient C-shaped spacer on the shaft between a secured bearing block and the roller cutter to position the roller cutter at the optimum cutting location between the bearing blocks.

4,709,463

APPARATUS FOR CONNECTING CONDUCTORS TO TERMINALS OF A CROSS-CONNECT CONNECTOR FOR COMMUNICATION LINES

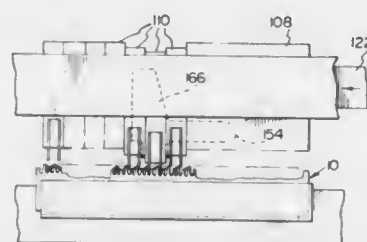
Alex G. Cristescu, Montreal, and Christopher A. Conea, Roxboro, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 8, 1985, Ser. No. 796,457

Int. Cl.⁴ H01R 43/00

U.S. Cl. 29—566.3

11 Claims



1. Apparatus for electrically connecting a group of insulated conductors along a row of terminals of a cross-connect connector, said apparatus having an assembly station and comprising:

means disposed at one side of the assembly station for holding the connector in the assembly station;

an insertion tool carrier located at the other side of the assembly station;

a plurality of conductor insertion tools mounted in a planar group and in slidable side-by-side relationship within the insertion tool carrier for sliding movement towards and away from the holding means; and

insertion tool operating means comprising an operating shaft reciprocally movable in the direction of the plane of the planar group transversely of the direction of sliding movement of the tools, said shaft connected to the tools to cause the tools to slide relative to one another and in sequence towards and away from the holding means.

4,709,464

INDEXING MECHANISM FOR COMPUTER CONTROLLED MILLING MACHINES

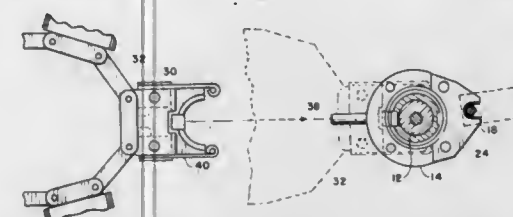
Richard J. Speroni, 29256 Union City Blvd., Union City, Calif. 94587

Filed Mar. 6, 1986, Ser. No. 836,707

Int. Cl.⁴ B23Q 3/157; B23B 31/10

U.S. Cl. 29—568

2 Claims



1. Indexing apparatus enabling the use of a high speed automatic reversing tapping head having a fixed horizontal tie rod with a numerical control vertical milling machine having an associated movable tool rack with a plurality of preassigned tool storage positions, said indexing apparatus providing alignment for the automatic insertion and removal of cutting tools in the movable tool rack and in the rotatable spindle of the milling machine, said apparatus comprising:

- a first member attached to a non-rotating, vertically movable location on the milling machine, said first member having secured thereto a vertical dependent shaft positioned adjacent the rotatable spindle of said machine;
- a second member attached to the housing of the high speed tapping head, said second member including coupling means for engaging said vertical dependent shaft to thereby lock the housing of said tapping head against rotation; and
- a third member attached to the movable tool rack at the assigned storage position of said tapping head, said third member having a tool holder engageable with said tapping head housing and a dependent fork for engaging the tapping head tie rod for preventing rotation of said housing upon receipt of said tapping head by said tool rack.

4,709,465

INTERCHANGEABLE SPINDLE-HEAD MILLING SYSTEM

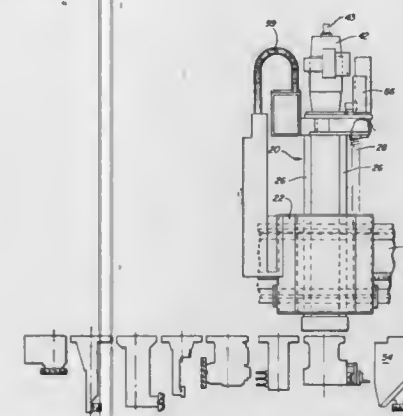
Henry W. Lewis, and Jan Van Roojen, both of Rockford, Ill., assignors to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Oct. 4, 1985, Ser. No. 784,723

Int. Cl.⁴ B23Q 3/157, 3/12

U.S. Cl. 29—568

6 Claims



1. In a milling machine having multiple axes of linear and rotational relative movement,

a master milling head and a tool-spindle unit detachably connected to the master head,

said master head comprising an elongated ram adapted to be mounted in a machine saddle having two axes of orthogonal relative linear movement,

said ram being linearly movable in the saddle axially of the ram and perpendicularly to the plane of said two axes,

a drum journaled for rotation in the ram on the longitudinal axis of the ram and having at one end thereof a drumhead with a coupling face connected to the coupling face of said tool-spindle unit,

a driveshaft journaled in said drum coaxially thereof and coupled to a drive motor remote from the coupling face of the drumhead,

said driveshaft having coupling means at the coupling face of the drumhead for coupling the driveshaft to the tool-spindle unit,

input coupling means on the tool-spindle unit complementary to and drivingly engaged with the coupling means of said driveshaft,

a plurality of releasable grippers disposed about the coupling face of the drumhead,

a plurality of complementary gripper-engageable retention knobs at the coupling face of the tool spindle unit secured in the grasp of said grippers, and

a positioning motor mounted on said ram and connected to rotate said drumhead and detachably connected tool-spindle unit.

4,709,466

PROCESS FOR FABRICATING THIN FILM PHOTOVOLTAIC SOLAR CELLS

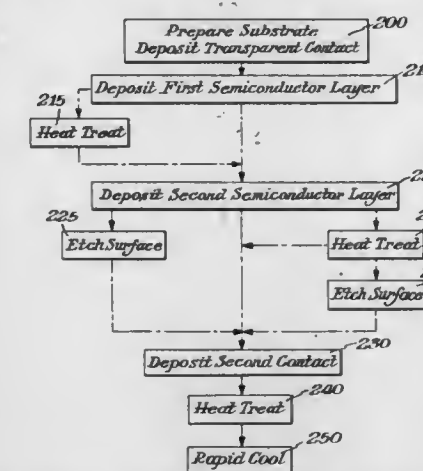
Brian E. McCandless, and Robert W. Birkmire, both of Newark, Del., assignors to The University of Delaware, Newark, Del.

Filed Apr. 15, 1985, Ser. No. 723,054

Int. Cl.⁴ H01L 31/18

U.S. Cl. 437—5

10 Claims



1. In a method of fabricating thin film photovoltaic solar cells made by sequentially forming a first contact layer on a substrate, a first semiconductor layer, and a second semiconductor layer, and a second contact layer, wherein at least one of the contact layers is transparent and at least one of the semiconductor layers comprises a tellurium containing II-VI compound the improvement being the steps of heat treating the cell after the second contact layer has been formed, and then rapidly cooling the cell at a temperature reduction rate of at least 10° C. per second.

4,709,467

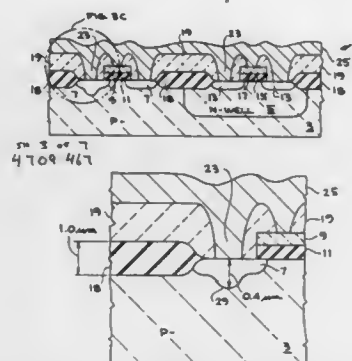
NON-SELECTIVE IMPLANTATION PROCESS FOR FORMING CONTACT REGIONS IN INTEGRATED CIRCUITS

Yow-Juang (Bill) Liu, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 13, 1986, Ser. No. 839,756
Int. Cl.⁴ H01L 21/265, 21/28

U.S. Cl. 437-30

7 Claims



1. In a process for fabricating an integrated circuit in a substrate containing both PMOS and NMOS devices, wherein process steps have been completed for forming in said substrate n-doped source and drain regions and p-doped source and drain regions, wherein the source and drain regions of one of said conductivity types is shallower than the source and drain regions of the opposite conductivity type, and wherein the process steps for forming electrical contacts to said source and drain regions have been completed up to the opening of contacts to said regions through an overlying insulating layer, a method for deepening the shallower source and drain regions of said one conductivity type to inhibit spiking of a subsequently formed metal contact thereon through said regions which comprises:

introducing impurities of said one conductivity type into said substrate through said contact openings in said insulation layer in a dosage having a range sufficiently high to deepen said shallow source and drain regions of said one conductivity type yet not high enough to lower the breakdown voltage of the source and drain regions of said opposite conductivity type, whereby spiking from a subsequently formed metal contact through said initially shallow source and drain regions is inhibited without lowering the breakdown voltage of said source and drain regions of the opposite conductivity type without the need for masking the source and drain regions of said opposite conductivity type during said introduction of impurities.

4,709,468

METHOD FOR PRODUCING AN INTEGRATED CIRCUIT PRODUCT HAVING A POLYIMIDE FILM INTERCONNECTION STRUCTURE

Arthur M. Wilson, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

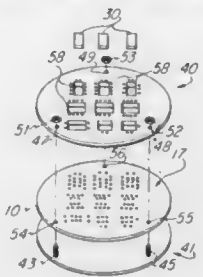
Filed Jan. 31, 1986, Ser. No. 824,403
Int. Cl.⁴ H01L 21/28, 21/283

U.S. Cl. 437-209

18 Claims

7. A method for making an integrated circuit having a flexible interconnection film attached thereto, comprising: providing a substrate, casting a polyimide/conductor multilevel film on said substrate, providing a template having holes adapted to receive an integrated circuit in alignment with corresponding locations on said substrate,

providing means for maintaining an alignment between said substrate, template, and integrated circuit, affixing said integrated circuit to said film,



and removing said film and integrated circuit from said substrate.

4,709,469

METHOD OF MAKING A BIPOLAR TRANSISTOR WITH POLYCRYSTALLINE CONTACTS

Tadashi Hirao, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 698,523, Feb. 5, 1985, Pat. No. 4,665,424.

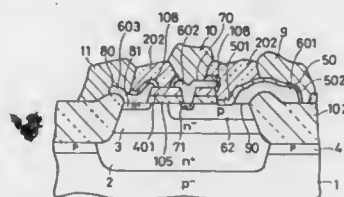
This application Dec. 11, 1986, Ser. No. 940,607

Claims priority, application Japan, Mar. 30, 1984, 59-64577; Jun. 14, 1984, 59-124146; Aug. 30, 1984, 59-183005

Int. Cl.⁴ H01L 21/28

U.S. Cl. 437-63

3 Claims



1. A method of manufacturing a semiconductor device comprising:

- a first step of forming a semiconductor layer (3) of a first conductivity type enclosed by an isolation oxide film (102);
- a second step of forming a base region (62) of a second conductivity type partially on the surface of said first conductivity type semiconductor layer;
- a third step of forming a first silicon film (601) in a region from a part of said base region to said isolation region being in contact with said base region;
- a fourth step of forming a silicon oxide film (401) on the surface of said semiconductor layer including said base region and said isolation region;
- a fifth step of selectively etching said silicon oxide film for removing said silicon oxide film from a portion for forming a collector electrode extracting region (81) and a portion for forming an emitter region (71);
- a sixth step of forming a second silicon film (602) and then selectively removing said second silicon film employing a mask covering said emitter region and said collector electrode extracting region;
- a seventh step of selectively removing said oxide film on said base layer and a part of said second silicon film;
- an eighth step of forming a thick oxide film (108) on said silicon film on at least said emitter layer into which highly concentrated impurities of said first conductive type are introduced and an insulating film consisting of a thin oxide film (107) on said base electrode forming portion exposed

- in said seventh step by oxidation at a relatively low temperature;
- a ninth step of forming a metal silicide film (501) on a electrode extracting region on and said insulating film on said base layer; and
- a tenth step of forming a protection film on said isolation region and regions enclosed by said isolation region and passed through respective said steps for forming a base electrode (9) on said first silicon film, an emitter electrode (10) above said emitter region and a collector electrode (11) above said collector electrode extracting region respectively through holes defined in said protection film.

4,709,470

METHOD AND APPARATUS FOR FABRICATING A CURVED MAGNET COIL

Konrad Meier, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

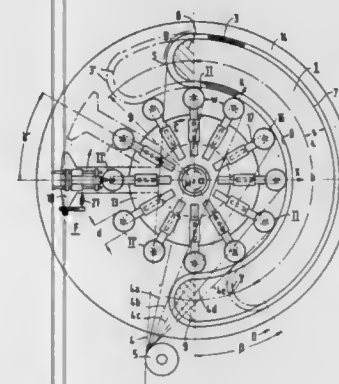
Filed Jan. 17, 1986, Ser. No. 820,205

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504211

Int. Cl.⁴ H01F 41/06

U.S. Cl. 29-605

11 Claims



1. A method for fabricating a curved disc-shaped magnet coil, the conductor of which is wound around a coil form having a convex side and a concave side with a therefore partly negative curvature, comprising the steps of utilizing means for winding and simultaneously pressing the conductor onto the concave side of the coil form or onto conductor turns already put in place on said concave side, and fixing the conductor in position after the winding process is complete, and further comprising the step of winding said conductor on the coil form or the conductor turns already present in the region of the convex side under tension, said step of utilizing comprising winding in the region of the concave side with relatively reduced tension with a plurality of pressure exerting means which can be moved along said concave side, said pressure exerting means being spaced substantially regularly and exerting a predetermined radial pressure, said pressure exerting means being held in position until said conductor is fixed in position on said coil form by at least one of mechanically, pneumatically or hydraulically operating means.

4,709,471

METHOD OF MAKING A MAGNETIC CORE

Milan D. Valencic, Athens, Ga., and Dennis A. Schaffer, Dallas, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 15, 1986, Ser. No. 896,781

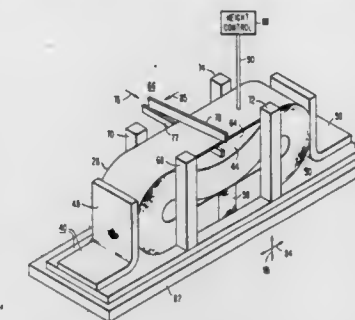
Int. Cl.⁴ H01F 41/06

U.S. Cl. 29-605

33 Claims

1. A method of constructing a jointed magnetic core from amorphous metal, comprising the steps of: winding a strip of amorphous metal to form a closed loop

having a plurality of lamination turns disposed about an opening, positioning said closed loop on a support surface in an orientation which allows the inherent flexibility of amorphous metal to collapse the loop opening and form a concave loop in an unsupported portion of the closed loop,



raising at least one of the lamination turns away from the concave loop to provide a clearance between the at least one raised lamination turn and the remaining portion of the the concave loop, cutting said at least one raised lamination turn, and repeating the raising and cutting steps until all of the lamination turns have been cut.

4,709,472

METHOD OF MANUFACTURING SPIRAL ELECTRODE ASSEMBLY

Toyoji Machida, and Shyuichi Ueno, both of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

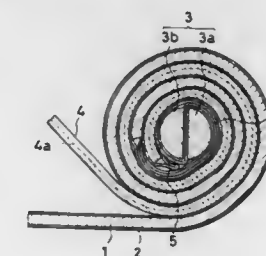
Filed Dec. 17, 1986, Ser. No. 943,650

Claims priority, application Japan, Dec. 23, 1985, 60-289807

Int. Cl.⁴ H01M 4/00, 6/00, 6/10

U.S. Cl. 29-623

8 Claims



1. A method of manufacturing a spiral electrode assembly formed by winding a first electrode member of one polarity and a second electrode member of opposite polarity separated by a separator around a spool, said method comprising the steps of covering at least both surfaces of the first electrode member with the separator, extending said separator forward beyond the leading end of said first electrode member to form a separator extension, inserting and holding the leading end of said separator extension in a slot of a spool, winding said separator extension around said spool until said separator extension is wound around said spool by a length more than the length of the circumference of said spool, inserting the second electrode member between the turns of said separator extension in such a relation that the leading end of said first electrode member is located rear relative to the leading end of said second electrode member, rotating said spool to wind said first and second electrode members separated by said separator around said spool, and withdrawing said spool.

4,709,473

DISAPPEARING SHELF ASSEMBLY FOR USE IN AN ELECTRICAL CONNECTOR APPLYING MACHINE

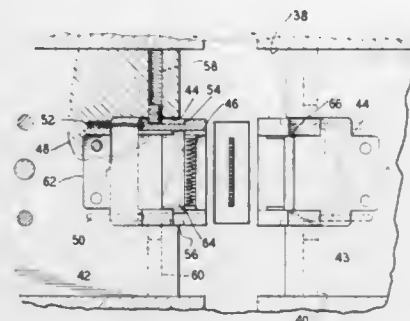
Charles E. Shields, 655 Woodland, Crystal Lake, Ill. 60014

Filed Jul. 17, 1986, Ser. No. 886,375

Int. Cl.⁴ H01R 43/04

U.S. Cl. 29-749

8 Claims



1. A machine for applying an electrical connector to a cable which includes, means for supplying a cable to which a connector is to be applied, means for supplying connector sections, means for receiving connector sections from the supply means and for applying connector sections to a cable, which includes tooling means for receiving a connector section and means for advancing said tooling means toward said cable and retracting said tooling means therefrom; wherein the improvement comprises said tooling means including shelf-like means carried thereon and constructed for movement relative to said tooling means between an extended connector-section receiving position and a retracted connector-section staking position, and there being provided biasing means associated with the tooling means and shelf-like means for urging said shelf-like means toward said extended position.

4,709,474

TRACTOR DUAL WHEEL REMOVER

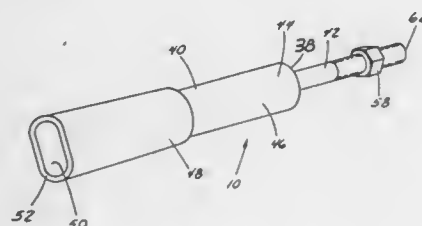
Bruce M. Eckert, 6526 Highway 38, Franksville, Wis. 53126

Filed Dec. 12, 1986, Ser. No. 940,936

Int. Cl.⁴ B23P 19/00

U.S. Cl. 29-802

12 Claims



1. A tractor dual wheel assembly with breakaway means, comprising:

- a main wheel with eyelets affixed thereto and a rim;
- a dual wheel having a dual wheel rim extension in telescoping coaxial frictional engagement with the main-wheel rim and having tabs affixed thereto each with an aperture aligned with one of said eyelets in a substantially axially parallel direction such that there are corresponding pairs of tabs and eyelets;
- a rigid elongate member having a main-wheel end portion non-rotatably receiving one of said eyelets and an opposite dual-wheel end portion forming a threaded shaft extending through the aperture of the corresponding tab, said threaded shaft being both axially and non-rotatably affixed with respect to the main-wheel end portion; and
- nut means threadably adjustably engaged with the shaft in position between the corresponding eyelet and tab, said

nut means having an outer surface engaged with the tab about its aperture, whereby rotation of the nut means easily and quickly causes breakage of the frictional engagement for removal of the dual wheel.

4,709,475

COMBINATION COMB, HAIR TRIMMER AND SAFETY RAZOR

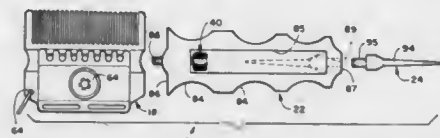
Ha T. Phung, 3802 Granada Ave., San Diego, Calif. 92104

Filed Sep. 11, 1986, Ser. No. 906,020

Int. Cl.⁴ B26B 19/00

U.S. Cl. 30-31

12 Claims



1. A combination comb, hair trimmer and safety razor comprising:

- a body member having a top surface, a bottom surface, a front edge, a rear edge, and laterally spaced side edges;
- a plurality of comb teeth are formed on said body member along its front edge;
- a substantially rectangularly shaped recess is formed in the top surface of said body member, said recess having a front edge, a rear edge, and laterally spaced side edges, the front edge of said recess coinciding with the front edge of said body member;
- a cover plate having a substantially rectangular shape having a top surface, a bottom surface, a front edge, a rear edge, and laterally spaced side edges, said cover plate being detachably received in the substantially rectangularly shaped recess formed in the top surface of said body member;
- said cover plate having a plurality of fingers formed along its front edge, said fingers on said cover plate having downwardly extending finger tips; and
- means for detachably securing said cover plate to said body member.

4,709,476

SAFETY RAZOR SYSTEM

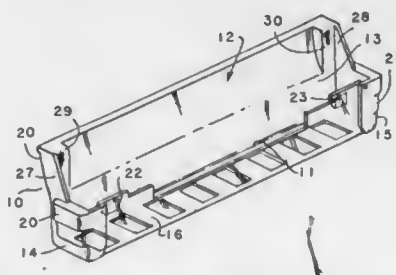
Jill M. Shurtleff, South Boston, and Alejandro C. Lee, Cambridge, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Oct. 8, 1986, Ser. No. 916,765

Int. Cl.⁴ B26B 21/44

U.S. Cl. 30-41

6 Claims



1. A safety razor system comprising:

- a razor blade assembly having a predetermined width made up of a cartridge having a guard member and a blade means, said blade means being permanently mounted between a platform and a cap, said cap including a water-activated shaving aid disposed on a surface of said cap

4,709,478

WINDOW PAINT SCRAPER

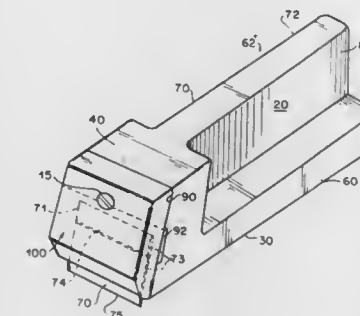
David H. Cortelyou, Jr., 95 Franklin Ave., Staten Island, N.Y. 10301

Filed Oct. 2, 1986, Ser. No. 914,670

Int. Cl.⁴ B26B 3/00

U.S. Cl. 30-169

7 Claims



behind said blade means, said shaving aid expanding with respect to said surface of said cap, when wet; and

a one-piece, integrally molded overcap having a chamber, said chamber having a transverse dimension substantially that of the width of the razor blade assembly and extending in height to cover said guard member and said blade means, said chamber including a substantially planar top wall and a bottom wall laterally displaced from said top wall, first and second end walls connecting said top wall to said bottom wall for preventing movement of said razor blade assembly into or out of said chamber in a transverse direction, and a hood member integrally connected to said top wall, said hood member extending over the entire surface of said shaving aid and exiting upward from the planar surface of said top wall and directed away from said chamber such that said shaving aid, when expanded, has sufficient clearance to prevent contact between said expanded shaving aid and said hood member.

4,709,477

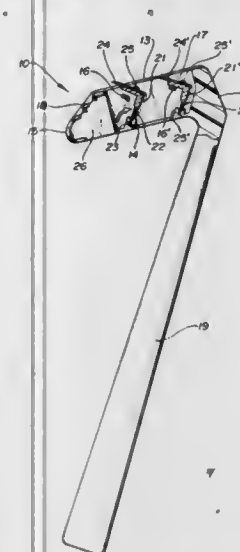
BLADE ASSEMBLY FEATURING VARIABLE SPAN
Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 2, 1986, Ser. No. 902,715

Int. Cl.⁴ B26B 21/22

U.S. Cl. 30-50

7 Claims



1. A blade assembly comprising in combination:

- (a) a frame with an essentially flat bottom portion, a front portion and a back portion both portions extending upward from said bottom portion, a hollow central portion defined at either side by inner faces of said front and back portion, said front portion including a guard bar formed on the top of said portion;
- (b) a first blade support mounted on said bottom portion and extending upward to support a first blade, said blade support including pivoting means which allows pivotal movement of the first blade along a predetermined arcuate path to change the span of said first blade in response to pressures exerted during shaving; and
- (c) a second blade support mounted on said bottom portion and extending upward to support a second blade, said blade support including pivoting means which allows pivotal movement of the second blade along a predetermined arcuate path to change the span of said second blade independent of the change in span of said first blade.

1. A window paint scraper for removing paint from a windowpane comprising:

- an elongated one-piece scraper body having a flat bottom surface and left and right parallel, vertical sidewalls, each of which comprises a guide wall for a user in operation of the scraper, said left and right guide walls extending continuously from front to rear of the scraper body for permitting one of said guide walls to engage and rest on a windowpane in alignment with and alongside the edge of a putty line which extends along the windowpane and is coated with paint which extends beyond the putty line and over the windowpane;
- said scraper body having a handle which is integral with said one-piece body;
- said scraper body having a flat bottom surface which, due to the use of said guide wall, is adapted to glide over said windowpane and over excess paint thereon immediately adjacent said putty line or sash;
- said scraper body having a front surface disposed at an angle relative to said bottom surface;
- a razor blade mounted on said front surface of said scraper body at said angle; the two side edges of said blade being spaced inwardly from said respective left and right guide walls, the cutting edge of said blade extending slightly below said bottom surface of said scraper body at the forward edge thereof so that said cutting edge of said blade removes excess paint from beyond said putty line from said windowpane as it is moved along the windowpane and so that the edges of said guide walls are raised above the surface of said windowpane so that the bottom surfaces of said left and right guide walls are raised slightly above the surface of the windowpane and can glide over the excess paint adjacent to the putty on said windowpane;
- a blade-retaining cover for said razor blade on the front surface of said scraper body and removably secured thereto, whereby a razor blade can be seated on or removed from said front surface; and
- means for removably attaching said razor blade and cover to said front surface of said scraper body;
- and including a compartment extending from said front surface into said body at about a 45 degree angle and operable as a storage chamber for receiving extra razor blades, said chamber being covered by said cover when said cover is in place in said front surface.

4,709,479

SHINGLE REMOVING MACHINE

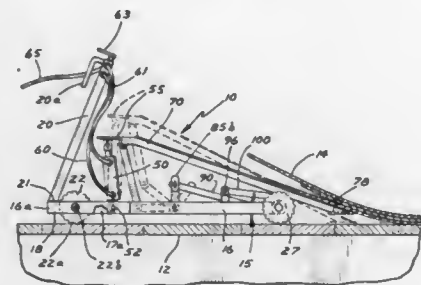
William J. Lavelette, 3137 South Superior St., Milwaukee, Wis. 53207

Filed Sep. 22, 1986, Ser. No. 910,061

Int. Cl.⁴ E04D 15/00

U.S. Cl. 30—170

4 Claims



1. A shingle removing machine having in combination a frame having a rear wheel support and a plurality of spaced front wheels, a shaft having said front wheels mounted thereon, sleeves carried on said shaft between said wheels, a power actuated cylinder having a vertically movable piston, a plate member carried at the top of and operated by said piston, a plurality of operating members diverging forwardly from said plate member, each of said operating members extending over and being secured to a respective of said sleeves and having terminal portions extending beyond said sleeves, a blade member extending across and being secured to said terminal portions, a driving gear on said shaft, means connecting said plate member and said gear engaging and driving said gear, whereby a movement of said plate member causes said blade to move downwardly underlying adjacent facing shingles and a second movement of said plate member causes a forward movement and a lifting action of said blade which causes said shingles to come free of the underlying roof boards, and a handle upstanding at the rear of said frame.

4,709,480

SCISSORS

Shigetugu Takigawa, and Masuhiko Takigawa, both of Osaka, Japan, assignors to ARS Edge Co. Ltd., Osaka, Japan

Filed Feb. 13, 1986, Ser. No. 828,913

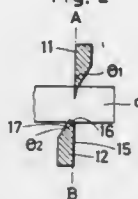
Claims priority, application Japan, Apr. 2, 1985, 60-49723[U]

Int. Cl.⁴ B26B 13/10

U.S. Cl. 30—254

1 Claim

Fig. 2



1. Scissors, comprising: a first blade made of a metal and having a cutting edge formed by a flat side and beveled side intersecting at an acute included angle; a second blade having a flat side adapted to rub against said

- flat side of said first blade when said first blade and said second blade meet;
- said second blade further having an adjacent side to said flat side such that said adjacent side and said flat side form an obtuse included angle;
- said second blade further having a beveled side intersecting said adjacent side at an angle and thereby forming a non-jagged sharp line cutting edge portion, at least said cutting edge portion being made of a ceramic; and
- a pivot for permitting the pivotal movement of said first blade and said second blade when handles at their ends are brought together or moved away from each other.

4,709,481

SHAVING TOOL

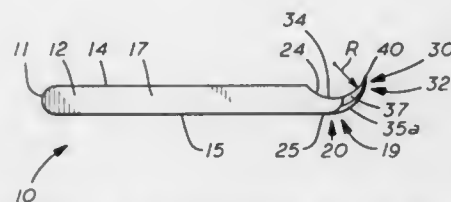
Milton D. Moore, 2940 Holly Hall, Houston, Tex. 77054

Filed Aug. 19, 1986, Ser. No. 897,871

Int. Cl.⁴ B26B 9/02

U.S. Cl. 30—356

16 Claims



1. An instrument for use in extricating ingrown hairs from skin tissues, comprising: a handle; a curved extension attached to said handle, said curved extension having a proximal portion and a distal portion, said distal portion comprising a tapered blade terminating in a sharp point, said tapered blade having a noncutting upper surface adapted for lifting but not cutting the ingrown hairs, said tapered blade further comprising an upper concave surface having radius R, two lower convex surfaces, and two upper side surfaces, all of said surfaces intersecting at said point.

4,709,482

ARBITRARY-DIRECTION TRACER CONTROL UNIT

Hitoshi Matsuura, Hachioji, and Hiroshi Sakurai, Hino, both of Japan, assignors to Fannu Ltd., Minamitsuru, Japan

PCT No. PCT/JP85/00414, § 371 Date Mar. 21, 1986, § 102(e)

Date Mar. 21, 1986, PCT Pub. No. WO86/00845, PCT Pub. Date Feb. 13, 1986

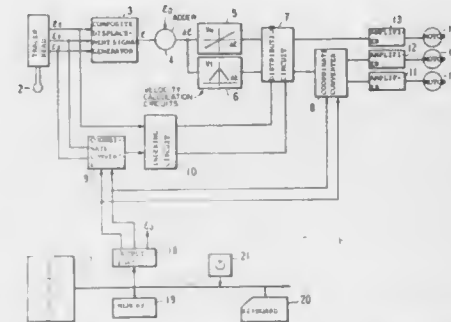
PCT Filed Jul. 22, 1985, Ser. No. 855,627

Claims priority, application Japan, Jul. 27, 1984, 59-157006

Int. Cl.⁴ G01B 7/28

U.S. Cl. 33—1 M

1 Claim



1. An arbitrary-direction tracer control unit, comprising: a tracer head for outputting a displacement signal corre-

- sponding to the displacement of a stylus in contact with a surface of a mode;
- a memory for storing an angle between an X-axis and a tracer feed axis;
- correction angle setting means for setting a fixed value correction angle with respect to the tracer feed axis;
- adder means for adding together the angle stored in said memory and the correction angle set by said correction angle setting means and producing an output; and
- tracing operation means for operating, on the basis of the added output of said adder means and the displacement signal from said tracer head, at a feed rate in each axis direction at which the model and the stylus are moved relative to each other in a direction corresponding to the added result output by said adder means.

4,709,483

GLASS CUTTING DEVICE

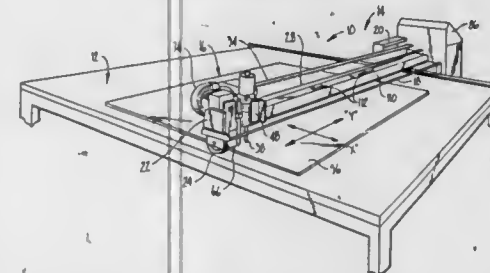
Charles B. Hembree, El Cerrito, and Brian T. Shea, Berkeley, both of Calif., assignors to Wing Aero, El Cerrito, Calif.

Filed Mar. 14, 1984, Ser. No. 589,583

Int. Cl.⁴ C03B 33/04

U.S. Cl. 33—18.1

6 Claims

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 52 Pages)

1. A method of operating a driven glass cutting head mounted on a glass cutting platform with the aid of a computer, comprising the steps of:
 - a. providing the computer with a data base for the motor driven glass cutting head, including at least: a list of dimensions of desired pieces of glass; a list of dimensions of pieces of glass in stock and a list of dimensions of desired waste pieces of glass;
 - b. repetitively comparing in the computer the dimensions of one piece of glass of said list of desired pieces of glass with said dimensions of said list of pieces of glass in stock and determining the smallest one stock piece of glass therefrom which will fit said one desired piece of glass with at least one remainder piece of glass;
 - c. determining in the computer the orientation of and cutting start and end points for the pattern of said one desired piece of glass in relation to said determined one stock piece of glass to produce a remainder piece of glass having a maximum area;
 - d. adding in the computer the dimensions of said at least one remainder piece of glass to said list of dimensions of pieces of glass in stock to form a combined list of pieces of glass;
 - e. repetitively comparing in the computer the dimensions of at least another piece of glass of said list of desired pieces of glass to said combined list of pieces of glass and determining at least another smallest piece of glass therefrom which will fit said another desired piece of glass;
 - f. determining in the computer the orientation of and the cutting start and end points for the pattern of said at least another desired piece of glass in relation to the determined at least another piece of glass from said combined list to produce at least another remainder piece of glass having a maximum area;
 - g. repetitively comparing in the computer the dimensions of at least one desired waste piece of glass from said list of

- desired waste pieces of glass to at least a plurality of remainder pieces of glass and determining the smallest of said plurality of said remainder pieces of glass which will fit said at least one desired waste piece of glass;
- h. determining in the computer the orientation of and the cutting start and end points for the pattern of said at least one desired waste piece of glass on said determined remainder piece of glass;
- i. positioning said determining one stock of glass on the glass on the glass cutting platform;
- j. signalling from the computer to the cutting head said cutting start and end points for the pattern of said one desired piece of glass;
- k. cutting said one desired piece of glass from said determined one stock piece of glass according to said one desired piece signal;
- l. positioning said determined at least another piece of glass from said combined list on the cutting table;
- m. signalling from the computer to the cutting head said cutting start and end points for the pattern of said at least another desired piece of glass; and
- n. cutting said at least another desired piece of glass from said determined at least another piece of glass from said combined list according to said another desired piece signal;
- o. positioning said determined remainder piece of glass on the glass cutting platform;
- p. signalling from the computer to the cutting head said cutting start and end points for said desired waste piece; and
- q. cutting said desired waste piece of glass from said determined remainder piece of glass according to said desired waste piece signal.

4,709,484

LEVER DISPLACEMENT GAUGE

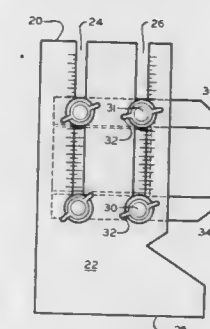
Daniel E. Bishop, East Corinth, Me., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 29, 1986, Ser. No. 913,791

Int. Cl.⁴ G01B 5/08

U.S. Cl. 33—169 R

1 Claim



1. A displacement gauge particularly suited for rigging collective pitch levers of helicopters comprising an aligning plate having parallel slots therein perpendicular to the base thereof, an indexing strip, a registering strip, two pins holding the indexing strip against the aligning plate parallel to the base of the aligning plate, one pin passing through each slot in the aligning plate and then through the indexing strip so that the indexing strip is slidable up and down against the aligning plate, two pins holding the registering strip against the aligning plate parallel to the aligning plate base, one pin passing through each slot in the aligning plate and through the registering strip so that the registering strip is slidable against the aligning plate, a spacer panel so disposed between the indexing strip and the registering strip as to be carried thereby so that when the indexing strip is moved to a set position the register-

ing strip is moved therewith by the spacer panel therebetween to maintain the predetermined distance between them, and lock nuts affixed to the pins for securing the indexing and registering strips in the set position, the indexing strip and the registering strip being provided with tongues along the facing sides thereof, and the spacer being provided with grooves on its sides adjacent the tongues to be held thereby between the indexing and registering strips.

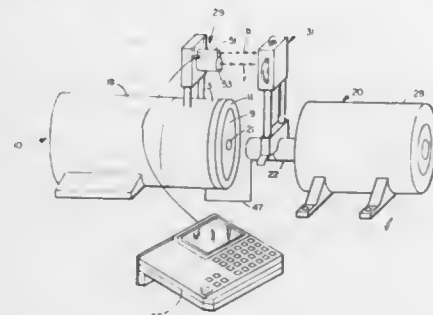
4,709,485

SHAFT ALIGNMENT METHOD AND APPARATUS
Donald E. Bowman, Joliet, Ill., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 4, 1986, Ser. No. 937,808
Int. Cl.⁴ G01B 5/25, 7/31

U.S. Cl. 33—228

19 Claims



1. An apparatus for use in alignment of respective shafts of two items of equipment along a common center line, comprising:

- a cylindrical alignment housing including means for mounting it on a housing of one of said items of equipment in substantially concentric relation to the shaft of the equipment item;
- a cylindrical bearing housing substantially concentrically disposed around said alignment housing and rotatably supported thereon, and
- measuring means supported on said bearing housing and a said shaft of the other item of equipment for determining whether said shafts are aligned with each other.

4,709,486

METHOD OF DETERMINING THE ORIENTATION OF A SURVEYING INSTRUMENT IN A BOREHOLE
Philip H. Walters, Austin, Tex., assignor to Tensor, Inc., Round Rock, Tex.

Filed May 6, 1986, Ser. No. 860,020
Int. Cl.⁴ F21B 47/22

U.S. Cl. 33—304

15 Claims

1. A method of determining the orientation of a surveying instrument in a borehole comprising:
measuring the radial components of the earth's magnetic field at a plurality of orientations of a surveying instrument in a borehole;
measuring the earth's gravitational field at a plurality of orientations of a surveying instrument in a borehole;
calculating the borehole axial magnetic component at each said orientation from said gravitational and the radial magnetic field measurements; and
computing the azimuth angle of each said orientation directly from said gravitational and radial magnetic field measurements and the calculated borehole axial magnetic component.

4,709,487

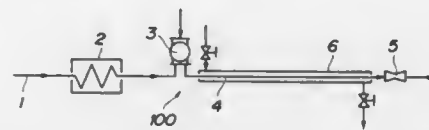
METHOD FOR PROCESSING BY HEATING AND EQUIPMENT FOR SAME

Takeshi Akao, and Toshio Furukawa, both of Chiba, Japan, assignors to Kikkoman Corporation, Chiba, Japan
Filed Feb. 28, 1986, Ser. No. 834,928

Claims priority, application Japan, Feb. 28, 1985, 60-39698
Int. Cl.⁴ F26B 3/10

U.S. Cl. 34—10

17 Claims



1. A method for processing by heating a powder-like and/or granular substance, comprising:
charging said powder-like and/or granular substance as a matter to be processed into a heated and pressurized medium stream adapted for directly heating;
heating said powder-like and/or granular substance while transferring said powder-like and/or granular substance in a heating tube (4, 6, 9) by said direct-heating medium stream;
discharging from said heating tube said powder-like and/or granular substance as it is heated to be processed by said direct-heating medium stream;
selectively varying the pressure of the medium stream within the tube by selectively restricting the discharge of the medium stream from the tube; and
whirling said direct-heating medium stream in said heating tube (4) to spirally transfer said powder-like and/or granular substance.

4,709,488

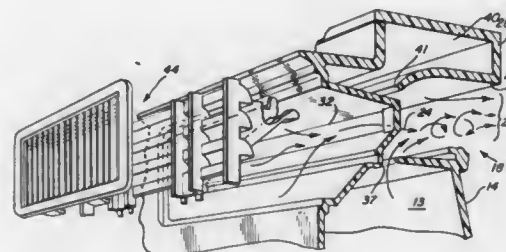
VENTURI AIR VENT FOR DISHWASHER

Jeffrey Anselmino, Pipestone Township, Berrien County, and Scott D. Slabbekoorn, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 6, 1986, Ser. No. 893,942
Int. Cl.⁴ F26B 25/12

U.S. Cl. 34—235

16 Claims



1. In an apparatus having means defining a drying chamber, means defining an outlet in communication with said drying chamber, means for effecting flow of air into and through the drying chamber to absorb moisture therein and flow of the air outwardly from the drying chamber through said outlet as a stream of moist air, and a wall member adjacent said drying chamber and having a dry air flow passage extending there-through, the improvement comprising:
venturi means with a converging inlet portion and a diverging outlet portion to develop a low pressure suction zone, said air with absorbed moisture from the drying chamber

flowing from the drying chamber through said venturi means to said outlet;
first means for delivering air from said dry air flow passageway as an incident of a pressure differential between the dry air flow passageway and suction zone to said suction zone for mixture with the air with absorbed moisture in the venturi means; and
second means separate from said first means for delivering air from said dry air flow passage to said low pressure suction zone against said moist air stream as a layer juxtaposed to a surface portion of said moist air stream as an incident of a pressure differential between the air flow passage and the suction zone, whereby said layer acts as a barrier preventing undesired delivery of said moist air to outwardly of said barrier.

4,709,489

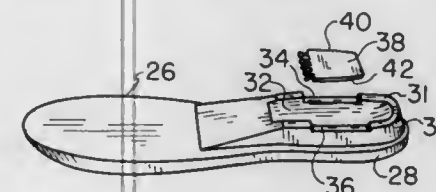
SHOCK ABSORBING ASSEMBLY FOR AN ATHLETIC SHOE

Kenneth F. Welter, 889 Heritage Dr., Addison, Ill. 60101
Filed Aug. 15, 1985, Ser. No. 765,845

Int. Cl.⁴ A43B 21/30

U.S. Cl. 36—27

14 Claims



1. A shock absorbing assembly for an athletic shoe comprising:
a resiliently flexible plate in the form of a beam having a front laterally extending marginal edge portion and laterally spaced opposite end portions, the plate being of a size between the end portions to support the heel of a person wearing the shoe and being of a thickness to be arcuately downwardly deflected by pressure applied by said person upon the plate;
a heel portion positioned within the shoe and provided with a pair of laterally spaced supports, each of said supports being relatively non-compressible, each of the plate end portions bearing upon one of said supports and said front marginal edge portion being unsupported and free to flex intermediate the supports;
means for retaining each of said plate end portions on its respective support; and
means intermediate the spaced supports to permit downward deflection of the plate between said supports by the weight of the person wearing the shoe whereby application of downward pressure on the heel portion by a person wearing the shoe downwardly deflects the resilient plate to form a longitudinally trough to longitudinally cradle the heel of said person.

4,709,490

INSOLE

Walter Föttinger, Weinheim, and Kurt Jörder, Weinheim-Heiligkreuz, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed May 27, 1986, Ser. No. 867,482

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520093

Int. Cl.⁴ A43B 13/38

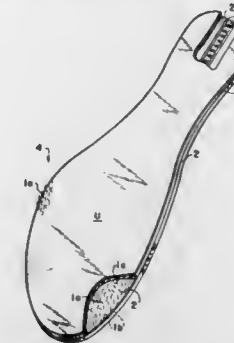
U.S. Cl. 36—44

8 Claims

1. A two layer insole including a moisture-storing layer and a capillary-conductive layer, having a total thickness from

about 1.5 to about 5 mm and a weight from about 200 g/m² to about 1200 g/m²,

said moisture-storing layer constituting not less than about 60 and not more than about 95 weight percent of the total weight per square meter, and comprising absorbent fibers, said capillary-conductive layer consisting of hydrophobic fibers superimposed on the moisture-storing layer and



providing an opposite, exposed surface, the hydrophobic fibers defining pores therebetween for capillary-conducting moisture from the exposed surface of the capillary-conductive layer to the moisture-storing layer; and means for bonding the two layers together moisture permeably, said bonding means comprising some of the hydrophobic fibers of the capillary-conductive layer which penetrate into the moisture-storing layer.

4,709,491

ALPINE SKI BOOT

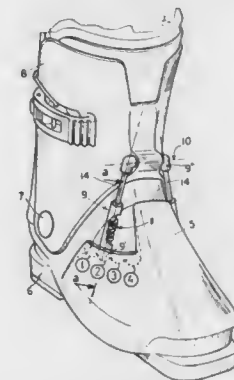
Joseph Morell, Annecy; Jean-Louis De Marchi, Duingt, and Norbert Kopp, Chavanod, all of France, assignors to Salomon S.A., Annecy, France

Filed Jun. 2, 1986, Ser. No. 869,245

Claims priority, application France, Jun. 12, 1985, 85 09178
Int. Cl.⁴ A43B 5/04

U.S. Cl. 36—121

54 Claims



1. A ski boot for surrounding the foot and the lower leg of a skier, wherein said boot comprises:

- a shell base portion;
- an upper portion, wherein said upper portion is adapted to flex with respect to said shell base portion; and
- an elastic apparatus for controlling the flexion of said upper portion, wherein said elastic apparatus is secured to each of said portions at a connection point, wherein said elastic apparatus generates an elastic force directed toward said connection point of said elastic apparatus with one of said portions of said boot, wherein the position of said connection point of said elastic apparatus with the other portions of said boot is adjustable to correspondingly vary the orientation of said elastic force.

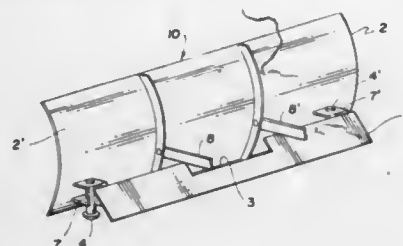
4,709,492

PUSHING APPARATUS, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Gordon Watson, 12750 Apple Dr., Nannica, Mich. 49448
 Filed Jul. 10, 1986, Ser. No. 884,001
 Int. Cl.⁴ E01H 5/04

U.S. Cl. 37-232

20 Claims



1. A pushing apparatus, comprising, in combination:
 - a main blade for pushing a portion of a substance when said main blade is moved in a forward direction;
 - a back scraper blade for pushing another portion of said substance when said main blade is moved in a rearward direction;
 - connecting means for operably and hingedly connecting said back scraper blade to the rear of said main blade; and
 - said connecting means comprising shoes disposed on the backside of said main blade and wedge brackets fitted over said shoes for hingedly holding said back scraper blade.

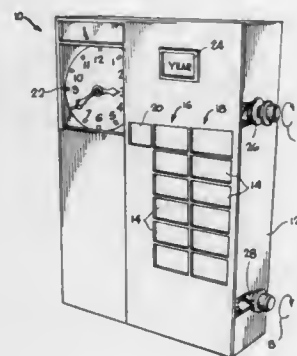
4,709,493

CLOCK WITH CALENDAR NOTEPAD

Charles E. Sapp, 2149 Rio Guacimal Ct., San Jose, Calif. 95116
 Filed Dec. 1, 1986, Ser. No. 936,493
 Int. Cl.⁴ G09D 3/10

U.S. Cl. 40-117

3 Claims



1. A clock calendar comprising,
 - a housing having a front side,
 - a plurality of windows on said front side of the housing, including a date window,
 - a paper roll adjustably disposed within said housing, said paper roll having a list of calendar days printed thereon,
 - means for positioning said paper roll within said housing such that a calendar day is readable within said date window and advancement of said paper roll causes a different day to be readable within the date window, said means for positioning the paper roll being a pair of rotatable shafts, said paper roll having a first end portion wrapped about a first rotatable shaft of said pair of rotatable shafts and having a second end portion wrapped about a second rotatable shaft, whereby rotation of said shafts causes the length of said paper roll between said end portions to move past said windows, said paper roll having blank

space for the recordation of personal dates through windows other than date windows, and

a clock in communication with said paper roll, said clock having a means for periodically advancing the paper roll, said means for periodically advancing the paper roll including a plurality of radially outwardly extending projections about the circumference of said first shaft and including a bar attached to said clock for rotation with the hour hand of the clock, said bar having sufficient length to communicate with said projections for rotation of said first shaft, wherein said bar is balanced upon a shaft to which said hour hand is fixed, whereby advancing of said paper roll causes the next calendar day to be readable within said date window and said recorded personal dates are caused to be brought forward toward said window adjacent said date window.

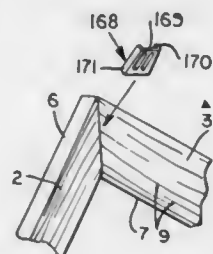
4,709,494

PICTURE FRAME FASTENER

Gary D. Kennedy, and Joseph G. Maher, both of Atlanta, Ga., assignors to Kentec, Inc., Decatur, Ga.
 Continuation of Ser. No. 169,371, Jul. 16, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,425
 Int. Cl.⁴ A47G 1/06; G09F 1/12

U.S. Cl. 40-152

2 Claims



1. A frame comprising elongated wooden frame elements positioned in a common plane, each frame element having generally parallel grain extending along the length of the frame element and angled end surfaces in abutment with the angled end surfaces of adjacent frame elements and forming mitered joints about the frame, said frame having a front surface, a back surface, an outer edge surface and an inner edge surface, and fasteners at each joint of said frame, the improvement therein of said fasteners being approximately U-shaped in cross-section and including a flat central web and side flanges extending along opposite edges of the central web at angles with respect to the central web and said side flanges of each fastener straddling the joint of the abutting frame elements, with the central web of each fastener extending from the back surface and sloped from adjacent the back surface and the outer edge surface at a joint of said frame toward the front surface and the inner edge surface at the joint of said frame, whereby the joints are characterized by having been drawn together by the insertion of the side flanges of the fasteners through the previously uncut grain of the frame elements and into the joints of the frame from the back surface at an angle sloped from the outer edge surface toward the inner edge surface of the joints of the frame.

4,709,495

SEPARATOR MEANS FOR FRAMELIKE DEVICES

Kendrick Backwalter, 18 Chetwynd Rd., Paoli, Pa. 19301
 Filed Aug. 6, 1982, Ser. No. 406,101
 Int. Cl.⁴ A47G 1/06

U.S. Cl. 40-158 R

3 Claims

1. A means for displaying a two dimensional item comprising in combination: three dimensional frame means formed to a particular configuration in a two dimensional sense and having an outer edge and an aperture therewithin defined by an

inner edge; said three dimensional frame means being further formed to have a horizontal shelflike section which has length and width dimensions being defined by said inner edge and by a line lying between said inner edge and said outer edge; said three dimensional frame means further formed to have a vertical wall section disposed to rise vertically from said line in a third dimension to thus define a depth dimension for said horizontal shelflike section; transparent means formed to fit completely over said aperture in abutment with said horizontal shelflike section and in close proximity to said vertical wall section; a plurality of three dimensional clear separator means formed to be individual from each other and disposed to be unattached to each other, each of said three dimensional clear separator means having length, width and depth dimensions with at least one of said separators being formed so that its length dimension is less than the length of an associated part of said shelflike section and each disposed to come in abutment

body for detecting the presence of an object in the chamber of said firearm; and

(c) movable indicator means, associated with said main body and connected with said chamber probe means, for providing a visible indication when said chamber probe means encounters an object in said chamber.

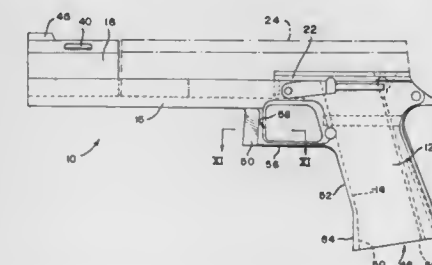
4,709,497

HANDGUN FRAME WITH FIXED BARREL BUSHING

Franco Resca, 117 Oak Avenue, Cullinan, Transvaal Province, South Africa
 Continuation-in-part of Ser. No. 750,332, Jun. 28, 1985, abandoned. This application Feb. 25, 1987, Ser. No. 18,860
 Int. Cl.⁴ F41C 21/22

U.S. Cl. 42-75.02

6 Claims



with said transparent means in alignment with an associated part of said shelflike section, said three dimensional clear separator means further formed of material which does not absorb moisture and which can be readily cut to enable any of said three dimensional clear separator means to be cut to a length to approximately match an associated part of said shelflike section; pressure sensitive adhesive means disposed on a front surface of each three dimensional clear separator means, which front surface is defined by the length and width dimensions of such three dimensional clear separators to then enable each three dimensional clear separator to be pressure secured along its front surface to said transparent means and alternatively to be removed therefrom whereby, when said plurality of three dimensional clear separator means are secured to said transparent means, a two dimensional item to be displayed can be disposed to overlay said plurality three dimensional clear separator means, and can be separated from said transparent means by the depth of said three dimensional clear separator means.

1. A handgun frame for receiving a barrel and slide of the type operating on the Browning short recoil principle, the frame including a magazine well defined within a grip formation, an elongated cantilever support extending forwardly from the grip formation to a position beyond a forward end of the barrel, a barrel bushing rigidly fixed to and directly mounted on a forward end of the cantilever support for slidably supporting a front end of the barrel therein, and slide support means for slidably supporting the slide.

4,709,498

METHOD FOR MOUNTING SHRIMP

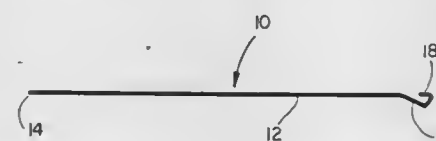
Frank Wolski, Poor Boys Fishin' Hole, P.O. Box 857, Coquille, Oreg. 97423

Filed Oct. 6, 1986, Ser. No. 915,413

Int. Cl.⁴ A01K 97/00

U.S. Cl. 43-4

7 Claims



1. A method of mounting shrimp as bait on a hook located at the end of a length of fishing leader line utilizing a fishline having a free end and a threading tool formed of a rigid wire pointed at one end, having a straight shank, and defining a crook at the opposite end, comprising: forming a loop in said length of fishing leader line opposite said hook, engaging said loop on said crook of said threading tool, impaling a shrimp on said pointed end of said threading tool, passing said threading tool completely through the body of said shrimp, thereby pulling said loop therewith, drawing said leader line into said body of said shrimp until said hook reaches said body, disengaging said loop from said crook, and attaching said loop to said free end of said fishline.

4,709,496

SAFETY DEVICE INCLUDING CHAMBER PROBE

David A. Johnson, 3432 Tanglewood Way, Salem, Oreg. 97302

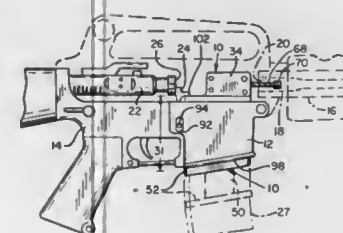
Filed Dec. 18, 1986, Ser. No. 943,946

The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.

Int. Cl.⁴ F41C 17/08

U.S. Cl. 42-70.11

19 Claims



1. A safety device for use in a repeating firearm of the type having a chamber for holding a cartridge during firing, a bolt reciprocatingly movable between a closed position necessary for the firearm to be fired and an open position which prevents firing, and having a magazine well including an opening for receiving a magazine therein, the safety device comprising:
 - (a) a main body capable of fitting within said magazine well;
 - (b) movable chamber probe means associated with said main

4,709,499

CHEMILUMINESCENT FISHING LURE DEVICE

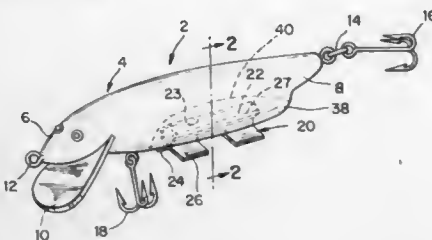
Gary W. Ottaviano, 24440 Uppingham, Bedford Heights, Ohio 44146

Filed Jul. 17, 1985, Ser. No. 755,809

Int. Cl.⁴ A01K 85/01

U.S. Cl. 43—17.6

17 Claims



1. A fishing lure device of the type for providing a chemical attractant for attracting fish, said device including a lure body having a predetermined shape to generally simulate a fishing bait, said body having an elongated cavity formed therein and having at least one open end communicating with the exterior of said body, and an elongated member removably disposed within said cavity, said elongated member containing a chemical attractant means adapted for providing a selected chemical attractant and having at least one guide member extending outwardly from said elongated member and exteriorly of said lure body.

4,709,500

VISUAL TIP

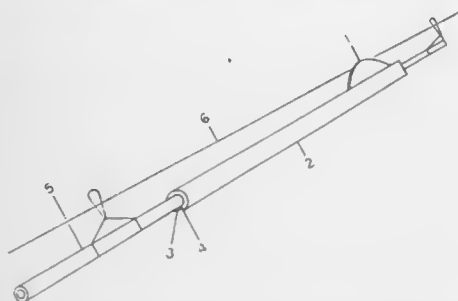
Calvin K. Yasumiishi, 1335 NE. 175th Ave., Portland, Oreg. 97230

Filed Oct. 14, 1986, Ser. No. 918,029

Int. Cl.⁴ A01K 97/12

U.S. Cl. 43—24

1 Claim



1. A one piece fishing apparatus for use on a fishing rod tip for aiding in the signaling of a fish strike composed of, in combination, a fluorescent polyvinyl plastic tubular staff of uniform cross section having a longitudinal seam formed by longitudinal edges mutually opposed, a flag of uniform cross section located on the distal end of the tubular staff, said flag mounted atop said tubular staff on one side opposite the longitudinal seam whereby the fishing apparatus can be quickly removed from or replaced upon the fishing rod intact.

4,709,501

LURES WITH DISSIMILAR TAIL LENGTHS

Gregory C. Garst, Rte. 3, Box 478, Many, La. 71449

Filed Apr. 7, 1986, Ser. No. 848,941

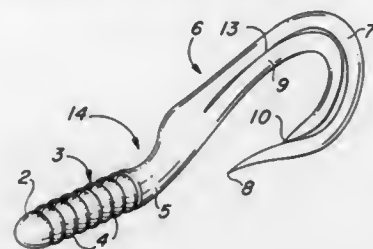
Int. Cl.⁴ A01K 85/00

U.S. Cl. 43—42.24

8 Claims

1. A fishing lure comprising a body portion; at least one curved, flexible split-tail portion extending outwardly and

rearwardly from a point of attachment to said body portion and curving inwardly toward said point of attachment; and a slot provided in said split-tail portion, said slot defining an outside tail segment extending substantially the entire length of said split-tail portion and defining an outside element of said split-tail portion, and an inside tail segment defining an inside element of said split-tail portion, said inside tail segment being



shorter than said outside tail segment, said slot separating said outside tail segment and said inside tail segment, whereby said inside tail segment and said outside tail segment are free to independently flutter with respect to each other at different frequencies in and out of a plane bisecting said outside tail segment and said inside tail segment when said lure is retrieved through a body of water.

4,709,502

ELECTRIC ROACH TRAP

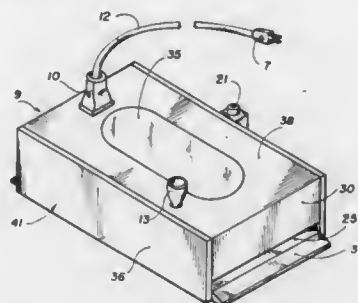
Albert Bierman, 2380 Windward Cir., West Lake Village, Calif. 91361

Filed Sep. 13, 1985, Ser. No. 775,776

Int. Cl.⁴ A01M 1/22

U.S. Cl. 43—112

5 Claims



1. An electric roach trap comprising:
a housing comprising a top housing and a bottom housing, said housing substantially enclosing at least three spaced apart conductors, each conductor representing a different type having a structurally different shape, said conductors being spaced from each other, each said conductor having a separate electrical conducting path which is normally open, upon a roach contacting simultaneously any two of said conductors the roach will be electrocuted with the conductors being located at locations to insure that each roach entering said trap will be electrocuted.

4,709,503

CRAWLING INSECT TRAP

Robert McQueen, 2744 Shipley Ter., SE., Washington, D.C. 20020

Filed Oct. 21, 1985, Ser. No. 789,645

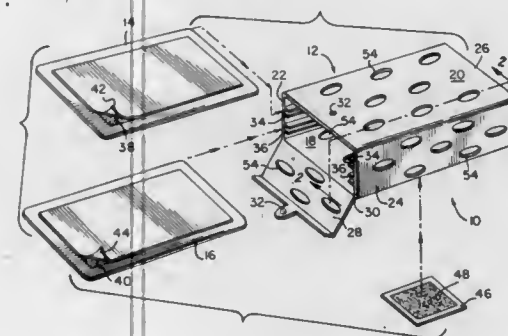
Int. Cl.⁴ A01M 1/14

U.S. Cl. 43—114

21 Claims

1. A crawling insect trap comprising:
a housing including a top, a bottom, and a side wall connecting said bottom and said top,

said side wall including at least one insect entry side wall opening through it to the interior of said housing, said top including at least one insect entry top opening through it to the interior of said housing, a shelf positionable in said housing, said shelf having a first shelf side, an opposite second shelf side and a first sticky insect-catching material on said first shelf side, said entry side wall opening providing access for an insect from the exterior of said housing to said first sticky insect-catching material, said shelf further including second sticky insect-catching material on said second shelf side,



said housing including a first securing means for releasably securing said shelf in said housing disposed so that said shelf can be positioned in place in said housing spaced from and between said top and said bottom and can also be removed from said housing, said housing further including an end cover movable between an open position providing access to the interior of said housing and defining an end opening through which said shelf can pass into and out of said housing and a closed position extending generally between said top and said bottom, said first shelf side facing said bottom when said shelf is disposed in said housing, and said insect entry side wall opening being positioned between said bottom and said shelf.

4,709,504

PORTABLE DISPOSABLE INSECT TRAP

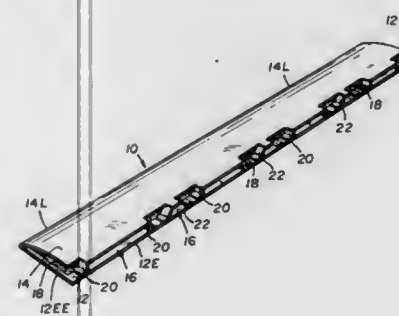
Milos D. Andric, 1635 Central Ave., Wilmette, Ill. 60091

Filed Mar. 24, 1986, Ser. No. 843,137

Int. Cl.⁴ A01M 1/14

U.S. Cl. 43—114

6 Claims



1. A disposable crawling insect trap, comprising, in combination:

an elongated strip housing made of a unitary piece of thin, flat-sheet foldable material, having a length many times its width, said piece being folded back along its length, so as to form a roof and overlay a floor portion of itself and being provided with a number of at least three tabs cut in its surface at spaced intervals along its length, said tabs

being folded inward so as to provide a plurality of spaced walls to maintain the longitudinal edges of the folded piece spaced apart a short vertical distance so as to form a substantially continuous narrow longitudinal side slit opening of a height sized to allow insects to enter into the housing between the longitudinal edges of the piece, anti-insect material provided within the housing and extending substantially along its entire length but set back from said slit-opening so as to not readily contact the hands of a human using the trap nor other articles outside the trap; and wherein said material is one of a group of pasteboard or heavy paper or plastic, and said tabs are cut from the upper folded-over roof portion of the roof-forming piece and bent downward to contact said floor portion.

4,709,505

HERBICIDE APPLICATOR APPARATUS

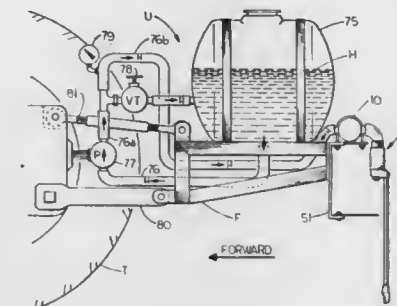
Bernard J. Lempa, Jr., A & M Rte., Box 66, Cuero, Tex. 77954

Filed Feb. 13, 1984, Ser. No. 579,507

Int. Cl.⁴ A01G 13/00

U.S. Cl. 47—1.7

17 Claims



1. Liquid herbicide spraying apparatus for mounting on a tractor to selectively detect and spray herbicide on unwanted plants including a frame for attaching said apparatus to said tractor, a tank mounted on said frame for carrying liquid herbicide, a header rotatably attached to said frame and transversely disposed with respect to the direction of travel of said tractor, means for transferring liquid herbicide from said tank to said header and maintaining pressure therein, and a plurality of moveable spray assemblies normally in a substantially vertical position attached at spaced intervals along said header, each of said spray assemblies comprising:

valve means including a valve body, an inlet connected to said header, an outlet and a valve member movable, relative to said valve body, between a closed position and an open position;

a spray nozzle connected to said valve means outlet for directing liquid spray therefrom generally downwardly toward said unwanted plants but being mounted for at least limited omnidirectional radial movement relative to normal substantially vertical position and

activation means operatively connected to said valve means and said spray nozzle and normally depending downwardly therefrom for temporary engagement with said unwanted plants for, upon continuing travel of said tractor, temporary displacement thereof said displacement of said activation means resulting in displacement of said valve member and said nozzle, said displacement moving said valve member to said open position and radially displacing said spray nozzle to direct said spray therefrom directly toward the area of said engagement of said activation means with said unwanted plants.

4,709,506

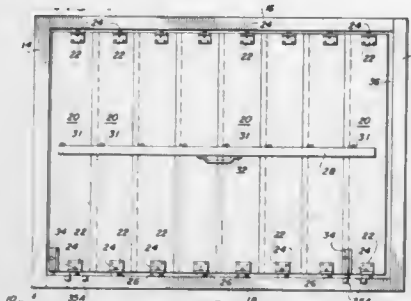
SWIVEL SHUTTER ASSEMBLY

William S. Lukaszonas, 7525 Old Father Rd., Tucson, Ariz. 85741

Filed Oct. 16, 1986, Ser. No. 919,631

Int. Cl.⁴ E06B 7/086

U.S. Cl. 49—88



1. A swivel shutter assembly adapted to open and close, and which presents a flat wall type appearance when closed comprising:

- a framework having a lower member, a spaced apart parallel upper member, and two spaced apart parallel side members, said lower, upper, and side members forming a rectangle;
- a plurality of louvers situated interiorly to said framework, each said louver having two ends, a front side, back side, opposite end sides, and a longitudinal center running centrally between each end, each said louver defining stepped portions on each of their respective end sides, each of said stepped portions adapted to be complementary with the stepped portion of each adjacent louver when closed;
- a plurality of swivel mechanisms, one of each of which operably attaching to each end of said louvers and to said framework, each said swivel mechanism including a "L" clip, one end of which attached to each end of said louvers, said other end including an opening therethrough, and further including a swivel pin adapted to reside in said opening and to be secured to each said framework upper and lower member, and further including a washer situated surrounding said swivel pin and interposed between said "L" clip and said framework upper and lower members, said swivel pin situated offset from the longitudinal center of each of said louvers and providing said louver pivotal point;
- a cross bar operably attached to each louver and a handle attached to said cross bar;
- a plurality of screw eyes, one of each of which attach to the back side of each louver, and one of each of which additionally attach to said cross bar, each of said screw eyes attached to said louvers interlocked connected with each of said screw eyes attached to said cross bar;
- a plurality of barrel lock assemblies operably attached to said louvers back side proximate said ends and said end sides, each said assembly including a slidable elongated rod, and a half collar attached to said framework lower member, said framework lower member defining a plurality of blind openings, said half collar and said blind openings adapted to receive said barrel lock assembly elongated rod to secure said louvers into a fixed open and closed position; and
- an elongated material strip attached to at least one of said framework side members to engage and limit movement of said louvers, whereby said louvers may be swiveled within said framework by grasping said handle to move said cross bar to open and close said louvers, and, to selectively secure the position of said louvers in said framework by manipulation of said barrel lock assembly elongated rod into one of the pluralities of blind openings

and half collar and thereby allow a selected passage of light and wind through said framework.

4,709,507

TUMBLING APPARATUS

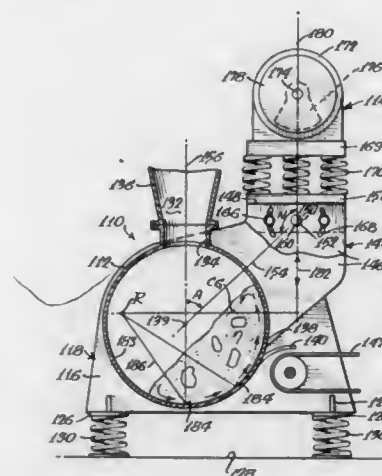
Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Continuation of Ser. No. 777,821, Sep. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 685,121, Dec. 21, 1984, abandoned. This application Oct. 22, 1986, Ser. No. 922,062

Int. Cl.⁴ B24B 31/06

U.S. Cl. 51—7

14 Claims



1. Vibratory apparatus comprising:

- a generally horizontally arranged container defining an inside, curved material supporting surface and having a central axis;
 - mounting means for resiliently mounting the container relative to a mounting surface;
 - a vibration generator mounted on said container;
 - said container having a center of gravity and having unconstrained movement relative to the mounting surface; and
 - means for directing the vibratory forces generated by the vibration generator along a linear path displaced from not only the central axis of the container but also from the center of gravity of the container, said linear path of vibratory forces passing on the side of the center of gravity removed from the central axis to cause points on the curved material supporting surface of the container to rotate along segments of circles.
- each of said segments of said circles having a center located at a position displaced from the central axis and from said center of gravity on the other side of said central axis from said center of gravity so that the segments of the circles do not conform to the curvature of the curved material supporting surface.

4,709,508

METHOD AND APPARATUS FOR HIGH SPEED PROFILE GRINDING OF ROTATION SYMMETRICAL WORKPIECES

Erwin Junker, Talstrasse 78, 7611 Nordrach, Fed. Rep. of Germany

Continuation of Ser. No. 705,475, Feb. 26, 1985, abandoned.

This application Sep. 8, 1986, Ser. No. 906,558

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409575; Sep. 26, 1984, 3435313

Int. Cl.⁴ B24B 5/00

U.S. Cl. 51—105 R

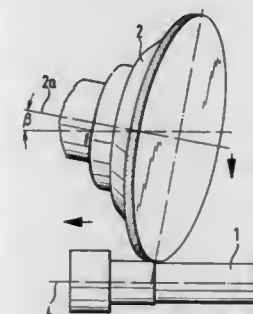
19 Claims

1. A method for grinding of a rotation symmetrical workpiece, comprising:

clamping in a grinding machine a workpiece having a longitudinal axis and rotating the workpiece about the longitudinal axis thereof,

providing a grinding disk having a central axis, a peripheral surface and a leading surface, said grinding disk having a hardness so that the grinding disk wears during grinding, installing the grinding disk adjacent the workpiece so that said peripheral surface is located radially inside and axially adjacent an imaginary cylindrical surface corresponding to the outer surface of the workpiece to be ground, said peripheral surface being arranged relative to the axis of the workpiece to form a clearance angle between said peripheral surface and the surface of the workpiece that is ground, and

rotating the grinding disk about the central axis thereof and moving the grinding disk in a direction parallel to the longitudinal direction of the workpiece so that said leading surface engages the workpiece and grinds the workpiece while the grinding disk wears, whereby said leading surface makes contact with the workpiece during grinding and the grinding disk makes only



point contact with the workpiece after grinding, independently of the wear of the grinding disk.

10. Apparatus for grinding of a rotation symmetrical workpiece, comprising

- a grinding machine;
 - means for clamping the workpiece in the grinding machine along a longitudinal axis of the workpiece;
 - a grinding disk having a peripheral surface and a leading surface;
 - means for moving the grinding disk in a direction parallel to the longitudinal direction of the workpiece and radially setting the grinding disk in correspondence with a circumferential profile of the workpiece to be ground; and
 - means for mounting the grinding disk with said peripheral surface arranged with respect to the axis of the workpiece to form a clearance angle between said peripheral surface and the surface of the workpiece that is ground,
- whereby said leading surface makes contact with the workpiece during grinding and the grinding disk makes only point contact with the workpiece after grinding independently of wear of the grinding disk.

4,709,509

NUMERICALLY CONTROLLED GRINDING MACHINE

Takao Yoneda, Nagoya; Tadashi Ogasawara, Toyoda; Norio Ohta, Okazaki, and Yasuji Sakakibara, Hekinan, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 17, 1986, Ser. No. 920,192

Claims priority, application Japan, Oct. 17, 1985, 60-231871

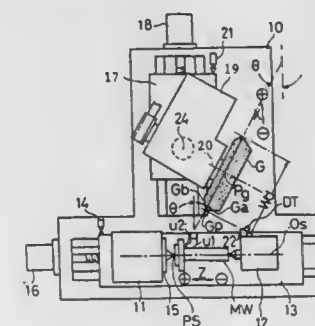
Int. Cl.⁴ B24B 49/02

U.S. Cl. 51—165.71

4 Claims

1. In a numerically controlled grinding machine having a grinding wheel head capable of moving along a first axis, a wheel spindle stock held on the grinding wheel head so as to be rotatable about its own axis within a horizontal plane,

- a grinding wheel rotatably mounted on the wheel spindle stock,
 - a worktable capable of moving along a second axis perpendicular to the first axis, the worktable holding a workpiece in such a way that the workpiece can rotate about an axis extending parallel to the second axis,
 - a first register for storing data concerning the position of the cylindrical grinding surface of the grinding wheel taken on the first axis,
 - a second register for storing data concerning the position of the shoulder grinding surface of the grinding wheel taken on the second axis, and
 - a feed control means for controlling the movement of the worktable according to the data stored in the first and second registers,
- the improvement comprising:
- manual feed means for moving the grinding wheel head and the worktable out of their home positions to bring the cylindrical and shoulder grinding surfaces of the grinding wheel into contact with first and second reference surfaces, respectively, of a reference member disposed on the worktable, the first and second reference surfaces being parallel to the cylindrical and shoulder grinding surfaces, respectively;
 - detecting means for detecting the distances traveled by the grinding wheel head and the worktable from their home positions;
 - a data-setting means for setting the positions of the first and second reference surfaces formed on the reference mem-



- ber relative to a reference point on the worktable, the diameter of the grinding wheel, and the angle at which the grinding wheel is inclined to the first axis;
- a deviation-calculating means for calculating the deviations of the cylindrical and shoulder grinding surfaces from the reference point on the wheel spindle stock as measured along the first and second axes, respectively, based on the diameter and the inclination angle of the grinding wheel which are set by the data-setting means;
- a distance-calculating means for calculating the distances between the reference point on the worktable and the reference point on the grinding wheel head along the first and second axes under the condition that the grinding wheel head and the worktable are in their home positions, based on the distances which are traveled by the grinding wheel head and the worktable and are detected by the detecting means, on the positions of the first and second reference surfaces set by the data-setting means, and on the deviations detected by the deviation-calculating means;
- a position-calculating means for calculating the positions of the cylindrical and shoulder grinding surfaces relative to the reference point on the worktable from the distances calculated by the distance-calculating means and from the deviations calculated by the deviation-calculating means; and
- present position-setting means which are operated when the grinding wheel head and the worktable are returned to their home positions and which place the data indicating

the positions of the cylindrical and shoulder grinding surfaces into the first and second registers, the positions being calculated by the position-calculating means.

4,709,510

FLOOR SANDING AND POLISHING MACHINE

Todescato Giovanni, Via Madonna, 29 - 36045 Lonigo (Vincenza), and Conterno Giovanni, Via XXV Aprile, 3 - 36072 Chiampo (Vincenza), both of Italy

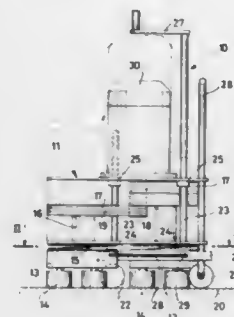
Filed Jan. 14, 1986, Ser. No. 818,765

Claims priority, application Italy, Jan. 22, 1985, 85503 A/85; Sep. 10, 1985, 22960/85[U]

Int. Cl.⁴ B24B 23/02

U.S. Cl. 51-177

3 Claims



1. A floor sanding and polishing machine comprising:
 - (a) a trolley member comprising a low platform having three spoke members disposed at approximately 120° from each other for supporting said machine on a work surface;
 - (b) a body member positioned above said trolley member and having an upper wall and a lower wall;
 - (c) a plurality of rotary heads positioned below said body and spring-mounted thereon, said rotary heads being positioned between adjacent spoke members;
 - (d) actuator means mounted on said body and operatively connected to said heads to cause said heads to rotate;
 - (e) a plurality of bolt members extending vertically upward from said trolley member through said body member;
 - (f) a plurality of nut means fixed to said lower walls of said body and threadably engaged with said bolt members to adjustably support said body on said trolley;
 - (g) a plurality of bushing means secured to said upper wall of said body, said bolt members extending through said bushing means and being guided thereby;
 - (h) means for synchronously rotating said bolt members comprising an actuator crank mount on one of said bolt members; sprockets on said bolt members; and a chain transmission engaging said sprockets so that said bolt members are synchronously rotated when said crank is rotated to adjust the height of said body member relative to said trolley.

4,709,511

CLAMP FOR LOCK KEY DUPLICATING MACHINE

Bianchi Camillo, Conegliano, Italy, assignor to SILCA S.p.A., Treviso, Italy

Filed Mar. 5, 1986, Ser. No. 836,425

Claims priority, application Italy, Mar. 6, 1985, 84111 A/85

Int. Cl.⁴ B24B 41/06

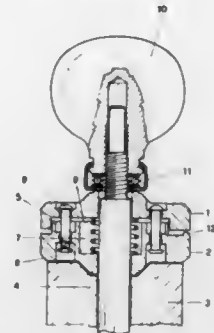
U.S. Cl. 51-216 R

8 Claims

1. A clamp for lock key duplicating machines comprising
 - a clamp support carriage,
 - a threaded pin rigid with the carriage and extending therefrom,
 - a pair of jaws mounted upon said pin,
 - means for drawing the two jaws together and to clamp a key therebetween said means applying clamping force along a line of action,

elastic means interposed between the two jaws to bias them apart, and

one of said jaws having a projecting portion in a position misaligned with said line of action and offset therefrom in a direction away from the gripping faces of the jaws thereby to create a moment opposite to the reaction moment produced by the clamped key,



characterized in that the projecting portion consists of an appendix (6) provided on one jaw (2) and which is received within a corresponding recess (5) provided on the other jaw (1), the depth of the recess (5) at the corresponding faces on the side comprising the rib (12) being greater than the difference in height between the appendix (6) and the rib (12), and the depth of the recess (5) at the corresponding faces on the side not comprising the rib (12) being less than the height of the appendix (6).

4,709,512

CHUCKING DEVICE OF WORKPIECE IN GRINDING MACHINE

Kimio Okubo, Yuki, and Hiroshi Nemoto, Tama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

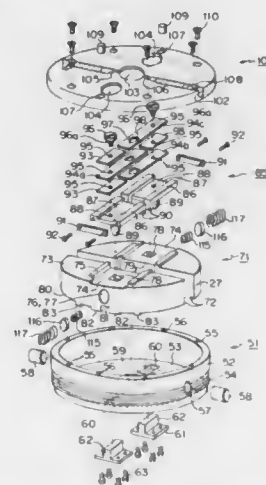
Filed Dec. 12, 1985, Ser. No. 807,950

Claims priority, application Japan, Dec. 18, 1984, 59-266851

Int. Cl.⁴ B25B 5/00

U.S. Cl. 51-237 R

15 Claims



1. A chucking device of a workpiece to be ground in a grinding machine, comprising:
 - a hollow housing, having guide means, which can be rotatably connected to the grinding machine;
 - a pair of elastically biased weight bodies which are opposed in said hollow housing so as to come away from and close to each other along said guide means;
 - a pair of clamp plate assemblies, each having a longitudinal axis, provided adjacent to said weight bodies and being

slideably movable away from and towards each other along their longitudinal axis and having openings defining a center insertion opening in which the workpiece is inserted, said clamp plate assemblies further being angularly movable, from side to side, in a plane parallel to said weight bodies;

support means, provided between said pair of clamp plate assemblies and said weight bodies, for supporting said pair of clamp plate assemblies; and

an end plate which is secured to said hollow housing for covering said hollow housing in which said weight bodies and said clamp plate assemblies are accommodated, the workpiece being firmly held in and by said center insertion opening of said clamp plate assemblies at at least four points of said center insertion opening by the outward displacement of said weight bodies, due to a centrifugal force acting thereon when said chucking device rotates.

4,709,513

GLASS SCRATCH REMOVAL METHOD

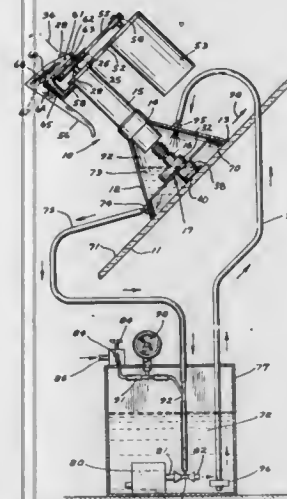
Eddie S. Tingley, Bloomington, Minn., assignor to Novus Inc., Minneapolis, Minn.

Division of Ser. No. 700,636, Feb. 11, 1985. This application Jul. 31, 1986, Ser. No. 891,293

Int. Cl.⁴ B24B 1/00

U.S. Cl. 51-283 R

5 Claims



1. A method for removing scratches from a smooth surface of a hard, substantially nonporous material while such material is in place for use comprising the steps of:
 - mounting a rotating tool on a manually movable support about an axis which is generally normal to the surface and supporting said tool and support on said surface;
 - providing a resilient force relative to the support urging said tool toward said surface with the support engaging the surface and manually controlling the position of the tool relative to the support to permit selectively moving the tool away from said surface and to permit controlling the force of the tool against the surface up to a preselected maximum;
 - rotating said tool; and
 - moving the support along the surface and over the region where the scratch is to be removed and manually holding the tool spaced from said surface until the support is moving along said surface and gradually lowering said tool into engagement with said surface while the support is being moved across said surface.

4,709,514

DUAL WHEEL CYLINDRICAL GRINDING CENTER

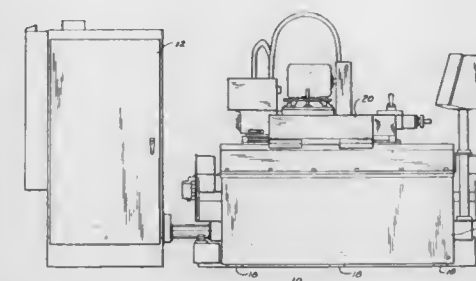
Richard P. Chase, Spencer; Gary E. Englander, Paxton, both of Mass.; Martin A. German, Solon, and Joseph F. Volk, Chargin Falls, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 506,076, Jun. 20, 1983, Pat. No. 4,510,716, which is a division of Ser. No. 228,424, Jan. 26, 1981, Pat. No. 4,443,975. This application Apr. 3, 1985, Ser. No. 719,370

Int. Cl.⁴ B24B 1/00

U.S. Cl. 51-325

16 Claims



1. A method for dressing a complex contour onto a driven grinding wheel of a grinding machine, said grinding machine including a carriage upon which said driven grinding wheel is mounted and at least a first dressing means mounted opposite said grinding wheel; said method comprising the steps of:
 - (1) providing means for simultaneously moving said carriage and grinding wheel along first and second substantially orthogonal axes;
 - (2) providing a programmable controller responsive to a set of preprogrammed instructions for controlling the moving means of step 1;
 - (3) selectively moving said carriage and grinding wheel in relationship to said dressing means along said first axis by said preprogrammed instructions and said programmable controller;
 - (4) selectively moving said carriage and grinding wheel in relationship to said dressing means along said second axis by said preprogrammed instructions and said programmable controller;
 - (5) continuously adjusting said selective movements of steps 3 and 4 by said preprogrammed instructions until said grinding wheel is dressed to the desired complex contour.

4,709,515

WET SANDBLASTING SYSTEM

Henry Copeland, 156 Barrios St., and Steve M. Copeland, Rte. 2, 307 Karen Dr., both of Lockport, La. 70374

Filed Jul. 15, 1986, Ser. No. 885,669

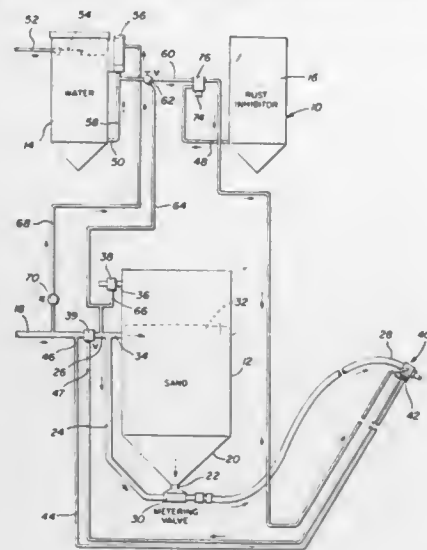
Int. Cl.⁴ B24C 5/04, 7/00

U.S. Cl. 51-436

6 Claims

1. A wet sandblasting system including a closed abrasive tank including abrasive outlet means, a pressurized air supply line, an air conduit including an air inlet end and an air outlet end, a discharge nozzle on said outlet end, air pressure operable and normally closed air valve means communicating said air line with said inlet end, a metering discharge valve operatively associated with said abrasive outlet means and serially disposed in said air conduit, a control air line including an inlet end communicated with said supply line upstream from said air valve means and an outlet end connected to said air valve means for actuation thereof, a control valve disposed adjacent said nozzle and serially connected in said control air line, liquid tank means having liquid outlet means, an air operated pump subject to stalling at a predetermined back pressure, a liquid delivery line including an inlet end and an outlet end, said pump being operatively connected to said liquid outlet means and said liquid delivery line inlet end for pumping liquid from

said outlet means to said liquid delivery line inlet end, said nozzle including liquid injection means for injecting liquid into the air and abrasive stream passing through said nozzle, air supply means for supplying air under pressure from said air supply line upstream from said air valve means to said pump for operation thereof, air pressure openable and normally closed control valve means serially connected in said liquid delivery line, control air conduit means communicating said air



conduit, downstream from said air valve means, with said control valve means for opening said control valve means, said air supply means including air pressure reducing means operatively associated therewith for reducing the pressure of air supplied to said pump relative to the pressure of air in said air conduit downstream from said air valve means, said outlet end of said liquid delivery line being communicated with said liquid injection means.

4,709,516

SELF-CLEANING GUTTER DEVICE

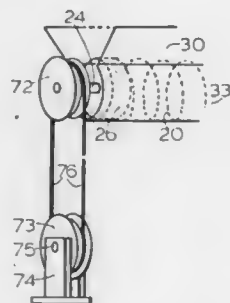
Geoffrey H. Gleaves, Hackensack, N.J., assignor to Ropol, Inc., Mahwah, N.J.

Filed Dec. 9, 1985, Ser. No. 806,482

Int. Cl.⁴ E04D 13/00

U.S. Cl. 52-11

2 Claims



1. A self-cleaning gutter device comprising: an elongated, self-supporting flexible member capable of being placed within and along the length of a gutter; and means for remotely activating said flexible member such that debris in said gutter is transported by said flexible member along said gutter to a discharge outlet, said flexible member being in the form of an elongated helix or coil, one end of which is connected to said remote activating means by

being fitted within a reinforcing hub such that said coil transports said debris in the manner of a screw conveyor.

4,709,517

FLOOR-TO-CEILING WALL SYSTEM

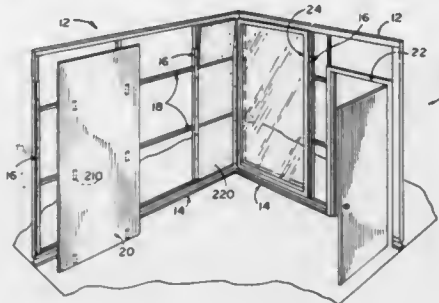
Terry L. Mitchell, and Robert J. Poortvliet, both of Jenison, Mich., assignors to Architectural Wall Systems, Inc., Grand Rapids, Mich.

Filed Jun. 2, 1986, Ser. No. 869,439

Int. Cl.⁴ A47B 5/00

U.S. Cl. 52-36

20 Claims



1. A floor-to-ceiling wall assembly for use in a room having a floor surface and a ceiling comprising:
a ceiling channel comprising a pair of spaced, downwardly depending sidewalls joined by a top wall adapted to be secured to the ceiling, a pair of upper lips projecting inwardly from said sidewalls of said channel at a point spaced below said channel top wall and above the bottom edges of said sidewalls;
a floor runner having means for receiving the lower ends of vertical studs and holding same in a fixed position;
a plurality of generally vertically telescoping studs each having a lower portion and a mating upper portion, said telescoping studs having lower ends seated on said floor runner and upper ends slidably received in and suspended by said ceiling channel, said upper ends of each of said telescoping studs including at least semi-resiliently deformable lateral projections which are adapted to semi-resiliently deform and seat on top of said upper lips as said upper portion is raised to thereby snap over said upper lips and suspend said upper portion of said stud from said ceiling channel;
means for securing said studs against lateral movement in said ceiling channel;
a plurality of stringers extending between said lower portions of said studs, said studs and stringers including matingly and releasably engaging securing means whereby a stud seated in said floor runner can be laterally adjusted at its top until vertically oriented and then secured, and the remainder of said studs aligned by positioning said stringers between adjacent studs.

4,709,518

UNIVERSAL FASCIA ASSEMBLY FOR SECURING A MEMBRANE TO A ROOF

Bennie L. Lane, W347 S7194 Sprague Rd., Eagle, Wis. 53119

Filed Oct. 23, 1986, Ser. No. 922,242

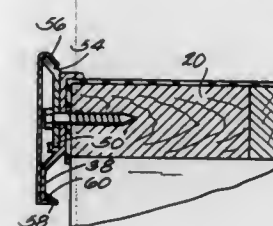
Int. Cl.⁴ E04D 13/15

U.S. Cl. 52-94

7 Claims

1. Apparatus for securing a rubber membrane to a roof, the roof having an upper surface and the edge of the roof defining a generally vertical surface, the rubber membrane being supported by the upper surface of the roof, and a portion of the membrane extending downwardly adjacent the vertical surface of the edge of the roof, the apparatus comprising:
an elongated membrane anchor bar adapted to extend along the edge of the roof, said anchor bar including a generally

planar portion having a rearward surface adapted to secure said portion of the membrane against the vertical surface of the edge of the roof, said anchor bar including an upper edge portion and a lower edge portion, a first flange integrally joined to said upper edge portion of said anchor bar and projecting rearwardly with respect to said rearward surface, said first flange having a generally planar downwardly facing lower surface adapted to engage a planar upper surface portion of the membrane to secure a portion of the membrane downwardly against the upper surface of the roof, and a second flange projecting



forwardly from said vertical planar portion and away from the edge of the roof, said second flange extending along the length of the anchor bar, and said second flange being located intermediate said upper edge portion and said lower edge portion; and said second flange including an upper surface adapted to support a lower edge of an elongated support plate; and means for securing the elongated membrane anchor bar to the vertical surface of the edge of the roof, the means for securing including a fastener adapted to extend through the vertical planar portion of the anchor bar into the edge of the roof.

4,709,519

MODULAR FLOOR PANEL SYSTEM

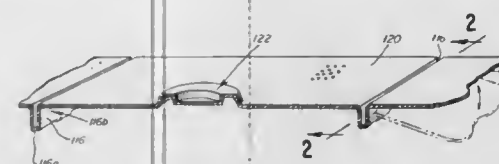
Allen C. Liefer, R.R. 3, Box 362, Macon, Mo. 63552; Gilbert L. Loewen, 802 Walnut St., and Paul J. Magathan, 502 Maple St., both of Peabody, Kans. 66866

Continuation-in-part of Ser. No. 471,860, Mar. 3, 1983, Pat. No. 4,557,086. This application Jul. 15, 1983, Ser. No. 514,161

Int. Cl.⁴ E04C 1/00

U.S. Cl. 52-98

17 Claims



1. A modular grain bin floor comprising in combination:
(a) a plurality of elongated modular grain bin floor panels each having opposite side edges and opposite ends, each of said panels formed of bendable sheet metal and including a plurality of modules each located between said side edges, said modules of each panel being disposed in end-to-end relation to one another and forming a substantially continuous upper surface extending the length of said panel between said opposite ends, a reverse-bend hem of said sheet metal extending transversely of the respective panel between and integrally joining each adjacent pair of said modules to one another, each of said hems extending downwardly relative to said upper surface and providing transverse support for said panel, and each of said hems providing means for facilitating severance of said modules whereby at least one of said modules can be separated from the respective modular floor panel along such hem for forming panels of selected lengths, said panels being

disposed in coplanar relationship with one another and with said side edges of adjacent panels adjacent to one another;

(b) a support beam extending subjacent each said pair of adjacent panel side edges; and

(c) a plurality of support posts for each of said beams, each of said posts straddling the respective beam and being in generally vertical alignment therewith.

4,709,520

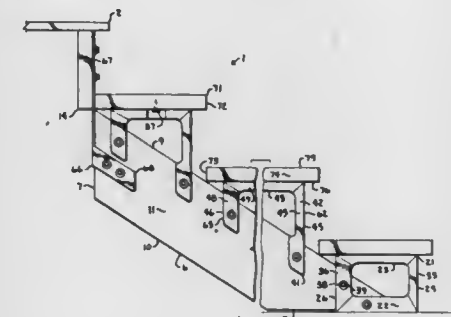
STAIR BRACKETS AND STAIR STRUCTURE

Richard L. Vochatzer, 232 N. 31st St., Kansas City, Kans. 66102
Filed Jul. 28, 1986, Ser. No. 889,773

Int. Cl.⁴ E04F 11/00

U.S. Cl. 52-191

2 Claims



1. A stair structure extending between upper and lower floors, which comprises:

(a) a parallel, spaced pair of stringers, each including:

- (1) upper and lower ends;
- (2) upper and lower edges; and
- (3) inside and outside faces;

(b) a discrete pair of lower brackets each including:

- (1) a vertical faceplate;
- (2) a horizontal baseplate placed between a respective stringer lower end and said lower floor;
- (3) front and back ends;
- (4) front and back strips extending from said faceplate at said front and back ends respectively;
- (5) a top strip extending from said faceplate in spaced relation over said stringer upper edge; and
- (6) a locating flange extending forwardly from said back strip and positioned against said stringer upper edge;

(c) a discrete pair of angle brackets each including:

- (1) a vertical faceplate with an opening defining front, back and top portions;
- (2) front and back ends;
- (3) front, back and top strips extending from said faceplate front, back and top portions respectively, said top strip being positioned in spaced relation over a respective stringer upper edge; and
- (4) front and back locating flanges extending downwardly and forwardly from said front and back strips respectively and engaging said stringer upper edge;

(d) a lower tread mounted on the top strips of said pair of lower brackets and extending therebetween;

(e) an upper tread mounted on said pair of angle brackets and extending therebetween;

(f) a pair of discrete stringer hangers each mounted on a respective stringer upper end and attached to said upper floor, each said stringer hanger including a joist section attached to a joist of said upper floor and a stringer section attached to a respective stringer upper end; and

(g) fastening means fastening said bracket faceplates to respective stringer faces.

4,709,521

METHOD OF INSERTING A TUBULAR OR BAR-SHAPED STRUCTURAL MEMBER TIGHTLY INTO A LOCATION HOLE IN A CONSTRUCTION ELEMENT
Georg Walz, Nibelungenstrasse 16, 7920 Heldenheim/Brenz, Fed. Rep. of Germany
PCT No. PCT/EP85/00530, § 371 Date Mar. 20, 1986, § 102(e) Date Mar. 20, 1986

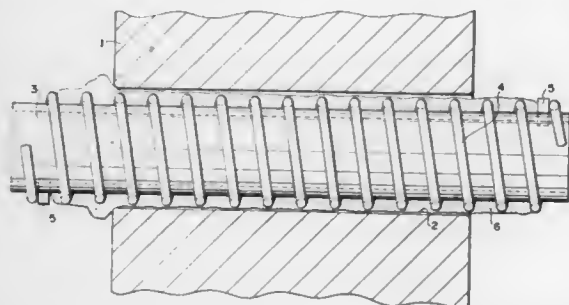
PCT Filed Oct. 10, 1985, Ser. No. 857,758

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1984, 59-112786

Int. Cl.⁴ E04B 5/48

U.S. Cl. 52—220

6 Claims



1. A feeding line house lead-in protective device for mounting in a masonry opening, the device comprising:
a lead-in tube for insertion into a slightly larger masonry opening, the lead-in tube having an outer surface;
an auxiliary element in the form of a helical tension spring extending around the outer surface of said tube, said spring having a stretched state and a retracted state; and
means for axial fixation of the ends of said tension spring when the spring is in the stretched state.

4,709,522

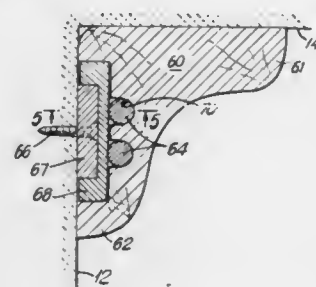
REMOVABLE WALL/CEILING MOLDING
V. B. Carnahan, 522 Devils Hole Rd., R.D. #1, Cresco, Pa. 18326

Filed Nov. 20, 1986, Ser. No. 932,623

Int. Cl.⁴ E04F 19/02

U.S. Cl. 52—287

6 Claims



1. A removable and remountable molding for a ceiling/wall or the like planar intersection, said molding comprising:
(a) a plurality of elongated magnetic mounting bars, said bars including attachment means for mounting said magnetic bars in spaced apart linear relationship outwardly from a flat surface proximate its intersection with another flat surface;
(b) at least one elongated molding member, said member being a single continuous strip including on its rear two flat-sided return spans, said returns being at generally right angles one to the other with one of said returns including an indented parallel area, said indented area

being presized to match said mounting bars' outward projection when mounted; and,
(c) at least one magnetized band attached to said molding strip at said indented return end,
so that when said magnetic mounting bars are mounted proximate a planar surface intersection, said molding member may be removably mounted on said magnets by said magnetized band, said indented area on said return spacing the overfit of said molding member on said intersection to hide said mounting bars and to provide flush mounting of said molding to said intersection.

4,709,523

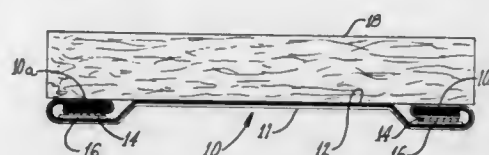
INSULATION BATT WITH PRESS-ON FACING FLANGES

Thomas B. Broderick, Granville; Donald J. Algrim, Reynoldsburg, and Richard F. Hayden, Columbus, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Aug. 18, 1986, Ser. No. 897,454

Int. Cl.⁴ E04B 1/88

U.S. Cl. 52—406

10 Claims



1. Faced insulation comprising a fibrous insulation batt, a facing having a facing flange normally extending transversely outwardly from an edge of the batt when in a condition for installation of the batt, pressure-sensitive adhesive on a side of the facing flange adjacent the batt when the facing flange is extended outwardly from the edge of the batt, and a release strip on an inner side of the facing inwardly of but adjacent said facing flange, the facing flange being folded inwardly between the batt and the remainder of the facing when in a condition for storage and shipment of the faced insulation, with the pressure-sensitive adhesive in engagement with said release strip, the facing transversely inwardly of the inwardly folded facing flange being adhered to a major surface of the batt.

4,709,524

PRESSURE SLIP EXPANSION JOINT
Joseph L. Knight, Box 167, Shippensburg, Pa. 17254

Filed Aug. 26, 1986, Ser. No. 900,393

Int. Cl.⁴ E04D 1/00

U.S. Cl. 52—536

8 Claims



1. A building component includes a central main section from which extend opposite underlying and overlying sections each having a rear face and a front face, wherein said underlying

4,709,526

MORTAR APPLICATION TEMPLATE

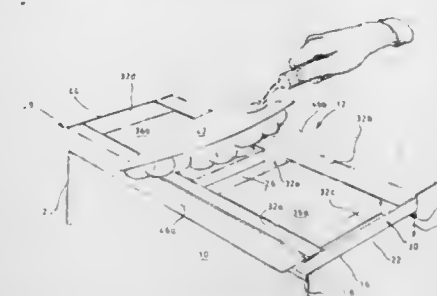
John T. Crumby, P.O. Box 23304, Knoxville, Tenn. 37923, assignor to John T. Crumby

Filed Apr. 21, 1986, Ser. No. 853,852

Int. Cl.⁴ E04D 15/00

U.S. Cl. 52—749

7 Claims



1. A template device for applying mortar to the exposed top surface of a precast concrete block or the like upon which other blocks are to be stacked during building operations, said top surface including a substantially rectangular perimeter having parallel longitudinal sections joined at their ends by parallel lateral sections of lesser length and at least one further parallel lateral interconnecting the longitudinal sections at a spaced location from their ends such that said top surface defined at least two openings spaced apart by said further parallel lateral sections, said template device comprising:

a frame having an outline similar to said rectangular perimeter of said top surface and including wall means defining mortar receiving openings which are substantially coextensive with said longitudinal and lateral sections of said top surface upon proper placement of said frame on said top surface, said wall means having a depth substantially equal to a desired thickness of mortar to be applied to said top surface, said frame member further including cover members attached to said wall means substantially coextensive with said openings in said top surface when said frame is properly placed on said top surface; and
guide means carried by said frame for proper placement of said frame on said top surface whereby said mortar receiving openings therein properly register with said sections of said top surface and said cover members register with said openings in said top surface when a user places said device on said surface of said block and applies mortar thereto as with a trowel, said mortar filling said mortar receiving openings in said device and thereby being applied to said sections of said top surface in a thickness substantially said thickness of said frame wall means without mortar falling into said openings in said top surface.

4,709,527

SHEETROCK HANGING TOOL

John Cooley, 208 Haystack Rd., Zephyrhills, Fla. 34249

Filed Oct. 21, 1986, Ser. No. 921,615

Int. Cl.⁴ E04D 15/00

U.S. Cl. 52—749

2 Claims

1. A sheetrock hanging tool comprising a rigid steel having a first, second and third legs, said first and second legs being contiguous, flat and coplanar with each other, said third leg bent substantially at right angles to the plane of said first and second legs, said first, second and third legs defining a gener-

ing and overlying sections are planar and disposed in laterally offset parallel planes, a pair of mating attachment members respectively on said underlying section and overlying section, wherein said attachment member on said underlying section is affixed to said front face thereof and said attachment member on said overlying member is affixed to said rear face thereof, said attachment members each including a pair of opposed non-planar flanges projecting respectively from said underlying and overlying sections, said flanges of each said pair of flanges define an arcuate configuration and being configured and spaced from each other to provide a snap-fitting attachment upon joining one said attachment member of one said building component with another one said attachment member of an adjacent like building component.

4,709,525

MOLDING FOR AUTOMOBILE BODY PANELS, SUCH AS DOORS

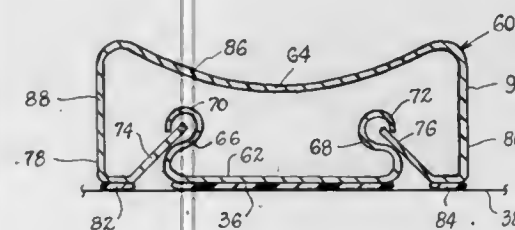
Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Nov. 19, 1986, Ser. No. 932,778

Int. Cl.⁴ E04F 19/02; B60R 13/04, 19/42

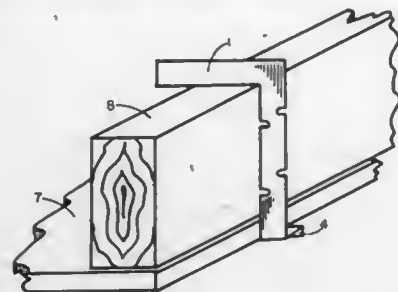
U.S. Cl. 52—718.1

6 Claims



1. In combination with the exterior surface of a vehicle body panel, such as a door, a decorative molding comprising an inner elongated metal part having a central portion and longitudinal marginal edge portions bounding said central portion, said central portion being disposed against the vehicle body panel and non-metallic means attaching said central portion to the vehicle body panel, a layer of non-metallic insulating material extruded onto the surface of said central portion disposed against the vehicle body panel such that said layer is disposed between said inner part and said body panel to insulate the metal of the inner part from the body panel, and an outer elongated metal part comprising a central portion bounded by longitudinal marginal edge portions, said longitudinal marginal edge portions of said inner and outer parts comprising mutually interlocking channels via which the outer part attaches to the inner part, the channels of said inner part facing away from each other, the outer part being constructed and arranged in relation to the inner part such that the outer part fully conceals the inner part and includes body-confronting portions of its own channels disposed to confront the body panel, and non-metallic insulating material extruded as a layer onto respective surfaces of the respective body-confronting portions of the channels of said outer part disposed against the body panel such that said last-mentioned layer insulates the metal of said outer part from the body panel, and in which said mutually interlocking channels are constructed and arranged such that the channels of said inner part are spaced outwardly away from the body panel, and free edge portions of the channels of said outer part are disposed contiguous said body-confronting portions and project away from the body panel to be received into the channels of said inner part.

ally rectangular opening, said third leg bearing a bent lip, said second leg bearing a multiplicity of notches, said notches of a



size and shape to accept one or more nails whereby said tool may be temporarily retained against a flat surface.

4,709,528

APPARATUS FOR PRODUCING BAG PACKAGES HAVING DISPENSING FITMENTS

Minne Merkus, Weert, Netherlands, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

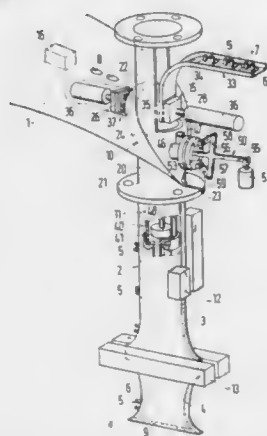
Filed Jan. 21, 1987, Ser. No. 5,988

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612196

Int. Cl.⁴ B65B 9/06

U.S. Cl. 53—128

8 Claims



1. An apparatus for producing bag packages (4) from a strip of heat sealable packaging material (1) having long edges which comprises a packaging material former (10) which shapes the strip of packaging material into a tube (2), said packaging material former (10) includes a tube former (11), with a surrounding tubular guide fitting (20), an oblique collar (22) which guides the tube in conjunction with an inlet opening on said guide fitting (20), a lengthwise seam sealing device (12) that joins the long edges of the strip of packaging material, a crosswise sealing and advancing device (13) that advances the tube incrementally and divides the tube into individual bag packages after they have been filled with a product, a dispenser for dispensing fitments to be secured to said packaging material, a device (15) for fastening dispensed fitments (5) to said tube, means for forming holes in said packaging material for receiving said fitments (5) which are secured to said packaging material, said device (15) including a holder (28) that receives one fitment at a time from a conveyor device (33) that conveys said fitment to said holder (28), a heat sealing stamp disposed opposite to said holder (28), said heat sealing stamp including blind bores (37) for receiving tubes of said fitments and a heating device for heating said package material in the vicinity thereof, said securing device (15) is disposed in the vicinity of said packaging material former (10), and an opening (29, 30) in said collar (22) and an opening (31) in said tube former (11), said sealing device (26) is movable into said opening in said

collar (22) and said holder (28) is movable into said opening (31) of said tube former (11) toward the inside of the tube (2) being formed, whereby the fitment is secured to the packaging material as a liquid is filled into a previously formed bag.

4,709,529

HIGH-SPEED WRAPPING MACHINE

Katsumi Matsuda, and Kunio Kono, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

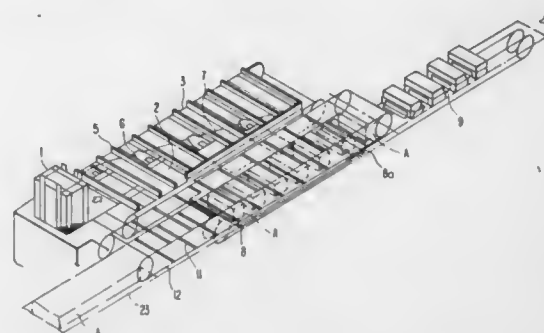
Filed Jun. 11, 1986, Ser. No. 873,778

Claims priority, application Japan, Aug. 15, 1985, 60-179872

Int. Cl.⁴ B65B 11/20

U.S. Cl. 53—207

2 Claims



1. A high speed wrapping machine for wrapping articles with flat sheets stored in a magazine, said machine comprising: a magazine conveyor extending in a transporting direction from said magazine for transporting the sheets one at a time from said magazine in said transporting direction, said magazine conveyor having a plurality of guide rails moving in said transporting direction which extend in a second direction that is perpendicular to said transporting direction, and a plurality of sheet sliders for supporting respective ones of the sheets transported by the magazine conveyor, each of said sheet sliders respectively slidably mounted on one of said guide rails, and slider means operatively connected to said sheet sliders for sliding said sheet sliders with respective ones of the sheets supported thereon along said guide rails in said second direction as the guide rails move in said transporting direction for successively delivering the sheets from the transporting conveyor in said second direction as the sheets are concurrently transported in said transporting direction; a case transporting conveyor adjacent and extending parallel to said magazine conveyor for receiving the sheets delivered in said second direction by said magazine conveyor, said case transporting conveyor having a plurality of sheet guides thereon defining buckets each for receiving one of the sheets delivered by said magazine conveyor, and synchronizing means for synchronously driving said case transporting conveyor in said transporting direction with said magazine conveyor; and articles transfer means above said transporting conveyor for continuously transferring the articles to be wrapped by the sheets onto the case transporting conveyor after the sheets have been delivered thereto by said magazine conveyor, each of the articles being transferred by said article transfer means onto one of said buckets on which a respective sheet has been received by the case transporting conveyor from the magazine conveyor.

4,709,530

CENTRALIZED DRIVE DEVICE IN A PACKAGING MACHINE

Aris Ballestrazzi, and Lamberto Tassi, both of, Savignano Sul Panaro, Italy, assignors to Sitma Società Italiana Macchine Automatiche S.p.A., Spilamberto, Italy

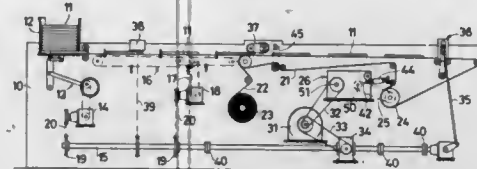
Filed Jul. 8, 1986, Ser. No. 883,150

Claims priority, application Italy, Jul. 17, 1985, 22526/85[U]

Int. Cl.⁴ B65B 11/12

U.S. Cl. 53—209

4 Claims



1. A machine for packaging products in continuous plastic film unwound from a reel, the machine comprising a conveying belt for conveying the products, and a sequence of product treatment units associated with the belt including a feeder unit for the products, an individual product advancing unit for receiving products from the feeder unit and delivering same to a receiving end of the conveying belt, a unit for wrapping said products in said film on the conveying belt, and a unit for welding and cutting the individual packaged products adjacent a delivery end of the conveying belt, a rigid transmission shaft extending along the length of the conveying belt from said feeder unit to said welding and cutting unit, a central variable-speed drive for the shaft, a series of individual motion transmissions driven from the shaft each for operating one of said units of the machine, and a further variable-speed drive with a positive transmission connected with the central variable-speed drive for driving the conveying belt.

4,709,531

STRETCH FILM PACKAGING MACHINE

Toshio Denda, Tokyo, Japan, assignor to Teraoka Seiko Co., Ltd., Tokyo, Japan

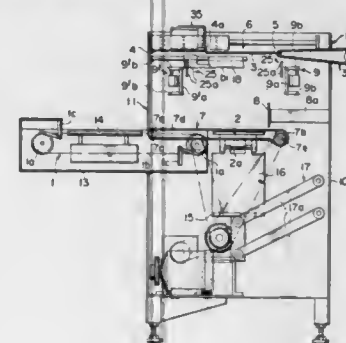
Filed May 17, 1985, Ser. No. 735,134

Claims priority, application Japan, May 23, 1984, 59-76300[U]; Jul. 31, 1984, 59-118936[U]

Int. Cl.⁴ B65B 11/18, 53/00, 61/00

U.S. Cl. 53—415

17 Claims



1. A stretch film packaging machine for covering trays with stretch film comprising:
(a) a pusher conveyor for conveying said trays towards an entrance port of said stretch film packaging machine;
(b) at least one elevator head adapted to be moved between two positions for transporting said tray, said two positions comprising an upper position and a lower position, wherein said at least one elevator head is positioned at a downstream end of said pusher conveyor;
(c) means for positioning and cutting at least one stretch film

to cover said trays, wherein said stretch film is adapted to be cut to a desired length and positioned above said at least one elevator head;

- (d) a discharging passage for discharging said covered trays;
- (e) at least one transporting belt extending from said pusher conveyor to said at least one elevator head wherein said at least one transporting belt is located between a transporting end of said pusher conveyor and said lower position of said at least one elevator head;
- (f) a position setting plate positioned at a transporting end of said at least one transporting belt;
- (g) a receiving passage located above said stretch film for receiving said tray;
- (h) at least one folding plate arranged adjacent to a side of said receiving passage for folding said stretch film to cover said tray on said at least one elevator head when said at least one elevator head is moved toward said upper position;
- (i) means for operating said pusher conveyor at a first predetermined operating speed;
- (j) means for operating said at least one transporting belt at a second predetermined operating speed which is greater than said first predetermined operating speed of said pusher conveyor;
- (k) a discharging pusher which is moveable towards said discharging passage;
- (l) at least one side plate positioned parallel to a direction of said discharging said covered tray;
- (m) at least one sliding plate including means for sliding the plate in a direction perpendicular to said at least one side plate wherein packaging trays are adapted to be pushed by said discharging pusher onto said at least one sliding plate; and
- (n) a heating belt aligned with said discharging passage, said at least one sliding plate mounted over said heating belt.

4,709,532

VERTICAL FORM-FILL SEAL PROCESS AND MACHINE WITH PRODUCT CATCHING DEVICE

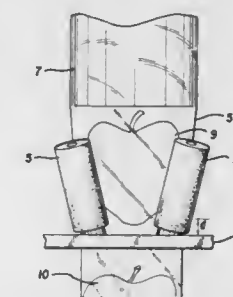
Monroe F. Taylor, Greenville, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Dec. 3, 1986, Ser. No. 937,268

Int. Cl.⁴ B65B 9/20, 9/08

U.S. Cl. 53—451

6 Claims



1. In a vertical form, fill, and seal machine for individually packaging product articles in transversely sealed tubes formed from thermoplastic film, the improvement for packaging an easily bruised article comprising:

- (a) transverse heat sealing and severing means for simultaneously sealing the bottom of an upper package and the top of a lower package and severing the tubular film between said seals; and,
- (b) catcher finger means associated with said sealing and severing means to catch and hold said individual article thereby preventing said article from striking either the bottom seal or transverse compression of the tube immediately below the held article or from striking the heat sealing means as the article is vertically dropped into the

tube and thereby holding said article spaced vertically from said transverse compression or seal area.

4,709,533

METHOD AND APPARATUS FOR MAKING RECLOSABLE BAGS IN A FORM, FILL AND SEAL MACHINE

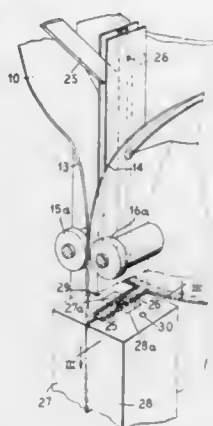
Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,980

Int. Cl.⁴ B65B 9/00

U.S. Cl. 53—451

19 Claims



1. The method of forming a vertical tubular form fill reclosable package from a sheet of plastic film comprising the steps: continuously feeding a supply of thin thermoplastic film from a supply means; wrapping the film into tubular shape over a filling spout bringing the lateral edges of the film together in abutting face-to-face relationship to form a tube; attaching the faces of said edges together at a seal location to form a fin seal; feeding a continuous supply of plastic zipper strip having first and second interlocking members each with a web on either side of said interlocking member into a space between said spout and said seal location; and attaching said members along their webs to the inner surface of the film between said seal location and said spout to provide a reopenable closure between the fin seal and contents of the tube supplied through the filling spout.

4,709,534

BAG FOR INFUSION SOLUTIONS AND THE LIKE AND METHOD OF MANUFACTURING THE SAME

Karl-Heinz Sengewald, Postfach 1460, 4801 Halle in Westf. 1, Fed. Rep. of Germany

Continuation of Ser. No. 471,140, Mar. 1, 1983, abandoned. This application Aug. 26, 1985, Ser. No. 770,001

Claims priority, application Fed. Rep. of Germany, May 15, 1982, 3218415

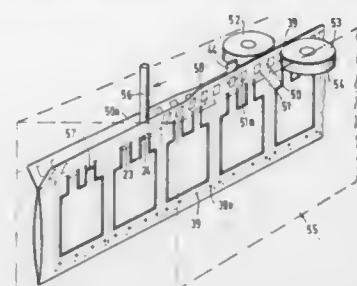
Int. Cl.⁴ B65B 3/02

U.S. Cl. 53—452

15 Claims

1. A method of manufacturing bags for infusion solutions and the like, comprising the steps of producing an elongated hose element of a synthetic thermoplastic foil in aseptic condition; laminating said elongated hose element by another outer thermoplastic foil by fixedly connecting said another thermoplastic foil to said hose element so as to form an elongated hose having two walls each composed of at least two connected foil layers; forming in said hose a plurality of shaped bag elements each having a body part and at least one connecting part which are of different widths and shapes, by a welding seam extending within said hose always through said four layers of said two walls of said hose and over and entire shaped contour of said body part and said connecting part of each of said bag

elements; thereafter cutting said hose outwardly around said shaped welding seam of each of said bag elements by a shaped cut around said body part and said connecting part of each said shaped bag elements with said walls in contact with one another, so as to form a plurality of shaped bags each having a



body part and at least one connecting part which are of different widths and shapes; filling each of said bags by introducing a filling element through said opening of said connecting part with spreading apart said walls in the region of said connecting part; and closing said connecting part of each of said bags.

4,709,535

PACKAGING LOADER APPARATUS FOR SLICED FOOD PRODUCTS

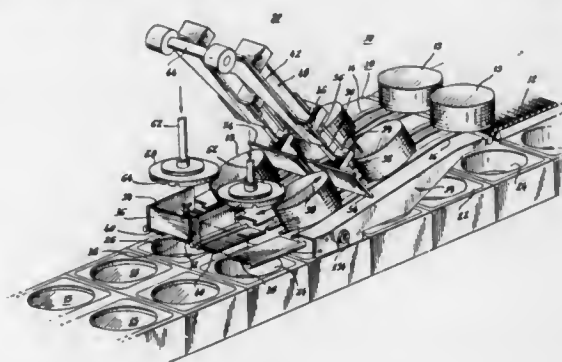
Reid A. Mahaffy, Montclair, N.J.; Eugene Garson, Bronx, N.Y., and Milan R. Ostrow, Pequannock, N.J., assignors to Mahaffy & Harder Engineering Co., Fairfield, N.J.

Continuation-in-part of Ser. No. 724,404, Apr. 18, 1985, abandoned. This application Apr. 11, 1986, Ser. No. 850,940

Int. Cl.⁴ B65B 5/06, 39/00

U.S. Cl. 53—473

23 Claims



1. In a vacuum packaging apparatus of the type comprising means to support and move semi-rigid packaging material through a series of stations where packaging operations are performed, said stations comprising a loading station where stacks of thinly-sliced, flexible food products are to be placed in cup-shaped receptacles formed of said semi-rigid packaging material and dimensioned to provide a close fit with said stacks of product;

automatic loading apparatus for transferring said stacks of product successively into said cup-shaped receptacles without the need for human manipulation, comprising: a drop station having pivoted trap door means normally spring-biased into horizontal position; a downwardly-inclined conveyor having its lower end immediately adjacent said drop station and serving to convey stacks of sliced product down to said trap door means; a pusher arm rotatably mounted above said drop station and having at its lower end a retractable pusher arranged to swing with said arm through an arcuate path forwardly over said downwardly-inclined conveyor to engage a

stack of product on the lower portion thereof to shift said stack onto said trap door means; ram means mounted directly above said trap door means and operable to be driven down to press a stack of product through said trap door means and into a waiting receptacle; and

means to retract said pusher from its lower position engageable with a stack of product to an upper position wherein said pusher can be swung rearwardly above the advancing stacks of product to permit said pusher to be shifted back down between the next set of stacks so as to be swept forward again to engage and transport another stack to said trap door means.

4,709,536

ARTICLE TRANSPORT APPARATUS

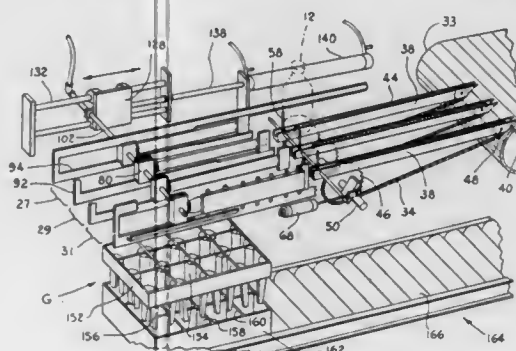
Robert G. Hartness, Greer, and Thomas S. Hartness, Greenville, both of S.C., assignors to Hartness International, Inc., Greenville, S.C.

Filed Jan. 28, 1987, Ser. No. 7,795

Int. Cl.⁴ B65B 35/36, 35/44, 39/02

U.S. Cl. 53—539

24 Claims



1. A case packing apparatus for loading groups of articles into cases, the articles having top, bottom, and side portions, the case packing apparatus comprising:

conveying means for supplying a flow of articles in a plurality of aligned rows in a predetermined direction; a receiving station for receiving articles supplied by said conveying means in said plurality of aligned rows; a loading station for loading articles in said plurality of aligned rows into cases; a carriage movable between said receiving station and said loading station for carrying articles in said plurality of aligned rows from said receiving station to said loading station, said carriage defining a receiving end having article passageways through which articles may be received;

carriage transfer means for moving said carriage to a receiving position in a direction opposite said predetermined direction of said flow of articles supplied by said conveying means for causing said receiving end of said carriage to receive articles, thereby allowing said carriage to encompass a predetermined number of articles at said receiving station;

article engagement means carried by said carriage for selectively engaging articles encompassed by said carriage and for substantially fixing the articles to said carriage for movement therewith; said carriage transfer means moving said carriage to said loading station in substantially said predetermined direction of said flow of articles supplied by said conveying means, after engagement of said article engagement means with the articles encompassed by said carriage; means for disengaging said article, engagement means for depositing articles carried by said carriage at said loading station; and

loading means associated with said loading station for loading the articles deposited at said loading station into cases.

4,709,537

LONGITUDINAL WELDING EQUIPMENT IN A PACKER MACHINE

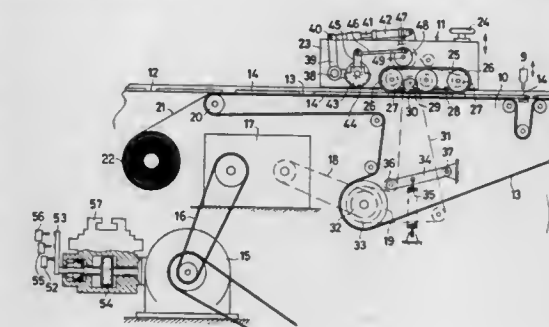
Aris Ballestrazzi, and Lamberto Tassi, both of Savignano Sul Panaro, Italy, assignors to Sitma-Societa Italiana Macchine Automatiche S.p.A., Spilamberto, Italy

Filed Sep. 18, 1986, Ser. No. 908,783

Claims priority, application Italy, Sep. 24, 1985, 23205/85[U] Int. Cl.⁴ B65B 9/06

U.S. Cl. 53—550

5 Claims



1. Longitudinal welding equipment in a machine for packaging products comprising a horizontal conveyor belt for transporting said products wrapped inside a continuous film of plastic material with said material having overlapping longitudinal side edges, a longitudinal welding means positioned above said overlapped edges, means for imparting an oscillatory rotary-translational motion to said longitudinal welding means in a vertical plane, at least one pressure and accompanying belt located above said products wrapped in said film, at least one side shoulder mounted above said products for positioning said at least one pressure and accompanying belt above said conveyor belt, central motor means for operatively driving in common said longitudinal welding means and said pressure belt and said conveyor belt, and temperature means for selectively controlling the temperature of said longitudinal welding means to correlate with the packaging speed.

4,709,538

APPARATUS FOR FEEDING AND OPENING A BEVERAGE CARRIER

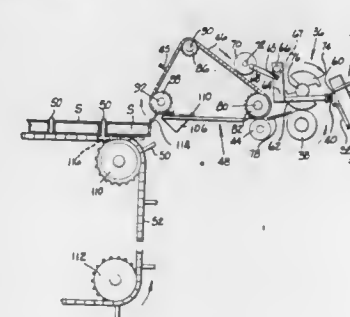
Peter C. Olsen, Jr.; Peter M. Conforto, both of Monroe; Jimmy R. Craighead, West Monroe, all of La., and David L. Wolf, Cedar Falls, Iowa, assignors to Manville Corporation, Denver, Colo.

Filed May 9, 1986, Ser. No. 861,470

Int. Cl.⁴ B65B 43/24

U.S. Cl. 53—566

5 Claims



1. Apparatus for feeding and opening a collapsed article

carrier sleeve, the sleeve having two side panels foldably connected to the bottom and top panels, the bottom panel and one of the side panels being in opposed generally parallel relationship, having been folded toward each other about their connecting fold line, and the top panel and the other side panel also being in opposed generally parallel relationship, having been folded toward each other about their connecting fold line, each side panel having end flaps foldably connected at each end of the side panel and lying in substantially the same plane as that of the side panel to which it is connected, comprising:

means for moving a collapsed carrier sleeve in a direction generally parallel to the length of the end flaps;
elongated guide means generally aligned with the end flaps of the moving collapsed carrier sleeve, the guide means comprising spaced support surfaces under which the lowermost end flaps of the collapsed carrier sleeve move and over which the uppermost end flaps of the collapsed carrier sleeve move;

retainer surfaces overlying and spaced from the support surfaces a distance allowing longitudinal movement of the uppermost end flaps therebetween but preventing significant movement of the uppermost end flaps transversely of their longitudinal travel;

a fixed stationary cam surface depending from each of the spaced support surfaces, each cam surface sloping downwardly at an angle to the horizontal and in the direction of travel of the carrier sleeve, the cam surfaces being located in the path of travel of the lowermost end flaps and extending downwardly a distance such that movement of the carrier sleeve downstream of the apparatus will cause the leading edges of the lowermost end flaps to engage the cam surfaces and to be moved downward thereby a distance which separates the lowermost end flaps from the uppermost end flaps sufficient to substantially completely open the carrier sleeve;

receptacle means moving downstream of the apparatus for receiving the opened carrier sleeve; and
means for depositing the opened carrier sleeve into the moving receptacle means.

4,709,539

GIRTH STRAP

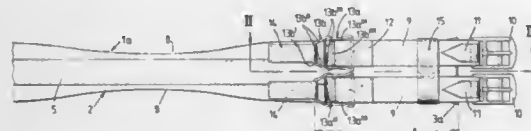
Elizabeth A. Bird, West Midlands, England, assignor to Cottage Industries (Equestrian) Limited, Worcestershire
Filed Sep. 6, 1985, Ser. No. 773,434

Claims priority, application United Kingdom, Sep. 7, 1984, 8422688; Jun. 10, 1985, 8514650

Int. Cl.⁴ B68C 1/14

U.S. Cl. 54—23

18 Claims



18. A strap, for attachment to a saddle or other support, comprising:

a girth strap having a main body with a first end and a second end;

a pair of end straps, each of which has a first end that is releasably attached to said first end of said main body of said girth strap, and a second end; and

respective attachment means provided on said second ends of said end straps, and on said second end of said girth strap, for effecting said attachment of said strap;
said main body of said girth strap being provided with an inside surface which is intended to face toward an animal, and an outside surface which is remote from said inside surface;

each first end of said end straps being provided with an interengaging retaining buckle to effect said releasable

attachment to said first end of said main body of said girth strap.

4,709,540

MOWING DEVICE

Johannes A. Collart, Heeze, Netherlands, assignor to P. J. Zweegers en Zonen, B.V., Geldrop, Netherlands

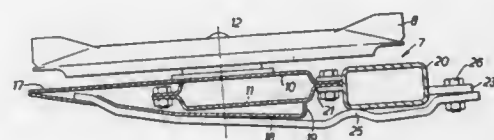
Filed Oct. 17, 1985, Ser. No. 788,719

Claims priority, application Netherlands, Oct. 25, 1984, 8403245

Int. Cl.⁴ A01D 34/66

U.S. Cl. 56—13.6

8 Claims



1. A mowing device having an elongated hollow casing disposed transverse to a direction of movement of the moving device, a plurality of adjacent cutting elements rotatable around upwardly extending axes of rotation and supporting upon said casing, transmission means for driving at least some of said cutting elements disposed in said casing, a reinforcing beam extending along a rear side of said casing with respect to said direction of movement and attached to said casing, a plurality of tensioned resilient straps extending transversely to said beam and underneath said casing, said straps having rear ends attached to said reinforcing beam and having front ends connected to a side of said casing away from said reinforcing beam such that a torque is applied to the casing to counteract any torsional movement of the casing during mowing.

4,709,541

GRASS/LAWN DEBRIS HANDLING SYSTEM

Donald E. Broman; Loren F. Hansen, and Donald J. Huber, all of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

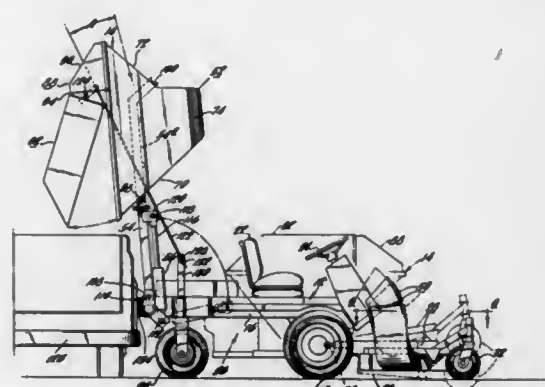
Continuation of Ser. No. 581,654, Feb. 21, 1984, abandoned.

This application Nov. 26, 1985, Ser. No. 802,075

Int. Cl.⁴ A01D 34/12

U.S. Cl. 56—202

22 Claims



1. A grass/lawn debris handling system for a lawn mower having a side grass discharge duct, said system comprising:

a hopper adapted for mounting on the side of a mower proximate the mower grass discharge duct and having a hopper opening near the upper end of said hopper, at least a portion of said hopper overlying said grass discharge duct,

a chute communicating at its lower end with the mower grass discharge duct and at its upper end with said hopper opening when said hopper is in a filling position, said

hopper having an uppermost portion when in said filling position,
means pivotally mounting said hopper on said mower for movement between said filling position and an elevated dumping position, the lowermost portion of said hopper when in said elevated dumping position being spaced substantially above the position of said uppermost portion of said hopper when in the filling position,
and means selectively operable to effect rotation of said hopper into said elevated dumping position.

4,709,542

METHOD AND APPARATUS FOR TWISTING FILAMENTS TO FORM A CABLE

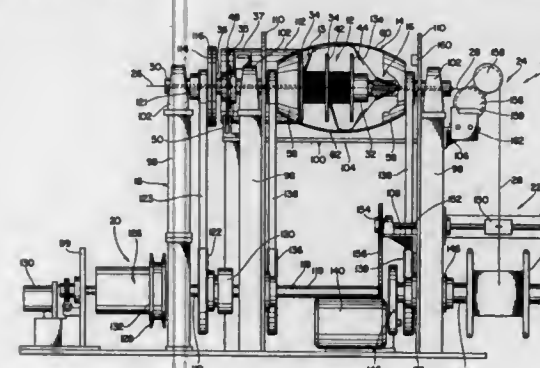
Frederic B. Krafft, Holden, Mass., assignor to The Entwistle Company, Hudson, Mass.

Filed Apr. 22, 1986, Ser. No. 855,112

Int. Cl.⁴ D07B 3/04, 3/00, 3/12

U.S. Cl. 57—16

21 Claims



1. An apparatus for twisting a filament on an advancing core to form a cable comprising:

a. a reel mounted for rotation about an axis and having a filament wound thereon;

b. a flyer mounted for rotation about said axis so that it travels around said reel, said flyer engaging said filament and being operable for unwinding it from said reel;

c. means for rotating said reel about said axis;

d. means for rotating said flyer about said axis in the same direction as said reel and at a speed which causes said filament to be unwound from said reel;

e. gathering means mounted for rotation about said axis with said flyer, said core passing axially through said gathering means, said filament passing to said gathering means from said flyer, said gathering means twisting said filament around said core element to form said cable;

f. means for drawing said cable from said gathering means; and

g. means for controlling and adjusting the rotational speed of said flyer relative to the rotational speed of said reel to achieve a substantially uniform number of rotations of said flyer per unit length of said cable.

14. A method of forming a cable comprising:

a. winding a first group of filaments onto a reel;

b. unwinding said first group of filaments from said reel with a flyer which rotates around said reel as said reel is rotated and in the same direction as said reel;

c. twisting the unwound filaments from said first group on an advancing core with a rotating closing die to form said cable, said closing die rotating with said flyer;

d. drawing said cable from said closing die; and

e. controlling the rotational speed of said flyer relative to the rotational speed of said reel to achieve a substantially uniform length of twist in said cable.

4,709,543

PRE-TAKE-UP ROLLER MECHANISM FOR VARYING THE TENSION ON A RUNNING THREAD IN A THREAD PROCESSING MACHINE

Rainer Lorenz, Nettetal-Breyell, Fed. Rep. of Germany, assignor to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany

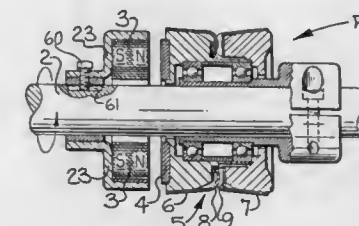
Continuation-in-part of Ser. No. 692,683, Jan. 18, 1985, abandoned. This application Sep. 23, 1986, Ser. No. 910,893

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403144

Int. Cl.⁴ B65H 59/18; D01H 1/10, 13/02

U.S. Cl. 57—58.7

10 Claims



1. A thread processing machine including a take-up mechanism for winding processed running thread at a constant speed into a package after processing by said machine, said take-up mechanism including means for driving the package at a constant peripheral speed; the combination therewith of pre-take-up roller means for varying the tractive force and tension on the running thread being wound by said take-up mechanism and positioned in said machine in advance of said take-up mechanism in the running thread path, said means comprising:

a. a variably driven rotating drive shaft carried by said machine,

a thread pre-take-up roller rotatably mounted on said drive shaft for rotation with respect thereto for receiving the running thread on the surface thereof and for being driven by the running thread through adhesion, and

an eddy current clutch means operatively connecting said drive shaft and said pre-take-up roller for varying the torque of said pre-take-up roller and thus the tractive force and tension on the running thread by varying the driven rotational speed of said drive shaft while maintaining the constant winding speed of the running thread being wound by said take-up mechanism, said eddy current clutch means comprising permanent magnetic means positioned on and rotating with said drive shaft and a disc of electrically highly conductive material attached to one end of said pre-take-up roller and facing said permanent magnetic means and rotating with said pre-take-up roller and being spaced from said permanent magnetic means for forming an air gap of predetermined distance to create a magnetic field of desired strength in said eddy current clutch means.

4,709,544

REINFORCEMENT ASSEMBLY HAVING A LAYER COMPRISING A SHAPED THREAD: ARTICLES COMPRISING SUCH ASSEMBLIES

Jean-Louis Charvet, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Apr. 21, 1986, Ser. No. 854,432

Claims priority, application France, Apr. 29, 1985, 85 06874
Int. Cl.⁴ D02G 3/48; B60C 9/00

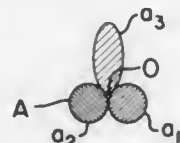
U.S. Cl. 57—218

15 Claims

1. A reinforcement assembly comprising an element having at least one layer and at most three layers of threads wound together;

at least one layer, known as a "shaped thread layer", being

formed, at least in part, of a round thread and a shaped thread;
the twist pitch of each shaped thread being different from the winding pitch of this shaped thread in the shaped thread layer in which it is located;
this difference of pitches being obtained in the following manner, for each shaped thread:



either the twist of said shaped thread is in the direction opposite the winding of said shaped thread in the shaped thread layer;
or the twist of said shaped thread is in the same direction as the winding of said shaped thread in the shaped thread layer, and the ratio

$$\frac{(\text{length of twist pitch}) - (\text{length of winding pitch})}{(\text{length of winding pitch})}$$

for said shaped thread is at least equal to 0.2 in absolute value.

4,709,545

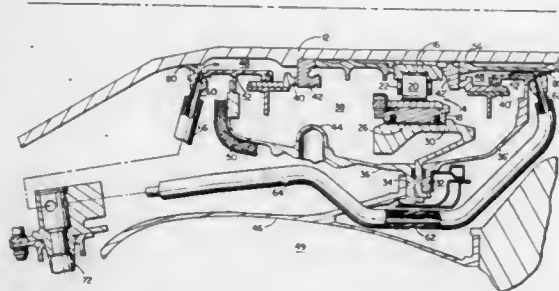
BEARING COMPARTMENT PROTECTION SYSTEM
Leonard W. Stevens, Vernon; William S. Siwik, Manchester; William A. Moore, Durham; Wayne M. Brown, North Granby, and Andrew A. Barnard, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 499,633, May 31, 1983, abandoned.
This application Jan. 6, 1986, Ser. No. 816,693

Int. Cl.⁴ F02C 7/12, 7/28

U.S. Cl. 60—39.08

6 Claims



1. For a gas turbine engine having a compressor, and a turbine and shaft interconnecting said compressor and said turbine, a bearing compartment housing a bearing supporting said shaft interconnecting the turbine and compressor located in an environment of hot engine air, said bearing compartment surrounding said shaft and having carbon contact sealing means surrounding said shaft mounted at the ends thereof in close proximity to said shaft, wall means defining open ended chambers defining buffer zones surrounding said shaft adjacent said carbon contact sealing means for receiving buffer air, a source of air extracted from said compressor, fluid connecting means for leading buffer air from said source to a point external of said engine into each of said buffer zones at a point in direct communication with the open end of a chamber so that a portion of said buffer air flows out of each of said open ends of said chambers and into said turbine for cooling purposes, said buffer air being at a pressure higher than the pressure of said hot air in said environment so that a small portion of the buffer air leaks through said carbon seal, and the remaining portion is

directed toward said turbine heat exchanger means intermediate said source and said buffer zones for cooling the buffer air prior to being admitted into said buffer zones and the buffer air normally flowing out of said open end flows into said bearing compartment in the event of a failure of said carbon contact sealing means.

4,709,546

COOLED GAS TURBINE OPERABLE WITH A CONTROLLED COOLING AIR QUANTITY
Wolfgang Weiler, Dachau, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union GmbH, Munich, Fed. Rep. of Germany

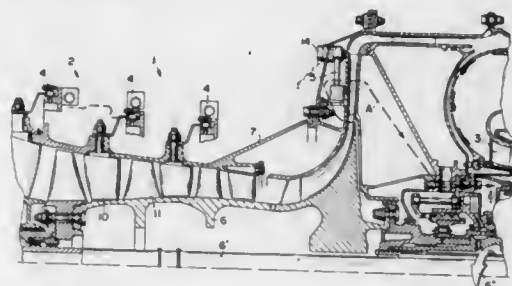
Filed Apr. 18, 1986, Ser. No. 853,477

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514354

Int. Cl.⁴ F02C 7/12, 9/16

U.S. Cl. 60—39.29

8 Claims



1. A cooled gas turbine power plant, comprising compressor means for providing a compressed gas flow, a high pressure turbine operatively connected to said compressor means downstream of said compressor means as viewed in the gas flow direction, first control means for controlling said compressor means, second control means for controlling the quantity of cooling air to be supplied to said high pressure turbine, and mechanical means for directly and mechanically coupling said second control means to said first control means for controlling the cooling air directly taken out of said compressor means for supplying the cooling air to said high pressure turbine in response to an operation of said first control means, said first and second control means cooperating for causing the quantity of cooling air supplied from said compressor means to said high pressure turbine means to be proportional to the instantaneous load conditions.

4,709,547

PROCESS FOR THE REGENERATION OF ENGINE EMISSION PARTICULATES DEPOSITED IN A PARTICULATE TRAP

Franz Pischinger, Aachen; Gerhard Lepperhoff, Eschweiler, and Georg Huthwohl, Aachen, all of Fed. Rep. of Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Aachen, Fed. Rep. of Germany

Filed Feb. 18, 1987, Ser. No. 16,003

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605255

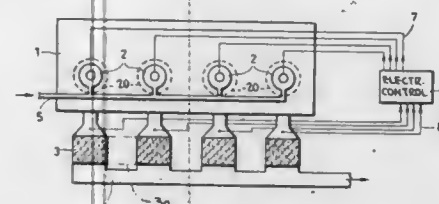
Int. Cl.⁴ F01N 3/02

U.S. Cl. 60—274

13 Claims

1. In an internal combustion engine having a plurality of engine cylinders operating at a given power output, a process for the regeneration of engine emission particulates collected in particulate filter traps respectively associated with each of the engine cylinders, comprising the steps of selectively elevating the emission temperature of at least one of the cylinders to the extent required for regeneration, by oxidation, of the filter trap associated therewith, by supplying engine fuel to said at least one of said cylinders in a predetermined amount to produce the

elevated emission temperature, and supply the remaining of said cylinders with amounts of engine fuel less than said prede-



termined amount as required to sustain the given engine power output.

4,709,548

ARRANGEMENT OF A SOOT FILTER IN THE EXHAUST GAS SYSTEM OF AN INTERNAL COMBUSTION ENGINE WITH AN EXHAUST GAS TURBOCHARGER

Ulrich Conrad, Ludwigsburg; Guenter Kellermann, Stuttgart; Angela Breyer, Altheim; Rolf Klinker, Stuttgart; Oswald Schult, Korb; Rainer Hoffmann, Ostfildern, and Frank-Dietrich Fabian, Kernen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

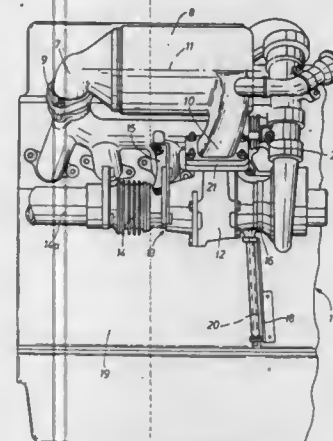
Filed Aug. 18, 1986, Ser. No. 897,629

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1985, 3529542

Int. Cl.⁴ F01N 3/02; F02B 37/00

U.S. Cl. 60—280

12 Claims



1. An arrangement of a soot filter in the exhaust gas system of an internal combustion engine equipped with an exhaust gas turbocharger means whose turbine housing is arranged downstream of the exhaust gas manifold of the internal combustion engine, in which the soot filter and exhaust gas turbocharger means form a unit, the soot filter including a short connecting pipe, said unit being angularly movably retained at the exhaust gas manifold by way of said short connecting pipe and at an exhaust gas pipe connection by way of a first support means, and said unit being retained essentially rigidly in the direction of the internal combustion engine vertical and transverse axes and movably within limits in the direction of the internal combustion engine longitudinal axis at a longitudinal wall of the internal combustion engine by way of further support means arranged at housing means of the exhaust gas turbocharger means.

4,709,549

ASSEMBLY FOR ENGINE EXHAUST GAS PARTICULATE FILTER TRAPS

Gerhard Lepperhoff, Eschweiler, Fed. Rep. of Germany, assignor to FEV Motorentechnik GmbH & Co. KG, Aachen, Fed. Rep. of Germany

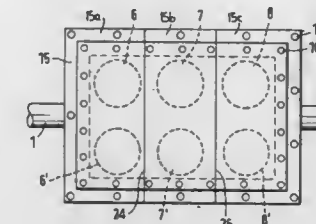
Filed Mar. 13, 1987, Ser. No. 25,818

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, 3608371

Int. Cl.⁴ F01N 3/02

U.S. Cl. 60—295

3 Claims



1. An assembly for particulate filter traps in which engine exhaust gas particulates are deposited for the treatment of internal combustion engine emission, comprising a filter trap support including a receptacle containing a plurality of individual particulate filter traps arranged side-by-side and parallel to the direction of exhaust gas flow therethrough, a cover on said receptacle, aligned openings in said receptacle and cover coaxial with said traps, an inflow housing coupled to an exhaust pipe section leading from the engine, an outflow housing coupled to another exhaust pipe section through which treated exhaust gas flows, said housings being mounted on opposite sides of said trap support in open communication with said traps via said openings, one of said housings being removably mounted to said cover for inspection of said filter traps through said cover openings upon removal of said one housing, and said cover comprising a plurality of cover sections removably mounted on said receptacle, each of said sections being associated with at least one of said traps to facilitate trap replacement upon removal of at least one of said sections.

4,709,550

HYDRAULIC ASSISTANCE DEVICE

Jean P. Sauvé, Aubervilliers; Christian Riquart, Paris, and Roland Levrai, Stains, all of France, assignors to Societe Anonyme D.B.A., Paris, France

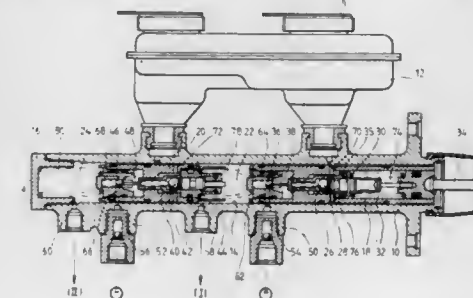
Filed Jan. 14, 1985, Ser. No. 691,346

Claims priority, application France, Jan. 31, 1984, 84 01439

Int. Cl.⁴ B60T 11/20

U.S. Cl. 60—562

5 Claims



1. A hydraulic assistance device incorporating a casing enclosing first and second sliding components arranged in line, the first component being capable of being displaced under the effect of the displacement of a pushrod and the second component being capable of being displaced through the intermediary of a hydrostatic connection, and associated with each component is a valve means in a respective hydraulic circuit between

a source of fluid under pressure and a respective braking circuit, characterized in that the first and second components each constitute a piston sliding in a bore in the casing and enclosing first and second valve assemblies each controlled by a plunger, the plunger of the first valve assembly being actuated by a pushrod, and the plunger of the second valve assembly being actuated by the hydrostatic connection between the two pistons.

4,709,551

PRESSURE CYLINDER AND METHOD OF ADJUSTING IDLE TRAVEL

Kurt Saalbach, Walldorf, and Willi Hartmann, Riedstadt, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

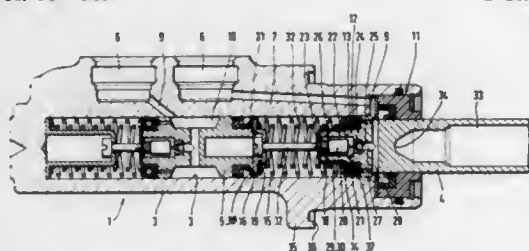
Filed Dec. 17, 1985, Ser. No. 810,020

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3446005

Int. Cl.⁴ B60T 11/28

U.S. Cl. 60—589

1 Claim



1. A method of adjusting the idle travel of a pressure cylinder used in a hydraulic actuating system of an automotive vehicle, of the type including an abutment face on a flanged provided on a cylinder casing and serving to fasten the pressure cylinder to a wall, a piston in a bore in the cylinder casing, said piston presenting a pressure surface to receive a force applying member and guiding within the bore a central valve with a length adjustable tension element pretensioned by a captive spring arrangement, said tension element adapted to untension upon slidable movement of said piston, said spring arrangement taking support through a support face provided at a spring retainer on a stop, said central valve thereupon interrupting a connection from a pressure chamber on one side of said piston to an intake chamber arranged on another side of said piston, comprising the steps: measuring the distance between said stop and the abutment face; and adjusting the length of the tension element to space the support face from the pressure surface an amount corresponding to the sum of the measured distance and a predetermined functional distance desired between said abutment face and said pressure surface.

4,709,552

MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINE WITH EXHAUST TURBOCHARGERS

Erwin Rutschmann, Bad Herrenalb; Khanh Tran-Van, Weisach, and Joachim Wagner, Stuttgart, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c. F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 737,212, May 23, 1985, abandoned.

This application Jan. 30, 1987, Ser. No. 9,571

Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3420015

Int. Cl.⁴ F02B 37/12

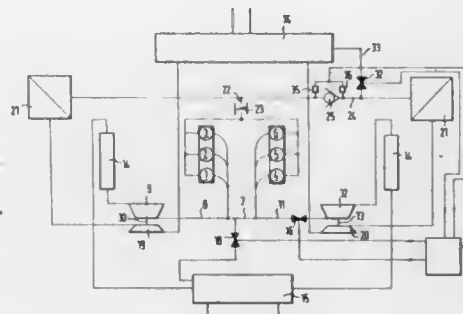
U.S. Cl. 60—600

5 Claims

1. An internal combustion engine having cylinder means in fluid communication with common manifold exhaust means, comprising:

first and second turbosupercharging means in fluid communication with said common manifold exhaust means, common manifold suction means for receiving compressed

air from said first and second turbosupercharging means and supplying said compressed air to said cylinder means, cut-in valve means interposed between said common manifold exhaust means and said second turbosupercharging means for controlling a flow of exhaust to said second turbosupercharging means, said cut-in valve means being responsive to an operating parameter of said engine, non-return valve means interposed between said second turbosupercharging means and said common manifold suction means for controlling a flow of compressed air from said second turbosupercharging means to said common manifold suction means, said non-return valve means being operably responsive to a pressure build-up upstream of said non-return valve means,



ventilation valve means upstream of said non-return valve means for venting at least a portion of said compressed air, pressure sensor means upstream and downstream of said non-return valve means for measuring a pressure differential across said non-return valve means, and control device means connected to said pressure sensors and said ventilation valve means for closing said ventilation valve means when said pressure differential decreases below a preselected pressure value, thereby permitting said compressed air to open said non-return valve means and pass through said common manifold suction means to said cylinder means.

4,709,553

METHOD OF AND APPARATUS FOR CONTROLLING SUPERCHARGE PRESSURE FOR A TURBOCHARGER

Takashi Ueno, Yokosuka, and Toshimi Abo, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

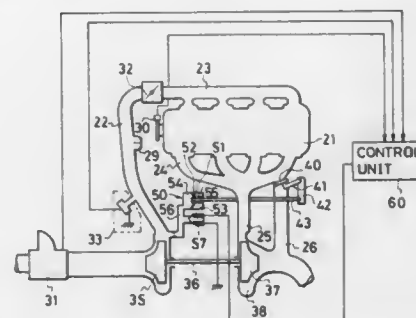
Filed Aug. 30, 1985, Ser. No. 771,406

Claims priority, application Japan, Sep. 5, 1984, 59-185633

Int. Cl.⁴ F02B 37/12

U.S. Cl. 60—602

7 Claims



1. A method for controlling supercharge pressure of a turbocharger which comprises the steps of:

- seeking basic control amount BASE from a look-up table in accordance with an intake air flow rate Q_a ;
- determining whether an acceleration condition is occurring;

(c) if an acceleration condition is determined, calculating a basic control amount BASE' by adding an acceleration increment X to the basic control amount BASE and calculating a target supercharge pressure P'set by adding an acceleration increment P_{up} to a preset supercharge pressure P'set, and if no acceleration condition is determined, calculating said basic control amount BASE' and said target supercharge pressure P'set without said acceleration increments;

(d) determining if an actual supercharge pressure P2 is equal to or greater than a predetermined pressure value P2fb;

(e) if the actual supercharge pressure P2 is equal to or greater than P2fb, calculating the deviation $\Delta P = P_{set} - P2$ between the target supercharge pressure P'set and the actual supercharge pressure P2, and calculating a correction amount Xfb to be fed back based on the deviation ΔP , and if the actual supercharge pressure P2 is smaller than P2fb, setting the correction amount Xfb to zero;

(f) producing a duty value by adding the correction amount Xfb to the basic control amount BASE'; and

(g) outputting a control signal based on said duty value to an electromagnetic valve for controlling the supercharge pressure.

5. An apparatus for controlling supercharged pressure of a turbocharger comprising:

operational state detecting means for detecting operational conditions of an engine connected to said turbocharger; basic control amount calculating means for calculating a basic control amount based on said detected operating conditions;

acceleration determining means for determining based on said detected operational conditions whether said engine is experiencing an acceleration condition;

acceleration increment calculating means for calculating an acceleration increment based on the output of said acceleration determining means in accordance with said basic control amount from said basic control amount calculating means;

target supercharge pressure setting means for setting a target supercharge pressure higher than a normal supercharge pressure when said acceleration determining means determines that said engine is operating in an acceleration condition;

deviation calculating means for calculating a deviation between the target supercharge pressure set by the target supercharge pressure setting means and an actual supercharge pressure detected by the operational state detecting means;

correction amount calculating means for calculating a correction amount of feedback control of the supercharge pressure based on the deviation calculated by the deviation calculating means;

control amount correction means for correcting the basic control amount from the basic control amount calculating means based on the correction amount from the correction amount calculating means; and

control means for controlling exhaust gas flow of said engine based on the basic control amount corrected by the control amount correction means to perform feedback control of the supercharge pressure.

4,709,554

AIR CONDITIONING APPARATUS

Hiroyuki Umemura; Kenji Matsuda; Tomofumi Tezuka; Kazuaki Isono; Hidenori Ishioka, all of Shizuoka; Fumio Matsuoka, Kamakura, and Hitoshi Iijima, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

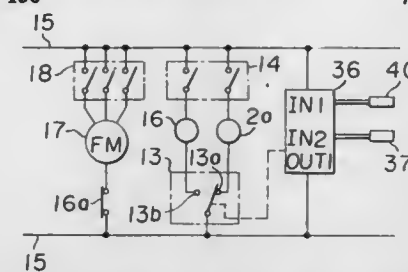
Filed Aug. 21, 1986, Ser. No. 898,492

Claims priority, application Japan, Aug. 22, 1985, 60-184901; Aug. 22, 1985, 60-184904; Aug. 22, 1985, 60-184905; Oct. 15, 1985, 60-229074; Nov. 28, 1985, 60-267825; Nov. 28, 1985, 60-267826

Int. Cl.⁴ F25D 21/06

U.S. Cl. 62—156

7 Claims



1. An air conditioning apparatus comprising a refrigerant circuit in which a compressor is connected to a four-way valve, and the four-way valve is connected by pipe lines in a circuit including a room side heat exchanger, a pressure-reducing device and an outdoor side heat exchanger connected in that order, further comprising:

a refrigerant temperature detector provided at a pipe line near said outdoor side heat exchanger, a room temperature detector for detecting temperature of a room, and a controlling device which is electrically connected to said refrigerant temperature detector and said room temperature detector and which controls operations for room-warming and defrosting of the outdoor side heat exchanger based on inputs from said detectors;

wherein said controlling device includes a timer and outputs a signal to change the room-warming operation to the defrosting operation and vice versa and compares a room temperature at the time of starting the defrosting operation with a room temperature at a predetermined time after the start of the defrosting operation to detect a value of reduction in the room temperature thereby to determine a defrost prohibiting time which is maximum amount of time during which defrosting of the outside heat exchanger is to occur;

wherein said controlling device varies the defrosting prohibiting time based on a value of reduction in room temperature between a defrosting initiation time and defrosting ending time.

4,709,555

VARIABLE DELIVERY REFRIGERANT COMPRESSOR OF DOUBLE-ACTING SWASH PLATE TYPE

Katsunori Kawai; Hisao Kobayashi; Hiroyuki Deguchi, and Shuichi Sugizono, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidosokki Seisakusho, Kariya, Japan

Filed Jun. 27, 1986, Ser. No. 879,345

Claims priority, application Japan, Jul. 2, 1985, 60-145399

Int. Cl.⁴ F25B 1/00, 41/00

U.S. Cl. 62—228.3

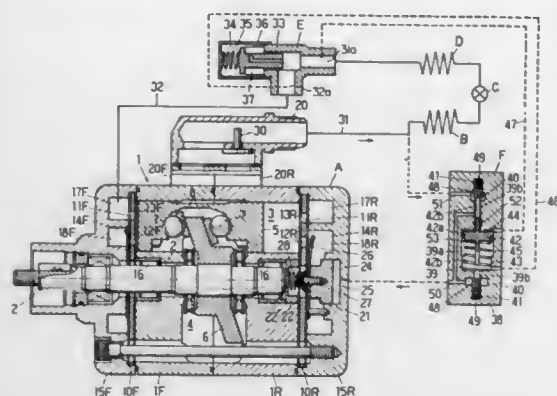
6 Claims

1. A refrigerant gas compressor of the double-acting swash plate type connected in an air conditioning system including an evaporator connected to the suction side of said compressor, comprising:

a cylinder block having formed therein a crankcase, and at least one cylinder bore which receives therein a slidable doubleacting piston;

a swash plate driven mechanism in said crankcase and cylinder bore, said mechanism comprising a swash plate ro-

tated by a drive shaft for producing reciprocal sliding movement of said piston, whereby respective compression chambers are formed alternately on opposite sides of said cylinder bore by the reciprocal movement of said piston; housing clamped to each end of said cylinder block with a valve plate interposed therebetween, each said housing having formed therein a suction chamber and a discharge chamber each of which chambers is communicable with an adjacent compression chamber through a suction port and a discharge port, respectively, formed through their said associated valve plate, the discharge chamber adjacent to one end of said cylinder block being communicable with the suction chamber adjacent thereto by passage means through said crankcase including a by-pass port formed through said valve plate; means disposed in the connection line between the outlet of said evaporator and the suction side of said compressor for throttling the refrigerant gas passing therethrough in such a way that its throttling effect is increased with a decrease of evaporator pressure of refrigerant gas on the upstream side of said throttling means with respect to the flow of refrigerant gas so that the suction pressure prevailing on the downstream side of said throttling means is decreased relative to said evaporator pressure in response to an increase of the throttling effect of said throttling means; a pressure responsive member disposed adjacent to the discharge chamber formed adjacent to said one end of the



cylinder block and movable between a first position thereof wherein normal compression of refrigerant gas in said compression chamber is effected, and a second position thereof wherein refrigerant gas displaced by the piston is by-passed into said crankcase through said by-pass port whereby compression of refrigerant gas in said compression chamber is rendered ineffective, said compressor being thereby operable selectively substantially between its 100% delivery capacity when said pressure responsive member is in its said first position and its 50% delivery capacity when said pressure responsive member is in its said second position;

control means connected to said pressure responsive member for controlling its movement between its said first and second positions selectively in response to a varying of the pressure differential between the discharge pressure at said evaporator outlet and the suction pressure at said suction side of said compressor;

said control means including first valve means actuable for establishing a communication passage of refrigerant gas under discharge pressure of the compressor for moving said pressure responsive member to said first position, second valve means actuable for establishing a communication passage of refrigerant gas under said suction pressure of the compressor for moving said member to said second position, and means for selectively actuating said first and second valve means in response to a varying

of the pressure differential between said evaporator discharge pressure and said compressor suction pressure.

4,709,556

HEAT EXCHANGER TUBE RETAINER FOR A REFRIGERATOR CONDENSER

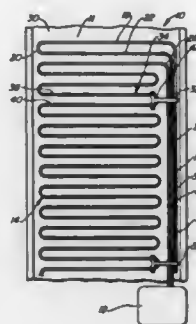
Ronald K. Hupfer, Knight Township, Vanderburgh County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 17, 1986, Ser. No. 931,624

Int. Cl.⁴ F25D 19/00; F16L 3/22

U.S. Cl. 62—298

18 Claims



1. In a refrigeration apparatus having fluid conducting tube means including first and second spaced side by side portions and a third portion extending transversely to said first and second portions, the axes of said tube means portions defining a common plane, means for rigidifying the tube means comprising:

retaining means defining a pair of outwardly oppositely opening seats spaced apart a distance substantially equal to the spacing between said first and second tube means portions, said first and second tube means portions being received one each in said seats to be constrained thereby against relative movement angularly to said common plane and movement toward each other; and securing means associated with said retaining means and removably secured to said third tube means portion for preventing movement of said retaining means toward and from said third tube means portion.

4,709,557

METHOD AND SYSTEM FOR COOLING STRIP

Akio Tosaka, Koichi Hashiguchi, Masahiko Morita, and Shinobu Okano, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

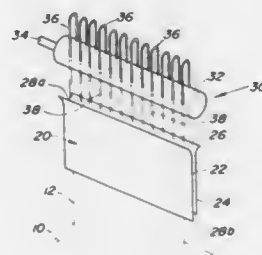
Filed Feb. 3, 1987, Ser. No. 10,496

Claims priority, application Japan, Feb. 4, 1986, 61-21102; Feb. 4, 1986, 61-21103; Nov. 7, 1986, 61-17033[U]; Nov. 7, 1986, 61-170334[U]

Int. Cl.⁴ F25D 17/02

U.S. Cl. 62—373

45 Claims



1. A strip colling system comprising:

a laminar flow nozzle constituted of a pair of first and second plates arranged in side-by-side relationship to each other for defining therebetween a fluid path of a cooling fluid for establishing a slit laminar flow substantially perpendicular to a strip path, through which the strip is transferred, said first plate being displaceable relative to said second plate for varying the path area of said fluid path; a cooling fluid supply means for supplying controlled amount of cooling fluid to flow through said fluid path; and said first plate being responsive to fluid pressure within said fluid path, for causing displacement relative to said second plate at a magnitude corresponding to said fluid pressure.

4,709,558

ADSORPTION REFRIGERATING APPARATUS

Masao Matsushita, Osaka; Kenzo Oku, Kyoto; Hiroki Nakano, Hirakata, and Shin-ichi Okumura, Ootsu, all of Japan, assignors to Nishiyodo Air Conditioner Co., Ltd., Osaka, Japan

Filed Sep. 12, 1986, Ser. No. 907,201

Claims priority, application Japan, Jan. 28, 1986, 61-017326

Int. Cl.⁴ F25B 17/08

U.S. Cl. 62—480

24 Claims



1. An adsorption refrigerating apparatus, comprising: a vessel substantially evacuated of air and having a refrigerant filled hermetically therein; a first finned tube heat exchanger housed in said vessel, through which first finned tube a first heat transfer medium on a heat source side is adapted to flow, said first finned tube having plural axially spaced fins between each of which is an interstice; a particulate adsorbent packed and held in the plural interstices of said first finned tube, said adsorbent forming contiguous voids among the particles thereof and adapted to allow refrigerant vapors to flow readily through said voids thereby to bring the vapors into good contact with the particles; and a second finned tube heat exchanger housed in said vessel, through which second finned tube a second heat transfer medium on a utilization side is adapted to flow, said second finned tube having plural axially spaced fins serving as a vaporizer and condenser; said first finned tube having an overall dimension smaller than an inside dimension of said vessel so as to leave a free space therebetween, said space allowing the refrigerant vapors to move freely about.

4,709,559

COOLING SYSTEM FOR RELATIVELY MOVABLE COMPONENTS

Peter Dotzauer, Buckenhof, and Martin Schmidt, Emskirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

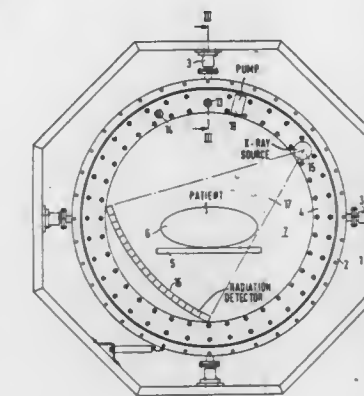
Filed Jun. 20, 1986, Ser. No. 876,752

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527657

Int. Cl.⁴ F25B 3/00

U.S. Cl. 62—499

2 Claims



1. A cooling system for an apparatus having a stationary part and a movable part rotatably mounted with respect to said stationary part comprising:

a sealed channel between said stationary part and said movable part, an evaporator disposed in said sealed channel disposed between the stationary part and the movable part; a cooling device connected with said evaporator; a closed cooling circulation path on said movable part including said channel; coolant filling said closed cooling circulation path; and a pump for circulating said coolant in said closed circulation path.

4,709,560

CONTROL MODULE COOLING

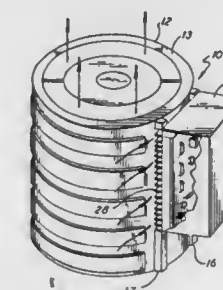
Roger Voorhis, Liverpool; Daryl G. Erbs, Canastota; John M. Palmer, Syracuse, and Derrick A. Marris, Blossvale, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 4, 1986, Ser. No. 938,105

Int. Cl.⁴ F25B 39/04

U.S. Cl. 62—508

7 Claims



1. In an air conditioning system of the type having a heat exchanger coil structure with an internal fan for causing the cooling air to flow radially inwardly through a coil, an improved power module comprising:

a control box containing electrical components for controlling the system, said control box being mounted to and supported by said outdoor coil structure; and

a heat sink associated with said control box, said heat sink having said electrical components mounted thereon so as to give up their generated heat to said heat sink, and said heat sink further being located in the flow path of the cooling air, between said control box and said outdoor coil structure, such that a portion of cooling air passing thru said coil, first passes over said heat sink to thereby enhance the cooling thereof.

4,709,561

APPARATUS AND METHOD FOR IMPROVING DRIVE FOR A CIRCULAR KNITTING MACHINE TO REDUCE WEAR AND GEAR BREAKAGE

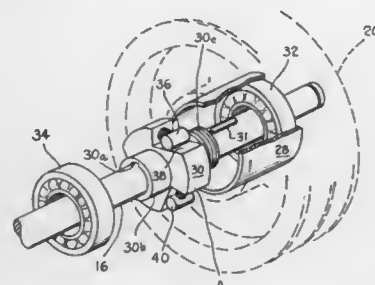
William I. Blackerby, P.O. Box 4111, Anderson, S.C. 29622

Filed Sep. 24, 1986, Ser. No. 911,170

Int. Cl.⁴ D04B 15/94

U.S. Cl. 66—8

16 Claims



1. Apparatus for converting the drive of a circular hose knitting machine to reduce wear and gear breakage, said circular hose knitting machine being of the type having a needle cylinder carrying a plurality of knitting needles, a beveled cylinder gear connected to said needle cylinder, a beveled cylinder drive gear affixed to a drive shaft meshing with said beveled gear of said knitting cylinder for revolving said knitting cylinder to effect a knitting motion of said knitting needles; an input drive sheave coupled to said drive shaft; and a clutch assembly coupling said input drive sheave and said drive shaft which includes an inner bearing race affixed to said drive shaft, an outer bearing race affixed to said input drive sheave, and an S-sprag clutch carried between said inner and outer races having a plurality of S-formed sprags which engage said inner and outer races to effect a drive engaging connection between said input drive sheave and said drive shaft when said input sheave is driven in rotation while permitting free rotation of said drive shaft when said input drive shaft is not driven in rotation wherein said apparatus comprises:

- a clutch unit directly affixed to said drive shaft adapted for replacing said inner bearing race and said S-sprag clutch, said clutch unit having a clutch body with a plurality of evenly spaced recesses formed in the outer periphery of said clutch body and each of said recesses having one flat surface inclined towards said periphery and said clutch unit having an extension on each side of said clutch body;
- said outer bearing race connected to the inner surface of said hollow sheave and having a smooth, even surface surrounding said clutch body;
- a plurality of locking members, one disposed in each of said recesses;
- biasing means for independently urging each of said locking members outwardly of its recess in a manner that said locking members move outwardly into wedging contact between the inclined flat surface of said recess and the outer race so that when said sheave is rotated in one direction said members will be wedged more tightly into driving contact with the outer race and the inclined flat surface and out of wedging contact with the outer race when said sheave is rotated in the opposite direction;
- bearings supported by each of the extensions of said clutch body and engaging said outer bearing race for

supporting said input sleeve for rotation relative to said clutch unit; and

- means disposed on one of said extensions for facilitating the removal of said clutch unit from said drive shaft.

4,709,562

WARP-KNIT SUPPORT TAPE FOR HOOK AND LOOP FASTENERS

Yoshio Matsuda, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

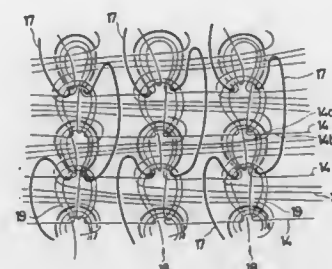
Filed Oct. 23, 1986, Ser. No. 922,166

Claims priority, application Japan, Oct. 23, 1985, 60-162742[U]

Int. Cl.⁴ D04B 7/12

U.S. Cl. 66—193

5 Claims



1. A warp-knit support tape for hook and loop fasteners which comprises a pile portion constructed with two needle stitches, laid-in weft threads and chain stitches formed by sinker looping into pile-loops, said pile-loops extending longitudinally of the tape alternately along the right and left sides of wales.

4,709,563

NEEDLE-SELECTING SYSTEM FOR CIRCULAR KNITTING MACHINE

Leonardo Camiciotti, and Edoardo Furia, both of Florence, Italy, assignors to Novitex s.r.l., Florence, Italy

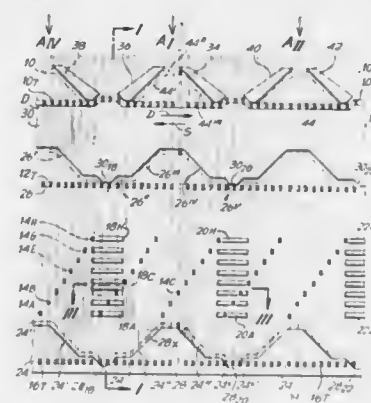
Filed Feb. 12, 1986, Ser. No. 828,968

Claims priority, application Italy, Feb. 15, 1985, 9336 A/85

Int. Cl.⁴ D04B 9/36, 15/68

U.S. Cl. 66—222

1 Claim



1. A circular knitting machine for the production of articles having an argyle or mosaic pattern, comprising a needle cylinder mounted for reciprocary rotary motion and having latch needles, intermediate jacks and selection jacks provided with selection butts with which stacked arrays of selection levers cooperate, the latter being disposed to select the needles to be raised to knit by depressing said selection jacks, the latter being

associated with elastic pusher jacks having respective butts; a bottom cam ring having lifting profiles arranged to cooperate with said pusher jacks; and a top cam ring having profiles arranged to cooperate with said intermediate jacks; wherein a stacked array of selection levers is disposed centered circumferentially between adjacent yarn feeding stations for selecting the needles to clear and knit in one or the other of said adjacent feeding stations depending upon the direction of said reciprocary motion, said lifting profiles of said bottom cam ring being substantially symmetrically located with respect to said feeding stations and to said stacked arrays of selection levers, said profiles of said top cam ring being similarly symmetrically located for controlling and lowering said intermediate jacks, said profiles of said bottom cam ring having, in alignment with said selection levers, V-notched profiles with a bottom slightly lower than the lower dwell path of said butts of said elastic pusher jacks, while corresponding lower projections are provided on said top cam ring for the control and lowering of said intermediate jacks; the width of said V-notched profiles being less than that of said selection levers to obtain by elasticity the engagement and subsequent lifting of said butts of said pusher jacks on said lifting profiles, whenever one selection lever does not depress the relative corresponding butt of the selection jack, and the butt of said elastic pusher jack enters said V-notched profile and engages said lifting profile, in order to obtain said selection of said needles.

4,709,564

DIGITAL LOCK

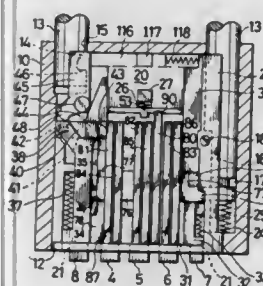
Saburo Minami, Osaka, Japan, assignor to Osaka Kanagu Co., Ltd., Osaka, Japan

Filed Nov. 15, 1985, Ser. No. 798,682

Int. Cl.⁴ E05B 37/18

U.S. Cl. 70—25

1 Claim



1. A digital lock having a case, a locking rod lockable within said case, a plate-like lock member and a front plate covering said lock member disposed in said case, a plurality of push-buttons, a return button and an opening button, and digital lock means comprising:

- a stop piece provided adjacent a forward end of a leg piece of said opening button and movable between a first position for preventing movement of said leg piece and a second position for allowing movement of said leg piece;
- a locking piece for locking and releasing said locking rod within said case having a protruding piece thereof engaged with a top end of said leg piece of said opening button;
- a slidable plate disposed between said lock member and said front plate and vertically movable and having a lock plate fitted thereto;
- a notch in said slidable plate for receiving therein a forward end of said stop piece when said slidable plate and said lock plate are moved vertically by a specified length;
- a return link provided along the lower edge portion of the lock plate and pivotably mounted by sling pieces having support axes at both ends thereof;
- a spring piece inserted in a cut-out surface of said front plate for pressing one of said sling pieces against a leg piece of said return button;
- pawl pieces arranged in front of said lock plate opposite

said slidable plate, said return link extending between said pawl pieces and said lock plate, and a comb-teeth shaped spring piece mounted at the surface of said front plate facing said lock member for pressing said pawls against said lock plate;

- a lock pawl having a protruding piece at its base end fitted loosely in the central lower part of said lock member;
- a protruding piece at the base end of each of said pawl pieces loosely fitted in a recess of said push-buttons and pawl tips on the forward end of each of said pawl pieces pressed against said lock plate;
- said lock plate having holes for receiving said pawl tips;
- said lock plate and said slidable plate being movable by a pitch length each time a push-button is pushed and when the push-buttons are pushed in a correct order;
- said leg piece of said opening button being movable to an open position when said stop piece is moved to said second position and said forward end enters said notch of said slidable plate after said slidable plate is moved vertically by said specified length;
- said locking piece being disengaged from said locking rod by said top end of said opening button when said opening button is moved to said opening position whereby unlocking is rendered possible;
- square recesses in the upper part and the intermediate part of the front surface of said front plate facing away from said lock member, a first groove in the upper part of said front plate open to said square recesses;
- an engaging plate in said recesses of said front plate being pressed downwards by a spring and leaving a gap corresponding to one said pitch length between the upper edge of said engaging plate and an upper edge of said recesses;
- a protrusion on the upper edge of the rear surface of said engaging plate fitted in a groove in said recesses of said front plate;
- a square hole in the substantially upper half of said engaging plate having an intermediate piece loosely fitted thereto;
- the lower edge of said intermediate piece located in said recesses of said front plate;
- the front surface of the intermediate piece being pressed by a spring piece fitted to the engaging plate for positioning the lower edge of said intermediate piece at the rear side of said front plate;
- a top edge of each of said pawl pieces positioned adjacent the lower edge of said intermediate piece, said lower edge positioned adjacent a side of a key-shaped piece of a top end of said lock pawl;
- said front plate having a second groove in its upper surface open to and communicating with said first groove in said recesses of said front plate, an engaging key and a push spring located in said second groove;
- said engaging key having one end pressed against the rear surface of said locking piece,

4,709,565 UNITED OPENING DEVICE FOR A DOUBLE-LOCKED DOOR

Jui C. Lin, 297, Bor Ay Rd., Kaohsiung City, Taiwan (800)

Filed Oct. 28, 1986, Ser. No. 923,869

Int. Cl.⁴ E05B 59/00

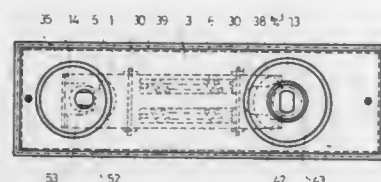
U.S. Cl. 70—107

2 Claims

1. In an opening device for simultaneously opening two

locks on a double-locked door including a main lock operated by a rotatable main shaft, an auxiliary lock operated by a rotatable shaft spaced from the main lock shaft, a main cam member operatively engaged with the main lock shaft to be rotated thereby, a sliding linking plate having main cam followers thereon engageable with the main cam member so that rotation of the main cam member reciprocally displaces the linking plate, auxiliary camming members on the linking plate, an auxiliary lock operated by a rotatable auxiliary shaft, and an auxiliary cam follower on the auxiliary shaft for rotation therewith and operatively engageable with the auxiliary camming members, so that when the auxiliary lock is in the locked position the auxiliary cam followers engage one of the auxiliary camming members and displacement of the linking plate by unlocking rotation of the main shaft simultaneously unlocks the auxiliary lock by displacement of one of the auxiliary camming members which rotates the auxiliary cam follower, the improvement comprising:

- two substantially straight slots in the linking plate;
- a hooking hole at one end of each slot;
- the main cam followers and auxiliary camming members being hook members projecting from opposite ends of the linking plate;
- a bottom plate having two slots therein aligned with said slots in the linking plate;
- two shaft holes in said bottom plate for receiving the main and auxiliary shafts, respectively;
- a plurality of screw holes in said bottom plate for use in attaching said bottom plate to a door;
- a surface plate attachable to said bottom plate;
- means for attaching said surface plate to said bottom plate;



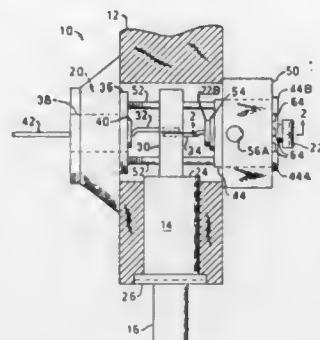
- two offset concave disc sections on said surface plate having two shaft holes therethrough aligned with said two shaft holes in said bottom plate for receiving the main and auxiliary shafts, respectively;
- two hooking holes on the interior surface of said surface plate facing said bottom plate;
- tension springs in said slots connected at opposite ends thereof to said linking member hooking holes and said surface plate hooking holes, respectively;
- a spacing edge wall around the periphery of said surface plate for spacing said surface plate from said bottom plate;
- guide members projecting from the interior surface of said surface plate for guiding the linking plate to move in a substantially straight line;
- retaining bars attachable to said guide members in spaced relationship and slidably engaging the surface of the linking plate facing said bottom plate for retaining the linking plate for sliding movement on said surface plate;
- the auxiliary cam follower being an auxiliary disc member having oppositely extending cam follower elements therein engageable adjacent the outer ends thereof with the auxiliary camming members when said auxiliary shaft is in the locking position and disengaged from the auxiliary camming members when in the unlocked position; and
- a stop member projecting inwardly from said offset concave disc section adjacent the position of the auxiliary shaft for limiting sliding movement of the linking plate in the non-operating retracted position under the resilient force of said tension springs.

4,709,566
SINGLE CYLINDER DEADBOLT LOCK MECHANISM
Carl H. Wildenrad, 2358 - 35th Ave., San Francisco, Calif. 94116

Filed Nov. 6, 1986, Ser. No. 927,517
Int. Cl.⁴ E05B 65/6

U.S. Cl. 70-129

9 Claims

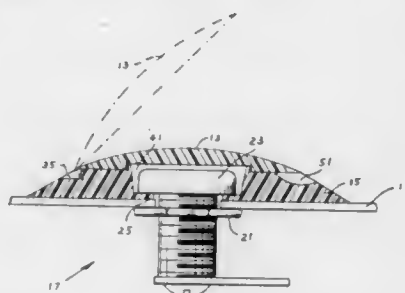


1. A lock mechanism comprising,
 - a key operated lock cylinder at one side thereof,
 - a turn piece at the opposite side thereof,
 - a latch bolt operated by rotation of said cylinder by a key and by rotation of said turn piece,
 - lost-motion connections between said latch bolt and cylinder and between said latch bolt and turn piece to allow for independent operation of said latch bolt by either said cylinder or turn piece,
 - manually movable means operable from said opposite side of the lock mechanism and movable between a first position for preventing operation of the latch bolt by said turn piece and a second position allowing for operation of the latch bolt by the turn piece, and
 - locking means operable from said opposite side of the lock mechanism for locking the manually movable means in said first position.

4,709,567
LOCK AND COVER DEVICE
Paul Appelbaum, 5115 E. Donald St., Denver, Colo. 80222
Filed May 30, 1985, Ser. No. 739,227
Int. Cl.⁴ E05B 17/18

U.S. Cl. 70-455

9 Claims



1. Apparatus to be mounted to a lock for releasably sealing a lock and having a keyway sealing position and an keyway exposing position, comprising:
 - a resilient polymeric housing, circular in planform and having a flat annular bottom surface, said housing having a central bore extending therethrough for admitting the cylinder of said lock, the upper surface of said housing having an upwardly sloping outer portion, an intermediate flat annular portion, and a central portion sunken substantially below the plane of said intermediate portion and having a generally annular flange at the bottom of said

sunken portion, bordering said central bore, and a resilient annular male locking lip extending upwardly and somewhat radially outwardly from said intermediate annular portion, and means within said sloping portion for receiving the posts of a hinge joint;

- b. a resilient polymeric lid, circular in planform and having a convex upper surface and a diameter the same as the outer circular boundary of said housing intermediate portion, the bottom of said lid being flat with a central circular depression therein that has a diameter somewhat larger than said male locking lip, and the side wall of said depression having a continuous, radially inwardly extending flange defining an inner circle that is slightly smaller in diameter than the outer diameter of said male lip, and means depending from the periphery of said lid for carrying posts receivable within said post receiving means on said housing whereby said lid is pivotally mounted for rotation from an open position to a sealed position wherein the bottom of said lid lies flush with said intermediate housing portion and whereby said female finger is pressed over the male lip to form sealing and locking engagement with the outer wall of said male lip, and whereby a dome-like configuration is provided to the combined top of said apparatus.

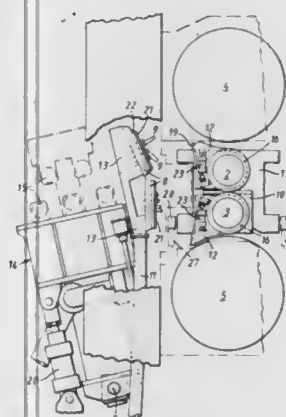
4,709,568
LUBRICATION OF ROLLING MILLS
Roy M. Ticehurst, and Joseph L. Watson, both of Bournemouth, England, assignors to Davy McKee (Poole) Limited, Dorset, England

Filed Jun. 10, 1986, Ser. No. 872,394
Claims priority, application United Kingdom, Jun. 10, 1985, 8514599; Jun. 10, 1985, 8514597

U.S. Cl. 72-201

Int. Cl.⁴ B21B 27/10

11 Claims

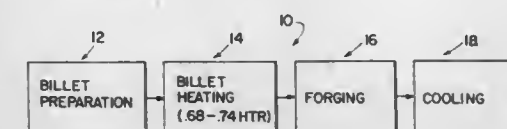


1. A rolling mill comprising
 - a plurality of mill rolls;
 - means for directing liquid coolant onto the rolls at the ingoing side of the mill;
 - one or more backing supports on which are mounted the coolant directing means;
 - a casing or casings which during operation enclose the coolant directing means and have contact seals which engage the rolls to prevent unwanted egress of coolant from the casing or casings onto work entering the mill;
 - sealing means between the casing or casings and the backing support or supports; and
 - mounting means for the casing or casings for withdrawal of the casing or casings from the mill for maintenance purposes independently of said one or more backing supports.

4,709,569
METHOD FOR PRODUCING GEARS
Alvin M. Sabroff, Mentor, Ohio; Samuel C. Chambers, and James C. Ream, both of Glasgow, Ky., assignors to Eaton Corporation, Cleveland, Ohio
Continuation of Ser. No. 238,255, Feb. 25, 1981, abandoned.
This application May 2, 1983, Ser. No. 484,800
Int. Cl.⁴ B21J 1/06

U.S. Cl. 72-340

3 Claims



1. A method of producing a spur or bevel gear of low to medium carbon level carbon or alloy steel comprising the steps of:
 - (a) providing a properly sized, shaped and cleaned billet of a given low to medium carbon level carbon or alloy steel having a carbon content of not more than 0.30%;
 - (b) heating the billet in a minimum oxidizing environment to a preselected temperature falling in the range of 0.069-0.71 for the homologous temperature ratio of the billet material;
 - (c) locating the heated billet in a first die member on a forging machine;
 - (d) precision forging the billet while substantially at said preselected temperature by engaging the heated billet with a second die member complementary with the first die member in a single forge flow to form a gear precision preform;
 - (e) removing the preform and allowing the preform to cool in air to substantially ambient temperature; and
 - (f) machining less than 0.060 inch of material from the exterior functional surfaces of the cooled preform without subjecting the cooled preform to any heat treating operation prior to said machining.

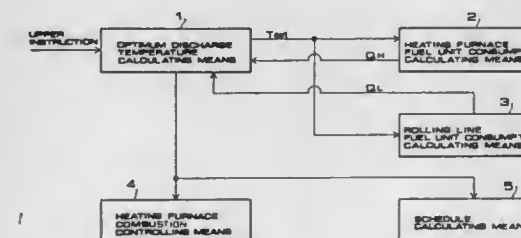
4,709,570
METHOD FOR SETTING STEEL STOCK DISCHARGE TEMPERATURE OF HEATING FURNACE IN HOT ROLLING LINE

Yoshinori Wakamiya, and Tomoko Sumino, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,326
Claims priority, application Japan, Nov. 7, 1984, 59-236429
Int. Cl.⁴ B21B 1/22, 37/10

U.S. Cl. 72-365

1 Claim



1. A method for setting a steel stock discharge temperature of a heating furnace in a hot rolling line, comprising the steps of:
 - (a) determining a fuel unit consumption in the heating furnace by a heating furnace fuel unit consumption calculating means employing the equation

$$Q_{Hf} = f(H, T_{in}, T_{out}, T_G, \Delta t)$$

where,
H: plate thickness in the heat furnace (mm)
 T_{in} : charging temperature ($^{\circ}$ C.)
 T_{out} : discharge temperature ($^{\circ}$ C.)
 T_G : intra-furnace atmosphere temperature ($^{\circ}$ C.)
 Δt : intra-furnace residence time (hour);

(b) determining a fuel unit consumption in a rolling line by a rolling line fuel unit consumption calculating means employing the equation

$$Q_L = g(H, T_{out}, h, T_D)$$

where,
h: final plate thickness (mm)
 T_D : finishing discharge temperature ($^{\circ}\text{C}$)

- determining a total fuel unit consumption Q ($Q=Q_H+Q_L$) in the entire line from said fuel unit consumption in the heating furnace and said fuel unit consumption in the rolling line with T_{out} and T_G as variables; and
- substituting present state T_G as value of T_G in the equation for Q ;
- determining an optimum discharge temperature so as to satisfy a metallurgical discharge temperature restrictive condition and minimize said total fuel unit consumption, according to a non-linear equation optimizing processing, by an optimum discharge temperature calculating means, said optimum discharge temperature calculating means performing the steps of:
 - determining T_{out} value for minimizing Q ;
 - substituting T_{out} value so determined in first equation above to determine intra-furnace atmosphere temperature T_G ;
 - determining whether $T_G - T_G' < \epsilon$, where ϵ is an arbitrary positive number;
 - if equation in step (3) is not satisfied, substituting T_G' for T_G and repeating steps (1), (2) and (3) until equation in step (3) is satisfied and
- using said optimum discharge temperature as the steel stock discharge temperature.

4,709,571
METHOD OF OPERATING A CONTROLLED
DEFLECTION ROLL AND A ROLLING MILL EQUIPPED
WITH AT LEAST ONE CONTROLLED DEFLECTION
ROLL

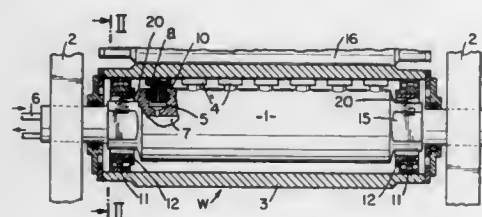
Heinz Güttinger, Schaffhausen, Switzerland, assignor to Sulzer-Escher Wyss AG, Winterthur, Switzerland
Division of Ser. No. 408,694, Aug. 16, 1982, Pat. No. 4,620,348.
This application Feb. 19, 1986, Ser. No. 830,766
Claims priority, application Switzerland, Sep. 21, 1981,
6072/81

The portion of the term of this patent subsequent to Nov. 4, 2003,
has been disclaimed.

Int. Cl.⁴ B21B 31/32

U.S. Cl. 72-366

17 Claims



13. A method of operating a rolling mill having a pair of controlled deflection rolls, comprising the steps of:
operating carrier members for compensating the weight of a roll shell of each controlled deflection roll of said pair of controlled deflection rolls and the weight of components

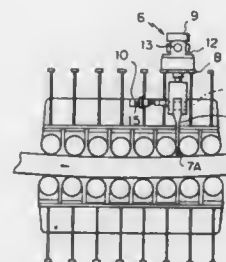
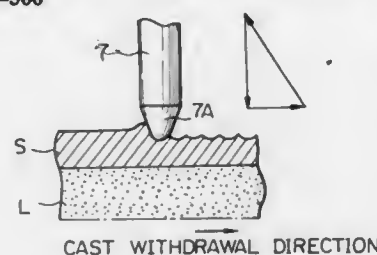
carried by said roll shells within a respective predetermined mobility range of each said roll shell; regulating said carrier members such that said weights are substantially exactly compensated; and operating and regulating pressure elements of each said controlled deflection roll for providing a predetermined degree and distribution of pressing force across the width of said pair of controlled deflection rolls independently of said weights.

4,709,572
METHOD OF PROCESSING CONTINUOUSLY CAST
SLABS

**Tsunee Yamada, Nishinomiya; Tsutomu Sakashita, Ibaraki;
Hiroshi Tomono; Takashi Kimura, both of Osaka; Yasuhiro
Machara, and Kunio Yasumoto, both of Kobe, all of Japan,
assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**
Filed Jul. 30, 1985. Ser. No. 760,453

Claims priority, application Japan, Jul. 31, 1984, 59-161183;
Aug. 20, 1984, 59-171439; Aug. 20, 1984, 59-171440
Int. Cl.⁴ B21B 1/46, 11/00; C21D 8/00
U.S. Cl. 72-366 8 Claims

8 Claims



1. A method of processing a continuously cast slab to prevent the formation of surface cracks by applying plastic strains to the upper surface layer of the slab in which a process of solidification is taking place, comprising pressing a projection against the slab surface to a depth of 1-5mm at a frequency of at least 50 times per minute prior to introducing the slab to a straightening stage.

5. A method of processing a continuously cast slab, characterized by imparting plastic strains to a depth of 2 mm or more from the surface in an amount of 5% or more at a strain rate ($\dot{\epsilon}$) given by the following expression:

$$\epsilon \geq a \times \exp(bT)$$

wherein, $a=4 \times 10^{-5}$, $b=4.6 \times 10^{-3}$, T is a cast slab surface temperature, and $700^{\circ} \text{C} \leq T \leq 1200^{\circ} \text{C}$, then passing the resulting slab through a series of withdrawal rollers and subjecting the slab to straightening.

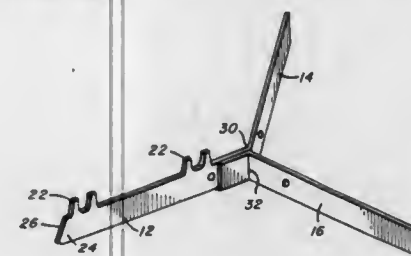
4,709,573

SURFACE HEATING ELEMENT SUPPORT SPIDER
James E. Philpot, Cookeville, Tenn., assignor to Teledyne Industries Inc., Cookeville, Tenn.

U.S. Cl. 72-379

U.S. Cl. 72-379

3 Claims



1. A method of making a support spider for a surface heating element utilizing a blank comprising first and second oppositely directed legs and a third leg spaced from and extending substantially parallel to one of the first and second legs and connected to a base area of one of the first and second legs, said method comprising the steps of:

(a) folding the third leg about the first and second legs and into a plane spaced from, overlying, and substantially coextensive with an adjacent one of the first and second legs; and

(b) spreading the third leg and the one of the first and second legs adjacent thereto from one another for arranging the first and second legs and the third leg substantially equidistant from one another.

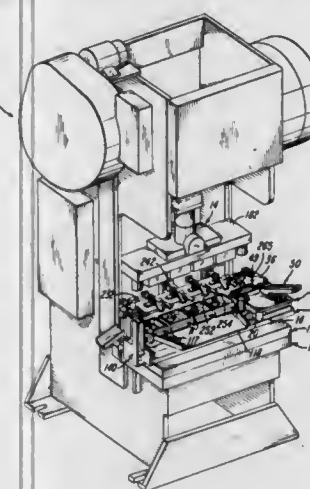
4,709,574
MACHINE FOR COLD FORMING SMALL TUBULAR
ELEMENTS

Charles Horn, deceased, late of Dayton (by Dorothy E. Horn, executor), and William R. Jenkins, Dayton, both of Ohio, assignors to Vulcan Tool Company, Dayton, Ohio

Filed Mar. 2, 1984, Ser. No. 585,763
Int. Cl.⁴ B21J 13/08; B21K 1/64

U.S. Cl. 72-405

8 Claims



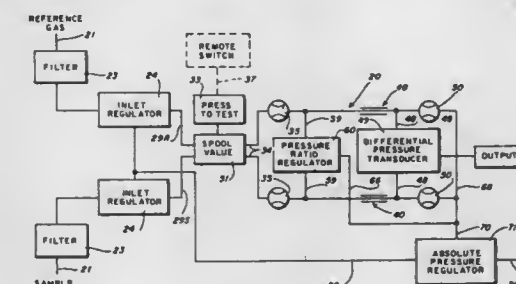
1. Apparatus for converting short lengths of tubing, constituting tubular elements, into nuts, small fitting, sleeves or other tubular or annular fasteners or coupling devices distinguished by utilitarian exterior and/or interior surface portions comprising means defining a plurality of stations, in each of which each tubular elements must be positioned in the course of its conversion, including a receiving station and plurality of following stations at least a portion of which are working stations, means defining said receiving station presenting a horizontally dis-

4,709,575
FLUIDIC OXYGEN SENSOR MONITOR
William P. Myers, Rock Island, Ill., assignor to Litton Systems,
Inc., Davenport, Iowa

Filed May 5, 1986, Ser. No. 859,382
Int. Cl.⁴ G01N 7/00

U.S. Cl. 73-23

12 Claims



1. A fluidic sensor for determining the partial pressure of oxygen in a gas comprising:

- a positive pressure inlet for a reference gas and a positive pressure inlet for a sample gas,
- a capillary passage for the reference gas and a capillary passage for the sample gas,
- an orifice passage for the reference gas and an orifice passage for the sample gas,
- an outlet for the fluidic sensor at ambient pressure, and
- means coupled to the outlets of the capillary passages for detecting a pressure differential between the outlet of the reference capillary passage and the outlet of the sample capillary passage.

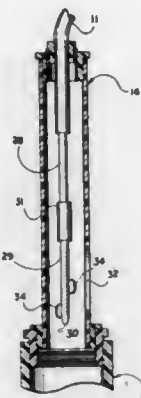
4,709,576

LEAK DETECTION METHOD AND APPARATUS
Austin B. Raabe, Alpharetta, Ga., assignor to Applied Biology, Inc., Decatur, Ga.

Filed Oct. 14, 1986, Ser. No. 918,368
Int. Cl.⁴ G01M 3/04

U.S. Cl. 73—40.5 R

10 Claims



1. Apparatus for detecting the presence of vapor within a well or the like, said apparatus including a housing receivable within said well, conduit means fixed to said housing and in communication therewith, said conduit means extending from said well and having an upper end, volume indicating means connected to said upper end of said conduit means, pump means connected to said volume indicating means for moving air through said housing, said conduit means, and said volume indicating means, and vapor indicating means received within said housing and in communication with said conduit means so that said air must pass through said vapor indicating means.

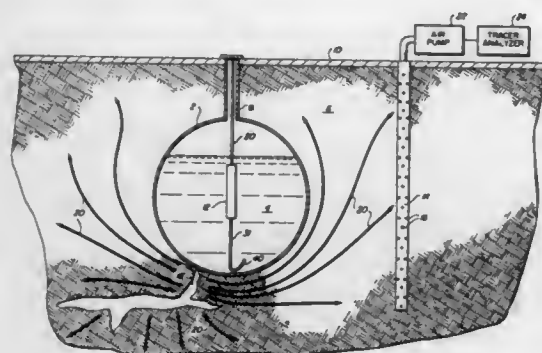
4,709,577

SYSTEM FOR CONTINUOUSLY MONITORING FOR LEAKS IN UNDERGROUND STORAGE TANKS
Glenn M. Thompson, Tucson, Ariz., assignor to Tracer Research Corporation, Tucson, Ariz.

Filed Nov. 29, 1983, Ser. No. 556,620
Int. Cl.⁴ G01M 3/20

U.S. Cl. 73—40.7

12 Claims



1. An apparatus for detecting leaks from at least one subsurface liquid storage tank comprising:
at least one subsurface liquid storage tank containing a quantity of liquid;
means for dispensing a highly detectable tracer into the liquid, wherein said dispensing means includes:
an elongated generally cylindrical container means for storing at least a partial reservoir of liquid tracer and a portion of gaseous tracer and,
an elongated permeation tube means extending downwardly from said container into said at least one subsurface liquid storage tank for diffusing the gaseous tracer through the

walls of the permeation tube means for releasing tracer into the liquid in said tank;
at least one subsurface sampling pipe having a plurality of apertures therein for collecting soil gas samples near the proximity of said at least one subsurface liquid storage tank; and
means for analyzing samples of soil gas from said at least one sampling pipe for detecting the presence of said tracer indicative of a liquid leak from said tank.

4,709,578

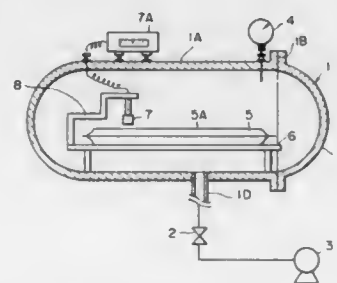
METHOD AND APPARATUS FOR DETERMINING A VACUUM DEGREE WITHIN A FLEXIBLE VACUUM PACKAGE

Tadayoshi Iwasaki, Fujisawa; Keiki Ariga, Yokohama, and Makoto Sato, Yokosuka, all of Japan, assignors to Nippon Sanso Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1985, Ser. No. 792,397
Claims priority, application Japan, Oct. 30, 1984, 59-228367
Int. Cl.⁴ G01M 3/36

U.S. Cl. 73—49.3

3 Claims



1. A method for determining a vacuum degree within a flexible vacuum package containing a material in a vacuum state, comprising the steps of:
sealingly placing the vacuum package within a vacuum chamber;
evacuating the vacuum chamber to a degree below the vacuum degree of the vacuum package sealingly placed within the vacuum chamber;
detecting a start of displacement of a part of the package during the evacuation step;
measuring pressure within the vacuum chamber when the start of displacement of the part of the package is detected, and
calculating the pressure within said vacuum package based upon the detected start of displacement of the part of the package during the evacuation step and the measured pressure within the chamber.

4,709,579

MEASUREMENT OF MOISTURE CONTENT
Merle A. Parker, Richard A. Pregall, and Hassan J. Ahmed, all of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

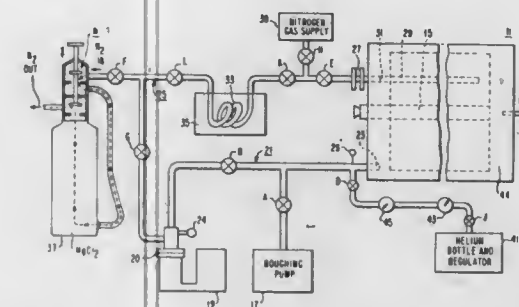
Filed Aug. 16, 1985, Ser. No. 766,306
Int. Cl.⁴ G01N 5/02

U.S. Cl. 73—76

12 Claims

1. A method of determining moisture content within each of a plurality of nuclear fuel rods, each fuel rod including cladding containing therein a plurality of fuel pellets, the cladding of each fuel rod having an opening for escape of air and vapor of moisture from the interior thereof; said method being practiced with apparatus including a drying oven, evacuating means connected to said oven and to at least one fuel rod randomly selected from said plurality of fuel rods, for evacuating said oven and said at least one rod, and moisture-vapor condensing means connected to said at least one rod through

said evacuating means; said method including heating said fuel rods in said oven to a predetermined temperature for a predetermined interval of time, while said rods are being heated enabling said evacuating means to evacuate said oven and said at least one rod, collecting said vapor of moisture from said at least one rod, through said evacuating means, in said moisture-vapor condensing means, condensing said vapor from said at least one rod in said condensing means, thereafter evaporating said moisture from said at least one rod condensed in said



condensing means, and measuring the quantity of moisture which was condensed from said at least one rod; the interior of said at least one rod being maintained through its said opening by said evacuating means and said oven at the same pressure as the interior of the remaining plurality of fuel rods are maintained through their respective openings, whereby the measurement of the moisture within said at least one rod is used as an equivalent measurement of the moisture within each of the remaining plurality of fuel rods.

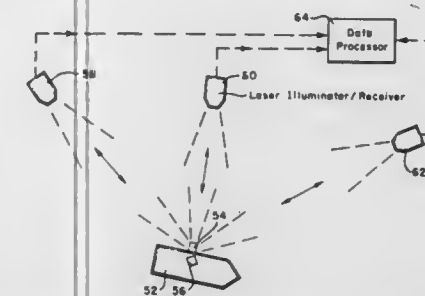
4,709,580

RETROFLECTIVE ATTITUDE DETERMINING SYSTEM
J. James Butts, Jr., Rolling Hills Estates, and Don R. Howard, Palos Verdes Estates, both of Calif., assignors to bd Systems, Inc., Torrance, Calif.

Filed Feb. 26, 1986, Ser. No. 834,213
Int. Cl.⁴ G01C 21/00

U.S. Cl. 73—178 R

20 Claims



9. A system for determining the orientation and rate of rotation of a spinning object comprising:
means for mounting at least one retroflective attitude marker (RAM) having a single predetermined plane of retroreflection on the object under consideration, each said RAM including a plurality of exposed pairs of reflecting surfaces with the surfaces of each pair being oriented at 90 degrees with respect to one-another;
means for directing at least two radiation beams toward said object;
means associated with said radiation beam directing means for receiving retroreflections from said object when and only when said RAM retroreflection plane is aligned with said beam directing means;
means for timing the interval between the occurrence of successive received retroreflections from said RAM; and

means for calculating the spin rate of said object from said successive retroreflections.

4,709,581

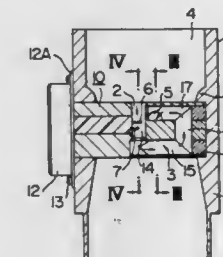
AIR FLOW METER

Yutaka Nishimura, and Yoshishige Oyama, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,309
Claims priority, application Japan, Sep. 7, 1984, 59-186370
Int. Cl.⁴ G01F 1/68, 5/00

U.S. Cl. 73—202

7 Claims



1. An air flow meter in an internal combustion engine, the air flow meter comprising:
a main passageway having an air inlet portion;
an air flow rate measuring tube mounted in said main passageway and extending over a predetermined axial length thereof;
a bypass passageway formed in the air flow rate measuring tube and including an air inlet portion located substantially in a central portion of a cross-sectional area of said main passageway and an outlet portion disposed downstream of the air inlet portion of said main passageway, said bypass passageway including at least one substantially straight portion having a constant cross-sectional area, and at least one further portion extending substantially at a right angle to said substantially straight portion, said bypass passageway having an axial length greater than said predetermined axial length of said air flow rate measuring tube;
a hot wire type air flow sensor mounted in the at least one substantially straight portion of the bypass passageway;
a control means including a control circuit means for controlling an operation of said hot wire type air flow sensor; wherein said hot wire type air flow sensor and said control means are formed as an integral unit forming a sensor assembly insertable in said air flow rate measuring tube, said sensor assembly in said air flow rate measuring tube and said air flow rate measuring tube form a unit insertable in said air inlet portion, and
wherein the air flow rate measuring tube including the bypass passageway and the hot wire type air flow sensor is exposed to the main air flow so that a temperature of the air in the bypass passageway becomes substantially equal to a temperature of the air in the main passageway.

4,709,582

INSPECTION DEVICE FOR ROTOR BINDING DEFECTS IN ELECTRICAL MACHINES

Michel Besanceney, Plancher-Bas Centre, France, assignor to Alstom, Paris, France

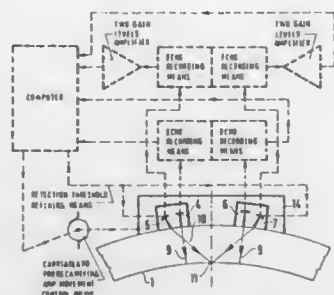
Filed Mar. 6, 1986, Ser. No. 836,885
Claims priority, application France, Mar. 6, 1985, 85 03302
Int. Cl.⁴ G01N 29/04

U.S. Cl. 73—622

7 Claims

1. Device for inspecting electrical machine rotor bindings for defects, comprising a self-powered carriage movable about the rotor shaft and a probe-carrying arm carried by said carriage and operable to move longitudinally parallel to the axis of the rotor between the stator and the rotor binding, said arm carrying at its extremity two detector units each comprising a

right angle, longitudinal wave probe and an oblique angled, transverse wave probe, each of the latter being symmetrically inclined with respect to the radii of the rotor and acting both as transmitter and receiver, wherein are additionally provided: means for recording the echoes from the right angle probes defining the strength of the acoustic coupling, the thickness of the binding band and the location—in or outside the binding zone—of the inspection point,



means for recording the echoes from the oblique-angled probes within a time interval centered on the travel time corresponding to the inspected zone, and means of control defining for the oblique-angled probes, on the basis of the indications from the right angle probes, a detection threshold varying in height according to whether the inspection point is located in a bound zone or an unbound zone.

4,709,583

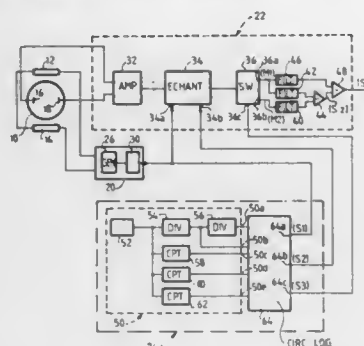
ELECTROMAGNETIC FLOW METER USING A PULSED MAGNETIC FIELD

Thijlbert De Paep, Palaiseau, and Gérard Crochet, Cernay La Ville, both of France, assignors to Sereg, Montrouge, France
Filed Oct. 28, 1986, Ser. No. 923,991

Claims priority, application France, Oct. 31, 1985, 85 16192
Int. Cl.⁴ G01F 1/60

U.S. Cl. 73—861.17

9 Claims



1. An electromagnetic flow meter comprising:
a measuring tube for passing the liquid whose flow rate is to be measured;
induction windings have an excitation current passing there-through for setting up a magnetic field perpendicular to the direction of liquid flow;
diametrically-opposed electrodes for sensing the voltage signal which results from the flow of liquid through the magnetic field;
a circuit for feeding current to said induction windings and comprising means for generating a periodic excitation current of period T_1 , each period T_1 being the result of a combination in time of n periods of a first excitation current (I_1) of period T_1 and m period of a second excitation current (I_2) of period T_2 , where $T_2 > T_1$, with the period T_2 being long enough to ensure that portion of the corre-

sponding sensed voltage signal is free from the relaxation phenomenon; and

a processor circuit comprising means for generating a first intermediate measurement signal (M_1) of period T_1 and having a short response time, a second intermediate measurement signal (M_2) corresponding to the voltage signal of period T_2 and being free from measurement drift, and for combining and filtering said first and second intermediate measurement signals in order to generate a measurement signal S being both short in response time and free from drift.

4,709,584

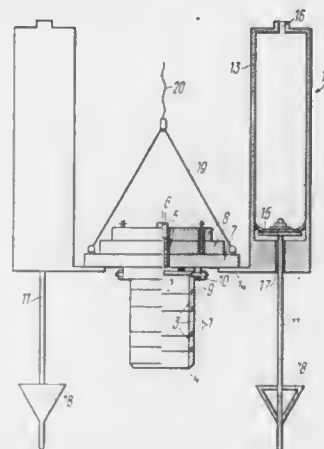
DEVICE FOR TAKING SAMPLES OF BOTTOM SEDIMENTS FROM WATER BASINS

Martin A. Voll; Robert K. Eiskop, and Kharri I. Yankovsky, all of Tallin, U.S.S.R., assignors to Institut Khimii AN, Tallin, U.S.S.R.

Filed Oct. 15, 1986, Ser. No. 918,929
Int. Cl.⁴ G01N 1/04

U.S. Cl. 73—864.44

4 Claims



1. A device for taking samples of bottom sediments from water basins, comprising:
a vertical coring tube;
sections of said coring tube arranged in succession one after another longitudinally of said tube;
a closed upper end of said tube;
an open lower end of said tube;
a check valve built in said upper end;
a ballast weight on said upper end;
rod-type vertical supports having upper and lower ends and a length greater than the length of said coring tube and uniformly spaced around the circumference of said coring tube;
at least three hollow cylinders with closed upper and lower ends;
a central hole in each of said upper and lower ends of each of said hollow cylinders;
a plunger in each of said hollow cylinders;
said cylinders installed around said tube, being uniformly spaced and parallel to the tube and secured by the lower ends thereof to the ballast weight, so that said lower ends of the cylinders are on a level approximately the same as that of the upper end of the tube;
each upper end of said rod-type supports passing through a hole in one of said lower ends of the cylinders and being rigidly connected to one of said plungers in one of said cylinders.

4,709,585

METHOD AND APPARATUS FOR MONITORING ENVIRONMENTAL EVAPOTRANSPIRATION

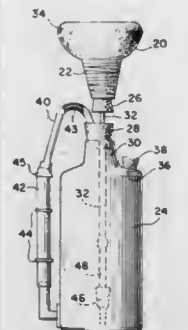
Jonathan M. Altenhofen, 4135 W. Horsetooth Rd., Ft. Collins, Colo. 80526

Filed Jun. 13, 1986, Ser. No. 874,142

Int. Cl.⁴ G01N 19/10; G01F 23/02

U.S. Cl. 73—866.4

19 Claims



1. A method of estimating crop consumptive water use comprising the steps of:
providing a means for simulating the diffusion resistance and albedo characteristics of a crop;
providing a continuous supply of liquid to said means for simulating;
exposing said means for simulating in an outdoor environment;
measuring an amount of evaporated liquid from said means for simulating; and
determining an estimated crop evapotranspiration value by comparing said measured amount of evaporated liquid to a reference amount of evaporated liquid which is correlated with an actual crop evapotranspiration value.

4,709,586

SPRING-DRIVEN GYROSCOPE

Jacques Moutardier, Le Plessis Robinson, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

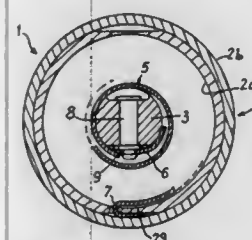
Filed Dec. 12, 1986, Ser. No. 941,043

Claims priority, application France, Dec. 20, 1985, 85 18958

Int. Cl.⁴ G01C 19/26; F03G 1/00

U.S. Cl. 74—5.12

8 Claims



1. In a gyroscope, of the type comprising:
a hollow rotor adapted to rotate about a fixed shaft traversing it,
a leaf spring housed inside the rotor and spirally surrounding said fixed shaft,
first and second connection means for respectively joining a first end of the spring to the fixed shaft and the second end of the spring to the rotor, with the result that it is possible to store energy in the spring by tensioning it,
means for blocking the rotor with respect to the fixed shaft in a position for which the spring is tensioned,
means for controlling the blocking means in order to unblock the rotor so that it is driven in rotation by the release of the spring,
said first connection means being such that the connection

that they establish is broken at the end of release of the spring,

said first connection means comprising a finger borne by a fixed shaft which is capable of being engaged in an opening in the first end of said spring; said finger being provided with a groove for fastening the front edge of the opening in the first end of the spring, the transverse and longitudinal dimensions of said opening allowing a relative movement between the finger and said opening; said spring having a tongue fixed on that part of the edge of the opening opposite that to be held in said groove, which tongue, with the spring in a tensioned position, is inclined outwardly with respect to the fixed shaft, its free end lying in contact with or in the vicinity of the end of said finger.

4,709,587

FRICTION DRIVE FOR AUTOMOTIVE AND TRUCK ACCESSORIES

Nicola Fiornascente, 165 Valley Rd., Montclair, N.J. 07042

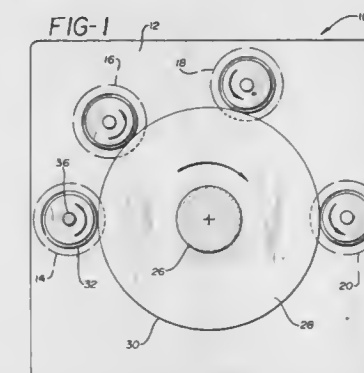
Continuation-in-part of Ser. No. 727,766, Jun. 10, 1985,

abandoned. This application Sep. 2, 1986, Ser. No. 902,950

Int. Cl.⁴ F16H 37/06; F02B 67/04

U.S. Cl. 74—15.63

4 Claims



1. A friction drive arrangement for driving automotive and truck accessories, each with an input from the automotive/truck engine thereof comprising in combination:
a drive wheel for mounting on an output shaft of said engine having an outer rim surface;
one or more driven wheels for driving said accessories having portions thereof mating frictionally with said outer rim surface, said driven wheels further comprising:
hub means for concentrically mounting the driven wheel onto the input shaft;
a cylindrical rim supported by said hub means and formed axially thereabout;
a pair of end flanges extending radially outward from the ends of the cylindrical rim;
plurality of elastic o-rings for transmitting driving forces resiliently mounted adjacently and compressively to said cylindrical rim and within said end flanges, said elastic O-rings having an inner diameter slightly less than that of said cylindrical rim and being dimensioned so that each o-ring can be mounted over one of said end flanges and dimensioned to extend radially beyond said end flanges and to form axially disposed, substantially V-shaped grooves between adjacent elastic o-rings; whereby said drive wheel transmits rotational forces to said accessories.

4,709,588

OPERATING ARM FOR AN EARTH-MOVING AND FOUNDATION MACHINE

Hugo Cordes, No. 7, Rulantweg, 2000 Hamburg 50, and Hans Krüger, No. 184c, Stockfleeweg, 2000 Hamburg 62, both of Fed. Rep. of Germany

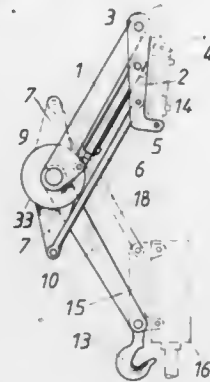
Filed Apr. 8, 1983, Ser. No. 483,320

The portion of the term of this patent subsequent to Nov. 1, 2003, has been disclaimed.

Int. Cl.⁴ B25J 9/06; F16H 21/04; G05G 11/00

U.S. Cl. 74-103

10 Claims



1. An operating arm to be adapted to an earth-moving or foundation machine for the guidance of a tool, comprising:
 - (a) an upper arm (1) pivotally connected by a pivot pin (3) either directly to the machine or via a boom (4);
 - (b) a lower arm (10) pivotally connected to the upper arm and carrying the tool;
 - (c) a drive which moves the upper arm and the lower arm from an extended position via a folded position, in which both arms are side by side, into an oppositely extended position;
 - (d) a base guide (2) which is supported on the pivot pin (3) of the upper arm (1) and revolving about said pin by means of a directive cylinder (14) supported on the boom (4);
 - (e) an upper arm cylinder (5) driving the upper arm (1) and a connecting rod (6) being parallel to and of the same length as the upper arm, which are both pivotally connected to the base guide (2);
 - (f) a parallel guide (7) which is pivotally supported on the joint (9) between said upper arm and lower arm and is guided by the connecting rod (6) parallel to said base guide, and
 - (g) a device for equal angular movement which is connected to the parallel guide (7) and by means of which the lower arm (10) and the upper arm (1) execute equivalent but opposite angular deflections relative to the parallel guide.

4,709,589

FIXED RATIO TRACTION ROLLER TRANSMISSION

Charles E. Kraus, Austin, Tex., assignor to Exclermatic Inc., Austin, Tex.

Filed Aug. 13, 1986, Ser. No. 896,106

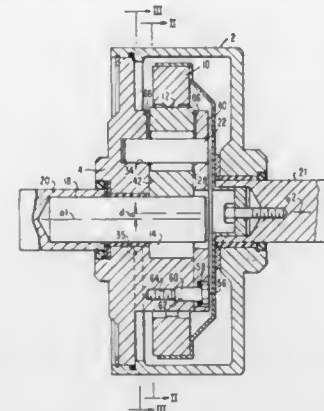
Int. Cl.⁴ F16H 13/06, 13/02

U.S. Cl. 74-206

7 Claims

1. A fixed ratio planetary type traction roller transmission having input and output shafts and comprising a mounting plate structure through which one of said shafts extends, said one shaft carrying a sun roller, a traction ring carried by the other of said shafts for rotation therewith, said sun roller being arranged within said traction ring such that an annular space is formed between said sun roller and said traction ring, a number of motion transmitting traction rollers supported in said annular space so as to be in engagement with said sun roller and said traction ring for transmitting motion therebetween, a roller

alignment plate arranged opposite said mounting plate structure with said traction rollers disposed therebetween, support projections extending through said annular space between said mounting plate structure and said alignment plate in the areas between said traction rollers, said traction rollers having smooth planar side faces and said support plate structure and said alignment plate having smooth planar parallel surfaces



adjacent said traction rollers, and means associated with said support projections, said mounting plate structure and said alignment plate for resiliently urging said alignment plate and said mounting plate structure toward one another with a predetermined force thereby urging their smooth planar surfaces adjacent said traction rollers into guiding abutment with the traction rollers side faces to provide for parallel orientation of said traction rollers.

4,709,590

HERRINGBONE GEARED MULTIPLE LOAD SHARING COUNTERSHAFT TRANSMISSION

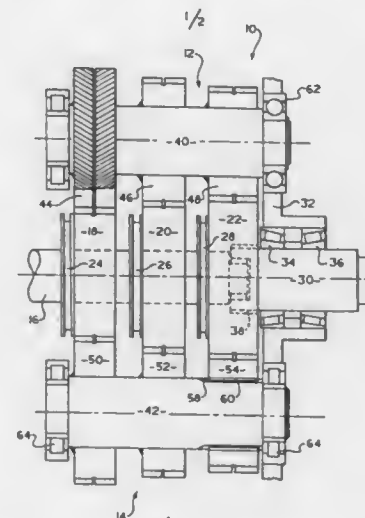
Elmer A. Richards, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 11, 1986, Ser. No. 872,798

Int. Cl.⁴ F16H 3/08

U.S. Cl. 74-331

7 Claims



1. A change speed gear transmission, comprising:
 - a plurality of spaced countershafts having parallel axes and means supporting said countershafts for rotation;
 - a plurality of sets of countershaft gears nonrotatably mounted on said countershafts, each set comprising one gear on each of the countershafts, the gears of each set being substantially identical;
 driving/driven means for rotating/rotation by said counter-

shafts, said driving/driven means comprising an input/output gear meshed with a set of countershaft gears, an input/output shaft in direct driving contact with said input/output gear and means mounting said input/output gear nonrotatably with respect to said input/output shaft; a rotatable central shaft arranged substantially parallel with said countershafts and located therebetween such that said countershafts are substantially equally circumferentially spaced thereabout and means supporting said central shaft for rotation, said central shaft being substantially axially aligned with said input/output shaft; a plurality of central gears encircling said central shaft, each of said central gears constantly meshed with a set of countershaft gears; clutch means for selectively establishing at least one driving connection between said input/output shaft, countershafts and said central shaft through a set of countershaft gears and a selected central gear; said transmission characterized by: all of said gears being double-helical gears; and all of the countershaft gears rotatably fixed to one of said countershafts also axially fixed to said one of said countershafts and, on all of the other countershafts, all but the countershaft gear meshed with the input/output gear axially fixed to the countershafts with which they are rotationally fixed, the countershaft gears rotationally fixed to said all of the other countershafts and meshed with the input/output gears being axially moveable relative to the countershaft rotating therewith.

4,709,591

RACK AND PINION STEERING APPARATUS

Yasuyoshi Emori, Meiwa, and Ikuo Nomura, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

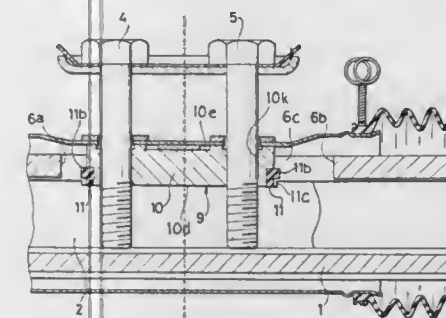
Continuation of Ser. No. 635,399, Jul. 30, 1984, abandoned. This application May 7, 1986, Ser. No. 861,743

Claims priority, application Japan, Aug. 12, 1983, 58-147388

Int. Cl.⁴ F16H 19/04; B62D 3/12

U.S. Cl. 74-422

5 Claims



1. A rack-and-pinion steering apparatus, comprising:
 - a rack shaft received within a rack housing and axially reciprocable therein;
 - a pinion disposed in meshing engagement with the rack shaft and adapted to be rotated to cause axial movement of the rack shaft in response to an operation of a steering wheel;
 - a stop member engaged with the rack shaft and having a portion projecting outwardly through an axially elongate shaft formed in the housing and means connected to the projecting portion of the stop member for turning steerable road wheels, said stop member having a metal body disposed for end interference with opposed end faces of the elongate slot formed in the housing to limit the movement of the rack shaft in either direction as the rack shaft moves, the height of said body being measured in a direction therethrough from inside said housing outwardly of said housing, said body having opposed inboard and outboard faces respectively facing into and outwardly of said housing, said body having side faces facing sides of said

slot and extending lengthwise of said slot, said body having an end in turn having a semicircular stepped cylindrical peripheral surface formed by coaxial inboard and outboard cylindrical, semicircular end faces, the inboard end face being of lesser diameter than the outboard end face and thereby forming a step having a semicircular portion facing inboard of said housing, said step lying in a plane intermediate planes defined by said inboard and outboard faces of said body, said semicircular step portion being of substantially constant radial width, said step and the inboard portion of said end defining a semicircular recess;

a resilient member which is capable of absorbing impacts produced as an interference occurs between said end of the stop member metal body and one opposed end face of the slot, said resilient member being received in said semicircular recess in said body and having a generally L-shaped central cross-section as seen looking sideways of said body and hence widthwise of said slot and such that a central part of an outboard portion of said resilient member forms a bulge that projects endwise beyond a central part of a recessed inboard portion of said resilient member and thus defines an inboard facing step, the bulge projecting beyond said end of the stop member toward the opposed slot end face for resiliently compressing prior to allowing contact between the end of said body and the opposed end face of said slot;

means for preventing detachment, including endwise detachment, of said resilient member from said stop member, said means comprising opposed, substantially rectilinear notches in opposite sides of said body and spaced from said end of said body, said semicircular recess defined by said semicircular step portion and semicircular inboard end face of said body extending through a half circle from one side face to the other side face of said body, said notches extending substantially diametrically into said body from the circumferential ends of said semicircular recess portion so as to undercut said semicircular inboard end face, said notches being sharply angled to the adjoining ends of said semicircular recess portion, said notches and semicircular recess portion together making said recess substantially D-shaped except that the adjacent ends of said notches are spaced apart, said notches opening sideways toward the opposed sides of said housing slot, said recessed inboard portion and said bulge each being about half the height of said resilient member, said resilient member being of corresponding substantial D-shape defined by a semicircular band of substantially half-circle extent and of inside diameter corresponding to the outside diameter of said semicircular recess, said substantially D-shaped resilient member having substantially rectilinear, spaced tabs extending toward each other from the circumferential ends of said semicircular band and sharply angled with respect thereto, said tabs rising the full height of said notches from the plane of said step of said body to the plane of said inboard face of said body, said step defined by said endwise projecting bulge of said resilient member having a width diminishing circumferentially toward said tabs, such that said bulge gradually merges into coplanar relation with said inboard portion at opposite sides of said D-shaped resilient member adjacent said tabs, the engagement between the tab and the notch being effective to mount the resilient member on the body of the stop member, said notches being of depth to fully receive therein said tabs of said resilient member so the latter does not protrude beyond the body side faces, said sides of the resilient member being of substantially constant thickness throughout their height, the sides of said resilient member at said tabs being substantially flush with the side faces of said body, the sides of said housing slot lying close along the sides of said resilient member at said tabs and thereby positively blocking removal of said tabs from said notches.

4,709,592

ADJUSTABLE STEERING WHEEL SHAFT FOR VEHICLES

Olle Andersson, Dalstorp, Sweden, assignor to Verkstads AB Claes Johansson, Dalstorp, Sweden

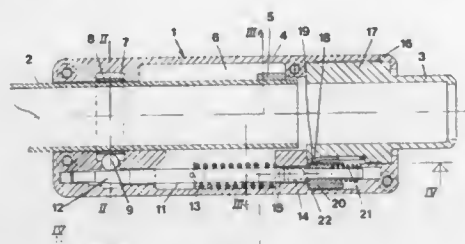
Filed Mar. 7, 1986, Ser. No. 837,250

Claims priority, application Sweden, Mar. 7, 1985, 8501109

Int. Cl.⁴ B62D 1/18; G05G 5/16

U.S. Cl. 74-493

10 Claims



1. An adjustable steering wheel column for vehicles provided with means for adjustment of its length and means for adjustment of its inclination relative to the vehicle body, comprising a steering wheel column housing, a first steering column tube displaceably arranged in said housing; a second steering column tube, pivotably arranged relative to said steering wheel column housing; said first and second steering column tubes being interconnected by an intermediate steering wheel column housing, said second steering column tube at its end cooperating with the steering wheel column housing being provided with a hub, which is restrictedly rotatable in a seat in the steering wheel column housing around a pivot axle extending perpendicularly to the longitudinal direction of the second steering column tube and being adapted to be locked from rotation in a number of angular positions by means of a locking mechanism, whereby a steering wheel axle and the steering wheel column housing are interconnected by an angularly adjustable coupling, and where a common control is provided for releasing or locking the length adjustment and tilting movement of the steering wheel column responsive to said common control; wherein at least one piston is axially displaceable in the housing, said piston being biased to a position in which it exerts a force locking said first steering column tube against axial displacement and further actuates a blocking means for preventing the hub from rotating around its pivot axle, whereby the piston by actuation of said control is displaceable to a first position in which it permits either axial displacement between said first steering column tube and the housing and a second position wherein it additionally permits the blocking mechanism to release the hub, thereby making possible rotation of said second steering column tube in relation to the housing or further to a second position wherein said displacement is permitted, whereby two distinct, spaced apart release positions are obtained one for each one of said motions.

4,709,593

STEERING MECHANISM FOR AUTOMOBILE

Kunio Takeuchi, Aichi, Japan, assignor to Tokai TRW & Co., Ltd., Aichi, Japan

Filed Apr. 16, 1986, Ser. No. 852,796

Claims priority, application Japan, Apr. 17, 1985, 60-81589

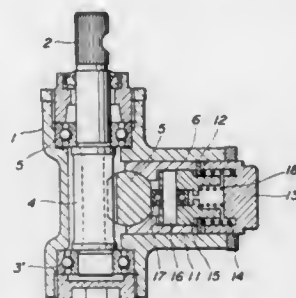
Int. Cl.⁴ B62D 3/12

U.S. Cl. 74-498

3 Claims

1. A rack and pinion steering mechanism for an automobile comprising:
a housing;
a rack bar having rack gear teeth and being longitudinally displaceable in said housing;
a pinion rotatably mounted in said housing and having gear teeth that engage the rack gear teeth of said rack bar; and
support means located between said rack bar and said housing on the side of said rack bar remote from said pinion for

supporting said rack bar to maintain engagement of the rack gear teeth with the teeth of said pinion;
said support means comprising a first yoke having surface means at one end thereof for engaging said rack bar, first spring means for biasing said first yoke into engagement with said rack bar, a ring located adjacent said other end of said first yoke, said first spring means acting on said ring which transfers the spring force to said first yoke, roller means engaging an arcuate surface defining a longitudinally extending arcuate recess on said remote side of



said rack bar, a second yoke for supporting said roller means, and second spring means acting between said second yoke and said housing for biasing said roller means into engagement with said arcuate surface;
said second yoke being movable relative to said first yoke and having surface means for engaging said ring to move said ring against the bias of said first spring means and relieve the force of said first spring means from acting on said first yoke when said roller means relative to said arcuate surface upon longitudinal displacement of said rack bar.

4,709,594

PLANETARY GEAR TYPE TRANSMISSION SYSTEM

Fujio Maeda, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

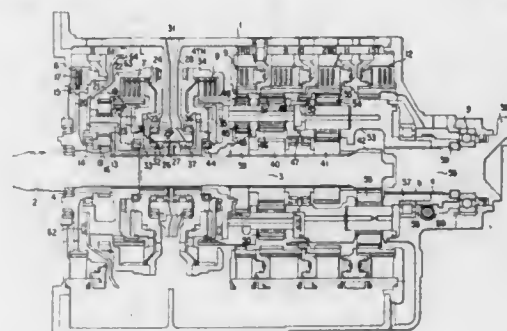
Filed Jan. 2, 1986, Ser. No. 815,594

Claims priority, application Japan, Jan. 14, 1985, 60-3218

Int. Cl.⁴ F16H 3/44

U.S. Cl. 74-753

1 Claim



1. A planetary gear type transmission system comprising:
a high speed stage gear train (H) disposed on an input side of a low speed stage gear train (L),
a low speed use first rotary clutch (7) in said low speed stage gear train (L) constructed so as to directly couple a ring gear (20) in said high speed stage gear train (H) with a carrier (13) in the high speed stage gear train (H), power being input through said carrier (13) to said low speed stage gear train (L) at a 1:1 ratio when said first rotary clutch (7) is engaged and being input to said high speed gear train (H) by said carrier (13) and output therefrom by said ring gear (20) when said first rotary clutch (7) is disengaged,

4,709,596

CONTROL OF A VEHICLE AUTOMATIC TRANSMISSION

Keiji Boda, Hiroshima; Kouchirou Waki, Mihara, and Keizo Yanagisawa, Fuji, all of Japan, assignors to Mazda Motor Corporation, Hiroshima and Japan Automatic Transmission Co., Ltd., Fuji, both of Japan

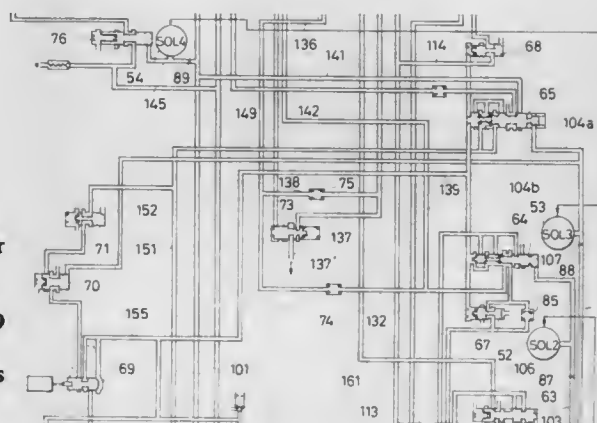
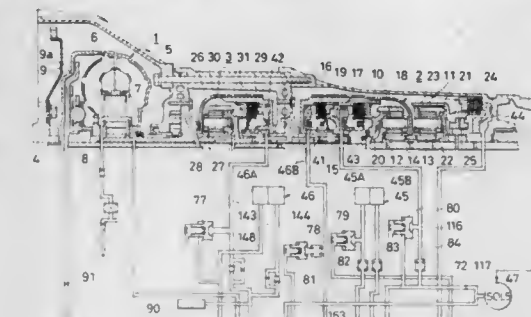
Filed Oct. 30, 1986, Ser. No. 925,244

Claims priority, application Japan, Oct. 31, 1985, 60-244840; Oct. 31, 1985, 60-244841; Oct. 31, 1985, 60-244842; Oct. 31, 1985, 60-244843; Oct. 31, 1985, 60-244844

Int. Cl.⁴ B06K 41/18, 41/16

U.S. Cl. 74-868

17 Claims



1. A vehicle automatic transmission including a torque converter having an engine driven input member and an output member, a multiple stage transmission gear mechanism connected with the output member of the torque converter and having a plurality of gear stages of different gear ratios, gear stage selecting means including a plurality of friction means adapted to be actuated by hydraulic actuator means and valve means for controlling supply of hydraulic pressure to said actuator means, control circuit means for operating said valve means in accordance with vehicle operating condition so that one of the gear stages is selected in accordance with a predetermined manner depending on the vehicle operating condition, said gear stages including at least a higher gear stage and a lower gear stage, said gear stage selecting means including first friction means adapted to be engaged for the higher gear stage and disengaged for the lower gear stage and second friction means adapted to be disengaged for the higher gear stage and engaged for the lower gear stage, first actuating means normally holding said first friction means in a disengaged position and operated by a hydraulic pressure to move said first friction means to an engaged position, second actuating means normally holding said second friction means in an engaged position and operated by a hydraulic pressure to move said second friction means to a disengaged position, first fluid passage means leading to said first actuator means for supplying the hydraulic pressure to the first actuator means, second fluid passage means branched from the first fluid passage means for supplying the hydraulic pressure to the second actuator means,

a first speed stage gear train (1ST) disposed on an output side of a second speed stage gear train (2ND), a first carrier (53) in said first speed stage gear train (1ST) and a third carrier in said second speed stage gear train (2ND) being coupled to an output shaft (38), and
a fourth speed stage gear train (4TH) having the same rotation rate as said high speed stage gear train (H) and said low speed stage gear train (L), a third speed stage gear train (3RD) and a reverse stage gear train (R) being disposed between the low speed stage gear train (L) and the second speed stage gear train (2ND), said fourth speed stage gear train, said third speed stage gear train and reverse stage gear train being directly connected to each other and commonly including a second carrier (43) and a second rotary clutch (8),
said first and second rotary clutches being disposed on an intermediate shaft (3) adjacent to each other between said high speed stage gear train (H) and said fourth speed stage gear train (4TH), said intermediate shaft (3) also carrying sun gears of said first (1ST), second (2ND), third (3RD) and reverse (R) speed stage gear trains.

4,709,595

CRUISE CONTROL SYSTEM FOR VEHICLE

Mamoru Hayama, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

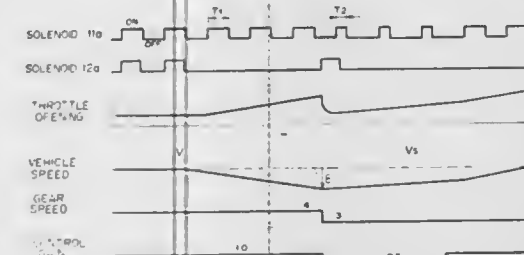
Filed Dec. 17, 1986, Ser. No. 942,752

Claims priority, application Japan, Dec. 19, 1985, 60/286349

Int. Cl.⁴ B60K 41/04

U.S. Cl. 74-864

10 Claims



1. A cruise control system for a vehicle having an automatic transmission comprising a vehicle speed detecting means for detecting the actual vehicle speed, an engine output power control means, a vehicle speed control means which compares the actual vehicle speed detected by the vehicle speed detecting means with a set speed and controls the engine output power control means in accordance with the result of the comparison so that the vehicle speed is converged upon the set speed at a predetermined rate, a downshift means which causes the automatic transmission to downshift when the actual vehicle speed is lowered from the set speed by a predetermined amount while the vehicle speed control means operates to fix the vehicle speed, and a rate reducing means which, when the automatic transmission is shifted down by the downshift means, controls the vehicle speed control means to reduce said predetermined rate to a reduced rate so that the vehicle speed is converged upon the set speed at said reduced rate.

said valve means including shift valve means provided in said first fluid passage means at a point further from the first actuator means than a point where the second fluid passage means is branched from the first passage means, said shift valve means having a first position wherein the first fluid passage means is opened to a source of hydraulic pressure and a second position wherein the first fluid passage means leading to the first actuator means and the second fluid passage means is drained, timing valve means provided in said second passage means and a having a first position making it possible to supply a hydraulic pressure from said first fluid passage means through said second fluid passage means to said second actuator means and a second position for draining said second actuator means, said control circuit means including means for producing a first signal for moving the shift valve means to said second position and a second signal for moving said timing valve means to said second position after a predetermined time from the first signal.

4,709,597

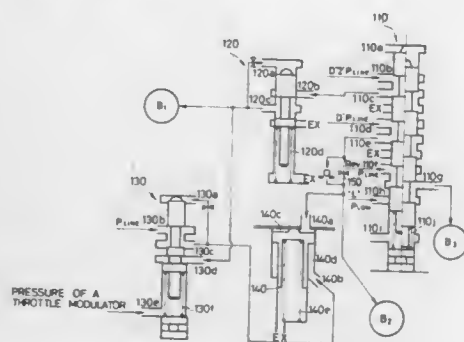
HYDRAULIC CONTROL SYSTEM IN AN AUTOMATIC TRANSMISSION FOR A VEHICLE

Hideki Yasue, and Kagenori Fukumura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed May 21, 1986, Ser. No. 865,372

Claims priority, application Japan, May 21, 1985, 60-108929
Int. Cl.⁴ B60K 41/24

U.S. Cl. 74—868

3 Claims



1. In an automatic transmission for a vehicle having a plurality of gears for providing a plurality of forward speed stages and a plurality of frictionally engaging devices for being selectively engaged and disengaged to achieve said plurality of forward speed stages, said plurality of frictionally engaging devices including a first frictionally engaging device in series with a one-way clutch and a second frictionally engaging device for a coasting mode during engine braking action, said second frictionally engaging device being disposed in parallel with said first frictionally engaging device;

a hydraulic control system for selectively engaging and disengaging said plurality of frictionally engaging devices in a forward running range to achieve said plurality of forward speed stages, said hydraulic control system comprising means for supplying hydraulic oil pressure to said first and second frictionally engaging devices to cause both said first and second frictionally engaging devices to change from a state of disengagement to a state of engagement during an upshift from one of said speed stages to another, said hydraulic control system further comprising means for controlling the increase of hydraulic oil pressure to said first and second frictionally engaging devices during said upshift such that the pressure increase to one of said first and second frictionally engaging devices is temporarily reduced during the engagement of the other of said first and second frictionally engaging devices.

4,709,598 METHOD OF MANUFACTURING UNIDIRECTIONAL DRIVE TOOL

James Headen, Lewisville, Tex., assignor to Radian Tool Corporation, Lewisville, Tex.

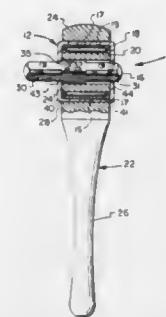
Division of Ser. No. 629,083, Jul. 9, 1984, Pat. No. 4,603,606.

This application May 2, 1986, Ser. No. 858,953

Int. Cl.⁴ B21K 5/16

U.S. Cl. 76—114

1 Claim



1. A method of manufacturing a unidirectional drive tool comprising the steps of;
providing a housing forming at least one thin walled cup member;
providing a unidirectional clutch adapted for mounting within said housing;
providing a drive shaft adapted for mounting within said unidirectional clutch;
providing means for receiving said drive shaft within said clutch for selective longitudinal positioning therewithin and rotational engagement thereof for selective torque transmission;
securing said shaft within said receiving means of said clutch and said clutch within said cup member;
providing a torque application member having a region formed therein for receiving said housing; and
securing said housing within said region of said tool for selective unidirectional torque drive applications.

4,709,599 COMPENSATING JAW ASSEMBLY FOR POWER TONGS

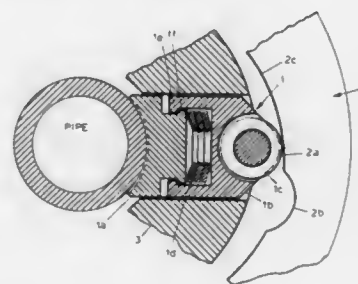
David A. Buck, 118 Rue Du Pain, Broussard, La. 70518

Filed Dec. 26, 1985, Ser. No. 813,516

Int. Cl.⁴ B25B 17/00

U.S. Cl. 81—57.18

4 Claims



1. An improved pipe gripping assembly for use in powered pipe tongs having:
(a) pipe gripping means mounted on said power tong and arranged to move toward and away from a pipe gripping position;
(b) cam follower means mounted on the power tong and arranged to move said pipe gripping means in response to movement of actuator means of the tong for developing gripping force;

the improvement comprising:

- (c) biased overtravel means situated to transmit the principle gripping forces between said pipe gripping means and said cam follower means and to permit bias resisted relative motion therebetween when gripping forces applied to the pipe exceed a preselected amount; and
- (d) means mounting said pipe gripping means and said cam follower means, for said relative movement, on the pipe tong.

4,709,600

POWER SCREW DRIVER WITH A RATCHET WHEEL HAVING FINELY GRADUATED TOOTHING

Hans-Bernd Mierbach; Gustav K. Frohn, both of Königswinter, and Olaf Blockisch, Henaf, all of Fed. Rep. of Germany, assignors to Applied Power, Inc., Milwaukee, Wis.

PCT No. PCT/DE85/00055; § 371 Date Oct. 25, 1985, § 102(e) Date Oct. 25, 1985, PCT Pub. No. WO85/03897, PCT Pub. Date Sep. 12, 1985

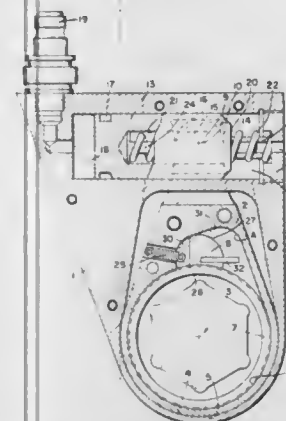
PCT Filed Feb. 25, 1985, Ser. No. 800,065

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407126

Int. Cl.⁴ B25B 13/46

U.S. Cl. 81—57.39

3 Claims



1. A wrench for rotating a work tool comprising:

- a housing including a reaction arm,
- a drive arm connected to said reaction arm for rotational movement relative thereto about a rotation axis extending perpendicular to said drive arm and said reaction arm;
- a ratchet wheel received in said drive arm for rotational movement about said rotation axis upon operational rotation of said drive arm in a first direction of rotation;
- a spring-loaded pawl housed within said drive arm for drivingly connecting said ratchet wheel to said drive arm upon rotational movement thereof in said first direction of rotation but allowing free rotational movement of said drive arm about said ratchet wheel in a second opposite direction of rotation,
- a piston and cylinder assembly connected to said housing along a driving axis perpendicular to said rotation axis of said drive arm, said assembly including a cylinder and a piston within the cylinder operable to translate within the cylinder;
- arcuate shaped coupling means connected between said said drive arm and said piston for converting reciprocating movement of the piston relative to the cylinder into rotational movement of said drive arm relative to said reaction arm, said coupling means including,
- a recess provided in said piston, and
- a head provided on said drive arm and being slidably received within said recess in said piston, said head and said recess comprising compatibly dimensional convex and concave surfaces designed for mutual engagement and said head and said recess having contact points substantially along said driving axis of said piston throughout the movement of said piston within said cylinder; and

a return spring axially extending between said cylinder and said piston and through a bore fashioned through said head of said drive arm for operably providing an elongate return stroke of said piston.

4,709,601

LONG NOSE LOCKING PLIERS

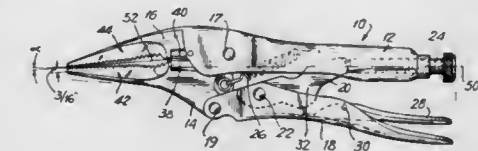
Christian Petersen, DeWitt, Neb., assignor to Petersen Manufacturing Co., Inc., DeWitt, Neb.

Continuation of Ser. No. 353,860, Mar. 2, 1982, Pat. No. 4,546,680, which is a continuation-in-part of Ser. No. 943,180, Sep. 18, 1978, Pat. No. D. 261,096, and a continuation-in-part of Ser. No. 241,085, Mar. 6, 1981, Pat. No. 4,541,312. This application Sep. 16, 1985, Ser. No. 776,226

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.
Int. Cl.⁴ B25B 7/12

U.S. Cl. 81—367

12 Claims



1. A long nose locking hand tool having a pair of opposing jaw members, a fixed handle having an adjustment screw, and a movable handle and lever locking means therebetween for maintaining a toggle relationship between the jaw faces of said jaw members when in a closed position; wherein each of said jaw members comprising a jaw face configuration having a total jaw length to average jaw height ratio of from about 6.5 to about 11.5 with a through jaw hardness range of from about 53 to about 57 Rockwell C, with said jaw members made of an alloy spring steel, and wherein said fixed handle having a straight strike surface forming a part of said adjustment screw, and having an axis passing through said strike surface defining the direction of a line of force impartable to the hand tool; and said pair of jaws further defining a bisecting axis or line formed by the angle of said jaws when closed against a workpiece gripped therebetween; and the angle between said axes being less than about 5° when the gripping tips of said jaw members are in a generally touching or closed position.

4,709,602

HAND GRIP DRIVE FOR TORQUE WRENCHES

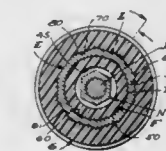
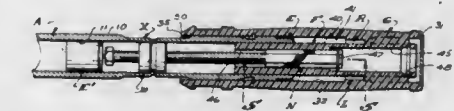
Bosko Grabovac, Arcadia, and Zlatko Kurtovic, Walnut, both of Calif., assignors to Consolidated Devices, Inc., City of Industry, Calif.

Filed Jan. 16, 1987, Ser. No. 3,862

Int. Cl.⁴ B25B 23/159

U.S. Cl. 81—483

8 Claims

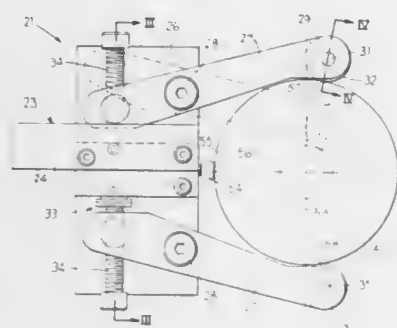


1. In a torque wrench structure including an elongate tubular metal lever arm with front and rear ends, a handgrip at the rear end of the arm, a work-engaging head at the front end of the arm and an elongate axially-extending adjusting screw concentric within and accessible at the rear end of the arm to adjust the operating force of the torque wrench; an improved, manual-

ly-operable adjusting mechanism to turn the adjusting screw, including an elongate, tubular handgrip of resilient, plastic material having front and rear ends slidably engaged about and extending longitudinally of the rear end portion of the wrench lever arm for free longitudinal and rotational movement relative thereto; an elongate core of resilient, molded plastic material having front and rear ends slidably entered in the rear end portion of the lever arm with its rear end in fixed longitudinal and rotary-driving engagement with the rear end of the grip, the grip and core are shiftable longitudinally of the arm from a normal forward position to a rear actuated position; a polygonal drive part on the adjusting screw; a longitudinally-extending opening in the rear portion of the core freely accommodating the drive part when the core is in its normal position; a longitudinally-extending polygonal opening in the core slidably receiving and establishing rotary-driving engagement with the drive part when the core is in its actuated position; and, a releaseable lock mechanism locking the grip against rotation relative to the lever arm when the grip is in its forward normal position and releasing the grip for free rotation relative to the lever arm when the grip is in its rear, actuated position, said locking mechanism includes a plurality of circumferentially-spaced, radially outwardly disposed, inner flats on and about the exterior of the rear end portion of the lever and a plurality of circumferentially-spaced, radially inwardly disposed, outer flats about the interior of the grip and in flat opposing bearing engagement with the inner flats when the grip is in its normal, forward position and out of engagement with the inner flats when the grip is in its rear, actuated position, the adjacent, inner flats on the lever arm establish circumferentially-spaced, longitudinally-extending cam edges that move across the outer flats and yieldingly expand the portion of the grip defining the outer flats radially outward when the grip is forceably rotated about the lever arm when the grip is in its normal position.

4,709,603

ADJUSTABLE SIDEWARDLY LOCATED BAR PULLER
James R. Buck, 1207 SE. 10th St., Cape Coral, Fla. 33904
Filed Aug. 5, 1986, Ser. No. 893,413
Int. Cl.⁴ B23B 13/02, 13/12
U.S. Cl. 82—2.5



1. A bar puller for use with a machine tool for engaging and pulling on a bar for advancing the latter axially of the machine tool, said bar puller comprising:

a support body adapted for securement to the machine tool; first and second levers pivotally supported on said body for swinging movement about substantially parallel axes, said levers projecting outwardly from said body substantially beyond said axes so that the levers project generally in the same direction, said levers projecting outwardly and terminating in free ends;

a roller rotatably supported on each of said levers adjacent the free ends thereof, each said roller being supported for rotation about an axis which is substantially parallel to the pivot axis;

stop means mounted on said body for cooperating with said first and second levers for limiting the inward swinging of the levers and the rollers thereon toward one another for

defining a minimal spacing between said rollers which is less than the diameter of said bar; manually actuatable adjusting means for adjusting the position of said stop means relative to said body to selectively adjust the magnitude of said minimal spacing between said rollers;

said stop means including a pair of stop members movably supported on said body, spring means coacting between said stop members and normally urging them outwardly in opposite direction, and a pair of stops fixed to said body, said spring means normally maintaining said stop members in engagement with said stops; and said adjusting means including threaded adjusting members coacting with said stop members and being threadably engaged with said levers so that rotation of said threaded adjusting members causes the position of said stop members to be adjusted relative to said levers so as to vary said minimal spacing between said rollers.

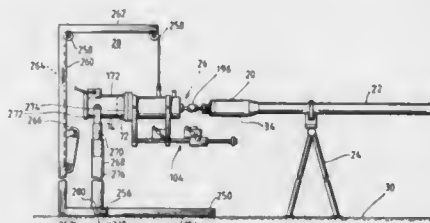
4,709,604

APPARATUS FOR MILLING EXTERIOR SURFACES AND REFACING BOTH SHOULDERS OF A TWO-SHOULDER TOOL JOINT

John M. Rogers, P.O. Box 777, Luling, Tex. 78648
Filed Jul. 10, 1986, Ser. No. 883,987
Int. Cl.⁴ B23B 5/16

U.S. Cl. 82—4 C

4 Claims



1. A portable multipurpose device for refacing a make-up shoulder and a secondary shoulder of a two-shoulder tool joint having a screw thread for engagement with another tool joint, the device comprising: a support means; a rotary drive source supported by said support means; a carriage means supported by said support means for movement parallel and transverse to a rotational axis of said rotary drive source; lathe tool means on said carriage; a first adapter having means to engage said screw thread of said tool joint and means for engagement with said rotary drive source to provide for rotary drive of said tool joint; said first adapter having a first gage means for measuring said make-up shoulder of said tool joint, whereby said make-up shoulder can be precisely refaced by said lathe tool means; a second adapter adapted to be substituted for said first adapter; said second adapter having rotary tool means and means to connect said rotary tool means with said source of rotary drive; said second adapter having means for engagement with said screw thread of said tool joint and having a second gage means calibrated corresponding to said first gage means for measuring said secondary shoulder, whereby said secondary shoulder can be precisely refaced by said rotary tool means in accordance with the amount of material removed from said make-up shoulder.

4,709,605

METHOD OF WORKING SHEET MATERIAL WORKPIECES BY A SHEET MATERIAL WORKING MACHINE TOOL

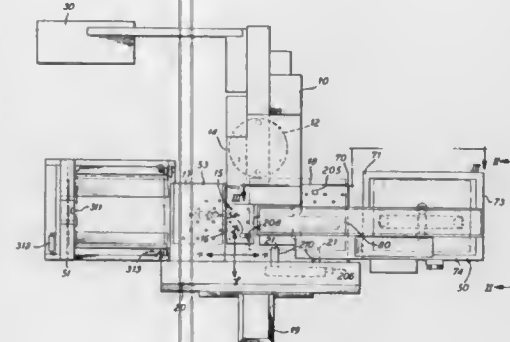
Stephen C. Clark, Williamsville, N.Y., assignor to Strippit/Di-Acro-Houdaille, Inc., Akron, N.Y.

Division of Ser. No. 52,241, Jun. 26, 1979, which is a continuation of Ser. No. 815,821, Jul. 15, 1977, abandoned. This application Apr. 8, 1985, Ser. No. 720,725

Int. Cl.⁴ B23Q 7/04; B21D 43/11, 43/22, 43/24

U.S. Cl. 83—23

26 Claims



1. The method of automatically running a machine tool assembly which includes a machine tool and an associated worktable provided with workpiece gripping members movable in at least X and Y axes directions with respect to a work station of the machine tool, the machine tool and gripping members controlled from an automatic control which comprises the steps of: providing a loading device adjacent the worktable, controlling the loading device from the control to cause the loading device to:

- segregate a workpiece from a stack of workpieces,
- move the workpiece to a generally defined loading area of the worktable and,
- deposit the workpiece on the loading area of the worktable,

thereafter gauging the workpiece in X and Y axes directions by movement of the workpiece on the worktable under control of the control and sensing the positioning of the workpiece on the worktable as a result of said movement by sensing contact between edges of the workpiece with machine tool assembly associated devices having predetermined positions at the time of sensing providing signals to said control as a result of said sensing indicating proper gauging of the workpiece in X and Y axes directions, controlling further movement of the gripper members by the control utilizing said gauging as a reference for said further movement, production running said workpiece through said machine tool, terminating said production run, moving said workpiece by said gripping members under control of said control to an unload area of the worktable, withdrawing said gripping members from contact with said workpiece, activating an unload device by said control to unload the workpiece from the unload area of the worktable, and repeating the steps of loading, gauging, production running and unloading.

4,709,606

PLANT FOR PRODUCING STACKS OF INTERMESHEDED BLANKS OF PAPER, CELLULOSE OR THE LIKE, FOLDED IN A ZIG-ZAG MANNER

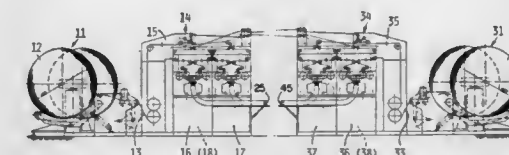
Kurt Stemmler, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dünnebier Maschinenfabrik und Eisengießerei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany
Filed Dec. 10, 1985, Ser. No. 807,318

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447404

Int. Cl.⁴ B26D 7/06

U.S. Cl. 83—94

5 Claims



1. A plant for the production of stacks of intermeshed blanks of paper material made from cellulose or the like, folded together in a zig-zag fashion, consisting of more than one stack producing unit, comprising: two material web unrolling stations, each with a supply roll (12,32) of paper material webs, associated with and at opposite ends of the plant, each of the material webs (13,33) correspond in width to an even-numbered multiple of the width of the individual blanks of the stacks (25,45); and means are provided for feeding said material webs toward and aligned with each other; longitudinal cutting stations (14,34) for dividing each of said material webs (13,33) into an identical even numbered plurality of partial webs (19 to 24; 39 to 44) are provided and connected at the output side of said two material web unrolling stations (11,31); the resultant partial webs (19,39; 20,40; 21,41; 22,42; 23,43; 24,44) of each material web opposing each other and feeding toward each other in the longitudinal direction of the webs constitute pairs of partial webs; and means are provided for feeding each partial web, of each pair of partial webs, to an associated one of said stack producing units (16, 17, 18, 36, 37, 38) from two opposing sides of the associated stack producing units; and each of the stack producing units (16,36; 17,37; 18,38) for laterally adjacent pairs of partial webs (19,39; 20,40; 21,41; 22,42; 23,43; 24,44) are arranged in displaced relation to each other in the direction of the path between the two supply rolls permitting the adjacent partial webs to be juxtaposed in the lateral direction.

4,709,607

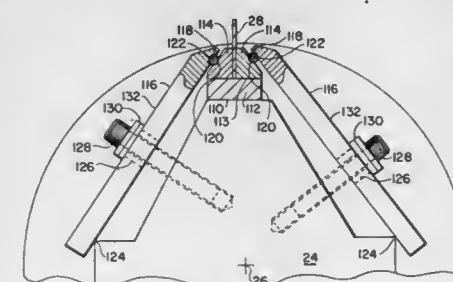
ROTARY CUTTER BLADE CLAMP

Eric S. Buhayar, P.O. Box 309, Swarthmore, Pa. 19081
Filed Apr. 15, 1983, Ser. No. 485,566

Int. Cl.⁴ B26B 1/40

U.S. Cl. 83—342

2 Claims



1. In a rotary cutter for cutting thin flexible web materials, the rotary cutter comprising a first blade, mounted in a roll rotating about a first axis, the first blade cooperating with a second blade, mounted for rotation about a second axis, an

improved apparatus for clamping the first blade in the roll comprising plural pairs of clamp members for positioning individual segments of the blade along the length of the roll, each pair of clamp members having opposed planar surfaces for contacting a segment of the blade and each clamp member being (i) adjustable to position its planar surface in a direction generally perpendicular to the plan of the blade, and (ii) able to adjust the direction of its planar surface with respect to the axis of the roll; and when clamped, said opposed planar surfaces and the blade segment there between all have the same planar angle, one clamp member of each pair having at one end the blade contacting planar surface, the other end being connected to the roll by means of a ball joint, said one clamp member having a bearing surface and bolt means extending there-through into the roll which when tightened exerts a clamping force on said bearing surface and on the blade surface.

4,709,608

APPARATUS FOR SECURELY HOLDING A LOAF FOOD PRODUCT DURING SLICING

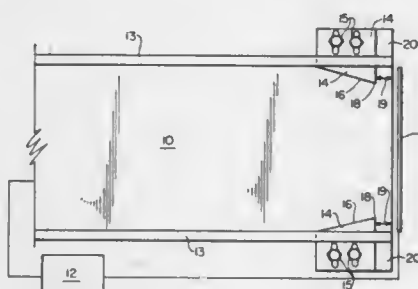
Charles J. Vletrogoski; Richard Obarowski, and Paul J. McDonough, all of Dover, Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 13, 1986, Ser. No. 862,883

Int. Cl.⁴ B26D 7/01

U.S. Cl. 83—355

14 Claims



1. In apparatus for automatically slicing a loaf food product, said apparatus comprising:
slicing means comprising a slicing blade for slicing a loaf food product;
conveyor means for conveying a loaf food product along a path to said slicing means for slicing a loaf food product;
means for automatically actuating said slicing means and said conveyor means for producing slices of the loaf food product having a desired slice thickness; and
a pair of guide members located on opposite sides of said path for guiding a loaf food product along said path and for preventing lateral displacement of a loaf food product from said path;
the improvement which comprises:
a pair of loaf-engaging members, each of said loaf-engaging members extending longitudinally along one of said guide members and having an inner edge tapering generally inwardly into said path and away from said guide members in a direction towards said slicing, each of said loaf-engaging members being positioned upstream of said slicing means and having a loaf-engaging area, said loaf-engaging area being spaced upstream of said slicing means a distance not greater than said slice thickness.

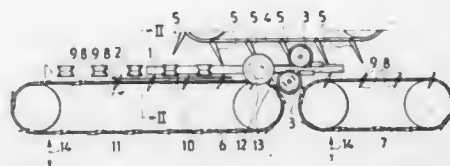
4,709,609

SAW MACHINE

Kauko Rautio, Kolmihaarantie, 52700 Mäntyhärju, Finland
Continuation of Ser. No. 783,321, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 566,683, Dec. 29, 1983, abandoned. This application Dec. 9, 1986, Ser. No. 940,183
Claims priority, application Finland, Dec. 30, 1982, 824522
Int. Cl.⁴ B26D 7/06; B27B 13/00

U.S. Cl. 83—435.2

7 Claims



1. A sawing machine for logs, comprising:
multiple spaced rollers which guide a log laterally to center it and feed it forward to at least one sawblade of the sawing machine;
a transporting chain assembly located between and under the multiple rollers for feeding the log to the sawblade, said transporting chain assembly extending both before and after the sawblade; and
a staying chain provided above the log for staying the log by means of staying spikes turnably attached to the staying chain and acting on the log surface, said staying chain being located before and after said sawblade, wherein the transporting chain assembly below the log carries multiple turnable supporting members which adapt their position to the shape of the log's surface, and which supporting members support the log at a plurality of points and clamp the log between the transporting chain and the staying chain so as to maintain its unchanged horizontal and vertical position relative sawblade during its forward motion through the sawing machine.

4,709,610

CUTTING APPARATUS WITH AUTOMATIC FEED

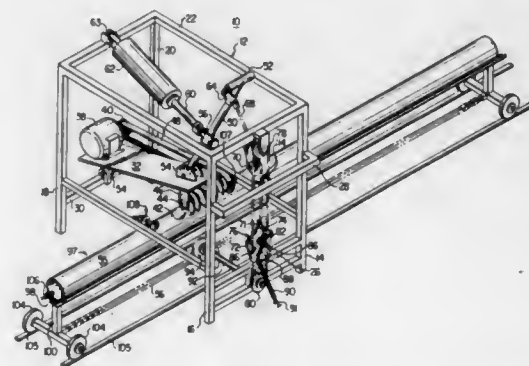
James R. Pool, 402 Colorado St., Athens, Tex. 75751

Filed Jun. 30, 1986, Ser. No. 879,992

Int. Cl.⁴ B26D 3/16, 5/22

U.S. Cl. 83—876

25 Claims



1. An apparatus for operating on a workpiece, comprising:
moveable carriage means for holding the workpiece in a horizontal position, said carriage means operable to move the workpiece back and forth along a set direction;
working means for contacting the surface of the workpiece and operating on the workpiece in a predetermined manner;
platform means attached to said working means, said platform means operable to move said working means towards and away from the workpiece disposed on said carriage means;

incrementing means for interacting with said carriage means to move the workpiece a predetermined interval along its travel path in response to said platform means moving said working means away from the workpiece, said incrementing means having:

a chain; and
ratchet means operable between first and second points, said ratchet means engageable with said chain when moving from said first point to said second point, and said ratchet means retractable from said chain when moving from said second point to said first point; and
said incrementing means activated when said platform means moves said working means away from the workpiece by a predetermined distance such that the workpiece can move along its travel path without making contact with said working means.

4,709,611

ELECTRONIC MUSICAL INSTRUMENT FOR GENERATING A NATURAL MUSICAL TONE

Yoshiyuki Takagi, Osaka, and Tetsuhiko Kaneaki, Ashiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 18, 1986, Ser. No. 841,110

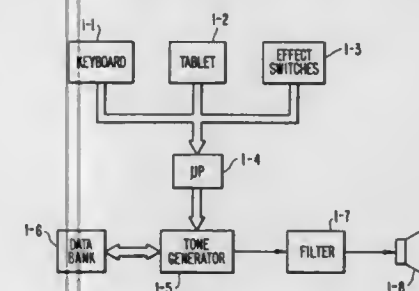
Claims priority, application Japan, Mar. 19, 1985, 60-53249;

Apr. 20, 1985, 60-83621; Apr. 27, 1985, 60-89919

Int. Cl.⁴ G10H 1/057, 1/08, 7/00

U.S. Cl. 84—122

5 Claims



1. An electronic musical instrument comprising:
a data bank for storing a first waveform data corresponding to an attack portion and one cycle waveform of a cyclic portion following the attack portion of a first musical tone, a second waveform data corresponding to one cycle waveform of a cyclic portion of a second musical tone, a first parameter data representing a first envelope data corresponding to a sound level variation of the first musical tone, and a second parameter data representing a second envelope data corresponding to a sound level variation of the second musical tone;
envelope forming means which reads out the first and second parameter data from the data bank and forms the first and second envelope data;
first musical tone data producing means which reads out the first waveform data from the data bank, the data corresponding to the one cycle waveform of the first waveform data being read out repeatedly, thereby producing a first continuous waveform data including at the beginning thereof the data corresponding to the attack portion, and multiplies the first continuous waveform data by the first envelope data to produce a first musical tone data including at the beginning thereof the data corresponding to the attack portion;
second musical tone data producing means which reads out the second waveform data repeatedly from the data bank thereby producing a second continuous waveform data, and multiplies the second continuous waveform data by the second envelope data to produce a second musical tone data;
musical tone data producing means which adds the first and second musical tone data to produce a synthesized musical

tone data including at the beginning thereof the data corresponding to the attack portion; and
means generating a musical tone including an attack portion according to the synthesized musical tone data.

4,709,612

NUT FOR STRINGED INSTRUMENTS

Trevor A. Wilkinson, 1075 State St., #201, Redlands, Calif. 92373

PCT No. PCT/US85/01428, § 371 Date Mar. 27, 1986, § 102(e)

Date Mar. 27, 1986, PCT Pub. No. WO86/01024, PCT Pub.

Date Feb. 13, 1986

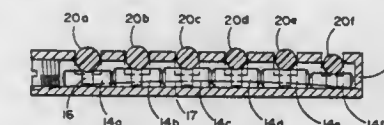
PCT Filed Jul. 25, 1985, Ser. No. 847,652

Claims priority, application Australia, Feb. 27, 1984, PG6259

Int. Cl.⁴ G10D 3/04

U.S. Cl. 84—314 N

4 Claims



1. A nut for stringed instruments, comprising:
(a) an elongated body having transversely extending grooves formed in the top surface thereof to receive therein the strings of said instrument and a bore axially formed in said body; and
(b) at least one roller so disposed axially therein that it can freely individually roll on the bottom surface of said bore;
(c) the depth of said grooves being such that a portion of the surface of said roller protrudes into said grooves, said strings being supported by said roller surface in said grooves; and
(d) each of said grooves having a width slightly larger than the diameter of the string associated with said groove rearwardly of said roller, and flaring outwardly in front of said roller;
(e) whereby said strings are laterally constrained by said groove rearwardly of said roller, and are free to move in any direction forwardly of said roller, and can freely move through said grooves transversely to said nut.

4,709,613

VARIABLE TENSIONING MECHANISM FOR DRUM HEAD

Steven Powers, 205 E. 67th St., New York, N.Y. 10023, and Morton Breier, Memory La., Greenwich, Conn. 06831

Filed Aug. 18, 1986, Ser. No. 897,668

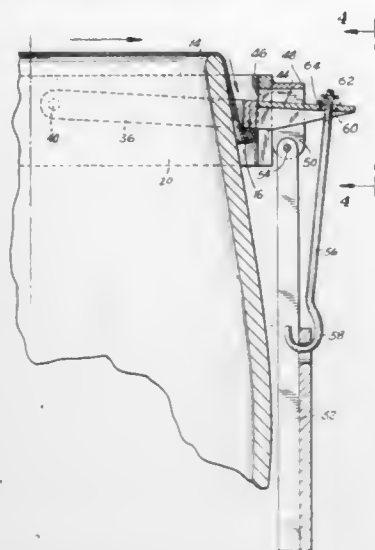
Int. Cl.⁴ G10D 13/02

U.S. Cl. 84—413

24 Claims

1. A variable head tensioning mechanism adapted for retrofitting on a drum of the type comprising a drum body, a drum head overlying one end of the drum body, and a hoop disposed about the drum body near said one end and secured to the periphery of the drum head, said head tensioning mechanism comprising:
an outer ring having an internal diameter greater than the outer diameter of said hoop and securable about said drum body near said one end;
an inner ring seated on said hoop and disposed about said drum body inside said outer ring;
means for securing said inner ring to said outer ring for movement relative thereto;
stop means defining a limit on movement of said inner ring towards said one end of said drum body; and

means for moving said inner ring relative to said outer ring towards the other end of said drum body for moving said



hoop towards said other end for varying the tension on said drum head.

4,709,614

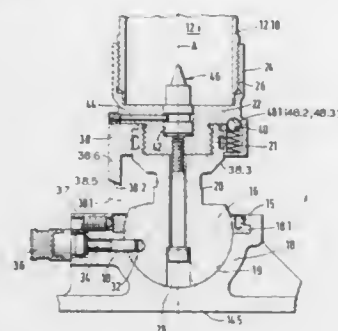
THROWING DEVICE FOR FIRING INCANDESCENT BODIES

Walter Klümpp, Duisburg, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany
Filed Sep. 19, 1986, Ser. No. 910,112

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533417

Int. Cl.⁴ F41F 1/06

U.S. Cl. 89—1.35



1. A throwing device preferably for firing incandescent bodies which, together with a predetermined number of incandescent bodies, can be transported, assembled, operated, and disassembled, by only one person, comprising,
a tube with a bore axis therethrough, having a muzzle on one end; and
a base plate;
said tube is operatively mounted on the base plate by a tube plate which is opposite the muzzle end of the tube; said tube is provided with
a firing pin and
a spherical part of a universal joint, having a bore on one side, and arranged near the firing pin at the tube end; said base plate having
a base plate socket which is operatively connected to the spherical part of the tube;
a selector dial for predialing a predetermined tube angle and

throw distance, said dial is rotatably arranged on the tube near the spherical part; the tube is separable into partial tube sections; and
an operable holding device is placed at the muzzle end of the firing tube.

4,709,615

ELECTRICAL FIRING SYSTEMS

John R. Field, Fareham, England, assignor to Plessey Overseas Limited, Ilford, England

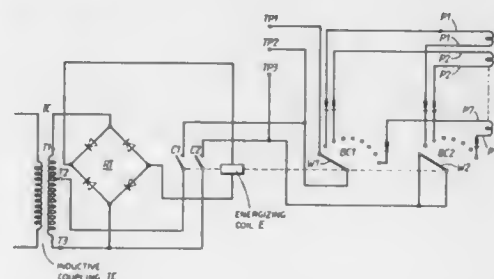
Filed May 8, 1985, Ser. No. 731,899

Claims priority, application United Kingdom, May 10, 1984, 8411977

Int. Cl.⁴ F23Q 5/00; H01H 47/00

U.S. Cl. 89—1.56

3 Claims



3 Claims

1. An electrical firing arrangement for firing in sequence a plurality of mortars stacked in end-to-end relationship within the barrel of a mortar launching means comprising:
an electromagnetic stepping switch including an operating coil, a normally-open make and break switch contact means, and a wiper switch contact means having movable wipers and a plurality of associated fixed contacts;
means for applying energising pulses to the electromagnetic stepping switch to produce a stepping operation of the electromagnetic stepping switch in response to successive energisations of the operating coil;
means for applying, simultaneously with said energising pulses, mortar firing pulses in sequence to igniters of the respective mortars through said normally-open make and break switch contact means when said normally-open switch make and break contact means are in the closed condition and through a respective conductor means as the electromagnetic switch and movable wipers are stepped from one position thereof to the next; and
said energising pulses and said mortar firing pulses being derived from said means for applying energising pulses and closure of said normally-open make and break switch contact means responsive to the energisation of the operating coil by each of said energising pulses being delayed until after movement of said moveable wipers of the wiper switch contact means out of engagement with one pair of associated fixed contacts and towards the next pair of contacts to prevent a short-circuit condition which may exist across any pair of associated fixed contacts of the wiper switch contact means due to short-circuiting of the respective conductor means from depriving the operating coil of an energising pulse whereby the electromagnetic stepping switch would fail to step to its next position.

4,709,616

OBTURATOR RING FOR A CANNON

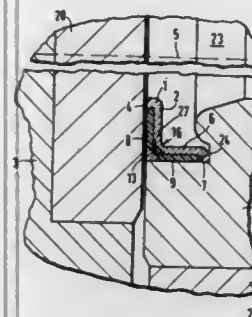
Rolf Bartolles, Korschbroich, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany
Filed Jan. 30, 1985, Ser. No. 696,415

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404676

Int. Cl.⁴ F41F 11/02

U.S. Cl. 89—26

4 Claims



1. A ring breech obturator system for a cannon, comprising an obturator ring having an angular cross section, which is positioned in use between the base ring of the barrel of the cannon and a wedge insert of a wedge-type breech block of the cannon, wherein a radial flank of the obturator ring, having internal and external sides, has positioned, on its external side adjacent the wedge insert of the breech block, a disc-shaped lining, and wherein a flank parallel to the axis of the barrel, having internal and external sides, has positioned, on its external side, a cylindrical-shaped lining, the two linings being deformable under gas pressure against the base ring and the wedge insert, respectively; the flanks of the obturator ring each has a trapezoid cross sectional recess to accommodate the respective linings, the cross section of each recess decreasing in width linearly towards the outer surface; said disc-shaped lining and said cylindrical-shaped lining, are each composed of an elastomer.

4,709,617

FIREARM

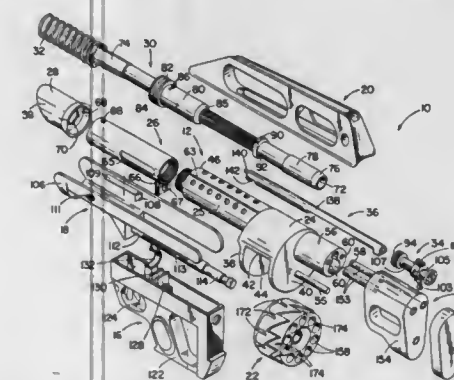
John A. Anderson, P.O. Box 5620, Hamden, Conn. 06518

Filed Jun. 21, 1984, Ser. No. 622,793

Int. Cl.⁴ F41D 7/04

U.S. Cl. 89—157

24 Claims



2. A firearm comprising barrel having a bore extending axially therethrough, means supporting said barrel for axial reciprocal forward and rearward movement, a generally cylindrical rotary magazine drum having front and rear walls and defining a circumaxial series of firing chambers and a circumaxial series of sets of cam recesses equal in number to said firing chambers each of said cam recesses opening outwardly

through the peripheral surface of said drum and having generally angularly opposed wall surfaces defining a cam track, each of said sets of cam recesses including a front cam recess opening outwardly through said front wall and a rear cam surface independent of said front cam recess and opening outwardly through said rear wall, means supporting said magazine drum rearward of said barrel for indexible rotation about its axis, and means for indexing said magazine drum about its axis to sequentially position each one of said firing chambers in a firing position wherein it is coaxially aligned with and defines a rearward extension of said bore and including a front indexing cam for engaging the cam track of an associated front cam recess during rearward movement of said barrel and a rear indexing cam for engaging the cam track of an associated rear cam recess during forward movement of said barrel, and means for moving said indexing cams in unison in response to said movement of said barrel.

4,709,618

SERIES SELF-LEVELING VALVE WITH SINGLE SPOOL FOR UNLOADING AND RELIEF

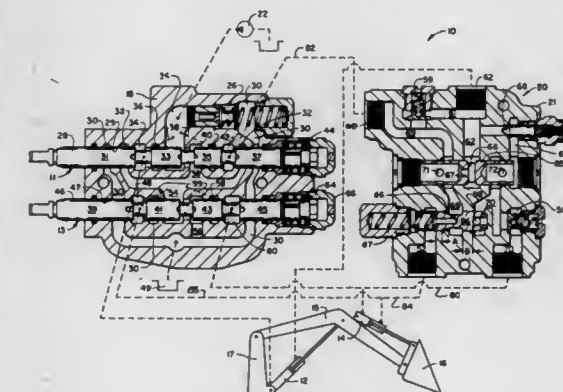
Dwight E. Zongker, Plevna, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Oct. 2, 1985, Ser. No. 783,119

Int. Cl.⁴ F15B 11/22, 13/07; B66F 3/46

U.S. Cl. 91—31

1 Claim



1. A self-leveling hydraulic system controlling two or more functions including a boom and bucket; double-acting cylinders controlled by separate boom and bucket directional control valves and an open-center series circuit with the boom control valve located upstream of the bucket control valve with a pressure source supplying the valves in a series path across open-center positions of each valve to reservoir;
a self-leveling valve including a flow-dividing valve means connected to the rod end of the boom cylinder which splits the flow from the boom cylinder into two flow paths;
a first passage means connecting the first of said two flow paths with an end of the bucket cylinder supplying a sufficient flow to maintain the bucket at a level position as the boom raises;
a second passage means connecting the second of said two flow paths with an open-center path downstream of the boom valve and upstream of the bucket valve whereby the bucket valve can be separately actuated concurrent with the boom valve and supplied with oil so as to override the boom cylinder if desired;
a third passage means connecting the opposite end of the bucket cylinder with the second passage means whereby the bucket cylinder discharge is returned to the circuit upstream of the bucket control valve, and the improvement comprising:
a servo-operated spool type valve means with dual functions as an unloading valve and a relief valve positioned in said third passage means normally spring-biased closed in a

first position blocking flow in the third passage means and a servo means acting on the valve against said biasing means sensing pressure in the first passage means which in a second spool position opens flow in the third passage means when a minimum pressure level is reached in the first passage means and a third spool position when maximum pressure is reached in the first passage means which opens the first passage means to relief into the second passage means.

4,709,619

PROPORTIONAL MAGNET

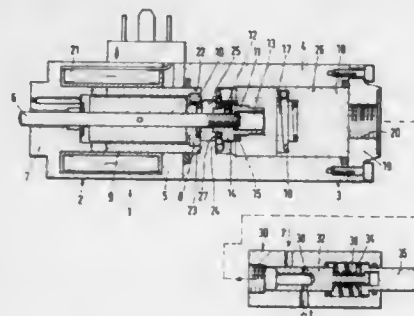
Reiner Bartholomäus, Neuendorf, and Karlheinz Widmann, Lohr, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany
Continuation of Ser. No. 631,129, Jul. 16, 1984, abandoned. This application Nov. 18, 1986, Ser. No. 931,884

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329734

Int. Cl.⁴ F01B 31/00

U.S. Cl. 92—130 D

17 Claims



1. In proportional magnet apparatus having a magnet unit with a housing in which an armature bar is mounted which is movable from a rest position under the influence of a magnetic field from an armature winding arranged in the housing and having means for providing a force biasing said armature bar to said rest position, the improvement comprising a hydraulic actuator unit with a housing having a control piston therein, means coupling the armature bar to said piston for moving said armature bar when said hydraulic unit is actuated in a manner equivalent to that of said magnetic field, and means for manually controlling the application of hydraulic pressure to said hydraulic unit for actuating said piston, wherein said coupling means contains a spring arrangement, said control piston is mechanically connected via said spring arrangement to said bar, said spring arrangement providing means for translating the hydraulically produced forces on said piston into forces which are the same as applied to said armature bar by said proportional magnet armature winding, and wherein said coupling means spring arrangement comprises a return spring bearing on said control piston and a control spring opposing the force of said biasing means by way of means enabling said control spring to bear on said armature bar, said control spring being preloaded said preload being less than a preload of said biasing means so that said control spring does not move said armature bar in said rest position, said return spring and said control spring bear on the side of said control piston which faces towards the interior of said hydraulic unit, and said return spring bears on said hydraulic housing.

4,709,620

PISTON AND CONNECTING ROD ASSEMBLY

Siegfried Mielke, Neckarsulm, Fed. Rep. of Germany, assignor to Kolbenschmidt AG, Neckarsulm, Fed. Rep. of Germany
Continuation of Ser. No. 641,531, Aug. 16, 1984, abandoned.

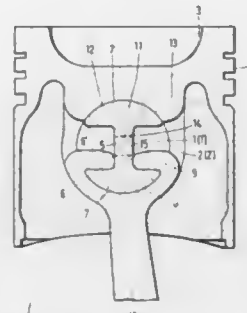
This application Apr. 14, 1987, Ser. No. 39,813

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331300

Int. Cl.⁴ F16J 1/16

U.S. Cl. 92—187

6 Claims



1. In a piston and connecting rod assembly for a reciprocating piston machine having a piston, a piston pin in the piston and a connecting rod connected to the piston pin, the improvement wherein the piston pin has a cross-section with the wide upper and lower flanges connected by a narrow web with parallel sides, said piston pin having an I-shaped cross-section, wherein the flanges comprise circular segments with outside surfaces along an arc of a circle and inside surfaces on both sides of the parallel sides of the narrow web, wherein the connecting rod has means clamping the piston pin in a fixed position in the connecting rod, said clamping means comprising a forked small end portion on the connecting rod which embraces the inside and outside surfaces of the lower flange of the piston pin.

4,709,621

INTERNAL COMBUSTION ENGINE PISTON AND A METHOD OF PRODUCING THE SAME

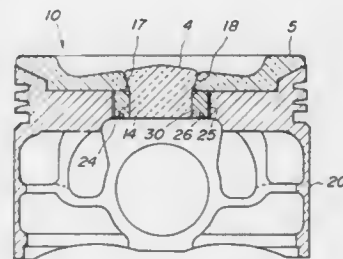
Minoru Matsui, Nagoya, and Nobuo Tsuno, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed Mar. 5, 1985, Ser. No. 708,404

Claims priority, application Japan, Mar. 13, 1984, 59-46411

Int. Cl.⁴ F02F 3/12

U.S. Cl. 92—212

3 Claims



1. An internal combustion engine piston comprising a metal piston body having a top portion and a piston cap which includes a plurality of ceramic pieces, said piston cap being fixed to the top portion of the metal piston body, wherein the piston cap comprises at least one ceramic material, at least one of the ceramic pieces is provided with a cylindrical projection which is fixed to the metal piston body indirectly by engagement of the cylindrical projection with a metallic member, said metallic member being secured to the metal piston body by being screwed thereto, and any of said plurality of ceramic pieces not

having said cylindrical projection are fixed to the metal piston body by said at least one ceramic piece having a cylindrical projection.

4,709,622

FLUIDIC OSCILLATOR

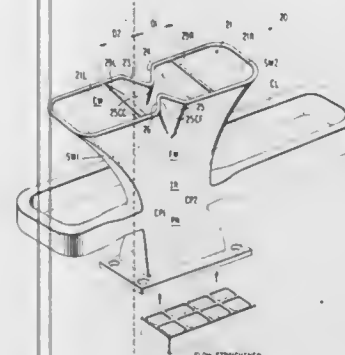
Ronald D. Stouffer, and Patrick T. Sharkitt, both of Silver Spring, Md., assignors to Bowles Fluidics Corporation, Columbia, Md.

Filed Apr. 7, 1986, Ser. No. 848,440

Int. Cl.⁴ B60H 1/34

U.S. Cl. 98—2

9 Claims



9. In a motor vehicle windshield defrost/defog system having a source of defrost/defog air and a centrally located nozzle for issuing defrost/defog air upon the driver and passenger sides, respectively, of a windshield surface to be cleared, the improvement comprising means for causing said defrost/defog air to issue in two alternating slug flows of substantially the full intensity of said source, first one of said two slug flows upon the driver side for a predetermined period of time and then the other of said two slug flows upon the passenger side for essentially the same predetermined period of time.

4,709,623

CEILING DISTRIBUTOR DUCT ASSEMBLY FOR ROOFTOP AIR CONDITIONERS

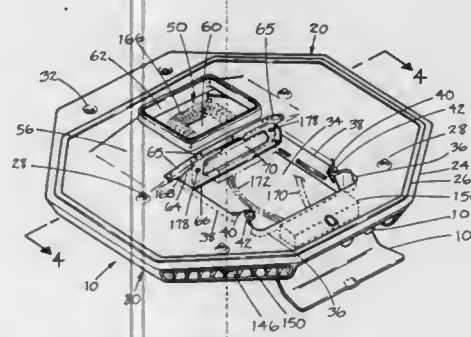
James E. Roth, DeSoto, and David W. Bales, Manchester, both of Mo., assignors to Nordyne, Inc., St. Louis, Mo.

Filed Aug. 22, 1986, Ser. No. 899,249

Int. Cl.⁴ F24F 13/06

U.S. Cl. 98—40.05

13 Claims



1. For use with an air conditioner to be installed on the roof spaced above a ceiling over room space, a ceiling distributor duct assembly comprising

A. a substantially planar ceiling plate, having there-through, at the plane of said plate, a return air opening and a conditioned air discharge opening,

both located adjacent to each other in fore-and-aft relationship substantially along a centerline of said plate, said conditioned air discharge opening being part of an upper plenum portion including a plenum inlet having duct connector means above the plane of said ceiling plate, forward-and-aft walls transverse to such centerline and reaching down at least to said plane, and plenum sides diverging outwardly and downwardly to the plane of said plate,

in combination with

B. a molded plastic air distributor box having a bottom wall terminating in an outer margin presented sealedly against the ceiling plate,

said air distributor box bottom wall having a return air opening adapted to communicate with the said return air opening of said ceiling plate, and having a bottom plenum wall portion at a depth beneath said ceiling plate sufficient to afford air flow sidewardly outward from said plenum inlet,

there being provided, as between said ceiling plate and said air distributor box bottom wall, vertical walls along the forward-and-aft sides of said bottom plenum wall portion, and a pair of vertical walls bounding those sides of said distributor box return air opening which continue forwardly from that wall at the forward side of said plenum and extend to said outer margin,

whereby those bottom wall portions sideward of the said bounding vertical walls comprise, with the, duct boundaries extending sidewardly outward from said plenum inlet and forward along the sides of said return air opening to adjacent outer margin portions of the bottom wall, there being outlet grilles along said outer margin at the forward ends of said boundaries.

4,709,624

APERTURE SEAL FOR A ROOF MOUNTED VENTILATOR AND METHOD FOR MAKING SAME

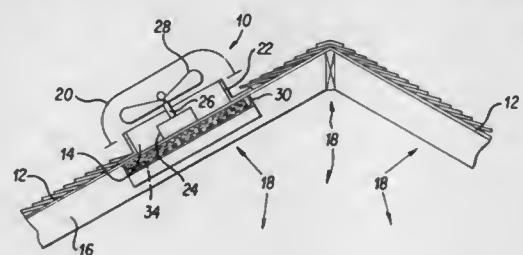
John E. Croft, 4695 Littlefield, Beaumont, Tex. 77706

Filed Sep. 16, 1985, Ser. No. 776,366

Int. Cl.⁴ F24F 7/00

U.S. Cl. 98—119

14 Claims



1. An aperture seal for closing and sealing a ventilator aperture in a roof including:

a base member;
an insulating member aligned with and coupled to the base member;
a first cover means aligned with the coupled to the insulating member on the side thereof opposite the base member for enhancing heat retention and for protecting the insulating member;
means coupled to the first cover means for adhesively engaging the roof;
a second cover means for holding and protecting the adhesively engaging means on the first cover means and for allowing exposure of the adhesively engaging means so that the adhesively engaging means can secure the aperture seal to the roof and close the ventilator aperture.

4,709,625

DISPENSING MACHINE FOR TEA

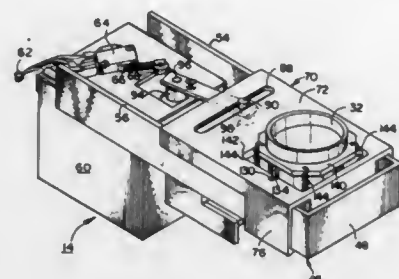
John Layre, Warminster; Yong S. Park, Lansdale, and George K. Schollhamer, Furlong, all of Pa., assignors to Gross-Given Manufacturing Co., St. Paul, Minn.

Filed Oct. 22, 1986, Ser. No. 921,975

Int. Cl.⁴ A47J 31/00

U.S. Cl. 99—289 R

18 Claims



1. Apparatus for nonpressurized infusion brewing of a beverage including a brew assembly, the brew assembly comprising a frame;

a carriage reciprocable along the frame in a first direction between a brew position and a discharge position, the carriage including a slot formed therein generally transverse to the first direction;

a motor driving a rotating shaft;

a crank arm having two ends and being attached to the shaft proximate one end;

a crank pin attached to the crank arm proximate the other end of the crank arm and extending into the slot in the carriage;

the motor being actuatable to cause the carriage to reciprocate between the brew and discharge positions by rotating the shaft whereby the crank pin reciprocates within the slot;

a brew cavity mounted to the carriage and having side walls and an open top and bottom, the brew cavity having at least one guide pin mounted on a side wall;

a filter assembly mounted on the frame and aligned with the brew cavity at the brew position and including a filter for supporting solid infusible material;

brew cavity mounting means for mounting the brew cavity to the carriage such that the brew cavity is moveable vertically with respect to the carriage between upper and lower positions;

biasing means extending between the brew cavity and the carriage normally exerting a biasing force to bias the brew cavity toward the lower position to such an extent that when the brew cavity is in the brew position, the bottom of the brew cavity is held in sealing engagement with the filter assembly surrounding the filter;

cam means having a camming surface mounted on the frame between the brew and discharge positions for engagement with the brew cavity guide pin to overcome the biasing force and for raising the brew cavity from the lower position toward the upper position as the guide pin travels along the camming surface from the brew position toward the discharge position; and

stop means associated with the brew cavity to prevent the brew cavity from extending below the lower position after the brew cavity guide pin travels past the cam means to the discharge position at which the brew cavity is abruptly biased to the lower position, whereby the infusible material from which the beverage has been brewed is discharged from the brew cavity.

4,709,626

FOLDABLE CHICKEN HOLDER

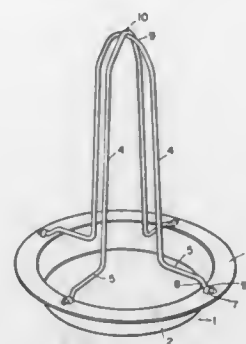
George J. Hamlyn, West Beach, Australia, assignor to Hamlyn Overseas Trading Company Pty Ltd, Australia.

Filed Mar. 25, 1986, Ser. No. 843,778

Claims priority, application Australia, Sep. 13, 1985, PH2412

Int. Cl.⁴ A47J 43/18

7 Claims



1. A foldable chicken holder, the holder comprising a bowl having a peripheral upstanding side wall, and only one pair of elongated "U" shaped members, each "U" shaped member having a leg laterally extending from each side, the leg being releasably clipped into and pivoted to the upstanding side wall, one "U" shaped member being displaced 90 degrees with respect to the other "U" shaped member, at least the other "U" shaped member having a notch at its upper extremity, the one "U" shaped member overlapping and engaging the other "U" shaped member at the notch at the upper extremity of the other "U" shaped member releasably to retain both the "U" shaped members in position, said members forming a central upstanding member so that when a chicken is placed over the member with the legs of the chicken extending into the bowl, the chicken is supported with the interior of the chicken open so that cooking can also take place from the interior due to the hot air passing therinto, and basting of the chicken takes place due to the juices from the chicken collecting in the bowl, whereby the pair of "U" shaped members may be folded down into a flat position or be removed from the pivotal connection for cleaning or storage purposes.

4,709,627

LOCKING SLEEVE MAGAZINE FEED ATTACHMENT FOR A DEVICE FOR SEALING STEEL WRAPPING BANDS

Wladyslaw Staszko, Duisburg, Fed. Rep. of Germany, assignor to ACME P.W. Lenzen GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 30, 1986, Ser. No. 892,140

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527695

Int. Cl.⁴ B65B 13/34

U.S. Cl. 100—30

9 Claims

1. A locking sleeve magazine feed attachment on a device for mechanically sealing a steel wrapping band on filled packages having sheet metal tubes stored in the locking sleeve magazine, comprising conveyor means for removing the steel band from an associated storage bin and conveying it to and placing it around and tightening it on the filled package, a sealing device for notching the steel band edges surrounded by the sheet metal tube, a locking sleeve storage holder, a stop device acting on the advancing steel band ends which are positioned one behind the other, means for sealing the steel wrapping band which is first run twice through a first smooth, oval sheet metal tube stored in the sleeve magazine storage holder, steel band pass-through openings being provided for such purpose, the tube magazine being mounted on a stationary axle arranged in parallel to the feed direction of the steel band

and arranged to swivel horizontally to a limited extent, whereby in the first swivel position the first tube faces coaxially and in correct position with respect to the steel band to be fed through, and in the other, swivel position the tube magazine is located externally of the steel band which is guided sideways

aperture (5) under the influence of said second force generating means (20,21,22) thereby to decrease the size of said outlet aperture; and in that said first and said second force generating means can be adjusted independently of one another.

4,709,629

ROLL WITH PRESSURE CHAMBER FOR DETECTION CONTROL

Valentin Appenzeller, deceased, late of Kempen; by Maria Appenzeller, heir, Kempen; by Regine Appenzeller, heir, Mitterfelden-Ainring; by Doris Pegels, heir, and by Ernst Appenzeller, heir, both of Krefeld, all of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

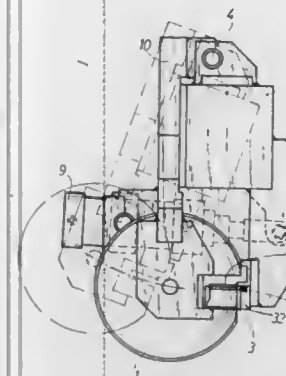
Filed May 30, 1986, Ser. No. 870,446

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519318

Int. Cl.⁴ B30B 3/04; F16C 13/02

U.S. Cl. 100—162 B

18 Claims



on the outside of the tube magazine which faces the second magazine swivel position in the direction of tube movement and extends parallel to the feed direction of the steel band, at least one tube magazine opening of the same size as a tube and a rigid tube buttress on the tube magazine for positioning the first tube in correct position in front of the said recess.

4,709,628

SCREW PRESS FOR DEWATERING SLUDGE AND FIBER SUSPENSIONS

Tad Glowacki, Nästaplan 7, 162 24 Vällingby, Sweden

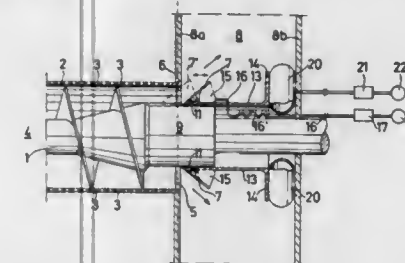
Filed May 6, 1986, Ser. No. 860,234

Claims priority, application Sweden, May 10, 1985, 8502339

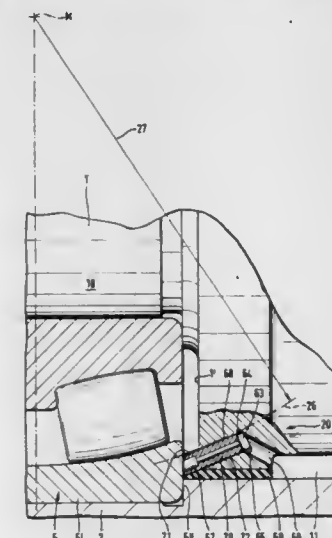
Int. Cl.⁴ B30B 9/18

U.S. Cl. 100—148

5 Claims



1. A screw press for dewatering sludge and fiber suspensions, comprising: a feed screw having an axis, a perforated drum surrounding the feed screw, an inlet aperture at one end of the drum and an annular outlet aperture located at the other end of the drum which includes a forward peripheral edge; said feed screw having an axial extension projecting through and coaxial with said other end of said drum, and an end-wall section of said annular outlet aperture comprising a plurality of flaps mounted coaxially relative to the extension of the feed screw, so that said flaps are yieldably arranged in a manner to enable the size of the outlet aperture to be adjusted, characterized in that: an attachment means (11) is provided, the end of each flap (7) located nearest the axis (9) of the feed screw (1) is pivotally mounted to said attachment means (11), and said attachment means (11) is arranged for displacement along the axis of the feed screw (1); a first force generating means mounted in structural association with said flaps, the flaps (7) being arranged to be pressed outwardly under the influence of said first force generating means (15,17,18) to form a larger angle with the screw axis (9), therewith to decrease the size of said outlet aperture (5); a second force generating means (20,21,22) in structural association with and enabling said attachment means (11) to be pressed axially towards the outlet



1. A deflection controlled roll juxtaposable to another roll to form a nip, said deflection controlled roll comprising:

a cylinder;

a crosshead longitudinally traversing said cylinder, said crosshead having an outer surface, said cylinder being rotatably mounted on said crosshead, said cylinder having an inner surface spaced from said outer surface of said crosshead;

a pair of longitudinal seals connected to said crosshead and slidably engaging said inner surface of said cylinder;

a pair of circumferentially extending transverse seals each having a radially inner side engaging said crosshead and a radially outer side slidably engaging a respective surface contiguous with said inner surface of said cylinder, said longitudinal seals and said transverse seals cooperating with each other, with an outer surface of said crosshead and with said inner surface of said cylinder to form a longitudinal chamber at the nip between the two rolls, said crosshead being provided with means including a conduit communicating with said longitudinal chamber for enabling pressurization of said longitudinal chamber with a pressure fluid; and

support means comprising a pair of bearings disposed at respective ends of said cylinder for rotatably supporting said cylinder on said crosshead, each of said bearings having a respective geometric center, each of said transverse seals having an annular abutment surface engaging a respective annular contact surface of said crosshead, the abutment surface of each of said transverse seals and the corresponding contact surface each having an orientation and shape conforming at least approximately to a spheri-

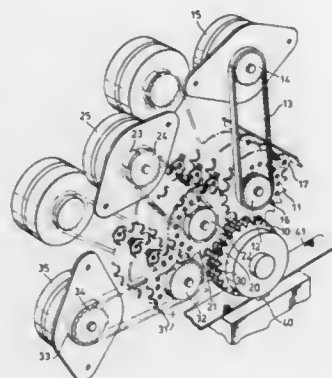
cal surface having a center at the geometric center of the one of said bearings disposed on a side of the respective transverse seal opposite said longitudinal chamber.

4,709,630
PRINTING WHEEL SETTING AND ALIGNING APPARATUS

David R. G. Wilkins, Wistaston; Reginald D. Brooker, Leonard Stanley; Roger Walker, Nantwich, and Harry Powell, Bidulph, all of England, assignors to McCorquodale Machine Systems Limited, Basingstoke, England
Continuation of Ser. No. 780,712, Sep. 26, 1985, abandoned, which is a continuation of Ser. No. 76,807, Sep. 18, 1979, abandoned. This application Jan. 21, 1987, Ser. No. 8,086
Int. Cl.⁴ B41J 1/46

U.S. Cl. 101-93.22

4 Claims



1. Printing apparatus for printing a line of characters comprising:

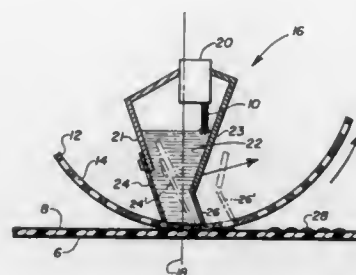
- a plurality of toothed printing wheels having a common axis of rotation, each printing wheel having a set of type characters spaced around its periphery;
- means defining a printing line, parallel to the said axis and containing a printing position for each printing wheel;
- a plurality of setting wheels, one for each printing wheel, each setting wheel having a separate different axis of rotation and having teeth engaging in the spaces between the type faces of its printing wheel, the axes of rotation of the setting wheels being parallel to the said axis of the printing wheels and being arranged in an arc around the axis of the printing wheels;
- a plurality of stepping motors, one for each printing wheel, each stepping motor having a driving shaft and a toothed wheel on the driving shaft, the axis of rotation of the stepping motors being spaced from one another about the axis of the printing wheels and being further than the setting wheel axes from the axis of the printing wheels;
- a plurality of endless flexible transmission means, one coupling each stepping motor toothed wheel respectively to the corresponding setting wheel, whereby each stepping motor rotates the corresponding printing wheel to bring a selected character into the printing position;
- an alignment bar having a portion for each printing wheel and being movable to cause each respective portion to engage in a slot in its printing wheel, such engagement of said portion and said slot being possible only if the corresponding printing wheel has a printing character in the printing position;
- a print control means controlling the printing of a line of characters from the printing wheel; and
- switching means, responsive to the engagement of all said portions of said alignment bar in their respective printing wheel slots to supply to said print control means a signal indicative of the print wheel alignment.

4,709,631
METHOD OF PRINTING A RAISED PATTERN OF LIQUID

Raymond G. Davey, Lancaster; Martin Dees, Jr., Landisville, and Daniel M. Sigman, Jr., Strasburg, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.
Filed Jan. 20, 1987, Ser. No. 4,873
Int. Cl.⁴ B41F 15/42

U.S. Cl. 101-129

1 Claim



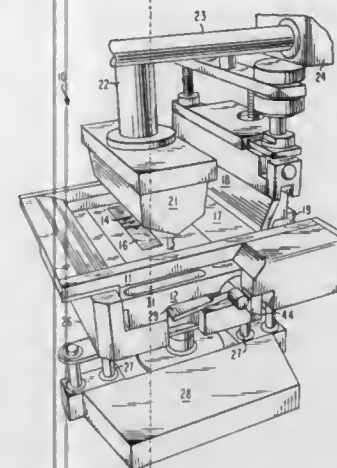
1. A method of printing a raised pattern on a substrate, said substrate being provided with a nonporous surface to receive a pseudo plastic thixotropic liquid that, at a first quantity of deposition will not have noticeable lateral flow and will yield a bead of liquid that will retain a geometric design the same as the print screen aperture, but at a second larger quantity of deposition will have noticeable lateral flow to have a number of beads of liquid flow together to form a different larger pattern of liquid due to the shear weight of the extra deposited liquid causing lateral flow, the steps comprising:

- (a) providing a substrate to be printed with the substrate having a nonporous surface to receive the printed liquid;
- (b) providing a printer with a circular screen having apertures therein of a desired design and size;
- (c) positioning said screen tangent to and above said substrate;
- (d) positioning within said screen a source of liquid which feed to a reservoir of liquid;
- (e) retaining the reservoir of liquid within the screen at a first position directly above the point where the screen is tangent to the substrate so that a first quantity of liquid is deposited on the substrate and the amount of liquid deposited will yield a bead of liquid on the substrate that it retains a geometric design and size comparable to that of the aperture in the screen;
- (f) moving the substrate and screen together in a continuous manner to deposit a plurality of beads of liquid onto the substrate while the screen and substrate are in contact;
- (g) moving the retained reservoir of liquid within the screen from its first position directly above the point where in the screen is tangent to the substrate, to a second position where the reservoir of liquid is offset, in the direction of screen movement; and
- (h) moving the substrate and screen together in a continuous manner to deposit a plurality of beads of liquid of a larger quantity of liquid than would have been deposited when the reservoir was in its first position since deposition of liquid is occurring partly at the time the screen and substrate are not in contact so that the larger quantity of liquid is deposited and the liquid will have noticeable lateral flow to cause a number of beads of liquid to flow together to form a pattern of raised liquid larger than and of a different shape from the apertures of the screen.

4,709,632
SELECTIVE INTAGLIO INKING DEVICE WITH REMOVABLE CARTRIDGE
Gerard Samuels, Paoli, Pa., and Paul R. Smith, Chester, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 21, 1987, Ser. No. 5,808
Int. Cl.⁴ B41M 1/10; B41N 1/00
U.S. Cl. 101-163

14 Claims



1. In an intaglio inking device including an inking surface having an aperture, a plurality of separately moveable substantially planar inking bars arranged in said aperture, each inking bar having a substantially flat edge portion spanning one dimension of said aperture, and moveable between a first position flush with said inking surface and a second position displaced from said inking surface whereby inking bars in said second position form cavities between inking bars in said first position, a frame member surrounding said inking surface and including an ink reservoir, means for spreading ink over said inking surface and said flat edge portions to fill said cavities with ink, means for removing ink from said inking surface and said flat edge portions leaving said cavities filled with ink, means for moving said inking bars between said first position and said second position, improvements wherein:

- said inking bars are arranged in a removable cartridge whereby said inking bars are alignable with and separable from said support member and from said means for moving;
- and wherein said inking bars include a detent surface, said inking device further including stop bars for selectively engaging said detent surfaces whereby engaged inking bars are detented in said first position, first moving means for individually engaging said stop bars with said detent surfaces, second moving means for disengaging said stop bars from said detent surfaces, said stop bars being movably supported between said first moving means and said inking bars whereby said stop bars are moveable in a direction substantially normal to said inking bars, and said first moving means can each be effective in detenting two of said inking bars.

4,709,633
CIRCUIT FOR CONTROLLING THE INK LEVEL OF AN INTAGLIO PRINTING DEVICE
John W. Woestman, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 13, 1987, Ser. No. 37,896
Int. Cl.⁴ B41F 1/16, 31/02

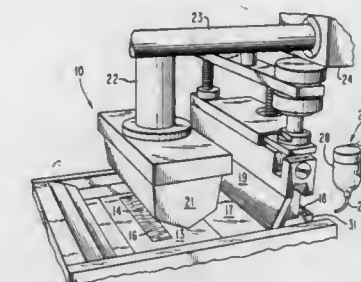
U.S. Cl. 101-163

11 Claims

1. A control circuit for controlling a system for supplying ink to an intaglio printing device, said printing device having an inking surface with a set of moveable bars for setting a bar code arranged in said inking surface, an ink spreader for applying ink from a reservoir to said bars, an ink scraper for removing ink from said inking surface, an ink supply for supplying

ink to said reservoir, a plurality of proximity switches associated with said ink supply for providing the level of ink in said ink supply to said control circuit; and means for transferring ink from said ink supply to said reservoir; said control circuit comprising:

- sensor means associated with said ink scraper for sensing voids in the ink on said inking surface in the proximity of said moveable bars;
- switch means responsive to said sensor means for actuating said control circuit;



generator means for energizing said means for transferring to effect transfer of ink from said supply to said reservoir in response to said sensor;

counter means responsive to said generator means, said counter means being set to a preselected count;

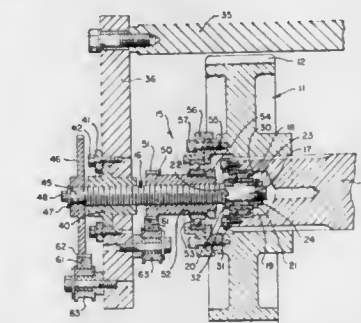
timer means responsive to said counter means, said timer means deactivating said generator means for a preselected time when said counter means reaches said preselected count whereby a preselected volume of ink is transferred to said reservoir, and whereby said means for transferring is disabled during said preselected time.

4,709,634
PLATE CYLINDER REGISTER CONTROL
Stanley Momot, La Grange, and William G. Hannon, Westchester, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1986, Ser. No. 914,430
Int. Cl.⁴ B41F 13/12

U.S. Cl. 101-248

6 Claims



1. In a rotary printing press having a set of side frame, a plate cylinder with journals for rotatably supporting the plate cylinder in said frames and a plate cylinder helical drive gear mounted on one of the journals to effect rotation of the plate cylinder, a lateral and circumferential register adjusting mechanism comprising:

- (a) elongated operator means having external threads on the outer surface thereof supported at a first end within a bore formed in the plate cylinder journal carrying the cylinder drive gear for relative rotation with respect to the journal and supported on a second end within first internally threaded means fixed with respect to a press side frame;
- (b) first drive means operably connected to said operator

means to effect rotation and simultaneous longitudinal movement thereof, whereby lateral movement of the plate cylinder is effected and adjustment of lateral register is accomplished;

- (c) second internally threaded means disposed on and mating with the external threads on the outer surface of said elongated operator means;
- (d) means operably connecting said internally threaded means to the plate cylinder drive gear; and
- (e) second drive means operably connected to said second internally threaded means to effect rotation thereof, which rotation creates lateral forces in the plate cylinder drive gear that causes rotation thereof and effects adjustment of circumferential register.

4,709,635

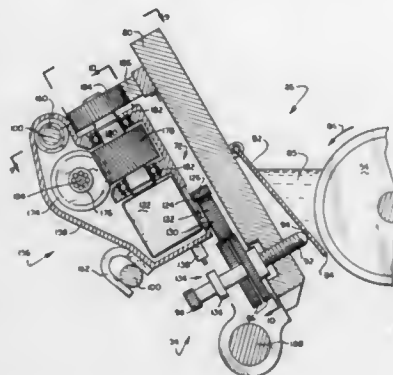
FLUID METERING METHOD AND APPARATUS

Vince T. Kubert, Indialantic, Fla., and John S. Richards, Arlington, Tex., assignors to Harris Graphics Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 629,616, Jul. 11, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 851,232
Int. Cl.⁴ B41F 31/04, 33/16

U.S. Cl. 101—426

19 Claims



1. A fluid metering apparatus comprising:
a fountain roll;

means for metering fluid on said fountain roll as said fountain roll rotates, said metering means including a flexible edge juxtaposed to said fountain roll;

a plurality of individually rotatable keys adjustably contacting said flexible edge at spaced locations therealong, rotational position of each key controlling spacing between an associated section of said flexible edge and said fountain roll, each key including a friction wheel fixed thereto;

a carriage mounted for movement along said keys;

first drive means for controlling movement of said carriage; a drivable friction wheel carried by said carriage and positioned to individually engage the friction wheel of each key as said carriage moves therepast; and

second drive means for rotating said drivable friction wheel at (i) a speed and a direction synchronized with the movement of the carriage when passing a key not to be adjusted to roll over such key and (ii) a speed and direction when at a key to be adjusted to effect a desired spacing between the fountain roll and a section of the flexible edge associated with the key being adjusted.

4,709,636

PROPELLANT CHARGE CASING

Dietmar Mueller, Karlsruhe, and Karlheinz Reinelt, Hermannsburg, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

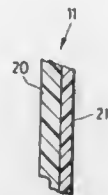
Filed Sep. 21, 1984, Ser. No. 653,675

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334026

Int. Cl.⁴ F42B 5/18

U.S. Cl. 102—431

9 Claims



1. An improved propellant charge casing for holding propellant charge powder in cartridge or artillery ammunition, wherein the propellant charge casing comprises an inner and an outer layer of synthetic foil material, said synthetic foil material is shrinkable at least one of said layers further comprises a mixture of at least one metal selected from the group consisting of magnesium boron and aluminum and at least one of the group consisting of lithium nitrate, lithium chlorate, sodium nitrate, sodium perchlorate, potassium nitrate, potassium perchlorate, ammonium nitrate, ammonium perchlorate, ammonium chlorate, hydrazine nitrate, organic peroxides, nitrile perchlorate, hexanitroethane, boron-potassium nitrate and zirconium barium nitrate.

4,709,637

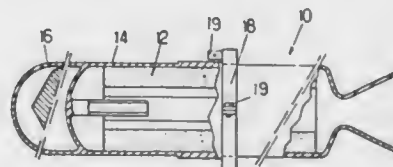
TEMPERATURE SENSITIVE PYROTECHNICAL TRAIN INTERRUPTION DEVICE

Henri Boggero, Velizy, France, assignor to Matra, Paris, France
Filed May 23, 1985, Ser. No. 737,167

Claims priority, application France, May 25, 1984, 84 08262
Int. Cl.⁴ F42C 15/06, 15/20, 15/28

U.S. Cl. 102—481

7 Claims



1. A unitary system for venting a rocket motor of an ordnance item carrying a warhead, comprising:
a circumferential belt containing a cutting explosive charge and constructed for removable mounting around a housing of said rocket motor, and an activating device having:
a casing permanently connected to said belt, primer means in said casing for energization of said explosive charge,
a striker mounted in said casing for movement therein, a spring means located in said casing and operatively associated with said striker for urging said striker toward said primer means from a rest position, and latch means for retaining said striker in said rest position, said latch means including a part of eutectic alloy normally opposing movement of said striker, so located as to be in thermal balance with the ambient atmosphere and becoming ineffective above a predetermined melting temperature.

4,709,638

DISCARDING SABOT PROJECTILE

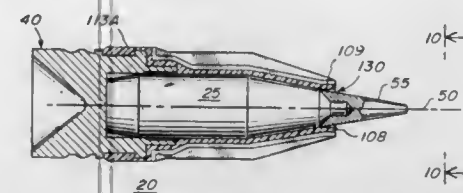
David E. Broden, Minnetonka; Wilford E. Martwick, New Hope, and John B. Warren, Wayzata, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 24, 1981, Ser. No. 305,077

Int. Cl.⁴ F42B 13/16

U.S. Cl. 102—522

6 Claims



1. A low dispersion discarding sabot projectile comprising:
(a) a full calibre cylindrically shaped pusher of lightweight metallic material having a cup-like forward facing recess concentric with the external surface of said pusher, said cup-like forward facing recess of said pusher being stepped with the aft portion thereof being of slightly smaller diameter than the forward portion thereof;
(b) a cylindrically shaped subcaliber projectile of dense metallic material having:
(i) a rear portion adapted to be inserted into said forward facing recess of said pusher,
(ii) a main body portion projecting forward from said pusher, and
(iii) a forward tip portion having a surface thereof concentric with the longitudinal axis of said projectile;
(c) a discarding sabot of lightweight frangible material disposed around said main body portion, the forward portion of said sabot being
(i) in approximate radial register with said forward tip portion, and
(ii) spaced away from the external surface of said forward tip portion piece, said sabot having external surfaces concentric with said primary axis and being adapted, after said projectile has accelerated down a gun barrel, to separate apart and away from said subcaliber projectile, said separation commencing at the forward portion of said sabot; and
(d) said apparatus being further characterized by said aft portion of said pusher recess being adapted to closely engage a short longitudinal portion of said subcaliber projectile.

4,709,639

RAILWAY SYSTEM UTILIZING A LINEAR MOTOR FOR PROPULSION OF TRAINS

Robert Geais, 10 rue Talma, Paris, 75016, France

Filed Oct. 28, 1985, Ser. No. 792,059

Claims priority, application France, Nov. 5, 1984, 84 16796

Int. Cl.⁴ B61B 13/12

U.S. Cl. 104—292

10 Claims



1. A railway system employing a discontinuous linear motor for train propulsion, comprising a train assembly formed with a plurality of transport units each including a group of vehicles ordinarily maintained coupled to one another, the transport units being joined end-to-end and all being of the same length L meters, the transport units also carrying secondary elements of said linear motor disposed at regular intervals such that the secondary of said linear motor is discontinuous, a track for operation of said train assembly thereon, said track having

spaced active sections each equipped with a group of inductors which are disposed at regular intervals of L meters from center line to center line within each active section, the groups of inductors of said active sections constituting the primary of said linear motor and said active sections being separated from one another by inactive track sections having no primary inductors of said linear motor, such that during operation said train assembly will alternately occupy active and inactive sections of said track and thereby receive a propulsive force from said linear motor intermittently as said train assembly alternately passes through the active and inactive track section.

4,709,640

WOODEN MODULAR FURNITURE

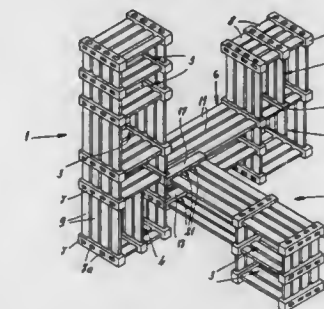
Pierre Jouanin, 4, allée de la Venerie, Auffargis, Le Peray en Yvelines, France

Filed Feb. 26, 1986, Ser. No. 833,835

Int. Cl.⁴ A47B 7/02

U.S. Cl. 108—91

8 Claims



1. A piece of modular furniture formed as a plurality of side, top, and bottom panels having ends joined together with the side panels extending parallel to one another and perpendicular to the top and bottom panels and thereby forming therewith a plurality of parallelepipedal compartments in a furniture configuration, each panel being formed by:

at least one rectangularly parallelepipedal and wooden coupling bar having a predetermined length and extending along a respective end of the respective panel, whereby each compartment is formed by a plurality of bars of the respective panels, each bar having a plurality of like longitudinally extending faces and being formed with a respective longitudinally extending and equispaced succession of like mortises opening perpendicularly at each face, the bars forming each compartment extending parallel to one another at the corners thereof; and

a group of like flat and wooden slats extending coplanar and parallel to one another and having ends received snugly in the respective mortises with the slats projecting perpendicularly from the respective bar face, the slats of each compartment extending perpendicularly between and interconnecting the bars at the corners of the respective compartment, at least one of the panels also comprising a wooden bar extending parallel to and of generally the same length as the respective coupling bar, each side having one side face formed with a succession of mortises identical to those of the coupling bar and receiving the ends of the respective slats and an opposite side face formed with an oppositely open longitudinal groove complementarily fittable over the longitudinal edge of a slat of another panel to join two of said compartments together.

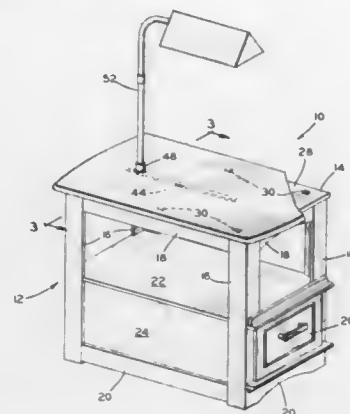
4,709,641 ADJUSTABLE TABLE STRUCTURE

Sidney A. Lenger, Kernersville, N.C., assignor to The Pilliod Cabinet Company, Swanton, Ohio

Filed Aug. 18, 1986, Ser. No. 897,504

Int. Cl.⁴ A47B 11/00

U.S. Cl. 108—102



1 Claim

and at least one horizontal shelf, said vertical supports and said shelf being made of like modular members, said modular members having longitudinal dovetail projections, fixing means for anchoring said shelf to said vertical supports, said vertical supports and said shelf when assembled forming two right angle corners, said fixing means consisting of right angle components located in the corners between said vertical supports and said shelf, said right angle components having two arms, one arm supporting said shelf and the other arm adhering to each of the vertical supports when the shelf structure is assembled, each of said arms having cavities, a slot passing through each arm and into each cavity permitting each cavity to be elastically deformed, the cavities in one arm being perpendicular to the cavities in the other arm, each of said dovetail longitudinal projections having ends, said ends being anchored in said cavities when the shelf structure is assembled, said right angle components having longitudinal through-holes along the longest dimension thereof, tie rods being inserted in said through-holes when the shelf structure is assembled, whereby said right angle components are tightened around said projections as each cavity is deformed about each of said projections.

4,709,643 PRIMARY STAGE COMBUSTOR LINING

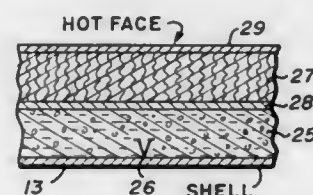
Frederick E. Moreno, Los Altos, and Creighton D. Hartman, San Francisco, both of Calif., assignors to PruTech II, San Jose, Calif.

Filed Feb. 24, 1987, Ser. No. 17,483

Int. Cl.⁴ F23M 5/00

U.S. Cl. 110—336

17 Claims



1. A table comprising:
 - a floor engaging base section, said section including a top structural member having an upwardly facing horizontally disposed surface and a downwardly facing horizontally disposed surface, the structural member in spaced relation above the supporting floor and having a slot formed therein;
 - a top member having an upwardly facing horizontally disposed supporting surface and a second downwardly facing surface disposed in facing relation to the upwardly facing surface of the top structural member of said base section;
 - guide means extending downwardly from said top member through the slot formed in the top structural member of said base section for attaching said top member to said base section and permitting movement of said top member relative to said base section along a path defined by the slot and including a mounting plate slidably coupled to the downwardly facing surface of the top structural member of said base section for movement with said top member; and
 - track means positioned between the mounting plate of said guide means and the top structural member of said base section to slidably guide relative movement between the mounting plate and the top structural member.

4,709,642 SIMPLIFIED METALLIC STRUCTURES AND PROCEDURE FOR THEIR PRODUCTION

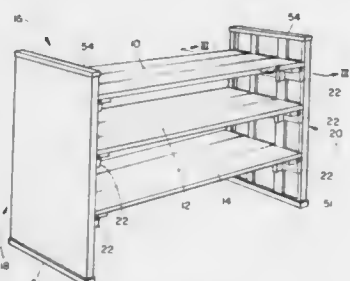
Antonello Briosi, V.le del Lavoro, 3, 38068 Rovereto, Italy

Filed Sep. 30, 1985, Ser. No. 782,209

Int. Cl.⁴ A47B 3/00; A47F 5/00

U.S. Cl. 108—111

3 Claims



1. A shelf structure assembly comprising at least two vertical

1. In a method for protecting the shell of a primary combustion chamber of a staged low NO_x burner for a thermally enhanced oil recovery steam generator, the steps of:
 - lining the interior of the primary combustion chamber of the staged low NO_x burner with a first layer of fibrous, thermally insulative material comprised of ceramic fibers, said first layer of insulation material having a density falling within the range of 3 to 30 lbs. per cubic foot, and
 - lining the interior of said first layer of thermally insulative material with a coating of a tough, durable refractory material, whereby the thermal energy stored in the thermally insulative liner is reduced while reducing the weight of the insulative liner and while protecting the first fibrous insulative layer from the deleterious effects of the combustion processes.

4,709,644 SEWING MACHINE PRESSER FOOT LIFTING APPARATUS

Masaaki Fujihara; Ikunori Fujii, and Shuji Fujita, all of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,591

Claims priority, application Japan, Jun. 20, 1985, 60-135117; Jun. 20, 1985, 60-135118

Int. Cl.⁴ D05B 29/00

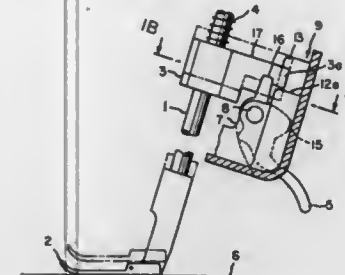
U.S. Cl. 112—237

5 Claims

1. In a presser foot lifting mechanism, wherein a presser bar with a presser foot at its lower end receives a continuous downwardly directed force and is in an operating position when pressing a workpiece against a machine bed and is in an

idle position when the presser foot is lifted and rotated outwardly around the longitudinal axis of said presser bar, a sewing machine presser foot lifting foot lifting apparatus, comprising:

- a first means associated with a presser foot lifting lever for



- preventing the presser foot from rotating outward when the presser foot is either in operating position or regardless of the level to which the presser foot is raised
- a second means associated with the rotation of the presser foot for preventing unintentional lowering of the presser foot when the presser foot is in said idle position.

4,709,645 WASTE FABRIC AND LINE COLLECTION BOX FOR A SEWING MACHINE

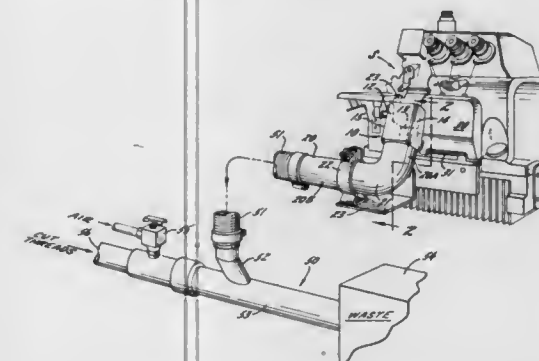
Christopher R. Jones, Greensboro, and Lee S. Jones, Jamestown, both of N.C., assignors to Tempex, Inc., High Point, N.C.

Filed Nov. 24, 1986, Ser. No. 934,101

Int. Cl.⁴ D05B 65/06

U.S. Cl. 112—282

9 Claims



1. A waste and lint collector for collecting and conveying waste and lint away from a sewing machine having needles for sewing fabric and cutter knives for trimming away excess fabric, said waste and lint collector comprising an open top collection box communicatively connected with an inlet end of a waste conduit, said collection box of rectangular cross-sectional configuration and comprising a front wall, a rear wall and side walls, the tops of said walls defining an edge about the open top of the collector, said edge being shaped to sealingly fit against the frame of the sewing machine and to position the open top of the collection box in an operative position immediately beneath the cutter knives, and means for inducing a flow of air into the collection box from the area of the cutter knives, whereby trimmed fabric and lint is drawn into the collector box as it is generated and before it escapes into the atmosphere.

4,709,646 FUNCTIONAL UNIT INSTALLATION IN A WARSHIP

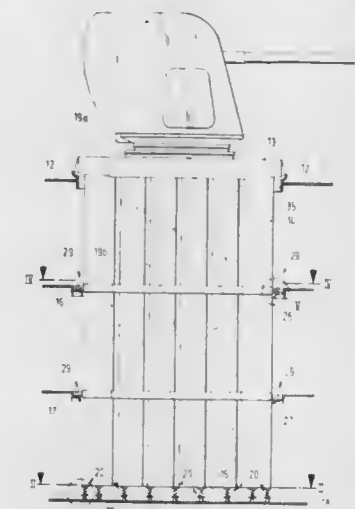
Karl-Otto Sadler, Hamburg; Willy Schmidt, Ellerbek, and Hans-Joachim Franz, Köln-Reisiek, all of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Jun. 21, 1985, Ser. No. 747,232

U.S. Cl. 114—5

Int. Cl.⁴ B63G 1/00

24 Claims



1. A warship comprising:
 - a unit seating extending around an opening in a ship's deck,
 - a unit platform mounted in said seating and levelled relative to the said warship;
 - a functional unit installation mounted on and extending downwardly through said platform;
 - a unit container carried by said platform, beneath said platform, said unit container accommodating a part of said functional unit installation and extending downwardly beneath the ship's deck into the interior of the warship; and
 - spring means for supporting the bottom of said unit container;
 - said spring means comprising vertically resiliently acting means for supporting at least a part of the weight of said platform, said unit container and said functional unit installation; and
 - means underlying said spring means for supporting said spring means;
 - said spring means being horizontally deflectable to allow relative horizontal movement of said unit container and said support means in response to damage to said warship.

4,709,647 FLOATING DOCK

David H. Rytand, 2402 Killarney Way, S.E., Bellevue, Wash. 98004

Filed Jan. 6, 1986, Ser. No. 816,204

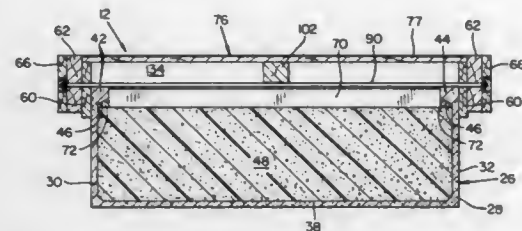
Int. Cl.⁴ B63B 35/38

U.S. Cl. 114—267

18 Claims

1. A floating dock, comprising:
 - a plurality of aligned float modules having aligned opposed walls;
 - a deck having opposing edges in spaced relationship above opposing edges of said float modules;
 - a pair of wale means extending along and in engagement with each of said opposing walls of said float modules and said opposing edges of said deck; and
 - compression means above said float modules and below said

deck extending between and acting on said pair of wale means for exerting compression force on said float mod-



ules and deck whereby said float modules, deck, and wale means form a box beam type structure under compression.

4,709,648

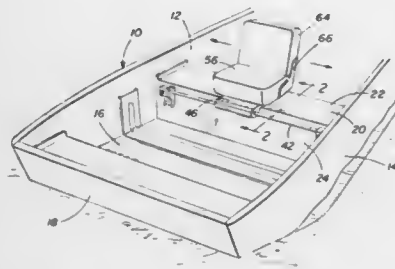
BOAT SEAT BRACKET

John R. Andrews, Jackson, Miss., assignor to Cullen Wayne Fugitt, Terry, Miss., a part interest

Filed Aug. 8, 1986, Ser. No. 894,833
Int. Cl.⁴ B63B 17/00

U.S. Cl. 114—363

11 Claims



1. In combination with a boat of the type including opposite sides and an elongated bench seat extending lengthwise transversely of said boat at least substantially between said sides and including opposite side longitudinal margins, a seat assembly including a horizontal seat portion having front and rear marginal portions, said bench seat and seat assembly including coacting mounting means mounting said seat assembly from one of said margins with said seat assembly supported atop said bench seat for support therefrom and for guided sliding movement therealong throughout at least a major portion of the length of said bench seat, whereby said seat assembly may be guidingly shifted between positions adjacent the sides of said boat, said coacting means including pivot means swingably supporting said seat assembly from said one margin for angular displacement relative to said bench seat about an axis closely adjacent and paralleling said one margin and with said seat assembly being swingable generally 180° about said axis upwardly away from said bench seat, outwardly of said one margin and then downwardly to an inverted position disposed outwardly of said one margin and below the upper extremity of said bench seat, with an effective pivotal and sliding connection maintained between said seat assembly and said one margin throughout the swinging of said seat assembly relative to said bench seat as well as the sliding of said seat assembly relative to said bench seat.

4,709,649

BASS BOAT ADJUSTABLE SEAT APPARATUS

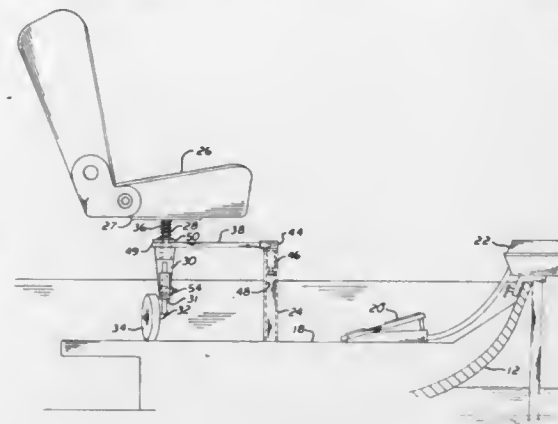
Robert E. Wann, 1647 Hobbit Rd., Dunedin, Fla. 33528

Filed Jul. 31, 1986, Ser. No. 891,095

Int. Cl.⁴ B63B 29/00

U.S. Cl. 114—363

6 Claims



1. A fishing boat seat apparatus comprising:
 - (a) a pedestal securely mounted to a deck of the boat,
 - (b) a frame supporting a seat,
 - (c) a pair of shafts, each engaged to the frame at an upper end and in engagement with an element in contact with the deck at a lower end, the frame movable in a vertical direction with respect to the shafts,
 - (d) a U-shaped horizontal support element connecting the pedestal and the frame,
 - (e) the support element having an open end attached to a mounting element rotatably mounted on the pedestal and a closed end clamped to the frame, the frame movable in a horizontal direction within the horizontal support element by releasing a clamp plate.

4,709,650

RESCUE LAUNCHER

John W. Ingle, 85 Cynthia Road, Toronto, Ontario, Canada M6N 2P8

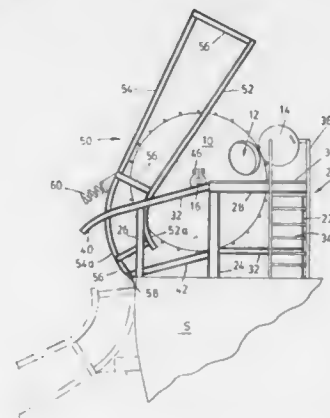
Filed May 9, 1985, Ser. No. 732,141

Claims priority, application Canada, May 11, 1984, 454191

Int. Cl.⁴ B63B 23/28

U.S. Cl. 114—375

3 Claims



1. A launching device for a rotatable rescue craft having a spherical exterior and comprising:
 - a base portion, for supporting said rescue craft;
 - a ramp portion on said base portion, ramp rail means on said ramp portion spaced apart a predetermined distance to engage said rescue craft, and located at a predetermined

height and defining a predetermined spacing therebeneath to receive and support said rescue craft therebetween, said ramp rail means being tilted at a predetermined launching angle, and adapted to procure initial movement of said rescue craft off said base portion, said base portion and said ramp portion being so dimensioned so that said rescue craft is located with a major portion of its mass on said ramp portion when in said storage position and releaseable means restraining it from such movement;

- a chute portion, having inboard and outboard ends, said inboard end being pivotally mounted to said base portion in registration with said ramp portion, and said chute portion being swingable between a more or less upright storage position, with said outboard end directed upwardly, and a launching position, wherein said chute portion is swung outwardly and downwardly at a predetermined launching angle, with said outboard end directed outwardly from said ramp portion;
- chute rail means on said chute portion spaced apart a lesser distance than said ramp rail means and being adapted to receive said rescue craft as the same moves off said ramp rail means, and to support said rescue craft for motion at a downward angle away from said base portion, and, a second said chute portion movably connected to said first chute portion, and being extendable therefrom.

4,709,651
WHISTLE

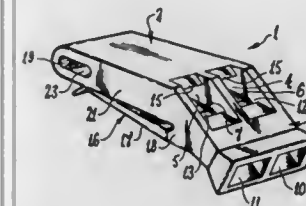
Mark A. Lance, Melbourne, Australia, assignor to W.A. Deutscher Proprietary Limited, Moorabbin, Australia

Filed Aug. 13, 1986, Ser. No. 896,123

Claims priority, application Australia, Aug. 14, 1985, PH1937
Int. Cl.⁴ G01K 5/00

U.S. Cl. 116—137 R

3 Claims



1. A whistle formed as a one-piece molding, comprising an elongated body having first and second lengthwise extending sound producing chambers arranged in a side-by-side contiguous relationship, an open mouth of each of said chambers being located at one end of said body, a closed end of each of said chambers being located at a second end of said body, said first chamber being substantially longer in length than said second chamber in order to permit said first and second chambers to simultaneously produce a sound in a low and high frequency range respectively, a mouthpiece extending angularly from said one end of said body, first and second open ended passages formed through said mouthpiece and arranged so that each passage has an inner end located adjacent the open mouth of a respective one of said chambers, each said passage being arranged so that a stream of air passing therethrough emerges from said inner end thereof to pass in a straight path across the adjacent open mouth of said respective one of said chambers, said path having a direction which is angularly disposed relative to a longitudinal direction of the respective one of said chambers, each passage of said mouthpiece thereby directing the produced sound of said respective one of said chambers forwardly of said elongate body, and said passages being arranged so that air blown into said mouthpiece passes simultaneously through each said passage, a clip formed integral with said elongate body and comprising a flat plate-like member which is attached to said body at said one end of said body to produce a resilient relationship between said body and said clip, and a cord attaching means provided in said elongated

body comprising a third passage extending through the body in a direction transverse to said longitudinal direction of said chambers, said third passage being disposed adjacent said closed ends of said lengthwise extending chambers.

4,709,652

PNEUMATIC AUDIO SWEEP GENERATOR

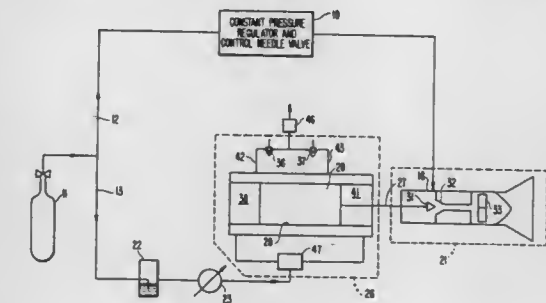
Harold E. Douglass, Jr., Hanover, and Joseph W. Mahaffee, III, Bowie, both of Md., assignors to The United States of America as represented by the director of the National Security Agency, Washington, D.C.

Filed Jan. 16, 1985, Ser. No. 691,963

Int. Cl.⁴ G10K 7/06

U.S. Cl. 116—140

11 Claims



1. An audio apparatus, comprising:
 - air-actuated means for generating an audio tone, the volume of said tone being dependent upon the rate of air flow and the frequency of said tone being dependent upon the velocity of air flow;
 - a source of compressed air;
 - a first conduit connecting said air source and said generating means;
 - means within said first conduit for regulating the rate of air flow therethrough;
 - air-actuated means for varying the velocity of air passing through said generating means;
 - said air-actuated means having periodically varying means to fluctuate said rate of air flow and thereby sweep frequencies periodically;
 - a second conduit connecting said velocity varying means and said air source; and
 - means within said second conduit for regulating the pressure of air to said velocity-varying means.

4,709,653

MECHANICAL FLUID INDICATOR

Lothar H. Salomon, 1813 Jack Frost Rd., Virginia Beach, Va. 23455

Filed Mar. 29, 1983, Ser. No. 466,892

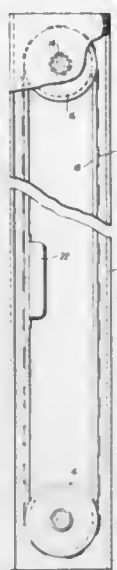
Int. Cl.⁴ G01F 23/30

U.S. Cl. 116—228

3 Claims

1. In a mechanical fluid depth indicator for measuring the level of liquid held in a tank from the top of the tank of the type comprising a first pulley mounted at the top of the depth indicator and a second pulley mounted at the bottom of said depth indicator with an endless belt having a float and marking elements affixed thereto extending about the pulleys such that when the depth indicator is in a liquid the float will rise and fall with the liquid to thereby drive the belt about the pulleys and allow one to read the amount of liquid in the tank from the marking elements, the improvement wherein:
 - said fluid depth indicator further comprising a single tube extending its entire length, said tube having holes machined in its walls at both ends thereof and a first shaft means mounted in the holes at one end thereof and a second shaft means mounted in the holes at the other end

thereof, said first and second shaft means respectively rotatably mounting said first and second pulleys thereon



inside said tube so that said belt and its attachments are entirely inside said tube.

4,709,654

INDICATOR FOR LOOSE LUG NUTS

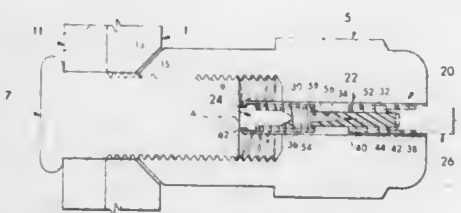
Stanley R. Smith, 8174 Tempest Ridge Way, Parker, Colo. 80134

Filed Aug. 15, 1986, Ser. No. 896,729

Int. Cl.⁴ G01D 5/00

U.S. Cl. 116—283

13 Claims



1. A device primarily intended for use as an indicator that an object such as a lug nut has come loose and moved away from a preferred tight position relative to another object such as a stud on an automobile axle, said device including:

a channel member having a channel therein extending along an axis,

a follower member dimensioned to be slideably received in said channel for movement relative to said channel member between a cocked position and an uncocked position, an indicator member dimensioned to be slideably received in said channel for movement relative to said channel member between a cocked position and an uncocked position, first means for biasing said follower member in a first direction toward its uncocked position,

second means for biasing said indicator member in a direction substantially opposite said first direction and toward its uncocked position, said follower member and said indicator member being farther apart from each other when in the respective uncocked positions than in the respective cocked positions and said follower member abutting against one of said objects and being moved against the force of the first biasing means to its cocked position when the objects are moved together into the preferred tight position,

said device further includes means for holding said indicator member in its cocked position against the force of the second biasing means when said follower member is in its

cocked position and means for releasing said indicator member to move to its uncocked position under the force of the second biasing means when said follower member is moved under the force of the first biasing means away from its cocked position in response to said objects moving away from the preferred tight position whereby the indicator member is held in its cocked position when the two objects are in the preferred tight position and the indicator member is moved under the force of the second biasing means to its uncocked position when the two objects move apart, the movement of the indicator member to its uncocked position serving to indicate that the two objects have moved relative to each other away from the preferred tight position, and

said channel in said channel member has two chambers spaced from each other along said axis with a passageway interconnecting the two chambers, said passageway being smaller than either chamber wherein at least a portion of said follower member is slideably received in one of said chambers as said follower member moves between its cocked and uncocked positions, at least a portion of said indicator member is slideably received in the other chamber as said indicator member moves between its cocked and uncocked position, and only a portion of one of said follower and indicator members is slideably received at any one time in said interconnecting passageway as said follower and indicator members move between their cocked and uncocked positions.

4,709,655

CHEMICAL VAPOR DEPOSITION APPARATUS

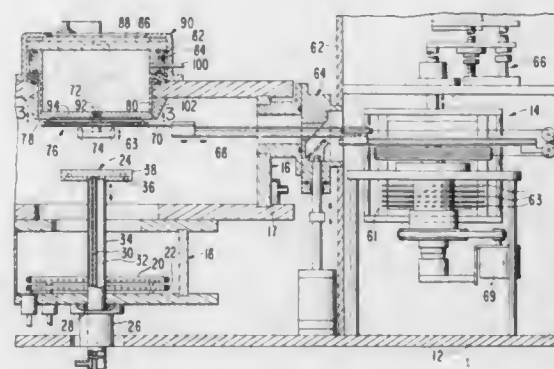
Max Van Mastrigt, San Jose, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 3, 1985, Ser. No. 805,029

Int. Cl.⁴ C23C 16/46, 16/50

U.S. Cl. 118—719

20 Claims



1. An apparatus for chemical vapor deposition on a workpiece comprising:

a deposition reaction chamber;

a gas mixing chamber communicating with said deposition reaction chamber;

connection means for connecting a vacuum pumping means to said deposition reaction chamber;

gas distribution means for introducing gas into said gas mixing chamber;

adjustable baffle means between said gas mixing chamber and said deposition reaction chamber for controlling the flow of gas from said gas mixing chamber into said deposition reaction chamber, said adjustable baffle means including a generally flat thin body attached near the center of said flat thin body to a slender support;

chuck means for controlling the temperature of a workpiece, said chuck means being located within said deposition reaction chamber; and

wafer holding means for holding a workpiece against said chuck means.

4,709,656

LAYER FORMING APPARATUS

Yasutomo Fujiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

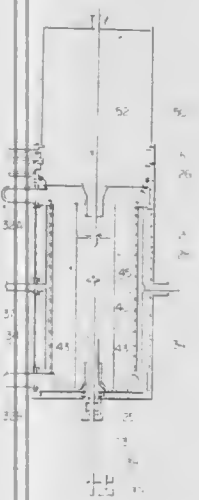
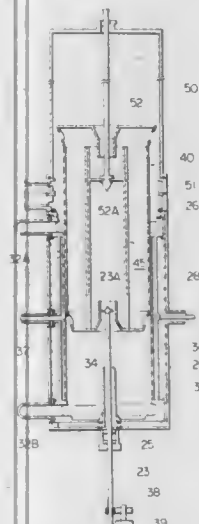
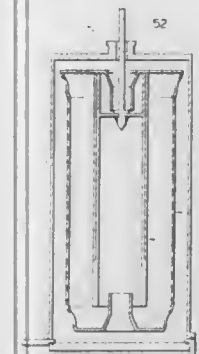
Filed Nov. 14, 1985, Ser. No. 798,188

Claims priority, application Japan, Nov. 21, 1984, 59-244376

Int. Cl.⁴ B05D 3/06

U.S. Cl. 118—723

1 Claim



1. A layer forming apparatus comprising:
a conveyor chamber including:
a space for receiving a cassette, said cassette having means

for receiving a substrate on which a film is to be formed; loading means for inserting and removing the cassette in and out of the space in said conveyor chamber; and first gate valve means for allowing the cassette to be inserted into or removed from the space in said conveyor chamber, and enabling said conveyor chamber to be sealed airtight; and

a film forming chamber including:

a space for receiving the cassette being defined by an interior surface wall of said film forming chamber, said interior surface constituting a wall electrode;

positioning means for positioning the cassette at a predetermined position in the space of said film forming chamber;

electrode means electrically connected to said wall electrode;

gas introduction means formed in said wall for introducing gas into said film forming chamber;

gas supply means connected to the gas introduction means for supplying reaction gas into the space formed in said film forming chamber; and

second gate valve means for allowing the cassette to be moved between said chambers while maintaining said film forming chamber airtight, the moving of said cassette between said conveyor chamber and said film forming chamber being performed by opening said first and second gate valve means without allowing atmosphere to enter either chamber.

4,709,657

AQUATIC VIEWING SYSTEM

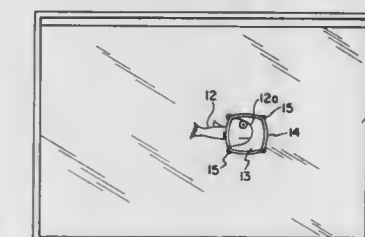
Patrick G. Gothard, Casper, Wyo., assignor to Aquarium Pharmaceuticals, Inc., Chalfont, Pa.

Filed Apr. 9, 1986, Ser. No. 849,878

Int. Cl.⁴ A01K 63/00

U.S. Cl. 119—5

13 Claims



9. An aquatic viewing system for enabling a person to view magnified images of marine life contained in an aquarium, said aquatic viewing system comprising in combination:

(a) an aquarium having at least one transparent face, said aquarium containing an aqueous medium and marine life in said medium;

(b) a magnifying lens; and

(c) mounting means attached to the periphery of said lens; wherein said mounting means is adapted to be detachably mounted to said face of said aquarium;

wherein said magnifying lens is adapted to be moved to any desired viewing location on said face by detaching said mounting means from said face and re-positioning said mounting means and lens at said desired viewing location.

4,709,658

CAGE ANCHOR FOR WATERING DEVICE

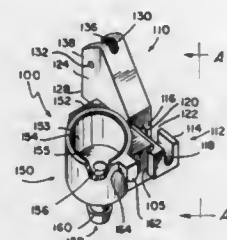
Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.

Filed Jan. 4, 1985, Ser. No. 688,722

Int. Cl.⁴ A01K 31/00

U.S. Cl. 119—18

33 Claims



1. Means for supporting a watering device about first and second intersecting wire elements on an enclosure formed from a plurality of intersecting wire elements, comprising:

a retaining portion for receiving said first and second intersecting wire elements, said retaining portion including first wire engaging means for engaging said first wire element and second wire engaging means for engaging said second wire element, said second wire engaging means having at least two spaced apart slots with oppositely disposed openings for receiving said second wire element, said wire elements being received by said first and second wire engaging means in a cooperating manner with respect to said retaining portion so as to restrict motion of said watering device with respect to said enclosure.

4,709,659

BALLISTIC AND FORCED ENTRY RESISTANT BARRIER

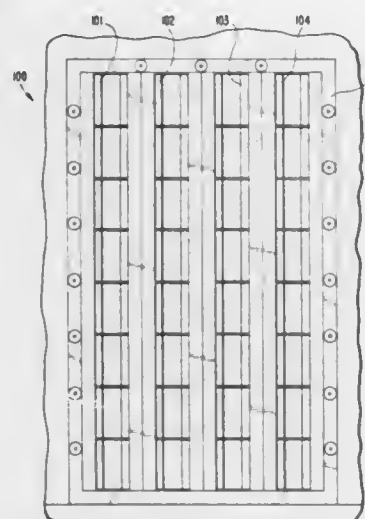
Jeffrey B. Quante, III; Steven C. Scoggin; Dennis L. Maxwell, all of Montgomery; Marvin W. Rosenkoetter, Elmore, and James J. Ferencik, Prattville, all of Ala., assignors to Norment Industries, Inc., Montgomery, Ala.

Filed Sep. 30, 1985, Ser. No. 781,783

Int. Cl.⁴ E06B 7/30

U.S. Cl. 109—21.5

18 Claims



1. A forced entry and ballistic resistant barrier comprising a plurality of attached adjacent segments, each of said segments comprising:

a first pair of longitudinally elongated C-shaped channels

positioned so that their concave sides are diametrically opposed;

a longitudinally elongated flat bar positioned between said first pair of C-shaped channels such that a first end portion of the width of said flat bar is surrounded by one of said channels, a second end portion of the width of said flat bar is surrounded by the other of said channels, and a central portion of the width of said flat bar which is not surrounded by either of said channels, thereby allowing the circulation of air from one side of said flat bar to the opposite side while prohibiting the passage of projectiles from one side to the other;

positioning means for rigidly positioning both said first pair of channels in said diametric position and said flat bar between said first pair of channels; and

a second pair of longitudinally elongated C-shaped channels concentrically positioned about said first pair of C-shaped channels such that one channel of said second pair overlaps a convex portion of one channel of said first pair, and the other channel of said second pair overlaps a complementary convex portion of the other channel of said first pair, thereby allowing increased circulation of air from one side of said segment to the other, wherein said second pair of channels are rigidly positioned by said positioning means.

4,709,660

INSTRUMENT AND METHOD FOR ACCESSING VESSELS AND TISSUES WITHIN ANIMALS

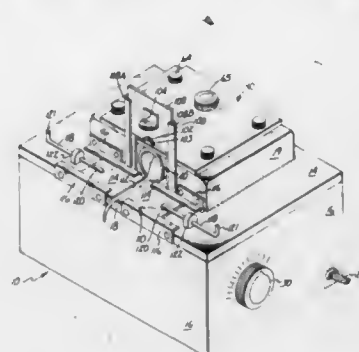
William J. M. Hrushesky, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 5, 1985, Ser. No. 720,423

Int. Cl.⁴ A61D 3/00

U.S. Cl. 119—103

33 Claims



15. A laboratory instrument to assist a technician in gaining access to vessels and tissues within a tail of an animal used for experimentation, comprising:

a base;

restrainer means mounted to the base for restraining movement of the animal;

window means positioned on the base adjacent to the restrainer means for supporting the tail and for propagating light to the tail;

light means mounted with respect to the window means for impinging light upon the window means to transilluminate the tail and make vessels and tissues therein visible; and shutter means mounted with respect to the window means and forming an aperture through which light is propagated to the tail.

4,709,661

WASTE BAG

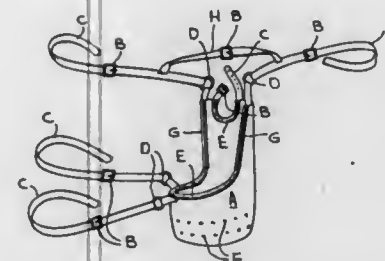
Johnny D. Mayle, Jr., Rte. 2, Box 217, Petersburg, W. Va. 26847

Filed Jul. 21, 1986, Ser. No. 847,040

Int. Cl.⁴ A01K 23/00

U.S. Cl. 119—95

7 Claims



1. A waste receptacle for attachment to a horse to collect solid waste excretions, said waste receptacle comprising:

a bag having a bottom portion and a back portion, said bottom portion having a generally cup-like configuration with an open top, said cup-like configuration having a forward side adapted for disposition between the horse's legs and under the horse's belly, and a rearward side, said back portion being integral with said bottom portion and extending generally upward from said rearward side of said bottom portion toward the tail of the horse, said back portion having an upper end and first and second generally vertically-extending edges;

reinforcement means for flexibly reinforcing said first and second edges of said back portion to permit said first and second edges to follow the contour of the horse's hips;

tail engaging means for securing the upper end of said back portion to the horse's tail;

first and second upper strap members secured to said back portions proximate said upper end and adapted to extend along opposite sides of the horse's back to engage a waistband secured about the horse's waist; and

third and fourth strap members secured proximate the forward side and open top of said bottom portion and adapted to extend from between the horse's legs along the horse's belly to engage the waistband.

4,709,662

FLUIDIZED BED HEAT GENERATOR AND METHOD OF OPERATION

Albert H. Rawdon, Shrewsbury, Mass., assignor to Riley Stoker Corporation, Worcester, Mass.

Filed Jan. 20, 1987, Ser. No. 5,114

Int. Cl.⁴ F22B 1/02

U.S. Cl. 122—4 D

21 Claims

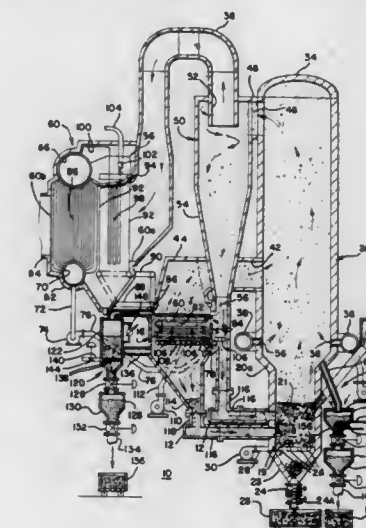
1. In a heat generating system including a combustion vessel having a fluidized bed containing large size solid particles normally permanently residing therein for providing a dense, multi-size solids fluidized bed section and including recirculating solid particles of smaller size moving through said dense bed section, a source of fluidizing and combustion gas introduced into said vessel and discharged therefrom along with said recirculating smaller solid particles and a fuel injector for supplying fuel for combustion to generate heat absorbed by said solid particles in said vessel; the improvement comprising,

first separator means for removing said recirculating smaller size solid particles of a selected upper size range thereby preventing segregation of said upper size range particles in said dense bed section when a reduced flow rate of fluidizing gas is moving through said dense bed section at a reduced combustion load,

said large size particles of said dense bed section comprising particles having a size range of approximately 6000 microns to 15,000 microns and said recirculating smaller size

particles having a size range of approximately 50 microns to 500 microns, and wherein

said first separator means is positioned remotely of said combustion vessel and includes means for removing solid



particles having a size range of approximately 500 microns to 1000 microns from said recirculating smaller size particles to be recycled back to said dense bed section of said combustion vessel.

4,709,663

FLOW CONTROL DEVICE FOR SOLID PARTICULATE MATERIAL

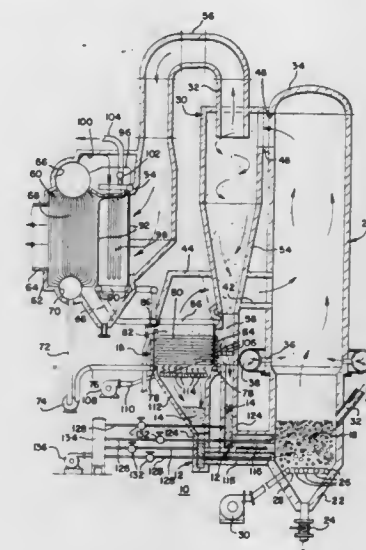
John W. Larson, Sturbridge, and Ronald W. Breault, Paxton, both of Mass., assignors to Riley Stoker Corporation, Worcester, Mass.

Filed Dec. 9, 1986, Ser. No. 939,819

Int. Cl.⁴ F22B 1/00

U.S. Cl. 122—4 D

28 Claims



1. Flow control apparatus for feeding recycled particulate solid material into a fluidized bed combustion vessel, said apparatus comprising:

a generally horizontal material feeder conduit having an outlet end in communication with said fluidized bed combustion vessel and a receiving end remote from said vessel; an upstanding material collector conduit having a lower end

in communication with said receiving end of said feeder conduit and an upper end for receiving a flow of said granular solid material to be recycled back into said combustion vessel, said upstanding collector conduit forming a standpipe adapted to retain a quantity of said granular solid material to establish a pressure sealing head of solid material extending in a column upwardly of said receiving end of said feed conduit; and

gas assisted flow initiating control means extending into said feeder conduit having a discharge outlet spaced between said outlet end of said feeder conduit and said receiving end thereof that is supplied with solid material from said standpipe for directing of a flow of pressurized gas into said solid material in said feeder conduit to fluidize the solid material for travel into said combustion vessel through said outlet end of said feeder conduit.

4,709,664

METHOD FOR DETERMINING THE EXISTENCE OF PHOSPHATE HIDEOUT

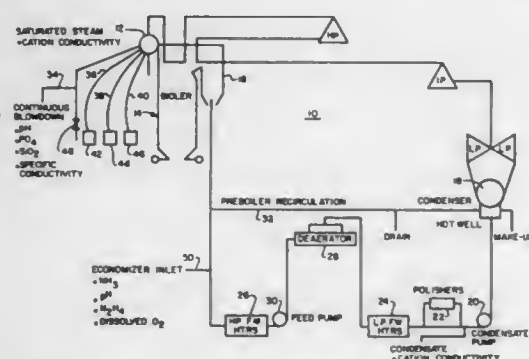
Ronald J. Barto, West Hartford; Stephen L. Goodstine, Windsor, and Frank A. Noto, East Windsor, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 3, 1986, Ser. No. 926,058

Int. Cl.⁴ F22B 37/18, 37/48

U.S. Cl. 122—379

15 Claims



1. A method for determining the existence of phosphate hideout in a steam generating steam cycle comprising the steps of:

- determining from the concentration of PO₄ that is provided to the steam generating steam cycle the input of PO₄ to the steam generating steam cycle;
- determining the loss of PO₄ from the steam generating steam cycle that is attributable to blowdown and solubility and contamination; and
- determining whether phosphate hideout is present by comparing to the input of PO₄ to the steam generating steam cycle the loss of PO₄ from the steam generating steam cycle that is attributable to blowdown and solubility and contamination.

4,709,665

HIGH TEMPERATURE VIBRATION ISOLATING MOUNT

Michael E. Ewbank, Rockford, and Henry F. Johnson, Rockton, both of Ill., assignors to Sandstrand Corporation, Rockford, Ill.

Filed Dec. 22, 1986, Ser. No. 944,760

Int. Cl.⁴ F22B 37/24

U.S. Cl. 122—510

9 Claims

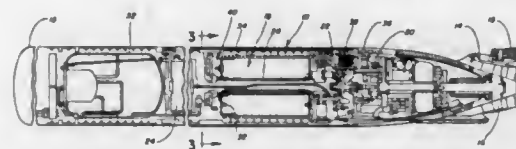
1. A vibration isolating mount for use in high temperature environments comprising:

- a first element adapted to be connected to a source of radiant energy, said first element having a side adapted to face said source;

a first elastomeric pad secured to said side of said first element;

a second element adapted to be secured to a base and spaced from said first element sufficiently to be in non contacting relation therewith, said second element having a side adapted to face said source;

a second elastomeric pad secured to said side of said second element; and



an intermediate element having a first side facing said source and a second side facing said sides of said first and second elements and being spaced from both said elements sufficiently to be in non contacting relation therewith, said second side being secured to said pads so that said intermediate element and the first side thereof are interposed between said source and said pads to shade said pads from radiant energy from said source.

4,709,666

REGULATABLE FAN DRIVE

Johann Merz, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, Ag., Friedrichshafen, Fed. Rep. of Germany

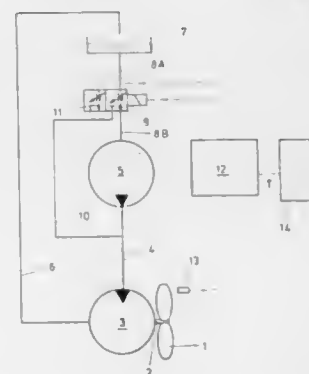
Filed Mar. 6, 1986, Ser. No. 836,982

Claims priority, application PCT Int'l Appl., Mar. 14, 1985, PCT/EP85/00104

Int. Cl.⁴ F01P 5/04

U.S. Cl. 123—41.12

14 Claims



1. A regulatable drive for the cooling fan (1) of an internal combustion engine/14 comprising a tank (7) for holding a fluid, a pump (5) and a fluid motor (3) in sequential connection whereby fluid from said tank is pumped to said fluid motor for driving said fan, said pump having a suction side connecting to said tank and said fluid motor having a suction side connecting to the pressure outlet of said pump;

the improvement which comprises:

pump suction passage means (8A, 8B) from said tank to the suction side of said pump, and a regulatable valve means (9) in said pump suction passage means;

a fluid motor suction passage means (4) from the pressure outlet of said pump to the suction side of said fluid motor; a bypass passage (10) connecting said latter passage means (4) to said regulatable valve means (9);

said regulatable valve means comprising movable control means (16) movable from a position to effect flow from said tank to the suction side of said pump and thence to said fluid motor to drive said fan, and in another position to bypass flow through said bypass passage from the

pressure outlet of said pump to therethrough via said regulatable valve means to regulate fan speed.

4,709,667

OIL SUPPLY DEVICE FOR VALVE OPERATING SYSTEM HAVING HYDRAULIC TAPPET IN INTERNAL COMBUSTION ENGINE

Ellchi Ichihara, Shikujii, and Itsuo Iwai, Shinminato, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Tanaka Machine Industries Co., Ltd., Toyama, both of Japan

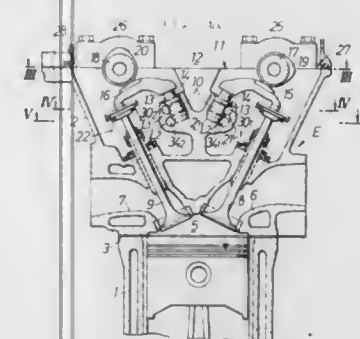
Filed May 13, 1986, Ser. No. 862,722

Claims priority, application Japan, May 14, 1985, 60-102057

Int. Cl.⁴ F01M 1/16

U.S. Cl. 123—90.34

11 Claims



1. An oil supply device for a valve operating system having hydraulic tappets in an internal combustion engine, in which a combustion chamber and intake and exhaust ports communicating with the combustion chamber are formed in a cylinder head of an engine body, and valve operating cams for operating intake and exhaust valves for opening and closing the intake and exhaust ports are mounted on a valve operating cam shaft, and in which hydraulic tappets are incorporated in the interlocking portion between said valve operating cams and said intake and exhaust valves, wherein an oil supply line for supplying a working oil into said hydraulic tappet and a lubricating oil line for supplying lubricating oil to those portions of said valve operating cam shaft which are to be lubricated are juxtaposed in said cylinder head, and first and second flow rate control orifice means are respectively provided on the ways of said oil supply line and said lubricating oil line, said oil supply line and lubricating oil line being connected in a row to a main oil passageway connected to a source of a hydraulic oil upstream of said first and second orifice means, said cylinder head being securely connected on a cylinder block of said engine body by means of a head bolt, and said oil supply line has a oil supply passage communicating with said main oil passageway, and wherein said first orifice means is disposed with one end thereof engaged with a locking stepped portion formed in said oil supply passage and with the other end surface thereof faced to the outer surface of said head bolt.

4,709,668

SELF-ADJUSTING HYDRAULIC VALVE TAPPET

Horst Klug, Wolfgang Mockler, George Schaeffler, all of Herzogenaurach, and Walter Speil, Ingolstadt, all of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Continuation of Ser. No. 785,448, Oct. 5, 1985, abandoned. This application May 22, 1987, Ser. No. 53,087

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 3437478

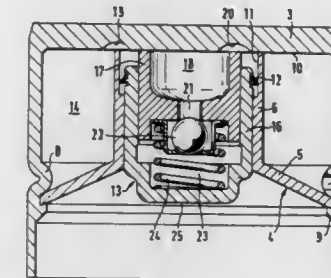
Int. Cl.⁴ F01L 1/24

U.S. Cl. 123—90.55

11 Claims

1. A self-adjusting hydraulic valve tappet arranged in a bore of a cylindrical guide bore of a cylinder head of an internal combustion engine, the tappet comprising a cup shaped hous-

ing comprised of a hollow cylindrical wall closed at one end by an end member against the outside of which a cam of a cam shaft abuts and a cylindrical guide sleeve concentric with the cylindrical wall and arranged in the center of an annular flange element which at its outer circumference merges into the cylindrical wall of the housing and defines an annular oil reservoir between the cylindrical wall, the end member, the cylindrical guide sleeve, and the annular flange element, the oil reservoir being supplied with oil through a bore leading to the



outside of the housing, a self-adjusting hydraulic play compensating element being guided for longitudinal movement in the guide sleeve and bearing with an end face opposite to the end member against the end of the valve stem, characterized in that the cylindrical guide sleeve and the annular flange element are made in one piece as a separate part and the cylindrical guide sleeve extends to the end member of the housing and contacts the inner face thereof, whereby the guide sleeve is supported and provides additional stability.

4,709,669

IGNITION ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE OF A HANDHELD PORTABLE TOOL

Michael Wissmann, Schorndorf-Weiler; Jürgen Weber, Waiblingen, and Hans Nickel, Cottenweiler, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

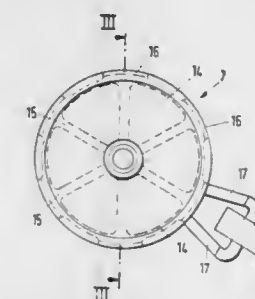
Filed Sep. 12, 1986, Ser. No. 907,045

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535477

Int. Cl.⁴ F02P 3/00

U.S. Cl. 123—149 D

17 Claims



1. An ignition arrangement for an internal combustion engine of a handheld portable tool, the engine having a crankshaft and the ignition arrangement comprising: a permanent magnet having at least one pole shoe; a fan wheel mounted on the crankshaft of the engine for rotation therewith and for generating a flow of cooling air for cooling the engine, the fan wheel including: an annular metal supporting member mounted on the crankshaft of the engine for rotation therewith and extending radially from the crankshaft; and a plastic disc-like member mounted on said supporting mem-

ber and defining a plurality of vanes for generating said flow of cooling air;
said supporting member being made of ferromagnetic material and having a plurality of projections formed thereon and extending therefrom so as to pass said one pole shoe as the crankshaft rotates;
said projections and said permanent magnet conjointly defining a magnetic circuit wherein the flux varies as said projections pass said pole shoe; and,
igniting spark generating means operatively connected to said permanent magnet and responsive to the variations in said flux for generating a spark for the engine.

4,709,670

FASTENING ARRANGEMENT OF A COVER HOOD AT A CYLINDER HEAD

Herbert Ampferer, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Dr. Ing.h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

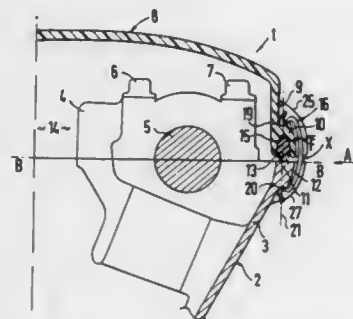
Filed May 29, 1986, Ser. No. 868,322

Claims priority, application Fed. Rep. of Germany, May 29, 1985, 3519205

Int. Cl.⁴ F02F 7/00

U.S. Cl. 123—195 C

18 Claims



1. A fastening arrangement of a cover hood at a cylinder head of an internal combustion engine, comprising detachable retaining means, and seal means provided between sections of the cylinder head and of the cover hood which are placed adjacent one another, the retaining means being formed by spring clamps exhibiting mutually facing nose-shaped support areas which apply resilient clamping forces in a clamping direction corresponding to a line through said nose-shaped support areas, said spring clamps being disposed such that the nose-shaped support areas engage in adjacent mounting recesses provided in substantially vertical boundary walls of the cover hood and of the cylinder head in such a manner that the clamping direction of action of the support areas of the spring clamps lies approximately on a vertical line that includes substantially a center line of the sections and of the sealing means.

4,709,671

OUTBOARD MOTOR PROVIDED WITH A FOUR-STROKE ENGINE

Yukio Sumigawa, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 650,291, Sep. 12, 1984, Pat. No. 4,611,559.

This application May 8, 1986, Ser. No. 860,848

Claims priority, application Japan, Sep. 13, 1983, 58-167425; Sep. 13, 1983, 58-167426

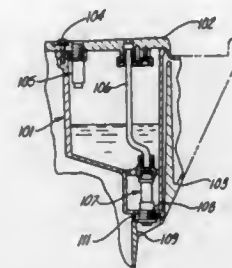
Int. Cl.⁴ F01M 1/00

U.S. Cl. 123—196 S

6 Claims

1. In an outboard motor having a power head containing an internal combustion engine, a drive shaft housing depending from said power head, said drive shaft housing having an outer wall enclosing a drive shaft driven by said engine and a lower unit depending from said drive shaft housing and containing

propulsion means driven by said drive shaft, the improvement comprising an oil reservoir formed by upstanding walls formed



integrally with said drive shaft housing outer wall for supplying lubricant to said engine.

4,709,672

COMBUSTION CHAMBER FOR AN INTERNAL-COMBUSTION ENGINE

Shiro Ishida, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

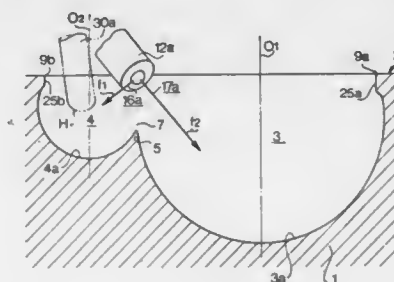
Filed May 19, 1986, Ser. No. 864,673

Claims priority, application Japan, May 21, 1985, 60-106944; Nov. 29, 1985, 60-267401; Dec. 13, 1985, 60-278879

Int. Cl.⁴ F02B 23/08

U.S. Cl. 123—256

35 Claims



1. A combustion chamber for an internal-combustion engine, comprising:

- a main combustion chamber defined by a first recess in the top surface of the crown of a piston;
- an auxiliary combustion chamber defined by a second recess in the top surface of the crown of said piston beside said main combustion chamber, the volume of said auxiliary combustion chamber being smaller than the volume of said main combustion chamber;
- a connecting part between said main combustion chamber and said auxiliary combustion chamber;
- fuel injecting means disposed in said connecting part between said main combustion chamber and said auxiliary combustion chamber, and having an auxiliary nozzle hole for injecting fuel into said auxiliary combustion chamber during all running conditions of the engine, and a main nozzle hole for injecting fuel into said main combustion chamber only when the engine is operated under running heavier than a light engine load condition; and
- ignition assisting means extending into said auxiliary combustion chamber for assisting in igniting the fuel.

4,709,673

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Rudolf Babitzka, Kirchberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

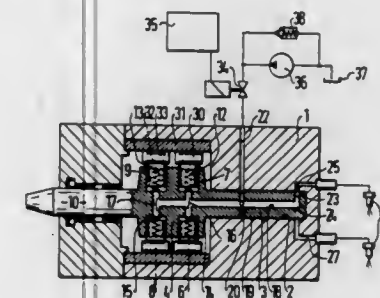
Filed Aug. 8, 1985, Ser. No. 763,595

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 3437933

Int. Cl.⁴ F02M 41/14

U.S. Cl. 123—299

11 Claims



1. A fuel injection apparatus for internal combustion engines having a rotationally driven distributor supported in a distributor cylinder, at least one pump piston operative in a first pump cylinder arranged to enclose a first pump work chamber in said driven distributor and at least one second pump piston operative in a second pump cylinder arranged to enclose a second pump work chamber in said driven distributor, said first pump cylinder being located in a first radial plane and said second pump cylinder being located in a second radial plane with said pump cylinders angularly offset with respect to each other, said distributor further having a first distributor opening and a second distributor opening positioned angularly relative to each other, said distributor openings adapted during the course of distributor rotation to coincide successively with injection lines which extend from said distributor cylinder to injection locations of said engine, said openings further arranged to communicate via pressure lines (23, 24) in said distributor with one end of an axially extending distributor line 18 which communicates with said first pump work chamber (14) and said second work chamber (15) at its other end, each of said pump work chambers being connectable in succession via said one distributor line 18 and a common intake line in said distributor with a fuel supply line 22 provided with a metering device (34) in said fuel supply line, a cam ring (31) with radially arranged cams (39) that extend longitudinally of said cam ring in proximity to said at least one first and second pump pistons of said first and second pump cylinders, a pump drive mechanism 10 for rotation of said distributor and to generate in synchronism thereto a reciprocating movement of said pump pistons relative to said cam ring, and said pump pistons (12, 13) are positioned angularly relative to each other such that the angular interval of the distributor openings (24, 26) are such that said first pump piston (12) is actuated by the associated cams (39) by this angular interval offset from the actuation of said second pump piston (13).

4,709,674

SYSTEM FOR AUTOMATICALLY CONTROLLING THE IDLING SPEED OF AN INTERNAL COMBUSTION ENGINE

Valerio Bianchi, Crespellano, and Carlo Conticelli, Bologna, both of Italy, assignors to Weber S.p.A., Turin, Italy

Filed Jun. 9, 1986, Ser. No. 872,173

Claims priority, application Italy, Jun. 11, 1985, 67544 A/85

Int. Cl.⁴ F02D 41/16

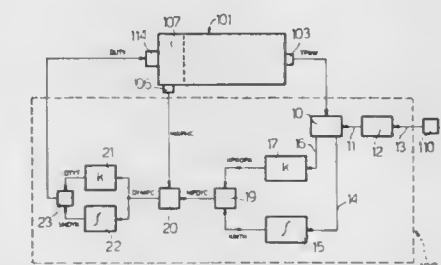
U.S. Cl. 123—339

22 Claims

1. A system for automatically controlling the idling speed of an internal combustion engine (101) within an idling speed range, said system comprising a valve (114) for supplying an

adjustable quantity of additional air, characterized by the fact that it comprises means (102) for controlling the setting of said valve (114) as a function of a detected speed of said engine (101) and comparison of the detected engine speed with an idling speed range, and further as a function of a detected pressure in an intake manifold (107) and comparison of the detected intake manifold pressure with a value equivalent to the required air supply

wherein said control means (102) comprises means (29) for detecting a deceleration rate of said engine (101) and for



thereafter calculating dynamic limits which exceed preset static limits of said idling speed range, said control means further comprising means (31) for determining whether said deceleration rate is below a given threshold value, or whether a mean speed over a predetermined number of previous strokes on said engine (101) is within said static limits of said range, and, if either condition is true, for saving said static range limits for future calculations, and otherwise saving said dynamic limits for future calculations.

4,709,675

GOVERNOR FOR SMALL SIZE VEHICLE

Minoru Fujita, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

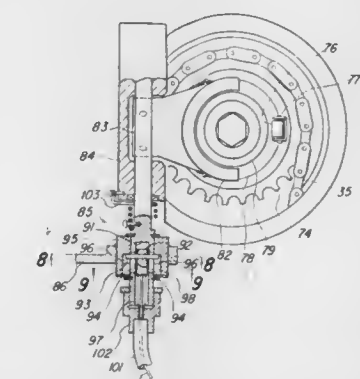
Filed Mar. 11, 1986, Ser. No. 838,466

Claims priority, application Japan, Mar. 12, 1985, 60-47498; May 7, 1985, 60-95614

Int. Cl.⁴ F02D 31/00

U.S. Cl. 123—376

28 Claims



1. An overhead valve internal combustion engine having a cylinder block and a crankcase jouralling an output shaft, a cylinder head affixed to said cylinder block, intake and exhaust valves carried by said cylinder head, an induction system including an intake port formed in said cylinder head and communicating with a combustion chamber through said intake valve, and means fixed to said cylinder head for supplying a charge to said intake port including speed control means operative to control engine speed, said speed control means

being positioned remotely from said engine output shaft and in proximity to said cylinder head, an auxiliary engine shaft journaled by said cylinder head and driven with said engine output shaft, governor means driven by said auxiliary engine shaft and providing a speed responsive signal, and linkage means operatively connecting said governor means to said speed control means for automatic speed control of said engine.

4,709,676

FUEL SUPPLY SYSTEM FOR TURBOCHARGED INTERNAL COMBUSTION ENGINE

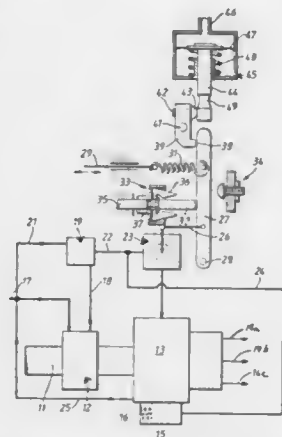
Michael L. Monaghan, Shoreham-By-Sea, England, assignor to Ricardo Consulting Engineers plc, West Sussex, England
Filed Apr. 15, 1986, Ser. No. 852,135

Claims priority, application United Kingdom, Apr. 15, 1985, 8509558

Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—383

13 Claims



1. An improved fuel-supply system for a fuel-injected turbocharged internal-combustion engine, including means for improving acceleration response at low boost pressure with minimal smoking, said system comprising in combination: a fuel pump; a fuel distributor; a control valve; and fuel-injection timing means operably associated with said fuel distributor, for determining the timing of fuel distributed thereby; said means for improving acceleration response including a control unit and fluid-conduit means coupling said fuel pump to said fuel distributor via said control valve to convey combustion fuel serially therebetween; said fuel distributor being of a type to supply a predetermined quantity of fuel sequentially to individual injectors associated with individual cylinders of said engine under timing control by said injection timing means; means for sensing fuel pressure from said fuel pump and applying said pressure sense to said control unit, and for applying said pressure sense from said control unit to said fuel-injection timing device, for controlling the timing operation thereof by which fuel is supplied by said distributor to said injectors; said control unit including an actuating member; means for applying biasing forces to said actuator as a function of the amount of turbocharger boost pressure present and as a function of engine accelerator position; and means associated with said control unit and responsive to said actuator member, for modifying the fuel pressure sense applied to said injection timing device in response to said biasing forces in a manner causing retarding of the timing of the fuel injection to said engine when the latter is subjected to a demand for increased fuelling at boost pressure below a predetermined minimum level.

4,709,677 FUEL CONTROL SYSTEM FOR AIR-FUEL MIXTURE SUPPLY DEVICES

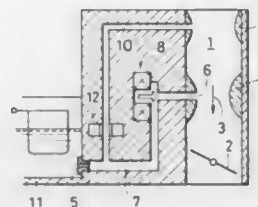
Tetsuo Muraji, Odawara, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 880,877

Claims priority, application Japan, Jul. 5, 1985, 60-146627
Int. Cl.⁴ F02M 7/18

U.S. Cl. 123—438

16 Claims



1. A fuel control system for air-fuel mixture supply devices, comprising:

- an intake mixture passageway having a first negative pressure generating section and a second negative pressure generating section disposed upstream of said first negative pressure generating section for generating a negative pressure weaker than that generated in said first negative pressure generating section;
- a fuel passageway having its one end opening in said first negative pressure generating section of said intake mixture passageway and having its other end connected, via a fuel metering jet, to a fuel supply source;
- a first electric fuel flow rate controlling means provided in association with said fuel passageway for controlling the flow rate of the fuel which should flow through said fuel passageway;
- a negative pressure passageway having its one end opening into said second negative pressure generating section of said intake mixture passageway and having its other end connected to said fuel passageway at a site located between said fuel metering jet and said electric fuel flow rate controlling means; and
- a level detecting means disposed at a site close to said negative pressure passageway and capable of generating an electric signal indicative of whether or not the level of the fuel column ascending through the negative pressure passageway is higher than a preset level by virtue of a difference between a fuel pressure in the region where said negative pressure passageway is connected to said fuel passageway and a negative pressure produced in said second negative pressure generating section, said first fuel flow rate controlling means being operated by a signal generated by said level detecting means, in order to control the rate of flow of the fuel which is to be supplied into said intake mixture passageway from said fuel passageway.

4,709,678

UNCERTAINTY DETECTOR IN FEED-BACK CONTROL SYSTEM BASED ON COMBUSTION PEAK POSITION DATA FOR INTERNAL COMBUSTION ENGINE AND IGNITION TIMING CONTROL HAVING PARTICULAR DETECTOR

Shizuo Yagi, Asaka; Makoto Kawai, Tokorozawa, and Yorihiya Yamamoto, Sbiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1986, Ser. No. 868,592

Claims priority, application Japan, May 31, 1985, 60-117769;
Aug. 9, 1985, 60-175179

Int. Cl.⁴ F02P 5/145

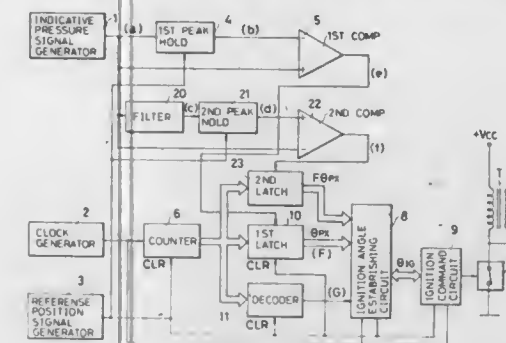
U.S. Cl. 123—425

13 Claims

1. In a feed-back control system for controlling an internal

combustion engine in response to an indicative pressure signal representing the inner pressure of the combustion chamber of the engine, the improvement which comprises:

- a reference position pulse generator for producing a reference pulse at each time when the crank angle of the engine reaches a predetermined reference position;
- a first peak detector for producing a first peak signal when a maximum peak appears in said indicative pressure signal;



- a filter for eliminating noises contained in said indicative pressure signal;
- a second peak detector for producing a second peak signal when a maximum peak appears in the filtered indicative pressure signal; and
- comparing means for comparing the crank angle at which said first and second peak signals occur so as to produce an uncertainty detection signal when said first and second peak signals appear at different crank angles.

4,709,679

MODULAR ACCUMULATOR INJECTOR

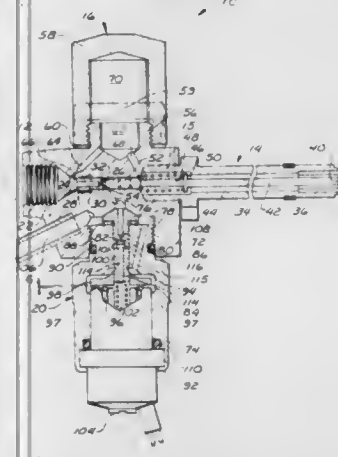
Ilija Djordjevic, Windsor, and Marco Ganser, Granby, both of Conn., assignors to Stanadyne, Inc., Windsor, Conn.

Filed Mar. 25, 1985, Ser. No. 715,354

Int. Cl.⁴ E02M 39/00

U.S. Cl. 123—447

21 Claims



1. An accumulator injector for a fuel injection system comprising:

- body means forming a control chamber, a bleed passage from said control chamber, and an accumulator passage to receive fuel at rail pressure and transfer said fuel to said control chamber and said accumulator passage;
- nozzle means mounted to said body means to receive pressurized fuel from said accumulator passage and to inject pressurized fuel, said nozzle means comprising discharge orifice means, a valve seat and an elongated valve needle engageable with said valve seat in response to pressure in said control chamber to prevent the passage of pressurized

fuel through said discharge orifice means and momentarily axially displaceable from said seat for injecting pressurized fuel through said discharge orifice means; auxiliary accumulator chamber means comprising a cap threadably removably mounted to said body means at the exterior thereof, said cap at least partially defining an auxiliary accumulator chamber communicating with said accumulator passage and said nozzle means to accumulate pressurized fuel; adaptor means for removable mounting to said body means, said adaptor means forming a receiving cavity and fuel return means communicable with said bleed passage; and solenoid valve means received in said receiving cavity and mounted to said adaptor means to selectively vent said bleed passage for communication with said fuel return means so that energization of said solenoid valve means causes a release of pressure from said control chamber and the momentary axial displacement of said valve needle to inject a discrete charge of pressurized fuel through said discharge orifice means.

4,709,680

DEVICE FOR CONTROLLING FUEL INJECTION APPARATUS IN DIESEL ENGINES

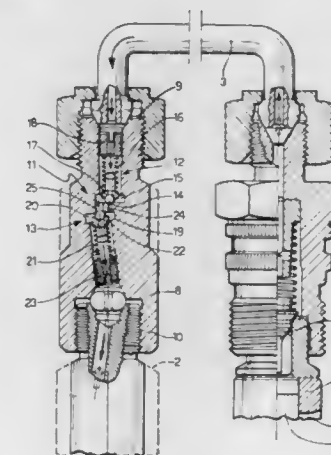
Sergio Turchi, Rivalta, and Renato Filippi, Nichelino, both of Italy, assignors to Weber S.p.A. Azienda Altecna, Turin, Italy
Filed Jun. 23, 1986, Ser. No. 877,074

Claims priority, application Italy, Jul. 2, 1985, 53563/85[U]

Int. Cl.⁴ F61M 39/00

U.S. Cl. 123—467

5 Claims



1. Fuel injection apparatus for diesel engines, comprising an injection pump, an injector nozzle, and a device including valve means which connects the pump to the nozzle and is intended to maintain a residual pressure of a predetermined magnitude between the valve means and the injector nozzle between each injection cycle and the next, wherein the valve means comprise a valve body having first and second opposed chambers connected in series between said pump and said nozzle by two parallel orifices, a non-return valve located in each chamber for controlling a respective orifice the orifice associated with the non-return valve located nearer the pump is open at one side in communication with the inlet of the injector and is closed at its other side by the obturator of the respective non-return valve in the direction of flow of the injected fuel, and the orifice associated with the non-return valve located nearer the injector is open on one side in communication with the outlet of the injection pump and is closed on its other side by the obturator of the respective non-return valve in the direction opposite the flow of injected fuel.

4,709,681

FUEL INJECTION DEVICE

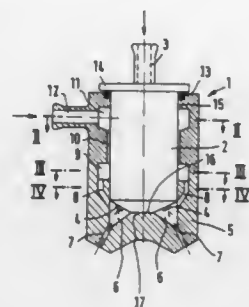
Tomas Rozsas, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany
Filed Feb. 19, 1987, Ser. No. 16,244

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1986, 3606918

Int. Cl.⁴ F01B 25/08

U.S. Cl. 123—531

6 Claims



1. A device for injection of a two-phase mixture composed of fuel and carrier air into intake pipes associated with individual cylinders of a multi-cylinder, mixture-compressing combustion engine, the device having carrier air apportioning means which apportion a carrier air current, branched off an intake manifold and conveyed by an air pump, to injection lines associated separately with the individual cylinders of the combustion engine and opening into the intake pipes thereof, and a fuel injection valve which injects fuel by way of separate injection nozzles into the individual injection lines, the carrier air apportioning means being provided with a carrier air collecting space formed in a housing containing the injection valve, said collecting space surrounding the injection valve in an annular manner so as to communicate, on the one hand, with the air pump and, on the other hand, with the injection lines, the device further comprising a carrier air reservoir provided between the carrier air collecting space and the injection lines so as to surround the injection valve in an annular manner, the carrier air reservoir communicating with the carrier air collecting space by means of a connecting line whose cross section is restricted.

4,709,682

DEVICE FOR CONTROLLING THE PRESSURE IN THE BEARINGS OF A ROOTS BLOWER SUPERCHARGER

Kichiro Kato, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

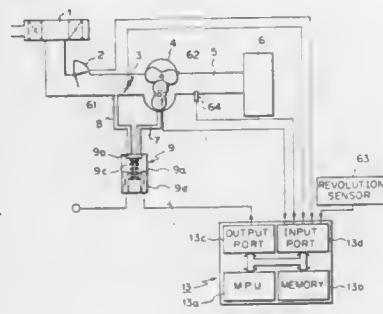
Filed Nov. 20, 1986, Ser. No. 932,565

Claims priority, application Japan, Dec. 3, 1985, 60-270748

Int. Cl.⁴ F02B 33/00

U.S. Cl. 123—559

7 Claims



1. A pressure controlling device for controlling pressure acting on bearings provided in a Roots blower type supercharger mounted on an internal combustion engine, said super-

charger having a housing formed with an inner wall to define a chamber therein, said bearings being provided in said housing and outside of said inner wall, two rotary shafts extending through said inner wall and provided with impellers which are housed in said chamber and mated with each other, said shafts being rotatably supported by said bearings, an annular sealing member being provided on an end face of at least one of said bearings to form an annular space between said at least one of said bearings and said inner wall, said annular space being communicated with the atmosphere through an air passage formed in said housing,

said pressure controlling device comprising:
a control valve connected to said air passage,
means for sensing an increase in load of said internal combustion engine, and
means for controlling said control valve to vary a flow passage area of said air passage according to said engine load,
said controlling means closing said valve to reduce said flow passage area for a predetermined period after said sensing means senses an engine load which is higher than a predetermined value.

4,709,683

INTERNAL COMBUSTION ENGINE WITH A POSITIVE DISPLACEMENT SUPERCHARGER MECHANICALLY DRIVEN FROM THE ENGINE CRANKSHAFT

Oskar Schatz, Teltow, D-8031 Stockdorf, Fed. Rep. of Germany

Continuation of Ser. No. 609,927, May 14, 1984, Pat. No. 4,643,156. This application Jun. 13, 1986, Ser. No. 874,116

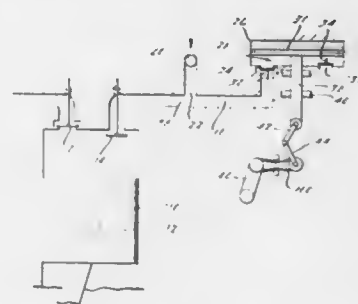
Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318094; May 18, 1983, 3318113; May 18, 1983, 3318136

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.⁴ F02B 33/06

U.S. Cl. 123—560

3 Claims



1. A positive displacement supercharger adapted for use with an internal combustion engine, comprising:
said supercharger having a chamber with an internally moving piston, wherein the displacement of said supercharger piston in said chamber is related to the maximum air requirement of one of the cylinders of said engine,
duct means for conducting air from said supercharger to said engine,
a mechanical drive for driving said supercharger in a timed relationship with said engine such that the motion of the pistons of said engine and said supercharger have a phase relationship such that pressurized air is supplied by said supercharger to said engine cylinder at a point in the operating cycle of said engine where the engine piston is near its bottom dead center position during the suction stroke, said duct means enabling atmospheric air to be drawn through said duct means during one portion of the suction stroke of said engine cylinder and pressurized air is provided by said supercharger during another portion of said suction stroke.

4,709,684

METHOD OF STABILIZING CURRENT FLOW THROUGH AN AUTOMOTIVE-TYPE IGNITION COIL

Günther Kaiser, Stuttgart, and Immanuel Krauter, Eibstetten, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

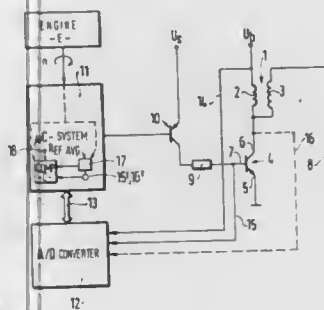
Filed May 8, 1986, Ser. No. 861,156

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1985, 3528103

Int. Cl.⁴ F02P 3/12

U.S. Cl. 123—644

12 Claims



1. Method of stabilizing and controlling current flow through a primary winding (2) of an ignition coil (1), a secondary winding (3) of which is connected to a spark gap (8) of an internal combustion engine E, and
utilizing a switching transistor (4) serially connected to the primary winding and having a first main current path terminal (5), a second main current path terminal (6) and a control terminal (7),
and a control circuit (11, C, 17, 18) responsive to a control value (18, REF) connected to and controlling said switching transistor (4) for controlling current flow there-through and through the ignition coil,
comprising the steps of
sensing the voltage across the first main current path terminal (5) and at least one (6, 7) other one of said terminals of the transistor (4), and deriving a sensed value;
sensing engine speed and deriving an engine speed value (n) representative of the speed of the engine; and
determining a control value for current flow through the main current path of the transistor (4) based on said sensed value:
(1) within a speed range of the engine (E) as determined by the engine speed value, in which current through the main current path of the transistor (4) rises from a value of at least approximately zero, at the ignition instant, indicative of essentially no residual stored electromagnetic energy in the ignition coil, in accordance with a predetermined reference value (18, REF); and
(2) within a speed range of the engine, as determined by the engine speed value, in which the current through the main current path of the transistor (4) rises from a value other than approximately zero, indicative of stored residual energy in the ignition coil, by comparison of said sensed value with said reference value (18, REF);
and, under condition (2), changing the duration of current flow through the primary winding (2) of the ignition coil based on and as a function of said comparison.

4,709,685

BALL THROWING DEVICE

Boris G. Kholin, Sumy, U.S.S.R., assignor to Sumsky Filial Kharkovskogo Politeknicheskogo Instituta, Sumy, U.S.S.R.
PCT No. PCT/SU84/00055, § 371 Date Jun. 6, 1986, § 102(e)
Date Jun. 6, 1986, PCT Pub. No. WO86/02572, PCT Pub. Date May 9, 1986

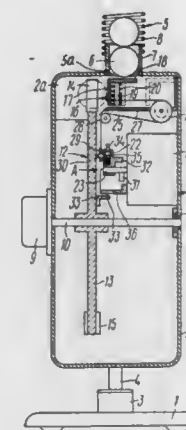
PCT Filed Oct. 24, 1984, Ser. No. 878,378

Claims priority, application Canada, Apr. 19, 1985, 479629; France, Apr. 19, 1985, 85 05993

Int. Cl.⁴ A63B 69/40

U.S. Cl. 124—7

6 Claims



1. A ball throwing device, comprising:
a separator (5) connected to a housing (2) and adapted for one-by-one delivery of balls (6);
a striker (12) fitted on a shaft (10) of a drive (9) for rotating said strike (12) in a plane perpendicular to said shaft (10), said shaft (10) being supported by said housing (2); and
a spring-actuated pusher (16) located at an exit opening (5a) of a separator (5) and adapted for displacing the balls (6) to a delivery position by virtue of a stroke, said pusher (16) being operatively associated with said striker (12) through a timing mechanism (21) which brings the motion of said pusher and said striker in synchronism;
said timing mechanism (21) comprising:
a crank (22) mechanically linked to said pusher (16) and mounted on an axle drive (23) of a drive (24) and arranged substantially parallel to said shaft (10) to rotate towards the direction of rotation thereof, said crank (22) being adapted for conjoint rotation with said drive axle (23) at the same speed, and also at a speed higher than that of said drive axle (23) when said pusher (16) causes the balls (6) to move into a stroke position, for which purpose projections (31, 32) are provided on said axle (23) and said crank (22) respectively, which projections being adapted to interact with each other, said striker being provided thereon with another projection (33), while said crank (22) carries a spring actuated stop (34) adapted to interact with the projection (33);
a yoke (36) fixed on the housing of the drive (24) and arranged between the crank (22) and the shaft (10), said yoke (36) being adapted to interact with the spring-actuated stop (34), before the stop (34) interacts with said other projection (33) of said striker (12); and
the distance between the axis of the drive axle (23) and the inner surface of the yoke (36) varying from a length equal to the outside radius of the crank (22) with the spring-actuated stop extended, at the yoke front and facing the crank (22), to a length equal to the outside radius of the crank (22) with the spring-actuated stop (34) in a sunk position, at the yoke back end.

4,709,686 AIR WEAPON WITH GAS-TIGHT EXPANSION CHAMBER

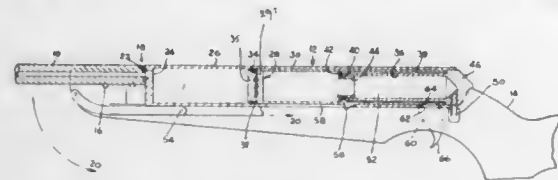
Hugh F. Taylor, Sawston, and David R. Theobald, St. Ives, both of United Kingdom, assignors to Utec B.V., DeLeersum, Netherlands

Continuation-in-part of Ser. No. 357,331, Mar. 11, 1982, abandoned. This application Nov. 16, 1983, Ser. No. 552,457
Claims priority, application United Kingdom, Oct. 1, 1980, 8031687; May 14, 1981, 8114842

Int. Cl.⁴ F41B 11/00

U.S. Cl. 124-67

11 Claims



1. An air weapon for launching a projectile by means of a charge of compressed air, said weapon comprising: a barrel from which to launch said projectile; an outer cylinder with an internal bore, said outer cylinder having a closed end and an open end, said open end being in communication with said barrel; an inner cylinder with an internal bore and an outer wall, said inner cylinder located within said outer cylinder with a coaxial clearance, said inner cylinder having a closed end and an open end, said open end located between said outer wall of said inner cylinder and said internal bore of said outer cylinder of said inner cylinder being relatively closer to said barrel than said closed end of said inner cylinder; a piston axially movably located within said outer cylinder between a cocked and an uncocked position, said piston having a piston crown and a cylindrical piston wall, said piston wall having an inner surface closed at the crown end of said piston and forming a piston interior, said piston interior being open at the end thereof opposite said crown end, said piston interior being in communication with the internal bore of said inner cylinder via said open end of said inner cylinder, said piston cooperating with said bore of said outer cylinder to form a piston and cylinder device capable of compressing a charge of air to expel said projectile, said piston wall extending axially into said coaxial clearance and being axially movable therein; first annular sealing means between said piston wall inner surface and the outer wall of said inner cylinder to define a gas-tight expansion chamber defined by said internal bore of said inner cylinder and said piston interior, said expansion chamber being capable of being filled permanently with a charge of compressed gas; and cocking means for retracting said piston toward said inner cylinder into said cocked position to compress gas in said expansion chamber, whereby upon release of said cocking means, said charge of compressed gas acts as a gas spring to force said piston into said uncocked position thereby compressing air before said piston crown to launch from said barrel said projectile.

4,709,687 GAS COOKERS

Hugh V. Barnes, Sutton Coldfield, England, assignor to TI Gas Spares Limited, London, England

Filed Sep. 22, 1986, Ser. No. 909,633

Claims priority, application United Kingdom, Jun. 12, 1985, 8530060; Sep. 20, 1985, 8523248

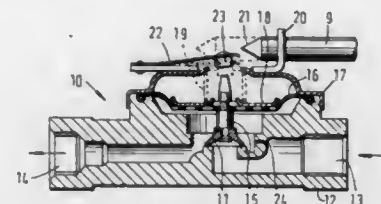
Int. Cl.⁴ F24C 3/12

U.S. Cl. 126-42

3 Claims

1. A gas cooker comprising at least one gas burner, a lid or door movable between an open position giving access to the at

least one burner and a closed position preventing access to the at least one burner, at least one tap for controlling the supply of gas to a respective burner and a gas control valve controlling the supply of gas to the at least one tap and operatively connected to the lid or door such that movement of the lid or door into its closed position operates the gas control valve to terminate the supply of gas to the at least one tap, while lid or door movement from the closed to the open position restores the supply, the gas control valve including a first valve for controlling the supply of gas to the at least one tap, a valve



spindle on which the first valve is carried and which is operatively connected to said lid or door, a pressure operated surface means carried by said valve spindle and a responsive to gas pressure for maintaining said first valve closed when said lid or door is opened and said at least one tap is "ON", a weep passage by passing said first valve, and a further valve constituted in part by said pressure operated surface means for controlling the flow of gas through said weep passage whereby the flow of gas via said weep passage is prevented when said lid or door is closed.

4,709,688 OPEN CELL SHEETING

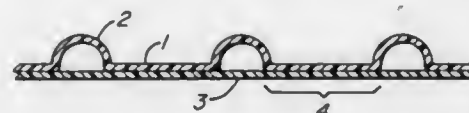
Roger O. Paradis, 998 Terranova Drive, Orleans, Ontario, Canada K1C 3K6

Filed Mar. 25, 1986, Ser. No. 843,582

Int. Cl.⁴ F24J 3/02

U.S. Cl. 126-415

17 Claims



1. A pool cover comprised of:

- (a) a lower sheet of flexible, thermoplastic material, said lower sheet having upwardly-displaced dimples protruding therefrom, said dimples having upper ends and being crushable and adapted to rebound elastically, and being further adapted to contain air and provide flotation when the cover is deployed on the surface of a pool; and
- (b) an upper sheet of flexible, thermoplastic material joined to said lower sheet at the upper ends of said protruding dimples.

4,709,689 SOLAR HEAT EXCHANGE SYSTEM

Allan W. Simcox, Las Vegas, Nev., assignor to Environmental Resources, Inc., Las Vegas, Nev.

Filed Dec. 2, 1986, Ser. No. 936,781

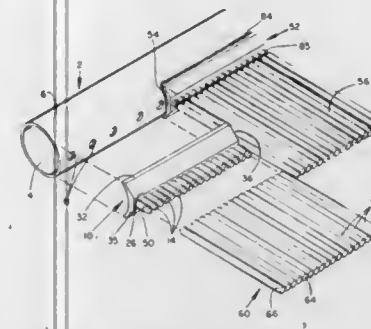
Int. Cl.⁴ F24J 2/24

U.S. Cl. 126-448

18 Claims

1. In combination a header comprising a conduit having an exterior wall, at least one aperture in the header wall, a one-piece molded manifold having a base portion and a

plurality of aligned tube-connecting means extending therefrom, channel means in a rear portion of the manifold communicating with the tube-connecting means,



the base portion having a rear surface adapted to conform to the exterior wall of the header and being affixed thereto such that the channel means communicates with the bore means, and a plurality of aligned, longitudinally connected tubular elements attached to the tube-connecting means.

4,709,690 IMPLANTABLE BLOOD FLOW AND OCCLUSION PRESSURE SENSING SPHINCTERIC SYSTEM

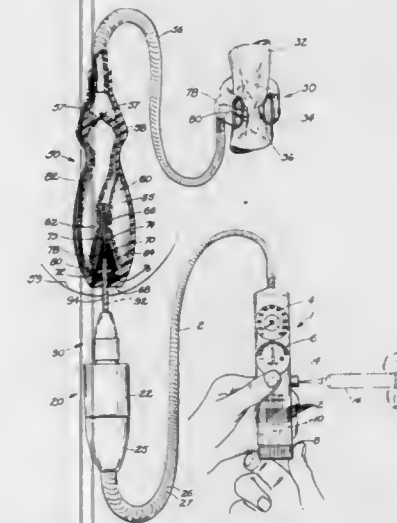
Terry M. Haber, Lake Forest, Calif., assignor to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Apr. 21, 1986, Ser. No. 853,963

Int. Cl.⁴ A61F 1/00

U.S. Cl. 128-1 R

25 Claims



14. A sphincteric system including a hollow, inflatable occlusion cuff to be located around the urethra of an incontinent patient for occluding and relaxing the urethra to enable the patient to achieve continence, said sphincteric system comprising:

hyponometer means to be interconnected with said occlusion cuff so that said cuff can be percutaneously infused with or exsuffled of a measured supply of fluid, whereby to inflate or deflate said cuff and regulate occlusive pressure to the urethra; transducer means located at said occlusion cuff to provide an output signal in response to the patient's blood flow through the urethra when said cuff is inflated and said urethra is occluded; indicator means located at said hyponometer means and interconnected with said transducer means to receive the

output signal therefrom and provide an indication when excessive occlusive pressure is applied to the urethra so as to interrupt the flow of blood therethrough; and electro-fluidic path means located between said hyponometer means and said occlusion cuff and having a fluid circuit to convey fluid from said hyponometer means to said occlusion cuff and an electrical circuit to transmit the output signal of said transducer means to said indicator means at said hyponometer means.

4,709,691 FULL BODY HYDROMASSAGER HAVING AN ECCENTRIC WEIGHT ROTOR

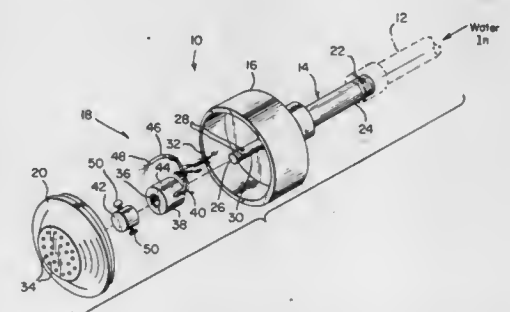
David H. Lemons, 1807 Elkhart Dr., Greensboro, N.C. 27408, and George Spector, 233 Broadway, Rm 3615, New York, N.Y. 10007

Filed Jun. 19, 1986, Ser. No. 875,939

Int. Cl.⁴ A61H 9/00

U.S. Cl. 128-66

2 Claims



1. A full body massager apparatus activated by water pressure from a water outlet which comprises:
 - (a) a flexible hose fluidly coupled to said water outlet;
 - (b) a hollow shaft with input and output ends having external threads at said input end and an opening with said outlet ports at output end, said input end coupled to said flexible hose;
 - (c) a cylindrical housing having an open side, said housing coupled to said hollow shaft with said output end extending therein;
 - (d) means for vibrating said apparatus by said water pressure, said vibrating means rotatably coupled to said output end over said outlet ports of said hollow shaft;
 - (e) an end bell having a plurality of holes therein, said end bell snaps onto said open side of said housing so that when said hollow shaft is held by a hand said end bell can be rubbed over a persons body with said vibrating means activated by said water pressure from said water outlet in which said water pressure will cause a vigorous vibration massaging effect as water passes through said vibrating means out of said holes in said end bell to said persons body, wherein said vibrating means includes:
 - (f) a pair of bearings coupled onto said output end of said hollow shaft between said outlet ports;
 - (g) a rotor having a reservoir within, said rotor rotatably coupled onto said bearings;
 - (h) an elbow fitting with a curved jet tube portion having an orifice, said elbow fitting coupled through said reservoir of said rotor; and
 - (i) an end cap secured to said output end of said hollow shaft to seal said opening and allow said rotor to turn with said elbow fitting off center when said water exits said orifice thus causing vibration further comprising:
 - (j) said hollow shaft having a second set of external threads at said output end;
 - (k) said end cap having a well with internal threads therein;
 - (l) a compressible rubber gasket placed within said well of said end cap;

- (m) said rotor having an annular raceway formed in the side adjacent to said end cap; and
- (n) bearings formed on the side of said end cap adjacent said rotor so that when said end cap is threaded onto said threads of said output end of said hollow shaft, said gasket will seal said opening and said bearings will ride in said raceway allowing said rotor to turn with said elbow fitting off center when said water exits said orifice thus causing vibration.

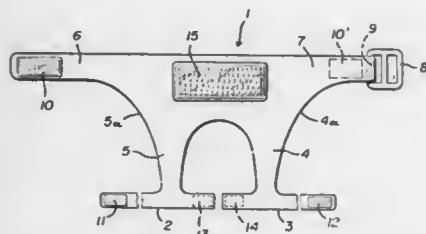
4,709,692

THIGH MOUNTED LOWER BACK SUPPORT BELT
 Bruce H. Kirschenberg, 2811 Pine Island Rd. N., Sunrise, Fla. 33300, and Richard L. Platt, 1440 NE. 43rd Ct., Pompano Beach, Fla. 33064

Filed Jul. 2, 1986, Ser. No. 881,451
 Int. Cl.⁴ A61F 5/02

U.S. Cl. 128—78

2 Claims



1. A lower back support to be worn by a person to urge the spine straight while allowing natural movement of the upper torso, said support comprising:

- a pair of flexible left and right thigh straps constructed and arranged to be wrapped snugly around the person's corresponding thighs individually;
 - a pair of flexible left and right buttock straps extending up individually from said left and right thigh straps, respectively;
 - and a flexible hip belt consisting essentially of a back segment joined to the upper ends of said buttock straps and dimensioned to extend across the person's lower back, left and right front segments joined to the opposite sides of said back segment and dimensioned to extend across the front of the person and overlap each other at the person's navel, and manually releasable fastener means on said front segments for holding them overlapped;
 - said back segment of the hip belt having a substantially greater vertical dimension for most of its extent from left to right than said front segments;
 - said hip belt being the top part of said lower back support and being unattached except to said thigh straps;
 - said lower back support having left and right outer edges respectively extending up along said buttock straps and diverging laterally outward from each other and upward along the bottom of said back segment and along the bottom of said front segments to pass over the top of the person's iliac crest.
- said thigh straps, when the person's knees are bent, moving forward and pulling on said buttock straps to pull down on said back segment of the hip belt and pull back on said overlapped front segments of the hip belt for restraining the forward curvature of the person's spine.

4,709,693

BELT FOR ARTHROSCOPIC TREATMENT OF AN INJURED LEG SUPPORTED BY A SURGEON

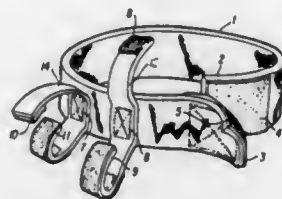
James D. Key, 10 Medical Pkwy., Dallas, Tex. 75234-7895

Filed Feb. 10, 1986, Ser. No. 827,501

Int. Cl.⁴ A61F 3/00

U.S. Cl. 128—80 G

5 Claims



1. A belt holder for the arthroscopic examination and treatment of an injured leg of a patient so as to leave both hands of a surgeon free by supporting said leg comprising a waist belt portion worn by said surgeon, and parallel perpendicularly attached straps to said belt for support of said injured leg around its calf and above its ankle.

4,709,694

GLOVE-LIKE DYNAMIC SPLINT AND METHOD OF USING SAME

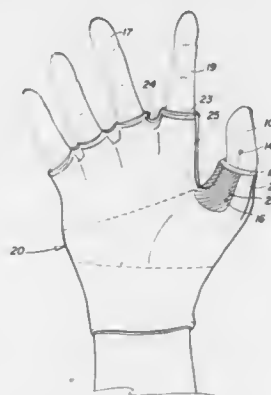
Bonnie O'Connell, 11 Dover Ln., Old Bethpage, N.Y. 11804

Filed Jul. 28, 1986, Ser. No. 890,908

Int. Cl.⁴ A61F 5/10, 5/04

U.S. Cl. 128—87 A

4 Claims



1. A dynamic splint for treating the hands of a person having a spastic condition causing thumb adduction and hyperextension comprising a covering made entirely of elastic stretch fabric material adapted for covering the palm and the back of the person's hand, said covering having at least one sleeve portion with an opening therethrough adapted for the thumb, said sleeve portion adapted for at least partly covering the metacarpal and proximal phalanx of the thumb, said covering including at least one web portion adapted for extending between the thumb and the index finger of the person's hand, and a pad connected to said covering and in a position adapted for engaging over the metacarpal-phalangeal joint of the thumb of the person's hand whereby the thumb is held in an abducted position, said covering including additional sleeve portions adapted for each finger of the person's hand and a collar of material adapted for engagement around the base of each finger of the person's hand, each collar having an accumulation of material.

4,709,695

PROTECTIVE DEVICE

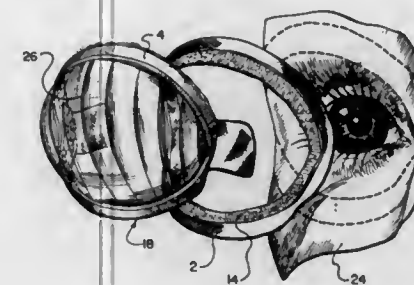
Roger Kohn, 2920 "F" St. #C-17, Bakersfield, Calif. 93301, and William K. M. Shields, 20031 117th Ave. SE., Kent, Wash. 98031

Filed Mar. 27, 1986, Ser. No. 844,804

Int. Cl.⁴ A61F 13/00

U.S. Cl. 128—132 R

11 Claims



1. A protective device adhesively bindable to the skin of a patient for protectively enclosing a wound, the protective device comprising:

- an adhesive base having an upper surface and a lower surface, the lower surface being coated with an adhesive for adhesively binding said adhesive base to the skin of the patient, said adhesive base forming a substantially closed loop for encircling the wound,
- a protective covering for spanning over the wound and protectively enclosing the wound, said protective covering including a perimeter, and
- a means for securing said protective covering to said adhesive base, said securing means lying between the upper surface of said adhesive base and the perimeter of said protective covering, said securing means being of the type which can be repeatedly re-used and which enables said protective covering to be decoupled from said adhesive base without unbinding the adhesive base from the skin of the patient.

4,709,696

SIGHT CORRECTION ATTACHMENT FOR RESPIRATORS

Cyril N. E. Angell, Trowbridge, England, assignor to Avon Industrial Polymers Limited, Melksham, England

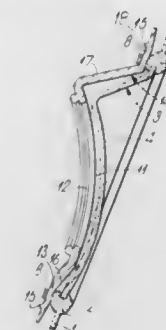
Filed Dec. 9, 1985, Ser. No. 806,463

Claims priority, application United Kingdom, Dec. 14, 1984, 8431592

Int. Cl.⁴ A62B 10/08; A61F 9/02

U.S. Cl. 128—201.12

8 Claims



1. A mount means for receiving a sight corrective lens and attaching the sight corrective lens adjacent an eyepiece of a respirator having projecting apertured lugs of different widths, the mount means having projecting tabs of different widths, the tabs being for respectively engaging the apertures of the

lugs whereby to maintain the lens in said mount means adjacent to the eyepiece in a unique orientation relative thereto.

4,709,697

TISSUE PNEUMATIC SEPARATOR STRUCTURE AND METHOD

George H. Muller, Ann Arbor, Mich., assignor to Joseph J. Berke, Detroit, Mich., a part interest

Continuation of Ser. No. 214,006, Dec. 9, 1980, abandoned, which is a continuation-in-part of Ser. No. 103,206, Dec. 13, 1979, Pat. No. 4,357,940. This application Nov. 21, 1983, Ser. No. 582,971

Int. Cl.⁴ A61B 17/00

U.S. Cl. 128—303 R

31 Claims



1. A tissue separator comprising a handle, a stem having a longitudinal axis secured to the handle, tip means retained on one end of the stem including blunt tissue separating means at one end thereof for mechanically separating tissue along natural cleavage planes without cutting of the tissue on nudging of the tissue with the tissue separating means, wherein the handle, stem and tip are hollow to provide for the flow of a fluid medium into the hollow handle, and wherein the tip is not fixed relative to the stem but is a floating tip and means for moving the floating tip axially relative to the stem in accordance with the pressure of the fluid medium acting in balance on the tip.

4,709,698

HEATABLE DILATION CATHETER

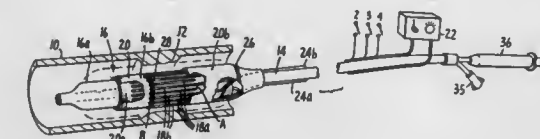
James H. Johnston, Jackson, Miss.; George D. Hermann, Palo Alto, and Tanya A. Atagi, Menlo Park, both of Calif., assignors to Thomas J. Fogarty, Palo Alto, Calif.

Filed May 14, 1986, Ser. No. 863,089

Int. Cl.⁴ A61B 17/36

U.S. Cl. 128—303.12

18 Claims



1. A heatable dilation catheter for simultaneously dilating and heating tissue within a vessel, the catheter comprising: an inflatable balloon attached to the distal end of the catheter; an elastic heating element mounted on the exterior of the balloon; means for introducing fluid into the balloon to inflate the balloon such that the balloon expands to dilate the tissue and to bring the heating element into contact with the tissue; and means for activating the elastic heating element to apply heat to the tissue.

4,709,699

SURGEON'S GIGLI SAW AND METHOD

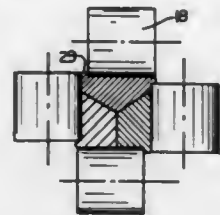
Mark S. Michael, Garrett, and Scott A. Glaze, Ft. Wayne, both of Ind., assignors to Fort Wayne Metals Research Products Corporation, Fort Wayne, Ind.

Filed Aug. 6, 1986, Ser. No. 893,876

Int. Cl.⁴ A61B 17/14

U.S. Cl. 128—317

27 Claims



1. A surgeon's Gigli saw comprising, in combination: a cable comprising a plurality of strands twisted together in a first rotational direction; at least one strand of said cable having been previously twisted along its own axis in the opposite rotational direction from that of said cable; and each strand comprising a plurality of wires substantially coiled together into a generally polygonal cross-sectional shape.

4,709,700

ELECTRO CONVULSIVE THERAPY METHOD

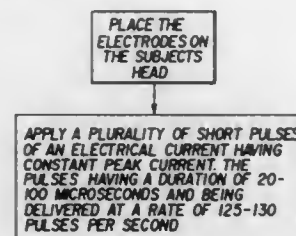
Vaclav Hyrman, 2420 Norcrest Court, Burnaby, British Columbia, Canada C3J 1C6

Filed Mar. 11, 1985, Ser. No. 710,576

Int. Cl.⁴ A61N 1/36

U.S. Cl. 128—421

3 Claims



1. A method for electro convulsive therapy comprising placing electrodes on the head of a subject and applying a plurality of short pulses of an electric current, said pulses having a duration of 20-100 microseconds and being delivered at a rate of 125 to 300 pulses per second.

4,709,701

APPARATUS FOR MEDICAL TREATMENT BY HYPERTHERMIA

Raviv Weber, Herzliya, Israel, assignor to Medical Research & Development Associates, Potomac, Md.

Filed Apr. 14, 1986, Ser. No. 851,724

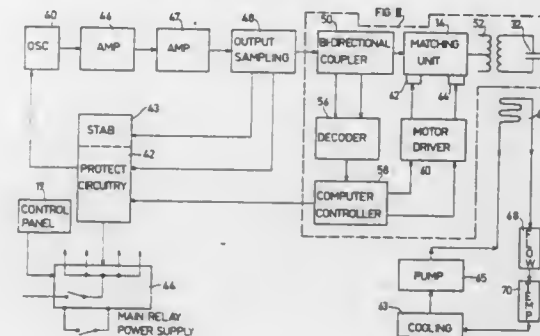
Int. Cl.⁴ A61N 1/40

U.S. Cl. 128—422

2 Claims

1. A hyperthermia apparatus, comprising: power amplifier means for providing a variable output power; remote electrode means for receiving said output power provided by said power amplifier means and for coupling said output power across a capacitive load interacting with said remote electrode means, said capacitive load constituting portions of a patient to be treated; power transmission means for electrically applying said

output power provided by said power amplifier means to the remote electrode means; capacitive matching means including a capacitive matching unit and step motor means for providing real time capacitive matching between the power amplifier means and the capacitive load across the electrode means; and control means for governing the operation of the step motor means in accordance with real time sensing of reflected power from said electrode means,



and wherein the control means comprises a bidirectional coupler, a decoder receiving an input from the bidirectional coupler and providing x and y coordinate indications of reflected power, and computer operated controller means for receiving the output of the decoder and providing operating instructions to the step motor means by means of Smith chart coordinates generated thereby, whereby the x and y coordinate indications provide direction indications to the step motor means to significantly reduce the real time required for capacitive matching.

4,709,702

ELECTROENCEPHALOGRAPHIC CAP

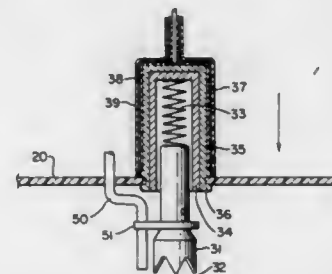
Gary W. Sherwin, South Huntingdon Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,031

Int. Cl.⁴ A61B 5/04

U.S. Cl. 128—644

20 Claims



1. An electroencephalographic (EEG) electrode mounting cap for a patient's head having keratinous and epidermis layers of skin, comprising: an adjustable freely movable headband adapted to be carried and supported by the head and adapted to tightly fit the head when adjusted; and electrode means, attached to said headband at regions for measurement on the head, for electrically contacting the head in the regions for measurement and conducting EEG signals, said electrode means including stabilization means, adapted to be positioned substantially adjacent to the head, for mechanically stabilizing said electrode means, thereby mechanically stabilizing the electrical contact between the head and said electrode means.

4,709,703

IMAGING SYSTEM AND METHOD USING RADIOPAQUE MICROSPHERES FOR EVALUATION OF ORGAN TISSUE PERFUSION

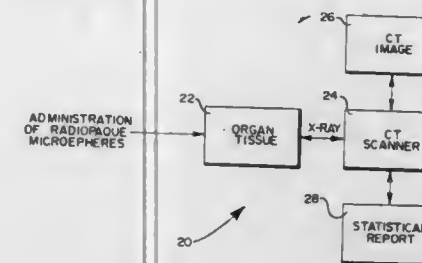
Normand H. Lazarow, and Alfred A. Bove, both of Rochester, Minn., assignors to Mayo Foundation, Rochester, Minn.

Filed Nov. 12, 1985, Ser. No. 796,952

Int. Cl.⁴ A61B 6/00, 5/02

U.S. Cl. 128—654

16 Claims



1. An imaging method for evaluating organ tissue perfusion, comprising the steps of:
 - (a) administering radiopaque microspheres to the organ tissue which become occluded in terminal capillary beds in the organ tissue;
 - (b) subjecting the organ tissue to electromagnetic radiation; and
 - (c) measuring the electromagnetic radiation from selected regions of interest in the organ tissue, thereby quantitating the organ tissue perfusion in the selected regions of interest.

4,709,704

MONITORING DEVICE FOR BIO-SIGNALS

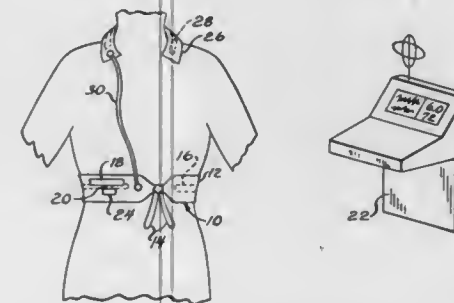
Mark Lukasiewicz, New City, N.Y., assignor to The Kendall Company, Walpole, Mass.

Continuation of Ser. No. 586,658, Mar. 6, 1984, abandoned. This application Aug. 26, 1986, Ser. No. 900,267

Int. Cl.⁴ A61B 5/04

U.S. Cl. 128—644

2 Claims



1. A portable bio-information monitoring device, comprising:
 - a signal processing unit for converting neck and abdominal electrode signals applied to a pair of inputs thereof to a single composite signal containing bio-information suitable for radio transmission thereof;
 - an FM radio transmitter having an input coupled to the output of the signal processing unit for transmitting radio waves containing the bio-information of the composite signal;
 - an open collar electrode assembly for producing a neck electrode signal including:
 - an elongate, flexible open collar having an intermediate portion adapted to be held in an upright position against the back of the patient's neck when the patient is standing or sitting upright and elongate end portions at oppo-

site sides thereof, said portions being of sufficient length to be drapable over and at least partially supportable by the opposite shoulders of the patient when the patient is standing or sitting upright and having free ends spaced from one another at the patient's throat to preclude any restriction of the patient's throat and to facilitate attachment and removal of the collar electrode assembly, an elongate, flexible neck electrode carried by said open collar at an inner surface thereof for making electrical contact with a patient's neck, and an elongate lead attached to the collar to be supported thereby and connected to the neck electrode, said lead having sufficient length for extending downwardly from the collar to the patient's abdominal area for connection with an input to said signal processing unit carried thereat; and an abdominal belt electrode assembly for producing an abdominal electrode signal including, an elongate, flexible abdominal belt of sufficient length for placement around a patient's abdominal region, an elongate, flexible, belt electrode carried by said belt at an inside surface thereof for making electrical contact with a patient's back, means for attaching the signal processing unit and the radio transmitter to the abdominal belt to be carried thereby with an input of the signal processing unit connected with the belt electrode, and a connector connected with the elongate lead carried by the belt at an outside surface thereof and coupled to another input of the signal processing unit for connection of said other input with the neck electrode through said elongate lead.

4,709,705

LAVAGE DEVICE FOR OBTAINING A FLUID SPECIMEN FROM A BODY CAVITY FOR DISEASE DIAGNOSIS

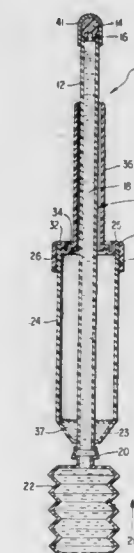
Diana Truglio, Sayville, N.Y., assignor to Medtech Diagnostics Inc., New York, N.Y.

Continuation-in-part of Ser. No. 768,052, Aug. 22, 1985, abandoned. This application Jan. 30, 1987, Ser. No. 8,956

Int. Cl.⁴ A61B 10/00

U.S. Cl. 128—750

15 Claims



1. A lavage device for obtaining a fluid specimen from a body cavity, said device comprising a first member comprising:
 - an elongated first tube having opposing first and second ends, said first end being insertable into a body cavity and said first tube having at least one lateral opening

close to said first end and capable of discharging a lavage medium radially therefrom; and means forming a variable volume chamber for containing the lavage medium to irrigate the inside of the body cavity, said chamber being attached in sealing relationship to said second end of said first tube and communicating with the interior of said first tube; and a second member comprising means forming a collection chamber having opposing first and second ends, said first end having vents and said second end being mounted at, and in sealing relationship onto and around, said first tube near said means forming a variable volume; and an elongated second tube having opposing first and second ends, said first end being open and said second tube being shorter than, concentric with, surrounding and radially spaced from said first tube, to define a passage therebetween for the lavage medium to reenter the device through said first end of said second tube when the lavage medium is expelled from the body cavity, said second tube being insertable into the body cavity, said first end of said second tube being positioned at a distance from said first end of said first tube, and said second end of said second tube being in flow communication with said first end of said means forming a collection chamber so as to transfer the lavage medium thereto.

4,709,706

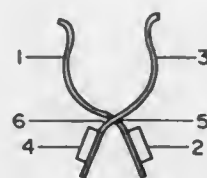
CIGARETTE HOLDER

Juan G. Turro, 1558 Sevilla Ave., Coral Gables, Fla. 33134

Filed Sep. 17, 1985, Ser. No. 777,082

Int. Cl.⁴ A24F 13/08

U.S. Cl. 131—240.1



1. A cigarette holder comprising two substantially shaped flat arms having formed midway in each arm a groove in the side of each arm wherein said flat arms are fitted together to form an X having a top and a base portion; a magnet included in each portion of said arms at said base wherein the arms at the base have a tendency to be drawn to each other and the arms at the top portion have a tendency to be drawn to each other and being so positioned so as to permit positioning of cigarette between the arms at the top portion.

4,709,707

USE OF 4,4A,5,6-TETRAHYDRO-7-METHYL-2-(3H) NAPHTHALENE IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF SMOKING TOBACCO AND SMOKING TOBACCO ARTICLES

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven, and Myrna L. Hagedorn, Edison, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. Division of Ser. No. 514,522, Jul. 18, 1982, which is a division of Ser. No. 368,640, Apr. 15, 1982, which is a continuation-in-part of Ser. No. 354,111, Apr. 2, 1982, abandoned. This application

Oct. 17, 1986, Ser. No. 920,292

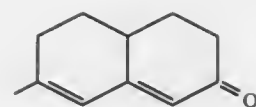
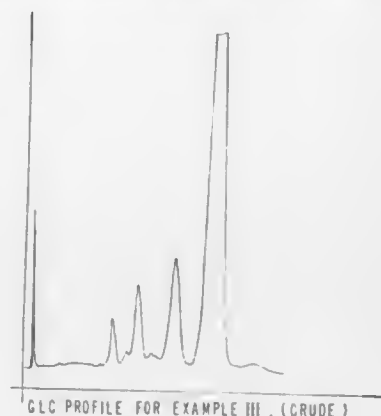
Int. Cl.⁴ A24B 3/12, 15/30

U.S. Cl. 131—276

6 Claims

1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco composition comprising the step of adding to said smoking tobacco composition, an aroma or taste

augmenting or enhancing quantity of 4,4A,5,6-tetrahydro-7-methyl-2-(3H)-naphthalene having the structure:



4,709,708

CONTROL SYSTEM FOR HUMIDITY CONTROLLER OF TOBACCO LEAVES

Kenichi Kagawa, Hiratsuka, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Japan

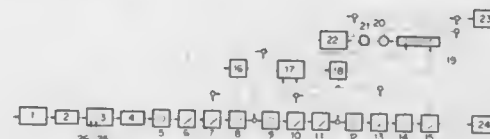
Filed Jul. 12, 1984, Ser. No. 630,064

Claims priority, application Japan, Jul. 21, 1983, 58-131976

Int. Cl.⁴ A24B 3/02, 3/04

U.S. Cl. 131—302

9 Claims



1. A system for controlling the water content and temperature of tobacco leaves in a humidity controller comprising

- (1) means for measuring the water content, temperature and flow rate of the tobacco leaves conveyed to the humidity controller which provides the tobacco leaves with the water content and temperature necessary for rib removal to maintain the quality of the tobacco leaves;
- (2) operation means for calculating the amount of water and steam to be added upon the basis of the measurements of said measuring means and the preset values representative of the water content and temperature provided to the tobacco leaves and for compensating for deviation existing between a spraying position of water and steam and a position of measuring the water content and the temperature of the tobacco leaves which have been provided with water and steam and the time lag of rise up and fall of the water content and temperature when the preset values are changed; and
- (3) control means for controlling means for supplying the water and steam in response to the values calculated by the operation means and for correcting the deviation between the measurements of the water content and temperature of the tobacco leaves provided with water content and steam and the preset values.

4,709,709

PROCESS FOR THE MOISTENING OF COMMUNUTED SMOKING MATERIALS

Glitta Jünemann; Werner Hirsch, both of Hamburg, and Arno Weiss, Delingsdorf, all of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Fed. Rep. of Germany

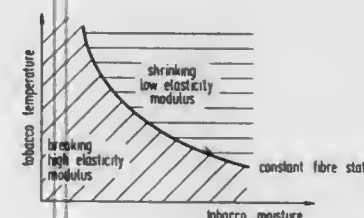
Continuation of Ser. No. 712,822, Mar. 18, 1985. This application Jan. 5, 1987, Ser. No. 4,214

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410184

Int. Cl.⁴ A24B 3/04, 3/12

U.S. Cl. 131—306

7 Claims



1. A process for remoistening comminuted smoking materials overdried during expansion thereof by moistening and cooling said smoking materials while maintaining the same substantially in the constant fibre state which comprises:

- (a) moistening said smoking materials, while in a free falling state by water droplets produced by ultrasonic atomizers, nad cooling said comminuted smoking materials while flowing them along supporting surface in incremental steps to cause said smoking materials to follow the functional curve of a constant fibre state arrived at by plotting smoking materials temperature and degree of moisture in said smoking materials;
- (b) repeating said incremental steps until said smoking materials reach the desired temperature and moisture condition for further processing.

4,709,710

PROCESS FOR IMPROVING TOBACCO

Helmut Gaisch, Cormondreche, and Urs Nyffeler, Cortaillod, both of Switzerland, assignors to Fabriques De Tabac Reunies S.A., Neuchatel, Switzerland

Filed Sep. 5, 1978, Ser. No. 939,758

Int. Cl.⁴ A24B 15/20, 15/24

U.S. Cl. 131—308

9 Claims

1. A process for microbial reduction of the nitrate or nitrite content of tobacco comprising the steps of:

- a. inoculating the tobacco with a pure culture of microorganisms selected from strains of *Enterobacter aerogenes* which derive their oxygen from the nitrates or nitrites in the tobacco and which are in their exponential growth phase;
- b. incubating the inoculated tobacco with a nutrient solution under substantially anaerobic conditions for a period of time sufficient to degrade the nitrates or nitrites contained therein to a lower level; and
- c. thereafter terminating the activity of the microorganisms.

4,709,711

CIGARETTE FILTER, METHOD AND APPARATUS FOR MAKING SAME

Ichiro Hirose, and Takayoshi Sagawa, both of Hiratsuka, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Japan

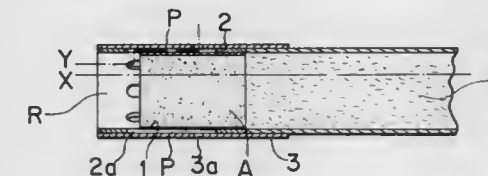
Filed Feb. 17, 1984, Ser. No. 581,299

Claims priority, application Japan, Jul. 21, 1983, 58-131975

Int. Cl.⁴ A24D 3/04

U.S. Cl. 131—336

3 Claims



1. A cigarette filter for a cylindrical cigarette comprising: a cylindrical filter having a suction end, a smoke inlet end and an outer surface between said ends;

a comparatively thin air impervious first plug paper wrapped around the outer surface of the filter to form an air impervious tubular cover for said filter, said first plug paper tubular cover having an outer diameter less than the outer diameter of the cylindrical cigarette to be connected to the smoke inlet end of the filter in an axial alignment therewith and having an end coplanar with said filter smoke inlet end to abut a smoke outlet end of the cigarette associated with the filter, whereby the filter is made impervious to air entering radially through said outer surface and pervious to smoke flowing axially of said cylindrical filter;

a comparatively thick second plug paper wrapped around the first plug paper to form a tubular case for said air impervious tubular cover, said tubular case having a plurality of axially extending channels, said second plug paper tubular case having an outer diameter substantially equal to that of the cylindrical cigarette and having an inlet end coplanar with said tubular cover first end and said filter smoke inlet end and abutting said cigarette smoke outlet end said first plug paper and said second plug paper being wrapped around said cylindrical filter and then all of just-mentioned elements cut off together to form a coplanar configuration between said filter smoke inlet end and said first plug paper end and said second plug paper inlet end; and

a tip paper wrapped around the second plug paper tubular case, said channels being operable as passages or air captured between the second plug paper tubular case and said tip paper and the smoke outlet end of the cigarette which is located adjacent to the filter, and said air passages being separated from smoke passages through the filter by said air impervious tubular cover.

4,709,712

POLYCARBOXYLIC ACID POLYMER GELS AS PROTECTIVE AGENTS

Michael J. Bordovsky, and John W. Feik, both of San Antonio, Tex., assignors to Dermatological Products of Texas, Fort Worth, Tex.

Filed Oct. 22, 1986, Ser. No. 921,496

Int. Cl.⁴ A45D 7/00

U.S. Cl. 132—7

8 Claims

1. A method of protecting the scalp during hair treatment procedures involving the use of caustic solutions comprising first contacting exposed scalp with an aqueous gel of an acidic polymer gel having a pH of 4.5 to 5.5.

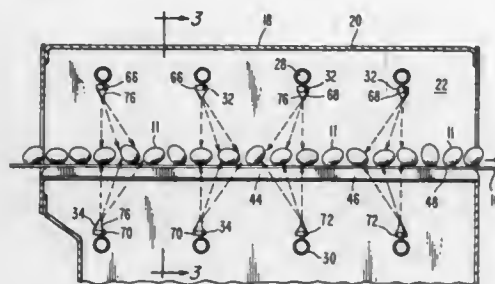
4,709,713

APPARATUS FOR CONVEYING AND WASHING MEANS THEREFOR

Henry Y. Kohl, Kuhl Rd., P.O. Box 26, Flemington, N.J. 08822
Filed Jan. 21, 1986, Ser. No. 820,862Int. Cl.⁴ B08B 3/02

U.S. Cl. 134—72

7 Claims



7. An apparatus for conveying and washing means therefor, comprising:

- (a) a conveying belt means comprising a plurality of wire members interlocking with and movable with respect to one another, each said wire member including:
 - (1) a central section extending approximately straight laterally across said conveying means perpendicularly with respect to the direction of movement of said conveying means;
 - (2) interlocking end means adapted to movably grip adjacent wire members to maintain a spatial distance between central sections of adjacent wire members of approximately one inch and allow pivotal movement between adjacent wire members for flexibility, said interlocking end means including a wire loop means defining an opening therethrough into which an adjacent wire means extends for providing of said interlocking means;
- (b) a wash station for cleaning of said conveying belt means and articles randomly positioned thereon comprising:
 - (1) a wash housing means enclosing a portion of said conveying belt means and defining a washing chamber therein for enclosing and gathering cleaning solution sprayed toward said conveying belt means, said wash housing means defining an outlet means in the lower section thereof to allow used cleaning solution to exit from said wash housing means;
 - (2) a pump means for pumping cleaning solution into said washing chamber;
 - (3) an intake manifold means for receiving cleaning solution under pressure from said pump means and delivering same into an area adjacent to said conveying belt means, said intake manifold means including an upper manifold section extending across the upper surface of said conveying belt means and a lower manifold section extending across the under surface of said conveying belt means, said upper manifold section and said lower manifold section being in fluid flow communication with respect to said pump means to receive cleaning fluid therefrom;
 - (4) a plurality of upper nozzles mounted in said upper manifold section and extending downwardly therefrom, said upper nozzles being in fluid flow communication with respect to the cleaning solution within said upper manifold section for dispensing same in a downwardly direction onto said conveying belt means and any articles randomly positioned thereon, said upper nozzles including deflector means thereon for controlling the flow of cleaning solution, said upper nozzles including a first upper nozzle section and a second upper nozzle section, said first upper nozzle section having upper nozzles with said deflector means thereof oriented facing downstream with respect to the direction of movement of said conveyor means to facilitate cleaning of the

bottom and rearmost areas of said conveyor belt means and any articles randomly positioned thereon, said second upper nozzle section having upper nozzles with said deflector means thereof oriented facing upstream with respect to the direction of movement of said conveyor means to facilitate cleaning of the bottom and frontmost areas of said conveyor belt means and any articles randomly positioned thereon;

- (5) a plurality of lower nozzles mounted in said lower manifold section and extending upwardly therefrom, said lower nozzles being in fluid flow communication with respect to the cleaning solution within said lower manifold section for dispensing same in an upwardly direction onto said conveying belt means and any articles randomly positioned thereon, said lower nozzle including deflector means thereon for controlling flow of cleaning solution, said lower nozzles including a first lower nozzle section and a second lower nozzle section, said first lower nozzle section having lower nozzles with said deflector means nozzles oriented facing downstream with respect to the direction of movement of said conveyor means to facilitate cleaning of the bottom and rearmost areas of said conveyor belt means and any articles randomly positioned thereon, said second lower nozzle section having lower nozzles with said deflector means thereof oriented facing upstream with respect to the direction of movement of said conveyor means to facilitate cleaning of the bottom and frontmost areas of said conveyor belt means and any articles randomly positioned thereon;
- (6) a drive means for operatively controlling said pump means;
- (7) a tank means positioned below said outlet means of said wash housing means to receive and gather used cleaning solution therefrom;
- (8) a return line in fluid flow communication with respect to said tank means and with respect to said pump means for supplying cleaning solution to said pump;
- (9) a support means mounted within said wash housing means for supporting and guiding said conveying belt means while traveling through said wash station, said support means defining open channels through which cleaning solution can be directed by said lower nozzles for cleaning of the bottom of said conveying belt means and the bottoms of any articles randomly positioned thereon, said support means comprising three vertically extending plates including upper edges for supporting said conveying belt means and being spatially disposed with respect to one another for defining said open channels therebetween;
- (10) a filter means positioned between said outlet means of said wash housing means and said tank means to filter the cleaning solution prior to being drawn into said return lines for reuse;
- (c) a drying station positioned downstream from said wash station and enclosing said conveying belt means traveling therethrough, said drying station including:
 - (1) a drying housing means enclosing said conveying belt means;
 - (2) a blower means supplying forced air for drying of said conveying belt means and any articles randomly positioned thereon;
 - (3) an air manifold means for receiving forced air from said blower means and communicating same into said drying housing means adjacent to said conveying belt means; and
 - (4) an air dispensing means positioned within said drying housing means and in fluid flow communication with respect to said air manifold means for delivering forced air for drying into said conveying belt means and any articles randomly positioned thereon.

4,709,714

APPARATUS FOR EXPOSING FIBROUS REINFORCEMENTS OF FIBER REINFORCED RESIN BODY

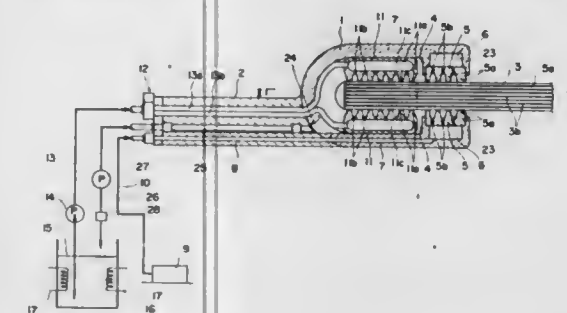
Yoshinori Nishino, Yamatotakada; Masahiko Yamamoto, Nishinomiya; Tadayoshi Uda, Izumi; Kiyoshi Kondo, Itami; Yutaka Kondo, and Kazuo Kondo, both of Amagasaki, all of Japan, assignors to Hitachi Zosen Corporation, Japan
Filed Dec. 27, 1984, Ser. No. 686,843

Claims priority, application Japan, Aug. 6, 1984, 59-164469; Oct. 25, 1984, 59-225433

Int. Cl.⁴ B08B 7/00, 7/02

U.S. Cl. 134—89

13 Claims



1. An apparatus for exposing and cleaning the fibrous reinforcements of a fiber reinforced resin body comprising at least one processing unit including, a generally U-shaped main body with an open front end and open sides for laterally movably receiving an edge portion of the resin body, a pair of opposed liquid applicators arranged in the main body on both opposite walls thereof and adapted to slidably contact both sides of said edge portion of the resin body, each applicator having liquid jetting orifices on the side thereof opposing the other applicator, and means for alternately supplying a heated resin removing liquid to the applicators so that the liquid is jetted to said edge portion of the resin body alternately through the orifices of the respective applicators to cause the resin body to vibrate.

5. An apparatus for exposing and cleaning the fibrous reinforcements of a fiber reinforced resin body comprising, a first processing unit having means for heating a portion of the resin body, a second processing unit having first vibrator press means for roughly or coarsely cracking said portion of the resin body in a resin removing liquid, a third processing unit having second vibrator press means and means for jetting a heated resin removing liquid to said portion of the resin body so that said portion of the resin body is minutely or finely cracked, a fourth processing unit having ultrasonic cleaning means for roughly washing off the cracked resin matrix from said portion of the resin body in a heated resin removing liquid, a fifth processing unit having means for applying to said portion of the resin body a shower of a heated purified resin removing liquid so as to completely wash off the remaining cracked resin matrix, and means for transporting the resin body through said processing units.

4,709,715

RETRACTABLE PRE-RINSE UNIT WITH AUTOMATIC SHUTOFF

Silsby H. Knight, New Tripoli, Pa., assignor to Hayes-Ivy Manufacturing Inc., New Tripoli, Pa.

Filed Feb. 11, 1986, Ser. No. 828,402

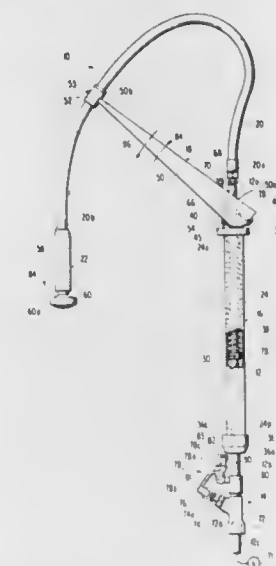
Int. Cl.⁴ B08B 3/00; B05B 15/08

U.S. Cl. 134—172

9 Claims

1. A retractable pre-rinse unit comprising a vertical upright tubular assembly comprising a fixed vertical internal riser pipe having upper and lower ends, an outer tube of a diameter in excess of that of said riser pipe, a normally closed water shutoff valve connected to said internal riser pipe at the lower end thereof for connecting to a source of water, means for mounting said outer tube concentrically on said vertical riser pipe

above said shutoff valve for movement axially and for rotation about its axis on said riser pipe, a flexible hose fixably connected at one end coaxially to the upper end of said riser pipe, a spray head fixably coupled to the other end of said hose, means rotatably mounted to the upper end of said fixed vertical internal riser pipe for supporting said hose in arcuate, semi-loop form with said spray head pointing downwardly and to a side of said tubular assembly for raising and lowering said spray head parallel to said vertical upright tubular assembly and being spaced laterally therefrom, spring biasing means mounted externally of said internal riser pipe and operatively



engaging said outer tube for biasing said outer tube upwardly away from said valve, stop means carried by said vertical riser pipe for limiting vertical movement of said outer tube away from said valve, means responsive to outer tube movement axially on said vertical internal riser pipe toward said shutoff valve and against said spring biasing means for opening said normally closed shutoff valve, and cam means carried by said hose supporting means and operatively engaging said outer tube for effecting vertical movement of said outer tube on said riser pipe against the bias of said spring biasing means in response to manual pull down of the spray head to open said normally closed valve.

4,709,716

RINSE TANK

Russell G. Raush, and Raymond A. Alleman, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 16, 1986, Ser. No. 907,976

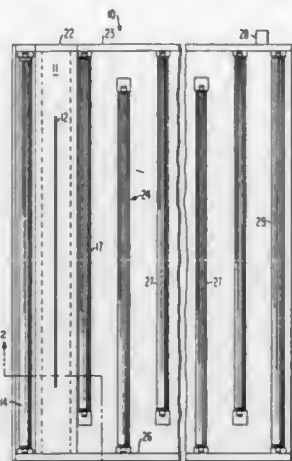
Int. Cl.⁴ B08B 3/04

U.S. Cl. 134—122 R

6 Claims

1. A rinse tank for rinsing residue from fine apertures in a moving strip of material comprising:
a chamber having an elongated slot for spanning said strip when said strip passes in the proximity of said chamber;
first fluid inlet means for providing fluid to said chamber whereby fluid exits said elongated slot as a fluid curtain substantially normal one side of said strip;
second liquid inlet means arranged in the proximity of said elongated slot for providing fluid to said tank and on the other side of said strip, said second fluid inlet means being positioned so that fluid exiting said second inlet means creates a fluid flow substantially parallel to said elongated slot whereby fluid flow into said fine apertures is enhanced and enhances the rinsing of residue from said apertures;
third fluid inlet means, spaced from said second fluid inlet means along the length of said rinse tank; and

a plurality of pairs of rollers for holding said strip beneath said fluid, said pairs of rollers being staggered between



second and third fluid inlet means whereby fluid from said third inlet means follows a labyrinth path prior to joining fluid from said second fluid inlet means.

4,709,717

CLEANING APPARATUS FOR PAINT ROLLERS AND THE LIKE

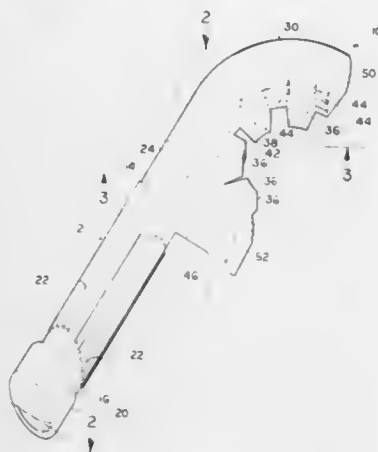
Robert C. Rannigan, 5825 Lexington La., Earlsyville, Va. 22936, and Gregory E. Webber, 13 Iroquois Trail, Ruckersville, Va. 22968

Filed May 9, 1986, Ser. No. 861,402

Int. Cl.⁴ B08B 3/02

U.S. Cl. 134-199

9 Claims



1. Cleaning apparatus for cleaning a paint roller and the like, said cleaning apparatus comprising:

- A. a C-shaped cleaning head having a curved inner surface and an annular passage therein;
- B. a plurality of spaced, generally radially inwardly extending nipples positioned circumferentially along the inner surface of said cleaning head, each of said nipples having an end face provided with a fluid outlet and having a fluid passage extending from the fluid outlet to said annular passage of said cleaning head; and
- C. means for connecting said cleaning head to a cleaning fluid source to supply cleaning fluid to said annular passage and the fluid passages of said nipples, the curved inner surface of said cleaning head having a size and shape similar to that of the exterior of the roller to be cleaned, and said nipples being closely spaced and of sufficient length to penetrate the roller when it is brought into contact with said cleaning head, whereby cleaning fluid

can be conveyed to the roller beneath the outer surface thereof through the fluid passages of said nipples.

4,709,718

TENT FLY APPARATUS AND METHOD

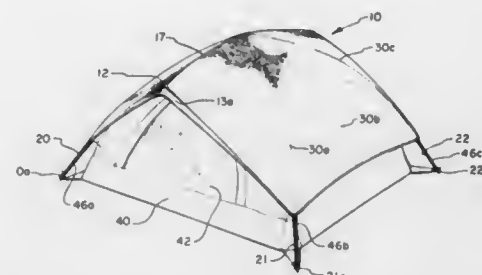
Nichols, Philip T., 4399 Walter Way, West Valley City, Utah 84120

Continuation-in-part of Ser. No. 732,494, May 9, 1985, abandoned. This application May 8, 1986, Ser. No. 861,062

Int. Cl.⁴ A45F 1/16; E04B 1/347

U.S. Cl. 135-106

11 Claims



1. A mountable and demountable rain fly system for a tent comprising:

- a single spar, said spar being formed from a plurality of hollow sections releasably mountable end-to-end into joints to form said spar and including an elastic means passing through said hollow sections to releasably hold said hollow sections in said end-to-end relationship to form said spar;
- mounting means on said spar for removably mounting said spar to said tent;
- a rain fly comprising a fabric sheet mounted to said spar to form said rain fly as a single unit, said fabric sheet being mounted over said spar and having a plurality of spar-receiving sleeves, said sleeves having a plurality of openings, said openings corresponding to said joints in said spar to permit separation of said hollow sections;
- slack means in said rain fly to accommodate separation of said joints; and
- securement means for releasably securing said rain fly system to said tent when said mounting means is mounted to said tent.

4,709,719

AUTOMATIC CUP PIG LAUNCHING AND RETRIEVING SYSTEM

Jody Littleton, Brighton, and Gary W. Davis, Broomfield, both of Colo., assignors to Tamworth, Inc., Broomfield, Colo.

Filed Dec. 15, 1986, Ser. No. 941,400

Int. Cl.⁴ B08B 9/06

U.S. Cl. 137-268

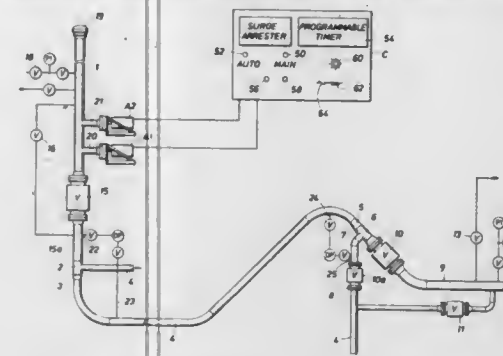
18 Claims

1. Apparatus for launching cup pigs into a pipeline, comprising:

- (a) a generally vertically oriented launching barrel of a height sufficient to contain a plurality of cup pigs, said launching barrel having an internal diameter greater than the internal diameter of the pipeline;
- (b) an isolation valve connected to said launching barrel and having a flow port of substantially the same internal dimension as said launching barrel;
- (c) a holding ram located intermediate the upper and lower extremities of said launching barrel and being movable to a pig holding position within said launching barrel and a pig release position permitting downward movement of cup pigs within said launching barrel;
- (d) a launching ram located between said holding ram and said isolation valve and being spaced below said launching ram sufficiently that a single cup pig will be received

between said holding ram and launching ram, said launching ram being movable to an extended position blocking downward movement of a cup pig within said launching barrel and a retracted position permitting downward movement of cup pigs;

- (e) a pipe section located below said isolation valve and having substantially the same internal dimensions as said launching barrel;
- (f) a connection member in the form of a pipe tee coupled in fluid receiving relation with said pipeline and having a straight through passage of substantially the same internal diameter as said pipe section and having a branch connec-



tor coupled with said pipeline, said connection member combining a launched cup pig into fluid flowing from said pipeline and permitting fluid pressure induced transport of said cup pig through said pipeline;

- (g) a concentric launching reducer having a large end coupled in fluid receiving relation with said connection member and having a small end coupled in fluid supplying relation with said pipeline; and
- (h) differential pressure detector means sensing pressure of flowing fluid upstream of said connection member and downstream of said concentric launching reducer and providing a signal indicating passage of a launched cup pig into said pipeline.

4,709,720

AUTOMATICALLY LOCKING VALVE

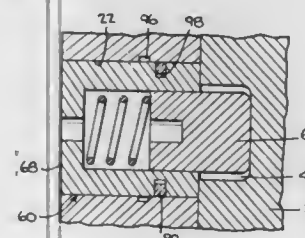
Onofrio N. Russo, Middle Village, N.Y., assignor to Gas Energy, Inc., Brooklyn, N.Y.

Filed Oct. 31, 1986, Ser. No. 925,621

Int. Cl.⁴ F16K 35/00

U.S. Cl. 137-385

3 Claims



1. A locking valve comprising:

- a housing defining a passageway, a stem bore and a lock bore intersecting said stem bore;
- a valve stem seated in said stem bore for movement through a range of positions encompassing a closed position in which said valve stem occludes said passageway and an open position in which said valve stem permits fluid flow through said passageway;
- said stem being formed with a cylindrical portion confronting said lock bore and with at least one recess in said cylindrical portion;
- lock means disposed in said lock bore for automatically arresting movement of said stem upon its movement to

one of said positions, said lock means including a sleeve mounted in said lock bore, a pin mounted in said sleeve for axial movement therein and means biasing said pin toward said stem so that a portion of said pin will enter said at least one recess upon movement of said stem to a position in which said recess is aligned with said lock bore;

an annular groove in the surface of said lock bore and a second annular groove formed in the exterior surface of said sleeve, said grooves being out of register when said sleeve is inserted to a desired operable position in said lock bore and being adapted to come into register upon axial movement of said sleeve in a direction away from said stem; and

security means in said groove in said sleeve for limiting said axial movement of said sleeve beyond that position at which said grooves come into registry.

4,709,721

INTEGRAL BASE REFILL SYSTEM BALLCOCK ASSEMBLY

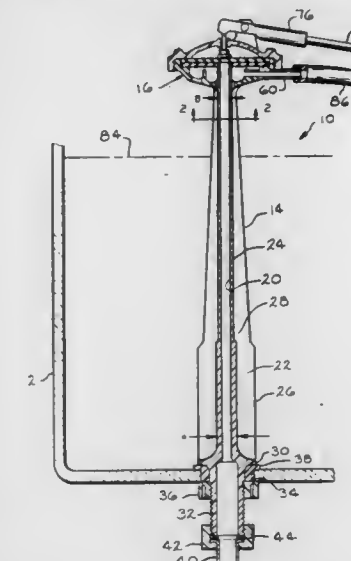
Larry D. Gish, Robards, Ky., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Mar. 18, 1987, Ser. No. 27,542

Int. Cl.⁴ F16K 31/20, 33/00, 47/02

U.S. Cl. 137-437

4 Claims



3. A ballcock assembly for controlling the flow of water from a supply line into a toilet reservoir tank comprising:

a ballcock valve assembly including:

- a bowl-shaped housing having an outer flange, a central water discharge pipe, vent outlets, an upstanding wall positioned radially between said central discharge pipe and said vent outlets, a bowl fill tube connection communicating with the interior of said housing adjacent said pipe, and a plurality of refill openings encircling said water discharge pipe;
- a cover enclosing said housing;
- a first flexible diaphragm disposed between said cover and said housing and covering said water discharge pipe, said first diaphragm adapted to control the flow of water from said water discharge pipe;
- a second flexible diaphragm disposed between said cover and said housing and having a central hole surrounding said water discharge pipe, said second diaphragm engageable with said upstanding wall;
- a ball float lever coupled to said first diaphragm wherein when the water level in said reservoir is below a reference level, water is permitted to deflect said first diaphragm to flow from said discharge pipe and deflects said second diaphragm causing said second diaphragm

to seal against said wall wherein water is discharged through said refill openings and said bowl fill tube connection, and wherein said second diaphragm and said vent outlets operate as a vacuum break when the pressure in said water supply pipe is below atmospheric, said lever acting on said first diaphragm to seal against said water discharge pipe when the water reaches said reference level, and

a standpipe having a central water inlet duct and a plurality of integral generally longitudinally outwardly extending external walls, said walls being tapered along the entire length of said standpipe, decreasing in width as they approach the refill openings and terminating on opposite sides of the refill openings, said standpipe adapted to extend vertically within said reservoir tank, said refill openings being oriented such that they produce individual streams of water which are directed along said outside surface of said standpipe and are separated from each other by said walls to maintain the flow of water in contact with the standpipe external walls for producing a cascading flow action to reduce the refilling noise caused by the discharge of the flow of water from the refill openings.

4,709,722

VALVE APPARATUS FOR CRANKCASE OIL DRAINAGE

Paul A. Knapp, 1303 W. 9th St., Tempe, Ariz. 85282

Filed Sep. 22, 1986, Ser. No. 909,876

Int. Cl.⁴ F16K 15/04

U.S. Cl. 137—539

6 Claims



1. Drain valve apparatus for draining a fluid from a reservoir, comprising, in combination:
 - valve body means, including
 - a valve body securable to a reservoir to be drained,
 - first bore means in the valve body communicating with the fluid to be drained, and
 - second bore means in the valve body communicating with the first bore means, and
 - a threaded portion for securing the valve body to a threaded drain opening of the reservoir to be drained; and
 - insert means secured to the valve body means and extending into the second bore means and out of the valve body means, including
 - a tube having a first end for receiving the fluid from the first bore means,
 - a valve seat in the tube at the first end,
 - a ball in the tube,
 - spring means for biasing the ball against the seat, and
 - connector means extending outwardly from the valve body means for connecting the tube to a conduit for receiving the fluid from the first bore means when the ball is moved off the valve seat.

4,709,723

SEPTIC TANK FOR ALTERNATIVE SEWER SYSTEMS

H. John Sidaway, Findlay, and Donald A. Lytle, Tiffin, both of Ohio, assignors to Hancor, Inc., Findlay, Ohio

Filed Jul. 17, 1986, Ser. No. 887,077

Int. Cl.⁴ F16K 24/00; E02D 29/14

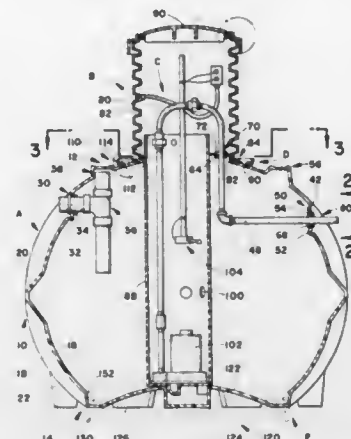
U.S. Cl. 137—584

16 Claims

1. In a corrugated sewage tank which has generally vertically extending alternating ribs and valleys which define a corrugated side wall extending between a bottom wall and an

apex area and which ribs and valleys tend to compress in an accordion-like manner and which apex area tends to become distorted under large pressure differentials between the tank interior and exterior, the improvement comprising:

an annular structure mounted to the tank and extending peripherally around the apex area for inhibiting the apex area from becoming distorted under exterior hydrostatic



pressure when the tank is disposed in water-laden soil, the annular structure including a horizontally mounted portion to prevent horizontally inward compression of the apex area and a generally upward standing portion for preventing upward and downward deflection of portions of the apex area out of a plane defined by the annular structure.

4,709,724

FLUID VALVE STRUCTURES

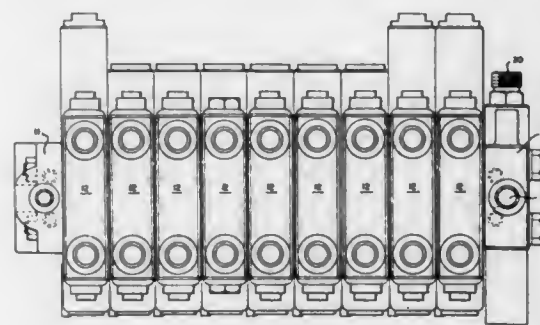
Arthur Williams, Masury, Ohio, assignor to Commercial Shear-ing, Inc., Youngstown, Ohio

Filed Jan. 17, 1986, Ser. No. 820,262

Int. Cl.⁴ F15B 13/08

U.S. Cl. 137—596

47 Claims



1. A fluid valve structure comprising a first inlet section separately connected to a source of pressure fluid and to a reservoir, a second inlet section, a plurality of side by side valve sections between said first inlet and second inlet sections each having a housing with at least one inlet chamber, a work chamber and a tank chamber intersected by a passage open at opposite ends to a control chamber and a tank chamber at a common pressure, a valve spool having both ends in said chamber at a common pressure and being movable in said passage, said spool having spaced grooves adapted in one position to connect said work chamber to the inlet chamber and in a second position to connect the work chamber with a tank chamber, lever means in said control chamber engaging one end of the valve spool, said lever means being rotatable about a shaft whose axis is transverse to and spaced from the axis of spool valve, seals and bearings in said housing through

which both ends of said shaft pass to the outside of the valve housing, handle means external of the housing acting on the shaft means to rotate the lever means whereby the valve spool moves axially in the passage, said shaft, lever means and valve spool being fully enclosed within the valve housing in all operative positions and a parallel pressure passage provided from the first inlet section to a second inlet section such that pressure fluid is provided at two points in the valve bank to minimize pressure drop to sections remote from the first inlet.

4,709,725

METAL-TO-METAL SEAL STRUCTURE

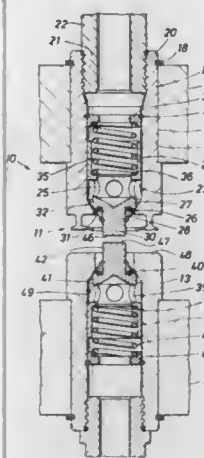
Bertram L. Morrison, Houston, Tex., assignor to Vetco Gray, Inc., Houston, Tex.

Filed Feb. 17, 1987, Ser. No. 15,071

Int. Cl.⁴ F16L 37/28

U.S. Cl. 137—614.04

22 Claims



1. A seal structure for use in preventing fluid leakage from a flow path, comprising: an annular body having a first, inwardly directed flexible flange and a second, outwardly directed flexible flange; a first seal foot on the inner margin of said first flange; and a second seal foot on the outer margin of said second flange, said first seal foot having a lower surface that initially extends below the lower surface of said second seal foot, whereby when said seal structure is brought into engagement with a companion seal surface said first seal foot engages said seal surface first to induce elastic bending of said first flange and rotation of said body prior to engagement of said second seal foot with said seal surface.

12. A connector apparatus for use in a hydraulic system that is employed in remote control of a subsea wellhead or the like, comprising: a first junction plate having at least one valve means thereon for normally closing the end of a hydraulic control line, said valve means having an outlet; a second junction plate having at least one valve means thereon for normally closing the end of another hydraulic control line, said last-mentioned valve means having an inlet; actuator means for automatically opening said valve means to communicate said outlet with said inlet when said junction plates and said valve means are moved relatively toward one another; and a seal structure on one of said valve means engageable with said other valve means when said valve means are open to prevent leakage of hydraulic fluid, said seal structure including an annular body on one of said valve means having an inwardly directed flange and an outwardly directed flange on the outer end thereof, a first, circumferentially continuous seal foot on the inner margin of said inwardly directed flange, a second, circumferentially continuous seal foot on the outer margin of said outwardly directed flange, said first seal foot having a bottom surface that in the relaxed condition of said inwardly directed flange extends beyond the corresponding bottom surface of said second seal foot, whereby when said seal structure is engaged with a companion seal surface on the other of said valve means, said first seal foot engages said seal surface before

said corresponding bottom surface engages said seal surface to induce elastic bending of said inwardly directed flange and rotation of said annular body.

4,709,726

HYDRAULIC COUPLER WITH FLOATING METAL SEAL

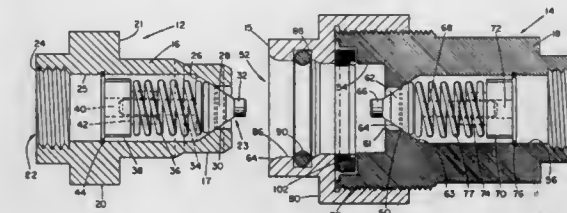
Michael R. Fitzgibbons, Houston, Tex., assignor to Ferranti Subsea Systems, Inc., Sugar Land, Tex.

Filed Feb. 17, 1987, Ser. No. 15,797

Int. Cl.⁴ F16L 29/00

U.S. Cl. 137—614.04

20 Claims



11. In a hydraulic coupling of a type employing male and female coupling bodies each having a fluid passageway there-through for the transmission of fluid and including a sealing surface for sealing engagement when the coupling is unmated with a valve means movably mounted within the respective passageway of each coupling body, the female coupling body having a fluid input end and an opposing male receiving end, the valve means within each coupling body having end portions adapted for engagement when the coupling bodies are mated for unseating each valve means from its respective sealing surface for allowing the transmission of fluid through the mated coupling, the improvement comprising:

- the male coupling body including a cylindrical outer sealing surface;
- a floating ring member housed within the female coupling body and radially movable with respect to the female coupling body;
- a first compressible metallic-material seal ring housed on the floating ring member for sealing engagement between the cylindrical outer surface of the male coupling body and a sealing surface on the ring member, the first seal in cross-section having an opening facing the fluid input end of the female coupling body to increase sealing effectiveness of the first seal ring;
- a second compressible metallic-material seal ring housed on the floating ring for sealing engagement between a planar sealing surface of the female coupling body substantially perpendicular to the axis of the coupling and another sealing surface on the ring member, the second seal in cross-section having an opening facing radially outwardly to increase sealing effectiveness of the second seal ring; and
- the second metallic seal ring biasing the floating metallic ring out of engagement with the sealing surface of the female coupling body prior to mating of the coupling bodies to facilitate alignment of the male coupling body and the floating metallic ring during the coupling operation, and fluid pressure in the mated coupling biasing the floating metallic ring toward the planar sealing surface of the female coupling body to enhance sealing effectiveness of the second seal ring when the coupling is mated.

4,709,727

PILOT VALVE

Ruel R. Gober, 3525 Lake Catherine, Harvey, La. 70058

Filed Sep. 23, 1986, Ser. No. 910,507

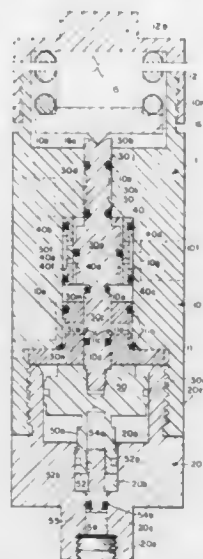
Int. Cl.⁴ F15B 13/042

U.S. Cl. 137—625.66

23 Claims

13. A pilot valve comprising a tubular valve body having a

central bore; a radially disposed control fluid inlet port communicating with said central bore; a radially disposed venting port communicating with said central bore at a location axially spaced from said control fluid inlet port; a radially disposed control fluid outlet port communicating with said central bore intermediate said control fluid inlet and outlet ports; a spool valve mounted in said central bore for limited axial movements between a first position and a second position; sealing means between said central bore and said spool valve for directing control fluid from said control fluid inlet port to said control



fluid outlet port and preventing fluid communication with said venting port when said spool valve is in said first position, and connecting said venting port and said control fluid outlet port and preventing fluid communication with said control fluid inlet port when said spool valve shifts to said second position; resilient means urging said spool valve to said first position; piston means responsive to a monitored fluid pressure urging said spool valve to said second position; and means responsive to control fluid pressure in said central bore for biasing said spool valve toward said first position only when displaced therefrom to said second position.

4,709,728

SINGLE-AXIS CONTROL AUTOMATIC FAUCET

Chen Ying-Chung, 841 Chung Shan North Rd., Sec. 5, Taipei, Taiwan

Filed Aug. 6, 1986, Ser. No. 893,724

Int. Cl.⁴ F16K 11/18

U.S. Cl. 137—636.4

2 Claims

1. A single axis water faucet for selectively discharging water automatically and manually, said faucet comprising:

(A) a manually actuable valve comprising:

(1) a cylindrical main valve body including:

(i) diametrically opposed hot water and cold water inlets,

(ii) a first water outlet at a first longitudinal end of said main valve body, and

(iii) a side water outlet spaced longitudinally from said first outlet, and

(2) adjusting cylinder means rotatably housed in said main valve body and comprising cylindrical wall means, said adjusting cylinder means including:

(i) a curved adjusting valve plate disposed at one longitudinal end of said adjusting cylinder means in overlying relationship to said hot and cold water inlets and arranged to be rotated along with said adjusting cylinder means to adjust the relative sizes of said hot water and cold water inlets,

(ii) a hole formed in said cylindrical wall and arranged

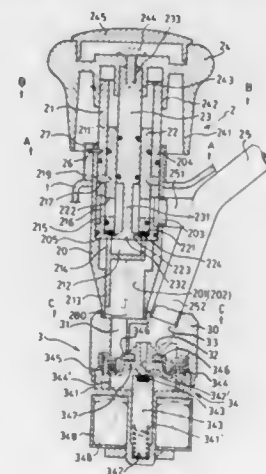
for alignment with said side water outlet of said main valve body,

(iii) a valve port for communicating said hot and cold water inlets with said hole to discharge water through said side water outlet,

(iv) removable retaining means for rotatably mounting said adjustable cylinder means to said main valve body,

(v) a manually actuable control stem longitudinally slidably disposed in said adjusting cylinder means and including a control rod and a valve plate disposed at one longitudinal end of said valve rod for closing and opening said valve port to control communication between said side water outlet and said cold and hot water inlets in response to longitudinal sliding movement of said valve stem relative to said adjusting cylinder means, and

(vi) a control knob operably connected to said valve stem and said adjusting cylinder means for effecting



longitudinal movement of the former and rotation of the latter,

(3) said adjustable cylinder means, said control stem, and said control knob being removable as a unit from said main valve body in response to removal of said removable fastening means,

(B) an additional water outlet port communicating with said cold and hot water inlets through said first water outlet of said main valve body,

(C) a solenoid valve arranged for opening and closing said additional water outlet port,

(D) infrared sensing means for opening said solenoid valve in response to sensing a user's hand in a predetermined location, to discharge water through said additional water outlet port, and

(E) a water discharge pipe including two intake portions communicating with said side water outlet and said additional water outlet port, respectively, and a common discharge outlet communicating with both said intake portions.

4,709,729

PIPE WELD REPAIR DEVICE AND METHOD FOR THE INSTALLATION THEREOF

George W. Harrison, Houston, Tex., assignor to Team, Inc., Alvin, Tex.

Continuation of Ser. No. 657,192, Oct. 3, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 820,235

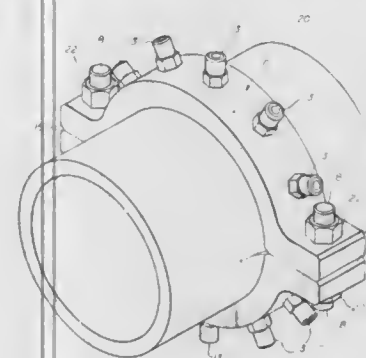
Int. Cl.⁴ F16L 55/16

U.S. Cl. 138—99

10 Claims

1. A method of forming an assembly, the assembly including: a pipe; at least two pipe clamp segments disposed around said pipe and connected together with connector means to form a

complete clamp; said clamp segment of said clamp segment defining two inner surfaces adapted to be in direct contact with the outer surface of said pipe when said clamp is connected around said pipe; each clamp segment of said clamp segments defining an inner grooved recess disposed between said inner surfaces and adapted to enclose a weld circumferentially disposed around said pipe with said clamp being connected around said pipe; said inner surfaces of said clamp segments defining an internal diameter when said clamp segments are connected to form said complete clamp; said internal diameter being movable around the outside diameter of said pipe while said clamp segments as connected together are at a sufficiently high temperature above the temperature of said pipe to be



thermally expanded; and said internal diameter being reduced to a fixed shrink connection around the outside diameter of said pipe after said clamp segments are allowed to cool from said high temperature to the same temperature of said pipe; the method including the steps of:

(a) heating said clamp segments to a temperature sufficiently above the temperature of said pipe to cause appropriate thermal expansion of said clamp segments;

(b) connecting said clamp segments together while heated to form said clamp disposed around said pipe and covering a circumferential crack in said pipe; and

(c) pausing to allow the temperature of said clamp segments and said pipe to equalize with consequent shrinking of said clamp into a tight shrink connection with said pipe.

4,709,730

PIPE CLUSTER UNIT

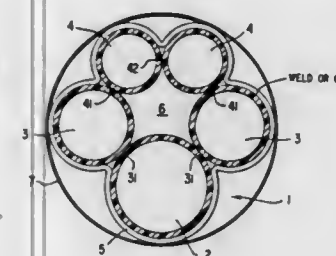
Hermann Zwilling, Rehau, Fed. Rep. of Germany, assignor to Rehau AG & Co., Rehau, Fed. Rep. of Germany
Continuation of Ser. No. 777,361, Sep. 18, 1985, abandoned, which is a division of Ser. No. 587,767, Mar. 9, 1984. This application Dec. 23, 1986, Ser. No. 946,132

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308482

Int. Cl.⁴ F16L 9/20

U.S. Cl. 138—111

7 Claims



1. A flexible pipe cluster unit comprising

(a) a plurality of synthetic pipes arranged parallel to one another; each pipe being in mutual engagement solely

with two adjoining pipes along longitudinal lines of contact to form a pipe cluster; and

(b) a cover layer united by a bond with external surface portions of each of said pipes; said cover layer connecting adjoining pipes to one another by bridging the adjoining pipes at locations spaced from respective lines of contact between adjoining pipes providing bond-free pipe surface portions situated between said respective lines of contact and said cover layer; said surface portions enclosing an empty space; the pipes of the cluster together surrounding an inner space providing a means for allowing a shift of the pipes relative to one another.

4,709,731

FLEXIBLE ELEMENT OF (DUAL) WAVE CREST
Liang Wang, No. 49 Defengxixiang, Qianmen, Chongwen Dis., Beijing, China

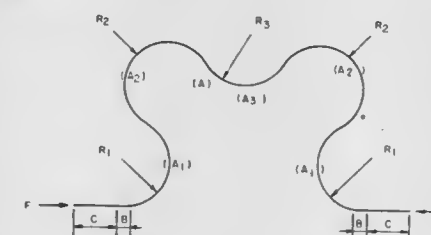
Filed Mar. 10, 1986, Ser. No. 841,493

Claims priority, application China, Apr. 1, 1985, 85100678

Int. Cl.⁴ F16L 11/11, 11/12

U.S. Cl. 138—121

5 Claims



1. A tubular flexible member comprising:

a first cylindrical portion;

a second cylindrical portion; and

an annular flexible segment interconnecting said first and second cylindrical portions, said annular flexible segment comprising,

a first annular arcuate portion connected to said first cylindrical portion and being inwardly arcuate with respect to said first and second cylindrical portions and having a radius of curvature of R1,

a second annular arcuate portion connected to said first annular arcuate portion and being outwardly arcuate with respect to said first and second cylindrical portions and having a radius of curvature of R2,

a third annular arcuate portion connected to said second annular arcuate portion and being inwardly arcuate with respect to said first and second cylindrical portions and having a radius of curvature of R3,

a fourth annular arcuate portion connected to said third annular arcuate portion and being outwardly arcuate with respect to said first and second cylindrical portions and having a radius of curvature of R2; and

a fifth annular arcuate portion connected to said fourth annular arcuate portion and being inwardly arcuate with respect to said first and second cylindrical portions and having a radius of curvature of R1;

said first, second, third, fourth and fifth annular arcuate portions forming an annular flexible segment having a dual wave crest and wherein the radius of curvature R1 is equal to the said radius of curvature R2.

4,709,732

FOURTEEN HARNESS DUAL LAYER WEAVE

Martti I. Kinnunen, Espoo, Finland, assignor to Huyck Corporation, Wake Forest, N.C.

Filed May 13, 1986, Ser. No. 862,761

Int. Cl.⁴ D03D 15/00; D21F 1/10

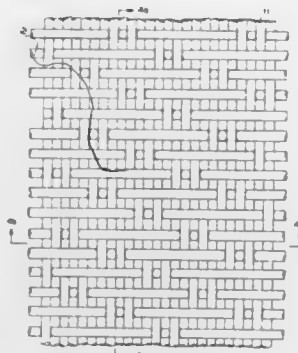
U.S. Cl. 139—383 A

14 Claims

1. An improved papermakers' fabric comprising a fourteen

harness dual layer endless fabric with at least 80% cover formed of machine direction and cross machine direction yarn systems having:

- a set of machine direction yarns;
- a first set of cross machine direction yarns located mainly on a side of the fabric facing the material to be formed and interlaced with said set of machine direction yarns in a pattern;



- a second set of cross machine direction yarns located mainly on a side of the fabric facing the machine and interlaced with said set of machine direction yarns in a pattern different than the pattern of the first set of cross machine direction yarns;
- a float of the interlacing pattern of the machine side cross machine direction yarn being under eleven machine direction yarns; and
- each machine direction yarn having the same pattern of interlacing as the adjacent machine direction yarn.

4,709,733

ELECTRON TUBE PIN-SENSING AND STRAIGHTENING DEVICE

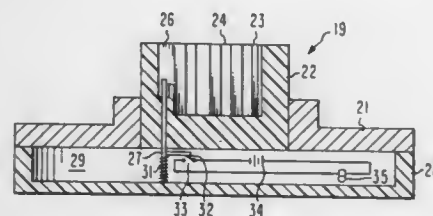
Kenneth J. Yakmovitz, Jermyn, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 24, 1986, Ser. No. 888,804

Int. Cl.⁴ B21F 1/02

U.S. Cl. 140—147

3 Claims



1. An electron tube pin sensing and straightening device for use with an electron tube having a plurality of electrical connecting pins and a base for receiving said pins, at least one of said pins being arranged in a silo portion of said base, said pin sensing and straightening device comprising:

- a sturdy support member;
- an insulative portion affixed to said support member, said insulative portion having an aperture configured to receive said base, and having a silo portion for receiving said silo, whereby said aperture and said insulative portion mate in a particular orientation;
- a transparent member affixed to said sturdy support, said transparent member having a cavity juxtaposed said sturdy support;
- a slidable pin arranged in said silo portion of said insulative portion, and extending into said cavity, said slidable pin including an actuator arm; said slidable pin being posi-

tioned to engage said at least one pin when said sensing and straightening device is mated with said base, and an indicator circuit arranged in said cavity, said indicator circuit including a battery, a light and a switch positioned for actuation by said actuator arm.

4,709,734

METHOD AND SYSTEM FOR FILLING PACKAGES WITH A CARBONATED BEVERAGE PRE-MIX UNDER MICRO-GRAVITY CONDITIONS

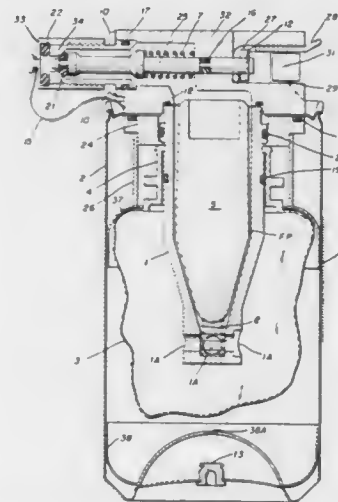
Arthur G. Rudick, Marietta, and William S. Credle, Jr., Stone Mountain, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 724,155, Apr. 17, 1985. This application Sep. 18, 1985, Ser. No. 777,316

Int. Cl.⁴ B65B 3/04

U.S. Cl. 141—2

14 Claims



1. A method for filling packages with a carbonated beverage pre-mix in the micro-gravity conditions of outer space, each package including a rigid container, a collapsible bag disposed within the rigid container, said bag containing the carbonated beverage pre-mix, a drinking spout for dispensing said carbonated beverage directly into the consumer's mouth, a valve associated with said spout for starting or stopping the flow of carbonated beverage therethrough, valve actuator means for opening or closing said valve to start or stop said flow, respectively, propellant gas means disposed in said rigid container around said collapsible bag for compressing said bag and forcing said carbonated pre-mix to flow through said spout when said valve is open, said propellant gas means having a sufficient initial pressure to ensure that the carbonation of said carbonated beverage pre-mix remains in solution throughout the dispensing period of the package, and flow-rate control means for maintaining a substantially constant rate of flow of the carbonated beverage pre-mix from said bag through said drinking spout, comprising the steps of:

- (a) providing a supply tank containing a sufficient quantity of carbonated beverage pre-mix to fill a plurality of said packages, said tank including,
 1. an outer rigid shell,
 2. a collapsible supply bag for containing said quantity of carbonated beverage pre-mix;
 3. a dip tube extending into said supply bag having a conduit for accommodating the flow of the pre-mix therethrough;
 4. a source of gas under pressure in the rigid outer shell for pressing the walls of the supply bag against the pre-mix, the pressure of said gas being substantially constant and sufficient to maintain the carbonation of the pre-mix in solution, and

5. a valve assembly for coupling the dip tube of the supply tank to the spout of said package; and
- (b) connecting the spout of a package to said valve assembly; and
- (c) actuating said valve assembly to fill a package with said pre-mix.

4,709,735

AUTOMATIC SHUT-OFF DEVICE FOR FUEL DISPENSER

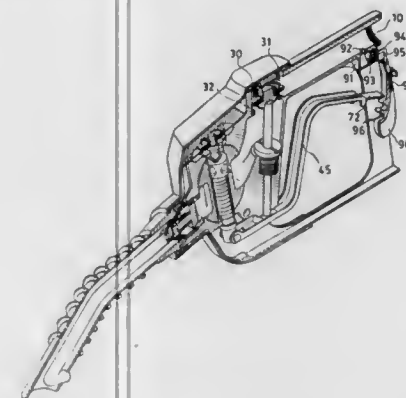
King-chang Chang, No. 20, Hsi Wei Street, San Chung City, Taiwan

Filed Jan. 3, 1985, Ser. No. 688,525

Int. Cl.⁴ B67D 5/04

U.S. Cl. 141—209

4 Claims



1. An automatic shut-off dispensing nozzle, especially for dispensing liquid fuel, said nozzle comprising:

- (a) a hollow walled handle body, said body defining a chamber, and said body having an inlet, an outlet, and passage means connecting said inlet to said outlet; said passage means being adapted to create a venturi effect when liquid flows through said passage means from said inlet to said outlet in response to activation of a pressurized source of fuel communicating with said inlet; and said passage means providing communication with the atmosphere and said chamber;
- (b) a first valve means, said first valve means being arranged at the outlet of said handle body and adapted to allow fuel flow;
- (c) a second valve means in said passage means for controlling liquid fuel flow from said inlet to said outlet of said body;
- (d) movable control handle means for moving said second valve means to an open position;
- (e) means for retaining said control handle means when said second valve means is in an open position, and said retaining means being adapted to release said control handle means when fuel flow is terminated;
- (f) at least one diaphragm operatively arranged in said chamber of said hollow walled handle body;
- (g) actuating means to release said control handle means resulting in said second valve means being moved to its closed position; said at least one diaphragm being connected to said actuating means in such a way to render said actuating means effective upon movement of said at least one diaphragm in response to a partial vacuum being created in said chamber when the level of the liquid in a respective tank being filled reaches a predetermined level;
- (h) a handle guard secured at said handle body;
- (i) means for controlling the position of said control handle means when fuel flow from said inlet to said outlet of said body is terminated, a sensing cylinder which is mounted under said passage means at the inlet of said handle body but above said handle guard; and said cylinder including

a compression spring; a sensing piston with an L-shaped piston stem; wherein upon the flow of liquid being terminated, the returning force of said compression spring will move said piston stem and said retaining means until said control handle means is separated from said retaining means to automatically terminate fuel flow.

4,709,736

TRACTOR MOUNTED ROTARY CUTTING EQUIPMENT

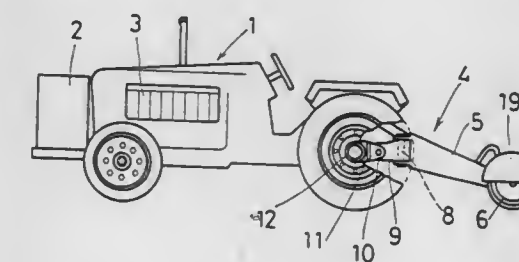
Terence G. Bellars, P.O. Box 1442 Pietermaritzburg, Natal Province, South Africa

Continuation of Ser. No. 728,305, Apr. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 573,338, Jan. 24, 1984, abandoned. This application Mar. 5, 1986, Ser. No. 837,643

Int. Cl.⁴ A01G 23/06

U.S. Cl. 144—2 N

11 Claims



1. Rotary cutting equipment for mounting on a tractor having an engine, a power take off at the rear thereof, and a three point hitch assembly, the rotary cutting equipment comprising a hollow, rearwardly extending rigid beam attached to, and supported by, the tractor's three point hitch through a mounting member at one end of the beam, pivot means for pivotally connecting said beam to the tractor through said mounting member so that both lateral angular slewing of the beam can take place as well as up and down angular movement thereof, means for effecting such angular movements of the beam, a transverse rotatable drive shaft operatively receiving a cutting disc thereon mounted at the other end of the beam, a hydraulic pump operatively connected to the power take off and housed inside said beam, the hollow beam serving as well as a reservoir for hydraulic fluid for the pump, and a hydraulic motor mounted on the beam and powered by said pump, the drive shaft of the cutting disc being coupled directly to the hydraulic motor.

4,709,737

DEBARKING TOOL AND ARM COMBINATION

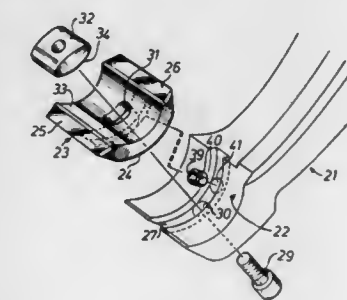
Karl-Erik A. Jonsson, Floraplan 14, S-802 28 Gävle, Sweden

Filed Sep. 26, 1986, Ser. No. 911,966

Int. Cl.⁴ B27L 1/00

U.S. Cl. 144—241

31 Claims



1. A debarking device comprising: a debarking tool and a debarking arm, said debarking arm

being adapted to receive said debarking tool, said debarking tool having a curved bearing surface and said debarking arm being provided with a recessed seat for receiving said debarking tool, said recessed seat having substantially the same radius of curvature as said bearing surface; guide means provided in the bearing surface of said debarking tool and in said recessed seat of said debarking arm whereby the debarking tool can be located in different positions relative to said recessed seat, and means for fixing said debarking tool to the recessed seat of said debarking arm, wherein said guide means comprises a ridge means and a groove means which are provided in the bearing surface of said debarking tool and in the recessed seat of said debarking arm, wherein the ridge means extends from the peripheral surface of the debarking tool and said groove means comprises at least one groove provided in said curved surface of the recessed seat, wherein said curved bearing surface and said recessed seat are spherical, and said groove means comprises a plurality of intersecting grooves which radially extend across said recessed surface.

4,709,738

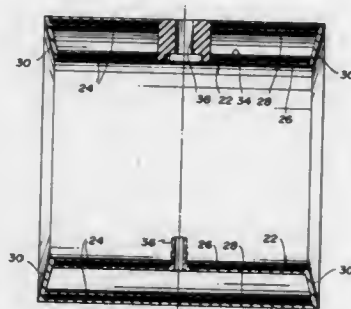
BEAD LOCK FOR PNEUMATIC TIRES

Fred L. Goodell, Grosse Ile, and Michael J. Ellison, Canton, both of Mich., assignors to AM General Corporation, Livonia, Mich.

Filed Feb. 14, 1986, Ser. No. 829,198
Int. Cl.⁴ B60C 17/00

U.S. Cl. 152—400

4 Claims



1. A device for locking the bead portions of a pneumatic tire against the outer periphery of a vehicle wheel and being adapted to seat in the vehicle wheel, the device comprising: at least one endless inextensible band; an inflatable annular member having radially inner and outer portions and interconnecting side portions, said outer portion comprising a matrix in which said band is embedded; wherein said inflatable member is formed with a cavity extending substantially circumferentially therein and includes a valve through which pneumatic medium is adapted to be supplied into said cavity to inflate said inflatable member; and means defining an aperture extending radially completely therethrough said inner and outer portions and said band to communicate the inner and outer portions, said means extending completely between said inner and outer portions within said cavity to prevent communication of pneumatic medium between the cavity and the aperture; said side portions, when said annular member is inflated, preventing the bead portions of the tire from being displaced from the outer periphery of the wheel in the event of a partial or total deflation of the tire and said band preventing radial expansion of said outer portions.

4,709,739

UNIVERSAL TUBULAR-TIRE FOR BICYCLES

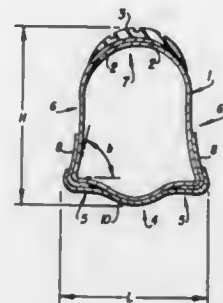
Emilio Ruscelli; Cesare Carrera, both of Milan, and Giuseppe Formenti, Motta Visconti, all of Italy, assignors to Pneumatici Clement S.p.A., Italy

Filed Nov. 15, 1985, Ser. No. 798,338

Claims priority, application Italy, Nov. 23, 1984, 23730 A/84
Int. Cl.⁴ B60C 5/00, 3/02

U.S. Cl. 152—453

9 Claims



1. In a beadless tubular bicycle tire, having a carcass with at least one rubberized-fabric strip comprising reinforcing cords, the extremities of said strip being jointed so as to form a ring, with its lateral edges jointed together longitudinally to form a closed tubular-carcass of a substantially constant thickness, that presents a tunnel-shaped cross-section comprising a substantially concave supporting-base and two sidewalls terminating in a substantially semicircular vault—with the section-ratio comprised between 1 and 1.7, the inner angle of the corner formed by the coupling between said base and said sidewalls being less than 90°, the improvement wherein corresponding to said base and joined to it, said carcass comprises for each of said coupling-corners a first reinforcing element, said reinforcing element extending on both sides of the corresponding coupling-corner axially on at least part of said supporting base and radially outwardly along the sidewalls of the tubular-tire, for a height of not less than 15% of the section height of said carcass, and a second reinforcing element made of a rubberized-fabric axially extending from one sidewall to the other sidewall of the tubular-tire and reinforced with cords disposed in the circumferential direction with respect to the tire.

4,709,740

DIRECT CHILL CASTING OF ALUMINUM-LITHIUM ALLOYS

John E. Jacoby; Ho Yu, both of Murrysville, and Robert A. Ramser, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 550,466, Nov. 10, 1983, Pat. No. 4,610,295. This application Apr. 11, 1986, Ser. No. 850,488

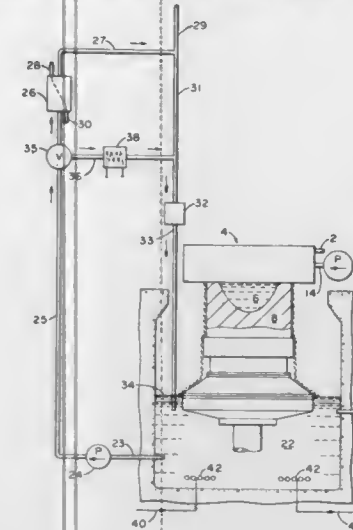
Int. Cl.⁴ B22D 11/24

U.S. Cl. 164—5

7 Claims

1. A method of continuously casting an aluminum-lithium alloy comprising: cooling aluminum-lithium alloy sufficiently to form a continuous ingot having a substantially solid shell; and cooling said ingot by direct chill with a coolant comprising ethylene glycol containing water at a controlled level from about 1% to no more than about 5% by volume in a direct chill cooling zone to form a shell of sufficient thick-

ness substantially to avoid bleed-outs and a subsequent lower head transfer for stress relief, said coolant being



applied to the surface of said ingot and separating therefrom.

4,709,741

MOLD MATERIAL AND PROCESS FOR CASTING OF PURE TITANIUM OR TITANIUM ALLOY

Seizo Nakamura, Osaka, Japan, assignor to Obara Co., Ltd., Osaka, Japan

Filed Dec. 2, 1985, Ser. No. 803,447

Claims priority, application Japan, Dec. 4, 1984, 59-257154; Mar. 22, 1985, 60-58706; Mar. 22, 1985, 60-58705

Int. Cl.⁴ B22C 1/00

U.S. Cl. 164—35

2 Claims

1. A process for casting pure titanium or a titanium alloy, which comprises mixing 10 to 80% by weight of silica, 80 to 10% by weight of alumina, 5 to 15% by weight of a phosphate and 5 to 30% by weight of a basic metal oxide together with colloidal silica, hardening the resulting mixture while burying a wax pattern within the mixture to prepare a mold, removing the wax pattern, firing the mold at 900° C. or above to form a refractory structure comprising at least one of mullite, spinel or cordierite in the mold and casting molten pure titanium or titanium alloy in the casting space of the mold.

4,709,742

METHOD FOR PRODUCING A THIN CASTING OF CR-SERIES STAINLESS STEEL

Jiro Harase; Kuniteru Ohta; Tetsuro Takeshita, all of Kitakyushu, and Michio Endo, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 934,108

Claims priority, application Japan, May 24, 1986, 61-118390
Int. Cl.⁴ C21D 8/02; B22D 11/00

U.S. Cl. 164—76.1

17 Claims

1. A method for producing a thin casting of Cr-series stainless steel consisting of, by weight %, from 8 to 30% of Cr, from 0.001 to 0.5% of C, from 0.001 to 0.5% of N, and from 0.001 to 0.5% of Al as main components, a balance being essentially iron, a matrix of said Cr-series stainless steel being constituted, on the basis of an equilibrium phase diagram, of an α -phase at an entire temperature region, or of an α -phase at room temperature and $\alpha + \gamma$ phase at a high temperature region, comprising steps of:

casting a thin casting of said Cr-series stainless steel; cooling said thin casting from a solidification temperature thereof to an end temperature of a γ -phase-precipitation at

a cooling speed at least equal to an air cooling-speed of said thin casting, and, subsequently subjecting said thin casting to a precipitation treatment in a temperature range of not less than 700° C. and not more than 1000° C. for 10 seconds or more, thereby forming precipitates in the α -phase matrix.

4,709,743

CASTING METAL STRIP

Anthony G. Law, Lichfield, and Michael J. Fleetwood, Bewdley, both of England, assignors to Inco Engineered Products Ltd. and The General Electric Company plc, both of, England

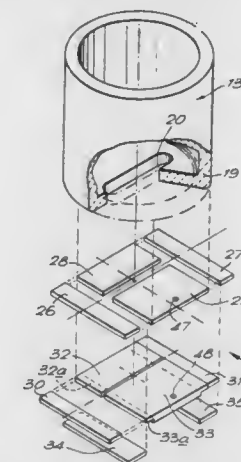
Filed Jan. 15, 1987, Ser. No. 3,625

Claims priority, application United Kingdom, Jan. 28, 1986, 8602001

Int. Cl.⁴ B22D 11/06, 11/10, 39/00

U.S. Cl. 164—463

17 Claims



1. Apparatus for dynamic casting of metallic strip or foil wherein a crucible for molten metal to be poured on a moving casting surface has a bottom outlet, an outlet orifice control assembly is mounted to underlie said crucible outlet, said outlet orifice control assembly comprising two opposed shut-off plates mounted for controlled relative movement between closed and open positions to control flow of molten metal from said crucible outlet, and said outlet orifice control assembly further comprising two opposed slot plates underlying said shut-off plates and mounted for controlled relative movement between closed and open positions to define a slot through which the molten metal is discharged onto the moving casting surface.

12. A dynamic casting process for producing thin metallic strip or foil comprising the steps of: melting a charge in a crucible having a bottom outlet; providing a moving casting surface; controlling the flow of molten metal from the bottom outlet onto the moving casting surface by relatively moving two opposed shut-off plates to open a passageway for molten metal; and relatively moving two opposed slot plates mounted below the shut-off plates to define an outlet slot.

4,709,744

MODULAR MOULD SYSTEM AND METHOD FOR CONTINUOUS CASTING OF METAL INGOTS

Neil B. Bryson, Kingston; David T. T. Auchterlonie, Jonquiere; Guy LeBlanc, Longueuil, and Vincent J. Newberry, Beaconsfield, all of Canada, assignors to Alcan International Limited, Kingston, Canada

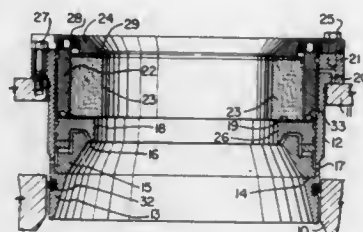
Filed Feb. 27, 1987, Ser. No. 19,649

Claims priority, application Canada, May 27, 1986, 510072

Int. Cl.⁴ B22D 11/04, 11/07, 11/124

U.S. Cl. 164—472

12 Claims



1. A modular mould system for continuous casting of metal ingots comprising:

- (a) a hollow cylindrical body adapted to be mounted in a casting table,
 - (b) an annular water baffle removably mounted in said body, said baffle having a central opening through which a forming ingot passes and said baffle providing a flow path for cooling water to flow radially inwardly from the body and discharge inwardly and downwardly against a forming ingot passing through the central opening,
 - (c) an annular mould removably mounted in the body immediately above the water baffle and having a central forming cavity for forming a metal ingot, said forming cavity having a smaller diameter than the central opening of the water baffle,
 - (d) a feed inlet for molten metal comprising an insulating ring removably mounted within the body immediately above the mould, the outer diameter of said insulating ring being less than the diameter of the body,
 - (e) a pressure ring removably mounted in the body in the annular gap between the body and the outer diameter of the insulating ring, and
 - (f) a cover plate adapted to compress the components of the mould system together,
- wherein at least said annular members may be selectively replaceable with ones of variable inner diameter or length.
11. A method for the production of aluminum ingots by direct chill continuous casting which comprises:

- (1) forming a modular mould system comprising (a) a hollow cylindrical body adapted to be mounted in a casting table, (b) an annular water baffle removably mounted in said body, said baffle having a central opening through which a forming ingot passes and said baffle providing a flow path for cooling water to flow radially inwardly from the body and discharge inwardly and downwardly against a forming ingot passing through the central opening, (c) an annular mould removably mounted in the body immediately above the water baffle having a central forming cavity for forming a metal ingot, said forming cavity having a smaller diameter than the central opening of the water baffle, (d) an annular oil plate mounted on top of the mould, (e) a feed inlet for molten metal comprising an insulating ring removably mounted within the body immediately above the mould and resting on the oil plate, the outer diameter of said insulating ring being less than the diameter of the body, (f) a pressure ring removably mounted in the body in the annular gap between the body and the outer diameter of the insulating ring and resting on the oil plate, and (g) a cover plate adapted to compress the components of the mould system together;

- (2) pouring molten aluminum into the top of the mould system;
 - (3) forming a continuous ingot in the mould; and
 - (4) applying cooling water directly to the surface of the ingot emerging from the mould,
- characterized in that the diameter of the ingot to be produced may be changed by changing the annular water baffle, annular mould and oil plate with ones of a different inner diameter.

4,709,745

PROCESS AND APPARATUS FOR MAKING THIN STEEL SLABS

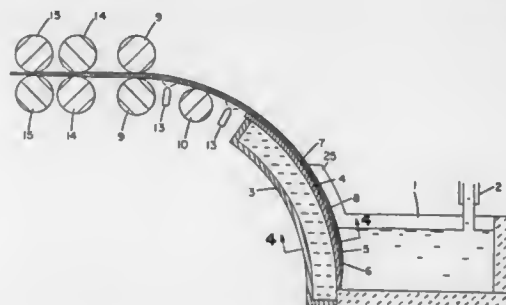
Irving Rossi, Dunross Farm, James St., Morristown, N.J. 07960

Continuation of Ser. No. 718,179, Apr. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 612,048, May 18, 1984, abandoned. This application Oct. 9, 1986, Ser. No. 916,831

Int. Cl.⁴ B22D 11/00, 11/128

U.S. Cl. 164—484

8 Claims



1. A process for the continuous casting of thin steel slabs of uniform transverse thickness which comprises

- exposing a pool of molten metal to a fixed chilled surface which is flat transversely and curved longitudinally to form a convex arc and which has a first portion submerged within the pool and a second portion extending above and beyond the surface of said pool as a continuation of said first portion, said second portion having a length greater than said first portion
- withdrawing heat from the molten metal in one direction only through said first portion of said chilled surface while restricting heat transfer from the molten metal along the side edges of said chilled surface to form an embryo flat cast slab thereon which is of uniform thickness across its width, and
- withdrawing the embryo cast slab continuously along said chilled surface while continuing to withdraw heat from the embryo flat cast slab in one direction only through said chilled surface while restricting heat transfer from the embryo flat cast slab along the side edges of said slab, at a rate to permit withdrawal of heat through said chilled surface sufficient to cause a flat slab of the desired thickness to be formed thereon.

4,709,746

PROCESS AND APPARATUS FOR CONTINUOUS SLURRY CASTING

Kenneth P. Young, Ballwin, Mo.; Derek E. Tyler, Cheshire, Conn.; Harvey P. Cheskis, North Haven, Conn., and W. Gary Watson, Cheshire, Conn., assignors to Alumax, Inc., San Mateo, Calif.

Continuation of Ser. No. 627,925, Jul. 5, 1984, abandoned, which is a division of Ser. No. 384,019, Jun. 1, 1982, Pat. No. 4,482,012. This application Apr. 23, 1986, Ser. No. 854,795

Int. Cl.⁴ B22D 11/124, 27/02

U.S. Cl. 164—485

4 Claims

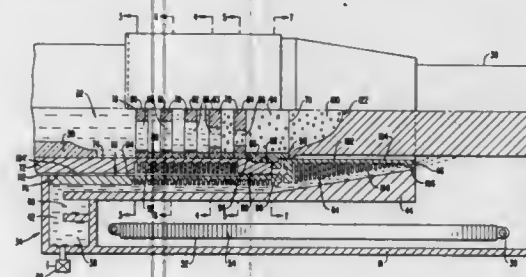
1. A mold for use in a system for casting molten material, said mold comprising:

- first chamber means for extracting heat from said molten

material, said first chamber means having means for controlling the amount of heat extracted from the molten material and the cooling rate of the molten material so as to initiate growth of primary phase particles of said material and control solidification to form a semi-solid heterogeneous slurry having a fraction solid comprising said particles sufficient to form a cast structure having a shell and a non-dendritic structure across substantially its entire cross-section, said first chamber means having inner and outer walls formed from a material having the desired thermal conductivity and an exit end;

said controlling means comprising a plurality of spaced apart members lying in at least one circumferential plane, said members being formed from a material having substantially no thermal conductivity wherein the areas between said spaced apart members in each said plane form an effective heat transfer area for removing said heat from said molten material through said walls and wherein said controlling means comprise a plurality of said circumferential planes, each said circumferential plane containing a plurality of said spaced apart members defining said effective heat transfer area, a most upstream one said circumferential planes having the first effective heat transfer area, a most downstream one of said circumferential planes having a second effective heat transfer area wherein said first effective heat transfer area being greater than said second effective heat transfer area;

second chamber means for casting said semi-solid slurry into an ingot having a shell and said cast structure, said second chamber means having an inlet end; and



transition means between the exit end of said first chamber means and the inlet end of said second chamber means for delivering said semi-solid slurry to said casting means and for preventing said shell in said first chamber means from extending into said second chamber means and preventing said shell in said second chamber means from extending back into said first chamber means.

3. A process for casting a molten material, said process comprising:

- providing a mold having first chamber means for containing said molten material, second chamber means for casting said material into an ingot and transition means between the exit end of said first chamber means and the inlet end of said second chamber means for delivering said material to said second chamber;
- extracting heat from said molten material in said first chamber means;
- controlling the amount of said heat extracted from said molten material and the cooling rate of said molten material so as to initiate growth of primary phase particles of said molten material and control solidification to form a semi-solid heterogeneous slurry within said first chamber means, said slurry having a fraction solid comprising said particles sufficient to form a cast structure having a shell and a non-dendritic structure across substantially its entire cross-section;
- delivering said slurry to said second chamber means;
- solidifying said semi-solid slurry within said second chamber means into said ingot having said cast structure and a shell; said transition means preventing any of said shell formed in said first chamber means from extending into said second chamber means and preventing said shell in said

second chamber means from extending back into said first chamber means;

providing a plurality of circumferential planes containing at least member formed of a material having a relatively low thermal conductivity, each said circumferential plane having its effective heat transfer area defined by that portion of said plane non-encompassing said at least one member;

providing a most upstream one of said circumferential planes with a first effective heat transfer area;

providing a most downstream one of said circumferential planes with a second effective heat transfer area less than said first effective heat transfer area; and

extracting said heat from said molten material through said heat transfer areas.

4,709,747

PROCESS AND APPARATUS FOR REDUCING MACROSEGREGATION ADJACENT TO A LONGITUDINAL CENTERLINE OF A SOLIDIFIED BODY

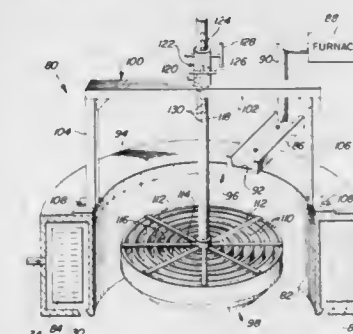
Ho Yu, and Douglas A. Granger, both of Murrysville, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 774,887, Sep. 11, 1985, abandoned. This application Aug. 22, 1986, Ser. No. 899,492

Int. Cl.⁴ B22D 11/00

U.S. Cl. 164—487

23 Claims



1. A process for reducing macrosegregation adjacent to a centerline of a solidified body, said body being formed from a pool of molten metal having flow currents present therein, said liquid pool having dendrites which are lean in eutectic elements growing about the periphery thereof as said molten metal solidifies, said process comprising the step of weakening the magnitude of said flow currents by placing a mechanical damper in said pool, said damper including at least three plates connected together to form at least two passageways therebetween through which said molten metal can flow, said damper reducing shear stress acting on the tips of said dendrites and thereby reducing breakage and transport of particles of said dendrites to the center of said solidified body.

11. An apparatus for reducing macrosegregation in a solidified body formed in a mold from a liquid pool of molten metal having flow currents present therein, said apparatus comprising:

- (a) a support structure positioned above said mold;
- (b) a damper including at least three plates with a passageway formed between adjacent plates through which said molten metal can flow; and
- (c) attachment means for securing said damper to said support structure whereby said damper is positioned within said liquid pool at a desired depth to weaken said flow currents.

4,709,748

PROTECTIVE SLEEVE FOR THE SHROUD OF A HOT METAL LADLE

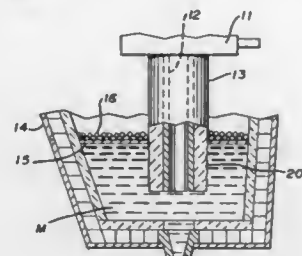
Micheal D. Labate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Nov. 4, 1986, Ser. No. 926,680

Int. Cl.⁴ B22D 11/10, 1/00

U.S. Cl. 164—488

4 Claims



3. A method of delivering and cleaning molten steel from a ladle to a mold which includes the steps of flowing the molten steel through a shroud communicating with said ladle into a receptacle communicating with said mold, insulating said shroud with a protective sleeve thereon, immersing a portion of said shroud and sleeve in said molten steel with slag thereon in said receptacle to protect said molten steel in said receptacle around said shroud and sleeve from atmospheric air, neutralizing acid in said slag with a reactive agent in said sleeve, protecting said molten steel in said receptacle with a sealing covering compound, and substantially maintaining the temperature of said molten steel in said shroud with said protective sleeve.

4,709,749

CONTINUOUS METAL CASTING APPARATUS

Hugh R. Lowry, Fairfield, Conn., and Robert T. Frost, Berwyn, Pa., assignors to General Electric Company, Bridgeport, Conn.

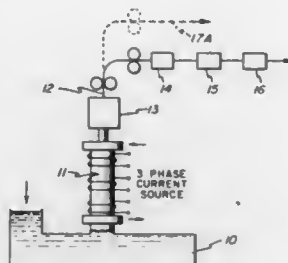
Continuation of Ser. No. 430,830, Sep. 30, 1982, which is a continuation of Ser. No. 165,421, Jul. 2, 1980, abandoned. This application Dec. 15, 1986, Ser. No. 941,997

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.⁴ B22D 27/02

U.S. Cl. 164—503

13 Claims



1. Continuous casting apparatus comprising an elongated casting vessel disposed in upright position to receive liquid metal for solidification, means for delivering liquid metal into a lower portion of the vessel, heat exchange means associated with the casting vessel for cooling and solidifying liquid metal therein, electromagnetic levitation and containment field producing means disposed around the casting vessel along a portion of its length for simultaneously reducing the hydrostatic head of the liquid metal to a minimum and maintaining a predetermined dimensional relationship between the outer surface of the liquid metal and the interior surrounding surfaces of the casting vessel, excitation current supply means coupled to said electromagnetic levitation and containment field producing means for establishing and maintaining the electromagnetic levitation and containment field, means for controlling excita-

tion current supplied to said electromagnetic field producing means for maintaining the value of the containment electromagnetic field so that the cross section of the liquid metal is less than the cross sectional area of the interior surrounding surface of the casting vessel to establish a slight gap but is sufficiently large to preclude formation of a substantial gap between the outer surface of the liquid metal and the interior surrounding surfaces of the casting vessel to thereby effect heat transfer between the liquid metal and the casting vessel sufficient to solidify the liquid metal while simultaneously reducing gravitational, frictional and adhesive forces acting on the liquid metal to a minimum, means independent from said electromagnetic levitation field producing means for moving the liquid metal upwardly into the casting vessel and within the electromagnetic field, and means for removing solidified metal product from the upper portion of the vessel.

4,709,750

PHASE CHANGE HEAT EXCHANGER

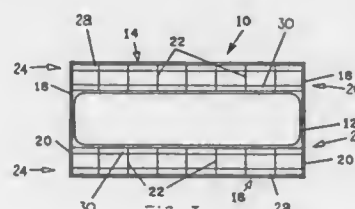
Geoffrey T. White, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Filed Apr. 10, 1986, Ser. No. 850,027

Int. Cl.⁴ F28D 17/00

U.S. Cl. 165—10

2 Claims



1. A phase change heat exchange unit which comprises:
 - (a) upper and lower skeletal support frames having
 - (i) opposing side walls wherein the upper frame is supported on the lower frame at oppositely facing edges of the side walls,
 - (ii) at least two spaced apart grid supports forming an air passage therebetween and extending between the side walls remote from said oppositely facing side wall edges, said grid supports formed by a plurality of cross support beams extending between the side walls and a plurality of vertical spacers extending parallel to the side walls and intersecting and supporting said cross support beams, and
 - (iii) means for securing the upper and lower frames together, and
 - (b) a container filled with a phase change material disposed between the upper and lower frames and supported thereby.

4,709,751

VEHICULAR AIR CONDITIONER WITH DEFOGGING FEATURE

Yoshiro Ichimaru, Yokohama; Shigeru Kobayashi, Zama, and Toshio Ohashi, Atsugi, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 16, 1985, Ser. No. 766,192

Claims priority, application Japan, Aug. 20, 1984, 59-171483

Int. Cl.⁴ F25B 29/00; B60S 1/54; B60H 3/00

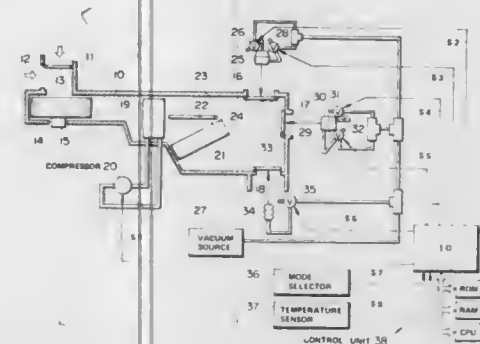
U.S. Cl. 165—17

3 Claims

1. An air conditioner for a vehicle having a window, the air conditioner comprising:

- (a) first means for conditioning air, said first means including an air duct having a defroster outlet, a vent outlet and a floor outlet, and an evaporator, a heater, and an air mixing door located within the air duct;

- (b) second means for moving air to be conditioned through the first means;
- (c) third means, connected to the first means for directing the conditioned air toward the window via the defroster outlet to prevent the window from fogging over;
- (d) fourth means, connected to the first means for directing the conditioned air toward an upper part of a vehicle passenger compartment via the vent outlet;
- (e) fifth means, connected to the first means for directing the conditioned air toward a lower part of the vehicle passenger compartment;



- (f) sixth means for setting a preset bi-level operation mode;
- (g) a cooling compressor connected to the evaporator of the first means; and
- (h) control means for selectively activating and deactivating the compressor and for controlling the third, fourth and fifth means, when a preset bi-level operation mode has been set by the sixth means, to block the defroster outlet, unblock the vent outlet and the floor outlet when the compressor is activated, and to unblock the defroster outlet, the vent outlet and the floor outlet when the compressor is deactivated.

4,709,752

COOLING ARRANGEMENT FOR HEAT GENERATING ELECTRICAL COMPONENTS

Johann Schröder, Klaus Gawron, both of Aachen; Leo Bertram, Stolberg, all of Fed. Rep. of Germany, and Hugo Schemmann, Schaesberg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

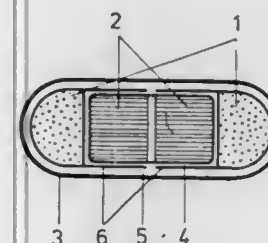
Filed Jun. 27, 1986, Ser. No. 879,728

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524242

Int. Cl.⁴ H02K 9/00

U.S. Cl. 165—47

9 Claims



1. A cooling arrangement for heat generating electrical components comprising:

- a latent heat store between the heat generating component and a component to be protected from overheating, the latent heat store comprising a latent heat storing agent whose melting-point T is between the operating temperature of the heat generating component and the maximum permissible temperature of the component to be protected, the quantity of said storing agent is proportioned

so that the storage capacity of the latent heat store is sufficient for the amount of maximum heat generated by the heat generating component, between the heat transmitting component and the latent heat store and between the latent heat store and the component to be protected, a thermal insulation is provided, and the melting-point T of the latent heat storing agent and the thicknesses d of the respective insulations between said heat transmitting component and store, and store and component to be protected are proportioned so that the temperature gradient $\Delta T/d$ from the heat generating component, which is at the operating temperature, to the latent heat store is greater than the temperature gradient $\Delta T/d$ from the latent heat store to the component to be protected.

4,709,753

UNI-DIRECTIONAL FIN-AND-TUBE HEAT EXCHANGER

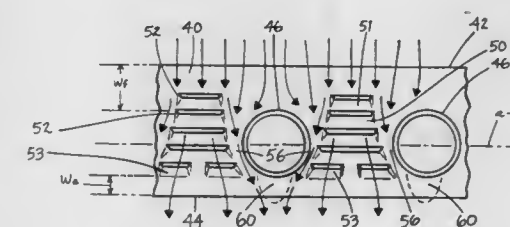
Allan J. Reifel, Florissant, Mo., assignor to Nordyne, Inc., St. Louis, Mo.

Filed Sep. 8, 1986, Ser. No. 904,406

Int. Cl.⁴ F24B 1/06

U.S. Cl. 165—125

10 Claims



1. For exchanging heat between liquid and air, a uni-directional fin-and-tube heat exchanger having a curved portion and being of the type in which air flows in from the outside of the curve, comprising

a single row of linearly-aligned ductile tubes of circular cross-section for conducting such liquid, in combination with

a plurality of fins formed from originally planar ribbon-like fin stock and having parallel leading and trailing edges between which air flows generally aft, further having circular collars spacedly between edges drawn from the original plane of said fin stock, whereby to accept said tubes perpendicular to the fins,

there being, in each fin stock area defined by the spacing of the tube centers from each other, a plurality of longitudinal louvers bent from the plane of said fin stock toward one side only thereof, and open adjacent to the leading edge, whose length increases progressively between said edges from a length substantially less than the distance of the nearest collar walls from each other, to a length at least substantially equal to the such distance, each louver being supported by louver end walls formed from such plane and spaced from said collars,

whereby a greater portion of the air inflowing along the leading edge at each side of a collar is channeled convergingly by the louver end walls into otherwise stagnant air spaces along the fin stock behind the collars, the said collars being offset aft of a centerline between the leading and trailing edges and inward of the trailing edge of said fin stock, whereby to decrease their distance from the trailing edges of the fins,

such heat exchanger curved portion being formed by said tubes being bent to such an arc, common to all said tubes, that the trailing edges of said fins are inside the curve of the arc,

whereby the decreased distance from the collars to the fin trailing edges increases the spacing of adjacent trailing edges from each other, thereby lessening the resistance to

airflow from angular convergence of the fins, and the extent of such otherwise stagnant air spaces along the fin stock behind the collars may be somewhat lessened.

4,709,754

HEAT TRANSFER ELEMENT WITH NUCLEATE BOILING SURFACE AND BIMETALLIC FIN FORMED FROM ELEMENT

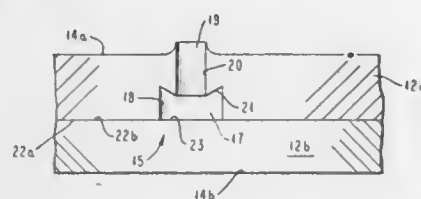
Richard C. Chu, and Robert E. Simons, both of Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 756,219, Jul. 18, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 921,902

Int. Cl.⁴ F28F 3/06

U.S. Cl. 165-133

6 Claims



5. A heat transfer element containing nucleate boiling cavities providing the heat transfer element with a nucleate boiling surface for heat transfer to a liquid in contact with the surface, comprising:

a metal foil, the surfaces of the foil being designated "outer" and "inner", the foil having a plurality of through holes formed as a larger diameter hole opening to the inner surface and forming a main cavity in the heat transfer element and a smaller diameter hole opening to the outer surface and forming the entrance of the nucleate boiling cavity in the heat transfer element,

the foil in the region of the intersection of the main cavity and the entrance being designated the ceiling of the cavity, said ceiling having a truncated cone shape inverted to reduce flooding to the main cavity by said liquid,

a substrate of thermally conductive material, the foil being attached at its inner surface to the substrate whereby the surface of the substrate closes the holes opening to the inner surface and thereby forms the floor of the nucleate boiling cavities.

4,709,755

HEAT EXCHANGER

Cecil C. Gentry, and William M. Small, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 692,449, Jan. 16, 1985, Pat. No. 4,633,940, which is a division of Ser. No. 477,475, Mar. 21, 1983, abandoned, which is a division of Ser. No. 182,741, Aug. 29, 1980, Pat. No. 4,429,739. This application Sep. 3, 1986, Ser. No. 903,355

Int. Cl.⁴ F28F 9/22

U.S. Cl. 165-160

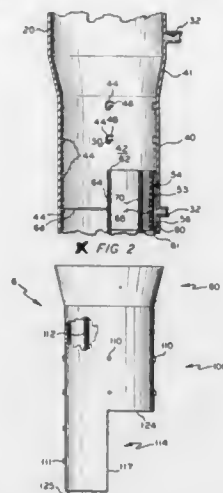
9 Claims

1. Apparatus comprising:

(a) a shell having a generally cylindrical interior surface;
(b) at least one channel affixed to the generally cylindrical interior surface of the shell, said channel having a generally circumferential path portion and a generally longitudinal path portion with respect to the generally cylindrical interior surface of the shell, the circumferential path portion having a mouth at one end and opening into the longitudinal path portion at the other end, the longitudinal path portion being at least partially closed at each of its ends and having at least one end removed from the opening from the circumferential path portion;
(c) a shroud having a generally cylindrical exterior surface

in juxtaposed relationship with the generally cylindrical interior surface of the shell;

(d) at least one boss extending radially outward from the generally cylindrical exterior surface of the shroud suit-



able for being received by the at least one channel on the generally cylindrical interior surface of the shell at a position in the channel adjacent the end of the longitudinal path portion which is spaced apart from the opening from the circumferential path portion.

4,709,756

STEAM GENERATOR TUBE SUPPORT

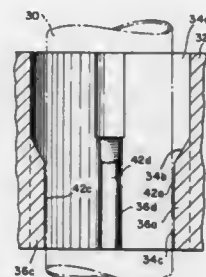
Robert M. Wilson, Plum Boro, and Robert M. Wepfer, Wilkesburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1984, Ser. No. 670,773

Int. Cl.⁴ F28F 9/00

U.S. Cl. 165-162

5 Claims



1. A tube support plate for supporting a plurality of tubes with reduced vibration in a nuclear steam generator, said support plate being of a solid construction and having a plurality of holes disposed therethrough in a regular array, each of said holes having an axis, an interior surface and a plurality of lands supported on said interior surface, said support plate having a given thickness as taken along said axis, each of said lands is disposed substantially parallel with and extends towards its hole axis, whereby a drop in the fluid flow rate through said holes is minimized each of said lands has at its exposed end a contact surface disposed toward said axis for supporting one of the tubes and a height taken along said axis less than said given thickness.

4,709,757

METHOD OF INJECTION MOLDING AND PLASTIC PART FORMED THEREBY

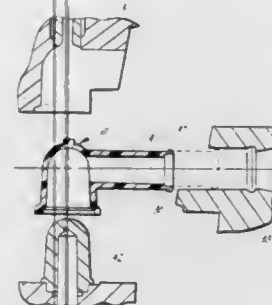
Tom C. Bly, Erie, Pa., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Nov. 24, 1986, Ser. No. 934,437

Int. Cl.⁴ F28F 9/00; B29C 45/44

U.S. Cl. 165-173

4 Claims



3. A plastic molded radiator part having a tubular portion for supporting a hose, said tubular portion being provided with a smooth external surface uninterrupted with any sharp protrusions that could extend into a hose on said tubular portion and having a radially enlarged external surface lip at the terminal end thereof and a reduced thickness wall portion at the terminal end.

4,709,758

HIGH TEMPERATURE PACKER FOR WELL CONDUITS

Dan C. Preston, Jr., Whittier, Calif., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Dec. 6, 1985, Ser. No. 806,030

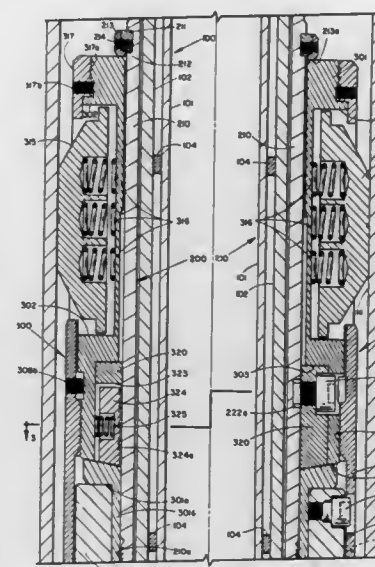
Int. Cl.⁴ E21B 33/128, 33/129

U.S. Cl. 166-120

4 Claims

1. A packer for a subterranean well having a casing comprising, in combination, an inner tubular body assembly having connector means at its upper end for detachable threaded connection to the bottom of a tubing string whereby the packer may be run into the casing to a desired position; an outer operative tubing assembly mounted in surrounding relationship to a medial portion of said inner tubular body assembly; said outer tubular body assembly including a drag block unit, a connection block, a slip mechanism including peripherally spaced slips and upper and lower cone elements, an external packing element having one end abutting said lower cone element and deformable by axial force to sealingly engage the bore of the casing, and an annular abutment element engaging the other end of said packing element; a J-pin radially transversing said connecting block, a J-slot in said inner tubular body assembly receiving said J-pin for securing said inner tubular body assembly and said outer tubular operative assembly in a fixed relationship during run-in of the packer in the casing with only said drag block unit engaging the casing wall; said J-pin and J-slot being operable by limited rotation of said inner tubular body assembly relative to said outer tubular operative assembly to release said assemblies for limited relative axial movement; collet means for detachably securing said inner tubular body assembly to said abutment element, whereby upward movement of said inner tubular body assembly produced solely by upward movement of the tubing string applies an axial force to said packing element and moves said lower cone element toward said upper cone element to expand said slips into biting engagement with the casing bore; axially extending ratchet teeth formed on the periphery of said inner tubular assembly; and a segment shaped detent unit radially shiftably mounted in said connecting block and having a ser-

rated inner surface engagable with said ratchet teeth to prevent downward movement of said inner tubular body assembly



relative to said outer tubular assembly, thereby locking the axial compressive force in said external packing element.

4,709,759

ENHANCED OIL RECOVERY WITH HYDROPHOBICALLY ASSOCIATING POLYMERS CONTAINING N-VINYL-PYRROLIDONE FUNCTIONALITY

Jan Bock, Bridgewater; Salvatore J. Pace, Glen Gardner, and Donald N. Schulz, Annandale, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 29, 1986, Ser. No. 946,864

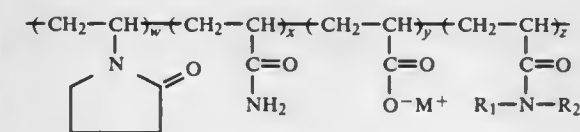
Int. Cl.⁴ C08F 20/06; E21B 43/22

U.S. Cl. 166-275

10 Claims

1. A water flooding process for the secondary recovery of oil from a production well comprising injecting an aqueous solution under pressure to force oil to the production well, said aqueous solution comprising:

(a) water; and
(b) about 100 to about 5,000 ppms of a water soluble polymer having the formula:



wherein R₁ is a C₆ to C₂₂ straight chained or branched alkyl or alkylcycloalkyl group; R₂ is hydrogen or a C₆ to

C₂₂ straight chained or branched alkyl or cycloalkyl group or a C₁ to C₃ straight chained or branched alkyl group; and M⁺ is an alkali metal or ammonium cation, wherein x is about 10 to 90 mole percent, y is about 2 to about 40 mole percent, z is about 0.1 to about 10.0 mole percent, and w is about 1 to about 80 mole %.

4,709,760 CEMENTING TOOL

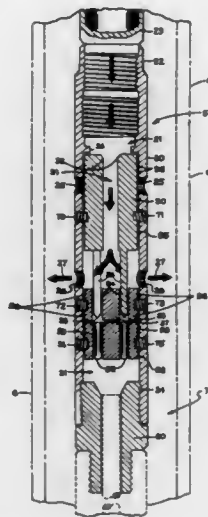
Wilmer W. Crist, 110 Teche Dr., and Dan Firmin, 215 Camella Blvd., both of Lafayette, La. 70503

Filed Oct. 23, 1981, Ser. No. 314,356

Int. Cl.⁴ E21B 43/11, 33/13

U.S. Cl. 166—285

24 Claims



1. An apparatus for cementing an oil or gas well casing comprising:

- a. a tubular body section for placing in an oil or gas well casing, said tubular body section being connectable at its upper end to a string of drill pipe and at its lower end to means for perforating an oil or gas well casing, said tubular body section having:
 - (i) a hollow interior;
 - (ii) a plurality of upper port means;
 - (iii) a plurality of lower port means;
- b. a sliding sleeve means having firing pin means connected thereto, said sliding sleeve means being located inside said tubular body section, said sliding sleeve means being adapted to permit drilling fluids to be pumped there-through and out of said lower ports and to slide downwardly in response to pressure applied to the interior of said string of drill pipe when seal means are placed in contact with said sliding sleeve means and thereby
 - (i) activate said means for perforating an oil or gas well casing to perforate said casing,
 - (ii) close said lower ports, and
 - (iii) open said upper ports to permit cement or other fluids to be pumped outwardly through said upper ports.

4,709,761

WELL CONDUIT JOINT SEALING SYSTEM

John R. Setterberg, Jr., Victoria, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 626,442, Jun. 29, 1984, Pat. No. 4,602,796.

This application May 27, 1986, Ser. No. 867,015

Int. Cl.⁴ E21B 29/00; B23B 41/12

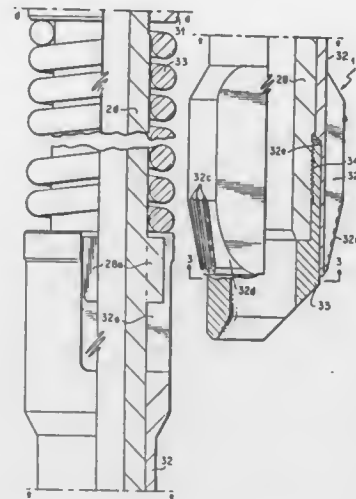
U.S. Cl. 166—387

16 Claims

2. A milling tool for forming an upwardly facing sealing surface on a shoulder in a conduit comprising:

- (a) an upper mandrel having a top connector;

- (b) an intermediate mandrel connected to said upper mandrel;
- (c) a lower mandrel connected to said intermediate mandrel having a cutter slidably mounted thereon, adjustable biasing means for controlling downward force on said cutter including



- an adjusting ring threaded on said lower mandrel and a spring around said lower mandrel between said ring and said cutter, and
- a shoulder limiting downward travel of said cutter; and
- (d) means for keying said lower mandrel to said cutter.

4,709,762

VARIABLE FLUID PASSAGEWAY FOR A WELL TOOL

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 789,234, Oct. 18, 1985, Pat. No. 4,629,002. This application Dec. 15, 1986, Ser. No. 941,973

Int. Cl.⁴ E21B 34/10

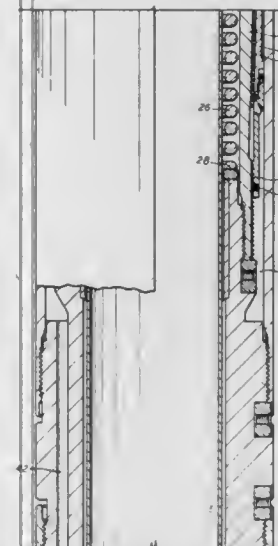
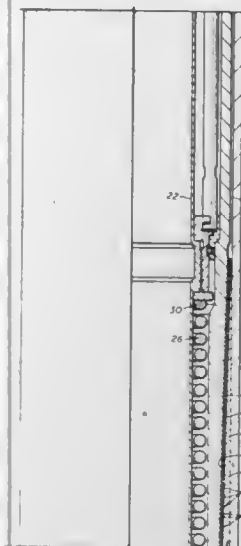
U.S. Cl. 166—324

10 Claims

1. In a well tool having a housing and a pressure reducing and fluid velocity reducing passageway, the improvement comprising,

- said passageway formed by first and second vertically positioned members spaced from each other, said first member having a tapered surface including a plurality of grooves and ridges,

said second member having a tapered surface facing the grooves and ridges, and



means for longitudinally moving one of the members relative to the other member for adjusting the space between the members thereby adjusting the size of the passageway.

4,709,763

SELF-ACTIVATING FIRE EXTINGUISHER

James Jessick, Franklin Township, Gloucester County, N.J., assignor to Future Fire Suppression, Inc., Franklinville, N.J.

Filed Feb. 13, 1987, Ser. No. 14,720

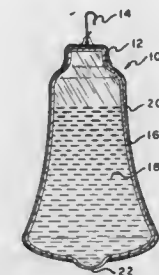
Int. Cl.⁴ A62C 35/02

U.S. Cl. 169—26

10 Claims

1. A self-activating fire extinguisher comprising:
 - a glass container having an outer surface, said container being totally closed and sealed from the outside atmosphere;
 - a quantity of a fire extinguishing liquid within said container, said liquid having a relatively low boiling point and, when converted into a gaseous state, having fumes which are denser than air whereby said fumes tend to settle downwardly and are capable of extinguishing a fire;
 - a thin but substantially flexible plastic material coating substantially the entire outer surface of said glass container and adhering thereto, said plastic coating being capable of substantially maintaining its shape and physical character-

istics and of adhering to said glass container at a temperature above the boiling point of said liquid and above the temperature which is needed for the boiling liquid in said container to cause said container to shatter; at least one portion of the outer surface of said glass container being devoid of said plastic coating;



whereby, in the event of a fire, the temperature of the liquid within said container rises and the same begins to boil thereby increasing the pressure within the container until at least a portion of the glass shatters, said plastic coating substantially maintaining the shape of said container so that said liquid and the fumes therefrom escape substantially only at that portion of the glass container which is not coated by said plastic.

4,709,764

SHEET PILE SUPPORTED DRIVER

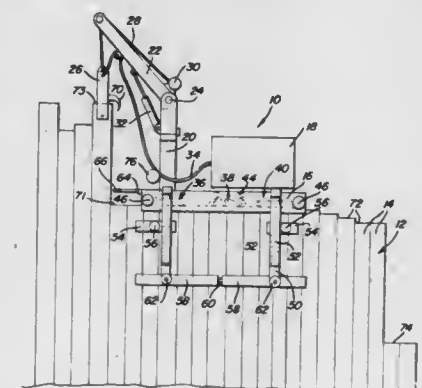
Frank B. Gibbons, Mesa, Ariz., assignor to Maxine S. Gibbons, Pataskala, Ohio

Filed Jan. 16, 1986, Ser. No. 819,344

Int. Cl.⁴ E21B 15/04

U.S. Cl. 173—45

7 Claims



1. A driver for sheet piles adapted to be supported from the upper edge of a wall formed by a plurality of sheet piles comprising a frame, boom means on the frame, a sheet pile hammer supported from said boom means, a plurality of longitudinally extending and longitudinally spaced roller and track assemblies on the frame and adapted to be in supporting engagement with the top edge of a sheet pile wall to enable the frame to move in both directions along the top edge of the sheet pile wall, and means on the frame and depending therefrom in laterally spaced relation for engaging opposite surfaces of the sheet pile wall below the top edge thereof for stabilizing the frame on the top edge of the sheet pile wall, said means on the frame and depending therefrom including a pair of laterally spaced depending support members rigid with the frame, each of said support members including a pair of vertically spaced guide shoes thereon for engaging the surface of a sheet pile wall, and means interconnecting the support members and guide shoes for providing clamping force on the guide shoes for biasing the guide shoes into clamping engagement with the opposite sur-

faces of the sheet pile wall, said means interconnecting the depending support members and guide shoes including a hydraulic piston and cylinder assembly and a spring device associated with each guide shoe and extending from a support member for exerting clamping pressure on the guide shoes with the clamping pressure being variable by operating the piston and cylinder assembly and being maintained in the event of hydraulic pressure failure by the spring means, the lowermost guide shoes on each of the depending support members being horizontally elongated and disposed in horizontal alignment and generally perpendicular to the support members with the inner ends being disposed in adjacent relation and means hingedly interconnecting the adjacent ends of the horizontally elongated shoes to enable movement of the guide shoes and frame along the top edge of a curved sheet pile wall, each of said roller and track assemblies having a width substantially greater than the width of the sheet pile wall with manipulation of the guide shoes enabling the roller and track assemblies and frame to be centered and laterally adjusted in relation to the wall, said frame having three roller and track assemblies thereon with the centermost roller and track assembly being vertically adjustably connected to the frame for vertical movement to enable the frame to move along uneven upper edge portions of the sheet pile wall, means reversibly driving the endmost roller and track assemblies for moving the driver along the top edge of the wall, at least one end of the frame being provided with a sheet pile clamp connected to a piston and cylinder assembly extending longitudinally therefrom and connected to the frame to enable the frame to be pushed or pulled along the top edge of the wall.

4,709,765

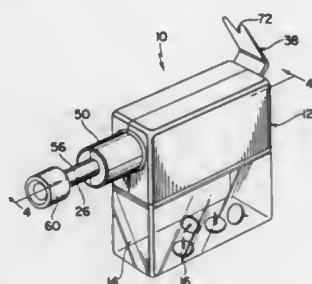
TACK DRIVER

Ronald J. Campanelli, 86A Touisset Rd., Warren, R.I. 02885
Filed Mar. 28, 1986, Ser. No. 846,289

Int. Cl.⁴ B23B 45/16

U.S. Cl. 173—119

5 Claims



1. A device for driving tacks and the like comprising:

- a housing,
- a plunger having inner and outer ends and slidably mounted in said housing so that it projects outwardly therefrom terminating in said outer end, said plunger being slidable in said housing between an outwardly extended first position and a retracted second position;
- a hammer element mounted in said housing and having a bore therein which terminates in a bore inner end, the inner end portion of said plunger being slidably receivable in said bore, said hammer element being mounted so that it is movable to a position wherein said bore inner end is in engagement with the inner end of said plunger;
- means biasing said hammer element so that said bore inner end is biased toward said plunger inner end;
- a release pin mounted in said hammer element, said release pin being of substantially circular cross section and of elongated configuration, said release pin having an enlarged retainer portion and a reduced release portion, said release portion defining a rounded annular groove in said release pin, said retainer portion engaging said plunger inner end when said plunger is in the first position thereof, said release pin being mounted so that it is slidable be-

tween a position wherein said retainer portion engages said plunger inner end to maintain the latter in spaced relation to said bore inner end and a position wherein said reduced release portion is positioned adjacent said bore to enable said plunger inner end to pass by said release pin and to be engaged by said bore inner end when said plunger is in the second position thereof; and

- (f) means positioning said release pin so that it engages the inner end of said plunger when said plunger is in the first position thereof and also as said plunger is moved from the first position thereof toward the second position thereof but so that said plunger inner end can pass by said release pin when said plunger is in the second position thereof, whereby as said plunger is moved inwardly in said housing, said hammer element is urged against said biasing means to effect a loading thereof, but when said plunger reaches said second position thereof, said hammer element is propelled into impacting engagement with said plunger inner end to drive a tack positioned in engagement with said plunger outer end.

4,709,766

WELL PIPE HANDLING MACHINE

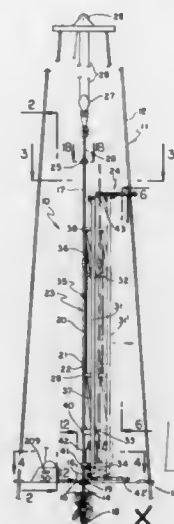
George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Apr. 26, 1985, Ser. No. 727,724

Int. Cl.⁴ E21B 19/14

U.S. Cl. 175—52

41 Claims



17. A well pipe handling machine for use in a rig having a string of pipe extending vertically along an axis of a well and having a rack for receiving and holding a series of pipe sections from said string in essentially vertically extending condition, comprising:

- a support column structure which extends essentially vertically and is movable generally horizontally to store said sections of pipe in said rack or retrieve them therefrom;
- pipe holding means carried by said support column structure for movement therewith and adapted to hold a section of pipe in vertical condition during such movement;
- means for moving said support column structure and said pipe holding means carried thereby and a vertical pipe section supported by said pipe holding means between a first position in which the support column structure extends essentially vertically and said pipe holding means support said pipe section in vertical condition in alignment with said axis of the well and a second position in which said column structure remains in essentially vertically extending condition but is offset horizontally from said first position and in which said pipe holding means can

move a pipe supported thereby in vertical condition into or out of said rack; and
a control station for carrying an operator and having controls for operating the machine, and which control station is mounted to said support column structure for movement therewith and with said pipe holding means and with a vertical pipe held thereby between said first and second positions of the column structure.

4,709,767

PRODUCTION PROCESS FOR MANUFACTURING LOW MOLECULAR WEIGHT WATER SOLUBLE ACRYLIC POLYMERS AS DRILLING FLUID ADDITIVES

William Alexander, Naperville, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Filed Jan. 6, 1986, Ser. No. 816,290

Int. Cl.⁴ E21B 21/00

U.S. Cl. 175—65

11 Claims

1. A method of drilling comprising mixing a monomer solution of an acrylic monomer neutralized 0 to 100 mole percent; and water to form a mixed monomer solution, wherein the monomers of the mixed monomer solution consist essentially of one or more acrylic monomers; and the monomer concentration is 50-90 percent by weight of the monomer solution prior to polymerization initiation, and the water concentration is 1% to 40% of the monomer solution prior to polymerization initiation; and initiating polymerization of the acrylic monomer while limiting the weight average molecular weight of the acrylic polymer to 1,000 to 50,000 such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, and to drive off sufficient water to form a solid, essentially uncrosslinked, water-soluble acrylic polymer having a water content of 15 percent by weight or less, and thereafter adding said water-soluble polymer in an effective amount up to about 0.03 pounds per barrel to a drilling fluid surrounding a drill bit to lower the viscosity of the drilling fluid during drilling of a bore hole.

4,709,768

ANNULAR AIR HAMMER APPARATUS FOR DRILLING WELLS

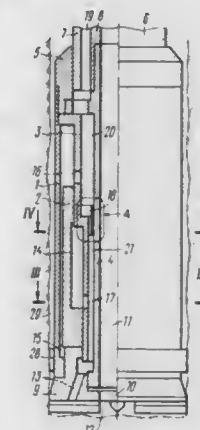
Alexandr D. Kostylev; Vladimir P. Boginsky; Boris N. Smolyanitsky; Jury N. Syryamin; Boris B. Danilov, all of Novosibirsk; David I. Kogan, and Vyacheslav N. Savelliev, both of Moscow, all of U.S.S.R., assignors to Institut Gornogo Dela So An USSR, Novosibirsk, U.S.S.R.

Filed Sep. 2, 1986, Ser. No. 902,671

Int. Cl.⁴ E21B 4/14

U.S. Cl. 175—296

7 Claims



1. An annular air hammer apparatus for drilling wells, comprising:

- a cylindrical body;
- a hammer received coaxially for reciprocations from a top position to a lower position in said body;

a stepped air distribution tube rigidly secured in said body and cooperating with said hammer;
a work stroke chamber defined between said air distribution tube and said hammer;
a return stroke chamber defined between said body and said air distribution tube;
a pipe for receiving drillings mounted in stationary disposition in said air distribution tube and having an interior space for the removal of drillings from the well bottom;
a plenum defined between said pipe and said air distribution tube;
a source of a gaseous fluid under pressure;
said plenum having an inlet establishing permanent communication between said plenum and said source of a gaseous fluid under pressure;
admission ports in the upper step of said air distribution tube for alternately communicating said plenum with said return stroke chamber when said hammer is in the lower position;
exhaust ports in the lower step of said air distribution tube;
a rock breaking tool mounted in the lower part of said body for axial movements;
an axial passage in said rock breaking tool, for providing communication between said pipe and the exterior of the hammer apparatus;
blowing passages in said rock breaking tool for feeding the gaseous fluid under pressure to said pipe for receiving drillings and for removing broken rock therethrough to the surface;
an annular member provided between said pipe for receiving drillings and said air distribution tube in the zone between said admission ports and said exhaust ports of the air distribution tube;
an exhaust chamber defined by said annular member between the outer surface of said pipe for receiving drillings and inner surface of said air distribution tube, the exhaust chamber alternately communicating through said exhaust ports of the air distribution tube with said work stroke chamber when the hammer is in the lower position and with said return stroke chamber when the hammer is in the upper position and;
a throttle means provided between said pipe for receiving drillings and said air distribution tube, the throttle means being located below the admission ports, said exhaust chamber permanently communicating with said plenum through the throttle means.

4,709,769

COMBINATION WEIGHING METHOD

Shoji Yamano, Akashi, and Isao Miyamoto, Himeji, both of Japan, assignors to Yamato Scale Company, Limited, Akashi, Japan

Continuation-in-part of Ser. No. 788,388, Oct. 17, 1985, Pat. No. 4,706,766. This application Nov. 5, 1986, Ser. No. 927,251

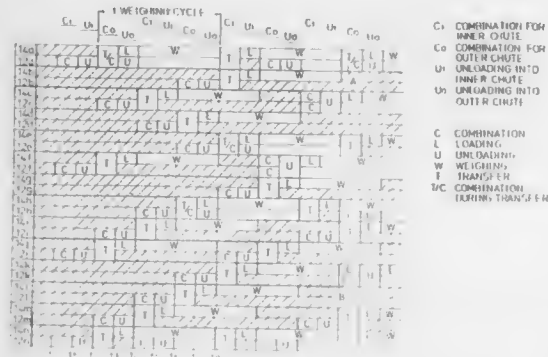
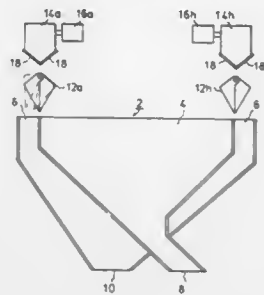
Claims priority, application Japan, Oct. 26, 1984, 59-226473
Int. Cl.⁴ G01G 19/22

U.S. Cl. 177—1

19 Claims

1. A combination weighing method comprising a transfer step for transferring product to empty ones of a plurality of auxiliary hoppers arranged to receive product from a plurality of weighing hoppers respectively, from those weighing hoppers corresponding to said empty auxiliary hoppers; a loading/weighing step for feeding product to said weighing hoppers having emptied by transferring the product to said empty auxiliary hoppers, and weighing the same; and a combination/unloading step effected in parallel with said transfer step and said loading/weighing step for repeatedly combining in various fashion the weights of said product having been transferred to said auxiliary hoppers and selecting from the resultant combinations a combination whose sum weight is

equal or approximate to a predetermined weight, and unloading the hoppers of the selected combination to make a delivery,



successive deliveries of product from said auxiliary hoppers being received concurrently by a pair of receiving device.

4,709,770

DEVICE FOR CORRECTING DYNAMIC WEIGHT SIGNAL FROM CONVEYER WEIGHER

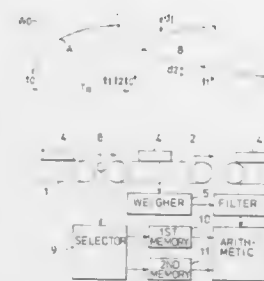
Toru Kohashi, and Motoyuki Adachi, both of Hyogo, Japan, assignors to Yamato Scale Company, Limited, Akashi, Japan
Filed Dec. 2, 1986, Ser. No. 937,105

Claims priority, application Japan, Dec. 5, 1985, 60-274797

Int. Cl.⁴ G01G 19/52, 23/10

U.S. Cl. 177-50

6 Claims



1. A device for correcting dynamic weight signals provided by a conveyor weigher through a filter for removing the vibration components of said signals to obtain corresponding static weight signals, including first memory means for storing a first correction constant and arithmetic means for applying a correction computation to said dynamic weight signals based upon said first correction constant; characterized by said device further including second memory means for storing a second correction constant, means for detecting each article fed to said weigher to produce a detection signal, and selection means responsive to said detection signals for measuring the time interval between adjoining articles fed to said weigher to apply the content of said first memory to said arithmetic means

when the measured value is less than a predetermined value and to apply the content of said second memory means to said arithmetic means when the measured value is greater than said predetermined value.

4,709,771

SPEED AND STEERING CONTROL FOR A FLOOR MAINTENANCE MACHINE

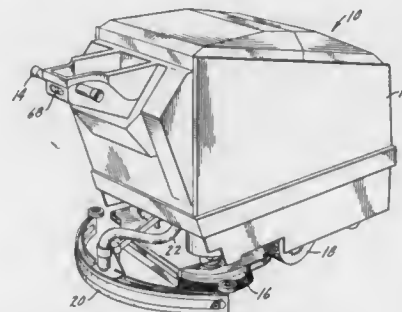
Michael T. Basham, Maple Grove; Robert M. Berdahl, Plymouth, and Bruce E. Field, Minneapolis, all of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Apr. 21, 1986, Ser. No. 853,865

Int. Cl.⁴ B62D 51/04, 11/04

U.S. Cl. 180-6.5

11 Claims



1. A drive control for a vehicle including, first and second drive motors, each arranged to drive a vehicle wheel, means responsive to an operator command for providing an electrical signal representative of a desired speed for the vehicle, means for translating the speed signal into drive signals for each motor, binary means for detecting an operator turning command, and means for changing one of the motor drive signals in response thereto, selected in accordance with the turning command, from its level representative of the motor speed just prior to the turning command toward a no-speed level at a programmed rate in accordance with a voltage ramp, with the initial point for the ramp being the motor drive signal representative of the motor current just prior to the turning command and the end point of the ramp being a signal representative of no motor current, and wherein said means for changing the motor drive signal includes means for progressively restoring said one of the motor drive signals when the operator turning command is terminated.

4,709,772

MOTORIZED MOVING DEVICE

Pierre Brunet, 12 Rue Ancienne Ferme, 38120 Saint-Egreve, France

Filed Jan. 24, 1986, Ser. No. 822,040

Claims priority, application France, Jan. 31, 1985, 85 01389

Int. Cl.⁴ B62B 5/02; B60B 19/00

U.S. Cl. 180-8.2

6 Claims

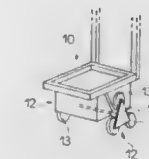
1. A motorized vehicle for transporting a person or an object over an external configuration which includes a flat surface, steps up and steps down, said vehicle comprising:

- a chassis equipped for receiving a person or object to be transported;
- a first axle mounted on said chassis in a lower region thereof for pivotal movement on a first axis;
- frame means fixed to an end of said first axle;
- at least three wheels pivotally supported on said frame means;
- first reversible electric-motor drive means coupled to said first axle for rotating said first axle;
- a second axle mounted on said chassis for pivotal movement on said first axis, said first and second axles being

coaxially and concentrically mounted on said first axis, said first axis being the sole axle-axis on said chassis, said second axle being coupled to said three wheels;

g. second reversible electric-motor drive means coupled to said second axle for selectively rotating said second axle thereby to rotate said three wheels independently of the rotation of said first axle;

h. detector means on said chassis for detecting the tilt of said chassis;



- means on said chassis for detecting counter electromotive force of the second drive means; and
- control means for actuating said first and second drive means in response to signals from both detector means, said tilt detector means acting through said control means on said first drive means to maintain a constant frame tilt by accelerating, slowing down, or reversing the direction of rotation of said first drive means in response to signals from said tilt detector means.

4,709,773

VARIABLE GEOMETRY TRACK VEHICLE

Gilles Clement, Paris, and Eric Villedieu, Palaiseau, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

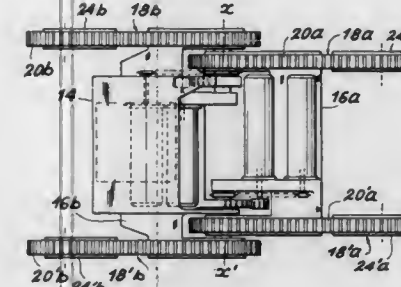
Filed Jun. 17, 1986, Ser. No. 875,325

Claims priority, application France, Jun. 21, 1985, 85 09485

Int. Cl.⁴ B62D 55/04

U.S. Cl. 180-9.32

2 Claims



1. A tracked vehicle comprising two to four tracked bodies and at least one non-tracked body, each of the tracked bodies having at least one track, the total number of tracks of the vehicle being three or four, the tracked bodies and the non-tracked bodies all being articulated about a common axis, wherein the vehicle also comprises means for permanently maintaining the vertical passing through the centre of gravity of the vehicle within the support polygon thereof, including control means acting on an angulation motorization means for the non-tracked body about the common axis, in order to make said angulation dependent on a position reference, wherein the control means are sensitive to signals supplied by sensors for the relative positioning between tracked and nontracked bodies and by a vertical position sensor carried by one of these bodies, and motorization means carried by the tracked bodies and placed within envelopes defined by the tracks of said tracked bodies.

4,709,774

MOTORCYCLE

Naoyuki Saito, and Motoo Ozawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 654,786, Sep. 26, 1984, abandoned. This application Jul. 25, 1986, Ser. No. 888,635

Claims priority, application Japan, Sep. 26, 1983, 58-148610[U]

The portion of the term of this patent subsequent to Feb. 18,

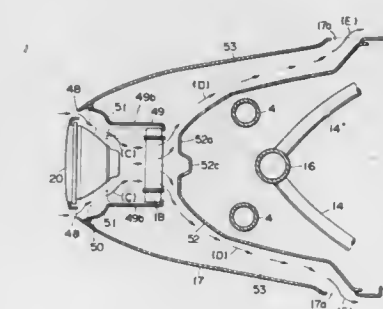
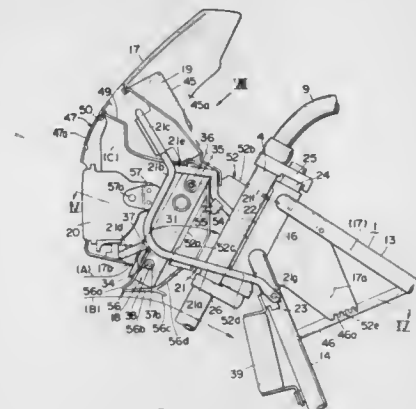
2003, has been disclaimed.

Int. Cl.⁴ B60K 11/04, 11/08

U.S. Cl. 180-229

12 Claims

- A motorcycle comprising:
- (a) a motorcycle body having a longitudinal axis;
- (b) a motorcycle frame;
- (c) a head pipe fixedly mounted on a front end of said motorcycle frame and inclined rearwardly with respect to a vertical line;
- (d) a radiator disposed forwardly of said head pipe substantially parallel to an axis thereof and positioned in a plane lying normally to the longitudinal axis of said motorcycle body;
- (e) an instrument cluster unit disposed in a slanted plane extending upwardly and forwardly from above said radiator;
- (f) a headlight disposed in a recess defined between said instrument cluster unit and said radiator, said recess having a substantially V shape as viewed in side elevation, and said headlight being disposed forwardly of said radiator in front of said head pipe;
- (g) a fairing covering said headlight, said radiator, and said instrument cluster unit; and



- (h) a single attachment frame by which said radiator, said instrument cluster unit, and said headlight are supported on said motorcycle frame.

4,709,775

TORQUE CONTROL SYSTEM FOR VEHICLES

Kenichi Watanabe, Hideshi Hiruta, and Manabu Hiketa, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

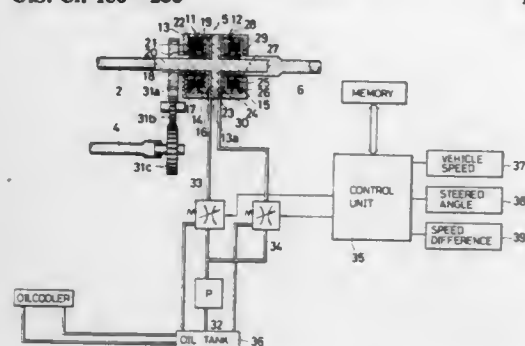
Filed Aug. 29, 1986, Ser. No. 901,776

Claims priority, application Japan, Aug. 30, 1985, 60-191033; Aug. 30, 1985, 60-191035; Sep. 20, 1985, 60-206271

Int. Cl.⁴ B60K 17/34

U.S. Cl. 180—233

13 Claims



10. A torque control system for vehicles provided with four-wheel drive system including a power plant producing a drive torque for driving wheels, torque transmitting mechanisms for transmitting the drive torque from the power plant to front and rear wheels respectively, and power transiting means provided in at least one of said power transmitting mechanisms for changing the amount of the drive torque transmitted therethrough so that the torque distribution ratio between the front and rear wheels can be controlled, CHARACTERIZED IN THAT the torque control system further comprises actuator means for operating said power transmitting means to control said torque distribution ratio vehicle speed detecting means for detecting a vehicle speed, steering angle detecting means for detecting a steered angle of the steering wheel, speed difference detecting means for detecting a rotation speed difference between the front and rear wheels, torque control means for determining a control factor for operating said actuator means in accordance with the speed difference under a given vehicle speed and a given steering angle so that the torque distribution ratio between the front and rear wheels is maintained at a desirable constant value wherein said power transmitting means are provided in a torque transmitting path for transmitting the drive torque from the power plant to the front wheels, and the system including a transmission disposed in the vicinity of an engine located transversely at front portion of an vehicle body, the transmission being provided with an input and output shaft extending in the axial direction of the output shaft of the engine, a ring gear in meshing engagement with an output gear of the transmission, a front differential gear mechanism relatively rotatable with the ring gear extending through the central portion of the ring gear, a hydraulic clutch disposed on the same axis as the ring gear so as to control engagement and disengagement between the ring gear and the front differential mechanism and changing the amount of the drive torque transmitted through the clutch device in accordance with a hydraulic pressure, and a rear wheel drive mechanism in meshing engagement with the ring gear for transmitting the drive torque from the engine to the rear wheels.

4,709,776

AUTOMATIC POWER DOOR LOCK SYSTEM

Marcus C. Metz, Canton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 7, 1986, Ser. No. 882,568

Int. Cl.⁴ B60K 28/12

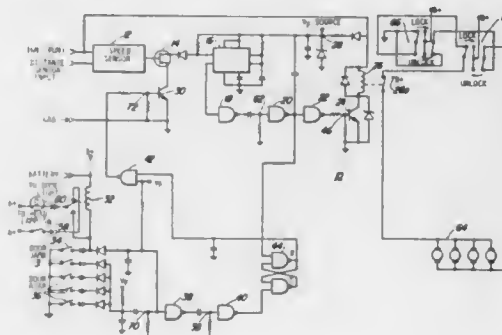
U.S. Cl. 180—281

5 Claims

1. An automatic power door lock system for automatically locking door locks of a motor vehicle after a door is opened or

becomes ajar while the ignition of the vehicle is on and after the vehicle reaches a predetermined speed, said system comprising:

- speed sensor means connected to a distance sensor of the vehicle for providing to the system a pulse signal indicative of the speed of the vehicle so that the system will know when the vehicle reaches the predetermined speed;
- door jamb switch means mechanically connected to the door of the vehicle for providing an electrical signal to the system indicative of the door being opened;
- a door ajar switch mechanically connected to the door and having a switch contact connected between an electrical signal source and said door jamb switch means for providing an electrical signal to the system indicative of the door being in an ajar position; and



- a drive means connected to the door lock for driving the lock to a lock position; and
- bi-stable latch means interconnected to said speed sensor means, said door jamb switch means and said drive means responsive to the electrical signal from said door jamb switch means indicating the door being opened or ajar and to the speed of the vehicle pulse signal from said speed sensor means, for providing an electrical signal to said drive means to cause said drive means to drive the door lock to a lock position when the vehicle reaches the predetermined speed.

4,709,777

VEHICLE POWER DOOR LOCKS, IGNITION KEY INTERLOCK SYSTEM THEREFOR

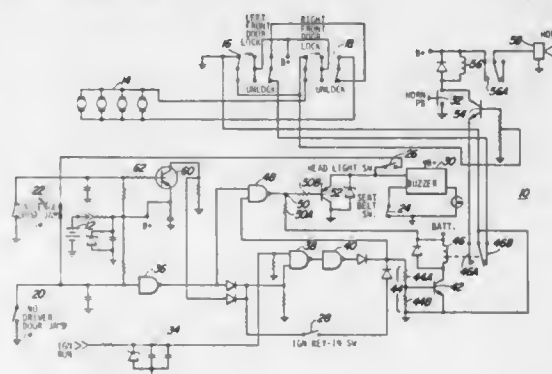
Marcus C. Metz, Canton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 7, 1986, Ser. No. 882,656

Int. Cl.⁴ B60K 28/00

U.S. Cl. 180—286

6 Claims



1. An interlock system for an automotive vehicle with power door locks for preventing the accidental locking of the vehicle while the ignition key is in an ignition key cylinder, the vehicle being either the type having a tilt or non-tilt steering column, the ignition key cylinder being the type wherein the ignition key is positioned to the OFF, ACCESSORY or IGN-

RUN position without starting or causing an engine of the vehicle to operate, said system comprising:

- means for detecting the presence of the ignition key positioned in the ignition key cylinder in the OFF and ACCESSORY positions;
- means for detecting the presence of the ignition key positioned in the ignition key cylinder in the IGN-RUN position;
- driver door jamb switch circuit means mechanically connected to a driver door of the vehicle for providing an electrical signal to the system indicative of the driver door being opened;
- driver door audible indication means connected to said driver door jamb switch circuit means, said ignition key in IGN-RUN position detection means and said ignition KEY-IN in position detection means for providing an audible sound when the driver door is opened while the ignition key is in the IGN-RUN, OFF and ACCESSORY positions;
- passenger door jamb switch circuit means mechanically connected to a passenger door of the vehicle for providing an electrical signal to the system indicative of the passenger door being opened;
- means for inhibiting the power door lock circuits in response to the passenger door and/or the driver door being opened while the ignition key is positioned in the ignition key cylinder in the ON, OFF or ACCESSORY position; and
- vehicle horn activation means for turning on the vehicle horn in response to the power door locks being inhibited by said power door lock inhibiting means.

4,709,778

VEHICLE DRIVE UNIT

Rolf von Sivers, Rutesheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 733,785

Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417815

Int. Cl.⁴ B60K 5/12

U.S. Cl. 180—292

13 Claims



1. A vehicle drive unit comprising:
 - a combustion engine supported at the vehicle structure by elastic bearing means,
 - a transmission,
 - a transmission shaft drivingly connecting the engine and the transmission,
 - a transfer case drivingly connectible with the transmission, first and second differentials drivingly connectible with the transmission and transfer case,
 - a drive shaft for drivingly connecting the transmission with the second differential, said drive shaft being supported at a support member,
 - said support member being rigidly connected with the transmission,
 - said elastic bearing means including first and second elastic bearing support means,
 - said first elastic bearing support means arranged between the combustion engine and the support member for vibrationally isolating the combustion engine with respect to the support member for the drive shaft,
 - said second elastic bearing support means arranged between the combustion engine and the transmission for vibrationally isolating the combustion engine with respect to the

transmission, and said transmission shaft exhibiting low torsional rigidity and being associated with inertial masses in such a manner as to provide a damping effect on torque transfer induced vibrations.

4,709,779

VIBRATION DAMPING SYSTEM FOR POWER UNIT

Shin Takehara, Higashihiroshima, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

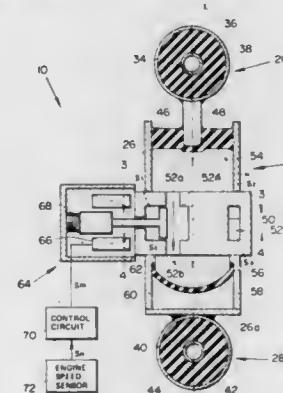
Filed Feb. 20, 1986, Ser. No. 831,286

Claims priority, application Japan, Feb. 20, 1985, 60-32444

Int. Cl.⁴ F16F 9/50

U.S. Cl. 180—300

22 Claims



1. A vibration damping system for a power unit of vehicle, said vibration damping system comprising:
 - mounting devices for supporting a power unit from a vehicle body;
 - a damper operatively disposed between the power unit and the vehicle body, said damper operatively disposed independently from said mounting devices so that said mounting devices receive the static load of the power unit, said damper including:
 - a first connecting section connected to the power unit;
 - a second connecting section connected to the vehicle body;
 - a first elastic wall member connected to one of said first and second connecting sections and defining a first fluid chamber;
 - a second elastic wall member defining a second fluid chamber;
 - means for defining a communication passage through which said first and second fluid chambers are communicable with each other, and
 - a fluid filled in said first and second fluid chambers and said communication passage; and
 - means for changing volume of said communication passage in response to engine speed of the power unit.

4,709,780

EXHAUST DISSIPATOR/DISRUPTOR DEVICE

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Dec. 27, 1985, Ser. No. 813,817

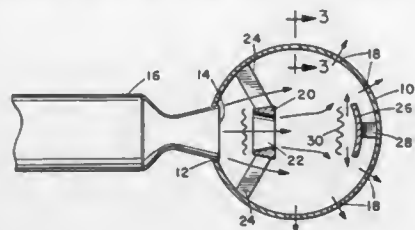
Int. Cl.⁴ F02K 1/44

U.S. Cl. 181—213

7 Claims

1. A dissipator device for connection to a rocket exhaust, comprising:
 - a container having an inlet at an intermediate point in its length for connection to a rocket exhaust and a plurality of outlet exhaust orifices of smaller dimensions than the inlet for exhaust flow out of the container in a plurality of different directions;
 - a solid deflector surface in the container opposite the inlet for deflecting incoming exhaust flow out of the incoming flow direction and into deflected flow directions generally normal to the incoming flow direction; and

disrupter means in the container in the path of incoming exhaust flow between the inlet and the deflector surface for reducing the pressure of exhaust gases downstream of the disrupter means, the disrupter means comprising a disrupter member spaced from the inlet having a through bore aligned with the inlet, the through bore having an inlet opening at one end positioned closest to the inlet of



an area less than the cross-sectional area of the exhaust flow at the inlet opening and shaped for restricting the exhaust gas flow and directing it through and around the disrupter member.

4,709,781

SOUND-DAMPING AND HEAT-INSULATING COMPOSITE PLATE

Wilhelm Scherzer, Berndorf, Austria, assignor to Austria Metall Aktiengesellschaft, Braunau am Inn, Austria

Filed Nov. 18, 1985, Ser. No. 799,160

Claims priority, application Austria, Nov. 16, 1984, 3632/84

Int. Cl.⁴ E04B 1/82; B32B 15/06

U.S. Cl. 181—290

7 Claims



1. A sound-damping composite body consisting essentially of two metal cover layers and a porous core layer, said core layer being positioned between the two metal cover layers and bonded to each of said metal layers, said core layer being composed of interbonded particles of rubber forming pores between them.

4,709,782

SKID-OUT HIGHRISE FIRE ESCAPE DEVICE

Henry Lipinski, 1832-20th St., Wyandotte, Mich. 48192, assignor to Henry Lipinski; Theresa Janet Lipinski; James Robert Sobocienski and Lorraine Sobocienski, all of Wyandotte, Mich.

Filed Jan. 13, 1987, Ser. No. 2,953

Int. Cl.⁴ A62B 1/20

U.S. Cl. 182—3

60 Claims



1. An emergency gravity operated fire escape apparatus

particularly useful for egressing from highrise type structures, which in combination, comprises:

a skid track vertically disposed and in a spaced relationship to a wall of a structure having a ground end, said skid track having a front side and a back side with a partition interposed between the front and the back side forming a guide channel and a back section having an inside wall, a longitudinal aperture disposed the length of the front side of said skid track and a plurality of doors disposed along said skid track's front side;

a plurality of descent retarders uniformly disposed within the back section of said skid track and partially protruding into the guide channel of said track through a rectangular aperture disposed within the partition, said descent retarder having a plane frictional surface and rear portion; means for controlling said descent retarders horizontal displacement, said means for controlling being disposed within the back section of said skid track and placed between the rear of said descent retarder and the inside of the back side of said skid track; and

a skid disposed within the guide channel of said skid track, said skid having a back and bevel front portions with a handle affixed to the back and a loop affixed near the bevel front portion; whereby a harness may be attached to the loop of said skid, allowing the user to safely and slowly descend to the ground during an emergency exit from a highrise structure.

4,709,783

APPARATUS FOR INSTALLING ESCAPE DEVICE FOR SLOWLY LOWERING A BODY

Hisatsugu Tomioka, Ibaraki; Tatsuo Waki, and Yoshiki Miyata, both of Tokyo, all of Japan, assignors to Lonsal, Tokyo, Japan

Filed Dec. 26, 1985, Ser. No. 813,373

Claims priority, application Japan, Dec. 29, 1984, 59-201969[U]; Nov. 16, 1985, 60-177167[U]

Int. Cl.⁴ A62B 1/16

U.S. Cl. 182—8

25 Claims



1. An apparatus for supporting an escape device for slowly lowering a person from a structure toward the ground comprising:

(a) a ladder assembly having an upper portion for mounting said ladder assembly to said structure, with at least two horizontal bars mounted to said upper portion; and

(b) at least two vertical rods mounted on said at least two horizontal bars such that a gate-like shape is formed by said ladder assembly upper portion, said at least two horizontal bars, and said at least two vertical rods, wherein each of said vertical rods is substantially L-shaped in cross-section and has at least one substantially horizontal cylindrical portion which is adapted to receive one horizontal bar, each said horizontal cylindrical portion being attached to one end of a substantially vertical portion of each said vertical rod and further comprising a threaded section which is adapted to receive a screw for detachably connecting said horizontal bars and said vertical rods to

each other, said vertical portions having second ends attached to each other by a lower horizontal member, wherein a portion of said structure is held by and between said ladder assembly and said at least two vertical rods.

4,709,784

APPARATUS FOR AIDING IN LOADING A MOBILE WORK PLATFORM ONTO AN ELEVATED SURFACE

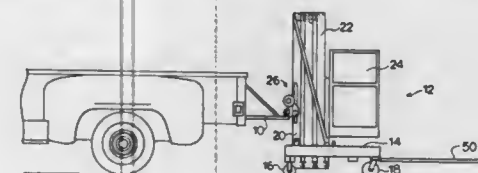
Lyle D. Grider, 25990 North Oak Hills Road, Barrington, Ill. 60010

Filed Mar. 30, 1987, Ser. No. 31,455

Int. Cl.⁴ E04G 1/24

U.S. Cl. 182—16

15 Claims



1. In a mobile work platform apparatus having a base member and a side extension thereof extending upwards from the base, the improvement comprising:

a surface engaging pivot means fixed to said side of said base member; and anti-friction means mounted to said side of said base member proximate said pivot means and arranged to support the weight of the mobile work platform when positioned on its side.

4,709,785

RETROFIT FRICTION-HYDROSTATIC EMERGENCY LUBRICATION SYSTEM FOR A LARGE ROTATING SHAFT

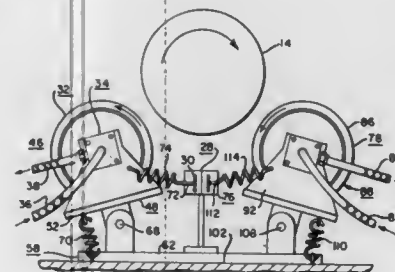
Michael Csanady, Jr., Ridley Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 2, 1986, Ser. No. 902,728

Int. Cl.⁴ F01M 1/00

U.S. Cl. 184—6.4

14 Claims



1. A retrofit friction-hydrostatic emergency lubrication system for supplying lubricating oil to a bearing means for a large rotating shaft during electrical power outage, said bearing means for carrying and maintaining said shaft in position, lubrication means for lubricating said bearing means, said lubrication means including oil supply tank means, pump means for pumping lubricating oil to said bearing means, first piping means in fluid communication with said oil supply tank means and said bearing means, said retrofit friction-hydrostatic emergency lubrication system comprising:

(a) first sensing and actuator means for sensing and responding to a first predetermined low oil pressure at said bearing means;

(b) first rotatable friction means for contacting said shaft, said first sensing and actuator means upon detecting said

first predetermined low oil pressure at said bearing means causing said first friction means to contact said shaft;

(c) first high pressure pump means having an intake and a discharge, said first high pressure pump means driven by said friction means;

(d) second piping means in fluid communication with said first high pressure pump means and said oil supply tank means;

(e) hydraulic motor pump means in fluid communication with said discharge of said first high pressure pump means, said hydraulic motor pump means driven by said discharge of said first high pressure pump means; and

(f) first oil supply tank pump means disposed within said oil supply tank means, said first oil supply tank pump means driven by said first hydraulic motor pump means, whereby when said first predetermined low oil pressure is detected during shaft coastdown, the inertia of said shaft drives said emergency lubrication system to maintain an adequate flow of oil to said bearing means.

4,709,786

INDUSTRIAL TRUCK, PARTICULARLY HIGH-LIFT TRUCK, ALSO AS A HIGH-LIFT TRUCK HAVING A DISPLACEABLE MAST

Bernd David, Henstedt-Ulzburg, and Alfred Klingberg, Norderstedt, both of Fed. Rep. of Germany, assignors to Jungheinrich Unternehmensverwaltung KG

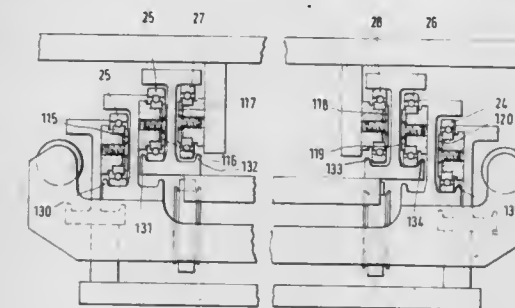
Filed Jan. 30, 1986, Ser. No. 824,159

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1985, 3503359; Aug. 19, 1985, 3529601

Int. Cl.⁴ B66B 9/20

U.S. Cl. 187—9 E

8 Claims



4. An industrial truck comprising a lifting frame and at least one vertically movable load-carrying carriage, wherein said lifting frame is provided with laterally disposed vertical rails, and rotatably mounted guide rollers are provided, said rails serve in alternation as carriers for said guide rollers, which are engageable with guideways of adjacent rails, or to provide guideways for such guide rollers, guide rollers are also provided on the load-carrying carriage and the guideways are provided at least on one side with a bordering ledge for a lateral guidance of the guide rollers, wherein the improvement resides in that at least part of the guide rollers (20, 22, 30; 24, 26, 28; 102-104; 105, 106; 108, 109; 143) are axially displaceable, the guideways (127-129) provided on one side of the lifting frame (2) and cooperating with associated guide rollers (20, 22, 30; 20', 22' 30'; 24027, 65, 143), which are axially fixed in their bearings, are wider than the tread of the respective associated guide roller, the guideways provided on both sides of the lifting frame (2) are provided with bordering ledges (130-135), which are raised from the guideways, and the thread of the guiding rollers (24, 26-28) disposed on one side is narrower than the guideway within the bordering ledge.

4,709,787 ELEVATOR

Eiji Uchino, 4-12, Kamo 2-chome, Takaishi-shi, Osaka-pref., Japan

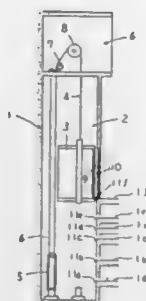
Filed Jul. 14, 1986, Ser. No. 882,954

Claims priority, application Japan, Dec. 11, 1985, 60-191187

Int. Cl.⁴ B66B 13/00

U.S. Cl. 187-56

7 Claims



1. An elevator including a cage having a floor, said cage positioned within a vertical shaft inside a building having floors, comprising:

an elastic member comprising an elongated body with a right triangle cross-section placed between the front edge of said elevator cage floor and the building floor edge abutting said front edge of said elevator cage floor with one side lying in the plane of said elevator cage floor and the hypotenuse facing the bottom of said shaft and both the elevator cage and the building floor having sliding doors for permitting entry and exit to and from the cage only when the cage floor is level with the building floor.

4,709,788

GROUP CONTROL APPARATUS FOR ELEVATORS
Yataka Harada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

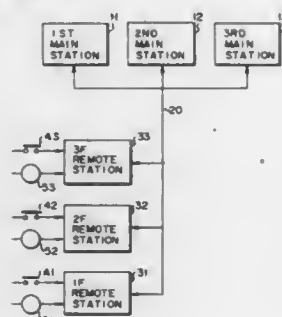
Filed Jun. 18, 1986, Ser. No. 875,876

Claims priority, application Japan, Jun. 28, 1985, 60-142156

Int. Cl.⁴ B66B 1/18

U.S. Cl. 187-124

12 Claims



1. A group control apparatus for elevators, comprising:
a plurality of main stations each for performing a hall call registration of an elevator cage, one of said main stations serving as a master main station for governing the hall call registration of said elevator cage, another of said main stations serving as a slave main station which is supplied from said master main station, and an address signal being used for receiving hall call data indicating said hall call registration;
a plurality of floor remote stations arranged in elevator halls of respective floors in a building in which elevators are installed, for generating said hall call data which calls said

elevator cage, and performing a call display of said elevator cage; and
single data transmission means, for coupling each of said floor remote stations with each of said main stations, for performing serial data transmission of said hall call data between said floor remote stations and said main stations so that said hall call registration is effected at each of said main stations, and for performing serial data transmission of said address signal between said master main station and said slave main station,
wherein when said master main station fails to stop the supply of said address signal on said single data transmission means for a period more than a predetermined period of time, said slave main station detects the failure of said master main station based on the absence of said address signal on said single data transmission means,
so that said slave main stations governs the hall call registration of said elevator cage in place of the failed master main station.

4,709,789

DUST COVER FOR CYLINDRICAL ELEMENTS OF THE TYPE FOR USE IN A PIN GUIDE ARRANGEMENT OF A SPOT-TYPE DISC BRAKE

Erhard Czich, Eppstein/Bremthal; Peter Drott, Frankfurt am Main, and Horst Haefner, Steinbach, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

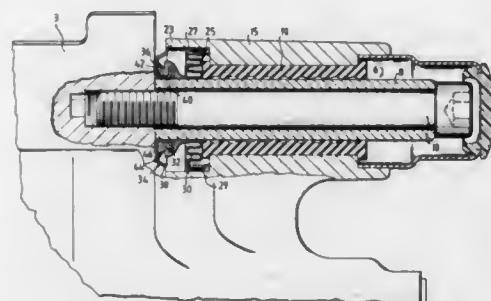
Filed Apr. 22, 1986, Ser. No. 855,079

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1985, 3514497

Int. Cl.⁴ F16D 65/09, 65/02

U.S. Cl. 188-73.44

5 Claims



1. A dust cover for use in a pin guide arrangement of a spot-type disc brake, comprising an elastic folded sleeve having a first end section including means adapted to be stationarily, sealingly received against a first cylindrical element associated with an attachment member of said pin guide arrangement and a second end section including means adapted to be rotationally, sealingly mounted to the circumference of a second cylindrical element of said pin guide arrangement including a ring providing at said second end section, said ring being a substantially U-shaped configuration in longitudinal section an inner diametrical portion of said ring adapted to be stationarily mounted on said second cylindrical element, said ring at least partly surrounds said second end section of said folded sleeve, and said second end section being sealingly, rotatably mounted inside the U-shaped portion of said ring, an outer diametrical portion of said ring adapted to abut against said first cylindrical element.

4,709,790 CONTINUOUSLY ADJUSTABLE LENGTH ADJUSTMENT DEVICE

Herbert Freitag, Koblenz; Castor Fuhrmann, Brachtendorf, and Hans-Josef Hosan, Neuwied, all of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

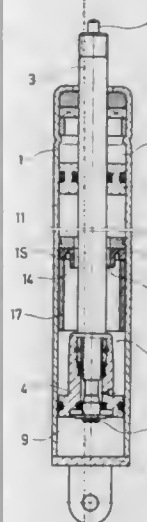
Filed Oct. 3, 1985, Ser. No. 783,840

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437098

Int. Cl.⁴ F16F 9/44

U.S. Cl. 188-300

18 Claims



1. A continuously adjustable length adjustment device wherein

- a cylindrical container is provided having an axis, two end walls, namely a first and a second end wall and a cavity between said two end walls;
- a piston rod axially extends inwards and outwards of said cavity through said first end wall;
- a piston unit is connected with said piston rod within said cavity and divides said cavity into two subcavities, a first subcavity adjacent said first end wall and a second subcavity adjacent said second end wall;
- said first subcavity contains an elastically compressible compensation volume adjacent said first end wall and a hydraulic volume adjacent said piston unit;
- said hydraulic volume and said second subcavity are filled with a hydraulic liquid;
- said hydraulic volume and said second subcavity are interconnected by passage means;
- voluntarily operable valve means are provided for opening and closing said passage means;
- an annular partition unit is provided within said hydraulic volume axially intermediate said elastic compensation volume and said piston unit, said partition unit separating said hydraulic volume into a first subvolume adjacent said elastic compensation volume and a second subvolume adjacent said piston unit;
- throttled throughflow means interconnect said first and second subvolumes such that a pressure difference occurs between a higher pressure within said second subvolume and a lower pressure in said first subvolume in response to traction acting onto said piston rod in the sense of extraction of said piston rod from said container in the closed state of said voluntarily operable valve means; and
- locking means are provided for preventing extraction of said piston rod, said locking means being exclusively responsive to said pressure difference so as to enter a locking condition before said piston unit mechanically engages said locking means.

4,709,791 ADJUSTABLE DOUBLE-ACTING DAMPER

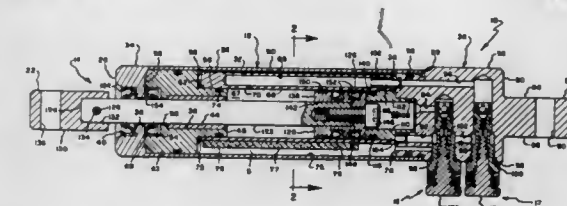
Benjamin T. Houghton, Tonawanda, N.Y., assignor to Enidine Incorporated, Orchard Park, N.Y.

Filed May 23, 1985, Ser. No. 737,326

Int. Cl.⁴ F16F 9/34

U.S. Cl. 188-315

17 Claims



1. A damper for acting between two relatively movable objects comprising:

- housing means adapted to be operatively connected to one of said objects;
- piston means comprising a head within said housing means and a rod extending from said housing means adapted to be operatively connected to the other of said objects, said housing means including means defining an elongated cavity for containing hydraulic fluid, said piston head being received by said cavity so as to separate said cavity into a first variable-volume chamber and a second variable-volume chamber and adapted to slidably move relative to and along the length of said elongated cavity and thereby vary the volumes of said first and second chambers in response to relative movement between said two objects toward and away from one another, said housing means further including means defining an access opening, a first passage and a second passage, said first chamber communicating with said access opening through said first passage and said second chamber communicating with said access opening through said second passage; and
- hydraulic fluid flow control means including a body sealingly accepted by said access opening and defining a passageway therethrough providing flow communication between said first and second passages and thereby providing a flow path for hydraulic fluid forced to flow between said first and second chambers as the volumes of said chambers are varied by said relative movement of said two objects toward and away from one another, said flow control means further including means associated with said body passageway for controlling the flow of hydraulic fluid in one direction through said passageway so that as hydraulic fluid is forced to flow through said passageway in said one direction, the damping effect of said damper is controlled, said passageway including a ball chamber having a flow inlet end and flow outlet end and said means associated with said passageway including a spherical ball received by said ball chamber, said ball adapted to be biased toward the ball chamber inlet or outlet end having the lower fluid pressure, one of said inlet and said outlet ends being of such a conformation that when hydraulic fluid pressure is lower at said one end than the fluid pressure at the other end, said ball and said one end cooperate to controllably restrict the flow of hydraulic fluid through said passageway, and the other of said inlet and said outlet ends being of such a conformation that when hydraulic fluid pressure is lower at said other end than the fluid pressure at said one end, said ball and said other end cooperate to permit substantially unrestricted flow of hydraulic fluid through said passageway, said one end of said ball chamber defining a contoured surface of such configuration that flow of hydraulic fluid through said one end is controlled by controlling the positional relationship of said ball to said contoured surface and said flow control means including adjustment means for adjusting the positional relationship of said ball to said contoured surface of said one end, said adjustment

means including ball-engaging means mounted for movement relative to and within said body passageway for moving said ball relative to said contoured surface between one positional relationship with and within said ball chamber and another such positional relationship, said body of said control means defining an elongated opening extending therethrough, one portion of said elongated opening defining at least a portion of said passageway and another portion of said elongated opening is internally-threaded along the length of said opening, said adjustment means including a plug member having a securement portion and a stem portion attached to said securement portion, said securement portion being rotatably and threadably accepted by said threaded portion of said opening for bodily movement of said plug member relative to and along the length of said elongated opening as said securement portion is rotated relative to said body of said control means, and said stem portion extending from said securement portion and into said ball chamber and engageable with said ball for moving said ball between said one positional relationship with said contoured surface and another as said securement portion is rotated relative to said body.

4,709,792

METHOD OF CONTROLLING CREEP PREVENTING DEVICE FOR VEHICLE EQUIPMENT WITH AUTOMATIC TRANSMISSION

Shino Sakai, Saitama, and Masao Nishikawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

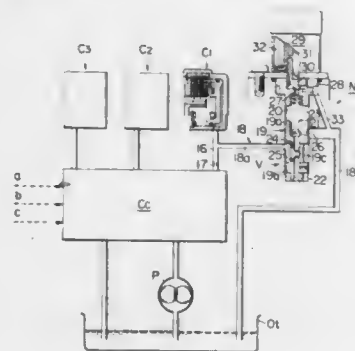
Continuation of Ser. No. 512,892, Jul. 11, 1983. This application Oct. 27, 1986, Ser. No. 924,177

Claims priority, application Japan, Jul. 12, 1982, 57-121055; Aug. 20, 1982, 57-144142

Int. Cl.⁴ B60K 41/28; F16D 43/28

U.S. Cl. 192—0.044

5 Claims



1. In a creep preventing device for a vehicle equipped with an automatic transmission in which an oil discharge passage communicating with an oil tank is branched from an oil feed passage for supplying an operating oil pressure to a starting means of the automatic transmission and an electromagnetic valve capable of closing said oil discharge passage under the demagnetized state and opening the same under the excited state is disposed in said oil discharge passage, a method of controlling the creep preventing device comprising the steps of:

chopping a power feed circuit controlling said electromagnetic valve a predetermined number of times in the course of the creep preventing device coming into an inoperative state in response to the release of an associated brake pedal when said electromagnetic valve is returned from the excited state to the demagnetized state; and stopping the chopping of the power feed circuit to immediately bring the electromagnetic valve into the demagnetized state, when an associated accelerator pedal is pressed during the chopping step of the power feed circuit of the

electromagnetic valve thereby rendering the creep preventing device inoperative for swift connection of said starting means.

4,709,793

PARKING MECHANISM FOR TRANSMISSIONS

Shiro Sakakibara, and Kazuhisa Ozaki, both of Anjo, Japan, assignors to Aisin-Warner Limited, Japan

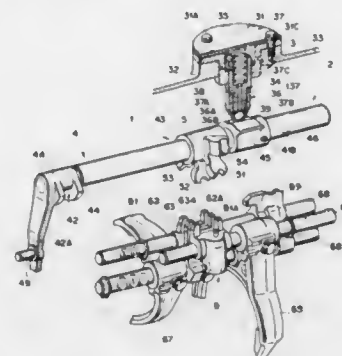
Filed Feb. 20, 1985, Ser. No. 703,676

Claims priority, application Japan, Feb. 22, 1984, 59-31853

Int. Cl.⁴ B60K 41/26, 20/02

U.S. Cl. 192—4 A

8 Claims



2. A parking mechanism for transmission, comprising: an input shaft, an output shaft located in a coaxial relationship with said input shaft, and having a plurality of driven gears, a countershaft located in parallel with said input shaft, and having a plurality of drive gears constantly meshed with said driven gears; a plurality of dog clutches selectively coupled between one of said driven gears and said output shaft, a plurality of parallel shifter rails disposed in parallel with said input shaft, each of said shifter rails having a shifter fork fixed thereon for axial movement with said shifter rail into engagement with one of said dog clutches, each of said shifter rails also having a shifter arm mounted thereon, each of said shifter arms having a groove therein; a select and shifter shaft disposed in parallel with said shifter rails, and an annular member fixed to said select and shifter shaft for movement therewith, said annular member having a plurality of coupling members, said coupling members being engaged in said grooves, by rotation of said select and shifter shaft, for axial movement of one of said shifter rails, and a parking coupling member for the parking position provided on the annular portion of said select and shifter shaft for engagement within the grooves of at least two of said shifter arms, by rotation of said select and shifter shaft, for axial movement of two shifter rails whereby the shifter fork on one of said two shifter rails is brought into operative engagement with a first of said dog clutches and the shifter fork on the other of said two shifter rails is brought into operative engagement with a second of said dog clutches establishing a parking position independent of other shift positions.

4,709,794

ELECTROMOTIVE VARIABLE-SPEED AND CONTROL DRIVE PARTICULARLY FOR USE IN INDUSTRIAL SEWING MACHINES

Karl Lengsfeld, Plankstadt; Erich Link, Brühl; Adolf Martin, Rheinstetten, and Hilmar Wittler, Karlsruhe, all of Fed. Rep. of Germany, assignors to Frankl & Kirchner GmbH & Co KG, Schwetzingen, Fed. Rep. of Germany

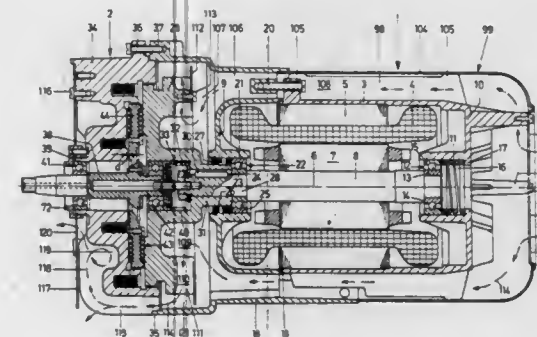
Filed Mar. 5, 1986, Ser. No. 836,258

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508227

Int. Cl.⁴ F16D 67/06

U.S. Cl. 192—18 B

4 Claims



1. An electromotive variable-speed and control drive particularly for use in industrial sewing machines comprising: a motor capable of continuous drive and having a motor shaft, a flywheel having a clutch surface and connected to said motor shaft, and a clutch-brake unit for selectively connecting said motor shaft to a drive shaft, said clutch-brake unit having a clutch-disk which is connected to said drive shaft non-rotatably with respect thereto, a non-rotatable brake bearing bracket having a brake surface, said clutch-disk being brought into friction engagement optionally with said brake surface of said brake bearing bracket, or optionally with said clutch surface of said flywheel, said clutch-brake disk having an armature ring, said brake bearing bracket including a clutch coil casing portion, a clutch coil in said clutch coil casing portion, said brake bearing bracket including a brake coil casing portion, a brake coil in said brake coil casing portion, said armature ring having a radially outer-lying ring portion, said clutch coil casing portion encompassing said radially outer-lying ring portion of said armature ring forming a first radial gap between said clutch coil casing portion and said ring portion, said ring portion forming an axial gap to said flywheel, said flywheel having a peripheral portion, said clutch coil casing portion encompassing said peripheral portion of said flywheel forming a second radial gap therebetween, said armature ring having a brake friction layer, said brake coil casing portion being positioned radially within said brake friction layer and, with a small axial gap, in front of said armature ring, and an undercut in said clutch coil casing portion and confining said first radial gap on a side of said ring portion in said clutch coil casing portion and facing said brake bearing bracket, and radially extending recesses confining said second radial gap, one of said recesses being provided in said clutch coil casing portion and another of said recesses being provided in at least one of said peripheral portion of said flywheel and said clutch coil casing portion.

4,709,795

HYDRAULICALLY-ACTUATED STARTING CLUTCH ASSEMBLY WITH BALANCED PISTON ACTUATION

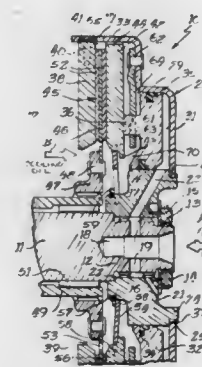
Ernest A. Ferris, Oakbrook, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 685,682, Dec. 24, 1984. This application Jul. 11, 1986, Ser. No. 884,347

Int. Cl.⁴ F16D 25/063, 13/50

U.S. Cl. 192—106 F

11 Claims



1. A starting clutch adapted to engage upon a signal from a throttle-induced system oil pressure to couple a driving shaft with a driven concentric sleeve shaft, comprising a hub operatively connected to rotate with the continuously rotating driving shaft, a clutch housing secured to said hub and having an intermediate step and an axial flange portion, said hub and stepped portion of the housing defining an annular pressure chamber therein receiving an axially reciprocable annular piston, a clutch plate carrying friction facings, a second hub operatively connected to the driven sleeve shaft and secured to the clutch plate, an end plate secured to said axial flange portion, a pressure plate axially reciprocable in said housing on the opposite side of the clutch plate from the end plate, a Belleville spring in said housing and operatively connected between said pressure plate and hub for driving rotation therewith, a plurality of axial projections on said piston contacting said pressure plate to move it against the clutch plate and end plate, and a source of hydraulic pressure communicating with said pressure chamber.

4,709,796

TORSION RUBBER TYPE DAMPER DISC

Norihisa Uenohara, Moriguchi, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

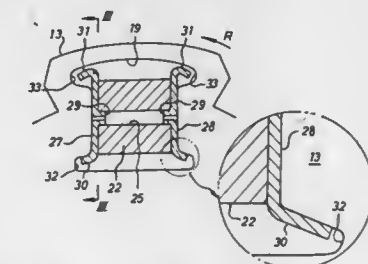
Filed Oct. 8, 1985, Ser. No. 785,435

Claims priority, application Japan, Oct. 15, 1984, 59-155636[U]

Int. Cl.⁴ F16D 3/14

U.S. Cl. 192—106.1

5 Claims



1. A torsion rubber type damper disc, in which a flange is formed on an outer periphery of a hub, freely rotatable side plates are disposed on opposite sides of said flange, holes are formed in said flange and said side plates, said flange and said side plates being elastically interconnected with each other in

circumferential direction by a torsion rubber member in said holes seated on metal torsion rubber seats, claws are provided on said metal torsion rubber seats between said side plates at the inner and outer peripheral sides of said holes, said metal torsion rubber seats forming stoppers for said torsion rubber member; characterized by that said claws on said metal torsion rubber seats are bent outwardly and in the circumferential direction of said flange and said side plates away from said torsion rubber member to avoid interference between said torsion rubber member and said claws as said torsion rubber member is compressed and recessions for receiving said claws are formed on both circumferential faces of said flange hole under a free state of the disc.

4,709,797

CLUTCH DRIVEN PLATE

Luigi Cucinotta, and Orazio Di Benedetto, both of Milan, Italy, assignors to Automotive Products plc, Leamington Spa, England

Filed Sep. 10, 1986, Ser. No. 905,534

Claims priority, application Italy, Sep. 18, 1985, 22175 A/85
Int. Cl.⁴ F16D 3/14, 3/64

U.S. Cl. 192—106.2

11 Claims

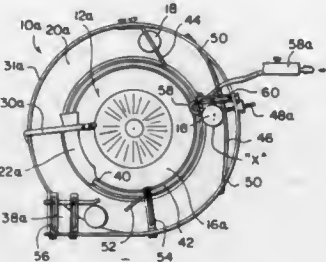


1. A driven plate for a clutch, said driven plate being rotatable about an axis of rotation, said driven plate comprising first and second annuli and an intermediate disc disposed between the annuli, said disc having a central opening centered on said axis, said opening being lined by axial splines, said disc being rotatable about said axis, said annuli and disc being keyed together by plug and socket connections whereby the annuli and disc rotate in synchronism, a friction material carrier comprising a first plate arrangement and a second plate arrangement, said first plate arrangement being axially spaced from said second plate arrangement, said first and second plate arrangements being fast one with the other for rotation in synchronism about said axis, said intermediate disc being disposed between the first and second plate arrangements, said first and second plate arrangements being in contact with the first and second annuli respectively, said first annulus being disposed between the first plate arrangement and the disc and said second annulus being disposed between the second plate arrangement and said disc, said first plate arrangement having a central opening in which the first annulus extends axially away from said disc, friction material in annular array being mounted on said carrier and disposed radially outwardly of the annuli, rotary motion about said axis being transmissible from the carrier to the intermediate disc and vice-versa, the carrier and the intermediate disc being capable of limited angular movement one relative to the other about said axis against action of resilient torsion damping means between the disc and carrier, and wherein said carrier rubs on said annuli during said relative angular movement.

4,709,798
ROTARY FEEDER TO ORIENT AND FEED BOTTLE CAPS AND SIMILAR PARTS
Michael Herzog, 135 Industrial Blvd., Riverhead, N.Y. 11901
Continuation of Ser. No. 708,074, Mar. 4, 1985, abandoned. This application Mar. 20, 1987, Ser. No. 28,044
Int. Cl.⁴ B23G 7/12

U.S. Cl. 198—380

4 Claims



1. A rotary feeder for closure cap which caps have an external crown side and an internal cavity side bordered by a peripheral skirt, said feeder comprising in combination: a bowl, means mounting said bowl for rotation about a vertical axis, said bowl having a floor raised at the center on said axis and descending radially outward from said axis, and an annular ledge concentric with said axis and positioned above said floor; a stationary substantially vertical wall structure surrounding said ledge; a stationary ramp mounted within said bowl near the radially outer boundary of said bowl and having a lower ramp end for scooping up caps from said bowl and having an upper ramp end positioned alongside said ledge for depositing caps on said ledge for transport circumferentially about said axis with bowl rotation; said stationary wall structure being disposed for retaining said caps on said ledge in the presence of centrifugal force; first means disposed adjacent said ledge circumferentially downstream from said upper ramp end of said ramp for establishing a single level single file array of said caps around and on said ledge by returning to said bowl those caps on said ledge in excess of said single level single file array, said array consisting of caps with arbitrary orientation with regard to side up and side down; side stationary wall structure including circumferentially downstream of said first means an exit opening adjacent said ledge through which caps on said ledge reaching said exit opening are discharged; and second means mounted over said ledge between said first means and said exit opening for removing from said ledge and returning to said bowl any cap that is oriented crown side up, said second means including a portion of said stationary wall structure positioned to constrict the pathway immediately above said ledge so that caps passing said second means wall portion will be caused to overhang said ledge above said bowl, an air nozzle positioned above said ledge radially inward from said pathway constricting wall portion oriented to direct an air jet angled downward and radially outward toward both said ledge and said stationary wall structure, and means for feeding said nozzle with an adjustable air supply to produce an air jet whereby crown side up caps passing said second means blown off said ledge back into said bowl while the skirts of cavity side up caps are encountered by said air jet for urging said caps radially outward against said stationary wall structure to keep said cavity up caps on said ledge.

4,709,799
ARRANGEMENT FOR ORIENTING ARTICLES ON A CONVEYOR
Per-Allan Ljungberg, Lund, Sweden, assignor to Tetra Pak International AB, Lund, Sweden
Filed May 1, 1985, Ser. No. 729,204
Claims priority, application Sweden, May 8, 1984, 8402464
Int. Cl.⁴ B65G 47/24

U.S. Cl. 198—412

8 Claims

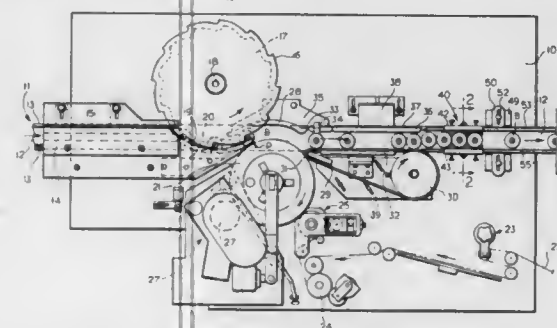


7. Conveyor apparatus for orienting objects on the conveyor while the conveyor is moving, comprising an endless conveyor element bendable laterally and vertically; guide means for guiding said element along a first path part, a second path part and a third path part with said first, second and third path parts being arranged to move at the same speed and substantially in the same direction; said first path part being substantially straight, said second path part having an upwardly inclined section and a raised section and a laterally progressive section and a straight section in sequence, and said third path part being parallel with said first path part and situated along one side thereof, said first path part being side by side with said second path part along said inclined section and vertically below said second path part along said straight section, said first and second path parts cooperating so that an incoming object on the first path part projects over onto the second path part, said second path part, because of its changing position relative to the first path part along said path, progressively orienting an object on the conveyor element and urging the object onto said third path part as said object moves along the conveyor.

4,709,800
BOTTLE CONVEYOR WITH BRUSH SPACER
Robert F. Olsen, Toledo, Ohio, assignor to Owens-Illinois Glass Container Inc., Toledo, Ohio
Filed Apr. 28, 1986, Ser. No. 856,564
Int. Cl.⁴ B65G 47/26

U.S. Cl. 198—459

4 Claims



1. Apparatus for handling bottles that are exiting from a label applying machine in an upright attitude on a moving conveyor with means for spacing the bottles at evenly spaced intervals on said conveyor, said spacing means comprising a pair of opposed bottle engaging brushes extending along both sides of said conveyor at a height and relative spacing so as to engage opposite side walls of the bottles, said brushes exerting a holding force on said bottles that is greater than the frictional engagement of the bottles with the moving conveyor, and means for pushing bottles in bottle-to-bottle contact through the zone of engagement of said brushes with said bottles whereby the brushes slow the forward movement of the bot-

ties so that all the bottles engaging the brushes are in surface to surface contact with adjacent bottles; and as soon as the foremost brush engaging bottle leaves the brush engaging area, the conveyor will speed up that bottle, thus creating spacing of the bottle from the next foremost bottle.

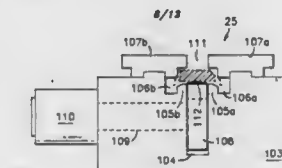
4,709,801
INPUT BUFFER AND ARTICLE INJECTOR MECHANISM FOR AN AUTOMATED ARTICLE HANDLER

Mavin C. Swapp, and Milo W. Frisbie, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 815,853, Jan. 3, 1986, abandoned. This application May 22, 1987, Ser. No. 53,528

Int. Cl.⁴ B65G 37/00

U.S. Cl. 198—464.2

5 Claims



2. An apparatus for use in handling a plurality of integrated circuits, said integrated circuits each comprising a body and leads extending from said body, said apparatus comprising: guide means for guiding a plurality of said integrated circuits from an input end to an output end thereof, said guide means contacting a base of said integrated circuits; alignment means for aligning said integrated circuits such that said guide means and said alignment means do not come in contact with said leads of said integrated circuits; motive means for moving said integrated circuits along said guide means from said input end to said output end; injector means for removing one of said plurality of integrated circuits from said output end; first sensing means for sensing when said integrated circuit is in a position between said guide means and a plurality of work areas; control means for controlling said injector means such that when an empty one of said plurality of work areas is positioned for receiving said integrated circuit, said control means will operate said injector means to inject said integrated circuit into said empty work area; and second sensing means for sensing when said integrated circuit is in said work area.

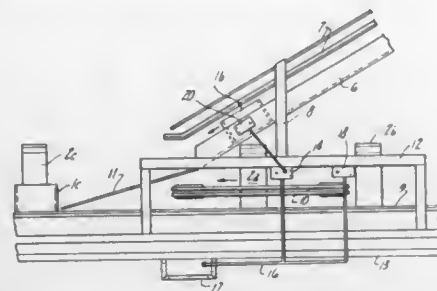
4,709,802
MASS PRODUCT HANDLING RING SYSTEM
Stephen H. Green; Robert W. Hofstetter, Sr. and Robert W. Hofstetter, Jr., all of Clio, Mich., assignors to I&H Conveying & Machine Company, Clio, Mich.
Filed Jan. 25, 1984, Ser. No. 573,629
Int. Cl.⁴ B65G 37/00

U.S. Cl. 198—465.1

11 Claims

8. An apparatus for mass handling of articles in a conveying line environment comprising:
(a) a ring delivery chute adjacent to an article carrying conveyor line;
(b) means for separation of said articles on said article carrying conveyor line by automatic timing circuitry;

- (c) means for sensing the presentation of said individual articles to a point adjacent to said ring delivery chute;
 (d) means for releasing a single rigid cylindrical ring from said chute to encircle said article;
 (e) means for discharging the combined article and cylindrical ring to an article processing station;



- (f) means for removing said rings from said articles;
 (g) means for discharging said articles from the conveyor environment; and
 (h) conveyor means transporting said rings to said delivery chute for reuse.

4,709,803

PREFORM TRANSFER MECHANISM

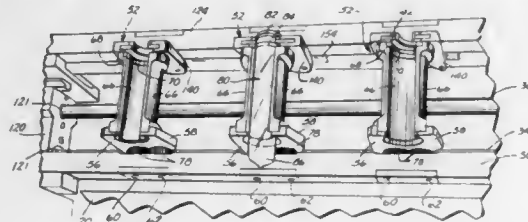
Kevin J. Swiderski, Alto, Mich., assignor to B & G Machinery Company, Grand Rapids, Mich.

Filed Feb. 12, 1986, Ser. No. 828,970

Int. Cl.⁴ B65G 47/90

U.S. Cl. 198—468.2

20 Claims



1. A preform transfer mechanism for receiving preforms, transferring the preforms to a blow mold station and for removing the formed product from the mold station, said mechanism comprising:

- a support frame including a guide rod;
- a slide block slidably mounted on said guide rod of said support frame;
- an elongated transfer bar fixed to said slide block for reciprocating movement therewith;
- a plurality of jaw assemblies on said elongated transfer bar for gripping the preforms;
- jaw actuating means connected to said jaw assemblies for opening and closing said jaw assemblies;
- preform receiving means on said support frame for receiving preforms from an oven or the like and holding the preforms in a fixed position relative to said slide block until such are engaged by said jaw assemblies; and
- drive means operatively connected to said transfer bar for reciprocating said slide block and said bar on said support frame, said preform receiving means comprising:
- an elongated support bar fixedly mounted on said support frame in spaced, parallel relationship to said guide rod;
- a plurality of basket sets on said support bar, each basket set including a pair of curved, partially cylindrical basket halves and arm means for pivotally supporting said halves to said support bar; and
- basket actuating means operatively connected to said arm means for moving said basket halves from an open position to a closed position at which the basket halves encircle and support a preform.

tion to a closed position at which the basket halves encircle and support a preform.

4,709,804

SELF-CLEANING TRASH RACK

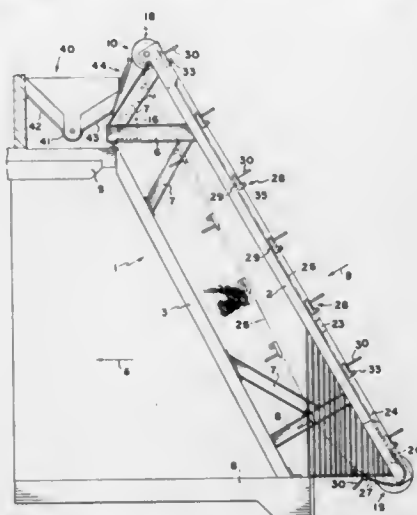
Terry L. Duperon, Saginaw, Mich., assignor to Duperon Corporation, Saginaw, Mich.

Filed Oct. 7, 1985, Ser. No. 785,560

Int. Cl.⁴ B65G 19/00

U.S. Cl. 198—719

16 Claims



1. A self-cleaning trash rack comprising an upstanding frame inclined to the vertical; an upper turning drum rotatably mounted on said frame adjacent its upper end; a lower turning drum mounted on said frame adjacent its lower end; drive means coupled to said upper drum for rotating the latter; a plurality of endless, transversely spaced, flexible strands trained around and spanning said drums and forming substantially coplanar upwardly and downwardly movable runs, each of said strands being of such length as to provide slack in the downwardly movable run; non-slip driving means drivingly coupling each of said strands and said upper drum for driving upwardly each of said upwardly movable runs, each of said strands being in non-driving engagement with said lower drum; a plurality of trash supports secured to each of said strands at spaced apart intervals for movement with the associated strand and in such position as to engage trash; a pair of guide rails for each of said strands carried by said frame, the guide rails of each pair thereof straddling the associated strand for guiding the upwardly movable run of said strand and the trash supports secured thereto; and means carried by each of said trash supports for slideable engagement with the associated guide rails to support the upwardly movable run of the associated strand and form a fulcrum overlying said upwardly movable run and about which said trash support may rock, the non-driving engagement between said strands and said lower drum and said slack enabling a trash support on the upwardly movable run to rock about said fulcrum through an arc sufficient to permit such trash support to pass by such object in response to the imposition by an object of predetermined resistance to upward movement of such trash support.

4,709,805

DRIVE/FRAME ASSEMBLY FOR RECIPROCATING FLOOR CONVEYOR

Raymond K. Foster, P.O. Box 1, Madras, Ore. 97741
 Continuation-in-part of Ser. No. 477,767, Mar. 22, 1983. This application Dec. 11, 1984, Ser. No. 680,370

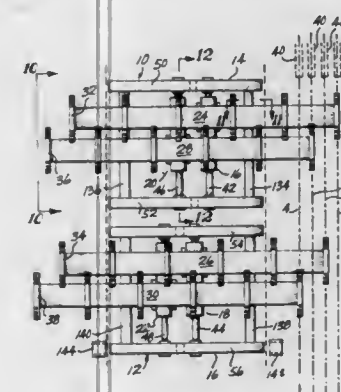
Int. Cl.⁴ B65G 25/00

U.S. Cl. 198—750

13 Claims

1. For use in a reciprocating floor conveyor of a type comprising at least four sets of floor slat members which are mounted adjacent to each other for longitudinal reciprocation, a first hydraulic drive assembly for simultaneously moving the first and third sets of floor slat members in one direction, for advancing a load, and for sequentially retracting the first and third sets of floor slat members in the opposite direction, and a second hydraulic drive assembly for simultaneously moving the second and fourth sets of floor slat members in one direction, for advancing the load, and for sequentially retracting the second and fourth sets of floor slat members in the opposite direction, said second hydraulic drive assembly being positioned endwise of the first hydraulic drive assembly, in the direction of floor slat member movement, and each said hydraulic drive assembly comprising:

a frame comprising a pair of spaced apart transverse frame members;



a pair of reversible linear hydraulic drive units, each drive unit comprising an elongated piston rod having two opposite end mounting portions, a piston portion fixed on a mid part of the piston rod, and a cylinder body mounted to reciprocate back and forth on said piston rod, said cylinder body and said piston portion together defining two variable volume chambers, one outwardly from each end of the piston portion;

means securing the opposite end mounting portions of said piston rods to mid portions of the transverse frame members;

means for connecting each cylinder body to a separate set of floor slat members; and

wherein the division of the drive units between two separate frames enables the placement of the drive assemblies in a relatively narrow space.

4,709,806

FOLDING BELT SYSTEM AND SAID BELT

Richard D. Candle, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

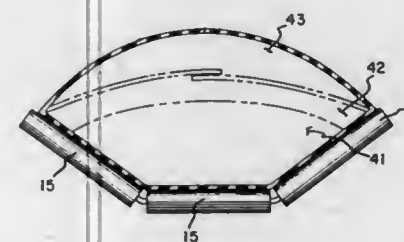
Continuation of Ser. No. 630,786, Jul. 13, 1984. This application

May 7, 1986, Ser. No. 860,409

Int. Cl.⁴ B65G 15/08

U.S. Cl. 198—819

11 Claims



1. A conveying apparatus with a load carrying portion and a return portion for continuously carrying and unloading a

load comprising: an endless driven conveyor belt having a tail terminal at one end and a head terminal at the other end thereof around which said belt passes, said endless conveyor belt being foldable about laterally spaced longitudinal fold axes thereby forming an integral flap laterally outward of said axes on each side of said belt, said pair of integral flaps being adapted to increase the load carrying capacity of the belt and to prevent spillage of said load by closing said integral flaps over said load on the load carrying portion of said conveying apparatus; a means for driving said endless conveyor belt; support rolls positioned at intervals between said tail terminal and said head terminal; means for loading said belt; and a means for unloading said belt, said means for unloading said belt being positioned near the head terminal, said means for loading being positioned near the tail terminal, said tail terminal having a width essentially equal to that of the belt between the laterally spaced longitudinal fold axes, said belt running substantially closed and flattened around said tail terminal with a loading chute for placing said load on said belt at a position near the tail terminal medially of the belt and interposed between said longitudinal sides of said belt to partially open said belt a limited distance as said belt moves past said chute, said belt running closed and flattened along a substantial portion of the return run portion of said belt thereby minimizing spillage along said return portion of said conveying apparatus.

4,709,807

LINK CONVEYOR WITH INSERTED RODS

Nicolaas J. Poerink, Prins Bernardlaan 25, NL-7620 AA Borne, Netherlands

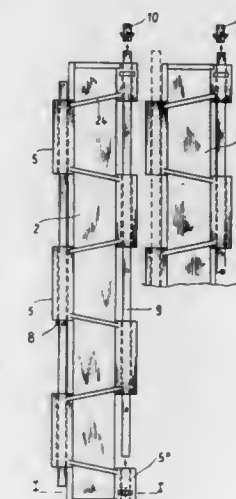
Continuation of Ser. No. 549,757, Nov. 8, 1983, abandoned. This application Sep. 5, 1986, Ser. No. 904,758

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241632

Int. Cl.⁴ B65G 17/06

U.S. Cl. 198—853

1 Claim



1. A conveyor belt comprising:

- a plurality of link members including plural spaced-apart sleeve-like ears each of which defines an opening, said ears of one said link member being interdigitated with said ears of an adjoining said link member such that said openings of said interdigitated link members are axially aligned with one another;
- rod means inserted into said aligned openings of said one and adjoining link members for coupling said one and adjoining link members to one another to permit relative articulation between said one and adjoining link members about an axis established by said rod means, said rod means having opposing terminal ends each located within a respective opening of a lateral-most one of said ears to thereby define a space within said opening between said

terminal end and an exterior side of said lateral-most one of said ears; and

plural locking means each inserted within a respective said defined space for axially locking said rod means within said aligned openings, each said locking means including a resiliently compressible peg having opposing base ends and a circumferential surface sized and configured to be accepted within said defined space, and a recessed surface radially extending from said defined space relative to said axis, wherein

said peg includes (a) means defining a locking surface resiliently compressible upon insertion into said defined space radially projecting from said circumferential surface of said peg relative to said axis for interlocking engagement with said recessed surface, the resiliency of said means defining said locking surface enabling the same to resume an uncompressed state when adjacent said recessed surface so as to provide said interlocking engagement, (b) means defining a wedge surface outwardly inclined from said circumferential surface and terminating at said locking surface for effecting wedged interengagement with said defined space, and (c) means defining an axial slit to establish a pair of resilient tongues, each said tongue including said locking surface and said wedge surface, said slit extending to a base end of said peg which is in confronting relation to a respective terminal end of said rod means, each said terminal end of said rod means defining a tapered surface, said base end of each said peg in confronting relationship to said respective terminal end defining a socket for accepting said tapered surface, said socket and terminal ends together establishing means for outwardly expanding said resilient tongues in response to axial displacement of said rod means toward said peg, wherein,

said means defining said locking surface and said wedge surfaces together lock said peg within said space, without permanently deforming the wall defining said space, which, in turn, axially locks said rod means within said aligned openings.

4,709,808

DEGRADABLE POLYMER COMPOSITION AND ARTICLES PREPARED FROM SAME

Dennis C. Balduff, Toledo, and Saleh A. Jabarin, Holland, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 856,638, Apr. 25, 1986, abandoned, which is a continuation of Ser. No. 726,487, Apr. 24, 1985, abandoned, which is a continuation of Ser. No. 524,279, Aug. 18, 1983, abandoned. This application Oct. 17, 1986, Ser. No. 920,296

Int. Cl.⁴ C08J 3/20; B65D 71/00; C08L 23/06, 23/12

U.S. Cl. 206—158 19 Claims

1. A degradable polymer composition comprising:
 - (a) an ethylene-carbon monoxide copolymer only in an amount sufficient to provide a total of substantially about 0.01 to 0.025 percent by weight of CO in the composition; and
 - (b) a high density polyethylene constituting substantially the rest of the composition.
2. A degradable polymer composition comprising:
 - (a) an ethylene-carbon monoxide copolymer only in an amount sufficient to provide a total of substantially about 0.05 to 0.25 weight percent CO in the composition; and
 - (b) a linear low density polyethylene constituting substantially the rest of the composition whereby the composition degrades in about two months or more as signified by an elongation of about 200% or less.
4. A degradable polymer composition comprising:
 - (a) an ethylene-carbon monoxide copolymer only in an amount sufficient to provide a total of substantially about 0.05 to 0.1 weight percent CO in the composition; and
 - (b) polypropylene constituting substantially the balance of the composition whereby the composition degrades in

about two months or more as signified by an elongation of about 200% or less.

4,709,809

BOTTLE CARRIER

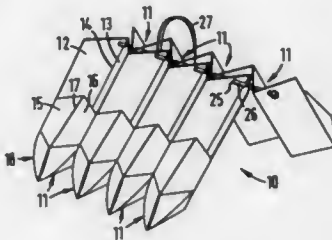
Alan C. South, Willingham, England, assignor to R. W. Simon Limited, Devon, England

Filed Aug. 22, 1986, Ser. No. 899,159

Int. Cl.⁴ B65D 5/36, 5/64, 33/06, 30/22

U.S. Cl. 206—162

9 Claims



1. A carrier (10) for a bottle comprising a container (11) having opposite facing side walls (12, 13, 15, 16) and a base portion (18) united with the side walls (12, 13, 15, 16), the base portion (18) having downwardly converging walls (23) arranged such that, when a bottle is received in the container (11), weight of the bottle causes the walls (23) of the base portion (18) to diverge one from another and the side walls (12, 13, 15, 16) to converge towards the bottle, there being a plurality of containers (11) each suspended from an elongate member (26) extending adjacent upper portions of the side walls (12, 13).

4,709,810

CONTAINER FOR AN ELECTROPHORETIC SUPPORT MEDIUM

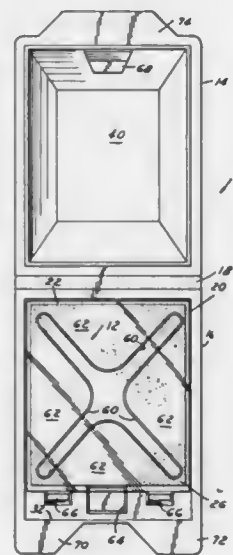
David G. Mayes, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Nov. 14, 1986, Ser. No. 930,620

Int. Cl.⁴ G01N 27/28

U.S. Cl. 206—205

18 Claims



1. A container for protecting and enclosing an electrophoretic support medium having a base sheet with at least two opposed major surfaces and a layer of an electrophoretic gel adhered to one of the major surfaces of the base sheet, comprising:
 - a top portion and a bottom portion which when closed being sealably engageable with one another;

said bottom portion having a recess therein for accommodating the support medium, at least a portion of said recess having a substantially smooth planar surface; and
a liquid being disposed between the planar surface of said bottom portion and the other surface of said base sheet, said liquid being in surface contact with the other surface of said base sheet and the planar surface of said recess, whereby the support medium may be retained in said recess as a result of the contact adhesion between the other surface of said base sheet and said liquid, and as a result of the contact adhesion between the planar surface of said recess and said liquid.

4,709,811

DEVICE FOR OPENING SEAL OF CIGARET PACKAGE AND PULLING OUT CIGARETS FROM THE PACKAGE

Katsuyuki Shimada, Takarazuka, Japan, assignor to Kinki Insatsu Kabushiki Kaisha, Osaka, Japan

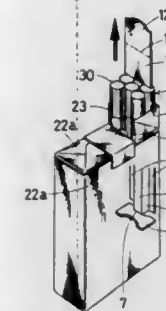
Filed Aug. 26, 1986, Ser. No. 900,632

Claims priority, application Japan, Sep. 3, 1985, 60-134907[U]

Int. Cl.⁴ B65D 85/10, 5/54, 17/34

U.S. Cl. 206—254

12 Claims



1. A device for opening the seal of and for pulling out cigarettes from a cigarette package of the type enclosed by a folded packaging sheet having score line on the top thereof, the device comprising:

- an inserting piece having upper and lower ends;
- a cigarette base end contacting piece for contacting the bases of cigarettes and integrally connected at the upper end of said inserting piece;
- a package seal opening and cigarette removing tongue piece integrally connected to said cigarette base end contacting piece;
- a cigarette end supporting piece integrally connected to the lower end of said inserting piece;
- said inserting piece having a central piece substantially at a central portion thereof;
- a pair of said pieces, each one of said pair of blade pieces integrally connected to a respective side of said central piece;
- a pair of blade pieces, each one of said pair of blade pieces integrally connected to a respective side of said central piece;
- said cigarette end supporting piece being substantially centrally connected to said central piece, said cigarette end supporting piece being necked at the connection to said central piece, said cigarette end supporting piece being substantially horizontally disposed in the cigarette package when said inserting piece is substantially vertically disposed in the cigarette package;
- said central piece, said pair of side pieces, and said pair of blade pieces substantially extending the width of the cigarette package, whereby said cigarette end supporting piece supports an odd number of cigarettes greater than or equal to five, whereby the pair of side pieces and the pair of blade pieces support and urge the central piece centrally of the package, thereby ensuring that the central piece

remains centrally located and assures positive pulling out of the at least five cigarettes from the package.

4,709,812

COMPACT DISC PACKAGE AND A METHOD OF MAKING SAME

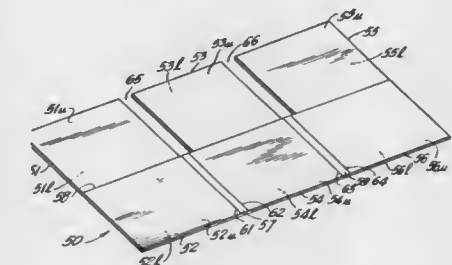
Donald W. Kosterka, Chicago, Ill., assignor to AGI Incorporated, New York, N.Y.

Filed Jul. 11, 1986, Ser. No. 884,730

Int. Cl.⁴ B65D 85/67

U.S. Cl. 206—310

22 Claims



1. A package for a compact disc comprising:

- a rectangular sheet divided into two rows of three rectangular sections, the rows being separated by a fold line, the three sections in the first row being separated from each other by strips having a width small relative to the width of the sections, the strips being bounded by fold lines, the three sections in the second row being separated from each other by slots having a width slightly greater than the width of the strips, the second row being folded along the fold line so that each of the sections of the second row partially overlies a section of the first row but does not overlie any strip adjacent that section of the first row, the overlying sections being joined together to form segments;
- at least one compact disc holder adhered to the segment at a first end of the sheet;
- the width of the sections in the first row, of the strips and of the slots being predetermined so that when the segment to which the holder has been adhered is folded along the fold lines bordering the strip at its edge and the segment at the second end of the sheet is folded along the fold lines bordering the strip at its edge, the three segments abut each other.

4,709,813

ANTI-THEFT DEVICE FOR COMPACT DISCS

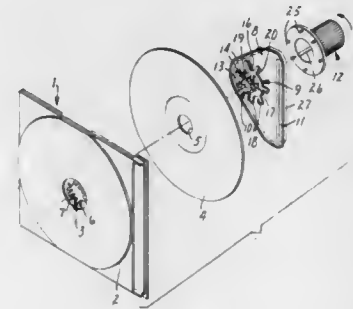
Theodor N. Wildt, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 10, 1986, Ser. No. 850,161

Int. Cl.⁴ B65D 85/57

U.S. Cl. 206—312

16 Claims



1. An anti-theft device for restricting unauthorized removal of an article, such as a recording medium, a compact disc

audio disc or the like, from a cartridge having a mounting stud engaging a central opening in the article when said article is in position in the cartridge, said device comprising a perforate plate having a plurality of holes extending therethrough, means for locking the plate to the mounting stud of said cartridge when said article is in position between said perforate plate and cartridge, and unlocking means having thereon pins for engaging said through-holes in the perforate plate from the side thereof opposite the article to actuate said locking means for releasing the plate and article from the mounting stud.

4,709,814

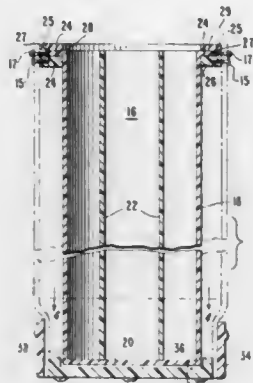
ROTATABLE CLUB HOLDER INSERT FOR A GOLF BAG
Anthony J. Antonious, 205 East Joppa Rd., Unit 1603, Towson, Md. 21204

Filed Dec. 17, 1986, Ser. No. 942,675

Int. Cl.⁴ A63B 55/00

U.S. Cl. 206—315.3

39 Claims



1. A golf bag for receiving and carrying a plurality of golf clubs, the golf bag comprising:
an elongated outer shell;
an elongated insert for receiving and holding a plurality of golf clubs, said insert being positioned within said outer shell; and
connector means for interconnecting said insert with said outer shell in a manner which permits said insert to rotate about its longitudinal axis relative to said outer shell, whereby the user of the golf bag can selectively rotate the insert so that he can easily withdraw a club from or place a club into said insert, said connector means including an annular support member included on said outer shell and an annular mounting flange included on said insert, said mounting flange cooperating with and being rotatably supported on said support member.

4,709,815

TAPE CARTRIDGE HOLDING CASE

Macy J. Price; Macy J. Price, Jr., both of Golden, and Mack E. Johnson, Littleton, all of Colo., assignors to Engineered Data Products, Inc., Broomfield, Colo.

Filed Aug. 25, 1986, Ser. No. 899,731

Int. Cl.⁴ A47B 81/00

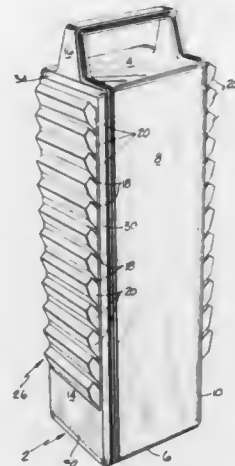
U.S. Cl. 206—387

6 Claims

1. A tape cartridge holding case for use in moving tape cartridges into and out of a storage system and for transporting tape cartridges from one location to another location comprising:

- an elongated member having a generally rectangular transverse cross-sectional configuration;
- said elongated member having at least a top wall portion, a bottom wall portion and four side wall portions all of which are integral;
- a first side wall portion having an inner surface;

a second side wall portion having an inner surface facing said inner surface of said first side wall portion;
a plurality of spaced apart ledges extending inwardly from said inner surfaces of said first side wall portion and said second side wall portion for a fixed distance and terminating in an edge;
a third side wall portion extending between said first and second side wall portions;
a fourth side wall portion extending between said first and second side wall portions;
means defining only one opening in said third side wall portion facing in one direction and means defining only one opening in said fourth side wall portion facing in a direction opposite to said one direction;



said ledges cooperating with said openings to form a plurality of shelf means so that tape cartridges may be inserted through each of said openings and be supported by opposite ledges of said first and second side wall portions;
stop means comprising central rib means integral with said first and second side wall portions, said top wall portion and said bottom wall portion and extending inwardly therefrom;
each of said ledges extending between said central rib means and said means defining said opening in said third and fourth side wall portions to form back to back compartments; and
each of said ledges forming an acute angle with said central rib means with said acute angle facing said top wall portion.

4,709,816

RECORDING DISC CARTRIDGE

Fujio Matsumoto, Ibaraki; Hajime Dol, Ibaraki; Kanio Mizushima, Ibaraki; Masaya Funahashi, Osaka; Tomizo Taniguchi, Kyoto, and Sholchi Sakamoto, Ibaraki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Mar. 11, 1986, Ser. No. 838,474

Claims priority, application Japan, Mar. 14, 1985, 60-49436; Apr. 30, 1985, 60-94084

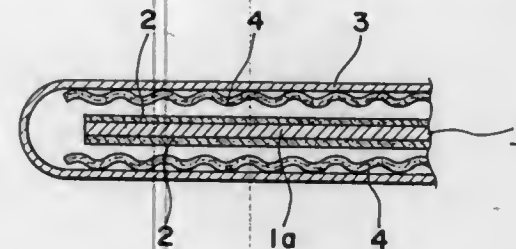
Int. Cl.⁴ G11B 5/70; B65D 85/57

U.S. Cl. 206—444

8 Claims

1. A recording disc cartridge comprising a recording disc containing, at least in its surface layer, a lubricant comprising at least one compound selected from the group consisting of an

aliphatic acid, its salt, ester and amide, a case in which the recording disc is rotatively contained, and a liner comprising at



least 30% by weight polyester fiber which is interposed between the case and the recording disc, facing the disc.

4,709,817

CONTAINER AND PROTECTIVE INSERT FOR SHOCK SENSITIVE DEVICES

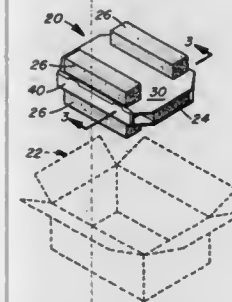
Peter Keady, Menlo Park, and Thomas P. Magennis, Fremont, both of Calif., assignors to Viking Container Company, San Jose, Calif.

Filed Feb. 10, 1986, Ser. No. 827,631

Int. Cl.⁴ B65D 85/30, 5/50

U.S. Cl. 206—523

6 Claims



6. A blank for forming a shock-resistant unit for protecting from shock an article and for insertion, with said article inside said unit, into a shipping carton, including in combination:

- a base sheet having end and side edges and a series of first, parallel score lines, parallel to said end edges, enabling folding and defining a base area between two of said score lines, a narrow connecting area between a pair of score lines, and a cover area between a pair of score lines, said narrow area lying between and immediately adjoining said base and cover areas, said base sheet having an upper surface and a lower surface,
- a first group of shock-resistant blocks secured to said upper surface in said second area and defining an article-receiving space, the thickness of said blocks being approximately equal to the width of said third area, to enable folding of said sheet so that said cover area can overlie and engage the upper surfaces of said blocks,
- a second group of shock-resistant blocks secured to said lower surface of said sheet in said base area and aligned with said article-receiving space, and
- a third group of shock-resistant blocks secured to said lower surface in said cover area and comprising a second pair of blocks and aligned so that when said cover area is folded over said first group of blocks, said third group of blocks are aligned with said article-receiving space.

4,709,818

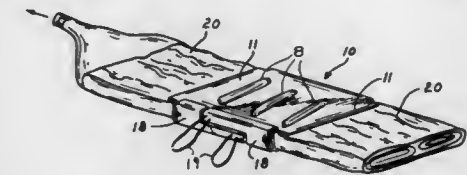
APPARATUS AND METHOD FOR COMPRESSION PACKAGING A COMPRESSIBLE ARTICLE INTO A CONTAINER AND A CONTAINER THEREFOR
Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Hauppauge, N.Y.

Filed Aug. 20, 1985, Ser. No. 767,412

Int. Cl.⁴ B64D 17/50

U.S. Cl. 206—524.8

13 Claims



1. A container for compression packaging of a compressible article comprising:

- two rigid planar rectangular sides each connected to the other at a first end for establishing a spaced-apart, parallel, and substantially coextensive relationship between said sides,
- closure means at the other end of each said side for releasably holding said sides in said established relationship against the force of said compressed article held therebetween, and
- two retaining means arranged on said sides opposite each other and extending between said ends, said retaining means having an open condition and a closed condition, said open condition permitting compression packaging of said compressible article through said retaining means and said closed condition retaining said compressible article under pressure, whereby said compressible article is packaged in said container under pressure and retained therein until released by said closure means.

4,709,819

METHOD FOR PRESERVING PLATED MEDIA AND PRODUCT

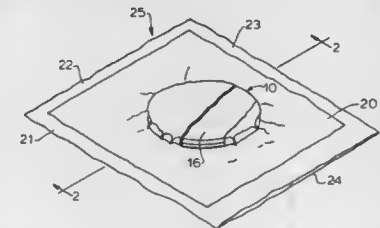
Charles P. Lattuada, Burlington, and Frank R. Gladden, Jr., Mebane, both of N.C., assignors to Environmental Diagnostics, Inc., Burlington, N.C.

Filed Jul. 23, 1986, Ser. No. 888,521

Int. Cl.⁴ B65D 85/00; B65B 55/04

U.S. Cl. 206—524.8

4 Claims



1. A vacuum packaging process for preserving a medium in the nature of biological media or gel such that the media or gel can be preserved without dehydration or deterioration and without refrigeration at ambient temperature for a prolonged time period substantially in excess of six months, said process comprising the steps:

- (a) storing the medium to be preserved in a sterile, optically clear, plastic container formed as a petri like dish with a loose fitting cover to permit air flow between the cover and dish and of sufficient strength to withstand without breakage the vacuum pressures of the process;
- (b) preparing a preformed rectangular pouch having air,

liquid, and light impervious heat sealable flexible walls with three sides sealed and one end open to receive said container and treating the interior of the pouch with a bactericidal aerosol agent admitted through said open end to sterilize the interior space and to leave interior surfaces of the pouch coated with the agent prior to receiving said container containing said medium, said agent being selected to have no deleterious effect on the said media or gel;

- (c) aseptically inserting said container into the pouch through said open end with the said open end remaining open and with said container placed so as to permit subsequent heat sealing of said open end;
- (d) placing said sterilized pouch containing said container containing said medium in a vacuum chamber having means for confining a gas introduced and retaining a reduction in pressure established therein and other means within said chamber for heat sealing said open end while maintaining a vacuum in said chamber;
- (e) sealing said chamber to provide a gas tight enclosure and reducing the pressure therein to a first level below the external atmospheric pressure;
- (f) during the presence of such reduced pressure at said first level, admitting to said chamber a gas having the characteristic of being inert to said medium;
- (g) allowing said inert gas to flow through said pouch open end into said container;
- (h) flowing said inert gas from said chamber to remove sufficient oxygen to stop oxidation activity in said biological media or gel and to remove excess said inert gas from said container interior, from said pouch and from space within the chamber surrounding said pouch;
- (i) equalizing the pressure within said pouch and within said chamber surrounding said pouch to a second level below atmospheric pressure;
- (j) heat sealing said pouch open end within said chamber during the presence of said second level of pressure; and
- (k) relieving said reduced pressure in said chamber to bring the chamber pressure to the level of atmospheric pressure and allowing said pouch walls to collapse around said container and bring the interior surfaces of said pouch sterilized and coated by said agent into intimate contact with the exterior surfaces of said container.

3. A packaged medium product made by the process of claim 1 and storable without refrigeration at ambient temperature for a prolonged time period substantially in excess of six months without dehydration or deterioration of said media or gel.

4,709,820

SHEET DISPENSING APPARATUS

Stuart M. Jenkins, Sussex; Michael S. Spencer, Portsmouth, both of England, and Ross Mayfield, Torrance, Calif., assignors to De La Rue Systems Limited, London, England
Filed Mar. 12, 1985, Ser. No. 710,964

Claims priority, application United Kingdom, Mar. 12, 1984, 8406374

Int. Cl.⁴ B07C 5/36; B65H 7/00

U.S. Cl. 209—534

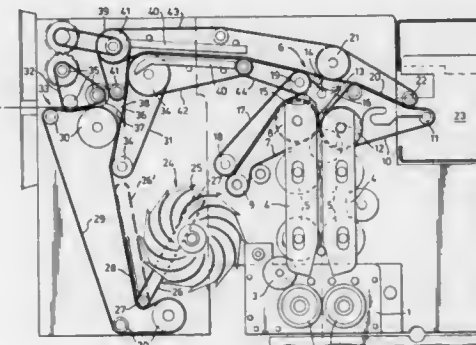
6 Claims

1. Sheet dispensing apparatus comprising:

- a dispense outlet;
- a dump;
- a first diverter;
- a second diverter;
- a first conveying means for dispensing sheets along a feed path defined by said first conveying means to said first diverter;

second conveying means for conveying sheets from said first diverter to a stacking position;
stacking means downstream of said first diverter at said stacking position for stacking sheets;
reject conveying means for conveying sheets from said first diverter along a first reject path to said dump and for

conveying stacked sheets from said second diverter along a second reject path to said dump;
detection means for detecting unsuitable sheets in accordance with predetermined criteria;
said first diverter including a movable guide cooperating with said first, second, and reject conveying means whereby in a first position said first diverter guides sheets from said feed path to said second conveying means, said first diverter being movable in response to an output signal from said detection means to a second position in which



detected unsuitable sheets are diverted along said reject conveying means via said first reject path to said dump;
third conveying means for selectively delivering said stacked sheets to said second diverter,
said second diverter downstream of said stacking means being selectively movable to cause said third conveying means to convey said stacked sheets either to said dispense outlet or to said reject conveying means which conveys said stacked sheets along a second reject path, a portion of which includes at least a portion of said first reject path, to said dump.

4,709,821

CONTAINER SHAPED IN SUCH MANNER AS TO BE UNOVERTURNABLE FOR RECEIVING A LIQUID

Michel Guiffroy, 136, rue Vulfran Warmé, 80000 Amlens, France

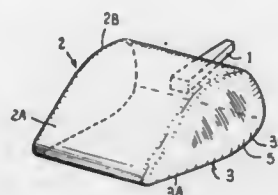
Filed Nov. 25, 1986, Ser. No. 934,876

Claims priority, application France, Nov. 26, 1985, 85 17456

Int. Cl.⁴ B65D 23/00

U.S. Cl. 215—1 R

14 Claims



1. A container adapted to receive a liquid comprising a neck, an opening in the neck for expelling the liquid, two sides each comprising a planar bearing portion and a rounded portion connected to the planar portion and to the neck, the two planar portions forming a dihedral, and rounded lateral portions interconnecting said two bearing portions.

4,709,822

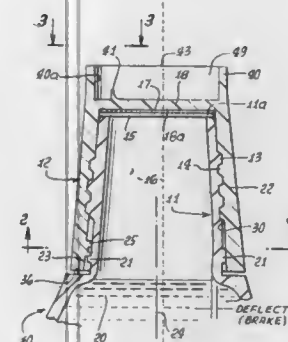
BOTTLE CAP WITH SEAL CUTTER IN TOP RECESS
Marcel Vataru, Los Angeles, Calif., assignor to Wynn Oil Company, Fullerton, Calif.

Filed Aug. 11, 1986, Ser. No. 895,205

Int. Cl.⁴ B65D 41/50

U.S. Cl. 215—216

7 Claims



1. In a child resistant upright bottle neck and cap combination, the neck having threads formed on its outer side and there being means at the uppermost end of the neck to close same, the cap having a first skirt and threading formed on the skirt at the inner side thereof to mesh with the neck threads when the cap is rotatably attached to the neck, the improvement comprising

- (a) first lug means including a first lug on the neck and protruding sidewardly outwardly thereof,
- (b) and a second lug on the cap skirt and protruding sidewardly inwardly thereof to engage and ride over said first lug during said rotatable attachment of the cap to the neck,
- (c) and a brake surface formed on the cap generally opposite said second lug and presented inwardly to engage the neck and frictionally resist cap rotation in either direction after the second lug rides over the first lug in a cap tightening direction,
- (d) the cap having an inner wall surface including a surface portion that defines said brake surface, said surface portion protruding inwardly toward a central axis defined by the cap, said surface portion smoothly merging with said inner wall surface and extending uninterruptedly over an arc of at least about 25° as measured about said central axis defined by the cap.

4,709,823

TAMPER EVIDENT BOTTLE OR PACKAGE CLOSURE

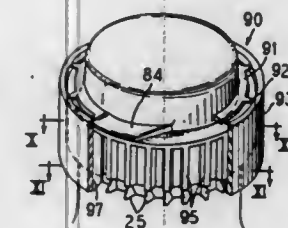
James M. Beck, 290 Iowa Ct., Carol Stream, Ill. 60188, and Robert D. Rohr, Elgin, Ill., assignors to James M. Beck

Filed Feb. 5, 1987, Ser. No. 11,111

Int. Cl.⁴ B65D 41/32

U.S. Cl. 215—235

14 Claims



1. A tamper resistant container closure assembly comprising a container having an orifice associated with a container neck, a closure cap for said orifice having top portions, means carried by the container and by the closure cap for affixing the closure cap to the container closing said orifice, an overcap

receivable over said closure cap, said overcap having a peripheral skirt for surrounding a peripheral portion of said closure cap and of said container neck, anti-rotation means carried by said skirt and by said container interacting to resist rotation of said skirt with respect to said container in at least one rotational direction, abutable, opposed surfaces on said closure cap and said overcap resisting removal of said skirt in a direction away from said container, said overcap having end portions thereof overlying top portions of said closure cap, said end portions effective to prevent said closure cap from being acted upon to open said orifice, said end portions being connected to said skirt through frangible connections whereby said end portions may be broken away from said skirt to allow said closure cap to be acted upon to open said orifice.

4,709,824

TAMPER EVIDENT PLASTIC CAPS WITH LOWER SEPARABLE OR BREAKAWAY PORTIONS AND A METHOD OF FORMING THEM

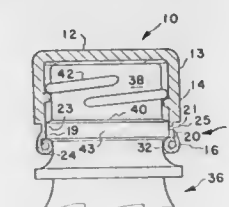
Mortimer S. Thompson, Arlington, Mass., assignor to Tri-Tech Systems International Inc., Maumee, Ohio

Filed Dec. 12, 1985, Ser. No. 809,057

Int. Cl.⁴ B65D 41/34

U.S. Cl. 215—252

41 Claims



23. A tamper evident cap for a container, comprising:
a top wall, and

a plastic skirt depending from said top wall including a line of weakness therein, and a lower resilient free end which is curved away from said skirt into a resilient curled free end of plastic forming an arc of at least 50 degrees which is prestressed for enhancing the engaging and interferring functions of said curled free end, and wherein said prestressed curled free end reduces the breadth of said skirt prior to capping and is adapted upon capping to provide an interference with a container so that upon initial removal of the cap from the container the line of weakness separates to indicate the condition of the container.

4,709,825

PRESS-ON TWIST-OFF CLOSURE FOR CONTAINER

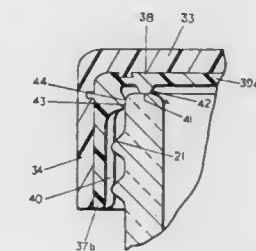
George V. Mumford, Ventura, Calif., assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Sep. 15, 1982, Ser. No. 418,366

Int. Cl.⁴ B65D 41/16

U.S. Cl. 215—318

16 Claims



1. A closure for a container, the container comprising a neck finish area with tenebrally helical threads, the closure comprising a cap having a top and a peripheral skirt of a hard, flexible

thermoplastic material, a gasket member of resilient plastic located next to the shell of the cap, the gasket member including a skirt located just inside and concentric with the shell skirt, there being a plurality of ribs in the gasket material on the inside thereof for deformation around the threads of the container when the cap is closed over the threads, the area of the ribs being less than about 10% of the circumferential area of the gasket on the skirt, there being sufficient ribs spaced apart to adequately retain the cap on the container when subject to abuses from shipping and handling, the plastic gasket material and plastic cap shell being held together by vertical interlocking spline means on the cap skirt and the gasket skirt, the spline means being so constructed and arranged that the gasket member will not rotate with respect to the shell when the closure is twisted off the container, the spline means including a plurality of spaced apart vertical splines and vertical corresponding cooperating grooves.

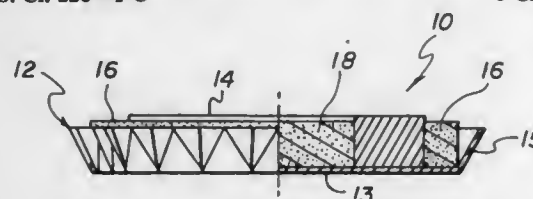
4,709,826

APPARATUS FOR THE RETENTION OF FLUID FLOWING FROM A CONTAINER

Mon N. Wong, 4132 Konya Dr., Torrance, Calif. 90503
Continuation of Ser. No. 811,766, Dec. 20, 1985, abandoned.
This application Mar. 9, 1987, Ser. No. 20,219
Int. Cl.⁴ B65D 1/34, 25/20

U.S. Cl. 220-1 C

3 Claims



1. An apparatus for retention of fluid flowing from a container mounted on a vehicle comprising:
 - an open-ended shallow pan having a center;
 - a single unitary substantially annular magnet mounted near the center of said pan and attaching said pan to said vehicle;
 - a first annular absorbent disposed in said pan within said magnet; and
 - a second annular absorbent disposed in said pan and peripherally disposed immediately adjacent to and about said magnet.

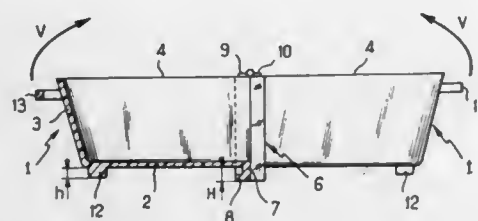
4,709,827

HOME CONTAINER

Jeannine Jalliet, and Georges Jalliet, both of 19 boulevard de Bercy, 75012 Paris, France
Filed Dec. 30, 1986, Ser. No. 947,809
Claims priority, application France, Jan. 15, 1986, 86 00495
Int. Cl.⁴ B65D 6/12

U.S. Cl. 220-4 A

9 Claims



1. A home container comprising two container elements each comprising a bottom and a side wall extending around a portion of the bottom and extending upto first and second ends on either side of a bottom division edge which does not include

a side wall, hinged connection means interconnecting the two container elements about a hinge axis adjacent to a top edges of the ends of the side wall on either side of the bottom division edge, and retaining means for holding the bottom division edges of the associated container elements against each other, the container including bag-fastening means adjacent to the ends of the side walls of the container elements.

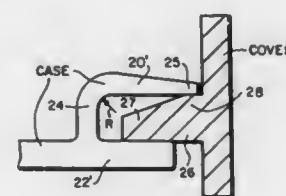
4,709,828

TWO-PART TRANSFORMER CASTING HAVING LIQUID-TIGHT SEAL

Frank J. Zoladz, Morristown, Tenn., assignor to North American Phillips Consumer Electronics Corp., Knoxville, Tenn.
Continuation of Ser. No. 746,488, Jun. 19, 1985. This application Mar. 18, 1986, Ser. No. 842,055
Int. Cl.⁴ B65D 6/34

U.S. Cl. 220-76

9 Claims



1. A transformer casing comprising:
 - a first part having a rigid first member, and a flexible member extending in a direction substantially parallel to said rigid first member at a predetermined distance therefrom and connected to said rigid first member at a first extremity thereof, said rigid first member and said flexible member together forming a channel;
 - a second part having a rigid projecting member adapted to be inserted into said channel, said rigid projecting member having a first portion clearing said flexible member and having a wedge-shaped cross section, said projecting member further having a first surface for contacting said rigid first member to form a liquid-tight seal; and
 - wherein said first part of said casing and said second part of said casing together constitute a housing containing hot potting compound.

4,709,829

SAN-I-CAN (A BEVERAGE CONTAINER INCORPORATING ITS OWN STRAW)

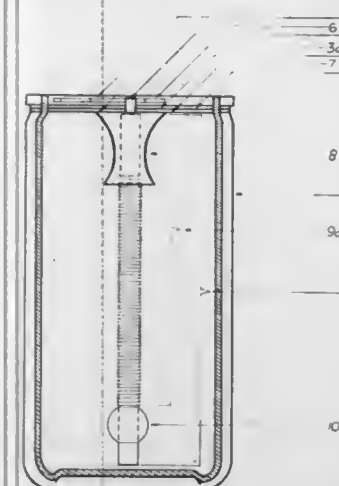
Lee R. Johnson, and Lee K. Johnson, both of P.O. Box 415, Avon, Mont. 59713
Filed Sep. 2, 1986, Ser. No. 902,949
Int. Cl.⁴ A47G 19/22

U.S. Cl. 220-90.2

1 Claim

1. A straw assembly device adapted for suitably optimal beverage consumption within a liquid container of the type having a top surface wall with a pull-tab closure over an opening therein, a hollow shaped containing body, and a bottom surface wall, said assembly device comprising in combination:
 - (a) a flexible, extendible corrugated drinking straw with a buoyant air chamber mounted near its bottom portion,
 - (b) means for allowing variable positioning of said straw within the confines of said beverage container consisting of an orifice, attached to or integrally a part of the underside of said top surface wall of said beverage container in alignment with said opening, comprising a sufficiently constructed shape to slidably receive a straw said orifice being wider at its top, narrow near its midpoint, and bell-shaped near its bottom, while possessing a circular cross-sectional diameter at any given longitudinal point that a plane may be passed perpendicular to its vertical axis whereby

said straw, once said beverage container has been opened and said straw manually extended, may be axially moved toward any convenient locality within the confines of said beverage container,



- (c) means to consume the optimal amount of liquid within said beverage container comprising said axial movement of said manually extended straw slidably received by said orifice while said beverage container is in open position whereby said straw may be so placed to consume the utmost amount of liquid within said beverage container.

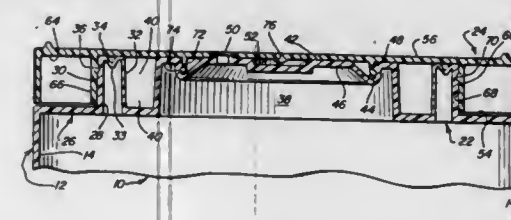
4,709,830

CLOSURE WITH TOP CUT TAMPER EVIDENT FEATURE FOR WIDE MOUTH CONTAINER

Walter J. Kreiseder, Barrington, Ill., assignor to Courtesy Mold & Tool Corporation, Wheeling, Ill.
Filed Apr. 16, 1987, Ser. No. 39,151
Int. Cl.⁴ B65D 51/22

U.S. Cl. 220-258

14 Claims



1. A closure for a container having a body with a top end, the closure comprising:
 - a stationary endcap integrally joined to and integrally closing said top end, said endcap and top end being joined by a raised annular rib, said rib having a weakened portion; an overcap attached to and covering said endcap and being coaxially rotatable thereabout; and
 - a knife blade secured to and depending from said overcap and arranged to engage and circumscribe said weakened portion as said overcap is rotated about said endcap to sever said endcap from said container.

4,709,831

THREADED END ENCLOSURE

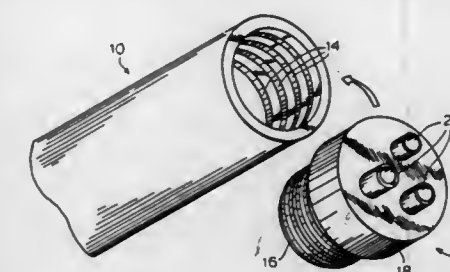
Myron J. Coplan, Natick, Mass., assignor to Albany International Corporation, Menands, N.Y.
Continuation-in-part of Ser. No. 807,256, Dec. 10, 1985, abandoned. This application Feb. 18, 1986, Ser. No. 830,622
Int. Cl.⁴ B65D 53/00

U.S. Cl. 220-304

5 Claims

1. A pressure shell for housing a membrane separatory system, the pressure shell comprising a hollow body which is

generally cylindrical in shape and has threads on at least one end thereof: a first threaded end plug adapted to engage the threaded interior of the hollow body, and at least one aperture in the first end plug for allowing fluid communication between



the interior of the pressure shell and the outside environment and comprising a second threaded end plug and wherein the hollow body is threaded at both ends and wherein said hollow body has an external diameter in the area of the threads which is greater than its external diameter elsewhere.

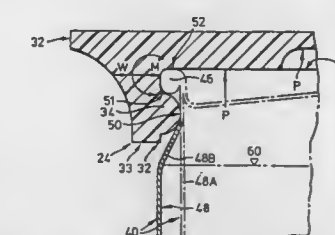
4,709,832

FLEXIBLE CLOSURE FOR RESEALING CONTAINERS

Jim Mantyla, 12 Westhill Road, Guelph, Ontario, N1H 7T6, Canada
Filed Jul. 7, 1986, Ser. No. 882,559
Claims priority, application Canada, Nov. 12, 1985, 494996
Int. Cl.⁴ B65D 41/16, 41/18

U.S. Cl. 220-306

12 Claims



1. A flexible closure for sealing a container of carbonated fluid having a circular top, said circular top having an opening, a vertically extending rim, and a sidewall extending below said vertically extending rim, said flexible closure comprising:
 - a top portion deflectable away from said circular top in response to pressure from carbon dioxide gas escaping from said carbonated fluid through said opening; and
 - a rigid sealing skirt extending from said top portion for receiving said circular top in sealing relationship and for sealing against said vertically extending rim and said sidewall; said sealing skirt being rigidly attached to said top portion to render the top portion and the sealing skirt substantially immovable relative to one another, the closure being sufficiently flexible to enable rotation of said sealing skirt towards said sidewall in response to deflection of said top portion outwardly, and for rotation of said sealing skirt away from said sidewall in response to deflection of said top portion inwardly.

4,709,833

ROTATIONALLY MOLDED SALVAGE DRUM AND RECESSED LID

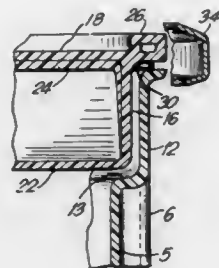
William J. Granberg, Mansfield; Richard A. Wagner, and Gary W. Handt, both of Fort Worth, all of Tex., assignors to Essex Environmental Industries, Inc., Hurst, Tex.

Filed Feb. 20, 1987, Ser. No. 17,068

Int. Cl.⁴ B65D 45/32

U.S. Cl. 220—319

18 Claims



1. In a rotationally molded polyethylene salvage drum having generally cylindrical sidewall and a lid, the improvement which comprises:

- a plurality of spaced apart vertical column ribs radially disposed from said sidewall,
 - an outwardly projecting rim at the open end of the drum, and
 - a double walled recessed lid with a circumferential reinforcing bead,
- wherein said reinforcing bead and said projecting rim are adapted to be secured by a ring clamp to seal the drum.

4,709,834

STORAGE BOX

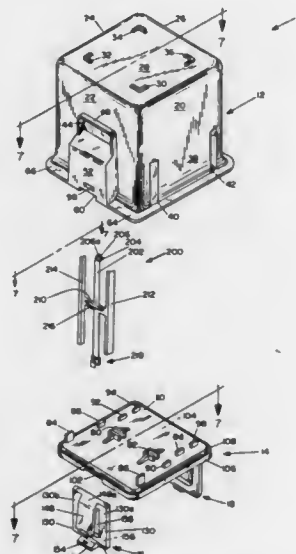
Roger Mortensen, and Barry Gregerson, both of Excelsior, Minn., assignors to Empak Inc., Chanhassen, Minn.

Filed Feb. 2, 1987, Ser. No. 9,899

Int. Cl.⁴ B65D 45/16

U.S. Cl. 220—326

4 Claims



1. Storage box for a wafer processing cassette comprising:
- a. box including four sides and a top, outboard robotic handle member positioned on opposing sides, outboard spring clip retaining means positioned on opposing sides and adjacent said box opening a perimeter flange extending

substantially about said four sides, and means for supporting a box door within said box;

- b. box door including a plurality of geometrically spaced upwardly extending means for locating said wafer processing cassette on end on an upper side of said door and two opposing detents on a lower side of said door;
- c. spring clip means including a locking retainer for engaging in said clip retaining means and a spring latch for engaging against said detents, said locking retainer means and said spring latch on opposing ends of geometrically configured member; and,
- d. wafer retainer means including a spring bar, a cross member positioned perpendicularly to said spring bar, opposed parallel vertically aligned contact bars positioned vertically and perpendicularly to the plane of said cross member, a link and wedge shaped member attached to said bottom of said spring bar whereby said spring biased wafer retainer positions against wafers in said processing cassette.

4,709,835

DISPENSER POUCH FOR BEVERAGE SYRUPS AND CONCENTRATES

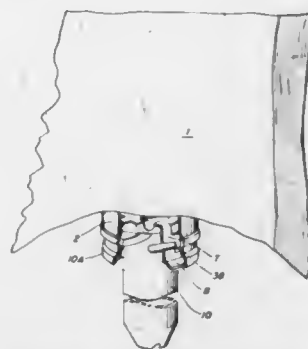
Manfred Krüger, Berlin, Fed. Rep. of Germany, and Lawrence S. Mucha, Mableton, Ga., assignors to Coca-Cola Company, Atlanta, Ga. and Bosch-Siemens Hausgerate GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 711,364, Mar. 13, 1985, Pat. No. 4,667,853. This application Nov. 13, 1985, Ser. No. 797,661

Int. Cl.⁴ B67B 7/24; B65D 35/00

U.S. Cl. 222—87

9 Claims



1. A non-reusable disposable syrup package system wherein contents of a non-reusable disposable syrup package can be dispensed in controlled volumes comprising:

- a dispensing nozzle with valve means for controlling and delivering a predetermined quantity of the contents of the syrup package;
- a collapsible bag having a discharge opening therein;
- a discharge spout secured to said discharge opening;
- a metering element disposed within said spout and having a fluid passage therethrough;
- mounting means substantially permanently attached to said spout of the syrup package;
- web means for releasably connecting said metering element to said mounting means, said web means including preset breaking points;
- connecting means for releasably coupling said metering element to said dispensing nozzle upon connecting said dispensing nozzle to the syrup package,
- said breaking points of said web means being broken, detaching said metering element from said mounting means, after said connecting means is releasably coupled to said metering element upon connecting said dispensing nozzle to the syrup package,
- said metering element being released from said connecting means of said dispensing nozzle and substantially retained within the syrup package upon removing said dispensing

nozzle from the syrup package, thereby preventing the reuse of the syrup package as a controlled volume dispensing device.

4,709,836

FLUID FLOW NOZZLE

Arve Andersen, Krokstad, Norway, assignor to Elopak A/S, Norway

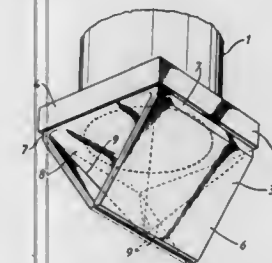
Filed Apr. 16, 1986, Ser. No. 852,533

Claims priority, application United Kingdom, Apr. 16, 1985, 8509712

Int. Cl.⁴ B65D 5/72

U.S. Cl. 222—490

10 Claims



1. A fluid flow nozzle having an inlet end region and outlet end region and comprising:

- first and second relatively rigid flaps arranged facing each other at respective first and second opposite sides of the nozzle;
- first and second relatively flexible walls arranged between the flaps and facing each other at respective third and fourth opposite sides of the nozzle and each having opposite edge zones thereof attached to respective edge zones of the respective flaps so as to form with the flaps a loop encircling the nozzle interior;
- a ring at said inlet end region and peripherally co-extensive with said loop and mounting said loop;
- said first flap being so mounted upon said ring as to turn relative to said second flap, about an axis of turning transverse to a longitudinal axis of the nozzle and substantially parallel to respective linear outer edges of the flaps, between an open position and a closed position in which closed position said outer edges come together along a linear zone at the base of an interior space bounded by said flaps and converging towards said linear zone and the walls close off said interior space at said third and fourth sides and each wall extends from said respective edge zone of the respective flap toward said longitudinal axis; and
- said first flap being biased into the closed position against the action of any fluid supplied under pressure to the nozzle.

4,709,837

FILTER ASSEMBLY FOR DRY POWDER FILLING MACHINE

George R. Erdman, Harrisonburg, Va., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 1, 1984, Ser. No. 605,745

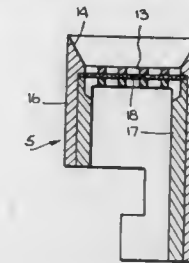
Int. Cl.⁴ A01N 17/08

U.S. Cl. 222—636

1 Claim

1. In a dry powder filling machine using a rotary wheel filling mechanism having at least one radially disposed volume adjustable cylindrical filling cavity comprising an outer shell, an inner shell and a small mesh circular screen, said outer shell consisting of a cylinder open at one end and an integrally formed recessed end plate having regularly spaced small perforations at the other end, said other end of the outer shell cylinder having an annular sloping inner wall surface that slopes inwardly from an outer edge of the other end to an inner edge of the sloping surface, said end plate being joined to the outer

shell cylinder adjacent the inner edge of the sloping surface wherein said small mesh circular screen is sandwiched between



4,709,838

MULTIPLE PURPOSE HANGER

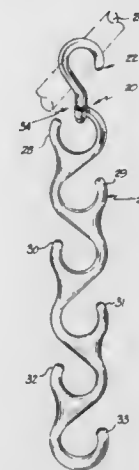
Frank P. Campbell, 11853 W. 71st Ave., Arvada, Colo. 80004

Filed Oct. 24, 1986, Ser. No. 922,723

Int. Cl.⁴ A47G 25/34

U.S. Cl. 223—85

11 Claims



1. Apparatus for hanging articles of clothing or the like in a clothes closet or the like by suspension from a hanger rod or the like comprising:

- an elongated vertically extending article hanging means having a plurality of vertically spaced oppositely facing hook means portions and being made of one piece of material for supporting the articles of clothing or the like and having a central vertical longitudinal axis;
- a support means made of one piece of material and having a hook portion for mounting on a hanger rod or the like;
- swivel connecting means having a central vertical axis of rotation which is coaxial with said central vertical longitudinal axis for rotatably connecting said elongated vertically extending article hanging means to said support means and
- each of said oppositely facing hook means portions having a central generally circular opening having a central axis of curvature and the central axes of curvature of the circular openings being transverse to said central vertical longitudinal axis and the circular openings being generally coplanar with and located substantially along said central vertical longitudinal axis.

4,709,839

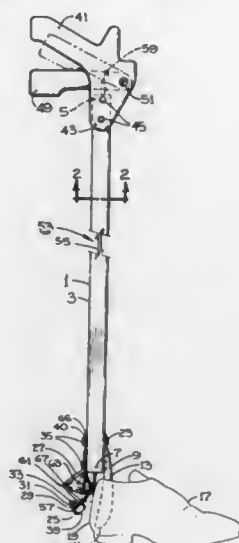
SHOE BUTLER WITH HEEL GRIPPING DEVICE

Dalton R. Tucker, San Marcos, Calif., assignor to Arcoa Industries, San Marcos, Calif.

Filed Nov. 24, 1986, Ser. No. 934,256
Int. Cl.⁴ A47G 25/82

U.S. Cl. 223—119

20 Claims



1. A shoe butler comprising:

- (a) an elongated shaft terminating at spaced apart upper and lower ends;
- (b) a shoe horn extending from said lower shaft end for insertion into a shoe adjacent an upper rear wall thereof;
- (c) a chock held apart from behind said shoe horn by a spring attached to said shaft;
- (d) means, including a handle with a finger-actuable trigger at said upper shaft end, for drawing said chock along an upwardly arcuate path into sliding contact with said shoe horn to clasp the upper rear shoe wall therebetween; and
- (e) a tongue, extending from said lower shaft end, to engage said means as said chock is drawn into contact with said shoe horn, to lock said chock thereagainst for manipulating the shoe.

4,709,840

UNIVERSAL FOLDING CARRIER

Richard A. Allen, Lewis St., Lincoln, Mass. 01773

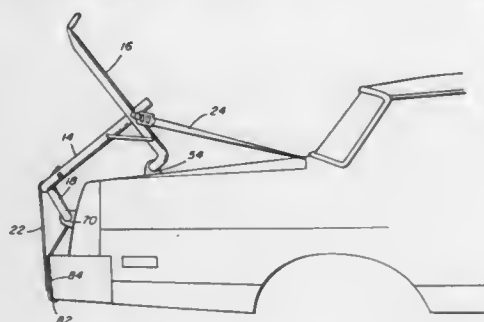
Filed Oct. 18, 1985, Ser. No. 788,749

The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.

Int. Cl.⁴ B60R 9/10

U.S. Cl. 224—314

19 Claims



1. A folding carrier mountable on a tailgate, trunk lid or the like, said carrier configured to carry objects such as bicycles and the like, said carrier comprising:

- (a) a frame;
- (b) a carrying member pivotally mounted to said frame said carrying member movable between an extended position and a collapsed position, said carrying member and said frame being in a substantially side-by-side relationship when said carrying member is in its collapsed position;
- (c) clamping means associated with said carrying member for mounting the carrier to a tailgate;
- (d) bracing means mounted to said frame and configured to engage and disengage said carrying member, said carrying member fixed in its extended position when said bracing means is in engagement with said carrying member; and
- (e) a supporting member pivotally mounted to said frame and constrained for limited rotational movement relative thereto between an extended position and a collapsed position, when said supporting member is in its extended position, a portion of said supporting member is pressed against said frame and prevents further movement of said supporting member relative to said frame said supporting member and said frame substantially in perpendicular relationship to one another when said supporting member is in its extended position, said supporting member and said frame being in a substantially side-by-side relationship when said carrying member is in its collapsed position.

4,709,841

TOOL FOR INSTALLING EXPANDABLE FASTENER

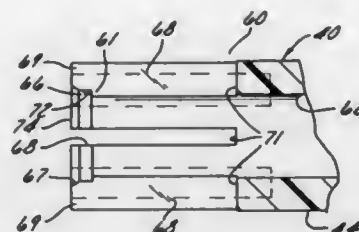
Burnell Wollar, Barrington, Ill., assignor to Phillips Plastics Corporation, Phillips, Wis.

Filed Jun. 9, 1986, Ser. No. 872,272

Int. Cl.⁴ B21J 15/00, 15/38

U.S. Cl. 227—55

13 Claims



11. As an article of manufacture for mounting on a fastener installation tool and adapted to support and align a two-piece fastener to be installed by said tool, said fastener comprising a fastener body having a head and a relatively movable fastener pin associated with said body and insertable in a body bore in said body; said article of manufacture taking the form of a sleeve made of resilient flexible plastic and having inner and outer ends and an axial sleeve bore therethrough for accommodating a pushrod on said tool;
- at least one slot extending axially inwardly from the outer end of said sleeve to enable resilient flexing of a portion of the sleeve wall adjacent said slot whereby the sleeve bore at the outer end of said sleeve defines a recess which can receive a portion of said fastener body in frictional engagement;
- and shoulder means on said sleeve near said outer end thereof and within said bore for engaging said head of said fastener body to exert axial pressure thereon.

4,709,842

TOOL FOR FASTENING AN ELONGATED OBJECT ON A SUPPORTING SURFACE BY MEANS OF U-SHAPED CLIPS

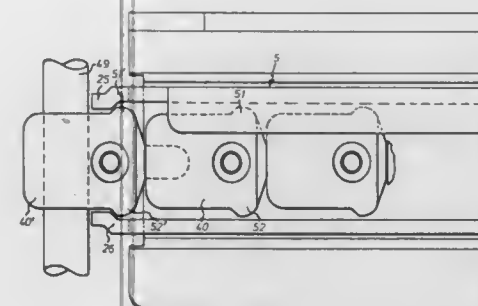
Bengt A. Westerlund, Hestra, Sweden, assignor to Isaberg AB, Hestra, Sweden

Filed Jun. 12, 1986, Ser. No. 873,378

Claims priority, application Sweden, Jun. 20, 1985, 8503074
Int. Cl.⁴ B25C 5/11, 7/00

U.S. Cl. 227—120

6 Claims



1. A fastening tool for use with U-shaped clips of a type which has a fastening member extending through a leg of the clip and drivable into a supporting surface with the clip embracing an elongate object such as a wire or cable on the supporting surface so as to fasten said object to said supporting surface and which also has a guide portion protruding laterally from at least one side of one leg of the clip, said tool including a magazine for receiving a succession of said clips carrying respective fastening members with the clips oriented such that the respective U-legs of each clip are disposed one after the other in the longitudinal direction of the magazine, feeding means for feeding the clips in the magazine successively to a predetermined mounting position at a front end of the tool, and driving means having a driver for driving the fastening member of a clip at said mounting position into said supporting surface such that that clip is secured over the elongated object and to the supporting surface with the elongated object being oriented transversely of the longitudinal direction of the magazine, said magazine having stop means including a guide member extending in a direction of stroke of said driver and disposed to arrest the foremost clip in succession in a protruding state at said mounting position such that the fastening member of that clip is aligned with said driver and to engage the laterally protruding guide portion of the clip in said mounting position.

4,709,843

SYSTEM FOR SECURING WEDGE SOCKETS

Juergen Wagenknecht, Pinneberg, and Dieter Raedisch, Hamburg, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Feb. 7, 1986, Ser. No. 827,356

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1985, 3504437

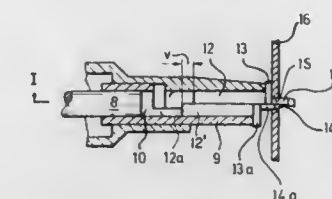
Int. Cl.⁴ B25B 31/00; B25C 1/04, 1/06

U.S. Cl. 227—156

9 Claims

1. A system for securing a mounting member having a wedging socket in a hole of a structural component, comprising a fastener having a longitudinally divided shaft having first and second shaft sections which are slidable relative to each other in the longitudinal shaft direction, each of said shaft sections having a wedging portion (14, 14a) together forming said wedging socket, said shaft sections being initially axially displaced relative to each other by a defined distance (v) in a starting position, said wedging portions (14, 14a) being correspondingly axially displaced relative to each other by said defined distance (v) so that the wedging portion of said first shaft section is fully inserted in to said hole in said starting

position while the wedging portion of said second shaft is only partially inserted into said hole in said starting position, said system further comprising power drive means for completely forcing said wedging portion of said second shaft section into said hole to wedge said wedging socket into said hole in a final wedged-in position, said power drive means comprising a housing having a grip, trigger means for releasing a drive stroke, and a holder recess means in said housing for holding



said shaft sections in said starting position, power driven driving means operatively mounted in said housing in alignment with an axial bore in said holder recess means for driving said second shaft section with its wedging portion into said hole in which said wedging socket is held in said final wedged-in position, and power supply means responsive to said trigger means for applying said drive stroke to said second shaft section, whereby said first shaft section limits the movement of said second shaft section to said defined distance (v).

4,709,844

PRESSURE WELDING BONDING APPARATUS

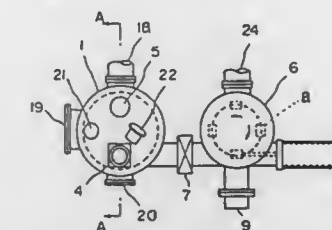
Yukio Sekiguchi, Higashimatsuyama; Hiroyasu Funakubo, Tokyo; Hitoyuki Sakanoue, and Osamu Komura, both of Itami, all of Japan, assignors to Life Technology Research Found. and Hiroyasu Funakubo & Sumitomo Elec. Ind., Ltd., both of Tokyo, Japan

Filed Mar. 13, 1986, Ser. No. 839,180

Int. Cl.⁴ B23K 20/00

U.S. Cl. 228—3.1

8 Claims



1. A bonding apparatus for bonding first and second substances to one another, said apparatus comprising: a vacuum bonding chamber in which the substances are bonded, said bonding chamber having a first stage means for releasably supporting the first substance when the substances are bonded, and a rotary table to which said first stage means is mounted;
- a vacuum preparatory chamber connected to said vacuum bonding chamber through a gate valve means and in which the substances are releasably supported;
- a conveying means for conveying the substances releasably supported in said preparatory chamber to said vacuum bonding chamber along a conveying path, said table being positionable between a predetermined position for disposing said first stage means at a first position in said conveying path and at least one other position for disposing the first stage means at a second position out of said conveying path, and said conveying means for transferring the first substance from said preparatory chamber

to said first stage means along said conveying path when said first stage means is at said first position;
 a pressing means within said vacuum bonding chamber for releasably supporting the second substance, said pressing means being disposed within said vacuum bonding chamber adjacent said first stage means in said first position; and
 means for moving said pressing means to a second substance receiving position in said conveying path when said first stage means is in said second position, said conveying means for transferring the second substance from said preparatory chamber along said conveying path to said pressing means when the pressing means is in said receiving position, and for moving said pressing means when releasably supporting the second substance toward said first stage means when said first stage means is in said first position and releasably supports the first substance to press the second substance against the first substance.

4,709,845

APPARATUS FOR CONTINUOUSLY PRODUCING STEEL PIPES INCLUDING USING ROTABLE BEDS OF TOOLS FOR DIFFERENT SIZE PIPE

Masashi Akiyama, Kobe, and Yasuo Tagashira, Miki, both of Japan, assignors to Kusakabe Electric & Machinery Co. Ltd., Japan

Continuation of Ser. No. 620,841, Jun. 15, 1984, abandoned.

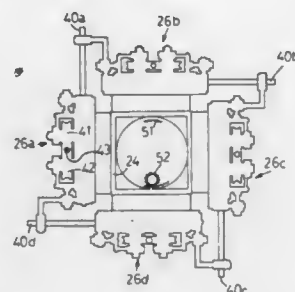
This application Jan. 13, 1987, Ser. No. 4,836

Claims priority, application Japan, Mar. 15, 1984, 59-50728

Int. Cl.⁴ B23K 31/06

U.S. Cl. 228—17

10 Claims



1. A tube-forming machine adapted for manufacture of tubing of varying sizes, comprising:

a base;

an elongated bed adapted to be pivoted about its axis of elongation with respect to said base, said bed being generally regularly polygonal in cross-section along its length so as to define a number of tool-mounting surfaces, each of said surfaces having removably mounted thereon a set of tools making up a tube-forming line for the forming of tubing;

means for controllably rotating said bed with respect to said base, between defined angular positions, such that in a given angular position the tools on one of said beds are properly aligned with means for supply of material to said tube-forming machine and with means for finishing tubes having been formed by said machine;

means for locking said bed with respect to said base except during relative rotation thereof; and

drive means for driving at least some of said tools, wherein said drive means is stationary with respect to said base and comprises a motor and coupling means, said coupling means being actuated by a hydraulic cylinder for releasable engagement of said motor and said ones of said tools, wherein said means for locking is separate from said drive means.

4,709,846

APPARATUS FOR THE CONTINUOUS HOT TINNING OF PRINTED CIRCUIT BOARDS

Kaspar Eidenberg, Barbarastrasse 18, D-5241 Gebhardshain, Fed. Rep. of Germany

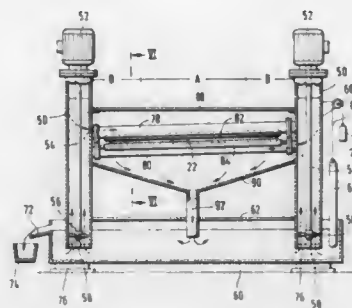
Filed Oct. 6, 1986, Ser. No. 915,741

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536304; Nov. 8, 1985, 3539585; Dec. 23, 1985, 3545933

Int. Cl.⁴ B23K 1/00

U.S. Cl. 228—34

34 Claims



1. Apparatus for the continuous hot tinning of printed circuit boards, comprising: a heating station, a fluxing station, a hot tinning station, a cleaning station and a drying station; conveyor rollers for conveying said circuit boards through the apparatus, arranged approximately horizontally above and below the path of conveying movement of said circuit boards; and, at said hot tinning station, a trough for accommodating the molten tin, heating means for heating the tin in the trough, column means at respective sides of said path of conveying movement, the column means having open lower ends which dip deeply into said trough and having upper ends disposed above the level of said path of conveying movement of said circuit boards through the apparatus, nozzles arranged above and below said path of conveying movement on both sides thereof and directed towards same to apply molten tin to circuit boards passing therebetween, means connecting the inlets of said nozzles in the plane of the path of conveying movement to the column means, and pump means for pumping tin from said trough through said column means to said nozzles.

4,709,847

DEVICE FOR ASSEMBLING ELECTRICAL COMPONENTS ON A TERMINAL CARRIER PLATE

Franz Koller, Neuried, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

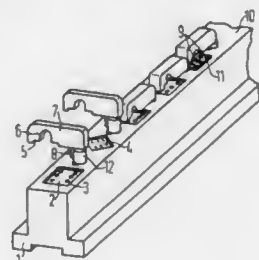
Filed Jul. 16, 1986, Ser. No. 886,587

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1985, 3526329

Int. Cl.⁴ B23K 31/02

U.S. Cl. 228—49.1

13 Claims



1. A device for mounting electrical components such as coils to terminal carrier plates, comprising:
 a longitudinally elongated base of synthetic material, the

base having a top surface in which is located a plurality of recesses, each recess being shaped to receive a terminal carrier plate; and

a like plurality of clamping means, each clamping means being associated with a corresponding one of the recesses and comprising a movable arm which is spring-biased to releasably clamp an electrical component against a terminal carrier plate located in the corresponding recess.

4,709,848

METHOD OF BONDING

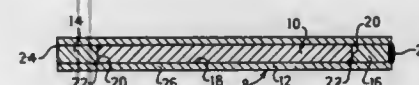
Henry A. Saller, deceased, late of Columbus (by Marjorie Saller, executrix); Edwin S. Hodge; Stanley J. Paprocki, and Russell W. Dayton, all of Columbus, Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 2, 1957, Ser. No. 687,842

Int. Cl.⁴ B23K 20/14

U.S. Cl. 228—159

4 Claims



1. A method of making a fuel-containing structure for nuclear reactors, comprising providing an assembly comprising a plurality of fuel units; each fuel unit consisting of a core plate containing thermal-neutron-fissionable material, sheets of cladding metal on its bottom and top surfaces, said cladding sheets being of greater width and length than said core plates whereby recesses are formed at the ends and sides of said core plate, and end pieces and first side pieces of cladding metal of the same thickness as the core plate positioned in said recesses, the assembly further comprising a plurality of second side pieces of cladding metal engaging the cladding sheets so as to space the fuel units from one another, and a plurality of filler plates of an acid-dissolvable nonresilient material whose melting point is above 2000° F., each filler plate being arranged between a pair of said second side pieces and the cladding plates of two adjacent fuel units, the filler plates having the same thickness as the second side pieces; the method further comprising enclosing the entire assembly in an envelope; evacuating the interior of the entire assembly through said envelope; applying inert gas under a pressure of about 10,000 psi to the outside of said envelope while at the same time heating the assembly to a temperature above the flow point of the cladding metal but below the melting point of any material of the assembly, whereby the envelope is pressed against the assembly and integral bonds are formed between plates, sheets, first side pieces, and end pieces and between the sheets and the second side pieces; slowly cooling the assembly to room temperature; removing the envelope; and dissolving the filler plates without attacking the cladding metal.

4,709,849

SOLDER PREFORM AND METHODS EMPLOYING THE SAME

Norbert J. Socolowski, Denville, N.J., assignor to Fry Metals, Inc., Providence, R.I.

Filed Nov. 27, 1985, Ser. No. 802,240

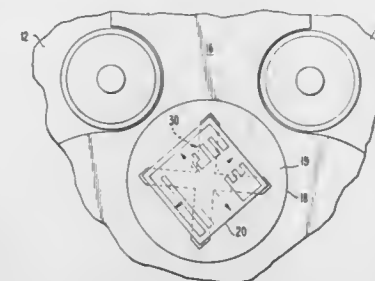
Int. Cl.⁴ B23K 35/12

U.S. Cl. 228—246

1 Claim

1. A method of soldering a substantially rectangular semiconductor die to a supporting surface, comprising providing a solder preform including a body of solder foil having four legs extending outward from a generally central base portion of the body at angles corresponding to angles between the diagonals of the semiconductor die, placing the solder preform in a desired position with its legs on the supporting surface, placing the semiconductor die on the solder preform, with

the die being positioned such that the base portion of the preform lies substantially beneath the center of the die and the legs of the preform lie beneath the diagonals of the die, the legs of the preform being of sufficient length such that with the die positioned on the preform as aforesaid they project slightly outward from respective corners of the die and thereby indicate alignment of the legs with the diagonals of the die positioned thereon.



heating the preform sufficiently to melt the solder thereof and to cause the solder to flow, solder flow between the die and the supporting surface being generally away from the base portion of the preform toward the periphery of the die, and cooling the flowed solder to solidify the same and thereby bond the die to the supporting surface.

4,709,850

MAILER INCLUDING RETURN ENVELOPE AND REMITTANCE STUB COMBINED IN OUTER ENVELOPE

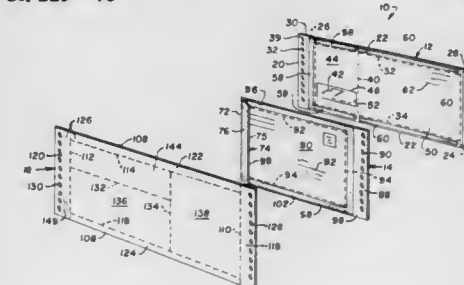
David G. Wagner, Amherst, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Mar. 20, 1986, Ser. No. 841,814

Int. Cl.⁴ B65D 27/10, 27/06, 27/34

U.S. Cl. 229—73

31 Claims



1. A mailer, comprising:
 an inner envelope defined between two superimposed generally rectangular panels of sheet material having respectively joined marginal strips extending along adjacent three edges of each, one of these two panels having a fourth edge along which that one panel is not joined to the other, so that an at least potentially open mouth is provided for said inner envelope;
 means defining a closure flap for said mouth of said inner envelope, said closure flap being foldably joined to said one panel along said fourth edge so that said closure flap may be externally overlapped with the other of said two panels;
 a strip of activatable inactivated adhesive adapted, when activated, to secure said closure flap onto said other of said two panels in externally overlapped condition therewith, thereby sealingly closing said mouth of said inner envelope;

said other of said two panels, outwardly of said mouth, including an extension panel joined thereto along a line that with said fourth edge of said one panel defines said mouth of said inner envelope; and an outer envelope defined by:

said other of said two panels, and said extension panel together constituting a first member having a perimetrical extending margin having at least two opposite edges;

a second member comprising a sheet of material having a perimetrical extending margin having at least two opposite edges; and

means severably connecting said margin of said first member along at least two of said opposite edges thereof to said margin of said second member along a corresponding at least two of said opposite edges thereof, with said second member covering at least a substantial portion of said one panel, including said mouth of said inner envelope,

so that upon severing said connecting means and thereby disconnecting said second member from said first member, said extension panel may be displaced, said strip of adhesive actuated and urged into externally overlapping condition with said other of said two panels thereby sealingly closing said mouth of said inner envelope;

said flap being foldably joined to said fourth edge of said one panel for rotation substantially 360 degrees about said fourth edge as an axis; and

said flap being doubled-back upon said one panel and releasably held there by said second member so long as said second member is severably connected marginally thereof to said first member by said severable connecting means.

4,709,851

PACKAGE FOR LOAF OF BREAD

Robert W. Vanasse, Overland Park, Kans., assignor to Interstate Brands Corporation, Kansas City, Mo.

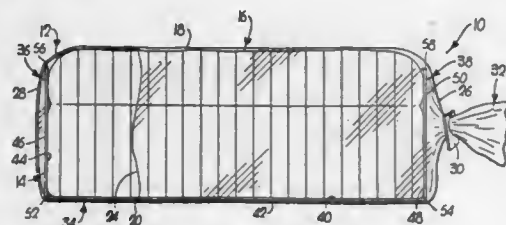
Continuation of Ser. No. 882,429, Jul. 7, 1986, abandoned, which is a continuation of Ser. No. 680,133, Dec. 10, 1984, abandoned.

This application Feb. 17, 1987, Ser. No. 15,790

Int. Cl.⁴ B65D 33/02

U.S. Cl. 229—87 B

1 Claim



1. A bread package comprising:

an elongated loaf of bread presenting a bottom surface, a pair of spaced apart upstanding heel surfaces, elongated upstanding sidewall surfaces, and an upper surface;

an elongated, U-shaped, lightweight cardboard support member for said loaf of bread, said member having an elongated bottom panel in direct contact with said bottom surface of the loaf of bread, and a pair of marginal, upstanding end flaps respectively in direct engagement with corresponding heel surfaces of the bread loaf,

there being respective transverse lines of weakness operably connecting each of said flaps to said bottom panel for swinging movement thereof with respect to the bottom panel and away from the adjacent heel surface,

each of said flaps being of a height and a width to be substantially coincident with the height and width of the corresponding adjacent heel surface; and

an elongated flexible bag completely enclosing said loaf of bread and support therefor in a closely conforming rela-

tionship about the entire outer surface presented by the bread loaf and support,

said upright end flaps, and the closely conforming portions of said bag, cooperatively serving to prevent undue compression of said bread loaf in the event that additional bread packages are placed atop said bread package,

said U-shaped support member having sufficient rigidity and structural integrity in relation to said closely conforming bag and said loaf of bread for removal of the bread loaf bodily from said bag by grasping one of said flaps and slowly pulling both the support member and the bread loaf from the bag,

the lightweight cardboard material making up said flaps, and said respective lines of weakness, imparting sufficient flexibility to said support member in relation to said closely conforming bag and said loaf of bread for removal of the support member from said bag while leaving said bread loaf within the confines of the bag, by grasping one of said flaps and quickly jerking the support from the bag, said U-shaped support member and bag being the sole support means for maintaining said loaf in its desired position within said package.

4,709,852

PRODUCE TRANSPORT AND COOLING CONTAINER AND METHOD FOR USING SAME

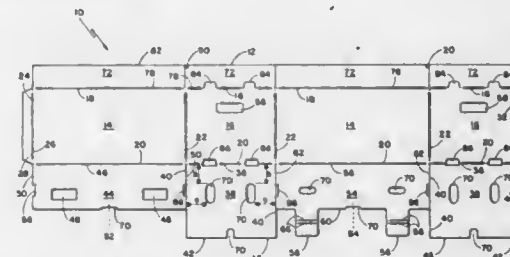
Mark S. Stoll, Deephaven, Minn., assignor to Liberty Diversified Industries, Minneapolis, Minn.

Filed Jul. 24, 1986, Ser. No. 888,719

Int. Cl.⁴ B65D 21/00, 5/36

U.S. Cl. 229—119

9 Claims



1. A produce transport and cooling container comprising: four substantially rectangular and generally vertical wall panels each having a top edge and a bottom edge, and assembled to form a generally box-shaped receptacle; and at least two bottom support panels extending generally downward from the bottom edges of two opposing said wall panels and hingedly connected thereto along score lines, said bottom support panels each having a bottom edge, one of said bottom panels defining one or more apertures extending through the surface of said panel proximate to said bottom edge of said bottom support panel, the other of said bottom support panels having the same number of retroverse tabs extending from the bottom edge of said other bottom support panel as the number of said apertures, said retroverse tabs positioned along said bottom edge of said other bottom support panel to overlap and communicate with said apertures when said bottom support panels are folded upwardly and inwardly at generally right angles along said score lines to a horizontal position between said vertical wall panels, said retroverse tabs having one or more score lines traversing said retroverse tabs adjacent to and in overlapping communication with said apertures, said retroverse tabs being insertable through said apertures and foldable over and generally parallel the planar surfaces of said bottom support panels.

4,709,853

ADJUSTABLE PLATFORM MEANS

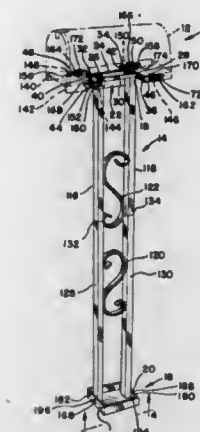
Ronald R. Hahn, Barrington, Ill., assignor to Hahn Manufacturing Co., Franklin Park, Ill.

Filed Nov. 21, 1985, Ser. No. 790,390

Int. Cl.⁴ B65D 91/00

U.S. Cl. 232—39

16 Claims



16. In combination, a rural mailbox and support comprising:

a box member;

vertical member support means for supporting said box member;

a base for mounting said vertical support means in the ground;

a pair of C-shaped base members extending laterally from said vertical support means, each of said pair of said C-shaped base members having a first and second extending arm and each of said first and second extending arms having one or more longitudinal slots and an L-shaped bracket member attached thereon and adapted for attachment to said box member; and,

each of said L-shaped bracket members having one or more longitudinal bracket slots formed therein and one or more locking tabs at the proximal and distal ends thereof for insertion into and engagement with said one or more longitudinal slots in said extending arms.

4,709,854

SYSTEM FOR REGULATING TEMPERATURE OF HOT WATER IN WALL-HUNG INSTANTANEOUS MIXED GAS HEATING UNITS

Giuliano Biagini, and Roberto Bartolozzi, both of Florence, Italy, assignors to Nuovopignone-Industrie Meccaniche e Fonderia S.p.A., Florence, Italy

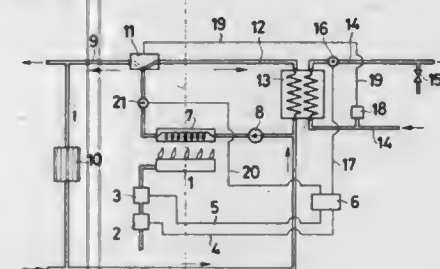
Filed May 18, 1987, Ser. No. 51,498

Claims priority, application Italy, May 23, 1986, 20544 A/86

Int. Cl.⁴ F24D 3/08

U.S. Cl. 236—20 R

2 Claims



1. System for regulating temperature of hot water in a wall-hung instantaneous mixed gas heating unit comprising a burner fired by gas through a first electrically-controlled on/off operating valve and a second gas modulating valve, also electrically controlled, said burner yielding heat, through a lamellar

heat exchanger, to the heating system water circulated by a pump in the radiator circuit or, through a three-way valve, in the primary circuit of a heat exchanger is whose secondary circuit, where the hot water circulates, is inserted a flow switch which commands said three-way valve as well as a hot water temperature sensor, characterized by the fact that the electric signal generated by this hot water temperature sensor is compared with an electric set signal entered through a potentiometer, and their error or difference signal is sent in input to an amplifier of the proportional - integrational - derivative type (P.I.D.), whose output is connected to one input of a minimum power selector, to the other input of which is sent the error or difference signal between the temperature of the heating system water detected by a second sensor in the primary circuit on output from the lamellar heat exchanger, and the maximum tolerable set temperature, the output of this minimum power selector being sent to command the second gas modulating valve through a power amplifier, and the first on/off operating valve after having been compared with an electric signal proportional to the minimum thermal power that can be supplied by the heating unit.

4,709,855

RECIRCULATING HEATING SYSTEM

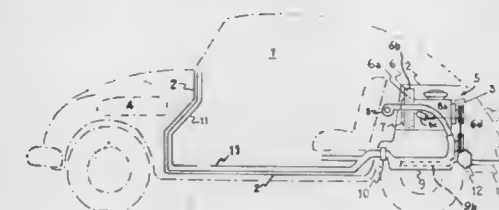
Barnett S. Brenner, 343 E. Prince Rd., Tucson, Ariz. 85705

Filed Jun. 30, 1986, Ser. No. 880,291

Int. Cl.⁴ B60H 1/02

U.S. Cl. 237—12.3 A

4 Claims



1. A motor vehicle having a rear or mid-mounted engine and a heating system comprising

an engine cooling air blower for directing cool air drawn from outside the vehicle through passages in the engine, duct or conduit means for directing said cooling air to heat exchanger means to be warmed by indirect heat exchange with hot engine exhaust gas,

means for conducting said warmed air from said exchanger means to the passenger compartment,

an air blower driven by an electric motor, preferably mounted on the vehicle's firewall, for drawing air through passageways from the passenger compartment and discharging it into channel means connected at one end to said driven air blower and at the other end to inlets of said heat exchanger means, whereby air drawn from the passenger compartment is circulated through the heat exchanger means and back to the passenger compartment as needed for providing a recirculating heated air system while not allowing infiltration of dust or pollen from outside air usually stirred up by rotating front wheels of the motor vehicle and

plug means provided at the hose connections at the exits of said channel means.

4,709,856

ELECTRICAL AND MECHANICAL COUPLING FOR MODEL RAIL SECTIONS

Helmut Röther, Wangen, and Manfred Reyher, Hattenhofen, both of Fed. Rep. of Germany, assignors to Gebr. Marklin & Cie. GmbH, Fed. Rep. of Germany

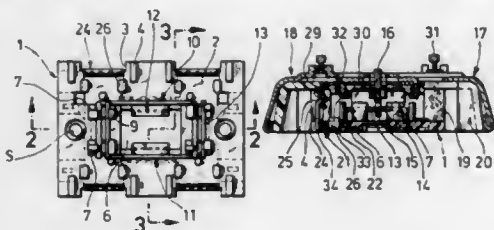
Filed Oct. 9, 1986, Ser. No. 916,832

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536631

Int. Cl.⁴ E01B 23/04, 11/54

U.S. Cl. 238—10 E

20 Claims



1. A coupling for two adjacent rail sections of a model railway comprising a bed member with rails and a conductor rail held thereon, projections in electrically conductive connection with said rail and said conductor rail, a coupling member arranged beneath said adjacent bed members and carrying at least two upwardly open locking elements that are separate from one another and consist of electrically conductive material which is elastically deformable, said projections engaging said locking elements from above, whereby each of the projections on the adjacent rail sections are mechanically and electrically connectable to one another via one locking element, characterized in that one locking element comprises upwardly protruding elastic tongues, with the projections engaging this locking element resting thereagainst, and the other said locking element comprises for each projection (15) of the two adjacent rail sections (18) two spring wires (10, 11) extending parallel to each other, whose distance apart is set by at least one spacer (7), and wherein said projection (15) is provided with a recess and is insertable between these spring wires (10, 11) in an insertion area beside the spacer (7) in which said spring-wires can be elastically bent apart.

4,709,857

VARIABLE HEIGHT FIELD SPRAYER FRAME

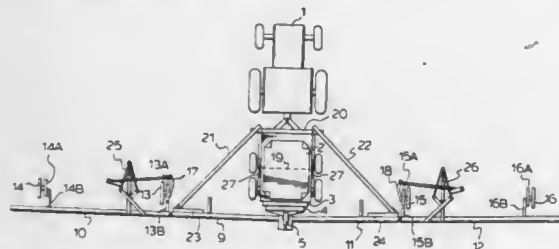
Wilfred H. Wilger, 219 Ball Crescent, Saskatoon, Saskatchewan, Canada S7K 6E1

Filed Nov. 20, 1986, Ser. No. 932,883

Int. Cl.⁴ B05B 1/20

U.S. Cl. 239—164

5 Claims



1. A frame for a field sprayer that is foldable to a narrow width transportation mode and extendable to a broad width working mode for wide swath application of spray from nozzles mounted thereon, the folding and extension of the frame being operable from a position at the controls of a motive power source serving to pull the sprayer, said frame comprising:

- (a) a vertical planar rectangular guide frame mounted rigidly at the back of said motive power source,
- (b) a moveable boom hitch bracket mounted in said guide frame and adapted to move only vertically but freely therein,
- (c) a power source adapted to move and position said boom hitch bracket in said guide frame, operable from the controls of said motive power source,
- (d) a boom hitch rigidly attached to said boom hitch bracket, adapted to move vertically with said bracket and to support and pull the inner ends of elongated boom sections of the sprayer frame,
- (e) two universal hinges mounted on said boom hitch, each adapted to pivot on a common vertical axis and each adapted to attach, through separate pivots on horizontal axes, to a respective inner end of an elongated boom section,
- (f) two elongated main boom sections, each attached by its inner end to a respective one of said universal hinges to pivot in a horizontal plane around the vertical axis of its hinge and to pivot in a vertical plane around the horizontal axis of its hinge,
- (g) two wheel mount brackets, each rigidly fastened to a respective boom section near the outer end thereof, each having a distal end section hinged thereto on a vertical axis,
- (h) two wheel support frames each associated with a respective wheel mount bracket, moveably mounted in the hinged distal end section of its respective bracket, and held in vertical relative position with reference thereto by first taut cable means having one end fastened to a fixed point by the bottom of said guide frame, said cable means passing over pulley means to extend past the associated universal hinge, along the associated boom section, wheel mount bracket, and upwardly to the associated wheel support frame to which its distal end is fastened near the top thereof, above the level of the boom section,
- (i) wheel means each with an axle in the base of a respective wheel support frame, maintaining the wheel means aligned with the support frame,
- (j) power operated wheel pivoting means pivotally connected between each wheel support frame and associated boom section and adapted to pivot the associated wheel and support frame between positions respectively parallel to and normal to the boom section on the hinge axis of the hinged distal end section of the associated wheel mount bracket,
- (k) a rigid inverted U-shaped member pivoted at its lower extremities on a horizontal axis which is positioned parallel to said planar guide frame at an elevation proximate the lowest operating level of said boom hitch and proximate the midpoint of the length of said motive power source, said member being adapted to pivot so that its upper extremity oscillates between a forward position proximate the front of said motive power source and a rearmost position approximately vertically above said boom hitch,
- (l) power means to pivot said U-shaped member between said forward and rearmost positions, and
- (m) an elongated rigid brace member associated with each said elongated boom sections, each brace member extending from a respective point of attachment of its forward end near the upper extremity of said U-shaped member to a respective point of attachment of its distal end near the outer end of its associated boom section, said forward end being longitudinally moveably attached to said U-shaped member and adapted to releasably latch relative to its point of attachment, said distal end being attached to said boom section by means adapted to permit movement of said distal end along a portion of the length of said boom section and to latch it releasably at the outermost extremity of said movement.

4,709,858

DIGITAL FLOW CONTROL SYSTEM

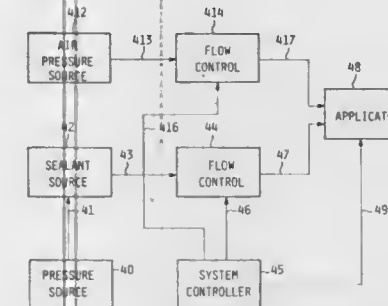
Howard Stern, Greenlawn; Alex Mauro, Wheatley Heights, and Jay Lee, Kings Park, all of N.Y., assignors to Robotic Vision System, Inc., Hauppauge, N.Y.

Filed Mar. 14, 1986, Ser. No. 840,326

Int. Cl.⁴ B05B 1/28

U.S. Cl. 239—296

1 Claim



1. An arrangement for enabling air-assisted fluid material deposition shape control, comprising: a source of fluid for deposition supplied at predetermined pressure; an inlet manifold for dividing incoming fluid into at least two paths; a restricting orifice in each said path for setting a predetermined flow rate in said path; a controllable valve in each said path for transmitting flow or blocking flow of said fluid; an outlet manifold for combining said fluid from each said path into an output conduit; applying means having a central orifice for material deposition and at least one air stream orifice located lateral to said central orifice with respect to intended direction of travel during material deposition; said applying means forming a fluid bead profile of predetermined size and shape; a source of air supplied at predetermined pressure; an inlet manifold for dividing incoming air into at least two air paths; an air restricting orifice in each said air path for setting a predetermined flow rate in said air path; a controllable valve in each said air path for transmitting flow or blocking flow of said air; and outlet manifold for combining said air from each said path into an output conduit; and a system controller for controlling the flow rate of said fluid and the flow rate of said air to said applying means, directed flow of said air controlling shape and size of said fluid bead profile emitted from said applying means, said air being emitted from said air restricting orifices in substantially concentrated streams to prevent said fluid bead from spreading more than a predetermined amount.

4,709,859

HIGH PRESSURE WASHING APPARATUS

Werner Schulze, Winnenden-Höfen, and Josef Gerich, Winnenden, both of Fed. Rep. of Germany, assignors to Alfred Kärcher GmbH & Co., Winnenden, Fed. Rep. of Germany

Filed Feb. 25, 1985, Ser. No. 705,066

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407744

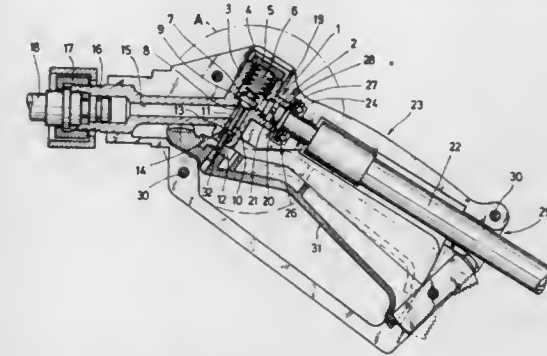
Int. Cl.⁴ B05B 9/01

U.S. Cl. 239—525

8 Claims

1. High pressure washing apparatus that can operate with hot water or steam comprising a spray handle having two mating housing sections formed of a plastic material, a central body located within the housing section having a socket and a connection for a spray tube, a shutoff valve disposed within said central body, a bearing surface formed at the interior of said housing sections, a flexible high pressure hose, a hose nipple secured on an end of the hose adjacent said spray handle and insertable into the socket, and a flange secured on said hose nipple, said housing section, when mated, replaceably capturing and

supporting said hose nipple within said socket, and containing a central body, said bearing surface and said flange, said flange being secured, in a sealed fashion, against the bearing surface and thereby blocked from pulling out of the socket, and



said bearing surface and said flange surrounding said hose nipple being rotatable with respect to one another around the longitudinal axis of the hose nipple.

4,709,860

SYSTEM FOR APPLYING PESTICIDES WITHOUT DRIFT

Keith H. Patrick, Birmingham, and Charles W. Murchison, Montgomery, both of Ala., assignors to Omni Spray, Inc., Prattville, Ala.

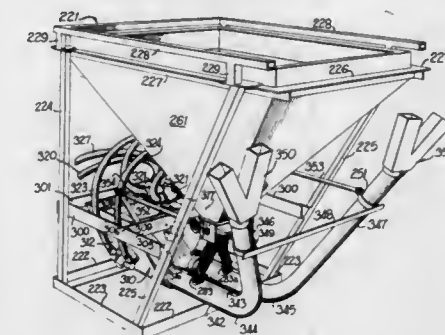
Continuation of Ser. No. 616,383, May 31, 1984, abandoned.

This application Mar. 27, 1986, Ser. No. 843,803

Int. Cl.⁴ A04C 15/04

U.S. Cl. 239—654

18 Claims



1. An apparatus for spraying particulates from a moving vehicle comprising: a hopper supportable by said vehicle for storing the particulates, said hopper having a hopper discharge opening out through which said particulates can pass, a tubular barrel supportable by said vehicle, said tubular barrel having a first barrel end and a second barrel end, an air blower means operatively connected to said first barrel end for blowing air through said barrel and out said second barrel end, a conduit means for directing said particulates into the air passing through said barrel, a metering means communicating with said hopper discharge opening and with said conduit for receiving said particulates from said discharge opening and progressively delivering metered amounts of said particulates to said conduit means, and a supporting means for supporting said barrel and providing for a swinging pendulum action of said barrel relative to

said vehicle to help maintain the orientation of the tubular barrel as said vehicle travels over uneven and sloping terrain, said supporting means including a cradle mounted for swinging action about a longitudinal axis of said vehicle, a connecting means for connecting said barrel to said cradle so that said barrel and cradle move together, and a dampening means connected to said cradle for dampening the swinging action of said cradle and barrel.

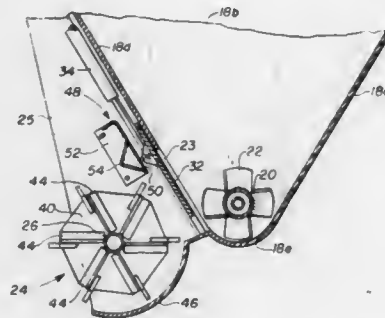
4,709,861

EXPULSED DEFLECTOR FOR MANURE SPREADERS
James S. Henderson, New Holland, Pa., assignor to New Holland Inc., New Holland, Pa.

Filed Oct. 21, 1986, Ser. No. 921,652
Int. Cl.⁴ A01C 15/16

U.S. Cl. 239—675

6 Claims



1. In a manure spreader having a tank for containing manure, an auger rotatably mounted in said tank for moving manure toward an opening formed in said tank, an expeller rotatably disposed adjacent said opening to discharge manure away from said tank, said expeller engaging manure exiting said tank through said opening on an inner side of said expeller, the improvement comprising:

deflector means located on said inner side of said expeller and cooperating with said expeller for breaking up clumps of manure after they exit said tank through said opening but before they are discharged by said expeller.

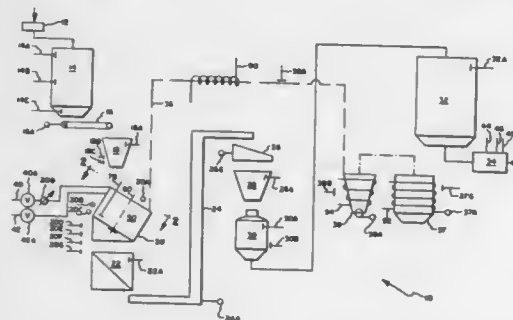
4,709,862

METHOD OF RECLAIMING GREEN SAND
Dieter S. Leidel, R.R. No. 5, Barrie, Ontario L4M 4S7, Canada
Filed Jan. 30, 1987, Ser. No. 8,748

Int. Cl.⁴ B02C 19/12

U.S. Cl. 241—23

9 Claims



1. A process for reclaiming green sand including: successively presenting portions of said sand to a reclaiming unit; sensing the initial temperature of each said portion presented to said unit; and selectively subjecting each said portion within said unit to attrition and cooling by the exhaust of air and water vapor

from said unit when said initial temperature is within the range of about 120° F. to 140° F. until the temperature of said portion is reduced to about 120° F. and said portion is free flowing, or to cooling by the addition of water when said initial temperature is above about 140° F. until the temperature of said portion is reduced to about 140° F. and to attrition and cooling by exhaust of air and water vapor from said unit until the temperature of said portion is reduced to about 120° F. and is free flowing, or to heating to raise the temperature of said portion to about 140° F. when said initial temperature is below about 120° F. and to attrition and cooling by exhaust of air and water vapor from said unit until the temperature of said portion is reduced to about 120° F. and said portion is free flowing.

4,709,863

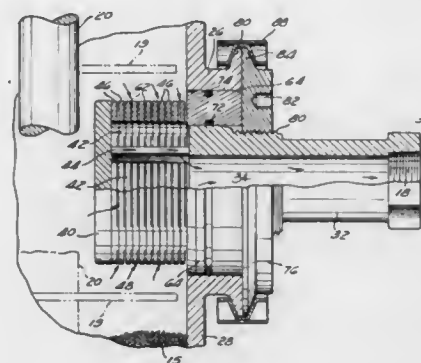
MEDIA MILL SCREEN ASSEMBLY
Edward J. Szkaradek, Santa Ana, and John J. Corrigan, Garden Grove, both of Calif., assignors to Morehouse Industries, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 784,865, Oct. 4, 1985, which is a continuation-in-part of Ser. No. 746,440, Jun. 21, 1985, Pat. No. 4,624,418, which is a continuation-in-part of Ser. No. 663,049, Oct. 19, 1984, Pat. No. 4,651,935, and a continuation-in-part of Ser. No. 627,918, Jul. 5, 1984, abandoned. This application Feb. 26, 1986, Ser. No. 833,854

Int. Cl.⁴ B02C 17/16

U.S. Cl. 241—69

11 Claims



1. A milling apparatus comprising: a vessel for receiving grinding media and a liquid having small particles therein which are to be milled or reduced in size within the vessel; a motor driven rotor in said vessel for agitating the grinding media; a liquid inlet to which said liquid is introduced as the grinding media is agitated by the rotor; a liquid outlet in said vessel; and a screen assembly at said outlet to prevent the media from passing through said outlet while permitting the liquid to pass through said outlet, said assembly including a plurality of ring-shaped screen elements arranged in a stack, each of said elements having a plurality of projections extending from one axial face of the element and a plurality of recesses extending into its other axial face, with each projection being axially aligned with a recess, with said projections and recesses having a similarly shaped cross-section, said elements being stacked so that the projections on said elements space said elements from each other to provide a gap or passage smaller than said media whereby liquid may flow through the passage but said media may not; said projections and recesses being sized so that the projections of one ring will partially nest into the recesses of an adjacent ring when said rings are rotatably oriented in one

circumferentially indexed position with the projections on the face of one ring facing the recessed face of an adjacent ring, whereby said gap is approximately equal to the height of a projection minus the portion of the projection which extends into the recess of the adjacent ring; said projections and recesses being formed so that when said rings are rotated to a second circumferentially indexed position wherein the projections of one ring extended toward the recessed face of the adjacent ring engage the face of said adjacent ring so that said gap is approximately equal to the height of one of said projections, and said rings having means for indexing the rings in said first and second positions.

4,709,865

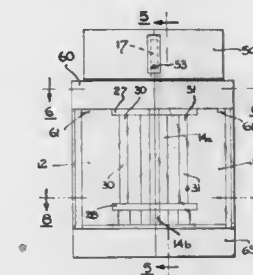
DUAL CONDIMENT MILL

William E. Bounds, 3737 W. 240th St., Torrance, Calif. 90505
Filed Dec. 30, 1982, Ser. No. 454,736

Int. Cl.⁴ B02C 25/00

U.S. Cl. 241—169.1

7 Claims



1. A dual condiment mill comprising: first and second compartments having top and bottom ends and a divider wall therebetween, each of said compartments for containing a separate condiment to be ground, a first and second grinder installed at the bottom of each compartment respectively, first and second shafts having bottom ends fixedly attached to each of said grinders and top ends respectively extending upwardly through their associated compartments, first and second gears fixedly attached to the top ends of each of said first and second shafts respectively, gear drive means pivotally supported on said mill opposite said gears, and means for use in alternatively driving the gear drive means rotatably in a first direction to engage and rotatably drive only the first of said gears, shafts and grinders or in a second direction opposite to said first direction to rotatably drive only the second of said gears, shafts and grinders.

4,709,866

THREAD GUIDING AND SCREENING ELEMENT FOR USE IN FILAMENT WINDER

Kurt Schefer, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

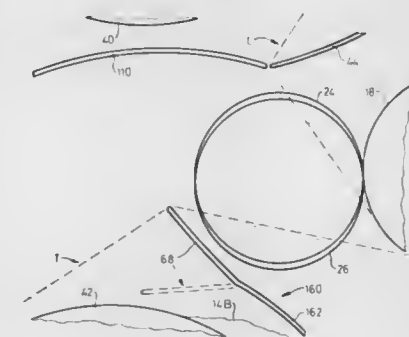
Filed Jan. 12, 1987, Ser. No. 2,164

Claims priority, application United Kingdom, Jan. 22, 1986, 8601453

Int. Cl.⁴ B65H 67/044

U.S. Cl. 242—18 A

10 Claims



1. Apparatus for simultaneously removing water from and crushing material having a high moisture content by passage between two rolls which are urged together under high pressure, said apparatus comprising screw conveyor means for simultaneously subjecting said material to mechanical precompression and forcible direct delivery between the two rolls, the fluid flow from said moisture removal being forced to the sides of said rollers and backward of the direction of material movement during crushing; means for separating the fluid pressed out of said material during crushing from the crushed material emerging from between the two rolls as a stream of particles immediately below the rolls to prevent remoistening of the particles, said separating means including blade means for separating fluid from the emerging crushed material; and wiping strips cooperating with the end and peripheral faces of said rolls for separating fluid pressed out of said material and carried along by said rolls during their rotation, said separating means including water collection and passage means for conducting the separated fluid away from said rolls.

1. A winder for thread comprising a contact member rotatable about a longitudinal axis thereof for receiving and delivering a travelling thread; a first chuck movable between a first rest position above said contact member and a winding position adjacent said

contact member to receive and wind a thread into a thread package thereon;
 a second chuck movable between a second rest position below said contact member and a winding position adjacent said contact member to receive and wind a thread into a thread package thereon; and
 a screen having an operative position between said contact member and said second chuck during movement of said second chuck to said second rest position to screen a package on said second chuck from said contact member and a package forming on said first chuck, said screen including a guide element to divert a thread extending between said contact member and a package on said second chuck towards said first chuck in said operative position.

4,709,867

METHOD AND APPARATUS FOR REELING A WEB
 Hannu U. Oinonen, Järvenpää, Finland, assignor to Oy Wartsila Oy, Finland

Filed Jul. 30, 1986, Ser. No. 890,734

Claims priority, application Finland, Aug. 6, 1985, 853019
 Int. Cl.⁴ B65H 18/20, 19/28, 19/30

U.S. Cl. 242—56 R

21 Claims



1. A method for reeling a web, comprising the steps of:
 feeding a web onto a web roll being formed while supporting the web roll being formed on first and second carrying rolls with a topside pressing roll pressing down with a pressing force on the web roll being formed;
 accelerating rotation of at least two lowering rolls situated below said web roll until said lowering rolls rotate with an appropriate surface velocity;
 upon substantial completion of said web roll, elevating said lowering rolls along respective movement paths into engagement with said completed web roll;
 interrupting the web to provide a cut-off end of the web;
 lowering said completed web roll by lowering said lowering rolls;
 at substantially the same time as said completed web roll is being lowered, inserting a new core tube in a throat defined between said first and second carrying rolls; and
 affixing the cut-off end of the web to the new core tube to initiate formation of a new web roll.

4,709,868

SETTING AND WINDING MECHANISM FOR TAPE-LIKE LAMINATE IN LAMINATOR

Tadao Kashiwaba, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Feb. 21, 1986, Ser. No. 832,041

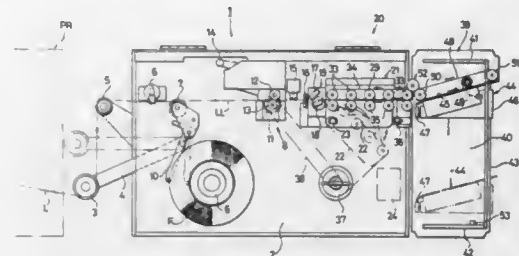
Claims priority, application Japan, Feb. 28, 1985, 60-37532
 Int. Cl.⁴ B65H 54/71; B26D 5/20

U.S. Cl. 242—56 R

3 Claims

1. A setting and winding mechanism for a tape-like laminate strip having a printed medium disposed on said strip, for use in a laminator, the setting and winding mechanism comprising:
 a feeding device for moving the tape-like laminate strip through the mechanism;
 a take-up device for receiving a leading end of the tape-like

laminate strip from the feeding device, the feeding device and take-up device being responsive to a first start signal to feed the laminate strip from the feeding device to the take-up device during a setting mode of the mechanism;
 sensing means for detecting predetermined positions on the tape-like laminate strip and for producing an output signal in response to detection of the positions;
 cutting means disposed relative to the laminate strip for cutting the laminate strip at predetermined locations thereof, in response to the output signal;
 delivery means for receiving successively cut laminate pieces from the cutting means, the delivery means and the



feeding device being responsive to a second start signal to feed the laminate strip past the cutting means and for delivering the cut pieces out of the setting and winding mechanism;
 a first start switch and a second start switch for initiating, respectively, the first and second start signals; and
 drive controlling means coupled to the feeding device, to the take-up device and to the delivery means for causing the leading end of the tape-like laminate strip to be wound on the take-up device in response to the first start signal and for causing the cutting means to produce the cut laminate pieces and the delivery means to deliver the cut pieces out of the setting and winding mechanism.

4,709,869

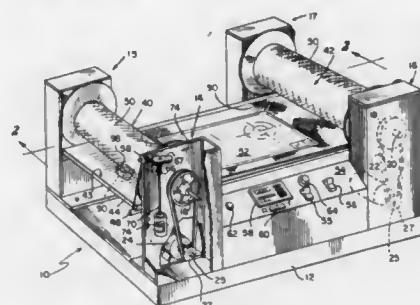
FILM STORAGE SYSTEM

Darrell E. Candler, 10651 Vandergriff Rd., Indianapolis, Ind. 46239

Filed Apr. 14, 1986, Ser. No. 851,821

Int. Cl.⁴ B65H 18/00; G09F 11/18; B65B 63/04; B42D 1/00
 U.S. Cl. 242—673 R

16 Claims



8. An apparatus for storing and retrieving sheets of film-like material, comprising
 a base having two spaced apart pairs of opposed support columns extending upwardly therefrom;
 a pair of rollers;
 the support columns including means for rotatably and removably mounting the rollers;
 a film like substrate for holding the sheets which has a portion wound on each roller when in use for storing and retrieving the sheets and having an exposed portion ex-

tending between the rollers for receiving a sheet to be stored and from which a stored sheet can be removed, a movable bed;
 suspending means for suspending the movable bed from the support columns beneath the rollers when the rollers are mounted to the support columns, the suspending means including urging means for urging portions of the bed up against the rollers;
 rotating means for rotating at least one of the rollers for winding the substrate onto one of the rollers and unwinding it from the other roller;
 counting means for counting each revolution of a counting roller and accumulating a first count, the first count, when a sheet is placed on the exposed portion of the substrate for storage, indicative of a location on the substrate on which the sheet is stored;
 retrieval means for retrieving a desired stored sheet including
 means for causing the rotating means to rotate at least one of the rollers to unwind a roll of substrate containing stored sheets from one roller and wind it onto the other roller;
 second counting means for counting each revolution of the counting roller to accumulate a second count; and
 means for comparing the first count indicative of the location of the desired sheet on the substrate with the second count and causing the rotating means to cease rotating the roller when the first and second counts match.

4,709,870

DEVICE FOR REPLACEABLY SUSPENDING THE WINDING SHAFT OF A BALE OF CLOTH

Gustav G. Veith, and Götz U. Veith, both of Frasdorf, Fed. Rep. of Germany, assignors to Gustav Georg Veith GmbH & Co., Fed. Rep. of Germany

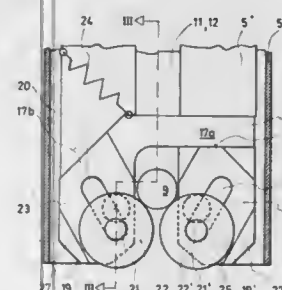
Filed Apr. 1, 1986, Ser. No. 846,965

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519591

Int. Cl.⁴ B65H 16/06

U.S. Cl. 242—68

10 Claims



1. A device for releasably suspending a winding shaft for a bale of cloth, comprising:
 at least one suspension carrier provided with a downwardly extendable member, said downwardly extendable member containing a slot having a downwardly extending opening and being dimensioned to receive said winding shaft;
 bearing means for rotatably supporting said winding shaft when it is inserted into said slot, said bearing means having first and second components arranged at opposite sides of said slot, at least one of said components being mounted for transverse movement relative to said slot from a first position to a second position such that in said first position said at least one component extends into said slot below said winding shaft when said shaft is inserted into said slot, the distance between said components then being smaller than the diameter of said winding shaft, the distance between said components being greater than said diameter in said second position;
 means for releasably locking said at least one of said components in said first position, so that said winding shaft is able to be supported by said components when said at least one

component is in said first position and to be released from said components when said at least one component is in said second position.

4,709,871

REEL RECEIVING DEVICE

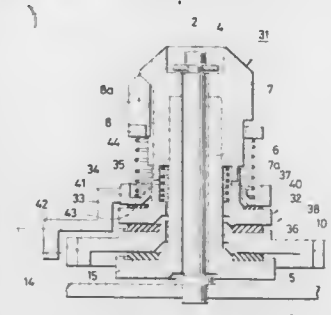
Shinsaku Tanaka, Tokyo, and Kunio Kido, Wako, both of Japan, assignors to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1986, Ser. No. 927,184

Claims priority, application Japan, Feb. 13, 1986, 61-19391[U]
 Int. Cl.⁴ B65H 20/36, 20/38

U.S. Cl. 242—68.3

3 Claims



1. A reel receiving device, comprising a reel shaft erected on a base, a reel receiving body mounted for rotation on said reel shaft and having an engaging portion adapted to engage with a tape reel, said reel receiving body further having a pair of axially opposing surfaces, a friction transmission mechanism mounted for rotation on an outer periphery of said reel receiving body for frictionally transmitting a turning force of a motor to said reel receiving body, a friction coupling member located between said pair of opposing surfaces of said reel receiving body, and a spring member interposed between said friction coupling member and one of said opposing surfaces of said reel receiving body for pressing said friction coupling member toward the other of said opposing surfaces, said friction coupling member engaging with a mechanism which operates in response to rotation or stopping of said reel receiving body.

4,709,872

WEB TENSION CONTROL AND EMERGENCY STOP SYSTEM

Josef Hammer, Asbach-Bäumenheim, and Walter Handschuh, Königsbrunn, both of Fed. Rep. of Germany, assignors to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 17,758

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608182

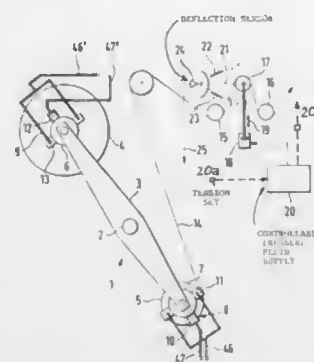
Int. Cl.⁴ B65H 26/00

U.S. Cl. 242—75.43

14 Claims

1. Web tension control and combined rapid-stop system, particularly for paper webs being delivered to a rotary web printing machine, said system having
 a roll support carrier (1, 2, 3) for supporting at least one roll (4, 5) on which the web (14) is wound;
 a first brake forming an operating brake (10) secured to the support carrier for braking the at least one roll upon unwinding thereof;
 a second brake forming a fast stop brake (11) secured to the support carrier and additionally braking the at least one roll for fast stopping condition;
 a movably journaled tension or compensating roller (17) about which the web (14), unreel from the at least one roll is looped;
 a tension sensing means (21, 24) for sensing the position of

the tension or compensating roller and for providing a tension signal;
 a computer-controller unit (28) receiving the tension signal, and
 a source of fluid pressure (29),
 and comprising
 an electrically controllable fluid pressure regulator (26) receiving pressurized fluid from said source (29) connected to and controlled by the computer-controller unit (28) and providing fluid pressure output at a regulated pressure level, as commanded by said computer-controller unit (28);
 an electrically controlled magnetic valve (36) having two pressure fluid outputs (41, 43) connected to and controlled by said computer-controller unit (28);
 means (35) for supplying pressure fluid from said fluid pressure regulator (26) to said valve (36);
 a fluid disjunctive or OR-gate valve (42) having a fluid output connection (47) connected to and controlling the operating brake (10);



an operating brake fluid connecting (41) from a first output of the electrically controllable magnetic valve (36) to a first input of the fluid disjunctive or OR-gate valve (42);
 a stop brake fluid pressure connection (43, 44, 46, 46b) from a second output of the electrically controllable magnetic valve (36) to the fast-stop brake (11); and
 a further branch connection (46a) from said second output of the electrically controlled magnetic valve (36) to a second input of the fluid disjunctive or OR-gate valve (42), to provide

(a) for normal operation, controlled fluid pressure to the operating brake (10) via the first input of the OR-gate valve (42), and
 (b) under fast-stop conditions or emergency conditions, controlled fluid pressure to the fast-stop brake (11) via the fast-stop brake fluid pressure connection and further to the operating brake (10) via said further branch connection (46, 46a) to the OR-gate valve (42).

4,709,873

DEVICE FOR POSITIONING A TAPE THREADER PIN IN A TAKE-UP REEL

David E. Smith, Lafayette; Dennis R. Olmsted, and Joseph A. Fryberger, both of Longmont, all of Colo., assignors to Aspen Peripherals, Longmont, Colo.

Filed Jun. 11, 1986, Ser. No. 872,952

Int. Cl.⁴ G11B 15/66, 23/04; G03B 1/56

U.S. Cl. 242—195

7 Claims

1. A mechanism for positioning a tape threader pin at the axis of rotation of a tape take-up reel adapted to receive said tape threader pin in association with a tape leader block, said mechanism comprising:

a plate having a receiver slot which extends from an outer edge of the plate to a point beyond the axis of rotation of the take-up reel and a biasing means housing cavity having an open region in front of the axis of rotation of the take-up reel, said biasing means housing cavity being of sufficient

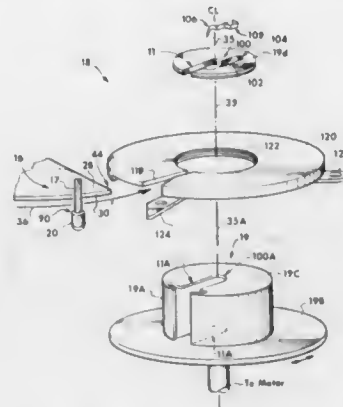
size to receive a biasing means depressed into the housing cavity by the threader pin as it enters and leaves the receiver slot; and

a biasing means having a raised region which projects from the biasing means housing cavity into the receiver slot at a position in front of the axis of rotation of the take-up reel, said biasing means further comprising means for keeping the biasing means in said housing cavity.

6. A tape take-up reel mechanism which positions a tape threader pin at the take-up reel's axis of rotation, said mechanism comprising:

a powered take-up reel having a generally cylindrical hub about which a tape is wound, said hub further comprising a hollow region which extends into the hub past the take-up reel's axis of rotation and which is of sufficient size to receive the threader pin and an associated leader block;

a first circular plate having a circular center hole and which is concentrically mounted with the take-up reel's axis of rotation and wherein the first circular plate is provided with a first receiver slot running radially from the circumference of the first circular plate to its circular center hole;



a second circular plate which fits into the center hole of the first circular plate, said second circular plate further comprising (1) a second receiver slot which is aligned with the first receiver slot of the first circular plate and which extends radially from the circumference of the second circular plate to a point beyond the axis of rotation of the take-up reel and (2) a spring housing slot which lies parallel to and partially contiguous with the second receiver slot such that an open region is created between the two slots in front of the axis of rotation of the take-up reel, and wherein said spring housing slot is also of sufficient size to receive a leaf spring when it is depressed into the spring housing slot by the threader pin as it enters and leaves the second receiver slot; and

a leaf spring having a raised center region which is biased from the spring housing slot into the second receiver slot in front of the axis of rotation of the take-up reel, and wherein said spring being is further provided with a keeper which can be wedged into said spring housing slot.

4,709,874

CLUTCH MECHANISM FOR A FISHING REEL

Hideo Murakami, Hiroshima, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed Feb. 14, 1986, Ser. No. 829,501

Claims priority, application Japan, Feb. 15, 1985, 60-21051

Int. Cl.⁴ A01K 89/02

U.S. Cl. 242—220

5 Claims

1. A clutch mechanism for a fishing reel comprising: frame means for supporting components of said reel in an operative arrangement;

a spool for storing and dispensing fishing line therefrom, said spool being rotatable held by said frame means;

means for driving said spool;
 a spool shaft connected to and rotatable with said spool;
 a pinion gear;

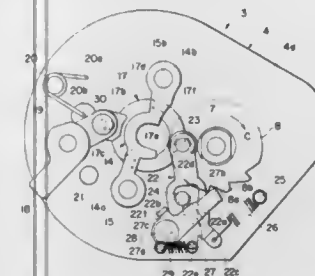
control means for selectively engaging said pinion gear to drive said spool, said control means including an actuating lever and cam means connected to said actuating lever, said cam means being rotatably mounted on said frame means for rotating with respect to said pinion gear to engage and disengage said pinion gear and said spool shaft;

first spring means urging said cam means to a position where said pinion gear is engaged with said spool shaft;

an elongated intermediate link having a first end pivotally connected to said cam means and a second end at an extremity of said link substantially opposite said first end, said link including an opening having a stepped portion and an elongated portion;

means for pivotally connecting said first end of said link to said cam means;

said frame means including a frame projection extending within said opening and disposed to limit movement of



said link when said projection is engaged with said stepped portion of said opening, said stepped portion being engaged with said projection when said pinion gear is disengaged from said spool shaft;

second spring means connected between said link and said frame means for biasing said stepped portion of said link into engagement with said projection;

a kick pawl pivotally affixed to said second end of said link, said kick pawl having a tip portion spaced from said second end;

means for pivotally affixing said kick pawl to said second end of said link;

a circular ratchet member connected top said drive means and having a plurality of teeth disposed on an outer peripheral edge thereof;

third spring means connected between said kick pawl and said link for biasing said tip portion toward said ratchet member, said tip portion being disposed to lie between said teeth when said pinion gear is disengaged from said spool shaft; and

means on said link for limiting the extent of movement of said tip portion toward said ratchet.

4,709,875

APPARATUS FOR GUIDING A MISSILE

Gregor Cremosnik, Regensdorf; Joachim Timper, Zürich, and Johann Holzberger, Schöffnisdorf, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Jan. 22, 1987, Ser. No. 5,697

Claims priority, application Switzerland, Jan. 30, 1986, 00349/86

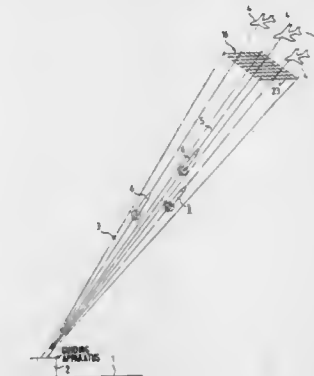
Int. Cl.⁴ F41G 7/26

U.S. Cl. 244—3.13

20 Claims

1. An apparatus for guiding a missile, comprising: means for generating an electromagnetic guide beam guiding the missile along a trajectory leading to a target; encoding means for encoding in said guide beam generated by said guide beam generating means, data required for

guiding said missile along the trajectory leading to the target;
 deflecting means for incrementally deflecting said encoded guide beam through a predetermined number of field sectors of a predetermined scanning field;
 a computer; and



said encoding means and said deflecting means being mutually coupled by means of said computer such as to generate individual codes associated with each one of said predetermined number of sector fields of said predetermined scanning field.

4,709,876

PNEUMATIC MISSILE SEEKER HEAD

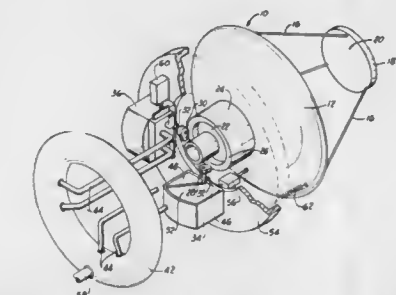
George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 24, 1985, Ser. No. 726,670

Int. Cl.⁴ F42B 15/02

U.S. Cl. 244—3.16

6 Claims



1. A pneumatic seeker head for moving about a rotational axis in response to a command from a control system, the seeker head scanning an area searched by a target detector, the seeker head comprising:

a primary optical element for receiving signal information thereon, the element mounted on a flexible ball joint;
 a first pneumatic actuator attached to a mounting plate, the first actuator having a first eccentric means for engaging and rotating the primary optical element on the ball joint; and

a second pneumatic actuator attached to the mounting plate, the second actuator having a second eccentric means for engaging and rotating the primary optical element on the ball joint; and

a high pressure gas source for supplying high pressure gas to the pneumatic actuators.

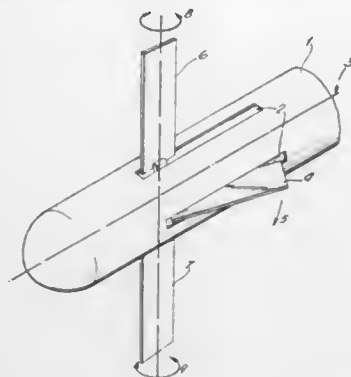
4,709,877

DEPLOYMENT AND ACTUATION MECHANISMS
Kenneth Goulding, Stevenage, England, assignor to British Aerospace PLC, London, England

Filed Apr. 9, 1986, Ser. No. 849,945
Int. Cl.⁴ F42B 15/027; F16H 1/00

U.S. Cl. 244—3.28

5 Claims



1. A mechanism for erecting a member from an initial stowed position to one of a range of operative positions by turning movement about a first axis, and for then moving the member within said range by turning movement about a second axis arranged at an angle other than zero with respect to said first axis, the mechanism comprising a support structure operable for supporting said member for movement with respect to said support structure, a drive motor connected to said support structure and having a movable output element, means coupling said motor output element to said member and operable whilst said member is at said stowed position and between said stowed and operative positions for translating movement of said motor output element to produce said erection of said member and which becomes operable when said member is erected for translating movement of said motor output element to produce movement of said member within said range of operative positions.

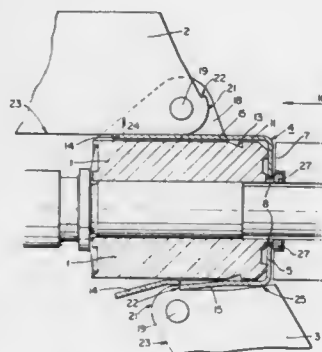
4,709,878

FIN ASSEMBLY DEPLOYMENT SPRING
Mark C. Titley, Stevenage, United Kingdom, assignor to British Aerospace PLC, London, England

Filed Apr. 10, 1986, Ser. No. 850,166
Int. Cl.⁴ F16F 1/00

U.S. Cl. 244—328

4 Claims



1. In a projectile comprising a body portion, a plurality of fins spaced around the body portion and pivotably connected thereto for radially outward movement from respective stowed positions adjacent said body portion to respective deployed positions in which they extend radially from the body portion, and a fin deployment assembly including a body engaging part engaged with said body portion and a plurality of spring members, supported by the body engaging part and

operable for engaging respective ones of said fins and urging movement thereof from the stowed to the deployed position, the improvement comprising

said deployment assembly comprising a one-piece integral member made from a single piece of sheet spring material shaped to define a connecting portion, a plurality of first spring portions defining said body engaging part extending from said connecting portion and operable for gripping said body portion between them for maintaining the member attached to the body portion, and a plurality of second spring portions extending all in the same general direction from said connecting portions and operable for engaging respective ones of said fins and applying radially outward spring forces thereto.

4,709,879

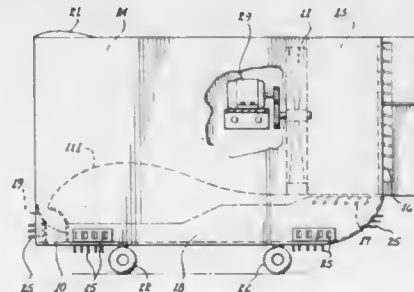
CONTROLLED AIR-FLOW AIRCRAFT CAPABLE OF VERTICAL FLIGHT

Lannon F. Stafford, P.O. Box 27752, Tempe, Ariz. 85282
Continuation of Ser. No. 726,414, Apr. 24, 1985, abandoned.
This application Nov. 21, 1986, Ser. No. 935,622

Int. Cl.⁴ B64C 23/00

U.S. Cl. 244—12.1

20 Claims



1. An aircraft capable of hovering and vertical flight comprising:
an airfoil;
a propulsion unit causing forced air flow over said airfoil;
an air chamber coupled to said propulsion unit, said propulsion unit causing air from said forced air flow to enter said chamber;
at least one passage for releasing air in said chamber along a forward portion of said airfoil; and
side members coupled to said airfoil, said side members positioned to confine said forced air flow over said airfoil, said side members extending at least from said propulsion unit to said forward airfoil portion, said propulsion unit and said side members controlling a flow of air over said airfoil, said forced air flow causing a lifting force capable of providing said hovering and vertical flight.

4,709,880

METHOD AND SYSTEM FOR IMPROVED V/STOL AIRCRAFT PERFORMANCE

Ganey W. Bradfield, Fort Worth, and Glynn P. Cragin, Jr., Irving, both of Tex.; assignors to General Dynamics Corporation, Fort Worth, Tex.

Continuation-in-part of Ser. No. 974,589, Dec. 29, 1978, Pat. No. 4,301,980, and a continuation-in-part of Ser. No. 296,710, Aug. 27, 1981, Pat. No. 4,505,443. This application Dec. 20, 1984, Ser. No. 684,209

The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.

Int. Cl.⁴ B64C 15/02

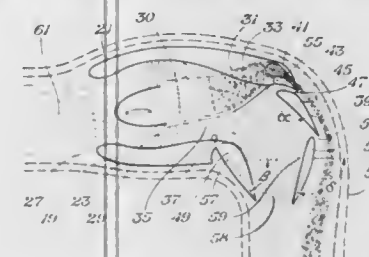
U.S. Cl. 244—12.5

23 Claims

1. In a V/STOL airplane in which a higher than ambient pressure, including both static and dynamic pressure, flow of exhaust gas from a power means is turned to effect the change

between flight modes respectively having greater horizontal and greater vertical thrust factors, the mode of improving airplane flight characteristic which comprises:

- directing a major portion of said exhaust gas flow through a closed conduit means to exit through a thrust-producing primary nozzle that includes a nozzle exit plane at the end of a converging nozzle section and includes turning means downstream of the power means and within a superatmospheric region of higher than ambient pressure extending from immediately downstream of the power means to said nozzle exit plane,
- turning the exhaust flow via said thrust producing primary nozzle including turning means to an angle from a condition in which the exhaust flow is directed predominantly



horizontally to a condition in which the exhaust flow is directed predominantly downwardly, thereby forming a bend;
c. bleeding off through at least one secondary nozzle a second portion of the exhaust flow from an outer portion of the bend downstream of the bend leading edge to reduce vortex formation in said bend;
d. directing the bleed-off exhaust flows adjacent each other and oriented in the same direction in all flight modes for recovery of the thrust potential in all flight modes; whereby maximum thrust is effected in all flight modes by eliminating contra-rotating vortices and achieving high efficiency in the exhaust and turn of the exhaust gas from the power means in a superatmospheric region and by recovering the thrust potential of the bleed-off portion.

4,709,881

SAFETY LOWERING OR DESCENT PARACHUTE SYSTEM FOR DISABLED HELICOPTERS AND OTHER SIMILAR TYPES OF HOVERING AIRCRAFT

Faraz Rafikian, 9529 Treyford Ter., Gaithersburg, Md. 20879 (by Faraz Rafikian, executor), and Manoucher Rafikian, deceased, late of Gaithersburg, Md., assignors to Faraz Rafikian, Rockville, Md.

Filed Jul. 9, 1986, Ser. No. 883,685

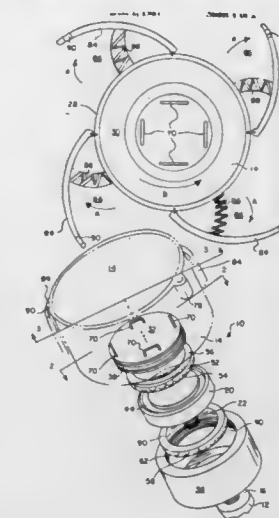
Int. Cl.⁴ B64D 17/42

U.S. Cl. 244—17.15

20 Claims

1. A safety lowering or descent system for rotor aircraft, comprising:
a rotor hub assembly;
a parachute housing mounted atop said rotor hub assembly for housing a safety lowering or descent parachute for said aircraft under aircraft disabled conditions;
ball bearing means interposed between said rotor hub assembly and said parachute housing for rotationally isolating said parachute housing from said rotor hub assembly under normal operating conditions; and
means movably mounted upon said parachute housing, between a first stowed position and a second operative position, and operative in conjunction with deployment of said parachute under said aircraft disabled conditions, for

substantially reducing rotation of said parachute housing as induced by said rotor hub assembly through said ball



bearing means under weight load support conditions of said aircraft by said safety lowering or descent parachute.

4,709,882

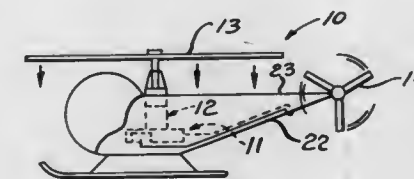
ELECTRIC PROPULSION SYSTEM FOR AIRCRAFT
Andrew D. Galbraith, Los Altos, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Nov. 25, 1983, Ser. No. 555,203

Int. Cl.⁴ B64D 27/24

U.S. Cl. 244—53 R

14 Claims



1. In an aircraft having a blade to be rotatively driven in effecting powered flight of the aircraft, an improved power supply system for driving said blade comprising:
electric motor means for rotatively driving said blade;
electrochemical power system means for generating electrical power to operate said motor means, said electrochemical power system means including a lithium/peroxide fuel cell utilizing an aqueous electrolyte at a desired molarity; and
means for maintaining said desired molarity of said electrolyte, said molarity maintaining means including means for circulating said electrolyte from said electrochemical power system means through separate heat transfer means for cooling thereof so as to effect precipitation of lithium-hydroxide monohydrate, said molarity maintaining means also including means for collecting said precipitated lithium-hydroxide monohydrate.

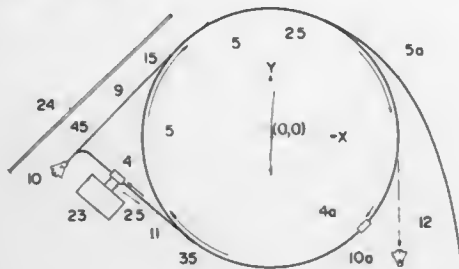
4,709,883

LAUNCH AND ASCENT SYSTEM

Robert L. Giuliani, 1456 Thurston Ave. A-1204, Honolulu, Hi. 96822; Mark A. Giuliani, and Karen A. Giuliani, both of 45-310 Akimela Pl., Kaneohe, Hi. 96744
 Filed Apr. 22, 1985, Ser. No. 726,152
 Int. Cl.⁴ B64F 1/04

U.S. Cl. 244—63

6 Claims



1. An apparatus for launching a vehicle, the combination comprising:

- a guideway, the guideway including a curve along at least a portion of its length;
- a load, the load comprising a first vehicle and at least one additional vehicle;
- a magnetic force field between the first vehicle and the guideway for propulsion of the load along the guideway, the propulsion including an acceleration of the load;
- a relatively shallow bank of the guideway along the curve toward the inside thereof for providing centripetal force to the load at lower velocities;
- a releasable engagement between the first vehicle and the additional vehicle, the engagement permitting a variable tilt therebetween; the tilt restricted essentially toward the inside of the curve transverse to a tangent thereof during at least a part of the propulsion;
- the additional vehicle characterized by aerodynamic lift surfaces thereupon; and
- the tilt of the additional vehicle effecting centripetal force thereupon by the aerodynamic lift at higher velocities wherein the load is accelerated to a velocity for releasing the engagement to launch the additional vehicle.

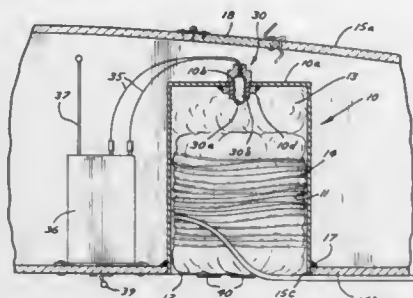
4,709,884

PARACHUTE APPARATUS FOR MODEL AIRPLANE
 Troy C. Gustafson, 9913 Delridge Rd., Bloomington, Minn. 55420

Filed Jan. 16, 1987, Ser. No. 4,027
 Int. Cl.⁴ B64D 17/72

U.S. Cl. 244—139

7 Claims



1. An apparatus controlling the descent of an airborne model airplane, having in combination
 an opening in the bottom wall of the fuselage of a model airplane,
 a container disposed into said opening,

said container having an open bottom,
 a parachute packed into said container through said opening, means connecting said parachute and said airplane,
 a hatch in the top wall of said fuselage for access to the top wall of said container,
 a parachute ejecting cartridge,
 means positioning said cartridge into said top wall of said container, and
 means activating said cartridge to eject said parachute downwardly of said airplane.

4,709,885

PARACHUTE SYSTEM AND AIRCRAFT EJECTION SEAT INCORPORATING THE SAME

James W. Martin, Beaconsfield, England, assignor to Engineering Patents & Equipment Limited, St. Peter, Channel Islands
 Filed Nov. 7, 1985, Ser. No. 796,100
 Claims priority, application United Kingdom, Nov. 22, 1984, 8429508

Int. Cl.⁴ B64D 25/10

U.S. Cl. 244—141

4 Claims



1. A parachute system for an airman ejected from an aircraft in an ejection seat, including at least one drogue parachute, a rigid hollow container housing said drogue parachute, connecting means at least temporarily connecting said drogue parachute with said ejection seat, said connecting means including line means and a closure fitted to said container, said line means including a first line connected to said drogue parachute and a second line at least temporarily connected to said ejection seat, with said closure connecting said first and second lines, said container, with said drogue parachute and with said closure, being formed as a projectile, the system including a projection device for mounting on an ejection seat, means mounting said projectile in said projection device, said projection device being operable to propel the projectile from said projection device along a predetermined trajectory, said container having a trailing end which faces in the direction opposite to that along which, in operation, the container is moved along said trajectory by the projection device and which trailing end is closed by said closure, whereby when said container is projected from the projecting device, the container remains closed, with said closure in position, until said second line becomes taut, arresting said closure whilst allowing the container and said drogue parachute to proceed along said trajectory and opening the container to allow the drogue parachute to be drawn from the container when the first line becomes taut and the momentum imparted to the container by the projection device carries the container further along said trajectory, and wherein after projection of the rigid container from the projection device there is no positive connection between the container and any component still connected with the seat or said drogue parachute so that after the drogue parachute has left said container, the container is completely free from the other components.

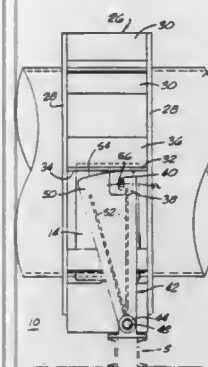
4,709,886

HIGH TEMPERATURE PIPE AND DUCT SUPPORT

Leonard G. Smart, Monrovia, and Henry T. Hui, Arcadia, both of Calif., assignors to CF Braun & Company, Alhambra, Calif.
 Filed Feb. 13, 1986, Ser. No. 829,446
 Int. Cl.⁴ F16L 3/16

U.S. Cl. 248—49

6 Claims



6. A pipe and duct support apparatus comprising:
 a frame positioned to circumscribe the pipe or duct, said frame having cam following surfaces and slotted tabs positioned adjacent said cam following surfaces, extending perpendicularly thereto;
 a cradle comprising a strap member of a ductile material attached to the pipe or duct said strap member having sufficient thickness to provide lateral and vertical support for the pipe or duct, said cradle being pivotally attached to side portions of said frame and suspended therebetween and having surface contact with the pipe or duct such that the temperature of the cradle is similar to that of the pipe or duct;
 rocker arms pivotally secured to a support surface for supporting said frame, said rocker arms including cammed surfaces for engagement with the cam following surfaces on said frame and further including detents positioned adjacent said cammed surfaces, extending perpendicularly thereto for engagement in the slotted tabs of said frame; and
 a keel member attached to said cradle extending perpendicularly from the surface thereof, said keel member being slidably mounted on a support surface.

4,709,887

HIGHWAY CABLE CLAMP

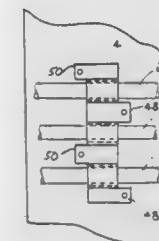
Nicola Bongiovanni, 320 Dixon Road, Apartment 1810, Weston, Ontario, Canada M9R 1S8, and Vincent Cianfarani, 45 Marilyn Street P.O. General Delivery, Caledon East, Ontario, Canada L0N 1E0

Filed Sep. 15, 1986, Ser. No. 907,076

Int. Cl.⁴ F16L 3/08

U.S. Cl. 248—66

11 Claims



4. A clamp for supporting a plurality of horizontally spaced highway guard cables against a wooden post having a vertical split, said clamp comprising: a plate member presenting flat portions and a plurality of U-shaped spaced apart recess means

adapted to freely slidably retain said plurality of cables, respectively, against said post, said flat portions including a series of aperture means staggered along two vertical opposing edges thereof, said aperture means adapted to receive nails to be driven into said wooden post for fastening said clamp to said post, said clamp adapted to be disposed adjacent said split so that said clamp and said staggered series of aperture means along said opposing edges of said flat portions straddle said split and improve the strength characteristics of said wooden posts.

4,709,888

HANGER APPARATUS FOR ELECTRICAL CONDUIT AND THE LIKE

Harry T. Cubit, Lansdale, and George C. Johnson, Norristown, both of Pa., assignors to T. J. Cope, Inc., Collegeville, Pa.
 Filed Oct. 1, 1985, Ser. No. 782,659

Int. Cl.⁴ F16L 3/03

U.S. Cl. 248—73

16 Claims



1. Hanger apparatus for suspending elongated members from supporting structures, comprising: a strap member having respective opposite faces thereof and adapted to be coupled to a supporting structure, said strap member having a series of longitudinally spaced openings therein; a first load support coupled to and supported by said strap member in association with one face thereof, said load support having a hook member thereon, an opening therein spaced from said hook member by a distance corresponding to the spacing between said openings in said strap member, and a projection thereon extending the direction of said hook member and spaced from said hook member by a distance corresponding to the spacing between said openings in said strap member; and a second load support coupled to and supported by said strap member in association with the other face thereof and having a hook member thereon, said hook member of said second load support extending through one of said openings in said strap member and said opening in said first load support, whereby said hook member of said second load support operatively interconnects said load supports and said strap member.

4,709,889

WIRE CLIP

David A. Erickson, Hinsdale, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 27, 1986, Ser. No. 900,806

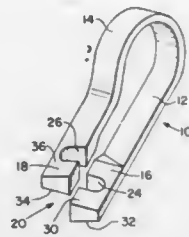
Int. Cl.⁴ F16L 3/08

U.S. Cl. 248—74.5

1 Claim

1. A wire clip comprising an elongate flexible strip having a longitudinal axis, a first end and a second end, said strip being formed to provide a loop-shaped wire retaining portion and having attachment means for attaching said clip to a workpiece in an installed position; said attachment means comprising first and second wedge-shaped blocks integrally formed respectively in said first and second ends, there being first and second U-shaped slots respectively formed through said first and second wedge-shaped blocks with a bight near a thinner end of each of said blocks and with a channel leading from each of said bights to the respective thicker ends of each of said blocks,

the axis of each of said slots being substantially perpendicular to said longitudinal axis, and a pin means for compressively attaching said clip in said installed position; said attachment means being configured to, in said installed position, present complementary uninterrupted sloping faces, from said thicker ends to said thinner ends, in slidable engagement between said



4,709,891 SUPPORT BRACKET FOR SIGNS AND ADVERTISING DISPLAYS

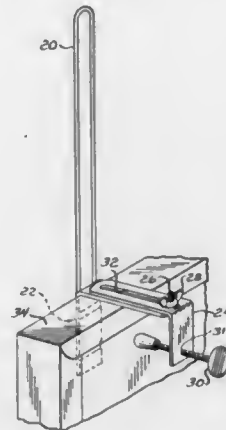
Earl D. Barnett, Morton Grove, Ill., assignor to Chicago Show Printing Co., Morton Grove, Ill.

Filed Jan. 2, 1986, Ser. No. 815,540

Int. Cl.⁴ G09F 3/18

U.S. Cl. 248—214

1 Claim



first and second wedge-shaped blocks, said first and second U-shaped slots opening toward each other, whereby application of a compressive force by said pin means in installing said clip effects a continuous sliding wedge action between said first and second wedge-shaped blocks urging said bights of said first and second slots against said pin means.

4,709,890 LANTERN HOLDER

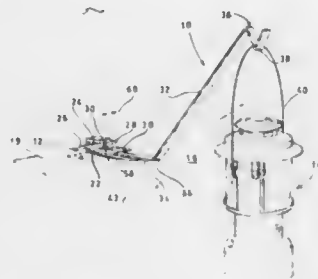
Carl F. Moore, 4417 Mellowood Cir., Knoxville, Tenn. 37920

Filed Sep. 8, 1986, Ser. No. 904,209

Int. Cl.⁴ A47B 96/00

U.S. Cl. 248—205.1

20 Claims



1. A lantern holder for releasably supporting a lantern and for releasably engaging and being supported by a cleat mounted on a supporting surface, said cleat comprising a base portion for mounting said cleat on said supporting surface, an upper portion defining a pair of oppositely disposed horizontally projecting arms, and a bottom surface and a rear side surface oppositely disposed from a side surface toward said lantern, and a waist portion joining said base portion and said upper portion, said lantern holder comprising:

an elongated support arm defining a first end portion and a further distal end portion, said distal end portion being provided with means for releasably engaging and supporting said lantern; and

cleat engaging means fixedly carried by said first end portion of said support arm for releasably engaging said cleat, said cleat engaging means comprising at least one shank portion having a lower surface for being received under and releasably engaging said bottom surface of said upper portion of said cleat, said shank portion defining a first end portion extending from said first end portion of said support arm and a second end portion provided with an upstanding retainer means for engaging said rear side surface of said upper portion of said cleat whereby weight of said lantern engaged with said distal end portion of said support arm causes said support arm to be biased downwardly such that said lower surface of said shank portion contacts said supporting surface and said shank portion

1. A support bracket arrangement for securing signs and advertising displays to a vertically disposed shelf gondola comprising:

an adjustable clamp for securing the bracket to the gondola, said adjustable clamp comprising one L-shaped member secured over a second L-shaped member by a screw and wing nut combination with one of said L-shaped members having a slot to permit adjustment of the clamp to receive different sized gondolas, one of said one L-shaped members including a set screw positioned in a thread hole for engaging the gondola to secure the clamp thereagainst;

a vertically extending support for securing a sign thereon, said support comprising an inverted U-shaped wire loop which extends vertically along its entire length above the gondola and is attached at its ends to the other of said L-shaped member;

a backing member attachable to a sign or display, said backing member comprising a channel having an inverted U-shaped portion dimensioned to snugly but slidably receive said inverted U-shaped wire loop such that said inverted U-shaped wire loop mateably engages said channel along said inverted U-shaped portion;

whereby a sign attached to said backing member can be supported for display above said gondola at a predetermined height by the engagement of said inverted U-shaped portion of said channel with said inverted U-shaped wire loop.

4,709,892 ADJUSTABLE SUPPORT FOR BOOKSHELVES

Merce B. Gurgul, C. Consell de Cent, 83, 08015 Barcelona, Spain

Filed Jul. 9, 1986, Ser. No. 883,702

Claims priority, application Spain, Jul. 11, 1985, 288,009

Int. Cl.⁴ A47B 57/04

U.S. Cl. 248—250

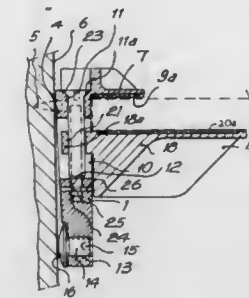
14 Claims

1. Adjustable support for a bookshelf, comprising a first clamping member having a first clamping surface, means for fixing said first clamping member to a stationary mounting,

said first clamping member comprising a passageway, a threaded member rotatably mounted in said first clamping

and said retainer means are releasably engaged with said upper portion of said cleat.

member and including a portion which extends into said passageway, and a second clamping member coupled to said first clamping member and having a second clamping surface in spaced opposed relationship to said first clamping surface, said second clamping member being threadably mounted upon said threaded member,



said threaded member comprising means for moving said second clamping surface towards or away from said first clamping surface upon rotation of said threaded member in one or another direction respectively, whereby rotation of said threaded member causes the spacing between said first and second clamping members to smoothly vary.

4,709,893 STRESS BRACE

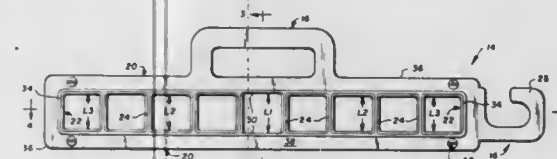
Robert Ljungberg, 373 Cottonwood Dr., Williamville, N.Y. 14221

Filed Sep. 26, 1986, Ser. No. 912,004

Int. Cl.⁴ A47G 29/00

U.S. Cl. 248—360

19 Claims



1. A brace member for holding an article comprising: two, spaced apart side, beam support members, said side beam members having end and central portions with at least part of the central portions being spaced apart a first distance and the end portions being spaced apart a second distance different from said first distance; means for spanning between said side beam members to establish and maintain the spaced apart relationship thereof; and means for maintaining edges of said article in contact with said side support members.

4,709,894 SLIP CONNECTOR FOR WEIGHT ACTUATED HEIGHT ADJUSTORS

Glenn A. Knoblock, Kentwood, and Brian L. Scolten, Jenison, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Apr. 10, 1986, Ser. No. 850,510

Int. Cl.⁴ F16M 11/24

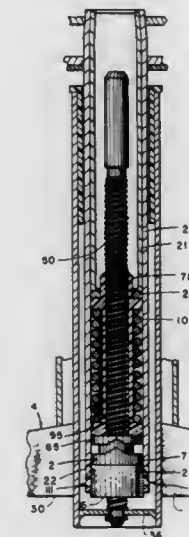
U.S. Cl. 248—406.2

30 Claims

1. In seating of the type having a base, a seat rotatably supported thereon, and a weight actuated height adjuster which is engaged when said seating is unoccupied to raise and lower the height of said seat in response to rotation of said seat with respect to said base, and is disengaged when said seating is occupied to permit said seat to swivel with respect to said base

without affecting the height of said seat, the improvement of a slip connector to alleviate unintentional height adjustment; said slip connector comprising:

first and second coupling members positioned for mutual rotation about a common axis; said first coupling member being operably connected with said seat for rotation therewith, and said second coupling member being operably connected with said height adjuster, such that rotation of said seat with respect to said base is transmitted to said height adjuster through said slip connector; means for positively interconnecting said first and second coupling members when said seat is unoccupied and when



said first and second coupling members assume a first, selected angular relationship to rotate said first and second coupling members together about said axis; means for rotatably biasing said first and second coupling members when said seating is occupied into a second, selected angular relationship which is spaced a preselected angular measure from said first selected angular relationship, whereby when the user exits said seating, said seat must be rotated through said preselected angular measure with respect to said base before said positive interconnecting means engages and seat rotation is transmitted to said height adjuster, thereby alleviating unintentional height adjustment.

4,709,895 PORTABLE VIEWING STAND

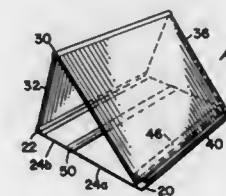
Keith R. Mardak, Elm Grove, Wis., assignor to Hal Leonard Publishing Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 829,769, Feb. 14, 1986, abandoned. This application Jan. 30, 1987, Ser. No. 9,574

Int. Cl.⁴ A47B 97/04

U.S. Cl. 248—460

5 Claims



1. A portable collapsible apparatus for supporting an article to be viewed by an individual without the need for the viewing

individual to support the article by hand, said apparatus comprising:

- a first rigid panel (12') having a rear edge (16') and a forward edge (15');
- a second rigid panel (13') having first and second spaced apart edges (18', 19'), said second panel (13') disposed adjacent said first panel (12') with said first edge (18') of said second panel generally parallel to and spaced from said rear edge (16');
- a third rigid panel (14'), having first and second spaced apart edges (20', 21'), said third panel (14') disposed adjacent said second panel (13') with said first edge (20') of said third panel generally parallel to and spaced from said second edge (19') of said second panel;
- a first sheet (25') of flexible material disposed covering first sides of said first, second and third panels;
- a second sheet (27') of flexible material disposed covering second sides of said first, second and third panels;
- said first and second sheets (25', 27') each sized to extend beyond peripheral edges of said panels with peripheral edges (25a', 27a') of said sheets opposing one another;
- a portion of said first sheet (25') opposing a portion of said second sheet (27') between opposing edges (16', 18') of said first and second panels (12', 13') to define a first hinge area (30');
- a portion of said first sheet (25') opposing a portion of said second sheet (27') between opposing edges (19', 20') of said second and third panels (13', 14') to define a second hinge area (32');
- a seal formed joining opposing peripheral edges (25a', 27a') of said sheets (25', 27') to define an enclosed volume between said sheets with said panels (12', 13', 14') disposed within said enclosed volume;
- a first flexible hinge seal (34') formed joining opposing sheet portions in said first hinge area (30');
- a second flexible hinge seal (36') formed joining opposing sheet portions in said second hinge area (32');
- said first and second hinge seals dividing said enclosed volume into first, second and third pockets containing said first, second and third panels, respectively, said hinge seals accommodating pivotal movement of adjacent panels about pivot axes generally parallel to opposing edges of said panels;
- a stop (40') secured to one of said sheets and protruding above said first panel (12') and adjacent said forward edge (15') of said first panel, said stop disposed to abut said second edge (21') of said third panel (14') when said panels are pivoted about said hinge areas to generally assume a shape of a triangular prism with said third panel projecting upwardly and away from said stop, and said stop (40') including a first retaining surface (44') extending upwardly from said first panel (12') and away from said forward edge (15'), said stop further including a second retaining surface (46') extending upwardly from said first panel (12') and toward said forward edge (15').

4,709,896

IN-SEAT SUSPENSION

Robert Wahls, Leclaire, Iowa, and Dennis Gryp, Silvis, Ill., assignors to Sears Manufacturing Co., Davenport, Iowa

Filed Oct. 30, 1985, Ser. No. 793,084

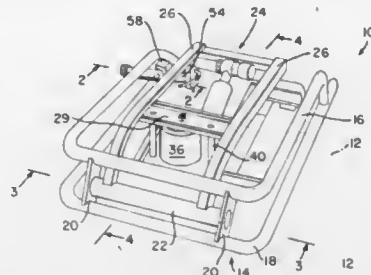
Int. Cl. A47C 3/00

U.S. Cl. 248—550

11 Claims

1. A vehicle seat suspension apparatus, comprising:
 - a frame including rigidly connected upper and lower structural members;
 - a platform contained within the frame and hinged at one end to a side of the frame to allow limited rotation of the platform in a generally vertical arc contained within the frame; and

means attached between the frame and platform and contained within the frame for resiliently biasing the platform



within the frame in response to a force exerted on the platform.

4,709,897

SURVEILLANCE CAMERA MOUNT

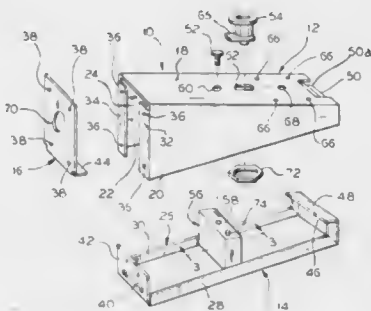
Paul C. Mooney, Northbrook, Ill., assignor to Quick-Set, Incorporated, Northbrook, Ill.

Filed Jul. 30, 1986, Ser. No. 890,469

Int. Cl. F16M 13/00

U.S. Cl. 248—551

21 Claims



1. A surveillance camera mount, comprising:

- a bracket adapted to be permanently secured to a mounting surface, said bracket defining a portion of a hollow housing having a surface adapted to support a surveillance camera and an opening disposed to face opposite said camera supporting surface, and including means for permanently mounting said bracket to said mounting surface;
- a base conforming to said opening in said bracket, said base defining the remainder of said hollow housing and having a flange extending substantially about the perimeter thereof with at least a portion adapted to be disposed internally of said bracket when said base is secured to said bracket, and including means for securing said base to said bracket;
- said base securing means including first securing means operatively associated with said base and said bracket adjacent said mounting surface and second securing means operatively associated with said base and said bracket at a point remote from said mounting surface; and
- means for locking said base to said bracket in a tamper-proof manner;
- said first and second securing means and said bracket mounting means being concealed by said base when said base is locked to said bracket by said base locking means.

4,709,898

FLUID-SEALED ENGINE MOUNTING

Hiroshi Yoshida; Takéumi Toyoshima, both of Saitama; Tomio Iwabori; Hideaki Ohkura, both of Kanagawa; Yasuo Miyamoto; Izumi Nishimura, both of Saitama; Toshiyuki Oikawa, Kanagawa; Kenji Sekijima, Kanagawa, and Makoto Ohashi, Kanagawa, all of Japan, assignors to Hokushin Kogyo Kabushiki Kaisha, Kanagawa, Japan

Division of Ser. No. 633,324, Jul. 7, 1984, Pat. No. 4,573,656.

This application Oct. 4, 1985, Ser. No. 784,024

Claims priority, application Japan, Jul. 22, 1983, 58-134826; Feb. 20, 1984, 59-23573

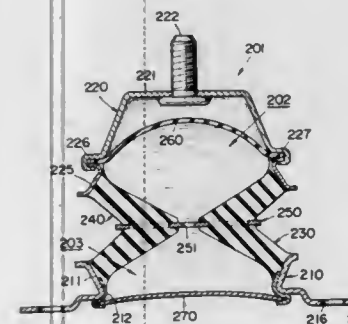
The portion of the term of this patent subsequent to Mar. 4,

2003, has been disclaimed.

Int. Cl. F16M 13/00

U.S. Cl. 248—562

3 Claims



1. A fluid-sealed engine mounting for mounting an engine on a vehicle frame, comprising:

- (a) a connector adapted to be connected to the engine;
- (b) a base adapted to be connected to the vehicle frame;
- (c) an elastic member joined between said connector and said base and elastically deformable in response to vibrations transmitted thereto, said connector, said base and said elastic member jointly defining a fluid chamber in which a fluid is sealed;
- (d) a partition intermediate said connector and said base and dividing said fluid chamber into a first chamber adjacent to said connector and a second chamber adjacent to said base, said partition having an orifice through which said first and said second chambers communicated with each other; and
- (e) a diaphragm mounted in said connector for maintaining the pressure in said first chamber substantially constant when vibrations are transmitted to the engine mounting, said base comprises a frustoconical tubular body mounted on an end of said elastic member and having a radially outwardly projecting flange on one end thereof remotely from said connector for attachment to the vehicle frame, said fluid chamber being between said radially outwardly projecting flange and said connector.

3. A fluid-sealed engine mounting according to claim 2, wherein said base further comprises a ring attached on to the inner side of said frustoconical tubular body, and said rigid member is connected to said ring through caulking of said ring.

4,709,899

CLIMBING FORMWORK APPARATUS FOR CONCRETE PLACING

Yasuo Kajioka; Tomio Komine; Hitoshi Kadowaki; Shigeyoshi Matsuda; Yoshinori Yugami; Shinya Kubota; Yoshio Takahashi; Hiroshi Shimada, and Nobutaka Kurata, all of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

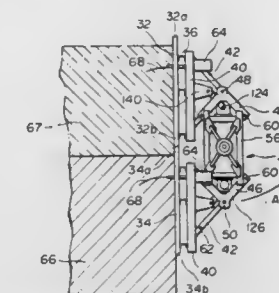
Filed Oct. 27, 1986, Ser. No. 923,428

Claims priority, application Japan, Oct. 28, 1985, 60-241050; May 10, 1986, 61-106956; May 15, 1986, 61-111615; May 15, 1986, 61-111616; May 27, 1986, 61-121706; May 27, 1986, 61-80111[U]; Sep. 16, 1986, 61-141501[U]

Int. Cl. E04G 11/28

U.S. Cl. 249—20

25 Claims



1. A formwork apparatus for concrete placing comprising: a center frame assembly having upper and lower ends; first and second form panels for molding concrete walls, each having a supporting member mounted on an outer surface thereof, the first form panel pivotally connected at the supporting member thereof to the upper end of the frame assembly so as to be pivoted about a substantially horizontal axis, the second form panel pivotally connected at the supporting member thereof to the lower end of the frame assembly so as to be pivoted about an axis parallel to a pivot connecting the first panel with the frame assembly; first fixing means for fixing and releasing the first panel to and from a concrete wall; second fixing means for fixing and releasing the second panel to and from the concrete wall; first drive means for pivoting the frame assembly around the first panel when the first panel is fixed to the concrete wall so that the second panel is lifted to a position upper side of the first panel; and second drive means for pivoting the frame assembly around the second panel when the second panel is fixed to the concrete wall so that the first panel is lifted to a position upper side of the second panel.

4,709,900

CHOKE VALVE ESPECIALLY USED IN OIL AND GAS WELLS

Einar Dyhr, Skodsborgvej 160, DK-2840 Holte, Denmark

Filed Mar. 20, 1986, Ser. No. 841,564

Claims priority, application Denmark, Apr. 11, 1985, 1628/85

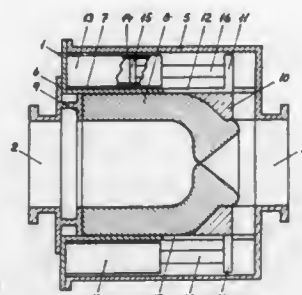
Int. Cl. F16K 31/22

U.S. Cl. 251—5

10 Claims

1. A choke valve comprising:
 - an inlet at an upstream end thereof;
 - an outlet at a downstream end thereof;
 - a flexible tubular element between said inlet and said outlet;
 - a central passage in said flexible tubular element for permitting a flow of a fluid from said inlet to said outlet;
 - means for deforming a downstream end of said flexible tubular element into a controllable position selectively constricting said central passage; and
 - said means for deforming further including means for successively deforming additional portions of said flexible tubular element into said controllable position as de-

formed portions at said downstream end of said flexible tubular member are abraded away by said flow of a fluid, whereby an operating lifetime of said choke valve can be



made as long as desired by increasing a length of said flexible tubular element and an operational range of said means for deforming.

4,709,901

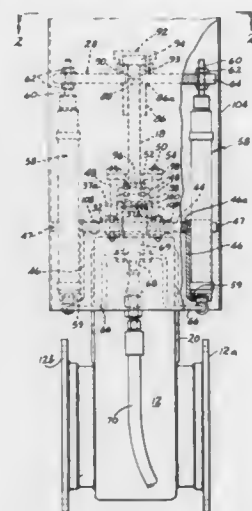
FLUID POWER OPERATED SLIDING GATE VALVE SYSTEM FOR TANK TRUCKS, PIPELINES, STORAGE TANKS AND THE LIKE

Karl B. Pierson; Thomas E. Mooney, both of Warren, Pa., and William G. Jones, Frewsburg, N.Y., assignors to Betts Industries, Inc., Warren, Pa.

Filed Apr. 20, 1987, Ser. No. 39,925
Int. Cl.⁴ F16K 31/124

U.S. Cl. 251—58

19 Claims



1. Fluid power operated mechanism for controlling actuation of a sliding gate valve or the like, adapted for use in tank trucks, pipelines and the like comprising, spaced supports, one of said supports including means for attaching the operating rod of a sliding gate valve thereto, constant force spring means coacting between said supports and urging the latter toward one another, means for guiding the movement of said one support relative to the other support, and fluid powered reciprocal motor means extending between said supports and when actuated from a source of pressurized fluid, adapted to move one of said supports relative to the other support against the bias of said spring means to cause movement of the gate valve operating rod and thus actuation of the gate valve, said means for guiding said one support including guide posts supported on said other support, and extending outwardly relative thereto and through openings in said one support, sleeve means generally encompassing the respective said guide posts and extending between said supports for limiting movement of said one support toward said other support during relative move-

ment between said supports, and said guide posts preventing tilting of said one support relative to said other support during relative movement between said supports, said spring means comprises a spool of constant force spring rotatably mounted on said other support with a spring tape thereof being coiled about said spool and then attached at its distal end to said one support, resulting in preloading of said spring tape means a predetermined amount.

4,709,902

BALL VALVE HAVING VALVE HOUSING WITH INTERIOR ANNULAR RIDGE FOR HOLDING ANNULAR RETAINING ELEMENT IN POSITION

Anders N. Hansen, Husby, Denmark, assignor to Broen Armatur A/S, Assens, Denmark

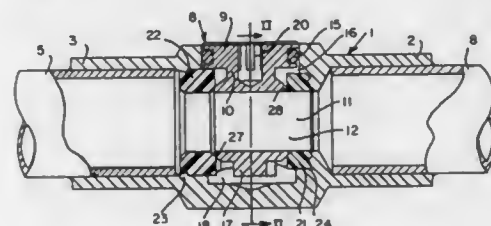
PCT No. PCT/DK85/00067, § 371 Date Mar. 5, 1986, § 102(e) Date Mar. 5, 1987, PCT Pub. No. WO86/00680, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 10, 1985, Ser. No. 845,702

Claims priority, application Denmark, Jul. 11, 1984, 3418/84
Int. Cl.⁴ F16K 5/20

U.S. Cl. 251—315

3 Claims



1. A ball valve which comprises
a valve housing which defines opposite first and second hollow branches and an internal recess therebetween, said first hollow branch including ridge means extending interiorly thereof,
an annular sealing element, said annular sealing element being located in said recess adjacent said second hollow branch,
a rotatable valve plug which includes a generally spherical part having a flow passage therethrough, said rotatable valve plug being located in said recess such that said generally spherical part contacts said annular sealing element, and
an annular retaining element which is positioned in said first hollow branch and extends past said ridge means into said recess to apply pressure against the generally cylindrical part of said rotatable valve plug, said annular retaining element being made of a sufficiently resilient material that its outer surface, which is cylindrical in shape when in an unstressed condition, is inwardly deformed by said ridge means and thus held in position against said rotatable valve plug.

4,709,903

SLAG RETAINING DEVICE FOR USE IN CONVERTERS, LADLES, OR THE LIKE

Micheel D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed May 8, 1986, Ser. No. 860,826

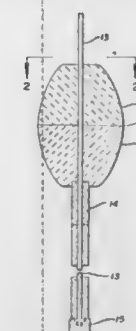
Int. Cl.⁴ C21C 5/46

U.S. Cl. 266—227

8 Claims

1. The combination in a vessel for molten metal having a tap hole of a preformed cylindrical refractory sleeve registering with said tap hole and a preformed slag retaining device for selectively engaging said cylindrical refractory sleeve during the drawing off of metal from said vessel, said slag retaining device comprising a closure of a barrel shape having ends and curved sides with a dimension between said ends that is equal to or greater than a maximum dimension between said curved

sides and having a size to effectively close said cylindrical refractory sleeve when engaged therein, said slag retaining device and said cylindrical refractory sleeve being formed of refractory materials resistant to dissolution in the molten metal



and slag for a time sufficient to assure the lodgement of said slag retaining device in said cylindrical refractory sleeve and wherein said slag retaining device has a density of about 0.12 to about 0.22 lbs. per cubic inch so that it will float in said molten metal and below said slag.

4,709,904

VACUUM FURNACE FOR HEAT-TREATING A CHARGE

Peter Schmetz, Menden, Fed. Rep. of Germany, assignor to Schmetz GmbH & Co. KG, Menden, Fed. Rep. of Germany
Division of Ser. No. 731,058, May 5, 1985, Pat. No. 4,612,064.

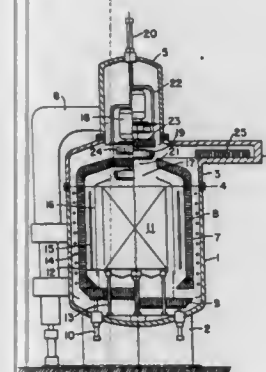
This application May 28, 1986, Ser. No. 868,300

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416902

Int. Cl.⁴ C21D 1/74

U.S. Cl. 266—250

3 Claims



1. A vacuum furnace for heat-treating a charge as rapidly as possible to about 750° C. heat-treating temperature permissible for a circulation device in a first stage and in a second stage the charge is heated by radiation heating to a higher desired end temperature with an overall more rapid and more uniform heating of the charge although the circulation device is protected from effect of higher temperatures in the second stage, comprising:

a steel vessel which can be closed off;
means forming a heating chamber, provided in said vessel, for receiving said charge;
heating elements provided within said heating chamber;
fan assembly means including a fan as the circulation device capable of being disposed in said vessel;
means for movement of the entire fan assembly means projected into an operating position within said vessel only during said first stage and retracted into a rest position externally of said vessel during said second stage so as to

remove and protect the fan as the circulation device from effect of higher temperatures in the second stage;
a gas guiding arrangement for gas conveying guided in the manner of a hood disposed in said heating chamber and located axially inside said vessel, with said fan and said gas guiding arrangement during the first stage cooperating to produce a gas circulation internally through said heating chamber; and
means to close off said heating chamber and separate said heating chamber from said fan in rest position during the second stage at the higher temperatures.

4,709,905

CASING ASSEMBLY FOR INJECTING MATERIAL INTO A METALLURGICAL VESSEL

Manfred Winkelmann, Krefeld; Udo Muschner, Tönisvorst, both of Fed. Rep. of Germany, and Pierre Gerber, Hausen, Switzerland, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

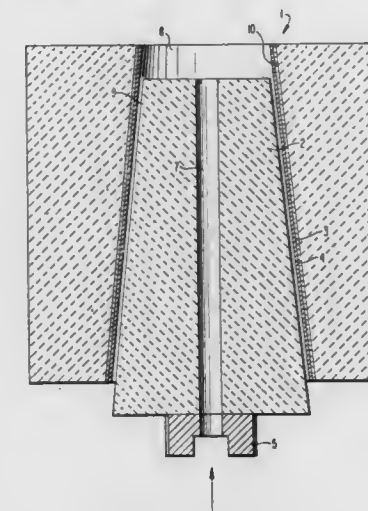
Filed Apr. 30, 1986, Ser. No. 857,538

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520207

Int. Cl.⁴ C21C 5/48

U.S. Cl. 266—270

9 Claims



1. A casing assembly, for use with a metallurgical vessel containing molten material, said casing assembly comprising:
a nozzle brick adapted to form part of a wall of a metallurgical vessel, said nozzle brick having therethrough a conical opening defined by a conical inner surface;
a casing to be inserted into said conical opening and having a truncated conical shape including a conical outer surface;
said conical opening and said casing having coaxial center axes, and said conical inner and outer surfaces extending at equal angles of inclination to said axes; and
said conical inner surface being jacketed with a thin metal shell having a conical shape with the same inclination as said conical inner and outer surfaces;
whereby said casing is insertable into said conical opening such that said conical outer surface seats precisely and snugly on said metal shell.

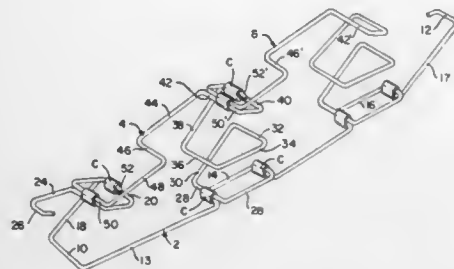
4,709,906

FURNITURE SEAT SUPPORTS AND SPRING ASSEMBLIES

Ned W. Mizelle, P.O. Box 5985, High Point, N.C. 27262
Filed Oct. 14, 1986, Ser. No. 917,863Int. Cl.⁴ F16F 3/00

U.S. Cl. 267-103

51 Claims



1. A furniture spring assembly for forming a resilient seat support on a substantially horizontal seat frame, said spring assembly including a base spring and at least two upper springs mounted on said base spring, said base spring formed of a length of wire which has a forward mounting portion which is connectible to a front rail of a seat frame, said base spring also having a rear mounting portion which is connectible to a rear rail of the seat frame, said base spring extending longitudinally from the forward mounting portion to the rear mounting portion and being bent between and below the forward mounting portion and the rear mounting portion to form spaced apart support portions for supporting the upper springs,

a first upper spring having a lower base portion, a resilient vertically collapsible midportion and an upper attachment portion, said lower base portion of the first upper spring being connected to one of the support portions of the base spring,

a second upper spring having a lower base portion, a resilient vertically collapsible midportion and an upper attachment portion, said lower base portion of the second upper spring being connected to one of the support portions of the base spring, and means for connecting the upper attachment portion of the first upper spring to the upper attachment portion of the second upper spring.

4,709,907

QUIET FLUID FILLED VIBRATION ISOLATOR

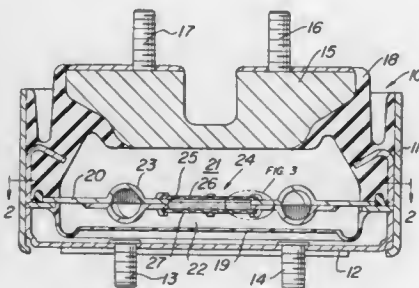
Richard P. Thorn, Lord Corporation, 1635 W. 12th St., Erie, Pa. 16512

Filed Jan. 30, 1986, Ser. No. 824,367

Int. Cl.⁴ F16F 15/04; B60G 15/04; F16M 13/00

U.S. Cl. 267-140.1

17 Claims



1. In a vibration isolating device having a housing with at least one flexible wall portion movable in response to vibrations imparted thereto, a partition dividing the housing into at least two chambers for containing a working fluid displaceable

in response to movement of the flexible wall, an inertia track passageway providing fluid communication between the chambers, and decoupling means cooperable with the inertia track passageway to control fluid flow between the chambers, the improvement wherein said decoupling means comprises passage means providing fluid communication between said chambers, a mass of particulate matter loosely contained in a said passage means, foraminous means between opposite ends of said passage means for confining said particulate matter loosely therein, said particulate matter cooperable with said fluid and said foraminous means to permit fluid to flow substantially freely in said passage means in response to vibrations of a predetermined amplitude while progressively throttling fluid flow through said passage means in response to vibrations of greater amplitude wherein the density of said particulate matter corresponds substantially to the density of the working fluid which oscillates between the chambers.

6. In a vibration isolating device having a housing with at least one flexible wall portion movable in response to vibrations imparted thereto, a partition dividing the housing into at least two chambers for containing a working fluid displaceable in response to movement of the flexible wall, an inertia track passageway providing fluid communication between the chambers, and decoupling means cooperable with the inertia track passageway to control fluid flow between the chambers, the improvement wherein the decoupling means comprises:

passage means in said partition providing fluid communication between said chambers,

foraminous means provided at spaced locations in said passage means for defining a cavity having a predetermined volume in said passage means,

a mass of particulate matter contained within said cavity and occupying less than said volume when at rest therein, the particles composing said particulate matter having a density corresponding substantially to the density of the working fluid,

said particulate matter being movable in said cavity in response to fluid movement therein between a dispersed condition providing minimum resistance to fluid flow and a compacted condition in engagement with said foraminous means providing maximum resistance to fluid flow, whereby the vibration isolator functions quietly over a range of vibration frequencies and amplitudes.

4,709,908

STABILIZER DEVICE FOR AUTOMOBILE SUSPENSION SYSTEMS

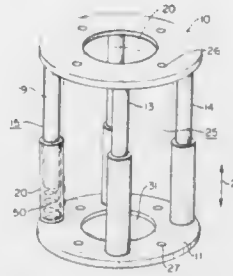
Gerald Joseph, 1275 15th St., Fort Lee, N.J. 07024, and Joseph Berta, 827 Linden Ave., Ridgefield, N.J. 07657

Filed Nov. 22, 1985, Ser. No. 800,957

Int. Cl.⁴ F16F 5/00

U.S. Cl. 267-140.4

10 Claims



1. A stabilizer suspension housing for enclosing an elastomeric inflatable bag for use as a suspension assembly in a vehicle, comprising:

top and bottom annular seat members spaced apart, one from another, residing in relatively congruent relationship, each of said members having a central aperture and corresponding extending arms which telescopically engage to

enable said top and bottom seat members to reciprocate with respect to one another with the space between said top and bottom seat members being coupled together by said arms forming an enclosure for said elastomeric inflatable bag, with end portions of said bag when accommodated within said housing being positioned within each central aperture of said annular seat members.

4,709,909

RETENTION STRAP IN A GRID ASSEMBLY FIXTURE

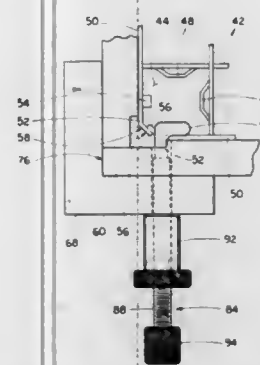
Robert Duncan, Fork Township, Lexington County, and Wade H. Widener, Cayce, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1985, Ser. No. 809,703

Int. Cl.⁴ B25B 1/20

U.S. Cl. 269-41

7 Claims



1. An improved retention strap for maintaining a fuel assembly grid in an assembled condition during manufacture thereof, said grid including outer grid straps defining the periphery of the grid and having respective opposite end portions which together in pairs at inner and outer terminal edges thereof overlap one another to form a plurality of corners of the grid, said retention strap comprising:

(a) a plurality of members extending along the respective outer grid straps, between respective corners and about the periphery of the grid when the grid is in the assembled condition;

(b) means interconnecting said members so as to form a plurality of substantially squared corners located generally outwardly of and adjacent to the corners of the grid; and

(c) means mounted at said squared corners being operable for engaging selected ones of the end portions of the outer grid straps forming the respective corners of the grid to pull outwardly on the end portions and secure them respectively adjacent said squared corners of said retention strap in order to prevent distortion of the grid corners during welding of the respective outer grid strap end portions to form the grid corners;

(d) said operable means engaging only said ones of said outer grid strap end portions having said inner ones of said overlapped terminal edges thereon, the location of engagement of said operable means with said outer grid strap end portions being displaced from the location of overlap of said terminal edges with one another such that said engaged outer grid strap end portions can be secured by said operable means in contact adjacent said respective squared corners of said retention strap.

4,709,910

REMOVABLE DIVIDER WALL CELL WHEEL

APPARATUS FOR PROCESSING PRINTED PRODUCTS
Werner Honegger, Tann Rütli, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

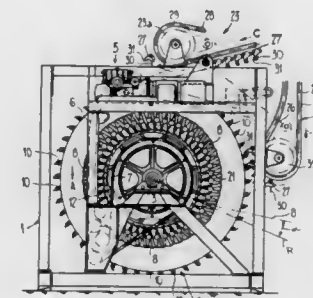
Filed Feb. 9, 1987, Ser. No. 12,808

Claims priority, application Switzerland, Feb. 14, 1986, 602/86

Int. Cl.⁴ B65H 5/30

U.S. Cl. 270-55

7 Claims



1. An apparatus for processing printed products, especially for stuffing inserts into the printed products, comprising: a cell wheel having a substantially horizontally extending longitudinal axis and a periphery; means for rotatably driving said cell wheel about said substantially horizontally extending longitudinal axis; said cell wheel comprising a plurality of compartments each having a lengthwise direction of extent; each of said plurality of compartments being open at said periphery of said cell wheel for receiving the printed products;

means provided for each compartment for advancing the printed products in the lengthwise direction of extent of each said compartment and serving for forwardly feeding the printed products in each compartment in the direction of said substantially horizontally extending longitudinal axis of said cell wheel;

at least one removable divider wall operatively associated with each compartment;

each said removable divider wall extending into each said associated compartment of said plurality of compartments and dividing each said compartment into two feed channels for the printed products;

said means for advancing the printed products having an operative region in the associated compartment thereof; said removable divider wall of each said associated compartment being located exterior to said operative region of said means for advancing the printed products in the associated compartment and being detachably connected to said cell wheel; and

said means for advancing the printed products stuffed into said feed channels in each said associated compartment being capable of conjointly advancing the printed products in each said compartment.

4,709,911

AUTOMATIC SHEET FEEDING DEVICE

Eisaku Saiki, Yokohama, and Masataka Kawauchi, Ishioka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 578,110, Feb. 8, 1984, abandoned. This application Mar. 6, 1987, Ser. No. 22,958

Claims priority, application Japan, Feb. 16, 1983, 58-22725

Int. Cl.⁴ B65H 3/52

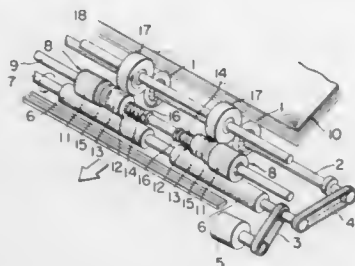
U.S. Cl. 271-10

6 Claims

1. An automatic sheet feeding device for successively feeding sheets from a stack of sheets by separating the sheets, each sheet having a substrate and a material applied to a surface of the substrate so the material side of the sheet has a higher

coefficient of friction than the substrate side of the sheet, the device comprising:

- feeding means for feeding the sheets from said stack of sheets;
- separating means cooperating with said feeding means for separating the sheets, such that said material side of the sheet to be fed tends to be separated from the substrate side of an adjacent sheet when a friction force acts on the material side of the sheet to be fed as a result of each sheet being in contact with said separating means during feeding, so as to allow the sheets to be fed one by one by said feeding means, a coefficient of friction of the separating



- means with respect to the sheets being lower than the coefficient of friction of the feeding means with respect to the sheets and higher than a coefficient of friction of one sheet with respect to another sheet;
- torque regulating means for regulating a torque applied to said separating means;
- rotating means for rotating the separating means through said torque regulating means; and
- wherein said separating means are maintained in engagement with the rotating means and feeding means in such a manner that the separating means can be rotated freely in a direction in which the sheets are fed and in a direction opposite to the direction in which the sheets are fed.

4,709,912

APPARATUS FOR SEPARATING AND CONVEYING SHEET-LIKE ARTICLES

Egon Illig, Stuttgart, and Volkmar Kniep, Esslingen, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.v., Fed. Rep. of Germany

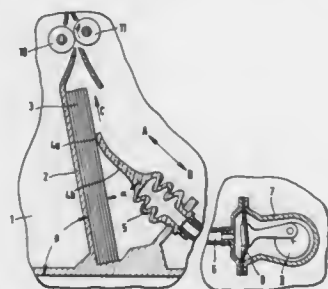
Filed Mar. 12, 1986, Ser. No. 839,047

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1985, 3508737

Int. Cl.⁴ B65H 3/24

U.S. Cl. 271—42

16 Claims



1. An apparatus for separating and transporting sheet-like articles from a stack of sheet-like articles, comprising:
 - a stacking table for holding the stack of sheet-like articles and defining a transport direction into which the sheet-like articles are to be transported from the stack;
 - a pair of conveyor rollers arranged at a predetermined dis-

tance from the stack in the transport direction for conveying the sheet-like articles further in the transport direction; continuously reciprocating drive means for generating a reciprocating movement in a predetermined direction toward and away from the stack, said predetermined direction being inclined with respect to the transport direction by a predetermined angle; and a friction element attached at one end to the drive means and extending away from the drive means in said predetermined direction, said friction element including at its other end an elastic portion which can be flexed elastically away from said predetermined direction, said elastic portion being arranged to impinge on the uppermost one of the sheet-like articles at least during a part of that portion of the reciprocating movement directed toward the stack thereby bending said elastic portion and increasing the pressure exerted by said elastic portion on the uppermost one of the sheet-like articles, and to be straightened at least during a part of that portion of the reciprocating movement directed away from the stack thereby decreasing the pressure exerted on the uppermost one of the sheet-like articles.

4,709,913

STORAGE CASSETTE FOR FILM PROCESSING SYSTEM

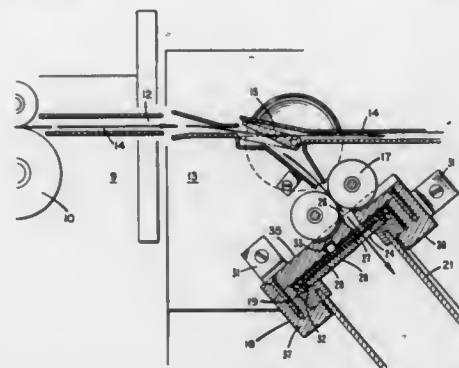
Lee B. Cagey, Fairfax, Va., assignor to LogEtronics, Inc., Springfield, Va.

Filed Nov. 5, 1986, Ser. No. 927,030

Int. Cl.⁴ B65H 31/00

U.S. Cl. 271—207

4 Claims



1. In a system for transferring film material sheets to a processing system, and alternatively diverting said sheets to a storage cassette, a removable light-tight cassette for storing said film material sheets comprising:

- a mounting bracket for supporting a rectangular enclosure in a position for receiving said sheets, said bracket including a rectangular channel having a base with a first longitudinal extending slot for passing said material sheets, and first and second lateral camming slots, the first of said camming slots beginning on one side of said longitudinal slot, extending parallel to said longitudinal slot and thence at an angle away from said longitudinal slot, said second camming slot beginning at an opposite side of said longitudinal slot extending parallel to said longitudinal slot and thence at an angle thereto, ending at a point between said longitudinal slot and said first camming slot; and
- a cassette for storing said film material sheets comprising a rectangular flange having a width and thickness for being received in said rectangular channel, said flange having a slot which aligns with said material passing slot;
- a spring biased door supported for movement in the plane of said flange to cover said slot, said door being movable between a covering position and an uncovering position, said door including on opposite ends two upstanding camming tabs, each located on an opposite side of said material passing slot and positioned to be received in one of said camming slots; and

an enclosure connected to said flange for receiving and storing said material sheets.

4,709,914

ELECTRONIC CONTROLLER FOR DISPENSERS AND THE LIKE

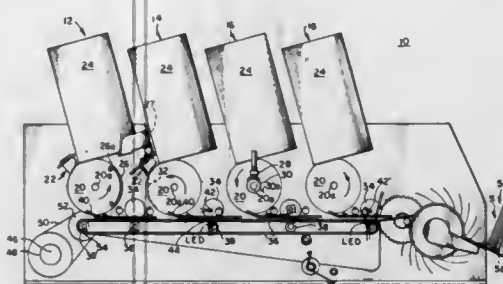
Lawrence D. Taylor, Lansdale, Pa., assignor to Brandt, Inc., Bensalem, Pa.

Filed Feb. 7, 1985, Ser. No. 699,055

Int. Cl.⁴ B65H 7/12

U.S. Cl. 271—263

14 Claims



1. An adaptive density measurement technique for use on sheets normally moving one-at-a-time between a light source and a sensor which generates an output whose value D represents sheet density; comprising the steps of:
 - sampling the sensor output at N intervals as the sheet is passing the sensor where N > 1;
 - summing the value D which for the first sheet is represented by the sum

$$S_0 = \sum_{n=1}^N D_n$$

forming N additional sums S₁ through S_m of the values D such that each sum

$$S_m = \sum_{n=1}^{N-m} D_n$$

where m = 1, 2, . . . N-1;

- sampling the next sheet N times to obtain density samples; summing the samples D_{n2} for the next sheet to form a sum S₀₂ such that

$$S_{02} = \sum_{n=1}^N D_{n2}$$

comparing S₀₂ with S₀; halting sheet movement if |S₀₂-S₀| > V where V is a first predetermined value.

4,709,915

SORTING APPARATUS

Tadashi Ishikawa, Urawa; Kazuhiro Matsuo, Tokyo, and Aki-mitsu Hoshi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 663,678, Oct. 18, 1984, abandoned.

This application Feb. 18, 1987, Ser. No. 17,032

Claims priority, application Japan, Oct. 22, 1983, 58-197869

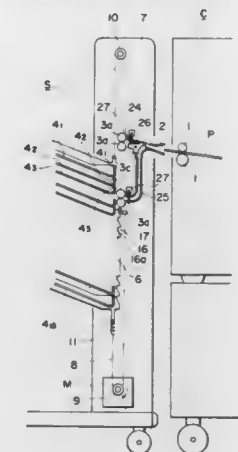
Int. Cl.⁴ B65H 39/11

U.S. Cl. 271—288

8 Claims

1. A sorting apparatus, comprising:
 - a plurality of trays arranged in substantially a vertical direction and movable in said direction;

- a first sheet inlet for receiving a sheet material and directing it to one of said trays;
- a second sheet inlet, disposed at a level lower than said first sheet inlet, for receiving the sheet material and directing it to said trays;
- guiding means for guiding the sheet materials only to said first sheet inlet in a non-sorting mode operation, and for guiding the sheet material only to said second inlet in a sorting mode operation; and



- driving means for holding said one of said trays at a position for receiving the material from said first sheet inlet in the non-sorting mode operation and for setting, in the sorting mode operation, a topmost one of said trays for sorting, substantial alignment with said second sheet inlet and then driving said trays upward to sequentially dispose said plural trays a substantial alignment with said second sheet inlet.

4,709,916

BOWLERS GRIP EXERCISER

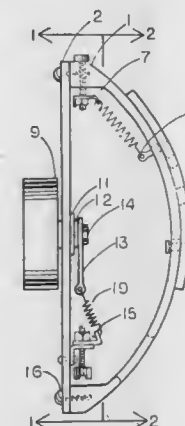
Dean Clark, Box 1821, Riverton, Wyo. 82501

Filed Mar. 10, 1986, Ser. No. 837,901

Int. Cl.⁴ A63B 5/00, 21/02; A61H 1/02

U.S. Cl. 272—67

2 Claims



1. In a device for exercising a bowler's fingers, hand and wrist wherein the improvement comprises:
 - a. an arcuate chord shaped casing having the same radius as a bowling ball;
 - b. two slidable arcuate members with finger grips spring tensioned in the finger extended position;
 - c. longitudinal slots in the arcuate casing for guiding the movement of the finger grips;
 - d. a thumb grip on the arcuate casing;

- e. the position of the finger and thumb grips simulating the arrangement of the finger holes on a bowling ball;
f. means for tensioning the movement of the finger grip members towards the thumb grip;
g. a rotatable hand grip knob on the bottom of the exerciser; and
h. said rotatable hand grip knob spring tensioned in torsion with respect to the casing.

4,709,917

MOCK BICYCLE FOR EXERCISE AND TRAINING EFFECTS

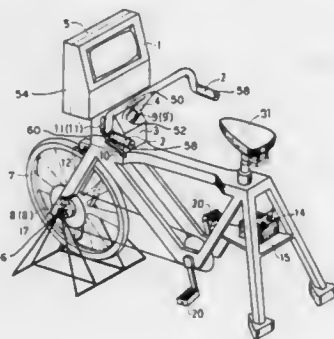
Tai-her Yang, 5-1, Tai-Pin Street, Kuang-Hwa Li, Si-Hu Jenn, Chang-Hwa Hsien, Taiwan

Continuation of Ser. No. 414,876, Sep. 3, 1982, abandoned. This application Apr. 29, 1985, Ser. No. 726,961

Int. Cl.⁴ A63B 21/00

U.S. Cl. 272-73

2 Claims



1. An exercise apparatus comprising:
a frame for supporting a user;
first mechanical means, rotatably journaled to said frame, for being rotated by the feet of a user;
velocity sensing means, coupled to said first mechanical means, for producing a first signal proportional to the angular velocity of the rotation of said first mechanical means;
second mechanical means, rotatably journaled to said frame, for being manipulated between a first and a second position by the hands of the user;
position sensing means, coupled to said second mechanical means, for producing a second signal indicative of the position of said second mechanical means;
electronic simulation means, mounted to said frame and responsive to said first and second signals, for providing a changing visual scene simulating road conditions, said scene simulating inclines and declines in said simulated road conditions, the rate of change of said scene responsive to said first signal, the position of said scene with respect to said user responsive to said second signal;
resistance control means, responsive to said simulated inclines and declines, for automatically applying a variable braking torque to said first mechanical means, wherein said resistance control means includes multi-pole A.C. synchronous induction motor means, mechanically coupled to said first mechanical means, for converting the rotational energy of said first mechanical means to electrical energy, said electrical energy being fed back to said motor means when said first mechanical means is rotated at an angular velocity exceeding the synchronous speed of said motor means, said motor means converting said fed back electrical energy to braking torque for braking said first mechanical means; and
one-way transmission means for coupling braking torque produced by said motor means to said first mechanical means whenever said first mechanical means is rotated at an angular velocity exceeding the synchronous speed of said motor means, and for permitting said first mechanical

means to freely rotate at a velocity less than the synchronous speed of said motor means.

4,709,918

UNIVERSAL EXERCISING APPARATUS

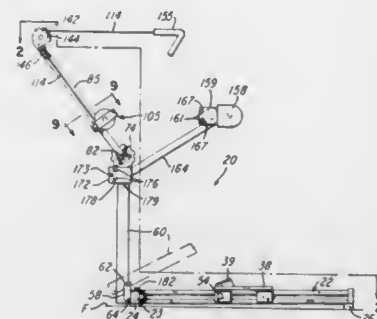
Arkady Grinblat, 52 Fairfax St., Somerville, Mass. 02144

Filed Dec. 29, 1986, Ser. No. 946,910

Int. Cl.⁴ A63B 69/18, 21/04

U.S. Cl. 272-97

20 Claims



1. Apparatus for performing a variety of body exercises, comprising an elongated generally horizontal base frame having first and second end portions, a pair of foot support members, means mounted on said base frame and supporting said foot members for corresponding longitudinal movement along generally parallel spaced paths, a generally vertical column having a lower end portion and an upper end portion, means for securing said lower end portion of said column to said first end portion of said base frame, a pair of arms each having inner and outer end portions, means connecting said inner end portions of said arms to said upper end portion of said column and providing for substantial rotation of said arms about a generally horizontal axis and for substantial pivotal movement of each said arm about an axis transverse to said horizontal axis, means for locking said arms at different rotary and pivoted positions, a spring retractable reel operatively connected to each said arm and having a flexible cable with a free end portion, means for directing each said cable from said outer end portion of the corresponding said arm generally horizontally regardless of the position of said arm, a handle grip member connected to said free end portion of each said cable, and a one-way clutch and adjustable brake mechanism associated with each said reel to provide for selecting the force required to extend each said cable according to the selected exercise being conducted on said apparatus.

4,709,919

EXERCISE MACHINE

Richard A. Cano, 1118 Cypress, Pueblo, Colo. 81004

Continuation-in-part of Ser. No. 93,046, Nov. 13, 1979, abandoned. This application Apr. 19, 1982, Ser. No. 369,820

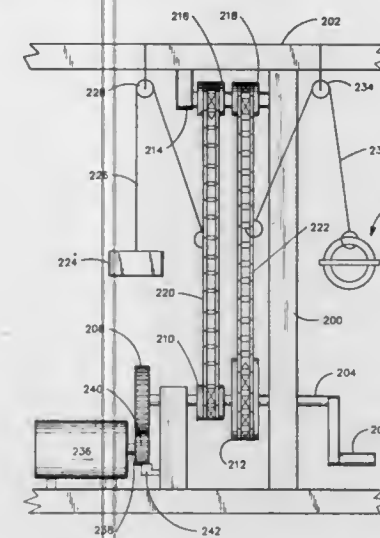
Int. Cl.⁴ A63B 21/06

U.S. Cl. 272-117

9 Claims

1. A machine for use in exercising a human body comprising:
a frame;
a first sprocket mounted on and rotatable relative to said frame;
a second sprocket mounted on and rotatable relative to said frame;
an axle mounted on and rotatable relative to said frame;
a third sprocket fixedly mounted on said axle;
a fourth sprocket fixedly mounted on said axle;
a first endless chain intermeshing with said first sprocket and said third sprocket and a second endless chain intermeshing with said second sprocket and said fourth sprocket whereby said first, second, third and fourth sprockets rotate concurrently;
a weight connected to and suspended by said first endless

chain, whereby concurrent rotation of said first, second, third and fourth sprockets causes a concomitant vertical displacement of said weight; and



means for causing concurrent rotation of said first, second, third and fourth sprockets, said rotation causing means connected to said second endless chain and said rotation causing means adapted for forceful contact with a limb of the user's body.

4,709,920

EXERCISING APPARATUS

Josef Schnell, Sportweg 9, Ortsteil Peutenhausen, 8899 Gachenbach, Fed. Rep. of Germany

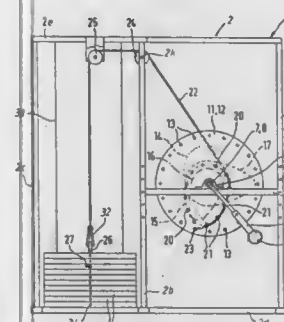
Filed May 22, 1986, Ser. No. 866,217

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539796

Int. Cl.⁴ A63B 21/06

U.S. Cl. 272-117

17 Claims



1. Exercising apparatus, comprising:
a frame;
a user-actuated member connected to said frame;
weight means for providing resistance during an exercise;
force transfer means operatively connected to said weight means and to said user-actuated member; and
adjusting means for providing varying moment arms to allow a modification of the resistance as provided by said weight means without changing the initial position of said user-actuated member, said adjusting means being interposed between said force transfer means and said user-actuated member and selectively defining a plurality of paths for guiding said force transfer means to allow each muscle of a human body to be exercised according to its capability in each phase of motion.

4,709,921

WEIGHTED INSOLE

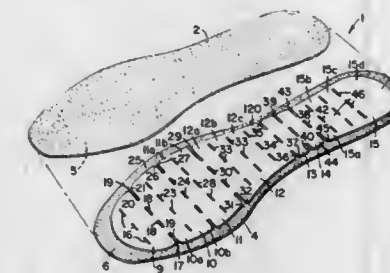
Antonette G. Valukas, and Ralph Valukas, both of 2098 Highwood Ave., St. Paul, Minn. 55119

Filed Mar. 5, 1986, Ser. No. 836,439

Int. Cl.⁴ A63B 23/04; A64B 21/18

U.S. Cl. 272-119

5 Claims



1. A weighted insole adapted to be placed inside of a shoe comprising:
(a) a first sheet of a flexible material having the planform of a shoe sole;
(b) a relatively dense base member, the base member having a planform substantially identical in shape, but somewhat smaller in dimension, than the first sheet of flexible material, the base member possessing a series of lateral perforations, the perforations defining joints within the base member such that the base member has sufficient flexibility to conform to foot movement;
(c) a second sheet of a flexible material having a planform substantially identical to the planform of the first sheet; and
(d) an adhesive for securing the first sheet, the base member and the second sheet in a layered relationship such that the base member is permanently constrained between the first and second sheet, the adhesive being applied to the first sheet and the second sheet such that the first and second sheet are secured together and the base member is constrained between the first and second sheet.

4,709,922

BARBELL SUPPORT APPARATUS FOR WEIGHT LIFTING EXERCISING

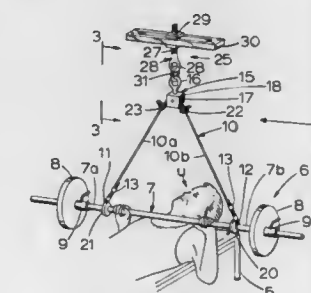
James R. Slade, Jr., 45 Cedar Hill Rd., Randallstown, Md. 21133, and Richard F. Sterba, 9536 Bauer Ave., Baltimore, Md. 21236

Filed Jan. 21, 1986, Ser. No. 821,162

Int. Cl.⁴ A63B 13/00

U.S. Cl. 272-123

4 Claims



1. In a barbell support means for adjustably supporting a barbell from a fixed support above a user in position for the barbell's being raised from a starting position and lowered to a rest position by said user in exercising, the barbell support means including a fixed support and an elongate member having means for attachment to a first end of the barbell, said

elongate member extending over a portion of said fixed support and having means for attachment to a second end of the barbell, the improvement comprising in combination: means for protecting a user from injury consequent to the user's raising the barbell from a starting position at a selected angle and lowering it to a rest position at an angle different from that of the starting position, consisting of: first and second stops mounted on the elongate member on opposite sides of the fixed support, said portion of the fixed support being anti-friction means for permitting the elongate member to pass freely back and forth over the fixed support anywhere between the first stop and the second stop when supporting the barbell, for return of the barbell to said starting position.

4,709,923

PORTABLE EXERCISE MACHINE

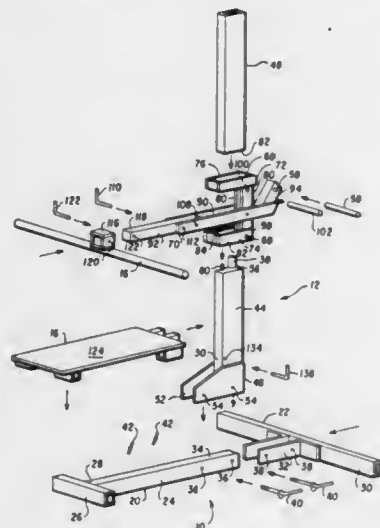
Christopher S. Gibson, 403 St. Ronan St., New Haven, Conn. 06511

Continuation-in-part of Ser. No. 669,680, Nov. 9, 1984, Pat. No. 4,618,144. This application Oct. 20, 1986, Ser. No. 922,077

Int. Cl.⁴ A63B 21/00

U.S. Cl. 272-134

15 Claims



1. A portable self-contained exercise machine kit in a compact, hand-transportable, generally rectangular configuration readily assemblable for performing upper and lower body exercises comprising

a first base member having a longitudinal extending section and a transverse section,

a second base member having an elongated section and being configured for detachable connection to said first base member to form a stable ground-engaging base for an exercise machine, said first and second base members having cooperating means for readily detachable interconnection such that said elongated section is disposed generally parallel to said transverse section of said first base member,

first and second stanchion members having cooperating means for readily detachable interconnection to form an elongated support stanchion, said first stanchion member having means for detachable connection to said base so that said support stanchion extends vertically upward from said ground engaging base,

an exercise arm assembly for performing upper and lower body exercises having a pivotal exercise arm detachably mountable to said support stanchion so as to extend over said base and means for detachably mounting said exercise arm to said support stanchion at a plurality of selected vertical positions,

an elongated handle member having means for detachable connection to said exercise arm,

a bench member for mounting on said base for sitting and lying position exercises, said first and second base members, said first and second stanchion members, and said handle member being substantially no longer than said bench member and being nested with said exercise arm assembly against said bench member to form a substantially rectangular compact configuration for transport and storage, and means for maintaining said first and second base members, said first and second stanchion members, said exercise arm assembly, said handle member, and said bench member in said compact configuration.

4,709,924

ADJUSTABLE BATTING TEE

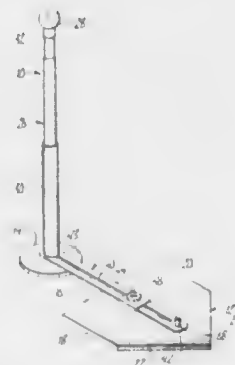
Richard A. Wilson, and Joseph C. Barbaglia, both of Centerville, Iowa, assignors to Robert L. Wright, Des Moines, Iowa

Continuation-in-part of Ser. No. 626,886, Jul. 2, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 783,852

Int. Cl.⁴ A63B 69/40

U.S. Cl. 273-26 R

8 Claims



1. An adjustable batting tee for use on ground and floor support surfaces, comprising:

a first plate member positioned on said support surface;

a second plate member positioned on said support surface and spaced apart from said first plate member, said second plate member having substantial area for contact with said support surface but being smaller in area than said first plate member;

an upright ball support means attached to said second plate member for supporting a ball to be hit; and

an elongated flexible armature having a first end connected to said first plate member by a first fastener means and a second end connected to said second plate by a second fastener means, at least one of said first and second fastener means being adjustable such that the relative position of said second plate member with respect to said first plate member is selectively adjustable;

said second plate member being adapted to tip on said support surface in response to a bat impacting said ball or said ball support means such that said armature flexes upwardly between the ends thereof to absorb the forces of impact and thereby minimizes transmission of forces from said ball support means to said first fastener means and whereby movement of said first plate member with respect to said support surface is substantially eliminated.

4,709,925

TACTILE TRAINING DEVICE FOR A TENNIS RACKET HANDLE

C. Elmon Gatlin, 620 E. Twigg, Tampa, Fla. 33602

Continuation of Ser. No. 682,803, Dec. 17, 1984, abandoned, which is a continuation of Ser. No. 431,797, Sep. 30, 1982, abandoned. This application Jan. 27, 1986, Ser. No. 823,128

Int. Cl.⁴ A63B 69/38

U.S. Cl. 273-29 A

9 Claims



1. A training device for tactually indicating to a player whether the player's hand has properly gripped the handle of a racket for forehanded play and for backhanded play, with the proper forehanded play position being defined as gripping the handle such that the racket face is substantially parallel to the heel of the player's hand and with the proper backhanded play being defined as gripping the handle ninety degrees from the proper forehanded play position, comprising in combination:

an elongated member; means for connecting said elongated member relative to the butt of the racket in a non-rotatable position substantially parallel to the face of the racket such that said elongated member bears evenly against the heel of the player's hand when the player has properly gripped the racket in the forehanded position, thereby tactually indicating to the player whether the racket is properly oriented for forehanded play; and

said elongated member including a contoured recess configured to comfortably receive the outer edge of the player's hand when the player's hand has been rotated substantially ninety degrees from the forehanded play position to the backhanded play position with the elongated member unchanged in its location relative to the handle thereby tactually indicating to the player whether the racket is properly oriented for backhanded play.

4,709,926

ELECTORAL COLLEGE GAME

Leo C. DiEgidio, 10512 Northfield Rd., Northfield, Ohio 44067

Continuation of Ser. No. 544,097, Oct. 21, 1983, abandoned.

This application May 15, 1986, Ser. No. 867,418

Int. Cl.⁴ A63F 3/00

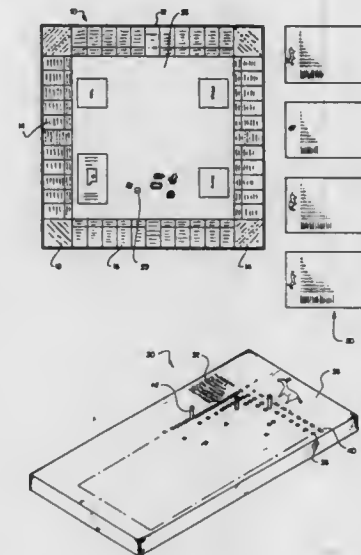
U.S. Cl. 273-257

8 Claims

1. A political campaign game for simulating the electoral college of the United States, comprising:

a game board having a playing surface defining a plurality of playing zones which establish a continuous path, one of said playing zones providing a starting position from which play is commenced, said playing zones including: a first group of popular vote-obtaining zones each of which contains the names of a predetermined number of voting areas selected from fifty states and the District of Columbia, at least two of the zones of said first group containing the name of the same voting area; and a second group of political occurrence zones containing instructions for the drawing and using of cards; a player scoring means for each player, each scoring means

having a scoring surface with indicia indicating a candidate from a political party, a list of voting areas, and a score registering means for indicating the percentage of popular votes received in each voting area; a plurality of distinct play pieces representing candidates from different political parties, each piece being selected and used by a player and moved along the continuous path; a chance means for randomly determining the number of playing zones a play piece may be moved during a given player's turn; a plurality of state cards, each of said cards having indicia setting forth the number of electoral votes available in that voting area, each of said state cards being presented to a player upon that player attaining 50 percent of the popular vote in that state; and



a plurality of political occurrence cards containing instructions for controlling the actuation of said score registering means by a player, said political occurrence cards including:

cards which set forth a speech made by the player who draws that card and which causes popular votes to be gained or lost in predetermined voting areas; cards setting forth events likely to occur during the course of a campaign, which cards instruct the player drawing a given card to gain or lose popular votes in predetermined voting areas; and cards which permit the player drawing a given one of the cards to enter into agreements with the other players regarding the gain or loss of votes in predetermined voting areas or the gain or loss of state cards.

4,709,927

GAME BOARD CONSTRUCTION

Thomas L. Cline, Hanover, Pa., assignor to Corra-Board Products Co., Inc., Hanover, Pa.

Filed Sep. 15, 1986, Ser. No. 907,416

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

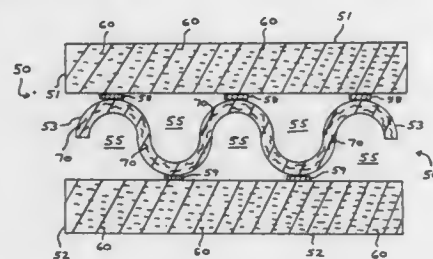
Int. Cl.⁴ A63F 3/00; B32B 3/28, 7/02

U.S. Cl. 273-286

1 Claim

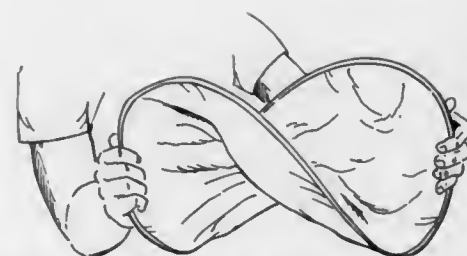
1. A game board structure (10) having a solid left panel (20), a solid right panel (21) and a foldable middle section (25), said panels (50) having an overlay (51) comprised of chipboard material having relatively shorter fiber lengths (60) contained therein, said chipboard material being solid and devoid of perforations or apertures, said panels having an underlayer (52) comprised of chipboard material having relatively shorter fiber lengths (60)

contained therein, said chipboard material being solid and devoid of perforations or apertures, said panels further having an undulating midstratum layer (53) between said overlayer (51) and underlayer (52), wherein the upper undulation portions of said midstratum layer (53) are secured directly to said overlayer (51) by adhesive means (58), and wherein the lower undulation portions of said midstratum layer (53) are secured directly to said underlayer (52) by adhesive means (59), said panels providing means wherein air cells (55) are formed internally thereof such that a given game board caliper or thickness may be maintained while reducing the number of chipboard layers required for construction,



wherein said undulating midstratum layer (53) has relatively longer fiber lengths (70) contained therein as compared to the relatively shorter fiber lengths (60) contained in said overlayer (51) and said underlayer (52), wherein the average fiber length (60) of said overlayer (51) and said underlayer (52) is two millimeters or less, wherein the average fiber length (70) of said undulating midstratum layer (53) is five millimeters or more, wherein said air cells (55) are formed between said overlayer (51) and said underlayer (52) by way of said undulating midstratum layer (53) such that the overall weight of a panel (50) is reduced while improving panel strength via the spring-like effect of said midstratum layer and by the relatively longer fiber lengths (70) contained in said midstratum layer.

ration for storage, said spring-like member being in the form of a length of thin metal, whose ends have been joined together



after insertion into said tubular member to form the endless ring serving to keep said playing surface taut.

4,709,929

GAME BOARD

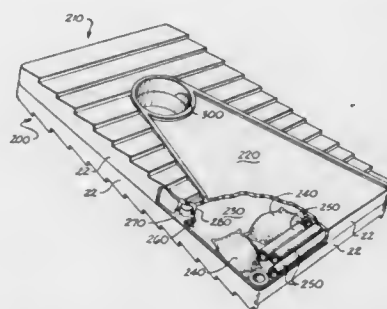
Russell C. Mills, 113 Oak, Elmhurst, Ill. 60126, and Stewart C. Jager, 266 W. Norman, Wheeling, Ill. 60090

Filed Mar. 23, 1987, Ser. No. 28,965

Int. Cl.⁴ A63B 67/00

U.S. Cl. 273-402

20 Claims



4,709,928

CIRCULAR GAME BOARD FOLDABLE INTO SMALL VOLUME

W. Preston Willingham, 1399 1/2 Miller Ave., Winter Park, Fla. 32789

Filed Jun. 19, 1986, Ser. No. 876,119

Int. Cl.⁴ A63F 9/00

U.S. Cl. 273-309

18 Claims

1. A circular game board foldable into thirds for storage, comprising a circular playing surface bounded by a generally tubular member affixed around the periphery of said playing surface, a spring-like member disposed in said tubular member, which spring-like member normally serves to keep said playing surface in a taut condition, means for securing the ends of said spring-like member together so as to create an endless ring, said game board being readily foldable into a smaller configu-

18. A game apparatus having a pair of separable target members adapted to receive similar but distinguishable playing pieces tossed thereat, said apparatus comprising:

a pair of generally planar target members separably engageable in back-to-back relationship for portability and storage thereof, and adapted to be placed in play positions when separated, wherein each of said target members have target surfaces which generally include a relatively centralized scoring opening, a structurally-designated scoring area, and a plurality of baffle-configured projections disposed on said target surface in complement to said scoring opening and scoring areas.

4,709,930

SHAFT AND SEALING RING

Hans Forch, Birkenau, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

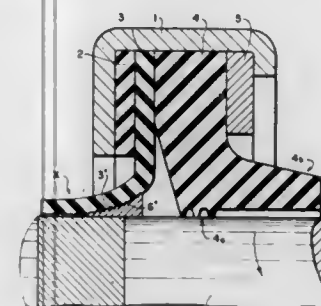
Filed Mar. 6, 1985, Ser. No. 708,704

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418738

Int. Cl.⁴ F16J 15/32, 15/54

U.S. Cl. 277-68

6 Claims



1. In a seal combination of a shaft with a polymeric sealing ring thereabout, the ring having an inner, sealing surface which flares against a counter surface on the shaft to form a dynamic fluid-sealing zone therebetween upon relative rotation of the shaft and ring, the improvement comprising:

first hydrodynamically-acting feed-back means having a first spiral groove on the sealing surface of the ring for pumping fluid which seeps into the dynamic sealing zone upon the relative rotation; and

second hydrodynamically-acting feed-back means having a second spiral groove on the counter surface of the shaft for pumping fluid which seeps into the dynamic sealing zone upon the relative rotation,

said first spiral groove having at least one dimension of its pitch and depth dimensions, respectively, which is different from that of said second spiral groove;

wherein said first and second feed-back means have different pumping actions with a net axial component of said pumping actions in an axial direction along the shaft.

4,709,931

SEAL FOR DAMPERS ON MOTOR VEHICLES

Keiichi Shimizu, Sanae Kikuchi, and Hitoshi Nakano, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

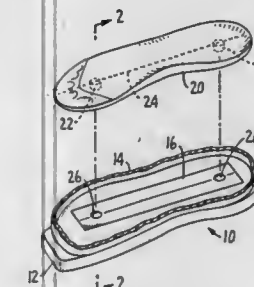
Filed Jun. 9, 1986, Ser. No. 872,161

Claims priority, application Japan, Jun. 13, 1985, 60-128645

Int. Cl.⁴ F16J 15/32

U.S. Cl. 277-153

9 Claims



1. A seal for use in a damper having a fluid cylinder, a piston axially slidable in the cylinder, and a piston rod secured to the piston, said seal comprising an annular contacting portion adapted to be held in contact with the outer peripheral surface of said piston rod and a resilient connecting portion having one end joined to said contacting portion and the other end

adapted to be secured to the inner peripheral surface of said cylinder, said contacting portion being movable with said piston rod when the piston rod is moved with respect to said cylinder in a higher-frequency, smaller-amplitude range.

4,709,932

DOUBLE WIPER SEAL ARRANGEMENT

Roy Edlund, Stuttgart, Fed. Rep. of Germany, and Jorgen Hom, Holte, Denmark, assignors to Busak & Luyken GmbH and Co., Stuttgart, Fed. Rep. of Germany

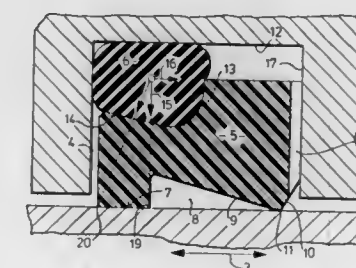
Filed Jan. 30, 1987, Ser. No. 9,298

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603669

Int. Cl.⁴ F16J 15/32

U.S. Cl. 277-165

5 Claims



1. Double wiper arrangement comprising a wiper ring made from a tough elastic material and fitted in the groove of one of two machine parts which are movable in a direction perpendicular to the said groove, and a stressing ring made from a rubber-elastic material, arranged between the wiper ring and the base of the groove and loading the wiper ring in the radial direction, the wiper ring being provided on its one end with a surface portion which rests flat against the other machine part, with an edge near its other end which rests against the other machine part and which is formed by the line of intersection of two conical surfaces rising outwardly and towards the flat surface portion, respectively, and with a recess arranged on its side facing the base of the groove, opposite the flat surface portion, for receiving the stressing ring, characterized by the combination of the following features:

(1) the said groove is only little larger than the width of the said wiper ring, and the depth and width of the said recess as well as the dimensions of the said stressing ring are adapted to each other in such a manner that

(a) the said wiper ring is retained in the groove in contact with the flank of the groove which is opposite to the said stressing ring, at least under normal operating conditions, and

(b) the maximum of pressure exerted by the said stressing ring is situated above the inner edge of the said flat surface portion,

(2) the recess extending concentrically to the base of the said groove rises towards the end of the said wiper ring so that the space accommodating the said stressing ring gets narrower towards the end of the said wiper ring and the force exerted by the said stressing ring produces a contact pressure which declines at least nearly linearly along the said flat surface portion, starting from its inner end, but is still defined at the outer end thereof, and

(3) the end face adjacent the outer conical surface is provided with radial relief grooves.

4,709,933

TEMPERATURE TRANSIENT RESISTANT SEAL

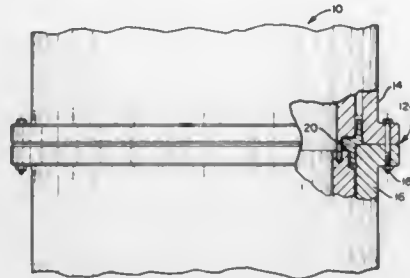
Frank C. Adamek, Pasadena, and Charles D. Bridges, Houston, both of Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Apr. 16, 1987, Ser. No. 39,060

Int. Cl.⁴ F16J 15/06

U.S. Cl. 277—167.5

5 Claims



1. A temperature transient resistant seal apparatus for sealing a circumferential joint in a cylindrical pressure vessel comprising:

- said pressure vessel including an upper cylinder, a lower cylinder, means for securing said upper and lower cylinders against relative axial movement, an inwardly facing upper seal surface on said upper cylinder, and an inwardly facing lower seal surface on said lower cylinder;
- a substantially cylindrical seal ring including an inwardly extending rib having exposed upper and lower surfaces;
- an upwardly extending first cantilever arm of substantially cylindrical form, integral with an outboard portion of said rib;
- a first outwardly facing seal surface located on an upper portion of said first cantilever arm;
- a downwardly extending second cantilever arm of substantially cylindrical form, integral with an outboard portion of said rib;
- a second outwardly facing seal surface located on a lower portion of said second cantilever arm;
- said cantilever arms each joining said rib with a smooth radius, whereby stress concentrations are avoided and conduction of heat from said rib to said cantilever arms is facilitated;
- said first seal surface engaging said inwardly facing surface on said upper cylinder;
- said second seal surface engaging said inwardly facing surface on said lower cylinder;
- the length of each cantilever arm from rib to said outwardly facing seal surface being greater than the minimum thickness of the respective cantilever arm.

4,709,934

VEHICLE LEVELING SYSTEM

Hideo Suzuki, Kunihide Okamoto, Yasuyuki Hayashi, and Mitsuru Aiba, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Showa Seisakusho, Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 811,943

Int. Cl.⁴ B60G 17/00

U.S. Cl. 280—6 R

10 Claims

- 1. A vehicle leveling system comprising:
 - a pneumatic leveling unit for adjusting the height of a vehicle body in response to supply and discharge of a gas pressure to and from the pneumatic leveling unit;
 - gas pressure generator means for generating the gas pressure to be supplied to said pneumatic leveling unit;
 - valve means pneumatically connected to said leveling unit and said gas pressure generator means;
 - control means for controlling said gas pressure generator means and said valve means to supply the gas pressure to and discharge it from said pneumatic leveling unit, said control means being arranged such that when the gas is to be discharged from said pneumatic leveling unit for reducing the height of the vehicle body, the control means controls said release valve to intermittently open and close the same according to the output signal of said pressure sensor for thereby reducing the pressure of the gas in said pneumatic leveling unit at a substantially constant speed.

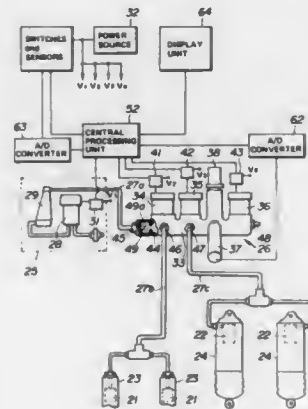
said passage into and out of communication with the atmosphere;

control means for controlling said gas pressure generator means and said valve means to supply the gas pressure to and discharge it from said pneumatic leveling unit;

said control means including switch means and a pressure sensor detecting gas pressure in said passage and generating a pressure output signal representing the detected gas pressure, gas pressure in said pneumatic leveling unit being detectable by said pressure sensor when said passage communicates with said pneumatic leveling unit;

said control means being operable in response to commands applied by said switch means and the output signal from said pressure sensor; and

said control means including means operable after the height of the vehicle body has been adjusted for effecting a pressure checking process by closing said control valve, then opening said release valve to vent said passage to the atmosphere, then closing said release valve, and then measuring the gas pressure in said passage with said pres-



sure sensor and determining whether the measured pressure in said passage is substantially equal to the atmospheric pressure.

5. A vehicle leveling system comprising:

- a pneumatic leveling unit for adjusting the height of a vehicle body in response to supply and discharge of a gas pressure to and from the pneumatic leveling unit;
- gas pressure generator means for generating the gas pressure to be supplied to said pneumatic leveling unit;
- valve means pneumatically connected to said leveling unit and said gas pressure generator means;
- control means for controlling said gas pressure generator means and said valve means to supply the gas pressure to and discharge it from said pneumatic leveling unit, said control means being arranged such that when the gas is to be discharged from said pneumatic leveling unit for reducing the height of the vehicle body, the control means controls said release valve to intermittently open and close the same according to the output signal of said pressure sensor for thereby reducing the pressure of the gas in said pneumatic leveling unit at a substantially constant speed.

4,709,935

REAR WHEEL STEERING SYSTEM

Shozo Takizawa, Okazaki; Kazuyoshi Kobayashi, Oobu; Kazuo Fukuyama, Okazaki; Masanori Tani, Okazaki; Shoji Yamamoto, Okazaki; Hiroo Yuasa, Nagoya; Masayoshi Nishimori, Okazaki; Hiroaki Yoshida, Okazaki; Shinichi Eto, Okazaki; Eiji Hirao, Okazaki, and Masaki Goto, Nagoya, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

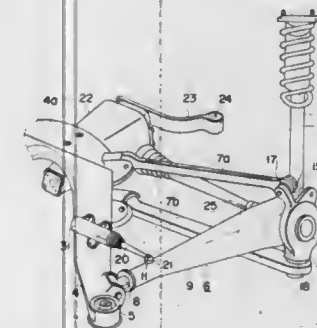
Filed Jul. 8, 1986, Ser. No. 883,097

Claims priority, application Japan, Jul. 15, 1985, 60-155522; Nov. 8, 1985, 60-250495; Nov. 8, 1985, 60-172085[U]; May 30, 1986, 61-125276

Int. Cl.⁴ B62D 5/06; B60G 7/04

U.S. Cl. 280—91

6 Claims



1. A rear wheel steering system comprising:

- a trailing arm having a rear portion connected to the rear wheel for rotatably supporting the rear wheel, said trailing arm having a front end pivotally coupled to a vehicle body, and extending substantially longitudinally of the vehicle body;
 - upper and lower lateral arms having lateral outward ends pivotally coupled to the rear portion of the trailing arm by means of a ball joint, and lateral inward ends pivotally coupled to the vehicle body; and
 - steering means having one end pivotally coupled to the trailing arm, for displacing the trailing arm,
- said trailing arm including a first arm having front and rear ends, said front end pivotally coupled to the vehicle body, and a second arm having front and rear ends, said rear end coupled to the wheel,
- said rear end of the first arm and said front end of the second arm being pivotally coupled to each other and forming an angle therebetween and said rear end of the second arm being pivotally coupled to each of the lateral outward ends of said lateral arms,
- said steering means being capable of moving said trailing arm in a plane of the vehicle body to thereby control the angle formed between said first arm and said second arm.

4,709,936

STEERING ASSEMBLY FOR MOTOR VEHICLE

Yutaka Tashiro, and Sholchi Sano, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1986, Ser. No. 905,755

Claims priority, application Japan, Sep. 11, 1985, 60-201430; Sep. 11, 1985, 60-201431

Int. Cl.⁴ B62D 5/06; 3/02

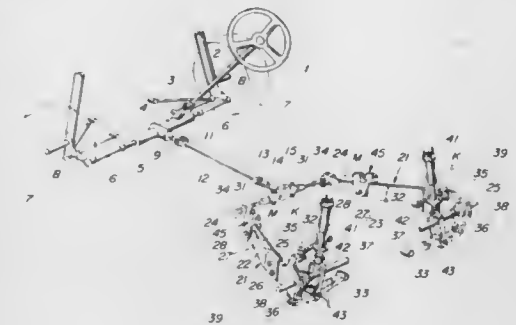
U.S. Cl. 280—91

14 Claims

- 1. A steering assembly in a motor vehicle, comprising:
 - a trailing arm pivotally supported on a pivot shaft extending substantially transversely of the motor vehicle and rotatably supporting a wheel at a rear end thereof;
 - a first link having one end pivotally coupled to said trailing arm and extending substantially transversely of the motor

vehicle to a second end opposite the one end that is operatively coupled to said steering gear box;

a second link having one end pivotally coupled to an upper portion of said trailing arm at a rear end thereof by a link in the vicinity of a steering center about which said wheel is steerable and having a second end opposite the one end pivotally supported on a vehicle frame of the motor vehicle;



a third link having one end pivotally coupled to a lower portion of said trailing arm at the rear end thereof by a link in the vicinity of a steering center about which said wheel is steerable with a straight line serving as a kingpin axis for steering said wheel passing through the joints connecting the second and third links to the trailing arm, the third link further having a second end opposite the one end pivotally supported in a vehicle frame of the motor vehicle; and a steering gear box for steering the wheel.

4,709,937

TWO-WHEELED COMBINATION ROLLER SKATE-SKI

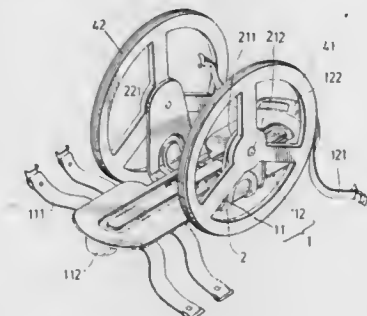
Jerry Lin, Brian Lin, and Tiung-Jen Lin, all of No. 215, Sec. 2, Chang Chiang Rd., Panchiao City, Taiwan

Filed Aug. 20, 1986, Ser. No. 898,333

Int. Cl.⁴ A63C 17/04

U.S. Cl. 280—11.2

5 Claims



1. A roller skate comprising:

- a telescopic flat base member including a front base plate and a rear base plate which overlap and are slideable relative to one another, each base plate having two parallel longitudinal guide grooves extending therein and two longitudinally elongated positioning apertures spaced apart from one another and extending in each of said grooves, said positioning apertures of said front base plate being in register respectively with said positioning apertures of said rear base plate;
- screw means to penetrate through said positioning apertures and to adjustably clamp said front and rear base plates against one another;
- two wheels to be mounted on said base member;
- safety foot straps attached to said base member for retaining a player's foot on said base member,

a telescopic transverse frame for mounting said wheels which includes a left frame and a right frame each of which has a horizontal plate portion underlying and clamped against said base member, and an upstanding portion extending upward from said horizontal plate portion past one of the sides of said base member, said horizontal plate portions of said left and right frames being slideable relative to one another, overlapping one another, and having four transversely elongated openings to register with said positioning apertures to receive said clamping screw means, and two wheel mounting shafts projecting horizontally outwardly from said upstanding portions of said left and right frames at a height which permits said wheels to be rotatably mounted with the centers thereof substantially higher than said telescopic frame; and a brake member removably attached to the underside of said front base plate.

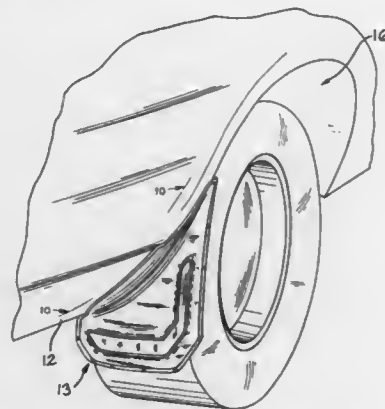
4,709,938

SPLASH GUARD

Douglas K. Ward, and Jerry N. Moscovitch, both of Toronto, Canada, assignors to Powerflow, Inc., Buffalo, N.Y.
Filed Nov. 18, 1985, Ser. No. 799,332
Int. Cl.⁴ B62B 9/14

U.S. Cl. 280—154.5 R

18 Claims



1. A splash guard for use on auto vehicle having a body panel including a flange defining a wheel well opening curved in a plane of cross section longitudinal of the vehicle and a body surface curved in a plane of cross section transverse to the vehicle, the splash guard being formed of a material which is sufficiently elastic to permit deformation during installation but sufficiently inelastic to substantially retain its shape once installed on a vehicle, the splash guard comprising:

- a body portion having, in an upright plane of cross section when the splash guard is in use, a curved contour;
- the body portion including an upper section having an outer surface and an opposed curved surface adjacent a mounting part of the body portion, the mounting part having a wheel well flange engagement surface adapted to engage and cover a section of such wheel well flange when in use;
- the mounting part having a curvature in an upright plane of cross section substantially equal to or greater than the curvature of a wheel well flange of substantially any vehicle of intended use whereby when in use such mounting part either remains undistorted or is distorted into a condition of lesser curvature;
- the body portion also including a lower splash deflecting section of a transverse dimension greater than the remainder of the body portion and greater than the transverse dimension of any original equipment tire on any such vehicle of intended use;
- the splash deflecting section being dish-shaped to provide enhanced vehicle splash protection when in use;
- the splash guard also including a flange portion project-

ing from the body portion in a direction that is rearwardly when in use, the flange portion being curved transversely of the body portion in a contour substantially complementary to the adjacent opposed surface such that the flange portion and the opposed surface define spaced extremities of the wheel well flange engagement surface;

- the flange portion including a body panel engagement surface at an acute angle with the flange engagement surface in a plane of cross section longitudinal of the vehicle when the splash guard is in use;
- the flange portion also having an outer surface contoured to a configuration which disguises any deformation of the flange portion which may occur when the splash guard is in use and the panel engagement surface of the flange portion is in deforming engagement with a body panel of the vehicle; and,
- the flange portion being sufficiently deformable and having sufficient elasticity to effect a seal between the flange portion and the body panel and any decorative trim or the like secured to the panel.

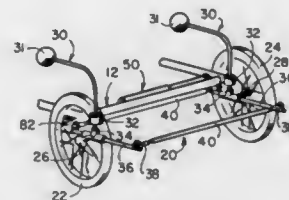
4,709,939

FRONT WHEEL CENTERING MECHANISM FOR WHEELCHAIRS

Raymond Stewart, 9026 Horley Ave., Downey, Calif. 90240
Filed Nov. 3, 1986, Ser. No. 925,967
Int. Cl.⁴ B62M 1/14

U.S. Cl. 280—242 WC

12 Claims



1. A wheelchair comprising a frame supporting a seat, a pair of rear wheels mounted in fixed orientation relative to said frame and having driving handwheels thereon, a linkage forming a parallelogram structure with hinged corners, a pair of front wheels mounted on said parallelogram structure in mutually parallel alignment and movable by said parallelogram structure in adjustable alignment relative to said rear wheels, steering means coupled to said parallelogram structure to selectively adjust the alignment of said front wheels, and a centering means for returning said front wheels to said steering means including a first member coupled to said parallelogram structure, a second member coupled to said frame in longitudinally offset, overlapping reciprocal fashion relative to said first member, and spring biasing means acting to urge said first and second members toward relative longitudinal positions defining a predetermined distance of overlap.

4,709,940

STORAGE APPARATUS FOR HITCH AND HITCH TORSION BARS WHEN NOT IN USE

Jack L. Mishler, 6607 Avenue 396, Dinuba, Calif. 93618
Filed Oct. 23, 1986, Ser. No. 922,209
Int. Cl.⁴ B60D 1/14

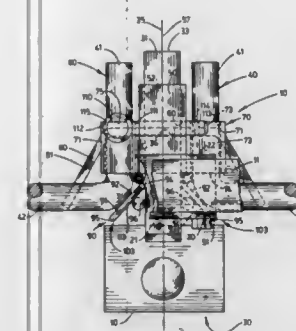
U.S. Cl. 280—405 R

10 Claims

1. A storage apparatus for a detachable hitch assembly and a pair of spring bars, the apparatus mounting the detachable hitch assembly and the pair of spring bars on a supporting structure, the apparatus comprising:

- a hitch receiving member that defines a channel which is adapted to receive in fixed relation therein the detachable hitch assembly, the hitch receiving member further having an outside surface, which mounts a bracket adapted to

be secured on the supporting structure, and a pin receiving station is formed in the hitch receiving member for receiving a locking pin, said locking pin adapted to secure the detachable hitch assembly in secure mating relationship internally of the hitch receiving member; spring receiving members mounted on the outside surface adapted to receive and deploy the spring bars in a secured predetermined attitude; and



a pivotally mounted door mounted in close proximity to the channel of the hitch receiving member for releasably interlocking the spring bar in secure mating engagement with the spring receiving members, said pivotally mounted doors having a locking member mounted thereon that positions the pivotally mounted door in a closed attitude when the detachable hitch assembly is received in secure mating engagement internally of the hitch receiving member to prevent the removal of the spring bars from the spring receiving members.

4,709,941

TELESCOPIC ADJUSTING CRANK FOR TRACTOR 3-POINT HITCH

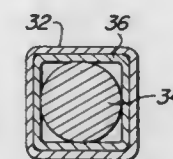
Werner Öbel, Ludwigshafen, and Klaus Zahn, Ostringen, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Jun. 3, 1986, Ser. No. 870,194
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519987

Int. Cl.⁴ A01B 63/118

U.S. Cl. 280—461 A

3 Claims



1. In a tractor having an operator's station and a 3-point hitch including draft links, lift arms, and lift links interconnecting the draft links and the lift arms, one of the lift links being adjustable in length by rotation of a part thereof, a variable length crank for the rotatable part of the adjustable lift link comprising: an upper tubular member having a non-circular interior, said upper member be mounted on the tractor for rotation in a position convenient to the operator station, a lower shaft having a lower end operatively connected to the rotatable part of the adjustable lift link, an upper portion of the shaft having an enlarged cross-section relative to the cross-section of the remainder of the shaft, said upper portion having an outer surface configuration complementary to the interior of the upper member and be slidably engaged in the upper member.

4,709,942

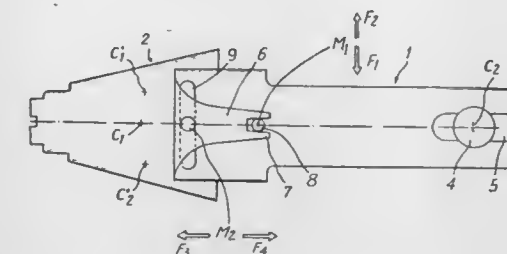
SAFETY SKI BINDING INCLUDING AN AUTOMATIC COMPENSATION MECHANISM

Jean-Pierre Dimier, Rumilly, and Pierre Rullier, Annecy, both of France, assignors to Salomon S.A., Annecy, France
Filed Mar. 11, 1985, Ser. No. 710,365

Claims priority, application France, Mar. 9, 1984, 84 03664
Int. Cl.⁴ A63C 9/081

U.S. Cl. 280—618

37 Claims



1. A safety binding having a front abutment for holding the front of a boot on a ski and a vertical pivot wherein said binding comprises:

- an element positioned under said boot wherein said element is adapted to pivot around a substantially vertical axis passing through said vertical pivot and wherein said element is adapted to be displaced in translation on in the longitudinal direction of said binding with respect to said vertical pivot, wherein said element comprises:
 - first means for linking said element to said front abutment, wherein said first linking means links said element to said front abutment during said longitudinal translational displacement of said element; and
 - second means for linking said element to said front abutment, wherein said second linking means links said element to said front abutment during said pivoting of said element around said vertical pivot, wherein said first and second linking means are distinct from one another.

4,709,943

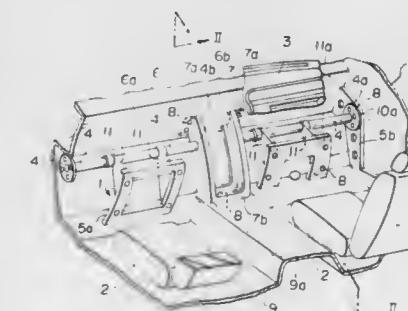
KNEE PROTECTOR STRUCTURE FOR VEHICLE
Toshiteru Yoshimura; Takayuki Kobayashi, and Masayoshi Ono, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Jul. 15, 1986, Ser. No. 885,675
Claims priority, application Japan, Jul. 17, 1985, 60-158828; Jul. 24, 1985, 60-114287; Jul. 29, 1985, 60-117041; Jul. 29, 1985, 60-117042

Int. Cl.⁴ B60R 21/04

U.S. Cl. 280—751

28 Claims



1. A knee protector structure for a vehicle comprising a transverse frame member extending in the transverse direction of the vehicle body below an instrument panel provided in front of the front of the front seat, bracket an upper portion of

which is connected to a body panel in front of the front seat substantially at the middle between right and left sides of the vehicle body and a lower portion of which is connected to the floor of the vehicle body, said frame member being connected to the cabside at an outer end portion and to the center bracket at an inner end portion, and a knee pad supported by a bracket member connected to the frame member at a front end portion and to the knee pad at a rear end portion, said bracket for supporting the knee pad comprising a first portion connected to the knee pad at a rear end portion and a second portion connected to the frame member at a front end portion, the first and second portions being connected together by a mounting member passed through a slit formed in one of the first and second portions.

4,709,944

STEERING WHEEL FOR VEHICLES

Suzuaki Hongo; Minoru Niwa, both of Ichinomiya; Takahiro Hashiba, Aichi; Mitsuru Harata, Nagoya; Ichiro Hirata, Gifu; Isamu Ito, Inazawa, and Akihiko Sonobe, Nagoya, all of Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai, Japan

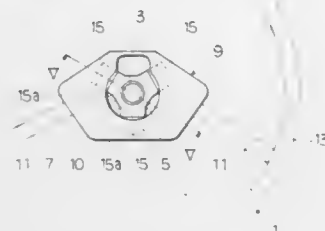
Filed May 8, 1986, Ser. No. 860,795

Claims priority, application Japan, May 9, 1985, 60-98821; May 9, 1985, 60-98822; Oct. 29, 1985, 60-242230

Int. Cl.⁴ B62D 1/08; B60R 21/02

U.S. Cl. 280-777

5 Claims



1. A steering wheel for vehicles, comprising:

- a rim;
- two spokes each having a radially inner end and radially outer end, the two spokes having respective outer ends thereof secured to said rim thereby providing a spoke assembled body;
- a self-aligning plate connecting between said inner ends of said spokes and a boss, said self-aligning plate comprising a boss-fitting portion, a spoke-fitting portion and three plastically deformable arm portions arranged to extend in respective radial directions as a substantially Y-shaped array in an annular space formed between said boss-fitting portion and said spoke-fitting portion so as to interconnect said boss-fitting portion to said spoke-fitting portion;
- intermediate portions of said plastically deformable arm portions being curved;
- an intersection angle defined between the respective two adjacent said plastically deformable arm portions near the respective spokes mounted on said spoke-fitting portion being obtuse;
- and
- one of said two spokes being connected to said self-aligning plate between a pair of adjoining ones of said deformable arm portions, and the other of said two spokes being connected to said self-aligning plate between another pair of adjoining ones of said deformable arm portions.

4,709,945

PRISMATIC CONNECTION MEMBER FOR THE SUPPLY OF VALVES OR THE LIKE

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

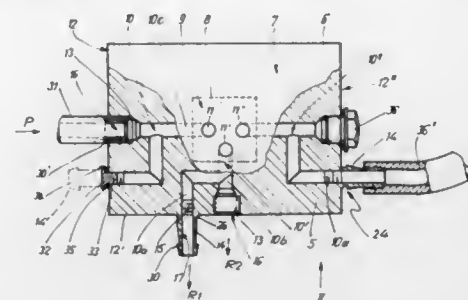
Filed Aug. 1, 1986, Ser. No. 892,509

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529276

Int. Cl.⁴ F16L 39/00

U.S. Cl. 285-4

20 Claims



1. In a connection member with a prismatic form adapted for having at least one valve mounted on it and having at least one duct therein, said duct extending from a first orifice at a valve mounting surface of the connection member adapted to carry such valve, to a second orifice on a connection side of the member, the improvement that at the connection side of said member the second orifice of the at least one duct in said connection member is in the form of both a socket with a female thread therein and a male nipple projecting from the connection side, both said socket and said nipple being connected with one of two sections of said at least one duct in said connection member to enable a length of pressure fluid lead to be connected with said male nipple and said socket alternatively at will.

4,709,946

LINED PIPE JOINT

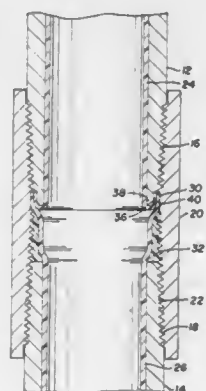
John J. Hunter, P.O. Box 3879, Abilene, Tex. 79603

Filed Feb. 20, 1987, Ser. No. 17,174

Int. Cl.⁴ F16L 9/14

U.S. Cl. 285-55

3 Claims



1. A pipe joint comprising:

- first pipe means having an external annular channel adjacent the end thereof and a continuous fluid impervious liner on the internal surface thereof extending around the end face of said first pipe means and into said external annular channel;
- second pipe means having a continuous fluid impervious liner on the internal surface thereof and extending from the end of said second pipe means; and
- sleeve means securing the ends of said first and second

pipe means together, said sleeve means having an internal channel positioned in register with said external channel in said first pipe means and securing the end of the liner extending from said second pipe means within said internal channel and overlapping the liner in said external annular channel, whereby the end of said first pipe means and said sleeve means coact to radially compress the overlapped portions of said liners.

4,709,947

PLUMBING FITTING FOR A MULTIPLE-LINE CONNECTION

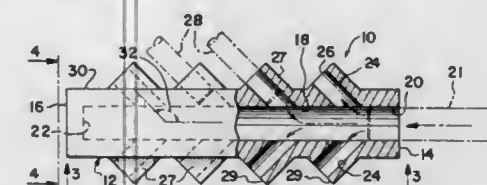
Donald L. Kniess, 124 Cedar Dr., West Milton, Ohio 45383

Filed Nov. 15, 1985, Ser. No. 798,651

Int. Cl.⁴ F16L 41/00

U.S. Cl. 285-150

4 Claims



1. A fitting for connecting a plurality of plumbing conduits, comprising:

- an elongated, hollow body having first and second ends, said body being formed as a single piece;
- said body defining a generally smooth outer surface, said body being square in cross section, said body thereby defining first and second opposed side walls along said outer surface, and having an inner central passageway extending from said first end to said second end;
- said central passageway defining at said first end an inlet opening having a circular cross section, said central passageway further being closed at said second end;
- said body further defining a plurality of branch passageways formed in a spaced relationship through said outer surface, each of said branch passageways opening through said outer surfaces at an outlet opening having a circular cross section, and opening into said central passageway;
- a number of first ones of said branch passageways being defined through said first side wall and an equal number of second ones of said branch passageways being defined through said second side wall, said first and second branch passageways further being arranged symmetrically along said central passageway;
- each of said first branch passageways being formed in parallel, each of said second branch passageways being formed in parallel; and
- each of said first and second branch passageways defining an angle in cooperation with a portion of said central passageway extending from said branch passageway to said inlet opening of 135°.

4,709,948

FIBRE REINFORCED POLYMERIC ARTICLE

Joel Archer, Nucourt; Denis V. Wassenbove, Crepy en Valois, both of France; Kenneth B. Pithouse, Swindon, England; Leslie J. Buck, Swindon, England; Jeffrey P. Molyneux, Swindon, England, and Peter S. Bradshaw, Swindon, England, assignors to Raychem Limited, England

Continuation-in-part of Ser. No. 767,300, Aug. 19, 1985, abandoned. This application Feb. 18, 1986, Ser. No. 830,387

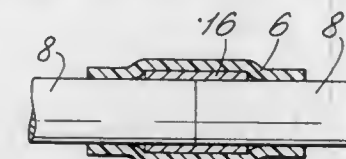
Int. Cl.⁴ F16L 25/00

U.S. Cl. 285-381

50 Claims

1. A method of coupling two substrates comprising (a) positioning to bridge contiguous portions of the substrates a coupling assembly comprising a heat-recoverable tubular driver and telescoped with the driver tubular coupling means comprising substantially unconsolidated fibre reinforcement and

heat-flowable polymeric material, and (b) applying heat to recover the driver and to cause the polymeric material to flow such that the recovering driver consolidates the coupling means, thereby coupling the substrates together, wherein the fibre reinforcement is provided by a braid and the fibres of the braid individually carry the polymeric material, which poly-



meric material has a sufficiently high softening temperature so that when the heat is applied to recover the driver the braid is caused to change its braid angle by slippage of the braid fibres at their cross-over points to conform to the shape of the recovering driver before further heating causes the polymeric material to flow such that the recovering driver consolidates the coupling means.

4,709,949

LATCH DEVICE

Takashi Umezawa, Sagami, and Koji Watanabe, Fujisawa, both of Japan, assignors to Nifco, Inc., Yokohama, Japan

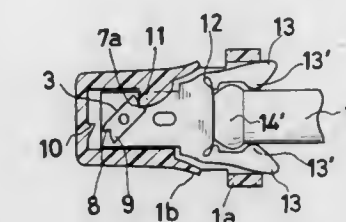
Continuation of Ser. No. 626,984, Jul. 2, 1984, abandoned. This application Jun. 23, 1986, Ser. No. 877,710

Claims priority, application Japan, Jul. 6, 1983, 58-103889[U]

Int. Cl.⁴ E05C 19/02

U.S. Cl. 292-6

16 Claims



1. A latch system defined between a stationary support structure and a closure movably mounted upon said support structure between an open, unlatched position, and a closed, latched position, comprising:

- a cylinder fixedly mounted upon said stationary support structure;
- a strike fixedly mounted upon said closure;
- a rod, having strike-engaging means disposed thereon, and movably mounted within said cylinder between a first, strike-released outer position, and a second, strike-clamped inner position;
- first means disposed within said cylinder for biasing said rod toward said first, strike-released outer position;
- means disposed within said cylinder for releasably retaining said rod, and therefore said strike and said closure, in said second, strike-clamped inner position, and said closed, latched position, respectively;
- said strike being provided upon the leading end thereof with a radially expanded portion;
- said strike-engaging means of said rod comprising a central, strike-engaging portion for contact engagement with said leading end of said strike when said closure, and said strike and rod, are moved from said open, unlatched, and first strike-released outer, positions, respectively, toward said closed, latched, and second strike-clamped inner, positions, respectively, against the biasing force of said first biasing means; and a pair of strike-engaging arms projecting outwardly from opposite sides of said said central,

strike-engaging portion for envelopingly engaging said radially expanded portion of said strike therebetween, said arms being mounted upon said central, strike-engaging portion of said rod for accommodation within said cylinder when said closure, and said strike and said rod, are moved from said open, unlatched, and first, strike-released outer, positions, respectively, toward said closed, latched, and second strike-clamped inner, positions, respectively; and

rotary cam means mounted upon said rod for cooperation with said retaining means of said cylinder when said rod is moved from said first outer position to said second inner position so as to retain said rod at said second inner position such that said strike-engaging means are engaged with said closure strike whereby said closure is disposed in said closed state, and for disengaging said retaining means of said cylinder when an inwardly directed force is applied to said closed closure whereby said rod is able to move from said second inner position to said first outer position under the influence of said first biasing means so as to permit said strike-engaging means to disengage said closure strike such that said closure can assume said open state.

4,709,950

CRASH BAR DOOR LOCKING DEVICE

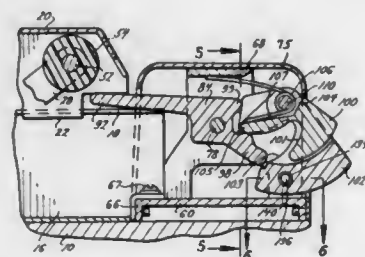
Zedekiah Z. Zortman, Steelville, Ill., assignor to American Device Manufacturing Co., Steelville, Ill.

Filed Jun. 21, 1984, Ser. No. 623,032

Int. Cl.⁴ E05B 65/10

U.S. Cl. 292—92

18 Claims



1. A door latch having a fire safety locking mechanism, to secure the latch in a locked position upon release of said safety lock mechanism, wherein the door latch has a latch bolt and a mounting bracket, the latch bolt having a transverse bore and the bracket having two transverse holes therein, the bracket being located on the door latch with the bore opening in alignment with the holes in the bracket, the latch bolt having two slidably received in the bore, each pin being biased against the other pin by a means for biasing located between the pins, the pins and the biasing means being retained in a compressed position by two plugs of fusible material frictionally engaged at either end of the bore to restrain the pins and biasing means in a compressed position out of engagement with the holes, whereby when the locking mechanism is exposed to heat sufficient to melt the fusible plugs, the pins are released and engage the holes in the bracket, securing the latch bolt in the locked condition.

4,709,951 OPEN LID LATCHING MECHANISM FOR AUTOMATIC WASHER

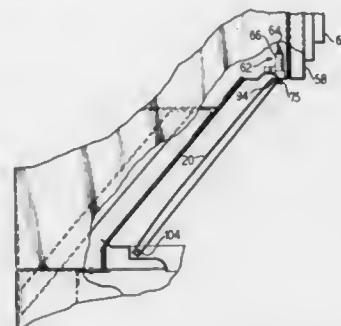
Harold S. Stacik, St. Joseph Township, Berrien County, and Warren R. Hafstrom, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 551,970, Nov. 15, 1983. This application Mar. 21, 1986, Ser. No. 843,918

Int. Cl.⁴ E05C 1/10

U.S. Cl. 292—189

9 Claims



1. A combination washer/dryer wherein a dryer unit is positioned above a washer unit, a pivotal lid, having a free front edge, being attached to the washer unit and pivotable toward the dryer unit, a dryer cabinet having a bottom wall facing said pivotal lid with an opening therethrough and a latching mechanism, said latching mechanism comprising:

a single piece latch guide mounted in said dryer cabinet and having a vertical passage therein overlying said cabinet bottom wall opening;

a latch pin carried in said vertical passage for limited vertical movement and being continuously biased downwardly by gravity;

said latch pin having a bottom end which protrudes through said opening in said dryer bottom wall being manually accessible below said dryer bottom wall for manual manipulation and being engagable by said free front edge of said pivotal lid;

said latch pin being oriented so that rotation of the washer lid engages said protruding end of said latch pin urging it upwardly until said front edge rotates past said end, said latch pin then dropping by gravity to positively latch the lid in an open position returning said latch pin end to the manually accessible location.

4,709,952

CHOKER HOOK ASSEMBLY

John S. Selby, Puyallup, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 1, 1986, Ser. No. 936,526

Int. Cl.⁴ B66C 1/38

U.S. Cl. 294—82.14

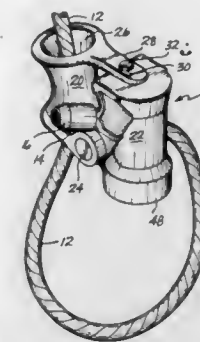
11 Claims

1. A choker assembly of the type having a substantially closed body and a pivotally mounted latch arm on the outside of the body having an open position and a locked position where the locked position will capture and hold the end of a cable-ferrule combination running to the assembly, having the improvement comprising:

a first opening in the choker assembly where the latch arm is in the locked position defined by a portion of the surface on the body and a portion of the inside surface on the latch arm and having a size large enough to allow the ferrule to pass therethrough,

a second opening in the choker assembly where the latch arm is in the locked position adjacent the first opening defined by another portion of the surface on the body and a portion of the inside surface on the latch arm and having

a size small enough to prevent the ferrule from passing therethrough, and



a gap between the first and second openings when the latch arm is in the locked position having a size to allow the cable to pass therethrough but not the ferrule.

4,709,953

ROLL HANDLING APPARATUS

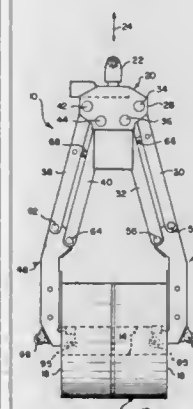
Gabriel J. Sirota, Gibsonia, Pa., assignor to Amco Industries, Inc., Ford City, Pa.

Filed Dec. 13, 1985, Ser. No. 808,758

Int. Cl.⁴ B66C 1/00

U.S. Cl. 294—106

23 Claims



1. A lifting leg for a tong means for grasping a roll having a horizontal eye comprising:

a. a frame means;

b. guide means supported by said frame means for yieldingly contacting the end of said roll and or horizontal and vertical movement relative to said frame means from a rest position to a displaced position; and,

c. a horizontal lifting deck affixed to said frame means for engaging said horizontal eye.

4,709,954

HAND CARRYING DEVICE FOR GARMENT HANGERS

Marlee Beyda, and Marilyn Beyda, both of 8537 Alcott St., Los Angeles, Calif. 90035

Filed Jul. 14, 1986, Ser. No. 885,304

Int. Cl.⁴ A45C 13/26; A45F 5/10

U.S. Cl. 294—142

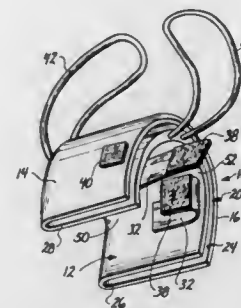
14 Claims

1. A carrier for garment hangers of the type having a hook for suspending the hanger from a horizontal rod or the like, said carrier comprising:

a carrier body having a longitudinal axis and at least one lower edge extending between the two carrier body ends; and

a hanger receiving slot extending within said body along said axis, said slot having a substantially constant hook-

shaped cross-section in a plane transverse to said longitudinal axis and being open at least at one of said body ends and along said lower edge said open lower edge communicating with said open end for laterally admitting and



supporting a plurality of garment hanger hooks side by side along said axis such that the hangers associated with said hooks may be carried together suspended from said carrier body.

4,709,955

DEVICE FOR TRANSPORTING TREES AND THE LIKE

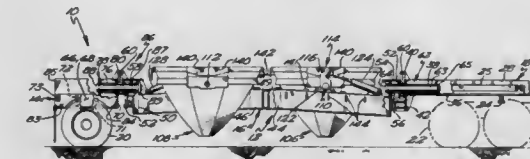
Douglas C. Peters, Chaska, and Charles S. Hansen, Eagan, both of Minn., assignors to Art Dahlquist, Burnsville, Minn.

Filed Feb. 6, 1987, Ser. No. 11,618

Int. Cl.⁴ B60P 3/00

U.S. Cl. 296—3

15 Claims



1. Trailer for transporting trees and the like comprising, in combination: a front frame section; a center frame section; a rear frame section, with the front frame section including means for connection to a powered vehicle, with the rear frame section including wheels for providing mobility along the travel surface; means for pivotably mounting the center frame section to the front frame section about a frame portion pivot axis; means for pivotably mounting the center frame section to the rear frame section about the frame portion pivot axis; at least a first pod for carrying the root ball of a tree and the like; means for pivotably mounting the pod to the center frame section about a pod pivot axis, with the frame portion pivot axis being perpendicular to the pod pivot axis; means for pivoting the pod about the pod pivot axis; and means for pivoting the center frame section about the frame portion pivot axis.

4,709,956

HANDY-CAP PICK-UP COVER

Lawrence S. Bowman, P.O. Box 779, Valley View, Pa. 17983

Filed Aug. 25, 1986, Ser. No. 900,290

Int. Cl.⁴ B60P 3/42

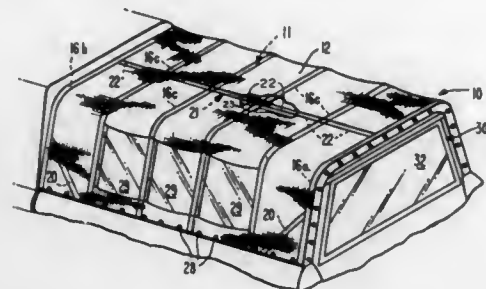
U.S. Cl. 296—100

7 Claims

1. A cover assembly for the bed of a pick-up truck having side walls provided with top edges comprising, in combination: a framework including a removable frame assembly and a pair of base rails permanently mounted on said side wall top edges,

said frame assembly including a pair of opposite end most and a plurality of intermediate inverted U-shaped frame members disposed in an upright spaced apart relationship

atop said base rails, angular braces joined between said end most frame members and said rails,
a locking bar comprising a plurality of adjacent tubular sections of rectangular stock each having respective end faces, hinge means joining at least certain of said locking bar section end faces in an opposed manner, opposed ones



of said end faces each provided with a semi-circular notch whereby,
adjacent ones of said semi-circular notches provide a circular opening surrounding respective ones of said intermediate frame members when said locking bar is in a longitudinal disposition to secure said frame members in a fixed relationship atop said base rails.

4,709,957

FRONT DOOR STRUCTURE FOR VEHICLE

Takegi Ohya, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

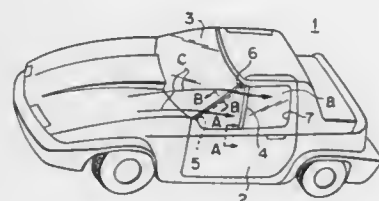
Filed Dec. 2, 1985, Ser. No. 803,554

Claims priority, application Japan, Dec. 4, 1984, 59-256697

Int. Cl.⁴ B60J 1/00

U.S. Cl. 296-146

8 Claims



1. A front door structure for a vehicle comprising an inner panel and an outer panel, a window sash having a closed cross section being formed by the inner panel and the outer panel wherein the window sash is divided into a front sash portion and a rear sash portion by a vertical dividing member, a windowpane is fixedly bonded to the front sash portion by bonding means to cover at least the windshield side edge portion of the front sash portion and the front sash portion is provided with at least one air discharge opening which is adapted to be communicated with an air duct of an air conditioner unit provided in the vehicle way of the interior of the window sash and opens toward the windowpane, means defining a space formed along said outer panel of the front sash portion between the outer panel and a forward portion of said windowpane and a connecting portion formed by said bonding means between the outer panel and a front edge portion of the forward portion of said windowpane, said space being formed rearward of said connecting portion, an air passage in the front sash portion communicating with said space between the outer panel and the forward portion of the windowpane via said at least one air discharge opening which opens into the outer panel so that air flows into said space through the at least one air discharge opening, hits an inner surface of the forward portion of the windowpane and disperses rearward of the at least one air discharge opening by rearward flow.

4,709,958 RIDABLE VEHICLE AND ASSEMBLY METHOD

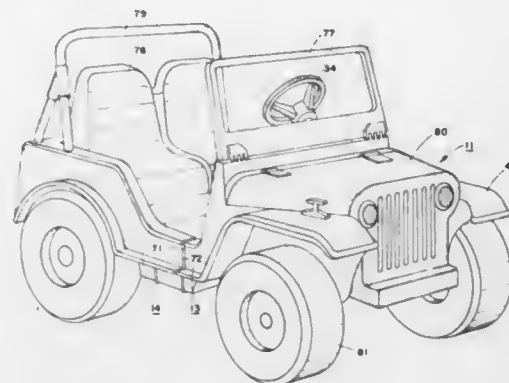
Lawrence R. Harrod, Fort Wayne, Ind., assignor to Kramco Manufacturing, Inc., San Francisco, Calif.

Filed Sep. 22, 1986, Ser. No. 910,019

Int. Cl.⁴ B62D 25/08; B62K 9/00

U.S. Cl. 296-177

7 Claims



1. A child's rideable vehicle comprising, in combination;
first and second complementary plastic body portions;
one of said body portions being the front and the other of said body portions being the rear of a body for a child's vehicle;
a frame including first and second longitudinal frame members each with an intermediate portion;
first and second inverted generally U-shaped sill portions on said first body portion adapted to overlie the intermediate portion of said first and second longitudinal frame members, respectively;
first and second inverted generally U-shaped sill portions on said second body portion adapted to overlap and be complementary to said first body portion sill portions;
an alignment aperture in each said sill portion; and
fasteners securing said overlapped sill portions to said frame at said alignment apertures.

4,709,959

SLIDING AND LIFTING ROOF

Jochen Paerisch, Herrenberg; Werner Herlemann, Aidlingen, and Walter Schaetzler, Stockdorf/Gauting, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting and Daimler-Benz AG, Stuttgart, both of, Fed. Rep. of Germany

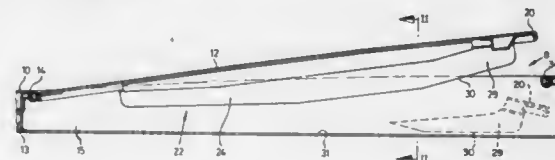
Filed Nov. 21, 1985, Ser. No. 800,409

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1984, 3442616

Int. Cl.⁴ B60J 7/22, 7/05

U.S. Cl. 296-217

21 Claims



1. Sliding and lifting roof for vehicles of the type having a rigid cover, which in a closed position closes a roof opening in a fixed roof surface, and therefrom, is selectively tiltable upwardly so as to raise a rear edge of the cover above the fixed roof surface, and lowerable for sliding displacement below the fixed roof surface, comprising a frame encircling at least part of the roof opening, said frame forming a rain gutter extending below opposite sides of the roof opening; and a strip-shaped shield element arranged at each of said sides of the cover so as to be essentially normal to the cover surface and substantially

flush with its edge, wherein a lower portion of each shield element is of a material sufficiently flexible to deform upon contact with said gutter or other fixed structure of the roof and the shield elements are fixedly connected with the cover along upper edges thereof, and wherein at least a major portion of a longitudinal extent of each lower portion laterally bears against a respective side edge of the roof opening when the cover is tilted upwardly, and wherein the flexible portion of each strip-shaped shield element is an extension of the strip-shaped shield element that is disposed so as to extend parallel to a plane within which the shield element is displaceable.

guide frame and slot means in any position of movement of the reclinable seat, and
means for rotating the shaft.

4,709,961

SELF-RELEASING RATCHET-TYPE SEAT ADJUSTMENT

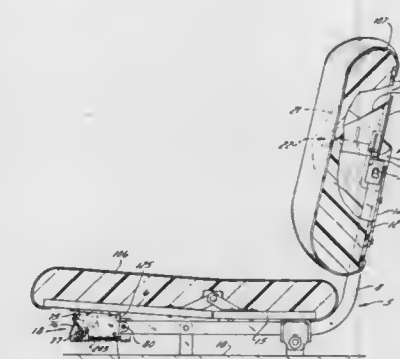
Kevin E. Hill, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Sep. 29, 1986, Ser. No. 912,495

Int. Cl.⁴ A47C 3/00, 7/46

U.S. Cl. 297-284

4 Claims



4,709,960

RECLINABLE CHILDREN'S CHAIR

Joaquín J. Launes, Barcelona, Spain, assignor to Play, S. A., Spain

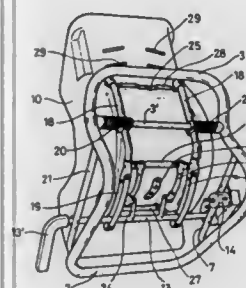
Filed Apr. 17, 1986, Ser. No. 852,993

Claims priority, application Spain, Apr. 24, 1985, 286732; Jun. 12, 1985, 287,400

Int. Cl.⁴ A47D 1/10

U.S. Cl. 297-250

8 Claims



1. Reclining children's chair for use as a portable chair on a vehicle seat in a motor vehicle, comprising
a base frame adapted to be placed on such a vehicle seat, and
a reclinable child's seat operatively slidably and guidably engaged with and supported by the base frame and movable generally longitudinally back and forth relative to the base frame selectively angularly between an upright rearward position and a reclined forward position,
guide frame supports interlocked to the base frame, and a generally vertically arcuate guide frame attached to the reclinable seat for movement therewith and guidably engaged with and supported by the guide frame supports, a rotatable transverse drive shaft mounted on the base frame and a connecting rod linkage operatively connecting the shaft to the reclinable seat for so moving the reclinable seat upon corresponding rotation of the shaft and including radial crank arm means on the shaft and connecting rod means correspondingly operatively connected at one end to the arm means and at the other end to an intermediate portion of the guide frame for transmitting rotational motion of the shaft as longitudinal motion to the reclinable seat,
limit means for limiting the movement of the reclinable seat between two opposing operative end positions corresponding to the upright and reclined positions of the reclinable seat and including generally longitudinal slot means in the guide frame provided with opposing forward and rearward slot end stop means, the shaft being arranged in the slot means for independently guidably engaging and supporting the guide frame thereat,
such that upon reclinable seat rearward movement to the upright rearward position, the forward slot end stop means will abut the shaft to limit further rearward seat movement, and in turn upon reclinable seat forward movement to the reclined forward position, the rearward slot end stop means will abut the shaft to limit further forward seat movement, and further
such that the guide frame supports and shaft on the base frame correspondingly guidably engage and support the

1. In a seat comprising a relatively stationary frame element and a seat element which is swingable in opposite adjustment directions between a pair of defined limits about an adjustment axis that is fixed in relation to the frame element and which is normally urged in one of said directions by its support of an occupant of the seat, adjustment means comprising ratchet means consisting of a ratchet member cooperable with a pawl member for holding said seat element against swinging in said one direction out of each of a plurality of defined adjustment positions to which it can be swung in the opposite adjustment direction, and a latch member cooperating with said ratchet means to provide for substantially free swinging of the seat element in said one direction to one of said limits in consequence of its being swung in said opposite direction to the other of said limits, said adjustment means being characterized by:

- one of said members of the ratchet means being fixed to one of said elements;
- the other of said members of the ratchet means
 - being confined to movement relative to the other of said elements in opposite ratcheting directions towards and from said one member that are substantially transverse to said adjustment directions, and
 - being biased in the ratcheting direction towards said one member for ratcheting engagement with it; and
- said latch member being carried by said other of said elements and confined to motion relative thereto in substantially said adjustment directions between defined latching and release positions;
- said latch member having means fixed thereon defining a first pair of abutments and said one of said elements having means fixed thereon defining a second pair of abutments, said abutments of each pair being arranged to cooperate with those of the other pair in defining a lost motion connection between said latch member and said one of said elements whereby the latch member is moved to a release position and to a latching position, respectively, by movement of the seat element to its said one limit and to its said other limit;
- said latch member and said other member of the ratchet means having cooperating driving surfaces
 - which are spaced apart when the latch member is in its release position,

- (2) which are engaged during motion of the latch member to its latching position, and
 (3) through which the latch member by that motion drives said other member of the ratchet means to a disabled position in which it is spaced from said one member of the ratchet means; and

F. cooperating latch member restraining means on said latch member and on a part carried by said other of said elements, said latch member restraining means being arranged

- (1) to be disengaged when the latch member is out of its latching position, but
 (2) to be engaged under the bias of said other member of the ratcheting means when the latch member is in its latching position, and
 (3) when engaged to releasably restrain the latch member against movement out of its latching position while the latch member retains said other member of the ratcheting means in its disabled position.

4,709,962

WORK CHAIR WITH A TILTING MECHANISM FOR SEAT SQUAB AND BACKREST

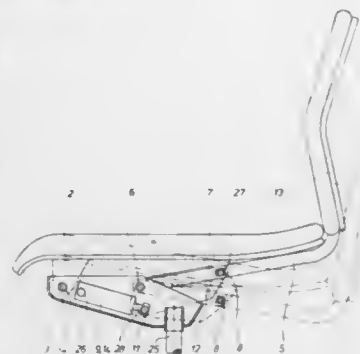
Joachim Steinmann, Meersburg, Fed. Rep. of Germany, assignor to Kloeber GmbH & Co., Fed. Rep. of Germany
 Filed Oct. 24, 1985, Ser. No. 790,933

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1984, 3438901; Oct. 24, 1984, 3438902

Int. Cl.⁴ A47C 1/032

U.S. Cl. 297—301

7 Claims



1. A work chair having a seat carrier, a seat squab having a front edge and a rear edge, a backrest carrier with a backrest and a lever arm extending from said backrest, a first pivotal connection being formed by a first axle adjacent the front edge for securing the seat squab to the seat carrier, a second pivotal connection being formed by a second axle securing a free end of the lever arm of the backrest carrier to the seat carrier, a third pivotal connection between the seat squab and backrest carrier, said third pivotal connection being formed by a third axle connecting said lever arm inward of the free end thereof to the rear edge of said seat squab with a loose connection having play so that the seat squab and backrest will pivot interdependently in the same direction, load element means for pivoting the seat squab and the backrest carrier into a position of rest under spring loading, said load element means comprising two parallel extending compression springs with a hydraulic locking element means disposed therebetween for adjusting the linear extension of each of said two springs, one end of the load element means being pivotally connected to a free end of the lever arm of the backrest carrier and the other end of the load element means being connected to the squab seat adjacent the first pivotal connection.

4,709,963

ADJUSTABLE OFFICE CHAIR

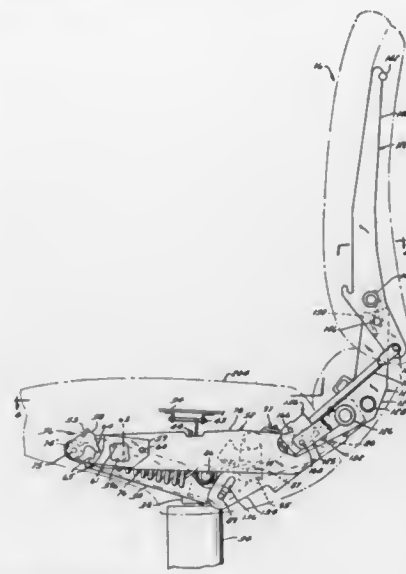
Ronald T. Uecker, Slinger, and Steven D. Slicker, Mequon, both of Wis., assignors to MILSCO Manufacturing Company, Milwaukee, Wis.

Filed Dec. 12, 1986, Ser. No. 940,953

Int. Cl.⁴ A47C 1/02

U.S. Cl. 297—316

22 Claims



1. A chair comprising:
 a base assembly (12);
 a seat assembly (14);
 a backrest assembly (16);
 connecting means to enable movement of at least one of said seat assembly (14) and said backrest assembly (16) from one position to another position relative to said base assembly (12) in response to force exerted by a chair occupant;
 means to apply a biasing force to bias said one assembly (14, 16) toward said one position and against the force exerted by said chair occupant during movement of said one assembly (14, 16) from said one position to said another position,
 said means comprising:
 at least one preloaded biasing spring (76) connected to said base assembly (12) and which is preloaded to exert a predetermined biasing force,
 and force transmitting means (87, 94, 95) connected to said biasing spring (76) and to said one assembly (14, 16) for transmitting biasing force from said preloaded biasing spring (76) to said one assembly (14, 16);
 and adjustable means (97, 100) operable upon said force transmitting means (87, 94, 95) to change the biasing force acting on said one assembly (14, 16) without changing said predetermined biasing force exerted by said biased spring (76).

4,709,964

VEHICLE REAR SEAT

Yasuyuki Seura, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Kanagawa, Japan

Filed Mar. 5, 1986, Ser. No. 836,479

Claims priority, application Japan, Mar. 22, 1985, 60-39858[U]

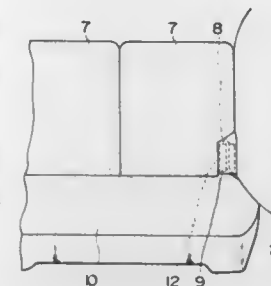
Int. Cl.⁴ B60N 1/02

U.S. Cl. 297—354

6 Claims

1. A rear seat located at a rear portion of a vehicle, including:
 a pair of cushions, one of said cushions being a cushioned

seat back, including a recess formed a lower bottom of a side thereof;
 the other of said cushions being a seat cushion, one of said cushions being reclinable relative to the other;
 a reclining device located in said recess;



a side finisher attached to a side of said vehicle and including a cover piece attached thereto; and
 wherein said cover piece extends from said side finisher across a front side of said recess, said cover piece shielding said reclining device located in said recess.

4,709,965

SEAT RECLINING APPARATUS

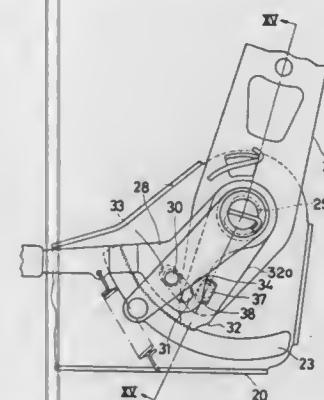
Kenichi Kazaoka, Nagoya, and Hiroshi Okazaki, Toyota, both of Japan, assignors to Aisin Seiki Kabushika Kaisha, Japan
 Filed May 11, 1984, Ser. No. 609,116

Claims priority, application Japan, Jun. 13, 1983, 58-105451

Int. Cl.⁴ B60N 1/02

U.S. Cl. 297—366

7 Claims



1. An apparatus for adjusting the inclination of a backrest of a vehicle seat having a seat cushion comprising:
 a lower bracket for supporting the seat cushion;
 an upper bracket for supporting the backrest;
 hinge means mounted on said lower bracket for rotatably supporting said upper bracket;
 means mounted on said upper bracket for slidably connecting said upper bracket to said hinge means, wherein said slidably connecting means includes a sleeve member having an elongated slot disposed about said hinge means;
 an operating lever rotatably mounted on said sleeve member and biased in a first direction;
 means extending between said upper bracket and said hinge means for biasing said upper bracket in said first direction;
 first engaging means spaced radially from said hinge means on said lower bracket and extending along a curve, wherein said curve comprises an arc of a circle centered at said hinge means;
 second engaging means projecting from said upper bracket for cooperating with said first engaging means to hold said upper bracket at the desired inclination; and
 means for releasably locking said first engaging means into

fixed engagement with said second engaging means, said locking means including a locking plate fixedly attached to said hinge means and having a projection mounted thereon, said locking means also including an elongated groove extending along said operating lever for receiving said projection, wherein rotation of said lever slidably moves said groove along said projection enabling said second engagement means to be selectively positioned in a lock position and in a release position, said first and second engaging means being engaged in said lock position and disengaged in said release position to allow adjustment of the inclination of the backrest.

4,709,966

PROTECTIVE DEVICE

James G. Parkinson, Safia Place, Tankfield Paget 6-15, Bermuda, and Thomas P. Kirsten, 99 Joao Alvares Soares, CEP 04609, San Paulo, Brazil

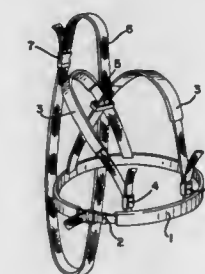
Filed Jun. 17, 1986, Ser. No. 875,280

Claims priority, application Brazil, Jun. 17, 1985, 6500811[U]

Int. Cl.⁴ B60R 22/12; A62B 35/00

U.S. Cl. 297—473

4 Claims



1. A protective device for providing limited movement of a child traveling in a vehicle comprising
 a seat anchoring belt assembly having a generally vertically extending closed loop, said loop being adapted to encircle a portion of the seat of the vehicle to prevent movement of said belt relative to the seat;
 said belt operatively engaging a child restraining harness adapted to be positioned around the upper torso of a child, said harness including a single child encircling belt assembly and a shoulder strap assembly;
 said child encircling belt assembly having a front portion and a rear portion and extending circumferentially about the chest or abdomen of the child and beneath the arms of the child;
 said shoulder strap assembly including a pair of straps, each of said straps including a first and second end respectively affixed to said front and rear portions of said belt assembly;
 said shoulder straps being arranged in crossover relation such that the right rear and the left front portions of said belt are connected by one of said shoulder harness straps and the right front and the left rear portions of said belt are connected by the other of said shoulder harness straps;
 said pair of shoulder straps arranged in crossover relation being free to separately move in a longitudinal direction with respect to each other;
 a single free-floating coupling ring receiving and positioning respectively portions of said seat anchoring belt and said shoulder harness strap assembly to permit limited movement of said child restraining harness with respect to said anchoring belt thereby permitting limited movement of the child restrained within said device; and
 said coupling ring securing said shoulder straps in said crossover relation while at the same time permitting said longitudinal movement of said straps with respect to each other.

4,709,967 WHEEL CAP

Fujio Sakamoto, Nagoya, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

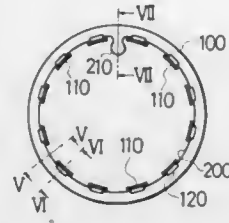
Filed Dec. 11, 1985, Ser. No. 807,583

Claims priority, application Japan, Dec. 14, 1984, 59-190594[U]; Dec. 20, 1984, 59-193699[U]

Int. Cl.⁴ B60B 7/06

U.S. Cl. 301-37 P

7 Claims



1. A wheel cap adapted to be mounted to a wheel disk so as to cover at least a portion thereof, by engagement with an inner peripheral surface of an axially accessible face of the wheel disk, said wheel cap comprising:

- a circular disk form base part;
- a plurality of axially extending, circumferentially spaced engaging parts which are elastically deformable in a radial direction relative to said base part, said engaging parts being disposed on a circumferential part of said base part and arranged to be engaged with said inner peripheral surface of a wheel disk when said wheel cap is mounted to said wheel disk;
- a plurality of stopper parts disposed along the circumferential direction of the circumferential part of said base part and each comprising a stopper surface arranged to be opposed to the inner peripheral surface of said wheel disk with a gap usually existing between said stopper surfaces of said stopper parts and the inner peripheral surface of said wheel disk when said wheel cap is mounted to said wheel disk, but being arranged for temporarily coming into contact with said inner peripheral surface when said base part is temporarily strongly pressed against the inner peripheral surface of said wheel disk; and
- a ring holder held by said engaging parts and urging said engaging parts radially outwards into resilient engagement with said inner peripheral surface of said wheel disk, said ring holder being an endless annular member which includes an arc portion adapted to engage with said engaging parts and a looped flexible portion which extends between and joins angularly spaced sites on said arc portion in such a manner that the looped flexible portion extends radially inwards from the circumference of an imaginary circle on which said arc portion lies, the looped flexible portion and the arc portion being curved about respective axes which are substantially parallel to one another.

4,709,968

FLUID PRESSURE CONTROL APPARATUS FOR REDUCING SWING OR FALL OF VEHICLE BODY DUE TO BRAKING DURING BACKWARDS RUNNING OF VEHICLE

Ryuichi Tanaka, and Akira Ishii, both of Kanagawa, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed May 12, 1986, Ser. No. 862,043

Claims priority, application Japan, May 17, 1985, 60-73030[U]

Int. Cl.⁴ B60T 13/00

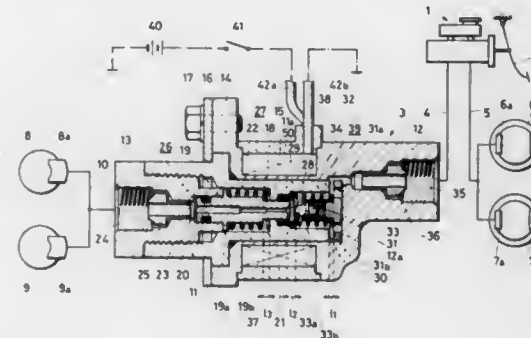
U.S. Cl. 303-6 C

9 Claims

1. A fluid pressure control apparatus for a vehicle comprising:

- (A) an inlet port connected to a master cylinder;

- (B) an outlet port connected to a wheel cylinder of a brake apparatus for a front wheel;
- (C) a valve apparatus arranged in a path connecting said inlet and outlet ports;
- (D) a movable plunger for closing and opening said valve apparatus, receiving fluid pressure at both sides;
- (E) a first spring for urging said plunger in the direction to open said valve apparatus;
- (F) an electromagnetic coil to be energized by a signal transmitted on the basis of the driver's operation for driving said vehicle backwards;



- (G) said valve apparatus including a valve body which can be separated from and seated on a valve seat formed on said plunger;
- (H) a second spring for urging said valve body to the first position where said valve body cannot contact with said valve seat of the plunger in spite of movement of said plunger; and
- (I) said valve body being moved by energization of said electromagnetic coil to the second position where said valve body can contact with said valve seat of the plunger with movement of said plunger.

4,709,969

BRAKE PRESSURE BOOSTER IN VEHICLE BRAKE SYSTEMS

Gerhard Heess, Tamm, and Anton van Zanten, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

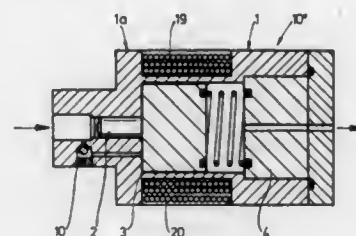
Filed Jul. 23, 1986, Ser. No. 887,302

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1985, 3526192

Int. Cl.⁴ B60T 8/32, 13/74

U.S. Cl. 303-114

15 Claims



1. A brake pressure booster in vehicle brake systems, in combination with an anti-skid system for realizing anti-skid functions, which comprises a housing (1), a pressure chamber (5) in said housing, an inlet (11) in said housing to which a brake pressure from a master brake cylinder is connectable, an outlet (15) which is connectable with an associated wheel brake cylinder, a potential energy means (3) in said pressure chamber so embodied that with increasing or decreasing brake pressure from said master brake cylinder to said inlet, the storage of potential energy increasing simultaneously in one or

4,709,971

COMPUTER WORK STATION

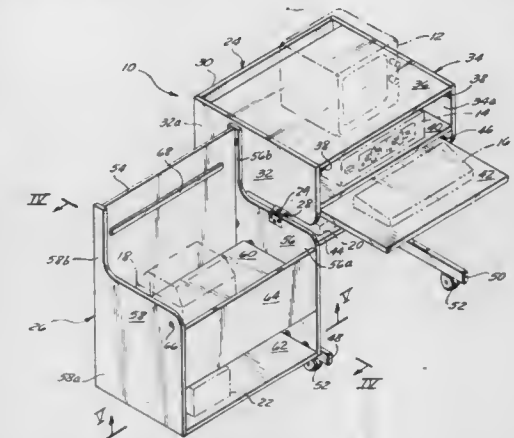
Richard Leeds, Lawrence, and Arthur Roberts, Westbury, both of N.Y., assignors to Global Equipment Company, Hempstead, N.Y.

Filed Nov. 12, 1985, Ser. No. 796,802

Int. Cl.⁴ A47B 21/03

U.S. Cl. 312-201

17 Claims



1. A computer work station for use with a computer system, comprising:

- a desk section having first and second side panels, a rear panel, and a first support surface between said first and second side panels for supporting a first component of said computer system;
- said first and second side panels being solid and having a substantially inverted L shape;
- said rear panel being substantially solid;
- an auxiliary section having third and fourth side panels, a front panel and a second support surface for supporting a second component of said computer system;
- said third and fourth side panels being solid and having a substantially L shape, said L shape having a substantially complementary shape to said inverted L shape;
- said front panel being substantially solid;
- coupling means hingedly interconnecting said desk and auxiliary sections about a vertically disposed pivot axis for pivoting horizontal movement of said auxiliary section relative to said desk section between an open position and a closed position;
- said front panel and said rear panel extending substantially a full height of said computer work station;
- said complementary shape, when said auxiliary section is in said closed position, permitting said sections to fit together to form a substantially enclosed structure with said front and rear panels constituting the front and rear closed walls thereof, said first and third end panels forming a first side thereof and said second and fourth end panels forming a second side thereof; and
- one of said first and second support surfaces being disposed above the other thereof within said enclosed structure when said auxiliary section is in said closed position.

4,709,972

KEYBOARD CABINET WITH SLIDING TRAY

Brian R. LaBudde, Greece, and Kevin C. Koek, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1986, Ser. No. 900,929

Int. Cl.⁴ A47B 21/03

U.S. Cl. 312-208

10 Claims

1. A work station cabinet for keying entries into a keyboard, the work station cabinet comprising:
- a housing having an opening in a front face thereof;

another direction is transferred for raising or lowering pressure applied from said brake pressure booster to the wheel brake cylinder, wherein the booster includes a fixed permanent magnet (4) and said potential energy means is a moveable permanent magnet (3) having a varying distance with respect to said fixed permanent magnet (4) and which is displaceably supported in said pressure chamber (5).

4,709,970 PORTABLE CABINET

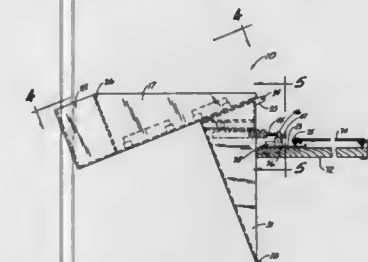
Neil A. Savoie, 22 Pelham Rd., Hudson, N.H. 03051

Filed Oct. 9, 1986, Ser. No. 917,362

Int. Cl.⁴ A47B 47/02

U.S. Cl. 312-140.4

8 Claims

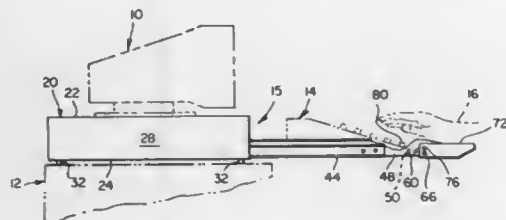


1. A portable cabinet comprising:

- a first assembly having a floor member, first and second sidewall members connected to the floor member and a rear wall member connected to the floor member and to said first and second sidewalls;
- a second assembly having a top wall, third and fourth sidewalls connected to said top wall and a front wall connected to said top wall and to said third and fourth sidewalls;
- means for pivotally attaching a bottom portion of said front wall of the second assembly to a front portion of the floor member of said first assembly for permitting said second assembly to pivot between a first position closing the portable cabinet and a second position wherein the cabinet is open;
- a shaft;
- means for selectively movably attaching said shaft to the third and fourth sidewalls of said second assembly for permitting said shaft to move in a first direction towards or away from said top wall;
- an arm;
- means for slidably attaching one end of said arm onto said shaft whereby said arm is movable in a second direction which is perpendicular to the first direction of movement of said shaft;
- means for selectively attaching the other end of said arm to a stationary object; and
- means attached to said second assembly for selectively holding said arm and shaft in one of a number of pre-selected positions to selectively limit movement of said second assembly relative to said arm and shaft in said first direction; wherein, said means attached to said second assembly includes a downwardly extending projection connected to the other end of said arm and a threaded rod means connects said downwardly extending projection to said arm for extending or shortening the effective length of said arm.

a tray means having a surface for supporting the keyboard; means coupling the tray means and the housing for movement of the tray means through the front face of the housing to an extended position wherein the keyboard is outside the housing and accessible for keying of entries thereinto, and to a retracted position wherein the keyboard is located within the housing for storage;

a door pivotably connected to the tray means, the door having a front face and a rear face, the rear face cooperat-



ing with the housing to seal the front face of the housing when the tray means is in its retracted position when the door is pivoted to a generally vertical orientation; and means for supporting the door so that the rear face is in a generally horizontal orientation while the tray means is in its extended position, the rear face of the door being elevated relative to said surface of the tray means, without overlying the surface of the tray means, and providing support for the hands or wrists of an operator for keying entries into the keyboard.

4,709,973

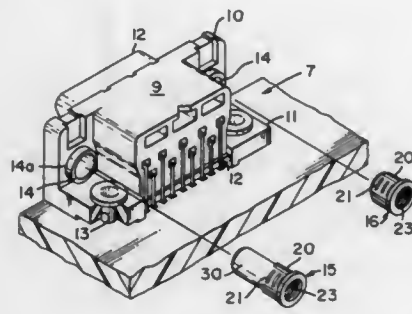
INSERT RETENTION MEMBERS FOR CONNECTORS
Mark H. Waters, Harrisburg, and Robert N. Whiteman, Jr., Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 20, 1986, Ser. No. 876,569

Int. Cl.⁴ H05K 1/00; F16B 13/06

U.S. Cl. 439—78

10 Claims



1. A retention member for a dielectric housing such as an insert retention member, comprising:

a flange;
a shank interconnected with said flange;
an aperture in said shank and said flange for securing a screw device and the like within the same, said shank further including a plurality of longitudinal antitorque retention means, each of said longitudinal antitorque retention means extending along an outer surface of said shank, upstanding therefrom and being spaced apart from its adjacent longitudinal antitorque retention means in at least one segment peripheral to said outer surface of said shank; and

a plurality of transverse retention means extending along said outer surface of said shank and upstanding therefrom, said transverse retention means being spaced apart from each other and spaced from adjacent said longitudinal

antitorque retention means within said at least one segment of said shank.

4,709,974

BATTERY CONNECTOR

Clive F. J. Hawkins, Raynes Park, Great Britain, assignor to PAG Limited, London, United Kingdom and PAG America Ltd., Asheville, N.C.

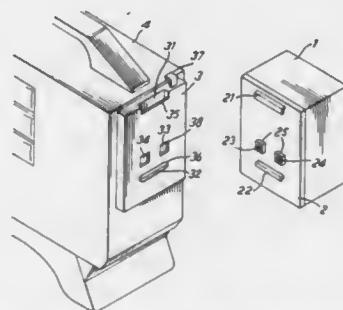
Filed Mar. 24, 1986, Ser. No. 843,375

Claims priority, application United Kingdom, Oct. 15, 1985, 8525339

Int. Cl.⁴ H01R 13/639

U.S. Cl. 439—345

8 Claims



1. A connector unit for connecting two electrical devices together, the connector unit comprising:

a first connector element and a second connector element, said first and second connector elements being complementary to one another; said first connector element being for attachment to one of the two electrical devices and said second connector element being for attachment to the other of the two electrical devices;

said first connector element including:

a first plate;
at least one upper claw attached to said first plate;
at least one lower claw attached to said first plate; and
at least one first electrical connection connected to said first plate;

said second connector element including:

a second plate having an upper edge and a lower edge;
at least one recess defined in said upper edge of said second plate for receiving said at least one upper claw of said first plate to form an elongated hinge means for allowing hinging movement between said first and second plate, said first plate being hangable from said second plate upon receipt of said at least one upper claw by said at least one recess;

at least one slot defined in said second plate for receiving said at least one lower claw of said first plate when said recess receives said at least one upper claw of said first plate;

at least one second electrical connection connected to said second plate for coupling with said at least one first electrical connection of said first plate when said recess receives said at least one upper claw and said slot receives said at least one lower claw; and

locking means associated with said slot for locking said lower claw within said slot.

4,709,975

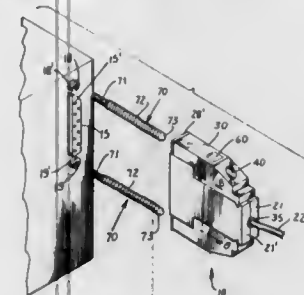
RELEASEABLE SNAP CONNECTOR

Joseph R. Williams, II, 5296 Amburst, Norcross, Ga. 30092
Continuation of Ser. No. 532,679, Sep. 16, 1983, Pat. No. 4,589,716. This application Jul. 29, 1985, Ser. No. 760,147
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.

Int. Cl.⁴ H01R 13/627

U.S. Cl. 439—350

3 Claims



1. A self-locking, releasable connector for a plug and socket, comprising:

a plug;
a socket configured to receive said plug;
an elongate member defining a first end portion and a second end portion, said first end portion being formed for attachment to one of said socket and said plug, and said second end portion being formed with external ribs and extending outwardly of said first end portion; and

an adapter member comprising an internal passageway and means for attaching said adapter member to the other of said plug and said socket so as to receive freely said elongate member within said passageway upon engagement of said plug and said socket,

said adapter member further comprising a pair of inwardly biased hinge plates mounted for pivotal movement about said internal passageway and configured to define an opening therebetween so as to yieldingly receive said elongate member, and means for selectively separating said inwardly-biased hinge plates,

whereby, upon insertion of said elongate member into said passageway, said inwardly-biased hinge plates capture said second end portion of said elongate member so that said plug is positively interlocked with said socket and, upon activation of said separating means, said hinge plates release said second end portion of said elongate member such that said plug is released from connection with said socket.

4,709,976

CONNECTOR BUILT FROM ONE OR MORE SINGLE ROWED HOUSINGS WITH LONG LASTING LOCKING MECHANISM

Katsuhiko Nakama, Nagaokakyo; Hiroshi Ninomiya, Uji; Toru Michisbigi, Nagaokakyo, and Fumiaki Itsuki, Ibaraki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jan. 28, 1986, Ser. No. 823,329

Int. Cl.⁴ H01R 13/62

U.S. Cl. 439—350

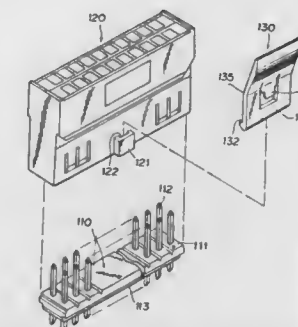
3 Claims

1. An electric connector for engaging with a fixed base, comprising a main housing formed with a catch fitting projection on at least one side thereof and defining an engagement aperture, and a lock mechanism for locking said main housing to said fixed base and comprising a catch piece formed with:

a main body which is bent at an intermediate portion thereof; a manually pressable portion formed on a first end portion of said main body;

an engaging portion formed on a second end portion of said main body opposite to said first end portion, said bent intermediate portion being located between said first and

second portions, said engaging portion being formed with a catch shape for engaging with said fixed base; and an elastic fixing tongue engagable into said engagement aperture so as to elastically support said catch piece on the side of said main housing with said bent portion pressing



against said main housing and acting as a fulcrum, and in this state biasing said manually pressable portion in the direction away from said main housing and said engaging portion in the direction towards said main housing whereby said catch is engagable with said base.

4,709,977

CONTROLLABLE DIRECTIONAL COUPLER

Franz Auracher, Baierbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

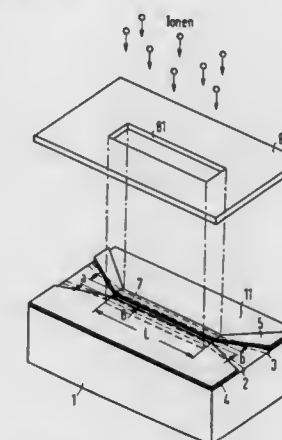
Filed Apr. 16, 1985, Ser. No. 723,874

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420580

Int. Cl.⁴ G03B 6/10

U.S. Cl. 350—96.14

13 Claims



1. In a controllable directional coupler of the type in which a pair of light waveguides extend parallel to one another for a length L at a surface of a substrate of electro-optical material defining an interstice therebetween, and in which a control electrode structure is carried on the surface of the substrate and comprises a pair of spaced control electrodes respectively positioned over respective ones of said waveguides, the improvement therein comprising:

a zone in the interstice having a lower refractive index down to a predetermined depth with respect to the remainder of the substrate, whereby the lower refractive index and the predetermined depth are selected such that a cross over between the two wave guides still occurs.

4,709,978 MACH-ZEHNDER INTEGRATED OPTICAL MODULATOR

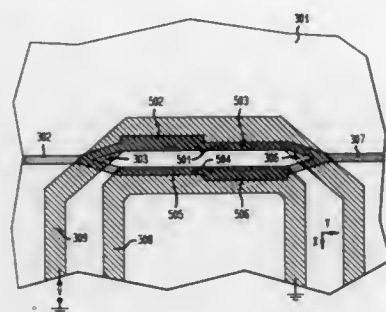
Janet L. Jackel, Holmdel, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Feb. 21, 1986, Ser. No. 831,607

Int. Cl.⁴ G02B 6/10; G02F 1/00

U.S. Cl. 350—96.14

9 Claims



1. An optical interferometric modulator comprising an input waveguide section
an input branching section for dividing an optical signal on said input section into two substantially equal portions, first and second branch waveguides for transmitting the two portions of the divided optical signal,
first and second electrodes each associated with said first and second branch waveguides, respectively, and each in a proximate physical relationship with its associated branch waveguide along a modulation length,
an output branching section for combining the optical signals on said first and second branch waveguides, characterized in that
said first and second branch waveguides are disposed in such a proximate physical relationship with each other along the modulation length to maximize the field overlap between the electric fields from said first and second electrodes and the optical field in the branch waveguides, and said modulator further comprises means for optically decoupling said first and second branch waveguides.

4,709,979 SYSTEM FOR THE CONNECTION OF PHOTODETECTORS TO OPTICAL FIBERS

Fabrizio Spodati, Ospitaletto Di Cormanio Milan, and Mario Tamburello, Milan, both of Italy, assignors to Telettra-Telefonia Elettronica e Radio S.p.A., Italy

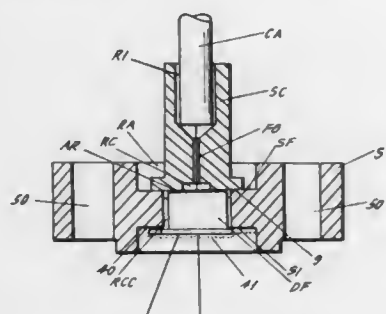
Filed Oct. 22, 1984, Ser. No. 663,240

Claims priority, application Italy, Nov. 4, 1983, 23587 A/83

Int. Cl.⁴ G02B 6/36, 7/26

U.S. Cl. 350—96.20

7 Claims



6. A connection assembly for connecting the glass face of a photodetector of any commercially available structure to continuous optical fiber protected substantially along its length by an insulation covering, except for a free end of said continuous

optical fiber having a section without insulation covering, said insulation covering terminating abruptly at said section to form an annular shoulder of insulation comprising:

- an optical fiber support member applied onto one end of said continuous optical fiber, said optical fiber support member having a first cylindrical zone with a diameter slightly greater than the insulated optical fiber;
- a truncated connection zone, said annular shoulder of insulation abutting said optical fiber support member at said truncated cone; a second cylindrical zone having a diameter slightly larger than the optical fiber without said insulation covering; and a terminal flange with a central recess;
- a support plate with first and second seats on opposite faces of said plate, said first seat cooperating with said terminal flange of said optical fiber support member and said second seat cooperating with said photodetector, said first and second seats having a cylindrical and coaxial shape and communicating with each other by a hole;
- first means for fastening said optical fiber support member to said end of said optical fiber;
- second means for fastening said flange of said optical fiber support member into said first plate seat; and
- third means for fastening said photodetector into said second seat of the said plate.

4,709,980 BURIED-CABLE JUNCTION ENCLOSURE WITH CABLE-STORAGE VAULT

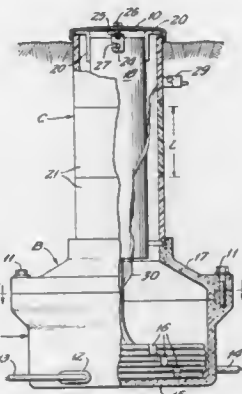
Gene P. Coll, Cranford, and Ignazio Leonardo, Mountainside, both of N.J., assignors to Coastal Engineered Products Company, Inc., Varnville, S.C.

Filed Aug. 2, 1985, Ser. No. 761,792

Int. Cl.⁴ G02B 6/24

U.S. Cl. 350—96.20

15 Claims



1. A buried-cable vault enclosure for receiving end lengths of two multiple-line cables to be spliced and for also receiving a splice case interconnecting the respective corresponding lines of the two cables, said enclosure comprising a relatively large-diameter upwardly open cup-shaped base member having a closed bottom wall and an upstanding cylindrical wall with first and second diametrically opposed cable-entry ports providing cable access substantially at the level of the upper surface of the closed bottom wall, an open-ended intermediate member having a circular lower end conforming and secured to the upper end of the cylindrical wall of said base member, said intermediate member being characterized by a frustoconical wall which converges to a reduced-diameter upper circular end, an upstanding open-ended cylindrical upper wall member conforming to said reduced diameter and fitted at its lower end to the upper end of said intermediate member, said upper wall member being sufficiently elongate and adapted to removably support a portable splice case therewithin, with at least the inner volume of said base member totally available for recep-

tion of coiled lengths of both cables associated with the spliced ends of the cables.

4,709,981 CONNECTING STRUCTURE FOR CONNECTING OPTICAL CONDUCTORS

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

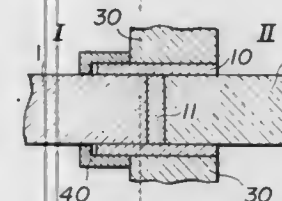
Filed Feb. 28, 1985, Ser. No. 706,548

Claims priority, application Japan, Mar. 5, 1984, 59-41848

Int. Cl.⁴ G02B 6/38

U.S. Cl. 350—96.21

12 Claims



10. A connecting structure for use on a space craft for connecting optical conductor means which pass through the external wall of a space craft and which transmit light rays into said space craft for illuminating said space craft, comprising a coupling ring air-tightly mounted within an opening in the external wall of a space craft, a light-admitting intercepting plate of transparent material disposed at an intermediate position of the longitudinal length of said coupling ring such that said light-admitting intercepting plate completely shuts off the internal space of the space craft from the surrounding external space, an external cylindrical optical conductor means having an end portion disposed in one end of said coupling ring, an internal cylindrical optical conductor means having an end portion disposed in the other end of said coupling ring, said end portions of said external and internal cylindrical optical conductor means each having an outer diameter approximately equal to the inner diameter of said coupling ring, said end portions of said external and internal optical conductor means each having a longitudinal end surface opposed to one another and juxtaposed to said light-admitting intercepting plate, first matching oil or optical paste connecting said end surfaces with said light-admitting intercepting plate, second matching oil or optical paste connecting said end portions of said external and internal optical conductor means to said coupling ring, said first matching oil or optical paste having a refractive index equal to the refractive index of said external and internal optical conductor means, said second matching oil or optical paste having a refractive index less than the refractive index of said external and internal optical conductor means, said external cylindrical optical conductor means having a coupling portion extending from said end portion of said external cylindrical optical conductor means, said coupling ring having an external longitudinal end, said coupling portion being disposed externally of said longitudinal end of said coupling ring, said coupling portion having a frusto-conical configuration which increases in diameter as said longitudinal end of said coupling ring is approached such that said coupling portion diffuses and dilutes the light energy transmitted in said external cylindrical optical conductor means, a cover member disposed externally of said space craft about a portion of said coupling ring and a portion of said external optical conductor means, said cover member contacting said external optical conductor means and said coupling ring and thereby retaining in place said first and second matching oil or optical paste, said cover member being made of a material having a refractive index less than the refractive index of said external and internal optical conductor means, whereby light rays are transmitted from the outside to the inside of said space craft via said external optical conductor means, said coupling portion, said light-admitting intercepting plate, and said internal optical conductor means, and wherein said coupling portion diffuses and dilutes light rays of high energy density transmitted in said external cylindrical optical

conductor means to a lower desired energy density to be utilized within the space craft.

4,709,982 GELLED OIL FILLING COMPOUNDS

Robert W. Corne, and John M. R. Hagger, both of London, England, assignors to BICC Public Limited Company, United Kingdom

Filed Nov. 13, 1985, Ser. No. 797,618

Claims priority, application United Kingdom, Nov. 27, 1984, 8429878

Int. Cl.⁴ G02B 6/44

U.S. Cl. 350—96.23

8 Claims

1. A gelled oil filling compound comprising a hydrocarbon oil with an aromatic content not greater than 12% and, as the only substantial polymeric constituent, a block copolymer having at least one molecular segment that tends to confer solubility in the oil and at least one molecular segment that tends to inhibit solubility in the oil, the proportion of the segments being such that the block copolymer forms a gel with the oil, wherein the weight average molecular weight of the block copolymer is in the range 200,000 to 2,000,000 and the quantity of block copolymer being so chosen from the range 1-10% that the compound resists drainage at temperatures up to 70° C. but has a viscosity at 120° C. not greater than 1000 cp.

8. A cable filled with the filling compound claimed in claim 1.

4,709,983 OPTICAL CABLES

Karl W. Plessner, Kings Langley, and Michael J. Poole, London, both of England, assignors to BICC public limited company, London, England

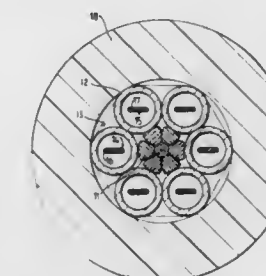
Filed Sep. 19, 1985, Ser. No. 777,620

Claims priority, application United Kingdom, Sep. 21, 1984, 8423985

Int. Cl.⁴ G02B 6/44

U.S. Cl. 350—96.23

12 Claims



1. A non-metallic flexible elongate strengthening member comprising a plurality of non-metallic flexible elements helically laid around a central non-metallic flexible element, each of which flexible elements comprises a multiplicity of filaments of non-metallic reinforcing material bonded together by a heat-softenable organic material and is coated with a release agent, the flexible elements of the assembly being so deformed and compacted together that any tendency for the flexible elements to spring apart is substantially eliminated.

4,709,984

RIBBON-SHAPED TRANSMISSION ELEMENT AND METHOD OF MANUFACTURE

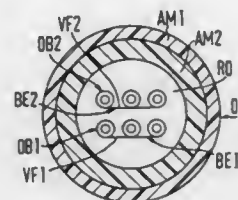
Ulrich Oestreich, Munich, and Ernst Mayr, Starnberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 22, 1985, Ser. No. 757,442

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428567

Int. Cl.⁴ G02B 6/44

U.S. Cl. 350-96.23

18 Claims



1. A ribbon-shaped transmission element comprising a plurality of optical fibers, each of the optical fibers being provided with a separate coating to form an optical waveguide element, and a connecting layer, said waveguide elements being disposed in a side-by-side relationship and at a distance from one another on the layer with the layer proceeding roughly tangentially to outside surfaces of the coatings and the optical waveguide elements, and the coatings of the fibers consisting of the same material as the material of the layer.

4,709,985

FLEXIBLE OPTICAL FIBERS FOR USE IN VIEWING DEVICES

Toshio Takeuchi, Tokyo, Japan, assignor to Toyo Menka Kaisha, Ltd., Tokyo, Japan

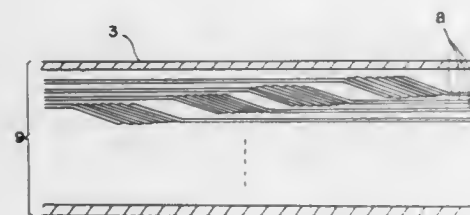
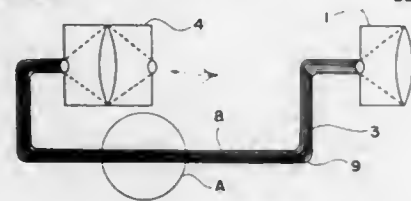
Filed Sep. 4, 1984, Ser. No. 646,521

Claims priority, application Japan, Sep. 27, 1983, 58-176983

Int. Cl.⁴ G02B 6/06

U.S. Cl. 350-96.25

11 Claims



1. A twisted flexible optical fiber bundle for use in viewing devices comprising a plurality of flexible optical fibers disposed in parallel with one another to define flexible optical fiber gatherings, each of said flexible optical fiber gatherings being twisted by 180° to define twisted flexible optical fiber gatherings so that a right side-left side inverted image is formed of an object viewed through a viewing device, said twisted

optical fiber gatherings being longitudinally laminated together to define the twisted flexible optical fiber bundle.

4,709,986

ENSHEATHED OPTICAL FIBER AND COUPLING METHOD

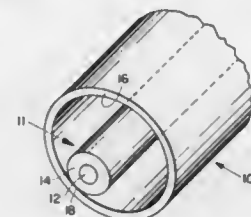
John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 18, 1984, Ser. No. 621,933

Int. Cl.⁴ G02B 6/16, 6/26

U.S. Cl. 350-96.33

8 Claims



1. A single mode optical fiber comprising a single mode inner fiber nested within an auxiliary cladding tube, said inner fiber comprising a core of given diameter fabricated from optical transmission material having an index of refraction n_1 , and a cladding layer of optical transmission material having an index of refraction n_2 , where n_2 is less than n_1 , said cladding layer having a wall thickness ranging between one to two core diameters for enhancing lateral coupling to an inner fiber of similar construction, said auxiliary cladding tube being fabricated from material having an index of refraction not substantially greater than that of said cladding layer and of large inner diameter as compared to the outer diameter of said inner fiber such that said inner fiber is at least partially spaced from the inner diameter of said auxiliary cladding tube, and said inner fiber being in supporting engagement with and connected to the inside surface of said auxiliary cladding tube along a lineal connection zone.

4,709,987

PRESSURE AND TEMPERATURE INSENSITIVE GLASS AND OPTICAL COATINGS AND FIBERS THEREFROM

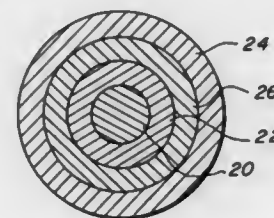
Douglas Blackburn, Damascus; Albert Feldman, Rockville, and Nicholas Lagakos, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 10, 1985, Ser. No. 807,150

Int. Cl.⁴ G02B 6/44

U.S. Cl. 350-96.34

23 Claims



1. A glass composition suitable for use as a temperature and pressure insensitive protective layer for optical fibers, comprising:

up to about 30 weight percent CaO ;
between about 15-25 weight percent Al_2O_3 ;
between about 5-15 weight percent MgO ;
up to about 15 weight percent TiO_2 ;
up to about 10 weight percent ZrO_2 ;
between about 20-35 weight percent SiO_2 ;
up to about 10 weight percent B_2O_3 ;

between about 5-45 weight percent Ta_2O_5 ; and
up to about 40 weight percent Nb_2O_5 .

4,709,988

DIRECTIONAL LIGHT-SHIELD BOARD

Yasuaki Kai, Takatoshi Sagawa, and Hiroshi Tabata, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

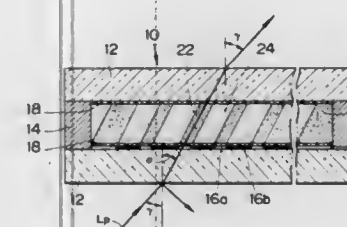
Filed Nov. 4, 1985, Ser. No. 794,844

Claims priority, application Japan, Nov. 17, 1984, 59-241622

Int. Cl.⁴ G02B 5/00

U.S. Cl. 350-276 R

11 Claims



1. A directional light-shield board for placement in front of a visual display device, the light-shield board comprising: a transparent substrate; and an opaque film which is bonded to a major surface of said substrate and is formed with a number of substantially uniformly distributed light-transmitting apertures such that said opaque film comprises a number of wall-like parts respectively partitioning said apertures, said apertures having a substantially rectangular shape and arranged in a checkered pattern, said apertures being bored obliquely such that at least a first pair of parallel wall-like parts of said opaque film are substantially unidirectionally inclined from a plane normal to said surface of said substrate and such that an apparent area of each of said apertures become maximum when the light-shield board is viewed from the direction of the inclination of said wall-like parts of said film.

4,709,989

CHASSIS FOR OPTICAL INSTRUMENTS

Meinrad Mächler, Ellwangen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

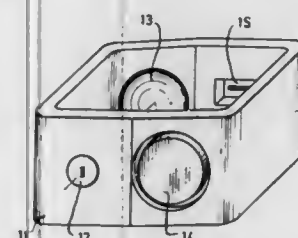
Continuation-in-part of Ser. No. 478,891, Mar. 25, 1983, abandoned. This application Sep. 25, 1985, Ser. No. 779,878

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211868

Int. Cl.⁴ G02B 27/00

U.S. Cl. 350-321

11 Claims



9. An optical instrument comprising a first optical element made of optical glass, a second optical element also made of optical glass and positioned to receive light from said first element, and a chassis for holding said first and second elements in rigid fixed position relative to each other, said chassis being formed of compacted ceramic material compacted to a density of not less than about 2.8 grams per cubic centimeter

and having a coefficient of thermal expansion approximately equal to the coefficients of thermal expansion of the glasses from which both of said optical elements are made.

4,709,990

METHOD OF MANUFACTURING A COLOR-MATRIX-TYPE LIQUID CRYSTAL DISPLAY DEVICE

Yasuhisa Oana, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

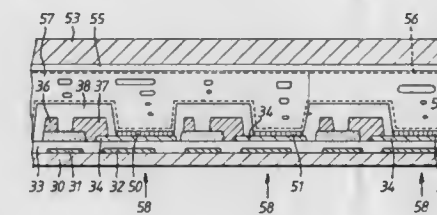
Filed Mar. 8, 1985, Ser. No. 709,666

Claims priority, application Japan, Mar. 8, 1984, 59-42930

Int. Cl.⁴ G02F 1/133

U.S. Cl. 350-339 F

19 Claims



1. A method of forming a self-aligned filter on an active matrix substrate for a color-matrix-type liquid crystal display device, the active matrix substrate comprising a plurality of picture element units arranged on a substrate in a matrix of rows and columns, each picture element unit including a switching element and a display electrode, said method comprising the steps of:

immersing the active matrix substrate into an emulsion comprising coloring matter of a predetermined color;
applying a voltage to at least one selected display electrode, the voltage being of a value, and applied for a length of time, sufficient to form an electrodeposited filter layer of the predetermined color on the display electrode;
removing the active matrix substrate from the emulsion; and curing the electrodeposited filter layer.

4,709,991

LIQUID CRYSTAL DISPLAY WITH BARRIER LAYER TO REDUCE PERMEABILITY

Jun Hoshikawa, Nagano, Japan, assignor to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 603,865, Apr. 25, 1984, abandoned.

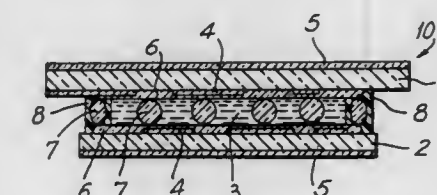
This application Jun. 19, 1986, Ser. No. 875,519

Claims priority, application Japan, Apr. 26, 1983, 58-73329; Apr. 26, 1983, 58-73330; Apr. 26, 1983, 58-73331

Int. Cl.⁴ G02F 1/13; C09K 19/00

U.S. Cl. 350-339 R

20 Claims



1. A liquid crystal display panel, comprising two spaced apart transparent substrates, each substrate having transparent electrodes selectively formed on the interior opposed surfaces thereof, at least one of the transparent substrates being formed of a synthetic resin selected from the group consisting of polyester resin, cellulose resin, polyether sulfone resin, polysulfone resin, acrylic resin, polyethylene terephthalate resin, phenoxy

resin, urethane resin, phenoxy-urethane resin, polyether-ketone resin, polyether-ether-ketone resin, polyetherimide resin, epoxy resin, polyimide resin, polyamide resin, polyimideamide resin, polycarbonate resin, a mixture of the above resins, and a multilayer of the above resins and having a thickness between about 0.3 to 0.5 mm and a barrier coating layer disposed thereon for reducing permeability to at least one of air and water vapor and wherein said barrier coating layer is selected from the group consisting of polyvinyl alcohol, polyacrylonitrile, a mixture of polyvinyl alcohol and acrylic resin, a mixture of polyvinyl butyral and epoxy resin, polyvinylidene chloride, polyvinyl butyral, silicon dioxide and a material containing at least phosphoric acid and iron and having a thickness between about 5 to 50 μ disposed thereon.

4,709,992

LIQUID CRYSTAL MATRIX DISPLAY DEVICE HAVING OPPOSED DIODE RINGS ON SUBSTRATES

Masakazu Ueno, Koyoso, Japan, assignor to Fuji Electric Co., Ltd., Japan

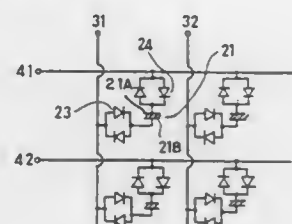
Filed Dec. 9, 1986, Ser. No. 939,616

Claims priority, application Japan, Dec. 10, 1985, 60-277459

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—339 R

2 Claims



1. A liquid crystal matrix display comprising a pair of transparent substrates, between which is positioned a liquid crystal material for excitation, each substrate supporting an array of control electrodes and a set of picture element electrodes, characterized in that on each substrate a diode ring comprising a parallel pair of oppositely-poled diodes is connected between each picture element electrode and its control electrode.

4,709,993

LIQUID CRYSTAL COLOR DISPLAY DEVICE HAVING PLURAL COLOR FILTERS PER SEGMENT ELECTRODE

Shigeru Matsuyama; Mikio Kanazaki, both of Mohara; Norio Aoki, Chiba, and Akira Ishii, Mohara, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Device Engineering Co., Ltd., Chiba, both of Japan

Filed Dec. 17, 1986, Ser. No. 942,634

Claims priority, application Japan, Dec. 18, 1985, 60-282933

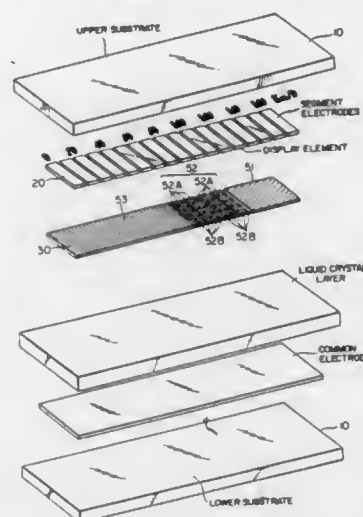
Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—339 F

17 Claims

1. A liquid crystal color display device comprising: at least one first patterned electrodes and at least one second electrodes formed on a pair of opposed transparent substrates, respectively, for applying an electric field across a liquid crystal layer sandwiched between said first and second electrodes, each of said first electrodes defining, together with a one mating second electrode, a display element operable for display in a particular color; and a filter layer formed for each of said first electrodes on one of said substrates, said filter layer being supported by said one substrate and placed in an optical path of light having entered the display device, in which the filter layer formed for at least one of said first electrodes includes at least two kinds of plural filtering segments, a first kind of filtering segments among said at least two kinds being made of a material having optical characteristics to pass therethrough light having wavelengths representative of a first color, and a second kind of filtering segments among

said at least two kinds being made of a material having optical characteristics to pass therethrough light having wavelengths representative of a second color, said at least two kinds of plural filtering segments being arranged so



that the display element including said at least two kinds of plural filtering segments gives, when activated, a display in a color of a hue visually perceived different, as viewed at a distance, from those of said filtering segments.

4,709,994

LIQUID CRYSTAL DEVICE USING FERROELECTRIC LIQUID CRYSTAL TWISTED IN TWO STABLE STATES

Junichiro Kanbe, Yokohama, and Shinjiro Okada, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

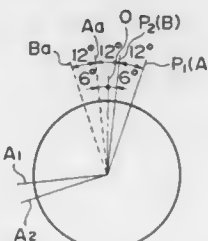
Filed Sep. 6, 1985, Ser. No. 773,221

Claims priority, application Japan, Sep. 12, 1984, 59-190791

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—350 S

38 Claims



11. A liquid crystal device comprising a ferroelectric liquid crystal placed under bistability condition comprising two stable states, said ferroelectric liquid crystal being placed under the bistability condition in the presence of a surface which has been subjected to a uniaxial orientation treatment, the molecules of the ferroelectric liquid crystal aligning so as to be twisted in the direction of the liquid crystal layer thickness in either of the two stable states, the average electric dipole moments of the liquid crystal molecules in the two stable states being in mutually opposite polarities.

23. A switching device for electrooptically switching light rays from a light source, comprising:

a. switching means comprising a pair of oppositely spaced electrodes and a ferroelectric liquid crystal disposed between the opposite electrodes and placed under bistability condition comprising two stable states in the presence of a surface which has been subjected to a uniaxial orientation treatment, the molecules of the ferroelectric liquid crystal

aligning so as to be twisted in either of the two stable states, b. means for applying a first voltage signal for orienting the liquid crystal molecules to one stable state and a second voltage signal for orienting the liquid crystal molecules to the other stable state, and c. means for detecting an optical difference between a light ray having passed through ferroelectric liquid crystal molecules oriented to said one stable state and a light ray having passed through ferroelectric liquid crystal molecules oriented to said other stable state.

4,709,995

FERROELECTRIC DISPLAY PANEL AND DRIVING METHOD THEREFOR TO ACHIEVE GRAY SCALE

Masaki Kuribayashi, Higashikurume; Toshihiko Nakazawa, and Junichiro Kanbe, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

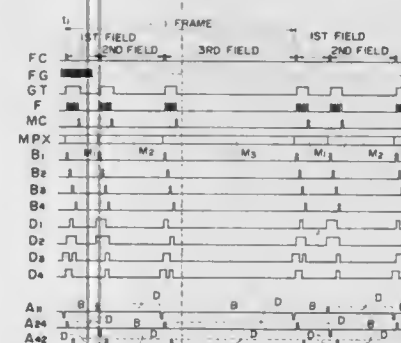
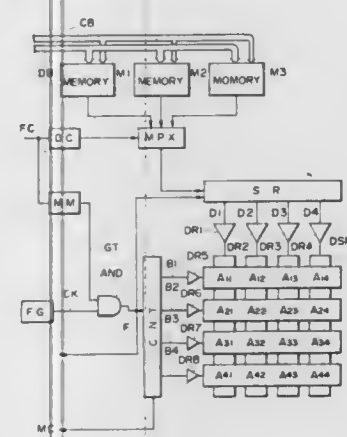
Filed Aug. 7, 1985, Ser. No. 763,432

Claims priority, application Japan, Aug. 18, 1984, 59-172231; Jul. 5, 1985, 60-148872; Jul. 5, 1985, 60-148873; Jul. 5, 1985, 60-148874

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—350 S

68 Claims



1. A display panel, comprising:

a liquid crystal device comprising a plurality of picture elements arranged in a plurality of rows and columns, each picture element comprising a ferroelectric liquid crystal under bistability condition showing either a first or a second orientation state, means for orienting the ferroelectric liquid crystal to either one of the first and second orientation states at respective picture elements, and duration-controlling means for controlling the duration of the first or second orientation state at respective picture elements.

54. In a method for driving a display panel of the type comprising a plurality of picture elements arranged in a plurality of rows and columns, each picture element comprising a ferro-

electric liquid crystal under bistability condition showing either a first or a second orientation state, either one of the first and second orientation states being written in respective picture elements to effect a display; the improvement comprising: applying row by row a first signal for orienting the ferroelectric liquid crystal to the first orientation state at the whole or a part of the picture elements on a row ((N+1)th row) subsequent to a writing row (Nth row) to clear the picture elements and a second signal for orienting the ferroelectric liquid crystal to the second orientation state at a selected picture element among the cleared elements on the writing row (Nth row), and controlling the duration of the first or second orientation state at respective picture elements.

4,709,996

FLUID LENS

Paul E. Michelson, 2280 Calle Tiara, La Jolla, Calif. 92037 Continuation-in-part of Ser. No. 432,409, Sep. 30, 1982, Pat. No. 4,466,705. This application Aug. 10, 1984, Ser. No. 639,480 The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.

Int. Cl.⁴ G02B 1/06; G02C 7/04; A61F 2/16; A61K 9/22 U.S. Cl. 350—418 13 Claims



1. A device for forming a fluid lens when immersed in a liquid medium, comprising: a semipermeable transparent sheath defining a fully enclosed cavity and having a plurality of pores for permitting a liquid medium to flow into said cavity; a hydrophilic polymer array disposed in said cavity and presenting a pressure differential across said sheath when said sheath is immersed in the liquid medium for causing liquid medium to flow into said cavity and to hydrate said array, causing said array to expand and to completely fill said cavity, thereby causing said sheath to expand and to assume a defined lenticular shape, wherein said hydrated array assumes a shape having an outer contour defined by said expanded sheath and constitutes a fluid lens.

4,709,997

ZOOM LENS

Hideonori Terasawa, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 602,962

Claims priority, application Japan, Apr. 27, 1983, 58-74539

Int. Cl.⁴ G02B 15/00

U.S. Cl. 350—427

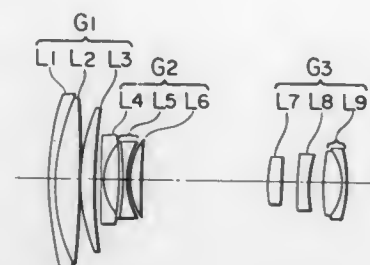
12 Claims

1. A zoom lens in which fluctuation of lateral chromatic aberration is small during magnification change and which can maintain an excellent imaging performance over the entire magnification change range, said zoom lens having, in succession from the object side, a first group of positive refractive power including at least one positive lens, a second group of negative refractive power including at least one negative lens, and an aperture stop disposed closer to the image plane than said second group, each of said groups being moved on the optic axis during magnification change so that the distance between said first group and said second group becomes greater and the distance between said second group and said

aperture stop becomes smaller as the focal length of the entire system becomes longer, at least one of negative lenses constituting said second group being formed of a material which satisfies the following conditions:

$$vd + 596.7\theta > 386.5$$

$$vd > 55,$$



where, when the refractive indices of the lens material for wavelengths 436 nm (g-line), 486 nm (F-line), 588 nm (d-line) and 656 nm (c-line) are ng, nF, nd and nc, respectively, vd and θ are defined as follows:

$$vd = (nd - 1)/(nF - nc)$$

$$\theta = (ng - nF)/(nF - nc).$$

4,709,998

TELEPHOTO LENS SYSTEM

Takanori Yamanashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

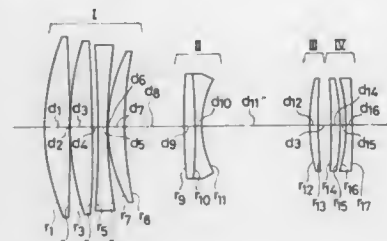
Filed Jun. 4, 1985, Ser. No. 741,222

Claims priority, application Japan, Jun. 8, 1984, 59-116574

Int. Cl.⁴ G02B 9/00

U.S. Cl. 350-454

7 Claims



1. A telephoto lens system comprising, in the order from the object side, a first lens unit having positive refractive power comprising at least one positive lens component and at least one negative lens component, a second lens unit having negative refractive power, a third lens unit having positive refractive power, and a fourth lens unit consisting of a positive lens component and a negative lens component, wherein said telephoto lens system is arranged to be focused by integrally moving said first lens unit through said third lens unit along the optical axis and is arranged to fulfill the conditions (1) through (7) shown below, said telephoto lens system being small in size and having high performance:

$$0.35 < f_1/f < 0.5$$

$$0.9 < \beta_{IV} < 1.2$$

$$1.21 \leq \theta_{IV} \leq 1.29, 60 \leq v_{IV} \leq 95.5$$

$$25 < v_{In} < 40$$

$$1.43 < n_{Ip} < 1.65 \quad (5)$$

$$1.6 < n_{In} < 1.9 \quad (6)$$

$$0.1 < r_{IVa}/r_{IVb} < 1.3 \quad (7)$$

where, reference symbol f represents the focal length of the lens system as a whole, reference symbol f_1 represents the focal length of the first lens unit, reference symbol β_{IV} represents the lateral magnification of the fourth lens unit when said telephoto lens system is focused on an object at the infinite distance, reference symbol θ_{IV} represents the partial dispersion ratio of said at least one positive lens component in the first lens unit, reference symbol v_{IV} represents Abbe's number of said positive lens component in the first lens unit for d-line, reference symbol v_{In} represents Abbe's number of said negative lens component in the first lens unit for d-line, reference symbol n_{Ip} represents the refractive index of said positive lens component in the first lens unit for d-line, reference symbol n_{In} represents the refractive index of said negative lens component in the first lens unit for d-line, reference symbol r_{IVa} represents the radius of curvature of the surface on the negative lens component side of said positive lens component in the fourth lens unit, and reference symbol r_{IVb} represents the radius of curvature of the surface on the positive lens component side of each negative lens component in fourth lens unit.

4,709,999

LIGHT RADIATOR

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,449

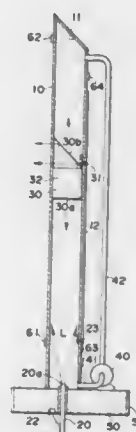
Claims priority, application Japan, Jun. 7, 1984, 59-117241

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.⁴ G02B 5/08; F21V 7/04, 33/00

U.S. Cl. 350-486

23 Claims



1. A light radiator comprising a transparent cylinder, an optical conductor for guiding light rays into said cylinder through one end of said cylinder, an optical means which is movably accommodated inside of said cylinder for reflecting said light rays which have been guided into said cylinder from said optical conductor and then radiating said light rays outside said cylinder, and driving means for moving said optical means along the axis of said cylinder, said optical means being constructed with a cylindrical transparent member having an edge surface formed on a plane and another edge surface formed on an inclined plane.

4,710,000

SURGICAL STEREOMICROSCOPE

Manfred Splitznas, Bonn; Josef Reiner, Rodenkirchen; Wolfgang Velt, Solms, and Rainer Kirchhube, Asslar, all of Fed. Rep. of Germany, assignors to Oculus Optikgeraete GmbH, Wetzlar, Fed. Rep. of Germany

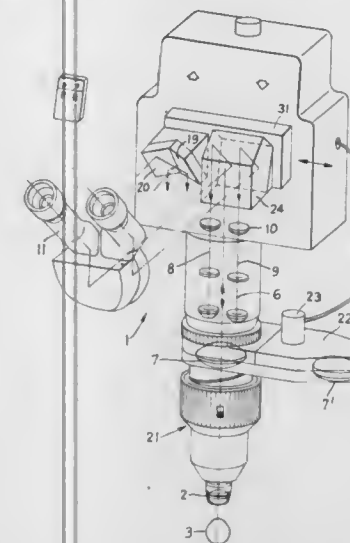
Filed Feb. 28, 1986, Ser. No. 834,943

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507458

Int. Cl.⁴ G02B 21/22; A61B 3/10

U.S. Cl. 350-516

5 Claims



1. In a stereomicroscope for use in performing surgeries, in particular eye surgeries, comprising a collecting lens which is common to both beam paths and an objective lens for each beam path, an ocular tube for each beam path forming a telescope having two reversing prisms with adjustable interocular distance, the improvement comprising wherein between said objective lens and said ocular tubes which contain the telescopes there is inserted a double-refracting, reflecting system which delivers a turned, unreflected image and covers both beam paths, and wherein said reflecting system is arranged in such a manner in the stereomicroscope, that said reflecting system can be exchanged with a 90° prism which is constructed with the same optical path length and covers both beam paths.

4,710,001

SUPPORT FOR A MOVING MIRROR IN AN INTERFEROMETER

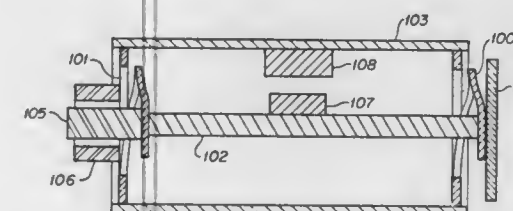
Richard F. Lacey, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 21, 1986, Ser. No. 934,239

Int. Cl.⁴ G02B 7/18

U.S. Cl. 350-632

7 Claims



1. A supporting device for restricting movement to substantially one direction without tilting or wobbling, comprising: a flat spring created by forming a plurality of opened slots in a flat sheet of spring stock, each slot partially enclosing the next innermost slot;

a frame for holding the edges of the flat spring in a fixed position; and a moving means for imparting movement to the center of the flat spring in a direction substantially perpendicular to the plane of the flat spring.

4,710,002

MAGNIFYING OPHTHALMOSCOPE

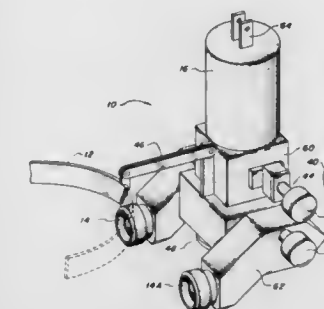
Oleg Pomerantzeff, Brookline, Mass., assignor to Eye Research Institute of Retina Foundation, Boston, Mass.

Continuation of Ser. No. 583,158, Feb. 24, 1984. This application May 27, 1986, Ser. No. 869,853

Int. Cl.⁴ A61B 3/10

U.S. Cl. 351-205

10 Claims



1. A stereoscopic ophthalmoscope for use with a condensing lens to observe the fundus of a patient's eye, the ophthalmoscope having a left eyepiece and a right eyepiece, a light source and a means for directing light from the light source into the patient's eye whereby a single image of the patient's eye is focused by the condensing lens in a focal plane perpendicular to an optical axis, said ophthalmoscope having the improvement comprising

- an image-splitting means for splitting the single image, without interchange into a left image and a right image travelling along a left optical path and a right optical path, respectively,
- left and right image-rotating means, each arranged in optical alignment with said image splitting means, for inverting and reversing each of the left and right images from the image-splitting means, and
- left and right magnifying means, each comprising an objective lens and an ocular lens and each arranged in optical alignment with the respective image rotating means to magnify the image therefrom and to transmit that image to the respective eyepiece, whereby said eyepieces present to an observer a stereoscopic, magnified view of said fundus, inverted and with proper stereopsis.

4,710,003

CORNEA SHAPE MEASURING APPARATUS

Takashi Masuda, Kawasaki; Yukitugu Nakamura, Sagami-hara, and Kyoji Sekiguchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 543,041, Oct. 18, 1983, abandoned.

This application Feb. 21, 1986, Ser. No. 833,660

Claims priority, application Japan, Oct. 21, 1982, 57-185290; Oct. 26, 1982, 57-188434

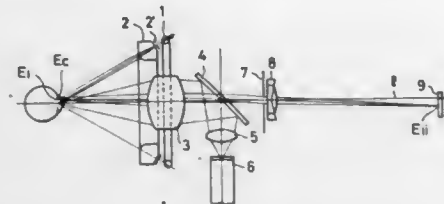
Int. Cl.⁴ A61B 3/10

U.S. Cl. 351-212

12 Claims

1. A cornea shape measuring apparatus comprising: a continuous ring-shaped chart for measurement; a continuous ring-shaped projecting means having a central axis and a continuous cylindrical surface, formed around the central axis, having a refractive power in each meridian direction but lacking a refractive power in a direction perpendicular thereto for projecting without distortion said chart onto the cornea of an eye to be examined by

converting rays emitted from said chart into parallel rays along a direction inclined relative to the central axis in a plane containing the central axis;
measuring means for measuring the corneal reflection image of said chart;
a measuring optical system for projecting the corneal reflection image of said chart onto said measuring means;
observation means for observing the corneal reflection image of said chart; and



an observation optical system for projecting the corneal reflection image of said chart onto said observation means, the magnification of said observation optical system being less than the magnification of said measuring optical system, such that the area of said eye observable by said observation means is larger than the image area of the corneal reflection image of said chart measured by said measuring means.

4,710,004

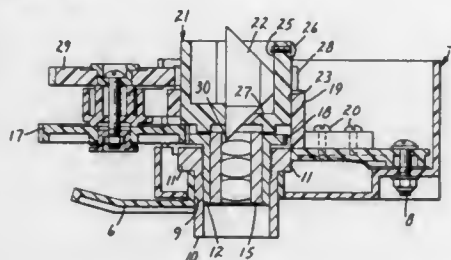
IMAGE ROTATION SYSTEM

Ronald J. Verhaagen, Vadnais Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 25, 1987, Ser. No. 18,425

Int. Cl.⁴ G03B 23/12

U.S. Cl. 353—81

2 Claims



1. In a photographic apparatus for projecting images, a projection lens barrel assembly, said lens barrel assembly being disposed in an axially adjustable collar for focussing, and a dove prism being mounted in axial alignment with said projection lens barrel assembly in a rotatable prism holder, wherein said dove prism is slidable in said prism holder to maintain contact with said projection lens barrel assembly during axial movement thereof.

4,710,005

CAMERA FLASH MOUNT

Robert E. Bennett, 31411 Donnelly, Garden City, Mich. 48135
Filed Mar. 3, 1986, Ser. No. 835,729

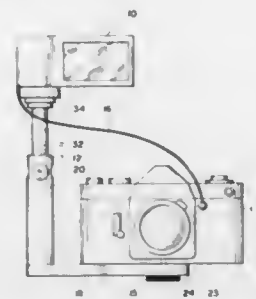
Int. Cl.⁴ G03B 15/05

U.S. Cl. 354—126

7 Claims

1. A strobe light support for a camera, comprising:
a first member;
a second member;
the first member having a tubular end with a first end opening and a sidewall having a slot defined therein, the slot having sides spaced a first distance and being relatively movable, the slot having one end merging into the first end opening and the opposite end of the slot being en-

larged to define a second opening having a diameter greater than said first distance;
the second member being received in the end opening of the first member in a first position, and being pivotally movable from said end opening through the slot to said second opening to a second position;



pivot means connecting the first member to the second member;
means for supporting a strobe light on one of said members; and means for attaching the other member to the camera; whereby the strobe light mounted on said one member is movable from said first position to said second position with respect to the camera.

4,710,006

SHUTTER RELEASE AND FILM ADVANCE INTERLOCK MECHANISM

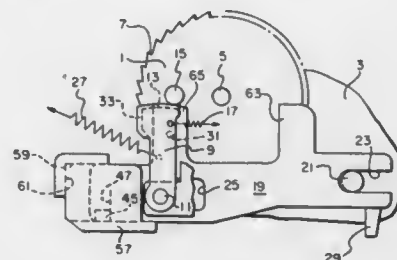
Wai C. Wong, Quarry Bay, Hong Kong, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 7, 1987, Ser. No. 46,767

Int. Cl.⁴ G03B 17/42

U.S. Cl. 354—204

5 Claims



1. An improved camera of the type wherein a shutter is opened to take a picture and film advance means is manually operable, and wherein the improvement comprises:

locking means movable between a locking position for preventing manual operation of said film advance means and a non-locking position for permitting manual operation of the film advance means;

actuating means movable from a cocked position a first increment of travel for opening said shutter and a second increment of travel for moving said locking means to its non-locking position; and

manually operable trigger means movable from an original position in which said trigger means engages said actuating means in its cocked position to a taking position for first disengaging said actuating means in its cocked position to permit the actuating means to move its first increment of travel and for then re-engaging said actuating means when the actuating means completes its first increment of travel, and movable back to its original position for again disengaging said actuating means to permit the actuating means to move its second increment of travel, whereby said film advance means is prevented from being manually operated when said shutter is opened.

4,710,007

CAMERA SYSTEM WITH LENS COUPLING MEMBER

Kazuo Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

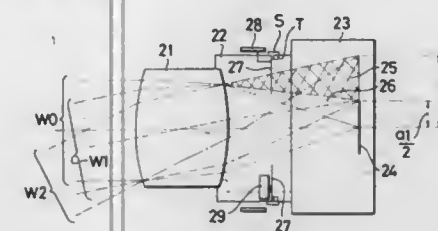
Filed Jul. 22, 1985, Ser. No. 757,612

Claims priority, application Japan, Jul. 23, 1984, 59-152523

Int. Cl.⁴ G03B 17/00

U.S. Cl. 354—286

8 Claims



6. A tube for connecting a camera body having a small format image plane to a photographic lens apparatus which images on said image plane, comprising:

an aperture stop for shielding off-axial rays directed toward the margin of said image plane without shielding on-axial rays of said photographic lens apparatus.

4,710,008

CAMERA WITH OPERATION SWITCH

Yoichi Tosaka, and Masami Shimizu, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha

Continuation of Ser. No. 681,021, Dec. 13, 1984, abandoned.

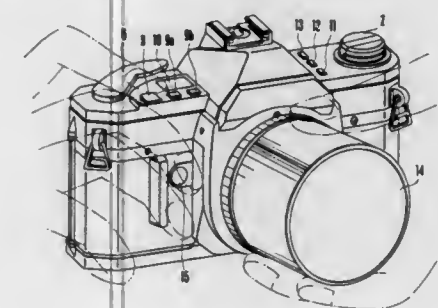
This application Dec. 10, 1986, Ser. No. 940,175

Claims priority, application Japan, Dec. 15, 1983, 58-192130[U]; Dec. 15, 1983, 58-192131[U]; Dec. 27, 1983, 58-199064[U]; Dec. 27, 1983, 58-199065[U]

Int. Cl.⁴ G03B 17/02, 7/00

U.S. Cl. 354—289.1

31 Claims



1. A camera comprising:

(a) a protruding part formed on the upper surface of the camera having a view finder optical system formed in the protruding part; and

(b) operation means for permitting change of a photographic information, said operation means including:

(b-1) a first operation switch arranged on one side of said protruding part;

(b-2) a second operation switch arranged on the other side of said protruding part;

(b-3) selecting means for selecting a particular one from a plurality of changeable photographic informations in a changeable condition in response to a switching operation of said first operation switch; and

(b-4) changing means for changing the value of said plurality of photographic informations in response to a switching operation of said second operation switch, said changing means changing the value of said one particular photographic information selected by said switching operation

of said first operation switch in response to said switching operation of said second operation switch.

4,710,009

PHOTOTECHNICAL APPARATUS OF VERTICAL ARRANGEMENT FOR CONTINUOUS DEVELOPMENT OF PHOTOGRAPHIC MATERIALS, PARTICULARLY PHOTOGRAPHIC PLATES

László Schneider, Néphadsereg u. 13, Budapest, V., Hungary
PCT No. PCT/HU84/00064, § 371 Date Aug. 22, 1985, § 102(e)

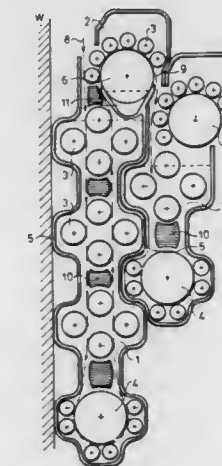
Date Aug. 22, 1985, PCT Pub. No. WO85/02919, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 20, 1984, Ser. No. 774,591

Claims priority, application Hungary, Dec. 23, 1983, 4444/83
Int. Cl.⁴ G03D 3/02, 3/08

U.S. Cl. 354—322

14 Claims



1. In a phototechnical apparatus for continuous development of photographic materials, comprising first and second development units arranged in series between an input and an output and a forwarding unit arranged between said first and second development units for forwarding photographic materials from said first development unit to said second development unit, each of said development units including a plurality of passing rolls arranged in first, second and third columns parallel to a first axis and a reversing roll arranged at the end of said columns of passing rolls for reversing the direction of travel of the photographic materials, the third column of passing rolls of said first development unit being arranged adjacent to the first column of passing rolls of said second development unit, and the third column of said first development unit and the first column of said second development unit being separated by a wall, the improvement wherein said wall has an undulating cross section such that said wall intersects a plane tangent to adjacent passing rolls of said third column of said first development unit and a plane tangent to adjacent passing rolls of said first column of said second development unit.

4,710,010

LENS BARREL DRIVING DEVICE FOR CAMERA

Akihiro Namai, Kanagawa; Akira Egawa, and Takanori Kodaira, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha

Continuation of Ser. No. 713,473, Mar. 19, 1985, abandoned.

This application Feb. 9, 1987, Ser. No. 13,198

Claims priority, application Japan, Mar. 19, 1984, 59-51226; Mar. 19, 1984, 59-51228

Int. Cl.⁴ G03B 3/10

U.S. Cl. 354—400

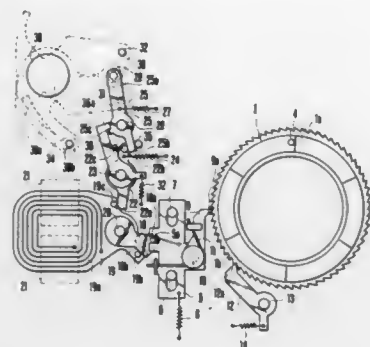
18 Claims

1. A barrel driving device for a camera comprising:

(a) a photographic lens barrel axially movable from an initial position;

(b) moving means having a ratchet;

- (c) a cam for moving said photographic lens barrel axially said cam operating with movement of said moving means to axially move said photographic lens barrel from the initial position, and, after completion of said movement, to return said photographic lens barrel to the initial position;
- (d) an advancing member arranged upon engagement with said ratchet to move said moving means;
- (e) an engaging member arranged upon engagement with said ratchet to hinder backward movement of said moving means;
- (f) electromagnetic means for operating said advancing means;



- (g) control means for controlling the supply of current to said electromagnetic means, said control means repeating periodic current passage to said electromagnetic means and determining the amount of movement of said photographic lens barrel from said initial position on the basis of the number of times of the repeated current passage;
- (h) a switch for stopping the periodic current passage of said control means in response to return of said photographic lens barrel to the initial position; and
- (i) counter means for counting the number of times of the periodic current passage of said counter means and disabling the switch until the value reaches a predetermined value.

4,710,011

AUTOMATIC RANGE FINDING DEVICE

Seimei Ushiro, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

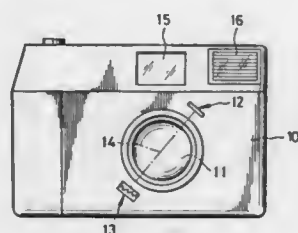
Filed Oct. 9, 1986, Ser. No. 917,190

Claims priority, application Japan, Oct. 9, 1985, 60-154467[U]

Int. Cl.⁴ G03B 3/10

U.S. Cl. 354-403

7 Claims



1. In an automatic range finding device comprising a light-emitting unit and a light-receiving unit disposed on the front face of a camera body, said units being spaced apart at opposite ends of an imaginary base line of predetermined lengths, means for emitting a slit of light in the form of a beam having a predetermined width toward a subject to be photographed, the light from said beam reflected from said subject being received by said light-receiving unit to measure the subject distance based on the incident position of the received reflected light; the

improvement in which: said light-emitting unit and said light-receiving unit are so disposed that said beam is disposed slantwise relative to an image plane of the camera, whereby the subject distance can be correctly measured irrespective of whether the camera is used in a horizontal position or in a vertical position.

4,710,012

FLASH PHOTOGRAPHY SYSTEM

Masanori Yamada, Sagami-hara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

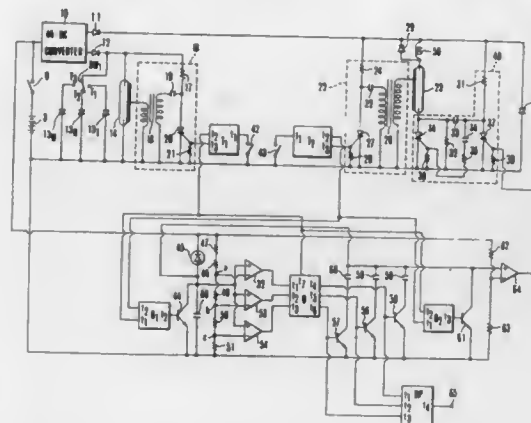
Filed Feb. 12, 1986, Ser. No. 828,960

Claims priority, application Japan, Feb. 14, 1985, 60-027193

Int. Cl.⁴ G03B 15/05

U.S. Cl. 354-415

19 Claims



1. A flash exposure device having main light issuing means for producing flash light with which an object to be photographed is illuminated, and preliminary light issuing means of constant illumination coverage angle for producing flash light prior to the issuing of the main light to obtain information to be used when an exposure is made by illumination with the main light, comprising:

- (a) illumination coverage angle varying means for varying the angle of illumination coverage of the flash light of said main light issuing means; and
- (b) object light adjusting means for adjusting the object light amount illuminated by said preliminary light issuing means of constant illumination coverage angle in accordance with the preset angle of illumination coverage by said illumination coverage angle varying means.

4,710,013

AUTOMATIC FOCUSING MECHANISM FOR CAMERA

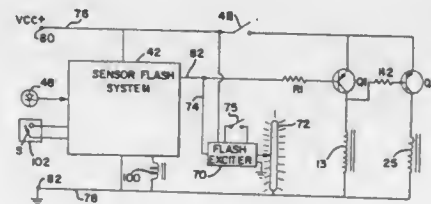
Wai C. Wong, North Point, Hong Kong, assignor to W. Haking Enterprises Limited, North Point, Hong Kong

Continuation-in-part of Ser. No. 785,572, Oct. 8, 1985, abandoned, and Ser. No. 891,360, Jul. 29, 1986, abandoned. This application Aug. 27, 1986, Ser. No. 900,718

Int. Cl.⁴ G03B 3/00, 7/16, 15/03, 7/085

U.S. Cl. 354-419

10 Claims



1. In an improved camera having an aperture stop adjustable

between a fully open and at least one reduced aperture setting, a variable focus lens, a flash system for scene illumination, a photosensor-responsive control system including aperture control means for varying the aperture stop setting and focus control means for varying the lens focus-setting and for operating said flash system between operative and inoperative states, a shutter, a shutter cocking system, and a shutter actuating system for actuating the said shutter responsively to movement of a user-operated release member, the improvement comprising:

said lens being adjustable alternatively between a far-focus position for distant objects and a near-focus position providing a shorter object focusing distance, said control system responding to ambient illumination below a given value to actuate said flash system to an operative state, said aperture stop to said fully open setting, and said lens to said near-focus position, said control system responding to ambient illumination above said given value to actuate said flash system to an inoperative state, said aperture stop to a first reduced aperture setting no greater than the hyperfocal aperture value corresponding to said far-focus position of said lens, and said lens to said far-focus position.

4,710,014

CONTROL CIRCUIT FOR A PROGRAMMING SHUTTER

Takanori Kohno, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

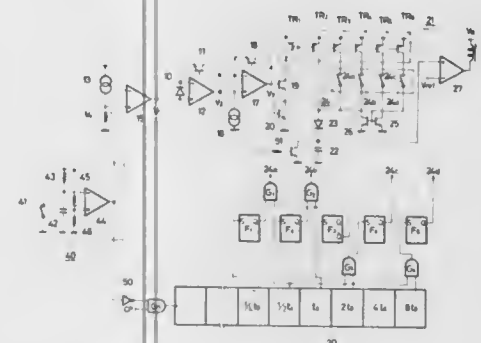
Filed Dec. 9, 1986, Ser. No. 943,941

Claims priority, application Japan, Dec. 14, 1985, 60-281689

Int. Cl.⁴ G03B 7/08

U.S. Cl. 354-427

6 Claims



1. A control circuit for a programming shutter including first logarithmic compression means for logarithmically compressing a current flowing through a light receiving element in accordance with brightness of a subject to be photographed, logarithmic expansion means for logarithmically expanding an output voltage of the first logarithmic compression means, an integrating condenser charged by a current determined corresponding to an output current of the logarithmic expansion means in interlocked relationship with opening operation of shutter blades having function of diaphragm and a comparison circuit for producing a signal closing the shutter blades when a charging level of the integrating condenser reaches a predetermined reference level, comprising:

- a plurality of weighted current sources each producing a current controlled by the output current of the logarithmic expansion means;
- a plurality of current switches corresponding to each of said current sources for adding or subtracting current flowing through each of said current sources to or from the charged current to said integrating condenser; and
- a counter which starts counting operation in interlocked relationship with the opening operation of the shutter blades to control operation pattern of said plurality of current switches by count of said counter.

4,710,015

DEVELOPING APPARATUS

Fuchio Takeda, Tokyo; Hiroyuki Matsushiro, Yokohama; Kazuo Kobayashi, Kawasaki, and Toshio Kaneko, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

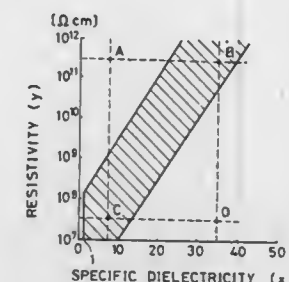
Filed Oct. 28, 1986, Ser. No. 923,904

Claims priority, application Japan, Oct. 28, 1985, 60-239598; Oct. 28, 1985, 60-239599

Int. Cl.⁴ G03G 15/08

U.S. Cl. 355-3 DD

2 Claims



1. A developing apparatus of the type in which a thin toner layer is formed on a toner carrier such that said toner carrier is in contact with a latent image carrier through said toner layer to develop a latent image on said latent image carrier, characterized by that said toner carrier is composed of an electrically conductive substrate an elastic dielectric layer formed on said substrate and supported thereby and an insulating layer formed on said elastic dielectric layer and that said elastic dielectric layer is formed of a material which satisfies

$$\log_{10} y < 0.15x + 7.5 \quad (x > 1)$$

where x is specific dielectricity of said material and y is resistivity of said material.

4,710,016

DEVELOPING APPARATUS

Junji Waatanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

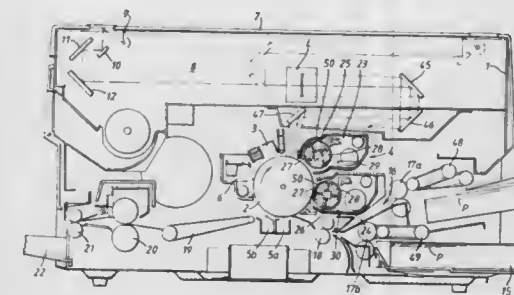
Filed Mar. 3, 1986, Ser. No. 835,249

Claims priority, application Japan, Mar. 26, 1985, 60-61477; Jul. 15, 1985, 60-155508

Int. Cl.⁴ G03G 15/08, 15/01

U.S. Cl. 355-4

10 Claims



1. A copying machine comprising:

- (a) an image carrier having a surface on which a latent image can be formed;
- (b) a first developing unit arranged close to said image carrier for developing a latent image formed on the surface of said image carrier with a first developer;
- (c) a second developing unit arranged close to said image carrier for developing a latent image formed on the surface of said image carrier with a second developer;
- (d) a first moving means for moving said first developing

unit between a first position in which said first developing unit is operably associated with said image carrier and a second position in which said first developing unit is disassociated from said image carrier, said first moving means comprising a first spring member one end of which is connected to said first developing unit;

(e) a second moving means for moving said second developing unit between a first position in which said second developing unit is operably associated with said image carrier and a second position in which said second developing unit is disassociated from said image carrier, said second moving means comprising a second spring member one end of which is connected to said second developing unit; and

(f) an actuating means connected to said first and second moving means for selectively actuating said first and second moving means so that said first or second developing unit is operably associated with said image carrier while said second or first developing unit is disassociated from said image carrier, said actuating means comprising:

(i) an arm member pivotable about a fulcrum positioned at the middle portion of said arm member, one end of said arm member being connected to the other end of said first spring member while the other end of said arm member is connected to the other end of said second spring member, and

(ii) a reversible motor connected to said arm member so as to reversibly pivot said arm member.

4,710,017

OPTICAL UNIT HOLDING DEVICE FOR COPYING MACHINES

Toshio Watanabe, Takatsuki; Eiji Tsutsui, Amagasaki, and Akihiro Tsunoda, Higashiosaka, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

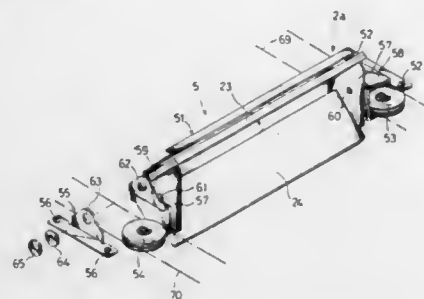
Filed Jun. 26, 1986, Ser. No. 879,732

Claims priority, application Japan, Jun. 27, 1985, 60-142293; Sep. 30, 1985, 60-218790; Sep. 30, 1985, 60-218792; Sep. 30, 1985, 60-218793

Int. Cl.⁴ G03G 15/00, 15/28; G03B 27/34

U.S. Cl. 355—8

7 Claims

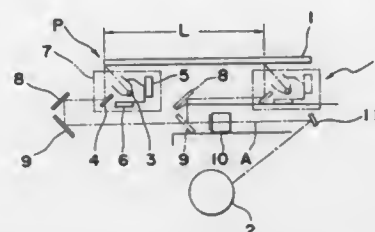


1. An optical unit holding device for copying machines comprising a support frame having a support frame proper to hold an optical system reciprocating for exposure of the documents placed on a contact glass, pairs of slide members attached respectively to the bottom of both ends of said support frame, and an end member attached to one of said pairs of slide members; wherein said end member is connected to said support frame proper in a manner that said end member turns within the plane including a slider which is holding said slide members, a driving wire to transmit driving power is attached respectively to said end member and said support frame proper, and said pairs of slide members are respectively held on a corresponding slider.

4,710,018
VARIABLE MAGNIFICATION COPYING APPARATUS
Takashi Miyaji, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 18, 1986, Ser. No. 886,612
Claims priority, application Japan, Jul. 19, 1985, 60-160959
Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—8

3 Claims



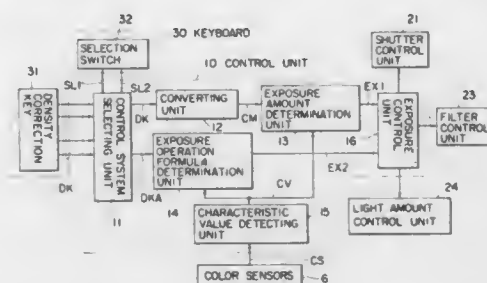
1. A variable magnification copying apparatus arranged to determine a scanning amount having a leading edge of an original document as a reference point, based on a copy paper size and a copying magnification as selected so as to control positions of a zoom lens assembly from the copying magnification, the improvement comprising an original document trailing edge indicating plate provided on a copy lamp unit for scanning the original document, and means for displacing said original document trailing edge indicating plate together with the copy lamp unit based on the value calculated from said copy paper size and copying magnification, thereby to set a terminal point of said displacement as a home position of said copy lamp unit.

4,710,019

PHOTOGRAPHIC PRINTER AND METHOD FOR DETERMINING EXPOSURE AMOUNT THEREOF
Takaaki Terashita, Ashigara-Kamigun, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Continuation-in-part of Ser. No. 743,966, Jun. 12, 1985, abandoned. This application Dec. 9, 1986, Ser. No. 944,055
Claims priority, application Japan, Jun. 15, 1984, 59-123263
Int. Cl.⁴ G03B 27/73

U.S. Cl. 355—38

19 Claims



1. A method for determining a printing exposure amount in a photographic printer comprising the steps of: obtaining a plurality of characteristic values of a negative film to be printed, which represent features of a picture image, by scanning said negative film; calculating an exposure amount necessary for printing said negative film due to the obtained characteristic values; inputting classification information for correcting the calculated exposure amount on the basis of a visual discrimination of said negative film; selecting one of a plurality of previously prepared exposure operation formulas according to said inputted classification information; and determining printing exposure amount in accordance with

said calculated exposure amount and said selected exposure operation formula using said characteristic values.

4,710,020

BEACON PROXIMITY DETECTION SYSTEM FOR A VEHICLE

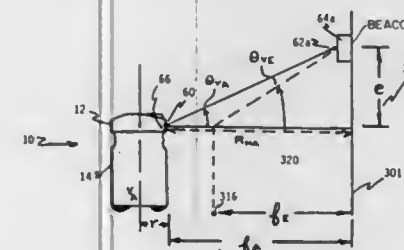
James F. Maddox, Arlington; Mark B. Kadonoff, Somerville, both of Mass.; Alan D. Berger, Pittsburgh, Pa.; Amy L. Taitalkoski, Salem; Robert W. George, II, Windham, both of N.H., and Faycal E. Benayad-Cherif, Somerville, Mass., assignors to Denning Mobil Robotics, Inc., Woburn, Mass.

Filed May 16, 1986, Ser. No. 864,292

Int. Cl.⁴ G01C 3/00; B25J 5/00

U.S. Cl. 356—1

24 Claims



1. A proximity detection system for determining the distance between a vehicle and a navigation beacon comprising: detector means, responsive to the beacon, for resolving the altitude angle between the beacon and the vehicle; means, responsive to said resolved altitude angle and to the height of the beacon, for determining the distance between the beacon and the vehicle; and means for defining an optimum distance between the beacon and the vehicle and for comparing said determined distance and said optimum distance to establish any difference between them.

4,710,021

PARTICULATE MATTER ANALYZING APPARATUS AND METHOD

Wieland E. von Behrens, Chicago, Ill., assignor to Sequoia-Turner Corporation, Mountain View, Calif.

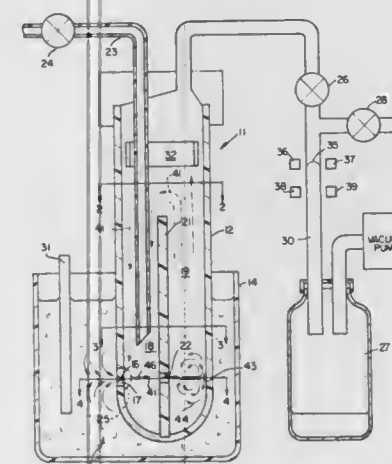
Continuation of Ser. No. 542,224, Oct. 14, 1983, abandoned.

This application Mar. 5, 1986, Ser. No. 837,875

Int. Cl.⁴ G01N 15/12, 15/14, 21/85

U.S. Cl. 356—72

13 Claims



1. The method for the analytic counting of particulates suspended in a liquid medium including the steps of passing the particulate-carrying fluid through an aperture into a first region of a chamber containing particulate-free fluid, passing the

stream of particulate-carrying fluid so produced through one or more sensors for analytically counting the particulates, passing the particulate-carrying stream through an opening in a barrier straddling the jet stream into a second region of the chamber, said barrier serving to preserve the volume of the first region in which the particle-carrying stream line is maintained, said barrier preventing direct recirculation of previously sensed particles through the opening straddling the jet stream into the first region while maintaining within said chamber, spaced from the opening between the first and second regions, free, direct and unhindered fluidic communication between the first and second regions and passing a volume of particulate-carrying and/or particulate-free fluid through a single output port so that the volume entering the chamber, the volume leaving the chamber, and the volume of particulate-carrying fluid passed through the sensors are all exactly equal, no portion of the particulate-carrying fluid being permitted to return to the regions of the sensors.

4,710,022

METHOD AND APPARATUS FOR MEASURING CHROMATIC DISPERSION COEFFICIENT

Kazuhiko Soeda, Yokohama; Masakazu Mori, Kawasaki; Tsutomu Nishikawa, Yokohama, and Kiyoshi Tomimori, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

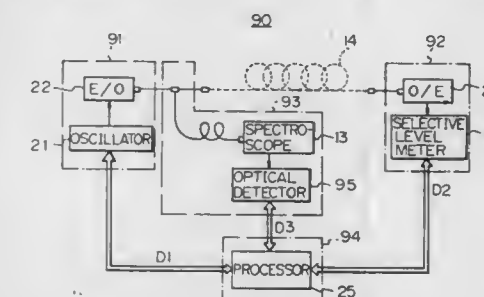
Filed Sep. 25, 1984, Ser. No. 654,158

Claims priority, application Japan, Oct. 31, 1983, 58-202706

Int. Cl.⁴ G01N 21/84

U.S. Cl. 356—73.1

19 Claims



1. A method for measuring a chromatic dispersion coefficient comprising the steps of:

- measuring an actual baseband characteristic of an optical fiber in accordance with a received optical signal level at an output end of the optical fiber, wherein the received optical signal corresponds to an input optical signal, having components of respective amplitudes in its optical spectrum corresponding to a plurality of oscillation modes, that is provided to an input end of the optical fiber, the input optical signal being modulated in amplitude with an AC signal which is varied to provide a plurality of modulation frequencies;
- obtaining a calculated baseband characteristic having a profile fitting closest to the actual baseband characteristic, by using data concerning the wavelengths and amplitudes of said components corresponding to said oscillation modes in the optical spectrum of the input optical signal, data concerning the modulation frequencies, and data concerning a provisional chromatic dispersion coefficient; and
- determining the provisional chromatic dispersion coefficient providing said closest fitting profile as the actual chromatic dispersion coefficient of the optical fiber.

4,710,023

MEASUREMENT OF CONTACT LENSES

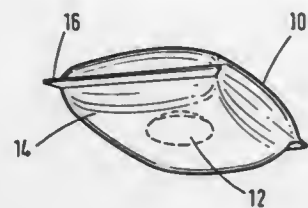
Ronald Loveridge, Harrow, United Kingdom, assignor to Ruxley Holdings Ltd. and Kilfa Limited, both of, United Kingdom
Continuation of Ser. No. 620,063, Jun. 13, 1984, abandoned.
This application Sep. 29, 1986, Ser. No. 913,598

Claims priority, application United Kingdom, Jun. 17, 1983, 8316567

Int. Cl.⁴ A45C 11/04; G01B 9/00

U.S. Cl. 356—124

9 Claims



1. In a method for measurement of one or more optical parameters of a contact lens, the improvement comprising the step of taking the measurement while the lens is contained in an aqueous fluid in a sealed sachet of plastics film of composition optically compatible with the measurements to be taken.

4,710,024

SPECTROPHOTOMETER

Toshiaki Fukuma, Kyoto, Japan, assignor to Shimadzu Corporation, Japan

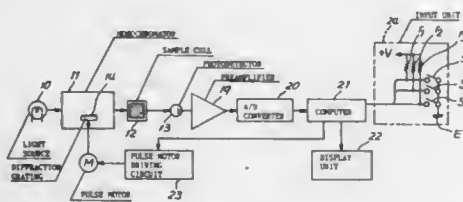
Filed Jul. 2, 1986, Ser. No. 881,331

Claims priority, application Japan, Jul. 2, 1985, 60-145377

Int. Cl.⁴ G01J 3/42

U.S. Cl. 356—328

5 Claims



1. A spectrophotometer comprising:
a light source;
a monochromator including a diffraction grating and a motor for driving said diffraction grating to provide a beam of monochromatic light at the exit slit of said monochromator;
a sample cell containing a sample to be analyzed and so disposed that said monochromatic light beam impinges on said sample cell;
a photodetector for detecting the light from said sample to produce a corresponding electrical signal;
a data processor for obtaining the wavelength of said monochromatic light from the amount of rotation of said motor in accordance with a predetermined functional relation;
an input unit for setting a parameter corresponding to the difference between the nominal and actual grating constants of said diffraction grating;
said data processor being so arranged as to obtain said wavelength in accordance with said nominal grating constant having been modified with said parameter set in said input unit; and
a display unit for displaying said wavelength.

4,710,025

PROCESS FOR CHARACTERIZING SUSPENSIONS OF SMALL PARTICLES

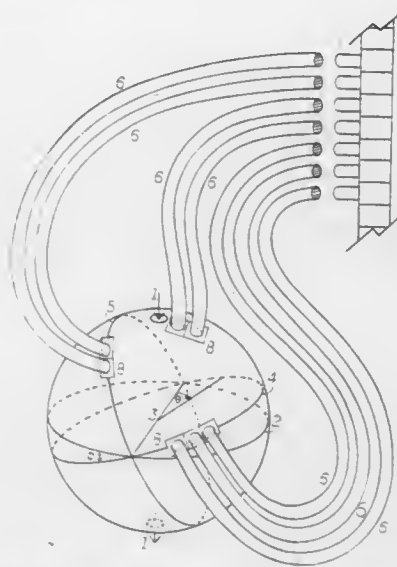
Philip J. Wyatt, Santa Barbara, and Gregory M. Quist, Goleta, both of Calif., assignors to Wyatt Technology Company, Santa Barbara, Calif.

Continuation of Ser. No. 390,980, Jun. 22, 1982, Pat. No. 4,548,500. This application Sep. 9, 1985, Ser. No. 773,652
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.⁴ G01N 21/53

U.S. Cl. 356—343

17 Claims



1. A Process to characterize a suspension of particles comprising the steps of:
A. Introducing said suspension into a region surrounded by a plurality of detectors, each at a different angular location;
B. Passing a narrow beam of electromagnetic radiation through said suspension;
C. Detecting the radiation scattered by said suspension at said different angular locations;
D. Converting each said detected scattered radiation into a proportional numerical value;
E. Storing said numerical values in a memory means corresponding to each discrete detector means;
F. Deriving measured optical observable values by combining sufficient selected sets of stored numerical values to yield a set of optical observables characteristic of the suspension of interest;
G. Defining an optical observable map for a fixed range of optical observable values in terms of a set of physical observables, each physical parameter restricted to a domain encompassing those characteristic of the suspension of interest, and said map consisting of closed regions within which ranges the circumscribing physical parameters would result in an optical observable within the defining fixed range;
H. Retrieving from memory means previously stored maps of optical observables, one map for each measured optical observable value and whose range of optical observable values bracket the corresponding computed values;
I. Superimposing a sufficient number of said retrieved maps of optical observables to yield a unique and finite region of overlap;
J. Identifying the range of each suspension's physical parameters corresponding to the common overlap region of said retrieved maps; and
K. Classifying and identifying the unknown suspension by the value of the physical parameters defined by the optical observable map overlap region.

4,710,026

POSITION DETECTION APPARATUS

Nobutaka Magome, Kawasaki, and Yutaka Ichihara, Yokohama, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

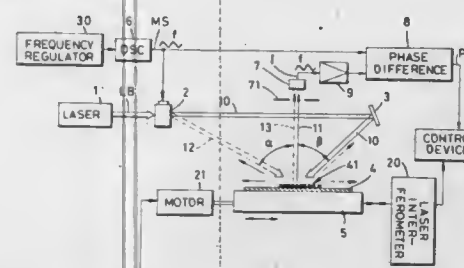
Filed Mar. 18, 1986, Ser. No. 840,880

Claims priority, application Japan, Mar. 22, 1985, 60-57890; Sep. 5, 1985, 60-196783

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—349

17 Claims



1. An apparatus for detecting a position of an article on which a diffraction grating is provided, comprising:
means for emitting first and second coherent light beams radiated onto said diffraction grating, said first and second light beams having different frequencies, thereby generating an optical beat based on interference between diffracted light beams of said first and second light beams which are generated from said diffraction grating;
means for producing a reference signal having a frequency corresponding to a frequency difference between said first and second light beams; and
means, including means for detecting said optical beat, for comparing a phase of said optical beat with that of said reference signal.

4,710,027

METHOD AND APPARATUS FOR MECHANICAL DITHER STABILIZATION OF A LASER ANGULAR SENSOR

Samuel N. Fersht, and Rena S. Fersht, both of Studio City, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

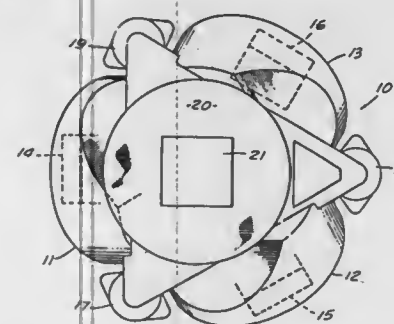
Continuation-in-part of Ser. No. 634,324, Jul. 25, 1984,

abandoned, which is a continuation-in-part of Ser. No. 574,845, Jan. 30, 1984, abandoned. This application May 16, 1986, Ser. No. 864,284

Int. Cl.⁴ G01C 19/64

U.S. Cl. 356—350

35 Claims



1. In combination:
at least three ring laser angle sensors, having non-coaxial sensing axes, for sensing angular motions, each having an operative laser part and a mounting part with freedom of angular vibration between said parts, said mounting parts of said sensors being rigidly attached together to form an instrument block, further including at least three angular sensor dithering means, one on each of said sensors, re-

spectively, for mechanically dithering said operative portion of each said sensor about its sensing axis, at a prescribed frequency, amplitude and phase, relative to said block;

a compensating weight, mounted upon said instrument block with freedom of angular vibration, relative to said block, about a dither axis that has components in the directions of each of said sensing axes;
compensating weight dithering means for mechanically dithering said compensating weight about said dither axis at a prescribed frequency, amplitude, and phase to reduce rotational vibration of said block; and
said three ring laser angle sensors being substantially identical and mounted with mutually orthogonal sensing axes for sensing rotations about said sensing axes, and said compensating weight being mounted with said dither axis at prescribed angles relative to each of said sensing axes.

4,710,028

SYSTEM FOR LOCATING A BODY IN MOTION

Gilles Grenier, L'Hay-Les-Roses; Jérôme Maffert, Versailles; Jean-Pierre Merle, Orsay, and Jacques R. des Ordon, Savigny, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

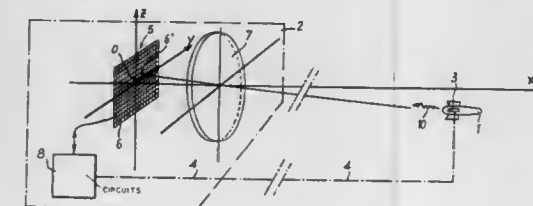
Filed Jun. 2, 1986, Ser. No. 869,302

Claims priority, application France, Jun. 17, 1985, 85 09158

Int. Cl.⁴ G01B 11/26

U.S. Cl. 356—375

8 Claims



1. A tracking device for locating a flying body, such as a missile, within the line of sight of said tracking device, said tracking device comprising:
a fixed planar matrix of controllable photosensitive elements, the plane of which is at least substantially at right angles with said line of sight;
electronic means for controlling said photosensitive elements;
an optical system for forming an optical image of said flying body onto said fixed planar matrix;
an optical emitter producing flash signals being carried by said flying body and synchronization means being provided for said electronic control means to deliver control pulses triggering off the taking of images synchronized with said flash signals.

4,710,029

PROJECTION TYPE EXPOSING APPARATUS

Kinya Katoh, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 796,785

Claims priority, application Japan, Nov. 19, 1984, 59-244229

Int. Cl.⁴ G01B 11/00

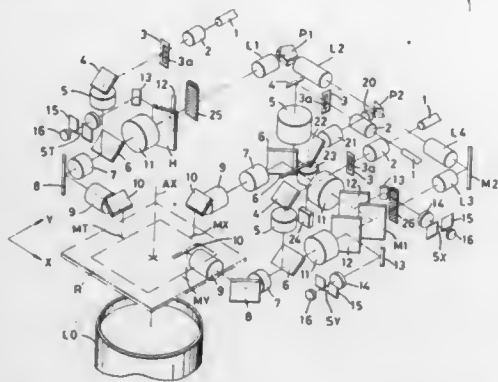
U.S. Cl. 356—401

11 Claims

1. A projection type exposing apparatus including:
(a) a projection objective for projecting the image of a first object having a predetermined pattern and a plurality of alignment marks onto a second object;
(b) photoelectric alignment means for aligning said first object, said photoelectric alignment means having an imaging optical system for forming images of the alignment marks of said first object, a photoelectric detecting slit member disposed at a predetermined image position of

said imaging optical system, and slit image displacing optical means for optically displacing the image position of said slit member on said first object in a direction perpendicular to the lengthwise direction of said slit member, said slit member being designed such that the lengthwise direction of the image of said slit member on said first object is coincident with a radial direction from the optic axis of said projection objective;

(c) a movable stage for supporting said second object thereon for movement relative to said projection objective; and



(d) a reference index mark member provided on said movable stage, said slit image displacing optical means displacing the image of said slit member so that the image of said slit member substantially corresponds to the image of said reference index mark member which said projection objective projects on said first object when said movable stage is disposed at a predetermined position, whereby rotational error of said photoelectric alignment means relative to said movable stage is eliminated.

4,710,030

OPTICAL GENERATOR AND DETECTOR OF STRESS PULSES

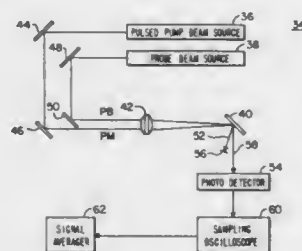
Jan Tauc; Humphrey J. Maris, both of Barrington, and Christian Thomsen, Providence, all of R.I., assignors to Bw Brown University Research Foundation, Providence, R.I.

Filed May 17, 1985, Ser. No. 735,825

Int. Cl.⁴ G01N 21/00

U.S. Cl. 356—432

37 Claims



1. An optical stress pulse generation and detection system for non-destructively measuring physical properties of a sample, comprising:

a radiation source for providing a pulsed pump beam having at least one short duration radiation pulse having a duration of 0.01 to 100 psec, and having an intensity and at least one wavelength selected to non-destructively generate a stress pulse in a sample;
means for directing said pump beam to a surface of a sample to generate said stress pulse in said sample;
means for guiding said probe beam to a location at said sample to intercept said stress pulse; and
means for detecting a change in an optical parameter of said

probe beam representative of the change in optical constants induced by said stress pulse in said sample.

4,710,031

MICROTITER PLATE READER

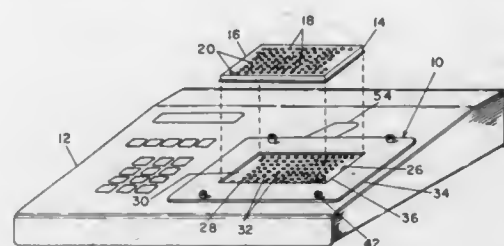
John E. Kelly, Duluth, Ga.; Don C. Jones, Madison, Wis.; Frederick R. Tuck, Norcross; William A. Zimmermann, Lilburn, both of Ga., and Kenneth R. Clark, Cottage Grove, Wis., assignors to Lancraft, Inc., Norcross, Ga.

Filed Jul. 31, 1985, Ser. No. 761,199

Int. Cl.⁴ G01N 21/00

U.S. Cl. 356—440

13 Claims



1. A microtiter plate reader for optically examining the contents of the wells of a microtiter plate having an array of wells, comprising:

- (a) supporting means for supporting the microtiter plate with the wells opening generally upwardly;
- (b) a light emitting surface extending under a microtiter plate when held by the supporting means to transmit light upwardly to the plate;
- (c) an array of regions of reduced light emission on the light emitting surface corresponding in relative position to a selected portion of the array of microtiter plate wells when held by the supporting means, wherein the array of regions of reduced light emission is a selected number of black dots arranged as a black dot array, each black dot generally corresponding in location to a well; and
- (d) locator means for locating the microtiter plate in selected relation to the black dot array of regions of reduced light emission such that the array of black dots can be selectively aligned or disaligned with the wells of the plate.

4,710,032

ARRANGEMENT FOR PREPARING A CHARGE OF COMPOSITIBLE MATERIAL FOR A COMPOSTING PLANT

Tore H. Nordlund, Torshälla, Sweden, assignor to Purac AB, Lund, Sweden

Filed Apr. 23, 1986, Ser. No. 854,835

Claims priority, application Sweden, Apr. 29, 1985, 8502087

Int. Cl.⁴ B01F 15/02

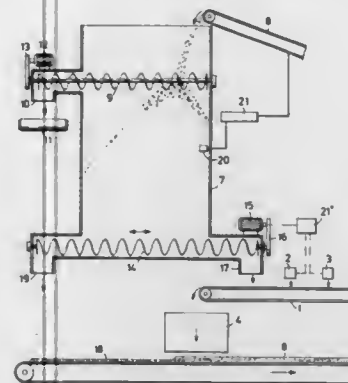
U.S. Cl. 366—156

3 Claims

1. An arrangement for preparing a charge for composting, which charge includes sewage sludge, a carbon-carrier and material that has already been composed, said arrangement comprising

- (a) a first conveyor (1),
- (b) a first supply means for supplying sewage sludge and a carbon-carrier to said first conveyor,
- (c) a second supply means for supplying already composted material to said first conveyor,
- (d) a mixer for mixing together the materials received from said first and second supply means,
- (e) a second conveyor (5) for receiving the material discharged from said mixer and delivering it to a composting plant,
- (f) a residence tank (7) for receiving composed material from a composting plant,

- (g) a third conveyor (8) for conveying composted material from said composting plant to said residence tank (7),
- (h) a first feeding means in the upper part of said residence tank (7) that is adapted to feed composted material from a first level in said residence tank (7) to a first outlet for the final composted product, and



- (i) a second feeding means (14) adjacent the lower part of said residence tank (7) for feeding composted material withdrawn from the residence tank (7) to said second supply means (c).

4,710,033

TEMPERATURE MEASUREMENT SYSTEM

Masao Hirano, Takatsuki; Mitsutaka Kato; Hirohiko Yasuda, both of Kyoto, and Seisuke Hinoda, Uji, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 365,028, Apr. 2, 1982, abandoned. This application May 28, 1985, Ser. No. 738,512

Claims priority, application Japan, Apr. 7, 1981, 56-51997

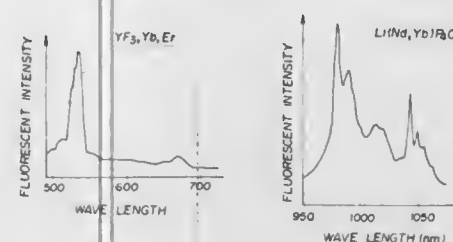
Int. Cl.⁴ G01K 11/12

U.S. Cl. 374—161

2 Claims

U.S. Cl. 384—115

8 Claims



1. A temperature measurement system comprising:

a phosphorescent material adapted for placement in an environment the temperature of which is to be measured, said material including one of the active rare earth substances chosen from the group consisting of Yb, Er, Tm, and Ho and one of the parent substances chosen from the group consisting of GdF₃, LaF₃, YF₃, LuF₃, CaF₂, BaF₂, BaYF₃, NaLuF₄ and Y₂OCl₇;
means for exciting said material to emit phosphorescent light, said exciting means comprising a light emitting diode for irradiating said material with infrared radiation to excite said material;
means for receiving emitted light and detecting the intensity thereof; and
means for integrating the value of intensity for a given time only following cessation of excitation to determine said temperature.

4,710,034

DOUBLE-CONICAL STATIC PRESSURE-TYPE GAS BEARING

Gabriel Tittizer, Rösrath-Hoffnungstal; Ewald Junghans, Bergisch Gladbach; Georg Bestenreiner, Rösrath, and Christian Dahm, Cologne, all of Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

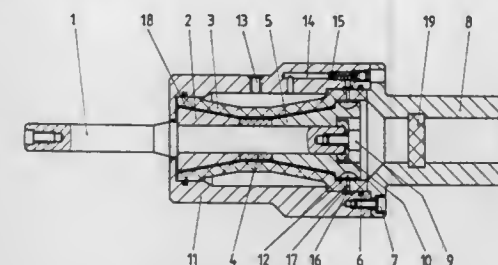
Filed Jun. 6, 1986, Ser. No. 871,705

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1985, 3520717; Apr. 10, 1986, 3612097

Int. Cl.⁴ F16C 32/06, 33/02

U.S. Cl. 384—110

10 Claims



1. Static pressure-type gas bearing assembly for a high-speed rotary shaft, comprising a porous bearing bushing formed of a pair of hollow cone frustums connected to one another at respective narrow ends thereof, and a plurality of bearing members formed of plastic material and mountable on a shaft, said bearing members having a shape complementary to that of said bearing bushing and comprising two discrete frustoconical members having respective smaller diameter ends facing towards one another.

4,710,035

INHERENT VARIABLE FLUID RESTRICTOR

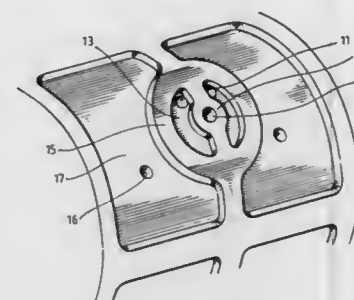
Mark R. Vaughn, Albuquerque, N. Mex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jun. 16, 1986, Ser. No. 874,859

Int. Cl.⁴ F16C 17/02

U.S. Cl. 384—115

8 Claims



4. A hydrostatic bearing comprising:

a hollow body member defining a sleeve-like member;
a shaft member journaled in said sleeve-like member;
said members having opposed bearing surfaces;
a plurality of bearing pockets distributed around one of said surfaces in diametrically opposed pairs;
a separate inlet port in each said pocket adapted to supply fluid lubricant to said pocket;
a separate restrictor land around each said inlet port;
a separate isolation land around and spaced from each said restrictor land to define a collection gallery between said lands, said isolation land also isolating said collection gallery from the remaining portion of its respective pocket; and
a separate outlet port in each said gallery configured to

convey fluid lubricant from its respective gallery to said remaining portion of the pocket diametrically opposite the bearing pocket of said outlet port.

4,710,036

BEARING ASSEMBLY

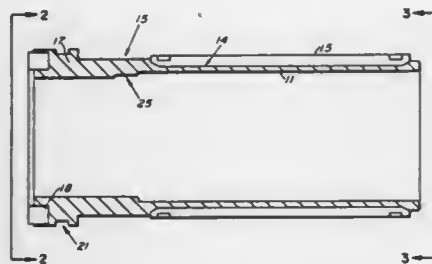
Bela Geczy, Orange, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 20, 1986, Ser. No. 841,570

Int. Cl.⁴ F16C 17/10

U.S. Cl. 384-275

3 Claims



1. In a downhole earth boring motor, apparatus comprising: a drive shaft; a generally cylindrical unitary bearing sleeve having an elongated recessed area on its outer surface and an integrally formed thrust head at one end thereof; a radial bearing comprising tungsten carbide chips in a copper base infiltrant bonded to said sleeve in said elongated recessed area; a plurality of radially disposed cylindrical openings in said thrust head for mounting thrust bearing elements; a plurality of cylindrical diamond faced thrust bearing elements, one mounted in each of said openings; an eccentric interior locking ring means on said unitary sleeve; and means on said drive shaft cooperating with said interior locking ring means for locking said unitary bearing sleeve to said drive shaft.

4,710,037

BEARING RETAINER STRUCTURE

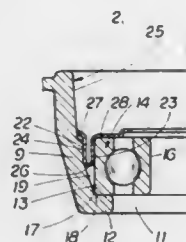
Barry M. Newberg, Creve Coeur, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 4, 1986, Ser. No. 903,419

Int. Cl.⁴ F16L 35/077; B23P 19/04

U.S. Cl. 384-537

22 Claims



1. In combination, an improved end assembly structure for an electric motor comprising: an endshield adapted to be mounted adjacent one end of said motor; a bearing hub in said endshield, said hub having support means to support a bearing thereon; an annular bearing having an outer periphery, said bearing being mounted in said bearing hub with one face thereof resting on said support means of said hub to permit a rotor shaft of said motor to be journaled therein, said hub hav-

ing an inner wall radially spaced from said outer periphery of said bearing, said bearing and said hub being sized relative each other to provide a preselected space between said inner wall of said hub and said opposed outer periphery of said bearing, said space extending from one face of said bearing to the opposite face to eliminate the need for machining operations; and,

fastening means adapted to be inserted into press-fit relation in said preselected space between said hub and bearing in contact with said inner wall of said hub and said outer periphery of said bearing to retain said bearing firmly in position to absorb torsional, axial and radial thrusts of a rotor shaft journaled in said bearing.

4,710,038

BEARING CAP ASSEMBLY

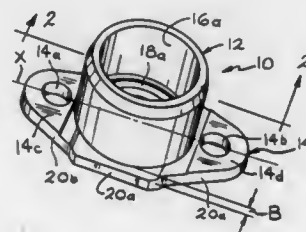
Erin D. Hennon, Lima, and Thomas J. Keller, Cridersville, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 2, 1985, Ser. No. 803,586

Int. Cl.⁴ F16C 19/22; F16D 3/30

U.S. Cl. 384-569

7 Claims



1. A bearing cap and mounting plate assembly comprising: an open ended bearing cap having an axis and a generally cylindrical sidewall parallel to said axis and a closed end wall attached to said sidewall and perpendicular to said axis, said cylindrical sidewall defining an outer diameter; a mounting plate generally parallel to and securely attached to said end wall of said bearing cap, said mounting plate including a mounting surface in facing relationship with said bearing cap; said mounting surface having a central surface portion secured to the outer surface of said end wall and first and second spaced apart end surface portions located on opposite sides of said central surface portion and spaced outwardly past the sidewall of said bearing cap; said end surface portions connected to said central surface portion along first and second boundary lines, said first and second boundary lines being spaced from one another by a distance at least as great as said outer diameter of said bearing cap; and said end surface portions being raised relative to the area of said central surface portion lying adjacent to said first and second boundary lines.

4,710,039

CAGE FOR ROLLER BEARING

Klaus Huttner, Heidenfeld, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 4, 1987, Ser. No. 21,476

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608184

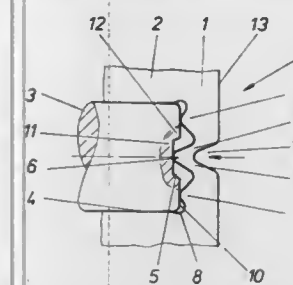
Int. Cl.⁴ F16C 33/54

U.S. Cl. 384-574

5 Claims

1. In a roller cage, comprised of a substantially cylindrical sheet metal sleeve having closed pockets for receiving rollers, the cage having annular side ring defining the sides of the pockets, the rollers having depressions in their end surfaces, and holding projections extending from said side rings into the recesses of the rollers; the improvement wherein guide projec-

tions are provided extending axially into said pockets from said side ring on each side of the respective holding projection, said guide projections engaging annular end surfaces of said rollers radially outside of said recesses, the portion of said cage be-



tween said holding projection and guide projections being axially spaced from the transition region of the ends of said rollers between said recesses and the annular end surfaces thereof.

4,710,040

PRINTER HAVING CONSTANT PRESSURE BETWEEN PRINT HEAD AND PLATEN

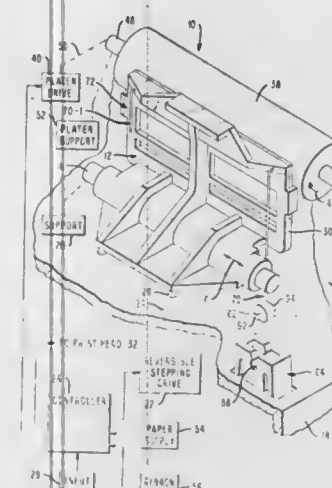
Michael O. Grey, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 2, 1985, Ser. No. 804,019

Int. Cl.⁴ B41J 11/20, 3/04

U.S. Cl. 400-55

1 Claim



1. A printer comprising: a frame; a platen mounted on said frame and having a longitudinal axis; a print station; means for feeding printing media to said print station; a carriage mounted on said frame and having a print head thereon, and means for moving said carriage with said print head thereon in reciprocating movement parallel to the longitudinal axis of said platen and relative to said print station; and means for biasing said print head towards said platen comprising: at least one biasing member having first and second end portions; said first end portion having an offset portion which is pivotally mounted in said carriage so as to bias said print head into printing relationship with the printing media at said print station; and mounting means secured to said frame to slidably receive

said second end portion of said biasing member for sliding movement in a plane and to enable said second end portion to be pivoted about a pivoting axis which is substantially perpendicular to said plane as said carriage is moved; said biasing member having a central portion with said first and second end portions being joined to said central portion; said second end portion being offset at an angle relative to said central portion; and said first and second end portions and said central portion lying in a common plane, with said first and second end portions being located on the same side of said central portion; said mounting means comprising a base member secured to said frame and a pivoting member pivotally mounted in said base member to pivot about said pivoting axis; said pivoting member having an aperture therein to slidably receive said second end portion of said biasing member for said sliding movement in said plane; said base member having an opening therein which leads to an arcuately-shaped recess therein; said pivoting member having aligned, cylindrical projections extending from opposed sides thereof, with said cylindrical projections having portions removed to produce flat areas thereon to enable said pivoting member to pass through said opening in said base member and to be retained in said arcuately-shaped recess upon an approximately ninety-degree rotation of pivoting member; and said aperture in said pivoting member being substantially perpendicular to a plane including at least one of said flat areas on said cylindrical projections.

4,710,041

HEAT-TRANSFER THERMAL RECORDING DEVICE
Mitsuhiko Shimada; Junichiro Matsumoto, both of Nara; Susumu Nonaka, Yamatokoriyama, and Haruo Sayama, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

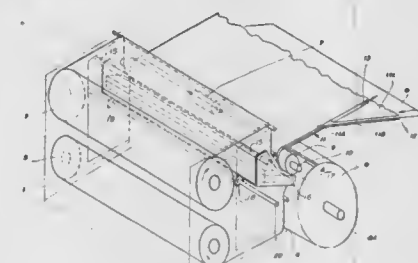
Continuation of Ser. No. 790,520, Oct. 23, 1985, abandoned. This application Mar. 26, 1987, Ser. No. 31,178

Claims priority, application Japan, Oct. 23, 1984, 59-223478; Oct. 26, 1984, 59-226449

Int. Cl.⁴ B41J 3/02

U.S. Cl. 400-120

9 Claims



1. A vertical cassette unit for use in combination with a heat-transfer thermal recording device for recording/printing color pictures by selective heating of multi-colored segmented ink film tape on color picture recording paper by a thermal line head consisting of: a case having a continuous rear panel, a concave, U-shaped continuous front panel, two side panels shaped so as to conform to the U-shaped configuration of said front panel and superior and inferior apertures formed in upper and lower front edges of said U-shaped front panel, respectively; ink film tape supply reel rotatably mounted at both ends thereof by a rotary shaft on said side panels in an upper rear interior portion of said case;

ink film take-up reel rotatably mounted at both ends thereof by a rotary shaft on said side panels in a lower rear portion of said case below said supply reel, one end of said take-up reel being provided with a gear connector which protects from a corresponding side panel to be connected to a drive source; and

a multi-colored segmented ink film tape in the form of a continuous sheet having two end portions wound on said supply reel and take-up reel, each of said two end portions being engaged by said respective supply reel and take-up reel, said ink film tape traversing from said supply reel to said take-up reel via said superior and inferior apertures in front of said U-shaped front panel forming a space between said ink film tape and said front panel such that a thermal line head may be rotatably installed in said space laterally between both sides of said cassette unit, parallel to said continuous sheet of said ink film tape.

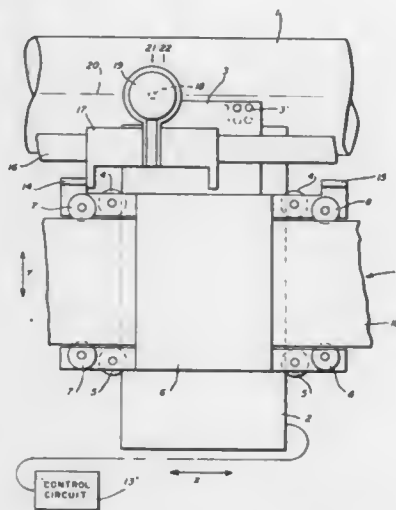
4,710,042

METHOD AND APPARATUS FOR INDEXING THE PRINT HAMMER OF TYPEWRITERS OR THE LIKE
Manfred Moritz, Nuremberg, and Wilfried Rettke, Altdorf, both of Fed. Rep. of Germany, assignors to Ta Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany
Filed Apr. 23, 1986, Ser. No. 855,113
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515108

Int. Cl.⁴ B41J 9/14, 1/16

U.S. Cl. 400—141

11 Claims



1. In a typewriter having a print hammer and a type matrix supporting type characters in rows and columns and being positionable to present a character in a selected row and column for printing by the print hammer, the improvement comprising

a linear motor having a rotor adapted to be energized to effect movement of said rotor in row and column directions, said type matrix being connected to said rotor, rotor guide means driven by said rotor when energized, a hammer carrier supporting said print hammer, and first means on said guide means and hammer carrier for carrying along said print hammer carrier to position said print hammer to the next printing position when said rotor is energized to move in a columnar typing direction, and for carrying along said print hammer carrier to position it at the beginning of a line of print when said rotor is energized to effect a carriage return.

4,710,043

IMPACT PRINTER WITH VARIABLE DELAY FOR PRINT CYCLE BASED ON DIFFERENT PRINT-HAMMER ENERGY LEVELS

Tsuyoshi Matsushita, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

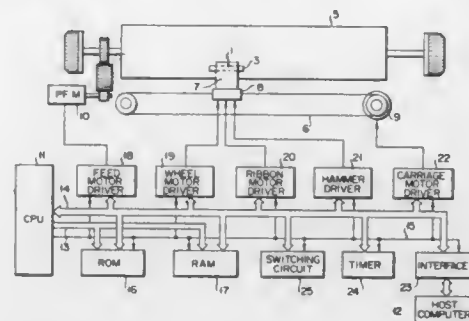
Filed Apr. 7, 1986, Ser. No. 849,060

Claims priority, application Japan, Apr. 18, 1985, 60-83089

Int. Cl.⁴ B41J 1/30

U.S. Cl. 400—144.2

7 Claims



1. A printing device comprising:
a printing wheel having types formed at respective outer end portions of its respective spokes;
printing wheel driving means responsive to a wheel drive signal to rotate the printing wheel so that it is set to a printing position designated by an input character code;
a printing ribbon driver;
a printing hammer;
a printing hammer driving means for driving the printing hammer with a printing energy corresponding to energy data;
carriage having the printing wheel, printing ribbon driver and printing hammer fixed thereto;
a platen;
a carriage driving means for driving the carriage along the platen so that it is set to a printing position;
memory means for storing energy data and time data corresponding to the character code representing the type; and
control means for reading energy data and time data corresponding to the input character code and for supplying the energy data from the memory means to the printing hammer driving means when the printing wheel is set to a printing position designated by the input character code and preventing the operation of the carriage driving means over a time period corresponding to the time data from the memory means after the printing hammer has been driven with a printing energy corresponding to the energy data.

4,710,044

RIBBON CASSETTE WITH END OF RIBBON DETECTOR
Rolf Ackermann, Nuremberg, Fed. Rep. of Germany, assignor to Ta Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Jan. 9, 1987, Ser. No. 1,958

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1986, 3601482

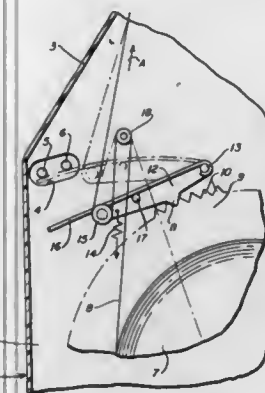
Int. Cl.⁴ B41J 32/00, 35/36

U.S. Cl. 400—208

6 Claims

1. An apparatus for use in a typewriter, comprising a ribbon cassette, a ribbon cassette holder therefor, and means for drawing off ribbon from a supply spool in the ribbon cassette,
said ribbon cassette pivotably mounting a ribbon tensioning lever biased to normally engage said supply spool and operable in response to pull on the ribbon to draw off ribbon to release and then to reengage said supply spool

after a length is drawn off, thereby to maintain ribbon tension, and
an end of ribbon detector comprising
two contact pins spaced at predetermined locations, and a springy contact web on said tensioning lever for bridging said contact pins when said tensioning lever is pulled by ribbon tension due to an end of ribbon condition to a respective contact making position, said springy contact web having a respective electrically conductive part for electrically bridging said contact pins, said contact pins being positioned on a line which



is not parallel to said springy contact web when said springy contact web first contacts one of said pins, continued movement of said tensioning lever after said springy contact web contacts one of said pins causing said springy contact web to bend so that said springy contact web when bent simultaneously contacts both of said pins, wherein said bridging of said contact pins by said springy contact web requires said ribbon tension to be sufficient to bend said springy contact web by a predetermined amount according to the spacing of said contact pins.

4,710,045

DIASYWHEEL PRINTER WITH IMPROVED ADJUSTABLE CARRIAGE ASSEMBLY AND CARTRIDGE LATCHING MEMBER

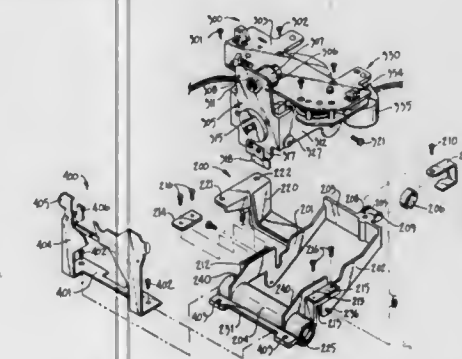
Sam K. Lim, San Jose, Calif., assignor to Genicom Corporation, Waynesboro, Va.

Division of Ser. No. 762,021, Aug. 1, 1985, which is a continuation of Ser. No. 538,606, Oct. 3, 1983. This application Mar. 18, 1986, Ser. No. 841,080

Int. Cl.⁴ B41J 11/22, 11/20, 19/56

U.S. Cl. 400—352

6 Claims



1. A carriage assembly for a printing device having a print mechanism to be translated along a linear print path, said carriage assembly comprising:
upper carriage means for supporting said print mechanism;
lower carriage means for supporting said upper carriage

means, said lower carriage means comprising a unitary member having a pair of laterally spaced arm members each having an open pivot slot and a support ramp portion located rearwardly of said slot, a rear tube portion joining said arm members at the rear, a front cross brace joining said arm members at the front, said rear tube portion being dimensioned to accommodate a first carriage support rod, and front bearing means carried by said front cross brace and dimensioned to accommodate a second carriage support rod so that said lower carriage means is carried by said first and second carriage support rods;

said upper carriage means including a pair of laterally opposed laterally extending support studs, each received in a different one of said pivot slots and removably supported thereby, and a pair of laterally opposed adjustable guide members, each located rearwardly of the respective one of said support studs, said guide members normally engaging corresponding support ramp portions when said carriage assembly is in a first operative position to establish the relative positions of said upper and lower carriage means; and

spring means coupled between said upper and lower carriage means in the region adjacent the pivot portions and arranged to provide a spring detent for said upper carriage means with respect to said lower carriage means in said first operative position and in a second inoperative position.

4,710,046

PLATEN CLUTCH MECHANISM

Hiroaki Ookubo, Kurume, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

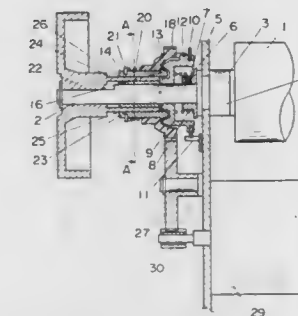
Filed Jul. 10, 1985, Ser. No. 753,565

Claims priority, application Japan, Jul. 10, 1984, 59-142726

Int. Cl.⁴ B41J 19/06, 11/24

U.S. Cl. 400—556.2

2 Claims



1. A platen clutch mechanism comprising:
a shaft having a platen fixedly mounted thereon;
a knob mounted on said shaft and axially movable therealong and having at least one projection thereon extending parallel to said shaft;
a first clutch member fixedly mounted on said shaft and having a through hole therein offset from said shaft and through which said projection slidably extends;
a second clutch member movably mounted on said shaft on the opposite side of said first clutch member from said knob for movement along said shaft and resiliently engaged in clutching engagement with said first clutch member and engagable by said projection for being moved out of clutching engagement with said first clutch member when said knob is moved toward said first clutch member;
a driven gear rotatably mounted around said first clutch member and means between said driven gear and said second clutch member for slidably and rotatably engaging said driven gear with said second clutch member, and means for normally holding said driven gear in a substan-

tially fixed position along the axial length of said first clutch member; and
drive gear means in a fixed position along the axial length of said first clutch member and engaged with said driven gear at said substantially fixed position;
whereby with said clutch members engaged, said platen can be driven through said driven gear, and when said knob is moved toward said first clutch member, only said second clutch member is moved to move away from said first clutch member to be disengaged therefrom, so that said platen can be moved by rotation of said knob and at the same time said driven gear remains in said substantially fixed position and does not move relative to said drive gear means.

4,710,047

DESK-TOP CORRECTION RIBBON SYSTEM

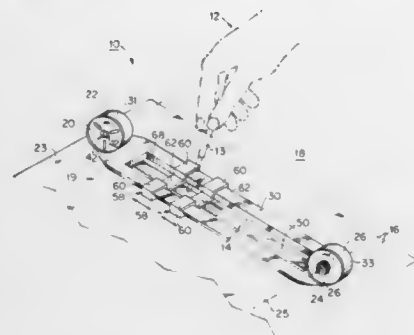
Victor Barouh, 111 Wheatley Rd., and Seth Dinsky, 4 Deepwood Ct., both of Old Westbury, N.Y. 11568

Filed Jul. 12, 1985, Ser. No. 754,226

Int. Cl.⁴ B41J 29/367

U.S. Cl. 400—697

14 Claims



1. A system for positioning a correction ribbon having a dry correction material over an image on a surface for subsequent covering of said image, comprising, in combination, a correction ribbon having a removable opaque correction material layer on one side of said ribbon, supply means for holding and advanceably releasing an unused amount of said ribbon with said opaque material being aligned downwardly upon release, said supply means including a first cylindrical holder including a first cylindrical wall having a first axis and a first rear wall perpendicular to said first axis, said first rear wall and said first cylindrical wall defining a first cylindrical chamber, said supply means further including a supply spool member having a supply spindle and a circular supply spool outside wall perpendicular to said supply spindle, said unused amount of said ribbon being wound around said supply spindle, said first cylindrical chamber having a first open side opposite said first rear wall and being capable of receiving said supply spindle with said ribbon, said supply spindle being aligned with said first axis, said supply spool outside wall covering said first open side, take-up means spaced from said supply means for receiving a used amount of said ribbon from said supply means, said take-up means including a second cylindrical holder including a second cylindrical wall having a second axis parallel to said first axis and a second rear wall perpendicular to said second axis, said second rear wall and said second cylindrical wall defining a second cylindrical chamber, said take-up means further including a take-up spool member having a take-up spindle and a circular take-up spool outside wall perpendicular to said take-up spindle, said used amount of said ribbon being wound around said take-up spindle, said second cylindrical chamber having a second open side opposite said second rear wall, said second cylindrical chamber being capable of

receiving said take-up spindle with said ribbon, said take-up spindle being aligned with said second axis, said take-up spool outside wall covering said second open side, track means connected to said supply means and said take-up means for holding down said unused amount of said ribbon against said image and providing a passage for said ribbon between said supply means and said take-up means, said first and second axes being transverse to said track means, access means associated with said track means for aligning a portion of said unused ribbon over said image and for providing access to said ribbon, and supply spool clip-on means and take-up spool clip-on means for holding said supply spool member and said take-up spool member in said first and second cylindrical chambers, respectively, said supply spool clip-on means and said take-up spool clip-on means including a first and second pair of biasable parallel elongated members, respectively, said elongated members having inner ends connected to said first and second rear walls of said first and second cylindrical holders spaced from said first and second axes and opposed outer ends spaced outwardly from said open sides of said first and second cylindrical chambers, said pair of elongated members further including a first pair of detent elements positioned at said outer ends, capable of being moved from normally unbiased modes of parallel relationship to biased modes wherein said first pair of detent elements move toward one another to a position closely spaced from one another, said elongated members having inner ends connected to said first and second rear walls of said first and second cylindrical holders spaced from said first and second axes and opposed outer ends spaced outwardly from said open sides of said first and second cylindrical chambers, said pair of elongated members further including a second pair of detent elements positioned at said outer ends, each said second pair of detent elements having an outer edge and having an outward taper at said outer edge, each said second pair of detent elements having a flat inner side facing said first and second rear walls, each said flat inner side and each said biasable elongated member forming a locking recess, said supply and take-up spool outside walls each having an inner rim with a circular flat outer surface said flat inner side of said second pair of detent elements being in pressing contact with said circular flat outer surface at said locking recess, said supply spindle and said take-up spindle forming first and second cylindrical apertures, respectively, having first and second cylindrical inner surfaces, said first and second cylindrical apertures being capable of receiving said first and second pairs of detent elements in said biased mode during mounting of said supply and take-up spindles onto said first and second pairs of detent elements, said first and second inner surfaces riding along said outward tapers during the mounting process, said first and second pairs of biasable elongated members returning to the unbiased mode when said supply spool and said take-up spool outer walls become locked at said flat inner sides of said locking recesses, ratchet means associated with said take-up spool member and said second cylindrical holder for keeping said take-up spool member from being rotated in a reverse direction upon rotation of said take-up spool member, said second cylindrical wall having a flat rim surface at said second open side aligned perpendicular to said second axis, said ratchet means including said take-up spool outside wall having an inner surface rim in pressing contact with said flat rim surface, said flat rim surface having at least a portion of said flat rim surface forming first grooves, and said inner surface rim forming second grooves being capable of interlocking with said first grooves and preventing reverse rotation upon cessation of rotation of said take-up spool member.

4,710,048

APPLICATOR BOTTLE WITH SEALING CAP

Victor Vartoughian, 358 N. Ridgewood Pl., Los Angeles, Calif. 90004

Continuation of Ser. No. 518,419, Jul. 29, 1983, abandoned, which is a continuation of Ser. No. 246,726, Mar. 23, 1981, Pat. No. 4,447,169. This application Feb. 21, 1985, Ser. No. 704,901
Claims priority, application 05081983, May 8, 1983, PCT/US83/01201

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.⁴ A46B 11/00; A45D 34/00

U.S. Cl. 401—269

9 Claims



1. In an applicator dispenser bottle for dispensing a liquid or the like automatically the applicator dispenser having a brush, a liquid containing bottle body portion and a cap threadably mounted to said bottle body portion, the improvement which comprises:

said bottle body portion being refillable and being substantially transparent and of a squeezable material, and having a neck at one end communicating with the interior thereof and a bottom at the other end with a cavity formed therein;
said brush including a bulbous closure portion for releasably and engageably fitting into said neck and a flange means for preventing said bulbous closure portion from extending more than a predetermined distance into said neck and a passageway through said closure portion;
said cap, in a first position normally closing off said neck of said bottle body portion in a fluid tight seal relationship and defining a chamber between said cap and said bulbous closure portion, said cap, in a second position, being receivably and frictionally held in said cavity to provide an extension to said bottle body portion, and said brush further including a tapered portion to one side extending only partly into said chamber when said cap is in said first position;
said brush including a plurality of bristles retained therein, said bulbous closure portion of said brush having a surface conforming annularly to the upper interior surface of said cap wherein a fluid tight seal is provided for said chamber between said cap and said bulbous closure portion of said brush when said cap is inserted over said brush and threaded onto said bottle body portion.

4,710,049

SAFETY HINGE

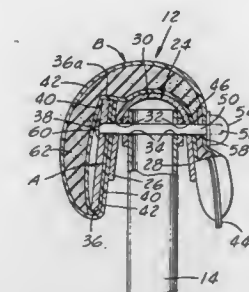
Chang Chang, Monterey Park, Calif., assignor to Virco Mfg. Corporation, Los Angeles, Calif.

Filed Jan. 30, 1987, Ser. No. 9,517

Int. Cl.⁴ F16B 11/00

U.S. Cl. 403—23

6 Claims



5. A protective covering for covering a hinge mechanism of the character embodied in infant furniture and having a pivot plate provided with an aperture therethrough, a pivot pin removably receivable within said aperture, a head affixed to one end of said pivot pin and a pivotally movable member having an aperture therethrough for receiving said pivot pin, said protective covering means comprising:

- a first portion receivable between said head of said pivot pin and said pivot plate, said first portion having an aperture therethrough indexable with said aperture in said pivot plate;
- a second hollow portion connected to said first portion said second hollow portion being foldable over said first portion, said pivot plate and said pivotally movable member and having an edge portion provided with an aperture therethrough indexable with said apertures in said pivot plate and said pivotally movable member when said second hollow portion is folded over said pivot plate and said pivotally movable member;
- pad means carried within said second hollow portion for padding said pivot plate and said pivotally movable member when said second hollow portion is folded thereover; and
- cap means connectable with said other end of said pivot pin for engagement with said second hollow portion for holding said hollow portion in a folded position.

4,710,050

MODULAR METALLIC BELLOWS ASSEMBLY

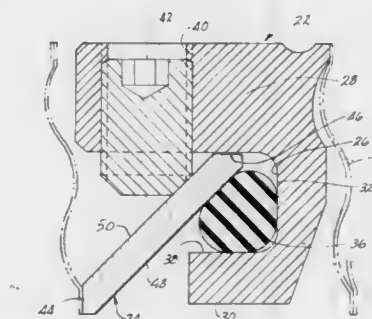
Richard R. Larsen, Port Orange, Fla., assignor to Pacific Scientific Co., Anaheim, Calif.

Filed Oct. 20, 1986, Ser. No. 921,231

Int. Cl.⁴ F16B 7/10

U.S. Cl. 403—51

12 Claims



1. A coupling for connecting a first member to a second member comprising:

a female coupling portion operatively attached to the first member, said female coupling portion containing an annular recess therein;
resilient sealing means received within said annular recess in said female coupling portion;
a male coupling portion operatively attached to the second member, said male coupling portion having a conical configuration and being receivable within said annular recess in said female coupling portion and being positioned therein so as to contact said resilient sealing means; and
means for applying a radially inwardly directed force to said male coupling portion said male coupling portion to move axially into said female coupling portion compressing said resilient sealing means between said male coupling portion and said female coupling portion.

4,710,051

DEVICE FOR FASTENING A CLOSED CASING

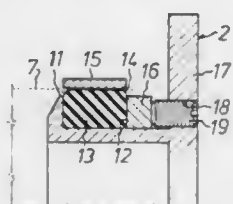
Jan E. L. Karmazin, Norregatan 5, S-230 10 Skanör, Sweden

Filed May 27, 1986, Ser. No. 866,768

Int. Cl.⁴ F16B 7/04; B07B 1/49

U.S. Cl. 403—227

6 Claims



1. Apparatus for use in assembling a screening drum, comprising a circumferentially closed cylindrical wire cloth screen which is open at both ends, and at least one end supporting means attachable to one end of said screen for circumferentially supporting said one end of said screen, said end supporting means including a supporting member having a cylindrical outer surface of substantially the same diameter as said screen and axially insertable into said one end of said screen, an annular elastic engagement element received in a circumferential groove in said cylindrical surface and having an outer circumferential surface of substantially the same diameter as said cylindrical surface so that said engagement element is insertable into said one end of said screen with said cylindrical surface, mounting ring means having an inner diameter slightly greater than the diameter of said screen and receivable over said one end of said screen outwardly of the inserted engagement element, and pressure applying means for effecting circumferential clamping of said screen between said mounting ring means and said elastic engagement element and for deforming said engagement element such that a furthest inserted circumferential portion of said engagement element is forced outward from said cylindrical surface to circumferentially stretch said one end of said screen.

4,710,052

LINEAR COUPLING

Gerd Elger, Neftenbachstrasse 26, CH-8408 Winterthur, Switzerland

PCT No. PCT/CH85/00048, § 371 Date Nov. 27, 1985, § 102(e) Date Nov. 27, 1985, PCT Pub. No. WO85/04456, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 28, 1985, Ser. No. 810,325

Claims priority, application Sweden, Mar. 28, 1984, 1549/84; Sep. 14, 1984, 4381/84

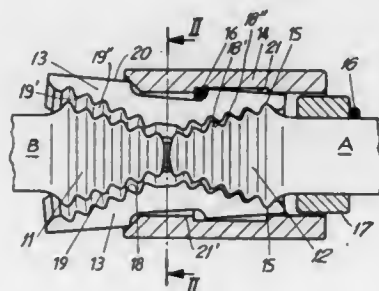
Int. Cl.⁴ F16B 7/18

U.S. Cl. 403—310

2 Claims

1. Linear coupling for the transmission of large tractive and alternating forces free from play comprises two coupling links

and coupling means for interconnecting said coupling links, each said coupling link comprises a rod end portion (A, B) and a truncated cone (11, 12), having a central axis with said cone connected to and extending axially from said end portion, each of said cones (11, 12) being substantially similar and having a conically shaped exterior surface extending in the axial direction with a waveform (19) configuration comprising alternating lands (19') and grooves (19'') extending transversely of the axial direction, each said cone (11, 12) having a smaller diameter and a larger diameter and with the larger diameter ends connected to the respective end portions (A, B) and the smaller diameter ends disposed in adjacent facing relation, said coupling means comprises an elongated annular coupling member (13) having an axis extending generally parallel with the axes of said cones formed of a number of elongated circular segments (13), said circular segments (13) having an axial length substantially equal to the combined axial lengths of said cones, said segments having an inner surface (18) and an outer surface (20) extending circumferentially around said cones and a pair of opposite ends extending transversely of the axis of said connecting member, the inner surface (18) of said segments having alternating lands (18') and grooves (18'') arranged to interfit with the corresponding said grooves (19'') and lands (19') of said cones (11, 12), said inner surface (18) of said segments (13) being conically shaped converging inwardly from each of the opposite ends to approximately mid-way between the opposite ends, the outer surface (20) of said segments form-



ing a cylindrically shaped surface with an annular groove (21') approximately mid-way between the opposite ends thereof, said coupling means also includes an axially extending annular sliding coupling sleeve (14) generally coaxial with and laterally encircling said segments (13), said sliding coupling sleeve (14) having an inner surface and an outer surface with said inner surface being cylindrically shaped and having an annular groove (21'') therein corresponding to said annular groove (21') in said segments, said sliding coupling sleeve (14) being axially displaceable between an unlocked position with said annular groove (21'') therein out of register with said annular groove (21') in said segments (13) and a locked-position with said annular groove (21'') in said sliding coupling sleeve in register with said annular groove (21') in said segments, a bearing ring on one of said end portions (A, B) adjacent to and spaced axially from the larger diameter end of said cone attached to said end portion, and a twin U-shaped spring clip-like stirrup (16) with said stirrup having a pair of webs spaced apart and extending transversely of the axial direction of said sliding coupling sleeve, and legs extending in the axial direction of said sliding coupling sleeve and interconnecting said webs, one of said webs located within said annular grooves (21', 21'') in said segments (13) and said sliding coupling sleeve (14) and the other said web arranged in the unlocked position of said sliding coupling sleeve in bearing contact with an end of said bearing ring (17) spaced more remotely from the adjacent said cone and in the locked position being located between said bearing ring (17) and the larger diameter end of the adjacent said cone.

4,710,053

TRAFFIC CONTROL ELEMENTS

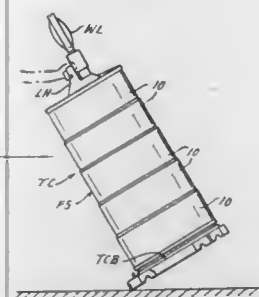
Jack H. Kulp, San Juan Capistrano, and Richard M. Cunningham, Huntington Beach, both of Calif., assignors to Lukens General Industries, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 464,025, Feb. 4, 1983, Pat. No. 4,475,101, which is a continuation-in-part of Ser. No. 447,616, Dec. 7, 1982, abandoned. This application May 30, 1984, Ser. No. 615,878

Int. Cl.⁴ E01F 9/00

U.S. Cl. 404—9

37 Claims



1. A traffic control element comprising a molded, plastic, hollow element having a preselected configuration and a molded, plastic base element adapted to be readily assembled and separated from the hollow element, the hollow element being mounted to the base element when it is arranged in a vertical traffic controlling position, the base element being adapted to store ballast means thereon for stabilizing the hollow element when the hollow element is arranged in said vertical position, the improvement comprising the base element having outwardly extending skid means integrally constructed therewith along one side thereof for permitting the assembled traffic control element to be slid across a surface on the skid means when the skid means are positioned into engagement with a surface and so defined to prevent the hollow element and the base element to become unintentionally separated during the sliding on the skid means.

4,710,054

MATERIAL SPREADER SYSTEM

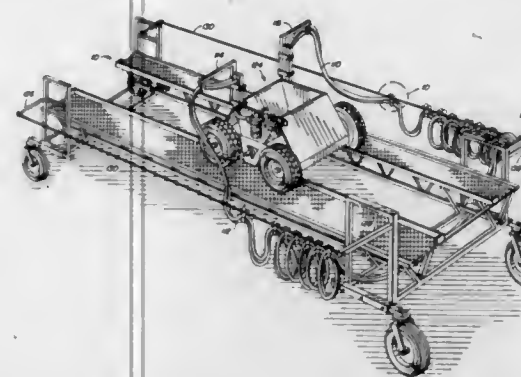
J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Continuation of Ser. No. 407,620, Aug. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 311,674, Oct. 15, 1981, Pat. No. 4,540,312, which is a continuation-in-part of Ser. No. 170,126, Jul. 18, 1980, Pat. No. 4,349,294, which is a continuation-in-part of Ser. No. 101,545, Dec. 10, 1979, abandoned. This application Nov. 4, 1985, Ser. No. 794,574

Int. Cl.⁴ E01C 19/18

U.S. Cl. 404—110

17 Claims



1. Self-propelled apparatus for uniformly spreading topping material over a substantially planar, non-load bearing plastic

concrete surface having a length, width, first and second opposing sides and a load supporting perimeter, comprising:

- a spreader including a hopper for storing a supply of loose particulate topping material and for dispensing a uniformly wide and uniformly thick layer of topping material through a widthwise slot in said hopper as said spreader is translated along a path, the flow of topping material from within said hopper through said slot and onto the plastic concrete surface defining a topping flow path;
- bridge means supported above and spanning the width of the concrete surface to provide a continuous, linear path for translating said spreader back and forth across the non-load bearing plastic concrete surface and for maintaining said spreader vertically spaced above and separated from the plastic surface, said bridge means including:
 - At least one triangular truss bridge span including a load bearing base having an upper surface and first and second spaced apart edges for supporting said spreader, an apex element spaced apart from and extending parallel to said span base and first and second end sections, said first and second edges and said apex element defining the triangular cross section of said bridge span;
 - guide means coupled to said span base and including a linear, vertically oriented surface defining a linear path along said span;
 - first and second bridge support units coupled to said first and second bridge span end sectional for engaging the load supporting perimeter surrounding said plastic concrete surface at spaced apart positions on each side of said concrete surface to elevate said bridge span above the plastic concrete surface;
 - means including first and second roller units coupled to said bridge support units and contacting the load supporting perimeter on each side of the concrete surface for translating said bridge means along the load supporting perimeter, wherein said first roller unit engages the load supporting perimeter on one side of said concrete surface and said second roller unit engages the opposite side of the load supporting perimeter;
- spreader to bridge coupling means for transferring the weight of said spreader to said bridge span load bearing base, for engaging the vertically oriented surface of said guide means at first and second spaced apart intervals to direct said spreader along the linear path defined by said guide means and for engaging said bridge span at first and second spaced apart intervals along the length of said bridge span to maintain a fixed planar relationship between said hopper and said bridge span as said spreader is translated back and forth along said bridge span to thereby maintain a fixed planar relationship between said spreader and the underlying, substantially planar plastic concrete surface, said spreader to bridge coupling means including:
 - a first wheel assembly including at least one rolling member engaging said bridge span at a first location and including a first axis of rotation;
 - a second wheel assembly including at least one rolling member engaging said bridge span at a second location spaced apart from said first location and including a second axis of rotation;
- flow control means including rotating metering means positioned in series with the topping flow path through said widthwise slot for positively controlling the discharge of topping material through said slot at a rate related to the rotational velocity of said rotating metering means and independent of the vertical spacing between said widthwise slot and the plastic concrete surface, said rotating metering means including a drive shaft having an axis of rotation spaced apart from the first axis of rotation and from the second axis of rotation;
- rotary drive means coupled to and forming a part of said spreader for rotating the rolling member of said first wheel assembly and for rotating the spaced apart drive shaft of said rotating metering means; and

f. drive control means coupled to said rotary drive means for controlling the direction of movement of said spreader along said bridge span and for energizing and deenergizing said rotating metering means;
whereby sequential translations of said spreader across said bridge means followed by sequential translations of said bridge means along the length of said area in displacements related to the width of the layer of topping material dispensed by said spreader covers the entire surface of said area with a uniform layer of topping material.

4,710,055

RIDING-TYPE MULTIPLE TROWEL MACHINE

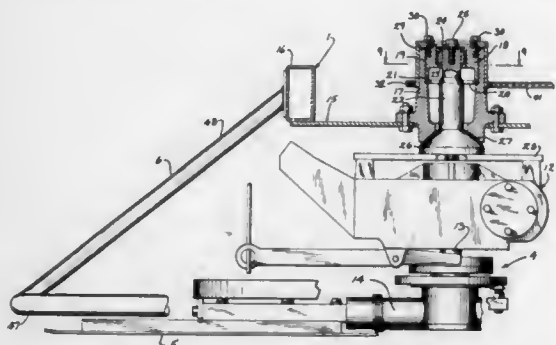
Helmut Maass, West Bend, and Joseph H. Klatzka, Hartford, both of Wis., assignors to M-B-W Inc., Slinger, Wis.

Filed Jul. 2, 1986, Ser. No. 881,255

Int. Cl.⁴ E01C 19/22

U.S. Cl. 404—112

11 Claims



1. A riding-type surface working machine, comprising a frame, at least one rotor means mounted on the frame, surface working means carried by said rotor means and adapted to rotate in contact with a surface to be worked, an eccentric carried by said rotor means and mounted for rotation relative to said frame, mounting means for mounting said rotor means for universal tilting movement with respect to said frame, drive means for rotating said rotor means about its axis to thereby rotate said surface working means, and operating means for rotating said eccentric and thereby tilting said rotor means to cause selective directional movement of said machine.

4,710,056

METHOD AND APPARATUS FOR RESTORING A BEACH

William L. Parker, 220 21st St. S.W., Naples, Fla. 33964
Continuation of Ser. No. 823,739, Jan. 29, 1986, abandoned. This application Mar. 10, 1987, Ser. No. 22,578

Int. Cl.⁴ E02B 3/04, 3/06

U.S. Cl. 405—15

9 Claims



1. A method of restoring a sandy beach by raising the level of the beach between the high tide line and at least the low tide line of the beach comprising
suspending by a temporary supporting structure an elongated net generally perpendicular to the high tide line of the beach and extending from the high tide line to at least the low tide line,
said net being made of flexible material and having a uniform mesh sized to prohibit passage through said net of the larger rocks, coral and shells present on the sea floor,
said net having a weighted bottom edge, resting upon the sea

floor and a top edge suspended above the high tide level of the sea,
leaving said net suspended between the high tide line and at least the low tide line for a period of not less than twelve hours to cause the gradual buildup of rocks, coral, shells and sand along the lower portion of the net,
and then removing said net and its supporting structure from the beach.

4,710,057

METHOD AND APPARATUS FOR BUILDING UP BEACHES AND PROTECTING SHORELINES

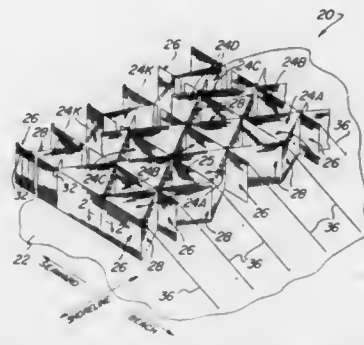
James E. Laier, 2620 Wagon Wheel Dr., Mobile, Ala. 36609

Filed Oct. 3, 1986, Ser. No. 915,186

Int. Cl.⁴ E02B 3/04

U.S. Cl. 405—30

18 Claims



1. A system for controlling erosion of a beach at a seabed through sedimentation of sand caused by wave action, said system comprising a plurality of interconnected compartments disposed under the water on said seabed in an array extending generally parallel to the shoreline of said beach, said compartments being formed by plural flexible wall portions, each formed of an open mesh, buoyant material, said wall portions being anchored to said seabed in a generally vertical orientation by anchoring means, said anchoring means comprising means for holding said wall portions on said seabed, said wall portions flexing towards said beach with incoming waves, said anchoring means also comprising means for precluding said wall portions from flexing backwards substantially beyond said vertical orientation with backwash waves, the mesh of said wall portions decreasing the velocity of the water flowing therethrough on backwash waves, whereupon sand suspended in said water is enabled to drop out of suspension within said compartments during said backwash waves to settle therein and thus automatically fill said compartments.

4,710,058

CONCRETE LINING MACHINE

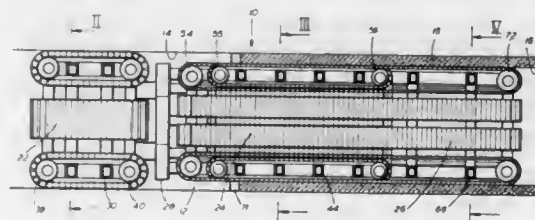
Man Y. Han, Y-4-A Hensel Apt., College Station, Tex. 77840

Filed Feb. 25, 1987, Ser. No. 18,478

Int. Cl.⁴ E21D 11/10

U.S. Cl. 405—146

31 Claims



1. Apparatus positionable behind a tunnel boring machine for forming a concrete lining in a tunnel by injecting a concrete

mixture in the annulus between the earthen walls of the tunnel and the apparatus, the apparatus including driving means for moving said apparatus within the tunnel and having a passageway for transmitting earthen material from adjacent the tunnel boring machine through the apparatus, the apparatus further comprising:

- a first machine portion having a first portion frame;
- a plurality of first endless loop chains each including a plurality of first plates each movably mounted about said first portion frame, each of said first endless loop chains having a portion for lying within a first longitudinal plane adjoining the earthen walls for temporarily supporting the earthen walls of the tunnel;
- a second machine portion having a second portion frame;
- a plurality of second endless loop chains each including a plurality of second plates each movably mounted about said second portion frame, each of said second endless loop chains having a portion for lying within a second longitudinal plane adjoining the interior surface of the concrete lining;
- a plurality of third endless loop chains each including a plurality of third plates each movably mounted about said second frame, each of said third endless loop chains having a portion for lying within the second longitudinal plane adjoining the interior surface of the concrete lining; said second and third plurality of plates being arranged in respective second and third chains alternately spaced about the periphery of the second portion frame and together forming a substantially sealed tubular surface for sealing from said second frame concrete injected in the annulus between the earthen walls and said plurality of second and third plates;
- a third machine portion having a third portion frame; and said second plurality of plates each being movably mounted about said third portion frame and arranged in one of said second plurality of endless loop chains for temporarily supporting the concrete lining downstream from the second machine portion as the apparatus moves through the tunnel in response to said driving means.

4,710,059

METHOD AND APPARATUS FOR SIMULTANEOUS TRENCHING AND PIPE LAYING IN AN ARCTIC ENVIRONMENT

Billy M. Hazlegrove, and Richard A. Roberts, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Nov. 24, 1986, Ser. No. 934,016

Int. Cl.⁴ F16L 1/04

U.S. Cl. 405—162

25 Claims



1. Apparatus for simultaneously trenching and laying submarine pipeline within the bed of a body of water covered with an ice mass, comprising
a vehicle capable of advancing over an ice mass in the direction of a pre-assembled pipeline to be laid;
means for creating a slot-like opening of indeterminate length in the ice mass, ahead of the advancing vehicle;
a submersible dredging means for excavating a submarine trench in the bed of the body of water, into which the pipeline is to be laid;
a support means for carrying and deploying the dredging means, the support means having a longitudinally aligned slot, and having a first end pivotally connected to the vehicle and a second, submersible end which carries the dredging means, the support means being operably disposed through the opening in the ice mass such that the

dredging means is able to excavate a subterranean trench to a predetermined depth;
means pivotally secured to and extending between the vehicle and an intermediate portion of the support means for raising and lowering the support; and
pipeline means having a surface component, a submerged component and an entrenched component, the submerged component intersecting with the support means through the longitudinally disposed slot, such that the slot provides support to the submerged component of the pipeline at a location between the midpoint of the submerged component and the surface of the water.

4,710,060

WATER VESSELS OF THE FLOATING-DECK TYPE
Jorma Kämäräinen, Espoo, Finland, assignor to Valmet Oy, Finland

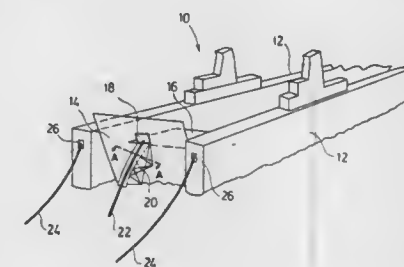
Filed May 2, 1986, Ser. No. 858,946

Claims priority, application Finland, May 8, 1985, 851813

Int. Cl.⁴ F16L 1/04

U.S. Cl. 405—166

14 Claims



1. In a water vessel of the floating-dock type which includes a pair of spaced side walls, a cargo deck extending between said side walls defining a cargo space, and a door situated at the stern of said vessel, an improvement for adapting the vessel for seismic or like research comprising:

- a platform for supporting research equipment mounted above said cargo deck and extending between said side walls;
- research equipment including at least a measurement cable mounted on a reel, said research equipment supported on said platform;
- means for passing said measurement cable from said reel through said stern door into the sea;
- at least one of said side walls of vessel being provided with an interior space therewithin;
- a transmitter cable for generating an impulse to be measured situated in said interior space provided within a respective side wall; and
- means for passing said transmitter cable through a stern end of a respective side wall to lower said transmitter cable into the sea.

4,710,061

OFFSHORE WELL APPARATUS AND METHOD
Christon R. Blair, Spring, Tex., and Kenneth B. Parker, Anchorage, Ak., assignors to Atlantic Richfield Company, Plano, Tex.

Division of Ser. No. 722,853, Apr. 12, 1985. This application Oct. 6, 1986, Ser. No. 915,359

Int. Cl.⁴ E02B 17/00

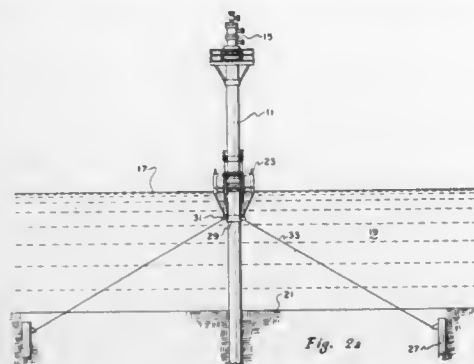
U.S. Cl. 405—195

5 Claims

1. A method of saving a well located offshore in a first depth of water having a surface and above a bottom, comprising the steps of:

- a. completing the well with a wellhead located on the top of a main casing protruding above the surface of the water;
- b. emplacing a landing means adjacent the main casing;

- c. attaching a first respective end of each of a plurality of at least three cables to said respective plurality of respective anchor piles and driving said anchor piles with the cables connected thereto into the bottom at respective azimuths and distances about the well;
- d. movably affixing a plurality of clamping means on said main casing; said clamping means being movable with respect to said main casing; said clamping means including



an upper clamping means and a cable clamp movably connected with said main casing a predetermined distance below said upper clamping means and at a predetermined distance below the surface of the water and supporting said plurality of at least three pulleys adapted for passing therethrough of said cables; and

- e. running respective said cables upwardly through respective said pulleys and connecting said cables with said well after said cables are pulled taut against said anchor piles.

4,710,062

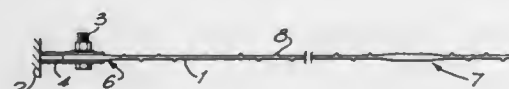
METAL STRIP FOR USE IN STABILIZED EARTH STRUCTURES

Henri Vidal, 8 bis, Boulevard Maillot, 92200 Neuilly-sur-Seine, France, and Daniel Weinreb, Rexdale, Canada, assignors to Henri Vidal, Neuilly-sur-Seine, France
 Filed Jul. 3, 1986, Ser. No. 881,651
 Claims priority, application United Kingdom, Jul. 5, 1985, 8517152

Int. Cl.⁴ E02D 5/20

U.S. Cl. 405—262

22 Claims



21. A stabilised earth structure comprising a plurality of facing units, an earth mass behind the facing units, a plurality of rolled metal strips extending rearwardly into the earth mass from the facing units, and fastening means for attaching the strips to the facing units, wherein each said strip is capable of sustaining tensile forces to which it is subjected in the earth mass, each said strip having a plurality of thickened reinforcement regions spaced at intervals along the length of the strip, said reinforcement regions being formed during the rolling of each said strip and each being between 40 mm and 100 mm in length, each said strip being cut to a desired length with one of said reinforcement regions being located at or near an end of the strip, an aperture being formed through the end reinforcement region and receiving said fastening means to attach the strip to a respective facing unit.

4,710,063

NON-RETURN VALVE FOR BORE HOLE SLEEVES

Eskil Faktus, Arjang, and Rolf Dahlen, Tockfors, both of Sweden, assignors to Elektro Mekani Arjang AB, Arjang, Sweden
 PCT No. PCT/SE85/00481, § 371 Date Jul. 25, 1986, § 102(e)
 Date Jul. 25, 1986, PCT Pub. No. WO86/03254, PCT Pub. Date Jun. 5, 1986

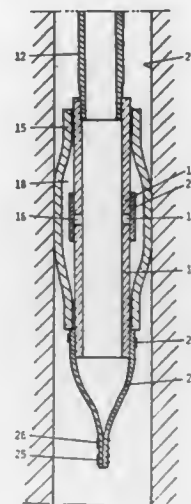
PCT Filed Nov. 25, 1985, Ser. No. 893,327

Claims priority, application Sweden, Nov. 28, 1984, 8406010

Int. Cl.⁴ E21D 21/00

U.S. Cl. 405—269

13 Claims



1. A non-return valve for use with a bore hole sleeve for injecting a sealing and/or reinforcing compound into rock cracks and similar apertures, the bore hole sleeve including a rigid case (10), one end (10A) of which is provided with means for detachable connection to the case of a pump hose (12) for the compound to be injected, as well as an expandable device (15) which is mounted on the rigid case and which is expandable into engagement with the wall of the bore hole to secure the rigid case in the bore hole (21), said non-return valve comprising: an elastic sleeve (22) which is connected at the other end (10B) of the rigid case (10) in such a way that the rigid case (10) runs into the elastic sleeve (22); and contraction means for flattening the free end of the elastic sleeve when no compound is being injected so that already-injected compound cannot flow backwards into the rigid case (10), the contraction means including mechanical means adjacent the free end of the elastic sleeve for providing two projecting folds (27, 28) in the wall of the elastic sleeve, the projecting folds being diametrically positioned in relation to each other.

4,710,064

MOVABLE ROOF SUPPORT AND BOLTER SYSTEM

Frank K. Stafford, Box 1434, and Robert C. Nasby, 236 Trolley Dr., both of Beckley, W. Va. 25801

Division of Ser. No. 723,045, Apr. 15, 1985, Pat. No. 4,676,697.

This application Sep. 26, 1986, Ser. No. 912,331

Int. Cl.⁴ E21D 15/00

U.S. Cl. 405—290

28 Claims

1. A mine roof support system comprising:

a plurality of truss members each having first and second ends, said truss members being positioned in spaced relationship one behind another;

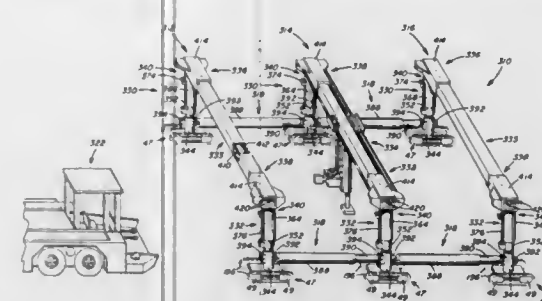
each said truss member having a major portion fabricated from a fiber glass material that has an elastic limit permitting deformation of said truss member under a load when in contact with a mine roof;

a plurality of vertically extensible props each having an upper end portion and a lower end portion and including means for extending and retracting said upper end portion

relative to said lower end portion to adjust a vertical height of said props;

one of said props being positioned under each of said ends of each said truss member;

said upper end portion of said prop being connected to a respective said end of said truss member so that each said truss member is supported by a pair of said props for movement into and out of engagement with said mine roof;



ground engaging means for supporting each said prop at said lower end portion thereof for movement on a mine floor; connecting means beneath said ends of said truss members for connecting adjacent props in tandem arrangement to permit limited horizontal movement of said truss members and associated props relative to each other; and each said ground engaging means including a selectively operable propulsion unit capable of being operated to produce said horizontal movement of its respective said prop and said end of said truss member.

4,710,065

METHOD, A DEVICE AND A MEANS FOR CARRYING OUT WIRE BOLTING OF A ROCK

Jarmo Leppänen, Ylöjärvi, Finland, assignor to Oy Tampella AB, Tampere, Finland

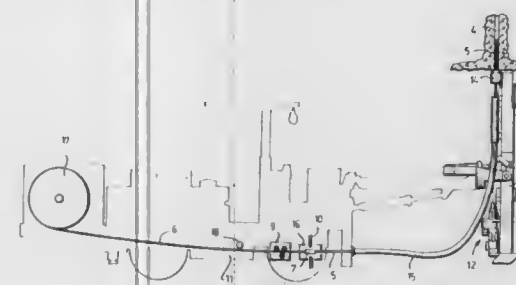
Filed Oct. 20, 1986, Ser. No. 920,597

Claims priority, application Finland, Nov. 7, 1985, 854377

Int. Cl.⁴ E21D 20/02

U.S. Cl. 405—303

4 Claims



1. A wire bolting device comprising:

a wire magazine holding at least one continuous wire;

a feeding mechanism for withdrawing the continuous wire from the wire magazine;

wire cutting means for cutting the continuous wire to form a cut wire section, said wire cutting means receiving said continuous wire to be cut from said feeding mechanism;

a guide pipe for receiving the cut wire section from the cutting means;

a head guide for receiving the cut wire section from said guide pipe, said head guide being positionable close to a drill hole having a depth, said cut wire section being pushed through said guide pipe and said head guide and into said drill hole by the remaining uncut continuous wire being fed by the feeding mechanism, said cut wire section

pushed into said drill hole being capable of being shorter in length than the depth of said drill hole;

a feeding beam for supporting said guide; and

a carrier upon which said feeding beam is mounted, said carrier additionally mounting drilling equipment.

4,710,066

METHOD AND APPARATUS FOR PNEUMATICALLY TRANSPORTING FILTER ROD SECTIONS AND THE LIKE

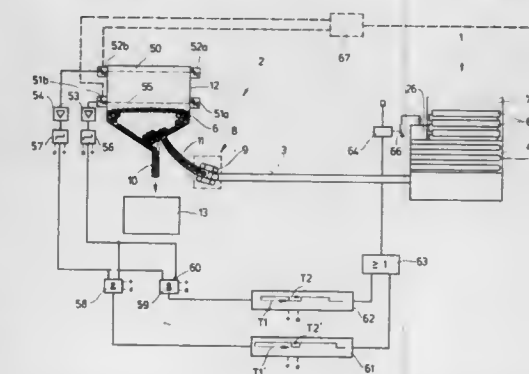
Peter Kägeler, Rudolf Bostelmann, both of Geesthacht, and Olaf Buhrmester, Schwarzenbek, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany
 Filed Nov. 1, 1985, Ser. No. 794,097

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442168

Int. Cl.⁴ B65G 51/02

U.S. Cl. 406—29

14 Claims



6. Apparatus for pneumatically conveying rod-shaped articles, particularly sections of filter rods and other articles which constitute or form part of smokers' products, comprising a receiver; a pneumatic conveyor having an inlet and an outlet which is connected to said receiver; a source of articles; a sender connected to said inlet and having means for intermittently propelling into said conveyor by a gaseous fluid articles which are supplied by said source; and means for repeatedly interrupting the propulsion of articles by said sender upon completed propulsion of predetermined numbers of articles into said inlet so that first intervals of propulsion continuously alternate with second intervals of interruption of propulsion of articles regardless of the quantity of articles in said receiver.

4,710,067

ROTARY AIR LOCK FEEDER

Frank Salley, 4425 Peachtree-Dunwoody Rd., NE., Atlanta, Ga. 30342

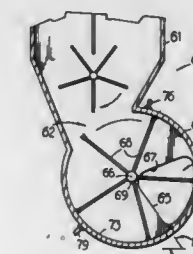
Continuation-in-part of Ser. No. 689,477, Jan. 7, 1985,

abandoned. This application Apr. 9, 1986, Ser. No. 849,691

Int. Cl.⁴ B65G 53/46

U.S. Cl. 406—64

4 Claims



1. A method of forming a stream of particulated material such as fibrous insulation comprising the steps of:

- (a) passing an airstream through a cylindrical chamber having its axis oriented generally horizontally with the airstream passing substantially along a path offset from a plane extending vertically through the chamber axis;
- (b) feeding particulated material into an upper portion of the chamber and forming it into batches; and
- (c) successively moving the batches about the chamber axis to the bottom of the chamber and then lifting the material upwardly into the airstream with substantially the entire leading upper surfaces of the batches being at and entering the airstream at a slope substantially equal to the angle of natural repose of the material with the slope of the successive batches each being substantially the same as they enter the airstream, whereby the material is entrained into the airstream by erosion of the upper surfaces of the batches while not being substantially changed by gravity.

4,710,068

AIR CONVEYOR

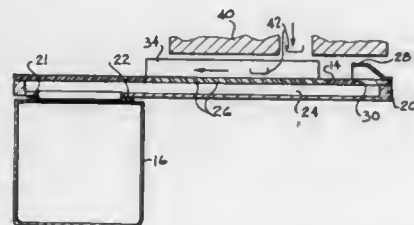
Donald E. Lindstrom, Lakewood, and David T. Setzer, Long Beach, both of Calif., assignors to Reynolds Metals Company, Richmond, Va.

Filed Sep. 15, 1986, Ser. No. 907,443

Int. Cl.⁴ B65G 53/16

U.S. Cl. 406—88

9 Claims



1. A conveying system for objects comprising a conveying surface along which said objects are conveyed, an air plenum positioned beneath said conveying surface, said air plenum being in fluid flow connection with said conveying surface through a plurality of air jets within said conveying surface to provide an air cushion between said conveying surface and an end surface of said objects, an air duct in fluid flow connection with said air plenum and with a source of air, an acceleration hood in fluid flow connection with said air plenum, said acceleration hood being positioned above said conveying surface and behind an entry point for said objects to be conveyed along said conveying surface, and means for providing said objects to said conveying surface at said entry point and in front of said acceleration hood, said acceleration hood being constructed and arranged to produce a stream of airflow generally parallel and along to said conveying surface and against a side surface of said objects such that said acceleration hood provides initial acceleration of said objects along said conveying surface as they arrive at said conveying surface.

4,710,069

CUTTING INSERT FOR CHIP FORMING MACHINING

Kaj-Ragnar Loqvist, Fagersta, Sweden, assignor to Seco Tools AB, Fagersta, Sweden

Filed Jul. 7, 1986, Ser. No. 882,516

Claims priority, application Sweden, Jul. 9, 1985, 850339/

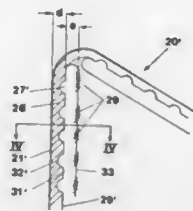
Int. Cl.⁴ B23B 27/22

U.S. Cl. 407—114

14 Claims

1. A cutting insert for chip-forming machining of workpieces, said insert including an upper face defining a rake face, and a side face intersecting said rake face to form a cutting edge for cutting chips from a workpiece; said rake face including an upsetting face extending rearwardly from said cutting edge, a curved chip breaking face including a first portion extending curvilinearly rearwardly downwardly from said

upsetting face, and a second portion extending curvilinearly rearwardly upwardly from a rear end of said first portion; said rake face further including a plurality of depressions spaced apart in a direction parallel to said cutting edge and intersecting both said upsetting face and said chip breaking face, said depressions defining chip working means for working and



heating chips as portions thereof enter said depressions; a front end of said first portion of said chip breaking face disposed closer to said cutting edge than are rear ends of said depressions and farther from said cutting edge than are front ends of said depressions such that the chips are simultaneously bent by said chip breaking surface and heated by the working in said depressions.

4,710,070

DEVICE IN BACK SPOT FACING TOOLS

Per Alsen, and Timo Salo, both of Göteborg, Sweden, assignors to Erix Tool AB, Göteborg, Sweden

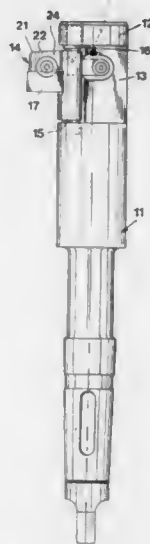
Filed Feb. 18, 1986, Ser. No. 830,134

Claims priority, application Sweden, Feb. 15, 1985, 8500707

Int. Cl.⁴ B23B 51/00

U.S. Cl. 408—93

5 Claims



1. A back spot facing tool of the type comprising a spindle and at least one wing having a curved external envelope surface and arranged in a recess at one front end portion of said spindle, said wing being pivotally mounted about an axis parallel with the spindle and eccentric to the spindle axis, said wing being arranged upon rotation of the spindle to pivot from an inactive position inside the circumference of the spindle to an active position outside the spindle, the part of the wing projecting outside the spindle being provided with at least one cutting edge, characterized in that, when the wing is in its full active position, the part of the wing which is outside the spindle has an end surface provided with an inclined ramp having the maximum height as seen in the axial direction of the spindle at a portion located closest to the circumference of the spindle and that a transitional portion between the ramp and the enve-

lope surface of the wing is slightly chamfered, in order to ensure that the portion of the wing, which during rotation projects from the spindle, at insertion of the tool in a bore in a work piece, engages the bore edge and is pivoted to inactive position upon continued displacement in the bore.

4,710,071

FAMILY OF ELECTRIC DRILLS AND TWO-SPEED GEAR BOX THEREFOR

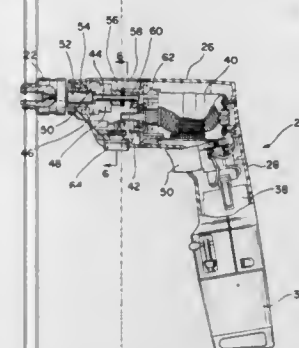
Heinrich P. Koehler, Hanover, Pa., and John R. Dixon, Hampstead, Md., assignors to Black & Decker Inc., Newark, Del.

Filed May 16, 1986, Ser. No. 863,968

Int. Cl.⁴ B23B 47/14; F16H 3/32

U.S. Cl. 408—133

18 Claims



1. A handheld electric tool, comprising: an electric motor arranged to drive a tool holder through a gear transmission having different transmission ratios; a gear shift element having a manual actuating member, said actuating member being movable between two positions for changing said gear transmission between high and low transmission ratios; said gear transmission including an output shaft for driving said tool holder, and two output gears mounted on said output shaft for rotation of the latter; said gear transmission also including a lay shaft having two lay shaft gears mounted thereon and in mesh respectively with said two output gears; two dog clutch members mounted on said lay shaft; a dog carrier member mounted on said lay shaft and having a dog slidably mounted therein; said dog being disposed radially outwardly of and being slidably parallel to said lay shaft; said gear shift element having an arm extending transversely to said lay shaft and engaging said dog for moving the latter between low and high transmission ratio positions, in said low transmission ratio position said dog engaging in one of said dog clutch members to effect drive from said motor to one of said lay shaft gears, and in said high transmission ratio position said dog engaging in the other of said dog clutch members to effect drive from said motor to the other of said lay shaft gears; and said arm being flexible but only flexing after actuation of said manual actuating member if said dog does not immediately engage in the respective dog clutch member, said flexing then urging said dog to complete such engagement.

4,710,072

CONE DRILL BIT

Heinrich Heule, Kristallstrasse 6, Au, Switzerland (9434)

Filed Jun. 5, 1984, Ser. No. 617,560

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321110

Int. Cl.⁴ B23B 51/00

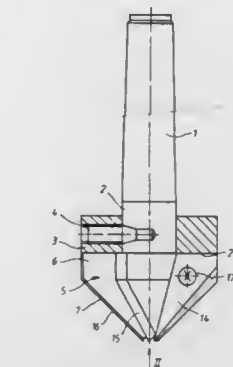
U.S. Cl. 408—18

5 Claims

1. A chamfering tool for cutting a conical chamfer in the rim

of a bore hole, and having a central main longitudinal axis, comprising,

a main body and a conical chamfering head integral therewith, the chamfering head having a plurality of recesses distributed around said main longitudinal axis, and each including a pair of flat surfaces extending axially, and tangent to base circles, and directed horizontally in generally circumferential direction, said recesses disposed at less than 180°, but not less than 90°, relative to each other about the axis, each recess being without confining surfaces radially outwardly of said pair of surfaces thereby presenting a generally concave recess directed radially outwardly,



a plurality of cutting plates separate from said integral body and head, one in each of said recesses and bearing against both of said surfaces in the recesses, and means detachably securing the cutting plates in said recesses, the securing means constituting the sole means confining the cutting plates against said surfaces.

5. A chamfering tool according to claim 1, in conjunction with a sharpening device that is in the design of the chamfering tool, wherein, the cutting plate, in the sharpening device attached to the attachment member is inclined at 20° of angle trailing in feed direction, and extends a predetermined distance radially outwardly from said central longitudinal axis.

4,710,073

TOOL APPARATUS FOR BORING A HOLE

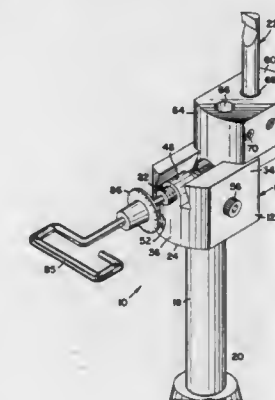
Richard L. Peterson, Plymouth, Minn., assignor to Infinity Boring Tool Company, Minneapolis, Minn.

Filed May 5, 1986, Ser. No. 859,718

Int. Cl.⁴ B23B 29/034

U.S. Cl. 408—181

2 Claims



1. Tool apparatus for holding a cutting bar for boring a hole, comprising:

a primary member including a body with opposite first and second ends, opposite first and second sides and opposite third and fourth sides, said primary member further including a shank extending away from the first end of said body, said body having a channel in the second end between the opposite first and second sides, said channel having a bottom and opposite first and second side walls, said channel further having a partial end wall;
 a slide having opposite third and fourth ends, said slide including in the fourth end means for receiving said cutting bar, said slide including in the third end a guide for fitting into said channel of said body;
 means, within said channel extending between said partial end wall and said guide, for adjustably sliding said guide along said channel thereby controllably moving said slide with respect to said body, said adjustable sliding means includes a first threaded opening in the partial end wall of said body and a second threaded opening in the guide of said slide, said first and second threaded openings being aligned, said adjustable sliding means further including a threaded rod for threading into each of said first and second threaded openings, wherein turning of said threaded rod causes said slide to move controllably one of toward and away from said partial end wall of said body; and
 means, between the bottom of said channel and said first end of said body, for applying by each of said first and second side walls of said channel a compressive force against said guide.

4,710,074

CASING MILL

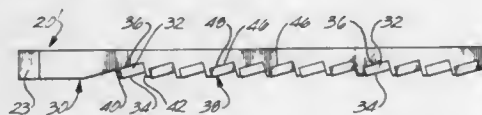
Johann B. Springer, Aberdeen, Scotland, assignor to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 4, 1985, Ser. No. 804,807

Int. Cl.⁴ B23B 51/06; E21B 10/00

U.S. Cl. 409—200

16 Claims



1. In a casing mill of the type having a cylindrical body to be received into a well bore casing and having means at one end to attach the mill to a drill string for rotation therewith and means at the other end for piloting the mill in the casing, the improvement comprising:

- a plurality of blades projecting outwardly from the body, each blade having a forward surface including a stair-step configuration having treads arranged at an angle between 10 and 20 degrees with respect to an axial plane, and orthogonal risers;
- a plurality of polygonal cutting elements secured in a telescoping arrangement on each of said blade forward surfaces each of said elements having a back face secured to the treads on the forward surface and a front face to engage and mill the casing, so that said front faces are arranged to tilt in the direction of mill rotation to make, with respect to an axial plane, an angle of between 10 and 20 degrees.

4,710,075

ADJUSTABLE DRILL GAUGE

Dale Davison, Warsaw, Ind., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Oct. 1, 1986, Ser. No. 914,079

Int. Cl.⁴ B23B 51/00

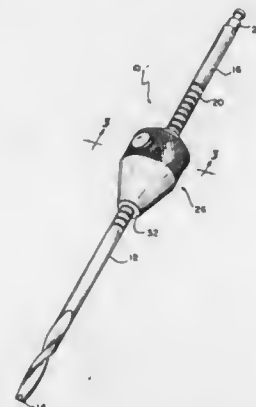
U.S. Cl. 409—202

10 Claims

1. A drill stop apparatus for use with an elongated drill bit having a drilling end used to drill a hole of a specified, predetermined depth, the drill bit having a plurality of circumferen-

tially extending, axially spaced grooves formed thereon, the stop comprising,

- a body member having a first end and formed to include an axially extending bore sized to receive said drill bit to permit said drill bit to be moved axially within said body member;
- said body member also formed to include a cavity that extends substantially perpendicular through said bore, and
- a plunger disposed in said cavity for releasably engaging one of said plurality of grooves in said drill bit to lock said drill bit against axial movement within said body member such that a specified length of said drill bit extends beyond said first end of said body member to define a specified operable drilling length of said drill bit between said first end



and said drilling end, said plunger formed to include a transverse opening therethrough sized to receive said drill bit, said transverse opening including a ridge formed therein configured to engage selectively any one of said grooves in said drill bit to lock said drill bit against axial movement within said body member when said plunger is in a groove-engaging position, wherein a portion of said plunger extends beyond the outer surface of said body member, said extending portion adapted to be depressed by a force applied along an axis substantially perpendicular to the axis defined by said body member bore to move said plunger into a groove-disengaged position and spring means for yieldably urging said plunger into said groove-engaging position.

4,710,076

METHOD FOR CUTTING COMPLEX TOOTH PROFILES IN A CYLINDRICAL, SINGLE-SCREW GATE-ROTOR

Wayne W. Boblitt, Glen Burnie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 13, 1985, Ser. No. 775,981

Int. Cl.⁴ B23F 9/10

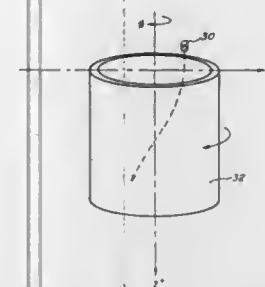
U.S. Cl. 409—26

4 Claims

1. A method for cutting a complex tooth profile in a cylindrical gate-rotor blank, comprising the steps of:

- rotating the cylindrical gate-rotor blank about its center axis;
- engaging the cylindrical gate-rotor blank with a cutting element having a longitudinal axis perpendicular to said center axis translating the cutting element along a non-circular path in a fixed two-axis plane while cutting the blank, that plane being parallel to the plane defined by the centerline of the cylindrical blank and a line extending radially therefrom, while keeping the cutting element normal to the two-axis plane throughout the cutting operation, said translating step including maintaining the cutter in said plane while moving the cutter simultaneously

along lines parallel and perpendicular to said blank centerline to form said path and



repeating the cutting operation to form a plurality of tooth profiles.

4,710,077

LOCKING TOOL HOLDER

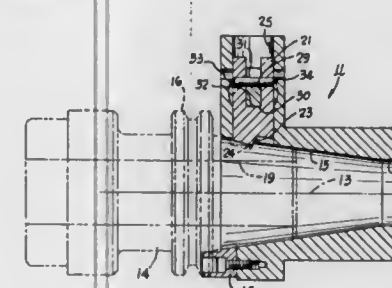
Valdas S. Ramunas, Euclid, Ohio, assignor to Erickson Tool Company, Solon, Ohio

Filed Aug. 5, 1985, Ser. No. 762,255

Int. Cl.⁴ B23C 5/26

U.S. Cl. 409—232

13 Claims



1. A locking tool holder for a rotatable spindle having a socket adapted to receive a tool having a lateral recess therein; said locking tool holder comprising in combination:
 - a first aperture in the rotatable spindle tool socket extending transversely to the axis of the tool socket;
 - a lock pin movable in said first aperture;
 - said lock pin adapted to wedgingly cooperate with and be lockably complementary to the lateral recess on a tool in the tool socket;
 - a second aperture in said tool socket intersecting said first aperture transversely thereto;
 - a cam bar slidable in said second aperture;
 - first and second cam surfaces on said cam bar cooperable respectively with first and second cam follower surfaces carried on said lock pin;
 - said cam bar being movable in opposite directions in said second aperture into first and second positions;
 - movement of said cam bar to said first position acting through said second cam and follower surfaces and establishing said lock pin in wedging engagement with the lateral recess on a tool to lock the tool in the tool socket, and movement of said cam bar towards said second position causing said first cam surface to act on said first cam follower surface to force said lock pin transversely outwardly to unlock a tool in the tool socket;
 - first retention means including said first and second cam surfaces on said cam bar to wedgingly retain said lock pin in said first aperture;
 - second retention means to retain said cam bar in said second aperture; and
 - said second retention means including said first and second cam follower surfaces on said lock pin.

4,710,078

DEVICE FOR THE INTERNAL DEBURRING OF A PIPE
 Werner Altmeyer, Völklingen; Ewald Jakobs, Bous, and Friedrich Meier, Remscheid, all of Fed. Rep. of Germany, assignors to TechnoARBED Deutschland GmbH, Saarbrücken-Burbach, Fed. Rep. of Germany

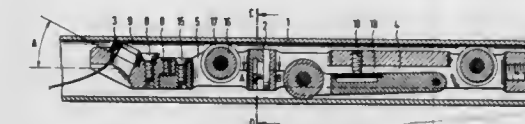
Filed Dec. 26, 1984, Ser. No. 686,196

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1983, 3347146

Int. Cl.⁴ B23D 1/08

U.S. Cl. 409—233

3 Claims



1. Device for the internal deburring of an axially elongated pipe or shaped tubular member having an axially extending welded seam with a portion of the welded seam projecting into the interior of the pipe or tubular member whereby the device removes the inwardly projecting portion of the welded seam in the cutting direction extending in the axial direction of the pipe or tubular member, the device includes a support body elongated in the cutting direction and arranged to be positioned in the pipe or tubular section, said support body having a first end and a second end spaced apart in the cutting direction, a cutting ring mounted on said support body adjacent the first end thereof, said cutting ring having an axis extending transversely of the cutting direction, wherein the improvement comprises that said cutting ring on said support body is movably displaceable relative to the interior of the pipe or tubular member being deburred in the direction extending transversely of the cutting direction during the deburring operation, said cutting edge has a cutting edge surface at one end thereof extending transversely of the axis thereof and an opposite end surface spaced from the cutting edge surface and extending transversely of the axis, an interior surface within said cutting ring extending between said cutting edge surface and said opposite end surface, said interior surface comprising a first cylindrical section extending from said cutting edge surface toward said opposite end surface, a second cylindrical section located at the opposite end surface and spaced axially from said first cylindrical section, a frusto-conical section extending between said first and second cylindrical sections with said frusto-conical section diverging outwardly from said first section toward said second section and then diverging inwardly to said second cylindrical section.

4,710,079

QUICK CHANGE SPINDLE ADAPTER FOR TOOL HOLDER

D. Frederick Smith, Rochester, and James E. Goodsmith, Utica, both of Mich., assignors to T. M. Smith Tool International Corp., Mount Clemens, Mich.

Continuation of Ser. No. 743,365, Jun. 11, 1985, abandoned.

This application Dec. 29, 1986, Ser. No. 943,825

Int. Cl.⁴ B23C 5/26

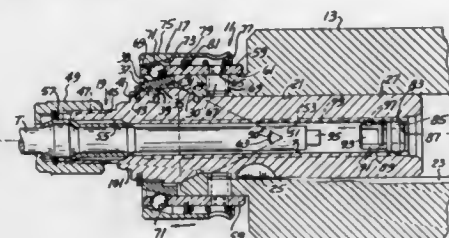
U.S. Cl. 409—234

3 Claims

1. In a spindle, adapter and tool holder assembly including a power rotated spindle having a bore and a forward end adapted to receive a tool holder, a cylindrical body having a uniform axial bore mounted upon and secured to said spindle and projecting forwardly thereof, a retractable spring biased sleeve movably mounted on the body and including a tapered inner wall, a tool holder mounting a tool projected into said body having a shank at its inner end slidably positioned in the spindle bore and keyed to said spindle and a tapered collar on said tool holder intermediate its ends projecting into said body, there being a series of spaced balls movably nested in and

around said body, portions of said balls projecting radially inward retainingly engaging said collar and projected radially outward in cooperative engagement with said tapered inner wall, the tapered sleeve inner wall converging relative to the collar providing a cooperative wedging action of the balls between the collar and sleeve inner wall for anchoring the tool holder within said body and against the end of said spindle whereby manual retraction of said sleeve releases said balls facilitating assembly into and manual removal of said tool holder from said body and spindle;

the improvement comprising



a conical recess within the inner bore surface at the forward end of said spindle defining an axial bearing;

and a centering cone upon and around said tool holder adjacent and forwardly of said shank in snug axial registry with said bearing maintaining an axial self-alignment of said tool holder and spindle; said sleeve inner wall and said collar having surfaces tapered rearwardly and outwardly so that said sleeve and balls exert an inward axial thrust upon said tool holder and shank biasing said centering cone against and into said conical spindle bearing.

4,710,080

CLAMPING APPARATUS FOR MAKING AN IMPROVED ELECTRICAL CONNECTION

Howard H. Sheppard, 7430 Sprague St., Philadelphia, Pa. 19119
Division of Ser. No. 417,240, Sep. 13, 1982, Pat. No. 4,482,782.
This application Aug. 24, 1984, Ser. No. 644,304

Int. Cl.⁴ F16B 39/02; H01R 4/02

U.S. Cl. 411—82

5 Claims



1. Clamping apparatus for use in making an improved soldered electrical connection between a wire and a terminal, comprising:

a ring shaped structure;

said ring shaped structure being comprised of a metallic material of a composition sufficiently malleable to be radially inwardly and plastically compressible over a terminal and a wire and of a sufficient rigidity to retain the deformed shape as compressed such that it is adapted to hold a wire tightly against a terminal;

said ring shaped structure being comprised of a member, said ring shaped structure having an outside and an inside diameter and a thickness measured perpendicular to said diameters, said ring member having a width dimension measured as the difference between an outside radius and an inside radius in the direction of the diameter, both of said diameters being large relative to said thickness and the thickness of the ring member measured perpendicular to a diameter being equal to or less than said width dimension;

said ring shaped structure being adapted to be applied over a terminal and a wire by a tool having a pair of mating jaws with slots therein, said width of said ring member

being selected to be substantially equal to the depth of the slot in each of said mating jaws;

said ring shaped structure being provided with a radial slit or division at one location providing for a first and second free end wherein said first and second free ends of said ring shaped structure are offset in the direction perpendicular to said diameters one from the other to increase the ease of the free ends sliding past each other upon compression of the ring shaped structure over a terminal and a wire; and

said metallic ring shaped structure being provided with a layer of tinning material to enable the soldering of said ring, wire and terminal together as a unit.

4,710,081

SELF-LOCKING RESILIENT OR NON-RESILIENT ELEMENT

Egon Overhues, Neuenrade, Fed. Rep. of Germany, assignor to Vossloh-Werke GmbH, Werdohl, Fed. Rep. of Germany
Filed May 15, 1986, Ser. No. 863,442

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519610

Int. Cl.⁴ F16B 39/24

U.S. Cl. 411—161

6 Claims



1. A self-locking resilient or non-resilient element, such as a spring-ring or a washer, comprising: first and second major surfaces having an inner and an outer boundary; wall-like protrusions arranged on each major surface and extending from the inner to the outer boundary; and recesses lying between said protrusions, wherein said protrusions have plateau-like upper surfaces which are concavely curved as viewed in cross-sections along the circumferential direction of the element to form scraping edges at sides of said upper surfaces, and wherein the wall-like protrusions extend generally radially in zig-zag fashion from the inner boundary to the outer boundary of each major surface, and the recesses lying between said protrusions are formed as zig-zag-shaped continuous channels which are open in the region of the inner and outer boundaries.

4,710,082

SEALED AND SECURED FASTENER

Gerald J. Curtis, 8806 Glen Loch Dr., Houston, Tex. 77017

Filed Jun. 18, 1986, Ser. No. 876,375

Int. Cl.⁴ F16B 41/00

U.S. Cl. 411—373

10 Claims

1. An apparatus for sealably securing a bolt, comprising:

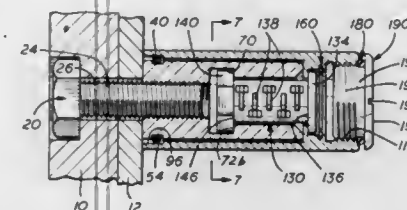
a nut member for mating with and securing the bolt,

said nut member having a nut body with an exterior surface of the same general shape from the nut head at one end of the nut base at the other end, said nut body having a circumferential groove adjacent said nut head adapted for an O-ring,

said nut body having a threaded bore extending from said nut head to an anchoring bore, and a receiving bore and a pair of longitudinal grooves cut into the interior wall of said nut body extending from said anchoring bore to said nut base providing a securing end and a locking end of said nut member;

a housing with an exterior surface which extends from the housing head to the housing base for substantially surrounding said nut member,

said housing having a nut receiving bore which has an inner diameter greater than the outer diameter of said nut member and extends to an inwardly projecting nut landing shoulder, such that when said shoulder contacts said nut base both said nut head and said housing head are flush



with an adjacent surface, and gland bore which extends from said housing head to said nut receiving bore;

locking means, disposed within said housing, for locking said housing to said nut member wherein said housing can move without imparting sufficient torque to said nut member to rotate said nut member; and

sealing means for sealing said nut member within said housing.

4,710,083

NAILING PLATE FOR THE PRODUCTION OF COMPOUND SUPPORTS, AND COMPOUND SUPPORT

Johann Wolf, Scharnstein, Austria, assignor to Johann Wolf Gesellschaft m.b.H. KG, Scharnstein, Austria

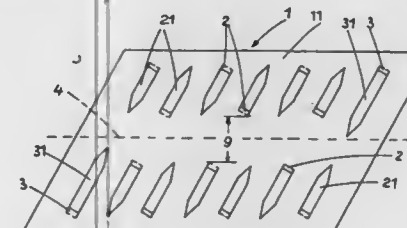
Filed Sep. 24, 1985, Ser. No. 779,989

Claims priority, application Austria, Oct. 29, 1984, 3428/84; Oct. 29, 1984, 3429/84; Nov. 15, 1984, 3624/84; Nov. 15, 1984, 3625/84; Jul. 3, 1985, 1977/85; Jul. 8, 1985, 2021/85

Int. Cl.⁴ F16B 15/00

U.S. Cl. 411—466

2 Claims



1. In a nailing plate comprising a sheet-metal plate having a first parallel pair of edges and a second parallel pair of edges interconnecting said first parallel pair of edges, a plurality of nails extending from said sheet-metal plate, said plurality of nails being formed from parallel tongue-shaped perforations effected in said sheet-metal plate, said sheet-metal plate further comprising a central imperforate zone extending along an axis parallel to said first parallel pair of edges, all said parallel tongue-shaped perforations being inclined relative to said axis and evenly distributed on opposite sides of said imperforate zone; the improvement in which said second parallel pair of edges of said sheet-metal plate is inclined relative to said first parallel pair of edges, and all said parallel tongue-shaped perforations are parallel to said second parallel pair of edges of said sheet-metal plate.

4,710,084

APPARATUS FOR THE APPLICATION OF A STRIP ALONG THE SIDE EDGES OF A SHEET

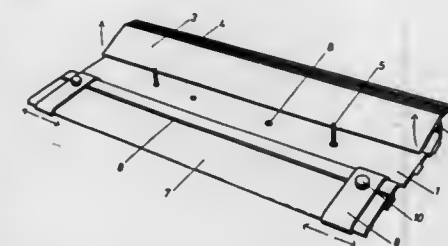
Poul F. B. Ludvigsen, Tommerup, Denmark, assignor to Brdr. Ludvigsen, Tommerup APS, Tommerup, Denmark
PCT No. PCT/DK85/00126, § 371 Date Aug. 22, 1986, § 102(e)
Date Aug. 22, 1986, PCT Pub. No. WO86/04026, PCT Pub. Date Jul. 17, 1986

PCT Filed Dec. 20, 1985, Ser. No. 902,448

Claims priority, application Denmark, Jan. 7, 1985, 75/85
Int. Cl.⁴ B42B 9/00

U.S. Cl. 412—9

1 Claim



1. An apparatus for application of a strip along a side edge of a piece of sheet-formed material, the strip having adhesive and non-adhesive areas and at least one opening used in filing of the sheet-formed material, said apparatus comprising:

a bottom portion having at least one hole, one end of said bottom portion having a hinge, a clamping plate secured to said hinge, at least one pin protruding substantially upwardly from the hole of the bottom portion, a support part connected to said bottom portion, said support part having side-guides secured thereto for guiding the piece of sheet-formed material, said guides being movable transversely in the direction of insertion of the piece of sheet-formed material, and wherein there are several holes provided within said bottom portion for securing of said pin.

4,710,085

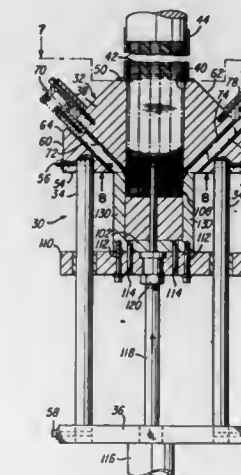
LAMINATION STACK SELECTION METHOD AND APPARATUS

John M. Beakes, Fairborn, and Hyman B. Finegold, Dayton, both of Ohio, assignors to Statomat-Globe, Inc., Dayton, Ohio
Filed Feb. 20, 1986, Ser. No. 831,646

Int. Cl.⁴ B65G 59/06

U.S. Cl. 414—27

27 Claims



1. Apparatus for supporting a vertical column of laminations in a chute and selecting a stack of laminations having a predetermined height from the bottom of said column, comprising:

a plurality of support pins each having a column-supporting portion;

means mounting each of said support pins adjacent the lower end of said column for movement between a first, column-supporting position wherein said column-supporting portions of at least most of said support pins extend beneath and engage the bottom margin of said column to a second, column-releasing position wherein all of said column-supporting portions are out of engagement with said bottom margin;

lamination receptacle means for receiving and supporting a stack of laminations, said lamination receptacle means having an upwardly facing lamination-support surface upon which laminations may be stacked;

means for moving said lamination receptacle means into and away from a lamination stack-receiving position wherein said lamination-support surface is aligned with said column and spaced from the bottom of said column by substantially said predetermined height;

support pin positioning means moving said support pins out of supporting engagement with said column as said lamination receptacle means is moved into said lamination stack-receiving position so that, when said lamination receptacle means is moved into said lamination stack-receiving position, said column lowers until its bottom face engages and is thereby supported by said lamination-support surface; and

means returning said support pins to their respective said first, column-supporting positions as said lamination receptacle means begins to move away from said lamination stack-receiving position so that said support pins engage beneath the bottom of that portion of said column that remains in said chute.

4,710,086

BALE ACCUMULATOR

Adrianus Naaktgeboren, Zedelgem, and Roger H. Van Eecke, Blankenberge, both of Belgium, assignors to New Holland Inc., New Holland, Pa.

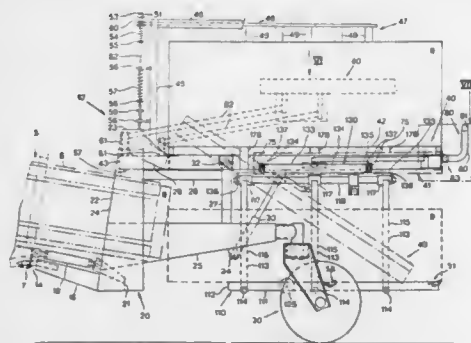
Filed Feb. 26, 1986, Ser. No. 834,098

Claims priority, application European Pat. Off., Feb. 27, 1985, 85.200.268

Int. Cl.⁴ A01D 87/12

U.S. Cl. 414-44

13 Claims



1. In a bale accumulator for use in conjunction with a baler from which, during operation, bales successively are discharged, the bale accumulator including a bale receiving table movable between a home position for receiving a bale from the baler and a bale transfer position, a loadbed disposed to receive bales from the bale receiving table and to accumulate a plurality of bales thereon, positioning means for moving the bale receiving table between its home position and its bale transfer position, the bale receiving table being disposed at least partially vertically underneath the loadbed when in its home position, the position means being operable to move the bale receiving table from its home position underneath the loadbed

to its bale transfer position generally alongside and at the level of the loadbed, wherein the improvement comprises:

the bale receiving table being pivotally mounted on a shuttle mechanism which itself is movable along a transfer linear path between retracted and extended positions; the shuttle mechanism assuming its retracted position and the bale receiving table assuming a lower position when the bale receiving table is located in its home position, and the positioning means, when moving the bale receiving table to the bale transfer position, being operable to simultaneously pivot the bale receiving table upwardly around its pivotal mounting on the shuttle mechanism and to translate the shuttle mechanism with the bale receiving table thereon from its retracted position to its extended position; so that the bale receiving table is moved through a composite path of elongated curved shape.

4,710,087

BALE ACCUMULATOR AND DISCHARGER

Adrianus Naaktgeboren, Zedelgem, and Roger H. Van Eecke, Blankenberge, both of Belgium, assignors to New Holland Inc.

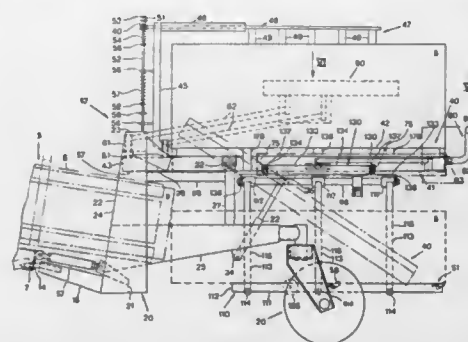
Filed Feb. 26, 1986, Ser. No. 834,099

Claims priority, application European Pat. Off., Feb. 27, 1985, 85.200.269.0

Int. Cl.⁴ A01D 87/12

U.S. Cl. 414-44

11 Claims



1. In a bale accumulator for use in conjunction with a baler from which, during operation, bales successively are discharged, said bale accumulator including a bale receiving table movable between a home position for receiving a bale from the baler and a bale transfer position, a loadbed movable between a home position for accumulating a plurality of bales thereon transferred thereto from the bale receiving table and a bale dumping position for discharging accumulated bales onto the ground, first positioning means for moving the bale receiving table between its home position and its bale transfer position, second positioning means for moving the loadbed between its home position and its bale dumping position, and the bale receiving table being mounted on the loadbed in a manner for movement in unison therewith as the loadbed is moved between its home position and its bale dumping position, wherein the improvement comprises:

the bale receiving table being pivotally mounted on the loadbed, and, when in its home position, having a generally horizontal bale receiving surface disposed at a level below the level of the loadbed and the base receiving table also having generally upright bale support means arranged so that, as the bale receiving table is moved from its home position to its bale transfer position, the bale support means becomes operative to support a bale held on the bale receiving table, and assumes a position generally aligned with the surface of the loadbed for, in effect, becoming part of said surface to enlarge the bale holding capacity thereof.

4,710,088

MAGAZINE FOR STACKING SHEET-METAL MEMBERS

Felix Kramer, Friedlisberg, Switzerland, assignor to Elpatronic AG, Switzerland

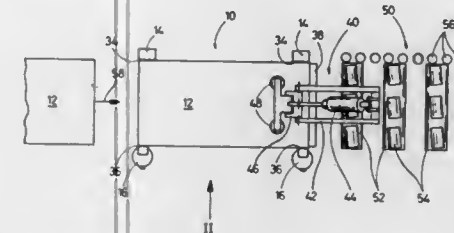
Filed Oct. 28, 1986, Ser. No. 924,066

Claims priority, application Switzerland, Nov. 1, 1985, 4709/85

U.S. Cl. 414-113

Int. Cl.⁴ B65H 1/04

2 Claims



1. A magazine used with the production of cans for stacking sheet-metal members, comprising:

a plurality of columns on which mutually remote edges of the sheet-metal members are guided; and
a resiliently flexible strip for at least one of said columns for exerting pressure on the associated edges of the sheet-metal members stacked between a first one of said columns and an opposite rigid column, said strip divided into a plurality of resiliently supported pressure members disposed one below the other, and having surfaces (32) deviating from a horizontal plane at their adjoining ends.

4,710,089

ARTICLE UNSTACKING SYSTEM

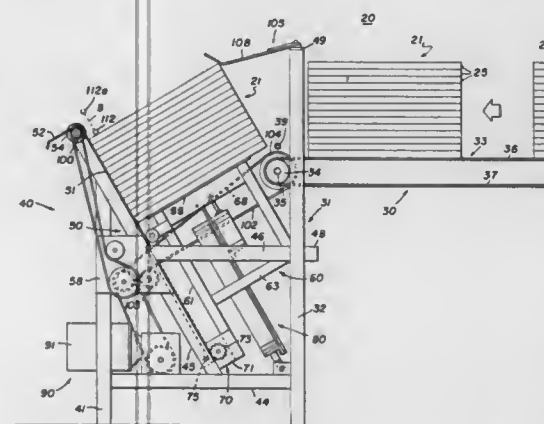
Thomas C. Schneider, Oak Forest, Ill., assignor to Velten & Pulver, Inc., Chicago Ridge, Ill.

Filed May 29, 1986, Ser. No. 868,026

Int. Cl.⁴ B65G 59/02, 59/08

U.S. Cl. 414-118

19 Claims



1. Apparatus for removing articles one at a time from the top of a stack of articles having an axis intersecting the top and bottom articles in the stack at the centers thereof, said apparatus comprising: stack support means for receiving the stack thereon, said support means including carriage means movable with respect to the remainder of said support means for effecting reciprocating movement of the stack in directions parallel to its axis; drive means coupled to said carriage means for effecting movement thereof and of the stack thereon between a discharge condition wherein the top article in the stack is disposed in a discharge position and a withdrawn condition below said discharge condition; discharge means engageable with the top article in the stack when it is disposed in its discharge position for removing it from the stack and moving it from its discharge position; and control means coupled to said

drive means for controlling the operating thereof, of, said control means being responsive to movement of the top article to its discharge position for causing movement of the carriage means to its withdrawn condition while said discharge means is moving the top article from its discharge position to facilitate separation of the top article from the stack, said control means being responsive to removal of the top article from its discharge position and from the stack when said carriage means is in its withdrawn condition for causing movement of the carriage means back to its discharge condition.

4,710,090

HYDRAULIC HOIST PARTICULARLY FOR MOUNTING ON PICK-UP TRUCK BEDS OR THE LIKE

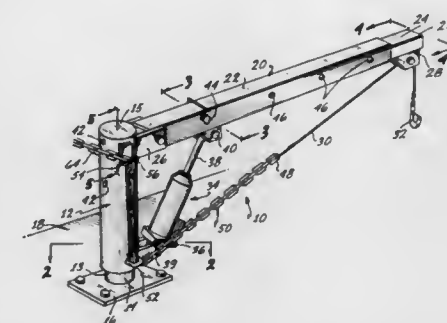
Charles Q. DeLuca, 33-1 8th Floor, Sunny Building An-ho Road, Taipei, and Huang J. Shiang, No. 227, Sec. 2 Po Ai Rd., Chilai, both of Taiwan

Filed May 22, 1986, Ser. No. 866,125

Int. Cl.⁴ B65G 67/02

U.S. Cl. 414-550

6 Claims



1. A hoist comprising:
an upright bearing post having a base at its lower end for mounting to an underlying structure such as the bed of a cargo vehicle;
a tubular support column rotatably coaxially supported on said upright post and having an upper end and a lower end;
a boom hingedly connected at one end to the upper end of said column such that the opposite free end of the boom can be raised or lowered;
drive means connected between said column and said boom operative for raising or lowering the free end of said boom;
a sheave carried at the free end of the boom;
a hoist cable looped over said sheave;
an eye affixed to said column near said lower end;
a chain threaded through said eye and secured at one end to said hoist cable; and
chain anchor means affixed to said column near its upper end and slotted for edgewise admitting any selected single link of said chain into said slot but blocking passage of the next upwardly adjacent transversely oriented link through said slot thereby to anchor said chain to said column against the pull of a load suspended from said hoist cable, whereby the effective length of said chain can be conveniently adjusted by selecting the link inserted into the slot; said eye acting to apply the lateral load component transmitted through said chain and cable to said column at a point near the base of said post so as to minimize the leverage effect on said base.

4,710,091

LOADING AND UNLOADING APPARATUS

Toshio Ochiai, Tokyo; Akio Tsujimura, Kawasaki, and Hiroshi Tsukiyasu, Yuki, all of Japan, assignors to Toyo Seikan Kaisha, Ltd. and Komatsu Forklift Kabushiki Kaisha, both of Tokyo, Japan

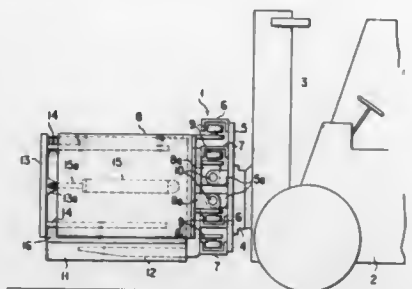
Filed Nov. 15, 1985, Ser. No. 798,273

Claims priority, application Japan, Nov. 16, 1984, 59-240497

Int. Cl.⁴ B60P 1/00

U.S. Cl. 414—623

1 Claim



1. A loading and unloading apparatus for moving stacked sheets comprising a movable vehicle, a vertically movable main body mounted on the front of said vehicle, said main body including a fork extending forward from the front of said vehicle for positioning under and for lifting said stacked sheets, a plurality of horizontal guide rails spaced vertically and fixedly mounted on said main body adjacent the front of said vehicle, a pair of arms at the opposite ends of said guide rails and slidably supported at their base ends via telescope means within said guide rails and extending forward from the front of said vehicle substantially parallel to said fork, a first drive means coupled to each arm of said pair of arms and to said main body for selectively moving each said arm closer to and away from the other said arm, said first drive means including a hydraulic cylinder coupled at one of its ends to the base end of said arm and at the other of its ends to said main body, each arm of said pair of arms being formed in a flat box shape extending vertically of and forwardly from the front of said vehicle, front stopper means at the front forward end of each said arm of said pair of arms, each said front stopper means extending inwardly from the front forward end of one of said arms of said pair of arms toward the other of said pair of arms, each of said front stopper means having an upper and a lower guide rod extending into the front end of said one of said arms and a second drive means coupled to said front stopper means for moving said stopping means closer to and away from the front forward end of said arms, said second drive means having a hydraulic cylinder in said arm coupled at one of its ends to said arm and at the other end to said stopper means.

4,710,092

INDUSTRIAL ROBOT HAVING TWO GIMBAL-RING TYPE ARRANGED SWINGING AXES

Hans Skoog, Ulf Holmqvist, and Lelf Telldén, all of Västerås, Sweden, assignors to ASEA AB, Västerås, Sweden

Filed May 10, 1985, Ser. No. 732,650

Claims priority, application Sweden, May 18, 1984, 8402693

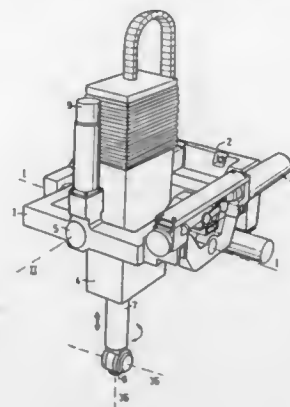
Int. Cl.⁴ B25J 11/00

U.S. Cl. 414—729

3 Claims

1. An industrial robot comprising a gimbal-ring type suspended part, a first motor and a second motor for rotating the gimbal-ring type suspended part about two mutually perpendicular axes, a translatable movable arm having an axis and in the gimbal-ring type suspended part, a protruding end of the arm having an axially rotatable tool attachment, said arm being attached to a platform which is mounted on guides located within the gimbal-ring type suspended part, a third motor mounted on the gimbal-ring type suspended part, the third motor for providing translatable movement of the platform along the guides, and three additional motors mounted on said

platform including a fourth motor whose shaft connects through a gear engagement with a gear which is rotatably mounted on the platform on the same axis as the arm, and a fifth motor and a sixth motor attached to said gear, the fifth and



the sixth motors each connected to a respective shaft which extend to the tool attachment and which are adapted to rotate said tool attachment about a first tool axis extending at right angles to the arm and about a second tool axis which extends at right angles to the first tool axis.

4,710,093

DEVICE FOR THE AUTOMATIC GRIPPING AND RELEASING OF A TOOL HOLDER IN A MANIPULATOR

Ernst Zimmer, Friedberg, and Botho Kikut, Augsburg, both of Fed. Rep. of Germany, assignors to KUKA Schweissanlagen & Roboter GmbH, Fed. Rep. of Germany

PCT No. PCT/EP85/00265, § 371 Date Feb. 7, 1986, § 102(e) Date Feb. 7, 1986, PCT Pub. No. WO86/00040, PCT Pub. Date Jan. 3, 1986

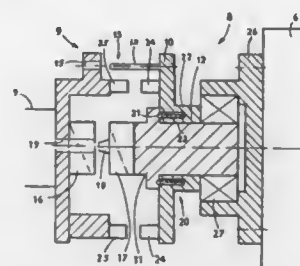
PCT Filed Jun. 4, 1985, Ser. No. 832,712

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421452

Int. Cl.⁴ B25J 11/00

U.S. Cl. 414—730

16 Claims



1. A coupling arrangement for the automatic gripping and releasing of a tool for use with a last drive member of a multi-axial manipulator, the last drive member having an axis of rotation, the coupling arrangement comprising: a first coupling part, operatively connected to the last drive member, having a first operating element and a second operating element, each of the first and second operating elements having an axis of rotation coincident with the axis of rotation of the last drive member, said first operating element being concentrically mounted on said second operating element; a second coupling part, connected to the tool, a rotational connector, having a first rotational connector part associated with said second operating element and a second rotational connector part connected with said second coupling part; rotational barrier means, associated with said first operating element and engageable with

said second coupling part, for preventing relative rotation between said first operating element and said second coupling part; clutch means for fixing said first operating element relative to said second operating element and for releasing said first operating element relative to said second operating element when said rotational barrier means acts to prevent said first operating element from rotating relative to said second coupling part, thereby allowing said first rotational connector part to rotate, upon rotation of the last drive member and said second operating element, to allow engagement of said first and second rotational connector part, while said rotation barrier means prevents relative rotation between said first operating element and said second coupling part and said drive member acts as energy source to rotate together the two coupling parts.

4,710,094

AUTOMATIC CONTINUOUSLY CYCLEABLE MOLDING SYSTEM AND METHOD

Richardus H. J. Fierkens, Herwen, and Ireneus J. T. M. Pas, Rozendaal, both of Netherlands, assignors to ASM Fico Tooling, b.v., Herwen, Netherlands

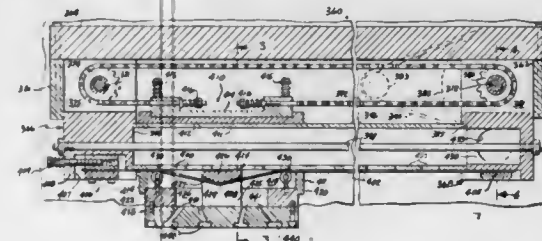
Division of Ser. No. 586,855, Mar. 6, 1984, Pat. No. 4,575,328.

This application Nov. 15, 1985, Ser. No. 798,679

Int. Cl.⁴ B65G 25/00

U.S. Cl. 414—752

2 Claims



1. A conveyor mechanism for transporting workpieces comprising, in combination:

- (a) an elongated tube means for providing a bore and a plurality of ports passing therethrough;
- (b) said plurality of ports of said elongated tube means being formed in longitudinally spaced increments along the length thereof;
- (c) an elongated band means in coextensive contiguous engagement with said tube means for closing said plurality of ports;
- (d) said band means being suitable for being deflectable out of port closing engagement with said tube means;
- (e) a carriage means mounted on said tube for defining a chamber which encloses a portion of said tube means and a portion of said band means;
- (f) a means coupled to said carriage means for reciprocal movement thereof along the length of said tube means;
- (g) a holding means mounted in said chamber of said carriage means for engaging said band means at spaced apart locations;
- (h) deflecting means mounted in said chamber of said carriage means for engagement with said band means;
- (i) said deflecting means being operably engaged with said band means at a portion which is between the spaced apart locations where said holding means engages said band means to deflect a portion of said band means out of port closing engagement with said tube means to place said bore of said tube means in communication with said chamber of said carriage means;
- (j) a pick-up head means for being carried on said carriage means and being in fluid communication with said chamber; and
- (k) a means coupled to said tube for selectively producing a negative static pressure therein.

4,710,095

TURBOMACHINE AIRFLOW TEMPERATURE SENSOR

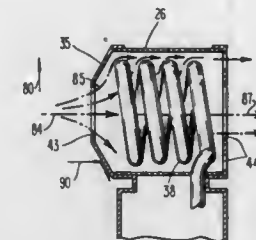
Dana D. Freberg, Middletown, and William R. Spencer, Springfield, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 404,942, Aug. 4, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 589,866

Int. Cl.⁴ F01D 17/08

U.S. Cl. 415—48

1 Claim



1. An apparatus for sensing the dry bulb temperature of a fluid stream having a gaseous phase and a liquid phase, comprising:

- a hollow generally cylindrical member having a first radius;
- a means for admitting a fluid stream having a gaseous phase and a liquid phase into the cylindrical member, comprising a generally circular opening in one end of the cylindrical member having a second radius smaller than the first radius, the opening being capable of admitting a fluid stream into the cylindrical member along the longitudinal axis of the member such that the fluid stream is accelerated away from the axis, the acceleration of the gaseous phase being greater than that of the liquid phase; and
- a means for sensing the dry bulb temperature of the fluid stream admitted into the hollow member, comprising a temperature sensor located inside the cylindrical member a distance away from the axis between the first and second radii, the path between the axis and the temperature sensor being unobstructed along substantially the entire length of the axis inside the cylindrical member.

4,710,096

FAN MOUNTING

David P. Erlam, Winchester, England, assignor to Rittal-Werk Rudolf Loh GmbH & Co KG, Fed. Rep. of Germany

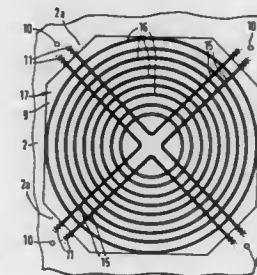
Filed Jan. 14, 1986, Ser. No. 818,776

Claims priority, application United Kingdom, Jan. 23, 1985, 8501657

Int. Cl.⁴ F04B 17/00

U.S. Cl. 415—121 G

8 Claims



1. A fan casing for mounting a plurality of motor/fan units and comprising an upper planar member, a lower planar member, motor/fan units sandwiched between said planar members and finger guard members to cover openings in the planar members, wherein inwardly directed projections are provided on the planar members to engage in apertures in the motor/fan units to locate the motor/fan units, indentations are formed in the planar members to receive and locate the finger guard

members so that when the casing is assembled the finger guard members are disposed between the motor/fan units and the planar members, the two planar members are substantially identical, and attachment means are provided to couple the two planar members one to the other.

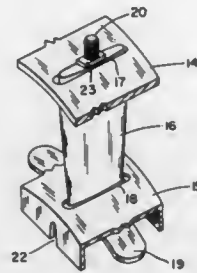
4,710,097

STATOR ASSEMBLY FOR GAS TURBINE ENGINE
Aldo A. Tinti, Fairfield, Conn., assignor to Avco Corporation, Providence, R.I.

Filed May 27, 1986, Ser. No. 867,163
Int. Cl.⁴ F04D 29/34

U.S. Cl. 415—138

14 Claims



10. A vane assembly for a gas turbine engine comprising:
a vane having inner and outer ends;
a pad integral with the outer end of said vane;
a stud integral with and extending outwardly from said pad;
and
a flexible compression plate integral with the inner end of said vane.

12. A method of assembling a stator assembly to the casing of a gas turbine engine comprising the steps of:
providing the stator assembly with a plurality of first vanes of a first vane type each of which is fixedly attached at opposing ends thereof to an outer and an inner shroud;
providing the stator assembly with radially opposed pairs of openings made through the inner and outer shrouds;
providing openings through the casing;
positioning the stator assembly within a groove formed on an interior wall of the casing such that the openings made through the outer shroud and the openings made through the casing are in registration one with the other;
sliding a second vane of a second vane type radially through each of the pairs of openings of the inner and outer shrouds, the second vane having a fastening means provided on an outer end, the second vane further having a compression means provided on an inner end for compressively engaging a bottom surface of the inner shroud; and
securing each of the second vanes to the casing with a securing means which tightly engages the fastening means through the corresponding opening within the casing such that the second vane is placed in tension whereby the compression means compressively engages the bottom surface of the inner shroud to clamp the stator assembly to the casing.

4,710,098

VALVE AND BLOWER APPARATUS FOR PNEUMATIC TUBE SYSTEM

Walter G. Anders, North Canton; Leo J. Grosswiller, Jr., East Canton; Benjamin F. Lozier, and Alan J. Rozlosnik, both of Louisville, all of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

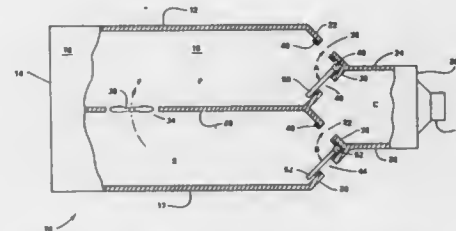
Filed Nov. 27, 1985, Ser. No. 802,796
Int. Cl.⁴ B65G 51/08; F04D 29/40

U.S. Cl. 415—149 A

55 Claims

30. Apparatus for selectively applying pressure or suction at an outlet port comprising:

a housing;
dividing means dividing said housing into compartments, said compartments including suction area and a pressure area;
suction producing means for producing suction in the suction area;
pressure producing means for producing pressure in the pressure area;
second air flow passage means for air flow between said suction area and atmosphere;
third air flow passage means for air flow between said suction area and said outlet port;
fourth air flow passage means for air flow between the pressure area and said outlet port;
fifth air flow passage means for air flow between the pressure area and atmosphere;
first air flow director means for directing air flow into said suction area, said first air flow director means having a



first condition opening said third air flow passage means while closing said second air flow passage means, and a second condition opening said second air flow passage means while closing said third air flow passage means;
second air flow director means for directing air flow out of said pressure area, said second air flow director means having a first condition opening said fifth air flow passage means while closing said fourth air flow passage means, and a second condition opening said fourth air flow passage means while closing said fifth air flow passage means; and
control means for controlling the conditions of said first and second air flow direction means, suction being applied at said outlet port when the first and second air flow director means are in their respective first conditions and pressure being applied at said outlet port when the first and second air flow director means are in their respective second conditions.

4,710,099

MULTI-STAGE TURBINE

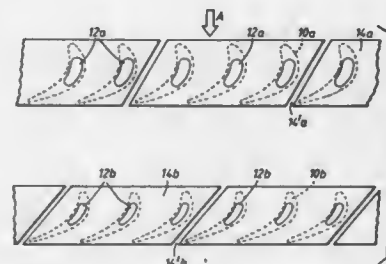
Toshihiro Matsuura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 803,348, Dec. 2, 1985, abandoned. This application Feb. 24, 1987, Ser. No. 18,733

Claims priority, application Japan, Nov. 30, 1984, 59-253265
Int. Cl.⁴ F01D 9/04

U.S. Cl. 415—199.5

7 Claims



1. A multistage turbine comprising:

(a) a rotor disk having a cylindrical outer surface in which a plurality of dovetail-shaped grooves are formed;
(b) a casing surrounding said rotor disk;
(c) a plurality of dovetail-shaped anchoring portions, each one of said plurality of dovetail-shaped anchoring portions being slidably received in a corresponding one of said plurality of dovetail-shaped grooves;
(d) a first turbine stage comprising a plurality of axially aligned, circumferentially equally spaced first turbine blades, at least one of said first turbine blades being mounted on each one of said plurality of dovetail-shaped anchoring portions and projecting radially outwardly from said rotor disk;
(e) a second turbine stage located downstream of said first turbine stage and comprising a plurality of axially aligned, circumferentially equally spaced second turbine blades, at least one of said second turbine blades being mounted on each one of said plurality of dovetail-shaped anchoring portions and projecting radially outwardly from said rotor disk;
(f) a plurality of axially aligned, circumferentially equally spaced first nozzle plates mounted on said casing and projecting inwardly therefrom, said first nozzle plates being located upstream of and closely adjacent to said first turbine stage;
(g) a plurality of axially aligned, circumferentially equally spaced second nozzle plates mounted on said casing and projecting radially inwardly therefrom, said second nozzle plates being located between said first and second turbine stages and closely adjacent to said second turbine stage;
(h) a first circumferentially extending shroud surrounding said first turbine stage and connecting the radially outer ends of at least some of said first turbine blades, said first circumferentially extending shroud being divided by gaps at intervals in the circumferential direction; and
(i) a second circumferentially extending shroud surrounding said second turbine stage and connecting the radially outer ends of at least some of said second turbine blades, said second circumferentially extending shroud being divided by gaps at intervals in the circumferential direction and the gaps dividing portions of said second circumferentially extending shroud being offset in the circumferential direction from the gaps dividing portions of said first circumferentially extending shroud,
whereby, in use, the vibration level of said first and second turbine blades due to the eddies-containing wakeflow coming from the trailing edges of said first and second nozzle plates is greatly reduced.

4,710,100

WIND MACHINE

Oliver Laing, and Johannes L. N. Laing, both of 4461 Ocean Blvd., Apt. 54, San Diego, Calif. 92019

Filed May 17, 1984, Ser. No. 611,464

Claims priority, application Switzerland, Nov. 21, 1983, 6242/83

Int. Cl.⁴ F03B 7/00; B63H 5/08

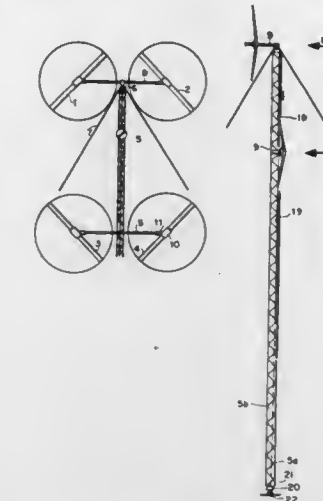
U.S. Cl. 416—11

12 Claims

1. A wind machine of the type having at least two rotor units, and a tower for supporting the rotor units and having a vertical axis, comprising:

(a) a foot bearing for rotatably supporting the tower at a bottom end;
(b) a stud rigidly fixed to said tower in a generally horizontal position for supporting a pair of said at least two rotor units in a position that the rotors rotate in a plane on the downwind side of the tower and are spaced horizontally;
(c) a second bearing on said tower positioned above the lowest point of rotation of said rotor and below said stud

and providing attachment for guy wires to hold said tower in an upright position rotatable about a vertical axis; and



(d) each of said rotor units of said pair rotates in a direction opposite from the other.

4,710,101

WIND TURBINE

Peter M. Jamieson, Stirling, Scotland, assignor to James Howden & Company Limited, Glasgow, Scotland

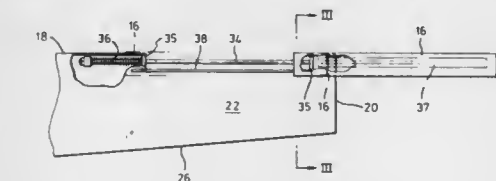
Filed Apr. 25, 1986, Ser. No. 856,049

Claims priority, application European Pat. Off., Apr. 26, 1985, 85302983.3

Int. Cl.⁴ F03D 7/04

U.S. Cl. 416—32

9 Claims



1. A wind turbine comprising, in combination:

(a) a rotor;
(b) a plurality of circumferentially spaced blades on said rotor;
(c) an aerofoil cross-section to each of said blades;
(d) major upper and lower surfaces of said aerofoil cross-section;
(e) a leading edge and a trailing edge of said aerofoil cross-section;
(f) a tip of each said blade;
(g) a nose portion of the leading edge of each blade adjacent the blade tip, said nose portion having a shape conforming to a part of the leading edge of the aerofoil cross-section;
(h) guide means guiding said nose portion for movement longitudinally of the associated blade; and
(i) a remaining forwardly facing portion of each said blade, normally covered by said nose portion, said remaining forwardly facing portion having a different, high drag shape than said leading edge, said high drag shape being revealed only when said nose portion is moved longitudinally radially outwardly of the rotor axis to a displaced position.

4,710,102

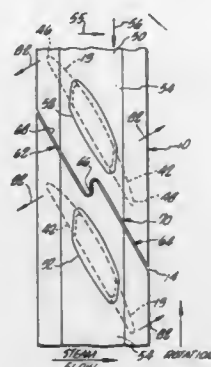
CONNECTED TURBINE SHROUDING

Ralph J. Ortolano, 3776 Coolheights Dr., Rancho Palos Verdes, Calif. 90274

Filed Nov. 5, 1984, Ser. No. 668,160
Int. Cl. F01D 5/22

U.S. Cl. 416—190

9 Claims



1. A rotor structure for an axial flow elastic fluid utilizing machine comprising:

- a rotor spindle;
- an annular row of radially extending blades carried by the rotor spindle; and
- a non-integral arcuate shroud ring structure, attached to the radially outermost tips of the blades for rigidly connecting the blades to each other in long arc groups comprising at least 12 blades, the shroud ring structure being divided into shroud segments with gaps therebetween, one shroud segment for each group, the long arc groups being of substantially equal central angular extent, the number of long arc groups being equal to the blade resonant frequency divided by an integer multiple of the rotor running speed; the blade tips being skewed relative to the direction of rotation of the shroud, the shroud segments having a leading end and a trailing end, at least one pair of adjacent segments having their adjoining ends configured to be flexibly interlocked to each other without connectors at a gap that is completely between blade tips, with the adjoining ends having a "Z" configuration comprising two end sections connected by a section substantially parallel to the direction of rotation of the shroud, the two end sections being transverse to the direction of rotation of the shroud, such that when the machine is in operation, the blades tend to untwist resulting in the gap closing in the middle section of the "Z" configuration.

4,710,103

METHOD FOR FASTENING BLADES ON THE PERIPHERY OF THE ROTOR BODY OF A STEAM TURBINE AND THE TURBO-MACHINE PRODUCED BY THE METHOD

Gay Faber, and Gottfried Kuhn, both of Oberrohrdorf, Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 11, 1986, Ser. No. 873,605
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1985, 3521664

Int. Cl. F01D 5/30; B23P 15/02; B21K 23/00

U.S. Cl. 416—219 R

18 Claims

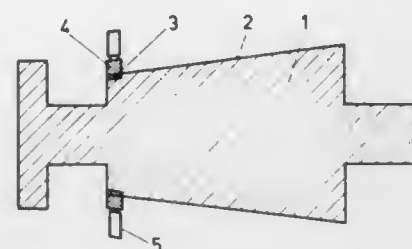
1. A rotor and blade arrangement for a steam turbine, comprising:

- a rotor body;
- an outer layer applied to the rotor body comprising at least one welding run of a steel that is one of high temperature corrosion resistance and stress corrosion resistance;

said outer layer being machined for the purpose of receiving blades; and
blades inserted into the machined outer layer.

8. A method for fastening blades on the periphery of a rotor body of a steam turbine by firmly clamping and wedging the blades in recesses and/or protrusions of the rotor body, comprising:

covering an annular portion of the outer surface of the rotor body, by means of deposit welding, with at least one layer,



said at least one layer being formed by welding a run of one of a high temperature corrosion resistant and stress corrosion resistant steel,

after solidification of the welding run, subjecting the part of the rotor body formed by deposit welding to machining by one of turning, milling and grinding for the purpose of forming at least one of a recess and a protrusion to receive the blades, and

inserting the blades in said at least one machined layer of weld material.

4,710,104

VARIABLE DISPLACEMENT FLUID PUMP WITH TRANSDUCER INTERFACE

Eric Dring, Mansfield, United Kingdom, assignor to Dale (Mansfield) Limited, England

Continuation of Ser. No. 746,426, Jun. 19, 1985, abandoned.

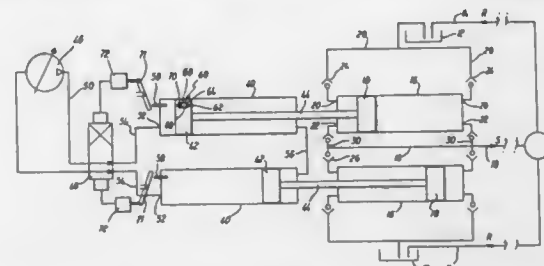
This application Nov. 17, 1986, Ser. No. 931,888

Claims priority, application United Kingdom, Jul. 10, 1984, 8417539

Int. Cl. F04B 17/00, 35/00

U.S. Cl. 417—53

3 Claims



3. A method of providing a variable supply of a water-based fluid at constant pressure to a hydraulic ring main in a mine to which hydraulically operated machines are connected comprising the steps of:

- actuating out-of-phase a pair of double acting piston and cylinder pumps interposed in said hydraulic ring main to maintain a constant pressure level in a first pressure fluid therein for hydraulically operating machines connected thereto;
- driving said double acting piston and cylinder pumps by use of a pair of out-of-phase piston and cylinder hydraulic motors, the piston of each of said motors being mechanically connected to the piston of a corresponding pump;
- supplying a second pressure fluid from a variable displacement pump to the cylinders of the motors in front of their pistons;

- permitting a flow of said first pressure fluid between the rear of the pistons of the motor; and
- controlling the flow of said second pressure fluid from the variable displacement pump to the motors by means of a spool valve to supply and exhaust the motor cylinders alternately.

4,710,105

LIQUID-RING COMPRESSOR UNIT

Udo Segebrecht, and Siegfried Auschrat, both of Heiligenstedten, Fed. Rep. of Germany, assignors to Sihl GmbH & Co. KG, Itzehoe, Fed. Rep. of Germany

PCT No. PCT/EP85/00286, § 371 Date Feb. 13, 1986, § 102(e) Date Feb. 13, 1986, PCT Pub. No. WO86/00117, PCT Pub. Date Jan. 3, 1986

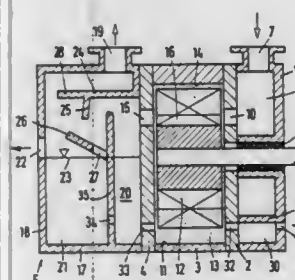
PCT Filed Jun. 10, 1985, Ser. No. 833,390

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1984, 3421866

Int. Cl. F04C 19/00

U.S. Cl. 417—68

6 Claims



1. In a liquid ring compressor unit having an elongated horizontal housing including a gas inlet suction connection piece in communication with a suction intake chamber leading to at least one compressor stage, a shaft passing horizontally through the compressor stage, an outlet pressure connection piece in communication with a pressure opening in the last compressor stage, the last compressor stage including a working chamber having a vane rotor mounted on the shaft which cooperates with a working liquid ring to compress the gas and to form a fluid medium containing said gas and entrained working liquid, the fluid medium being discharged through said pressure opening into said pressure connection piece, wherein the improvement comprises:

- the housing including a pressure chamber located longitudinally adjacent the last compressor stage, the pressure chamber having substantially the same height and width dimensions as the compressor stage;
- the pressure opening being located in a geodetically upper portion of the compressor stage and extending horizontally into communication with the pressure chamber;
- the pressure chamber including a vertical wall which projects upwardly at least to a position directly opposed to the pressure opening, the wall defining a first region between the wall and the compressor stage and a second region between the wall and one longitudinal end of the housing, the first and second regions being in fluid communication above the wall;
- said pressure connection piece being in communication with a geodetically upper portion of said pressure chamber through a penetration in the housing;
- a liquid overflow discharge port separate from the pressure connection piece, located in the second region and penetrating the housing;
- a baffle means positioned between the top of the wall and the pressure connection piece, for defining a baffled flow path within the second region between the wall and the pressure connection piece;
- whereby the fluid medium emerging from the pressure opening strikes against the wall such that a large part of the liquid is separated in the first region and the medium then

enters the baffled flow path where at least some of the liquid remaining in the medium is deposited on the baffle means before the medium is discharged through the pressure connection piece.

4,710,106

VOLUME CONTROLLING DEVICE FOR VARIABLE VOLUME PUMP

Hiroshi Iwata; Masatoshi Kuroyanagi, both of Kariya; Masahiko Suzuki, Hoi; Koichi Moriguchi, Nagoya; Yasuhiro Horiuchi, Hoi, and Kanehito Nakamura, Oubu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

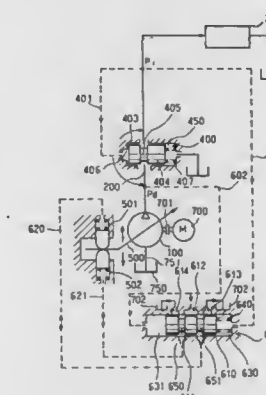
Filed Nov. 25, 1985, Ser. No. 801,309

Claims priority, application Japan, Nov. 26, 1984, 59-249896; Nov. 5, 1985, 60-247687

Int. Cl. F04B 49/00, 1/06

U.S. Cl. 417—213

10 Claims



1. A volume controlling pumping device comprising: a pump for compressing and discharging working fluid; variable choke, having an input connected to an output of said pump and having an outlet; mechanical means for controlling said variable choke to adjust the fluid flow through said variable choke in direct response to fluid pressure at said outlet of said variable choke and substantially independently of fluid pressure at said input of said variable choke, whereby said variable choke means is controlled substantially independently of vibration of the discharge pressure of said pump; and means for varying the capacity of said pump so as to maintain the fluid pressure difference on opposite sides of said variable choke means constant.
8. A volume controlling pumping device comprising: a pump for compressing and discharging working fluid at an output; a channel fluidly coupled to said output of said pump; variable choke means disposed in said channel for varying the flow through cross-section of said channel, said variable choke means reducing the flow through cross-section of said channel when the pressure of the working fluid in said channel downstream of said variable choke increases, said variable choke means increasing the flow through cross-section of said channel when the pressure of the working fluid in said channel downstream of said variable choke decreases; said variable choke means having a control piston reciprocating within said channel, a passing area being defined by said control piston for passing working fluid through said variable choke means, said passing area varying its area facing said channel in accordance with movement of said control piston so that the opening area of said channel is controlled in accordance with the movement of said control piston, a drain chamber, and a bypass passage connecting said drain chamber and said passing area; variable capacity means for controlling the capacity of said

pump including a first drive piston and a second drive piston; and
 pressure detecting means for detecting the pressure of working fluid in said channel downstream and upstream of said variable choke, means including:
 a first pressure passage through which a control signal is introduced into said first drive piston,
 a second pressure passage through which a control signal is introduced into said second drive piston,
 an introducing pressure port through which pressure of working fluid in said channel between said pump and said variable choke is introduced into said pressure detecting means,
 a drain port through which working fluid is drained from said pressure detecting means, and switching means selecting the connection of said first pressure passage, said second pressure passage, said introducing pressure port and said drain port from one of: (1) an increasing position wherein said first pressure passage is connected to said introducing pressure port and said second pressure passage is connected to said drain port for moving said first drive piston and said second drive piston so that the capacity of said pump is increased when said pressure detecting means detects the difference of the pressures of the working fluid in said channel downstream and upstream of said variable choke is smaller than a predetermined pressure, (2) a keeping position wherein said first pressure passage and said second pressure passage are shut off from said introducing pressure port and said drain port for keeping the position of said first drive piston and said second drive piston so that the capacity of said pump is maintained when said pressure detecting means detects the difference of the pressure of the working fluid in said channel downstream and upstream of said variable choke means is about said predetermined pressure, and (3) a reducing position wherein said first pressure passage is connected to said drain port and said second pressure passage is connected to said introducing pressure port for moving said first drive piston and said second drive piston so that the capacity of said pump is reduced when said pressure detecting means detects the difference of the pressure of the working fluid in said channel downstream and upstream of said variable choke is larger than said predetermined pressure.

4,710,107

SWASHBLOCK LUBRICATION IN AXIAL PISTON FLUID DISPLACEMENT DEVICES

Kerry R. Kanies, Hubertus, Wis., assignor to The Oilgear Company, Milwaukee, Wis.

Filed Apr. 15, 1986, Ser. No. 852,348

Int. Cl.⁴ F04B 1/12, 27/03; F01M 11/00

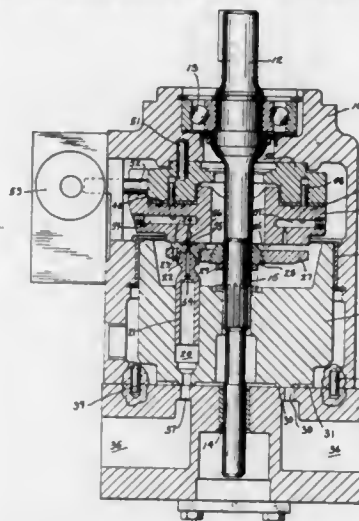
U.S. Cl. 417-269

6 Claims

1. In a variable displacement fluid device having a housing with a high pressure port and a low pressure port, a rotatable cylinder barrel journaled in the housing and including a plurality of cylinders each having a piston that pivotally mounts a shoe that slides over a front face of a swashblock, the pistons and shoes having cooperating passages that lead from the cylinder to the front face of the swashblock to provide fluid from the cylinders to lubricate the front face of the swashblock, the swashblock having a pair of rear arcuate bearing surfaces, a support in said housing for the swashblock bearing surfaces, a pair of arcuate bearings disposed against said support and engaged by the swashblock bearing surfaces, and means for pivoting the swashblock over the surface of the bearings to vary the angle of the front face of the swashblock, the improvement wherein:

the one swashblock bearing surface of said swashblock that is opposite the high pressure port is formed with a continuous groove that faces the respective bearing,

a passageway is formed internal of the swashblock and terminates in the groove, and
 an opening including an orifice is provided in the swashblock leading to the passageway from a position on the front face of the swashblock that is axially aligned with said one bearing surface and in the path of the shoes,



whereby a small, controlled amount of fluid from the passages in the pistons and shoes will be pumped into the opening, through the orifice, and into the passageway to deposit fluid in the groove to lubricate said respective bearing.

4,710,108

ISOLATION VALVE CONSTRUCTION

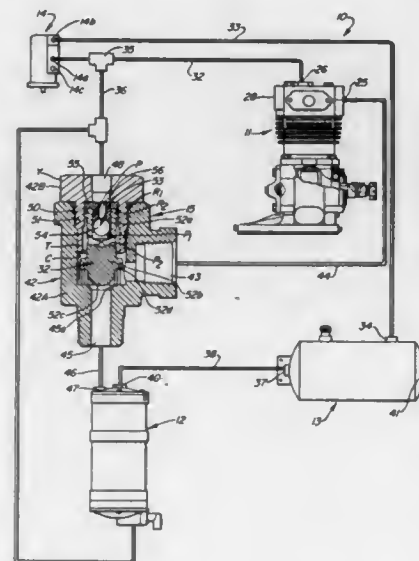
Thomas R. Soupal, Owosso, Mich., assignor to Midland Brake, Inc., Owosso, Mich.

Filed Mar. 11, 1987, Ser. No. 24,624

Int. Cl.⁴ F04B 49/00

U.S. Cl. 417-298

12 Claims



1. An isolation valve for use in a pneumatic system having an air compressor adapted to operate in normal and unloading modes and having first and second ports, an air dryer having inlet and outlet ports, a reservoir of charged air having an inlet port and a signal outlet port, the reservoir inlet port being in communication with the dryer outlet port, and a governor having a first port in communication with the reservoir signal outlet port, a second port in communication with the compres-

sor second port, and an exhaust third port, the governor being adapted to effect select communication between the ports thereof under preset conditions; said isolation valve comprising a housing provided with an internal cavity, a first port to the cavity adapted to communicate with the compressor first port, a second port to the cavity adapted to communicate with the dryer inlet port, a third port to the cavity adapted to communicate with the governor second port; a pneumatically responsive primary valve means mounted within said housing cavity for movement between open and closed positions relative to said housing second port, said primary valve means being provided with an internal passage having one end thereof in communication with the housing third port and second end in communication with said housing cavity; and a pneumatically responsive secondary valve means mounted within said passage for independent movement between passage blocking and unblocking positions, said secondary valve means being in said blocking position and said primary valve means being in said open position when the compressor is in the normal mode, said secondary valve means being in an unblocking position, and said primary valve means being in said closed position when the compressor is in an unloading mode and the first and second ports of the governor are in communication with one another.

4,710,109

DIAPHRAGM PUMPS WITH IMPROVED STRUCTURAL COOLING AND MAINTENANCE

Patrick J. M. Ballu, Reims, France, assignor to Tecnomat, France

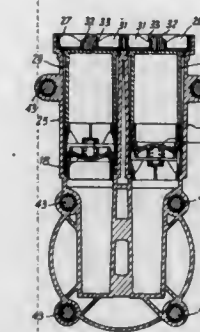
Filed May 8, 1986, Ser. No. 861,235

Claims priority, application France, May 10, 1985, 85 07098

Int. Cl.⁴ F04B 21/00

U.S. Cl. 417-454

18 Claims



1. A diaphragm attachment screw for a diaphragm pump, characterized in that the head thereof has the form of a metal cup of large diameter with concavity facing opposite the threaded part and whereof the surface is provided with a plurality of annular reliefs insuring that the cup has a large surface relative to the volume which it occupies.

4,710,110

FLUID PUMP APPARATUS

Henry G. Paulus, 50 Bilodeau Ct., Burlington, Vt. 05401

Filed Sep. 22, 1986, Ser. No. 875,017

Int. Cl.⁴ F04C 18/18

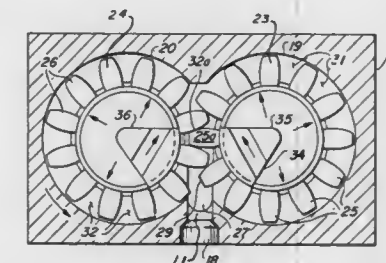
U.S. Cl. 418-15

9 Claims

1. A compressor having a central cavity having walls, a fluid inlet means including an inlet cap and a fluid outlet means including an outlet cap coupled to the cavity, at least a pair of intermeshing impellers each having a hollow interior positioned in the cavity between the fluid inlet means and the fluid outlet means,

each impeller having a fluid inlet on at least one end coupled to the fluid inlet means of the cavity and to the hollow interior of each impeller,

each impeller further having a plurality of external means, having pockets therebetween,
 each impeller further having a plurality of openings between said external means connecting the interior of each impeller with said pockets,
 means coupled to at least one of said impellers for rotating the impellers to draw fluid through the fluid inlet means to the cavity and into the hollow interior of the impellers and through the openings between substantially all of said external means into the pockets between the external means,
 said external means on each impeller adapted to intermesh



with the external means on the other impeller for compressing the fluid introduced into the pockets between the external means and the walls of the cavity and force the compressed fluid out of the pockets through the fluid outlet means, and

a gate fixedly positioned in the hollow interior of each impeller and positioned only immediately adjacent the fluid outlet means where the impellers intermesh and arranged to close only those selected ones of said openings in each of said impellers immediately adjacent said fluid outlet means as said impellers are rotated in said cavity and around said gate to prevent the compressed fluid from passing back into the interiors of the impellers.

4,710,111

ROTARY COMPRESSOR WITH OIL GROOVE BETWEEN JOURNAL AND JOURNAL BEARING

Masahiro Kubo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 10, 1986, Ser. No. 837,830

Claims priority, application Japan, Mar. 14, 1985, 60-50887

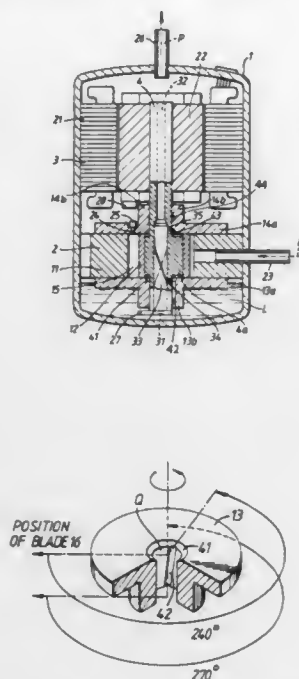
Int. Cl.⁴ F04C 18/356, 29/02; F01M 1/00; F16C 33/10

U.S. Cl. 418-63

11 Claims

1. Rotary compressor comprising:
 a journal having an eccentric portion;
 compression means including a cylinder and a rolling piston provided on said journal to suck, compress and discharge refrigerant gas by rotating said rolling piston eccentrically in the interior of said cylinder;
 a motor to drive said journal;
 journal bearing means for freely rotatably supporting said journal; and
 an axial direction oil groove to introduce a lubricating oil into a gap between said journal and journal bearing means, wherein each axial portion of said axial direction oil groove is positioned on said journal in a circumferential position determined to correspondence to a low pressure

area of an oil film of said lubricating oil caused by a deflection of said journal due to dynamic imbalances in said



journal, including dynamic imbalances arising from the eccentricity of said rolling piston.

4,710,112

AUGER CONSTRUCTION FOR MACHINES FOR FORMING HOLLOW CORE CONCRETE SLABS
Ernst Martens, Winnipeg, Canada, assignor to Alphair Ventilating Systems Inc., Winnipeg, Canada

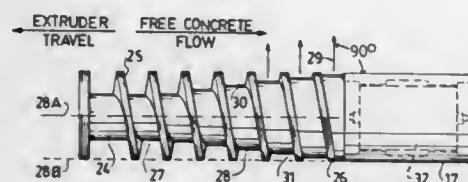
Filed Dec. 24, 1986, Ser. No. 945,949

Claims priority, application United Kingdom, Dec. 31, 1985, 8531919

Int. Cl.⁴ B28B 21/52

U.S. Cl. 425—64

14 Claims



1. An auger assembly for use in machines used for forming hollow core concrete slabs; said auger assembly comprising in combination an auger core having an upstream end and a downstream end, and an auger flighting on the outer surface of said auger core, the diameter of said flighting remaining substantially constant throughout the length thereof, the diameter of said auger core increasing from the upstream end to the downstream end and thereof, whereby the depth of the flighting gradually decreases from a maximum at the upstream end to a minimum at the downstream end, the surface of said auger core between said flighting being substantially parallel to the longitudinal axis of said auger core and including a product core forming mandrel extending axially from the downstream end of said auger core.

4,710,113

APPARATUS FOR GRANULATING PLASTICS MATERIALS

Jürgen Volgt, Wathlingen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

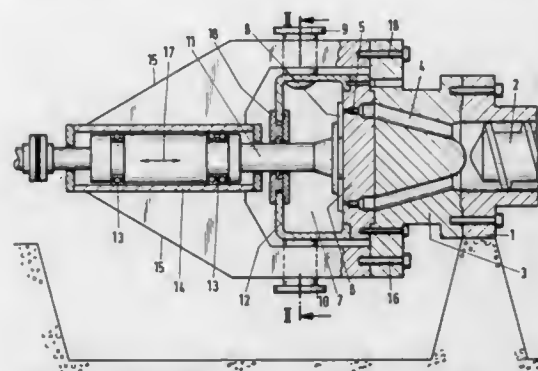
Filed Nov. 21, 1986, Ser. No. 933,158

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1985, 3541500

Int. Cl.⁴ B28B 11/16

U.S. Cl. 425—67

7 Claims



1. An apparatus for granulating plastics material comprising a bearing housing, shaft bearing means disposed within said bearing housing, shaft means journaled to rotate in said bearing means and cutter means mounted on said shaft for rotation therewith externally of said housing, nozzle plate means disposed opposite said cutter means and spaced at a pre-set distance therefrom and means mounting said nozzle plate means to a base member, feed means supplying plastics materials to be granulated to said nozzle plate means, cutter housing means surrounding said cutter, said cutter housing means defining an inlet for water and an outlet disposed substantially diametrically opposite said inlet for discharging said water and granules produced by said cutter device, said water simultaneously acting as a cooling and granule conveying medium, said cutter device being immersed in said water during operation of said apparatus, and support arm means directly connecting said bearing housing to said nozzle plate mounting means wherein said cutting housing means is located therebetween, said support arms being thermally isolated from said cutter housing and from said base member.

4,710,114

APPARATUS FOR INSULATING AN ELECTRICAL CONDUCTOR

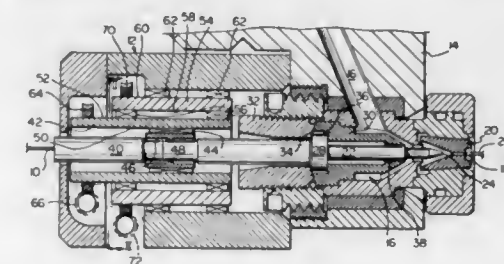
John N. Garner, Kingston, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 18, 1986, Ser. No. 853,593

Int. Cl.⁴ B29C 47/02, 47/12

U.S. Cl. 425—110

5 Claims



1. An apparatus for forming an insulation layer around an electrical conductor comprising an extruder head having a die

orifice, a die insert mounted for universal movement within the head, the insert having an outlet orifice for passage of the conductor along a passline towards the die orifice, and position control means to controllably position the insert within the head, said position control means comprising a first rotatable mounting eccentrically holding the die insert, said first rotatable mounting being rotatable about the die insert, and a second rotatable mounting radially outside of and eccentrically holding the first rotatable mounting, a driving means for rotatably turning each mounting, and means for monitoring and analyzing degree of eccentricity of the conductor and the insulation layer downstream from the extruder head and for issuing control signals dependent upon the degree of eccentricity of said conductor, the driving means responsive to the control signals to selectively rotate the mountings and universally move the insert in an appropriate direction to lessen the degree of eccentricity of the conductor and the insulation layer.

4,710,115

CAGE POSITIONING DEVICE FOR USE WITH A CONCRETE PIPE FORM

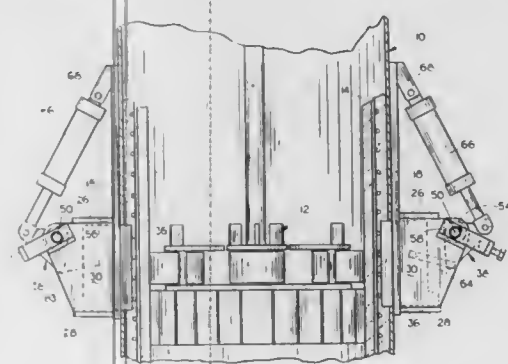
James L. Tucker, Terry R. Landen, and Robert L. Schelby, all of Lincoln, Nebr., assignors to Nebco, Inc., Lincoln, Nebr.

Filed May 5, 1986, Ser. No. 859,368

Int. Cl.⁴ B28B 21/56, 21/26

U.S. Cl. 425—117

10 Claims



1. In combination, a hollow cylindrical concrete pipe form having upper and lower ends, and inner and outer wall surfaces, said form being adapted to receive a cylindrical reinforcing cage means therein which will be embedded in the concrete pipe formed in said form, and a plurality of cage positioning devices mounted on the outer wall surface of said form, each of said cage positioning devices comprising a vertically disposed guide frame means having a horizontally slidable slide member mounted therein adapted to be moved between operative and inoperative positions, said slide member having inner and outer ends, the inner end of said slide member being moved inwardly through an opening formed in the form, for engagement with the reinforcing cage, when in its operative position, a cam means pivotally mounted on said guide frame means in operative engagement with said slide for moving said slide relative to said guide frame means, said cam means movable along a pivotal path, means located in said pivotal path for limiting the pivotal movement of said cam means to limit the inward movement of said slide, a power cylinder including a base end and a rod end, said base end of said power cylinder being operatively secured to said form above said cam means, and means pivotally connecting the rod end of said power cylinder to said cam means whereby extension of said power cylinder will cause pivotal movement of said cam

means which causes said slide to be moved inwardly into said form.

4,710,116

SYSTEM FOR FEEDING FILM, FORMING A PARTIAL COATING AT LEAST OF A MOLDED OBJECT, INTO A MOLD

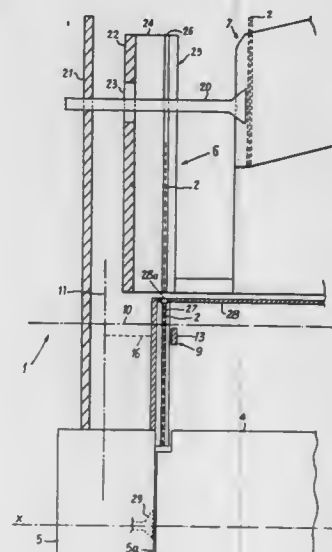
Pierre Dromigny, 54 avenue de Versailles, 75016 Paris, France, and Théodore Schöttli, Duessenhofen, Switzerland, assignors to Pierre Dromigny, Paris, France

Filed Jun. 24, 1986, Ser. No. 877,742

Int. Cl.⁴ B29C 49/24

U.S. Cl. 425—125

6 Claims



1. In a molding machine, comprising a mold having a fixed part and a movable part, and a magazine for films each forming at least a partial coating of a molded object, a system for bringing a film between the fixed part of the mold and the part thereof which is movable, in a predetermined direction of movement, with respect to the fixed part, comprising: a device for transferring films precut to the desired format, one by one, from the magazine to a waiting position in the vicinity of the mold; and a device for transporting the film from the waiting position to a working position in which the film is situated between the fixed and movable parts of the mold, including means for holding the film in position during its transport from the waiting position to the working position, and two cooperating members, of the rack or screw type, meshing with each other, the first of which is parallel to the direction of movement of the movable part of the mold and is fixed to one of the parts thereof, and the second of which is fixed to the means for holding the film in position and may slide in the movable part of the mold, so that any movement of the movable part, in said direction of movement, with respect to the fixed part, causes sliding of the second member in the movable part of the mold and a given concomitant movement, in a plane parallel to the front face of the movable part of the mold, of said holding means towards or away from said front face.

4,710,117

APPARATUS FOR PLACING CONFECTIONERY WAFER PIECES INTO MOLDING DEPRESSIONS OF CASTING MOLDS

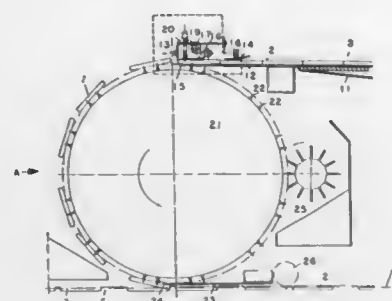
Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Austria

Continuation-in-part of Ser. No. 315,285, Oct. 27, 1981, abandoned. This application Mar. 27, 1986, Ser. No. 844,835
Claims priority, application Austria, Oct. 27, 1980, 5302/80; Apr. 3, 1985, 1015/85

Int. Cl.⁴ B29D 3/00

U.S. Cl. 425—126 R

42 Claims



1. An apparatus for placing pre-cut wafer pieces into molding depressions of casting molds, which comprises

(a) a molding-conveying means for continuously conveying the casting molds in a first plane of conveyance in a first direction of travel in such a manner that the casting mold depressions are arranged to form a plurality of longitudinal rows extending in the first direction of travel and a plurality of transverse rows extending transversely to the first direction of travel, the longitudinal rows having predetermined transverse spacings and the transverse rows having predetermined longitudinal spacings therebetween,

(b) a separating device for feeding the pre-cut wafer pieces in a second plane of conveyance in a second direction of travel extending opposite to the first direction of travel, the second plane of conveyance being spaced a substantial distance above the first plane of conveyance, the separating device having

(1) diverging guide channels extending in the second direction of travel and laterally moving the pre-cut wafer pieces apart until they have the same transverse spacings as the longitudinal rows of casting mold depressions, and

(c) a transfer device adjoining the separating device in the second direction of travel for receiving the moved-apart pre-cut wafer pieces from the separating device and for placing said wafer pieces into the casting mold depressions, the transfer device bridging the space between the first and second planes of conveyance and comprising

(1) a rotating wafer piece carrying drum arranged between the first and second planes of conveyance, the planes of conveyance extending substantially tangentially to the rotating drum and the drum having an axis of rotation extending perpendicularly to the first direction of travel and parallel to the first plane of conveyance, the drum having wafer piece retaining prongs distributed above the peripheral surface thereof and adapted to register with respective ones of the casting mold depressions, and

(2) common drive means for the mold-conveying means and the rotating drum,

(d) a support plate for the pre-cut wafer pieces arranged in the second plane of conveyance between the separating device and the rotating drum;

(e) arresting means cooperating with the support plate for

temporarily arresting the pre-cut wafer pieces on the support plate until respective ones of said prongs on the rotating drum have retained a leading transverse row of said pre-cut wafer pieces, the arresting means comprising a movable stop for arresting the leading transverse row of the wafer pieces moving on the support plate in the second direction of travel into engagement with the movable stop, and

(f) a raking device arranged above the casting molds conveyed in the first plane of conveyance for stripping the pre-cut wafer pieces off the retaining prongs as they are moved into registry with respective ones of the casting mold depressions by the rotating drum and project thereinto.

4,710,118

APPARATUS FOR FORMING PREFORMS WITH INTERNAL BARRIER

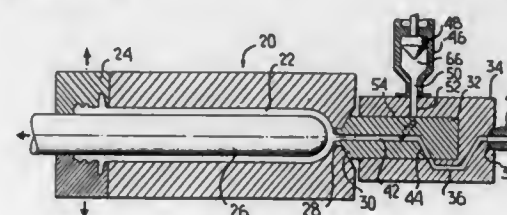
Suppayan M. Krishnakumar, Nashua, and Thomas E. Nahill, Salem, both of N.H., assignors to Continental PET Technologies, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 581,409, Feb. 17, 1984, Pat. No. 4,609,516. This application May 12, 1986, Ser. No. 861,854

Int. Cl.⁴ B29C 31/06

U.S. Cl. 425—130

11 Claims



1. Apparatus for forming a laminated preform having inner and outer first layers, inner and outer second layers within said first layers, and an innermost third layer, said apparatus comprising a conventional preform forming injection mold unit including a mold element and a cooperating core defining a mold cavity, at least one supply of thermoplastic resin under pressure and a separate supply of barrier material under pressure, a valve between said supplies and said mold unit, and means for actuating said valve in sequence to admit first a preselected quantity of thermoplastic resin to said mold cavity to form said first layers, then a preselected quantity of barrier material to said mold cavity to form said second layers, and finally more thermoplastic resin to said mold cavity to at least form said third layer.

4,710,119

INJECTION MOLDING MACHINE USING SERVO MOTOR AND HAVING MOLD PROTECTING FUNCTION

Hiromasa Otake, Tanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP85/00624, § 371 Date Jul. 8, 1986, § 102(e) Date Jul. 8, 1986, PCT Pub. No. WO86/02878, PCT Pub. Date May 22, 1986

PCT Filed Nov. 8, 1985, Ser. No. 885,610

Claims priority, application Japan, Nov. 9, 1984, 59-235258

Int. Cl.⁴ B29C 45/84

U.S. Cl. 425—136

3 Claims

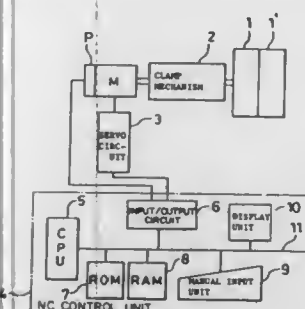
1. A mold injecting machine using a servo motor and having a mold protecting function, comprising:

a clamp mechanism for operating a mold to perform mold clamping;

a servo motor, coupled to said clamp mechanism, for driving said clamp mechanism;

a position detector, coupled to said servo motor, for detect-

ing a position of the mold and producing a detection output; and
an NC control unit, coupled to said servo motor and said position detector, for controlling said servo motor, said NC control unit having a torque limit function for suppressing a torque output from said servo motor below a predetermined value, said NC control unit including:
means for inputting a preset mold protection start position, a preset mold contact position and a preset predetermined time period, the preset predetermined time period being set to a value sufficient for allowing the mold to move from the preset mold protection start position to the preset



mold contact position when no foreign matter exists in the mold;
mold position discriminating means for discriminating whether the preset mold protection start position and the preset mold contact position have been reached based on the detection output from said position detector;
elapsed time discriminating means for discriminating whether the preset predetermined time period has elapsed after a point in time at which the mold reaches the preset mold protection start position; and
alarm means for generating an alarm when the predetermined period of time has elapsed before the mold reaches the preset mold contact position.

4,710,120

APPARATUS FOR REMOVING A DIE FROM A DIE RING

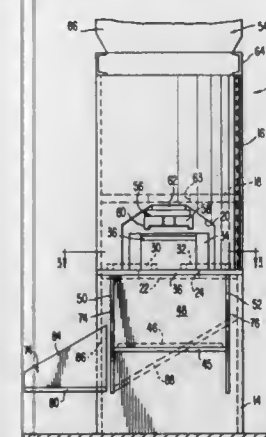
James B. Chapman, Pierce City, Mo., assignor to Revere Copper and Brass Incorporated, Stamford, Conn.

Filed Dec. 17, 1985, Ser. No. 809,977

Int. Cl.⁴ B29C 47/08

U.S. Cl. 425—185

5 Claims



1. In combination, apparatus comprising an assembly in the form of a housing surrounding an enclosed space along a substantially vertical axis, a first working surface supported within said housing between its ends, said first working surface disposed stationarily in substantially a horizontal plane and including an opening, a hopper in said housing below said open-

ing, locator means formed by a pair of members each supported by said first working surface on opposite sides of said opening, said members having a side surface extending vertically of said first working surface and disposed in positions whereby said side surfaces confront one another along paths that converge from the region of a point of tangency at equiradial and equiangular locations from the axis of said opening and a diameter through said axis, respectively, said members, further, forming a pocket defined by said points of tangency for positional receipt of a ring-like structure carrying a removable member, and mechanical means supported stationarily within said housing above said first working surface, said mechanical means including a plunger having a ring-like extension toward said opening around an outer periphery, said plunger being movable in opposite directions along the axis of said opening whereby said ring-like extension in downward movement is received within said ring-like structure for contacting said removable member around its outer edge with a force to cause said removable member to release from said ring-like structure and fall through said opening into said hopper.

4,710,121

INJECTION MOLD CHANGING UNIT

Karl Hehl, Arthur-Hehl-Strasse 32, D-7298 Lössburg 1, Fed. Rep. of Germany

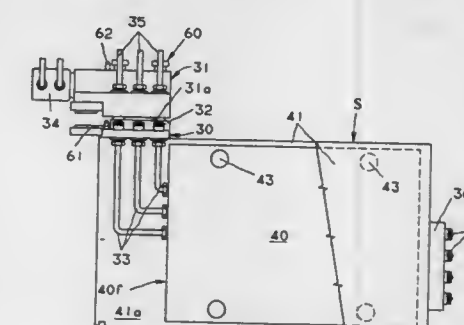
Filed Mar. 17, 1986, Ser. No. 840,457

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509518

Int. Cl.⁴ B29C 45/26

U.S. Cl. 425—190

16 Claims



1. In a mold closing unit for an injection molding machine, including an exchangeable injection mold assembly having a mold body bounded on opposite sides thereof by back plates secured thereto; means defining a clamping space where said mold body is clamped in a working position thereof; a conditioning table situated adjacent said clamping space; said injection mold assembly being movable to and onto said conditioning table from a location outside said mold closing unit or from said clamping space of said mold closing unit; said injection mold assembly being movable from said conditioning table to said clamping space or to said location outside said mold closing unit; supply line coupling, means for operatively connecting to and disconnecting from one another conduit terminals of mold-side supply conduits forming a permanent part of said injection mold assembly and machine-side supply conduits forming a permanent part of said injection molding machine externally of said injection mold assembly; said supply line coupling means being formed of a mold-side coupling half containing terminals of said mold-side supply conduits and being fixedly attached to said mold body, and a machine-side coupling half containing terminals of said machine-side supply conduits and being arranged to be movable between said conditioning table and said clamping space; said mold-side coupling half and said machine-side coupling half being joinable to and disconnectable from one another along a horizontal parting plane of said supply line coupling means for coupling the

machine-side and mold-side conduits to one another for pre-heating said injection mold assembly on said conditioning table; said injection mold assembly being movable from said conditioning table into said working position in said clamping space horizontally and perpendicularly to a closing direction of said mold losing unit without disconnection of said supply line coupling means; the improvement wherein said machine-side coupling half is situated above the conditioning table; further where in the improvement comprises

- a coupling drive means mounted on said machine-side coupling half for performing coupling and uncoupling strokes;
- force-transmitting connecting means connecting said coupling drive means with said machine-side coupling half for effecting coupling and uncoupling motions, respectively, of said machine-side coupling half during respective coupling and uncoupling strokes of said coupling drive means;
- vertically oriented coupling pins being connected at least indirectly to said coupling drive means and being further arranged to guide said machine-side coupling half during said coupling and uncoupling motions thereof; each said coupling pin having opposite first and second ends;
- a holding element mounted on said conditioning table; and
- first, second, third and fourth inter-engagement means; said first and second interengagement means forming part of said first and second ends, respectively, of each said coupling pin; said third and fourth engagement means forming part of said holding element and said mold-side coupling half, respectively; said first and third engagement means being arranged for entering into an interengaging position with one another and said second and fourth engagement means being arranged for entering into an interengaging position with one another dependent upon a conveying motion of said mold assembly; in said interengaging position said coupling drive means and said machine-side coupling half being supported for executing the coupling stroke to move said machine-side coupling half into an operative engagement with said mold-side coupling half by said coupling stroke of said coupling drive means.

4,710,122

MACHINE FOR MANUFACTURING FLAT BODIES IN A CONTINUOUS LINE

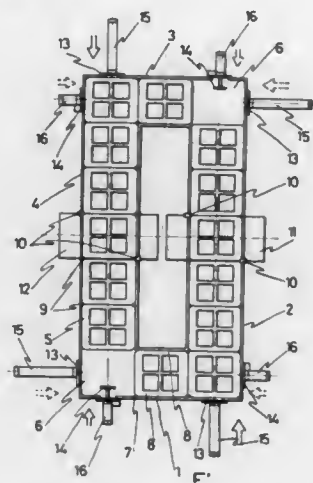
Eliseo H. Villanueva, c/ Cid, s/n - Poligono Torrubero, Museros (Valencia), Spain

Filed Mar. 7, 1986, Ser. No. 837,589

Int. Cl.⁴ B28B 5/04

U.S. Cl. 425-259

4 Claims



1. Machine for manufacturing flat bodies in a continuous linear process comprising, a closed circuit static sliding run-

way having four interconnected rectilinear sections connected together to form a rectilinear closed circuit, each rectilinear section having a head end and a tail end which is opposite from the head end, a plurality of substantially quadrangular moulds each having at least one space for receiving material to form a piece to be molded, each space having a bottom for supporting the material, said moulds having dimensions which comprise a sub-multiple of the length of each rectilinear section with all rectilinear sections being completely filled with moulds except for opposite corners of said runway, each mould having bevelled vertices which, with the bevelled vertices of an adjacent mould in the runway form an angular vertical channel, feelers operatively connected to said runway for engagement in said angular vertical channels to center each mould on at least two of said rectilinear sections at a location corresponding to a press site where material in the space of each mould is to be pressed, a pusher mounted at the head end of each rectilinear section, each pusher having a cylinder with a stroke which is at least equal to a dimension of moulds in the rectangular section serviced by that pusher, for pushing all moulds in the rectangular section in a linear passage along that rectangular section, a buffer mounted at the tail end of each rectangular section and cooperating with the pusher of that rectangular section for receiving moulds pushed by the pusher, each rectangular section having its own pusher plus buffer pair, each buffer having a cylinder for withdrawing the buffer as the cylinder of the pusher extends the pusher for synchronizing movement of the pusher plus buffer pairs for moving the moulds along the rectangular sections in the linear passage, and a microswitch operatively connected to each of the cylinders of the pusher plus buffer pairs for activating a cylinder plus buffer pair which is downstream of a previously activated pusher plus buffer pair after the moulds of the previous pusher plus buffer pair have been moved along their respective rectangular section.

4,710,123

EXTRUSION DEVICE FOR THE PRODUCTION OF HONEYCOMB STRUCTURES

Anton Ziebig, Ottensoos; Hans Brigasky, and Willi Lewand, both of Lauf, all of Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb, Fed. Rep. of Germany

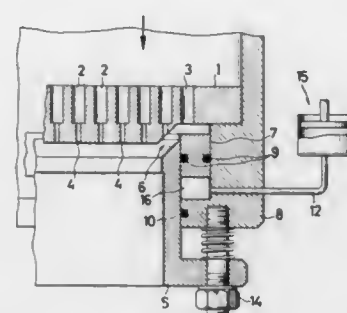
Filed Mar. 19, 1986, Ser. No. 841,320

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1985, 3510181

Int. Cl.⁴ A01J 21/00

U.S. Cl. 425-464

2 Claims



1. An extrusion device for the production of a honeycomb structure from plastic material comprising:
 - a stationary frame part having a flange;
 - a die part supported on the frame part, the die part having feed passageways for the plastic material on an inlet side and shaping slots communicating with the feed passageways on an outlet side;
 - a die element, which with the die part forms on the outlet

side a die passageway for a skin of the honeycomb structure; first adjustable means for adjusting the die element to vary the skin thickness; and second adjustable means downstream of the feeds for adjusting the flow rate of the plastic material in the die passageway.

4,710,124

AUTOMATIC PART AND RUNNER SEPARATOR

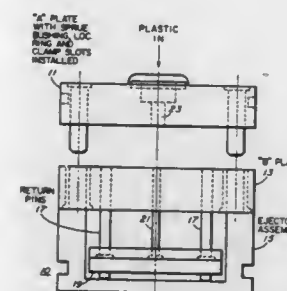
James Harrison, 13182 Marshall La., Tustin, Calif. 92680

Filed Nov. 13, 1985, Ser. No. 797,692

Int. Cl.⁴ B29C 45/40, 45/42, 45/43

U.S. Cl. 425-554

14 Claims



1. A runner and product separator for sequentially separating a runner and a molded product from an injection mold assembly comprising:

first and second mold portions disposed in retractable mutual engagement, said first and second mold portions having mating surfaces formed to mold a runner and a product therebetween;

an ejector plate assembly disposed within said second mold portion, said ejector plate assembly being operative to retractably translate a first distance within said second mold portion;

a plurality of first ejector pins connected to said ejector plate assembly so as to translate within said second mold portion to strike, and separate from said second mold portion, only one of said runner and said product; and

a pin extension mechanism disposed within said second mold portion and connected to a second ejector pin, said pin extension mechanism being adapted to retractably translate said second ejector pin independent of the translation of said ejector plate assembly to cause said second ejector pin to strike and separate from said second mold portion the other of said runner and said molded product.

4,710,125

SAFETY DEVICE FOR OIL BURNER

Kazuharu Nakamura; Motoki Matsumoto; Akinobu Kondo, and Kiyonobu Ito, all of Aichi, Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Apr. 3, 1986, Ser. No. 847,513

Claims priority, application Japan, Apr. 11, 1985, 60-77287

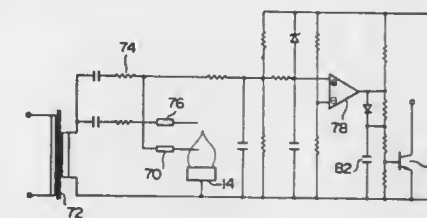
Int. Cl.⁴ F23N 5/24

U.S. Cl. 431-22

5 Claims

1. A safety device for an oil burner comprising:
 - a first flame electrode arranged at a position to be exposed to flame formed due to normal combustion in said oil burner; means for applying an AC voltage between said first flame electrode and said oil burner so that normal combustion in said oil burner may be detected when a DC flame current flows through said first flame electrode due to the rectification of flame carried out between said first flame electrode and said oil burner;
 - a second flame electrode arranged at a position to which

flame of said normal combustion in said oil burner does not reach, said means for applying an AC voltage including circuit means for providing a single source of current to said first and second electrodes and dividing current from said single source between said first and second flame electrodes when said second electrode is reached by an excessive flame;



detection means for detecting abnormal combustion due to either a failure in the flowing of said flame current through said first flame electrode when said flame is too small, or a decrease in said flame current flowing through said first flame electrode because of said division of current between said first and second flame electrodes when said flame is excessive.

4,710,126

METHOD AND APPARATUS FOR DRYING METAL CHIPS

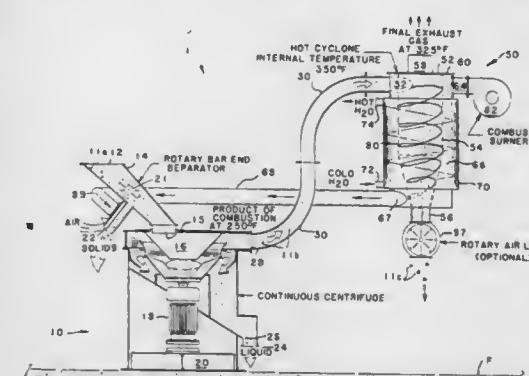
Larry D. Areaux, Portage, and Robert H. Dudley, Richland, both of Mich., assignors to Pre-Melt Systems, Inc., Kalamazoo, Mich.

Filed May 23, 1986, Ser. No. 866,795

Int. Cl.⁴ F27B 15/00

U.S. Cl. 432-58

34 Claims



1. In a metal chip drying apparatus, the combination comprising
 - cyclone separator means having a wall, said wall being of heat-conducting material and having inner and outer surfaces, and having inlet means for the entry into said cyclone separator means of gas-entrained metal chips,
 - outlet means for the exit of dried chips from said cyclone separator means,
 - outlet means at the opposite end of said cyclone separator means for the exit of exhaust gases therefrom,
 - combustion chamber means about the outer surface of the wall of said cyclone separator means for the combustion of fuel therein,
 - inlet means into said combustion chamber means for the entry of heat and flame thereinto,
 - burner means associated with said inlet means into said combustion chamber means and with fuel source means, and

outlet means for exit of gaseous products of combustion from said combustion chamber means.

4,710,127

METHOD AND DEVICE FOR ESTABLISHING NEW DENTAL OCCLUSAL SCHEME FOR PATIENT

William D. Bellavia, Medina, N.Y., and William Missert, 120 Halstead St., Rochester, N.Y. 14610, assignors to William Missert, Rochester, N.Y.

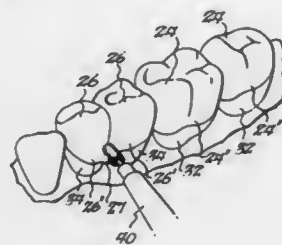
Continuation of Ser. No. 613,887, May 24, 1984, abandoned.

This application Jun. 26, 1986, Ser. No. 878,637

Int. Cl.⁴ A61C 5/00

U.S. Cl. 433—215

21 Claims



1. A method of establishing a new dental occlusal scheme comprising the steps of making casts of a person's upper and lower natural teeth, constructing a build-up of material over one cast, positioning the other cast in articulated position relative to said one cast to produce a desired occlusal scheme relationship of said material with said other cast, making an overlay device from said material, sculpting said overlay device to produce an overlay unit resembling a plurality of overlay cap members resembling outer portions of crowns of natural teeth connected by struts with said cap members having the desired occlusal scheme and morphology, bonding said overlay unit to said person's natural teeth, severing and removing said struts after said overlay unit has been bonded to said person's natural teeth to provide complete divisions between adjacent cap members which merge into the divisions between said person's natural teeth on which said cap members are mounted, and shaping said individual cap members to merge into the person's natural teeth on which they are mounted.

4,710,128

SPATIAL DISORIENTATION TRAINER-FLIGHT SIMULATOR

Robert H. Wachsmuth, Elkins Park, and Donald W. Brusch, Newtown, both of Pa., assignors to Environmental Tectonics Corporation, Southampton, Pa.

Filed Oct. 25, 1984, Ser. No. 664,807

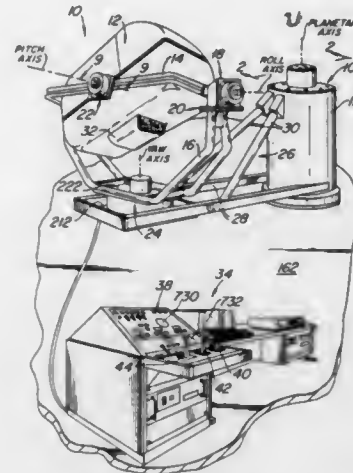
Int. Cl.⁴ G09B 9/08

U.S. Cl. 434—46

32 Claims

1. Spatial disorientation trainer-flight simulator, comprising: a cockpit; means for mounting the cockpit for independent rotation about pitch, roll and yaw axes; motor means for rotating the cockpit about the pitch, roll and yaw axes in response to speed command signals and for rotating the cockpit about at least one of said pitch, roll and yaw axes at a sub-threshold speed in response to a sub-threshold speed command signal to demonstrate a vestibular illusion; pilot manipulable control means located at said cockpit for generating pilot command signal; operator control means located at a console station for generating operator command signals; cockpit computer means located at said cockpit and console computer means located at said console station, said cockpit and console computer means being interconnected to generate said speed command signals including said sub-

threshold speed command signal in response to at least at one of said pilot and operator command signals; and



means including a slip ring assembly for interconnecting said cockpit and console computer means.

4,710,129

SIMULATION DEVICE

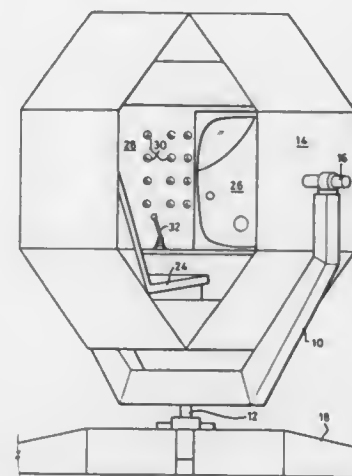
Geoffrey C. S. Newman, Watton; Andrew L. Pilkington, Attleborough, and Kenneth H. Winch, Diss, all of England, assignors to Scortech Mech. Ltd., Attleborough, United Kingdom

Filed Feb. 6, 1986, Ser. No. 827,277

Int. Cl.⁴ A63G 31/02

U.S. Cl. 434—55

10 Claims



1. A simulation device, comprising: user occupancy means; a yoke as a support on which said user occupancy means is mounted with freedom for rotational movement about a first axis extending through said occupancy means; a structure having a base on which said yoke is mounted with freedom for rotational movement about a second axis generally normal to the first axis and extending through said occupancy means; prime mover means for moving said occupancy means at least in rotation about said first axis and said yoke in rotation at least about said second axis; manual control means, carried by said occupancy means, for causing said prime mover means to drive said occupancy means and said yoke in a controlled manner at least in rotation respectively about said first axis and said second axis;

a VDU carried by said occupancy means, said VDU being capable of displaying a computer generated picture responding to picture signals fed thereto; sensor means for sensing rotational movement of said occupancy means, said sensor means comprising a first sensor directly responsive to rotation of said user occupancy means relative to said yoke and a second sensor directly responsive to rotation of said yoke relative to said base structure so that there is one sensor for each axis of rotation thereby permitting said sensor means to be responsive to all movement of said user occupancy means, said sensor means not forming a part of, and not being responsive to, said manual control means; and a computer which is fed from said sensor means and which generates picture signals fed to the VDU so as to cause the display to scroll in synchronized relationship to said rotational movements of said occupancy means and said yoke respectively about said first axis and said second axis, said movement including those produced by the use of said manual control means.

4,710,130

DICHOTIC-DIOTIC PAIRED-ASSOCIATION FOR LEARNING OF VERBAL MATERIALS

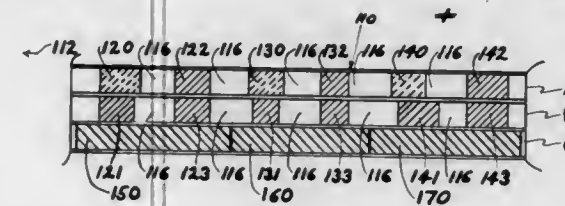
Louis Aarons, 8348 Niles Center Rd., Skokie, Ill. 60077

Filed Dec. 24, 1986, Ser. No. 946,037

Int. Cl.⁴ G09B 19/06, 50/60, 50/004

U.S. Cl. 434—157

20 Claims



1. Audio medium for educational use, having plural channels from which prerecorded sounds may be reproduced, comprising a multiplicity of sets or prerecorded sounds on said medium, each said set having a dichotic presentation and a diotic presentation, each said dichotic presentation having a stimulus on one of said channels and a first response, corresponding to said stimulus, on a second of said channels, and each said diotic presentation having a second response on both said one and said second channels, said second response of each said set corresponding to the said stimulus of that set.

4,710,131

LIMITED ROTATION TWIST CAPSULE

Kenneth E. Bonenberger, Blacksburg, Va., assignor to Litton Systems, Inc., Blacksburg, Va.

Filed May 12, 1986, Ser. No. 861,709

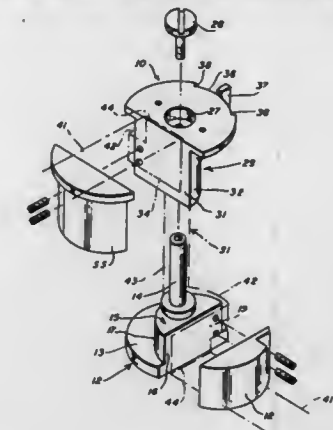
Int. Cl.⁴ H01R 39/02

U.S. Cl. 439—13

3 Claims

1. A limited rotation twist capsule having an axis of rotation comprising: a stator having a shaft extending therefrom which defines the axis of rotation of the twist capsule; a rotor mounted on said shaft and rotatable relative to the stator; a continuous flexible cable having end portions extending from the stator and the rotor; first means for clamping a first portion of the continuous cable to the stator; second means for clamping a second portion of the continuous cable to the rotor; an intermediate portion of the continuous cable located between said first portion and said second portion; and two right angles in the intermediate portion of the continuous cable dividing the intermediate portion into three

segments, whereby two of the segments are perpendicular to the axis of the twist capsule and one segment is parallel to the axis of the twist capsule, said intermediate portion



having a "Z" shape and a length which is greater than the distance between the first means and the second means whereby the rotor is free to rotate a preselected number of degrees relative to the stator.

4,710,132

ELECTRICAL PLUG CONNECTOR STRIP

Kurt Glomb, Germering; Heinz Niggel, Poeking; Leo Pelzl, Holzkirchen, and Karl Zell, Niederpoecking, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

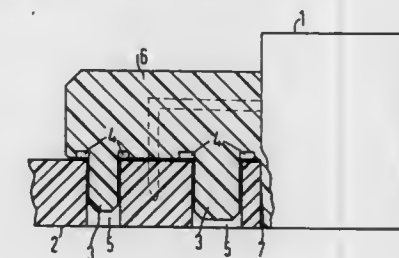
Filed Oct. 2, 1985, Ser. No. 783,112

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1984, 3441310

Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—79

1 Claim



1. In an electrical plug connector strip provided with a plurality of rows of contact elements that are connected by means of terminal elements to a printed circuit board of an electrical assembly, the improvement comprising: a plurality of flanges having downwardly directed insertion posts provided on the back side of said plug connector strip to engage in bores in said circuit board; engagement means between said strip and said circuit board to provide increasing engagement between said strip and said circuit board upon insertion of said posts into said bores, whereby said plug connector strip can be secured to said circuit board by means of a plugging operation; two of said insertion posts being provided per flange, said insertion post closest to the plug connector strip body has a larger diameter and a greater length in comparison to the second insertion post; and said engagement means comprising a pinch rib having a triangular cross section fashioned on the strip body opposite every insertion post positioned closest to said strip body, the cross section of said pinch rib enlarging in the direction toward the underside of said flange to increas-

ingly engage a forward edge of said circuit board as said connector strip is engaged into said circuit board.

4,710,133

ELECTRICAL CONNECTORS

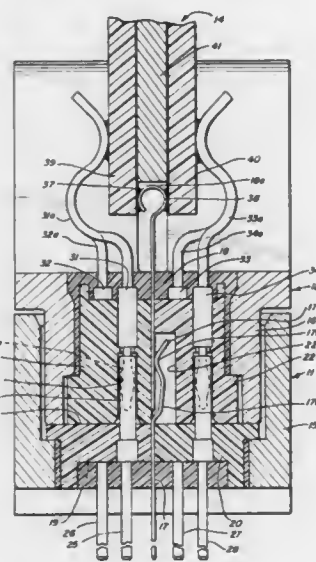
Richard J. Lindeman, Wood Dale, Ill., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jun. 19, 1986, Ser. No. 876,179

Int. Cl.⁴ H01R 4/66

U.S. Cl. 439—92

16 Claims



1. An electrical connector assembly including a pair of mating connectors and arranged for high velocity propagation of electrical signals along a plurality of paths between first circuit means connected to one connector and second circuit means connected to the other connector, each connector comprising: a plurality of contact elements for propagation of said signals, each having connection means at one end thereof for connection to a terminal of said first circuit means and having a contact surface at an opposite end thereof for engagement with a contact surface of a contact element of the mating connector, a ground plate having connector means along one edge thereof for connection to a ground terminal of said first circuit means and having contact surface means along an opposite edge thereof for engagement with contact surface means of a ground plate of a mating connector, said contact surface means of one connector being in the form of multi-spring-fingered contact surface means along said opposite edge thereof for engagement with oppositely disposed contact surface means of a continuous ground plate of the mating connector, and each connector comprising support means for supporting said contact elements thereof in fixed and electrically insulated relation to each other and to said ground plate thereof, said contact elements of each connector including a group of elements supported in at least one row in longitudinally spaced parallel relation to said ground plate thereof, and said ground plate of each connector extending in a common plane and longitudinally for substantially the full length of said row of contact elements thereof.

4,710,134 LOW INSERTION FORCE CHIP CARRIER CONNECTOR WITH MOVABLE HOUSING

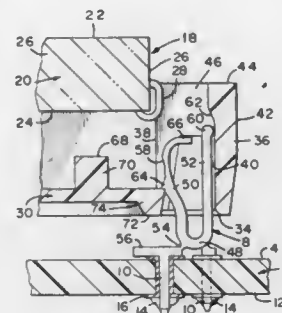
Iosif Korsunsky, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 29, 1986, Ser. No. 913,056

Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—264

20 Claims



1. A chip carrier connector for an integrated circuit chip carrier, comprising:

a housing having a rectangular recess therein which is dimensioned to receive the chip carrier, and a rectangular base having walls extending normally from edges of the rectangular base;

the walls defining the recess for the chip carrier, each of the walls having an internal surface which is opposed to a chip carrier side surface when a chip carrier is placed in the recess the internal surface having a camming surface located thereon, each of the walls having terminal-receiving cavities extending inwardly thereof from its internal surface;

electrical terminals positioned in the terminal-receiving cavities, the terminals being movable such that contact portions of the terminals are located in the cavities when the housing is in a first position and in the recess when the housing is in a second position;

the housing being movable with respect to the terminals, whereby as the chip carrier is inserted into the recess, the housing is positioned in the first position with the terminals completely in the cavities to allow for low insertion force of the carrier into the recess of the housing, as insertion continues the chip carrier contacts a surface of the housing causing the chip carrier and the housing to move to the second position, the second position being defined when a bottom surface of the housing contacts a circuit board, as this movement occurs the camming surfaces of the walls cooperate with the terminals to move the terminals against contact pads of the chip carrier, causing the terminals to create a wiping action on the contact pads, ensuring a positive electrical connection is effected between the terminals and the contact pads.

4,710,135

ELECTRICAL CONNECTOR HAVING INTEGRAL LATCH MEANS

Kohji Aoyama, Tokyo, and Masaro Noguchi, Sagami, both of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 10, 1986, Ser. No. 884,157

Int. Cl.⁴ H01R 13/639

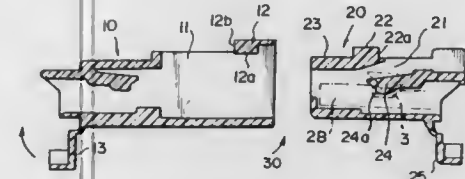
U.S. Cl. 439—354

14 Claims

1. An electrical connector comprising a dielectric matable receptacle housing and a dielectric matable plug housing, the receptacle housing having a plurality of terminals therein, the plug housing having a like plurality of matable terminals located therein, the electrical connector being characterized in that:

a resilient latching arm is located between sidewalls of the plug housing forming part of an upper wall of the plug

housing, the latching arm having a front portion which is pivotally connected to the sidewalls of the plug housing and a rear portion which has an engaging projection located therein, a lance is provided in the plug housing rearwardly of the latching arm forming another part of the upper wall of the plug housing, inner ends of the resilient latching arm and the lance are spaced from each other in overlapping relationship, forming an aperture therebetween, an engaging portion is provided on the receptacle portion, the engaging portion positioned to cooperate with the latching arm.



whereby as the receptacle housing and the plug housing are mated together, the latching arm of the plug housing comes in contact with the engaging portion of the receptacle housing, such that as mating continues, the engaging projection of the latching arm engages the engaging portion, causing the latching arm to move inwardly, and as mating is completed, the projection moves past the portion, allowing the latching arm to resiliently return to its unstressed position, thereby placing the projection in an aperture of the receptacle housing in contact with the portion, latching the housings together and preventing the housings from unwanted disengagement.

4,710,136

MOUNTING STRUCTURE FOR ELECTRONIC APPARATUS OR THE LIKE

Takeshi Suzuki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Continuation of Ser. No. 468,698, Feb. 22, 1983, abandoned.

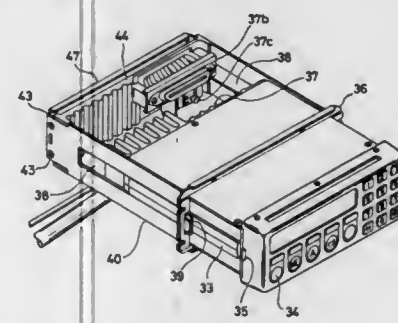
This application Apr. 11, 1985, Ser. No. 722,195

Claims priority, application Japan, Feb. 26, 1982, 57-26910[U]

Int. Cl.⁴ H01R 13/62

U.S. Cl. 439—374

7 Claims



1. A structure for mounting an apparatus having at least a pair of opposite sides and front and rear ends, a first coupling device on the rear end of said apparatus for establishing an electrical circuit connection between the apparatus and the structure when the apparatus is inserted into said structure, means for extending said circuit connection to an external source, said structure comprising a pair of opposed stationary side members having front and rear ends for slidably engaging the sides of said apparatus to having a second coupling device for engaging said first coupling device of from said structure, a movable rear member in said structure having a coupling element for engaging the coupling element of said apparatus, said movable rear member being movably engaged with said

stationary side members for movement over a predetermined distance along a portion of the length of said side members adjacent to the rear ends of said apparatus and said structure so that the movable rear member is moved over said predetermined distance with said apparatus when said coupling devices are engaged with each other, a first heat radiating member having a plurality of heat dissipating cooling fins secured to said movable rear member for partially radiating heat generated by said apparatus into the air, and a second stationary heat radiating member secured to said apparatus and having a plurality of heat dissipating cooling fins of a configuration which is complementary to the configuration of the fins of said first heat radiating member, the fins of said first and second heat radiating members engaging each other with the fins of said first heat radiating member interdigitating with said fins of said second heat radiating means when said apparatus is inserted into said structure for partially transmitting said heat from said first to said second heat radiating member and for guiding said coupling devices into alignment with each other.

4,710,137

CABLE STRAIN RELIEF

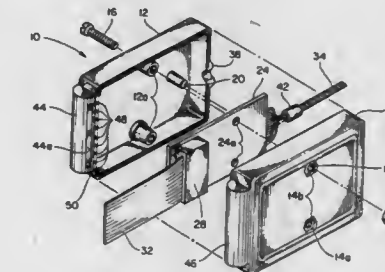
Terry A. Perdue, St. Joseph, and William Cabbage, Coloma, both of Mich., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 1, 1986, Ser. No. 936,415

Int. Cl.⁴ H01R 13/56

U.S. Cl. 439—457

9 Claims



1. For use in a housing having a first elongated aperture defined by at least one inner edge of said housing through which a first single flat electrical cable extends and a second aperture through which a second electrical cable having a generally circular cross-section extends, an arrangement for limiting the bending strain exerted upon the electrical cables comprising:

a first housing section having first and second recessed edge portions;

a second housing section having third and fourth recessed edge portions, said first and second housing sections being of identical size and configuration and adapted for engagement along respective edges thereof and wherein said first and third recessed edge portions are disposed adjacent to one another so as to form the first elongated aperture in the housing and said second and fourth recessed edge portions are disposed adjacent one another so as to form the second generally circular aperture in the housing;

a first convex projection disposed on an outer surface of said first housing section immediately adjacent to the first recessed edge portion thereof;

a second convex projection disposed on an outer surface of said second housing section immediately adjacent to the second recessed edge portion of said second housing section, wherein said first and second convex projections each have a given radius of curvature which limit the angular bending of and the bending strain exerted upon the first single flat electrical cable;

a first curvilinear projection disposed on the outer surface of

said first housing section adjacent to the second recessed edge portion thereof;
 a second curvilinear projection disposed on the outer surface of said second housing section adjacent to the fourth recessed edge portion thereof, wherein said first and second curvilinear projections limit the angular bending of and the bending strain exerted upon the second generally circular electrical cable; and
 first and second bosses coupled respectively to said first and second housing sections for engaging opposed surfaces of a PC board positioned within the housing and coupled to the first and second electrical cables in maintaining the PC board securely in position within the housing.

4,710,138

ELECTRICAL CONNECTOR APPARATUS

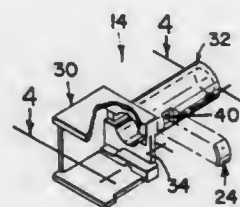
James D. Bradley, Mound, and George B. Pfeffer, Minnetonka, both of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Dec. 1, 1986, Ser. No. 936,181

Int. Cl.⁴ H01R 17/18

U.S. Cl. 439—581

7 Claims



1. Electrical apparatus, comprising:
 a frame with a first conductive material forming a first conductive path, said frame along said first conductive path having a first edge;
 an insert with a contact surface and a second edge, said insert including a second conductive material continuous on and between said contact surface and said second edge;
 said frame including means for holding said insert, said holding means including means for forming a seal between said first and second edges for preventing passage of gas between said first and second materials thereby minimizing any oxidation of one of said first and second materials along said first and second edges;
 a conductor including a spring forming a second conductive path; and
 insulating means for supporting said conductor with respect to said frame, said spring having a contact portion extending from said insulating means to yieldably contact said contact surface of said insert;
 whereby said first and second material may be different, said seal forming means maintaining high conductivity between said first and second material at said first and second edges, said spring forming low contact resistance with said insert when said contact portion of said spring is yieldably contacting said contact surface of said insert.

4,710,139

ELECTRICAL JACK ASSEMBLY

Akihito Shichida, Osaka, Japan, assignor to Hosiden Electronics Co. Ltd., Osaka, Japan

Filed May 16, 1986, Ser. No. 864,041

Claims priority, application Japan, Nov. 8, 1985, 60-171906[U]

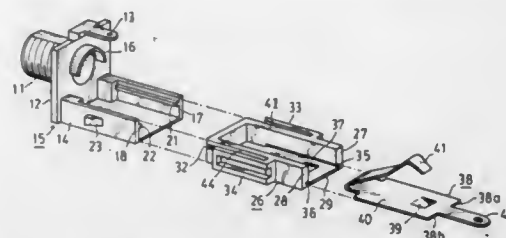
Int. Cl.⁴ H01R 17/18

U.S. Cl. 439—668

9 Claims

1. A plug comprising:
 a single die cast body of conductive material which integrates a cylindrical portion having a through hole for receiving a plug, a flange at one end of the cylindrical portion, said cylindrical portion extending away from one

face of said flange, a terminal extending outwardly of the flange, and a holding portion extending away from another face of the flange opposite to said one face, said holding portion of said die cast body having a pair of opposed side panels on both sides of the cylindrical portion of said die cast body, said side panels extending away from said flange along said holding portion and in parallel relation to said holding portion in a direction opposite to the direction of extension of the cylindrical portion;
 a contact piece holder fabricated of an insulating material, said contact piece holder being fitted into said holding portion of said die cast body, in slidable engagement with



- said side panels of said holding portion, from an open end of said holding portion remote from said cylindrical portion;
 locking means between said holding portion of said die cast body and said contact piece holder for locking said holding portion to said contact piece holder as said contact piece holder is slidably fitted into said holding portion; and
 a contact piece carried by said contact piece holder for making contact with a plug inserted into the cylindrical portion of said die cast body, the contact piece being fabricated of a conductive material and having a terminal integrally formed therewith.

4,710,140

PLIERS CRIMPABLE TERMINAL

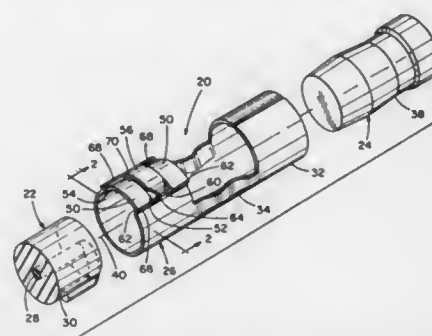
Lanny J. Frawley, St. Charles, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 3, 1987, Ser. No. 21,165

Int. Cl.⁴ H01R 13/415

U.S. Cl. 439—733

12 Claims



1. A metallic terminal for use with a conductor having a conductive-core and a jacket of electrical insulation disposed about the core, said terminal comprising a deformable barrel for receiving said conductor, and a portion for contacting another electrical component, said barrel having an axis and comprising:
 a channel having a first end and a second end with said ends extending generally parallel to said axis;
 a first finger extending from said first end at least substantially across the opening of said channel and having a pointed distal end directed inside said channel;

first abutment means associated with said first end for engagement by one of the jaws of a pliers; and
 second abutment means associated with said second end for engagement by the other of the jaws of said pliers whereby after insertion of said conductor into said barrel with the core, from which a jacket portion was stripped, folded back over the jacket, closing the jaws of the pliers results in the channel being deformed to compressively hold said conductor and said finger distal end piercing said jacket.

4,710,141

MARINE PROPULSION DEVICE POWER STEERING SYSTEM

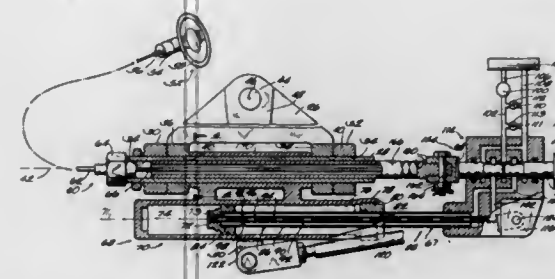
Arthur R. Ferguson, Northbrook, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 29, 1984, Ser. No. 614,821

Int. Cl.⁴ B63H 21/26

U.S. Cl. 440—61

40 Claims



6. A marine propulsion device comprising a propulsion unit, mounting means adapted to be mounted on a boat and connected to said propulsion unit for affording pivotal steering movement of said propulsion unit in opposite directions about a steering axis and power assist means adapted to operably connect an actuator to said propulsion unit for increasing the steering force applied to said propulsion unit by the actuator, said power assist means being wholly supported on said mounting means and including a hydraulic cylinder piston assembly for reciprocative movement therein and an extendable and retractable piston rod connected to said piston, and control means for selectively extending and retracting said piston rod, said control means having first and second members axially movable relative to each other, one of said members being adapted to be connected to the actuator for axial movement relative to the other of said members in response to movement of the actuator and said other member being connected to said piston rod for common movement therewith and connected to said propulsion unit for effecting steering movement of said propulsion unit in response to movement of said other member.

4,710,142

PROPELLER SHAFT BEARING ASSEMBLY

Roger Lovell, P.O. Drawer 760, Palacios, Tex. 77465

Filed Apr. 9, 1985, Ser. No. 721,433

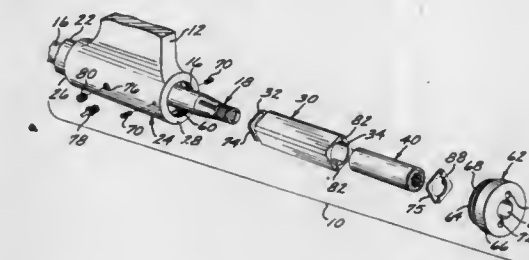
Int. Cl.⁴ B63H 23/34

U.S. Cl. 440—83

11 Claims

1. A bearing assembly for a boat propeller shaft which comprises:
 an outer housing having front and rear ends adapted to be rigidly secured to the boat hull and having first bore means therethrough,
 an inner housing removably axially slideably engagable in said outer housing bore means and having second bore means therethrough,
 bearing sleeve means removably fixedly secured within said second bore means within which said propeller shaft is adapted to be journaled; and
 front end rear apertured shoulder means on the ends of said outer housing for axially retaining said inner housing and

bearing sleeve within said outer housing, said rear shoulder means being removably attached to said outer housing allowing for removal of said inner housing and bearing sleeve means from said outer housing, replacement of said bearing sleeve means in said inner housing, and then replacement of said inner housing and bearing sleeve means in said outer housing.



said first bore means and the outer periphery of said inner housing having complementary out-of-round cross-sectional configuration along their lengths preventing rotational movement of said inner housing and bearing sleeve means in said outer housing.

4,710,143

PADDLE-DRIVEN WATERCRAFT

Paul Boulanger, rue Vinave 131, Grivegnée-Liege, Belgium

Continuation of Ser. No. 761,570, Aug. 1, 1985, abandoned. This

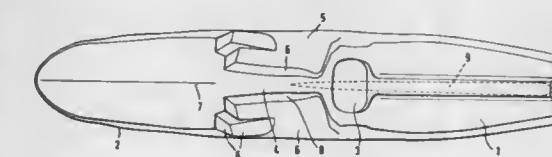
application Feb. 27, 1987, Ser. No. 21,542

Claims priority, application Belgium, Aug. 3, 1984, 6/47990

Int. Cl.⁴ A63C 15/00

U.S. Cl. 441—65

2 Claims



1. A paddle-driven watercraft comprising a single elongated closed shell formed with a hull constituting an underside of said shell and a deck constituting an upper surface of said shell, said shell defining a bow at a front end thereof, said hull and said deck being elongated in a direction of travel of said watercraft, said hull being formed with:

a downwardly open, rearwardly widening channel terminating at a stern of said shell and commencing at a location substantially midway of the length of said shell, and said channel subdividing said hull between said location and said stern into two rearwardly extending hull sections separated by said channel,
 said deck being formed with:
 a seat-forming recess bounded toward the stern by a raised rim and open forwardly toward said bow,
 a central dip immediately ahead of said seat-forming recess in the direction of said bow, p2 a central rise convexly curved upwardly from said dip forwardly to a level above said rim,
 a forwardly and downwardly inclined slope from said rise to said bow,
 a pair of laterally unconfined platforms upon which a user of the watercraft can kneel on opposite sides of said rise, and
 a respective upwardly and forwardly inclined footrest at an end of each of said platforms proximal to said bow, said footrests being formed on opposite sides of said central rise, said seat-forming recess, said platforms and said footrests being constructed and arranged to preclude collection of water on said deck.

4,710,144

WATER SKIS AND THE LIKE

John Hunt, 2 Crackstone Cottage, Stroud Minchinhampton Gloucestershire, Great Britain

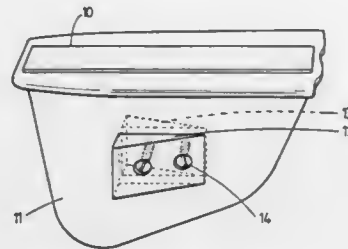
Filed Aug. 30, 1985, Ser. No. 771,555

Claims priority, application United Kingdom, Sep. 11, 1984, 8422952

Int. Cl.⁴ B63H 5/06

U.S. Cl. 441-79

7 Claims



1. Water ski equipment comprising a platform, a fin attached to the platform to project downwardly, in a position of use and means on the fin arranged to deflect water laterally of the direction of travel, in use, said means defining a pair of surfaces set at acute angles with respect to the plane of the fin and the front ends of such surfaces being nearer together than their rear ends, the surfaces being independently adjustable.

4,710,145

THERAPEUTIC DOLL FIGURE

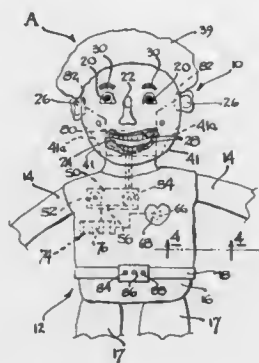
Nancy Hall Vandis, 4730 Laurel Grove Ave., North Hollywood, Calif. 91607

Filed Dec. 27, 1984, Ser. No. 686,647

Int. Cl.⁴ A63H 3/16, 3/28, 3/44

U.S. Cl. 446-100

18 Claims



1. A therapeutic doll figure capable of receiving and recording speech of a person and generating speech of that person to simulate the presence of that person and capable of having the facial expression altered to represent known or unknown persons through the doll figure, said doll figure comprising:

- a doll body having a head section and a torso section, said head section having a representation of a human face thereon including a representation of eyes, a representation of a mouth and a representation of a nose;
- a first means of attachment associated with and closely located with respect to the representation of a mouth and which enables attachment and removal of an element to enable alteration of facial appearance;
- a second means of attachment associated with and closely located with respect to the representations of eyes and which enables attachment and removal of an element to also enable alteration of facial appearance, and where the elements for attachment and removal enable the doll figure to represent a known or unknown human person;
- a transport having a recordable media on which a spoken

message may be recorded and from which the message may be reproduced;

- read-write means associated with said transport for recording and reproducing the message from the recordable media;
- a speaker located in or on said doll figure and operatively connected to said transport and read-write means to reproduce the message of a person through the doll figure to simulate the presence of the person producing the message; and
- a microphone located in or on said doll figure and operatively connected to said transport and read-write means to enable a message to be recorded on said recordable media.

4,710,146

PROJECTILE PROPELLING ATTACHMENT FOR TOY FIGURES

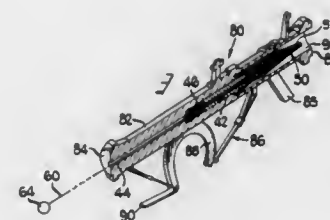
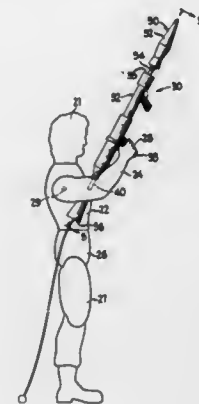
Russell G. Rasmussen, Skokie; Leonard J. Stubenfol, Chicago, and Harry Disko, South Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 6, 1986, Ser. No. 827,245

Int. Cl.⁴ A63H 13/10, 33/30

U.S. Cl. 446-308

9 Claims



1. A toy projectile propelling attachment comprising: an apparatus including a barrel having a bore extending through the barrel; spring biasing means contained within the barrel; a projectile; the barrel receiving and seating at least a portion of the projectile; the tether having a forward end and a rearward end; the forward end of the tether secured to the projectile; and the rearward end of the tether extending through the apparatus so that pulling on the rearward end of the tether engages the biasing means with the projectile and releasing the tether propels the projectile completely outside the confines of the barrel vehicle while retaining the spring biasing means within the barrel.

4,710,147

FOUR-WHEEL DRIVE UNIT FOR TOY VEHICLE

Hirosbi Wakase, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

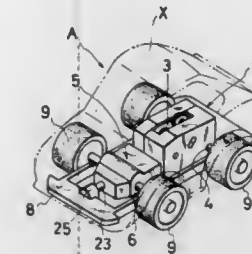
Filed Jul. 1, 1986, Ser. No. 880,724

Claims priority, application Japan, Jul. 2, 1985, 60-100780[U]

Int. Cl.⁴ A63H 29/00, 17/26

U.S. Cl. 446-464

11 Claims



1. A four-wheel drive unit for a toy vehicle comprising: a spring drive mechanism; a link shaft rotatably connected to the spring drive mechanism; a gear mechanism rotatably connected to the link shaft; and means for rotating either the gear mechanism or the spring drive mechanism about the link shaft, the rotating means including a tubular projection and a support hole that provides an interface between the gear mechanism and spring drive mechanism, and further including a pivoting projection fixed to either the gear mechanism or the spring drive.

4,710,148

TOY VEHICLE ASSEMBLY WITH MULTIPLE DRIVE UNITS

Junichi Nagaoka, Misato, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

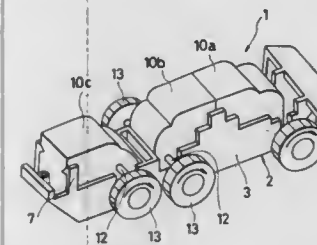
Filed Oct. 21, 1986, Ser. No. 921,674

Claims priority, application Japan, Oct. 23, 1985, 60-162712[U]

Int. Cl.⁴ A63H 29/00

U.S. Cl. 446-464

6 Claims



1. A combination chassis and multiple drive unit-assembly for a toy vehicle comprising: a chassis member having a plurality of compartments; and at least a pair of unitary drive units mounted respectively in a pair of compartments, each unitary drive unit includes a body member, a drive mechanism contained in the body member, a rotary shaft connected to the drive mechanism, and a pair of wheels connected to the rotary shaft, the rotary shaft extends on either side of the chassis member to position the respective wheels on the sides of the chassis member, for translation on a support surface, each compartment has means for removably retaining a unitary drive unit and each drive unit body member has complementary retention means for co-acting with the means for retaining whereby a user can selectively insert and remove the unitary drive units in the chassis member compartments.

4,710,149

TOY VEHICLE WITH SELF-CONTAINED BRIDGE

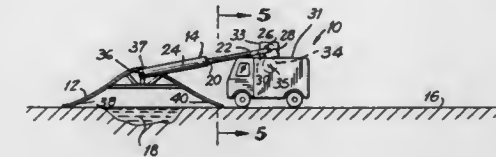
David Prusman, 138 Walgrove Ave., Dobbs Ferry, N.Y. 10522

Filed Mar. 21, 1986, Ser. No. 842,306

Int. Cl.⁴ A47H 18/00

U.S. Cl. 446-476

11 Claims



1. A vehicle with self-contained bridge comprising: (a) a movable vehicle capable of traveling on a surface; (b) a hazard spanning bridge secured to said vehicle by bridge connection means; (c) said bridge having both a bridge operative position wherein said bridge is in front of the intended direction of movement of said vehicle and said bridge is supported directly on said surface, and a bridge and vehicle transport position wherein said bridge is behind the intended direction of movement of said vehicle and said bridge is suspended and held above said surface by said bridge connection means; (d) said bridge, when in its bridge operative position, allowing said vehicle to pass thereover; and (e) the passage of said vehicle over said bridge causes said bridge to change from said bridge operative position to said bridge and vehicle transport position.

4,710,150

SEALING DEVICE FOR A UNIVERSAL JOINT

Jacques Mangiavacchi, Chatou, France, assignor to Glaenzer Spicer, Poissy, France

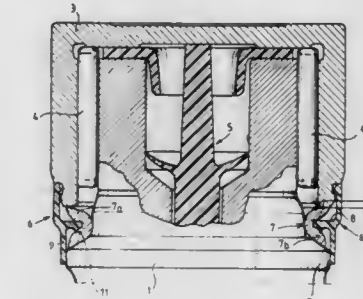
Filed Jun. 12, 1985, Ser. No. 743,965

Claims priority, application France, Jun. 15, 1984, 84 09451

Int. Cl.⁴ F16D 3/84

U.S. Cl. 464-14

4 Claims



1. A sealing device for a universal joint comprising: spider element branches, each of said spider element branches having an outer flange; an annular cup, surrounding each of said spider element branches, having a circular inner flange extending radially inward from an inner surface thereof and having a skirt extending perpendicularly from said circular inner flange which caps said outer flange of a corresponding one of said spider element branches with a gripping effect; a bearing ring capping an end of each of said spider element branches, said bearing ring being connected to said annular cup; a flexible sealing element disposed around said corresponding spider element branch and providing a dynamic seal with said bearing ring, said flexible sealing element having an annular recess between a pair of lips, said circular inner flange.

flange of said annular cup being received in said annular recess and engaged with said pair of lips of said flexible sealing element; and means for fixing said flexible sealing element to said circular inner flange of said annular cup to prevent rotation of said flexible sealing element with respect to said annular cup; whereby said gripping effect exerted by said skirt results in a reduction in deflection and deformation of said flexible sealing element.

4,710,151
SYSTEM FOR CONTROLLING THE PRESSURE OF OIL IN A SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

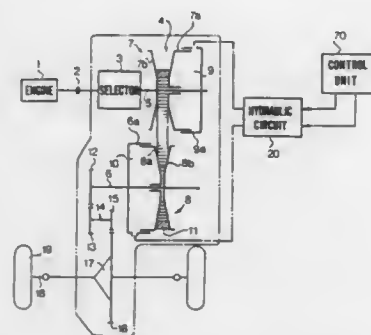
Yasuhito Sakai, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1986, Ser. No. 879,650

Claims priority, application Japan, Jun. 29, 1985, 60-143473
Int. Cl.⁴ F16H 11/04

U.S. Cl. 474-28

9 Claims



1. In a control system for a continuously variable transmission for transmitting power of an internal combustion engine, the system comprising a drive pulley having a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable disc and a second hydraulic cylinder for operating the disc of the driven pulley, a belt engaged with both pulleys, a line pressure control valve having ports and a spool and provided for supplying line pressure, a transmission ratio control valve having ports and a spool, a first hydraulic circuit having a pump for supplying oil to the first hydraulic cylinder through the line pressure control valve and the transmission ratio control valve, wherein the improvement comprises:

- first means for applying a first pressure to adjacent a first end of at least one of the spools of the control valves for urging said at least one spool in one direction;
- second means for applying a second pressure to adjacent a second end of the at least one spool of the control valves so as to shift said at least one spool in the other direction;
- a pressure reducing valve communicated with the first hydraulic circuit for supplying a constant basic pressure of the oil lower than the line pressure;
- a second hydraulic circuit communicated with the pressure reducing valve for applying the basic pressure of the oil to adjacent at least one of the first and second ends of said at least one spool so as to apply the basic pressure to said at least one spool;
- control valve means provided in the second hydraulic circuit to control the basic pressure so as to apply the basic pressure to adjacent at least one of the first and second ends of said at least one spool as a control pressure; and
- means for controlling the control valve means so as to control the control pressure in accordance with operating conditions of the engine.

4,710,152
CRANK DAMPER PULLEY STRUCTURE FOR THE INTERNAL COMBUSTION ENGINE OF A CAR

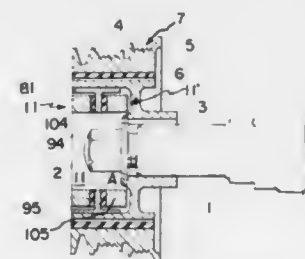
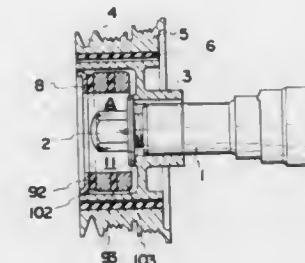
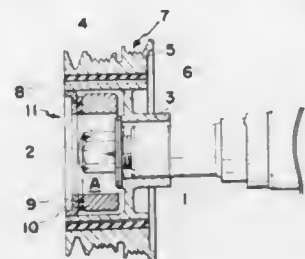
Noriyuki Ichikawa; Tetsushi Suzuki, and Tomiaki Atsumi, all of Shizuoka, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 12, 1986, Ser. No. 838,940

Claims priority, application Japan, Mar. 13, 1985, 60-048300
Int. Cl.⁴ F16F 15/12; F16H 55/36

U.S. Cl. 474-166

16 Claims



1. In a crank damper pulley structure for an internal combustion engine having a crank shaft to the tip of which is fixed a pulley hub having a generally circular coaxial cavity in one end thereof, the improvement comprising:

- a damper support fixed to the interior peripheral surface of said cavity and having a flange extending radially inward at a substantially right angle to the hub axis; and
- a ring-like damper rubber fixed coaxially to one end of a ring-like damper mass, both comprising a dynamic damper, disposed coaxially in said cavity with said rubber fixed to said flange.

4,710,153
LINK CHAIN

Kurt Allert, Panoramaweg 3, D-7238 Oberndorf, Fed. Rep. of Germany

Filed May 21, 1986, Ser. No. 866,064

Claims priority, application Fed. Rep. of Germany, May 21, 1985, 3518160

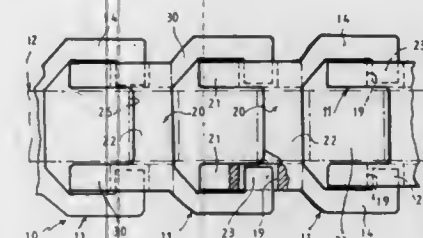
Int. Cl.⁴ F16G 13/07

U.S. Cl. 474-211

27 Claims

1. An elongated link chain comprising a plurality of hingedly connected chain links,

each chain link being made of punched out sheet metal defining a first plane, and comprising two lateral walls extending in the longitudinal direction of the chain and spaced from one another in a direction transverse to said longitudinal direction, at least one transverse web in said first plane and rigidly interconnecting said lateral walls for holding said walls in position with respect to one another, each lateral wall including an arm, each arm having an end portion constituting a bearing pin, said bearing pins being bent so that the end portions extend in a direction transverse to said longitudinal direction, at least parts of respective of said end portions extending in a direction approximately parallel to that of said transverse web,



each of said lateral walls having a separate bearing hole punched-out in said sheet metal for receiving the respective associated bearing pin of another identical chain link which is arranged adjacently to said bearing holes, said separate bearing holes being made coaxial with one another by bending said lateral walls in a direction approximately at right angles to said first plane, so as to extend in a second plane, and to constitute an approximately U-shaped bracket with said transverse web, and so that the bearing holes are spaced at an axial distance from one another, said bearing holes defining a first axis, and said parts of respective of said end portions of said bearing pins defining a second axis, said axes being parallel to one another.

4,710,154
PLATE LINK CHAIN FOR CONE PULLEY DRIVES

Manfred Rattunde, Bad Homburg, Fed. Rep. of Germany, assignor to Reimers Getriebe AG, Ch-zug, Switzerland

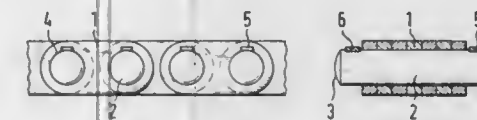
Filed Jun. 24, 1986, Ser. No. 877,938

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3526062

Int. Cl.⁴ F16G 1/24

U.S. Cl. 474-242

13 Claims



1. A plate-link chain for infinitely adjustable friction disks cone pulley drives, including hardened pivot link elements (2, 10, 11, 16, 17) joining individual chain links (1, 7, 19) by insertion of said hardened pivot link through recesses (4) therein in an assembled plate-link chain in which said pivot link elements have end faces (3) that transmit frictional forces between said friction disks cone pulley drives and said pivot link elements, said pivot link elements are inserted into recesses (4) in said chain links with the pivot link elements with at least one contacting part of their profile in pivot contact with said plate recesses and said hardened pivot link elements are secured within said recesses by at least one non-removable securing element against escaping sideways out of said plate recesses, said at least one non-removable securing element being a metal piece (5, 6, 12-15, 21-24, 37, 38, 39, 48, 49) secured in contour

4,710,155
BELT

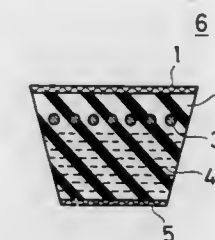
Hiroshi Matsuoka, Izumi, and Susumu Onoe, Osaka, both of Japan, assignors to Bando Chemical Industries, Ltd., Hyogo, Japan

Filed Apr. 26, 1985, Ser. No. 727,862

Claims priority, application Japan, Apr. 26, 1984, 59-85953
Int. Cl.⁴ F16G 5/06

U.S. Cl. 474-260

7 Claims



1. A transmission-type belt characterized in its ability to resist flexure, comprising a tension section, a compression section and load carriers disposed between said two sections composed of polyethyleneterephthalate filament of which at least 85 mol % ethyleneterephthalate is a repeated unit, said filament being at least 0.8 in ultimate viscosity, less than 0.190 in birefringence rate, less than 60 in the degree of orientation of its amorphous portion and less than 15 equivalent/10⁶ g in terminal carboxyl group content.

6. A method of fabricating a transmission-type belt characterized in that it can resist flexure, comprising the steps of:

- (a) treating raw cords composed of polyethyleneterephthalate filament which has at least 85 mol % ethyleneterephthalate as repeated unit and is at least 0.8 in ultimate viscosity, less than 0.190 in birefringence rate, less than 60 in the degree of orientation of amorphous portion and less than 15 equivalent 10⁶ g in terminal carboxyl group content, said treatment including dry heat for 30 minutes at 150° C. after an adhesive treatment and a heat treatment whereby load carriers are fabricated having less than 5% in shrinkage percentage, at least 6 g/denier in strength and less than 4% in elongation at a load of 2 g/denier,
- (b) disposing between tension and compression sections of a rubber matrix, load carriers, and
- (c) vulcanizing said rubber matrix containing said load carriers.

4,710,156
SHEET PROCESSING APPARATUS

Franz Vossen, Radolfzell, Fed. Rep. of Germany, assignor to Meurer Druck & Carton GmbH, Fed. Rep. of Germany
Continuation of Ser. No. 426,904, Sep. 29, 1982, Pat. No. 4,544,367. This application Jun. 21, 1985, Ser. No. 747,456

Int. Cl.⁴ B31B 1/00

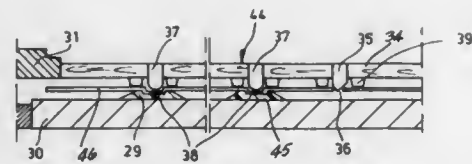
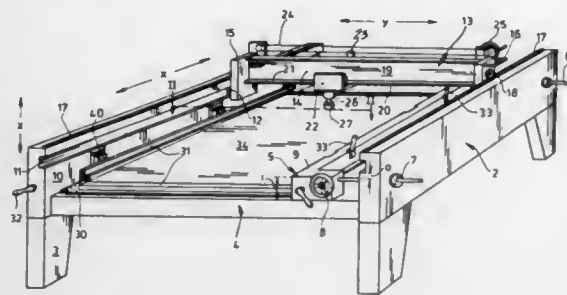
U.S. Cl. 493-1

15 Claims

1. Apparatus for processing a sheet of material such as sheets of cardboard for the manufacture of folding boxes or the like comprising:

- a table plate;
- a stamping plate having die means for forming bend lines fixed to said table plate;
- said stamping plate carrying a cardboard plate on an upper surface above said die means;
- a chase structure movable relative to said stamping plate;

means for defining a folding box pattern including cut lines and bend lines;
said pattern defining means being surrounded by said chase structure and carrying at least one member for forming said bend lines and at least one tool for forming said cut lines;
a beam member extending over the table plate at a spacing therefrom and disposed movably thereabove.
a carriage movable in a direction transverse with respect to the direction of movement of said beam member;

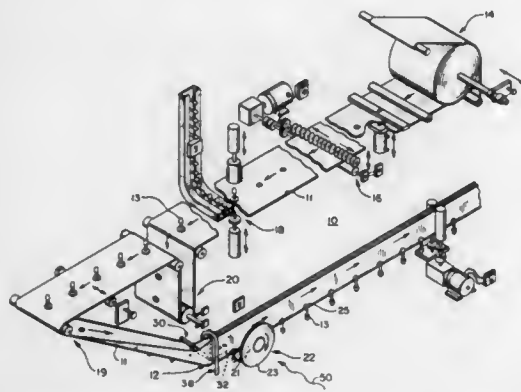


at least one vertically movable pressure member carried on said carriage; and
each said pressure member comprising a ram head operatively directed towards said pattern defining means and said die means whereby pressure is applied against said pattern defining means so that said defining means can press said plate against said die means for producing said cut lines and said bend lines on said cardboard plate.

4,710,157

FORMER FOR FORM, FILL AND SEAL PACKAGING MACHINE

John Posey, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Continuation of Ser. No. 697,542, Feb. 1, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 902,038
Int. Cl.⁴ B31B 23/36, 23/90
U.S. Cl. 493—213 16 Claims



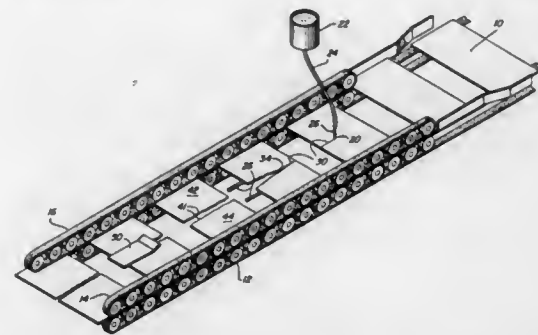
6. An apparatus for producing from a web of flexible film flexible pouches having a fitment located at one end comprising:

means for attaching a fitment to the film;
means for feeding the film with attached fitment to a former; the former including means for aligning opposite longitudinal portions of the film;
the means for aligning opposite longitudinal portions including a substantially V-shaped member, an elongated member secured to the V-shaped member, support means for supporting the V-shaped member and elongated member, and means for maintaining the film with aligned opposite longitudinal portions;
the elongated member of the former including means for heating the fitments;
a base former for forming the base of the fitment attached to the web of film so that the base takes on a substantially curved shape, the base former being located downstream of the former; and
means for feeding the film from the former to the base former.

4,710,158

METHOD AND APPARATUS FOR PRODUCING DECKLED EDGE PAPER

Randall S. Knipp, Kansas City, and Lewis Loyd, Independence, both of Mo., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.
Continuation of Ser. No. 832,530, Feb. 24, 1986, abandoned. This application Apr. 24, 1987, Ser. No. 42,515
Int. Cl.⁴ B26F 3/02
U.S. Cl. 493—328 18 Claims

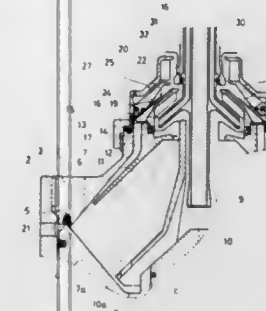


1. A process for producing a deckle edge on greeting card or stationery paper which comprises:
(a) depositing a web of paper stock adapted for greeting card or stationery use into conveyor means,
(b) maintaining the said web of paper stock on the conveyor means in a taut and substantially flat condition,
(c) applying a stream of liquid to said paper stock to form a wetted line of desired width thereon along a predetermined path,
(d) transporting said wetted paper stock to a splitting operation,
(e) exerting a shearing force on the wetted paper stock sufficient to cause the paper stock to split into two parts in a direction along the wetted line thereby producing a deckle edge on both separated parts of the paper, and
(f) removing moisture from the separated parts of the paper stock to set the paper fibers.

4,710,159

CENTRIFUGAL SEPARATOR

Per Gullers, Södertälje, Sweden, assignor to Alfa-Laval Separation AB, Tumba, Sweden
PCT No. PCT/SE85/00326, § 371 Date Jun. 2, 1986, § 102(e) Date Jun. 2, 1986, PCT Pub. No. WO86/02021, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 2, 1985, Ser. No. 876,873
Claims priority, application Sweden, Oct. 8, 1984, 8405015
Int. Cl.⁴ B04B 11/00
U.S. Cl. 494—27 5 Claims



1. In a centrifugal separator including a rotor having an inlet (9) for a mixture of components to be separated, a first central outlet (12, 15) for a separated light liquid component, a second central outlet (20, 26) for a separated heavy liquid component, and a peripheral outlet (21), and means (4) for opening said peripheral outlet intermittently during operation of the rotor, said second central outlet having a first overflow outlet (20) positioned to maintain a free liquid surface of the separated heavy liquid component at a predetermined level in the rotor, the improvement comprising an axially movable slide (23) movable to open and close said second central outlet (20, 26) for the separated heavy liquid component, and means forming a second overflow outlet (22a) located radially inside said predetermined level in position to allow discharge of separated heavy liquid component from the rotor when said slide (23) is in its closing position.

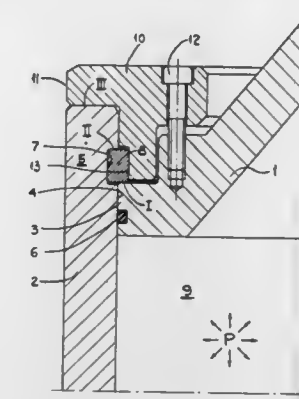
4,710,160

CENTRIFUGAL SEPARATOR

Kjell Klintenstedt, Nacka; Zoltan Földhazy, Tumba, both of Sweden, and Björn Forsberg, Hörsholm, Denmark, assignors to Alfa-Laval AB, Tumba, Sweden
PCT No. PCT/SE85/00249, § 371 Date Jan. 15, 1986, § 102(e) Date Jan. 15, 1986, PCT Pub. No. WO86/00029, PCT Pub. Date Jan. 3, 1986
PCT Filed Jun. 13, 1985, Ser. No. 844,387
Claims priority, application Sweden, Jun. 14, 1984, 8403182
Int. Cl.⁴ B04B 15/06
U.S. Cl. 494—64 7 Claims

1. Centrifugal separator comprising a first and a second rotor part (1, 2), which together surround a separation chamber (9), an annular flange portion (3) of the first rotor part (1) being axially inserted into a sleeve formed end portion (5) of the second rotor part (2) and connected thereto by means of a locking joint comprising at least one locking member (8), which from a position radially inside said sleeve formed end portion (5) and axially outside said annular flange portion (3) has been moved radially outwards, so that part of the locking member (8) is located in an internal recess (7) in the sleeve formed end portion (5), while the remaining part of the locking member (8) is located radially inside the periphery of said flange portion (3), whereby the locking member (8) is arranged to transmit to said second rotor part (2) axial forces arising during operation of the rotor and acting against the inside of said first rotor part (1), characterized in that said locking joint also comprises a circular pre-stressing element (10), which has a radially outer portion (11) abutting against an essentially axially facing surface of said sleeve formed end portion (5),

preferably against its end surface, and which is arranged by means of a prestressing member (12) to be connected with the

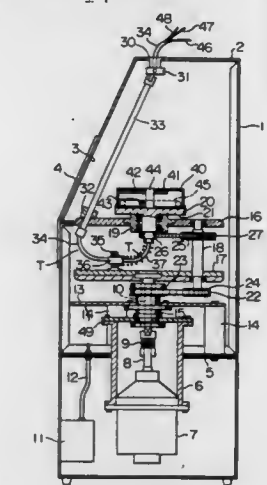


first rotor part (1) and to prestress it axially via a locking element (8) against the second rotor part (2).

4,710,161

CONTINUOUS TYPE CENTRIFUGAL SEPARATOR

Kuniaki Takabayashi, Higashiosaka; Yoshitsugu Takaoka, Nara; Kouichi Hori, Hirakata; Masaki Shimotakahara, Katano; Kikujiro Okada, Ikoma, and Satoru Shiino, Uji, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan
Filed Apr. 21, 1986, Ser. No. 853,921
Claims priority, application Japan, Apr. 22, 1985, 60-85923
Int. Cl.⁴ B04B 9/02
U.S. Cl. 494—84 10 Claims



1. A continuous type centrifugal separator comprising: rotary means rotating around a predetermined axis; connection means rotatably provided on said rotary means, the rotary axis of said connection means being in parallel with said predetermined axis and being deviated from said predetermined axis in a direction perpendicular to said predetermined axis; centrifugal separation means rotatably provided coaxially with said predetermined axis; supply/discharge means, one end of said supply/discharge means being connected to said centrifugal separation means, said supply/discharge means extending therefrom to a predetermined position of said rotary means and at the predetermined position being rotatably held on said rotary means and the other end extending outside of said separator, passing on said predetermined axis; and

rotary driving mechanism means including means for rotating said connection means around said predetermined axis and rotating said connection means on its own axis, and means for rotating said centrifugal separation means at the half speed of said rotary means by the rotations of said connection means.

4,710,162

FAT COLLECTION AND INJECTION PROCESS INTO SAME BODY

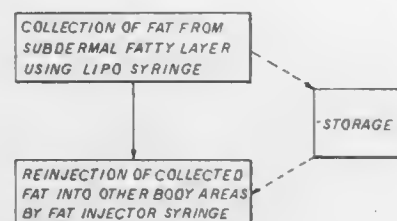
Gerald W. Johnson, 17070 Red Oak, Suite 301, Houston, Tex. 77090

Filed Oct. 31, 1986, Ser. No. 925,443

Int. Cl.⁴ A61M 31/00

U.S. Cl. 604—51

24 Claims



1. A method of reconstructing human body surface configurations comprises the steps of providing a vacuum-operated collection syringe having a barrel, plunger and needle, injecting said collection needle into a subdermal fatty layer of a human body, applying sufficient vacuum to said syringe to withdraw fatty material from said subdermal fatty layer while withdrawing said plunger in said barrel, providing an injection syringe having a barrel, plunger and needle, supplying said withdrawn fatty material from said collection syringe to said injection syringe, inserting said injection needle into another area of the same body from which said fatty material was withdrawn, and operating said injection syringe by withdrawing said needle and barrel relative to said plunger to inject said fatty material in a controlled distribution.

4,710,163

DETECTION OF FLUID FLOW FAULTS IN THE PARENTERAL ADMINISTRATION OF FLUIDS

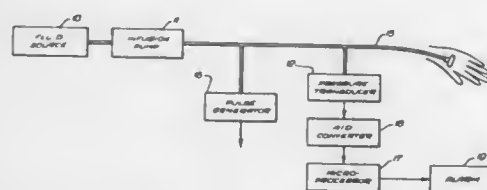
Robert D. Butterfield, San Diego, Calif., assignor to Ivac Corporation, San Diego, Calif.

Filed Jan. 6, 1986, Ser. No. 872,086

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—65

20 Claims



1. A system for monitoring the flow of parenteral fluid through a parenteral fluid delivery system to a patient wherein the fluid in the delivery system is at a base level of pressure or flow rate, the system comprising:

(a) means to apply to fluid in the fluid delivery system a fluid flow excitation pulse which is at a pressure or flow rate significantly greater or lesser than the base level of pressure or flow rate of fluid therein;

(b) means to sense the pressure response of fluid in the deliv-

ery system to the applied excitation pulse and generate a signal representing the response or characteristic thereof;

(c) means to generate a reference signal representing a pressure response or characteristic thereof of fluid in the delivery system to a fluid flow excitation pulse of a magnitude and duration equivalent to the fluid flow excitation pulse applied in (a) above when fault-free fluid flow conditions into the patient exist;

(d) means to compare the signal representing the sensed pressure response or characteristic thereof with the signal representing the reference pressure response or characteristic thereof to detect a difference therebetween; and

(e) means responsive to the difference to generate an alarm signal.

4,710,164

AUTOMATED HEMODIALYSIS CONTROL BASED UPON PATIENT BLOOD PRESSURE AND HEART RATE

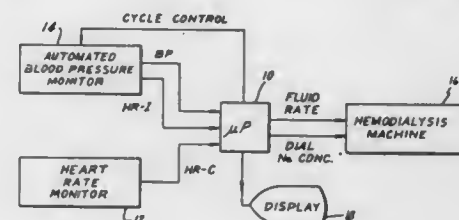
Nathan W. Levin, Birmingham, and Gerard A. Zasuwa, Redford, both of Mich., assignors to Henry Ford Hospital, Detroit, Mich.

Filed May 1, 1984, Ser. No. 605,776

Int. Cl.⁴ A61M 31/00

U.S. Cl. 604—66

13 Claims



1. A system for controlled patient hemodialysis comprising hemodialysis means including means for establishing circulation of dialysate and patient blood across opposite sides of an ultrafiltration membrane, means for establishing a goal rate of extraction of fluids from the patient through said membrane and means for controlling concentration of sodium in said dialysate,

means responsive to a cycle control signal for periodically reading patient blood pressure, means responsive to patient blood pressure for storing an initial blood pressure level at the onset of hemodialysis, and means responsive to deviation of patient blood pressure from said initial level by more than a first preselected deviation limit to provide a first alarm signal,

means for continuously monitoring patient heart rate, means for storing an initial heart rate level at the onset of hemodialysis, and means for providing a second alarm signal when patient heart rate deviates from said initial heart rate level by more than a second preselected deviation limit, and

means responsive to both said first and second alarm signals for automatically controlling said cycle control signal so as to increase the frequency of reading patient blood pressure in response to alarm deviation of patient heart rate or blood pressure or both.

4,710,165

WEARABLE, VARIABLE RATE SUCTION/COLLECTION DEVICE

Charles B. McNeil, 5960 Arbour Ave., Edina, Minn. 55436, and Thomas J. McEvoy, 13103 Baker Trail, Minnetonka, Minn. 55343

Filed Sep. 16, 1985, Ser. No. 776,633

Int. Cl.⁴ A61M 5/14

U.S. Cl. 604—67

27 Claims

1. A wearable, variable vacuum level suction and collection

device for the withdrawal and collection of fluid from a patient, said device comprising:

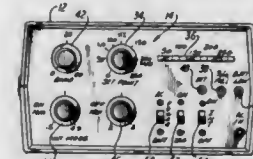
at least one collection receptacle including at least one patient inlet for connection to the patient, a further, suction inlet and an outlet for emptying the receptacle;

pump means, including a pump connection to said suction inlet, for creating suction within said collection receptacle so that fluids from the patient are drawn into the collection receptacle;

a bacterial filter, interposed between the pump and the collection receptacle, for filtering air drawn into the suction inlet;

venting means interposed between the pump and bacterial filter for venting the device;

a pump motor for driving said pump;



a battery powered power supply for said pump motor;

a transducer for sensing the suction created;

suction level selector means for permitting an operator to select a given suction pressure within a predetermined range; and

a control circuit, responsive to the transducer and to said suction level selector means, for controlling the suction created within the receptacle over said predetermined range; said control circuit including means for providing a selected suction pressure dead band on both sides of the selected suction pressure which defines an upper pressure limit above which the pump motor is de-energized and a lower pressure limit below which the pump motor is re-energized.

4,710,166

AUTOMATED DRUG ADDITIVE INFUSION SYSTEM

Thomas C. Thompson, McKinney, and David J. Harrison, Carrollton, both of Tex., assignors to Quest Medical, Inc., Carrollton, Tex.

Filed Nov. 8, 1985, Ser. No. 796,108

Int. Cl.⁴ A61M 5/14

U.S. Cl. 604—81

6 Claims

1. A system for administering to a patient fluid from a secondary fluid container at a selected secondary flow rate, followed by fluid from a primary fluid container at a selected primary flow rate, in which the rates are governed at a rate control site by an electromechanical device, the system comprising:

a Y-connector upstream from the rate control site;

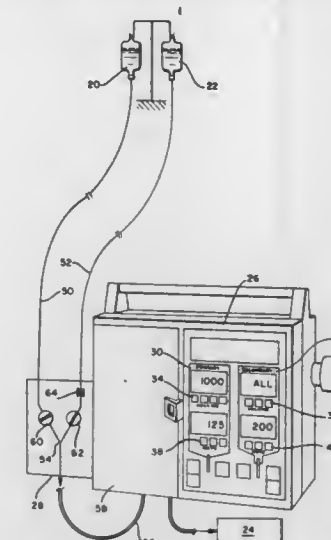
a primary fluid tube extending from the primary fluid container to the Y-connector through a primary valve;

a secondary fluid tube extending from the secondary fluid container to the Y-connector through a secondary valve;

an output flow tube extending from the Y-connector toward the patient whereby a primary fluid path is provided from the primary container to the device through the primary fluid tube, Y-connector and output flow tube, and a secondary fluid path is provided from the secondary con-

tainer to the device through the secondary fluid tube, Y-connector and output flow tube;

detection means for automatically detecting the absence of fluid at a location in the secondary fluid path near the Y-connector, said location being selected so that no fluid holding means other than tubing is interposed in the sec-



ondary fluid path below the detection means and above the Y-connector; and switching means responsive to detection by the detection means to close the secondary valve and open the primary valve, and thereafter cause the device to govern flow at the rate selected for the primary fluid.

4,710,167

IMPLANTABLE DEVICE FOR CHRONICALLY INJECTING A SUBSTANCE, IN PARTICULAR A THERAPEUTANT

Guy Lazorthes, Toulouse, France, assignor to Applied Precision Limited, London, England

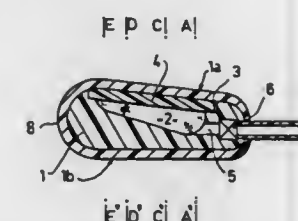
Filed May 21, 1986, Ser. No. 865,412

Claims priority, application France, May 21, 1985, 85 08067

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—93

9 Claims



1. A device for subcutaneous implantation in an accessible zone for forming a site for perfusion or chronic injection of a liquid comprising

a unitary body having a thickness less than its width and breadth and having an upper, active face and a lower face profiled so as to permit said body to slide into said zone, said body having a rounded concave recess therewith with a continuous concave bottom and being open at upper face and having a depth less than the width and breadth of said recess at said upper face,

duct means extending through said body from the bottom of said recess to the outside of said body on one side of said body,

flexible catheter means secured to said duct means so as to extend said duct outside of said body,

said body having a peripheral rim around said recess and a substantially planar flexible membrane sealingly secured to said rim and closing said recess, said membrane being self-sealing whereby said membrane may be pierced by a needle for filling said recess and said membrane may be deformed by pressure so as to substantially conform to the shape of said recess for expelling liquid therefrom; said body being tapered toward said catheter means and said membrane being positioned on said body in an inclined position with respect to said lower face said recess bottom being angled downwardly toward the duct means, and

4,710,168

NON-RETURN VALVE FOR MEDICAL PURPOSES IN PARTICULAR FOR BALLOON CATHETERS

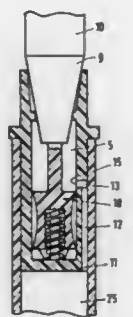
Egon Schwab, Otto-Schwabe Strasse 4, 6203 Hochheim, and Steve Padar, Theresen Strasse 17, 6235 Kelkheim, both of Fed. Rep. of Germany

Continuation of Ser. No. 726,071, Apr. 19, 1985. This application May 13, 1986, Ser. No. 865,907

Int. Cl.⁴ A61M 25/00; F16K 15/14

U.S. Cl. 604—99

10 Claims



1. In a non-return valve suitable for medical purposes comprising a hollow valve housing having an opening to receive the mouthpiece of a syringe, said housing having a first abutment at its syringe-receiving end and a second abutment at its opposite end to thereby contain a valve closure member; a reciprocal, valve closure member disposed within the valve housing and displaceable by a syringe, the improvement which comprises a valve housing having a first slight abutment disposed inwardly of the interior wall of the housing so as to facilitate entry disposing of the valve closure member within the housing, a slidable valve-closure member having a peripheral surface in constant contact with the interior wall of the valve housing when the valve is in open or closed position; and an opening in the interior wall of the valve housing which communicates with an opening in the syringe mouthpiece through axial displacement of the valve closure member past the opening in the interior wall of the housing.

4,710,169

URINARY CATHETER WITH COLLAPSIBLE URETHRAL TUBE

T. Graham Christopher, 8727 Talbot Rd., Edmonds, Wash. 98020

Continuation-in-part of Ser. No. 562,094, Dec. 16, 1983, Pat. No. 4,571,241. This application Dec. 11, 1985, Ser. No. 805,546

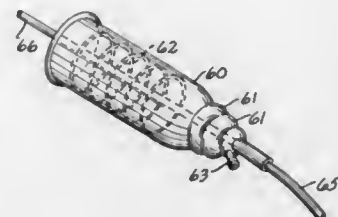
Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—104

2 Claims

1. A urinary catheter comprising:
a noncollapsible exit tube, said exit tube having an internal bore and being of sufficient length to extend through a portion of the urethra and out of the body from a position spaced inward from the urethral exit;
a noncollapsible bladder tube, said bladder tube having an interior bore and being of sufficient length to extend into the bladder from the area adjacent the bladder neck;
a urethral tube having an interior bore, said urethral tube

being connected at its proximal end to the distal end of said exit tube and connected at its distal end to the proximal end of said bladder tube, said tube being constructed of a pliant material and having fibers therein, said tube being normally collapsed within the urethra but radially distended by a flow of urine through the bore, said interior bore being closed when said tube is collapsed and open when said tube is radially distended, the interior bore of said urethral tube being cooperatively connected with the interior bores of said exit tube and said bladder tube to form a drainage channel; and



an external seal disposed in sealing engagement about a portion of the periphery of said exit tube outside of the body and in conforming, sealed engagement with the exterior anatomy, said seal forming a pocket about the exterior anatomy when said catheter is positioned in place, said seal including accordion folds disposed between the respective points of engagement of said seal with said exit tube and said anatomy, said folds being extensible and distensible in response to movement of said exit tube, said seal including an injection port providing fluid access to said pocket.

4,710,170

ANTI-NEEDLE STRIKE AND ANTI-DRUG ABUSE SYRINGE

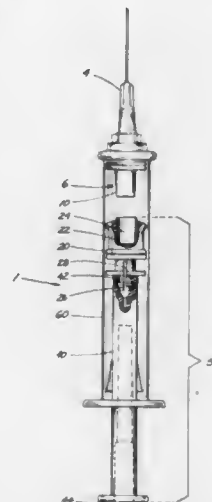
Terry M. Haber, Lake Forest; William H. Smedley, Lake Elsinore, and Clark B. Foster, El Toro, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Feb. 12, 1987, Ser. No. 14,270

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—110

21 Claims



1. An anti-needle strike and anti-drug abuse syringe comprising a hollow syringe cylinder, a hypodermic needle, means for carrying said hypodermic needle to be connected to said needle and removably attached to a first end of said syringe cylinder such that said hypodermic needle projects outwardly from

said first end by which to inject or infuse a fluid, means to relocate said needle carrying means from said first cylindrical end to another location within said cylinder such that said hypodermic needle extends within the interior of said syringe cylinder from said other location, and means to be inserted through said first cylindrical end after the removal of said needle carrying means therefrom, said means to be inserted extending into the interior of said cylinder to prevent access to or reuse of said needle after fluid has been injected from said cylinder.

4,710,171

NEEDLE DEPTH SETTING SHEATH ASSEMBLY AND NEEDLE STOP

Helmut W. G. Rosenberg, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jun. 9, 1986, Ser. No. 872,352

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—117

4 Claims



1. A biological needle assembly having a depth setting and stop arrangement thereon, comprising:
an elongated needle;
a connector means at the proximal end of the needle;
a needle stop assembly arranged with the connector at the proximal end of a needle; and
a sheath assembly having graduations thereon to effectuate the proper depth setting of said needle with respect thereto;
said needle stop assembly comprising a threadably adjustable compressive arrangement which locks said needle thereto, which includes a radially inwardly directed gripping means which can be tightened and untightened to permit the passage of the needle therethrough, comprising a hub and a housing which are coaxially arranged about a centrally disposed needle, and a centrally disposed bushing arranged therebetween, said bushing being receivable within said housing and engagable against one end of a portion of said hub.

4,710,172

HIGH PRESSURE SYRINGE WITH PRESSURE INDICATOR

John Jacklich, 102 Western Ct., Santa Cruz, Calif. 95060, and George Mikula, Bozeman, Mont., assignors to John Jacklich, Santa Cruz, Calif.

Filed Nov. 24, 1986, Ser. No. 934,434

Int. Cl.⁴ A61M 1/00

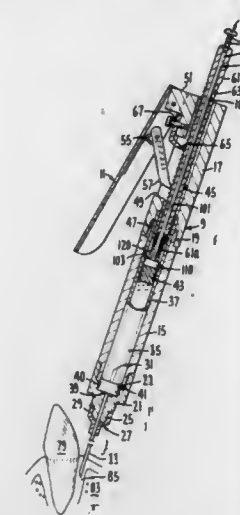
U.S. Cl. 604—118

10 Claims

1. In a syringe capable of delivering anesthetic under high pressure for use in procedures such as intraligamentary anesthesia, wherein said syringe has a barrel for holding an anesthetic carpule, said carpule having a bung at a first end of the carpule which may be driven toward the second end of the carpule, the second end having a diaphragm which is adapted to be pierced by one end of a double cannula, a piston rod for actuating the carpule bung, and a drive mechanism for advancing said piston rod to express the anesthetic from said carpule, the improvement comprising:

- an elongated stem means slidably mounted within a passage-way formed in said piston rod,
- head means carried at one end of said elongated stem means, said head means adapted to engage the bung of said carpule,
- spring means located between said head means and said piston rod, and

d. indicator means actuated by relative motion between said elongated stem means and said piston rod, whereby the



pressure being applied to said anesthetic is displayed for use by the operator of said syringe.

4,710,173

FLASHBACK STRUCTURE

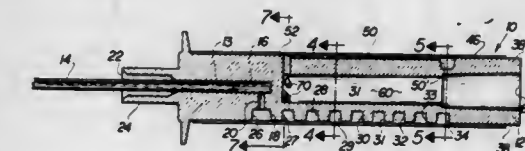
Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134

Filed Mar. 24, 1986, Ser. No. 843,493

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—168

15 Claims



1. A flashback structure of the type used to determine proper placement of a needle tip within a blood vessel, such as when placement of a catheter assembly within the blood vessel is being attempted, said structure comprising:

- a base having an elongated configuration and an outer surface comprising a substantially elongated cylindrical configuration and including a needle extending outwardly from one end of said base, said needle terminating in a sharpened tip at a distal end thereof,
- said needle comprising a hollow interior portion extending along the length thereof from said tip to a proximal end of said needle, said proximal end secured on the interior of said base, whereby blood travels along said needle into said base when said tip is located within said blood vessel,
- a flow channel integrally formed on said outer cylindrical surface of said base and disposed in fluid communication with said needle at substantially one end of said base and a vent means at the opposite end of said flow channel relative to said needle,
- said vent means formed on said cylindrical outer surface of said base for the exiting of air from said flow channel as blood enters therein from said needle,
- said flow channel comprising a groove structure extending along at least a portion of the length of said base and comprising a plurality of groove segments,
- said plurality of groove segments integrally formed in said cylindrical outer surface in spaced relation to one another and collectively extending between and in fluid communication with said proximal end of said needle and said vent means,

- (g) each of said groove segments comprising a curvilinear configuration disposed transversely to the length of said base in at least partially surrounding relation thereto and extending into said base a sufficient depth to allow a free flow of blood therealong, and
- (h) cover means being at least partially transparent and mounted in engaging and surrounding relation to said cylindrical outer surface of said base and in covering, fluid retaining relation to said plurality of groove segments and said vent means,
- (i) whereby blood is viewable as it flows from said needle along the length of said flow channel beneath said cover means when said tip is properly positioned within a blood vessel.

4,710,174

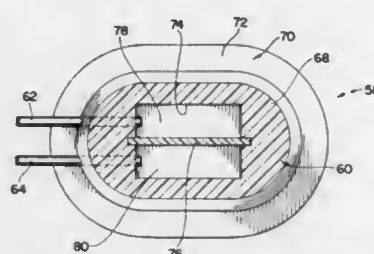
IMPLANTABLE INFUSION PORT

James R. Moden, Bristol; Michael D. Caldwell, East Greenwich, and Robert D. Moden, Barrington, all of R.I., assignors to Surgical Engineering Associates, Inc., Bristol, R.I.
Filed Dec. 16, 1985, Ser. No. 809,773

Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—175

8 Claims



1. An implantable infusion port for dispensing medication in the body of a patient comprising a septum having a base portion, a side wall portion and a top wall portion which cooperate to define an enclosed cavity in said septum, at least a portion of said side wall portion being made of a material which is penetrable by a hypodermic needle or the like for introducing medication into said cavity but which is substantially self-sealing upon removal of said needle therefrom, catheter means providing communication between said cavity and the exterior of said septum for dispensing said medication in the body of said patient, and impenetrable means within said port extending substantially upright relative to said base portion and operable for limiting the extent of penetration of said needle in said port in a direction substantially parallel to said base portion.

4,710,175

INTRAVENOUS INFUSION ASSEMBLY FORMED AS AN INTEGRAL PART

Robert L. Cartmell, Kettering; Charles W. Daugherty, Xenia, and David B. Ireland, Dayton, all of Ohio, assignors to Deseret Medical, Inc., Franklin Lakes, N.J.

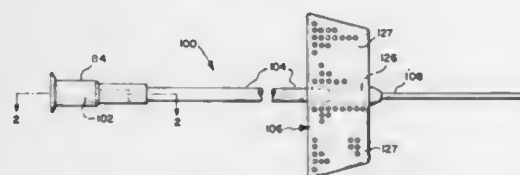
Continuation of Ser. No. 524,728, Aug. 19, 1983, abandoned.

This application Feb. 12, 1986, Ser. No. 829,457

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—177

1 Claim



1. A unitary winged catheter assembly comprised entirely of a plurality of polyurethane parts of varying degrees of hard-

ness, said parts being dielectrically welded together into said unitary assembly, characterized by

- (a) a fluid receiving hub for said assembly;
- (b) said hub having a fluid receiving first end and a second end;
- (c) said hub being comprised of a substantially hard rigid polyurethane material having a Shore D hardness within the range of between about 50 and 75;
- (d) a fluid canal in said hub, said canal extending from said first end to said second end;
- (e) said canal having a reduced diameter portion adjacent said second end to define a tubing stop in said hub canal;
- (f) a length of substantially soft flexible polyurethane tubing having a Shore A hardness within the range of between about 75 and 90, said tubing having a first end and a second end;
- (g) the first end of said tubing extending into said second end of said hub to said tubing stop and forming a first joint for said assembly;
- (h) said first end of said tubing and said second end of said hub having internal diameters substantially equal at said tubing stop;
- (i) a gripping member comprised of a substantially soft flexible polyurethane having a Shore A hardness within the range of between about 75 and 90, and having a passageway extending therethrough from a first end of said gripping member to a second end thereof;
- (j) the internal diameter of said gripping member passageway receiving in the first end thereof the said second end of said tubing, and forming a second joint for said assembly;
- (k) a pair of substantially soft flexible polyurethane wings having a Shore A hardness within the range of between about 75 and 90 and positioned on said gripping member, and movable from a first position transverse to the axis of said passageway through said gripping member to a second position with said wings in facing relation to each other;
- (l) a substantially rigid polyurethane catheter having a Shore D hardness within the range of between about 55 and 70 with a first end and a second end, and having the second end tapered for insertion into a vein;
- (m) the first end of said catheter being inserted into the said second end of said passageway of said gripping member to form a third joint for said assembly;
- (n) the internal diameter of said gripping member passageway being large enough to receive in the second end thereof the said first end of said catheter for said third joint;
- (o) the mating surfaces of said first, second and third joints being joined together by dielectric welding for comingling the components of said mating surfaces; and
- (p) the internal diameters of said first, second and third joints being of sufficient diameter for receiving a dielectric electrode for said dielectric welding.

4,710,176

NEEDLE DEVICE FOR USE WITH SUBCUTANEOUS CATHETER ASSEMBLIES

Richard L. Quick, Trabuco Canyon, Calif., assignor to Gish Biomedical, Inc., Santa Ana, Calif.

Continuation of Ser. No. 776,379, Sep. 16, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,506

Int. Cl.⁴ A61M 5/00

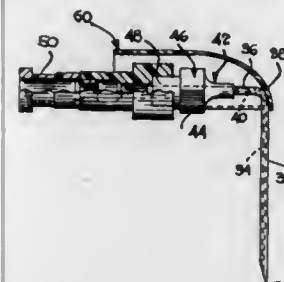
U.S. Cl. 604—177

22 Claims

1. A needle device adapted for use with a subcutaneous implanted assembly having a fluid reservoir, said device comprising:

- (a) a tubular needle shank of the type used with a subcutaneous implanted fluid reservoir and having a tip portion adapted to extend through the skin and into the fluid reservoir, said shank having a bore through which fluid may enter or be withdrawn from said reservoir;

- (b) a tubular arm angularly located with respect to said shank and being integrally connected to said shank, said arm having a bore in fluid communication with the bore of said shank,
- (c) a mounting jacket extending partially around a portion of said arm and being secured to said arm, said jacket extending outwardly transversely from said arm and which is capable of being flatwise disposed on the surface of the skin adjacent to the region where the shank penetrates the



skin so that tape may be adhesively secured to the jacket and to the skin to retentively hold the needle device in a fixed position onto the user without the necessity of independently taping the arm to the user's skin, and

(d) an upstanding section on said jacket and being substantially rigid so that it can be grasped by an attendant with one hand and positioned with respect to a user and properly maneuvered to insert the tip portion through the user's skin and into the fluid reservoir.

4,710,177

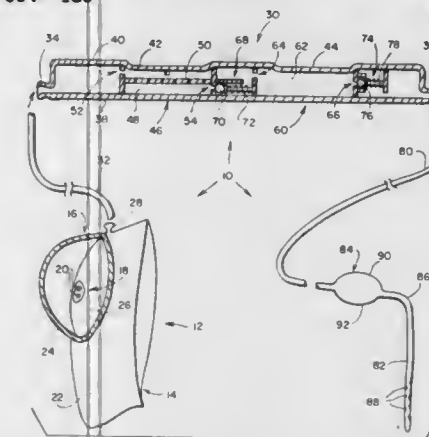
SUBCUTANEOUS VENTRICULAR INJECTION APPARATUS AND METHOD

Robert R. Smith, 2574 Lake Cir., Jackson, Miss. 39211, and Thomas B. Briggs, 238 E. Lorenz Bldg., Jackson, Miss. 39216
Filed May 15, 1986, Ser. No. 863,419

Int. Cl.⁴ A61M 1/00

U.S. Cl. 604—185

14 Claims



1. An injection system for delivering a fluid to a subcutaneous body site comprising:

- a reservoir containing a plurality of doses of the fluid, said reservoir adapted to be subcutaneously located;
- a subcutaneous catheter means for connecting said reservoir and the body site, said catheter means including an end located at the body site;
- a subcutaneous pump means located adjacent the body site and fluidly disposed between the end of said catheter means and said reservoir for pumping measured amounts of the fluid from said reservoir to the end of said catheter means, said pump means including a first depressible member which is manually depressed to pump the fluid; and
- a subcutaneous valve means located adjacent said pump

means and fluidly disposed between the end of said catheter means and said reservoir for blocking the flow of fluid through said catheter means even when said first depressible member of said pump means is depressed, said valve means including a resilient biasing means for resiliently biasing said valve means to the closed position and a second depressible member physically separated from said first depressible member which is manually depressed to overcome said resilient biasing means and open said valve means such that the flow of fluid through said catheter means is only accomplished when said first depressible member and said second depressible member are depressed simultaneously.

4,710,178

PRECISION INJECTION SYSTEM AND METHOD FOR INTRALIGMENTAL ANESTHESIA

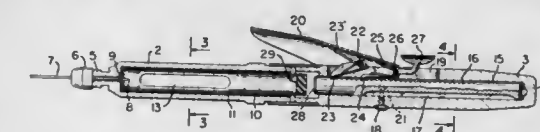
Henri Leonard, Besancon and Michel Seigneurin, St. Cergues-Douvaine, both of France, assignors to Micro-Mega S.A., Besancon, France

Continuation of Ser. No. 793,676, Oct. 31, 1985, which is a continuation-in-part of Ser. No. 547,768, Nov. 1, 1983, abandoned. This application Sep. 11, 1986, Ser. No. 906,641
Claims priority, application France, Nov. 3, 1982, 82 18546; Aug. 3, 1983, 83 12932; Nov. 9, 1984, 84 17226

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—209

32 Claims



1. A precision injection system for intraligmental anesthesia, filling of tooth cavities by injection, and the like comprising, an intraligmental syringe having a tubular handle portion and exchangeable tubular headpieces mountable on and dismountable from the handle portion for exchange thereof with other individual headpieces, means for removably and releasably mounting the headpieces individually coaxially with the tubular handle portion extending longitudinally therefrom for jointly defining therewith a tubular syringe, each headpiece having in use at an end thereof a nozzle, each headpiece defining a chamber for carpule control and dimensioned for receiving therein and containing a carpule cartridge with either liquid or compositions of a semi-solid mass contents therein to be injected, a dosing plunger housed in the handle portion in a retracted starting position, a servo-dosing lever mounted externally on the tubular handle portion for activating the dosing plunger for incremental gradual advancing movement axially out of said handle portion from the starting position into said chamber of the headpiece to effect delivery of metered quantities of contents of the carpule cartridge for flow through said nozzle in dependence upon the incremental axial advancing movement of the dosing plunger, activating means on the tubular handle portion coactive with the servo-dosing lever and dosing plunger for activating the dosing plunger incrementally each time the servo-dosing lever is depressed, and means comprising a resetting key on the handle portion actuatable manually for enabling semiautomatic retraction of the dosing plunger to the retracted starting position.

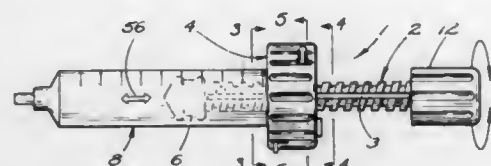
4,710,179

SNAP-ON VERNIER SYRINGE

Terry M. Haber, Lake Forest; Clark B. Foster, El Toro, and John A. Lewis, Jr., Costa Mesa, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.
Filed Oct. 27, 1986, Ser. No. 923,572
Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—211

14 Claims



1. A syringe assembly comprising: a cylinder from which a volume of material can be dispensed; piston means to be inserted in and moveable through said cylinder for expelling material therefrom; and collar means having a hole for receiving said piston means therethrough, said collar means being removably connected to said cylinder to support and align said piston means for movement through said cylinder, said collar means also including: at least one exterior face; an interior core spaced from said face; an access opening formed in said face through which an end of said cylinder may be inserted, said collar means being removably connected to said cylinder when said cylinder is inserted through said access opening and rotated through the space between said exterior face and said interior core; a catch member; a seat formed in said interior core into which said catch member may be moved; and position control means communicating with said catch member and extending through said collar means to a manually accessible position thereof at which to control the movement of said catch member relative to said seat, said position control means being operable to move said catch member either into said seat in said core to permit the rotation of said cylinder end and the connection or disconnection of said collar means to or from said cylinder or out of said seat and into the space between said exterior face said interior core to block the rotation of said cylinder end and prevent the disconnection of said collar means from said cylinder.

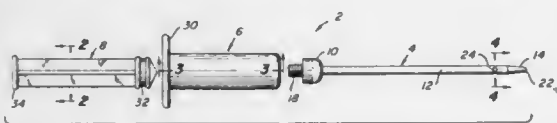
4,710,180

LIPOJECT NEEDLE

Gerald W. Johnson, 2010 Castlerock, Houston, Tex. 77090
Filed Oct. 6, 1986, Ser. No. 915,550
Int. Cl.⁴ A61M 5/325

U.S. Cl. 604—239

8 Claims



1. Apparatus for the atraumatic injection of particles of fat into the body of a patient, comprising an elongated needle having a successive proximal, intermediate, and distal portions and containing a through-bore extending continuously between said proximal and distal portions;

said needle intermediate portion having a generally tubular configuration;
said needle distal portion having a generally conical configuration, the remote end thereof having a blunt smooth surface;
said needle intermediate portion containing a plurality of radial ports equally spaced about the circumference thereof adjacent said distal portion, the cross-sectional area of each of said ports corresponding with the cross-sectional area of said through-bore, whereby when said needle distal and intermediate portion are inserted into a given location in the body of a patient and when particles of fat are supplied to the proximal end of said needle through-bore, the particles are injected into the body via said ports.

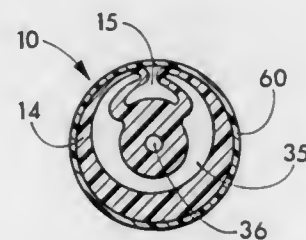
4,710,181

VARIABLE DIAMETER CATHETER

Clark R. Fuqua, Salem, Va., assignor to Genus Catheter Technologies, Inc., Roanoke, Va.
Continuation-in-part of Ser. No. 743,705, Jun. 11, 1985, Pat. No. 4,601,713. This application Jun. 10, 1986, Ser. No. 872,601
Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—280

13 Claims



1. A variable diameter catheter adapted to be folded in a longitudinal manner, comprising a resiliently flexible tube of generally uniform diameter along the length of said tube, said tube in cross-section having a single, external wall of varying thickness, such that the portion of said wall which is adapted to fold is thinner than the rest of said wall; said catheter comprising a means for retaining said fold in said tube, said fold retaining means surrounding said tube.

4,710,182

OSTOMY APPLIANCE AND METHOD OF MAKING

Robert M. Bryson, Arlington Heights, Ill., assignor to Hollister Incorporated, Libertyville, Ill.
Filed Dec. 4, 1986, Ser. No. 937,824
Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—339

18 Claims

1. An ostomy appliance comprising an ostomy pouch equipped with a faceplate for adhesive attachment to a patient; said pouch being formed of thermoplastic film and having one wall provided with a stoma opening therein; said faceplate comprising a skin barrier ring, a microporous patch, and a connecting ring joining together said skin barrier ring, microporous patch, and pouch; said skin barrier ring being formed of a soft, pliable, water-absorbing composition having both dry tack and wet tack characteristics; said skin barrier ring also having a proximal face for sealingly engaging the peristomal skin surfaces of a patient and a generally planar distal face; said microporous patch being formed of thin, microporous sheet material having gas and water vapor transmissibility and having planar proximal and distal surfaces; said proximal surface being coated with a pressure-sensitive adhesive and said distal surface being generally coplanar with said distal face of said skin barrier ring; said microporous patch having an opening receiving said skin barrier ring; said connecting ring being formed of soft, flexible, liquid and gas impermeable, closed-cell

thermoplastic foam and having an outside diameter substantially greater than said opening of said microporous patch; said connecting ring covering, and being adhesively secured to, the distal face of said skin barrier ring and a concentric portion of



the distal surface of said microporous patch about said skin barrier ring; said connecting ring having a distal surface heat sealed to said wall of said pouch in an annular zone about said stoma opening.

4,710,183

OSTOMY APPLIANCE

Peter L. Steer, Surrey, England, assignor to Craig Medical Products Ltd., Sussex, England
Continuation of Ser. No. 664,726, Oct. 25, 1984, abandoned.

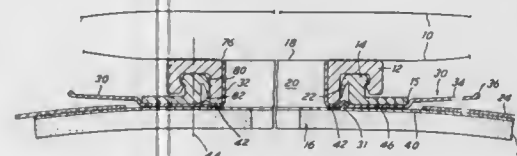
This application May 2, 1986, Ser. No. 860,695

Claims priority, application United Kingdom, Nov. 1, 1983, 8329121

U.S. Cl. 604—344

Int. Cl.⁴ A61F 5/44

12 Claims



1. A body side coupling for an ostomy appliance which includes a pad of medical grade adhesive, a coupling ring, and a flexible ring located between the pad and the coupling ring, the flexible ring extending outwardly radially of the coupling ring beyond the coupling ring and having a chute portion located to prevent discharged material from lodging in crevices formed when said body side coupling ring is assembled together with a mating coupling ring attached to an ostomy bag portion of said ostomy appliance and between said flexible ring and said body side coupling ring, said flexible ring secured to the adhesive pad adjacent said chute portion at a first annular region which is radially inwardly of the coupling ring with respect to the coupling axis of the mating coupling rings and secured to the coupling ring at a second annular region which is spaced apart and radially outwardly of the first annular region.

4,710,184

ABSORBING MATERIAL CONTAINING AN ISOTHIAZOLINE-ONE-3 DERIVATIVE, APPLICATION TO PERSONAL HYGIENE AND PROCESS FOR MANUFACTURING THIS MATERIAL

Philippe Ehret, Colmar, France, assignor to Beghin-Say S.A., Thumeries, France

PCT No. PCT/FR84/00074, § 371 Date Nov. 23, 1984, § 102(e) Date Nov. 23, 1984, PCT Pub. No. WO84/03631, PCT Pub. Date Sep. 27, 1984

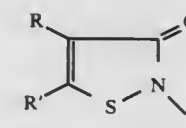
PCT Filed Mar. 20, 1984, Ser. No. 689,043

Claims priority, application France, Mar. 23, 1983, 83 04785
Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—368

12 Claims

1. An absorbent article comprising a continuous material and a second material incorporated in said continuous material, said second material including a water-insoluble, hydrocolloidal polyelectrolyte capable of absorbing an aqueous liquid several times its own weight, said polyelectrolyte having an isothiazoline-one-3 derivative of the general formula:



wherein

- Y is a hydrogen atom, a C₁ to C₈ linear or branched alkyl group, or a C₃ to C₆ cycloalkyl group,
R is a hydrogen atom, a C₁ to C₄ alkyl group or a halogen, and
R' is a hydrogen atom, a C₁ to C₄ alkyl group or a halogen, in contact therewith, said absorbent article being constructed and arranged for application to a human's anatomy for purposes of personal hygiene.

4,710,185

FORAMINOUS NET COVER FOR ABSORBENT ARTICLES

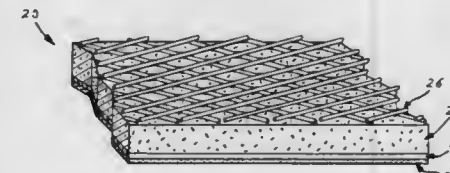
James C. Sneyd, Jr.; Robert D. Harris, both of Cobb County, and Margaret G. Latimer, Fulton County, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 775,480, Sep. 12, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 931,952

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—372

41 Claims



1. An absorbent article for proximate contact with a mammalian body adapted to receive a fluid containing discharge therefrom, including an absorbent member bearing a clean, dry body-side cover as an interfacial fluid transfer and stain masking member, said cover comprising a foraminous net having a generally recticular network of first and second arrays of continuous polymeric monofilaments disposed generally parallel one to another within each of said arrays and at a displacement angle between respective arrays.

4,710,186

CLEAN AND DRY APPEARANCE FACING

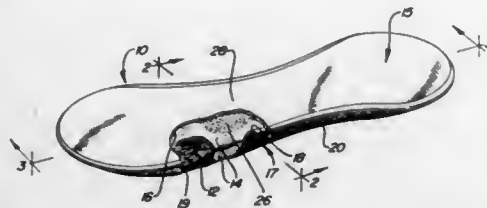
Edmund Z. DeRossett, Mercerville, and Thomas J. Luceri, Little Ferry, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Jul. 20, 1984, Ser. No. 632,753

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—383

7 Claims



1. In a product to be worn for absorbing body fluids and comprising an absorbent core having a body facing side and a garment facing side, the improvement wherein said body facing side has an overlying facing layer comprising a continuous sheet comprising a polyolefin selected from the group consisting of polyethylene, polypropylene or copolymers thereof; said sheet having apertures therethrough for allowing for the passage of body fluids; said sheet comprising from about 5 to about 12% by weight of an opacifying agent; said apertures comprising at least about 15% open area but an amount of open area insufficient to reduce the brightness of the film to less than 45.

4,710,187

FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH A STRETCHABLE BODYSIDE LINER

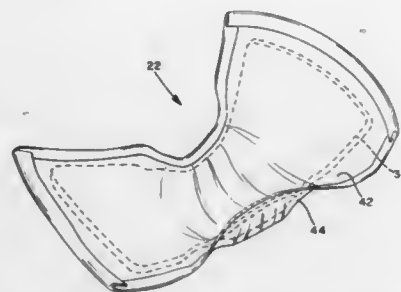
Leona G. Boland, Neenah; Robert A. Stevens, Appleton; John C. Wilson, Neenah, and Georgia L. Zebner, Larsen, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 6, 1985, Ser. No. 773,743

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—385 A

36 Claims



1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:

a breathable elastomeric nonwoven outer cover comprising a nonwoven elastic web joined to one or more gatherable nonwoven webs, including a waist opening, a pair of leg openings, a central crotch section between said leg openings and front and rear panels separated by said crotch section;

an absorbent insert structure, substantially superposable on said front and rear panels and said crotch section having longitudinally opposed ends and including a liquid permeable bodyside liner resiliently stretchable or expansible in at least one direction and a liquid impermeable barrier with an absorbent core disposed therebetween; and

attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof.

4,710,188

INCONTINENCE PROTECTOR AND A METHOD FOR ITS MANUFACTURE

Bo Runeman, Göteborg, Sweden, assignor to MoInlycke AB, Gothenburg, Sweden

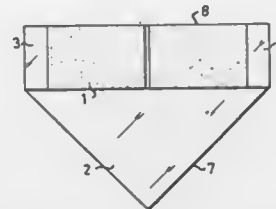
Filed Feb. 4, 1986, Ser. No. 825,913

Claims priority, application Sweden, Feb. 4, 1985, 8500492

Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—385 R

2 Claims



1. A method of manufacturing an incontinence protector for men, comprising securing together a rectangular absorbent layer and a rectangular liquid impermeable layer with an edge of the impermeable layer extending beyond the adjacent edge of the absorbent layer, folding the secured together layers double with the impermeable layer on the outside about a fold line perpendicular to said edge of the impermeable layer, thereby to bring two lengths of said edge of the impermeable layer into parallel juxtaposed position, and securing together only said juxtaposed lengths of said edge of the impermeable layer along a line of securement that is perpendicular to said fold line and that meets said fold line at one end of said fold line.

4,710,189

SHAPED DISPOSABLE DIAPERS WITH SHAPED ELASTICALLY CONTRACTIBLE WAISTBANDS

Glen R. Lash, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 756,416, Jul. 18, 1985, abandoned,

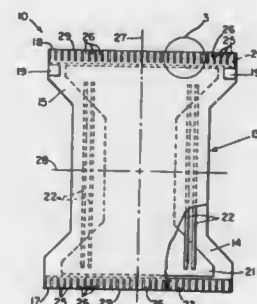
which is a continuation of Ser. No. 476,734, Mar. 18, 1983,

abandoned. This application Mar. 3, 1987, Ser. No. 21,074

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—385 A

5 Claims



1. A disposable diaper comprising:

a liquid permeable topsheet;

a liquid impermeable backsheet, said backsheet being affixed to said topsheet;

an absorbent element, said absorbent element being interposed between said backsheet and said topsheet;

a waistband extending from the laterally extending margin of the diaper to about the laterally extending margin of said absorbent element;

fold regions at which said topsheet and said backsheet are folded; and

an elastomeric element, said elastomeric element being af-

fixed to said waistband, said elastomeric element having a middle portion of relatively less contraction and a pair of additional portions of relatively more contraction compared to said middle portion, said additional portions being separated by said middle portion.

4,710,190

DIAPER HAVING IMPROVED REINFORCED AREA FOR RECEIVING ADHESIVE FASTENING TAPE

Leigh E. Wood, Woodbury; John A. Miller, and Alan J. Sipinen, both of Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 4, 1986, Ser. No. 903,680

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—389

19 Claims



1. Disposable diaper which includes an outer liquid-impermeable film and a bilayer film bonded to the liquid-impermeable film as a peel-resistant reinforced fastening area to which pressure-sensitive adhesive fastening tapes attached at another part of the diaper may be adhered to hold the diaper in a closed position, the bilayer film

comprising a reinforcing layer and a room-temperature-non-tacky bonding layer, and

being bonded to the liquid-impermeable film under heat and pressure that leaves the liquid-impermeable film substantially undeformed,

the bonding layer holding the reinforcing layer to the liquid-impermeable film with greater force than that which the fastening tape applies when adhered to the top of the bilayer film, whereby the fastening tapes may be reliably and lastingly adhered to the reinforced area of the diaper by hand pressure, and may be removed and reapplied, all without distortion or tearing of the liquid-impermeable film.

4,710,191

THERAPEUTIC DEVICE FOR THE ADMINISTRATION OF MEDICAMENTS

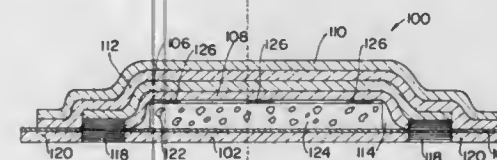
Alfred Kwiatek, New York, N.Y., and Jack W. Schwartz, Burlington, Vt., assignors to Jonergin, Inc., Swanton, Vt.

Filed Dec. 16, 1985, Ser. No. 809,483

Int. Cl.⁴ A61K 9/00

U.S. Cl. 604—897

16 Claims



1. A device for the administration of an active agent to the skin or mucosa of a host comprising a reservoir containing said active agent, said reservoir including an inner surface and an outer surface, a release layer formed on said inner surface of said reservoir, and active agent impermeable backing layer formed on said outer surface of said reservoir, said backing layer overlying said release layer and sealed thereto about a circumferential sealed area so as to enclose said reservoir, said backing layer and said release layer extending peripherally beyond said sealed area about the entire periphery thereof so as to create an extended peripheral area, adhesive means disposed between said backing layer and said release layer in said extended peripheral area and thereby separated from said reser-

4,710,192

DIAPHRAGM AND METHOD FOR OCCLUSION OF THE DESCENDING THORACIC AORTA

Domingo S. Liotta, and Holga E. Troncoso De Liotta, both of 3 De Febrero 2025, Buenos Aires, Argentina (1428)

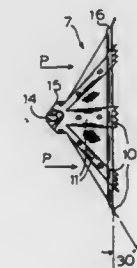
Filed Oct. 17, 1986, Ser. No. 919,984

Claims priority, application Argentina, Dec. 30, 1985, 302764

Int. Cl.⁴ A61F 2/06; A61B 17/00, 17/12

U.S. Cl. 623—1

9 Claims



1. A diaphragm for providing occlusion in a descending thoracic aorta, of the type capable of isolating a portion of the aorta affected by an aneurysm, and installed via a surgical treatment in which a permanent arterial by-pass of medically compatible material extending from the ascending aorta to the abdominal aorta is provided, said diaphragm comprising:

a flexible and substantially circular element, said circular element including a cushion rim around the outer periphery thereof, said cushion rim having a thickness substantially greater than said circular element; and

a plurality of resilient ribs having inner and outer ends supporting said circular element, said inner ends of said ribs joined together at a hub with said ribs extending radially outwardly therefrom, said ribs generally positioned on and attached to said circular element with said outer ends of said ribs having protrusions projecting radially beyond said cushion of said circular element, said ribs having a resilient expansion tendency, such that said diaphragm may be held in a biased collapsed position during installation, and sprung open into a normally vaulted shape upon installation in the aorta, whereby said protrusions are urged radially outwardly by the resilient expansion tendency of said ribs to engage the aorta and hold said diaphragm in position.

7. A surgical procedure for treating an aneurysm in a patient's descending thoracic aorta, comprising the steps of: installing an artificial aorta by-pass connecting the patient's ascending natural aorta with the patient's abdominal aorta end;

installing a temporary graft onto said by-pass; and advancing a catheter having a capsule end holding a retracted diaphragm through said graft; positioning said diaphragm into a selected site in said aorta; and

releasing the diaphragm by ejecting it from the capsule thereby allowing said diaphragm to spring open into a vaulted shape and engage the inner walls of aorta all around; and withdrawing the catheter with the diaphragm remaining within the aorta to provide an occlusion therein.

4,710,193

ACCOMMODATING INTRAOCULAR LENS AND LENS SERIES AND METHOD OF LENS SELECTION

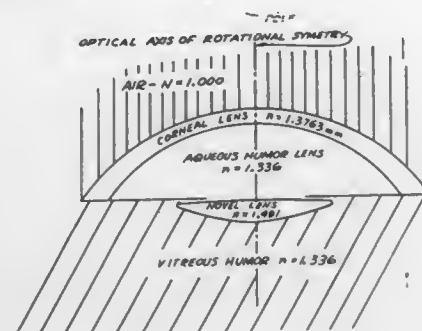
David Volk, 3336 Kersdale Rd., Pepper Pike, Ohio 44124

Filed Aug. 18, 1986, Ser. No. 897,656

Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

15 Claims



1. An intraocular lens for the correction of the axial refractive error and the accommodative insufficiency of the post-surgical aphakic eye, made of homogeneous transparent optical material, for placement in the posterior chamber of the human aphakic eye, of continuously and regularly increasing refractive power peripheralward, of a diameter between 4.5 mm and 7 mm and of thickness between 0.65 mm and 1 mm, with at least one surface of said intraocular lens a positive aspheric surface of revolution having an apical umbilical point at which the derivative of curvature vanishes, said surface increasing continuously and regularly in curvature and refractive power from said apical umbilical point to its periphery and where the magnitude and shape of said surface is defined mathematically by means of the following expression:

$$y = (Ax + Bx^2)^{\frac{1}{2}} + Cx^p + Dx^q + Ex^z,$$

where $A = 2r_{\text{apex}}$, $B = (e^2 - 1)$, e being the eccentricity at the apex of said surface, where C , D , and E are integral or non-integral coefficients of x^p , x^q , and x^z respectively, and where p , q , and z can be integral or non-integral exponents of x , and where r ranges from 5 mm to 150 mm, where e ranges from 0.0 to 4.0, where at least one of the values of C , D , and E is other than zero, values of C , D , and E ranging from 0.0 to ± 9 , the values of p , q , and z range from a value of 0.5 to 6.0.

4,710,194

INTRAOCULAR LENS WITH OPTIC OF EXPANDABLE HYDROPHILIC MATERIAL

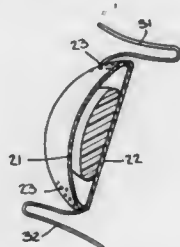
Charles D. Kelman, 269 Grand Central Pkwy., Floral Park, N.Y. 11005

Filed Oct. 20, 1986, Ser. No. 921,227

Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

18 Claims



18. An intraocular lens for implantation in a human eye, comprising:
optic means of hydrophilic material adapted to be in contracted condition when dry and to expand to an expanded condition in response to uptake of liquid from the environ-

ment, said hydrophilic optic means being formed to such a size and shape, in dry contracted condition thereof, that it will have the desired optical characteristics when in final expanded condition thereof;

position-fixation means for seating the lens in the eye, said position-fixation means being constructed of substantially non-hydrophilic material so as to retain their shape and resiliency characteristics substantially independently of the liquid environment within the eye; and

connecting means for securing said hydrophilic optic means to said position-fixation means, said connecting means being constructed to permit expansion of said optic means from contracted to expanded condition thereof without resulting in any substantial movement being imparted to said position-fixation means, said connecting means being adapted to position said hydrophilic optic means generally centrally with respect to the optical axis of the eye, when said hydrophilic optic means is in said expanded condition thereof, and to permit seating of said position-fixation means within the eye irrespective of the size of said hydrophilic optic means between said contracted and expanded conditions thereof.

4,710,195

POSTERIOR CHAMBER INTRAOCULAR LENS

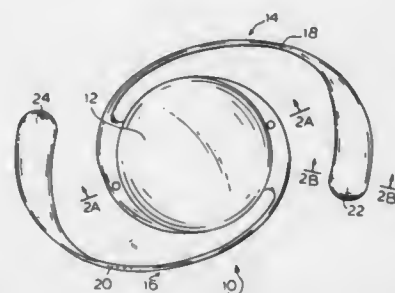
Vincent J. Giovinazzo, 299 Lighthouse Ave., Staten Island, N.Y. 10306

Filed Apr. 18, 1986, Ser. No. 853,551

Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

5 Claims



1. A posterior chamber intraocular lens usable as an implant in cataract patients, the lens comprising:
an optic capable of performing the focusing function of a human lens;
a first haptic having a substantially continuous surface and being connected to said optic;
a second haptic having a substantially continuous surface and being connected to said optic; and
a first blocking segment connected to said first haptic, said first blocking segment having a chord length of at least 1.5 mm and having a width of at least 1.5 mm and defining a substantially circumferentially linear segment for contacting eye tissue over substantially its entire length, said first blocking segment being curved and when, in an eye, positioned such that it is posteriorly convex;
said first blocking segment being sufficiently rigid to retain its shape;
said first and second haptics being sufficiently flexible to permit insertion of the lens behind a pupil while being sufficiently rigid to avoid bending or pulling in response to a negative pressure;
said first and second haptics both being vaulted in an anterior direction away from said optic.

4,710,196

INTRAOCULAR CRYSTALLINE LENS

Nikola G. Dyakov; Pravoslava T. Guguchkova-Yanchuleva, and Dimitar V. Benchev, all of Sofia, Bulgaria, assignors to V T P "Maimex", Sofia, Bulgaria

PCT No. PCT/BG85/00001, § 371 Date Sep. 5, 1985, § 102(e) Date Sep. 5, 1985, PCT Pub. No. WO85/02995, PCT Pub. Date Jul. 18, 1985

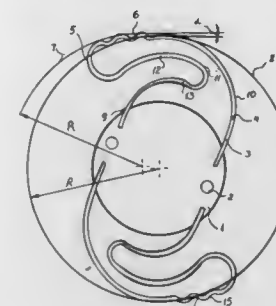
PCT Filed Jan. 4, 1985, Ser. No. 776,787

Claims priority, application Bulgaria, Jan. 5, 1984, 63804

Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

2 Claims



1. An implantable intraocular lens assembly comprising:
a circular crystalline lenticular body formed with a pair of mutually parallel frontal apertures traversing opposite lens surfaces, and two pairs of mutually parallel lateral apertures opening along the circumference of said lenticular body; and
two asymmetric elastic loops disposed symmetrically with respect to a center of said body for affixing the lens assembly to and eye surface surrounding said assembly, each of said loops:
having respective mutually parallel straight portions received in the lateral apertures of a respective one of said pairs,
being continuously curved between said straight portions, having outwardly convexly curved inner and outer portions diverging toward a bight in the form of a circular arc

segment with a radius of 0.3 to 0.8 mm with said outer portion being progressively of increasing spacing from said circumference away from a respective straight portion and constituting a supporting sector engageable with said eye surface,

being so formed with said supporting sector that said supporting sector has an enveloping circumference with a radius of curvature R equal to that of said eye surface and intersected by a circle concentric with said body such that tangents to said circle and enveloping circumference at a point of intersection include an angle of 1.5° to 7.5° , being constructed so that said supporting sector and said bight are connected respectively by connecting sectors to said straight portions, said connecting sectors having the same elasticity, and
said supporting sector has a wavy configuration with at least two outwardly convex parts alternating with at least two outwardly concave parts.

4,710,197

INTRAOCULAR-EXTERNAL LENS COMBINATION SYSTEM AND METHOD OF USING SAME

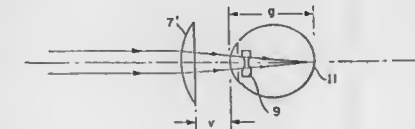
Anthony Donn, 635 W. 165th St., New York, N.Y. 10032, and Charles J. Koester, 60 Kent Rd., Glen Rock, N.J. 07452

Filed Oct. 30, 1981, Ser. No. 316,920

Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

34 Claims



28. A negative-powered intraocular lens sized and shaped for implantation in the eye, said lens providing greater than a 2X magnification power of the retinal image when used in combination with an external positive lens and a field of view of at least 27° .

CHEMICAL

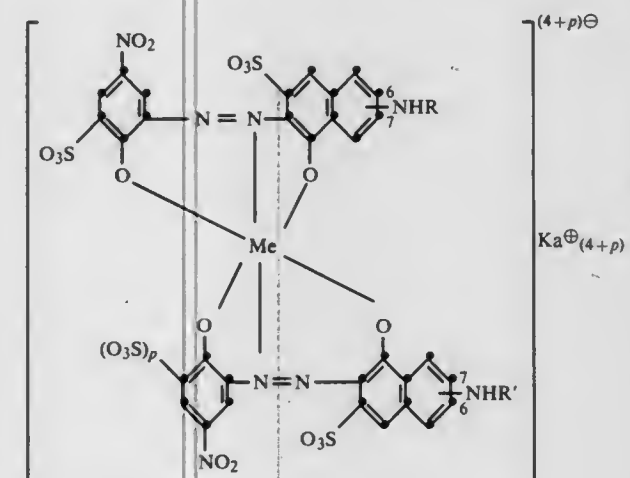
4,710,198 1:2 CHROMIUM OR COBALT METAL COMPLEX DYES AND USE THEREOF FOR DYEING LEATHER

Fabio Beffa, Riehen, and Hans U. Schütz, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Dec. 9, 1985, Ser. No. 806,871

Claims priority, application Switzerland, Dec. 17, 1984, 5995/84

Int. Cl.⁴ C09B 29/30, 45/14; D06P 1/10, 3/24
U.S. Cl. 8—437 9 Claims

1. A process of dyeing leather which comprises contacting said material with a dye of the formula



wherein

Me is cobalt or chromium,

Ka⁺ is a cation,

p is 0 or 1,

R and R' are each independently of the other hydrogen or a group of the formula —CO—(O)_n—Y, where n is 0 or 1, and

Y is C₁—C₅alkyl, or phenyl which may be substituted by nitro, halogen, C₁—C₅alkyl or C₁—C₅alkoxy, with the proviso that R and R' may not both be hydrogen, —COCH₃ or —COC₂H₅ if p is 1.

4,710,199 METHOD OF DYEING AN OPTICAL ARTICLE

Hans R. Suter, Wangen, Switzerland, assignor to Roag (AG), Illnau, Switzerland

Continuation-in-part of Ser. No. 740,851, Jun. 3, 1985, abandoned. This application May 19, 1986, Ser. No. 864,716

Int. Cl.⁴ D06P 5/00
U.S. Cl. 8—507 4 Claims

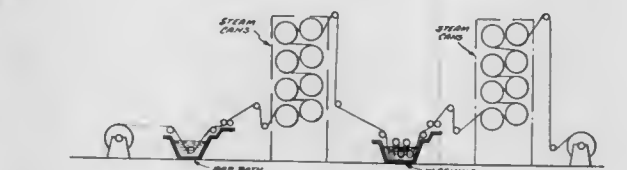
1. A method of dyeing an optical article of plastic, comprising the steps of immersing said article in a dyeing solution in a tank, subjecting said dyeing solution to heating energy exclusively via a side wall of said tank, and to ultrasonic energy via the bottom wall of said tank, said ultrasonic energy having a frequency range of 25,000 to 60,000 hertz to excite the particles of dye continuously within the dyeing solution and to constantly and consistently agitate said solution, maintaining said article in said solution until the desired tint is obtained, removing the article from the solution and then rinsing and drying the article.

4,710,200 PROCESS FOR THE CONTINUOUS DYEING OF POLY(M-PHENYLENE-ISOPHTHALAMIDE) FIBERS

Barbara J. Cates, and Tanya E. FitzGerald, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed May 14, 1986, Ser. No. 863,038

Int. Cl.⁴ C09B 67/00 24 Claims



1. A process for continuously dyeing a poly(m-phenyleneisophthalamide) fiber, comprising the steps of:

- (1) contacting a dyeable poly(m-phenyleneisophthalamide) fiber with a solution of a dye dissolved in an organic swelling agent adapted to swell said fiber and selected from the group consisting of N-methylpyrrolidone, dimethylsulfoxide, and dimethylacetamide, and a diluent, selected from the group consisting of water, xylene, ethylene glycol, lower alcohols and 4-butyrolactone in which the weight ratio of swelling agent to diluent is from about 70:30 to 90:10, the solution maintained at a temperature in the range of about 65° F. to about 200° F.;
- (2) heating the poly(m-phenyleneisophthalamide) fiber treated in step (1) to fix said dye to said fiber;
- (3) washing the fiber to remove any residual dye and organic swelling agent; and
- (4) drying the fiber.

4,710,201 MODIFIED SUCCINIMIDES (IX)

Thomas F. Buckley, Hercules, Calif., assignor to Chevron Research Company, San Francisco, Calif.

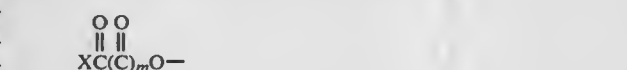
Division of Ser. No. 904,086, Sep. 4, 1986, which is a continuation-in-part of Ser. No. 820,457, Jan. 17, 1986, abandoned. This application Mar. 20, 1987, Ser. No. 28,351

Int. Cl.⁴ C10L 1/18, 1/22 39 Claims

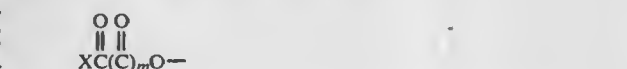
1. A fuel composition comprising a hydrocarbon boiling in the gasoline or diesel range and from about 10 to 10,000 parts per million of a product produced by the process which comprises contacting at a temperature sufficient to cause reaction a polyamino alkenyl or alkyl succinimide having at least one primary or secondary amino group with a compound of the Formula V:



wherein R₄ is selected from the group consisting of a divalent hydrocarbyl of from 2 to 30 carbon atoms with the proviso that the hydrocarbyl carbon atom bound to one



group is not also bound to the other



group and —R₅—OR₅—p wherein R₅ is alkylene of from 2 to

5 carbon atoms and p is an integer of from 1 to 100; X is selected from the group consisting of bromo, chloro and —OR₆ wherein R₆ is selected from the group consisting of alkyl of from 1 to 6 carbon atoms, phenyl and phenyl substituted with 1 to 2 substituents selected from the group consisting of chloro, bromo, nitro, alkyl of from 1 to 6 carbon atoms and trifluoromethyl; and m is independently an integer of from 0 to 1 and wherein the molar charge of the compound of Formula V to the basic nitrogen of the polyamino alkenyl or alkyl succinimide is from about 0.1:1 to about 0.5:1.

4,710,202

APPARATUS FOR GASIFYING PULVERIZED COAL

Peter Gühler, Rolf Mangler, Manfred Schingnitz, all of Freiberg; Wolfgang Seidel, Oberbobritzsch; Friedrich Berger, Brand-Erbisdorf, all of German Democratic Rep.; Ernest Gudymov, Moscow, U.S.S.R.; Vladimir Semenov, Moscow, U.S.S.R.; Vasilij Fedotov, Moscow, U.S.S.R., and David Gamburg, Moscow, U.S.S.R., assignors to Brennstoffinstitut Freiberg, Freiberg, German Democratic Rep.

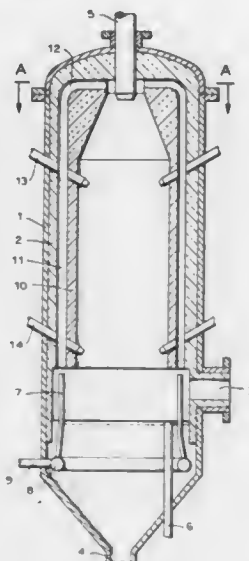
Filed Nov. 7, 1986, Ser. No. 928,750

Claims priority, application German Democratic Rep., Nov. 12, 1985, 2827492

Int. Cl.⁴ C10J 3/48

U.S. Cl. 48—73

13 Claims



1. An apparatus for gasifying pulverized coal, the apparatus comprising:

- a housing having a top, a lower part with a bottom, a granulated slag discharge opening in said bottom, and a producer gas outlet opening in said lower part;
- a layer of thermal insulation lining said housing;
- a pulverized coal burner extending axially through said top and being formed to produce a flame for gasifying coal to provide a producer gas;
- a layer of heat-resistant lining located above said producer gas outlet opening and defining a discharge area, said pulverized coal burner having an extended portion extending axially into said discharge area so as to direct said flame axially downward further into said discharge area, said discharge area having an upper space radially surrounding said extended portion of said pulverized coal burner;
- a plurality of ducts arranged between said heat-resistant lining and said thermal insulation and each having an outlet opening communicating with said upper space of said discharge area and having an inlet opening, each of said ducts extending horizontally from said outlet opening and then bending vertically downward to terminate at said inlet opening;

means for injecting steam into said inlet opening of each of said ducts; and
means for cooling the producer gas and including a plurality of cooling medium supply nozzles arranged in said housing and extending into said discharge area.

4,710,203

ELECTROSTATIC PRECIPITATOR ELECTRODE

Willi Bätza, Offenbach, and Werner Rösch, Oberursel, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

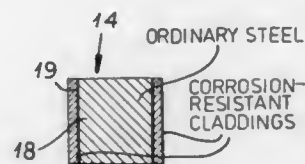
Filed Jan. 10, 1986, Ser. No. 818,126

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501155

Int. Cl.⁴ B03C 3/04, 3/41, 3/47

U.S. Cl. 55—2

1 Claim



1. A method of operating an electrostatic precipitator for the removal of pyrophoric dust from a gas, comprising the steps of:

- (a) forming corona-discharge electrode assemblies by tensioning corona-discharge electrode strips each composed of a sheet steel core clad on opposite sides with a corrosion-resistant steel and cut from sheet metal having an overall thickness of 1.5 to 2 mm and a cladding thickness of 8 to 12% of the overall thickness, in a frame, said corrosion-resistant steel cladding being resistant to spalling induced by pyrophoric reaction of deposits on said electrodes and selected from the group which consists of:
 - (a₁) titanium or niobium stabilized steel with 10 to 18% by weight chromium, up to 0.1% by weight carbon, up to 1.0% by weight silicon, up to 1% by weight manganese, the balance being iron and unavoidable impurities which do not affect the properties of the composition,
 - (a₂) titanium or niobium stabilized steel with 16 to 20% by weight chromium, 7 to 12% by weight nickel, up to 0.1% by weight carbon, up to 1% by weight silicon, up to 2% by weight manganese, the balance being iron and unavoidable impurities, and
 - (a₃) a steel with 26 to 28% by weight chromium, 4 to 5% by weight nickel, 1.3 to 2% by weight molybdenum, up to 0.1% by weight carbon, up to 2% by weight manganese, the balance being iron and unavoidable impurities;
- (b) juxtaposing said assemblies with collector electrodes; and
- (c) electrostatically precipitating pyrophoric dust by electrostatically energizing said electrodes and passing said dust between said collector electrodes and said corona-discharge electrodes at a temperature of substantially 150° C. to 250° C.

4,710,204

POLYPHOSPHAZENE GAS SEPARATION MEMBRANES

Menahem A. Kraus, St. Louis, and Milton K. Murphy, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1983, Ser. No. 566,244

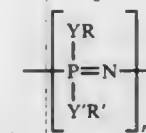
Int. Cl.⁴ B01D 53/22

U.S. Cl. 55—16

2 Claims

1. A process for separating acid gases from non-acid gases comprising:
contacting a gaseous feed mixture of acid gases and non-acid gases with a first surface of a separation membrane comprising polyphosphazenes having a preferential selectivity

and permeability for the acid gases and represented by the formula:



where n is between about 100 and about 70,000; where Y and Y' are the same or different and are comprised of oxygen, sulfur or nitrogen; R and R' are the same or different and are comprised of alkyl, aryl, substituted alkyl, or substituted aryl groups, each group having from 1 to about 25 carbon atoms;
maintaining a second surface of the polyphosphazene membrane at a lower chemical potential for the acid gases than the chemical potential at the first surface;
permeating the acid gases into and through the polyphosphazene membrane; and
removing from the vicinity of the second surface a permeated product having a greater concentration of acid gases relative to non-acid gases than contained in the gaseous feed mixture.

4,710,205

STABILIZED LIQUID FILMS

David W. Deetz, Apple Valley, and Maurice M. Kreevoy, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 16, 1987, Ser. No. 25,920

Int. Cl.⁴ B01D 53/22

U.S. Cl. 55—158

22 Claims

1. A stabilized immobilized liquid membrane (ILM) for transporting at least one gaseous species of interest comprising: a composite membrane structure further comprising an ultra-thin membrane skin having microscopic pores therein characterizing an anisotropic microporous film and a relatively thick macroporous support substrate carrying said ultra-thin membrane skin; and
a quantity of liquid transport medium contained in the pores of said ultra-thin membrane skin.

4,710,206

ATMOSPHERE CONTROLLING PROCESS FOR FOOD STORAGE

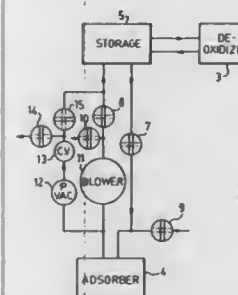
Ronald C. Allen, 654 Geneva St., St. Catharines, Ontario, Canada L2N 2J8, and V. Sajur, 49 Arthur St., St. Catharines, Ontario, Canada L2M 1H1

Filed Jul. 7, 1986, Ser. No. 883,041

Int. Cl.⁴ B01D 53/04

U.S. Cl. 55—58

5 Claims



1. A process for removing undesirable gasses from mixed gasses in a storage chamber with minimal variation in pressure within the storage chamber comprising the following sequence of steps:

- (a) circulating the mixed gasses through an adsorber cham-

- ber to remove the undesirable gasses for a first period of time;
- (b) shutting off the adsorber chamber inlet from the storage chamber;
- (c) reducing the pressure in the adsorber chamber by expelling a portion of the gas in the adsorber chamber into the storage chamber;
- (d) shutting off the adsorber chamber outlet to the storage chamber;
- (e) opening the adsorber chamber inlet and outlet to the ambient atmosphere and flushing the adsorber chamber with air from the ambient atmosphere;
- (f) shutting off the adsorber chamber inlet from the ambient atmosphere and reducing the pressure in the adsorber chamber by expelling portion of the gas in the adsorber chamber to the ambient atmosphere;
- (g) shutting off the adsorber chamber outlet to the ambient atmosphere;
- (h) opening the adsorber chamber inlet and outlet to the storage chamber and repeating the steps starting at step (a).

4,710,207

AIR FILTERING APPARATUS WITH ROLLER ASSEMBLY FOR CLEANING

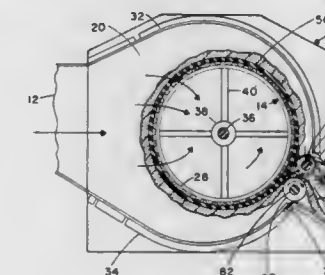
Paul W. Bodovsky, Sherman, and Donald H. Rodgers, Dennison, both of Tex., assignors to Continental Conveyor & Equipment Co., Inc., Winfield, Ala.

Continuation of Ser. No. 415,867, Sep. 8, 1982, abandoned, which is a continuation of Ser. No. 248,148, Mar. 30, 1981, abandoned. This application Jan. 30, 1984, Ser. No. 575,132

Int. Cl.⁴ B01D 46/04

U.S. Cl. 55—290

1 Claim



- 1. Apparatus for filtering air including a chamber, a drum mounted for rotation within said chamber, filtering media secured to the cylindrical surface of said drum, means to cause a flow of particle laden air into said chamber and into contact with said filtering media and to cause a flow of clean air from within said drum to exterior of said drum and said chamber, means to remove bat formed of filtered particles from the filtered media on the surface of said drum including a compression seal roller mounted for rotation out of contact with said drum but at a distance to contact and remove bat therefrom, a doffing roller having flights made of flexible sheet material extending across the drum, each of said flights of said doffing roller having forwardly disposed faces, said doffing roller mounted for rotation to have said forwardly disposed faces of said flights contact said drum to assist in removing bat from said drum, a wiper roller having rigid flights made of sheet material extending across the wiper roller and mounted for rotation in the same direction as the flights of said doffing roller whereby said rigid flights will contact said forwardly disposed faces of said doffing roller to direct bat away from said doffing roller and to preclude bat from

being rotatably transported back towards said filtering media on said drum surface by said doffing roller, and means to rotate said drum, doffing roller and wiper roller in a first direction of rotation and to rotate said seal roller in a direction of rotation opposite from said first direction of rotation.

4,710,208

SUSPENDABLE MODULAR FRAME ARRANGEMENT FOR CLEAN ROOM CEILINGS HAVING A FLUID SEAL Wolf Ziemer, Berlin; Fritz Neubert, Kissing, and Wilhelm Hölle, Münzenberg, all of Fed. Rep. of Germany, assignors to Fläkt AB, Nacka, Sweden

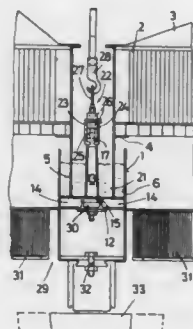
Filed Dec. 27, 1985, Ser. No. 814,227

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1984, 3447901

Int. Cl.⁴ B01D 46/00

U.S. Cl. 55—355

17 Claims



1. Modular frame arrangement for clean room ceilings suspendable from the ceiling of a room for receiving filters comprising: a sealing fluid; at least two structural rails intersecting at a given angle to each other and each having U-section channels facing up for receiving the fluid and provided with a lower web having at least one hollow chamber extending longitudinally of the rail and an upstanding central web; and an angular connection member for connecting the structural rails comprising a central part having a tube guide passing from the top to the bottom therethrough, and at least two arms integrally formed to project out laterally from said central part at said given angle to each other, each arm having an upwardly-facing channel for said sealing fluid, said channels of the arms being interconnected to interconnect said U-section channels of the intersecting rails, the lower surfaces of the arms being offset upwardly from the lower surface of said central part to form upright abutment surfaces, said arms being engaged in the U-section channels of said rails respectively so that the ends of said lower web hollow chambers confront said abutment surfaces.

4,710,209

MOISTURE TRAP FOR FLUID SUCTION EQUIPMENT, IN PARTICULAR AS EMPLOYED IN DENTISTRY Augusto Cattani, Parma, Italy, assignor to Officine Agusto Cattani & C. S.p.A., Parma, Italy

Filed Jun. 19, 1986, Ser. No. 876,271

Claims priority, application Italy, Jul. 31, 1985, 40080 A/85

Int. Cl.⁴ B01D 45/16, 45/08, 51/00

U.S. Cl. 55—418

4 Claims

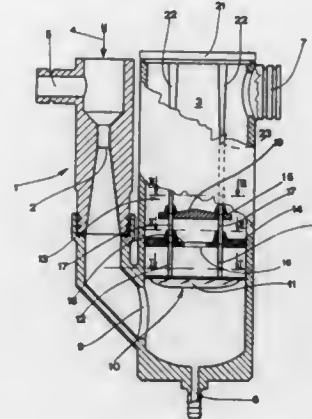
1. A moisture trap for separating liquid and air from a fluid suspension of air and liquid, for use with fluid suction dental equipment, comprising:

a generally cylindrical, vertical separation chamber for separating liquid and air from a fluid suspension of air and liquid, sealed by a concave interior bottom wall and a top wall including a removable flanged lid, said chamber having an inlet located at a lower portion of the cylindrical sidewall of said chamber, a liquid outlet located at the

lowest level of said concave interior bottom wall, and an air outlet located at an upper portion of the cylindrical sidewall opposite said inlet;

an intake for a fluid suspension of air and liquid including a venturi duct, said intake in fluid communication with said inlet;

a circular separator baffle disk having opposite edges bent downward, said disk positioned within said separation chamber to substantially block said chamber above said inlet;



a circular peripheral baffle disk having a central opening, said peripheral baffle positioned above said separator baffle disk within said separation chamber;

a circular core baffle disk having an outside diameter smaller than said peripheral baffle disk, said core baffle disk positioned above said peripheral baffle disk within said separation chamber; and

mounting means for securing said baffle disks to each other at a fixed distance and relative orientation, said mounting means secured to said removable flanged lid to secure said disks at a fixed position within said separation chamber.

4,710,210

CRYOGENIC PROCESS FOR THE REMOVAL OF ACIDIC GASES FROM MIXTURES OF GASES BY USING SOLVENTS

Luigi Gazzi, Milan, and Carlo Rescaldi, San Donato Milanese, both of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

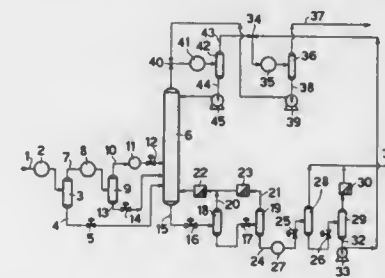
Filed May 16, 1986, Ser. No. 863,875

Claims priority, application Italy, May 24, 1985, 20890 A/85

Int. Cl.⁴ F25J 3/02

U.S. Cl. 62—17

6 Claims

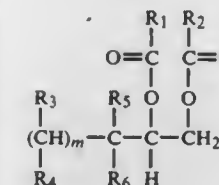
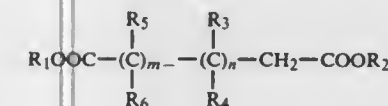


1. Cryogenic process for the removal of acidic gases from natural gases or from synthesis gases essentially comprising an absorption in one or more towers in order to reduce the content of acidic gases, a cooling carried out, in the case of one single absorber tower, upstream the same tower, or, in case of two absorber towers, between the same towers, a regeneration of the solvent or of the solvents used in the absorption, the

solvent or the solvents used being selected among low molecular weight esters, alcohols and ethers, belonging to the following classes:

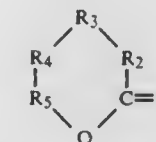
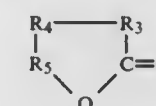
esters of alcohols of general formula R_1COOR_2 , wherein R_1 and R_2 are alkyl groups of from 1 to 4 carbon atoms, equal to or different from each other, wherein one or more hydrogen atoms can be substituted by alcoholic groups;

esters of glycols of general formula



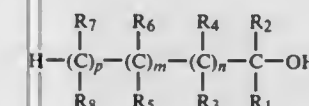
wherein R_1 and R_2 are alkyl groups having from 1 to 3 carbon atoms, equal to or different from each other, R_3 , R_4 , R_5 , R_6 , equal to or different from each other, are either alkyl groups containing from 1 to 3 carbon atoms or hydrogen atoms, m and n are integers which can have the value 0 or 1;

cyclic esters (lactones) of formula



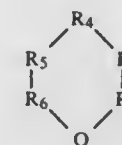
wherein R_2 , R_3 , R_4 , R_5 , equal to or different from each other, are alkylene groups wherein one or more hydrogen atoms can also be substituted by alkylic, alcoholic or ether groups;

alcohols of general formula



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , equal to or different from each other, are alkyl groups having from 1 to 3 carbon atoms or hydroxy groups or hydrogen atoms, m , n and p are integers which can assume the values 0 and 1;

cyclic ethers such as



wherein R_2 , R_5 , R_6 , equal to or different from each other, are alkyl groups wherein hydrogen can also be substituted by alkyl or methoxy groups, R_3 is either an oxygen atom

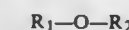
or an alkylene group wherein hydrogen can also be substituted by alkyl or methoxy groups, R_4 is either equal to R_3 or can be absent in case of a pentaatomic ring;

ethers of general formula



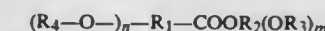
wherein R_1 is an alkyl group of from 1 to 4 carbon atoms, R_2 is either an alkyl group of from 1 to 4 carbon atoms or a hydrogen atom, R_3 is either an alkylene group or (CH_2-O-CH_2) , n is an integer which can have the value 0 or 1;

ethers of general formula



wherein R_1 and R_2 , either equal to or different from each other, are alkyl groups of from 1 to 4 carbon atoms, wherein one or more hydrogen atoms can be substituted by alcoholic groups;

ester-ethers, compounds containing both the functions, of formula:



wherein R_3 and R_4 , equal to or different from each other, are alkyl groups having from 1 to 4 carbon atoms, R_2 is an alkylene group having from 1 to 4 carbon atoms, R_1 is either equal to R_2 or equal to R_3 , m and n are integers which can have the value 0 or 1;

characterized in that the gas outcoming from one or more of the absorber towers is mixed once or more times with the solvent or solvents, the mixtures thus formed being then cooled, the solvent or solvents being thus separated from the same gas.

4,710,211

CRYOGENIC PROCESS FOR THE SELECTIVE REMOVAL OF ACIDIC GASES FROM MIXTURES OF GASES BY SOLVENTS

Luigi Gazzi, and Carlo Rescaldi, both of Milan, Italy, assignors to Snamprogetti S.p.A., Milan, Italy

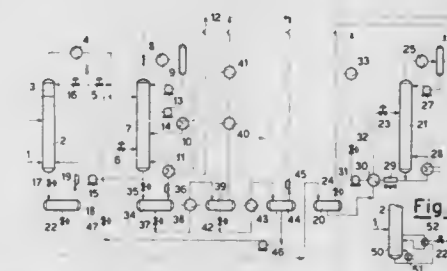
Filed May 16, 1986, Ser. No. 864,133

Claims priority, application Italy, May 24, 1985, 20887 A/85

Int. Cl.⁴ F25J 3/02

U.S. Cl. 62—17

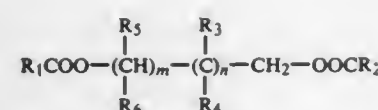
42 Claims



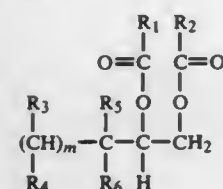
1. Cryogenic process for the selective removal of acidic gases from natural gases or from synthesis gases by adsorption in two towers and cooling of the gas outcoming from the first tower to the purpose of condensing a portion of the acidic gases contained in the same gas, characterized in that it uses a mixture constituted by one or more selective solvents selected among low molecular weight esters, alcohols and ethers of the following classes:

esters of alcohols of general formula R_1COOR_2 , wherein R_1 and R_2 are alkyl groups of from 1 to 4 carbon atoms, equal to or different from each other, wherein one or more hydrogen atoms can be substituted by alcoholic groups;

esters of glycols of general formula

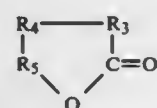


or

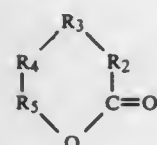


wherein R_1 and R_2 are alkyl groups having from 1 to 3 carbon atoms, equal to or different from each other, R_3 , R_4 , R_5 , R_6 , equal to or different from each other, are either alkyl groups containing from 1 to 3 carbon atoms or hydrogen atoms, m and n are integers which can have the value 0 or 1;

cyclic esters (lactones) of formula

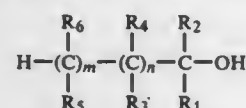


or



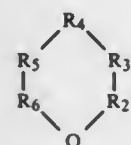
wherein R_2 , R_3 , R_4 , R_5 , equal to or different from each other, are alkylene groups wherein one or more hydrogen atoms can also be substituted by alkylic, alcoholic or ether groups;

alcohols of general formula



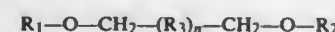
wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , equal to or different from each other, are alkyl groups having from 1 to 3 carbon atoms or hydroxy groups or hydrogen atoms, m and n are integers which can assume the values 0 or 1;

cyclic ethers such as



wherein R_2 , R_5 , R_6 , equal to or different from each other, are alkylene groups wherein hydrogen can also be substituted by alkyl or methoxy groups, R_3 is either an oxygen atom or an alkylene group wherein hydrogen can also be substituted by alkyl or methoxy groups, R_4 is either equal to R_3 or can be absent in case of a pentaatomic ring;

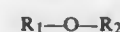
ethers of general formula



wherein R_1 is an alkyl group of from 1 to 4 carbon atoms,

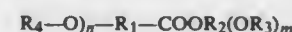
R_2 is either an alkyl group of from 1 to 4 carbon atoms or a hydrogen atom, R_3 is either an alkylene group or $(CH_2-O-CH_2)_n$, n is an integer which can have the value 0 or 1;

ethers of general formula



wherein R_1 and R_2 , either equal to or different from each other, are alkyl groups of from 1 to 4 carbon atoms, wherein one or more hydrogen atoms can be substituted by alcoholic groups;

ester-ethers, compounds containing both the functions, of formula:



wherein R_3 and R_4 , equal to or different from each other, are alkyl groups having from 1 to 4 carbon atoms, R_2 is an alkylene group having from 1 to 4 carbon atoms, R_1 is either equal to R_2 or equal to R_3 , m and n are integers which can have the value 0 or 1,

and by one or more organic compounds selected from:

heptane,
fractions of natural gasolines containing hydrocarbons having a number of carbon atoms comprised within the range of from 5 to 8;

monoaromatic compounds having a number of paraffinic carbon atoms comprised within the range of from 2 to 4, bound to the benzene ring either separately or as one or more linear or branched side chains;

dimethylethers of polyglycols having the glycolic unit $-CH_2-CH_2-O-$ repeated from once to five times;

methoxy- and/or ethoxyalcohols, wherein the alcoholic group is a radical having from 1 to 4 carbon atoms in either linear or branched chain.

4,710,212

PROCESS TO PRODUCE HIGH PRESSURE METHANE GAS

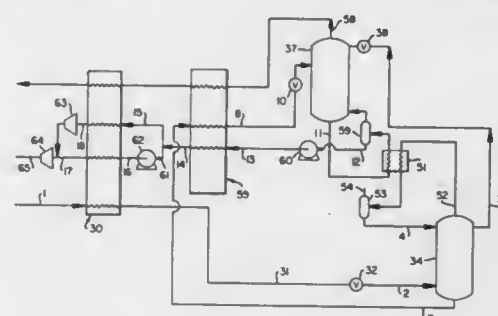
Thomas C. Hanson, Buffalo; Theodore F. Fisher, Tonawanda, and Joseph A. Weber, Cheektowaga, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 24, 1986, Ser. No. 911,142

Int. Cl.⁴ F25J 3/06

U.S. Cl. 62—23

9 Claims



1. A process to produce high pressure methane gas comprising:

- (A) cooling a gaseous feed comprising methane and nitrogen;
- (B) introducing cooled feed into the higher pressure column of a double column cryogenic rectification plant and producing methane-rich liquid therein;
- (C) withdrawing methane-rich liquid and passing said liquid into the lower pressure column of the double column rectification plant and producing methane liquid therein;
- (D) partially vaporizing methane liquid by indirect heat

exchange with top vapor from the higher pressure column, passing the resulting vapor to the lower pressure column and pumping remaining methane liquid to a higher pressure;

(E) warming pumped methane liquid and further pumping at least a portion of the warmed methane liquid to a still higher pressure; and

(F) heating resulting higher pressure methane by indirect heat exchange with said cooling gaseous feed to produce high pressure methane gas.

4,710,213

PROCESS FOR SEPARATING CO₂ FROM A GASEOUS MIXTURE

Rainer Sapper, Neuried, and Helmut Kick, Irschenhausen, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

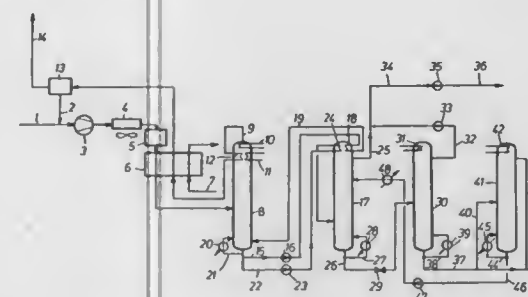
Filed Mar. 20, 1986, Ser. No. 841,635

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1985, 3510097

Int. Cl.⁴ F25J 3/02

U.S. Cl. 62—28

27 Claims



1. In a process for separating CO₂ from a gaseous mixture containing CO₂ and light hydrocarbons by multistage distillation, wherein the gaseous mixture to be fractionated is separated in a first fractionating stage into overhead fraction containing essentially all of the C₁ and C₂ hydrocarbons, as well as a portion of the CO₂, and into a bottoms fraction containing essentially all of the C₃+ hydrocarbons and the largest portion of the CO₂, and the bottoms fraction is separated, in a second fractionating stage, into a CO₂ fraction and into a C₃+ hydrocarbon fraction, the improvement comprising that the second fractionating stage is operated under a higher pressure than the first fractionating stage, and at least part of the bottoms heating of the first fractionating stage is effected by liquid withdrawn from the bottoms, which liquid is heated while cooling the head of the second fractionating stage and is then recycled into the bottoms of the first fractionating stage.

4,710,214

PROCESS FOR SEPARATION OF HYDROCARBON GASES

Shanmuk Sharma, Houston; Donnie K. Hill, Woodlands, and Charles A. Durr, Houston, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Dec. 19, 1986, Ser. No. 944,272

Int. Cl.⁴ F25J 3/02

U.S. Cl. 62—28

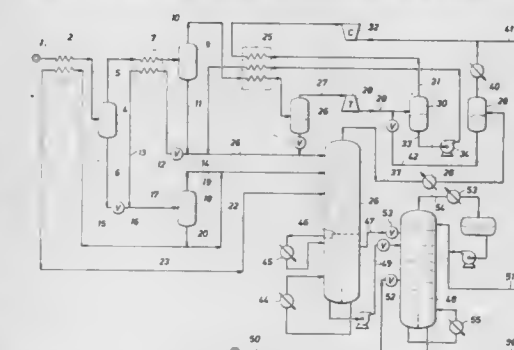
4 Claims

1. A process for separation of a high pressure gaseous stream containing mixed light hydrocarbons which comprises:

- (a) expanding the high pressure gaseous stream to a first intermediate pressure and introducing the resulting expanded stream to a first single equilibrium separation zone;
- (b) recovering a first vapor stream and a separate first liquid stream from the first single equilibrium separation zone;
- (c) elevating the first liquid stream to a second intermediate pressure;
- (d) recovering refrigeration from the first liquid stream at the second intermediate pressure through indirect heat

exchange by cooling the high pressure gaseous stream prior to its expansion thereby forming a revaporized stream from the first liquid stream at the second intermediate pressure and introducing the revaporized stream to a multi-equilibrium separation zone;

(e) recovering and cooling an ethane-containing gaseous mixture from the multi-equilibrium separation zone;



(f) introducing the cooled ethane-containing gaseous mixture to a second single equilibrium separation zone;

(g) recovering a second vapor stream and a separate second liquid stream from the second single equilibrium separation zone; and

(h) expanding the second liquid stream into the first single equilibrium separation zone.

4,710,215

PROCESS FOR DISTILLATION-CRYSTALLIZATION OF ZINC CARBONATE

Tatsushi Kasai; Tatsuo Niikura; Masanori Sato, all of Tokyo; Takao Hashimoto, and Akiya Yamashita, both of Ibaraki, all of Japan, assignors to Tsukishima Kikai Co., Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of Japan

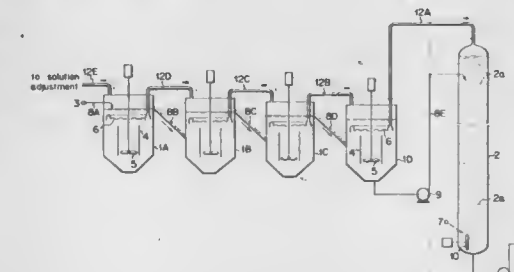
Filed Dec. 24, 1985, Ser. No. 813,103

Claims priority, application Japan, Dec. 28, 1984, 59-275231; Dec. 28, 1984, 59-275232; Dec. 28, 1984, 59-275233; Dec. 28, 1984, 59-275234; Dec. 28, 1984, 59-275236; Dec. 28, 1984, 59-275238

Int. Cl.⁴ B01D 3/08

U.S. Cl. 62—532

11 Claims



1. A process for the distillation-crystallization of basic zinc carbonate ($2ZnCO_3 \cdot 3Zn(OH)_2$ or $ZnCO_3 \cdot 3Zn(OH)_2 \cdot H_2O$) comprising:

- feeding a basic zinc ammonium carbonate ($Zn(NH_4)_4CO_3$) solution to a crystallizer or crystallizers so as to effect a certain degree of crystallization and form a slurry or solution having crystals therein;
- feeding the slurry or solution having crystals therein from a final crystallizer to a distillation column having a plurality of plates or trays so as to effect a final crystallization, passing vapor generated by heat applied to a bottom portion of the distillation column through a top portion of the column to a preceding crystallizer or crystallizers sequentially; and
- allowing the vapors to flow to a first crystallizer countercur-

rently with respect to the flow of the slurry or solution to the distillation column.

4,710,216

METHOD OF MAKING FLEXIBLE OPTICAL FIBER BUNDLE

Yuhō Harada; Tsutomu Maruyama; Yoshiyuki Kumakura, and Shigeo Kuwayama, all of Ohmiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Japan

Continuation of Ser. No. 485,285, Apr. 15, 1983, abandoned.

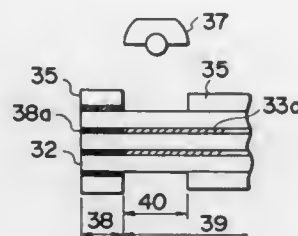
This application Dec. 12, 1985, Ser. No. 808,226

Claims priority, application Japan, Apr. 19, 1982, 57-65064; Mar. 24, 1983, 58-49614

Int. Cl.⁴ C03B 23/20, 37/10

U.S. Cl. 65—4.1

5 Claims



1. A method of making a flexible optical fiber bundle, which comprises the steps of:

- (i) forming an optical fiber bundle by bundling, heating and stretching a plurality of optical fibers each comprising a core glass, cladding glass having a refractive index lower than the refractive index of the core glass and coated on the core glass, and an acid-soluble borosilicate glass coated on the cladding glass;
- (ii) covering at least a portion of said optical fiber bundle with an acid-resistant material;
- (iii) treating the optical fiber bundle with an acid solution, then treating the optical fiber bundle with an alkali solution, and then treating the optical fiber bundle with an acid solution, thereby to remove acid-soluble borosilicate glass from the uncovered portion of the optical fiber bundle and form said uncovered portion into a flexible portion of the optical fiber bundle;
- (iv) charging a photosetting plastic resin exhibiting little change in volume during curing into interstices among the individual fibers at a part of the flexible portion of the optical fiber bundle proximate an interface between at least one covered portion of said optical fiber bundle and the flexible portion thereof from which said acid-soluble borosilicate glass has been removed, exposing a predetermined length of the part of said optical fiber bundle charged with photosetting plastic resin to light, one end of said predetermined length abutting said interface, and removing photosetting plastic resin from such length of the resin-charged part of the optical fiber bundle not exposed to light, thereby to form a boundary at the end of said resin-charged part of the optical fiber bundle opposite that end abutting said interface; and
- (v) forming a reinforcement around the periphery of at least a part of said bundle proximate said interface, by covering the periphery of at least a part of the bundle proximate said interface with a plastic resin of flexibility different from that of said plastic resin charged into said interstices among individual fibers of the optical fiber bundle.

4,710,217

BONDING GLASS-CERAMIC DENTAL PRODUCTS

Lorraine F. Bailey, Painted Post, N.Y., and Richard J. Bennett, Milford, Del., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 10, 1986, Ser. No. 837,729

Int. Cl.⁴ C03C 17/00; A61C 5/08

U.S. Cl. 65—31

8 Claims

1. A method for developing a bond exhibiting a shear strength in excess of 1200 psi between dental cements and etched fitting surfaces of dental appliances prepared from glass-ceramic materials wherein the exterior surface of the appliance is protected during the etching of the fitting surface, said method comprising the steps of:

- (a) contacting at a temperature not exceeding about 150° F. the fitting surface of a dental appliance prepared from a glass-ceramic material consisting essentially, expressed in terms of weight percent on the oxide basis, of 10–18% K₂O, 14–19% MgO, 0–2% Al₂O₃, 0–7% ZrO₂, 55–65% SiO₂, and 4–9% F with an etchant in flowable gel form for a period of time adequate to promote differential etching of said fitting surface whereby the glass phase is removed to produce a tortuous path around the crystals of said glass-ceramic materials to provide a bonding surface having a depth of about 0.25–5 microns with holes resulting from said etching having diameters of about 0.35–10 microns dispersed throughout, said etchant consisting of an aqueous 5–20% NH₄HF₂ solution and said gel exhibiting a viscosity between 3000–8000 centipoises;
- (b) removing the gelled etchant from the fitting surface of the appliance;
- (c) contacting the etched surface of the appliance with a silane solution for a period of time adequate to promote impregnation of the holes in said surface;
- (d) removing the excess silane solution from the etched surface and drying and curing the residual silane; and thereafter
- (e) applying a dental cement to the etched surface and curing the cement in place.

4,710,218

TAKE-OUT TONG HEAD ASSEMBLY

Serse Giberti-Fornaciari, Garza Garcia, Mexico, assignor to Vidriera Monterrey, S.A., Monterrey, Mexico

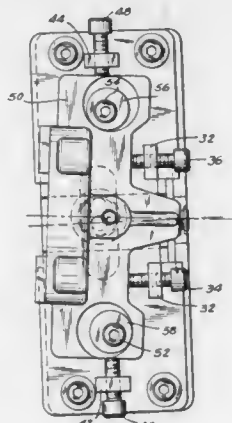
Filed Dec. 11, 1985, Ser. No. 808,354

Claims priority, application Mexico, Dec. 14, 1984, 203756

Int. Cl.⁴ C03B 9/44

U.S. Cl. 65—260

3 Claims



1. A take-out tong head assembly for a glass blowing machine of the type including tongs for gripping and holding a blown article during its transfer from a blow mold to a cooling plate, including:

- at least one pair of tongs supported for movement towards

and away from each other on opposite sides of a central vertical axis;
means for effecting movement of said tongs to alternatively grip and release an article of blown glassware formed in said glass blowing machine;
a first support on which said tongs and said means for movement of said tongs are mounted;
a second support coupled to an arm of a take out mechanism, said arm being supported for oscillation angularly from the position of the blow mold to the position of cooling plate; and,
means for controllably adjusting the position of said first support relative to said second support for omnidirectional adjustment in a plane perpendicular to said vertical axis to permit co-axial alignment of said vertical axis to said tongs with a vertical axis of the blow mold in which said glass article has been formed.

4,710,220

BIOCIDAL PASTE

Hans Pischky, Lantertal, Fed. Rep. of Germany, assignor to Ciba-Geigy Corp., Ardsley, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,867

Claims priority, application Switzerland, Nov. 7, 1984, 5360/84

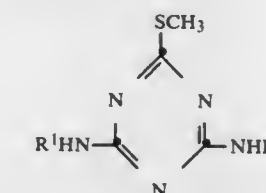
Int. Cl.⁴ A01N 25/00

U.S. Cl. 71—67

8 Claims

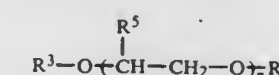
1. A water-free algicide preparation in paste form which consists essentially of:

- (a) an s-triazine of the formula I



wherein R¹ and R² independently of one another are each C₂–C₆-alkyl or C₃–C₆-cycloalkyl, and

- (b) at least one polyethylene glycol/polypropylene glycol condensate or one compound of the formula II



wherein R³ and R⁴ independently of one another are each a monovalent acyl radical of a saturated or unsaturated C₆–C₂₀-carboxylic acid, or are hydrogen, C₁–C₂₀-alkyl or phenyl, or phenyl substituted by one or two C₁–C₁₂-alkyl groups, and R⁵ is hydrogen or methyl, and wherein the index n is an integer between 1 and 10, and the weight ratio of component (a) to component (b) is 30:70 to 70:30.

4,710,219

PRODUCTION METHOD OF COMBINED PHOSPHORUS FERTILIZER AND SOIL CONDITIONER

Arvo Wahlberg, deceased, late of Soukan Rantatie 16C, 02360 Espoo, Finland, and by Anna-Maija Wahlberg, heiress

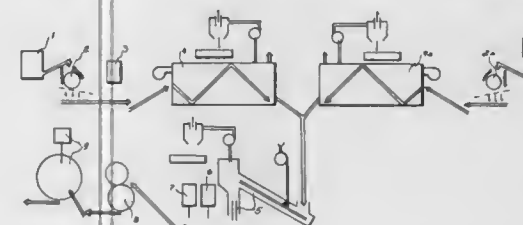
Filed Apr. 17, 1986, Ser. No. 853,354

Claims priority, application Finland, Apr. 17, 1985, 85 1525

Int. Cl.⁴ C05F 13/00; C05B 17/00

U.S. Cl. 71—11

13 Claims



1. A method for producing a combined phosphate fertilizer and soil conditioner without employing a mineral acid, which consists essentially of the steps of:

- (a) grinding a moist, acidic, organic waste material having a pH less than 5, a water content of at least 40% and lower calcium and phosphorous contents than the calcium and phosphorous contents of phosphate rock;
- (b) heating the acidic, organic waste material ground during step (a) to a temperature of 40° to 120° C. and at a pressure of 16 to 22 bar;
- (c) grinding phosphate rock to a particle size of 0.02 to 1 mm;
- (d) heating the phosphate rock ground during step (c) to a temperature of 50 to 800° C.;
- (e) combining the ground, acidic, organic waste material obtained during step (b) as the sole acidic reactant with the ground phosphate rock obtained during step (d) at a pressure of 20 to 55 bar to permit the ground, acidic, organic waste material and the ground phosphate rock to collide, to cause disintegration of the phosphate rock; and
- (f) cooling the mixture obtained during step (e) to 20° to 40° C. to obtain the desired product which contains almost all nutrient elements of phosphate rock.

4,710,221

HERBICIDAL SULFONAMIDES

Craig L. Hillemann, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

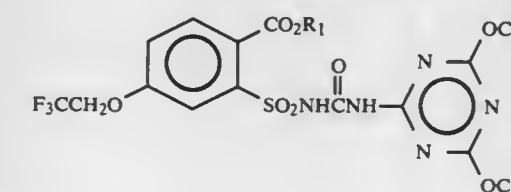
Continuation-in-part of Ser. No. 720,702, Apr. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 613,412, May 24, 1984, abandoned. This application Nov. 22, 1985, Ser. No. 801,165

Int. Cl.⁴ C07D 251/46; A01N 43/66

U.S. Cl. 71—93

12 Claims

2. A method for controlling the growth of undesired vegetation which comprises applying to the locus of a cotton crop an effective amount of the compound of the formula



wherein

R₁ is —CH₃ or —CH₂CH₃.

4,710,222

METHOD FOR REMOVAL OF PLUTONIUM IMPURITY FROM AMERICIUM OXIDES AND FLUORIDES

John R. FitzPatrick, Jerry G. Dunn, and Larry R. Avers, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 13, 1987, Ser. No. 14,324

Int. Cl.⁴ C22B 60/02; C01G 56/00

U.S. Cl. 75—84.1 R

5 Claims

1. A method for the removal of plutonium impurity from oxides and/or fluorides of americium which comprises the steps of:

- reacting impure americium oxides containing plutonium impurity with fluorine gas to produce impure AmF₄;
- reacting the resulting impure AmF₄ with O₂F to produce PuF₆; and
- separating the PuF₆ from the AmF₄.

4,710,223

INFILTRATED SINTERED ARTICLES

Daniel E. Matejczyk, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 21, 1986, Ser. No. 842,580

Int. Cl.⁴ B22F 3/00

U.S. Cl. 75—248

16 Claims

1. In a method for preparing a sintered powdered metal article comprising mixing powdered metal with a binder, forming the mixture to a desired shape, removing the binder from the formed shape by solvent extraction to form a rigid skeletal article, the improvement comprising:

- sintering the rigid skeletal article to a specific predetermined density, less than theoretical density, and thereby forming interstices within the article, according to the following sequential steps:
 - determining the article shrink factor as a function of initial batch composition, and as a function of article sintered density;
 - sintering at a combination of time and temperature to produce a selected article shrinkage during sintering;
 - using a refractory material fixture to further control article sintered dimensions;
 - using a refractory material heat shield surrounding the article during sintering to minimize thermal stresses; and
 - producing a rigid skeletal article having a density of from about 70% to about 90% of theoretical and a shrink factor of from about 10% to about 17% having final article dimensions controllable to about 1.0%;
- infiltrating the skeletal article with a metal infiltrant according to the following steps:
 - contacting the skeletal article with a metal infiltrant;
 - heating the skeletal article and the metal infiltrant under a reducing atmosphere to a temperature which is at least the melting point of the metal infiltrant;
 - maintaining the temperature for a time sufficient for the infiltrant to infiltrate the skeletal article;
 - cooling the infiltrated skeletal article to solidify the metal infiltrant;
- forming a metal infiltrant article; and
- recovering the infiltrated article so formed.

4,710,224

PROCESS FOR INTRODUCING BATH COMPONENTS INTO ELECTROLYTIC AND CURRENTLESS BATHS

Hasso Kaiser, Schwabische Gmund, Fed. Rep. of Germany, assignor to DEGUSSA Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 586,264, Mar. 5, 1984, abandoned. This application May 6, 1987, Ser. No. 47,495

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307901

Int. Cl.⁴ C23C 18/40

U.S. Cl. 106—1.23

1 Claim

1. A process for introducing bath components into a currentless bath for the deposition of copper or deposition of copper layers, comprising introducing a water soluble reducing agent which is hydrazine and together with an inert gas into the bath and admixing the bath components by flowing said gas.

4,710,225

REFRACTORY CEMENT

Robert A. Rucker, 25 Timberlake Dr., Orchard Park, N.Y. 14127

Filed May 23, 1986, Ser. No. 866,275

Int. Cl.⁴ C04B 7/32

U.S. Cl. 106—104

10 Claims

1. A refractory cement comprising refractory clay, ball clay and calcium aluminate cement mixed together in such amounts that said refractory cement is adapted to be air-cured to a hardened condition and which is non water soluble when in a hardened, cured condition, the refractory cement having a Tyler screen analysis of about 2 percent to 6 percent +40 mesh, 20 percent to 35 percent +70 mesh, 10 percent to 15 percent +100 mesh and 40 percent to 60 percent -100 mesh, the percentage by weight of the refractory clay in the composition of said refractory cement is in the range from about 50 percent to 70 percent, and the percentage by weight of the ball clay in the composition of said refractory cement is in the range from about 10 percent to 30 percent.

4,710,226

FLUIDIZATION OF LIMESTONE SLURRIES AND RESULTANT PRODUCTS

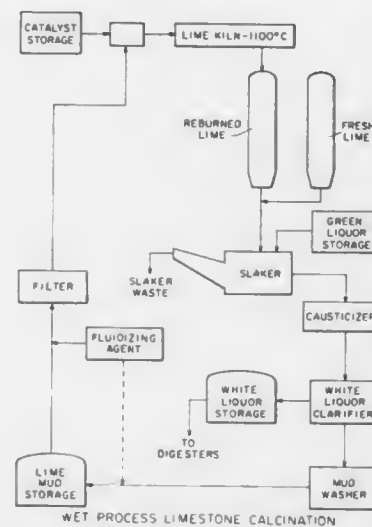
William A. Mallow, Helotes, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 8, 1986, Ser. No. 849,384

Int. Cl.⁴ C04B 2/06

U.S. Cl. 106—119

10 Claims



1. The method of treating a limestone slurry to remove water therefrom comprising admixing therewith at least about 0.25 part by weight of a fluidizing agent for each 100 parts by

weight of solids in said slurry, said fluidizing agent consisting essentially of a micelle-forming surfactant and a protective colloid in a ratio of from about 2:1 to 1:2 by weight, and then removing water from the slurry.

8. A fluidizing agent for dewatering a limestone slurry consisting essentially of a micelle-forming surfactant capable of coating lime and a protective colloid selected from a mixture of linolenic and oleic acids and rosen acids and mixtures of fatty acids in a ratio of from about 2:1 to 1:2.

4,710,228

EDIBLE COATING COMPOSITION AND METHOD OF PREPARATION

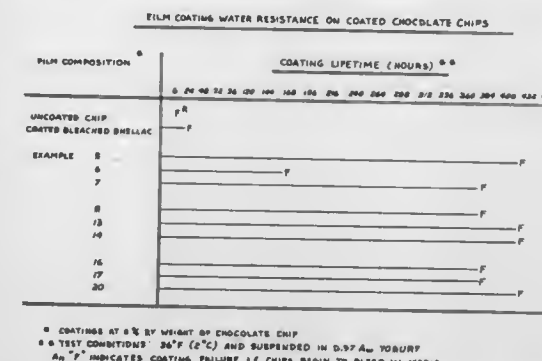
Jonathan Seaborne, Corcoran, and David C. Egberg, Plymouth, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Oct. 16, 1985, Ser. No. 788,178

Int. Cl.⁴ C08L 89/00; C09F 1/00; C08G 8/34

U.S. Cl. 106—218

12 Claims



1. An edible coating polymer having a low water vapor permeability, comprising the heat cured reaction product of: a refined, carbon filtered, unbleached, edible, virgin shellac, and wherein the product has an average molecular weight ranging from about 1,500 to 6,000

4,710,227

DISPERSION PROCESS FOR CERAMIC GREEN BODY

A. Dale Harley, Midland, Mich.; Lawrence G. Duquette, Maynard, Mass.; Issam A. Khoury, Southboro, Mass., and Iwao Kohatsu, Lexington, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 28, 1986, Ser. No. 856,879

Int. Cl.⁴ C08L 1/08; C03C 3/00; C04B 35/46

U.S. Cl. 106—193 R

63 Claims

- A process comprising:
 - forming a hydrolyzable solution of a first group of alkoxides comprising at least one compound characterized as A(OR)_x, wherein A is at least one metal selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ge, Pb, Sb and Bi, a second group of alkoxides comprising at least one compound characterized as B(OR)_x, wherein B is at least one metal selected from the group consisting of Ti, Zr, Sc, Y, La, Nb, Fe, Ta, W, Mn, Sn, Mg, and Zn, and wherein R is a compound characterized as C_yH_z wherein y is an integer from 1 to 10, z is an integer selected from the group consisting of 2y, 2y+1 and 2y-1, and x is an integer from 1 to 7, such that said first and second groups of alkoxides are suitable to be hydrolyzed to form a compound characterized as ABO₃, and an alcohol suitable to dissolve said first and second groups of alkoxides;
 - hydrolyzing said hydrolyzable solution to form a hydrolyzed dispersion of said compound characterized as ABO₃ in said alcohol;
 - concentrating at least a portion of said dispersion to a sediment;
 - admixing a binder solution, a plasticizer, and a release agent with said sediment to make a ceramic slip formulation; and
 - preparing a ceramic green body from said slip formulation.

4,710,229

POWDERED BITUMEN CONCENTRATE AND ITS USE

Karl H. Muller, Bruchkobel, and Walter Barthel, Langenselbold, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

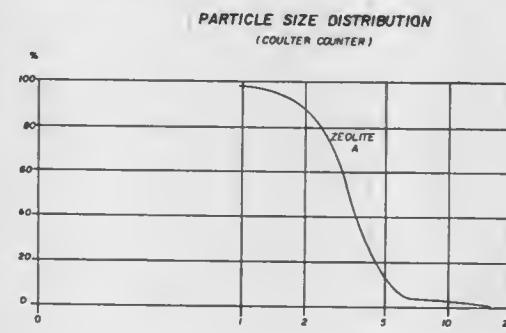
Filed Feb. 10, 1986, Ser. No. 827,719

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505051

Int. Cl.⁴ C08L 95/00

U.S. Cl. 106—281 R

14 Claims



1. A powdered bitumen concentrate containing a mixture consisting of bitumen, synthetic silica and at least one synthetic zeolite.

4,710,230 PIGMENT PASTE

Noboru Okoshi, Sodegaura; Masatoshi Motomura, Ichihara; Mitsuru Ohtsubo, Kisarazu, and Takenori Ikeda, Ichihara, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

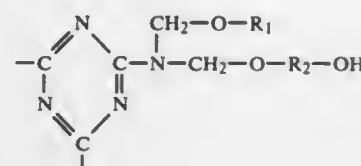
Filed Apr. 21, 1986, Ser. No. 854,398

Claims priority, application Japan, Apr. 25, 1985, 60-89286
Int. Cl.⁴ C09C 3/00

U.S. Cl. 106—308 N

10 Claims

1. A pigment paste comprising a pigment and as a pigment dispersing agent, a compound having a basic structure represented by the following formula



wherein R₁ represents a hydrogen atom or a C₁–C₄ alkyl group, and R₂ represents a residue of a diol or polyol, or a mixture of said pigment dispersing agent and an organic solvent, said pigment being dispersed in said pigment dispersing agent or in said mixture in an amount such that the pigment weight concentration (PWC, weight %) as defined by

$$\text{PWC (\%)} = \frac{\text{Weight of the pigment}}{\text{Weight of the pigment} + \text{dispersing agent} + \text{solids weight of the pigment}} \times 100$$

is 0.5 to 99.5% by weight.

4,710,231

SOLID FRUCTOSE

John R. Bateman, Frilsham; Brita C. Goodacre, Sonning, and Alan Smithson, Reading, all of England, assignors to Tate & Lyle Public Limited Company, England

Filed Jan. 6, 1984, Ser. No. 568,584

Claims priority, application United Kingdom, Jan. 7, 1983, 8300333; Nov. 7, 1983, 8329647

Int. Cl.⁴ F24B 3/00

U.S. Cl. 127—30

19 Claims

1. A process for producing solid fructose, said process comprising dispersing a fructose syrup of at least 80 Brix and at least 90% fructose on a dry solids basis in an alcoholic medium to give solid fructose, said dispersion being effected at high shear of 2,000 to 200,000 s⁻¹ and said alcoholic medium being one in which fructose is soluble to the extent of 1 to 10 wt% at the temperature at which said syrup is dispersed in said alcoholic medium, said temperature being from 20 to 55 degrees C. and the medium to syrup ratio being up to 3 ml/g.

4,710,232

PROCESS FOR CLEANING METAL ARTICLES

John A. Tabbaz, 5396 Willow La. #E, Murray, Utah 84107

Filed Jan. 1, 1984, Ser. No. 616,203

Int. Cl.⁴ B08B 3/12

U.S. Cl. 134—1

12 Claims

1. A process for cleaning metal articles which have an undesirable, dirty residue left on the surfaces thereof resulting from previous metal working operations to which the metal articles have been subjected, said process comprising the steps of mixing an alkaline cleaner and an emulsion cleaner with water to form a cleaning solution mixture, wherein said alkaline cleaner comprises a soluble salt selected from the group consisting of alkaline carbonates, alkaline silicates, alkaline phosphates, alkaline sulfates, alkaline borates,

caustic soda, caustic potash and mixtures thereof, and said emulsion cleaner comprises about 1 to 30% water, about 1 to 10% surfactant, and the remainder being an organic solvent consisting essentially of one or more organic compounds selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, ketones, aldehydes, alcohols, glycols, glycol ethers, and mixtures thereof wherein the organic compounds in said group are further limited to those containing from 4 to 16 carbon atoms, and with the surfactant being anionic, nonionic, cationic or amphoteric and selected from the group consisting essentially of sulfated hydrocarbons, sulfonated hydrocarbons, ethoxylated hydrocarbons, ethoxylated alcohols, saponified fatty acids, polymerized fatty acids, quaternary ammonium compounds, amines, amide condensates and mixtures thereof, said cleaning solution mixture containing from about 1 to 6 ounces of said alkaline cleaner and from about 1 to 6 ounces of emulsion cleaner per gallon of water in the mixture, and

intimately contacting the surfaces of the metal articles with the mixture of alkaline cleaner and emulsion cleaner at a temperature within the range of about 4° C. and 40° C. and for a time sufficient to clean the dirty residues from the surfaces of the metal articles.

6. A process in accordance with claim 1, wherein the metal articles are sprayed with the mixture of alkaline cleaner and emulsion cleaner during the contacting step.

4,710,233

METHOD AND APPARATUS FOR CLEANING, DISINFECTING AND STERILIZING MEDICAL INSTRUMENTS

Eugen Hohmann, Bensheim; Konrad Mund, Uttenreuth, and Erhard Weidlich, Spardorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

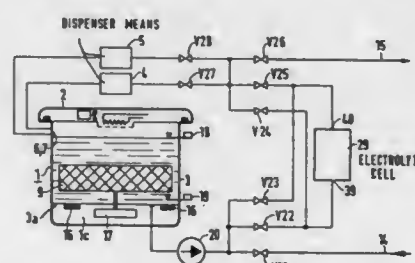
Filed Aug. 15, 1985, Ser. No. 765,948

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1984, 3430605

Int. Cl.⁴ B08B 3/12

U.S. Cl. 134—1

27 Claims



1. A method for cleaning, disinfecting and sterilizing a medical instruments, said method comprising the steps of: providing a container for receiving a fluid bath, and introducing the instruments into the container; filling the container with a fluid and a cleaning agent to form a first fluid bath receiving the instruments to be cleaned; precleaning the instruments by subjecting the first fluid bath in the container to ultrasonic energy for a period of time T₁; emptying the first fluid bath from the container and filling said container with a second fluid bath containing both a cleaning agent and sodium chloride; fine cleaning and sterilizing the instruments in the second fluid bath for a time period T₂ by subjecting the second of fluid bath to ultrasonic energy, and circulating the second fluid bath through an electrolytic cell operating on a voltage to create an electrolytic disassociation therein; emptying the second fluid bath from the container and filling said container with a rinsing fluid bath; rinsing the instrument for a time period T₃ by subjecting the

rinsing bath to the ultrasonic energy and circulating the rinsing bath through the electrolytic cell; subsequently emptying the rinsing bath; and drying the instruments for a time period T₄ by subjecting the instruments to heated air.

10. An apparatus for cleaning, disinfecting and sterilizing medical instruments, said apparatus comprising a housing, a container positioned in the housing for receiving the instruments to be processed and for receiving a fluid bath, an electrolytic cell, drying means for drying the instruments in the container, an ultrasonic means having at least one ultrasonic transducer coupled to the container for applying ultrasonic energy to a fluid in the container, hydraulic control means for controlling the filling and draining of the container, and including lines extending between the container and the electrolytic cell, and an electrical control means for controlling the operation of the ultrasonic means, the electrolytic cell, the drying means and the hydraulic circuit.

4,710,234

PROCESS FOR MANUFACTURING AN ANTI-BLOOMING DIODE ASSOCIATED WITH A SURFACE CANAL

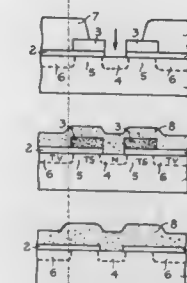
Pierre Blanchard, Verrières le Buisson, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 25, 1986, Ser. No. 833,733

Claims priority, application France, Mar. 8, 1985, 85 03447
Int. Cl.⁴ H01L 21/265; G11C 19/28

U.S. Cl. 437—40

2 Claims



1. A process for manufacturing an anti-blooming diode associated with a surface canal gate of a frame transfer matrix comprising the steps of depositing a first layer of a dielectric material on a silicon substrate then depositing a second polycrystalline silicon layer on this first layer, etching by a photolithographic process the second silicon layer so as to bare the dielectric layer in two zones, a first zone defining the space for formation of the diode, a second zone defining a volume canal zone, a third zone defining the surface canal being protected by the remaining silicon, implanting impurities in the volume transfer canal zone and masking the volume transfer canal zone while leaving the zone reserved for the diode uncovered so as to bare the substrate in the zone reserved for the diode and depositing a second polycrystalline silicon layer on the whole formed by the bared part of the substrate, the second silicon layer and the dielectric and etching the second of the two silicon layers so as to form the gate.

4,710,235

PROCESS FOR PREPARATION OF LIQUID PHASE BONDED AMORPHOUS MATERIALS

David M. Scruggs, San Juan Cap., Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 5, 1984, Ser. No. 586,199

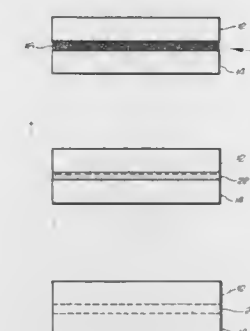
Int. Cl.⁴ C23C 10/00

U.S. Cl. 148—4

11 Claims

1. A process for bonding together a first solid piece and a second solid piece to form a bonded piece, the first piece being an amorphous metal, comprising the steps of: placing an interlayer material between the two solid pieces,

the interlayer material having a solidus temperature less than the crystallization temperature of the first piece and a composition which is diffusively compatible with the first piece, and wherein the interlayer material is an alloy of aluminum and at least one other element, the other element being selected from the group consisting of silicon, germanium, silver and gold; and



hot pressing the two pieces with the interlayer material therebetween at a temperature greater than the solidus temperature of the interlayer material and less than the crystallization temperature of the first piece whereby the interlayer material interdiffuses with the amorphous metal without inducing crystallization of the interdiffused portion of the amorphous metal.

4,710,236

METHOD FOR THE PREPARATION OF A METALLIC BODY FROM AN AMORPHOUS ALLOY

Ludwig Schultz, Bubenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 7, 1986, Ser. No. 848,984

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515167

Int. Cl.⁴ C22C 1/00

U.S. Cl. 148—11.5 P

22 Claims

1. In a method for manufacturing an amorphous metal alloy body including the steps of:

forming an intermediate product of at least a first alloy component and a second alloy component in powder form wherein each alloy component in the intermediate product has at least one dimension of at most about 1 μm in extent said forming step including a compacting step; and converting the intermediate product into a body having an amorphous metal alloy structure by a diffusion reaction at a predetermined elevated temperature; the improvement comprising: producing a mixture powder by milling a mixture of at least said first alloy component powder and said second alloy component powder and terminating the milling at a time so that the particles of the produced mixture powder are formed of predominately layer-like structures of said at least said first and second alloy components; and then effecting said compacting step by compacting and deforming the produced mixture powder to form the intermediate product having a predetermined shape.

4,710,237

METHOD FOR THERMAL TREATMENT OF NICKEL BASED ALLOY MATERIALS

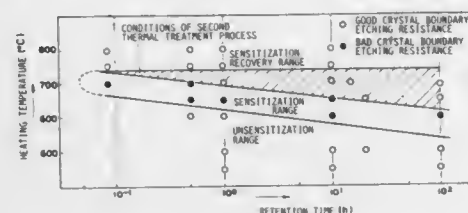
Toshio Yonezawa; Nobuya Sasaguri; Kichiro Onimura; Hiroshi Susukida; Katsuji Kawaguchi, all of Takasago; Hiroo Nagano, Kobeshi; Takao Minami, Amagasaki; Kazuo Yamanaka, Monooshi; Yasutaka Okada, Narashi, and Mamoru Inoue, Kobeshi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of Japan

Continuation of Ser. No. 550,024, Nov. 8, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 815,774

Claims priority, application Japan, Nov. 10, 1982, 57-197362 Int. Cl.⁴ C22F 1/10

U.S. Cl. 148—13

2 Claims



1. A method for the thermal treatment of a nickel based alloy comprising the steps of:

- (1) heating in a furnace an alloy consisting essentially of 58 to 64% by weight Ni, 25 to 35% by weight Cr, not more than 0.003% by weight boron, 0.012 to 0.035% by weight C, not more than 1% by weight Mn, not more than 0.5% by weight Si, not more than 0.015% by weight P, not more than 0.015% by weight S, with the remainder being Fe

at a temperature from T° C. to (T+100)° C. to thoroughly solubilize the carbide in the alloy and cooling the thus treated alloy at a cooling rate which is at least as fast as the cooling rate of the furnace in which the alloy was heated; and

- (2) heating the thus cooled alloy in the sensitization recovery range as defined in FIG. 2 at a temperature in the range from 600° to 750° C. for a period of from 0.1 to 100 hours and then cooling the thus treated alloy at a cooling rate which is at least as fast as the cooling rate of the furnace in which the alloy was heated.

4,710,238

MAKING OF STEEL COMPONENT

Cyril Dawes, Sutton Coldfield, and Donald F. Tranter, Evesham, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Feb. 4, 1986, Ser. No. 825,890

Claims priority, application United Kingdom, Feb. 20, 1985, 8504349

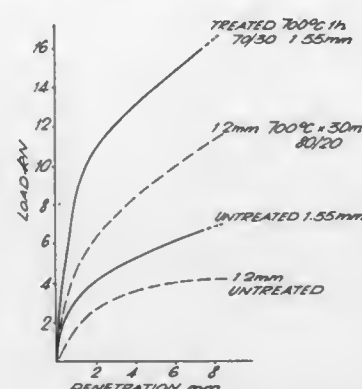
Int. Cl.⁴ C21D 1/74

U.S. Cl. 148—16.6

11 Claims

1. A method of treating a component of steel by nitriding the component to form an epsilon iron nitride surface layer, the nitriding being carried out by heating the component in a gaseous atmosphere containing a nitrogen donor, the heat treatment being performed at a temperature of from about 500° C. to about 740° C. for a period of about 30 minutes to about 4 hours wherein (i) the component is formed of an interstitial-free steel and has a thickness of at least 0.5 mm, and (ii) the

concentration of nitrogen donor in the gaseous atmosphere is sufficient to form the epsilon iron nitride surface layer and



below the surface layer, a layer of nitrides of the trace alloy elements of the interstitial-free steel.

4,710,239

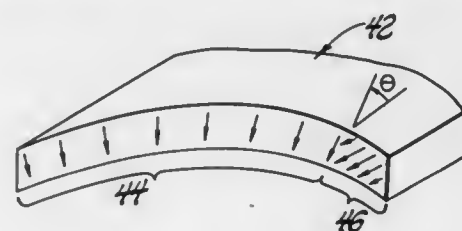
HOT PRESSED PERMANENT MAGNET HAVING HIGH AND LOW COERCIVITY REGIONS

Robert W. Lee, Troy, Mich., and Neal A. Schaffel, Noblesville, Ind., assignors to General Motors Corporation, Detroit, Mich. Division of Ser. No. 650,623, Sep. 14, 1984, abandoned. This application Aug. 18, 1986, Ser. No. 897,591

Int. Cl.⁴ H01F 1/02

U.S. Cl. 148—101

5 Claims



1. A method of making a permanent magnet body comprising first and second regions spaced along a surface dimension of the body that differ in magnetic alignment, the method comprising

- hot pressing magnetically isotropic particles of a composition comprising iron, neodymium and/or praseodymium, and boron to form a substantially fully densified body of the composition, and
- hot working the body nonuniformly to produce at least two regions in the body spaced along a surface dimension of it that differ in magnetic alignment.

4,710,240

ANNEALING STEEL STRIP

Klaus Frommann, Meerbusch, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany Filed Mar. 14, 1986, Ser. No. 840,322

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1985, 3510050

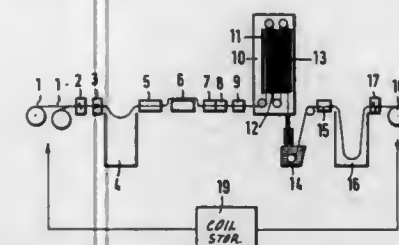
Int. Cl.⁴ C21D 9/52

U.S. Cl. 148—156

2 Claims

1. In a method of annealing cold rolled steel strip wherein the strip is uncoiled, cleaned, and passed into and through continuously operating annealing furnace wherein the strip is heated to and held at a relatively hot temperature, said strip after leaving the furnace being subsequently quenched, the

improvement comprising: drying and coiling said strip; passing the strip again through the same equipment including additionally pickling of removing an oxide layer; and



passing the strip a second time through the annealing furnace, while operating said annealing furnace for heating to and holding at a lower temperature said relatively hot temperature to obtain aging and coiling the strip again.

4,710,241

METHOD OF MAKING A BIPOLAR SEMICONDUCTOR DEVICE

Shigeru Komatsu, Kitakyushu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

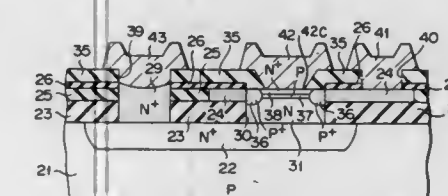
Filed Jan. 8, 1986, Ser. No. 817,103

Claims priority, application Japan, Jan. 17, 1985, 60-6218

Int. Cl.⁴ H01L 21/36, 21/38, 21/42, 21/00

U.S. Cl. 437—162

7 Claims



7. A method of manufacturing a semiconductor device, comprising the steps of:

- selectively forming a buried layer of a second conductivity type in a surface region of a semiconductor substrate of a first conductivity type;
- forming at least one insulating film on the semiconductor substrate;
- forming at least one first opening on a portion of the buried layer in the insulating film;
- forming a collector connection layer of the second conductivity type in the first opening and connected to the buried layer;
- forming at least one second opening on the buried layer and in the insulating film;
- forming a monocrystalline silicon layer of the second conductivity type in the second opening and connected to the buried layer, said monocrystalline layer being formed after forming said collector connection layer;
- forming a base of the first conductivity type in the monocrystalline silicon layer by a heat treatment at a temperature of less than 1,000° C. and forming a collector in the remaining portion of the monocrystalline silicon layer; and
- selectively forming an emitter of the second conductivity type in the base by annealing at a temperature less than 1,000° C.

4,710,242

MATERIAL FOR TEMPERATURE SENSITIVE ELEMENTS

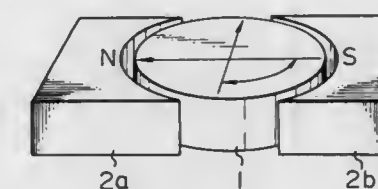
Wataru Yamagishi, Kawasaki, and Masato Sagawa, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan Continuation of Ser. No. 480,031, Mar. 29, 1983, abandoned, which is a continuation of Ser. No. 290,973, Aug. 7, 1981, abandoned. This application Jun. 3, 1986, Ser. No. 871,175

Claims priority, application Japan, Nov. 8, 1980, 55-109129

Int. Cl.⁴ H01F 1/04

U.S. Cl. 148—301

5 Claims



1. A temperature sensitive element which comprises a sintered powder of fine grains consisting of a spin reorientation type ferromagnetic material having a transition temperature range T₂—T₁ defined between transition beginning and ending temperatures T₁, T₂, below which transition beginning temperature T₁ the easy direction of magnetization of said material is in a first predetermined crystallographic direction and above which transition ending temperature T₂ the easy direction of magnetization is in a second predetermined crystallographic direction that is perpendicular to the first predetermined crystallographic direction, said material having the formula:



wherein R is one element selected from the group consisting of Sm and Pr, M is Al or Al and Fe, 0 ≤ u ≤ 0.5, 0 < x < 0.4, and 4.4 ≤ z ≤ 5.5.

4,710,243

WEAR-RESISTANT ALLOY OF HIGH PERMEABILITY AND METHOD OF PRODUCING THE SAME

Hakaru Masumoto, Sendai, and Yuetsu Murakami, Izumi, both of Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Japan

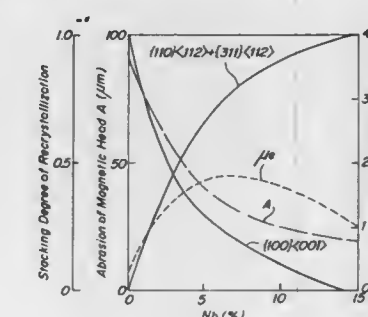
Filed Jul. 29, 1985, Ser. No. 760,038

Claims priority, application Japan, Jan. 30, 1985, 60-14556

Int. Cl.⁴ H01F 1/04

U.S. Cl. 148—312

3 Claims



1. A wear-resistant alloy having a high permeability, comprising by weight about 60–90% of Ni, about 0.5–14% of Nb, and a remainder being Fe with unavoidable impurities, and having an effective permeability of at least about 3,000 at 1 KHz, a saturation magnetic flux density of at least about 4,000 G, and a recrystallized texture of {110}<112>+{311}<112>.

4,710,244

DREDGER TEETH

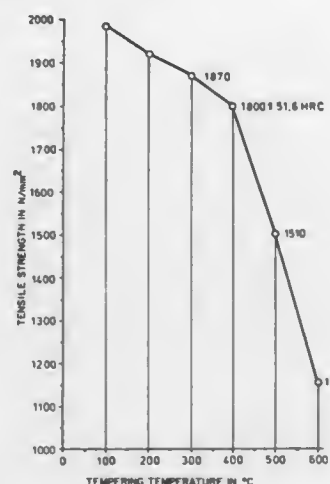
Heinz Lepand; Margrit Hüser; Franz-Josef Biniasz, and Axel Fuchs, all of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Fed. Rep. of Germany
Continuation of Ser. No. 718,168, Apr. 1, 1985, abandoned. This application Nov. 4, 1986, Ser. No. 928,615

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412405

Int. Cl.⁴ C22C 38/18

U.S. Cl. 148—333

4 Claims



1. A wear resistant and temper resisting steel which has been forged, hardened and tempered for use as a work material in dredger teeth, said steel consisting of:

0.30-0.40%	carbon
1.0-1.60%	silicon
0.50-0.80%	manganese
2.0-2.6%	chromium
maximum 0.025%	phosphorus
maximum 0.025%	sulfur, and
the remainder iron and contaminants in normal quantities.	

4,710,245

METHOD OF MAKING TUBULAR UNITS FOR THE OIL AND GAS INDUSTRY

Kurt Roether, Duesseldorf, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany
Filed Dec. 9, 1985, Ser. No. 806,764

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3445371

Int. Cl.⁴ C21D 9/08

U.S. Cl. 148—12.4

4 Claims



1. A method of making tubing and pipes for conduction in the oil and gas industry or for use as drillpipes, wherein such tubing is connected at both ends with connector sleeves by means of welding, the welding seam being deburred thereafter and the unit so produced being heat treated and subjected to cutting, the improvement comprising:

providing tubing, pipes or drill pipes as well as connector sleeves made of steel consisting essentially of the following composition, all percentages by weight, between 0.2 and 0.6% carbon, between 0.5 and 1.8% manganese, between 0.5 and 3.5% combined chromium and molybde-

num, not more than 0.2% phosphorus and not more than 0.005% sulphur;

heat treating by quenching and tempering the combined unit of tubing and two welded on connectors to obtain the following properties: yield strength between 515 to 760 N/square mm, tensile strength at least 660 N/square mm, elongation at least 15.5%, hardness not more than 26 HRC, impact notch ductility at room temperature in accordance with ISOV of at least 60 Joules, long duration strength tested for more than 720 hours in accordance with NACE-TM-01-77 in a hydrogen sulfide saturated test solution at a load of not less than 80% of said minimum yield strength.

4,710,246

AMORPHOUS ALUMINUM-BASED ALLOYS

Gerard Le Caer, Nancy, and Jean-Marie Dubois, Pompey, both of France, assignors to Centre National de la Recherche Scientifique "CNRS", Paris, France

Continuation-in-part of Ser. No. 506,993, Jun. 23, 1983, Pat. No. 4,595,429. This application Sep. 27, 1984, Ser. No. 655,167

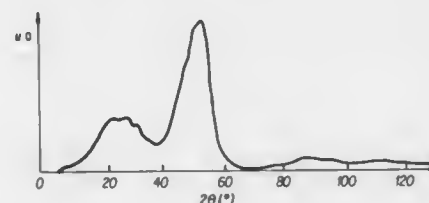
Claims priority, application France, Jul. 6, 1982, 82 12404

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.⁴ C22C 21/00

U.S. Cl. 148—403

2 Claims



1. A substantially amorphous Al-based alloy, wherein said Al-based alloy is represented by the formula:



in which:

$$\begin{aligned} a+b+c+d+e &= 100 \\ 50 \leq a \leq 95 \text{ atom \%} \\ 0 \leq b \leq 40 \text{ atom \%} \\ 0 \leq c \leq 15 \text{ atom \%} \\ 0 \leq d \leq 20 \text{ atom \%} \\ 0 \leq e \leq 3 \text{ atom \%} \end{aligned}$$

wherein

at least two of the subscripts b, c or d are strictly positive, and wherein M is at least one metal selected from the group consisting of Mn, Ni, Cu, Zr, Cr, Ti, V, Fe and Co; M' is Mo, W, or a mixture thereof

X is at least one element selected from the group consisting of Ca, Li, Mg, Ge, Si, and Zn; and

Y is the inevitable production impurities, with the proviso that when element M is Co, Mn and/or Ni, the total amount of these elements is at least 12 wt % of the alloy.

4,710,247

RAPIDLY SOLIDIFIED TRI-NICKEL ALUMINIDE BASE ALLOY

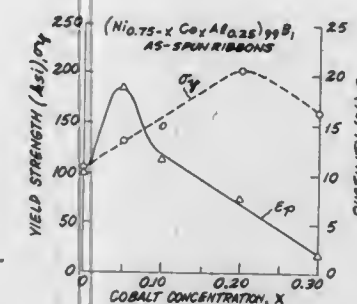
Shyh-Chin Huang, Latham; Keh-Minn Chang, and Alan I. Taub, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 647,326, Sep. 4, 1984, abandoned. This application Mar. 14, 1986, Ser. No. 839,659

Int. Cl.⁴ C22C 19/00

U.S. Cl. 148—429

10 Claims



1. A rapidly solidified tri-nickel aluminide base alloy having a crystal structure of the L1₂ type, said alloy comprising a composition having the formula



wherein the x is between 0.25 and 0.15, and the y is between 97.5 and 99.9, and

said alloy having a tensile strength of at least 100 ksi.

4,710,248

EMULSION EXPLOSIVE COMPOSITION

David E. Yates, and Stuart W. Dack, both of Melbourne, Australia, assignors to ICI Australia Limited, Victoria, Australia

Filed Aug. 21, 1986, Ser. No. 898,674

Claims priority, application Australia, Aug. 21, 1985, PH2061

Int. Cl.⁴ C06G 45/00

U.S. Cl. 149—21

23 Claims

1. An emulsion explosive composition comprising a discontinuous oxidizer-phase containing an oxygen-supplying component and an organic-fuel medium forming a continuous phase wherein the oxygen-supplying component and organic-fuel medium are emulsified in the presence of a modifier comprising a hydrophilic moiety and a lipophilic moiety wherein the hydrophilic moiety comprises a carboxylic acid or a group capable of hydrolyzing to a carboxylic acid group, and wherein the lipophilic moiety is a saturated or unsaturated hydrocarbon chain, and wherein the said emulsion explosive composition pH, being the pH of the said oxidizer phase, is above 4.5.

4,710,249

TIRE REPAIR METHOD

Simon Roberts, 30543 Shoreham, Southfield, Mich. 48076
Division of Ser. No. 592,506, Mar. 26, 1984, Pat. No. 4,579,161.

This application Jul. 2, 1985, Ser. No. 751,296

Int. Cl.⁴ B60C 21/06; G01B 5/12

U.S. Cl. 156—64

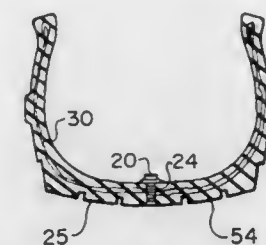
9 Claims

1. A method of repairing and sealing a puncture of a tire comprising:

(a) inserting into a tire puncture alternate rigid slender rod shaped members to measure the size of said tire puncture, said rigid rod members being indexed to corresponding sizes of a series of resilient plug type closures;

(b) selecting a corresponding size closure from the series of closures;

(c) engaging a tool with the closure; and



(d) forcibly inserting the closure into the puncture by using the tool.

4,710,250

METHOD FOR PRODUCING A PACKAGE FOR A SEMICONDUCTOR DEVICE

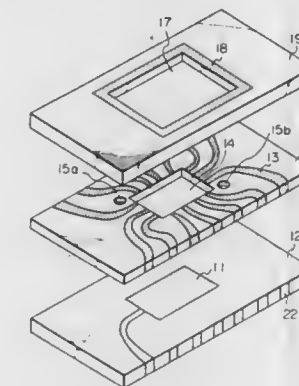
Haruo Kojima, Yokohama, and Hidehiko Akasaki, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 439,593, Nov. 5, 1982, abandoned. This application Feb. 11, 1986, Ser. No. 809,796

Claims priority, application Japan, Nov. 6, 1981, 56-177888

Int. Cl.⁴ B32B 31/14

U.S. Cl. 156—89

6 Claims



1. A method for producing a package for a semiconductor device by sequentially laminating three ceramic green sheets and firing the laminated ceramic green sheets, the package facilitating the mounting of a semiconductor chip thereon, comprising the steps of:

(a) providing a first green sheet having a chip stage on the upper surface thereof;

(b) providing a second green sheet having an internal conductor pattern on at least the upper surface thereof and by using a single mold, simultaneously forming therein, a chip-inserting window and at least two marks, the window being formed in the second green sheet at a predetermined location as required for exposing the surface of the chip stage of the first green sheet when the first and second green sheets are subsequently laminated, and the marks being provided at predetermined, respective positions relative to the location of the first chip-inserting window for subsequent detection and recognition, thereby, of the location of the first chip-inserting window;

(c) superimposing the second green sheet on the first green sheet and laminating the second green sheet to the first green sheet;

(d) providing a third green sheet and forming a second chip-inserting window at a predetermined location therein as required, when the third green sheet is subsequently

laminated with the first and second laminated green sheets, for exposing the first chip-inserting window, the marks, and a predetermined portion of the internal conductor pattern located adjacent to the periphery of the first chip-inserting window, said exposed, predetermined portion of the internal conductor pattern of said second green sheet functioning as a wire-bonding area, and the predetermined location of the marks being selected so as to form the marks in the wire-bonding area of the second green sheet;

- (e) superimposing the third green sheet on the second green sheet and laminating the third green sheet to the second green sheet;
- (f) firing the laminated ceramic green sheets; and
- (g) in preparation for inserting a semiconductor chip through the first and second chip-inserting windows and mounting same on the chip stage of the first sheet, recognizing the location of the first chip-inserting window by means of the marks.

4,710,251

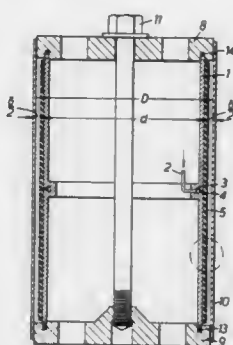
PROCESS FOR MANUFACTURING ENDLESS BELTS
Horst Borchardt, Hörter, Fed. Rep. of Germany, assignor to Arntz-Optibelt-KG, Hörter, Fed. Rep. of Germany
Filed May 17, 1984, Ser. No. 611,172

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318470

Int. Cl.⁴ F16G 5/00

U.S. Cl. 156—137

5 Claims



1. A process of manufacturing virtually inextensible endless drive belts of natural or synthetic rubber including stability supports of synthetic polymers extending substantially longitudinally of the endless drive belts, said process including the steps of constructing a belt sleeve, vulcanizing the belt sleeve while supported on a tubular former, radially stretching the belt sleeve on said tubular former immediately after vulcanization while the belt sleeve retains heat, cooling the belt sleeve under tension, and subsequently cutting the belt sleeve to provide individual V-belts.

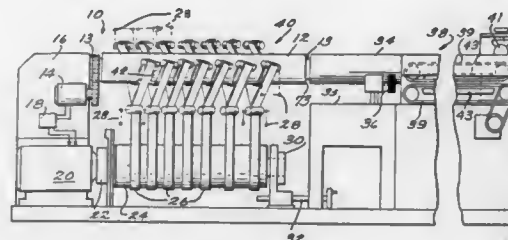
5. A process of manufacturing virtually inextensible drive belts including the steps of vulcanizing a belt sleeve on a former, sealing the former within a sleeve member, immediately after the vulcanizing step forcing a pressure medium between the former and the vulcanized belt sleeve to stretch said vulcanized belt sleeve uniformly while the vulcanized belt sleeve retains some of the heat of the vulcanization process, cooling the vulcanized belt sleeve under pressure and cutting the vulcanized belt sleeve into individual endless belts.

4,710,252
METHOD AND MACHINE FOR CONVOLUTE OR SPIRAL WINDING OF COMPOSITE MATERIALS
Leo Kadunce, Morrisville, Pa., assignor to Steeltin Can Corporation, Baltimore, Md.

Continuation of Ser. No. 663,211, Oct. 22, 1984, Pat. No. 4,629,529. This application May 8, 1986, Ser. No. 861,238
Int. Cl.⁴ B05D 3/08

U.S. Cl. 156—195

15 Claims



1. An apparatus for forming a cylindrical body from a substantially flat, flexible sheet material comprising:
mandrel means having a longitudinal axis and a peripheral surface,

means for feeding the sheet material to said mandrel means with the sheet material having a leading edge and a trailing edge and with the leading edge oriented in a selected manner relative to said longitudinal axis of said mandrel means,

endless belt means with said belt means having means for guiding said belt means along a selected path extending from a belt drive means to a selected portion of said mandrel means and for guiding said belt means along a substantially spiral path about and along a selected portion of the longitudinal axis of said mandrel means where said belt means is in contact with the surface of said mandrel means through a partial spiral wrap of greater than 300 degrees but less than 360 degrees about said mandrel means, said substantially spiral path of said belt means including a gap for receiving sheet materials from the feeding means so that a sheet material fed to said mandrel means at a selected angle with respect to said longitudinal axis of said mandrel means will be engaged by said belt means and formed into a cylindrical body on said mandrel means.

9. A method of forming a cylindrical body with an apparatus including a forming mandrel, an array of belts comprising the steps of

moving at least some of said belts each along a separate substantially spiral path about a portion of the mandrel where each said belt is in contact with the surface of the mandrel through a partial spiral wrap of greater than 300 degrees but less than 360 degrees about said mandrel with each spiral path including a gap,

feeding, sequentially, flat webs of material to the gap of a first belt,

wrapping each web about the circumference of the mandrel with an initial number of the belts until the web material takes on substantially a cylindrical shape,

maintaining the said cylindrical shape with a further at least one belt and conveying sequentially the formed webs to take off means.

4,710,253

METHOD FOR MANUFACTURING A CIRCUIT BOARD
Peter Soszek, Winnipeg, Canada, assignor to Somich Technology Inc., Winnipeg, Canada

Filed May 30, 1985, Ser. No. 739,192
Claims priority, application United Kingdom, Jun. 4, 1984, 8414178

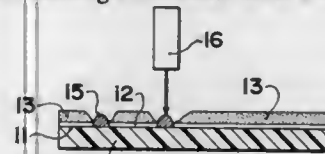
Int. Cl.⁴ B32B 31/28

U.S. Cl. 156—272.8

15 Claims

1. A method of producing a circuit board comprising an

electrically conductive pattern on an electrically non-conductive surface, the method comprising taking a circuit board substrate having an electrically non-conductive surface thereon, applying a layer of a heat actuable adhesive to said surface, loosely dispensing onto said layer an electrically conductive powder consisting of elemental metal in such a manner



that the powder remains unbonded to the surface and can be readily removed therefrom, selectively heating said powder in said pattern to a temperature sufficient only to activate said adhesive without affecting the powder to adhesively bond said powder to said surface in said pattern, and removing from said surface powder which remains unbonded.

4,710,254

PROCESS FOR FABRICATING A SOLAR ENERGY CONVERTER EMPLOYING A FLUORESCENT WAVELENGTH SHIFTER

George F. J. Garlick, Los Angeles, Calif., assignor to Spectrolab, Inc., Sylmar, Calif.

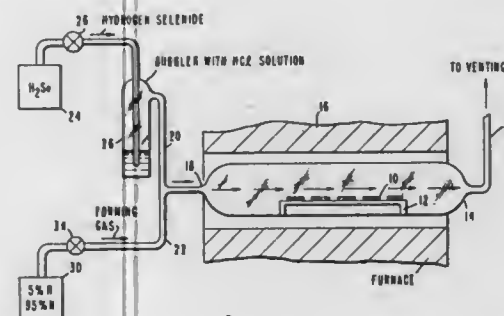
Division of Ser. No. 651,864, Sep. 12, 1984, Pat. No. 4,584,428.

This application Jan. 27, 1986, Ser. No. 822,450

Int. Cl.⁴ B32B 31/12

U.S. Cl. 156—278

7 Claims



1. A process for fabricating a solar converter which includes a gallium arsenide photovoltaic solar cell in combination with a zinc selenide fluorescent wavelength shifter comprising:

- (a) providing a fluorescent zinc selenide substrate by passing chlorine-containing zinc selenide vapor over a nonfluorescent zinc selenide substrate at a predetermined elevated temperature to introduce chlorine atoms into said substrate for a time sufficient to convert nonfluorescent zinc selenide to high quality, stable fluorescent zinc selenide;
- (b) coating one surface of said zinc selenide substrate with a first anti-reflective coating;
- (c) coating another surface of said zinc selenide substrate with a second anti-reflective coating;
- (d) providing a gallium arsenide solar cell having an anti-reflecting coating thereon; and
- (e) adhesively bonding said second anti-reflective coating on said solar cell using a transparent bonding material, whereby said solar cell is protected from ultraviolet and proton radiation damage.

4,710,255

APPARATUS FOR MOLDING A BELT FOR TRANSMITTING POWER

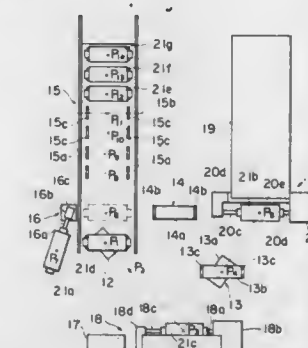
Koichi Takeuchi, Sennan; Megumi Yamanaka, Osaka; Masayoshi Kubo, Nagasaki; Hideaki Katayama, Nagasaki, and Kenji Tokunaga, Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Bando Chemical Industries, Inc., Hyogo, both of Japan

Filed Jul. 29, 1985, Ser. No. 759,735

Int. Cl.⁴ B65H 81/00

U.S. Cl. 156—361

2 Claims



1. An apparatus for manufacturing a power transmitting belt comprising:

- a rubber sheet mounting unit for mounting an unvulcanized rubber sheet on a mandrel;
- a cord layer forming unit for forming a cord layer on the rubber sheet;
- a ply servicer for winding an unvulcanized rubber sheet on the cord layer to form a laminated body;
- a cutting means for cutting the laminated body to a predetermined shape;
- mandrels preserving means for preserving a plurality of mandrels;
- a first transportation unit for moving the mandrel to the cord layer forming unit from the rubber sheet mounting unit;
- a second transportation unit for moving the mandrel to the ply servicer from the cord layer forming unit;
- a third transportation unit for moving the mandrel to said mandrels preserving means from the cutting means;
- said winding process and said cutting process are carried out at the same position;
- said mandrel is preserved in said mandrels preserving means;
- said mandrels preserving means comprises a mandrel rack including rails, a running loader which runs on said rails and a mandrel supporter;
- each of said plurality of mandrels has a mark for identifying the particular mandrel and the particular mandrel is selected by means of said mark from said plurality of mandrels;
- said rubber sheet mounting unit includes a shaft for holding the selected mandrel, a bracket for fixing the shaft and a base for supporting the mandrel rotatably;
- said cord layer forming unit comprises means for fixing the selected mandrel to a predetermined position, means for confirming whether the cord is identical with the designated cord and means for winding the cord in accordance with a predetermined program;
- a cord feeding unit including a reel stand for rotatably holding the selected cord reel on which the desired padding cord is wound, tension means for giving the cord a predetermined tension and detection means for detecting a feeding amount of the cord to said cord layer forming unit;
- said ply servicer includes a stand for receiving a stock roll on which the unvulcanized rubber sheet is wound together with cloth, drive means for feeding the rubber sheet from the stock roll to said mandrel wound with the padding

cord, a photoelectric switch for detecting a condition of festoon, a pulse generator for detecting the feeding quantity of the rubber sheet and cutting means for automatically cutting an extra rubber sheet after winding the rubber sheet on the selected mandrel;

said cutting means comprises means for fixing the selected mandrel to a predetermined position and means for cutting the laminated body in accordance with a predetermined program;

a main spindle, a headstock, a tail spindle, a tailstock and a cutter for cutting a cylindrical laminated body prepared in the former processes;

said first to third transportation units include rails, a truck which runs on the rails, a movable stand mounted on the truck slidably in the axis direction, a pair of mandrel supporters mounted on both ends of the movable stand movably in the vertical direction;

said rubber sheet mounting unit, said cord layer forming unit, said ply servicer, said cutting means and said first to third transportation units are controlled by a control unit comprising the means for inputting data necessary for molding the belt, detection means for detecting operation of each portion of units, drive means for driving each portion of units, means for outputting various information, and a central control unit CPU.

4,710,256

APPARATUS FOR ATTACHING FLAP-OVER COVERS TO STACKS OF PAPER SHEETS OR THE LIKE

Dieter Ladewig, Jesteburg, and Bernd Ramcke, Hamburg, both of Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

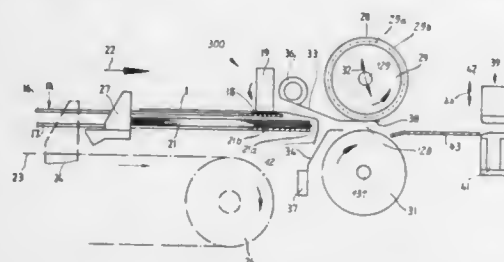
Division of Ser. No. 613,898, May 24, 1984, abandoned. This application Sep. 11, 1985, Ser. No. 774,933

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320645

Int. Cl.⁴ B42C 9/00, 1/00, 3/00, 11/02

U.S. Cl. 156—484

22 Claims



1. Apparatus for applying flap-over cover sheets, each of which has an elongated downwardly extending adhesive-coated partially bent over marginal portion, to selected elongated edge faces of a series of stacks of paper sheets or the like, comprising a source of stacks; first transporting means for advancing said series of stacks from said source along a first path and in a first direction in such orientation that the selected edge faces of the stacks in said path extend transversely of said direction; a first support disposed at a first level and arranged to receive successive stacks from the first transporting means; a source of cover sheets; second transporting means for advancing successive cover sheets from the respective source along a second path and in a second direction in parallelism with the edge faces of stacks in said first path and longitudinally of the marginal portions of the respective cover sheets to positions in which the marginal portion of each successive cover sheet is adjacent to the selected edge face of the corresponding stack in said first path; a second support disposed at a second level above said first level and arranged to receive successive cover sheets from said second transporting means, the marginal portion of the cover sheet on said second support being adjacent to the selected edge face of the stack on said first support and such cover sheet being substantially parallel

to the sheets of the stack on said first support; and pressure applying means for bonding the marginal portions of successive cover sheets to the edge faces of the respective stacks while the cover sheets remain substantially parallel to the sheets of the respective stacks.

4,710,257

DEVICE FOR THE APPLICATION OF AN ADHESIVE TO ONE OR MORE LOCALIZED AREAS OF A SHEET OF FLEXIBLE WRAPPING MATERIAL

Riccardo Mattel, and Alessandro Minarelli, both of Bologna, Italy, assignors to G. D. Societa Per Azioni, Bologna, Italy

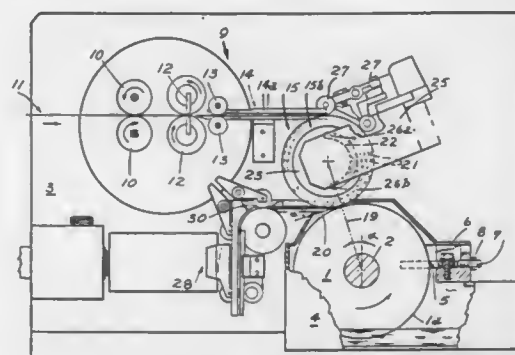
Filed Nov. 27, 1985, Ser. No. 802,461

Claims priority, application Italy, Nov. 29, 1984, 3637 A/84; Sep. 3, 1985, 3532 A/85

Int. Cl.⁴ B65H 5/12

U.S. Cl. 156—578

10 Claims



1. A device for the application of an adhesive to one or more localized areas of a sheet of flexible wrapping material, comprising a glue roller having either a one-piece or a sectional cladding which picks up adhesive from a tray or tank, and at least one scraper located in contact with the outer surface of the roller cladding, positioned upstream of the point where adhesive is applied to the sheet of wrapping material and performing a thorough cleaning action on the outer surface of the cladding such that adhesive remains only in localized areas, wherein a contact roller lying tangential to the glue roller at the point of application of the adhesive serves to transfer the sheet from an infeed point, located upstream of the point of application in relation to rotation of the contact roller, to a release point downstream of same at which sheets are taken up from the contact roller by a guide positioned adjacent thereto, and wherein the contact roller is provided with internal galleries that communicate with its cylindrical surface and connect by way of a chamber, located between the infeed point and the release point, with a means of generating suction, wherein the glue roller and the contact roller make contact with one another through a straight line generator lying in a plane that coincides with the axis of the glue roller and is raked in the direction of rotation thereof, so as to form an acute angle with a vertical axial plane passing through the self-same glue roller, and further wherein the guide takes up the sheet as it exits from the device itself, located in such a way as to ride the outer surface of the glue roller in close proximity to the point where the adhesive is transferred from the glue roller to the sheet of wrapping material, and positioned so as to afford uninterrupted support to the exiting sheet without any risk of its sticking fast or becoming diverted from its path.

4,710,258

SYSTEM FOR CONTROLLING THE DIAMETER OF A CRYSTAL IN A CRYSTAL GROWING FURNACE

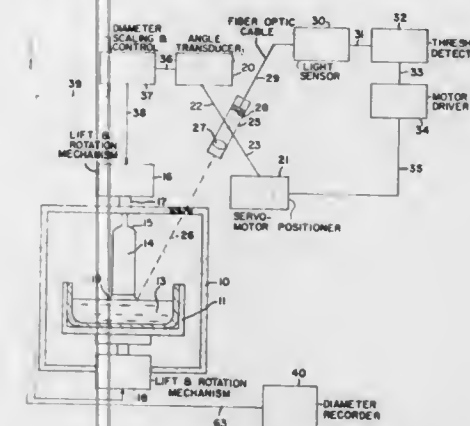
Henry C. Latka, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 676,694, Nov. 30, 1984, Pat. No. 4,617,173. This application May 19, 1986, Ser. No. 864,224

Int. Cl.⁴ C30B 15/26, 15/30

U.S. Cl. 156—601

2 Claims



1. The method of controlling the diameter of a crystal in a crystal growing furnace having lift and rotation control means for both the crystal and a crucible containing a melt comprising the steps of:

- sensing a spot of light on a meniscus at an interface between a growing crystal and the melt by transmitting said spot through an angularly operable light tube to an electrical transducing means,
- generating an electrical signal corresponding to the light intensity senses,
- generating an error signal in response to variations in the electrical signal,
- driving a servo motor shaft connected to the light tube to actuate the light tube angularly in response to the error signal,
- driving a shaft of an angular transducer by the shaft of the servo motor,
- generating a transducer error signal in response to rotation of the shaft of the transducer,
- governing the rate of lift and rotation by the transducer error signal,
- a further step of electronically limiting angular operation of the light tube by the servo motor to positions between inside and outside angular limits determined by a range of crystal diameters for which the method is used as sensed by electrical signals from the angular transducer and controlled by light levels through the light tube, and
- a further step of causing the light tube to scan an area of the melt between the inside and outside limits in case of a momentary power interruption to relocate the meniscus for continuation of the normal tracking operation.

4,710,259

SETTING THE ORIENTATION OF CRYSTALS

Stephen H. Howe, 4 Scariff Court, 39 Sycamore Grove, New Malden, Surrey, and Donald Rogers, 11 Salvington Crescent, Bexhill-on-Sea, East Sussex, both of United Kingdom

PCT No. PCT/GB84/00324, § 371 Date May 14, 1985, § 102(e) Date May 14, 1985, PCT Pub. No. WO85/01349, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 24, 1984, Ser. No. 740,043

Int. Cl.⁴ C30B 33/00, 15/20

U.S. Cl. 156—601

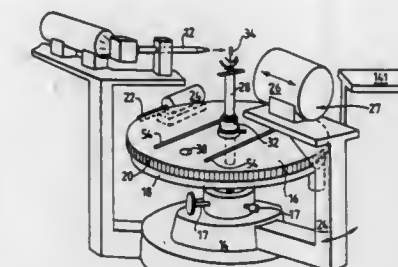
7 Claims

1. A method of determining the orientation of one crystallographic axis in a plane of symmetry of a single crystal, having

at least one plane of symmetry, relative to a predetermined set of orthogonal axes comprising:

directing onto the crystal, along one of said orthogonal axes, an X-ray beam comprising a peak of energy at a given wavelength,

detecting reflected X-ray energy by means of a two dimensional detector, and



adjusting the orientation of the crystal while relatively moving the crystal and the beam about an axis perpendicular to an equatorial plane containing the X-ray beam until any pair of reflexions that are symmetrical with respect to the equatorial plane occur simultaneously at the said wavelength of X-ray radiation.

4,710,260

DEPOSITION OF SILICON AT TEMPERATURES ABOVE ITS MELTING POINT

David E. Witter, Richardson, and Mohendra S. Bawa, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

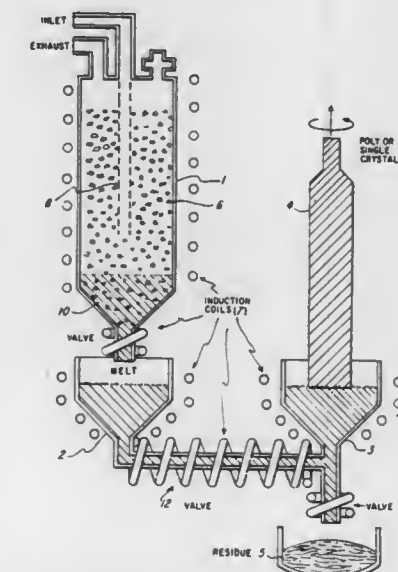
Continuation of Ser. No. 452,173, Dec. 12, 1982, Pat. No. 4,547,258. This application Aug. 26, 1985, Ser. No. 769,632

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.⁴ C30B 15/04

U.S. Cl. 156—605

2 Claims



1. A method for continuous production of silicon from a silicon bearing gas flow, comprising the steps of:

- providing a matrix of silicon nitride particles;
- forcing through a portion of said matrix of silicon nitride particles a stream of a silicon bearing gas mixture;
- said matrix of silicon nitride particles being heated to above 1300° C. but below the melting point of silicon while said gas flow is forced through said matrix; and
- periodically heating said matrix of nitride particles during said gas flow to above the melting point of silicon and collecting, at the bottom of said matrix of silicon nitride

particles, liquified silicon deposited on said nitride particles from said gas stream.

4,710,261

APPARATUS AND METHOD FOR MAINTAINING A UNIFORM ETCHING SOLUTION COMPOSITION

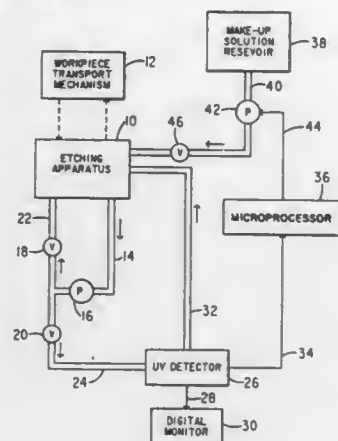
Timothy A. Dennis, Bloom Township, Wood County, Ohio, assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 28, 1987, Ser. No. 7,858

Int. Cl.⁴ H01L 21/306

U.S. Cl. 156—626

6 Claims



1. A method of etching at a substantially uniform rate a metallization layer disposed on a substrate, comprising the steps of:

- contacting said metallization layer with an etching solution comprising HNO_3 and H_3PO_4 ;
- sampling at least a portion of said etching solution with a UV detector to produce an output signal which is a function of the HNO_3 concentration; and
- delivering a make-up solution comprising HNO_3 and H_3PO_4 in controlled amounts responsive to said output signal to said etching solution, whereby a substantially uniform HNO_3 concentration is maintained within said etching solution.

4,710,262

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING CARBOXY BENZOTRIAZOLE

Gregory C. Weed, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 867,431, May 28, 1986, Pat. No. 4,680,249.

This application Feb. 24, 1987, Ser. No. 17,891

Int. Cl.⁴ B44C 1/22; C23F 1/02; B05D 3/06, 5/12

U.S. Cl. 156—630

2 Claims

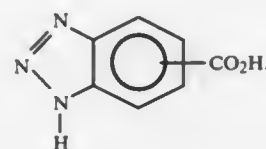
1. In a process for laminating a photosensitive film to a substrate comprising the steps of

- (a) laminating to the substrate a supported solid photosensitive film,
 - (b) imagewise exposing the layer to actinic radiation,
 - (c) removing unexposed areas of the layer to form resist areas,
 - (d) permanently modifying areas of the substrate which are unprotected by the resist areas by etching the substrate or by depositing a material onto the substrate, and
- wherein the photosensitive film contains
- (a) addition polymerizable ethylenically unsaturated monomer,
 - (b) an initiating system activatable by actinic radiation
 - (c) an amphoteric polymer derived from interpolymerization of (1) at least one basic comonomer which is an acrylic or methacrylic acrylamide or methacrylamide, an aminoalkyl acrylate or methacrylate or mixture of any of these; (2) at least one acidic comonomer containing one or more carboxyl groups and (3) at least one

further comonomer which is acrylic or methacrylic in character;

wherein the improvement comprises incorporation in the composition of

- (d) a carboxy benzotriazole of the formula:



4,710,263

METHOD OF FABRICATING PRINT HEAD FOR THERMAL PRINTER

Masakazu Kato, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

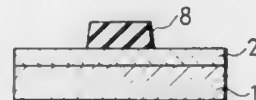
Filed Sep. 5, 1986, Ser. No. 904,629

Claims priority, application Japan, Sep. 11, 1985, 60-200819

Int. Cl.⁴ C23F 1/00, 1/02; B44C 1/22; C03C 15/00

U.S. Cl. 156—637

13 Claims



1. A method of fabricating a print head for use in a thermal printer, comprising the steps of:

- forming a thin metal film on the portion of a glaze layer that does not lie under the heater portion of the head;
- then plating the thin metal film with a metal to form a metal layer;
- forming a layer of a chemically stable and heat-resistant insulator on the portion of the metal layer that lies under the heater portion and also on the exposed portion of the glaze layer; and
- thereafter removing the metal layer and the thin metal film, whereby the insulator layer on the glaze layer protrudes to the heater portion.

4,710,264

PROCESS FOR MANUFACTURING A SEMICONDUCTOR ARRANGEMENT

Eckeard Waschler, Neuhausen; Hermann Clauss, Leingarten, and Heinz-Achim Hefner, Brackenheim, all of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Continuation of Ser. No. 735,322, May 17, 1985, abandoned.

This application Nov. 17, 1986, Ser. No. 931,879

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421127

Int. Cl.⁴ B44C 1/22; C03C 15/00

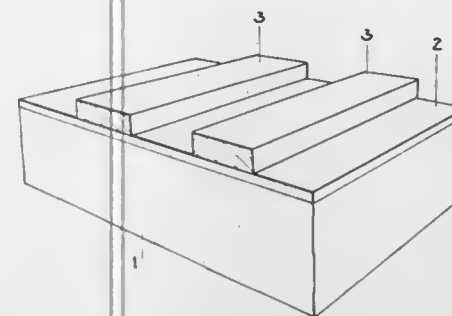
U.S. Cl. 437—228

9 Claims

1. A process for obtaining a planar-surface semiconductor consisting essentially of

- forming an insulating layer on an uneven semiconductor surface, the insulating layer being planar and having a

depth substantially greater than the thickest portion of the uneven surface to build an extra depth; and



removing a portion of the insulating layer over the entire surface to obtain a thinner insulating layer having a substantially planar surface of a standard thickness.

4,710,265

METHOD OF PRODUCING SEMICONDUCTOR INTEGRATED CIRCUIT HAVING PARASITIC CHANNEL STOPPER REGION

Tadahiko Hotta, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

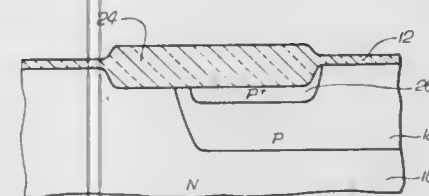
Filed Dec. 4, 1986, Ser. No. 938,010

Claims priority, application Japan, Nov. 30, 1985, 60-270325

Int. Cl.⁴ H01L 21/22, 21/38; B44C 1/22; C03C 15/00

U.S. Cl. 437—29

6 Claims



1. A method of producing a semiconductor integrated circuit, comprising the steps of:

- preparing a semiconductor substrate of a first conductivity type and having a principal surface;
- disposing a first mask material layer on said principal surface, said first mask material layer having a first impurity introducing region corresponding to a predetermined well forming pattern;
- selectively doping a first impurity which determines a second conductivity type, opposite to said first conductivity type, into said principal surface through said first impurity introducing region, thereby forming a well region in said principal surface, said well region having said second conductivity type which is determined by said first impurity;
- forming a second mask material layer in such a manner as to cover both said first impurity introducing region and said first mask material layer;
- disposing first and second mask layers on said second mask material layer, said first and second mask layers respectively corresponding to a first active region pattern inside said well region and a second active region pattern outside said well region, thereby defining a second impurity introducing region corresponding to a predetermined parasitic channel stopper pattern between the stack portion of said first and second mask material layers and said first mask layer;
- selectively ion-implanting a second impurity which determines said second conductivity type into the surface of said well region through said second impurity introducing region;
- selectively removing said first and second mask material

layers by selective etching using said first and second mask layers; and

carrying out selective thermal oxidation using the remaining portions of said first and second mask material layers as a mask, whereby a field oxide film is formed on said principal surface, and a parasitic channel stopper region is formed within said well region and directly below said field oxide film, said parasitic channel stopper region having said second conductivity type which is determined by said second impurity.

4,710,266

APPARATUS FOR SUBJECTING A RADIOACTIVE SODIUM BORATE WASTE SOLUTION TO VOLUME REDUCTION AND SOLIDIFICATION

Tadamasa Hayashi, and Toyoshi Mizushima, both of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation of Ser. No. 639,114, Aug. 9, 1984, abandoned. This

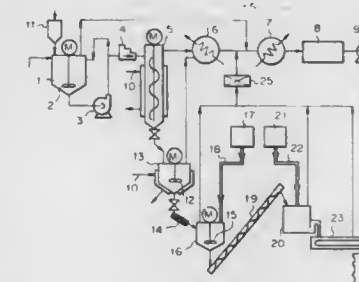
application Mar. 20, 1986, Ser. No. 841,036

Claims priority, application Japan, Aug. 9, 1983, 58-144452

Int. Cl.⁴ B01D 1/22; G21F 9/08, 9/16

U.S. Cl. 159—7

4 Claims



1. An apparatus for producing a vitric solid solution comprising (a) the solid content of a radioactive waste solution of sodium borate discharged from a pressurized water reactor, having a Na_2O to B_2O_3 molar ratio of 0.1 to 0.06 and (b) 10 to 40 mole % of ZnO or 10 to 40 mole % of ZnO plus 3 to 10 mole % of Al_2O_3 and/or CaO so that the total content of ZnO plus Al_2O_3 and/or CaO does not exceed 43 mole %, the apparatus comprising:

- (A) a waste solution feed tank equipped with a hopper for stabilizing agent in water, a stirrer for stirring the sodium borate waste solution and the stabilizing agent in water added thereto from said hopper;
- (B) a waste solution circulation pump for circulating a part of the resulting mixture to the waste solution feed tank and another part of the resulting mixture to an evaporator through a waste solution supply pump;
- (C) the evaporator for evaporating and concentrating the waste solution fed from the pump to remove water by a heating fluid so as to form an evaporator residue;
- (D) a heating type dehydrator for heating the evaporator residue sent from the evaporator by a heating fluid while being stirred by a stirrer, for further evaporation;
- (E) a powder dryer for removing the crystal water of the evaporation residue, thereby rendering said residue as a porous lump, by heating with a microwave generator through a microwave guide tube, and a stirrer for grinding the lump into a powder provided therein;
- (F) discharger means for forcible batch delivery of said residue to said powder dryer;
- (G) a melting furnace for melting into a vitric melt the dried power sent from the powder dryer by irradiation with microwaves transmitted from a microwave generator through a microwave guide tube, said melt being charged in a solid solution container;
- (H) a condenser for condensing the evaporated water generated from the evaporator and the heating type dehydrator;

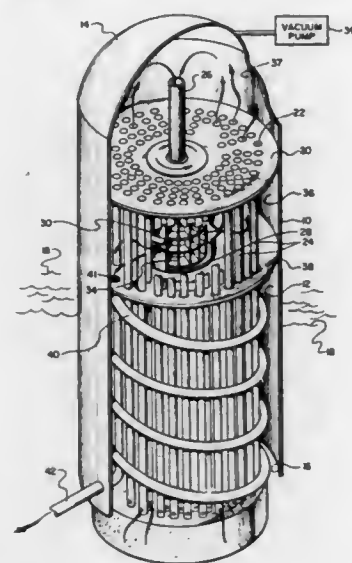
4,710,272 DISTILLING APPARATUS

Frank J. Passarelli, 1728 Kelton Ave., Los Angeles, Calif. 90024; George A. Matsukas, 1834 W. Hlway 154, Santa Ynez, Calif. 93460, and Charles P. Caspary, 21524 Nordhoff St., Chatsworth, Calif. 91311

Continuation-in-part of Ser. No. 700,976, Feb. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 476,582, Mar. 18, 1983, abandoned. This application Mar. 20, 1986, Ser. No. 841,803

Int. Cl.⁴ B01D 3/04, 3/10
U.S. Cl. 202—205

4 Claims



1. In combination with a means defining a source of non-consumable water, a distilling apparatus connecting with said means, said distilling apparatus comprising:

- a tubular container having a longitudinal center axis, said longitudinal center axis being substantially vertical, said tubular container having a top and a bottom, said top being closed, said bottom being open, said bottom being submerged beneath the surface of the source, said container defining an upper section and a lower section;
- means for drawing vacuum within said upper section, a reservoir formed within said lower section, wherein a portion of said source flows into said reservoir comprising a free standing vertical column within said reservoir, said portion of said source having a surface exposed to vacuum, whereby vapor is released from said surface;
- a vapor collecting chamber and a product liquid collecting chamber located within said upper section, said product liquid collecting chamber being located between said vapor collecting chamber and said reservoir;
- a first conduit means passing through the product liquid collecting chamber with the upper open end connected with said vapor collecting chamber and the lower open end connected with said reservoir, said first conduit means for moving the vapor into said vapor collecting chamber heat produced during condensation of the vapor within said product liquid collecting chamber being conducted into said first conduit means;
- compressor means mounted within said product liquid collecting chamber, said compressor means having an inlet connected to a second conduit means and an outlet connect with said product liquid collecting chamber, said second conduit means having an inlet connected to the vapor collecting chamber and an outlet connected to the compressor, said compressor means for extracting the vapor from said vapor collecting chamber and compressing said vapor facilitating condensation of the vapor into product liquid; and
- discharge means connected to said product liquid collecting

chamber for conducting said product liquid exteriorly of said product liquid collecting chamber, whereby said product liquid is removed from said product liquid collecting chamber and additional non-consumable water of said source automatically flows into said reservoir maintaining said source at said free standing vertical column.

4,710,273 OLEFIN PURIFICATION PROCESS

Ted T. Okamoto, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 8, 1985, Ser. No. 763,525

Int. Cl.⁴ B01D 3/34; C07C 7/148

U.S. Cl. 203—29

12 Claims

1. A process for removing vinylidene olefins from a mixture of C₆-C₃₀ olefins containing about 5-40 mole percent vinylidene olefins, 0-20 mole percent interval olefins and the balance vinyl olefins said process comprising:

- (A) reacting said mixture of olefins with a sulfur halide in the presence of a Lewis Acid catalyst to selectively couple said vinylidene olefins through a sulfide or polysulfide bridge to form an intermediate mixture containing halo-substituted sulfide-bridged compounds,
- (B) reacting said intermediate mixture with an aqueous alkali metal hydrosulfide solution to form a second intermediate mixture and
- (C) distilling said vinyl olefins and internal olefins from said second intermediate mixture to obtain as the distillate an olefin mixture containing substantially less vinylidene olefins than were in said mixture of C₆-C₃₀ olefins and leaving a residual product useful as an extreme pressure additive for lubricating oil.

4,710,274 SEPARATION OF ETHANOL FROM ISOPROPANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. 3rd Ave., Bozeman, Mont. 59715, and Mark G. Vosburgh, 4670 - 23rd Ave., Missoula, Mont. 59803

Continuation-in-part of Ser. No. 757,318, Jul. 19, 1985, abandoned. This application Aug. 4, 1986, Ser. No. 892,288

Int. Cl.⁴ B01D 3/40; C07C 29/84

U.S. Cl. 203—51

5 Claims

1. A method for recovering ethanol from a mixture of ethanol and isopropanol which comprises distilling a mixture of ethanol and isopropanol in a rectification column in the presence of about one to two parts of extractive agent per part of ethanol-isopropanol mixture, recovering ethanol as overhead product and obtaining the extractive agent and isopropanol from the stillpot, the extractive agent comprises a benzoate containing from eight to nine carbon atoms.

4,710,275 SEPARATION OF ISOPROPANOL FROM T-BUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., and Mark G. Vosburgh, 522 W. Main St., both of Bozeman, Mont. 59715

Filed Sep. 20, 1985, Ser. No. 778,403

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.⁴ B01D 3/40; C07C 29/84

U.S. Cl. 203—51

4 Claims

1. A method for recovering isopropanol from a mixture of isopropanol and t-butanol which comprises distilling a mixture of isopropanol and t-butanol in a rectification column in the presence of about one to two parts of extractive agent per part of isopropanol - t-butanol mixture, recovering essentially pure isopropanol as overhead product, obtaining the t-butanol and the extractive agent from the stillpot or reboiler, separating the t-butanol from the extractive agent by conventional distillation in another rectification column, wherein said extractive agent (1) is an organic compound or a mixture of organic com-

- pounds composed solely of carbon, hydrogen and oxygen and containing a six carbon atom aromatic ring
- (2) boils at least 100 Centigrade degrees above t-butanol
- (3) does not form binary azeotropes with either isopropanol or t-butanol
- (4) does not form a ternary azeotrope with isopropanol and t-butanol
- (5) is soluble in boiling isopropanol - t-butanol mixtures
- (6) in combination with isopropanol and t-butanol, results in a relative volatility of isopropanol to t-butanol greater than 1.10.

4,710,276 PROCESS FOR THE GALVANOPLASTIC PRODUCTION OF JEWELRY

Herbert Kull, Nuremberg, Fed. Rep. of Germany, assignor to Juwedor GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 940,859

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1985, 3544429

Int. Cl.⁴ C25O 1/02

U.S. Cl. 204—9

14 Claims

1. A process for the galvanoplastic production of substantially hollow jewelry made from metal with at least one mount for a stone, wherein the metal is electrolytically deposited on an electrically conductive mould core to form a metal coating having the spatial contour of a piece of jewelry having a mount, wherein after reaching the desired coating thickness the core material is dissolved and removed through an opening in the metal coating, wherein the mould core is provided in the vicinity of the mount with a mould surface forming in the metal coating a gem support and projections surrounding the same, and wherein after removing the core material a gem is placed on the gem support and the projections are pressed onto the gem to hold it in place on the support.

4,710,277 METHOD FOR MANUFACTURING ZINC HYDROMETALLURGICALLY

Fröstel Dyvik, Odda, and Thomas K. Mißen, Stockholm, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

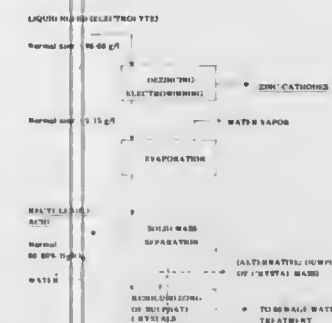
Filed Dec. 2, 1986, Ser. No. 937,074

Claims priority, application Sweden, Dec. 20, 1985, 8506050

Int. Cl.⁴ C25C 1/14

U.S. Cl. 204—119

15 Claims



1. A method for manufacturing zinc hydrometallurgically from a zinc-containing starting material that has been treated with at least one leaching stage to form a solution, at least one solution purifying stage and at least one electrowinning stage from which recovered liquid is recycled to at least one of said leaching stages, said method comprising:

- (a) withdrawing a predetermined portion of the solution from after at least one of said electrowinning stages, said portion containing dissolved zinc, magnesium and manganese;
- (b) concentrating the portion by evaporation to precipitate

magnesium and manganese in the form of metal salt crystals; and
(c) separating the metal salt crystals from the portion so as to form a residual liquid phase, said predetermined portion being selected so that accumulation of magnesium and manganese in the solution is avoided.

4,710,278 METHOD AND APPARATUS FOR SEPARATION AND PURIFICATION OF HYDROGENOUS COMPOUNDS WITH NOVEL MEMBRANE

Anthony J. Polak, Lake Zurich, and Allyson J. Beubler, Indian Head Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

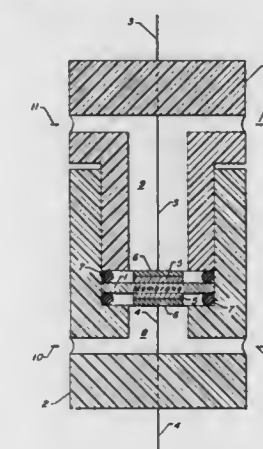
Continuation-in-part of Ser. No. 566,841, Dec. 29, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 854,285

The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

Int. Cl.⁴ C25B 1/02, 9/00

U.S. Cl. 204—129

18 Claims



1. Apparatus for separation of hydrogen from a gaseous mixture having a component which is capable, in the presence of a catalytic agent, of dissociating to yield hydrogen ions comprising:

- (a) a thin film membrane which comprises a single phase solution blend of (i) from about 10% to about 70% by weight of a compound selected from the group consisting of heteropoly acids and salts thereof, where said heteropoly acids have the generic formula:



in which X is selected from the group consisting of boron, aluminum, gallium, silicon, germanium, tin, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, iodine, and metals of the first, second, third, fourth, fifth and sixth transitional metal series of the periodic table, said series including scandium, yttrium, lanthanum, actinium, titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum and tungsten, where Y is dissimilar from X and is selected from the group consisting of the metals of the first, second, third and fourth transitional metal series of the periodic table, A is selected from the group consisting of hydrogen, ammonium, sodium, potassium, lithium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium, m is an integer of from 1 to 10, y is an integer of from 6 to 12 based on x taken as 1, z is an integer of from 30 to 80, and n is an integer of from 3 to 100, and (ii) from about 90% to about 30% by weight of a polymer compatible with said compound which is selected from the group consisting of poly(vinyl alcohol), poly(vinyl fluoride), polyethylene oxide, polyethyleneimine, polyacrylic acid, polyethylene glycol, cellulose acetate, polyvinylmethylethyl ether, and phenol formaldehyde resins;

- (b) a membrane housing comprising a first gas chamber and a second gas chamber separated by a substantially impervious partition comprising said membrane, said membrane having a first surface in common with the first gas chamber and a second surface in common with the second gas chamber;
- (c) two separate portions of catalytic agent effective to promote dissociation and combination, one portion in contact with said first surface and one portion in contact with said second surface of said membrane;
- (d) means for forming electrical connection in operative contact with said catalytic agent at said first surface and with said catalytic agent at said second surface; and
- (e) means to supply a gaseous mixture containing hydrogen to said first gas chamber.

14. Method for separation of hydrogen from a gaseous mixture having a component which is capable, in the presence of a catalytic agent, of dissociating to yield hydrogen ions, such method comprising contacting said gaseous mixture with a first surface of a thin film solution blend membrane and forming an electrical connection between two separate portions of catalytic agent effective to promote dissociation and combination, where one portion of catalytic agent is in contact with said first surface and one portion of catalytic agent is in contact with a second opposing surface of said membrane, which membrane isolates said gaseous mixture from a pure gas comprising hydrogen separated from the gaseous mixture, and which membrane has said second surface exposed to the pure gas while recovering hydrogen formed at said second surface, said membrane comprising a single phase solution blend of (i) from about 10 to about 70% by weight of a compound selected from the group consisting of heteropoly acids and salts thereof, where said heteropoly acids have the generic formula:



in which X is selected from the group consisting of boron, aluminum, gallium, silicon, germanium, tin, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, iodine, and metals of the first, second, third, fourth, fifth and sixth transitional metal series of the periodic table, said series including scandium, yttrium, lanthanum, actinium, titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum and tungsten, where Y is dissimilar from X and is selected from the group consisting of the metals of the first, second, third, and fourth transitional metal series of the periodic table, A is selected from the group consisting of hydrogen, ammonium, sodium, potassium, lithium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium, m is an integer of from 1 to 10, y is an integer of from 6 to 12 based on x taken as 1, z is an integer of from 30 to 80, and n is an integer of from 3 to 100, and (ii) from about 90% to about 30% by weight of a polymer compatible with said compound which is selected from the group consisting of poly(vinyl alcohol), poly(vinyl fluoride), polyethylene oxide, polyethyleneimine, polyacrylic acid, polyethylene glycol, cellulose acetate, polyvinylmethylethyl ether, and phenol formaldehyde resins.

4,710,279

METHOD AND BATH FOR ELECTRO-CHEMICALLY RESHARPENING OF CUTTING TOOLS

Norman R. Hoyer, 2085 Brookfield Dr., Thousand Oaks, Calif. 91362

Filed Mar. 2, 1987, Ser. No. 20,510

Int. Cl. C25F 3/00

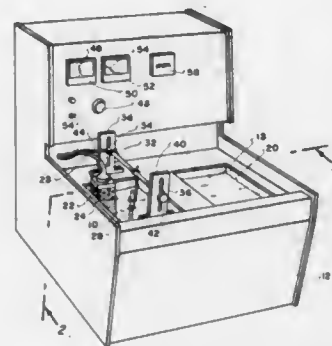
U.S. Cl. 204—129.55

5 Claims

1. A bath for electro-chemically sharpening of metallic cutting tools comprising:

an aqueous solution of phosphoric acid (approximately sixty-nine percent by volume) and sulphuric acid (approximately twenty-five percent by volume) to which is added

stabilizers of chromic acid (approximately two grams per liter), nickel carbonate (approximately five grams per



liter) and ferric oxide (approximately two-tenths gram per liter).

4,710,280

METHOD AND APPARATUS FOR ELECTROCHEMICALLY CLEANING GUN BORES AND THE LIKE

George H. Brilmyer, 1009 Sherman Rd., Cedarburg, Wis. 53012, and Dennis L. Marshall, 2006 N. 107th St., Wauwatosa, Wis. 53226

Filed May 5, 1986, Ser. No. 859,437

Int. Cl. C25F 5/00, 7/00

U.S. Cl. 204—146

21 Claims

1. The method for selective removal of nonferrous metal deposits selected from the group consisting of copper, lead and alloys of each from ferrous base metals comprising the steps of:

- selecting an electrolytic solution which promotes solubilization of the nonferrous metal deposit and does not promote oxidation of the ferrous base metal;
- selecting electrode means for supporting an electrical current to oxidize the nonferrous metal;
- applying a controlled direct current potential between the ferrous base metal and the electrode means in the electrolytic solution such that the ferrous base metal is maintained sufficiently positive with respect to the electrode means to oxidize the nonferrous metal without actively oxidizing the ferrous base metal; and
- maintaining the potential for a time sufficient to remove the nonferrous metal.

4,710,281

PROCESS FOR COATING AN ELECTRICALLY CONDUCTIVE SUBSTRATE AND AN AQUEOUS COATING COMPOSITION BASED ON A CATIONIC BINDER

Chantal H. Guioth, Rantigny; Etienne G. Maze, Breuil le Vert, and Loick P. Rabajole, Chantilly, all of France, assignors to Akzo NV, Arnhem, Netherlands

Filed Jul. 7, 1986, Ser. No. 882,379

Claims priority, application Netherlands, Jul. 5, 1985, 8501939

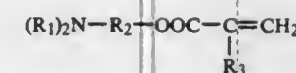
Int. Cl. C25D 13/06

U.S. Cl. 204—181.7

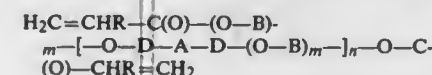
16 Claims

1. A process for coating a substrate, comprising applying to said substrate an aqueous coating composition based on a cationic binder obtained by polymerization of a monomer mixture in the presence of 0.25–4 parts by weight of a polyethylenically unsaturated compound per 100 parts by weight of the monomer mixture,

said monomer mixture consisting of (a) 1–30% by weight of a hydroxy(cyclo)alkyl (meth)acrylate of which the (cyclo)alkyl group contains 2–8 carbon atoms, (b) 4–45% by weight of an amino (meth)acrylate of the formula



where at least one of the groups R_1 is a hydrocarbon group containing 1–12 carbon atoms and the other group R_1 is a hydrocarbon group containing 1–12 carbon atoms or a hydrogen atom, or the two groups R_1 , together with the nitrogen atom attached thereto, form a heterocyclic group, R_2 is a hydrocarbon group containing 2–12 carbon atoms and R_3 is a hydrogen atom or a methyl group, (c) 0–80% by weight of a monovinyl aromatic hydrocarbon containing 8–14 carbon atoms, and (d) 0–50% by weight of a different monoethylenically unsaturated monomer containing 2–20 carbon atoms; said polyethylenically unsaturated compound being an acrylic or methacrylic bisphenol ester of the formula



wherein R represents a hydrogen atom or a methyl group, A represents a hydrocarbon group containing 1–4 carbon atoms, B represents a hydrocarbon group containing 2–3 carbon atoms, or a 2-hydroxypropylene group D represents a phenylene group or a cyclohexylene group, m is a number from 1–4 and n is a number from 1–3;

amino groups present in said binder being at least partially neutralized with an acid.

4,710,282

DEVICE FOR SILVERIZING RUNNING WATER

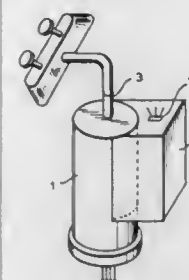
Maryan Chak, 483 Ocean Pkwy., Brooklyn, N.Y. 11218, and Moisey Dobruskin, 2901 Ocean Pkwy., Brooklyn, N.Y. 11235

Filed Aug. 8, 1986, Ser. No. 894,900

Int. Cl. C25B 9/00, 11/03, 11/04

U.S. Cl. 204—228

22 Claims



1. A device for silverizing water, comprising passage forming means having an inlet, an outlet and a passage extending between said inlet and said outlet so that said inlet and said outlet are open during silverizing of water and water can run from said inlet to said outlet through said passage; and at least one pair of electrodes including a silver-containing anode and a cathode formed and located relative to one another and relative to said inlet and said outlet so that water running from said inlet to said outlet through said passage is guided by said electrodes to repeatedly change its direction so as to flow transversely to and along said electrodes to continuously saturate the water running from said inlet to said outlet with ions of silver emerging from said anode, said electrodes being formed as plates each having a central region and a peripheral region, one of said electrodes being provided with a central through channel, whereas the other of said electrodes is provided with a peripheral channel for passing the running water through said channels.

6. A device as defined in claim 1; and further comprising current supply means arranged to supply current to said electrodes; and current adjusting means actuable by a user so as

to adjust current supplied by said current supply means to at least two different current values alternatingly and thereby to adjust the quantity of silver ions discharged into the running water to at least two silverizing values alternatingly so as to obtain at said outlet either a higher silverized water or a lower silverized water.

4,710,283

COLD CATHODE ION BEAM SOURCE

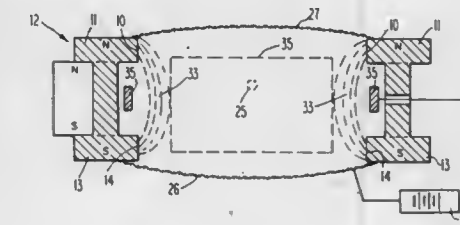
Bawa Singh, and Peter R. Denton, both of Cherry Hill, N.J., assignors to Denton Vacuum Inc., Cherry Hill, N.J.

Filed Jan. 30, 1984, Ser. No. 574,882

Int. Cl. C23C 14/36; H01J 27/02

U.S. Cl. 204—298

3 Claims



1. A cold cathode ion beam source comprising in combination: first and second magnetic flux conducting means with each formed into an endless configuration having a relatively large aperture therethrough, first separation means formed of material which does not conduct magnetic flux and formed into an endless configuration having an aperture therethrough which aperture is larger than said relatively large aperture, said first separation means disposed to separate said first and second magnetic flux conducting means and provide a common aperture, with first and second ends, passing through said first magnetic flux conducting means, through said first separation means, and through said second magnetic flux conducting means said common aperture having an inside surface formed to be concave with said first and second magnetic flux conducting means providing first and second ends of said concave configuration; magnetic flux source means disposed in close proximity to said first and second magnetic flux conducting means to provide flux passing from said first end to said second end of said concave formed inside surface thereby creating a first enclosure between said last mentioned magnetic flux and said concave formed inside surface; third and fourth magnetic flux conducting means separated by second separation means, said second separation means formed of material which does not conduct magnetic flux and disposed with respect to said third and fourth magnetic flux conducting means to form a second concave surface made up by part of said third magnetic flux conducting means, by said second separation means, and by part of said fourth magnetic flux conducting means, said third and fourth magnetic flux conducting means formed to fit within said common aperture and disposed to provide a gap between the combination of said first and second magnetic flux source means and the combination of said third and fourth magnetic flux conducting means, second magnetic flux source means disposed in close proximity to said third and fourth magnetic flux conducting means to provide flux to pass there-through, said second concave surface designed to be a mirror image of said concave formed inside surface whereby magnetic flux provided by said second magnetic flux source means passes from a first end to a second end of said second concave surface thereby creating a second enclosure, and said second enclosure being between said last mentioned magnetic flux and said second concave surface; first and second anode means respectively disposed within said first and second enclosures; cathode means disposed along said gap; electrical power means connected to said cathode and said anodes to cause an electrostatic field therebetween whereby a region of plasma can be formed in said gap; ionizable fluid disposed in said gap so that

when electrical energy is applied to said cathode and to said anodes a plasma forms along said gap.

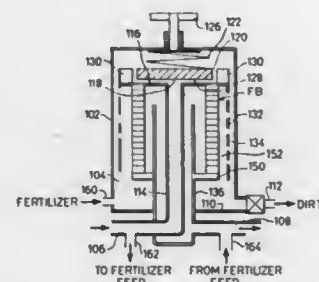
4,710,284 CYCLONIC SEPARATOR

Meir Amit, Nethanya, Israel, assignor to Amlad, Korazim, Israel
Filed Oct. 25, 1985, Ser. No. 791,610

Claims priority, application Israel, Oct. 26, 1984, 73329
Int. Cl.⁴ B03B 5/66

U.S. Cl. 209—17

17 Claims



1. A cyclonic separator for separating solid particles from a fluid, comprising:

a housing including a chamber, a fluid inlet into said chamber, a fluid outlet from said chamber, and a radially-extending passageway between said inlet and said chamber;

first deflector means between said inlet and said chamber for deflecting the fluid flowing from said inlet to said radially-extending passageway before reaching said chamber;

said first deflector means being displaceable to enlarge or restrict said radially-extending passageway, and including biasing means biasing it in the direction of restricting said passageway but displaceable by the inletted fluid in the direction of enlarging said passageway,

second deflector means between said radially-extending passageway and said chamber for deflecting the fluid in the circumferential direction before entering said chamber to produce a vortex therein for separation of the solid particles from the fluid before the fluid reaches the housing outlet;

and a dirt-purging outlet at the bottom of said chamber for purging the solid particles settling therein.

4,710,285 VERMICULITE FLOTATION PROMOTER

Anthony E. Gross, St. Charles; Richard D. Christie, Downers Grove, both of Ill., and Thomas E. Pinder, Fort Mill, S.C., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Dec. 4, 1986, Ser. No. 937,843

Int. Cl.⁴ B03D 1/02

U.S. Cl. 209—166

2 Claims

1. A method for improving the froth flotation recovery and/or grade of vermiculite from vermiculite containing rock and clay which comprises using as an improved froth flotation collector a composition comprising oil and between 2-60% by weight of an alkyl phenol formaldehyde condensation product having 4-15 phenol nuclei with the alkyl group of said phenol having between 4-15 carbon atoms.

4,710,286 SIEVE FOR POWDER

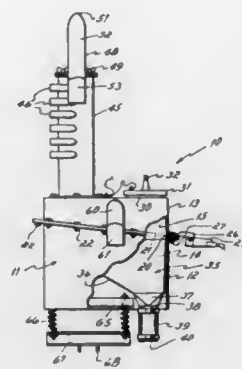
Douglas C. Mulder, Wellington, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Filed Sep. 17, 1982, Ser. No. 419,167

Int. Cl.⁴ B07B 1/28

U.S. Cl. 209—250

1 Claim



1. A sieve for powder comprising:

a housing formed of an upper section and a lower section, said sections having perimeter flanges,

a screen having a perimeter sandwiched between said flanges, said screen thereby extending across said housing and dividing it into an upper chamber and a lower chamber,

said screen being inclined to horizontal at an angle of about 10°,

an elongated vertically-extending cyclone housing for introducing powder carried by air under pressure into said upper chamber,

said elongated vertically-extending cyclone housing having a top cover and inclined stack section projecting vertically at an angle of about 30° to vertical from said top cover, and a downwardly and inclined stack section being at an angle of about 30° to vertical connected to the upper end of said vertical stack section to relieve the pressure of air by which the powder is introduced,

a relief port connected to the side of said housing above said screen and below said elongated vertically-extending cyclone housing,

an inclined floor at the lower end portion of said lower chamber within said housing,

a discharge port in said housing adjacent the lower end of said floor,

an inspection cover in the top of said housing overlying the lower end portion of said screen for removal of large particles resting on the lower end portion of said screen, and

a vibrator fixedly secured to said flanges and said screen sandwiched therebetween,

whereby powder carried by air under pressure entering said elongated vertically-extending cyclone housing will swirl around inside said elongated vertically-extending cyclone housing with excess air passing out of said vertical stack sections and any build up of pressure within said upper chamber being relieved by said relief port, so that the bulk of said powder will become loosened through said swirling action and will drift downwardly under the influence of gravity into said upper chamber and onto said screen so as not to blind said screen.

4,710,287 FIBROUS SUSPENSION PRESSURIZED SORTER

Hans-Otto Henrich, and Reimund Rienecker, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

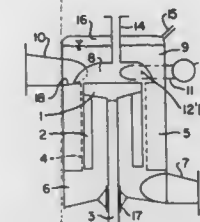
Filed May 21, 1986, Ser. No. 865,424

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519373

Int. Cl.⁴ B07B 1/20

U.S. Cl. 209—270

6 Claims



1. A sorter for fibrous suspensions comprising:

a rotationally symmetric vertically oriented screen mounted in said sorter, said screen defining an interior side and a screen outlet side radially outside said screen;

an accepts screen space on said screen outlet side;

a central drain space connected to the interior of said screen for receiving overflow material;

an accepts drain space at an axial end of said screen surrounding said central drain space, which accepts drain space has an upper part;

a constricted connection communicating between said accepts drain space and said accepts screen space, which accepts drain space receives flow through material from said accepts screen space;

a pressurized gas space in the upper part of said accepts drain space;

an outlet connected to said accepts drain space for receiving the flow through material; and

an inlet for the suspension located on the other axial end of said screen opposite said central drain space for receiving fibrous suspensions.

4,710,288 FILTRATION SYSTEM

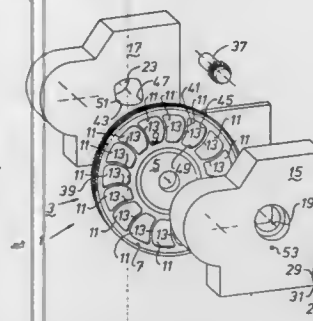
Hubert Patrovsky, 290 Samson Blvd., #1, Ste. Dorothee, Quebec, Canada H7X 3C1

Filed Apr. 17, 1987, Ser. No. 39,328

Int. Cl.⁴ B01D 35/12

U.S. Cl. 210—111

4 Claims



1. A filtration system for filtering a molten plastic flow flowing from a source to a tool, comprising:

a rotatable disc having an annularly arranged screening zone comprising a plurality of like cavities separated by spacing webs;

a housing for said disc comprising a first plate having a front side and a rear side, and a second plate having a front side

and a rear side, said disc being rotatably mounted between said rear side of said first plate and said front side of said second plate;

a first flow-through bore in said first plate having a front side and a rear side, and a second, aligned, flow-through bore in said second plate having a front side and a rear side;

said disc being mounted in said housing such that at least one of said cavities is in alignment with said first flow-through bore and said second flow-through bore, said first flow-through bore, said second flow-through bore and said at least one cavity forming a flow-through channel;

said second flow-through bore having a preselected outer contour at the front side thereof;

said first flow-through bore comprising flow-shape forming means for causing the contour of a cross-section of said molten flow at said rear side of said first flow-through bore to correspond with said preselected outer contour.

4,710,289 CHROMATOGRAPHY PRECOLUMN

Stefan Wermuth, Darmstadt; Günter Hauke, Mühlthal, and Klaus Kreher, Münster, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

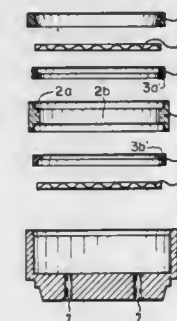
Filed Feb. 27, 1987, Ser. No. 19,737

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606474

Int. Cl.⁴ B01D 15/08

U.S. Cl. 210—198.2

2 Claims



1. A precolumn for use with a chromatography column, the precolumn comprising:

an outer annular casing defining a circular chamber of a selected internal diameter, having first and second ends with the first end being completely open to accommodate the end of the chromatography column and the second end being enclosed by a wall with openings therethrough for admitting eluent;

a first and a second frit element received in the circular chamber; the first frit element being in abutment with the wall, the second frit element being axially spaced from the wall; each first frit element having a diameter less than that of the chamber;

first and second annular sealing members having internal diameters approximately that of the frit elements, external diameters less than that of the circular chamber and a shoulder with an internal diameter less than that of the frit elements;

a column ring having an external diameter proximate the internal diameter of the circular chamber and an internal diameter proximate the external diameter of the annular sealing members, the ring further having an internal annular shoulder spaced from the edges thereof a distance equal to the axial dimension of the sealing members, whereby the sealing members nest between the respective frits and the column ring while the column ring nests within the circular chamber with a space defined by the shoulder between the frits;

a bed of sorbent disposed in the space defined by the shoulder

der projecting from the column ring and retained between the first and second frits, and an elastic sealing ring disposed in the circular space between the second end of the outer annular casing for effecting a seal between the precolumn and the chromatography column.

4,710,290

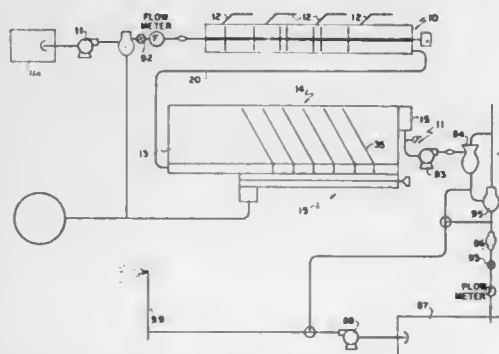
FLUID CLARIFYING ASSEMBLY

Raymond P. Briltz, Regina, Canada, assignor to 3M Holding Co. Ltd., Regina and Magill-Stephenson Company Limited, Winnipeg, both of, Canada, a part interest

Filed Aug. 22, 1985, Ser. No. 768,247
Int. Cl.⁴ C02F 1/52; B01D 21/08

U.S. Cl. 210—199

26 Claims



1. A fluid clarifying assembly comprising in combination a mixing tube assembly, a fluid intake at one end thereof, a fluid outlet at the other end thereof, a plurality of selective and discrete chemical injection means for the flocculation and precipitation of materials contained in said fluid, operatively connected to said mixing tube assembly, said flocculating and precipitation of materials forming a sludge, and a main shaft journaled for rotation within said mixing tube assembly, said discrete chemical injection means being operatively connected to said shaft, chemical injection nozzles along the length of said shaft, separate conduits extending through said shaft and communicating between individual chemical injection means and individual injection nozzles and mixing means on said shaft, a sedimentation extraction assembly, means operatively connecting said mixing tube assembly to one end of said sedimentation extracting assembly, said sedimentation extraction assembly including an elongated separating tube, said means operatively connecting said mixing tube assembly to said one end of said sedimentation extracting assembly being operatively connected to one end of said separating tube, a plurality of baffles along the length of said separating tube, means at the base of said separating tube to remove sludge therefrom, said baffles including means at the upper side thereof forming a passage with the upper wall of said separating tube, said upper sides acting as weirs and means for removing clarified fluid flowing over said weirs from the other end of said sedimentation extraction assembly.

4,710,291
TWO-STAGE APPARATUS FOR CLARIFYING LIQUID CHARGED WITH SOLID MATTER

Elie Condolios, Grenoble, France, assignor to Alstom, Paris, France

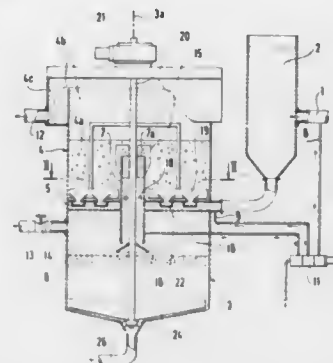
PCT No. PCT/FR85/00211, § 371 Date Mar. 31, 1986, § 102(e)
Date Mar. 31, 1986, PCT Pub. No. WO86/00879, PCT Pub. Date Feb. 13, 1986

PCT Filed Jul. 31, 1985, Ser. No. 859,983

Claims priority, application France, Jul. 31, 1984, 84 12141
Int. Cl.⁴ B01D 21/08

U.S. Cl. 210—199

6 Claims



1. Sludge belt clarification apparatus for receiving a cloudy liquid charged with fine solid particles in suspension to provide firstly a clarified liquid and secondly a sludge, said apparatus comprising:

a clarification chamber (4);
a distribution chamber (5) extending under said clarification chamber;

means (8, 9, 11) for adding a flocculation additive to said cloudy liquid in such a manner as to provide a mixture in which said fine particles meet one another and bind together with the aid of said additive to form flakes;

means (2) for inserting said mixture into said distribution chamber while setting up a substantially uniform pressure therein;

a plurality of injectors (22) distributed over the bottom area of the clarification chamber, each injector having an axis (22a) and being provided with guide means, and each of said injectors communicating the distribution chamber with the clarification chamber for continuously inserting said mixture into the bottom of said clarification chamber with a flow which is distributed over the area of said chamber;

an orifice (4b) for continuously removing clarified liquid from the upper portion of the clarification chamber (4); and

an orifice (26) for continuously removing sludge below said orifice for removing clarified liquid;

the flowrate through said injectors being chosen in such a manner as to form a belt of sludge (4a) above said injectors through which belt a mixed cloudy liquid rises between the already-formed flakes such that the fine particles still in suspension in said liquid bind to said flakes to increase the volume thereof and such that the liquid which arrives above said sludge belt is clarified and forms a layer of clarified liquid (4a);

the improvement wherein said apparatus further comprises a thickening chamber (3) for thickening the sludge from said sludge belt and constituting a secondary stage with said clarification chamber constituting a primary stage, said thickening chamber being disposed below the clarification chamber and being co-extensive therewith; and a central vertical well (7) having a high inlet (7a) for receiving an overflow of flakes from the top layer of said sludge belt and for limiting the height thereof, a low inlet consti-

tuted by at least one hole (18) in the clarification chamber (4) at the bottom thereof for receiving large dense agglomerates of flakes formed in the sludge belt, and an intermediate height outlet into said thickening chamber (3);

first conveying means for conveying said large dense agglomerates from the bottom surface of said clarification chamber towards said central well low inlet;

said thickening chamber including an outlet for clarified water (13) higher than the outlet from said central well, an outlet for sludge (26) in the lower portion thereof; and second conveying means for conveying thickened sludge from the bottom surface of said thickening chamber towards said sludge outlet.

4,710,292

DIGESTER TANK WITH FOAM CONTROL COVER

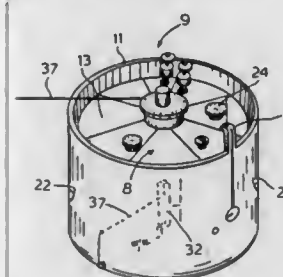
Jerry DeVos, Montville, N.J., assignor to Atara Corporation, Quebec, Canada

Filed Aug. 18, 1986, Ser. No. 897,088

Int. Cl.⁴ C02F 11/04

U.S. Cl. 210—218

14 Claims



1. In apparatus for carrying out chemical reactions involving a liquid phase and a gas phase, wherein there is formation of foam above the liquid phase, the apparatus comprising a reactor vessel having an enclosed sidewall and bottom and designed to contain a liquid and a gas; a floating cover vertically movably maintained within the vessel and having a lower ceiling surface extending transversely across the vessel within the sidewall and designed to be supported above the level of liquid in the vessel; gas withdrawal conduit means located within the vessel and designed to permit the passage of gas between the vessel and the exterior of the vessel; and gas pressure controlling means for limiting the pressure below the floating cover within the vessel by controlling the flow of gas through the gas withdrawal conduit means;

the improvement which comprises a gas-filled buoyancy chamber rigidly connected to and located below the floating cover and within the vessel and designed to partially support the floating cover above liquid within the vessel; and a variable level liquid/foam withdrawal member, rigidly supported from and below the floating cover, and defining a withdrawal opening, located within the vessel and below the uppermost portion of the buoyancy chamber, and withdrawal conduit means connecting the withdrawal opening to the exterior of the vessel, to control the passage of foam and liquid between the vessel and its exterior; wherein the floating cover and the withdrawal opening, moving together, can be maintained at a desired height relative to the surface of the liquid so as to permit the removal of any proportion of foam and sludge floating on the surface of the liquid.

4,710,293

FILTER CLOTH CAKE REMOVAL DEVICE

Steven S. Davis, Farmington, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Dec. 9, 1985, Ser. No. 806,656

Int. Cl.⁴ B01D 25/32

U.S. Cl. 210—225

8 Claims

1. An apparatus for removing filter cake in a filter press

having a plurality of filter plates mounted within a frame; said filter plates being adapted for opening, including first and second adjacent filter plates, a pair of scissor-like suspension arms pivotally mounted to each pair of adjacent filter plates an elongate horizontal first rod mounted above and between each pair of said adjacent filter plates, and a filter cloth, folded over the horizontal rod, and secured to the first and second filter plates, said apparatus comprising:

a second elongate rod mounted above said filter press and parallel said first rod, said second rod being connected to said first horizontal rod by means of a cable; said first rod being positioned to suspend said filter cloth in a tensioned, substantially inverted "V"-shaped configuration between any opened said first and second filter plates; and

a return means mounted on each filter plate for rapidly returning said second rod to an equilibrium position subsequent to a displacement of said second rod; said return means comprising:

a first compression plate mounted on said suspension arms; a first spring mounted on top of said first compression plate;

an elongate first shaft mounted on said second horizontal rod, having a first longitudinal axis; said first shaft extending through said first compression plate and through said first spring;

a second compression plate mounted on said elongate shaft wherein said first spring is positioned between said first and second compression plate; wherein a displacement of said second rod in a first direction effects a compression of said first spring along said first longitudinal axis;

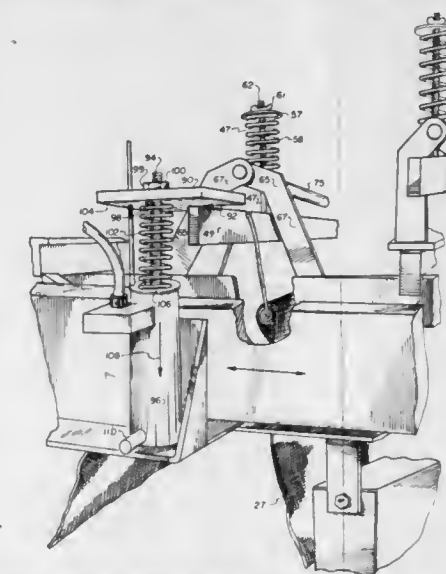
a carriage mounted to slide along said frame;

an impact-loading means mounted on said frame said impact loading means comprising:

a first pneumatically operated cylinder having a second shaft, reciprocally slidable piston mounted therein; wherein said piston is driven in a first direction upon pressurized air being supplied to said cylinder;

a second spring mounted on said cylinder and over said second shaft wherein said second shaft extends through said second spring;

a third compression plate mounted on said second shaft



wherein said second spring is mounted between said third compression plate and said cylinder wherein a displacement of said second shaft in said first direction effects a compression of said second spring; along said second longitudinal axis;

wherein a pneumatic pressure is applied to said piston inducing a displacement of said piston effecting a first direction displacement of said third compression plate with a corresponding displacement of said second rod; said second spring being compressed by said third com-

pression plate's first direction displacement; said first rod being displaced in said first direction under the force of gravity as said second rod is displaced in said first direction; said first rod's first direction displacement operating to ease any tension applied to said filter cloth by said first horizontal rod;

wherein, thereafter; upon said pneumatic pressure on said piston being released, said second spring effects a rapid displacement of said third compression plate in said second direction thereby applying a sudden impact, tensioning load to said filter cloth through a displacement of said second horizontal rod in a second direction to effect a snapping motion in said filter cloth and thereby remove said filter cake from said filter cloth.

4,710,294

ROTARY DISK FILTER ELEMENT

Josef Ziller, Waldstetten, Fed. Rep. of Germany, assignor to Schenk Filterbau Gesellschaft mit beschränkter Haftung, Waldstetten, Fed. Rep. of Germany

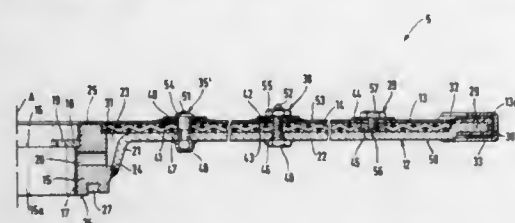
Filed Nov. 22, 1985, Ser. No. 801,009

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1984, 3442870

Int. Cl.⁴ B01D 33/26

U.S. Cl. 210—232

13 Claims



1. A rotary disk filter element for a liquid filter with depth effect; said filter element comprising:

a retaining member;
a collar member disposed inwardly of said retaining member and having at least one supply opening for wash liquid;
a closed base plate in the form of a ring-like member disposed between said retaining member and said collar member;

a support fabric placed on said base plate;

at least one filter fabric placed on said support fabric on a side thereof remote from said base plate; said filter fabric having a radially outer portion secured to said base plate via said retaining member in a radially outer fastening zone; said filter fabric also having a radially inner portion secured by said collar member in a radially inner fastening zone, with said filter fabric communicating with said supply opening of said collar member so that filter residue can be removed from said filter fabric during general cleaning thereof by having said wash liquid flush through said filter fabric in a direction opposite to the direction of filtration; and

securing means for securing said filter fabric to said support fabric and to said base plate at a plurality of point locations in a radial region between said radially inner fastening zone and said radially outer fastening zone particularly for avoidance of an over-expansion of said filter fabric during said flushing.

4,710,295

SEPTIC TANK FILTERS

Robert Zabel, 9315 Fairground Rd., Louisville, Ky. 40291

Continuation-in-part of Ser. No. 639,129, Aug. 9, 1984, abandoned. This application Sep. 9, 1985, Ser. No. 778,349

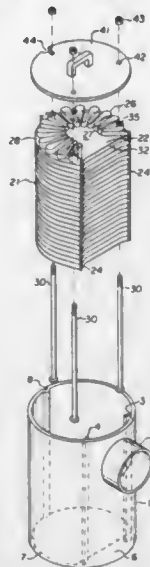
Int. Cl.⁴ B01D 25/02

U.S. Cl. 210—336

4 Claims

1. A filter unit for use in cylindrical casing means adapted to be disposed in a septic tank including: a plurality of stacked disc-dam units to form a cartridge having a longitudinal axis where each disc-dam unit has a generally circular planar base

with a chord segment cut away to form a chord edge where the chord edges of each disc-dam is in mutual alignment and first and second sealing edges are formed at the respective ends of the chord edge and the first and second sealing edges are parallel to the longitudinal axis and where each base includes a continuous elongate dam located on one side of the base and extending outwardly therefrom to terminate at a dam top where the elongate dam has a dam first end adjacent said first sealing edge and extends continuously to a dam second end at said second sealing edge to divide said base into an upstream and downstream side; retaining device to hold at least two



disc-dam units in stacked relation with the dam top of one disc-dam unit facing one surface of the next base opposite the side carrying the dam wherein said casing means is of selected diameter to receive said filter unit with said longitudinal axis of said filter unit in generally coincident relation with said longitudinal axis of said casing and wherein said casing means includes first and second longitudinal seal means extending generally parallel to said longitudinal axis in spaced relation to engage said first and second sealing edges and outlet means whereby said outlet means communicating with said outlet of said casing.

4,710,296

STATIC SIEVE FEED CONTROL

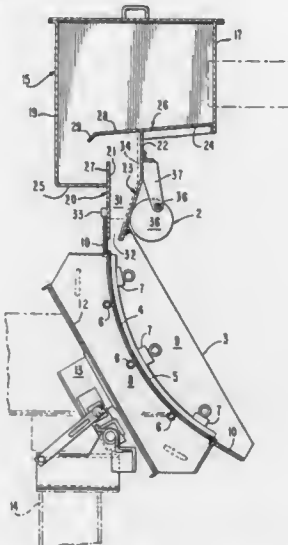
James D. Connolly, P.O. Box 5329, Princeton, W. Va. 24740

Filed Sep. 4, 1986, Ser. No. 903,560

Int. Cl.⁴ B01D 25/04

U.S. Cl. 210—420

6 Claims



1. In a static sieve assembly, the combination with a housing mounting a screen and a feed box for feeding a solid-liquid

mixture to the screen, of a feed control device for controlling the rate of discharge of said mixture from said box to said sieve comprising a discharge spout on said feed box for discharging said mixture therefrom onto and across said screen, said spout having front and rear walls together bounding opposite sides of a passage tapering downwardly to a discharge outlet, said front wall having a lower part, elastomeric means connecting said parts for relative horizontal angling, and means mounted on said feed box and acting on said lower part for selectively adjusting the cross-sectional area of said outlet between said walls.

4,710,297

FLUID FILTER WITH PLEATED FILTER MEDIUM

Mitsutoshi Suzuki, Kawagoe; Yoshitaka Morita, Fussa; Masami Okada, Ichikawa, and Jun Shimohara, Kamifukuoka, all of Japan, assignors to Kabushiki Kaisha Tsuchiya Seisakusho, Tokyo, Japan

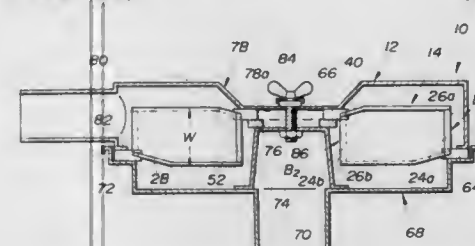
Filed Mar. 28, 1986, Ser. No. 845,842

Claims priority, application Japan, Jun. 15, 1985, 60-130356; Sep. 30, 1985, 60-218836; Nov. 29, 1985, 60-184344[U]; Dec. 28, 1985, 60-297388

Int. Cl.⁴ F02M 35/00

U.S. Cl. 210—493.2

31 Claims



1. A fluid filter for an automotive engine, comprising a filter element including a pleated filter medium having a plurality of pleats, said plurality of pleats defining adjacent pairs of first and second pleats, each pleat having first and second sides which are integrally connected through a first score line with each other to form an upwardly-pointing pleat portion, the second side of said first pleat and the first side of said second pleat being integrally connected through a second score line with each other to form a downwardly-pointing pleat portion, each pleat side having oppositely located first and second end sections which have first and second edges, respectively, which extend substantially perpendicular to each score line, the first end sections of said first and second sides of each pleat being approached and bonded to each other to form a plurality of first bonded sections, the second end section of said first pleat second side and the second end section of said second pleat first side, of said adjacent pairs of first and second pleats, being approached and bonded to each other to form a plurality of second bonded sections.

4,710,298

AUXILIARY FOR DEWATERING OF SLUDGE

Kimihiro Noda, Uji; Yoji Fujiura, Kyoto, and Yoichi Hasegawa, Joyo, all of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

PCT No. PCT/JP84/00214, § 371 Date Dec. 3, 1985, § 102(e) Date Dec. 3, 1985, PCT Pub. No. WO85/04857, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 24, 1984, Ser. No. 812,886

Int. Cl.⁴ B01D 39/04

U.S. Cl. 210—505

14 Claims

1. An auxiliary for dewatering a sludge, comprising a separability improving amount of at least one cationic polymeric flocculant and at least one organic fibrous material having the bulk specific gravity thereof increased to at least 0.3 g/cm³ by being pressed, wherein the weight ratio of said flocculant to said fibrous material is 1:01 to 1:1000, and wherein said fibrous

material has a density not more than 0.1 g/cm³ before being pressed.

4,710,299

CYCLONE SEPARATOR

Gavan J. J. Prendergast, Glen Iris, Australia, assignor to Noel Carroll, Sherbrooke, Australia

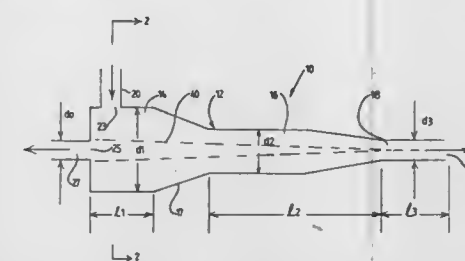
Continuation-in-part of Ser. No. 776,164, filed as PCT AU85/0001, Jan. 24, 1985, published as WO85/03242, Aug. 1, 1985, abandoned. This application Apr. 4, 1986, Ser. No. 848,385

Claims priority, application Australia, Jan. 24, 1984, PG3311/84; Canada, Jan. 24, 1985, 472531; Australia, Apr. 4, 1985, 40909/85

Int. Cl.⁴ B04C 5/081

U.S. Cl. 210—512.1

25 Claims



1. A cyclone separator for separating denser components of a fluid mixture from less dense components thereof, said separator comprising: means for permitting provision of only a single inlet opening in an axially extending separating chamber having towards one end inlet means for admission of the mixture with a tangential flow component, the separating chamber having an axially positioned overflow outlet adjacent said one end and said separating chamber of generally tapered form with a relatively larger cross-sectional size at said one end and a relatively small cross-sectional size at an axially positioned underflow outlet at the end of the separating chamber opposite said one end, including means for directing the denser component to the underflow outlet in a fashion such as to encompass an inner axially positioned core of the less dense component which is subjected at least over a substantial part of its length to a pressure differential causing it to flow to the overflow outlet, said inlet means being defined by a portion of the separating chamber and at least one inlet tract communicating with said portion, said portion being that portion of the separating chamber which is at the same lengthwise position as the or each inlet tract, wherein the or each inlet tract includes means for presenting inner and outer profiles, when viewed axially of the separator, said outer profile extending from a first location at which it meets the circumference of said portion of the separating chamber and at least the inward projection of said inner profile extending from a second location at which the inner profile or its said projection meets said circumference, said outer profile being dimensioned so that a first vector T describing the location of any particular point on said outer profile and contained in a plane normal to said axis, and having its origin at said first location, is such that as the magnitude of the vector T increases, an angle θ between the vector T and that tangent to said circumference which passes through said first location never decreases substantially and never becomes less than negative 0.1 radian; the cross-sectional area perpendicular to the direction of flow generally contracting in the direction of flow.

4,710,300

METHOD FOR PROCESSING OF ORGANIC MATERIALS CONTAINING NITROGEN COMPOUNDS
Jaroslav Kristoufek, Prague, Czechoslovakia, assignor to Československá akademie věd, Prague, Czechoslovakia
Continuation of Ser. No. 269,710, Jun. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 119,142, Feb. 5, 1980, abandoned. This application May 5, 1983, Ser. No. 491,980
Claims priority, application Czechoslovakia, Oct. 29, 1976, 6994-76

Int. Cl.³ C02F 3/28, 1/04

U.S. Cl. 210—603

7 Claims



1. A method of producing concentrated nitrogen compounds, phosphate containing concentrate and clear water from a liquid component obtained after anaerobic digestion of organic compounds in waste waters containing nitrogen in the form of ammonium salts of carbonic acid comprising the sequential steps of:

- heating the liquid component to a boiling temperature;
- subjecting the heated liquid component to a rectification thereby producing gaseous fractions of ammonia, carbon dioxide and water, and a tail fraction;
- isolating the gaseous fractions separately or as compounds formed by their chemical reaction as ammonium carbonate and ammonium water, and isolating the tail fraction with the residual content of less than 200 mg NH₃ bonded as ammonium salts thereto per 1 kg of the tail fraction;
- alkalizing the tail fraction by adding an equivalent of lime up to 20 g CaO per 1 kg at a temperature of 60° to 100° C., while simultaneously draining any residual ammonia;
- carbonating with carbon dioxide the alkalized product to a final value of 0.01 to 1.5 g CaO per 1 kg; and
- separating an organo-phosphate-lime concentrate and clear water.

4,710,301

WASTEWATER PURIFICATION PROCESS
Luc Geuens, Brussels, Belgium, assignor to S.A. Innovi N.V., Belgium

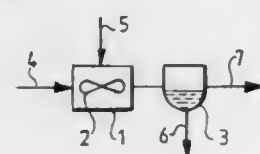
Filed Aug. 29, 1986, Ser. No. 901,649

Claims priority, application Netherlands, Sep. 30, 1985, 8502677

Int. Cl.⁴ C02F 3/30

U.S. Cl. 210—605

9 Claims



1. A process for the purification of wastewater to remove metals, colorants, detergents, phenols and other cationic contaminants comprising the steps of:

- contacting for about 5 to 20 minutes said wastewater with completely anaerobic fermented oxidative biological water purification sludge which has been fermented for at

least 20 days and is substantially free of viable microorganisms in order to adsorb metals, colorants, detergents, phenols and cationic contaminants from said wastewater onto said sludge, and

- separating said sludge from said wastewater after said contact.

4,710,302

PROCESS FOR THE SEPARATION OF THE WATER RESULTING DURING THE COKING PROCESS INTO A SMALL SALT-RICH FRACTION AND A LARGE SALT-POOR FRACTION

Georg Pollert, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen-Kray, Fed. Rep. of Germany
PCT No. PCT/EP85/00298, § 371 Date Feb. 14, 1986, § 102(e)
Date Feb. 14, 1986, PCT Pub. No. WO86/00332, PCT Pub. Date Jan. 16, 1986

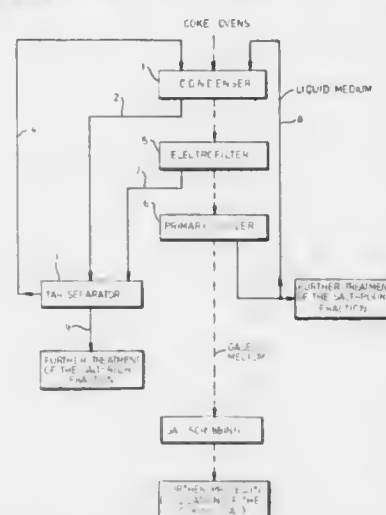
PCT Filed Jun. 19, 1985, Ser. No. 833,388

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423798

Int. Cl.⁴ C02F 5/00; C10K 1/00

U.S. Cl. 210—696

2 Claims



1. A process for the treatment of hot crude gas resulting from a coking operation, comprising the steps of:

- cooling said hot crude gas in a condenser to produce a tar-containing and a water-containing condensate and a gas phase;
- electrofiltering particulates from the gas phase produced in step (a) to produce a discharge and a filtered gas;
- subjecting said filtered gas to primary cooling to condense water therefrom in a salt-poor fraction of the total water contained in said hot crude gas and suitable for use as service water in a coking plant;
- combining said water-containing condensate from step (a) with said discharge from step (b) in a tar separator and recycling a tar and salt containing recycle from said tar separator to said condenser;
- withdrawing from said tar separator a salt-rich fraction of the total water contained in said hot crude gas for further treatment; and
- feeding a quantity of said salt-poor fraction of the water from step (c) to said condenser to prevent buildup of deposits therein.

4,710,303

LOW MOLECULAR WEIGHT POLYVINYL SULFONATE FOR LOW PH BARIUM SULFATE SCALE CONTROL
Daniel H. Emmons, Rosenberg, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 14, 1986, Ser. No. 896,354

Int. Cl.⁴ C02F 5/10

U.S. Cl. 210—698

2 Claims

1. A method of preventing the formation of barium sulfate scale deposited by aqueous produced or injection fluids having a pH below 7.5 which are recovered with or are used to recover petroleum from underground formations which comprises treating these aqueous fluids with from 1–25 ppm by weight of a low molecular weight water-soluble polyvinyl sulfonate which has a molecular weight within the range of between 500–10,000 and containing a minimum of 90 mole percent of vinyl sulfonate monomer.

4,710,304

METHOD FOR IMPROVING THE UTILIZATION OF POLYELECTROLYTES IN DEWATERING AQUEOUS SUSPENSIONS

James J. Lang, Springfield, Oreg., assignor to Joseph J. Campbell and Equest, Inc., both of Prairie Village, Kans.

Continuation-in-part of Ser. No. 674,782, Nov. 26, 1984, abandoned. This application Jul. 8, 1986, Ser. No. 883,085

Int. Cl.⁴ C02F 1/36

U.S. Cl. 210—734

12 Claims

1. The process for dewatering a stream of an aqueous suspension which comprises:

- forming a mixture of a water-soluble polyelectrolyte with a molecular weight above about 1,000,000 and water
- aging said mixture for a period of at least six hours to prepare an aged solution of said polyelectrolyte
- adding an amount of said aged solution to said aqueous suspension approximately equal to the minimum effective amount required to flocculate and dewater said aqueous suspension, and
- dewatering said aqueous suspension.

4,710,305

PROCESSES AND OXIDIZING AGENTS FOR OXIDIZING SULFIDE ION TO INNOCUOUS, SOLUBLE SULFUR SPECIES

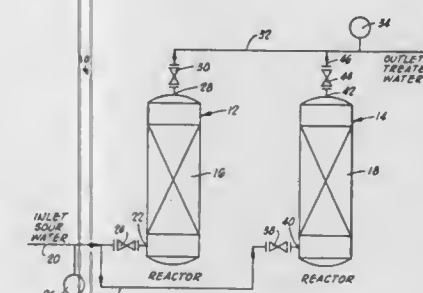
Joe D. Allison, and J. W. Wimberley, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Dec. 29, 1986, Ser. No. 947,327

Int. Cl.⁴ C02F 1/76

U.S. Cl. 210—747

32 Claims



1. A process for oxidizing sulfide ion found in sour water to innocuous, soluble sulfur species, comprising:

- contacting said sour water with a nitrogen halogenated triazine or a nitrogen halogenated derivative thereof for a period of time sufficient to convert said sulfide ion to soluble sulfur species.
- A process of removing sulfide ion from oil field produced sour water, comprising the steps of: directing said water into a reaction chamber containing a

nitrogen halogenated triazine or a nitrogen halogenated derivative thereof, whereby said water is contacted with said nitrogen halogenated triazine or nitrogen halogenated derivative thereof and said sulfide ion is converted into sulfate ion within said chamber; and withdrawing said water from said chamber to a place of disposal.

21. In a secondary recovery process for the recovery of hydrocarbons from a subterranean formation wherein an aqueous solution is directed into said formation by way of one or more injection wells, and hydrocarbons and sour water are recovered from said formation by way of one or more production wells, the improvement comprising contacting said sour water with a nitrogen halogenated triazine or a nitrogen halogenated derivative thereof for a period of time sufficient to convert sulfide ion contained therein to innocuous, soluble sulfur species.

4,710,306

REMOVING OR DECREASING IRON-CAUSED YELLOW COLOR IN A SOLUTION

Warren B. Kirsch, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 22, 1985, Ser. No. 693,661

Int. Cl.⁴ B01D 21/00; E21B 43/00

U.S. Cl. 252—8,551

20 Claims

1. A process for removing or decreasing the amount of iron-caused yellow color in a solution, comprising adding to the solution a decolorizing agent, which is a soluble aluminum salt which forms a very insoluble hydroxide at the near neutral pH point, in a sufficient amount to remove or decrease the amount of color present in said solution after the solution has been neutralized and filtered, raising the pH of the solution containing the soluble salt to near neutral, and filtering the near neutral pH solution to remove any precipitate in said solution, thereby forming a substantially clear solution.

4,710,307

PICKLING AGENT

Jacques Périard, Sins, and Alain Cron, Hildesrieden, both of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Continuation-in-part of Ser. No. 757,307, Jul. 22, 1985, abandoned. This application Aug. 11, 1986, Ser. No. 895,384

Claims priority, application Switzerland, Jul. 23, 1984, 3570/84

Int. Cl.⁴ C10M 125/00

U.S. Cl. 252—18

28 Claims

1. Agent for the pickling of and as an antioxidant for a workpiece made of iron and/or steel which is subjected to non-cutting, hot transformation, comprising:

- 20 to 80 percent by weight of one or more effective pickling compounds selected from the group consisting of: Na₂B₄O₇·10H₂O, Na₂B₄O₇·5H₂O, anhydrous Na₂B₄O₇, NaBO₂·4H₂O, boric acid, boric acid anhydride, soluble sodium silicate having a SiO₂/Na₂O ratio of 2.5 to 3.3, and sodium metasilicate, anhydrous or having 5 to 9 molecules of water of crystallization;
- 1 to 75 percent by weight of one or more dry substances selected from the group consisting of: graphite, calcium fluoride, cryolite, antimony oxide, molybdenum disulfide, boron nitride, and at least one phosphate selected from the group consisting of: hydrated or anhydrous trisodium phosphate, hydrated or anhydrous tripotassium phosphate, sodium metaphosphate, potassium metaphosphate, polymetaphosphate, hydrated or anhydrous sodium triphosphate, sodium polyphosphate, and zinc phosphate.
- 5 to 79 percent by weight of one or more substances selected from the class consisting of group (d), group (e) and group (f);
- zero to 35 percent by weight of one or more additives, which act as an antioxidant and which influence the for-

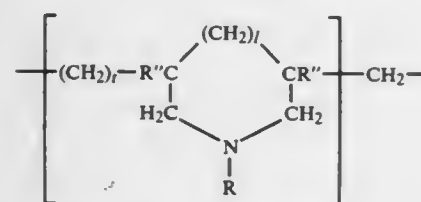
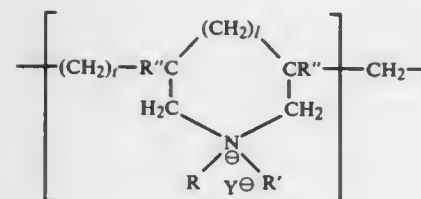
proviso that when the radical is an alkoxyalkyl radical there are at least two carbon atoms which separate the oxygen atom from the nitrogen atom, the total number of carbon atoms present in radicals denoted by R₉, R₁₀ and R₁₁ being between 3 and 12;

R₉, R₁₀ and R₁₁, taken together, can denote, with the nitrogen atom to which they are attached, one of the following radicals: pyridine, α-methylpyridine, 3,5-dimethylpyridine, 2,4,6-trimethylpyridine, N-methylpiperidine, N-ethylpiperidine, N-methylmorpholine or N-ethylmorpholine; X is an anion;

V is an integer equal to the valency of X; the average value of n per anhydroglucose unit in this cellulose ether is between 0.01 and approximately 1, and the average value of (m+n+p+q) per anhydroglucose unit in this cellulose ether is between approximately 0.01 and approximately 4;

(ii) a copolymer of cellulose or cellulose derivative grafted with a water-soluble quaternary ammonium monomer is a graft copolymer of hydroxyalkylcellulose with a (methacryloyl)ethyltrimethylammonium salt, a (methacrylamidopropyl)trimethylammonium salt or a dimethyldiallylammonium salt;

(iii) a cationic cyclopolymer having a molecular weight of between 20,000 and 3,000,000 and containing units of formulae:



in which l and t are equal to 0 or 1 and L+t=1, R'' denotes hydrogen or methyl, R and R' denote independently of each other an alkyl group having from 1 to 22 carbon atoms, a hydroxyalkyl group in which the alkyl group has 1 to 5 carbon atoms, or a lower amidoalkyl group, and in which R and R' can also denote, conjointly with the nitrogen atom to which they are attached, heterocyclic groups chosen from piperidiny or morpholinyl groups, as well as copolymers containing units of formula (X) or (X') and acrylamide and diacetone acrylamide units, Y[⊖] being an anion chosen from bromide, chloride, acetate, borate, citrate, tartrate, bisulphate, bisulphite, sulphate and phosphate.

4,710,315 ANISOTROPIC COMPOUNDS AND LIQUID CRYSTAL MIXTURES THEREWITH

Hans P. Schad, Rieden, and Stephen M. Kelly, Kaiseraugst, both of Switzerland, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany
PCT No. PCT/EP85/00163, § 371 Date Dec. 16, 1985, § 102(e)
Date Dec. 16, 1985, PCT Pub. No. WO85/04874, PCT Pub. Date Nov. 7, 1985

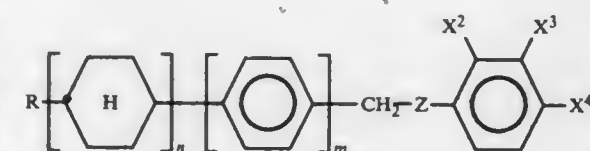
PCT Filed Apr. 13, 1985, Ser. No. 815,708
Claims priority, application Switzerland, Apr. 16, 1984, 1900/84

Int. Cl.⁴ C09K 19/30; C07C 121/00, 121/75, 121/60, 43/225, 25/18

U.S. Cl. 252—299.63

16 Claims

1. A compound of the formula



in which R is an alkyl, alkoxy, or alkanoyloxy group which has in each case 1–12 C atoms in the alkyl moiety and which has a straight or branched and chiral or non-chiral chain, X² and X³ are independently hydrogen, halogen or nitrile, X⁴ is halogen or nitrile, Z is the ether oxygen bridge —O— and m and n are independently 0, 1 or 2 with the provisos that
(a) the sum of n and m is at least 1 and at most 3, and
(b) at least one of the groups X² and X³ is not hydrogen.

4,710,316 ALDEHYDES, ACETALS, ALCOHOLS AND ETHERS HAVING 3-METHYL- OR 3,5-DIMETHYL-BENZYL GROUPS, THEIR MANUFACTURE AND PERFUME MATERIALS CONTAINING SAME

Walter Hafner, Eurasburg; Peter Ritter, Kempten; Helmut Gebauer, and Marlies Regiert, both of Munich, all of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany
Filed Aug. 13, 1986, Ser. No. 896,019

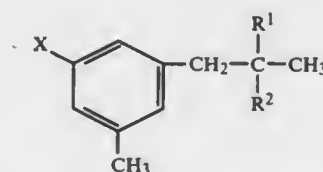
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531585

Int. Cl.⁴ A61K 7/46, 31/13, 43/164, 47/105

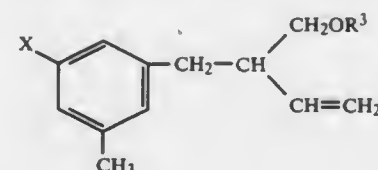
U.S. Cl. 512—20

3 Claims

1. A compound selected from the group consisting of a compound of formula (I)



and a compound of formula (II)



wherein

R¹ is a substituent selected from the group consisting of —OH, —CH₂OH, —CH₂—OCH₃, —CHOH—CH₃, —CHO and —CH(OCH₃)₂,

R² is methyl or ethyl,
R³ is hydrogen or methyl,
X is hydrogen or methyl,
and wherein 2-methyl-3-(3-methylphenyl)-propan-2-ol and 2-methyl-3-(3,5-dimethylphenyl)-propan-2-ol are excluded.

4,710,317 FLAME RETARDANT POLYOLEFIN RESIN COMPOSITION

Nobuchika Tabata, and Shohji Fukumitsu, both of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 20, 1986, Ser. No. 864,983

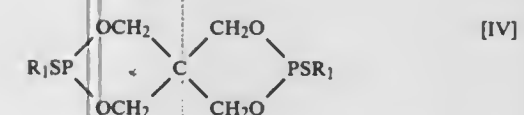
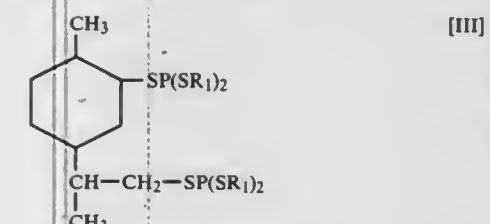
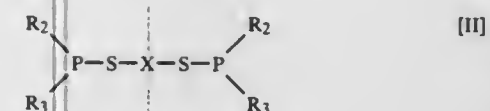
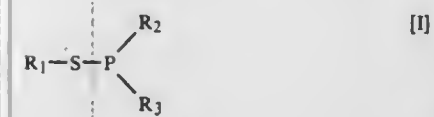
Claims priority, application Japan, May 28, 1985, 60-114776
Int. Cl.⁴ C09K 21/00; C08K 5/49, 5/51

U.S. Cl. 252—609

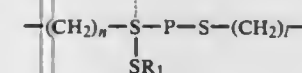
8 Claims

1. A flame retardant polyolefin resin composition consisting of

- (A) 5 to 60% by weight of a halogen-containing flame retardant,
(B) 100 to 10% by weight of antimony trioxide based on the weight of said halogen-containing flame retardant,
(C) 0.5 to 15% by weight of a crosslinking agent,
(D) 0.05 to 5% by weight of a thiophosphite selected from those expressed by the following formulas [I], [II], [III] and [IV]:



wherein R₁ represents an alkyl group, a cycloalkyl group or an aryl group each of 6 to 20 carbon atoms; R₂ represents —SR₂' or —R₂'; R₃ represents —SR₃' or —R₃'; —R₂' and —R₃' each represent the same or different alkyl groups, cycloalkyl groups or aryl groups each of 6 to 20 carbon atoms; X represents —(CH₂)_n—, —(CH₂)_n—O—(CH₂)_m— or

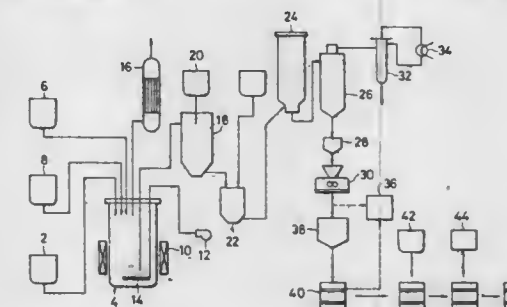


wherein m, n and l each represent an integer of the same or different numbers within a range of 2 to 6, and
(E) the balance % by weight of a polyolefin resin the total of the quantities of (A), (B), (C), (D) and (E) being 100% by weight.

4,710,318
METHOD OF PROCESSING RADIOACTIVE WASTE
Susumu Horiuchi, and Shin Tamata, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 500,827, Jun. 3, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 761,334
Claims priority, application Japan, Jun. 4, 1982, 57-96585
Int. Cl.⁴ G21F 9/16

U.S. Cl. 252—628

17 Claims



1. A method of processing radioactive organic waste occurring in a nuclear power plant for storage, comprising:
reducing the volume of said radioactive organic waste, wherein said radioactive organic waste includes at least one of a spent ion exchange resin and spent filter assistant by converting said radioactive organic waste to inorganic waste by way of an oxidation decomposition process with liquid hydrogen peroxide, said at least one of said spent ion exchange resin and said spent filter assistant being decomposed into water and carbon dioxide by way of the oxidation decomposition process with said hydrogen peroxide liquid to leave a residue of inorganic waste;
neutralizing the residue of the inorganic waste with an alkali substance;
pulverizing the residue of the inorganic waste; and
packing the pulverized inorganic waste in a container with an inorganic hardening agent to solidify the resulting mixtures therein.

7. A method of processing radioactive organic waste in a slurry occurring in a nuclear power plant for storage, comprising:
reducing the volume of said radioactive organic waste, wherein said radioactive organic waste includes at least one of a spent ion exchange resin and spent filter assistant by converting said radioactive organic waste to inorganic waste by way of an oxidation decomposition process with hydrogen peroxide liquid in the presence of one of ferric ions and chromate ions, so that said at least one of said spent ion exchange resin and said spent filter assistant is decomposed into water and carbon dioxide by way of the oxidation decomposition process with the hydrogen peroxide liquid to leave a residue of inorganic waste;
neutralizing the residue of inorganic waste with an alkali substance;
heating the neutralized residue of inorganic waste to concentrate the same;
pulverizing the neutralized and concentrated residue of inorganic waste; and
pelletizing the pulverized residue of inorganic waste.

4,710,319
AUTOFLUOROGRAPH COMPOSITION
Duk-Hi Lee, Wellesley; Susan E. Feierberg, Belmont, and Patricia Mayer, Burlington, all of Mass., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 8, 1985, Ser. No. 796,068
Int. Cl.⁴ C09K 11/04, 11/06; G21H 5/02
U.S. Cl. 252—646
3 Claims
1. An autofluorography composition comprising:

- (i) a first aqueous solution of a water soluble fluor having a formula selected from $R-CO_2X$; $R-SO_3X$; and $R-NH_3Y^-$; where R is a fluor molecule, X is a cation and Y is an anion, which with their respective R counterions are ionized in water to impart water solubility; and
- (ii) a second aqueous solution of a precipitator reagent capable of reacting with R in (i) to precipitate an insoluble fluor or an insoluble fluor salt in and to impregnate an electrophoresis gel matrix which when
- (a) the water soluble fluor is $R-CO_2X$ or $R-SO_3X$ the precipitator reagent is selected from MgZ_2 , CaZ_2 , BaZ_2 , CdZ_2 , NH_4Z_2 , NaZ , ZnZ_2 (where Z is Cl or OAc); poly(ethyleneimine); N-[4-(2,5-diphenyloxazolyl)-methyl]-ammonium chloride; N-(1-naphthylmethyl) trimethylammonium chloride; and N-[4-(2,5-diphenyloxazolyl)methyl]-trimethyl ammonium chloride; and
- (b) the water soluble fluor is $R-NH_3Y^-$ the precipitator reagent is selected from R^1-CO_2X and R^1-SO_3X where R^1 is a fluor or sodium dodecyl sulfate.

4,710,320

METHOD FOR PRODUCING 1-AMINO-2-PHENOXY-4-HYDROXYANTHRAQUINONES

Makoto Hattori, Toyonaka; Masao Nishikuri, Hirakata, and Yasuyoshi Ueda, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Jul. 11, 1985, Ser. No. 753,860

Claims priority, application Japan, Jul. 19, 1984, 59-150868
Int. Cl.⁴ C07C 97/26

U.S. Cl. 260-378 11 Claims
1. A method for producing a 1-amino-2-unsubstituted or substituted phenoxy-4-hydroxyanthraquinone, which comprises carrying out a reaction between a 1-amino-2-halogeno-4-hydroxyanthraquinone and a phenol compound at a temperature of 50° C. or higher in a sulfolane in the presence of an acid binding agent and in the presence or absence of a quaternary compound.

4,710,321

QUATERNARY AMMONIUM SALTS OF SULFONATED TRIARYLPHOSPHINES AND PROCESS FOR THE PRODUCTION THEREOF

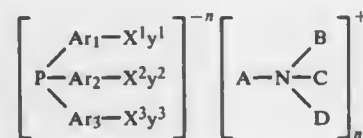
Helmut Bahrmann, Hamminkein; Boy Cornils, Dinslaken; Wolfgang Lipps, Oberhausen; Peter Lappe, Oberhausen, and Helmut Springer, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 738,868, May 29, 1985, Pat. No. 4,673,535.
This application Mar. 5, 1987, Ser. No. 22,274

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420493

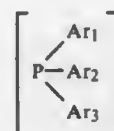
Int. Cl.⁴ C07C 87/30

U.S. Cl. 200-501.15 20 Claims
1. A process for the preparation of a quaternary ammonium salt of a mono, di, or trisulfonated triarylphosphine, said salt being of formula I



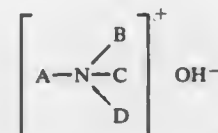
wherein Ar_1-Ar_3 are each phenyl; X^1-X^3 are each independently a sulfo group; y^1-y^3 are each independently 0 or 1, provided that the sum of said y^1 , y^2 and y^3 is at least 1; A is benzyl or alkyl of 12 to 18 carbon atoms; B, C and D are each independently straight chain or branched alkyl having 1-4 carbon atoms, and n is 1, 2 or 3, said process comprising

- (c) sulfonating a triarylphosphine of formula II



wherein Ar_1-Ar_3 are each independently phenyl with oleum to form a first reaction product;

- (d) mixing said first reaction product with water to form an aqueous mixture;
- (e) adding a solution of a water insoluble amine to said aqueous mixture, resulting in a first aqueous phase and a first organic phase;
- (f) intensively mixing said aqueous and organic phases;
- (g) partitioning the result in step f into a second aqueous phase and a second organic phase;
- (h) separating said second organic phase and said second aqueous phase from one another; and
- (i) mixing said second organic phase with an aqueous solution of a quaternary ammonium hydroxide of formula III



wherein A, and B, C and D have the above definitions to result in said salt of said formula I.

4,710,322

PROCESS FOR THE PREPARATION OF ALKALI METAL AND ALKALINE EARTH SALTS OF BENZALDEHYDE-2,4-DI-SULFONIC ACID

Hans J. Metz, Heppenheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 776,003, Sep. 13, 1985, abandoned. This application Mar. 2, 1987, Ser. No. 21,622

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1984, 3434079

Int. Cl.⁴ C07C 143/38

U.S. Cl. 260-511 16 Claims
1. A process for the preparation of an alkali metal or alkaline earth metal salt of benzaldehyde-2,4-disulfonic acid, comprising the steps of:

reacting 2,4-dichlorobenzaldehyde with an alkali metal or alkaline earth metal sulfite or an alkali metal or alkaline earth metal hydrogensulfite, or mixtures of any of these salts, in a reaction medium containing water, wherein the reaction temperature is in the range of 140° C. to below 180° C. and the reaction time is less than 7 hours.

4,710,323

NITRODIARYL SULFOXIDE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL AND PESTICIDAL COMPOSITIONS CONTAINING THEM AS ACTIVE INGREDIENT

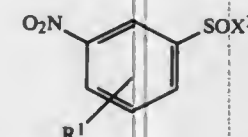
Janos Kreidl; Peter Turcsanyi; Zsuzsanna Aracs; Bela Steffo; Judit Meszaros; Ida Deutsch; Jeno Szilbereky; Eva Csizer; Szilard Vezser; Erik Bogesch, all of Budapest; Jozsef Bakos, Veszprem; Laszlo Szotyori, Veszprem, and Balint Heil, Veszprem, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

Continuation-in-part of Ser. No. 706,704, Feb. 28, 1985, and a continuation-in-part of Ser. No. 706,705, Feb. 28, 1985, and a continuation-in-part of Ser. No. 706,707, Feb. 28, 1985. This application Feb. 26, 1986, Ser. No. 833,834

Claims priority, application Hungary, Feb. 29, 1984, 813/84; Feb. 29, 1984, 814/84; Feb. 29, 1984, 815/84
Int. Cl.⁴ C07C 145/00

U.S. Cl. 260-543 R

1. A compound of formula (V),



wherein

R^1 is halogen or alkoxy having from 1 to 6 carbon atoms, X^2 is halogen.

4,710,324

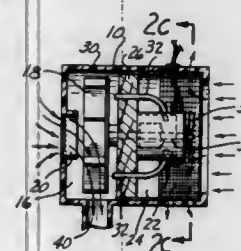
WATER AERATING DEVICE

Galdino Vesnaver, 5690 San Jacinto, Atascadero, Calif. 93422

Filed Nov. 28, 1986, Ser. No. 935,832

Int. Cl.⁴ B01F 3/04

U.S. Cl. 261-30



1. In combination, a tank for containing fish or other aquatic animals, and a device for aerating the water therein comprising:

- a fan within a pumping chamber for drawing air through an area of the pumping chamber defining an intake port and forcing air out an area of the pumping chamber defining an exhaust port;
- a fan enabling means located outside of the pumping chamber for moving the fan so that air is drawn through the area of the pumping chamber defining the intake port and is forced out the area of the pumping chamber defining the exhaust port;
- a means for insulating the pumping chamber from the heat created by the fan enabling means; and
- a means for dispersing the air flowing out the exhaust port and communication with said tank.

4,710,325

ASPIRATING AERATION AND LIQUID MIXING APPARATUS

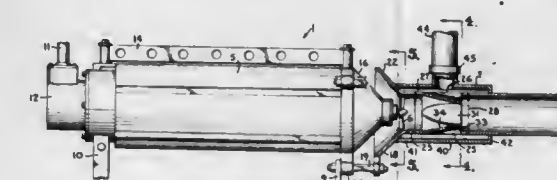
Barry G. Cramer, and Roy A. Cramer, both of Kansas City, Mo., assignors to Air-O-Lator Corporation, Kansas City, Mo.

Filed Jan. 20, 1987, Ser. No. 4,916

Int. Cl.⁴ B01F 5/02

U.S. Cl. 261-24

6 Claims



1. An aspirating aeration and liquid mixing apparatus comprising:

- (a) pump means generating a high rate, directed flow of liquid;
- (b) an elongate conduit means mounted in the flow path of said liquid;
- (c) an airflow plenum sealed about at least a portion of said conduit means;
- (d) an air intake pipe communicating with said plenum;
- (e) a nozzle portion constriction in said conduit means and having a plurality of passages through a nozzle portion sidewall and communicating with said plenum; and
- (f) ramps extending over said passages in convergence to form said constriction, and said ramps having downstream facing openings and providing a low pressure area for drawing air from said plenum and through said intake pipe, said ramps and passages being spaced in an array including channels between said ramps for passage of large sized waste materials.

4,710,326

CORRUGATED PACKING AND METHODS OF USE

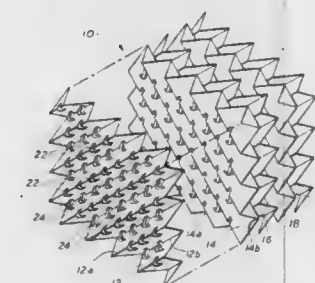
Alexander M. Seah, 5800 Leedale, Houston, Tex. 77016

Filed Aug. 29, 1986, Ser. No. 902,189

Int. Cl.⁴ B01F 3/04

U.S. Cl. 261-112

49 Claims



1. A packing system for use in an exchange chamber wherein two fluids may interact, comprising:

- a. a plurality of corrugated plates positioned mutually parallel, with the corrugations of each of said plates forming a non-parallel relationship with the corrugations of the next corrugated plate; and
- b. at least one of said plates comprising at least one slot and corresponding tab connected to the plate at the ends of the slot, straddling a corrugation ridge with the tab extending from the slot and within the groove side of the corrugation.

4,710,327

METHOD OF MOLDING AN EYE COLOR CHANGE CONTACT LENS BLANK

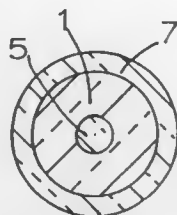
Charles W. Neefe, 811 Scurry St., P.O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 832,381, Feb. 24, 1986, abandoned. This application Jun. 27, 1986, Ser. No. 879,296 The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.⁴ B29D 11/00

U.S. Cl. 264—1.7

6 Claims



1. A method of molding a cosmetic contact lens blank from which a cosmetic contact lens is made by the steps of providing a cylinder shaped mold having a centrally located convex cone at the bottom of the cylinder, filling the mold with a colored liquid lens monomer, polymerizing the colored liquid lens monomer to form a colored cylinder shaped polymer body having a concave centrally located cone at one end of the cylinder, filling the concave centrally located cone with a transparent liquid lens monomer, polymerizing the transparent liquid lens monomer, cutting a peripheral convex cone on the opposite end of the cylinder from the centrally located concave cone, filling the peripheral convex cone with a clear transparent liquid lens monomer, polymerizing the clear transparent liquid lens monomer, to form a cosmetic contact lens blank, cutting a concave lens curvature that intersects the clear transparent peripheral convex cone and the colored cylinder shaped body and the transparent centrally located cone, providing a larger lens pupil and iris area by cutting the concave contact lens curve deeper into the cosmetic contact lens blank, cutting a convex contact lens curve intersecting the transparent centrally located cone to form the cosmetic lens pupil area and intersecting the colored cylinder shaped polymer body to form the cosmetic lens iris area, and intersecting the clear transparent peripheral cone to form the clear peripheral lens area.

4,710,328

METHOD OF MAKING AN EYE COLOR CHANGE CONTACT LENS

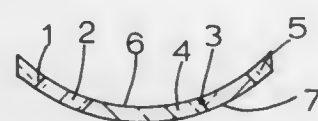
Charles W. Neefe, 811 Scurry St., Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 832,381, Feb. 24, 1986, abandoned. This application Jun. 20, 1986, Ser. No. 876,790 The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.⁴ B29D 11/00

U.S. Cl. 264—1.7

7 Claims



1. A method of making a cosmetic contact lens that changes the apparent color of the eye by the steps of providing a colored daylight fluorescent polymer having a central concave cone shaped depression, and a peripheral convex cone shape, filling the cone shaped central depression with a colored transparent monomer, polymerizing the monomer to form a colored transparent polymer, filling the peripheral convex cone shaped

area with a clear transparent monomer, polymerizing the monomer to form a clear transparent polymer, to form the cosmetic contact lens blank, cutting a concave lens surface that intersects, (1) the central cone shaped colored transparent polymer to form the pupil area and intersects, (2) the colored daylight fluorescent polymer to form the lens iris area, and intersects (3) the clear peripheral cone area to form a clear transparent peripheral lens area, cutting a convex lens surface to provide a cosmetic contact lens having a transparent colored pupil lens area, a daylight fluorescent iris lens area and a clear transparent peripheral lens area.

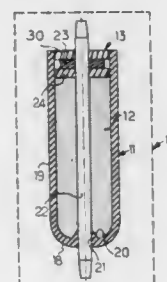
4,710,329

METHOD OF MANUFACTURING ARTICLES OF COMPACTED POWDER

Jean-Marie Lebas, Rueil-Malmaison; Pierre Rat, Massy; Jean-Marcel Dupont, and Germain Vinuesa, both of Angoulême, all of France, assignors to Basset Bretagne Loire - B.B.L. and Société Nationale des Poudres et Explosifs, both of, France Continuation of Ser. No. 314,052, Oct. 23, 1981, abandoned, which is a division of Ser. No. 72,584, Sep. 5, 1979, Pat. No. 4,330,251. This application May 16, 1984, Ser. No. 610,696 Claims priority, application France, Sep. 12, 1978, 78 26140 Int. Cl.⁴ C06B 21/00

U.S. Cl. 264—3.1

7 Claims



1. A method of manufacturing articles of compacted propellant powder for arms ammunition of substantially uniform density and substantially straight cylindrical shape with minimum bend,

comprising the successive steps of

providing at least one hollow mold made from flexible or resilient material having an approximately cylindrical tubular side wall of substantially constant wall thickness and a bottom wall integral with said side wall at one end thereof, and a removable plug insertable into an opposite open end of said mold for closing the same in sealing relationship, said side wall being lengthwise curved radially outwardly all around through a thickness thereof to a barrel-like shape over one longitudinal portion intermediate of the ends thereof in a normal condition of the mold; providing a pressure chamber adapted to be filled with a substantially incompressible fluid and to accommodate at least one mold therein;

providing nitrocellulose-based powder grains, and impregnating the grains with a small predetermined amount of a suitable gelatinizing plasticizer which is liquid at a temperature lower than or equal to about 80° C. for bonding said grains together;

filling the mold with an amount of powder appropriate to form a unit charge to cause the same to assume, in its confined condition, a substantially barrel-shaped configuration with an intermediate bulge;

tightly closing the mold with said removable plug;

placing the mold into said pressure chamber filled with said substantially incompressible fluid;

heating said mold and its contents to a temperature of about 80° C. and then

building up an adequate pressure within said chamber to

subject said mold and its powder contents to an isostatic compression for a pre-determined period of time to cause said side wall to be deformed to a substantially perfect cylindrical shape; restoring normal pressure within said chamber; and removing said mold from said chamber and then cooling said mold and its contents and withdrawing the compacted powder article thus obtained from said mold.

4,710,330

APPLICATION OF THE LASER JET METHOD FOR INSCRIBING OFFICE MACHINE KEYBOARD BUTTONS

Dieter Lewandowski; Rolf Ostermoor, both of Wilhelmshaven, and Dieter Spranger, Schortens, all of Fed. Rep. of Germany, assignors to Olympia Aktiengesellschaft, Fed. Rep. of Germany

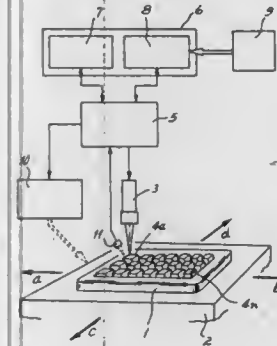
Filed Jan. 21, 1986, Ser. No. 820,693

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502678

Int. Cl.⁴ B29C 71/04, 35/08

U.S. Cl. 264—25

7 Claims



1. The method of producing an inscription on key buttons, said key buttons consisting of plastic material which changes color under the effect of energy radiation, said key buttons being mounted on a keyboard, said keyboard being adapted to be installed as a unit in a completely assembled office machine, said method comprising the steps of moving said keyboard relative to an energy radiation supply to bring each blank key button successively into the effective area of the energy radiation, storing in a memory of a control unit for controlling the deflection of the energy radiation control data for all characters and symbols to be inscribed on the blank key buttons, and upon the keyboard reaching each new inscription position deflecting the energy radiation supply so that the character or symbol coordinated with this position is inscribed on one of said key buttons by the energy radiation in accordance with the respective control data retrieved from the said memory.

4,710,331

PROCESS FOR THE PRODUCTION OF POLYTETRAFLUOROETHYLENE POROUS MEMBRANES

Kawahigashi Nobuo; Hashida Shigesou, and Kojima Yasunobu, all of Kanagawa, Japan, assignors to Nippon Valqua Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,994

Claims priority, application Japan, Jun. 21, 1985, 60-135664 Int. Cl.⁴ B29C 55/04, 55/12, 67/20

U.S. Cl. 264—41

6 Claims

1. A process for the production of polytetrafluoroethylene porous membranes, which comprises preparing a polytetrafluoroethylene preform by compression molding a polytetrafluoroethylene resin molding powder having an average particle diameter of 1-900 μ m obtained by suspension polymerization of tetrafluoroethylene, heating the preform at a temperature above 327° C. followed by skiving the heated preform into a film form, heating the obtained film at a temperature above

327° C., slowly cooling the heated film at a cooling rate of less than 70° C./hr so as to adjust the crystallinity of polytetrafluoroethylene in the heated film to 60-75%, and stretching the heated film either uniaxially or biaxially to 1.3 to 6.5 times while heating at a temperature of 100°-320° C.

4,710,332

PROCESS OF INJECTION MOLDING A LASER MIRROR SUBSTRATE

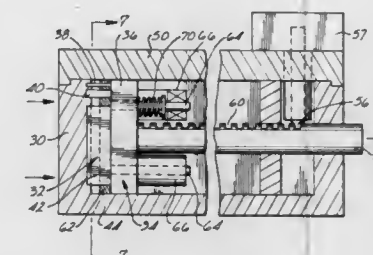
Irwin E. Rosman, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 15, 1982, Ser. No. 368,542

Int. Cl.⁴ B29C 45/16; B32B 18/00, 31/00

U.S. Cl. 264—60

7 Claims



1. A sequential process for forming a molded article from molded plates formed in sequence in serial abutment with each other in a mold, said mold having a cavity therein defined by walls the back wall being movable and one or more of the other walls bearing injector openings, dies for forming passages within and extending therethrough said plates, said dies projecting from said movable wall toward one of the non-movable walls, said process comprising the steps of:

- (1) injecting a mixture of inorganic particles and a resin binder into said cavity between the die-bearing movable wall and said non-movable wall and molding a plate therefrom having passages extending therethrough formed by said dies;
- (2) moving said movable wall away from said molded plate to form another cavity in said mold adjacent to said molded plate;
- (3) injecting a second mixture of inorganic particles and resin binder into the cavity formed in step 2 to mold another plate; and
- (4) repeating steps 2 and 3 at least once to form a stack of abutting, molded plates which comprise a molded article containing passages therein formed by said dies.

6. A sequential process for forming a molded article from molded plates formed in sequence in serial abutment with each other in a mold, said mold having a cavity therein defined by walls the back wall being movable and one or more of the other walls bearing injector openings, dies for forming passages within said plates projecting from said movable wall toward one of the non-movable walls, said process comprising the steps of:

- (1) injecting a first mixture of inorganic particles and a resin binder into said cavity between the die-bearing movable wall and said non-movable wall and molding a plate therefrom having passages formed by said dies;
- (2) moving said passage forming dies out of said plate;
- (3) injecting the passages formed in said molded plate with a resin, said resin filling the passages;
- (4) moving said movable wall away from said molded plate to form another cavity in said mold adjacent to said molded plate;
- (5) injecting another mixture of inorganic particles and resin binder into the cavity formed in step 4 to mold another plate;
- (6) moving said passage forming dies out of said plate;
- (7) injecting the passages formed in said plate molded in step

- 5, with a resin, said resin filling the passages formed in said plate; and
 (8) repeating steps 4, 5, 6 and 7 as many times as desired to form a stack of abutting, molded plates which comprise a molded article containing passages therein formed by said dies.

4,710,333

PROCESS FOR CONTINUOUS PREPARATION OF SYNTHETIC RESIN PLATES HAVING IRREGULAR FLOW PATTERN OF DIFFERENT COLORS

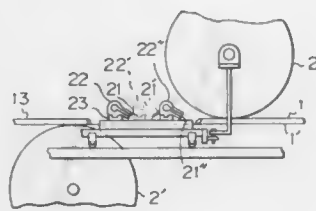
Saburo Murakami, Shoji Kinashi, and Toyokazu Ego, all of Toyama, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,639

Claims priority, application Japan, May 24, 1985, 60-110117
 Int. Cl.⁴ B29C 39/20

U.S. Cl. 264—73

5 Claims



1. A process for the continuous preparation of synthetic resin plates having an irregular flow pattern of different colors by continuously polymerizing polymerizable materials in a polymerization zone defined by confronting surfaces of two confronting and running endless belts and gaskets held between the confronting surfaces of the belts, wherein polymerizable materials of different colors are supplied in the polymerizable material supply region close to the upstream end of the polymerization zone by a plurality of supply means, each supply means including at least one polymerizable material supply opening to the polymerizable material supply region and said supply means being arranged in such a manner that they are spaced from one another in the direction of travel of the belts;

the colored polymerizable materials are supplied into the polymerizable material supply region from the respective supply means while the supply opening of the supply means arranged on the upstream end in the width direction of the belts is reciprocated; the supply opening of the supply means arranged on the downstream end is kept stationary or reciprocated in the width direction of the belts at an amplitude smaller than the amplitude of the reciprocative movement of the supply opening of the supply means arranged on the upstream end; and
 the colors of the colored polymerizable materials supplied from at least two of the supply means are made different from each other or the colored polymerizable material supplied from at least one of the supply means is formed into a laminar flow composed of a plurality of polymerizable materials differing in the color.

4,710,334

METHOD OF PREPARING A TEMPLATE

James J. Rossetti, Palmyra, Wis., assignor to Advanced Tool Technology, Inc., Lake Geneva, Wis.

Filed May 1, 1986, Ser. No. 858,205

Int. Cl.⁴ B29C 33/40, 39/42

U.S. Cl. 264—102

20 Claims

1. A method of preparing a template for a product from a sample of the product, comprising the steps of
 a. preparing a mixture of liquid rubber and a curing agent,
 b. covering the sample with the mixture,

- c. permitting the mixture to harden about the sample to form a mold,
 d. removing the sample from the mold to form a cavity in the mold,



- e. altering the size of the cavity of the mold, by proportionately and permanently changing the dimensions of the mold after the mixture has hardened, and
 f. pouring a hardenable material into the mold to form the template.

4,710,335

METHOD OF PRODUCING ELECTRIC CELL ANODE USING POWDERY ACTIVE MATERIAL

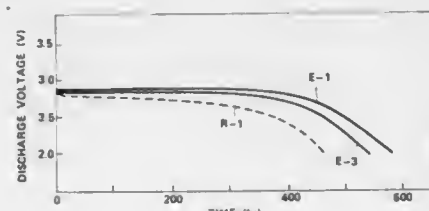
Yasushi Kita, and Shiro Morol, both of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jun. 12, 1985, Ser. No. 743,931

Claims priority, application Japan, Jun. 13, 1984, 59-119915
 Int. Cl.⁴ H01M 4/26

U.S. Cl. 264—105

5 Claims



1. A method of producing an anode for use in a lithium cell, the method comprising the steps of:
 preparing a dispersion of a graphite flouride in finely divided form, which is employed as an active material, and an electrically conductive material in finely divided form in a solution of an organic polymer, which is employed as binder, in a first liquid;
 mixing said dispersion with a second liquid in which said polymer is substantially insoluble so as to cause precipitation of said polymer in a state intimately mixed with said graphite flouride and said conductive material;
 separating the mixture of said graphite flouride, said conductive material and the precipitated polymer from the mixed liquid;
 drying the separated mixture; and
 forming the dried mixture into an anode body of a desired shape by application of a pressure.

4,710,336

PROCESS FOR PREPARING TWO-COMPONENT SYNTHETIC FIBERS SUITED FOR REPLACING CELLULOSE FIBERS

Lino Credali, Casalecchio di Reno; Gianfranco Corsi, and Antonio Chiolle, both of Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 692,421, Jan. 18, 1985, abandoned, which is a continuation of Ser. No. 488,816, Apr. 26, 1983, abandoned. This application Nov. 15, 1985, Ser. No. 798,400

Claims priority, application Italy, Apr. 27, 1982, 20951 A/82
 Int. Cl.⁴ D01D 1/02, 5/11

U.S. Cl. 264—171

3 Claims

1. A process for preparing a two-component fiber having a surface area of at least 1 m²/g consisting of a core of an olefinic

polymer and an outer sheath of a hydrophilic polymer, suited for replacing cellulose fibers in the manufacture of paper and paper-like products, comprising:

extruding a mixture, at autogenous pressure or greater, into a medium at a lower pressure, said mixture being a stable water-in-oil emulsion comprising an olefinic polymer and a solvent, and a hydrophobic polymer and a solvent, said solvents being, in part, reciprocally insoluble, said emulsion being characterized by a volume ratio of the solvent for the olefinic polymer to the solvent for the hydrophilic polymer of at least 2.5, the concentration of the hydrophilic polymer in its own solvent being at least 2 grams per liter of solvent, and the concentration of the olefinic polymer in its solution being between 20 and 200 g/l of solvent, said extruding being conducted at a temperature exceeding the boiling temperature of the solvent for the olefinic polymer, and at a temperature at least equal to the dissolution temperature of the olefinic polymer in said solvent.

4,710,337

METHOD AND APPARATUS FOR CONTINUOUSLY EXTRUDING SINGLE-WALL PIPE OF PLASTICS OR OTHER MOULDABLE MATERIAL

Erik G. W. Nordström, Kovland, Sweden, assignor to Uponor AB, Sweden

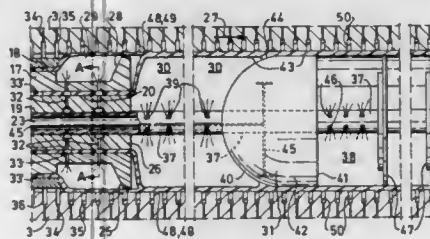
PCT No. PCT/SE84/003849, § 371 Date Jul. 8, 1985, § 102(e)
 Date Jul. 8, 1985, PCT/Pub. No. WO85/02144, PCT Pub. Date May 23, 1985

PCT Filed Nov. 14, 1984, Ser. No. 758,666

Claims priority, application Sweden, Nov. 15, 1983, 8306284
 Int. Cl.⁴ B29C 47/30

U.S. Cl. 264—508

35 Claims



1. In a method of manufacturing a single-wall ribbed conduit having a smooth inner surface from a thermoplastic extrudable material wherein said material is fed from at least one extruder through an extruder nozzle and into a molding apparatus comprising mould-jaw chains which move adjacent one another along a molding line and include mould-jaw parts whose mutually opposing surfaces in the molding line have a form corresponding to a desired form of an outer surface of the conduit under manufacture, and wherein said material is pressed against the surfaces of the mould-jaw along at least a part of the molding line and wherein the mould-jaw chain are caused to move away from one another subsequent to passing the moulding line, the mould-jaw parts therewith releasing their engagement with the outer surface of the conduit under manufacture, the improvement comprising:

producing the conduit under manufacture in at least two stages by supplying said extrudable material to said moulding line to at least two separate locations, a first location and a second location positioned after the first location in the direction of conduit movement;
 supplying said material to said first location from a first channel of circular cross-section and forcing such material against the mould-jaw part by a gaseous medium under pressure and/or suction-drawing such material against said mould-jaw part by a vacuum exerted through passages in said mould-jaw parts, while adjusting the quantity of material supplied and the pressure and/or vacuum at said first location so that grooves in the mould-jaw parts, corresponding to outwardly protruding portions of the

conduit under manufacture, are filled with said material at least to the bottom thereof; and

supplying additional extrudable material to said second location from a second channel of circular cross-section formed between an external first mandril and an internal second mandril and discharging such additional material into a cavity located between an input end of a smoothing mandril and ends of said first and second mandrils facing said smoothing mandril, and forcing such additional material against the material delivered to said first location by a pressurized gaseous medium fed to said cavity.

16. In an apparatus for producing a single-wall ribbed conduit having a smooth inner surface from an extrudable plastics material, said apparatus comprising at least one extruder; a plurality of complementary mould-jaws having mutually facing surfaces with recesses therein corresponding to a desired form of outer surface of the conduit being produced, said mould-jaws being arranged for transportation in an endless chain along a select transport distance of said chain to define a moulding line; an extrusion nozzle coupled with said extruder for supplying molten plastics material to said moulding line; pressure means for urging the molten plastics material against said mutually facing surfaces of the mould-jaws along at least a part of the moulding line; cooling means for cooling the conduit being produced; separating means for moving the mould-jaws apart subsequent to passage past said moulding line, said mould-jaws being arranged to release their engagement with the outer surface of the conduit being produced; the improvement comprising:

at least two stages for supplying material to the moulding line at least at two mutually separated locations, a first location and a second location positioned after the first location in the direction of material movement along said moulding line;

adjustment means for regulating the amount of material supplied and the pressure and/or vacuum applied at said first location in a manner such that the recesses in the mould-jaws are filled with said material at least to their respective bottom portions;

supply means for providing a pressurized gaseous medium to said first and second location to press supplied material against the mould-jaws and for providing a vacuum to at least said first location to draw supplied material against the mould-jaws;

passages in said mould-jaws at the bottom of the grooves of each respective recesses connected to said vacuum supply means at least in the vicinity of said first location;

a first channel having a circular cross-section positioned to supply material to said first location, said first channel opening into an annular first space formed between an outer first mandril and the mould-jaws and coupled with said supply means for pressurized gaseous medium and vacuum; and

a second channel having a circular cross-section positioned to supply material to said second location, said second channel being formed between said outer said first mandril and an inner second mandril, said second channel opening into an annular second space defined, when seen in the direction of material movement, by respective end of said first and second mandrils facing a smoothing mandril located past said second channel and an input end of said smoothing mandril; and means for interconnecting said supply means for pressurized gaseous medium to said second space to provide said pressurized gaseous medium to such second space to press the material supplied at the second location against the material supplied at the first location.

4,710,338

METHOD OF MANUFACTURING A MOLDED PLASTICS ARTICLE INCORPORATING A BLANK OF SHEET

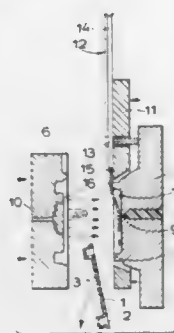
Paul J. H. Bagnall, Admaston, and Norman Whiteley, Walsall, both of England, assignors to Peerless Plastics Packaging Limited, Great Britain

Filed Nov. 10, 1986, Ser. No. 929,989

Int. Cl.⁴ B29C 31/08, 45/14

U.S. Cl. 264—509

19 Claims



1. A method of manufacturing a moulded plastics article which incorporates a blank of sheet material smaller in size in its flat state than the area of the mould cavity where the halves of an injection mould in which the article is to be moulded meet along a vertically disposed parting plane comprising the steps of placing said blank in a vertically orientation in holder means externally of said mould cavity above one of said mould halves containing a recess of said mould cavity which is to receive said blank, causing said blank to be released by said holder means when said mould halves are open so as to fall edge-first between said mould halves and causing said blank as it falls to be entered transversely into said recess in said one mould half, closing said mould when said blank is in said recess, forcing a thermoplastics material into said mould cavity and on to said blank, and when said material has cooled to form a solidified plastics article removing said article incorporating said blank from said mould cavity.

4,710,339

ION CYCLOTRON RANGE OF FREQUENCIES HEATING OF PLASMA WITH SMALL IMPURITY PRODUCTION

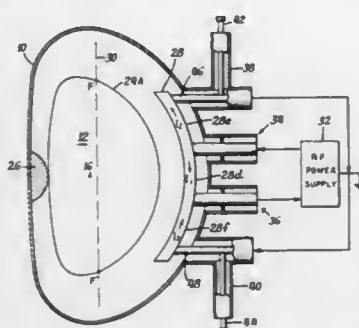
Tihiro Ohkawa, La Jolla, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 27, 1984, Ser. No. 645,031

Int. Cl.⁴ G21B 1/00

U.S. Cl. 376—123

4 Claims



1. In a plasma device having plasma including plasma ions magnetically confined by a magnetic field, wherein the plasma has a defined outer surface and is intersected by resonance surfaces of respective common ion cyclotron frequency of a predetermined species of plasma ions moving in said magnetic

field, an apparatus for ion cyclotron range of frequencies heating of said plasma comprising

radio frequency source means for providing radio frequency power at a radio frequency corresponding to the ion cyclotron frequency of said predetermined species of plasma ions moving in said field at a respective said resonance surface, and launching means coupled to said radio frequency source means for radiating radio frequency energy at said radio frequency onto said respective said resonance surface within said plasma simultaneously from a plurality of locations located outside said plasma at such respective distances from the intersections of said respective resonance surface and said defined outer surface and at such relative phases that the resulting interference pattern provides substantially null net radio frequency energy over regions near and including substantial portions of said intersections relative to the radio frequency energy provided thereby at other portions of said respective resonance surface within said plasma.

3. A method for ion cyclotron range of frequencies heating of plasma including plasma ions magnetically confined by a magnetic field, wherein the plasma has a defined outer surface and is intersected by resonance surfaces of respective common ion cyclotron frequency of a predetermined species of plasma ions moving in said magnetic field, said method comprising providing radio frequency energy at a radio frequency corresponding to the ion cyclotron frequency of said predetermined species of plasma ions moving in said field at a respective said resonance surface, and radiating said radio frequency energy at said radio frequency onto said respective said resonance surface within said plasma simultaneously from a plurality of locations located outside said plasma at such respective distances from the intersections of said respective resonance surface and said defined outer surface and at such relative phases that the resulting interference pattern provides substantially null net radio frequency energy over regions near and including substantial portions of said intersections relative to the radio frequency energy provided thereby at other portions of said respective resonance surface within said plasma.

4,710,340

MECHANICAL SPECTRAL SHIFT REACTOR

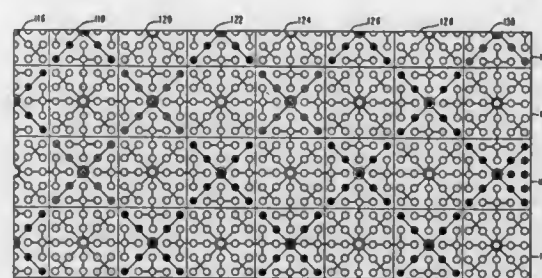
Walter J. Dollard, Penn Hills; Pratap K. Doshi, Murrysville, and Raymond A. George, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 565,513, Dec. 27, 1983, abandoned, which is a continuation of Ser. No. 217,060, Dec. 16, 1980, abandoned. This application Sep. 24, 1986, Ser. No. 910,840

Int. Cl.⁴ G21C 7/26

U.S. Cl. 376—209

16 Claims



1. The method of operating pressurized-water nuclear reactor fueled by material having both fissile and fertile constituents in such manner that the neutron spectrum is hardened at the beginning of normal reactor operation and during prolonged reactor operation which results in the gradual depletion of reactor fuel, the neutron spectrum is gradually shifted toward a more moderated state to compensate for the depleted

4,710,341

APPARATUS AND METHOD FOR CLOSED-LOOP CONTROL OF REACTOR POWER

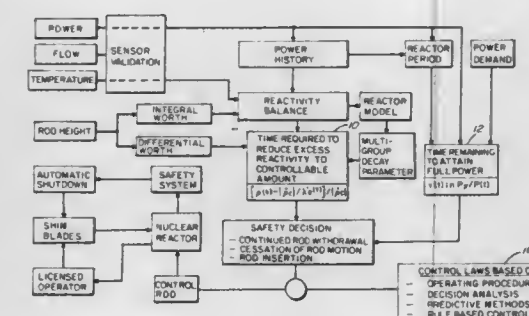
John A. Bernard, Needham Heights; Allan F. Henry, Boston, both of Mass.; David D. Lanning, Hampstead, N.H., and Kwan S. Kwok, Newtonville, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 633,939, Jul. 24, 1984, Pat. No. 4,637,911. This application Sep. 12, 1986, Ser. No. 907,048

Int. Cl.⁴ G21C 7/36

U.S. Cl. 376—216

20 Claims



1. Apparatus for closed-loop control of reactor power in a nuclear reactor in which power level is altered by adjustments in reactivity balance comprising:
means for adjusting said reactivity balance; and
computing apparatus for computing repeatedly at intervals the two functions $[\rho(t) - |\rho_c|/\lambda_e(t)]/|\rho_c|$ and $\tau(t)\ln(R_F/P(t))$; whereby net reactivity is limited by adjusting said reactivity balance when the two functions become equal.

4,710,342

STRUCTURE ASSEMBLABLE AND DISASSEMBLABLE ON A RACKING SITE FOR THE STORAGE OF NUCLEAR REACTOR FUEL ELEMENTS

Louis J. Helary, Nantes, and Pierre Grenon, Treilleres, both of France, assignors to Et. Lemer & Cie., Cedex, France

PCT No. PCT/FR84/00232, § 371 Date Jun. 19, 1985, § 102(e) Date Jun. 19, 1985, PCT Pub. No. WO85/01827, PCT Pub. Date Apr. 25, 1985

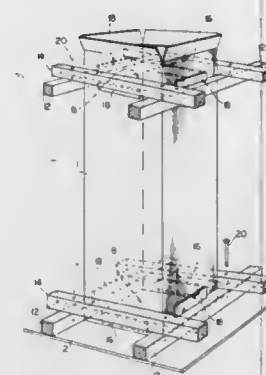
PCT Filed Oct. 17, 1984, Ser. No. 751,776

Claims priority, application France, Oct. 19, 1983, 83 16847

Int. Cl.⁴ G21C 19/40, 19/06

U.S. Cl. 376—272

1 Claim



1. An assemblable and disassemblable nuclear fuel element storage rack structure comprising
(a) a juxtapositioning of vertically arranged parallelepipedic racks, said racks being open at their ends and having two pairs of respectively parallel faces;

fuel, said reactor including a pressure vessel enclosing a reactor core and having an inlet and an outlet for circulating a water coolant moderator in heat transfer relationship with said core, said core comprising a plurality of fuel assemblies disposed therein for generating heat by nuclear fission, said fuel assemblies having a fuel enrichment which provides a measure of excess reactivity at the beginning of core life which is later drawn upon to lengthen core life, said reactor provided with a plurality of neutron-absorbing control rods which are vertically movable into and out of said core so that movement of said control rods into said core will substantially decrease reactivity and withdrawal of said control rods from said core will substantially increase reactivity, said control rods when inserted into said core displacing an equivalent volume of said water coolant moderator, said reactor also provided with a plurality of neutron-spectral-shift displacer rods which have a substantially lower absorptivity for neutrons than said control rods, each said neutron-spectral-shift displacer rod comprising a hollow thin-walled Zircaloy member containing a filling of solid or annular zirconium- or aluminum-containing material for providing internal support and mass for said thin-walled tubular member, each said displacer rod having overall neutron-absorbing and -moderating characteristics essentially not exceeding those of hollow tubular Zircaloy members with or without a filling of zirconium oxide pellets or aluminum oxide pellets, said neutron-spectral-shift displacer rods when fully inserted into said core displacing an equivalent volume of said water coolant moderator to decrease reactivity, said neutron-spectral-shift displacer rods being vertically movable into and out of said reactor core with the spectral-shift-rod movement being independent of the movement of said control rods, the volume of said water coolant moderator which is displaced by all said neutron-spectral-shift displacer rods when fully inserted into said core very substantially exceeding the volume of said water coolant moderator which is displaced by said control rods if fully inserted into said core, and the decrease in reactivity resulting from the full insertion into said core of all of said neutron-spectral-shift displacer rods being less than said measure of excess reactivity, said method comprising:

at least partially compensating for said measure of excess reactivity at the beginning of core life by fully inserting said neutron-spectral-shift displacer rods into said core and separately controlling reactor operation by using neutron absorption, with the displacement of said water coolant moderator by said neutron-spectral-shift displacer rods resulting in a hardened neutron spectrum which functions to convert fertile material constituents of said fuel to fissionable material;

as said reactor continues to operate with the attendant gradual depletion of fuel, withdrawing portions of said neutron-spectral-shift displacer rods from said core so that the water coolant moderator which replaces said withdrawn neutron-spectral-shift rods operates to shift the neutron spectrum from a hardened state to increase the reactivity of said reactor fuel to offset the effects of fuel depletion; and

continuing to withdraw said neutron-spectral-shift displacer rods from said core during prolonged reactor operation to offset the gradual fuel depletion until near the end of reactor core life when all of said neutron-spectral-shift displacer rods have been fully withdrawn from said core; whereby the additional fissionable material converted from fertile material by the hardened neutron spectrum contributes heat to reactor operation.

- (b) a horizontal base plate;
- (c) at least two meshed networks of horizontal bars, each said network comprising a first series of parallel bars and a second series of parallel bars which are crossed with the bars of said first series, thereby defining openings, each of said openings receiving one said rack, a first of said networks, called lower network, being fixed to said base plate, and a second of said networks being located at an upper part of said racks;
- (d) dismantlable fixing means connecting, in each of said networks, the bars of said first series to the bars of said second series, and in said lower network, the bars of each series of bars to said base plate;
- (e) at least two horizontal strips fixed to two different faces of each said rack, substantially at level of each said network, a first of said strips being located in contact with and above one bar of said first series and a second of said strips being located in contact with and below one bar of said second series, whereby said racks are locked with respect to said networks of bars; and
- (f) means securing said racks located on the periphery of said rack structure against the bars located at the ends of each said series.

4,710,343

NUCLEAR BREEDER REACTOR FUEL ELEMENT WITH SILICON CARBIDE GETTER

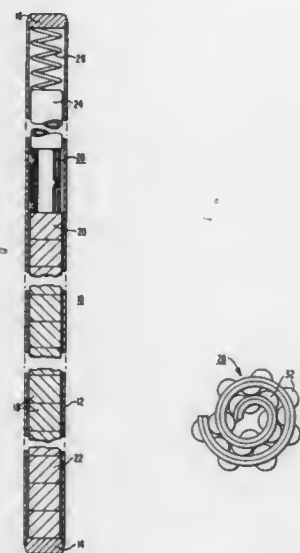
David W. Christiansen, Kennewick, and Richard A. Karnesky, Richland, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 27, 1985, Ser. No. 802,559

Int. Cl.⁴ G21C 3/20

U.S. Cl. 376-414

2 Claims



1. A breeder reactor fuel element including a tubular cladding hermetically sealed at each end by an end plug, one interior portion of the cladding defining a fuel space filled with a column of fissile material comprising a mixture of PO₂ and UO₂, and an upper and lower fertile material blanket comprising UO₂ arranged axially in tandem with the fissile column within the cladding, wherein the improvement comprises a cesium getter disposed at least at the upper end of said upper blanket, said getter including a helical rolled substrate of stainless steel coated with silicon carbide material for collecting and isolating cesium migrating thereto and said stainless steel substrate having dimples formed therein for holding apart successive convolutions of said rolled substrate to permit a volume expansion of said getter.

4,710,344

METHOD OF FORMING A GETTER ASSEMBLY

Thomas H. Ward, Bay Village; Phillip A. Costanzo, Parma; Vincent Pietrasz, Cleveland, and Edmund J. Soeder, Parma Hts., all of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

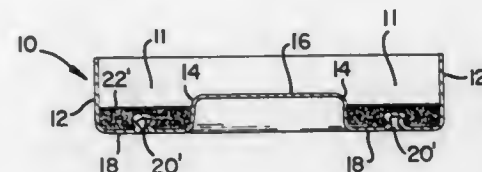
Division of Ser. No. 539,795, Oct. 7, 1983, Pat. No. 4,642,516.

This application Dec. 22, 1986, Ser. No. 944,581

Int. Cl.⁴ B22F 7/04

U.S. Cl. 419-8

1 Claim



1. A method of forming a getter assembly comprising: providing a metal annular channel defined by outer and inner sidewalls and a bottom connecting said outer and inner walls, said bottom wall having an integrally formed annular groove having the general shape of half a sine period extending upwardly into said channel; providing getter material into said annular channel to cover said annular groove; and pressing said getter material to deform said annular groove into a generally bulb-shaped cross section which narrows down adjacent said bottom wall, said annular groove thereby interlocking with the pressed getter material.

4,710,345

MANUFACTURING METHOD OF SUPER-HEAT-RESISTING ALLOY MATERIAL

Yoshihiko Doi, Nobuhito Kuroishi, Shigeki Ochi, and Noboru Uenishi, all of Itami, Japan, assignors to Japan as represented by Director-General, Agency of Industrial Science & Technology, Tokyo, Japan

PCT No. PCT/JP85/00595, § 371 Date Apr. 22, 1986, § 102(e) Date Apr. 22, 1986, PCT Pub. No. WO86/02669, PCT Pub. Date May 9, 1986

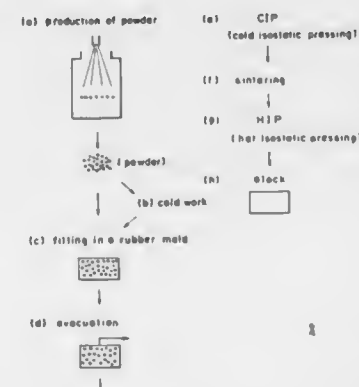
PCT Filed Oct. 26, 1985, Ser. No. 852,966

Claims priority, application Japan, Oct. 26, 1984, 59-224094; Oct. 26, 1984, 59-224095

Int. Cl.⁴ B22F 3/24

U.S. Cl. 419-28

4 Claims



1. A method of manufacturing a super-heat-resisting alloy material comprising the steps: cold working a powder of Ni-based super-heat-resisting alloy; filling and sealing the powder in a rubber mold;

isostatically cold pressing the powder in the rubber mold into compacted powder; sintering the compacted powder in a vacuum or in a gas atmosphere at a temperature of 1000° C. or more so that the density of the resulting sintered compact material increase up to 95% or more of the theoretical density; and isostatically hot pressing the sintered compact material.

4,710,346

METHOD FOR MANUFACTURING POWDER MATERIAL AND SHAPED PRODUCTS UTILIZING THE CONDITIONS IN OUTER SPACE

Axel Rossman, Karlsfeld, Fed. Rep. of Germany, assignor to Motoren-und Turbinen-Union München, GmbH, Munich, Fed. Rep. of Germany

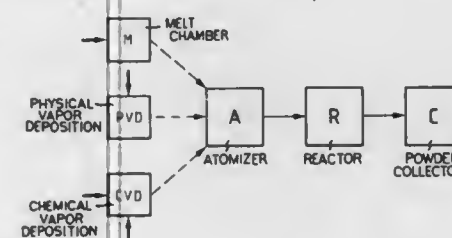
Filed Jan. 9, 1985, Ser. No. 689,839

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401700

Int. Cl.⁴ B22F 33/02

U.S. Cl. 419-68

16 Claims



1. A method for manufacturing powders comprising converting a solid starting material from the solid state to the gaseous or vapor phase, and forming powder particles by introducing the starting material in gaseous or vapor phase through an inlet into a sealed chamber and subjecting said chamber and the material therein to substantially zero gravity such that the crystal nuclei of the starting material become formed into the powder particles in flotation condition in said chamber, expanding or contracting said sealed chamber while the material is subjected to zero gravity and reflecting radiation into the chamber from a radiation reflecting coating in a portion of the wall of the chamber.

4,710,347

MARAGING STEEL HAVING HIGH STRENGTH AND HIGH TOUGHNESS

Kim Y. Gil, and Lee C. Sun, both of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

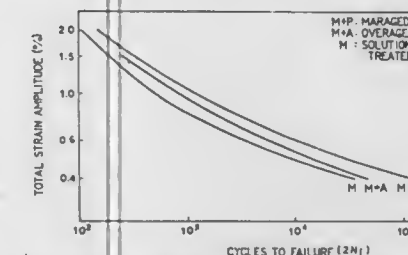
Filed May 30, 1986, Ser. No. 868,594

Claims priority, application Rep. of Korea, Oct. 12, 1985, 7505

Int. Cl.⁴ C22C 38/44

U.S. Cl. 420-94

1 Claim



1. A maraging steel having high strength and high toughness, consisting of 15% to 25% nickel, 2% to 8% tungsten,

4,710,348

PROCESS FOR FORMING METAL-CERAMIC COMPOSITES

John M. Brupbacher; Leontios Christodoulou, and Dennis C. Nagle, all of Baltimore, Md., assignors to Martin Marietta Corporation, Bethesda, Md.

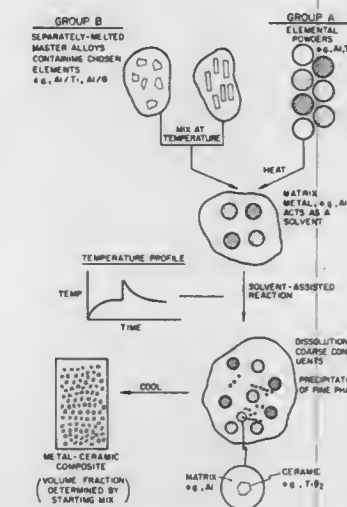
Continuation of Ser. No. 662,928, Oct. 19, 1984, abandoned.

This application Dec. 19, 1986, Ser. No. 943,899

Int. Cl.⁴ C22C 1/00

U.S. Cl. 420-129

43 Claims



1. A method for the production of metal-ceramic composite materials containing a ceramic phase, said method comprising precipitating at least one ceramic material in a metal matrix by contacting reactive ceramic forming constituents, in the presence of a non-reactive solvent matrix metal in which said ceramic forming constituents are more soluble than said ceramic phase, at a temperature at which sufficient diffusion of said constituents into said solvent matrix metal occurs to cause reaction of said reactive ceramic forming constituents raising the temperature above the melting temperature of the matrix metal to precipitate said ceramic phase in said solvent matrix metal.

4,710,349

HIGHLY CONDUCTIVE COPPER-BASED ALLOY

Shinsuke Yamazaki, Ichikawa; Rikio Takeda, Koganei, and Iwao Uda, Sakai, all of Japan, assignors to Sumitomo Metal & Mining Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 22,377

Claims priority, application Japan, Mar. 18, 1986, 61-58024

Int. Cl.⁴ C22C 9/00

U.S. Cl. 420-495

2 Claims

1. A highly conductive copper-based alloy consisting essentially of, by weight, 0.001% to 0.02% of tellurium, 0.05% to 0.3% of one element selected from the group consisting of iron and chromium, and 0% to 0.01% of phosphorous with the balance being copper and incidental impurities.

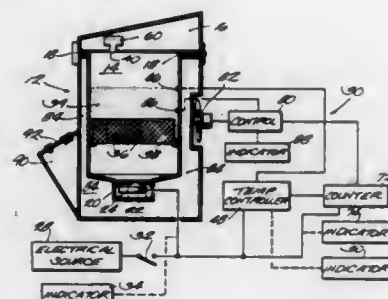
4,710,350

APPARATUS AND METHOD FOR STERILIZING WITH VAPORIZABLE LIQUIDS

C. William Petersen, 295 Poplar, Elmhurst, Ill. 60126
Continuation of Ser. No. 625,319, Jun. 27, 1984, abandoned.
This application Apr. 9, 1986, Ser. No. 851,313
Int. Cl.⁴ A61L 2/20

U.S. Cl. 422—37

12 Claims



1. A sterilizing device comprising a housing having an openable access closure and defining an interior chamber having upper and lower portions,

a reservoir means in the lower portion of said chamber containing a substantially non-toxic, substantially inert, vaporizable sterilizing liquid having a boiling point sufficiently high to kill microorganisms unsafe for humans, electrical heating means for heating and vaporizing the sterilizing liquid and providing a rising blanket of substantially saturated vapors of said sterilizing liquid, support means located above said reservoir means supporting articles to be sterilized and permitting the rising vapors to contact and pass over the articles, electrical control circuit means connected to a source of electrical energy and to said heating means for controlling the operation of said heating means and thereby controlling the level of the vapors in said chamber, said control circuit means including,

means located above said support means and the articles supported thereon for sensing the presence and absence of a relatively dense blanket of the vapors, means electrically interconnecting said sensing means and said heating means for permitting the flow of electrical energy to said heating means in response to said sensing means sensing the absence of a vapor blanket and for terminating the flow of electrical energy to said heating means after a predetermined period sufficient to sterilize the articles subsequent to said sensing means sensing the presence of a vapor blanket, and

vent passage means providing an opening to the atmosphere throughout normal operation of said device for discharging to the atmosphere the air displaced from said chamber by the rising vapor blanket, said vent passage means including an inlet communicating with said chamber at a location above said sensing means and an outlet communicating with the atmosphere.

4,710,351

AUTOMATED HANDLING SYSTEM

Frank W. Wogoman, South Bend, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 4, 1984, Ser. No. 657,940
Int. Cl.⁴ B01L 11/00; B65H 5/28

U.S. Cl. 422—50

3 Claims

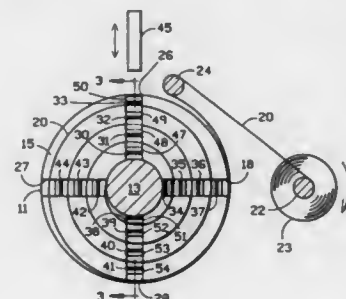
1. Storage spool apparatus for storing and dispensing multiple flexible test devices having a reagent matrix attached to substrate material, said storage spool apparatus comprising:

a storage spool having at least two wall members extending radially from a central core member, said wall members having multiple channels constructed and arranged for

retaining flexible test devices parallel to said central core member;

interwinding material wound around the central core member and between two wall members for retaining flexible test devices in said multiple channels while segregating a flexible test device from a next adjacent parallel flexible test device in the same channel;

a take-up spool interconnected to said storage spool by attachment to one end of said interwinding material such that rotation of said take-up spool rotates said storage spool and sequentially exposes successive flexible test devices by removing interwinding material from over



successive flexible test devices located in said multiple channels of said storage spool;

vacuum pickup head means mounted adjacent to said storage spool;

reciprocating means for moving said vacuum pickup head means into said storage spool between said wall members when said storage spool is in a stationary position to contact a flexible test device exposed by rotation of said take-up spool and removing said pickup head means from said storage spool following such contact; and

means for supplying vacuum to said vacuum pickup head means when said vacuum pickup head means is in contact with a flexible test device in said storage spool.

4,710,352

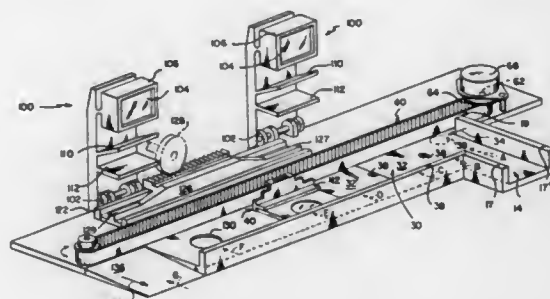
SIMPLIFIED TEST ELEMENT ADVANCING MECHANISM HAVING POSITIVE ENGAGEMENT WITH ELEMENT

Daniel A. Slater; William A. Meredith, and Mark J. Devaney, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 20, 1985, Ser. No. 777,985
Int. Cl.⁴ G01N 35/00

U.S. Cl. 422—63

9 Claims



1. A test element advancing mechanism for use in an analyzer to move a test element from station to station, the mechanism comprising

(a) a support surface over which elements are slidably advanced in a predetermined direction, said surface having first and second edges,

4,710,354

DEVICE FOR HEATING OF SOLID OR LIQUID SAMPLES IN SMALL QUANTITIES

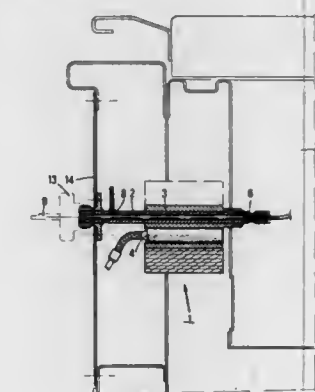
Francoise Behar, Paris; Jeannine Roucace, Le Chesnay; Jean Auger, Dourdan, and Luc Bondet, Chelles, all of France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France

Filed Jun. 18, 1985, Ser. No. 746,093

Claims priority, application France, Jun. 18, 1984, 84 09622
Int. Cl.⁴ G01N 31/12

U.S. Cl. 422—80

9 Claims



(b) a test element mover having a pivot axis extending parallel to said support surface, said mover including engaging means projecting therefrom for engaging test elements, said test element engaging means including two interior corners and a surface between them constructed to engage at least one edge of engaged test elements along one side of such test elements, said one test element edge being an edge that extends generally parallel to said pivot axis,

(c) means for reciprocating said mover along a surface disposed to one side of said support surface, a portion of said mover being constructed to engage said reciprocating means, and

(d) means for pivoting said mover about said axis, so that said engaging means are moved into or out of contact with test elements, said mover including a lever arm emanating from one side of said reciprocating means engaging portion and constructed to interact with said pivoting means, said reciprocating means being sufficiently flexible as to be rotatable about said pivot axis when said pivoting means is activated,

said test element engaging means of said mover emanating from a side of said reciprocating means engaging portion that is opposite to said one side,

whereby said mover engages test elements at a side edge.

4,710,353

CORROSIVE LIQUID LEAK DETECTING SENSOR

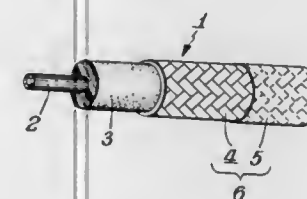
Satoshi Tanaka, Hitaka, and Haruo Imaizumi, Nishi-Asuma, both of Japan, assignors to Junkosha Co., Ltd., Japan

Filed Jul. 11, 1986, Ser. No. 884,725

Claims priority, application Japan, Jul. 19, 1985, 60-159557
Int. Cl.⁴ G01N 17/00, 21/17, 21/71; G02B 6/22

U.S. Cl. 422—68

20 Claims



1. A device of manufacture for detecting leaks of a corrosive liquid comprising an elongated optical fiber light guide core having a covering thereover, and light-emitting means and light-receiving means connected to the light guide core, wherein said covering generates heat upon contact with a corrosive liquid to be detected thereby changing the light transmittivity of the light guide core, which change is detected by said light-receiving means, wherein said covering is a porous polymer containing within its pores a material which generates heat upon contact with the corrosive liquid to be detected and wherein the liquid to be detected is alkaline and said material which generates heat is an ammonium salt.

12. A device of manufacture for detecting leaks of a corrosive liquid comprising an elongated optical fiber light guide core having a covering thereover, and light-emitting means and light-receiving means connected to the light guide core, wherein said covering generates heat upon contact with a corrosive liquid to be detected thereby changing the light transmittivity of the light guide core, which change is detected by said light-receiving means, wherein said covering is a porous polymer containing within its pores a material which generates heat upon contact with the corrosive liquid to be detected and wherein the liquid to be detected is acid and said material which generates heat is sodium carbonate.

4,710,355

REAGENT DELIVERY DEVICE

Masao Ushikubo, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,389

Claims priority, application Japan, Jun. 14, 1984, 59-120640;
Aug. 18, 1984, 59-171001

Int. Cl.⁴ B01L 3/02; G01N 37/00

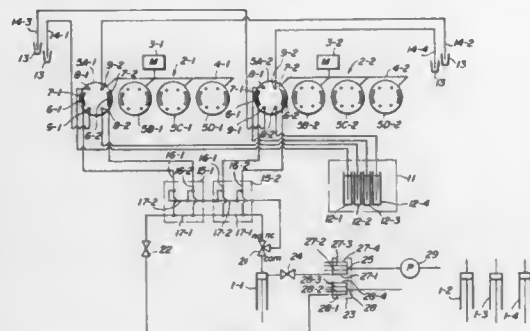
U.S. Cl. 422—100

7 Claims

1. A reagent delivery device comprising:

- a plurality of sucking and discharging means;
- a plurality of like-constructed units connected to said sucking and discharging means, each unit having valves the number of which corresponds to the number of said sucking and discharging means, and driving means for simultaneously driving said valves;
- a plurality of reagent tanks connected to said valves in which a plurality of reagents are respectively contained;
- a plurality of delivery nozzles connected to said valves; and
- a plurality of like-constructed manifold block means connected to said sucking and discharging means and being readily attachable to and detachable from one another, said units and said sucking and discharging means, each

said manifold block means having a plurality of flow lines for connecting a corresponding sucking and discharging means to one of said valves in each respective unit; whereby respective delivery nozzles and reagent tanks are selectively connected to said sucking and discharging means by an operation of said valves; and



further whereby the number of reagents can be increased by simply providing additional delivery nozzles and like-constructed units, connected to said sucking and discharging means through additional like-constructed manifold block means or manifold block means having additional flow lines, without additional sucking and discharging means.

4,710,356

APPARATUS TO ACCELERATE THE TRANSFER OF MATERIAL BETWEEN TWO MEDIA REACTING IN A FLUIDIZED BED

Franz Alstetter, Karlsfeld, and Guenther Hultsch, Oberschleissheim, both of Fed. Rep. of Germany, assignors to Krauss-Maffel A.G., Fed. Rep. of Germany

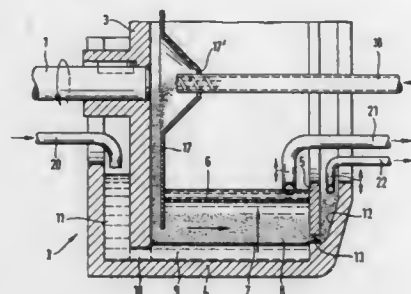
Filed Dec. 21, 1984, Ser. No. 685,233

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346861

Int. Cl.⁴ B01J 8/18

U.S. Cl. 422-140

20 Claims



1. A device for the acceleration of a reaction between media of solid and liquid phase, comprising:

- means for forming a fluidized bed, wherein a solid medium is held suspended in a liquid medium, including a sieve drum,
- a first cylindrical sieve disposed within the sieve drum,
- means for controlling operational parameters for creating a pressure drop so that the liquid medium passes radially through said first cylindrical sieve and maintains the solid phase in suspension;
- means for generating a centrifugal field for acting on the fluidized bed including a shaft means for rotating said sieve drum and said first cylindrical sieve about a vertical axis of the sieve drum;
- means for introducing the liquid medium outside the first cylindrical sieve;
- means for defining a reaction chamber disposed radially

inward of said first cylindrical sieve having a top and a bottom;

a drum bottom of said sieve drum for bounding the bottom of the reaction chamber;

an annular rim for bounding the top side of the reaction chamber;

means for defining an annular discharge chamber above the top of the reaction chamber;

means for defining a first discharge bore in said annular rim disposed at substantially the same radial height as the first cylindrical sieve, and for connecting the discharge chamber with the reaction chamber;

means for defining a pressure chamber between said first cylindrical sieve and said sieve drum having a top bounded by said annular rim, and having a bottom bounded by the drum bottom;

means for defining a second annular chamber disposed below the drum bottom;

means for defining a circulation bore for connecting the second annular chamber with the pressure chamber;

an inner second cylindrical sieve for defining a radially-inward side of said reaction chamber disposed radially inward of said discharge bore;

wherein said means for introducing the liquid medium comprise a feed line for introducing the liquid medium into said second annular chamber, wherein the second annular chamber extends to a radial region near said shaft means, and wherein the feed line enters said chamber in the radial region near said shaft means; and

means for introducing the solid medium into said reaction chamber comprising a central filling pipe.

4,710,357

FCC COMBUSTION ZONE CATALYST COOLING APPARATUS

Ismail B. Cetinkaya, Mt. Prospect, and Daniel N. Myers, Arlington Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

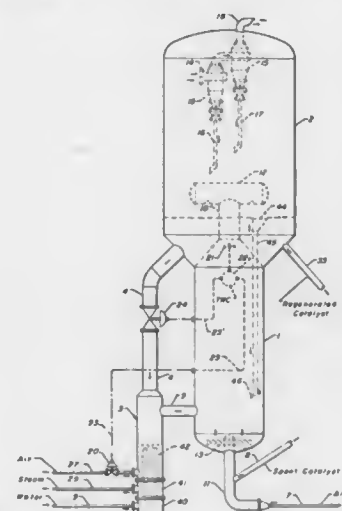
Division of Ser. No. 687,352, Dec. 28, 1984, Pat. No. 4,578,366.

This application Aug. 12, 1985, Ser. No. 764,360

Int. Cl.⁴ B01J 8/18

U.S. Cl. 422-144

8 Claims



1. An apparatus for the combustion of a combustible material present on fluidized solid particles which apparatus comprises:
- (a) a vertically oriented combustion chamber having a cylindrical vertical sidewall, with an opening being located in said sidewall;
 - (b) a disengagement chamber located superadjacent to said combustion chamber and in communication therewith, there being a hot fluid particle collection section located at the bottom of said disengagement chamber;

- (c) a cooling chamber surrounding at least one heat exchanger, the cooling chamber being in close proximity to a lower portion of said combustion chamber, the cooling chamber having an upper particle inlet opening and a lower particle outlet opening, with the entire heat exchanger being located below both said openings;
- (d) a hot particle conduit of vertical orientation connecting said hot particle collection section of the disengagement chamber with said cooling chamber particle inlet opening such that hot particles can flow downwardly from said disengagement chamber to said cooling chamber;
- (e) a particle flow restriction means in said hot particle conduit;
- (f) an open passageway connecting said particle outlet opening of said cooling chamber with the opening located in said sidewall of said combustion chamber and providing means for the flow of cooled particles and fluidizing gas from said heat exchanger to said combustion chamber;
- (g) a fluidizing gas inlet conduit connected to a bottom portion of the cooling chamber providing means for the passage of fluidizing gas onto the shell side of said heat exchanger and maintaining a fluidized catalyst bed within the cooling chamber; and,
- (h) a means to control the flow of fluidizing gas in said fluidizing gas inlet conduit.

4,710,358

APPARATUS FOR CHANGING THE SURFACE TENSION OF CUP-LIKE CONTAINERS

Hans Neuhaus, Giffers, Switzerland, assignor to Polytype AG, Switzerland

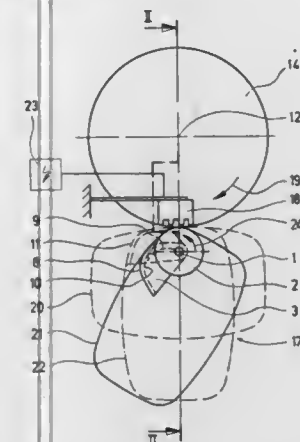
Filed Jul. 9, 1986, Ser. No. 883,541

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524985

Int. Cl.⁴ B01J 19/08

U.S. Cl. 422-186.05

3 Claims



1. An apparatus for changing the surface tension of cup-like containers of round, oval and similar forms without corners by a corona treatment, wherein a cup-like container is adapted to rest with its interior side walls on a mandrel, comprising a rotatable mandrel having an axle, said mandrel having a rotation symmetrical cross section of a diameter which is equal to or smaller than the smallest diameter of the cup-like container to be treated, at least one drive wheel overlying said container and the mandrel, the cup-like container being caused by driving engagement of said drive wheel as it is pressed against the outer side wall of the container to roll off on the mandrel, an electrode opposite to said mandrel which is connected as a counter electrode, an electrode associated with said mandrel, at least one guide shoe pivotal on said axle and being electrically connected with said mandrel and having a surface toward the inside of a wall of the cup-like container extending initially away from said mandrel in a tangential direction and being

spring supported in such a way that said guide shoe applied against the wall of the cup-like container.

4,710,359
GAS GENERATOR

Hermann Erdmann, Weyhe, and Heiko Rahm, Hamburg, both of Fed. Rep. of Germany, assignors to Erno Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

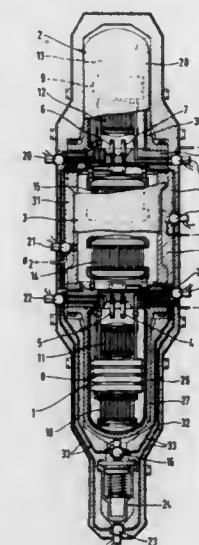
Filed Mar. 8, 1985, Ser. No. 709,510

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408592

Int. Cl.⁴ B01J 7/00; B01D 13/00, 53/36

U.S. Cl. 422-191

6 Claims



1. Gas generator device for use in orbital space stations, satellites, or space vehicles comprising:

- a first and a second process chamber, each including at least one catalytic means for decomposing a liquid energy carrier to obtain a blend of pressurized gas, each of said first and second process chambers further including (i) a first separator for separating the components of the gas as produced by said catalytic means (ii) a supplemental catalytic converter for receiving residual pressurized gas and (iii) a second separator connected to said supplemental catalytic converter for separating product gas from the pressurized gas produced therein;
- a first means for removing gas produced in each of said process chambers from said generator device;
- a third common chamber intermediate said first and second process chambers, means alternately communicating said third chamber with said first and second process chambers for receiving unseparated product gas from the second separator thereof and including means for completing the separation;
- a plurality of second means for separately removing different individual components of the gaseous components from said third intermediate chamber separating means; and
- means for alternately feeding liquidous energy carrier to the first and second process chambers.

4,710,360

APPARATUS FOR DISSOLVING UREA AND OTHER ENDOTHERMIC MATERIALS

Bruce Harbolt, Northridge; Perry L. Murata, Torrance, and Neal C. Burmaster, Anaheim, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

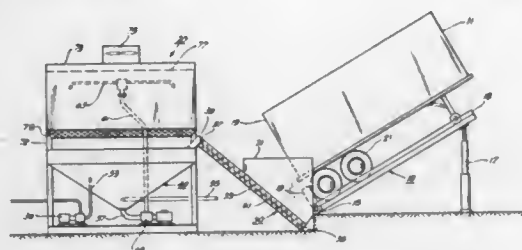
Division of Ser. No. 668,036, Nov. 5, 1984, Pat. No. 4,610,714.

This application Jun. 11, 1986, Ser. No. 872,807

Int. Cl.⁴ B01D 11/02

U.S. Cl. 422-269

9 Claims



1. An apparatus for dissolving endothermic materials, without fossil fuel-derived heat, which comprises:

- a mixing tank, means for introducing endothermic material, as a solid phase, into said mixing tank, a process water feed pipe connected to said mixing tank for feeding process water into said mixing tank for forming a slurry of the endothermic material and the process water, and a slurry discharge pipe connected to said mixing tank for removing the slurry from said mixing tank,
- an orificed spray pipe, in fluid communication with said slurry discharge pipe, said orificed spray pipe being positioned above said mixing tank and arranged so as to spray droplets of the slurry downwardly into said mixing tank, and
- a spray box enclosing said spray pipe, and having an open bottom to thereby allow the spray droplets to descend into said mixing tank, said spray box further having an opening for air and a fan in flow communication with said opening for drawing ambient air through the spray box for direct heat exchange with the spray droplets.

4,710,361

GOLD RECOVERY BY SULHYDRIC-FATTY ACID FLOTATION AS APPLIED TO GOLD ORES/CYANIDATION TAILINGS

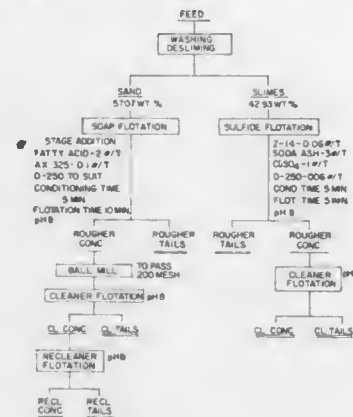
Antonio M. Ostrea, 19 Istanbul Street, Merville Park Subdivision, Paranaque, Metro Manila, Philippines

Continuation of Ser. No. 665,341, Oct. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 566,810, Dec. 29, 1983, abandoned. This application Apr. 2, 1986, Ser. No. 848,326

Int. Cl.⁴ C22B 7/00

U.S. Cl. 423-26

4 Claims



1. In a process of upgrading residual gold values from gold cyanidation tailings which comprises treating the said tailings

by froth flotation in the presence of a combination of flotation collectors, the improvement consisting of fractionating the flotation feed (90% passing 6.5 mesh) into sand (+200 mesh) and slimes (31 200 mesh) and separately subjecting the sand portion to soap flotation using a sulhydic-fatty acid combination as the collector, and the slime portion to sulfide flotation using sulhydic collectors.

4,710,362

SELECTIVE RECOVERY OF CARBON DIOXIDE

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 5, 1986, Ser. No. 859,560

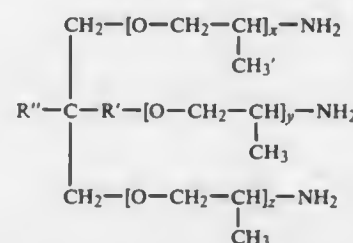
Int. Cl.⁴ C01B 17/16, 31/20

U.S. Cl. 423-228

5 Claims

1. In a method for the selective separation of carbon dioxide from a stream of acid gas containing carbon dioxide and sulfur-containing acid gas components including hydrogen sulfide the improvement which comprises the steps of:

- countercurrently contacting said gas stream in an absorption zone with a treating agent to thereby selectively remove a substantial portion of the carbon dioxide from said gas stream by absorption into said treating agent, discharging a gas stream from said absorption zone containing a significantly reduced amount of carbon dioxide and discharging said treating agent enriched with absorbed carbon dioxide from said absorption zone,
- said treating agent being an aqueous solution containing from about 35 wt. % to about 55 wt. % of a polyoxypropylene triamine having the formula:



Wherein:

R' represents a methylene group and R'' represents hydrogen or methyl or ethyl and wherein the sum of x + y + z is a positive integer having a value of from about 4 to about 6,

said polyoxypropylene triamine having a molecular weight of about 320 to about 475 and said aqueous solution having an amine concentration of about 2.5 to about 3.5 meq/g.

4,710,363

PROCESS OF REMOVING SO_x AND NO_x FROM WASTE GASES

Heinrich Frubbuss, Hubert-Reissnerstr. 5a, 8032 Gräfelfing, Fed. Rep. of Germany

Continuation of Ser. No. 674,018, Nov. 21, 1984, Pat. No. 4,629,609. This application Sep. 22, 1986, Ser. No. 910,363

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342500

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.⁴ B01J 8/00; C01B 17/00, 21/00

U.S. Cl. 423-239

2 Claims

1. Process of removing SO_x and NO_x from waste gases which comprises the steps of and in sequence

- removing substantially all of the SO_x present in the gas by contacting said waste gas with an adsorptive coke having an adsorption capacity for SO₂ of above 40 g SO₂ per kg of coke,
- introducing NH₃ into the gas now substantially free of SO_x,

- subjecting the NH₃ containing gas to contact with a catalyst having an adsorptive capacity for SO₂ of below, 10 g per kg of catalyst containing as effective ingredient at least one member of the group of aluminum, copper, cobalt, nickel, iron and vanadium oxide supported on a granular refractory material for reducing the NO_x to N₂, and
- recovering the SO_x and NO_x free gas.

4,710,364

CONTINUOUS RECOVERY OF SULFUR OXIDE FROM FLUE GAS

W. Wes Berry, Lakeland, Fla., assignor to Advanced Separation Technologies Incorporated, St. Petersburg, Fla.

Filed Sep. 10, 1986, Ser. No. 905,512

Int. Cl.⁴ B01D 8/00; C01B 17/00, 17/48; C05B 11/04

U.S. Cl. 423-244

11 Claims

1. A process for removing sulfur dioxide from flue gas, comprising:

- arranging a plurality of adsorption chambers for rotation about a fixed vertical axis, said chambers containing adsorption particles capable of absorbing sulfur dioxide and of desorbing sulfuric acid when contacted with water;
- conducting flue gas containing sulfur dioxide and particulate material through a precipitator to at least partially remove said particulate material, while allowing flue gas containing sulfur dioxide to pass through the precipitator;
- conducting said flue gas containing sulfur dioxide through a first fixed port and through said chambers containing said adsorption particles in sequence while said chambers are rotating about said fixed axis and adsorbing sulfur dioxide on the surface of adsorption particles
- regenerating said adsorption particles by conducting water through a second fixed port and through said chambers in sequence after said flue gas conducting step to produce and desorb sulfuric acid from said adsorption particles in the form of weak sulfuric acid;
- discharging said flue gas from said chambers before said regenerating step (iv), and subsequently;
- discharging said sulphuric acid from said chambers; and
- mixing said sulfuric acid with ground phosphate rock to produce normal superphosphate.

4,710,365

PROCESS FOR THE DRY REMOVAL OF SULFUR DIOXIDE FROM FLUE GAS

Georg R. U. Gebhard, Reichshof; Klaus R. G. Hein, Bergheim-Ahe, and Wolfgang Glaser, Frechen, all of Fed. Rep. of Germany, assignors to Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft, Essen, Fed. Rep. of Germany

Division of Ser. No. 526,904, Aug. 26, 1983, abandoned. This application Aug. 9, 1985, Ser. No. 764,844

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232080

Int. Cl.⁴ C01B 17/00; B01J 8/00

U.S. Cl. 423-244

1 Claim

1. A process for the dry removal of sulfur dioxide from a fossil-fuel flue gas containing same together with fly ash, consisting essentially of the steps of:

- treating the flue gas with a finely divided particulate capable of reacting with said sulfur dioxide by directly contacting said gas with said particulate in a dry state said particulate being a calcium or magnesium compound selected from the group consisting of the oxides, hydroxides, carbonates and mixtures thereof;
- dry separating particles from said flue gas to form a mass of dry recovered solids containing fly ash, unreacted particulate and reaction products of said particulate with said sulfur dioxide;
- dry milling said recovered solids;
- treating said recovered solids with liquid water or water vapor;
- continuously recycling at least part of the milled recovered solids after the treatment thereof with liquid water or water vapor, to contact with said flue gas for further absorption of said sulfur dioxide from said flue gas by said recovered solids by mixing the recovered solids with coal and milling the resulting mixture and thereby feeding the mixture into a burner in a combustion chamber in which said flue gas is produced; and
- continuously adding to the recycled milled recovered solids from the treatment thereof with liquid water or water vapor a quantity of said compound.

4,710,366

METHOD FOR PRODUCING STABILIZED WET PROCESS PHOSPHORIC ACID WITH LOW CONTENT OF MAGNESIUM AND ALUMINUM

Vivian C. Astley, New Orleans, and Jody J. Taravella, Harvey, both of La., assignors to Freeport Minerals Company, New Orleans, La.

Filed Oct. 23, 1986, Ser. No. 922,420

Int. Cl.⁴ C01B 25/06

U.S. Cl. 423-321 R

20 Claims

1. A method for producing wet process phosphoric acid with low post-precipitation characteristics and reduced aluminum and magnesium levels from an unclarified dilute wet process phosphoric acid containing aluminum and magnesium impurities and having a fluorine to magnesium oxide weight ratio of less than about 2.5:1, comprising the steps of:

- mixing fluosilicic acid with said unclarified dilute wet process phosphoric acid in an amount sufficient to provide a fluorine to magnesium oxide weight ratio of about 2.5:1.0 to about 10.1:1.0 to form a mixture thereof;
- concentrating said mixture to a P₂O₅ content of about 45 to about 55 percent by weight;
- subjecting the resulting concentrated mixture to crystallizing conditions for at least 8 hours whereby impurities are crystallized;
- clarifying the resulting concentrated mixture containing crystallized impurities until the total solids are reduced to less than about 2 percent by weight; and
- concentrating the resulting clarified wet process phosphoric acid to a P₂O₅ content of about 56 percent to about 63 percent by weight to provide a phosphoric acid product having low post-precipitation characteristics and reduced magnesium and aluminum levels.

4,710,367

PROCESS FOR REDUCING THE CONCENTRATION OF HEAVY METALS IN GEOTHERMAL BRINE SLUDGE

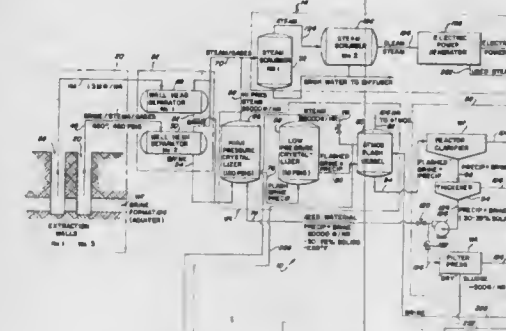
Morton M. Wong, Placentia, and Arnold L. Shugarman, Santa Ana, both of Calif., assignors to Union Oil Co. of California, Los Angeles; Mono Power Co., Rosemead and Southern Pacific Land Co., San Francisco, all of, Calif.

Filed Oct. 15, 1984, Ser. No. 661,154

Int. Cl.⁴ C01B 33/12

U.S. Cl. 423-335

40 Claims



1. A process for reducing the total concentration of heavy

metal in silica sludge precipitated from a flow of geothermal brine, the process comprising:

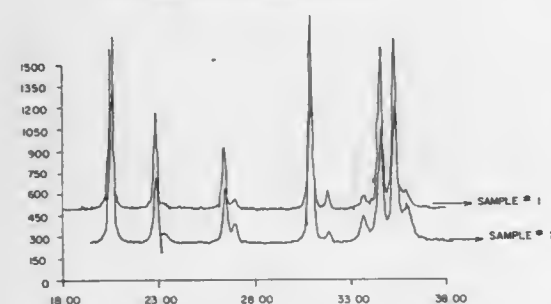
- washing the silica sludge with hot water so as to replace with said water geothermal brine which is entrapped in said sludge;
- contacting the washed sludge with a hydrochloric acid solution having a weight ratio of hydrochloric acid relative to said washed sludge causing the pH of the acid-sludge mixture to be less than about 1;
- separating a silicious solids residue from the hydrochloric acid solution, and
- washing the silicious solids residue with water to flush hydrochloric acid solution from said residue.

4,710,368

HIGH PURITY HIGH SURFACE AREA ALPHA CRYSTALLINE SILICON NITRIDE

Joseph E. Ritsko, and Howard L. Acla, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn. Continuation-in-part of Ser. No. 748,080, Jun. 24, 1985. This application May 19, 1986, Ser. No. 864,614
Int. Cl.⁴ C01B 21/068, 33/06
U.S. Cl. 423—344

4 Claims

X-RAY DIFFRACTION PATTERNS OF Si₃N₄

1. High purity silicon nitride particles which are essentially alpha crystalline, said silicon nitride particles having a surface area of greater than about 25 m²/g.

4,710,369

OXIDATION METHOD FOR PRODUCTION OF SPECIAL ALUMINAS FROM PURE ALUMINUM CHLORIDE

Lee H. Bergman, Baton Rouge, La., assignor to Toth Aluminum Corporation, Metairie, La.

Filed Jun. 10, 1986, Ser. No. 872,600
Int. Cl.⁴ C01F 7/02

U.S. Cl. 423—625

20 Claims

1. A process for producing alumina from anhydrous aluminum chloride which comprises reacting said anhydrous aluminum chloride with an oxidizing agent having a temperature within the range of from about 700° C. to less than 1,150° C. while introducing chlorine in the presence of said aluminum chloride and oxidizing agent, thereby increasing the yield of said alumina produced from said aluminum chloride and oxidizing agent.

4,710,370

METHOD FOR DETECTION OF CUSHING'S SYNDROME IN DOMESTIC ANIMALS

Dennis W. Macy, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.
Filed Apr. 25, 1985, Ser. No. 727,367
Int. Cl.⁴ A61K 49/00

U.S. Cl. 424—9

5 Claims

1. A method for diagnosing Cushing's Syndrome in animals, said method comprising the steps of:

- administering a pharmaceutical dose of glucagon to an animal suspected of having Cushing's Syndrome;
- taking a blood sample from the animal between about 15 and about 60 minutes after administration of the glucagon;
- exposing the blood sample to a test which compares the blood glucose level of the sample to an indicator of blood glucose level which is capable of indicating a blood glucose level greater than about 295 mg/dl; and
- noting a blood glucose level greater than about 295 mg/dl and thereby diagnosing Cushing's Syndrome in the animal.

4,710,371

WATERPROOF SUNSCREEN COMPOSITIONS

Victor Palinczar, 435 Adeline St., Trenton, N.J. 08611
Filed Feb. 19, 1986, Ser. No. 830,838
Int. Cl.⁴ A61K 7/42, 7/44, 9/12

U.S. Cl. 424—47

21 Claims

1. A water-proof sunscreen composition comprising:
- from about 5% to about 98% by weight of isobutylene-butene copolymers having an average molecular weight from about 200 to about 2500; and
 - from about 1.0% to about 30.0% by weight of an active ultraviolet radiation absorber.

4,710,372

DENTIFRICE FOR HYPERSENSITIVE TEETH

Hans-Ulrich Scheller, Eislingen/Fils, Fed. Rep. of Germany, assignor to Württembergische Parfümerie-Fabrik GmbH, Eislingen/Fils, Fed. Rep. of Germany
Continuation of Ser. No. 731,286, May 7, 1985, Pat. No. 4,634,589. This application Sep. 25, 1986, Ser. No. 911,426
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418427

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.⁴ A61K 7/16, 7/18

U.S. Cl. 424—49

4 Claims

1. A dentifrice for hypersensitive teeth containing essentially at least 15% by weight of hydroxylapatite or fluoroapatite of an average of particle size of less than 8 microns and an abrasion value (RDA) of less than 30 as the sole crystalline and polishing substance, the dentifrice containing no further soluble mineral salts.

4,710,373

LONG WAVELENGTH ULTRAVIOLET RAY ABSORBER
Koichi Nakamura, Ichikaimachi; Michihiro Hattori, Utsunomiya; Tadashi Tamura, Ichikaimachi; Toru Teijima, Kokubun-jimachi; Naotake Takashi; Genji Imokawa, both of Utsunomiya, and Hajime Hotta, Funabashi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 12, 1985, Ser. No. 710,714

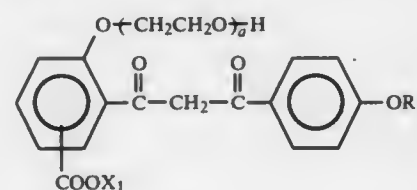
Claims priority, application Japan, Mar. 12, 1984, 59-46850

Int. Cl.⁴ A61K 7/021, 7/027, 7/42, 9/10

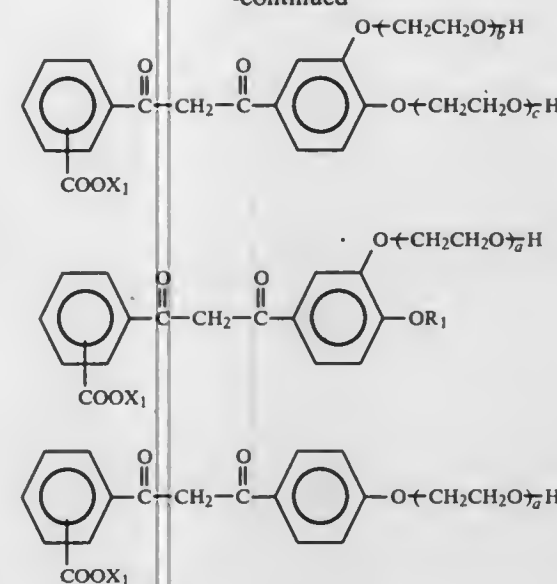
U.S. Cl. 424—59

5 Claims

1. A long wavelength ultraviolet ray absorber composition comprising 0.1 to 20 wt. % of a dibenzoylmethane derivative selected from the group consisting of



-continued



in which X₁ represents hydrogen, sodium, potassium, lithium, trimethylethanolamine, or arginine; R₁ represents a hydrogen atom, or a hydrocarbon group having from 1 to 18 carbon atoms; a is an integer of from 1 to 10, and c are independently integers of from 1 to 6; and an inert cosmetic carrier.

4,710,374

COSMETIC COMPOSITION CONTAINING CATIONIC POLYMERS AND ANIONIC LATEXES

Jean F. Grollier, Paris, and Claude Dubief, Versailles, both of France, assignors to L'Oreal, Paris, France

Filed Feb. 16, 1983, Ser. No. 467,185

Claims priority, application Luxembourg, Feb. 16, 1982, 83949

Int. Cl.⁴ A61K 7/04, 7/06, 7/13; A45D 7/00

U.S. Cl. 424—61

15 Claims

1. A process for treating hair, nails and/or skin, which comprises applying to hair, nails and/or skin a cosmetically acceptable medium containing about 0.01 to 10% by weight of at least one cationic polymer of the polyamine, polyamino polyamide or poly-(quaternary ammonium) type containing amine or ammonium groups in or joined to the polymer chain, said cationic polymer having a molecular weight of 500 to 3,000,000, and about 0.01 to 10% by weight of at least one anionic latex which is in the form of a colloidal suspension of particles of polymers containing anionic functional groups, in an aqueous or organic liquid phase, said anionic functional groups being introduced by (i) the polymerization or copolymerization of anionic monomers, by (ii) combination of an anionic free radical derived from a reaction initiator with one or more monomers, during the initiation of the polymerization of the said monomer(s), by (iii) the juxtaposition of these two processes, or by (iv) the introduction of end groups via a chain transfer reaction in the process (ii).

4,710,375

STICK COSMETICS CONTAINING COATED PEARLESCENT PIGMENTS

Yutaka Takasuka, Kamakura; Kunihiko Mohri, Shizuoka, and Akiko Kawaguchi, Shimizu, all of Japan, assignors to Pola Chemical Industries Inc., Japan

Division of Ser. No. 632,334, Jul. 19, 1984, Pat. No. 4,648,908. This application Nov. 12, 1986, Ser. No. 929,529

Claims priority, application Japan, Feb. 28, 1984, 59-36985

Int. Cl.⁴ A61K 7/035; C04B 14/00; C09C 1/00

U.S. Cl. 424—69

9 Claims

1. A stick-type cosmetic comprising gypsum and a pearlescent pigment composition; said pigment composition comprising

ing at least one coated pigment and including water to the amount of at least 20 wt.% of said pigment composition, said pigment being selected from the group consisting of titanium dioxide-coated mica, colored titanium dioxide-coated mica, and colored bismuth oxychloride, coated on the surfaces thereof with a water-repellant coating of a metallic soap of the formula-



wherein R is selected from straight chain, branched chain, saturated and unsaturated aliphatic hydrocarbon groups having more than 6 carbon atoms, M is selected from aluminum and zinc and n is the valance of the metal, said surface coating being prepared by reacting in an aqueous medium an alkaline salt of an aliphatic acid radical (RCOO)⁻ with a mineral acid metal salt where said metal is M as defined above in a theoretical equivalent ratio of 1:4 to 1:10 and in an amount to cause said water-repellent soap to form and coat the surfaces of said pigment and wherein the wt. ratio of said pigment to said metallic soap being from 1:0.01 to 1:0.1.

4,710,376

TOPICAL THERAPEUTIC COMPOSITION CONTAINING OXIDATION INHIBITOR SYSTEM

Sean A. Evans, High Bridge; Eva A. Terpinski, New Brunswick, and Douglas Testa, Neshanic Station, all of N.J., assignors to Interferon Sciences, Inc., New York, N.Y.

Filed Feb. 1, 1985, Ser. No. 697,320

Int. Cl.⁴ A61K 31/745, 45/02

U.S. Cl. 424—83

18 Claims

1. A substantially non-toxic, stable, topical therapeutic composition which comprises:
- a lymphokine which is susceptible to oxidative degradation;
 - an oxidative degradation-inhibitory amount of a redox system containing
 - a water soluble polymer containing a plurality of reducing moieties covalently bound thereto and
 - a water soluble polymer containing a plurality of oxidizing moieties covalently bound thereto; and
 - an aqueous vehicle base compatible with the lymphokine which is capable of holding the lymphokine in suspension and releasing a therapeutically effective amount of lymphokine at the site of application.
2. The therapeutic composition of claim 1 wherein the lymphokine is one or more natural or recombinant interferons.

4,710,377

ANTIGENS AND MONOCLONAL ANTIBODIES REACTIVE AGAINST SPOOROZOITES OF EIMERIA SPP.

Robert H. Schenkel, Yardley, Pa.; Rosie B. Wong, Piscataway, and Pallaiah Thammana, Hazlet, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 524,819, Aug. 19, 1983, abandoned. This application Mar. 19, 1984, Ser. No. 591,288

Int. Cl.⁴ G01N 33/53; C12P 21/00; A61K 39/00, 45/02
U.S. Cl. 424—88

14 Claims

1. Monoclonal antibodies produced by hybridomas formed by fusion from mouse myeloma line P3X63.Ag8.653 cells and spleen cells from BALB/c mouse previously immunized with *Eimeria tenella* sporozoites, which antibody:
- reacts specifically with antigens of *Eimeria* spp. sporozoites;
 - reacts specifically with antigens of *Eimeria tenella* having a molecular weight of approximately 13 to 150 Kd; and
 - is produced by the hybridomas designated clone number s1C4 and deposited as ATCC number HB8333; hybridoma designated clone number s3D3 and deposited as ATCC number HB8331; and hybridoma designated clone number s1E5 and deposited as ATCC number HB8332.

4,710,378

LYOPHILIZED HEPATITIS B VACCINE

Nobuya Ohtomo; Kyosuke Mizuno; Fukusaburo Hamada, and Hiroshi Mizokami, all of Kumamoto, Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Filed Mar. 8, 1985, Ser. No. 709,705

Claims priority, application Japan, Mar. 13, 1984, 59-48669

Int. Cl.⁴ A61K 39/29

U.S. Cl. 424—89

3 Claims

1. A lyophilized preparation of hepatitis B vaccine, which comprises a purified hepatitis B virus surface antigen produced by a recombinant organism being capable of producing HBs antigen, which is adsorbed on aluminum gel in the lyophilized state in the presence of a stabilizer, said lyophilized preparation being prepared by the steps of adding an aluminum gel and a stabilizer to a purified recombinant-origin HBs antigen and lyophilizing the mixture, wherein the stabilizer is a combination of at least one amino acid or a salt thereof, at least one saccharide or sugar alcohol and at least one colloidal substance.

4,710,379

INTESTINAL MICROFLORA-IMPROVING AGENT

Yasuo Kawai, Atsugi, and Hirotsuka Shimohashi, Kodaira, both of Japan, assignors to Kabushiki Kaisha Advance Kaihatsu Kenkyujo, Tokyo, Japan

Continuation of Ser. No. 737,057, May 23, 1985, abandoned.

This application Dec. 4, 1986, Ser. No. 938,348

Claims priority, application Japan, Jun. 19, 1984, 59-124584

Int. Cl.⁴ A61K 35/74, 35/78

U.S. Cl. 424—93

2 Claims

1. A method of selectively stimulating the growth of intestinal lactic acid bacteria, which comprises orally administering an effective amount of bacterial cells, or an extract thereof, of a microorganism belonging to the genus *Streptococcus* to a person recognized as being deficient in intestinal lactic acid bacteria.

4,710,380

TREATMENT OF AUTOIMMUNE DISORDERS WITH IMMUNOAMPLIFIERS

A. Arthur Gottlieb, New Orleans, La., assignor to Imreg, Inc., New Orleans, La.

Filed Apr. 4, 1986, Ser. No. 848,210

Int. Cl.⁴ A61K 35/14

U.S. Cl. 424—101

18 Claims

1. A method of treating human or mammalian subjects for disorders characterized by hyperactive immune response, comprising the administration to said subject of an effective dosage amount of an amplifier of the immune system in a pharmaceutically acceptable carrier.

16. As an article of manufacture, an effective biweekly dosage amount of an amplifier of the immune system for the treatment of an autoimmune disorder, said dosage amount being in a pharmaceutically acceptable carrier, and said dosage amount being approximately 10^5 to 10^8 times the amount of said amplifier found to produce a maximal delayed type hypersensitivity response to antigen in a skin test.

4,710,381

METHOD FOR MAINTAINING INTACT, NON-DEGRADED FACTOR VIII/VON-WILLEBRAND FACTOR DURING BLOOD PROCESSING

Thomas J. Kunicki, Brookfield, and Robert R. Montgomery, Mequon, both of Wis., assignors to The Blood Center of Southeastern Wisconsin, Milwaukee, Wis.

Filed May 22, 1984, Ser. No. 612,873

Int. Cl.⁴ A61K 35/16; C07K 15/00

U.S. Cl. 424—101

20 Claims

1. A method of preparing blood or plasma for the extraction of intact, non-degraded FVIII/vWF, the blood or plasma containing FVIII/vWF and cellular sources of a calcium activated

protease capable of cleaving the FVIII/vWF, said method including the step of removing substantially all cellular sources of the calcium activated protease from the blood or plasma while avoiding release of the protease from the cellular sources prior to or during removal of the cellular sources from the blood or plasma.

14. A method of preparing blood or plasma for the extraction of intact, non-degraded FVIII/vWF, the blood or plasma containing platelets and FVIII/vWF, said platelets comprising a source of a calcium activated protease capable of cleaving the FVIII/vWF, said method including the steps of obtaining platelet poor plasma while avoiding release of the protease from the platelets and adding a chelating agent to the platelet poor plasma to prevent calcium in the plasma from activating the protease.

20. A method of obtaining intact, non-degraded FVIII/vWF from blood or plasma containing FVIII/vWF and cellular sources of a calcium activated protease capable of cleaving the FVIII/vWF, said method comprising the steps of:

obtaining platelet poor plasma while avoiding release of the calcium activated protease from the cellular sources; passing the platelet poor plasma through a filter capable of retaining particles 0.1 micron in size and larger for removing substantially all cellular sources of the calcium activated protease from the platelet poor plasma; and purifying FVIII/vWF from the filtered plasma.

4,710,382

TREATMENT FOR OSTEOPOROSIS USING HGRF(1-40)NH₂

Robert R. Recker, 3309 S. 116th St., Omaha, Nebr. 68144

Filed Sep. 27, 1985, Ser. No. 780,949

Int. Cl.⁴ A61K 37/02, 35/55

U.S. Cl. 424—108

10 Claims

1. A method of treating osteoporosis, comprising: administering to a patient an effective amount of human GRF(1-44)—NH₂, to stimulate the pituitary growth hormone release; and continuing said administration until bone mass increases and the patient's calcium balance becomes positive and indicates mineral accumulation in the skeleton.

4,710,383

PHARMACEUTICAL DERMAL COMPOSITIONS WITH PROLONGED AND CONTINUOUS ACTION BASED ON ESSENTIAL FATTY ACIDS

P. R. Dick, 95 avenue de la Lanterne, 06000 Nice, France

Filed Jul. 8, 1983, Ser. No. 511,941

Claims priority, application France, Jun. 29, 1983, 83 10735

Int. Cl.⁴ A61L 15/03; A61F 13/00; A61K 9/70

U.S. Cl. 424—449

18 Claims

1. In a transdermal delivery device for providing continuous and regulated release of essential fatty acids to a mammal, to prevent disorders associated with a deficiency in essential fatty acids, the improvement comprising incorporating therein from 5 to 35% of the total weight of an active component which is selected from the group consisting of linoleic acid (18:2 ω 6), γ -linolenic acid (18:3 ω 6), arachidonic acid (20:4 ω 6), γ -homolinolenic acid (20:3 ω 6), linoleic acid (18:3 ω 3), eicosapentaenoic acid (20:5 ω 3), docosahexaenoic acid (22:6 ω 3), their linear and branched C₁₄ esters, and mixtures thereof, diffusion regulators for said active component selected from the group consisting of nitrogenous compounds and azo compounds, and stabilizing agents for said active component comprising antioxidants selected from the group consisting of alpha tocopherol and its esters, phenol and its aromatic derivatives, polyphenols and propyl, butyl or octyl gallates.

4,710,384

SUSTAINED RELEASE TABLETS MADE FROM MICROCAPSULES

Avner Rotman, 6 Alkalai Street, Rehovot, Israel

Filed Jul. 28, 1986, Ser. No. 889,775

Int. Cl.⁴ A61K 9/50, 9/28, 9/26, 9/22

U.S. Cl. 424—465

6 Claims

1. A new sustained release galenical form in the form of a disintegratable tablet, comprising compressed microcapsules of active principle and a pharmaceutically acceptable excipient interspersed among and thoroughly mixed with said microcapsules, wherein said microcapsules have a size range distributed between about 5 and about 300 microns and comprise particles of active principle coated with an encapsulating layer of an ethyl cellulose or acrylic resin sustained release polymer containing a sufficient amount of plasticizer to render said coating flexible, said amount being within the range of about 15 to about 30% of the weight of said sustained release polymer, said coating being no thicker than that which forms 25% of the weight of the active principle.

4,710,385

COMBINATION SOAP AND FISH BAIT

Ken M. Vickers, Rte. #1, Ambrose, Ga. 31512

Filed Nov. 5, 1986, Ser. No. 927,158

Int. Cl.⁴ A01K 85/00; C11D 9/38, 9/40, 17/00

U.S. Cl. 426—1

2 Claims

1. A fish bait composition consisting essentially of about 55% soap carrier, about 1% poultry liver, about 4% salmon oil, about 10% fish meal and about 30% cottonseed meal.

2. A fisherman's hand soap for removing the human scent that repels fish consisting essentially of about 55% soap carrier, about 1% poultry liver, about 4% salmon oil, about 10% fish meal and about 30% cottonseed.

4,710,386

ALL NATURAL, READY-TO-EAT ENZYME-SACCHARIFIED CEREAL DERIVED FROM WHOLE CEREAL GRAIN

Charles V. Fulger, Katonah, and Ernest K. Gum, Granit Springs, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 29, 1985, Ser. No. 696,665

The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.

Int. Cl.⁴ A23L 1/10, 1/164; A23P 1/00

U.S. Cl. 426—28

26 Claims

1. A process for preparing an enzyme-saccharified ready-to-eat cereal derived from a whole cereal grain comprising:

- (a) milling and separating a whole cereal grain to produce a germ fraction, a bran fraction and an endosperm fraction;
- (b) processing the germ fraction by:
 - (i) toasting the germ fraction, and
 - (ii) grinding the toasted germ to a particle size of from 0.25 to 2.0 millimeters;
- (c) modifying the bran fraction to improve its functionality by high temperature, high shear extrusion in a counter-rotating twin screw extruder by a process which comprises:
 - (i) combining bran with water to form a feed having a bran to water ratio of from 5.5:1 to 10:1, said bran containing from 10% to 25% starch on a dry weight basis, said starch either being naturally present in the said bran or admixed therewith;
 - (ii) introducing the feed into a counter-rotating twin screw extruder;
 - (iii) extruding the feed at a temperature of from 150° C. to 180° C.; and
 - (iv) developing a shear rate of from 500 to 2,000 seconds⁻¹ in said extruder through which the said feed is extruded;
- (d) processing the endosperm fraction by:

- (i) milling to a particle size less than 2 millimeters,
- (ii) forming a slurry containing from 15 to 60% by weight of said milled endosperm,
- (iii) cooking the milled endosperm until substantially all the starch is gelatinized, and
- (iv) enzymatically hydrolyzing from 15 to 75% by weight of said endosperm to form soluble saccharides such that the ready-to-eat cereal contains from 7.5 parts sucrose-equivalent sweetness up to 50 parts sucrose-equivalent sweetness;
- (e) recombining the ground, toasted germ of step (b)(ii), the modified bran of step (c) and the enzymatically hydrolyzed endosperm of step (d)(iv) to form a cereal dough containing whole grain levels of protein, fiber and digestible carbohydrates;
- (f) obtaining a ready-to-eat cereal from said cereal dough.

4,710,387

NUTRITIONAL SUPPLEMENT PREPARATION INTENDED FOR PREGNANT AND BREAST-FEEDING WOMEN BASED ON MILK CONSTITUENTS AS WELL AS A PROCESS FOR PREPARING IT

Dirk J. D. Uiterwaal, Bodegraven, and Aart Hersevoort, Nieuwegein, both of Netherlands, assignors to Melkunte Holland B.V., AE Woerden, Netherlands

Filed Nov. 7, 1985, Ser. No. 795,973

Claims priority, application Netherlands, Nov. 9, 1984, 8403433

Int. Cl.⁴ A23C 11/00; A23L 1/302, 1/304

U.S. Cl. 426—72

18 Claims

1. Nutritional supplement preparation intended for pregnant and breast-feeding women based on milk constituents, comprising 10–20% by weight of protein, 16–28% by weight of fat, 43–65% by weight of carbohydrates, at least a part of which is hydrolyzed lactose, at most 3.5% by weight of moisture, and minerals, trace elements and vitamins, and, amounts of flavouring and colorant which do not affect the nutritional character of the supplement.

4,710,388

METHOD FOR TREATING PINEAPPLES

Yuan K. Liu, Concord, Calif., assignor to Del Monte Corporation, San Francisco, Calif.

Division of Ser. No. 718,790, Apr. 1, 1985, Pat. No. 4,614,659. This application Jul. 25, 1986, Ser. No. 889,433

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.⁴ A23B 7/00

U.S. Cl. 426—102

4 Claims

1. A harvested pineapple possessing the desired degree of maturity and ripeness and having its crown treated with at least 0.01 milligram of a gibberellin whereby withering and senescence of the crown is retarded.

4,710,389

METHOD AND APPARATUS FOR CONTROLLING PEELING MACHINES FOR PEELING FRUIT OR VEGETABLES

Karl-Dietrich Dornow, Kaiser-Friedrich-Ring 96, 4000 Düsseldorf, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 821,056

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 3502845

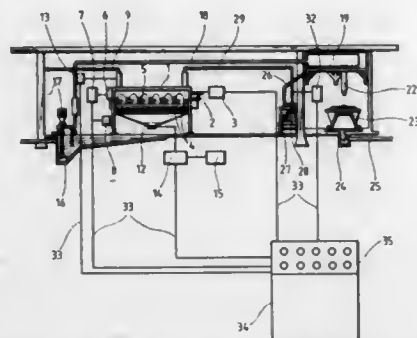
Int. Cl.⁴ G01N 33/02; A23N 7/02

U.S. Cl. 426—231

13 Claims

1. In a method of controlling a peeling machine for peeling fruit or vegetables supplied thereto, said machine comprising rotary peeling means for the fruit or vegetables including movable peeling rollers having roughened surfaces for peeling the fruit or vegetables, a motor driving said peeling means and means for supplying water to said peeling means, the improvement comprising the steps of checking at least one of peel

waste discharged from said peeling means and the appearance of the peeled fruit or vegetables discharged from said peeling means and adjusting the operation of said machine in dependence upon the magnitude of the at least one of the peeled waste and said appearance, and further comprising the steps of determining the magnitude of one of the amount of said fruit or vegetables instantaneously supplied to said peeling means and the average amount of said fruit or vegetables supplied to said peeling means during a specific unit of time, signalling said magnitude to a computer, determining the quantity of water supplied to said peeling means, determining the quantity of water and waste peelings discharged from said peeling means,



relating said magnitude and said quantities to one another for establishing a difference therebetween, said difference indicating at least one of the amount of waste peelings instantaneously and the average of said waste peelings over said specific unit of time, using said difference as a starting variable and calculating from said starting variable the ratio of said difference to at least one of said magnitude of said instantaneous and said average amount to determine the ratio of waste peelings to said magnitude, displaying said ratio on a visual display in the computer and adjusting said machine to bring said ratio to a predetermined value and maintaining said ratio at said predetermined value.

4,710,390

INGESTIBLE, HIGH DENSITY, COMPRESSED-TABLET FRUIT FIBER COMPOSITION

Robert W. Schumacher, Kenil, and Mary B. Houston, Morris-town, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 882,799, Jul. 7, 1986, Pat. No. 4,680,189. This application Apr. 10, 1987, Ser. No. 36,942

Int. Cl.⁴ A23L 1/29

U.S. Cl. 426—285

24 Claims

1. A method for preparing an ingestible, high density, compressed-tablet fruit fiber-composition which comprises:

- blending at least one fruit fiber source having a maximum starch content of about 25% by weight of said fruit fiber and a microcrystalline cellulose compression aid to form a homogenous blend;
- mixing water with the blend of step (A) at a weight ratio of about 1.5:1 to about 2.5:1, based on the weight of water to the weight of the blend, for a time sufficient to form a cohesive, deformable, plastic mass;
- drying the plastic mass of step (B) to a moisture content of less than about 8% by weight, based on the weight of the dried material;
- milling the dried product of step (C) to recover granules having a particle size of about 125 to about 840 microns;
- blending the granules of step (D) with a tableting lubricant; and
- compressing the composition of step (E) into a tablet to form a high density, fruit fiber tablet containing about 30% to about 95% dietary fiber, based on the total weight of the compressed-tablet fruit-composition.

4,710,391

FLAVORING METHOD FOR FRIED FOOD PRODUCTS

Jeffrey F. Klrn, Godfrey, Ill., and James M. Connaughton, Jr., Cincinnati, Ohio, assignors to Conagra, Inc., Omaha, Nebr.

Filed Jun. 11, 1985, Ser. No. 743,501

Int. Cl.⁴ A23L 1/22

U.S. Cl. 426—289

12 Claims

1. A method of flavoring food products comprising the steps of:
- encapsulating an oil-soluble flavoring agent with an edible, oil impervious, heat resistant, gum arabic encapsulating material;
 - coating said encapsulated flavoring agent with a flavor modifying agent comprising cooked chicken skins, enzyme modified cheese, amino acid and wheat flour;
 - adding the resulting coated, encapsulated flavoring agent to a food product; and
 - frying said food product.

4,710,392

FLAVORING WITH OCT-2-EN-4-OL

Jürgen Brüning; Roland Emberger; Rudolf Hopp, and Theodor Sand, all of Holzminden, Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

Filed Mar. 31, 1986, Ser. No. 846,661

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512339

Int. Cl.⁴ A23L 1/235

U.S. Cl. 426—534

2 Claims

1. An edible composition comprising a foodstuff and an amount of oct-2-en-4-ol effective to impart a cherry flavour to the composition.

4,710,393

LOW WATER ACTIVITY CONFECTION COMPOSITION

Mark E. Holmgren; Gregory K. Parrish, and Phillip A. Cartier, all of Hummelstown, Pa., assignors to Hershey Foods Corporation, Hershey, Pa.

Filed Sep. 15, 1986, Ser. No. 907,079

Int. Cl.⁴ A23G 3/32, 3/00

U.S. Cl. 426—660

2 Claims

1. A water-based sugar confection having good flavor and soft texture comprising (a) a total carbohydrate content equal to or greater than fifty percent by weight, dry basis; wherein said carbohydrate ingredient consists essentially of a blend of dextrose and fructose in which the ratio of fructose to dextrose is from 30:70 to 90:10; (b) the moisture content is an amount within the range of from about 4% to about 10%; and (c) the water activity (Aw) is an amount within the range of from about 0.20 Aw to about 0.50 Aw.

4,710,394

PREPARATION AND PROCESS FOR THE PRESERVATION OF PLANTS

Eric L. Sellegaard, 8 Domaine du Camp Lauvas -1575 Rte de Valbonne, 06520 Mougins, France

Filed Jul. 28, 1986, Ser. No. 891,119

Claims priority, application France, Aug. 2, 1985, 85 11992

Int. Cl.⁴ C09K 15/32; A01G 5/06; B05D 1/18

U.S. Cl. 427—4

9 Claims

1. A dry preparation for use in dissolved form for the preservation of plants or parts thereof, containing essentially 1-6% by weight of citric acid, 30-60% by weight of at least one dye and 40-60% by weight of at least one inorganic salt formed by at least one cation selected from the group consisting of potassium, sodium, calcium, magnesium and manganese, and at least one anion selected from the group consisting of nitrate, chloride, sulfate, carbonate and phosphate.

4. A solution for the preservation of the plants or parts thereof, containing a dry preparation of claim 1 in a solvent comprising water and glycerol.

8. A method for the preservation for plants or parts thereof, in which the roots or the lower part of the freshly cut stem of the plant is immersed in the solution of claim 4 and subsequently dried.

4,710,395

METHOD AND APPARATUS FOR THROUGH HOLE SUBSTRATE PRINTING

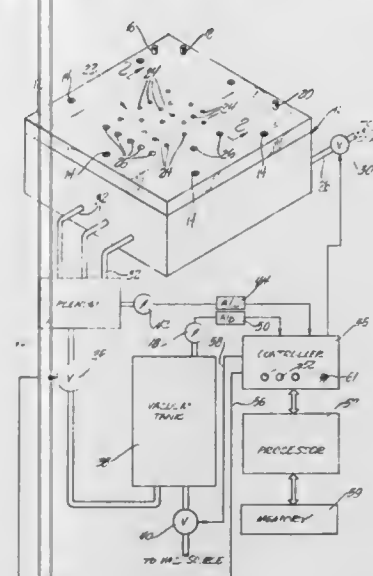
William M. Young, and Mark E. Wolfe, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed May 14, 1986, Ser. No. 863,145

Int. Cl.⁴ H05K 3/12

U.S. Cl. 427—8

2 Claims



1. A method not only of controllably forming coatings of a printing substance on through holes in insulative substrates but also of concurrently determining variations in quality of the coated substrate, comprising the steps of:

- placing a face of an insulative substrate having through-holes therein on a holder while leaving the opposite face of the substrate exposed to atmospheric air, said holder having a first vacuum area, that does not register with said through-holes and is used for hold-down of said insulative substrate on said holder, and a second vacuum area, for registration with said through-holes;
- drawing a vacuum in said first vacuum area to secure said insulative substrate to said holder;
- depositing a printing substrate over portions of the insulative substrate having said through-holes;
- producing a predetermined vacuum in a plenum of predetermined volume for exposure to the second vacuum area;
- terminating evacuation of said plenum after establishing said predetermined plenum vacuum;
- without resuming said plenum evacuation, exposing said second area to said predetermined plenum vacuum, effective to cause said printing substance to be pulled into said through-holes in a highly controlled manner, and thereby produce a highly controlled coating on substrate walls forming said through holes;
- measuring pressure in said plenum at one or more preselected times during a period immediately following exposure of the second vacuum area to the predetermined plenum vacuum; and
- comparing each such measured plenum pressure to a reference pressure, whereby potentially unsatisfactory coated insulative substrates are identified.

4,710,396

TEXTILE SLASHER LUBRICATING METHOD AND APPARATUS

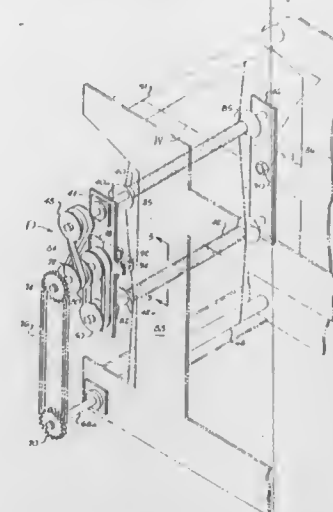
Scott O. Seydel, 80 Broad St., N.W., Atlanta, Ga. 30303, and William H. Cutts, P.O. Box 748, Clemson, S.C. 29631

Division of Ser. No. 727,868, Apr. 26, 1985, Pat. No. 4,656,705, which is a continuation-in-part of Ser. No. 308,449, Oct. 10, 1981, Pat. No. 4,513,485. This application Feb. 17, 1987, Ser. No. 15,341

Int. Cl.⁴ B05D 1/28

U.S. Cl. 427—8

12 Claims



1. In a textile fluid treatment method wherein fluid is applied to a sheet of textile material consisting of a number of individual textile yarn ends arranged in a side-by-side parallel manner, said method comprising the steps of:

- providing an elongated hollow porous rod having a hollow interior and an outer cylindrical porous wall which includes a porous liquid application surface consisting of pores having a mean dimension smaller than the mean diameter of said yarn ends so that a relatively smooth application surface is presented to said individual yarn ends in said sheet of material, and utilizing a liquid distribution layer next adjacent said porous application surface which extends inwardly toward the center of said hollow rod;
- metering said liquid through a flow control membrane formed over an interior boundary region of said distribution layer to provide a region having less porosity than said distribution layer and said application surface;
- delivering a predetermined amount of said liquid to said interior of said hollow rod and metering said liquid through said flow control membrane whereby said liquid is equalized through said distribution layer onto said application surface; and
- passing said material over said porous application surface causing said liquid to be applied to said textile yarn ends in a desired amount.

4,710,397

PHOTOELECTRIC CONVERSION DEVICE AND ITS MANUFACTURING METHOD

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Division of Ser. No. 554,763, Nov. 23, 1983, Pat. No. 4,593,152.

This application Jun. 13, 1984, Ser. No. 620,177

Claims priority, application Japan, Nov. 24, 1982, 57-206806; Nov. 24, 1982, 57-206809; Feb. 22, 1983, 58-28211; Apr. 29, 1983, 58-75712; Oct. 31, 1983, 58-204443

Int. Cl.⁴ B05D 5/12; H01L 25/00

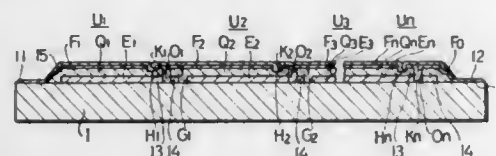
U.S. Cl. 427—53.1

11 Claims

1. A method of making a photoelectric conversion device in

which a plurality n (when n is an integer greater than one) of semiconductor elements U_1 to U_n are sequentially formed side by side on a substrate having an insulating surface and connected in series one after another, the semiconductor element U_i ($i=1, 1, \dots, n$) comprising a first electrode E_i on the substrate, a non-single-crystal semiconductor laminate member Q_i on the first electrode E_i and a second electrode F_i on the laminate member, the second electrode F_{j+1} of the semiconductor element U_{j+1} ($j=1, 2, \dots, (n-1)$) being connected via coupling portion K_j to the first electrode E_j , comprising the steps of:

- forming a first conductive layer on the substrate;
- forming $(n-1)$ sequentially arranged first grooves G_1 to G_{n-1} in the first conductive layer by using a first laser beam to form therein n sequentially arranged first electrodes E_1 to E_n separated by the first grooves G_1 to G_{n-1} , respectively;
- forming on the substrate a non-single-crystal semiconductor laminate layer having formed therein at least one semiconductor junction and continuously extending onto the first electrode E_1 to E_n and into the first grooves G_1 to G_{n-1} ;
- forming $(n-1)$ sequentially arranged second grooves O_1 to O_{n-1} in the non-single-crystal semiconductor laminate layer by using a second laser beam to form therein n sequentially arranged non-single-crystal semiconductor



laminate members Q_1 to Q_n separated by the grooves O_1 to O_n and extending on the first electrodes E_1 to E_n , respectively, the second groove O_j being opposite the electrode E_j , the distance between first groove G_j and the second groove O_j being greater than the thickness of the non-single-crystal semiconductor laminate member Q_j in the lateral direction;

- forming on the substrate a second conductive layer continuously extending on the non-single-crystal semiconductor laminate members Q_1 to Q_n and into the grooves O_1 to O_{n-1} to provide coupling portions K_1 to K_{n-1} which are connected to the first electrodes E_1 to E_{n-1} through the grooves O_1 to O_{n-1} , respectively; and
- forming $(n-1)$ sequentially arranged isolating portions H_1 to H_{n-1} in at least the second conductive layer using third laser beam to form therein n sequentially arranged second electrodes F_1 to F_n separated by the isolating portions H_1 to H_n and opposing the first electrodes E_1 to E_n through the non-single-crystal semiconductor laminate member Q_j , the distance between the second groove O_j and the isolating portion H_j being greater than the thickness of the non-single-crystal semiconductor laminate member Q_j in the same lateral direction in which the second groove O_j is spaced apart from the first groove G_j , the second electrode F_{j+1} being connected to the first electrode E_j through the coupling portion K_j .

4,710,398

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

Yoshio Homma, and Takashi Nishida, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 26, 1986, Ser. No. 900,523

Claims priority, application Japan, Sep. 6, 1985, 60-195837

Int. Cl. H01L 21/285

U.S. Cl. 437-235

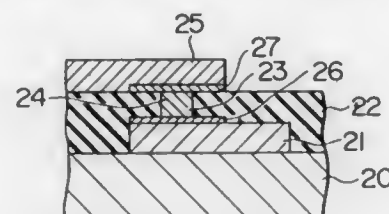
10 Claims

1. A method of manufacturing a semiconductor device, comprising steps of:

forming an insulation film having an opening on a semiconductor substrate;

filling said opening with an electrically conductive material so as to substantially flatten the top end face of the filled opening;

forming an intermediate layer of an electrically conductive



material having a greater allowable current density than that of a wiring layer, said intermediate layer having a greater area than that of said opening so as to cover at least the surface of said electrically conductive material filling said opening; and

forming said wiring layer which extends from said intermediate layer onto said insulation film.

4,710,399

METHOD AND MECHANISM TO DEPOSIT SOLDER PASTE UPON SUBSTRATES

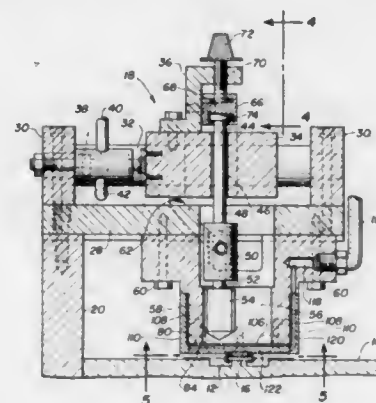
Richard K. Dennis, P.O. Box 2039, R.D. #2, Etters, Pa. 17319

Filed Sep. 2, 1986, Ser. No. 902,785

Int. Cl. B05D 5/12

U.S. Cl. 437-245

20 Claims



1. A method to deposit viscous solder paste upon a substrate of a semi-conductor device comprising the steps of:
 - a. positioning a substrate at a predetermined position to receive dots of paste in a desired pattern,
 - b. connecting a solder deposit head to a source of said paste maintained under predetermined pressure,
 - c. reciprocating said head between an elevated starting position spaced above said substrate and a depositing position immediately adjacent the substrate but spaced a limited distance thereabove,
 - d. exerting pressure upon paste within said head to effect discharge of paste through a die having a desired pattern of holes therein while said head is in said depositing position and similar columns of paste are discharging through said holes toward said substrate by said exerted pressure,
 - e. instantly effecting elevation of said head from said substrate when the discharging ends of said columns have engaged said substrate and adhered thereto and thereby cause separation of said columns from the adhered ends thereof on said substrate which comprise similar sized dots of said solder thereon, and
 - f. momentarily and immediately discontinuing said pressure

within said head upon initiating elevation of said head as aforesaid and thereby very briefly discontinue discharge movement of paste through said holes in said die and thereby enhance said separation of said dots from said columns of paste by said elevation of said head,

g. followed by removing said first mentioned substrate from its receiving position and advancing a succeeding substrate to said receiving position and repeating the above-described sequence of operations after restoring pressure to the paste in said head immediately following each discontinuance of pressure thereon.

4,710,400

CHEMICAL PROCESS FOR CONFERRING CONDUCTOR, ANTISTATIC AND FLAME-PROOFING PROPERTIES TO POROUS MATERIALS

Gian P. Gardini, Pilastro Di Parma, and Vittorio Bocchi, Parma, both of Italy, assignors to Università Degli Studi Di Parma, Parma, Italy

Filed Jun. 20, 1986, Ser. No. 876,846

Claims priority, application Italy, Jun. 21, 1985, 42507 A/85

Int. Cl. B05D 3/02, 5/12

U.S. Cl. 427-121

14 Claims

1. A process for the preparation of a thin film of a conductive, solid, microporous composite material comprising:
 - contacting one face of the composite material with a compound selected from pyrrole, N-methylpyrrole and 3,4-dimethylpyrrole until said material is impregnated with said compound;
 - contacting only the opposed face of the impregnated material with an oxidizing solution to thereby cause the compound to polymerize only on the opposed face of the impregnated material; and
 - washing the impregnated material having the pyrrolic polymer on the opposed face to remove residual oxidizing solution.

4,710,401

METHOD OF PRINTING ELECTRICALLY CONDUCTIVE IMAGES ON DIELECTRIC SUBSTRATES

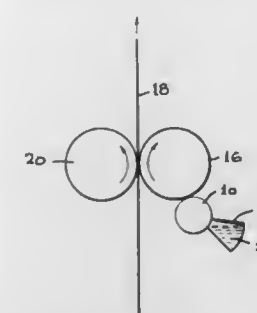
Leslie F. Warren, Jr., Louis Maus, both of Camarillo, and William F. Hall, Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 883,260, Jul. 8, 1986, and Ser. No. 916,917, Oct. 9, 1986. This application Feb. 9, 1987, Ser. No. 12,460

Int. Cl. B05D 5/12, 5/00; C23C 16/00

U.S. Cl. 427-121

25 Claims



1. A process for generating electrically conductive patterns on a dielectric substrate which comprises:
 - applying to preselected areas of the substrate a preselected concentration of an ink consisting essentially of a suitable oxidizing agent capable of reacting with a pyrrole monomer to form a printed ink surface,
 - exposing the printed surface to a pyrrole monomer to form an electrically conductive polypyrrole material, and

developing conductive images in those areas of the printed ink surface of the substrate containing the oxidizing agent.

16. The process of claim 1, said substrate being a fabric selected from the group consisting of fiberglass fabric, mixed oxide fabric and a synthetic organic fabric.

4,710,402

METHOD OF MAKING FILTER PAPER

Sune Backman, Yngvevagen 6, Djursholm, S-182 64, and Hakan Hakanson, Strakvagen 54, Taby, S-183 40, both of Sweden

Filed Sep. 4, 1984, Ser. No. 646,726

Int. Cl. B05D 5/00

U.S. Cl. 427-244

14 Claims

1. A method for making filter paper for use in an edge-filtering system, comprising the steps of:
 - (a) soaking a filter paper in a liquified phenolic resin until the paper is saturated, said filter paper being a sheet;
 - (b) punching annular disks from said saturated sheet;
 - (c) applying heat and low pressure to said annular disks from said saturated sheet of filter paper, so that the resin hardens in close contact with the paper and its constituent fibers; and
 - (d) reducing the pressure applied to the annular disks at or just before hardening of the resins.

4,710,403

METALLIZED POLYMERS

Larry J. Krause, and Jack A. Rider, both of Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 5, 1986, Ser. No. 859,471

Int. Cl. B05D 3/10

U.S. Cl. 427-304

39 Claims

1. A process for the deposition of metal layers onto at least one polymeric surface having electroactive sites therein comprising contacting said at least one polymeric surface with a first solution wherein at least 10 molar percent of all negative charge intercalation ions within said first solution are selected from the group consisting of monoatomic ions and complexed transition metals as negative charge intercalation ions and wherein the half-wave potential of said at least 10 molar percent of said negative charge intercalation ions is negative with respect to the half-wave potential of the electroactive sites in said polymer surface, thereby reducing the polymer of said at least one polymeric surface without substantial plating of metal onto said at least one polymeric surface, then contacting said at least one surface of the reduced polymer with a second solution having reducible metal cations therein so that the reduced polymer of said at least one polymeric surface reduces the metallic ion to form metal in a form selected from the group consisting of metal film on said at least one polymer surface and metal particles within said at least one polymer surface.

4,710,404

SOLVENT-FREE COATING COMPOSITION AND PROCESS FOR PROTECTING A SURFACE FROM CORROSION

William W. Reichert, Freehold; Charles A. Cody, East Windsor; Michael A. Desesa, Fair Haven, and Bruce K. Faulseit, Mount Holly, all of N.J., assignors to NL Chemicals, Inc., Hightstown, N.J.

Continuation-in-part of Ser. No. 753,456, Jul. 10, 1985, Pat. No. 4,615,918. This application Jul. 11, 1986, Ser. No. 884,635

Int. Cl. B05D 3/02; C04B 9/02; B66D 3/04

U.S. Cl. 427-386

45 Claims

36. A process for protecting a surface from corrosion comprising:
 - (a) coating the surface with a solvent-free coating composition comprising
 - (i) a solvent-free coating material; and
 - (ii) a non-pigmentary anti-corrosive agent comprised of a calcined mixture consisting essentially of from about 5

to about 95% by weight of magnesium oxide and from about 5 to about 95% by weight of zinc oxide; and (b) permitting the coating composition to harden.

4,710,405

ADHESION OF SILICONE ELASTOMERS OBTAINED FROM AQUEOUS EMULSION

Daniel Graiver, Midland, and Robert E. Kallinowski, Auburn, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

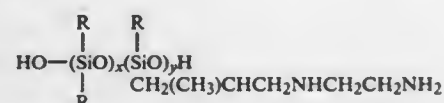
Filed Aug. 25, 1986, Ser. No. 899,847
Int. Cl.⁴ B05D 5/10

U.S. Cl. 427—387

6 Claims

1. A method of improving the adhesion of silicone elastomers, obtained from aqueous emulsion, to substrates comprising mixing

- (A) an anionically polymerized polydiorganosiloxane, in the form of an emulsion that cures into a silicone elastomer upon removal of the water, and
(B) an amine functional polydiorganosiloxane co-oligomer of the formula



where R is a monovalent alkyl radical of from 1 to 6 carbon atoms, x is from 1 to 250, and y is from 2 to 50, then applying the mixture to a substrate and allowing to dry, to give a silicone elastomer adhered to the substrate in a cohesive manner.

4,710,406

RESIN FOR A SIZING COMPOSITION, A PROCESS FOR ITS PREPARATION AND THE SIZING COMPOSITION OBTAINED

Roger Fagier, Rantigny; Charles de Goys de Mezerac, Gif sur Yvette, both of France; Jacky Joachim, Berwyn, Pa., and Michel Decagny, Clermont, France, assignors to Isover Saint-Gobain, Aubervilliers, France

Division of Ser. No. 672,909, Nov. 19, 1984, Pat. No. 4,663,419.
This application Jan. 20, 1987, Ser. No. 4,425

Claims priority, application France, Nov. 29, 1983, 83 19017
Int. Cl.⁴ C08G 14/08

U.S. Cl. 427—389.8

9 Claims

1. A composition of matter consisting essentially of a phenol formaldehyde and urea condensate for use in a sizing composition for mineral fibers wherein the phenol and formaldehyde are condensed by (a), heating together a preliminary mixture of phenol and formaldehyde at a temperature of about 45° C., the molar ratio F/P of formaldehyde to phenol being between 3 and 6 (b), raising the temperature up to between Ca 60° C. and 75° C. and thereby reacting phenol and formaldehyde after addition of a basic catalyst in an amount of 12 to 20 moles of hydroxyl equivalent for 100 moles of initial phenol, and maintaining this temperature until the phenol conversion rate is above 98% (c) cooling the reaction medium and introducing urea into the reaction medium, the molar ratio U/P of urea to initial phenol being between (F/P—2.55/2.6) and (F/P—2.55/0.7), said condensate being a liquid and having a free phenol content below 0.5%, a free formaldehyde content below 3% expressed by weight based on the total weight of liquid, a water tolerance measured at 20° C. of at least equal to 1000%, a storage stability of at least 15 days and a dry extract content of at least equal to 40%.

4,710,407

METHOD FOR PRESERVING FISHING NETS

Richard L. Keeton, P.O. Drawer 125, Taft, Tex. 78390-0125
Filed Dec. 10, 1985, Ser. No. 807,286

Int. Cl.⁴ B05D 3/02

U.S. Cl. 427—389.9

10 Claims

1. A process for treating a fishing net to increase durability which comprises:

- preparing a mixture of a urethane alkyd resin and a thinning agent;
contacting a fishing net with said mixture; and
drying said fishing net.

4,710,408

PRIMER COATING FOR CYCLOOLEFIN POLYMER ARTICLES

Wayne A. Kraus, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jul. 11, 1986, Ser. No. 884,821
Int. Cl.⁴ B05D 3/02; C08L 61/02

U.S. Cl. 427—393.5

14 Claims

6. A process for preventing staining of painted cycloolefin polymer articles comprising applying a primer coating composition to the articles, said composition comprising

- (a) from about 8% to about 46% alkyd resin,
(b) from about 3% to about 18% urea-formaldehyde resin,
(c) from about 25% to about 83% of at least on 2-4 carbon alkanol,
(d) from about 1.5% to about 24% nonleaching aluminum pigment, and
(e) from about 0.5% to about 3.5% of an acid catalyst, and then causing the composition to cross-link before painting.

4,710,409

CONTROLLING AND REDUCING OPENING TORQUES OF CAPS AND LIDS

Marcel Lahaye, La Reid, Belgium, assignor to Spadel S.A., Brussels, Belgium

Filed Apr. 10, 1986, Ser. No. 850,243

Claims priority, application United Kingdom, Apr. 16, 1985, 8509745

Int. Cl.⁴ B05D 1/02

U.S. Cl. 427—421

11 Claims

1. A method of reducing opening torques of caps and lids on containers comprising covering the sliding surface of said caps or lids and/or of the finish of the containers prior to closure with an appropriate lubricant applied by contacting the sliding surface of the caps or lids and/or of the finish of the containers prior to closure with a lubricating formulation containing from 0.001 to 10% by volume of the lubricant in the appropriate diluent.

4,710,410

DUAL BASKET SMALL PARTS COATING APPARATUS

Michael J. Narusch, Jr., 5131 Skylite La., Utica, Mich. 48087
Filed Nov. 26, 1986, Ser. No. 935,015

Int. Cl.⁴ B05D 1/18; B05C 3/00, 19/02

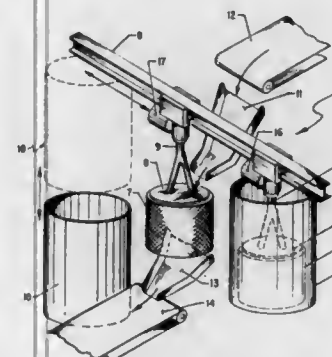
U.S. Cl. 427—430.1

12 Claims

8. The improvement in the method of applying a fluid coating composition to parts processed in coating equipment which includes a perforate, rotatable basket, where parts are loaded to a basket, the basket is contacted with coating composition and rotated therein to provide intimate contact between parts and coating composition, and coated parts are discharged from said basket, the improvement comprising:

- establishing a path of travel for said parts, which path includes a direction of movement for uncoated parts to be charged to a basket, as well as a direction of movement for coated parts discharging from a basket;
providing a basket loading/unloading zone in said path of travel;
establishing a line of travel for a first and second basket,

which line intersects said parts path of travel at said loading/unloading zone and extends there through from a first basket coating zone to a second basket coating zone; supplying parts to be coated to a first basket at said loading/unloading zone while said second basket is located at its coating zone;
shuttling the resulting loaded first basket from said loading-



/unloading zone along the basket line of travel to the first basket coating zone; while at the same time shuttling the second basket along the basket path of travel from its coating zone to the basket loading/unloading zone; and unloading said second basket at the loading/unloading zone, while subsequently loading same, and while at that time coating parts in said first basket located at its coating zone.

4,710,411

COMPATIBLE BEDDING COMPOUND FOR ORGANICALLY SEALED INSULATING GLASS

Michael J. Gerace, Kettering; Gary D. Krysiak, Englewood, and Russell F. Schiappacasse, Dayton, all of Ohio, assignors to Protective Treatments, Inc., Dayton, Ohio

Division of Ser. No. 741,522, Jun. 5, 1985. This application Nov. 14, 1986, Ser. No. 930,680

Int. Cl.⁴ E06B 3/24

U.S. Cl. 428—34

6 Claims

1. A method of sealing an insulated glass unit to a frame comprising the steps of applying a bedding composition to said frame; said bedding composition being compatible with the sealant used to form said insulated glass unit and comprising a polar solvent or mixture of polar solvents which are substantially insoluble with nonpolar hydrocarbons, a plasticizer selected from the group consisting of a polar plasticizer containing at least one noncarbon/hydrogen functional group, a polymeric plasticizer, and mixtures thereof, and an elastomer compatible with said polar solvent and said plasticizer; and sealing said insulated glass unit against said bedding compound and said frame.

4,710,412

MANUFACTURE OF FRAMES

Jean-Louis Darrieux, Merignac, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed May 29, 1985, Ser. No. 739,266

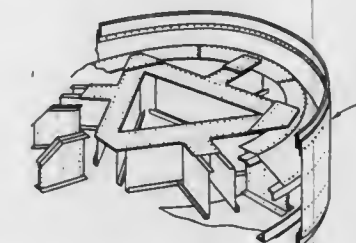
Claims priority, application France, May 30, 1984, 84 08524
Int. Cl.⁴ B27N 5/02; B64D 27/00, 41/00

U.S. Cl. 428—36

1 Claim

1. A composite frame having a longitudinal axis of symmetry and comprising an outer sleeve coaxial with said axis, an assembly of elongate elements disposed substantially perpendicularly to the said axis, an annular casing anchoring said elongate elements to said outer sleeve, and reinforced elements connecting the beams together, said sleeve, said casing and said elements being hollow and being formed from filamentary material impregnated with hardenable resin, said casing comprising two axial halves bonded together end to end and each includ-

ing a cylindrical flange portion concentric with said axis, said elongate and reinforcing elements being disposed within and



bonded to said halves of the casing, and said outer sleeve being formed about said cylindrical flange portions.

4,710,413

COATING COMPOSITION AND ITS USE FOR THE PREPARATION OF OXYGEN BARRIER COATINGS ON PLASTIC ARTICLES

Wolfgang Quack, Mettmann, Fed. Rep. of Germany, assignor to Dow Chemical Handels-und Vertriebsgesellschaft mbH, Midland, Mich.

Division of Ser. No. 653,397, Sep. 24, 1984, abandoned. This application Jul. 29, 1985, Ser. No. 760,235

Int. Cl.⁴ C08F 8/00; C08L 27/00

U.S. Cl. 428—36

9 Claims

1. A method for reducing the oxygen permeability of a plastic pipe by coating the plastic pipe with a coating composition comprising from 75 to 95 weight percent of a thermoplastic vinylidene chloride copolymer and 25 to 5 weight percent of a thermoplastic polyester urethane having a Shore A hardness of 80 to 90 derived from (1) a polyester polyol which comprises (a) a condensation product of a saturated aliphatic diol and a saturated aliphatic dicarboxylic acid, (b) a condensation product of a saturated aliphatic lactone, or (c) mixtures of (a) and (b); and (2) an aromatic diisocyanate, whereby the percentages refer to the total weight of the copolymer and the polyester urethane.

4,710,414

FASTENER ASSEMBLY WITH HEAT SHRINKABLE FILM COVER

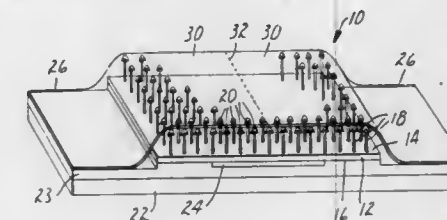
Walter E. Northrup, and Maurice E. Freeman, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 10, 1984, Ser. No. 629,331

Int. Cl.⁴ A44B 21/00

U.S. Cl. 428—43

3 Claims



1. In an elongate fastener assembly comprising a backing strip having first and second major surfaces; a multiplicity of stems each secured at one end to said backing strip, projecting generally normally to the first surface of said backing strip, and having enlarged heads at their ends opposite said backing strip adapted to engage loops on materials pressed against said heads; an open porous permanent attachment layer attached to the second major surface of said backing strip, said permanent

attachment layer having sufficient open areas to afford movement of foam into said permanent attachment layer to permanently attach said fastener assembly to a foamed article; and

an elongate film cover means overlaying the heads and having longitudinal edge parts attached along the longitudinal edges of said backing, said film cover means being adapted to expose said heads upon the application of heat; the improvement wherein said film cover means comprises two longitudinal portions, said portions being sufficiently heat shrinkable in the transverse direction that upon application of said heat each of said portions will shrink towards a different one of said edge parts while remaining in one piece to expose said heads.

4,710,415

REINFORCED FOAM ANTI-FATIGUE FLOOR TILE MODULE AND METHOD OF MAKING SAME

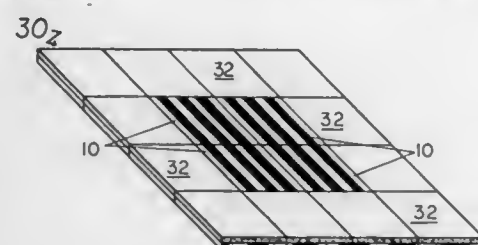
David K. Slosberg, Atlanta, and Gilbert S. Nowell, Marietta, both of Ga., assignors to Compo Industries, Inc., Waltham, Mass.

Filed Sep. 11, 1986, Ser. No. 906,223

Int. Cl.⁴ B32B 3/30, 5/14, 5/20; B05D 3/02

U.S. Cl. 428-48

33 Claims



1. A reinforced vinyl-foam, anti fatigue floor module of defined dimensions, which comprises:

- (a) a resilient, substantially closed cell, vinyl-foam layer of sufficient thickness to provide anti-fatigue cushioning properties, said layer having a face surface and a back surface, the foam layer having a density of about 20 pounds per cubic foot or more, and one surface having an embossed, anti-friction or design pattern thereon; and
- (b) a reinforcing fibrous sheet material within the foam layer and positioned between 55% to 65% of the depth of the foam layer from the non-embossed surface to provide a dimensionally stable floor module characterized by laying flat on a floor surface and which has a shrinkage of less than about two-tenths of one percent on aging.

10. A floor covering system which comprises a floor surface covered by a plurality of the anti-fatigue floor modules of claim 1 the floor modules adjoining each other in a close, edge-to-edge matching floor covering relationship.

11. The floor covering system of claim 10 in which modules are a plurality of fibrous-face carpet tiles, the carpet tiles and floor modules, adjoining each other in a close, edge-to-edge matching floor covering relationship.

4,710,416

CORE STRUCTURE FOR USE IN A SEAL

Russell W. Barth, Upper Sandusky, and Ronald P. Buess, Wharton, both of Ohio, assignors to Uni-Grip, Inc., Upper Sandusky, Ohio

Filed Apr. 8, 1985, Ser. No. 721,233

Int. Cl.⁴ B32B 7/00

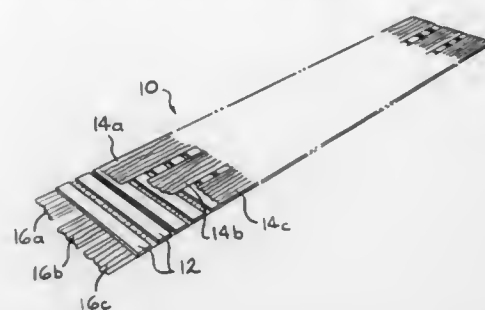
U.S. Cl. 428-119

3 Claims

1. A core structure for use in a seal assembly, trim assembly, and the like, comprising:

- a plurality of individual core segments of resilient material positioned in spaced apart relationship to one another, and at least one strip of flexible substantially inextensible adhesive tape adhered to and extending along one surface of

each of said segments, said segments being coupled together only by said tape strips, each of said tape strips



extending in a direction perpendicular to the length of each said segment and being substantially narrower than the length of each said segment.

4,710,417

PAPERBOARD PANEL CONSTRUCTION

Thomas L. Cline, Hanover, Pa., assignor to Corra-Board Products Co., Inc., Hanover, Pa.

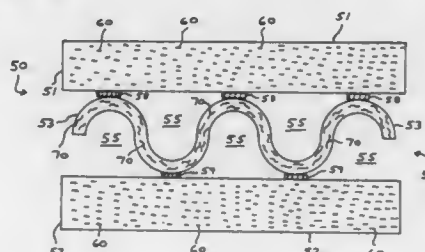
Filed Sep. 26, 1986, Ser. No. 911,727

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.⁴ B32B 3/12

U.S. Cl. 428-182

1 Claim



1. A paperboard panel construction (50), said paperboard panel structure (50) having an overlayer (51) comprised of chipboard material having relatively shorter fiber lengths (60) contained therein,

said paperboard panel structure having an underlayer (52) comprised of chipboard material having relatively shorter fiber lengths (60) contained therein,

said paperboard panel structure further having an undulating midstratum layer (53) between said overlayer (51) and underlayer (52),

wherein the upper undulation portions of said midstratum layer (53) are secured directly to said overlayer (51) by adhesive means (58),

and wherein the lower undulation portions of said midstratum layer (53) are secured directly to said underlayer (52) by adhesive means (59),

said paperboard panel structure providing means wherein air cells (55) are formed internally thereof such that a given panel caliper or thickness may be maintained while reducing the number of chipboard layers required for construction,

wherein said undulating midstratum layer (53) has relatively longer fiber lengths (70) contained therein as compared to the relatively shorter fiber lengths (60) contained in said overlayer (51) and said underlayer (52),

wherein the average fiber length (60) of said overlayer (51) and said underlayer (52) is two millimeters or less,

wherein the average fiber length (70) of said undulating midstratum layer (53) is five millimeters or more,

wherein said air cells (55) are formed between said overlayer

(51) and said underlayer (52) by way of said undulating midstratum layer (53) such that the overall weight of a panel (50) is reduced while improving panel strength via the spring-like effect of said midstratum layer and by the relatively longer fiber lengths (70) contained in said midstratum layer.

4,710,418

OPTICAL RECORDING MEDIUM

Katsuhiko Takano, Yokohama; Satoshi Yoshihara; Shigeharu Iijima, both of Kawasaki; Eizo Sasamori, Yokohama; Masaaki Matsushima, Machida, and Hiroyoshi Kishi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 623,474, Jun. 22, 1984, abandoned.

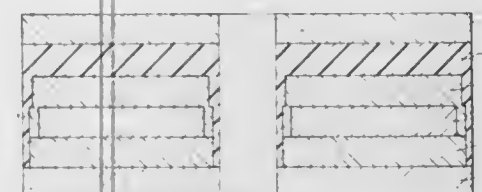
This application Feb. 2, 1987, Ser. No. 9,545

Claims priority, application Japan, Jun. 29, 1983, 58-116157

Int. Cl.⁴ B32B 7/12, 15/04; G01D 9/00

U.S. Cl. 428-192

6 Claims



1. An optical recording medium, wherein a plurality of layers including an optical recording layer are laminated on the substrate, characterized in that said substrate has a region on and around the edge portion thereof where no optical recording layer is formed, and that said region is sealed by one or more remaining layers other than said optical layer, the remaining layer or layers comprising a thin film of a metal, Si or a compound thereof.

4,710,419

IN-MOLD PROCESS FOR FABRICATION OF MOLDED PLASTIC PRINTED CIRCUIT BOARDS

Vernon C. Gregory, 239 W. Myrna La., Tempe, Ariz. 85284

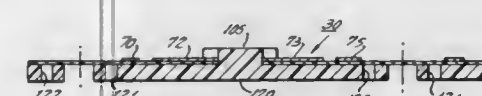
Division of Ser. No. 631,209, Jul. 16, 1984, Pat. No. 4,584,767.

This application Mar. 21, 1986, Ser. No. 842,183

Int. Cl.⁴ B32B 3/00; H05K 1/00; G03C 5/00; B44C 1/22

U.S. Cl. 428-210

7 Claims



1. A molded printed circuit board comprising a generally flat molded body portion of electrical insulation material having top and bottom generally parallel surfaces; a conductive patterned foil disposed atop said top surface and firmly adherent thereto; and at least one molded projection of electrical insulation material integrally joined to said molded body portion, extending from said flat molded body portion and above the plane of the surface of said conductive patterned foil, and having its sides free of conductive material; said projection extending from an area of said molded body which is spaced inwardly from the periphery of said molded body.

4,710,420

UNSATURATED POLYESTER RESIN COMPOSITIONS
Satoshi Tonoki, Suita; Hidenari Tsunemi, Ohtsu; Asachi Nishimura, Ohtsu, and Kunihisa Abe, Ohtsu, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 20, 1985, Ser. No. 811,860

Claims priority, application Japan, Dec. 21, 1984, 59-271389; Dec. 21, 1984, 59-271390

Int. Cl.⁴ B32B 7/02, 27/08; C08F 8/00

U.S. Cl. 428-212

30 Claims

1. An unsaturated polyester resin composition comprising a hard unsaturated polyester component, a soft unsaturated polyester component and a cross-linking monomer, said soft polyester component containing a polyoxyalkylene segment having a molecular weight from 600 to 6000 in the backbone thereof and being dispersed in said hard polyester component forming fine particles having a particle size not greater than 0.4 microns, said resin composition exhibiting in its cured state a glass transition temperature corresponding to said hard polyester component from 100° C. to 200° C. and another glass transition temperature corresponding to said soft polyester component from -100° C. to 0° C.

14. An electrical laminate comprising at least two layers of a fibrous substrate impregnated with the resin composition of claim 1.

4,710,421

MAGNETIC RECORDING MEDIUM

Toshio Ono, Yasuo Tamai, Chiaki Mizuno, Hiroshi Ogawa, and Shinji Saito, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1987, Ser. No. 29,557

Claims priority, application Japan, Mar. 24, 1986, 61-65315

Int. Cl.⁴ G11B 5/70

U.S. Cl. 428-213

7 Claims

1. A magnetic recording medium having a heat shrinkage ratio of not higher than 1% and comprising a nonmagnetic support in the form of a tape which has a heat shrinkage ratio of not higher than 1.8%, a Young's modulus of 450 to 650 kg/mm² in the longitudinal direction and a Young's modulus of 450 to 550 kg/mm² in the width direction, and a magnetic recording layer provided on the support which comprises a binder and a ferromagnetic powder dispersed therein and has a squareness ratio of not less than 0.89, all the heat shrinkage ratios being determined after being allowed to stand at 110° C. for 4 hours.

4,710,422

PROCESS FOR THE TREATMENT OF A FIBROUS SHEET OBTAINED BY PAPERMAKING PROCESS, WITH A VIEW TO IMPROVING ITS DIMENSIONAL STABILITY, AND APPLICATION OF SAID PROCESS TO THE FIELD OF FLOOR AND WALL-COVERINGS

Pierre Fredenucci, Charavines, France, assignor to Arjomari-Prioux, Paris, France

Filed Jan. 16, 1986, Ser. No. 819,349

Claims priority, application France, Jan. 18, 1985, 85 00745

Int. Cl.⁴ B32B 7/00; B05D 3/02

U.S. Cl. 428-248

4 Claims

4. A floor or wall covering support formed from a fibrous sheet containing cellulosic fibers obtained by a papermaking process which comprises impregnating said sheet with a chemical composition containing at least one wetting agent select from the group consisting of polyglycols and derivatives thereof, and at least one organic binder selected from the group consisting of SBR, acrylic and PVC polymers, vinylacetate-vinylchloride-ethylene terpolymers, starch, polyvinyl alcohols, and polyamide-polyamine-epichlorhydrin resins.

4,710,423

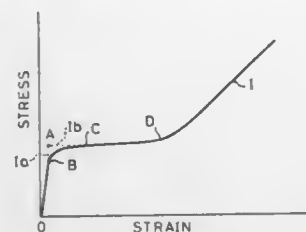
WOVEN POLYESTER WEBBING FOR SAFETY BELTS
Tosuke Imamura, Nara, Japan, assignor to Teijin Limited, Osaka, Japan

Filed Nov. 10, 1986, Ser. No. 929,638

Claims priority, application Japan, Nov. 11, 1985, 60-250639
Int. Cl.⁴ D03D 15/00

U.S. Cl. 428-272

5 Claims



1. A webbing useful for safety belts comprising a woven belt composed of warps and wefts, and characterized in that at least the warps consist of polyester filament yarns having an intrinsic viscosity of 0.7 or more, a birefringence of from 0.08 to 0.15, a tensile strength of 4 g/denier or more, an ultimate elongation of from 50% to 80% and an elongation of 5% or less at a point A in a tensile stress-strain curve of the yarns, which point A denotes an intersecting point of an extension line from a steeply sloped portion of the curve appearing at an initial stage of the elongation of the yarns with an extension line from a substantially horizontal or slightly sloped portion of the curve appearing at an middle stage of the elongation of the yarns.

4,710,424

MAGNETIC DISK AND METHOD OF MAKING SAME
Upali Bandara, Stuttgart; Holger Hinkel; Werner Steiner, both of Boeblingen, and Gerhard Trippel, Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

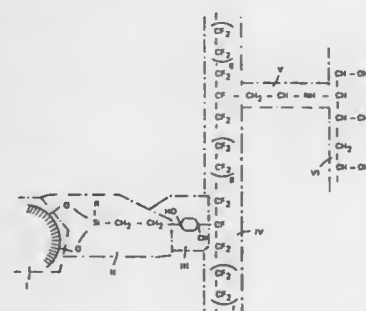
Filed Oct. 24, 1985, Ser. No. 790,710

Claims priority, application European Pat. Off., Oct. 31, 1984, 84113054.5

Int. Cl.⁴ G11B 5/708

U.S. Cl. 428-325

3 Claims



1. A magnetic disk having a magnetic layer applied on a substrate and comprising a binder, magnetic particles, and particles of an abrasion-resistant material, characterized in that the abrasion-resistant particles are of diameter smaller than the thickness of the magnetic layer, and comprise hard ceramic material coated with an enveloping layer, and in that the enveloping layer comprises a material selected from the group consisting of $\text{SiO}_2/\text{Al}_2\text{O}_3$ and poly(tetrafluorethylene), and is between 1 and 100 nanometers thick, and further characterized in that the abrasion-resistant particles are coated prior to being dispersed in the binder and in that said coating and said enveloping layer intensify the bonding of said abrasion-resistant particles with the binder.

oping layer intensify the bonding of said abrasion-resistant particles with the binder.

4,710,425

ABRASION RESISTANT ARTICLES AND COMPOSITION UTILIZING A BORON-DOPED REFRACTORY PARTICLE

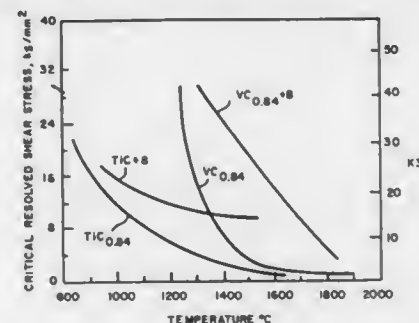
J. Gary Baldoni, II, Walpole; Sergej-Tomislav Buljan, Acton, and Vinod K. Sarin, Lexington, all of Mass., assignors to GTE Laboratories Inc., Waltham, Mass.

Filed Dec. 17, 1985, Ser. No. 809,939

Int. Cl.⁴ B32B 9/00; C04B 35/58; B24D 3/34

U.S. Cl. 428-328

19 Claims



1. An improved abrasion resistant composition consisting essentially of a densified ceramic matrix having dispersed therein, at least one refractory dispersoid doped with boron, said refractory dispersoid having an average particle size below about 20 μm .

4,710,426

SOLAR RADIATION-CONTROL ARTICLES WITH PROTECTIVE OVERLAYER

Robert K. Stephens, Windham, N.H., assignor to Polaroid Corporation, Patent Dept., Cambridge, Mass.

Filed Nov. 28, 1983, Ser. No. 555,520

Int. Cl.⁴ B32B 15/08, 27/06, 27/36

U.S. Cl. 428-336

28 Claims



1. A radiation-control sheet material comprising: a transparent support carrying means for reflecting infrared radiation; and as a protective outer layer for said radiation-control sheet material, a polymeric layer substantially transmissive of infrared radiation, said polymeric layer having therein or as a layer contiguous thereto an effective amount of an isocyanate adhesion-promoting agent.

2. The radiation-control sheet material of claim 1 wherein said protective outer layer has a physical thickness of about 0.08 micron to about 25 microns.

4,710,427

PROCESS FOR TREATING MAGNETIC METAL POWER
Yasuhisa Yamauchi; Masao Asano; Hideyuki Anzai, and Yoshitaka Yasufuku, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

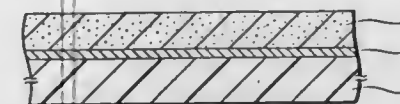
Filed May 6, 1985, Ser. No. 731,126

Claims priority, application Japan, May 17, 1984, 59-98981
The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.⁴ G11B 5/706

U.S. Cl. 428-407

17 Claims



1. A process for treating a magnetic metal powder comprising:
(a) treating the surface of said magnetic metal powder with an alkylamine fatty acid,
(b) then steeping said magnetic powder in an organic liquid, and
(c) then drying said magnetic powder in the presence of an oxidative gas.

4,710,428

SINTERED SILICON CARBIDE POROUS BODY IMPREGNATED WITH METALLIC SILICON

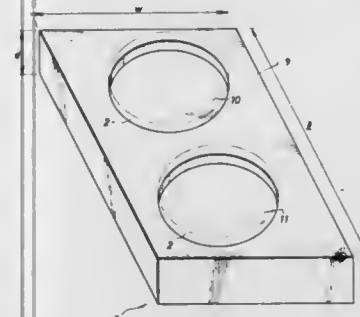
Teruyasu Tamamizu, Sagami; Kichihei Sato; Takashi Tanaka, both of Oguni, and Shunkichi Sato, Sekikawa, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1986, Ser. No. 837,821

Int. Cl.⁴ B32B 9/00

U.S. Cl. 428-408

10 Claims



1. A susceptor for use in an in-line deposition of a coating on a silicon wafer by a CVD process, comprising Si-SiC ceramic comprising a sintered body of SiC with pores therein impregnated with from about 7% to 25% by weight of metallic silicon of high purity.

4,710,429

LAMINATES FROM EPOXIDIZED PHENOL-HYDROCARBON ADDUCTS

Gary W. Bogan, Lake Jackson, Tex.; Peter A. Lucas, Allentown, Pa.; Georgia A. Monnerat, and Dale J. Aldrich, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 827,989, Feb. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 723,392, Apr. 15, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 4,986

Int. Cl.⁴ C08G 59/04, 59/32

U.S. Cl. 428-417

12 Claims

1. In a laminate having a Tg of at least about 150° C. prepared from a cured composition comprising

(A) at least one reinforcing material;
(B) at least one epoxy resin; and
(C) at least one curing agent for component (B);

the improvement which comprises employing as at least a part of component (B) at least one hydrocarbon-phenol epoxy resin, halogenated hydrocarbon-phenol epoxy resin or combination thereof in an amount such that at least about 40 percent of the epoxy groups present in component (B) are contributed by said hydrocarbonphenol epoxy resin or halogenated hydrocarbon-phenol epoxy resin.

4,710,430

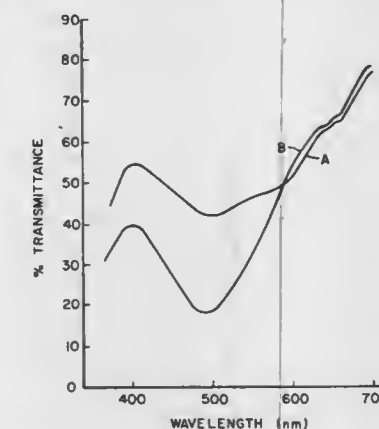
COLORED PHOTOCHROMIC GLASSES AND METHOD
Nicholas F. Borrelli, Elmira; George B. Hares, Corning; Dennis W. Smith, Corning, and Brent M. Wedding, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 650,846, Sep. 17, 1984, Pat. No. 4,537,612, which is a continuation-in-part of Ser. No. 364,472, Apr. 1, 1982, abandoned. This application May 3, 1985, Ser. No. 729,965

Int. Cl.⁴ C03C 4/06

U.S. Cl. 428-432

2 Claims



1. A photochromic glass article which has silver halide as the photochromic agent, which contains at least 1% by weight Li_2O , at least 2% by weight Na_2O , and at least 6% by weight $\text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O}$, and which has a surface permanent coloration zone, said surface coloration zone consisting of a first layer of coloration overlying a second layer of different coloration, said first layer having an absorption peak at a longer wavelength than said second layer, at least said first layer exhibiting an absorption band between about 510-580 nm.

4,710,431

MAGNETOOPTICAL RECORDING ELEMENT AND A MAGNETOOPTICAL RECORDING DEVICE

Petrus P. J. Van Engelen, and Kurt H. J. Buschow, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1986, Ser. No. 928,953

Claims priority, application Netherlands, Mar. 13, 1986, 8600647

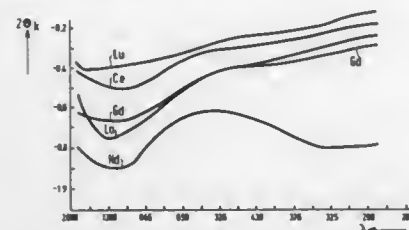
Int. Cl.⁴ G11B 7/24

U.S. Cl. 428-457

8 Claims

1. A magnetooptical recording element comprising:
a substrate;
a thin recording layer on the substrate; and
a heading means on the substrate for providing information for controlling the recording of information onto the recording element.

characterized in that the recording layer consists essentially of a crystalline alloy having the composition $R_2T_{14}B$,



where R is one or more rare-earth metals, T is one or more transition metals, and B is boron.

4,710,432

BASE MATERIAL FOR HONEYCOMB CORE STRUCTURE AND PROCESS FOR PRODUCING THE SAME

Kunio Nishimura, and Tadashi Hirakawa, both of Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 19, 1986, Ser. No. 865,210

Claims priority, application Japan, Aug. 8, 1985, 60-173108

Int. Cl.⁴ B32B 3/12

U.S. Cl. 428—542.8

8 Claims

1. A base material for a honeycomb core structure comprising a paper-like polyester fiber sheet which comprises 20% to 80% by weight of drawn polyester staple fibers, the drawn polyester staple fibers having a flat cross-sectional profile with a major axis and a minor axis and

4,710,433

TRANSPARENT CONDUCTIVE WINDOWS, COATINGS, AND METHOD OF MANUFACTURE

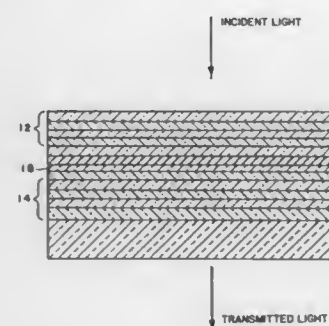
James M. Rowe, Torrance, and Rudolph W. Modster, Los Angeles, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Jul. 9, 1986, Ser. No. 883,897

Int. Cl.⁴ B21D 39/00

U.S. Cl. 428—623

29 Claims



1. An electrically conductive window having high optical transparency in the infrared, visible, or UV bands comprising a substrate having at least one smooth continuous surface on one side thereof, an intermediate dielectric impedance matching stack disposed on said substrate surface, a first diffusion barrier layer deposited on said intermediate matching stack, a nucleating layer deposited on said first barrier layer, a conductive metal layer deposited on said nucleating layer in a film of continuous uniform thickness of about 10 nm or less with optical constants n , k , said nucleating layer being selected to cooperate with said metal layer to allow the metal layer to form in a continuous thin film without agglomeration having optical con-

stants n , k approximating these of the bulk metal and with a low sheet resistance, said intermediate stack forming an impedance match between said substrate and said conductive layer, a second diffusion barrier layer deposited on said metal layer, and an outer dielectric anti-reflection stack deposited on said second barrier layer to form an impedance match between said conductive layer and air.

4,710,434

OPTOMAGNETIC RECORDING MEDIUM

Noboru Sato, Kanagawa; Kazutaka Habu, Tokyo, and Sanae Abe, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

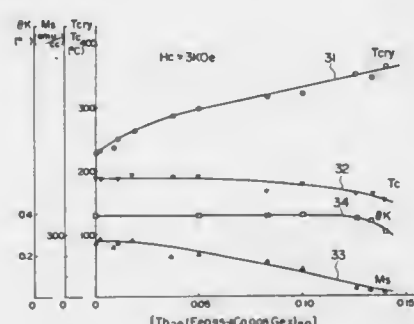
Filed Dec. 16, 1985, Ser. No. 808,991

Claims priority, application Japan, Dec. 17, 1984, 59-265640

Int. Cl.⁴ G11B 7/24

U.S. Cl. 428—678

6 Claims



1. An optomagnetic recording medium comprising a non-magnetic base and a recording layer on said base having an overall composition of from 15 to 35 atomic % of at least one of the metals Gd, Tb, and Dy, with the remainder being composed of a mixture of Fe, Co, and Ge, said mixture containing 1 to 14 atomic % Ge, 5 to 10 atomic % Co and the balance essentially Fe, said recording layer being formed of alternately superposed layers in which some of said layers are enriched with at least one of said metals Gd, Tb, and Dy, and the others of said layers being enriched with said mixture of Fe, Co, and Ge.

4,710,435

METHOD FOR PRODUCTION OF SINTERED COMPOSITE HAVING SPINEL REINFORCED WITH SHORT FIBERS OF SILICON CARBIDE AND SINTERED COMPOSITE PRODUCED BY SAID METHOD

Kikuo Nakano, and Hiroshi Hayashi, both of Aichi, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

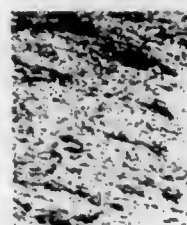
Filed Oct. 31, 1986, Ser. No. 925,560

Claims priority, application Japan, Nov. 18, 1985, 60-258333

Int. Cl.⁴ C04B 35/56

U.S. Cl. 428—698

2 Claims



1. A sintered composite having spinel reinforced with short

fibers of silicon carbide, which comprises a spinel matrix containing MgO and Al_2O_3 in a molar ratio in the range of 1:1 to 1:1.3 and 10 to 30% by weight, based on said spinel matrix, of short fibers of silicon carbide having an average diameter in the range of 0.5 to 2 microns and a length in the range of 5 to 100 microns.

4,710,436

MOLTEN CARBONATE FUEL CELL AND METHOD OF MANUFACTURING ELECTROLYTE PLATE THEREOF

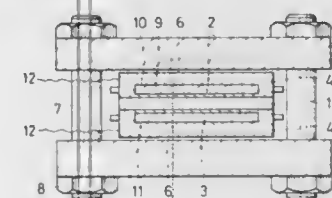
Junji Nakamura; Ikuma Nishimura; Goro Salto, all of Tokyo, and Kozo Matsumoto, Kanagawa, all of Japan, assignors to Toppan Printing Co., Ltd and Fuji Electric Co., Ltd., both of, Japan

Continuation-in-part of Ser. No. 716,421, Mar. 27, 1985, abandoned. This application May 14, 1986, Ser. No. 867,406

Int. Cl.⁴ H01M 8/14

U.S. Cl. 429—41

10 Claims



1. A molten carbonate fuel cell comprising a porous anode plate; a fuel gas chamber defined on one surface of said anode plate and adapted to supply fuel gas to said one surface of said anode; a porous cathode plate; an oxidation agent chamber defined on one surface of said cathode plate and adapted to supply an oxidation agent to said one surface of said cathode plate; a sintered porous ceramic plate disposed in between the other surface of said anode plate and the other surface of said cathode plate in intimate contact therewith, said porous ceramic plate being formed with a number of fine continuous pores having diameters distributed in a range from 0.05 μm to 10 μm , at least 60% of said fine pores having diameters distributed in a range from 0.05 μm to 0.5 μm , said fine pores having an average diameter of not more than 0.2 μm to provide a porosity of 50-70%, said fine pores communicating one surface of said ceramic plate with the other; molten carbonate electrolyte that fills said fine pores of said sintered porous ceramic plate; and means for continuously supplying fuel gas and oxidizing agent to said fuel gas chamber and said oxidizing agent chamber, respectively.

4,710,437

HIGH RATE METAL OXYHALIDE CELLS

Narayan Doddapaneni, Glenside, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 652,362, Sep. 19, 1984. This application Jan. 13, 1986, Ser. No. 818,072

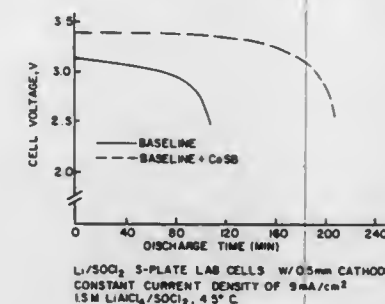
Int. Cl.⁴ H01M 10/36

U.S. Cl. 429—101

6 Claims

1. In a non-aqueous electrochemical cell system having an active metal anode, a cathode and a non-aqueous electrolyte having an oxyhalide depolarizer, the improvement comprising: a catalyst for the reduction of said oxyhalide depolarizer comprising a metal complex of Schiff's base, said Schiff's base being selected from the group consisting of macrocyclic complexes of 5-methyl isophthalaldehyde and 1,3-diaminopropane wherein the metal in said metal complex

is selected from the group consisting of iron and cobalt and wherein said metal complex is binuclear.



4,710,438

ACTIVATABLE BATTERY

Yannick Leben, Bobigny, and Louis D'Ussel, Paris, both of France, assignors to SAFT, S.A., Romainville, France

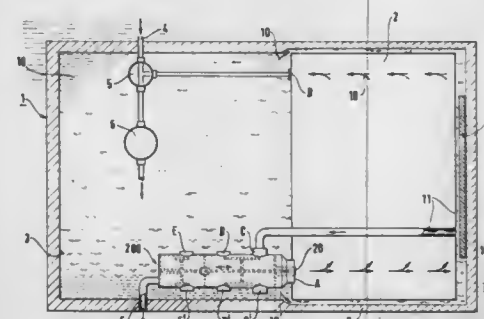
Filed Jan. 13, 1987, Ser. No. 2,985

Claims priority, application France, Oct. 23, 1986, 86 14712

Int. Cl.⁴ H01M 6/34

U.S. Cl. 429—119

6 Claims



1. A battery activatable by seawater and comprising an electrochemical block implementing AgO/Al couples and having an inlet and an outlet for an electrolyte distribution circuit for distributing a sodium hydroxide-based electrolyte, and said electrolyte distribution circuit which comprises:

an inlet for seawater;
a pump for pumping the electrolyte;
a tank for electrolyte in solution, said tank having a first outlet which is directly connected to a first inlet to a thermostatic valve, and having a second outlet which is connected to a second inlet of said thermostatic valve via a heat exchanger, the outlet from said thermostatic valve being connected to said inlet to said electrochemical block;
an exhaust outlet for hot electrolyte containing aluminates and controlled by a valve which is controlled as a function of a parameter that varies with the rate of aluminate generation; and
means for regenerating the electrolytes, said means comprising a block of solid sodium hydroxide disposed in the cold electrolyte in the vicinity of the outlet from said heat exchanger.

4,710,439

SECONDARY LITHIUM BATTERY INCLUDING A LITHIUM MOLYBDATE CATHODE

Jean-Marie Tarascon, Millington, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Oct. 9, 1986, Ser. No. 917,020

Int. Cl.⁴ H01M 4/48

U.S. Cl. 429-194

3 Claims



1. A non-aqueous battery including a lithium anode, an electrolyte and a cathode, characterized in that said cathode comprises $\text{Li}_x\text{Mo}_2\text{O}_4$ wherein x is an integer ranging from 0.3 to 2.

4,710,440

TEST MASK FOR DETERMINING ALIGNMENT OF AN AUTOMATIC IC MASK TESTING APPARATUS

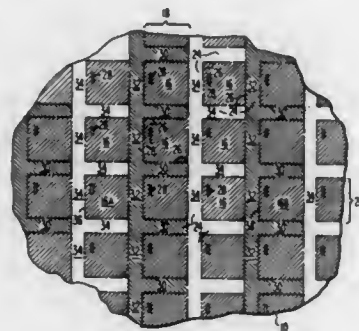
Paul J. Del Priore, Somerville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 14, 1986, Ser. No. 885,165

Int. Cl.⁴ G03F 9/00

U.S. Cl. 430-5

7 Claims



1. A mask for determining whether or not an automatic IC mask testing apparatus is scanning within a desired care area comprising:

- (a) a substrate having a major surface;
- (b) a plurality of identical care areas defined on said surface in substantially parallel rows, each of said care areas, having first optical properties and being surrounded by peripheral region on said surface which is adjacent an edge of said care area and extends outwardly therefrom, wherein portions of said peripheral regions have said first optical properties and other portions of said peripheral regions have second optical properties so that for a pair of said care areas, each portions of said peripheral region of one of said pair having said first optical properties spatially corresponds to a portion of said peripheral region of the other of said pair having said second optical properties.

4,710,441

STABLE HIGH RESISTANCE TRANSPARENT COATING

Ian T. Ritchie, Santa Monica, and Wilfred C. Kittler, Westlake Village, both of Calif., assignors to Andus Corp., Canoga Park, Calif.

Filed Dec. 18, 1985, Ser. No. 811,126

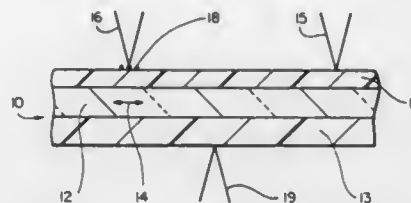
Int. Cl.⁴ G03G 15/04

U.S. Cl. 430-62

9 Claims

1. An apparatus for storing information by supporting electrostatic charges, comprising:

- a substrate;
- a ground plane disposed on the substrate;
- a dielectric material disposed on the ground plane adapted for supporting electrostatic charges thereon when subjected to an electric field created by electrodes;



the ground plane comprising a wide band gap semiconducting oxide, the oxide being formed by choosing an undoped wide band gap semiconducting oxide and forming a film from elements constituting the undoped oxide and from a dopant so as to form a doped oxide the doped oxide, having an electrical resistance greater than the undoped oxide.

4,710,442

GRADIENT LAYER PANCHROMATIC PHOTORECEPTOR

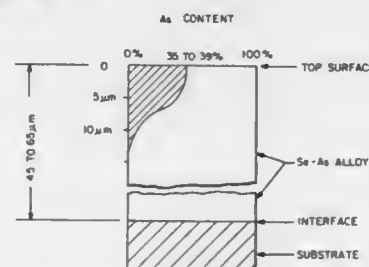
Alan L. Koelling, William J. Murphy, and Edward F. Mayer, all of San Jose, Calif., assignors to Ricoh Systems, Inc., San Jose, Calif.

Filed Feb. 11, 1986, Ser. No. 828,371

Int. Cl.⁴ G03G 5/082

U.S. Cl. 430-85

6 Claims



1. A photoreceptor comprising selenium-arsenic alloys, characterized by a gradient concentration of arsenic increasing from the bottom surface which interfaces a substrate to the top surface of the photoreceptor such that the arsenic concentration is about 5 wt. % at a depth of about 5 to 10 microns from the top surface of the photoreceptor and is about 35 to 40 wt. % at the top surface of the photoreceptor, wherein said photoreceptor is prepared by vapor deposition of a mixture of selenium-arsenic alloys, comprising about 74.0 wt. % or more of a selenium-arsenic alloy containing about 0 to 1.05 wt. % arsenic, and about 26.0 wt. % or less of a selenium-arsenic alloy containing about 10.0 to 25.0 wt. % arsenic and a selenium-arsenic alloy containing about 35.0 to 40.0 wt. % arsenic, onto a substrate wherein the mandrel holding the substrate is maintained at a temperature in the range of about 70°-80° C. during the entire evaporation procedure.

4,710,443

TONER, CHARGE-IMPARTING MATERIAL AND COMPOSITION CONTAINING TRIAZINE TYPE COMPOUND

Katsuhiko Tanaka, Tokyo, and Hiroshi Fukumoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1986, Ser. No. 840,854

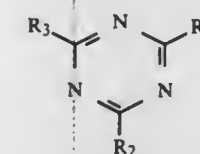
Claims priority, application Japan, Mar. 19, 1985, 60-53352; May 13, 1985, 60-100925

Int. Cl.⁴ G03G 9/14

U.S. Cl. 430-106.6

16 Claims

1. A positively chargeable toner for developing electrostatic latent images, comprising: a binder resin, a colorant, and a triazine type compound represented by the following formula (I):



wherein R_1 , R_2 and R_3 are the same or different groups selected from hydrogen atom and electron-donating groups which are more electron-donative than hydrogen atom, all of R_1 , R_2 and R_3 not being hydrogen atom.

4,710,444

PROCESS FOR THE FORMATION OF LINEWORK OR HALFTONE MULTICOLOR COLLOID PATTERNS

Luc H. Leenders, Eddie R. Daems, Herentals, and Jan A. Van den Bogaert, Schilde, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Jan. 30, 1986, Ser. No. 824,081

Claims priority, application European Pat. Off., Feb. 4, 1985, 85101127.0

Int. Cl.⁴ G03C 5/54, 7/22

U.S. Cl. 430-237

11 Claims

1. A process for forming a line or halftone multicolour colloid pattern which process comprises the following steps in sequence:

- (1) scanningwise exposing a multicolour original to obtain separate red light, green light and blue light output signals, receiving the latter by photon-detectors to produce separate series of electrical signals corresponding to said different light signals, and feeding the separate series of signals thus produced to a computer,
- (2) scanningwise exposing a corresponding number of separate black-and-white photosensitive silver halide emulsion layer materials to a light source controlled by said computer in accordance with the respective series of light signals,
- (3) developing a first one of the exposed silver halide emulsion layer materials with a hardening developing agent, and during such development effecting imagewise migration of oxidized hardening developing agent from the developing emulsion layer to a hardenable non-photosensitive gelatin-containing layer coloured with diffusion-resistant coloured substances, said coloured layer being carried at the time of such migration on a permanent support, to selectively harden regions of the coloured layer, and
- (4) removing the non-hardened regions of the coloured gelatin-containing layer by wash-off or transfer processing to leave a coloured hardened gelatin relief image on the permanent support, or
- (3') developing a first one of the exposed silver halide emulsion layer materials with a hardening developing agent, and during developing effecting imagewise migration of oxidized hardening developing agent from said developing emulsion layer to a hardenable non-photosensitive

gelatin-containing layer that is coloured with diffusion-resistant coloured substances and is carried out on a temporary support to selectively harden image regions of the coloured layer, and

- (4') removing the non-hardened regions of the coloured gelatin containing layer by wash-off processing to leave a coloured hardened gelatin relief image on the temporary support and then transferring such residual relief image onto a permanent support by pressing the relief image while dry, and in the presence of heat if needed, against the permanent support and removing the temporary support, and
- (5) repeating steps (3) and (4) or (3') and (4') with at least another one of said scanningwise exposed photographic emulsion layer materials and a differently coloured non-light sensitive gelatin-containing layer originally carried on a temporary support and transferred to said permanent support on top of the initial relief image thereon in advance of migration of such oxidized developing agent from such other emulsion layer material to add for each repetition another coloured relief image to said permanent support in registration with the preceding coloured relief image thereon.

4,710,445

RESIST IMAGEABLE PHOTOPOLYMERIZABLE COMPOSITIONS

James F. Sanders, St. Joseph Township, County St. Croix, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 22, 1986, Ser. No. 854,850

Int. Cl.⁴ G03C 11/12, 3/00, 1/727

U.S. Cl. 430-252

24 Claims

1. An aqueous alkaline developable photopolymerizable composition capable of being imagewise transferred after photopolymerization and development comprising:

- (1) a polyfunctional photopolymerizable monomer,
- (2) a polyfunctional photopolymerizable polymer which will swell in an aqueous alkaline developer having a pH of 7.5,
- (3) an inert, thermoplastic polymeric binder, and
- (4) a photoinitiator system for said monomer and polymer, said polymeric binder being non-reactive with the polymerization mechanism of said monomer and polymer, the polymeric binder being not soluble in at least one solution selected from the class consisting of aqueous alkaline solutions at a pH of 9.0, aqueous alcohol solutions, and organic solutions, said polymeric binder in bulk form having a glass transition temperature or softening point between 38° C. and 205° C. and a viscosity of 10^3 poise or less between 63° C. and 205° C. and said composition further containing a colorant in sufficient concentration to provide an optical density of at least 0.3 by having 2 to 50% by weight of colorant in said composition.
2. The composition of claim 1 wherein both said monomer and polymer are ethylenically unsaturated.
3. The composition of claim 2 wherein both said monomer and polymer have ethylenically unsaturated groups selected from the class consisting of acryloyl and methacryloyl groups.
15. A color prepress proofing element capable of being imagewise laminated to a surface after exposure and development comprising a support having on at least one surface thereof a strippable layer comprising the composition of claim 1.

4,710,446

PHOTOSENSITIVE RECORDING MATERIALS

Gerhard Hoffmann, Otterstadt; Reiner Hofmann, Ludwigshafen, and Albert Elzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Filed Feb. 14, 1985, Ser. No. 701,536

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405959

Int. Cl.⁴ G03C 1/495

U.S. Cl. 430—281

10 Claims

1. In a photosensitive recording material for the production of a printing plate or a resist image comprising a dimensionally stable base and a photosensitive recording layer containing a polymeric binder, which photosensitive layer can be developed with water or an aqueous alkaline media, the improvement which comprises using as the polymeric binder a copolymer which is soluble or dispersible in water or an aqueous alkaline medium and contains, as a copolymerized comonomer, the anhydride of the polymerizable, ethylenically unsaturated monocarboxylic acid in an amount of from 0.05 to 2% by weight, based on the copolymer, said copolymer, in addition to the anhydride of the polymerizable, ethylenically unsaturated monocarboxylic acid, containing, as further components, one or more comonomers from the group consisting of vinylaromatic monomers, acrylates and methacrylates, and one or more comonomers from the group consisting of maleic anhydride, maleic half-esters, acrylic acid and methacrylic acid.

4,710,447

COLOR PROOFING AND COLOR PROOFING TRANSFER PROCESS USING WATER DEVELOPED INK

Manny Kreiter, Chicago, Ill., assignor to Castcraft Industries, Inc., Chicago, Ill.
Continuation of Ser. No. 681,929, Dec. 14, 1984, abandoned.
This application Dec. 22, 1986, Ser. No. 4,857

Int. Cl.⁴ G03C 7/00, 7/20; G03F 3/06

U.S. Cl. 430—293

9 Claims

1. A tone-accurate color process proof comprising a substrate coated with a photo-sensitive water soluble ink solution that has been exposed to actinic light through an image-bearing negative, said photo-sensitive ink being such that only the unexposed portion thereof is water removable from said substrate by means of a water spray; said method comprising the steps of:

- applying a first sealer coat over said substrate to prevent ink from being unintentionally absorbed into the substrate;
- drying said first sealer coat;
- applying next a layer of powdered material as a matting agent;
- applying a photo-sensitive water soluble ink layer over said layer of powdered material;
- spreading said ink layer over said powdered layer;
- drying said ink layer;
- exposing the foregoing layers of materials to actinic light through an image-bearing film comprising the design to be formed on said substrate, whereby said photosensitive ink material hardens only where exposed to said actinic light;
- removing the unexposed photo-sensitive ink layer and powder only in the areas of said unexposed photo-sensitive ink layer by means of a light water spray;
- drying said water spray; and
- repeating steps (c)–(i) for each additional color coat desired to be applied to said substrate.

8. A method of producing a tone-accurate color transfer comprising a non-porous substrate coated with a photo-sensitive water soluble ink over varnish material containing a release agent; said ink being exposed to actinic light through an image-bearing negative, said photo-sensitive ink being such that only the unexposed portion thereof is water removable from said substrate by means of a water spray, said method comprising the steps of:

- applying a varnish coat containing a release agent over said substrate;

- drying said release coat;
- applying a layer of powdered material over said release coat;
- applying a water soluble photo-sensitive ink compound layer over said powdered layer;
- spreading said ink layer over said powdered layer;
- drying said ink layer;
- exposing the foregoing layers of materials to actinic light through a reversal image bearing film comprising the design to be formed on said substrate, whereby said photo-sensitive ink solution material hardens only where exposed to said actinic light;
- removing the unexposed photo-sensitive ink solution layer and powder only in the areas of said unexposed photo-sensitive ink layer by means of a light water spray;
- drying said water spray;
- repeating steps (c)–(i) for each additional color coat desired to be applied to said substrate;
- removing unexposed release coat with developer; and
- applying a pressure sensitive adhesive material over said layers of materials as a final coat.

4,710,448

METHOD OF FABRICATING ULTRA-THIN FLEX CABLES

Jacques F. Linder, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 651,406, Sep. 17, 1984, abandoned. This application Apr. 11, 1986, Ser. No. 851,873

Int. Cl.⁴ G03C 5/00

U.S. Cl. 430—314

6 Claims



1. A method of fabricating an ultra-thin flex cable having a thickness of about 0.0010 inch or less comprising the steps of:

- providing a thin metallic foil having opposing first and second planar surfaces;
- vapor depositing a first insulating layer onto said first planar surface of said conductive metallic foil;
- treating said second planar surface of said metallic foil to form a plurality of spaced-apart conducting lines wherein said first insulating layer supports said spaced-apart conducting lines; and
- vapor depositing a second insulating layer onto said second planar surface of said metallic foil remaining after said treating of step (c) so as to cover said conducting lines and fill the spaces therebetween and form said ultra-thin flex cable including said first and second insulating layers and said spaced-apart conducting lines, and having a thickness of about 0.0010 inch or less.

4. The method of claim 1 wherein said conducting lines are formed by photolithographic etching.

4,710,449

HIGH CONTRAST LOW METAL ION POSITIVE PHOTORESIST DEVELOPING METHOD USING AQUEOUS BASE SOLUTIONS WITH SURFACTANTS

James M. Lewis, Williamsville, N.Y., and Andrew J. Blakeney, Seekonk, Mass., assignors to Petrarch Systems, Inc., Bristol, Pa.

Filed Jan. 29, 1986, Ser. No. 823,892

The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.

Int. Cl.⁴ G03F 7/26; G03C 5/00

U.S. Cl. 430—326

30 Claims

1. A process for developing a positive radiation sensitive

resist film comprised of radiation sensitive quinone diazide sulfonic acid derivatives in admixture with an alkali soluble resin that has been coated on a substrate and exposed to radiation in the form of a pattern to form soluble areas in the coating which are dissolved by the developer to form a surface relief pattern and which comprises:

- contacting the exposed film with a solution comprising an organic base aqueous solution adjusted to a concentration that does not give development of photoresist and containing a cationic surfactant from about 0.0001 to about 1.0% by weight of the total solution, to form a developer resistant layer

- subjecting said film to an aqueous rinse, and
- contacting the said film with an organic aqueous base developer solution having a pH of at least 9 or greater and containing from about 0.0001 to 5% based on the weight of developer of a fluorocarbon surfactant having the formula:



where Y is a radical selected from the group $-CH_2CH_2O-$, $-SO_2NR-$, $-SO_3-$, $-SO_2N(R')CH_2CO_2-$, $-CO_2-$ and $-CO-NR'-$ wherein R_f is either a straight or branched chain of the formula C_pF_{2p+1} where p is an integer of from 3–17 and wherein R is hydrogen or an acyl or alkyl radical of 1 to 30 carbon atoms and m is an integer of 2 to 26 and R' is hydrogen or an alkyl radical of 1–6 carbon atoms, until the exposed portions of the film are dissolved.

4,710,450

PHOTOGRAPHIC ELEMENT COMPRISING AT LEAST TWO EXOTHERMIC ELECTROCONDUCTIVE LAYERS

Hideki Naito, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 13, 1986, Ser. No. 829,033

Claims priority, application Japan, Feb. 13, 1985, 60-26055

Int. Cl.⁴ G03G 15/12

U.S. Cl. 430—351

17 Claims

1. A photographic element comprising at least two exothermic electroconductive layers and at least one layer selected from a photosensitive layer and an image-receiving layer on a support, where upon heat developing the photosensitive layer, or transferring a mobile dye resulting from heat-development of the photosensitive layer to an image-receiving layer, or conducting such heat-development and dye transfer at the same time, electricity is applied to at least one of the electroconductive layers to generate heat, wherein at least one layer of said at least two exothermic electroconductive layers is an exothermic electroconductive layer having the function of a heating element on which at least an auxiliary exothermic electroconductive layer is formed.

4,710,451

HIGH CONTRAST DEVELOPMENT OF SILVER HALIDE EMULSION MATERIAL

Richard A. Ooms, Mechelen, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Mar. 24, 1986, Ser. No. 843,256

Int. Cl.⁴ G03C 5/24, 1/06, 1/34

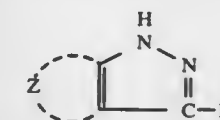
U.S. Cl. 430—441

13 Claims

1. A method of effecting high contrast development of an image-wise exposed photographic negative-working silver halide emulsion layer material, the silver halide of which is at least 90 mole percent silver bromide, with the balance being silver chloride and/or silver iodide, which comprises developing said exposed material in the presence of the following ingredients in an aqueous developing medium having a pH of at least 10.5:

- hydroquinone or a substituted hydroquinone as sole developing agent in said medium,
- an inorganic sulfite compound providing free sulphite ions in an amount of at least 5 grams per liter,

- an organic anti-fogging agent corresponding to the following general formula (A):



(A)

wherein:

Z represents the necessary atoms to complete a nitro-substituted homocyclic aromatic nucleus, and

R is hydrogen or a lower (C₁–C₅) alkyl group,

(d) a polymer containing a plurality of alkylene oxide units and having a molecular weight of at least 1500, and

(e) an inorganic alkaline compound imparting said pH to said medium,

said ingredients (a), (b), (c), (d) and (e) being present in said developing medium during said development in such amounts that when said photographic material is image-wise exposed through a continuous tone wedge and test developed in the thus-constituted developing medium for a time of 35 sec. at 38° C. and then fixed there results a silver wedge image corresponding with a log exposure versus density sensitometric curve wherein the maximum gradient (γ) is at least 5 and the product of said maximum gradient (γ) and of the gradient in the toe (γ_v) of said curve is at least 20, the maximum gradient being measured between the log exposure values corresponding with the densities 0.3 and 3.0 above fog of said curve and the gradient in the toe being measured between the log exposure values corresponding with the densities 0.1 and 0.6 above fog of said curve.

4,710,452

THIN FILM AMORPHOUS OPTICAL RECORDING FILMS

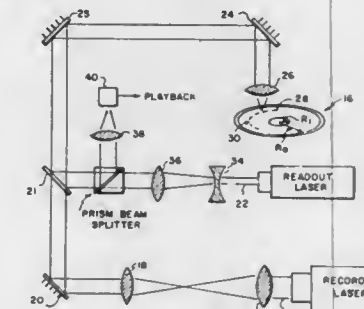
Pranab K. Raychaudhuri, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,423

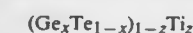
Int. Cl.⁴ G03C 1/72

U.S. Cl. 430—495

5 Claims



1. A recording element comprising, as the optical recording layer, an amorphous thin film of an alloy having the formula:



wherein, on an atom-to-atom basis, x is from 0.33 to 0.55, and z is greater than zero up to 0.30.

4,710,453

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL
Shigeto Hirabayashi; Syoji Matsuzaka, both of Hachioji; Yukio Ohya, Hino, and Yoshiyuki Nonaka, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

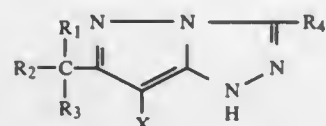
Filed Feb. 18, 1986, Ser. No. 830,180

Claims priority, application Japan, Feb. 19, 1985, 60-29452
Int. Cl.⁴ G03C 7/36, 7/38

U.S. Cl. 430—505

14 Claims

1. A silver halide color photographic material having formed on a base photographic layers including a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer, wherein said blue-sensitive silver halide emulsion layer contains at least one highly reactive yellow coupler having a relative coupling reaction rate of 0.3 or more, said green-sensitive silver halide emulsion layer containing at least one compound of Formula (I):



wherein X is a halogen atom or a monovalent organic group capable of leaving upon coupling reaction with the oxidized product of a developing agent; R₁ to R₃ which may be the same or different each represents a hydrogen atom, a halogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, a cycloalkenyl group, an alkynyl group, an aryl group, a heterocyclic group, an acyl group, a sulfonyl group, a sulfinyl group, a phosphoryl group, a carbamoyl group, a sulfamoyl group, a cyan group, a spiro compound residual group, a bridged hydrocarbon compound residual group, an alkoxy group, an aryloxy group, a heterocyclic oxy group, a siloxy group, an acyloxy group, a carbamoyloxy group, an amino group, an acylamino group, a sulfonamido group, an imido group, a ureido group, a sulfamoylamino group, an alkoxy carbonylamino group, an alkoxy carbonylamino group, an aryloxy carbonylamino group, an alkoxy carbonyl group, an aryloxy carbonyl group, an alkylthio group, an arylthio group or a heterocyclic thio group, provided that at least two of R₁ to R₃ are other than a hydrogen atom; and R₄ is a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, an acylamino group, an alkylamino group, an anilino group, an alkoxy carbonyl group or an alkylthio group.

4,710,454

PHOTOGRAPHIC RECORDING MATERIAL AND A PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES

Hans Langen; Heinz-Dieter Schütz; Udo Wernicke, Wolfgang Himmelmann; and Günter Renner, all of Agfa-Gevaert Aktiengesellschaft, D-5090 Leverkusen, Fed. Rep. of Germany

Filed Jan. 6, 1986, Ser. No. 816,329

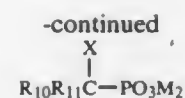
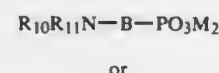
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501074

Int. Cl.⁴ G03C 1/34, 7/32

U.S. Cl. 430—546

8 Claims

1. A photographic recording material with at least one photosensitive silver halide emulsion layer, a coupler associated with the silver halide emulsion layer and optionally further layers, characterized in that it contains at least one phosphonic acid of the following structures



wherein

X represents PO₃M₂ or CO₂M

M represents a hydrogen atom or a cation which confers water-solubility,

B represents (CH₂)_n, whereby n is an integer or a substituted alkylene group,

R₁₀, R₁₁ are the same or different and represent hydrogen, an optionally substituted carbamoyl group, an optionally substituted alkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group preferably having from 7 to 9 carbon atoms, an optionally substituted alicyclic group or an optionally substituted heterocyclic radical or together the ring members for forming a ring system with 5 or 6 ring members;

(I) and, in the coupler-containing layer, at least one polyacrylic acid derivative.

4,710,455

NOVEL SILVER HALIDE CRYSTAL AND PROCESS FOR PRODUCTION OF SAME

Keisuke Iguchi, and Seigo Ebato, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

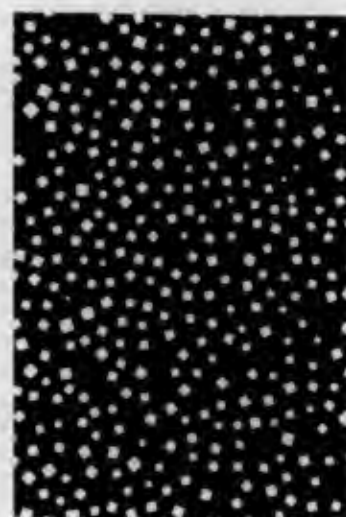
Filed Apr. 2, 1986, Ser. No. 847,315

Claims priority, application Japan, Apr. 8, 1985, 60-75042

Int. Cl.⁴ G03C 1/02

U.S. Cl. 430—567

14 Claims



1. Silver halide crystals which are cubic type crystals and which have a depression on each face thereof and/or a hollow portion formed by joining of the depression with other depressions.

4,710,456

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Takashi Naoi; Takashi Fujioka; Hisashi Okamura, and Masaki Satake, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 11, 1985, Ser. No. 774,681

Claims priority, application Japan, Sep. 12, 1984, 59-191355

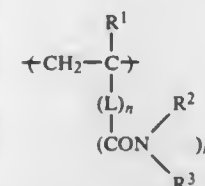
Int. Cl.⁴ G03C 1/06

U.S. Cl. 430—564

8 Claims

1. A silver halide photographic material comprising a support with at least two silver halide emulsion layers on the same side of said support on one or both sides thereof, wherein at least two of said silver halide emulsion layers contain a poly-

mer having a repeating unit represented by the general formula (I) and/or dextran:



wherein R¹ is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; R² and R³, which may be the same or different, each may represent a hydrogen atom, or a group having 10 or less carbon atoms and selected from the group consisting of a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, and a substituted or unsubstituted aralkyl group, and R² and R³ may combine together with the nitrogen atom to which they are attached to form a nitrogen-containing heterocyclic ring; L is an (m+1)-valent connecting group; n is 0 or 1; and m is 1 or 2, and wherein the density of said polymer and/or dextran in the emulsion layer closer to the support is 30 wt% or less than that in the emulsion layer farther from the support than said closer emulsion layer, and wherein said polymer and/or dextran is present in an amount of from about 30 to 40 weight percent based on the total weight of the binder present in said emulsion layers.

4,710,457

MONOCLONAL ANTIBODY FOR HUMAN HEMATOPOIETIC GLYCOPROTEINS AND METHOD

Bo Dupont, South Glenfield Harrison, N.J.; Yasuo Morishima, Nagoya, Japan; Nancy Collins, Larchmont, N.Y.; Shun-ichiro Ogata, Kagoshima, Japan, and Kenneth O. Lloyd, Bronx, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Jun. 29, 1983, Ser. No. 509,201

Int. Cl.⁴ G01N 33/53, 33/577; C12P 37/00

U.S. Cl. 435—7

4 Claims

1. Method for differentiating between human B cells and T cells in a human hematopoietic specimen which comprises (a) contacting the human hematopoietic specimen with monoclonal antibody 4C (ATCC Accession No. HB 8311) under immunoprecipitating conditions so as to allow the formation of 4C: Leu 200 glycoprotein immunoprecipitate complexes; (b) analyzing the immunoprecipitate complexes by SDS-PAGE to determine the presence of Leu 2 glycoproteins having molecular weights of approximately 230 kD, 215 kD, 205 kD and 190 kD; and (c) differentiating B cells from T cells wherein B cells are indicated when the 215 kD glycoprotein predominates in appearance over the 205 kD and 190 kD glycoproteins, are wherein T cells and indicated when the 205 kD and 190 kD glycoproteins predominate over the 215 kD glycoprotein.

4,710,458

NYLON STRIPS FOR MEDICAL ASSAY

Robert Maines, Tappan, N.Y., assignor to R. J. Harvey Instrument Corporation, Hillsdale, N.J.

Continuation-in-part of Ser. No. 76,222, Sep. 17, 1979, Pat. No. 4,279,506. This application Apr. 27, 1981, Ser. No. 257,860

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.⁴ C12Q 1/00, 1/28, 1/54

U.S. Cl. 435—12

4 Claims

1. A test strip for quantitatively determining and permanently recording the concentration of analytes in solution, said test strip comprising a non-fibrous Nylon IV Strip having impregnated therein an enzyme and a plurality of test reagents, said enzyme and test reagents adapted to react with the analyte to produce a color, the intensity of which is indicative of said analyte concentration.

4,710,459

PROCESS AND REAGENT FOR THE DETERMINATION OF FIBRIN MONOMER IN PLASMA

Knut Bartl, Wilzhofen, and Helmut Lill, Wielenbach, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 21, 1985, Ser. No. 767,865

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430906

Int. Cl.⁴ C12Q 1/56; C12N 9/74, 9/68

U.S. Cl. 435—13

5 Claims

1. Process for the determination of fibrin monomer in plasma, comprising incubating a plasma sample containing fibrin monomer and freed from plasmin inhibitors in buffered solution with tissue plasminogen activator (EPA), plasminogen and a chromogenic plasmin substrate to form a color and measuring color formed to determine the amount of fibrin monomer present in said sample.

4,710,460

DIAGNOSTIC APPLICATIONS OF PHOSPHOFRUCTOKINASE

Kunie Nakamura, 3120-10, Kobuchi, Sagami-hara-shi, Kanagawa-ken, Japan

Filed Jun. 15, 1984, Ser. No. 620,822

Claims priority, application Japan, Jun. 20, 1983, 58-109419

Int. Cl.⁴ C12Q 1/48

U.S. Cl. 435—15

4 Claims

1. A method of diagnostically detecting malignant neoplasm from a human body fluid sample which comprises:

- (i) determining the inhibitory potency against phosphofructokinase of a sample by
 - (a) adding an aqueous solution of a phosphofructokinase as the first solution to the sample;
 - (b) then adding to the mixture of the first solution and the sample an aqueous solution of adenosine triphosphate as the second solution;
 - (c) adding to the reaction mixture of the first and second solutions and the sample, within 30 minutes after the addition of the second solution thereto, an aqueous solution of a mixture of phosphoenolpyruvic acid, betanicotinamide adenine dinucleotide in reduced form, pyruvate kinase and lactic acid dehydrogenase dissolved in water, as the third solution;
 - (d) allowing the resulting admixture to undergo enzymatic reactions;
 - (e) measuring by a spectrophotometer the light absorbance at 340 nm of the reaction solution where the enzymatic reactions are taking place, the measurement of the light absorbance at 340 nm being made in such manner that the measurement of a first value of the light absorbance is done at the commencement of the enzymatic reaction caused by the addition of the third solution and then the measurement of a second value of the light absorbance at 340 nm of said reaction solution is done after the lapse of a predetermined time;
 - (f) calculating a numerical difference by subtraction of the second value from the first value, said numerical difference being termed as the value of reduction in the light absorbance; and
 - (g) comparing the so calculated value of reduction in the light absorbance for the sample with a reference value which is the value of reduction in the light absorbance as similarly measured and calculated with reference samples collected from healthy persons who are confirmed to be free from any malignant neoplasm, to detect any abnormality in the aforesaid calculated value of reduction in the light absorbance for the sample in comparison with said reference value,
- (ii) thereby estimating whether a phosphofructokinase-inhibitor is present in the sample at such a potency that is abnormally higher than the potencies normally observed with the reference samples, and

(iii) preliminarily diagnosing for the presence of malignant neoplasms when the sample is estimated to contain the phosphofructokinase-inhibitor at an abnormally high potency.

4,710,461

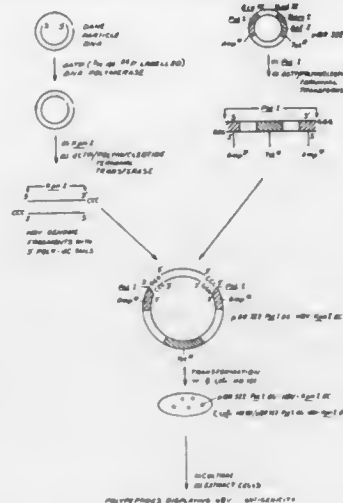
PROMOTER DERIVED FROM CHLOROPLAST DNA
Tohru Komano, Kyoto, and Kanji Ohyma, Uji, both of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo and Marubeni Kabushiki Kaisha, Osaka, both of Japan
Filed Aug. 20, 1984, Ser. No. 642,191

Claims priority, application Japan, Aug. 24, 1983, 58-154270
Int. Cl.⁴ C12P 21/00; C12N 15/00, 1/00

U.S. Cl. 435—68

13 Claims

1. A promoter comprising a DNA having the same base sequence as that of a DNA fraction having a size of about 1.1 kbp, which is obtained by cleavage by restriction enzyme Bam HI of a DNA fraction comprising all of a 16SrRNA gene and a part of a 23SrRNA gene, said DNA fraction comprising all of a 16SrRNA gene and a part of a 23SrRNA gene being obtained by cleavage by restriction enzyme Eco RI of chloroplast DNA of *Marchantia polymorpha* L.; said promoter being isolated from the rest of the chloroplast DNA of *Marchantia polymorpha* L.



gen or HBV surface antigen and being operatively linked to an expression control sequence in said DNA molecule.

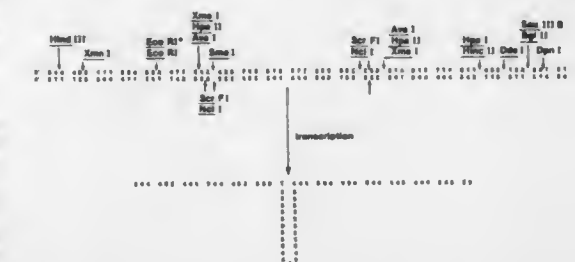
4,710,464

TRANSCRIPTION TERMINATORS
Ramamoorthy Belagaje, Stuart A. Kuhstoss, and R. Nagaraja Rao, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed Sep. 27, 1984, Ser. No. 655,184

Int. Cl.⁴ C12P 19/34, 21/00; C12N 15/00, 1/00, 1/20, 1/16, 1/18; C07H 21/04

U.S. Cl. 435—91

22 Claims



1. A DNA sequence selected from the group consisting of:

5' GAAAGCTTTCAAAGAATTCCTGGGTGGGTATT-
3' CTTTCGAAAGTTTCTTAAGGGCCACCCATAA-
TCCACCCGGGTAGTTTTTGTAACTAAGATCT 3'
AGGGTGGGGCCATCAAAAACAATTGATTCTAGA 4',

5' AATTCCTGGGTGGGTATT-
3' TTAAGGGCCACCCATAA-

CCCACCCGGGTAGTTTTTGT 3'
GGGTGGGGCCATCAAAAACA 5',

and

5' CCCGGGTGGGTATTTCACCCGGGTAGTTTTT 3'
3' GGGCCACCCATAAAGGGTGGGGCCATCAAAA 5'

wherein

A is deoxyadenyl
G is deoxyguanyl,
C is deoxycytosyl and
T is thymidyl.

4,710,463

RECOMBINANT DNA MOLECULES CAPABLE OF EXPRESSING HBV CORE AND SURFACE ANTIGENS
Kenneth Murray, Heidelberg, Fed. Rep. of Germany, assignor to Biogen N.V., Curacao, Netherlands Antilles
Continuation of Ser. No. 107,441, Dec. 26, 1979, abandoned.

This application Mar. 31, 1982, Ser. No. 363,763
Claims priority, application United Kingdom, Dec. 22, 1978, 49907/78; Dec. 27, 1978, 50039/78; Nov. 1, 1979, 7937910

Int. Cl.⁴ C12P 21/00, 21/02, 19/34; C12N 15/00, 1/20, 1/00; C07H 15/12; C07K 13/00

U.S. Cl. 435—68

36 Claims

1. A recombinant DNA molecule comprising an HBV DNA sequence, said HBV DNA sequence consisting essentially of a

4,710,465

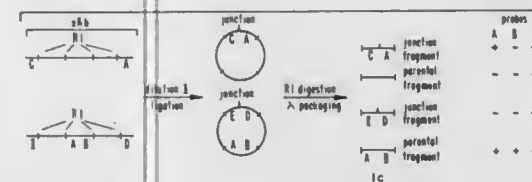
JUNCTION-FRAGMENT DNA PROBES AND PROBE CLUSTERS

Sherman M. Weissman, New Haven, and Francis Collins, Cheshire, both of Conn., assignors to Yale University, New Haven, Conn.

Filed Apr. 19, 1984, Ser. No. 601,916
Int. Cl.⁴ C12Q 1/68; C12N 15/00

U.S. Cl. 435—91

24 Claims



1. A method of forming a probe capable of binding by homologous base pairing independently to an upstream gene region which is present on a linear section of mammalian genomic DNA and which binds by homologous base pairing to a selected probe, and to a downstream gene region which is also present on said section and is spaced from the upstream gene region by a distance of about 20–2,000 kilobases, said method comprising

digesting the mammalian genomic DNA section by endonuclease treatment to produce genomic fragments, at least some of which have sizes consistent with section fragments containing said upstream and downstream regions at their opposite ends,

ligating the genomic fragments under fragment concentration conditions which favor circularization of single fragments into circular DNA species with connected fragment ends,

digesting the circular DNA species by endonuclease treatment to release digest fragments which are of a size which can be cloned, and which include fragments containing such connected fragment ends, cloning the digest fragments, and isolating cloned digest fragments which contain the connected fragment ends, and which are able to bind by homologous base pairing to the selected probe.

4,710,466

METHOD OF CLONING MODIFIED STREPTOMYCETES DNA

Charles L. Hersberger, New Palestine, and Jeffrey L. Larson, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 25, 1984, Ser. No. 654,063

Int. Cl.⁴ C12P 19/34; C12N 15/00, 1/20, 1/00; C12R 1/465
U.S. Cl. 435—91

9 Claims

1. A method for converting naturally-occurring Streptomyces DNA, said DNA incapable of being cloned into a restrictionless heterospecific host because of the presence of nucleotides other than adenine, guanine, cytosine, on thymine, said method comprising:

(a) inserting said naturally-occurring DNA into a bacteriophage cloning vector and transforming a bacterial host cell with said vector, said vector being capable of replication in said host cell, and
(b) growing said bacterial host cell transformed with bacteriophage cloning vector of step (a) under conditions suitable for replicating and thereby converting said naturally-occurring a replicated DNA consisting of nucleotides selected from the group consisting of adenine, guanine, cytosine, and thymine.

4,710,467

PROCESS FOR PREPARING PHENYLALANINE

Louis L. Wood, Rockville, and Gary J. Carlton, Elkridge, all of Md., assignors to Purification Engineering, Inc., Columbia, Md.

Continuation-in-part of Ser. No. 518,756, Jul. 29, 1983, Pat. No. 4,600,692, which is a continuation-in-part of Ser. No. 465,551, Feb. 10, 1983, and Ser. No. 358,784, Mar. 16, 1982, Pat. No. 4,436,813. This application Aug. 14, 1984, Ser. No. 640,778
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.⁴ C12P 13/22; C12N 11/08, 11/04

U.S. Cl. 435—108

1 Claim

1. A process for preparing phenylalanine which comprises contacting a reaction mixture containing phenylpyruvic acid or phenylpyruvate, and aspartic acid or a combination of aspartic acid and glutamic acid, with aspartate transaminase present in *E. coli* ATCC 11303 and recovering phenylalanine in high yield from the reaction mixture.

4,710,468

PROCESS FOR PREPARING L-CARNITINE AND CHEMICAL INTERMEDIATES EMPLOYED THEREIN
Charles J. Sih, Madison, Wis., assignor to Sigma-Tau Industrie Pharmaceutiche Riunite S.p.A., Rome, Italy

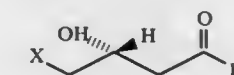
Continuation-in-part of Ser. No. 544,957, Oct. 24, 1983, which is a continuation-in-part of Ser. No. 447,171, Dec. 6, 1982, Pat. No. 4,642,290. This application Feb. 15, 1984, Ser. No. 580,439
The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

Int. Cl.⁴ C12P 7/62, 7/52

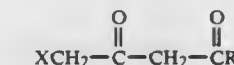
U.S. Cl. 435—135

3 Claims

1. A process for preparing optically active 4-substituted 3(R) hydroxybutyric acid derivatives having the formula and 3(R) configuration



wherein X is Cl; and R is an alkoxy radical having from 1 to 4 carbon atoms which comprises subjecting compounds having the formula



wherein X and R have the above-identified meaning to the enzymatic action of an oxido-reductase (EC 1.1.1.35), and recovering the thus formed optically active 4-substituted 3(R)-hydroxybutyric acid derivatives from the enzymatic reaction mixture.

4,710,469

NOVEL PHOSPHOTYROSYL PROTEIN PHOSPHATASE
Theming Liang, Miami, Fla., and Eve E. Slater, Short Hills, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 2, 1986, Ser. No. 858,622

Int. Cl.⁴ C12N 9/12

U.S. Cl. 435—194

4 Claims

1. A human phosphotyrosyl protein phosphatase enzyme characterized in having a molecular weight of approximately 200,000 as determined by gel filtration high pressure liquid chromatography; a subunit molecular weight of approximately 73,000 as shown by SDS reducing gel electrophoresis; being a dephosphorylating enzyme with characterizing percentage inhibition of dephosphorylation in the presence of phosphatase inhibitors as follows:

10 μM molybdate

96.4%

extending perpendicularly from the substrate surface into said substrate for the entire depth of the well below portions where source and drain regions are to be formed with sufficient doping density to substantially inhibit latch-up of the FET;

- (b) performing an ion implantation of source and drain impurities into the surface of said substrate so as to provide source and drain regions in said well region; and
- (c) performing an incomplete anneal of said well, source and drain regions such that a substantial density of residual crystal defects remain in and generally associated with the deepest portions of said source and drain regions and the respective immediately underlying portions of said well, source and drain regions, said residual defects acting as charge carrier recombination centers.

4,710,478

METHOD FOR MAKING GERMANIUM/GALLIUM ARSENIDE HIGH MOBILITY COMPLEMENTARY LOGIC TRANSISTORS

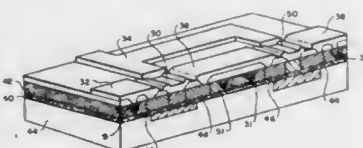
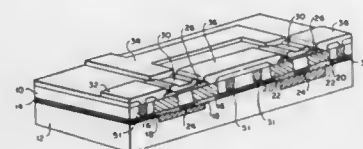
Max N. Yoder, Falls Church, and George B. Wright, McLean, both of Va., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1985, Ser. No. 736,051

Int. Cl.⁴ H01L 21/203

U.S. Cl. 437—40

6 Claims



3. A method of producing a germanium-gallium arsenide complementary logic transistor comprising the steps of:
- providing an undoped gallium arsenide substrate, growing a first layer of undoped GaAs epitaxial material on the substrate,
 - depositing a second layer of undoped amorphous germanium onto the layer of undoped GaAs,
 - implanting protons into portions of the first layer for rendering first portions of the first layer non-conducting, increasing the heat of the device to a temperature not to exceed 300° C. for crystallizing the germanium by solid phase epitaxy,
 - implanting germanium ions and gallium ions respectively into first regions of the second and first layers proximate the non-conducting first portion to create regions of high hole concentration,
 - implanting germanium ions and arsenic ions respectively into second regions of the first and second layers proximate other non-conducting first portions to create regions of high electron concentration,
 - rapid thermal annealing of the device,
 - depositing an insulating layer onto appropriate portions of the device, and
 - depositing metalization contacts over appropriate regions for providing control gates.
5. A method of producing a germanium-gallium arsenide complementary logic transistor comprising the steps of:

providing a high resistivity germanium substrate, depositing a first layer of GaAs onto the substrate at a temperature less than 320° C., depositing a second layer of doped GaAs onto the first layer at a temperature of less than 320° C., creating first regions of p-GaAs and n-GaAs in the second layer by ion implantation and subsequent rapid thermal annealing, and depositing metalization contacts over appropriate regions for providing control gates.

4,710,479

SEALING GLASS COMPOSITION WITH LEAD CALCIUM TITANATE FILLER

Toshio Yamanaka, and Fumio Yamaguchi, both of Shiga, Japan, assignors to Nippon Electric Glass Company, Limited, Otsu, Japan

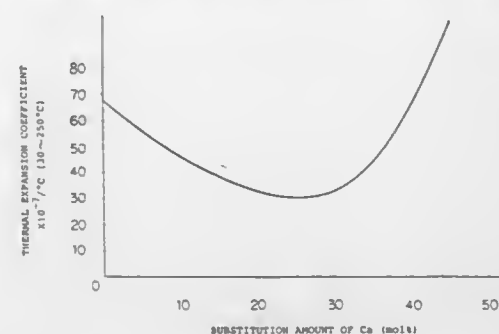
Filed Apr. 9, 1987, Ser. No. 36,072

Claims priority, application Japan, Apr. 16, 1986, 61-87542

Int. Cl.⁴ C03C 8/14, 8/24, 14/00, 3/064

U.S. Cl. 501—15

3 Claims



1. In a sealing glass composition, as used for sealing members in electronic parts, comprising solder glass powder of a low melting temperature and low expansion coefficient filler powder, the improvement wherein said filler consists essentially of a lead calcium titanate represented by the following chemical formula;



where $0 < m \leq 0.40$.

4,710,480

METHOD OF CERAMIC MOLDING WHICH PRODUCES A POROSITY GRADIENT AND THE MANUFACTURE OF COMPOUND MOLDINGS USING THIS METHOD

Rüdiger Buschmann, Amberg; Rudolf Ganz, Mainz-Consenheim; Gerd Willmann, Neidernhausen; Ludwig Wirth; Ingo Elstner, both of Wiesbaden, and Peter Jeschke, Walluf, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,280

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444407

Int. Cl.⁴ C04B 35/02, 35/80

U.S. Cl. 501—95

15 Claims

1. A ceramic molding manufactured from high-temperature resistant fire-resistant or refractory fibers; and fine-grain, fire-resistant or refractory materials; and additives chosen from a member of the group consisting of surface active materials, densifiers, flocculants, polyacrylate dispersions and combinations thereof, said molding having a porosity of less than 20%, increasing gradually and continuously along an axis of the molding up to more than 70%, wherein the areas with low porosity comprise basically the fine-grain, fire-resistant or refractory materials such that a good dispersion of the fine grain materials and refractory materials is assured, wherein the

areas of high porosity comprise the additives and a ceramic fiber on the basis of fibers selected from the group consisting of Al_2O_3 , SiO_2 , ZrO_2 , C, SiC or mixtures thereof, and wherein the intermediate areas comprise mixtures of the ceramic fiber and fire-resistant or refractory materials.

4,710,481

METHOD FOR MELTING TI OR A HIGH-TI ALLOY IN CAO REFRACTORIES

Toru Degawa, Kurashiki; Gen Okuyama, Tamano; Akio Hashimoto, Takamatsu; Seiju Uchida; Kouzou Fujiwara, both of Tamano; Makoto Ebata, Tokyo; Takashi Satou, Sendai, and Tohei Ototani, Tokyo, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1986, Ser. No. 906,487

Claims priority, application Japan, Sep. 13, 1985, 60-202813

Int. Cl.⁴ C04B 2/02

U.S. Cl. 501—123

20 Claims

1. A method for melting Ti, comprising melting Ti in a container formed of high-purity CaO materials having the inner sides thereof composed of not less than 99% by weight of CaO, not more than 0.1% by weight of SiO_2 , not more than 0.02% by weight of Fe_2O_3 , and not more than 0.5% by weight in total of other metal oxides under a nonoxidizing atmosphere.

16. CaO refractories for use in the melting of Ti or a high-Ti alloy, comprising not less than 99% by weight, of CaO not more than 0.1% by weight of SiO_2 , not more than 0.02% by weight of Fe_2O_3 , and not more than 0.5% by weight in total of other metal oxides.

4,710,482

OLEFIN POLYMERIZATION CATALYST COMPONENT

Robert C. Joh, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 18, 1986, Ser. No. 875,845

Int. Cl.⁴ C08F 4/64

U.S. Cl. 502—127

14 Claims

1. A solid magnesium halide/titanium halide catalyst component useful for the polymerization of alpha olefins which has been obtained by the process comprising:

- contacting a stable magnesium compound of the formula $[\text{Mg}_4(\text{OR})_6(\text{R}'\text{OH})_{10}]\text{X}$ where X is a counter ion having a total charge of -2 and R and R', which may be the same or different, are selected from alkyl groups of 1 to 4 carbon atoms with a halide of tetravalent titanium in the presence of an electron donor;
- contacting the resulting halogenated product with a tetravalent titanium halide;
- washing the resulting product to remove unreacted titanium compounds; and
- recovering the solid product.

4,710,483

NOVEL CARBONACEOUS MATERIAL AND PROCESS FOR PRODUCING A HIGH BTU GAS FROM THIS MATERIAL

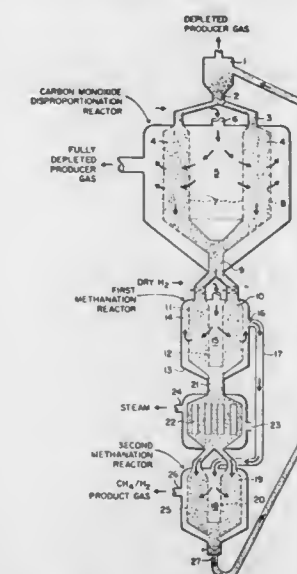
Maksymilian Burk, and Jack L. Blumenthal, both of Los Angeles, Calif., assignors to TRW Inc., Redondo Beach, Calif. Division of Ser. No. 99,789, Dec. 3, 1979, abandoned, which is a continuation-in-part of Ser. No. 917,240, Jun. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 817,647, Jul. 21, 1977, abandoned. This application Dec. 17, 1984, Ser. No. 682,459

Int. Cl.⁴ B01J 23/74, 27/22; C10J 3/00; C10K 3/04

U.S. Cl. 502—185

24 Claims

1. A fibrous carbonaceous material comprising partially graphitized carbon formed by disproportionation of carbon monoxide at a temperature above 400° C. to about 700° C. at a pressure of about 1 to about 100 atmospheres over a metallic initiator comprising initiator alloy, the initiator alloy comprising at least two of iron, cobalt, and nickel, the fibrous carbonaceous material comprising from about 30 to about 99.5% by weight carbon and from about 0.5 to about 70% by weight



being nodules which are dispersed throughout the major phase and are intimately associated with and at least partly bonded to the carbon in the major phase, the minor phase comprising the ferrous metal product alloy.

4,710,484

METHOD FOR PREPARING A SUPPORTED MIXED-METAL OXIDE OXIDATION CATALYST

Serge R. Dolhyj, Parma; Wilfrid G. Shaw, Lyndhurst, and Marc A. Pepera, Northfield Center, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 25, 1982, Ser. No. 392,199

Int. Cl.⁴ B01J 27/14, 27/198, 27/188, 27/19

U.S. Cl. 502—208

10 Claims

1. An improved method for preparing a supported, mixed-metal oxide oxidation catalyst, the method comprising:
- forming a catalyst precursor with a volatile content from a support and the mixed-metal components,
 - reducing the volatile content of the precursor of (1), and
 - calcining the precursor of (2) to a finished catalyst, the improvement comprising conditioning the catalyst precursor with a solution of at least one C_1 — C_8 aliphatic alcohol that is substantially free of water and is substantially removed upon calcination subsequent to reducing the volatile content of the

4,710,495

SOFT STEROIDS HAVING ANTI-INFLAMMATORY ACTIVITY

Nicholas S. Bodor, Gainesville, Fla., assignor to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

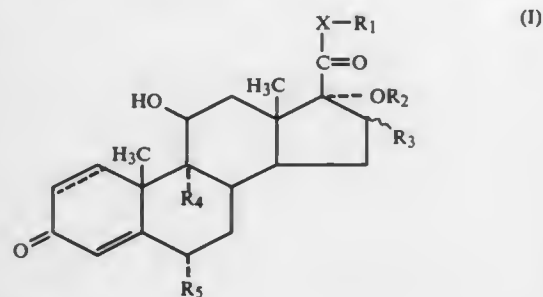
Continuation-in-part of Ser. No. 626,535, Jun. 29, 1984, abandoned, which is a continuation of Ser. No. 418,458, Sep. 15, 1982, abandoned, which is a continuation-in-part of Ser. No.

265,785, May 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 168,453, Jul. 10, 1980, abandoned. This application Apr. 8, 1985, Ser. No. 721,282

Int. Cl.⁴ A61K 31/58, 31/56; C07J 21/00, 1/00

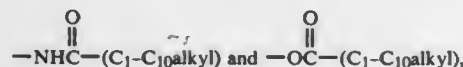
U.S. Cl. 514-174

70 Claims

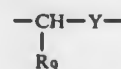
1. A compound selected from the group consisting of:
(a) a compound of the formula

wherein:

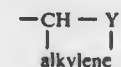
R₁ is C₁-C₁₀alkyl; C₂-C₁₀ (monohydroxy or polyhydroxy) alkyl; C₁-C₁₀ (monohalo or polyhalo)alkyl; or —CH₂COOR₆ wherein R₆ is unsubstituted or substituted C₁-C₁₀ alkyl, C₃-C₈ cycloalkyl, C₃-C₈ cycloalkenyl or C₂-C₁₀ alkenyl, the substituents being selected from the group consisting of halo, lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl,



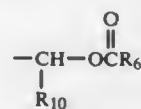
or R₆ is unsubstituted or substituted phenyl or benzyl, the substituents being selected from the group consisting of lower alkyl, lower alkoxy, halo, carbamoyl, lower alkoxy-carbonyl, lower alkanoyloxy, lower haloalkyl, mono(lower alkyl)amino, di(lower alkyl)amino, mono(lower alkyl)carbamoyl, di(lower alkyl)carbamoyl, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl; or R₁ is —CH₂CONR₇R₈ wherein R₇ and R₈, which can be the same or different, are each hydrogen, lower alkyl, C₃-C₈ cycloalkyl, phenyl or benzyl, or R₇ and R₈ are combined such that —NR₇R₈ represents the residue of a saturated monocyclic secondary amine; or R₁ is unsubstituted or substituted phenyl or benzyl, the substituents being selected from the group of phenyl and benzyl substituents defined hereinabove with respect to R₆; or R₁ is



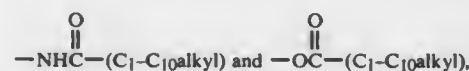
(lower alkyl) wherein Y is —S—, —SO—, —SO₂— or —O— and R₉ is hydrogen, lower alkyl or phenyl, or R₉ and the lower alkyl group adjacent to Y are combined so that R₁ is a cyclic system of the type



wherein Y is defined as above and the alkylene group

contains 3 to 10 carbon atoms, of which at least 3 and no more than 6 are ring atoms; or R₁ is

wherein R₆ is defined as hereinabove and R₁₀ is hydrogen, lower alkyl, phenyl or halophenyl;
R₂ is unsubstituted or substituted C₁-C₁₀ alkyl, C₃-C₈ cycloalkyl, C₃-C₈ cycloalkenyl or C₂-C₁₀ alkenyl, the substituents being selected from the group consisting of halo, lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl,



or R₂ is unsubstituted or substituted phenyl or benzyl, the substituents being selected from the group consisting of lower alkyl, lower alkoxy, halo, carbamoyl, lower alkoxy-carbonyl, lower alkanoyloxy, lower haloalkyl, mono(lower alkyl)amino, di(lower alkyl)amino, mono(lower alkyl)carbamoyl, di(lower alkyl)carbamoyl, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl;

R₃ is hydrogen, α-hydroxy, β-hydroxy, α-methyl, β-methyl, =CH₂, or α- or β-OR₂ wherein R₂ is identical to R₂ as defined hereinabove;

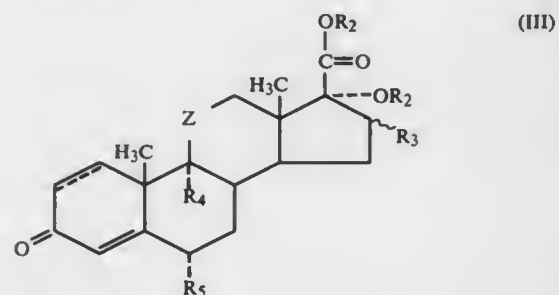
R₄ is hydrogen, fluoro or chloro;R₅ is hydrogen, fluoro, chloro or methyl;

X is —O— or —S—;

and the dotted line in ring A indicates that the 1,2 linkage is saturated or unsaturated;

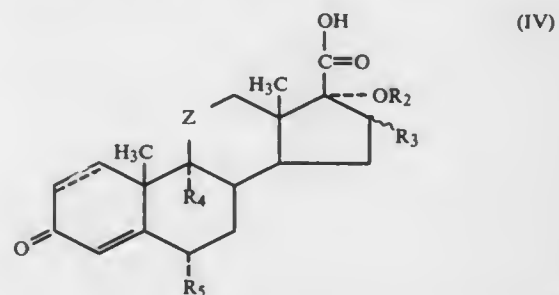
(b) a quaternary ammonium salt of a compound of formula (I) wherein at least one of R₁ and R₂ is a halo-substituted alkyl group;

(c) a compound of the formula

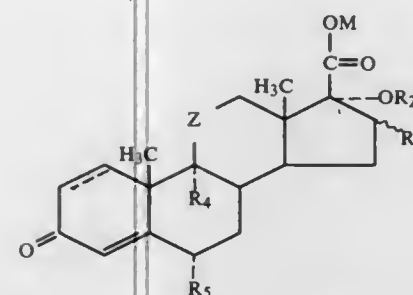


wherein R₂, R₃, R₄, R₅, and the dotted line is ring A are as defined in (a) above, Z is carbonyl or β-hydroxymethylene and R₃ is hydrogen, α-methyl, β-methyl, =CH₂ or α- or β-OR₂ wherein R₂ is identical to R₂ above;

(d) a compound of the formula

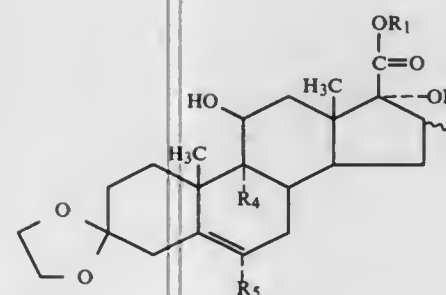
wherein R₂, R₄, R₅, and the dotted line in ring A are as

defined in (a) above, Z is carbonyl or β-hydroxymethylene and R₃ is hydrogen, α-methyl, β-methyl, =CH₂ or α- or β-OR₂ wherein R₂ is identical to R₂ above;
(e) a compound of the formula

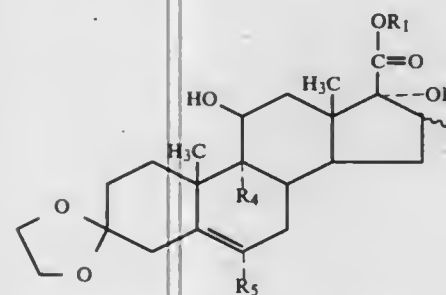


wherein M is alkali metal, thallium, alkaline earth metal/2 or NH₄ and R₂, R₃, R₄, R₅, Z and the dotted line in ring A are as defined in (a) and (d) above;

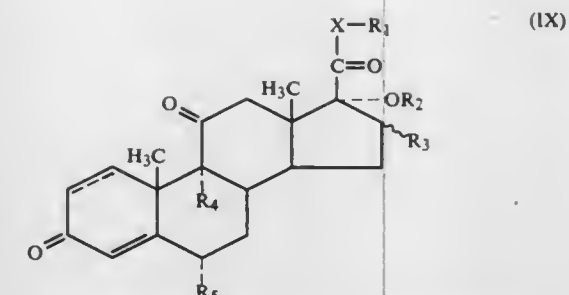
(f) a compound of the formula

wherein R₃ is hydrogen, α-methyl, β-methyl,

or β-OR₂, and R₁, R₄ and R₅ are as defined in (a) above;
(g) a compound of the formula

wherein R₃ is hydrogen, α-methyl, β-methyl,

or β-OR₂, and R₁, R₂, R₄ and R₅ are as defined in (a) above;
(h) a compound of the formula



wherein R₁, R₂, R₃, R₄, R₅, X and the dotted line in ring A are as defined in (g) above.

64. A pharmaceutical composition of matter comprising an anti-inflammatory effective amount of a compound of claim 1 or 2 having the structural formula (I), in combination with a non-toxic pharmaceutically acceptable carrier therefor suitable for topical or other local application.

4,710,496

PYRROL-1-YLPHENYLDIHYDROPYRIDAZINONES, THEIR PREPARATION AND THEIR USE

Karl-Heinz Geiss, Beindersheim; Bernhard Schmied, Dossenheim; Manfred Raschack, Weisenheim am Sand; Hans-Dieter Lehmann, Hirschberg; Josef Gries, Wachenheim, and Klaus Ruebsamen, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,278

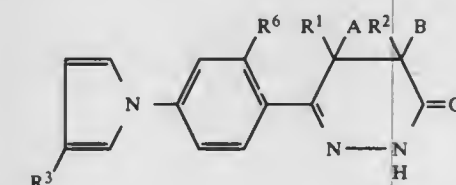
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 3425632

Int. Cl.⁴ A61K 31/50; C07D 403/10, 403/14, 401/14

U.S. Cl. 514-183

13 Claims

1. A pyrrol-1-ylphenyldihydropyridazinone of the formula I



where R¹ is hydrogen, methyl or hydroxymethyl, R² is hydrogen or methyl or R¹ and R² together form a methylene or ethylene radical, A and B are each hydrogen, R³ is formyl or hydroxymethyl or CH₂—NR⁴R⁵ where R⁴ is C₁-C₆-alkyl or phenyl-C₁-C₃-alkylene and R⁵ is hydrogen, C₁-C₆-alkyl or formyl or R⁴ and R⁵ together form a C₄-C₇-alkylene radical and R⁶ is hydrogen, and its addition salts with acids.

2. A therapeutic composition which inhibits platelet aggregation, reduces blood pressure, inhibits gastric acid secretion and serves as a cardiotonic agent comprising a pharmaceutical excipient and an effective amount of a compound of claim 1 as the active compound.

4,710,497

METHOD FOR PERCUTANEOUSLY ADMINISTERING
PHYSIOLOGICALLY ACTIVE AGENTS

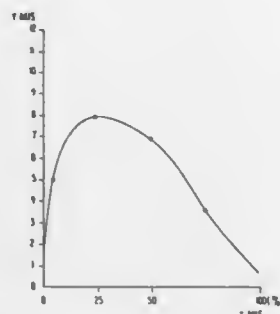
Jorge Heller, Woodside; Wilfred A. Skinner, Portola Valley; Kenichiro Saito, Menlo Park, all of Calif., and Susumu Satoh, Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 729,023, Apr. 30, 1985, abandoned, which is a continuation of Ser. No. 496,732, May 20, 1983, abandoned. This application May 31, 1985, Ser. No. 739,790

Int. Cl.⁴ A61K 31/55

U.S. Cl. 514—221

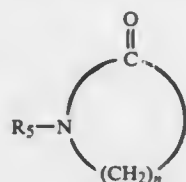
8 Claims



1. A method for percutaneously administering a benzodiazepine to a mammal which comprises applying the physiologically active agent to the skin of the mammal in a mixture comprising at least one of the following components A and at least one of the following components B:

Component A: an alcohol ester of an aliphatic carboxylic acid having a total number of carbon atoms of from 7 to 18 or mixtures thereof;

Component B: a compound represented by the formula:



wherein R₅ represents a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms and n represents an integer of 3 to 5 or mixtures thereof, wherein the amount of the component A is from 0.1 to 80% by weight based on the total weight of the components A and B.

4,710,498

PYRIDYLOXY DERIVATIVES

Fujio Nohara, Takaoka, and Tomoaki Fujinawa, Toyama, both of Japan, assignors to Ikeda Mohando Co., Ltd., Toyama, Japan

Filed Sep. 30, 1985, Ser. No. 781,881

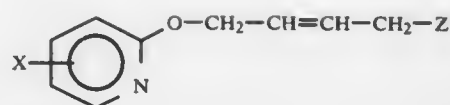
Claims priority, application Japan, Oct. 2, 1984, 59-206690; Mar. 12, 1985, 60-50207

Int. Cl.⁴ A61K 31/501, 31/53, 31/44, 31/41; C07D 401/12, 401/14, 213/64

U.S. Cl. 514—242

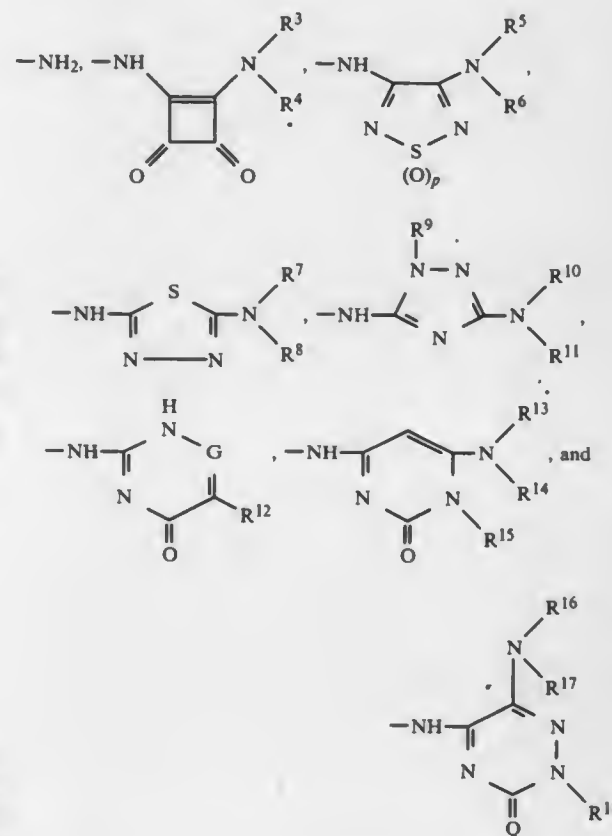
22 Claims

18. A pharmaceutical composition for treatment of digestive ulcers, comprising an effective amount of at least one member selected from the group consisting of pyridyloxy derivatives having the formula:



wherein

X is R¹R²N-A-(wherein R¹ and R² are, individually hydrogen atoms of C₁₋₆ alkyl groups, or R¹ and R², taken together with the nitrogen atom bonded thereto, form a four to eight-membered heterocyclic ring, with the nitrogen atom being the sole heteroatom in the ring, which is unsubstituted or substituted by a C₁₋₄ alkyl group; A is a straight-chain or branched-chain alkylene group having 1 to 6 carbon atoms; and Z is selected from the group consisting of



wherein

R³, R⁴, R⁵, R⁶, R⁷, R⁸, R⁹, R¹⁰, R¹¹, R¹³, R¹⁴, R¹⁵, R¹⁶, R¹⁷ and R¹⁸ are, individually, hydrogen, C₁₋₆ alkyl, C₁₋₆ alkenyl, C₁₋₆ alkynyl, aralkyl groups having a C₁₋₆ alkyl group, or a heterocyclic aralkyl group selected from the group consisting of 2-pyridylmethyl, 3-pyridylmethyl, 4-pyridylmethyl, 2-furanylmethyl, 2-thiofuranylmethyl, 3-thiofuranylmethyl, 5-dimethylaminomethyl-2-furanylmethyl and 5-dimethylaminomethyl-2-thiofuranylmethyl groups; or R³ and R⁴, R⁵ and R⁶, R⁷ and R⁸, R¹⁰ and R¹¹, R¹³ and R¹⁴, R¹⁶ and R¹⁷, respectively, taken together with the corresponding nitrogen atom bonded thereto, form a heterocyclic group selected from the group consisting of azetidino, pyrrolidino, piperidino, and 4-methylpiperazino groups, wherein the aryl portion of said aralkyl group is phenyl or phenyl substituted with methoxy or dimethylaminomethyl groups;

R¹² is selected from the group selected from hydrogen, C₁₋₆ alkyl, a dialkylaminoalkyl group selected from (R¹⁹R²⁰N(CH₂)_q), a dialkylaminoalkylbenzyl group selected from (R²¹R²²N(CH₂)_r-C₆H₅-CH₂-) and a pyridylalkyl group selected from (C₅H₅N-(CH₂)_s-),

wherein R¹⁹, R²⁰, R²¹ and R²² are alkyl groups having 1 to 6 carbon atoms; q, r and s indicate integers of 1 to 6; G is a nitrogen or carbon atom; p is 0, 1 or 2; and Q is an oxygen or sulfur atom; or pharmaceutically acceptable salts, hydrates and solvates thereof; and a pharmaceutically acceptable carrier or excipient.

4,710,499

NEW DERIVATIVES OF PYRIDAZINE ACTIVE ON THE
CENTRAL NERVOUS SYSTEM

Camille G. Wermuth, Strasbourg, and Jean-Pierre Chambon, Montarnaud, both of France, assignors to Sanofi, Paris, France

Continuation of Ser. No. 406,042, Aug. 6, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,363

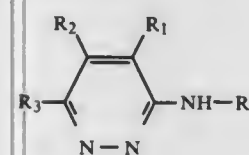
Claims priority, application France, Aug. 11, 1981, 81 15546

Int. Cl.⁴ C07D 237/20; A61K 31/50

U.S. Cl. 514—247

20 Claims

1. Pyridazine compounds having the formula:



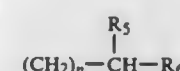
in which

R₁ is a lower alkyl having 1 to 4 carbon atoms or a phenyl group;

R₂ represents H;

R₃ represents H or phenyl;

R₄ represents a group



in which n is an integer of from 1 to 7, R₅ is H or CH₃ and R₆ is selected from H, OR₇, an ester group OCOR₇ in which R₇ represents a lower alkyl radical having 1 to 4 carbon atoms as well as the pharmaceutically acceptable acid addition salts of said compounds.

4,710,500

1-(4'-FLUOROPHENYL)-3,5-SUBSTITUTED INDOLES
USEFUL IN THE TREATMENT OF PSYCHIC
DISORDERS AND PHARMACEUTICAL
COMPOSITIONS THEREOF

Jens K. Perregaard, Oelstykke, Denmark, assignor to H. Lundbeck A/S, Copenhagen-Valby, Denmark

Filed Apr. 1, 1986, Ser. No. 846,912

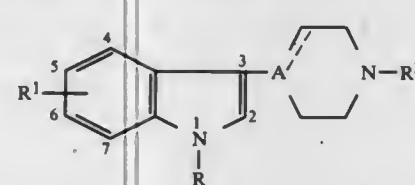
Claims priority, application United Kingdom, Apr. 10, 1985, 8509164

Int. Cl.⁴ A61K 31/495; C07D 403/14, 403/04, 401/04

U.S. Cl. 514—254

9 Claims

1. A compound selected from the group consisting of a) an indole derivative of the following formula:



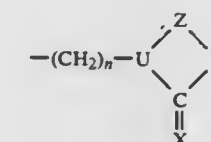
wherein R is selected from phenyl, optionally substituted with one substituent selected from halogen and trifluoromethyl and a hetero aromatic group selected from 2-thienyl, 3-thienyl, in which

2-furoyl, 3-furoyl, 2-thiazol, 2-oxazol, 2-imidazole, 2-pyridyl, 3-pyridyl and 4-pyridyl;

R¹ is selected from hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, cyano, nitro, lower alkylthio, trifluoromethyl, lower alkylsulfonyl, amino, lower alkylamino and lower di-alkylamino;

"A" is selected from nitrogen and carbon, and the dotted line indicates - when A is carbon - an optional bond;

R² is selected from hydrogen, cycloalkyl of C₃-C₄ inclusive lower alkyl and lower alkenyl, optionally substituted with one or two hydroxy groups, any hydroxy group present being optionally esterified with an aliphatic carboxylic acid having from two to twenty-four carbon atoms inclusive, and the group



wherein "n" is an integer of 2-6;

X is selected from oxygen and sulfur, C=X may constitute the group CH=when Y is selected from =N- and =CH-;

Y is selected from oxygen, sulfur, CH₂ and N-R³, where R³ is selected from hydrogen and lower alkyl, lower alkenyl and a cycloalkylmethyl group, said "cycloalkyl" having from three to six carbon atoms inclusive;

Z is selected from -(CH₂)_m-, "m" being selected from 2 and 3, and -CH=CH and 1,2-phenylene optionally substituted with a group selected from halogen and trifluoromethyl, and -CO (or S)CH₂-;

U is selected from nitrogen and carbon, provided that when R¹ is chloro, A is nitrogen and R² is selected from methyl and cyclohexyl, R may not be phenyl; and

(b) a pharmaceutically acceptable acid addition salt thereof.

7. A method for the treatment of disorders comprising administering amount in unit dosage form of a compound of claim 1, as an active ingredient, optionally together with one or more pharmaceutical diluents or carriers, to a warmblooded animal including a human being.

4,710,501

CIRCULATION ACTIVE

PYRIMIDINYL-DIHYDROPYRIDINES

Gerhard Franckowiak; Martin Bechem; Rainer Gross, all of Wuppertal; Michael Kayser, Hagen; Matthias Schramm, Cologne, all of Fed. Rep. of Germany, and Günter Thomas, Milan, Italy, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 862,869

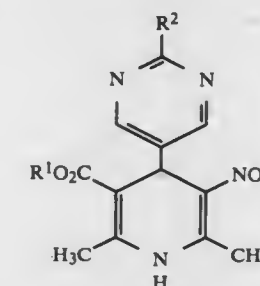
Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517473

Int. Cl.⁴ A61K 31/44; C07D 401/04, 239/24

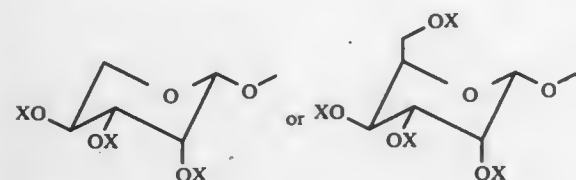
U.S. Cl. 514—256

7 Claims

1. A 4-pyrimidinyl-1,4-dihydropyridine of the formula

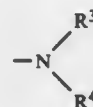


R¹ represents straight-chain, branched or cyclic alkyl or alkenyl with up to 8 C atoms, which is optionally substituted by phenyl, phenoxy, phenylthio, cyano, hydroxyl, one or more fluorine, chlorine or bromine, by C₁-C₆-alkoxy, C₁-C₆-alkylthio, trifluoromethoxy, carboxyl, C₁-C₄-alkoxycarbonyl, or pyridyl, optionally substituted by fluorine, chlorine, methyl or trifluoromethyl, or by a group of the formulae



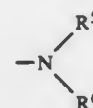
in which

X represents hydrogen or acetyl, or is substituted by an amino group of the formula



wherein

R³ and R⁴ are identical or different and represent hydrogen, or represent phenyl, or represent benzyl, or represent C₁-C₄-alkyl, or represent benzoyl or acetyl, and R² represents hydrogen, or represents straight-chain, branched or cyclic alkyl or alkenyl which has up to 6 C atoms and is optionally substituted by one or more fluorine, chlorine, bromine or cyano, or represents fluorine, chlorine or bromine, or represents phenyl, or represents C₁-C₄-alkoxy, or represents an amino group of the formula



wherein

R⁵ R⁶ are identical or different and (optionally) represent hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₅-C₇-cycloalkyl, phenyl, benzyl, benzoyl or acetyl.

4. A positively inotropic composition comprising an amount effective thereof of a compound or salt according to claim 1 in admixture with a diluent.

4,710,502

3-HETEROARYLALKYL-4-QUINAZOLINONES

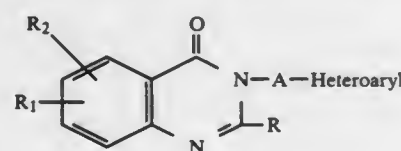
William B. Wright, Jr., and Andrew S. Tomcufcik, both of Bergen, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 4, 1985, Ser. No. 795,022
Int. Cl.⁴ A61K 31/505; C07D 403/06

U.S. Cl. 514-259

7 Claims

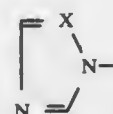
7. A composition of matter in dosage unit form, said composition comprising from about 10 mg to about 700 mg of a compound selected from those of the formula:



wherein A is a divalent moiety of the formula:



wherein n is an integer from 3 to 10, inclusive; R is hydrogen or alkyl having from one to four carbon atoms; R₁ and R₂ may be the same or different and may be selected from the group consisting of hydrogen, halogen, or trifluoromethyl provided that at least one R₁ or R₂ is halogen or trifluoromethyl; wherein Heteroaryl is



wherein X is CH or N, together with the pharmaceutically acceptable salts thereof in association with a pharmaceutically acceptable carrier.

4,710,503

6-THIOXANTHINE DERIVATIVES

Peter Hofer, Liestal, Switzerland, assignor to Euroceltique S.A., Luxembourg, Luxembourg

Filed Feb. 7, 1985, Ser. No. 699,254
Int. Cl.⁴ C07D 473/06; A61K 31/52

U.S. Cl. 514-263

7 Claims

1. The compound 3-propyl-6-thioxanthine and pharmaceutically acceptable salts thereof.

4,710,504

ANTI-DEPRESSANT SPIRO HEXAHYDRO ARYLQUINOLIZINE DERIVATIVES, COMPOSITION, AND METHOD OF USE THEREFOR

John J. Baldwin, Gwynedd Valley; Joel R. Huff, Lederach; Joseph P. Vacca, Telford; Steven D. Young, Lansdale; Jane deSolms, Norristown, and James P. Guare, Jr., Quakertown, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

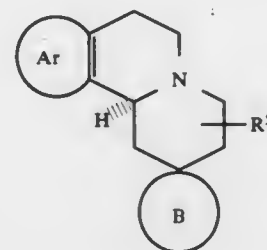
Filed Apr. 4, 1986, Ser. No. 848,262

Int. Cl.⁴ A61K 31/415, 31/305; C07D 455/00, 471/20

U.S. Cl. 514-267

24 Claims

1. A compound of structural formula:

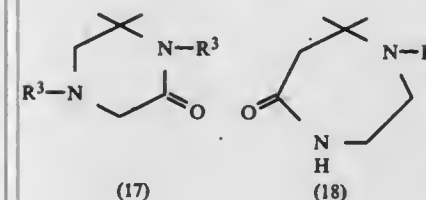
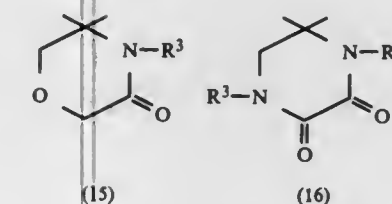
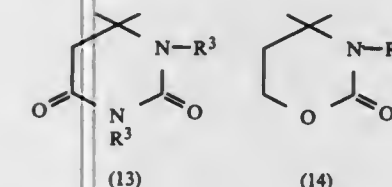
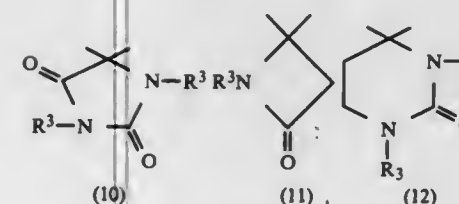
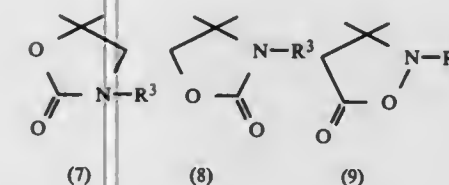
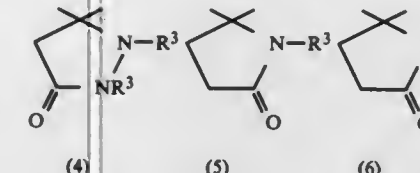
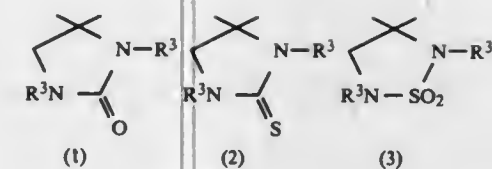


wherein

Ar represents an aromatic heterocycle selected from R¹, R²-benzo[b]furo-, R¹, R²-benzo[b]thieno-, thieno-, furo-, R¹, R²-benzo-, R¹, R²-pyridino-, thiazolo-, imidazo-, and pyrazolo; R¹ and R² are independently:

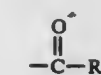
- (1) hydrogen,
- (2) halo,
- (3) hydroxy,
- (4) C₁-alkoxy, or
- (5) C₁-alkyl;

B represents a spiroheterocycle of 4-7 members selected



R³ is

- (1) hydrogen,
- (2)



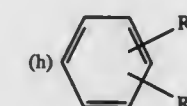
wherein R is hydrogen or C₁-alkyl,

- (3) C₁-alkyl, either unsubstituted or substituted with one or more of;
- (a) hydroxy,
- (b) carboxy,

- (c) C₁-alkoxycarbonyl,
- (d) halo,
- (e) C₁-alkoxy,

(f) -CONR⁶R⁷, wherein R⁶ and R⁷ are the same or different and are hydrogen or C₁-alkyl, or joined together directly to form a 5-7 membered ring selected from pyrrolidino, and piperidino or through a heteroatom selected from O, N and S, to form a 6-membered heterocycle selected from morpholino, piperazino, and N-C₁-alkylpiperazino with the nitrogen to which they are attached,

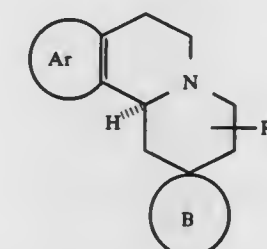
- (g) -NR⁶R⁷,



- (i) -SO₂NR⁶R⁷ or
- (j) -SO₂(C₁-alkyl); and R⁵ is

- (1) hydrogen,
- (2) C₁-alkyl, either unsubstituted or substituted with one or more of
- (a) -OR⁸, wherein R⁸ is
- (i) H, or
- (ii) C₁-alkyl
- (b) -NR⁸COR⁸, or
- (c) -CO₂R⁸,
- (3) -CO₂R⁸, or
- (4) CONR⁶R⁷.

13. A pharmaceutical composition having α₂-adrenoceptor antagonist activity comprising a pharmaceutically acceptable carrier and an effective α₂-adrenoceptor antagonist amount of a compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein Ar, B, and R⁵ are as defined in claim 1.

19. A method of treating depression, which comprises administering to a patient in need of such treatment an effective antidepressant amount of the compound of claim 1 or a pharmaceutically acceptable salt thereof.

4,710,505

ASYMMETRIC HETEROCYCLIC ESTER DERIVATIVES OF 1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACIDS

Jacques Robin; Didier Pruneau, both of Dijon, France, and Alain Bonenfant, Genève, Switzerland, assignors to Societe de Recherches Industrielles (S.O.R.I.), Paris, France

Filed Feb. 19, 1986, Ser. No. 830,927

Claims priority, application France, Feb. 20, 1985, 85 02412

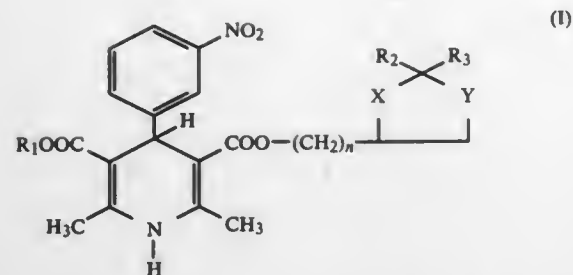
Int. Cl.⁴ A61K 31/44; C07D 405/12

U.S. Cl. 514-278

8 Claims

1. An asymmetric heterocyclic ester compound of a 1,4-dihydropyridine-3,5-dicarboxylic acid, selected from the group consisting of:

- (i) 1,4-dihydro-2,6-dimethylpyridine-3,5-dicarboxylic acid esters of the formula:



wherein R_1 is a C_1 - C_4 -alkyl group; X and Y, which are identical or different, each represent O or S, at least one of the symbols X and Y being different from S; n is an integer equal to 1 or 2; and R_2 and R_3 , which are identical or different, each represent the hydrogen atom, the methyl group, the trifluoromethyl group, the phenyl group or a halogenophenyl group, wherein R_2 and R_3 taken together, can form a 5-membered to 7-membered spirocycloalkyl group with the carbon atom of the heterocycle to which they are bonded;

- (ii) optical isomers thereof; and
(iii) diastereoisomers thereof.

4,710,506

ANTIHYPERTENSIVE THIENOPYRIDINES

Roy V. Davies, Nottinghamshire, and James Fraser, Nottingham, both of England, assignors to The Boots Company PLC, England

Filed Jun. 13, 1986, Ser. No. 874,337

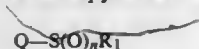
Claims priority, application United Kingdom, Jun. 15, 1985, 8515207

Int. Cl.⁴ A61K 31/44; C07D 495/04

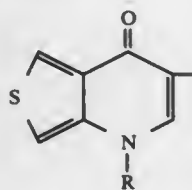
U.S. Cl. 514-301

36 Claims

1. A thienopyridone of the formula V,



or a pharmaceutically acceptable acid addition salt thereof, wherein n is 0 or 1, R_1 is lower alkyl, and Q is a group of the formula VA or VB,

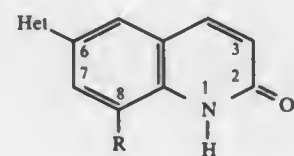


VA

or a pharmaceutically-acceptable salt thereof, wherein "Het" is pyridyl or triazolyl, optionally substituted by 1 or 2 substituents each selected from C_1 - C_4 alkyl, C_1 - C_4 alkoxy, cyano, amino and carbamoyl, said "Het" group being attached by a carbon atom to the 6-position of the quinolone nucleus; and R, which is attached to the 8-position, is hydrogen, C_1 - C_4 alkyl, C_1 - C_4 alkoxy, C_1 - C_4 alkylthio, C_1 - C_4 alkylsulphonyl, C_1 - C_4 alkylsulphonyl, halo, CF_3 , hydroxy, hydroxymethyl, or cyano.

VB

6. A method for the treatment of congestive heart failure in a patient which comprises administering to the patient a cardiac stimulating effective amount of a compound of the formula (IA) as claimed in claim 1, or a pharmaceutically acceptable salt thereof.



(IA)

4,710,508

O-SUBSTITUTED TETRAHYDROPYRIDINE OXIME CHOLINERGIC AGENTS

Stephen C. Bergmeier; David A. Downs; Walter H. Moos; David W. Moreland, and Haile Tecle, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 8, 1986, Ser. No. 939,507

Int. Cl.⁴ A61K 31/44; C07D 211/70

U.S. Cl. 514-357

42 Claims

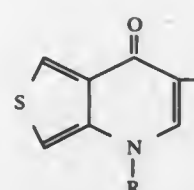
1. A compound having the formula



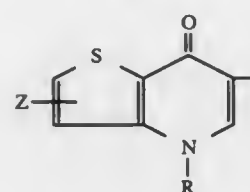
V

wherein n is 0 or 1, R_1 is lower alkyl, and Q is a group of the formula VA or VB,

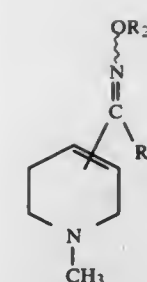
VA



VB



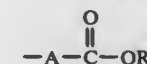
wherein R is lower alkyl and Z in formula VB is hydrogen, lower alkoxy, 2-(lower alkyl), 2-phenyl, 2-(2-halophenyl) or 2-(3-halophenyl), in combination with a pharmaceutically acceptable carrier.



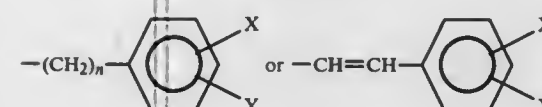
wherein

 R_1 is

straight or branched alkyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxy of from one to four carbon atoms;
straight or branched alkenyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxy of from one to four carbon atoms;
straight or branched alkynyl of from one to six carbon atoms optionally substituted from one to four carbon atoms;
cycloalkyl of from three to eight carbon atoms;



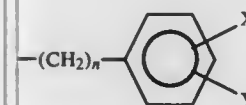
where A is a bond or is a hydrocarbon chain of from one to four carbon atoms and when containing two or more carbon atoms may contain one double bond and R_4 is alkyl of from one to six carbon atoms; or



where n is zero to four and X and Y are independently selected from
hydrogen,
fluorine,
chlorine,
bromine,
hydroxy,
straight or branched alkyl of from one to three carbon atoms, or
alkoxy of from one to four carbon atoms;

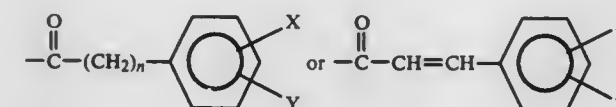
 R_2 is selected from

straight or branched alkyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxy of from one to four carbon atoms;
straight or branched alkenyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxy of from one to four carbon atoms;
straight or branched alkynyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxy of from one to four carbon atoms;
cycloalkyl of from three to six carbon atoms;

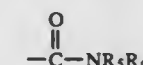


where n is zero to four and X and Y are independently selected from
hydrogen,
fluorine,

chlorine,
bromine,
hydroxy,
straight or branched alkyl of from one to three carbon atoms, or alkoxy of from one to four carbon atoms;
alkylcarbonyl of from two to twelve carbon atoms;
alkenylcarbonyl of from three to twelve carbon atoms;
alkynylcarbonyl of from three to twelve carbon atoms;



where n, X and Y are as previously defined; or



where R_5 and R_6 are independently selected from hydrogen, alkyl of from one to four carbons, and phenyl; or a pharmaceutically acceptable acid addition salt thereof.

39. A pharmaceutical composition useful for alleviating pain in a mammal comprising an analgesically effective amount of a compound as defined in claim 1 together with a pharmaceutically acceptable carrier.

4,710,509

SUBSTITUTED PHENYLSULFONYLAZOLES

Junichi Saito, Mitaka; Tatsuo Tamura, Hamura; Yoshio Kurahashi, Hachioji; Shigeru Uzawa, Sagami; Noboru Matsumoto, Hachioji, and Naoko Yamaguchi, Hino, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K. K., Tokyo, Japan

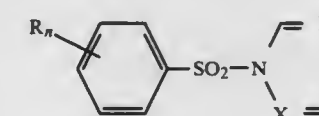
Continuation-in-part of Ser. No. 771,454, Aug. 30, 1985, abandoned. This application Jun. 20, 1986, Ser. No. 876,547
Claims priority, application Japan, Sep. 3, 1984, 59-182579

Int. Cl.⁴ C07D 249/08, 233/56; A01N 43/50, 43/653

U.S. Cl. 514-384

11 Claims

1. A substituted phenylsulfonylazole of the formula (I)



(I)

wherein

X is N or a CH-group,
R each independently is halogen, lower alkyl, lower alkoxy, trifluoromethyl, nitro, optionally halogeno-substituted phenyl or cycloalkyl, and
n is 2 or 3 and, if R is not a methyl group, may also be 1.

10. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim 1.

4,710,510

PYRROLOBENZIMIDAZOLES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, AND USE OF THEM TO TREAT CERTAIN HEART AND CIRCULATORY DISEASES

Alfred Mertens, Schriesheim; Jens-Peter Hölck, Mannheim; Wolfgang Kampe, Heddeshheim; Bernd Müller-Beckmann, Grünstadt; Klaus Strein, Hemsbach, and Wolfgang Schumann, Heidelberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,260

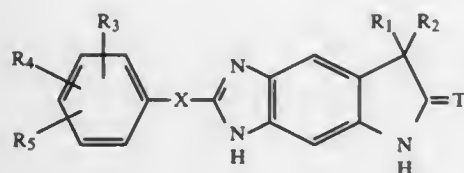
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445669

Int. Cl.⁴ A61K 31/415, 31/55; C07D 487/04

U.S. Cl. 514—394

14 Claims

1. A compound or tautomer thereof, of the formula:



wherein

R₁ is hydrogen, C₁–C₆ alkyl, C₂–C₆ alkenyl or C₃–C₇ cycloalkyl;

R₂ is hydrogen, cyano, C₁–C₆ alkyl, C₂–C₆ alkenyl, or a carbonyl group substituted by hydroxyl, C₁–C₆ alkyl, C₁–C₆ alkoxy, amino, C₁–C₆ alkylamino, C₂–C₁₂ dialkylamino or hydrazino, or

R₂ and R₁ together with the carbon to which they are attached form a C₃–C₇ spirocycloalkyl ring, or R₁ and R₂ together form a C₃–C₇ alkylidene or a C₃–C₇ cycloalkylidene radical;

R₃, R₄ and R₅, which can be the same or different, each represent hydrogen; C₁–C₅ alkanesulphonyloxy; trifluoromethane-sulphonyloxy; C₁–C₅ alkanesulphonylamino; trifluoromethane-sulphonylamino; N-alkyl-alkanesulphonylamino with 1 to 5 carbon atoms in each alkyl moiety; C₁–C₅ N-alkyl-trifluoromethanesulphonylamino; C₁–C₅ alkylsulphenylmethyl; C₁–C₅ alkylsulphenylmethyl; C₁–C₅ alkylsulphonylmethyl; carbonyl substituted by hydroxyl, C₁–C₅ alkoxy, amino, C₁–C₅ alkylamino or C₂–C₁₀ dialkylamino; sulphonyl substituted by amino, C₁–C₅ alkylamino, C₂–C₁₀ dialkylamino, morpholino, pyrrolidino, piperidino or hexamethylene-imino, C₁–C₅ alkylcarbonylamino, aminocarbonylamino or C₁–C₅ alkylaminocarbonylamino radical, an C₁–C₅ alkylthio, C₁–C₅ alkylsulphinyl or C₁–C₅ alkylsulphonyl radical, a nitro, halogen, amino, hydroxyl, C₁–C₅ alkyl, trifluoromethyl, C₁–C₅ alkoxy, C₂–C₅ alkenyloxy, C₂–C₅ alkynyloxy, cyano (C₁–C₅)alkoxy, carboxyl(C₁–C₅)alkoxy, and (C₁–C₅)alkoxycarbonyl (C₁–C₅)alkoxy, C₂–C₁₀ dialkylamino, 1-imidazolyl or cyano group;

X is a valency bond, C₁–C₄ alkylene or vinylene and

T is an oxygen or

a physiologically acceptable salt thereof with an inorganic or organic acid.

13. A method of treating heart or circulatory diseases that respond to a lowering of blood pressure, a positive inotropic action, an improvement in microcirculation or a combination thereof, comprising administering to a patient in need thereof an amount of the compound of claim 1 effective to treat such heart or circulatory diseases.

4,710,511

ETODOLAC FOR INHIBITION OF JOINT ANKYLOSIS
Paul H. Wooley, Belle Mead, N.J., assignor to American Home Products Corporation (Del.), New York, N.Y.

Filed Oct. 27, 1986, Ser. No. 923,373

Int. Cl.⁴ A61U 31/40

U.S. Cl. 514—411

3 Claims

1. A method for inhibiting joint ankylosis for the treatment of ankylosing spondylitis in a mammal in need of such treatment which comprises administering to the mammal an effective amount of etodolac or a therapeutically acceptable salt thereof.

4,710,512

PESTICIDAL COMPOSITIONS EMPLOYING STABILIZED AMITRAZ

(I) Michael A. Webb, Bar Hill, England, assignor to Schering Agrochemicals Limited, England

Filed Oct. 14, 1986, Ser. No. 918,342

Claims priority, application United Kingdom, Oct. 16, 1985, 8525447

Int. Cl.⁴ A01N 37/52, 43/02, 43/22

U.S. Cl. 514—431

10 Claims

1. A liquid pesticide composition which comprises a solution of 0.5 to 50% weight by volume amitraz in an organic solvent, together with a stabilizing amount from 0.1 to 5% weight by volume of at least one aluminum C₁–6 alkoxide.

4,710,513

SUBSTITUTED PYRANONE INHIBITORS OF CHOLESTEROL SYNTHESIS

Alvin K. Willard, Wilmington, Del.; Frederick C. Novello, Berwyn, Pa.; William F. Hoffman, and Edward J. Cragoe, Jr., both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

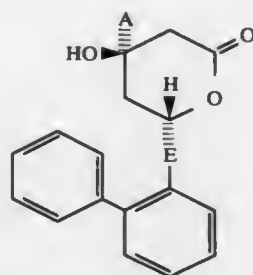
Division of Ser. No. 387,065, Jun. 10, 1982, Pat. No. 4,459,422, which is a division of Ser. No. 233,521, Feb. 11, 1981, Pat. No. 4,375,475, which is a continuation-in-part of Ser. No. 140,323, Apr. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 67,574, Aug. 1, 1979, abandoned. This application Mar. 14, 1984, Ser. No. 589,379

Int. Cl.⁴ A61K 31/35

U.S. Cl. 514—460

4 Claims

1. A compound of the structural formula



wherein:

A is H or methyl; and

E is —CH₂CH₂ or —CH=CH—.

4,710,514

FUNGICIDAL CARBAMATES AND THIOLCARBAMATES

Junya Takahashi; Toshiro Kato, both of Hyogo, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 26, 1983, Ser. No. 488,829

Claims priority, application Japan, May 4, 1982, 57-75766; May 4, 1982, 57-75767

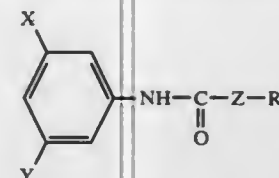
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.⁴ A01N 47/20; C07C 125/073

U.S. Cl. 514—485

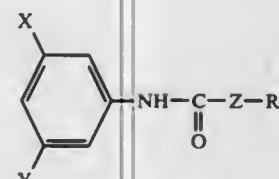
8 Claims

1. A compound of the formula:



wherein X and Y are the same or different and each is a lower alkyl group or a lower alkoxy group, R is a lower alkenyl group, a lower alkynyl group, a lower haloalkyl group, a lower haloalkenyl group, a lower haloalkynyl group or a lower alkyl group substituted with at least one member selected from the group consisting of beta-cyano, lower alkoxy and lower cycloalkyl and Z is an oxygen atom or a sulfur atom.

4. A fungicidal composition which comprises as an active ingredient a fungicidally effective amount of a compound of the formula:



wherein X and Y are the same or different and each is a lower alkyl group or a lower alkoxy group, R is an isopropyl group, a lower alkenyl group, a lower alkynyl group, a lower haloalkyl group, a lower haloalkenyl group, a lower haloalkynyl group or a lower alkyl group substituted with at least one member selected from the group consisting of beta-cyano, lower alkoxy and lower cycloalkyl and Z is an oxygen atom or a sulfur atom, and an inert carrier or diluent.

4,710,515

SUBSTITUTED BIPHENYL DERIVATIVES

Alan R. Kirk, Cottage Grove, and Robert A. Scherrer, White Bear Lake, both of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

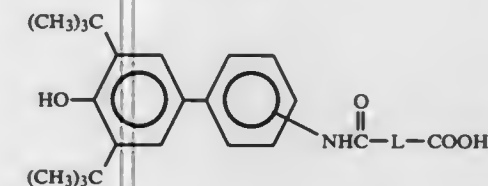
Filed Mar. 17, 1987, Ser. No. 26,877

Int. Cl.⁴ A61K 31/195

U.S. Cl. 514—563

5 Claims

1. A compound of the formula



wherein L is divalent phenyl, straight-chained lower alkylene wherein the alkylene chain may optionally contain an ether or thioether linkage, or divalent cycloalkyl, with the proviso that

when L is divalent cycloalkyl and the amide carbonyl and the carboxyl are on adjacent carbons, then the amide carbonyl and the carboxyl are cis to each other; or a carboxylate derivative thereof selected from a lower alkyl ester, a (lower)alkylamino(lower)alkyl ester, a pharmaceutically acceptable (lower)alkylamino(lower)alkyl ester acid addition salt and a pharmaceutically acceptable carboxylate salt.

3. A method for inhibiting bronchoconstriction due to an allergic reaction in a mammal comprising administering a compound according to claim 1 to said mammal in an amount effective to inhibit said constriction.

4,710,516

INSECTICIDAL AND ACARICIDAL COMPOSITION COMPRISING A BENZOYLUREA COMPOUND

Marius S. Brouwer, and Arnoldus C. Grosscurt, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Continuation-in-part of Ser. No. 572,143, Jan. 19, 1984, Pat. No. 4,665,235. This application Nov. 19, 1986, Ser. No. 932,296

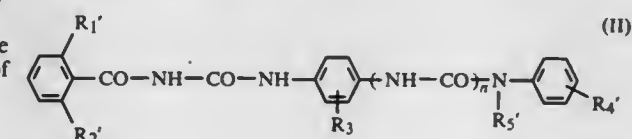
Claims priority, application Netherlands, Jan. 24, 1983, 8300238

Int. Cl.⁴ A01N 47/28

U.S. Cl. 514—594

3 Claims

1. A composition having insecticidal and acaricidal activity, comprising a liquid or solid inert carrier material and an active substance of the formula:



wherein

R₁' and R₂' are both fluorine atoms, or wherein R₁' is a chlorine atom and R₂' is a hydrogen atom,

R₃ is a hydrogen atom or represents 1 or 2 substituents which are selected from the group consisting of halogen, methyl and trifluoromethyl,

R₄' is a hydrogen atom or represents 1–3 substituents which are selected from the group consisting of halogen, C₁–C₄ alkyl, C₁–C₄ haloalkyl and C₁–C₄ haloalkoxy, n is 0 or 1, and

R₅' is a hydrogen atom or a C₂–C₅ alkyl group, with the proviso, that, if n is 0 and R₅' is a hydrogen atom, R₃ is a hydrogen atom.

4,710,517

MEDICAL COMPOSITION FOR INJECTION CONTAINING A SPERGUALIN AS ACTIVE INGREDIENT AND PROCESS FOR PREPARING THE SAME

Hamao Umezawa; Shintaro Suzuki; Taka'aki Ohkuma; Fumihiko Sato, all of Tokyo, and Teruya Nakamura, Kusatsu, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Jan. 9, 1986, Ser. No. 817,266

Claims priority, application Japan, Jan. 14, 1985, 60-3351

Int. Cl.⁴ A61K 31/16

U.S. Cl. 514—616

4 Claims

1. A medical composition for injection containing (1) at least one spergualin compound selected from the group consisting of 1-amino-19-guanidino-11,15-dihydroxy-4,9,12-triazanonadecan-10,13-dione, 1-amino-19-guanidino-11-hydroxy-4,9,12-triazanonadecan-10,13-dione and a medically acceptable salt thereof, and (2) at least one stabilizer selected from the group consisting of maltose and lactose in an amount between about 0.5 to about 100 parts by weight of said stabilizer per part by weight of said spergualin compound.

4,710,518

NOVEL N-BENZYL-CYCLOPROPANECARBOXAMIDE
FUNGICIDES

Yoshio Kurahashi, Tokyo; Kozo Shiokawa, Kanagawa; Shinzo Kagabu, Tokyo; Shinji Sakawa, Tokyo, and Koichi Moriya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

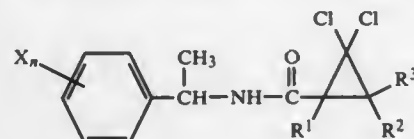
Continuation-in-part of Ser. No. 750,558, Jun. 27, 1985, abandoned. This application Apr. 9, 1986, Ser. No. 850,462. Claims priority, application Japan, Jul. 2, 1984, 59-135268; Jul. 6, 1984, 59-138955; Nov. 13, 1985, 60-252822

Int. Cl.⁴ C07C 103/737, 61/15; A01N 37/18

U.S. Cl. 514—624

10 Claims

1. An N-benzyl-cyclopropanecarboxamide of the formula



wherein

X represents halogen,

n represents 1 or 2,

R¹ represents hydrogen, halogen or lower alkyl,R² represents lower alkyl, halogen-substituted lower alkyl or hydrogen, andR³ represents hydrogen or lower alkyl.

4,710,519

PROCESS FOR PREPARING SPRAY DRIED
ACETAMINOPHEN POWDER AND THE POWDER
PREPARED THEREBY

Jeffrey L. Finnan, Southgate; Rudolph E. Lisa, and Douglass N. Schmidt, both of Grosse Ile, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Sep. 30, 1985, Ser. No. 781,345

Int. Cl.⁴ A61K 31/735, 31/165

U.S. Cl. 514—629

14 Claims

1. A process of preparing a spray-dried acetaminophen powder, the process comprising:

(a) spray-drying effective amounts of an aqueous slurry of acetaminophen and a binder; and

(b) adding a lubricant to the acetaminophen and binder in the presence of heat so that the lubricant is not susceptible to demixing the the spray-dried acetaminophen.

4,710,520

MICA-POLYMER MICRO-BITS COMPOSITION AND
PROCESS

Max Klein, P.O. Box 3, Dalton, Mass. 01226

Filed May 2, 1986, Ser. No. 858,942

Int. Cl.⁴ C08J 9/00

U.S. Cl. 521—55

18 Claims

1. A composition useful as a component of a high temperature filter material, comprising a mixture of mica particles, a majority of said particles being of a size below 40 microns, and polymer micro-bits produced from an expanded, thermoplastic polymer selected from the group of a styrene polymer, a lower polyolefin which is the polymer of an ethylenically unsaturated hydrocarbon monomer having from 2 to 6 carbon atoms, or copolymers or blends of said polymers, each said polymer being non-brittle in expanded form, or produced from a flexible foamed polyurethane, said polymer micro-bits being substantially completely free of intact cells of the expanded or foamed polymer from which they are produced.

4,710,521

CATALYST MIXTURES FOR POLYISOCYANURATE
FOAM

Thomas G. Soukup, Clearwater, and John P. Oliver, St. Petersburg, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Jul. 25, 1986, Ser. No. 889,560

Int. Cl.⁴ C08G 18/14

U.S. Cl. 521—118

30 Claims

1. A continuous process for producing a rigid polyisocyanurate foam which comprises:

(a) bringing together on a continuously advancing conveyor an organic polyisocyanate, a minor amount of a polyester polyol, a blowing agent and, in an organic solvent, a catalyst mixture comprising (i) a salt of a low molecular weight carboxylic acid selected from the group consisting of an alkali metal salt and an alkaline earth metal salt and mixtures thereof, (ii) a salt of a higher molecular weight carboxylic acid selected from the group consisting of an alkali metal salt and an alkaline earth metal salt and mixtures thereof, the higher molecular weight carboxylic acid having from about 5 to 30 carbon atoms, and (iii) a tertiary amine, and

(b) forming the foam-forming mixture.

4,710,522

FOAMABLE COMPOSITION AND PROCESS FOR
FORMING SAME

Mark T. Huggard, Mechanicsville, Va., assignor to Mobil Oil Corporation, New York, N.Y.

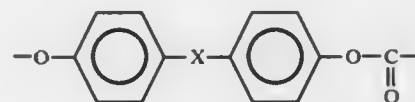
Division of Ser. No. 766,226, Aug. 16, 1985, abandoned. This application Oct. 9, 1986, Ser. No. 917,341

Int. Cl.⁴ C08J 9/08

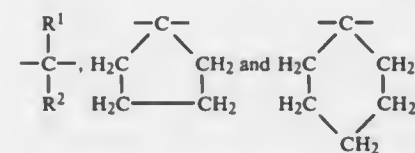
U.S. Cl. 521—138

6 Claims

1. A foamable composition comprising an admixture of an aromatic sulfone polymer, said aromatic sulfone characterized by the presence of both aryl ether and aryl sulfone linkages in the polymer backbone; a high molecular weight linear polyester which is a polycondensation product of an aromatic dicarboxylic acid and a glycol; and a high molecular weight linear aromatic polycarbonate represented by the repeating structural unit of the formula



wherein X is a divalent hydrocarbon radical with a total of from 2 to 9 carbon atoms selected from the group consisting of



where R¹ is hydrogen or lower alkyl; and R² is phenyl or C₁-C₇ alkyl, said composition free of any chemical non-polymeric blowing agent.

4,710,523

PHOTOCURABLE COMPOSITIONS WITH
ACYLPHOSPHINE OXIDE PHOTOINITIATOR
Peter Lechtken, Frankenthal; Ingolf Bueth, Ludwigshafen; Manfred Jacobi, Frankenthal, and Werner Trimborn, Limbargerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Continuation of Ser. No. 238,611, Feb. 26, 1981, abandoned, which is a continuation of Ser. No. 148,665, May 12, 1980, Pat. No. 4,298,738, which is a continuation of Ser. No. 55,399, Jul. 6, 1979, abandoned. This application Jan. 18, 1984, Ser. No. 571,794

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909994

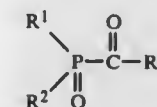
The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.

Int. Cl.⁴ C08F 2/50, 4/00; C08L 63/10

U.S. Cl. 522—14

10 Claims

1. A process for the preparation of photopolymerizable surface-coatings, finishes and printing inks wherein an acylphosphine oxide compound of the general formula



where

R¹ is straight-chain or branched alkyl of 1 to 6 carbon atoms, cyclohexyl, cyclopentyl, phenyl or naphthyl which is unsubstituted or substituted by halogen, alkyl of 1 to 6 carbon atoms, or an S-containing or N-containing five-membered or six-membered heterocyclic radical selected from pyridyl or thienyl, R² has one of the meanings of R¹ with the proviso that R¹ and R² may be identical or different, or R² is alkoxy of 1 to 6 carbon atoms, phenoxy, methylphenoxy or benzyloxy, or R¹ and R² may be joined together to form a five- or six-membered P-containing ring, and R³ is an at least disubstituted phenyl, pyridyl, furyl or thienyl radical which carries, at least at the two carbon atoms adjacent to the linkage point of the carbonyl group, the substituents A and B, which may be identical or different, and each of which is alkyl, alkoxy or alkylthio of 1 to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, phenyl or halogen, or R³ is α-naphthyl substituted by A and B at least in the 2- and 8-positions or is α-naphthyl substituted by A and B at least in the 1 and 3 positions, is mixed as a photoinitiator in a concentration of from 0.001% to 20% by weight of the total amount of the photopolymerizable mixture with at least one photopolymerizable material containing at least one carbon-carbon polymerizable double bond and at least one aryl, carbonyl, amino, amido, ester, carboxyl or cyanide group or halogen atom or additional carbon-carbon double bond or carbon to carbon triple bond in photopolymerization activating relationship to the said carbon-carbon polymerizable double bond.

4,710,524

HIGH ENERGY RADIATION STABILIZATION OF
SEMI-CRYSTALLINE POLYMERS

John Donohue, New York, N.Y., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 545,578, Oct. 26, 1983, abandoned. This application Aug. 5, 1985, Ser. No. 762,600

Int. Cl.⁴ C08J 3/28

U.S. Cl. 522—75

21 Claims

1. A radiation stabilized and sterilized, flexible article comprising:

a polyolefin having a crystalline content of from twenty percent to ninety percent;

0.01 percent to 5.0 percent by weight of a hindered piperidine stabilizer; and

0.01 percent to 5.0 percent by weight of resorcinol monobenzoate, said article having been irradiated with a sterilizing amount of high energy radiation and being substantially resistant to radiolysis while retaining its flexibility.

4,710,525

POLYMER PARTICLES AND LATICES THEREOF FOR
THE IMMOBILIZATION OF BIOLOGICALLY ACTIVE
SUBSTANCES

Dieter Kraemer, Mainz; Werner Siol, Pfungstadt; Gerhard Markert; Norbert Suetterlin, both of Ober-Ramstadt, and Cornelia Feil, Erzhhausen, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 827,222, Feb. 5, 1986, abandoned, which is a continuation of Ser. No. 369,099, Apr. 16, 1982, abandoned. This application Nov. 7, 1986, Ser. No. 930,023

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3116995

Int. Cl.⁴ C08L 83/00

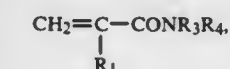
U.S. Cl. 523—201

7 Claims

1. A polymer particle, redispersible in a liquid to form a dispersion and capable of covalently bonding a biological substance to itself, said particle having an average particle diameter between about 0.05 micron and about 5 microns and having an inner core of a first polymer surrounded by an outer shell of a second, different, polymer thereover wherein the ratio of the weight of the polymer of the core to the weight of the polymer of the shell is between 1:3 and 10:1, said first core polymer imparting dispersibility and stability of form to said particle and being an intrinsically hard polymer having a T_{max} of at least 0° C., said second shell polymer being hydrophilic and being internally crosslinked, crosslinked or grafted to said core, or both internally crosslinked and crosslinked or grafted to said core, having a T_{max} of 20°-250° C. in an anhydrous condition, and comprising, by weight of the shell polymer,

(a) from 4.9 to 99.9 percent of a combination of

(i) at least one hydrophilic monomer, which per se forms an at least partially water soluble polymer and is selected from the group consisting of methacrylamides and acrylamides of the general formula



wherein

R₁ is hydrogen or methyl and

R₃ and R₄, independently of each other, are selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms;

(ii) said combination including at least 0.1 percent of at least one monomer of the formula



wherein

Z' is a free radically polymerizable vinyl group,

R is a spacing unit,

X is sulfonic acid halide, thioisocyanate, an activated ester of N-hydroxysuccinimide or a N-hydroxyphthalimide, carbonyldioxy, carbonylimidoyldioxy, haloethoxy, haloacetoxy, oxirane, formyl, keto, acryloyl, or anhydride, and n has the value 0 or 1;

(b) from 0 to 95 percent by weight of at least one non-hydrophilic monomer selected from the group consisting of esters of acylic acid and methacrylic acid with C₁-C₂₀ alcohols and vinyl esters of C₂-C₄ alkanic acids; and

(c) from 0.1 to 20 percent by weight of at least one polyunsaturated crosslinking monomer.

4,710,526

ALKALINE CURING EMULSIONS FOR USE IN CEMENT ADMIXTURES

Minoru Tokumoto, Nara; Motoyuki Takagi; Shizuo Shitaka, both of Osaka, all of Japan; Samuel Gold, Watchung, and Carmine P. Iovine, Bridgewater, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

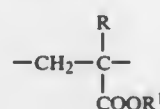
Filed Jul. 2, 1986, Ser. No. 878,441

Int. Cl.⁴ C08K 3/22

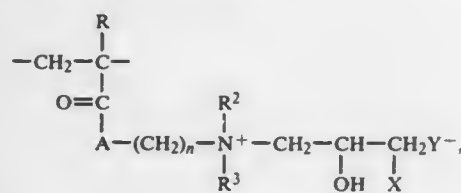
U.S. Cl. 524—5

18 Claims

1. A cement admixture comprising a cement and an effective amount of an aqueous emulsion of an acrylate polymer with a T_g between below 10°C . and -40°C ., the polymer comprising (a) about 25–85% of an acrylate or methacrylate monomer, (b) about 0.5–15% of an alkaline-curable cationic quarternary ammonium salt monomer, (c) 0–70% of a hydrolytically-stable monomer other than (a) or (b), and (d) 0–30% of a hydrolytically-unstable monomer other than (a) or (b) with the percentages being by weight and totaling 100%; wherein the acrylate unit in the polymer has the formula



and the alkaline-curable cationic quarternary ammonium unit in the polymer has the formula



where R is hydrogen or a methyl group; R^1 is a C_1 – C_{12} alkyl group or a C_6 – C_{12} cycloalkyl group with the proviso that R^1 is not a methyl or ethyl group when R is hydrogen; R_2 and R_3 are methyl or ethyl groups and R^2 and R^3 may be the same or different; A is $-\text{O}-$ or $-\text{NH}-$; X is chlorine, bromine or iodine; Y^- represents an organic or inorganic anion; and n is 2 or 3.

4,710,527

MALONATE-BASED LIGHT STABILIZERS FOR PLASTICS

Richard V. Nelson, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

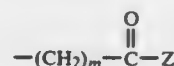
Continuation-in-part of Ser. No. 786,798, Oct. 11, 1985, abandoned. This application Aug. 29, 1986, Ser. No. 901,624

Int. Cl.⁴ C08K 5/34

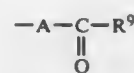
U.S. Cl. 524—98

13 Claims

1. A compound of the formula I wherein; R^1 is selected from hydrogen and an alkyl group of 1 to 5 carbon atoms; R^2 is selected from hydrogen, oxyl, hydroxyl, a methylene-linked alkyl group having from 1 to 18 carbon atoms, an alkanoyl group having 2 to 18 carbon atoms, an alkenyl group of 3 to 4 carbon atoms, an alkenoyl group having 3 to 6 carbon atoms, an alkynyl group having 3 to 6 carbon atoms, a cyanomethyl group, a 2,3-epoxypropyl group, an aralkyl group of 7 to 15 carbon atoms, a group $-\text{CH}_2\text{C}(\text{H})(\text{OR}^4)-\text{R}^5$, and a group of the formula



wherein m is either zero or one and Z is a group selected from $-\text{OR}^6$, $-\text{N}(\text{R}^7)(\text{R}^8)$ and



and when m is zero, Z may be a group $-\text{C}(\text{O})-\text{OR}^{10}$; R^3 is selected from an alkyl group of 1 to 18 carbon atoms and a group of formula II,

R^4 is selected from hydrogen, an aliphatic group of 1 to 18 carbon atoms, an araliphatic group, and an aliphatic acyl group of 2 to 18 carbon atoms,

R^5 is selected from hydrogen, an alkyl group of 1 to 16 carbon atoms and phenyl,

R^6 is selected from an alkyl group of 1 to 18 carbon atoms, a cycloalkyl group of 5 to 12 carbon atoms, and a group of formula II wherein R^1 and R^2 are as described above;

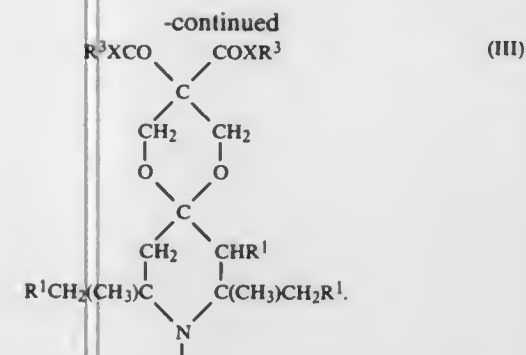
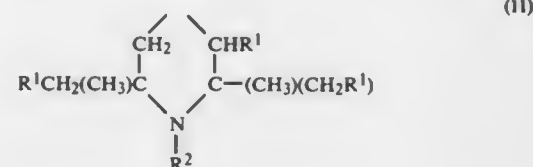
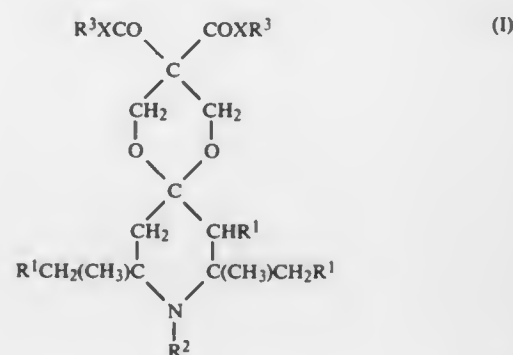
R^7 and R^8 are selected from hydrogen, an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 5 to 12 carbon atoms, an aryl group having 6 to 10 carbon atoms, and an aralkyl group having 7 to 15 carbon atoms, R^7 and R^8 together with the nitrogen atom to which they are attached can form a 5 to 7-membered ring selected from pyrrolidine, piperidine and homopiperidine;

A is selected from an alkylene group of 1 to 12 carbon atoms, phenylene, and a group $-\text{NH}-\text{R}^{11}-\text{NH}-$ where R^{11} is selected from an alkylene group of 2 to 18 carbon atoms, a cycloalkylene group having 5 to 18 carbon atoms, an arylene group having 6 to 18 carbon atoms, and an aralkylene group having 7 to 18 carbon atoms, and R^9 is a group of the formula III;

R^{10} is selected from an aliphatic group of 1 to 18 carbon atoms, phenyl and benzyl,

X is either $-\text{O}-$ or $-\text{NR}^{12}-$ where R^{12} is selected from hydrogen or an alkyl group of 1 to 8 carbon atoms;

and wherein said formulas are as follows:



4,710,528

FLAME RESISTANT THERMOPLASTIC POLYMERIC COMPOSITIONS COMPRISING (1) MELAMINE BROMOHYDRATE AND (2) SB OR AS COMPOUND ENDOWED WITH IMPROVED FLAME-RESISTANCE

Guido Bertelli, and Renato Locatelli, both of Ferrara, Italy, assignors to Hilmont Incorporated, Wilmington, Del.

Filed Apr. 29, 1986, Ser. No. 857,635

Claims priority, application Italy, Apr. 30, 1985, 20548 A/85

Int. Cl.⁴ C08K 3/10, 3/20, 5/34

U.S. Cl. 524—100

5 Claims

1. Polymeric compositions endowed with improved self-extinguishing properties, consisting essentially of by weight:

- (A) from 57.5 to 98.9% of a thermoplastic polymer;
- (B) from the group consisting of 0.1 to 10% of at least a product selected from antimony oxide, antimony oxychloride, antimony trisulfide, metal bismuth and one organic or inorganic oxygenated or non-oxygenated bismuth salt;
- (C) from 0 to 1% of a promoter of free radicals;
- (D) from 1 to 35% of melamine bromohydrate.

4,710,529

STABILIZED THERMOPLASTIC MOULDING MATERIALS BASED ON ABS POLYMERS AND ACYL PHOSPHANOXIDES

Helmut-Martin Meier, Ratingen; Hans-Georg Heine, Krefeld; Alfred Pischtschan, Kuerten; Rolf Dhein, and Hans Rudolph, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 938,141

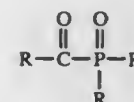
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544000

Int. Cl.⁴ C08F 220/44, 257/02

U.S. Cl. 524—139

8 Claims

1. A thermoplastic moulding material comprising ABS and containing, as stabilizer, an acyl phosphanoxide of the formula



wherein each R is linear or branched C_1 – C_{12} alkyl, C_5 – C_7 cycloalkyl, aryl mono- or poly-substituted by C_1 – C_{12} alkyl, alkoxy substituted aryl, halo-substituted aryl or unsubstituted aryl and

wherein the ABS is a polymer having the following composition:

- A. 5–100% by weight of a graft copolymer prepared by graft polymerization from
1. 10–95% by weight of a mixture from
- (i) 50–90% by weight of styrene, α -methylstyrene,

nuclear-substituted styrene or methylmethacrylate or mixtures thereof and

(ii) 50–10% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof, on

2. 90–5% by weight of a rubber having a glass transition temperature $T_g \leq 0^\circ\text{C}$. and

B. 95–0% by weight of a thermoplastic copolymer from

1. 90–50% by weight of styrene, α -methylstyrene, nuclear-substituted styrene or methyl methacrylate or mixtures thereof and

2. 50–0% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof.

4,710,530

FLAME RETARDANT POLYPHENYLENE ETHER MOLDING COMPOSITIONS

Joseph Green, East Brunswick, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 1, 1986, Ser. No. 858,612

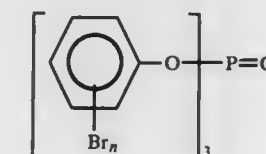
Int. Cl.⁴ C08K 5/52

U.S. Cl. 524—142

7 Claims

1. A flame retarded thermoplastic molding composition consisting essentially of

- (a) a normally flammable styrene modified polyphenylene ether resin
- (b) a flame retardant amount of a polybromotriphenyl phosphate of the formula



wherein n is a whole number having a value of 0 to 5 inclusive, representing the number of bromine atoms on each phenyl ring, and the ratio of bromine atoms to phosphorus atoms is 3 to 10.

4,710,531

SELF-EXTINGUISHING POLYCARBONATE COMPOSITION

Giovanni Dozzi; Giorgio Della Fortuna, both of Milan, and Salvatore Cucinella, S. Donato Milanese, all of Italy, assignors to Anic, S.p.A., Palermo, Italy

Filed Aug. 19, 1983, Ser. No. 524,788

Claims priority, application Italy, Aug. 25, 1982, 22964 A/82; Aug. 25, 1982, 22965 A/82; Aug. 25, 1982, 22968 A/82; Aug. 26, 1982, 22987 A/82; May 3, 1983, 20903 A/83

Int. Cl.⁴ C08K 5/17

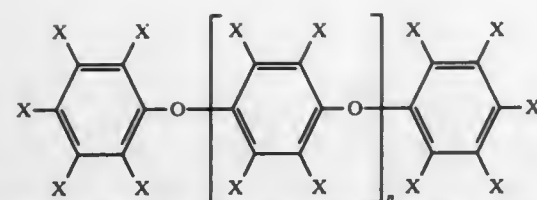
U.S. Cl. 524—239

4 Claims

1. A self-extinguishing polycarbonate composition consisting of an aromatic polycarbonate having an average viscometric molecular weight between 10,000 and 100,000 mixed with

- (A) at least one metal salt and/or ammonium salt of ethylenediaminetetraacetic acid, said metal being selected from the metals of Groups IA, IB, IIA or IIB of the Periodic Table; and
- (B) a halogenated organic ether having the general formula

(II)



wherein n is an integer from 0 to 10,000 and X can be, independently, hydrogen, fluorine, chlorine or bromine, wherein at least one X per aromatic ring is halogen.

4,710,532

MEDICAL ARTICLE AND METHOD

Ezekiel H. Hull, Greensboro, and Edward P. Frappier, Kernersville, both of N.C., assignors to Morflex Chemical Company, Inc., Greensboro, N.C.

Continuation of Ser. No. 711,284, Mar. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,583, Jun. 11, 1984, abandoned. This application May 22, 1986, Ser. No. 866,463

Int. Cl.⁴ C08K 5/11

U.S. Cl. 524—310

7 Claims

1. A polyvinyl chloride composition comprising a polyvinyl chloride resin and a plasticizing amount of N-butyltri-N-hexyl citrate, and N-butyltri-N-hexyl citrate having heat stability characteristics, after heating at 150° C. for two hours, of a color not greater than 50–60 apha and a mild odor at 25° C.

4. A medical article formed from a polyvinyl chloride composition comprising a polyvinyl chloride resin, a plasticizing amount of N-butyltri-N-hexyl citrate, a stabilizer and a lubricant, and wherein said citrate has heat stability characteristics after heating at 150° C. for two hours, of a color not greater than 50–60 apha and a mild odor at 25° C.

5. A medical article as claimed in claim 4 comprising a blood bag.

4,710,533

MELT PROCESSABLE CPVC BLENDS

Richard C. Neuman, Vermilion, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 11, 1986, Ser. No. 895,096

Int. Cl.⁴ C08K 5/09; C08L 27/04

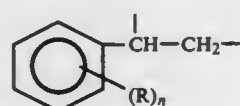
U.S. Cl. 524—394

8 Claims

1. A melt processable chlorinated polyvinyl chloride blend comprising:

100 parts by weight of chlorinated polyvinyl chloride, said chlorinated polyvinyl chloride having a chlorine content of from about 60% to about 75% by weight;

an effective amount of a flow enhancing polymer to impart improved melt processability to said chlorinated polyvinyl chloride, said flow enhancing polymer being made from monomers having the formula



where R is an aliphatic having from 1 to 5 carbon atoms, wherein n is an integer of 1 to 3, wherein said effective amount of said flow enhancing polymer is from about 12 parts to about 40 parts by weight per 100 parts by weight of said chlorinated polyvinyl chloride, and

an effective amount of a compatibilizing agent to improve compatibility of the blend so that said blend has an Izod impact value (ASTM D256) of at least 1.5 ft.lbs./in. of notch.

4,710,534

LOW GLOSS, FLAME RETARDANT, IMPACT RESISTANT POLYCARBONATE COMPOSITION

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 9, 1985, Ser. No. 806,499

Int. Cl.⁴ C08K 5/06

U.S. Cl. 524—411

16 Claims

1. A composition comprising
(a) a major quantity of aromatic polycarbonate;
(b) a minor amount of a polyalkylene terephthalate wherein the alkylene group is from 2 to about 10 carbon atoms, and is present in such quantities so as to substantially reduce the DTUL of the polycarbonate;

(c) an effective amount of a combination of impact modifier and gloss suppressant selected from an olefin diene copolymer and an acrylonitrile-butadiene-alkenylaromatic copolymer; and

(d) an effective amount of flame retardant system to maintain a VO rating for a 1.6 mm sample under UL 94 test conditions wherein the overall composition has a DTUL in °C. of less than or equal to 115° C., a 3.2 mm Notched Izod impact resistance in kilograms f-cm per cm of at least about 10 and has a surface gloss as measured with a Hunter Lab's gloss meter at 60° reflection of less than or equal to about 80 wherein the olefin diene copolymer is present and (a) is from about 60 to 75 weight percent, (b) is from about 8 to 15 weight percent, (c) is from about 4 to 12 weight percent and (d) is from about 12 to 18 weight percent, all weight percents measured on the total of (a), (b), (c), and (d) or wherein the acrylonitrile-butadiene-alkenylaromatic copolymer is present and (a) is from about 55 to 75 weight percent, (b) is from about 8 to 15 weight percent, (c) is from about 4 to 12 weight percent and (d) is from about 13 to 22 weight percent, all weight percent measured on the total of (a), (b), (c) and (d).

4,710,535

MASTERBATCHES FOR DELUSTRING POLYAMIDES

Pierre Perrot, Charbonnières-les-Bains, and Georges Vuillemeys, Toussieu Mions, both of France, assignors to Rhone-Poulenc Fibres, Lyons, France

Filed Jun. 9, 1986, Ser. No. 871,827

Claims priority, application France, Jun. 13, 1985, 85 09122

Int. Cl.⁴ C08K 3/22, 9/04

U.S. Cl. 524—413

9 Claims

1. Masterbatches intended for delustring processible polyamides by addition of at least a portion of the masterbatch to the polyamide prior to shaping thereof, wherein the masterbatch comprises 50 to 90% by weight of a polyamide selected from the group consisting of homopolyamides and copolyamides used as a binder, consisting of 30 to 100% of hexamethylene adipamide units and 0 to 70% of caproamide units,

10 to 50% by weight of anatase titanium dioxide first coated with a mixture of silica and of alumina in a proportion of 0.01 to 1.5% of silica and 1 to 3% of alumina and then contacted with a polydimethylsiloxane oil present in a proportion of 0.2 to 10% relative to the weight of the coated titanium dioxide powder, the mean particle size of the titanium dioxide in the masterbatch being between 0.15 to 0.45 μ m.

4,710,536

PRESSURE-SENSITIVE ADHESIVE TAPE CONTAINING HYDROPHOBIC SILICA

Jurgen Klingen, Schwalmatal, Fed. Rep. of Germany, and Patrick G. Zimmerman, Saint Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 763,458, Aug. 7, 1985,

abandoned, and Ser. No. 658,769, Aug. 7, 1985, abandoned. This application Jul. 22, 1986, Ser. No. 888,787

Int. Cl.⁴ C08R 3/34

U.S. Cl. 524—493

8 Claims

1. Pressure-sensitive adhesive tape, the adhesive layer which comprises a copolymer of by weight (a) a major proportion of acrylic acid ester of tertiary alkyl alcohol, the molecules of which have from 1 to 14 carbon atoms, at least a major proportion of said molecules having a carbon-to-carbon chain of 4–12 carbon atoms terminating at the hydroxyl oxygen atom, said chain containing at least about one-half the total number of carbon atoms in the molecule, and (b) a minor proportion of at least one copolymerizable monomer having a polar group, wherein the improvement comprises:

the pressure-sensitive adhesive layer includes hydrophobic silica having a surface area of at least 10 m²/g and in an amount comprising by weight from 2 to 15 phr.

4,710,537

SUBSTANTIALLY HOMOGENEOUS COPOLYMERS OF ACRYLIC OR METHACRYLIC ACID AND MALEIC ACID

Stanley W. Wallinsky, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

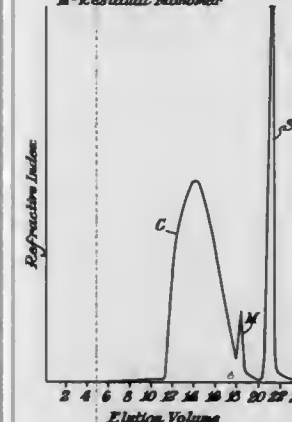
Division of Ser. No. 476,668, Mar. 18, 1983, Pat. No. 4,547,559, which is a continuation-in-part of Ser. No. 232,475, Feb. 9, 1981, Pat. No. 4,390,670. This application Oct. 11, 1985, Ser. No. 786,422

Int. Cl.⁴ C08F 8/12, 122/02

U.S. Cl. 524—549

2 Claims

Example 1
40/60 Methacrylic Acid/Maleic Acid
C-Homogeneous Copolymer Product
S-Elution Solvent
M-Residual Monomer



1. A substantially homogeneous copolymer consisting essentially of from about 35 to 65 mole percent acrylic or methacrylic acid repeat units and from about 65 to 35 mole percent maleic acid repeat units and having a number average molecular weight of from about 500 to 5000, or an alkali metal, ammonium or amine salt thereof.

4,710,538

PROCESS FOR THE PRODUCTION OF A STICKY POLYMER

Robert J. Jorgensen, Belle Mead, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 10, 1986, Ser. No. 837,215

Int. Cl.⁴ C08F 2/34

U.S. Cl. 525—53

7 Claims

1. A process for the gas phase production of a sticky, but fluidizable, polymer comprising (i) introducing at least one gaseous monomer, which is a precursor for the polymer, into a bed of particles located in a fluidized bed reactor at a velocity sufficient to cause the particles to separate and act as a fluid; (ii) introducing into the bed a catalyst adapted to cause the monomer to polymerize; (iii) contacting the catalyst with the monomer at a temperature below the sticking temperature of the polymer and at a temperature and pressure sufficient to polymerize the monomer in the presence of the catalyst whereby the polymer is produced; and (iv) passing the polymer from the fluidized bed reactor into at least one fluid bed reactor wherein a fluidizing gas is passed through a bed of particles at a velocity sufficient to cause the particles to separate and act as a fluid; the polymer is passed through the fluid bed reactor in an essentially plug flow mode; and the polymer is maintained in an agitated state by mechanical means.

4,710,539

HEAT ACTIVATABLE ADHESIVE OR SEALANT COMPOSITIONS

Bahram Siadat, Boxborough, Mass., and Charles R. Morgan, Brookeville, Md., assignors to W. R. Grace & Co., New York, N.Y.

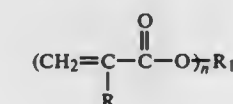
Continuation-in-part of Ser. No. 317,672, Nov. 2, 1981, abandoned. This application Apr. 22, 1983, Ser. No. 487,563

Int. Cl.⁴ C08F 210/18, 212/08, 218/08, 220/18

U.S. Cl. 525—59

3 Claims

1. A heat activatable adhesive or sealant organic resin composition consisting of
(1) a liquid, ethylenically unsaturated monomer, oligomer or prepolymer of the formula:



wherein R is H or CH_3 , R_1 is an organic moiety and n is at least 2,
(2) a thermal initiator selected from the group consisting of substituted or unsubstituted pinacols, azo compounds, organic peroxides and mixtures thereof, and
(3) a thermoplastic adhesive material selected from the group consisting of polyvinyl acetals, polyamides, butadiene-acrylonitrile copolymers, styrene-butadiene copolymers, styrene-isoprene copolymers, styrene-ethylene-butylene copolymers, ethylene-vinyl acetate copolymers, ethylene-ethyl acrylate copolymers, ethylene propylene diene monomer and mixtures thereof.

4,710,540

COMPOSITION FOR PREPARING CEMENT-ADHESIVE REINFORCING FIBERS

James J. McAlpin, and Wal Y. Chow, both of Houston, Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jan. 3, 1986, Ser. No. 816,032

Int. Cl.⁴ C08F 8/00

U.S. Cl. 525—101

13 Claims

1. A polyolefin resin from which concrete adherent fibers may be produced, comprising:
from about 95 wt % to about 99 wt % of a olefinic polymer;
from about 1 wt % to about 5 wt % of a modifying agent in intimate admixture with said olefinic polymer, said modi-

fyng agent comprising the reaction product resulting from dry blending of an alkylamino alkoxy silane with an acid modified polyolefin in an amount of from about 50 to about 150% of the stoichiometric amount required to react with the acid functionality of the acid modified polyolefin.

4,710,541

PROCESS FOR MOLDING AND VULCANIZING RUBBER PRODUCTS

Seisuke Tomita, Tokorozawa, and Takatsugu Hashimoto, Higashiyama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,228

Claims priority, application Japan, Oct. 22, 1984, 59-221805; Oct. 22, 1984, 59-221806

Int. Cl.⁴ C08L 7/00, 9/00, 15/02, 19/00

U.S. Cl. 525-104

13 Claims

1. A curing bladder, comprising:
a rubber compound containing (A) an organic rubber and (B) a polyorganosiloxane, the ratio of (A)/(B) being 95/5 to 5/95, said polyorganosiloxane (B) comprising at least two monovalent substituted or unsubstituted hydrocarbon groups having five or more carbon atoms and 0.05 to 20 mol % of a C=C double bond connected to the silicon atom through at least one carbon atom, and having a degree of polymerization greater than 20.

4,710,542

ALKYL CARBAMYL METHYLATED AMINO-TRIAZINE CROSSLINKING AGENTS AND CURABLE COMPOSITIONS CONTAINING THE SAME

Peter S. Forgiione, and Balwant Singh, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 16, 1986, Ser. No. 864,627

Int. Cl.⁴ C08L 75/00

U.S. Cl. 525-127

8 Claims

1. A curable composition comprising:
(a) an active hydrogen-containing material;
(b) a triazine compound selected from
(i) a triaminotriazine compound of the formula $C_3N_6(CH_2OR)_6-x(CH_2NHCOOR^1)_x$;
(ii) a benzoguanamine compound of the formula $C_3N_5(C_6H_5)(CH_2OR)_4-x(CH_2NHCOOR^1)_x$;
(iii) an oligomer of (i) or of (ii); or
(iv) a mixture of at least two of any of (i), (ii) and (iii), wherein the R groups are, independently, hydrogen or alkyl from 1 to 12 carbon atoms, the R¹ groups are, independently, alkyl of from 1 to 20 carbon atoms, x is in the range of from about 2 to about 6, and y is in the range of from about 2 to about 4; and
(c) a cure catalyst.

4,710,543

GLYCIDYL-HYDROXY-ACRYLIC HIGH SOLIDS COATING COMPOSITIONS

Mohinder S. Chattha, Livonia, and Ares N. Theodore, Farmington Hills, both of Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US82/01089, § 371 Date Aug. 9, 1982, § 102(e) Date Aug. 9, 1982, PCT Pub. No. WO84/00768, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 9, 1982, Ser. No. 425,191

Int. Cl.⁴ C08L 37/00, 61/24, 61/28

U.S. Cl. 525-161

23 Claims

1. A thermosetting coating composition, characterized in that said composition comprises a mixture of components:
(A) acrylic copolymer bearing pendant epoxide groups and hydroxyl groups and having a number average molecular weight (M_n) of between about 1000 and about 5000, said copolymer being prepared from a monomer mixture comprising (i) between about 5 and about 35 weight percent of glycidyl ester of a monoethylenically unsaturated carboxylic acid, (ii) between about 5 and about 35 weight percent of hydroxy alkyl acrylate or hydroxy alkyl methacrylate and (iii) between 60 and about 90 weight percent of other monoethylenically unsaturated monomers;

(B) dicarboxylic acid anhydride comprising at least about 50 percent by weight of alkyl hexahydrophthalic anhydride, said dicarboxylic acid anhydride being included in said composition in an amount so as to provide between about 1.0 and about 1.2 anhydride groups for each epoxide group on said acrylic copolymer;

(C) amine-aldehyde crosslinking agent included in said composition in an amount sufficient to provide at least about 0.60 nitrogen crosslinking functional groups for each hydroxyl group initially present in said composition on said copolymer (A); and
(D) solvent,
said coating composition being an essentially unreacted mixture of said components.

4,710,544

THERMOPLASTIC COMPOSITION OF POLYOLEFIN AND HIGH ETHYLENE CONTENT ETHYLENE/ALKYL ACRYLATE ELASTOMER

James R. Wolfe, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 796,589, Nov. 7, 1985. This application Feb. 20, 1987, Ser. No. 17,332

Int. Cl.⁴ C08L 23/26, 23/36, 23/04, 23/10

U.S. Cl. 525-194

26 Claims

1. A melt processible thermoplastic composition comprising a blend of:

- (A) 15-75 parts by weight of a crystalline polyolefin resin comprising polymerized monomer units of ethylene or propylene or mixtures thereof, and
(B) 25-85 parts by weight of a crosslinked ethylene/alkyl acrylate elastomer made from dynamically crosslinking an ethylene/alkyl acrylate/monoalkyl ester of 1,4-butenedioic acid copolymer containing about 60-90 weight percent ethylene and wherein the alkyl group of the alkyl acrylate contains 1-6 carbon atoms, the dynamically crosslinked elastomer being dispersed throughout the crystalline polyolefin resin.

4,710,545

POLYMER-BOUND ALKYL DIARYLPHOSPHINITE CATALYST COMPOSITIONS AND PROCESSES FOR MAKING SAME

William J. Boyle, Jr., Warren; Frank Mares, Whippany, and Andrea M. Corbo, Randolph, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 636,181, Jul. 31, 1984, Pat. No. 4,581,415, which is a continuation-in-part of Ser. No. 438,686, Nov. 3, 1983, abandoned. This application Aug. 19, 1985, Ser. No. 766,997

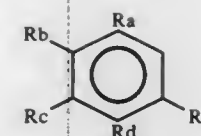
Int. Cl.⁴ C08F 8/40

U.S. Cl. 525-340

5 Claims

1. A process for the preparation of a polymeric substance having formula I, $p-C_6H_4-P(Ar')OR$ which comprises the steps of:

- (a) contacting a polymer containing aromatic groups with PX_3 , in the presence of an effective amount of a Friedel-Crafts catalyst, for a time sufficient to produce a polymer containing aromatic groups substituted with PX_2 wherein X is F, Cl, Br or I;
(b) contacting the polymer containing the aromatic groups substituted with PX_2 , in the presence of an effective amount of a Friedel-Crafts catalyst, with an aromatic compound $Ar'H$ having formula:



wherein R_a , R_b , R_c , R_d , and R_e are independently N,N-dialkylamino groups, $-N(R^4, R^5)$, hydrogen, straight or branched chain alkyl groups of 1 to 10 carbons or cycloalkyl groups having 5 to 10 carbons or wherein two of said R_{a-e} groups form part of a fused alicyclic ring and the remainder of said R_{a-e} groups are independently hydrogen, N,N-dialkylamino groups $-N(R^4, R^5)$ alkyl groups having 1 to 10 carbons or cycloalkyl groups having 5 to 10 carbons, or wherein at least one of said R_{a-e} groups is a N,N-dialkylamino group, $-N(R^4, R^5)$, and the remainder of said R_{a-e} groups are independently hydrogen or alkyl or cycloalkyl as defined hereinabove, for a time sufficient to produce a polymer having the formula $p-C_6H_4-P(Ar')X$;

(c) contacting the product of step (b) with an aprotic solvent and water in an amount sufficient to produce a polymer having the formula $p-C_6H_4-P=O(Ar')H$ substantially free of residual metal-containing species;

(d) contacting the product of step (c) with PX_3 wherein X is defined as hereinabove in an amount sufficient to produce a polymer having the formula $p-C_6H_4-P(Ar')X$; and
(e) contacting the product of step (d) with a straight or branched chain alcohol having no more than 10 carbons or cycloalkanol having 5 to 10 carbon atoms in the presence of a base for a time sufficient to produce a polymer having formula $p-C_6H_4-P(Ar')OR$.

4,710,546

FIBRE-REINFORCED OR FILLED POLYPHENYLENE SULPHIDE CONTAINING TREATED ARAMIDE FIBERS

Karl-Heinz Relchert, and Ingo Koschinski, both of Berlin, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 753,385, Jul. 10, 1985, Pat. No. 4,657,945. This application Oct. 9, 1986, Ser. No. 917,599

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3426918

Int. Cl.⁴ C08G 69/48; C08L 77/10; C08K 9/02

U.S. Cl. 525-420

4 Claims

1. A fiber-reinforced or filled polyphenylene sulphide containing chemically-activated fibers which have been activated by a pretreatment with bromine vapor, chlorine gas, thionyl chloride or ozone wherein the fibers pretreated are aramide fibers.

4,710,547

PROCESS FOR PRODUCING THREE-DimensionALLY CROSSLINKED POLYESTER HAVING THE LIQUID CRYSTAL STRUCTURE

Toshiyuki Uryu, and Takashi Kato, both of Tokyo, Japan, assignors to Celanese Corporation, New York, N.Y.

Filed May 29, 1986, Ser. No. 867,997

Claims priority, application Japan, Sep. 25, 1985, 60-211951

Int. Cl.⁴ C08G 63/76

U.S. Cl. 525-437

8 Claims

1. A process for producing a three-dimensionally crosslinked polyester having the liquid crystal structure, said process comprising incorporating a thermotropic liquid crystal polyester (a) which exhibits the anisotropy in the molten state or a polyester composition (b) which is a thermotropic liquid crystal mixture composed of a polyester and a low-molecular weight compound, with a compound (c) having at least three functional groups, whereby crosslinking said polyester (a) or polyester composition (b).

4,710,548

BLENDS OF A POLYCARBONATE WITH A POLYESTER-POLYCARBONATE COPOLYMER

Joseph B. Byrne, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

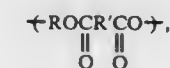
Continuation of Ser. No. 307,135, Sep. 30, 1981, abandoned. This application May 19, 1986, Ser. No. 866,991

Int. Cl.⁴ C08L 67/00, 69/00, 67/02

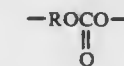
U.S. Cl. 525-439

13 Claims

1. A polycarbonate copolymer or terpolymer blend comprising:
(a) from about 1 to about 99 weight percent of at least one normally-solid polycarbonate copolymer or terpolymer which contains a plurality of repeating units comprising ester moieties corresponding to the formula



and carbonate moieties corresponding to the formula



wherein each R is independently aromatic hydrocarbylene or inertly-substituted aromatic hydrocarbylene, each R' is independently meta- or para-phenylene and the number of ester and carbonate moieties are selected such that the ratio of ester to carbonate moieties is from 0.05 to 10; and

- (b) from about 99 to about 1 weight percent of at least one normally-solid aromatic hydrocarbylene or inertly-substituted aromatic hydrocarbylene polycarbonate resin, with the proviso that the overall ratio of ester to carbonate groups in the polycarbonate blend is in the range from about 1:19 to about 7:1 and the Izod impact strength of a blend consisting essentially of components (a) and (b) alone is at least about 4.0 foot-pounds per inch notch at 23° C. when a blend specimen having a 5 mil notch radius is tested otherwise in accordance with ASTM D-256.

4,710,549

CROSS-LINKED PHOSPHAZENE POLYMER

F. Alexander Pettigrew, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

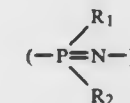
Filed Jul. 14, 1986, Ser. No. 885,651

Int. Cl.⁴ C08F 283/00

U.S. Cl. 525-538

32 Claims

1. A siloxane cross-linked organophosphazene polymer comprising low molecular weight cyclic organophosphazene containing about 3-7



units in which R_1 and R_2 are substituent groups which can be the same or different on each unit and can be the same or different on different units and are selected from the group consisting of alkoxy and aralkoxy and, prior to cross-linking, an average of at least 1.5 up to 10 olefinically unsaturated groups per molecule, said low molecular weight cyclic organophosphazene being cross-linked through a siloxane bridging group.

4,710,550

METHOD OF USING A DIELECTRIC PROBE TO MONITOR THE CHARACTERISTICS OF A MEDIUM

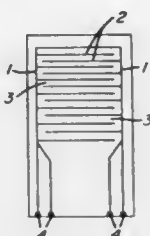
David E. Kranbuehl, 201 Harrison Ave., Williamsburg, Va. 23185

Division of Ser. No. 729,459, May 1, 1985. This application May 5, 1986, Ser. No. 859,579

Int. Cl.⁴ C08F 2/00; G01R 27/02

U.S. Cl. 526—60

8 Claims



1. Method of sensing characteristics of a medium comprising contacting said medium with a probe comprising

- (a) a substrate having an electrical conductivity no greater than 10^{-7} mho/cm⁻¹ over a frequency range of use, a stable capacitance curve exhibiting little or no hysteresis through the range of one hertz to 10 megahertz at the temperatures of use, and a known dielectric permittivity of less than 13, and
- (b) at least two chemically resistant, electrically conductive parallel interdigitated electrodes having a width no greater than 0.02 inch affixed thereto, the spaces between the digits of the interdigitated electrodes being no greater than about 0.01 inch, imposing an alternating current across the electrodes thereof, measuring the capacitances and conductance of the medium contacting said probe, and generating an output signal representative of the complex permittivity of the medium as a function of said capacitance and conductance.

4,710,551

PROCESS FOR PRODUCING A VINYL CHLORIDE POLYMER OR COPOLYMER IN AQUEOUS SUSPENSION USING A HYDROTALCITE COMPOUND AS SUSPENSION STABILIZER

Shigeo Miyata, Takamatsu, Japan, assignor to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1985, Ser. No. 807,246

Int. Cl.⁴ C08F 2/18

U.S. Cl. 526—91

6 Claims

1. In a process for producing a polymer or copolymer of a vinyl chloride monomer with or without a comonomer by aqueous suspension polymerization or copolymerization in the presence of a suspension stabilizer and a polymerization initiator which is insoluble or sparingly soluble in water and soluble in the monomer; the improvement comprising carrying out the polymerization or copolymerization in the presence of, as said suspension stabilizer, a hydrotalcite compound of the following formula



wherein M^{2+} is a divalent cation of a metal selected from the group consisting of Mg, and the combinations of Mg and Zn, and Mg and Cd, M^{3+} is at least one trivalent metal cation, A^{n-} is an anion having a valence of 1 to 4, and x and m represent numbers satisfying the following expressions

$$0 < x < 0.5 \text{ and } 0 \leq m < 2.$$

4,710,552

PREPARATION OF HOMOPOLYMERS OF ETHENE AND COPOLYMERS OF ETHENE WITH HIGHER- α -MONOLEFINS USING A ZIEGLER CATALYST SYSTEM

Robert Bachl, Worms; Volker Warzelhan, Weisenheim; Guenther Schweler, Friedelsheim; Hans Gropper, Ludwigshafen, and Wolfgang Ball, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 666,480, Oct. 30, 1984, abandoned.

This application Jun. 18, 1986, Ser. No. 876,299

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417238

Int. Cl.⁴ C08F 4/64, 210/02

U.S. Cl. 526—116

3 Claims

1. A process for the preparation of copolymers of ethylene with minor amounts of C_3 - C_8 - α -monoolefins by polymerization of the monomers at from 50° to 125° C. and under a pressure of from 5 to 60 bar, the improvement which comprises using a Ziegler catalyst system comprising

- (1) a transition metal catalyst component,
- (2) an organoaluminum catalyst component of the formula



where R is C_2 - C_8 -alkyl, and

- (3) an organohalogen catalyst component (cocatalyst), selected from the group consisting of those of the formulae $CFCl_3$, CCl_4 , $CHCl_3$, CH_2Cl_2 , CF_2Cl_2 , $CH_2=CH-CH_2Cl$, $CCl_2=CCl-CCl_3$, $CH=C-CH_2Cl$, α -chlorotoluene, α,α -dichlorotoluene, α,α,α -trichlorotoluene, methyl perchlorocrotonate and n-butyl 2,3,4,4-tetrachlorobut-2-enoate

with the provisos that the atomic ratio of the transition metal from the catalyst component (1) to aluminum from the catalyst component (2) is from 1:0.2 to 1:50, and the molar ratio of the organoaluminum catalyst component (2) to the organohalogen catalyst component (3) is from 1:0.01 to 1:10, wherein the transition metal catalyst component (1) used is a solid-phase product (VI), obtained by a method in which

- (1.1) first
 - (1.1.1) a finely divided, porous silicon dioxide (I), which has a particle diameter of from 1 to 400 μ m, a pore volume of from 1 to 2.5 cm³/g and a specific surface area of from 200 to 400 m²/g and
 - (1.1.2) a solution (II), as obtained on combining
 - (IIa) 100 parts by weight of a saturated alicyclic oxahydrocarbon of 1 oxa oxygen atom and 4 to 6 carbon atoms and
 - (IIb) from 1 to 50 parts by weight of a mixture of
 - (IIb1) 100 molar parts of a vanadium trihalide/alcohol complex of the formula $VY_3 \cdot nZ \cdot OH$, wherein Y is chlorine, n is from 1 to 6, and Z is an alkyl of not more than 6 carbon atoms,
 - (IIb2) from 0.5 to 100 molar parts of a titanium trichloride or of a titanium trihalide/alcohol complex of the formula $TiY_3 \cdot nZOH$, where Y is chlorine, n is from 1 to 6 and Z is an alkyl of not more than 4 carbon atoms and
 - (IIb3) from 3 to 200 molar parts of a zirconium tetrachloride, are brought into contact with one another to form a suspension (III), with the proviso that the weight ratio of silicon dioxide (I) to transition metal composition (IIb) is from 1:0.2 to 1:1.5, the suspension (III) is evaporated to dryness at below 160° C. and above the melting point of the oxahydrocarbon (IIa) used, a solid-phase intermediate (IV) being formed, and
 - (1.2) thereafter
 - (1.2.1) the solid-phase intermediate (IV) obtained from stage (1.1) and
 - (1.2.2) a solution, in an organic solvent, of an aluminum compound (V) of the formula



where X is chlorine, R is C_2 - C_8 -alkyl, and m is the number 2, are brought into contact with one another to form a suspension, with the proviso that the weight ratio of the solid-phase intermediate (IV) to the aluminum compound (V) is from 1:0.1 to 1:1, and the resulting suspended solid-phase product (VI) is the transition metal catalyst component (1).

4,710,553

PROCESS FOR THE POLYMERIZATION OR COPOLYMERIZATION OF BUTADIENE

Antonio Carbonaro, Milan; Silvano Gordini, and Salvatore Cucinella, both of San Donato Milanese, all of Italy, assignors to Enichem Elastomeri S.p.A., Palermo, Italy

Filed May 2, 1986, Ser. No. 859,009

Claims priority, application Italy, May 15, 1985, 20715 A/85

Int. Cl.⁴ C08F 4/52

U.S. Cl. 526—142

23 Claims

1. In a process for the preparation of 1,4-cis polybutadiene or butadiene copolymers with other related diolefins for the catalytic polymerization or copolymerization of butadiene monomer, in the absence or substantial absence of solvents or diluents, comprising preparing a catalytic mixture by placing in contact in an inert hydrocarbon vehicle the following:

- (a) at least one neodymium compound chosen from among neodymium oxide, alcoholates, phenates and carboxylates or mixtures thereof with other rare earth elements;
- (b) at least one organic compound containing hydroxyl groups derived from alcohols or phenols or carboxyl groups, with the possible addition of water;
- (c) at least one halogen compound, chosen from among secondary or tertiary alcohol halogenides, aryl or alkyl-aryl halogenides, halogenides or organic acids, metallic or organometallic halogenides, and halogens; and
- (d) at least one organometallic aluminum compound or relative hydride derivatives thereof; wherein

the quantities of compounds (a) and (b) are such so as to obtain a ratio between hydroxyl groups (including those of water) and/or carboxyl groups and neodymium atoms of 2/1 to 80 and maintaining contact of said components to thereby obtain a catalytic mixture having an aluminum/neodymium ratio of 20/1 to 80/1 and a halogen/neodymium ratio of 0.2/1 to 3/1; feeding said catalytic mixture and liquid butadiene monomer, possibly premixed, in quantities of 10^4 to $4 \cdot 10^5$ g. mols of butadiene per g. atom, discontinuously in an agitated polymerization reactor, or continuously in two reactors in series the first of which is homogeneous, or at one end of an elongated reactor in which is carried out the polymerization of the mixture flowing by piston ("plug-flow"), controlling the temperature through the partial evaporation of butadiene monomer from the liquid phase of polymerization, until a mixture with a polymer content of approximately 25 to approximately 70% by weight is obtained, which is discharged from the other end of the reactor; and separating and recovering 1,4-cis polybutadiene from said mixture discharged from the reactor; the improvement comprising carrying out polymerization in two phases, the first phase is carried out at a temperature of between 0° and 30° C. and the second phase is carried out at a temperature of between 50° and 90° C.

4,710,554

POLYBUTADIENE AND PROCESS FOR PREPARING THE SAME

Akio Imai, Ichihara; Yasushi Okamoto, Ibaraki, and Masatoshi Saito, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 703,896, Feb. 21, 1985, abandoned.

This application Feb. 14, 1986, Ser. No. 829,846

Claims priority, application Japan, Feb. 27, 1984, 59-37150

Int. Cl.⁴ C08F 4/48

U.S. Cl. 526—180

15 Claims

1. A process for producing a polybutadiene having branched polymer chains, said polybutadiene having an average 1,2-

bond content of 18 to 32% by mole, a branched polymer chain content of 60% by weight or more and a Mooney viscosity at 100° C. of 40 to 90, the viscosity of a 5% by weight concentration solution of the polybutadiene in styrene at 25° C. being 60 to 90 cps, said process comprising starting the polymerization of 1,3-butadiene in an inert hydrocarbon solvent in the presence of a Lewis basic compound and an organomonolithium compound in an amount of 0.5 to 3 millimoles per 100 g of 1,3-butadiene at a temperature selected from the range of 30° to 40° C., conducting the polymerization while controlling the temperature so that the temperature at the end of the polymerization may be 20° to 40° C. higher than the temperature at the start of the polymerization, and adding to the resulting polymer solution of a polyfunctional halogen compound in an amount of 0.6 to 1 equivalent per equivalent of the organomonolithium compound to effect further reaction thereof.

4,710,555

NOVEL POLYAMPHOLYTE COMPOSITIONS POSSESSING HIGH DEGREES OF ACID, BASE, OR SALT TOLERANCE IN SOLUTION

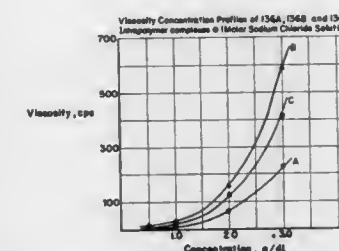
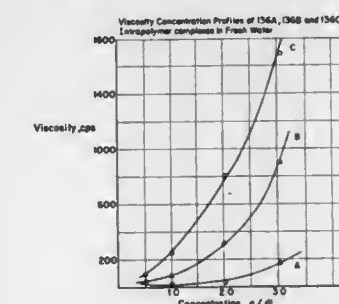
Dennis G. Peiffer, East Brunswick, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 688,238, Jan. 2, 1985, abandoned. This application Feb. 5, 1986, Ser. No. 826,229

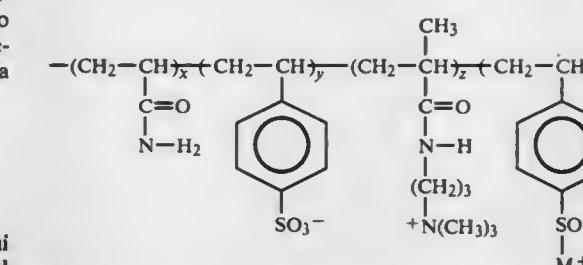
Int. Cl.⁴ C08F 230/04

U.S. Cl. 526—240

11 Claims



1. A terpolymer having the formula:



wherein x is 1 to 50 mole %, y is 1 to 50 mole %, z is 1 to 50 mole %, y is equal to z, A is 1 to 25 mole %, wherein A, y and z are less than 50 mole % and the ratio of A/y+z is 0.25 to 15, and M is selected from the group consisting of amines and a metallic cation being selected from the group consisting of lead, iron, aluminum, Groups IA, IIA, IB and IIB of the Periodic Table of Elements.

4,710,556

PROCESS FOR PREPARING COPOLYMERS AND USE OF THE PRODUCTS OBTAINED

Helmut Plum, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst AG, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,577

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3101887

Int. Cl.⁴ C08F 18/14

U.S. Cl. 526—273

13 Claims

1. A process for preparing copolymers which comprises copolymerizing in a radical bulk polymerization the following components:

- (A) between 10 and 60 parts by weight of at least one diester of an α,β -olefinically unsaturated dicarboxylic acid with a monohydric alcohol having 1 to 8 carbon atoms in each ester group,
 (B) between 10 and 70 parts by weight of at least one vinyl derivative of a monocyclic aromatic hydrocarbon having but one vinyl group, in which any alkyl groups optionally in α -position or attached to the aromatic ring system have from 1 to 3 carbon atoms;
 (C) between 0 and 30 parts by weight of at least one glycidyl ester of an aliphatic saturated monocarboxylic acid being branched in α -position, the acid having from 9 to 11 carbon atoms,
 (D) between 0 and less than 51 parts by weight of at least one ester or amide of at least one α,β -olefinically unsaturated monocarboxylic acid or an anhydride of at least one α,β -olefinically unsaturated dicarboxylic acid,
 (E) between 0 and 40 parts by weight of at least one α,β -olefinically unsaturated monocarboxylic acid,

wherein at least one of Components (D) and (E) is present, the total amount of Components (A) to (E) is 100 parts by weight, the polymerization is effected by introducing at first at least one part of Component A into the reaction vessel alone or in combination with at least a part of Component (C), heating the contents of the vessel to a temperature in the range between 140° and 200° C. and then copolymerizing by gradually adding a mixture of Component (B) with at least one of Components (D) and (E) or a combination of said mixture with remaining parts, if any, of Component A or of Components (C) and (A) or a combination of said mixture with the whole part of Component (C) into said vessel together with a radical initiator alone or in combination with a molecular weight regulator and wherein, if Component (C) is present, an at least equimolar amount, referred to Component (C), of Component (E) is added.

4,710,557

POLYMERS OF THIOPHENYL THIOACRYLATE AND THIOMETHACRYLATE MONOMERS

David P. Warren, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 697,554, Feb. 1, 1985, Pat. No. 4,606,864.

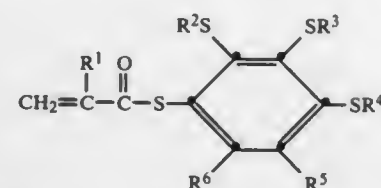
This application Aug. 14, 1986, Ser. No. 896,553

Int. Cl.⁴ C08F 28/04

U.S. Cl. 526—289

14 Claims

1. A polymer comprising
 (a) 5 to 100 mole percent of recurring units derived from a monomer having the formula:



wherein:
 R¹ is H or methyl;

R², R³ and R⁴ are alkyl; and
 R⁵ and R⁶ are thioalkyl; and

- (b) 0 to 95 mole percent of a polymerized copolymerizable ethylenically unsaturated monomer; said polymer having an index of refraction greater than 1.7.

4,710,558

PROCESS FOR STABILIZING ORGANOPOLYSILOXANES

Reinhard Jira, Burghausen, and Ralph Ottlinger, Murnau, both of Fed. Rep. of Germany, assignors to Wacker Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 1, 1986, Ser. No. 891,997

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535379

Int. Cl.⁴ C08G 77/06

U.S. Cl. 528—14

10 Claims

1. A process for stabilizing organopolysiloxanes against viscosity changes which contain alkaline compounds selected from the group consisting of alkali metal hydroxides, alkali metal silanates, and alkali metal siloxanates or a mixture of at least two of such alkaline compounds which comprises neutralizing the alkaline compounds with a neutralizing agent selected from the group consisting of a compound consisting of carbon, hydrogen and oxygen atoms, in which 2, 3 or 4 hydrocarbon groups are bonded to the same carbon atoms via oxygen, a compound consisting of carbon, hydrogen, oxygen and at least one halogen atom, in which 2, 3 or 4 hydrocarbon groups are bonded to the same carbon atom via oxygen, and an acylacetic acid ester in which the neutralizing agent is a liquid at room temperature at 1020 hPa (abs.) and has a boiling point up 200° C. at 1020 hPa (abs.).

4,710,559

HEAT CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

James F. Esslinger, Jr., Adrian, Mich., assignor to Wacker Silicones Corporation, Adrian, Mich.

Filed Dec. 22, 1986, Ser. No. 945,132

Int. Cl.⁴ C08G 77/06

U.S. Cl. 528—15

17 Claims

1. A heat curable organopolysiloxane composition comprising (a) an organopolysiloxane having an average of at least two aliphatically unsaturated hydrocarbon radicals per molecule, (b) an organohydrogenpolysiloxane having an average of at least two Si-bonded hydrogen atoms per molecule, (c) a platinum catalyst capable of promoting the addition of the Si-bonded hydrogen atoms to the aliphatically unsaturated hydrocarbon radicals and (d) a hydrazone compound.

4,710,560

POLYURETHANE COATING COMPOSITION

Cung Vu, Gaithersburg, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Sep. 8, 1986, Ser. No. 904,732

Int. Cl.⁴ C08G 18/12

U.S. Cl. 528—67

16 Claims

1. A moisture-curable composition comprising an isocyanate terminated, branched prepolymer which is the reaction product of

- (a) an alcohol having two or three —OH groups,
 (b) a hydrophobic polymer diol or triol, and
 (c) at least one polyisocyanate,
 said prepolymer having an NCO content in the range 0.3 to 1.0 meq/g, the mole ratio of (a), (b) and (c) being in the range 1:2.6–6.0:4.6–9, respectively.

4,710,561

[POLY]IMIDAZOLINE ADDUCT FOR ELECTROCOATING

Akira Tominaga, and Reiziro Nishida, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Nov. 26, 1986, Ser. No. 935,306

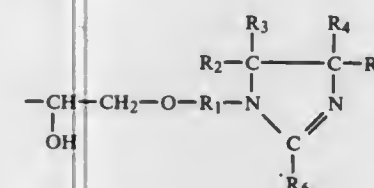
Claims priority, application Japan, Nov. 27, 1985, 60-265101

Int. Cl.⁴ C08G 59/64

U.S. Cl. 528—111

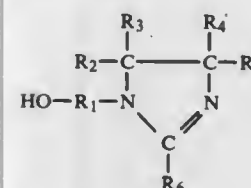
20 Claims

1. A resin coating composition comprising an epoxy resin derivative having an imidazoline ring functional group of the formula



wherein R₁ represents an alkylene group having 2 to 6 carbon atoms, each of R₂, R₃, R₄ and R₅ represents a hydrogen atom or a methyl group, and R₆ represents a residue of a carboxylic acid,

as a rest binder.
 2. A resin coating composition of claim 1 wherein the group of formula (I) is an imidazoline ring functional group obtained by reacting the 1,2-epoxy groups of an epoxy resin with an N-hydroxyimidazoline of the formula



wherein R₁, R₂, R₃, R₄, R₅ and R₆ are as defined in claim 1.

4,710,562

STABILIZING POLYARYLETHERTERKETONES

Louis M. Maresca, Belle Mead, N.J., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 710,118, Mar. 11, 1985, abandoned.

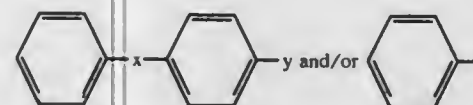
This application May 27, 1986, Ser. No. 867,619

Int. Cl.⁴ C08G 8/02, 14/00

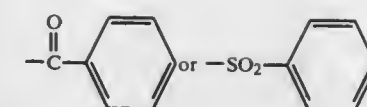
U.S. Cl. 528—125

9 Claims

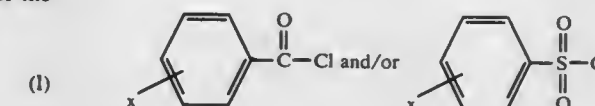
1. A method of stabilizing poly(aryl ether ketones) produced by reacting a nucleophilic coreactant with an electrophilic coreactant under heterogeneous polymerization conditions in the presence of a Friedel-Crafts catalyst at a temperature of from about 0° to about 160° C. in an organic solvent, which comprises adding a nucleophilic and/or an electrophilic capping agent during the polymerization, said nucleophilic capping agent being of the following formula:



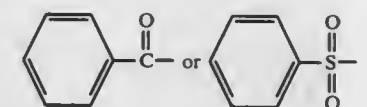
wherein x is a covalent bond, —O—, —S—, or —CR₂—, wherein each R is independently hydrogen, C₁ to C₁₀ alkyl, C₁ to C₁₀ fluoroalkyl, phenyl or an electron withdrawing group substituted phenyl, y is NO₂,



and z is halogen, alkyl or alkoxy; said electrophilic capping agent being of the following formula:



wherein x is halogen, alkyl, alkoxy, nitro,



4,710,563

PROCESS FOR THE RECOVERY OF AMORPHOUS DEVAPORIZED POLYALPHAOLEFIN

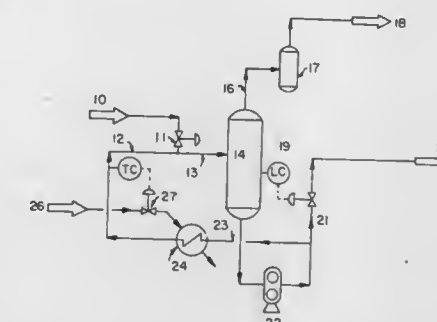
Steven L. Oetting, Midland, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Aug. 15, 1986, Ser. No. 896,793

Int. Cl.⁴ C08F 6/26, 6/28

U.S. Cl. 528—501

3 Claims



1. A process for the production of a polyalphaolefin in fluid form which comprises:

- (a) withdrawing from a bulk polymerization zone maintained at a temperature between about 130° F. and about 175° F. and at a pressure between about 400 psig and about 550 psig through a valve a reactor effluent comprised of amorphous polyalphaolefin and liquid unreacted monomer;
 (b) directly contacting said effluent immediately upon withdrawal through said valve with a heated devaporized amorphous polyalphaolefin obtained in step (f) below and having a temperature in the range from about 350° F. to about 425° F.;
 (c) passing the resulting mixture from step (b) to a flash zone maintained at a pressure from about 40 to about 80 psig and a temperature between about 300° F. and about 375° F.;
 (d) withdrawing a vapor stream of unreacted monomer from said flash zone;
 (e) withdrawing devaporized amorphous polyalphaolefin from said flash zone;
 (f) heating a portion of said devaporized polyalphaolefin from step (e) by indirect heat exchange and passing the heated portion to step (b) above, and

least 5 carbon atoms free of additional carboxyl groups selected from the group consisting of benzoyl optionally substituted with at least one member of the group consisting of alkyl and alkoxy of 1 to 6 carbon atoms, chlorine, bromine and iodine, phenylalkanoyl of 1 to 4 alkyl carbon atoms optionally substituted on the phenyl with at least one member of the group consisting of alkyl and alkoxy of 1 to 6 carbon atoms, chlorine, bromine and iodine,



and A is a 5- or 6-member aromatic heterocycle ring containing oxygen, nitrogen or sulfur, and acyl of an alkanic acid of 5 to 18 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

4,710,572

HISTAMINE H₁ ANTAGONISTS

Magid A. Abou-Gharbia, and Susan T. Nielsen, both of Wilmington, Del., assignors to American Home Products Corporation, New York, N.Y.

Filed Jul. 30, 1986, Ser. No. 892,159

Int. Cl.⁴ C07D 473/08; A61K 31/52

U.S. Cl. 544-267

1 Claim

1. The compound which is 7-[3-[4-bis(4-fluorophenyl)methyl]-1-piperazinyl]propyl-3,7-dihydro-1,3-dimethyl-1H-purine-2,6-dione or a pharmaceutically acceptable salt thereof.

4,710,573

3-(PIPERIDINYL)-AND 3-(PYRROLIDINYL)-1H-INDAZOLES

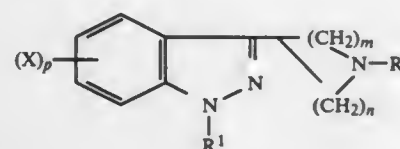
Joseph T. Strupczewski, Flemington, N.J., assignor to Hoechst Roussel Pharmaceuticals, Inc., Somerville, N.J. Division of Ser. No. 811,090, Dec. 19, 1985, Pat. No. 4,670,447, which is a continuation-in-part of Ser. No. 694,198, Jan. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 679,662, Dec. 7, 1984, abandoned, which is a continuation-in-part of Ser. No. 525,088, Aug. 22, 1983, abandoned. This application Mar. 19, 1987, Ser. No. 37,194

Int. Cl.⁴ C07D 401/14, 403/14

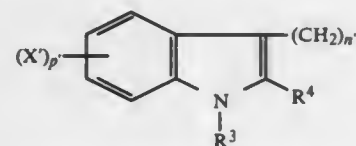
U.S. Cl. 546-199

1 Claim

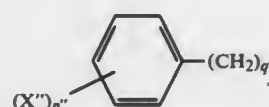
1. A compound of the formula



wherein R is

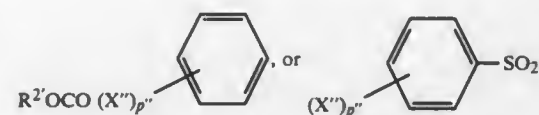


and R¹ is hydrogen, loweralkyl, loweralkenyl, lowercycloalkyl, loweralkyl, cyano, cyanomethyl, formyl,

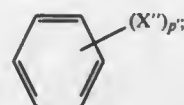


diloweralkylaminoloweralkyl, cyano, cyanomethyl, formyl,

loweralkanoyl, hydroxymethyl, hydroxyloweralkyl, lowercycloalkyl, loweralkanoyl, loweralkoxycarbonyl, loweralkyl,



R² is loweralkyl, 2,2,2-trichloroethyl, phenyl or



R³ and R⁴ are independently hydrogen or loweralkyl; X, X' and X'' are independently hydrogen, halogen, loweralkyl, loweralkoxy, loweralkanoyl, loweralkylthio, cyano, carbamoyl, hydroxy, nitro, amino or trifluoromethyl; m is 2 or 3, n is 1 or 2, and the sum of m and n is 3 or 4; n' is 2 or 3; p, p' and p'' are independently 1 or 2 except when x'' is halogen p'' is 1 through 5; and q' is 1, 2, 3 or 4; the optical antipode thereof; or the pharmaceutically acceptable salt thereof.

4,710,574

α-AMINO ACIDS THROUGH CATALYTIC REACTION OF CO AND A HYDROXYL COMPOUND WITH ENAMIDES

Mark C. Cesa, South Euclid, and James D. Burrington, Richmond Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

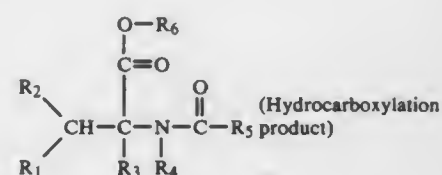
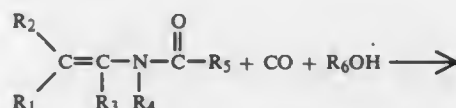
Filed Nov. 16, 1983, Ser. No. 552,561

Int. Cl.⁴ C07D 207/16

U.S. Cl. 548-533

1 Claim

1. A process for making a compound hydrolyzable to an α-amino acid which comprises reacting an enamide with CO and water or an organic hydroxyl compound according to the equation



wherein R₁ and R₃ are H, each of R₂ and R₄ is a —CH₂— group, and wherein each of R₅ and R₆ contains no ethylenic or acetylenic unsaturation, contains zero to 15 carbon atoms and are independently selected from:

- (1) H or a hydrocarbyl group,
- (2) a hydrocarbyl group substituted with acylamino, acyl-(N-hydrocarbyl) amino, formylamino and formyl-(N-hydrocarbyl) amino, hydrocarbyloxy, hydrocarbylthio, acyloxy, acylthio, carboxyl, hydrocarbyl carboxyl, hydrocarbyl thiocarboxyl, hydrocarbyl amino, dihydrocarbyl amino, hydrocarbonyl, hydrocarbyl carbonyl, 3-indolyl, carbomoyl hydrocarbylcarbomoyl, dihydrocarbylcarbomoyl, 5-imidazolyl, 2-guanidinoyl and halo groups, and wherein R₄ is linked with R₂ to form a ring.

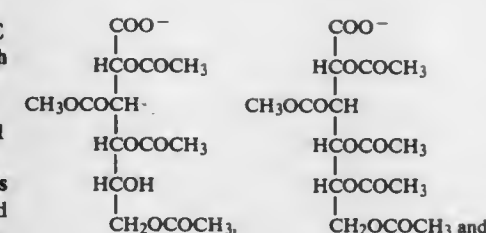
4,710,575

BISNEOPENTYL ALKYL ORGANOMETALLIC COMPOUNDS AND METHODS OF PREPARING SAME
Orville T. Beachley, Jr., Buffalo, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.
Continuation-in-part of Ser. No. 673,836, Nov. 21, 1984, Pat. No. 4,621,147. This application Aug. 8, 1986, Ser. No. 894,571
Int. Cl.⁴ C07F 5/00

U.S. Cl. 556-1

3 Claims

1. M[CH₂C(CH₃)₃]X where X is chloro, bromo or iodo and M is selected from the group consisting of gallium and indium.



4,710,576

THERMOCHROMIC ARSENIC AND ANTIMONY COMPOUNDS

Anthony J. Arduengo, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

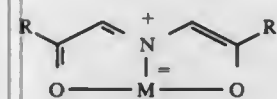
Filed Feb. 19, 1986, Ser. No. 830,840

Int. Cl.⁴ C07F 9/68, 9/90

U.S. Cl. 556-40

9 Claims

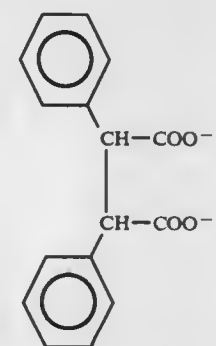
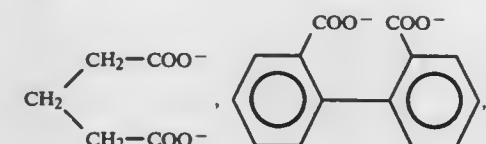
1. A compound having the formula



wherein R and R' are selected from the group consisting of (a) substituents having the formula R¹R²R³C-wherein R¹ is H or an alkyl groups of 1 to 6 carbon atoms, and R² and R³ are independently alkyl of 1 to 6 carbon atoms; (b) phenyl group; (c) phenyl group substituted by Br, Cl, F, alkyl group of 1 to 10 carbon atoms, or alkoxy group of 1 to 10 carbon atoms; and (d) an adamantyl group; and M is As or Sb; with the proviso that when R and R' are phenyl or substituted phenyl in which the substituents are in meta or para positions, M is As.



or R₁ and R₂ may together represent —OOC(CHOH)₄COO—, —OOC—CH=CH—COO—,



or —OOC(CHOCOCH₃)₄COO—, (with the proviso that R₁ and R₂ are not both NO₃), the configuration of the 1,2-diaminocyclohexane (DACH) being selected from cis, trans-d and trans-l, or mixtures of any of these.

4,710,577

CYTOSTATIC PLATINUM ORGANIC COMPLEXES
Yoshinori Kidani, 2-718, Mataho-kodan jutaku, 2-1 Mataho-cho, Nishi-ku, Nagoya-shi, Aichi-ken, and Masahide Noji, 184-5, Aza Fukazawa, Ohaza Kikko, Moriyama-ku, Nagoya-shi, Aichi-ken, both of Japan

Filed Aug. 3, 1984, Ser. No. 637,463

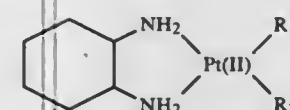
Claims priority, application Japan, Aug. 5, 1983, 58-143405; Nov. 2, 1983, 58-206215

Int. Cl.⁴ C07F 15/00

U.S. Cl. 556-137

7 Claims

1. 1,2-Diaminocyclohexane platinum (II) complexes of the general formula:



wherein R₁ and R₂, which may be the same or different, are selected from NO₃⁻, MOOC(CHOH)₂COO⁻ (wherein M is an alkali metal),

4,710,578

ISOTHIURONIUM SALTS

Csaba Vértési; Attila Molnár, and Lajos Guccigohy, all of Budapest, Hungary, assignors to Peremartoni Vegyipari Vállalat, Peremartonyartelep, Hungary

PCT No. PCT/HU85/00022, § 371 Date Nov. 25, 1985, § 102(e) Date Nov. 25, 1985, PCT Pub. No. WO85/04399, PCT Pub. Date Oct. 10, 1985

PCT Filed Apr. 2, 1985, Ser. No. 809,888

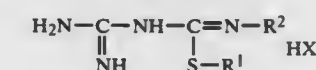
Claims priority, application Hungary, Apr. 3, 1984, 1324/84; Mar. 19, 1985, 1324/84

Int. Cl.⁴ C07C 157/14

U.S. Cl. 558-4

13 Claims

1. A salt of the Formula (I)



wherein

R¹ is allyl, 2-chloroethyl, 2-chloro-2-hydroxypropyl, 3-chloropropyl, 2-hydroxyethyl, glycidyl, 2-bromoethyl, 3-bromopropyl, 3-hydroxypropyl, 3-mercapto-propyl, propargyl, methallyl, or 1-chloro-2-hydroxy-propyl; R² is hydrogen, C₁ to C₆ alkyl, C₂ to C₆ alkenyl, C₂ to C₆ alkynyl, or C₃ to C₆ cycloalkyl; and X is halide.

4,710,579

2-(ACETOACETYLOXY)-3-(OCTADECYLOXY)PROPYL-3-TRIMETHYLAMMONIOPROPYL PHOSPHATE OR A PHARMACEUTICALLY ACCEPTABLE SALT THEREOF

Shoshichi Nojima, Tokyo; Hiroaki Nomura, and Tetsuya Okutani, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 30, 1985, Ser. No. 792,878

Claims priority, application Japan, Nov. 9, 1984, 59-237271; Apr. 19, 1985, 60-84781

Int. Cl.⁴ C07F 9/10

U.S. Cl. 558—169

2 Claims

1. 2-(Acetoacetyloxy)-3-(octadecyloxy)propyl 3-trimethylammoniopropyl phosphate.

4,710,580

2-[1,3,2-DIOXAPHOSPHOLAN-2-YLOXY]ETHYL COMPOUNDS

William H. McGregor, Malvern, and Joseph Y. Chang, Berwyn, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 12, 1986, Ser. No. 895,779

Int. Cl.⁴ C07F 9/15

U.S. Cl. 558—86

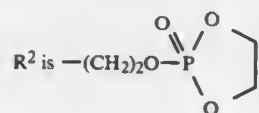
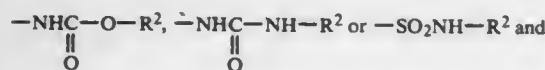
4 Claims

1. A compound having the formula



wherein

R¹ is alkyl of 8–22 carbon atoms; X is



4,710,581

NUCLEOPHILIC SUBSTITUTION PROCESS

G. Patrick Stahly, and Barbara C. Stahly, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 640,004, Aug. 10, 1984, Pat. No. 4,581,463, which is a continuation-in-part of Ser. No. 452,517, Dec. 23, 1982, abandoned, and a continuation-in-part of Ser. No. 452,617, Dec. 23, 1982, abandoned, said Ser. No. 452,517, is a continuation-in-part of Ser. No. 419,341, Sep. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 312,176, Oct. 16, 1981, abandoned, said Ser. No. 452,617, is a continuation-in-part of Ser. No. 419,344, Sep. 17, 1982, abandoned. This application Oct. 3, 1985, Ser. No. 783,419

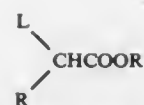
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.⁴ C07C 79/46

U.S. Cl. 560—20

12 Claims

1. A process which comprises reacting a halonitroaromatic compound with an alpha, alpha-disubstituted acetic acid ester corresponding to the formula:



wherein L is halo, R is hydrocarbyl, and R' is alkyl in an inert solvent and in the presence of a base so as to form a halonitroaromatic acid ester by effecting a nucleophilic substitution of the ester reagent on an unsubstituted ring carbon of the halonitroaromatic compound during which the alpha-halo substituent functions as a leaving group.

4,710,582

HERBICIDALLY ACTIVE SUBSTITUTED DIPHENYL ETHER OXIME DERIVATIVES

James G. Phillips, Medina, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

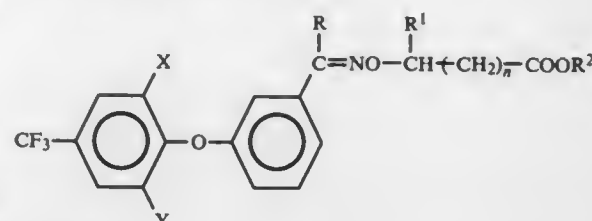
Filed Jul. 14, 1986, Ser. No. 885,359

Int. Cl.⁴ C07C 101/00

U.S. Cl. 560—35

5 Claims

1. A compound of the formula:



wherein:

X and Y are the same or different halogen; R is hydrogen, halogen, cyano, C₁ to C₄ alkyl or haloalkyl, C₁ to C₄ alkoxy or alkylthio, or mono or dialkylamino; R¹ is hydrogen or C₁ to C₄ alkyl; R² is hydrogen or up to C₁₀ alkyl, haloalkyl, cycloalkyl, alkenyl, alkynyl, alkoxyalkyl or phenyl, substituted phenyl, benzyl or substituted benzyl; and n is 0, 1, 2 or 3.

4,710,583

DIPEPTIDES AND PROCESS

Alan B. Chmurny, Frederick; Akiva T. Gross, Rockville; Robert J. Kupper, Mount Airy, and Rowena L. Roberts, Derwood, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

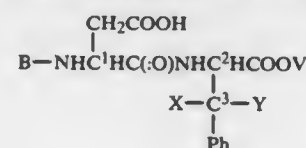
Filed Oct. 21, 1985, Ser. No. 789,595

Int. Cl.⁴ C07C 101/32; C12P 21/02; A61K 37/02

U.S. Cl. 560—40

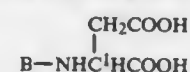
19 Claims

1. Process for producing a dipeptide of the formula



wherein B represents hydrogen or Q; Q represents an amino acid protective group; V represents hydrogen or an alkyl group having 1, 2, 3, or 4 carbon atoms; C¹ and C² have the common natural configuration of naturally occurring amino acids; and Y is hydrogen and X is chloro or hydroxyl, said process comprising:

reacting B-substituted aspartic acid of the formula



wherein X, Y, and V are as defined above and the C² carbon has the common natural configuration of naturally occurring amino acids;

said reaction being conducted in

- (d) a water-immiscible solvent in the presence of a metallo-proteinase,
- (e) a water-miscible solvent in the presence of a non-metallo-proteinase, or
- (f) a water-immiscible solvent in the presence of a non-metallo-proteinase.

4,710,584

DERIVATIVES OF 3-BENZYLIDENE CAMPHOR, PROCESS FOR THEIR PREPARATION AND THEIR USE AS PROTECTIVE AGENTS AGAINST UV RAYS AND AS MEDICAMENTS

Gerard Lang, Saint Gratien; Serge Forestier, Claye Souilly, and Alain LaGrange, Chatou, all of France, assignors to L'Oreal, Paris, France

Filed Dec. 11, 1984, Ser. No. 680,559

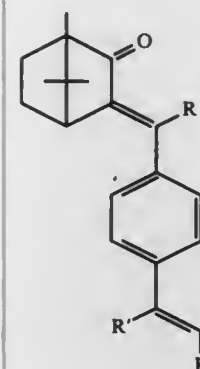
Claims priority, application Luxembourg, Dec. 14, 1983, 85139

Int. Cl.⁴ C07L 69/76, 143/52

U.S. Cl. 560—51

27 Claims

1. A compound consisting of a derivative of 3-benzylidene camphor of the formula:



in which

R is a hydrogen atom, a methyl radical or an ethyl radical, R' is a hydrogen atom, a methyl radical or an ethyl radical, with the proviso that if one of R and R' is a hydrogen atom, the other of R and R' is a methyl radical or an ethyl radical,

R₁ is a —COOR₂, —CONHR₂, —COO—M⁺, —CHO, —CH(OR₄) or —CH₂OR₄ group,

R₂ is an alkyl, alkenyl, cycloalkyl or aralkyl radical containing at most 20 carbon atoms or said alkyl, alkenyl, cycloalkyl or aralkyl radical, substituted by hydroxy, alkoxy, amine or quaternary ammonium groups,

M is a hydrogen atom, an alkali metal or a N⁺(R₃)₄ group, R₃ being a hydrogen atom or a C₁ to C₄ alkyl or hydroxy-alkyl radical, and

R₄ is a hydrogen atom or an alkyl, cycloalkyl or aralkyl radical containing at most 20 carbon atoms.

4,710,585

LIQUID CRYSTAL COMPOUND

Masaaki Taguchi, Tokyo, and Hitoshi Suenaga, Hyogo, both of Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo and Teikoku Chemical Industry Co., Ltd., Osaka, both of Japan

Filed Jun. 10, 1985, Ser. No. 743,095

Claims priority, application Japan, Jul. 3, 1984, 59-137491

Int. Cl.⁴ C09K 19/12, 19/20; C07C 69/76, 69/78

U.S. Cl. 560—64

3 Claims

1. A liquid crystal compound selected from the group consisting of 4'-octylphenyl 4'-(6-methyloctyloxy)benzoate, 4'-(6'-

methyloctyloxy)phenyl 4-n-octylbenzoate, 4'-n-octylphenyl 4-(5-methylheptylcarboxy)-benzoate and 4'-(6'-methyloctyloxy)phenyl 4-n-heptylbiphenyl-4'-carboxylate.

4,710,586

FLUID LOSS ADDITIVES FOR OIL BASE MUDS AND LOW FLUID LOSS COMPOSITIONS

Arvind D. Patel, Houston, and Carmelita S. Salandanan, Sugarland, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

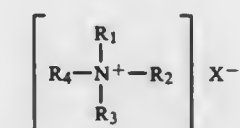
Filed Oct. 17, 1984, Ser. No. 661,639

Int. Cl.⁴ C07C 69/88

U.S. Cl. 560—68

10 Claims

1. Quebracho ammonium salt reaction products of quebracho with an alkyl quaternary ammonium salt having the formula



- wherein R₁, R₂, R₃ and R₄ are alkyl groups, at least one of which contains from 1 to 6 carbon atoms and at least one of which contains 10 to 22 carbon atoms, or aralkyl groups, wherein the alkyls contain 1 to 3 carbon atoms; X is a halogen, sulfate or hydroxyl anion.

4,710,587

PROCESS FOR REMOVING TRIORGANOPHOSPHINE FROM AN ORGANIC LIQUID

David R. Bryant, and Richard A. Galley, both of South Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 140,740, Apr. 16, 1980, abandoned.

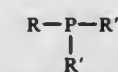
This application Aug. 2, 1985, Ser. No. 762,028

Int. Cl.⁴ C07C 45/80

U.S. Cl. 568—454

8 Claims

1. A process for selectively removing at least about 65 percent of alkyl substituted phosphine of the formula

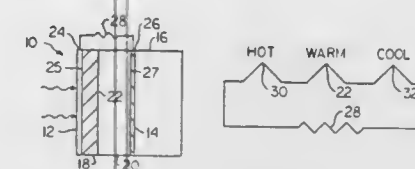


wherein R is an alkyl radical, R' is an alkyl or aryl radical and R'' is an aryl radical from an organic liquid containing alkyl substituted phosphine of said formula and triarylphosphine while removing only about 15 percent or less of said triarylphosphine from said organic liquid, said process consisting of the steps of

- (1) mixing said organic liquid with an aqueous solution of about 40 to about 60 percent by weight phosphoric acid,
- (2) allowing the mixture to settle into two distinct liquid phases, and
- (3) separating the aqueous-acidic phase which contains the protonated reaction products of said phosphines with said phosphoric acid from the non-aqueous organic phase resulting from said steps (1) and (2); and
- (4) washing said non-aqueous organic phase of step (3) with an aqueous alkaline solution and then with water; wherein the volume ratio of said aqueous phosphoric acid solution employed to the volume of said organic liquid employed is at least about 0.1 to 1, and wherein said organic liquid is a distillate of a rhodium complex catalyst containing hydroformylation medium or derivative of said distillate containing alkyl substituted phosphine of said formula and triarylphosphine, the remainder of said distillate consisting essentially of high boiling aldehyde condensation by-products.

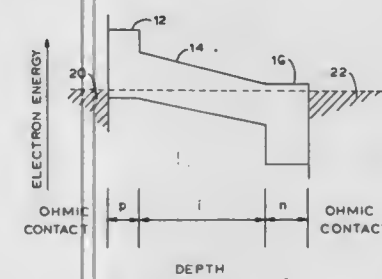
ELECTRICAL

4,710,588
COMBINED PHOTOVOLTAIC-THERMOELECTRIC SOLAR CELL AND SOLAR CELL ARRAY
 M. Edmund Ellion, Arcadia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
 Filed Oct. 6, 1986, Ser. No. 915,354
 Int. Cl.⁴ H02N 6/00; H01L 25/02, 35/00
 U.S. Cl. 136—206 13 Claims



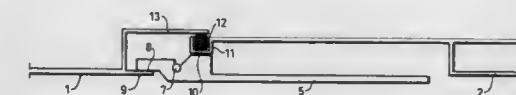
1. A solar cell array, comprising:
 a plurality of electrically connected gallium arsenide solar cells;
 means for imposing a thermal gradient across the thickness of each of said solar cells greater than that normally experienced by gallium arsenide solar cells exposed to direct sunlight, a hot face of said solar cells being at a temperature greater than a cool face thereof; and
 face electrode means in contact with said solar cells, including a hot junction electrode producing a high thermoelectric potential at said hot face and a cool junction electrode producing a low thermoelectric potential at said cool face of each of said solar cells.

4,710,589
HETEROJUNCTION P-I-N PHOTOVOLTAIC CELL
 Peter V. Meyers, Green Lane, Pa.; Chung-Heng Liu, Princeton Junction, N.J., and Timothy J. Frey, Schwenksville, Pa., assignors to Ametek, Inc., Paoli, Pa.
 Filed Oct. 21, 1986, Ser. No. 922,122
 Int. Cl.⁴ H01L 31/06
 U.S. Cl. 136—258 PC 21 Claims



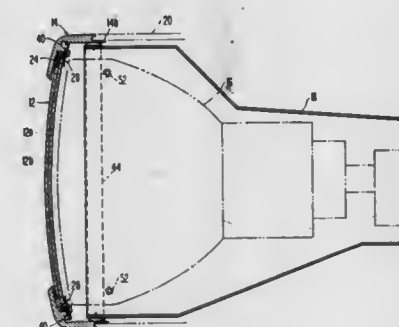
1. A heterojunction p-i-n photovoltaic cell having at least three layers of different semiconductor materials, composed together of at least four different elements, comprising:
 a p-type, relatively wide band gap semiconductor layer;
 a high resistivity intrinsic semiconductor layer, used as an absorber of light radiation;
 an n-type, relatively wide band gap semiconductor layer; said intrinsic layer being in electrically conductive contact on one side with said p-type layer and on an opposite side with said n-type layer; and
 first and second ohmic contacts in electrically conductive contact with said p-type layer and said n-type layer, respectively.

4,710,590
SEALING DEVICE IN METAL CABINETS, WHICH SCREENS OFF ELECTRO-MAGNETIC FIELDS
 Per A. A. Ekdahl, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
 PCT No. PCT/SE85/00219, § 371 Date Jan. 23, 1986, § 102(e)
 Date Jan. 23, 1986, PCT Pub. No. WO86/00491, PCT Pub. Date Jan. 16, 1986
 PCT Filed May 24, 1985, Ser. No. 843,700
 Claims priority, application Sweden, Jun. 18, 1984, 84032507
 Int. Cl.⁴ H05K 9/00
 U.S. Cl. 174—35 GC 10 Claims



1. A sealing device for a metal cabinet for screening electromagnetic fields comprising first and second adjacent elements, one of said elements being a pivotable door which is pivotably movable around a pivot axis between open and closed positions relative to the other of said elements, a compressible metallic gasket, said door having an edge facing said other element which supports said gasket and which moves towards and away from said other element when the door travels between said open and closed positions, an elongate element disposed adjacent said edge of said door and substantially coextensive in length therewith, hinge means supporting said elongate element for pivotal movement about an axis parallel to the pivot axis of the door, said elongate element having first and second elongate contact surfaces so disposed that when the elongate element is pivoted in one direction about its hinge axis relative to said other element said first elongate contact surface applies pressure to compress said gasket with increased leverage effect while said second elongate contact surface applies counterpressure against said other element to prevent the door from warping due to the pressure applied on the gasket, said hinge means being located between said first and second elongate contact surfaces such that the hinge means is not substantially loaded when the elongate contact surfaces apply the pressure and counterpressure respectively.

4,710,591
EMI/RFI SHIELDING ASSEMBLY FOR CATHODE RAY TUBE MONITORS
 Charles R. Rochester, Jr., Upper Darby, Pa., assignor to Unisys Corporation, Detroit, Mich.
 Filed Oct. 6, 1986, Ser. No. 924,428
 Int. Cl.⁴ H05K 9/00
 U.S. Cl. 174—35 GC 9 Claims



1. A shielding assembly for suppressing electromagnetic emissions from the face of a cathode ray tube mounted in a metallic chassis comprising:
 a filter window positioned in proximity to the face of said

cathode ray tube, said filter window being comprised of a pair of contiguous glass plates having metallic mesh interposed therebetween, said pair of glass plates including an inner plate situated closest to said face of said cathode ray tube and an outer plate, the corresponding dimensions of said outer plate being smaller than those of said inner plate, whereby a ledge is formed around the periphery of said window, said metallic mesh protruding from said plates as a sleeve along said ledge,

a resilient member disposed on said ledge and encircling said filter window, said sleeve being wrapped upon said resilient member,

a metallic bezel, clamping means disposed on said bezel for retaining said filter window therein, said resilient member being positioned adjacent the inner surface of said bezel, said clamping means including a movable member having an arcuate section at one extremity thereof, an adjacent planar section having a slot-like aperture therein for accommodating a screw, and a section orthogonal to said planar section at the opposite extremity thereof, said last mentioned section having a tail-like medial projection, said bezel having a tapped hole for receiving said screw and an oversized locating hole to accommodate said projection, said locating hole having a depth greater than the length of said projection, whereby the portion of the orthogonal section adjacent said projection abuts the inner surface of said bezel as said screw is torqued, said arcuate section contacting the surface of said inner glass plate whereby a pressure is applied normal to the glass surface, thereby compressing said resilient member against said bezel and effecting a first electrical termination.

4,710,592

MULTILAYER WIRING SUBSTRATE WITH ENGINEERING CHANGE PADS

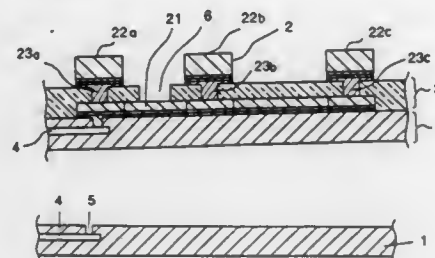
Kohji Kimbara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,670

Claims priority, application Japan, Jun. 25, 1985, 60-138722
Int. Cl.⁴ H05K 1/00

U.S. Cl. 174-68.5

11 Claims

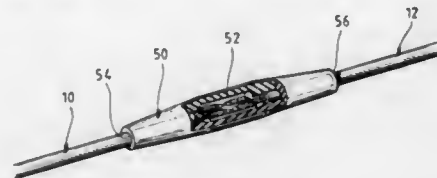


1. A multilayer wiring substrate comprising:
 - a wiring layer section including a plurality of wiring layers and insulating layers laminated alternatively;
 - a link structure made of electrically conductive material formed at a predetermined area on said wiring layer section and electrically connected to at least one of said wiring layers;
 - a further insulating layer formed on said link structure, and on some regions of said wiring layer section other than said predetermined area;
 - said further insulating layer having a plurality of via holes and a gap through which said link structure is exposed; and
 - a plurality of pad portions respectively formed on said further insulating layer and contacting said link structure through a corresponding via hole.

4,710,593
GEOPHONE CABLE SPLICE AND METHOD
Ernest M. Hall, Jr., Houston, and Jeffrey A. Buis, Sugar Land, both of Tex., assignors to Oyo Corporation, Houston, Tex.
Filed Jul. 14, 1986, Ser. No. 885,558
Int. Cl.⁴ H02G 15/18

U.S. Cl. 174-88 R

11 Claims



1. A geophone cable splice comprising,
 - a printed circuit board having at least two spaced apart electrical conductive lands bonded to an electrical non-conductive base,
 - first and second round cables, each of said cables having at least first and second round electrical conductors said first conductors of each of said cables soldered to one of the electrical lands and said second conductors of each of said cables soldered to another electrical land, and
 - a resilient boot having an opening therethrough, said opening enclosing the printed circuit board with one end of the boot sealingly engaging the first cable and the other end of the boot sealingly engaging the second cable.
7. The method of splicing two round geophone cables together, each of which have an outer round jacket, and at least first and second insulation-covered round electrical conductors comprising,
 - stripping the outer jackets of the ends of the cables to be spliced,
 - stripping the insulated covers from the ends of the electrical conductors;
 - soldering the first stripped conductors to a conductive land which is bonded to an electrically nonconductive base of a printed circuit board,
 - soldering the second stripped conductors to a second conductive land which is bonded to be base of the printed circuit board, and
 - sliding a resilient boot having an opening therethrough over the cables and the printed circuit board with a lubricant located between the boot and the cables in which the ends of the opening have a normal size of less than the outside circumference of the cables.

4,710,594

TELECOMMUNICATIONS CABLE

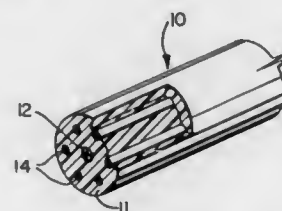
Jorg-Hein Walling, Beaconsfield; Jacques Cornibert, Ile Des Seours; Gordon D. Baxter, Kingston; Marie-Francoise Bottin, Lachine; Oleg Axluk, Pinpoint, and Phillip J. Reed, Dorval, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 23, 1986, Ser. No. 877,065

Int. Cl.⁴ H01B 7/00

U.S. Cl. 174-120 SR

16 Claims



1. A telecommunications cable devoid of a metal sheath and comprising a core including a plurality of individually insu-

lated conductors, a surrounding jacket and a plurality of substantially equally pre-tensioned and substantially inextensible elongate tensile members embedded in the jacket and extending longitudinally of the cable to place an axially compressive force upon the jacket, the elongate members spaced apart circumferentially around the core.

4,710,595

COORDINATE INPUT DEVICE

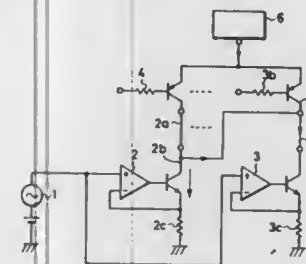
Kiyoshi Kimura, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 12, 1986, Ser. No. 941,160

Claims priority, application Japan, Jan. 25, 1986, 61-8397[U]
Int. Cl.⁴ G08C 21/00

U.S. Cl. 178-18

4 Claims



1. A coordinate input device comprising
 - main loops made of conductors embedded parallelly in an input plane,
 - a compensating loop disposed in the vicinity of the common wire of said main loops,
 - switching elements for successively sending out a scanning signal to said individual main loops,
 - a switching element for sending out a current to said compensating loop,
 - a current drive circuit pertinent to said main loops, and
 - a current drive circuit pertinent to said compensating loop, wherein a position is obtained on the basis of signals detected by a coordinate designating means capable of pointing out any spot on said input plane,
 - characterized in that the output side of said main loops is connected with the input side of said compensating loop.

4,710,596

TELEPHONE UNIT ADAPTED FOR VERTICAL AND HORIZONTAL MOUNTING

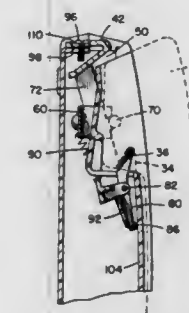
Haru Kurokawa, Liverpool, N.Y., assignor to General Electric Company, Bridgeport, Conn.

Filed Dec. 31, 1984, Ser. No. 687,587

Int. Cl.⁴ H04M 1/02, 1/04, 1/08, 11/00

U.S. Cl. 379-424

7 Claims



1. A telephone unit adapted for mounting in vertical and horizontal modes, said telephone unit comprising:
 - a handset having a predetermined configuration,
 - a cradle including stationary wall means at least partially

forming a complementary configuration for receiving and supporting said handset in a fixed position relative thereto, the predetermined configuration of said handset including a downwardly facing recess therein when the telephone unit is mounted in its vertical mode,

a hook member movable between a first position in which a portion of said hook member projects from said stationary wall means into a space occupied by said handset recess when said handset is received in said fixed position relative to said cradle and a second position in which no portion of said hook member projects into the space occupied by said handset recess when said handset is received in said fixed position relative to said cradle,

a movable wall means movable between a first position spaced substantially from the space occupied by said handset when said handset is received in said fixed position relative to said cradle and a second position adjacent the space occupied by said handset when said handset is received in said fixed position relative to said cradle, means coupling said hook member and said movable wall means such that said hook member and said movable wall means may be selectively moved by a user in unison in either direction between their respective first positions and their respective second positions,

and locking means for selectively locking said hook member and said movable wall means in either of their respective first and second positions, the said handset recess and said hook member having an orientation in its first position such that when the telephone unit is mounted in its vertical mode and said handset is placed on said cradle the weight of said handset causes said handset to move downwardly with said hook member received in said handset recess to said fixed position of said handset relative to said cradle, and an orientation of said handset and said movable wall means in its second position being such that when the telephone unit is mounted in its horizontal mode and said handset is placed on said cradle the weight of said handset causes said handset to move downwardly in engagement with said movable wall means to said fixed position of said handset relative to said cradle,

whereby a user may move said hook member and said movable wall means to their respective first positions when mounting of the telephone in its vertical mode is desired and said hook member and said movable wall means to their respective second positions when mounting of the telephone in its horizontal mode is desired.

4,710,597

KEYBOARD FOR THE CONTROL BOX OF AN ELECTRIC APPARATUS

Charles Loheac, Auray, France, assignor to Tabur Caoutchouc, Vannes, France

PCT No. PCT/FR85/00173, § 371 Date Feb. 13, 1986, § 102(e) Date Feb. 13, 1986, PCT Pub. No. WO86/00462, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 25, 1985, Ser. No. 845,140

Claims priority, application France, Jun. 26, 1984, 84 10056
Int. Cl.⁴ H01H 13/70

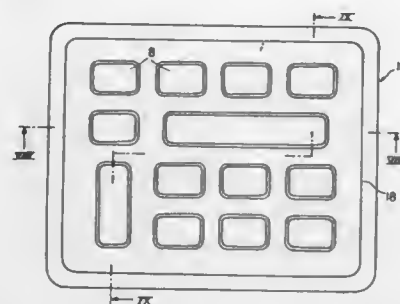
U.S. Cl. 200-5 A

18 Claims

1. A keyboard for a control box of an electrical apparatus comprising:

- (a) a first sheet comprising:
 - (i) a plurality of contactors, wherein each of said contactors comprises an elastically deformable blister projecting from said first sheet to function as a spring; and
 - (ii) a plurality of contact pads positioned within said blisters; and
- (b) a second sheet comprising a plurality of keys, each having a housing therein, wherein said plurality of contact pads comprise means for contacting a printed circuit in response to a pressure applied on said plurality of keys, wherein at least one of said plurality of contactors comprises

a stub positioned atop of said contactor opposite from said contact pads, and



wherein said at least one stub comprises means for being force fitted into said housing of one of said plurality of keys.

4,710,598

DISTRIBUTOR FOR MULTI-CYLINDER ENGINE

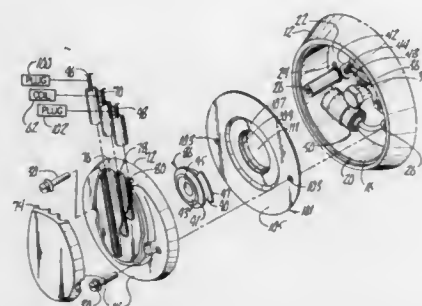
Mac P. McAbee, 3136 Cottage Grove, Des Moines, Iowa 50311, and Deloss J. Biddle, Urbandale, Iowa, assignors to Mac Patrick McAbee, Des Moines, Iowa

Continuation-in-part of Ser. No. 826,989, Feb. 7, 1986, Pat. No. 4,658,103. This application Dec. 22, 1986, Ser. No. 945,035

Int. Cl.⁴ H01H 19/04

U.S. Cl. 200—21

9 Claims



1. An improvement in a distributor for a two cylinder engine having first and second sparkplugs, said distributor comprising a housing forming a compartment having an open upper end and containing therein a rotor, a stationary contact point, a movable contact point, and spring means normally holding said movable contact point in a closed position in contact with said stationary contact point, said movable contact point being yieldably movable to an open position in spaced relation to said stationary contact point, said rotor having two lobes adapted for rotation to engage said movable contact point and cause said movable contact point to move to its open position twice during each revolution of said rotor, an electrical power circuit connected to said contact points and including an outlet connection, said power circuit being adapted to cause a surge of electrical current to be introduced to said outlet connection each time said movable contact point is moved to its open position, a single discharge coil having an inlet terminal connected to said outlet connection of said power circuit, said discharge coil having a single discharge post, said improvement comprising:

a dielectric gasket positioned in covering relation within said compartment over said stationary contact point and said movable contact point, said gasket having a central opening therein;

a dielectric circular disk above said gasket and having a lower portion extending through said central opening of said gasket and being detachably connected to said rotor for rotation in unison therewith, said disk having a con-

ductive sheet attached thereto positioned above said gasket whereby said gasket provides a physical barrier between said conductive sheet above said gasket and said movable and stationary contacts below said gasket;

coil connection means connecting said discharge post of said coil to said conductive sheet for electrical connection thereto at all times throughout said rotation of said conductive sheet in unison with said rotor;

a first plug contact positioned to electrically engage said conductive sheet during a first portion of each revolution of said disk,

second plug contact positioned to electrically engage said conductive sheet during a second portion of each revolution of said disk,

means for connecting said first sparkplug to said first plug contact and said second sparkplug to said second plug contact,

said first and second plug contacts being positioned to be in contact with said conductive sheet at separate times and not simultaneously during any portion of each revolution of said disk.

4,710,599

SWITCH ATTACHMENT STRUCTURE FOR USE ON MOTOR VEHICLES WITH HANDLEBARS

Shoji Motodate, Yulchi Morino, and Norihiro Kurata, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

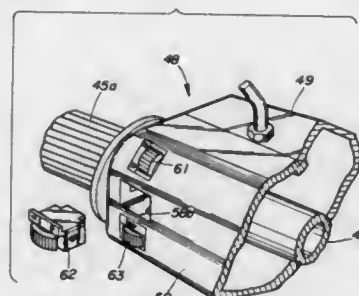
Filed Apr. 7, 1986, Ser. No. 849,000

Claims priority, application Japan, Apr. 30, 1985, 60-92532

Int. Cl.⁴ H01H 9/06

U.S. Cl. 200—61.85

21 Claims



1. A switch attachment structure on a motor vehicle having a handlebar, comprising:

a handle cover fixed to the handlebar and at least partly covering said handlebar;

a plurality of switches mounted on said handle cover for controlling electric components on the motor vehicle;

said handle cover having a plurality of switch receivers to which said switches are fittingly attached, respectively;

said switch receivers comprising recesses formed in said handle cover, said recesses being shaped complementarily to switch bodies of said switches; and

said switches being insertably mounted into said handle cover recesses from outside of said handle cover.

4,710,600

DETENT MECHANISM FOR SLIDING ELECTRIC PARTS

Shinji Sasaki, Miyagi; Yujiro Shimoyama, and Yoshinori Watanabe, both of Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 23, 1985, Ser. No. 779,151

Claims priority, application Japan, Sep. 21, 1984, 59-143134[U]

Int. Cl.⁴ H01H 15/10

U.S. Cl. 200—291

1 Claim

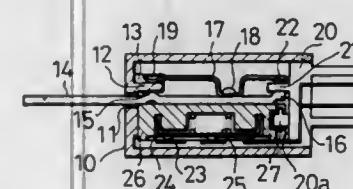
1. In a sliding electric switch of the type having a casing with an elongated linear slit formed horizontally in a front wall of the casing and an operation lever disposed in the casing so

as to move linearly along the slit, the lever having a portion extending outside the casing for operation by the user, the improvement comprising:

means in said casing and including a portion of said operation lever disposed in said casing for constraining said lever for movement in parallel with said slit;

a slide guide formed integrally with said front wall of said casing on an upper side of said slit having a corrugated surface with a series of cam crests on an upper face of said slide guide extending parallel to said slit;

an engaging member fixed to said operation lever and having an end disposed on said corrugated surface to engage said cam crests in a series of corresponding detent positions as said operation lever is moved along said slit; and



means for biasing at least one of said slide guide and said end of said engaging member in pressing engagement with each other despite their relative movement across said cam crests and without any looseness, said biasing means being constituted by said engaging member being a leaf spring fixed to an upper side of said operation lever at an intermediate position thereof with a downward protrusion formed at its end in engagement with said cam crests, and by an upward protrusion formed on the upper side of said operation lever slidably in contact with a lower face of said slide guide for elastically clamping said downward protrusion of said leaf spring to said corrugated surface of said slide guide.

4,710,601

SEALED TOGGLE ACTION ELECTRICAL SWITCHES

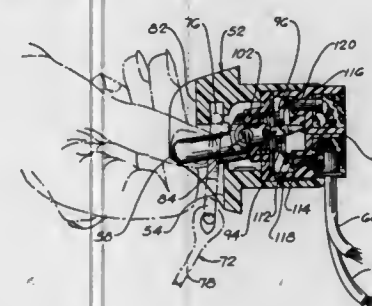
Andrew F. Raab, Morton Grove, and John W. Habecker, Zion, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Division of Ser. No. 803,491, Dec. 2, 1985. This application Mar. 18, 1987, Ser. No. 27,528

Int. Cl.⁴ H01H 19/06

U.S. Cl. 200—302.3

6 Claims



1. A toggle action electrical switch, comprising a casing, an electrical insulating operating lever swingable in the casing, the lever having an outer arm projecting out of the casing and an inner arm projecting into the casing, an electrically conductive electrical contactor slidable along the inner arm and swingable relative to the inner arm, first and second fixed electrical contacts mounted in the casing and slidably engageable by the contactor, such contactor being movable with the lever between a first

position in which the contactor bridges electrically between the contacts and a second position in which the contactor does not bridge electrically between the contacts,

a coil spring mounted around the inner arm and interposed between the lever and the contactor for biasing the contactor toward the contacts,

the lever having first and second positions corresponding to the first and second positions of the contactor,

the spring producing a toggle action for resiliently resisting movement of the lever between its first and second positions while resiliently biasing the lever alternately into its first and second positions,

and a flexible resilient sealing boot interposed between the operating lever and the casing,

the boot having a sealing flange interposed between the coil spring and the lever whereby the sealing flange is compressed into sealing engagement with the lever by the spring.

4,710,602

ILLUMINATED ROCKER SWITCH ASSEMBLY

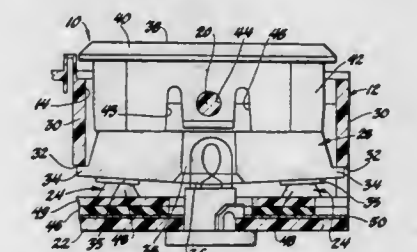
Donald N. Baity; Gregory J. Schwandt, both of Kokomo, and Charles E. Kidwell, Greentown, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1986, Ser. No. 825,151

Int. Cl.⁴ H01H 9/00

U.S. Cl. 200—315

6 Claims



1. A manually operated switch assembly for selectively actuating a pair of switches, comprising:

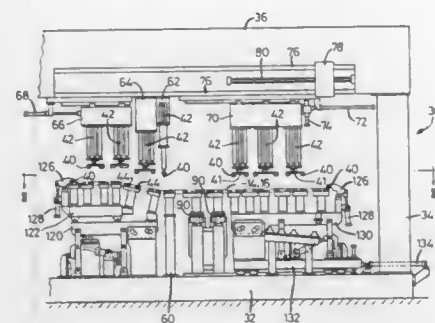
a housing defining an aperture, a circuit board mounted in said housing opposite the aperture,

a pair of resilient push-button switches mounted on the circuit board, each switch defining a switch contact point thereon,

a rocker pivotally mounted in the aperture of the housing for movement about a fixed axis at the center of the aperture, and

an actuator between the rocker and the switches, each end of the actuator continuously engaging one of said switches at said switch contact points and further engaging the housing at points in substantial alignment with the switch contact points to define pivot axes for the respective opposite ends of the actuator, whereby upon rocker movement against one end of said actuator, said actuator rotates about the pivot axis at the other end of said actuator, said switches being such that lateral movement of the actuator at the switch contact point is minimized.

clamp said component members in opposite clamping directions toward each other substantially perpendicular to said longitudinal direction of the component members; a pivot base supporting at least one of said at least three stationary clamps; a supporting device for supporting said pivot base pivotally in a plane parallel to said clamping directions, about a



pivot axis which is located on said component members clamped by said movable and stationary clamps; and a pivoting actuator operable for pivoting said pivot base prior to welding of said component members along the lengths thereof, and thereby bending said component members, so as to compensate for welding strains of the component members.

4,710,609

PROCESS FOR HEATING HAIR CURLERS BY MICROWAVE ENERGY

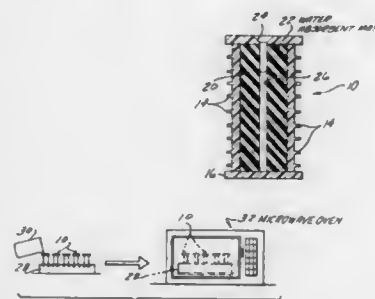
Michael Switlicki, 3330 Rabidue Rd., Goodells, Mich. 48027

Filed Mar. 27, 1986, Ser. No. 844,965

Int. Cl.⁴ A45D 2/00; H05B 1/00, 6/64

U.S. Cl. 219-222

2 Claims



1. A process of heating hair curlers constructed of a material through which microwaves may pass comprising the steps of: positioning a mass of wicking material within a cavity in a hair curler constructed of a material transparent to microwave energy and configured to be impermeable to water vapor along the sides thereof, said wicking material being constructed of a material which allows the passage of microwave energy therethrough; dispersing a quantity of water into said mass of wicking material contained in said cavity; subjecting said hair curler with said dispersed quantity of water to microwave radiation to heat said quantity of water and thereby heat said hair curler.

4,710,610 ELECTRIC RESISTANCE HEATER AND LIMIT SWITCH ASSEMBLY

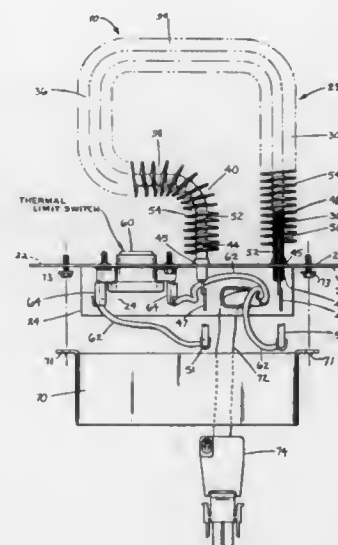
Allan J. Reifel, Florissant, and James E. Roth, DeSoto, both of Mo., assignors to Nordyne, Inc., St. Louis, Mo.

Filed Sep. 8, 1986, Ser. No. 904,414

Int. Cl.⁴ H05B 1/02; F24H 3/00; H01H 37/00

U.S. Cl. 219-363

5 Claims



1. A heater and limit switch assembly adapted for installation within an air duct, comprising

- a mounting plate,
 - a rigid planar modified-loop electrical resistance heater comprising
 - a first elongated end leg portion mounted at one end onto and substantially perpendicular to said mounting plate and terminating at its other end at the first end of an elongated second portion,
 - said second portion extending substantially perpendicular to said first end leg portion,
 - an elongated initial return portion extending from the other end of said second portion, substantially parallel to and spaced from said first end leg portion; and, continuing therefrom,
 - an inward offset portion extending toward said first end leg portion and substantially parallel to and spaced from said mounting plate, the length of said offset portion being substantially less than said second portion, and terminating in
 - a second end leg portion spaced from and substantially parallel to said first end leg portion and mounted onto and substantially perpendicular to said mounting plate, in combination with
 - a temperature responsive limit switch mounted on said plate outwardly of said second end leg portion and inwardly of said initial return portion and facing said inward offset portion,
- whereby said modified loop configuration, and particularly the inward offset and second leg portions thereof, together with the mounted position of said limit switch relative thereto, afford improved response to temperature rise of the loop.

4,710,611 ARRANGEMENT IN A COOKING PLATE OR HOB HAVING A TEMPERATURE SENSOR

Claes J. H. Axelsson, Stockholm, Sweden, assignor to AB Electrolux, Sweden

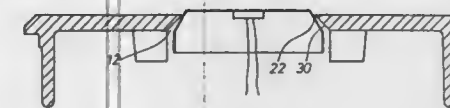
Filed Jun. 26, 1986, Ser. No. 878,589

Claims priority, application Sweden, Jul. 12, 1985, 8503462

Int. Cl.⁴ H05B 3/70

U.S. Cl. 219-450

4 Claims



1. In an arrangement in a cooking plate or hob having a temperature sensor, the cooking plate or hob being provided with a central through hole in which a body supporting the temperature sensor is movably arranged, the body being urged by spring means in a direction towards the upper side of the cooking plate or hob, the movement being limited by a shoulder in the boundary surface of the hole, the shoulder cooperating with a surface on the body, said surface having a shape that corresponds with the adjacent envelope surface of said movable body, wherein the improvement comprises said shoulder connecting with the upper side of the cooking plate and the body being constituted of a cup-shaped thin plate which opens downwards and has a planar upper side and an annular skirt which is adapted to be seated in the through hole and wherein the surface which cooperates with the shoulder connects the upper side of the plate with its skirt, and wherein said movable body is a right cone and said shoulder has a conical shape adapted to the cone wherein the cone angle of said shoulder is greater than that of said movable body.

4,710,612

STRUCTURE OF ELECTRIC HEATER

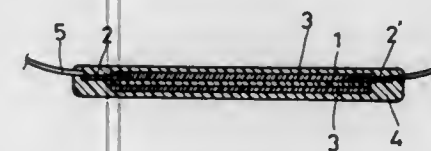
Jong-Tsuen Lin, No. 33, Sec. 4, Chung Hsing Rd., Wu Ku Hsiang, Taipei Hsien, and Chien-Han Ho, No. 8, Alley 12, Lane 91, Sec. 1, Nei Hu Road, Taipei, both of Taiwan

Filed Oct. 15, 1986, Ser. No. 919,142

Int. Cl.⁴ H05B 3/34, 3/54

U.S. Cl. 219-547

1 Claim



1. An electric heater comprising: a bendable, strip conductor of a material selected from the group consisting of plastic or rubber and having an electric conductive and heat resistant chemical additive dispersed therethrough; first and second electrical conductive means attached, respectively, to opposite sides of said strip conductor and adapted to be coupled to a source of electrical energy so that current will flow through said first means and through said strip to said second means to complete a circuit and thereby cause said strips to be heated; a polyethylene layer adhering to and covering said strip; and a PVC layer covering said polyethylene layer whereby heat generated in said strip will be emitted through said layers.

4,710,613 IDENTIFICATION SYSTEM

Yoshimi Shigenaga, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

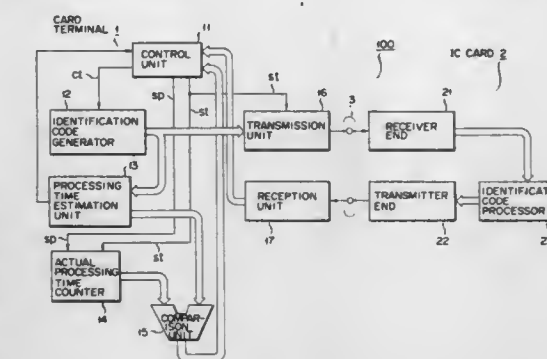
Filed Dec. 4, 1985, Ser. No. 805,187

Claims priority, application Japan, Dec. 13, 1984, 59-263331

Int. Cl.⁴ G06K 5/00

U.S. Cl. 235-380

14 Claims



1. An identification system wherein validity between a first unit and a second unit is identified when the first unit is electrically communicated with the second unit, said first unit including: means for generating identification code information; means for calculating, based upon the identification code information, an estimation time required for processing the identification code information in the second unit; means for measuring an actual time required for completely processing the identification code information in the second unit, and means for identifying validity between said first and second units by comparing the actual processing time to the estimation processing time; and said second unit including: means for processing the identification code information sent from said first unit.

4,710,614

SECURITY DOCUMENT USING OPTICAL FIBERS AND AUTHENTICATION METHOD

Michel Camus, Charvines, France, assignor to Arjomari-Prioux, Paris, France

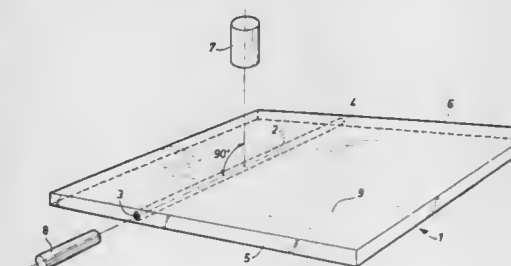
Filed Jun. 18, 1986, Ser. No. 875,622

Claims priority, application France, Jun. 24, 1985, 85 09586

Int. Cl.⁴ G06K 5/00

U.S. Cl. 235-380

10 Claims



1. A security document comprising a substrate containing at least one optical fiber of which at least one end is flush with a surface of the substrate so as to permit authentication of the document by exposing the document to a source of electromagnetic radiation and simultaneously observing the radiation transmitted to either end of the optical fiber and wherein the optical fiber has a transparent coating and is located within the

substrate at a depth from at least one surface of the substrate which is not greater than the depth of penetration of the electromagnetic radiation into the substrate.

4,710,615

CCD BAR CODE SCANNER

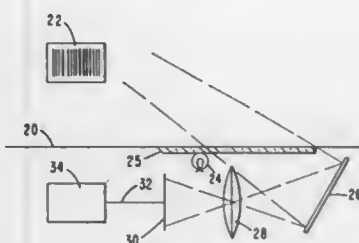
Thomas J. Meyers, St. Clairsville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 26, 1986, Ser. No. 878,748

Int. Cl.⁴ G06K 7/10

U.S. Cl. 235-454

11 Claims



1. A system for scanning coded indicia comprising; means for providing a plurality of light beams for illuminating a coded indicia; rotating support means mounted in the path of the light beams reflected from the coded indicia; light receiving means mounted on said rotating support means for storing electrical signals in response to receiving the reflected light beams; circuit means mounted on said rotating support means and coupled to said light receiving means for reading and converting said electrical signals to binary data signals; processing means for processing said binary data signals to establish the data represented by the coded indicia scanned; and means coupled to said processing means and mounted adjacent said rotating support means for transferring the binary data signals stored by said light receiving means and converted by said circuit means, to said processing means.

4,710,616

MULTI-STATION DATA COLLECTION SYSTEM

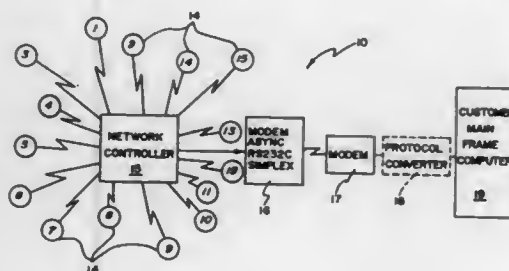
David L. Utley, Salt Lake City, Utah, assignor to National Transdata Systems, Inc., Murray, Utah

Filed Jun. 2, 1986, Ser. No. 869,234

Int. Cl.⁴ G06K 7/10

U.S. Cl. 235-472

8 Claims



1. A data collection system for a shop area having multiple work stations comprising, a production work order generated for each work station having job identification data, steps, and delays programmed thereon in English and corresponding bar code groupings for each work item to be produced at said work station; a portable data entry terminal means that includes optical scanning means and a self contained power supply and can store optical pulses sensed by said scanning means as digital pulses in a memory portion thereof, which

portable data entry terminal means is maintained at each work station by an operator/supervisor who moves said optical scanning means over selected bar code groupings for collecting job status information; means for retrieving and transmitting data collected by said data entry terminal for transmittal to a network controller means; a network controller means for the shop area arranged to receive said data transmitted from each said data entry terminal, receiving that data sequentially or simultaneously at entry ports and provides for multiplexing said data into a collection register that store that entered data as discrete signals in a holding register for later transmittal through an output port; mode means connected for receiving said network controller means data output and transmitting it to a main frame computer means; and a main frame computer means connected to receive said data output from said modem to process and handle that information to control operations in said shop area.

4,710,617

METHOD OF PROTECTING SECURITY DOCUMENTS

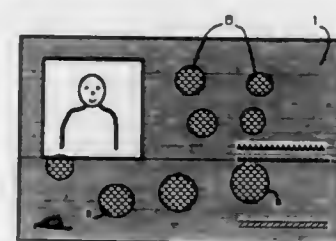
Daniel G. E. Mouchotte, Golfe Juan, France, assignor to Cimsa Sintra (S.A.), France

Filed May 23, 1986, Ser. No. 866,370

Int. Cl.⁴ G06K 19/00

U.S. Cl. 235-487

4 Claims



1. A method of protecting security documents of the type comprising uniting a substrate bearing information which is to be protected from tampering, together with transparent protective layers of thermoplastic material heat sealed around said substrate, the method including providing a set of pigment-retaining micro-holes in the substrate, said pigment being soluble in protective layer solvents.

4,710,618

AIRBORNE TRACKING SUNPHOTOMETER APPARATUS AND SYSTEM

Yutaka Matsumoto, San Jose; Cesar Mina, Santa Clara; Philip B. Russell, Los Altos, and William B. van Ark, Sunnyvale, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 29, 1986, Ser. No. 823,712

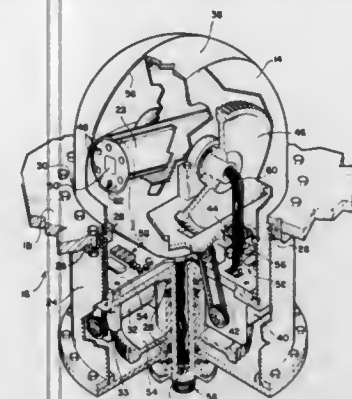
Int. Cl.⁴ G01J 1/20

U.S. Cl. 250-203 R

15 Claims

1. An airborne tracking sunphotometer system, which comprises an aircraft having an interior and a bulkhead, a rotatable dome extending from the interior through the bulkhead, a first drive means connected to rotate said rotatable dome, said rotatable dome having an equatorial slot above said bulkhead, a portion of the outer surface of said cylindrical housing substantially filling said equatorial slot, a photometer mounted in said cylindrical housing to move in the equatorial slot as said cylindrical housing pivots, said photometer having an end facing outward from the slot, an optical flat transparent window mounted over the outward facing end of said photometer, said cylindrical housing being coupled to said rotatable dome

whereby the cylindrical housing and photometer are rotated when the dome is rotated, and a second drive means connected



to pivot said cylindrical housing to move said photometer in the slot of said rotatable dome.

4,710,619

APPARATUS FOR GENERATING A SIGNAL PROVIDING INFORMATION REGARDING A RADIATING SOURCE, ESPECIALLY AN INFRARED SOURCE

Fritz Haberl, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

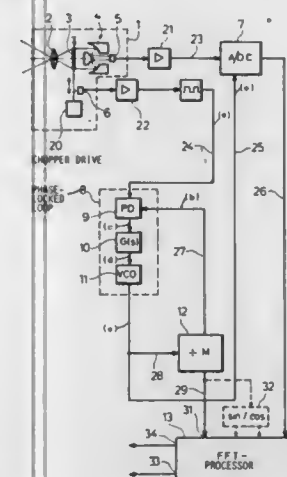
Filed Dec. 20, 1985, Ser. No. 811,667

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3447721

Int. Cl.⁴ G05D 1/08

U.S. Cl. 250-203 R

9 Claims



1. An apparatus for generating a deviation signal and a presence signal, wherein said deviation signal represents a deviation of an optical axis of an optical means from a line connecting said optical means with the center of a distant radiation source which is imaged by said optical means onto its image plane, and wherein said presence signal represents an information whether said radiation source is located at all within a range of vision of said optical means, said apparatus comprising an oscillating chopper disk being located in said image plane of said optical means and having a diameter equal to that of the image of said radiation source and sensor means for receiving all the radiation components passing periodically past the edges of said oscillating chopper disk and for producing therefrom a periodic analog sensor signal, drive means for driving said chopper disk, pick-up means arranged for producing a periodic analog chopper signal, an analog-to-digital con-

verter connected to receive said analog sensor signal for converting said analog sensor signal into a digitized sensor signal, a phase-locked-loop circuit including a phase detector having a first input for receiving said periodic analog chopper signal for providing a phase control signal, control amplifier means connected to an output of said phase detector for integrating said phase control signal, an oscillator connected to said control amplifier means for producing start impulses, means connecting said oscillator to a start input of said analog-to-digital converter for repeatedly starting a sampling and digitizing of said analog sensor signal, mode-M counter means having an input connected to said oscillator and an output connected to a second input of said phase detector thereby providing a closed loop phase control circuit, said mode-M counter means counting up to a preselected number M and, upon reaching the count of M, providing phase reference carry signals to said second input of said phase detector, fast Fourier transformation processing means having a first input connected to said analog-to-digital converter for receiving said digitized sensor signal, and means connecting a second input of said fast Fourier transformation processing means to said mode-M counter means for receiving counted values having the same frequency or rhythm as said start impulses and being continuously numbered between two neighboring phase reference carry signals, whereby said fast Fourier transformation processing means produce said deviation signal and said presence signal.

4,710,620

SENSING APPARATUS FOR DETERMINING THE RELATIVE POSITION BETWEEN TWO BODIES WITH PLURAL EMITTERS AND A SHADING MEMBER

Bernd Kunkel, Kirchheim, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

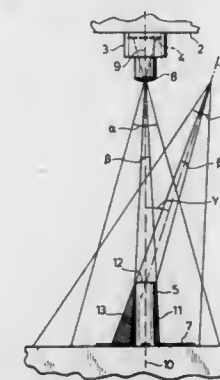
Filed Aug. 22, 1985, Ser. No. 768,409

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1984, 3431616

Int. Cl.⁴ G01J 1/20

U.S. Cl. 250-203 R

6 Claims



1. Sensing apparatus for determining the relative position of two bodies located at a distance from one another with respect to a predetermined reference position comprising: a camera having an areal matrix of photosensitive elements arranged in the image plane thereof mounted at one of said bodies; a shading member provided at the other of said bodies projecting from the surface thereof; and means defining an optically clearly distinguishable reference pattern in the area of the base of said shading member, said reference pattern being formed by means of a plurality of light sources each emitting a light pattern which is as punctiform as possible with said reference pattern being linearly or areally distributed outside of said base of said shading member; said reference pattern being partially covered in an asymmetric manner by said shading member during a deviation of said two bodies from said reference position.

4,710,621

OPTO-MECHANICAL SCANNER WITH FIXED-FIELD RANGING DEVICE

Fernand R. Loy, Sceaux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 814,841, Dec. 30, 1985, abandoned.

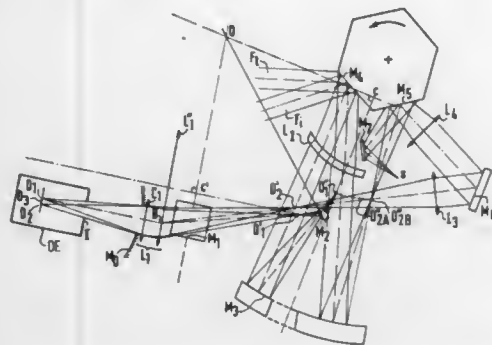
This application Mar. 9, 1987, Ser. No. 23,894

Claims priority, application France, Jan. 11, 1985, 85 00338

Int. Cl.⁴ G01J 1/20

U.S. Cl. 250—203 R

11 Claims



1. An opto-mechanical scanner having a scanning function and an associated ranging function, the scanning field being obtained by line-scanning and frame scanning means and the ranging field being fixed during the propagation time of a ranging echo the ranging source, being a laser, the beams issuing from said fields converging on a scanning detector array and on a ranging detector respectively, which are arranged in the same cooled space, characterized in that said scanning beam and said ranging beam traverse a common entrance optical system and an arrangement of fixed optical elements arranged to make said beams follow two different optical paths such that the ranging beam traverses said line-scanning means twice, which ensures that it has a fixed orientation which is independent of the line scanning, said scanning function and said ranging function being simultaneously and requiring no switching of optical elements, and the laser pulse being emitted in a specific position of said line-scanning and frame scanning means.

4,710,622

DEVICE FOR STABILIZING PHOTENSOR OUTPUT TO VARYING TEMPERATURE

Tomotsu Imamura, Isehara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

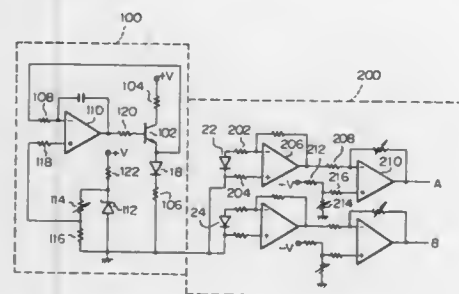
Filed Jul. 26, 1985, Ser. No. 759,320

Claims priority, application Japan, Jul. 31, 1984, 59-161974

Int. Cl.⁴ H01V 40/14

U.S. Cl. 250—214 R

7 Claims



1. A device for stabilizing an output of a photensor which includes a light-emitting element supplied with a current from a power source for emitting light and a light-receiving element for generating an output responsive to the light incident

thereto from the light-emitting element, said device comprising:

- resistor means connected in series with said light-emitting element; and
- voltage control means which maintains a constant voltage across the series connected light-emitting element and said resistor means whereby the output of said light-receiving means is substantially constant over a wide temperature range.

4,710,623

OPTICAL FIBER CATHETER WITH FIBER-CONTAINED REACTIVE ELEMENT

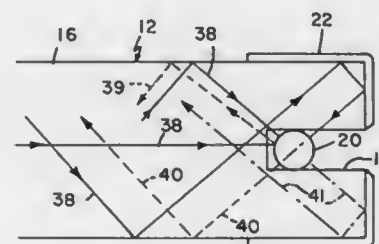
David Lipson; Benjamin L. Liu, and Nicolas G. Loebel, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 27, 1986, Ser. No. 833,245

Int. Cl.⁴ H01J 5/16

U.S. Cl. 250—227

20 Claims



1. An elongated optical fiber apparatus for transmitting an incident light signal toward a first end of the apparatus, the first end situated in a fluid, and for transmitting a returning light signal toward a second end of the apparatus that is indicative of a specified characteristic of the fluid, the second end being situated outside the fluid, the apparatus comprising:

- a light-conductive cable containing only a single optical fiber capable of transmitting light;
- a hole formed in the first end of the single fiber;
- a reactive element inserted into said hole to react with the contents of the fluid to alter a property of the light that is indicative of a specified characteristic of the fluid.

4,710,624

APPARATUS AND METHOD FOR MEASURING LIGHT TRANSMITTANCE OR REFLECTANCE

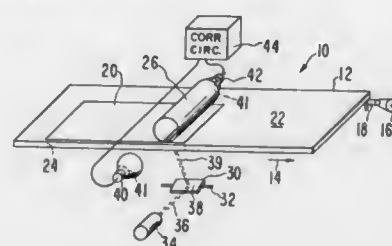
Robert Alvarez, Mountain View; Leonard Lehmann, Redwood City, and Bruno Strul, Palo Alto, all of Calif., assignors to DigiRad Corporation, Palo Alto, Calif.

Filed May 10, 1984, Ser. No. 608,747

Int. Cl.⁴ G02B 26/10

U.S. Cl. 250—228

20 Claims



11. In scanning apparatus for taking transmittance or reflectance measurements from a radiation transmitting or reflecting sheet mounted in an operative position so that the sheet can be exposed for being scanned along a line by a radiation beam comprising:

- means for directing a beam of radiation onto the sheet and

along a line in scanning relationship thereto when the sheet is in said operative position;

means defining an elongated cavity having a radiation-receiving slot therein to allow radiation from the line scanning across the sheet to pass into the cavity, the cavity defining means having a radiation-reflecting surface to allow the radiation entering the cavity to be reflected;

photodetector means for sensing at the ends of the cavity the radiation reflected in the cavity and for generating an electronic signal corresponding to the sensed radiation; and

circuit means coupled with the photodetector means for correcting the signal for variations in the intensity of the radiation entering the cavity as a function of the distance along the slot during scanning of the beam.

4,710,625

CHARGED PARTICLE ENERGY ANALYZER BASED UPON ISENTROPIC CONTAINMENT

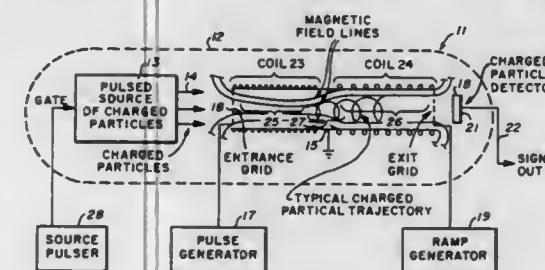
Michael A. Kelly, Portola Valley, Calif., assignor to Kevex Corporation, Foster City, Calif.

Filed Oct. 15, 1985, Ser. No. 787,098

Int. Cl.⁴ H01J 49/44

U.S. Cl. 250—305

20 Claims



1. In a method for analyzing the energies of charged particles, the steps of:

- generally isentropically trapping the charged particles to be analyzed in an evacuated containment region;
- mixing the axial and orbital momenta of the trapped charged particles so that an individual particle cyclically experiences periodic maximum and minimum axial momenta with corresponding minimum and maximum orbital momenta; and
- analyzing the energy of the particles by selectively extracting from the containment region those particles having a maximum axial momenta exceeding a predetermined threshold energy level.

4,710,626

RADIATION IMAGE RECORDING AND READ-OUT METHOD AND APPARATUS

Kenji Takahashi; Chiyuki Umamoto, and Hisatoyo Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 484,738, Apr. 13, 1983. This application Jul. 7, 1986, Ser. No. 883,287

Claims priority, application Japan, May 19, 1982, 57-84437

Int. Cl.⁴ G03C 5/16

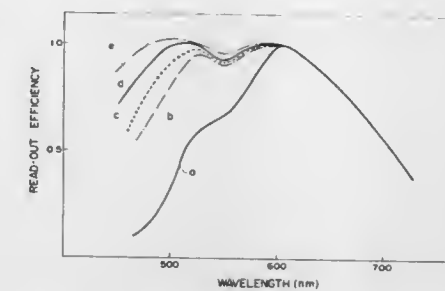
U.S. Cl. 250—327.2

21 Claims

1. A radiation image recording and read-out method including the steps of:

- (i) recording a radiation image of an object on a recording material comprising a stimutable phosphor layer by exposing said recording material to a radiation passing through the object to have the radiation absorbed in said recording material; and
- (ii) scanning said recording material carrying said radiation image stored therein with a laser beam which has a wavelength within the stimulation range of said stimutable phosphor and which causes said recording material to emit light in the pattern of said radiation image stored

therein upon stimulation thereof by using a gas ion laser beam, the wavelength of which is selected to improve read-out efficiency and wherein the selected wavelength



is at least 480 nm and less than 600 nm, and reading out the emitted light by use of a photodetector to obtain an electric signal corresponding to said radiation image.

4,710,627

METHOD AND AN APPARATUS FOR DETERMINING THE GENUINENESS OF A SECURITY BLANK

Heinrich P. Baltes, Zug, and André M. J. Huiser, Lausanne, both of Switzerland, assignors to LgZ Landis & Gyr Zug AG, Zug, Switzerland

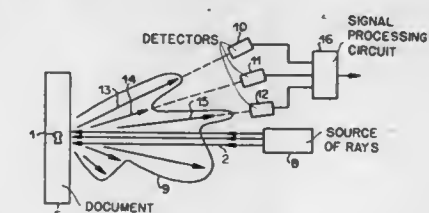
Division of Ser. No. 364,256, Apr. 1, 1982, abandoned. This application Feb. 26, 1985, Ser. No. 705,741

Claims priority, application Switzerland, Apr. 16, 1981, 2558/81

Int. Cl.⁴ G01J 1/00

U.S. Cl. 250—339

17 Claims



1. In a method of determining the genuineness of a security blank, including an elongated security thread of predetermined dimensions, said security thread having a cross-section constant throughout a portion of its length and other than circular or rectangular,

- the steps comprising
- securing said elongated thread to said security blank,
- directing rays of electromagnetic radiation having a wavelength of the order of said predetermined dimensions onto said security thread, at least some of said rays being scattered from said security thread in a preconceived characteristic manner,
- detecting the rays scattered from said security thread as a function of the angle between the incident rays directed onto said security thread and the scattered rays therefrom and
- electronically processing the measured angular distribution of intensity of said scattered rays to determine whether said radiation has been scattered in a preconceived characteristic manner from said security thread, whereby the genuineness of said security blank is determined by a comparison of said characteristic angular distribution of the intensity of the detected radiation with predetermined stored values.

4,710,628

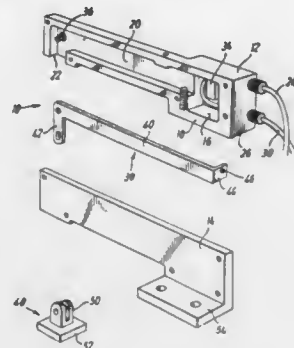
FAULT DETECTING APPARATUS

Barry J. Jordan, Heage, England, assignor to Jordon Instruments (Derby) Limited, England

Filed Dec. 18, 1985, Ser. No. 810,182
Int. Cl.⁴ G01J 1/00; G01F 23/00

U.S. Cl. 250-341

6 Claims



1. Apparatus for detecting a structural fault in a material, said apparatus comprising a substantially closed body, sensing means which is pivotally mounted within the body and which provides a first part extending externally of the body for continuous engagement with the material to thereby directly detect any structural fault therein, and a second part presenting a path for transmission of energy therethrough, means for transmitting a beam of said energy and means for receiving the beam of said energy, said second part of the sensing means being normally positioned with the transmission path aligned with the transmitting and receiving means, but being movable in the event of a structural fault on the material being continuously monitored by said first part, whereby to affect the transmission of energy, the energy transmitting means comprising a first fibre optic cable connected to the body with an end located therein for transmission of light into the body and the energy receiving means comprising a further fibre optic cable having an end within the body aligned with said end of the first cable.

4,710,629

INFRARED INTRUSION DETECTOR

Kurt Müller, Stäfa, and Walter Meier, Männedorf, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

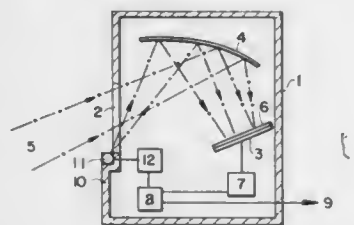
Filed Dec. 26, 1985, Ser. No. 813,508

Claims priority, application Switzerland, Jan. 8, 1985, 00058/85

Int. Cl.⁴ G01J 5/08

U.S. Cl. 250-342

19 Claims



1. An infrared intrusion detector, comprising:
a housing having an entrance window defining at least one reception zone of the detector;
said entrance window being transparent to external infrared radiation;
an infrared dual sensor for generating an output signal in

response to externally impinging infrared radiation enclosed in said housing;
an optical arrangement for directing external infrared radiation entering said housing through said entrance window from predetermined ones of said at least one reception zone to said infrared dual sensor;
an evaluation circuit connected to said infrared dual sensor for generating a first alarm signal in response to a predetermined type of change in said output signal;
an infrared radiation source for emitting checking infrared radiation and contained in said housing and constructed and arranged such that said checking infrared radiation irradiates said infrared dual sensor after traversing said entrance window;
said evaluation circuit being constructed for additionally generating a second alarm signal in response to a predetermined degree of attenuation of said checking infrared radiation to indicate possible sabotage of the infrared intrusion detector;
said infrared dual sensor comprising a first sensor element and a second sensor element arranged in proximate relationship to one another;
said first sensor element being irradiated with said checking infrared radiation by said infrared radiation source in a first predetermined manner;
said second sensor element being irradiated with said checking infrared radiation by said infrared radiation source in a second predetermined manner; and
differential circuit means interconnecting said first sensor element and said second sensor element.

4,710,630

OPTICAL DETECTION SYSTEM

John D. Kuppenheimer, Jr., Tewksbury, Mass., and Kirby A. Smith, Derry, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 7, 1985, Ser. No. 763,158

Int. Cl.⁴ G01J 3/36

U.S. Cl. 250-353

8 Claims



1. An optical system for applying radiation from the same field of view onto separate portions of a detector, comprising:
an angle converting cone having an input opening and a smaller output opening;
means for imaging radiation from a predetermined field of view at a point in a plane at the input opening of said angle converting cone; and
detection means disposed at the output opening of said angle converting cone.

4,710,631

TEMPERATURE COMPENSATION FOR A SEMICONDUCTOR LIGHT SOURCE USED FOR EXPOSURE OF LIGHT SENSITIVE MATERIAL
Yasuo Aotsuka, Masahiro Konishi, and Koji Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

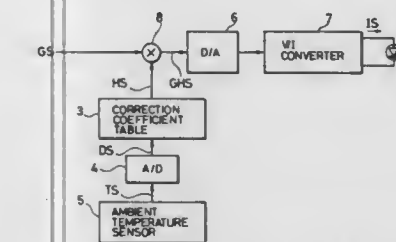
Filed Aug. 27, 1985, Ser. No. 769,915

Claims priority, application Japan, Aug. 28, 1984, 59-179035; Aug. 29, 1984, 59-180131

Int. Cl.⁴ G03B 27/72; G05D 25/02

U.S. Cl. 250-354.1

3 Claims



1. In an image forming method wherein a light-sensitive material having spectral sensitivity characteristics with a peak value is exposed under a semiconductor light source, the improvement comprising:
rendering a center wavelength of variations in peak spectral radiation due to variation of temperature from said light source substantially equal to a wavelength for peak spectral sensitivity of said light-sensitive material, and compensating any temperature-dependent variations in said radiation intensity of said light source.

4,710,632

ION MICROBEAM APPARATUS

Tohru Ishitani, Sayama; Hideo Todokoro, Nishitama; Yoshimi Kawanami, Kokubungi, and Hifumi Tamura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

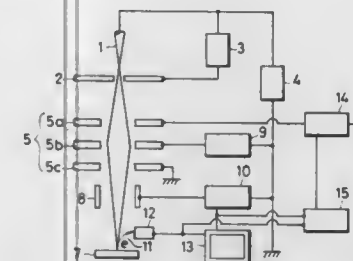
Filed May 13, 1985, Ser. No. 733,632

Claims priority, application Japan, May 18, 1984, 59-98712

Int. Cl.⁴ H01J 37/04, 37/10

U.S. Cl. 250-396 R

8 Claims



1. An ion microbeam apparatus comprising:
an ion source;
acceleration power supply means for accelerating ions extracted from the ion source;
electrostatic lens means for adjusting focusing of accelerated ions, the electrostatic lens means including at least three electrodes with an intermediate electrode and at least two other electrodes disposed so that respective ones of the at least two other electrodes are arranged on opposite sides of the intermediate electrode;
first power supply means for supplying a high potential to said intermediate electrode of said electrostatic lens means;
ion beam diameter measuring means for measuring the diameter of an ion beam impinging on a sample and providing an output indicative thereof; and
second power supply means for supplying a low potential to

one of the at least two other electrodes of the electrostatic lens means for finely adjusting the focusing of the accelerated ions in response to the output from the ion beam diameter measuring means so as to enable the ion beam to assume an optimum diameter.

4,710,633

SPECIMEN MOVING DEVICE FOR ELECTRON MICROSCOPE

Shigeru Suzuki, Tachikawa, Japan, assignor to Akashi Seisaku-sho Ltd., Tokyo, Japan

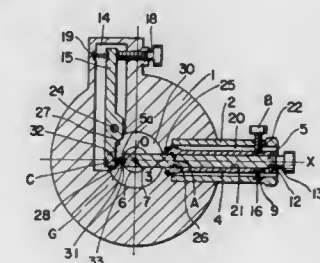
Filed Dec. 11, 1985, Ser. No. 807,858

Claims priority, application Japan, Feb. 9, 1983, 58-160557

Int. Cl.⁴ H01J 37/20

U.S. Cl. 250-442.1

3 Claims



1. A specimen moving apparatus for an electron beam apparatus comprising:
a specimen holder mounted on a lens column defining an electron beam axis, said specimen holder extending slideably in a direction orthogonal to the electron beam axis and being mounted rotatably in a direction substantially orthogonal to the electron beam axis, said specimen holder having an outwardly curved end face;
a lever member disposed in the vicinity of a distal end of said specimen holder in a direction perpendicular to said specimen holder for slideably moving said holder; and
a coupling member interposed between said lever member and said specimen holder for operatively interconnecting said lever member and said specimen holder;
said coupling member having an apex and a bottom surface, said apex engaging a notch provided on a lateral portion of said lever member and said bottom surface being curved about said apex and rollingly engaging said end face of said specimen holder.

4,710,634

SANITARY DOOR HANDLE HAVING AN UPPER HOUSING AND A SPACER ELEMENT

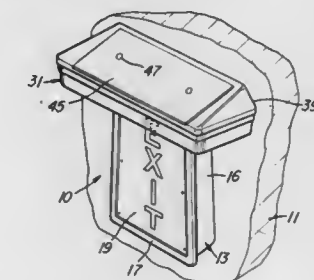
Richard L. Brookes, 2894 General Motors Blvd., Detroit, Mich. 48202

Filed Apr. 14, 1986, Ser. No. 851,956

Int. Cl.⁴ G01N 21/00

U.S. Cl. 250-455.1

10 Claims



1. A sanitary door handle comprising:
a plate having a pushing surface facing away from the door;

a spacer element mounting and interconnecting the plate and door;
 a peripheral flange upon the spacer extending outwardly from the plate;
 said flange having a gripping surface spaced from and facing the door;
 a housing being located above the plate;
 said housing including a removable cover and also including a light chamber within the housing;
 said light chamber including an ultraviolet germicidal light source;
 said cover including a downwardly and forwardly slanted top having a cut away rectangular recess therein, a corresponding shaped access plate being nested within the cover recess; and
 shielding means supported on and depending from the cover and enclosing the light source for directing the ultraviolet germicidal light upon the pushing and gripping surfaces to thereby sanitize the handle and shield points above the housing from exposure to the ultraviolet light.

4,710,635

DUAL LASER EXCITATION FROM SINGLE LASER SOURCE

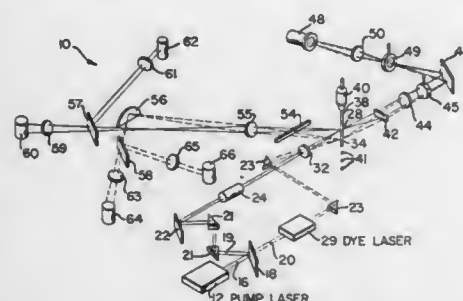
Vernon L. Chupp, Los Alto, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Apr. 14, 1986, Ser. No. 852,007

Int. Cl.⁴ G01N 21/64

U.S. Cl. 250-461.2

22 Claims



1. A flow cytometry apparatus for determining characteristics of cells or the like flowing in a liquid stream comprising:
 means for moving cells, substantially one at a time, in a liquid flow stream;
 a first excitation light source for providing a first beam of light;
 a dichroic element positioned in the path of said light beam for transmitting a portion of said light and for reflecting a portion of said light;
 dispersive means for spectrally separating wavelengths of the light reflected by said dichroic element and directing said spectrally separated light toward said cells moving in said flow stream to provide a first area of illumination therefor;
 a second excitation light source positioned to receive the light transmitted through said dichroic element and adapted to be driven by the energy of said transmitted light for producing a second beam of light which is directed toward said cells moving in said flow stream to provide a second area of illumination therefor;
 means for detecting light associated with each moving cell as it passes through said areas of illumination; and
 means for using said detected light to determine one or more characteristics of said cells.

RETICLE PLATE HAVING A FLUORESCING PATTERN

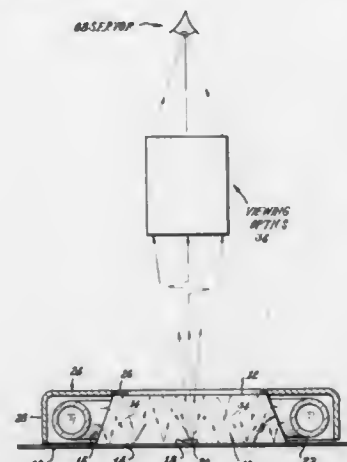
Ronald J. Martino, Geneva, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 31, 1984, Ser. No. 646,666

Int. Cl.⁴ F21K 2/00

U.S. Cl. 250-467.1

10 Claims



1. In an optical instrument having a viewing system for viewing photographic film and a referencing assembly for assisting in location of specific points upon the film being viewed, said referencing assembly comprising:

- a reticle plate positioned so as to be in close proximity to the film being viewed by the optical instrument, said reticle plate being constructed to totally internally reflect light emitted by a preselected source of illumination, said reticle plate including a reticle pattern thereon which is highly fluorescent when activated by light emitted by a preselected source of illumination;
- a source of illumination having predetermined lightwave characteristics, said source being mounted with respect to said reticle plate such that, when energized, light rays emitted therefrom enter and are totally internally reflected within said reticle plate and at least a portion of the totally internally reflected light rays strike and fluoresce said reticle pattern thereby causing said reticle pattern to become highly visible in the viewing system of the optical instrument; and
- means cooperative with said source of illumination for substantially blocking non-refracted illumination emitted by said source of illumination in its energized mode from entering the viewing system of the optical instrument.

4,710,637

HIGH EFFICIENCY FLUORESCENT SCREEN PAIR FOR USE IN LOW ENERGY X RADIATION IMAGING

George W. Luckey; Bernard Roth; Kathleen E. Brendel, and Margaret S. Den Dunne, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 827,683, Feb. 10, 1986, abandoned. This application Dec. 22, 1986, Ser. No. 944,893

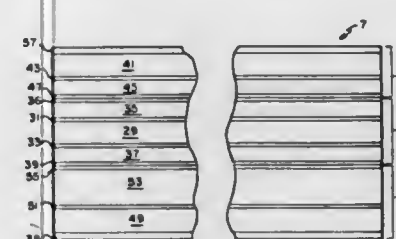
Int. Cl.⁴ G01J 1/58

U.S. Cl. 250-486.1

7 Claims

1. A pair of front and back intensifying screens capable of providing a sharp imagewise exposure of a dual coated silver halide radiographic element to light when imagewise exposed to X-radiation predominantly of an energy level below 40 keV, the front intensifying screen being comprised of a fluorescent layer
 having modulation transfer factors greater than those of reference curve A in FIG. 3 and
 being capable of attenuating by 20 to 60 percent a reference X radiation exposure produced by a Mo target tube operated at 28 kVp with a three phase power

supply, wherein the reference X radiation exposure passes through 0.03 mm of Mo and 4.5 cm of poly(methyl methacrylate) to reach said fluorescent layer mounted 25 cm from a Mo anode of the target tube and attenuation is measured 50 cm beyond the fluorescent layer, and
 the back intensifying screen



having modulation transfer factors greater than those of reference curve B in FIG. 3 and
 being capable of attenuating at least 60 percent of the X radiation received from the front screen when the reference exposure is repeated with both the front and back screens present.

4,710,638

APPARATUS FOR TREATING COATINGS

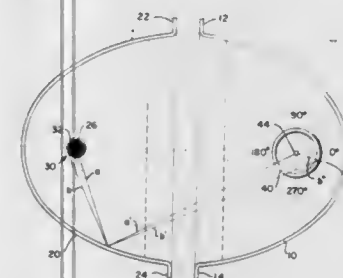
Charles H. Wood, Rockville, Md., assignor to Fusion Systems Corporation, Rockville, Md.

Filed Feb. 10, 1986, Ser. No. 827,587

Int. Cl.⁴ G01J 1/00; G02B 5/10; G21K 5/00

U.S. Cl. 250-492.1

9 Claims



1. Apparatus for treating material with concentrated radiant energy comprising:

- first and second reflectors comprising an elliptical reflector having a source focus and an object focus;
- a volume radiant energy source positioned at said source focus;
- means for positioning material to be treated with radiant energy at said object focus; and,
- an auxiliary reflector having a concave reflecting surface, said auxiliary reflector being positioned near said object focus and having its concave surface facing both foci of the elliptical reflector so as to direct towards said object focus at least a portion of the radiation which originates at said source and strikes the auxiliary reflector.

4,710,639

ION BEAM LITHOGRAPHY SYSTEM

Hiroshi Sawaragi, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

Filed Apr. 15, 1986, Ser. No. 852,185

Claims priority, application Japan, Apr. 18, 1985, 60-83355

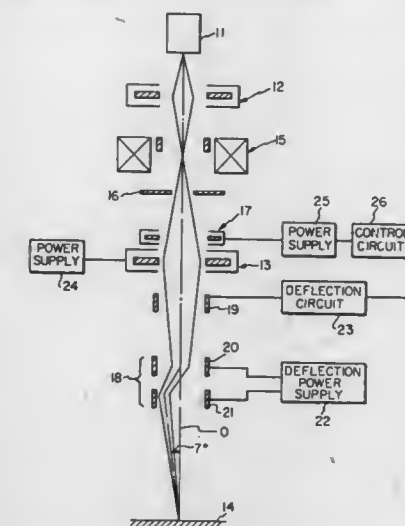
Int. Cl.⁴ H01J 37/302

U.S. Cl. 250-492.2

3 Claims

1. A doping ion beam implantation lithography system comprising, in sequence, an ion source for generating an ion beam,

means for focusing the ion beam emanating from said ion source onto a substrate material to be patterned, and deflecting means for deflecting the beam comprising means to vary the position on the substrate material illuminated by the beam to draw a pattern on the substrate material, an additional deflection means consisting of a deflecting element of a first stage for



deflecting the beam in a one direction, a deflecting element of a second stage for deflecting the beam in the opposite direction, and means for coordinating said first and second stages so that the beam is deflected at a constant incident angle that is sufficiently less than 90 degrees to avoid channeling of the implanted ions in surface crevices.

4,710,640

ELECTRON BEAM LITHOGRAPHY

Katsuhiko Kawasaki, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

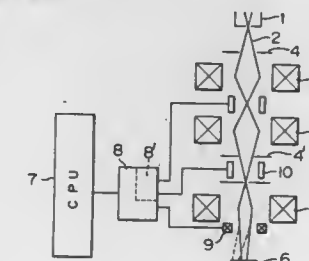
Filed Jul. 22, 1985, Ser. No. 757,285

Claims priority, application Japan, Jul. 24, 1984, 59-153703

Int. Cl.⁴ H01J 37/00

U.S. Cl. 250-492.2

4 Claims



1. An electron beam lithography method comprising the steps of:

- generating an electron beam;
- shaping said electron beam;
- focusing the shaped electron beam on a sample;
- selectively permitting the focused electron beam to pass through aperture means so that the surface of said sample is exposed to the focused electron beam; and
- blanking said electron beam by deflecting said electron beam in one direction to one side of said aperture means, unblanking said electron beam by enabling said electron beam to pass through an aperture of said aperture means, and blanking said electron beam by deflecting said electron beam to the opposite side of said aperture means, respectively, in sequence.

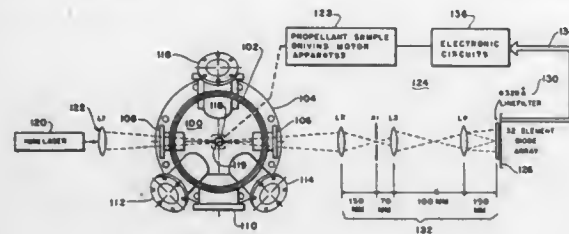
4,710,641

**PROPORTIONAL DRIVE SERVO CONTROLLER WITH
ARRAYED POSITION DETECTOR**

James M. Auld, Oxford, and Roger J. Becker, Kettering, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jun. 27, 1986, Ser. No. 879,718
Int. Cl.⁴ G01N 21/86

U.S. Cl. 250—554

15 Claims



1. Apparatus for maintaining the eroding burn surface of a movable solid rocket propellant sample positioned along an axial path within the limited depth of field of a camera system comprising:

- electromechanical means for advancing said propellant sample along said axial path in response to an electrical driving signal;
- a linear array of optical-to-electrical transducer elements disposed along said axial path adjacent said propellant sample and optical eclipse responsive to both said burn surface eroding and said propellant sample feeding;
- means for determining the number of said transducer elements illuminated and the number eclipsed by said propellant sample at each instantaneous position of said burn surface;
- means for storing numerical values representing the number of illuminated transducer elements found in two successive samples of an output signal from said means for determining;
- means for converting one of said stored numeric values to an analog signal; and
- means for generating said electrical driving signal in response to the difference between said analog signal and a first reference signal.

4,710,642

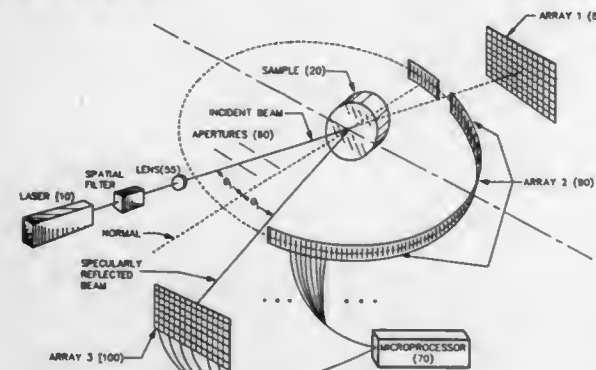
**OPTICAL SCATTEROMETER HAVING IMPROVED
SENSITIVITY AND BANDWIDTH**

John R. McNeil, 13423 Desert Hills NE., Albuquerque, N. Mex. 87111

Filed Aug. 20, 1985, Ser. No. 767,611
Int. Cl.⁴ G01N 21/86

U.S. Cl. 250—571

10 Claims



1. An optical scatterometer comprising:
a material having optical and microstructure characteristics to be analyzed;

laser means for transmitting an incident laser beam to irradiate a spot on the material;

- a first array of optical detectors positioned to detect the incident laser beam in the absence of said material for characterizing the optical characteristics of the incident laser beam;
- a second array of optical detectors positioned in a plane containing the incident laser beam and further positioned in a circular arc whose center coincides with the spot on the material irradiated by the incident laser beam, said second array of optical detectors being operative for detecting indications of both back-scattered and forward-scattered light resulting from irradiation of said spot on said material;
- a third array of optical detectors positioned to detect a specularly reflected beam of light from said material; and
- microprocessor means coupled to the first, second, and third arrays of optical detectors for processing electrical signals received therefrom to provide an indication to the user of the optical characteristics of the incident laser beam and of the optical and microstructure characteristics of said material.

4,710,643

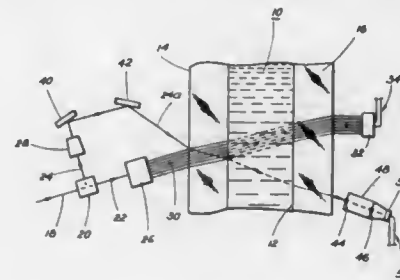
**METHOD AND APPARATUS FOR DETERMINING THE
DEGREE OF PURITY OF A LIQUID**

Charles S. Schmukler, Flushing, and Georges A. Buon, White-stone, both of N.Y., assignors to Marine Moisture Control Company, Inc., Inwood, N.Y.

Filed Aug. 8, 1986, Ser. No. 894,956
Int. Cl.⁴ G01N 15/06

U.S. Cl. 250—573

18 Claims



1. A method for monitoring the purity of a liquid, comprising the steps, of:
providing a laser beam;
dividing the laser beam into first and second portions prior to directing the beam through the liquid;
positioning a pair of windows on opposite sides of the liquid container;
impinging the first portion of the beam onto a beam expander directed towards one of said windows for passing said first portion through the liquid in a direction to exit through the other side of said windows to thereby survey a relatively large area of the liquid;
impinging the second portion of the beam onto a mirror arrangement to change the angle of entry of the second portion into the liquid so that it passes through the liquid at an angle different from the direction of travel of the first portion;
detecting the first portion of the beam after it exits from said second window to detect the amount of the solid particles present in the liquid;
detecting the second portion of the beam after it exits from the second window; and
sensing any deviations of the path of the second portion through the liquid as a result of changes in the liquid from its pure state in response to change in refraction effect on said second portion as it passes through the liquid.

4,710,644

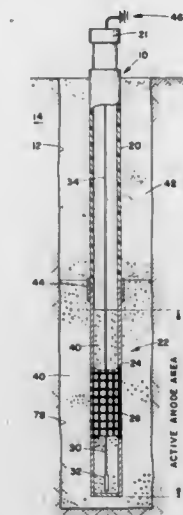
REPLACEABLE DEEP ANODE SYSTEM

Michael K. Baach, Houston, Tex., assignor to Corpro Companies, Inc., Medina, Ohio

Filed Oct. 30, 1985, Ser. No. 792,963
Int. Cl.⁴ C23F 13/02

U.S. Cl. 307—95

11 Claims



1. An anode assembly for cathodic protection of subterranean structures comprising in combination:
an elongated anode casing having a first upper electrically non-conductive portion and a second lower electrically conductive portion, said second portion comprising an electrically conductive wall including an electrically conductive polymer coating;
an anode received in said casing;
electrically conductive material received in said casing contiguous to said anode and further disposed about an outer wall surface of said casing second portion; and
means for supplying electrical energy to said anode whereby electrical energy flows from said anode through said electrically conductive materials and through said polymer coating to cause the subterranean structures to become cathodic and thereby substantially prevent corrosion of such structures.
5. A replaceable deep anode system for the cathodic protection of underground metallic structure comprising:
a rigid casing received within a drilled hole, said casing having a top portion of non-conductive material and a lower portion of substantially chemically inert conductive material, generally defining a system active anode area;
an anode received within said lower portion;
means for selectively positioning said anode in said lower portion;
electrically conductive material received within and about said casing at said active anode area to provide an electrically conductive path from said anode through said casing lower portion and to the drilled hole; and
means for supplying electrical energy to the anode whereby upon sacrificial corrosion of the anode, the anode may be selectively retrieved and replaced in said casing while maintaining the integrity of the drilled hole indefinitely.
10. A replaceable anode system for the cathodic protection of underground metallic structures comprising:
an anode casing having an electrically non-conductive, dimensionally stable portion and a substantially incorrodible, dimensionally stable, electrically conductive portion, a selectively insertable anode received in the casing contiguous to the conductive portion, and electrically conductive material received in said casing adjacent the anode and about the casing conductive portion whereby said casing provides an integral anode housing for selective removal and resupply of anodes.

4,710,645

**DEVICE FOR MONITORING THE STATE OF AN
ELECTRIC SWITCH OR AN ELECTRIC RELAY**

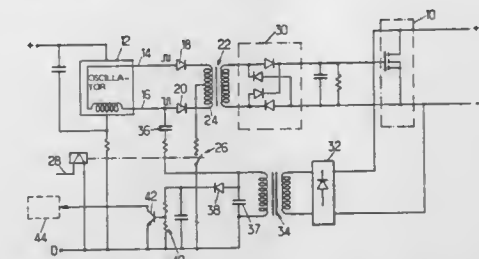
Pierre O. Doitau, Villiers St Frederic, and Hervé Moal, Velizy, both of France, assignors to Matra, Paris, France

Filed May 28, 1986, Ser. No. 867,475

Claims priority, application France, May 30, 1985, 8508134
Int. Cl.⁴ H03K 17/687

U.S. Cl. 307—115

7 Claims



1. A device for monitoring an operating state of an electrical switch having a pair of output terminals, said switch, when in a closed state, having an impedance across terminals thereof lower than the impedance when said switch is in an open state by several orders of magnitude, comprising: an insulating transformer having a first winding and a second winding; rectifier means for connecting the first winding across said terminals of the switch; oscillator means having an impedance substantially higher than that of said second winding when said switch is in closed condition and in electric series relation with said second winding; and analysing means connected to said second winding and responsive to a signal received from said second winding.

4,710,646

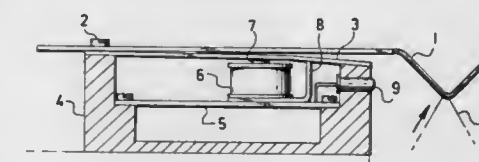
THREAD MOVEMENT SENSOR

Otakar Curda; Jaroslav Maxa, and Pavel Uhlir, all of Trebic, Czechoslovakia, assignors to Elitex koncern textilního strojírenství, Liberec, Czechoslovakia

Filed Apr. 3, 1986, Ser. No. 847,499

Claims priority, application Czechoslovakia, Apr. 3, 1985, 2463-85
Int. Cl.⁴ D01H 13/16; B65H 25/14; D03D 51/28; D01G 31/00
U.S. Cl. 307—116

5 Claims



1. Device for detecting the presence and movement of a thread under tension and for stopping a thread manipulating machine when the tension of the thread changes by a predetermined desired amount comprising
an arm having a thread guide at one end and being fixed at its other end to a body, said body containing a coil wherein said arm and said coil form part of a magnetic circuit, such that movement of said arm results in a change in the magnetic flux of said magnetic circuit, said thread passing over said thread guide so as to deflect said arm with respect to said coil
whereby said arm and said coil function as a contactless switch to signal movement of the arm by providing a corresponding change in the magnetic flux of the coil such that the magnitude of any change in flux of said coil corre-

sponds to the magnitude of any movement of the arm, the movement of the arm thereby being able to be measured electronically by measuring the change in the magnetic flux of the coil.

4,710,647

SUBSTRATE BIAS GENERATOR INCLUDING MULTIVIBRATOR HAVING FREQUENCY INDEPENDENT OF SUPPLY VOLTAGE

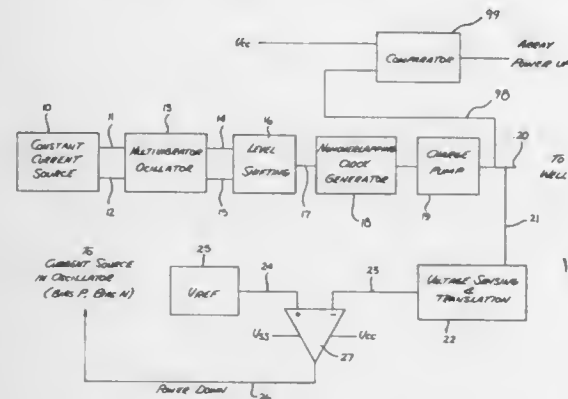
Ian Young, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 18, 1986, Ser. No. 830,469

Int. Cl.⁴ H03L 1/00; G05F 1/56

U.S. Cl. 307—297

18 Claims



1. A device for biasing a well of a first conductivity type to a well voltage, exceeding a first voltage by a first reference voltage, said device comprising:

- current generating means having first and second outputs, said current generating means for producing a current independent of said first voltage;
- frequency generating means coupled to said first and second outputs, said frequency generating means having third and fourth outputs;
- level shifting means coupled to said third and fourth outputs, said level shifting means for raising the voltage level of said third and fourth outputs;
- clock generating means coupled to said level shifting means, said clock generating means for generating a plurality of clocking signals;
- charge pumping means coupled to said clock generating means, said charge pumping means for biasing said well;
- first comparing means coupled to said well, said first comparing means for comparing said well voltage to said first reference voltage, said first comparing means having a fifth output coupled to said frequency generating means for controlling the output of said frequency generating means.

4,710,648

SEMICONDUCTOR INCLUDING SIGNAL PROCESSOR AND TRANSIENT DETECTOR FOR LOW TEMPERATURE OPERATION

Shoji Hanamura, Kodaira; Masaaki Aoki, Minato, and Toshiaki Masuhara, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1985, Ser. No. 731,014

Claims priority, application Japan, May 9, 1984, 59-90960; Jul. 25, 1984, 59-152834; Sep. 29, 1984, 59-205311

Int. Cl.⁴ H03K 17/16, 19/20

U.S. Cl. 307—443

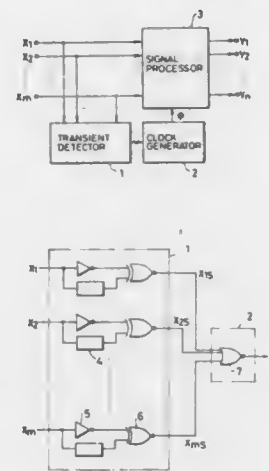
4 Claims

1. A semiconductor device for low-temperature operation comprising:

- a signal processing circuit having at least one input for receiving at least one input signal and at least one output,

said signal processing circuit being comprised of a logic gate which includes a load transistor and at least one drive transistor, wherein the drive transistor receives the input signal at said input and provides a logic output at said output in connection with the load transistor;

an input signal transient detector including means for detecting a change of a state of said at least one input signal and means for outputting a signal-processing commencing signal to said signal processing circuit in response to a



detected change of state of said at least one input signal; and

charge supply means including means for receiving the signal-processing commencing signal and for supplying electric charge to a circuit node in the signal processing circuit,

wherein said load transistor is activated when at least one input signal changes, and said signal processing circuit and charge supply means are operated in a range of temperature below 200K.

4,710,649

TRANSMISSION-GATE STRUCTURED LOGIC CIRCUITS

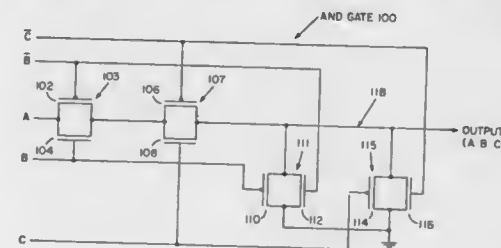
Edward T. Lewis, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 11, 1986, Ser. No. 850,642

Int. Cl.⁴ H03K 19/094

U.S. Cl. 307—451

9 Claims



1. A logic circuit for converting a plurality of input logic signals into an output logic signal representative of a predetermined logical combination of the plurality of input logic signals comprising:

- a plurality of electronic switch means, each of said switch means having an input terminal, an output terminal, a first control terminal and a second control terminal for coupling or decoupling the input terminal and the output terminal selectively in accordance with a logic state of a signal fed to the first and second control terminals;
- a first one of said plurality of input logic signals being fed to an input terminal of a first one of said switch means;
- a second one of said plurality of input logic signals being fed

to the first control terminal of said first one of said switch means;

a second one of said switch means having an input terminal coupled to the output terminal of said first one of said switch means;

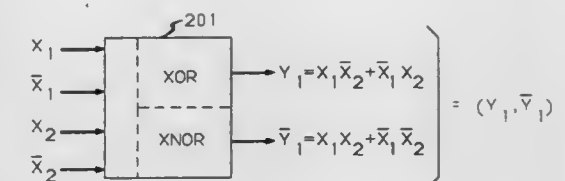
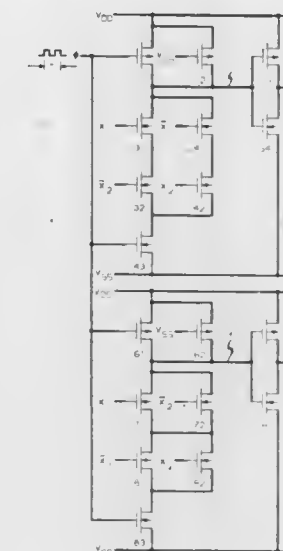
a third one of said plurality of input logic signals being fed to the first control terminal of said second one of said switch means;

output terminals of a third one and a fourth one of said switch means coupled to the output terminal of said second one of said switch means and to an output of said logic circuit wherein: (i) said second one of said plurality of input logic signals being fed to the first control terminal of said third one of said switch means; (ii) said third one of said plurality of input logic signals being fed to the first control terminal of said fourth one of said switch means; and (iii) the input terminal of said third and fourth switch means being coupled to a signal having a predetermined reference potential representative of one of the logic states of the input logic signals;

a fourth one of said plurality of input logic signals being fed to the second control terminal of said first switch means and the second control terminal of said third switch means; and

a fifth one of said plurality of input logic signals being fed to the second control terminal of said second switch means and the second control terminal of said fourth switch means.

first and second sets, respectively, of logic input signals, whereby during each evaluation phase the first and second



sections generate first and second outputs, respectively, that are the inverse of each other.

4,710,651

JOSEPHSON-JUNCTION LOGIC DEVICE

Hideo Suzuki, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

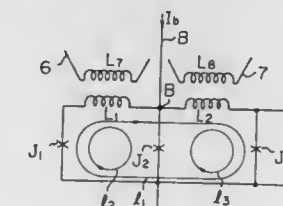
Continuation of Ser. No. 735,726, May 20, 1985, abandoned, which is a continuation of Ser. No. 428,481, Sep. 29, 1982, abandoned. This application Oct. 10, 1986, Ser. No. 917,313

Claims priority, application Japan, Sep. 30, 1981, 56-153886

Int. Cl.⁴ H03K 19/195

U.S. Cl. 307—462

3 Claims



4,710,650

DUAL DOMINO CMOS LOGIC CIRCUIT, INCLUDING COMPLEMENTARY VECTORIZATION AND INTEGRATION

Masakazu Shoji, Warren, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 26, 1986, Ser. No. 900,579

Int. Cl.⁴ H03K 19/003, 19/096

U.S. Cl. 307—452

7 Claims

1. A domino CMOS logic circuit, operable on a succession of precharge and evaluation phases of a clock sequence, including a dual gate having first and second logic gate sections which are logic duals of each other, the first and second sections having first and second mutually complementarily interconnected arrays, respectively, of driver transistors that are respectively connected for receiving mutually complementary

1. A Josephson-junction logic device having inductances and forming an AND circuit, comprising:

- at least two superconductive loops, each having at least two Josephson-junction elements and a loop inductance connected between each of said at least two Josephson-junction elements, said at least two superconductive loops being connected so that two adjacent ones of said at least two superconductive loops commonly include one of said at least two Josephson-junction elements, each of said

Josephson-junction elements and each loop inductance forming a quantum interference elements;
 at least two logic input signal lines, operatively connected to receive input currents, for supplying logic input signals, each of said logic input signal lines being independently arranged to be opposite one loop inductance forming a quantum interference elements, for magnetically coupling with said one loop inductance forming a quantum interference elements;
 a bias line, operatively connected to said at least two superconductive loops, for supplying a bias current to said at least two superconductive loops, said bias current satisfying the condition $|I_m| > |I_{m0}|$, where I_m is a first threshold current, for switching said AND circuit, determined when said at least two logic input signal lines receive different magnitude input currents and where I_{m0} is a second threshold current for switching said AND circuit, determined when said at least two logic input signal lines receive the same magnitude input currents; and
 output terminals, operatively connected to one of said at least two Josephson-junction elements, for outputting a logic output signal as a result of a logic operation performed on said logic input signals, whereby an operating margin of the AND circuit is expanded.

4,710,652

INTERFERENCE SIGNAL COMPONENT COMPENSATION CIRCUIT

Jan Petr, Oberwil, Switzerland, assignor to Lgz Landis & Gyr Zug AG, Zug, Switzerland

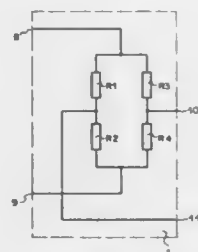
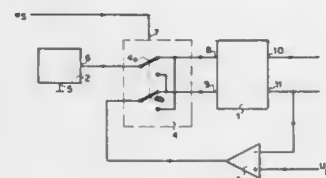
Filed May 27, 1986, Ser. No. 867,490

Claims priority, application Switzerland, Feb. 10, 1986, 519/86

Int. Cl.⁴ G01R 17/00; H03F 15/00

U.S. Cl. 307—491

6 Claims



1. An interference signal component compensation circuit for use with a four-pole device wherein two poles thereof form inputs and two poles thereof form outputs in which the output signal of said four-pole device is measured from one output relative to a base potential at the other output, comprising:
 an amplifier having an inverting input coupled to the base potential on the other output of said four-pole device and having a non-inverting input operable for being coupled to a reference voltage, said amplifier having an output voltage which is proportional to the difference between said base potential and said reference voltage; and
 a reversing two-pole switch connected to the inputs of said four-pole device and having one connection to the output of said amplifier and another connection operable for being coupled to a signal source; said reversing switch operable for reversing the connection of said signal source and said amplifier to the inputs of said four-pole device.

4,710,653 EDGE DETECTOR CIRCUIT AND OSCILLATOR USING SAME

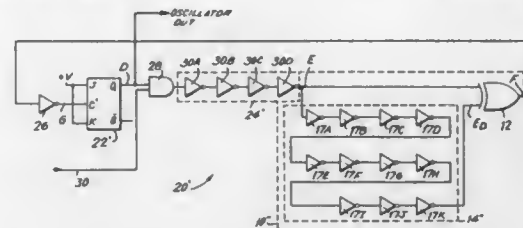
Seening Yee, Port Washington, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 3, 1986, Ser. No. 882,146

Int. Cl.⁴ G01R 19/145; H03K 5/13, 5/159, 5/22

U.S. Cl. 307—518

27 Claims



1. An electronic circuit comprising:
 delay and inverting means for logically inverting and delaying an input signal to supply a delayed and inverted pulse;
 gate means having a first input for receiving said input signal and a second input for receiving said delayed and inverted signal, said gate means providing a logic output signal whenever said input signal and said delayed and inverted signal are at different logic levels;
 delay means for delaying said input signal supplied to the input of the delay and inverting means and to the first input of the gate means; and
 an additional gate means, said additional gate means having an input for receiving said logic output signal and an output connected to an input of the delay means, said additional gate means being configured so that a logic gate of pulses provided at an output thereof changes upon selected changes in state of said logic output signal.

4,710,654

DELAY CIRCUIT INCLUDING AN IMPROVED CR INTEGRATOR CIRCUIT

Takashi Saitoh; Nobuya Nizaki, both of Yokohama; Hideho Yamamura, Tokyo, and Shinichi Hayashi, Isezaki, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Electronics Engineering Co., Ltd., Kanagawa, both of Japan

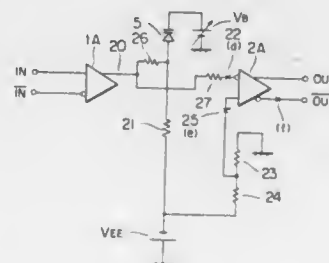
Filed Sep. 5, 1984, Ser. No. 647,484

Claims priority, application Japan, Sep. 5, 1983, 58-162081; Sep. 26, 1983, 58-176279

Int. Cl.⁴ H03K 5/13, 5/01, 3/26

U.S. Cl. 307—601

2 Claims



1. A delay circuit comprising:
 a first comparator having at least one input for receiving an input signal for the delay circuit, and also having an open emitter output;
 a second comparator having a non-inverting input and an inverting input, one of which is connected to the output of said first comparator, and an output for producing an output signal delayed from said input signal of said first comparator;
 a CR integrator circuit comprising a first resistor, an second

resistor and a variable capacitance diode, of which one electrode of said first resistor is connected to the output of said first comparator and the other electrode is connected to one electrode of said variable capacitance diode, wherein one electrode of said second resistor is connected to a node between said first resistor and said variable diode and the other electrode of said second resistor is connected to a voltage supply, said first resistor controlling the rise-time of the output signal of said first comparator, and said second resistor controlling the fall-time of said output signal of said first comparator according to the time constant produced with said second resistor and the variable capacitance diode;
 a variable voltage source connected to the other electrode of the variable capacitance diode to control the capacitance of said variable capacitance diode; and
 a reference voltage source connected to the other input terminal of said second comparator which is not connected to the first comparator.

4,710,655

RESONANT VIBRATION-TRANSMITTING APPARATUS

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

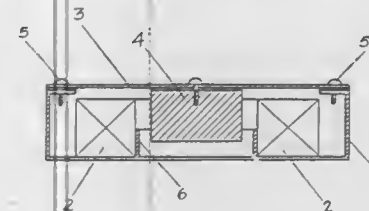
Filed Jun. 12, 1986, Ser. No. 874,016

Claims priority, application Japan, Jul. 1, 1985, 60-144172

Int. Cl.⁴ H02K 33/00

U.S. Cl. 310—30

8 Claims



1. A vibrating device including an apparatus comprising
 (a) a vibrant leaf spring,
 (b) an iron core attached to said vibrant leaf spring,
 (c) a solenoid having a hollow tubular interior, and
 (d) a yoke supporting said vibrant leaf spring and solenoid in such manner that said solenoid comes under said vibrant leaf spring, and that said iron core reciprocally moves in the interior of the solenoid in resonance with the frequency of a power source for activating said solenoid,
 wherein

the ratio of the combined mass of said leaf spring plus iron core to that of said yoke plus solenoid is in the range of 1:2 to 1:10,

said apparatus has a top surface at which said vibrant leaf spring vibrates, and
 said apparatus is mounted in an opening in the surface of a sponge by a plastic plate connected to said top surface of said apparatus and extending across said opening and on the surface of said sponge in the vicinity of said opening.

4,710,656

SPRING NEUTRALIZED MAGNETIC VIBRATION ISOLATOR

Phillip A. Studer, 10313 Ridgemoor Dr., Silver Spring, Md. 20901

Filed Dec. 3, 1986, Ser. No. 937,208

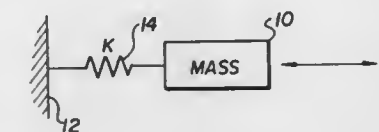
Int. Cl.⁴ H02K 5/24

U.S. Cl. 310—51

26 Claims

1. A vibration isolator for supporting a mass mounted on a base, comprising:
 mechanical spring means, exhibiting a positive stiffness constant, and electromagnetic force means, exhibiting an

effect of a negative stiffness constant, coupled between said mass and said base,
 said electromagnetic force means further comprising, permanent magnetic circuit means including a pair of axially separated air gaps, magnetically permeable armature means extending between said air gaps and having a pair of magnetically permeable prominences partially shorting each of said air gaps, electromagnetic coil means encir-



clinging a selected portion of said armature means, and means for selectively energizing said electromagnetic coil means for generating differential magnetic forces across said air gaps and causing said armature to move in a predetermined direction in response to a control signal, whereby a vibration isolator having a zero natural frequency response is provided exhibiting broadband attenuation of vibrational frequencies.

4,710,657

SEMI ENCLOSED ALTERNATOR

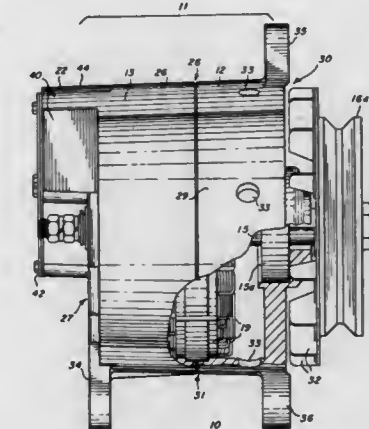
Alfred G. Ocken, Franklin Park, and Raymond E. Nordbrock, St. Charles, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 06/738,140, May 24, 1985. This application Sep. 9, 1986, Ser. No. 906,570

Int. Cl.⁴ H02K 9/02

U.S. Cl. 310—62

27 Claims



1. An alternator suitable for agricultural or industrial construction use in which an atmosphere surrounding the alternator may have particle contaminants, comprising:
 an alternator outer housing having front and rear housing portions joined together;
 an alternator drive shaft coupled to the housing and having a first drive shaft portion positioned within the housing and a second drive shaft portion axially extending from said first portion and extending outward from and beyond at least the front housing portion, said drive shaft being rotatable with respect to the housing about a drive shaft axis;
 a rotor assembly mounted on the first drive shaft portion and positioned within the outer housing;
 a stator assembly mounted to and inside the outer housing for electrical/magnetic cooperation with the rotor assembly;
 rectifying diode means secured to said outer housing and rectifying an AC output of at least one of said stator and

rotor assemblies and providing an alternator output signal in response to said rectified output; wherein the improvement comprises, said rear housing portion, at least after assembly of the alternator, having a generally cylindrical outer shape comprising substantially cylindrical sidewalls joined to a closed end portion and having an opposite open end facing said front housing portion, said rear housing cylindrical sidewalls and closed end portion forming a substantially air closed internal cavity except for said open end, said rear housing cylindrical sidewalls being generally concentric with respect to said shaft axis;

said front housing portion having a generally tubular outer shape comprising generally cylindrical sidewalls generally concentric with respect to said shaft axis, said front housing cylindrical sidewalls effectively terminating at substantially open first and second end openings, said first end opening facing said rear housing open end and said second end opening providing an opening to the ambient atmosphere surrounding said alternator, said drive shaft second portion axially extending outward from and beyond said front housing portion; and fan assembly means mounted on said drive shaft and positioned concentrically about said axis and mounted external to said front housing portion, said second front housing end opening facing said fan assembly means, said fan assembly means, during normal driven rotation of said drive shaft, providing for air flow in a direction out of said second front housing end opening.

4,710,658

CONNECTION SOCKET FOR A SUBMERSIBLE ELECTRIC MOTOR

Torvald Stahl, Alvsjo, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

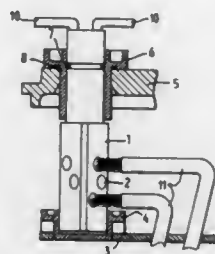
Filed Oct. 16, 1986, Ser. No. 919,749

Claims priority, application Sweden, Oct. 23, 1985, 8504983

Int. Cl.⁴ H02K 5/10, 3/50

U.S. Cl. 310-71

1 Claim



1. A connection socket in a connection box for a submersible electric motor comprising in combination:

- a first upper plate having a plurality of first mounting holes;
- a second lower plate having a plurality of second mounting holes;
- a first upper insulated holder mounted in one of said plurality of first holes;
- a second lower insulated holder mounted in one of said plurality of second holes;
- a connection pin, one end being mounted in said first insulated holder and another end being mounted in said second insulated holder, said one end having first connection means for connecting to incoming conductors, and said connection pin having second connection means adjacent said other end and positioned between said first and second plates for connecting to conductors from the electric motor;
- said connection pin having adjacent said one end a peripheral groove for retaining a sealing ring between said pin and said first holder;
- said first insulated plate having another peripheral groove for retaining another sealing ring between said first insulated plate and said first upper plate, whereby liquid is

prevented from entering the chamber formed by said first and second plate from said one end of said connection pin.

4,710,659

RESIN MOLDED ROTOR FOR A MAGNETO GENERATOR

Masami Takano, and Yukio Tamura, both of Gunma, Japan, assignors to Sawafuji Electric Co., Inc., Tokyo, Japan

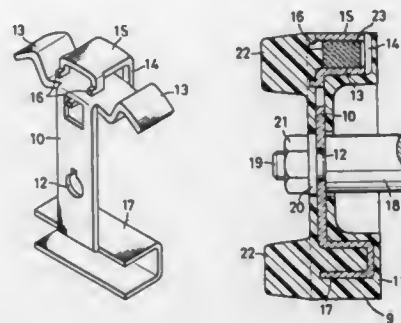
Filed Aug. 18, 1986, Ser. No. 897,263

Claims priority, application Japan, Aug. 28, 1985, 60-131353[U]

Int. Cl.⁴ H02K 21/12

U.S. Cl. 310-153

10 Claims



1. A resin molded rotor for a magneto generator comprising: a magnet for generating electric power;
- a metal core made of a ferromagnetic substance for supporting the mechanical strength;
- a holding means formed on said metal core for holding said magnet;
- a first pole portion integrally formed with said metal core, said first pole portion being formed on and extended from a first receiving portion of said holding portion where one pole of said magnet is received;
- a second pole portion integrally formed with said metal core, said second portion being formed on and extended from a second receiving portion of said holding means where another pole of said magnet is received;
- a pair of bridges formed with said metal core and arranged side-by-side for connecting said first receiving portion with said second receiving portion, said bridges being narrowly dimensioned such that they will be immediately saturated by magnetic flux thereby prohibiting any additional magnetic flux from entering said bridges; and
- a molded resin disk connected to said metal core by insert molding to give the rotor a circular shape.

4,710,660

SOLENOIDAL HOMOPOLAR GENERATOR

Bobby D. McKee; Michael P. Cain, both of San Jose; Robert M. Delvecchio, Sunnyvale, and Emmanuel Aivaliotis, San Jose, all of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1986, Ser. No. 912,736

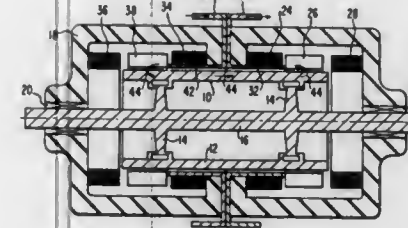
Int. Cl.⁴ H02K 31/00

U.S. Cl. 310-178

7 Claims

1. A dynamoelectric machine comprising: a stator structure;
- a rotor having a central axis, being positioned within said stator structure and being mounted for rotation with respect to said stator structure;
- a first inner field coil supported by said stator structure and positioned around a first portion of said rotor;
- a first outer field coil supported by said stator structure, concentric with said rotor axis and longitudinally spaced from said first inner field coil;

said first inner and outer field coils being wound to produce solenoidal magnetic flux in the same direction; and a current collecting brush assembly for conducting current with a circumferential component to produce solenoidal magnetic flux in the same direction as magnetic flux produced by said first inner and outer field coils, said current



collecting brush assembly including a plurality of brush boxes each connected at one end to a cylindrical conductor, each lying at an inclined angle with respect to the axis of said rotor and each being generally positioned between said first inner and outer field coils in a longitudinal direction.

4,710,661

WINDING ARRANGEMENT OF A STATOR AND/OR ROTOR OF A THREE-PHASE GENERATOR OR ELECTROMOTOR WITH IMPROVED PERFORMANCES

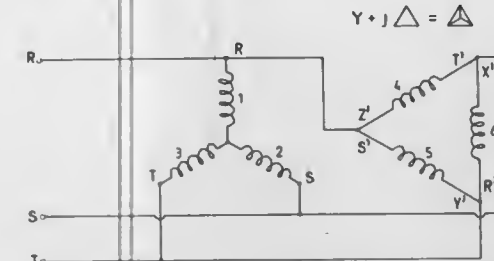
Rifat Gjota, Titogradska 19, YU-38300 Pe, Yugoslavia

Filed Dec. 22, 1986, Ser. No. 944,063

Int. Cl.⁴ H02K 3/00

U.S. Cl. 310-198

2 Claims



1. Winding arrangement of a stator and/or rotor of a three-phase generator or electromotor with improved performances, characterized in that into the stator and/or rotor of a generator or electromotor there are installed star-connected and delta-connected windings that are mutually shifted in the space for an angle of $(\pi/2p) \pm (\pi/6p)$, p being the number of pole pairs.

4,710,662

DYNAMOELECTRIC MACHINE ROTOR STRUCTURE HAVING IMPROVED INSULATION

Roy L. Balke; Charles H. Merrifield, and Frank E. Mizikowski, all of Erie, Pa., assignors to General Electric Company, Salem, Va.

Filed Dec. 9, 1985, Ser. No. 807,046

Int. Cl.⁴ H02K 3/38, 3/50

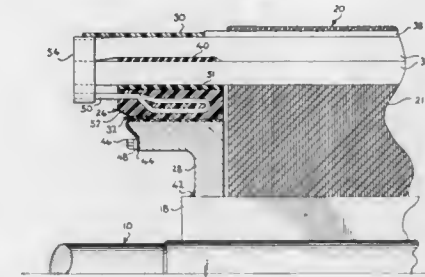
U.S. Cl. 310-204

16 Claims

10. In a dynamoelectric machine rotor structure of the type including a centrally extending shaft, main windings supported by said shaft, a winding support supported by said shaft and an encapsulated equalizer winding assembly disposed around said winding support contiguously to one end of said main windings, the improvement comprising:

- (a) an expansion member positioned between at least a por-

tion of the winding support and the encapsulated equalizer winding assembly; and,



(b) an insulating resin covering at least exposed proximate portions of said winding support, said expansion member and said encapsulated equalizer winding assembly.

4,710,663

DYNAMOELECTRIC MACHINE COIL SLOT WEDGE MOUNTING ARRANGEMENT

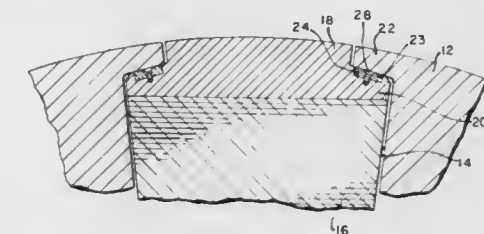
Stephen R. Reid, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 12, 1986, Ser. No. 941,250

Int. Cl.⁴ H02K 3/48

U.S. Cl. 310-214

8 Claims



1. A dynamoelectric machine rotor comprising an armature having circumferentially spaced rotor teeth with coil slots formed between adjacent teeth and coils disposed in said coil slots, said teeth having projections formed at their radially outer ends and projecting toward one another into the adjacent coil slots, and coil wedges disposed in said coil slots between adjacent teeth, and having shoulder portions engaging said tooth projections to be supported thereby, said coil wedges having a self-lubricating material structure disposed on their shoulder portions in engagement with said tooth projections.

4,710,664

SPACE BLOCK CONTROL MEANS FOR DYNAMOELECTRIC MACHINE

Frederick E. Cox, Gloversville; Frederick J. Rink, Jr., and Richard A. Valachovic, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 1, 1986, Ser. No. 881,157

Int. Cl.⁴ H02K 1/18

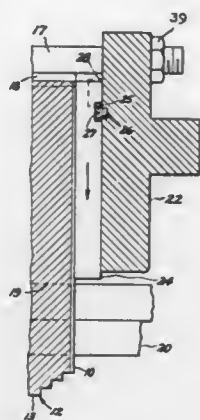
U.S. Cl. 310-217

12 Claims

1. In a stator core structure of a dynamoelectric machine wherein the core structure comprises an axially stacked array of laminations which form, in assembled relationship, a laminated core structure, and wherein the core structure is retained in its assembled relationship by one of a pair of flanges disposed at each end of the core, and retaining means coupled to said pair of flanges for maintaining clamping forces on the core structure in its assembled relationship, and wherein a space block is inserted between at least one of the flanges and the core structure in abutting surface relationship with the flange for distributing clamping forces imposed on the core structure

between said flanges, the improvement which comprises in combination:

each abutting surface of said flange and said space block having a mutually registrable groove disposed therein for forming a keyway between said flange and said space block;



a key member disposable in said keyway and having a width less than the width of the groove of the space block, whereby when the key member is disposed in the keyway there is excess space between the key member and a side-wall of the groove of the space block; and
tab means disposed in the groove of the space block for occupying at least a portion of said excess space thereby limiting relative motion between said abutting surfaces.

4,710,665

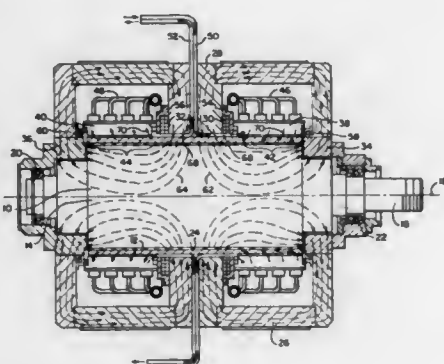
HOMOPOLAR DYNAMOELECTRIC MACHINE WITH SELF-COMPENSATING CURRENT COLLECTOR

Lee A. Kilgore, Export, Pa., and Bobby D. McKee, San Jose, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1986, Ser. No. 912,733
Int. Cl.⁴ H02K 13/00

U.S. Cl. 310-219

4 Claims



1. A dynamoelectric machine comprising:
a stator structure;
a rotor having a central axis, being positioned within said stator structure and being mounted for rotation with respect to said stator structure;
said stator structure having a flux path with a pole piece mounted to direct flux radially into a first portion of said rotor;
an excitation coil for producing magnetic flux in said flux path;
a generally cylindrical stator conductor positioned around said rotor to form an annular gap between said rotor and said stator conductor;
a current collecting means capable of making electrical

contact with a second portion of said rotor and connected to conduct current from said rotor to one end of said stator conductor; and

a plurality of slits in said stator conductor, said slits being skewed at a preselected angle with respect to the rotor axis in a circumferential direction, so that current flowing in said stator conductor between said slits has a circumferential component which adds flux to the magnetic flux produced by said excitation coil;

wherein said current collecting means includes a plurality of generally rectangular brush assemblies, each of said generally rectangular brush assemblies being inclined at a second angle with respect to said rotor axis in a circumferential direction, so that current flowing in said assemblies has a circumferential component which adds flux to the magnetic flux produced by said excitation coil.

4,710,666

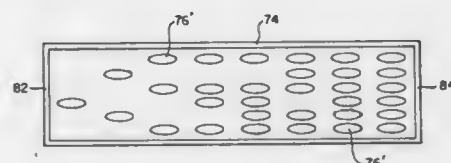
HOMOPOLAR GENERATOR WITH VARIABLE PACKING FACTOR BRUSHES

Ronald A. Rindal, Roseville, and Bobby D. McKee, San Jose, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1986, Ser. No. 912,737
Int. Cl.⁴ H02K 13/00

U.S. Cl. 310-248

5 Claims



1. A homopolar dynamoelectric machine comprising:
a rotor having a central axis;
an annular field coil encircling said rotor;
a stator structure supporting said field coil for directing magnetic flux produced by current flowing in said field coil, into a first section of said rotor;
means for rotating said rotor with respect to said stator;
a brush assembly including a plurality of contact elements which are capable of making sliding electrical contact with a second section of said rotor and extending longitudinally adjacent to said second rotor section; and
wherein said plurality of contact elements are packed with an increasing density in a longitudinal direction parallel to said central axis, such that the number of said contact elements capable of making sliding electrical contact with said rotor increases in said longitudinal direction.

4,710,667

BRUSHLESS D.C. DYNAMOELECTRIC MACHINE WITH DECREASED MAGNITUDE OF PULSATIONS OF AIR GAP FLUX

Eric Whiteley, Peterborough, Canada, assignor to Maghemite Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 703,388, Feb. 20, 1985, Pat. No. 4,605,874. This application Aug. 11, 1986, Ser. No. 895,673
Claims priority, application United Kingdom, Jun. 12, 1984, 8414953

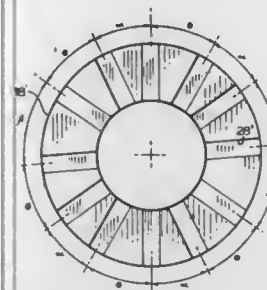
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.⁴ H02K 21/14, 1/16

U.S. Cl. 310-268

12 Claims

1. In a brushless D.C. dynamoelectric machine, which comprises:
a disc-like rotor element comprising hard ferrite toroid

means providing a plurality of magnetic poles of alternating polarity and mounted for rotation about its axis,
a disc-like stator element comprising soft ferrite toroid means and mounted coaxially with and spaced apart from the rotor element to define an air gap therebetween, said



soft ferrite toroid means being formed with radially-directed coil winding-receiving slots, and
electrical coil windings mounted to said stator in said slots, the improvement which comprises means for decreasing the magnitude of pulsations of air gap flux during rotation of said rotor with respect to said stator.

4,710,668

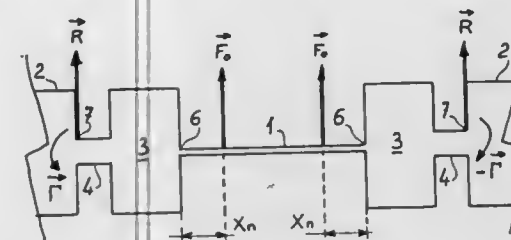
VIBRATING STRING RESONATOR

Henri Fima, Malissard, and Denis Janiaud, Les Ulis, both of France, assignors to Crouzet, Paris and Office National d'Etudes et de Recherche Aérospatiales (O.N.E.R.A.), Chatillon, both of France

Filed Dec. 2, 1985, Ser. No. 803,160
Claims priority, application France, Dec. 4, 1984, 84 18587
Int. Cl.⁴ H01L 41/08

U.S. Cl. 310-323

11 Claims



1. A resonator, comprising:
a beam capable of vibrating under flexion;
a pair of fixing means for fixing said beam at both of its ends;
a pair of inertia mass means disposed between said beam and respective ones of said fixing means for providing a vibratory decoupling between said beam and said pair of fixing means;
a pair of flexible articulation means disposed between and interconnecting respective ones of said inertia mass means and said fixing means;
a pair of flexible articulation means disposed between and interconnecting respective ones of said inertia mass means and said fixing means;
each inertia mass means being mounted to oscillate in a vibration plane in which said beam vibrates and to pivot about a pivot axis orthogonal to said vibration plane, said pivot axis being situated at one of said flexible articulation means;
each inertia mass being rigid, compact and having a convex contour and being connected at its face opposite to said beam to one of said flexible articulation means;
each inertia mass means being driven to rotate only about said pivot axis in response to vibration of said beam; and
the pair of inertia mass means having predetermined sizes to

yield in said vibration plane a substantially zero resulting force applied to said pair of fixing means by said beam, said pair of inertia mass means and said pair of flexible articulation means.

4,710,669

INTERNAL ELECTRICAL CONNECTOR FOR A TENSION MASK TUBE

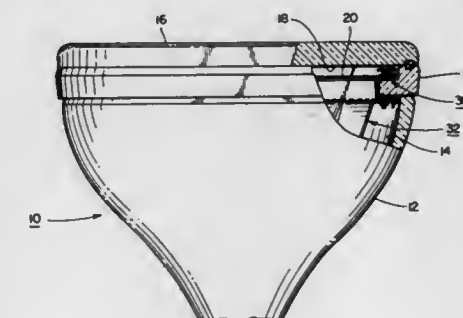
Alfred Adamski, Elmhurst; Thomas P. DeFranco, Norridge, and Lawrence W. Dougherty, Sleepy Hollow, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 19, 1985, Ser. No. 811,051

Int. Cl.⁴ H01J 29/07, 29/92

U.S. Cl. 313-402

6 Claims



1. In a CRT comprising a funnel having a conductive coating applied to a selected area of its internal wall, a faceplate having a luminescent screen deposited upon its display surface, a ring formed of a non-conductive material and interposed between said funnel and said faceplate for supporting a tension color selection electrode in registration with said screen, an improved unitary connector arrangement for establishing said funnel coating, said screen, and said color selection electrode at a common electrical potential, said connector arrangement comprising:

a clip formed of a resilient conductive material and configured to be retained upon said ring;
first contact means supported by said clip for effecting a conductive engagement between said screen and said clip;
second contact means, also supported by said clip, for effecting a conductive engagement between said funnel coating and said clip; and
means for effecting an electrical connection between said clip and said color selection electrode, whereby said screen, said funnel coating and said color selection electrode are established at a common electrical potential by said unitary connector arrangement.

4,710,670

FRONT ASSEMBLY SYSTEM FOR A TENSION MASK COLOR CATHODE RAY TUBE

Lawrence W. Dougherty, Sleepy Hollow, and James R. Fendley, Arlington Heights, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 21, 1986, Ser. No. 832,559

Int. Cl.⁴ H01J 29/07, 29/02

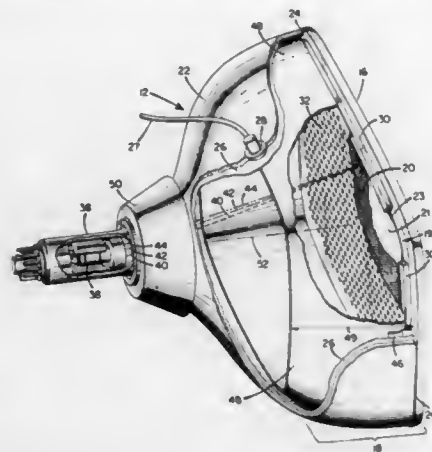
U.S. Cl. 313-407

4 Claims

1. A front assembly system for a color cathode ray tube having an improved internal electrical interconnection system comprising:

a substantially flat faceplate having on its inner surface a centrally disposed target area on which is disposed at least one pattern of phosphor deposits;
a funnel attached to a peripheral sealing area on said inner surface of said faceplate, and having an internal electrically conductive funnel coating adapted to receive a high electrical potential;
an electrically conductive frame attached to said inner sur-

face between said target area and said peripheral sealing area and enclosing said target area, said frame supporting in electrical union therewith a tensed metallic foil shadow mask;
an electrically conductive screen disposed on said pattern of phosphor deposits and electrically interconnected to said frame;
electrical interconnecting means for providing an electrical



connection between said frame and said internal electrically conductive funnel coating;
whereby a high-voltage conduit is formed between said internal funnel coating and said mask through said frame, said electrically conductive frame multi-functionally serving to mechanically support said interconnecting means and said mask, and to electrically interconnect said conductive funnel coating, said conductive screen film, and said mask.

4,710,671

COLOR TELEVISION DISPLAY TUBE WITH COMA CORRECTION

Albertus A. S. Sluyterman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

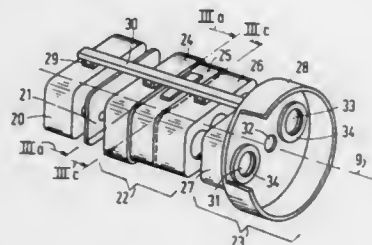
Filed Jun. 10, 1986, Ser. No. 872,771

Claims priority, application Netherlands, Jun. 12, 1985, 8501687; Oct. 9, 1985, 8502746

Int. Cl.⁴ H01J 29/51, 29/76

U.S. Cl. 313—413

9 Claims



1. A color display tube comprising an envelope containing a display screen, and an electron gun system for producing a central electron beam and first and second outer electron beams having respective axes which lie in a single plane and converge toward a point on the screen, the electron gun system including an end from which the electron beams exit into a deflection field region of the envelope where a field deflection field effects deflection of the beams in a direction perpendicular to said plane and a line deflection field effects deflection of the beams in a direction parallel to said plane, said line deflection field producing a positive lens action;

characterized in that the electron gun system includes field coma-correcting means comprising:

- first and second deflection field shaping means of magnetically-permeable material arranged adjacent the respective outer electron beams, at the end of the electron gun system, for cooperating with the positive lens action of the line deflection field to anisotropically overcorrect the field coma error of said outer electron beams relative to that of the central electron beam; and
- a third deflection field shaping means of magnetically-permeable material arranged adjacent the central electron beam, at a position in the electron gun system further from the screen than the first and second field shaping means, for cooperating with the positive lens action of the line deflection field to reverse-anisotropically correct the field coma error of the central electron beam by an amount sufficient to compensate for the overcorrection by the first and second field shaping means, thereby effecting production of a central-electron-beam-produced raster which is substantially identical to the outer-electron-beam-produced rasters.

4,710,672

PICTURE DISPLAY DEVICE

Maurits W. Van Tol, Almelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

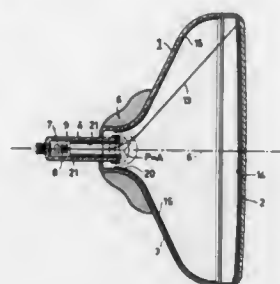
Filed Mar. 1, 1982, Ser. No. 353,315

Claims priority, application Netherlands, Apr. 16, 1981, 8101888

Int. Cl.⁴ H01J 29/54, 29/74

U.S. Cl. 313—413

5 Claims



1. A cathode ray tube comprising an evacuated envelope containing an electron gun, centered on an electron optical axis of the tube, and further comprising deflection coil means mounted on the envelope for effecting deflection of an electron beam produced by the electron gun to paths along lines intersecting a deflection point on the axis,

characterized in that the electron gun includes a plurality of electrodes positioned along the axis to effect formation of an accelerating electrostatic lens system comprising, in the direction of propagation of the electron beam, a positive lens followed by a negative lens, said deflection point being centrally located between opposing faces of said lenses.

4,710,673

ELECTRON TUBE ENVELOPE ASSEMBLY WITH PRECISELY POSITIONED WINDOW

Gerardus A. H. M. Vrijssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 544,765, Oct. 24, 1983, abandoned.

This application Jun. 25, 1986, Ser. No. 880,941

Claims priority, application Netherlands, Nov. 2, 1982, 8204238

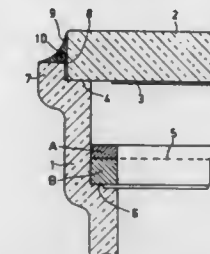
Int. Cl.⁴ H01J 31/00; C03C 27/02

U.S. Cl. 313—477 R

1 Claim

1. An electron tube envelope assembly comprising:
a tubular envelope having a first end and an axis, said enve-

lope having a bearing surface at the first end, the bearing surface being perpendicular to the axis;
a window having a radiation-sensitive layer thereon, said window directly contacting the bearing surface of the envelope to form a seam along the junction between the window and the bearing surface; and
means for hermetically sealing the seam;



wherein the hermetic sealing means comprises:
a mass of indium solder or an indium alloy solder provided outside the seam and along the circumference of the seam; and
a metal wire embedded in the solder, said metal wire capable of being soldered with indium or an indium alloy.

4,710,674

PHOSPHOR PARTICLE, FLUORESCENT LAMP, AND MANUFACTURING METHOD

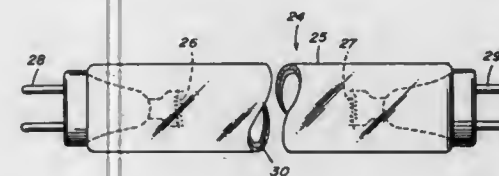
A. Gary Sigal, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 607,865, May 7, 1984, abandoned, and a continuation-in-part of Ser. No. 607,846, May 7, 1984, abandoned. This application Apr. 3, 1985, Ser. No. 718,095

Int. Cl.⁴ H01J 1/70, 61/35

U.S. Cl. 313—489

19 Claims



1. A method for improving lumen maintenance of fluorescent lamps comprising the steps of

- depositing a continuous aluminum oxide coating on individual particles of a finely-divided fluorescent lamp phosphor to form individually coated phosphor particles, each phosphor particle being surrounded by a nonparticulate aluminum oxide coating of a conformal nature;
- applying one or more layers of phosphor to a fluorescent lamp envelope to form a phosphor coated envelope, at least one of the phosphor layers having a phosphor component comprising said individually coated phosphor particles;
- processing said phosphor coated envelope into a finished lamp.

4,710,675

SOLID DYNODE STRUCTURE FOR PHOTOMULTIPLIER

Kenneth E. Stephenson, Pennington, N.J., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Apr. 29, 1985, Ser. No. 728,135

Int. Cl.⁴ H01J 43/06, 43/22

U.S. Cl. 313—532

10 Claims

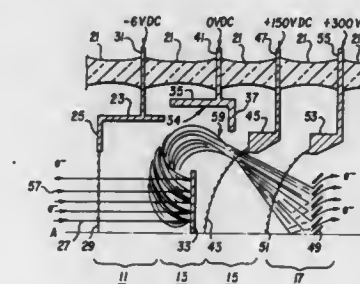
1. In an electron multiplier of the type including a source of electrons and means for collecting electrons multiplied by the electron multiplier spaced apart from the electron source along

a longitudinal axis of the electron multiplier, an improved dynode and electron guiding structure, comprising:

a solid dynode formed from a disk of electrically conductive material exhibiting secondary electron emission arranged between the electron source and the electron collecting means, the dynode having a surface oriented in a plane substantially perpendicular to the longitudinal axis of the electron multiplier;

a first guide electrode formed from a cylindrical ring of electrically conductive material and arranged symmetrically about the longitudinal axis of the electron multiplier between the dynode and the electron source, the electrode including an annular flange formed along a portion of the ring remote from the dynode and toward the electron source and directed radially inward toward the longitudinal axis of the electron multiplier to define an opening therein, with the flange being oriented in a plane substantially perpendicular to the longitudinal axis of the electron multiplier;

a second guide electrode formed from an annular ring of electrically conductive material and arranged symmetrically about the dynode, the second electrode including an



annular flange formed along a portion of the ring remote from the dynode and on the side opposite to the dynode from the first electrode and directed radially inward toward the longitudinal axis of the electron multiplier to define an opening therein, with the flange being oriented in a plane substantially perpendicular to the longitudinal axis of the electron multiplier; and
an electrically conductive grid disposed between the dynode and the electron collecting means,

whereby when the dynode and the second guide electrode are placed at the same electrical potential, and an electrical potential is applied to the first guide electrode which is slightly negative with respect to the potential applied to the dynode, and an electrical potential is applied to the grid which is more positive than that applied to the dynode and second guide electrode, the first and second guide electrodes cooperate together to cause substantially all secondary electrons emitted from the surface of the dynode, due to impacts from the electrons from the electron source, to be guided away from the first guide electrode and between the dynode and the second guide electrode and through the grid and focused at an area containing the electron collector.

4,710,676

MULTI-LEVEL FUSER LAMP

Merle E. Morris; Lawrence M. Rice, both of Lexington, and Steven L. Meade, Winchester, all of Ky., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 765,975, Aug. 15, 1985, abandoned.

This application Jun. 25, 1987, Ser. No. 67,405

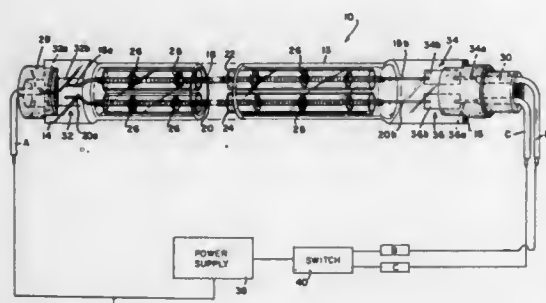
Int. Cl.⁴ H01K 9/00, 1/18

U.S. Cl. 313—579

13 Claims

1. A tungsten-halogen, incandescent heating lamp for use in a photocopier, said lamp comprising:

a tubular quartz envelope having first and second press sealed end portions;
 first and second coiled tungsten filaments extending longitudinally through the interior of said tubular envelope;
 a fill gas mixture disposed within said envelope;
 first contact means associated with said first press sealed end portion and electrically coupled to a first end of each of said first and second filaments;
 second contact means associated with said second press sealed end portion and electrically coupled to a second end of said first filament, said first filament being energized upon application of a predetermined voltage across said first and second contact means to provide a first level of heating energy from said lamp along a given length of said lamp;
 third contact means associated with said second press sealed end portion and electrically coupled to a second end of said second filament, said second filament being energized upon application of a predetermined voltage across said



first and third contact means to provide a second level of heating energy from said lamp along said same given length of said lamp, said second level of heating energy different from said first level of said heating energy; and means for electrically isolating said first and second filaments, said isolating means disposed within and extending longitudinally through the interior of said envelope, said lamp providing a third level of heating energy from said lamp along said same given length of said lamp substantially equal to the total of said first and second levels of heating energy upon simultaneous application of a predetermined voltage across said first and second contact means and across said first and third contact means, said lamp thereby providing three different levels of heating energy along said same given length of said lamp and per square centimeter of paper heated by said lamp within said photocopy, said isolating means comprised of electrically insulative material and including at least one quartz tube disposed within said coiled tungsten filaments therein.

4,710,677

INCANDESCENT LAMPS

Alex L. Halberstadt, London, and Roger A. Hume, Melton Mowbray, both of England, assignors to Thorn Emi plc, London, England

Filed Aug. 2, 1984, Ser. No. 636,990

Claims priority, application United Kingdom, Aug. 2, 1983, 8320639

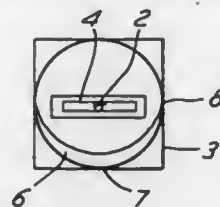
Int. Cl.⁴ H01K 1/26

U.S. Cl. 313—580

6 Claims

1. An incandescent lamp comprising:
 an envelope having an exterior surface and being formed from a material having a substantially high silica content; a filament enclosed within said envelope; and
 a coating reflective of radiation emitted by said filament and consisting of a layer of a substantially pure metallic oxide containing no binding agent, said layer having been applied whilst in a molten state to an area of said exterior surface, thereby causing said layer to be fused in a substan-

tially permanent manner to said exterior surface without a binding agent, so that, when heated by radiation from said filament, said coating undergoes substantially no discolor-



tion, and wherein said coating possesses a variable thickness which is a maximum in a central region of said area of said exterior surface and a minimum in a peripheral region of said area.

4,710,678

ELECTRODELESS LOW-PRESSURE DISCHARGE LAMP

Henk Houkes; Pieter Postma, and Andreas C. Van Veghel, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

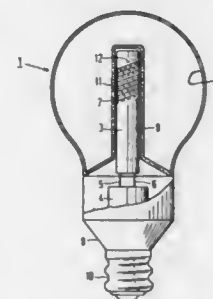
Filed Apr. 22, 1985, Ser. No. 725,441

Claims priority, application Netherlands, Apr. 24, 1984, 8401307

Int. Cl.⁴ H05B 41/16, 41/24

U.S. Cl. 315—39

4 Claims



1. An electrodeless low-pressure discharge lamp comprising:
 a lamp vessel which is sealed in a vacuum-tight manner and contains a metal vapor and a rare gas;
 a core of magnetic material;
 a first winding coupled by a pair of lead-in wires to a high-frequency voltage supply, the winding being arranged about the core so that during operation of the lamp an electrical field is produced in the lamp vessel and an inductive potential drop is induced in said winding;
 means for connecting high frequency voltage supply to electrical supply conductors;
 and the improvement comprising:
 a second winding also arranged about the core, respective turns of the second winding being located adjacent successive turns of the first winding and electrically insulated therefrom, so that during operation a potential voltage is induced across ends of the second winding which is substantially equal and opposite said potential drop of the first winding; and one end of the second winding being electrically connected to one of the lead-in wires of the first winding, the other end of the second winding being free, said second winding being arranged such that parasitic capacitive coupling of interference currents to ground and said supply conductors is suppressed.

4,710,679

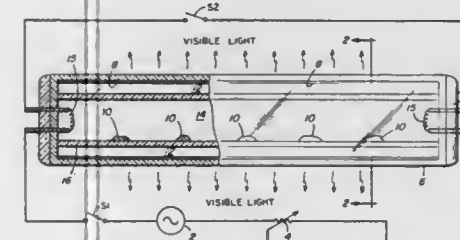
FLUORESCENT LIGHT SOURCE EXCITED BY EXCIMER EMISSION

A. Bowman Badinger, Westford, and Walter P. Lapatovich, Hudson, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 6, 1985, Ser. No. 806,048

Int. Cl.⁴ H01J 7/44, 13/36, 17/78, 29/96; H01K 1/62
 U.S. Cl. 315—58

12 Claims



1. A light source comprising:
 (a) a visible light transparent outer envelope containing fluorescent means for emitting visible light radiation upon absorption of UV emission; and
 (b) UV emission means for providing UV excimer emission within a separate inner envelope within said outer envelope for transmission through said separate inner envelope and absorption by said fluorescent means to produce visible illumination for passage through said outer envelope; said UV emission means comprising a metal halide and a buffer gas and an electrode means for creating an electrical discharge which excites the buffer gas and dissociates the metal halide and wherein molecules of said halide combine with molecules of the excited gas to produce an excimer, which upon decay, results in spontaneous emission of UV light.
 2. A source of visible illumination comprising:
 (a) ultraviolet emission means within a first envelope for generating spontaneous excimer ultraviolet emission from an electrical discharge between two electrodes in an enclosed atmosphere of metal halide vapors and an inert gas; and
 (b) visible emission means in a second envelope about said first envelope responsive to said ultraviolet emission for generating visible light and wherein a ballast circuit is coupled across said electrodes for providing a current flow through said electrodes to emit sufficient electrons to cause an electrical discharge through a buffer gas, bringing the buffer gas molecule to its excited state and heating an inner chamber to cause the metal halide to form metal halide vapors and wherein the metal halide is dissociated, and halide molecules combine with the excited state buffer gas molecules whereupon spontaneous excimer radiation at UV wavelength occurs.

4,710,680

DRIVER DEVICE MOUNTING FOR A FLAT MATRIX DISPLAY PANEL

Hiroshi Nakatani, Tenri; Hirokazu Yoshida, Osaka, and Keiji Yamamura, Takaichi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 640,563, Aug. 14, 1984, abandoned.

This application Mar. 24, 1987, Ser. No. 30,256

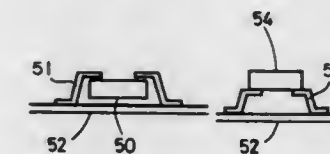
Claims priority, application Japan, Aug. 24, 1983, 58-155279
 Int. Cl.⁴ G09G 3/10

U.S. Cl. 315—169.4

2 Claims

1. A flat matrix display panel system comprising:
 a flat matrix display panel including a plurality of X-electrodes and a plurality of Y-electrodes, said plurality of Y-electrodes being divided into first and second groups having first terminals formed along a first edge of said flat

matrix display panel and second terminals formed along a second opposing edge of said display panel respectively;
 a circuit substrate;
 an X-electrode driver LSI mounted on a first major surface of said circuit substrate;
 a first Y-electrode driver LSI mounted on said first major surface of said circuit substrate by a face-up bonding of a tape automated bonding technique, said first Y-electrode



driver LSI being connected to said first terminals formed along said first edge of said flat matrix display panel; and a second Y-electrode driver LSI mounted on said first major surface of said circuit substrate by a face-down bonding of the tape automated bonding technique, said second Y-electrode driver LSI being connected to said second terminals formed along said second opposing edge of said flat matrix display panel.

4,710,681

PROCESS FOR BURNING A CARBONACEOUS FUEL USING A HIGH-ENERGY ALTERNATING CURRENT WAVE

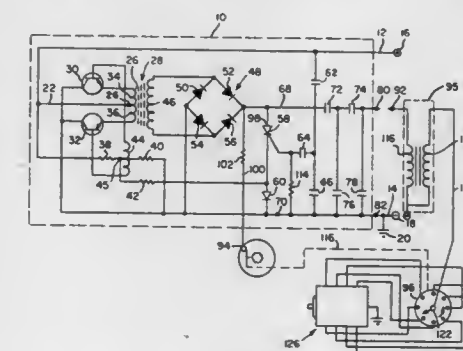
Aleksandar Zivkovich, 93 Stuyvesant Rd., Pittsford, N.Y. 14534

Filed Feb. 18, 1986, Ser. No. 829,972

Int. Cl.⁴ F02P 3/04, 15/08

U.S. Cl. 315—209 T

8 Claims



2. In an electronic ignition circuit for applying a high-frequency, high-voltage wave to a spark gap of a spark ignition device in a combustion chamber into which a combustible fuel is introduced and including a.c. means for providing an alternating current high-voltage, high-frequency wave, and switching means coupled to said a.c. means for providing said wave during ignition intervals, and in which said a.c. means includes a d.c.-d.c. converter that is formed of a step-up transformer having a center tap primary, and a secondary, a pair of transistors coupled in push-pull between said primary and a battery potential, with a center tap of the primary being connected to a complementary battery potential, and with said transistors having control electrodes, feedback means coupled to said control electrodes and supplying a feedback signal thereto so that said primary receives oscillations of current through said transistors, and rectifier means coupled to said secondary to produce a high voltage d.c. current, and further including a chopper circuit connected to said rectifier means for producing a high voltage a.c. current; the improvement in which said chopper circuit produces said high voltage a.c. current at a substantially constant predetermined frequency, and includes a trigger circuit coupled to said feedback means and to said pair of push-pull transistors to switch the chopper circuit on and off

at said predetermined frequency with oscillations of said transformer primary such that the output wave has a peak voltage of 25,000 to 200,000 volts and at said predetermined frequency in the range of 8 KHz to 80 KHz; and said switching means is coupled to control the voltage of the chopper circuit so that during said ignition intervals said a.c. wave is provided at the wave peak voltage sufficient to arc across said gap, and during the intervals between successive said ignition intervals said wave is provided at a finite peak voltage insufficient to arc across said gap, but maintaining said substantially constant predetermined frequency during such intervals.

4,710,682

FLUORESCENT LAMP OPERATING CIRCUIT

Anton Zachtriegel, Taufkirchen, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft für elektrische Glühlampen m.b.H., Munich, Fed. Rep. of Germany

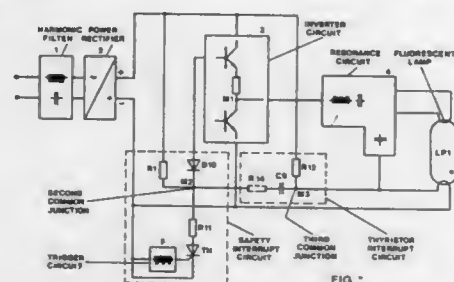
Filed Mar. 9, 1987, Ser. No. 23,456

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608615

Int. Cl.⁴ H05B 37/00

U.S. Cl. 315—224

6 Claims



1. Automatically restarting operating circuit for a low-pressure discharge lamp, such as a fluorescent lamp, for operation of the lamp with alternating current at a frequency high with respect to the frequency of a power network, having

- a power rectifier (2) adapted for connection to the power network;
- a push-pull inverter circuit (3), connected to the rectifier (2) and including serially connected, alternately switching transistors (T1, T2) having a common junction (M1), and connected across the power rectifier (2), and
- a control circuit for alternately controlling the transistors to conduct or block;
- a series resonance circuit (4) associated with the low-pressure lamp (LP1, LP2) including a resonance inductance (L3.1, L4.1), and a coupling capacitor (C4, C10) and a resonance capacitor (C5, C11);
- a connection network interconnecting the series resonance circuit and the low-pressure lamp including a connection circuit connecting a first electrode (E1, E3) of the lamp to the coupling capacitor (C4, C10) and the resonance inductance (L3.1, L4.1) with the common junction (M1) of the switching transistors (T1, T2);
- a second connection circuit connecting the second electrode (E2, E4) of the lamp with the negative terminal of the power rectifier (2); and
- a safety interrupt circuit to remove the current from the electrode terminals of the lamp upon failure or removal of the lamp including a series bypass circuit having a diode (D10) and a resistor (R11), said diode and resistor forming a second common junction (M2) and a main current path of a thyristor (TH) connected to the base of that one switching transistor (T1) which is connected to the positive terminal of the power rectifier (2), and the negative terminal of the power rectifier (2),

a trigger control circuit (5) for the thyristor (TH) and connected to the gate of the thyristor, and a holding circuit including a holding resistor (R1) coupled to the positive terminal of the power rectifier (2) and said second common junction (M2) between the control circuit resistor (R11) and the control circuit diode (D10),

and comprising, in accordance with the invention, a circuit to interrupt conduction of the thyristor (TH) after firing thereof due to the removal of the holding current from the thyristor, including a thyristor disconnect capacitor (C9, C12) and a disconnect resistor (R12, R13), said disconnect capacitor and resistor having a third common junction (M3); the thyristor disconnect capacitor (C9, C12) having a free terminal connected to said second common junction (M2) between the series circuit diode (D10) and series circuit resistor (R11) of the thyristor disconnect circuit; the disconnect resistor (R12, R13) having the free terminal connected to the positive terminal of the power rectifier (2); and said third common junction (M3) between the thyristor disconnect capacitor (C9, C12) and the thyristor disconnect resistor (R12, R13) being connected to one of the heater electrode terminals (A3, A7) of that one of the electrodes (E2, E4) of the lamp (LP1, LP2) which has its other terminal (A4, A8) directly connected to the negative terminal of the power rectifier (2), to discharge, and recharge in opposite direction of the thyristor disconnect capacitor (C9, C12) upon reinsertion of a lamp (LP1, LP2) in the circuit and thereby withdraw holding current from the disconnect thyristor (TH) and permit the alternating switching transistors (T1, T2) to resume oscillation.

4,710,683

ROTATION DETECTING APPARATUS

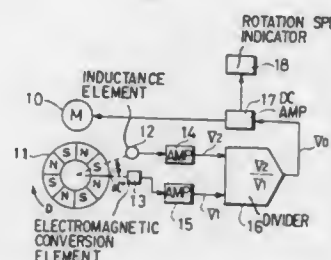
Itsuki Bahn, and Hideo Okada, both of Tokyo, Japan, assignors to Secoh Geiken Inc., Tokyo, Japan

Continuation of Ser. No. 805,256, Dec. 5, 1985, abandoned, which is a continuation of Ser. No. 418,994, Sep. 16, 1982, abandoned. This application Feb. 24, 1987, Ser. No. 18,724

Int. Cl.⁴ H02K 29/00

U.S. Cl. 318—254

11 Claims



1. A rotational detecting apparatus for producing an output proportional to rotational speed of a rotary machine having a rotary shaft, comprising:

- a magnetic means, having a plurality of magnetic poles, arranged to rotate along with said shaft of said rotary machine so as to provide a rotating magnetic field flux density of which varies at fixed points in time relation to said rotational speed;
- a first means, fixedly disposed in said rotating magnetic field, comprising electromagnetic conversion means including at least one Hall element operating on the Hall principle to provide a first output voltage the amplitude of which is a function only of magnetic flux density of said rotating magnetic field;
- a second means, fixedly disposed in said rotating magnetic field, comprising an inductance means operating by elec-

tromagnetic induction to provide a second output voltage the amplitude of which is a function of both flux density of said magnetic field and its rotational speed; and electric circuit means for receiving said first and second output voltages and producing as an output a third output voltage corresponding to a quotient of the value of said second output voltage divided by the value of said first output voltage, said third output voltage being directly proportional to said rotational speed of said rotating magnetic field and independent of its flux density.

4,710,684

DRIVE CIRCUIT FOR BRUSHLESS DC MOTORS

Masaya Okita, Yokohama; Masahiro Sawada, and Tadashi Ota, both of Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

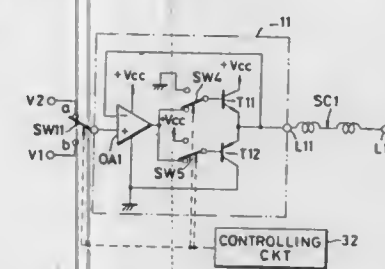
Filed Oct. 12, 1984, Ser. No. 660,503

Claims priority, application Japan, Oct. 14, 1983, 58-190862

Int. Cl.⁴ H02P 6/02

U.S. Cl. 318—254

10 Claims



1. A drive circuit for a brushless DC motor for controlling the flow of current between terminals of each stator coil of said motor, said drive circuit including voltage application means provided for each of said stator coils so as to apply a voltage across the terminals thereof, said voltage application means comprising:

- (a) a first complementary symmetry circuit having an input terminal and an output terminal, said output terminal being connected to one of the terminals of said stator coil, said first complementary symmetry circuit including first and second transistors having different polarities, means for connecting a base of said first transistor with a base of said second transistor and means for connecting an emitter of said first transistor with an emitter of said second transistor;
- (b) a second complementary symmetry circuit having an input terminal and an output terminal connected to the other terminal of said stator coil, said second complementary symmetry circuit including third and fourth transistors having different polarities, means for connecting a base of said third transistor with a base of said fourth transistor and means for connecting an emitter of said third transistor with an emitter of said fourth transistor;
- (c) switch means for turning off all the transistors in said first and second complementary symmetry circuits;
- (d) a first operational amplifier having an inverting input terminal, a noninverting input terminal and an output terminal connected to the input terminal of said first complementary symmetry circuit;
- (e) means forming a negative feedback loop between said first operational amplifier and said first complementary symmetry circuit;
- (f) first control means for controlling the potential at the noninverting input terminal of said first operational amplifier;
- (g) a second operational amplifier having an inverting input terminal, a noninverting input terminal and an output terminal connected to the input terminal of said second complementary symmetry circuit;
- (h) means forming a negative feedback loop between said

second operational amplifier and said second complementary symmetry circuit, and

(i) second control means for controlling the potential at the noninverting input terminal of said second operational amplifier,

wherein said switch means includes means for maintaining the input terminals of said first and second complementary symmetry circuits at the same potential.

9. A drive circuit for a brushless DC motor for controlling the flow of current between terminals of each stator coil of said motor, said drive circuit including voltage application means provided for each of said stator coils so as to apply a voltage across the terminals thereof, said voltage application means comprising:

- (a) a first complementary symmetry circuit having an input terminal and an output terminal, said output terminal being connected to one of the terminals of said stator coil, said first complementary symmetry circuit including first and second transistors having different polarities means for connecting a base of said first transistor with a base of said second transistor and means for connecting an emitter of said first transistor with an emitter of said second transistor;
- (b) a second complementary symmetry circuit having an input terminal and an output terminal connected to the other terminal of said stator coil, said second complementary symmetry circuit including third and fourth transistors having different polarities, means for connecting a base of said third transistor with a base of said fourth transistor and means for connecting an emitter of said third transistor with an emitter of said fourth transistor;
- (c) switch means for turning off all the transistors in said first and second complementary symmetry circuits said switch means having first means and second means, said first means disconnecting the bases of said first and second transistors, causing the potential of the base of said first transistor to become substantially equal to the potential of the collector of said second transistor and causing the potential of the base of said second transistor to become substantially equal to the potential of the collector of said first transistor, said second means disconnecting the bases of said third and fourth transistors, causing the potential of the base of said third transistor to become substantially equal to the potential of the collector of said fourth transistor and causing the potential of the base of said fourth transistor to become substantially equal to the potential of the collector of said third transistor;
- (d) a first operational amplifier having an inverting input terminal, a noninverting input terminal and an output terminal connected to the input terminal of said first complementary symmetry circuit;
- (e) means for forming a negative feedback loop between said first operational amplifier and said first complementary symmetry circuit;
- (f) first control means for controlling the potential at the noninverting input terminal of said first operational amplifier;
- (g) a second operational amplifier having an inverting input terminal, a noninverting input terminal and an output terminal connected to the input terminal of said second complementary symmetry circuit;
- (h) means for forming a negative feedback loop between said second operational amplifier and said second complementary symmetry circuit; and
- (i) second control means for controlling the potential at the noninverting input terminal of said second operational amplifier.

4,710,685

VEHICLE POWER WINDOW CONTROL CIRCUIT WITH REVERSE BATTERY PROTECTION

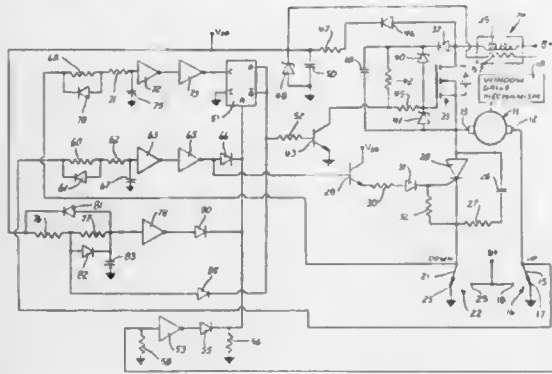
Richard N. Lehnhoff, and Robert J. Disser, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 17, 1987, Ser. No. 15,321

Int. Cl.⁴ H02P 1/22; H02H 7/08

U.S. Cl. 318—287

3 Claims



3. A power window control circuit for a motor vehicle comprising, in combination:

- an electric power supply having power and ground terminals with a power supply voltage therebetween;
- an electric motor having an armature with first and second armature terminals;
- a FET having a drain connected to the power terminal and a source connected to the first armature terminal, the FET further having a gate and an internal anti-parallel diode;
- an SCR connecting the first armature terminal to the ground terminal of the electric power supply;
- a switch having first and second states connecting the second armature terminal to the power and ground terminals, respectively, the switch being normally in its second state;
- a first diode having an anode connected to the FET drain and a cathode;
- a capacitor connected from the cathode of the first diode to the FET source;
- first and second resistors in series connected between the cathode of the first diode and the FET gate;
- a transistor having a control electrode and further having an internal controlled current path connecting the junction of the first and second resistors to the ground terminal;
- a first zener diode having a cathode connected to the cathode of the first diode and an anode connected to the FET gate, the first zener diode having a zener voltage greater than the power supply voltage but less, by at least the FET threshold voltage, than the maximum allowable FET source to drain voltage;
- a second zener diode having a cathode connected to the FET gate, an anode connected to the FET source and a zener voltage less than the maximum allowable FET source to gate voltage;
- first control means activatable to activate the SCR and change the switch to its first state, whereby the motor is activated to run in a first window moving direction, and deactivatable to return the switch to its second state, whereby the motor stops running, the SCR deactivates and the inductive energy of the motor armature is dissipated through the internal anti-parallel diode of the FET; and
- second control means connected to the transistor control electrode to cause conduction through the transistor and thus ground the FET gate, the second control means being activatable to end conduction through the transistor and thus allow the capacitor to activate the FET to conduct, whereby the motor is activated to run in a second window moving direction, and deactivatable to resume conduction through the transistor, whereby the FET

stops conducting, the motor stops running, and the inductive energy of the motor armature is dissipated by the FET conducting due to the high voltage generated thereby across the FET and the first zener diode.

4,710,686

METHOD AND APPARATUS FOR CONTROL OF CURRENT IN A MOTOR WINDING

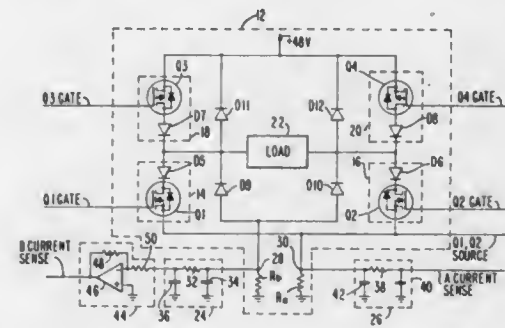
Nahum E. Guzik, Mt. View, Calif., assignor to Guzik Technical Enterprises, Sunnyvale, Calif.

Filed Aug. 4, 1986, Ser. No. 892,109

Int. Cl.⁴ H02P 1/22

U.S. Cl. 318—293

10 Claims



1. In a method for controlling the flow of current in an inductive load to cause the current to follow a certain command waveform having a rapidly decaying portion, comprising the steps of:

- connecting the inductive load across a power supply for flow of current through the inductive load in a first direction;
- connecting first and second current modulators in series with said inductive load and on opposite sides of said load, for modulating the flow of current through the inductive load;
- connecting a first diode in parallel with the series connection of the inductive load and said second current modulator, and in reverse polarity to the first direction of current flow, for allowing the current to circulate through the inductive load and the second current modulator in the first direction when the current flow to the inductive load from the power supply is interrupted by said first current modulator;
- connecting a second diode in parallel with the series connection of the inductive load and said first current modulator, and in reverse polarity to the first direction of the current flow, for allowing the current to circulate through the inductive load in the first direction, and through the power supply and the first diode in the opposite direction, when the current is interrupted by both said first and second current modulators, whereby the circulating current in said inductive load is caused to decay rapidly;
- sensing the flow of current through said second current modulator;
- sensing the flow of current through said first diode;
- comparing the sensed currents with the command waveform to derive an error signal;
- controlling said first current modulator in response to the error signal, derived from the comparison of the sensed current flow through said second current modulator so as to cause the modulating current to follow the command waveform;
- sensing loss of current control when the first current modulator can no longer cause the current through the inductive load to decay rapidly enough to follow the decaying portion of the command waveform; and
- cutting off the current flow through both of said first and second current modulators in response to sensing loss of

current control, to cause the current to circulate through the power supply in the opposite direction, and through the inductive load in the first direction, whereby the current in the inductive load in the first direction is caused to decay rapidly.

7. In a motor-drive circuit for causing the current in the motor winding to follow a certain command waveform having a rapidly decaying portion comprising

current supply means for supplying a flow of current in a first direction;

a motor winding connected across said current supply means for flow of current from said current supply means through said motor winding for driving said motor;

first and second current modulator means connected in series with said motor winding and on opposite side of said winding for modulating the flow of current through said winding;

a first diode means connected in parallel with the series connection of said motor winding and said second current modulator means, and in reverse polarity to said first direction of current flow, for allowing current to circulate through said motor winding and said second current modulator means in the first direction when the current flow to said motor winding from said power supply means is interrupted by said first current modulator means;

a second diode means connected in parallel with the series connection of said motor winding and said first current modulator means and in reverse polarity to the first direction of current flow for allowing the current to circulate through said motor winding in the first direction, and through said power supply means and said first diode means in the opposite direction, when the current is interrupted by both said first and second current modulator means, whereby the circulating current in said motor winding is caused to decay rapidly;

first sensing means for sensing the flow of current through said second current modulator means to derive a first sensed output;

comparator means for comparing said first sensed current output with the command waveform to derive a first error signal output;

said first current modulator means being responsive to said first error signal output, for causing the current flowing through said motor winding and said second current modulator means to follow the command waveform;

control sensing means including means for sensing loss of control over the current in said motor winding and means for producing a loss of control output when said first current modulator means can no longer cause the current through said motor winding, to decay rapidly enough to follow the rapidly decaying portion of the command waveform; and

said second current modulator means being responsive to said loss of control output, for modulating current flow therethrough and for causing current to circulate through said motor winding in the first direction, through said second diode, power supply means, and first diode means in the opposite direction, and to cause the circulating current in said motor winding to decay rapidly.

4,710,687

SEEK OPERATION CONTROL APPARATUS

Hiroyuki Kanda, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 29, 1986, Ser. No. 901,882

Claims priority, application Japan, Aug. 30, 1985, 60-191565

Int. Cl.⁴ G05B 13/00

U.S. Cl. 318—561

12 Claims

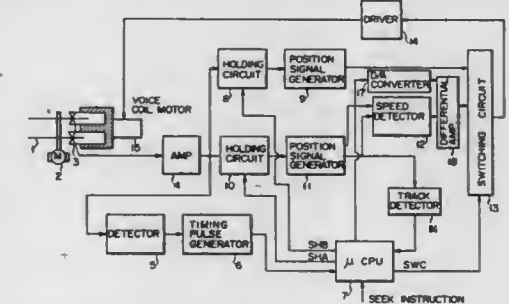
1. A seek operation control apparatus comprising:
- readout means for reading out data recorded on a disk that indicates a track position, and for outputting position data corresponding to the readout data;
- first generation means for generating a first position signal on the basis of the position data from said readout means, in accordance with a first instruction;

second generation means for generating a second position signal on the basis of the position data from said readout means, in accordance with a second instruction, the second position signal having a predetermined waveform;

speed difference detecting means for detecting a speed signal with respect to the head in accordance with the first position signal from said first generation means, and for determining and outputting a speed difference signal representing a speed difference between the detected speed signal and a designated speed signal input thereto;

switching means for selectively outputting one of the second position signals from said second generation means and the speed difference signal from said speed difference signal generation means in accordance with an input third instruction;

control means for detecting a distance between a current



track position of said head and a destination track position designated by a seek instruction based on the first position signal, for outputting the designated speed signal to said speed difference detecting means such that a drive operation of said head is initiated before a seek instruction is completely input and such that the speed of said head is decelerated gradually from a first predetermined distance to the destination track position, said control means for outputting the first instruction to said first generation means based on the position data, and for outputting the second instruction prior to the third instruction after the seek instruction is completely input, and for generating the third instruction when said head reaches within a second predetermined distance; and

head position driving means for driving said head on the basis of said input speed difference signal.

4,710,688

VARIABLE SPEED CONTROL WITH SELECTIVELY ENABLED COUNTER CIRCUITS

Shigeo Neki, Kenichi Ohara, Nobuho Shibata, and Takashi Dohi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

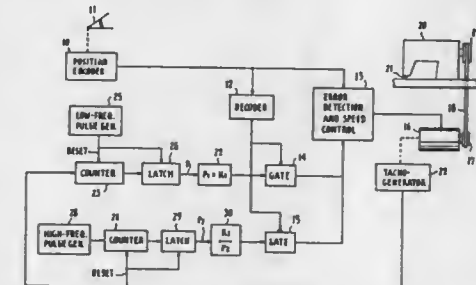
Filed Jun. 23, 1986, Ser. No. 877,425

Claims priority, application Japan, Jun. 24, 1985, 60-137214

Int. Cl.⁴ G05B 19/29

U.S. Cl. 318—603

6 Claims



1. A sewing machine having a motor for driving a needle armshaft, comprising:
- means for generating a variable reference speed signal;
- means for generating speed pulses at a frequency proportional to the rotational speed of said motor;
- means for generating low-frequency clock pulses;

means for generating high-frequency clock pulses;
first speed detecting means including a first counter for counting said speed pulses during the interval between successive ones of said low-frequency clock pulses and deriving from the count a first actual speed signal proportional to the rotational speed of said motor;
second speed detecting means including a second counter for counting said high-frequency clock pulses during the interval between successive ones of said speed pulses and deriving from the count a second actual speed signal proportional to the rotational speed of said motor;
control means for controlling the rotational speed of said motor in response to a speed control signal applied thereto so that the speed control signal substantially equals the reference speed signal; and
means for applying said first actual speed signal to said speed control means as said speed control signal when said reference speed signal is higher than a predetermined value and applying said second actual speed signal to said control means as said speed control signal when said reference speed signal is lower than said predetermined value.

4,710,689

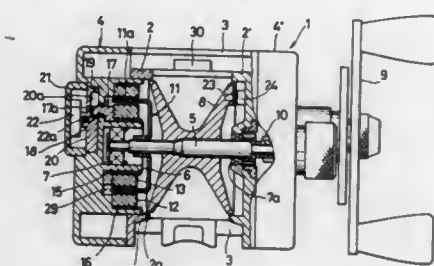
DEVICE FOR PREVENTING BACKLASH ON A FISHING REEL

Haruo Uetsuki, Takehiro Kobayashi, and Hiroto Yamane, all of Hiroshima, Japan, assignors to Ryobi, Ltd., Fuchu, Japan
Filed Jun. 20, 1986, Ser. No. 877,009

Claims priority, application Japan, Jun. 21, 1985, 60-94793[U]
Int. Cl.⁴ G05B 11/01

U.S. Cl. 318—630

11 Claims



1. A device for preventing backlash on a fishing reel wherein said reel includes a spool and a nonmagnetic electroconductive member rotated therewith, said member at times applying a braking force upon generation of an eddy current therein, said device comprising:

- a sensor for detecting rotation of said spool and generating an output signal, said output signal being comprised of pulses relating to rotation of said spool;
- a reference clock circuit for generating reference pulses at predetermined time intervals;
- counter means including a circuit for counting the number of said pulses from said sensor and said reference clock circuit;
- means governed by said counter means for calculating at least the speed of rotation of said spool; and
- control means governed by said calculating means for generating an eddy current in said nonmagnetic electroconductive member at times when the speed of said spool reaches a preset value.

4,710,690

CLOSED-LOOP CONTROL SYSTEM FOR A STEPPING MOTOR

Bruce A. Reid, Elmira, and John R. M. Deline, Kitchener, both of Canada, assignors to NCR Corporation, Dayton, Ohio
Filed Jul. 3, 1986, Ser. No. 881,754

Int. Cl.⁴ G05B 19/40

U.S. Cl. 318—685

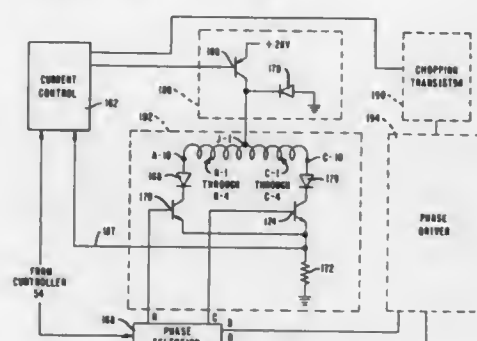
9 Claims

1. A control system for a stepping motor operable in start, run, and stop modes of operation and having windings and a

rotor moveable in rotation through a plurality of stable positions, said control system comprising:

- means for indicating the position of said rotor including first and second detectors having first and second outputs, respectively; and
- a controller means for receiving said first and second outputs of said first and second detectors and for energizing said windings in said start, run, and stop modes of operation; said controller means including means for determining the stepping velocity of said rotor; and
- said controller means utilizing the first and second outputs of said first and second detectors to energize said windings with at least a two step lead angle in said run mode of operation when said stepping velocity reaches a predetermined rate;

said controller means comprising:



means for generating an interrupt signal from said first and second outputs,
means for determining which of said start, run, or stop modes of operation said stepping motor is being operated in whenever a said interrupt signal occurs;
start, run, and stop tables; each said start, run, and stop table having a plurality of phases denoting which of said windings are to be energized and not energized for the various combinations of the first and second outputs from said first and second detectors;
means for selecting the phase in said start, run, and stop tables to be utilized in energizing said windings; and
means for energizing said windings in response to said phase selected.

4,710,691

PROCESS AND APPARATUS FOR CHARACTERIZING AND CONTROLLING A SYNCHRONOUS MOTOR IN MICROSTEPPER MODE

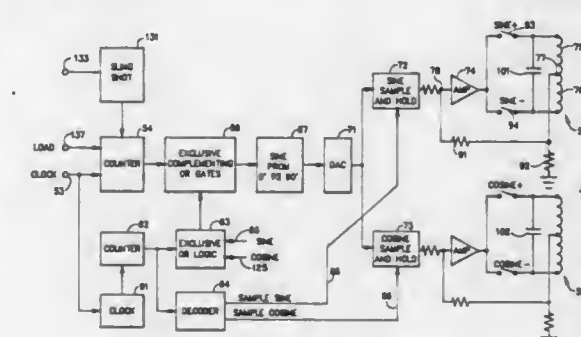
Donald J. Bergstrom, San Diego, and Allan J. Wolfer, Encinitas, both of Calif., assignors to Anacom, Inc., Carmel, Ind.

Filed Mar. 27, 1986, Ser. No. 845,923

Int. Cl.⁴ H02P 8/00

U.S. Cl. 318—696

28 Claims



1. A method for characterizing the angular velocity of a stepper motor operating in microstepper mode with sine/cosine motor excitation currents, the motor being controlled in

rotational speed by the frequency of the excitation pulses, said frequency being controlled by signals from a memory, the motion of the motor being repeatable with identical input excitation signals, said method comprising the steps of:
generating an initial predetermined nominal frequency;
energizing the motor at the nominal frequency;
measuring time differences to reach predetermined desired positions of the motor;
converting said time difference measurements into digital signals representing frequency correction terms in a form acceptable to the memory; and
entering said frequency correction term in the memory for each time error detected.

4,710,692

SELF CALIBRATION OF THE THYRISTOR FIRING ANGLE OF A MOTOR CONTROLLER USING A CURRENT WINDOW TO DETERMINE A FINAL VALUE OF A REFERENCE CURRENT LAG PHASE ANGLE

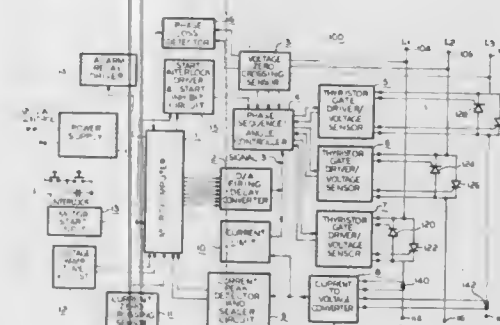
James T. Libert, Waukesha, and Earl J. Curran, Jr., South Milwaukee, both of Wis., assignors to Square D Company, Palatine, Ill.

Filed Oct. 16, 1986, Ser. No. 919,915

Int. Cl.⁴ H02P 5/40

U.S. Cl. 318—729

15 Claims

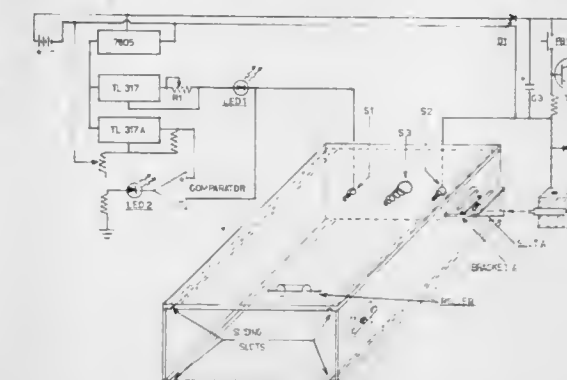


1. An improved motor controller having,
a plurality of thyristors for controlling electric current flow to an electric motor;
a firing circuit for firing said thyristors at a selected firing angle;
means for measuring a current lag as a phase angle between a power line voltage and electric current flow to said motor;
wherein the improvement comprises:
means for selecting a temporary value of a reference current lag;
means for selecting said firing angle to adjust a current lag measured by said "means for measuring a current lag" to be substantially equal to said reference current lag;
means for determining that a current flow to said motor is between an upper predetermined motor current and a lower predetermined motor current; and,
means, responsive to said "means for determining that a current flow to said motor is between an upper predetermined motor current and a lower predetermined motor current", for replacing said temporary value of said reference current lag with a final value of said reference current lag in response to said motor current being between said upper predetermined motor current and said lower predetermined motor current.

4,710,693
FRONT LOADING CONTINUOUS CHARGER
Arthur H. Wigell, 6647 Wheeler Ave., La Verne, Calif. 91750
Filed Apr. 17, 1987, Ser. No. 39,443
Int. Cl.⁴ H02J 7/00; H01M 10/46

U.S. Cl. 320—2

5 Claims



1. A front loading continuous charging facility for radio headphones or other device using rechargeable batteries comprising:
an outer enclosure having an electrically releasable latch, a drawer slidable within the outer enclosure having latch engagement means releasably engaged by said latch, a depression in the drawer of shape complementary to the shape of the device to be charged, resilient contacts in the drawer co-operable with complementary contacts on said device to be charged when contained in the drawer and the drawer is closed, and a voltage and current regulated power supply circuit in said enclosure coupled to said contacts.

4,710,694
MICROPROCESSOR CONTROLLED BATTERY CHARGER

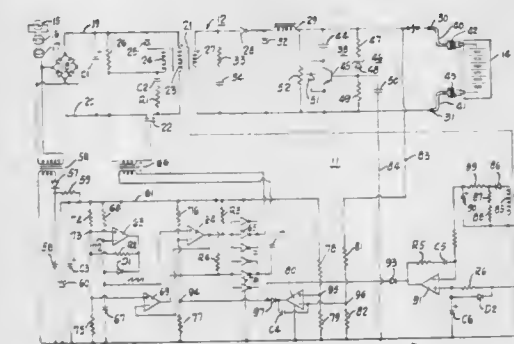
Richard C. Sutphin, Cuba, N.Y.; Steven R. Bell, Shinglehouse, Pa., and Kurt Monsell, Portville, N.Y., assignors to Acme Electric Corporation, Olean, N.Y.

Filed Jun. 2, 1986, Ser. No. 869,684

Int. Cl.⁴ H02J 7/00

U.S. Cl. 320—21

15 Claims



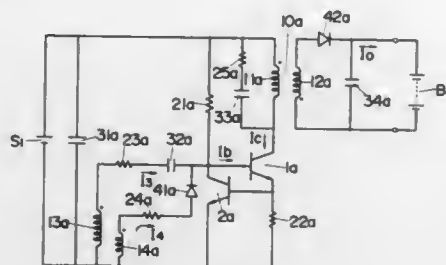
1. A microprocessor controlled battery charger adapted to be connected to a battery to be charged, said battery charger comprising, in combination:
means to connect the battery charger to the battery to be charged;
means to read the voltage of the battery;
a timer;
a microprocessor connected to said timer and to said voltage reading means for establishing a first charging rate for at least a short time period and for establishing a reduced

second charging rate until the rate of change of voltage with time is less than $x/100$ volts per hour at which time the current is further reduced to a third charging rate for a finishing charge of the battery, where x is a positive number; and
selector means to select the value of said first charging rate.

4,710,695

POWER SUPPLY CIRCUIT

Satoshi Yamada, and Kaoru Furukawa, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Oct. 1, 1986, Ser. No. 914,040
Claims priority, application Japan, Oct. 14, 1985, 60-228147
Int. Cl.⁴ H02J 7/10; H02M 3/335
U.S. Cl. 320—21 10 Claims



1. A power supply circuit of ringing choke converter type adapted in use to charge a battery from a dc power source comprising:

- a transformer having its primary winding connected to the dc power source and having its secondary winding connected to the battery to be charged;
- a switching transistor connected in series with the primary winding
- a series combination of a resistor and a speedup capacitor connected in the base-emitter path of the switching transistor to be cooperative with the switching transistor and the transformer to form a blocking oscillator in which the switching transistor is controlled to alternately turn on and off to interrupt the current to the primary winding and thereby develop an induced voltage across the secondary winding;

first and second feedback windings provided in the transformer and connected in the base-emitter path of the switching transistor;

said first feedback winding being connected to the series combination of the resistor and the speedup capacitor so as to provide a first current to the base of the switching transistor to trigger it on; and

said second feedback winding being connected in a parallel relation with the combination of the first feedback winding and the speedup capacitor so as to provide a second current which is added to said first current to be applied to the base of the switching transistor to maintain the switching transistor conductive.

4,710,696

CONTROL DEVICE FOR CONTROLLABLE ELECTRIC VALVE

Fumio Mizohata, and Takao Kawabata, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 15, 1986, Ser. No. 919,056
Claims priority, application Japan, Oct. 16, 1985, 60-228765
Int. Cl.⁴ G05F 1/613 13 Claims

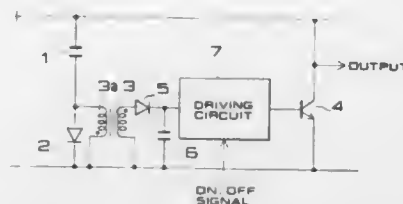
U.S. Cl. 323—223

1. A device for controlling a three-terminal controllable electric valve connected between positive and negative lines comprising:

- a driving circuit for supplying a driving signal to a control

terminal of said controllable electric valve in response to an ON signal from outside; and
means for supplying to said driving circuit an electric current necessary for its operation making use of an electric current delivered from said positive and negative lines, which includes:

- (a) a transformer including a primary winding and a secondary winding, a first end of said secondary winding being connected to said negative line;
- (b) a first capacitor connected between said positive and negative lines for storing electric charge while said con-



trollable electric valve is in a non-conductive state and for conducting its discharging current through said primary winding of said transformer when said controllable electric valve is brought into a conductive state; and
(c) a second capacitor having an end connected to a second end of said secondary winding of said transformer to be charged with an electric current induced in said secondary winding;

the input terminal of said driving circuit being connected with a junction of said secondary winding of said transformer and said second capacitor.

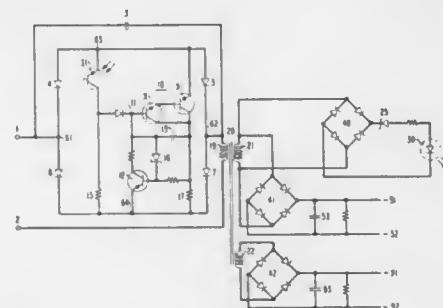
4,710,697

OFF-LINE SERIES TYPE REGULATING POWER SUPPLY

John Tardy, Somerville, N.J., assignor to American Telephone and Telegraph Company AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Apr. 3, 1986, Ser. No. 847,939
Int. Cl.⁴ G05F 1/44 6 Claims

U.S. Cl. 323—239



1. A power supply comprising:
an input for accepting an AC signal,
an output circuit for accepting a load to be energized,
a power transformer including a primary winding and a secondary winding,
a power regulating transistor for coupling the input to the primary winding,
means for constraining current flow in the power regulating transistor to be unidirectional,
a bias circuit for causing the power regulating transistor to operate in a saturated low impedance conduction mode and responsive to a control signal to cause the power regulating transistor to operate in an active high impedance

dance conduction mode for series regulating current flow in the power regulating transistor,
a voltage threshold detection device coupled to the secondary winding and separate from the output and operative for generating a control signal when a voltage of the secondary winding achieves a predetermined threshold value,
the voltage threshold detection device having a threshold level such that the voltage threshold detector device is continuously operative in a breakdown mode in each half cycle of the AC signal between a finite time after a beginning of the half cycle and a finite time preceding a termination of the half cycle,
feedback circuitry for coupling the control signal to the bias circuit including a light emitting device responsive to the voltage threshold detector device and a light responsive device operative to utilize the control signal to bias the power regulating transistor into its active high impedance conduction mode for series regulating current flow through the power regulating transistor.

4,710,698

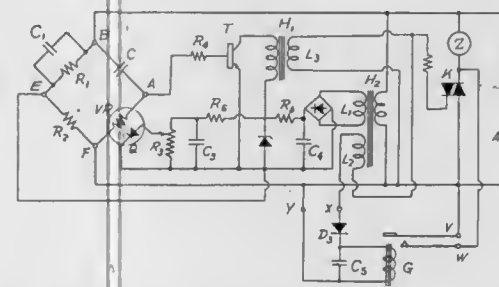
PHASE-CONTROLLED AUTOMATIC SWITCHING CIRCUIT

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed May 28, 1986, Ser. No. 869,457

Claims priority, application Japan, Jun. 5, 1985, 60-122058
Int. Cl.⁴ G05F 1/455 7 Claims

U.S. Cl. 323—239



1. In a phase-controlled switching circuit which comprises a controlled rectifier having a main current path connected with an ac source through a load, and means for triggering the gate of the controlled rectifier while keeping an initial conduction angle thereof small, the improvement whereby the heat generation of the controlled rectifier is reduced, comprising

- a pair of mechanical contacts connected in parallel with the main current path of the controlled rectifier, and means for closing the mechanical contacts when the operation of the load reaches a stationary level, to thereby short circuit said controlled rectifier,

wherein

- a control signal is provided to said controlled rectifier with a phase relative to a phase of the voltage of said ac source to provide said small initial conduction angle and to increase said conduction angle thereof as said operation of the load reaches said stationary level, and

- a signal corresponding to said control signal is superposed with a voltage of said ac source to provide an activation signal for supplying power from said ac source to said closing means for closing said mechanical contacts when said operation of the load reaches said stationary level,

said circuit further comprising
a further switch with a lower current switching capacity, and
a time constant circuit that charges upon the closing of said further switch,

wherein said phase angle is controlled by the charging of said time constant circuit, and said phase angle controls the

superposing to produce said activation signal for closing said mechanical contacts according to said phase angle.

4,710,699

ELECTRONIC SWITCHING DEVICE

Kiyoshi Miyamoto, Otsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

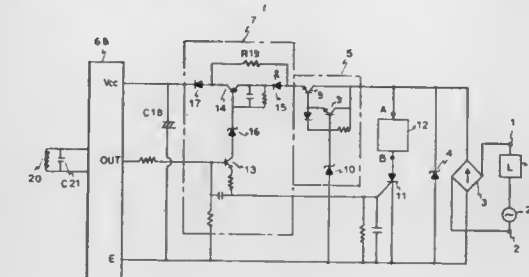
Filed Oct. 15, 1984, Ser. No. 660,675

Claims priority, application Japan, Oct. 14, 1983, 58-192923; Oct. 14, 1983, 58-192924; Jan. 18, 1984, 59-6440; Jan. 18, 1984, 59-6442

Int. Cl.⁴ H03K 17/78; H02H 9/02

U.S. Cl. 323—324

7 Claims



1. An electronic switching device including means for controlling the flow of current from an external source through an external load, comprising:

- input means rendered operable by a voltage produced by said external source and load and for producing an operating signal responsive to a predetermined external condition,

power switching means in a series circuit with said external source and said external load and connected to receive said output signal from said input means for switching current flow through said series circuit responsive to said output signal,

current detecting means coupled to said power switching means for detecting abnormally large currents flowing through said power switching means and for producing a limiting signal responsive to the appearance of an abnormally large current equal to or greater than a predetermined value,

current limiting means connected in series with said power switching means for interrupting the current flow there-through, said current limiting means being coupled to said current detecting means whereby said current limiting means is operated responsive to the appearance of said limiting signal and

holding circuit means coupled to said current limiting means for maintaining the current limiting means in an operative state for interrupting flow through said power switching means for a predetermined period of operation of said electronic switching device.

4,710,700

METHOD OF MEASURING ORIENTATION OR DIELECTRIC CHARACTERISTIC OF DIELECTRIC SHEETS OR WEBS

Shigeyoshi Osaki, Hyogo, and Yoshihiko Fujii, Osaka, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

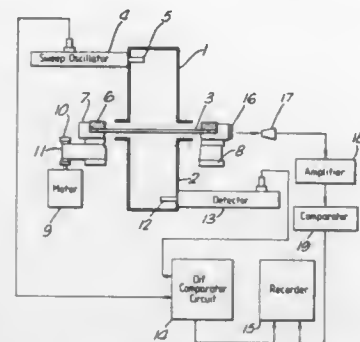
Filed Sep. 18, 1985, Ser. No. 777,453

Claims priority, application Japan, Sep. 22, 1984, 59-199225
Int. Cl.⁴ G01R 27/04; G01B 5/16 2 Claims

U.S. Cl. 324—58.5 A

1. A method of measuring the molecular orientation of the constituents of a dielectric sheet or web by means of dielectric constant and/or dielectric loss, comprising the steps of inserting a sample portion of the dielectric sheet or web in a small

clearance in a cavity resonator formed by a pair of waveguides, each of said waveguides having a rectangular cross section which is open at one end thereof, one of said waveguides having a transmitting antenna and the other waveguide having a receiving antenna, said waveguides being spaced apart from each other with their openings defining said clearance therebetween, irradiating said sample portion with frequency sweep type linearly polarized microwaves emitted by said transmitting antenna and its associated waveguide perpendicularly to said sample portion, producing a relative rotation between the plane of polarization of said microwaves and said sample portion around the axis of said cavity resonator by rotating said



dielectric sheet or web relative to said pair of waveguides, measuring the resonance frequency "f" of the microwaves received by said receiving antenna and/or Q value "Q" of the waveguides with the sample portion located at predetermined angular positions so as to interrupt the relative rotation for each aforesaid measurement, and thereafter determining anisotropic dielectric constants and/or anisotropic dielectric losses from the relation between the resonance frequencies "f" and "fo" and/or the relation between the value "Q" and "Qo", wherein the "fo" and "Qo" are the resonance frequency and the Q value in the initial state of the waveguides without the sample portion.

4,710,701

CAPACITIVE CELL FOR CONTINUOUS MEASUREMENT OF THE LINEAR MASS OF TEXTILE PRODUCTS

Daniel Strentz, Mulhouse, France, assignor to Superba S.A., Mulhouse, France

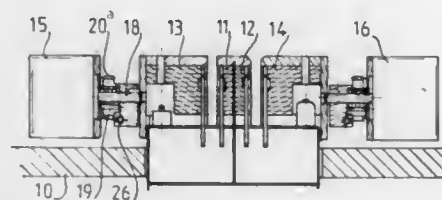
Filed Jun. 26, 1986, Ser. No. 879,136

Claims priority, application France, Sep. 24, 1985, 85 14234

Int. Cl. G01R 27/26; B65H 63/06

U.S. Cl. 324-61 P

5 Claims



1. Device having two identical air capacitors for continuous measurement of a linear mass of textile products, wherein a thread is passed through an air gap of one of the capacitors, and wherein said thread's presence causes differences in capacitance between the two capacitors which are used to detect any irregularities in the thread, comprising means of simultaneously modifying the air gap of both capacitors to enable different grades of material to be monitored.

4,710,702 HETERODYNE TYPE SIGNAL-MEASURING METHOD AND A MEASURING APPARATUS INCLUDING AUTOMATIC DETUNING CORRECTION MEANS

Hiroshi Itaya, Isehara, and Goro Saito, Aikawamachi, both of Japan, assignors to Anritsu Corporation, Tokyo, Japan

PCT No. PCT/JP86/00183, § 371 Date Dec. 10, 1986, § 102(c)

Date Dec. 10, 1986, PCT Pub. No. WO86/06174, PCT Pub.

Date Oct. 23, 1986

PCT Filed Apr. 14, 1986, Ser. No. 2,692

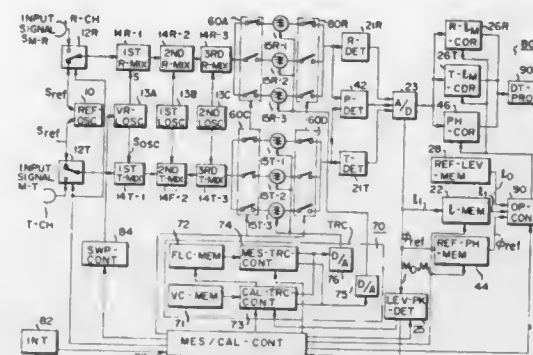
Claims priority, application Japan, Apr. 13, 1985, 60-78755;

Apr. 13, 1985, 60-78756

Int. Cl. G01R 23/14

U.S. Cl. 324-79 R

23 Claims



1. A heterodyne type signal measuring method comprising the steps of:
generating a reference signal having a reference frequency and a predetermined signal level;
generating a variable frequency signal whose oscillating frequency is varied within a given range;
producing a signal having an intermediate frequency by receiving either the reference signal, or a signal to be measured so as to be heterodyne-mixed with said variable frequency signal;
resolution-bandwidth-filtering the intermediate frequency signal;
acquiring a peak level value in said bandwidth-filtering step upon receipt of said reference signal while the frequency of said variable frequency signal is varied;
correcting the detuning occurring in said filtering step based upon said peak level value; and
calculating a level of said input signal which has been bandwidth-filtered when said input signal to be measured is received so as to correct a level error caused by the detuning, based upon said peak level value, whereby the level of said input signal can be measured under the correct level by correcting the detuning error occurring at said filtering step when the level of said input signal is measured.

4,710,703

DIRECTION SENSING SYSTEM FOR AN AC POWER SUPPLY AND AC MOTOR DRIVE WITH SUCH DIRECTION SENSING SYSTEM

Gary A. Harkiewicz, West Seneca, and Paul W. Wagener, Alden Township, Erie County, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1986, Ser. No. 819,083

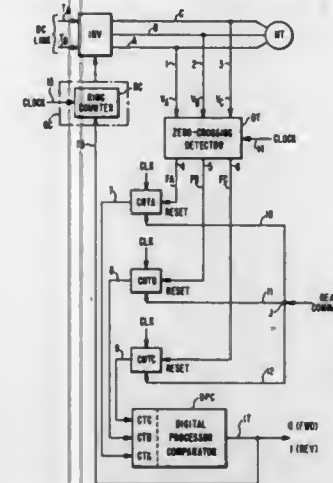
Int. Cl. G01R 25/00

U.S. Cl. 324-86

4 Claims

1. A method of ascertaining the phase rotation of the three AC phase voltages of a three-phase AC power supply; said phase voltages being viewed in a predetermined order; comprising the steps of:
sensing each of said phase voltages to derive a representative waveform thereof;
detecting for each of said representative waveforms a zero-crossover;

counting for each waveform and simultaneously for all phases the amount of electrical degrees accumulated from the corresponding detected zero-crossover to derive a corresponding phase count;
establishing by pairs for each consecutive phases in a predetermined order of succession corresponding to said predetermined order a reference sign of inequality between the



accumulated electrical angles on such pairs of consecutive phases;
comparing in magnitude said phases counts as derived to derive an actual sign of inequality between phase counts in each pair; and
deriving a phase rotation representative signal from matching said reference signs of inequality with said actual signs of inequality.

4,710,704

IC TEST EQUIPMENT

Masakazu Ando, Gyoda, Japan, assignor to Advantest Corporation, Tokyo, Japan

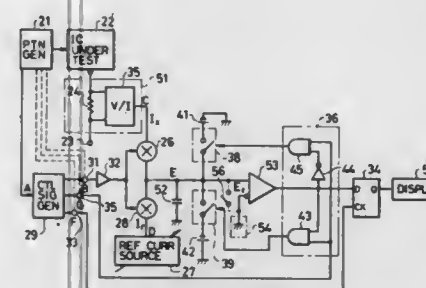
Filed Oct. 15, 1985, Ser. No. 787,032

Claims priority, application Japan, Oct. 15, 1984, 59-155218[U]

Int. Cl. G01R 31/28

U.S. Cl. 324-73 R

17 Claims



1. IC test equipment connected to receive a reference voltage and comprising:
a test pattern generator for generating a test pattern;
a current converter for converting a power supply current of the IC under test to a corresponding current;
a reference current source for producing a reference current reverse in polarity from said output current of the current converter;
an integrating capacitor;
first and second switches, connected between said integrating capacitor and said current converter and connected between said integrating capacitor and said reference current source, respectively;
a switch drive circuit, connected to said first and second

switches, for providing a switch control signal for simultaneously controlling said first and second switches to open and close in synchronism with said test pattern;
a comparator, connected to said integrating capacitor and connected to receive the reference voltage, for comparing the voltage of said integrating capacitor and the reference voltage, and for providing a corresponding output;
reset means, connected to said integrating capacitor, for generating a reset signal and making the voltage of the integrating capacitor equal to the reference voltage when the first and second switches are open, said reset means including:
a positive power source and a negative power source, connected to said integrating capacitor, said positive power source increasing the voltage across said integrating capacitor and said negative power source reducing the voltage across said integrating capacitor;
third and fourth switches connected to said positive and negative power sources, respectively, and to said integrating capacitor; and
switch control means, connected to said comparator, for receiving said reset signal and the output from said comparator, and selectively turning on one of said third and fourth switches in accordance with the comparison between the voltage of said integrating capacitor and the reference voltage, when the voltage of said integrating capacitor is higher than the reference voltage said fourth switch is turned on and when the voltage of said integrating capacitor is lower than the reference voltage said third switch is turned on;
a flip-flop, operatively connected to said comparator and said reset means, for receiving the output of said comparator during a time interval between the turning-OFF of said first and second switches and a resetting of the flip-flop by the reset means; and
control signal generating means, connected to said switch drive circuit, said reset means, said test pattern generator and said flip-flop, for generating the switch control signal, the reset signal and a strobe pulse in synchronism with said test pattern.

4,710,705

NOISE REMOVAL CIRCUIT FOR USE IN A PARTIAL DISCHARGE MEASURING DEVICE OF A HIGH VOLTAGE APPARATUS

Osamu Kawabata, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kawasaki, Japan

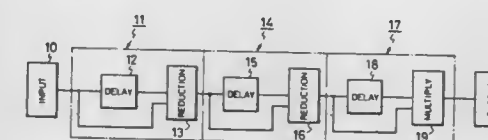
Filed Sep. 26, 1985, Ser. No. 780,170

Claims priority, application Japan, Sep. 28, 1984, 59-203686; Dec. 20, 1984, 59-268979; Jan. 28, 1985, 60-14102; Sep. 19, 1985, 60-207590

Int. Cl. G01R 19/00, 23/16; H04B 1/10

U.S. Cl. 324-102

9 Claims



1. A noise removing circuit for use in a partial discharge measuring device for use with a high voltage apparatus responsive to an input signal composed of a partial discharge pulse signal having a pulse width in a predetermined time range and periodic noise having a period of time longer than said predetermined time range for removing the noise without deforming a waveform of the partial discharge pulse signal, said circuit comprising:
first phase shift/reduction means, responsive to the input signal, for passing the input signal directly and delaying the input signal by a predetermined time, for reducing the

delayed input signal with the directly passed input signal and producing an output,
 second phase shift/reduction means for passing the output of the first phase shift/reduction means directly and delaying the output by the predetermined time for reducing the delayed output with the directly passed output and producing an output signal, and
 phase shift/multiplying means for directly passing the output signal of the second phase shift/reduction means while delaying the output signal by a time twice as much as the predetermined time and for multiplying the directly passed output signal from the second phase shift/reduction means with the delayed output signal.

4,710,706

ELECTRICAL MEASURING METER AND METHOD INCLUDING A CALIBRATING ELEMENT

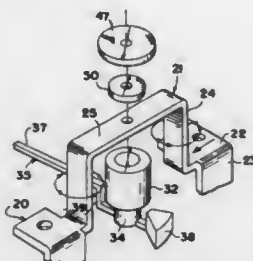
Robert L. Krupa, Jr., Parma Heights, Ohio, assignor to Prime Instruments, Inc., Cleveland, Ohio

Filed Aug. 9, 1985, Ser. No. 764,800

Int. Cl.⁴ G01R 35/04, 1/20

U.S. Cl. 324—146

20 Claims



1. In an electrical measuring meter, a polarized motor magnet mounted for movement to and from a starting position, a permanent, polarized holding magnet operative magnetically to influence said motor magnet towards such starting position, and calibrating means magnetized by said holding magnet and positioned between said holding magnet and motor magnet to effect a partial cancellation of the holding magnet's influence on said motor magnet.

4,710,707

HIGH VOLTAGE ELECTRONIC COMPONENT TEST APPARATUS

Terence J. Knowles, Lincolnshire; Francis M. Ray, Glenview, and Charles E. Shewey, Mundelein, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 16, 1985, Ser. No. 692,583

Int. Cl.⁴ G01R 19/15

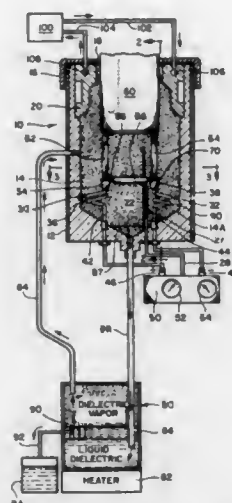
U.S. Cl. 324—158 F

13 Claims

1. Apparatus for applying a high voltage across an electronic component having a pair of leads and measuring a small current therein, said apparatus comprising:

a housing having an opening leading to a chamber therein; first and second electrodes positioned within said chamber and adapted for electrical contact with a respective axial lead of an electronic component inserted within said chamber through the opening in said housing;
 voltage generating and current measuring means coupled to said first and second electrodes for applying a high voltage thereacross and measuring the current within an electronic component coupled to said electrodes;
 fluid circulating means coupled to said chamber and containing a liquid dielectric for converting said liquid dielectric to vapor form and providing the vapor dielectric to said chamber for electrically isolating said first and second electrodes, wherein the vapor dielectric condenses to liquid form within said chamber and returns to said fluid circulating means for re-vaporization and return to said chamber, said fluid circulating means including a heated reservoir for receiving the dielectric in liquid form from

said chamber and for converting said dielectric to a vapor for diffusion back into said chamber; and



means within said heated reservoir for removing water from the liquid dielectric therein.

4,710,708

METHOD AND APPARATUS EMPLOYING RECEIVED INDEPENDENT MAGNETIC FIELD COMPONENTS OF A TRANSMITTED ALTERNATING MAGNETIC FIELD FOR DETERMINING LOCATION

Louis H. Rorden, Los Altos, and Thomas C. Moore, Sunnyvale, both of Calif., assignors to Develco, San Jose, Calif.

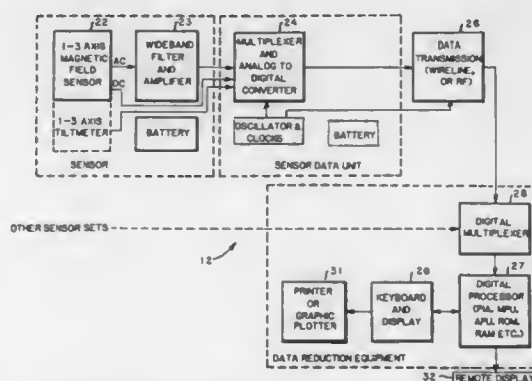
Continuation-in-part of Ser. No. 257,645, Apr. 27, 1981,

abandoned, which is a continuation-in-part of Ser. No. 36,017, May 4, 1979, abandoned. This application Jul. 23, 1982, Ser. No. 401,267

Int. Cl.⁴ G01B 7/14; G01C 21/00; G01S 3/02; G01G 7/78

U.S. Cl. 324—207

20 Claims



15. In an apparatus employing an alternating magnetic field for determining location,
 means for transmitting an alternating magnetic field from a transmitter station means;
 means for receiving the transmitted alternating field at receiving station means spaced from said transmitter station means to derive a plurality of independent magnetic field components of the complex vector field being received, each of said independent magnetic field components having amplitude and phase information;
 means for successively approximating the relative location of said transmitter and receiver station means one with respect to the other by using primarily the amplitude information of said derived independent magnetic field components, and successively determining said magnetic

field components that would have been received at said receiver station means for each approximated relative location; and
 means for comparing said successively determined field components with said received field components to derive a convergence between the approximated relative locations of said transmitter and receiver station means for determining the relative locations of said transmitter and receiver station means one with respect to the other.

4,710,709

MAGNETOMECHANICAL TRANSDUCERS UTILIZING RESONANT FREQUENCY SHIFTS TO MEASURE DISPLACEMENT OF AN OBJECT

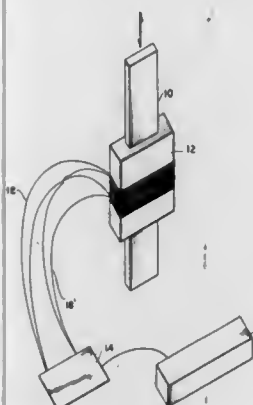
Philip M. Anderson, III, Chatham, and Jeffrey C. Urbanski, Sparta, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 4, 1983, Ser. No. 548,815

Int. Cl.⁴ G01B 7/14; G01R 33/00

U.S. Cl. 324—207

13 Claims



1. A magnetomechanical-resonant-frequency transducer system responsive to the strength of a d.c. bias field on a target comprising:

- means including a driving coil co-axial with said target for interrogating said target;
- generating means for generating an a.c. magnetic field within said coil to effect direct magnetic coupling between said ac magnetic field and said target, said ac magnetic field incorporating the resonant frequency of said target;
- means including a displaceable object, biasing means for generating said dc bias field and changing means for varying the relative displacement of said object and said target so as to vary the strength of said dc bias field on said target, thereby applying a variable d.c. bias field to said target to produce changes in the resonant frequency of said target that are correlated with displacement of said object; and
- detection means for detecting the resonant frequency produced in said target by the strength of said dc bias field.

4,710,710

SCANNING APPARATUS AND METHOD FOR INSPECTION OF HEADER TUBE HOLES

John H. Flora, Lynchburg; Robert E. Womack, Forest; Carlton E. Stinnett, and Claude W. Dalton, both of Lynchburg, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 22, 1986, Ser. No. 855,100

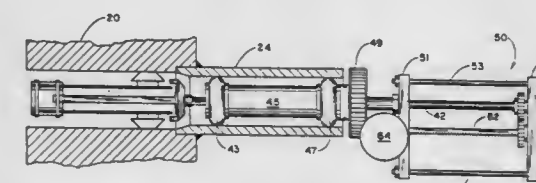
Int. Cl.⁴ G01N 27/82; G01R 33/12

U.S. Cl. 324—220

19 Claims

1. An apparatus for scanning a peripheral surface encircling

a portion of a header tube hole in a header while a tube stub having an inner diameter is seated within the hole, comprising:
 a probe assembly capable of being inserted into the header tube hole having cantilevered spring means for resiliently urging at least one sensor mounted thereon into engagement with the peripheral surface to be scanned;
 a tube stub mounting mechanism, capable of being inserted into the tube stub, having a central hollow cylinder connected to one end of the probe assembly, a flanged tube slidably disposed on the central hollow cylinder, a pair of expansible rings mounted on the flanged tube, and means mounted on the flanged tube for diametrically expanding



the rings into engagement with the tube stub inner diameter to facilitate support and reference for the apparatus; and

a drive carriage, attached to the tube stub mounting mechanism, having means for rotating the central hollow cylinder and the probe assembly connected to one end thereof so that the at least one sensor slides in the circumferential direction along the peripheral surface of the hole and means for axially translating the central hollow cylinder and the probe assembly connected to one end thereof so that the at least one sensor slides in the axial direction along the peripheral surface of the hole.

4,710,711

APPARATUS FOR NONDESTRUCTIVE TESTING OF SUBSURFACE PIPING USING THREE COILS WITH OPPOSING FIELDS

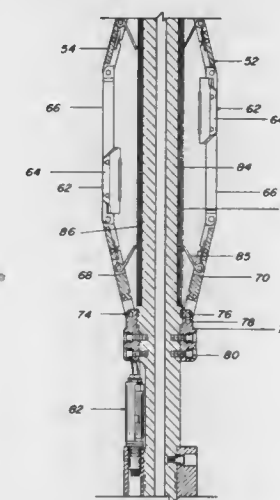
Arnold M. Walkow, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Dec. 4, 1985, Ser. No. 805,027

Int. Cl.⁴ G01N 27/72, 27/82; G01R 33/12

U.S. Cl. 324—221

3 Claims



1. Apparatus for nondestructive testing of subsurface piping, comprising:

first and second non-magnetic housing members;
 an elongated magnetic core member having a first end retained within said first housing member and a second end retained within said second housing member;
 first and second arm carrier members coupled to said core

member, said arm carriers constructed of magnetic material for magnetic poles;
 first coil assembly coupled to said core member between said first and second arm carrier members for inducing a unidirectional magnetic flux field along a portion of said piping;
 second and third coil assemblies coupled to said core member longitudinally spaced on said core member outside said first and second arm carrier members, respectively, for emitting second and third unidirectional magnetic flux fields therefrom, said second and third fields being in opposition to said magnetic flux field from said first coil assembly;
 detector means comprising a plurality of detector shoes coupled to said arm carrier members, said detector means located proximate said first coil assembly and between said second and third coil assemblies, said detector means adapted to contact the interior surface of said piping for sensing alterations in said flux field for indicating defects in said piping.

4,710,712

METHOD AND APPARATUS FOR MEASURING DEFECTS IN FERROMAGNETIC ELEMENTS

James E. Bradfield; John E. Kahl; Mark S. Jaynes; Gordon L. Moake; Marvin Milewits; Curtis W. Bolton, III; Clive C. Lam, and Roderic K. Stanley, all of Houston, Tex., assignors to PA Incorporated, Houston, Tex.

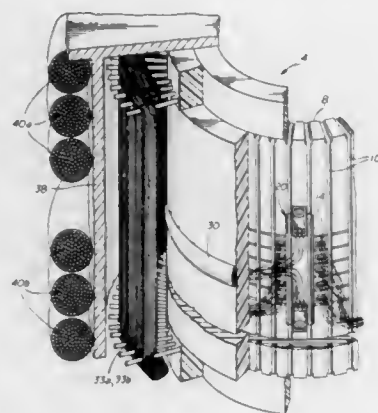
Filed Apr. 11, 1984, Ser. No. 599,053

The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.

Int. Cl. G01R 27/72, 27/82; G01R 33/12

U.S. Cl. 324-227

67 Claims



27. A tubing trip tool for determining at the well head the extent of defects in ferromagnetic tubing sections of a continuous tubing string used in a subterranean well bore as the tubing string travels into or out of the well bore, comprising:
 means for measuring the axial velocity of each tubular section relative to a saturating magnetic field including means for detecting, at a fixed location within the saturating magnetic field, a first signal produced by the changing magnetic leakage fields emanating from the tubular section due to axial velocity of the tubular section and axial changes in the magnetic properties of the tubing section due to movement of each tubing section, means for detecting a second signal simultaneously produced by the magnetic leakage emanating from the section due to axial changes in the magnetic properties of the tubing section, and means for comparing the first and second signals to measure the velocity of the tubing string;
 means transversely spaced from the tubing string for successively applying a saturating magnetic field along the length of each tubing section of sufficient intensity to saturate the portion of the tubing section within the satu-

rating magnetic field as the tubing string travels axially relative to the wall head;
 means transversely spaced from the tubing string for detecting the total magnetic flux generated by the saturated magnetic field in each tubing section;
 means for correlating the total magnetic flux generated by the saturated magnetic field in each tubing section to the average wall thickness along the length of each tubing section;
 means transversely spaced from the tubing string for detecting flux leakage in the saturated magnetic field of each tubing section;
 means for correlating the flux leakage in the saturated magnetic field of each tubing section to the depth of defects in each tubing section;
 means transversely spaced from the tubing string for applying a cyclic magnetic field to each tubing section in addition to the saturating magnetic field;
 means transversely spaced from the tubing string for detecting driven fields induced in each tubing section by the cyclic magnetic field;
 means for comparing the driven fields to the cyclic magnetic field; and
 means for correlating the difference between the driven fields and the cyclic magnetic fields to the extent of axially extending defects, including wear defects due to sucker rod interference, located at discrete circumferential locations on each tubular section.

4,710,713

NUCLEAR MAGNETIC RESONANCE SENSING APPARATUS AND TECHNIQUES

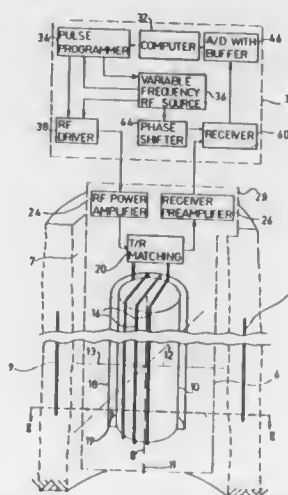
Shmuel Strikman, both of Rehovot, Israel, assignor to Numar Corporation, Malvern, Pa. and Zvi Taicher

Filed Mar. 11, 1986, Ser. No. 838,503

Int. Cl. G01R 33/20

U.S. Cl. 324-303

26 Claims



1. Nuclear magnetic resonance sensing apparatus comprising:
 at least one magnet operative to generate a static magnetic field in a region remote therefrom containing materials sought to be analyzed, said at least one magnet having a longitudinal axis and having a magnetization direction extending substantially perpendicularly to said longitudinal axis;
 means for generating a radio frequency magnetic field in said remote region for exciting nuclei of the material sought to be analyzed and including at least one coil wound in a manner whereby the coil turns lie in planes substantially parallel to said magnetization direction and said longitudinal axis; and
 receiving means for receiving nuclear magnetic resonance

signals from the excited nuclei and for providing an output indication of properties of the material sought to be analyzed.

4,710,714

METHOD AND APPARATUS FOR MEASURING NUCLEAR MAGNETIC PROPERTIES

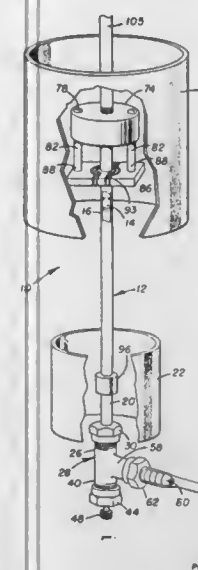
Daniel P. Weltekamp, 39 Kenyon Ave., Kensington, Calif. 94708; Anthony Bielecki; David B. Zax, both of Berkeley, Calif.; Kurt W. Zilm, Hamden, Conn., and Alexander Pines, Berkeley, Calif., assignors to The Regents of the University of California and Daniel Paul Weltekamp, both of Berkeley, Calif.

Filed Apr. 10, 1984, Ser. No. 598,844

Int. Cl. G01R 33/20

U.S. Cl. 324-307

29 Claims



1. A method for analyzing a sample comprising the steps of:
 (a) polarizing the sample within a magnetic field having a selected first field intensity;
 (b) reducing the magnetic field to a substantially zero intensity for a selected first time period;
 (c) increasing the magnetic field to a second field intensity sufficient to maintain the polarization of the sample at the value existing at the end of said first time period;
 (d) measuring the magnetization of said sample;
 (e) repeating steps (a)-(d) for different durations of said first time periods; and
 (f) determining the Fourier-transform of said measured magnetization as a function of said selected first time period.

4,710,715

METHOD OF MAPPING MAGNETIC FIELD STRENGTH AND TIPPING PULSE ACCURACY OF AN NMR IMAGER

Gary L. Mee, and M. Robert Willcott, both of Houston, Tex., assignors to NMR Imaging, Inc., Houston, Tex.

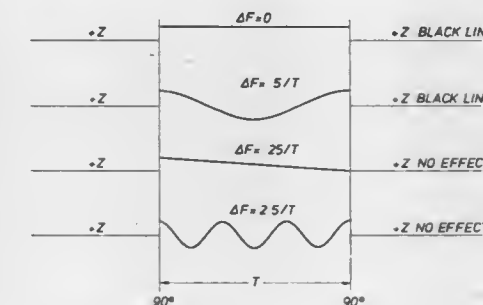
Filed Apr. 23, 1985, Ser. No. 726,086

Int. Cl. G01R 33/24

U.S. Cl. 324-307

2 Claims

1. A method of measuring the accuracy of the tipping process of an NMR imager comprising the steps of tipping the spins through an angle equal to $2N+1$ times the angle through which the RF signal is suppose to tip the spins so that any



the image and obtaining the image to check the accuracy of the tipping process.

4,710,716

SLICE ORIENTATION SELECTION ARRANGEMENT

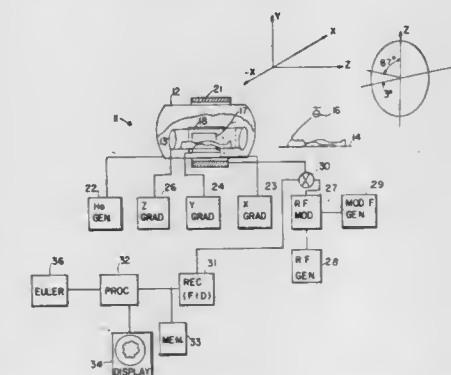
Hanan Keren, Kfar Saba, and David Freundlich, Haifa, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Sep. 20, 1985, Ser. No. 778,503

Int. Cl. G01R 33/20

U.S. Cl. 324-309

12 Claims



1. A method of imaging a subject using MRI systems wherein the selected imaging plane is at any desired angle to the usual X, Y and Z coordinate axes of said MRI system, the method comprises the steps of:
 (a) subjecting the subject to a strong static magnetic field along the Z axis in order to align magnetic spins in the Z direction in said subject being imaged;
 (b) applying magnetic gradient vector pulses to vary said static field;
 (c) generating FID signals by applying RF magnetic pulses rotating at Larmor frequencies to nutate said spins;
 (d) selecting desired non-orthogonal imaging planes by selectively rotating the direction of the magnetic gradient vectors by determined angular amounts about coordinate axes prior to applying the magnetic gradient vector pulses;
 (e) determining the angular amount to rotate the magnetic gradient vectors about the coordinate axis using visual indicators; and
 (f) projecting said visual indicators onto the image of said subject being imaged.

4,710,717

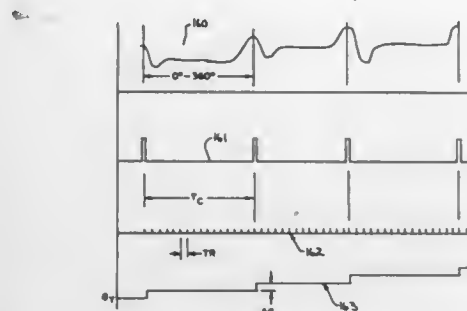
METHOD FOR FAST SCAN CINE NMR IMAGING

Norbert J. Pelc, Wauwatosa, and Gary H. Glover, Delafield, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 29, 1986, Ser. No. 947,211
Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—309

16 Claims



1. A method for producing an image with an NMR imaging system which depicts an object at a selected phase of its functional cycle, the steps comprising:

- repeatedly executing an NMR pulse sequence throughout a functional cycle to acquire a subset of NMR data, said execution being asynchronous with respect to said functional cycle to produce NMR data at each of a plurality of phases of the functional cycle, and said NMR pulse sequence including a position encoding gradient pulse;
- correlating the NMR data acquired during the execution of each NMR pulse sequence with the phase of the functional cycle at the time the NMR data is acquired;
- repeating steps (a) and (b) for a plurality of functional cycles with a different position encoding gradient pulse employed during each functional cycle to produce other subsets of NMR data;
- reconstructing an image at a selected phase of the functional cycle by interpolating between NMR data within each subset of acquired NMR data to produce a set of interpolated NMR data which is employed to produce the image.

4,710,718

SPATIALLY SELECTIVE NUCLEAR MAGNETIC RESONANCE PULSE SEQUENCES

Athan J. Shaka, Oxford, United Kingdom, assignor to Varian Associates, Inc., Palo Alto, Calif.

PCT No. PCT/US85/00593, § 371, Date, Dec. 3, 1985, § 102(e)
Date Dec. 3, 1985, PCT Pub. No. WO85/04727, Pub. Date Oct. 24, 1985

PCT filed Dec. 3, 1985, Ser. No. 807,098

Claims priority, application Australia, Apr. 5, 1984, PG4432
Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—309

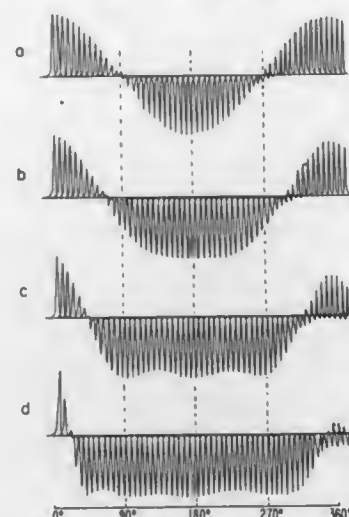
20 Claims

1. The method of exciting nuclear magnetic resonance in an exclusively selected aggregate of gyromagnetic resonators comprising the steps of

- imposing a polarizing magnetic field on said gyromagnetic resonators,
- flipping the magnetization representing said selected resonators by 180° about a first selected axis in a selected plane whereby the magnetization is re-oriented 180° as the first step of a composite continuous set of steps Q^m ,
- applying an RF pulse to cause the magnetization vector to rotate by 180° about a second axis as another step of said composite continuous set Q^m , said second axis at +90° to said selected axis,
- flipping the magnetization by 180° as another step of said composite continuous set Q^m , said flipping reversed in

sense from the flipping of step (b) whereby the step (b) is time reversed,

- accumulating a nuclear magnetic resonance signal, and
- repeating steps (b) through (c) at least through three further repetitions and for each said repetition,



- (1) cycling each said rotation or flip axis by advancing said axis 90° in the selected plane with respect to the preceding repetition, and
- (2) reversing the algebraic sense of accumulation of the NMR signal for each adjacent accumulation.

4,710,719

HIGH VOLTAGE CAPACITOR WAND FOR HIGH POWER TUNED CIRCUITS

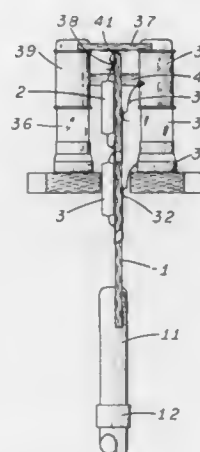
Francis D. Doty, Columbia, S.C., assignor to Doty Scientific, Inc., Columbia, S.C.

Filed Jan. 13, 1986, Ser. No. 818,486

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—318

3 Claims



1. A detachable capacitor wand for a high power NMR probe coil circuit, said wand including at least two series connected high voltage capacitors, surface mounted on one side of a removable circuit board strip, with plated copper pads provided for making low electrical resistance contacts between said circuit board strip and said probe coil circuit at the junction and at opposite ends of said series connected capacitors, said probe coil circuit including plated spring contact fingers to engage said plated pads.

4,710,720

ARRANGEMENT FOR TESTING FUSES

Hans Weiner, Mühlacker, Fed. Rep. of Germany, assignor to Dr. Ing.h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

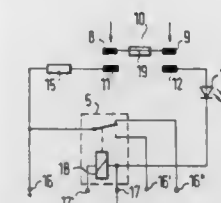
Filed Jul. 24, 1985, Ser. No. 758,373

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427540

Int. Cl.⁴ H01H 85/32

U.S. Cl. 324—550

10 Claims



1. A fuse testing arrangement for testing fuses in a motor vehicle utilizing an existing current distribution system connected to a relay of said vehicle whereby said relay provides dual functionality and comprises:

- test circuit means for individually and manually testing fuses in the motor vehicle;
- said test circuit means including in a series circuit, a current limiting resistance, a pair of electrical contacts, and an indicating means;
- said test circuit means operable independently and in addition to normal operative functions of the relay.

4,710,721

APPARATUS FOR MONITORING THE PERIOD OF SEPARATION OF IMPULSES

Etienne Camus, Senlis, France, assignor to Jeumont-Schneider Corporation, Puteaux, France

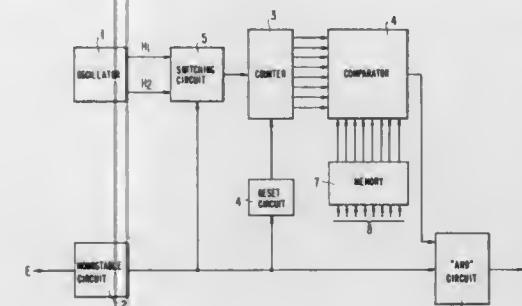
Filed Feb. 20, 1986, Ser. No. 831,422

Claims priority, application France, Feb. 21, 1985, 85 02483

Int. Cl.⁴ H03K 5/22; G01R 19/145

U.S. Cl. 328—109

7 Claims



1. Apparatus for monitoring the period of separation between impulses, comprising a monostable circuit having an input to which said impulses are applied and an output on which said monostable circuit generates output pulses in response to the applied input impulses, oscillator circuit means having output means on which said oscillator circuit means generates a high frequency output signal and a low frequency output signal, counter circuit means having input means connected to receive said high frequency signal and said low frequency signal from said output means of said oscillator circuit means, switching circuit means connected for switching an input signal of said counter circuit means between said low frequency signal and said high frequency signal, said switching circuit means having a control input connected to said output of said monostable circuit and switching in response to the

output pulses from said monostable circuit such that said counter circuit means is driven by said low frequency signal between output pulses from said monostable circuit and by said high frequency signal during output pulses from said monostable circuit, reset circuit means having a control input connected to said output of said monostable circuit and an output connected to reset said counter circuit means in response to trailing edges of the output pulses from said monostable circuit, comparator circuit means having input means connected to output means of said counter circuit means, said comparator circuit means comparing a number represented by a signal on the output means of said counter circuit means to a number corresponding to a predetermined period to be monitored and providing an output signal when the compared numbers coincide, and AND circuit means having an input connected to the output of said monostable circuit and another input connected to said output means of said comparator circuit means, whereby said AND circuit means provides an output signal when the period between successive impulses applied to the input of said monostable circuit is substantially the same as said predetermined period to be monitored.

4,710,722

APPARATUS GENERATING A MAGNETIC FIELD FOR A PARTICLE ACCELERATOR

Andreas Jahnke, Forchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich

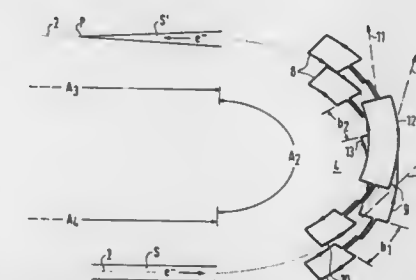
Filed Feb. 26, 1986, Ser. No. 833,726

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508334

Int. Cl.⁴ H05H 7/00, 13/00

U.S. Cl. 328—234

8 Claims



1. Magnetic field-generating apparatus for an installation for accelerating electrically charged particles, the particle track of which has a plurality of curved and straight sections, comprising a plurality of main magnetic field generating windings located in the curved sections and at least one supplemental winding provided for focusing the particles on the particle track, the supplemental winding comprising a quadrupole triplet conductor arrangement in the region of at least one of the curved sections of the particle track, forming a quadrupole triplet for focusing the particles during acceleration, the turns of the supplemental winding being arranged on both sides of the plane in which the article track is disposed.

4,710,723

RECEIVER HAVING A MODULATION AMPLIFIER FOR ENHANCING RECEPTION OF A DESIRED SIGNAL IN THE PRESENCE OF INTERFERENCE

Guy Pelchat, Indialantic, and Luther L. Crabtree, Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 4, 1986, Ser. No. 848,269

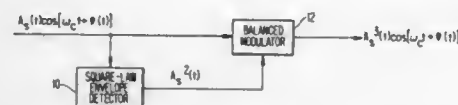
Int. Cl.⁴ H03D 1/04; H04B 1/10, 15/00

U.S. Cl. 329—192

29 Claims

1. A receiver for receiving an input signal containing a desired signal component and an interference signal compo-

ment, wherein the improvement comprises means for amplifying the degree of a prescribed modulation of the input signal to



enhance detection of the desired signal component in the input signal in the presence of said interference signal component.

4,710,724

DIFFERENTIAL CMOS COMPARATOR FOR SWITCHED CAPACITOR APPLICATIONS

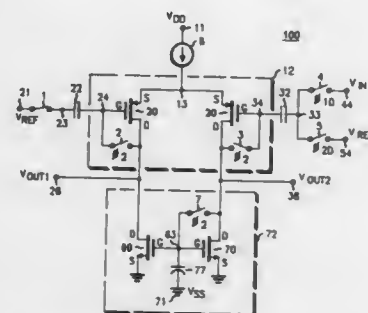
Lawrence E. Connell, Darien, and Ronald J. Webb, Elgin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1986, Ser. No. 847,361

Int. Cl.⁴ H03F 1/26, 3/45

U.S. Cl. 330—9

29 Claims



1. A voltage comparator comprising: a differential input stage including a pair of input devices connected in a differential amplifier configuration, said input stage having corresponding pairs of input terminals and output terminals; a load stage including a first pair of load devices connected to said pair of output terminals, each load device having a control terminal thereof connected to a first common bias node; and first means, including a first switched capacitor means connected to said first common bias node, for biasing said first pair of load devices to a bias point derived solely from at least one of said output terminals.

4,710,725

PREAMPLIFIER FOR AN IMAGING SYSTEM

Charles M. White, Liverpool, and Wayne T. Green, Mexico, both of N.Y., assignors to General Electric Company, Charlottesville, Va.

Filed Aug. 23, 1984, Ser. No. 643,408

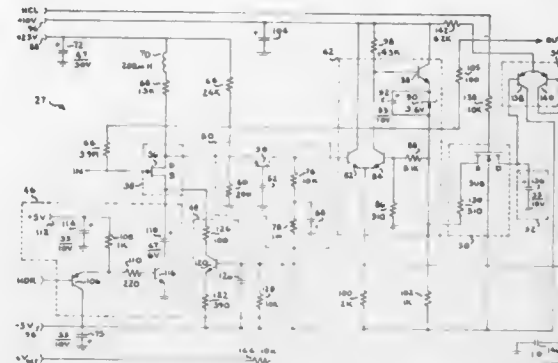
Int. Cl.⁴ H03F 1/14

U.S. Cl. 330—51

6 Claims

1. A preamplifier for use in an imaging system including a charge-injection device comprising: an amplifier for amplifying a video signal; means for making said amplifier insensitive to an AC component of said video signal during at least a portion of a blanking interval of said video signal; means for differencing an output of said amplifier during said at least a portion of a blanking interval with a reference voltage and for producing a DC bias therefrom; means for connecting said DC bias to an input of said amplifier, whereby said output is driven toward a value equal to said reference voltage; means for storing a voltage effective for producing said DC

bias from the end of said at least a portion of a blanking interval until the next blanking interval; and



means for continuing to supply said DC bias existing at an end of said at least a portion of a blanking interval, whereby a DC bias required for proper operation of said amplifier is provided.

4,710,726

SEMICONDUCTIVE MOS RESISTANCE NETWORK

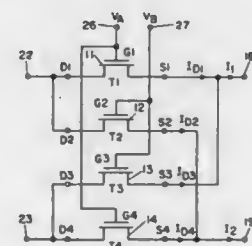
Zdzislaw Czarnul, New York, N.Y., assignor to Columbia University in the City of New York, New York, N.Y.

Filed Feb. 27, 1986, Ser. No. 834,321

Int. Cl.⁴ H03F 1/34

U.S. Cl. 330—69

10 Claims



1. A circuit arrangement including a two-port network whose transresistance is voltage-tunable over a linear range and which includes a pair of input terminals, a pair of output terminals, and a pair of control terminals, an input circuit branch connected between the input terminals, and an output circuit branch connected between the output terminals; the two-port network comprising first, second, third and fourth matched MOS transistor, each having first and second current-carrying electrodes and a control electrode, and capable of operation in a non-saturated condition; the first current-carrying electrode of each of the first and second transistors being connected to one of the input terminals and the first current-carrying electrode of each of the third and fourth transistors being connected to the other of the input terminals; the second current-carrying electrode of each of the first and third transistors being connected to one of the output terminals, the second current carrying electrode of each of the second and fourth transistors being connected to the other of the output terminals; the control electrode of each of the first and fourth transistors being connected to one of the control terminals and the control electrode of each of the second and third transistors being connected to the other of the control terminals; and voltage means connected to the control terminals for maintaining during operation each transistor continually conductive in a non-saturated region of its transfer charac-

teristic currents whereby the conductances of the transistors may be combined in the output circuit branch.

4,710,727

NONLINEAR DISTORTION SYNTHESIZER USING OVER-THRESHOLD POWER-FUNCTION FEEDBACK

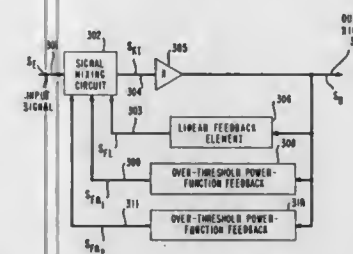
Thomas E. Rutt, Asbury Park, N.J., assignor to Aardvark Audio Inc., Asbury Park, N.J.

Continuation-in-part of Ser. No. 771,235, Aug. 30, 1985, abandoned. This application Aug. 1, 1986, Ser. No. 892,350

Int. Cl.⁴ H03F 1/34

U.S. Cl. 330—110

22 Claims



1. A circuit, responsive to an input signal, for use with an amplifier, which circuit comprises: a signal-mixing means for providing an input signal to the amplifier in response to the input signal and at least one over-threshold power-function negative feedback signal; and at least one negative feedback means for providing the at least one over-threshold power-function negative feedback signal in response to the amplifier output signal, which comprises: (a) a peak-pass means, responsive to the amplifier output signal, for picking off predetermined portions of the amplifier output signal, to produce a peak-over-threshold signal, and (b) a polarity-preserving power-function means, responsive to the peak-over-threshold signal, for producing the at least one over-threshold power-function negative feedback signal having an amplitude which is proportional to the peak-over-threshold signal level raised to a power greater than one.

4,710,728

AMPLIFIER HAVING IMPROVED GAIN-BANDWIDTH PRODUCT

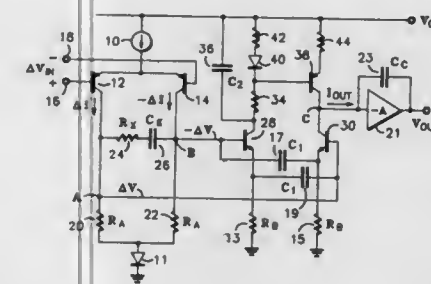
William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1986, Ser. No. 880,251

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—252

4 Claims



1. An amplifier circuit having a unity gain frequency, comprising: an input stage including first and second differentially coupled input transistors each having a base, emitter and collector terminals, said emitter terminals for coupling to a first source of supply voltage, and the base terminals

being coupled to receive first and second input signals respectively, the collector terminals of said first and second input transistors forming first and second outputs; a second stage including third and fourth differentially coupled input transistors each having base, emitter and collector terminals, said emitter terminals for coupling to a source of supply voltage, and said base terminals of said third and fourth transistors being coupled to receive said first and second outputs respectively, the collector terminal of said fourth transistor forming a third output; first circuit means coupled to said input stage and to said second stage for generating first and second pole-zero pairs (P_A, Z_A) and (P_C, Z_C), said first circuit means comprising an RC series network having a first end coupled to the collector of said first input transistor and having a second end coupled to the collector of said second input transistor, a first capacitor having a first terminal coupled to the collector at said second input transistor and to the base of said third input transistor and a second terminal coupled to the emitter of said fourth input transistor, and a third capacitor having a first terminal coupled to the collector of said first input transistor and to the base of said third input transistor and a second terminal coupled to the emitter of said third input transistor;

current mirror means for coupling between the collector terminals of said third and fourth transistors and said first source of supply; and second circuit means coupled between the collector terminal of said third transistor and said current mirror means for producing a third pole-zero pair (P_B, Z_B).

4,710,729

MICROWAVE OSCILLATOR COMPRISING A DIELECTRIC RESONATOR INSENSITIVE TO MECHANICAL VIBRATIONS

Daniel Doyen, Ozoir, and Tarcisio Vriz, Montgeron, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

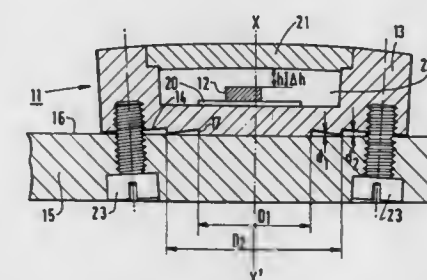
Filed Sep. 2, 1986, Ser. No. 903,048

Claims priority, application France, Sep. 6, 1985, 85 13315

Int. Cl.⁴ H03B 5/18

U.S. Cl. 331—96

5 Claims



1. An arrangement for minimizing the effect of vibration of the operating frequency of a dielectric resonator, said arrangement comprising:

- (a) a housing having opposed first and second inner surfaces and an outer surface all extending transversely of a common axis, one of said inner surfaces being adapted for mounting the dielectric resonator in the vicinity of the axis;
- (b) a support body having an outer surface extending transversely of the axis on which the housing is supported, said outer surface of the support body and the outer surface of the housing facing each other; and
- (c) means for producing flexural strain in the housing when it is affixed to the support body, said means comprising: (1) space-defining means for defining a space between predefined respective portions of the facing outer sur-

faces, said space including at least one location where said facing outer surfaces can be forced together to effect flexion of the housing; and

- (2) affixing means, disposed at said at least one location, for locally forcing together the facing outer surfaces.

4,710,730

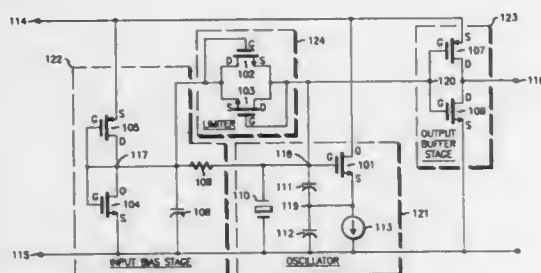
DATA CLOCK OSCILLATOR HAVING ACCURATE DUTY CYCLE

Joseph E. Doyle, III, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 20, 1987, Ser. No. 28,287
Int. Cl.⁴ H03B 5/32

U.S. Cl. 331-116 FE

20 Claims



1. A crystal oscillator comprising:

oscillator means for generating an AC output signal, said oscillator means including tank circuit means for resonating at a predetermined operating frequency, and including feedback amplifier means for providing regenerative feedback to said tank circuit means to sustain oscillation, said oscillator means further including input means for accepting a bias signal and output means for providing said AC output signal having a first duty cycle and having an average DC value determined by said bias signal;

buffer means for amplifying said AC output signal, said buffer means including input means, coupled to said oscillator output means, for accepting said AC output signal, said buffer input means having a predefined switching threshold, said buffer means further including output means for providing a crystal oscillator output signal having a second duty cycle determined by said first duty cycle, said AC output signal average DC value, and said predefined switching threshold;

biasing means, coupled to said oscillator input means, for providing said bias signal, said biasing means adapted to track device parameter variations of said buffer means and adapted to vary said bias signal such that said average DC value of said AC output signal follows said predefined switching threshold over changes in temperature, supply voltage, and manufacturing processes, thereby providing a crystal oscillator output signal exhibiting a precise duty cycle.

4,710,731

PLANAR TYPE THICKNESS SHEAR MODE QUARTZ OSCILLATOR

Mitsuyuki Sagita, and Isamu Hoshino, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1986, Ser. No. 885,931

Claims priority, application Japan, Jul. 15, 1985, 60-155734

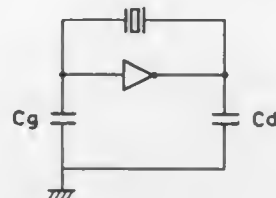
Int. Cl.⁴ H03B 5/32

U.S. Cl. 331-158

10 Claims

1. An oscillator comprising a planar type thickness shear mode quartz resonator connected to a negative resistance oscillation circuit in which the proportion between the diame-

ter and the thickness of the quartz resonator is so designed that the difference between the impedance of the quartz resonator



and the negative resistance of the oscillation circuit is greater in the third overtone than in other oscillation modes.

4,710,732

SPATIAL LIGHT MODULATOR AND METHOD

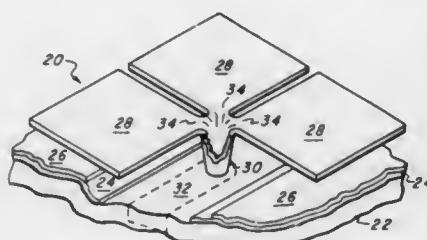
Larry J. Hornbeck, Van Alstyne, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1984, Ser. No. 635,966

Int. Cl.⁴ G02F 1/27; B44C 1/22; H04N 5/74

U.S. Cl. 332-7.51

8 Claims



1. A method of fabricating a spatial light modulator with deflectable beams, comprising the steps of:

- apply a spacer on a substrate including electronic addressing circuitry;
- pattern said spacer to define post holes extending down to said substrate;
- deposit a layer of metal on said spacer and post holes;
- define deflectable beams in said metal so that each beam is hinged to the metal in one of said post holes;
- remove said spacer.

4,710,733

R.F. PHASE MODULATOR

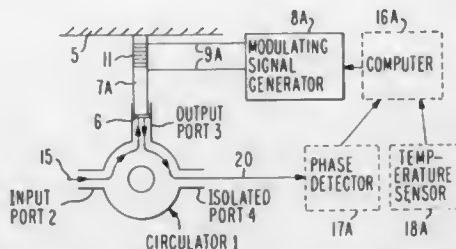
Philip D. Crill, Los Altos, and Michael D. Rubin, Saratoga, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Oct. 28, 1986, Ser. No. 923,989

Int. Cl.⁴ H01P 1/32

U.S. Cl. 332-26

10 Claims



1. A linear r.f. phase modulator comprising:

an r.f. sinusoidal carrier passing through a circulator having input, output, and isolated ports, said output port consisting solely of reflective, non-dissipative components;

fitting within an open end of the output port, a moving reflective surface coupled by a moving plunger to a housing fixedly mounted with respect to the circulator; and means for generating a modulating signal; wherein the modulating signal is applied to the plunger; the position of the reflective surface within the output port is a linear function of the amplitude of the modulating signal; and movement of the reflective surface changes the path length of the r.f. carrier within the circulator, thereby linearly phase modulating said carrier, which exits the isolated port substantially unattenuated.

4,710,734

MICROWAVE POLARIZATION CONTROL NETWORK

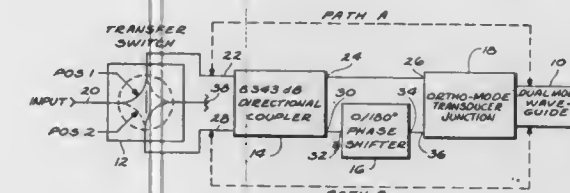
William G. Sterns, Canoga Park, Calif., assignor to ITT Gilfillan, a division of ITT Corporation, Van Nuys, Calif.

Filed Jun. 5, 1986, Ser. No. 871,210

Int. Cl.⁴ H01P 1/10, 1/161, 1/17

U.S. Cl. 333-101

4 Claims



1. A microwave polarization control network comprising a two position transfer switch for directing an input to one of two paths; a directional coupler having two ports, alternating as input and isolated ports, and two ports alternating as through output and coupled output ports; said two position transfer switch being connected to alternately switch an input to one or the other of said two ports of said directional coupler alternating as input and isolated ports and connect the other remaining one of said two ports, then called the isolated port, to a termination; an ortho-mode transducer junction having two input ports; means coupling one of said output ports to one input of said ortho-mode transducer junction; a 0/180° phase shifter coupled in series between the other of said output ports and the other input of said ortho-mode transducer junction; and a dual mode waveguide for transmitting a variable polarization output from said ortho-mode transducer junction to produce two sets of orthogonal linear polarizations.

4,710,735

ABSORPTION CIRCUIT

Leopold Blahous, Wettingen, and Gerhard Linhofer, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

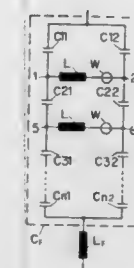
Filed Dec. 17, 1985, Ser. No. 809,799

Claims priority, application Switzerland, Jan. 8, 1985, 59/85

Int. Cl.⁴ H03H 7/01, 7/06

U.S. Cl. 333-175

4 Claims



1. In absorption circuitry for filtering current harmonics of

the type having a filter choke in series with a symmetric array of filter capacitor branches in parallel, each filter capacitor branch including a series combination of at least two capacitors, the improvement comprising:

compensating choke means connecting at least two nodes between symmetrically corresponding capacitors in the parallel filter capacitor branches, the inductance of the compensating choke means being at least approximately equal to $1/\omega^2 C$ wherein ω is the angular frequency of a harmonic to be filtered and C is the total capacitance of the array of parallel filter capacitor branches, whereby the virtual capacitance of the absorption circuitry substantially retains its rated value after failure of a capacitor in the array.

4,710,736

FLEXIBLE WAVEGUIDES WITH 45° CORRUGATIONS TO ALLOW BENDING AND TWISTING OF WAVEGUIDES

Alan G. Stidwell, Higher Lake Farm, Woodland, Ashburton, TO13 7LL, Devon, United Kingdom

PCT No. PCT/GB84/00241, § 371 Date Mar. 4, 1985, § 102(e)

Date Mar. 4, 1985, PCT Pub. No. WO85/00471, PCT Pub. Date Jan. 31, 1985

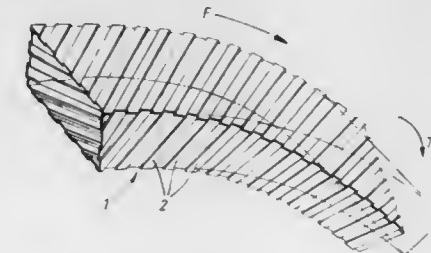
PCT Filed Jul. 5, 1984, Ser. No. 708,954

Claims priority, application United Kingdom, Jul. 5, 1983, 8318144

Int. Cl.⁴ H01P 3/14

U.S. Cl. 333-241

9 Claims



1. A waveguide capable of being bent and twisted through substantial angles, and formed of discontinuity-free metal tubing with continuous corrugations of the wall of the waveguide extending all around the waveguide at an angle of substantially 45° to the longitudinal direction of the waveguide.

4,710,737

BAND SWITCHING CIRCUIT TUNER

Shigetoshi Matsuta, Soma, Japan, assignor to Alps Electric, Ltd., Japan

Filed Feb. 15, 1985, Ser. No. 702,045

Claims priority, application Japan, Feb. 15, 1984, 59-19985[U]

Int. Cl.⁴ H03J 5/24

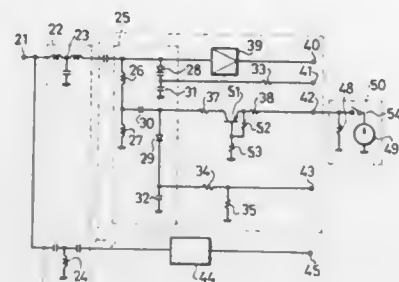
U.S. Cl. 334-56

2 Claims

1. In a band switching circuit coupled to a VHF tuner and a UHF tuner of the type having a switching diode with a PN junction which is forward biased to a conducting state to short-circuit a tuning coil for tuning said VHF tuner to a high VHF channel, reverse biased to a non-conducting state to render said tuning coil operative for tuning said VHF tuner to a low VHF channel, and zero biased in a power-off state for allowing tuning said UHF tuner to a UHF channel, said band switching circuit having first and second band switching terminals which are connected to an anode side and a cathode side of said switching diode, respectively, for applying a selected bias voltage to a selected side of said switching diode, a pair of resistors, each resistor of said pair being connected between a respective one of said terminals and ground, and means for selectively applying a DC bias voltage to said first terminal,

said second terminal, and to neither terminal to obtain said conducting, non-conducting, and power-off states of band switching, respectively,

the improvement wherein a transistor has one terminal connected to said first band switching terminal and another terminal connected to said anode side of said switching



diode such that one PN junction of said transistor is in the opposite bias direction from the PN junction of said switching diode, wherein said band switching circuit does not form a closed loop when said switching diode is zero-biased in the power-off state, whereby interference by harmonics generated by a leakage signal flowing through said switching diode in the power-off state is prevented.

4,710,738

MOULDED CASE CIRCUIT BREAKER

Jean-Philippe Neel, Meylan; Roger Case, Seyssins, and Gilbert Garnier, Fontaine, all of France, assignors to Merlin Gerin, Grenoble, France

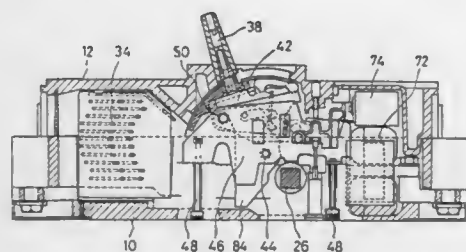
Filed Jan. 4, 1986, Ser. No. 870,412

Claims priority, application France, Jan. 12, 1985, 85 09003

Int. Cl.⁴ H01H 9/00

U.S. Cl. 335—172

7 Claims



1. A moulded case low voltage electrical circuit breaker having stationary and moving contacts assuming three stable positions respectively an open position, a closed position; and a tripped position, said circuit breaker comprising:

at least one stationary contact and one moving contact fitted in said case,

a moving contact support pivotally mounted in said case to bring said contacts respectively into the closed position and the open position,

an operating mechanism, housed in said case, to actuate said support between the open and closed positions of said contacts, said mechanism having a pivoting handle controlling manual opening and closing of the circuit breaker and a frame fixed to said case having a fixed spindle and a latching device,

a hook pivotally mounted on the fixed spindle of said frame and cooperating with the latching device, release of said latching device causing tripping of the circuit breaker, a toggle-joint comprising an upper rod and a lower rod and a toggle-joint spindle connecting said rods, a free end of the upper rod being articulated by a spindle on the hook

and an end of the lower rod being articulated on said support,

a tension spring anchored on the toggle-joint spindle and on the handle to urge the toggle-joint respectively to an extension position, when the handle is in the circuit breaker closed position, and to a broken position when the handle is in the open position, the hook being released by unlocking of the latching device thereby causing the hook and toggle-joint assembly to move to the tripped position of the circuit breaker, and

an aperture functioning as a guide means in said hook for cooperating with a catch on the upper rod during tripping operation of the circuit breaker, said tripping operation pivoting said hook to move both said articulated spindle of the upper rod and said catch of the upper rod thereby breaking the toggle-joint and bringing the toggle-joint spindle to a position beyond the dead point of said pivoting handle, said dead point being defined by the alignment of the articulation spindle of the handle, the toggle-joint spindle and the anchoring point of the spring on the handle.

4,710,739

CIRCUIT BREAKER HAVING SHOCK-PROOF TRIP-ACTUATING ASSEMBLY

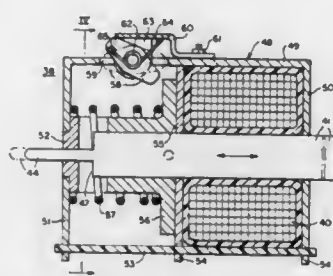
Carl J. Heyne, Hampton Twp., Allegheny County, and Nicholas A. Tomasic, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 15, 1986, Ser. No. 885,633

Int. Cl.⁴ H01H 9/00

U.S. Cl. 335—174

7 Claims



1. In combination with a circuit breaker having a housing of insulating material that contains a pair of contacts one of which is movable into make-circuit and break-circuit relationship with the other contact by a spring-powered operating mechanism that includes a toggle assembly and a latch component,

a trip member pivotally mounted within said housing and adapted to engage and releasably capture said latch component when the operating mechanism is spring-loaded and thereby maintain the operating mechanism and contacts in make-circuit relationship, said trip member being actuable to release said latch component and permit the spring-loaded operating mechanism to rapidly separate the contacts and swing the movable contact to break-circuit position,

means for actuating said trip member and tripping the circuit breaker in response to a current-overload condition, comprising;

an elongated actuator reciprocally movable along a path and through a distance such that the end of said actuator strikes said trip member and releases said latch component when the actuator is moved from a dormant NO-TRIP position to a TRIP position,

means responsive to a current-overload condition for rapidly moving the actuator from NO-TRIP to TRIP position,

means mechanically locking the plunger in dormant NO-TRIP position,

means for releasing said locking means in response to a current-overload condition and in synchronism with the

actuation of the actuator-moving means so that the actuator is automatically motivated and initiates the tripping sequence within a predetermined period of time after the current-overload condition occurs,

the actuator-moving means comprising a solenoid that has a wire coil and a reciprocally-movable magnetic core member and is mounted within the circuit breaker housing adjacent the trip member,

the actuator comprises a longitudinally extending appendage of said solenoid core member,

the actuator-locking means comprises a keeper of magnetic material that is movable into and out of abutting engagement with a laterally-protruding portion of the solenoid core member,

said keeper is mounted in such relationship with the solenoid core member on a yoke of magnetic material that is secured to and provides a chassis for the solenoid core member and wire coil, and

said yoke-chassis being so structured that magnetic flux generated by the energized solenoid is conducted by said yoke to the magnetic keeper and produces a magnetic field that retracts the keeper from abutting engagement with the solenoid core member when the solenoid is energized and thus releases the solenoid core member and actuator from locked NO-TRIP position.

4,710,740

ELECTROMAGNETIC OPERATOR FOR A CONTACTOR WITH IMPROVED SHOCK PAD

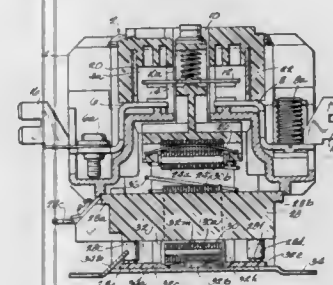
William G. Dennison, Cedarburg, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 20, 1987, Ser. No. 4,522

Int. Cl.⁴ H01F 7/12

U.S. Cl. 335—248

10 Claims



1. An electromagnetic operator for a contactor or the like having a two-part housing, a magnetic armature movably mounted in one part of said housing, a magnetic core having a plurality of pole pieces opposite said armature joined by a yoke portion and positioned in the other part of said housing, a coil encased in plastic molding material to provide a molded coil surrounding one of said pole pieces, and means clamping said two housing parts together whereby one of said housing parts forces the molded coil against the other housing part and supports said magnetic core between said one housing part and said molded coil, characterized by:

a shock pad taking up tolerances and confining said molded coil against movement relative to said housing while allowing limited radial rocking movement of said magnetic core so as to enable said armature to seat fully against said pole pieces upon energization of said coil comprising:

a resilient generally flat portion substantially coextensive with said magnetic core having at its center a shallow resilient spherical segment bump between said magnetic core and said other part of said housing allowing said limited radial rocking movement of said magnetic core; resilient means extending up from opposite sides of said flat portion and over said yoke portion of said magnetic core between said yoke portion and said molded coil to allow

said limited radial rocking movement of said magnetic core relative to said molded coil;

and a plurality of resilient supporting pads extending laterally in opposite directions from said flat portion providing supports between said molded coil and said other part of said housing;

and said molded coil having a plurality of legs pressed against said supporting pads by said clamping means to take up tolerances and to hold said molded coil relatively immovable with respect to said housing while at the same time enabling said clamping means to act through said spherical segment and said magnetic core to apply the desired lesser pressure on said resilient strip means between said coil and said magnetic core to allow said limited radial rocking movement of said magnetic core.

4,710,741

ELECTROMAGNET ARRANGEMENTS FOR PRODUCING A MAGNETIC FIELD OF HIGH HOMOGENEITY

John V. M. McGinley, London, England, assignor to Picker International Ltd., Wembley, England

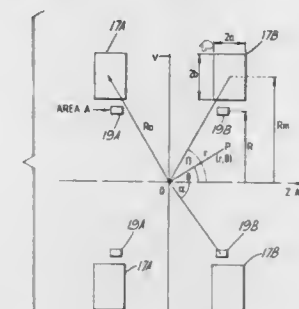
Filed Dec. 3, 1986, Ser. No. 937,215

Claims priority, application United Kingdom, Dec. 9, 1985, 8530295

Int. Cl.⁴ H01F 7/06

U.S. Cl. 335—296

12 Claims



1. An electromagnet arrangement comprising a single pair of substantially identical annular coils disposed coaxially in spaced relationship, and a pair of annular members of ferromagnetic material disposed coaxially with the coils symmetrically with respect to a plane which perpendicularly intersects the axis of the coils at a position centrally between the coils, the dimensions and relative positions of the coils and rings being such that, with the coils carrying substantially equal currents, at least two of the spherical harmonic field coefficients are substantially eliminated.

4,710,742

ELECTRIC/GAS OVEN THERMOSTAT

Craig M. Cors, Aurora, and Joseph C. Kadlubowski, Willowbrook, both of Ill., assignors to Harper-Wyman Company, Lisle, Ill.

Filed May 29, 1986, Ser. No. 867,932

Int. Cl.⁴ H01H 37/12

U.S. Cl. 337—323

9 Claims

1. A thermostat for use with an oven of an electric or gas range comprising:

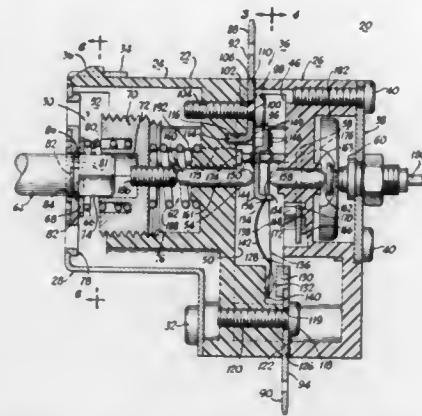
a first electrical contact;

a second electrical contact;

actuating means for opening and closing an electrical path between said first and second electrical contacts, said actuating means including a spring arm having a fixed end coupled to said first electrical contact and a free end moved between a contacting position and a noncontacting position with said second electrical contact;

manually operable means movable to an OFF position and to

a plurality of ON positions for selecting an oven operating temperature;
said spring arm being operatively coupled to said manually operable means for moving from the noncontacting position to the contacting position with said second electrical contact when said manually operable means is moved from the OFF position;
temperature responsive means movable in response to changes in oven temperature;



said spring arm being operatively coupled to said temperature responsive means for moving from and to the contacting position upon increases and decreases in the oven temperature relative to the selected oven operating temperature; and
calibration means separately arranged and spaced from said manually operable means and being operatively coupled to said actuating means to determining the position of said actuating means relative to said temperature responsive means.

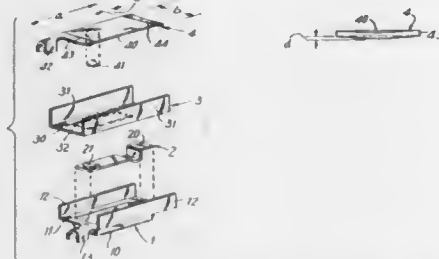
4,710,743

THERMOSTATIC DEVICE WITH LEAK TIGHT CASING
Omar R. Givler, North Canton, Ohio, assignor to Portage Electric Products, Inc., North Canton, Ohio

Continuation-in-part of Ser. No. 804,492, Dec. 4, 1985, abandoned. This application Dec. 16, 1986, Ser. No. 942,621
Int. Cl.⁴ H01H 37/04, 37/52

U.S. Cl. 337—380

4 Claims



1. In a thermostatic device having a cup-shaped base, said base being provided with a ledge around the opening of the cup in said cup-shaped base; and insulating member adapted to lie against the ledge provided on said base; and a lid to lie above the insulating member; means being provided on said ledge for crimping said base, said insulating member, and said lid together, said lid being crimped to said ledge of said base, through said insulating member, by action of said means on said ledge for crimping said base, said insulating member, and said lid together; the improvement which comprises a stepped-down area in said lid, only the center of said stepped-down

area lying against said insulating member prior to crimping said base, said insulating member, and said lid together.

4,710,744

PRESSURE TRANSDUCER PACKAGE

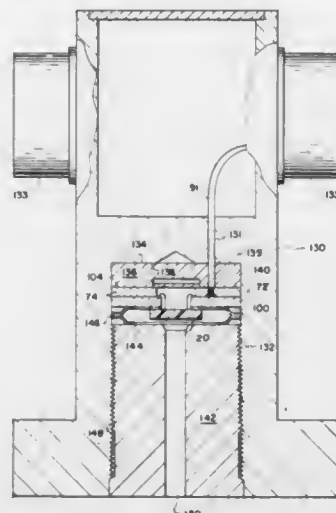
David B. Wamstad, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 8, 1985, Ser. No. 721,105

Int. Cl.⁴ G01L 1/22

U.S. Cl. 338—4

19 Claims



1. A pressure transducer unit, the unit comprising:
 - a housing having a chamber located within the housing bounded by surfaces within the housing except for an aperture in the housing which permits access to the chamber from outside the housing, the housing comprising a body with an interior opening as a basis for the chamber, a first end of the chamber being a surface within the body, and further comprising a plug means plugging part of the opening for hermetically sealing the chamber except at the aperture, the plug means having a surface forming a second end of the chamber;
 - a pressure transducer comprising a pressure sensing die mounted on a support member, the support member having first and second end surfaces, the pressure transducer located in the chamber;
 - an interface plate having first and second end surfaces, the first end surface of the interface plate adjacent the first end of the chamber, the second end surface of the interface plate adjacent the first support member end surface; and
 - a compressive ring located between the second support member end surface and the surface of the plug means whereby the interface plate, support member, and compressive ring together are compressed between the first end and the second end of the chamber.

4,710,745

VEHICLE WARNING SYSTEM

Luis del Rosario, 1636 N. Verdugo Rd., Apt. #304, Glendale, Calif. 91208

Filed Aug. 24, 1982, Ser. No. 410,940

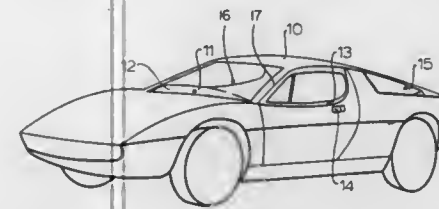
Int. Cl.⁴ B60R 25/00, 25/04; B60Q 1/46

U.S. Cl. 340—63

7 Claims

1. An electrical indicator for unattended vehicles including a battery and an ignition switch for starting the vehicle comprising at least one lighted indicator located at a position on a vehicle where it is visible from the exterior of the vehicle by one attempting an unauthorized entry of the vehicle; means for applying power from the battery of the vehicle to cause said indicator to be visibly active; and relay means including back contacts for coupling said power

applying means to the battery of the vehicle and to the ignition switch of the vehicle;
said relay means being operative to disable said power applying means when the ignition switch of the vehicle is ON by opening said back contacts whereby said indicator is operative when the vehicle ignition switch is in an OFF



position and enabling said power applying means via said back contacts of said relay means when said relay means is not operated and is not drawing current;
said electrical indicator being characterized by the absence of any switch required to be operated by the user to make the indicator visibly active or disabled other than the normal usage of the ignition switch.

4,710,746

SEQUENTIAL DECODING DEVICE FOR DECODING SYSTEMATIC CODE

Kaneyasu Shimoda; Tadayoshi Katoh, both of Kawasaki, and Yuzo Ageno, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

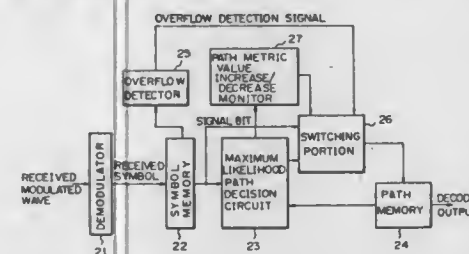
Filed Feb. 6, 1987, Ser. No. 11,537

Claims priority, application Japan, Feb. 7, 1986, 61-023972

Int. Cl.⁴ H03M 13/12

U.S. Cl. 340—347 DD

1 Claim



1. A sequential decoding device for decoding a data expressed by the systematic code having a symbol memory, a maximum likelihood path decision circuit, and a path memory, said device comprising:

an overflow detection circuit for detecting an overflow of said symbol memory;
switching means for supplying signal bit data, as an decoded output, read from said symbol memory directly to said path memory in correspondence with an overflow detection signal from said overflow detection circuit; and
a path metric value increase/decrease monitoring circuit for monitoring the increase/decrease of a path metric value delivered from said maximum likelihood path decision circuit and controlling said switching means in such manner that, when a monotonous increase of said path metric value is detected, the decoded output of said maximum likelihood path decision circuit is supplied to said path memory, instead of the direct supply of said decoded output of said symbol memory to said path memory.

4,710,747

METHOD AND APPARATUS FOR IMPROVING THE ACCURACY AND RESOLUTION OF AN ANALOG-TO-DIGITAL CONVERTER (ADC)

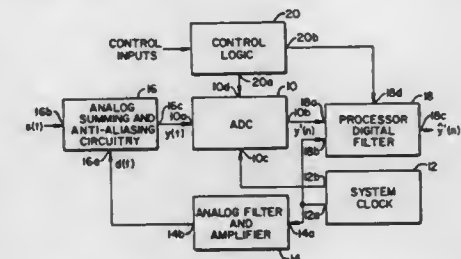
Alex Holland, Mountain View, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 586,902, Mar. 9, 1984, abandoned. This application May 7, 1985, Ser. No. 731,683

Int. Cl.⁴ H03M 1/20

U.S. Cl. 340—347 AD

11 Claims



6. A system for generating a digital representation of an analog test signal, $s(t)$, comprising:
 - an analog to digital converter (ADC) for generating an analog ADC input signal, $y(t)$, with said ADC characterized by a given input dynamic range;
 - means for generating a known dither signal, $d(t)$; where said dither signal is rapidly varying with respect to said test signal and where the amplitude of $d(t)$ substantially covers the given dynamic range of said ADC;
 - means for adding $d(t)$ to $s(t)$ to form said analog ADC input signal, $y(t)$; and
 - means for digitally filtering said m-bit digital signal to attenuate said dither signal.

4,710,748

METHOD AND DEVICE FOR CONVERTING AN ANALOG SIGNAL INTO A PULSE SIGNAL

Louis Champavier, Mouans Sartoux, France, assignor to Vita Center Inc., Panama, Panama

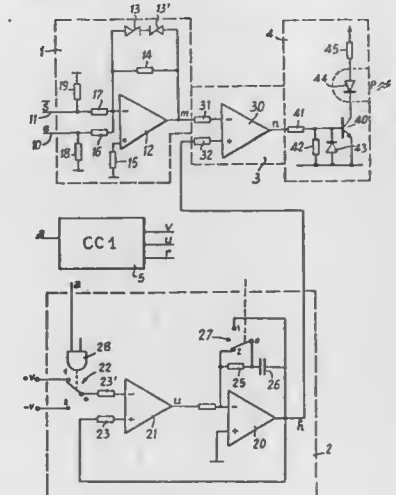
Filed Oct. 18, 1984, Ser. No. 662,261

Claims priority, application France, Jan. 16, 1984, 84 01076

Int. Cl.⁴ H03K 13/00

U.S. Cl. 340—347 AD

29 Claims



1. A transmission system for transmitting an analog signal in closed loop including on its direct loop:
 - a summing device, subtracting the transmitted signal from the signal to be transmitted,
 - a first direct conversion device on the input of which the output signal from the summing device is applied, com-

prising first function generating means for generating a first standard signal, comparison means for comparing said analog signal to said first standard signal, emitting means for emitting a pulse when the comparison means detects the equality between the analog signal and said first standard signal;

- a first reverse conversion device comprising receiving means for receiving the pulses from said first direct conversion device, second function generating means for generating a second standard signal, means for synchronizing said second standard signal with said first standard signal, and means for memorizing the value reached by said second standard signal upon reception of a pulse;
- means for coupling the output from the first direct conversion device to the input of the first reverse conversion device; and
- means for feeding the output from the first reverse conversion device back onto itself.

4,710,749

SIREN WITH REMOTE DRIVER

Howard M. Berke, Madison, and Harold W. Lyons, Deep River, both of Conn., assignors to Whelen Engineering Co., Inc., Chester, Conn.

Continuation of Ser. No. 648,538, Sep. 10, 1984, abandoned. This application Dec. 29, 1986, Ser. No. 946,681

Int. Cl.⁴ G08B 3/00; G10K 7/00

U.S. Cl. 340—405

10 Claims



1. A siren comprising:

- a sound wave generator, said sound wave generator being responsive to an alternating electrical signal and including a movable diaphragm, said sound wave generator further including a passage which converges to a throat, said passage having an exit end through which sound produced by movement of said diaphragm exits said generator;
- speaker means including a horn from which sonic energy delivered to said speaker means is radiated, said horn defining a radiation pattern;
- a sound pipe capable of flexing in any direction without kinking, said sound pipe having a substantially uniform inner diameter with a smooth inner surface, and first and second oppositely disposed ends; and
- first and second adapter means for acoustically coupling the first and second ends of said sound pipe respectively to said generator and speaker means.

4,710,750

FAULT DETECTING INTRUSION DETECTION DEVICE

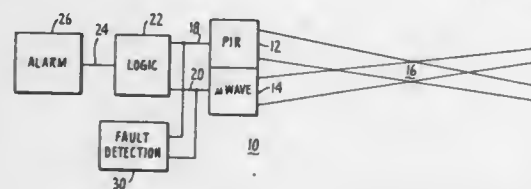
Richard A. Johnson, Pleasanton, Calif., assignor to C & K Systems, Inc., San Jose, Calif.

Filed Aug. 5, 1986, Ser. No. 893,399

Int. Cl.⁴ G08B 19/00, 23/00

U.S. Cl. 340—522

6 Claims



1. In an intrusion detection apparatus of the type having dual sensing means, a first sensing means for generating a first out-

put signal in response to the detection of an intruder, a second sensing means for generating a second output signal in response to the detection of an intruder, and logic means for receiving said first and said second output signals and for generating an alarm in response thereto, wherein the improvement comprising:

- first means for storing the number of first output signals received from said first sensing means;
- second means for storing the number of second output signals received from said second sensing means; and
- logic means for comparing the number of first output signals from said first storing means and the number of second output signals from said second storing means and for generating an output signal indicative of fault in said apparatus, in response to said comparison.

4,710,751

GROUND FAULT MONITOR CIRCUIT

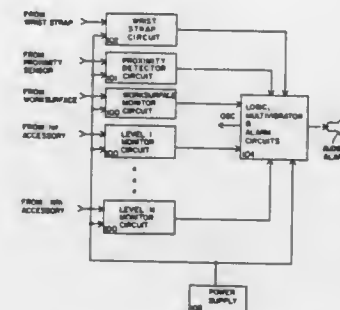
James B. Webster, Santa Ana, Calif., assignor to Environmental Protection Systems, Irvine, Calif.

Filed Apr. 24, 1986, Ser. No. 855,400

Int. Cl.⁴ G08B 19/60

U.S. Cl. 340—522

29 Claims



1. A fault monitoring system comprising,

- a wrist strap monitoring circuit connected to monitor the grounded status of an operator at a workstation;
- a proximity monitoring circuit connected to monitor the presence status of a person in proximity to said workstation;
- at least one surface monitoring circuit connected to monitor the grounded status of a surface related to said workstation;
- logic circuit means connected to each of said wrist strap monitoring circuit, said proximity monitoring circuit and said at least one surface monitoring circuit to receive signals therefrom which signals are representative of the status monitored by the respective monitoring circuit; and
- alarm means connected to be selectively activated by said logic circuit means when one or more of said monitoring circuits produces a signal indicative of a prescribed status condition thereat.

4,710,752

APPARATUS AND METHOD FOR DETECTING A MAGNETIC MARKER

Robert A. Cordery, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 8, 1986, Ser. No. 894,429

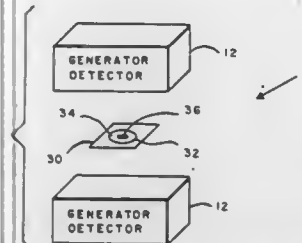
Int. Cl.⁴ G08B 13/24

U.S. Cl. 340—551

32 Claims

1. A system for detecting the presence of a ferromagnetic marker in an interrogation zone, comprising:
- first generating means for generating a first magnetic field in the interrogation zone at a first frequency,
 - second generating means for generating a second magnetic field in the interrogation zone at a second frequency,

said second frequency having a value less than approximately one-fifth of said first frequency and



means for detecting amplitude modulated signals produced by a magnetic marker present in the interrogation zone when said first and second magnetic field generating means are enabled.

4,710,753

SECURITY SYSTEM TRANSMISSION LINE

Brian G. Rich, Nepean; John W. Patchell, Carleton Place, and R. Keith Harman, Kanata, all of Canada, assignors to Senstar Security Systems Corporation, Ontario, Canada

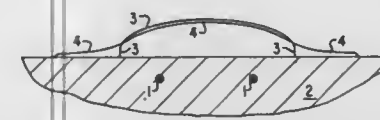
Filed Feb. 8, 1985, Ser. No. 699,742

Claims priority, application Canada, Mar. 22, 1984, 450243

Int. Cl.⁴ G08B 13/26

U.S. Cl. 340—561

36 Claims



1. A leaky cable intrusion detection system comprising a pair of spaced, parallel, buried, leaky coaxial cables, means for applying a radio frequency signal to one of the cables, whereby an electromagnetic field outside said one cable is established, means for receiving a radio frequency signal from the field from the other of the cables whereby disturbances in said field can be detected, the cables being spaced apart a distance such that they are intermediately coupled, being coupled to a greater degree than loosely coupled and to a lesser degree than tightly coupled, wherein the cables are buried in a subsoil material of varying conductivity and dielectric constant, a longitudinal shield buried with the cables located along, below and spaced from the cables, the distance between the cables and the shield below the cables decreasing with decreasing conductivity and/or dielectric constant of said material, and increasing with increasing conductivity and/or dielectric constant said material, whereby variations in said electromagnetic field which may be caused by at least said varying conductivity and dielectric constant, are substantially reduced.

4,710,754

MAGNETIC MARKER HAVING SWITCHING SECTION FOR USE IN ELECTRONIC ARTICLE SURVEILLANCE SYSTEMS

Samuel Montean, Blaine, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 19, 1986, Ser. No. 909,340

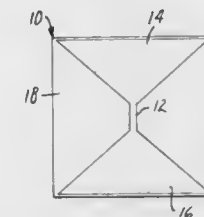
Int. Cl.⁴ G08B 13/18

U.S. Cl. 340—572

28 Claims

1. A marker adapted for use in an electronic article surveillance system said marker having a substantially sheet-like configuration and comprising a magnetic construction having at least one switching section and flux collectors proximate to each end of each switching section, wherein said construction comprises pieces of magnetic material in which the overall length and width respectively are not greater than 3.2 cm and

- (a) wherein each of said switching sections
 - (i) is formed of a piece of low coercive force, high permeability material;
 - (ii) has a minimum width at which the cross-sectional area is in the range of 0.003–0.03 mm², and
 - (iii) has a length normal to the minimum width not greater than twenty times that width and less than 2.0 cm, the terminal ends of said length being further defined by



- points at which the width parallel to said minimum width is no longer less than five times the minimum width, and
- (b) wherein each of said flux collectors
 - (i) is formed of co-planar sections of sheet-like material having a low coercive force and high permeability, and
 - (ii) has a width not less than ten times the minimum width of any switching section.

4,710,755

ALARM FOR MILK COOLER

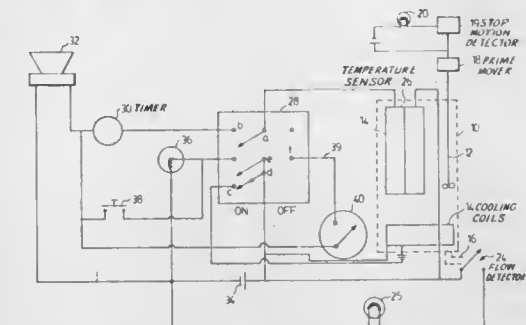
Robert A. Gurney, R.R.#7, Brighton, Ontario, Canada K0K 1H0

Filed May 12, 1986, Ser. No. 861,972

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340—585

11 Claims



4,710,756

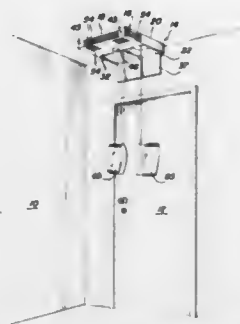
COMBINATION SMOKE DETECTOR AND DEVICE FOR CONTAINING AIR

Dennis D. Thornburg, 6035 Alfredo Ave., Chino, Calif. 91710, and Richard R. Parentean, 23542 Belmar, Laguna Niguel, Calif. 92677

Filed Jan. 7, 1985, Ser. No. 689,068
Int. Cl.⁴ G08B 17/10

U.S. Cl. 340—628

9 Claims



1. A smoke detector in combination with a bag for containing ambient air, comprising:
 - a housing adapted to be mounted to a ceiling or a wall of a room adjacent the exit door;
 - a smoke-detector unit mounted within said housing to detect smoke within said room;
 - said housing having at least one storage compartment;
 - a hinged panel covering said storage compartment;
 - an air bag folded and stored in said storage compartment; and
 - releasable latching means adapted to release said hinged panel to an open position, whereby said air bag for containing ambient air is freed from said storage chamber when said smoke detector is activated;
- wherein said bag defines an air chamber having an opening therein, whereby the head of the wearer is received in said chamber, and wherein said air bag includes means for securing said bag to said wearer's body;
- wherein said securing means comprises a pair of tie-down straps secured at one end to opposite sides of said air bag, the free ends thereof being tied about the body of said wearer when in use;
- and wherein said air bag includes means for attaching one of said tie-down straps to said storage compartment, so as to allow said bag to drop down and hang from said storage compartment, wherein the wearer thereof can remove said bag from said housing.

4,710,757

PLANTER MONITOR SYSTEM

Wayne C. Haase, 2764 Doverton Sq., Mountain View, Calif. 94040

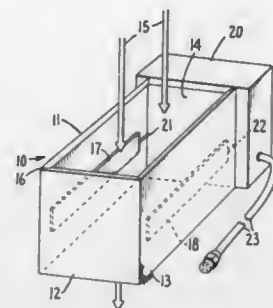
Filed Feb. 14, 1984, Ser. No. 580,108
Int. Cl.⁴ G08B 21/00

U.S. Cl. 340—684

12 Claims

1. A system for monitoring small discrete particles having a high dielectric constant, such as seeds, that pass along a path, comprising
 - a sensor having at least one transmitter and one receiver electrode means spaced from one another and electrically exposed to said path passing between them;
 - transmitter circuit means applying to said transmitter electrode means a constant electrical signal to produce an electrical sensing field between said electrode means transverse to said path;
 - receiver circuit means detecting a change in electrical energy received by said receiver electrode means from said transmitter electrode means in response to a particle passing on said path in proximity to said electrode means; and
 - a grounded conductive shield extending further along said

path than the electrode means sufficiently for both isolating said electrode means from the external environment



and for confining said transverse electric sensing field to a short length of said path between electrodes.

4,710,758

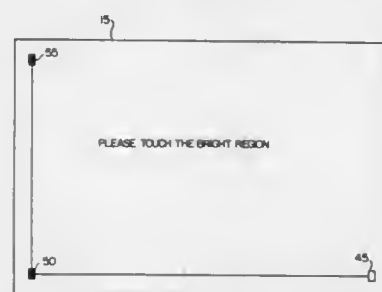
AUTOMATIC TOUCH SCREEN CALIBRATION METHOD

James M. Massler, Bethel Park, and Mark E. Swartz, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1985, Ser. No. 727,966
Int. Cl.⁴ G09G 3/00

U.S. Cl. 340—712

17 Claims



1. An automatic calibration method for a touch screen used in conjunction with a display during interactive sessions, where the touch screen and the display have first and second sets of axes and the first and second sets of axes are assumed to substantially overlay, respectively, said method comprising the steps of:

- (a) displaying, prior to each of the interactive sessions, a first point on the display;
- (b) obtaining first coordinates of a first touch on the touch screen at approximately the first point; and
- (c) generating terms in a translation matrix for translating coordinates of the first touch into coordinates.

4,710,759

INTERACTIVE CRT WITH TOUCH LEVEL SET

James Fitzgibbon, Lombard, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 582,505, Feb. 22, 1984, abandoned.
This application Apr. 13, 1987, Ser. No. 37,079
Int. Cl.⁴ G09G 1/00

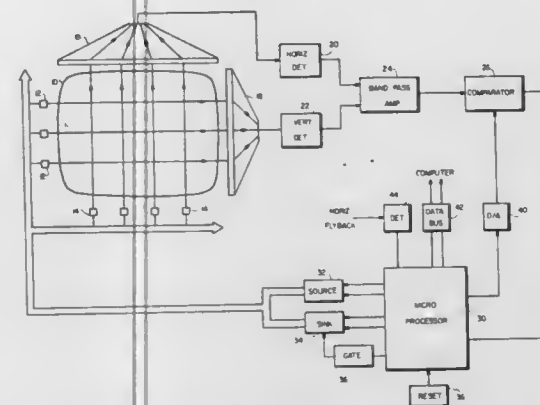
U.S. Cl. 340—712

5 Claims

1. In a touch control panel having a plurality of crossing energy paths and means for repetitively testing the energy levels in said paths against stored test levels for said paths to determine if an interruption, corresponding to a touch, has occurred, a method of updating the stored test levels for said paths comprising the steps of:
 - energizing each of said paths in sequence;

comparing the detected energy level in each of said paths with a nominal threshold level;

- (1) if the test indicates energy is detected, testing again with a maximum threshold level;
- (2) if at a maximum energy level, storing the maximum threshold level as the updated test level for that energy path;
- (3) if not at a maximum energy level, increasing the nominal threshold level and testing again;



- (4) continuing testing and increasing the threshold level until no energy is detected, and storing the last threshold level as the updated test level for that path;
- (1) if the test indicates no energy detected, testing for a minimum threshold level;
 - (2) if at a minimum threshold level, storing the minimum threshold level as the updated test level for that path;
 - (3) if the threshold level is not at a minimum, decreasing the threshold level by a predetermined amount; and
 - (4) storing the decreased threshold level as the updated test level for that path.

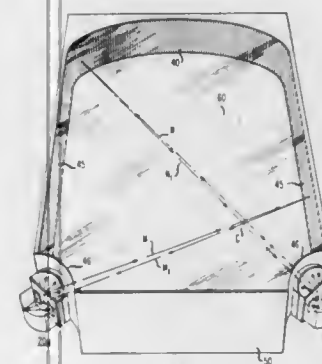
4,710,760

PHOTOELASTIC TOUCH-SENSITIVE SCREEN
Leonard R. Kasday, East Windsor, N.J., assignor to American Telephone and Telegraph Company, AT&T Information Systems Inc., Murray Hill, N.J.

Filed Mar. 7, 1985, Ser. No. 709,554
Int. Cl.⁴ G09G 1/00

U.S. Cl. 340—712

20 Claims



1. A touch-sensitive device comprising
 - a screen,
 - means for generating and directing polarized signals having at least a predetermined polarization into said screen, said screen causing changes in the polarization of ones of said polarized signals which pass through a point on said screen at which a force is applied, and
 - means responsive to said ones of said signals having changes

in said polarization for determining the location of said point at which said force is applied on said screen.

4,710,761

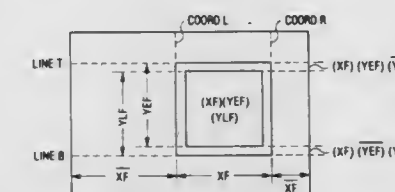
WINDOW BORDER GENERATION IN A BITMAPMED GRAPHICS WORKSTATION

Rajan N. Kapur, Summit, and Edward S. Szurkowski, Maplewood, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 9, 1985, Ser. No. 753,270
Int. Cl.⁴ G09G 1/16

U.S. Cl. 340—721

15 Claims



1. A bitmapped graphics workstation comprising
 - a host processor,
 - a visual output display device having a raster scanned display screen,
 - means for defining a plurality of independent window areas on the screen,
 - a plurality of bitmap memories each having contiguous storage words addressable by the host processor for storing display data associated with a different said window,
 - means responsive to the window defining means for identifying when the screen raster enters and exits one of the windows,
 - means activated by the identifying means for retrieving display data from one of the bitmap memories associated with the one window,
 - means for transmitting the retrieved display data to the display device in synchronism with the raster, and
 - means responsive to the detection of entry and exit of the raster in the window by the identifying means for substituting for a predetermined number of the data signals from the one bitmap signals of a predetermined state for generating the window border.

4,710,762

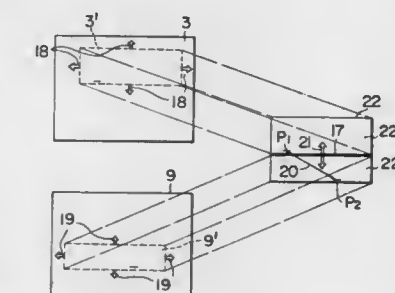
DISPLAY SCREEN CONTROL SYSTEM

Kimitoshi Yamada, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 22, 1983, Ser. No. 554,333
Claims priority, application Japan, Nov. 22, 1982, 57-203623
Int. Cl.⁴ G06K 15/20

U.S. Cl. 340—721

3 Claims



1. A display screen control system
 - capable of carrying out simultaneously a plurality of functions of a terminal connected to a central processing unit,
 - said system comprising:

first memory means for storing data to be processed by a first function;
 second memory means for storing data to be processed by a second function;
 third memory means for storing parameters which specify a first data area which has a part of the data stored in said first memory means, a second data area which has a part of the data stored in said second memory means, and boundary information for the display of said data;
 input means operated by an operator for inputting data and commands for changing the contents of said third memory means;
 control means for changing the contents of said third memory means in response to commands from said input means;
 a single display device having a display screen for displaying data; and
 display control means for taking out the data of said first and second data areas from said first and second memory means and for supplying said data to said single display device for simultaneous display in first and second fields on said display screen in accordance with the parameters in said third memory means;
 wherein data which corresponds to a plurality of different works are displayed simultaneously on respective areas of the same display screen; and wherein said input means includes a keyboard having an alteration key for designating alteration of the boundary between said first field and said second field, and said control means comprises means for altering the parameters in said third memory means, when said alteration key is actuated, to shift the boundary of said first field and said second field on the display screen of said display device.

4,710,763

METHOD FOR GENERATING AND DISPLAYING TREE STRUCTURES IN A LIMITED DISPLAY AREA

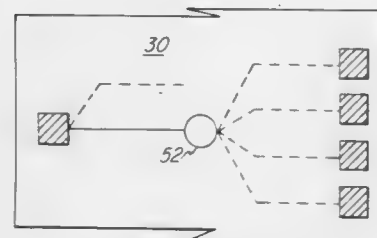
David W. Franke, and Carrol R. Hall, both of Austin, Tex., assignors to Texas Instruments Incorporated

Filed Oct. 19, 1984, Ser. No. 663,005

Int. Cl.⁴ G09G 1/14

U.S. Cl. 340—723

22 Claims



1. A method for providing a display of a tree structure which includes a plurality of nodes interconnected by tree branches, said method comprising the steps of:

- selecting a portion of said tree structure to be displayed,
- scaling the geometry of said portion in a manner different than that which would be used if the entire tree were to be displayed, and
- displaying the scaled portion on a medium suitable for interpretation.

4,710,764

DEVICE FOR OBTAINING CONTINUOUS PLOTS ON THE SCREEN OF A DISPLAY CONSOLE CONTROLLED BY A GRAPHIC PROCESSOR

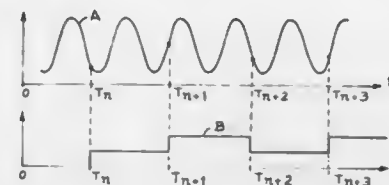
Luc P. Van Cang, Savigny Sur Orge, France, assignor to Thomson Video Equipment, Gennevilliers, France

Filed Apr. 15, 1985, Ser. No. 723,276

Claims priority, application France, Apr. 17, 1984, 8406053 Int. Cl.⁴ G09G 1/16

U.S. Cl. 340—728

7 Claims



1. A device for obtaining a continuous line between points on a plot on a screen of a graphic image television display controlled by a graphic processor, the points being ordered in the form of a matrix of fixed points on the screen said device comprising:

- a graphic memory for storing all the points of the plot in binary form
- an attribute memory for containing the attributes of each of the points
- an interpolation circuit controlled by the graphic processor from instructions fed into the processor from a keyboard for entering a value PN of the attributes of consecutive points on the plot on either side of the point to be modified, said interpolation circuit comprising a memory for storing a table for calculating the attributes of the intermediate points between consecutive points of the plot the table of the interpolation circuit being addressed at a first input by the pre-existing attribute PA of the point to be modified found in the attribute memory, at a second input by the said value PN and at a third input by an interpolation value F equal to the fractional part of the position of the intermediate point to be modified between said consecutive points on the plot, each position of the table containing an attribute value PM confirming the relationship

$$PM = F \cdot PA + (1 - F) \cdot PN$$

the value PM obtained being transferred into the attribute memory for updating the contents of the position corresponding to the address of the modified point.

4,710,765

LUMINESCENT DISPLAY DEVICE

Akio Ohkoshi, Tokyo; Koji Tsuruta, Kanagawa; Hideaki Nakagawa, Tokyo, and Satoshi Shimada, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,608

Claims priority, application Japan, Jul. 30, 1983, 58-140141; Jul. 30, 1983, 58-140143

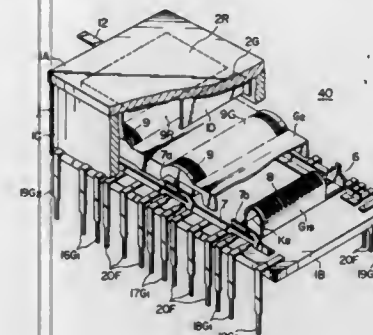
Int. Cl.⁴ G09G 3/00

U.S. Cl. 340—781

11 Claims

1. A luminescent display device, comprising:
 - a glass envelope having front panel, side wall and rear plate;
 - a plurality of luminescent segments formed on an inner surface of the front panel with a conductive layer coated thereon and positioned to form red, green, and blue displays in a line;
 - a separator electrode formed of partitions extending from said front panel inner surface towards said rear plate and forming a frame around each segment;
 - a respective cathode adjacent to the rear panel for each of the luminescent segments;

a respective control grid electrode arranged between a respective segment and a respective cathode for each respective cathode and segment;
 a common accelerating electrode arranged between said segments and said control grid electrodes; and
 the control grid electrodes, common accelerating electrode, luminescent segment, and cathodes being positioned and



dimensioned such that with an anode voltage applied to the separator electrode and said segments, a voltage applied to the accelerating electrode, and a voltage selectively applied to one or more of said control grid electrodes, electron emission from the respective cathodes is controlled so that the respective segment is selectively luminescent for display.

4,710,766

DEVICE FOR DISPLAYING SYMBOLS BY MEANS OF A LIQUID CRYSTAL MATRIX

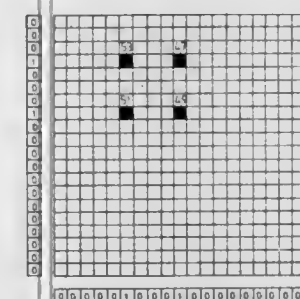
Marcel Dubois, Paris, and Pierre Fagard, Montigny le Bretonneux, both of France, assignors to Societe Francaise d'Equipements pour la Navigation Aeronautique, Velizy Villacoublay, France

Filed Aug. 21, 1984, Ser. No. 642,815

Claims priority, application France, Aug. 25, 1983, 83 13698 Int. Cl.⁴ G09G 3/36

U.S. Cl. 340—784

9 Claims



1. A device for displaying symbols forming a complete image on a liquid crystal display having a matrix formed from a plurality of lines and a plurality of columns, the device comprising:

- a computer having a random access memory for storing and developing in succession a plurality of elementary images derived from the complete image, each of said elementary images being represented by a first assembly of bits equal in number to the number of lines of the matrix, each of said bits in said first assembly having either a first value or a second value and being associated with a different one of the lines of the matrix, and a second assembly of bits equal in number to the number of columns of the matrix, each of said bits in said second assembly having either said first value or said second value and being associated with a different one of the columns of the matrix at least one of

said subimages having at least two bits in each said first and second assemblies of bits of each said first value and said second value;

means for refreshing said random access memory during successive periods; and

a control circuit connected to said random access memory and to the lines and columns of the matrix for receiving in succession from said random access memory said first assembly of bits and said second assembly of bits corresponding to each of said elementary images and for simultaneously applying to each of the lines of the liquid crystal display either a first voltage level or a second voltage level in accordance with said associated bits in said received first assembly of bits having said first value or said second value, respectively, and to each of the columns of the liquid crystal display either a third voltage level or a fourth voltage level in accordance with said associated bits in said received second assembly of bits having said first value or said second value, respectively, to control the liquid crystal display to display the complete image as a result of the successive display of the elementary images derived therefrom.

4,710,767

METHOD AND APPARATUS FOR DISPLAYING MULTIPLE IMAGES IN OVERLAPPING WINDOWS

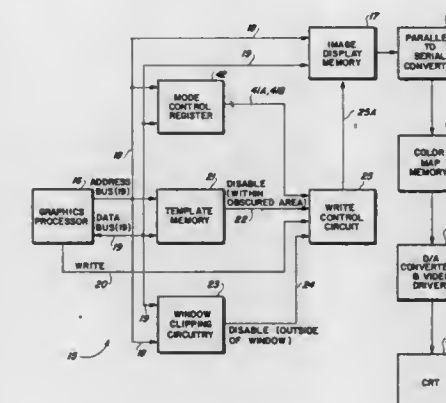
James R. Sciacero, Scottsdale, and Douglas L. Pardee, Mesa, both of Ariz., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 19, 1985, Ser. No. 757,126

Int. Cl.⁴ G09G 1/16

U.S. Cl. 340—799

34 Claims



1. A display system including a display screen and an image memory, the display system comprising in combination:

- first means for determining the addresses of pixels of a first group that are located within a first window of the display screen area, within which first window a portion of a first image is to be displayed, and second means for determining the addresses of pixels of a second group that are located within a second window of the display screen area, within which second window a portion of a second image of higher priority than the first image is to be displayed, the second window obscuring an area of the first window;
- means for storing a bit mask, the bit mask constituting a plurality of bits that are respectively addressable by a plurality of the addresses of pixels of the first group;
- means for writing the bits of the bit mask into locations of the bit mask storing means defined by the addresses of the pixels of the first group;
- means for transmitting pixel data and pixel addresses of pixels of the first group to the image memory, and concurrently transmitting those pixel addresses to the bit mask storing means;

(e) means for outputting a bit signal from the bit mask storing means in response to the address presently being transmitted to produce a first write disable signal if the pixel bears a predetermined relationship to the first group and the obscured area; and

(f) means for disabling the pixel from being written into the image memory in response to the first write disable signal.

4,710,768

LIQUID CRYSTAL DISPLAY WITH SWITCHING TRANSISTOR FOR EACH PIXEL

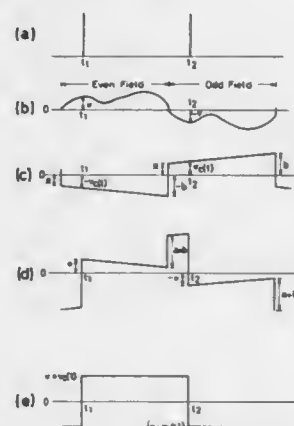
Makoto Takeda, Tenri; Keisaku Nonomura, Nara, and Kunihiro Yamamoto, Kitakatsuragi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 11, 1984, Ser. No. 660,005

Claims priority, application Japan, Oct. 13, 1983, 58-192076
Int. Cl.⁴ G09G 3/00

U.S. Cl. 340—805

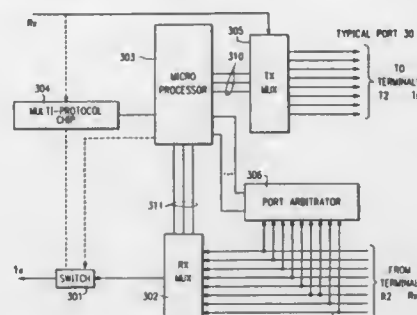
3 Claims



1. A liquid crystal display device comprising:

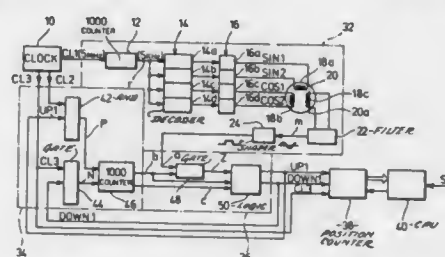
- a liquid crystal display including,
 - row and column electrodes formed as a matrix array on a first substrate,
 - a switching transistor formed at the intersection of each said row and column electrode,
 - a display picture element electrode connected to each said switching transistor defining a display element,
 - an opposed electrode formed on a second substrate at a position opposite from each said display picture element electrode, and
 - a liquid crystal layer disposed between said display picture element electrodes and said opposed electrodes; and
- signal processing means connected to said liquid crystal display for providing a video signal, having fields of alternating positive/negative polarity to said column electrodes and for sequentially applying scan pulses to said row electrodes; and
- opposed electrode signal generator means for applying an alternating predetermined voltage in synchronism with the fields of alternating polarity of said video signal but of opposite voltage polarity thereto to said opposed electrodes to produce a sum voltage of said video signal and said alternating predetermined voltage across each said display element, said sum voltage applied to each said display element having a voltage greater than either said video signal supplied to that said display element or said alternating predetermined voltage.

4,710,769
TRANSMIT-SECURE NON-BLOCKING
CIRCUIT-SWITCHED LOCAL AREA NETWORK
Lee G. Friedman, Croton-on-Hudson; Brent T. Halpern, Katonah; Lee W. Hoevel, Yorktown Heights, and Yannick J. Thefaine, Beacon, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.
Filed Dec. 30, 1985, Ser. No. 815,358
Int. Cl.⁴ H04Q 11/04
U.S. Cl. 340—825.030 9 Claims



1. A non-blocking, transmit secure switching system for connecting any one of a plurality of n transceivers to any other of said plurality of transceivers, wherein n is an integer greater than 1,
 - a plurality of dedicated bus lines, a different pair of dedicated bus lines for each different pair of said transceivers,
 - a port associated with each transceiver, each port including $2(n-1)$ terminals, each coupled to a different one of said bus lines, and
 - each port further including switching means for connecting said associated transceiver with at least a selected one of said terminals.

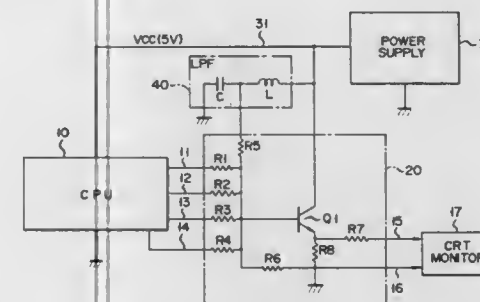
4,710,770
PHASE MODULATION TYPE DIGITAL POSITION DETECTOR
Yoshitami Hakata; Masanori Wakuda, and Kimio Suzuki, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 22, 1984, Ser. No. 592,296
Claims priority, application Japan, Mar. 24, 1983, 58-49283;
Dec. 22, 1983, 58-242859
Int. Cl.⁴ G08C 19/12
U.S. Cl. 340—870.18 56 Claims



1. An apparatus for determining a physical quantity, comprising:
 - first means for generating a first signal the phase of which is modulated corresponding to a variation of said physical quantity;
 - second means for generating a second signal the phase of which follows that of said first signal;
 - third means for generating a third signal corresponding to the time intervals during which differences in phase exist between the first and the second signal; and
 - fourth means comprising storing means for storing said third

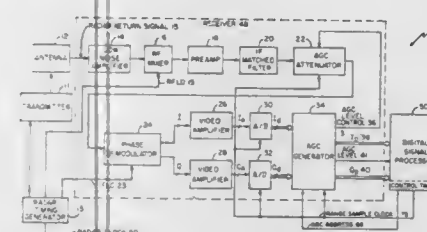
signal in accumulation, said second means controlling, in response to said third signal, the degree by which the second signal follows the first signal.

4,710,771
COMPUTER IMAGE DISPLAY APPARATUS
Haruhiko Banno, and Shigeo Yatagai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 14, 1984, Ser. No. 620,485
Claims priority, application Japan, Jun. 22, 1983, 58-112162
Int. Cl.⁴ G09G 1/14
U.S. Cl. 340—811 4 Claims



1. A computer image display apparatus comprising:
 - processing means for performing predetermined digital processing of data;
 - displaying means, compatible with said processing means, for displaying data processed by said processing means;
 - a composite video interface for generating horizontal and vertical synchronizing signals;
 - power supply means for providing electric power to said processing means and said composite video interface;
 - a power supply line interconnecting said power supply means to said processing means and to said composite video interface for conducting said electrical power from said power supply means to said processing means and said composite video interface; and
 - filter means, operatively disposed in said power supply line between said power supply means and said composite video interface, for eliminating switching noise in said electric power at approximately the same frequency as the frequency of said horizontal synchronizing signal, said electric power causing said composite video interface to be electrically energized, thereby preventing said switching noise from being displayed on said displaying means.

4,710,772
LOG MAGNITUDE PULSE INTERFERENCE DETECTION FOR A RADAR SYSTEM
Robert H. Cantwell, Sudbury; William K. Marksteiner, Boston, and V. Gregers Hansen, Framingham, all of Mass., assignors to Raytheon Company, Lexington, Mass.
Filed Dec. 5, 1985, Ser. No. 804,946
Int. Cl.⁴ G01S 7/34
U.S. Cl. 342—92 27 Claims

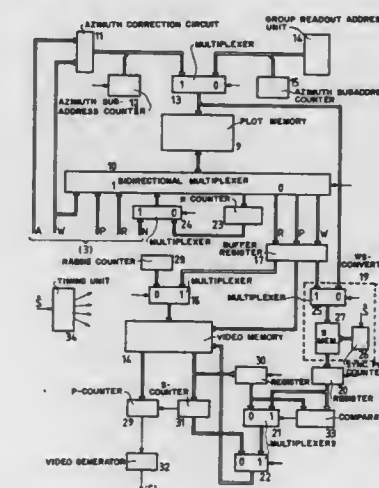


1. In a radar system wherein received signals having amplitudes which may vary within a wide range of possible ampli-

tudes are processed using automatic gain control (AGC), a pulse interference detection apparatus comprising:

- means for converting a fixed point data representation of an in-phase (I) component and a quadrature (Q) component for each of said received signals to a floating point data representation having a mantissa and an exponent, said mantissa having at least one or more bits based on desired accuracy;
- means coupled to said converting means and in response to an AGC level word for generating a log magnitude value for each of said received signals; and
- means coupled to said log magnitude generating means for detecting a pulse of interference to one of said received signals in a sweep $N-1$ at range M based on an examination of said log magnitude value of adjacent sweeps N and $N-2$ at said range M .

4,710,773
DATA CONVERTER FOR A PULSE RADAR APPARATUS
Jouke Gietema, and Bernard H. M. Oude Elberink, both of Oldenzaal, Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands
Continuation of Ser. No. 508,219, Jun. 27, 1983. This application
Mar. 6, 1987, Ser. No. 22,503
Claims priority, application Netherlands, Jul. 9, 1982, 8202784
Int. Cl.⁴ G01S 13/72
U.S. Cl. 342—185 8 Claims



1. A data converter for a pulse radar apparatus including:
 - (a) a transmitter/receiver unit for producing video signals representing target information received by an antenna;
 - (b) video processing means electrically connected to the transmitter/receiver unit and including a video extractor for deriving digitized target plotting data from the video signals, and a plot processor for deriving track positions A , R indicative of the target centroid azimuth position and the target range, respectively, and associated digital data N indicative of the number of antenna revolutions for which the track of a target is to be displayed from the plotting data obtained from consecutive antenna revolutions; and
 - (c) a display system electrically connected to the transmitter/receiver unit and to the video processing means for displaying both the video signals and the track positions and associated digital data;
- said data converter comprising an output electrically connected to the display system, input means electrically connected to the video processing means for receiving said track positions and associated digital data, a first memory, a second memory, address means for effecting writing of the data received at said input means into and

reading said data from said memories, and timing means for controlling operation of the address means, said address means effecting application of data from the second memory to the display system in such an order that the track followed within said predetermined number of antenna revolutions by a target displayed in real time is simultaneously displayed in synchronism with the radar sweeps;

said data converter being characterized in that: the input means is adapted to receive from the video processing means digital data indicative of the width W of a target and the length P of a received echo pulse, the address means comprises:

- (i) first address means arranged to effect the storage of the quantities R, P, W and N in the first memory locations depending on the azimuth values $A - \frac{1}{4}W$ associated with said data;
 - (ii) second address means arranged to effect reading from the storage locations of the first memory in a sequence synchronized with the radar sweeps and, at substantially the same time, to effect the writing of the quantities P and W read from the first memory into the second memory at locations depending on the range values R associated with said quantities;
 - (iii) third address means arranged to effect at each radar sweep the reading of the storage locations of the second memory as a function of range;
- register means is provided for receiving the P-values from the second memory during a number of sweeps determined by the associated W values; and video signal generator means is provided for converting the P-values from the register means to video signals for application to the display system.

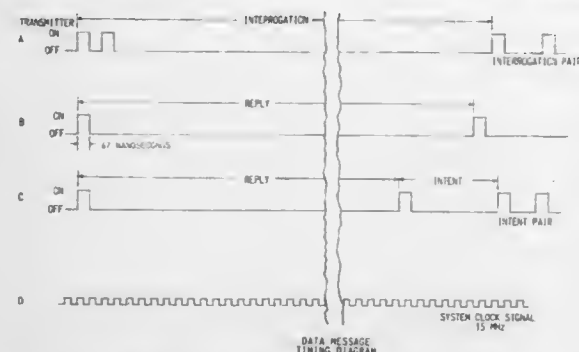
4,710,774

AIRCRAFT COLLISION AVOIDANCE SYSTEM
Edmond R. Gunny, 7612 Alverstone Ave., Los Angeles, Calif. 90045

Filed Feb. 18, 1986, Ser. No. 830,629
Int. Cl.⁴ G01S 3/02

U.S. Cl. 342—455

39 Claims



1. An aircraft collision avoidance system in which a plurality of aircraft are equipped with radio communication systems, each such communication system comprising: message receiving and transmitting means; data processing means coupled to the transmitting means for generating plural-data-content interrogation messages in accordance with a first selected format and for generating reply messages in accordance with a second selected format; said data processing means further including means for decoding a received interrogation message according to said first format and means for initiating generation of a reply message thereto in said second format if and only if the data decoded from said received interrogation message indicates proximity of the interrogating aircraft to the receiving aircraft within preselected limits; wherein said first and second formats comprise brief initiation and termination pulses spaced apart by a time dura-

tion of silence corresponding to the data content of the message.

4,710,775

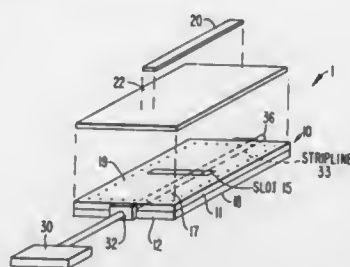
PARASITICALLY COUPLED, COMPLEMENTARY SLOT-DIPOLE ANTENNA ELEMENT

Richard J. Coe, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1985, Ser. No. 781,650
Int. Cl.⁴ H01Q 21/00

U.S. Cl. 343—727

32 Claims



1. A parasitically coupled, complementary slot-dipole antenna element adapted to be coupled to a source of excitation signals having a center frequency, said antenna element comprising:

- a driven, cavity-backed slot antenna element adapted to be coupled to said source of excitation signals, said cavity-backed slot antenna element having a first axis and a slot with a longitudinal axis transverse to said first axis of said cavity-backed antenna element; and
- a parasitic dipole element displaced a selected distance from said cavity-backed slot antenna element and having a longitudinal axis which is parallel with said first axis of said cavity-backed slot antenna element for producing a relatively symmetrical electromagnetic signature of increased bandwidth, said parasitic dipole element and said cavity-backed slot antenna element resonating approximately at said center frequency.

4,710,776

POWER DIVIDER FOR MULTIBEAM ANTENNAS WITH SHARED FEED ELEMENTS

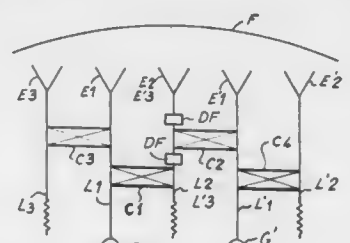
Antoine G. Roederer, Noordwijk, Netherlands; Giulio Doro, and Marco Lisi, both of Rome, Italy, assignors to Agence Spatiale Europeenne, Paris, France

Filed Dec. 13, 1984, Ser. No. 680,800
Claims priority, application France, Jan. 5, 1984, 84 00103

Int. Cl.⁴ H01Q 13/00

U.S. Cl. 343—778

8 Claims



1. An antenna for transmitting or receiving closely spaced multiple beams, with very low level sidelobes, of the type comprising, for each beam, a beam feed consisting of a primary source (G; G') feeding several radiating elements (E1, E2, E3; E'1, E'2, E'3), through a feed line (L1; L'1), the primary source (G; G') having at least one main element (E1; E'1) surrounded by a plurality of secondary radiating elements (E2, E3; E'2, E'3) some of which (E2; E'3) are shared between several adja-

cent beam feeds, the power supplied by the primary source (G; G') being distributed to the different elements by means of couplers, characterized in that each secondary radiating element (E2; E'3) shared between at least two adjacent beams feeds is fed from each of the power transmission lines (L1; L'1) feeding the main element (E1; E'1) of said adjacent beams through a respective coupler (C1, C2), each coupler (C1, C2) being mounted in series on the transmission line (L2, L'3) of the secondary radiating element (E2, E'3) shared.

4,710,777

DISH ANTENNA STRUCTURE

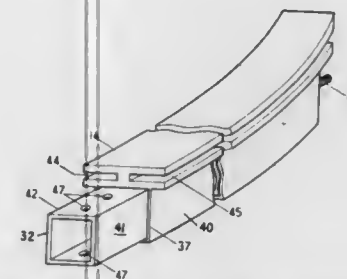
Ross Halverson, Lone Rock, Wis., assignor to Kaultronics, Inc., Richland Center, Wis.

Filed Jan. 24, 1985, Ser. No. 694,435

Int. Cl.⁴ H01Q 15/16

U.S. Cl. 343—840

21 Claims



11. A support rib adapted for use in a dish antenna structure comprising:

- (a) an outer sheath of flexible, resilient plastic material transparent to microwaves, having grooves along the side edges thereof defined by top and bottom walls, and an inner hollow channel in the sheath extending along its length beneath the grooves therein; and
- (b) a rigid inner support member fitted within the inner channel in the sheath to strengthen the rib and limit the longitudinal flexibility of the rib.

4,710,778

SATELLITE EARTH STATION

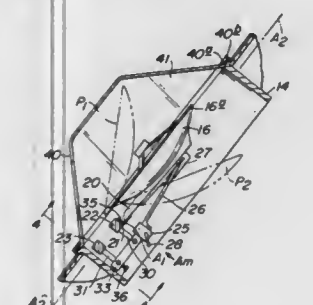
Mitchell C. Radov, 631 Montroyale Dr. East, Erie, Pa. 16504

Filed Aug. 7, 1985, Ser. No. 763,195

Int. Cl.⁴ H01Q 3/02, 1/42

U.S. Cl. 343—882

15 Claims



1. A satellite earth station, comprising: frame means adapted to be fixedly mounted in a building roof for defining an opening therein; concave dish antenna means having as peripheral rim received within said frame means opening and movable therein; means carried by said frame means mounting said antenna for adjustable motion in said opening relative to said frame means, said mounting means cooperating with said frame

means to dispose said antenna rim substantially coplanar with the roof when the antenna is in a home position; and canopy means overlying said frame means opening and cooperating therewith to define a space above the opening for receiving at least a displaced portion of the antenna means;

whereby the position of the antenna means can be adjusted relative to the roof.

4,710,779

OPTICAL RECORDING APPARATUS

Shinsuke Funaki, Hachioji; Yuichi Akanabe, Kunitachi, and Hiroaki Ikeda, Tachikawa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP81/00333, § 371 Date Jul. 1, 1982, § 102(e)

Date Jul. 1, 1982, PCT Pub. No. WO82/01797, PCT Pub.

Date May 27, 1982

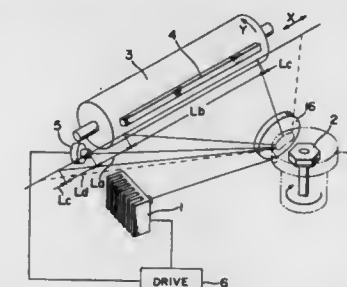
Continuation of Ser. No. 395,007, Jul. 1, 1982, abandoned. This

PCT application Nov. 13, 1981, Ser. No. 769,763

Claims priority, application Japan, Nov. 14, 1980, 55-160573

Int. Cl.⁴ G01D 18/00; G11B 7/00; H04N 1/23; H01S 3/13

U.S. Cl. 346—1.1 4 Claims



1. In a recording method wherein a scanning operation is conducted with a light beam which is modulated on the basis of image information, the improvement which comprises driving a laser beam before scanning a leading edge of a page, generating a photoconverted signal of an optical output of said laser beam, repeatedly controlling said optical output based on a difference signal corresponding to a difference between said photoconverted signal and a reference signal so as to reduce said difference and maintaining a power supply to a controlled value during a period of recording said page.

4,710,780

RECORDER WITH SIMULTANEOUS APPLICATION OF THERMAL AND ELECTRIC ENERGIES

Koichi Saito; Yoshihiko Fujimura, and Nanao Inoue, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,437

Claims priority, application Japan, Mar. 27, 1986, 61-67308

Int. Cl.⁴ G01D 9/00, 15/18

U.S. Cl. 346—1.1 7 Claims

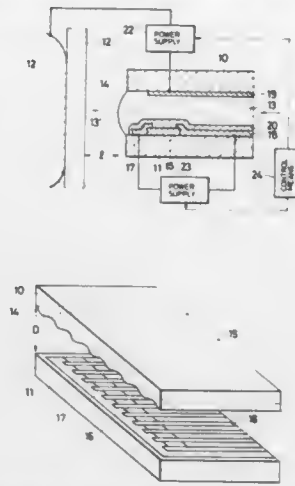
1. An image recording head for jetting a liquid coloring agent at a recording member to form images of corresponding picture elements comprising:

- a pair of wall members arranged a fixed space apart to contain the liquid coloring agent between the inner faces thereof, the edges of said wall members forming a discharge portion on one side thereof, the inner face of at least one of said wall members having a methodically uneven pattern in said discharge portion composed of a plurality of portions with similar cross-sections; thermal energy applying means for heating the liquid coloring agent between said wall members; and electric energy applying means for applying an electric field to the liquid coloring agent between said wall members; said thermal energy applying means comprising at least

one heating element on the inner face of one of said wall members, for selectively heating an area thereof corresponding to a location for jetting a portion of the liquid coloring agent through said discharge portion.

6. A method of recording images at high speed comprising the steps of:

providing a recording head including a pair of spaced apart wall members with a liquid coloring agent therebetween;



applying a uniform electric field to the liquid coloring agent arranged between the pair of wall members; heating said agent in a selected local area thereof to cause said agent to be jetted from the selected area at a recording medium; and providing on one of said wall members a periodic pattern of modulation to restrain said agent in unheated areas thereof from being jetted.

4,710,781

THERMAL PRINTER COLOR DYE FRAME IDENTIFICATION USING RED AND YELLOW LIGHT SOURCES

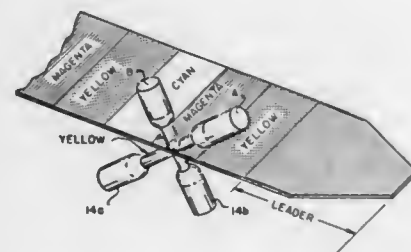
Stanley W. Stephenson, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,620

Int. Cl.⁴ G01D 15/10; B41J 3/20

U.S. Cl. 346—76 PH

3 Claims



1. In a thermal printer system including a printer which uses a carrier with a repeating series of spaced yellow, magenta and cyan dye frames, and a receiver which receives dye from the yellow, magenta and cyan dye frames of a series to form a colored image, such printer including a print head having a plurality of selectively energizable heating elements, means for moving the carrier and the receiver along respective paths so as to sequentially move each dye frame of a series and the receiver relative to the print head such that as the heating elements are selectively energized, dye from each dye frame of a series is transferred to the receiver and forms a colored image in the receiver, means for identifying dye frames of such series comprising:

- a red LED disposed adjacent to the carrier path for illuminating the carrier with red light;
- a yellow LED disposed adjacent to the carrier path for illuminating the same dye frame of the carrier illuminated by red light with yellow light;
- first and second spaced photodetectors disposed adjacent to the carrier path and respectively responsive to the intensity of yellow and red light which passes through the dye frames for respectively providing electrical signals, the levels of such signals being a function of the intensity of source light which passes through a dye frame;
- said first photodetector producing a signal level above a threshold level when illuminated by yellow light passing through a yellow dye frame and below such threshold level when illuminated by yellow light passing through a cyan or magenta dye frame, said second photodetector producing a signal level above the threshold level when illuminated by red light passing through a yellow or a magenta dye frame and below such threshold level when illuminated by red light passing through cyan dye frames; and
- means responsive to the threshold levels such first and second photodetector for identifying the particular dye frame being illuminated by the red and yellow light sources.

4,710,782

CURRENT-APPLYING THERMAL TRANSFER FILM

Seiichi Hayashi, Takashi Nakamura, both of Nagano, and Hisayuki Tanabe, Osaka, all of Japan, assignors to Seiko Epson Corporation, Tokyo and Nippon Kores Kabushiki Kaisha, Osaka, both of Japan

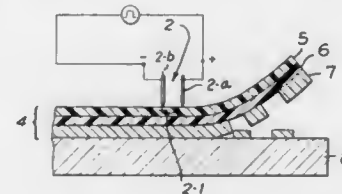
Filed Aug. 28, 1986, Ser. No. 901,332

Claims priority, application Japan, Aug. 29, 1985, 60-190763

Int. Cl.⁴ G01D 15/10

U.S. Cl. 346—76 R

15 Claims



1. A current-applying thermal transfer film, comprising: a support layer; a current-applying exothermic resistance layer disposed on one surface of the support layer, the resistance layer including about 10 to 40 wt % conductive dispersion particles (Ck), about 45 to 75 wt % thermoplastic polyester copolymer (Cs), and about 2 to 15 wt % cellulose nitrate; and an ink layer disposed on the opposed surface of the support layer.

4,710,783

TEMPERATURE COMPENSATED CONTINUOUS TONE THERMAL PRINTER

Holden Caine, and Scott A. Brownstein, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 24, 1986, Ser. No. 889,140

Int. Cl.⁴ G01D 15/10; H04N 1/23; B41J 3/20

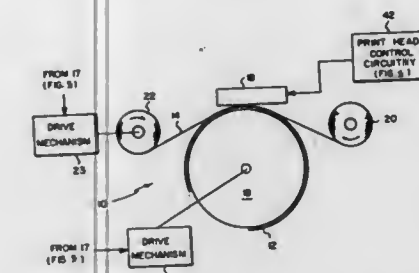
U.S. Cl. 346—76 PH

4 Claims

1. In a continuous tone thermal printing apparatus including a print head having a plurality of heating elements, one for each image pixel formed into a plurality of groups of heating elements, the heating elements of each group being simultaneously addressable in parallel N different times and selec-

tively energizable when addressed with constant current pulses to provide N different possible temperature levels, the improvement comprising:

- a shift register having one operative stage for each heating element;
- a digital memory for holding a selectable number of dye density words, each such word being representative of the dye density level of a particular image pixel;
- logic means responsive to the dye density words for sequentially storing N image data digital signals in the stages of the storage device in which the state of each



- stage corresponds to whether or not a corresponding heating element is to be selectively energized;
- means for sequentially addressing the groups of heating elements each time one of the N image data digital signal is stored in the storage device with each group of heating elements being addressed N separate times;
- means for producing a signal representative of the average temperature of the print head; and
- means responsive to such average temperature signal for selectively energizing each heating element each time it is addressed and for adjusting the pulse width of the constant current pulse applied to the heating elements.

4,710,784

INK JET PRINTING DEVICE

Tetsuro Nakayama, Mishima, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

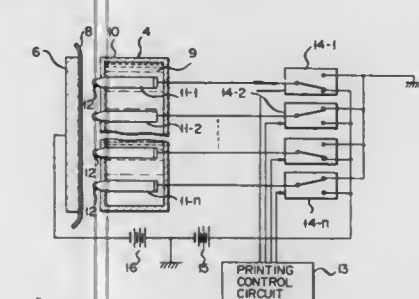
Filed Jul. 2, 1986, Ser. No. 881,140

Claims priority, application Japan, Jul. 11, 1985, 60-153301; Jul. 12, 1985, 60-153490

Int. Cl.⁴ G01D 15/16

U.S. Cl. 346—140 R

11 Claims



1. An ink jet printing device, comprising: a first electrode; a printing head of an ink jet type having at least one second electrode, and means for supporting said printing head so that said at least one second electrode faces said first electrode for discharging ink from said second electrode toward said first electrode in response to a voltage applied between said first and said second electrodes during a printing cycle; power supply means connected to said first and said second

electrodes for applying said voltage from at least one voltage source; means for supporting a recording medium between said printing head and said first electrode; printing control means coupled to said power supply means for selectively applying a voltage between said first and said second electrodes according to predetermined dot data representing a character to be printed, and for controlling the amount of ink discharged from said second electrode of said printing head by varying electric energy applied between said first and said second electrodes according to a preset concentration code, and the size of ink markings to be printed on the recording medium is correspondingly varied to obtain a desired grade of printed tone.

4,710,785

PROCESS CONTROL FOR ELECTROSTATOGRAPHIC MACHINE

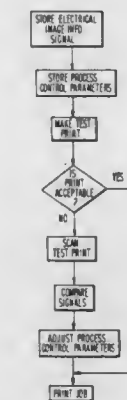
Borden H. Mills, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 12, 1986, Ser. No. 940,832

Int. Cl.⁴ G01D 15/06

U.S. Cl. 346—153.1

5 Claims



1. In an electrostatographic machine having at least one adjustable process control parameter and means for receiving electrical image information signals of an original; the improvement comprising: means for electronically storing the received electrical image information signal of an original; means for creating a reproduction of the original using the received electrical image information signal; means for creating a second electrical image information signal from said reproduction; means for comparing said second electrical image information signal with the first electrical image information signal to produce an error signal representative of differences therebetween; and means, responsive to said error signal, for adjusting the process control parameter to minimize said differences.

4,710,786

WIDE BAND GAP SEMICONDUCTOR ALLOY MATERIAL

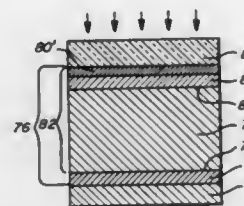
Stanford R. Ovshinsky, 2700 Squirrel Rd., Bloomfield Hills, Mich. 48013, and Arun Madan, 31520 Evergreen, Birmingham, Mich. 48000

Continuation of Ser. No. 710,359, Apr. 18, 1985, which is a continuation of Ser. No. 540,153, Oct. 7, 1983, which is a continuation of Ser. No. 427,688, Sep. 29, 1982, Pat. No. 4,409,605, which is a continuation of Ser. No. 222,489, Jan. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 104,284, Dec. 17, 1979, abandoned, which is a division of Ser. No. 887,353, Mar. 16, 1978, Pat. No. 4,226,898. This application Jun. 9, 1986, Ser. No. 872,075

The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.

Int. Cl.⁴ H01L 45/00

U.S. Cl. 357—2



1. An improved amorphous semiconductor alloy, said alloy including a host matrix of silicon and incorporating therein carbon or nitrogen and further incorporating therein a plurality of different and complimentary density of states reducing elements for forming a wide band gap silicon alloy having altered electronic configurations and without substantially increasing the states in the gap.

4,710,787

SEMICONDUCTOR DEVICE

Toshiyuki Usagawa, Kokubunji; Yuichi Ono, and Susumu Takahashi, both of Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

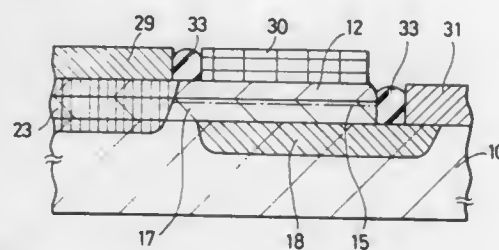
Filed Dec. 27, 1984, Ser. No. 686,691

Claims priority, application Japan, Dec. 28, 1983, 58-246279

Int. Cl.⁴ H01L 29/161, 29/74, 29/12, 29/06

U.S. Cl. 357—16

9 Claims



1. A semiconductor device comprising, at least, a three-layer structure in which a first semiconductor layer and a second semiconductor layer are arranged so as to define a heterojunction and in which the second semiconductor layer and a third semiconductor layer were arranged so as to define a junction, a source electrode which is connected with two-dimensional carriers which accumulate in the vicinity of the heterojunction interface, a drain electrode which is electrically connected to said two-dimensional carriers at the heterojunction only through a series connection path formed of said third semiconductor layer and the junction of the third semiconductor layer with the second semiconductor layer, and a gate electrode which is connected to said first semiconductor layer and which serves as control means for the two-dimensional carriers,

wherein said third semiconductor layer is selectively formed in a semi-insulating substrate, wherein said semi-insulating substrate has an upper and lower surface, with the third semiconductor layer being formed in the upper surface, and wherein said source, drain and gate electrodes are all formed over the upper surface of said semi-insulating substrate.

4,710,788

MODULATION DOPED FIELD EFFECT TRANSISTOR WITH DOPED $\text{Si}_x\text{Ge}_{1-x}$ INTRINSIC SI LAYERING

Heinrich Dämbkes, Ulm; Hans-J. Herzog, Neu-Ulm, and Helmut Jorke, Gerstetten, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

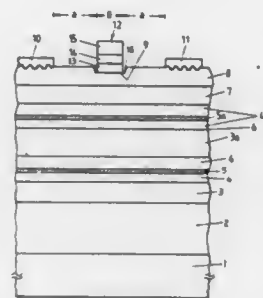
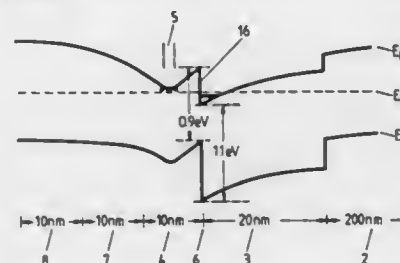
Filed Dec. 1, 1986, Ser. No. 936,257

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542482

U.S. Cl. 357—22

Int. Cl.⁴ H01L 29/80

14 Claims



1. In a modulation doped field effect transistor including a silicon substrate on which a modulation doped silicon-germanium alloy/silicon layer sequence has been applied, and at least one control electrode, a source electrode and a drain electrode disposed on the outermost silicon layer, the improvement wherein said layer sequence includes at least one n-conductive channel which is formed by a heterostructure produced by at least one combination of an undoped silicon layer and at least one n-doped silicon-germanium alloy layer.

4,710,789

SEMICONDUCTOR MEMORY DEVICE

Kiyohiro Furutani; Koichi Mashiko, and Kazutami Arimoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1986, Ser. No. 937,206

Claims priority, application Japan, Jan. 30, 1986, 61-20614

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.6

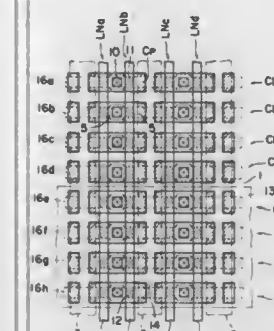
5 Claims

1. A semiconductor memory device comprising a plurality of memory cells arranged in rows and columns to form a matrix, a first bit line to which memory cells of a first column are connected, each of the memory cells of the first column comprising an N-channel FET and capacitance means,

a second bit line to which memory cells of a second column are connected, each of the memory cells of the second column comprising a P-channel FET and capacitance means,

the first bit line and the second bit line being connected to complementary terminals of a sense amplifier to form a folded-bit line pair,

a word line connected to the gate of the N-channel FET of one of the memory cells of the first column and to the gate



of the P-channel FET of one of the memory cells of the second column, and

means selectively providing the word line with a first voltage to make conductive the N-channel FET connected thereto and to make nonconductive the P-channel FET connected thereto, or a second voltage to make conductive the P-channel FET connected thereto and make nonconductive the N-channel FET connected thereto, or a third voltage to make nonconductive both the N-channel FET and the P-channel FET connected thereto.

4,710,790

MOS TRANSISTOR

Tatsuo Okamoto; Kouji Eguchi, and Saburo Oosaki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

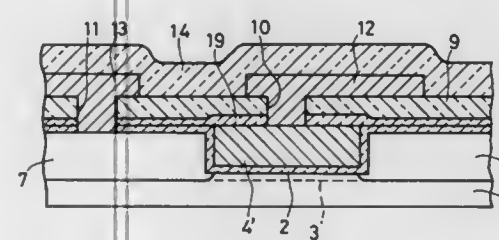
Filed Jul. 3, 1984, Ser. No. 627,470

Claims priority, application Japan, Sep. 26, 1983, 58-179647

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.6

5 Claims



1. A MOS transistor comprising: a semiconductor substrate having a depression formed on one major surface thereof; an insulating film formed at least on an inner bottom surface and a side surface of said depression; a gate electrode formed in said depression coated with said insulating film; and a source region and a drain region formed in said major surface of said semiconductor substrate so as to be opposed to each other with said depression being located therebetween, wherein substantially the entire upper surface of said gate electrode is generally flat and approximately even with said major surface of said semiconductor

tor substrate and contained substantially entirely within said depression.

4,710,791

PROTECTION DEVICE IN AN INTEGRATED CIRCUIT

Takehide Shirato, Hiratsuka, and Shinichi Sekine, Yokohama, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

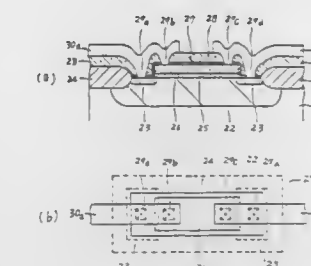
Filed Jul. 30, 1985, Ser. No. 760,368

Claims priority, application Japan, Aug. 9, 1984, 59-166823

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.13

7 Claims



1. A protection device formed on a semiconductor substrate of an IC and connected in a circuit in series with at least one of an input to and output from a circuit formed on said IC, said protection device comprising:

a diffusion region formed on said substrate and having a conductivity type opposite to that of the substrate; an insulating layer covering said diffusion region; a resistance body composed of polysilicon formed on said insulating layer over said diffusion region so as to be electrically isolated from said substrate by said diffusion region; and at least one contact region formed entirely within said diffusion region comprising a layer doped at a higher rate with the same conductivity type of impurity as that of the diffusion region, said resistance body and said diffusion region being electrically connected in parallel through said contact region; said parallel connected resistance body and diffusion region being connected in series between at least one of an input pad and output pad and said at least one of an input to and output from a circuit.

4,710,792

GATE TURN-OFF THYRISTOR

Masanori Suzuki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1985, Ser. No. 705,118

Claims priority, application Japan, Apr. 17, 1984, 59-78924

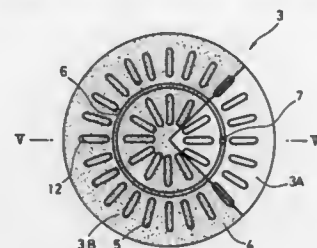
Int. Cl.⁴ H01L 29/74, 29/167

U.S. Cl. 357—38

4 Claims

1. In a gate turn-off thyristor comprising a semiconductor wafer structured by a first base layer (8c) of a first conductivity type semiconductor, a second base layer (8b) of second conductivity type semiconductor adjacent to one side of said first base layer (8c), a first emitter layer (8d) of said second conductivity type semiconductor adjacent to the other side of said first base layer (8c), and a plurality of second emitter regions (8a) of said first conductivity type semiconductor formed on the outer surface of said second base layer (8b) excluding a region assigned for a gate region, further comprising a first electrode (9) on the outer surface of said first emitter layer (8d), second electrodes (5) on the outer surfaces of said second emitter regions (8a), a gate electrode (4) on the outer surface of said

gate region and a lead-out point (7) for said gate electrode (4), the improvement wherein said semiconductor wafer (8) includes a plurality of areas (3A and 3B) having different carrier lifetimes, said lifetime being the longest in a first area (3A) of said areas where said gate lead-out point (7) is positioned and said lifetime being shorter in a second area (3B) of said areas



further from said gate led-out point (7) wherein said lifetime is controlled by carrier killer of Au or Pt diffused in said wafer and the concentration of said carrier killer is the lowest in said first area and becomes higher in the second area farther from said gate lead-out point (7) wherein said carrier lifetime in said second area is shortest in the second emitter region further from the first area.

4,710,793

VOLTAGE COMPARATOR WITH HYSTERESIS

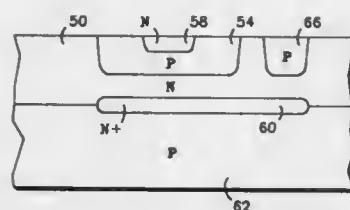
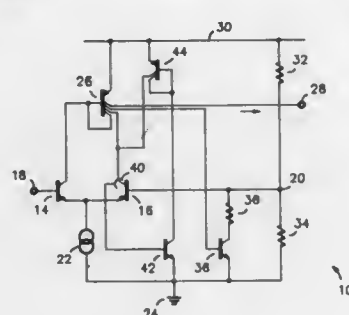
Randall C. Gray, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1985, Ser. No. 772,579

Int. Cl.⁴ H01L 27/02; H03K 3/33, 5/153, 19/20

U.S. Cl. 357-44

2 Claims



1. An integrated circuit for producing output transitions in response to an input signal passing through and exceeding a first threshold voltage level then passing through and falling below a second threshold voltage level whereby hysteresis is established, comprising:

a differential amplifier including first and second transistors coupled respectively to first and second inputs of the differential amplifier, the input signal being applied to said first input, said differential amplifier having an output at which the transitions occur, said first and second transistors each having a collector region, a base region and an emitter region, said base regions being coupled respec-

tively to said first and second inputs of said differential amplifier, said emitter regions being connected together, first current source means for providing currents to said collector regions of said first and second transistors, and second current source means coupled to said emitter regions of said first and second transistors, said first current source means including a transistor having multiple collector regions, the emitter region of which is coupled to a power supply, the base region being coupled to said collector region of said first transistor and to one of said multiple collector regions, a second one of said collector regions being coupled to said collector of said second transistor, and a third one of said collector regions being coupled to said output of said differential amplifier;

threshold level determining means for producing the first and second threshold voltage levels at an output which is coupled to said second input of said differential amplifier, said threshold level determining means including a plurality of resistors connected in series for establishing said first threshold voltage level corresponding to a first voltage level therebetween at said output of said threshold level determining means, and a third transistor the collector and emitter regions being coupled across one of said plurality of series connected resistors and having a base region coupled to a fourth one of said collector regions of said transistors of said first current source means, said third transistor being rendered conductive by the input signal exceeding said first threshold voltage level for causing said first threshold voltage level to be reduced to said second threshold voltage level; and

collector means responsive to said second transistor becoming saturated for inhibiting saturation current therefrom being sourced to the substrate of the integrated circuit, said collector means including a secondary region formed within the integrated circuit in spaced relationship about said collector region of said second transistor, said secondary region collecting said saturation current that otherwise would be injected into the substrate and a fourth transistor the base region of which is connected to said secondary region and having a collector region and an emitter region, said emitter region being connected to a source of ground reference potential; and

an additional multiple collector region transistor having an emitter region coupled to said power supply, a base region coupled with one of said multiple collector regions to said collector region of said fourth transistor, and a second one of said multiple collector regions being coupled to said collector region of said second transistor.

4,710,794

COMPOSITE SEMICONDUCTOR DEVICE

Yutaka Koshino, Yokosuka; Tatsuo Akiyama, Tokyo, and Yoshiro Baba, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

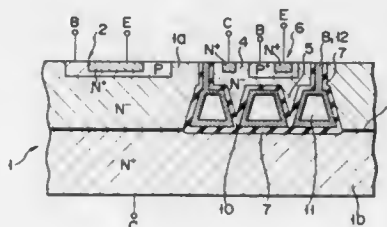
Filed Feb. 12, 1986, Ser. No. 828,536

Claims priority, application Japan, Feb. 13, 1985, 60-24389

Int. Cl.⁴ H01L 27/12, 29/06, 25/04

U.S. Cl. 357-49

6 Claims



1. A composite semiconductor device, comprising:

a composite substrate including first and second semiconductor substrates, one surface of each of said substrates being mirror-polished, with said mirror-polished surfaces being bonded together at a bonding interface, said first semiconductor substrate having a space adjacent to said bonding interface and an annular insulating layer embedded therein and extending from a surface of said first semiconductor substrate opposite the bonding interface to a peripheral edge portion of said space, said space and insulating layer defining a first portion of said first semiconductor substrate said first portion being electrically isolated from a second portion of said first semiconductor substrate adjacent thereto and from said second semiconductor substrate;

at least one pillar extending from a bottom of said first portion to said interface, for supporting said first portion;

a first functional element formed in said first portion; and a second functional element formed in said second portion.

4,710,795

SEMICONDUCTOR POWER MODULE

Georg Nippert, Worms; Berthold Hahn, Lampertheim, both of Fed. Rep. of Germany, and Jens Gobrecht, Gebenstorf, Switzerland, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Kaefertal, Fed. Rep. of Germany

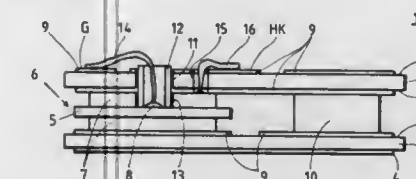
Filed Feb. 25, 1985, Ser. No. 705,089

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 3406528

Int. Cl.⁴ H01L 21/447, 23/10, 23/40, 23/14

U.S. Cl. 357-65

19 Claims



1. Semiconductor power module, comprising at least one upper substrate and at least one lower substrate, said substrates being mutually parallel and formed of ceramic, each substrate having upper and lower sides, metallizations disposed on at least said upper and lower sides of said upper substrate and said upper side of said lower substrate, at least one controlled semiconductor power component disposed between each two respective substrates and electrically contacted by said metallizations disposed on said lower side of said upper substrate and on said upper side of said lower substrate, defining a substrate above said component and a substrate below said component, said substrate above said component having at least one hole formed therein above said component for accommodating control connections to said component, said metallization disposed on said upper side of said upper substrate being structured.

4,710,796

RESIN ENCAPSULATION TYPE SEMICONDUCTOR DEVICE BY USE OF EPOXY RESIN COMPOSITION

Hirotohi Ikeya, Yokosuka, and Michiya Higashi, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed May 31, 1985, Ser. No. 739,920

Claims priority, application Japan, Aug. 23, 1984, 59-174148

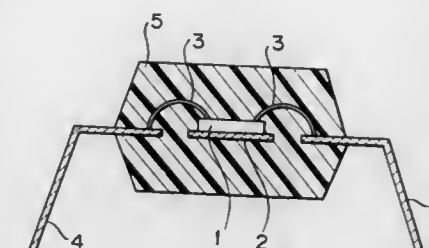
Int. Cl.⁴ H01L 23/28

U.S. Cl. 357-72

12 Claims

1. A resin encapsulation type semiconductor device having a semiconductor element and a resinous encapsulating material for encapsulating said semiconductor element therein, said resinous encapsulating material comprising a cured product of an epoxy resin composition for encapsulation of semiconductor, comprising:

- (a) 100 parts by weight of an epoxy resin;
- (b) 5 to 500 parts by weight of a curing agent having at least two phenolic hydroxyl groups in one molecule;
- (c) 0.01 to 20 parts by weight of an organic phosphine compound; and



- (d) 0.1 to 100 parts by weight of at least one antimony oxide selected from the group consisting of diantimony tetroxide, hexantimony tridecaoxide and diantimony pentoxide.

4,710,797

ERASABLE AND PROGRAMABLE READ ONLY MEMORY DEVICES

Seietsu Tanaka, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

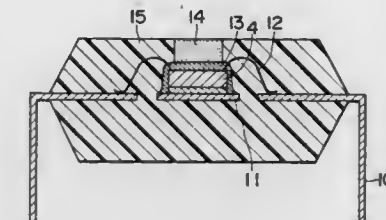
Filed Mar. 7, 1984, Ser. No. 586,998

Claims priority, application Japan, Mar. 14, 1983, 58-40579

Int. Cl.⁴ H01L 23/08, 23/18

U.S. Cl. 357-74

2 Claims



1. An erasable and programable read only memory device of the plastic package type comprising:

- an integrated circuit lead frame having an island area and a plurality of lead wires;
- an erasable and programable read only memory integrated circuit chip having an upper surface and a bottom surface, the bottom surface thereof mounted on said island area;
- a plurality of wires each adapted to connect a bonding pad of said erasable and programable read only memory integrated circuit chip to one of said lead wires of said integrated circuit lead frame;
- a thin silicone resin layer formed on the upper surface of said erasable and programable read only memory integrated circuit chip for transmitting ultraviolet rays to the upper surface of said erasable and programable read only memory integrated circuit chip;
- a window plate placed on the surface of said silicone resin layer to be bonded with said silicone resin layer, said window plate being of a high-purity alumina which can transmit ultraviolet rays; and
- a molded package of epoxy resin which prevents transmission of ultraviolet rays encapsulating said island area of said integrated circuit lead frame, said erasable and programable read only memory integrated circuit chip and said silicone resin layer without covering a surface of said window plate through which ultraviolet rays are transmitted to said erasable and programable read only memory integrated circuit chip.

4,710,798

INTEGRATED CIRCUIT CHIP PACKAGE

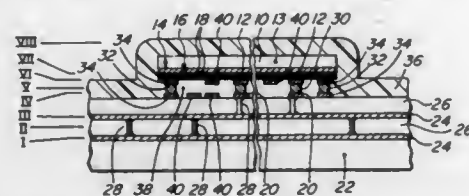
Gabriel Marcantonio, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 12, 1985, Ser. No. 775,277

Int. Cl.⁴ H01L 23/02, 23/12, 23/48

U.S. Cl. 357—80

12 Claims



1. An integrated circuit chip package comprising: an integrated circuit chip having a plurality of circuit elements contained therein, said circuit elements being electrically extended to a plurality of bonding pads on a surface thereof, a substrate having a plurality of bonding pads on a surface of the substrate, said surface of the substrate facing said surface of the chip, a connection extending from selected bonding pads on the chip to corresponding bonding pads on the substrate, and material extending from said chip surface to said substrate surface for defining a perimeter of a sealed cavity formed between said chip surface and said substrate surface.

4,710,799

HIGH RESOLUTION COLOR TELEVISION

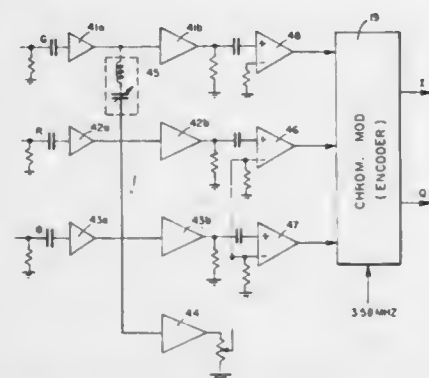
Jimmie D. Songer, Burleson, Tex., assignor to High Resolution Television, Inc., Los Angeles, Calif.

Filed Jan. 22, 1984, Ser. No. 623,421

Int. Cl.⁴ H04N 11/06

U.S. Cl. 358—12

5 Claims



1. An improved method for increasing the vertical resolution of color television display on a picture tube of a program from a color television camera, wherein the camera has three pick-up tubes which produce television camera signals, one tube with a green filter, one tube with a red filter and one tube with a blue filter, and all three pick-up tubes are driven to produce synchronous horizontal scans in interlaced fields of a frame with only the horizontal scan of the green pick-up tube further modulated vertically to scan each line along an undulating path at a predetermined frequency, and wherein all three electron beams for the green, red and blue display of said picture tube are synchronously modulated with the electron beam modulation of the camera pick-up tubes, comprising the steps of

filter trapping the television camera signal from said green camera pick-up tube at said predetermined undulating

modulation frequency in a narrow bandwidth of about $\pm \frac{1}{2}$ MHz, and combining said filter trapped green television camera signal with television camera signals from said red and blue camera pick-up tubes in a differential amplifier such that said green television camera signal is added to the red and blue television camera signals, thereby pseudomodulating the red and blue television camera signals in synchronism with the green television camera signal as though the electron beam of the red and blue camera pick-up tubes were modulated to scan each line along an undulating path.

4,710,800

APPARATUS FOR ALLOWING OPERATOR SELECTION OF A COLOR REGION OF A VIDEO IMAGE FOR RECEIVING COLOR CORRECTIONS

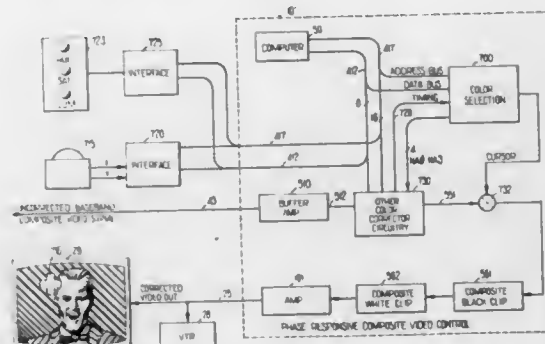
Craig Fearing, Hollywood, and Michael L. Orsburn, Cooper City, both of Fla., assignors to Utah Scientific Advanced Development Center, Inc., Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 760,339, Jul. 29, 1985, which is a continuation-in-part of Ser. No. 604,845, Apr. 27, 1984, Pat. No. 4,642,682. This application Sep. 16, 1985, Ser. No. 776,438

Int. Cl.⁴ H04N 9/74, 9/68

U.S. Cl. 358—22

32 Claims



1. In a video signal color correction system, an apparatus for selecting a region in a video image represented by an input video signal and for correcting a video parameter of said input video signal, comprising: first operator control means for selecting a region on a video monitor displaying said image; video signal correction means responsive to a video characteristic of said input video signal for selecting a particular one of a plurality of video signal correction signals for correcting a parameter of said input video signal to provide a corrected video output signal; second operator control means for changing one of said plurality of video signal correction signals; and means responsive to said video characteristic and said selected region for modifying said selected particular one of said video signal correction signals.

4,710,801

SYSTEM FOR DECOMPOSITION OF NTSC COLOR VIDEO SIGNALS USING TWO FRAME BUFFERS

Charles A. Kunzinger, Morrisville, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,013

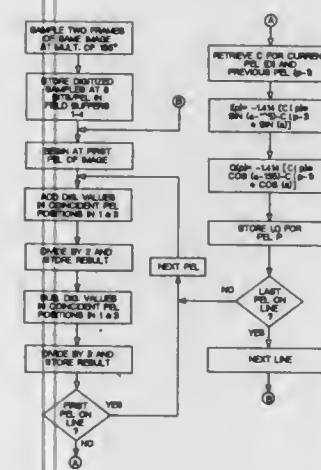
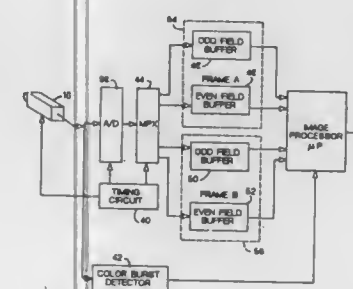
Int. Cl.⁴ H04N 9/66

U.S. Cl. 358—23

3 Claims

1. For use in a freeze frame video system having an analog input conforming to NTSC color signal standards, a method for decomposing composite NTSC signals into luminance (Y) and chrominance (C) components comprising the steps of: digitizing the analog input at predetermined sampling instants corresponding to recurring phase angle displacements

ments relative to the phase of the color burst component of the analog input, said displacements including those at $\pm 90^\circ$ and 180° relative to the color burst phase; storing the digitized pel values in memory locations corresponding to pel positions in four successive image fields; establishing Y values for selected pels as a function of the sum of stored digitized pel values occupying corresponding coincident pel positions in non-successive fields; establishing C values for selected pels as a function of the difference between stored digitized pel values occupying corresponding coincident pel positions in non-successive fields; and



deriving I and Q values based on the established C value for each selected pel, said deriving step comprising the further steps of retrieving the established C values for two successive pels p and p-1 on a given line, solving the below stated equations for I and Q

$$I = -1.414[C(p) \sin(a-135) - C(p-1) \sin(a)]$$

$$Q = +1.414[C(p) \cos(a-135) - C(p-1) \cos(a)]$$

where a is the sampling angle phase for pel position p, nd assigning the calculated I and Q values of both of the pels p and p-1.

4,710,802

TELEVISION RECEIVER INCLUDING A CIRCUIT ARRANGEMENT FOR DEMODULATING AN NTSC-CODED COLOR SIGNAL

Otto L. Warmuth; Martin H. Johannelter, both of Hamburg, Fed. Rep. of Germany, and Johannes G. Raven, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

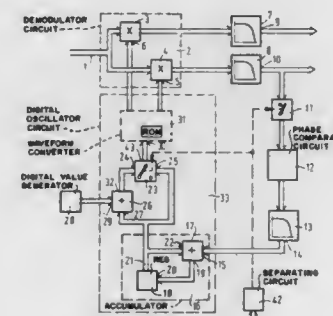
Filed Mar. 4, 1986, Ser. No. 836,034

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511440

Int. Cl.⁴ H04N 9/66

U.S. Cl. 358—25

8 Claims



1. A color television signal receiver including a circuit arrangement for demodulating an NTSC-encoded chrominance signal available as a sequence of digital values, including an oscillator circuit (33) producing two reference signals of a chrominance subcarrier frequency and said reference signals being different in phase relative to each other, the oscillator circuit comprising an accumulator (16) which produces an output signal, said accumulator incorporating a register (18) coupled at its output to an output (21) of said accumulator and a first modulo-adder (17) coupled at its input to an input of said accumulator and coupled at its output to an input of said register and a waveform converter (31) which forms the reference signals from the accumulator output signal, and a phase comparator circuit (12) determining the phase of the reference signals and receiving during the occurrence of a color synchronizing signal in said NTSC-encoded chrominance signal, a signal produced in at least one demodulator (2) multiplying the chrominance signal by at least one of said reference signals, characterized in that in a first switching position of a change-over switch (23) an adjustable value is added in a second adder (26, 38) to the accumulator output signal and an output signal of the adder is applied to the waveform converter (31) and that the change-over switch (23) is in a second switching position during the occurrence of the color synchronizing signal, in said second position the accumulator output signal is applied to the waveform converter.

4,710,803

COLOR FILTER AND COLOR IMAGE SENSOR USING THE SAME

Kenji Suzuki; Takaaki Terashita, and Jin Murayama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 3, 1987, Ser. No. 11,421

Claims priority, application Japan, Feb. 5, 1986, 61-22155

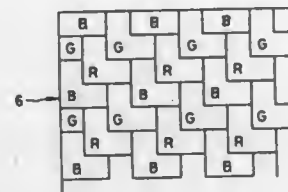
Int. Cl.⁴ H04N 9/04, 9/07

U.S. Cl. 358—41

7 Claims

1. A color filter having color areas of N colors, N being an integer at least equal to 3, each of said color areas being L-shaped and having a first leg and a second leg, said first legs being arranged in columns with portions of said second legs.

said second legs being arranged in rows with portions of said first legs, and



the number of different colors in each column and in each row being $N-1$.

4,710,804

COLOR FILTER ARRAYS FOR USE IN A SINGLE CHIP COLOR TELEVISION PICKUP SYSTEM USING THE FIELD INTEGRATION MODE

Yuji Ide, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

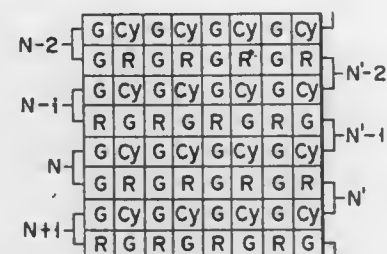
Filed Feb. 9, 1987, Ser. No. 12,490

Claims priority, application Japan, Feb. 18, 1986, 61-33353

Int. Cl.⁴ H04N 9/07, 9/077

U.S. Cl. 358-48

8 Claims



1. A color television pickup system comprising: a solid state imaging device adapted for operation in a field integration mode; and a mosaic color filter array disposed on said solid state imaging device, and having unit filter arrays arranged in columns and rows, each of said unit filter arrays having eight color filter elements arranged in two columns and four rows, an upper filter array of four filter elements and a lower filter array of four filter elements in each of said unit filter arrays each consisting of color filter elements of green (G), green (G), red (R) and cyan (Cy), four pairs of two adjacent color filter elements, in each of unit filter arrays, arranged in columns being different from each other in combination of colors, and each pair of two adjacent color filter elements arranged in a row having different colors.

4,710,805

METHOD OF, AND APPARATUS FOR, MODIFYING LUMINANCE LEVELS OF A BLACK AND WHITE VIDEO SIGNAL

Wilson Markle, Toronto, Canada, and Christopher Mitchell, Anaheim, Calif., assignors to Colorization Inc., Toronto, Canada

Filed Jul. 11, 1983, Ser. No. 512,844

Claims priority, application Canada, May 5, 1983, 427543

Int. Cl.⁴ H04N 9/43

U.S. Cl. 358-81

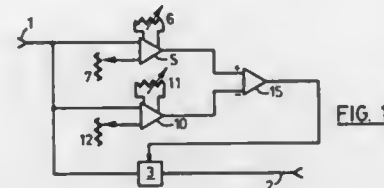
2 Claims

1. A circuit for receiving an input of a black and white video signal and for expanding and compressing bands of luminance levels to produce a modified signal at an output, the circuit comprising:

a voltage controlled amplifier connected between the input

and the output, and adapted to receive the input video signal and a control signal;

first and second clipper amplifiers, each of which is adapted to receive the input video signal, and has means for adjusting the gain and means for adjusting the clip level of the



respective clipper amplifier to affect their respective outputs;

a summation device connected to the outputs of the first and second clipper amplifiers, for producing said control signal and connected to the voltage controlled amplifier to input said control signal thereto.

4,710,806

DIGITAL DISPLAY SYSTEM WITH COLOR LOOKUP TABLE

Shinichi Iwai, Kawasaki, and Sakae Uno, Hachiohji, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

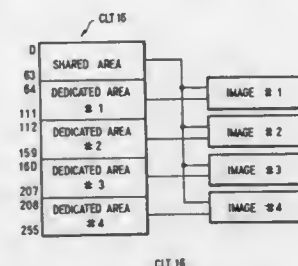
Filed Jun. 24, 1986, Ser. No. 877,910

Claims priority, application Japan, Jul. 4, 1985, 60-145879

Int. Cl.⁴ H04N 1/46

U.S. Cl. 358-81

4 Claims



1. A digital display system comprising a frame buffer store, a color lookup table, means for accessing the color lookup table by data read from the frame buffer store to generate color data sequences for display on a display device, said table comprising a first area for storing color data common to a plurality of images and further areas each for storing color data different from the color data in said first area and relating to a corresponding one of said images, means for uniformly sampling a color space to generate the color data for said first area of said table, and quantizer means for adaptively sampling an input data image to generate the color data for the color lookup table area corresponding to that data image.

4,710,807

ILLUMINATING LIGHT SUPPLY SYSTEM IN ELECTRONIC ENDOSCOPE APPARATUS

Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

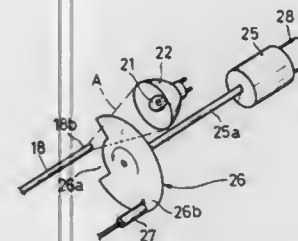
Filed Nov. 4, 1986, Ser. No. 927,267

Claims priority, application Japan, Nov. 11, 1985, 60-250847; Nov. 11, 1985, 60-250848; Dec. 28, 1985, 60-293566; Jan. 9, 1986, 61-1444

U.S. Cl. 358-98

Int. Cl.⁴ H04N 7/18

23 Claims



1. An electronic endoscope apparatus comprising:
 - (a) an endoscope including an operating body, an inserting body extending from said operating body, and a viewing window and an illuminating window provided at respective appropriate locations of said inserting portion;
 - (b) a solid state image pickup device including a light receiving portion for receiving images entering through said viewing window of said endoscope, and a memory portion for storing image signals from said light receiving portion;
 - (c) circuit means for converting the image signals from said image pickup device into television picture signals of an interlaced scanning system;
 - (d) a monitor television for displaying pictures on the basis of said television picture signals;
 - (e) light source means:
 - (f) an illuminating light transmitting optical system arranged within said endoscope, for transmitting an illuminating light from said light source means to said illuminating window;
 - (g) chopper means disposed between an end of said illuminating light transmitting optical system and said light source means and including at least one light shielding section and at least one light transmitting section;
 - (h) motor means for rotating said chopper means to cause said light shielding section and said light transmitting section of said chopper means to successively cross a luminous flux of the illuminating light, to thereby bring the illuminating light into the form of pulses; and
 - (i) synchronizing circuit means for controlling the rotation of said motor means in such a manner that a center of supply time duration of each of the illuminating light pulses is brought into coincidence with a point of time at which the image signals to be offered to either one of odd and even field scanings are transferred from said light receiving portion to said memory portion of said image pickup device.

4,710,808

MACHINE VISION DIFFERENTIAL MEASUREMENT SYSTEM

Leo Hoogenboom, Ballston Spa; Robert L. Jackson, Jr., Schenectady; Russell P. Kraft, Averill Park, and Alan M. Offt, Clifton Park, all of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Aug. 5, 1986, Ser. No. 893,220

Int. Cl.⁴ H04N 7/18

U.S. Cl. 358-107

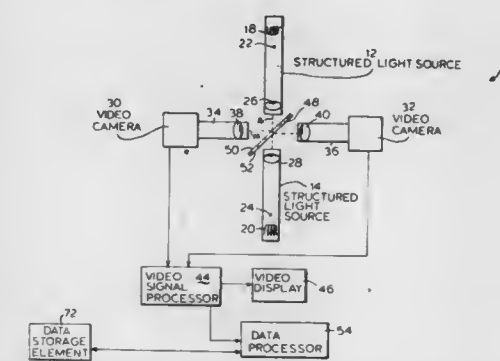
4 Claims

1. A system for measuring a dimension of an object along a

predetermined axis said object having a first and a second surface defining said dimensions, comprising:

projecting means for projecting first and second features on said first and second surfaces respectively along a first axis;

imaging means for projecting first and second features on first and second planes respectively along a second axis; said first and second axis being perpendicular and said object being placed at an intersection between said first and second axis, with said predetermined axis forming an acute angle with said second axis; and



processing means for determining the distances between said features and corresponding reference points on said planes, and for determining said dimensions in accordance with said distances;

said projecting means including a first and a second structured light source, each said sources having a light generating element, an imaging element and a projection lens for projecting a reference image from said element along said first axis and

wherein the imaging element comprises a wire disposed perpendicularly with respect to said first axis wherein said first and second features are elongated dark features.

4,710,809

METHOD FOR THE REPRESENTATION OF VIDEO IMAGES OR SCENES, IN PARTICULAR AERIAL IMAGES TRANSMITTED AT REDUCED FRAME RATE

Joachim Ries, and K. Heinrich W. Dörgele, both of Braunschweig, Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

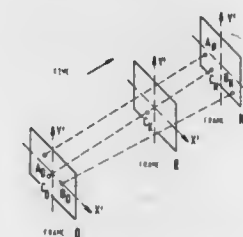
Filed Jun. 25, 1986, Ser. No. 878,318

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523424

Int. Cl.⁴ H04N 7/18, 7/12

U.S. Cl. 358-109

6 Claims



1. A method for the representation of video images, pictures or scenes, in particular aerial pictures with a relative movement between a pick-up sensor and the scene transmitted at reduced frame rate, said method comprising the steps of: generating, by interpolation or by extrapolation or by both interpolation and extrapolation on the basis of two transmitted frames, at least one intermediate frame; inserting said at least

one intermediate frame into a transmitted frame sequence; determining the positions of picture elements (pels) identical in the two transmitted frames from the relationship of the positions of at least two pels on different vertical and horizontal coordinates in each of the two transmitted frames; determining, before reconstruction of said at least one intermediate frame for limited picture areas which represent the environment of the position of at least one of the corresponding pels in said two transmitted frames, the mean brightness values of these picture areas; subtracting or dividing these mean brightness values; and correcting the brightness value in the extrapolation zone of said at least one intermediate frame for which brightness values from only one of the transmitted frames of a frame sequence are available according to the resulting differences or quotients.

4,710,810

PREDICTIVE CODING/DECODING APPARATUS FOR VIDEO SIGNAL

Toshio Koga, Tokyo, Japan, assignor to NEC Corporation, Japan

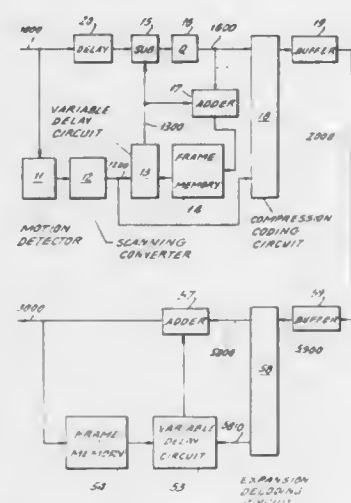
Filed Mar. 5, 1985, Ser. No. 708,272

Claims priority, application Japan, Mar. 6, 1984, 59-42306

Int. Cl.⁴ H04N 7/12; H04B 1/66

U.S. Cl. 358-133

14 Claims



1. A coding apparatus for encoding an input video signal, said apparatus comprising:

means for detecting motion contained in said input video signal and for generating motion vectors representative thereof, said motion being detected for each of several blocks into which a video picture frame associated with said input video signal is divided, said motion vectors being delivered in accordance with a time sequence associated with said blocks;

means for converting the time sequence of said motion vectors into converted motion vectors having a time sequence associated with said input video signal;

means for generating a prediction error signal in response to said input video signal and said converted motion vectors; means for converting the time sequence of said prediction error signal into another time sequence to produce a converted prediction error signal; and

means for coding said converted prediction error signal by a variable length coding scheme.

4,710,811 HIGHLY EFFICIENT CODING APPARATUS FOR A DIGITAL VIDEO SIGNAL

Tetsujiro Kondo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

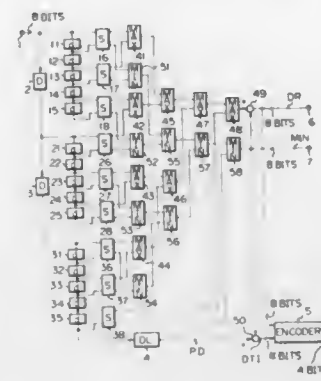
Filed Dec. 17, 1985, Ser. No. 809,742

Claims priority, application Japan, Dec. 21, 1984, 59-269866

Int. Cl.⁴ H04N 7/12, 1/40

U.S. Cl. 358-135

7 Claims



1. A highly efficient coding apparatus for coding digital video data in a format composed of blocks of digital video data representing plural picture elements and allowing compression of the video data, comprising:

first and second detecting means for detecting maximum and minimum values, respectively, of the digital video data representing the plural picture elements in each of said blocks;

means for generating dynamic range information for each said block from said maximum and minimum values for the respective block;

means for generating modified digital video data for each said block as the difference between each of the digital video data and one of said maximum and minimum values for said respective block;

means for encoding said modified digital video data with a variable digitized bit number determined by said dynamic range information for said respective block so as to provide coded data of variable bit length; and transmitting means for transmitting the coded data of variable bit length and an additional code for each said respective block formed of at least two of said maximum and minimum values and a signal corresponding to said dynamic range information.

4,710,812

INTERFRAME ADAPTIVE VECTOR QUANTIZATION ENCODING APPARATUS AND VIDEO ENCODING TRANSMISSION APPARATUS

Tokumichi Murakami, Atsushi Itoh, Kohtaro Asai, Koh Kamizawa, and Masami Nishida, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 833,269

Claims priority, application Japan, Feb. 28, 1985, 60-39351; Mar. 8, 1985, 60-46120; Apr. 5, 1985, 60-72094; Apr. 12, 1985, 60-77741; Sep. 30, 1985, 60-217320

Int. Cl.⁴ H04N 7/12

U.S. Cl. 358-136

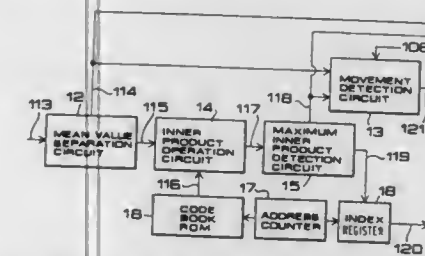
9 Claims

1. An interframe adaptive vector quantization apparatus comprising:

a frame memory for storing at least one frame of video signals normally;

a subtractor where, when input signal series of K in number (K: integer) are brought together into a block and the last video signal series is inputted, prediction signal series in a

block at position corresponding to the same position as the previous block at least one frame before the previous signal series on the screen is read from the frame memory and the interframe difference signal series is calculated; a mean value separation circuit for estimating intrablock mean value of the interframe difference signal series and converting it into input vector by the mean value separation; a vector quantization encoding member for encoding the input vector into discrimination code of the output vector to maximize total sum of products of elements of the input and output vectors, i.e., the inner product, among a plurality of sets of the output vectors optimized by clustering method in the poly-dimensional space based on statistical properties of normalization vectors by the normalization of the input vectors by the intrablock standard deviation; a movement detection circuit for executing processing that a block having amplitude coefficient as the total sum of products and the intrablock mean value both being less than prescribed threshold value is made insignificant



block and the intrablock picture element values of the interframe difference signal series are made all zero; a vector quantization decoding member for selecting output vector among the output vector discrimination code corresponding to the significant blocks other than the insignificant blocks and reproducing the interframe difference signal series by multiplication of the amplitude coefficient and adding of the mean value and making the interframe difference signal series to be zero for the insignificant block; an adder for adding the interframe difference signal series reproduced after the vector quantization to the prediction signal series and reproducing the video signal and writing the video signal to the frame memory; and a transmission data buffer for performing the variable length encoding of the significance/insignificance block discrimination code, the output vector discrimination code, the block mean value and the amplitude coefficient and controlling the threshold value to make the information generating amount constant.

4,710,813

LOW BANDWIDTH VIDEO TELECONFERENCING SYSTEM AND METHOD

Robert H. Wallis, Portola Valley, and William K. Pratt, Saratoga, both of Calif., assignors to Compression Labs, Inc., San Jose, Calif.

Continuation of Ser. No. 270,619, Jan. 4, 1981, abandoned. This application Jul. 31, 1986, Ser. No. 892,738

Int. Cl.⁴ H04N 7/12

U.S. Cl. 358-136

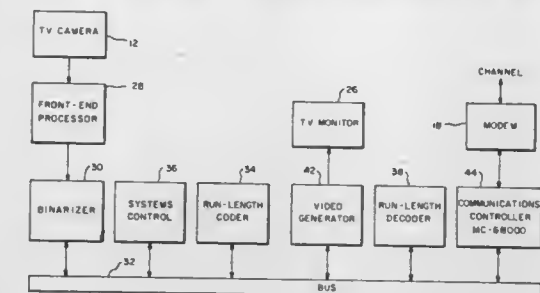
1 Claim

1. A bandwidth compression method for frames of gray scale digital video image data including lines of pixels comprising,

calculating the two dimensional mean gray scale level of a predetermined plurality of pixels located about a pixel in question,

calculating the two dimensional activity level of a plurality of pixels relative to the pixel in question, comparing a predetermined combination of the activity level and the mean to a threshold,

turning the pixel in question either black or white in response to the results of the comparison, determining the intraframe correlation of the lines of the frame, determining a first interframe correlation between the lines of the present frame and the corresponding lines of the previous frame, generating a plurality of displaced versions of the previous frame, each displaced version being shifted by one or



more pixels in either the lateral, vertical or diagonal directions, determining additional interframe correlations between the lines of the present frame and the corresponding lines of each of the displaced versions of the previous frame, comparing the intraframe correlation and interframe correlations and selecting as a reference the frame having the best correlation with the present frame, run length encoding in two dimensions the present frame with respect to the reference.

4,710,814

TELEVISION SOUND RECEIVING CIRCUIT FOR AT LEAST ONE SOUND CHANNEL CONTAINED IN AN RF SIGNAL

Gerhard G. Gassmann, Neuweiler-Agenbach; Hermann Schat, Freiburg i.Br.; Herbert Elms, Denzlingen; Bernd Novotny, Gundelfingen; Otmarr Kappeler, Neuenburg, and Dietmar Ehrhardt, Freiburg i.Br., all of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

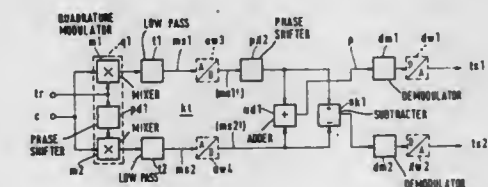
Filed Aug. 25, 1986, Ser. No. 899,973

Claims priority, application European Pat. Off., Aug. 27, 1985, 85110735.9

Int. Cl.⁴ H04N 7/04; G06G 7/14; H03K 5/00

U.S. Cl. 358-143

21 Claims



1. A channel separating circuit for use in a television sound receiving circuit for at least one sound channel transmitted by means of a sound carrier and contained in an RF signal which also contains a composite color signal transmitted by means of a picture carrier and a chrominance subcarrier, said channel separating circuit comprising:

a single-sideband demodulator using the "phasing method" and having an output for a first sideband and an output for a second sideband, and comprising:

a first quadrature modulator to which a composite signal and a separating signal are fed as signals to be mixed, said composite signal containing a first composite sound carrier or a first composite sound carrier and a second composite sound carrier;

first and second low pass filters connected, respectively, to first and second outputs of said first quadrature modulator to provide a first mixer signal and a second mixer signal, the passband of each of said first and second low pass filters being at least equal to the bandwidth of a sound channel frequency modulated about its sound carrier in a base signal, the stop band of each of said first and second low pass filters being chosen to suppress signals on adjacent channels;

- a 90° phase-shift stage having its input coupled to the output of said first low-pass filter;
 - a first adder having one input coupled to the output of said 90° phase-shift stage, a second input coupled to the output of said second low pass filter;
 - a first subtracter having a minuend input coupled to said 90° phase-shift stage output, a subtrahend input connected to said second low pass filter output;
 - a first frequency demodulator having its input coupled to the sum output of said first adder and having an output which is the sound signal of the first sound channel in the desired audio-frequency range; and
 - a second frequency demodulator having its input coupled to the output of said first subtracter and having an output which is the sound signal of the second sound channel in the desired audio-frequency range;
- said RF signal being applied as the composite signal directly to said channel-separating circuit; and wherein the frequency of said separating signal is set so that, in the presence of said first and second composite sound carriers, it lies approximately in the middle between the frequencies of said first and second composite sound carriers, and it has the same frequency deviation from the first composite sound carrier in the presence of only said first composite sound carrier.

4,710,815

APPARATUS FOR IMPROVING THE LINEARITY OF TV TRANSMITTERS USING A KLYSTRON

Peter G. Douglas, Chandler's Ford, and Morris N. Kyffin, Andover, both of England, assignors to Independent Broadcasting Authority, London, United Kingdom

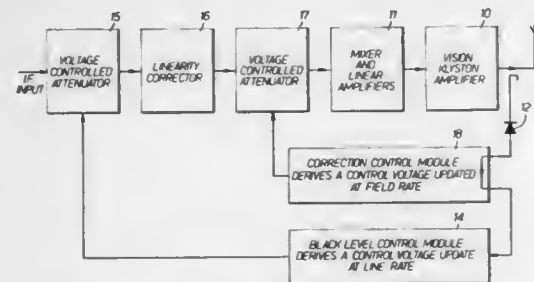
Filed Feb. 5, 1985, Ser. No. 698,584

Claims priority, application United Kingdom, Feb. 6, 1984, 8403067

Int. Cl.⁴ H04N 5/38; H04B 1/04

U.S. Cl. 358—186

4 Claims



1. A transmitter apparatus comprising a klystron circuit having an input and output, input signal conditioning circuitry having an input for signals to be transmitted and an output connected to the input of said klystron circuit for inputting conditioning signals thereto, a detector for detecting a modulating signal at the output of said klystron circuit and producing an output representative thereof, and a feedback circuit including a control circuit having an input connected to said detector, and an output connected to said input signal conditioning circuitry, said input signal conditioning circuitry comprising a linearity corrector means for affecting linearity correction of said klystron circuit and a further feedback circuit including a further control circuit having an input connected to said detector and an output connected to said input signal

conditioning circuitry; said feedback circuit and said further feedback circuit coupled to said detector for evaluating the linearity of the output from the klystron circuit; and in response to the evaluated linearity of said klystron circuit to generate a correction signal dependent on a determined linearity, said linearity corrector means modifies said linearity of the klystron circuit in response to said correction signal.

4,710,816

PICTURE SIGNAL GENERATING APPARATUS

Seiichi Yabumoto, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

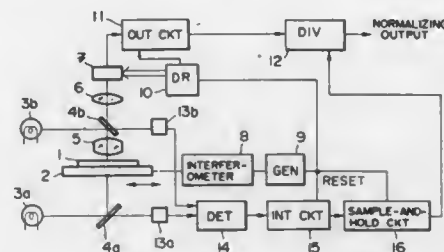
Filed Sep. 25, 1986, Ser. No. 911,356

Claims priority, application Japan, Sep. 30, 1985, 60-216781; Sep. 30, 1985, 60-216782

Int. Cl.⁴ H04N 3/14

U.S. Cl. 358—213.15

10 Claims



1. An apparatus for illuminating an object with illuminating means, providing a relative displacement between a linear image sensor and a pattern distribution of light from the object in a direction substantially perpendicular to an alignment direction of a plurality of photoelectric transducer elements constituting said linear image sensor, and controlling a picture signal of said image sensor according to the pattern distribution of light from the object, including:

- (a) means for detecting the relative displacement and generating a displacement detection signal whenever a predetermined displacement occurs between said image sensor and the pattern distribution of light from the object;
- (b) exposure detecting means having light-receiving means for receiving light from said illuminating means, said exposure detecting means being adapted to detect an exposure of said light-receiving means upon illumination of light from said illuminating means in response to the displacement detection signal and to generate an exposure detection signal representing the detected exposure; and
- (c) normalizing means for normalizing the picture signal in response to the exposure detection signal.

4,710,817

SOLID STATE IMAGE SENSOR

Fumihiko Ando, Tokyo, Japan, assignor to Nippon Hoso Kyo-kai, Tokyo, Japan

PCT No. PCT/JP85/00710, § 371 Date Aug. 25, 1986, § 102(e) Date Aug. 25, 1986, PCT Pub. No. WO86/03918, PCT Pub. Date Jul. 3, 1986

PCT Filed Dec. 25, 1985, Ser. No. 900,139

Claims priority, application Japan, Dec. 26, 1984, 59-273144

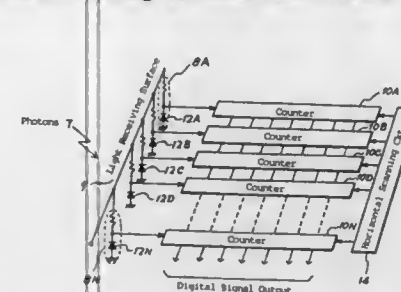
Int. Cl.⁴ H04N 5/14

U.S. Cl. 358—213.11

7 Claims

1. A solid state image sensor comprising:
 - a plurality of light receiving means arranged in the form of at least one dimension and each for delivering a pulse signal representative of the number of photons incident to each light receiving means;
 - a plurality of counting and holding means, each connected to a corresponding one of said light receiving means and

for counting said pulse signals and for holding a count value as a video output;
means for resetting said count value of each of said plurality



of counting and holding means to its initial state at a pre-determined interval; and
scanning means for sequentially reading out said count value from each of said counting and holding means.

4,710,818

METHOD OF READING IMAGE DATA

Kenichi Inatsuki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

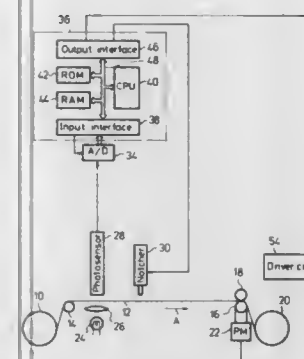
Filed Jul. 28, 1986, Ser. No. 890,243

Claims priority, application Japan, Aug. 8, 1985, 60-174725

Int. Cl.⁴ H04N 3/40

U.S. Cl. 358—214

6 Claims



1. A method of sensing image information wherein a film is fed by film driving feed means including a pulse motor, and image information from the film is sensed by a sensor, comprising the steps of:

storing values indicative of time periods corresponding to constant feeding lengths of said film during periods of acceleration and deceleration of said pulse motor; and operating said sensor during feeding of said film by said pulse motor at time intervals defined by said values, wherein said sensor is operated at intervals corresponding to constant feeding lengths of said film.

4,710,819

SUSPENSION SYSTEM FOR SUPPORTING AND CONVEYING EQUIPMENT, SUCH AS A CAMERA

Garrett W. Brown, 515 Adison Ct., Philadelphia, Pa. 19147

Continuation of Ser. No. 445,572, Dec. 1, 1982, abandoned. This

application Jul. 30, 1985, Ser. No. 760,390

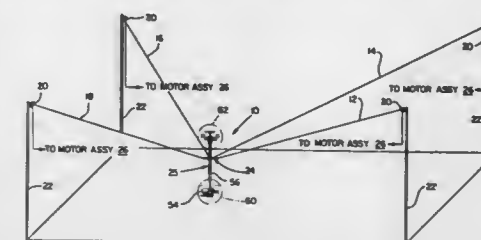
Int. Cl.⁴ H04N 5/30; B66C 21/00; G03B 39/00; B63C 11/10

U.S. Cl. 358—229

67 Claims

1. A suspension system for supporting and conveying equipment, said system comprising:
 - at least three elongate, flexible members;
 - mounting means spaced-apart from each other for extendably and retractably supporting said flexible members;
 - an equipment support member attached to each of the flexible members, wherein the equipment support member is

adapted to be moved in three directions in response to movement of the flexible members; and



means for operatively connecting said equipment with said equipment support member so that said equipment is in controllable isolation from angular movement of said equipment support member.

4,710,820

SINGLE LAYER OPTICAL COUPLER FOR PROJECTION TV CRT

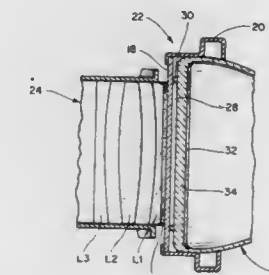
William N. Roberts, Niles, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 22, 1986, Ser. No. 866,185

Int. Cl.⁴ H04N 5/74

U.S. Cl. 358—231

5 Claims



1. In a projection television receiver wherein a video image is projected and displayed, an arrangement comprising:
 - a CRT having a window through which said video image is directed;
 - lens means aligned with said CRT for receiving said video image directed through the window thereof for projecting said video image;
 - compressible, adhesive, solid, optical coupling means having a unitary structure and a characteristic adhesiveness and compressibility and including first and second flat opposed surfaces disposed in tight-fitting engagement with said CRT window and said lens means, respectively, wherein said optical coupling means is comprised of at least first and second silicone resins and at least first and second catalysts, and wherein said characteristic adhesiveness may be changed by varying the ratio of said silicone resins and said characteristic compressibility may be changed by varying the ratio of said catalysts; and
 - mounting means for securely coupling said lens means to said CRT and for maintaining said optical coupling means in compression between said CRT window and said lens means.

4,710,821

IMAGE RECORDING APPARATUS

Shinichi Ohta, Kunitachi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

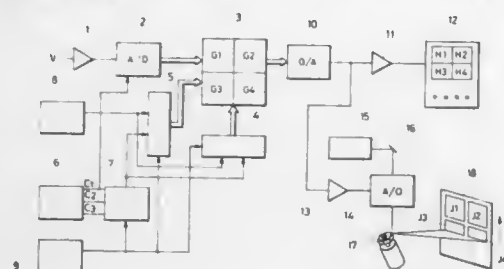
Filed Jun. 10, 1985, Ser. No. 743,352

Claims priority, application Japan, Jun. 14, 1984, 59-122746; Jun. 14, 1984, 59-122747; Jul. 24, 1984, 59-153688; Jul. 24, 1984, 59-153689; Jul. 24, 1984, 59-153690

Int. Cl.⁴ H04N 1/00, 1/40

U.S. Cl. 358—256

14 Claims



1. An image recording apparatus comprising: a memory for storing a plurality of frames of image data; recording means for reading out the frames of image data to be recorded from said memory and for recording a predetermined number of the frames of image data in a predetermined arrangement; and display means for reading out the frames of image data from said memory and for displaying the read out image data from memory, in substantially the same predetermined arrangement as that for recording, and in such a predetermined compressed mode as to decrease the number of pixels within the frame as compared with that upon recording.

4,710,822

IMAGE PROCESSING METHOD

Masahiko Matsunawa, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

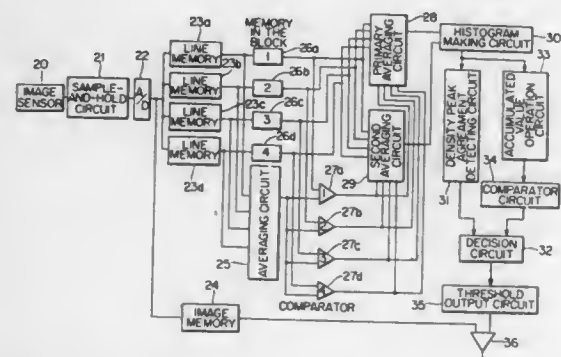
Continuation of Ser. No. 533,430, Sep. 16, 1983, abandoned. This application Aug. 21, 1986, Ser. No. 899,751

Claims priority, application Japan, Sep. 21, 1982, 57-164419

Int. Cl.⁴ H04N 1/40

U.S. Cl. 358—280

5 Claims



1. An image processing method comprising steps of: dividing an image into a plurality of blocks, each block comprises a plurality of picture elements; sorting the picture elements in each block into a first group consisting of picture elements of densities not lower than a reference density and a second group consisting of picture elements of densities lower than said reference density;

obtaining a representative density of picture elements of said first group in each block;
obtaining a representative density of picture elements of said second group in each block;
effecting an image discrimination in accordance with said representative densities;
effecting a determination of threshold value in accordance with said representative densities and result of said image discrimination;
said image discrimination and determination of threshold values are conducted by using histograms made out from said representative density of picture elements of said first group in each block and said representative density of picture elements of said second group in each block; and
converting image information into binary signals according to said threshold value.

4,710,823

DENSITY CONVERSION IN IMAGE REPRODUCTION

Yoshihiro Kitazawa, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

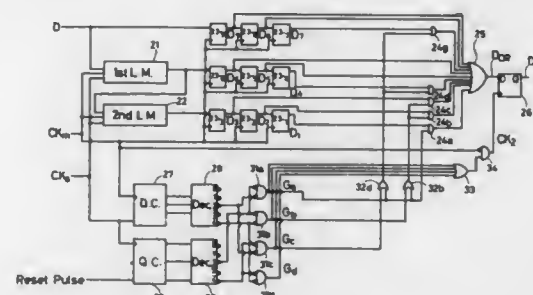
Filed May 7, 1985, Ser. No. 731,514

Claims priority, application Japan, Jun. 8, 1984, 59-118721

Int. Cl.⁴ H04H 1/40

U.S. Cl. 358—280

8 Claims



1. A method for converting density in image reproduction, comprising the steps of: scanning an original to obtain binary image data; distributing into several groups binary image data of several pixels to be recorded two dimensionally in main and sub-scanning directions; obtaining a logical sum of the image data belonging to each of the pixel groups to generate a recording signal; and modulating an output device using the recording signal to produce a reproduction image, wherein image data of five by five pixels in the main and the sub-scanning directions are distributed into four groups by a ratio of three to two in both the main and sub-scanning directions.

4,710,824

SYSTEM AND METHOD FOR IMPROVING CHROMINANCE IN VIDEO DISC STORAGE SYSTEM

Lawrence E. Alston, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1986, Ser. No. 848,156

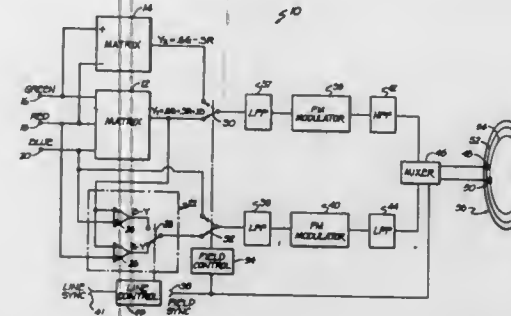
Int. Cl.⁴ H04N 9/80

U.S. Cl. 358—310

21 Claims

1. A system for encoding a video signal into a format suitable for recording wherein the video signal is of the type comprising at least three separate color component signals comprising: first means for providing a first luminance type output signal as a function of the sum of select portions of the three separate color component signals;
second means for providing a second luminance type output signal as a function of the difference between select portions of two of the three separate color component signals;
third means for providing a chrominance type output signal

as a function of the respective differences between said first luminance type signal and at least two of the separate color component signals; and
fourth means responsive to the output signals from said first, second and third means and the video signal for providing: said first luminance type signal in correspondence with first alternate fields of the video signal in a format suitable for recording within a first select bandwidth; said second luminance type signal in correspondence with second



alternate fields disposed between every other field of said first alternate fields of the video signal in a format suitable for recording within said first select bandwidth, said chrominance type signal in correspondence with said first alternate fields of the video signal in a format suitable for recording within a second select bandwidth below said first select bandwidth, and one select separate color component signal in correspondence with said second alternate fields in a format suitable for recording within said second select bandwidth.

4,710,825

DISC RECORDING SYSTEM WITH SPEED CONTROL

Masaya Okita, Yokohama; Masahiro Sawada, Kawasaki, and Tadashi Ota, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 612,689, May 22, 1984, abandoned.

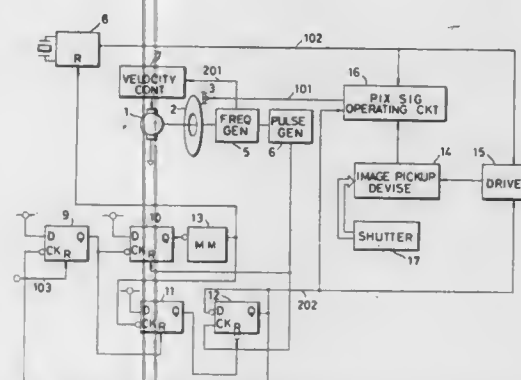
This application Dec. 8, 1986, Ser. No. 939,225

Claims priority, application Japan, May 26, 1983, 58-93121; Jul. 14, 1983, 58-126860; Jul. 14, 1983, 58-126861

Int. Cl.⁴ H04N 5/781

U.S. Cl. 358—342

17 Claims



1. A system for controlling rotation velocity of a motor comprising:

- (a) first pulse generating means for generating a predetermined number of pulses for every revolution of said motor, the period of the pulses from said means being inversely proportional to the rotation velocity of said motor;
- (b) second pulse generating means for generating a plurality of pulses having a predetermined phase difference with respect to the pulses from said first pulse generating

means, each of said pulses from said second pulse generating means having a predetermined period in which the level of said pulses from said second pulse generating means varies linearly;

- (c) first sample and hold means for sampling and holding the pulse from said second pulse generating means in synchronism with the pulse from said first pulse generating means;
- (d) second sample and hold means for sampling and holding the pulse from said second pulse generating means within said predetermined period in synchronism with the pulse from said second pulse generating means; and
- (e) means for controlling the rotation velocity of said motor in accordance with the difference between the value of the pulse from said second pulse generating means sampled and held by said first and second sample and hold means, respectively.

4,710,826

APPARATUS WITH LIQUID CRYSTAL DISPLAY PANEL, FOR RECORDING/PLAYING BACK TELEVISION SIGNAL BY UTILIZING DIGITAL AUDIO TAPE RECORDER SYSTEM

Keiichi Sakurai, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

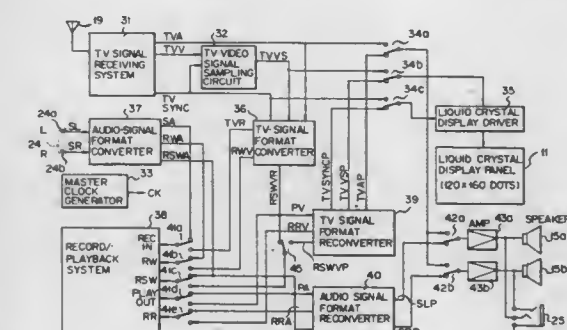
Filed Jun. 9, 1986, Ser. No. 872,224

Claims priority, application Japan, Jun. 18, 1985, 60-132419

Int. Cl.⁴ H04N 5/92

U.S. Cl. 360—9.1

20 Claims



18. An apparatus for recording/playing back a signal with a sync signal by using a digital audio tape recorder (DAT) system, comprising:

first control signal generating means for generating first and second control signals according to the sync signal to record the input signal;

converting means for converting an input signal to a PCM signal having a predetermined bit length within 256 bits and a predetermined block size within 256 blocks in response to the first and second control signals;

DAT tape driving means for driving a rotary head in response to a fourth control signal of a frequency based on that of a selected one of the first control signal and a third control signal based on the DAT tape drive instruction, outputting the playback digital signal from said DAT tape in response to a read instruction in the DAT tape drive instruction, and writing an input recording digital signal on said DAT tape in response to a write instruction in the DAT tape drive instruction;

PCM signal recording/playback processing means for receiving the PCM signal converted according to the first and second control signals, supplying the recording digital signal derived from the PCM signal to said DAT tape driving means in response to the fourth control signal, receiving the playback digital signal from said DAT tape driving means in response to the fourth control signal, and outputting a playback PCM signal derived from the play-

back digital signal in response to the third control signal and a fifth control signal;
second control signal generating means for generating the third and fifth control signals and the playback sync signal to playback the playback PCM signal; and
reconverting means for reconverting the playback PCM signal from said PCM signal recording/playback processing means to the same signal as input to said converting means.

4,710,827

SERVO APPARATUS

Masaya Okita, Yokohama, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

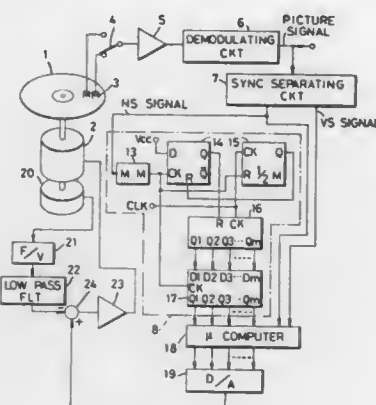
Filed May 21, 1986, Ser. No. 865,415

Claims priority, application Japan, May 29, 1985, 60-116282

Int. Cl.⁴ H04N 5/78; G11B 15/52

U.S. Cl. 360—10.1

13 Claims



7. A method for controlling an apparatus that repeatedly reproduces a picture signal from a motor-driven disk, comprising the steps of:

- providing memory means;
- providing supplying means for supplying voltage to control the rotation of said motor;
- providing control means for controlling said supplying means to change said voltage;
- successively producing horizontal synchronizing signals separated from the reproduced picture signal;
- measuring time intervals at which said horizontal synchronizing signals are produced and outputting time-interval data indicative of a plurality of measured time intervals;
- storing in said memory means time-interval data corresponding to at least one field of the picture signal;
- producing control data which determine the change of said voltage during the reproduction of at least one field of the picture signal, on the basis of said time-interval data stored in said memory means, storing said control data in said memory means, and causing said control means to control said supplying means on the basis of said control data stored in said memory means; and
- repeating the steps (d), (e), (f), and (g) until all of said measured time intervals are within a predetermined range.

4,710,828

TRACKING ALIGNMENT FOR A ROTATING MAGNETIC TRANSDUCER HEAD

Jean F. Sulzer, Sevres, France, assignor to Enertec, Sevres, France

Filed Jun. 5, 1985, Ser. No. 741,515

Claims priority, application France, Jun. 28, 1984, 84 1023

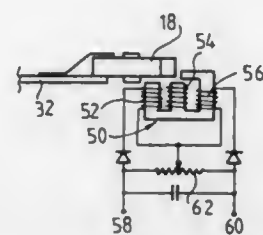
Int. Cl.⁴ G11B 21/02, 5/58

U.S. Cl. 360—75

15 Claims

14. In a transducer of the type including a magnetic trans-

ducer head mounted to the end of a rotating support, the support being relatively inflexible in its plane of rotation and relatively flexible in a direction transverse to its plane of rotation, a method of modifying the trajectory of the rotating magnetic transducer head with respect to its plane of rotation



comprising the steps of: (a) periodically applying a magnetic field directly to the magnetic transducer head and transverse to and within the plane of rotation; and (b) responsive to said magnetic field inducing said head to oscillate in a direction transverse to the plane of rotation.

4,710,829

DISK LOADING MECHANISM FOR RECORDING AND REPRODUCING APPARATUS

Motohiro Shimaoka, and Yunkio Saito, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

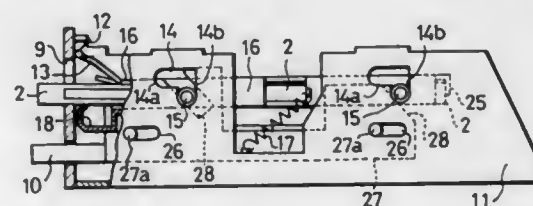
Continuation of Ser. No. 569,671, Jan. 10, 1984, abandoned. This application Jan. 13, 1987, Ser. No. 4,839

Claims priority, application Japan, Jan. 11, 1983, 58-1296[U]

Int. Cl.⁴ G11B 5/012

U.S. Cl. 360—97

4 Claims



1. A recording and reproducing apparatus comprising:
 - a body having an opening at a forward portion thereof to allow insertion of a disk cartridge into the apparatus;
 - a movable cartridge holder disposed inwardly of the opening at an insertion position for receiving a disk cartridge inserted through the opening;
 - means within the apparatus for moving the cartridge holder inwardly and downwardly to an operative position within the apparatus when the cartridge has been fully inserted in the holder, and for moving the holder upwardly and forwardly to the insertion position when the cartridge is to be ejected;
 - a pivotable shutter having an end pivotally mounted to the body of the apparatus on one side of the opening and having its free end pivotally movable to close at least a portion of the opening;
 - means biasing the shutter to close said portion of the opening when the cartridge is removed from the holder and withdrawn through the opening; and
 - a receiving portion on the forward end of the holder which is disposed on an opposite side of the opening from the shutter when the holder is in the insertion position, said receiving portion having an end which is pressed back upon insertion of the cartridge into the holder and, when the cartridge is to be ejected, said end of the receiving portion springing forward and being engaged on an inner surface thereof by the free end of the pivotable shutter as the cartridge is withdrawn from the holder through the

opening such that the opening is closed by the combination of said shutter and said receiving portion, whereby said receiving portion of the cartridge holder engaged on its inner surface by the end of the shutter at the insertion position prevents movement of the holder to the operative position unless a disk cartridge is first inserted in the holder to push said pivotable shutter back away from engagement with the inner surface of said end of said receiving portion.

4,710,830

SEALED DISC DRIVE ASSEMBLY WITH INTERNAL AIR FILTER

Hiroshi Imai, and Kouichi Yoshioka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

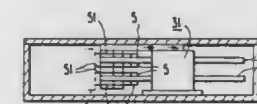
Filed Oct. 22, 1986, Ser. No. 921,504

Claims priority, application Japan, Oct. 24, 1985, 60-238660

Int. Cl.⁴ G11B 5/012

U.S. Cl. 360—97

4 Claims



1. A disc drive assembly, comprising:
 - a hermetically sealed housing (1);
 - at least one hard magnetic storage disc (2) disposed within the housing and coupled to rotational drive means (31);
 - an air filter (45; 46; 47) disposed within the housing with an intake side (451; 461; 471) thereof oriented directly in the path of and perpendicular to a spiralling, centrifugally pumped air flow generated by the rotating disc, and
 - an air guide (71; 72; 73) disposed within the housing for ducting clean air from an outlet side (452; 462; 472) of the filter to a low pressure zone proximate the center of the disc such that a pressure differential is established across the filter to promote a continuous cyclical air flow there-through and the attendant removal of contaminating particles of dust and the like, wherein the intake side of the filter extends over substantially the full height of the housing, and further comprising a flue box (41; 42; 43) disposed within the housing enclosing the outlet side of the filter and establishing open communication with an inlet of the air guide.

4,710,831

LOADING AND UNLOADING SYSTEM FOR FLEXIBLE DISC DRIVE APPARATUS

Akimasa Nishimura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1984, Ser. No. 659,703

Claims priority, application Japan, Oct. 19, 1983, 58-195507

Int. Cl.⁴ G11B 17/035, 5/016, 15/64

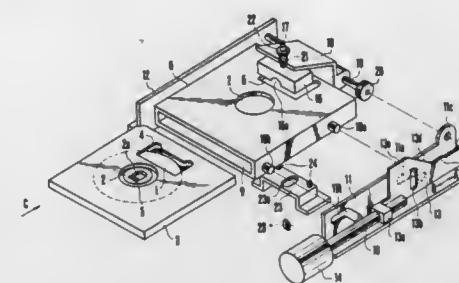
U.S. Cl. 360—99

9 Claims

7. A recording and/or reproducing apparatus using a disc-shaped flexible record-bearing medium, comprising:

- a recording and/or reproducing head arranged to selectively confront a recording surface of the medium;
- a stabilizing means for stabilizing the medium near said head, said stabilizing means having three positions:
 - a first position at which said medium is stabilized near said head,
 - a second position at which said medium is not stabilized,

and which is apart from said medium by a predetermined distance, and
a third position at which said medium is not stabilized and which is more apart from said medium than said second position; and



- (c) control means for holding said stabilizing means selectively at said first position for recording and/or reproducing, at said second position for preventing deformation of said medium, or at said third position for allowing ejection of said medium.

4,710,832

TRACKING SYSTEM FOR ROTARY MAGNETIC RECORDING MEDIUM USING WEIGHTED SAMPLED TRACK VALUES

Haruo Itoh, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

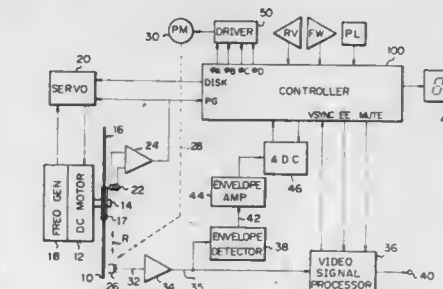
Filed Oct. 5, 1984, Ser. No. 658,440

Claims priority, application Japan, Oct. 14, 1983, 58-190631

Int. Cl.⁴ H04N 5/781

U.S. Cl. 360—10.2

8 Claims



1. A tracking system for a rotary magnetic recording disc having a plurality of tracks recorded concentrically thereon, comprising:
 - driving means having a driving shaft which is removably loaded with said rotary magnetic recording disc for rotatably driving said disc;
 - magnetic transducer means for sensing signals recorded on said tracks of said magnetic recording disc;
 - transducer feeding means for feeding said magnetic transducer means to a position where one desired track is located; and
 - control means for controlling said transducer feeding means to effect tracking,
 said control means including operational means for sampling a signal sensed by said magnetic transducer means in response to the rotation of said magnetic recording disc at a plurality of sampling points generally distributed along the track, and summing the sampled values with predetermined weight according to the location of the sampling point along the track to produce a weighted addition result,
 said operational means including means for determining a difference between a present result of weighted addition

and an immediately preceding weighted addition result and producing a difference signal if the difference exceeds a first predetermined value,
said control means executing a tracking control on said transducer feeding means in response to the produced difference signal to cause said magnetic transducer means to move to a position where a larger weighted addition result is determined,
said control means controlling said transducer feeding means to cause said magnetic transducer means to remain at a position where said magnetic transducer means is located when said means for determining determines that a difference between a present result of weighted addition from an immediately preceding of weighted addition is associated with a peak of said signal recorded on said track.

4,710,833

FLOPPY DISK R/W HEAD ASSEMBLY

Tadashi Hasegawa, Koriyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

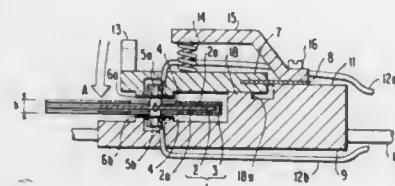
Filed Dec. 5, 1985, Ser. No. 805,826

Claims priority, application Japan, Feb. 27, 1985, 60-38174

Int. Cl.⁴ G11B 5/54

U.S. Cl. 360—105

4 Claims



1. A movable magnetic head assembly simultaneously cooperable with opposite sides of a magnetic storage disk (2), comprising:

- (a) an elongate carriage (9) radially movable relative to the disk and having a pedestal (11) upstanding from a radially outer end thereof,
- (b) an elongate loading arm (7) pivotally mounted to the pedestal, extending parallel to the carriage to define therewith a disk receiving slot, and radially movable with the carriage,
- (c) spring means (8) biasing the loading arm towards the carriage,
- (d) first and second signal transducer heads (5a, 5b) respectively mounted opposite and facing each other to radially inner portions of the carriage and loading arm by respective gimbal springs (6a, 6b), and
- (e) stop means (18, 19, 20) disposed intermediate the transducers and the pedestal and between said loading arm and said carriage at a position radially outwardly and spaced from an outer circumference of the disk for preventing the pivotal movement of the loading arm towards the carriage by the spring means beyond a predetermined position whereat the transducer heads pinchingly engage the opposite sides of the disk with a predetermined tracking force determined exclusively by the gimbal springs, said stop means defining an inner end of the disk receiving slot.

4,710,834
APPARATUS FOR POSITIONING A MAGNETIC DISK
READ HEAD WITH PULSE OPERATED DETENT
MAGNET

Wilhelm Brand, Rosenheim; Vaclav Vanek, Haar, and Franz Jakobec, Unterhaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

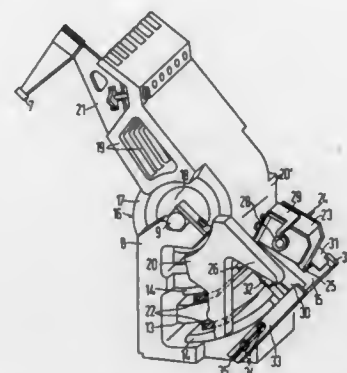
Filed Jun. 26, 1985, Ser. No. 749,312

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423502

Int. Cl.⁴ G11B 5/59

U.S. Cl. 360—105

14 Claims



1. A positioning mechanism for a magnetic disk storage device of the rotational positioner type, comprising a bearing block for mounting a positioning shaft, a swivel unit rotatable about said shaft, said bearing block forming part of a motor system for rotating said swivel unit, said swivel unit comprising a pivot member rotationally seated on said shaft and having pivot arms carrying magnetic heads and brackets for carrying the movable member of the motor system for the rotational positioner, a detent electro-magnet having a solenoid and a stop armature movable between an operating position which is juxtaposed with said pivot member when said pivot member is in a detent position for selectively restraining movement of said pivot member when it has been moved to said detent position and an inoperated position for enabling the first member to rotate freely, said detent magnet solenoid comprising an electrical pulse operated solenoid, said stop armature being adapted to move away from said pivot member to its inoperative position in response to a brief excitation of said detent magnet to enable said pivot member to rotate freely, and means for mechanically holding said stop armature in its operating position as long as said pivot member does not swing back into said detent position.

4,710,835

MAGNETIC HEAD DRIVING MECHANISM FOR TAPE PLAYER

Fumiya Yamada; Seiichiro Matsuki; Masahiko Kawamura, and Masashi Kawamoto, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 13, 1985, Ser. No. 775,977

Claims priority, application Japan, Sep. 14, 1984, 59-138757; Sep. 20, 1984, 59-141580; Sep. 20, 1984, 59-141581; Sep. 20, 1984, 59-141583; Sep. 25, 1984, 59-143614

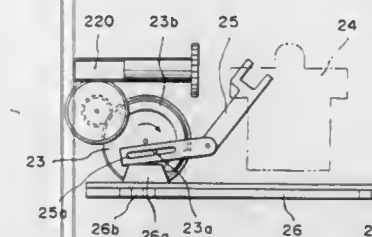
Int. Cl.⁴ G11B 21/08

U.S. Cl. 360—106

1 Claim

1. In an auto-reverse type tape player, a head rotation mechanism for rotating a rotary head in said tape player, said mechanism comprising a sector gear; a boss extending in the direction opposite to the rotary head side of the sector gear and having a tapered foreend; a slide lever; a cam crest positioned on said slide lever; a cam gear having a pin and a semicircular cam each extending from a major surface thereof, said cam gear

being positioned with respect to said slide lever and said crest so that said semicircular cam is contactible with said cam crest; linking means for rotating the rotary head, including a link having two arms which are pivotally connected at one end of each other, one of said arms having a groove in which said pin is slidable, the linking means being rocked by said gear and having its other arm equipped with a U-shaped member engag-



ing with the boss on the sector gear, wherein the boss on the sector gear engages with the U-shaped member of said linking means for rotating the head only when the rotary head is located at a retracted position, and the boss is out of contact with the U-shaped member when the rotary head is located ahead of the retracted position, whereby a reversible rotation of the single cam gear is used to change a direction of the rotary head and move the head forward.

4,710,836

MAGNETIC HEAD

Yuichi Hishi, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

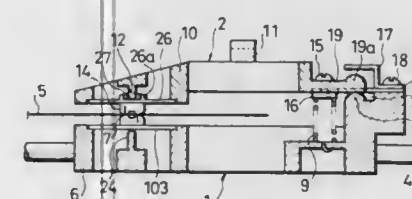
Filed Jan. 23, 1986, Ser. No. 821,596

Claims priority, application Japan, Jan. 23, 1985, 60-7477[U]

Int. Cl.⁴ G11B 5/54, 5/016, 5/58

U.S. Cl. 360—106

3 Claims



1. A magnetic head capable of reading information from or writing information on both sides of a magnetic disc inserted therein, comprising:

- a carriage slidably supported on a guide rod so as to be slidable in the radial direction of the magnetic disc;
 - an arm joined at the rear end thereof through an elastic member to the rear end of the carriage so as to be swingable on the elastic member;
 - an upper head fixed to the free front end of the arm;
 - a lower head mounted through a gimbal spring on the carriage opposite to the upper head;
 - resilient means urging the arm toward the carriage so that the upper head is pressed against the lower head;
 - a pivot defining the vertical position of the upper head with respect to the arm;
 - a pivot defining the vertical position of the lower head with respect to the carriage; and
 - a holding member for inhibiting the excessive upward turning of the arm,
- wherein said carriage has a supporting portion on the rear end thereof for abutting a lower surface of the rear end of the arm in order to define a stable vertical position of the arm when it is lowered toward the carriage so as to form a stable reference plane for the free end of the arm in which the upper head is located, whereby the vertical

positions of the upper head and the lower head can be simply adjusted.

4,710,837

MAGNETIC HEAD DEVICE INCLUDING MAGNETIC MEDIA BIASING AND POSITIONING MEANS

Takashi Matsumoto, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

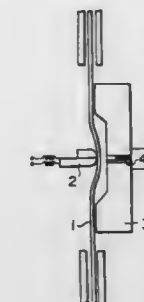
Filed Jun. 20, 1985, Ser. No. 746,963

Claims priority, application Japan, Jun. 27, 1984, 59-132256

Int. Cl.⁴ G11B 17/32, 21/21

U.S. Cl. 360—110

3 Claims



1. A magnetic head device comprising:

- a thin-film magnetic recording and reproducing head, said thin-film magnetic recording and reproducing head applying a longitudinal magnetic field to a magnetic recording medium during a recording mode;
- positioning means for keeping said thin-film magnetic recording and reproducing head in contact with said magnetic recording medium, said thin-film magnetic recording and reproducing head and said positioning means being located on opposite sides of said magnetic recording medium; and
- a biasing magnetic head for applying a longitudinal biasing magnetic field to the magnetic recording medium during the recording mode, said biasing magnetic head being mounted in said positioning means in confronting relation to said thin-film magnetic recording and reproducing head with the magnetic recording medium adapted to be interposed therebetween.

4,710,838

MAGNETIC THIN-FILM HEAD FOR A RECORDING MEDIUM THAT CAN BE MAGNETIZED VERTICALLY

Andreas Jahnke, Forchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 807,538

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446924

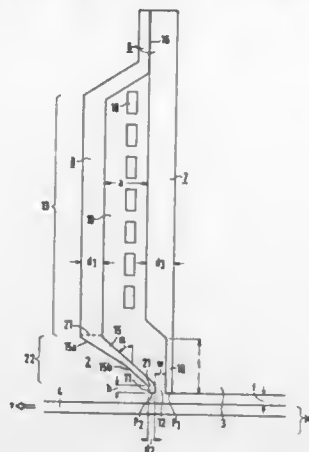
Int. Cl.⁴ G11B 5/127

U.S. Cl. 360—125

8 Claims

1. A magnetic thin-film head comprising a layer-wise build-up on a nonmagnetic substrate for a recording medium which is provided with a magnetized storage layer, into which information can be written along a track by perpendicular magnetization of the storage layer, said magnetic head comprising a ring head-like magnetic conduction body for carrying magnetic flux having two magnet legs, a first of the magnet legs being disposed on the substrate and a second of the magnet legs being spaced from the first magnet leg by a defined space, the magnet legs forming end pole pieces facing the recording medium arranged one behind the other as viewed in the direction of motion of the head and medium, the end pole pieces having a predetermined small spacing therebetween and having a predetermined small width transverse to the direction of motion, said defined space between the magnet legs being

substantially larger than the spacing between the end pole pieces, the second magnet leg being formed so as to provide the defined space, the turns of a write/read coil winding extending through said defined space, the end pole piece associated with the second magnet leg having a predetermined short vertical length, the corresponding vertical length of the other end pole piece being at least twice as large as said predetermined short vertical length of the end pole piece associated



with the second magnet leg, the second magnet leg being formed with a leg part which has an increasing width in a region between the associated end pole piece and the region of the second magnet leg which defines said defined space, the leg part being provided with an aperture which extends along a center line of the second magnet leg lying in the conduction direction of the magnetic flux and reaches at least approximately to the end pole piece associated with the second leg.

4,710,839

MAGNETIC DISC CARTRIDGE

Michio Iizuka, Saku, and Haruo Shiba, Komoro, both of Japan, assignors to TDK Corporation, Tokyo, Japan

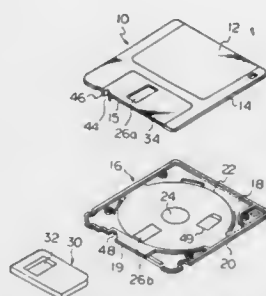
Filed Nov. 27, 1985, Ser. No. 803,205

Claims priority, application Japan, Dec. 5, 1984, 59-184867[U]

Int. Cl.⁴ G11B 23/033

U.S. Cl. 360-133

4 Claims



1. A magnetic disc cartridge adapted for use with a magnetic disc drive apparatus having a housing to receive said cartridge, a read-write head and a shutter actuation pin, said magnetic disc cartridge comprising a magnetic disc, a pair of upper and lower case members, superimposed one upon the other, to define a generally flat case for accommodating said magnetic disc therein, said case having a center axis and a peripheral wall, said upper and lower case members having peripheral edges which form said peripheral wall, with a seam line formed between said case members and upon said peripheral wall when said case members are superimposed one upon the other, a means for defining an aperture in said case between said center axis and said peripheral wall for access of said read-write head to said magnetic disc, a shutter moveably mounted

on said case and engageable with said shutter actuation pin to move between a first position in which said shutter closes said aperture and a second position in which said shutter opens said aperture, and a means for defining a groove on said peripheral wall of said case, said groove extending through the case in parallel to said center axis to receive said shutter actuation pin when said shutter is in said second position, wherein said means for defining said groove comprises a cut-out section in one of said case members along the peripheral edge thereof, and a wall member defining said groove and extending integrally from the other of the upper and lower case members along the peripheral edge thereof, said wall member extending into said cut-out section so that said groove contains no seam line, whereby catching of said shutter actuation pin upon said seam line is precluded.

4,710,840

GENERATING SYSTEM WITH FAULT DETECTION

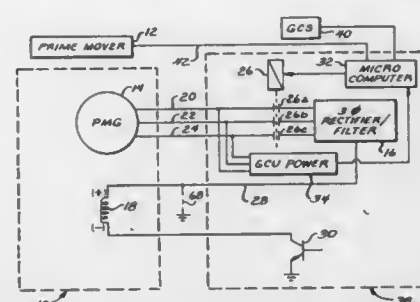
John E. Shepler, and Dov Zur, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 8, 1985, Ser. No. 689,765

Int. Cl.⁴ H02H 7/06

U.S. Cl. 361-20

8 Claims



1. In a generating system, the combination of: a permanent magnet generator characterized by an output whose voltage is inversely affected by its loading; an exciter receiving electrical power from said permanent magnet generator and generating a magnetic field, said exciter including a winding; an electrically controllable switch selectively connecting or disconnecting said winding to or from said permanent magnet generator and powered by said permanent magnet generator; and a fault detector operating said switch including an electrical computing circuit powered by said permanent magnet generator and characterized by inability to operate at low output voltage levels of said permanent magnet generator caused by heavy loading thereof indicative of a fault in said exciter winding and a non-volatile memory in which is written information indicative of the inability of said computing circuit to operate in response to a said low voltage level, said computing circuit, upon restoration to ability to operate in response to an output voltage increase from said low voltage level, reading said memory in response thereto, and controlling said switch to prevent connection of said winding to said permanent magnet generator.

4,710,841

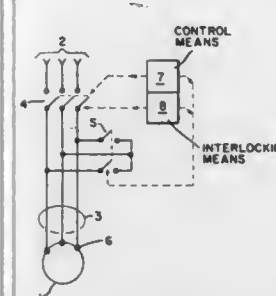
SYSTEM FOR PRODUCTION OF INDUCTION MACHINES AGAINST DAMAGE FROM RESIDUAL VOLTAGE EFFECTS

Gerald W. Bottrell, 2442 Teasley St., La Crescenta, Calif. 91214
Filed Oct. 23, 1985, Ser. No. 790,151

Int. Cl.⁴ H02H 7/08

U.S. Cl. 361-23

18 Claims



1. A system for protection of an induction machine, comprising:
a voltage source switching means for connection to a voltage source;
a short-circuiting switch for connection to induction machine supply conductors, between said voltage source switching means and the terminals of said induction machine, in such a manner that said supply conductors are short circuited when said short-circuiting switch is closed; control means for closing said short-circuiting switch after said voltage source is interrupted, said short-circuiting switch being held closed for a predetermined period of time and, at the end of said predetermined period of time, said short-circuiting switch being opened, thereby enabling said voltage source to be re-established; and an interlocking system to prevent closing said voltage source switching means unless said short-circuiting switch is open and to prevent closing said short-circuiting switch unless said voltage source switching means is open.

4,710,842

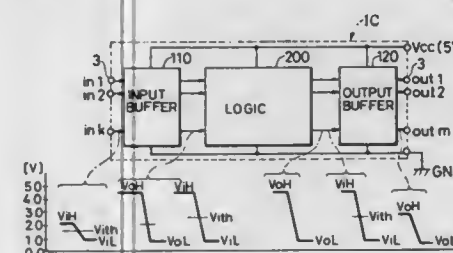
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE
Yasunaga Suzuki, Toshiaki Matsubara, and Akira Urugami, all of Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 18, 1986, Ser. No. 840,655

Claims priority, application Japan, Mar. 25, 1985, 60-58366

Int. Cl.⁴ H02H 3/00

U.S. Cl. 361-88

15 Claims



1. An integrated circuit comprising:
(1) a substrate having a main surface;
(2) a plurality of bonding pads formed at said main surface;
(3) a plurality of input circuit forming portions and a plurality of output circuit forming portions formed at said main surface in such a manner as to form pairs that each correspond respectively to one of a plurality of said bonding pads, each input circuit forming portion and each output circuit forming portion having predetermined elements;
(4) a plurality of input circuits formed in selected input

circuit forming portions among said plurality of input circuit forming portions by electrically connecting said predetermined elements in said selected input circuit forming portions, each input circuit having an input and an output;

(5) a plurality of output circuits formed in selected output circuit forming portions among said plurality of output circuit forming portions by electrically connecting said predetermined elements in said selected output circuit forming portions, which said selected output circuit forming portions are different from the output circuit forming portions formed so as to correspond to said selected input circuit forming portions, each output circuit having an input and an output;
(6) an internal circuit disposed on said main surface in such a manner as to receive at input terminals thereof the output signals of said plurality of input circuits and to generate at output terminals thereof output signals that drive the inputs of said plurality of output circuits; and
(7) input protection means for protecting an input stage of each respective input circuit from an external surge, said input protection means having a terminal connected to said input of said input circuit, wherein each of said input protection means is formed by an output circuit forming portion corresponding to said selected input circuit portion by electrically connecting selected predetermined elements in the output circuit forming portion to form the input protection means.

4,710,843

SELECTABLE INTEGRATING CHARACTERISTIC TIMER

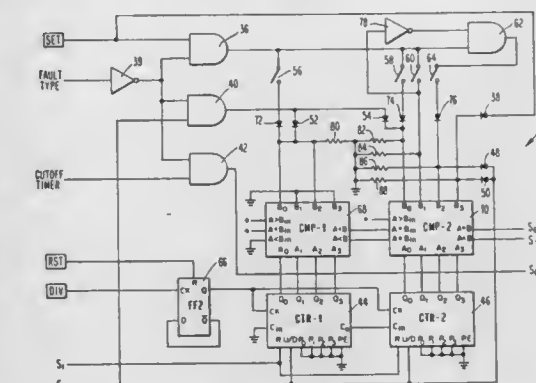
Thomas B. Breen, Landsdowne, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Dec. 27, 1985, Ser. No. 813,793

Int. Cl.⁴ H02H 3/093

U.S. Cl. 361-96

7 Claims



1. A characteristic timer for use with a protective relay, which timer receives an applied signal comprising a pulse train, each pulse thereof having a pulse width which is representative of normal or fault conditions of a portion of an AC transmission line associated with a protective relay, said timer comprising:

(a) means for receiving a cut off time signal which establishes a cut off time period;
(b) means for receiving a fault type signal which indicates the occurrence of at least a first type of fault condition; and
(c) means acting upon occurrence of said first type fault condition and during said cut off time period for:
(i) measuring the magnitude of the width of each pulse in said applied signal;
(ii) determining an integrated magnitude of pulse widths which exceed a predetermined check level; and
(iii) generating an output signal whenever the pulse width

magnitude or the integrated pulse width magnitude exceeds a first predetermined operate level magnitude.

4,710,844

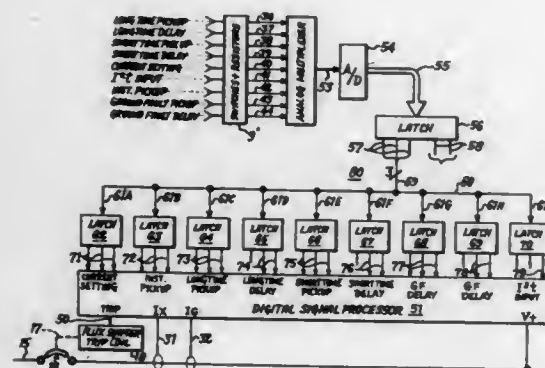
ELECTRONIC CIRCUIT BREAKER TRIP FUNCTION ADJUSTING CIRCUIT

Graham A. Scott, Avon, and Alan J. Messerli, Naugatuck, both of Conn., assignors to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 760,224, Jul. 29, 1985, abandoned. This application Aug. 11, 1986, Ser. No. 895,400
Int. Cl.⁴ H02H 7/00

U.S. Cl. 361-96

18 Claims



1. An electronic circuit interrupter comprising: current sensing means arranged around a bus conductor within a protected circuit and providing an output current in proportion to current through said protected circuit; first circuit means including a first signal processor connected with said current sensing means for determining overcurrent conditions of first predetermined magnitudes and connected with a trip actuating coil initiating first time delays prior to providing a first tripping signal to said trip actuating coil to separate a pair of separable contacts serially connected within said bus conductor and controlled by said trip actuating coil; first pickup setting means connected with said first circuit means for providing numeric values representing said first predetermined magnitudes, said first pickup setting means including a first binary encoded switch; second circuit means for determining overcurrent conditions of second predetermined magnitudes and initiating second time delays prior to providing a second tripping signal to said trip actuating coil to separate said contacts said first binary encoded switch being encoded as depicted in FIG. 7B.

4,710,845

CIRCUIT BREAKER WITH SOLID-STATE TRIP UNIT WITH SAMPLING AND LATCHING AT THE LAST SIGNAL PEAK

Pierre Demeyer, Uriage, France, assignor to Merlin Gerin S.A., France

Filed Feb. 10, 1986, Ser. No. 827,438

Claims priority, application France, Feb. 25, 1985, 85 03159
Int. Cl.⁴ H02H 3/08

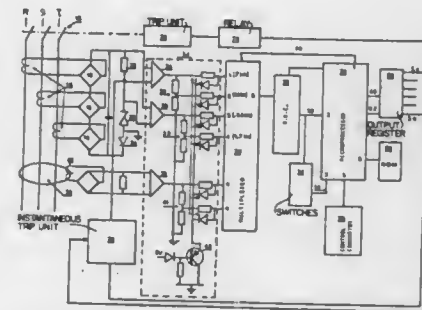
U.S. Cl. 361-96

7 Claims

1. A digital solid-state trip-unit for an electrical circuit-breaker comprising:

current sensor means for generating analog current signals proportional to respective currents flowing through conductors protected by said circuit-breaker; rectifier means for rectifying said current signals and for producing an analog signal representative of an instantaneous maximum value of said currents; analog-to-digital converter means connected to said rectifier means for sampling said analog signal at a sampling period

and for converting said analog signal to a sampled digitized signal; microprocessor-based digital processing means connected to said analog-to-digital converter means including: means for comparing, once during each processing cycle of said processing means, said sampled digitized signal with a latched peak value stored in said processing means; means for replacing said stored value by said sample digitized signal and for setting a stored countdown period to a predetermined maximum value which is greater than one period of the analog current signals, if said means for comparing determine that said sampled digitized signal is greater than said stored latched peak value,



means for decrementing the stored countdown period if the countdown period is not equal to zero and if said means for comparing determines that said sampled digitized signal is less than said stored latched peak value; means for erasing the stored latched peak value if the stored countdown period is equal to zero and if said means for comparing determines that said sampled digitized signal is less than said stored latched peak value; and means for providing a circuit-breaker tripping order after a long time delay or after a short time delay, when said stored latch peak value exceeds respective predetermined levels; and circuit-breaker trip means activated by said tripping order.

4,710,846

MODULAR PROTECTOR FOR TELECOMMUNICATIONS EQUIPMENT

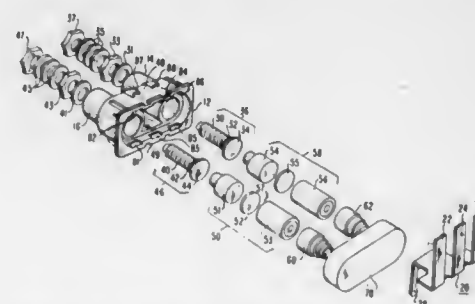
Robert F. Heisinger, Parsippany-Troy Hills Township, Morris County, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 776,484, Sep. 16, 1985, abandoned. This application Apr. 15, 1987, Ser. No. 40,709

Int. Cl.⁴ H02H 3/22

U.S. Cl. 361-119

24 Claims



1. Apparatus for protecting equipment connected to a tele-

phone line and for protecting persons using said equipment against spurious voltages and spurious currents said apparatus comprising

- (1) a housing, said housing comprising a base, a landing, first and second wells between said base and said landing, each of said wells having an end elevated above said landing by a predetermined height and an opening through each end, the base of said housing having a trough surrounding the interior walls of said wells,
- (2) first and second terminals, said terminals housed within said first and second wells, respectively, said terminals forming a substantially air tight seal with said ends, and said terminals projecting through said openings,
- (3) first and second protectors introduced through an opening in said base and housed within said first and second wells respectively and communicating with said first and second terminals,
- (4) first and second springs communicating with said first and second protectors,
- (5) a base cup, said base cup substantially covering said open base and retaining said first and second springs in said first and second wells respectively said base cup lodged within said trough, trapping an air pocket within said housing and forming a substantial seal with said housing, and
- (6) means for grounding said spurious signals from said first and second terminals, said grounding means comprising a plurality of tines, said tines retaining said base cup in position by penetrating apertures in opposite walls of said housing to form a tight seal, said grounding means further comprising means for securing said grounding means to a binding post of an adaptor.

4,710,847

CURRENT-LIMITING SURGE ARRESTER DISCONNECTOR

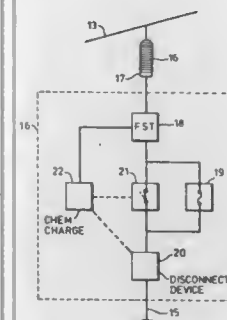
Juri Kortschinski, 1414 Lochlin Trail, Mississauga, Ontario, Canada L5G 3V3; Michael V. Lat, 1431 Monaghan Circle, Mississauga, Ontario, Canada L5C 1R7; Claude G. Maurice, 62 Royal Salisbury Way, Brampton, Ontario, Canada L6V 3J7, and Derek C. Tickner, 477 Dorland Road, Oakville, Ontario, Canada L6J 6B3

Filed Jun. 9, 1986, Ser. No. 871,685

Int. Cl.⁴ H02H 1/04

U.S. Cl. 361-125

8 Claims



1. A protective device for use in association with a surge arrester having a ground lead terminal, the device being capable of limiting and interrupting fault current, comprising an insulative housing, a first terminal mounted at one end of the housing, said first terminal providing means for connection to the ground lead terminal of a surge arrester, a second terminal mounted at the other end of the housing, said second terminal having a separable portion providing means for connection to a ground lead, a current-limiting fuse connected in circuit between said first and second terminals, a bypass switch shunting the current-limiting fuse,

a fault-sensing device in series with the bypass switch and said first terminal, triggering means responsive to the fault-sensing device for opening the bypass switch, thereby to direct switch current to the fuse, the bypass switch having a movable element which, when operated by the triggering means, is constrained to strike said separable portion of the second terminal, thereby separating said portion and so isolating the surge arrester from ground.

4,710,848

SOLID STATE CELL

Gerhard-Ludwig Schlechtriemen, Lübeck; Gerhard Hötzel, and Werner Weppner, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Fed. Rep. of Germany

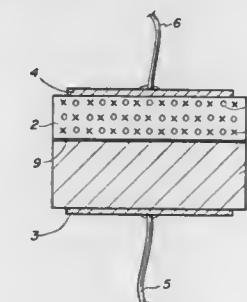
Filed Aug. 21, 1986, Ser. No. 898,904

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529335

Int. Cl.⁴ H01G 7/00; G01N 7/10, 31/00

U.S. Cl. 361-280

7 Claims



1. A solid state cell for measuring the activity of a component of a mixture, especially for the determination of the partial pressure of a component of a gas mixture, comprising a solid state ion conductor, a reference phase in contact with one side of said ion conductor, in contact with the other side of said conductor, a phase sensitive for the gas component to be determined and with said gas sensitive phase lead electrodes provided at the reference phase and at the gas sensitive phase, respectively, and wherein said gas sensitive phase contains an addition of a substance that increases the electronic conductivity and does not chemically react with the components of said sensitive phase and the gas to be detected.

4,710,849

HIGH VOLTAGE CONTROL

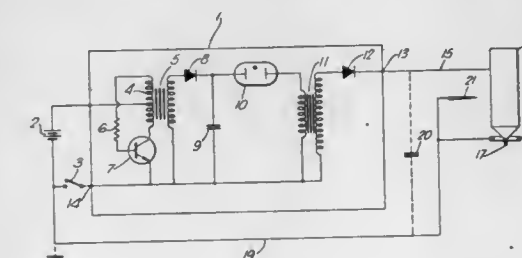
Alan J. Norris, Cleveland, England, assignor to Imperial Chemical Industries Plc, London, England

Filed Jul. 8, 1985, Ser. No. 752,623

Int. Cl.⁴ B05B 5/02

U.S. Cl. 361-228

15 Claims



1. Apparatus comprising:

a high impedance generator capable of producing an on-load voltage in an excess of 3 kV;
 spray dispenser means having a nozzle and coupled to said generator, for dispensing spray;
 field adjustment electrode means coupled to ground and spaced from said nozzle to cause electrostatic charging of said spray leaving said nozzle; and
 a first member having a low radius of curvature spaced from said dispenser by a gas gap, said member being coupled to the generator output, said member being spaced from said dispenser by such a spacing that when the voltage between said member and said dispenser exceeds a threshold value, corona discharge across said gap can occur to prevent corona discharge between said nozzle and said field adjustment electrode means.

4,710,850

TOWER DESIGN FOR HIGH-VOLTAGE SYSTEMS

Herbert Jahn, Erlangen, and Günter Waedt, Forchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

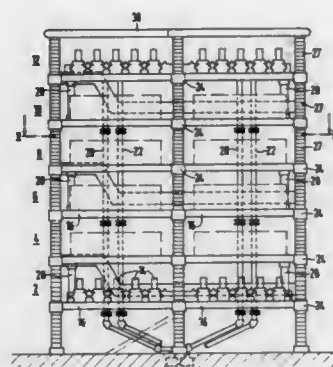
Filed Jan. 16, 1987, Ser. No. 3,933

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605337

Int. Cl.⁴ H02B 5/00

U.S. Cl. 361—333

8 Claims



1. A tower for high-voltage systems comprising:
 several stories which are connected to each other by means of insulators, each story consisting of support bars (16) of electrically insulating material, metallic cross bars (26) and cup-shaped node elements (24), wherein said bars (16) and said metallic cross bars (26) are interconnected by node elements (24) to enclose a rectangular area;
 a supporting rib structure (32) of insulating transverse and longitudinal supports (34, 36) arranged in said areas;
 said node elements including a cylindrical support body (42) with an axially arranged cylindrical core (44), a cylindrical surface (46), and end faces (48); and
 two fastening posts (38) arranged at right angles to each other and right angles to said end faces (48) of the support body (42), said cylindrical core (44) being connected at said end faces (48) to axially arranged studs (58, 60).

4,710,851

COOLING ACCESSORY ATTACHABLE TO AN ELECTRONIC INSTRUMENT

Andrew S. Pastecki, 1780 Del Mar Ave., San Marino, Calif. 91108

Filed Mar. 10, 1986, Ser. No. 842,425

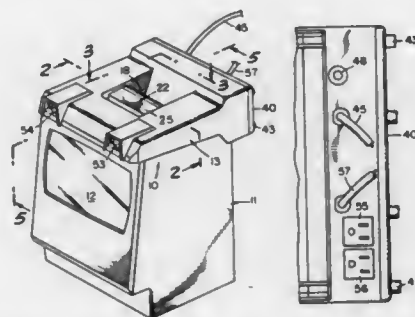
Int. Cl.⁴ H02B 1/00; H02K 7/20

U.S. Cl. 361—384

17 Claims

1. A cooling accessory adapted to be clipped to encased electronic equipment to facilitate cooling of components of said electronic equipment, said accessory comprising:

a housing enclosing power-driven fan means between air inlet and outlet openings of said housing;
 said housing being shaped for mounting against the exterior of encased electronic equipment with said air inlet in communication with an air outlet of said electronic equipment; and
 clip means constructed and arranged for assembly astride continuous portions of said housing and said encased



electronic equipment to hold said cooling accessory firmly in place against the exterior surface of said encased electronic equipment;
 wherein said housing has a depression in the wall thereof shaped and adapted for assembly in juxtaposition to a handle of said encased electronic equipment; and wherein said clip means is constructed for assembly astride said handle and juxtaposed portions of said cooling accessory housing.

4,710,852

SPRING RETAINER FOR ENCAPSULATED SEMICONDUCTOR DEVICE

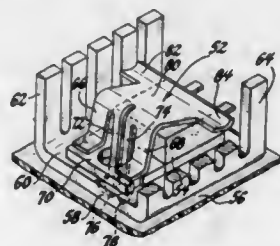
Nickey D. Keen, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 26, 1986, Ser. No. 911,736

Int. Cl.⁴ H05K 7/20

U.S. Cl. 361—386

9 Claims



1. An easily installed, pressure distributing retainer for clamping a device having an aperture therein to a plate-like member having an aperture therein, said retainer comprising:
 a body of flat spring stock bent approximately centrally along a transverse fold line to define integral first and second noncoplanar portions having an acute angle therebetween;
 first and second bayonet arms formed out of said first noncoplanar portion and extending substantially coplanarly within the acute angle between said noncoplanar portions; each of said bayonet arms terminating in a transversely operative barb portion;
 said bayonet arms being mutually transversely compliant to permit said bayonet arms to be flexed transversely as they are urged through an aperture;
 at least one clamping arm formed out of said first noncoplanar portion, said clamping arm being shorter than said bayonet arms and

having an end adapted for applying a clamping force towards a surface,
 effective to allow said second noncoplanar portion to also apply a clamping force towards said surface.

4,710,853

ASSEMBLY FOR MOUNTED COMPONENTS WITH SNAP-ACTION

Rudolf Reinhardt, Markt-Schwabener-Strasse 2, D-8059 Finsing, Fed. Rep. of Germany

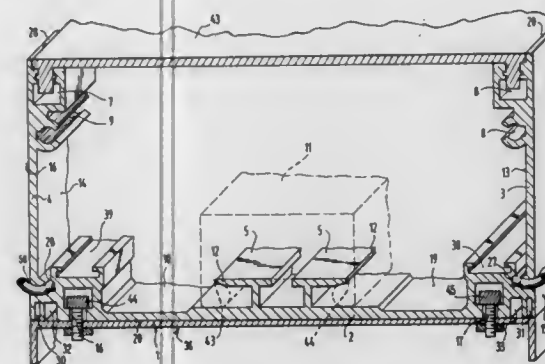
Filed Aug. 13, 1985, Ser. No. 765,336

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1984, 3429894

Int. Cl.⁴ H05K 7/14

U.S. Cl. 361—391

12 Claims



1. A structural assembly for interchangeably and supportably mounting electrical components of the type having snap-action mounts, comprising:

- one housing having a generally planar base wall extending along a longitudinal direction, a pair of upright longitudinally-extending side walls extending generally perpendicular to the base wall, a pair of upright end walls extending generally perpendicular to the base wall and generally perpendicular to the side walls, said walls bounding an interior space, and said one housing having an open top in communication with the interior space and through which electrical components are insertable in an insertion direction generally perpendicular to the base wall;
- a pair of longitudinally-extending slide rails spaced transversely apart from each other on the base wall within the interior space, said slide rails having respective snap-fastening elements situated above, and extending generally parallel to, the base wall, said snap-fastening elements being operative for releasably and interchangeably engaging snap-action mounts of electrical components;
- another housing arranged in mirror-symmetrical relationship with said one housing, said other housing having a bottom wall facing the base wall of said one housing at a distance, said base wall and said bottom wall having outer wall portions bounding outwardly-open longitudinally-extending grooves; and
- connecting plates mounted in opposing pairs of grooves on the housings and spanning said distance therebetween.

4,710,854

HYBRID MULTILAYER WIRING BOARD

Minoru Yamada, Iruma; Motoyo Wajima, Hitachi; Akira Masaki, Musashino; Akio Takahashi, Hitachi; Kelichiron Nakanishi, Kokubunji, and Katuo Sugawara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

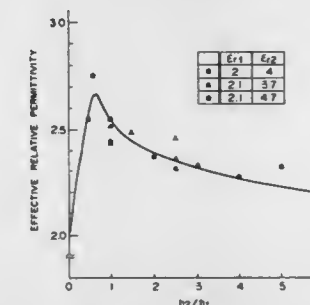
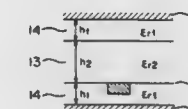
Continuation-in-part of Ser. No. 844,115, Mar. 26, 1986, abandoned. This application Mar. 10, 1987, Ser. No. 24,894

Claims priority, application Japan, Mar. 27, 1985, 60-60682

Int. Cl.⁴ H05K 01/14

U.S. Cl. 361—414

13 Claims



1. A multilayer wiring board comprising a plurality of conductor layers formed one over another each serving as either one of a power/ground line layer and a signal line layer, and a plurality of insulation layers each interposed between two adjacent ones of said conductor layers, wherein each of said insulation layers which are respectively interposed between two adjacent ones of said conductor layers serving as two power/ground layers with at least one conductor layer serving as a signal line layer also interposed between the two adjacent power/ground line layers is constituted by first and second insulating layer members formed one on the other, said second insulating layer member having a relative permittivity higher than that of said first insulating layer member, said first insulating layer member is disposed in a portion between the adjacent conductor layers serving as power/ground line layers where the density of electric flux created by a signal propagating in said signal line layer is relatively high and said second insulating layer member is disposed in a portion between the adjacent conductor layers serving as power/ground line layers where the density of electric flux created by a signal propagating in said signal line layer is relatively low, and the ratio of the thickness of said second insulating layer member with respect to that of said second insulating layer member is not smaller than about 1.4.

4,710,855

HEADLIGHT FOR MOTOR VEHICLES

Ulrich Urbschat, Hamm, Fed. Rep. of Germany, assignor to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Nov. 4, 1986, Ser. No. 927,238

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542784

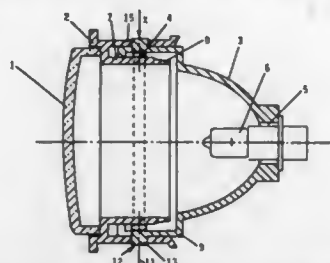
Int. Cl.⁴ B60Q 1/06

U.S. Cl. 362—66

12 Claims

1. A headlight for motor vehicles comprising: a reflector, an annular mount, and adjustment means as well as two bearings connecting said reflector to said annular mount; said bearings having an axis, said reflector being pivotable about said axis by said adjustment means, said axis being horizontal when the headlight is mounted in place; a light lens held at a continuous edge of said mount facing in direction of emerging light; said

mount having a cylindrical wall defining a cylindrical edge facing said reflector, said reflector having a cylindrical wall defining a cylindrical edge facing the cylindrical edge of said mount, one of said walls sized and partially disposed within the other of said wall in contactless overlap; a sealing ring clamped



between surfaces of said cylindrical overlapping walls; said sealing ring defining a plane, said pivoting axis of said reflector being in said plane; said clamping surfaces being free of projections and depressions; said sealing ring having a circular cross-section when untensioned; each of said bearings comprising a tab formed onto said mount and rotatable on said reflector.

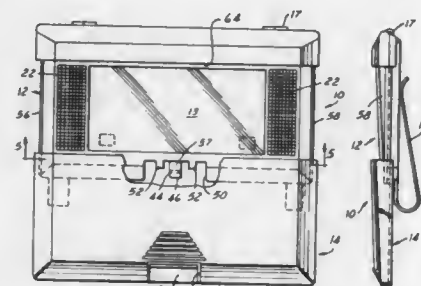
4,710,856

VANITY MIRROR ASSEMBLY

Kee K. Cheung, Kowloon, Hong Kong, assignor to Chi Kuan Manufactory Limited, Hong Kong, Hong Kong
Filed Jul. 7, 1986, Ser. No. 882,706
Int. Cl.⁴ B60Q 1/00; G02B 17/00

U.S. Cl. 362-74

9 Claims



1. A vanity mirror assembly adapted to be mounted on an automobile visor or the like, comprising a mirror, a mirror support having a front surface on which said mirror is mounted, a cover for said mirror, and means mounting said cover on said mirror support for sliding movement along a path generally parallel to the plane of said mirror from a closed position overlying and concealing said mirror to an open position exposing said mirror for use, said means mounting said cover on said mirror support comprising tracks on opposite sides of said cover slidably engaged with tracks on opposite sides of said mirror support, said cover being made of a material which is sufficiently flexible to permit its tracks to be manually disengaged from the tracks of said mirror support so that said cover can be detached from said mirror support

4,710,857

HEADLIGHT-BLINKING LIGHT UNIT FOR PASSENGER CARS

Kurt Haug, Reutlingen, and Rudolf Peterssen, Kusterdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Apr. 28, 1986, Ser. No. 856,785

Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516711

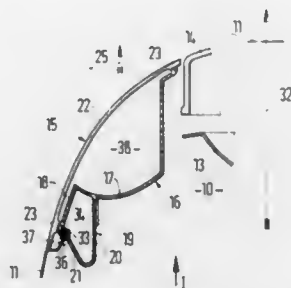
Int. Cl.⁴ B60Q 1/26

U.S. Cl. 362-80

9 Claims

1. A headlight-blinking light unit for passenger vehicles having a vehicle body, with a trough, the unit comprising a

headlight; a blinking light; a headlight housing arrangeable in a trough of the vehicle body and mountable in the same, said headlight housing having a shoulder and an edge; a blinking light housing displaceable on said headlight housing parallel to the longitudinal axis of the vehicle; means for mounting said blinking light housing in its operational position on said headlight housing, said blinking light housing being provided with at least one spring element which abuts against an inner side of the body and presses said blinking light against an outer side of



the body, said means for mounting said blinking light housing on said headlight housing including a horizontally acting spring arm which projects from said blinking light housing and cooperates with said shoulder of said headlight housing for providing a lateral arrangement of said blinking light housing and said headlight housing, and a vertically acting spring hook which projects from said blinking light housing and engages said edge of said headlight housing for providing an arrangement of said blinking light housing and said headlight housing in a travelling direction.

4,710,858

PANEL DISPLAYS, FRAMED LIGHTED SWITCH ACTUATORS THEREFOR

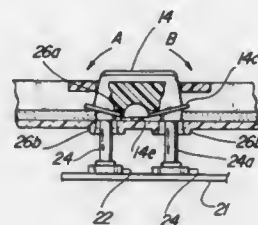
James E. Van Hout, 676 Briarvale Dr., Auburn Heights, Mich. 48057, and Frank H. Klein, 10020 Westleigh Dr., Huntsville, Ala. 35803

Filed Jan. 20, 1987, Ser. No. 4,449

Int. Cl.⁴ F21V 33/00

U.S. Cl. 362-95

5 Claims



1. An improved panel display for displaying lighted legends on rocker-type actuators used to actuate switches on a circuit board mounted below the panel display; wherein a backlighting system is employed to illuminate the legends on the actuators, the backlighting emanating from light sources on the circuit board; wherein the actuators rotate about a rotational axis within openings of an escutcheon plate of the panel display; wherein the underside and legend material of the actuators are transparent and translucent, respectively; and wherein a light pipe member is used to hold the actuators within the escutcheon plate, the light pipe member being of transparent material; the improvement comprising:

- means attached to the peripheral edge of the actuators for opposing seepage of backlighting through the apertures of the escutcheon plate and around edges of the actuators; and
- means for rotating the actuators about the axis within the

openings of the escutcheon while the light seepage opposing means is attached to the peripheral edge of the actuators.

4,710,859

D.C. TO D.C. CONVERTER WITH A SWITCH-MODE POWER SUPPLY

Gerard Rilly, Unterkirnach, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

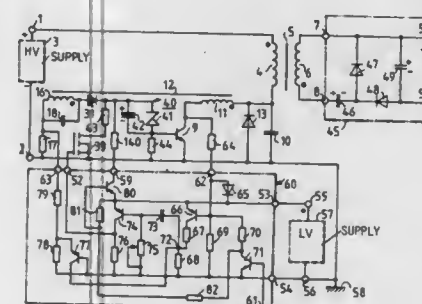
Filed Jun. 3, 1986, Ser. No. 870,112

Claims priority, application European Pat. Off., Jun. 24, 1985, 85107828.7

Int. Cl.⁴ H02M 3/335

U.S. Cl. 363-21

18 Claims



1. D.C. to D.C. converter with a switch-mode power supply including a switching transistor (9) having its collector-to-emitter path connected in series with the respective primary windings (11,4) of a current (12) and a power transformer (5), across the terminals (1,2) of a first D.C. power supply (3), a commutating capacitor (10) connected between the emitter of said transistor (9) and the junction of said primary windings (4,11), a base-drive circuit including the secondary winding (16) of said current transformer (12) and coupled to the base of said transistor (9) and a tuning capacitor (18) shunting said current transformer secondary winding (16) for forming with the inductance thereof a parallel resonant or oscillating circuit, characterized in that said secondary winding and said tuning capacitor have impedances selected for causing the resonant half-period of said parallel resonant or oscillating circuit (16, 18) to be shorter than that of the power transformer (5) primary winding (4) inductance with the capacitance of the commutating capacitor (10).

4,710,860

RIPPLE-FREE DC HIGH VOLTAGE GENERATING APPARATUS FOR X-RAY TUBE

Akira Tsuchiya, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 21, 1985, Ser. No. 800,319

Claims priority, application Japan, Nov. 26, 1984, 59-250350; Dec. 7, 1984, 59-257404

Int. Cl.⁴ H02M 3/315

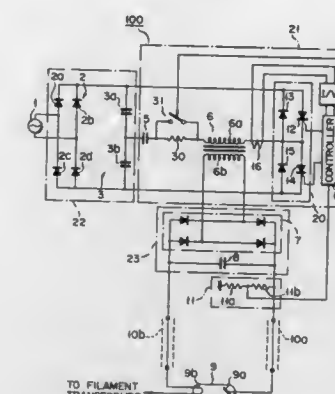
U.S. Cl. 363-28

7 Claims

1. A DC high voltage generating apparatus for an X-ray tube comprising:

- primary rectifier means for rectifying a low AC voltage to derive a low DC voltage;
- bridge inverter means including a single phase transformer having primary and secondary windings, a capacitive element series-connected via a current limiter to the primary winding so as to constitute a series resonant circuit, a bridge inverter circuit having switchable elements for inverting the low DC voltage into a pulsating low voltage, and a switching controller for controlling the switch-on times of the switchable elements;
- secondary rectifier means for rectifying a high AC voltage induced at the secondary winding of the transformer by

the pulsating low voltage into a high DC voltage for the X-ray tube; and switching means connected in parallel to the current limiter



of the bridge inverter means, for changing the value of the pulsating low voltage induced at the primary winding by short-circuiting the current limiter so as to vary the high DC voltage derived from the secondary rectifier means.

4,710,861

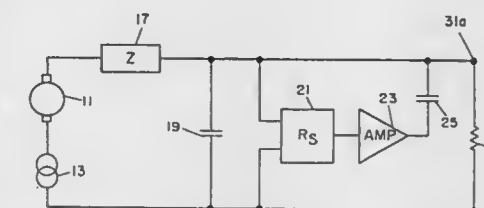
ANTI-RIPPLE CIRCUIT

Martin Kanner, 42 Glenwood Rd., Plainview, N.Y. 11803
Filed Jun. 3, 1986, Ser. No. 870,176

Int. Cl.⁴ H02M 1/14

U.S. Cl. 363-46

4 Claims



1. An apparatus for reducing ripple signals on a d.c. signal coupled across first and second terminals comprising:

- a differential voltage amplifier, having a gain, an inverting voltage input terminal coupled to said first terminal, a non-inverting voltage input terminal coupled to said second terminal, and a voltage output terminal responsive to voltage differences between voltages coupled to said inverting voltage input terminal and said non-inverting voltage input terminal; and
- a capacitor having a capacitance value, a first plate directly connected to said output terminal and a second plate directly connected to said first terminal, said capacitor and said differential voltage amplifier constructed and arranged to multiply said capacitance value by a factor determined by said gain such that a shunt capacitance value is developed across said first and second terminals that is equal to said capacitance value multiplied by said factor whereby said ripple signal is reduced in accordance with said shunt capacitance value.

4,710,862
INVERTER

Takeaki Asaeda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

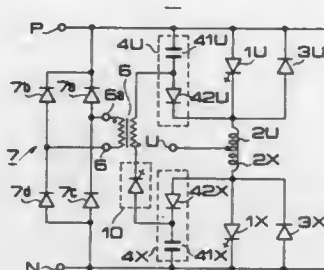
Filed Apr. 8, 1985, Ser. No. 720,962

Claims priority, application Japan, Jul. 27, 1984, 59-158320

Int. Cl.⁴ H02H 7/122

U.S. Cl. 363—58

5 Claims



1. An inverter comprising:

at least a pair of arm elements, each comprising a self turn-off switching device forming positive and negative parts; a pair of reactors connected in series between said positive and negative arm elements;

first and second snubbers, each including a serial connection of a snubber capacitor and a snubber diode, connected in parallel to said positive and negative arm elements, respectively;

a current transformer having primary and secondary windings for retrieving electrical energy stored in said snubbers;

a third closed circuit including the primary winding of said current transformer and a self turn-off switching device connected in series to said primary winding, with one end of said circuit being connected to the node of said diode and capacitor in said first snubber, and with another end of said circuit being connected to the node of said diode and capacitor in said second snubber;

a rectifying circuit for transferring electrical energy retrieved on the secondary winding of said current transformer back to a d.c. power source; and

a gate circuit which produces gate signals for turning on or off said switching devices forming said arm elements, and a gate signal for turning on and keeping on said switching device in said closed circuit for a period long enough to transfer energy stored in said snubbers back to said d.c. power source through said current transformer and said rectifying circuit, and thereafter turning off said switching device, in correspondence to the on-off operation of said arm switching devices.

4,710,863

PROGRAMMING DEVICE FOR A STORED-PROGRAM CONTROLLER

Felix Kaufmann, Mülligen, and Daniel Schillinger, Fislisbach, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 22, 1986, Ser. No. 854,602

Claims priority, application Switzerland, Apr. 25, 1985, 1763/85

Int. Cl.⁴ G06F 15/46

U.S. Cl. 364—146

2 Claims

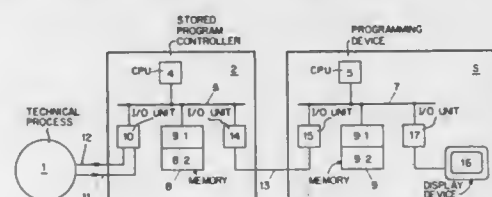
1. Apparatus for programming a stored-program controller, in which a control program of the controller, containing function calls and stored in a machine-readable form, is displayed in function-diagram representation on a graphical display device by an operating system of a digital computer, wherein said operating system of the digital computer:

- (a) searches for the function calls in the control program;
- (b) writes the function calls found sequentially with the lists of associated input and output parameters into a file;
- (c) splits the file by allocating the function calls to part

sequences of function calls, in which splitting operation, beginning with the last function call, each function call, the output parameter of which does not contribute anything to the formation of an input parameter of a function call already allocated to the respective part sequence, is allocated to a new part sequence;

(d) allocates values to a first set of variables which are allocated to the individual function calls, of the graphical representation of the function calls including edge zones on the display device;

(e) allocates values to a second set of variables which are also allocated to the individual function calls, in which operation these values establish the normalized horizontal displacement of the function calls on the display device and in each case correspond to the largest of the sums which, for the function call considered in each case, can be formed from the values of the variables of the first set which are allocated to the function calls depending on this function call with respect to parameters;



(f) allocates values to a third set of variables which are associated with the part sequences, in which operation the values establish the normalized vertical extension of the graphical representation of the part sequences on the display device and in each case correspond to twice the number of function calls in the respective part sequence plus the number of the input parameters not generated in the respective part sequence itself less the number of the first and last input parameters, generated in the respective part sequence itself, in the parameter lists of the individual function calls in the respective part sequence;

(g) allocates values to a fourth set of variables which, in turn, are allocated to the part sequences, in which operation the values establish the normalized vertical displacement of the part sequences on the display device and in each case result from the sum of the values of the variables of the third set which are allocated to the part sequences in the sequence of part sequences.

4,710,864

SELF-OPTIMIZING METHOD AND MACHINE

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Filed Sep. 19, 1984, Ser. No. 652,494

Int. Cl.⁴ G05B 13/02

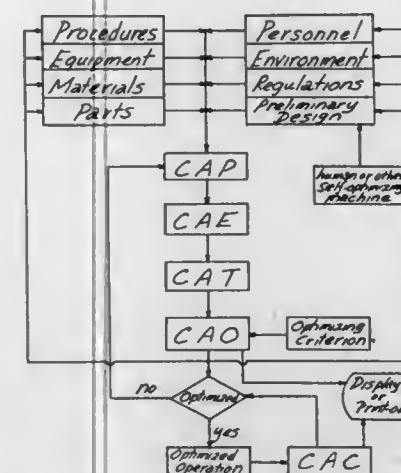
U.S. Cl. 364—148

20 Claims

1. A machine for real-time self-optimizing, without human interaction, an object relative to a specific criterion or activity in response to variations on a prescribed number m of variables, comprising:

- means for automatically planning a statistical design matrix for testing the m variables in n tests;
- means for performing said n designed tests according to the design matrix on said object;
- means for determining the instantaneous combination of said m variables which optimizes said specific criterion or activity;

means for setting the conditions of said m variables at the thus-determined optimal combination; and



means for coupling the planning, performing, determining, and setting means for substantially continuous recycling to achieve real-time self-optimizing control.

4,710,865

CONTROL SYSTEM FOR POSITIONING AN OBJECT USING SWITCHING FROM A SPEED CONTROL MODE TO A POSITION CONTROL MODE WITH ADJUSTABLE BRAIN

Makoto Higomura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

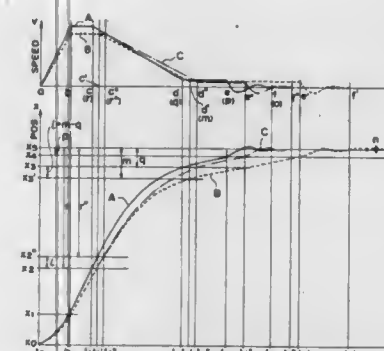
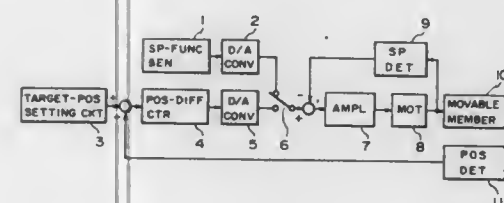
Filed Nov. 12, 1985, Ser. No. 797,030

Claims priority, application Japan, Nov. 14, 1984, 59-238665; Nov. 16, 1984, 59-240419; Nov. 16, 1984, 59-240420

Int. Cl.⁴ G05B 11/00

U.S. Cl. 364—170

9 Claims



1. A control system for positioning a movable member, said system comprising:

- first control means operative to move the movable member at a first moving speed toward a target stop position, said first control means also being operative to decrease said first moving speed of the movable member to a second moving speed when the movable member moves from a

predetermined deceleration starting position toward said target stop position;

second control means operative on the movable member, after said second moving speed is established, to place the movable member at said target stop position with a relatively high positional accuracy;

means for detecting a positional error of the movable member with respect to a reference at a time when said second moving speed is established; and

means for changing said deceleration starting position on the basis of detection by said detecting means.

4,710,866

METHOD AND APPARATUS FOR VALIDATING PREFETCHED INSTRUCTION

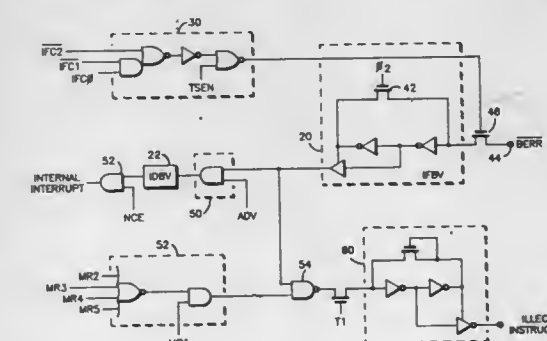
John Zolnowsky, Lester M. Crudele, both of Austin, and Michael E. Spak, Kyle, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 530,820, Sep. 12, 1983, abandoned. This application Oct. 7, 1986, Ser. No. 930,941

Int. Cl.⁴ G06F 11/00, 9/38

U.S. Cl. 364—200

2 Claims



1. In a data processor which executes predetermined sequences of instructions comprising programs stored in a memory, each instruction consisting of at least m instruction units, but on more than n instruction units where m is an integer greater than zero (0) and n is an integer greater than or equal to m , the data processor comprising:

an n -stage instruction pipeline for storing in each stage one instruction unit;

instruction execution means, coupled to the instruction pipeline and responsive to the one of said instructions stored in the instruction pipeline beginning at an output end thereof and ending at an m -th stage thereof, the instruction execution means executing said one of said instructions and providing an instruction prefetch signal during the execution thereof;

instruction prefetch means, coupled to the instruction execution means and responsive to the instruction prefetch signal, for fetching each instruction unit of the next instruction in said predetermined sequence of instructions from said memory; and

instruction pipeline control means, coupled to the instruction prefetch means and to the instruction pipeline, for storing each instruction unit fetched by the instruction prefetch means into an input stage of the instruction pipeline after advancing the instruction unit stored in each stage of the instruction pipeline into the next higher stage thereof, until the first instruction unit of the instruction to be next executed by the instruction execution means is stored in the output stage of the instruction pipeline;

a prefetch validation circuit comprising:

- n serially-connected validation latches, each corresponding to a respective stage of the instruction pipeline and serially advancing in synchronism therewith, for storing a valida-

tion bit indicative of the invalidity of the instruction unit stored in the corresponding stage of the instruction pipeline;

prefetch error detecting means, coupled to the instruction prefetch means and to the validation latch corresponding to the input stage of the instruction pipeline, for detecting errors occurring during the fetch of each instruction unit which indicate the invalidity of that instruction unit, and storing the validation bit as an indication of said detected error in the validation latch corresponding to the input stage of the instruction pipeline into which said invalid instruction unit is stored; and

instruction validation means, coupled to the instruction pipeline and the validation latches, for generating an invalid instruction signal if the validation bit stored in the validation latch corresponding to any of the m instruction units stored in the m highest stages of the instruction pipeline, comprising the next instruction to be executed by the instruction execution means, indicates that the instruction unit stored in the corresponding stage of the instruction pipeline is invalid.

4,710,867

VECTOR PROCESSING SYSTEM

Tadashi Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

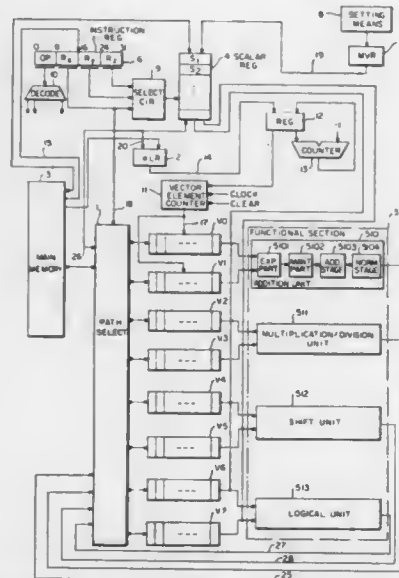
Filed Jul. 11, 1985, Ser. No. 753,943

Claims priority, application Japan, Jul. 11, 1984, 59-143578

Int. Cl.⁴ G06F 7/48

U.S. Cl. 364—200

4 Claims



1. A vector processing system comprising:

a main memory for storing instructions and operands including vector elements;

at least one scalar register;

a plurality of vector registers each having a plurality of storage locations for storing said vector elements;

functional means responsive to a first instruction for performing a predetermined operation for said vector elements supplied from at least one of said vector registers;

first storage means for holding register length information indicative of the number of storage locations to be used in each of said vector registers;

setting means for setting said register length information in said first storage means before a vector processing operation;

control means responsive to a second instruction for transferring said register length information from said first storage means to said at least one scalar register and said main memory during said vector processing operation;

second storage means for holding the number of said vector elements to be stored in said at least one vector register based upon one of (1) said register length information stored in said at least one scalar register and said main memory or (2) the remainder obtained by dividing a number (N) of vector operations specified by a third instruction by said register length information; and

read-out means for sequentially reading out said vector elements in said at least one vector register into said functional means in response to the content of said second storage means.

4,710,868

INTERCONNECT SCHEME FOR SHARED MEMORY LOCAL NETWORKS

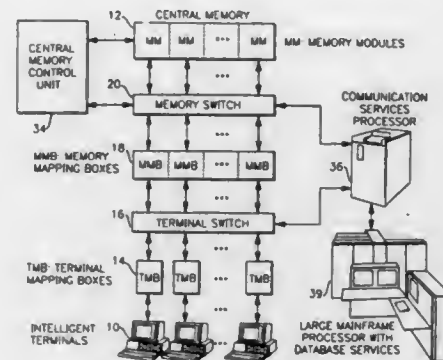
John Cocke, Bedford, and Brent T. Hailpern, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,260

Int. Cl.⁴ G06F 3/00

U.S. Cl. 364—200

7 Claims



1. A data processing system of the type including a plurality of intelligent terminals, a shared memory, and interconnect means for providing access to said shared memory by said intelligent terminals, said interconnect means comprising:

a plurality of first mapping boxes for receiving first addresses from said intelligent terminals, said first addresses including a virtual address and offset, and for converting said virtual addresses to respective terminal switch port designations and logical addresses;

a first switch having a plurality of first switch ports coupled to said first mapping boxes and having a plurality of second switch ports, said first switch for forwarding said logical addresses and offsets as second addresses to respective second switch ports corresponding to said terminal switch port designations;

a plurality of second mapping boxes for receiving said second addresses and converting said second addresses to respective memory switch port designations and physical addresses; and

a second switch having a plurality of first switch ports for receiving said memory switch port designations and physical addresses and having a plurality of second switch ports connected to address inputs of said shared memory, said second switch for forwarding said physical addresses and offsets to respective second ports of said second switch corresponding to said memory switch port designations.

4,710,869

KEY INPUT DATA EMULATION SYSTEM

Takatoshi Enokizono, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

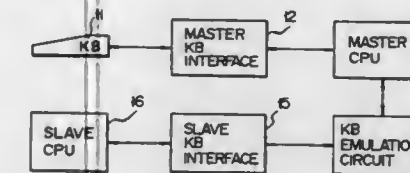
Filed Feb. 26, 1985, Ser. No. 705,729

Claims priority, application Japan, Feb. 29, 1984, 59-37516

Int. Cl.⁴ G06F 7/00

U.S. Cl. 364—200

7 Claims



1. A key input data emulation system comprising:

a single keyboard unit having key switches arranged in an X-Y matrix for generating, when depressed, an X key input code and a Y key input code corresponding to the depressed key switch;

master processing means responsive to said X and Y key input codes for selectively transmitting said X and Y key input codes;

slave processing means for reading data corresponding to said X and Y key input codes in response to an interrupt signal;

a keyboard emulation circuit responsive to said X and Y key input codes from said master processing means, including:

register means for holding said X and Y key input codes from said master processing means;

comparator means for comparing the X key input code from said register means and a keyboard scan signal and for outputting a comparison coincidence signal when said X key input code and said keyboard scan signal are coincident; and

a decoder for decoding the Y key input code from said register means using the comparison coincidence signal as an enable signal, said decoder outputting a decoded signal as a return signal; and

slave keyboard interface means for:

(1) outputting said keyboard scan signal to said comparator means to read the corresponding X and Y key input codes, (2) determining in response to said return signal from said decoder whether said X and Y key input codes are being presented by said master processing means to said keyboard emulation circuit, and (3) supplying said interrupt signal and said data corresponding to said X and Y input codes to said slave processing means if said X and Y key input codes are present.

4,710,870

CENTRAL COMPUTER BACKUP SYSTEM UTILIZING LOCALIZED DATA BASES

Catherine A. Blackwell, Franklin Township, Somerset County; Raman Lakshmanan, Edison Township, Middlesex County, and Mahadevan Subramanian, Fair Haven, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Jul. 10, 1985, Ser. No. 753,619

Int. Cl.⁴ G06F 15/16

U.S. Cl. 364—200

12 Claims

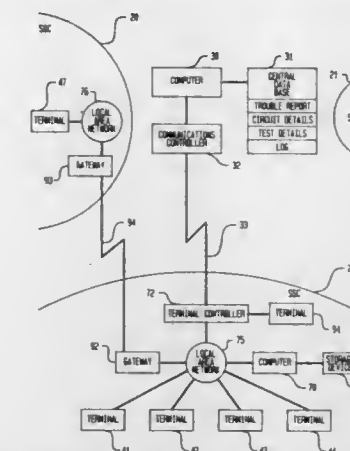
1. Information backup apparatus for a primary data base stored in a primary storage system comprising

a plurality of storage means each containing a secondary data base,

means, connected to said plurality of storage means, for accessing each said secondary data base, and

means, connected to said means for accessing and the primary storage system, for responding to input information provided by a direct user of the primary data base, for extracting data from the primary data base in response to said user input, for processing and storing data related to

said extracted data in predetermined groups in the primary storage system, and for periodically distributing said predetermined groups of data to predetermined ones of



said storage means to update each said secondary data base with corresponding data from said predetermined groups.

4,710,871

DATA TRANSMITTING AND RECEIVING APPARATUS

William M. Belknap; Albert J. Chanasyk; Robert R. O'Dell, and Donald J. Girard, all of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 1, 1982, Ser. No. 438,105

Int. Cl.⁴ G06F 13/00

U.S. Cl. 364—200

8 Claims

1. In a data processing system wherein a plurality of processing devices share a common communication channel by way of which transfer of data messages between a sending processing device and a receiving processing device takes place, an integrated circuit chip associated with each processing device for generating a data message comprising the acknowledgement of the receipt and the received condition of a data message transmitted between the sending processing device and the receiving device, said chip comprising:

means for generating a plurality of first control signals identifying the condition of the data message received from a sending processing device;

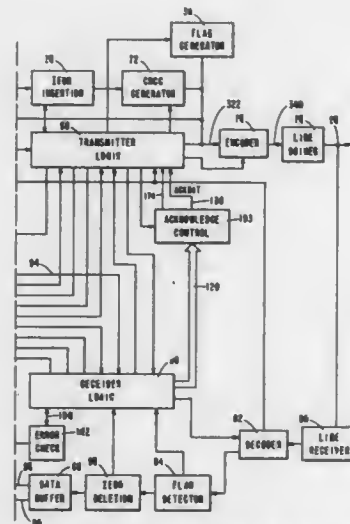
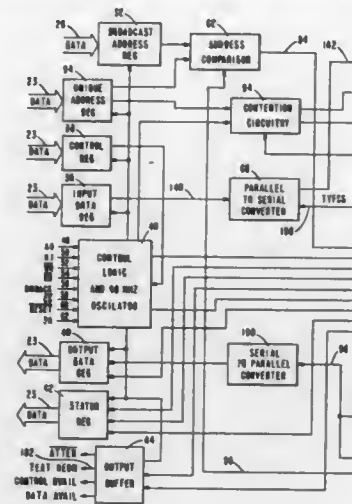
first logic circuit means connected to said generating means for outputting a second control signal in response to receiving said first control signals;

a shift register means connected to said generating means and said first logic circuit means for outputting a portion of an acknowledgement message comprising a sequence of two pairs of binary data bits which includes a pair of first binary data bits identifying the condition of the data message received from the sending processing device and a pair of second binary data bits preceding the least significant bit of each of said first binary data bits for use in framing and decoding said first binary data bits in response to receiving said first and second control signals;

transmitting means connected to said communication channel and to said shift register means for repeatedly transmitting said pairs of said first and second binary data bits over said communication channel to the sending processing device a predetermined number of times comprising the acknowledgement message acknowledging the receipt of said data message from the sending device in which each pair of first binary data bits are framed by two pairs of said second binary data bits; and

timing means connected to said transmitting means for dis-

abling said transmitting means after said transmitting means has repeatedly transmitted the sequence of pairs of



said first and second binary data bits said predetermined number of times over said communication channel.

4,710,872 METHOD FOR VECTORIZING AND EXECUTING ON AN SIMD MACHINE OUTER LOOPS IN THE PRESENCE OF RECURRENT INNER LOOPS

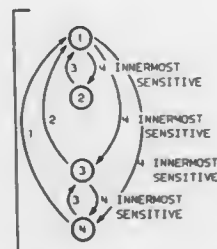
Randolph G. Scarborough, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 7, 1985, Ser. No. 763,481

Int. Cl.⁴ G06F 9/30

U.S. Cl. 364-300

8 Claims



1. A method for execution on an SIMD machine for ascertaining any source code procedural language statements which

are amenable to being compiled into object code for execution on an SIMD machine, comprising the steps of:

- mapping in said SIMD machine said source code statements onto n counterpart nodes of a dependence graph, said graph (FIGS. 2A, 2B) having directed edges, the edges connecting nodes according to dependences and selectively forming closed traverses or loops, the edges further being selectively nested and labeled with a level number (FIGS. 2A, 3A, edges labeled 4) indicating the level of any node (1, 2, ..., n) causing the dependence, each edge (FIG. 2B) being further labeled with indicia as to whether it is either innermost-sensitive or innermost-preventing;
- identifying in said SIMD machine the statements at the nodes bounding each level of any innermost-sensitive and loop-independent edges of the graph, if at that level, the edges having the labeled dependences can be reordered to operate as an innermost loop and if there are no cycles in the graph after recording; and
- generating in said SIMD machine object code obtained from any statements identified in step (b).

4,710,873 VIDEO GAME INCORPORATING DIGITIZED IMAGES OF BEING INTO GAME GRAPHICS

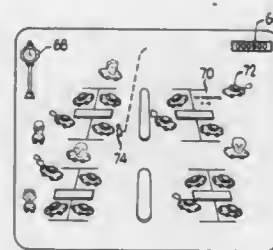
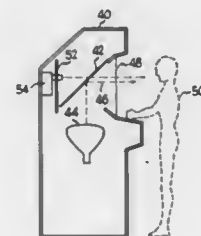
Jeffrey D. Breslow, Highland Park; Howard J. Morrison, Deerfield; Steven P. Hanson, Winnetka, and Russell G. Rasmussen, Skokie, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation-in-part of Ser. No. 395,353, Jul. 6, 1982, abandoned. This application Mar. 9, 1984, Ser. No. 587,990

Int. Cl.⁴ A63F 9/22; G06F 15/44

U.S. Cl. 364-410

18 Claims



- A video game system comprising: user input apparatus for providing signal outputs responsive to user provided stimulus; control means for providing a video game audiovisual presentation, said presentation comprising a sequence of display images, said display images each comprising the combination of a plurality of predetermined imagery segments including a preselected character imagery segment, said sequence order of presentation determined responsive to a non-user defined predefined set of game rules and responsive to the user input apparatus; means for creating a user video image responsive to the user input apparatus including means for storing said user video image in a memory; and means for associating said user video image with said pre-

lected character imagery segment such that said user video image is incorporated into said audiovisual presentation of said video game.

- Video game apparatus comprising: means, including video imaging means, for acquiring a video image of at least a portion of a being and generating video signals representing said acquired video image; means responsive to said video signals for encoding said video signals into digital data; means for storing said digital data; a video game including a display; player actuable video game control means for controlling the video game image displayed on said game display; and display generating means controlled by said video game control means for generating video game display signals to said video game display and for selectively incorporating said stored digital data for display of a display video image representing said acquired video image on said video game display.

4,710,874 METHOD AND APPARATUS FOR DISPLAYING PARTICLE SEDIMENTATION RATES IN LIQUIDS

Paul-Henri Cinquandre, 20, rue de la Ravinelle, 54000 Nancy, France

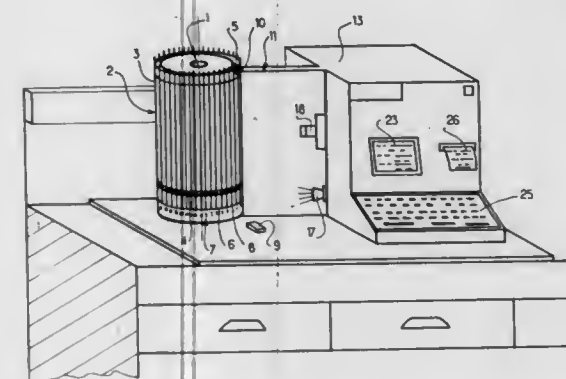
Filed Jun. 11, 1985, Ser. No. 743,596

Claims priority, application France, Jun. 13, 1984, 8409360

Int. Cl.⁴ G01N 33/48, 21/51; G06F 15/42

U.S. Cl. 364-413

14 Claims



- An apparatus for continuous display of a particle sedimentation rate in a liquid, comprising in combination rotary support means adapted to hold a plurality of light-transparent containers, each container holding a liquid, means for selecting any container to be observed, at least a portion of a selected container being observable from the exterior, lighting means illuminating the selected container, image-forming means arranged to form an image of said at least portion of the selected container, and the liquid held therein, means on said image-forming means to create video signals from the so-formed image, computer means arranged to process said video signals, video signal transmission means transmitting said video signals from said image-forming means to said computer means, and display means for displaying the signals processed by said computer means.

4,710,875 ALIGNMENT PROCEDURE FOR RADIATION IMAGES UNDERGOING SUBTRACTION PROCESSING

Nobuyoshi Nakajima, and Kazuhiro Hishinuma, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1983, Ser. No. 477,571

Claims priority, application Japan, Mar. 20, 1982, 57-45473

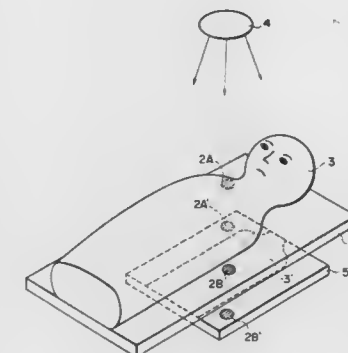
The portion of the term of this patent subsequent to Jan. 14,

2003, has been disclaimed.

Int. Cl.⁴ H04N 5/32

U.S. Cl. 364-414

6 Claims



- A subtraction processing method for radiation images including the steps of recording two or more radiation images on separate stimuable phosphor sheets, at least a part of image information being different among said radiation images, scanning the respective stimuable phosphor sheets with stimulating rays to sequentially release the radiation energy stored in the stimuable phosphor sheets as light emission, photoelectrically detecting the emitted light by a light detecting means to obtain digital image signal corresponding to the respective radiation images, and extracting an image of a specific portion of said radiation images by conducting a subtraction processing among said digital image signal,

the subtraction processing method for radiation images comprising:

- when each radiation image to be subtraction processed is recorded on each stimuable phosphor sheet, simultaneously recording a marker having such a shape as provides a reference point or a reference line to said stimuable phosphor sheet in a position fixed with respect to said radiation image,
- scanning said stimuable phosphor sheet carrying said radiation image stored therein with stimulating rays, and detecting the position coordinate of said reference point or said reference line provided by said marker from the digital image signal of said image detected from the light emitted from said stimuable phosphor sheet,
- conducting the steps i) and ii) for said two or more radiation images to be subtraction processed,
- calculating a rotation and a shift among said two or more radiation images based on the respective reference points or reference lines corresponding to said two or more radiation images to be subtraction processed,
- when said rotation exists, rotating digitally either one of said radiation images to be subtraction processed, and/or when said shift exists, moving digitally either one of said radiation images to be subtraction processed, and conducting a subtraction processing of the image signal value among the corresponding picture elements of said two or more radiation images to be subtraction processed.

4,710,876

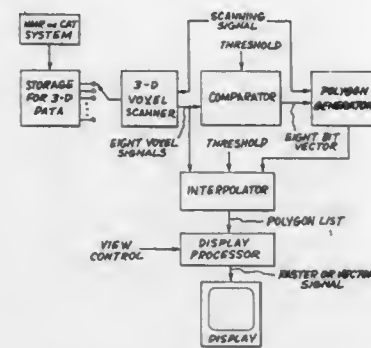
SYSTEM AND METHOD FOR THE DISPLAY OF SURFACE STRUCTURES CONTAINED WITHIN THE INTERIOR REGION OF A SOLID BODY

Harvey E. Cline, Schenectady, and William E. Lorensen, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 5, 1985, Ser. No. 741,390
Int. Cl. G06F 15/42

U.S. Cl. 364-414

16 Claims



1. A system for displaying three dimensional surface structures comprising:

- means for storing three dimensional signal patterns representing the value of at least one physical property associated with a three dimensional body at regularly spaced grid locations within said body;
- means for retrieving the eight three dimensional signal pattern values associated with each set of cubically adjacent grid locations within said body;
- means for comparing each set of said eight values with a predetermined threshold value to generate an eight bit binary vector each of whose elements is zero or one, based on the result of said comparison;
- means for generating a set of coordinate values for each distinct binary vector, said coordinate values representing the vertices of at least one predetermined polygonal surface which approximates the intersection of surfaces determined by said threshold value with the volume defined by said eight grid points, said coordinate values also being dependent on the location of said eight grid locations within said body;
- display processor means for receiving said coordinate values and for converting said coordinate values to a display format; and
- means for displaying surfaces determined by said threshold, said display means being driven by said display processor.

4,710,877

DEVICE FOR THE PROGRAMMED TEACHING OF ARABIC LANGUAGE AND RECITATIONS

Moustafa E. Ahmed, Dept. of Electrical Engineering Worcester Polytechnic Institute, Worcester, Mass. 01609

Filed Apr. 23, 1985, Ser. No. 726,060
Int. Cl. G06F 15/20, 15/38

U.S. Cl. 364-419

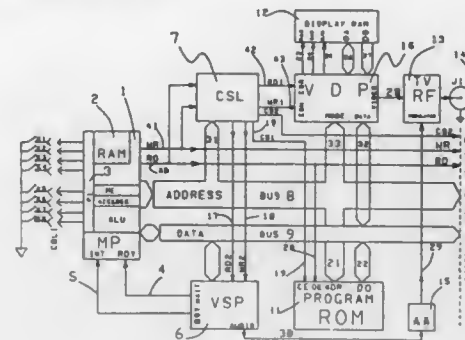
22 Claims

1. A teaching device for Arabic language and Qur'anic recitation which comprises:

- (a) an optical display means;
- (b) an interface means connected to said optical display means;
- (c) a first storage media for storage of Arabic character patterns for use in generation of characters;
- (d) a second storage media for coded Arabic allophones/syllables and words;
- (e) a first storage means for coded words and coded sounds;
- (f) a second storage means for teaching programs, the programs including limited-choice operation commands and

options in a programmed hierarchy, adapted to lead a student through progressing levels in accord with the student's response to a series of partially randomized questions and prompts, utilizing interactive evaluation means;

- (g) an input means whereby selection of said operation commands is achieved;



- (h) a voice synthesis means and means for speech and sound production;
- (i) a computer means for coupling the said optical display means to said input means, to said first and second storage media, to said first and second storage means, and to said voice synthesis means; and
- (j) an external storage means for operating software having an interface with said computer means.

4,710,878

APPARATUS AND A METHOD FOR CONTROLLING WIPER

Motomi Iyoda, Toyota, Japan, assignor to Toyota Jidoshi Kabushiki Kaisha, Aichi, Japan

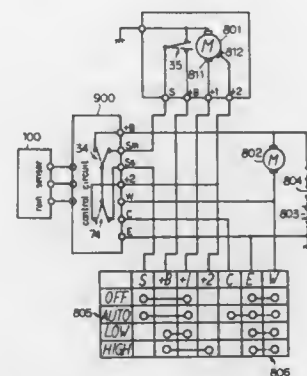
Filed Dec. 30, 1985, Ser. No. 814,801

Claims priority, application Japan, May 11, 1985, 60-54226[U]

Int. Cl. H02P 1/04

U.S. Cl. 364-424

20 Claims



1. An apparatus for controlling a wiper comprising:

- a detecting means for detecting an amount of rain positioned thereon, said detecting means outputting a detected rain signal, the detected rain signal corresponding to the detected amount of rain positioned on said detecting means after the wiper wipes out water deposited on said detecting means;
- a first comparator means for comparing the detected rain signal with a first predetermined signal, the first predetermined signal corresponding to a first predetermined amount of drops of water, said first comparator means determining if the detected amount of rain is equal to or greater than the first predetermined amount of drops of

water, wherein when said first comparator means determines the detected amount of rain is equal to or greater than the first predetermined amount of drops of water, said first comparator means outputs a first output signal; an actuator means for actuating the wiper in accordance with receipt of the first output signal so that when said actuator means receives the first output signal, said actuator means produces an actuating output signal and actuates the wiper at a first wiping speed;

a second comparator means for comparing the detected rain signal with a second predetermined signal, the second predetermined signal corresponding to a second predetermined amount of drops of water, said second comparator means determining if the detected amount of rain is equal to or greater than the second predetermined amount of drops of water, wherein when said second comparator means determines the detected amount of rain is equal to or greater than the second predetermined amount of drops of water, said second comparator means produces a second output signal;

a timer means for receiving the actuating output signal outputted from the actuator means, and for producing a first clock signal when the wiper returns to an initial position, the first clock signal having a first time period, said timer means receiving a change output signal, and producing a second clock signal having a second time period;

a memory means for receiving said second output signal and the first and second clock signals and for memorizing said second output signal, said memory means reproducing said memorized second output signal during the first time period after the wiper wipes out the water deposited on said detecting means in accordance with receipt of the first clock signal, said memory means reproducing said memorized second output signal during the second time period after the wiper wipes out the water deposited on said detecting means in accordance with receipt of the second clock signal; and

a changing means for receiving the memorized second output signal and for producing the change output signal for changing the wiping speed of the wiper at a time when the wiper returns to the initial position thereof in accordance with receipt of the memorized second output signal reproduced from the memory means.

4,710,879

RATIO CONTROL SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Hamid Vahabzadeh, Rochester Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1986, Ser. No. 828,677

Int. Cl. B60K 41/12; G06F 15/20

U.S. Cl. 364-424.1

3 Claims

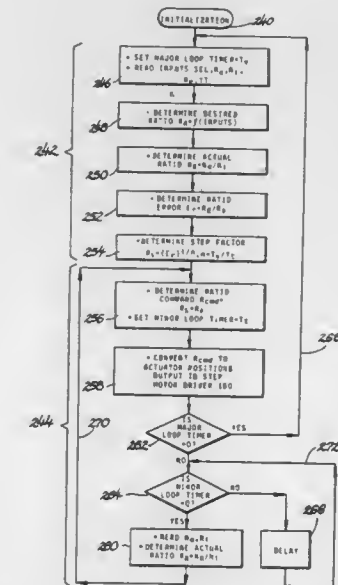
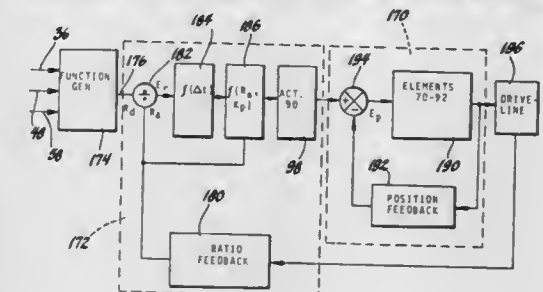
2. For a continuously variable ratio transmission having an inner servo loop which adjusts the transmission speed ratio in accordance with a ratio command R_{cmd} , and a mechanism for providing a periodically updated indication of the transmission desired speed ratio R_d , a method of operation for bringing the actual speed ratio R_a into correspondence with the desired speed ratio R_d , the method comprising the steps of:

- computing the speed ratio error E_r at each update of the desired speed ratio R_d substantially according to the expression: $E_r = R_d/R_a$; and
- for each computation of the ratio error E_r , obtaining n successive samples of the actual speed ratio R_a , determining a ratio command R_{cmd} in relation to the product of the actual ratio R_a and a ratio step factor R_s for each sample of the actual speed ratio R_a , the step factor being determined substantially according to the expression $R_s = (E_r)^{1/n}$, and applying the ratio command R_{cmd} to the inner servo loop, thereby to provide a system time response characteristic wherein the time required to change the ratio by any given factor is substantially the same.

3. For a vehicle drive train having a continuously variable transmission and a control mechanism which adjusts the trans-

mission speed ratio in accordance with a ratio command, control apparatus comprising:

- means including a computer based control unit for (1) determining a desired transmission speed ratio in accordance with vehicle operating parameters, (2) determining the ratio error of the actual speed ratio relative to the desired speed ratio as an indication of the factor f by which it is desired to change the actual ratio, and (3) computing a ratio step factor in relation to the n th root of said ratio



error, where n is the number of corrective steps to be employed in effecting the desired ratio change, and thereafter generating n successive ratio commands for the control mechanism, each such ratio command being generated according to the product of the actual speed ratio and said ratio step factor, thereby bringing the actual speed ratio into correspondence with the desired speed ratio in a time interval that is substantially the same for any factor f of ratio change.

4,710,880

VEHICLE SPEED CONTROL APPARATUS AND METHOD

Pierre A. Zuber, Baldwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 28, 1984, Ser. No. 675,675

Int. Cl. G06F 11/16; B61L 3/20

U.S. Cl. 364-426

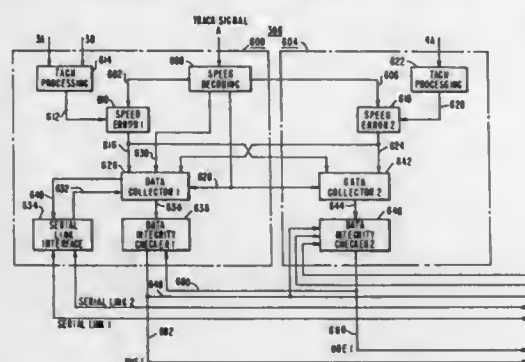
4 Claims

1. In apparatus for controlling a vehicle having a propulsion and brake controller and moving along a track providing to the vehicle an input speed command, the combination of:

- first means responsive to the vehicle movement for providing a first vehicle speed signal;
- second means responsive to the vehicle movement for providing a second vehicle speed signal;
- first speed channel control means having a first channel

responsive to the input speed command and responsive to the first vehicle speed signal to provide a first speed error and having a second channel responsive to the input speed command and the second vehicle speed signal to provide a second speed error;

at least second speed channel control means having a third channel responsive to the input speed command and responsive to the first vehicle speed signal to provide a third speed error and having a fourth channel responsive to the input speed command and responsive to the second vehicle speed signal to provide a fourth speed error; said first speed channel control means including comparator means for comparing the first, second, third and fourth speed errors to provide a first output signal to enable the operation of the propulsion and brake controller when there is substantial equality among said speed errors;



said first speed channel control means further having means for making a first integrity check of said first and second speed channel control means and permitting the first output enable signal to operate the controller when the first integrity check is satisfactory;

said second speed channel control means including another comparator means for comparing the first, second, third and fourth speed errors to provide a second output signal to enable the operation of the propulsion and brake controller when there is substantial equality among said speed errors; and

said second speed channel control means further having means for making a second integrity check of said first and second speed channel control means and permitting the second output enable signal to operate the controller when the second integrity check is satisfactory.

4,710,881

KNOCK CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Yasunori Mouri, and Noboru Sugiura, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 458,455, Jan. 17, 1983, abandoned. This application May 30, 1986, Ser. No. 868,441

Claims priority, application Japan, Jan. 18, 1982, 57-4997

Int. Cl.⁴ F02P 5/14

U.S. Cl. 364-431.08

21 Claims

1. A knock control apparatus for an internal combustion engine comprising:

sensor means for generating signals indicative of operation conditions of an engine;

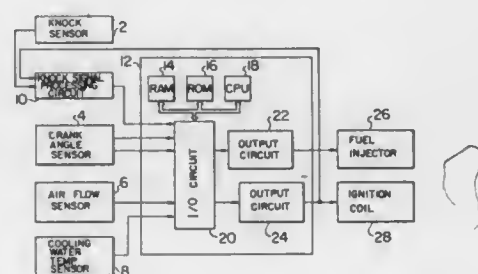
actuator means responsive to control signals from said sensor means to control energy conversion functions of said engine;

knock sensing means for sensing a presence or absence of knocking in said engine and generating a knock detection signal indicative of an occurrence of knocking;

control circuit means responsive to the signals from said sensor means to perform engine controlling data processing operations and thereby supply engine control values to said actuator means, said control circuit means including

first means for detecting an acceleration of said engine on a basis of output signals from said sensor means, memory means for storing first data of an ignition timing retard angle in an accelerated state of the engine and second data of an ignition time retard angle which is less than said first data in engine operational states other than the acceleration state, and second means for selectively reading out from said memory means one of said first and second data in response to said knock detection signal and for supplying the readout data to said actuator means to thereby retard the ignition timing by an angle corresponding to the read out data, and said second means reads out said first data when it is detected that said engine is in the acceleration state and reads out the second data when the engine is in another operational state.

14. A method of operating a knock control system for an internal combustion engine including: sensor means for generating signals indicative of operating conditions of an engine; actuator means responsive to control signals to control engine conversion functions of said engine; knock sensing means for sensing the presence or absence of knocking in said engine and generating a knock detection signal indicative of an occurrence



of a knocking; and control circuit means responsive to the signals from said sensor means to perform engine controlling data processing operations and thereby supply engine control values to said actuator means, said control circuit means including memory means for storing a first data of ignition timing retard angle in an acceleration state and a second data of ignition timing retard angle which is less than said first data in engine operation states other than the acceleration state; the method comprising the steps of:

a first step of determining whether said engine is in an acceleration state or states other than the acceleration state in accordance with output signals from said sensor means; a second step of reading out from said memory means selectively one of said first and second data in response to said knock detection signal in a manner such that said first is read out when it is determined that said engine is in the acceleration state and said second data is read out in another state; and

a third step of supplying the read out data to said actuator means from said control circuit means to thereby retard the ignition timing by an angle corresponding to the read out data.

4,710,882

ELECTRONIC POSTAGE METER HAVING A NONVOLATILE MEMORY SELECTION MEANS

Peter C. DiGiulio, Easton, and Henry Stalzer, Danbury, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 12, 1985, Ser. No. 710,871

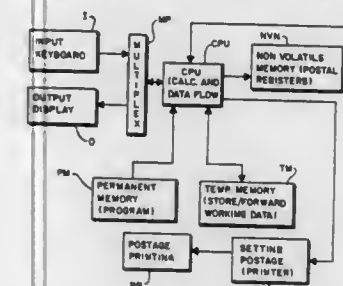
Int. Cl.⁴ G06F 13/00, 13/12, 7/04

U.S. Cl. 364-464

4 Claims

1. In a postage meter having microprocessor for controlling the printing of postage value and for accounting for the printing of such postage value and at least two nonvolatile memories for storing information, said microprocessor being operative to read information from and write information to said nonvolatile memories, said microprocessor providing a write

strobe signal operative for enabling writing of information into said nonvolatile memories, nonvolatile memory selection means comprising a logic circuit for selecting one of said non-



volatile memories in accordance with information from the microprocessor, and means for blocking said write strobe signal to said nonvolatile memories when neither of said nonvolatile memories is selected.

4,710,883

ELECTRONIC POSTAGE METER HAVING A STATUS MONITOR

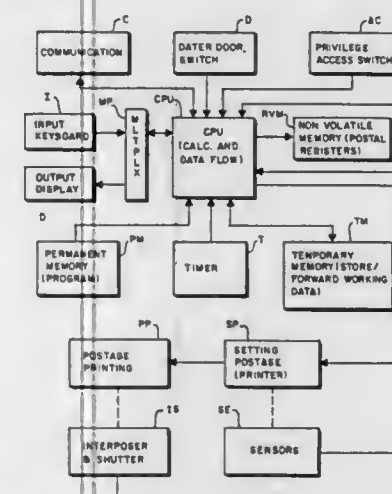
Woody W. Wilson, Westport, and Nathaniel G. Wadsworth, Oxford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 12, 1985, Ser. No. 710,898

Int. Cl.⁴ G06F 15/20; G06G 7/48

U.S. Cl. 364-466

7 Claims



1. An electronic postage meter having a microcomputer for controlling determined tasks to be performed, means for printing postage in accordance with instructions communicated from said microcomputer, means for accounting for postage printed by said printing means, means coupled to said microcomputer for nonvolatile storage of the accounting information communicated from the microcomputer, means for providing operator-selectable data to said microcomputer, means for periodically providing to said microcomputer an interrupt signal for interrupting the current operation of the microcomputer, said microcomputer being operative upon receipt of such interrupt signal to monitor the status of at least one element of the postage meter and in response to the status thereof to schedule a queue of determined tasks to be performed by the electronic postage meter.

4,710,884

DEVICE FOR COMPENSATING FOR DEFLECTION IN A PLIABLE POSITIONING APPARATUS

Hiroaki Tokairin; Kazuo Honma; Kichio Nakajima; Kiyoshi Nagasawa, and Takeshi Aritake, all of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

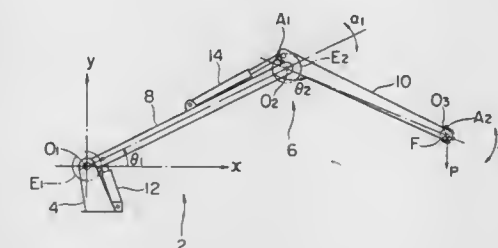
Filed Dec. 17, 1985, Ser. No. 809,908

Claims priority, application Japan, Dec. 19, 1984, 59-266370

Int. Cl.⁴ G06F 15/46; G05B 19/42

U.S. Cl. 364-513

8 Claims



1. A working apparatus of pliable structure having a support and an arm assembly pivotally connected to said support, said arm assembly including at least a first arm member, connected at one end to said support, and a second arm member pivotally connected to the first arm member at respective arm member ends and each being pivotally moved by a first actuator and a second actuator, respectively, and at least said second arm member having a working point, corresponding to an arm member end other than the pivotally connected arm member end, to which an external load is applied, wherein said apparatus comprises:

angle sensor means for sensing pivoting angles of the first arm member and second arm member, respectively;

load sensor means for sensing the external load applied to the work point of the second arm member;

target position indication means for indicating the coordinate values of a target position of the working point of the second arm member; and

control means including deflection calculation means for inputting signals produced by said angle sensor means and said load sensor means and calculating a deflection of the arm assembly at the working point of the second arm member; pivoting angle calculation means responsive to signals produced by the target position indication means for calculating provisional pivoting angles for the first arm member and second arm member corresponding to the target position when the arm assembly is assumed to produce no deflection; and correcting angle calculation means for inputting signals produced by the deflection calculation means and pivoting angle calculation means and calculating, as correcting angles, pivoting angles for the first arm member and second arm member corresponding to the deflection in the position of the provisional pivoting angles; and means for activating the first actuator and second actuator so as to pivotally move the first and second arm members, respectively, as determined by sums of the provisional pivoting angles and correcting angles, respectively, to thereby correct an error caused by the deflection of the arm assembly in positioning the working point of the second arm member for achieving accurate positioning thereof at the target position.

4,710,885

GENERATING FIGURES IN A DOCUMENT FORMATTER DIRECTLY FROM A DECLARATIVE TAG

Mark A. Litteken, Hurley, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Jul. 2, 1985, Ser. No. 751,172
Int. Cl.⁴ G06F 15/62, 15/20; B41B 19/00
U.S. Cl. 364-518

9 Claims



3. A method of combining text and a graphic illustration enclosing said text in a document formatter, comprising the steps of:

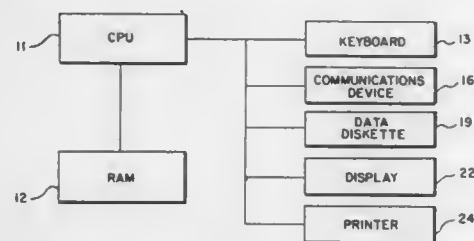
- attaching in a markup language a tag, indicating a type of graphic illustration, to a string of text, said graphic illustration being associated with said string of text and the size of said graphic illustration depending upon said string of text;
- computing in a document formatting program markup language parameters associated with said string of text;
- computing separate portions of said graphic illustration dependent on said parameters associated with said string of text; and
- using a plurality of said computed portions to generate a graphic illustration enclosing said text in the formatted output of said program.

4,710,886

TABLE DRIVEN PRINT FORMATTING

Allen W. Heath, Cedar Park, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 24, 1984, Ser. No. 664,181
Int. Cl.⁴ G06F 3/09, 15/02; B41J 5/30
U.S. Cl. 364-519

14 Claims



1. A word processing system for formatting a text data stream into a printable data stream of print commands to a printer including:

- a central processing unit, a keyboard device, a display device, a printer, a memory device, and a print formatting program, wherein said text data stream is formatted into said printable data stream by said print formatting program, said memory device having means to store:
- a printer description table having at least one specific print command subsection and at least one general print command subsection;
- printer status data which contains information describing the capabilities of and particular conditions within said printer;
- said print formatting program having commands for selecting one of said print command subsections in response to said text data, said printer description table, and said

printer status data, to place selected print commands into said printable data stream.

14. A method of formatting a printable data stream containing print commands from a text data stream comprising text commands and text data, including the steps of:

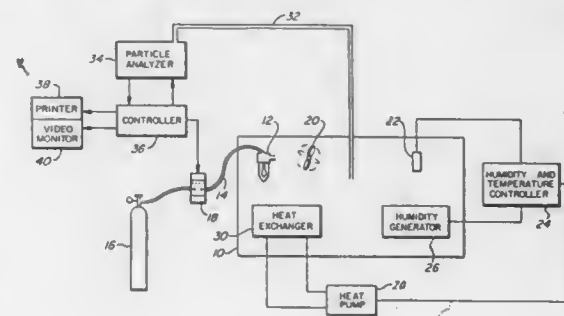
- dividing a storage table in a memory into at least one specific print command subsection and at least one general print command subsection, each specific subsection including at least one print command and each general subsection including printer description data and a general print command shell which is an incomplete print command having empty positions for storage of one or more unspecified print command parameters which are to be subsequently calculated;
- storing printer status data;
- storing printer description data;
- selecting one of said print command subsections in response to said text data, said printer status data and said printer description data;
- placing a particular print command in said printable data stream when a specific print command has been selected;
- constructing a parameter using said text data and said printer description data when a general print command has been selected;
- loading said parameter into said general print command shell to produce a dynamically created print command; and
- placing said dynamically created print command into said printable data stream.

4,710,887

COMPUTER CONTROLLED CONSTANT CONCENTRATION AND SIZE PARTICULATE GENERAL SYSTEM

Jim Y. W. Ho, Medicine Hat, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada
Filed Jun. 17, 1985, Ser. No. 745,167
Claims priority, application Canada, Aug. 21, 1984, 461480
Int. Cl.⁴ G01N 15/02
U.S. Cl. 364-555

3 Claims



1. An aerosol generating system comprising:

- (a) a closed chamber;
- (b) an aerosol generator in the chamber;
- (c) means for generating an air flow within the chamber to distribute aerosols therein;
- (d) a particle analyzer connected to the chamber to draw aerosol samples therefrom and to monitor particle size range of the aerosol; and
- (e) control means responsive to signals from the analyzer representative of changes in said particle size range to control operation of the aerosol generator so as to maintain said particle size substantially constant.

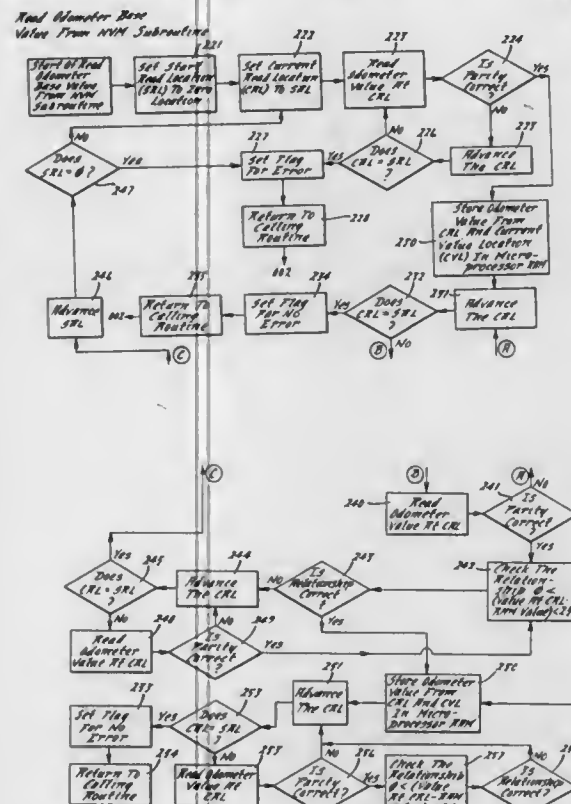
4,710,888

ELECTRONIC ODOMETER

Michael J. Burke, Detroit; Richard A. Pidsosny, Canton, and Gerald J. Lehner, Westland, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Oct. 1, 1984, Ser. No. 656,626
Int. Cl.⁴ G06F 15/20

U.S. Cl. 364-561

18 Claims



7. In an electronic odometer, a method of reading data from a non-volatile memory (NVM) device having data stored in one or more of a predetermined number of sequentially ordered storage locations including the following ordered steps of:

- (a) selecting a storage location in said NVM as a starting read location;
- (b) reading the data value present in the selected read location;
- (c) comparing parity coded portions of the read data value with predetermined correct parity values to determine if said read data value is parity correct or not;
- (d) advancing the reading location to the next sequential location in said NVM and repeating steps (b) and (c) only until the selected reading location is again equal to said starting reading location when said compared parity in step (c) is incorrect;
- (e) providing a data error indication and ending said method when said compared parity in step (c) is incorrect and said reading location is again equal to said starting read location;
- (f) temporarily storing the read data value in another memory device when the compared parity of step (c) is correct;
- (g) advancing the selection of the reading location to the next sequential location in said NVM;
- (h) providing said temporarily stored data value as a correct base odometer value and ending said method only when said selected read location is again equal to said starting read location;

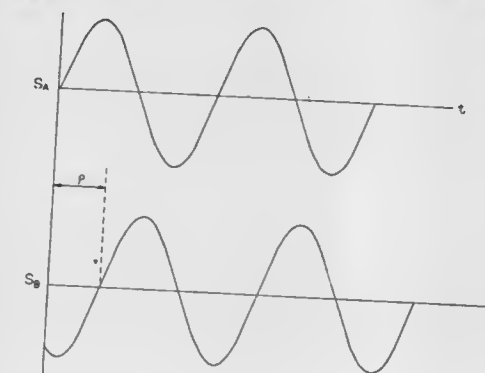
- (i) reading the data value present in the advanced read location;
- (j) comparing the parity coded portions of the read data value with predetermined correct parity values to determine if said read data value is parity correct or not;
- (k) repeating sequential steps of (g) through (j) when said compared parity in step (j) is incorrect;
- (l) comparing the data value read in step (i) with the value temporarily stored in said other memory device when said compared parity in step (j) is correct to determine if said value read is within a predetermined relationship established with respect to the temporarily stored value;
- (m) replacing the previously temporarily stored data in step (f) with the read data value compared in step (l) when that read data value is within the predetermined relationship established with respect to the previously temporarily stored value;
- (n) repeating steps (g) through (m);
- (o) repeating step (g) when the read data value compared in step (l) is without the predetermined relationship established with respect to the previously temporarily stored value;
- (p) repeating steps (i) through (m) only until the selected read location is again equal to said starting read location;
- (q) advancing the selection of the starting read location to the next sequential location in said NVM;
- (r) repeat steps (b) through (q) only until the starting read location is again equal to the starting read location selected in step (a); and
- (s) providing a data error indication and ending said method when said starting read location is again equal to the starting read location selected in step (a).

4,710,889

ANGULAR POSITION DETECTOR

Thomas D. Wason, Raleigh, N.C., assignor to Cain Encoder Co., Greenville, N.C.
Division of Ser. No. 516,714, Jul. 25, 1983, Pat. No. 4,606,008.
This application Aug. 8, 1986, Ser. No. 894,637
Int. Cl.⁴ G01C 17/38
U.S. Cl. 364-571

7 Claims



1. In a device for detecting the position of a rotating member with respect to a predetermined zero position, said device being of the type wherein a transducer confronts said rotating member and is electrically coupled thereto to provide a resultant electric signal indicative of said hand position; and wherein the indicated hand position may be in variance with the actual hand position because of fluctuation in the distance of the transducer from the rotating member, and further wherein such distance variance is related to a variance in the anticipated amplitude of the resultant electric signal, a method for compensating for said distance variance comprising the steps of:

- (a) determining the amplitude of resultant electric signal;

- (b) generating an amplitude compensation value based on said amplitude;
- (c) adding the amplitude compensation value to said resultant electric signal to provide a corrected value indicative of the compensated hand position.

3. In combination with an encoding apparatus for detecting the position of a rotating member with respect to a predetermined zero position, said apparatus being of the type in which a transducer confronts said rotating member and is electrostatically or electromagnetically coupled thereto to detect a resultant signal indicative of said position thereof, and wherein the indicated position may be in variance with the actual position because of a fluctuation in the distance of the transducer from the rotating member, and further wherein such distance variance is related to a variance in the anticipated amplitude of the resultant electric signal, a means for compensating for the effect of said distance variation, said means comprising:

- (a) measuring means for determining the amplitude of said detected resultant, position indicating electric signal;
- (b) computational means for generating a compensation value based upon said amplitude; and
- (c) combinatorial means for adding said compensation value to said resultant electrical signal.

4,710,890 BALANCED MIXER

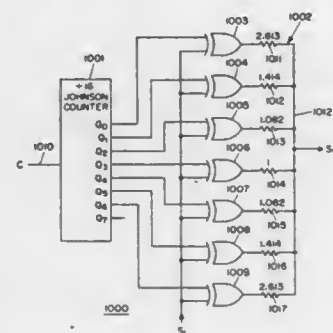
George Bailey, Montgomery County, Md., assignor to Hekimian Laboratories, Inc., Gaithersburg, Md.

Filed Sep. 5, 1985, Ser. No. 772,870

Int. Cl.⁴ H03B 19/00

U.S. Cl. 364-703

9 Claims



1. A balanced mixer for multiplying a first and a second signal and forming the product thereof comprising:

output means for providing the product of the first and second signals;

counter means having an input for receiving a periodic digital clock signal and a plurality of sequentially-ordered outputs including a first output, providing respective periodic digital output signals having a frequency which is a predetermined fraction of the frequency of the clock signal, the digital output signals being suitable for generating a discrete approximation of the first signal by appropriately weighting and summing such digital output signals;

a plurality of signal weighting means, each one corresponding to a respective operative one of the outputs of the counter means and having a first and a second terminal, the first terminal of each signal weighting means being coupled in a signal summing arrangement to the output means, each signal weighting means having a value such that if the second terminals of the signal weighting means are coupled to the corresponding operative output of the counter means, the output means provides a discrete approximation of the first signal; and

a plurality of EXCLUSIVE OR means each one having a first input coupled to a particular operative one of the outputs of the counter means, a second input coupled to

receive the second signal and an output coupled to the second terminal of the signal weighting means corresponding to the particular operative one of the outputs of the counter means.

4,710,891 DIGITAL SYNTHESIS TECHNIQUE FOR PULSES HAVING PREDETERMINED TIME AND FREQUENCY DOMAIN CHARACTERISTICS

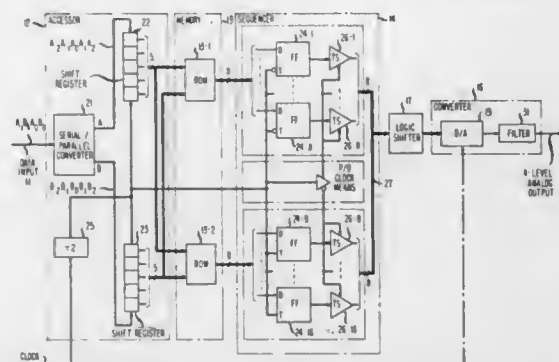
Walter Debus, Jr., Nottingham; Thomas L. Osborne, Sandown, both of N.H., and Curtis A. Siller, Jr., Andover, Mass., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 27, 1983, Ser. No. 517,803

Int. Cl.⁴ G06F 1/02

U.S. Cl. 364-718

9 Claims



1. Apparatus for synthesizing a multi-level coded signal with predetermined time domain and frequency domain characteristics in response to a binary input data stream; said signal defined in terms of discrete amplitude states, each amplitude state corresponding to a symbol representing a unique group of at least two input bits, said apparatus comprising:

accessing means for converting a predetermined number greater than one, m, of said symbols into at least one address, said accessing means comprising accumulating means for accumulating m symbols in respective successive address positions and shifting means for shifting each of said symbols one address position to change the address at the symbol rate, each new address comprising one new symbol and m-1 old symbols;

digital output means comprising memory means addressed by said accessing means for producing at least two digital representations for each symbol period;

said digital representations corresponding to a composite formed by the superposition of m individual and identical impulse time functions temporally displaced one from another by the symbol interval, each function weighted according to the discrete amplitude state and temporally displaced according to the position in the input data stream of the respective corresponding symbol of the m symbols forming said at least one address; and

digital-to-analog converting means connected to said digital output means for converting said digital representations to said multi-level coded signal.

4,710,892 PHASE CALCULATION CIRCUITRY IN DIGITAL TELEVISION RECEIVER

Russell T. Fling, Noblesville, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 29, 1984, Ser. No. 666,020

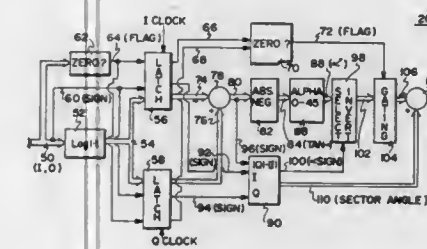
Int. Cl.⁴ G06F 7/347, 7/556; H04N 9/64

U.S. Cl. 364-729

4 Claims

1. Apparatus for generating the instantaneous phase value θ

of the vector sum C of a pair of quadrature-related signal components I and Q with respect to one of said signal components I; said apparatus comprising:



- (a) means for receiving a pair of instantaneous magnitude values of said orthogonal signal components I and Q;
- (b) means for calculating a value equal to:

$$\tan \alpha = \frac{\text{Smaller of said magnitude values}}{\text{Larger of said magnitude values}}$$

- (c) a source of coefficient values K_t , where t is an index varying from 1 to 2;
- (d) means for calculating the logarithm of $\tan \alpha$ to the base B, hereinafter $\text{Log}_B(\tan \alpha)$; wherein said logarithm calculating means comprises a ROM to which the value of $\tan \alpha$ is applied as an address code, and which is programmed to contain the associated $\text{Log}_B(\tan \alpha)$ values at the respective memory locations;
- (e) first means for adding to the value of $\text{Log}_B(\tan \alpha)$ a value equal to $\text{Log}_B(M) + \text{Log}_B(K_1)$, where M is a constant;
- (f) first means for determining the antilogarithm of the output of said first adding means;
- (g) means for multiplying the value of $\text{Log}_B(\tan \alpha)$ by a factor of 2;
- (h) second means for adding to the output of said multiplying means a value equal to $\text{Log}_B(M) + \text{Log}_B(K_2)$ to the base B;
- (i) second means for determining the antilogarithm of the output of said second adding means;
- (j) means for combining the output of said first antilogarithm determining means with the output of said second antilogarithm determining means to generate the value α' ; and
- (k) means for transposing the angle α' to the corresponding phase angle θ of the vector sum C.

4,710,893
HIGH SPEED INSTRUMENT BUS
Samuel McCutcheon, Saratoga; Jeffrey Lum, Fremont; Roman Solek, Mountain View; Troy Harrell, Sunnyvale, and Robert Leman, San Jose, all of Calif., assignors to Autek Systems Corporation, Santa Clara, Calif.

Filed Jun. 22, 1984, Ser. No. 623,381

Int. Cl.⁴ G06F 13/00

U.S. Cl. 364-900

30 Claims

1. A system for high speed, address independent data and command transfer between a computer and a plurality of instrument modules, comprising:

- a high speed bus comprised of a plurality of multipurpose lines and buses;
- a data bus and a command bus in said high speed bus coupled to said computer and to each of said instrument modules;
- a module polling means coupled to said computer wherein, after power up of said computer, said polling means sequentially polls each of said instrument modules by issuing a model identification number on said command bus to which each of said instrument modules may be coupled;
- a data transmission and reception means respectively coupled to said computer, to said data bus, to said command

bus and to each of said instrument modules for transmitting and receiving data over said data bus and said command bus in accordance with a desired instrument operation defined by a function code;

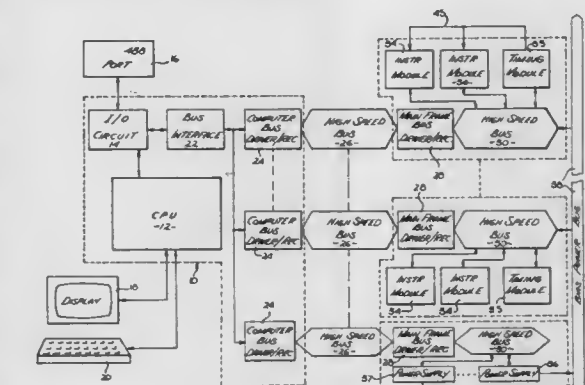
a first storage means in each of said instrument modules for storing instrument means identification numbers, wherein said data transmission and reception means transmits said module identification number to said computer upon receipt of said model identification number by said reception means;

a second storage means in said computer for storing said instrument module identification number received from said instrument modules in a poll table wherein said poll table associates an address slot in said poll table with said identified module thereby allowing any module to be associated with any slot;

function code generation means coupled to said computer for generating a function code (#0...N) corresponding to a desired instrument operation and transmitting to said instrument modules said code on said command bus;

a plurality of enable lines coupled to said computer and each of said instrument modules;

module enabling means coupled to said computer and each of said enabling lines for sequentially generating an enable signal and transmitting said enable signal on an enable line connected to a selected instrument module, such that said selected instrument module is enabled for data transfer and function code reception;



a function code receiving means coupled to each of said instrument modules, said enable line and said command bus for decoding said function code provided to said enabled instrument module into a unique operation for execution by said instrument module on receipt of said enable signal;

whereby a high speed data transfer occurs as a result of associating said instrument identification number in said poll table with an associated address slot and an associated function code such that said instrument modules can be coupled to any slot.

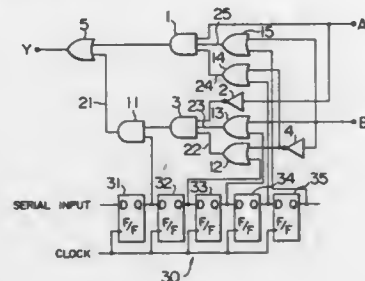
17. A method for transferring data and commands at high speed between a computer and a plurality of instrument modules comprising the steps of:

- said computer, upon power-up, sequentially generating model identification code signals to each of said instrument modules;
- said instrument module transmitting an instrument module identification number onto a data bus coupled to said computer and each of said instrument modules;
- said computer storing said instrument module identification number received from each of said instrument modules in a poll table;
- said computer associating an address slot in said poll table with each of said module identification numbers;
- said computer generating a digital function code (#0...N) corresponding to a desired instrument operation and transmitting said function code on a command bus cou-

first unit circuits positioned at the respective points where the input lines and the product term lines intersect and connected to the input lines and the product term lines, each of the first unit circuits having

- a first storage means for storing information which determines whether the product term line connected to the first unit circuits is to be sensitized or desensitized and
- a first means for selectively sensitizing or desensitizing the product term line on the basis of the information stored in the first storage means,

the AND array generating desired logical products of the logical variables on the respective product term lines; and an OR array having



signal lines connected to the product term lines, respectively,

one or more output lines intersecting the signal lines, and second unit circuits positioned at the respective points where the signal lines and the output lines intersect, each of the second unit circuits having

- a second storage means for storing information which determines whether the output line connected to the each of the second unit circuits is to be sensitized or desensitized and
- a second means for selectively sensitizing or desensitizing the output line on the basis of the information stored in the first storage means,

the OR array generating a desired logical sum of the logical products on the respective output lines.

4,710,899

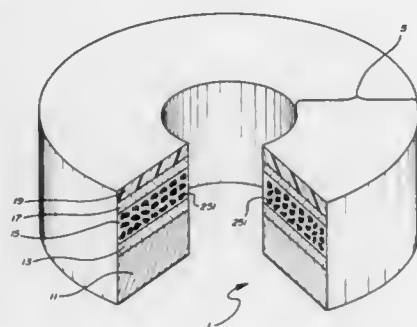
DATA STORAGE MEDIUM INCORPORATING A TRANSITION METAL FOR INCREASED SWITCHING SPEED

Rosa Young, Troy, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jun. 10, 1985, Ser. No. 742,813
Int. Cl. G11C 13/00

U.S. Cl. 365—113

2 Claims



1. A data storage device having a layer of non-ablative chalcogen phase change data storage medium switchable between detectable states differing in local order by the applica-

tion of projected beam energy thereto, the data storage medium comprising:

- (a) a chalcogen chosen from the group consisting of Te, Se, and mixtures thereof; and
- (b) a transition metal switching modulator chosen from the group consisting of Ni, Pd, Pt, and combinations thereof; the transition metal switching modulator increasing the switching speed and the switching sensitivity from the less ordered state to the more ordered state, increasing the signal to noise ratio, and increasing the randomness of orientation of crystallites of the more ordered state.

4,710,900

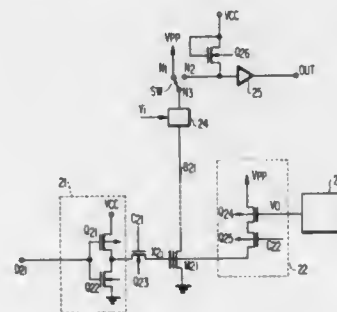
NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING AN IMPROVED WRITE CIRCUIT

Misao Higuchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,472
Claims priority, application Japan, Dec. 28, 1984, 59-277434
Int. Cl. G11C 7/00

U.S. Cl. 365—189

15 Claims



1. A non-volatile semiconductor memory device comprising:
 - a plurality of row lines;
 - a plurality of column lines;
 - a plurality of non-volatile memory cells each coupled to one of said row lines and one of said column lines;
 - a row selection circuit responsive to row address information for selecting one of said row lines;
 - a write voltage terminal to which a write voltage is applied; and
 - a plurality of write voltage application circuits each coupled between each one of said row lines and said write voltage terminal for applying said write voltage thereto in a write state, each of said write voltage application circuits including a current limiting MIS transistor of an enhancement type through which a limited amount of current flows and means for connecting a source-drain path of said current limiting transistor between said row line and said write voltage terminal.

4,710,901

DRIVING CIRCUIT FOR A SHARED SENSE AMPLIFIER

Masaki Kumanoya; Kazuyasu Fujishima, and Katsumi Dosaka, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 767,193
Claims priority, application Japan, Aug. 17, 1984, 59-172005
Int. Cl. G11C 7/00

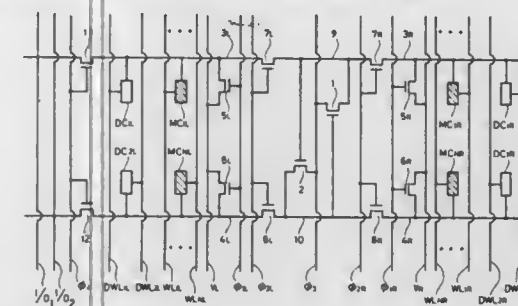
U.S. Cl. 365—190

10 Claims

1. A driving circuit for a shared sense amplifier which drives at a high speed a shared sense amplifier circuit including two pairs of bit lines (3_R, 4_R and 3_L, 4_L) respectively connected with memory cells (MC_{1R}, MC_{NR} and MC_{1L}, MC_{NL}), a sense amplifier (1, 2) provided between said two pairs of bit lines for amplifying information read from said memory cells, a first transfer transistor group (7_R, 8_R or 7_L, 8_L) interposed between

one of said pairs of bit lines (3_R, 4_R or 3_L, 4_L) and said sense amplifier and a second transfer transistor group (7_L, 8_L or 7_R, 8_R) interposed between the other pair of bit lines (3_L, 4_L or 3_R, 4_R) and said sense amplifier (1, 2) thereby to share said sense amplifier by said two pairs of bit lines (3_R, 4_R and 3_L, 4_L), said driving circuit comprising:

- a clamp clock generation circuit for generating a clamp clock (φ₅) responding at a high speed to addressing of said memory cells;
- a decoder for decoding said clamp clock (φ₅); and



on-off control means for controlling on-off operations of said first and second transfer transistor groups on the basis of an output from said decoder,

said on-off control means including clamp means for clamping, upon addressing of any one of said memory cells, the gate voltage of said transfer transistor group interposed between the pair of bit lines not connected with said addressed memory cell and said sense amplifier, said gate voltage equal to the precharge voltage of said bit lines thereby to turn off said transfer transistor group.

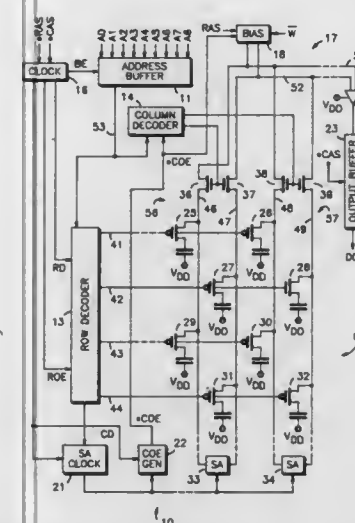
4,710,902

TECHNIQUE RESTORE FOR A DYNAMIC RANDOM ACCESS MEMORY

Perry H. Pelley, III, Austin, and Bruce L. Morton, Round Rock, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 4, 1985, Ser. No. 784,449
Int. Cl. G11C 7/00, 11/24, 11/34
U.S. Cl. 365—222

13 Claims



1. A dynamic random access memory, comprising:
 - a plurality of bit lines;
 - a plurality of word lines intersecting the plurality of bit lines;
 - a plurality of refreshable memory cells located at respective intersections of the bit lines and the word lines, each memory cell providing a signal to its respective bit line indicative of data stored therein in response to its respective word line being enabled;
 - address input means for sequentially receiving a row address

4,710,903

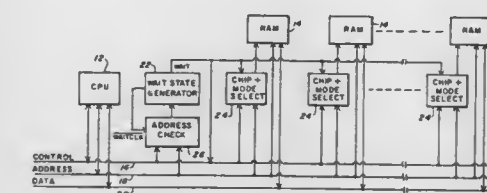
PSEUDO-STATIC MEMORY SUBSYSTEM

Michael R. Hereth, and Patricia A. Martin, both of Westford, Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Mar. 31, 1986, Ser. No. 846,328
Int. Cl. G11C 11/40

U.S. Cl. 365—194

26 Claims



1. A memory subsystem comprising memory devices which may be placed in a standby mode or in a low power mode in which greater access time is required, the subsystem comprising:

- means for placing the memory devices in the low power mode;
- means for selectively accessing discrete blocks of memory which are in either the standby mode or the low power mode;
- means for delaying access to a block of memory which is in the low power mode; and
- means for retaining an accessed block of memory in the standby mode and for preventing delay of subsequent access to the retained block of memory.

correction current values for correction of the spot of light intensity corresponding to the current values representative of the individual physical deviations and to the individual respective addresses thereof on said record surface, control means effective during read and write operations for positioning the focusing lens at in-focus positions relative to the record surface compensating for said physical deviations so that the light beam is applied to the record surface in an in-focus condition during both recording and reproducing modes of operation of said apparatus, and power varying means for varying the intensity of the spot of light as a function of the correction information to compensate for spot intensity changes caused by said physical deviations on the record surface.

4,710,909

PHASE COMPENSATION APPARATUS FOR AN OPTICAL INFORMATION RECORDING AND REPRODUCING SYSTEM

Toshiaki Tsuyoshi, Kokubunji; Seiji Yonezawa; Masuo Kasai, both of Hachioji, and Motoo Uno, Niihari, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

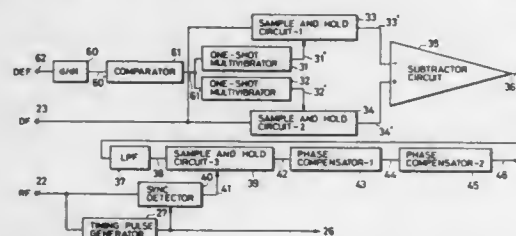
Filed Jan. 18, 1985, Ser. No. 692,575

Claims priority, application Japan, Jan. 20, 1984, 59-7123

Int. Cl.⁴ G11B 7/00

U.S. Cl. 369-46

9 Claims



1. An optical information recording and reproducing system comprising:

- a recording medium;
- at least one track on said recording medium along which a synchronization signal area and an information recording area are provided alternately, said synchronization signal area being provided with at least one pit preformed therein;
- a means for irradiating a light beam onto said recording medium;
- a means for deriving a tracking signal from said light beam modulated by the at least one pit preformed in said synchronization signal area while said light beam irradiates said synchronization signal area;
- a means for holding said tracking signal to enable tracking when said light beam irradiates said information recording area;
- a means for tracking by using said tracking signal from said holding means to control positioning of said light beam at least when said light beam irradiates said information recording area;
- a means for recording an information signal in said information recording area by modulating said light beam irradiating said information recording area with an information signal; and
- a means for compensation connected between said holding means and said tracking means for compensating an electrical phase delay caused by holding said tracking signal so as to enable accurate tracking when said light beam irradiates said information recording area.

4,710,910

SAFE LOADING-UNLOADING SYSTEM FOR TRAY IN COMPACT DISC PLAYER

Kazushige Ejiri, Iwaki, Japan, assignor to Alpine Electronics Inc., Japan

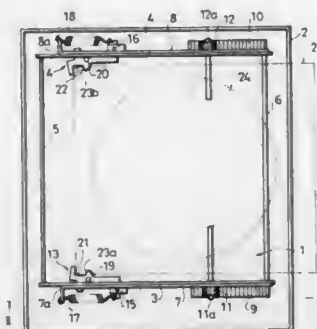
Filed Jul. 3, 1986, Ser. No. 881,848

Claims priority, application Japan, Jul. 13, 1985, 60-107367[U]

Int. Cl.⁴ G11B 3/10, 17/04

U.S. Cl. 369-75.2

1 Claim



1. A system for loading and unloading a tray carrying a compact disc into and from a compact disc player, wherein the compact disc player has a body with a front insertion part, and means for receiving the disc tray inserted in a longitudinal direction in said player body to an initial loading position and for moving the inserted tray to an operative loading position at which the disc can be separated from its tray and used for reproducing information recorded thereon, said system comprising:

- a pair of side walls mounted in said player body spaced apart in the transverse direction so as to define a tray insertion path between them and each having a longitudinally extending first aperture formed therein;
- a pair of slide plates each movable longitudinally along a respective one of said side walls and having a second aperture formed therein which is in registration with the first aperture of the respective side wall as the slide plate is moved longitudinally therealong;
- a pair of pivotable lock arms each pivotably mounted through the second aperture of a respective one of said slide plates so as to be pivotable horizontally through the first aperture of the respective side wall at the initial loading position of the tray between an engaged position in which a free end of the lock arm is engaged in a corresponding groove in the leading edge of the tray and a disengaged position in which the free end of the lock arm is displaced from the groove in the tray;
- biasing means for biasing each of said lock arms toward engagement of the free ends thereof into the grooves in the tray;
- each of said lock arms having a lock pin formed thereon which abuts against a portion of the respective side wall when the respective slide plate is moved to the operative loading position of the tray, such that the lock arms are held in their engaged positions with the tray at the operative loading position in order to prevent disengagement of the tray from said lock arms and removal from the player body; and
- each of said first apertures of said side walls having a recess providing clearance for the lock pin of the respective lock arm at a position corresponding to the initial loading position of the tray, such that the lock arms are pivotable through the first apertures to their disengaged positions to allow insertion and removal of the tray into and from the player body at the initial loading position.

4,710,911

METHOD FOR RECORDING, REPRODUCING AND ERASING OPTICAL INFORMATION

Noboru Yamada, Michiyoshi Nagashima, both of Hirakata, and Kenichi Nishiyuchi, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

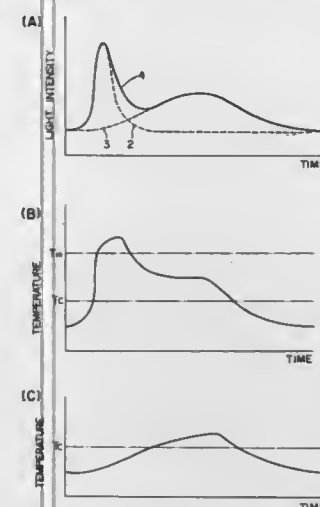
Filed Apr. 19, 1985, Ser. No. 724,887

Claims priority, application Japan, Apr. 27, 1984, 59-86474

Int. Cl.⁴ G11B 7/125

U.S. Cl. 369-100

14 Claims



1. An optical information recording/erasing method for irradiating light onto a state-changeable photosensitive recording film formed on a substrate so as to record erase information on said recording film, said recording film being made of a material whose optical properties vary in accordance with light irradiating conditions, said method comprising:

- (a) initially irradiating an area on said recording film with said irradiating light with a sufficient power level to raise the temperature of said area of said film to above its melting point, thereby cancelling the recording history of said area on said film;
- (b) allowing the temperature of said film at said area to cool to below its melting point;
- (c) performing at least one of a recording and erasing operation after said area cools to below its melting point, said recording operation being performed by rapidly cooling said area on said film by at least one of (1) suddenly removing said irradiating light and (2) suddenly reducing the light power irradiating said area of said film, said erasing operation being performed by a slower cooling of said area on said film by a slower reduction in the light power irradiating said area of said film.

4,710,912

AIR CUSHION-OPTICAL DATA READ HEAD

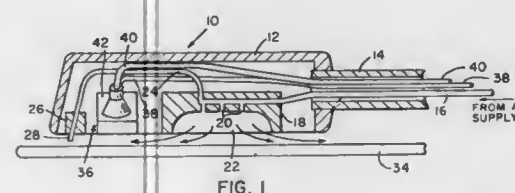
Hugh W. Greene, P.O. Box 8, Somerville, Ala. 35670; James D. Holder, 707 Graycroft Dr., and James A. Knauer, 8003 Benvoya, Apt. M 101, both of Huntsville, Ala. 35802

Filed Jun. 2, 1986, Ser. No. 870,217

Int. Cl.⁴ G11B 3/10

U.S. Cl. 369-218

4 Claims



1. An air cushion-optical data read head comprising a hous-

ing structure with one side of said housing structure being adapted for facing a disc, said one side of said housing structure having a chamber defined thereat with an air supply means connected to said chamber, a capillary tube connected to said air supply means and being designed to inject air from said air supply means into a V-groove of a disc to guide said head to cause said head to track the V-groove of the disc, and an optical pick-up system mounted in said housing structure and including fiber-optic light guides with lens at one end of each of the light guides and being arranged for projecting light transmitted through said light guides onto opposite sides of the V-groove of the disc, said light being adapted to be reflected from opposite sides of the V-groove and back through said lens and said light guides for being filtered out and utilized as data for reproducing a recording on the disc.

4,710,913

OPTICAL RECORDING DISC

Seiichi Matsushima; Toshio Higashihara, both of Ibaragi; Mitsuru Shimizu, Toride; Ken Yoshizawa, Ibaragi; Masahiro Suzuki, Ibaragi, and Toshinori Sugiyama, Ibaragi, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

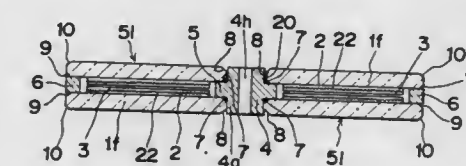
Filed Jun. 24, 1986, Ser. No. 878,075

Claims priority, application Japan, Jun. 24, 1985, 60-135981

Int. Cl.⁴ G01D 15/14

U.S. Cl. 369-280

10 Claims



1. An optical recording disc comprising:

- a cylindrical hub having a center hole for insertion of a spindle of a recording and playback device;
- a first disc unit comprising a first transparent disc substrate having a center hole in which said cylindrical hub is inserted and bonded, a resin layer formed on an inner surface of said transparent disc substrate and a recording layer formed on said resin layer; and
- a disc member being one of a second disc unit comprising a second transparent disc substrate having a center hole in which said cylindrical hub is inserted and bonded, a resin layer formed on an inner surface of said second transparent disc substrate and a recording layer formed on said resin layer or a reinforcement disc comprising a reinforcement disc substrate bonded to said cylindrical hub,
- said first transparent disc substrate including a first chamfer portion for receiving a bonding material for bonding said cylindrical hub and said first transparent disc substrate, said first chamfer portion being formed in a rim portion of an outside surface of said first transparent disc substrate at a boundary between said cylindrical hub and said transparent disc substrate,
- said second transparent disc substrate or reinforcement disc substrate of said disc member including a second chamfer portion for receiving a bonding material to bond said cylindrical hub and said transparent disc substrate or said reinforcement disc substrate, said second chamfer portion being formed in a rim portion of an outside surface of said second transparent disc substrate or said reinforcement disc substrate at a boundary portion between said cylindrical hub and said respective disc member.

4,710,914

OPTICAL FIBER TELECOMMUNICATION DEVICE
Jean Robieux, Chateaux Malabry, France, assignor to Compagnie General d'Electricite, Paris, France

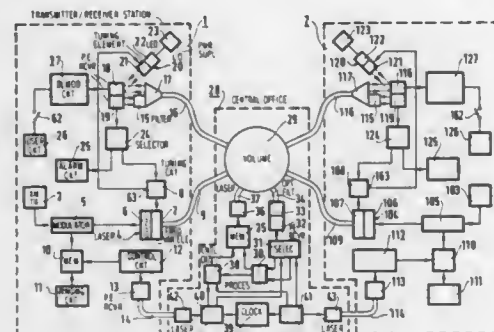
Filed Aug. 22, 1986, Ser. No. 899,352

Claims priority, application France, Aug. 29, 1985, 85 12902

Int. Cl.⁴ H04B 9/00; H04J 1/02

U.S. Cl. 370—3

9 Claims



1. Optical fiber telecommunication device adapted to provide communications between N users, comprising:

N stations assigned respectively to the N users, each station comprising:

a transmitter circuit adapted to transmit electrical signals,

a semiconductor laser adapted to deliver a transmit optical wave,

a modulation circuit connected between the transmitter circuit and the laser to amplitude modulate the transmit optical wave by the transmit electrical signals,

a photo-electric receiver system adapted to deliver receive electrical signals when it receives a receive optical wave,

a circuit utilizing the receive electrical signals, and

a ringing circuit adapted to form electrical signals or ringing other stations, this ringing circuit being connected to the modulation circuit to provide for amplitude modulation of the transmit optical wave by the ringing signals,

N pairs of optical fibers respectively connected to the N user stations, each pair comprising a transmit optical fiber of which a first end is optically coupled to the output of the laser and a receive optical fiber of which a first end is coupled to the input of the receiver system, and

an interconnection volume filled with a material whose refractive index is similar to that of the material constituting the core of the optical fibers being connected to the surface delimiting this volume, in which device:

the semiconductor laser is of the tunable emission frequency type and comprises an element adapted to vary the frequency of the transmit optical wave by variation of an electrical current applied to this element, this current being supplied by a tuning circuit whose output is connected to said element, this current adjusting the frequency of the transmit optical wave to a first carrier frequency f_1 when the tuning circuit does not receive any signal,

the device comprises an interconnection central office comprising said interconnection volume, this central office further comprising:

a timing circuit comprising a clock adapted to send periodic timing signals representative of different timing periods assigned respectively to the N stations,

a means for transmitting signals indicative of these periods to the respective stations, each station comprising means for amplitude modulating the frequency f_1 of the transmit optical wave by the ringing signals only within the timing period assigned to each station, and

a processor whose input is connected to the intercon-

nection volume in order to receive the ringing signals modulating the frequency f_1 , these signals originating from the N stations, the processor designating for each call requested an optical frequency f_p available at the time of the call and selected from a predetermined sequence of frequencies, two consecutive frequencies being separated by a constant frequency interval, the output of the processor being connected to the interconnection volume to transmit the information of the designated frequency f_p , transmission being effected on a second optical carrier frequency f_2 in the timing periods assigned to the calling and called stations, and

the receiver system of each station comprises:

a first photo-electric sensor optically coupled to the first end of the receive optical fiber to receive the signals of frequency f_2 transmitted in the timing period reserved to the station, these signals being transmitted to said tuning circuit for adjusting the frequency of the laser to the designated frequency f_p ,

a heterodyne detector system comprising a second photo-electric sensor optically coupled to the first end of the receive optical fiber and a semiconductor local oscillator with a tunable emission optical frequency, the station comprising means for adjusting the frequency of the local oscillator to a frequency f_q near f_p , $f_q - f_p$ being small relative to said constant frequency interval between two consecutive frequencies from the predetermined list, the optical wave transmitted by the local oscillator illuminating the receive surface of the second sensor and the output of the heterodyne detector system being connected to a user circuit.

4,710,915

LOOP TRANSMISSION SYSTEM HAVING AUTOMATIC LOOP CONFIGURATION CONTROL MEANS

Takeshi Kitahara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

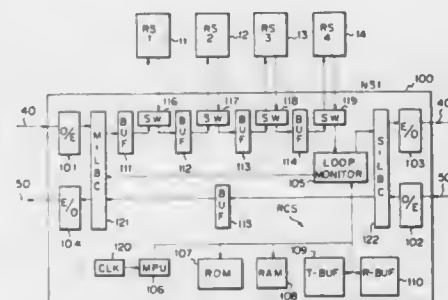
Filed Jul. 11, 1985, Ser. No. 753,960

Claims priority, application Japan, Jul. 13, 1984, 59-145702

Int. Cl.⁴ H04J 3/14

U.S. Cl. 370—16

10 Claims



1. A loop transmission system, comprising:

a plurality of node means each having first and second data transmission paths; and

first and second loop transmission lines, operatively connected to said plurality of node means, transmitting data with a carrier signal in opposite directions, each of said lines forming, with each of said data transmission paths in said node means, a separate closed loop transmission line when in a normal mode;

each of said node means comprising:

first loop-back means, operatively connected to said first and second loop transmission lines and said first and second data transmission paths at one end in said node means, for monitoring the carrier signal received from said first loop transmission line, and connecting said first and second data transmission paths in said first loop-back means when the carrier signal from said first loop transmission line is lost;

second loop-back means, connected to said first and second loop transmission lines and said first and second data transmission paths at the other end in said node means, for monitoring the carrier signal received from said second loop transmission line, connecting said first and second data transmission paths in said second loop-back means when the carrier signal from said second loop transmission line is lost, and restoring said first and second loop transmission lines to the normal mode to maintain said separate closed loop transmission lines when the carrier from said second loop transmission line signal re-appears;

loop monitor means, connected to the first data transmission path, for monitoring the transmitted data, detecting an abnormal state in the transmitted data, and detecting a recovery from the abnormal state;

activating means for activating at least one of said first and second loop-back means to loop-back in response to the detection of the abnormal state; and

restoring means for restoring the at least one of said first and second loop-back means from the loop-back state in response to the detection of recovery from the abnormal state.

4,710,916

SWITCHING APPARATUS FOR BURST-SWITCHING COMMUNICATIONS SYSTEM

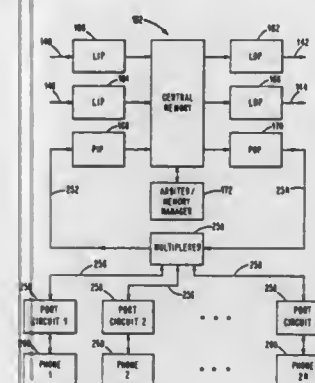
Stanford R. Amstutz, Andover; Mark Eliscu, Needham; Joseph M. Lenart, Arlington, and E. Fletcher Haselton, Waltham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 2, 1985, Ser. No. 762,589

Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370—58

6 Claims



1. Time-division multiplexed switching apparatus for switching bursts of digitally encoded information received on link communication links to link communication links as designated by address information in the headers of the bursts, said time division multiplexed switching apparatus comprising:

a plurality of switching units each being connected to associated link communication links for receiving and transmitting digitally encoded information in frames of a set of time-division multiplexed link channels;

said plurality of switching units being arranged in a closed ring with hub bus means connecting each switching unit to the succeeding switching unit of the ring for transmitting digitally encoded information in frames of a set of time division multiplexed hub channels;

each switching unit having hub storage means for storing a byte of digitally encoded information;

hub circulating means for transferring a byte in the hub storage means of each switching unit to the hub storage means of the succeeding switching unit at a rate to propagate a byte completely around the closed ring of switching units in a ring circulation period equal to the channel time of each hub channel, the transfer of bytes from each

4,710,917

VIDEO CONFERENCING NETWORK

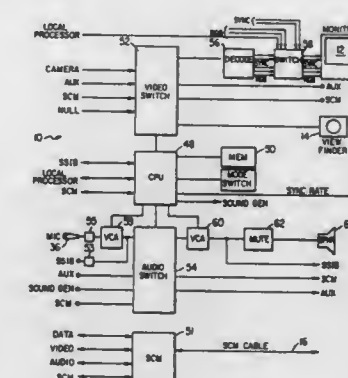
E. Neal Tompkins; Thomas C. Arends, and Michael W. Barry, all of San Antonio, Tex., assignors to Datapoint Corporation, San Antonio, Tex.

Filed Apr. 8, 1985, Ser. No. 721,281

Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370—62

65 Claims



1. A video conferencing network, comprising:

a plurality of video terminals each having a unique address for transmitting and receiving audio, video and data;

switching means for receiving audio and video information at one of a plurality of audio/video ports and selectively transmitting said received audio and video information to one or more of the remaining of said audio/video ports;

data manager means for receiving data at one of a plurality of data ports, determining which of the remaining of said data ports the received data is to be transmitted to in accordance with predetermined routing information and transmitting the received data to the determined one of said data ports;

communication link means disposed between each of said video terminals and a select one of said audio/video ports on said switching means and a select one of said data ports on said data manager means;

slave means for controlling the configuration of said switching means in response to receiving a reconfiguration signal from said data manager means, said slave means in data communication with a select one of said data ports on said data manager means;

network master means for controlling the network, said

generating the parallel data pattern output corresponding thereto; and
(c) third means, including parallel output means, for enabling the output of said parallel data pattern output signals.

4,710,923 CONTROL SYSTEM FOR DEINTERLEAVING MEMORIES IN DIGITAL AUDIO REPRODUCING APPARATUS

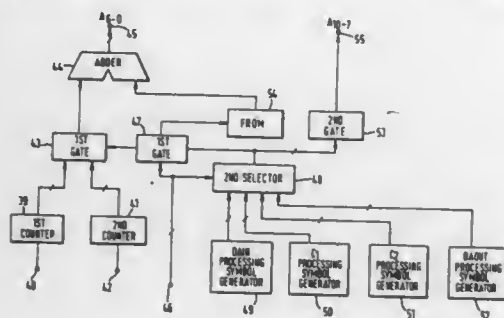
Masahide Nagumo, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 30, 1985, Ser. No. 792,890

Claims priority, application Japan, Oct. 31, 1984, 59-229234
Int. Cl.⁴ G06F 11/10

U.S. Cl. 371-2

13 Claims



1. A control system for deinterleaving memories in digital audio reproducing apparatus in which a plurality of cross-interleaved symbols are written into and read out from a RAM (Random Access Memory), said control system comprising:
a first processor for preparing at least one memory area with a predetermined storage capacity in said RAM,
a second processor for processing a first symbol in said plurality of cross-interleaved symbols to said memory area including a first counter which counts a first address for said processing of said first signal and
a third processor for processing a second symbol in said plurality of cross-interleaved symbols to said memory area including an adder which produces a sum of said count of said counter and a predetermined fix data as a second address for processing said second symbol.

4,710,924 LOCAL AND REMOTE BIT ERROR RATE MONITORING FOR EARLY WARNING OF FAULT LOCATION OF DIGITAL TRANSMISSION SYSTEM

Stanley Chum, Union City, Calif., assignor to GTE Sprint Communications Corp., Mountain View, Calif.

Filed Sep. 19, 1985, Ser. No. 777,802

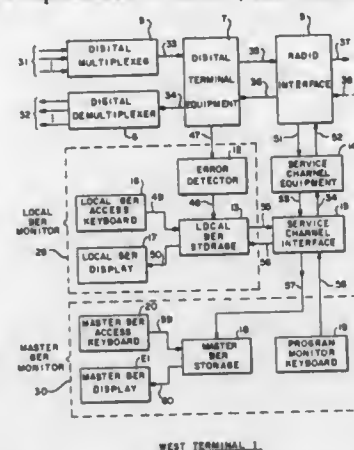
Int. Cl.⁴ H04L 1/00; G06F 11/10

U.S. Cl. 371-4

14 Claims

1. In a digital telecommunication system having at least two end terminals, apparatus for monitoring the BER (bit error rate) of the transmitted digital signals, which comprises:
means for periodically detecting the BER at each terminal in the system,
means for truncating the detected BER at each terminal such that at least the most significant digit and the exponent of said detected BER are included,
means for encoding said truncated BER for transmission to one of said terminals,
transmitting means at each terminal for transmitting said encoded truncated BER to said one terminal,
receiving means at said one terminal for receiving said transmitted encoded truncated BER,
means at said one terminal for decoding said encoded transmission to derive said truncated BER, and
first storage means at said one terminal for storing said truncated BER from each terminal and for providing an output that is representative thereof, and thereby providing

in-service line monitoring to detect marginal and failed transmission equipment.



in-service line monitoring to detect marginal and failed transmission equipment.

4,710,925 DATA COMMUNICATION SYSTEM

Tsunee Negi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

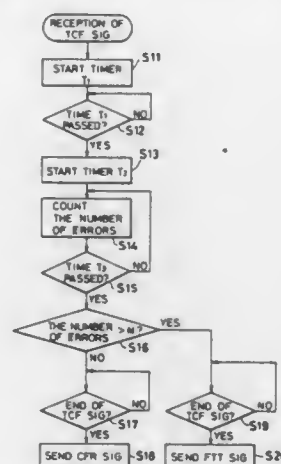
Filed Dec. 7, 1984, Ser. No. 679,558

Claims priority, application Japan, Dec. 12, 1983, 58-232870

Int. Cl.⁴ G06F 11/00

U.S. Cl. 371-5

8 Claims



1. A data communication method comprising the steps of:
receiving a test signal for testing a transmission rate;
dividing a reception period of the test signal into a plurality of periods and detecting an error for each of the periods;
discriminating a failure of the reception of the test signal for each of the periods in accordance with a criterion which is set to become increasingly difficult with the lapse of time; and
transmitting a signal representing the failure of the test signal reception to a test signal transmission party, in response to discrimination of the failure of the test signal reception in said discriminating step.

4,710,926 FAULT RECOVERY IN A DISTRIBUTED PROCESSING SYSTEM

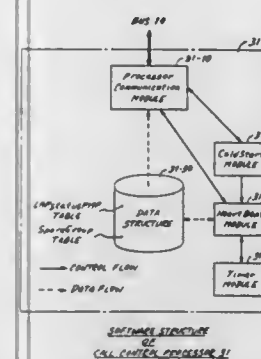
Donald W. Brown, Naperville; James W. Leth, Warrenville, and James E. Vandendorpe, Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1985, Ser. No. 814,115

Int. Cl.⁴ G06F 11/16

U.S. Cl. 371-9

37 Claims



1. In an arrangement comprising a plurality of processors interconnected for message communication and each having a logical identity defining functions performed by that processor with respect to said arrangement, a fault recovery method comprising

each of said processors repeatedly broadcasting heartbeat messages to others of said processors, which heartbeat messages each define the logical identity of the processor broadcasting the heartbeat message,
at least one of said processors maintaining an associated status table defining the logical identities of others of said processors based on heartbeat messages received therefrom and
said at least one of said processors, upon failing to receive heartbeat messages defining one of said logical identities defined in said status table, initiating performance of the functions defined by said one of said logical identities.

4,710,927 DIAGNOSTIC CIRCUIT

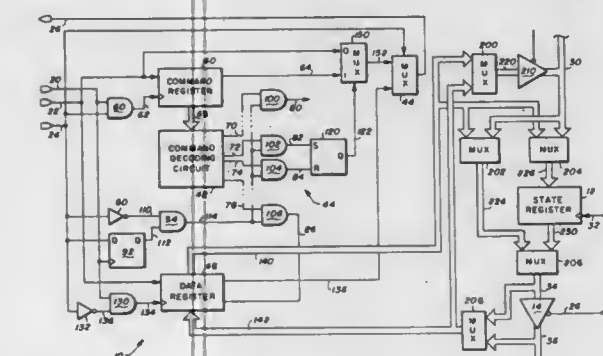
Michael J. Miller, San Jose, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Jul. 24, 1986, Ser. No. 888,701

Int. Cl.⁴ G01R 31/28

U.S. Cl. 371-15

8 Claims



1. A diagnostic circuit for receiving a serial diagnostic signal which includes in serial format both commands and data, a serial diagnostic signal clocking signal, and a command/data signal, the diagnostic circuit comprising in combination:
first coupling means;
a command register including a clock input coupled by said first coupling means to receive the serial diagnostic signal

clocking signal, a serial data input coupled to receive the command portion of the serial diagnostic signal, a serial data output at which said command register develops a signal representing said command portion of said serial diagnostic signal delayed a predetermined number of cycles of said serial diagnostic signal clocking signal, and a predetermined number of parallel data outputs at which said command register develops a plurality of signals representing the command most recently received by said command register;

second coupling means;

a data register including a clock input coupled by said second coupling means to receive said serial diagnostic signal clocking signal, a serial data input coupled to receive the data portion of said serial diagnostic signal, a serial data output at which said data register develops a signal representing said data portion of said serial diagnostic signal delayed a predetermined number of cycles of said serial diagnostic signal clocking signal, a predetermined number of parallel data inputs for receiving a predetermined number of signals representing data in parallel format, and a predetermined number of parallel data outputs at which said data register develops a plurality of signals representing the data most recently received by said data register;

third coupling means; and

a multiplexer including a first data input coupled by said third coupling means to said command register serial data output to receive the command register developed serial diagnostic signal delayed command portion, a second data input coupled to said data register serial data output to receive the data register developed serial diagnostic signal delayed data portion, a control input coupled to receive the command/data signal, and a data output at which said multiplexer develops a delayed serial diagnostic signal.

4,710,928 METHOD AND APPARATUS FOR DETECTING THE UNCONTROLLABLE OPERATION OF A CONTROL SYSTEM

Akihisa Ueda, Niigata, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

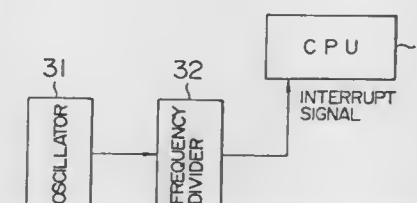
Filed Nov. 14, 1985, Ser. No. 797,894

Claims priority, application Japan, Nov. 16, 1984, 59-240433

Int. Cl.⁴ G06F 11/32

U.S. Cl. 371-16

9 Claims



1. An apparatus for detecting uncontrollable operation of a control system used for controlling a load, said apparatus comprising:

memory means for storing data relating to a given computational process;
central processing means for periodically executing the computational process based on the contents of said memory means and including means for setting a normality flag each time the execution of the computational process has been normally terminated;
output means for outputting an output signal based on the result of execution of the computational process, said output signal being applied to the load;
means for generating and applying to said central processing means an interrupt signal periodically at a predetermined time interval which is longer than a time interval required

for said central processing means to execute normally the computational process and then set the normality flag; and means provided to said central processing means for checking, in response to said interrupt signal, whether the normality flag is set and for resetting the normality flag, if the flag is set and executing an abnormality process if the normality flag is not set.

4,710,929

MODEM USE MONITOR

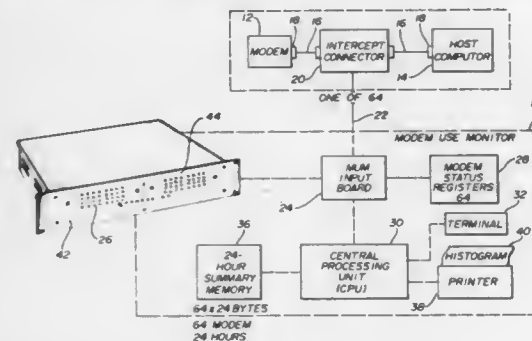
Robert J. Kelly, Old Tappan, and Tadgh Kelly, Randolph, both of N.J., assignors to Communication Devices, Inc., Clifton, N.J.

Filed Nov. 12, 1985, Ser. No. 797,166

Int. Cl.⁴ H04M 3/08; G06F 11/00

U.S. Cl. 371-22

28 Claims



23. A device for analyzing modem defects among a plurality of modems formed into one or more groups thereof, each said group of modems sequentially serving a rotary hunt arrangement of telephone lines for data communications, said device further receiving data carrier detect signals from each said modem: said device comprising:

central processing means for processing the data carrier detect signals from each modem and, in turn, being responsive to the presence and absence of said signals by providing responses on a periodic basis and by computing a modem utilization factor;

register means for storing said responses for each modem in numbered sequence;

said central processing means further for examining said register means upon acquisition of each said response and ascertaining if all modems lower in the numbered sequence have indication of data carrier detect present; and, histogram-forming means for recording all responses from said register means for a given period showing data carrier detect present, data carrier detect absent, and modem answering out-of-sequence;

whereby modem defects such as a ring no answer condition and a lock-up condition are apparent upon examination of the histogram.

4,710,930

METHOD AND APPARATUS FOR DIAGNOSING A LSI CHIP

Kazumi Hatayama, and Terumine Hayashi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,600

Claims priority, application Japan, Feb. 5, 1985, 60-20580

Int. Cl.⁴ G01R 31/28

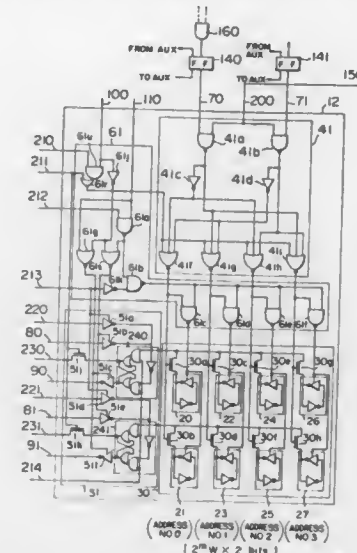
U.S. Cl. 371-25

9 Claims

1. A method for diagnosing a LSI chip, having a random access memory with a plurality of addressable locations including at least one location for storing test data, functional logic circuits coupled to said random access memory, and a latch means coupled to each location of the random access memory which stores test data to be outputted for diagnosis including the diagnosis of said functional logic circuits, comprising,

during diagnosis of a functional logic circuit by a scan-in/scan-out method, the steps:

storing an output signal from a functional logic circuit in one of said at least one storage location for storing test data;



reading out the stored output signal through the latch means; and
diagnosing whether a fault exists in said functional logic circuit being tested according to the data readout from the latch means.

4,710,931

PARTITIONED SCAN-TESTING SYSTEM

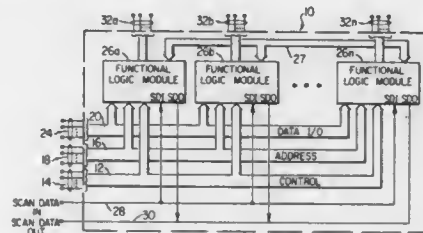
Jeffrey D. Bellay, Houston, and Theo J. Powell, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 23, 1985, Ser. No. 790,543

Int. Cl.⁴ G01R 31/28

U.S. Cl. 371-25

17 Claims



1. A method for test partitioning a logic circuit, comprising: arranging the logic into modules with an operational mode and test mode, each of the modules having a plurality of control/observation locations disposed therein, the modules in the operational mode interacting in accordance with a predetermined operational format;

isolating the modules to define a test boundary about each module enclosing both the logic associated with each module and the control/observation locations disposed therein;

addressing a select one of the modules in the test mode for testing thereof;

applying test vectors in accordance with a predetermined test pattern for the select module to the control/observation locations in the select module to perform the test, the results of the test captured in the control/observation locations; and

observing the results captured in the control/observation

locations of the select module after the test vectors have been applied.

4,710,932

PARALLEL/SERIAL SCAN SYSTEM FOR TESTING LOGIC CIRCUITS

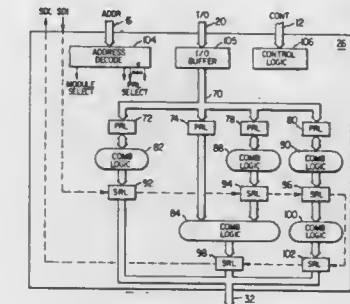
Theo J. Powell, Dallas; Jeffrey D. Bellay; Martin D. Daniels, both of Houston, and Yin-Chao Hwang, Sugar Land, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 23, 1985, Ser. No. 790,569

Int. Cl.⁴ G01R 31/28

U.S. Cl. 371-25

15 Claims



4,710,932

METHOD OF AND APPARATUS FOR FAULT DETECTION IN DIGITAL CIRCUITS BY COMPARISON OF TEST SIGNALS APPLIED TO A TEST CIRCUIT AND A FAULTLESS REFERENCE CIRCUIT

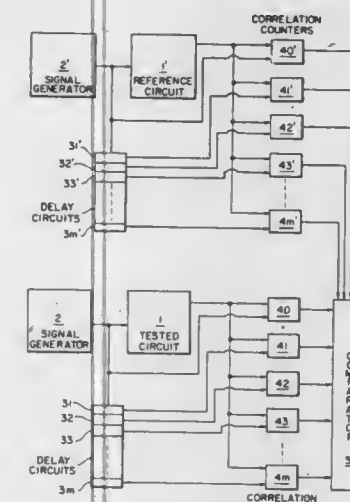
Kashiwagi Hiroshi, 4-711 Kurokami, Kumamoto-shi, Kumamoto-ken, Japan, assignor to Kashiwagi Hiroshi, Kumamoto, Japan

Filed Jan. 15, 1986, Ser. No. 819,225

Int. Cl.⁴ G06F 11/00

U.S. Cl. 371-25

5 Claims



1. An apparatus for fault detection in electronic circuits employing a correlation method, comprising:

first test circuitry including

a signal generator for supplying a circuit to be tested with a sequence of test signals,

at least one delay circuit connected to the output of said generator,

a plurality of correlation counters connected to the output of said generator, the output of said delay circuit and the output of said test circuit for counting correlation values between signals input to and output from said tested circuit,

a reference circuitry including

a second signal generator for supplying a reference faultless circuit with a sequence of test signals, the same number of delay circuits as in said test circuitry connected to the output of said second signal generator, the same number of correlation counters as in said test circuitry connected to the output of said second signal generator and each of the outputs of said delay circuits, and an output of said reference circuitry for counting correlation values between the signals input to and output from said reference circuitry, and

a comparator connected to outputs of said counters of both said test and reference circuitries for comparing the correlation values output therefrom.

4,710,934

RANDOM ACCESS MEMORY WITH ERROR CORRECTION CAPABILITY

Kevin Traynor, Albuquerque, N. Mex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 8, 1985, Ser. No. 796,367

Int. Cl.⁴ G11C 29/00; G06F 11/00

U.S. Cl. 371-38

12 Claims

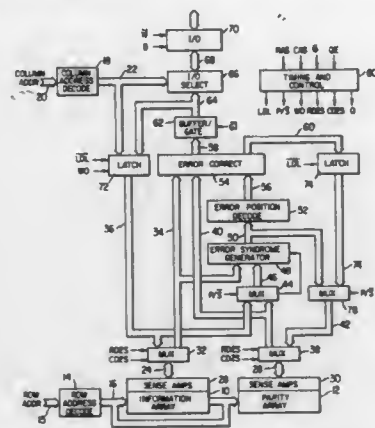
1. A read/write memory, comprising:

a plurality of data memory cells arranged in rows and columns;

a plurality of code memory cells arranged in rows and columns; each row of said code memory cells for storing an error detection code corresponding to a row of said data memory cells;

row addressing means for selecting a row of said data mem-

ory cells and the corresponding row of said code memory cells;
 sensing means for sensing the contents of each data memory cell and each said code memory cell in the row selected by said row addressing means and for writing the contents of said data memory cells and said code memory cells in the selected row;
 error detection logic, connected to said sensing means, for detecting an error in the sensed contents of said data memory cells and the contents of the associated code memory cells by way of a predetermined code;
 error correction logic, connected to said error detection logic and to said sensing means, for modifying the sensed output for a data memory cell corresponding to an error detected by said error detection logic;
 column addressing means for selecting a data memory cell to be read or written responsive to a column address signal;
 input/output means, connected to said column addressing means, for externally presenting the modified contents of the selected data memory cell in a read cycle, and for receiving data to be written to the selected data memory cell in a write cycle;



read/write logic, for controlling said input/output means to present data responsive to a read signal, and for controlling said input/output means to receive data in a write cycle;
 a data latch having a bit position for each data memory cell in a row, connected to the output of said error correction logic, for storing the output of said error correction logic, and connected to said input/output means and said read/write logic so that, in a write cycle, the bit position corresponding to the data memory cell selected by said column addressing means therewithin is rewritten with the data received by said input/output means;
 a data rewrite bus, connected to said data latch and to said sensing means, for communicating the contents of said data latch to said sensing means for application to the data memory cells in the selected row; and
 code generation means, connected to said data rewrite bus and to said sensing means, for generating the contents of the code memory cells for the selected row, based upon the contents of said data latch, for application to the code memory cells in the selected row.

4,710,935

PARITY DETECTION SYSTEM FOR WIDE BUS CIRCUITRY

Dongsung R. Kim, Laguna Hills, and Reinhard K. Krnics, Fountain Valley, both of Calif., assignors to Unisys Corporation, Detroit, Mich.

Filed Apr. 4, 1986, Ser. No. 848,073

Int. Cl.⁴ G06F 11/10

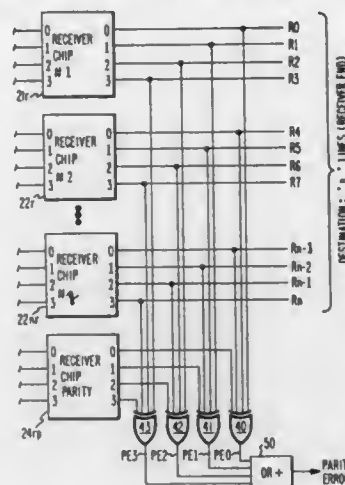
U.S. Cl. 371-49

12 Claims

1. A data transfer system for checking reliability of data transfers from a Source means to Destination means and

where a transfer bus has "n" data bit lines organized in groups of "k" lines and each group of "k" lines is serviced by a multiple driver chip and a corresponding multiple receiver chip, the system comprising:

- said data transfer bus having n data-bit lines for transferring data from said Source means to said Destination means;
- a plurality of "q" driver chips, connected to receive data from said Source means, where $q = n/k$ and wherein k represents a number of data transfer lines in a group where "k" is a submultiple of "n";
- a plurality of "q" receiver chips each of which is connected to receive "k" data bit lines from each of a co-related driver chip for subsequent transfer to said Destination means;
- first sense means, connected to said Source means; for sensing each of said data bits on each corresponding input line on each of said "q" driver chips to provide a first set of "k" resultant-parity bits to a parity driver chip;



- parity chip means including:

- (e1) said parity driver chip for receiving said first set of "k" resultant parity bits and transferring them to a parity receiver chip;
- (e2) said parity receiver chip connected to transmit said first set of "k" resultant parity bits to a second sense means;
- (f) second sense means, connected to said Destination means and receiving said first set of "k" resultant parity bits, and for sensing each of said data bits on each corresponding output line of said "q" receiver chips to provide a second set of "k" resultant-parity bits which result from comparing said receiver chips output line data bits with said first set of "k" resultant parity bits;
- (g) third sense means for receiving said second set of "k" resultant-parity bits to generate an error flag signal when a data transmission error has occurred.

4,710,936

OPTOELECTRONIC SEMICONDUCTOR DEVICE
 Jun Shibata, Sakai, and Hiroyuki Serizawa, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 12, 1985, Ser. No. 722,586

Claims priority, application Japan, Apr. 12, 1984, 59-73380
 Int. Cl.⁴ H01S 3/19

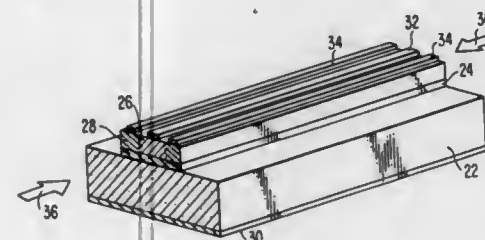
U.S. Cl. 372-45

11 Claims

1. In an optoelectronic semiconductor device, the improvement comprising:

- a bipolar transistor including,
 - a collector layer of a first type of conductivity;
 - a base layer of a second type of conductivity disposed on said collector layer, and

an emitter layer of said first type of conductivity disposed on said base layer;
 current supplying layers disposed on both sides of said base layer and composed of a semiconductor material of said second type of conductivity, said current supplying layers being electrically coupled to said base layer for supplying current thereto; and
 base electrodes respectively disposed on said current supplying layers;



said base layer being composed of a direct transition type semiconductor and having a band gap energy which is lower than the band gap energy of both said emitter and collector layers and having a refractive index which is higher than the refractive index of both said emitter and collector layers;
 wherein said base layer emits light when said current is supplied to said base layer through at least one of said base electrodes.

4,710,937

LASER SYSTEM

Tatsuo Oomori; Kouichi Ono, and Shigeto Fujita, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

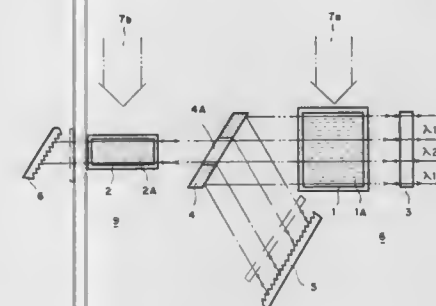
Filed Apr. 14, 1986, Ser. No. 851,219

Claims priority, application Japan, Jan. 13, 1985, 60-127249;
 Jun. 13, 1985, 60-127250

Int. Cl.⁴ H01S 3/20

U.S. Cl. 372-53

29 Claims



1. A laser system comprising:

- a plurality of dye vessels which are disposed in series at predetermined intervals and each of which contains a lasing dye and a solvent for the dye, said dyes generating light waves of different laser oscillation wavelengths when subjected to pumping;
- a transluent output mirror means disposed on one side of said dye vessels and used for both laser transmission and oscillation;
- reflecting mirror means disposed inclinedly between said dye vessels, said reflecting mirror means having a window formed centrally thereof;
- a first wavelength selecting means positioned so that a specific wavelength portion of a beam reflected by said re-

fecting mirror means is reflected selectively at a high reflectance toward said reflecting mirror means;
 a second wavelength selecting means disposed on an opposite side of said dye vessels and functioning to reflect a specific wavelength portion of a beam passing through the window of said reflecting mirror means, selectively at a high reflectance toward said output mirror means; and
 pumping means positioned so that a pumping light is directed toward each of said lasing dyes.

4,710,938

METAL ION LASER PROTECTED AGAINST THE DEPOSITION OF METAL VAPOR ON BREWSTER WINDOWS

Akira Fuke; Yasuhiro Tokita, and Katsuhiko Masuda, all of Shizuoka, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

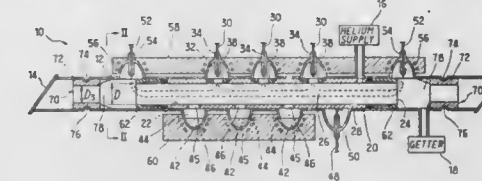
Filed Jun. 6, 1986, Ser. No. 873,155

Claims priority, application Japan, Jun. 7, 1985, 60-122821;
 Jun. 7, 1985, 60-122822

Int. Cl.⁴ H01S 3/22

U.S. Cl. 372-56

11 Claims



1. A metal ion laser for generating a laser beam by utilizing negative glow discharge, comprising:

- (a) a substantially tubular, hermetically sealed housing of an electrically nonconducting material having a pair of Brewster windows at its opposite ends;
- (b) a hollow cathode mounted within the housing and having opposite ends disposed at a distance from the Brewster windows;
- (c) primary anode means disposed intermediate the opposite ends of the hollow cathode and open to the interior thereof;
- (d) metal chamber means for containing a metal material to be vaporized, the metal chamber means being disposed intermediate the opposite ends of the hollow cathode and open to the interior thereof;
- (e) a pair of secondary anodes disposed adjacent the opposite ends of the hollow cathode for protecting the Brewster windows from contamination by the metal vapor by sending the metal vapor back into the hollow cathode;
- (f) a pair of tubular insulators disposed respectively between the opposite ends of the hollow cathode and the secondary anodes and in coaxial relation to the hollow cathode, so that the metal vapor is sent back by the secondary anodes into the hollow cathode through the tubular insulators;
- (g) each tubular insulator having an axial bore including a smaller diameter portion and a larger diameter portion, the smaller diameter portion of the bore being disposed away from the hollow cathode and having a diameter approximately equal to the inside diameter of the hollow cathode, the larger diameter portion of the bore being disposed closer to the hollow cathode and having a diameter greater than that of the smaller diameter portion; and
- (h) a pair of constriction means disposed respectively adjacent the Brewster windows for reducing the inside diameter of the housing and hence for impeding the travel of the metal vapor from the hollow cathode toward the Brewster windows.

4,710,939

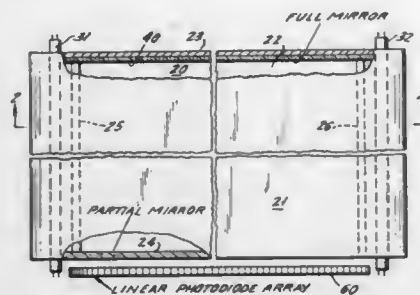
X-RAY FREQUENCY DOWN CONVERTER

Curtis Birnbach, Bronx, and Jay Tanner, Nesconset, both of N.Y., assignors to Quantum Diagnostics Ltd., Hauppauge, N.Y.

Continuation of Ser. No. 518,689, Jul. 23, 1983, abandoned. This application Feb. 3, 1987, Ser. No. 14,076
Int. Cl.⁴ H01S 3/00, 3/05

U.S. Cl. 372-73

20 Claims



1. An X-ray detector comprising an excimer laser consisting of a cavity filled with a mixture of a noble gas and a halogen gas; said cavity having first and second parallel spaced walls which have a respective fully reflecting and partially reflecting member fixed thereto; laser pumping means coupled to said cavity for pre-exciting said excimer gas within said cavity to a level first below its lasing energy level, whereby an input X-ray photon of given energy will induce local coherent light generation of a corresponding intensity within said cavity and exteriorly thereof through said partially reflecting member; an input source of X-ray photons fixed relative to said cavity and separate from said pumping means; and an output detector for detecting coherent light generated by said input source of X-ray photons.

4,710,940

METHOD AND APPARATUS FOR EFFICIENT OPERATION OF OPTICALLY PUMPED LASER

Donald L. Sipes, Jr., Los Angeles, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Oct. 1, 1985, Ser. No. 782,711

Int. Cl.⁴ H01S 3/093

U.S. Cl. 372-75

9 Claims



1. An optically pumped laser comprising an optical resonator cavity, a laser medium in said resonator cavity, said laser medium having an optical axis and two ends, one end at each of two opposite sides of said medium intersected by said optical axis, an array of laser diodes positioned for pumping said laser medium in the direction of the axis of said resonator cavity, and means for causing the pump distribution from said array of laser diodes to be concentrated inside the lasing mode volume of said medium.

4,710,941

PERFORATED ELECTRODES FOR EFFICIENT GAS TRANSFER IN CW CO₂ WAVEGUIDE LASERS

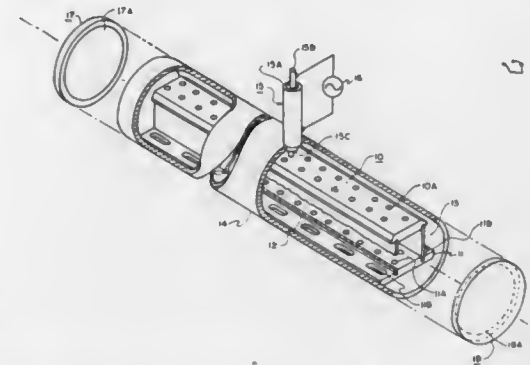
Elmer C. Sluss; John E. Nettleton, and Dallas N. Barr, all of Prince William County, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 26, 1986, Ser. No. 935,360

Int. Cl.⁴ H01S 3/02, 3/22

U.S. Cl. 372-87

5 Claims



1. In a gas laser having a large closed container filled with a gaseous lasing medium and a smaller waveguide mounted in said medium with dielectric sidewalls and isolated elongated metal top and bottom electrodes joining said sidewalls, said electrodes having broad parallel opposing faces to couple to a radio frequency source and propagate radio frequency energy; the improvement comprising:

a plurality of inner conduits formed through said electrodes normal to the said broad faces of said electrodes, whereby said gaseous medium when heated can flow transversely out of said waveguide through said top electrode and into said waveguide through said bottom electrode.

4,710,942

VARIABLE POWER GAS LASER TUBE

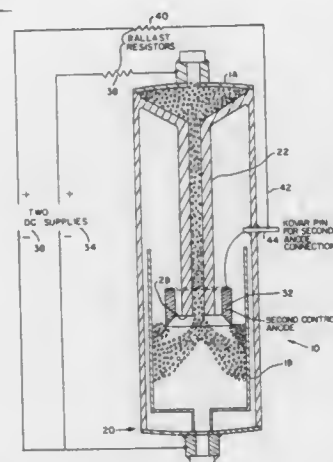
P. Guy Howard, Junction City, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Feb. 27, 1986, Ser. No. 834,289

Int. Cl.⁴ H01S 3/097

U.S. Cl. 372-87

8 Claims



1. In a gas laser having a plasma tube, a cathode at a cathode end, an anode at an anode end and two mirror assemblies, an improved construction for enabling power output to be controlled dependably by controlling current level in the laser, without flickering of said laser at low current levels as would otherwise occur, comprising second anode means in the vicinity of the cathode positioned within the cathode end of the

plasma tube, for assuring a consistently adequate supply of electrons in the vicinity of the cathode even at low current levels, so that laser output flicker due to electron starvation is avoided.

4,710,943

STARLAN CODED DATA TRANSCEIVER COLLISION DETECTION CIRCUIT

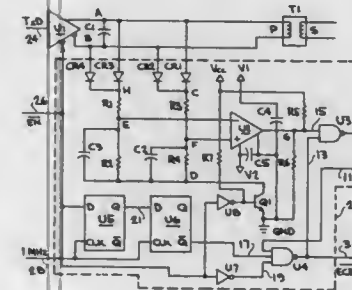
Raymond S. Duley, Buda, and Leslie Forth, Manchaca, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 12, 1986, Ser. No. 941,238

Int. Cl.⁴ H04B 1/40

U.S. Cl. 375-7

20 Claims



1. A daisy chain collision detection circuit for use with a StarLAN coded data transceiver, comprising:

a voltage comparator having an inverting input, a non-inverting input and an output;

first and second input nodes for receiving differential output voltages from a differential line driver and transient spike voltages from the primary of an isolation transformer;

first rectifier means being connected between said first input node and a first intermediate node;

second rectifier means being connected between said second input node and said first intermediate node;

a first voltage divider formed of a series connection of a first resistor and a second resistor, said first voltage divider being coupled between said input nodes and a second intermediate node, the junction of said first resistor and said second resistor being connected to the inverting input of said voltage comparator;

a second voltage divider formed of a series connection of a third resistor and a fourth resistor, said second voltage divider being connected between said first intermediate node and said second intermediate node, the junction of said third resistor and said fourth resistor being connected to the non-inverting input of said voltage comparator;

and a first charging capacitor being connected between the non-inverting input of said voltage comparator and said second intermediate node, said first charging capacitor being charged to a voltage which is directly proportional to the peak voltage of said differential output voltages.

4,710,944

DUAL TRANSMIT-RECEIVE SPACE DIVERSITY COMMUNICATION SYSTEM

Edward J. Nossen, Camden County, Cherry Hill Township, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 17, 1986, Ser. No. 920,218

Int. Cl.⁴ H04L 1/06; H04B 7/04

U.S. Cl. 375-40

11 Claims

1. A space-diversity communication system, comprising:

first and second spaced-apart antennas located at a first site and aimed towards third and fourth spaced-apart antennas located at a second site remote from said first site;

first transmitting means located at said first site, said first transmitting means being coupled to said first antenna for causing said first antenna to transmit a relatively narrow-

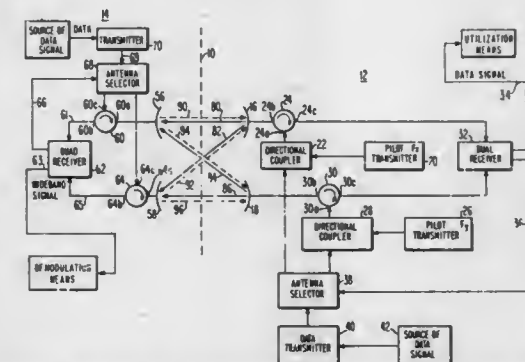
band first transmission signal at a first frequency towards said third and fourth antennas;

second transmitting means being coupled to said second antenna for causing said second antenna to transmit a relatively narrowband second transmission signal at a second frequency towards said third and fourth antennas;

first and second receivers located at said second site, said first and second receivers being coupled to said third and fourth antennas, respectively, and tuned to said first frequency for receiving said first transmission signal arriving at said third and fourth antennas by different paths, and for generating first and second control signals, respectively, in response to the amplitudes of said first transmission signal as received;

third and fourth receivers located at said second site, said third and fourth receivers being coupled to said third and fourth antennas, respectively, and tuned to said second frequency for receiving said second transmission signal arriving at said third and fourth antennas by different paths, and for generating third and fourth control signals, respectively, in response to the amplitudes of said second transmission signal as received;

first logic means coupled to said first, second, third and fourth receivers, and responsive to said first, second, third and fourth control signals for determining which of said third and fourth antennas is a part of the lowest-loss signal path between said first and second sites, and for generating a first selection control signal in response thereto;



first data transmission means located at said second site, said first data transmission means generating a first data transmission signal including first data for transmission to said first site;

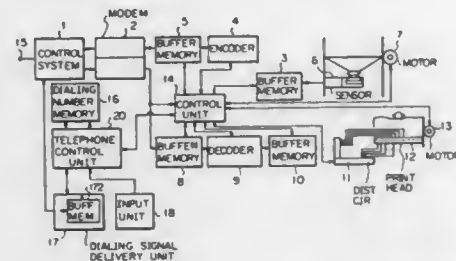
first controllable coupling means located at said second site, and coupled to said first data transmission means, said first logic means and to said third and fourth antennas for selectively coupling said first data transmission signal to one of said third and fourth antennas in response to said first selection control signal, whereby said first data transmission signal is received by different paths, one of which is said lowest-loss signal path, at said first and second antennas;

fifth and sixth receivers located at said first site, said fifth and sixth receivers being coupled to said first data transmission signal by said different paths, and for generating fifth and sixth control signals, respectively, in response to the amplitude of said first data transmission signal as received;

second logic means coupled to said fifth and sixth receivers for receiving said fifth and sixth control signals therefrom, for determining which of said first and second antennas is a part of said lowest-loss signal path between said first and second sites, and for generating a second selection control signal in response thereto;

second controllable coupling means located at said first site, and coupled to said second logic means and adapted to be coupled to utilization means for selecting for use by said

- information, dialing number and address information for an abbreviated dialing number;
- (c) a memory means for storing a plurality of full dialing numbers at predetermined addresses which each correspond to a plurality of abbreviated dialing numbers;
- (d) a buffer memory for temporarily storing a telephone number to be transmitted, said telephone number being read out from said memory means upon a designation of an address corresponding to a specified abbreviated dialing number;
- (e) a delivery means for delivering a dialing number stored in said buffer memory to a telephone circuit via said network control unit;
- (f) a modem for modulating data suitable for transmission over a telephone circuit and for demodulating data received from said telephone circuit;
- (g) a means for reading original sheets;
- (h) a means for printing the received data;



- (i) a first control means for controlling a facsimile communication operation of said facsimile system and a reading operation of said reading means and a printing operation of said printing means, and for detecting an end of a facsimile reception and for outputting an end-detection signal thereafter; and
- (j) a second control means for controlling said memory means and buffer memory, and for controlling said delivery means so as to deliver a dialing number stored in said buffer memory to said telephone circuit immediately during an idle state of the system, or after receiving said end-detection signal from said first control means after a facsimile reception;
- wherein when address information for said abbreviated dialing number and said transmission command information are received during a facsimile reception, said second control means controls said delivery means so as to deliver the full dialing number stored in said buffer memory to said telephone circuit in response to said end-detection signal from said first control means.

4,710,952

DISTRIBUTED CONTROL TYPE ELECTRONIC SWITCHING SYSTEM

Tsuneo Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 13, 1986, Ser. No. 829,039

Claims priority, application Japan, Feb. 13, 1985, 60-25950; Aug. 8, 1985, 60-174859

Int. Cl.⁴ H04M 3/08; H04Q 3/56, 11/04

U.S. Cl. 379-269

7 Claims

7. A distributed control type electronic switching system, comprising:

- a plurality of speech-path switches respectively provided with duplicated first and second speech-path switching means operable simultaneously; line and trunk circuits associated with each of said speech-path switches;
- a distributed first plurality of processors respectively provided with duplicated first and second processing means connected to said first and second speech-path switching means of each of said speech-path switches and to said line and trunk circuits associated with said corresponding speech-path switch, said first and second processing

means being complementarily arranged in active and standby operation states;

means for reciprocally switching said active and standby operation states of said first and second processing means;

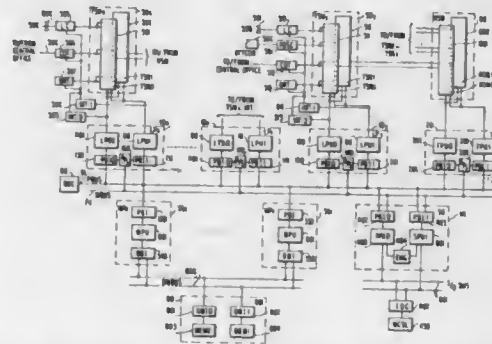
first and second interface means respectively connected to said first and second processing means;

a distributed second plurality of processors respectively provided with single processing means and single interface means for controlling various connections of said speech-path switches and said line circuits and said trunk circuits; and

transfer means connecting at least said first and second interface means of each of said first plurality of processors and said single interface means of each of said second plurality of processors, for transmitting information and data between said first and said second plurality of processors;

each of said interface means of said first and said second plurality of processors comprising:

first storage means for storing processor-number-data for the processor associated with said interface means; second storage means for storing operation-state-information for



said associated processor; third storage means for storing processor-number-information of a called party as received from a calling party via said transfer means; fourth storage means for storing processor-selection-condition-information of said called party as received from said calling party via said transfer means; first comparison means for comparing the information stored in said first and third storage means; second comparison means for comparing the information stored in said second and fourth storage means; means for transmitting either a data-transfer-possible indication or a data-transfer-impossible-indication to said calling party via said transfer means in dependence upon comparison results of said first and second comparison means; fifth storage means for storing processor-number-information for designating said called party; sixth storage means for storing processor-selection-condition-information for selecting said called party; seventh storage means for storing one of said data-transfer-possible-indication and said data-transfer-impossible-indication sent back from said called party; and means for enabling data transmission upon identifying data-transfer-possible-information stored in said seventh storage means.

4,710,953

SPEECH CONTROL IN A TELEPHONE STATION

Josef Lampl, Schoengeising, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,310

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541794

Int. Cl.⁴ H04M 1/58

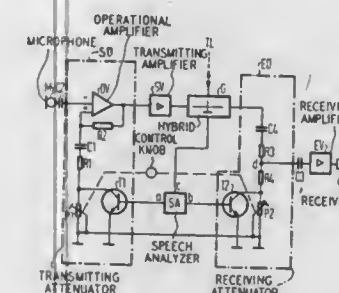
U.S. Cl. 379-391

1 Claim

1. In a telephone station of the type which includes a transmission channel and a receiving channel which are connected

by way of a hybrid to a subscriber line, in which the transmission channel includes a transmitting amplifier, and in which the receiving channel includes a receiving amplifier, the improvement therein comprising:

- a speech analyzer including an input connected to the hybrid and first and second outputs, said speech analyzer operable in response to speech signals in the transmitting direction to provide a first signal at both of said first and second outputs and operable in response to speech signals in the receiving direction to produce a second signal both of said first and second outputs;
- transmission attenuation means connected in said transmission channel, said transmission attenuation means comprising
- an operational amplifier including a first input for receiving speech signals to be transmitted, an output connected to the transmitting amplifier, and a second input,
- a feedback circuit connected between said output and said second input of said operational amplifier,
- a first variable resistor connected in circuit with said second



input of said operational amplifier and said feedback path and connected to a reference potential, and

a first switch connected across said first variable resistor and including a control input connected to said first output of said speech analyzer; and

receiving attenuation means connected in the receiving channel between the hybrid and the receiving amplifier, said receiving attenuation means comprising

a second variable resistor connected between the receiving amplifier and the reference potential, and

a second switch connected across said second variable resistor and including a control input connected to said second output of said speech analyzer;

means connecting said first and second variable resistors for symmetrical operation including a single actuating element,

said first and second switches operable to close in response to said first signal and short the respective variable resistors and operable to open in response to said second signal so that the respective variable resistors are effective for controlling attenuation.

4,710,954

TELEPHONE SET LINE SWITCH

Francis S. Doyle, Oaklandon, and Randall W. France, Indianapolis, both of Ind., assignors to American Telephone and Telegraph Company AT&T Information Systems, Holmdel, N.J.

Filed Oct. 3, 1985, Ser. No. 783,586

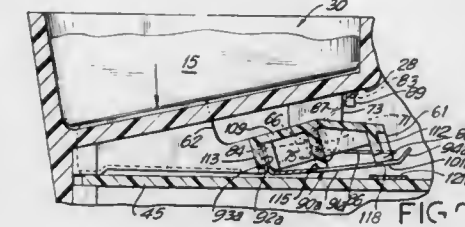
Int. Cl.⁴ H04M 1/08

U.S. Cl. 379-427

17 Claims

1. A telephone line switch device comprising: a generally horizontal unitary synthetic-resinous switch actuating lever extending longitudinally front-to-rear and having at its front and rear, respectively, as integral parts thereof, (a) a laterally broad contact mounting head and (b) a laterally narrow upwardly-projecting plunger fin, pivot means for mounting said lever to be rockable about a lateral pivot axis therefor located in the length of said lever between its front end and its longitudinal center so that such lever is adapted by rocking to move said head at its front to up and down positions responsive to

movement of said fin to respectively, a down and an up position, and a plurality of downward-facing laterally spaced metallic contacts carried by said head to be on the underside



thereof and adapted responsive to movement of the front of said head to respectively, its up position and down position to open and close, respectively, with corresponding fixed conductive elements underlying said head.

4,710,955

CABLE TELEVISION SYSTEM WITH TWO-WAY TELEPHONE COMMUNICATION PATH

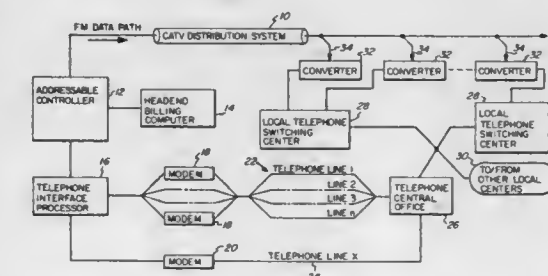
Marc W. Kauffman, Cheltenham, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,574

Int. Cl.⁴ H04N 7/167, 7/10; H04M 11/00

U.S. Cl. 380-10

32 Claims



1. Addressable television signal converter apparatus for providing impulse pay-per-view service on a cable television system or the like comprising:

means for receiving a band of signals from a television signal transmission path including scrambled television program signals for viewing on a pay-per-view basis;

data retrieval means coupled to said receiving means for retrieving converter data superimposed with said band of signals;

microprocessor means for processing converter data addressed thereto and retrieved by said data retrieval means;

tuner means coupled to said microprocessor and said receiving means for enabling a user to select a pay-per-view program and for descrambling the selected program for viewing by the user;

memory means coupled to said microprocessor for storing data indicative of pay-per-view programs selected by a user;

a modem means for interfacing said microprocessor to a telephone line;

auto-dial means responsive to converter data retrieved by said data retrieval means from said band of signals and processed by said microprocessor for dialing a telephone number, thereby enabling said converter apparatus to establish a separate telephone communication path independent of said television signal transmission path over which the microprocessor can communicate with a remote computer via said modem;

means operatively associated with said microprocessor for forwarding data stored in said memory means to a remote

means for multiplexing said predicted residual sequence and the parameter information sequence converted into said reflected binary code.

4,710,961

MINIATURE HEARING AID HAVING A BINDABLE MULTI-LAYERED AMPLIFIER ARRANGEMENT
Gerhard Büttner, Grossenseebach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

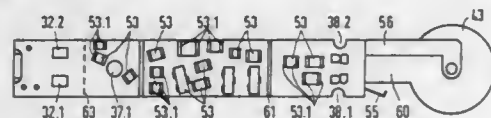
Filed May 20, 1985, Ser. No. 736,006

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 8428488[U]

Int. Cl.⁴ H04R 25/00

U.S. Cl. 381—68.7

7 Claims



1. A miniature hearing aid of the type having a housing with a substantially convex profile in which at least the following electrical components are included, an input transducer, an amplifier with control elements, a current source, and an output transducer, where at least a portion of the amplifier is formed on component mounting surfaces hinged together and connections among the components are provided by a support with electrically conducting paths, characterized in that:

said amplifier includes a multi-layered arrangement of said component mounting surfaces having a substantially elongated rectangular shape and which is bendable so that after having been installed in said hearing aid housing said multi-layered arrangement can conform to said substantially convex profile;

said multi-layered arrangement comprising at least three layers, of which the two outer layers are adapted for the attachment of said electrical components thereon and lie over a flexible continuous layer intermediate said two outer layers, said continuous layer running the length of said elongated rectangular shaped multi-layered arrangement and provided with conductor paths; and

said amplifier being sub-divided into structural sections of said multi-layered arrangement, each structural section comprising a group of electrical components which are attached thereto, adjacent structural sections being separated by bending zones, each bending zone having a length extending in a direction perpendicular to the length of said multi-layered arrangement and having a width which is relatively narrow so as to allow said bending zones to be bent only in a direction perpendicular to the plane of the multi-layered arrangement, and said electrical components being arranged on both sides of at least some of said structural sections.

4,710,962

SIGNAL CONTROL APPARATUS

Toshiyuki Matsui, Tokyo, Japan, assignor to Kabushiki Kaisha Kenwood, Japan

Filed Nov. 13, 1985, Ser. No. 797,664

Claims priority, application Japan, Nov. 14, 1984, 59-172516[U]

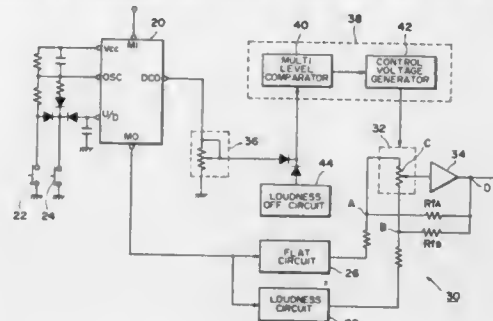
Int. Cl.⁴ H03G 5/00

U.S. Cl. 381—102

4 Claims

1. Loudness control circuitry comprising:
a volume controller in response to a setting position for setting the magnitude level of an audio input signal;
a first circuit for transmitting the magnitude level set audio input signal through a flat transmission characteristics with respect to frequencies;
a second circuit for transmitting the magnitude level set audio

input signal through a loudness transmission characteristics with respect to frequencies; and
an adder for summing the output from said first circuit and



the output from said second circuit, the adder including means for adjusting the summing ratio of the outputs from said first and second circuit independence upon the volume controller setting position.

4,710,963

APPARATUS FOR SENSING THE CONDITION OF A DOCUMENT

Victor B. Chapman, and Paul D. Lacey, both of Hants, England, assignors to De La Rue Systems Ltd., England

PCT No. PCT/GB85/00414, § 371 Date May 9, 1986, § 102(e)

Date May 9, 1986, PCT Pub. No. WO86/01923, PCT Pub.

Date Mar. 27, 1986

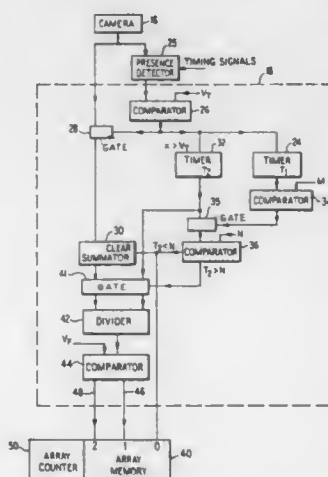
PCT Filed Sep. 11, 1985, Ser. No. 870,766

Claims priority, application United Kingdom, Sep. 11, 1984, 8422928

Int. Cl.⁴ G06K 9/60

U.S. Cl. 382—7

16 Claims



1. Apparatus for determining the fitness of a document by determining its degree of soiling, comprising:

(A) sensor means for providing a reflectance signal representing the intensity of light reflected from a sensed element of the face of the document; and

(B) signal processing means responsive to the reflectance signals from the sensor corresponding to sensed elements on the face of the document to provide a "fit" or an "unfit" signal for a document, depending upon the degree of soiling, the signal processing means including:

(1) a first comparator for comparing the level of the signal from the sensor means with a first predetermined threshold;

(2) means for integrating the signal only over periods in which the signal level exceeds the first predetermined

threshold, to provide a total reflectance signal indicative of the total reflectance of the brighter areas of the face of the document;

(3) means for providing a duration signal representing the total time that the reflectance signal level exceeds the first threshold; and

(4) means for comparing the total reflectance signal and the duration signal to provide a "fit" or "unfit" output signal.

4,710,964

PATTERN RECOGNITION APPARATUS USING OSCILLATING MEMORY CIRCUITS

Youko Yamaguchi; Hiroshi Shimizu; Ichiro Tsuda, all of Tokyo; Masafumi Yano, Chiba, and Tokiko Okumura, Tokyo, all of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

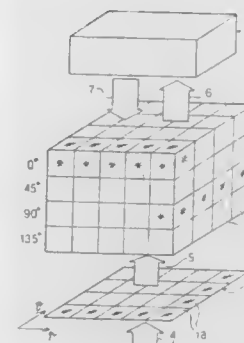
Filed Jul. 7, 1986, Ser. No. 882,470

Claims priority, application Japan, Jul. 6, 1985, 60-149034[U]

Int. Cl.⁴ G06K 9/48

U.S. Cl. 382—17

5 Claims



1. A pattern recognition apparatus which includes a pattern preprocessing part having a plurality of outputs, a clock oscillator, and an information consolidator and a memory having a plurality of nonlinear oscillating circuits, respectively, characterized in that

each of the oscillating circuits includes a plurality of inputs for controlling the oscillation condition and at least one output;

the output of each oscillating circuit in the information consolidator being interconnected to predetermined inputs of other oscillating circuits in a predetermined relation, and the inputs of the oscillating circuits being coupled to the outputs of the pattern preprocessing part in a predetermined distribution;

the clock oscillator being connected to receive as a main exciting signal, the sum of a group of signals obtained by phase-adjusting the outputs of a substantial part of oscillating circuits contained in the information consolidator; the respective oscillating circuits in the memory being connected to receive, as a main exciting signal, the output of the clock oscillator, and said oscillating circuits also being divided into a predetermined number of groups so that the sum of the outputs of the oscillating circuits in each group given an elementary signal of a pattern reference memory data; and

further including waveform comparison means for comparing the elementary signal of the memory data with the direct sum of the outputs of the said substantial part of oscillating circuits in the information consolidator, so that the result of comparison is applied to inputs of the oscillating circuits of the memory.

4,710,965

IMAGE DATA MASKING DEVICE

Kiyohiko Kobayashi, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

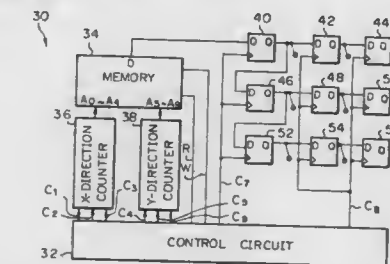
Filed Jul. 26, 1985, Ser. No. 759,323

Claims priority, application Japan, Jul. 30, 1984, 59-160020

Int. Cl.⁴ G06K 9/36

U.S. Cl. 382—41

4 Claims



1. A masking device for masking pixel data on the basis of $(2n+1) \times (2n+1)$ pixels, where n is a positive integer, comprising:

an image memory for storing the pixel data;

accessing means for directly accessing in two dimensions the pixel data stored in said image memory, said accessing means including an X direction address means and a Y direction address means for determining the location of said pixel data;

first shift register means for directly receiving $(2n+1)$ pixel data read out of said image memory and for serially shifting said pixel data at each time of accessing, each stage of said first shift register means being connected to a gate means including a first AND gate, a second AND gate and an OR gate with the outputs of said first AND gate and said second AND gate forming the inputs of said OR gate and the output of said OR gate forming the input to the stage, said AND gates being connected to said memory so that said pixel data may be received at either end of said first shift register means; and

2n second shift register means connected sequentially to said first shift register for shifting in parallel said pixel data from said first shift register means in synchronism.

4,710,966

DIGITAL FRAME PROCESSOR PIPE LINE CIRCUIT

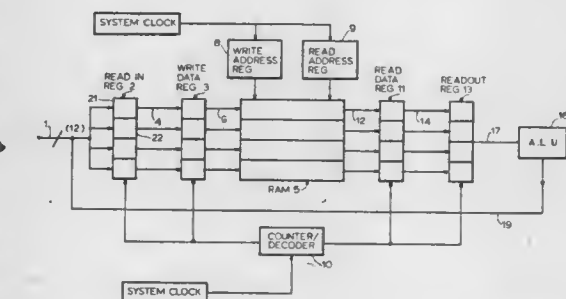
James M. Aufiero, Reading, Mass., assignor to Ittek Corporation, Lexington, Mass.

Continuation of Ser. No. 568,025, Jan. 4, 1984, abandoned. This application Nov. 12, 1986, Ser. No. 930,041

Int. Cl.⁴ G06K 9/00; G06F 13/00

U.S. Cl. 382—69

5 Claims



1. A method of writing q-bit words into and reading q-bit words out of a memory having an access time longer than a system clock period of p ns comprising: providing a memory having an $N \times q$ bit word size, a read-in register with $N \times q$ q-bit sections and a read-out register with n q-bit sections; for writing into said memory, loading N q-bit words into the sections of said register in sequence each in said period of p ns

and then transferring the $N \times q$ -bit contents of said register to said memory simultaneously; and, for reading, simultaneously transferring an $N \times q$ -bit work from said memory to said read-out register and then sequentially reading out the contents of the sections of said read-out register q -bits at a time, each in p ns, whereby a period $N \times p$ ns will be available for writing into and reading out of said memory $N \times q$ -bits at a time.

4,710,967

DOUBLE-WALL SACK MADE OF CIRCULAR-WOVEN TUBE WITH GATHERED LOOP

Goetz Petschner, Zollikon, Switzerland, assignor to IMAG-Verlage AG fur Immaterialguterrecht, Zug, Switzerland
Continuation of Ser. No. 665,639, Oct. 29, 1984, abandoned.

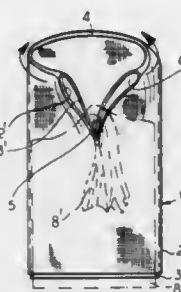
This application Nov. 13, 1986, Ser. No. 930,980

Claims priority, application Switzerland, Nov. 9, 1983, 6032/83

Int. Cl.⁴ B65D 33/10

U.S. Cl. 383—8

5 Claims



1. A sack comprising:

a circularly woven fabric tube having an outer portion and an inner portion unitarily joined thereto at a fold, the inner portion lying within the outer portion and extending the full length thereof from the fold, the portions having lower ends spaced from the fold;

means for connecting the lower ends together to form a sack bottom, the tube being formed with a single cut in both portions extending across the fold and toward the sack bottom, the cut forming a pair of adjacent openings between the portions; and

means extending through the cut between the portions along the full length of the fold for gathering the tube to form a suspension loop and to form a filling mouth opening laterally at the openings into the inner portion.

4,710,968

TRIDENT INTERLOCKING CLOSURE PROFILE CONFIGURATION

Michael G. Borchardt, Woodridge; Robert T. Dorsey, and Ewald A. Kamp, both of Chicago, Ill., assignors to First Brands Corporation, Danbury, Conn.

Filed Sep. 11, 1985, Ser. No. 774,997

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

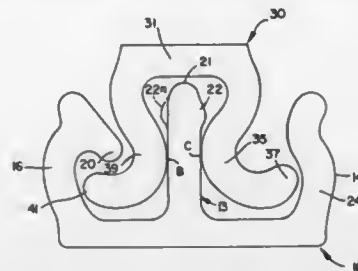
Int. Cl.⁴ B65D 33/24

U.S. Cl. 383—63

25 Claims

1. A closure fastening device comprising a first closure element and a second closure element; said first closure element having a general omega shape, comprising an apex portion and a profile portion extending from said apex portion, said profile portion comprising two spaced apart inwardly curved arm portions terminating in two outwardly facing curvilinear hook portions; said second closure element having a general trident shape, comprising in apex portion and a profile portion extending in a generally perpendicular direction. From said apex portion, said profile portion comprising a first arm portion, a second arm portion, and a third arm portion, said first arm portion, said second arm portion, and said third arm portion being generally parallel to and spaced apart from

each other, said first arm portion comprising a base portion curving generally outwardly, a middle portion curving generally inwardly, and a top portion curving inwardly forming a hook portion and then terminating in an outwardly extending hook projection portion and an inwardly extending hook projection portion which is larger than said outwardly extending hook projection portion; said second arm portion comprising a



generally straight structure extending perpendicularly from said apex portion, said third arm portion comprising a base portion curving generally outwardly, a middle portion curving generally inwardly, and a top portion curving generally outwardly prior to terminating in an outwardly extending funnel portion, said first closure element and said second closure element forming an interlocked closure fastening device when they are occluded together.

4,710,969

CATV TESTING SYSTEM

Sydney Fluck, Jr., Milford, Pa., and Marvin L. Milholland, Indianapolis, Ind., assignors to Wavetek Corporation, San Diego, Calif.

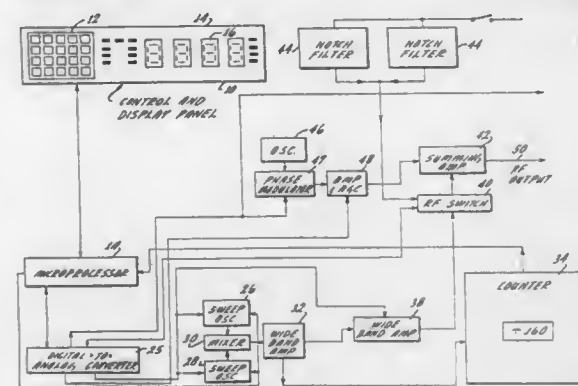
Continuation of Ser. No. 120,901, Feb. 12, 1980, abandoned.

This application Dec. 1, 1981, Ser. No. 326,216

Int. Cl.⁴ H04B 17/00

U.S. Cl. 455—67

29 Claims



1. In combination for use at a receiver for monitoring and analyzing the quality of signals passing through a cable in successive television frame times where television signals for the successive time frames are passed through the cable and digital signals are provided in the cable in serial form to represent information relating to the parameters of a frequency sweep and where first and second pass signals are provided in the cable to define successive frame times and where sweep signals are provided in the cable in synchronism with the second pass signal in the pair and where the digital signals, the pass signals and the sweep signals are transmitted through the cable to the receiver,

first means for recovering the pass signals, the sweep signals, the digital signals and the television signals in the successive frames,

second means for storing representations of the recovered signals in the successive frame times,

third means responsive to the second pass signal for passing

the representations of the recovered signals from the second means, and
fourth means responsive to the recovered signals from the first means and the representations of the recovered signals from the third means for subtracting such recovered signals to recover the sweep signals.

4,710,970

METHOD OF AND APPARATUS FOR GENERATING A FREQUENCY MODULATED ULTRAHIGH FREQUENCY RADIO TRANSMISSION SIGNAL

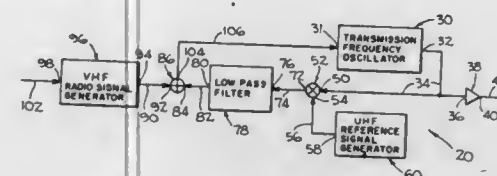
Joseph C. Wu, Saratoga; Yee-Shing Law, Milpitas, and John James, Los Gatos, all of Calif., assignors to TFT, Inc., Santa Clara, Calif.

Filed Sep. 11, 1985, Ser. No. 774,989

Int. Cl.⁴ H04B 1/04

U.S. Cl. 455—113

13 Claims



1. An ultrahigh frequency transmitter for transmitting an ultrahigh radio frequency transmission signal frequency modulated by a program signal, said transmitter comprising:

(a) a transmission frequency oscillator for generating an ultrahigh frequency transmission signal, said transmission frequency oscillator having a voltage input terminal for controlling the frequency of the ultrahigh frequency transmission signal generated by said transmission frequency oscillator;

(b) an ultrahigh frequency reference frequency generator for generating an unmodulated ultrahigh frequency reference frequency signal;

(c) mixing means for heterodyning a sample of said ultrahigh frequency transmission frequency signal and said unmodulated ultrahigh frequency reference frequency signal to produce an ultrahigh frequency difference signal;

(d) a very high frequency generator for generating a very high frequency signal frequency modulated by the program signal; and

(e) a phase detector receiving said ultrahigh frequency difference signal and said frequency modulated very high frequency signal for applying a voltage to said voltage input terminal of said transmission frequency oscillator for transmitting a stabilized ultrahigh frequency transmission signal frequency modulated by a program signal.

4,710,971

CHANNEL SELECTING DEVICE FOR CATV TERMINAL UNIT

Takashi Nozaki, and Takashi Hashimoto, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,448

Claims priority, application Japan, Aug. 20, 1984, 59-173521

Int. Cl.⁴ H04B 1/16

U.S. Cl. 455—179

3 Claims

1. A channel selecting device of a CATV terminal unit in which displayed channels can be changed with respect to received channels comprising:

a converter having a CATV signal as its input;

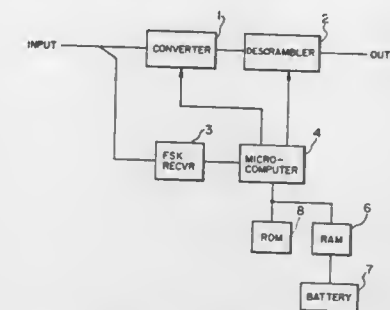
an FSK receiver having said CATV signal as an input;

a descrambler receiving the output of said converter as an input;

a microcomputer for controlling said converter and said descrambler and having the said output signal of said FSK signal receiver as its input;

a ROM for storing a programmed channel code table, said ROM accessed by said microcomputer;

a memory containing a compressed code of said channel code table the contents of which can be externally written



with respect to said displaying channels, said memory programmed by said microcomputer and the compressed code of said channel code table includes indications of first and last ones of continuous channels.

4,710,972

SHF RECEIVER

Toshihide Hayashi, Tokyo; Osamu Yamakami, and Ikuro Kanayama, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 2, 1986, Ser. No. 914,305

Claims priority, application Japan, Oct. 21, 1985, 60-234976

Int. Cl.⁴ H04B 11/16; F29Q 23/08

U.S. Cl. 455—179

5 Claims

1. An apparatus for receiving satellite broadcast signals broadcast in a number of channels occupying successively overlapping frequency bands with a first plane of polarization for first alternate channels and a second plane of polarization for second channels arranged between said first channels, said apparatus comprising:

antenna means for receiving said satellite broadcast signals;

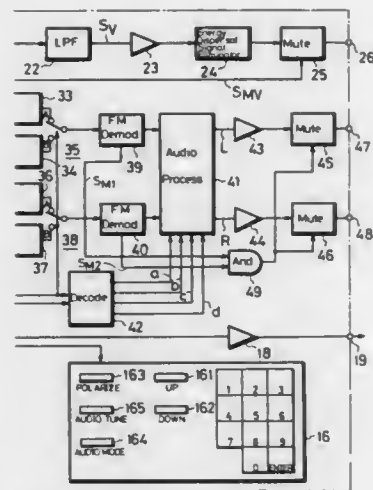
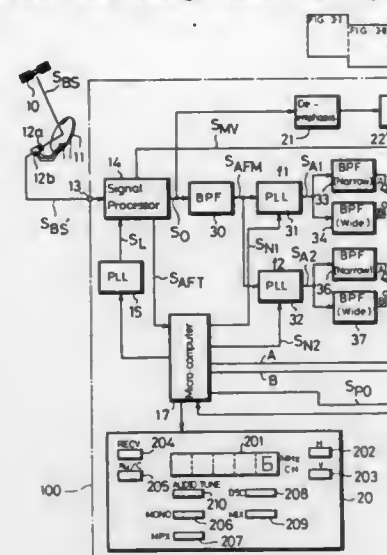
polarizer means for receiving a satellite broadcast signal derived from said antenna means and providing a plane of polarization adapted to be switched for correspondence with the plane of polarization of the received satellite broadcast signal;

channel selecting means for sequentially selecting the channels of said satellite broadcast signals;

means for tuning to each channel selected by said channel selecting means; and

controlling means for automatically controlling the sequential selecting of the channels, the tuning of said tuning means and the switching of the plane of polarization of said polarizer means in accordance with a channel selected by said channel selecting means, said controlling means causing said channel selecting means to first select sequentially from among said first alternate channels having said first plane of polarization, and thereafter automat-

ically switching the plane of polarization of said polarizer means and then causing channel selecting in sequence



from among said second channels having said second plane of polarization.

4,710,973

VARACTOR DIODE TUNER WITH BAND SWITCHED COILS AND LINES
Takeo Suzuki, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

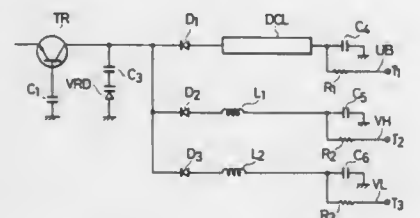
Filed Dec. 26, 1985, Ser. No. 813,651

Claims priority, application Japan, Dec. 26, 1984, 59-199532[U]

Int. Cl.⁴ H03J 5/24

U.S. Cl. 455-180

7 Claims



1. In a tuner having a common transistor in a high-frequency

amplification circuit an a common varactor diode in a local resonant circuit in which a band switching signal corresponding to a channel selected from a plurality of UHF and VHF bands applied to said tuner to form a suitable resonant circuit for receiving television signals of the selected channel, the improvement which comprises:

- said common varactor diode connected to ground at one end;
- a plurality of resonant coils each connected to ground at one end;
- a distribution constant line connected to ground at one end, each of said coils and said line being provided for forming a resonant circuit with said common varactor for tuning said tuner to a respective one of said bands;
- a plurality of switching diodes, each switching diode having one end connected to the other end of a respective one of said coils and said line and each switching diode's other end connected to the other end of said common varactor diode; and
- means for turning on and off said switching diodes selectively in response to said band switching signal.

4,710,974

CIRCUIT ARRANGEMENT FOR A TUNER FOR CHANGING OVER SEVERAL FREQUENCY RANGES
Karl-Heinz Kupfer, Krefeld, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

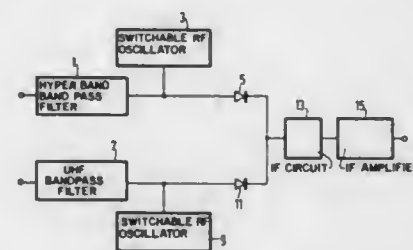
Filed Feb. 28, 1986, Ser. No. 835,124

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507865

Int. Cl.⁴ H04B 1/26

U.S. Cl. 455-190

8 Claims



1. A television tuner circuit, comprising:

- (a) first tunable filter means having an input and an output, for receiving first signals at said input, for filtering said signals, and for passing desired signals within a first frequency range to said output;
- (b) first switchable RF oscillator means for providing a signal which when mixed with said passed signal of said first tunable filter means will result in an IF signal, said first switchable RF oscillator means including an output coupled to the output of said first tunable filter means, and means for switching said RF oscillator means on and off;
- (c) first diode means having an anode input and a cathode output, with the anode of said first diode means connected to the coupled output of said first tunable filter means and said first switchable RF oscillator means, wherein when said first switchable RF oscillator means is switched on by said switching means, said first diode mixes said signals output by said first tunable filter means and said first switchable RF oscillator means to periodically provide an IF signal at the output cathode, and wherein when said first switchable RF oscillator means is switched off by said switching means, said first diode means cuts off the signals passed by said first tunable filter;
- (d) second tunable filter means having an input and output, for receiving second signals at its input, for filtering said signals, and for passing desired signals within a second frequency range to its output;
- (e) second switchable RF oscillator means for providing a signal which when mixed with said passed signals of said

second tunable filter means will result in an IF signal, said second switchable RF oscillator means including an output coupled to the output of said second tunable filter means, and second means for switching said second switchable RF oscillator means on and off;

- (f) second diode means having an anode input and a cathode output connected to the cathode of said first diode means, with the anode of said second diode means connected to the coupled output of said second tunable filter means and said second switchable RF oscillator means, wherein when said second switchable RF oscillator means is switched on by said second switching means, said second diode mixes said signals output by said second tunable filter means and said second switchable RF oscillator means to periodically provide an IF signal at the output cathode, and wherein when said second switchable RF oscillator means is switched off by said second switching means, said second diode means cuts off the signals passed by said second tunable filter; and
- (g) a common IF circuit means having an input connected to the outputs of said first and second diode means.

4,710,975

SPACE DIVERSITY RECEPTION SYSTEM HAVING COMPENSATION MEANS OF MULTIPATH EFFECT
Yoshiharu Okamoto, Yokosuka; Izumi Horikawa, Yokohama, and Shozo Komaki, Yokosuka, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Division of Ser. No. 113,591, Jan. 21, 1980, Pat. No. 4,326,294.

This application Apr. 5, 1982, Ser. No. 365,345

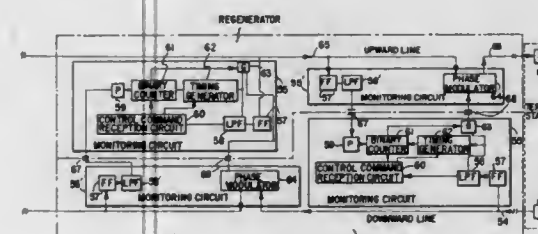
Claims priority, application Japan, Feb. 13, 1979, 54-14359; Mar. 28, 1979, 54-35643; Apr. 4, 1979, 54-39743; Nov. 19, 1979, 54-148867

The portion of the term of this patent subsequent to Oct. 1, 2001, has been disclaimed.

Int. Cl.⁴ H04B 7/08

U.S. Cl. 455-276

12 Claims



10. A space diversity reception system comprising a pair of spaced antenna means, a phase shifter means connected to a first one of said pair of antenna means for shifting the phase of a signal received by said first antenna means, a combiner connected to the output of said phase shifter means, phase modulating means including a sensing oscillator coupled to a second one of said pair of antenna means for phase modulating a signal received by said second antenna means, said combiner further coupled to the output of said phase modulating means and control means for the control of said phase shifter means wherein said control means comprises a plurality of level detectors connected to the output of said combiner for providing levels at a plurality of frequency points in a reception passband, and a control circuit for controlling said phase shifter means according to the output of said level detectors and wherein said control means controls said phase shifter means so that the phase of an interference wave received by said first antenna means is opposite at the input of said combiner to that received by said second antenna means, and interference waves of said pair of antenna means are cancelled by each other.

4,710,976

OPTICAL REPEATER MONITORING SYSTEM
Hiroharu Wakabayashi, and Yasuhiko Niino, both of Kanagawa, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

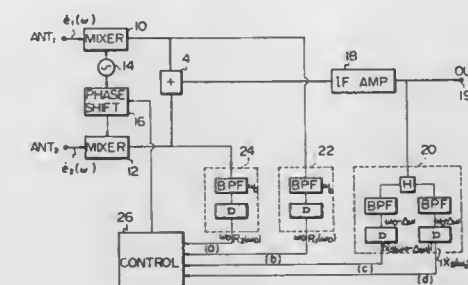
Filed May 7, 1985, Ser. No. 731,642

Claims priority, application Japan, May 16, 1984, 59-96662

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455-601

4 Claims



1. An optical repeater monitoring system for an optical digital transmission system, said optical repeater monitoring system comprising:

- transmission stations having terminal transmitter means for transmitting control commands and a burst carrier;
 - a pair of opposite direction lines between said transmission stations, said pair of opposite direction lines being a first line and a second line;
 - a plurality of repeaters inserted in said lines, each of said repeaters having at least a pair of regenerators, each of said regenerators having a pair of monitoring circuits, said monitoring circuits includes,
 - a flip-flop means for dividing frequency of signals in said first line to derive said control commands and said burst carrier;
 - a command control reception means for receiving and for detecting said control commands and said burst carriers in said first line from said flip-flop means,
 - a counter means for detecting parity errors in said second line and for counting parity errors,
 - a timing generation means for reading said counter means when said control command reception means detects said burst carrier in said first line, and
 - a phase modulator means for performing phase modulation to a clock pulse derived from said second line according to a binary code in said counter means,
- wherein said control commands and said burst carrier being constituted by arranging parity bits of in-service data in said first line, said control commands including first, second and third control commands, said first control command for controlling said plurality of repeaters to start said error counting in said second line and to store the number of errors in said counter means, said second control command for controlling said plurality of repeaters to stop said error counting in said second line, said third control command for designating a particular regenerator to return errors to said transmission station, and said burst carrier for sending errors from said counter means to said transmission station, said errors being sent by phase modulation of clock pulses for in-service data in said second line.

DESIGNS

DECEMBER 1, 1987

292,940

TACO SHELL

David J. DiPietro, 4840 E. Sunnyside Dr., Scottsdale, Ariz. 85254

Filed May 18, 1984, Ser. No. 611,995

Term of patent 14 years

U.S. Cl. D1—122



292,942

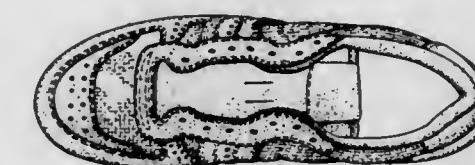
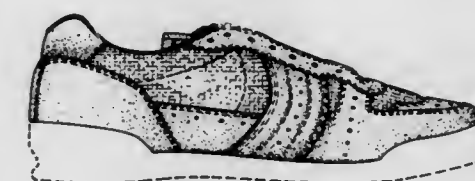
SHOE UPPER

Lawrence Selbiger, Portland, and John Ludeman, West Linn, both of Oreg., assignors to AVIA Group International, Inc., Portland, Oreg.

Filed Jan. 29, 1987, Ser. No. 8,400

Term of patent 14 years

U.S. Cl. D2—314



292,943

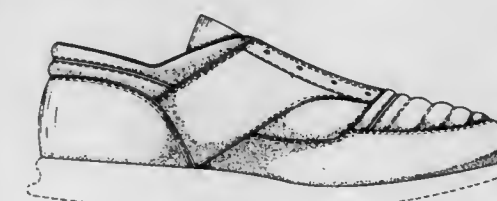
SHOE UPPER

James K. Tong, Beaverton, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.

Filed Jan. 29, 1987, Ser. No. 8,413

Term of patent 14 years

U.S. Cl. D2—314



292,941

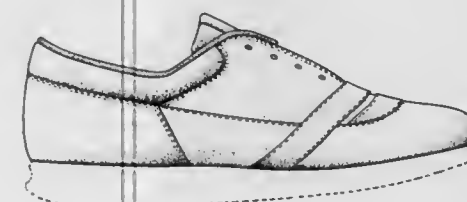
SHOE UPPER

Brenda Kelley, Beaverton, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.

Filed Jan. 29, 1987, Ser. No. 8,418

Term of patent 14 years

U.S. Cl. D2—314



292,944
SHOE UPPER

Brenda Kelley, Beaverton, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.
Filed Jan. 29, 1987, Ser. No. 8,420
Term of patent 14 years

U.S. Cl. D2—314



292,946
SHOE SOLE

Jerry D. Stubblefield, and Lawrence Selbiger, both of Portland, Oreg., assignors to The Donner Mountain Corporation, San Rafael, Calif.
Filed Jan. 9, 1987, Ser. No. 1,925
Term of patent 14 years

U.S. Cl. D2—320



292,947
UMBRELLA GEAR HOUSING

Edward D. Levy, Fort Lee, N.J., assignor to Finkel Outdoor Products, Inc., New York, N.Y.
Filed Jan. 25, 1985, Ser. No. 694,992
Term of patent 14 years

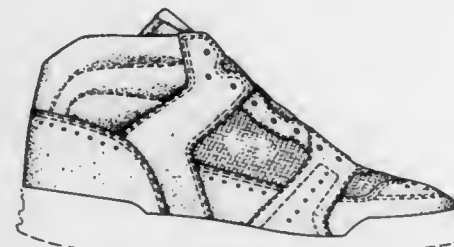
U.S. Cl. D3—10



292,945
SHOE UPPER

Lawrence Selbiger, Portland, and John Ludeman, West Linn, both of Oreg., assignors to AVIA Group International, Inc., Portland, Oreg.
Filed Jan. 29, 1987, Ser. No. 8,462
Term of patent 14 years

U.S. Cl. D2—314



292,948
DENTURE BRUSH

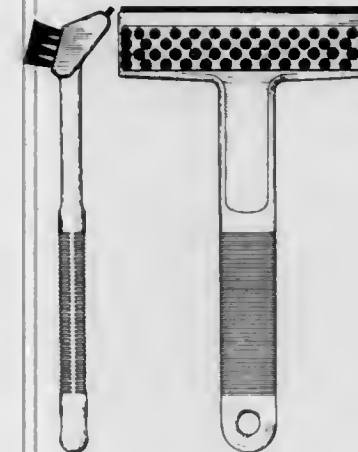
Emil Parina, 19600 Milan Dr., Maple Heights, Ohio 44137
Filed Jun. 8, 1987, Ser. No. 59,472
Term of patent 14 years

U.S. Cl. D4—104



292,949
CLEANING DEVICE FOR AUTOMOBILE WINDOWS
Roland Vetter, Giengen-Sachsenhausen, Fed. Rep. of Germany, assignor to Schwaebische Buerstenfabrik Hans Haug KG, Koenigsbrunn, Fed. Rep. of Germany
Filed Jul. 3, 1985, Ser. No. 752,228
Term of patent 14 years

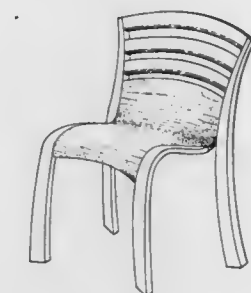
U.S. Cl. D4—116



292,951
CHAIR

Thomas Lamb, 31 Marietta Street, Uxbridge, Ontario, Canada
LOC 1K0
Filed Apr. 18, 1985, Ser. No. 724,748
Claims priority, application Canada, Mar. 16, 1985, 15-03-85-2

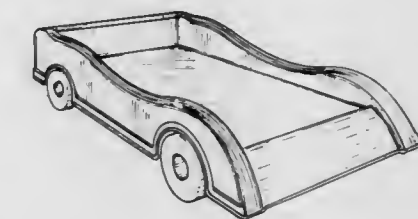
U.S. Cl. D6—470



292,952
BED

Thomas O. Mercurio, 40 Gladys Ct., Warwick, R.I. 02886
Filed Dec. 4, 1986, Ser. No. 938,738
Term of patent 14 years

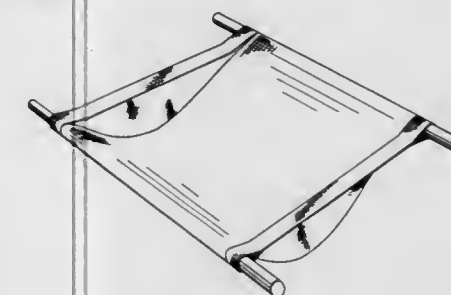
U.S. Cl. D6—388



292,950
SEAT FOR A TRUCK BED

Steven A. Fry, 30052 Running Deer La., Laguna Niguel, Calif. 92677, and Rodney L. Stafford, 100 S. Seranado, #44, Orange, Calif. 92669
Filed Dec. 20, 1984, Ser. No. 683,890
Term of patent 14 years

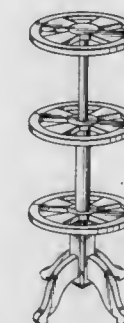
U.S. Cl. D6—356



292,953
PLANT STAND

Carol Cave, 4550 Hickory Hill Dr., Stephens City, Va. 22655
Filed Jan. 16, 1985, Ser. No. 691,936
Term of patent 14 years

U.S. Cl. D6—405



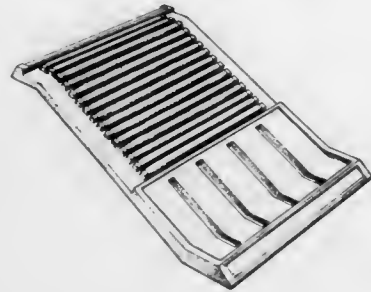
292,954

CARPET DISPLAY STAND

James L. Knight, Rte. 7, Cumming, Ga. 30130, and Christopher C. Bidwell, 342 Summer Pl., Norcross, Ga. 30071
Filed Apr. 6, 1984, Ser. No. 597,342

Term of patent 14 years

U.S. Cl. D6-409



292,955

CARPET DISPLAY STAND

James L. Knight, Rte. 7, Cumming, Ga. 30130
Filed Feb. 6, 1985, Ser. No. 699,121

Term of patent 14 years

U.S. Cl. D6-409



292,956

CONTROL DESK FOR USE IN CONTROLLING AN INDUSTRIAL ROBOT

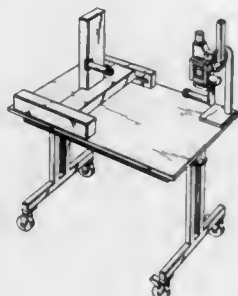
Akifumi Inoue, Hamamatsu, and Koshiro Takeda, Hamamatsu-shi, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed May 8, 1985, Ser. No. 731,800

Claims priority, application Japan, Nov. 20, 1984, 59-47657

Term of patent 14 years

U.S. Cl. D6-449



292,957

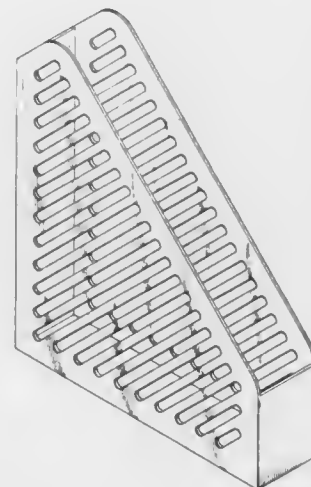
MAGAZINE RACK

Bernd Brüßing, Neu-Ulm, Fed. Rep. of Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany
Filed May 13, 1985, Ser. No. 733,586

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, MR619

Term of patent 14 years

U.S. Cl. D6-475



292,958

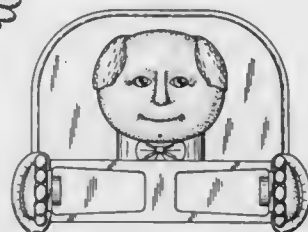
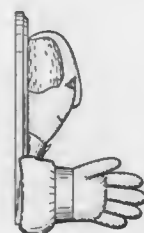
PAPER TOWEL HOLDER

Dawn M. Likness, MPO. 70L Riverside Dr., and Marvel M. LaRue, MPO. 63L Riverside Dr., both of Washougal, Wash. 98671

Filed Jun. 10, 1985, Ser. No. 743,302

Term of patent 14 years

U.S. Cl. D6-522



292,959

WHISK

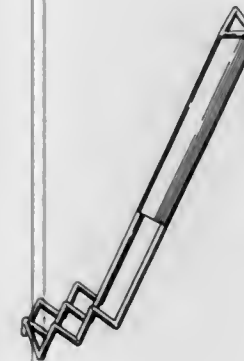
Morgan Fern, and Karl A. Andersson, both of Malmo, Sweden, assignors to Hammarplast AB, Tingsryd, Sweden

Filed Apr. 30, 1985, Ser. No. 729,037

Claims priority, application Sweden, Oct. 31, 1984, 842905

Term of patent 14 years

U.S. Cl. D7-103



292,961

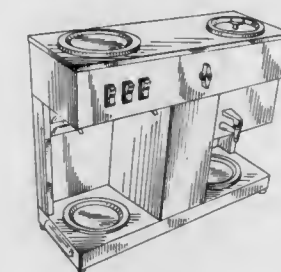
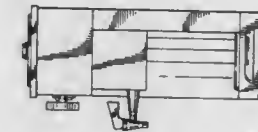
COFFEE BREWER AND HOT WATER DISPENSER

Donald L. Daugherty, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Nov. 7, 1984, Ser. No. 669,242

Term of patent 14 years

U.S. Cl. D7-309



292,960

SPOON

Vivienne D. Jagger, West Perth, Australia, assignor to Little People Limited, Hong Kong

Filed Mar. 5, 1985, Ser. No. 708,318

Term of patent 14 years

U.S. Cl. D7-137



292,962

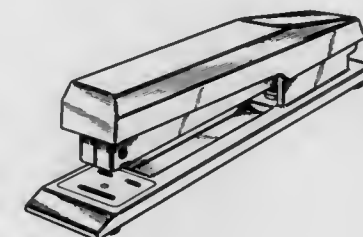
STAPLER

John Leszczak, Roselle Park, N.J., assignor to The Bates Manufacturing Company, Hackettstown, N.J.

Filed Apr. 2, 1985, Ser. No. 718,847

Term of patent 14 years

U.S. Cl. D8-50



292,963

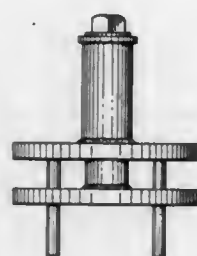
HUB REMOVING TOOL

Bernard H. Murtangh, c/o Connolly and Hutz, 1220 Market St.,
P.O. Box 2207, Wilmington, Del. 19899-2207

Filed May 23, 1985, Ser. No. 737,106

Term of patent 14 years

U.S. Cl. D8—51



292,966

COMBINED BULB AND CAP FOR A DROPPER APPLICATOR

James F. Gager, New York, N.Y., assignor to Estee Lauder Inc.,
New York, N.Y.

Filed Dec. 23, 1983, Ser. No. 565,155

Term of patent 14 years

U.S. Cl. D9—436



292,964

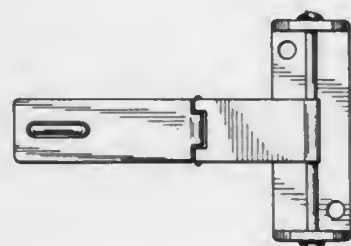
SELF-ADJUSTING HASP

Ronald H. Kaye, R.D. #1, Fairfield, Vt. 05455, and Robert H.
Lumbra, R.D. #1, Fairfax, Vt. 05454

Filed Sep. 9, 1985, Ser. No. 773,924

Term of patent 14 years

U.S. Cl. D8—344



292,967

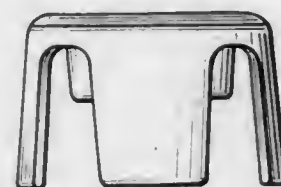
BOTTLE CAP

Paul L. Gagnon, 3714 Via Pacifica Walk, Oxnard, Calif. 93030

Filed Apr. 24, 1985, Ser. No. 726,761

Term of patent 14 years

U.S. Cl. D9—439



292,965

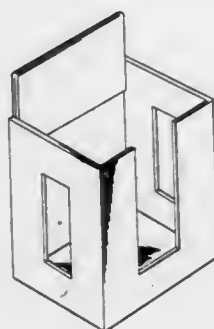
CONTAINER FOR CUSHIONS

Selwyn H. Fein, P.O. Box 4856, Johannesburg 2000, South
Africa

Filed Aug. 24, 1984, Ser. No. 643,716

Term of patent 14 years

U.S. Cl. D9—418



292,968

LIQUID CONTAINER

Richard C. Darr, Seville, Ohio, assignor to Plastipak Packaging,
Inc., Plymouth, Mich.

Filed Mar. 14, 1985, Ser. No. 711,624

Term of patent 14 years

U.S. Cl. D9—370



292,969

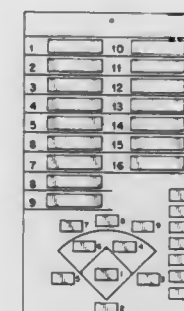
BASEBALL LINE-UP BOARD

Russell W. Love, 25597 Margaret Ave., Moreno Valley, Calif.
92388

Filed Mar. 11, 1985, Ser. No. 710,410

Term of patent 14 years

U.S. Cl. D10—46.1



292,972

MOTORCYCLE TIRE

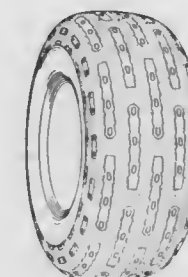
Hideaki Nishio, No. 31-12-509, Hon-cho, Wako-shi, Saitama,
and Atsushi Tomura, No. 5-2-8, Nakazato, Kiyose-shi, Tokyo,
both of Japan

Filed Jun. 6, 1985, Ser. No. 742,163

Claims priority, application Japan, Dec. 28, 1984, 59-53320

Term of patent 14 years

U.S. Cl. D12—136



292,973

WETBIKE WATER INLET MANIFOLD

Chris L. Lessel, 15205 Raymer St., Van Nuys, Calif. 91405

Filed Jun. 27, 1986, Ser. No. 879,795

Term of patent 14 years

U.S. Cl. D12—317



292,970

AMPHIBIAN BICYCLE

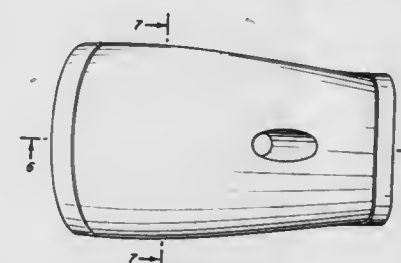
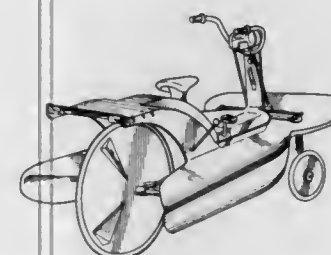
Masatsugu Takezono, Tokyo, Japan, assignor to Teiimu Giken
Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,144

Claims priority, application Japan, May 9, 1984, 59-18678

Term of patent 14 years

U.S. Cl. D12—3



292,974

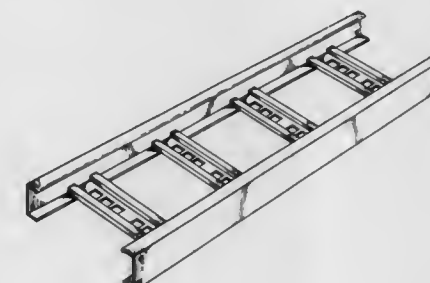
CABLE TRAY

James M. Kenning; William K. McErlane, both of Cincinnati,
Ohio, and Barry R. Schuster, Union, Ky., assignors to Square
D Company, Palatine, Ill.

Filed Sep. 17, 1984, Ser. No. 651,506

Term of patent 14 years

U.S. Cl. D13—40



292,971

MONORAIL VEHICLE

Anton Frech, Weggis, and Georg Riser, Bückten, both of Swit-
zerland, assignors to CWA Constructions SA, Olten, Switzer-
land

Filed Jan. 28, 1985, Ser. No. 695,844

Claims priority, application Switzerland, Jul. 31, 1984, 74259

Term of patent 14 years

U.S. Cl. D12—37



292,975

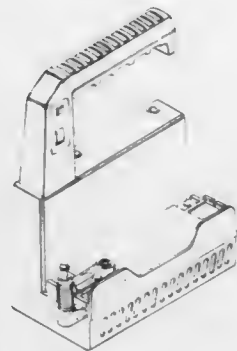
**COMBINED CARRYING CASE AND BATTERY PACK
FOR A CORDLESS TELEPHONE SET**
Fumiyuki Kobayashi, Tokyo, Japan, assignor to NEC Corpora-
tion, Tokyo, Japan

Filed Feb. 26, 1986, Ser. No. 836,617

Claims priority, application Japan, Aug. 27, 1985, 60-36364

Term of patent 14 years

U.S. Cl. D14-65



292,976

FACSIMILE

Masahiro Kando, Tokyo, Japan, assignor to Canon Kabushiki
Kaisha, Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,340

Claims priority, application Japan, Jan. 28, 1985, 60-2637

Term of patent 14 years

U.S. Cl. D14-94



292,977

PRINTER

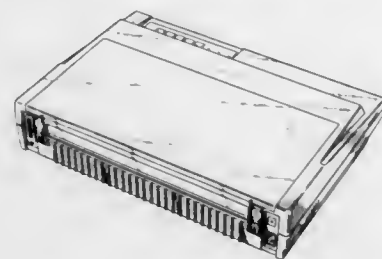
Haruo Ikeda, Sakado, Japan, assignor to Citizen Watch Co.,
Ltd., Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 713,682

Claims priority, application Japan, Sep. 25, 1984, 59-39362

Term of patent 14 years

U.S. Cl. D14-111



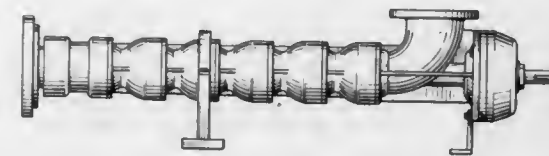
292,978

HORIZONTAL VARIABLE SPEED TURBINE PUMP
Donald J. Hansen, and Gary G. Read, both of Aurora, Ill.,
assignors to General Signal Corporation, Stamford, Conn.

Filed Aug. 23, 1985, Ser. No. 768,584

Term of patent 1 years

U.S. Cl. D15-7



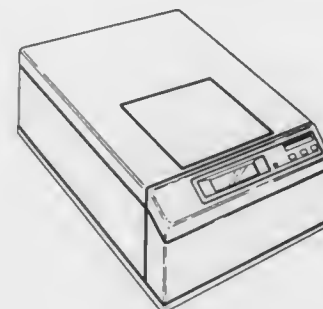
292,979

AUTOMATIC SEMICONDUCTOR WAFER TESTER
Marland Chow, San Jose, Calif., assignor to Prometrix Corpora-
tion, Santa Clara, Calif.

Filed Apr. 26, 1985, Ser. No. 727,417

Term of patent 14 years

U.S. Cl. D10-75



292,980

BUSH CUTTER

Hiroshi Tomita, and Hiroaki Hatano, both of Numazu, Japan,
assignors to Fujl Robin Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1985, Ser. No. 710,182

Term of patent 14 years

U.S. Cl. D15-16



292,981

ROBOT

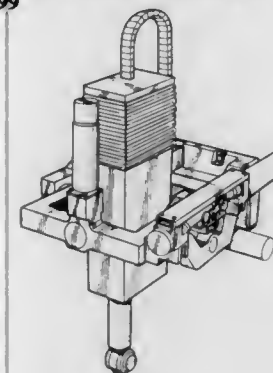
Hans-Olov Skoog, Ulf J. Holmqvist, and Leif K. Telldén, all of
Västerås, Fed. Rep. of Germany, assignors to ASEA AB,
Västerås, Sweden

Filed Nov. 13, 1984, Ser. No. 670,966

Claims priority, application Sweden, May 18, 1984, 84-1560

Term of patent 14 years

U.S. Cl. D15-199



292,982

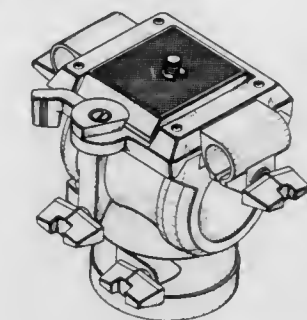
PAN HEAD ASSEMBLY

Koma Nakatani, Tokyo, Japan, assignor to Velbon International
Corp., Torrance, Calif.

Filed Aug. 23, 1984, Ser. No. 643,833

Term of patent 14 years

U.S. Cl. D16-46



292,983

SPECTACLES

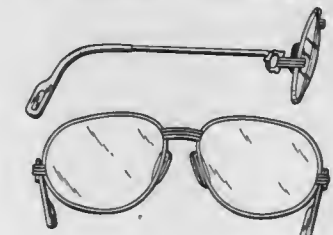
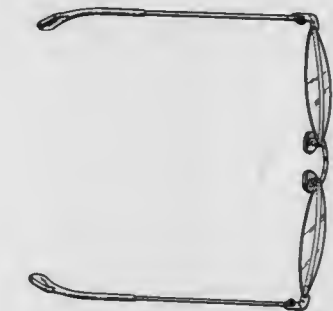
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A.,
Villars-sur-Glane, Switzerland

Filed Dec. 17, 1985, Ser. No. 810,052

Claims priority, application Hague, Jun. 17, 1985,
DM/005413

Term of patent 14 years

U.S. Cl. D16-102



292,984

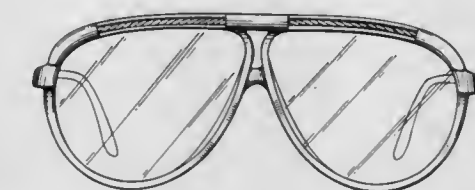
SUN GLASSES

Robert Sonthonnax, Marchon, Oyonnax, France (01100)

Filed Jul. 29, 1986, Ser. No. 890,309

Term of patent 14 years

U.S. Cl. D16-102



292,985
SPECTACLES

Masaki Hanagata, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan
Filed Apr. 10, 1985, Ser. No. 721,641
Claims priority, application Japan, Oct. 22, 1984, 59-43575 U.S. Cl. D18-27
Term of patent 14 years
U.S. Cl. D16-102

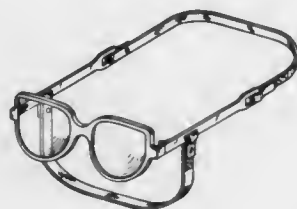


292,988
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TUVWX
YZ

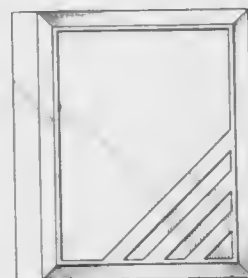
292,986
CANINE SPECTACLES

Terry J. Magestro, 3755 S. Pennsylvania Ave., Milwaukee, Wis. 53207
Filed Oct. 18, 1984, Ser. No. 663,474
Term of patent 14 years
U.S. Cl. D16-107



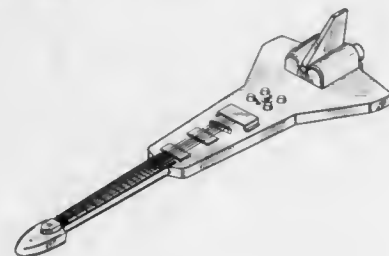
292,989
PHOTOGRAPH ALBUM COVER

Steven J. Gordon, Boston, Mass., assignor to Melannco International Ltd., Chelsea, Mass.
Filed Jul. 23, 1984, Ser. No. 633,497
Term of patent 14 years
U.S. Cl. D19-26



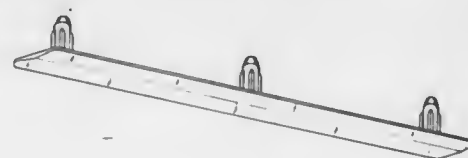
292,987
ELECTRICAL GUITAR

Frederick C. Johnson, Jr., 10550 Pepper Brook La., San Diego, Calif. 92131
Filed Mar. 21, 1985, Ser. No. 714,563
Term of patent 14 years
U.S. Cl. D17-18



292,990
LABEL HOLDER ATTACHMENT FOR THE BACK OF A BINDER

Erik Eliasson, Gislaved, Sweden, assignor to Tage & Soner Byggnadsfirma AB, Sweden
Filed Apr. 26, 1985, Ser. No. 727,419
Claims priority, application Sweden, Nov. 7, 1984, 84-2966
Term of patent 14 years
U.S. Cl. D19-32



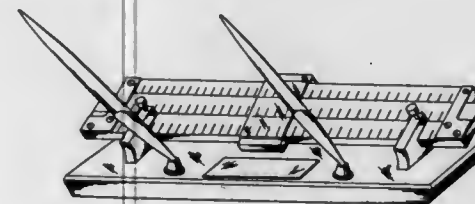
292,991
DESK CADDY

Herbert Adier, Nassau County, N.Y., assignor to Crest Industries Corp., Deer Park, N.Y.
Filed Aug. 22, 1986, Ser. No. 899,500
Term of patent 14 years
U.S. Cl. D19-78



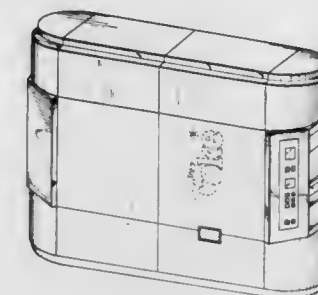
292,992
DESK SET

Jack F. Staley, 1304 Cardinal Dr., Warsaw, Ind. 46580
Filed Apr. 5, 1985, Ser. No. 720,385
Term of patent 14 years
U.S. Cl. D19-75



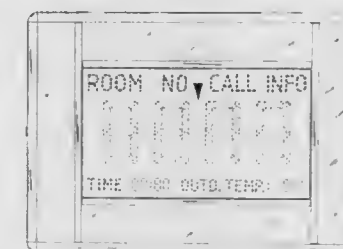
292,993
ISLAND VENDING MACHINE

Annis R. Morgan, Jr.; Eddie W. King; J. Henry Brandes, all of Atlanta, and James N. Lettera, Mableton, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 309,470, Oct. 7, 1981. This application Apr. 5, 1984, Ser. No. 596,997
Term of patent 14 years
U.S. Cl. D20-5



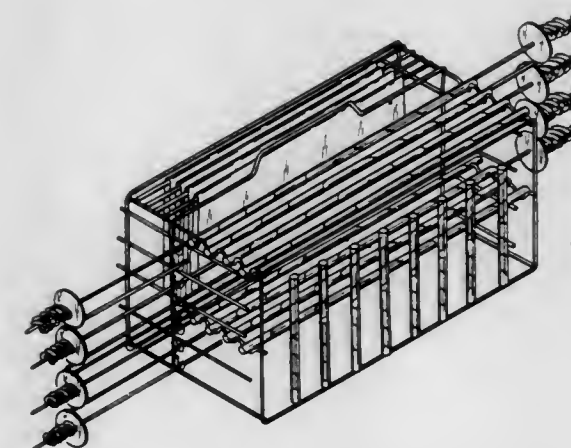
292,994
ANNUNCIATOR

Bengt L. Lindberg, Bangatan 24-30E, 41463 Göteborg, Sweden
Filed Aug. 29, 1984, Ser. No. 645,294
Term of patent 14 years
U.S. Cl. D20-20



292,995
REAL ESTATE SIGN SYSTEM AND CARRIER THEREFOR

Joseph P. Valento, 9159 Dinsdale St., Downey, Calif. 90240
Filed Dec. 20, 1984, Ser. No. 684,095
Term of patent 14 years
U.S. Cl. D20-10

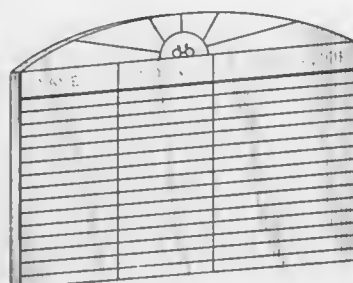


292,996
SIGN

Olga B. Gibb, 5731 W. 92nd Ave. #136, Westminster, Colo. 80030

Filed Mar. 16, 1984, Ser. No. 590,492
Term of patent 14 years

U.S. Cl. D20—42



292,997

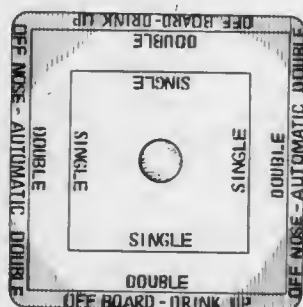
COIN TOSSING GAMEBOARD TARGET

Ronald P. Stewart, 172 E. Cove Ave., Wheeling, W. Va. 26003

Filed Jul. 16, 1984, Ser. No. 631,306

Term of patent 14 years

U.S. Cl. D21—5

292,998
GAMES SHEET

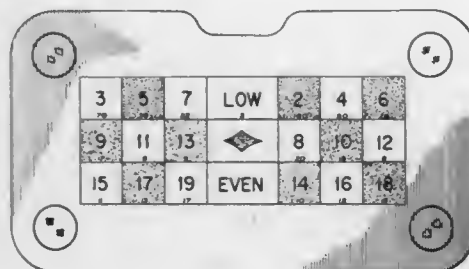
Brian Curran, 7 Sleeth Avenue, Dandenong, Victoria 3175, Australia

Filed Dec. 11, 1984, Ser. No. 680,482

Claims priority, application Australia, Jun. 28, 1984, 7974/84

Term of patent 14 years

U.S. Cl. D21—37



292,999

GAMES SHEET

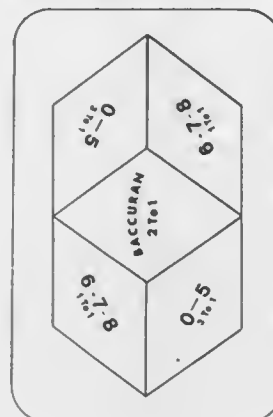
Brian Curran, 7 Sleeth Avenue, Dandenong, Victoria 3175, Australia

Filed Dec. 11, 1984, Ser. No. 680,483

Claims priority, application Australia, Jun. 28, 1984, 7974/84

Term of patent 14 years

U.S. Cl. D21—37



293,000

RATTLE BIRD TOY

D. Michael Williams, New York, and Lois E. Kelly, Brooklyn, both of N.Y., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Feb. 8, 1985, Ser. No. 699,626

Term of patent 14 years

U.S. Cl. D21—65



293,001

TOY VEHICLE

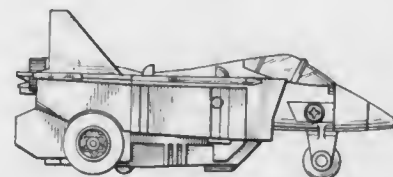
Tatsuya Suzuki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 803,896

Claims priority, application Japan, May 17, 1985, 60-20437

Term of patent 14 years

U.S. Cl. D21—87



293,002

TOY VEHICLE

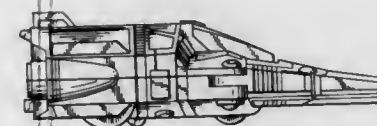
Hiroshi Ohkawa, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 803,913

Claims priority, application Japan, May 17, 1985, 60-20436

Term of patent 14 years

U.S. Cl. D21—87



293,005

TOY BIRD FIGURE

Jeffrey L. Peyton, P.O. Box C-32000, Richmond, Va. 23261

Filed Apr. 22, 1985, Ser. No. 725,747

Term of patent 14 years

U.S. Cl. D21—160



293,003

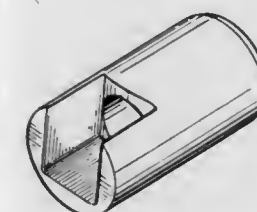
THRUST BEARING FOR WHEEL STRUTS OF MODEL AIRPLANES

Mark E. Larkin, 419 Northgate, Lindenhurst, Ill. 60046; Walter T. Szempruch, 4172 Dorchester Ave., Gurnee, Ill. 60031, and Stephen C. Yeaton, 151 Magnolia, Lindenhurst, Ill. 60046

Filed Oct. 15, 1984, Ser. No. 660,933

Term of patent 14 years

U.S. Cl. D21—91



293,006

TOY FIGURE

Julie Monroe, 409 Pinecrest Dr., Warner Robins, Ga. 31093

Filed Feb. 25, 1985, Ser. No. 705,384

Term of patent 14 years

U.S. Cl. D21—168



293,004

CHILD'S TOY

Norman R. Emms, Welwyn Garden City, England, assignor to Hestair Kiddicraft Limited, Surrey, England

Filed Oct. 3, 1984, Ser. No. 657,337

Claims priority, application United Kingdom, Jul. 4, 1984, 1020718

Term of patent 14 years

U.S. Cl. D21—158



293,007

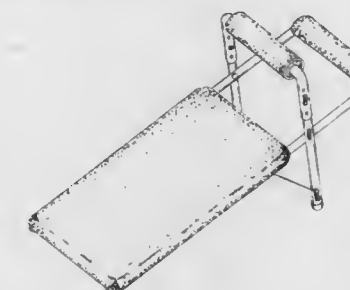
SLANT BOARD OR SIMILAR ARTICLE

Millie Dittig, 914 Logan Rd., Bethel Park, Pa. 15102

Filed Aug. 12, 1985, Ser. No. 764,330

Term of patent 14 years

U.S. Cl. D21—191



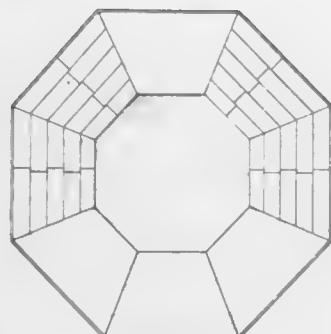
293,008

OCTAGONAL BALL COURT

Thomas Muller, 46 Mohawk Ave., Rockaway, N.J. 07866
Filed Oct. 15, 1984, Ser. No. 661,215

Term of patent 14 years

U.S. Cl. D21-199



293,009

STARTING-BLOCK

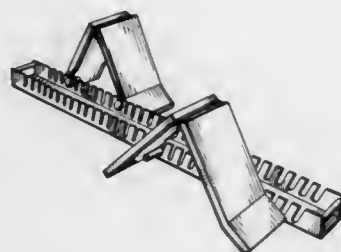
Esa Pieniniemi, Jalohaukantie 6 E 21, SF-90250 Oulu 25, Finland

Filed Nov. 15, 1984, Ser. No. 671,784

Claims priority, application Finland, May 17, 1984, 517/84

Term of patent 14 years

U.S. Cl. D21-199



293,010

SKI COASTER

Laurent R. Fortin, 6 - 28 Albanel Street, Hull, Quebec, Canada (J8Z 1P9)

Filed Nov. 1, 1985, Ser. No. 793,758

Claims priority, application Canada, Oct. 29, 1985, 29-10-85-3

Term of patent 14 years

U.S. Cl. D21-227



293,011

TIGER FLOAT

Henry S. Wolfe, 14480 62nd St. North, Clearwater, Fla. 33520
Filed Oct. 18, 1985, Ser. No. 789,030

The portion of the term of this patent subsequent to Sep. 1, 2001,
has been disclaimed.

Term of patent 14 years

U.S. Cl. D21-237



293,012

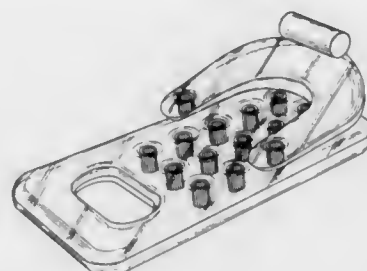
POOL LOUNGER

William R. Storey, Sunnyvale, and Leon H. Tager, San Carlos,
both of Calif., assignors to Poolmaster, Inc., Menlo Park,
Calif.

Filed Oct. 10, 1985, Ser. No. 785,971

Term of patent 14 years

U.S. Cl. D21-237



293,013

KNIFE

James L. Manniso, #5 Woodsman Dr., and Glenn R. Voshell,
339 Possum Park Rd., both of Newark, Del. 19711

Filed Feb. 19, 1985, Ser. No. 703,114

Term of patent 14 years

U.S. Cl. D22-118



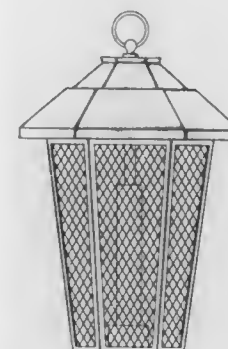
293,014

INSECT LIGHT

Kathleen A. Davis, 6749 Tads Ct., Lisle, Ill. 60532
Filed Jul. 10, 1984, Ser. No. 629,507

Term of patent 14 years

U.S. Cl. D22-123



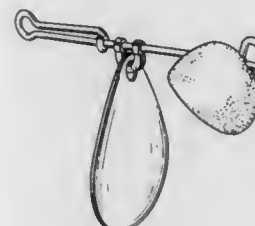
293,015

FISHING LURE

Hugh G. Shearer, 1645 Pin Oak Ct., Rose Hill, Kans. 67133
Filed Apr. 22, 1985, Ser. No. 725,485

Term of patent 14 years

U.S. Cl. D22-129



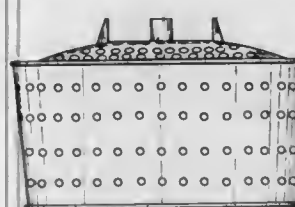
293,016

FILTER FOR DISHWASHER

Dan F. Fisher, 4902 Hillside, Lincoln, Nehr. 68596
Filed Feb. 11, 1985, Ser. No. 700,091

Term of patent 14 years

U.S. Cl. D23-209



293,017

COLLAPSIBLE WATERING CAN OR SIMILAR ARTICLE

C. Michael Janowitz, 446 E. 86th St., New York, N.Y. 10028
Filed Aug. 5, 1985, Ser. No. 762,257

Term of patent 14 years

U.S. Cl. D23-212



293,018

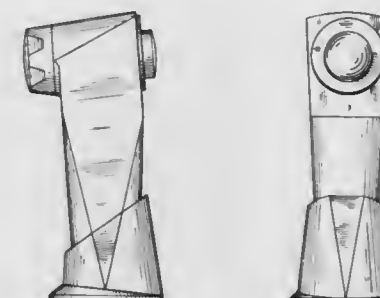
COMBINED SINK SPRAYER AND SUPPORT SLEEVE

John Rudelick, Milwaukee, Wis., assignor to Universal-Rundle
Corporation, New Castle, Pa.

Filed Jul. 23, 1984, Ser. No. 633,469

Term of patent 14 years

U.S. Cl. D23-226



293,019

WATER-CLOSET

Knud Holscher, Virum, Denmark, assignor to IFO Sanitar AB,
Bromolla, Sweden

Filed Jul. 10, 1984, Ser. No. 629,373

Term of patent 14 years

U.S. Cl. D23-301



293,020
HOT AIR BLOWER

Heinrich W. Steinel, Herzebrock, and Jurgen Greubel, Heidenrad, both of Fed. Rep. of Germany, assignors to Steinel GmbH & Co KG, Fed. Rep. of Germany

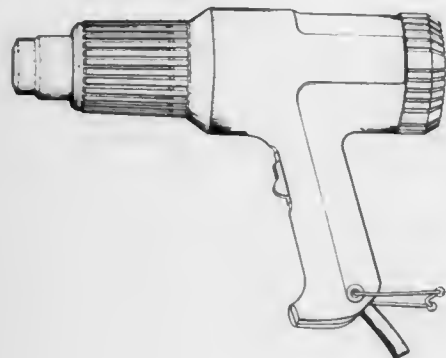
Filed Nov. 2, 1983, Ser. No. 548,157

Claims priority, application Fed. Rep. of Germany, May 3, 1983, MR 1669

The portion of the term of this patent subsequent to Mar. 17, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—332



293,022
FRONT PANEL FOR AN AIR CONDITIONER

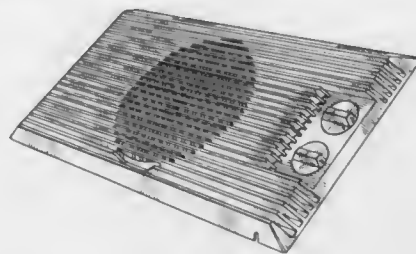
Richard H. Butcher, St Marys, Australia, assignor to F. F. Seeley Nominees Pty Ltd, St Marys, Australia

Filed Dec. 10, 1985, Ser. No. 807,273

Claims priority, application Australia, Jun. 18, 1985, 1591/85

Term of patent 14 years

U.S. Cl. D23—354



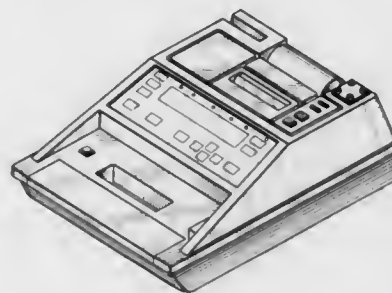
293,023
CARDIAC PACER ANALYZER

Joel F. Giurtino, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed May 21, 1985, Ser. No. 736,631

Term of patent 14 years

U.S. Cl. D24—17



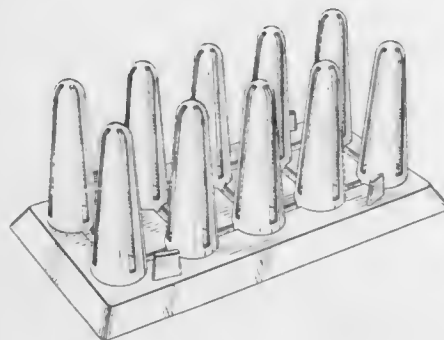
293,021
GARMENT DRYER OR SIMILAR ARTICLE

Lorne R. McCartney, 50 Jackson Court, Kanata, Ontario, Canada (K2K 1B7)

Continuation of Ser. No. 595,024, Mar. 30, 1984, Pat. No. 4,596,078. This application Apr. 4, 1986, Ser. No. 850,368

Term of patent 14 years

U.S. Cl. D32—6



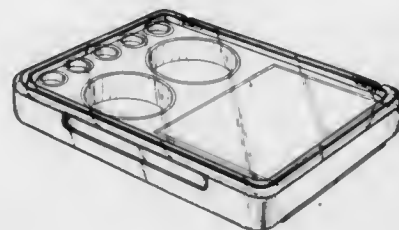
293,024
COMPARTMENTED PACKAGING CONTAINER FOR DENTAL MATERIALS OR THE LIKE

Robert D. Holewinski, Lakehurst, and Leslie Hamilton, Trenton, both of N.J., assignors to Johnson & Johnson Dental Products, Company, East Windsor, N.J.

Filed May 8, 1985, Ser. No. 731,706

Term of patent 14 years

U.S. Cl. D24—31



293,025
BALUSTER

John B. Noyce, Roswell, Ga., assignor to Manufacturers Merchandising Corp., Roswell, Ga.

Filed Nov. 16, 1984, Ser. No. 672,074

Term of patent 14 years

U.S. Cl. D25—129



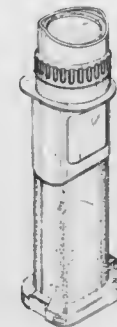
293,027
FLASHLIGHT

Donald W. Zurwelle, Lutherville, Md., assignor to Black & Decker Inc., Newark, Del.

Continuation-in-part of Ser. No. 574,731, Jan. 30, 1984, Pat. No. Des. 281,818. This application May 17, 1985, Ser. No. 735,115

Term of patent 14 years

U.S. Cl. D26—46



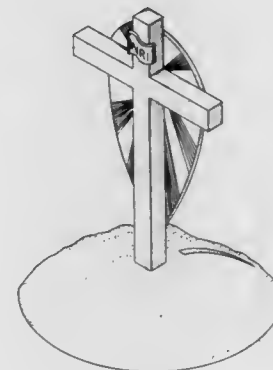
293,028
COMBINATION NIGHT LIGHT AND BANK

Lawrence E. Yother, and Douglas E. Tuckker, both of 4516 S. 26th, Fortsmith, Ark. 72901

Filed Jul. 19, 1985, Ser. No. 756,643

Term of patent 14 years

U.S. Cl. D26—51



293,026
LAMP

Haim Shwisha, Westport, Conn., assignor to Electrix, Inc., New Haven, Conn.

Filed Jun. 27, 1985, Ser. No. 749,204

Term of patent 14 years

U.S. Cl. D26—24

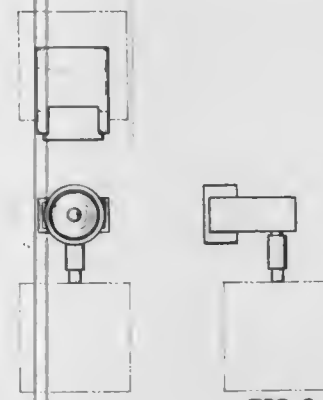


FIG-2

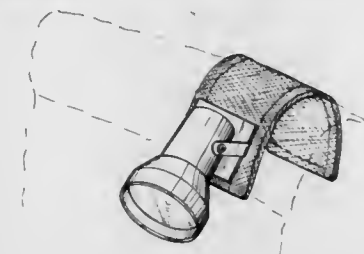
293,029
PORTABLE READING LAMP

Haim Shwisha, Westport, Conn., assignor to Electrix, Inc., New Haven, Conn.

Filed Jun. 27, 1985, Ser. No. 749,526

Term of patent 14 years

U.S. Cl. D26—60



293,030

LAMP OR SIMILAR ARTICLE

Stefan Vladescu, 73-12 35th Ave., Apt. B43, Jackson Heights, N.Y. 11373

Filed Nov. 26, 1985, Ser. No. 802,151

Term of patent 14 years

U.S. Cl. D26—107



293,032

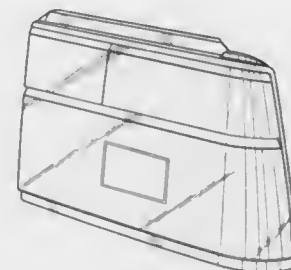
REAR COMBINATION LAMP FOR AN AUTOMOBILE

Shinichi Hiranaka, Toyota, Japan, assignor to Toyoda Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 30, 1985, Ser. No. 739,456

Term of patent 14 years

U.S. Cl. D26—120



293,031

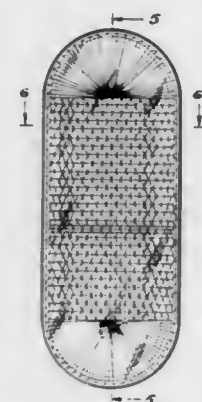
DIFFUSER FOR A NIGHTLIGHT

Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.

Filed Jul. 22, 1985, Ser. No. 757,221

Term of patent 14 years

U.S. Cl. D26—118



293,033

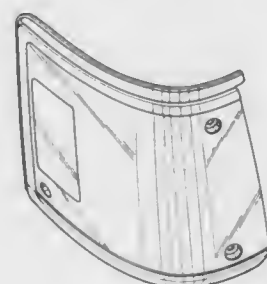
CLEARANCE LAMP FOR AN AUTOMOBILE

Shinichi Hiranaka, Toyota, Japan, assignor to Toyoda Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 30, 1985, Ser. No. 739,459

Term of patent 14 years

U.S. Cl. D26—120



293,034

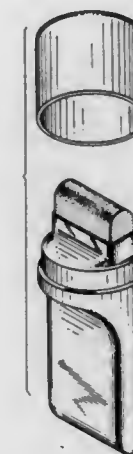
APPLICATOR CONTAINER

Doris duCret, New York, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Jan. 6, 1984, Ser. No. 568,752

Term of patent 14 years

U.S. Cl. D28—7



293,035

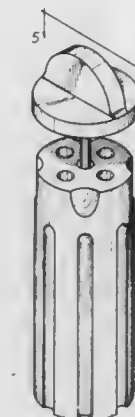
COMBINED MULTIPLE MASCARA DISPENSER AND APPLICATOR

Jennifer J. Osborne, Lot 6 Monitor Village, Centerville, Iowa 52544

Filed Feb. 21, 1985, Ser. No. 703,866

Term of patent 14 years

U.S. Cl. D28—7



293,036

SAFETY RAZOR HANDLE

Clemens A. Iten, Staunton, Va., and David O. Chase, Skaneateles, N.Y., assignors to American Safety Razor Company, Verona, Va.

Filed May 25, 1984, Ser. No. 614,133

Term of patent 14 years

U.S. Cl. D28—48



293,037

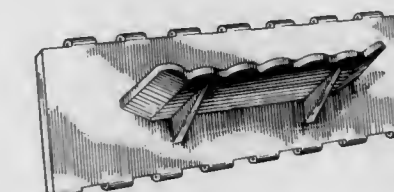
CONVEYOR CLEAT

Ross Capawana, 3250 Pollux Ave., Las Vegas, Nev. 89102

Filed Mar. 5, 1985, Ser. No. 708,411

Term of patent 14 years

U.S. Cl. D34—35



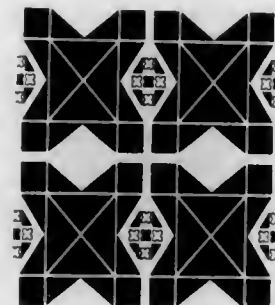
293,038
REFUSE RECEPTACLE

Joseph Kepiro, 810 Waterfront Dr., Lancaster, Pa. 17602
Filed Aug. 26, 1985, Ser. No. 769,315
Term of patent 14 years
U.S. Cl. D34-7



293,039
PLASTIC SHEET MATERIAL FOR A POOL LINER

D. Stuart Beattie, Ontario, Canada, assignor to Fox Pool Corporation, York, Pa.
Filed Jan. 28, 1985, Ser. No. 695,778
Term of patent 14 years
U.S. Cl. D5-61



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF DECEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Aardvark Audio Inc.: See—
Rutt, Thomas E., 4,710,727, Cl. 330-110.000.
- Aarons, Louis. Dichotic-diotic paired-association for learning of verbal materials. 4,710,130, Cl. 434-157.000.
- AB Electrolux: See—
Axelson, Claes J. H., 4,710,611, Cl. 219-450.000.
- Abe, Kunihisa: See—
Tonoki, Satoshi; Tsunemi, Hidenari; Nishimura, Asaichi; and Abe, Kunihisa, 4,710,420, Cl. 428-212.000.
- Abe, Sanae: See—
Sato, Noboru; Habu, Kazutaka; and Abe, Sanae, 4,710,434, Cl. 428-678.000.
- Abo, Toshimi: See—
Ueno, Takashi; and Abo, Toshimi, 4,709,553, Cl. 60-602.000.
- Abou-Gharbia, Magid A.; and Nielsen, Susan T., to American Home Products Corporation. Histamine H₁ antagonists. 4,710,572, Cl. 544-267.000.
- Ackermann, Rolf, to Ta Triumph-Adler Aktiengesellschaft. Ribbon cassette with end of ribbon detector. 4,710,044, Cl. 400-208.000.
- Acla, Howard L.: See—
Ritsko, Joseph E.; and Acla, Howard L., 4,710,368, Cl. 423-344.000.
- Acme Electric Corporation: See—
Sutphin, Richard C.; Bell, Steven R.; and Monsell, Kurt, 4,710,694, Cl. 320-21.000.
- ACME P.W. Lenzen GbmH & Co. KG: See—
Staszko, Wladyslaw, 4,709,627, Cl. 100-30.000.
- Adachi, Motoyuki: See—
Kohashi, Toru; and Adachi, Motoyuki, 4,709,770, Cl. 177-50.000.
- Adamek, Frank C.; and Bridges, Charles D., to Vetco Gray Inc. Temperature transient resistant seal. 4,709,933, Cl. 277-167.500.
- Adamski, Alfred; DeFranco, Thomas P.; and Dougherty, Lawrence W., to Zenith Electronics Corporation. Internal electrical connector for a tension mask tube. 4,710,669, Cl. 313-402.000.
- ADC Telecommunications, Inc.: See—
Bradley, James D.; and Pfeffer, George B., 4,710,138, Cl. 439-581.000.
- Adell, Robert, to U.S. Product Development Company. Molding for automobile body panels, such as doors. 4,709,525, Cl. 52-718.100.
- Adolph, Heinrich: See—
Buerstinghaus, Rainer; and Adolph, Heinrich, 4,710,494, Cl. 514-143.000.
- Advance Machine Company: See—
Sletten, William C., II, 4,709,442, Cl. 15-320.000.
- Advanced Micro Devices, Inc.: See—
Duley, Raymond S.; and Forth, Leslie, 4,710,943, Cl. 375-7.000.
- Liu, Yow-Juang (Bill), 4,709,467, Cl. 437-30.000.
- Scott, Paul H., 4,710,922, Cl. 370-112.000.
- Advanced Separation Technologies Incorporated: See—
Berry, W. Wes, 4,710,364, Cl. 423-244.000.
- Advanced Tool Technology, Inc.: See—
Rossetti, James J., 4,710,334, Cl. 264-102.000.
- Advantest Corporation: See—
Ando, Masakazu, 4,710,704, Cl. 324-73.00R.
- Aerospatiale Societe Nationale Industrielle: See—
Grenier, Gilles; Maffert, Jerome; Merle, Jean-Pierre; and des Ordon, Jacques R., 4,710,028, Cl. 356-375.000.
- Moutardier, Jacques, 4,709,586, Cl. 74-5.120.
- Agence Spatiale Europeenne: See—
Roederer, Antoine G.; Doro, Guilio; and Lisi, Marco, 4,710,776, Cl. 343-778.000.
- Agency of Industrial Science & Technology: See—
Nakano, Kikuo; and Hayashi, Hiroshi, 4,710,435, Cl. 428-698.000.
- Agno, Yuzo: See—
Shimoda, Kaneyasu; Katoh, Tadayoshi; and Agno, Yuzo, 4,710,746, Cl. 340-347.0DD.
- AGFA-Gevaert N.V.: See—
Leenders, Luc H.; Daems, Eddie R.; and Van den Bogaert, Jan A., 4,710,444, Cl. 430-237.000.
- Ooms, Richard A., 4,710,451, Cl. 430-441.000.
- AGI Incorporated: See—
Kosterka, Donald W., 4,709,812, Cl. 206-310.000.
- Ahmed, Hassan J.: See—
Parker, Merle A.; Pregall, Richard A.; and Ahmed, Hassan J., 4,709,579, Cl. 73-76.000.
- Ahmed, Moustafa E. Device for the programmed teaching of arabic language and recitations. 4,710,877, Cl. 364-419.000.
- Ahuja, Om, to Om Electronics Systems Corp. Telephone line fault locating device. 4,710,949, Cl. 379-26.000.
- Aiba, Mitsuru: See—
Suzuki, Hideo; Okamoto, Kunihide; Hayashi, Yasuyuki; and Aiba, Mitsuru, 4,709,934, Cl. 280-6.00R.
- Air-O-Lator Corporation: See—
Cramer, Barry G.; and Cramer, Roy A., 4,710,325, Cl. 261-24.000.
- Aisaka, Kazuo: See—
Uwajima, Takayuki; and Aisaka, Kazuo, 4,710,470, Cl. 435-200.000.
- Aisin Seiki Kabushika Kaisha: See—
Kazaoka, Kenichi; and Okazaki, Hiroshi, 4,709,965, Cl. 297-366.000.
- Aisin-Warner Limited: See—
Sakakibara, Shiro; and Ozaki, Kazuhisa, 4,709,793, Cl. 192-4.00A.
- Aivaliotis, Emmanuel: See—
McKee, Bobby D.; Cain, Michael P.; Delvecchio, Robert M.; and Aivaliotis, Emmanuel, 4,710,660, Cl. 310-178.000.
- Akanabe, Yuichi: See—
Funaki, Shinsuke; Akanabe, Yuichi; and Ikeda, Hiroaki, 4,710,779, Cl. 346-1.100.
- Akao, Takeshi; and Furukawa, Toshio, to Kikkoman Corporation. Method for processing by heating and equipment for same. 4,709,487, Cl. 34-10.000.
- Akasaki, Hidehiko: See—
Kojima, Haruo; and Akasaki, Hidehiko, 4,710,250, Cl. 156-89.000.
- Akashi Seisakusho Ltd.: See—
Suzuki, Shigeru, 4,710,633, Cl. 250-442.100.
- Akiyama, Masashi; and Tagashira, Yasuo, to Kusakabe Electric & Machinery Co. Ltd. Apparatus for continuously producing steel pipes including using rotatable beds of tools for different size pipe. 4,709,845, Cl. 228-17.000.
- Akiyama, Tatsuo: See—
Koshino, Yutaka; Akiyama, Tatsuo; and Baba, Yoshiro, 4,710,794, Cl. 357-49.000.
- Akzo NV: See—
Guioth, Chantal H.; Maze, Etienne G.; and Rabajoie, Loick P., 4,710,281, Cl. 204-181.700.
- Albany International Corporation: See—
Coplan, Myron J., 4,709,831, Cl. 220-304.000.
- Alcan International Limited: See—
Bryson, Neil B.; Auchterlonie, David T. T.; LeBlanc, Guy; and Newberry, Vincent J., 4,709,744, Cl. 164-472.000.
- Aldrich, Dale J.: See—
Bogan, Gary W.; Lucas, Peter A.; Monnerat, Georgia A.; and Aldrich, Dale J., 4,710,429, Cl. 428-417.000.
- Alexander, William, to American Colloid Company. Production process for manufacturing low molecular weight water soluble acrylic polymers as drilling fluid additives. 4,709,767, Cl. 175-65.000.
- Alfa-Laval AB: See—
Klintenstedt, Kjell; Foldhazy, Zoltan; and Forsberg, Bjorn, 4,710,160, Cl. 494-64.000.
- Alfa-Laval Separation AB: See—
Gullers, Per, 4,710,159, Cl. 494-27.000.
- Alfred Karcher GmbH & Co.: See—
Schulze, Werner; and Gerich, Josef, 4,709,859, Cl. 239-525.000.
- Alfred Teves GmbH: See—
Czich, Erhard; Drott, Peter; and Haefner, Horst, 4,709,789, Cl. 188-73.440.
- Saalbach, Kurt; and Hartmann, Willi, 4,709,551, Cl. 60-589.000.
- Algrim, Donald J.: See—
Broderick, Thomas B.; Algrim, Donald J.; and Hayden, Richard F., 4,709,523, Cl. 52-406.000.
- Alleman, Raymond A.: See—
Rausch, Russell G.; and Alleman, Raymond A., 4,709,716, Cl. 134-122.00R.
- Allen Engineering Corporation: See—
Allen, J. Dewayne, 4,710,054, Cl. 404-110.000.
- Allen, J. Dewayne, to Allen Engineering Corporation. Material spreader system. 4,710,054, Cl. 404-110.000.
- Allen, Richard A. Universal folding carrier. 4,709,840, Cl. 224-314.000.
- Allen, Ronald C.; and Sajur, Eugene V. Atmosphere controlling process for food storage. 4,710,206, Cl. 55-58.000.
- Alert, Kurt. Link chain. 4,710,153, Cl. 474-211.000.
- Allied Corporation: See—
Anderson, Philip M., III; and Urbanski, Jeffrey C., 4,710,709, Cl. 324-207.000.
- Boyle, William J., Jr.; Mares, Frank; and Corbo, Andrea M., 4,710,545, Cl. 525-340.000.
- Allison, Joe D.; and Wimberley, J. W., to Conoco Inc. Processes and oxidizing agents for oxidizing sulfide ion to innocuous, soluble sulfur species. 4,710,305, Cl. 210-747.000.
- Alpha Enterprises, Inc.: See—
Hehn, Bruce A.; and Sankey, James K., 4,709,437, Cl. 15-97.00R.
- Alphair Ventilating Systems Inc.: See—
Martens, Ernst, 4,710,112, Cl. 425-64.000.
- Alpine Electronics Inc.: See—
Ejiri, Kazushige, 4,710,910, Cl. 369-75.200.

Alps Electric Co., Ltd.: See—
Hishi, Yuichi, 4,710,836, Cl. 360-106.000.
Kato, Masakazu, 4,710,263, Cl. 156-637.000.
Kimura, Kiyoshi, 4,710,595, Cl. 178-18.000.
Sasaki, Shinji; Shimoyama, Yujiro; and Watanabe, Yoshinori, 4,710,600, Cl. 200-291.000.
Shimaoka, Motohiro; and Saito, Yukio, 4,710,829, Cl. 360-97.000.
Suzuki, Takeo, 4,710,973, Cl. 455-180.000.

Alps Electric, Ltd.: See—
Matsuta, Shigetoshi, 4,710,737, Cl. 334-56.000.

Alsen, Per; and Salo, Timo, to Erix Tool AB. Device in back spot facing tools. 4,710,070, Cl. 408-93.000.

Alstetter, Franz; and Hultsch, Guenther, to Krauss-Maffei A.G. Apparatus to accelerate the transfer of material between two media reacting in a fluidized bed. 4,710,356, Cl. 422-140.000.

Alstom: See—
Besanceney, Michel, 4,709,582, Cl. 73-622.000.
Condolios, Elie, 4,710,291, Cl. 210-199.000.

Alston, Lawrence E., to Polaroid Corporation. System and method for improving chrominance in video disc storage system. 4,710,824, Cl. 358-310.000.

Altenhofen, Jonathan M. Method and apparatus for monitoring environmental evapotranspiration. 4,709,585, Cl. 73-866.400.

Altmeyer, Werner; Jakobs, Ewald; and Meier, Friedrich, to TechnoARBED Deutschland GmbH. Device for the internal deburring of a pipe. 4,710,078, Cl. 409-233.000.

Alumax, Inc.: See—
Young, Kenneth P.; Tyler, Derek E.; Cheskis, Harvey P.; and Watson, W. Gary, 4,709,746, Cl. 164-485.000.

Aluminum Company of America: See—
Jacoby, John E.; Yu, Ho; and Ramser, Robert A., 4,709,740, Cl. 164-5.000.
Stemler, J. Robert; Klingensmith, James D.; Menzemer, Craig C.; Kulicki, John M.; and Theofanis, Nicholas D., 4,709,435, Cl. 14-73.000.
Yu, Ho; and Granger, Douglas A., 4,709,747, Cl. 164-487.000.

Alvarez, Robert; Lehmann, Leonard; and Strul, Bruno, to DigiRad Corporation. Apparatus and method for measuring light transmittance or reflectance. 4,710,624, Cl. 250-228.000.

AM General Corporation: See—
Goodell, Fred L.; and Ellison, Michael J., 4,709,738, Cl. 152-400.000.

Amco Industries, Inc.: See—
Sirota, Gabriel J., 4,709,953, Cl. 294-106.000.

American Colloid Company: See—
Alexander, William, 4,709,767, Cl. 175-65.000.

American Cyanamid Company: See—
Forgione, Peter S.; and Singh, Balwant, 4,710,542, Cl. 525-127.000.
Schenkel, Robert H.; Wong, Rosie B.; and Thammana, Pallaiah, 4,710,377, Cl. 424-88.000.
Wright, William B., Jr.; and Tomcufcik, Andrew S., 4,710,502, Cl. 514-259.000.

American Device Manufacturing Co.: See—
Zortman, Zedekiah Z., 4,709,950, Cl. 292-92.000.

American Home Products Corporation: See—
Abou-Gharbia, Magid A.; and Nielsen, Susan T., 4,710,572, Cl. 544-267.000.
McGregor, William H.; and Chang, Joseph Y., 4,710,580, Cl. 558-86.000.

American Home Products Corporation (Del.): See—
Wooley, Paul H., 4,710,511, Cl. 514-411.000.

American Sprayed-On Fibers, Inc.: See—
Miller, Dennis C., 4,710,309, Cl. 252-62.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: See—
Brown, Donald W.; Leth, James W.; and Vandendorpe, James E., 4,710,926, Cl. 371-9.000.
Debus, Walter, Jr.; Osborne, Thomas L.; and Siller, Curtis A., Jr., 4,710,891, Cl. 364-718.000.
Heisinger, Robert F., 4,710,846, Cl. 361-119.000.
Kapur, Rajan N.; and Szurkowski, Edward S., 4,710,761, Cl. 340-721.000.
Presby, Herman M., 4,710,605, Cl. 219-121.0LJ.
Shoji, Masakazu, 4,710,650, Cl. 307-452.000.

American Telephone and Telegraph Company AT&T Information Systems: See—
Doyle, Francis S.; and France, Randall W., 4,710,954, Cl. 379-427.000.

American Telephone and Telegraph Company, AT&T Information Systems Inc.: See—
Kasday, Leonard R., 4,710,760, Cl. 340-712.000.

American Telephone and Telegraph Company AT&T Technologies, Inc.: See—
Tardy, John, 4,710,697, Cl. 323-239.000.

American Television & Communications Corporation: See—
Rast, Robert M., 4,710,956, Cl. 380-20.000.

Ametek, Inc.: See—
Meyers, Peter V.; Liu, Chung-Heng; and Frey, Timothy J., 4,710,589, Cl. 136-258.0PC.

Amgen, Inc.: See—
Morris, Charles F., 4,710,473, Cl. 435-320.000.

Amiad: See—
Amit, Meir, 4,710,284, Cl. 209-17.000.

Amit, Meir, to Amiad. Cyclonic separator. 4,710,284, Cl. 209-17.000.

Amoco Corporation: See—
Hinch, Henry H.; Boyne, Gail E.; Daniels, David L.; and Kullmann, Eugene V., 4,710,946, Cl. 378-62.000.
Maresca, Louis M., 4,710,562, Cl. 528-125.000.
Stauffer, Richard D., 4,710,308, Cl. 252-42.700.

AMP Incorporated: See—
Aoyama, Kohji; and Noguchi, Masaro, 4,710,135, Cl. 439-354.000.
Korsunsky, Isosif, 4,710,134, Cl. 439-264.000.
Waters, Mark H.; and Whiteman, Robert N., Jr., 4,709,973, Cl. 439-78.000.

Ampferer, Herbert, to Dr. Ing.h.c.F. Porsche Aktiengesellschaft. Fastening arrangement of a cover hood at a cylinder head. 4,709,670, Cl. 123-195.00C.

Amstutz, Stanford R.; Eliscu, Mark; Lenart, Joseph M.; and Haselton, E. Fletcher, to GTE Laboratories Incorporated. Switching apparatus for burst-switching communications system. 4,710,916, Cl. 370-58.000.

Anacomp, Inc.: See—
Bergstrom, Donald J.; and Wolfer, Allan J., 4,710,691, Cl. 318-696.000.

Anders, Walter G.; Grosswiller, Leo J., Jr.; Lozier, Benjamin F.; and Rozlosnik, Alan J., to Diebold, Incorporated. Valve and blower apparatus for pneumatic tube system. 4,710,098, Cl. 415-149.00A.

Andersen, Arve, to Elopak A/S. Fluid flow nozzle. 4,709,836, Cl. 222-490.000.

Anderson, John A. Firearm. 4,709,617, Cl. 89-157.000.

Anderson, Philip M., III; and Urbanski, Jeffrey C., to Allied Corporation. Magnetomechanical transducers utilizing resonant frequency shifts to measure displacement of an object. 4,710,709, Cl. 324-207.000.

Andersson, Olle, to Verkstads AB Claes Johansson. Adjustable steering wheel shaft for vehicles. 4,709,592, Cl. 74-493.000.

Ando, Fumihiko, to Nippon Hoso Kyokai. Solid state image sensor. 4,710,817, Cl. 358-213.110.

Ando, Masakazu, to Advantest Corporation. IC test equipment. 4,710,704, Cl. 324-73.00R.

Andre Fantasies, Inc.: See—
Gettinger, Lillian, 4,709,420, Cl. 2-50.000.

Andreas Stahl: See—
Wissmann, Michael; Weber, Jurgen; and Nickel, Hans, 4,709,669, Cl. 123-149.00D.

Andrews, John R., to Fugitt, Cullen Wayne, a part interest. Boat seat bracket. 4,709,648, Cl. 114-363.000.

Andric, Milos D. Portable disposable insect trap. 4,709,504, Cl. 43-114.000.

Andus Corp.: See—
Ritchie, Ian T.; and Kittler, Wilfred C., 4,710,441, Cl. 430-62.000.

Angell, Cyril N. E., to Avon Industrial Polymers Limited. Sight correction attachment for respirators. 4,709,696, Cl. 128-201.120.

Angio Medical Corporation: See—
Catsimpoalas, Nicholas; McCluer, Robert; Sinn, Robert S.; and Evans, James, 4,710,490, Cl. 514-25.000.

Anic, S.p.A.: See—
Dozzi, Giovanni; Della Fortuna, Giorgio; and Cucinella, Salvatore, 4,710,531, Cl. 524-239.000.

Anritsu Corporation: See—
Itaya, Hiroshi; and Saito, Goro, 4,710,702, Cl. 324-79.00R.

Anselmino, Jeffrey; and Slabbeekorn, Scott D., to Whirlpool Corporation. Venturi air vent for dishwasher. 4,709,488, Cl. 34-235.000.

Antonious, Anthony J. Rotatable club holder insert for a golf bag. 4,709,814, Cl. 206-315.300.

Anzai, Hideyuki: See—
Yamauchi, Yasuhisa; Asano, Masao; Anzai, Hideyuki; and Yasufuku, Yoshitaka, 4,710,427, Cl. 428-407.000.

Aoki, Masaaki: See—
Hanamura, Shoji; Aoki, Masaaki; and Masuhara, Toshiaki, 4,710,648, Cl. 307-443.000.

Aoki, Norio: See—
Matsuyama, Shigeru; Kanazaki, Mikio; Aoki, Norio; and Ishii, Akira, 4,709,993, Cl. 350-339.00F.

Aotsuka, Yasuo; Konishi, Masahiro; and Takahashi, Koji, to Fuji Photo Film Co., Ltd. Temperature compensation for a semiconductor light source used for exposure of light sensitive material. 4,710,631, Cl. 250-354.100.

Aoyama, Kohji; and Noguchi, Masaro, to AMP Incorporated. Electrical connector having integral latch means. 4,710,135, Cl. 439-354.000.

Appelbaum, Paul. Lock and cover device. 4,709,567, Cl. 70-455.000.

Appenzeller, Ernst, heir: See—
Appenzeller, Valentin, deceased; Appenzeller, Maria, heir; Appenzeller, Regine, heir; Pegels, Doris, heir; and Appenzeller, Ernst, heir, 4,709,629, Cl. 100-162.00B.

Appenzeller, Maria, heir: See—
Appenzeller, Valentin, deceased; Appenzeller, Maria, heir; Appenzeller, Regine, heir; Pegels, Doris, heir; and Appenzeller, Ernst, heir, 4,709,629, Cl. 100-162.00B.

Appenzeller, Regine, heir: See—
Appenzeller, Valentin, deceased; Appenzeller, Maria, heir; Appenzeller, Regine, heir; Pegels, Doris, heir; and Appenzeller, Ernst, heir, 4,709,629, Cl. 100-162.00B.

Appenzeller, Valentin, deceased; Appenzeller, Maria, heir; Appenzeller, Regine, heir; Pegels, Doris, heir; and Appenzeller, Ernst, heir, 4,709,629, Cl. 100-162.00B.

Appenzeller, Valentin, deceased; Appenzeller, Maria, heir; by Appenzeller, Regine, heir; by Pegels, Doris, heir; and by Appenzeller, Ernst, heir, to Kusters, Eduard. Roll with pressure chamber for detection control. 4,709,629, Cl. 100-162.00B.

Applied Biology, Inc.: See—
Raabe, Austin B., 4,709,576, Cl. 73-40.50R.

Applied Power, Inc.: See—
Mierbach, Hans-Bernd; Frohn, Gustav K.; and Blockisch, Olaf, 4,709,600, Cl. 81-57.390.

Applied Precision Limited: See—
Lazorthes, Guy, 4,710,167, Cl. 604-93.000.

Aquarium Pharmaceuticals, Inc.: See—
Gothard, Patrick G., 4,709,657, Cl. 119-5.000.

Aracs, Zsuzsanna: See—
Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefko, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jeno; Csizer, Eva; Vezzer, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.00R.

Archer, Joel; Wassenhove, Denis V.; Pithouse, Kenneth B.; Buck, Leslie J.; Molyneux, Jeffrey P.; and Bradshaw, Peter S., to Raychem Limited. Fibre reinforced polymeric article. 4,709,948, Cl. 285-381.000.

Architectural Wall Systems, Inc.: See—
Mitchell, Terry L.; and Poortvliet, Robert J., 4,709,517, Cl. 52-36.000.

Arcoa Industries: See—
Tucker, Dalton R., 4,709,839, Cl. 223-119.000.

Arduengo, Anthony J., to Du Pont de Nemours, E. I., and Company. Thermochromic arsenic and antimony compounds. 4,710,576, Cl. 556-40.000.

Areaux, Larry D.; and Dudley, Robert H., to Pre-Melt Systems, Inc. Method and apparatus for drying metal chips. 4,710,126, Cl. 432-58.000.

Arends, Thomas C.: See—
Tompkins, E. Neal; Arends, Thomas C.; and Barry, Michael W., 4,710,917, Cl. 370-62.000.

Ariga, Keiki: See—
Iwasaki, Tadayoshi; Ariga, Keiki; and Sato, Makoto, 4,709,578, Cl. 73-49.300.

Arimoto, Kazutami: See—
Furutani, Kiyohiro; Mashiko, Koichiro; and Arimoto, Kazutami, 4,710,789, Cl. 357-23.600.

Aritake, Takeshi: See—
Tokairin, Hiroaki; Honma, Kazuo; Nakajima, Kichio; Nagasawa, Kiyoshi; and Aritake, Takeshi, 4,710,884, Cl. 364-513.000.

Arjomari-Prioux: See—
Camus, Michel, 4,710,614, Cl. 235-380.000.
Fredenucci, Pierre, 4,710,422, Cl. 428-248.000.

Armstrong World Industries, Inc.: See—
Davey, Raymond G.; Dees, Martin, Jr.; and Sigman, Daniel M., Jr., 4,709,631, Cl. 101-129.000.

Arntz-Optibelt-KG: See—
Borchardt, Horst, 4,710,251, Cl. 156-137.000.

ARS Edge Co. Ltd.: See—
Takigawa, Shigetugu; and Takigawa, Masuhiko, 4,709,480, Cl. 30-254.000.

Asaeda, Takeaki, to Mitsubishi Denki Kabushiki Kaisha. Inverter. 4,710,862, Cl. 363-58.000.

Asai, Kohtaro: See—
Murakami, Tokumichi; Itoh, Atsushi; Asai, Kohtaro; Kamizawa, Koh; and Nishida, Masami, 4,710,812, Cl. 358-136.000.

Asano, Masao: See—
Yamauchi, Yasuhisa; Asano, Masao; Anzai, Hideyuki; and Yasufuku, Yoshitaka, 4,710,427, Cl. 428-407.000.

ASEA AB: See—
Skoog, Hans; Holmqvist, Ulf; and Tellden, Leif, 4,710,092, Cl. 414-729.000.

ASM Fico Tooling, b.v.: See—
Fierkens, Richardus H. J.; and Pas, Ireneus J. T. M., 4,710,094, Cl. 414-752.000.

Aspen Peripherals: See—
Smith, David E.; Olmsted, Dennis R.; and Fryberger, Joseph A., 4,709,873, Cl. 242-195.000.

Astley, Vivian C.; and Taravella, Jody J., to Freeport Minerals Company. Method for producing stabilized wet process phosphoric acid with low content of magnesium and aluminum. 4,710,366, Cl. 423-321.00R.

Atagi, Tanya A.: See—
Johnston, James H.; Hermann, George D.; and Atagi, Tanya A., 4,709,698, Cl. 128-303.120.

Atara Corporation: See—
DeVos, Jerry, 4,710,292, Cl. 210-218.000.

Atlantic Richfield Company: See—
Blair, Christon R.; and Parker, Kenneth B., 4,710,061, Cl. 405-195.000.
Withjack, Eric M., 4,710,948, Cl. 378-208.000.

Atsumi, Tomiaki: See—
Ichikawa, Noriyuki; Suzuki, Tetsushi; and Atsumi, Tomiaki, 4,710,152, Cl. 474-166.000.

Aucherlonie, David T. T.: See—
Bryson, Neil B.; Aucherlonie, David T. T.; LeBlanc, Gny; and Newberry, Vincent J., 4,709,744, Cl. 164-472.000.

Aufiero, James M., to Itek Corporation. Digital frame processor pipe line circuit. 4,710,966, Cl. 382-69.000.

Auger, Jean: See—
Behar, Françoise; Roucache, Jeannine; Auger, Jean; and Boudet, Luc, 4,710,354, Cl. 422-80.000.

Aulds, James M.; and Becker, Roger J., to United States of America, Air Force. Proportional drive servo controller with arrayed position detector. 4,710,641, Cl. 250-554.000.

Auracher, Franz, to Siemens Aktiengesellschaft. Controllable directional coupler. 4,709,977, Cl. 350-96.140.

Auschat, Siegfried: See—
Segebrecht, Udo; and Auschat, Siegfried, 4,710,105, Cl. 417-68.000.

Ausnit, Steven, to Minigrip, Inc. Method and apparatus for making reclosable bags in a form, fill and seal machine. 4,709,533, Cl. 53-451.000.

Austria Metall Aktiengesellschaft: See—
Scherzer, Wilhelm, 4,709,781, Cl. 181-290.000.

Autek Systems Corporation: See—
McCutcheon, Samuel; Lum, Jeffrey; Solek, Roman; Harrell, Troy; and Leman, Robert, 4,710,893, Cl. 364-900.000.

Automotive Products plc: See—
Cucinotta, Luigi; and Di Benedetto, Orazio, 4,709,797, Cl. 192-106.200.

Avco Corporation: See—
Tinti, Aldo A., 4,710,097, Cl. 415-138.000.

Avens, Larry R.: See—
FitzPatrick, John R.; Dunn, Jerry G.; and Avens, Larry R., 4,710,222, Cl. 75-84.10R.

Avon Industrial Polymers Limited: See—
Angell, Cyril N. E., 4,709,696, Cl. 128-201.120.

Axelsson, Claes J. H., to AB Electrolux. Arrangement in a cooking plate or hob having a temperature sensor. 4,710,611, Cl. 219-450.000.

Axiuk, Oleg: See—
Walling, Jorg-Hein; Cornibert, Jacques; Baxter, Gordon D.; Bottin, Marie-Francoise; Axiuk, Oleg; and Reed, Phillip J., 4,710,594, Cl. 174-120.05R.

B.A.T. Cigaretten-Fabriken GmbH: See—
Junemann, Gitta; Hirsch, Werner; and Weiss, Arno, 4,709,709, Cl. 131-306.000.

B. F. Goodrich Company, The: See—
Neuman, Richard C., 4,710,533, Cl. 524-394.000.

B & G Machinery Company: See—
Swiderski, Kevin J., 4,709,803, Cl. 198-468.200.

Baach, Michael K., to Corpro Companies, Inc. Replaceable deep anode system. 4,710,644, Cl. 307-95.000.

Baba, Yoshiro: See—
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Babcock & Wilcox Company, The: See—
Flora, John H.; Womack, Robert E.; Stinnett, Carlton E.; and Dalton, Claude W., 4,710,710, Cl. 324-220.000.

Babitzka, Rudolf, to Robert Bosch GmbH. Fuel injection apparatus for internal combustion engines. 4,709,673, Cl. 123-299.000.

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Bagnall, Paul J. H.; and Whiteley, Norman, to Peerless Plastics Packaging Limited. Method of manufacturing a molded plastics article incorporating a blank of sheet. 4,710,338, Cl. 264-509.000.

Bahn, Itsuki; and Okada, Hideo, to Secoh Geiken Inc. Rotation detecting apparatus. 4,710,683, Cl. 318-254.000.

Bahrman, Helmut; Cornils, Boy; Lipps, Wolfgang; Lappe, Peter; and Springer, Helmut, to Ruhrchemie Aktiengesellschaft. Quaternary ammonium salts of sulfonated triarylphosphines and process for the production thereof. 4,710,321, Cl. 200-501.150.

Bailey, George, to Hekimian Laboratories, Inc. Balanced mixer. 4,710,890, Cl. 364-703.000.

Bailey, Lorraine F.; and Bennett, Richard J., to Corning Glass Works. Bonding glass-ceramic dental products. 4,710,217, Cl. 65-31.000.

Baity, Donald N.; Schwandt, Gregory J.; and Kidwell, Charles E., to General Motors Corporation. Illuminated rocker switch assembly. 4,710,602, Cl. 200-315.000.

Baker Oil Tools, Inc.: See—
Preston, Dan C., Jr., 4,709,758, Cl. 166-120.000.

Bakos, Jozsef: See—
Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefko, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jeno; Csizer, Eva; Vezzer, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.00R.

Baldoni, J. Gary, II; Buljan, Sergej-Tomislav; and Sarin, Vinod K., to GTE Laboratories Inc. Abrasion resistant articles and composition utilizing a boron-doped refractory particle. 4,710,425, Cl. 428-328.000.

Balduff, Dennis C.; and Jabarin, Saleh A., to Owens-Illinois Plastic Products Inc. Degradable polymer composition and articles prepared from same. 4,709,808, Cl. 206-158.000.

Baldwin, John J.; Huff, Joel R.; Vacca, Joseph P.; Young, Steven D.; deSolms, Jane; and Guare, James P., Jr., to Merck & Co., Inc. Antidepressant spiro hexahydro arylquinoline derivatives, composition, and method of use therefor. 4,710,504, Cl. 514-267.000.

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Roth, James E.; and Bales, David W., 4,709,623, Cl. 98-40.050.

Balke, Roy L.; Merrifield, Charles H.; and Mizikowski, Frank E., to General Electric Company. Dynamoelectric machine rotor structure having improved insulation. 4,710,662, Cl. 310-204.000.

Ball, Wolfgang: See—
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Ballestrazzi, Aris; and Tassi, Lamberto, to Sitma Societa Italiana Macchine Automatiche S.p.A. Centralized drive device in a packaging machine. 4,709,530, Cl. 53-209.000.

Ballestrazzi, Aris; and Tassi, Lamberto, to Sitma-Societa Italiana Macchine Automatiche S.p.A. Longitudinal welding equipment in a packer machine. 4,709,537, Cl. 53-550.000.

Ballu, Patrick J. M., to Tecnoma. Diaphragm pumps with improved structural cooling and maintenance. 4,710,109, Cl. 417-454.000.

Baltes, Heinrich P.; and Huizer, Andre M. J., to LgZ Landis & Gyr Zug AG. Method and an apparatus for determining the genuineness of a security blank. 4,710,627, Cl. 250-339.000.

Bandara, Upali; Hinkel, Holger; Steiner, Werner; and Trippel, Gerhard, to International Business Machines Corporation. Magnetic disk and method of making same. 4,710,424, Cl. 428-325.000.

Bando Chemical Industries, Inc.: See—
Takeuchi, Koichi; Yamanaka, Megumi; Kubo, Masayoshi; Katayama, Hideaki; and Tokunaga, Kenji, 4,710,255, Cl. 156-361.000.

Bando Chemical Industries, Ltd.: See—
Matsuoka, Hiroshi; and Onoe, Susumu, 4,710,155, Cl. 474-260.000.

Banno, Haruhiko; and Yataqui, Shigeo, to Kabushiki Kaisha Toshiba. Computer image display apparatus. 4,710,771, Cl. 340-811.000.

Barbaglia, Joseph C.: See—
Wilson, Richard A.; and Barbaglia, Joseph C., 4,709,924, Cl. 273-260.000.

Barnard, Andrew A.: See—
Stevens, Leonard W.; Siwik, William S.; Moore, William A.; Brown, Wayne M.; and Barnard, Andrew A., 4,709,545, Cl. 60-39.080.

Barnes, Austen B. Axial locking device. 4,709,454, Cl. 24-590.000.

Barnes, Hugh V., to TI Gas Spares Limited. Gas cookers. 4,709,687, Cl. 126-42.000.

Barnett, Earl D., to Chicago Show Printing Co. Support bracket for signs and advertising displays. 4,709,891, Cl. 248-214.000.

Barouh, Victor; and Dinsky, Seth. Desk-top correction ribbon system. 4,710,047, Cl. 400-697.000.

Barr, Dallas N.: See—
Sluss, Elmer C.; Nettleton, John E.; and Barr, Dallas N., 4,710,941, Cl. 372-87.000.

Barrick, Fred A. Combination device for applying tire chains and mounting a jack. 4,709,432, Cl. 7-100.000.

Barry, Michael W.: See—
Tompkins, E. Neal; Arends, Thomas C.; and Barry, Michael W., 4,710,917, Cl. 370-62.000.

Barth, Russell W.; and Buess, Ronald P., to Uni-Grip, Inc. Core structure for use in a seal. 4,710,416, Cl. 428-119.000.

Barthel, Walter: See—
Muller, Karl H.; and Barthel, Walter, 4,710,229, Cl. 106-281.000.

Bartholomaeus, Reiner; and Widmann, Karlheinz, to Mannesmann Rexroth GmbH. Proportional magnet. 4,709,619, Cl. 92-130.000.

Bartl, Knut; and Lill, Helmut, to Boehringer Mannheim GmbH. Process and reagent for the determination of fibrin monomer in plasma. 4,710,459, Cl. 435-13.000.

Barto, Ronald J.; Goodstine, Stephen L.; and Noto, Frank A., to Combustion Engineering, Inc. Method for determining the existence of phosphate hideout. 4,709,664, Cl. 122-379.000.

Bartolles, Rolf, to Rheinmetall GmbH. Obturator ring for a cannon. 4,709,616, Cl. 89-26.000.

Bartolozzi, Roberto: See—
Biagini, Giuliano; and Bartolozzi, Roberto, 4,709,854, Cl. 236-20.000.

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Bachl, Robert; Warzelhan, Volker; Schwieter, Guenther; Gropper, Hans; and Ball, Wolfgang, 4,710,552, Cl. 526-116.000.

Geiss, Karl-Heinz; Schmied, Bernhard; Raschack, Manfred; Lehmann, Hans-Dieter; Gries, Josef; and Ruebsamen, Klaus, 4,710,496, Cl. 514-183.000.

Hoffmann, Gerhard; Hofmann, Reiner; and Elzer, Albert, 4,710,446, Cl. 430-281.000.

Lechtken, Peter; Buethel, Ingolf; Jacobi, Manfred; and Trimborn, Werner, 4,710,523, Cl. 522-14.000.

BASF Corporation: See—
Finnan, Jeffrey L.; Lisa, Rudolph E.; and Schmidt, Douglass N., 4,710,519, Cl. 514-629.000.

Basham, Michael T.; Berdahl, Robert M.; and Field, Bruce E., to Tennant Company. Speed and steering control for a floor maintenance machine. 4,709,771, Cl. 180-6.500.

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Lebas, Jean-Marie; Rat, Pierre; Dupont, Jean-Marcel; and Vinuesa, Germain, 4,710,329, Cl. 264-3.100.

Bateman, John R.; Goodacre, Brita C.; and Smithson, Alan, to Tate & Lyle Public Limited Company. Solid fructose. 4,710,231, Cl. 127-30.000.

Batz, Willi; and Rosch, Werner, to Metallgesellschaft Aktiengesellschaft. Electrostatic precipitator electrode. 4,710,203, Cl. 55-2.000.

Bausch & Lomb Incorporated: See—
Martino, Ronald J., 4,710,636, Cl. 250-467.100.

Bavaveas, Tristan, to Eparco. Holder for a toilet cleaning product associated with an air deodorizer. 4,709,425, Cl. 4-228.000.

Bawa, Mohendra S.: See—
Witter, David E.; and Bawa, Mohendra S., 4,710,260, Cl. 156-605.000.

Baxter, Gordon D.: See—
Walling, Jorg-Hein; Cornibert, Jacques; Baxter, Gordon D.; Bottin, Marie-Francoise; Axluk, Oleg; and Reed, Phillip J., 4,710,594, Cl. 174-120.000.

Baxter Travenol Laboratories, Inc.: See—
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Bayer Aktiengesellschaft: See—
Frankowiak, Gerhard; Bechem, Martin; Gross, Rainer; Kayser, Michael; Schramm, Matthias; and Thomas, Gunter, 4,710,501, Cl. 514-256.000.

Franko, Gunter; Ockelmann, Dieter; Raue, Roderich; and Wild, Peter, 4,710,569, Cl. 544-31.000.

Meier, Helmut-Martin; Heine, Hans-Georg; Pischtschan, Alfred; Dhein, Rolf; and Rudolph, Hans, 4,710,529, Cl. 524-139.000.

Reichert, Karl-Heinz; and Koschinski, Ingo, 4,710,546, Cl. 525-420.000.

BBC Brown, Boveri & Company, Limited: See—
Blahous, Leopold; and Linhofer, Gerhard, 4,710,735, Cl. 333-175.000.

Faber, Guy; and Kuhn, Gottfried, 4,710,103, Cl. 416-219.000.

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bd Systems, Inc.: See—
Butts, J. James, Jr.; and Howard, Don R., 4,709,580, Cl. 73-178.000.

Beachley, Orville T., Jr., to Research Foundation of State University of New York. The Bisneopentyl alkyl organometallic compounds and methods of preparing same. 4,710,575, Cl. 556-1.000.

Beakes, John M.; and Finegold, Hyman B., to Statomat-Globe, Inc. Lamination stack selection method and apparatus. 4,710,085, Cl. 414-27.000.

Bechem, Martin: See—
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Beck, James M.; and Rohr, Robert D., to Beck, James M. Tamper evident bottle or package closure. 4,709,823, Cl. 215-235.000.

Becker, Roger J.: See—
Aulds, James M.; and Becker, Roger J., 4,710,641, Cl. 250-554.000.

Becton, Dickinson and Company: See—
Chupp, Vernon L., 4,710,635, Cl. 250-461.200.

Donohue, John, 4,710,524, Cl. 522-75.000.

Belfa, Fabio; and Schutz, Hans U., to Ciba-Geigy Corporation. 1:2 chromium or cobalt metal complex dyes and use thereof for dyeing leather. 4,710,198, Cl. 8-437.000.

Beghin-Say S.A.: See—
Ehret, Philippe, 4,710,184, Cl. 604-368.000.

Behar, Francoise; Roucace, Jeannine; Auger, Jean; and Boudet, Luc, to Institut Francais du Pétrole. Device for heating of solid or liquid samples in small quantities. 4,710,354, Cl. 422-80.000.

Belagaje, Ramamoorthy; Kuhstoss, Stuart A.; and Rao, R. Nagaraja, to Eli Lilly and Company. Transcription terminators. 4,710,464, Cl. 435-91.000.

Belknap, William M.; Chanasyk, Albert J.; O'Dell, Robert R.; and Girard, Donald J., to NCR Corporation. Data transmitting and receiving apparatus. 4,710,871, Cl. 364-200.000.

Bell Communications Research, Inc.: See—
Blackwell, Catherine A.; Lakshmanan, Raman; and Subramanian, Mahadevan, 4,710,870, Cl. 364-200.000.

Jackel, Janet L., 4,709,978, Cl. 350-96.140.

Tarascon, Jean-Marie, 4,710,439, Cl. 429-194.000.

Bell, Steven R.: See—
Sutphin, Richard C.; Bell, Steven R.; and Monsell, Kurt, 4,710,694, Cl. 320-21.000.

Bellars, Terence G. Tractor mounted rotary cutting equipment. 4,709,736, Cl. 144-2.000.

Bellavia, William D.; and Missert, William, to Missert, William. Method and device for establishing new dental occlusal scheme for patient. 4,710,127, Cl. 433-215.000.

Bellay, Jeffrey D.; and Powell, Theo J., to Texas Instruments Incorporated. Partitioned scan-testing system. 4,710,931, Cl. 371-25.000.

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Powell, Theo J.; Bellay, Jeffrey D.; Daniels, Martin D.; and Hwang, Yin-Chao, 4,710,933, Cl. 371-25.000.

Benayad-Cherif, Faycal E.: See—
Maddox, James F.; Kadonoff, Mark B.; Berger, Alan D.; Taivalkoski, Amy L.; George, Robert W., II; and Benayad-Cherif, Faycal E., 4,710,020, Cl. 356-1.000.

Benchev, Dimitar V.: See—
Dyakov, Nikola G.; Guguchkova-Yanchuleva, Pravoslava T.; and Benchev, Dimitar V., 4,710,196, Cl. 623-6.000.

Bennett, Richard J.: See—
Bailey, Lorraine F.; and Bennett, Richard J., 4,710,217, Cl. 65-31.000.

Bennett, Robert E. Camera flash mount. 4,710,005, Cl. 354-126.000.

Berdahl, Robert M.: See—
Basham, Michael T.; Berdahl, Robert M.; and Field, Bruce E., 4,709,771, Cl. 180-6.500.

Berfield, Robert C.; Seasholtz, Craig A.; and Fegan, Richard M., to Shop-Vac Corporation. Debris pan for rotary brush sweeper. 4,709,436, Cl. 15-79.000.

Berg, Lloyd; and Vosburgh, Mark G. Separation of ethanol from isopropanol by extractive distillation. 4,710,274, Cl. 203-51.000.

Berg, Lloyd; and Vosburgh, Mark G. Separation of isopropanol from t-butanol by extractive distillation. 4,710,275, Cl. 203-51.000.

Berger, Alan D.: See—
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Berger, Friedrich: See—
Gohler, Peter; Mangler, Rolf; Schingnitz, Manfred; Seidel, Wolfgang; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Gamburg, David, 4,710,202, Cl. 48-73.000.

Bergman, Lee H., to Toth Aluminum Corporation. Oxidation method for production of special aluminas from pure aluminum chloride. 4,710,369, Cl. 423-625.000.

Bergmeier, Stephen C.; Downs, David A.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, to Warner-Lambert Company. O-substituted tetrahydropyridine oxime cholinergic agents. 4,710,508, Cl. 514-357.000.

Bergstrom, Donald J.; and Wolfer, Allan J., to Anacomp, Inc. Process and apparatus for characterizing and controlling a synchronous motor in microstepper mode. 4,710,691, Cl. 318-696.000.

Bergwerksverband GmbH: See—
Pollert, Georg, 4,710,302, Cl. 210-696.000.

Berke, Howard M.; and Lyons, Harold W., to Whelen Engineering Co., Inc. Siren with remote driver. 4,710,749, Cl. 340-405.000.

Berke, Joseph J.: See—
Muller, George H., 4,709,697, Cl. 128-303.000.

Bernard, John A.; Henry, Allan F.; Lanning, David D.; and Kwok, Kwan W., to Massachusetts Institute of Technology. Apparatus and method for closed-loop control of reactor power. 4,710,341, Cl. 376-216.000.

Bernhard, Ragnar: See—
Santen, Sven; Eriksson, Sven; and Bernhard, Ragnar, 4,710,269, Cl. 162-30.100.

Bernstein, Michael: See—
Lerner, Michael; Bernstein, Michael; and Selame, Robert, 4,709,429, Cl. 4-661.000.

Berol Kemi AB: See—
Elsby, Leif; and Carlsson, Agneta, 4,710,267, Cl. 162-5.000.

Berry, W. Wes, to Advanced Separation Technologies Incorporated. Continuous recovery of sulfur oxide from flue gas. 4,710,364, Cl. 423-244.000.

Berta, Joseph: See—
Joseph, Gerald; and Berta, Joseph, 4,709,908, Cl. 267-140.400.

Bertelli, Guido; and Locatelli, Renato, to Himont Incorporated. Flame resistant thermoplastic polymeric compositions comprising (1) melamine bromohydrate and (2) Sb or As compound endowed with improved flame-resistance. 4,710,528, Cl. 524-100.000.

Bertram, Leo: See—
Schroder, Johann; Gawron, Klaus; Bertram, Leo; and Schemmann, Hugo, 4,709,752, Cl. 165-47.000.

Besanceney, Michel, to Alstom. Inspection device for rotor binding defects in electrical machines. 4,709,582, Cl. 73-622.000.

Bestenreiner, Georg: See—
Tittzer, Gabriel; Junghans, Ewald; Bestenreiner, Georg; and Dahm, Christian, 4,710,034, Cl. 384-110.000.

Betts Industries, Inc.: See—
Pierson, Karl B.; Mooney, Thomas E.; and Jones, William G., 4,709,901, Cl. 251-58.000.

Beuhler, Allyson J.: See—
Polak, Anthony J.; and Beuhler, Allyson J., 4,710,278, Cl. 204-129.000.

Beyda, Marilyn: See—
Beyda, Marlee; and Beyda, Marilyn, 4,709,954, Cl. 294-142.000.

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Biagini, Giuliano; and Bartolozzi, Roberto, to Nuovopignone-Industrie Meccaniche e Fonderia S.p.A. System for regulating temperature of hot water in wall-hung instantaneous mixed gas heating units. 4,709,854, Cl. 236-20.000.

Bianchi, Valerio; and Conticelli, Carlo, to Weber S.p.A. System for automatically controlling the idling speed of an internal combustion engine. 4,709,674, Cl. 123-339.000.

BICC Public Limited Company: See—
Cone, Robert W.; and Hagger, John M. R., 4,709,982, Cl. 350-96.230.

Plessner, Karl W.; and Poole, Michael J., 4,709,983, Cl. 350-96.230.

Biddle, Deloss J.: See—
McAbee, Mac P.; and Biddle, Deloss J., 4,710,598, Cl. 200-21.000.

Bielecki, Anthony: See—
Weitekamp, Daniel P.; Bielecki, Anthony; Zax, David B.; Zilm, Kurt W.; and Pines, Alexander, 4,710,714, Cl. 324-307.000.

Bierman, Albert. Electric roach trap. 4,709,502, Cl. 43-112.000.

Bigley, James E., to Scott & Fetzer Company. The Appearance fabric panel with in situ molded frame. 4,709,443, Cl. 15-339.000.

Biniars, Franz-Josef: See—
Lepand, Heinz; Huser, Margrit; Biniars, Franz-Josef; and Fuchs, Axel, 4,710,244, Cl. 148-333.000.

Biogen N.V.: See—
Murray, Kenneth, 4,710,463, Cl. 435-68.000.

Bird, Elizabeth A., to Cottage Industries (Equestrian) Limited. Girth strap. 4,709,539, Cl. 54-23.000.

Birkmire, Robert W.: See—
McCandless, Brian E.; and Birkmire, Robert W., 4,709,466, Cl. 437-5.000.

Birnbach, Curtis; and Tanner, Jay, to Quantum Diagnostics Ltd. X-ray frequency down converter. 4,710,939, Cl. 372-73.000.

Bis, Josef; and Petzelka, Antonin, to Tovarny Strojarske Techniky Koncern. Device for controlling movement of a copying roller. 4,709,434, Cl. 12-77.000.

Bishop, Daniel E., to United States of America, Army. Lever displacement gauge. 4,709,484, Cl. 33-169.000.

Black, Alfred T.: See—
Saur, Joseph W.; Reynolds, Charles P.; and Black, Alfred T., 4,710,472, Cl. 435-287.000.

Black & Decker Inc.: See—
Koehler, Heinrich P.; and Dixon, John R., 4,710,071, Cl. 408-133.000.

Black, John W., to Standex International Corporation. Wheel bracket mounting structure. 4,709,444, Cl. 16-31.000.

Blackburn, Douglas; Feldman, Albert; and Lagakos, Nicholas, to United States of America, Navy. Pressure and temperature insensitive glass and optical coatings and fibers therefrom. 4,709,987, Cl. 350-96.340.

Blackerby, William I. Apparatus and method for improving drive for a circular knitting machine to reduce wear and gear breakage. 4,709,561, Cl. 66-8.000.

Blackwell, Catherine A.; Lakshmanan, Raman; and Subramanian, Mahadevan, to Bell Communications Research, Inc. Central computer backup system utilizing localized data bases. 4,710,870, Cl. 364-200.000.

Blahous, Leopold; and Linhofer, Gerhard, to BBC Brown, Boveri & Company, Limited. Absorption circuit. 4,710,735, Cl. 333-175.000.

Blair, Christon R.; and Parker, Kenneth B., to Atlantic Richfield Company. Offshore well apparatus and method. 4,710,061, Cl. 405-195.000.

Blakeney, Andrew J.: See—
Lewis, James M.; and Blakeney, Andrew J., 4,710,449, Cl. 430-326.000.

Blanchard, Pierre, to Thomson-CSF. Process for manufacturing an anti-blooming diode associated with a surface canal. 4,710,234, Cl. 437-40.000.

Blockisch, Olaf: See—
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Blohm & Voss AG: See—
Sadler, Karl-Otto; Schmidt, Willy; and Franz, Hans-Joachim, 4,709,646, Cl. 114-5.000.

Blood Center of Southeastern Wisconsin, The: See—
Kunicki, Thomas J.; and Montgomery, Robert R., 4,710,381, Cl. 424-101.000.

Blumenthal, Jack L.: See—
Burk, Maksymilian; and Blumenthal, Jack L., 4,710,483, Cl. 502-185.000.

Bly, Tom C., to Johnson Service Company. Method of injection molding and plastic part formed thereby. 4,709,757, Cl. 165-173.000.

Board of Regents, The University of Texas System: See—
Vaughn, Mark R., 4,710,035, Cl. 384-115.000.

Boblitt, Wayne W., to United States of America, Navy. Method for cutting complex tooth profiles in a cylindrical, single-screw gate-rotor. 4,710,076, Cl. 409-26.000.

Bocchi, Vittorio: See—
Gardini, Gian P.; and Bocchi, Vittorio, 4,710,400, Cl. 427-121.000.

Bocci, Paul M.; Pietrzak, Carl M., Jr.; and Wilson, Alan L., to Motorola, Inc. Signal selection by statistical comparison. 4,710,945, Cl. 375-100.000.

Bocci, Paul M.; Pietrzak, Carl M., Jr.; and Wilson, Alan L., to Motorola, Inc. Data detection by statistical analysis. 4,710,957, Cl. 380-42.000.

Bock, Jan; Pace, Salvatore J.; and Schulz, Donald N., to Exxon Research and Engineering Company. Enhanced oil recovery with hydrophobically associating polymers containing N-vinyl-pyrrolidone functionality. 4,709,759, Cl. 166-275.000.

Boda, Keiji; Waki, Kouichiro; and Yanagisawa, Keizo, to Mazda Motor Corporation; and Japan Automatic Transmission Co., Ltd. Control of a vehicle automatic transmission. 4,709,596, Cl. 74-868.000.

Bodor, Nicholas S., to Otsuka Pharmaceutical Co., Ltd. Soft steroids having anti-inflammatory activity. 4,710,495, Cl. 514-174.000.

Bodovsky, Paul W.; and Rodgers, Donald H., to Continental Conveyor & Equipment Co., Inc. Air filtering apparatus with roller assembly for cleaning. 4,710,207, Cl. 55-290.000.

Boehringer Mannheim Corporation: See—
Davison, Dale, 4,710,075, Cl. 408-202.000.

Boehringer Mannheim GmbH: See—
Bartl, Knut; and Lill, Helmut, 4,710,459, Cl. 435-13.000.

Mertens, Alfred; Holck, Jens-Peter; Kampe, Wolfgang; Muller-Beckmann, Bernd; Strein, Klaus; and Schaumann, Wolfgang, 4,710,510, Cl. 514-394.000.

Boeing Company, The: See—
Coe, Richard J., 4,710,775, Cl. 343-727.000.

Pinson, George T., 4,709,876, Cl. 244-3.160.

Bogan, Gary W.; Lucas, Peter A.; Monnerat, Georgia A.; and Aldrich, Dale J., to Dow Chemical Company, The. Laminates from epoxidized phenol-hydrocarbon adducts. 4,710,429, Cl. 428-417.000.

Boggero, Henri, to Matra. Temperature sensitive pyrotechnical train interruption device. 4,709,637, Cl. 102-481.000.

Boginsky, Vladimir P.: See—
Kostylev, Alexandr D.; Boginsky, Vladimir P.; Smolyanitsky, Boris N.; Syryamin, Jury N.; Danilov, Boris B.; Kogan, David I.; and Saveliev, Vyacheslav N., 4,709,768, Cl. 175-296.000.

Bogsch, Erik: See—
Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefko, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jeno; Csizer, Eva; Vezér, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.000.

Boland, Leona G.; Stevens, Robert A.; Wilson, John C.; and Zehner, Georgia L., to Kimberly-Clark Corporation. Form-fitting self-adjust-

- ing disposable garment with a stretchable bodyside liner. 4,710,187, Cl. 604-385.00A.
- Bolden Aktiebolag: See—
Dyvik, Froystein; and Mioen, Thomas K., 4,710,277, Cl. 204-119.000.
- Bolton, Curtis W., III: See—
Bradfield, James E.; Kahil, John E.; Jaynes, Mark S.; Moake, Gordon L.; Milewits, Marvin; Bolton, Curtis W., III; Lam, Clive C.; and Stanley, Roderic K., 4,710,712, Cl. 324-227.000.
- Bonenberger, Kenneth E., to Litton Systems, Inc. Limited rotation twist capsule. 4,710,131, Cl. 439-13.000.
- Bonenfant, Alain: See—
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- Bongiovanni, Nicola; and Cianfarani, Vincent. Highway cable clamp. 4,709,887, Cl. 248-66.000.
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- Boston University, Trustees of: See—
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- Brendel, Kathleen E.: See—
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- Brenner, Barnett S. Recirculating heating system. 4,709,855, Cl. 237-12.30A.
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- Bridgestone Corporation: See—
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- Briggs, Thomas B.: See—
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- British Aerospace PLC: See—
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- Broman, Donald E.; Hansen, Loren F.; and Huber, Donald J., to Outboard Marine Corporation. Grass/lawn debris handling system. 4,709,541, Cl. 56-202.000.
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- Brown, Garrett W. Suspension system for supporting and conveying equipment, such as a camera. 4,710,819, Cl. 358-229.000.
- Brown & Root, Inc.: See—
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- Brownstein, Scott A.: See—
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- Brusch, Donald W.: See—
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- Bryant, David R.; and Galley, Richard A., to Gambro Dialysatoren KG; and Gambro Lundia AB. Process for removing triorganophosphine from an organic liquid. 4,710,587, Cl. 568-454.000.
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- Bryson, Robert M., to Hollister Incorporated. Ostomy appliance and method of making. 4,710,182, Cl. 604-339.000.
- Buck, David A. Compensating jaw assembly for power tongs. 4,709,599, Cl. 81-57.180.
- Buck, James R. Adjustable sidewardly located bar puller. 4,709,603, Cl. 82-2.500.
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- Buhayar, Eric S. Rotary cutter blade clamp. 4,709,607, Cl. 83-342.000.
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- Buis, Jeffrey A.: See—
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- Buon, Georges A.: See—
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- Burke, Michael J.; Pidosny, Richard A.; and Lehner, Gerald J., to Ford Motor Company. Electronic odometer. 4,710,888, Cl. 364-561.000.
- Burlington Industries, Inc.: See—
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- Burmester, Neal C.: See—
Harbolt, Bruce; Murata, Perry L.; and Burmaster, Neal C., 4,710,360, Cl. 422-269.000.
- Burrington, James D.: See—
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- Busak & Luyken GmbH and Co.: See—
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- Buschmann, Rudiger; Ganz, Rudolf; Willmann, Gerd; Wirth, Ludwig; Elstner, Ingo; and Jeschke, Peter, to Didier-Werke AG. Method of ceramic molding which produces a porosity gradient and the manufacture of compound moldings using this method. 4,710,480, Cl. 501-95.000.
- Buschow, Kurt H. J.: See—
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- Butterfield, Robert D., to Ivac Corporation. Detection of fluid flow faults in the parenteral administration of fluids. 4,710,163, Cl. 604-65.000.
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- Byrne, Joseph B., to Dow Chemical Company, The. Blends of a polycarbonate with a polyester-polycarbonate copolymer. 4,710,548, Cl. 525-439.000.
- C. Conradty Nurnberg GmbH & Co.: See—
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- Cagey, Lee B., to LogEtronics, Inc. Storage cassette for film processing system. 4,709,913, Cl. 271-207.000.
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- California Institute of Technology: See—
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- Camiciotti, Leonardo; and Furia, Edoardo, to Novitex s.r.l. Needle-selecting system for circular knitting machine. 4,709,563, Cl. 66-222.000.
- Camillo, Bianchi, to SILCA S.p.A. Clamp for lock key duplicating machine. 4,709,511, Cl. 51-216.00R.
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- Campbell, Frank P. Multiple purpose hanger. 4,709,838, Cl. 223-85.000.
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- Camus, Michel, to Arjomari-Prioux. Security document using optical fibers and authentication method. 4,710,614, Cl. 235-380.000.
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- Canadian Bird Equipment Limited: See—
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- Candle, Richard D., to Goodyear Tire & Rubber Company, The. Folding belt system and said belt. 4,709,806, Cl. 198-819.000.
- Candler, Darrell E. Film storage system. 4,709,869, Cl. 242-673.00R.
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- Cano, Richard A. Exercise machine. 4,709,919, Cl. 272-117.000.
- Canon Kabushiki Kaisha: See—
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- Negi, Tsuneo, 4,710,925, Cl. 371-5.000.
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- Ohta, Shinichi, 4,710,821, Cl. 358-256.000.
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- Tanaka, Kazuo, 4,710,007, Cl. 354-286.000.
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- Yamada, Masanori, 4,710,012, Cl. 354-415.000.
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- Carl Freudenberg, Firma: See—
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- Fottinger, Walter; and Jorder, Kurt, 4,709,490, Cl. 36-44.000.
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Young, Kenneth P.; Tyler, Derek E.; Cheskis, Harvey P.; and Watson, W. Gary, 4,709,746, Cl. 164-485.000.

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Lopez, Jaime; and Pasek, Eugene A., 4,710,486, Cl. 502-219.000.
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Christie, Richard D.: See—
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Christopher, T. Graham. Urinary catheter with collapsible urethral tube. 4,710,169, Cl. 604-104.000.

Chrysler Motors Corporation: See—
Metz, Marcus C., 4,709,776, Cl. 180-281.000.
Metz, Marcus C., 4,709,777, Cl. 180-286.000.

Chu, Richard C.; and Simons, Robert E., to International Business Machines Corp. Heat transfer element with nucleate boiling surface and bimetallic fin formed from element. 4,709,754, Cl. 165-133.000.

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Chupp, Vernon L., to Becton, Dickinson and Company. Dual laser excitation from single laser source. 4,710,635, Cl. 250-461.200.

Cianfarani, Vincent: See—
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Mouchotte, Daniel G. E., 4,710,617, Cl. 235-487.000.

Cinquembre, Paul-Henri. Method and apparatus for displaying particle sedimentation rates in liquids. 4,710,874, Cl. 364-413.000.

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Tazaki, Satoru, 4,710,958, Cl. 381-10.000.

Clark, Dean. Bowlers grip exerciser. 4,709,916, Cl. 272-67.000.

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Kelly, John E.; Jones, Don C.; Tuck, Frederick R.; Zimmermann, William A.; and Clark, Kenneth R., 4,710,031, Cl. 356-440.000.

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Clauss, Hermann: See—
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Clement, Gilles; and Villedieu, Eric, to Commissariat a l'Energie Atomique. Variable geometry track vehicle. 4,709,773, Cl. 180-9.320.

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Cline, Thomas L., to Corra-Board Products Co., Inc. Game board construction. 4,709,927, Cl. 273-286.000.

Cline, Thomas L., to Corra-Board Products Co., Inc. Paperboard panel construction. 4,710,417, Cl. 428-182.000.

Coastal Engineered Products Company, Inc.: See—
Coll, Gene P.; and Leonardo, Ignazio, 4,709,980, Cl. 350-96.200.

Coca-Cola Company: See—
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Rudick, Arthur G.; and Credle, William S., Jr., 4,709,734, Cl. 141-2.000.

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Reichert, William W.; Cody, Charles A.; Desesa, Michael A.; and Faulstich, Bruce K., 4,710,404, Cl. 427-386.000.

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Collart, Johannes A., to P. J. Zweegers en Zonen, B.V. Mowing device. 4,709,540, Cl. 56-13.600.

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Weissman, Sherman M.; and Collins, Francis, 4,710,465, Cl. 435-91.000.

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Dupont, Bo; Morishima, Yasuo; Collins, Nancy; Ogata, Shun-ichiro; and Lloyd, Kenneth O., 4,710,457, Cl. 435-7.000.

Colorado State University Research Foundation: See—
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Columbia University in the City of New York: See—
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Combustion Engineering, Inc.: See—
Barto, Ronald J.; Goodstine, Stephen L.; and Noto, Frank A., 4,709,664, Cl. 122-379.000.

Commercial Shearing, Inc.: See—
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Communication Devices, Inc.: See—
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Compagnie General d'Electricite: See—
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Compo Industries, Inc.: See—
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Compression Labs, Inc.: See—
Wallis, Robert H.; and Pratt, William K., 4,710,813, Cl. 358-136.000.

Conagra, Inc.: See—
Kinn, Jeffrey F.; and Connaughton, James M., Jr., 4,710,391, Cl. 426-289.000.

Condolios, Elie; to Alstom. Two-stage apparatus for clarifying liquid charged with solid matter. 4,710,291, Cl. 210-199.000.

Conea, Christopher A.: See—
Cristescu, Alex G.; and Conea, Christopher A., 4,709,463, Cl. 29-566.300.

Connelly, Elizabeth Y. Mobile clean-up device. 4,709,440, Cl. 15-257.300.

Conforto, Peter M.: See—
Olsen, Peter C., Jr.; Conforto, Peter M.; Craighead, Jimmy R.; and Wolf, David L., 4,709,538, Cl. 53-566.000.

Connaughton, James M., Jr.: See—
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Connell, Lawrence E.; and Webb, Ronald J., to Motorola, Inc. Differential CMOS comparator for switched capacitor applications. 4,710,724, Cl. 330-9.000.

Connolly, James D. Static sieve feed control. 4,710,296, Cl. 210-420.000.

Conoco Inc.: See—
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Conrad, Ulrich; Kellermann, Guenter; Breymayer, Angela; Klinker, Rolf; Schuldt, Oswald; Hoffmann, Rainer; and Fabian, Frank-Dietrich, to Daimler-Benz Aktiengesellschaft. Arrangement of a soot filter in the exhaust gas system of an internal combustion engine with an exhaust gas turbocharger. 4,709,548, Cl. 60-280.000.

Consolidated Devices, Inc.: See—
Grabovac, Bosko; and Kurtovic, Zlatko, 4,709,602, Cl. 81-483.000.

Consortium fur Elektrochemische Industrie GmbH: See—
Hafner, Walter; Ritter, Peter; Gebauer, Helmut; and Regiert, Marlies, 4,710,316, Cl. 512-20.000.

Conticelli, Carlo: See—
Bianchi, Valerio; and Conticelli, Carlo, 4,709,674, Cl. 123-339.000.

Continental Conveyor & Equipment Co., Inc.: See—
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Continental PET Technologies, Inc.: See—
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Cooley, Edward J.; and Shaw, Franklin D., to Platt Saco Lowell Corporation. Method and means of coiling start-up which prevents sliver slingover. 4,709,452, Cl. 19-159.00R.

Cooley, John. Sheetrock hanging tool. 4,709,527, Cl. 52-749.000.

Cooper Industries, Inc.: See—
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Copal Company Limited: See—
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Copeland, Henry; and Copeland, Steve M. Wet sandblasting system. 4,709,515, Cl. 51-436.000.

Copeland, Steve M.: See—
Copeland, Henry; and Copeland, Steve M., 4,709,515, Cl. 51-436.000.

Coplan, Myron J., to Albany International Corporation. Threaded end enclosure. 4,709,831, Cl. 220-304.000.

Corbo, Andrea M.: See—
Boyle, William J., Jr.; Mares, Frank; and Corbo, Andrea M., 4,710,545, Cl. 525-340.000.

Cordery, Robert A., to Pitney Bowes Inc. Apparatus and method for detecting a magnetic marker. 4,710,752, Cl. 340-551.000.

Cordes, Hugo; and Kroger, Hans. Operating arm for an earth-moving and foundation machine. 4,709,588, Cl. 74-103.000.

Corne, Robert W.; and Hagger, John M. R., to BICC Public Limited Company. Gelled oil filling compounds. 4,709,982, Cl. 350-96.230.

Cornell Research Foundation, Inc.: See—
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Walling, Jorg-Hein; Cornibert, Jacques; Baxter, Gordon D.; Bottin, Marie-Francoise; Axiuk, Oleg; and Reed, Phillip J., 4,710,594, Cl. 174-120.0SR.

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Bahrman, Helmut; Cornils, Boy; Lipps, Wolfgang; Lappe, Peter; and Springer, Helmut, 4,710,321, Cl. 200-501.150.

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Bailey, Lorraine F.; and Bennett, Richard J., 4,710,217, Cl. 65-31.000.

Borrelli, Nicholas F.; Hares, George B.; Smith, Dennis W.; and Wedding, Brent M., 4,710,430, Cl. 428-432.000.

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Cortelyou, David H., Jr. Window paint scraper. 4,709,478, Cl. 30-169.000.

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Costanzo, Phillip A.: See—
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Courtesy Mold & Tool Corporation: See—
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Cragin, Glynn P., Jr.: See—
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Cragoe, Edward J., Jr.: See—
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Craig Medical Products Ltd.: See—
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Craighead, Jimmy R.: See—
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Cramer, Barry G.; and Cramer, Roy A., to Air-O-Lator Corporation. Aspiring aeration and liquid mixing apparatus. 4,710,325, Cl. 261-24.000.

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Cramer, Barry G.; and Cramer, Roy A., 4,710,325, Cl. 261-24.000.

Credali, Lino; Corsi, Gianfranco; and Chiolle, Antonio, to Montedison S.p.A. Process for preparing two-component synthetic fibers suited for replacing cellulose fibers. 4,710,336, Cl. 264-171.000.

Credle, William S., Jr.: See—
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Cremosnik, Gregor; Timper, Joachim; and Holzberger, Johann, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for guiding a missile. 4,709,875, Cl. 244-3.130.

Crill, Philip D.; and Rubin, Michael D., to Ford Aerospace & Communications Corporation. r.f. Phase modulator. 4,710,733, Cl. 332-26.000.

Crist, Wilmer W.; and Firmin, Dan. Cementing tool. 4,709,760, Cl. 166-285.000.

Cristescu, Alex G.; and Conea, Christopher A., to Northern Telecom Limited. Apparatus for connecting conductors to terminals of a cross-connect connector for communication lines. 4,709,463, Cl. 29-566.300.

Crochet, Gerard: See—
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Croft, John E. Aperture seal for a roof mounted ventilator and method for making same. 4,709,624, Cl. 98-119.000.

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Crudele, Lester M.: See—
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Csanady, Michael, Jr., to Westinghouse Electric Corp. Retrofit friction-hydrostatic emergency lubrication system for a large rotating shaft. 4,709,785, Cl. 184-6.400.

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Cucinella, Salvatore: See—
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Curtis, Gerald J. Sealed and secured fastener. 4,710,082, Cl. 411-373.000.

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Czich, Erhard; Drott, Peter; and Haefner, Horst, to Alfred Teves GmbH. Dust cover for cylindrical elements of the type for use in a pin guide arrangement of a spot-type disc brake. 4,709,789, Cl. 188-73.440.

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Daems, Eddie R.: See—
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Dahlen, Rolf: See—
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Dahm, Christian: See—
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Dale (Mansfield) Limited: See—
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Daniels, Martin D.: See—
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Davey, Raymond G.; Dees, Martin, Jr.; and Sigman, Daniel M., Jr., to Armstrong World Industries, Inc. Method of printing a raised pattern of liquid. 4,709,631, Cl. 101-129.000.

David, Bernd; and Klingberg, Alfred, to Jungheinrich Unternehmensverwaltung KG. Industrial truck, particularly high-lift truck, also as a high-lift truck having a displaceable mast. 4,709,786, Cl. 187-9.00E.

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Davis, Gary W.: See—
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Davis, William F., to Motorola, Inc. Amplifier having improved gain-bandwidth product. 4,710,728, Cl. 330-252.000.

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De La Rue Systems Ltd.: See—
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Debus, Walter, Jr.; Osborne, Thomas L.; and Siller, Curtis A., Jr., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Digital synthesis technique for pulses having predetermined time and frequency domain characteristics. 4,710,891, Cl. 364-718.000.

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Reid, Bruce A.; and Deline, John R. M., 4,710,690, Cl. 318-685.000.

Della Fortuna, Giorgio: See—
Dozzi, Giovanni; Della Fortuna, Giorgio; and Cucinella, Salvatore, 4,710,531, Cl. 524-239.000.

Del Priore, Paul J., to RCA Corporation. Test mask for determining alignment of an automatic IC mask testing apparatus. 4,710,440, Cl. 430-5.000.

del Rosario, Luis. Vehicle warning system. 4,710,745, Cl. 340-63.000.

deLuca, Charles Q.; and Shiung, Huang J. Hydraulic hoist particularly for mounting on pick-up truck beds or the like. 4,710,090, Cl. 414-550.000.

Delvecchio, Robert M.: See—
McKee, Bobby D.; Cain, Michael P.; Delvecchio, Robert M.; and Aivaliotis, Emmanuel, 4,710,660, Cl. 310-178.000.

De Marchi, Jean-Louis: See—
Morell, Joseph; De Marchi, Jean-Louis; and Kopp, Norbert, 4,709,491, Cl. 36-121.000.

Demeyer, Pierre, to Merlin Gerin S.A. Circuit breaker with solid-state trip unit with sampling and latching at the last signal peak. 4,710,845, Cl. 361-96.000.

Denda, Toshio, to Teraoka Seiko Co., Ltd. Stretch film packaging machine. 4,709,531, Cl. 53-415.000.

Den Dunne, Margaret S.: See—
Luckey, George W.; Roth, Bernard; Brendel, Kathleen E.; and Den Dunne, Margaret S., 4,710,637, Cl. 250-486.100.

Denning Mobil Robotics, Inc.: See—
Maddox, James F.; Kadonoff, Mark B.; Berger, Alan D.; Taivalkoski, Amy L.; George, Robert W., II; and Benayad-Cherif, Faycal E., 4,710,020, Cl. 356-1.000.

Dennis, Richard K. Method and mechanism to deposit solder paste upon substrates. 4,710,399, Cl. 437-245.000.

Dennis, Timothy A., to RCA Corporation. Apparatus and method for maintaining a uniform etching solution composition. 4,710,261, Cl. 156-626.000.

Dennison, William G., to Eaton Corporation. Electromagnetic operator for a contactor with improved shock pad. 4,710,740, Cl. 335-248.000.

Denton, Peter R.: See—
Singh, Bawa; and Denton, Peter R., 4,710,283, Cl. 204-298.000.

Denton Vacuum Inc.: See—
Singh, Bawa; and Denton, Peter R., 4,710,283, Cl. 204-298.000.

De Paepe, Gilbert; and Crochet, Gerard, to Sereg. Electromagnetic flow meter using a pulsed magnetic field. 4,709,583, Cl. 73-861.170.

Dermatological Products of Texas: See—
Bordovsky, Michael J.; and Feik, John W., 4,709,712, Cl. 132-7.000.

DeRossett, Edmund Z.; and Luceri, Thomas J., to Personal Products Company. Clean and dry appearance facing. 4,710,186, Cl. 604-383.000.

Deseret Medical, Inc.: See—
Cartmell, Robert L.; Daugherty, Charles W.; and Ireland, David B., 4,710,175, Cl. 604-177.000.

Desesa, Michael A.: See—
Reichert, William W.; Cody, Charles A.; Desesa, Michael A.; and Faulstich, Bruce K., 4,710,404, Cl. 427-386.000.

deSolms, Jane: See—
Baldwin, John J.; Huff, Joel R.; Vacca, Joseph P.; Young, Steven D.; deSolms, Jane; and Guare, James P., Jr., 4,710,504, Cl. 514-267.000.

des Ordon, Jacques R.: See—
Grenier, Gilles; Maffert, Jerome; Merle, Jean-Pierre; and des Ordon, Jacques R., 4,710,028, Cl. 356-375.000.

de Tavares, Joaquim. Toothbrush with gravity switch. 4,709,438, Cl. 15-167.00A.

Deutsch, Ida: See—
Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefko, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jenő; Csizer, Eva; Vezér, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.00R.

Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V.: See—
Ries, Joachim; and Dorgeloh, K. Heinrich W., 4,710,809, Cl. 358-109.000.

Deutsche ITT Industries GmbH: See—
Gassmann, Gerhard G.; Schat, Hermannus; Elmis, Herbert; Novotny, Bernd; Kappeler, Otmar; and Ehrhardt, Dietmar, 4,710,814, Cl. 358-143.000.

Deutsche Thomson-Brandt GmbH: See—
Rilly, Gerard, 4,710,859, Cl. 363-21.000.

Devaney, Mark J.: See—
Slater, Daniel A.; Meredith, William A.; and Devaney, Mark J., 4,710,352, Cl. 422-63.000.

Develco: See—
Rorden, Louis H.; and Moore, Thomas C., 4,710,708, Cl. 324-207.000.

DeVos, Jerry, to Atara Corporation. Digester tank with foam control cover. 4,710,292, Cl. 210-218.000.

Dhein, Rolf: See—
Meier, Helmut-Martin; Heine, Hans-Georg; Pischtschan, Alfred; Dhein, Rolf; and Rudolph, Hans, 4,710,529, Cl. 524-139.000.

Di Benedetto, Orazio: See—
Cucinotta, Luigi; and Di Benedetto, Orazio, 4,709,797, Cl. 192-106.200.

Dick, P. R. Pharmaceutical dermal compositions with prolonged and continuous action based on essential fatty acids. 4,710,383, Cl. 424-449.000.

Didier-Werke AG: See—
Buschmann, Rudiger; Ganz, Rudolf; Willmann, Gerd; Wirth, Ludwig; Elstner, Ingo; and Jeschke, Peter, 4,710,480, Cl. 501-95.000.

Winkelmann, Manfred; Muschner, Udo; and Gerber, Pierre, 4,709,905, Cl. 266-270.000.

Diebold, Incorporated: See—
Anders, Walter G.; Grosswiller, Leo J., Jr.; Lozier, Benjamin F.; and Rozlosnik, Alan J., 4,710,098, Cl. 415-149.00A.

DiEgidio, Leo C. Electoral college game. 4,709,926, Cl. 273-257.000.

DigiRad Corporation: See—
Alvarez, Robert; Lehmann, Leonard; and Strul, Bruno, 4,710,624, Cl. 250-228.000.

DiOulio, Peter C.; and Stalzer, Henry, to Pitney Bowes Inc. Electronic postage meter having a nonvolatile memory selection means. 4,710,882, Cl. 364-464.000.

Dimier, Jean-Pierre; and Rullier, Pierre, to Salomon S.A. Safety ski binding including an automatic compensation mechanism. 4,709,942, Cl. 280-618.000.

Dinsky, Seth: See—
Barouh, Victor; and Dinsky, Seth, 4,710,047, Cl. 400-697.000.

Disko, Harry: See—
Rasmussen, Russell G.; Stubenfall, Leonard J.; and Disko, Harry, 4,710,146, Cl. 446-308.000.

Disser, Robert J.: See—
Lehnhoff, Richard N.; and Dissar, Robert J., 4,710,685, Cl. 318-287.000.

Dixon, John R.: See—
Koehler, Heinrich P.; and Dixon, John R., 4,710,071, Cl. 408-133.000.

Djordjevic, Ilija; and Ganser, Marco, to Stanadyne, Inc. Modular accumulator injector. 4,709,679, Cl. 123-447.000.

Dobruskin, Moisey: See—
Chak, Maryan; and Dobruskin, Moisey, 4,710,282, Cl. 204-228.000.

Dr. Ing.h.c.F. Porsche Aktiengesellschaft: See—
Ampferer, Herbert, 4,709,670, Cl. 123-195.00C.

von Sivers, Rolf, 4,709,778, Cl. 180-292.000.

Doddapaneni, Narayan, to Honeywell Inc. High rate metal oxyhalide cells. 4,710,437, Cl. 429-101.000.

Dohi, Takashi: See—
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, 4,710,688, Cl. 318-603.000.

Doi, Hajime: See—
Matsumoto, Fujio; Doi, Hajime; Mizushima, Kunio; Funahashi, Masaya; Taniguchi, Tomizo; and Sakamoto, Shoichi, 4,709,816, Cl. 206-444.000.

Doi, Yoshihiko; Kuroishi, Nobuhito; Ochi, Shigeki; and Uenishi, Noboru, to Japan as represented by Director-General, Agency of Industrial Science & Technology. Manufacturing method of super-heat-resisting alloy material. 4,710,345, Cl. 419-28.000.

Doittau, Pierre O.; and Moal, Herve, to Matra. Device for monitoring the state of an electric switch or an electric relay. 4,710,645, Cl. 307-115.000.

Dolan, John E. Automatic toilet bowl cleaner device. 4,709,424, Cl. 4-228.000.

Dolhyj, Serge R.; Shaw, Wilfrid G.; and Pepera, Marc A., to Standard Oil Company, The. Method for preparing a supported mixed-metal oxide oxidation catalyst. 4,710,484, Cl. 502-208.000.

Dollard, Walter J.; Doshi, Pratap K.; and George, Raymond A., to Westinghouse Electric Corp. Mechanical spectral shift reactor. 4,710,340, Cl. 376-209.000.

Donn, Anthony; and Koester, Charles J. Intraocular-external lens combination system and method of using same. 4,710,197, Cl. 623-6.000.

Donohue, John, to Becton, Dickinson and Company. High energy radiation stabilization of semi-crystalline polymers. 4,710,524, Cl. 522-75.000.

Dorgeloh, K. Heinrich W.: See—
Ries, Joachim; and Dorgeloh, K. Heinrich W., 4,710,809, Cl. 358-109.000.

Dornow, Karl-Dietrich. Method and apparatus for controlling peeling machines for peeling fruit or vegetables. 4,710,389, Cl. 426-231.000.

Doro, Guilio: See—
Roederer, Antoine G.; Doro, Guilio; and Lisi, Marco, 4,710,776, Cl. 343-778.000.

Dorsey, Robert T.: See—
Borchardt, Michael G.; Dorsey, Robert T.; and Kamp, Ewald A., 4,710,968, Cl. 383-63.000.

Dosaka, Katsumi: See—
Kumanoya, Masaki; Fujishima, Kazuyasu; and Dosaka, Katsumi, 4,710,901, Cl. 365-190.000.

Doshi, Pratap K.: See—
Dollard, Walter J.; Doshi, Pratap K.; and George, Raymond A., 4,710,340, Cl. 376-209.000.

Doty, Francis D., to Doty Scientific, Inc. High voltage capacitor wand for high power tuned circuits. 4,710,719, Cl. 324-318.000.

Doty Scientific, Inc.: See—
Doty, Francis D., 4,710,719, Cl. 324-318.000.

Dotzauer, Peter; and Schmidt, Martin, to Siemens Aktiengesellschaft. Cooling system for relatively movable components. 4,709,559, Cl. 62-499.000.

Dougherty, Lawrence W.; and Fendley, James R., to Zenith Electronics Corporation. Front assembly system for a tension mask color cathode ray tube. 4,710,670, Cl. 313-407.000.

Dougherty, Lawrence W.: See—
Adamski, Alfred; DeFranco, Thomas P.; and Dougherty, Lawrence W., 4,710,669, Cl. 313-402.000.

Douglas, Peter G.; and Kyffin, Morris N., to Independent Broadcasting Authority. Apparatus for improving the linearity of TV transmitters using a klystron. 4,710,815, Cl. 358-186.000.

Douglass, Harold E., Jr.; and Mahaffee, Joseph W., III, to United States of America, National Security Agency. Pneumatic audio sweep generator. 4,709,652, Cl. 116-140.000.

Dow Chemical Company, The: See—
Bogan, Gary W.; Lucas, Peter A.; Monnerat, Georgia A.; and Aldrich, Dale J., 4,710,429, Cl. 428-417.000.

Byrne, Joseph B., 4,710,548, Cl. 525-439.000.

Harley, A. Dale; Duquette, Lawrence G.; Khoury, Issam A.; and Kohatsu, Iwao, 4,710,227, Cl. 106-193.00R.

Dow Chemical Handels- und Vertriebsgesellschaft mbH: See—
Quack, Wolfgang, 4,710,413, Cl. 428-36.000.

Dow Corning Corporation: See—
Graiver, Daniel; and Kalinowski, Robert E., 4,710,405, Cl. 427-387.000.

Downs, David A.: See—
Bergmeier, Stephen C.; Downs, David A.; Moos, Walter H.; Moreland, David W.; and Teale, Haile, 4,710,508, Cl. 514-357.000.

Doyen, Daniel; and Vriz, Tarcisio, to U.S. Philips Corporation. Microwave oscillator comprising a dielectric resonator insensitive to mechanical vibrations. 4,710,729, Cl. 331-96.000.

Doyle, Francis S.; and France, Randall W., to American Telephone and Telegraph Company AT&T Information Systems. Telephone set line switch. 4,710,954, Cl. 379-427.000.

Doyle, Joseph E., III, to Motorola, Inc. Data clock oscillator having accurate duty cycle. 4,710,730, Cl. 331-116.0FE.

Dozzi, Giovanni; Della Fortuna, Giorgio; and Cucinella, Salvatore, to Anic, S.p.A. Self-extinguishing polycarbonate composition. 4,710,531, Cl. 524-239.000.

Dr. Ing.h.c.F. Porsche Aktiengesellschaft: See—
Rutschmann, Erwin; Tran-Van, Khanh; and Wagner, Joachim, 4,709,552, Cl. 60-600.000.

Weiner, Hans, 4,710,720, Cl. 324-550.000.

Drackett Company, The: See—
Richards, Randall G., 4,709,423, Cl. 4-228.000.

Dresser Industries, Inc.: See—
Patel, Arvind D.; and Salandanan, Carmelita S., 4,710,586, Cl. 560-68.000.

Scruggs, David M., 4,710,235, Cl. 148-4.000.

Dring, Eric, to Dale (Mansfield) Limited. Variable displacement fluid pump with transducer interface. 4,710,104, Cl. 417-53.000.

Dromigny, Pierre; and Schottli, Theodore, to Dromigny, Pierre. System for feeding film, forming a partial coating at least of a molded object, into a mold. 4,710,116, Cl. 425-125.000.

Drott, Peter: See—
Czich, Erhard; Drott, Peter; and Haefner, Horst, 4,709,789, Cl. 188-73.440.

Dubief, Claude: See—
Grollier, Jean F.; and Dubief, Claude, 4,710,374, Cl. 424-61.000.

Dubois, Jean-Marie: See—
Le Caer, Gerard; and Dubois, Jean-Marie, 4,710,246, Cl. 148-403.000.

Dubois, Marcel; and Fagard, Pierre, to Societe Francaise d'Equipements pour la Navigation Aeriennne. Device for displaying symbols by means of a liquid crystal matrix. 4,710,766, Cl. 340-784.000.

Dudley, Robert H.: See—
Areau, Larry D.; and Dudley, Robert H., 4,710,126, Cl. 432-58.000.

Duley, Raymond S.; and Forth, Leslie, to Advanced Micro Devices, Inc. Starlan coded data transceiver collision detection circuit. 4,710,943, Cl. 375-7.000.

Duncan, Robert; and Widener, Wade H., to Westinghouse Electric Corp. Retention strap in a grid assembly fixture. 4,709,909, Cl. 269-41.000.

Dunn, Jerry G.: See—
FitzPatrick, John R.; Dunn, Jerry G.; and Avens, Larry R., 4,710,222, Cl. 75-84.10R.

Duperon Corporation: See—
Duperon, Terry L., 4,709,804, Cl. 198-719.000.

Duperon, Terry L., to Duperon Corporation. Self-cleaning trash rack. 4,709,804, Cl. 198-719.000.

Duphar International Research B.V.: See—
Brouwer, Marius S.; and Grosscurt, Arnoldus C., 4,710,516, Cl. 514-594.000.

Dupont, Bo; Morishima, Yasuo; Collins, Nancy; Ogata, Shun-ichiro; and Lloyd, Kenneth O., to Sloan-Kettering Institute for Cancer Research. Monoclonal antibody for human hematopoietic glycoproteins and method. 4,710,457, Cl. 435-7.000.

Du Pont de Nemours, E. I., and Company: See—
Arduengo, Anthony J., 4,710,576, Cl. 556-40.000.

Chattha, Mohinder S.; and Theodore, Ares N., 4,710,543, Cl. 525-161.000.

Hillemann, Craig L., 4,710,221, Cl. 71-93.000.

Lee, Duk-Hi; Feierberg, Susan E.; and Mayer, Patricia, 4,710,319, Cl. 252-646.000.

Weed, Gregory C., 4,710,262, Cl. 156-630.000.

Wolfe, James R., Jr., 4,710,544, Cl. 525-194.000.

Dupont, Jean-Marcel: See—
Lebas, Jean-Marie; Rat, Pierre; Dupont, Jean-Marcel; and Vinuesa, Germain, 4,710,329, Cl. 264-3.100.

Duquette, Lawrence G.: See—
Harley, A. Dale; Duquette, Lawrence G.; Khoury, Issam A.; and Kohatsu, Iwao, 4,710,227, Cl. 106-193.00R.

Durr, Charles A.: See—
Sharma, Shanmuk; Hill, Donnie K.; and Durr, Charles A., 4,710,214, Cl. 62-28.000.

D'Ussel, Louis: See—
Leben, Yannick; and D'Ussel, Louis, 4,710,438, Cl. 429-119.000.

Dyakov, Nikola G.; Guguchkova-Yanchuleva, Pravoslava T.; and Benchev, Daniter V., to V T P "Maimex". Intracocular crystalline lens. 4,710,196, Cl. 623-6.000.

Dyhr, Einar. Choke valve especially used in oil and gas wells. 4,709,900, Cl. 251-5.000.

Dykes, Robert M.: See—
Townsend, Ray T.; Smith, David W.; and Dykes, Robert M., 4,709,447, Cl. 17-1.00F.

Dyvik, Froystein; and Mioen, Thomas K., to Boliden Aktiebolag. Method for manufacturing zinc hydrometallurgically. 4,710,277, Cl. 204-119.000.

E.C.H. Will (GmbH & Co.): See—
Ladewig, Dieter; and Ramcke, Bernd, 4,710,256, Cl. 156-484.000.

East/West Industries, Inc.: See—
Spinosa, Dominic J.; and Knoll, Frank, 4,709,818, Cl. 206-524.800.

Eastman Kodak Company: See—
Caine, Holden; and Brownstein, Scott A., 4,710,783, Cl. 346-76.0PH.

LaBudde, Brian R.; and Koek, Kevin C., 4,709,972, Cl. 312-208.000.

Luckey, George W.; Roth, Bernard; Brendel, Kathleen E.; and Den Dunne, Margaret S., 4,710,637, Cl. 250-486.100.

Mills, Borden H., 4,710,785, Cl. 346-153.100.

Raychaudhuri, Pranab K., 4,710,452, Cl. 430-495.000.

Slater, Daniel A.; Meredith, William A.; and Devaney, Mark J., 4,710,352, Cl. 422-63.000.

Stephenson, Stanley W., 4,710,781, Cl. 346-76.0PH.

Warren, David P., 4,710,557, Cl. 526-289.000.

Wong, Wai C., 4,710,006, Cl. 354-204.000.

Eaton Corporation: See—
Dennison, William G., 4,710,740, Cl. 335-248.000.

Richards, Elmer A., 4,709,590, Cl. 74-331.000.

Sabroff, Alvin M.; Chambers, Samuel C.; and Ream, James C., 4,709,569, Cl. 72-340.000.

Ebara Corporation: See—
Hayashi, Tadamasu; and Mizushima, Toyoshi, 4,710,266, Cl. 159-7.000.

Ebata, Makoto: See—
Degawa, Toru; Okuyama, Gen; Hashimoto, Akio; Uchida, Seiju; Fujiwara, Kouzou; Ebata, Makoto; Satou, Takashi; and Ototani, Tohei, 4,710,481, Cl. 501-123.000.

Ebato, Seigo: See—
Iguchi, Keisuke; and Ebato, Seigo, 4,710,455, Cl. 430-567.000.

Eckert, Bruce M. Tractor dual wheel remover. 4,709,474, Cl. 29-802.000.

Edlund, Roy; and Hom, Jorgen, to Busak & Luyken GmbH and Co. Double wiper seal arrangement. 4,709,932, Cl. 277-165.000.

Egawa, Akira: See—
Namai, Akihiro; Egawa, Akira; and Kodaira, Takanori, 4,710,010, Cl. 354-400.000.

Egberg, David C.: See—
Seaborne, Jonathan; and Egberg, David C., 4,710,228, Cl. 106-218.000.

Ego, Toyokazu: See—
Murakami, Saburo; Kinashi, Shoji; and Ego, Toyokazu, 4,710,333, Cl. 264-73.000.

Eguchi, Kouji: See—
Okamoto, Tatsuo; Eguchi, Kouji; and Oosaki, Saburo, 4,710,790, Cl. 357-23.600.

Ehret, Philippe; to Beghin-Say S.A. Absorbing material containing an isothiazoline-one-3 derivative, application to personal hygiene and process for manufacturing this material. 4,710,184, Cl. 604-368.000.

Ehrhardt, Dietmar: See—
Gassmann, Gerhard G.; Schat, Hermannus; Elmis, Herbert; Novotny, Bernd; Kappeler, Otmar; and Ehrhardt, Dietmar, 4,710,814, Cl. 358-143.000.

Eidenberg, Kaspar. Apparatus for the continuous hot tinning of printed circuit boards. 4,709,846, Cl. 228-34.000.

Eiskop, Robert K.: See—
Voll, Martin A.; Eiskop, Robert K.; and Yankovsky, Kharri I., 4,709,584, Cl. 73-864.440.

Ejiri, Kazushige, to Alpine Electronics Inc. Safe loading-unloading system for tray in compact disc player. 4,710,910, Cl. 369-75.200.

Ekdahl, Per A. A., to Telefonaktiebolaget LM Ericsson. Sealing device in metal cabinets, which screens off electro-magnetic fields. 4,710,590, Cl. 174-35.0GC.

El Paso Products Company: See—
Oetting, Steven L., 4,710,563, Cl. 528-501.000.

Elektro Mekani Arjang AB: See—
Faktus, Eskil; and Dahlen, Rolf, 4,710,063, Cl. 405-269.000.

Elger, Gerd. Linear coupling. 4,710,052, Cl. 403-310.000.

Eli Lilly and Company: See—
Belagaje, Ramamoorthy; Kuhstoss, Stuart A.; and Rao, R. Nagaraja, 4,710,464, Cl. 435-91.000.

Hershberger, Charles L.; and Larson, Jeffrey L., 4,710,466, Cl. 435-91.000.

Lipson, David; Liu, Benjamin L.; and Loebel, Nicolas G., 4,710,623, Cl. 250-227.000.

Eliscu, Mark: See—
Amstutz, Stanford R.; Eliscu, Mark; Lenart, Joseph M.; and Haselton, E. Fletcher, 4,710,916, Cl. 370-58.000.

Elitex concern tekstilnih strojirenstvi: See—
Curda, Otakar; Maxa, Jaroslav; and Uhlir, Pavel, 4,710,646, Cl. 307-116.000.

Ellion, M. Edmund, to Hughes Aircraft Company. Combined photo-voltaic-thermoelectric solar cell and solar cell array. 4,710,588, Cl. 136-206.000.

Ellis, Arthur B.; and van Ryswyk, Hal, to Minnesota Mining and Manufacturing Company. Surface-derivatized semiconductors with chemically sensitive luminescence. 4,710,476, Cl. 436-172.000.

Ellison, Michael J.: See—
Goodell, Fred L.; and Ellison, Michael J., 4,709,738, Cl. 152-400.000.

Elmis, Herbert: See—
Gassmann, Gerhard G.; Schat, Hermannus; Elmis, Herbert; Novotny, Bernd; Kappeler, Otmar; and Ehrhardt, Dietmar, 4,710,814, Cl. 358-143.000.

Elopak A/S: See—
Andersen, Arve, 4,709,836, Cl. 222-490.000.

Elpatronic AG: See—
Kramer, Felix, 4,710,088, Cl. 414-113.000.

Elshy, Leif; and Carlsson, Agneta, to Berol Kemi AB. Process for reducing discoloration and/or tackiness in processing waste paper fibers. 4,710,267, Cl. 162-5.000.

Elscint Ltd.: See—
Keren, Hanan; and Freundlich, David, 4,710,716, Cl. 324-309.000.

Elstner, Ingo: See—
Buschmann, Rudiger; Ganz, Rudolf; Willmann, Gerd; Wirth, Ludwig; Elstner, Ingo; and Jeschke, Peter, 4,710,480, Cl. 501-95.000.

Elzer, Albert: See—
Hofmann, Gerhard; Hofmann, Reiner; and Elzer, Albert, 4,710,446, Cl. 430-281.000.

Emberger, Roland: See—
Bruning, Jürgen; Emberger, Roland; Hopp, Rudolf; and Sand, Theodor, 4,710,392, Cl. 426-534.000.

Emerson Electric Co.: See—
Newberg, Barry M., 4,710,037, Cl. 384-537.000.

Emmons, Daniel H., to Nalco Chemical Company. Low molecular weight polyvinyl sulfonate for low pH barium sulfate scale control. 4,710,303, Cl. 210-698.000.

Emori, Yasuyoshi; and Nomura, Ikuo, to Jidosha Kiki Co., Ltd. Rack and pinion steering apparatus. 4,709,591, Cl. 74-422.000.

Empak Inc.: See—
Mortensen, Roger; and Gregerson, Barry, 4,709,834, Cl. 220-326.000.

Endo, Michio: See—
Harase, Jiro; Ohta, Kuniteru; Takeshita, Tetsuro; and Endo, Michio, 4,709,742, Cl. 164-76.100.

Energy Conversion Devices, Inc.: See—
Young, Rosa; and Ovshinsky, Stanford R., 4,710,899, Cl. 365-113.000.

Enertec: See—
Sulzer, Jean F., 4,710,828, Cl. 360-75.000.

Engineered Data Products, Inc.: See—
Price, Macy J.; Price, Macy J., Jr.; and Johnson, Mack E., 4,709,815, Cl. 206-387.000.

Engineering Patents & Equipment Limited: See—
Martin, James W., 4,709,885, Cl. 244-141.000.

Englander, Gary E.: See—
Chase, Richard P.; Englander, Gary E.; German, Martin A.; and Volk, Joseph F., 4,709,514, Cl. 51-325.000.

Enichem Elastomeri S.p.A.: See—
Carbonaro, Antonio; Gordini, Silvano; and Cucinella, Salvatore, 4,710,553, Cl. 526-142.000.

Enidine Incorporated: See—
Houghton, Benjamin T., 4,709,791, Cl. 188-315.000.

Enokizono, Takatoshi, to Kabushiki Kaisha Toshiba. Key input data emulation system. 4,710,869, Cl. 364-200.000.

Entwistle Company, The: See—
Kraft, Frederic B., 4,709,542, Cl. 57-16.000.

Environmental Diagnostics, Inc.: See—
Lattuada, Charles F.; and Gladden, Frank R., Jr., 4,709,819, Cl. 206-524.800.

Environmental Protection Systems: See—
Webster, James B., 4,710,751, Cl. 340-522.000.

Environmental Resources, Inc.: See—
Simcox, Allan W., 4,709,689, Cl. 126-448.000.

Environmental Tectonics Corporation: See—
Wachsmuth, Robert H.; and Brusch, Donald W., 4,710,128, Cl. 434-46.000.

Envirotech Corporation: See—
Davis, Steven S., 4,710,293, Cl. 210-225.000.

Eparco: See—
Bavaveas, Tristan, 4,709,425, Cl. 4-228.000.

Equivent, Inc.: See—
Lang, James J., 4,710,304, Cl. 210-734.000.

Erbs, Daryl G.: See—
Voorhis, Roger; Erbs, Daryl G.; Palmer, John M.; and Marris, Derrick A., 4,709,560, Cl. 62-508.000.

Erdman, George R., to Merck & Co., Inc. Filter assembly for dry powder filling machine. 4,709,837, Cl. 222-636.000.

Erdmann, Hermann; and Rahm, Heiko, to Erno Raumfahrttechnik GmbH. Gas generator. 4,710,359, Cl. 422-191.000.

Erickson, David A., to Illinois Tool Works Inc. Wire clip. 4,709,889, Cl. 248-74.500.

Erickson Tool Company: See—
Ramunas, Valdas S., 4,710,077, Cl. 409-232.000.

Eriksson, Sven: See—
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Erix Tool AB: See—
Alsen, Per; and Salo, Timo, 4,710,070, Cl. 408-93.000.

Erlam, David P., to Rittal-Werk Rudolf Loh GmbH & Co KG. Fan mounting. 4,710,096, Cl. 415-121.00G.

Erno Raumfahrttechnik GmbH: See—
Erdmann, Hermann; and Rahm, Heiko, 4,710,359, Cl. 422-191.000.

Essex Environmental Industries, Inc.: See—
Granberg, William J.; Wagner, Richard A.; and Hundt, Gary W., 4,709,833, Cl. 220-319.000.

Essinger, James F., Jr., to Wacker Silicones Corporation. Heat curable organopolysiloxane compositions. 4,710,559, Cl. 528-15.000.

Et.Lemer & Cie.: See—
Helary, Louis J.; and Grenon, Pierre, 4,710,342, Cl. 376-272.000.

Ethyl Corporation: See—
Kirsch, Warren B., 4,710,306, Cl. 252-8.551.

Okamoto, Ted T., 4,710,273, Cl. 203-29.000.

Pettigrew, F. Alexander, 4,710,549, Cl. 525-538.000.

Stahly, G. Patrick; and Stahly, Barbara C., 4,710,581, Cl. 560-20.000.

Etienne, Jacques: See—
Broquere, Bernard; and Etienne, Jacques, 4,709,457, Cl. 29-156.80R.

Eto, Shinichi: See—
Takizawa, Shozo; Kobayashi, Kazuyoshi; Fukuyama, Kazuo; Tani, Masanori; Yamamoto, Shoji; Yuasa, Hiroo; Nishimori, Masayoshi; Yoshida, Hiroaki; Eto, Shinichi; Hirao, Eiji; and Goto, Masaki, 4,709,935, Cl. 280-91.000.

Euroceltique S.A.: See—
Hofer, Peter, 4,710,503, Cl. 514-263.000.

Evans, James: See—
Catsimopoulos, Nicholas; McCluer, Robert; Sinn, Robert S.; and Evans, James, 4,710,490, Cl. 514-25.000.

Evans, Sean A.; Terpinski, Eva A.; and Testa, Douglas, to Interferon Sciences, Inc. Topical therapeutic composition containing oxidation inhibitor system. 4,710,376, Cl. 424-83.000.

Ewbank, Michael E.; and Johnson, Henry F., to Sundstrand Corporation. High temperature vibration isolating mount. 4,709,665, Cl. 122-510.000.

Excclermatic Inc.: See—
Kraus, Charles E., 4,709,589, Cl. 74-206.000.

Exxon Chemical Patents Inc.: See—
McAlpin, James J.; and Chow, Wai Y., 4,710,540, Cl. 525-101.000.

Exxon Research and Engineering Company: See—
Bock, Jan; Pace, Salvatore J.; and Schulz, Donald N., 4,709,759, Cl. 166-275.000.

Peiffer, Dennis G.; and Lundberg, Robert D., 4,710,555, Cl. 526-240.000.

Eye Research Institute of Retina Foundation: See—
Pomerantzeff, Oleg, 4,710,002, Cl. 351-205.000.

Faber, Guy; and Kuhn, Gottfried, to BBC Brown, Boveri & Company, Limited. Method for fastening blades on the periphery of the rotor body of a steam turbine and the turbo-machine produced by the method. 4,710,103, Cl. 416-219.00R.

Fabian, Frank-Dietrich: See—
Conrad, Ulrich; Kellermann, Guenter; Breymayer, Angela; Klinker, Rolf; Schult, Oswald; Hoffmann, Rainer; and Fabian, Frank-Dietrich, 4,709,548, Cl. 60-280.000.

Fabriques De Tabac Reunies S.A.: See—
Gaisch, Helmut; and Nyffeler, Urs, 4,709,710, Cl. 131-308.000.

Fagard, Pierre: See—
Dubois, Marcel; and Fagard, Pierre, 4,710,766, Cl. 340-784.000.

Fairchild Semiconductor Corporation: See—
Holland, Alex, 4,710,747, Cl. 340-347.0AD.

Faktus, Eskil; and Dahlen, Rolf, to Elektro Mekani Arjang AB. Non-return valve for bore hole sleeves. 4,710,063, Cl. 405-269.000.

Fanuc Ltd.: See—
Matsuura, Hitoshi; and Sakurai, Hiroshi, 4,709,482, Cl. 33-1.00M.

Obara, Haruki, 4,710,603, Cl. 219-69.00C.

Otake, Hiromasa, 4,710,119, Cl. 425-136.000.

Faulseit, Bruce K.: See—
Reichert, William W.; Cody, Charles A.; Desesa, Michael A.; and Faulseit, Bruce K., 4,710,404, Cl. 427-386.000.

Fearing, Craig; and Orsburn, Michael L., to Utah Scientific Advanced Development Center, Inc. Apparatus for allowing operator selection of a color region of a video image for receiving color corrections. 4,710,800, Cl. 358-22.000.

Feauto, Leo; and Gill, Harold. Smoke house tree. 4,709,446, Cl. 17-1.00R.

Fedotov, Vasilij: See—
Gohler, Peter; Mangler, Rolf; Schingnitz, Manfred; Seidel, Wolfgang; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Gamburg, David, 4,710,202, Cl. 48-73.000.

Fegan, Richard M.: See—
Berfield, Robert C.; Seasholtz, Craig A.; and Fegan, Richard M., 4,709,436, Cl. 15-79.00R.

Feierberg, Susan E.: See—
Lee, Duk-Hi; Feierberg, Susan E.; and Mayer, Patricia, 4,710,319, Cl. 252-646.000.

Feik, John W.: See—
Bordovsky, Michael J.; and Feik, John W., 4,709,712, Cl. 132-7.000.

Feil, Cornelia: See—
Kraemer, Dieter; Siol, Werner; Markert, Gerhard; Suetterlin, Norbert; and Feil, Cornelia, 4,710,525, Cl. 523-201.000.

Feldman, Albert: See—
Blackburn, Douglas; Feldman, Albert; and Lagakos, Nicholas, 4,709,987, Cl. 350-96.340.

Feldman, Joel A.; and Hofstetter, Edward M., to Massachusetts Institute of Technology. Voice encoder and synthesizer. 4,710,959, Cl. 381-36.000.

Fendley, James R.: See—
Dougherty, Lawrence W.; and Fendley, James R., 4,710,670, Cl. 313-407.000.

Ferag AG: See—
Honegger, Werner, 4,709,910, Cl. 270-55.000.

Ferencik, James J.: See—
Quante, Jeffrey B., III; Scoggin, Steven C.; Maxwell, Dennis L.; Rosenkoetter, Marvin W.; and Ferencik, James J., 4,709,659, Cl. 109-21.500.

Ferguson, Arthur R., to Outboard Marine Corporation. Marine propulsion device power steering system. 4,710,141, Cl. 440-61.000.

Ferranti Subsea Systems, Inc.: See—
Fitzgibbons, Michael R., 4,709,726, Cl. 137-614.040.

Ferraro, Frank A., to Warner-Lambert Company. Blade assembly featuring variable span. 4,709,477, Cl. 30-50.000.

Ferris, Ernest A., to Borg-Warner Corporation. Hydraulically-actuated starting clutch assembly with balanced piston actuation. 4,709,795, Cl. 192-106.00F.

Fersht, Rena S.: See—

Fersht, Samuel N.; and Fersht, Rena S., 4,710,027, Cl. 356-350.000.
Fersht, Samuel N.; and Fersht, Rena S., to Litton Systems, Inc. Method and apparatus for mechanical dither stabilization of a laser angular sensor. 4,710,027, Cl. 356-350.000.

FEV Motorentechnik GmbH & Co. KG: See—

Lepperhoff, Gerhard, 4,709,549, Cl. 60-295.000.
Pischinger, Franz; Lepperhoff, Gerhard; and Huthwohl, Georg, 4,709,547, Cl. 60-274.000.

Field, Bruce E.: See—

Basham, Michael T.; Berdahl, Robert M.; and Field, Bruce E., 4,709,771, Cl. 180-6.500.

Field, John R., to Plessey Overseas Limited. Electrical firing systems. 4,709,615, Cl. 89-1.560.

Fierkens, Richardus H. J.; and Pas, Ireneus J. T. M., to ASM Fico

Tooling, b.v. Automatic continuously cycleable molding system and method. 4,710,094, Cl. 414-752.000.

Filippi, Renato: See—

Turchi, Sergio; and Filippi, Renato, 4,709,680, Cl. 123-467.000.

Fima, Henri; and Janiaud, Denis, to Crouzet; and Office National d'Etudes et de Recherche Aerospatiales (O.N.E.R.A.). Vibrating string resonator. 4,710,668, Cl. 310-323.000.

Finagold, Hyman B.: See—

Beakes, John M.; and Finagold, Hyman B., 4,710,085, Cl. 414-27.000.

Finnan, Jeffrey L.; Lisa, Rudolph E.; and Schmidt, Douglass N., to BASF Corporation. Process for preparing spray dried acetaminophen powder and the powder prepared thereby. 4,710,519, Cl. 514-629.000.

Fiornascente, Nicola. Friction drive for automotive and truck accessories. 4,709,587, Cl. 74-15.630.

Firmin, Dan: See—

Crist, Wilmer W.; and Firmin, Dan, 4,709,760, Cl. 166-285.000.

First Brands Corporation: See—

Borchardt, Michael G.; Dorsey, Robert T.; and Kamp, Ewald A., 4,710,968, Cl. 383-63.000.

Fischer, Daniel O.: See—

Heyn, Lynn E.; Johnson, Malcolm L.; and Fischer, Daniel O., 4,709,419, Cl. 2-46.000.

Fisher, Theodore F.: See—

Hanson, Thomas C.; Fisher, Theodore F.; and Weber, Joseph A., 4,710,212, Cl. 62-23.000.

Fisons plc: See—

Woog, Jeffrey T., 4,710,488, Cl. 514-6.000.

FitzGerald, Tanya E.: See—

Cates, Barbara J.; and FitzGerald, Tanya E., 4,710,200, Cl. 8-574.000.

Fitzgibbon, James, to Zenith Electronics Corporation. Interactive CRT with touch level set. 4,710,759, Cl. 340-712.000.

Fitzgibbons, Michael R., to Ferranti Subsea Systems, Inc. Hydraulic coupler with floating metal seal. 4,709,726, Cl. 137-614.040.

FitzPatrick, John R.; Dunn, Jerry G.; and Avens, Larry R., to United States of America, Energy. Method for removal of plutonium impurity from americium oxides and fluorides. 4,710,222, Cl. 75-84.10R.

Flakt AB: See—

Ziemer, Wolf; Neubert, Fritz; and Holle, Wilhelm, 4,710,208, Cl. 55-355.000.

Fleetwood, Michael J.: See—

Law, Anthony G.; and Fleetwood, Michael J., 4,709,743, Cl. 164-463.000.

Fling, Russell T., to RCA Corporation. Phase calculation circuitry in digital television receiver. 4,710,892, Cl. 364-729.000.

Flora, John H.; Womack, Robert E.; Stinnett, Carlton E.; and Dalton, Claude W., to Babcock & Wilcox Company, The. Scanning apparatus and method for inspection of header tube holes. 4,710,710, Cl. 324-220.000.

Fluck, Sydney, Jr.; and Milholland, Marvin L., to Wavetek Corporation. CATV testing system. 4,710,969, Cl. 455-67.000.

FMC Corporation: See—

Green, Joseph, 4,710,530, Cl. 524-142.000.

Fogarty, Thomas J.: See—

Johnston, James H.; Hermann, George D.; and Atagi, Tanya A., 4,709,698, Cl. 128-303.120.

Foldhazy, Zoltan: See—

Klintenstedt, Kjell; Foldhazy, Zoltan; and Forsberg, Bjorn, 4,710,160, Cl. 494-64.000.

Forch, Hans, to Carl Freudenberg, Firma. Shaft and sealing ring. 4,709,930, Cl. 277-68.000.

Ford Aerospace & Communications Corporation: See—

Crill, Philip D.; and Rubin, Michael D., 4,710,733, Cl. 332-26.000.

Ford Motor Company: See—

Burke, Michael J.; Pidsony, Richard A.; and Lehner, Gerald J., 4,710,888, Cl. 364-561.000.

Forestier, Serge: See—

Lang, Gerard; Forestier, Serge; and LaGrange, Alain, 4,710,584, Cl. 560-51.000.

Forgione, Peter S.; and Singh, Balwant, to American Cyanamid Company. Alkylcarbamylmethylated amino-triazine crosslinking agents and curable compositions containing the same. 4,710,542, Cl. 525-127.000.

Formenti, Giuseppe: See—

Ruscelli, Emilio; Carrera, Cesare; and Formenti, Giuseppe, 4,709,739, Cl. 152-453.000.

Forsberg, Bjorn: See—

Klintenstedt, Kjell; Foldhazy, Zoltan; and Forsberg, Bjorn, 4,710,160, Cl. 494-64.000.

Fort Wayne Metals Research Products Corporation: See—

Michael, Mark S.; and Glaze, Scott A., 4,709,699, Cl. 128-317.000.

Forth, Leslie: See—

Duley, Raymond S.; and Forth, Leslie, 4,710,943, Cl. 375-7.000.

Foster, Clark B.: See—

Haber, Terry M.; Smedley, William H.; and Foster, Clark B., 4,710,170, Cl. 604-110.000.

Haber, Terry M.; Foster, Clark B.; and Lewis, John A., Jr., 4,710,179, Cl. 604-211.000.

Foster-Miller, Inc.: See—

Harvey, Andrew C.; Ribich, William A.; Marinaccio, Paul J.; and Sawaf, Bernard E., 4,709,453, Cl. 24-442.000.

Foster, Raymond K. Drive/frame assembly for reciprocating floor conveyor. 4,709,805, Cl. 198-750.000.

Fottinger, Walter; and Jorder, Kurt, to Carl Freudenberg, Firma. Insole. 4,709,490, Cl. 36-44.000.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: See—

Masumoto, Hakaru; and Murakami, Yuetsu, 4,710,243, Cl. 148-312.000.

France, Randall W.: See—

Doyle, Francis S.; and France, Randall W., 4,710,954, Cl. 379-427.000.

Frankowiak, Gerhard; Bechem, Martin; Gross, Rainer; Kayser, Michael; Schramm, Matthias; and Thomas, Gunter, to Bayer Aktiengesellschaft. Circulation active pyrimidinyl-dihydropyridines. 4,710,501, Cl. 514-256.000.

Franko, David W.; and Hall, Carroll R., to Texas Instruments Incorporated. Method for generating and displaying tree structures in a limited display area. 4,710,763, Cl. 340-723.000.

Franko, Gunter; Ockelmann, Dieter; Raue, Roderich; and Wild, Peter, to Bayer Aktiengesellschaft. Basic dyestuffs. 4,710,569, Cl. 544-31.000.

Frankl & Kirchner GmbH & Co KG: See—

Lengsfeld, Karl; Link, Erich; Martin, Adolf; and Wittler, Hilmar, 4,709,794, Cl. 192-18.00B.

Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: See—

Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,710,117, Cl. 425-126.00R.

Franz, Hans-Joachim: See—

Sadler, Karl-Otto; Schmidt, Willy; and Franz, Hans-Joachim, 4,709,646, Cl. 114-5.000.

Frappier, Edward P.: See—

Hull, Ezekiel H.; and Frappier, Edward P., 4,710,532, Cl. 524-310.000.

Fraser, James: See—

Davies, Roy V.; and Fraser, James, 4,710,506, Cl. 514-301.000.

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.v.: See—

Illig, Egon; and Kniep, Volkmar, 4,709,912, Cl. 271-42.000.

Frawley, Lanny J., to Cooper Industries, Inc. Pliers crimpable terminal. 4,710,140, Cl. 439-733.000.

Freberg, Dana D.; and Spencer, William R., to General Electric Company. Turbomachine airflow temperature sensor. 4,710,095, Cl. 415-48.000.

Fredenucci, Pierre, to Arjomari-Prigou. Process for the treatment of a fibrous sheet obtained by papermaking process, with a view to improving its dimensional stability, and application of said process to the field of floor and wall-coverings. 4,710,422, Cl. 428-248.000.

Freeman, Maurice E.: See—

Northrup, Walter E.; and Freeman, Maurice E., 4,710,414, Cl. 428-43.000.

Freeman, William R., Jr., to Howmet Turbine Components Corporation. Method of forming dense ingots having a fine equiaxed grain structure. 4,709,461, Cl. 29-526.300.

Freeport Minerals Company: See—

Astley, Vivian C.; and Taravella, Jody J., 4,710,366, Cl. 423-321.00R.

Freitag, Herbert; Fuhrmann, Castor; and Hosan, Hans-Josef, to Stabitus GmbH. Continuously adjustable length adjustment device. 4,709,790, Cl. 188-300.000.

Freundlich, David: See—

Keren, Hanan; and Freundlich, David, 4,710,716, Cl. 324-309.000.

Frey, Timothy J.: See—

Meyers, Peter V.; Liu, Chung-Heng; and Frey, Timothy J., 4,710,589, Cl. 136-258.0PC.

Friedman, Lee G.; Hailpern, Brent T.; Hoevel, Lee W.; and Thefaine, Yannick J., to International Business Machines Corporation. Transmit-secure non-blocking circuit-switched local area network. 4,710,769, Cl. 340-825.030.

Frisbie, Milo W.: See—

Swapp, Mavin C.; and Frisbie, Milo W., 4,709,801, Cl. 198-464.200.

Frohn, Gustav K.: See—

Mierbach, Hans-Bernd; Frohn, Gustav K.; and Blockisch, Olaf, 4,709,600, Cl. 81-57.390.

Frommann, Klaus, to Mannesmann AG. Annealing steel strip. 4,710,240, Cl. 148-156.000.

Frost, Robert T.: See—

Lowry, Hugh R.; and Frost, Robert T., 4,709,749, Cl. 164-503.000.

Fruhbusch, Heinrich. Process of removing SO₂ and NO_x from waste gases. 4,710,363, Cl. 423-239.000.

Fry Metals, Inc.: See—

Socolowski, Norbert J., 4,709,849, Cl. 228-246.000.

Fryberger, Joseph A.: See—

Smith, David E.; Olmsted, Dennis R.; and Fryberger, Joseph A., 4,709,873, Cl. 242-195.000.

Fuchs, Axel: See—

Lepand, Heinz; Huser, Margrit; Binasz, Franz-Josef; and Fuchs, Axel, 4,710,244, Cl. 148-333.000.

Fugier, Roger; de Goys de Mezerac, Charles; Joachim, Jacky; and Decagny, Michel, to Isover Saint-Gobain. Resin for a sizing composition, a process for its preparation and the sizing composition obtained. 4,710,406, Cl. 427-389.800.

Fugitt, Cullen Wayne: See—

Andrews, John R., 4,709,648, Cl. 114-363.000.

Fuhrmann, Castor: See—

Freitag, Herbert; Fuhrmann, Castor; and Hosan, Hans-Josef, 4,709,790, Cl. 188-300.000.

Fuji Electric Company, Ltd.: See—

Kawabata, Osamu, 4,710,705, Cl. 324-102.000.

Nakamura, Junji; Nishimura, Ikuma; Saito, Goro; and Matsumoto, Kozo, 4,710,436, Cl. 429-41.000.

Ueno, Masakazu, 4,709,992, Cl. 350-339.00R.

Fuji Jukogyo Kabushiki Kaisha: See—

Sakai, Yasuhiro, 4,710,151, Cl. 474-28.000.

Fuji Photo Film Co., Ltd.: See—

Aotsuka, Yasuo; Konishi, Masahiro; and Takahashi, Koji, 4,710,631, Cl. 250-354.100.

Inatsuki, Kenichi, 4,710,818, Cl. 358-214.000.

Itoh, Haruo, 4,710,832, Cl. 360-10.200.

Matsumoto, Takashi, 4,710,837, Cl. 360-110.000.

Naito, Hideki, 4,710,450, Cl. 430-351.000.

Nakajima, Nobuyoshi; and Hishinuma, Kazuhiro, 4,710,875, Cl. 364-414.000.

Naoki, Takashi; Fujioka, Takashi; Okamura, Hisashi; and Satake, Masaki, 4,710,456, Cl. 430-564.000.

Ono, Toshio; Tamai, Yasuo; Mizuno, Chiaki; Ogawa, Hiroshi; and Saito, Shinji, 4,710,421, Cl. 428-213.000.

Suzuki, Kenji; Terashita, Takaaki; and Murayama, Jin, 4,710,803, Cl. 358-41.000.

Takahashi, Kenji; Umemoto, Chiyuki; and Kato, Hisatoyo, 4,710,626, Cl. 250-327.200.

Terashita, Takaaki, 4,710,019, Cl. 355-38.000.

Ushiro, Seimei, 4,710,011, Cl. 354-403.000.

Fuji Photo Optical Co., Ltd.: See—

Harada, Yuho; Maruyama, Tsutomu; Kumakura, Yoshiyuki; and Kuwayama, Shigeo, 4,710,216, Cl. 65-4.100.

Fuji Xerox Co., Ltd.: See—

Miyao, Fumio, 4,710,918, Cl. 370-85.000.

Saito, Koichi; Fujimura, Yoshihiko; and Inoue, Nanao, 4,710,780, Cl. 346-11.000.

Fujihara, Masaaki; Fujii, Ikunori; and Fujita, Shuji, to Tokyo Juki Industrial Co., Ltd. Sewing machine presser foot lifting apparatus. 4,709,644, Cl. 112-237.000.

Fujii, Ikunori: See—

Fujihara, Masaaki; Fujii, Ikunori; and Fujita, Shuji, 4,709,644, Cl. 112-237.000.

Fujii, Yoshihiko: See—

Osaki, Shigeyoshi; and Fujii, Yoshihiko, 4,710,700, Cl. 324-58.50A.

Fujimura, Yoshihiko: See—

Saito, Koichi; Fujimura, Yoshihiko; and Inoue, Nanao, 4,710,780, Cl. 346-11.000.

Fujinawa, Tomoaki: See—

Nohara, Fujio; and Fujinawa, Tomoaki, 4,710,498, Cl. 514-242.000.

Fujioka, Takashi: See—

Naoki, Takashi; Fujioka, Takashi; Okamura, Hisashi; and Satake, Masaki, 4,710,456, Cl. 430-564.000.

Fujishima, Kazuyasu: See—

Kumanoya, Masaki; Fujishima, Kazuyasu; and Dosaka, Katsumi, 4,710,901, Cl. 365-190.000.

Fujita, Minoru, to Yamaha Hatsudoki Kabushiki Kaisha. Governor for small size vehicle. 4,709,675, Cl. 123-376.000.

Fujita, Shigetoshi: See—

Oomori, Tatsuo; Ono, Konichi; and Fujita, Shigetoshi, 4,710,937, Cl. 372-53.000.

Fujita, Shuji: See—

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Fujitsu Limited: See—

Kitahara, Takeshi, 4,710,915, Cl. 370-16.000.

Kojima, Haruo; and Akasaki, Hidehiko, 4,710,250, Cl. 156-89.000.

Maegawa, Harumi; Takai, Sakan; Sueda, Toshiaki; Irie, Shoji; and Kobata, Shoichi, 4,710,895, Cl. 365-2.000.

Okubo, Kimio; and Nemoto, Hiroshi, 4,709,512, Cl. 51-237.00R.

Shimoda, Kaneyasu; Katoh, Tadayoshi; and Ageno, Yuzo, 4,710,746, Cl. 340-347.0DD.

Shirato, Takehide; and Sekine, Shinichi, 4,710,791, Cl. 357-23.130.

Soeda, Kazuhiko; Mori, Masakazu; Nishikawa, Tsutomu; and Tomimori, Kiyoshi, 4,710,022, Cl. 356-73.100.

Suzuki, Atsushi, 4,710,904, Cl. 365-226.000.

Suzuki, Hideo, 4,710,651, Cl. 307-462.000.

Yamagishi, Wataru; and Sagawa, Masato, 4,710,242, Cl. 148-301.000.

Fujiura, Yoji: See—

Noda, Kimihiko; Fujiura, Yoji; and Hasegawa, Yoichi, 4,710,298, Cl. 210-505.000.

- Garson, Eugene: See—
Mahaffy, Reid A.; Garson, Eugene; and Ostrow, Milan R., 4,709,535, Cl. 53-473.000.
- Garst, Gregory C.: Lures with dissimilar tail lengths. 4,709,501, Cl. 43-42.240.
- Gas Energy, Inc.: See—
Russo, Onofrio N., 4,709,720, Cl. 137-385.000.
- Gassmann, Gerhard G.; Schat, Hermannus; Elms, Herbert; Novotny, Bernd; Kappeler, Otmir; and Ehrhardt, Dietmar, to Deutsche ITT Industries GmbH: Television sound receiving circuit for at least one sound channel contained in an RF signal. 4,710,814, Cl. 358-143.000.
- Gatlin, C. Elmon: Tactile training device for a tennis racket handle. 4,709,925, Cl. 273-29.00A.
- Gawron, Klaus: See—
Schroder, Johann; Gawron, Klaus; Bertram, Leo; and Schemmann, Hugo, 4,709,752, Cl. 165-47.000.
- Gaz de France: See—
Genest, Bernard, 4,710,312, Cl. 252-68.000.
- Gazzi, Luigi; and Rescaldi, Carlo, to Snamprogetti, S.p.A.: Cryogenic process for the removal of acidic gases from mixtures of gases by using solvents. 4,710,210, Cl. 62-17.000.
- Gazzi, Luigi; and Rescaldi, Carlo, to Snamprogetti S.p.A.: Cryogenic process for the selective removal of acidic gases from mixtures of gases by solvents. 4,710,211, Cl. 62-17.000.
- Geais, Robert: Railway system utilizing a linear motor for propulsion of trains. 4,709,639, Cl. 104-292.000.
- Gebauer, Helmut: See—
Hafner, Walter; Ritter, Peter; Gebauer, Helmut; and Regiert, Marlies, 4,710,316, Cl. 512-20.000.
- Gebhard, Georg R. U.; Hein, Klaus R. G.; and Glaser, Wolfgang, to Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft: Process for the dry removal of sulfur dioxide from flue gas. 4,710,365, Cl. 423-244.000.
- Gebr. Marklin & Cie. GmbH: See—
Rother, Helmut; and Reyher, Manfred, 4,709,856, Cl. 238-10.00E.
- Geczy, Bela, to Smith International, Inc.: Bearing assembly. 4,710,036, Cl. 384-275.000.
- Geiss, Karl-Heinz; Schmied, Bernhard; Raschack, Manfred; Lehmann, Hans-Dieter; Gries, Josef; and Ruebsamen, Klaus, to BASF Aktiengesellschaft: Pyrrol-1-ylphenyldihydropyridazinones, their preparation and their use. 4,710,496, Cl. 514-183.000.
- General DataComm, Inc.: See—
Manning, David J., 4,710,920, Cl. 370-100.000.
- General Dynamics Corporation: See—
Bradfield, Ganey W.; and Cragin, Glynn P., Jr., 4,709,880, Cl. 244-12.500.
- General Dynamics, Pomona Division: See—
Piesik, Edward T., 4,709,780, Cl. 181-213.000.
- General Electric Company: See—
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- Breen, Thomas B., 4,710,843, Cl. 361-96.000.
- Cline, Harvey E.; and Lorensen, William E., 4,710,876, Cl. 364-414.000.
- Cox, Frederick E.; Rink, Frederick J., Jr.; and Valachovic, Richard A., 4,710,664, Cl. 310-217.000.
- Freberg, Dana D.; and Spencer, William R., 4,710,095, Cl. 415-48.000.
- Huang, Shyh-Chin; Chang, Keh-Minn; and Taub, Alan I., 4,710,247, Cl. 148-429.000.
- Kurokawa, Haruo, 4,710,596, Cl. 379-424.000.
- Liu, Ping Y., 4,710,534, Cl. 524-411.000.
- Lowry, Hugh R.; and Frost, Robert T., 4,709,749, Cl. 164-503.000.
- Pelc, Norbert J.; and Glover, Gary H., 4,710,717, Cl. 324-309.000.
- Scott, Graham A.; and Messerli, Alan J., 4,710,844, Cl. 361-96.000.
- White, Charles M.; and Green, Wayne T., 4,710,725, Cl. 330-51.000.
- General Electric Company plc, The: See—
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- General Foods Corporation: See—
Fulger, Charles V.; and Gum, Ernest K., 4,710,386, Cl. 426-28.000.
- Vietrogoski, Charles J.; Obarowski, Richard; and McDonough, Paul J., 4,709,608, Cl. 83-355.000.
- General Instrument Corporation: See—
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- General Kinematics Corporation: See—
Musschoot, Albert, 4,709,507, Cl. 51-7.000.
- General Mills, Inc.: See—
Seaborn, Jonathan; and Egberg, David C., 4,710,228, Cl. 106-218.000.
- General Motors Corporation: See—
Baity, Donald N.; Schwandt, Gregory J.; and Kidwell, Charles E., 4,710,602, Cl. 200-315.000.
- Keen, Nicky D., 4,710,852, Cl. 361-386.000.
- Lee, Robert W.; and Schaffel, Neal A., 4,710,239, Cl. 148-101.000.
- Lehnhoff, Richard N.; and Disser, Robert J., 4,710,685, Cl. 318-287.000.
- Vahabzadeh, Hamid, 4,710,879, Cl. 364-424.100.
- General Signal Corporation: See—
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- Genest, Bernard, to Gaz de France: Stable mixtures of chlorofluorohydrocarbons and solvents and their use as heat transfer compositions for absorption heat pumps. 4,710,312, Cl. 252-68.000.
- Genicom Corporation: See—
Lim, Sam K., 4,710,045, Cl. 400-352.000.
- Gentry, Cecil C.; and Small, William M., to Phillips Petroleum Company: Heat exchanger. 4,709,755, Cl. 165-160.000.
- Genus Catheter Technologies, Inc.: See—
Fuqua, Clark R., 4,710,181, Cl. 604-280.000.
- George, Raymond A.: See—
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- George, Robert W., II: See—
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- Gerace, Michael J.; Krysiak, Gary D.; and Schiappacasse, Russell F., to Protective Treatments, Inc.: Compatible bedding compound for organically sealed insulating glass. 4,710,411, Cl. 428-34.000.
- Gerber, Pierre: See—
Winkelmann, Manfred; Muschner, Udo; and Gerber, Pierre, 4,709,905, Cl. 266-270.000.
- Gerich, Josef: See—
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- German, Martin A.: See—
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- Gettling, Lillian, to Andre Fantasies, Inc.: Shampoo cape with splash guard. 4,709,420, Cl. 2-50.000.
- Geuens, Luc, to S.A. Innovi N.V.: Wastewater purification process. 4,710,301, Cl. 210-605.000.
- Gibbons, Frank B., to Gibbons, Maxine S.: Sheet pile supported driver. 4,709,764, Cl. 173-45.000.
- Gibbons, Maxine S.: See—
Gibbons, Frank B., 4,709,764, Cl. 173-45.000.
- Giberti-Fornaciari, Serse, to Vidriera Monterrey, S.A.: Take-out tong head assembly. 4,710,218, Cl. 65-260.000.
- Gibson, Christopher S.: Portable exercise machine. 4,709,923, Cl. 272-134.000.
- Gietema, Jouke; and Oude Elberink, Bernard H. M., to Hollandse Signaalapparaten B.V.: Data converter for a pulse radar apparatus. 4,710,773, Cl. 342-185.000.
- Gil, Kim Y.; and Sun, Lee C., to Korea Advanced Institute of Science and Technology: Maraging steel having high strength and high toughness. 4,710,347, Cl. 420-94.000.
- Gill, Harold: See—
Feauto, Leo; and Gill, Harold, 4,709,446, Cl. 17-1.00R.
- Gillette Company, The: See—
Shurtliff, Jill M.; and Lee, Alejandro C., 4,709,476, Cl. 30-41.000.
- Giovanni, Conterno: See—
Giovanni, Todescato; and Giovanni, Conterno, 4,709,510, Cl. 51-177.000.
- Giovanni, Todescato; and Giovanni, Conterno: Floor sanding and polishing machine. 4,709,510, Cl. 51-177.000.
- Giovinazzo, Vincent J.: Posterior chamber intraocular lens. 4,710,195, Cl. 623-6.000.
- Girard, Donald J.: See—
Belknap, William M.; Chanasyk, Albert J.; O'Dell, Robert R.; and Girard, Donald J., 4,710,871, Cl. 364-200.000.
- Gish Biomedical, Inc.: See—
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- Gish, Larry D., to Johnson Service Company: Integral base refill system ballcock assembly. 4,709,721, Cl. 137-437.000.
- Gist-Brocades N.V.: See—
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Giuliani, Robert L.; Giuliani, Mark A.; and Giuliani, Karen A., 4,709,883, Cl. 244-63.000.
- Giuliani, Mark A.: See—
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- Giuliani, Robert L.; Giuliani, Mark A.; and Giuliani, Karen A.: Launch and ascent system. 4,709,883, Cl. 244-63.000.
- Givler, Omar R., to Portage Electric Products, Inc.: Thermostatic device with leak tight casing. 4,710,743, Cl. 337-380.000.
- Gjota, Rifat: Winding arrangement of a stator and/or rotor of a three-phase generator or electromotor with improved performances. 4,710,661, Cl. 310-198.000.
- Gladden, Frank R., Jr.: See—
Lattuada, Charles P.; and Gladden, Frank R., Jr., 4,709,819, Cl. 206-524.800.
- Glaenger Spicer: See—
Mangiavacchi, Jacques, 4,710,150, Cl. 464-14.000.
- Glaser, Wolfgang: See—
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- Glaze, Scott A.: See—
Michael, Mark S.; and Glaze, Scott A., 4,709,699, Cl. 128-317.000.
- Gleaves, Geoffrey H., to Ropol, Inc.: Self-cleaning gutter device. 4,709,516, Cl. 52-11.000.
- Gleich, Gerald J.; and Wasmoe, Terri L., to Mayo Medical Resources: Method for the determination of the imminence of labor. 4,710,475, Cl. 436-86.000.
- Global Equipment Company: See—
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- Glomb, Kurt; Niggel, Heinz; Pelzl, Leo; and Zell, Karl, to Siemens Aktiengesellschaft: Electrical plug connector strip. 4,710,132, Cl. 439-79.000.
- Glover, Gary H.: See—
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- Glowacki, Tad: Screw press for dewatering sludge and fiber suspensions. 4,709,628, Cl. 100-148.000.
- Gober, Ruel R.: Pilot valve. 4,709,727, Cl. 137-625.660.
- Gobrecht, Jens: See—
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- Godwin, Oliver W., Jr.: Means for producing a water splash shield for commodes, urinals or the like. 4,709,426, Cl. 4-300.300.
- Gohler, Peter; Mangler, Rolf; Schingnitz, Manfred; Seidel, Wolfgang; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Gamburg, David, to Brennstoffinstitut Freiberg: Apparatus for gasifying pulverized coal. 4,710,202, Cl. 48-73.000.
- Gold, Samuel: See—
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- Goodacre, Brita C.: See—
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- Goodell, Fred L.; and Ellison, Michael J., to AM General Corporation: Bead lock for pneumatic tires. 4,709,738, Cl. 152-400.000.
- Goodsmith, James E.: See—
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- Goodstine, Stephen L.: See—
Barto, Ronald J.; Goodstine, Stephen L.; and Noto, Frank A., 4,709,664, Cl. 122-379.000.
- Goodyear Tire & Rubber Company, The: See—
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- Gordini, Silvano: See—
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- Gothard, Patrick G., to Aquarium Pharmaceuticals, Inc.: Aquatic viewing system. 4,709,657, Cl. 119-5.000.
- Goto, Hideo: See—
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- Goto, Masaki: See—
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- Gottlieb, A. Arthur, to Imreg, Inc.: Treatment of autoimmune disorders with immunomodulators. 4,710,380, Cl. 424-101.000.
- Goulding, Kenneth, to British Aerospace PLC: Deployment and actuation mechanisms. 4,709,877, Cl. 244-3.280.
- Grabovac, Bosko; and Kurtovic, Zlatko, to Consolidated Devices, Inc.: Hand grip drive for torque wrenches. 4,709,602, Cl. 81-483.000.
- Graiver, Daniel; and Kalinowski, Robert E., to Dow Corning Corporation: Adhesion of silicone elastomers obtained from aqueous emulsion. 4,710,405, Cl. 427-387.000.
- Granberg, William J.; Wagner, Richard A.; and Hundt, Gary W., to Essex Environmental Industries, Inc.: Rotationally molded salvage drum and recessed lid. 4,709,833, Cl. 220-319.000.
- Granger, Douglas A.: See—
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- Gray, Randall C., to Motorola, Inc.: Voltage comparator with hysteresis. 4,710,793, Cl. 357-44.000.
- Green Cross Corporation, The: See—
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- Green, Joseph, to FMC Corporation: Flame retardant polyphenylene ether molding compositions. 4,710,530, Cl. 524-142.000.
- Green, Stephen H.; Hofstetter, Robert W., Sr.; and Hofstetter, Robert W., Jr., to I&H Conveying & Machine Company: Mass product handling ring system. 4,709,802, Cl. 198-465.100.
- Green, Wayne T.: See—
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- Greene, Hugh W.; Holder, James D.; and Knauer, James A.: Air cushion-optical data read head. 4,710,912, Cl. 369-218.000.
- Gregerson, Barry: See—
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- Grenier, Gilles; Maffert, Jerome; Merle, Jean-Pierre; and des Ordon, Jacques R., to Aerospaiale Societe Nationale Industrielle: System for locating a body in motion. 4,710,028, Cl. 356-375.000.
- Grenon, Pierre: See—
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- Grey, Michael O., to NCR Corporation: Printer having constant pressure between print head and platen. 4,710,040, Cl. 400-55.000.
- Grider, Lyle D.: Apparatus for aiding in loading a mobile work platform onto an elevated surface. 4,709,784, Cl. 182-16.000.
- Gries, Josef: See—
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- Grilliot, Mary I.: See—
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- Grilliot, William L.; and Grilliot, Mary I.: Firefighter's coat. 4,709,421, Cl. 2-81.000.
- Grinblat, Arkady: Universal exercising apparatus. 4,709,918, Cl. 272-97.000.
- Grollier, Jean F.; and Dubief, Claude, to L'Oreal: Cosmetic composition containing cationic polymers and anionic latexes. 4,710,374, Cl. 424-61.000.
- Gropper, Hans: See—
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- Gross, Akiva T.: See—
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- Gross, Anthony E.; Christie, Richard D.; and Pinder, Thomas E., to Nalco Chemical Company: Vermiculite flotation promoter. 4,710,285, Cl. 209-166.000.
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- Gross, Rainer: See—
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- Grosswiller, Leo J., Jr.: See—
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- Grumman Aerospace Corporation: See—
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- Gryp, Dennis: See—
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- GTE Laboratories Incorporated: See—
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- Baldoni, J. Gary, II; Buljan, Sergej-Tomislav; and Sarin, Vinod K., 4,710,425, Cl. 428-328.000.
- Budinger, A. Bowman; and Lapatovich, Walter P., 4,710,679, Cl. 315-58.000.
- Sigai, A. Gary, 4,710,674, Cl. 313-489.000.
- GTE Products Corporation: See—
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- Ritsko, Joseph E.; and Acla, Howard L., 4,710,368, Cl. 423-344.000.
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- Guczoghy, Lajos: See—
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- Gudymov, Ernest: See—
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- Guguchkova-Yanchuleva, Pravoslava T.: See—
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- Guiffay, Michel: Container shaped in such manner as to be unreturnable for receiving a liquid. 4,709,821, Cl. 215-1.00R.
- Guioth, Chantal H.; Maze, Etienne G.; and Rabajoie, Loick P., to Akzo NV: Process for coating an electrically conductive substrate and an aqueous coating composition based on a cationic binder. 4,710,281, Cl. 204-181.700.
- Gullers, Per, to Alfa-Laval Separation AB: Centrifugal separator. 4,710,159, Cl. 494-27.000.
- Gum, Ernest K.: See—
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- Gunny, Edmond R.: Aircraft collision avoidance system. 4,710,774, Cl. 342-455.000.
- Gurugi, Merce B.: Adjustable support for bookshelves. 4,709,892, Cl. 248-250.000.
- Gurney, Robert A.: Alarm for milk cooler. 4,710,755, Cl. 340-585.000.
- Gustafson, Troy C.: Parachute apparatus for model airplane. 4,709,884, Cl. 244-139.000.
- Gustav Georg Veith GmbH & Co.: See—
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- Guttinger, Heinz, to Sulzer-Escher Wyss AG: Method of operating a controlled deflection roll and a rolling mill equipped with at least one controlled deflection roll. 4,709,571, Cl. 72-366.000.
- Guzik, Nahum E., to Guzik Technical Enterprises: Method and apparatus for control of current in a motor winding. 4,710,686, Cl. 318-293.000.
- Guzik Technical Enterprises: See—
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- H. Lundbeck A/S: See—
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- Haarmann & Reimer GmbH: See—
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- Haas, Franz, Jr.: See—
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- Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: Apparatus for placing confectionery wafer pieces into molding depressions of casting molds. 4,710,117, Cl. 425-126.00R.
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- Haase, Wayne C. Planter monitor system. 4,710,757, Cl. 340-684.000.
- Habecker, John W.: See—
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- Haber, Terry M., to Habley Medical Technology Corporation. Implantable blood flow and occlusion pressure sensing sphincteric system. 4,709,690, Cl. 128-1.00R.
- Haber, Terry M.; Smedley, William H.; and Foster, Clark B., to Habley Medical Technology Corporation. Anti-needle strike and anti-drug abuse syringe. 4,710,170, Cl. 604-110.000.
- Haber, Terry M.; Foster, Clark B.; and Lewis, John A., Jr., to Habley Medical Technology Corporation. Snap-on vernier syringe. 4,710,179, Cl. 604-211.000.
- Haberl, Fritz, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung. Apparatus for generating a signal providing information regarding a radiating source, especially an infrared source. 4,710,619, Cl. 250-203.00R.
- Habley Medical Technology Corporation: See—
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Haber, Terry M.; Smedley, William H.; and Foster, Clark B., 4,710,170, Cl. 604-110.000.
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- Habu, Kazutaka: See—
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- Hafner, Walter; Ritter, Peter; Gebauer, Helmut; and Regiert, Marlies, to Consortium für Elektrochemische Industrie GmbH. Aldehydes, acetals, alcohols and ethers having 3-methyl- or 3,5-dimethyl-benzyl groups, their manufacture and perfume materials containing same. 4,710,316, Cl. 512-20.000.
- Hafstrom, Warren R.: See—
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- Hagedorn, Myrna L.: See—
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- Hagger, John M. R.: See—
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- Hahn, Berthold: See—
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- Hahn Manufacturing Co.: See—
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- Hahn, Ronald R., to Hahn Manufacturing Co. Adjustable platform means. 4,709,853, Cl. 232-39.000.
- Hailpern, Brent T.: See—
Cocke, John; and Hailpern, Brent T., 4,710,868, Cl. 364-200.000.
- Friedman, Lee G.; Hailpern, Brent T.; Hoevel, Lee W.; and Thefaime, Yannick J., 4,710,769, Cl. 340-825.030.
- Hakanson, Hakan: See—
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- Hakata, Yoshitami; Wakuda, Masanori; and Suzuki, Kimio, to Toshiba Kikai Kabushiki Kaisha. Phase modulation type digital position detector. 4,710,770, Cl. 340-870.180.
- Hal Leonard Publishing Corporation: See—
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- Halberstadt, Alex L.; and Hume, Roger A., to Thorn Emi plc. Incandescent lamps. 4,710,677, Cl. 313-580.000.
- Hall, Carroll R.: See—
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- Hall, David W. R.: See—
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- Hall, Ernest M., Jr.; and Buis, Jeffrey A., to Oyo Corporation. Geophone cable splice and method. 4,710,593, Cl. 174-88.00R.
- Hall Vandes, Nancy. Therapeutic doll figure. 4,710,145, Cl. 446-100.000.
- Hall, William F.: See—
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- Hallmark Cards, Incorporated: See—
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- Halverson, Ross, to Kaultronics, Inc. Dish antenna structure. 4,710,777, Cl. 343-840.000.
- Hamada, Fukusaburo: See—
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- Hamlyn, George J., to Hamlyn Overseas Trading Company Pty Ltd. Foldable chicken bolder. 4,709,626, Cl. 99-426.000.
- Hamlyn Overseas Trading Company Pty Ltd.: See—
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- Hammer, Josef; and Handschuer, Walter, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Web tension control and emergency stop system. 4,709,872, Cl. 242-75.430.
- Han, Man Y. Concrete lining machine. 4,710,058, Cl. 405-146.000.
- Hanamura, Shoji; Aoki, Masaki; and Masuhara, Toshiaki, to Hitachi, Ltd. Semiconductor including signal processor and transient detector for low temperature operation. 4,710,648, Cl. 307-443.000.
- Hancor, Inc.: See—
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- Handschuer, Walter: See—
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- Hannon, William G.: See—
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Peters, Douglas C.; and Hansen, Charles S., 4,709,955, Cl. 296-3.000.
- Hansen, Loren F.: See—
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- Hanson, Steven P.: See—
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- Harada, Yutaka, to Kabushiki Kaisha Toshiba. Group control apparatus for elevators. 4,709,788, Cl. 187-124.000.
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- Harman, R. Keith: See—
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- Harper-Wyman Company: See—
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Kubert, Vince T.; and Richards, John S., 4,709,635, Cl. 101-426.000.
- Harris, Robert D.: See—
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- Harrison, David J.: See—
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- Harrod, Lawrence R., to Kransco Manufacturing, Inc. Ridable vehicle and assembly method. 4,709,958, Cl. 296-177.000.
- Hartman, Creighton D.: See—
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- Hartmann, Willi: See—
Saalbach, Kurt; and Hartmann, Willi, 4,709,551, Cl. 60-589.000.
- Hartness International, Inc.: See—
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- Hartness, Thomas S.: See—
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- Hasegawa, Yoichi: See—
Noda, Kimihiko; Fujiura, Yoji; and Hasegawa, Yoichi, 4,710,298, Cl. 210-505.000.

- Haselton, E. Fletcher: See—
Amstutz, Stanford R.; Eliscu, Mark; Lenart, Joseph M.; and Haselton, E. Fletcher, 4,710,916, Cl. 370-58.000.
- Hashiba, Takahiro: See—
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- Hashiguchi, Koichi: See—
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Degawa, Toru; Okuyama, Gen; Hashimoto, Akio; Uchida, Seiju; Fujiwara, Kouzou; Ebata, Makoto; Satou, Takashi; and Ototani, Tohei, 4,710,481, Cl. 501-123.000.
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- Hashimoto, Takashi: See—
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- Hashimoto, Takatsugu: See—
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- Hattori, Michihiro: See—
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- Hauke, Gunter: See—
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- Hawkins, Clive F. J., to PAG Limited; and PAG America Ltd. Battery connector. 4,709,974, Cl. 439-345.000.
- Hayama, Mamoru, to Mazda Motor Corporation. Cruise control system for vehicle. 4,709,595, Cl. 74-864.000.
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- Hayashi, Shinichi: See—
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- Hayashi, Terumine: See—
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- Hayashi, Toshihide; Yamakami, Osamu; and Kanayama, Ikuo, to Sony Corporation. SHF receiver. 4,710,972, Cl. 455-179.000.
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- Hayashibara, Ken: See—
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- Hayden, Richard F.: See—
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- Hayes-Ivy Manufacturing Inc.: See—
Knight, Silsby H., 4,709,715, Cl. 134-172.000.
- Hazlegrove, Billy M.; and Roberts, Richard A., to Brown & Root, Inc. Method and apparatus for simultaneous trenching and pipe laying in an arctic environment. 4,710,059, Cl. 405-162.000.
- Headen, James, to Radian Tool Corporation. Method of manufacturing unidirectional drive tool. 4,709,598, Cl. 76-114.000.
- Heath, Allen W., to International Business Machines Corporation. Table driven print formatting. 4,710,886, Cl. 364-519.000.
- Heess, Gerhard; and van Zanten, Anton, to Robert Bosch GmbH. Brake pressure booster in vehicle brake systems. 4,709,969, Cl. 303-114.000.
- Hefner, Heinz-Achim: See—
Waschler, Eckehard; Clauss, Hermann; and Hefner, Heinz-Achim, 4,710,264, Cl. 437-228.000.
- Hehl, Karl. Injection mold changing unit. 4,710,121, Cl. 425-190.000.
- Hehn, Bruce A.; and Sankey, James K., to Alpha Enterprises, Inc. Compact disc cleaner. 4,709,437, Cl. 15-97.00R.
- Heil, Balint: See—
Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefko, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jeno; Csizer, Eva; Vezzer, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotoryi, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.00R.
- Hein, Klaus R. G.: See—
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- Heine, Hans-Georg: See—
Meier, Helmut-Martin; Heine, Hans-Georg; Pischtschan, Alfred; Rhein, Rolf; and Rudolph, Hans, 4,710,529, Cl. 524-139.000.
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- Hekimian Laboratories, Inc.: See—
Bailey, George, 4,710,890, Cl. 364-703.000.
- Helary, Louis J.; and Grenon, Pierre, to Et.Lemer & Cie. Structure assemblable and disassemblable on a racking site for the storage of nuclear reactor fuel elements. 4,710,342, Cl. 376-272.000.
- Helena Laboratories Corporation: See—
Mayes, David G., 4,709,810, Cl. 206-205.000.
- Hella KG Hueck & Co.: See—
Urbschat, Ulrich, 4,710,855, Cl. 362-66.000.
- Heller, Jorge; Skinner, Wilfred A.; Saito, Kenichiro; and Satoh, Susumu, to Nitto Electric Industrial Co., Ltd. Method for percutaneously administering physiologically active agents. 4,710,497, Cl. 514-221.000.
- Hembree, Charles B.; and Shea, Brian T., to Wing Aero. Glass cutting device. 4,709,483, Cl. 33-18.100.
- Henderson, James S., to New Holland Inc. Expelled deflector for manure spreaders. 4,709,861, Cl. 239-675.000.
- Henne, Heinrich; Patzelt, Norbert; Schneider, Lutz T.; Knobloch, Osbert; and Muller, Manfred, to Krupp Polysius AG. Method and apparatus for the crushing of material. 4,709,864, Cl. 241-167.000.
- Hennon, Erin D.; and Keller, Thomas J., to Dana Corporation. Bearing cap assembly. 4,710,038, Cl. 384-569.000.
- Henri, Leonard; and Seigneurin, Michel, to Micro-Mega S.A. Precision injection system and method for intraligmental anesthesia. 4,710,178, Cl. 604-209.000.
- Henrich, Hans-Otto; and Rienecker, Reimund, to J. M. Voith GmbH. Fibrous suspension pressurized sorter. 4,710,287, Cl. 209-270.000.
- Henry, Allan F.: See—
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- Henry Ford Hospital: See—
Levin, Nathan W.; and Zasuwa, Gerard A., 4,710,164, Cl. 604-66.000.
- Hercules Incorporated: See—
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- Hereth, Michael R.; and Martin, Patricia A., to Wang Laboratories, Inc. Pseudo-static memory subsystem. 4,710,903, Cl. 365-194.000.
- Herlemann, Werner: See—
Paerisch, Jochen; Herlemann, Werner; and Schaetzler, Walter, 4,709,959, Cl. 296-217.000.
- Hermann Berstorff Maschinenbau GmbH: See—
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- Hermann, George D.: See—
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- Hersevoort, Aart: See—
Uiterwaal, Dirk J. D.; and Hersevoort, Aart, 4,710,387, Cl. 426-72.000.
- Hershberger, Charles L.; and Larson, Jeffrey L., to Eli Lilly and Company. Method of cloning modified streptomycetes DNA. 4,710,466, Cl. 435-91.000.
- Hershey Foods Corporation: See—
Holmgren, Mark E.; Parrish, Gregory K.; and Cartier, Philip A., 4,710,393, Cl. 426-660.000.
- Herzog, Hans-J.: See—
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- Herzog, Michael. Rotary feeder to orient and feed bottle caps and similar parts. 4,709,798, Cl. 198-380.000.
- Heule, Heinrich. Cone drill bit. 4,710,072, Cl. 408-18.000.
- Hewlett-Packard Company: See—
Lacey, Richard F., 4,710,001, Cl. 350-632.000.
- Heyn, Lynn E.; Johnson, Malcolm L.; and Fischer, Daniel O., to Kimberly-Clarke Corporation. Cover garment with inner garment access option. 4,709,419, Cl. 2-46.000.
- Heyne, Carl J.; and Tomasic, Nicholas A., to Westinghouse Electric Corp. Circuit breaker having shock-proof trip-actuating assembly. 4,710,739, Cl. 335-174.000.
- Hicks, John W., Jr., to Polaroid Corporation. Ensheathed optical fiber and coupling method. 4,709,986, Cl. 350-96.330.
- Higashi, Michiya: See—
Ikeya, Hiroto; and Higashi, Michiya, 4,710,796, Cl. 357-72.000.
- Higashihara, Toshio: See—
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- High Resolution Television, Inc.: See—
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- Higomura, Makoto, to Canon Kabushiki Kaisha. Control system for positioning an object using switching from a speed control mode to a position control mode with adjustable gain. 4,710,865, Cl. 364-170.000.
- Higuchi, Misao, to NEC Corporation. Non-volatile semiconductor memory device having an improved write circuit. 4,710,900, Cl. 365-189.000.
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Hill, Donnie K.: See—
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Hill, Kevin E., to Milco Manufacturing Company. Self-releasing ratchet-type seat adjustment. 4,709,961, Cl. 297-284.000.

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Himont Incorporated: See—
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Hinch, Henry H.; Boyne, Gail E.; Daniels, David L.; and Kullmann, Eugene V., to Amoco Corporation. Method and apparatus for X-ray video fluoroscopic analysis of rock samples. 4,710,946, Cl. 378-62.000.

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Hirabayashi, Shigeto; Matsuzaki, Syoji; Ohya, Yukio; and Nonaka, Yoshiyuki, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material. 4,710,453, Cl. 430-505.000.

Hirakawa, Tadashi: See—
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Hirao, Eiji: See—
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Hirata, Ichiro: See—
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Hiroyasu Funakubo & Sumitomo Elec. Ind., Ltd.: See—
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Hirsch, Werner: See—
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Hiruta, Hideshi: See—
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Hishi, Yuichi, to Alps Electric Co., Ltd. Magnetic head. 4,710,836, Cl. 360-106.000.

Hishinuma, Kazuhiro: See—
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Hitachi Construction Machinery Co., Ltd.: See—
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Hitachi Device Engineering Co., Ltd.: See—
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Hatayama, Kazumi; and Hayashi, Terumine, 4,710,930, Cl. 371-25.000.

Homma, Yoshio; and Nishida, Takashi, 4,710,398, Cl. 437-235.000.

Horiuchi, Susumu; and Tamata, Shin, 4,710,318, Cl. 252-628.000.

Ishitani, Tohru; Todokoro, Hideo; Kawanami, Yoshimi; and Tamura, Hifumi, 4,710,632, Cl. 250-396.00R.

Kawasaki, Katsuhiko, to Funakubo, Hideo; Kawanami, Yoshimi; and Tamura, Hifumi, 4,710,640, Cl. 250-492.200.

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Matsuyama, Shigeru; Kanazaki, Mikio; Aoki, Norio; and Ishii, Akira, 4,709,993, Cl. 350-339.00F.

Mouri, Yasunori; and Sugiura, Noboru, 4,710,881, Cl. 364-431.080.

Nishimura, Yutaka; and Oyama, Yoshishige, 4,709,581, Cl. 73-202.000.

Saiki, Eisaku; and Kawauchi, Masataka, 4,709,911, Cl. 271-10.000.

Saitoh, Takashi; Niizaki, Nobuya; Yamamura, Hideho; and Hayashi, Shinichi, 4,710,654, Cl. 307-601.000.

Suzuki, Yasunaga; Matsubara, Toshiaki; and Urugami, Akira, 4,710,842, Cl. 361-88.000.

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Ueda, Akihisa, 4,710,928, Cl. 371-16.000.

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Yamada, Minoru; Wajima, Motoyo; Masaki, Akira; Takahashi, Akio; Nakanishi, Keiichiro; and Sugawara, Katuo, 4,710,854, Cl. 361-414.000.

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Hitachi Zosen Corporation: See—
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Hoechst AG: See—
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Hoechst Aktiengesellschaft: See—
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Hoechst CeramTec Aktiengesellschaft: See—
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Hoechst Roussel Pharmaceuticals, Inc.: See—
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Hoffman, William F.: See—
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Hoffmann, Gerhard; Hofmann, Reiner; and Elzer, Albert, to BASF Aktiengesellschaft. Photosensitive recording materials. 4,710,446, Cl. 430-281.000.

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Hofman, Petrus S.; Hall, David W. R.; and Jaitly, Kapil D., to Gist-Brocades N.V. 1H-imidazol-1-ethanol esters. 4,710,571, Cl. 544-216.000.

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Hofstetter, Edward M.: See—
Feldman, Joel A.; and Hofstetter, Edward M., 4,710,959, Cl. 381-36.000.

Hofstetter, Robert W., Jr.: See—
Green, Stephen H.; Hofstetter, Robert W., Sr.; and Hofstetter, Robert W., Jr., 4,709,802, Cl. 198-465.100.

Hofstetter, Robert W., Sr.: See—
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Hohmann, Eugen; Mund, Konrad; and Weidlich, Erhard, to Siemens Aktiengesellschaft. Method and apparatus for cleaning, disinfecting and sterilizing medical instruments. 4,710,233, Cl. 134-1.000.

Hokushin Kogyo Kabushiki Kaisha: See—
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,709,898, Cl. 248-562.000.

Holbrook, Philip: See—
Bradley, William B.; and Holbrook, Philip, 4,710,906, Cl. 367-35.000.

Holek, Jens-Peter: See—
Mertens, Alfred; Holek, Jens-Peter; Kampe, Wolfgang; Muller-Beckmann, Bernd; Strein, Klaus; and Schaumann, Wolfgang, 4,710,510, Cl. 514-394.000.

Holder, James D.: See—
Greene, Hugh W.; Holder, James D.; and Knaur, James A., 4,710,912, Cl. 369-218.000.

Holland, Alex, to Fairchild Semiconductor Corporation. Method and apparatus for improving the accuracy and resolution of an analog-to-digital converter (ADC). 4,710,747, Cl. 340-347.0AD.

Hollandse Signaalapparaten B.V.: See—
Gietema, Jouke; and Oude Elberink, Bernard H. M., 4,710,773, Cl. 342-185.000.

Holle, Wilhelm: See—
Ziemer, Wolf; Neubert, Fritz; and Holle, Wilhelm, 4,710,208, Cl. 55-355.000.

Hollister Incorporated: See—
Bryson, Robert M., 4,710,182, Cl. 604-339.000.

Holmgren, Mark E.; Parrish, Gregory K.; and Cartier, Philip A., to Hershey Foods Corporation. Low water activity confection composition. 4,710,393, Cl. 426-660.000.

Holmqvist, Ulf: See—
Skog, Hans; Holmqvist, Ulf; and Tellden, Leif, 4,710,092, Cl. 414-729.000.

Holzberger, Johann: See—
Cremosnik, Gregor; Timper, Joachim; and Holzberger, Johann, 4,709,875, Cl. 244-3.130.

Hom, Jorgen: See—
Edlund, Roy; and Hom, Jorgen, 4,709,932, Cl. 277-165.000.

Homma, Yoshio; and Nishida, Takashi, to Hitachi, Ltd. Semiconductor device and manufacturing method thereof. 4,710,398, Cl. 437-235.000.

Honda Giken Kogyo Kabushiki Kaisha: See—
Ichihara, Eiichi; and Iwai, Itsuo, 4,709,667, Cl. 123-90.340.

Motodate, Shoji; Morino, Yuchi; and Kurata, Norihiro, 4,710,599, Cl. 200-61.850.

Saito, Naoyuki; and Ozawa, Motoo, 4,709,774, Cl. 180-229.000.

Sakai, Shino; and Nishikawa, Masao, 4,709,792, Cl. 192-0.044.

Shimizu, Keiichi; Kikuchi, Sanae; and Nakano, Hitoshi, 4,709,931, Cl. 277-153.000.

Tashiro, Yutaka; and Sano, Shoichi, 4,709,936, Cl. 280-91.000.

Yagi, Shizuo; Kawai, Makoto; and Yamamoto, Yorihsa, 4,709,678, Cl. 123-425.000.

Honegger, Werner, to Ferag AG. Removable divider wall cell wheel apparatus for processing printed products. 4,709,910, Cl. 270-55.000.

Honeywell Inc.: See—
Brodin, David E.; Martwick, Wilford E.; and Warren, John B., 4,709,638, Cl. 102-522.000.

Deetz, David W.; and Kreevoy, Maurice M., 4,710,205, Cl. 55-158.000.

Doddapaneni, Narayan, 4,710,437, Cl. 429-101.000.

Wamstad, David B., 4,710,744, Cl. 338-4.000.

Hongo, Suzuki; Niwa, Minoru; Hashiba, Takahiro; Harata, Mitsuru; Hirata, Ichiro; Ito, Isamu; and Sonobe, Akihiko, to Toyoda Gosei Co., Ltd. Steering wheel for vehicles. 4,709,944, Cl. 280-777.000.

Honma, Kazuo: See—
Tokairin, Hiroaki; Honma, Kazuo; Nakajima, Kichio; Nagasawa, Kiyoshi; and Aritake, Takeshi, 4,710,884, Cl. 364-513.000.

Hooenboom, Leo; Jackson, Robert L., Jr.; Kraft, Russell P.; and Offt, Alan M., to Mechanical Technology Incorporated. Machine vision differential measurement system. 4,710,808, Cl. 358-107.000.

Hopp, Rudolf: See—
Bruning, Jurgen; Emberger, Roland; Hopp, Rudolf; and Sand, Theodor, 4,710,392, Cl. 426-534.000.

Hori, Kouichi: See—
Takabayashi, Kuniaki; Takaoka, Yoshitsugu; Hori, Kouichi; Shimotakahara, Masaki; Okada, Kikujiro; and Shiino, Satoru, 4,710,161, Cl. 494-84.000.

Horikawa, Izumi: See—
Okamoto, Yoshiharu; Horikawa, Izumi; and Komaki, Shozo, 4,710,975, Cl. 455-276.000.

Horiuchi, Susumu; and Tamata, Shin, to Hitachi, Ltd. Method of processing radioactive waste. 4,710,318, Cl. 252-628.000.

Horiuchi, Yasuhiro: See—
Iwata, Hiroshi; Kuroyanagi, Masatoshi; Suzuki, Masahiko; Moriguchi, Koichi; Horiuchi, Yasuhiro; and Nakamura, Kanehito, 4,710,106, Cl. 417-213.000.

Horn, Charles, deceased (by Horn, Dorothy E., executor); and Jenkins, William R., to Vulcan Tool Company. Machine for cold forming small tubular elements. 4,709,574, Cl. 72-405.000.

Horn, Dorothy E., executor: See—
Horn, Charles, deceased; and Jenkins, William R., 4,709,574, Cl. 72-405.000.

Hornbeck, Larry J., to Texas Instruments Incorporated. Spatial light modulator and method. 4,710,732, Cl. 332-7.510.

Horstmann, Harald: See—
Lockhoff, Oswald; Stadler, Peter; Opitz, Hans-Georg; Horstmann, Harald; Junge, Bodo; and Pelster, Bernhard, 4,710,491, Cl. 514-42.000.

Hosan, Hans-Josef: See—
Freitag, Herbert; Fuhrmann, Castor; and Hosan, Hans-Josef, 4,709,790, Cl. 188-300.000.

Hoshi, Akimitsu: See—
Ishikawa, Tadashi; Matsuo, Kazuhiro; and Hoshi, Akimitsu, 4,709,915, Cl. 271-288.000.

Hoshikawa, Jun, to Seiko Epson Kabushiki Kaisha. Liquid crystal display with barrier layer to reduce permeability. 4,709,991, Cl. 350-339.00R.

Hoshino, Isamu: See—
Sugita, Mitsuyuki; and Hoshino, Isamu, 4,710,731, Cl. 331-158.000.

Hosiden Electronics Co. Ltd.: See—
Shichida, Akihito, 4,710,139, Cl. 439-668.000.

Hostetter, Eldon, to Ziggy Systems, Inc. Cage anchor for watering device. 4,709,658, Cl. 119-18.000.

Hotta, Hajime: See—
Nakamura, Koichi; Hattori, Michihiro; Tamura, Tadashi; Tejima, Toru; Takaishi, Naotake; Imokawa, Genji; and Hotta, Hajime, 4,710,373, Cl. 424-59.000.

Hotta, Tadahiko, to Nippon Gakki Seizo Kabushiki Kaisha. Method of producing semiconductor integrated circuit having parasitic channel stopper region. 4,710,265, Cl. 437-29.000.

Hotzel, Gerhard: See—
Schlechtriemen, Gerhard-Ludwig; Hotzel, Gerhard; and Weppner, Werner, 4,710,848, Cl. 361-280.000.

Houghton, Benjamin T., to Enidine Incorporated. Adjustable double-acting damper. 4,709,791, Cl. 188-315.000.

Houkes, Henk; Postma, Pieter; and Van Veghel, Andreas C., to U.S. Philips Corporation. Electrodeless low-pressure discharge lamp. 4,710,678, Cl. 315-39.000.

Houston, Mary B.: See—
Schumacher, Robert W.; and Houston, Mary B., 4,710,390, Cl. 426-285.000.

Howard, Don R.: See—
Butts, J. James, Jr.; and Howard, Don R., 4,709,580, Cl. 73-178.00R.

Howard, P. Guy, to Spectra-Physics, Inc. Variable power gas laser tube. 4,710,942, Cl. 372-87.000.

Howe, Stephen H.; and Rogers, Donald. Setting the orientation of crystals. 4,710,259, Cl. 156-601.000.

Howmet Turbine Components Corporation: See—
Freeman, William R., Jr., 4,709,461, Cl. 29-526.300.

Hozer, Norman R. Method and bath for electro-chemically sharpening of cutting tools. 4,710,279, Cl. 204-129.550.

Hruskesy, William J. M., to University of Minnesota, Regents of the. Instrument and method for accessing vessels and tissues within animals. 4,709,660, Cl. 119-103.000.

Huang, Shyh-Chin; Chang, Keh-Minn; and Taub, Alan I., to General Electric Company. Rapidly solidified tri-nickel aluminide base alloy. 4,710,247, Cl. 148-429.000.

Huber, Donald J.: See—
Broman, Donald E.; Hansen, Loren F.; and Huber, Donald J., 4,709,541, Cl. 56-202.000.

Huff, Joel R.: See—
Baldwin, John J.; Huff, Joel R.; Vacca, Joseph P.; Young, Steven D.; deSolms, Jane; and Guare, James P., Jr., 4,710,504, Cl. 514-267.000.

Huggard, Mark T., to Mobil Oil Corporation. Foamable composition and process for forming same. 4,710,522, Cl. 521-138.000.

Hughes Aircraft Company: See—
Chen, John Y., 4,710,477, Cl. 437-34.000.

Ellion, M. Edmund, 4,710,588, Cl. 136-206.000.

Linder, Jacques F., 4,710,448, Cl. 430-314.000.

Hui, Henry T.: See—
Smart, Leonard G.; and Hui, Henry T., 4,709,886, Cl. 248-49.000.

Huizer, Andre M. J.: See—
Baltes, Heinrich P.; and Huizer, Andre M. J., 4,710,627, Cl. 250-339.000.

Hull, Ezekiel H.; and Frappier, Edward P., to Morflex Chemical Company, Inc. Medical article and method. 4,710,532, Cl. 524-310.000.

Hultsch, Guenther: See—
Alstetter, Franz; and Hultsch, Guenther, 4,710,356, Cl. 422-140.000.

Hume, Roger A.: See—
Halberstadt, Alex L.; and Hume, Roger A., 4,710,677, Cl. 313-580.000.

Hundt, Gary W.: See—
Granberg, William J.; Wagner, Richard A.; and Hundt, Gary W., 4,709,833, Cl. 220-319.000.

Hunt, John. Water skis and the like. 4,710,144, Cl. 441-79.000.

Hunter, John J. Lined pipe joint. 4,709,946, Cl. 285-55.000.

Hupfer, Ronald K., to Whirlpool Corporation. Heat exchanger tube retainer for a refrigerator condenser. 4,709,556, Cl. 62-298.000.

Huser, Margrit: See—
Lepand, Heinz; Huser, Margrit; Biniasz, Franz-Josef; and Fuchs, Axel, 4,710,244, Cl. 148-333.000.

Huthwohl, Georg: See—
Pischinger, Franz; Lepperhoff, Gerhard; and Huthwohl, Georg, 4,709,547, Cl. 60-274.000.

Huttner, Klaus, to SKF GmbH. Cage for roller bearing. 4,710,039, Cl. 384-574.000.

Huyck Corporation: See—
Kinnunen, Martti I., 4,709,732, Cl. 139-383.00A.

Hwang, Yin-Chao: See—
Powell, Theo J.; Bellay, Jeffrey D.; Daniels, Martin D.; and Hwang, Yin-Chao, 4,710,933, Cl. 371-25.000.

Hyman, Vaclav. Electro convulsive therapy method. 4,709,700, Cl. 128-421.000.

I&H Conveying & Machine Company: See—
Green, Stephen H.; Hofstetter, Robert W., Sr.; and Hofstetter, Robert W., Jr., 4,709,802, Cl. 198-465.100.

Ichihara, Eiichi; and Iwai, Itsuo, to Honda Giken Kogyo Kabushiki Kaisha; and Tanaka Machine Industries Co., Ltd. Oil supply device for valve operating system having hydraulic tappet in internal combustion engine. 4,709,667, Cl. 123-90.340.

Ichihara, Yutaka: See—
Magome, Nobutaka; and Ichihara, Yutaka, 4,710,026, Cl. 356-349.000.

Ichikawa, Noriyuki; Suzuki, Tetsushi; and Atsumi, Tomiaki, to Toyota Jidosha Kabushiki Kaisha. Crank damper pulley structure for the internal combustion engine of a car. 4,710,152, Cl. 474-166.000.

Ichimaru, Yoshiro; Kobayashi, Shigeru; and Ohashi, Toshio, to Nissan Motor Company, Limited. Vehicular air conditioner with defogging feature. 4,709,751, Cl. 165-17.000.

ICI Americas Inc.: See—
Nelson, Richard V.; and Stephen, John F., 4,710,527, Cl. 524-98.000.

ICI Australia Limited: See—
Yates, David E.; and Dack, Stuart W., 4,710,248, Cl. 149-21.000.

Ide, Yuji, to Kabushiki Kaisha Toshiba. Color filter arrays for use in a single chip color television pickup system using the field integration mode. 4,710,804, Cl. 358-48.000.

Ideal Security Hardware Corporation: See—
Waldo, Russell W.; and Miller, Cardell E., 4,709,445, Cl. 16-300.000.

Iguchi, Keisuke; and Ebato, Seigo, to Mitsubishi Paper Mills, Ltd. Novel silver halide crystal and process for production of same. 4,710,455, Cl. 430-567.000.

Iijima, Hitoshi: See—
Umemura, Hiroyuki; Matsuda, Kenji; Tezuka, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Matsuo, Fumio; and Iijima, Hitoshi, 4,709,554, Cl. 62-156.000.

Iijima, Shigeharu: See—
Takano, Katsuhiko; Yoshihara, Satoshi; Iijima, Shigeharu; Sasamori, Eizo; Matsushima, Masaaki; and Kishi, Hiroyoshi, 4,710,418, Cl. 428-192.000.

Iizuka, Michio; and Shiba, Haruo, to TDK Corporation. Magnetic disc cartridge. 4,710,839, Cl. 360-133.000.

Ikeda Bussan Co., Ltd.: See—
Seura, Yasuyuki, 4,709,964, Cl. 297-354.000.

Ikeda, Hiroaki: See—
Funaki, Shinsuke; Akanabe, Yuichi; and Ikeda, Hiroaki, 4,710,779, Cl. 346-1.100.

Ikeda Mohando Co., Ltd.: See—
Nohara, Fujio; and Fujinawa, Tomoaki, 4,710,498, Cl. 514-242.000.

Ikeda, Takenori: See—
Okoshi, Noboru; Motomura, Masatoshi; Ohtsubo, Mitsuru; and Ikeda, Takenori, 4,710,230, Cl. 106-308.00N.

Ikeya, Hirotsugu; and Higashi, Michiya, to Kabushiki Kaisha Toshiba. Resin encapsulation type semiconductor device by use of epoxy resin composition. 4,710,796, Cl. 357-72.000.

Illig, Egon; and Knipf, Volkmar, to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. Apparatus for separating and conveying sheet-like articles. 4,709,912, Cl. 271-42.000.

Illinois Tool Works Inc.: See—
Erickson, David A., 4,709,889, Cl. 248-74.500.

IMAG-Verlage AG für Immaterialgüterrecht: See—
Petschner, Goetz, 4,710,967, Cl. 383-8.000.

Imai, Akio; Okamoto, Yasushi; and Saito, Masatoshi, to Sumitomo Chemical Company, Limited. Polybutadiene and process for preparing the same. 4,710,554, Cl. 526-180.000.

Imai, Hiroshi; and Yoshioka, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Sealed disc drive assembly with internal air filter. 4,710,830, Cl. 360-97.000.

Imaizumi, Haruo: See—
Tanaka, Satoshi; and Imaizumi, Haruo, 4,710,353, Cl. 422-68.000.

Imamura, Tomotsu, to Ricoh Company, Ltd. Device for stabilizing photosensor output to varying temperature. 4,710,622, Cl. 250-214.00R.

Imamura, Tosuke, to Teijin Limited. Woven polyester webbing for safety belts. 4,710,423, Cl. 428-272.000.

Imokawa, Genji: See—
Nakamura, Koichi; Hattori, Michihiro; Tamura, Tadashi; Teijima, Toru; Takaishi, Naotake; Imokawa, Genji; and Hotta, Hajime, 4,710,373, Cl. 424-59.000.

Imperial Chemical Industries Plc: See—
Norris, Alan J., 4,710,849, Cl. 361-228.000.

Imreg, Inc.: See—
Gottlieb, A. Arthur, 4,710,380, Cl. 424-101.000.

INA Walzlagel Schaeffler KG: See—
Klug, Horst; Mockler, Wolfgang; Schaeffler, George; and Speil, Walter, 4,709,668, Cl. 123-90.550.

Inatsuki, Kenichi, to Fuji Photo Film Co., Ltd. Method of reading image data. 4,710,818, Cl. 358-214.000.

Inco Engineered Products Ltd.: See—
Law, Anthony G.; and Fleetwood, Michael J., 4,709,743, Cl. 164-463.000.

Indak Manufacturing Corp.: See—
Raab, Andrew F.; and Habecker, John W., 4,710,601, Cl. 200-302.300.

Independent Broadcasting Authority: See—
Douglas, Peter G.; and Kyffin, Morris N., 4,710,815, Cl. 358-186.000.

Infinity Boring Tool Company: See—
Peterson, Richard L., 4,710,073, Cl. 408-181.000.

Ingersoll Milling Machine Company, The: See—
Lewis, Henry W.; and Van Roojen, Jan, 4,709,465, Cl. 29-568.000.

Ingle, John W. Rescue launcher. 4,709,650, Cl. 114-375.000.

Innes, Robert S.: See—
McGuire, Bernie; Innes, Robert S.; and Pagowski, Stefan, 4,709,448, Cl. 17-11.000.

Inoue, Mamoru: See—
Yonezawa, Toshio; Sasaguri, Nobuya; Onimura, Kichiro; Susukida, Hiroshi; Kawaguchi, Katsuji; Nagano, Hiroo; Minami, Takao; Yamanaka, Kazuo; Okada, Yasutaka; and Inoue, Mamoru, 4,710,237, Cl. 148-13.000.

Inoue, Nanao: See—
Saito, Koichi; Fujimura, Yoshihiko; and Inoue, Nanao, 4,710,780, Cl. 346-1.100.

Institut Français du Pétrole: See—
Behar, Françoise; Roucace, Jeannine; Auger, Jean; and Boudet, Luc, 4,710,354, Cl. 422-80.000.

Institut Gornogo Dela So An USSR: See—
Kostylev, Alexandr D.; Boginsky, Vladimir P.; Smolyanitsky, Boris N.; Syryamin, Jury N.; Danilov, Boris B.; Kogan, David I.; and Saveliev, Vyacheslav N., 4,709,768, Cl. 175-296.000.

Institut Khimii AN: See—
Voll, Martin A.; Eiskop, Robert K.; and Yankovsky, Kharri I., 4,709,584, Cl. 73-864.440.

Integrated Device Technology, Inc.: See—
Miller, Michael J., 4,710,927, Cl. 371-15.000.

Intel Corporation: See—
Young, Ian, 4,710,647, Cl. 307-297.000.

Interatom GmbH: See—
Tittizer, Gabriel; Junghans, Ewald; Bestenreiner, Georg; and Dahm, Christian, 4,710,034, Cl. 384-110.000.

Interferon Sciences, Inc.: See—
Evans, Sean A.; Terpinski, Eva A.; and Testa, Douglas, 4,710,376, Cl. 424-83.000.

International Business Machines Corporation: See—
Bandara, Upali; Hinkel, Holger; Steiner, Werner; and Trippel, Gerhard, 4,710,424, Cl. 428-325.000.

Chu, Richard C.; and Simons, Robert E., 4,709,754, Cl. 165-133.000.

Cocke, John; and Hailpern, Brent T., 4,710,868, Cl. 364-200.000.

Friedman, Lee G.; Hailpern, Brent T.; Hoevel, Lee W.; and The-faine, Yannick J., 4,710,769, Cl. 340-825.030.

Heath, Allen W., 4,710,886, Cl. 364-519.000.

Iwai, Shinichi; and Uno, Sakae, 4,710,806, Cl. 358-81.000.

Kunzinger, Charles A., 4,710,801, Cl. 358-23.000.

Litteken, Mark A., 4,710,885, Cl. 364-518.000.

Scarborough, Randolph G., 4,710,872, Cl. 364-300.000.

International Flavors & Fragrances Inc.: See—
Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., 4,709,707, Cl. 131-276.000.

International Shoe Machine Corporation: See—
Walega, William, 4,709,433, Cl. 12-12.500.

International Teldata Corporation: See—
Oliver, Stewart W.; and Cosgrove, John, 4,710,919, Cl. 370-96.000.

InterNorth, Inc.: See—
White, Geoffrey T., 4,709,750, Cl. 165-10.000.

Interstate Brands Corporation: See—
Vanasse, Robert W., 4,709,851, Cl. 229-87.00B.

Iovine, Carmine P.: See—
Tokumoto, Minoru; Takagi, Motoyuki; Shitaoka, Shizuo; Gold, Samuel; and Iovine, Carmine P., 4,710,526, Cl. 524-5.000.

Ireland, David B.: See—
Cartmell, Robert L.; Daugherty, Charles W.; and Ireland, David B., 4,710,175, Cl. 604-177.000.

Irie, Shoji: See—
Maegawa, Harumi; Takai, Sakan; Sukeda, Toshiaki; Irie, Shoji; and Kobata, Shoichi, 4,710,895, Cl. 365-2.000.

Isaberg AB: See—
Westerlund, Bengt, 4,709,842, Cl. 227-120.000.

Ishida, Shiro, to Isuzu Motors Limited. Combustion chamber for an internal-combustion engine. 4,709,672, Cl. 123-256.000.

Ishidoh, Takanobu; and Kondoh, Yoshiyuki, to Sony Corporation. Digital signal transmitting system. 4,710,921, Cl. 370-110.100.

Ishii, Akira: See—
Matsuyama, Shigeru; Kanazaki, Mikio; Aoki, Norio; and Ishii, Akira, 4,709,993, Cl. 350-339.00F.

Tanaka, Ryuchii; and Ishii, Akira, 4,709,968, Cl. 303-6.00C.

Ishikawa, Tadashi; Matsuo, Kazuhiro; and Hoshi, Akimitsu, to Canon Kabushiki Kaisha. Sorting apparatus. 4,709,915, Cl. 271-288.000.

Ishioka, Hidenori: See—
Umemura, Hiroyuki; Matsuda, Kenji; Tezuka, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Matsuo, Fumio; and Iijima, Hitoshi, 4,709,554, Cl. 62-156.000.

Ishitani, Tohru; Todokoro, Hideo; Kawanami, Yoshimi; and Tamura, Hifumi, to Hitachi, Ltd. Ion microbeam apparatus. 4,710,632, Cl. 250-396.00R.

Isono, Kazuaki: See—
Umemura, Hiroyuki; Matsuda, Kenji; Tezuka, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Matsuo, Fumio; and Iijima, Hitoshi, 4,709,554, Cl. 62-156.000.

Isover Saint-Gobain: See—
Fugier, Roger; de Goys de Mezerac, Charles; Joachim, Jacky; and Decagny, Michel, 4,710,406, Cl. 427-389.800.

Isuzu Motors Limited: See—
Ishida, Shiro, 4,709,672, Cl. 123-256.000.

Itaya, Hiroshi; and Saito, Goro, to Anritsu Corporation. Heterodyne type signal-measuring method and a measuring apparatus including automatic detuning correction means. 4,710,702, Cl. 324-79.00R.

Itek Corporation: See—
Auffiero, James M., 4,710,966, Cl. 382-69.000.

Itezone, Toshiyuki, to Oki Electric Industry Co., Ltd. Facsimile system. 4,710,951, Cl. 379-100.000.

Ito, Isamu: See—
Hongo, Suzuaki; Niwa, Minoru; Hashiba, Takahiro; Harata, Mitsuru; Hirata, Ichiro; Ito, Isamu; and Sonobe, Akihiko, 4,709,944, Cl. 280-777.000.

Ito, Kiyonobu: See—
Nakamura, Kazuharu; Matsumoto, Motoki; Kondo, Akinobu; and Ito, Kiyonobu, 4,710,125, Cl. 431-22.000.

Itoh, Atsushi: See—
Murakami, Tokumichi; Itoh, Atsushi; Asai, Kohtaro; Kamizawa, Koh; and Nishida, Masami, 4,710,812, Cl. 358-136.000.

Itoh, Haruo, to Fuji Photo Film Co., Ltd. Tracking system for rotary magnetic recording medium using weighted sampled track values. 4,710,832, Cl. 360-10.200.

Itsuki, Fumiaki: See—
Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,709,976, Cl. 439-350.000.

ITT Gilfillan, a division of ITT Corporation: See—
Sterns, William G., 4,710,734, Cl. 333-101.000.

ITT Industries, Inc.: See—
Stahl, Torvald, 4,710,658, Cl. 310-71.000.

Ivac Corporation: See—
Butterfield, Robert D., 4,710,163, Cl. 604-65.000.

Iwabori, Tomio: See—
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,709,898, Cl. 248-562.000.

Iwai, Itsuo: See—
Ichihara, Eiichi; and Iwai, Itsuo, 4,709,667, Cl. 123-90.340.

Iwai, Shinichi; and Uno, Sakae, to International Business Machines Corporation. Digital display system with color lookup table. 4,710,806, Cl. 358-81.000.

Iwamoto, Joji: See—
Shirasu, Hiroshi; Shimeno, Kazuhiro; and Iwamoto, Joji, 4,710,604, Cl. 219-121.0LU.

Iwasaki, Tadayoshi; Ariga, Keiki; and Sato, Makoto, to Nippon Sanso Kabushiki Kaisha. Method and apparatus for determining a vacuum degree within a flexible vacuum package. 4,709,578, Cl. 73-49.300.

Iwata, Hiroshi; Kuroyanagi, Masatoshi; Suzuki, Masahiko; Moriguchi, Koichi; Horiuchi, Yasuhiro; and Nakamura, Kanehito, to Nippondenso Co., Ltd. Volume controlling device for variable volume pump. 4,710,106, Cl. 417-213.000.

Iyer, Srinivasa L., to Stress Steel Co., Inc. Method for making a pre-stressed composite structure and structure made thereby. 4,709,456, Cl. 29-155.00R.

Iyoda, Motomi, to Toyota Jidoshi Kabushiki Kaisha. Apparatus and a method for controlling wiper. 4,710,878, Cl. 364-424.000.

J. M. Voith GmbH: See—
Henrich, Hans-Otto; and Rienecker, Reimund, 4,710,287, Cl. 209-270.000.

Jabarin, Saleh A.: See—
Balduff, Dennis C.; and Jabarin, Saleh A., 4,709,808, Cl. 206-158.000.

Jackel, Janet L., to Bell Communications Research, Inc. Mach-Zehnder integrated optical modulator. 4,709,978, Cl. 350-96.140.

Jacklich, John; and Mikula, George, to Jacklich, John. High pressure syringe with pressure indicator. 4,710,172, Cl. 604-118.000.

Jackson, Robert L., Jr.: See—
Hoogenboom, Leo; Jackson, Robert L., Jr.; Kraft, Russell P.; and Offit, Alan M., 4,710,808, Cl. 358-107.000.

Jacobi, Manfred: See—
Lechten, Peter; Bueche, Ingolf; Jacobi, Manfred; and Trimborn, Werner, 4,710,523, Cl. 522-14.000.

Jacobson, Bernard, to Boston Biomedical Research Institute. Cell proliferation inhibitor and method of preparation. 4,710,462, Cl. 435-68.000.

Jacoby, John E.; Yu, Ho; and Ramser, Robert A., to Aluminum Company of America. Direct chill casting of aluminum-lithium alloys. 4,709,740, Cl. 164-5.000.

Jager, Stewart C.: See—
Mills, Russell C.; and Jager, Stewart C., 4,709,929, Cl. 273-402.000.

Jahn, Herbert; and Waedt, Gunter, to Siemens Aktiengesellschaft. Tower design for high-voltage systems. 4,710,850, Cl. 361-333.000.

Jahnke, Andreas, to Siemens Aktiengesellschaft. Apparatus generating a magnetic field for a particle accelerator. 4,710,722, Cl. 328-234.000.

Jahnke, Andreas, to Siemens Aktiengesellschaft. Magnetic thin-film head for a recording medium that can be magnetized vertically. 4,710,838, Cl. 360-125.000.

Jaillet, Georges: See—
Jaillet, Jeannine; and Jaillet, Georges, 4,709,827, Cl. 220-4.00A.

Jaillet, Jeannine; and Jaillet, Georges. Home container. 4,709,827, Cl. 220-4.00A.

Jaitly, Kapil D.: See—
Hofman, Petrus S.; Hall, David W. R.; and Jaitly, Kapil D., 4,710,571, Cl. 344-216.000.

Jakobec, Franz: See—
Brand, Wilhelm; Vanek, Vaclav; and Jakobec, Franz, 4,710,834, Cl. 360-105.000.

Jakobs, Ewald: See—
Altmeyer, Werner; Jakobs, Ewald; and Meier, Friedrich, 4,710,078, Cl. 409-233.000.

James Howden & Company Limited: See—
Jamieson, Peter M., 4,710,101, Cl. 416-32.000.

James, John: See—
Wu, Joseph C.; Law, Yee-Shing; and James, John, 4,710,970, Cl. 455-113.000.

Jamieson, Peter M., to James Howden & Company Limited. Wind turbine. 4,710,101, Cl. 416-32.000.

Janiaud, Denis: See—
Fima, Henri; and Janiaud, Denis, 4,710,668, Cl. 310-323.000.

Japan as represented by Director-General, Agency of Industrial Science & Technology: See—
Doi, Yoshihiko; Kuroishi, Nobuhito; Ochi, Shigeki; and Uenishi, Noboru, 4,710,345, Cl. 419-28.000.

Japan Automatic Transmission Co., Ltd.: See—
Boda, Keiji; Waki, Kouichiro; and Yanagisawa, Keizo, 4,709,596, Cl. 74-868.000.

Japan Tobacco & Salt Public Corporation, The: See—
Hirose, Ichiro; and Sagawa, Takayoshi, 4,709,711, Cl. 131-336.000.

Kagawa, Kenichi, 4,709,708, Cl. 131-302.000.

Jaynes, Mark S.: See—
Bradfield, James E.; Kahil, John E.; Jaynes, Mark S.; Moake, Gordon L.; Milewits, Marvin; Bolton, Curtis W., III; Lam, Clive C.; and Stanley, Roderic K., 4,710,712, Cl. 324-227.000.

Jenkins, Stuart M.; Spencer, Michael S.; and Mayfield, Ross, to De La Rue Systems Limited. Sheet dispensing apparatus. 4,709,820, Cl. 209-534.000.

Jenkins, William R.: See—
Horn, Charles, deceased; and Jenkins, William R., 4,709,574, Cl. 72-405.000.

Jeol Ltd.: See—
Sawaragi, Hiroshi, 4,710,639, Cl. 250-492.200.

Jeschke, Peter: See—
Buschmann, Rudiger; Ganz, Rudolf; Willmann, Gerd; Wirth, Ludwig; Elstner, Ingo; and Jeschke, Peter, 4,710,480, Cl. 501-95.000.

Jessie, James, to Future Fire Suppression, Inc. Self-activating fire extinguisher. 4,709,763, Cl. 169-26.000.

Jeumont-Schneider Corporation: See—
Camus, Etienne, 4,710,721, Cl. 328-109.000.

Jidosha Kiki Co., Ltd.: See—
Emori, Yasuyoshi; and Nomura, Ikuo, 4,709,591, Cl. 74-422.000.

Jira, Reinhard; and Oetlinger, Ralph, to Wacker Chemie GmbH. Process for stabilizing organopolysiloxanes. 4,710,558, Cl. 528-14.000.

Joachim, Jacky: See—
Fingier, Roger; de Goys de Mezerac, Charles; Joachim, Jacky; and Decagny, Michel, 4,710,406, Cl. 427-389.800.

Job, Robert C., to Shell Oil Company. Olefin polymerization catalyst component. 4,710,482, Cl. 502-127.000.

Johann Wolf Gesellschaft m.b.H. KG: See—
Wolf, Johann, 4,710,083, Cl. 411-466.000.

Johanndeiter, Martin H.: See—
Warmuth, Otto L.; Johanndeiter, Martin H.; and Raven, Johannes G., 4,710,802, Cl. 358-25.000.

Johnson, David A. Safety device including chamber probe. 4,709,496, Cl. 42-70.110.

Johnson, George C.: See—
Cubit, Harry T.; and Johnson, George C., 4,709,888, Cl. 248-73.000.

Johnson, Gerald W. Fat collection and injection process into same body. 4,710,162, Cl. 604-51.000.

Johnson, Gerald W. Lipoject needle. 4,710,180, Cl. 604-239.000.

Johnson, Henry F.: See—
Ewbank, Michael E.; and Johnson, Henry F., 4,709,665, Cl. 122-510.000.

Johnson, Lee K.: See—
Johnson, Lee R.; and Johnson, Lee K., 4,709,829, Cl. 220-90.200.

Johnson, Lee R.; and Johnson, Lee K. SAN-I-CAN (a beverage container incorporating its own straw). 4,709,829, Cl. 220-90.200.

Johnson, Mack E.: See—
Price, Macy J.; Price, Macy J., Jr.; and Johnson, Mack E., 4,709,815, Cl. 206-387.000.

Johnson, Malcolm L.: See—
Heyn, Lynn E.; Johnson, Malcolm L.; and Fischer, Daniel O., 4,709,419, Cl. 2-46.000.

Johnson, Richard A., to C & K Systems, Inc. Fault detecting intrusion detection device. 4,710,750, Cl. 340-522.000.

Johnson Service Company: See—
Bly, Tom C., 4,709,757, Cl. 165-173.000.

Gish, Larry D., 4,709,721, Cl. 137-437.000.

Johnston, James H.; Hermann, George D.; and Atagi, Tanya A., to Fogarty, Thomas J. Heatable dilation catheter. 4,709,698, Cl. 128-303.120.

Jonerger, Inc.: See—
Kwiatek, Alfred; and Schwartz, Jack W., 4,710,191, Cl. 604-897.000.

Jones, Christopher R.; and Jones, Lee S., to Templex, Inc. Waste fabric and line collection box for a sewing machine. 4,709,645, Cl. 112-282.000.

Jones, Don C.: See—
Kelly, John E.; Jones, Don C.; Tuck, Frederick R.; Zimmermann, William A.; and Clark, Kenneth R., 4,710,031, Cl. 356-440.000.

Jones, Lee S.: See—
Jones, Christopher R.; and Jones, Lee S., 4,709,645, Cl. 112-282.000.

Jones, William G.: See—
Pierson, Karl B.; Mooney, Thomas E.; and Jones, William G., 4,709,901, Cl. 251-58.000.

Jonsson, Karl-Erik A. Debarking tool and arm combination. 4,709,737, Cl. 144-241.000.

Jordan, Barry J., to Jordon Instruments (Derby) Limited. Fault detecting apparatus. 4,710,628, Cl. 250-341.000.

Jorder, Kurt: See—
Fottinger, Walter; and Jorder, Kurt, 4,709,490, Cl. 36-44.000.

Jordon Instruments (Derby) Limited: See—
Jordan, Barry J., 4,710,628, Cl. 250-341.000.

Jorgensen, Robert J., to Union Carbide Corporation. Process for the production of a sticky polymer. 4,710,538, Cl. 525-53.000.

Jorke, Helmut: See—
Dambkes, Heinrich; Herzog, Hans-J.; and Jorke, Helmut, 4,710,788, Cl. 357-22.000.

Joseph, Gerald; and Berta, Joseph. Stabilizer device for automobile suspension systems. 4,709,908, Cl. 267-140.400.

Jost, Robert M.: See—
Malone, Gilbert R.; Skursha, Susan K.; and Jost, Robert M., 4,710,474, Cl. 436-60.000.

Jouanne, Pierre. Wooden modular furniture. 4,709,640, Cl. 108-91.000.

Junemann, Gitta; Hirsch, Werner; and Weiss, Arno, to B.A.T. Cigaretten-Fabriken GmbH. Process for the moistening of comminuted smoking materials. 4,709,709, Cl. 131-306.000.

Junge, Bodo: See—
Lockhoff, Oswald; Stadler, Peter; Opitz, Hans-Georg; Horstmann, Harald; Junge, Bodo; and Pelster, Bernhard, 4,710,491, Cl. 514-42.000.

Junghans, Ewald: See—
Tittzer, Gabriel; Junghans, Ewald; Bestenreiner, Georg; and Dahm, Christian, 4,710,034, Cl. 384-110.000.

Junghenrich Unternehmensverwaltung KG: See—
David, Bernd; and Klingberg, Alfred, 4,709,786, Cl. 187-9.00E.

Junker, Erwin. Method and apparatus for high speed profile grinding of rotation symmetrical workpieces. 4,709,508, Cl. 51-105.00R.

Junkosha Co., Ltd.: See—
Tanaka, Satoshi; and Imaizumi, Haruo, 4,710,353, Cl. 422-68.000.

Juridical Foundation The Chemo-Sero-Therapeutic Research Institute: See—
Ohtomo, Nobuya; Mizuno, Kyosuke; Hamada, Fukusaburo; and Mizokami, Hiroshi, 4,710,378, Cl. 424-89.000.

Juwedor GmbH: See—
Kull, Herbert, 4,710,276, Cl. 204-9.000.

Kabushiki Kaisha Daikin Seisakusho: See—
Uenohara, Norihisa, 4,709,796, Cl. 192-106.100.

Kabushiki Kaisha Kenwood: See—
Matsui, Toshiyuki, 4,710,962, Cl. 381-102.000.

Kabushiki Kaisha Komatsu Seisakusho: See—
Maeda, Fujio, 4,709,594, Cl. 74-753.000.

Kabushiki Kaisha Machida Seisakusho: See—
Chikama, Toshio, 4,710,807, Cl. 358-98.000.

Kabushiki Kaisha Sato: See—
Kashiwaba, Tadao, 4,709,868, Cl. 242-56.00R.

Kabushiki Kaisha Showa Seisakusho: See—
Suzuki, Hideo; Okamoto, Kunihide; Hayashi, Yasuyuki; and Aiba, Mitsuru, 4,709,934, Cl. 280-6.00R.

Kabushiki Kaisha Toshiba: See—
Banno, Haruhiko; and Yatagai, Shigeo, 4,710,771, Cl. 340-811.000.

Enokizono, Takatoshi, 4,710,869, Cl. 364-200.000.

Harada, Yutaka, 4,709,788, Cl. 187-124.000.

Ide, Yuji, 4,710,804, Cl. 358-48.000.

Ikeya, Hiroshi; and Higashi, Michiya, 4,710,796, Cl. 357-72.000.

Kanda, Hiroyuki, 4,710,687, Cl. 318-561.000.

Komatsu, Shigeru, 4,710,241, Cl. 437-162.000.

Koshino, Yutaka; Akiyama, Tatsuo; and Baba, Yoshiro, 4,710,794, Cl. 357-49.000.

Kubo, Masahiro, 4,710,111, Cl. 418-63.000.

Masouka, Fujio; and Ochi, Kiyofumi, 4,710,897, Cl. 365-182.000.

Matsuura, Toshihiro, 4,710,099, Cl. 415-199.500.

Nagumo, Masahide, 4,710,923, Cl. 371-2.000.

Oana, Yasuhisa, 4,709,990, Cl. 350-339.00F.

Sumi, Masahiko, 4,710,898, Cl. 365-189.000.

Tsuchiya, Akira, 4,710,860, Cl. 363-28.000.

Uchida, Yukimasa, 4,710,905, Cl. 365-229.000.

Waatanabe, Junji, 4,710,016, Cl. 355-4.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: See—
Kawai, Katsunori; Kobayashi, Hisao; Deguchi, Hiroyuki; and Sugizono, Shuichi, 4,709,555, Cl. 62-228.300.

Kabushiki Kaisha Tsuchiya Seisakusho: See—
Suzuki, Mitsutoshi; Morita, Yoshitaka; Okada, Masami; and Shimohara, Jun, 4,710,297, Cl. 210-493.200.

Kabushiki Kaisha Advance Kaihatsu Kenkyujo: See—
Kawai, Yasuo; and Shimohashi, Hirotaka, 4,710,379, Cl. 424-93.000.

Kadlubowski, Joseph C.: See—
Cors, Craig M.; and Kadlubowski, Joseph C., 4,710,742, Cl. 337-323.000.

Kadonoff, Mark B.: See—
Maddox, James F.; Kadonoff, Mark B.; Berger, Alan D.; Taivalkoski, Amy L.; George, Robert W., II; and Benayad-Cherif, Faycal E., 4,710,020, Cl. 356-1.000.

Kadowaki, Hitoshi: See—
Kajioka, Yasuo; Komine, Tomio; Kadowaki, Hitoshi; Matsuda, Shigeyoshi; Yugami, Yoshinori; Kubota, Shinya; Takahashi, Yoshio; Shimada, Hiroshi; and Kurata, Nobutaka, 4,709,899, Cl. 249-20.000.

Kadunce, Leo, to Steeltin Can Corporation. Method and machine for convolute or spiral winding of composite materials. 4,710,252, Cl. 156-195.000.

Kagabu, Shinzo: See—
Kurahashi, Yoshio; Shiokawa, Kozo; Kagabu, Shinzo; Sakawa, Shinji; and Moriya, Koichi, 4,710,518, Cl. 514-624.000.

Kagawa, Kenichi, to Japan Tobacco & Salt Public Corporation, The. Control system for humidity controller of tobacco leaves. 4,709,708, Cl. 131-302.000.

Kageler, Peter; Bostelmann, Rudolf; and Buhmester, Olaf, to Korber AG. Method and apparatus for pneumatically transporting filter rod sections and the like. 4,710,066, Cl. 406-29.000.

Kahil, John E.: See—
Bradfield, James E.; Kahil, John E.; Jaynes, Mark S.; Moake, Gordon L.; Milewits, Marvin; Bolton, Curtis W., III; Lam, Clive C.; and Stanley, Roderic K., 4,710,712, Cl. 324-227.000.

Kai, Yasuaki; Sagawa, Takatoshi; and Tabata, Hiroshi, to Nissan Motor Co., Ltd. Directional light-shield board. 4,709,988, Cl. 350-276.00R.

Kaiser, Gunther; and Krauter, Immanuel, to Robert Bosch GmbH. Method of stabilizing current flow through an automotive-type ignition coil. 4,709,684, Cl. 123-644.000.

Kaiser, Hasso, to DEGUSSA Aktiengesellschaft. Process for introducing bath components into electrolytic and currentless baths. 4,710,224, Cl. 106-1.230.

Kajioka, Yasuo; Komine, Tomio; Kadowaki, Hitoshi; Matsuda, Shigeyoshi; Yugami, Yoshinori; Kubota, Shinya; Takahashi, Yoshio; Shimada, Hiroshi; and Kurata, Nobutaka, to Shimizu Construction Co., Ltd. Climbing formwork apparatus for concrete placing. 4,709,899, Cl. 249-20.000.

Kalinowski, Robert E.: See—
Graiver, Daniel; and Kalinowski, Robert E., 4,710,405, Cl. 427-387.000.

Kamarainen, Jorma, to Valmet Oy. Water vessels of the floating-deck type. 4,710,060, Cl. 405-166.000.

Kamizawa, Koh: See—
Murakami, Tokumichi; Itoh, Atsushi; Asai, Kohtaro; Kamizawa, Koh; and Nishida, Masami, 4,710,812, Cl. 358-136.000.

Kamoshita, Katsuzo: See—
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,710,514, Cl. 514-485.000.

Kamp, Ewald A.: See—
Borchardt, Michael G.; Dorsey, Robert T.; and Kamp, Ewald A., 4,710,968, Cl. 383-63.000.

Kampe, Wolfgang: See—
Mertens, Alfred; Holck, Jens-Peter; Kampe, Wolfgang; Muller-Beckmann, Bernd; Strein, Klaus; and Schaumann, Wolfgang, 4,710,510, Cl. 514-394.000.

Kamyr AB: See—
Nilsson, Bengt H., 4,710,268, Cl. 162-23.000.

Kanayama, Ikuo: See—
Hayashi, Toshihide; Yamakami, Osamu; and Kanayama, Ikuo, 4,710,972, Cl. 455-179.000.

Kanazaki, Mikio: See—
Matsuyama, Shigeru; Kanazaki, Mikio; Aoki, Norio; and Ishii, Akira, 4,709,993, Cl. 350-339.00F.

Kanbe, Junichiro; and Okada, Shinjiro, to Canon Kabushiki Kaisha. Liquid crystal device using ferroelectric liquid crystal twisted in two stable states. 4,709,994, Cl. 350-350.00S.

Kanbe, Junichiro: See—
Kuribayashi, Masaki; Nakazawa, Toshihiko; and Kanbe, Junichiro, 4,709,995, Cl. 350-350.00S.

Kanda, Hiroyuki, to Kabushiki Kaisha Toshiba. Seek operation control apparatus. 4,710,687, Cl. 318-561.000.

Kaneki, Tetsuhiko: See—
Takagi, Yoshiyuki; and Kaneaki, Tetsuhiko, 4,709,611, Cl. 84-1.220.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—
Tonoki, Satoshi; Tsunemi, Hidenari; Nishimura, Asaichi; and Abe, Kunihisa, 4,710,420, Cl. 428-212.000.

Kaneko, Toshio: See—
Takeda, Fuchio; Matsushiro, Hiroyuki; Kobayashi, Kazuo; and Kaneko, Toshio, 4,710,015, Cl. 355-3.0DD.

Kanies, Kerry R., to Oilgear Company, The. Swashblock lubrication in axial piston fluid displacement devices. 4,710,107, Cl. 417-269.000.

Kanner, Martin. Anti-ripple circuit. 4,710,861, Cl. 363-46.000.

Kansai Paint Co., Ltd.: See—
Tominaga, Akira; and Nishida, Reizi, 4,710,561, Cl. 528-111.000.

Kanzaki Paper Manufacturing Co., Ltd.: See—
Osaki, Shigeyoshi; and Fujii, Yoshihiko, 4,710,700, Cl. 324-58.50A.

Kao Corporation: See—
Nakamura, Koichi; Hattori, Michihiro; Tamura, Tadashi; Tejima, Toru; Takaishi, Naotake; Imokawa, Genji; and Hotta, Hajime, 4,710,373, Cl. 424-59.000.

Kappeler, Otmar: See—
Gassmann, Gerhard G.; Schat, Hermannus; Elms, Herbert; Novotny, Bernd; Kappeler, Otmar; and Ehrhardt, Dietmar, 4,710,814, Cl. 358-143.000.

Kapur, Rajan N.; and Szurkowski, Edward S., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Window border generation in a bitmapped graphics workstation. 4,710,761, Cl. 340-721.000.

Karmazin, Jan E. L. Device for fastening a closed casing. 4,710,051, Cl. 403-227.000.

Karnesky, Richard A.: See—
Christiansen, David W.; and Karnesky, Richard A., 4,710,343, Cl. 376-414.000.

Kasai, Masuo: See—
Tsuyoshi, Toshiaki; Yonezawa, Seiji; Kasai, Masuo; and Uno, Motoo, 4,710,909, Cl. 369-46.000.

Kasai, Tatsushi; Niikura, Tatsuo; Sato, Masanori; Hashimoto, Takao; and Yamashita, Akiya, to Tsukishima Kikai Co., Ltd.; and Sumitomo Metal Industries, Ltd. Process for distillation-crystallization of zinc carbonate. 4,710,215, Cl. 62-532.000.

Kasday, Leonard R., to American Telephone and Telegraph Company, AT&T Information Systems Inc. Photoelastic touch-sensitive screen. 4,710,760, Cl. 340-712.000.

Kashiwaba, Tadao, to Kabushiki Kaisha Sato. Setting and winding mechanism for tape-like laminate in laminator. 4,709,868, Cl. 242-56.00R.

Katayama, Hideaki: See—
Takeuchi, Koichi; Yamanaka, Megumi; Kubo, Masayoshi; Katayama, Hideaki; and Tokunaga, Kenji, 4,710,255, Cl. 156-361.000.

Kato, Hisatoyo: See—
Takahashi, Kenji; Umamoto, Chiyuki; and Kato, Hisatoyo, 4,710,626, Cl. 250-327.200.

Kato, Kichiro, to Toyota Jidosha Kabushiki Kaisha. Device for controlling the pressure in the bearings of a roots blower supercharger. 4,709,682, Cl. 123-559.000.

Kato, Masakazu, to Alps Electric Co., Ltd. Method of fabricating print head for thermal printer. 4,710,263, Cl. 156-637.000.

Kato, Mitsutaka: See—
Hirano, Masao; Kato, Mitsutaka; Yasuda, Hirohiko; and Hinoda, Seisuke, 4,710,033, Cl. 374-161.000.

Kato, Takashi: See—
Uryu, Toshiyuki; and Kato, Takashi, 4,710,547, Cl. 525-437.000.

Kato, Toshiro: See—
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,710,514, Cl. 514-485.000.

Katoh, Kinya, to Nippon Kogaku K. K. Projection type exposing apparatus. 4,710,029, Cl. 356-401.000.

Katoh, Tadayoshi: See—
Shimoda, Kaneyasu; Katoh, Tadayoshi; and Ageno, Yuzo, 4,710,746, Cl. 340-347.0DD.

Katsumata, Rybichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, to Kyowa Hakkō Kogyo Co., Ltd. Novel vector plasmids. 4,710,471, Cl. 435-253.000.

Kauffman, Marc W., to General Instrument Corporation. Cable television system with two-way telephone communication path. 4,710,955, Cl. 380-10.000.

Kaufmann, Felix; and Schillinger, Daniel, to BBC Brown, Boveri & Company, Limited. Programming device for a stored-program controller. 4,710,863, Cl. 364-146.000.

Kaultronics, Inc.: See—
Halverson, Ross, 4,710,777, Cl. 343-840.000.

Kawabata, Osamu, to Fuji Electric Company, Ltd. Noise removal circuit for use in a partial discharge measuring device of a high voltage apparatus. 4,710,705, Cl. 324-102.000.

Kawabata, Takao: See—
Mizohata, Fumio; and Kawabata, Takao, 4,710,696, Cl. 323-223.000.

Kawaguchi, Akiko: See—
Takasaka, Yutaka; Mohri, Kunihiko; and Kawaguchi, Akiko, 4,710,375, Cl. 424-69.000.

Kawaguchi, Katsuji: See—
Yonezawa, Toshio; Sasaguri, Nobuya; Onimura, Kichiro; Susukida, Hiroshi; Kawaguchi, Katsuji; Nagano, Hiroo; Minami, Takao; Yamanaka, Kazuo; Okada, Yasutaka; and Inoue, Mamoru, 4,710,237, Cl. 148-13.000.

Kawai, Hiroyuki: See—
Otake, Noboru; Tatsuta, Kuniaki; Mizobuchi, Shigeyuki; Komesima, Nobuyasu; Nakajima, Shohachi; Kawai, Hiroyuki; and Odagawa, Atsuo, 4,710,564, Cl. 536-6.400.

Kawai, Katsunori; Kobayashi, Hisao; Deguchi, Hiroyuki; and Sugizono, Shuichi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Variable delivery refrigerant compressor of double-acting swash plate type. 4,709,555, Cl. 62-228.300.

Kawai, Makoto: See—
Yagi, Shizuo; Kawai, Makoto; and Yamamoto, Yorihi, 4,709,678, Cl. 123-425.000.

Kawai, Yasuo; and Shimohashi, Hirotaka, to Kabushiki Kaisha Advance Kaihatsu Kenkyujo. Intestinal microflora-improving agent. 4,710,379, Cl. 424-93.000.

Kawamoto, Masashi: See—
Yamada, Fumiya; Matsuki, Seiichi; Kawamura, Masahiko; and Kawamoto, Masashi, 4,710,835, Cl. 360-106.000.

Kawamura, Masahiko: See—
Yamada, Fumiya; Matsuki, Seiichi; Kawamura, Masahiko; and Kawamoto, Masashi, 4,710,835, Cl. 360-106.000.

Kawanami, Yoshimi: See—
Ishitani, Tohru; Todokoro, Hideo; Kawanami, Yoshimi; and Tamura, Hifumi, 4,710,632, Cl. 250-396.00R.

Kawasaki, Katsuhiro, to Hitachi, Ltd. Electron beam lithography. 4,710,640, Cl. 250-492.200.

Kawasaki Steel Corporation: See—
Tosaka, Akio; Hashiguchi, Koichi; Morita, Masahiko; and Okano, Shinobu, 4,709,557, Cl. 62-373.000.

Kawauchi, Masataka: See—
Saiki, Eisaku; and Kawauchi, Masataka, 4,709,911, Cl. 271-10.000.

Kayser, Michael: See—
Frankowiak, Gerhard; Bechem, Martin; Gross, Rainer; Kayser, Michael; Schramm, Matthias; and Thomas, Gunter, 4,710,501, Cl. 514-256.000.

Kazaoka, Kenichi; and Okazaki, Hiroshi, to Aisin Seiki Kabushiki Kaisha. Seat reclining apparatus. 4,709,965, Cl. 297-366.000.

Kea, Sandra; and Walker, Charles E., to Nebraska Department of Economic Development, State of Nebraska. Separation and purification of sugar esters synthesized from both aqueous and nonaqueous systems. 4,710,567, Cl. 536-119.000.

Keady, Peter; and Magennis, Thomas P., to Viking Container Company. Container and protective insert for shock sensitive devices. 4,709,817, Cl. 206-523.000.

Keen, Nicky D., to General Motors Corporation. Spring retainer for encapsulated semiconductor device. 4,710,852, Cl. 361-386.000.

Keeton, Richard L. Method for preserving fishing nets. 4,710,407, Cl. 427-389.900.

Kegel, Kurt: See—
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Keller, Thomas J.: See—
Hennon, Erin D.; and Keller, Thomas J., 4,710,038, Cl. 384-569.000.

Kellermann, Guenter: See—
Conrad, Ulrich; Kellermann, Guenter; Breymayer, Angela; Klinker, Rolf; Schult, Oswald; Hoffmann, Rainer; and Fabian, Frank-Dietrich, 4,709,548, Cl. 60-280.000.

Kelly, John E.; Jones, Don C.; Tuck, Frederick R.; Zimmermann, William A.; and Clark, Kenneth R., to Lancraft, Inc. Microtiter plate reader. 4,710,031, Cl. 356-440.000.

Kelly, Michael A., to Kevex Corporation. Charged particle energy analyzer based upon isentropic containment. 4,710,625, Cl. 250-305.000.

Kelly, Robert J.; and Kelly, Tadgh, to Communication Devices, Inc. Modem use monitor. 4,710,929, Cl. 371-22.000.

Kelly, Stephen M.: See—
Schad, Hans P.; and Kelly, Stephen M., 4,710,315, Cl. 252-299.630.

Kelly, Tadgh: See—
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Kelman, Charles D. Intraocular lens with optic of expandable hydrophilic material. 4,710,194, Cl. 623-6.000.

Kendall Company, The: See—
Lukasiewicz, Mark, 4,709,704, Cl. 128-644.000.

Rosenberg, Helmut W. G., 4,710,171, Cl. 604-117.000.

Kennedy, Gary D.; and Maher, Joseph G., to Kentec, Inc. Picture frame fastener. 4,709,494, Cl. 40-152.000.

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Kennedy, Gary D.; and Maher, Joseph G., 4,709,494, Cl. 40-152.000.

Keren, Hanan; and Freundlich, David, to Elscint Ltd. Slice orientation selection arrangement. 4,710,716, Cl. 324-309.000.

Kevex Corporation: See—
Kelly, Michael A., 4,710,625, Cl. 250-305.000.

Key, James D. Belt for arthroscopic treatment of an injured leg supported by a surgeon. 4,709,693, Cl. 128-80.00G.

Kholin, Boris G., to Sumsy Filial Kharkovskogo Politeknicheskogo Instituta. Ball throwing device. 4,709,685, Cl. 124-7.000.

Khoury, Issam A.: See—
Harley, A. Dale; Duquette, Lawrence G.; Khoury, Issam A.; and Kohatsu, Iwao, 4,710,227, Cl. 106-193.00R.

Kick, Helmut: See—
Sapper, Rainer; and Kick, Helmut, 4,710,213, Cl. 62-28.000.

Kidani, Yoshinori; and Noji, Masahide. Cytostatic platinum organic complexes. 4,710,577, Cl. 556-137.000.

Kido, Kunio: See—
Tanaka, Shinsaku; and Kido, Kunio, 4,709,871, Cl. 242-68.300.

Kidwell, Charles E.: See—
Baity, Donald N.; Schwandt, Gregory J.; and Kidwell, Charles E., 4,710,602, Cl. 200-315.000.

Kikkoman Corporation: See—
Akao, Takeshi; and Furukawa, Toshio, 4,709,487, Cl. 34-10.000.

Kikuchi, Sanae: See—
Shimizu, Keiichi; Kikuchi, Sanae; and Nakano, Hitoshi, 4,709,931, Cl. 277-153.000.

Kikut, Botho: See—
Zimmer, Ernst; and Kikut, Botho, 4,710,093, Cl. 414-730.000.

Kilfa Limited: See—
Loveridge, Ronald, 4,710,023, Cl. 356-124.000.

Kilgore, Lee A.; and McKee, Bobby D., to Westinghouse Electric Corp. Homopolar dynamoelectric machine with self-compensating current collector. 4,710,665, Cl. 310-219.000.

Kim, Choung Un; and Misco, Peter F., Jr., to Bristol-Myers Company. Carbapenem antibiotics. 4,710,568, Cl. 540-350.000.

Kim, Dongsung R.; and Kronies, Reinhard K., to Unisys Corporation. Parity detection system for wide bus circuitry. 4,710,935, Cl. 371-49.000.

Kimbara, Kohji, to NEC Corporation. Multilayer wiring substrate with engineering change pads. 4,710,592, Cl. 174-68.500.

Kimberly-Clark Corporation: See—
Boland, Leona G.; Stevens, Robert A.; Wilson, John C.; and Zehner, Georgia L., 4,710,187, Cl. 604-385.00A.

Sneyd, James C., Jr.; Harris, Robert D.; and Latimer, Margaret G., 4,710,185, Cl. 604-372.000.

Kimberly-Clark Corporation: See—
Heyn, Lynn E.; Johnson, Malcolm L.; and Fischer, Daniel O., 4,709,419, Cl. 2-46.000.

Kimura, Kiyoshi, to Alps Electric Co., Ltd. Coordinate input device. 4,710,595, Cl. 178-18.000.

Kimura, Takashi: See—
Yamada, Tsuneco; Sakashita, Tsutomu; Tomono, Hiroshi; Kimura, Takashi; Maehara, Yasuhiro; and Yasumoto, Kunio, 4,709,572, Cl. 72-366.000.

Kinashi, Shoji: See—
Murakami, Saburo; Kinashi, Shoji; and Ego, Toyokazu, 4,710,333, Cl. 264-73.000.

Kinki Insatsu Kabushiki Kaisha: See—
Shimada, Katsuyuki, 4,709,811, Cl. 206-254.000.

Kinnunen, Martti I., to Huyck Corporation. Fourteen harness dual layer weave. 4,709,732, Cl. 139-383.00A.

Kirchhube, Rainer: See—
Spitznas, Manfred; Reiner, Josef; Veit, Wolfgang; and Kirchhube, Rainer, 4,710,000, Cl. 350-516.000.

- Kirin Beer Kabushiki Kaisha: See—
Komano, Tohru; and Ohyma, Kanji, 4,710,461, Cl. 435-68.000.
- Kirk, Alan R.; and Scherrer, Robert A., to Riker Laboratories, Inc. Substituted biphenyl derivatives. 4,710,515, Cl. 514-563.000.
- Kirn, Jeffrey F.; and Connaughton, James M., Jr., to Consagra, Inc. Flavoring method for fried food products. 4,710,391, Cl. 426-289.000.
- Kirsch, Warren B., to Ethyl Corporation. Removing or decreasing iron-caused yellow color in a solution. 4,710,306, Cl. 252-8.551.
- Kirschenberg, Bruce H.; and Platt, Richard L. Thigh mounted lower back support belt. 4,709,692, Cl. 128-78.000.
- Kirsten, Thomas P.: See—
Parkinson, James G.; and Kirsten, Thomas P., 4,709,966, Cl. 297-473.000.
- Kishi, Hiroyoshi: See—
Takano, Katsuhiko; Yoshihara, Satoshi; Iijima, Shigeharu; Sasamori, Eizo; Matsushima, Masaaki; and Kishi, Hiroyoshi, 4,710,418, Cl. 428-192.000.
- Kita, Yasushi; and Moroi, Shiro, to Central Glass Company, Limited. Method of producing electric cell anode using powdery active material. 4,710,335, Cl. 264-105.000.
- Kitahara, Takeshi, to Fujitsu Limited. Loop transmission system having automatic loop configuration control means. 4,710,915, Cl. 370-16.000.
- Kitazawa, Yoshihiro, to Dainippon Screen Mfg. Co., Ltd. Density conversion in image reproduction. 4,710,823, Cl. 358-280.000.
- Kittler, Wilfred C.: See—
Ritchie, Ian T.; and Kittler, Wilfred C., 4,710,441, Cl. 430-62.000.
- Klann, Horst. Assembly device for axle bearings and/or wheel flange hubs of motor vehicles. 4,709,459, Cl. 29-263.000.
- Klatzka, Joseph H.: See—
Maass, Helmut; and Klatzka, Joseph H., 4,710,055, Cl. 404-112.000.
- Klein, Frank H.: See—
Van Hout, James E.; and Klein, Frank H., 4,710,858, Cl. 362-95.000.
- Klein, Max. Mica-polymer micro-bits composition and process. 4,710,520, Cl. 521-55.000.
- Klein, Sigismund, to Siemens Aktiengesellschaft. Collimator for a radiation diagnostics apparatus. 4,710,947, Cl. 378-147.000.
- Klingberg, Alfred: See—
David, Bernd; and Klingberg, Alfred, 4,709,786, Cl. 187-9.00E.
- Klingen, Jürgen; and Zimmerman, Patrick G., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive tape containing hydrophobic silica. 4,710,536, Cl. 524-493.000.
- Klingensmith, James D.: See—
Stemler, J. Robert; Klingensmith, James D.; Menzemer, Craig C.; Kulicki, John M.; and Theofanis, Nicholas D., 4,709,435, Cl. 14-73.000.
- Klinker, Rolf: See—
Conrad, Ulrich; Kellermann, Guenter; Breymayer, Angela; Klinker, Rolf; Scholdt, Oswald; Hoffmann, Rainer; and Fabian, Frank-Dietrich, 4,709,548, Cl. 60-280.000.
- Klintonstedt, Kjell; Foldhazy, Zoltan; and Forsberg, Björn, to Alfa-Laval AB. Centrifugal separator. 4,710,160, Cl. 494-64.000.
- Kloeber GmbH & Co.: See—
Steinmann, Joachim, 4,709,962, Cl. 297-301.000.
- Klug, Horst; Mocker, Wolfgang; Schaeffler, George; and Speil, Walter, to INA Walzlager Schaeffler KG. Self-adjusting hydraulic valve tappet. 4,709,668, Cl. 123-90.550.
- Klump, Walter, to Rheinmetall GmbH. Throwing device for firing incandescent bodies. 4,709,614, Cl. 89-1.350.
- Knapp, Paul A. Valve apparatus for crankcase oil drainage. 4,709,722, Cl. 137-539.000.
- Knaur, James A.: See—
Greene, Hugh W.; Holder, James D.; and Knaur, James A., 4,710,912, Cl. 369-218.000.
- Kniep, Volkmar: See—
Illig, Egon; and Kniep, Volkmar, 4,709,912, Cl. 271-42.000.
- Kniess, Donald L. Plumbing fitting for a multiple-line connection. 4,709,947, Cl. 285-150.000.
- Knight, Joseph L. Pressure slip expansion joint. 4,709,524, Cl. 52-536.000.
- Knight, Silsby H., to Hayes-Ivy Manufacturing Inc. Retractable pre-rinse unit with automatic shutoff. 4,709,715, Cl. 134-172.000.
- Knipp, Randall S.; and Loyd, Lewis, to Hallmark Cards, Incorporated. Method and apparatus for producing deckled edge paper. 4,710,158, Cl. 493-328.000.
- Knobloch, Osbert: See—
Henne, Heinrich; Patzelt, Norbert; Schneider, Lutz T.; Knobloch, Osbert; and Muller, Manfred, 4,709,864, Cl. 241-167.000.
- Knobloch, Glenn A.; and Scolten, Brian L., to Steelcase Inc. Slip connector for weight actuated height adjusters. 4,709,894, Cl. 248-406.200.
- Knoll, Frank: See—
Spinosa, Dominic J.; and Knoll, Frank, 4,709,818, Cl. 206-524.800.
- Knowles, Terence J.; Ray, Francis M.; and Shewey, Charles E., to Zenith Electronics Corporation. High voltage electronic component test apparatus. 4,710,707, Cl. 324-158.00F.
- Kobata, Shoichi: See—
Maegawa, Harumi; Takai, Sakan; Sukeda, Toshiaki; Irie, Shoji; and Kobata, Shoichi, 4,710,895, Cl. 365-2.000.
- Kobayashi, Hisao: See—
Kawai, Katsunori; Kobayashi, Hisao; Deguchi, Hiroyuki; and Sugizono, Shuichi, 4,709,555, Cl. 62-228.300.
- Kobayashi, Kazuo: See—
Takeda, Fuchio; Matsushiro, Hiroyuki; Kobayashi, Kazuo; and Kaneko, Toshio, 4,710,015, Cl. 355-3.0DD.
- Kobayashi, Kazuyoshi: See—
Takizawa, Shozo; Kobayashi, Kazuyoshi; Fukuyama, Kazuo; Tani, Masanori; Yamamoto, Shoji; Yuasa, Hiroo; Nishimori, Masayoshi; Yoshida, Hiroaki; Eto, Shinichi; Hirao, Eiji; and Goto, Masaki, 4,709,935, Cl. 280-91.000.
- Kobayashi, Kiyohiko, to Ricoh Company, Ltd. Image data masking device. 4,710,965, Cl. 382-41.000.
- Kobayashi, Kozo; and Goto, Hideo, to Nakamichi Corporation. Operation prohibition device for an audio instrument. 4,710,907, Cl. 369-6.000.
- Kobayashi, Shigeru: See—
Ichimaru, Yoshiro; Kobayashi, Shigeru; and Ohashi, Toshio, 4,709,751, Cl. 165-17.000.
- Kobayashi, Takayuki: See—
Yoshimura, Toshiteru; Kobayashi, Takayuki; and Ono, Masayoshi, 4,709,943, Cl. 280-751.000.
- Kobayashi, Takehiro: See—
Uetsuki, Haruo; Kobayashi, Takehiro; and Yamane, Hiroto, 4,710,689, Cl. 318-630.000.
- Kobayashi, Tsuneo, to NEC Corporation. Distributed control type electronic switching system. 4,710,952, Cl. 379-269.000.
- Koch, Christian. Diesel exhaust gas catalyst. 4,710,487, Cl. 502-303.000.
- Kodaira, Takanori: See—
Namai, Akihiro; Egawa, Akira; and Kodaira, Takanori, 4,710,010, Cl. 354-400.000.
- Koehler, Heinrich P.; and Dixon, John R., to Black & Decker Inc. Family of electric drills and two-speed gear box therefor. 4,710,071, Cl. 408-133.000.
- Koek, Kevin C.: See—
LaBude, Brian R.; and Koek, Kevin C., 4,709,972, Cl. 312-208.000.
- Koelling, Alan L.; Murphy, William J.; and Mayer, Edward F., to Ricoh Systems, Inc. Gradient layer panchromatic photoreceptor. 4,710,442, Cl. 430-85.000.
- Koester, Charles J.: See—
Donn, Anthony; and Koester, Charles J., 4,710,197, Cl. 623-6.000.
- Koga, Toshio, to NEC Corporation. Predictive coding/decoding apparatus for video signal. 4,710,810, Cl. 358-133.000.
- Kogan, David I.: See—
Kostylev, Alexandr D.; Boginsky, Vladimir P.; Smolyanitsky, Boris N.; Syryamin, Jury N.; Danilov, Boris B.; Kogan, David I.; and Saveliev, Vyacheslav N., 4,709,768, Cl. 175-296.000.
- Kohashi, Toru; and Adachi, Motoyuki, to Yamato Scale Company, Limited. Device for correcting dynamic weight signal from conveyor weigher. 4,709,770, Cl. 177-50.000.
- Kohatsu, Iwao: See—
Harley, A. Dale; Duquette, Lawrence G.; Khoury, Issam A.; and Kohatsu, Iwao, 4,710,227, Cl. 106-193.00R.
- Kohn, Roger; and Shields, William K. M. Protective device. 4,709,695, Cl. 128-132.00R.
- Kohno, Takanori, to Copal Company Limited. Control circuit for a programming shutter. 4,710,014, Cl. 354-427.000.
- Koito Seisakusho Co., Ltd.: See—
Fuji, Akira; Tokita, Yasuhiro; and Masuda, Katsuhiko, 4,710,938, Cl. 372-56.000.
- Kojima, Haruo; and Akasaki, Hidehiko, to Fujitsu Limited. Method for producing a package for a semiconductor device. 4,710,250, Cl. 156-89.000.
- Kokusai Denshin Denwa Co., Ltd.: See—
Wakabayashi, Hiroharu; and Niino, Yasuhiko, 4,710,976, Cl. 455-601.000.
- Kolbenschmidt AG: See—
Mielke, Siegfried, 4,709,620, Cl. 92-187.000.
- Koller, Franz, to Siemens Aktiengesellschaft. Device for assembling electrical components on a terminal carrier plate. 4,709,847, Cl. 228-49.100.
- Komaki, Shozo: See—
Okamoto, Yoshiharu; Horikawa, Izumi; and Komaki, Shozo, 4,710,975, Cl. 455-276.000.
- Komano, Tohru; and Ohyma, Kanji, to Kirin Beer Kabushiki Kaisha; and Marubeni Kabushiki Kaisha. Promoter derived from chloroplast DNA. 4,710,461, Cl. 435-68.000.
- Komatsu Forklift Kabushiki Kaisha: See—
Ochiai, Toshio; Tsujimura, Akio; and Tsukiyasu, Hiroshi, 4,710,091, Cl. 414-623.000.
- Komatsu, Shigeru, to Kabushiki Kaisha Toshiba. Method of making a bipolar semiconductor device. 4,710,241, Cl. 437-162.000.
- Komeshima, Nobuyasu: See—
Otake, Noboru; Tatsuta, Kuniaki; Mizobuchi, Shigeyuki; Komeshima, Nobuyasu; Nakajima, Shohachi; Kawai, Hiroyuki; and Odagawa, Atsuo, 4,710,564, Cl. 536-6.400.
- Komine, Tomio: See—
Kajioka, Yasuo; Komine, Tomio; Kadowaki, Hitoshi; Matsuda, Shigeyoshi; Yugami, Yoshinori; Kubota, Shinya; Takahashi, Yoshio; Shimada, Hiroshi; and Kurata, Nobutaka, 4,709,899, Cl. 249-20.000.
- Komura, Osamu: See—
Sekiguchi, Yukio; Funakubo, Hiroyasu; Sakanoue, Hitoyuki; and Komura, Osamu, 4,709,844, Cl. 228-3.100.
- Kondo, Akinobu: See—
Nakamura, Kazuharu; Matsumoto, Motoki; Kondo, Akinobu; and Ito, Kiyonobu, 4,710,125, Cl. 431-22.000.
- Kondo, Kazuo: See—
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; Kondo, Kiyoshi; Kondo, Yutaka; and Kondo, Kazuo, 4,709,714, Cl. 134-89.000.

- Kondo, Kiyoshi: See—
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- Kondo, Tetsujiro, to Sony Corporation. Highly efficient coding apparatus for a digital video signal. 4,710,811, Cl. 358-135.000.
- Kondo, Yutaka: See—
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; Kondo, Kiyoshi; Kondo, Yutaka; and Kondo, Kazuo, 4,709,714, Cl. 134-89.000.
- Kondoh, Yoshiyuki: See—
Ishidoh, Takanobu; and Kondoh, Yoshiyuki, 4,710,921, Cl. 370-110.100.
- Konishi, Masahiro: See—
Aotsuka, Yasuo; Konishi, Masahiro; and Takahashi, Koji, 4,710,631, Cl. 250-354.100.
- Konishioku Photo Industry Co., Ltd.: See—
Funaki, Shinsuke; Akanabe, Yuichi; and Ikeda, Hiroaki, 4,710,779, Cl. 346-1.100.
- Hirabayashi, Shigetoshi; Matsuzaka, Syoji; Ohya, Yukio; and Nonaka, Yoshiyuki, 4,710,453, Cl. 430-505.000.
- Matsunawa, Masahiko, 4,710,822, Cl. 358-280.000.
- Yamauchi, Yasuhisa; Asano, Masao; Anzai, Hideyuki; and Yasufuku, Yoshitaka, 4,710,427, Cl. 428-407.000.
- Kono, Kunio: See—
Matsuda, Katsumi; and Kono, Kunio, 4,709,529, Cl. 53-207.000.
- Kopp, Norbert: See—
Morell, Joseph; De Marchi, Jean-Louis; and Kopp, Norbert, 4,709,491, Cl. 36-121.000.
- Korber AG: See—
Kageler, Peter; Bostelmann, Rudolf; and Buhrmester, Olaf, 4,710,066, Cl. 406-29.000.
- Korea Advanced Institute of Science and Technology: See—
Gil, Kim Y.; and Sun, Lee C., 4,710,347, Cl. 420-94.000.
- Korsunsky, Iosif, to AMP Incorporated. Low insertion force chip carrier connector with movable housing. 4,710,134, Cl. 439-264.000.
- Kortschinski, Juri; Lat, Michael V.; Maurice, Claude G.; and Tickner, Derek C. Current-limiting surge arrester disconnecter. 4,710,847, Cl. 361-125.000.
- Koschinski, Ingo: See—
Reichert, Karl-Heinz; and Koschinski, Ingo, 4,710,546, Cl. 525-420.000.
- Koshino, Yutaka; Akiyama, Tatsuo; and Baba, Yoshiro, to Kabushiki Kaisha Toshiba. Composite semiconductor device. 4,710,794, Cl. 357-49.000.
- Kosterka, Donald W., to AGI Incorporated. Compact disc package and a method of making same. 4,709,812, Cl. 206-310.000.
- Kostylev, Alexandr D.; Boginsky, Vladimir P.; Smolyanitsky, Boris N.; Syryamin, Jury N.; Danilov, Boris B.; Kogan, David I.; and Saveliev, Vyacheslav N., to Institut Gornogo Dela So An USSR. Annular air hammer apparatus for drilling wells. 4,709,768, Cl. 175-296.000.
- Kozarich, John W.; and Rhoads, Robert E., to Yale University. Purification of the messenger RNA cap-binding protein. 4,710,566, Cl. 536-28.000.
- Kraemer, Dieter; Siol, Werner; Markert, Gerhard; Suetterlin, Norbert; and Feil, Cornelia, to Rohm GmbH. Polymer particles and latices thereof for the immobilization of biologically active substances. 4,710,525, Cl. 523-201.000.
- Krafft, Frederic B., to Entwistle Company, The. Method and apparatus for twisting filaments to form a cable. 4,709,542, Cl. 57-16.000.
- Kraft, Russell P.: See—
Hoogenboom, Leo; Jackson, Robert L., Jr.; Kraft, Russell P.; and Offt, Alan M., 4,710,808, Cl. 358-107.000.
- Kramer, Felix, to Elpatronic AG. Magazine for stacking sheet-metal members. 4,710,088, Cl. 414-113.000.
- Kranbuehl, David E. Method of using a dielectric probe to monitor the characteristics of a medium. 4,710,550, Cl. 526-60.000.
- Kransco Manufacturing, Inc.: See—
Harrod, Lawrence R., 4,709,958, Cl. 296-177.000.
- Kraus, Charles E., to Excellermatic Inc. Fixed ratio traction roller transmission. 4,709,589, Cl. 74-206.000.
- Kraus, Menahem A.; and Murphy, Milton K., to Monsanto Company. Polyphosphazene gas separation membranes. 4,710,204, Cl. 55-16.000.
- Kraus, Wayne A., to Hercules Incorporated. Primer coating for cycloolefin polymer articles. 4,710,408, Cl. 427-393.500.
- Krause, Larry J.; and Rider, Jack A., to Minnesota Mining and Manufacturing Company. Metallized polymers. 4,710,403, Cl. 427-304.000.
- Krauss-Maffei A.G.: See—
Alstetter, Franz; and Hultsch, Guenther, 4,710,356, Cl. 422-140.000.
- Krauter, Immanuel: See—
Kaiser, Gunther; and Krauter, Immanuel, 4,709,684, Cl. 123-644.000.
- Kreevoy, Maurice M.: See—
Deetz, David W.; and Kreevoy, Maurice M., 4,710,205, Cl. 55-158.000.
- Kreher, Klaus: See—
Wermuth, Stefan; Hauke, Gunter; and Kreher, Klaus, 4,710,289, Cl. 210-198.200.
- Kreidl, Janos; Turcsanyi, Peter; Araos, Zsuzsanna; Stefko, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jeno; Csizer, Eva; Vezzer, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, to Richter Gedeon Vegyeszeti Gyart Rt. Nitrodiaryl sulfoxide derivatives, process for their preparation and pharmaceutical and pesticidal compositions containing them as active ingredient. 4,710,323, Cl. 260-543.00R.
- Kreider, Walter J., to Courtesy Mold & Tool Corporation. Closure with top cut tamper evident feature for wide mouth container. 4,709,830, Cl. 220-258.000.
- Kreiter, Manny, to Castcraft Industries, Inc. Color proofing and color proofing transfer process using water developed ink. 4,710,447, Cl. 430-293.000.
- Krishnakumar, Supayan M.; and Nahill, Thomas E., to Continental PET Technologies, Inc. Apparatus for forming preforms with internal barrier. 4,710,118, Cl. 425-130.000.
- Kristoufek, Jaroslav, to Ceskoslovenska akademie ved. Method for processing of organic materials containing nitrogen compounds. 4,710,300, Cl. 210-603.000.
- Kroger, Hans: See—
Cordes, Hugo; and Kroger, Hans, 4,709,588, Cl. 74-103.000.
- Kronies, Reinhard K.: See—
Kim, Dongsung R.; and Kronies, Reinhard K., 4,710,935, Cl. 371-49.000.
- Kruger, Manfred; and Mucha, Lawrence S., to Coca-Cola Company; and Bosch-Siemens Hausgerate GmbH. Dispenser pouch for beverage syrups and concentrates. 4,709,835, Cl. 222-87.000.
- Krupa, Robert L., Jr., to Prime Instruments, Inc. Electrical measuring meter and method including a calibrating element. 4,710,706, Cl. 324-146.000.
- Krupp Polysius AG: See—
Henne, Heinrich; Patzelt, Norbert; Schneider, Lutz T.; Knobloch, Osbert; and Muller, Manfred, 4,709,864, Cl. 241-167.000.
- Krysiak, Gary D.: See—
Gerace, Michael J.; Krysiak, Gary D.; and Schiappacasse, Russell F., 4,710,411, Cl. 428-34.000.
- Kubert, Vince T.; and Richards, John S., to Harris Graphics Corporation. Fluid metering method and apparatus. 4,709,635, Cl. 101-426.000.
- Kubo, Kanji; and Wakai, Katsuro, to Hitachi, Ltd. Access control system for storage having hardware area and software area. 4,710,894, Cl. 364-900.000.
- Kubo, Masahiro, to Kabushiki Kaisha Toshiba. Rotary compressor with oil groove between journal and journal bearing. 4,710,111, Cl. 418-63.000.
- Kubo, Masayoshi: See—
Takeuchi, Koichi; Yamanaka, Megumi; Kubo, Masayoshi; Katayama, Hideaki; and Tokunaga, Kenji, 4,710,255, Cl. 156-361.000.
- Kubota, Shinya: See—
Kajioka, Yasuo; Komine, Tomio; Kadowaki, Hitoshi; Matsuda, Shigeyoshi; Yugami, Yoshinori; Kubota, Shinya; Takahashi, Yoshio; Shimada, Hiroshi; and Kurata, Nobutaka, 4,709,899, Cl. 249-20.000.
- Kuhl, Henry Y. Apparatus for conveying and washing means therefor. 4,709,713, Cl. 134-72.000.
- Kuhnen, Gottfried: See—
Faber, Guy; and Kuhnen, Gottfried, 4,710,103, Cl. 416-219.00R.
- Kuhstoss, Stuart A.: See—
Belagaje, Ramamoorthy; Kuhstoss, Stuart A.; and Rao, R. Nagaraja, 4,710,464, Cl. 435-91.000.
- KUKA Schweissanlagen & Roboter GmbH: See—
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- Kulicki, John M.: See—
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- Kullmann, Eugene V.: See—
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- Kumanoya, Masaki; Fujishima, Kazuyasu; and Dosaka, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Driving circuit for a shared sense amplifier. 4,710,901, Cl. 365-190.000.
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- Kunkel, Bernd, to Messerschmitt-Bolkow-Blohm GmbH. Sensing apparatus for determining the relative position between two bodies with plural emitters and a shading member. 4,710,620, Cl. 250-203.00R.
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- Kupfer, Karl-Heinz, to U.S. Philips Corporation. Circuit arrangement for a tuner for changing over several frequency ranges. 4,710,974, Cl. 455-190.000.
- Kuppenheimer, John D., Jr.; and Smith, Kirby A., to Sanders Associates, Inc. Optical detection system. 4,710,630, Cl. 250-353.000.
- Kupper, Robert J.: See—
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Kurata, Nobutaka: See—
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Kyffin, Morris N.: See—
Douglas, Peter G.; and Kyffin, Morris N., 4,710,815, Cl. 358-186.000.

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Laing, Johannes L. N.: See—
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Landen, Terry R.: See—
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Landsberger, Albert. Therapeutic agent for the use in cancer treatment. 4,710,493, Cl. 514-56.000.

Lane, Bennie L. Universal fascia assembly for securing a membrane to a roof. 4,709,518, Cl. 52-94.000.

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Lapovich, Walter P.: See—
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Lash, Glen R., to Procter & Gamble Company. The Shaped disposable diapers with shaped elastically contractible waistbands. 4,710,189, Cl. 604-385.00A.

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Laverty, Martin J., Jr., to Coyne & Delany Co. Disabler system for plumbing fixture. 4,709,427, Cl. 4-427.000.

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Law, Yee-Shing: See—
Wu, Joseph C.; Law, Yee-Shing; and James, John, 4,710,970, Cl. 455-113.000.

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Lehmann, Hans-Dieter: See—
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 ichiro; and Lloyd, Kenneth O., 4,710,457, Cl. 435-7.000.
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 Harald; Junge, Bodo; and Pelster, Bernhard, to Troponwerke GmbH
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 Lang, Gerard; Forestier, Serge; and LaGrange, Alain, 4,710,584,
 Cl. 560-51.000.
 Madrange, Annie; and Canivet, Patrick, 4,710,314, Cl. 252-117.000.
 Lorensen, William E.: See—
 Cline, Harvey E.; and Lorensen, William E., 4,710,876, Cl.
 364-414.000.
 Lorenz, Rainer, to Palitex Project-Company GmbH. Pre-take-up roller
 mechanism for varying the tension on a running thread in a thread
 processing machine. 4,709,543, Cl. 57-58.700.
 Lovell, Roger. Propeller shaft bearing assembly. 4,710,142, Cl.
 440-83.000.
 Loveridge, Ronald, to Ruxley Holdings Ltd.; and Kilfa Limited. Mea-
 surement of contact lenses. 4,710,023, Cl. 356-124.000.
 Lowry, Hugh R.; and Frost, Robert T., to General Electric Company.
 Continuous metal casting apparatus. 4,709,749, Cl. 164-503.000.
 Loy, Ferdinand R., to U.S. Philips Corporation. Opto-mechanical scan-
 ner with fixed-field ranging device. 4,710,621, Cl. 250-203.00R.
 Loyd, Lewis: See—
 Knipp, Randall S.; and Loyd, Lewis, 4,710,158, Cl. 493-328.000.
 Lozier, Benjamin F.: See—
 Anders, Walter G.; Grosswiller, Leo J., Jr.; Lozier, Benjamin F.;
 and Rozlosnik, Alan J., 4,710,098, Cl. 415-149.00A.
 Lubrizol Corporation, The: See—
 Malone, Gilbert R.; Skursha, Susan K.; and Jost, Robert M.,
 4,710,474, Cl. 436-60.000.
 Lucas Industries Public Limited Company: See—
 Dawes, Cyril; and Tranter, Donald F., 4,710,238, Cl. 148-16.600.
 Lucas, Peter A.: See—
 Bogan, Gary W.; Lucas, Peter A.; Monnerat, Georgia A.; and
 Aldrich, Dale J., 4,710,429, Cl. 428-417.000.
 Luceri, Thomas J.: See—
 DeRossett, Edmund Z.; and Luceri, Thomas J., 4,710,186, Cl.
 604-383.000.
 Luckey, George W.; Roth, Bernard; Brendel, Kathleen E.; and Den
 Dunne, Margaret S., to Eastman Kodak Company. High efficiency
 fluorescent screen pair for use in low energy X radiation imaging.
 4,710,637, Cl. 250-486.100.
 Ludvigsen, Poul F. B., to Brdr. Ludvigsen, Tommfrup APS. Apparatus
 for the application of a strip along the side edges of a sheet. 4,710,084,
 Cl. 412-9.000.
 Luhowyj, Vladimir. Panel installation tool and method. 4,709,460, Cl.
 29-271.000.
 Lukasiewicz, Mark, to Kendall Company, The. Monitoring device for
 bio-signals. 4,709,704, Cl. 128-644.000.
 Lukaszonas, William S. Swivel shutter assembly. 4,709,506, Cl.
 49-88.000.
 Lukens General Industries, Inc.: See—
 Kulp, Jack H.; and Cunningham, Richard M., 4,710,053, Cl.
 404-9.000.
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 McCutcheon, Samuel; Lum, Jeffrey; Solek, Roman; Harrell, Troy;
 and Leman, Robert, 4,710,893, Cl. 364-900.000.
 Lundberg, Robert D.: See—
 Peiffer, Dennis G.; and Lundberg, Robert D., 4,710,555, Cl.
 526-240.000.
 Lyons, Harold W.: See—
 Berke, Howard M.; and Lyons, Harold W., 4,710,749, Cl.
 340-405.000.
 Lytle, Donald A.: See—
 Sidaway, H. John; and Lytle, Donald A., 4,709,723, Cl.
 137-584.000.

M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: See—
 Hammer, Josef; and Handschuh, Walter, 4,709,872, Cl.
 242-75.430.
 M-B-W Inc.: See—
 Maass, Helmut; and Klatzka, Joseph H., 4,710,055, Cl. 404-112.000.
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 Sharma, Shanmuk; Hill, Donnie K.; and Durr, Charles A.,
 4,710,214, Cl. 62-28.000.
 Maass, Helmut; and Klatzka, Joseph H., to M-B-W Inc. Riding-type
 multiple trowel machine. 4,710,055, Cl. 404-112.000.
 Machida, Toyoji; and Ueno, Shyuichi, to Sanyo Electric Co., Ltd.
 Method of manufacturing spiral electrode assembly. 4,709,472, Cl.
 29-623.000.
 Machler, Meinrad, to Carl-Zeiss-Stiftung. Chassis for optical instru-
 ments. 4,709,989, Cl. 350-321.000.
 Macy, Dennis W., to Colorado State University Research Foundation.
 Method for detection of Cushing's syndrome in domestic animals.
 4,710,370, Cl. 424-9.000.
 Madan, Arun: See—
 Ovshinsky, Stanford R.; and Madan, Arun, 4,710,786, Cl. 357-2.000.
 Maddox, James F.; Kadonoff, Mark B.; Berger, Alan D.; Taivalkoski,
 Amy L.; George, Robert W., II; and Benayad-Cherif, Faycal E., to
 Denning Mobil Robotics, Inc. Beacon proximity detection system for
 a vehicle. 4,710,020, Cl. 356-1.000.
 Madrange, Annie; and Canivet, Patrick, to L'Oreal. Detergent cosmetic
 composition containing a soap and cationic compound. 4,710,314, Cl.
 252-117.000.
 Maeda, Fujio, to Kabushiki Kaisha Komatsu Seisakusho. Planetary gear
 type transmission system. 4,709,594, Cl. 74-753.000.
 Maegawa, Harumi; Takai, Sakan; Sukeda, Toshiaki; Irie, Shoji; and
 Kobata, Shoichi, to Fujitsu Limited. Magnetic bubble memory mod-
 ule with protected terminals. 4,710,895, Cl. 365-2.000.
 Maehara, Yasuhiro: See—
 Yamada, Tsuneo; Sakashita, Tsutomu; Tomono, Hiroshi; Kimura,
 Takashi; Maehara, Yasuhiro; and Yasumoto, Kunio, 4,709,572,
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 Maffert, Jerome: See—
 Grenier, Gilles; Maffert, Jerome; Merle, Jean-Pierre; and des Or-
 dons, Jacques R., 4,710,028, Cl. 356-375.000.
 Magathan, Paul J.: See—
 Liefer, Allen C.; Loewen, Gilbert L.; and Magathan, Paul J.,
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 Magennis, Thomas P.: See—
 Keady, Peter; and Magennis, Thomas P., 4,709,817, Cl.
 206-523.000.
 Maghemite Inc.: See—
 Whiteley, Eric, 4,710,667, Cl. 310-268.000.
 Magill-Stephenson Company Limited: See—
 Britz, Raymond P., 4,710,290, Cl. 210-199.000.
 Magome, Nobutaka; and Ichihara, Yutaka, to Nippon Kogaku K. K.
 Position detection apparatus. 4,710,026, Cl. 356-349.000.
 Mahaffee, Joseph W., III: See—
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 Cl. 116-140.000.
 Mahaffy & Harder Engineering Co.: See—
 Mahaffy, Reid A.; Garson, Eugene; and Ostrow, Milan R.,
 4,709,535, Cl. 53-473.000.
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 & Harder Engineering Co. Packaging loader apparatus for sliced
 food products. 4,709,535, Cl. 53-473.000.
 Maher, Joseph G.: See—
 Kennedy, Gary D.; and Maher, Joseph G., 4,709,494, Cl.
 40-152.000.
 Maines, Robert, to R. J. Harvey Instrument Corporation. Nylon strips
 for medical assay. 4,710,458, Cl. 435-12.000.
 Mallow, William A., to Southwest Research Institute. Fluidization of
 limestone slurries and resultant products. 4,710,226, Cl. 106-119.000.
 Malone, Gilbert R.; Skursha, Susan K.; and Jost, Robert M., to Lubrizol
 Corporation, The. Method of analyzing high molecular weight dis-
 persants in motor oils. 4,710,474, Cl. 436-60.000.
 Mangiavacchi, Jacques, to Glaenger Spicer. Sealing device for a univer-
 sal joint. 4,710,150, Cl. 464-14.000.
 Mangler, Rolf: See—
 Gohler, Peter; Mangler, Rolf; Schingnitz, Manfred; Seidel, Wolf-
 gang; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir;
 Fedotov, Vasiliy; and Gamburg, David, 4,710,202, Cl. 48-73.000.
 Mannesmann AG: See—
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 Roether, Kurt, 4,710,245, Cl. 148-12.400.
 Mannesmann Rexroth GmbH: See—
 Bartholomaeus, Reiner; and Widmann, Karlheinz, 4,709,619, Cl.
 92-130.00D.
 Manning, David J., to General DataComm, Inc. Bit interleaved multi-
 plexer system providing byte synchronization for communicating
 apparatuses. 4,710,920, Cl. 370-100.000.
 Mantyla, Jim. Flexible closure for resealing containers. 4,709,832, Cl.
 220-306.000.
 Manville Corporation: See—
 Olsen, Peter C., Jr.; Conforto, Peter M.; Craighead, Jimmy R.; and
 Wolf, David L., 4,709,538, Cl. 53-566.000.
 Marcantonio, Gabriel, to Northern Telecom Limited. Integrated circuit
 chip package. 4,710,798, Cl. 357-80.000.
 Mardak, Keith R., to Hal Leonard Publishing Corporation. Portable
 viewing stand. 4,709,895, Cl. 248-460.000.

Mares, Frank: See—
 Boyle, William J., Jr.; Mares, Frank; and Corbo, Andrea M.,
 4,710,545, Cl. 525-340.000.
 Maresca, Louis M., to Amoco Corporation. Stabilizing polyaryle-
 therketones. 4,710,562, Cl. 528-125.000.
 Marinaccio, Paul J.: See—
 Harvey, Andrew C.; Ribich, William A.; Marinaccio, Paul J.; and
 Sawaf, Bernard E., 4,709,453, Cl. 24-442.000.
 Marine Moisture Control Company, Inc.: See—
 Schmukler, Charles S.; and Buon, Georges A., 4,710,643, Cl.
 250-573.000.
 Maris, Humphrey J.: See—
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 Markert, Gerhard: See—
 Kraemer, Dieter; Siol, Werner; Markert, Gerhard; Suetterlin,
 Norbert; and Feil, Cornelia, 4,710,525, Cl. 523-201.000.
 Markle, Wilson; and Mitchell, Christopher, to Colorization Inc.
 Method of, and apparatus for, modifying luminance levels of a black
 and white video signal. 4,710,805, Cl. 358-81.000.
 Marksteiner, William K.: See—
 Cantwell, Robert H.; Marksteiner, William K.; and Hansen, V.
 Gregers, 4,710,772, Cl. 342-92.000.
 Marris, Derrick A.: See—
 Voorhis, Roger; Erbs, Daryl G.; Palmer, John M.; and Marris,
 Derrick A., 4,709,560, Cl. 62-508.000.
 Marshall, Dennis L.: See—
 Brilmyer, George H.; and Marshall, Dennis L., 4,710,280, Cl.
 204-146.000.
 Martens, Ernst, to Alphair Ventilating Systems Inc. Auger construction
 for machines for forming hollow core concrete slabs. 4,710,112, Cl.
 425-64.000.
 Martin, Adolf: See—
 Lengsfeld, Karl; Link, Erich; Martin, Adolf; and Wittler, Hilmar,
 4,709,794, Cl. 192-18.00B.
 Martin, James W., to Engineering Patents & Equipment Limited. Para-
 chute system and aircraft ejection seat incorporating the same.
 4,709,885, Cl. 244-141.000.
 Martin Marietta Corporation: See—
 Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis
 C., 4,710,348, Cl. 420-129.000.
 Martin, Patricia A.: See—
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 365-194.000.
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 having a fluorescing pattern. 4,710,636, Cl. 250-467.100.
 Martwick, Wilford E.: See—
 Broden, David E.; Martwick, Wilford E.; and Warren, John B.,
 4,709,638, Cl. 102-522.000.
 Marubeni Kabushiki Kaisha: See—
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 Maruyama, Tsutomu: See—
 Harada, Yuhio; Maruyama, Tsutomu; Kumakura, Yoshiyuki; and
 Kuwayama, Shigeo, 4,710,216, Cl. 65-4.100.
 Marvin Glass & Associates: See—
 Breslow, Jeffrey D.; Morrison, Howard J.; Hanson, Steven P.; and
 Rasmussen, Russell G., 4,710,873, Cl. 364-410.000.
 Rasmussen, Russell G.; Stubenfol, Leonard J.; and Disko, Harry,
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 Masaki, Akira: See—
 Yamada, Minoru; Wajima, Motoyo; Masaki, Akira; Takahashi,
 Akio; Nakanishi, Keiichiro; and Sugawara, Katuo, 4,710,854,
 Cl. 361-414.000.
 Masaki, Kazumi, to Hayashibara, Ken. Resonant vibration-transmitting
 apparatus. 4,710,655, Cl. 310-30.000.
 Masaki, Kazumi, to Hayashibara, Ken. Phase-controlled automatic
 switching circuit. 4,710,698, Cl. 323-239.000.
 Mashiko, Koichiro: See—
 Furutani, Kiyohiro; Mashiko, Koichiro; and Arimoto, Kazutami,
 4,710,789, Cl. 357-23.600.
 Massachusetts Institute of Technology: See—
 Bernard, John A.; Henry, Allan F.; Lanning, David D.; and Kwok,
 Kwan S., 4,710,341, Cl. 376-216.000.
 Feldman, Joel A.; and Hofstetter, Edward M., 4,710,959, Cl.
 381-36.000.
 Masuda, Katsuhiko: See—
 Fuke, Akira; Tokita, Yasuhiro; and Masuda, Katsuhiko, 4,710,938,
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 Masuda, Takashi; Nakamura, Yukiugu; and Sekiguchi, Kyoji, to Canon
 Kabushiki Kaisha. Cornea shape measuring apparatus. 4,710,003, Cl.
 351-212.000.
 Masuhara, Toshiaki: See—
 Hanamura, Shoji; Aoki, Masaaki; and Masuhara, Toshiaki,
 4,710,648, Cl. 307-443.000.
 Masumoto, Hakaru; and Murakami, Yuetsu, to Foundation: The Re-
 search Institute of Electric and Magnetic Alloys. The. Wear-resistant
 alloy of high permeability and method of producing the same.
 4,710,243, Cl. 148-312.000.
 Masuoka, Fujio; and Ochi, Kiyofumi, to Kabushiki Kaisha Toshiba.
 Semiconductor memory device comprising six-transistor memory
 cells. 4,710,897, Cl. 365-182.000.
 Matejczyk, Daniel E., to Rockwell International Corporation. Infil-
 trated sintered articles. 4,710,223, Cl. 75-248.000.
 Matra: See—
 Boggero, Henri, 4,709,637, Cl. 102-481.000.
 Doitau, Pierre O.; and Moal, Herve, 4,710,645, Cl. 307-115.000.

Matsubara, Toshiaki: See—
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 Matsuda, Katsumi; and Kono, Kunio, to Mitsubishi Jukogyo Kabushiki
 Kaisha. High-speed wrapping machine. 4,709,529, Cl. 53-207.000.
 Matsuda, Kenji: See—
 Umemura, Hiroyuki; Matsuda, Kenji; Tezuka, Tomofumi; Isono,
 Kazuaki; Ishioka, Hidenori; Matsuo, Fumio; and Iijima, Hito-
 shi, 4,709,554, Cl. 62-156.000.
 Matsuda, Shigeyoshi: See—
 Kajioaka, Yasuo; Komine, Tomio; Kadowaki, Hitoshi; Matsuda,
 Shigeyoshi; Yugami, Yoshinori; Kubota, Shinya; Takahashi,
 Yoshio; Shimada, Hiroshi; and Kurata, Nobutaka, 4,709,899, Cl.
 249-20.000.
 Matsuda, Yoshio, to Yoshida Kogyo K. K. Warp-knit support tape for
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 Matsui, Minoru; and Tsuno, Nobuo, to NGK Insulators, Ltd. Internal
 combustion engine piston and a method of producing the same.
 4,709,621, Cl. 92-212.000.
 Matsui, Toshiyuki, to Kabushiki Kaisha Kenwood. Signal control
 apparatus. 4,710,962, Cl. 381-102.000.
 Matsukas, George A.: See—
 Passarelli, Frank J.; Matsukas, George A.; and Caspary, Charles P.,
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 Matsuki, Seiichi: See—
 Yamada, Fumiya; Matsuki, Seiichi; Kawamura, Masahiko; and
 Kawamoto, Masashi, 4,710,835, Cl. 360-106.000.
 Matsumoto, Fujio; Doi, Hajime; Mizushima, Kunio; Funahashi, Ma-
 saya; Taniguchi, Tomizo; and Sakamoto, Shoichi, to Hitachi Maxell,
 Ltd. Recording disc cartridge. 4,709,816, Cl. 206-444.000.
 Matsumoto, Junichiro: See—
 Shimada, Mitsuhiro; Matsumoto, Junichiro; Nonaka, Susumu; and
 Sayama, Haruo, 4,710,041, Cl. 400-120.000.
 Matsumoto, Kozo: See—
 Nakamura, Junji; Nishimura, Ikuma; Saito, Goro; and Matsumoto,
 Kozo, 4,710,436, Cl. 429-41.000.
 Matsumoto, Motoki: See—
 Nakamura, Kazuharu; Matsumoto, Motoki; Kondo, Akinobu; and
 Ito, Kiyonobu, 4,710,125, Cl. 431-22.000.
 Matsumoto, Noboru: See—
 Saito, Junichi; Tamura, Tatsuo; Kurahashi, Yoshio; Uzawa,
 Shigeru; Matsumoto, Noboru; and Yamaguchi, Naoko,
 4,710,509, Cl. 514-384.000.
 Matsumoto, Takashi, to Fuji Photo Film Co., Ltd. Magnetic head
 device including magnetic media biasing and positioning means.
 4,710,837, Cl. 360-110.000.
 Matsumoto, Yutaka; Mina, Cesar; Russell, Philip B.; and van Ark,
 William B., to United States of America, National Aeronautics and
 Space Administration. Airborne tracking sunphotometer apparatus
 and system. 4,710,618, Cl. 250-203.00R.
 Matsunawa, Masahiko, to Konishiroku Photo Industry Co., Ltd. Image
 processing method. 4,710,822, Cl. 358-280.000.
 Matsuo, Kazuhiro: See—
 Ishikawa, Tadashi; Matsuo, Kazuhiro; and Hoshi, Akimitsu,
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 Matsuo, Fumio: See—
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 Kazuaki; Ishioka, Hidenori; Matsuo, Fumio; and Iijima, Hito-
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 Matsuo, Hiroshi; and Onoe, Susumu, to Bando Chemical Industries,
 Lt. Belt. 4,710,155, Cl. 474-260.000.
 Matsushima, Masaaki: See—
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 Sasamori, Eizo; Matsushima, Masaaki; and Kishi, Hiroyoshi,
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 Matsushima, Seiichi; Higashihara, Toshio; Shimizu, Mitsuru; Yo-
 shizawa, Ken; Suzuki, Masahiro; and Sugiyama, Toshinori, to Hitachi
 Maxell, Ltd. Optical recording disc. 4,710,913, Cl. 369-280.000.
 Matsushiro, Hiroyuki: See—
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 Kaneko, Toshio, 4,710,015, Cl. 355-3.0DD.
 Matsushita Electric Industrial Co., Ltd.: See—
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 Ookubo, Hiroaki, 4,710,046, Cl. 400-556.200.
 Shibata, Jun; and Serizawa, Hiroyuki, 4,710,936, Cl. 372-45.000.
 Takagi, Yoshiyuki; and Kaneaki, Tetsuhiko, 4,709,611, Cl. 84-1.220.
 Yamada, Noboru; Nagashima, Michiyoshi; and Nishiuchi, Kenichi,
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 Matsushita Electric Works, Ltd.: See—
 Yamada, Satoshi; and Furukawa, Kaoru, 4,710,695, Cl. 320-21.000.
 Matsushita, Masao; Oku, Kenzo; Nakano, Hiroki; and Okumura, Shin-
 ichi, to Nishiyodo Air Conditioner Co., Ltd. Adsorption refrigerating
 apparatus. 4,709,558, Cl. 62-480.000.
 Matsushita, Tsuyoshi, to Tokyo Electric Co., Ltd. Impact printer with
 variable delay for print cycle based on different print-hammer energy
 levels. 4,710,043, Cl. 400-144.200.
 Matsuta, Shigetoshi, to Alps Electric, Ltd. Band switching circuit
 tuner. 4,710,737, Cl. 334-56.000.
 Matsuura, Hitoshi; and Sakurai, Hiroshi, to Fanuc Ltd. Arbitrary-direction
 tracer control unit. 4,709,482, Cl. 33-1.00M.
 Matsuura, Toshihiro, to Kabushiki Kaisha Toshiba. Multi-stage turbine.
 4,710,099, Cl. 415-199.500.
 Matsuyama, Shigeru; Kanazaki, Mikio; Norio; and Ishii, Akira, to
 Hitachi, Ltd.; and Hitachi Device Engineering Co., Ltd. Liquid

crystal color display device having plural color filters per segment electrode. 4,709,993, Cl. 350-339.00F.

Matsuzaka, Syoji: See—
Hirabayashi, Shigeto; Matsuzaka, Syoji; Ohya, Yukio; and Nonaka, Yoshiyuki, 4,710,453, Cl. 430-505.000.

Mattei, Riccardo; and Minarelli, Alessandro, to G. D. Societa Per Azioni. Device for the application of an adhesive to one or more localized areas of a sheet of flexible wrapping material. 4,710,257, Cl. 156-578.000.

Maurice, Claude G.: See—
Kortschinski, Juri; Lat, Michael V.; Maurice, Claude G.; and Tickner, Derek C., 4,710,847, Cl. 361-125.000.

Mauro, Alex: See—
Stern, Howard; Mauro, Alex; and Lee, Jay, 4,709,858, Cl. 239-296.000.

Maus, Louis: See—
Warren, Leslie F., Jr.; Maus, Louis; and Hall, William F., 4,710,401, Cl. 427-121.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: See—
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Maxa, Jaroslav: See—
Curda, Otakar; Maxa, Jaroslav; and Uhlir, Pavel, 4,710,646, Cl. 307-116.000.

Maxwell, Dennis L.: See—
Quante, Jeffrey B., III; Scoggin, Steven C.; Maxwell, Dennis L.; Rosenkoetter, Marvin W.; and Ferencik, James J., 4,709,659, Cl. 109-21.500.

Mayer, Edward F.: See—
Koelling, Alan L.; Murphy, William J.; and Mayer, Edward F., 4,710,442, Cl. 430-85.000.

Mayer, Patricia: See—
Lee, Duk-Hi; Feierberg, Susan E.; and Mayer, Patricia, 4,710,319, Cl. 252-646.000.

Mayes, David G., to Helena Laboratories Corporation. Container for an electrophoretic support medium. 4,709,810, Cl. 206-205.000.

Mayfield, Ross: See—
Jenkins, Stuart M.; Spencer, Michael S.; and Mayfield, Ross, 4,709,820, Cl. 209-534.000.

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Mayo Foundation: See—
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Mayo Medical Resources: See—
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Mayr, Ernst: See—
Oestreich, Ulrich; and Mayr, Ernst, 4,709,984, Cl. 350-96.230.

Mazda Motor Corporation: See—
Boda, Keiji; Waki, Kouichiro; and Yanagisawa, Keizo, 4,709,596, Cl. 74-868.000.

Hayama, Mamoru, 4,709,595, Cl. 74-864.000.

Ohya, Takagi, 4,709,957, Cl. 296-146.000.

Watanabe, Kenichi; Hiruta, Hideshi; and Hiketa, Manabu, 4,709,775, Cl. 180-233.000.

Yoshimura, Toshiro; Kobayashi, Takayuki; and Ono, Masayoshi, 4,709,943, Cl. 280-751.000.

Maze, Etienne G.: See—
Guioth, Chantal H.; Maze, Etienne G.; and Rabajoie, Loick P., 4,710,281, Cl. 204-181.700.

McAbee, Mac P.; and Biddle, Deloss J., to McAbee, Mac Patrick. Distributor for multi-cylinder engine. 4,710,598, Cl. 200-21.000.

McAbee, Mac Patrick: See—
McAbee, Mac P.; and Biddle, Deloss J., 4,710,598, Cl. 200-21.000.

McAlpin, James J.; and Chow, Wai Y., to Exxon Chemical Patents Inc. Composition for preparing cement-adhesive reinforcing fibers. 4,710,540, Cl. 525-101.000.

McCandless, Brian E.; and Birkmire, Robert W., to University of Delaware, The. Process for fabricating thin film photovoltaic solar cells. 4,709,466, Cl. 437-5.000.

McCluer, Robert: See—
Catsimopoulos, Nicholas; McCluer, Robert; Sinn, Robert S.; and Evans, James, 4,710,490, Cl. 514-25.000.

McCorquodale Machine Systems Limited: See—
Wilkins, David R. G.; Brooker, Reginald D.; Walker, Roger; and Powell, Harry, 4,709,630, Cl. 101-93.220.

McCutcheon, Samuel; Lum, Jeffrey; Solek, Roman; Harrell, Troy; and Leman, Robert, to Autek Systems Corporation. High speed instrument bus. 4,710,893, Cl. 364-900.000.

McDonough, Paul J.: See—
Vietrogoski, Charles J.; Obarowski, Richard; and McDonough, Paul J., 4,709,608, Cl. 83-355.000.

McEvoy, Thomas J.: See—
McNeil, Charles B.; and McEvoy, Thomas J., 4,710,165, Cl. 604-67.000.

McFarlane, Richard H. Flashback structure. 4,710,173, Cl. 604-168.000.

McGinley, John V. M., to Picker International Ltd. Electromagnet arrangements for producing a magnetic field of high homogeneity. 4,710,741, Cl. 335-296.000.

McGregor, William H.; and Chang, Joseph Y., to American Home Products Corporation. 2-[1,3,2-dioxaphospholan-2-yloxy]ethyl compounds. 4,710,580, Cl. 558-86.000.

McGuire, Bernie; Innes, Robert S.; and Pagowski, Stefan, to Canadian Bird Equipment Limited. Hock cutting mechanism. 4,709,448, Cl. 17-11.000.

McKee, Bobby D.; Cain, Michael P.; Delvecchio, Robert M.; and Aivaliotis, Emmanuel, to Westinghouse Electric Corp. Solenoidal homopolar generator. 4,710,660, Cl. 310-178.000.

McKee, Bobby D.: See—
Kilgore, Lee A.; and McKee, Bobby D., 4,710,665, Cl. 310-219.000.

Rindal, Roald A.; and McKee, Bobby D., 4,710,666, Cl. 310-248.000.

McNeil, Charles B.; and McEvoy, Thomas J. Wearable, variable rate suction/collection device. 4,710,165, Cl. 604-67.000.

McNeil, John R. Optical scatterometer having improved sensitivity and bandwidth. 4,710,642, Cl. 250-571.000.

McQueen, Robert. Crawling insect trap. 4,709,503, Cl. 43-114.000.

Meade, Steven L.: See—
Morris, Merle E.; Rice, Lawrence M.; and Meade, Steven L., 4,710,676, Cl. 313-579.000.

Mechanical Technology Incorporated: See—
Hoogenboom, Leo; Jackson, Robert L., Jr.; Kraft, Russell P.; and Offit, Alan M., 4,710,808, Cl. 358-107.000.

Medical Research & Development Associates: See—
Weber, Raviv, 4,709,701, Cl. 128-422.000.

Medtech Diagnostics Inc.: See—
Truglio, Diana, 4,709,705, Cl. 128-750.000.

Mee, Gary L.; and Willcott, M. Robert, to NMR Imaging, Inc. Method of mapping magnetic field strength and tipping pulse accuracy of an NMR imager. 4,710,715, Cl. 324-307.000.

Meier, Friedrich: See—
Altmeyer, Werner; Jakobs, Ewald; and Meier, Friedrich, 4,710,078, Cl. 409-233.000.

Meier, Helmut-Martin; Heine, Hans-Georg; Pischtschan, Alfred; Dhein, Rolf; and Rudolph, Hans, to Bayer Aktiengesellschaft. Stabilized thermoplastic moulding materials based on ABS polymers and acyl phosphonoxides. 4,710,529, Cl. 524-139.000.

Meier, Konrad, to Siemens Aktiengesellschaft. Method and apparatus for fabricating a curved magnet coil. 4,709,470, Cl. 29-605.000.

Meier, Walter: See—
Muller, Kurt; and Meier, Walter, 4,710,629, Cl. 250-342.000.

Meister, Alton, to Cornell Research Foundation, Inc. Glutathione delivery system. 4,710,489, Cl. 514-18.000.

Melkute Holland B.V.: See—
Uiterwaal, Dirk J. D.; and Hersevoort, Aart, 4,710,387, Cl. 426-72.000.

Menzemer, Craig C.: See—
Stemler, J. Robert; Klingensmith, James D.; Menzemer, Craig C.; Kulicki, John M.; and Theofanis, Nicholas D., 4,709,435, Cl. 14-73.000.

Merck & Co., Inc.: See—
Baldwin, John J.; Huff, Joel R.; Vacca, Joseph P.; Young, Steven D.; deSolms, Jane; and Guare, James P., Jr., 4,710,504, Cl. 514-267.000.

Erdman, George R., 4,709,837, Cl. 222-636.000.

Liang, Theming; and Slater, Eve E., 4,710,469, Cl. 435-194.000.

Willard, Alvin K.; Novello, Frederick C.; Hoffman, William F.; and Cragoe, Edward J., Jr., 4,710,513, Cl. 514-460.000.

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Schad, Hans P.; and Kelly, Stephen M., 4,710,315, Cl. 252-299.630.

Wermuth, Stefan; Hauke, Gunter; and Kreher, Klaus, 4,710,289, Cl. 210-198.200.

Meredith, William A.: See—
Slater, Daniel A.; Meredith, William A.; and Devaney, Mark J., 4,710,352, Cl. 422-63.000.

Merkus, Minne, to Robert Bosch GmbH. Apparatus for producing bag packages having dispensing fittings. 4,709,528, Cl. 53-128.000.

Merle, Jean-Pierre: See—
Grenier, Gilles; Maffert, Jerome; Merle, Jean-Pierre; and des Ordon, Jacques R., 4,710,028, Cl. 356-375.000.

Merlin Gerin: See—
Neel, Jean-Philippe; Case, Roger; and Garnier, Gilbert, 4,710,738, Cl. 335-172.000.

Merlin Gerin S.A.: See—
Demeyer, Pierre, 4,710,845, Cl. 361-96.000.

Merrifield, Charles H.: See—
Balke, Roy L.; Merrifield, Charles H.; and Mizikowski, Frank E., 4,710,662, Cl. 310-204.000.

Mertens, Alfred; Holck, Jens-Peter; Kampe, Wolfgang; Muller-Beckmann, Bernd; Strein, Klaus; and Schumann, Wolfgang, to Boehringer Mannheim GmbH. Pyrrolbenzimidazoles, pharmaceutical compositions containing them, and use of them to treat certain heart and circulatory diseases. 4,710,510, Cl. 514-394.000.

Merz, Johann, to Zahnradfabrik Friedrichshafen; Ag. Regulatable fan drive. 4,709,666, Cl. 123-41.120.

Messerli, Alan J.: See—
Scott, Graham A.; and Messerli, Alan J., 4,710,844, Cl. 361-96.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung: See—
Haberl, Fritz, 4,710,619, Cl. 250-203.00R.

Wagenknecht, Juergen; and Raedisch, Dieter, 4,709,843, Cl. 227-156.000.

Messerschmitt-Boelkow-Blohm GmbH: See—
Kunkel, Bernd, 4,710,620, Cl. 250-203.00R.

Meszaros, Judit: See—
Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefkó, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jenő; Csizer, Eva; Vezér, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.00R.

Metallgesellschaft Aktiengesellschaft: See—
Batza, Willi; and Rosch, Werner, 4,710,203, Cl. 55-2.000.

Metz, Hans J., to Hoechst Aktiengesellschaft. Process for the preparation of alkali metal and alkaline earth salts of benzaldehyde-2,4-di-sulfonic acid. 4,710,322, Cl. 260-511.000.

Metz, Marcus C., to Chrysler Motors Corporation. Automatic power door lock system. 4,709,776, Cl. 180-281.000.

Metz, Marcus C., to Chrysler Motors Corporation. Vehicle power door locks, ignition key interlock system therefor. 4,709,777, Cl. 180-286.000.

Meurer Druck & Carton GmbH: See—
Vossen, Franz, 4,710,156, Cl. 493-1.000.

Meyers, Peter V.; Liu, Chung-Heng; and Frey, Timothy J., to Ametek, Inc. Heterojunction p-i-n photovoltaic cell. 4,710,589, Cl. 136-258.0PC.

Meyers, Thomas J., to NCR Corporation. CCD bar code scanner. 4,710,615, Cl. 235-454.000.

Michael, Mark S.; and Glaze, Scott A., to Fort Wayne Metals Research Products Corporation. Surgeon's Gigli saw and method. 4,709,699, Cl. 128-317.000.

Michelson, Paul E. Fluid lens. 4,709,996, Cl. 350-418.000.

Michishige, Toru: See—
Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,709,976, Cl. 439-350.000.

Micro-Mega S.A.: See—
Henri, Leonard; and Seigneurin, Michel, 4,710,178, Cl. 604-209.000.

Microbial Chemistry Research Foundation: See—
Otake, Noboru; Tatsuta, Kuniaki; Mizobuchi, Shigeyuki; Kome-shima, Nobuyasu; Nakajima, Shohachi; Kawai, Hiroyuki; and Odagawa, Atsuo, 4,710,564, Cl. 536-6.400.

Midland Brake, Inc.: See—
Soupal, Thomas R., 4,710,108, Cl. 417-298.000.

Mielke, Siegfried, to Kolbenschmidt AG. Piston and connecting rod assembly. 4,709,620, Cl. 92-187.000.

Mierbach, Hans-Bernad; Frohn, Gustav K.; and Blockisch, Olaf, to Applied Power, Inc. Power screw driver with a ratchet wheel having finely graduated toothings. 4,709,600, Cl. 81-57.390.

Mikula, George: See—
Jacklich, John; and Mikula, George, 4,710,172, Cl. 604-118.000.

Mikuni Kogyo Kabushiki Kaisha: See—
Muraji, Tetsuo, 4,709,677, Cl. 123-438.000.

Miles Laboratories, Inc.: See—
Wogoman, Frank W., 4,710,351, Cl. 422-50.000.

Milewits, Marvin: See—
Bradfield, James E.; Kahil, John E.; Jaynes, Mark S.; Moake, Gordon L.; Milewits, Marvin; Bolton, Curtis W., III; Lam, Clive C.; and Stanley, Roderic K., 4,710,712, Cl. 324-227.000.

Miltholland, Marvin L.: See—
Fluck, Sydney, Jr.; and Miltholland, Marvin L., 4,710,969, Cl. 455-67.000.

Miller, Cardell E.: See—
Waldo, Russell W.; and Miller, Cardell E., 4,709,445, Cl. 16-300.000.

Miller, Dennis C., to American Sprayed-On Fibers, Inc. Lightweight soundproofing, insulation and fireproofing material and method. 4,710,309, Cl. 252-62.000.

Miller, John A.: See—
Wood, Leigh E.; Miller, John A.; and Sipinen, Alan J., 4,710,190, Cl. 604-389.000.

Miller, Michael J., to Integrated Device Technology, Inc. Diagnostic circuit. 4,710,927, Cl. 371-15.000.

Miller, Ray R., to Miller, Ray R.; and Weyerhaeuser Co., a part interest. Belt and drum-type press. 4,710,271, Cl. 162-360.100.

Miller, Stephen J., to Chevron Research Company. Paraffin isomerization catalyst. 4,710,485, Cl. 502-213.000.

Mills, Borden H., to Eastman Kodak Company. Process control for electrostatographic machine. 4,710,785, Cl. 346-153.100.

Mills, Russell C.; and Jager, Stewart C. Game board. 4,709,929, Cl. 273-402.000.

Milsko Manufacturing Company: See—
Hill, Kevin E., 4,709,961, Cl. 297-284.000.

Uecker, Ronald T.; and Slicker, Steven D., 4,709,963, Cl. 297-316.000.

Mina, Cesar: See—
Matsumoto, Yutaka; Mina, Cesar; Russell, Philip B.; and van Ark, William B., 4,710,618, Cl. 250-203.00R.

Minami, Saburo, to Osaka Kanagu Co., Ltd. Digital lock. 4,709,564, Cl. 70-25.000.

Minami, Takao: See—
Yonezawa, Toshio; Sasaguri, Nobuya; Onimura, Kichiro; Susukida, Hiroshi; Kawaguchi, Katsuji; Nagano, Hiroo; Minami, Takao; Yamanaka, Kazuo; Okada, Yasutaka; and Inoue, Mamoru, 4,710,237, Cl. 148-13.000.

Minarelli, Alessandro: See—
Mattei, Riccardo; and Minarelli, Alessandro, 4,710,257, Cl. 156-578.000.

Minigrip, Inc.: See—
Ausnit, Steven, 4,709,533, Cl. 53-451.000.

Ministry of International Trade & Industry: See—
Nakano, Kikuo; and Hayashi, Hiroshi, 4,710,435, Cl. 428-698.000.

Minnesota Mining and Manufacturing Company: See—
Ellis, Arthur B.; and van Ryswyk, Hal, 4,710,476, Cl. 436-172.000.

Klingen, Jürgen; and Zimmerman, Patrick G., 4,710,536, Cl. 524-493.000.

Krause, Larry J.; and Rider, Jack A., 4,710,403, Cl. 427-304.000.

Montean, Samuel, 4,710,754, Cl. 340-572.000.

Northrup, Walter E.; and Freeman, Maurice E., 4,710,414, Cl. 428-43.000.

Sanders, James F., 4,710,445, Cl. 430-252.000.

Thien, Tran V., 4,710,570, Cl. 544-31.000.

Verhaagen, Ronald J., 4,710,004, Cl. 353-81.000.

Wildt, Theodor N., 4,709,813, Cl. 206-312.000.

Wood, Leigh E.; Miller, John A.; and Sipinen, Alan J., 4,710,190, Cl. 604-389.000.

Mioen, Thomas K.: See—
Dyvik, Froystein; and Mioen, Thomas K., 4,710,277, Cl. 204-119.000.

Misco, Peter F., Jr.: See—
Kim, Choung Un; and Misco, Peter F., Jr., 4,710,568, Cl. 540-350.000.

Mishler, Jack L. Storage apparatus for hitch and hitch torsion bars when not in use. 4,709,940, Cl. 280-405.00R.

Missert, William: See—
Bellavia, William D.; and Missert, William, 4,710,127, Cl. 433-215.000.

Mita Industrial Co., Ltd.: See—
Watanabe, Toshio; Tsutsui, Eiji; and Tsunoda, Arihiro, 4,710,017, Cl. 355-8.000.

Mitchell, Christopher: See—
Markle, Wilson; and Mitchell, Christopher, 4,710,805, Cl. 358-81.000.

Mitchell, Terry L.; and Poortvliet, Robert J., to Architectural Wall Systems, Inc. Floor-to-ceiling wall system. 4,709,517, Cl. 52-36.000.

Mitsubishi Denki Kabushiki Kaisha: See—
Asaeda, Takeaki, 4,710,862, Cl. 363-58.000.

Furutani, Kiyohiro; Mashiko, Koichiro; and Arimoto, Kazutami, 4,710,789, Cl. 357-23.600.

Hasegawa, Tadashi, 4,710,833, Cl. 360-105.000.

Hirao, Tadashi, 4,709,469, Cl. 437-63.000.

Imai, Hiroshi; and Yoshioka, Kouichi, 4,710,830, Cl. 360-97.000.

Kumanoya, Masaki; Fujishima, Kazuyasu; and Dosaka, Katsumi, 4,710,901, Cl. 365-190.000.

Mizohata, Fumio; and Kawabata, Takao, 4,710,696, Cl. 323-223.000.

Murakami, Tokumichi; Itoh, Atsushi; Asai, Kohtaro; Kamizawa, Koh; and Nishida, Masami, 4,710,812, Cl. 358-136.000.

Okamoto, Tatsuo; Eguchi, Kouji; and Oosaki, Saburo, 4,710,790, Cl. 357-23.600.

Oomori, Tatsuo; Ono, Kouichi; and Fujita, Shigeto, 4,710,937, Cl. 372-53.000.

Suzuki, Masanori, 4,710,792, Cl. 357-38.000.

Umemura, Hiroyuki; Matsuda, Kenji; Tezuka, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Matsuo, Fumio; and Iijima, Hitoshi, 4,709,554, Cl. 62-156.000.

Wakamiya, Yoshinori; and Sumino, Tomoko, 4,709,570, Cl. 72-365.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—
Takizawa, Shozo; Kobayashi, Kazuyoshi; Fukuyama, Kazuo; Tani, Masanori; Yamamoto, Shoji; Yuasa, Hiroo; Nishimori, Masayoshi; Yoshida, Hiroaki; Eto, Shinichi; Hirao, Eiji; and Goto, Masaki, 4,709,935, Cl. 280-91.000.

Mitsubishi Jukogyo Kabushiki Kaisha: See—
Matsuda, Katsumi; and Kono, Kunio, 4,709,529, Cl. 53-207.000.

Takeuchi, Koichi; Yamanaka, Megumi; Kubo, Masayoshi; Katayama, Hideaki; and Tokunaga, Kenji, 4,710,255, Cl. 156-361.000.

Yonezawa, Toshio; Sasaguri, Nobuya; Onimura, Kichiro; Susukida, Hiroshi; Kawaguchi, Katsuji; Nagano, Hiroo; Minami, Takao; Yamanaka, Kazuo; Okada, Yasutaka; and Inoue, Mamoru, 4,710,237, Cl. 148-13.000.

Mitsubishi Paper Mills, Ltd.: See—
Iguchi, Keisuke; and Ebato, Seigo, 4,710,455, Cl. 430-567.000.

Mitsubishi Rayon Co., Ltd.: See—
Murakami, Saburo; Kinashi, Shoji; and Ego, Toyokazu, 4,710,333, Cl. 264-73.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: See—
Degawa, Toru; Okuyama, Gen; Hashimoto, Akio; Uchida, Seiju; Fujiwara, Kouzou; Ebata, Makoto; Satou, Takashi; and Orotani, Tohei, 4,710,481, Cl. 501-123.000.

Miyaji, Takashi, to Sharp Kabushiki Kaisha. Variable magnification copying apparatus. 4,710,018, Cl. 355-8.000.

Miyajima, Nobuyuki; Hata, Kenji; and Nakayama, Junichi, to Lion Corporation; and Toyo Contact Lens Co., Ltd. Detergent composition for contact lenses. 4,710,313, Cl. 252-105.000.

Miyamoto, Isao: See—
Yamano, Shoji; and Miyamoto, Isao, 4,709,769, Cl. 177-1.000.

Miyamoto, Kiyoshi, to Omron Tateisi Electronics Co. Electronic switching device. 4,710,699, Cl. 323-324.000.

Miyamoto, Yasuo: See—
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,709,898, Cl. 248-562.000.

Miyao, Fumio, to Fuji Xerox Co., Ltd. Composite data transmission system. 4,710,918, Cl. 370-85.000.

Miyata, Shigeo, to Kyowa Chemical Industry Co., Ltd. Process for producing a vinyl chloride polymer or copolymer in aqueous suspension using a hydrotalcite compound as suspension stabilizer. 4,710,551, Cl. 526-91.000.

Miyata, Yoshiki: See—
Tomioka, Hisatsugu; Waki, Tatsuo; and Miyata, Yoshiki, 4,709,783, Cl. 182-8.000.

Mizelle, Ned W. Furniture seat supports and spring assemblies. 4,709,906, Cl. 267-103.000.

- Mizikowski, Frank E.: See—
Balke, Roy L.; Merrifield, Charles H.; and Mizikowski, Frank E., 4,710,662, Cl. 310-204.000.
- Mizobuchi, Shigeyuki: See—
Otake, Noboru; Tatsuta, Kuniaki; Mizobuchi, Shigeyuki; Kome-shima, Nobuyasu; Nakajima, Shohachi; Kawai, Hiroyuki; and Odagawa, Atsuo, 4,710,564, Cl. 536-6.400.
- Mizohata, Fumio; and Kawabata, Takao, to Mitsubishi Denki Kabu-shiki Kaisha. Control device for controllable electric valve. 4,710,696, Cl. 323-223.000.
- Mizokami, Hiroshi: See—
Ohtomo, Nobuya; Mizuno, Kyosuke; Hamada, Fukusaburo; and Mizokami, Hiroshi, 4,710,378, Cl. 424-89.000.
- Mizuno, Chiaki: See—
Ono, Toshio; Tamai, Yasuo; Mizuno, Chiaki; Ogawa, Hiroshi; and Saito, Shinji, 4,710,421, Cl. 428-213.000.
- Mizuno, Kyosuke: See—
Ohtomo, Nobuya; Mizuno, Kyosuke; Hamada, Fukusaburo; and Mizokami, Hiroshi, 4,710,378, Cl. 424-89.000.
- Mizushima, Kunio: See—
Matsumoto, Fujio; Doi, Hajime; Mizushima, Kunio; Funahashi, Masaya; Taniguchi, Tomizo; and Sakamoto, Shoichi, 4,709,816, Cl. 206-444.000.
- Mizushima, Toyoshi: See—
Hayashi, Tadamasu; and Mizushima, Toyoshi, 4,710,266, Cl. 139-7.000.
- Moake, Gordon L.: See—
Bradfield, James E.; Kahil, John E.; Jaynes, Mark S.; Moake, Gordon L.; Milewits, Marvin; Bolton, Curtis W., III; Lam, Clive C.; and Stanley, Roderic K., 4,710,712, Cl. 324-227.000.
- Moal, Herve: See—
Doitau, Pierre O.; and Moal, Herve, 4,710,645, Cl. 307-115.000.
- Mobil Oil Corporation: See—
Bowman, Donald E., 4,709,485, Cl. 33-228.000.
- Huggard, Mark T., 4,710,522, Cl. 521-138.000.
- Mocker, Wolfgang: See—
Klug, Horst; Mocker, Wolfgang; Schaeffler, George; and Speil, Walter, 4,709,668, Cl. 123-90.550.
- Moden, James R.; Caldwell, Michael D.; and Moden, Robert D., to Surgical Engineering Associates, Inc. Implantable infusion port. 4,710,174, Cl. 604-175.000.
- Moden, Robert D.: See—
Moden, James R.; Caldwell, Michael D.; and Moden, Robert D., 4,710,174, Cl. 604-175.000.
- Modster, Rudolph W.: See—
Rowe, James M.; and Modster, Rudolph W., 4,710,433, Cl. 428-623.000.
- Mohri, Kunihiro: See—
Takasuka, Yutaka; Mohri, Kunihiro; and Kawaguchi, Akiko, 4,710,375, Cl. 424-69.000.
- Molnar, Attila: See—
Vertesi, Csaba; Molnar, Attila; and Guczoghy, Lajos, 4,710,578, Cl. 558-4.000.
- Molnycsek AB: See—
Runeman, Bo, 4,710,188, Cl. 604-385.00R.
- Molyneux, Jeffrey P.: See—
Archer, Joel; Wassenhove, Denis V.; Pithouse, Kenneth B.; Buck, Leslie J.; Molyneux, Jeffrey P.; and Bradshaw, Peter S., 4,709,948, Cl. 285-381.000.
- Momot, Stanley; and Hannon, William G., to Rockwell International Corporation. Plate cylinder register control. 4,709,634, Cl. 101-248.000.
- Monaghan, Michael L., to Ricardo Consulting Engineers plc. Fuel supply system for turbocharged internal combustion engine. 4,709,676, Cl. 123-383.000.
- Monnerat, Georgia A.: See—
Bogan, Gary W.; Lucas, Peter A.; Monnerat, Georgia A.; and Aldrich, Dale J., 4,710,429, Cl. 428-417.000.
- Mono Power Co.: See—
Wong, Morton M.; and Shugarman, Arnold L., 4,710,367, Cl. 423-335.000.
- Monsanto Company: See—
Kraus, Menahem A.; and Murphy, Milton K., 4,710,204, Cl. 55-16.000.
- Monsell, Kurt: See—
Sutphin, Richard C.; Bell, Steven R.; and Monsell, Kurt, 4,710,694, Cl. 320-21.000.
- Montean, Samuel, to Minnesota Mining and Manufacturing Company. Magnetic marker having switching section for use in electronic article surveillance systems. 4,710,754, Cl. 340-572.000.
- Montedison S.p.A.: See—
Credali, Lino; Corsi, Gianfranco; and Chiolle, Antonio, 4,710,336, Cl. 264-171.000.
- Montgomery, Robert R.: See—
Kunicki, Thomas J.; and Montgomery, Robert R., 4,710,381, Cl. 424-101.000.
- Mooney, Paul C., to Quick-Set, Incorporated. Surveillance camera mount. 4,709,897, Cl. 248-551.000.
- Mooney, Thomas E.: See—
Pierson, Karl B.; Mooney, Thomas E.; and Jones, William G., 4,709,901, Cl. 251-58.000.
- Moore Business Forms, Inc.: See—
Wagner, David G., 4,709,850, Cl. 229-73.000.
- Moore, Carl F. Lantern holder. 4,709,890, Cl. 248-205.100.
- Moore, Milton D. Shaving tool. 4,709,481, Cl. 30-356.000.
- Moore, Thomas C.: See—
Rorden, Louis H.; and Moore, Thomas C., 4,710,708, Cl. 324-207.000.
- Moore, William A.: See—
Stevens, Leonard W.; Siwik, William S.; Moore, William A.; Brown, Wayne M.; and Barnard, Andrew A., 4,709,545, Cl. 60-39.080.
- Moos, Walter H.: See—
Bergmeier, Stephen C.; Downs, David A.; Moos, Walter H.; More-land, David W.; and Teale, Haile, 4,710,508, Cl. 514-357.000.
- Morehouse Industries, Inc.: See—
Szkardak, Edward J.; and Corrigan, John J., 4,709,863, Cl. 241-69.000.
- Moreland, David W.: See—
Bergmeier, Stephen C.; Downs, David A.; Moos, Walter H.; More-land, David W.; and Teale, Haile, 4,710,508, Cl. 514-357.000.
- Morell, Joseph; De Marchi, Jean-Louis; and Kopp, Norbert, to Salo-mon S.A. Alpine ski boot. 4,709,491, Cl. 36-121.000.
- Moreno, Frederick E.; and Hartman, Creighton D., to PruTech II. Primary stage combustor lining. 4,709,643, Cl. 110-336.000.
- Morflex Chemical Company, Inc.: See—
Hull, Ezekiel H.; and Frappier, Edward P., 4,710,532, Cl. 524-310.000.
- Morgan, Charles R.: See—
Siadat, Bahram; and Morgan, Charles R., 4,710,539, Cl. 525-59.000.
- Mori, Kei. Connecting structure for connecting optical conductors. 4,709,981, Cl. 350-96.210.
- Mori, Kei. Light radiator. 4,709,999, Cl. 350-486.000.
- Mori, Masakazu: See—
Soeda, Kazuhiko; Mori, Masakazu; Nishikawa, Tsutomu; and Tomimori, Kiyoshi, 4,710,022, Cl. 356-73.100.
- Moriguchi, Koichi: See—
Iwata, Hiroshi; Kuroyanagi, Masatoshi; Suzuki, Masahiko; Morigu-chi, Koichi; Horiuchi, Yasuhiro; and Nakamura, Kanehito, 4,710,106, Cl. 417-213.000.
- Morino, Yuichi: See—
Motodate, Shoji; Morino, Yuichi; and Kurata, Norihiro, 4,710,599, Cl. 200-61.850.
- Morishima, Yasuo: See—
Dupont, Bo; Morishima, Yasuo; Collins, Nancy; Ogata, Shun-ichiro; and Lloyd, Kenneth O., 4,710,457, Cl. 435-7.000.
- Morita, Masahiko: See—
Tosaka, Akio; Hashiguchi, Koichi; Morita, Masahiko; and Okano, Shinobu, 4,709,557, Cl. 62-373.000.
- Morita, Yoshitaka: See—
Suzuki, Mitsutoshi; Morita, Yoshitaka; Okada, Masami; and Shimohara, Jun, 4,710,297, Cl. 210-493.200.
- Moritz, Manfred; and Rettke, Wilfried, to Ta Triumph-Adler Aktien-gesellschaft. Method and apparatus for indexing the print hammer of typewriters or the like. 4,710,042, Cl. 400-141.000.
- Monya, Koichi: See—
Kurahashi, Yoshio; Shiokawa, Kozo; Kagabu, Shinzo; Sakawa, Shinji; and Moriya, Koichi, 4,710,518, Cl. 514-624.000.
- Moroi, Shiro: See—
Kita, Yasushi; and Moroi, Shiro, 4,710,335, Cl. 264-105.000.
- Morris, Charles F., to Amgen, Inc. DNA plasmids. 4,710,473, Cl. 435-320.000.
- Morris, Merle E.; Rice, Lawrence M.; and Meade, Steven L., to GTE Products Corporation. Multi-level fuser lamp. 4,710,676, Cl. 313-579.000.
- Morrison, Bertram L., to Vetco Gray, Inc. Metal-to-metal seal struc-ture. 4,709,725, Cl. 137-614.040.
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- Mortensen, Roger; and Gregerson, Barry, to Empak Inc. Storage box. 4,709,834, Cl. 220-326.000.
- Morton, Bruce L.: See—
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- Motomura, Masatoshi: See—
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- Motoren-und Turbinen-Union Munchen, GmbH: See—
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- Motorola, Inc.: See—
Bocci, Paul M.; Pietrzak, Carl M., Jr.; and Wilson, Alan L., 4,710,945, Cl. 375-100.000.
- Bocci, Paul M.; Pietrzak, Carl M., Jr.; and Wilson, Alan L., 4,710,957, Cl. 380-42.000.
- Connell, Lawrence E.; and Webb, Ronald J., 4,710,724, Cl. 330-9.000.
- Davis, William F., 4,710,728, Cl. 330-252.000.
- Doyle, Joseph E., III, 4,710,730, Cl. 331-116.0FE.
- Gray, Randall C., 4,710,793, Cl. 357-44.000.
- Ocken, Alfred G.; and Nordbrock, Raymond E., 4,710,657, Cl. 310-62.000.
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- Mouri, Yasunori; and Sugiura, Noboru, to Hitachi, Ltd. Knock control apparatus for internal combustion engine. 4,710,881, Cl. 364-431.080.
- Moutardier, Jacques, to Aerospatiale Societe Nationale Industrielle. Spring-driven gyroscope. 4,709,586, Cl. 74-5.120.
- MTU Motoren-und Turbinen-Union GmbH: See—
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- Mucha, Lawrence S.: See—
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- Mueller, Dietmar; and Reinelt, Karlheinz, to Rheinmetall GmbH. Propellant charge casing. 4,709,636, Cl. 102-431.000.
- Mulder, Douglas C., to Nordson Corporation. Sieve for powder. 4,710,286, Cl. 209-250.000.
- Muller-Beckmann, Bernd: See—
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- Muller, George H.; to Berke, Joseph J., a part interest. Tissue pneumatic separator structure and method. 4,709,697, Cl. 128-303.00R.
- Muller, Karl H.; and Barthel, Walter, to Degussa Aktiengesellschaft. Powdered bitumen concentrate and its use. 4,710,229, Cl. 106-281.00R.
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- Muller, Manfred: See—
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- Mumford, George V., to Owens-Illinois Closure Inc. Press-on twist-off closure for container. 4,709,825, Cl. 215-318.000.
- Mund, Konrad: See—
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- Muraji, Tetsuo, to Mikuni Kogyo Kabushiki Kaisha. Fuel control system for air-fuel mixture supply devices. 4,709,677, Cl. 123-438.000.
- Murakami, Hideo; to Ryobi, Ltd. Clutch mechanism for a fishing reel. 4,709,874, Cl. 242-220.000.
- Murakami, Saburo; Kinashi, Shoji; and Ego, Toyokazu, to Mitsubishi Rayon Co., Ltd. Process for continuous preparation of synthetic resin plates having irregular flow pattern of different colors. 4,710,333, Cl. 264-73.000.
- Murakami, Tokumichi; Itoh, Atsushi; Asai, Kohtaro; Kamizawa, Koh; and Nishida, Masami, to Mitsubishi Denki Kabushiki Kaisha. Inter-frame adaptive vector quantization encoding apparatus and video encoding transmission apparatus. 4,710,812, Cl. 358-136.000.
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- Muralidhara, Ranya: See—
Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., 4,709,707, Cl. 131-276.000.
- Murata Manufacturing Co., Ltd.: See—
Ogawa, Toshio, 4,710,311, Cl. 252-62.900.
- Murata, Perry L.: See—
Harbolt, Bruce; Murata, Perry L.; and Burmaster, Neal C., 4,710,360, Cl. 422-269.000.
- Murayama, Jin: See—
Suzuki, Kenji; Terashita, Takaaki; and Murayama, Jin, 4,710,803, Cl. 358-41.000.
- Murchison, Charles W.: See—
Patrick, Keith H.; and Murchison, Charles W., 4,709,860, Cl. 239-654.000.
- Murphy, Milton K.: See—
Kraus, Menahem A.; and Murphy, Milton K., 4,710,204, Cl. 55-16.000.
- Murphy, William J.: See—
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- Murray, Kenneth, to Biogen N.V. Recombinant DNA molecules capa-ble of expressing HBV core and surface antigens. 4,710,463, Cl. 435-68.000.
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- Musschoot, Albert, to General Kinematics Corporation. Tumbling apparatus. 4,709,507, Cl. 51-7.000.
- Mussler, James M.; and Swartz, Mark E., to Westinghouse Electric Corp. Automatic touch screen calibration method. 4,710,758, Cl. 340-712.000.
- Myers, Daniel N.: See—
Cetinkaya, Ismail B.; and Myers, Daniel N., 4,710,357, Cl. 422-144.000.
- Myers, William P., to Litton Systems, Inc. Fluidic oxygen sensor moni-tor. 4,709,575, Cl. 73-23.000.
- Naaktgeboren, Adrianus; and Van Eecke, Roger H., to New Holland Inc. Bale accumulator. 4,710,086, Cl. 414-44.000.
- Naaktgeboren, Adrianus; and Van Eecke, Roger H., to New Holland Inc. Bale accumulator and discharger. 4,710,087, Cl. 414-44.000.
- Nagami, Akira, to NEC Corporation. Semiconductor memory having multiple access. 4,710,896, Cl. 365-149.000.
- Nagano, Hiroo: See—
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- Naganka, Junichi, to Takara Co., Ltd. Toy vehicle assembly with multiple drive units. 4,710,148, Cl. 446-464.000.
- Nagasawa, Kiyoshi: See—
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- Nagashima, Michiyoshi: See—
Yamada, Noboru; Nagashima, Michiyoshi; and Nishiuchi, Kenichi, 4,710,911, Cl. 369-100.000.
- Nagle, Dennis C.: See—
Bruppacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., 4,710,348, Cl. 420-129.000.
- Nagumo, Masahide, to Kabushiki Kaisha Toshiba. Control system for deinterleaving memories in digital audio reproducing apparatus. 4,710,923, Cl. 371-2.000.
- Nahill, Thomas E.: See—
Krishnakumar, Suppayan M.; and Nahill, Thomas E., 4,710,118, Cl. 425-130.000.
- Naito, Hideki, to Fuji Photo Film Co., Ltd. Photographic element comprising at least two exothermic electroconductive layers. 4,710,450, Cl. 430-351.000.
- Nakagawa, Hideaki: See—
Ohkoshi, Akio; Tsuruta, Koji; Nakagawa, Hideaki; and Shimada, Satoshi, 4,710,765, Cl. 340-781.000.
- Nakajima, Kichio: See—
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- Nakajima, Nobuyoshi; and Hishinuma, Kazuhiro, to Fuji Photo Film Co., Ltd. Alignment procedure for radiation images undergoing subtraction processing. 4,710,875, Cl. 364-414.000.
- Nakajima, Shohachi: See—
Otake, Noboru; Tatsuta, Kuniaki; Mizobuchi, Shigeyuki; Kome-shima, Nobuyasu; Nakajima, Shohachi; Kawai, Hiroyuki; and Odagawa, Atsuo, 4,710,564, Cl. 536-6.400.
- Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, to Omron Tateisi Electronics Co. Connector built from one or more single rowed housings with long lasting locking mechanism. 4,709,976, Cl. 439-350.000.
- Nakamichi Corporation: See—
Kobayashi, Kozo; and Goto, Hideo, 4,710,907, Cl. 369-6.000.
- Nakamura, Junji; Nishimura, Ikuma; Saito, Goro; and Matsumoto, Kozo, to Toppan Printing Co., Ltd; and Fuji Electric Co., Ltd. Molten carbonate fuel cell and method of manufacturing electrolyte plate thereof. 4,710,436, Cl. 429-41.000.
- Nakamura, Kanehito: See—
Iwata, Hiroshi; Kuroyanagi, Masatoshi; Suzuki, Masahiko; Morigu-chi, Koichi; Horiuchi, Yasuhiro; and Nakamura, Kanehito, 4,710,106, Cl. 417-213.000.
- Nakamura, Kazuharu; Matsumoto, Motoki; Kondo, Akinobu; and Ito, Kiyonobu, to Toyotomi Kogyo Co., Ltd. Safety device for oil burner. 4,710,125, Cl. 431-22.000.
- Nakamura, Koichi; Hattori, Michihiro; Tamura, Tadashi; Teijima, Toru; Takashi, Naotake; Imokawa, Genji; and Hotta, Hajime, to Kao Corporation. Long wavelength ultraviolet ray absorber. 4,710,373, Cl. 424-59.000.
- Nakamura, Kunie. Diagnostic applications of phosphofructokinase. 4,710,460, Cl. 435-15.000.
- Nakamura, Seizo, to Ohara Co., Ltd. Mold material and process for casting of pure titanium or titanium alloy. 4,709,741, Cl. 164-35.000.
- Nakamura, Takashi: See—
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- Nakamura, Teruya: See—
Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Taka'aki; Sato, Fumihiro; and Nakamura, Teruya, 4,710,517, Cl. 514-616.000.
- Nakamura, Yukitugu: See—
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- Nakanishi, Keiichiro: See—
Yamada, Minoru; Wajima, Motoyo; Masaki, Akira; Takahashi, Akio; Nakanishi, Keiichiro; and Sugawara, Katuo, 4,710,854, Cl. 361-414.000.
- Nakano, Hiroki: See—
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- Nakano, Hitoshi: See—
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- Nakano, Kikuo; and Hayashi, Hiroshi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for production of sintered composite having spinel reinforced with short fibers of silicon carbide and sintered composite produced by said method. 4,710,435, Cl. 428-698.000.
- Nakatani, Hiroshi; Yoshida, Hirokazu; and Yamamura, Keiji, to Sharp Kabushiki Kaisha. Driver device mounting for a flat matrix display panel. 4,710,680, Cl. 315-169.400.
- Nakayama, Junichi: See—
Miyajima, Nobuyuki; Hata, Kenji; and Nakayama, Junichi, 4,710,313, Cl. 252-105.000.
- Nakayama, Tetsuroh, to Tokyo Electric Co., Ltd. Ink jet printing device. 4,710,784, Cl. 346-140.00R.
- Nakazawa, Toshihiko: See—
Kuribayashi, Masaki; Nakazawa, Toshihiko; and Kanbe, Junichiro, 4,709,995, Cl. 350-350.00S.

- Nalco Chemical Company: See—
Emmons, Daniel H., 4,710,303, Cl. 210-698.000.
Gross, Anthony E.; Christie, Richard D.; and Pinder, Thomas E., 4,710,285, Cl. 209-166.000.
- Namai, Akihiro; Egawa, Akira; and Kodaira, Takanori, to Canon Kabushiki Kaisha. Lens barrel driving device for camera. 4,710,010, Cl. 354-400.000.
- Naoki, Takashi; Fujioka, Takashi; Okamura, Hisashi; and Satake, Masaki, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,710,456, Cl. 430-564.000.
- Narusch, Michael J., Jr. Dual basket small parts coating apparatus. 4,710,410, Cl. 427-430.100.
- Nasby, Robert C.: See—
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- National Starch and Chemical Corporation: See—
Tokumoto, Minoru; Takagi, Motoyuki; Shitaoka, Shizuo; Gold, Samuel; and Iovine, Carmine P., 4,710,526, Cl. 524-5.000.
- National Transdata Systems, Inc.: See—
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- NCR Corporation: See—
Belknap, William M.; Chanasyk, Albert J.; O'Dell, Robert R.; and Girard, Donald J., 4,710,871, Cl. 364-200.000.
Grey, Michael O., 4,710,040, Cl. 400-55.000.
Meyers, Thomas J., 4,710,615, Cl. 235-454.000.
Reid, Bruce A.; and Deline, John R. M., 4,710,690, Cl. 318-685.000.
- Nebco, Inc.: See—
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- Nebraska Department of Economic Development, State of Nebraska: See—
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- NEC Corporation: See—
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Kobayashi, Tsuneo, 4,710,952, Cl. 379-269.000.
Koga, Toshio, 4,710,810, Cl. 358-133.000.
Nagami, Akira, 4,710,896, Cl. 365-149.000.
Sato, Toshifumi, 4,710,960, Cl. 381-47.000.
Watanabe, Tadashi, 4,710,867, Cl. 364-200.000.
- Neefe, Charles W. Method of molding an eye color change contact lens blank. 4,710,327, Cl. 264-1.700.
- Neefe, Charles W. Method of making an eye color change contact lens. 4,710,328, Cl. 264-1.700.
- Neel, Jean-Philippe; Case, Roger; and Garnier, Gilbert, to Merlin Gerin. Moulded case circuit breaker. 4,710,738, Cl. 335-172.000.
- Negi, Tsuneo, to Canon Kabushiki Kaisha. Data communication system. 4,710,925, Cl. 371-5.000.
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- Nelson, Richard V.; and Stephen, John F., to ICI Americas Inc. Malonate-based light stabilizers for plastics. 4,710,527, Cl. 524-98.000.
- Nemoto, Hiroshi: See—
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- Nettleton, John E.: See—
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- Neubert, Fritz: See—
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- Neuhans, Hans, to Polytype AG. Apparatus for changing the surface tension of cup-like containers. 4,710,358, Cl. 422-186.050.
- Neuman, Richard C., to B. F. Goodrich Company. The Melt processable CPVC blends. 4,710,533, Cl. 524-394.000.
- New Holland Inc.: See—
Henderson, James S., 4,709,861, Cl. 239-675.000.
- Naaktgeboren, Adrianus; and Van Eecke, Roger H., 4,710,086, Cl. 414-44.000.
- Naaktgeboren, Adrianus; and Van Eecke, Roger H., 4,710,087, Cl. 414-44.000.
- Newberg, Barry M., to Emerson Electric Co. Bearing retainer structure. 4,710,037, Cl. 384-537.000.
- Newberry, Vincent J.: See—
Bryson, Neil B.; Auchterlonie, David T. T.; LeBlanc, Guy; and Newberry, Vincent J., 4,709,744, Cl. 164-472.000.
- Newman, Geoffrey C. S.; Pilkington, Andrew L.; and Winch, Kenneth H., to Scortech Mech. Ltd. Simulation device. 4,710,129, Cl. 434-55.000.
- NGK Insulators, Ltd.: See—
Matsui, Minoru; and Tsuno, Nobuo, 4,709,621, Cl. 92-212.000.
- Nichols, Philip T. Tent fly apparatus and method. 4,709,718, Cl. 135-106.000.
- Nickel, Hans: See—
Wissmann, Michael; Weber, Jurgen; and Nickel, Hans, 4,709,669, Cl. 123-149.00D.
- Nicoll, Douglas E. Weighted beach blanket. 4,709,430, Cl. 5-417.000.
- Nieh, Edward C. Y., to Texaco Inc. Selective recovery of carbon dioxide. 4,710,362, Cl. 423-228.000.
- Nielsen, Susan T.: See—
Abou-Gharbia, Magid A.; and Nielsen, Susan T., 4,710,572, Cl. 544-267.000.
- Nifco, Inc.: See—
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- Niggl, Heinz: See—
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- Nihashi, Iwao: See—
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- Nihon Tokushu Noyaku Seizo K. K.: See—
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- Nihon Tokushu Noyaku Seizo K.K.: See—
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- Niikura, Tatsuo: See—
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- Niuro, Yasuhiko: See—
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- Niizaki, Nobuya: See—
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- Nilsson, Bengt H., to Kamy AB. Method for regulating the pressure of blow-through discharge steam from a reboiler of process steam produced during production of mechanical pulp. 4,710,268, Cl. 162-23.000.
- Ninomiya, Hiroshi: See—
Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,709,976, Cl. 439-350.000.
- Nippert, Georg; Hahn, Berthold; and Gobrecht, Jens, to Brown, Boveri & CIE Aktiengesellschaft. Semiconductor power module. 4,710,795, Cl. 357-65.000.
- Nippon Air Brake Co., Ltd.: See—
Tanaka, Ryuichi; and Ishii, Akira, 4,709,968, Cl. 303-6.00C.
- Nippon Chemi-Con Corp.: See—
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- Nippon Electric Co., Ltd.: See—
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- Nippon Electric Glass Company, Limited: See—
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- Nippon Gakki Seizo Kabushiki Kaisha: See—
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- Nippon Hoso Kyokai: See—
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- Nippon Kogaku K. K.: See—
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- Okita, Masaya, 4,710,827, Cl. 360-10.100.
- Shirasu, Hiroshi; Shimeno, Kazuhiro; and Iwamoto, Joji, 4,710,604, Cl. 219-121.0LU.
- Terasawa, Hidenori, 4,709,997, Cl. 350-427.000.
- Yabumoto, Seiichi, 4,710,816, Cl. 358-213.150.
- Nippon Kogaku K.K.: See—
Okita, Masaya; Sawada, Masahiro; and Ota, Tadashi, 4,710,684, Cl. 318-254.000.
- Okita, Masaya; Sawada, Masahiro; and Ota, Tadashi, 4,710,825, Cl. 358-342.000.
- Nippon Kores Kabushiki Kaisha: See—
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- Nippon Sanso Kabushiki Kaisha: See—
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- Nippon Steel Corporation: See—
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- Nippon Telegraph & Telephone Public Corp.: See—
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- Nippon Valqua Kogyo Kabushiki Kaisha: See—
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- Nippondenso Co., Ltd.: See—
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- Nishida, Masami: See—
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- Nishida, Reiziro: See—
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- Nishida, Takashi: See—
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- Nishikawa, Masao: See—
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- Nishikawa, Tsutomu: See—
Soeda, Kazuhiko; Mori, Masakazu; Nishikawa, Tsutomu; and Tomimori, Kiyoshi, 4,710,022, Cl. 356-73.100.
- Nishikuri, Masao: See—
Hattori, Makoto; Nishikuri, Masao; and Ueda, Yasuyoshi, 4,710,320, Cl. 260-378.000.

- Nishimori, Masayoshi: See—
Takizawa, Shozo; Kobayashi, Kazuyoshi; Fukuyama, Kazuo; Tani, Masanori; Yamamoto, Shoji; Yuasa, Hiroo; Nishimori, Masayoshi; Yoshida, Hiroaki; Eto, Shinichi; Hirao, Eiji; and Goto, Masaki, 4,709,935, Cl. 280-91.000.
- Nishimura, Akimasa, to Canon Kabushiki Kaisha. Loading and unloading system for flexible disc drive apparatus. 4,710,831, Cl. 360-99.000.
- Nishimura, Asaichi: See—
Tonoki, Satoshi; Tsunemi, Hidenari; Nishimura, Asaichi; and Abe, Kunihisa, 4,710,420, Cl. 428-212.000.
- Nishimura, Ikuma: See—
Nakamura, Junji; Nishimura, Ikuma; Saito, Goro; and Matsumoto, Kozo, 4,710,436, Cl. 429-41.000.
- Nishimura, Izumi: See—
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,709,898, Cl. 248-562.000.
- Nishimura, Kunio; and Hirakawa, Tadashi, to Teijin Limited. Base material for honeycomb core structure and process for producing the same. 4,710,432, Cl. 428-542.800.
- Nishimura, Yutaka; and Oyama, Yoshishige, to Hitachi, Ltd. Air flow meter. 4,709,581, Cl. 73-202.000.
- Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; Kondo, Kiyoshi; Kondo, Yutaka; and Kondo, Kazuo, to Hitachi Zosen Corporation. Apparatus for exposing fibrous reinforcements of fiber reinforced resin body. 4,709,714, Cl. 134-89.000.
- Nishiuchi, Kenichi: See—
Yamada, Noboru; Nagashima, Michiyoshi; and Nishiuchi, Kenichi, 4,710,911, Cl. 369-100.000.
- Nishiyodo Air Conditioner Co., Ltd.: See—
Matsushita, Masao; Oku, Kenzo; Nakano, Hiroki; and Okumura, Shin-ichi, 4,709,558, Cl. 62-480.000.
- Nissan Motor Company, Limited: See—
Ichimaru, Yoshiro; Kobayashi, Shigeru; and Ohashi, Toshio, 4,709,751, Cl. 165-17.000.
- Kai, Yasuaki; Sagawa, Takatoshi; and Tabata, Hiroshi, 4,709,988, Cl. 350-276.00R.
- Takehara, Shin, 4,709,779, Cl. 180-300.000.
- Ueno, Takashi; and Abo, Toshimi, 4,709,553, Cl. 60-602.000.
- Nitto Electric Industrial Co., Ltd.: See—
Heller, Jorge; Skinner, Wilfred A.; Saito, Kenichi; and Satoh, Susumu, 4,710,497, Cl. 514-221.000.
- Niwa, Minoru: See—
Hongo, Suzuaki; Niwa, Minoru; Hashiba, Takahiro; Harata, Mitsuru; Hirata, Ichiro; Ito, Isamu; and Sonobe, Akihiko, 4,709,944, Cl. 280-777.000.
- NL Chemicals, Inc.: See—
Reichert, William W.; Cody, Charles A.; Desesa, Michael A.; and Fausleit, Bruce K., 4,710,404, Cl. 427-386.000.
- NL Industries, Inc.: See—
Bradley, William B.; and Holbrook, Philip, 4,710,906, Cl. 367-35.000.
- NMR Imaging, Inc.: See—
Mee, Gary L.; and Willcott, M. Robert, 4,710,715, Cl. 324-307.000.
- Nobuo, Kawahigashi; Shigesou, Hashida; and Yasunobu, Kojima, to Nippon Valqua Kogyo Kabushiki Kaisha. Process for the production of polytetrafluoroethylene porous membranes. 4,710,331, Cl. 264-41.000.
- Noda, Kimihiko; Fujitara, Yoji; and Hasegawa, Yoichi, to Sanyo Chemical Industries, Ltd. Auxiliary for dewatering of sludge. 4,710,298, Cl. 210-505.000.
- Noda, Naoki; Nihashi, Iwao; and Sato, Kazuhiro, to Toyota Jidosha Kabushiki Kaisha. Fixture for welding long workpieces. 4,710,608, Cl. 219-161.000.
- Noguchi, Masaro: See—
Aoyama, Kohji; and Noguchi, Masaro, 4,710,135, Cl. 439-354.000.
- Nohara, Fujio; and Fujinawa, Tomoaki, to Ikeda Mohando Co., Ltd. Pyridyloxy derivatives. 4,710,498, Cl. 514-242.000.
- Noji, Masahide: See—
Kidani, Yoshinori; and Noji, Masahide, 4,710,577, Cl. 556-137.000.
- Nojima, Shoshichi; Nomura, Hiroaki; and Okutani, Tetsuya, to Takeda Chemical Industries, Ltd. 2-(acetoacetoxyloxy)-3-(octadecyloxy)propyl-3-trimethylammonioethyl phosphate or a pharmaceutically acceptable salt thereof. 4,710,579, Cl. 558-169.000.
- Nomura, Hiroaki: See—
Nojima, Shoshichi; Nomura, Hiroaki; and Okutani, Tetsuya, 4,710,579, Cl. 558-169.000.
- Nomura, Ikuro: See—
Emori, Yasuyoshi; and Nomura, Ikuro, 4,709,591, Cl. 74-422.000.
- Nonaka, Susumu: See—
Shimada, Mitsuhiro; Matsumoto, Junichiro; Nonaka, Susumu; and Sayama, Haruo, 4,710,041, Cl. 400-120.000.
- Nonaka, Yoshiyuki: See—
Hirabayashi, Shigetoshi; Matsuzaka, Suyoji; Ohya, Yukio; and Nonaka, Yoshiyuki, 4,710,453, Cl. 430-505.000.
- Nonomura, Keisaku: See—
Takeda, Makoto; Nonomura, Keisaku; and Yamamoto, Kunihiko, 4,710,768, Cl. 340-805.000.
- Nordbrock, Raymond E.: See—
Ocken, Alfred G.; and Nordbrock, Raymond E., 4,710,657, Cl. 310-62.000.
- Nordlund, Tore H., to Purac AB. Arrangement for preparing a charge of compostable material for a composting plant. 4,710,032, Cl. 366-156.000.
- Nordson Corporation: See—
Mulder, Douglas C., 4,710,286, Cl. 209-250.000.
- Nordstrom, Erik G. W., to Uponor AB. Method and apparatus for continuously extruding single-wall pipe of plastics or other mouldable material. 4,710,337, Cl. 264-508.000.
- Nordyne, Inc.: See—
Reifel, Allan J., 4,709,753, Cl. 165-125.000.
Reifel, Allan J.; and Roth, James E., 4,710,610, Cl. 219-363.000.
Roth, James E.; and Bales, David W., 4,709,623, Cl. 98-40.050.
- Norment Industries, Inc.: See—
Quante, Jeffrey B., III; Scoggin, Steven C.; Maxwell, Dennis L.; Rosenkoetter, Marvin W.; and Ferencik, James J., 4,709,659, Cl. 109-21.500.
- Norris, Alan J., to Imperial Chemical Industries Plc. High voltage control. 4,710,849, Cl. 361-228.000.
- North American Philips Consumer Electronics Corp.: See—
Zoladz, Frank J., 4,709,828, Cl. 220-76.000.
- Northern Telecom Limited: See—
Cristescu, Alex G.; and Cones, Christopher A., 4,709,463, Cl. 29-566.300.
- Garner, John N., 4,710,114, Cl. 425-110.000.
- Marcantonio, Gabriel, 4,710,798, Cl. 357-80.000.
- Walling, Jorg-Hein; Cornibert, Jacques; Baxter, Gordon D.; Bottin, Marie-Francoise; Axiuk, Oleg; and Reed, Phillip J., 4,710,594, Cl. 174-120.05R.
- Northrop Corporation: See—
Rowe, James M.; and Modster, Rudolph W., 4,710,433, Cl. 428-623.000.
- Northrup, Walter E.; and Freeman, Maurice E., to Minnesota Mining and Manufacturing Company. Fastener assembly with heat shrinkable film cover. 4,710,414, Cl. 428-43.000.
- Nossen, Edward J., to RCA Corporation. Dual transmit-receive space diversity communication system. 4,710,944, Cl. 375-40.000.
- Noto, Frank A.: See—
Barto, Ronald J.; Goodstine, Stephen L.; and Noto, Frank A., 4,709,664, Cl. 122-379.000.
- Novello, Frederick C.: See—
Willard, Alvin K.; Novello, Frederick C.; Hoffman, William F.; and Cragoe, Edward J., Jr., 4,710,513, Cl. 514-460.000.
- Novitex s.r.l.: See—
Camiciotti, Leonardo; and Furia, Edoardo, 4,709,563, Cl. 66-222.000.
- Novotny, Bernd: See—
Gassmann, Gerhard G.; Schat, Hermannus; Elms, Herbert; Novotny, Bernd; Kappeler, Otmar; and Ehrhardt, Dietmar, 4,710,814, Cl. 358-143.000.
- Novus Inc.: See—
Tingley, Eddie S., 4,709,513, Cl. 51-283.00R.
- Nowell, Gilbert S.: See—
Slosberg, David K.; and Nowell, Gilbert S., 4,710,415, Cl. 428-48.000.
- Nozaki, Takashi; and Hashimoto, Takashi, to Pioneer Electronic Corporation. Channel selecting device for CATV terminal unit. 4,710,971, Cl. 455-179.000.
- Numar Corporation: See—
Strikman, Shmuel, 4,710,713, Cl. 324-303.000.
- Nuovopignone-Industrie Meccaniche e Fonderia S.p.A.: See—
Biagini, Giuliano; and Bartolozzi, Roberto, 4,709,854, Cl. 236-20.00R.
- Nyffeler, Urs: See—
Gaisch, Helmut; and Nyffeler, Urs, 4,709,710, Cl. 131-308.000.
- Oana, Yasuhisa, to Kabushiki Kaisha Toshiba. Method of manufacturing a color-matrix-type liquid crystal display device. 4,709,990, Cl. 350-339.00F.
- Obara, Haruki, to Fanuc Ltd. Electric discharge machining power source. 4,710,603, Cl. 219-69.00C.
- Obarowski, Richard: See—
Vetrogowski, Charles J.; Obarowski, Richard; and McDonough, Paul J., 4,709,608, Cl. 83-355.000.
- Obel, Werner; and Zahn, Klaus, to Deere & Company. Telescopic adjusting crank for tractor 3-point hitch. 4,709,941, Cl. 280-461.00A.
- Ochi, Shigeki: See—
Doi, Yoshihiko; Kuroishi, Nobuhito; Ochi, Shigeki; and Uenishi, Noboru, 4,710,345, Cl. 419-28.000.
- Ochiai, Toshio; Tsujimura, Akio; and Tsukiyasu, Hiroshi, to Toyo Seikan Kaisha, Ltd.; and Komatsu Forklift Kabushiki Kaisha. Loading and unloading apparatus. 4,710,091, Cl. 414-623.000.
- Ochii, Kiyofumi: See—
Masuoka, Fujio; and Ochii, Kiyofumi, 4,710,897, Cl. 365-182.000.
- Ockelmann, Dieter: See—
Franke, Gunter; Ockelmann, Dieter; Raue, Roderich; and Wild, Peter, 4,710,569, Cl. 544-31.000.
- Ocken, Alfred G.; and Nordbrock, Raymond E., to Motorola, Inc. Semi enclosed alternator. 4,710,657, Cl. 310-62.000.
- O'Connell, Bonnie. Glove-like dynamic splint and method of using same. 4,709,694, Cl. 128-87.00A.
- Oculus Optikgeraete GmbH: See—
Spitznas, Manfred; Reiner, Josef; Veit, Wolfgang; and Kirchhubeel, Rainer, 4,710,000, Cl. 350-516.000.
- Odagawa, Atsuo: See—
Otake, Noboru; Tatsuta, Kuniaki; Mizobuchi, Shigeyuki; Komesima, Nobuyasu; Nakajima, Shohachi; Kawai, Hiroyuki; and Odagawa, Atsuo, 4,710,564, Cl. 536-6.400.
- O'Dell, Robert R.: See—
Belknap, William M.; Chanasyk, Albert J.; O'Dell, Robert R.; and Girard, Donald J., 4,710,871, Cl. 364-200.000.

Oestreich, Ulrich; and Mayr, Ernst, to Siemens Aktiengesellschaft. Ribbon-shaped transmission element and method of manufacture. 4,709,984, Cl. 350-96.230.

Oetting, Steven L., to El Paso Products Company. Process for the recovery of amorphous devaporized polyalphaolefin. 4,710,563, Cl. 528-501.000.

Office National d'Etudes et de Recherche Aerospatiales (O.N.E.R.A.): See—

Fima, Henri; and Janiaud, Denis, 4,710,668, Cl. 310-323.000.

Officine Agusto Cattani & C. S.p.A.: See—

Cattani, Augusto, 4,710,209, Cl. 55-418.000.

Offt, Alan M.: See—

Hoogenboom, Leo; Jackson, Robert L., Jr.; Kraft, Russell P.; and Offt, Alan M., 4,710,808, Cl. 358-107.000.

Ogasawara, Tadashi: See—

Yoneda, Takao; Ogasawara, Tadashi; Ohta, Norio; and Sakakibara, Yasuji, 4,709,509, Cl. 51-165.710.

Ogata, Shun-ichiro: See—

Dupont, Bo; Morishima, Yasuo; Collins, Nancy; Ogata, Shun-ichiro; and Lloyd, Kenneth O., 4,710,457, Cl. 435-7.000.

Ogawa, Hiroshi: See—

Ono, Toshio; Tamai, Yasuo; Mizuno, Chiaki; Ogawa, Hiroshi; and Saito, Shinji, 4,710,421, Cl. 428-213.000.

Ogawa, Toshio, to Murata Manufacturing Co., Ltd. Piezoelectric ceramic composition. 4,710,311, Cl. 252-62.900.

Ohara Co., Ltd.: See—

Nakamura, Seizo, 4,709,741, Cl. 164-35.000.

Ohara, Kenichi: See—

Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuo; and Dohi, Takashi, 4,710,688, Cl. 318-603.000.

Ohashi, Makoto: See—

Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,709,898, Cl. 248-562.000.

Ohashi, Toshio: See—

Ichimaru, Yoshiro; Kobayashi, Shigeru; and Ohashi, Toshio, 4,709,751, Cl. 165-17.000.

Ohkawa, Tihro, to United States of America, Energy. Ion cyclotron range of frequencies heating of plasma with small impurity production. 4,710,339, Cl. 376-123.000.

Ohkoshi, Akio; Tsuruta, Koji; Nakagawa, Hideaki; and Shimada, Satoshi, to Sony Corporation. Luminescent display device. 4,710,765, Cl. 340-781.000.

Ohkuma, Taka'aki: See—

Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Taka'aki; Sato, Fumihiko; and Nakamura, Teruya, 4,710,517, Cl. 514-616.000.

Ohkura, Hideaki: See—

Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,709,898, Cl. 248-562.000.

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Ohta, Kuniteru: See—

Harase, Jiro; Ohta, Kuniteru; Takeshita, Tetsuro; and Endo, Michio, 4,709,742, Cl. 164-76.100.

Ohta, Norio: See—

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Ohta, Shinichi, to Canon Kabushiki Kaisha. Image recording apparatus. 4,710,821, Cl. 358-256.000.

Ohtomo, Nobuya; Mizuno, Kyosuke; Hamada, Fukusaburo; and Mizokami, Hiroshi, to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute. Lyophilized hepatitis B vaccine. 4,710,378, Cl. 424-89.000.

Ohtsubo, Mitsuru: See—

Okoshi, Noboru; Motomura, Masatoshi; Ohtsubo, Mitsuru; and Ikeda, Takenori, 4,710,230, Cl. 106-308.00N.

Ohya, Takegi, to Mazda Motor Corporation. Front door structure for vehicle. 4,709,957, Cl. 296-146.000.

Ohya, Yukio: See—

Hirabayashi, Shigeto; Matsuzaka, Syoji; Ohya, Yukio; and Nonaka, Yoshiyuki, 4,710,453, Cl. 430-505.000.

Ohyma, Kanji: See—

Komano, Tohru; and Ohyma, Kanji, 4,710,461, Cl. 435-68.000.

Oikawa, Toshiyuki: See—

Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,709,898, Cl. 248-562.000.

Oil Patch Group, Inc.: See—

Perkin, Gregg S.; and Papke, Duane D., 4,709,462, Cl. 29-434.000.

Oilgear Company, The: See—

Kanies, Kerry R., 4,710,107, Cl. 417-269.000.

Oinonen, Hannu U., to Oy Wartsila Oy. Method and apparatus for reeling a web. 4,709,867, Cl. 242-56.00R.

Oka, Tetsuo: See—

Katsumata, Ryoichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, 4,710,471, Cl. 435-253.000.

Okada, Hideo: See—

Bahn, Itsuki; and Okada, Hideo, 4,710,683, Cl. 318-254.000.

Okada, Kikujiro: See—

Takabayashi, Kuniaki; Takaoka, Yoshitsugu; Hori, Kouichi; Shimotakahara, Masaki; Okada, Kikujiro; and Shiino, Satoru, 4,710,161, Cl. 494-84.000.

Okada, Masami: See—

Suzuki, Mitsutoshi; Morita, Yoshitaka; Okada, Masami; and Shimohara, Jun, 4,710,297, Cl. 210-493.200.

Okada, Shinjiro: See—

Kanbe, Junichiro; and Okada, Shinjiro, 4,709,994, Cl. 350-350.00S.

Okada, Yasutaka: See—

Yonezawa, Toshio; Sasaguri, Nobuya; Onimura, Kichiro; Susukida, Hiroshi; Kawaguchi, Katsuji; Nagano, Hiroo; Minami, Takao; Yamanaka, Kazuo; Okada, Yasutaka; and Inoue, Mamoru, 4,710,237, Cl. 148-13.000.

Okamoto, Kunihide: See—

Suzuki, Hideo; Okamoto, Kunihide; Hayashi, Yasuyuki; and Aiba, Mitsuru, 4,709,934, Cl. 280-6.00R.

Okamoto, Tatsuo; Eguchi, Kouji; and Oosaki, Saburo, to Mitsubishi Denki Kabushiki Kaisha. MOS transistor. 4,710,790, Cl. 357-23.600.

Okamoto, Ted T., to Ethyl Corporation. Olefin purification process. 4,710,273, Cl. 203-29.000.

Okamoto, Yasushi: See—

Imai, Akio; Okamoto, Yasushi; and Saito, Masatoshi, 4,710,554, Cl. 526-180.000.

Okamoto, Yoshiharu; Horikawa, Izumi; and Komaki, Shozo, to Nippon Telegraph & Telephone Public Corp. Space diversity reception system having compensation means of multipath effect. 4,710,975, Cl. 455-276.000.

Okamura, Hisashi: See—

Naoi, Takashi; Fujioka, Takashi; Okamura, Hisashi; and Satake, Masaki, 4,710,456, Cl. 430-564.000.

Okano, Shinobu: See—

Tosaka, Akio; Hashiguchi, Koichi; Morita, Masahiko; and Okano, Shinobu, 4,709,557, Cl. 62-373.000.

Okazaki, Hiroshi: See—

Kazaoka, Kenichi; and Okazaki, Hiroshi, 4,709,965, Cl. 297-366.000.

Oki Electric Industry Co., Ltd.: See—

Itezo, Toshiyuki, 4,710,951, Cl. 379-100.000.

Tanaka, Seietsu, 4,710,797, Cl. 357-74.000.

Okita, Masaya; Sawada, Masahiro; and Ota, Tadashi, to Nippon Kogaku K.K. Drive circuit for brushless DC motors. 4,710,684, Cl. 318-254.000.

Okita, Masaya; Sawada, Masahiro; and Ota, Tadashi, to Nippon Kogaku K.K. Disc recording system with speed control. 4,710,825, Cl. 358-342.000.

Okita, Masaya, to Nippon Kogaku K. K. Servo apparatus. 4,710,827, Cl. 360-10.100.

Okoshi, Noboru; Motomura, Masatoshi; Ohtsubo, Mitsuru; and Ikeda, Takenori, to Dainippon Ink and Chemicals, Inc. Pigment paste. 4,710,230, Cl. 106-308.00N.

Oku, Kenzo: See—

Matsushita, Masao; Oku, Kenzo; Nakano, Hiroki; and Okumura, Shin-ichi, 4,709,558, Cl. 62-480.000.

Okubo, Kimio; and Nemoto, Hiroshi, to Fujitsu Limited. Chucking device of workpiece in grinding machine. 4,709,512, Cl. 51-237.00R.

Okumura, Shin-ichi: See—

Matsushita, Masao; Oku, Kenzo; Nakano, Hiroki; and Okumura, Shin-ichi, 4,709,558, Cl. 62-480.000.

Okumura, Tokiko: See—

Yamaguchi, Youko; Shimizu, Hiroshi; Tsuda, Ichiro; Yano, Masafumi; and Okumura, Tokiko, 4,710,964, Cl. 382-17.000.

Okutani, Tetsuya: See—

Nojima, Shoshichi; Nomura, Hiroaki; and Okutani, Tetsuya, 4,710,579, Cl. 558-169.000.

Okuyama, Gen: See—

Degawa, Toru; Okuyama, Gen; Hashimoto, Akio; Uchida, Seiju; Fujiwara, Kouzou; Ebata, Makoto; Satou, Takashi; and Ototani, Tohei, 4,710,481, Cl. 501-123.000.

Oliver, John P.: See—

Soukup, Thomas G.; and Oliver, John P., 4,710,521, Cl. 521-118.000.

Oliver, Stewart W.; and Cosgrove, John, to International Teldata Corporation. Multiplex system for automatic meter reading. 4,710,919, Cl. 370-96.000.

Olmsted, Dennis R.: See—

Smith, David E.; Olmsted, Dennis R.; and Fryberger, Joseph A., 4,709,873, Cl. 242-195.000.

Olsen, Peter C., Jr.; Conforto, Peter M.; Craighead, Jimmy R.; and Wolf, David L., to Manville Corporation. Apparatus for feeding and opening a beverage carrier. 4,709,538, Cl. 53-566.000.

Olsen, Robert F., to Owens-Illinois Glass Container Inc. Bottle conveyor with brush spacer. 4,709,800, Cl. 198-459.000.

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Lewandowski, Dieter; Ostermoor, Rolf; and Spranger, Dieter, 4,710,330, Cl. 264-25.000.

Olympus Optical Company Limited: See—

Ohshima, Ken; and Shimizu, Tadashi, 4,710,908, Cl. 369-32.000.

Ushikubo, Masao, 4,710,355, Cl. 422-100.000.

Yamanashi, Takanori, 4,709,998, Cl. 350-454.000.

Om Electronics Systems Corp.: See—

Ahuja, Om, 4,710,949, Cl. 379-26.000.

Omni Spray, Inc.: See—

Patrick, Keith H.; and Murchison, Charles W., 4,709,860, Cl. 239-654.000.

Omron Tateisi Electronics Co.: See—

Hirano, Masao; Kato, Mitsutaka; Yasuda, Hirohiko; and Hinoda, Seisuke, 4,710,033, Cl. 374-161.000.

Miyamoto, Kiyoshi, 4,710,699, Cl. 323-324.000.

Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,709,976, Cl. 439-350.000.

Onimura, Kichiro: See—

Yonezawa, Toshio; Sasaguri, Nobuya; Onimura, Kichiro; Susukida, Hiroshi; Kawaguchi, Katsuji; Nagano, Hiroo; Minami, Takao; Yamanaka, Kazuo; Okada, Yasutaka; and Inoue, Mamoru, 4,710,237, Cl. 148-13.000.

Ono, Kouichi: See—

Oomori, Tatsuo; Ono, Kouichi; and Fujita, Shigeto, 4,710,937, Cl. 372-53.000.

Ono, Masayoshi: See—

Yoshimura, Toshiro; Kobayashi, Takayuki; and Ono, Masayoshi, 4,709,943, Cl. 280-751.000.

Ono, Toshio; Tamai, Yasuo; Mizuno, Chiaki; Ogawa, Hiroshi; and Saito, Shinji, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,710,421, Cl. 428-213.000.

Ono, Yuichi: See—

Usagawa, Toshiyuki; Ono, Yuichi; and Takahashi, Susumu, 4,710,787, Cl. 357-16.000.

Onoe, Susumu: See—

Matsuo, Hiroshi; and Onoe, Susumu, 4,710,155, Cl. 474-260.000.

Ookubo, Hiroaki, to Matsushita Electric Industrial Co. Ltd. Platen clutch mechanism. 4,710,046, Cl. 400-556.200.

Oomori, Tatsuo; Ono, Kouichi; and Fujita, Shigeto, to Mitsubishi Denki Kabushiki Kaisha. Laser system. 4,710,937, Cl. 372-53.000.

Ooms, Richard A., to AGFA-Gevaert N.V. High contrast development of silver halide emulsion material. 4,710,451, Cl. 430-441.000.

Oosaki, Saburo: See—

Okamoto, Tatsuo; Eguchi, Kouji; and Oosaki, Saburo, 4,710,790, Cl. 357-23.600.

Opitz, Hans-Georg: See—

Lockhoff, Oswald; Stadler, Peter; Opitz, Hans-Georg; Horstmann, Harald; Junge, Bodo; and Pelster, Bernhard, 4,710,491, Cl. 514-42.000.

Orsburn, Michael L.: See—

Fearing, Craig; and Orsburn, Michael L., 4,710,800, Cl. 358-22.000.

Ortolano, Ralph J. Connected turbine shrouding. 4,710,102, Cl. 416-190.000.

Osaka Kanagu Co., Ltd.: See—

Minami, Saburo, 4,709,564, Cl. 70-25.000.

Osaki, Shigeyoshi; and Fujii, Yoshihiko, to Kanzaki Paper Manufacturing Co., Ltd. Method of measuring orientation or dielectric characteristic of dielectric sheets or webs. 4,710,700, Cl. 324-58.50A.

Osborne, Thomas L.: See—

Debus, Walter, Jr.; Osborne, Thomas L.; and Siller, Curtis A., Jr., 4,710,891, Cl. 364-718.000.

Oscar Mayer Foods Corporation: See—

Borsuk, Alvin, 4,709,449, Cl. 17-32.000.

Ostermoor, Rolf: See—

Lewandowski, Dieter; Ostermoor, Rolf; and Spranger, Dieter, 4,710,330, Cl. 264-25.000.

Ostrea, Antonio M. Gold recovery by sulphydic-fatty acid flotation as applied to gold ores/cyanidation tailings. 4,710,361, Cl. 423-26.000.

Ostrow, Milan R.: See—

Mahaffy, Reid A.; Garson, Eugene; and Ostrow, Milan R., 4,709,535, Cl. 53-473.000.

Ota, Tadashi: See—

Okita, Masaya; Sawada, Masahiro; and Ota, Tadashi, 4,710,684, Cl. 318-254.000.

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Otake, Hiromasa, to Fanuc Ltd. Injection molding machine using servo motor and having mold protecting function. 4,710,119, Cl. 425-136.000.

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- Rao, R. Nagaraja: See—
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- Raschack, Manfred: See—
Geiss, Karl-Heinz; Schmied, Bernhard; Raschack, Manfred; Lehmann, Hans-Dieter; Gries, Josef; and Ruebsamen, Klaus, 4,710,496, Cl. 514-183.000.
- Rasmussen, Russell G.; Stubenfol, Leonard J.; and Disko, Harry, to Marvin Glass & Associates. Projectile propelling attachment for toy figures. 4,710,146, Cl. 446-308.000.
- Rasmussen, Russell G.: See—
Breslow, Jeffrey D.; Morrison, Howard J.; Hanson, Steven P.; and Rasmussen, Russell G., 4,710,873, Cl. 364-410.000.
- Rast, Robert M., to American Television & Communications Corporation. Cable television system. 4,710,956, Cl. 380-20.000.
- Rat, Pierre: See—
Lebas, Jean-Marie; Rat, Pierre; Dupont, Jean-Marcel; and Vinuesa, Germain, 4,710,329, Cl. 264-3.100.
- Rattunde, Manfred, to Reimers Getriebe AG. Plate link chain for cone pulley drives. 4,710,154, Cl. 474-242.000.
- Raue, Roderich: See—
Franke, Gunter; Ockelmann, Dieter; Raue, Roderich; and Wild, Peter, 4,710,569, Cl. 544-31.000.
- Raush, Russell G.; and Alleman, Raymond A., to RCA Corporation. Rinse tank. 4,709,716, Cl. 134-122.00R.
- Rautio, Kauko. Saw machine. 4,709,609, Cl. 83-435.200.
- Raven, Johannes G.: See—
Warmuth, Otto L.; Johandeiter, Martin H.; and Raven, Johannes G., 4,710,802, Cl. 358-25.000.
- Rawdon, Albert H., to Riley Stoker Corporation. Fluidized bed heat generator and method of operation. 4,709,662, Cl. 122-4.00D.
- Ray, Francis M.: See—
Knowles, Terence J.; Ray, Francis M.; and Shewey, Charles E., 4,710,707, Cl. 324-158.00F.
- Raychaudhuri, Pranab K., to Eastman Kodak Company. Thin film amorphous optical recording films. 4,710,452, Cl. 430-495.000.
- Raychem Limited: See—
Archer, Joel; Wassenhove, Denis V.; Pithouse, Kenneth B.; Buck, Leslie J.; Molyneux, Jeffrey P.; and Bradshaw, Peter S., 4,709,948, Cl. 285-381.000.

Raytheon Company: See—
Cantwell, Robert H.; Marksteiner, William K.; and Hansen, V. Gregers, 4,710,772, Cl. 342-92.000.
Lewis, Edward T., 4,710,649, Cl. 307-451.000.

RCA Corporation: See—
Del Priore, Paul J., 4,710,440, Cl. 430-5.000.
Dennis, Timothy A., 4,710,261, Cl. 156-626.000.
Fling, Russell T., 4,710,892, Cl. 364-729.000.
Nossen, Edward J., 4,710,944, Cl. 375-40.000.
Rausch, Russell G.; and Alleman, Raymond A., 4,709,716, Cl. 134-122.00R.

Samuels, Gerard; and Smith, Paul R., 4,709,632, Cl. 101-163.000.
Woestman, John W., 4,709,633, Cl. 101-163.000.
Yakmowitz, Kenneth J., 4,709,733, Cl. 140-147.000.

Ream, James C.: See—
Sabroff, Alvin M.; Chambers, Samuel C.; and Ream, James C., 4,709,569, Cl. 72-340.000.

Recker, Robert R. Treatment for osteoporosis using hGRF(1-40)NH₂, 4,710,382, Cl. 424-108.000.

Reed, Phillip J.: See—
Walling, Jorg-Hein; Cornibert, Jacques; Baxter, Gordon D.; Bottin, Marie-Francoise; Axiuk, Oleg; and Reed, Phillip J., 4,710,594, Cl. 174-120.0SR.

Regiert, Marlies: See—
Hafner, Walter; Ritter, Peter; Gebauer, Helmut; and Regiert, Marlies, 4,710,316, Cl. 512-20.000.

Rehau AG & Co.: See—
Zwilling, Hermann, 4,709,730, Cl. 138-111.000.

Reichert, Karl-Heinz; and Koschinski, Ingo, to Bayer Aktiengesellschaft. Fibre-reinforced or filled polyphenylene sulphide containing treated aramide fibers, 4,710,546, Cl. 525-420.000.

Reichert, William W.; Cody, Charles A.; Desesa, Michael A.; and Faulseit, Bruce K., to NL Chemicals, Inc. Solvent-free coating composition and process for protecting a surface from corrosion, 4,710,404, Cl. 427-386.000.

Reid, Bruce A.; and Deline, John R. M., to NCR Corporation. Closed-loop control system for a stepping motor, 4,710,690, Cl. 318-685.000.

Reid, Stephen R., to Westinghouse Electric Corp. Dynamoelectric machine coil slot wedge mounting arrangement, 4,710,663, Cl. 310-214.000.

Reifel, Allan J., to Nordyne, Inc. Uni-directional fin-and-tube heat exchanger, 4,709,753, Cl. 165-125.000.

Reifel, Allan J.; and Roth, James E., to Nordyne, Inc. Electric resistance heater and limit switch assembly, 4,710,610, Cl. 219-363.000.

Reimers Getriebe AG: See—
Rattunde, Manfred, 4,710,154, Cl. 474-242.000.

Reinelt, Karlheinz: See—
Mueller, Dietmar; and Reinelt, Karlheinz, 4,709,636, Cl. 102-431.000.

Reiner, Josef: See—
Spitznas, Manfred; Reiner, Josef; Veit, Wolfgang; and Kirchhubele, Rainer, 4,710,000, Cl. 350-516.000.

Reinhardt, Rudolf. Assembly for mounted components with snap-action, 4,710,853, Cl. 361-391.000.

Renner, Gunter: See—
Langen, Hans; Schutz, Heinz-Dieter; Himmelmann, Wolfgang; Wernicke, Ubbö; and Renner, Gunter, 4,710,454, Cl. 430-546.000.

Resca, Franco. Handgun frame with fixed barrel bushing, 4,709,497, Cl. 42-75.020.

Rescalli, Carlo: See—
Gazzi, Luigi; and Rescalli, Carlo, 4,710,210, Cl. 62-17.000.
Gazzi, Luigi; and Rescalli, Carlo, 4,710,211, Cl. 62-17.000.

Research Development Corporation of Japan: See—
Yamaguchi, Youko; Shimizu, Hiroshi; Tsuda, Ichiro; Yano, Masafumi; and Okumura, Tokiko, 4,710,964, Cl. 382-17.000.

Research Foundation of State University of New York, The: See—
Beachley, Orville T., Jr., 4,710,575, Cl. 556-1.000.

Rettke, Wilfried: See—
Moritz, Manfred; and Rettke, Wilfried, 4,710,042, Cl. 400-141.000.

Revere Copper and Brass Incorporated: See—
Chapman, James B., 4,710,120, Cl. 425-185.000.

Reyher, Manfred: See—
Rother, Helmut; and Reyher, Manfred, 4,709,856, Cl. 238-10.00E.

Reynolds, Charles P.: See—
Saur, Joseph W.; Reynolds, Charles P.; and Black, Alfred T., 4,710,472, Cl. 435-287.000.

Reynolds Metals Company: See—
Lindstrom, Donald E.; and Setzer, David T., 4,710,068, Cl. 406-88.000.

Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft: See—
Gebhard, Georg R. U.; Hein, Klaus R. G.; and Glaser, Wolfgang, 4,710,365, Cl. 423-244.000.

Rheinmetall GmbH: See—
Bartolles, Rolf, 4,709,616, Cl. 89-26.000.
Klump, Walter, 4,709,614, Cl. 89-1.350.
Mueller, Dietmar; and Reinelt, Karlheinz, 4,709,636, Cl. 102-431.000.

Rhoads, Robert E.: See—
Kozarich, John W.; and Rhoads, Robert E., 4,710,566, Cl. 536-28.000.

Rhone-Poulenc Fibres: See—
Perrot, Pierre; and Vuillemeys, Georges, 4,710,535, Cl. 524-413.000.

Ribich, William A.: See—
Harvey, Andrew C.; Ribich, William A.; Marinaccio, Paul J.; and Sawaf, Bernard E., 4,709,453, Cl. 24-442.000.

Ricardo Consulting Engineers plc: See—
Monaghan, Michael L., 4,709,676, Cl. 123-383.000.

Rice, Lawrence M.: See—
Morris, Merle E.; Rice, Lawrence M.; and Meade, Steven L., 4,710,676, Cl. 313-579.000.

Rich, Brian G.; Patchell, John W.; and Harman, R. Keith, to Senstar Security Systems Corporation. Security system transmission line, 4,710,753, Cl. 340-561.000.

Richards, Elmer A., to Eaton Corporation. Herringbone geared multiple load sharing countershaft transmission, 4,709,590, Cl. 74-331.000.

Richards, John S.: See—
Kubert, Vince T.; and Richards, John S., 4,709,635, Cl. 101-426.000.

Richards, Randall G., to Drackett Company, The. Toilet tank dispenser, 4,709,423, Cl. 4-228.000.

Richter Gedeon Vegyeszeti Gyar Rt: See—
Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefko, Bela; Mezaros, Judit; Deutsch, Ida; Szilbereky, Jenő; Csizer, Eva; Vezér, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.00R.

Ricoh Company, Ltd.: See—
Imamura, Tomotsu, 4,710,622, Cl. 250-214.00R.
Kobayashi, Kiyohiko, 4,710,965, Cl. 382-41.000.
Takeda, Fuchio; Matsushiro, Hiroyuki; Kobayashi, Kazuo; and Kaneko, Toshio, 4,710,015, Cl. 355-3.0DD.

Ricoh Systems, Inc.: See—
Koelling, Alan L.; Murphy, William J.; and Mayer, Edward F., 4,710,442, Cl. 430-85.000.

Rider, Jack A.: See—
Krause, Larry J.; and Rider, Jack A., 4,710,403, Cl. 427-304.000.

Rienecker, Reimund: See—
Henrich, Hans-Otto; and Rienecker, Reimund, 4,710,287, Cl. 209-270.000.

Ries, Joachim; and Dorgeloh, K. Heinrich W., to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V. Method for the representation of video images or scenes, in particular aerial images transmitted at reduced frame rate, 4,710,809, Cl. 358-109.000.

Rieter Machine Works, Ltd.: See—
Schefer, Kurt, 4,709,866, Cl. 242-18.00A.

Riker Laboratories, Inc.: See—
Kirk, Alan R.; and Scherrer, Robert A., 4,710,515, Cl. 514-563.000.

Riley Stoker Corporation: See—
Larson, John W.; and Breault, Ronald W., 4,709,663, Cl. 122-4.00D.
Rawdon, Albert H., 4,709,662, Cl. 122-4.00D.

Rilly, Gerard, to Deutsche Thomson-Brandt GmbH. D.C. to D.C. converter with a switch-mode power supply, 4,710,859, Cl. 363-21.000.

Rindal, Roald A.; and McKee, Bobby D., to Westinghouse Electric Corp. Homopolar generator with variable packing factor brushes, 4,710,666, Cl. 310-248.000.

Rink, Frederick J., Jr.: See—
Cox, Frederick E.; Rink, Frederick J., Jr.; and Valachovic, Richard A., 4,710,664, Cl. 310-217.000.

Riquart, Christian: See—
Sauvee, Jean P.; Riquart, Christian; and Levrai, Roland, 4,709,550, Cl. 60-562.000.

Ritchie, Ian T.; and Kittler, Wilfred C., to Andus Corp. Stable high resistance transparent coating, 4,710,441, Cl. 430-62.000.

Ritsko, Joseph E.; and Acla, Howard L., to GTE Products Corporation. High purity high surface area alpha crystalline silicon nitride, 4,710,368, Cl. 423-344.000.

Rittal-Werk Rudolf Loh GmbH & Co KG: See—
Erlam, David P., 4,710,096, Cl. 415-121.00G.

Ritter, Peter: See—
Hafner, Walter; Ritter, Peter; Gebauer, Helmut; and Regiert, Marlies, 4,710,316, Cl. 512-20.000.

Rittman, Friedrich: See—
Wilhelmi, Herbert; Kegel, Kurt; Zollner, Dieter; Lauterbach-Dammier, Inge; Taube, Thomas; and Rittman, Friedrich, 4,710,607, Cl. 219-121.00P.

Roag (AG): See—
Suter, Hans R., 4,710,199, Cl. 8-507.000.

Robert Bosch GmbH: See—
Babitzka, Rudolf, 4,709,673, Cl. 123-299.000.
Haug, Kurt; and Petersen, Rudolf, 4,710,857, Cl. 362-80.000.
Heess, Gerhard; and van Zanten, Anton, 4,709,969, Cl. 303-114.000.
Kaiser, Gunther; and Krauter, Immanuel, 4,709,684, Cl. 123-644.000.
Merkus, Minne, 4,709,528, Cl. 53-128.000.

Roberts, Arthur: See—
Leeds, Richard; and Roberts, Arthur, 4,709,971, Cl. 312-201.000.

Roberts, David A.: See—
Campbell, Simon F.; and Roberts, David A., 4,710,507, Cl. 514-312.000.

Roberts, Richard A.: See—
Hazlegrove, Billy M.; and Roberts, Richard A., 4,710,059, Cl. 405-162.000.

Roberts, Rowena L.: See—
Churny, Alan B.; Gross, Akiva T.; Kupper, Robert J.; and Roberts, Rowena L., 4,710,583, Cl. 560-40.000.

Roberts, Simon. Tire repair method, 4,710,249, Cl. 156-64.000.

Roberts, William N., to Zenith Electronics Corporation. Single layer optical coupler for projection TV CRT, 4,710,820, Cl. 358-231.000.

Robieux, Jean, to Compagnie General d'Electricite. Optical fiber telecommunication device, 4,710,914, Cl. 370-3.000.

Robin, Jacques; Pruneau, Didier; and Bonenfant, Alain, to Societe de Recherches Industrielles (S.O.R.I.). Asymmetric heterocyclic ester derivatives of 1,4-dihydropyridine-3,5-dicarboxylic acids, 4,710,505, Cl. 514-278.000.

Robotic Vision System, Inc.: See—
Stern, Howard; Mauro, Alex; and Lee, Jay, 4,709,858, Cl. 239-296.000.

Rochester, Charles R., Jr., to Unisys Corporation. EMI/RFI shielding assembly for cathode ray tube monitors, 4,710,591, Cl. 174-35.0GC.

Rockwell International Corporation: See—
Matejczyk, Daniel E., 4,710,223, Cl. 75-248.000.
Momot, Stanley; and Hannon, William G., 4,709,634, Cl. 101-248.000.

Rosman, Irwin E., 4,710,332, Cl. 264-60.000.

Warren, Leslie F., Jr.; Maus, Louis; and Hall, William F., 4,710,401, Cl. 427-121.000.

Rodgers, Donald H.: See—
Bodovsky, Paul W.; and Rodgers, Donald H., 4,710,207, Cl. 55-290.001.

Roederer, Antoine G.; Doro, Guilio; and Lisi, Marco, to Agence Spatiale Europeenne. Power divider for multibeam antennas with shared feed elements, 4,710,776, Cl. 343-778.000.

Roether, Kurt, to Mannesmann AG. Method of making tubular units for the oil and gas industry, 4,710,245, Cl. 148-12.400.

Rogers, Donald: See—
Howe, Stephen H.; and Rogers, Donald, 4,710,259, Cl. 156-601.000.

Rogers, John M. Apparatus for milling exterior surfaces and refacing both shoulders of a two-shoulder tool joint, 4,709,604, Cl. 82-4.00C.

Rohm GmbH: See—
Kraemer, Dieter; Siol, Werner; Markert, Gerhard; Suetterlin, Norbert; and Feil, Cornelia, 4,710,525, Cl. 523-201.000.

Rohr, Robert D.: See—
Beck, James M.; and Rohr, Robert D., 4,709,823, Cl. 215-235.000.

Ropol, Inc.: See—
Gleaves, Geoffrey H., 4,709,516, Cl. 52-11.000.

Rorden, Louis H.; and Moore, Thomas C., to Develco. Method and apparatus employing received independent magnetic field components of a transmitted alternating magnetic field for determining location, 4,710,708, Cl. 324-207.000.

Rosch, Werner: See—
Batza, Willi; and Rosch, Werner, 4,710,203, Cl. 55-2.000.

Rosenberg, Helmut W. G., to Kendall Company, The. Needle depth setting sheath assembly and needle stop, 4,710,171, Cl. 604-117.000.

Rosenkoetter, Marvin W.: See—
Quante, Jeffrey B., III; Scoggin, Steven C.; Maxwell, Dennis L.; Rosenkoetter, Marvin W.; and Ferencik, James J., 4,709,659, Cl. 109-21.500.

Rosman, Irwin E., to Rockwell International Corporation. Process of injection molding a laser mirror substrate, 4,710,332, Cl. 264-60.000.

Rossetti, James J., to Advanced Tool Technology, Inc. Method of preparing a template, 4,710,334, Cl. 264-102.000.

Rossi, Irving. Process and apparatus for making thin steel slabs, 4,709,745, Cl. 164-484.000.

Rossman, Axel, to Motoren- und Turbinen-Union Munchen, GmbH. Method for manufacturing powder material and shaped products utilizing the conditions in outer space, 4,710,346, Cl. 419-68.000.

Roth, Bernard: See—
Luckey, George W.; Roth, Bernard; Brendel, Kathleen E.; and Den Dunne, Margaret S., 4,710,637, Cl. 250-486.100.

Roth, James E.; and Bales, David W., to Nordyne, Inc. Ceiling distributor duct assembly for rooftop air conditioners, 4,709,623, Cl. 98-40.050.

Roth, James E.: See—
Reifel, Allan J.; and Roth, James E., 4,710,610, Cl. 219-363.000.

Rother, Helmut; and Reyher, Manfred, to Gebr. Marklin & Cie. GmbH. Electrical and mechanical coupling for model rail sections, 4,709,856, Cl. 238-10.00E.

Rotman, Avner. Sustained release tablets made from microcapsules, 4,710,384, Cl. 424-465.000.

Roucache, Jeannine: See—
Behar, Françoise; Roucache, Jeannine; Auger, Jean; and Boudet, Luc, 4,710,354, Cl. 422-80.000.

Rowe, James M., and Modster, Rudolph W., to Northrop Corporation. Transparent conductive windows, coatings, and method of manufacture, 4,710,433, Cl. 428-623.000.

Rozlosnik, Alan J.: See—
Anders, Walter G.; Grosswiller, Leo J., Jr.; Lozier, Benjamin F.; and Rozlosnik, Alan J., 4,710,098, Cl. 415-149.00A.

Rozsas, Tomas, to Volkswagen AG. Fuel injection device, 4,709,681, Cl. 123-531.000.

Rubin, Michael D.: See—
Crill, Philip D.; and Rubin, Michael D., 4,710,733, Cl. 332-26.000.

Rucker, Robert A. Refractory cement, 4,710,225, Cl. 106-104.000.

Rudick, Arthur G.; and Credle, William S., Jr., to Coca-Cola Company, The. Method and system for filling packages with a carbonated beverage pre-mix under micro-gravity conditions, 4,709,734, Cl. 141-2.000.

Rudolph, Hans: See—
Meier, Helmut-Martin; Heine, Hans-Georg; Pischtschan, Alfred; Dhein, Rolf; and Rudolph, Hans, 4,710,529, Cl. 524-139.000.

Ruebsamen, Klaus: See—
Geiss, Karl-Heinz; Schmied, Bernhard; Raschack, Manfred; Lehmann, Hans-Dieter; Gries, Josef; and Ruebsamen, Klaus, 4,710,496, Cl. 514-183.000.

Ruhrchemie Aktiengesellschaft: See—
Bahrmann, Helmut; Cornils, Boy; Lipps, Wolfgang; Lappe, Peter; and Springer, Helmut, 4,710,321, Cl. 200-501.150.

Rullier, Pierre: See—
Dimier, Jean-Pierre; and Rullier, Pierre, 4,709,942, Cl. 280-618.000.

Runeman, Bo, to Molnlycke AB. Incontinence protector and a method for its manufacture, 4,710,188, Cl. 604-385.00R.

Ruscelli, Emilio; Carrera, Cesare; and Formenti, Giuseppe, to Pneumatici Clement S.p.A. Universal tubular-tire for bicycles, 4,709,739, Cl. 152-453.000.

Russell, Philip B.: See—
Matsumoto, Yutaka; Mina, Cesar; Russell, Philip B.; and van Ark, William B., 4,710,618, Cl. 250-203.00R.

Russo, Onofrio N., to Gas Energy, Inc. Automatically locking valve, 4,709,720, Cl. 137-385.000.

Rutschmann, Erwin; Tran-Van, Khanh; and Wagner, Joachim, to Dr. Ing. h.c. F. Porsche Aktiengesellschaft. Multiple cylinder internal combustion engine with exhaust turbochargers, 4,709,552, Cl. 60-600.000.

Rutt, Thomas E., to Aardvark Audio Inc. Nonlinear distortion synthesizer using over-threshold power-function feedback, 4,710,727, Cl. 330-110.000.

Ruxley Holdings Ltd.: See—
Loveridge, Ronald, 4,710,023, Cl. 356-124.000.

Ryobi, Ltd.: See—
Murakami, Hideo, 4,709,874, Cl. 242-220.000.
Utsuki, Haruo; Kobayashi, Takehiro; and Yamane, Hiroto, 4,710,689, Cl. 318-630.000.

Rytand, David H. Floating dock, 4,709,647, Cl. 114-267.000.

Saalebach, Kurt; and Hartmann, Willi, to Alfred Teves GmbH. Pressure cylinder and method of adjusting idle travel, 4,709,551, Cl. 60-589.000.

Sabroff, Alvin M.; Chambers, Samuel C.; and Ream, James C., to Eaton Corporation. Method for producing gears, 4,709,569, Cl. 72-340.000.

Sadler, Karl-Otto; Schmidt, Willy; and Franz, Hans-Joachim, to Blohm & Voss AG. Functional unit installation in a warship, 4,709,646, Cl. 114-5.000.

Safety 1st, Inc.: See—
Lerner, Michael; Bernstein, Michael; and Selame, Robert, 4,709,429, Cl. 4-661.000.

SAFT, S.A.: See—
Leben, Yannick; and D'Ussel, Louis, 4,710,438, Cl. 429-119.000.

Sagawa, Masato: See—
Yamagishi, Wataru; and Sagawa, Masato, 4,710,242, Cl. 148-301.000.

Sagawa, Takatoshi: See—
Kai, Yasuaki; Sagawa, Takatoshi; and Tabata, Hiroshi, 4,709,988, Cl. 350-276.00R.

Sagawa, Takayoshi: See—
Hirose, Ichiro; and Sagawa, Takayoshi, 4,709,711, Cl. 131-336.000.

Saiki, Eisaku; and Kawachi, Masataka, to Hitachi, Ltd. Automatic sheet feeding device, 4,709,911, Cl. 271-10.000.

Saito, Goro: See—
Itaya, Hiroshi; and Saito, Goro, 4,710,702, Cl. 324-79.00R.
Nakamura, Junji; Nishimura, Ikuma; Saito, Goro; and Matsumoto, Kozo, 4,710,436, Cl. 429-41.000.

Saito, Junichi; Tamura, Tatsuo; Kurahashi, Yoshio; Uzawa, Shigeru; Matsumoto, Noboru; and Yamaguchi, Naoko, to Nihon Tokushu Noyaku Seizo K. K. Substituted phenylsulfonfylazoles, 4,710,509, Cl. 514-384.000.

Saito, Kenichiro: See—
Heller, Jorge; Skinner, Wilfred A.; Saito, Kenichiro; and Satoh, Susumu, 4,710,497, Cl. 514-221.000.

Saito, Koichi; Fujimura, Yoshihiko; and Inoue, Nanao, to Fuji Xerox Co., Ltd. Recorder with simultaneous application of thermal and electric energies, 4,710,780, Cl. 346-1.100.

Saito, Masatoshi: See—
Imai, Akio; Okamoto, Yasushi; and Saito, Masatoshi, 4,710,554, Cl. 526-180.000.

Saito, Naoyuki; and Ozawa, Motoo, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle, 4,709,774, Cl. 180-229.000.

Saito, Shinji: See—
Ono, Toshio; Tamai, Yasuo; Mizuno, Chiaki; Ogawa, Hiroshi; and Saito, Shinji, 4,710,421, Cl. 428-213.000.

Saito, Yukio: See—
Shimaoka, Motohiro; and Saito, Yukio, 4,710,829, Cl. 360-97.000.

Saitoh, Takashi; Niizaki, Nobuya; Yamamura, Hideho; and Hayashi, Shinichi, to Hitachi, Ltd.; and Hitachi Electronics Engineering Co., Ltd. Delay circuit including an improved CR integrator circuit, 4,710,654, Cl. 307-601.000.

Sajur, Eugene V.: See—
Allen, Ronald C.; and Sajur, Eugene V., 4,710,206, Cl. 55-58.000.

Sakai, Shino; and Nishikawa, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling creep preventing device for vehicle equipment with automatic transmission, 4,709,792, Cl. 192-0.044.

Sakai, Yasuhito, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the pressure of oil in a system for a continuously variable transmission, 4,710,151, Cl. 474-28.000.

Sakakibara, Shiro; and Ozaki, Kazuhisa, to Aisin-Warner Limited. Parking mechanism for transmissions, 4,709,793, Cl. 192-4.00A.

Sakakibara, Yasuji: See—
Yoneda, Takao; Ogasawara, Tadashi; Ohta, Norio; and Sakakibara, Yasuji, 4,709,509, Cl. 51-165.710.

Sakamoto, Fujio, to Toyota Gosei Co., Ltd. Wheel cap, 4,709,967, Cl. 301-37.00P.

Sakamoto, Shoichi: See—
Matsumoto, Fujio; Doi, Hajime; Mizushima, Kunio; Funahashi, Masaya; Taniguchi, Tomizo; and Sakamoto, Shoichi, 4,709,816, Cl. 206-444.000.

Sakanoue, Hitoyuki: See—
Sekiguchi, Yukio; Funakubo, Hiroyasu; Sakanoue, Hitoyuki; and Komura, Osamu, 4,709,844, Cl. 228-3.100.

Sakashita, Tsutomu: See—
Yamada, Tsuneo; Sakashita, Tsutomu; Tomono, Hiroshi; Kimura, Takashi; Machara, Yasuhiro; and Yasumoto, Kunio, 4,709,572, Cl. 72-366.000.

Sakawa, Shinji: See—
Kurahashi, Yoshio; Shiokawa, Kozo; Kagabu, Shinzo; Sakawa, Shinji; and Moriya, Koichi, 4,710,518, Cl. 514-624.000.

Sakurai, Hiroshi: See—
Matsura, Hitoshi; and Sakurai, Hiroshi, 4,709,482, Cl. 33-1.00M.

Sakurai, Keichi, to Casio Computer Co., Ltd. Apparatus with liquid crystal display panel, for recording/playing back television signal by utilizing digital audio tape recorder system, 4,710,826, Cl. 360-9.100.

Salandanan, Carmelita S.: See—
Patel, Arvind D.; and Salandanan, Carmelita S., 4,710,586, Cl. 560-68.000.

Saller, Henry A., deceased (by Saller, Marjorie, executrix); Hodge, Edwin S.; Paprocki, Stanley J.; and Dayton, Russell W., to United States of America, Energy. Method of bonding, 4,709,848, Cl. 228-159.000.

Saller, Marjorie, executrix: See—
Saller, Henry A., deceased; Hodge, Edwin S.; Paprocki, Stanley J.; and Dayton, Russell W., 4,709,848, Cl. 228-159.000.

Salley, Frank. Rotary air lock feeder, 4,710,067, Cl. 406-64.000.

Salo, Timo: See—
Alsen, Per; and Salo, Timo, 4,710,070, Cl. 408-93.000.

Salomon, Lothar H. Mechanical fluid indicator, 4,709,653, Cl. 116-228.000.

Salomon S.A.: See—
Dimier, Jean-Pierre; and Rullier, Pierre, 4,709,942, Cl. 280-618.000.

Morell, Joseph; De Marchi, Jean-Louis; and Kopp, Norbert, 4,709,491, Cl. 36-121.000.

Samuels, Gerard; and Smith, Paul R., to RCA Corporation. Selective intaglio inking device with removable cartridge, 4,709,632, Cl. 101-163.000.

Sand, Theodor: See—
Bruning, Jürgen; Emberger, Roland; Hopp, Rudolf; and Sand, Theodor, 4,710,392, Cl. 426-534.000.

Sanders Associates, Inc.: See—
Kuppenheimer, John D., Jr.; and Smith, Kirby A., 4,710,630, Cl. 250-353.000.

Sciaccaro, James R.; and Pardee, Douglas L., 4,710,767, Cl. 340-799.000.

Sanders, James F., to Minnesota Mining and Manufacturing Company. Resist imageable photopolymerizable compositions, 4,710,445, Cl. 430-252.000.

Sangamo Weston, Inc.: See—
Stephenson, Kenneth E., 4,710,675, Cl. 313-532.000.

Sankey, James K.: See—
Hehn, Bruce A.; and Sankey, James K., 4,709,437, Cl. 15-97.00R.

Sano, Shoichi: See—
Tashiro, Yutaka; and Sano, Shoichi, 4,709,936, Cl. 280-91.000.

Sanofi: See—
Wermuth, Camille G.; and Chambon, Jean-Pierre, 4,710,499, Cl. 514-247.000.

Sanshin Kogyo Kabushiki Kaisha: See—
Sumigawa, Yukio, 4,709,671, Cl. 123-196.00S.

Santen, Sven; Eriksson, Sven; and Bernhard, Ragnar, to SKF Steel Engineering AB. Recovering chemicals from spent pulp liquors, 4,710,269, Cl. 162-30.100.

Sanyo Chemical Industries, Ltd.: See—
Noda, Kimihiko; Fujiura, Yoji; and Hasegawa, Yoichi, 4,710,298, Cl. 210-505.000.

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Machida, Toyoyi; and Ueno, Shyuichi, 4,709,472, Cl. 29-623.000.

Sapp, Charles E. Clock with calendar notepad, 4,709,493, Cl. 40-117.000.

Sapper, Rainer; and Kick, Helmut, to Linde Aktiengesellschaft. Process for separating CO₂ from a gaseous mixture, 4,710,213, Cl. 62-28.000.

Sarin, Vinod K.: See—
Baldoni, J. Gary, II; Buljan, Sergej-Tomislav; and Sarin, Vinod K., 4,710,425, Cl. 428-328.000.

Sasaguri, Nobuya: See—
Yonezawa, Toshio; Sasaguri, Nobuya; Onimura, Kichiro; Susukida, Hiroshi; Kawaguchi, Katsuji; Nagano, Hiroo; Minami, Takao; Yamanaka, Kazuo; Okada, Yasutaka; and Inoue, Mamoru, 4,710,237, Cl. 148-13.000.

Sasaki, Shinji; Shimoyama, Yujiro; and Watanabe, Yoshinori, to Alps Electric Co., Ltd. Detent mechanism for sliding electric parts, 4,710,600, Cl. 200-291.000.

Sasamori, Eizo: See—
Takano, Katsuhiko; Yoshihara, Satoshi; Iijima, Shigeharu; Sasamori, Eizo; Matsushima, Masaaki; and Kishi, Hiroyoshi, 4,710,418, Cl. 428-192.000.

Satake, Masaki: See—
Naoi, Takashi; Fujioka, Takashi; Okamura, Hisashi; and Satake, Masaki, 4,710,456, Cl. 430-564.000.

Sato, Fumihiro: See—
Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Taka'aki; Sato, Fumihiro; and Nakamura, Teruya, 4,710,517, Cl. 514-616.000.

Sato, Kazuhiro: See—
Noda, Naoki; Nihashi, Iwao; and Sato, Kazuhiro, 4,710,608, Cl. 219-161.000.

Sato, Kichihei: See—
Tamamizu, Teruyasu; Sato, Kichihei; Tanaka, Takashi; and Sato, Shunkichi, 4,710,428, Cl. 428-408.000.

Sato, Makoto: See—
Iwasaki, Tadayoshi; Ariga, Keiki; and Sato, Makoto, 4,709,578, Cl. 73-49.300.

Sato, Masanori: See—
Kasai, Tatsushi; Niikura, Tatsuo; Sato, Masanori; Hashimoto, Takao; and Yamashita, Akiya, 4,710,215, Cl. 62-532.000.

Sato, Noboru; Habu, Kazutaka; and Abe, Sanae, to Sony Corporation. Optomagnetic recording medium, 4,710,434, Cl. 428-678.000.

Sato, Shunkichi: See—
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Sato, Toshifumi, to NEC Corporation. Speech-adaptive predictive coding system having reflected binary encoder/decoder, 4,710,960, Cl. 381-47.000.

Satoh, Susumu: See—
Heller, Jorge; Skinner, Wilfred A.; Saito, Kenichiro; and Satoh, Susumu, 4,710,497, Cl. 514-221.000.

Satou, Takashi: See—
Degawa, Toru; Okuyama, Gen; Hashimoto, Akio; Uchida, Seiju; Fujiwara, Kouzou; Ebata, Makoto; Satou, Takashi; and Ototani, Tohei, 4,710,481, Cl. 501-123.000.

Saur, Joseph W.; Reynolds, Charles P.; and Black, Alfred T., to United States of America, Navy. Magnetic separation device, 4,710,472, Cl. 435-287.000.

Sauvee, Jean P.; Riquart, Christian; and Levrai, Roland, to Societe Anonyme D.B.A. Hydraulic assistance device, 4,709,550, Cl. 60-562.000.

Saveliev, Vyacheslav N.: See—
Kostylev, Alexandr D.; Boginsky, Vladimir P.; Smolyanitsky, Boris N.; Syryamin, Jury N.; Danilov, Boris B.; Kogan, David I.; and Saveliev, Vyacheslav N., 4,709,768, Cl. 175-296.000.

Savoie, Neil A. Portable cabinet, 4,709,970, Cl. 312-140.400.

Sawada, Masahiro: See—
Okita, Masaya; Sawada, Masahiro; and Ota, Tadashi, 4,710,684, Cl. 318-254.000.

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Sawaf, Bernard E.: See—
Harvey, Andrew C.; Ribich, William A.; Marinaccio, Paul J.; and Sawaf, Bernard E., 4,709,453, Cl. 24-442.000.

Sawafuji Electric Co., Inc.: See—
Takano, Masami; and Tamura, Yukio, 4,710,659, Cl. 310-153.000.

Sawaragi, Hiroshi, to Jeol Ltd. Ion beam lithography system, 4,710,639, Cl. 250-492.200.

Sayama, Haruo: See—
Shimada, Mitsuhiro; Matsumoto, Junichiro; Nonaka, Susumu; and Sayama, Haruo, 4,710,041, Cl. 400-120.000.

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Schad, Hans P.; and Kelly, Stephen M., to Merck Patent Gesellschaft mit beschränkter Haftung. Anisotropic compounds and liquid crystal mixtures therewith, 4,710,315, Cl. 252-299.630.

Schaeffler, George: See—
Klug, Horst; Mocker, Wolfgang; Schaeffler, George; and Speil, Walter, 4,709,668, Cl. 123-90.550.

Schaezler, Walter: See—
Paerisch, Jochen; Herlemann, Werner; and Schaezler, Walter, 4,709,959, Cl. 296-217.000.

Schaffel, Neal A.: See—
Lee, Robert W.; and Schaffel, Neal A., 4,710,239, Cl. 148-101.000.

Schaffer, Dennis A.: See—
Valencic, Milan D.; and Schaffer, Dennis A., 4,709,471, Cl. 29-605.000.

Schat, Hermannus: See—
Gassmann, Gerhard G.; Schat, Hermannus; Elms, Herbert; Novotny, Bernd; Kappeler, Otmir; and Ehrhardt, Dietmar, 4,710,814, Cl. 358-143.000.

Schatz, Oskar. Internal combustion engine with a positive displacement supercharger mechanically driven from the engine crankshaft, 4,709,683, Cl. 123-560.000.

Schaumann, Wolfgang: See—
Mertens, Alfred; Holck, Jens-Peter; Kampe, Wolfgang; Muller-Beckmann, Bernd; Strein, Klaus; and Schaumann, Wolfgang, 4,710,510, Cl. 514-394.000.

Schefer, Kurt, to Rieter Machine Works, Ltd. Thread guiding and screening element for use in filament winder, 4,709,866, Cl. 242-18.00A.

Schelby, Robert L.: See—
Tucker, James L.; Landen, Terry R.; and Schelby, Robert L., 4,710,115, Cl. 425-117.000.

Scheller, Hans-Ulrich, to Wurttembergische Parfümerie-Fabrik GmbH. Dentifrice for hypersensitive teeth, 4,710,372, Cl. 424-49.000.

Schemmann, Hugo: See—
Schroder, Johann; Gawron, Klaus; Bertram, Leo; and Schemmann, Hugo, 4,709,752, Cl. 165-47.000.

Schenk Filterbau Gesellschaft mit beschränkter Haftung: See—
Ziller, Josef, 4,710,294, Cl. 210-232.000.

Schenkel, Robert H.; Wong, Rosie B.; and Thammana, Pallaiah, to American Cyanamid Company. Antigens and monoclonal antibodies reactive against sporozoites of *Eimeria* spp., 4,710,377, Cl. 424-88.000.

Schering Agrochemicals Limited: See—
Webb, Michael A., 4,710,512, Cl. 514-431.000.

Scherrer, Robert A.: See—
Kirk, Alan R.; and Scherrer, Robert A., 4,710,515, Cl. 514-563.000.

Scherzer, Wilhelm, to Austria Metall Aktiengesellschaft. Sound-damping and heat-insulating composite plate, 4,709,781, Cl. 181-290.000.

Schiappacasse, Russell F.: See—
Gerace, Michael J.; Krysiak, Gary D.; and Schiappacasse, Russell F., 4,710,411, Cl. 428-34.000.

Schillinger, Daniel: See—
Kaufmann, Felix; and Schillinger, Daniel, 4,710,863, Cl. 364-146.000.

Schingnitz, Manfred: See—
Gohler, Peter; Mangler, Rolf; Schingnitz, Manfred; Seidel, Wolfgang; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Gamburg, David, 4,710,202, Cl. 48-73.000.

Schlechtriemen, Gerhard-Ludwig; Hotzel, Gerhard; and Weppner, Werner, to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V. Solid state cell, 4,710,848, Cl. 361-280.000.

Schmetz GmbH & Co. KG: See—
Schmetz, Peter, 4,709,904, Cl. 266-250.000.

Schmetz, Peter, to Schmetz GmbH & Co. KG. Vacuum furnace for heat-treating a charge, 4,709,904, Cl. 266-250.000.

Schmidt, Douglass N.: See—
Finnan, Jeffrey L.; Lisa, Rudolph E.; and Schmidt, Douglass N., 4,710,519, Cl. 514-629.000.

Schmidt, Martin: See—
Dotzauer, Peter; and Schmidt, Martin, 4,709,559, Cl. 62-499.000.

Schmidt, Willy: See—
Sadler, Karl-Otto; Schmidt, Willy; and Franz, Hans-Joachim, 4,709,646, Cl. 114-5.000.

Schmied, Bernhard: See—
Geiss, Karl-Heinz; Schmied, Bernhard; Raschack, Manfred; Lehmann, Hans-Dieter; Gries, Josef; and Ruebsamen, Klaus, 4,710,496, Cl. 514-183.000.

Schmukler, Charles S.; and Buon, Georges A., to Marine Moisture Control Company, Inc. Method and apparatus for determining the degree of purity of a liquid, 4,710,643, Cl. 250-573.000.

Schneider, Laszlo. Phototechnical apparatus of vertical arrangement for continuous development of photographic materials, particularly photographic plates, 4,710,009, Cl. 354-322.000.

Schneider, Lutz T.: See—
Henne, Heinrich; Patzelt, Norbert; Schneider, Lutz T.; Knobloch, Osbert; and Muller, Manfred, 4,709,864, Cl. 241-167.000.

Schneider, Thomas C., to Velten & Pulver, Inc. Article unstacking system, 4,710,089, Cl. 414-118.000.

Schnell, Josef. Exercising apparatus, 4,709,920, Cl. 272-117.000.

Schollhamer, George K.: See—
Layre, John; Park, Yong S.; and Schollhamer, George K., 4,709,625, Cl. 99-289.00R.

Schottli, Theodore: See—
Dromigny, Pierre; and Schottli, Theodore, 4,710,116, Cl. 425-125.000.

Schramm, Matthias: See—
Franckowiak, Gerhard; Bechem, Martin; Gross, Rainer; Kayser, Michael; Schramm, Matthias; and Thomas, Gunter, 4,710,501, Cl. 514-256.000.

Schroder, Johann; Gawron, Klaus; Bertram, Leo; and Schemmann, Hugo, to U.S. Philips Corporation. Cooling arrangement for heat generating electrical components, 4,709,752, Cl. 165-47.000.

Schuldt, Oswald: See—
Conrad, Ulrich; Kellermann, Guenter; Breymayer, Angela; Klinker, Rolf; Schuldt, Oswald; Hoffmann, Rainer; and Fabian, Frank-Dietrich, 4,709,548, Cl. 60-280.000.

Schultz, Ludwig, to Siemens Aktiengesellschaft. Method for the preparation of a metallic body from an amorphous alloy, 4,710,236, Cl. 148-11.50P.

Schulz, Donald N.: See—
Bock, Jan; Pace, Salvatore J.; and Schulz, Donald N., 4,709,759, Cl. 166-275.000.

Schulze, Werner; and Gerich, Josef, to Alfred Karcher GmbH & Co. High pressure washing apparatus, 4,709,859, Cl. 239-525.000.

Schumacher, Robert W.; and Houston, Mary B., to Warner-Lambert Company. Ingestible, high density, compressed-tablet fruit fiber composition, 4,710,390, Cl. 426-285.000.

Schutz, Hans U.: See—
Beffa, Fabio; and Schutz, Hans U., 4,710,198, Cl. 8-437.000.

Schutz, Heinz-Dieter: See—
Langen, Haas; Schutz, Heinz-Dieter; Himmelmann, Wolfgang; Wernicke, Ubbio; and Renner, Gunter, 4,710,454, Cl. 430-546.000.

Schwab, Egon; and Padar, Steve. Non-return valve for medical purposes in particular for balloon catheters, 4,710,168, Cl. 604-99.000.

Schwandt, Gregory J.: See—
Baity, Donald N.; Schwandt, Gregory J.; and Kidwell, Charles E., 4,710,602, Cl. 200-315.000.

Schwartz, Jack W.: See—
Kwiatek, Alfred; and Schwartz, Jack W., 4,710,191, Cl. 604-897.000.

Schweier, Guenther: See—
Bachl, Robert; Warzelhan, Volker; Schweier, Guenther; Gropper, Hans; and Ball, Wolfgang, 4,710,552, Cl. 526-116.000.

Sciaccaro, James R.; and Pardee, Douglas L., to Sanders Associates, Inc. Method and apparatus for displaying multiple images in overlapping windows, 4,710,767, Cl. 340-799.000.

Scoggin, Steven C.: See—
Quante, Jeffrey B., III; Scoggin, Steven C.; Maxwell, Dennis L.; Rosenkoetter, Marvin W.; and Ferencik, James J., 4,709,659, Cl. 109-21.500.

Scolten, Brian L.: See—
Knoblock, Glenn A.; and Scolten, Brian L., 4,709,894, Cl. 248-406.200.

Scortech Mech. Ltd.: See—
Newman, Geoffrey C. S.; Pilkington, Andrew L.; and Winch, Kenneth H., 4,710,129, Cl. 434-55.000.

Scott & Fetzer Company, The: See—
Bigley, James E., 4,709,443, Cl. 15-339.000.

Scott, Graham A.; and Messerli, Alan J., to General Electric Company. Electronic circuit breaker trip function adjusting circuit, 4,710,844, Cl. 361-96.000.

Scott, Paul H., to Advanced Micro Devices, Inc. Apparatus and associated methods for converting serial data pattern signals transmitted or suitable for transmission over a high speed synchronous serial transmission media, to parallel pattern output signals, 4,710,922, Cl. 370-112.000.

Scruggs, David M., to Dresser Industries, Inc. Process for preparation of liquid phase bonded amorphous materials, 4,710,235, Cl. 148-4.000.

Seaborn, Jonathan; and Egberg, David C., to General Mills, Inc. Edible coating composition and method of preparation, 4,710,228, Cl. 106-218.000.

Seah, Alexander M. Corrugated packing and methods of use, 4,710,326, Cl. 261-112.000.

Sears Manufacturing Co.: See—
Wahls, Robert; and Gryp, Dennis, 4,709,896, Cl. 248-550.000.

Seasholtz, Craig A.: See—
Berfield, Robert C.; Seasholtz, Craig A.; and Fegan, Richard M., 4,709,436, Cl. 15-79.00R.

Seco Tools AB: See—
Loqvist, Kaj-Ragnar, 4,710,069, Cl. 407-114.000.

Secoh Geiken Inc.: See—
Bahn, Itsuki; and Okada, Hideo, 4,710,683, Cl. 318-254.000.

Segebrecht, Udo; and Auschrat, Siegfried, to Sihl GmbH & Co. KG. Liquid-ring compressor unit, 4,710,105, Cl. 417-68.000.

Seidel, Wolfgang: See—
Gohler, Peter; Mangler, Rolf; Schingnitz, Manfred; Seidel, Wolfgang; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Gamburg, David, 4,710,202, Cl. 48-73.000.

Seigneurin, Michel: See—
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Seiko Epson Corporation: See—
Hayashi, Seiichi; Nakamura, Takashi; and Tanabe, Hisayuki, 4,710,782, Cl. 346-76.00R.

Seiko Epson Kabushiki Kaisha: See—
Hoshikawa, Jun, 4,709,991, Cl. 350-339.00R.

Seiko Instruments & Electronics Ltd.: See—
Taguchi, Masaaki; and Suenaga, Hitoshi, 4,710,585, Cl. 560-64.000.

Seikosha Co., Ltd.: See—
Sugita, Mitsuyuki; and Hoshino, Isamu, 4,710,731, Cl. 331-158.000.

Sekiguchi, Kyoji: See—
Masuda, Takashi; Nakamura, Yukitugu; and Sekiguchi, Kyoji, 4,710,003, Cl. 351-212.000.

Sekiguchi, Yukio; Funakubo, Hiroyasu; Sakanoue, Hitoyuki; and Komura, Osamu, to Life Technology Research Found.; and Hiroyasu Funakubo & Sumitomo Elec. Ind., Ltd. Pressure welding bonding apparatus, 4,709,844, Cl. 228-3.100.

Sekijima, Kenji: See—
Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,709,898, Cl. 248-562.000.

Sekine, Shinichi: See—
Shirato, Takehide; and Sekine, Shinichi, 4,710,791, Cl. 357-23.130.

Selame, Robert: See—
Lerner, Michael; Bernstein, Michael; and Selame, Robert, 4,709,429, Cl. 4-661.000.

Selby, John S., to Weyerhaeuser Company. Choker hook assembly, 4,709,952, Cl. 294-82.140.

Sellegaard, Eric L. Preparation and process for the preservation of plants, 4,710,394, Cl. 427-4.000.

Semenov, Vladimir: See—
Gohler, Peter; Mangler, Rolf; Schingnitz, Manfred; Seidel, Wolfgang; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Gamburg, David, 4,710,202, Cl. 48-73.000.

Semiconductor Energy Laboratory Co., Ltd.: See—
Yamazaki, Shunpei, 4,710,397, Cl. 427-53.100.

Sengewald, Karl-Heinz. Bag for infusion solutions and the like and method of manufacturing the same, 4,709,534, Cl. 53-452.000.

Senstar Security Systems Corporation: See—
Rich, Brian G.; Patchell, John W.; and Harman, R. Keith, 4,710,753, Cl. 340-561.000.

Sequoia-Turner Corporation: See—
von Behrens, Wieland E., 4,710,021, Cl. 356-72.000.

Sereg: See—
De Paape, Thijlbert; and Crochet, Gerard, 4,709,583, Cl. 73-861.170.

Serizawa, Hiroyuki: See—
Shibata, Jun; and Serizawa, Hiroyuki, 4,710,936, Cl. 372-45.000.

Setterberg, John R., Jr., to Otis Engineering Corporation. Well conduit joint sealing system. 4,709,761, Cl. 166-387.000.

Setzer, David T.: See—
Lindstrom, Donald E.; and Setzer, David T., 4,710,068, Cl. 406-88.000.

Seura, Yasuyuki, to Ikeda Bussan Co., Ltd. Vehicle rear seat. 4,709,964, Cl. 297-354.000.

Seydel, Scott O.; and Cutts, William H. Textile slasher lubricating method and apparatus. 4,710,396, Cl. 427-8.000.

Shaka, Athan J., to Varian Associates, Inc. Spatially selective nuclear magnetic resonance pulse sequences. 4,710,718, Cl. 324-309.000.

Shaktman, Donald H. Dual crowned hemorrhoid support seat cushion. 4,709,431, Cl. 5-481.000.

Sharkitt, Patrick T.: See—
Stouffer, Ronald D.; and Sharkitt, Patrick T., 4,709,622, Cl. 98-2.000.

Sharma, Shanmuk; Hill, Donnie K.; and Durr, Charles A., to M. W. Kellogg Company, The. Process for separation of hydrocarbon gases. 4,710,214, Cl. 62-28.000.

Sharp Kabushiki Kaisha: See—
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Takeda, Makoto; Noomura, Keisaku; and Yamamoto, Kunihiko, 4,710,768, Cl. 340-805.000.

Shaw, Franklin D.: See—
Cooley, Edward J.; and Shaw, Franklin D., 4,709,452, Cl. 19-159.00R.

Shaw, Wilfrid G.: See—
Dolhyj, Serge R.; Shaw, Wilfrid G.; and Pepera, Marc A., 4,710,484, Cl. 502-208.000.

Shea, Brian T.: See—
Hembree, Charles B.; and Shea, Brian T., 4,709,483, Cl. 33-18.100.

Shell Oil Company: See—
Job, Robert C., 4,710,482, Cl. 502-127.000.

Shepler, John E.; and Zur, Dov, to Sundstrand Corporation. Generating system with fault detection. 4,710,840, Cl. 361-20.000.

Sheppard, Howard H. Clamping apparatus for making an improved electrical connection. 4,710,080, Cl. 411-82.000.

Sherwin, Gary W., to Westinghouse Electric Corp. Electroencephalographic cap. 4,709,702, Cl. 128-644.000.

Shewey, Charles E.: See—
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Shiba, Haruo: See—
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Shibata, Jun; and Serizawa, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Optoelectronic semiconductor device. 4,710,936, Cl. 372-45.000.

Shibata, Nobuo: See—
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuo; and Dohi, Takashi, 4,710,688, Cl. 318-603.000.

Shichida, Akihito, to Hosiden Electronics Co. Ltd. Electrical jack assembly. 4,710,139, Cl. 439-668.000.

Shields, Charles E. Disappearing shelf assembly for use in an electrical connector applying machine. 4,709,473, Cl. 29-749.000.

Shields, William K. M.: See—
Kohn, Roger; and Shields, William K. M., 4,709,695, Cl. 128-132.00R.

Shigenaga, Yoshimi, to Casio Computer Co., Ltd. Identification system. 4,710,613, Cl. 235-380.000.

Shigesou, Hashida: See—
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Shimada, Hiroshi: See—
Kajioka, Yasuo; Komine, Tomio; Kadowaki, Hitoshi; Matsuda, Shigeyoshi; Yugami, Yoshinori; Kubota, Shinya; Takahashi, Yoshio; Shimada, Hiroshi; and Kurata, Nobutaka, 4,709,899, Cl. 249-20.000.

Shimada, Katsuyuki, to Kinki Insatsu Kabushiki Kaisha. Device for opening seal of cigaret package and pulling out cigarets from the package. 4,709,811, Cl. 206-254.000.

Shimada, Mitsuhiro; Matsumoto, Junichiro; Nonaka, Susumu; and Sayama, Haruo, to Sharp Kabushiki Kaisha. Heat-transfer thermal recording device. 4,710,041, Cl. 400-120.000.

Shimada, Satoshi: See—
Ohkoshi, Akio; Tsuruta, Koji; Nakagawa, Hideaki; and Shimada, Satoshi, 4,710,765, Cl. 340-781.000.

Shimadzu Corporation: See—
Fukuma, Toshiaki, 4,710,024, Cl. 356-328.000.

Shimaoka, Motohiro; and Saito, Yukio, to Alps Electric Co., Ltd. Disk loading mechanism for recording and reproducing apparatus. 4,710,829, Cl. 360-97.000.

Shimeno, Kazuhiro: See—
Shirasu, Hiroshi; Shimeno, Kazuhiro; and Iwamoto, Joji, 4,710,604, Cl. 219-121.0LU.

Shimizu Construction Co., Ltd.: See—
Kajioka, Yasuo; Komine, Tomio; Kadowaki, Hitoshi; Matsuda, Shigeyoshi; Yugami, Yoshinori; Kubota, Shinya; Takahashi,

Yoshio; Shimada, Hiroshi; and Kurata, Nobutaka, 4,709,899, Cl. 249-20.000.

Shimizu, Hiroshi: See—
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Sidaway, H. John; and Lytle, Donald A., to Hancor, Inc. Septic tank for alternative sewer systems. 4,709,723, Cl. 137-584.000.

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Auracher, Franz, 4,709,977, Cl. 350-96.140.

Brand, Wilhelm; Vanek, Vaclav; and Jakobec, Franz, 4,710,834, Cl. 360-105.000.

Buttner, Gerhard, 4,710,961, Cl. 381-68.700.

Dotzauer, Peter; and Schmidt, Martin, 4,709,559, Cl. 62-499.000.

Glomb, Kurt; Niggel, Heinz; Pelzl, Leo; and Zell, Karl, 4,710,132, Cl. 439-79.000.

Hohmann, Eugeo; Mund, Konrad; and Weidlich, Erhard, 4,710,233, Cl. 134-1.000.

Jahn, Herbert; and Waedt, Gunter, 4,710,850, Cl. 361-333.000.

Jahnke, Andreas, 4,710,722, Cl. 328-234.000.

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Klein, Sigismund, 4,710,947, Cl. 378-147.000.

Koller, Franz, 4,709,847, Cl. 228-49.100.

Lampl, Josef, 4,710,953, Cl. 379-391.000.

Meier, Konrad, 4,709,470, Cl. 29-605.000.

Oestreich, Ulrich; and Mayr, Ernst, 4,709,984, Cl. 350-96.230.

Schultz, Ludwig, 4,710,236, Cl. 148-11.50P.

Sigai, A. Gary, to GTE Laboratories Incorporated. Phosphor particle, fluorescent lamp, and manufacturing method. 4,710,674, Cl. 313-489.000.

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Sih, Charles J., 4,710,468, Cl. 435-135.000.

Sigman, Daniel M., Jr.: See—
Davey, Raymond G.; Dees, Martin, Jr.; and Sigman, Daniel M., Jr., 4,709,631, Cl. 101-129.000.

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Sihi GmbH & Co. KG: See—
Segebrecht, Udo; and Auschrat, Siegfried, 4,710,105, Cl. 417-68.000.

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Camillo, Bianchi, 4,709,511, Cl. 51-216.00R.

Siller, Curtis A., Jr.: See—
Debus, Walter, Jr.; Osborne, Thomas L.; and Siller, Curtis A., Jr., 4,710,891, Cl. 364-718.000.

Simcox, Allan W., to Environmental Resources, Inc. Solar heat exchange system. 4,709,689, Cl. 126-448.000.

Simons, Robert E.: See—
Chu, Richard C.; and Simons, Robert E., 4,709,754, Cl. 165-133.000.

Singh, Balwant: See—
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Singh, Bawa; and Denton, Peter R., to Denton Vacuum Inc. Cold cathode ion beam source. 4,710,283, Cl. 204-298.000.

Sinn, Robert S.: See—
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Sipes, Donald L., Jr., to California Institute of Technology. Method and apparatus for efficient operation of optically pumped laser. 4,710,940, Cl. 372-75.000.

Sipinen, Alan J.: See—
Wood, Leigh E.; Miller, John A.; and Sipinen, Alan J., 4,710,190, Cl. 604-389.000.

Sirota, Gabriel J., to Amco Industries, Inc. Roll handling apparatus. 4,709,953, Cl. 294-106.000.

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Ballestrazzi, Aris; and Tassi, Lamberto, 4,709,530, Cl. 53-209.000.

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Siwik, William S.: See—
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SKF GmbH: See—
Huttner, Klaus, 4,710,039, Cl. 384-574.000.

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Heller, Jorge; Skinner, Wilfred A.; Saito, Kenichiro; and Satoh, Susumu, 4,710,497, Cl. 514-221.000.

Skoog, Hans; Holmqvist, Ulf; and Tellden, Leif, to ASEA AB. Industrial robot having two gimbal-ring type arranged swinging axes. 4,710,092, Cl. 414-729.000.

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Malone, Gilbert R.; Skursha, Susan K.; and Jost, Robert M., 4,710,474, Cl. 436-60.000.

Slabbeekorn, Scott D.: See—
Anselmino, Jeffrey; and Slabbeekorn, Scott D., 4,709,488, Cl. 34-235.000.

Slade, James R., Jr.; and Sterba, Richard F. Barbell support apparatus for weight lifting exercising. 4,709,922, Cl. 272-123.000.

Slater, Daniel A.; Meredith, William A.; and Devaney, Mark J., to Eastman Kodak Company. Simplified test element advancing mechanism having positive engagement with element. 4,710,352, Cl. 422-63.000.

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Liang, Theming; and Slater, Eve E., 4,710,469, Cl. 435-194.000.

Sletten, William C., II, to Advance Machine Company. Portable extractor. 4,709,442, Cl. 15-320.000.

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Uecker, Ronald T.; and Slicker, Steven D., 4,709,963, Cl. 297-316.000.

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Dupont, Bo; Morishima, Yasuo; Collins, Nancy; Ogata, Shunichiro; and Lloyd, Kenneth O., 4,710,457, Cl. 435-7.000.

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Sluyterman, Albertus A. S., to U.S. Philips Corporation. Color television display tube with coma correction. 4,710,671, Cl. 313-413.000.

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Smart, Leonard G.; and Hui, Henry T., to CF Braun & Company. High temperature pipe and duct support. 4,709,886, Cl. 248-49.000.

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Smith, D. Frederick; and Goodsmith, James E., to T. M. Smith Tool International Corp. Quick change spindle adapter for tool holder. 4,710,079, Cl. 409-234.000.

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Smith, David W.: See—
Townsend, Ray T.; Smith, David W.; and Dykes, Robert M., 4,709,447, Cl. 17-1.00F.

Smith, Dennis W.: See—
Borrelli, Nicholas F.; Hares, George B.; Smith, Dennis W.; and Wedding, Brent M., 4,710,430, Cl. 428-432.000.

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Geczy, Bela, 4,710,036, Cl. 384-275.000.

Springer, Johann B., 4,710,074, Cl. 408-200.000.

Smith, Kirby A.: See—
Kuppenheimer, John D., Jr.; and Smith, Kirby A., 4,710,630, Cl. 250-353.000.

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Bateman, John R.; Goodacre, Brita C.; and Smithson, Alan, 4,710,231, Cl. 127-30.000.

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Gazzi, Luigi; and Rescalli, Carlo, 4,710,210, Cl. 62-17.000.

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Sobocienski, James Robert: See—
Lipinski, Henry, 4,709,782, Cl. 182-3.000.

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Sauvee, Jean P.; Riquart, Christian; and Levrai, Roland, 4,709,550, Cl. 60-562.000.

S.A. Innovi N.V.: See—
Geuens, Luc, 4,710,301, Cl. 210-605.000.

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Robin, Jacques; Pruneau, Didier; and Bonenfant, Alain, 4,710,505, Cl. 514-278.000.

Societe Europeenne de Propulsion: See—
Broquere, Bernard; and Etienne, Jacques, 4,709,457, Cl. 29-156.80R.

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Dubois, Marcel; and Fagard, Pierre, 4,710,766, Cl. 340-784.000.

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Lebas, Jean-Marie; Rat, Pierre; Dupont, Jean-Marcel; and Vinuesa, Germain, 4,710,329, Cl. 264-3.100.

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Darrieux, Jean-Louis, 4,710,412, Cl. 428-36.000.

Socolowski, Norbert J., to Fry Metals, Inc. Solder preform and methods employing the same. 4,709,849, Cl. 228-246.000.

Soeda, Kazuhiko; Mori, Masakazu; Nishikawa, Tsutomu; and Tomimori, Kiyoshi, to Fujitsu Limited. Method and apparatus for measuring chromatic dispersion coefficient. 4,710,022, Cl. 356-73.100.

Soeder, Edmund J.: See—
Ward, Thomas H.; Costanzo, Phillip A.; Pietrasz, Vincent; and Soeder, Edmund J., 4,710,344, Cl. 419-8.000.

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McCutcheon, Samuel; Lum, Jeffrey; Solek, Roman; Harrell, Troy; and Leman, Robert, 4,710,893, Cl. 364-900.000.

Somich Technology Inc.: See—
Soszek, Peter, 4,710,253, Cl. 156-272.800.

Songer, Jimmie D., to High Resolution Television, Inc. High resolution color television. 4,710,799, Cl. 358-12.000.

Sonobe, Akihiko: See—
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Kondo, Tetsujiro, 4,710,811, Cl. 358-135.000.

Ohkoshi, Akio; Tsuruta, Koji; Nakagawa, Hideaki; and Shimada, Satoshi, 4,710,765, Cl. 340-781.000.

Sato, Noboru; Habu, Kazutaka; and Abe, Sanae, 4,710,434, Cl. 428-678.000.

Yamamoto, Tadashi, 4,710,950, Cl. 379-70.000.

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Soukup, Thomas G.; and Oliver, John P., to Celotex Corporation, The. Catalyst mixtures for polyisocyanurate foam. 4,710,521, Cl. 521-118.000.

Soupal, Thomas R., to Midland Brake, Inc. Isolation valve construction. 4,710,108, Cl. 417-298.000.

South, Alan C., to R. W. Simon Limited. Bottle carrier. 4,709,809, Cl. 206-162.000.

Southern Pacific Land Co.: See—
Wong, Morton M.; and Shugerman, Arnold L., 4,710,367, Cl. 423-335.000.

Southwest Research Institute: See—
Mallow, William A., 4,710,226, Cl. 106-119.000.
Spadel S.A.: See—
Lahaye, Marcel, 4,710,409, Cl. 427-421.000.
Spak, Michael E.: See—
Zolnowsky, John; Crudele, Lester M.; and Spak, Michael E., 4,710,866, Cl. 364-200.000.
Spector, George: See—
Lemons, David H.; and Spector, George, 4,709,691, Cl. 128-66.000.
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Howard, P. Guy, 4,710,942, Cl. 372-87.000.
Spectrolab, Inc.: See—
Garlick, George F. J., 4,710,254, Cl. 156-278.000.
Speil, Walter: See—
Klug, Horst; Mockler, Wolfgang; Schaeffler, George; and Speil, Walter, 4,709,668, Cl. 123-90.550.
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Jenkins, Stuart M.; Spencer, Michael S.; and Mayfield, Ross, 4,709,820, Cl. 209-534.000.
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Freberg, Dana D.; and Spencer, William R., 4,710,095, Cl. 415-48.000.
Speroni, Richard J.: Indexing mechanism for computer controlled milling machines. 4,709,464, Cl. 29-568.000.
Spinosa, Dominic J.; and Knoll, Frank, to East/West Industries, Inc. Apparatus and method for compression packaging a compressible article into a container and a container therefor. 4,709,818, Cl. 206-524.800.
Spitznas, Manfred; Reiner, Josef; Veit, Wolfgang; and Kirchhubele, Rainer, to Oculus Optikgerate GmbH. Surgical stereomicroscope. 4,710,000, Cl. 350-516.000.
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Springer, Johann B., to Smith International, Inc. Casing mill. 4,710,074, Cl. 408-200.000.
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Libert, James T.; and Curran, Earl J., Jr., 4,710,692, Cl. 318-729.000.
Stabilus GmbH: See—
Freitag, Herbert; Fuhrmann, Castor; and Hosan, Hans-Josef, 4,709,790, Cl. 188-300.000.
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Stafford, Lannon F. Controlled air-flow aircraft capable of vertical flight. 4,709,879, Cl. 244-12.100.
Stahl, Torvald, to ITT Industries, Inc. Connection socket for a submersible electric motor. 4,710,658, Cl. 310-71.000.
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Stahly, G. Patrick; and Stahly, Barbara C., 4,710,581, Cl. 560-20.000.
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Cesa, Mark C.; and Burrington, James D., 4,710,574, Cl. 548-533.000.
Dolhyj, Serge R.; Shaw, Wilfrid G.; and Pepera, Marc A., 4,710,484, Cl. 502-208.000.
Standex International Corporation: See—
Black, John W., 4,709,444, Cl. 16-31.00A.
Stanley, Roderic K.: See—
Bradfield, James E.; Kahil, John E.; Jaynes, Mark S.; Moake, Gordon L.; Milewits, Marvin; Bolton, Curtis W., III; Lam, Clive C.; and Stanley, Roderic K., 4,710,712, Cl. 324-227.000.
Stanley, Thomas R.; and Zelezniak, Mark R., to Teepak, Inc. Apparatus and methods of stuffing food casings to provide dimensionally uniform products. 4,709,450, Cl. 17-49.000.
Staszko, Wladyslaw, to ACME P.W. Lenzen GbmH & Co. KG. Locking sleeve magazine feed attachment for a device for sealing steel wrapping bands. 4,709,627, Cl. 100-30.000.
Statomat-Globe, Inc.: See—
Beakes, John M.; and Finegold, Hyman B., 4,710,085, Cl. 414-27.000.
Stauffer, Richard D., to Amoco Corporation. Process for preparing overbased sulfurized phenates. 4,710,308, Cl. 252-42.700.
Steelcase Inc.: See—
Knoblock, Glenn A.; and Scolten, Brian L., 4,709,894, Cl. 248-406.200.

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Kadunce, Leo, 4,710,252, Cl. 156-195.000.
Steer, Peter L., to Craig Medical Products Ltd. Ostomy appliance. 4,710,183, Cl. 604-344.000.
Stefko, Bela: See—
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Stemler, J. Robert; Klingensmith, James D.; Menzemer, Craig C.; Kulicki, John M.; and Theofanis, Nicholas D., to Aluminum Company of America. Bridge deck system. 4,709,435, Cl. 14-73.000.
Stemmler, Kurt, to Winkler & Dunnebler Maschinenfabrik und Eisen-giesserei GmbH & Co. KG. Plant for producing stacks of intermeshed blanks of paper, cellulose or the like, folded in a zig-zag manner. 4,709,606, Cl. 83-94.000.
Stephen, John F.: See—
Nelson, Richard V.; and Stephen, John F., 4,710,527, Cl. 524-98.000.
Stephens, Robert K., to Polaroid Corporation, Patent Dept. Solar radiation-control articles with protective overlayer. 4,710,426, Cl. 428-336.000.
Stephenson, Kenneth E., to Sangamo Weston, Inc. Solid dynode structure for photomultiplier. 4,710,675, Cl. 313-532.000.
Stephenson, Stanley W., to Eastman Kodak Company. Thermal printer color dye frame identification using red and yellow light sources. 4,710,781, Cl. 346-76.0PH.
Sterba, Richard F.: See—
Slade, James R., Jr.; and Sterba, Richard F., 4,709,922, Cl. 272-123.000.
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Sterns, William G., to ITT Gilfillan, a division of ITT Corporation. Microwave polarization control network. 4,710,734, Cl. 333-101.000.
Stevens, Leonard W.; Siwik, William S.; Moore, William A.; Brown, Wayne M.; and Barnard, Andrew A., to United Technologies Corporation. Bearing compartment protection system. 4,709,545, Cl. 60-39.080.
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Stinnett, Carlton E.: See—
Flora, John H.; Womack, Robert E.; Stinnett, Carlton E.; and Dalton, Claude W., 4,710,710, Cl. 324-220.000.
Stoll, Kurt. Prismatic connection member for the supply of valves or the like. 4,709,945, Cl. 285-4.000.
Stoll, Mark S., to Liberty Diversified Industries. Produce transport and cooling container and method for using same. 4,709,852, Cl. 229-119.000.
Stouffer, Ronald D.; and Sharkitt, Patrick T., to Bowles Fluidics Corporation. Fluidic oscillator. 4,709,622, Cl. 98-2.000.
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Stress Steel Co., Inc.: See—
Iyer, Srinivasa L., 4,709,456, Cl. 29-155.00R.
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Clark, Stephen C., 4,709,605, Cl. 83-23.000.
Strul, Bruno: See—
Alvarez, Robert; Lehmann, Leonard; and Strul, Bruno, 4,710,624, Cl. 250-228.000.
Strupczewski, Joseph T., to Hoechst Roussel Pharmaceuticals, Inc. 3-(piperidinyl)- and 3-(pyrrolidinyl)-1H-indazoles. 4,710,573, Cl. 346-199.000.
Stubenfol, Leonard J.: See—
Rasmussen, Russell G.; Stubenfol, Leonard J.; and Disko, Harry, 4,710,146, Cl. 446-308.000.
Studer, Philip A. Spring neutralized magnetic vibration isolator. 4,710,656, Cl. 310-51.000.
Subramanian, Mahadevan: See—
Blackwell, Catherine A.; Lakshmanan, Raman; and Subramanian, Mahadevan, 4,710,870, Cl. 364-200.000.
Suenaga, Hitoshi: See—
Taguchi, Masaaki; and Suenaga, Hitoshi, 4,710,585, Cl. 560-64.000.
Suetterlin, Norbert: See—
Kraemer, Dieter; Siol, Werner; Markert, Gerhard; Suetterlin, Norbert; and Feil, Cornelia, 4,710,525, Cl. 523-201.000.

Sugawara, Katuo: See—
Yamada, Minoru; Wajima, Motoyo; Masaki, Akira; Takahashi, Akio; Nakanishi, Keichirou; and Sugawara, Katuo, 4,710,854, Cl. 361-414.000.
Sugita, Mitsuyuki; and Hoshino, Isamu, to Seikosha Co., Ltd. Planar type thickness shear mode quartz oscillator. 4,710,731, Cl. 331-158.000.
Sugiura, Noboru: See—
Mouri, Yasunori; and Sugiura, Noboru, 4,710,881, Cl. 364-431.080.
Sugiyama, Toshinori: See—
Matsushima, Seiichi; Higashihara, Toshio; Shimizu, Mitsuru; Yoshizawa, Ken; Suzuki, Masahiro; and Sugiyama, Toshinori, 4,710,913, Cl. 369-280.000.
Sugizono, Shuichi: See—
Kawai, Katsunori; Kobayashi, Hisao; Deguchi, Hiroyuki; and Sugizono, Shuichi, 4,709,555, Cl. 62-228.300.
Sukeda, Toshiaki: See—
Maegawa, Harumi; Takai, Sakan; Sukeda, Toshiaki; Irie, Shoji; and Kobata, Shoichi, 4,710,895, Cl. 365-2.000.
Sulzer-Escher Wyss AG: See—
Guttinger, Heinz, 4,709,571, Cl. 72-366.000.
Sulzer, Jean F., to Enertec. Tracking alignment for a rotating magnetic transducer head. 4,710,828, Cl. 360-75.000.
Sumi, Masahiko, to Kabushiki Kaisha Toshiba. Apparatus for performing desired logical function. 4,710,898, Cl. 365-189.000.
Sumigawa, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor provided with a four-stroke engine. 4,709,671, Cl. 123-196.00S.
Sumino, Tomoko: See—
Wakamiya, Yoshinori; and Sumino, Tomoko, 4,709,570, Cl. 72-365.000.
Sumitomo Chemical Company, Limited: See—
Hattori, Makoto; Nishikuri, Masao; and Ueda, Yasuyoshi, 4,710,320, Cl. 260-378.000.
Imai, Akio; Okamoto, Yasushi; and Saito, Masatoshi, 4,710,554, Cl. 526-180.000.
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,710,514, Cl. 514-485.000.
Sumitomo Metal Industries, Ltd.: See—
Kasai, Tatsushi; Niikura, Tatsuo; Sato, Masanori; Hashimoto, Takao; and Yamashita, Akiya, 4,710,215, Cl. 62-532.000.
Yamada, Tsuneo; Sakashita, Tsutomu; Tomono, Hiroshi; Kimura, Takashi; Machara, Yasuhiro; and Yasumoto, Kunio, 4,709,572, Cl. 72-366.000.
Yonezawa, Toshio; Sasaguri, Nobuya; Onimura, Kichiro; Susukida, Hiroshi; Kawaguchi, Katsuji; Nagano, Hiroo; Minami, Takao; Yamanaka, Kazuo; Okada, Yasutaka; and Inoue, Mamoru, 4,710,237, Cl. 148-13.000.
Sumitomo Metal & Mining Co., Ltd.: See—
Yamazaki, Shinsuke; Takeda, Rikio; and Uda, Iwao, 4,710,349, Cl. 420-495.000.
Sumsy Filial Kharkovskogo Politeknicheskogo Instituta: See—
Kholin, Boris G., 4,709,685, Cl. 124-7.000.
Sun, Lee C.: See—
Gil, Kim Y.; and Sun, Lee C., 4,710,347, Cl. 420-94.000.
Sunden, Agneta: See—
Sunden, Olof; and Sunden, Agneta, 4,710,270, Cl. 162-175.000.
Sunden, Olof; and Sunden, Agneta. Paper making process utilizing fillers with hardened envelopes of cationic starch. 4,710,270, Cl. 162-175.000.
Sundstrand Corporation: See—
Ewbank, Michael E.; and Johnson, Henry F., 4,709,665, Cl. 122-510.000.
Shepler, John E.; and Zur, Dov, 4,710,840, Cl. 361-20.000.
Superba S.A.: See—
Strentz, Daniel, 4,710,701, Cl. 324-61.00P.
Surgical Engineering Associates, Inc.: See—
Moden, James R.; Caldwell, Michael D.; and Moden, Robert D., 4,710,174, Cl. 604-175.000.
Susukida, Hiroshi: See—
Yonezawa, Toshio; Sasaguri, Nobuya; Onimura, Kichiro; Susukida, Hiroshi; Kawaguchi, Katsuji; Nagano, Hiroo; Minami, Takao; Yamanaka, Kazuo; Okada, Yasutaka; and Inoue, Mamoru, 4,710,237, Cl. 148-13.000.
Suter, Hans R., to Roag (AG). Method of dyeing an optical article. 4,710,199, Cl. 8-507.000.
Sutphin, Richard C.; Bell, Steven R.; and Monsell, Kurt, to Acme Electric Corporation. Microprocessor controlled battery charger. 4,710,694, Cl. 320-21.000.
Suzuki, Atsushi, to Fujitsu Limited. Constant pulse width generator including transition detectors. 4,710,904, Cl. 365-226.000.
Suzuki, Hideo; Okamoto, Kunihide; Hayashi, Yasuyuki; and Aiba, Mitsuru, to Kabushiki Kaisha Showa Seisakusho. Vehicle leveling system. 4,709,934, Cl. 280-6.00R.
Suzuki, Hideo, to Fujitsu Limited. Josephson-junction logic device. 4,710,651, Cl. 307-462.000.
Suzuki, Kenji; Terashita, Takaaki; and Murayama, Jin, to Fuji Photo Film Co., Ltd. Color filter and color image sensor using the same. 4,710,803, Cl. 358-41.000.
Suzuki, Kimio: See—
Hakata, Yoshitami; Wakuda, Masanori; and Suzuki, Kimio, 4,710,770, Cl. 340-870.180.
Suzuki, Masahiko: See—
Iwata, Hiroshi; Kuroyanagi, Masatoshi; Suzuki, Masahiko; Moriguchi, Koichi; Horiuchi, Yasuhiro; and Nakamura, Kanehito, 4,710,106, Cl. 417-213.000.

Suzuki, Masahiro: See—
Matsushima, Seiichi; Higashihara, Toshio; Shimizu, Mitsuru; Yoshizawa, Ken; Suzuki, Masahiro; and Sugiyama, Toshinori, 4,710,913, Cl. 369-280.000.
Suzuki, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Gate turn-off thyristor. 4,710,792, Cl. 357-38.000.
Suzuki, Mitsutoshi; Morita, Yoshitaka; Okada, Masami; and Shimohara, Jun, to Kabushiki Kaisha Tsuchiya Seisakusho. Fluid filter with pleated filter medium. 4,710,297, Cl. 210-493.200.
Suzuki, Shigeru, to Akashi Seisakusho Ltd. Specimen moving device for electron microscope. 4,710,633, Cl. 250-442.100.
Suzuki, Shintaro: See—
Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Taka'aki; Sato, Fumihiro; and Nakamura, Teruya, 4,710,517, Cl. 514-616.000.
Suzuki, Takeo, to Alps Electric Co., Ltd. Varactor diode tuner with band switched coils and lines. 4,710,973, Cl. 455-180.000.
Suzuki, Takeshi, to Nippon Electric Co., Ltd. Mounting structure for electronic apparatus or the like. 4,710,136, Cl. 439-374.000.
Suzuki, Tetsushi: See—
Ichikawa, Noriyuki; Suzuki, Tetsushi; and Atsumi, Tomiaki, 4,710,152, Cl. 474-166.000.
Suzuki, Yasunaga; Matsubara, Toshiaki; and Uragami, Akira, to Hitachi, Ltd. Semiconductor integrated circuit device. 4,710,842, Cl. 361-88.000.
Swapp, Mavin C.; and Frisbie, Milo W., to Motorola, Inc. Input buffer and article injector mechanism for an automated article handler. 4,709,801, Cl. 198-464.200.
Swartz, Mark E.: See—
Mussler, James M.; and Swartz, Mark E., 4,710,758, Cl. 340-712.000.
Swensrud, Roger L.: See—
Soroka, Daniel P.; Swensrud, Roger L.; and Zelezniak, Joseph J., 4,710,606, Cl. 219-121.0LU.
Swiderski, Kevin J., to B & G Machinery Company. Preform transfer mechanism. 4,709,803, Cl. 198-468.200.
Switlicki, Michael. Process for heating hair curlers by microwave energy. 4,710,609, Cl. 219-222.000.
Sryyamin, Jury N.: See—
Kostylev, Alexandr D.; Boginsky, Vladimir P.; Smolyanitsky, Boris N.; Sryyamin, Jury N.; Danilov, Boris B.; Kogan, David I.; and Saveliev, Vyacheslav N., 4,709,768, Cl. 175-296.000.
Szilbereky, Jenő: See—
Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefko, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jenő; Csizer, Eva; Vezér, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.00R.
Szkaradek, Edward J.; and Corrigan, John J., to Morehouse Industries, Inc. Media mill screen assembly. 4,709,863, Cl. 241-69.000.
Szotyori, Laszlo: See—
Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefko, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jenő; Csizer, Eva; Vezér, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.00R.
Szurkowski, Edward S.: See—
Kapur, Rajan N.; and Szurkowski, Edward S., 4,710,761, Cl. 340-721.000.
T. J. Cope, Inc.: See—
Cubit, Harry T.; and Johnson, George C., 4,709,888, Cl. 248-73.000.
T. M. Smith Tool International Corp.: See—
Smith, D. Frederick; and Goodsmith, James E., 4,710,079, Cl. 409-234.000.
Ta Triumph-Adler Aktiengesellschaft: See—
Ackermann, Rolf, 4,710,044, Cl. 400-208.000.
Moritz, Manfred; and Rettke, Wilfried, 4,710,042, Cl. 400-141.000.
Tabata, Hiroshi: See—
Kai, Yasuaki; Sagawa, Takatoshi; and Tabata, Hiroshi, 4,709,988, Cl. 350-276.00R.
Tabata, Nobuchika; and Fukumitsu, Shohji, to Chisso Corporation. Flame retardant polyolefin resin composition. 4,710,317, Cl. 252-609.000.
Tabur Caoutchouc: See—
Loheac, Charles, 4,710,597, Cl. 200-5.00A.
Tagashira, Yasuo: See—
Akiyama, Masashi; and Tagashira, Yasuo, 4,709,845, Cl. 228-17.000.
Taguchi, Masaaki; and Suenaga, Hitoshi, to Seiko Instruments & Electronics Ltd.; and Teikoku Chemical Industry Co., Ltd. Liquid crystal compound. 4,710,585, Cl. 560-64.000.
Tahbaz, John A. Process for cleaning metal articles. 4,710,232, Cl. 134-1.000.
Taicher, Zvi: See—
Strikman, Shmuel, 4,710,713, Cl. 324-303.000.
Taivalkoski, Amy L.: See—
Maddox, James F.; Kadonoff, Mark B.; Berger, Alan D.; Taivalkoski, Amy L.; George, Robert W., II; and Benayad-Cherif, Faycal E., 4,710,020, Cl. 356-1.000.
Takabayashi, Kuniaki; Takaoka, Yoshitsugu; Hori, Kouichi; Shimotakahara, Masaki; Okada, Kikujiro; and Shiino, Satoru, to Green Cross Corporation, The. Continuous type centrifugal separator. 4,710,161, Cl. 494-84.000.
Takagi, Motoyuki: See—
Tokumoto, Minoru; Takagi, Motoyuki; Shitaoka, Shizuo; Gold, Samuel; and Iovine, Carmine P., 4,710,526, Cl. 524-5.000.
Takagi, Yoshiyuki; and Kaneaki, Tetsuhiko, to Matsushita Electric Industrial Co., Ltd. Electronic musical instrument for generating a natural musical tone. 4,709,611, Cl. 84-1.220.

Takahashi, Akio: See—
Yamada, Minoru; Wajima, Motoyo; Masaki, Akira; Takahashi, Akio; Nakanishi, Keiichiro; and Sugawara, Katuo, 4,710,854, Cl. 361-414.000.

Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. Fungicidal carbamates and thiolcarbamates. 4,710,514, Cl. 514-485.000.

Takahashi, Kenji; Umemoto, Chiuyuki; and Kato, Hisatoyo, to Fuji Photo Film Co., Ltd. Radiation image recording and read-out method and apparatus. 4,710,626, Cl. 250-327.200.

Takahashi, Koji: See—
Aotsuka, Yasuo; Konishi, Masahiro; and Takahashi, Koji, 4,710,631, Cl. 250-354.100.

Takahashi, Susumu: See—
Usagawa, Toshiyuki; Ono, Yuichi; and Takahashi, Susumu, 4,710,787, Cl. 357-16.000.

Takahashi, Yoshio: See—
Kajioaka, Yasuo; Komine, Tomio; Kadowaki, Hitoshi; Matsuda, Shigeyoshi; Yugami, Yoshinori; Kubota, Shinya; Takahashi, Yoshio; Shimada, Hiroshi; and Kurata, Nobutaka, 4,709,899, Cl. 249-20.000.

Takai, Sakan: See—
Maegawa, Harumi; Takai, Sakan; Sukeda, Toshiaki; Irie, Shoji; and Kobata, Shoichi, 4,710,895, Cl. 365-2.000.

Takaishi, Naotake: See—
Nakamura, Koichi; Hattori, Michihiro; Tamura, Tadashi; Tejima, Toru; Takaishi, Naotake; Imokawa, Genji; and Hotta, Hajime, 4,710,373, Cl. 424-59.000.

Takano, Katsuhiko; Yoshihara, Satoshi; Iijima, Shigeharu; Sasamori, Eizo; Matsushima, Masaaki; and Kishi, Hiroyoshi, to Canon Kabushiki Kaisha. Optical recording medium. 4,710,418, Cl. 428-192.000.

Takano, Masami; and Tamura, Yukio, to Sawafuji Electric Co., Inc. Resin molded rotor for a magneto generator. 4,710,659, Cl. 310-153.000.

Takaoka, Yoshitsugu: See—
Takabayashi, Kuniaki; Takaoka, Yoshitsugu; Hori, Kouichi; Shimotakahara, Masaki; Okada, Kikujiro; and Shiino, Satoru, 4,710,161, Cl. 494-84.000.

Takara Co., Ltd.: See—
Nagaoka, Junichi, 4,710,148, Cl. 446-464.000.

Wakase, Hiroshi, 4,710,147, Cl. 446-464.000.

Takasuka, Yutaka; Mohri, Kunihiro; and Kawaguchi, Akiko, to Pola Chemical Industries Inc. Stick cosmetics containing coated pearlescent pigments. 4,710,375, Cl. 424-69.000.

Takeda Chemical Industries, Ltd.: See—
Nojima, Shoshichi; Nomura, Hiroaki; and Okutani, Tetsuya, 4,710,579, Cl. 558-169.000.

Takeda, Fuchio; Matsushiro, Hiroyuki; Kobayashi, Kazuo; and Kaneko, Toshio, to Ricoh Company, Ltd. Developing apparatus. 4,710,015, Cl. 355-3.0DD.

Takeda, Makoto; Nonomura, Keisaku; and Yamamoto, Kunihiro, to Sharp Kabushiki Kaisha. Liquid crystal display with switching transistor for each pixel. 4,710,768, Cl. 340-805.000.

Takeda, Rikio: See—
Yamazaki, Shinsuke; Takeda, Rikio; and Uda, Iwao, 4,710,349, Cl. 420-495.000.

Takehara, Shin, to Nissan Motor Co., Ltd. Vibration damping system for power unit. 4,709,779, Cl. 180-300.000.

Takeshita, Tetsuro: See—
Harase, Jiro; Ohta, Kuniteru; Takeshita, Tetsuro; and Endo, Michio, 4,709,742, Cl. 164-76.100.

Takeuchi, Koichi; Yamanaka, Megumi; Kubo, Masayoshi; Katayama, Hideaki; and Tokunaga, Kenji, to Mitsubishi Jukogyo Kabushiki Kaisha; and Bando Chemical Industries, Inc. Apparatus for molding a belt for transmitting power. 4,710,255, Cl. 156-361.000.

Takeuchi, Kunio, to Tokai TRW & Co., Ltd. Steering mechanism for automobile. 4,709,593, Cl. 74-498.000.

Takeuchi, Toshio, to Toyo Menka Kaisha, Ltd. Flexible optical fibers for use in viewing devices. 4,709,985, Cl. 350-96.250.

Takigawa, Masuhiko: See—
Takigawa, Shigetsugu; and Takigawa, Masuhiko, 4,709,480, Cl. 30-254.000.

Takigawa, Shigetsugu; and Takigawa, Masuhiko, to ARS Edge Co. Ltd. Scissors. 4,709,480, Cl. 30-254.000.

Takizawa, Shozo; Kobayashi, Kazuyoshi; Fukuyama, Kazuo; Tani, Masanori; Yamamoto, Shoji; Yuasa, Hiroo; Nishimori, Masayoshi; Yoshida, Hiroaki; Eto, Shinichi; Hirao, Eiji; and Goto, Masaki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Rear wheel steering system. 4,709,935, Cl. 280-91.000.

Tamai, Yasuo: See—
Ono, Toshio; Tamai, Yasuo; Mizuno, Chiaki; Ogawa, Hiroshi; and Saito, Shinji, 4,710,421, Cl. 428-213.000.

Tamamizu, Teruyasu; Sato, Kichihei; Tanaka, Takashi; and Sato, Shunkichi, to Toshiba Ceramics Co., Ltd. Sintered silicon carbide porous body impregnated with metallic silicon. 4,710,428, Cl. 428-408.000.

Tamata, Shin: See—
Horiuchi, Susumu; and Tamata, Shin, 4,710,318, Cl. 252-628.000.

Tamburello, Mario: See—
Spodati, Fabrizio; and Tamburello, Mario, 4,709,979, Cl. 350-96.200.

Tamura, Hifumi: See—
Ishitani, Tohru; Todokoro, Hideo; Kawanami, Yoshimi; and Tamura, Hifumi, 4,710,632, Cl. 250-396.00R.

Tamura, Tadashi: See—
Nakamura, Koichi; Hattori, Michihiro; Tamura, Tadashi; Tejima, Toru; Takaishi, Naotake; Imokawa, Genji; and Hotta, Hajime, 4,710,373, Cl. 424-59.000.

Tamura, Tatsuo: See—
Saito, Junichi; Tamura, Tatsuo; Kurahashi, Yoshio; Uzawa, Shigeru; Matsumoto, Noboru; and Yamaguchi, Naoko, 4,710,509, Cl. 514-384.000.

Tamura, Yukio: See—
Takano, Masami; and Tamura, Yukio, 4,710,659, Cl. 310-153.000.

Tamworth, Inc.: See—
Littleton, Jody; and Davis, Gary W., 4,709,719, Cl. 137-268.000.

Tanabe, Hisayuki: See—
Hayashi, Seiichi; Nakamura, Takashi; and Tanabe, Hisayuki, 4,710,782, Cl. 346-76.00R.

Tanaka, Katsuhiko; and Fukumoto, Hiroshi, to Canon Kabushiki Kaisha. Toner, charge-imparting material and composition containing triazine type compound. 4,710,443, Cl. 430-106.600.

Tanaka, Kazuo, to Canon Kabushiki Kaisha. Camera system with lens coupling member. 4,710,007, Cl. 354-286.000.

Tanaka Machine Industries Co., Ltd.: See—
Ichihara, Eiichi; and Iwai, Itsuo, 4,709,667, Cl. 123-90.340.

Tanaka, Ryuichi; and Ishii, Akira, to Nippon Air Brake Co., Ltd. Fluid pressure control apparatus for reducing swing or fall of vehicle body due to braking during backwards running of vehicle. 4,709,968, Cl. 303-6.00C.

Tanaka, Satoshi; and Imaizumi, Haruo, to Junkosha Co., Ltd. Corrosive liquid leak detecting sensor. 4,710,353, Cl. 422-68.000.

Tanaka, Seietsu, to Oki Electric Industry Co., Ltd. Erasable and programmable read only memory devices. 4,710,797, Cl. 357-74.000.

Tanaka, Shinsaku; and Kido, Kunio, to Tanashin Denki Co., Ltd. Reel receiving device. 4,709,871, Cl. 242-68.300.

Tanaka, Takashi: See—
Tamamizu, Teruyasu; Sato, Kichihei; Tanaka, Takashi; and Sato, Shunkichi, 4,710,428, Cl. 428-408.000.

Tanashin Denki Co., Ltd.: See—
Tanaka, Shinsaku; and Kido, Kunio, 4,709,871, Cl. 242-68.300.

Tani, Masanori: See—
Takizawa, Shozo; Kobayashi, Kazuyoshi; Fukuyama, Kazuo; Tani, Masanori; Yamamoto, Shoji; Yuasa, Hiroo; Nishimori, Masayoshi; Yoshida, Hiroaki; Eto, Shinichi; Hirao, Eiji; and Goto, Masaki, 4,709,935, Cl. 280-91.000.

Taniguchi, Tomizo: See—
Matsumoto, Fujio; Doi, Hajime; Mizushima, Kunio; Funahashi, Masaya; Taniguchi, Tomizo; and Sakamoto, Shoichi, 4,709,816, Cl. 206-444.000.

Tanner, Jay: See—
Birnback, Curtis; and Tanner, Jay, 4,710,939, Cl. 372-73.000.

Tarascon, Jean-Marie, to Bell Communications Research, Inc. Secondary lithium battery including a lithium molybdate cathode. 4,710,439, Cl. 429-194.000.

Taravella, Jody J.: See—
Astley, Vivian C.; and Taravella, Jody J., 4,710,366, Cl. 423-321.00R.

Tardy, John, to American Telephone and Telegraph Company AT&T Technologies, Inc. Off-line series type regulating power supply. 4,710,697, Cl. 323-239.000.

Tashiro, Yutaka; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Steering assembly for motor vehicle. 4,709,936, Cl. 280-91.000.

Tassi, Lamberto: See—
Ballestrazzi, Aris; and Tassi, Lamberto, 4,709,530, Cl. 53-209.000.

Ballestrazzi, Aris; and Tassi, Lamberto, 4,709,537, Cl. 53-550.000.

Tate & Lyle Public Limited Company: See—
Bateman, John R.; Goodacre, Brita C.; and Smithson, Alan, 4,710,231, Cl. 127-30.000.

Tatsuta, Kuniaki: See—
Otake, Noboru; Tatsuta, Kuniaki; Mizobuchi, Shigeyuki; Kome-shima, Nobuyasu; Nakajima, Shohachi; Kawai, Hiroyuki; and Odagawa, Atsuo, 4,710,564, Cl. 536-6.400.

Taub, Alan I.: See—
Huang, Shyh-Chin; Chang, Keh-Minn; and Taub, Alan I., 4,710,247, Cl. 148-429.000.

Taube, Thomas: See—
Wilhelmi, Herbert; Kegel, Kurt; Zollner, Dieter; Lauterbach-Dammler, Inge; Taube, Thomas; and Rittman, Friedrich, 4,710,607, Cl. 219-121.00P.

Tauc, Jan; Maris, Humphrey J.; and Thomsen, Christian, to Bw Brown University Research Foundation. Optical generator and detector of stress pulses. 4,710,030, Cl. 356-432.000.

Taylor, Hugh F.; and Theobald, David R., to Utec B.V. Air weapon with gas-tight expansion chamber. 4,709,686, Cl. 124-67.000.

Taylor, Lawrence D., to Brandt, Inc. Electronic controller for dispensers and the like. 4,709,914, Cl. 271-263.000.

Taylor, Monroe F., to W. R. Grace & Co., Cryovac Div. Vertical form-fill seal process and machine with product catching device. 4,709,532, Cl. 53-451.000.

Tazaki, Satoru, to Clarion Co., Ltd. Circuit for controlling separation and high-cut operation of a stereo demodulator in an FM radio receiver. 4,710,958, Cl. 381-10.000.

TDK Corporation: See—
Iizuka, Michio; and Shiba, Haruo, 4,710,839, Cl. 360-133.000.

Team, Inc.: See—
Harrison, George W., 4,709,729, Cl. 138-99.000.

TechnoARBED Deutschland GmbH: See—
Altmeyer, Werner; Jakobs, Ewald; and Meier, Friedrich, 4,710,078, Cl. 409-233.000.

Teale, Haile: See—
Bergmeier, Stephen C.; Downs, David A.; Moos, Walter H.; Moreland, David W.; and Teale, Haile, 4,710,508, Cl. 514-357.000.

Tecnomat: See—
Ballu, Patrick J. M., 4,710,109, Cl. 417-454.000.

Teepak, Inc.: See—
Stanley, Thomas R.; and Zeleznik, Mark R., 4,709,450, Cl. 17-49.000.

Teijin Limited: See—
Imamura, Tosuke, 4,710,423, Cl. 428-272.000.

Nishimura, Kunio; and Hirakawa, Tadashi, 4,710,432, Cl. 428-542.800.

Teikoku Chemical Industry Co., Ltd.: See—
Taguchi, Masaaki; and Suenaga, Hitoshi, 4,710,585, Cl. 560-64.000.

Tejima, Toru: See—
Nakamura, Koichi; Hattori, Michihiro; Tamura, Tadashi; Tejima, Toru; Takaishi, Naotake; Imokawa, Genji; and Hotta, Hajime, 4,710,373, Cl. 424-59.000.

Teledyne Industries Inc.: See—
Philpot, James E., 4,709,573, Cl. 72-379.000.

Telefonaktiebolaget LM Ericsson: See—
Ekdahl, Per A. A., 4,710,590, Cl. 174-35.0GC.

Telefunken Electronic GmbH: See—
Waschler, Eckehard; Clauss, Hermann; and Hefner, Heinz-Achim, 4,710,264, Cl. 437-228.000.

Telettra-Telefonia Elettronica e Radio S.p.A.: See—
Spodati, Fabrizio; and Tamburello, Mario, 4,709,979, Cl. 350-96.200.

Tellden, Leif: See—
Skog, Hans; Holmqvist, Ulf; and Tellden, Leif, 4,710,092, Cl. 414-729.000.

Templex, Inc.: See—
Jones, Christopher R.; and Jones, Lee S., 4,709,645, Cl. 112-282.000.

Tennant Company: See—
Basham, Michael T.; Berdahl, Robert M.; and Field, Bruce E., 4,709,771, Cl. 180-6.500.

Tensor, Inc.: See—
Walters, Philip H., 4,709,486, Cl. 33-304.000.

Terakoka Seiko Co., Ltd.: See—
Denda, Toshio, 4,709,531, Cl. 53-415.000.

Terasawa, Hidenori, to Nippon Kogaku K. K. Zoom lens. 4,709,997, Cl. 350-427.000.

Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Photographic printer and method for determining exposure amount thereof. 4,710,019, Cl. 355-38.000.

Terashita, Takaaki: See—
Suzuki, Kenji; Terashita, Takaaki; and Murayama, Jin, 4,710,803, Cl. 358-41.000.

Terpinski, Eva A.: See—
Evans, Sean A.; Terpinski, Eva A.; and Testa, Douglas, 4,710,376, Cl. 424-83.000.

Testa, Douglas: See—
Evans, Sean A.; Terpinski, Eva A.; and Testa, Douglas, 4,710,376, Cl. 424-83.000.

Tetra Pak International AB: See—
Ljungberg, Per-Allan, 4,709,799, Cl. 198-412.000.

Texaco Inc.: See—
Nieh, Edward C. Y., 4,710,362, Cl. 423-228.000.

Texas Instruments Incorporated: See—
Bella, Jeffrey D.; and Powell, Theo J., 4,710,931, Cl. 371-25.000.

Franke, David W.; and Hall, Carroll R., 4,710,763, Cl. 340-723.000.

Hornbeck, Larry J., 4,710,732, Cl. 332-7.510.

Powell, Theo J.; Bella, Jeffrey D.; Daniels, Martin D.; and Hwang, Yin-Chao, 4,710,933, Cl. 371-25.000.

Traynor, Kevin, 4,710,934, Cl. 371-38.000.

Wilson, Arthur M., 4,709,468, Cl. 437-209.000.

Witter, David E.; and Bawa, Mohendra S., 4,710,260, Cl. 156-605.000.

Tezuka, Tomofumi: See—
Umemura, Hiroyuki; Matsuda, Kenji; Tezuka, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Matsuo, Fumio; and Iijima, Hitoshi, 4,709,554, Cl. 62-156.000.

TFT, Inc.: See—
Wu, Joseph C.; Law, Yee-Shing; and James, John, 4,710,970, Cl. 455-113.000.

Thammana, Pallaiah: See—
Schenkel, Robert H.; Wong, Rosie B.; and Thammana, Pallaiah, 4,710,377, Cl. 424-88.000.

Thefaine, Yannick J.: See—
Friedman, Lee G.; Hailpern, Brent T.; Hoevel, Lee W.; and Thefaine, Yannick J., 4,710,769, Cl. 340-825.030.

Theobald, David R.: See—
Taylor, Hugh F.; and Theobald, David R., 4,709,686, Cl. 124-67.000.

Theodore, Ares N.: See—
Chattha, Mohinder S.; and Theodore, Ares N., 4,710,543, Cl. 525-161.000.

Theofanis, Nicholas D.: See—
Stemler, J. Robert; Klingensmith, James D.; Menzemer, Craig C.; Kulicki, John M.; and Theofanis, Nicholas D., 4,709,435, Cl. 14-73.000.

Thien, Tran V., to Minnesota Mining and Manufacturing Company. Azine redox dyes and leuco azine dyes. 4,710,570, Cl. 544-31.000.

Thomas, Gunter: See—
Frankowiak, Gerhard; Bechem, Martin; Gross, Rainer; Kayser, Michael; Schramm, Matthias; and Thomas, Gunter, 4,710,501, Cl. 514-256.000.

Thompson, Glenn M., to Tracer Research Corporation. System for continuously monitoring for leaks in underground storage tanks. 4,709,577, Cl. 73-40.700.

Thompson, Mortimer S., to Tri-Tech Systems International Inc. Tamper evident plastic caps with lower separable or breakaway portions and a method of forming them. 4,709,824, Cl. 215-252.000.

Thompson, Thomas C.; and Harrison, David J., to Quest Medical, Inc. Automated drug additive infusion system. 4,710,166, Cl. 604-81.000.

Thomsen, Christian: See—
Tauc, Jan; Maris, Humphrey J.; and Thomsen, Christian, 4,710,030, Cl. 356-432.000.

Thomson Video Equipment: See—
Van Cang, Luc P., 4,710,764, Cl. 340-728.000.

Thomson-CSF: See—
Blanchard, Pierre, 4,710,234, Cl. 437-40.000.

Thorn Emi plc: See—
Halberstadt, Alex L.; and Hume, Roger A., 4,710,677, Cl. 313-580.000.

Thorn, Richard P. Quiet fluid filled vibration isolator. 4,709,907, Cl. 267-140.100.

Thornburg, Dennis D.; and Parenteau, Richard R. Combination smoke detector and device for containing air. 4,710,756, Cl. 340-628.000.

TI Gas Spares Limited: See—
Barnes, Hugh V., 4,709,687, Cl. 126-42.000.

Ticehurst, Roy M.; and Watson, Joseph L., to Davy McKee (Poole) Limited. Lubrication of rolling mills. 4,709,568, Cl. 72-201.000.

Tickner, Derek C.: See—
Kortschinski, Juri; Lat, Michael V.; Maurice, Claude G.; and Tickner, Derek C., 4,710,847, Cl. 361-125.000.

Timper, Joachim: See—
Cremosnik, Gregor; Timper, Joachim; and Holzberger, Johann, 4,709,875, Cl. 244-3.130.

Tingley, Eddie S., to Novus Inc. Glass scratch removal method. 4,709,513, Cl. 51-283.00R.

Tinti, Aldo A., to Avco Corporation. Stator assembly for gas turbine engine. 4,710,097, Cl. 415-138.000.

Titley, Mark C., to British Aerospace PLC. Fin assembly deployment spring. 4,709,878, Cl. 244-328.000.

Tittizer, Gabriel; Junghans, Ewald; Bestenreiner, Georg; and Dahm, Christian, to Interatom GmbH. Double-conical static pressure-type gas bearing. 4,710,034, Cl. 384-110.000.

Todokoro, Hideo: See—
Ishitani, Tohru; Todokoro, Hideo; Kawanami, Yoshimi; and Tamura, Hifumi, 4,710,632, Cl. 250-396.00R.

Tokai TRW & Co., Ltd.: See—
Takeuchi, Kunio, 4,709,593, Cl. 74-498.000.

Tokairin, Hiroaki; Honma, Kazuo; Nakajima, Kichio; Nagasawa, Kiyoshi; and Aritake, Takeshi, to Hitachi Construction Machinery Co., Ltd. Device for compensating for deflection in a pliable positioning apparatus. 4,710,884, Cl. 364-513.000.

Tokita, Yasuhiro: See—
Fuke, Akira; Tokita, Yasuhiro; and Masuda, Katsuhiko, 4,710,938, Cl. 372-56.000.

Tokumoto, Minoru; Takagi, Motoyuki; Shitaka, Shizuo; Gold, Samuel; and Iovine, Carmine P., to National Starch and Chemical Corporation. Alkaline curing emulsions for use in cement admixtures. 4,710,526, Cl. 524-5.000.

Tokunaga, Kenji: See—
Takeuchi, Koichi; Yamanaka, Megumi; Kubo, Masayoshi; Katayama, Hideaki; and Tokunaga, Kenji, 4,710,255, Cl. 156-361.000.

Tokyo Electric Co., Ltd.: See—
Matsushita, Tsuyoshi, 4,710,043, Cl. 400-144.200.

Nakayama, Tetsuro, 4,710,784, Cl. 346-140.00R.

Tokyo Juki Industrial Co., Ltd.: See—
Fujihara, Masaaki; Fujii, Ikunori; and Fujita, Shuji, 4,709,644, Cl. 112-237.000.

Tomasic, Nicholas A.: See—
Heyne, Carl J.; and Tomasic, Nicholas A., 4,710,739, Cl. 335-174.000.

Tomcufcik, Andrew S.: See—
Wright, William B., Jr.; and Tomcufcik, Andrew S., 4,710,502, Cl. 514-259.000.

Tomimori, Kiyoshi: See—
Soeda, Kazuhiko; Mori, Masakazu; Nishikawa, Tsutomu; and Tomimori, Kiyoshi, 4,710,022, Cl. 356-73.100.

Tominaga, Akira; and Nishida, Reiziro, to Kansai Paint Co., Ltd. [Polyimidazoline adduct for electrocoating. 4,710,561, Cl. 528-111.000.

Tomioka, Hisatsugu; Waki, Tatsuo; and Miyata, Yoshiki, to Lonseal. Apparatus for installing escape device for slowly lowering a body. 4,709,783, Cl. 182-8.000.

Tomita, Seisuke; and Hashimoto, Takatsugu, to Bridgestone Corporation. Process for molding and vulcanizing rubber products. 4,710,541, Cl. 525-104.000.

Tomono, Hiroshi: See—
Yamada, Tsuneo; Sakashita, Tsutomu; Tomono, Hiroshi; Kimura, Takashi; Machara, Yasuhiro; and Yasumoto, Kunio, 4,709,572, Cl. 72-366.000.

Tompkins, E. Neal; Arends, Thomas C.; and Barry, Michael W., to Datapoint Corporation. Video conferencing network. 4,710,917, Cl. 370-62.000.

Tonoki, Satoshi; Tsunemi, Hidenari; Nishimura, Asaichi; and Abe, Kunihisa, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Unsaturated polyester resin compositions. 4,710,420, Cl. 428-212.000.

Toppan Printing Co., Ltd.: See—

Nakamura, Junji; Nishimura, Ikuma; Saito, Goro; and Matsumoto, Kozo, 4,710,436, Cl. 429-41.000.

Tosaka, Akio; Hashiguchi, Koichi; Morita, Masahiko; and Okano, Shinobu, to Kawasaki Steel Corporation. Method and system for cooling strip. 4,709,557, Cl. 62-373.000.

Tosaka, Yoichi; and Shimizu, Masami, to Canon Kabushiki Kaisha. Camera with operation switch. 4,710,008, Cl. 354-289.100.

Toshiba Ceramics Co., Ltd.: See—

Tamamizu, Teruyasu; Sato, Kichihei; Tanaka, Takashi; and Sato, Shunkichi, 4,710,428, Cl. 428-408.000.

Toshiba Kikai Kabushiki Kaisha: See—

Hakata, Yoshitami; Wakuda, Masanori; and Suzuki, Kimio, 4,710,770, Cl. 340-870.180.

Toth Aluminum Corporation: See—

Bergman, Lee H., 4,710,369, Cl. 423-625.000.

Tovarny Strojirenske Techniky Koncern: See—

Bis, Josef; and Petzelka, Antonin, 4,709,434, Cl. 12-77.000.

Townsend Engineering Company: See—

Townsend, Ray T.; Smith, David W.; and Dykes, Robert M., 4,709,447, Cl. 17-1.00F.

Townsend, Ray T.; Smith, David W.; and Dykes, Robert M., to Townsend Engineering Company. Encased product and method and apparatus for encasing same. 4,709,447, Cl. 17-1.00F.

Toy Contact Lens Co., Ltd.: See—

Miyajima, Nobuyuki; Hata, Kenji; and Nakayama, Junichi, 4,710,313, Cl. 252-105.000.

Toy Menka Kaisha, Ltd.: See—

Takeuchi, Toshio, 4,709,985, Cl. 350-96.250.

Toy Seikan Kaisha, Ltd.: See—

Ochiai, Toshio; Tsujimura, Akio; and Tsukiyasu, Hiroshi, 4,710,091, Cl. 414-623.000.

Toyoda Gosei Co., Ltd.: See—

Hongo, Suzuki; Niwa, Minoru; Hashiba, Takahiro; Harata, Mitsuru; Hirata, Ichiro; Ito, Isamu; and Sonobe, Akihiko, 4,709,944, Cl. 280-777.000.

Sakamoto, Fujio, 4,709,967, Cl. 301-37.00P.

Toyoda Koki Kabushiki Kaisha: See—

Yoneda, Takao; Ogasawara, Tadashi; Ohta, Norio; and Sakakibara, Yasuji, 4,709,509, Cl. 51-165.710.

Toyoshima, Takefumi: See—

Yoshida, Hiroshi; Toyoshima, Takefumi; Iwabori, Tomio; Ohkura, Hideaki; Miyamoto, Yasuo; Nishimura, Izumi; Oikawa, Toshiyuki; Sekijima, Kenji; and Ohashi, Makoto, 4,709,898, Cl. 248-562.000.

Toyota Jidosha Kabushiki Kaisha: See—

Ichikawa, Noriyuki; Suzuki, Tetsushi; and Atsumi, Tomiaki, 4,710,152, Cl. 474-166.000.

Kato, Kichiro, 4,709,682, Cl. 123-559.000.

Noda, Naoki; Nihashi, Iwao; and Sato, Kazuhiro, 4,710,608, Cl. 219-161.000.

Yasue, Hideki; and Fukumura, Kagenori, 4,709,597, Cl. 74-868.000.

Toyota Jidoshi Kabushiki Kaisha: See—

Iyoda, Motomi, 4,710,878, Cl. 364-424.000.

Toyotomi Kogyo Co., Ltd.: See—

Nakamura, Kazuharu; Matsumoto, Motoki; Kondo, Akinobu; and Ito, Kiyonobu, 4,710,125, Cl. 431-22.000.

Tracer Research Corporation: See—

Thompson, Glenn M., 4,709,577, Cl. 73-40.700.

Tran-Van, Khanh: See—

Rutschmann, Erwin; Tran-Van, Khanh; and Wagner, Joachim, 4,709,552, Cl. 60-600.000.

Tranter, Donald F.: See—

Dawes, Cyril; and Tranter, Donald F., 4,710,238, Cl. 148-16.600.

Traynor, Kevin, to Texas Instruments Incorporated. Random access memory with error correction capability. 4,710,934, Cl. 371-38.000.

Tri-Tech Systems International Inc.: See—

Thompson, Mortimer S., 4,709,824, Cl. 215-252.000.

Trimborn, Werner: See—

Lechten, Peter; Bueche, Ingolf; Jacobi, Manfred; and Trimborn, Werner, 4,710,523, Cl. 522-14.000.

Trippel, Gerhard: See—

Bandara, Upali; Hinkel, Holger; Steiner, Werner; and Trippel, Gerhard, 4,710,424, Cl. 428-325.000.

Troncoso De Liotta, Holga E.: See—

Liotta, Domingo S.; and Troncoso De Liotta, Holga E., 4,710,192, Cl. 623-1.000.

Troponwerke GmbH & Co., KG: See—

Lockhoff, Oswald; Stadler, Peter; Opitz, Hans-Georg; Horstmann, Harald; Junge, Bodlo; and Pelster, Bernhard, 4,710,491, Cl. 514-42.000.

Truglio, Diana, to Medtech Diagnostics Inc. Lavage device for obtaining a fluid specimen from a body cavity for disease diagnosis. 4,709,705, Cl. 128-750.000.

Trutzschler GmbH & Co. KG: See—

Leifeld, Ferdinand, 4,709,451, Cl. 19-105.000.

TRW Inc.: See—

Burk, Maksymilian; and Blumenthal, Jack L., 4,710,483, Cl. 502-185.000.

Lindeman, Richard J., 4,710,133, Cl. 439-92.000.

Tsuchiya, Akira, to Kabushiki Kaisha Toshiba. Ripple-free DC high voltage generating apparatus for X-ray tube. 4,710,860, Cl. 363-28.000.

Tsuda, Ichiro: See—

Yamaguchi, Youko; Shimizu, Hiroshi; Tsuda, Ichiro; Yano, Masafumi; and Okumura, Tokiko, 4,710,964, Cl. 382-17.000.

Tsujimura, Akio: See—

Ochiai, Toshio; Tsujimura, Akio; and Tsukiyasu, Hiroshi, 4,710,091, Cl. 414-623.000.

Tsukishima Kikai Co., Ltd.: See—

Kasai, Tatsushi; Niikura, Tatsuo; Sato, Masanori; Hashimoto, Takao; and Yamashita, Akiya, 4,710,215, Cl. 62-532.000.

Tsukiyasu, Hiroshi: See—

Ochiai, Toshio; Tsujimura, Akio; and Tsukiyasu, Hiroshi, 4,710,091, Cl. 414-623.000.

Tsunemi, Hidenari: See—

Tonoki, Satoshi; Tsunemi, Hidenari; Nishimura, Asaichi; and Abe, Kunihisa, 4,710,420, Cl. 428-212.000.

Tsuno, Nobuo: See—

Matsui, Minoru; and Tsuno, Nobuo, 4,709,621, Cl. 92-212.000.

Tsunoda, Arihiro: See—

Watanabe, Toshio; Tsutsui, Eiji; and Tsunoda, Arihiro, 4,710,017, Cl. 355-8.000.

Tsuruta, Koji: See—

Ohkoshi, Akio; Tsuruta, Koji; Nakagawa, Hideaki; and Shimada, Satoshi, 4,710,765, Cl. 340-781.000.

Tsutsui, Eiji: See—

Watanabe, Toshio; Tsutsui, Eiji; and Tsunoda, Arihiro, 4,710,017, Cl. 355-8.000.

Tsuyoshi, Toshiaki; Yonezawa, Seiji; Kasai, Masuo; and Uno, Motoo, to Hitachi, Ltd. Phase compensation apparatus for an optical information recording and reproducing system. 4,710,909, Cl. 369-46.000.

Tuck, Frederick R.: See—

Kelly, John E.; Jones, Don C.; Tuck, Frederick R.; Zimmermann, William A.; and Clark, Kenneth R., 4,710,031, Cl. 356-440.000.

Tucker, Dalton R., to Arcoa Industries. Shoe butler with heel gripping device. 4,709,839, Cl. 223-119.000.

Tucker, James L.; Landen, Terry R.; and Schelby, Robert L., to Nebco, Inc. Cage positioning device for use with a concrete pipe form. 4,710,115, Cl. 425-117.000.

Turchi, Sergio; and Filippi, Renato, to Weber S.p.A. Azienda Altecna. Device for controlling fuel injection apparatus in diesel engines. 4,709,680, Cl. 123-467.000.

Turcsanyi, Peter: See—

Kreidl, Janos; Turcsanyi, Peter; Aracs, Zsuzsanna; Stefko, Bela; Meszaros, Judit; Deutsch, Ida; Szilbereky, Jeno; Csizer, Eva; Vezér, Szilard; Bogsch, Erik; Bakos, Jozsef; Szotyori, Laszlo; and Heil, Balint, 4,710,323, Cl. 260-543.00R.

Turro, Juan G. Cigarette holder. 4,709,706, Cl. 131-240.100.

Tyler, Derek E.: See—

Young, Kenneth P.; Tyler, Derek E.; Cheskis, Harvey P.; and Watson, W. Gary, 4,709,746, Cl. 164-485.000.

Uchida, Seiju: See—

Degawa, Toru; Okuyama, Gen; Hashimoto, Akio; Uchida, Seiju; Fujiwara, Kouzou; Ebata, Makoto; Satou, Takashi; and Ootani, Tohei, 4,710,481, Cl. 501-123.000.

Uchida, Yukimasa, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 4,710,905, Cl. 365-229.000.

Uchino, Eiji. Elevator. 4,709,787, Cl. 187-56.000.

Uda, Iwao: See—

Yamazaki, Shinsuke; Takeda, Rikio; and Uda, Iwao, 4,710,349, Cl. 420-495.000.

Uda, Tadayoshi: See—

Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; Kondo, Kiyoshi; Kondo, Yutaka; and Kondo, Kazuo, 4,709,714, Cl. 134-89.000.

Uecker, Ronald T.; and Slicker, Steven D., to MILSCO Manufacturing Company. Adjustable office chair. 4,709,963, Cl. 297-316.000.

Ueda, Akihisa, to Hitachi, Ltd. Method and apparatus for detecting the uncontrollable operation of a control system. 4,710,928, Cl. 371-16.000.

Ueda, Yasuyoshi: See—

Hattori, Makoto; Nishikuri, Masao; and Ueda, Yasuyoshi, 4,710,320, Cl. 260-378.000.

Uenishi, Noboru: See—

Doi, Yoshitiko; Kuroishi, Nobuhito; Ochi, Shigeki; and Uenishi, Noboru, 4,710,345, Cl. 419-28.000.

Ueno, Masakazu, to Fuji Electric Co., Ltd. Liquid crystal matrix display device having opposed diode rings on substrates. 4,709,992, Cl. 350-339.00R.

Ueno, Shyuichi: See—

Machida, Toyoji; and Ueno, Shyuichi, 4,709,472, Cl. 29-623.000.

Ueno, Takashi; and Abo, Toshimi, to Nissan Motor Co., Ltd. Method of and apparatus for controlling supercharge pressure for a turbocharger. 4,709,553, Cl. 60-602.000.

Uenohara, Norihisa, to Kabushiki Kaisha Daikin Seisakusho. Torsion rubber type damper disc. 4,709,796, Cl. 192-106.100.

Uetsuki, Haruo; Kobayashi, Takehiro; and Yamane, Hiroto, to Ryobi, Ltd. Device for preventing backlash on a fishing reel. 4,710,689, Cl. 318-630.000.

Uhlir, Pavel: See—

Curda, Otakar; Maxa, Jaroslav; and Uhlir, Pavel, 4,710,646, Cl. 307-116.000.

Uiterwaal, Dirk J. D.; and Hersevoort, Aart, to Melkunte Holland B.V. Nutritional supplement preparation intended for pregnant and breast-

feeding women based on milk constituents as well as a process for preparing it. 4,710,387, Cl. 426-72.000.

Umamoto, Chiyuki: See—

Takahashi, Kenji; Umamoto, Chiyuki; and Kato, Hisatoyo, 4,710,626, Cl. 250-327.200.

Umamura, Hiroyuki; Matsuda, Kenji; Tezuka, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Matsuo, Fumio; and Iijima, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Air conditioning apparatus. 4,709,554, Cl. 62-156.000.

Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Taka'aki; Sato, Fumihiko; and Nakamura, Teruya, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Medical composition for injection containing a spargulal as active ingredient and process for preparing the same. 4,710,517, Cl. 514-616.000.

Umezawa, Takashi; and Watanabe, Koji, to Nifco, Inc. Latch device. 4,709,949, Cl. 292-6.000.

Uni-Grip, Inc.: See—

Barth, Russell W.; and Buess, Ronald P., 4,710,416, Cl. 428-119.000.

Union Carbide Corporation: See—

Hanson, Thomas C.; Fisher, Theodore F.; and Weber, Joseph A., 4,710,212, Cl. 62-23.000.

Jorgensen, Robert J., 4,710,538, Cl. 525-53.000.

Ward, Thomas H.; Costanzo, Phillip A.; Pietrasz, Vincent; and Soeder, Edmund J., 4,710,344, Cl. 419-8.000.

Union Oil Company of California: See—

Harbolt, Bruce; Murata, Perry L.; and Burmaster, Neal C., 4,710,360, Cl. 422-269.000.

Wong, Morton M.; and Shugarman, Arnold L., 4,710,367, Cl. 423-335.000.

Unisys Corporation: See—

Kim, Dongsung R.; and Kronies, Reinhard K., 4,710,935, Cl. 371-49.000.

Rochester, Charles R., Jr., 4,710,591, Cl. 174-35.00G.

United States of America

Air Force: See—

Aulds, James M.; and Becker, Roger J., 4,710,641, Cl. 250-554.000.

Army: See—

Bishop, Daniel E., 4,709,484, Cl. 33-169.00R.

Sluss, Elmer C.; Nettleton, John E.; and Barr, Dallas N., 4,710,941, Cl. 372-87.000.

Energy: See—

Christiansen, David W.; and Karnesky, Richard A., 4,710,343, Cl. 376-414.000.

FitzPatrick, John R.; Dunn, Jerry G.; and Avens, Larry R., 4,710,222, Cl. 75-84.10R.

Ohkawa, Tihiro, 4,710,339, Cl. 376-123.000.

Saller, Henry A.; deceased; Hodge, Edwin S.; Paprocki, Stanley J.; and Dayton, Russell W., 4,709,848, Cl. 228-159.000.

National Aeronautics and Space Administration: See—

Matsumoto, Yutaka; Mina, Cesar; Russell, Philip B.; and van Ark, William B., 4,710,618, Cl. 250-203.00R.

National Security Agency: See—

Douglas, Harold E., Jr.; and Mahaffee, Joseph W., III, 4,709,652, Cl. 116-140.000.

Navy: See—

Blackburn, Douglas; Feldman, Albert; and Lagakos, Nicholas, 4,709,987, Cl. 350-96.340.

Boblitt, Wayne W., 4,710,076, Cl. 409-26.000.

Saur, Joseph W.; Reynolds, Charles P.; and Black, Alfred T., 4,710,472, Cl. 435-287.000.

Yoder, Max N.; and Wright, George B., 4,710,478, Cl. 437-40.000.

U.S. Philips Corporation: See—

Doyen, Daniel; and Vriz, Tarcisio, 4,710,729, Cl. 331-96.000.

Houkes, Henk; Postma, Pieter; and Van Veghel, Andreas C., 4,710,678, Cl. 315-39.000.

Kupfer, Karl-Heinz, 4,710,974, Cl. 455-190.000.

Loy, Fernand R., 4,710,621, Cl. 250-203.00R.

Schroder, Johann; Gawron, Klaus; Bertram, Leo; and Schemmann, Hugo, 4,709,752, Cl. 165-47.000.

Sluyterman, Albertus A. S., 4,710,671, Cl. 313-413.000.

Van Engelen, Petrus P. J.; and Buschow, Kurt H. J., 4,710,431, Cl. 428-457.000.

Van Tol, Maartits W., 4,710,672, Cl. 313-413.000.

Vrijssen, Gerardus A. H. M., 4,710,673, Cl. 313-477.00R.

Warmuth, Otto L.; Johanndeiter, Martin H.; and Raven, Johannes G., 4,710,802, Cl. 358-25.000.

U.S. Product Development Company: See—

Adell, Robert, 4,709,525, Cl. 52-718.100.

United Technologies Corporation: See—

Stevens, Leonard W.; Siwik, William S.; Moore, William A.; Brown, Wayne M.; and Barnard, Andrew A., 4,709,545, Cl. 60-39.080.

Universita' Degli Studi Di Parma: See—

Gardini, Gian P.; and Bocchi, Vittorio, 4,710,400, Cl. 427-121.000.

University of California, The Regents of the: See—

Weitekamp, Daniel P.; Bielecki, Anthony; Zax, David B.; Zilm, Kurt W.; and Pines, Alexander, 4,710,714, Cl. 324-307.000.

University of Delaware, The: See—

McCandless, Brian E.; and Birkmire, Robert W., 4,709,466, Cl. 437-5.000.

University of Minnesota, Regents of the: See—

Hruschsky, William J. M., 4,709,660, Cl. 119-103.000.

Uno, Motoo: See—

Tsuyoshi, Toshiaki; Yonezawa, Seiji; Kasai, Masuo; and Uno, Motoo, 4,710,909, Cl. 369-46.000.

Uno, Sakae: See—

Iwai, Shinichi; and Uno, Sakae, 4,710,806, Cl. 358-81.000.

UOP Inc.: See—

Cetinkaya, Ismail B.; and Myers, Daniel N., 4,710,357, Cl. 422-144.000.

Polak, Anthony J.; and Beuhler, Allyson J., 4,710,278, Cl. 204-129.000.

Upjohn Company, The: See—

Livingston, Douglas A.; and Petre, Janet E., 4,710,565, Cl. 536-16.500.

Uponor AB: See—

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Urbanski, Jeffrey C.: See—

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Ushiro, Seimei, to Fuji Photo Film Co., Ltd. Automatic range finding device. 4,710,011, Cl. 354-403.000.

Utah Scientific Advanced Development Center, Inc.: See—

Fearing, Craig; and Orsburn, Michael L., 4,710,800, Cl. 358-22.000.

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Taylor, Hugh F.; and Theobald, David R., 4,709,686, Cl. 124-67.000.

Utley, David L., to National Transdata Systems, Inc. Multi-station data collection system. 4,710,616, Cl. 235-472.000.

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Saito, Junichi; Tamura, Tatsuo; Kurahashi, Yoshio; Uzawa, Shigeru; Matsumoto, Noboru; and Yamaguchi, Naoko, 4,710,509, Cl. 514-384.000.

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Baldwin, John J.; Huff, Joel R.; Vacca, Joseph P.; Young, Steven D.; deSolms, Jane; and Guare, James P., Jr., 4,710,504, Cl. 514-267.000.

Vahabzadeh, Hamid, to General Motors Corporation. Ratio control system for a continuously variable transmission. 4,710,879, Cl. 364-424.100.

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Valukas, Antonette G.; and Valukas, Ralph. Weighted insole. 4,709,921, Cl. 272-119.000.

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Vanasse, Robert W., to Interstate Brands Corporation. Package for loaf of bread. 4,709,851, Cl. 229-87.00B.

Van Cang, Luc P., to Thomson Video Equipment. Device for obtaining continuous plots on the screen of a display console controlled by a graphic processor. 4,710,764, Cl. 340-728.000.

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Leenders, Luc H.; Daems, Eddie R.; and Van den Bogaert, Jan A., 4,710,444, Cl. 430-237.000.

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Brown, Donald W.; Leth, James W.; and Vandendorpe, James E., 4,710,926, Cl. 371-9.000.

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Van Hout, James E.; and Klein, Frank H. Panel displays, framed lighted switch actuators therefor. 4,710,858, Cl. 362-95.000.

Van Mastrigt, Max, to Varian Associates, Inc. Chemical vapor deposition apparatus. 4,709,655, Cl. 118-719.000.

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Van Tol, Maurits W., to U.S. Philips Corporation. Picture display device. 4,710,672, Cl. 313-413.000.
Van Veghel, Andreas C.: See—
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van Zanten, Anton: See—
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Boyadjeff, George I., 4,709,766, Cl. 175-52.000.
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Shaka, Athan J., 4,710,718, Cl. 324-309.000.
Van Mastrigt, Max, 4,709,655, Cl. 118-719.000.
Vartoughian, Victor. Applicator bottle with sealing cap. 4,710,048, Cl. 401-269.000.
Vataru, Marcel, to Wynn Oil Company. Bottle cap with seal cutter in top recess. 4,709,822, Cl. 215-216.000.
Vaughn, Mark R., to Board of Regents, The University of Texas System. Inherent variable fluid restrictor. 4,710,035, Cl. 384-115.000.
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Veith, Gustav G.; and Veith, Gotz U., 4,709,870, Cl. 242-68.000.
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Velten & Pulver, Inc.: See—
Schneider, Thomas C., 4,710,089, Cl. 414-118.000.
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Andersson, Olle, 4,709,592, Cl. 74-493.000.
Vertesi, Csaba; Molnar, Attila; and Guczy, Lajos, to Peremartoni Vegyipari Vallalat. Isothiuronium salts. 4,710,578, Cl. 558-4.000.
Vesnaver, Galdino. Water aerating device. 4,710,324, Cl. 261-30.000.
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Adamek, Frank C.; and Bridges, Charles D., 4,709,933, Cl. 277-167.500.
Morrison, Bertram L., 4,709,725, Cl. 137-614.040.
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Vickers, Ken M. Combination soap and fish bait. 4,710,385, Cl. 426-1.000.
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Giberti-Formaciari, Serse, 4,710,218, Cl. 65-260.000.
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Villanueva, Eliseo H. Machine for manufacturing flat bodies in a continuous line. 4,710,122, Cl. 425-259.000.
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Champavier, Louis, 4,710,748, Cl. 340-347.0AD.
Vochatz, Richard L. Stair brackets and stair structure. 4,709,520, Cl. 52-191.000.
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von Behrens, Wieland E., to Sequoia-Turner Corporation. Particulate matter analyzing apparatus and method. 4,710,021, Cl. 356-72.000.
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Overhues, Egon, 4,710,081, Cl. 411-161.000.
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Perrot, Pierre; and Vuilleme, Georges, 4,710,535, Cl. 524-413.000.
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W. Haking Enterprises Limited: See—
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Taylor, Monroe F., 4,709,532, Cl. 53-451.000.
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Wachsmuth, Robert H.; and Brusch, Donald W., to Environmental Technica Corporation. Spatial disorientation trainer-flight simulator. 4,710,128, Cl. 434-46.000.
Wacker Chemie GmbH: See—
Jira, Reinhard; and Ottlinger, Ralph, 4,710,558, Cl. 528-14.000.
Wacker Silicones Corporation: See—
Essinger, James F., Jr., 4,710,559, Cl. 528-15.000.
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Wagner, David G., to Moore Business Forms, Inc. Mailer including return envelope and remittance stub combined in outer envelope. 4,709,850, Cl. 229-73.000.
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Walz, Georg. Method of inserting a tubular or bar-shaped structural member tightly into a location hole in a construction element. 4,709,521, Cl. 52-220.000.
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- Miller, Ray R., 4,710,271, Cl. 162-360.100.
- Selby, John S., 4,709,952, Cl. 294-82.140.
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- Wood, Leigh E.; Miller, John A.; and Sipinen, Alan J., to Minnesota Mining and Manufacturing Company. Diaper having improved reinforced area for receiving adhesive fastening tape. 4,710,190, Cl. 604-389.000.
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- Yakmovitz, Kenneth J., to RCA Corporation. Electron tube pin-sensing and straightening device. 4,709,733, Cl. 140-147.000.
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- Yuasa, Hiroo: See—
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- Zasuwa, Gerard A.: See—
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- Zax, David B.: See—
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- Zehner, Georgia L.: See—
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- Zelesniak, Joseph J.: See—
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- Zelesnik, Mark R.: See—
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- Zell, Karl: See—
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- Zenith Electronics Corporation: See—
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- Dougherty, Lawrence W.; and Fendley, James R., 4,710,670, Cl. 313-407.000.
- Fitzgibbon, James, 4,710,759, Cl. 340-712.000.
- Knowles, Terence J.; Ray, Francis M.; and Shewey, Charles E., 4,710,707, Cl. 324-158.00F.
- Perdue, Terry A.; and Cabbage, William, 4,710,137, Cl. 439-457.000.
- Roberts, William N., 4,710,820, Cl. 358-231.000.
- Ziebig, Anton; Brigasky, Hans; and Lewand, Willi, to Hoechst Ceramtec Aktiengesellschaft. Extrusion device for the production of honeycomb structures. 4,710,123, Cl. 425-464.000.
- Ziemer, Wolf; Neubert, Fritz; and Holle, Wilhelm, to Flakt AB. Suspensible modular frame arrangement for clean room ceilings having a fluid seal. 4,710,208, Cl. 55-355.000.
- Ziggity Systems, Inc.: See—
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- Ziller, Josef, to Schenk Filterbau Gesellschaft mit beschränkter Haftung. Rotary disk filter element. 4,710,294, Cl. 210-232.000.
- Zilm, Kurt W.: See—
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- Zimmer, Ernst; and Kikut, Botho, to KUKA Schweissanlagen & Roboter GmbH. Device for the automatic gripping and releasing of a tool holder in a manipulator. 4,710,093, Cl. 414-730.000.
- Zimmerman, Patrick G.: See—
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- Zimmermann, William A.: See—
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- Zivkovich, Aleksandar. Process for burning a carbonaceous fuel using a high-energy alternating current wave. 4,710,681, Cl. 315-209.00T.
- Zoladz, Frank J., to North American Philips Consumer Electronics Corp. Two-part transformer casting having liquid-tight seal. 4,709,828, Cl. 220-76.000.
- Zollner, Dieter: See—
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- Zolnowsky, John; Crudele, Lester M.; and Spak, Michael E., to Motorola, Inc. Method and apparatus for validating prefetched instruction. 4,710,866, Cl. 364-200.000.
- Zongker, Dwight E., to Cessna Aircraft Company. The. Series self-leveling valve with single spool for unloading and relief. 4,709,618, Cl. 91-31.000.
- Zortman, Zedekiah Z., to American Device Manufacturing Co. Crash bar door locking device. 4,709,950, Cl. 292-92.000.
- Zuber, Pierre A., to Westinghouse Electric Corp. Vehicle speed control apparatus and method. 4,710,880, Cl. 364-426.000.
- Zuchtriegel, Anton, to Patent-Treuhand-Gesellschaft für elektrische Glühlampen m.b.H. Fluorescent lamp operating circuit. 4,710,682, Cl. 315-224.000.
- Zur, Dov: See—
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- Zwilling, Hermann, to Rehau AG & Co. Pipe cluster unit. 4,709,730, Cl. 138-111.000.
- 3M Holding Co. Ltd.: See—
Briltz, Raymond P., 4,710,290, Cl. 210-199.000.

LIST OF REISSUE PATENTEES

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PATENTS WERE ISSUED ON THE 1ST DAY OF DECEMBER, 1987

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- Brinly-Hardy Co., Inc.: See—
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- Doering, Charles W., to Brinly-Hardy Co., Inc. Pushed dethatching unit. Re. 32,551, Cl. 56-396.000.
- Lai, Stanley H.: See—
Liebermann, Leonard; and Lai, Stanley H., Re. 32,552, Cl. 340-632.000.
- Liebermann, Leonard; and Lai, Stanley H. Gaseous impurity detector employing corona discharge phenomenon. Re. 32,552, Cl. 340-632.000.

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- Adler, Herbert, to Crest Industries Corp. Desk caddy. 292,991, 12-1-87, Cl. D19-78.000.
- American Safety Razor Company: See—
Itten, Clemens A.; and Chase, David O., 293,036, Cl. D28-48.000.
- Andersson, Karl A.: See—
Ferm, Morgan; and Andersson, Karl A., 292,959, Cl. D7-103.000.
- ASEA AB: See—
Skoog, Hans-Olov; Holmqvist, Ulf J.; and Tellden, Leif K., 292,981, Cl. D15-199.000.
- AVIA Group International, Inc.: See—
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- Kelley, Brenda, 292,944, Cl. D2-314.000.
- Selbiger, Lawrence; and Ludeman, John, 292,942, Cl. D2-314.000.
- Selbiger, Lawrence; and Ludeman, John, 292,945, Cl. D2-314.000.
- Tong, James K., 292,943, Cl. D2-314.000.
- Bates Manufacturing Company, The: See—
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- Beattie, D. Stuart, to Fox Pool Corporation. Plastic sheet material for a pool liner. 293,039, 12-1-87, Cl. D5-61.000.
- Bidwell, Christopher C.: See—
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- Black & Decker Inc.: See—
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- Brandes, J. Henry: See—
Morgan, Annis R., Jr.; King, Eddie W.; Brandes, J. Henry; and Lettera, James N., 292,993, Cl. D20-5.000.
- Bristol-Myers Company: See—
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- Brussing, Bernd, to Hefendehl, Hans Friedrich. Magazine rack. 292,957, 12-1-87, Cl. D6-475.000.
- Bunn-O-Matic Corporation: See—
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- Butcher, Richard H., to F. F. Seeley Nominees Pty Ltd. Front panel for an air conditioner. 293,022, 12-1-87, Cl. D23-354.000.
- Cable Electric Products, Inc.: See—
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- Canon Kabushiki Kaisha: See—
Kando, Masahiro, 292,976, Cl. D14-94.000.
- Capawana, Ross. Conveyor cleat. 293,037, 12-1-87, Cl. D34-35.000.
- Cave, Carol. Plant stand. 292,953, 12-1-87, Cl. D6-405.000.
- Chase, David O.: See—
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- Chow, Marland, to Prometrix Corporation. Automatic semiconductor wafer tester. 292,979, 12-1-87, Cl. D10-75.000.
- Citizen Watch Co., Ltd.: See—
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- Coca-Cola Company, The: See—
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- Crest Industries Corp.: See—
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- Curran, Brian. Games sheet. 292,999, 12-1-87, Cl. D21-37.000.
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- Darr, Richard C., to Plastipak Packaging, Inc. Liquid container. 292,968, 12-1-87, Cl. D9-370.000.
- Daugherty, Donald L., to Bunn-O-Matic Corporation. Coffee brewer and hot water dispenser. 292,961, 12-1-87, Cl. D7-309.000.
- Davis, Kathleen A. Insect light. 293,014, 12-1-87, Cl. D22-123.000.
- DiPietro, David J. Taco shell. 292,940, 12-1-87, Cl. D1-122.000.
- Dittig, Millie. Slant board or similar article. 293,007, 12-1-87, Cl. D21-191.000.
- Donner Mountain Corporation, The: See—
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- duCret, Doris, to Bristol-Myers Company. Applicator container. 293,034, 12-1-87, Cl. D28-7.000.
- Electrix, Inc.: See—
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- Fry, Steven A.; and Stafford, Rodney L. Seat for a truck bed. 292,950, 12-1-87, Cl. D6-356.000.
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- Gibb, Olga B. Sign. 292,996, 12-1-87, Cl. D20-42.000.
- Giurino, Joel F., to Cordis Corporation. Cardiac pacer analyzer. 293,023, 12-1-87, Cl. D24-17.000.
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- Hanagata, Masaki, to Nippon Kogaku K. K. Spectacles. 292,985, 12-1-87, Cl. D16-102.000.
- Hansen, Donald J.; and Read, Gary G., to General Signal Corporation. Horizontal variable speed turbine pump. 292,978, 12-1-87, Cl. D15-7.000.
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- Hefendehl, Hans Friedrich: See—
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- Hestair Kiddicraft Limited: See—
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- Hiranaka, Shinichi, to Toyoda Jidosha Kabushiki Kaisha. Rear combination lamp for an automobile. 293,032, 12-1-87, Cl. D26-120.000.
- Hiranaka, Shinichi, to Toyoda Jidosha Kabushiki Kaisha. Clearance lamp for an automobile. 293,033, 12-1-87, Cl. D26-120.000.

- Holewinski, Robert D.; and Hamilton, Leslie, to Johnson & Johnson Dental Products, Company. Compartmented packaging container for dental materials or the like. 293,024, 12-1-87, Cl. D24-31.000.
- Holmqvist, Ulf J.: See—
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- Inoue, Akifumi; and Takeda, Koshiro, to Nippon Gakki Seizo Kabushiki Kaisha. Control desk for use in controlling an industrial robot. 292,956, 12-1-87, Cl. D6-449.000.
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- Iten, Clemens A.; and Chase, David O., to American Safety Razor Company. Safety razor handle. 293,036, 12-1-87, Cl. D28-48.000.
- Jagger, Vivienne D., to Little People Limited. Spoon. 292,960, 12-1-87, Cl. D7-137.000.
- Janowitz, C. Michael. Collapsible watering can or similar article. 293,017, 12-1-87, Cl. D23-212.000.
- Johnson, Frederick C., Jr. Electrical guitar. 292,987, 12-1-87, Cl. D17-18.000.
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- Knight, James L. Carpet display stand. 292,955, 12-1-87, Cl. D6-409.000.
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- Schwartz, Frederic W., to Cable Electric Products, Inc. Diffuser for a nightlight. 293,031, 12-1-87, Cl. D26-118.000.
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- Tellden, Leif K.: See—
Skoog, Hans-Olov; Holmqvist, Ulf J.; and Tellden, Leif K., 292,981, Cl. D15-199.000.
- Tomita, Hiroshi; and Hatano, Hiroaki, to Fuji Robin Kabushiki Kaisha. Bush cutter. 292,980, 12-1-87, Cl. D15-16.000.
- Tomura, Atsushi: See—
Nishio, Hideaki; and Tomura, Atsushi, 292,972, Cl. D12-136.000.
- Tomy Kogyo Co., Inc.: See—
Ohkawa, Hiroshi, 293,002, Cl. D21-87.000.
- Suzuki, Tatsuya, 293,001, Cl. D21-87.000.
- Tong, James K., to AVIA Group International, Inc. Shoe upper. 292,943, 12-1-87, Cl. D2-314.000.
- Toyoda Jidosha Kabushiki Kaisha: See—
Hiranaka, Shinichi, 293,032, Cl. D26-120.000.
- Hiranaka, Shinichi, 293,033, Cl. D26-120.000.
- Tucker, Douglas E.: See—
Yother, Lawrence E.; and Tucker, Douglas E., 293,028, Cl. D26-51.000.
- Universal-Rundle Corporation: See—
Rudelick, John, 293,018, Cl. D23-226.000.
- Valento, Joseph P. Real estate sign system and carrier therefor. 292,995, 12-1-87, Cl. D20-10.000.
- Velbon International Corp.: See—
Nakatani, Koma, 292,982, Cl. D16-46.000.
- Vetter, Roland, to Schwaebische Buerstenfabrik Hans Haug KG. Cleaning device for automobile windows. 292,949, 12-1-87, Cl. D4-116.000.
- Vladescu, Stefan. Lamp or similar article. 293,030, 12-1-87, Cl. D26-107.000.
- Voshell, Glenn R.: See—
Manniso, James L.; and Voshell, Glenn R., 293,013, Cl. D22-118.000.
- Williams, D. Michael; and Kelly, Lois E., to Johnson & Johnson Baby Products Company. Rattle bird toy. 293,000, 12-1-87, Cl. D21-65.000.
- Wolfe, Henry S. Tiger float. 293,011, 12-1-87, Cl. D21-237.000.
- Yeaton, Stephen C.: See—
Larkin, Mark E.; Szempruch, Walter T.; and Yeaton, Stephen C., 293,003, Cl. D21-91.000.
- Yother, Lawrence E.; and Tucker, Douglas E. Combination night light and bank. 293,028, 12-1-87, Cl. D26-51.000.
- Zurwelle, Donald W., to Black & Decker Inc. Flashlight. 293,027, 12-1-87, Cl. D26-46.000.

LIST OF PLANT PATENTEES

Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Kardo. 6,050, 12-1-87, Cl. 74.000.
 Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Calvex. 6,051, 12-1-87, Cl. 79.000.
 Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Zilcon. 6,052, 12-1-87, Cl. 80.000.
 Klemm & Sohn: See—
 Nobbio, Giacomo, 6,049, Cl. 72.000.
 Nieuwoudt, Hermias C. Variety of navel orange tree. 6,047, 12-1-87, Cl. 45.000.
 Nobbio, Giacomo, to Klemm & Sohn. Carnation named "Elinor". 6,049, 12-1-87, Cl. 72.000.
 Van Staaveren B.V.: See—
 van Andel, Jacob, 6,048, Cl. 68.000.
 van Andel, Jacob, to Van Staaveren B.V. Alstroemeria named Stalsam. 6,048, 12-1-87, Cl. 68.000.
 Yoder Brothers, Inc.: See—
 Duffett, William E., 6,050, Cl. 74.000.
 Duffett, William E., 6,051, Cl. 79.000.
 Duffett, William E., 6,052, Cl. 80.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 1ST DAY OF DECEMBER, 1987

Alexander, Harry B., Jr., to Du Pont de Nemours, E. I., and Company. Strain relief and ground connector for shielded cable. H379, 12-1-87, Cl. 439-610.000.
 Bol, Gerard M., to Shell Oil Company. Shale coagulating low solids drilling fluid. H385, 12-1-87, Cl. 252-8.510.
 Bremer, James C., to United States of America, Army. Degradation monitor for laser optics. H376, 12-1-87, Cl. 356-239.000.
 Burt, Carolyn S., to United States of America, Army. Television test signal generator. H393, 12-1-87, Cl. 358-139.000.
 Cadena, Edward R.: See—
 Kruka, Vitold R.; and Cadena, Edward R., H387, Cl. 367-154.000.
 Cleaton, Neil J., to United States of America, Navy. Flexible coupling device with electrical bonding for metallic ducts. H394, 12-1-87, Cl. 361-215.000.
 Danielson, Arnold O.: See—
 Dillinger, Robert B.; and Danielson, Arnold O., H384, Cl. 60-230.000.
 Dillinger, Robert B.; and Danielson, Arnold O., to United States of America, Navy. Stowable three-axis reaction-steering system. H384, 12-1-87, Cl. 60-230.000.
 Du Pont de Nemours, E. I., and Company: See—
 Alexander, Harry B., Jr., H379, Cl. 439-610.000.
 Levitt, George, H386, Cl. 71-92.000.
 Greig, Walter G., to Moore Business Forms, Inc. Releaseable adhesive pads. H377, 12-1-87, Cl. 281-2.000.
 Henriquez, Theodore A.; and Tims, Allan C., to United States of America, Navy. Piezoelectric polymer hydrophone. H391, 12-1-87, Cl. 367-159.000.
 Jones, Peter N.: See—
 Keown, William P.; and Jones, Peter N., H382, Cl. 102-517.000.
 Keown, William P.; and Jones, Peter N., to United States of America, Army. Long rod penetrator. H382, 12-1-87, Cl. 102-517.000.
 Kioritz Corporation: See—
 Matsumoto, Isao, H378, Cl. 30-382.000.
 Yokochi, Yoetsu, H380, Cl. 30-276.000.
 Kruka, Vitold R.; and Cadena, Edward R., to Shell Oil Company. Wavelength filter for marine seismic cables. H387, 12-1-87, Cl. 367-154.000.
 Lee, Robert E.; and Levy, Harold M., to United States of America, Air Force. Self-aligned gate MESFET and the method of fabricating same. H390, 12-1-87, Cl. 357-22.000.
 Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. H386, 12-1-87, Cl. 71-92.000.
 Levy, Harold M.: See—
 Lee, Robert E.; and Levy, Harold M., H390, Cl. 357-22.000.
 Lloyd, Joseph P., to Shell Oil Company. Apparatus and method for locating towed seismic floats. H388, 12-1-87, Cl. 367-19.000.
 Matsumoto, Isao, to Kioritz Corporation. Spiked bumper. H378, 12-1-87, Cl. 30-382.000.
 Moon, Lamar F., to United States of America, Air Force. Fluid refraction optical path phase correction. H389, 12-1-87, Cl. 372-58.000.
 Moore Business Forms, Inc.: See—
 Greig, Walter G., H377, Cl. 281-2.000.
 Nash, Thomas F., to United States of America, Army. Process for measuring the electrical properties of liquids and granular substances. H395, 12-1-87, Cl. 324-58.50B.
 Pounds, Stanley G.; and Ramer, Daniel, to United States of America, Army. Condition monitoring device. H381, 12-1-87, Cl. 374-142.000.
 Ramer, Daniel: See—
 Pounds, Stanley G.; and Ramer, Daniel, H381, Cl. 374-142.000.
 Shell Oil Company: See—
 Bol, Gerard M., H385, Cl. 252-8.510.
 Kruka, Vitold R.; and Cadena, Edward R., H387, Cl. 367-154.000.
 Lloyd, Joseph P., H388, Cl. 367-19.000.
 Skarika, John R., to United States of America, Energy. Laminated magnet field coil sheath. H383, 12-1-87, Cl. 29-599.000.
 Staehlin, John H., to United States of America, Air Force. Microwave waveguide manifold and method. H392, 12-1-87, Cl. 333-114.000.
 Tims, Allan C.: See—
 Henriquez, Theodore A.; and Tims, Allan C., H391, Cl. 367-159.000.
 United States of America
 Air Force: See—
 Lee, Robert E.; and Levy, Harold M., H390, Cl. 357-22.000.
 Moon, Lamar F., H389, Cl. 372-58.000.
 Staehlin, John H., H392, Cl. 333-114.000.
 Army: See—
 Bremer, James C., H376, Cl. 356-239.000.
 Burt, Carolyn S., H393, Cl. 358-139.000.
 Keown, William P.; and Jones, Peter N., H382, Cl. 102-517.000.
 Nash, Thomas F., H395, Cl. 324-58.50B.
 Pounds, Stanley G.; and Ramer, Daniel, H381, Cl. 374-142.000.
 Energy: See—
 Skarika, John R., H383, Cl. 29-599.000.
 Navy: See—
 Cleaton, Neil J., H394, Cl. 361-215.000.
 Dillinger, Robert B.; and Danielson, Arnold O., H384, Cl. 60-230.000.
 Henriquez, Theodore A.; and Tims, Allan C., H391, Cl. 367-159.000.
 Yokochi, Yoetsu, to Kioritz Corporation. Trimmer. H380, 12-1-87, Cl. 30-276.000.

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CLASSIFICATION OF PATENTS

ISSUED DECEMBER 1, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	304	4,709,486	CLASS 56	248	4,710,223	282	4,709,645	4,710,233
46	4,709,419	CLASS 34	13.6	4,709,540	CLASS 76	5	4,709,646	4,709,713
50	4,709,420	10	4,709,487	202	4,709,541	5	4,709,647	4,709,714
81	4,709,421	235	4,709,488	396	Re.32,551	267	4,709,648	4,709,716
180	4,709,422	CLASS 36	16	4,709,542	CLASS 81	363	4,709,649	4,709,717
228	4,709,423	27	4,709,489	57.18	4,709,599	375	4,709,650	CLASS 135
427	4,709,424	44	4,709,490	57.39	4,709,600	137 R	4,709,651	4,709,718
605	4,709,425	121	4,709,491	367	4,709,601	140	4,709,652	CLASS 136
661	4,709,426	CLASS 37	232	4,709,492	483	4,709,602	228	4,709,653
300.3	4,709,427	CLASS 40	274	4,709,547	CLASS 82	2.5	4,709,603	258 PC
427	4,709,428	117	4,709,493	280	4,709,548	4 C	4,709,604	4,710,589
481	4,709,430	152	4,709,494	295	4,709,549	CLASS 83	23	4,709,605
481	4,709,431	158 R	4,709,495	562	4,709,550	94	4,709,606	4,709,720
100	4,709,432	CLASS 42	70.11	4,709,496	589	4,709,551	342	4,709,722
437	4,710,198	75.02	4,709,497	600	4,709,552	355	4,709,607	4,709,723
507	4,710,199	CLASS 43	17	4,710,210	435.2	4,709,609	435.2	4,709,724
574	4,710,200	4	4,709,498	4,710,211	876	4,709,610	876	4,709,725
12.5	4,709,433	17.6	4,709,499	4,710,212	CLASS 84	1.22	4,709,611	4,709,726
77	4,709,434	24	4,709,500	4,710,213	314 N	4,709,612	314 N	4,709,727
73	4,709,435	42.24	4,709,501	4,710,214	413	4,709,613	413	4,709,728
79 R	4,709,436	112	4,709,502	4,709,554	CLASS 89	1.35	4,709,614	4,709,729
97 R	4,709,437	114	4,709,503	4,709,555	1.56	4,709,615	1.56	4,709,730
167 A	4,709,438	CLASS 44	63	4,710,201	26	4,709,616	26	4,709,731
230.16	4,709,439	CLASS 47	1.7	4,709,505	157	4,709,617	157	4,709,732
257.3	4,709,440	CLASS 48	73	4,710,202	CLASS 91	31	4,709,618	4,709,733
301	4,709,441	88	4,709,506	4,710,216	CLASS 92	130 D	4,709,619	4,709,734
320	4,709,442	CLASS 49	88	4,709,506	260	4,710,217	260	4,709,735
339	4,709,443	CLASS 51	7	4,709,507	31	4,710,218	31	4,709,736
31 A	4,709,444	165.71	4,709,508	4,709,561	CLASS 65	4.1	4,710,216	4,709,737
300	4,709,445	177	4,709,509	4,709,562	CLASS 66	8	4,709,561	4,709,738
1 F	4,709,447	216 R	4,709,511	4,709,563	CLASS 70	193	4,709,562	4,709,739
1 R	4,709,448	237 R	4,709,512	4,709,564	222	4,709,563	222	4,709,740
32	4,709,449	283 R	4,709,513	4,709,565	CLASS 71	11	4,710,219	4,710,235
49	4,709,450	436	4,709,515	4,709,566	CLASS 72	93	4,710,220	4,710,236
105	4,709,451	CLASS 52	11	4,709,516	CLASS 73	201	4,709,568	4,710,237
159 R	4,709,452	36	4,709,517	4,709,569	40.5 R	23	4,709,575	4,710,238
442	4,709,453	94	4,709,518	4,709,570	40.7	4,709,576	40.7	4,710,239
590	4,709,454	98	4,709,519	4,709,571	49.3	4,709,577	49.3	4,710,240
40	4,709,455	191	4,709,520	4,709,572	76	4,709,578	76	4,710,241
155 R	4,709,456	220	4,709,521	4,709,573	178 R	4,709,579	178 R	4,710,242
156.8 R	4,709,457	287	4,709,522	4,709,574	40.5 R	4,709,576	40.5 R	4,710,243
243.5	4,709,458	406	4,709,523	4,709,575	40.7	4,709,577	40.7	4,710,244
263	4,709,459	536	4,709,524	4,709,576	49.3	4,709,578	49.3	4,710,245
271	4,709,460	718.1	4,709,525	4,709,577	76	4,709,579	76	4,710,246
434	4,709,462	749	4,709,526	4,709,578	128	4,709,528	128	4,710,247
526.3	4,709,461	207	4,709,529	4,709,579	207	4,709,529	207	4,710,248
566.3	4,709,463	209	4,709,530	4,709,580	209	4,709,530	209	4,710,249
568	4,709,464	415	4,709,531	4,709,581	451	4,709,532	451	4,710,250
605	4,709,465	451	4,709,532	4,709,582	452	4,709,533	452	4,710,251
623	4,709,472	452	4,709,534	4,709,583	453	4,709,534	453	4,710,252
749	4,709,473	539	4,709,535	4,709,584	539	4,709,536	539	4,710,253
802	4,709,474	550	4,709,537	4,709,585	550	4,709,537	550	4,710,254
31	4,709,475	566	4,709,538	4,709,586	566	4,709,538	566	4,710,255
41	4,709,476	CLASS 54	23	4,709,539	CLASS 55	2	4,710,203	4,710,256
50	4,709,477	CLASS 55	16	4,710,204	CLASS 56	16	4,710,204	4,710,257
169	4,709,478	18.1	4,709,483	4,710,205	18.1	4,709,483	18.1	4,710,258
170	4,709,479	169 R	4,709,484	4,710,206	169 R	4,709,484	169 R	4,710,259
254	4,709,480	228	4,709,485	4,710,207	228	4,709,485	228	4,710,260
356	4,709,481	418	4,710,208	4,710,209	418	4,710,209	418	4,710,261
1 M	4,709,482	CLASS 57	13.6	4,709,540	CLASS 58	13.6	4,709,540	4,710,262
18.1	4,709,483	202	4,709,541	4,709,542	202	4,709,541	202	4,710,263
169 R	4,709,484	396	Re.32,551	4,709,543	396	Re.32,551	396	4,710,264
228	4,709,485	CLASS 59	16	4,709,542	CLASS 60	274	4,709,547	4,710,265
		218	4,709,544	4,709,545	218	4,709,544	218	4,710,266
		39.08	4,709,545	4,709,546	39.08	4,709,545	39.08	4,710,267
		39.29	4,709,546	4,709,547	39.29	4,709,546	39.29	4,710,268
		280	4,709,548	4,709,548	280	4,709,548	280	4,710,269
		295	4,709,549	4,709,549	295	4,709,549	295	4,710,270
		562	4,709,550	4,709,550	562	4,709,550	562	4,710,271
		589	4,709,551	4,709,551	589	4,709,551	589	4,710,272
		600	4,709,552	4,709,552	600	4,709,552	600	4,710,273
		480	4,709,553	4,710,210	480	4,709,553	480	4,710,274
		508	4,709,554	4,710,211	508	4,709,554	508	4,710,275
		532	4,710,215	4,710,212	532	4,710,215	532	4,710,276
		4.1	4,710,216	4,710,213	4.1	4,710,216	4.1	4,710,277
		31	4,710,217	4,710,214	31	4,710,217	31	4,710,278
		260	4,710,218	4,709,555	260	4,710,218	260	4,710,279
		11	4,710,219	4,709,556	11	4,710,219	11	4,710,280
		67	4,710,220	4,709,557	67	4,710,220	67	4,710,281
		93	4,710,221	4,709,558	93	4,710,221	93	4,710,282
		201	4,709,568	4,709,559	201	4,709,568	201	4,710,283
		340	4,709,569	4,709,560	340	4,709,569	340	4,710,284
		365	4,709,570	4,709,561	365	4,709,570	365	4,710,285
		366	4,709,571	4,709,562	366	4,709,571	366	4,710,286
		379	4,709,572	4,709,563	379	4,709,572	379	4,710,287
		405	4,709,573	4,709,564	405	4,709,573	405	4,710,288
		23	4,709,575	4,709,565	23	4,709,575	23	4,710,289
		40.5 R	4,709,576	4,709,566	40.5 R	4,709,576	40.5 R	4,710,290
		40.7	4,709,577	4,709,567	40.7	4,709,577	40.7	4,710,291
		49.3	4,709,578	4,709,568	49.3	4,709,578	49.3	4,710,292
		76	4,709,579	4,709,569	76	4,709,579	76	4,710,293
		178 R	4,709,580	4,709,570	178 R	4,709,580	178 R	4,710,294
		202	4,709,581	4,709,571	202	4,709,581	202	4,710,295
		622	4,709,582	4,709,572	622	4,709,582	622	4,710,296
		861.17	4,709,583	4,709,573	861.17	4,709,583	861.17	4,710,297
		864.44	4,709,584	4,709,574	864.44	4,709,584	864.44	4,710,298
		866.4	4,709,585	4,709,575	866.4	4,709,585	866.4	4,710,299
		CLASS 74	5.12	4,709,586	CLASS 75	15.63	4,709,587	4,710,300
		103	4,709,587	4,709,588	103	4,709,587	103	4,710,301
		206	4,709,588	4,709,589	206	4,709,588	206	4,710,302
		331	4,709,589	4,709,590	331	4,709,589	331	4,710,303
		422	4,709,590	4,709,591	422	4,709,590	422	4,710,304
		493	4,709,591	4,709,592	493	4,709,591	493	4,710,305
		498	4,709,592	4,709,593	498	4,709,592	498	4,710,306
		753	4,709,594	4,709,595	753	4,709,594	753	4,710,307
		864	4,709,595	4,709,596	864	4,709,595	864	4,710,308
		868	4,709,596	4,709,597	868	4,709,596	868	4,710,309
		84.1 R	4,710,222	4,709,644	84.1 R	4,710,222	84.1 R	4,709,645
		237	4,709,644	4,709,645	237	4,709,644	237	4,709,646
		511	4,709,645	4,709,646	511	4,709,645	511	4,709,647
		21.5	4,709,646	4,709,647	21.5	4,709,646	21.5	4,709,648
		336	4,709,647	4,709,648	336	4,709,647	336	4,709,649
		51	4,709,648	4,709,649	51	4,709,648	51	4,709,650
		102	4,709,649	4,709,650	102	4,709,649	102	4,709,651
		111	4,709,650	4,709,651	111	4,709,650	111	4,709,652
		306	4,709,651	4,709,652	306	4,709,651	306	4,709,653
		308	4,709,652	4,709,653	308	4,709,652	308	4,709,654
		336	4,709,653	4,709,654	336	4,709,653	336	4,709,655
		7	4,709,654	4,710,232	7	4,709,654	7	4,710,233
		1	4,710,232	4,709,706	1	4,710,232	1	4,709,707
		5	4,709,706	4,709,707	5	4,709,706	5	4,709,708
		276	4,709,707	4,709,708	276	4,709,707	276	4,709,709
		302	4,709,708	4,709,709	302	4,709,708	302	4,709,710
		306	4,709,709	4,709,710	306	4,709,709	306	4,709,711
		308	4,709,710	4,709,711	308	4,709,710	308	4,709,712
		336	4,709,711	4,709,712	3			

35	4,709,741	61.85	4,710,599	120	4,709,842	461.2	4,710,635	405 R	4,709,940	729	4,710,692
76.1	4,709,742	291	4,710,600	156	4,709,843	467.1	4,710,636	461 A	4,709,941		
463	4,709,743	302.3	4,710,601			468.1	4,710,637		4,709,942	CLASS 320	
472	4,709,744	315	4,710,602	CLASS 228		492.1	4,710,638	751	4,709,943	2	4,710,693
484	4,709,745	501.15	4,710,621	3.1	4,709,844	492.2	4,710,639	777	4,709,944	21	4,710,694
485	4,709,746			17	4,709,845		4,710,640				4,710,695
487	4,709,747	CLASS 202		34	4,709,846	554	4,710,641	CLASS 285		CLASS 323	
488	4,709,748	205	4,710,272	49.1	4,709,847	571	4,710,642	4	4,709,945	223	4,710,696
503	4,709,749	CLASS 203		159	4,709,848	573	4,710,643	55	4,709,946	239	4,710,697
		CLASS 165		246	4,709,849			130	4,709,947	324	4,710,698
10	4,709,750	29	4,710,273	CLASS 229		5	4,709,900	381	4,709,948		
17	4,709,751	51	4,710,275	73	4,709,850	58	4,709,901			CLASS 324	
47	4,709,752	CLASS 204		87 B	4,709,851	315	4,709,902	6	4,709,949	58.5 A	4,710,700
125	4,709,753	9	4,710,276	119	4,709,852			92	4,709,950	61 P	4,710,701
133	4,709,754	119	4,710,277	39	4,709,853	8,551	4,710,306	189	4,709,951	73 R	4,710,702
160	4,709,755	129	4,710,278	CLASS 232		18	4,710,307	82.14	4,709,952	79 R	4,710,703
162	4,709,756	129.55	4,710,279	CLASS 235		42.7	4,710,308	106	4,709,953	106	4,710,704
173	4,709,757	181.7	4,710,281	380	4,710,613	62	4,710,309	142	4,709,954	146	4,710,705
		228	4,710,282	454	4,710,614	62.2	4,710,310	CLASS 296		158 F	4,710,706
120	4,709,758	298	4,710,283	472	4,710,615	62.9	4,710,311	207	4,710,707	207	4,710,708
275	4,709,759	CLASS 206		487	4,710,616	68	4,710,312	3	4,709,955	220	4,710,709
285	4,709,760	158	4,709,808	CLASS 236		105	4,710,313	100	4,709,956	221	4,710,710
324	4,709,762	162	4,709,809	20 R	4,709,834	299.63	4,710,314	146	4,709,957	222	4,710,711
387	4,709,761	205	4,709,810	CLASS 237		609	4,710,315	217	4,709,958	227	4,710,712
		254	4,709,811	12.3 A	4,709,855	628	4,710,316	307	4,709,959	303	4,710,713
26	4,709,763	310	4,709,812	CLASS 238		646	4,710,317	CLASS 297		307	4,710,714
45	4,709,764	312	4,709,813	10 E	4,709,856	CLASS 260		250	4,709,960	309	4,710,715
119	4,709,765	315.3	4,709,814	CLASS 239		378	4,710,320	284	4,709,961	318	4,710,716
		387	4,709,815	CLASS 241		511	4,710,322	301	4,709,962	530	4,710,720
35 GC	4,710,590	444	4,709,816	10 E	4,709,856	543 R	4,710,323	316	4,709,963		
68.5	4,710,591	523	4,709,817	CLASS 242		354	4,709,964	354	4,709,964	109	4,710,721
88 R	4,710,593	524.8	4,709,818	164	4,709,857	366	4,709,965	473	4,709,966	234	4,710,722
120 SR	4,710,594	17	4,710,284	296	4,709,858	473	4,709,966	CLASS 301		192	4,710,723
		166	4,710,285	525	4,709,859	112	4,710,324	104	4,710,721	CLASS 328	
52	4,709,766	250	4,710,286	654	4,709,860	112	4,710,324	234	4,710,722		
65	4,709,767	270	4,710,287	675	4,709,861	CLASS 264		37 P	4,709,967	CLASS 329	
296	4,709,768	534	4,709,820	CLASS 241		1.7	4,710,327	6 C	4,709,968	CLASS 330	
		111	4,710,288	23	4,709,862	3.1	4,710,328	114	4,709,969	9	4,710,724
1	4,709,769	198.2	4,710,289	69	4,709,863	25	4,710,329	CLASS 307		51	4,710,725
50	4,709,770	199	4,710,290	167	4,709,864	41	4,710,330	95	4,710,726	69	4,710,726
		218	4,710,291	169.1	4,709,865	60	4,710,331	115	4,710,727	110	4,710,727
18	4,710,595	225	4,710,292	18 A	4,709,866	73	4,710,332	116	4,710,728	252	4,710,728
CLASS 178		232	4,710,293	56 R	4,709,867	102	4,710,333	297	4,710,729	96	4,710,729
CLASS 180		233	4,710,294	68	4,709,868	105	4,710,334	443	4,710,730	116 FE	4,710,730
6.5	4,709,771	236	4,710,295	68.3	4,709,870	171	4,710,335	451	4,710,731	158	4,710,731
8.2	4,709,772	237	4,710,296	75.43	4,709,871	509	4,710,336	452	4,710,732	7.51	4,710,732
9.32	4,709,773	238	4,710,297	195	4,709,872	227	4,710,337	491	4,710,733	26	4,710,733
229	4,709,774	239	4,710,298	220	4,709,873	250	4,710,338	518	4,710,734	101	4,710,734
233	4,709,775	240	4,710,299	673 R	4,709,874	250	4,710,339	601	4,710,735	175	4,710,735
281	4,709,776	241	4,710,300	CLASS 244		270	4,710,340	601	4,710,736	241	4,710,736
286	4,709,777	242	4,710,301	18 A	4,709,866	102	4,710,341	443	4,710,737	172	4,710,738
292	4,709,778	243	4,710,302	56 R	4,709,867	105	4,710,342	451	4,710,738	174	4,710,739
300	4,709,779	244	4,710,303	68	4,709,870	509	4,710,343	452	4,710,739	248	4,710,740
		245	4,710,304	68.3	4,709,871	509	4,710,344	453	4,710,740	296	4,710,741
213	4,709,780	246	4,710,305	75.43	4,709,872	227	4,710,345	491	4,710,741	323	4,710,742
290	4,709,781	247	4,710,306	195	4,709,873	250	4,710,346	518	4,710,742	380	4,710,743
CLASS 181		248	4,710,307	673 R	4,709,874	250	4,710,347	601	4,710,743		
CLASS 182		249	4,710,308	CLASS 245		270	4,710,348			CLASS 331	
3	4,709,782	250	4,710,309	18 A	4,709,866	102	4,710,349	443	4,710,744	172	4,710,744
8	4,709,783	251	4,710,310	56 R	4,709,867	105	4,710,350	451	4,710,745	174	4,710,745
16	4,709,784	252	4,710,311	68	4,709,870	509	4,710,351	452	4,710,746	248	4,710,746
CLASS 184		253	4,710,312	68.3	4,709,871	509	4,710,352	491	4,710,747	296	4,710,747
6.4	4,709,785	254	4,710,313	75.43	4,709,872	227	4,710,353	491	4,710,748	323	4,710,748
CLASS 187		255	4,710,314	195	4,709,873	250	4,710,354	518	4,710,749	380	4,710,749
9 E	4,709,786	256	4,710,315	673 R	4,709,874	250	4,710,355	601	4,710,750		
36	4,709,787	257	4,710,316	CLASS 246		270	4,710,356			CLASS 332	
124	4,709,788	258	4,710,317	18 A	4,709,866	102	4,710,357	443	4,710,751	172	4,710,751
		259	4,710,318	56 R	4,709,867	105	4,710,358	451	4,710,752	174	4,710,752
CLASS 188		260	4,710,319	68	4,709,870	509	4,710,359	452	4,710,753	248	4,710,753
73.44	4,709,789	261	4,710,320	68.3	4,709,871	509	4,710,360	491	4,710,754	296	4,710,754
300	4,709,790	262	4,710,321	75.43	4,709,872	227	4,710,361	491	4,710,755	323	4,710,755
315	4,709,791	263	4,710,322	195	4,709,873	250	4,710,362	518	4,710,756	380	4,710,756
		264	4,710,323	673 R	4,709,874	250	4,710,363	601	4,710,757		
CLASS 192		265	4,710,324	CLASS 247		270	4,710,364			CLASS 333	
0.044	4,709,792	266	4,710,325	18 A	4,709,866	102	4,710,365	443	4,710,758	172	4,710,758
4 A	4,709,793	267	4,710,326	56 R	4,709,867	105	4,710,366	451	4,710,759	174	4,710,759
18 B	4,709,794	268	4,710,327	68	4,709,870	509	4,710,367	452	4,710,760	248	4,710,760
106 F	4,709,795	269	4,710,328	68.3	4,709,871	509	4,710,368	491	4,710,761	296	4,710,761
106.1	4,709,796	270	4,710,329	75.43	4,709,872	227	4,710,369	491	4,710,762	323	4,710,762
106.2	4,709,797	271	4,710,330	195	4,709,873	250	4,710,370	518	4,710,763	380	4,710,763
		272	4,710,331	673 R	4,709,874	250	4,710,371	601	4,710,764		
CLASS 198		273	4,710,332	CLASS 248		270	4,710,372			CLASS 334	
380	4,709,798	274	4,710,333	18 A	4,709,866	102	4,710,373	443	4,710,765	172	4,710,765
412	4,709,799	275	4,710,334	56 R	4,709,867	105	4,710,374	451	4,710,766	174	4,710,766
459	4,709,800	276	4,710,335	68	4,709,870	509	4,710,375	452	4,710,767	248	4,710,767
464.2	4,709,801	277	4,710,336	68.3	4,709,871	509	4,710,376	491	4,710,768	296	4,710,768
465.1	4,709,802	278	4,710,337	75.43	4,709,872	227	4,710,377	491	4,710,769	323	4,710,769
468.2	4,709,803	279	4,710,338	195	4,709,873	250	4,710,378	518	4,710,770	380	4,710,770
719	4,709,804	280	4,710,339	673 R	4,709,874	250	4,710,379	601	4,710,771		
750	4,709,805	281	4,710,340	CLASS 249		270	4,710,380			CLASS 335	
819	4,709,806	282	4,710,341	18 A	4,709,866	102	4,710,381	443	4,710,772	172	4,710,772
853	4,709,807	283	4,710,342	56 R	4,709,867	105	4,710,382	451	4,710,773	174	4,710,773
		284	4,710,343	68	4,709,870	509	4,710,383	452	4,710,774	248	4,710,774
CLASS 200		285	4,710,344	68.3	4,709,871	509	4,710,384	491	4,710,775	296	4,710,775
5 A	4,710,597	286	4,710,345	75.43	4,709,872	227	4,710,385	491	4,710,776	323	4,710,776
21	4,710,598	287	4,710,346	195	4,709,873	250	4,710,386	518	4,710,777	380	4,710,777

CLASSIFICATION OF PATENTS

457	4,710,137		256	4,710,501	394	4,710,533	16.5	4,710,565	
581	4,710,138	CLASS 493	259	4,710,502	411	4,710,534	28	4,710,566	CLASS 604
668	4,710,139	1	263	4,710,503	413	4,710,535	119	4,710,567	51
733	4,710,140	213	267	4,710,504	493	4,710,536			65
		328	278	4,710,505	549	4,710,537		CLASS 540	66
			301	4,710,506					67
CLASS 440			312	4,710,507	CLASS 525		350	4,710,568	81
61	4,710,141		357	4,710,508	53	4,710,538		CLASS 544	93
83	4,710,142		384	4,710,509	59	4,710,539	31	4,710,569	99
			394	4,710,510	101	4,710,540			104
CLASS 441			411	4,710,511	104	4,710,541	216	4,710,571	110
65	4,710,143		431	4,710,512	127	4,710,542	267	4,710,572	117
79	4,710,144		460	4,710,513	161	4,710,543			118
			485	4,710,514	194	4,710,544		CLASS 546	168
CLASS 446			563	4,710,515	340	4,710,545	199	4,710,573	175
100	4,710,145		594	4,710,516	420	4,710,546			177
308	4,710,146		616	4,710,517	437	4,710,547		CLASS 548	209
464	4,710,147		624	4,710,518	439	4,710,548	533	4,710,574	211
476	4,710,148		629	4,710,519	538	4,710,549			239
								CLASS 556	280
CLASS 455				CLASS 521			1	4,710,575	339
67	4,710,149		55	4,710,520	60	4,710,550	40	4,710,576	344
113	4,710,150		118	4,710,521	91	4,710,551	137	4,710,577	368
179	4,710,151		138	4,710,522	116	4,710,552			372
			20	4,710,316	142	4,710,553		CLASS 558	383
180	4,710,152		CLASS 514		180	4,710,554	4	4,710,578	385 A
190	4,710,153		14	4,710,523	240	4,710,555	86	4,710,580	
276	4,710,154	6	75	4,710,524	273	4,710,556	169	4,710,579	
601	4,710,155	18			289	4,710,557			385 R
603	4,710,156	25		CLASS 523				CLASS 560	389
		42	201	4,710,525	CLASS 528		20	4,710,581	897
CLASS 464		50			14	4,710,558	35	4,710,582	
	4,710,150	56		CLASS 524	15	4,710,559	40	4,710,583	CLASS 623
		143	5	4,710,526	67	4,710,560	51	4,710,584	1
CLASS 474		174	98	4,710,527	111	4,710,561	64	4,710,585	6
28	4,710,151	183	100	4,710,528	125	4,710,562	68	4,710,586	
166	4,710,152	221	139	4,710,529	501	4,710,563			
211	4,710,153	242	142	4,710,530					4,710,195
242	4,710,154	247	239	4,710,531	CLASS 536		CLASS 568		4,710,196
260	4,710,155	254	310	4,710,532	6.4	4,710,564	454	4,710,587	4,710,197

CLASSIFICATION OF DESIGNS

D1—	122	292,940	470	292,951	136	292,972	32	292,990	191	293,007		31	293,024	
D2—	314	292,941	475	292,957	317	292,973	75	292,992	199	293,008	D25—	129	293,025	
		292,942	522	292,958	D13—	40	292,974	78	292,991	293,009	D26—	24	293,026	
		292,943	D7—	103	292,959	D14—	65	292,975	D20—	5	292,993	227	293,010	
		292,944	137	292,960		94	292,976	10	292,995	237	293,011	26	293,027	
		292,945	309	292,961		111	292,977	20	292,994		51	293,028		
	320	292,946	D8—	50	292,962	D15—	7	292,978	42	292,996		60	293,029	
D3—	10	292,947		51	292,963		16	292,980	D21—	5	292,997	D22—	118	293,013
D4—	104	292,948		344	292,964		199	292,981		37	292,998		123	293,014
	116	292,949	D9—	370	292,968	D16—	46	292,982			292,999		129	293,015
D5—	61	293,039		418	292,965		102	292,983		65	293,000	D23—	209	293,016
D6—	356	292,950		436	292,966			292,984		87	293,001		212	293,017
	388	292,952		439	292,967			292,985			293,002		226	293,018
	405	292,953	D10—	46.1	292,969		107	292,986		91	293,003		301	293,019
	409	292,954		75	292,979	D17—	18	292,987		158	293,004		332	293,020
	292,955		D12—	3	292,970	D18—	27	292,988		160	293,005		354	293,022
	449	292,956		37	292,971	D19—	26	292,989		168	293,006	D24—	17	293,023

CLASSIFICATION OF PLANTS

P.—	45	6,047	68	6,048	72	6,049	74	6,050	79	6,051	80	6,052
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STATUTORY INVENTION REGISTRATIONS

29—	599	H383	71—	92	H386	324—	58.5 B	H395	357—	22	H390	367—	19	H388	372—	58	H389
30—	276	H380	102—	517	H382	333—	114	H392	358—	139	H393		154	H387	374—	142	H381
	382	H378	252—	8.51	H385	356—	239	H376	361—	215	H394		159	H391	439—	610	H379
60—	230	H384	281—	2	H377												

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,709,659	4,710,036	4,710,745	4,710,527	4,709,830	4,710,466
	4,709,860	4,710,045	4,710,747	4,710,544	4,709,841	4,710,602
	4,709,876	4,710,048	4,710,750	4,710,572	4,709,853	4,710,623
	4,710,057	4,710,049	4,710,751	4,710,576	4,709,889	4,710,852
	4,710,912	4,710,053	4,710,756	4,709,503	4,709,891	4,710,892
02 :	4,710,054	4,710,068	4,710,757	4,709,420	4,709,897	4,710,954
04 :	4,709,440	4,710,100	4,710,774	4,709,431	4,709,929	4,709,447
	4,709,506	4,710,102	4,710,813	4,709,527	4,709,950	4,709,896
	4,709,577	4,710,124	4,710,841	4,709,603	4,710,021	4,709,924
	4,709,722	4,710,145	4,710,851	4,709,635	4,710,089	4,710,598
	4,709,764	4,710,163	4,710,872	4,709,649	4,710,130	4,709,520
	4,709,801	4,710,170	4,710,893	4,709,692	4,710,133	4,709,618
	4,709,855	4,710,172	4,710,919	4,709,706	4,710,140	4,709,851
	4,709,879	4,710,176	4,710,922	4,709,925	4,710,141	Re. 32,551
	4,710,419	4,710,179	4,710,924	4,709,928	4,710,146	4,709,721
	4,710,728	4,710,201	4,710,927	4,710,050	4,710,157	4,710,295
	4,710,767	4,710,223	4,710,935	4,710,056	4,710,171	4,710,676
	4,710,793	4,710,235	4,710,940	4,710,364	4,710,173	4,709,501
06 :	Re. 32,552	4,710,254	4,710,970	4,710,469	4,710,182	4,709,515
	4,709,441	4,710,272	4,709,367	4,710,495	4,710,278	4,709,538
	4,709,464	4,710,279	4,709,385	4,710,521	4,710,285	4,709,599
	4,709,467	4,710,324	4,709,654	4,710,663	4,710,308	4,709,727
	4,709,475	4,710,332	4,709,719	4,710,723	4,710,350	4,709,760
	4,709,483	4,710,339	4,709,815	4,710,800	4,710,357	4,710,273
	4,709,493	4,710,360	4,709,838	4,709,419	4,710,391	4,710,306
	4,709,502	4,710,367	4,709,873	4,709,471	4,710,447	4,710,366
	4,709,566	4,710,388	4,709,919	4,709,494	4,710,534	4,710,369
	4,709,580	4,710,401	4,710,370	4,709,576	4,710,601	4,710,380
	4,709,602	4,710,433	4,710,956	4,709,734	4,710,657	4,710,549
	4,709,612	4,710,441	4,709,461	4,709,975	4,710,669	4,710,581
	4,709,643	4,710,442	4,709,477	4,710,031	4,710,670	4,709,484
	4,709,655	4,710,448	4,709,545	4,710,067	4,710,707	4,709,622
	4,709,660	4,710,473	4,709,617	4,710,185	4,710,724	4,709,652
	4,709,665	4,710,477	4,709,664	4,710,385	4,710,730	4,709,814
	4,709,758	4,710,483	4,709,679	4,710,396	4,710,742	4,709,881
	4,709,766	4,710,485	4,709,749	4,710,415	4,710,759	4,709,922
	4,709,780	4,710,486	4,709,923	4,709,883	4,710,820	4,709,987
	4,709,817	4,710,497	4,710,097	4,709,450	4,710,840	4,710,076
	4,709,822	4,710,548	4,710,465	4,709,460	4,710,873	4,710,348
	4,709,825	4,710,588	4,710,492	4,709,465	4,710,926	4,710,467
	4,709,826	4,710,618	4,710,537	4,709,473	4,710,945	4,710,472
	4,709,839	4,710,624	4,710,542	4,709,485	4,710,957	4,710,560
	4,709,863	4,710,625	4,710,749	4,709,489	4,710,968	4,710,566
	4,709,865	4,710,635	4,710,752	4,709,504	4,709,556	4,710,583
	4,709,882	4,710,660	4,710,844	4,709,507	4,709,658	4,710,638
	4,709,886	4,710,666	4,710,882	4,709,575	4,709,699	4,710,656
	4,709,939	4,710,686	4,710,883	4,709,634	4,709,869	4,710,890
	4,709,940	4,710,691	4,710,920	4,709,665	4,709,958	4,709,429
	4,709,954	4,710,699	4,709,466	4,709,767	4,710,075	4,708,453
	4,709,996	4,710,708	4,709,608	4,709,784	4,710,309	4,709,476
	4,710,001	4,710,714	4,710,221	4,709,795	4,710,351	4,709,514
	4,710,025	4,710,733	4,710,408	4,709,812	4,710,395	4,709,542
	4,710,027	4,710,734	4,710,513	4,709,823	4,710,464	4,709,662

4,709,663	4,710,190	35 :	4,710,977	4,710,801	4,709,956	4,710,303
4,709,824	4,710,205		4,709,428	4,710,889	4,709,973	4,710,326
4,709,831	4,710,228		4,710,035	4,709,421	4,710,071	4,710,327
4,709,840	4,710,403		4,710,222	4,709,423	4,710,080	4,710,328
4,709,918	4,710,414		4,710,642	4,709,437	4,710,128	4,710,362
4,709,986	4,710,475		4,710,934	4,709,443	4,710,134	4,710,407
4,710,002	4,710,515	36 :	4,709,424	4,709,499	4,710,252	4,710,429
4,710,020	4,710,744		4,709,478	4,709,523	4,710,262	4,710,482
4,710,319	4,710,754		4,709,533	4,709,569	4,710,340	4,710,540
4,710,341	28 : 4,709,648		4,709,560	4,709,574	4,710,368	4,710,563
4,710,425	4,709,698		4,709,605	4,709,723	4,710,377	4,710,586
4,710,462	4,710,177		4,709,613	4,709,724	4,710,393	4,710,593
4,710,490	29 : 4,709,519		4,709,694	4,709,800	4,710,399	4,710,644
4,710,539	4,709,623		4,709,704	4,709,806	4,710,417	4,710,711
4,710,630	4,709,746		4,709,705	4,709,808	4,710,437	4,710,712
4,710,649	4,709,753		4,709,720	4,709,848	4,710,504	4,710,715
4,710,674	4,710,037		4,709,751	4,709,926	4,710,580	4,710,732
4,710,679	4,710,120		4,709,791	4,709,947	4,710,589	4,710,763
4,710,772	4,710,158		4,709,798	4,710,038	4,710,591	4,710,799
4,710,824	4,710,204		4,709,818	4,710,077	4,710,606	4,710,866
4,710,877	4,710,325		4,709,850	4,710,085	4,710,662	4,710,886
4,710,903	4,710,610		4,709,858	4,710,095	4,710,665	4,710,902
4,710,916	30 : 4,709,829		4,709,893	4,710,098	4,710,739	4,710,906
4,710,959	4,710,274		4,709,971	4,710,175	4,710,758	4,710,917
4,710,966	4,710,275		4,709,972	4,710,189	4,710,917	4,710,931
26 : 4,709,444	31 : 4,709,446		4,710,040	4,710,193	4,710,778	4,710,931
4,709,488	4,709,541		4,710,047	4,710,261	4,710,819	4,710,943
4,709,492	4,709,601		4,710,127	4,710,286	4,710,843	4,710,948
4,709,517	4,709,750		4,710,149	4,710,344	4,710,880	4,710,948
4,709,590	4,710,115		4,710,191	4,710,411	4,710,955	4,710,949
4,709,697	4,710,382		4,710,194	4,710,416	4,710,969	4,709,718
4,709,738	4,710,567		4,710,195	4,710,474	4,710,969	4,710,232
4,709,776	32 : 4,709,689		4,710,197	4,710,484	4,710,030	4,710,293
4,709,777	33 : 4,709,433		4,710,212	4,710,533	4,710,174	4,710,616
4,709,782	4,709,970		4,710,217	4,710,574	4,709,452	4,710,110
4,709,802	4,710,118		4,710,225	4,710,582	4,709,532	4,709,427
4,709,803	4,710,426		4,710,247	4,710,615	4,709,536	4,709,430
4,709,804	4,710,891	34 :	4,710,258	4,710,641	4,709,561	4,709,653
4,709,894	4,709,516		4,710,282	4,710,706	4,709,579	4,709,717
4,709,951	4,709,535		4,710,352	4,710,743	4,709,909	4,709,837
4,710,005	4,709,587		4,710,386	4,710,771	4,710,719	4,709,913
4,710,079	4,709,707		4,710,430	4,710,871	4,709,456	4,710,131
4,710,108	4,709,713		4,710,449	4,709,755	4,709,526	4,710,181
4,710,126	4,709,745		4,710,452	4,710,305	4,709,573	4,710,478
4,710,137	4,709,759		4,710,458	4,710,946	4,709,828	4,710,522
4,710,164	4,709,763		4,710,489	4,709,432	4,709,890	4,710,550
4,710,227	4,709,849		4,710,524	4,709,496	4,709,462	4,710,710
4,710,239	4,709,908		4,710,557	4,709,498	4,709,468	4,710,941
4,710,249	4,709,978		4,710,568	4,709,500	4,709,481	53 : 4,709,647
4,710,405	4,709,980		4,710,575	4,709,805	4,709,486	4,709,952
4,710,410	4,710,186		4,710,596	4,710,304	4,709,505	4,710,169
4,710,508	4,710,283		4,710,636	4,710,647	4,709,525	4,710,271
4,710,519	4,710,292		4,710,637	4,710,942	4,709,589	4,710,343
4,710,543	4,710,371		4,710,643	4,709,435	4,709,598	4,710,775
4,710,559	4,710,376		4,710,653	4,709,436	4,709,604	54 : 4,709,661
4,710,565	4,710,390		4,710,664	4,709,495	4,709,610	4,710,064
4,710,609	4,710,404		4,710,681	4,709,522	4,709,624	4,710,296
4,710,634	4,710,439		4,710,694	4,709,524	4,709,693	4,710,587
4,710,786	4,710,440		4,710,703	4,709,607	4,709,712	4,709,449
4,710,858	4,710,457		4,710,725	4,709,625	4,709,725	4,709,458
4,710,879	4,710,502		4,710,726	4,709,631	4,709,726	4,709,474
4,710,888	4,710,511		4,710,769	4,709,632	4,709,729	4,709,479
4,710,899	4,710,520		4,710,781	4,709,633	4,709,761	4,709,518
27 : 4,709,422	4,710,530		4,710,783	4,709,702	4,709,762	4,709,895
4,709,442	4,710,538		4,710,785	4,709,715	4,709,810	4,709,961
4,709,445	4,710,545		4,710,808	4,709,716	4,709,833	4,709,963
4,709,513	4,710,555		4,710,861	4,709,733	4,709,880	4,710,055
4,709,638	4,710,562		4,710,864	4,709,740	4,709,933	4,710,107
4,709,660	4,710,573		4,710,868	4,709,747	4,709,946	4,710,187
4,709,703	4,710,605		4,710,876	4,709,748	4,710,058	4,710,280
4,709,771	4,710,650		4,710,885	4,709,756	4,710,059	4,710,334
4,709,813	4,710,675		4,710,939	4,709,757	4,710,061	4,710,381
4,709,834	37 : 4,710,697		4,709,426	4,709,785	4,710,082	4,710,445
4,709,852	4,710,709		4,709,439	4,709,861	4,710,142	4,710,468
4,709,884	4,710,727		4,709,641	4,709,888	4,710,162	4,710,476
4,709,921	4,710,760		4,709,645	4,709,901	4,710,166	4,710,692
4,709,955	4,710,761		4,709,691	4,709,903	4,710,180	4,710,717
4,710,004	4,710,846		4,709,819	4,709,907	4,710,207	4,710,740
4,710,073	4,710,870		4,709,906	4,709,914	4,710,214	4,710,777
4,710,138	4,710,929		4,710,927	4,709,927	4,710,226	56 : 4,709,657
4,710,165	4,710,944		4,710,532	4,709,953	4,710,260	4,709,916

DESIGN PATENTS

04 :	292,940	09 :	293,026	292,978	34 :	292,947	292,968	44 :	293,038
05 :	293,028		293,029	293,003		292,962	292,974		292,952
06 :	292,950	10 :	293,013	293,014		293,008	292,997	45 :	293,031
	292,967	12 :	293,011	292,992	18 :	293,024	292,997	50 :	292,964
	292,969		293,023	293,035	19 :	293,035	292,991	51 :	292,953
	292,973	13 :	292,954	293,015	36 :	292,966	292,942		293,005
	292,979		292,955	293,027		292,991	292,943		293,036
	292,987		292,993	292,988	25 :	293,000	292,944		293,036
	292,995		293,006	292,989		293,017	292,945	53 :	292,958
	293,012		293,025	293,016		293,030	292,946	55 :	292,986
08 :	292,996	17 :	292,961	293,037	39 :	292,948	293,007		293,018

PLANT PATENTS

06 :	6,050	6,051	6,052			
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STATUTORY INVENTION REGISTRATIONS

01 :	H393	H389	12 :	H391	29 :	H394	36 :	H377	48 :	H387
	H395	H390	24 :	H376	34 :	H381		H383		
06 :	H384	H386		H392		H382	42 :	H379		H388

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Vol. 1085 Number 2

OFFICIAL GAZETTE

of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 8, 1987

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and
Commissioner of Patents
and Trademarks.

June 2, 1987.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on December 4, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,485,489 through 4,486,900
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

DECEMBER 8, 1987

U.S. PATENT AND TRADEMARK OFFICE

1085 OG 13

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . \$ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (\$1.9(f)) \$ 225.00
By other than a small entity \$ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 \$ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (\$1.9(f)) \$ 55.00
By other than a small entity \$ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable \$ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 20, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,404,689	06/219,138	9/20/83
4,404,695	06/330,682	9/20/83
4,404,699	06/294,389	9/20/83
4,404,700	06/342,713	9/20/83
4,404,701	06/341,531	9/20/83
4,404,705	06/250,610	9/20/83
4,404,711	06/294,003	9/20/83

4,404,716	06/405,993	9/20/83
4,404,734	06/404,239	9/20/83
4,404,742	06/281,039	9/20/83
4,404,751	06/358,840	9/20/83
4,404,752	06/270,083	9/20/83
4,404,753	06/330,966	9/20/83
4,404,757	06/263,256	9/20/83
4,404,761	06/280,747	9/20/83
4,404,762	06/346,506	9/20/83
4,404,764	06/291,114	9/20/83
4,404,766	06/262,902	9/20/83
4,404,788	06/241,347	9/20/83
4,404,809	06/401,374	9/20/83
4,404,817	06/352,184	9/20/83
4,404,818	06/417,993	9/20/83
4,404,819	06/398,745	9/20/83
4,404,822	06/265,041	9/20/83
4,404,824	06/231,777	9/20/83
4,404,826	06/269,839	9/20/83
4,404,832	06/348,034	9/20/83
4,404,833	06/305,632	9/20/83
4,404,835	06/304,327	9/20/83
4,404,839	06/232,366	9/20/83
4,404,840	06/264,687	9/20/83
4,404,842	06/368,538	9/20/83
4,404,857	06/303,215	9/20/83
4,404,868	06/385,074	9/20/83
4,404,878	06/247,576	9/20/83
4,404,879	06/357,021	9/20/83
4,404,881	06/294,326	9/20/83
4,404,883	06/226,117	9/20/83
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4,405,019	06/299,358	9/20/83
4,405,022	06/310,548	9/20/83
4,405,025	06/302,623	9/20/83
4,405,034	06/334,130	9/20/83
4,405,041	06/283,873	9/20/83
4,405,043	06/272,902	9/20/83
4,405,048	06/352,242	9/20/83
4,405,049	06/310,799	9/20/83
4,405,059	06/281,671	9/20/83
4,405,061	06/335,244	9/20/83
4,405,064	06/266,747	9/20/83
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4,405,091	06/255,849	9/20/83
4,405,098	06/267,560	9/20/83
4,405,099	06/261,261	9/20/83
4,405,100	06/236,480	9/20/83
4,405,107	06/391,176	9/20/83
4,405,108	06/257,905	9/20/83
4,405,114	06/268,157	9/20/83
4,405,117	06/305,973	9/20/83
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4,405,152	06/285,702	9/20/83	4,405,565	06/439,319	9/20/83
4,405,157	06/354,452	9/20/83	4,405,573	06/331,949	9/20/83
4,405,158	06/266,643	9/20/83	4,405,605	06/286,693	9/20/83
4,405,165	06/246,241	9/20/83	4,405,608	06/296,839	9/20/83
4,405,175	06/313,134	9/20/83	4,405,610	06/247,375	9/20/83
4,405,184	06/243,684	9/20/83	4,405,613	06/401,305	9/20/83
4,405,187	06/246,248	9/20/83	4,405,619	06/298,789	9/20/83
4,405,200	06/228,239	9/20/83	4,405,623	06/263,898	9/20/83
4,405,202	06/248,695	9/20/83	4,405,634	06/232,731	9/20/83
4,405,204	06/242,762	9/20/83	4,405,637	06/306,535	9/20/83
4,405,217	06/298,388	9/20/83	4,405,639	06/374,370	9/20/83
4,405,240	06/249,716	9/20/83	4,405,644	06/331,712	9/20/83
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4,405,256	06/254,324	9/20/83	4,405,738	06/354,981	9/20/83
4,405,258	06/347,930	9/20/83	4,405,744	06/265,570	9/20/83
4,405,269	06/314,171	9/20/83	4,405,759	06/365,438	9/20/83
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4,405,365	06/412,552	9/20/83	4,405,861	06/294,674	9/20/83
4,405,366	06/276,837	9/20/83	4,405,873	06/314,617	9/20/83
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4,405,407	06/250,154	9/20/83	4,405,905	06/224,133	9/20/83
4,405,412	06/362,589	9/20/83	4,405,908	06/255,161	9/20/83
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			4,406,018	06/291,181	9/20/83

Notification of Acceptance of Delayed Payment of Maintenance Fee
(35 U.S.C. 41(c); 37 CFR 1.378)

The patents listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,357,296	06/228,276	11/02/82	1/26/81	11/03/87
4,365,378	06/240,994	12/28/82	3/05/81	11/03/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,550,516, Re. S.N. 114,233, Filed Oct. 29, 1987, Cl. 40/513, PICTURE VIEWER, Peter Ackeret, Owner of Record: *Licinvest AG, Chur, Switzerland*, Attorney or Agent: Charles B. Smith, et al., Ex. Gp.: 333

4,598,605, Re. S.N. 111,417, Filed Oct. 19, 1987, Cl. 74/501M, MECHANISM WITH TORQUE-LIMITING DEVICE FOR CONTROLLING A REARVIEW-MIRROR, Stephane Manzoni, Owner of Record: *Manzoni Bouchoir, Saint-Claude, France*, Attorney or Agent: Remy J. Vanophem, et al., Ex. Gp.: 358

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 31,873, Reexam. No. 90/001,368, Requested: Nov. 4, 1987, Cl. 128/674, VENOUS CATHETER DEVICE, Randolph M. Howes, Owner of Record: *Randolph M. Howes & Janice Kinchen, Picayune, Miss. & Hammond, La.*, Attorney or Agent: Richard H. Smith, Ex. Gp.: 330, Requester: Hayes, Davis, et al., Manchester, N.H.

4,549,087, Reexam. No. 90/001,365, Requested: Nov. 2, 1987, Cl. 250/561, LEAD SENSING SYSTEM, Robert J. Duncan, et al., Owner of Record: *USM Corp., Farmington, Conn.*, Attorney or Agent: Arthur B. Moore, Ex. Gp.: 250, Requester: Universal Instruments Corp., Binghamton, N.Y.

4,564,313, Reexam. No. 90/001,366, Requested: Oct. 30, 1987, Cl. 405/125, RECTILINEAR CULVERT STRUCTURE, Robert L. Niswander, et al., Owner of Record: *Highway Concrete Pipe Co., Inc., Findlay, Ohio*, Attorney or Agent: David D. Murray, Ex. Gp.: 350, Requester: Owner

4,647,994, Reexam. No. 90/001,369, Requested: Nov. 2, 1987, Cl. 360/85, MINIATURIZED CARTRIDGE-TYPE DRIVE FOR DATA PROCESSORS, Samuel N. Irwin, et al., Owner of Record: *Irwin Magnetic Systems, Inc., Ann Arbor, Mich.*, Attorney or Agent: William W. Dewitt, Ex. Gp.: 230, Requester: Townsend & Townsend, San Francisco, Calif.

4,677,481, Reexam. No. 90/001,367, Requested: Nov. 2, 1987, Cl. 358/139, DUAL DISPLAY MONITOR, Dan H. Nicholas, Owner of Record: *Tektronix, Inc., Beaverton, Ore.*, Attorney or Agent: Francis I. Gray, Ex. Gp.: 260, Requester: Owner

Erratum

"All reference to Reexam No. B1-4,189,879 (516th) to Zenshiro Uehara of Japan, for 'CONTROLLABLE DRIVE FOR A TAPE RECORDER', appearing in the Official Gazette of June 10, 1986, should be deleted since no Reexamination Certificate was granted."

Department of Commerce
Patent and Trademark Office
37 CFR Part 1 [Docket No. 71008-7208]

Variety Denomination Requirements
for Plant Patent Applications

Agency: Patent and Trademark Office, Commerce.

Action: Notice of proposed rulemaking.

Summary: The Patent and Trademark Office proposes to amend certain of the rules of practice applicable to the patenting of plants. Under the proposed rules of prac-

tice, an applicant for such a patent would, in addition to any requirements for obtaining a patent, also be required to record an identifying variety denomination for the plant. These proposed rules fulfill an obligation imposed by the Convention of the International Union for the Protection of New Plant Varieties (the UPOV Convention), to which the United States adheres.

Dates: Comments on the proposed rules must be submitted by Jan. 8, 1988, to assure their consideration in formulating the rules put into effect. A public hearing will be held on Jan. 15, 1988, beginning at 9:30 A.M., in the Commissioner's Conference Room, Crystal Plz. 3, the Patent and Trademark Office.

Addresses: Address comments to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231. All comments received will be publicly available in the Patent and Trademark Office, Crystal Plz. 3, Arlington, Va., Rm. 11C28.

For Further Information Contact: Mr. Stanley D. Schlosser, Office of Legislation and International Affairs, by telephone at (703) 557-3065 or by mail addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.

Supplementary Information: The UPOV Convention became applicable to the United States on Nov. 8, 1981, as a consequence of the President's exercise of authority to adhere to this international agreement. Under Articles 6 and 13 of the UPOV Convention, each plant variety for which protection is sought must be given a variety denomination and that denomination recorded ("registered" in the language of the Convention) at least by the time the patent is granted. It is left to each of the UPOV member states to determine how recordation is effected. For the United States, the issuance of a patent which includes the denomination of the variety would constitute recordation and registration for the purposes of compliance with UPOV Convention. The patent examining process would include consideration of the suitability for recordation of the proposed variety denomination.

Attention is called to two earlier Commissioner's Notices on this subject. The Notice of Oct. 20, 1981 (46 FR 51426) stated that appropriate rules for the registration of variety denominations, as required by the UPOV Convention, would be issued. The Commissioner's Notice, published in the Federal Register on Aug. 16, 1985, 50 FR 33062, proposed amendments to the Patent and Trademark Office's rules of practice to carry out this requirement. In light of public comments received, the earlier proposed rules are being withdrawn from consideration and replaced by these revised proposed rules. These would apply to plants patented under either 35 U.S.C. 101 or 161, but would not apply to any protection sought under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.), administered by the United States Department of Agriculture.

These proposed rules, in accordance with the patent law requirements for providing a descriptive title for a patent application, would require the variety denomination proposed for recordation to be included in the title of the application. The denomination would be judged for recordability by the examiner assigned the application for examination, who would consult with appropriate trademark examination officials to determine if there exists a possibly conflicting trademark registration or application for registration.

The recordation of a variety denomination for purposes of compliance with UPOV Convention Article 13 is not to be understood as conveying any legal rights in that denomination. Recordation does no more than establish a prima facie case that can be asserted as evidence of the possible generic nature of the variety denomination, if genericness is not already established by its usage in the commercial market, advertising or publication.

Under the proposed rules, the Patent and Trademark Office in examining the recordability of variety denominations will, in addition to its trademark records, utilize the Office's compilation of denominations obtained from horticultural, agricultural, floral and other professional

societies, national breeders' rights offices, the UPOV Union's Secretariat, standard references and other available sources. Article 13 of the UPOV Convention requires that the variety denomination must enable the plant variety to be identified, that the denomination not consist solely of numbers except if this is shown to be an established practice for designating plant varieties, and that the denomination not be liable to mislead or cause confusion concerning the characteristics, value or identity of the variety or the identity of the breeder. No specific naming system is required by the Article. While a portion of the consuming public and others might prefer plant variety names conforming to the International Code of Nomenclature for Cultivated Plants or the UPOV Guidelines, common usage, code systems or other ways of identifying plants cannot be ignored.

The Patent and Trademark Office would accept for recordation a variety denomination complying with the requirements of the UPOV Convention's Articles 13(2) and 13(4). A number of variety denomination systems currently in use, such as the system described in the 1980 revision of the International Code of Nomenclature for Cultivated Plants, the UPOV Guidelines and various code systems may also meet these requirements. Sexually reproduced varieties could be named in compliance with the requirements of the Federal Seed Act.

In the event the examiner does not approve a proposed variety denomination for recordation, the applicant could petition the Commissioner for approval. Thus, the examination and approval of variety denominations will be handled in the same way as other procedural and administrative requirements not relating to the merits of the invention, such as the requirement to provide an abstract of the disclosure or the requirement to provide a title. A final refusal by the Commissioner on petition would require submission of another proposed denomination for recordation.

The petition to the Commissioner will be subject to a fee and the other requirements relating to petitions. The Commissioner may in appropriate cases delegate to the Assistant Commissioner for Trademarks or other appropriate trademark officials the decision of such petitions, under 37 C.F.R. 1.181(g).

The UPOV Convention requires the applicant to identify the patented variety by the same variety denomination (or a translation thereof) in all UPOV member states. A different denomination may be recorded in a particular member state, however, in cases where the denomination registered in another member state is unsuitable for business or other reasons. An applicant may during the course of examination be required to inform the Office of any other denomination by which the variety is known.

While these rules provide for the recordation of variety denominations, they recognize at the same time that, in cases of conflict, previously established proprietary rights are paramount. Recordation is in legal effect, therefore, no more than publication of a denomination which is or may become the generic name of a plant variety.

Trademark owners, owners of other proprietary rights and patent applicants share a common interest in knowing as early as possible if a variety denomination proposed for recordation possibly conflicts with a trademark or other proprietary rights. Accordingly, each denomination proposed for recordation, along with the genus and species to which the variety belongs, shall be published in the Official Gazette as soon as reasonably possible after receipt of the application in the Office. The Commissioner has determined that publication of such information constitutes special circumstances under 35 U.S.C. 122.

The public may provide information to the Office concerning the recordability of a proposed denomination. Such information would be entered in the official file wrapper of the application and be available to the examiner. Such information shall be called to the attention of the applicant by the Office.

Also, the *Official Gazette* would list newly recorded denominations in United States patents in order for trademark owners to assert their rights in appropriate

cases through private negotiations or judicially, as they may now do in trademark cases. Proceedings in the Office in regard to the registration of variety denominations, however, will be conducted ex parte.

Under the proposed rules, each applicant would be required to specify in an application for protection of a plant variety the date of first use of the denomination if used prior to filing of the patent application, or later to provide information about the date of first commercial use during pendency of the application. In cases of conflict between a trademark and a proposed variety denomination, the variety denomination will not be accepted for recordation unless its first commercial use clearly antedates another's established rights.

If a patentee learns of a conflict between a trademark and the recorded variety denomination after issuance of the patent, the patentee in order to resolve the conflict will be permitted to record a different denomination by means of the Certificate of Correction procedure. Also, a variety denomination found after issuance of a patent to be commercially unsuitable or ill-advised could be changed in a similar manner.

The Office now permits plants and plant varieties to be patented both specifically and broadly under patent 35 U.S.C. 101. In some cases, however, claims in an application will not be limited to a specific variety. These proposed rules would apply only to applications where a specific variety or varieties are claimed. Only these need be identified by a variety denomination, except where the number of varieties involved makes this impractical. In such a case, each claim directed to a specific variety would include its variety denomination, but these variety denominations could be omitted from the title of the patent. Variety denominations would not be required for microorganisms or microscopic plant parts.

Other Considerations: The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. This rule contains a collection of information requirement subject to the Paperwork Reduction Act. This collection of information requirement has been cleared by OMB under control No. 0651-0011.

The General Counsel of the Department Commerce has certified to the Small Business Administration that the proposed rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The variety denomination requirement will not impose extra work on patent applicants (whether small or large businesses or individuals). The rules will help avoid burdensome and expensive litigation over trademark rights.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set out in the preamble, 37 CFR Part 1 is proposed to be amended by revising §§1.72, and 1.17 and adding a new §1.168 as set forth below. All proposed additions are printed between arrows.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

AUTHORITY: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.17 is proposed to be amended by adding the following items in numerical order to the list in paragraph (h) to read as follows:

§1.17 Patent application processing fees.

(h) ***

- ▶ §1.168(d) For petitioning the Commissioner to record a plant variety denomination . . .
- §1.168(g) For petitioning the Commissioner to record a substitute plant variety denomination . . .

3. Section 1.72 is proposed to be amended by adding the following paragraph:

§1.72 Title and abstract.

- ▶ (c) In the case of an application for the patenting of a plant variety under the provisions of 35 U.S.C. 101 or 161, the title of the application must include a variety denomination for the specific new variety claimed, except as provided for in §1.168(b). The granting of the patent will be deemed the recordation of the variety denomination for purposes of compliance with Article 13 of the International Convention for the Protection of New Varieties of Plants, as revised on Oct. 23, 1978.

4. A new §1.168 is proposed to be added, to read as follows:

- ▶ §1.168 Variety denomination, submission to the Office, examination.
 - (a) The variety denomination submitted by the patent applicant under §1.72 will be examined for compliance with the International Convention for the Protection of New Varieties of Plants. Specifically, the denomination:

- (1) must enable the plant variety to be identified;
- (2) must not be likely to cause confusion, to cause mistake or to deceive concerning the characteristics, value or identity of the plant variety or the identity of the breeder;
- (3) must not consist solely of numbers except if this is an established practice for designating plant varieties; and
- (4) must not be likely to cause confusion or mistake or to deceive as to any prior right of a third party, and shall not affect prior rights of third parties.

(b) If a proposed variety denomination is not included as part of the title of the application, when filed, the examiner shall set a period of not less than thirty days to provide a variety denomination. If a plurality of plant varieties are claimed, which make it impractical to include each variety denomination in the title of the application, each claim directed to a specific plant variety shall instead include the denomination of the claimed plant variety. In cases where no specific plant variety is claimed, for example, a patent directed to the improvement of a plant species, the denomination requirement applicable to the patenting of a plant variety or varieties will be waived.

(c) If the examiner determines that a proposed variety denomination is not suitable for recordation, the examiner shall refuse recordation thereof and shall set forth in an Office action the reasons for such refusal. An applicant disagreeing with the reasons for such refusal may request reconsideration and withdrawal of the refusal, giving the reasons therefor. If the examiner's refusal to record a proposed variety denomination is repeated and made final, the examiner shall at the same time require the applicant to propose another variety denomination for recordation.

(d) After a final requirement by the examiner for submission of a proposed new variety denomination, the applicant, in addition to making any response due on the remainder of the action, may in lieu of proposing another variety denomination petition the Commissioner for review of the examiner's holding, upon payment of the fee set forth in §1.17(h).

(e) The applicant is required to submit for recordation the same variety denomination (or, if not in English, a translation or transliteration thereof) as that previously registered or recorded, or proposed for registration in an earlier filed application for protection of the same variety in another member state of the International Union for the Protection of New Varieties of Plants. The applicant may submit another denomination for recordation, however, upon a showing satisfactory to the examiner as to why the denomination originally submitted or registered in another member state of the said Union is unsuitable for recordation in the United States. During pendency of an application, the examiner may require the applicant to provide information regarding all denominations for the same variety registered or proposed for registration in other member states of the said Union before the application was filed in the United States.

(f) The applicant shall indicate in the application the date of first commercial use in the United States if any, of the variety denomination proposed for recordation; or, if not commercially used prior to filing of the application, indicate during pendency of the application when the denomination has first been commercially used in this country. No variety denomination will be recorded if first commercially used after the establishment of third party proprietary rights to the denomination.

(g) A patentee in order to avoid a conflict between a recorded variety denomination and a trademark or other proprietary right, or where the recorded variety denomination is likely to be confused with another, or where business or marketing considerations dictate, may propose for recordation a substitute variety denomination for that already recorded. Such a proposal shall be in the form of a petition to the Commissioner together with the fee set forth in §1.17(h). The proposed substitute denomination will be examined in the same manner as the denomination originally recorded, and upon recordation shall be promptly published in the *Official Gazette*. A Certificate of Correction indicating such substitute denomination shall be issued for the patent. If the patent has been assigned, only the assignee of record may apply for recordation of a substitute denomination.

(h) The Commissioner shall upon its receipt in the Office promptly publish in the *Official Gazette* each variety denomination proposed for recordation and the genus and species of the plant involved. Correspondence from the pub-

lic objecting to the recordation of such denomination, if accompanied by reasons therefor, will be placed in the official file and considered by the examiner in an ex parte manner. An objection to recordation may be based on an earlier recorded or unrecorded variety denomination, a registered or common law trademark, a trade name or trade indicia, or other alleged prior right timely called to the Office's attention. The applicant shall be notified by the Office of the receipt of such correspondence. The secrecy of any pending application will be preserved in accordance with 35 U.S.C. 122. ◀

Sept. 18, 1987. **RENE TEGTMEYER,**
Assistant Commissioner
for Patents.

Patents Available for License or Sale

4,457,504. THE COLLAPSIBLE/KNOCKDOWN

SAWBUCK, *Gilbert E. Mottla*, 173 Mill Ln., Amherst, Mass. 01002.

4,587,746. ALVIN WILLIAMS SOLE AND HEEL SHOE TAP, *Evelyn M. Sommer*, 360 Lexington Ave., New York, N.Y. 10017.

4,677,278. FOOD VENDING MACHINE, *Hans Knoll, J. Nissen McAulay, Fields, Fisher, Goldstein & Nissen*, 405 Lexington Ave., New York, N.Y. 10174.

4,684,479. SURFACTANT MIXTURES, STABLE GAS-IN-LIQUID EMULSIONS, AND METHODS FOR THE PRODUCTION OF SUCH EMULSIONS FROM SAID MIXTURES, *J. S. D'Arrigo*, Cav-Con, 1622-3 Farmington Ave., Unionville, Conn. 06085.

4,689,001. BAT FOR POTTERS WHEEL, *Sherman Levy*, Suite 739 Investment Bldg., 1511 K St., N.W., Washington, D.C. 20005.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 8, 1987

Re. 32,412	4,641,110	4,669,431	4,678,329
Re. 32,468	4,642,869	4,670,482	4,678,637
D. 289,897	4,644,587	4,670,608	4,678,681
3,987,684	4,644,618	4,670,811	4,678,762
4,442,245	4,644,938	4,671,999	4,678,817
4,452,818	4,645,756	4,672,619	4,679,247
4,481,081	4,646,330	4,673,401	4,680,042
4,486,741	4,646,762	4,673,520	4,680,825
4,492,234	4,648,656	4,673,686	4,681,302
4,494,828	4,650,130	4,673,869	4,681,327
4,505,689	4,653,563	4,674,020	4,681,883
4,508,545	4,654,787	4,674,051	4,682,002
4,515,073	4,656,720	4,674,273	4,682,084
4,516,745	4,656,730	4,674,336	4,682,184
4,521,723	4,657,047	4,674,691	4,682,456
4,534,266	4,659,255	4,674,728	4,682,810
4,567,910	4,659,751	4,675,246	4,682,817
4,591,762	4,661,259	4,676,174	4,683,624
4,596,689	4,661,678	4,676,259	4,684,059
4,597,436	4,662,192	4,676,331	4,684,262
4,600,368	4,662,560	4,676,486	4,684,479
4,605,696	4,662,827	4,676,598	4,684,920
4,609,391	4,663,431	4,676,729	4,684,998
4,613,032	4,663,445	4,676,992	4,685,118
4,613,491	4,663,491	4,677,128	4,685,362
4,616,528	4,664,779	4,677,172	4,685,463
4,616,607	4,665,071	4,677,386	4,685,793
4,622,107	4,665,267	4,677,418	4,685,854
4,623,173	4,665,298	4,677,535	4,685,965
4,624,966	4,665,418	4,677,540	4,686,191
4,626,179	4,666,473	4,677,590	4,687,018
4,632,689	4,667,323	4,677,741	4,687,532
4,633,161	4,667,741	4,677,931	4,687,737
4,635,592	4,667,806	4,678,123	4,689,967
4,639,165	4,668,972	4,678,151	4,694,737

Disclaimers

4,433,446.—*Ronald N. Grimstad*, Sheboygan, Wis. FLUSH VALVE ATTACHMENT SYSTEM. Patent dated Feb. 28, 1984. Disclaimer filed Oct. 2, 1987, by the assignee, *Kohler Co.*

Hereby enters this disclaimer to claims 1-3 and 5-9 of said patent.

4,625,947.—*Stephen A. Denman*, Centerville and *Garthwood R. Taylor*, Dayton, Ohio. TIRE LIFT/CARRIER. Patent dated Dec. 2, 1986. Disclaimer filed Sept. 17, 1987, by the assignee, *Deuer Manufacturing Inc.*

The term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

4,681,428.—*James M. Devoy*, Rochester, N.Y. APPARATUS FOR PRODUCING INTERLEAVED COPY SHEETS. Patent dated July 21, 1987. Disclaimer filed Oct. 6, 1987, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimer and Dedication

4,658,548.—*John T. Gerritsen*, Hanover Park, Ill. WEATHERSTRIP MEMBER WITH FLOATING INTERIOR BULB. Patent dated Apr. 21, 1987. Disclaimer and Dedication filed Oct. 7, 1987, by the assignee, *Jarrow Products, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 24, 1987

PATENT EXAMINING GROUPS

Actual Filing Date of Oldest
New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	9-11-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-05-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-24-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	9-06-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-02-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-06-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during October 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,531,806 to 3,537,106, inclusive
Plant Patents	Numbers 2,991 to 2,995 inclusive

1085 OG 22

REEXAMINATIONS

DECEMBER 8, 1987

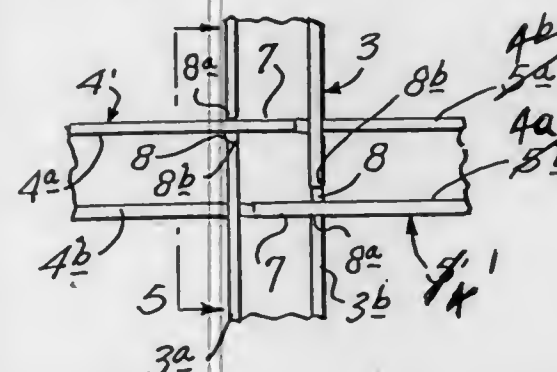
Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicate additions made by reexamination.

B1 4,034,534 (787th)

LOUVERED CEILING

John L. Taylor, Jagerslaan, Netherlands, assignor to Intalite International, Willemstaad, Netherlands Antilles
Reexamination Request No. 90/001,130, Nov. 21, 1986.
Reexamination Certificate for Patent No. 4,034,534, issued Jul. 12, 1977, Ser. No. 649,724, Jan. 16, 1976.
Continuation-in-part of Ser. No. 462,423, Apr. 19, 1974, abandoned.
Claims priority, application Canada, Apr. 30, 1973, 169893
Int. Cl. 4 E04C 2/47

U.S. Cl. 52-668



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-7 is confirmed.

1. A light transmitting, louvered ceiling assembly comprising:

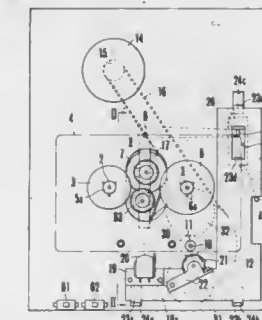
- at least one runner of upwardly open channel section, comprising a first side-wall, a second side-wall and a base wall joining said side-walls;
- a louver comprising first and second sections, adapted to be supported on said runner, each of said first and second sections comprising at least one upwardly open channel member having a third side-wall, a fourth side-wall and a base wall joining said side-walls;
- a downwardly extending slot disposed in each of said first and second side-walls of said runner, each of said slots having widened upper portion, a narrowed lower portion and a substantially vertical edge, the vertical edges of the slots in said first and second side-walls being offset from each other by a distance substantially equal to the spacing between said third and fourth side-walls;
- each of said third side-walls comprising a downwardly extending hook-shaped extension, the extension from said first louver section being engaged in the slot in said runner first side-wall and the extension from said second louver section being engaged in the slot in said runner second side-wall, said third side-walls projecting within said runner channel, said third side-walls abutting against said vertical edges of said slots in proximity to said extensions, the fourth side-wall of said first louver section terminating in a substantially vertical edge which abuts against said runner first side-wall and the fourth side-wall of said second louver section terminating in a substantially vertical edge which abuts against said runner second side-wall, so as to prevent light leakage through said widened slot portions.

B1 4,189,079 (788th)

CONTROLLABLE DRIVE FOR TAPE RECORDER

Zenshiro Uehara, Tokyo, Japan, assignor to Tokyo Rokuon Kogyo Kabushiki Kaisha, Tokyo, Japan
Reexamination Request No. 90/000,661, Nov. 5, 1984.
Reexamination Certificate for Patent No. 4,189,079, issued Feb. 19, 1980, Ser. No. 913,513, Jun. 7, 1978.
Claims priority, application Japan, Oct. 31, 1977, 52-129641
Int. Cl. 4 B65H 17/22

U.S. Cl. 226-188



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-4 are cancelled.

New claims 5-7 are added and determined to be patentable.

[1. A controllable drive for tape recorder comprising a capstan rotatably mounted on a chassis, a flywheel mounted on and in concentric relationship with the capstan, a gear integrally connected with the flywheel in concentric relationship therewith, a toothed wheel with hiatus which is rotatably mounted on the chassis and disposed for meshing engagement with the gear, a cam integral with the hiatus wheel, a link disposed for angular movement on the chassis to be angularly driven by the cam for producing a force which is necessary to operate the tape recorder, a movable element mounted on the chassis so as to be engageable and disengageable from the hiatus wheel and operative to lock the hiatus wheel when a hiatus thereof is located in opposing relationship with the gear, and means for operating the movable element.]

B1 4,232,179 (789th)

PROCESS FOR PREPARING ETHENE

Helcio V. Valladares Barrocas, Niteroi; Joao B. de Castro M. da Silva, and Ruy Coutinho de Assis, both of Rio de Janeiro, all of Brazil, assignors to Petroleo Brasileiro S.A.-Petrobras, Rio de Janeiro, Brazil

Reexamination Request No. 90/000,378, May 9, 1983.
Reexamination Certificate for Patent No. 4,232,179, issued Nov. 4, 1980, Ser. No. 932,283, Aug. 9, 1978.
Claims priority, application Brazil, Aug. 9, 1977, 7705256[U]
Int. Cl. 4 C07C 1/24

U.S. Cl. 585-640

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-12 are cancelled.

[1. Process for preparing ethene by dehydrating ethyl alco-

hol in the presence of catalyst, characterized in that ethyl alcohol is heated by indirect heat exchange, up to a temperature in the range from 180°–600° C., introducing thus heated ethyl alcohol into one or more adiabatic reactors containing in its interior a catalyst fixed bed, said adiabatic reactor being maintained in a pressure range between 0.2 and 20 kg/cm² absolute, and said fixed catalyst bed being maintained at a temperature comprised within the range from 600° C. on the top to 180° C. in the bottom, by means of a sensible heat carrying stream heated up to a temperature up to 800° C., the weight ratio between the sensible heat carrying fluid stream and the stream of ethyl alcohol varies within a 0.2:1 to 20:1 range, and the ratio between the amounts of ethyl alcohol and the catalyst is comprised within a range from 10 to 0.01 g/h of ethyl alcohol per gram of catalyst; removing the effluent from said adiabatic reactor and sending the same to the purification step.]

B1 4,346,427 (791st)
CONTROL DEVICE RESPONSIVE TO INFRARED RADIATION

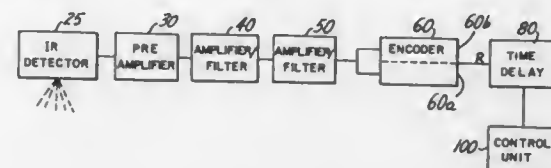
Kitson Blissett, Freeport, N.Y., and Robert A. Dunbar, Swampscott, Mass., assignors to Robert Rothenhaus, Bayside, N.Y., a part interest

Reexamination Request Nos. 90/001,022, Jun. 2, 1986 and 90/001,037, Jun. 20, 1986.

Reexamination Certificate for Patent No. 4,346,427, issued Aug. 24, 1982, Ser. No. 202,592, Oct. 31, 1980.

Int. Cl.⁴ H01H 47/24

U.S. Cl. 361—173



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–58 are cancelled.

1. A device responsive to heat emanating from a human body for controlling an auxiliary current line, comprising detection means including an infrared detector for producing detection signals in response to infrared radiation in the frequency spectrum emitted by the human body; circuit means adapted to receive said detection signals for amplifying them and producing reset signals for those detection signals resulting from movement of a body emanating infrared radiation in said spectrum; timing means adapted to receive said reset signals for producing a control signal after failing to receive a reset signal for a time period preselected to be longer than the time period expected between movements of a human body within the field of view of said detector; and control means adapted to receive said control signal for controlling said current line in response thereto.

B1 4,428,768 (792nd)
PROCESS FOR THE RECOVERY OF PLATINUM GROUP METALS FROM REFRACTORY CERAMIC SUBSTRATES

Joseph G. Day, Holmer Green, England, assignor to Johnson Matthey & Co., Limited, London, England

Reexamination Request No. 90/000,775, May 3, 1985.

Reexamination Certificate for Patent No. 4,428,768, issued Jan. 31, 1984, Ser. No. 214,267, Dec. 8, 1980.

Claims priority, application United Kingdom, Dec. 31, 1979, 7944656

Int. Cl.⁴ C22B 4/00, 11/02

U.S. Cl. 75—10.19

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 11 is cancelled.

Claims 1, 7 and 12 are determined to be patentable as amended.

Claims 2–6, 8–10 and 13–17, dependent on an amended claim, are determined to be patentable.

New claims 18–20 are added and determined to be patentable.

B1 4,329,090 (790th)
EMPLOYING QUICKLIME IN STABILIZING SURFACE LAYERS OF THE EARTH

Joe D. Teague, Fort Worth, and Paul J. Wright, Euless, both of Tex., assignors to Porta Batch Co., Fort Worth, Tex.

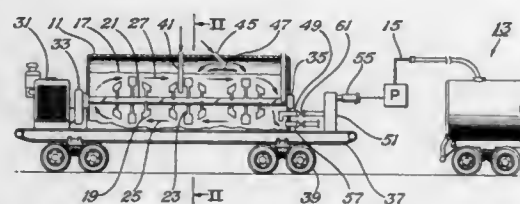
Reexamination Request Nos. 90/001,086, Sep. 12, 1986 and 90/001,153, Jan. 20, 1987.

Reexamination Certificate for Patent No. 4,329,090, issued May 11, 1982, Ser. No. 6,109,791, Jan. 7, 1980.

Continuation-in-part of Ser. No. 969,421, Dec. 14, 1978, Pat. No. 4,233,015.

Int. Cl.⁴ E02D 3/12

U.S. Cl. 405—263



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–7 is confirmed.

1. A method of treating top surface layers of the earth for forming a stabilized base of controlled strength, movement and water permeability comprising the steps of:

- admixing in a slurry mixing tank unslaked lime called quicklime and water to form a hot hydrated lime slurry at elevated temperature above ambient; and
- working the hot hydrated lime slurry before said hot hydrated lime slurry cools below ambient temperature and while said hot hydrated lime slurry is at a temperature above ambient into the top surface layers of the earth such that for the first time it is economically feasible that said surface layers are treated in situ with a hot lime slurry to obtain the desired strength and stabilization to allow stabilization even when the ambient temperature decreases to 40° F. and lower.

1. A secondary refining process employing a plasma arc furnace for the recovery of platinum group metals present in [used] a charge containing auto emission control catalyst comprising a refractory ceramic substrate having the platinum group metal deposited on or contained in the refractory ceramic substrate, the said substrate containing an aluminum-silicate [and/or] and carrying an alumina washcoat, said process comprising preparing the whole of the charge by mixing together;

- particulate refractory ceramic substrate bearing the washcoat and the said metals;
- one or more particulate fluxes;
- particulate iron collector material for the metal or metals to be recovered or particulate iron collector material precursor and

[in divided form, a charge containing the refractory ceramic substrate bearing the said metal, one or more fluxes, and a collector material or collector material precursor, for the metal or metals to be recovered, feeding said] (d) any optional components of the charge, then feeding the charge into a high intensity plasma arc furnace and heating the charge to a temperature in the range 1500°–1750° C. by means of the high intensity plasma arc of said furnace to produce a molten metallic phase containing a substantial proportion of the said metal or metals formerly deposited on or contained in the substrate, and a molten slag phase containing flux, ceramic residues and the remainder of the said metals, separating the two phases, and separating the platinum group metals from the metallic phase [the collector material comprising iron powder or filings, iron sponge or cast iron shavings].

B1 4,457,847 (793rd)
CARBOXYLATE POLYMERS FOR INTERNAL SCALE CONTROL AGENTS IN BOILER SYSTEMS

Walter F. Lorenc, Harvey; John G. Kelly, Woodridge, both of Ill., and Fredrick S. Mandel, Baton Rouge, La., assignors to Nalco Chemical Company, Oak Brook, Ill.

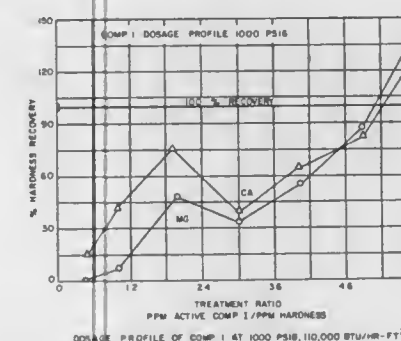
Reexamination Request No. 90/001,084, Sep. 9, 1986.

Reexamination Certificate for Patent No. 4,457,847, issued Jul. 3, 1984, Ser. No. 382,567, May 28, 1982.

Continuation-in-part of Ser. No. 318,665, Nov. 5, 1981, abandoned.

Int. Cl.⁴ C02F 5/10

U.S. Cl. 210—698



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 3, 5, 6, and 13 are determined to be patentable as amended.

Claims 2, 4, 7–12 and 14, dependent on an amended claim, are determined to be patentable.

1. A method of treating hardness including calcium and magnesium present in boiler waters which are in contact with heat transfer surfaces exposed to boiler operating conditions to prevent formation of scale including calcium and magnesium on, and to remove previously formed scale from, these heat transfer surfaces, which comprises treating the boiler waters with a noncorrosive treatment composition substantially free of

potentially corrosive chelants, and containing a water-soluble sequestrant anionic vinyl polymer containing at least 30% by weight of carboxylate functionality, said polymer being chosen from the group consisting of:

- homopolymers of the group consisting of acrylic acid, methacrylic acid, maleic acid, and fumaric acid;
- copolymers of one member of the group consisting of acrylic acid, methacrylic acid, maleic acid, and fumaric acid with at least one other member of the group consisting of acrylic acid, methacrylic acid, maleic acid, and fumaric acid;
- copolymers of at least one member of the group consisting of acrylic acid, methacrylic acid, maleic acid and fumaric acid with acrylamide;
- copolymers of at least one member of the group consisting of acrylic acid, methacrylic acid, maleic acid and fumaric acid with vinyl sulfonate; and
- hydrolyzed polyacrylamide;

said polymer further having a molecular weight within the range of 500–50,000 and a chelation value of at least 200, which chelation value represents the milligrams of calcium or magnesium expressed in terms of calcium carbonate complexed by one gram of a sequestrant, and with the amount of said sequestrant anionic vinyl polymer being based upon the amount of hardness present, and being within the range of [1–30] 3–30 ppm of polymer per ppm of hardness present in such boiler waters, whereby the hardness in the boiler waters is sequestered by the water-soluble sequestrant anionic vinyl polymer, thereby preventing formation of scale on, and removing previously formed scale from, the heat transfer surfaces [of boilers] exposed to boiler waters.

B1 4,507,019 (794th)
METHOD AND APPARATUS FOR REPLACING BURIED PIPE

Alan E. Thompson, Kilgore, Tex., assignor to Expand-A-Line, Incorporated, Pasadena, Tex.

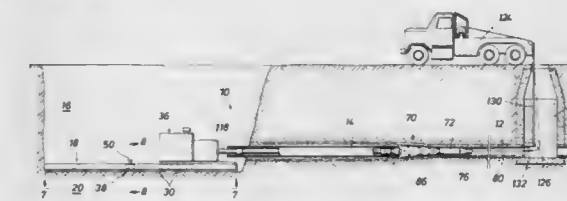
Reexamination Request No. 90/001,085, Sep. 11, 1986.

Reexamination Certificate for Patent No. 4,507,019, issued Mar. 26, 1985, Ser. No. 468,137, Feb. 22, 1983.

Filed Sep. 11, 1986, Ser. No. 468,137

Int. Cl.⁴ F16L 1/00, 55/18

U.S. Cl. 405—154



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 3 and 11 are cancelled.

Claims 1, 7–10, 13, 18 and 19 are determined to be patentable as amended.

Claims 2, 4–6, 12 and 14–17, dependent on an amended claim, are determined to be patentable.

New claims 3 and 11 are added and determined to be patentable.

1. A method of replacing buried nonmetal tile pipe with replacement pipe having an internal diameter that may exceed the internal diameter of the existing buried fractureable tile pipe comprising:

- locating pipe fracturing and replacement apparatus in axial registry with the centerline of the pipe to be replaced, said pipe fracturing and replacement apparatus having a pipe fracturing mandrel of generally frusto-coni-

cal configuration and having a diameter at its leading extremity not greater than the internal diameter of said buried nonmetal tile pipe and a diameter at its trailing extremity which is greater than the outer diameter of said replacement pipe;

- (b) simultaneously forcing said pipe fracturing mandrel through said buried tile fracturable pipe by *simultaneous linear and rotary components of movement*, reducing the pipe to be replaced to a fractured form having a multitude of pipe fragments of irregular form and forcing each of the pipe fragments of the fractured tile pipe radially outwardly into the surrounding earth formation thus forming a replacement pipe passage of a dimension exceeding the external dimension of the replacement pipe; and
- (c) extending a replacement pipe into **[the]** *said replacement pipe* passage simultaneously with passage of said pipe fracturing mandrel through said buried nonmetal tile pipe.

**B1 4,513,453 (795th)
PRE-TIED NECKTIE**

Jiann Chen, and Ching H. Chen, both of No. 21, Alley 21, La. 244, Sec. 5, Yen-Ping North Rd., Taipei, Taiwan
Reexamination Request No. 90/001,140, Dec. 15, 1986.
Reexamination Certificate for Patent No. 4,513,453, issued Apr. 30, 1985, Ser. No. 496,057, May 19, 1983.
Int. Cl.⁴ A41D 25/08

U.S. Cl. 2—150

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-5 is confirmed.

1. A necktie comprising an inner tie member, the upper end of said inner tie member being formed as a loop defining a neck-encircling opening; a zip fastener operatively mounted on said loop to enlarge and decrease the size of said opening, said zip fastener comprising a slide member having a slider plate



attached thereto; a knot support having a hollow upper portion which is generally oval when viewed from above and tapers downwardly to a depending tongue; and an outer tie member; said inner tie member being disposed within said hollow knot support with the lower end thereof depending from the knot support; the upper end of said outer tie member, said knot support, and said slider plate being joined, each to the others, by fixing means; said outer tie member being formed into a knot around said knot support.

REISSUES

DECEMBER 8, 1987

Matter enclosed in heavy brackets **[]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,553

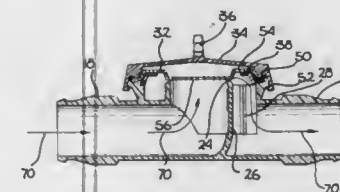
EXHALATION VALVE ASSEMBLY

Clifford D. Bennett, 6275 Sacramento, Alta Loma, Calif. 91701, and Charles Odenthal, 525 Euclid, Upland, Calif. 91786
Original No. 4,241,756, dated Dec. 30, 1980, Ser. No. 964,682, Nov. 29, 1978. Application for reissue Oct. 15, 1984, Ser. No. 661,233

Int. Cl.⁴ F16K 15/14

U.S. Cl. 137—271

12 Claims



1. A valve assembly for use in a volume ventilator, comprising:

- a valve body in part defining a pressure chamber, *said valve body having an annular diaphragm seat*;
- a gas inlet conduit joined to and in flow communication with said pressure chamber for directing a gas into said pressure chamber, said gas inlet conduit forming a discharge port in said pressure chamber;
- a gas outlet conduit joined to and in flow communication with said pressure chamber for directing gas out of said pressure chamber;
- diaphragm means removably disposed in and extending across said valve body adjacent said discharge port for selectively closing off said discharge port, said diaphragm means defining the remainder of said pressure chamber;
- a removably disposed ring member extending into said pressure chamber from a position adjacent the periphery thereof;
- a plurality of positioning members disposed on said body for positioning said ring member in said pressure chamber such that said ring member supports a predetermined portion of said diaphragm means; and
- a cover having a gas inlet joined to said valve body and extending across said diaphragm means on the opposite side thereof from said pressure chamber;
- said cover having an annular lip and said diaphragm means is sealed at its periphery between said annular lip and said diaphragm seat; and*
- the removably disposed ring member interfitting with a portion of the diaphragm means and the valve body such that by removing said ring member a valve assembly having a substantially different valve area ratio may be achieved, permitting the valve assembly to be used in different volume ventilator circuits.*

Re. 32,554

VENT STRUCTURE

Dennis E. Murphy, Costa Mesa, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Original No. 4,033,247, dated Jul. 5, 1977, Ser. No. 641,429, Dec. 17, 1975. Application for reissue Nov. 7, 1977, Ser. No. 849,086

Int. Cl.⁴ B64D 13/04

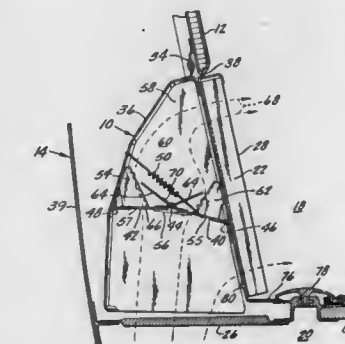
U.S. Cl. 244—118.5

84 Claims

1. A vent for equalizing the pressure on opposite sides of a structure comprising:
a movable vent panel which in a first position restricts the

flow from a first side of the structure to a second side thereof; and

a plenum chamber pneumatically connected to the first side of the structure, said chamber having at least one movable wall having first and second sides, said first side of said movable wall being in pneumatic connection with the first side of the structure and said second side of said movable wall being in pneumatic connection with the second side of the structure so that differential pressure across the



structure applies force to said wall, and bias means for urging said movable wall into a first position, said movable wall being operatively connected to said vent panel to maintain said movable vent panel in said first position thereof when said movable wall is in its first position whereby a predetermined differential pressure is capable of overpowering said bias means to move said movable wall to a position which allows said movable vent panel to move to a second position wherein flow from the first side of the structure to the second side is less restricted.

Re. 32,555

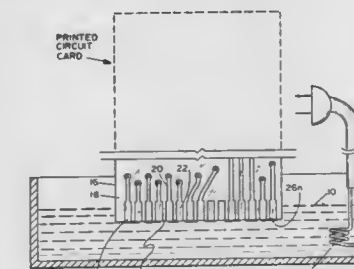
SOLDER STRIPPING SOLUTION

James J. Czaja, Maple Plain, Minn., assignor to Circuit Chemistry Corporation, Maple Plain, Minn.
Original No. 4,397,753, dated Aug. 9, 1983, Ser. No. 420,482, Sep. 20, 1982. Application for reissue Aug. 2, 1985, Ser. No. 761,864

Int. Cl.⁴ C09K 13/08

U.S. Cl. 252—79.3

31 Claims



1. Solution for the removal of tin or tin-lead alloy solder from a copper or nickel base, said solution comprising:

- 20-150 g/l of a m-nitro substituted aromatic compound;
- 0.5-10 g/l of a thiourea selected from a group of thiourea per se, an alkyl thiourea or an aromatic thiourea;
- 0.1-50 percent by volume of an inorganic acid

selected from a group including fluoboric acid, fluosilicic acid, sulfamic acid, or nitric acid; and,
 [(d)] c. 0.1-50.0 g/l of a hydroxyphenol providing extended life to the stripping solution.

Re. 32,556

PROCESS FOR RECOVERING CESIUM FROM CESIUM ALUM

Peter G. Mein, 2211 Twin Oaks Rd., Peru, Ill. 61354
 Original No. 4,466,950, dated Aug. 21, 1984, Ser. No. 512,926,
 Jul. 12, 1983, Application for reissue Jul. 28, 1986, Ser. No.
 889,904

Int. Cl.⁴ C01G 45/12

U.S. Cl. 423-599

10 Claims

1. A process for recovering cesium from cesium alum, CsAl(SO₄)₂, comprising:

- dissolving solid cesium alum in an aqueous hydroxide solution selected from the class consisting of aqueous sodium and/or potassium hydroxides, said solution having a hydroxide normality of from 0.5 to 4.0;
- forming cesium aluminum hydroxide, CsAl(OH)₄, and sodium and/or potassium sulfate [I.] (Na₂SO₄ and/or K₂SO₄) with part of the Na₂SO₄ and/or K₂SO₄ precipitating;
- separating the solids from the supernatant solution;
- adding a water-soluble permanganate to the supernatant solution;
- forming a precipitate of cesium permanganate, CsMnO₄, and
- separating the CsMnO₄ precipitate from the residual solution to obtain cesium permanganate of high purity.

Re. 32,557

METHOD OF DETERMINING PREGNANEDIOL IN FEMALE URINE AND TEST DEVICE FOR USE THEREIN

Robert T. Chatterton, Chicago, Ill., assignor to Northwestern University, Evanston, Ill.
 Original No. 4,450,239, dated May 22, 1984, Ser. No. 304,803,
 Sep. 23, 1981, Application for reissue Feb. 27, 1986, Ser. No.
 833,600

Int. Cl.⁴ G01N 33/53, 33/552, 33/544; B65D 69/00

U.S. Cl. 435-7

17 Claims

14. The method of determining the concentration of pregnanediol glucuronide (PG) in female urine, comprising:

- adding to a measured sample of said urine a predetermined quantity of antibodies binding to PG for reacting said antibodies with the amount of PG in the urine, said antibodies being in excess of the amount of PG to leave unreacted antibodies;
- contacting the antibody-containing sample with a quantity of a 20-α reagent immobilized on a support for reacting the antibodies which have not reacted with said PG with said 20-α reagent on said support, said 20-α reagent consisting essentially of a 20-α-hydroxy-4-pregnen-3-one, the said quantity of 20-α reagent being at least sufficient to bind the PG-unreacted antibodies;
- separating the residual urine sample from said support with said PG-unreacted antibodies bound thereto; and, thereafter,
- determining the amount of PG-unreacted antibodies thus separated from the urine sample as a measure of the PG concentration in the urine sample by (i) a color change reaction indicating separated antibody quantity, or (ii) by means of an enzyme associated with said separated antibodies which enzyme is capable of providing a color reaction indicating antibody quantity, or (iii) by means of a protein-staining dye which dye is capable of providing a color reaction indicating antibody quantity, or (iv) by means of a radiolabel associated with said separated antibodies which radiolabel is capable of providing an indication of antibody quantity.

PLANT PATENTS

GRANTED DECEMBER 8, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,053

ROSE PLANT NAMED SAVAMAE

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Nov. 25, 1985, Ser. No. 801,699

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—7

1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by unusually attractive carrot red colored flowers of good exhibition form that hold color well through development and aging.

6,054

ROSE PLANT NAMED LAVCALE

Keith Laver, Caledon East, Canada, assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Nov. 25, 1985, Ser. No. 801,700

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—10

1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized by unusually stable red flower coloring, near currant red, which maintains color through flower development and aging.

6,055

VARIETY OF GERANIUM NAMED DANIELLE

Daniel T. Busch, Thornton, Colo., assignor to Busch Greenhouses, Inc., Denver, Colo.

Filed Dec. 9, 1985, Ser. No. 807,172

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct variety of geranium plant substantially as herein shown and described and parts thereof.

6,056

CARNATION NAMED LONDRENAS

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, La Londe, France

Filed Dec. 23, 1985, Ser. No. 812,357

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—70

1 Claim

1. The new and distinct carnation cultivar, substantially as herein shown and described, characterized in particular by its well formed, medium sized blooms of white color which are produced profusely in a recurrent manner during the spring, midseason and fall seasons.

6,057

CARNATION NAMED LONPACHEL

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, La Londe, France

Filed Dec. 23, 1985, Ser. No. 811,993

Claims priority, application France, Mar. 14, 1985, 5145

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—71

1 Claim

1. A new and distinct carnation cultivar, substantially as herein shown and described, characterized by the very light pink coloration of its medium sized flowers which are borne singly on sturdy, upright and rigid flower stems.

6,058

CHRYSANTHEMUM PLANT NAMED SOLO

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 10, 1985, Ser. No. 786,003

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct cultivar of *Dentranthema morifolium*, Ramat., named Solo, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; white ray floret color; diameter across face of capitulum ranging from 5 to 6 cm. at maturity; uniform seven week flowering response; medium plant height; spreading branching pattern; tolerance of both low winter 12° C. to 14° C. and high summer 23° C. to 38° C. temperatures for bud initiation and flower development; and golden yellow pollen-producing disc florets.

6,059

CHRYSANTHEMUM PLANT NAMED ADORN

William E. Duffett; Cornelis P. VandenBerg, both of Salinas, Calif., and Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, assignors to Grace H. Mack, New Canaan, Conn.

Filed Aug. 20, 1985, Ser. No. 767,360

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., named Adorn, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, daisy capitulum type, purple ray floret color, diameter across face of capitulum up to 8 cm., short plant height, semi-spreading branching pattern, average natural season flowering date of September 10 in the West Coast area, average flowering response period of seven weeks in photoperiodic controlled short day programs, and durable, uniform performance in Spring small pot flowering programs.

PATENTS

GRANTED DEC. 8, 1987

ERRATA

For	See
CLASS	PATENT NO.
130-027	4,711,075
182-106	4,711,282
439-108	4,711,506
439-292	4,711,507
439-595	4,711,508
439-587	4,711,509
439-246	4,711,510
439-347	4,711,511
425-206	4,711,602
437-052	4,711,699
502-209	4,711,903
525-356	4,711,949
379-040	4,712,097
346-001	4,712,172

PATENTS

GRANTED DECEMBER 8, 1987

GENERAL AND MECHANICAL

4,710,978

PROTECTIVE GARMENT FOR WATER ACTIVITIES

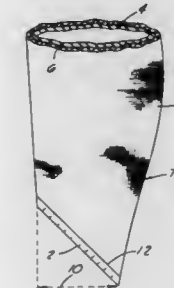
Bradford Pankopf, 267 Nieto Ave., Long Beach, Calif. 90803

Filed Jul. 14, 1986, Ser. No. 885,893

Int. Cl.⁴ A62B 17/00; A41B 7/00

U.S. Cl. 2—2.1 R

8 Claims



1. A protective garment for personal use as in water sport activities such as surfing, diving, water skiing and board sailing, said garment comprising:

a body covering formed of rubber-like sheet material having a thickness of at least three thirty-seconds of one inch, said covering including at least one tubular section for substantially containing a body extremity in snug-fit relationship, said tubular section terminating in an elongated orifice having an orifice annular measurement substantially greater than the annulus measurement of a cross section of said tube at a location contiguous to said terminating section whereby to accommodate putting on and removing said garment as a result of the greater annular measurement of said orifice.

4,710,979

MOTHER'S APRON OR BIB WITH DETACHABLE MULTICOLORED TWO-DIMENSIONAL INFANT TOYS TO AID SUPERVISED BABY PLAY

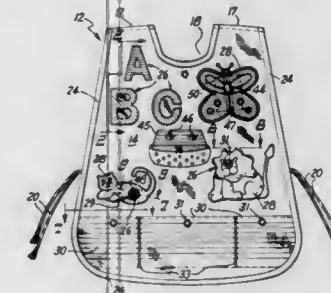
Rebecca L. Bull, 1228 Pennsylvania Ave., LaPorte, Ind. 46350, and Kristine A. Shupert, 2334 W. Maple Dr., Union Mills, Ind. 46382

Filed Sep. 5, 1986, Ser. No. 903,990

Int. Cl.⁴ A41B 13/10; G09B 1/00

U.S. Cl. 2—48

6 Claims



1. In an apron-like garment worn by a mother or babysitter having a front panel, a neck opening, a rear panel and means to tie the garment at the waist of the wearer and further having at least one two-dimensional applique figure for removable attachment and detachment by hook and pile type fastening means by the baby sitting on the lap of the mother or babysitter, that improvement consisting of

an additional movable sounding toy which is securely attached to the front of the apron and which is moved by the baby to create a sound, the detachment and reattach-

ment of said applique toy figure developing the visual and motor skills of the baby while the movement and sounding toy developing the visual, motor and hearing skills of the baby; and

an additional toy figure in the form of a multicolored cat is secured to the front of said apron, said cat having a pocket, an iron metal plate within said pocket and a tether attached to said cat having a cloth ball surrounding a magnet, the tether permitting the baby to move the ball for attachment to the plate by magnetic forces.

4,710,980

PROTECTING GARNMENT USABLE IN PARTICULAR IN HAIRDRESSING SALONS AND NEW TYPE OF TOWEL INCORPORATED IN THE DESIGN OF SAID GARNMENT

Bernard Brison, 9 chemin des Rivières, 69260 Charbonnières; Jacques Galerneau, 92 rue G. Clémenceau; Alex Gontier, 44 chemin de Taignon, both of Sainte Foy Les Lyon, and Gérard Petrozzi, 39 rue des Bienvenus, 69110 Villeurbanne, all of France

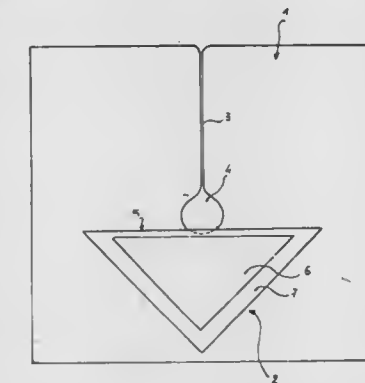
Filed Mar. 13, 1987, Ser. No. 25,728

Claims priority, application France, Mar. 13, 1986, 86 03779

Int. Cl.⁴ A41B 13/10

U.S. Cl. 2—50

5 Claims



1. Protecting garment usable in particular in hairdressing salons, of the type composed of an overall or cape, designed to be wrapped around the user's body, and of a towel adaptable on said overall, garment wherein:

the overall or cape is a one-piece garment, the geometrical shape of which is such as to allow a sufficient development to protect efficiently the user, said garment having a neck opening to allow the user's head through, the towel at least is made from a complex material containing an absorbing non-woven material, and is triangular-shaped, said towel being provided along one of the sides of the triangle with means for securing it on the overall, at the level of the shoulders, at the back of the neck opening.

4,710,981

INTERACTIVE MESSAGE GARMENT

David J. Sanchez, 3430 Arbor Dr., Pleasanton, Calif. 94566

Filed Nov. 24, 1986, Ser. No. 934,431

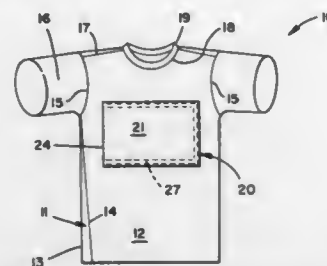
Int. Cl.⁴ A41B 1/00

U.S. Cl. 2—115

5 Claims

1. An interactive message garment comprising: a garment of wearing apparel having at least a front panel and a rear panel joined in a sack-like configuration with arm openings and a neck opening at its top;

a flap means hingedly connected on said front panel in its central portion with a vertical hinge axis offset to one side of said front panel in a manner operable to allow one end of said flap means to be swung away from and swung against the outer surface of said front panel; and



a continuous gripping surface means arranged between said panel and the peripheral unhinged edges of said flap means operable to releasably maintain said flap against said panel whereby said flap means may be manipulated by the wearer of the garment to display written indicia under said flap means.

4,710,982 ZIPPER NECKTIE

Martin Lande, 34 Glenmore Road, Hampstead, Quebec, Canada H3X 3M6

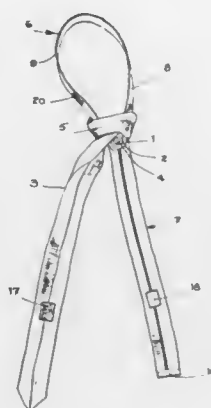
Filed Nov. 25, 1985, Ser. No. 801,694

Claims priority, application Canada, Nov. 1, 1985, 494395

Int. Cl.⁴ A41D 25/02

U.S. Cl. 2—150

8 Claims



1. In a necktie comprising: a slide fastener including a slide means, a knot portion having an opening therethrough, a front tie element depending from said knot portion, and a rear tie element having a lower end portion extending through said opening and having an upper neck embracing loop portion, said rear tie element comprising only one slide fastener stringer and a border of similar material as the front tie element sewn along a longitudinal edge portion of said stringer, said slide fastener stringer comprising a continuous string of interlockable elements of identical construction, said slide means being operatively connected to said interlockable elements upon relative movement between said rear tie element and said slide means for varying the size of said neck embracing loop portion, said lower end portion of said rear tie element including interlocked portions of said rear tie element so that said border extends at least partially along opposite sides of said lower end portion.

4,710,983 COMBINATION HANDBAG AND DRESS ACCESSORY ITEM

Bradley S. Markoff, 4912 Libbit Ave., Encino, Calif. 91436

Filed Mar. 26, 1987, Ser. No. 30,343

Int. Cl.⁴ A41F 19/00

U.S. Cl. 2—301

10 Claims



1. A dress accessory item convertible into a handbag comprising: an elongated flexible belt-like dress accessory item; and first and second courses of decorative fastener means each originating from a common point on the periphery of said belt-like accessory item and affixed to and extending in opposite directions around the peripheral edge portion of said accessory item, said first course of fastener means cooperable with said second course of fastener means for joining said peripheral edge portion of said accessory item together upon itself commencing initially at said common point and successively thereafter along the length of said courses of fastener means to form thereby a handbag.

4,710,984 HELMET FOR PROTECTION AGAINST IMPACTS AND A METHOD OF MANUFACTURING THE SAID HELMET

Jean-Jacques Asper, Croix De Rozon, Switzerland, and Rémi Cottenceau, Viry, France, assignors to Motul S.A., Aubervilliers, France

PCT No. PCT/CH85/00098, § 371 Date Feb. 14, 1986, § 102(e) Date Feb. 14, 1986, PCT Pub. No. WO86/00198, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 14, 1985, Ser. No. 847,901

Claims priority, application Switzerland, Jan. 18, 1984, 2942/84

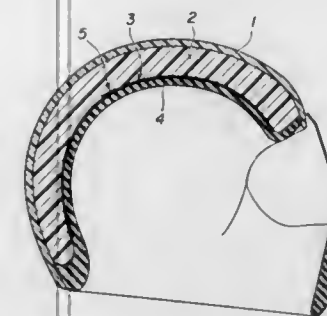
Int. Cl.⁴ A42B 3/02

U.S. Cl. 2—412

4 Claims

1. A helmet for protection against impacts, comprising a rigid outer protective shell, a first layer made from a non-elastically compressible material for absorbing the energy of the impact, an elastically compressible second layer forming the inner surface of the helmet, and an intermediate layer disposed between the two preceding layers for distributing the pressure exerted on both sides of a portion of the first layer for absorbing the energy of the impact over a large portion of the first layer, characterized in that the said intermediate layer is formed by a semi-rigid dome, which is independent of the outer protective shell and which is formed from a sheet mate-

rial of 0.3 to 1 mm thickness, of which the modulus of elasticity is between 1800 and 3500 N/mm², the elongation at rupture



less than 100% and the ultimate tensile strength between 30 and 100 N/mm².

4,710,985 PROTECTIVE HEADGEAR FOR WRESTLER

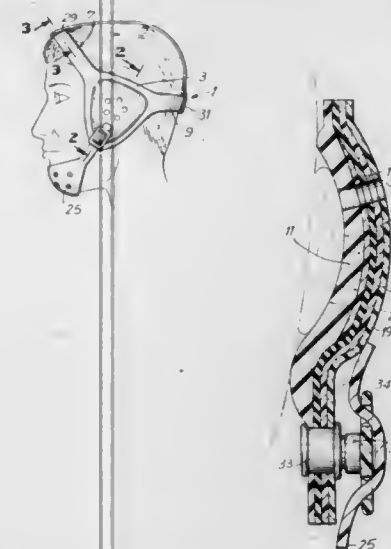
Robert Dubner, Russel S. Dubner, and Todd A. Dubner, all of Roslyn Harbor, N.Y., assignors to Rebound Systems, Inc., Roslyn Harbor, N.Y.

Filed Mar. 10, 1982, Ser. No. 356,901

Int. Cl.³ A63B 71/10

U.S. Cl. 2—425

7 Claims



1. A protective head gear for wrestlers including:

- (a) a pair of ear guards each comprising:
 - a shock absorbing inner foam layer having a substantially triangular ridge adapted to engage the head surrounding the ear;
 - a non-stretchable outer vinyl;
 - a cross-linked polyethylene intermediate foam layer bonded to said outer vinyl and to said inner foam layer; and
 - a high density polyethylene non-deformable insert substantially trapezoidal in shape and adapted to receive the ear, the lower edge of which is above the mastoid bone, bonded to and between said inner foam and said intermediate foam layers, and the upper and side edges of which substantially contact said ridge of said inner foam layer;
- (b) a top head strap integrally attached to each ear guard to pass over the top of the wearer's head;
- (c) a rear head strap integrally attached to each ear guard to pass behind the wearer's head;

- (d) engaging means to adjustably engage the straps of the respective ear guards comprising:
 - loops from a loop-hook fastener on the inner surface of said top and rear-head straps of one of said ear guards;
 - hooks from a loop-hook fastener on the outer surface of said top and rear head straps of the other of said ear guards;
- (e) a safety strap having elastic loops at each of its respective ends surrounding said engaging means to hold said engaging means in engagement; and
- (f) a releasable chin strap releasably connecting said ear guards to engage the wearer's head substantially at his chin.

4,710,986 OUTLET VALVE FOR TOILET TANK

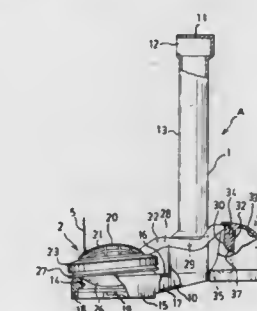
Ou Pi-Yu, No. 9, Alley 2, Ln. 247, Kuang-Chou Rd., Tainan City, Taiwan

Filed Apr. 24, 1986, Ser. No. 855,340

Int. Cl.⁴ E03D 1/34

U.S. Cl. 4—382

4 Claims



1. An outlet valve for use in a toilet tank, comprising: an outlet valve body having a vertically disposed overflow tube and a valve seat formed integrally at a lower end of said overflow tube said valve seat being disposed slightly inclined forwardly and downwardly, said valve seat extending to one side of said overflow tube to form a generally L-shape with said overflow tube and provided with a valve port which communicates with said overflow tube, a valve assembly having a front part formed as an inverted mesh disc and a rear part formed as a valve support means in the form of a U-shaped arm, a gas bag valve being affixed to a lower side of said mesh disc, said valve sealing said valve port from above, and the legs of said U-shaped arm being pivotably connected to a lower end of said overflow tube thereby allowing the valve to be closable and openable with respect to the valve port the base of said U-shaped arm extending freely to the side of the tube opposite said valve seat, actuator means for manually lifting and opening the valve, and a control member comprising a generally cup-shaped hollow body, a front wall thereof being provided with an upwardly projecting bar, said projecting bar including a stop formed adjacent a lower end of said bar, and a lower front end of said control member being pivotably connected to the lower end of said overflow pipe; said valve normally sealing the valve port while said free end of the arm is in contact with an upper portion of the projecting bar of said control means; when the valve is slightly opened upon manual operation said control means is inoperative to hold said valve in the open position; when said valve is completely open said free end of the arm is locked beneath said stop of said control means so that said valve is held in a completely open position until the water level falls to where the control means descends and unlocks the arm to enable the valve to descend upon said valve port.

4,710,987

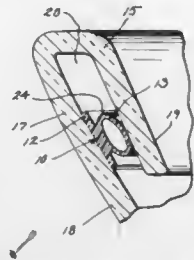
TOILET RIM WATER DISTRIBUTOR

Randy O. Mesun, Sheboygan, and Frank Schobert, Plymouth, both of Wis., assignors to Kohler Co., Kohler, Wis.
Continuation of Ser. No. 791,943, Oct. 28, 1985, abandoned.
This application May 15, 1987, Ser. No. 53,512

Int. Cl.⁴ E03D 5/00

U.S. Cl. 4-420

4 Claims



1. A water distributor suitable for use in a downwardly open flush rim of a toilet bowl, the rim being of the type having a fixed top wall and fixed at least partially downwardly directed sidewalls with one side wall having a flushing water inlet, said sidewalls being of the type devoid of support projections or grooves for the distributor, the distributor being freely removable from said rim, comprising:

- a flexible compressible tube portion positionable under the top wall below said inlet to follow the bowl periphery with an upper surface suitable to support water flow in the rim above and outside of the tube, the tubular portion capable of being deformed to provide compressive retention of said distributor in said rim without the need for an adhesive;
- a flexible generally flat planar side surface guide portion tangentially connected to the tube portion and extending above and below said tangential connection and positionable along one of the rim side-walls, and said guide portion having a plurality of at least somewhat downwardly directable water channels, said water channels extending through said planar portion to permit communication between a space above the distributor water support surface in the rim and the space below the distributor in the bowl, at least one of which extends in a manner to be in open communication with the rim sidewall such that the rim sidewall can form a sidewall for the channel.

4,710,988

FLUSH TOILET

John M. Stewart, Ontario, Canada, assignor to Sanitation Equipment Limited, Concord, Canada

Filed Feb. 19, 1986, Ser. No. 830,805

Int. Cl.⁴ E03D 11/10

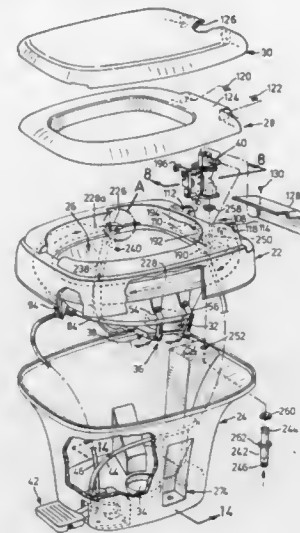
U.S. Cl. 4-438

15 Claims

1. A flush toilet comprising:

- a toilet bowl having a downwardly opening waste outlet at a lower end thereof surrounded by an annular sealing surface;
- a housing for supporting said bowl above a floor surface, said housing defining an internal space below said bowl outlet for receiving waste from the bowl, and having a bottom wall that includes a waste disposal outlet from said space for connection to external waste disposal means;
- a valve member adapted to co-operate with said annular sealing surface surrounding the bowl outlet, for closing said outlet;
- means pivotally supporting said valve member for movement between a closed position which the valve member co-operates with said sealing surface and closes said bowl outlet, and an open position in which the valve member is disposed laterally of and clear of said bowl outlet, said pivotal support means including two unequal length links pivotally supporting the valve member, said links being spaced in the direction of movement of the valve member

between said open and closed positions and constraining the valve member to swing away from said sealing surface while moving laterally towards said open position when the bowl outlet is to be opened;



actuation means accessible from externally of the housing for moving the valve member between its closed and open positions; and, flush means operable to deliver flushing liquid into the bowl at appropriate times.

4,710,989

DRY CLOSET

Bo Grenthe, 17 Gyllenehimsgatan, Vänersborg, Sweden S-462 00

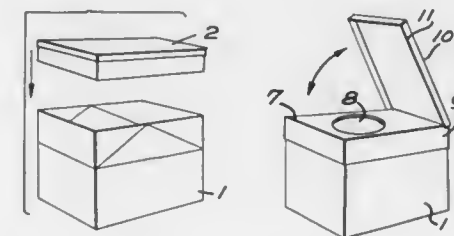
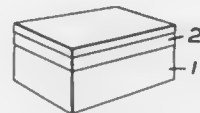
Filed Dec. 2, 1985, Ser. No. 803,667

Claims priority, application Sweden, Nov. 30, 1984, 8406066

Int. Cl.⁴ A47K 11/02, 11/04

U.S. Cl. 4-449

6 Claims



1. A portable, disposable, combustible dry closet made of corrugated cardboard or paperboard comprising a box-like bottom part and an upper seat part of lid-like construction which includes a flat top wall having an opening therein, said bottom part having a bottom wall and upright side walls, the upper portions of said side walls being foldable inwardly, at a location above said bottom wall so as to reduce the height of said bottom part for storage or transport and also form an

4,710,990

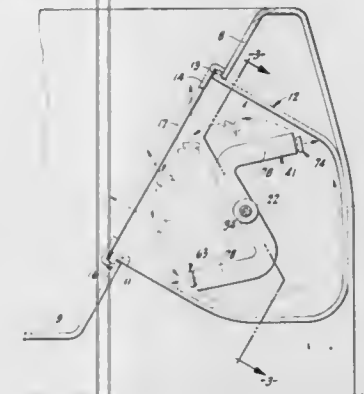
AIR-WATER NOZZLE FOR A SPA TANK

Donald M. Morsey, 2121 Carlotta Dr., Sacramento, Calif. 95825
Filed Feb. 24, 1987, Ser. No. 17,956

Int. Cl.⁴ A61H 33/02

U.S. Cl. 4-542

6 Claims



1. An air-water nozzle for a spa tank comprising:
 - a. a housing extending from a wall of said tank and open to said tank between a pair of housing side walls;
 - b. an S-shaped rotor having opposite ends;
 - c. means for mounting said rotor on said side walls for rotation about a horizontal axis, said rotor mounting means including coaxial nipples extending toward each other through said housing side walls;
 - d. walls in said rotor defining separate coaxial chambers each communication with a respective one of said nipples;
 - e. means in said rotor defining separate passages extending from both of said chambers substantially to the ends of said rotor;
 - f. means for conducting water under pressure through said rotor mounting means into said rotor for ejection from the ends thereof;
 - g. means for conducting air under pressure through said rotor mounting means into said rotor for ejection from the ends thereof; and,
 - h. means for mixing said water and said air prior to said ejection from said ends.

4,710,991

HEADREST PILLOW

Scott H. Wilmore, 7027 Woodland Dr., Eden Prairie, Minn. 55344, and Ronald D. Robinson, 3819 Tonkawood Rd., Minnetonka, Minn. 55345

Filed Jan. 21, 1986, Ser. No. 820,105

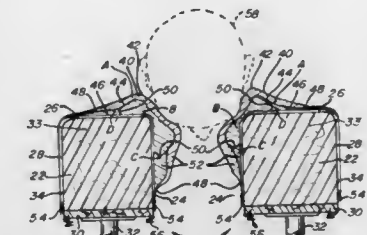
Int. Cl.⁴ A47C 20/02

U.S. Cl. 5-435

22 Claims

20. A pillow for engaging support and immobilization of the cervical spine of a person in a supine position, comprising
 - (a) a top plastic film having a predetermined length and width;
 - (b) an intermediate plastic film having a predetermined length and width sealed about its periphery to the top plastic film forming a closed upper chamber therebetween;
 - (c) a bottom plastic film having a predetermined length and width sealed about its periphery to the periphery of the intermediate film forming a closed lower chamber therebetween;
 - (d) at least two plastic film baffles within and extending the

width of the lower chamber sealed to the intermediate and bottom films forming laterally oriented outer, intermediate and inner lower subchambers; and



(e) a viscous gel within the upper chamber and outer, intermediate and inner lower subchambers.

4,710,992

WATERBED RAIL CAP

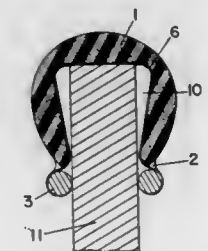
Bobby R. Falwell, Rte. 7, Box 696, Murray, Ky. 42071, and Orval H. Wooley, 7301 Annie Ln., Paducah, Ky. 42001

Filed May 1, 1987, Ser. No. 45,447

Int. Cl.⁴ A47C 21/00

U.S. Cl. 5-508

3 Claims



1. A rail cap for use on bedrails comprising:
 - a. a piece of foam or similarly flexible compressible padded material adapted to match and approximately cover the length and uppermost surfaces of a bedrail;
 - b. a cover mounted along the top surface of said foam material which cover is folded around the peripheral edges and secured to the lower surface of said foam material;
 - c. cylinders formed by and within the lengthwise outermost portions of said cover, said cylinders adapted for receiving a rigid structural member;
 - d. rigid structural members inserted within said cylinders leaving a gap in the center of each such cylinder such that said foam material and cover can be folded at their midpoint; and
 - e. a plurality of spaced apart spring clip means for forming said foam material and cover into a channel which slidably friction fits over said bedrail.

4,710,993

DYE COLOR CONTROL SYSTEM

Alvin W. Whaley, 2286 Dawnville-Beaverdale Rd., NE., Dalton, Ga. 30720

Division of Ser. No. 674,695, Nov. 26, 1984, Pat. No. 4,632,147.

This application Apr. 29, 1986, Ser. No. 856,965

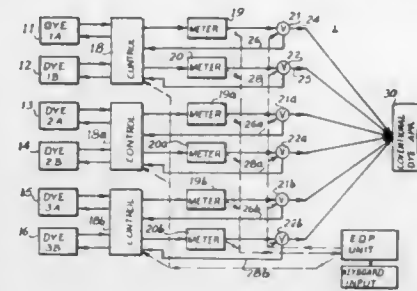
Int. Cl.⁴ D06B 23/00; F17D 1/14, 3/01

U.S. Cl. 8-158

3 Claims

1. A method for providing a color to a dyeing apparatus wherein said color comprises a mixture of a plurality of dyes, said mixture being provided for use in said dyeing apparatus, said method including the steps of feeding a first dye from a first tank, metering said first dye and establishing a rate of flow of said first dye, feeding a second dye from a second tank, metering said second dye and establishing a rate of flow of said

second dye, said rate of flow of said first dye and said rate of flow of said second dye being such as to yield said color when said first dye and said second dye are mixed, and causing said first dye and said second dye to flow to said dyeing apparatus, said method further including the steps of defining a plurality



of colors in terms of said tanks and flow rates from said tanks, selecting some of said plurality of colors and establishing a sequence of said some of said plurality of colors, and subsequently carrying out said steps of feeding a first dye and feeding a second dye for providing each color of said some of said plurality of colors in said sequence.

4,710,994

METHOD OF FORMING A COMPOSITE STRUCTURAL MEMBER

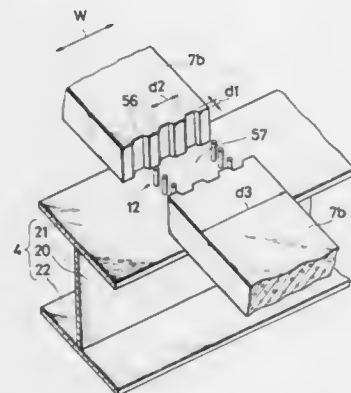
Hiroo Kishida, and Hirofumi Takenaka, both of Osaka, Japan, assignors to Harumoto Iron Works Co., Ltd., Osaka, Japan
Continuation of Ser. No. 668,821, Nov. 6, 1984, abandoned. This application Oct. 6, 1986, Ser. No. 915,900

Claims priority, application Japan, Nov. 7, 1983, 58-209599; Apr. 9, 1984, 59-70503

Int. Cl.⁴ E01D 1/00

U.S. Cl. 14-1

3 Claims



1. A bridge comprising:
 - a pair of abutments arranged in spaced relationship with each other;
 - a plurality of main beams placed in parallel with each other on and extending between said pair of abutments;
 - a plurality of concrete slabs having undulated end surfaces defining concave end recesses, said concrete slabs being disposed to extend transversely across and between said main beams in side-by-side and end-to-end fashion with undulated end surfaces of transversely adjacent said concrete slabs confronting each other;
 - dowels fixed to said main beams and extending upwardly therefrom into spaces defined between said concave end recesses of said confronting undulated end surfaces;
 - mortar filling said spaces and thereby integrally fixing said concrete slabs to said main beams; and
 - means for subjecting said concrete slabs to compressive stress acting thereon in the longitudinal direction of said

main beams and thereby for imparting to said main beams a tensile force acting in said longitudinal direction thereof and a negative bending moment acting upwardly.

2. A method for constructing a bridge, said method comprising the steps of:

preparing a plurality of concrete slabs each having buried therein a plurality of sheath tubes extending parallel with each other, said preparing comprising forming each said slab with undulated end surfaces at opposite ends thereof; arranging a pair of abutments in spaced relationship with each other; placing a plurality of main beams in parallel with each other on and extending between said pair of abutments; disposing said concrete slabs across said main beams such that said slabs are juxtaposed to extend across said beams and that said sheath tubes in said slabs extend parallel with the longitudinal direction of said beams, said disposing said slabs comprising positioning said slabs on and across said main beams at specified intervals such that said undulated end surfaces of said slabs face one another on said beams; inserting pc steel wires into said sheath tubes in said slabs; then producing in said slabs compressive stress acting in a direction parallel with said longitudinal direction of said main beams by applying tension to said pc steel wires by means of stretching means; fixing said compressive stress to said slabs by means of fixing means; fixedly securing said concrete slabs on said main beams to thereby integrate said slabs and beams, said securing comprising positioning dowels fixed to said main beams in spaces defined between the thus confronting undulated end surfaces and filling said spaces with mortar, thereby integrally securing said slabs to said beams; and thereafter actuating said fixing means to adjustingly release said compressive stress acting in said slabs thereby producing in said beams a tensile force acting in said longitudinal direction of said beams and a negative bending moment acting upwardly.

4,710,995

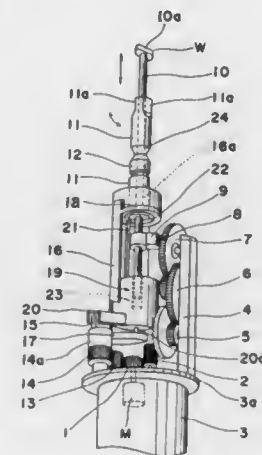
ELECTRIC MOTOR DRIVEN TOOTHBRUSH
Hisashi Joyashiki, Takatsuki; Minoru Iwasawa, Moriyama; Masakazu Oohigashi, Yao, and Masao Terai, Kobe, all of Japan, assignors to Sunstar Kabushiki Kaisha, Osaka, Japan
Filed Mar. 19, 1986, Ser. No. 841,325

Claims priority, application Japan, Mar. 19, 1985, 60-56347; Mar. 19, 1985, 60-40768[U]; Mar. 19, 1985, 60-40769[U]; Jan. 31, 1986, 61-13447[U]

Int. Cl.⁴ A46B 13/02

U.S. Cl. 15-22 R

8 Claims



1. A motor driven toothbrush comprising a housing having an end plate formed on one end portion of the housing, an

electric motor accommodated in the housing with the motor shaft projected outward of the housing through the end plate, a scrubbing shaft supported on a standard secured to the end plate of the housing for moving in a direction of the axis of the scrubbing shaft, a rolling shaft coaxially fitted to the scrubbing shaft for moving around the axis of the rolling shaft, first drive means driven by the rotation of the electric motor for driving said scrubbing shaft reciprocally in the axial direction, second drive means driven by the rotation of the electric motor for swinging said rolling shaft reciprocally around the axis of the rolling shaft, and adapter means having a toothbrush unit and being detachably mounted to the rolling shaft and/or the scrubbing shaft.

4,710,996

INTERDENTAL BRUSH HANDLE

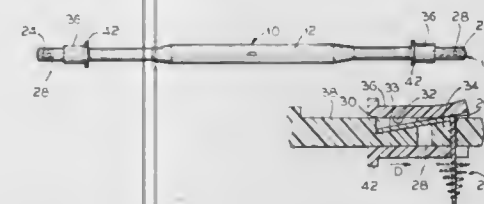
Emanuel B. Tarrson, and Dane Maric, both of Chicago, Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Aug. 12, 1986, Ser. No. 895,872

Int. Cl.⁴ A46B 3/08, 9/04

U.S. Cl. 15-105

11 Claims



5. A handle for receiving and supporting interdental brushes, said handle comprising an elongated member having oppositely disposed tip ends which form an obtuse angle with respect to an axis of said elongated member, means on at least one of said tip ends for receiving and capturing either an individually associated twisted wire brush or a toothpick, and sleeve means slidable over said tip ends, said sleeve having an elongated slot for receiving said twisted wire brush and for capturing said toothpick, a side of said sleeve opposite said elongated slot capturing said twisted wire brush and covering a broken end of said toothpick whereby at least one tip end may optionally receive either a brush or a toothpick.

4,710,997

LAST-CASE FOR CLEANING FOOTWEAR

Felipe U. Hermida, Fuentesmilanos 2 - hotel no. 3, Ciudad Puerta de Hierro, Madrid, Spain

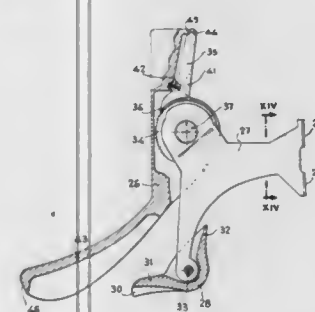
Filed Jul. 31, 1984, Ser. No. 636,153

Claims priority, application Spain, Aug. 3, 1983, 273.882

Int. Cl.⁴ A47L 23/18, 23/28

U.S. Cl. 15-268

15 Claims



1. A last-case for use in cleaning footwear, the last-case comprising:
 - a wall cover adapted to be mounted in a substantially vertical position, the wall cover comprising a pair of projecting

sections, the sections each being placed at an angle to the other;

an external cover detachably fixed to the lower edge of the wall cover and pivotable thereon between a closed position wherein the external cover and wall cover are substantially parallel, and an open position wherein the external cover is approximately at right angles to the wall cover; and

a last adapted for mounting in the last case, the last comprising:

- an angular member having at least one end, the at least one end of the angular member being releasably fixed to the wall cover by a pair of interconnecting flaps, the angular member comprising a widened area defining a flat opening, the flat opening providing a housing;
- a base member pivotally connected to the angular member between its ends;
- a heel member connected to the at least one end of the angular member remote from the flaps;
- a segmented, toothed wheel interjacent the angular member and the base member, the toothed wheel being fixed relative to the angular member and abutting the housing provided by the flat opening to prevent its rotation, the base member being rotatable relative to the toothed wheel and including a housing, the housing being mounted over the widened area of the angular member and the toothed wheel;
- a pawl member on the base member, one end of which is adapted to engage the toothed wheel to lock the base member in a plurality of positions relative to the angular member, the pawl being releasable from the toothed wheel to permit rotation of the base member in both directions;
- a pin, the pin lying in an axis normal to the toothed wheel so that the base member is pivotable about the pin relative to the angular member, the angular member, toothed wheel, and base member all being mounted about the pin, the pin comprising a head at one end and a threaded portion at another end;
- a locknut having an annular channel, the locknut being received by the threaded portion of the pin for securing the pin in position and being held by the engagement of the projecting sections of the wall cover which are received in the annular channel.

4,710,998

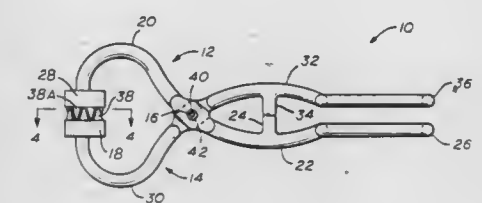
GAME SKINNING DEVICE

Daniel A. Gast, 4419 Trail Lake Dr., Houston, Tex. 77045
Continuation-in-part of Ser. No. 791,415, Oct. 25, 1985, Pat. No. 4,635,319. This application Oct. 20, 1986, Ser. No. 920,746

Int. Cl.⁴ A22B 5/16

U.S. Cl. 17-21

7 Claims



1. A hand operated animal skinning device comprising:
 - (a) a plurality of generally conical skin grasping teeth mounted with opposing teeth carrier members with said carrier members being respectively mounted at the ends of elongated jaw members;
 - (b) said teeth having rounded ends and being mounted in plural rows and spaced apart to permit teeth extending from one of said carrier members to intermesh and fit in between the teeth of the other of said carrier members;

- (c) said jaw members being connected together through pivot means and adapted for pivotal movement from an open position into a forceful biting gripping position of said teeth against the skin of an animal wherein the conical surfaces of the opposing teeth laterally squeeze the skin into clamping contact between said conical surfaces without piercing or damaging said skin;
- (d) a pair of handles respectively mounted at the ends of elongated handle respectively with said handle members being respectively joined with said jaw members at said pivot means; and
- (e) said handle members being adapted to drive said jaw members into biting position when forced together about said pivot means by hand operation whereby said skin can be gripped and pulled away from said animal.

4,710,999

DEVICE FOR CLEANING SHELLFISH

Josef Brunner, A-6322, Niederbreitenbach 156, and Josef Ritzler, Schwaige 28a, A-6344 Walchsee, both of Fed. Rep. of Germany

PCT No. PCT/DE85/00232, § 371 Date May 7, 1986, § 102(e) Date May 7, 1986, PCT Pub. No. WO86/00500, PCT Pub. Date Jan. 30, 1986

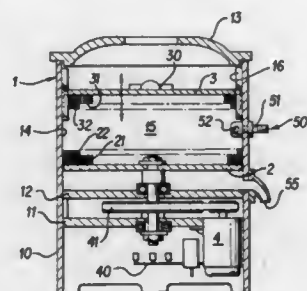
PCT Filed Jul. 5, 1985, Ser. No. 855,816

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425884; Jan. 11, 1985, 3500787

Int. Cl.⁴ A22C 29/00

U.S. Cl. 17—65

24 Claims



1. Device for cleaning shellfish comprising a chamber (15) for accommodating a quantity of shellfish, the chamber having two approximately opposite walls that are comprised of substantially planar, bristle-bearing brush wheels (2,3) which can be moved in their planes in relation to one another, at least one of the brush wheels (2) being equipped with a motor (4) for rotation thereof relative to the other brush wheel, the chamber including at least one input port (50) and one output port (55) for a rinsing fluid.

4,711,000

HANDS-FREE CLAMPING DEVICE FOR HOLDING FISH OR GAME FOR CLEANING

Jaye M. Bedsole, 16201 S.W. 283rd St., Homestead, Fla. 33030

Filed May 19, 1986, Ser. No. 864,505

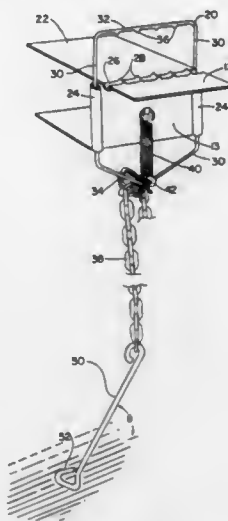
Int. Cl.⁴ A22C 25/06

U.S. Cl. 17—70

16 Claims

1. A hands-free clamping fixture for immobilizing a fish or animal carcass to enable the cleaning and/or descaling thereof, comprising a base member, and a movable clamping device interacting therewith, said base member having a work surface, said movable clamping device principally comprising a component of generally U-shaped configuration, said component having a base portion and a pair of arms, and being inverted such that said arms extend downwardly away from said base portion, means on each side of said base member for guiding said arms for vertical movement, and for preventing undesirable lateral displacement of said arms during such vertical movement and a foot operated device for causing the base portion of said inverted U-shaped component to selectively

move into a tightly clamping relation with said work surface, so as to firmly grasp and hold a portion of fish or animal placed on said work surface, and spring bias means for causing the



4,711,001

FASTENING ARRANGEMENT FOR OPEN HOSE CLAMP

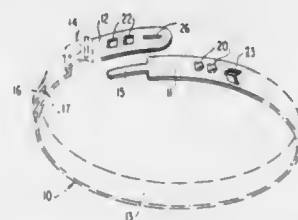
Hans Oetiker, Oberdorfstrasse 21, CH-8810 Horgen 2, Switzerland

Division of Ser. No. 622,766, Jun. 20, 1984, which is a continuation-in-part of Ser. No. 446,503, Dec. 3, 1982, Pat. No. 4,492,004. This application Oct. 23, 1986, Ser. No. 922,151

Int. Cl.⁴ B65D 63/02

U.S. Cl. 24—20 TT

15 Claims



1. A clamp structure, comprising clamping band means having open ends, and means mechanically interconnecting the open ends of the band means including at least two outwardly extending hook means in an inner band portion operable to engage in aperture means in an outer band portion, at least one of the hook means being a cold-deformed support hook, another one of the hook means being a hook in the form of an outwardly directed tab-like member pressed-out of the band material of the inner band portion and extending generally in the longitudinal direction of the band means, said another hook being operable to initially engage in its corresponding longitudinally extending aperture means before engagement of the cold-deformed hook in its corresponding aperture means to absorb the circumferentially directed tightening forces until the cold-deformed hook becomes effective, and wherein said tab-like member is pressed-out of the band material in such a manner that a larger amount of band material, as viewed in the transverse direction, is left on one side thereof than on the other.

4,711,002

BAG TIE WITH PRESS RELEASE LEVER

Elsmer W. Kreeger, Howell, Mich., assignor to Pinckney Molded Plastics, Inc., Howell, Mich.

Filed Jan. 14, 1987, Ser. No. 3,372

Int. Cl.⁴ B65D 77/10

U.S. Cl. 24—30.5 P

16 Claims



1. A bag tie with press release lever comprising: an elongated member having a longitudinal axis, a retaining housing at one end, a flexible middle section, and a free end portion at another end; a first wall of the retaining housing opposing a second wall of the retaining housing; third and fourth walls of the retaining housing opposing each other and formed integrally with the first and second walls; passage means for receiving the free end portion and the middle section through the retaining housing; a corniculate lever connected at a narrow end to the first wall of the retaining housing for releasably retaining the middle section and disposed between said third and fourth walls with an enlarged outer extremity end extending above the second wall, said corniculate lever having a middle-section-engaging surface on a concave side of said lever, a press-to-release-actuating end, and is biased against movement of the enlarged outer extremity end below the second wall; shaped means on the flexible middle section for releasably retaining the middle section in an engaged position within the retaining housing in cooperation with said middle-section-engaging surface of said lever; and a tapered surface of the free end portion tapering away from said middle section.

4,711,003

COUPLING SYSTEM

Jerome D. Gelula, 535 E. 86th St., New York, N.Y. 10028

Continuation of Ser. No. 640,071, Aug. 13, 1984, Pat. No. 4,578,844. This application Mar. 21, 1986, Ser. No. 842,325

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

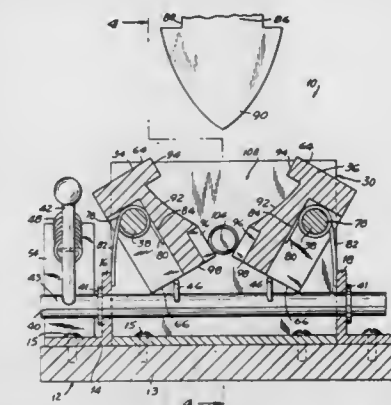
Int. Cl.⁴ A44B 17/00

U.S. Cl. 24—631

1 Claim

1. A latching system comprising, in combination: a support structure; at least one capturing member supported for movement between capturing and releasing positions by said support member; a locking member supported for movement between locked and unlocked positions by said support structure; first spring means carried by said capturing member and interrelated with said supporting structure for biasing said capturing member toward said releasing position; second spring means interrelated with said locking member and said support structure for biasing said locking member to said locked position; unlocking means integral with said locking member for enabling movement of said locking member from said locked position to said unlocked position, said latching system further including another capturing member supported for movement between capturing and releasing positions by said supporting member, said another captur-

ing member being mated with and opposed to said one capturing member, and further including another first spring means carried by said another capturing member, said another capturing member being interrelated with said locking member, said second spring means, and said locking means for movement synchronous with said one capturing member, said capturing members being rotatably connected to a pair of substantially parallel cylindrical pivots, said capturing members including top and bottom portions positioned on respective top and bottom opposing sides of said parallel pivots, said top portions being relatively distantly spaced and said bottom portions being approximately spaced in said releasing positions and said top and bottom portions being substantially equally spaced in said capturing positions, wherein said bottom portions of said capturing members include a bottom wall, said capturing members forming recesses in said bottom



portions opening at said bottom walls, said recesses being defined in part by rear surfaces transverse to the direction of rotation of said capturing members, and wherein said locking members include a cylindrical bar rotatably mounted on said support structure positioned below said bottom portions of said capturing members and substantially equidistant from said parallel pivots and substantially perpendicular to the direction of said parallel pivots, and two substantially parallel pins connected to and radially extending from said bar, said pins being in biased contact with said bottom walls of said capturing members in said unlocked position and positioned in said recesses with said rear surfaces being in biased contact with said pins in said locked position, said system further including an inserting portion formed with opposing convex surfaces and relatively reduced diameter portion defining a shoulder adapted to be obstructed when said inserting portion is releasably held.

4,711,004

APPARATUS FOR SHEARING A MOVING WEB OF MATERIAL

Alfonsius A. J. Van Dijk, St. Odilienberg, Netherlands, assignor to Johannes Menschner Maschinenfabrik GmbH & Co. KG, Viersen, Fed. Rep. of Germany

Filed Oct. 30, 1986, Ser. No. 925,887

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538922

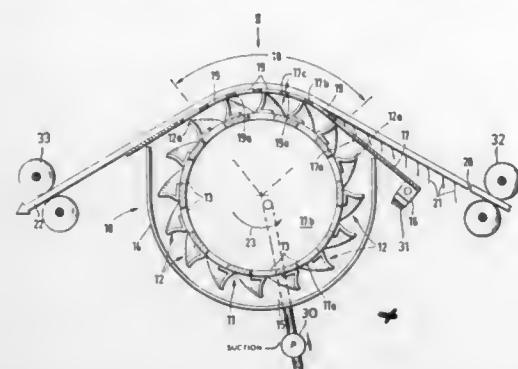
Int. Cl.⁴ D06C 13/00, 23/02

U.S. Cl. 26—15 R

8 Claims

1. A shearing apparatus for shearing a web of moving material comprising: a rotating shearing cylinder having a plurality of spiral shearing blades mounted on the outer circumferential surface of said shearing cylinder, each of said spiral shearing blades having a shearing edge and the axis of said shearing edge of said spiral shearing blade being at least

substantially parallel to the axial direction of said shearing cylinder; and
a spatially fixed nap height determining plate provided with a plurality of holes, the edges of which contact said shearing edges of said spiral shearing blades along a part of the



circumference of said shearing cylinder, the exterior side of said plate being the bearing surface for said web of material and the edges of said holes providing a plurality of opposing shearing edges for a plurality of said shearing edges of said shearing cylinder.

4,711,005

METHOD AND APPARATUS FOR MAKING SLATS FOR WINDOW BLINDS AND THE LIKE FROM A CONTINUOUS WEB OF PLASTIC MATERIAL

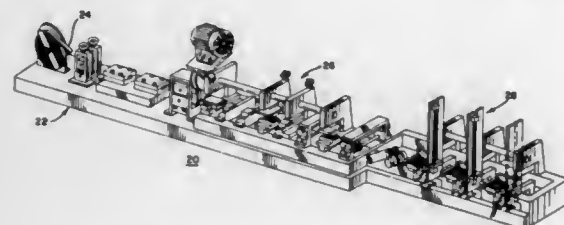
A-Shen Chang, Changhua Hsien, Taiwan, assignor to Joanna Western Mills Company, Chicago, Ill.

Continuation-in-part of Ser. No. 775,262, Sep. 12, 1985, Pat. No. 4,615,087. This application Jul. 14, 1986, Ser. No. 884,991

Int. Cl.⁴ B23P 19/04, 23/00; B29C 43/22

U.S. Cl. 29—24.5

20 Claims



1. A method of forming slats for window blinds and the like from a continuous web of plastic material, comprising the steps of:

feeding said web from a roll thereof at a selected feed rate into a heating chamber;
heating a flat traveling segment of said web while moving longitudinally thereof through said heating chamber to a selected elevated temperature level ready for molding;
molding said heated web to form a curved transverse cross-section while cooling to a selected cooling temperature while traveling longitudinally through a cooling chamber to mold and permanently set said web into said curved transverse cross-section; and
thereafter cutting said cooled and molded web into slats of discrete length and punching openings therein ready for receiving flexible support elements to form said blinds.

10. Apparatus for making slats for window blinds and the like from a continuous web of plastic material, comprising:
feed roll means for directing said web from a supply roll in a longitudinal direction at selected feed rate into a heating chamber;

a heating chamber having upper and lower plates each having a longitudinal groove for defining a heating path for the longitudinal travel of a flat section of said continuous

web between inlet and exit ends of said heating chamber, said grooves having heated, confronting, matching, opposite heating surfaces for heating contact with opposite sides of said traveling web moving adjacent thereof;

a cooling and molding chamber having an inlet end closely adjacent the exit end of said heating chamber and having upper and lower molding and cooling dies defining a longitudinal cooling and molding path for permanently molding and setting said web into a curved transverse cross-section, while a section of said web is traveling longitudinally toward an exit end of said cooling and molding chamber; and

exit feed roll means for directing said web exiting from said cooling and molding chamber longitudinally towards a cutting and punching section for cutting said web into slats of discrete length and punching openings therein ready for receiving flexible support elements to complete the formation of blinds from said slats at a final assembly section.

4,711,006

DOWNHOLE SECTIONAL SCREW MOTOR, MOUNTING FIXTURE THEREOF AND METHOD OF ORIENTED ASSEMBLY OF WORKING MEMBERS OF THE SCREW MOTOR USING THE MOUNTING FIXTURE

Dmitry F. Balenko, Moscow; Nikolai P. Bezlepkin, Otkryatsky Bashkirskoi; Jury V. Vadetsky, Moscow; Moisel T. Gusman, Moscow; Jury F. Potapov, Ljubertsy Moskovskoi, and Valery I. Semenets, Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchnoissledovatel'skiy Institut Burovoi Tekhniki, Moscow, U.S.S.R.

PCT No. PCT/SU85/00051, § 371 Date Mar. 17, 1986, § 102(e) Date Mar. 17, 1986, PCT Pub. No. WO86/00954, PCT Pub. Date Feb. 13, 1986

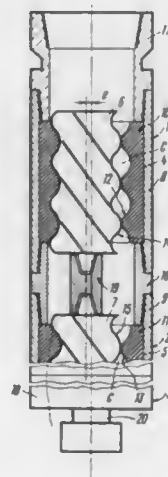
PCT Filed Jun. 27, 1985, Ser. No. 848,046

Claims priority, application U.S.S.R., Jul. 19, 1984, 3771625

Int. Cl.⁴ B23P 15/00, 19/00; B23Q 17/00

U.S. Cl. 29—156.4 R

3 Claims



1. A method of oriented assembly of successive working members of a downhole sectional screw motor which includes an output shaft, a moving section connected to the output shaft and incorporating successively arranged working members each working member including a stator and a rotor each having screw surfaces that interact with each other and having multiple screw starts that are equal for pairs of the surfaces, the like pairs of the adjacent working members being rigidly coaxially connected to each other, wherein the rigid coaxial connection of each like pair of the adjacent working members is made in the form of a solid threaded bushing using a frame including mounting elements each having multiple start screw profile surfaces, the number of multiple starts being equal and determined by the number of starts of screw threads on a screw

profile surface of a working member of the motor, coupling means for connecting the mounting elements in spaced relationship, a bushing carried in each mounting element and having a surface defining the screw profile surface, the bushings being installed coaxially with each other, one of the bushings being rigidly connected to the coupling means and the other bushing mounted for movement with respect to its longitudinal axis, a disk including securing means, the disk carried by one mounting element of the coupling the disk and the movable bushing each having angularly equidistantly spaced radial cuts whose number is equal to the number of starts in the profile surfaces of the mounting elements, which method comprises: superposing the profile surfaces of the working members of the motor and the bushings of the mounting elements of the mounting fixture, connecting like working members to each other by threaded bushings with a pre-securing movement along the threads superposing the profile surfaces of the bushings of the mounting elements of the adjusted mounting fixture respectively with the profile surfaces of the working members being connected, and securing the threads in the range of angular displacements of the connected working member within the limits of the permissible torques on the screwed threads until radial cuts on the disk and radial cuts on the movable bushing of the mounting element are aligned.

4,711,007

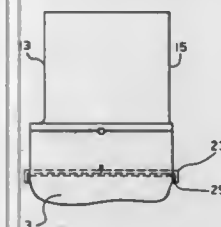
METHOD AND APPARATUS FOR INSTALLING FREE STANDING TURBINE BLADES

Kenneth C. Conrad, Birmingham, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1986, Ser. No. 912,872

Int. Cl.⁴ B21K 3/04; B23P 15/04; B64C 27/48; F01D 5/32
U.S. Cl. 29—156.8 R

20 Claims



1. A method of installing free standing turbine blades upon a rotor comprising the steps of:

- forming a plurality of serrations in a spaced relationship about an outer faced portion of said rotor, each of said serrations having a preselected cross-sectional area substantially conforming to the shape of a root portion of said blades, an inlet side, an exit side, and a bottom;
- inserting each of said blades into a respective one of said serrations;
- aligning an inlet face portion of each of said root portions with the inlet side of its respective serrations;
- inserting, at the exit side of each serration between its respective blade and bottom, a tapered shim;
- tapping each of said tapered shims;
- shaking each of said blades at a tip portion thereof to check for movement of its respective root portion;
- bending an excess portion of said tapered shim protruding from the exit side of serration back against the rotor; and
- repeating step (f).

12. Improved apparatus for preventing gouging and fretting of a blade root in a free standing blade installed in a serration formed on a turbine motor, said serration having an exit side, wherein the improvement comprises:

- locking means coupled between the blade root and the serration; and
- a tapered shim inserted beneath said locking means at an exit side of said serration, said tapered shim being wedged

between said locking means and serration to secure the blade.

4,711,008

METHOD OF PRODUCING PROPELLER SHAFTS FOR JET-PROPELLED SMALL-SIZED BOATS

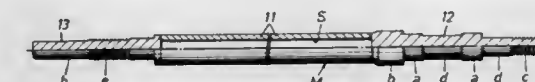
Yukio Nakamura, 3-19, 1-Chome, Tengachayakita, Nishinari-Ku, Osaka-Shi, Osaka-Fu, Japan

Filed Dec. 19, 1986, Ser. No. 943,399

Int. Cl.⁴ B21K 23/00, 1/06, 3/00; F16C 3/00

U.S. Cl. 29—156.8 P

1 Claim



1. A method of producing propeller shafts for jet-propelled small-sized boats, comprising the steps of preparing a main shaft in the form of a hollow round bar, which is a finished part and a pair of auxiliary shafts shorter in length than said main shaft, in the form of solid round bars, which are roughly shaped parts, connecting and integrating said pair of auxiliary shafts with the opposite cut ends of said main shaft by the friction welding process utilizing heat of friction produced by relative pressurized rubbing movement between said parts, and, with said main shaft, which is a finished part, used as a standard, machining the surfaces of said auxiliary shafts, which are roughly shaped parts, to form mount surfaces for fitting thereon such parts as oils seals, bearings, and a propeller.

4,711,009

PROCESS FOR MAKING METAL SUBSTRATE CATALYTIC CONVERTER CORES

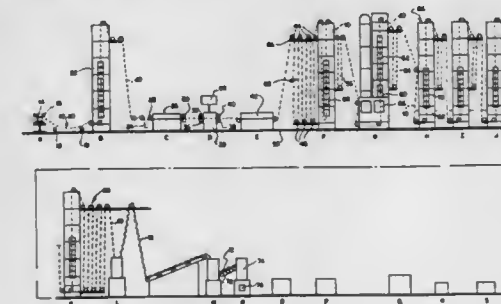
Richard C. Cornelison, Hiram, Ohio, and William B. Retallick, West Chester, Pa., assignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,698

Int. Cl.⁴ B21D 53/00

U.S. Cl. 29—157 R

37 Claims



1. A process for making a metal catalyst support core for a catalytic converter from a continuous metal strip, comprising the steps of:

- corrugating the metal strips,
- depositing at least one catalyst material on the corrugated metal strip,
- impressing fold lines on alternate sides of the strip along the entire length thereof, the fold lines extending transversely of the strip, and
- folding and gathering the strip along the fold lines impressed in step (c) to form a fan-folded metal catalyst support core.

4,711,010

METHOD OF SEALING OFF THE VAPORIZATION CHAMBER OF A STEAM IRON

Robert Walter, Eppertshausen, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

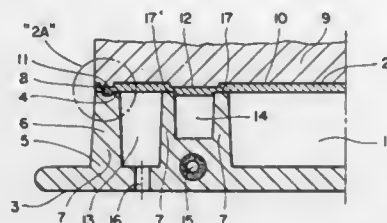
Filed May 9, 1986, Ser. No. 861,783

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517018

Int. Cl.⁴ B21D 53/00; B21K 29/00; B23P 15/26

U.S. Cl. 29—157 R

1 Claim



1. A method of sealing off outer and inner vaporization chambers provided in a metal sole plate of a steam iron by means of a metal cover, the outer vaporization chamber having an outer peripheral wall with an upper edge surrounding and spaced from the inner chamber defined by inner and outer walls, the method including forming a continuous groove the upper edge of in said outer peripheral wall of trapezoidal dovetail cross-sectional shape opening at said upper edge, choosing a material for said metal cover having a lower yield limit than the yield limit for the material of said metal sole plate, placing said metal cover over said vaporization chambers, applying pressure to said metal cover to force portions thereof into said continuous groove to fill said groove and force portions thereof into pressed engagement between said inner and outer walls of said inner chamber without substantially deforming said sole plate during said pressing.

4,711,011

APPARATUS FOR EXTRACTING AN ELEMENT FROM AN ASSEMBLY

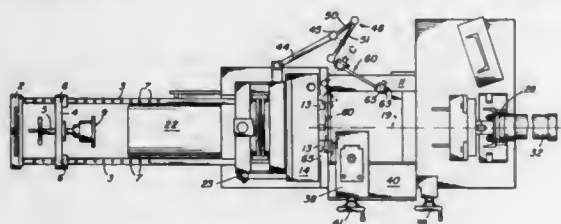
John G. Nugler, Burns, Tenn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 16, 1985, Ser. No. 766,307

Int. Cl.⁴ B23P 19/04

U.S. Cl. 29—239

4 Claims



1. Apparatus for extracting an element from an assembly comprising:

- an elongated frame comprising a plurality of elongated parallel stringer members having spaced bores therein for securing a transverse support bar in said bores to provide a plurality of positions of said bar with respect to the frame;
- a transverse support bar mechanism transversely positioned and detachably secured to said stringer members to support a portion of the assembly;
- a first chuck means mounted on said frame which aligns with said support bar mechanism for holding a portion of the element to be extracted;
- a tool means secured to said frame which is movable longitudinally to and away from said first chuck means and movable transversely to said frame;

dinally to and away from said first chuck means and movable transversely to said frame;

a vise means secured to said frame which is longitudinally retractable to hold a portion of the element which is to be extracted;

an arm assembly including a second chuck means having a pair of jaws which extracts the element from the assembly being movable both longitudinally and axially towards said first chuck means comprising

a pair of rails located on the frame for supporting said second chuck means including means securing said rails in spaced apart and parallel relation to each other;

a pair of blocks supporting the jaws of said second chuck means, said blocks being attached to said rails and at least one of said pairs of blocks being movable along said rails; and

each of said pair of jaws of said second chuck means being secured to a respective one of said pair of blocks to move with said blocks and to move relative to said blocks in a direction transverse to the movement of said blocks.

4,711,012

APPARATUS AND METHOD FOR INSTALLING GUTTER DROPS ON RAIN GUTTERS

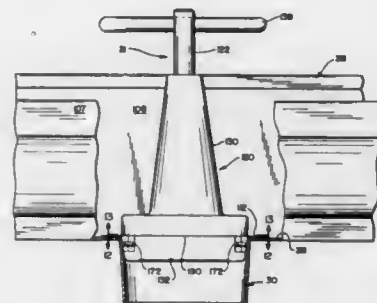
Donald R. Wolters, Phoenix City, Ala., assignor to J & L Associates, Inc., Columbus, Ohio

Filed Sep. 18, 1981, Ser. No. 303,510

Int. Cl.⁴ B23P 11/00

U.S. Cl. 29—243.52

7 Claims



1. A portable, hand-carried swaging tool for swaging outwardly protruding formations in a flanged gutter drop to secure the gutter drop to a rain gutter, comprising

- a housing structure having a housing portion which is configured and dimensioned for reception in the gutter drop after the gutter drop is inserted into a hole in the bottom wall of the rain gutter, a plurality of swaging dies mounted on said housing portion for movement between retracted and swaging positions, and means for selectively shifting said swaging dies from their retracted positions to their swaging positions while said housing portion is received in said gutter drop to swage said formations on the underside of said bottom wall and to thereby secure the gutter drop to said bottom wall by sandwiching said bottom wall between said formations and the flange of said gutter drop.

4,711,013

METHOD FOR REMOVING INJECTABLE MATERIAL FROM A PACKING CYLINDER

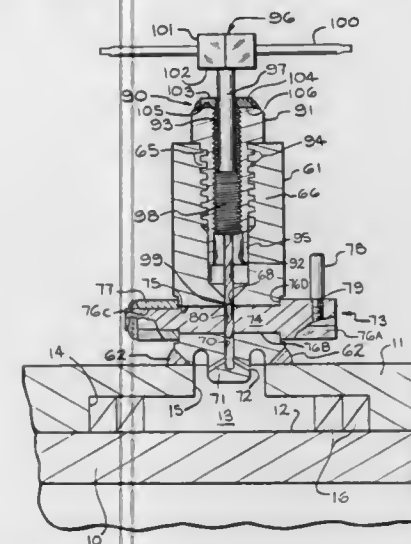
Daniel E. Hannah, Williamsville; Eugene W. Miliczky, Clarence; Clifford F. Bea, Alden, and Martin J. Hannah, Williamsville, all of N.Y., assignors to Advanced Thermal Systems, Inc., Lancaster, N.Y.

Continuation of Ser. No. 719,545, Apr. 3, 1985, abandoned. This application Jan. 8, 1987, Ser. No. 4,766

Int. Cl.⁴ B23P 7/00

U.S. Cl. 29—402.02

6 Claims



1. A method for injecting packing material through a packing cylinder provides with a cavity at least partially defined by an internally threaded wall, a plunger provided with corresponding external threads, and a bore extending along the longitudinal axis of the packing cylinder towards an injection tip, said method comprising the steps of:

- rotating said plunger to disengage it from the packing cylinder and checking for any sign of blow-back during disengagement;
- during disengagement of the plunger, upon any sign of blow-back, rotating the plunger to reengage it with the packing cylinder and injecting packing material through at least one adjacent packing cylinder and repeating the method beginning with the step of rotating the plunger to disengage it;
- rotating a reamer device to engage corresponding external threads provided thereon with those in the packing cylinder cavity, said reamer device including a shaft assembly provided with a bit and means mounting the shaft assembly in said reamer for selectively advancing and withdrawing said bit in the packing cylinder bore to remove packing material therefrom;
- advancing said bit to remove packing material from the bore of the packing cylinder;
- withdrawing said bit from the bore of the packing cylinder, disengaging the reamer device from the packing cylinder cavity and checking for any sign of blow-back;
- during disengagement of the reamer device, upon any sign of blow-back, rotating the reamer device to reengage it in the packing cylinder cavity and injecting packing material through at least one adjacent packing cylinder and repeating the preceding step;
- inserting packing material into the cavity of the packing cylinder;
- partially engaging said plunger in the packing cylinder cavity;
- applying up to a given amount of torque to rotate said plunger to force the packing material through said bore, during rotation of the plunger, upon the given amount of

torque being exceeded, repeating the method beginning with the step of rotating the plunger to disengage it.

4,711,014

METHOD FOR HANDLING SEMICONDUCTOR DIE AND THE LIKE

Victor E. Althouse, Los Altos, Calif., assignor to Vichem Corporation, Stanford, Calif.

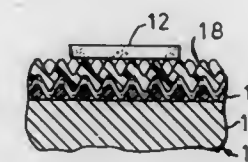
Division of Ser. No. 770,713, Aug. 29, 1985, Pat. No. 4,667,944.

This application Jan. 29, 1987, Ser. No. 8,645

Int. Cl.⁴ B32B 31/18

U.S. Cl. 29—412

9 Claims



1. A method of handling objects such as semiconductor chips, wafers, or like devices, said method including, attaching an object to an air-impermeable flat sheet member by interfacial forces between said sheet member and said object,

locating the flat sheet member on a porous texturized fibrous fabric having spaced high points at fiber crossovers, drawing portions of said sheet member over said high points and between said crossovers by connection of said fabric to a vacuum source for withdrawing portions of said sheet member away from said object without forming a vacuum between said sheet member and said object for reducing the contact area and interfacial forces between said sheet member and said object to allow for the ready removal of said object from said sheet member.

4,711,015

APPARATUS FOR HANDLING AND ASSEMBLING AXIAL ELECTRONIC COMPONENTS ON PRINTED CIRCUIT CARDS

Ezio Tega; Fabrizio Piccini; Marco Mazzini, and Raffaello Magi, all of Arezzo, Italy, assignors to Metalmeccanica Gori & Zucchi M.G.Z. S.p.A., Italy

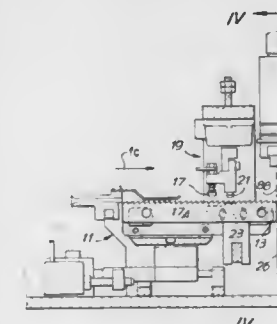
Filed Oct. 11, 1985, Ser. No. 786,875

Claims priority, application Italy, Oct. 17, 1984, 9514 A/84; Apr. 19, 1985, 9392 A/85

Int. Cl.⁴ H01R 43/04

U.S. Cl. 29—566.2

6 Claims



1. Apparatus for assembling on printed circuit cards components having axially extending wire leads, comprising in combination: tools prearranged for cutting and bending said leads as well as engaging the resultant component, which tools operate at a common station, a mobile hand of a robot for carrying operatively some of said tools and for transferring said resultant component to a circuit card station for assembly

to a circuit card, said tools to be carried by said mobile hand comprising a bending member with two appendices constructed to cooperate with separate counterpart members mounted at said common station for bending said leads into parallel relationship, means at said common station for feeding said components to a work station, said two appendices being constructed with confronting surfaces having guide and retaining channels terminating at the ends of said appendices in channels for centering said leads, said appendices being arranged for holding said resultant components with said parallel-bent leads resiliently pressing against said confronting surfaces, a slide block associated with said bending member for sliding movement along said bending member and said appendices, an axial actuation system carried by said mobile hand and constructed to cooperate operatively with said slide block for moving the latter to urge said resultant component from said appendices so as to introduce said leads into holes of said printed circuit card, a body engageable and disengageable by said mobile hand, said body having a channel-like seat for removably receiving said bending member, cooperating wire cutting elements mounted at said common station with a first part of said cutting elements fixedly supported and a second part mounted for counter-movement relative to said first part, and means associated with said second part which means are actuable by said mobile hand as the latter approaches said common station to actuate said wire cutting elements prior to accomplishing said bending of said leads.

4,711,016

FLEXIBLE MANUFACTURING UNIT

Henning Genschow, Vienenburg; Uwe Heisel, and Joachim Schuster, both of Berlin, all of Fed. Rep. of Germany, assignors to Werner and Kolb Werkzeugmaschinen GmbH, Berlin, Fed. Rep. of Germany

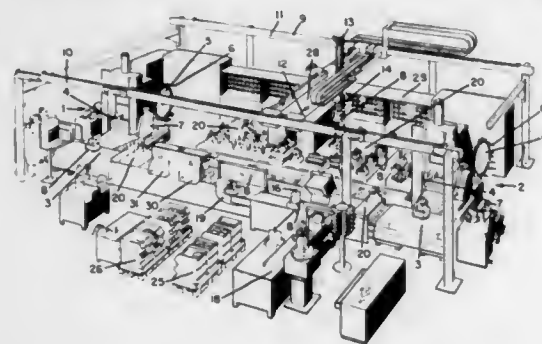
Filed Nov. 8, 1983, Ser. No. 550,083

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3243335; Feb. 4, 1983, 3304285

Int. Cl.⁴ B23Q 3/156

U.S. Cl. 29—568

17 Claims



1. Flexible manufacturing unit with at least two machine tools, a tool buffer store assigned to all machine tools, tool magazines, of which each is assigned to one machine tool adjoining it, and a single transport device for transporting tools and carriers, said transport device being movable in rectangular coordinates for individually transporting tools between the tool buffer store and the tool magazines and for the transport of work pieces fastened on the carriers, said unit being adapted to manufacture with random selection of tools and workpieces, said single transport device being developed in cross-portal construction and having a single gripping device for the tools and the carriers.

4,711,017 FORMATION OF BURIED DIFFUSION DEVICES

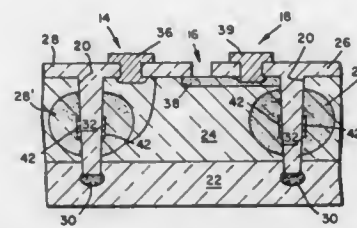
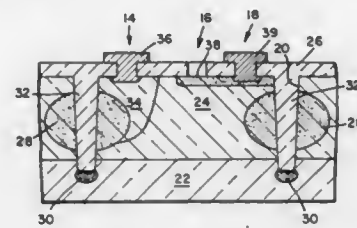
Michael D. Lammert, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 3, 1986, Ser. No. 835,571

Int. Cl.⁴ H01L 21/00

U.S. Cl. 437—20

48 Claims



1. A process for reducing collector parasitic resistance in a bipolar transistor having a collector, base and emitter, suitable contacts and metallization thereto, the process for forming said collector comprising:

- providing a P-type substrate;
- forming at least one lightly doped N⁻ region in the P-type substrate;
- etching a vertical trench in said N⁻ region to define the perimeter of said transistor;
- forming an N⁺ region in the bottom of said trench;
- driving said N⁺ region to a depth of about one-half the width of the device;
- etching said trench past said N⁺ region into said P-type substrate region;
- forming a P⁺ region in the bottom of said trench; and
- refilling said trench with insulating material.

25. A process for reducing collector resistance in a bipolar transistor having a collector, base and emitter and suitable contacts and metallization thereto, the process for forming said collector comprising:

- providing a P-type substrate;
- forming a lightly doped N region in the P-type substrate;
- etching a vertical trench in said N⁻ region to define the perimeter of said transistor;
- oxidizing the walls of said trench;
- anisotropically etching to remove oxide formed on the bottom of said trench;
- etching said trench an additional amount within said N⁻ region to expose silicon along a portion of the walls of said trench;
- diffusing an N-type species into said exposed silicon of said trench to form an N⁺ region;
- driving said N⁺ region by diffusion to a depth of about one-half the width of the device;
- etching said trench past said diffused region into said P-type substrate;
- forming a P⁺ region in the bottom of said trench; and
- refilling said trench with insulating material.

36. A process of reducing collector resistance in a bipolar transistor having a collector, base and emitter and suitable contacts and metallization thereto, the process for forming said collector comprising:

- providing a P-type substrate;

- forming a lightly doped N⁻ region in the P-type substrate;
- etching a vertical trench in said N⁻ region to define the perimeter of said transistor;
- oxidizing the walls of said trench;
- anisotropically etching to remove oxide formed on the bottom of said trench;
- etching said trench an additional amount within said N⁻ region to expose silicon along a portion of the walls of said trench;
- diffusing an N-type species into the exposed silicon of said trench to form an N⁺ region;
- driving said N⁺ region by diffusion to a depth of about one-half the width of the device;
- forming a metal silicide on the exposed walls of said trench, on said N⁺ diffused region;
- anisotropically etching the bottom of said trench to remove the silicide formed thereon;
- etching said trench past said diffused region into said P-type substrate;
- forming a P⁺ region in the bottom of said trench; and
- refilling said trench with insulating material.

4,711,018

METHOD OF MANUFACTURING A MAGNETIC HEAD CORE

Soichiro Matsuzawa, Kuwana, Japan, assignor to NGK Insulators, Ltd., Japan

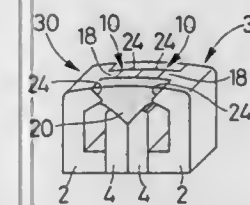
Filed Jan. 2, 1985, Ser. No. 688,502

Claims priority, application Japan, Jan. 14, 1984, 59-5203; Apr. 14, 1984, 59-5204

Int. Cl.⁴ G11B 5/42

U.S. Cl. 29—603

7 Claims



1. A process of manufacturing a composite magnetic head core, which comprises the steps of:

- butting and bonding together a first ferrite core element having a C-shaped portion, and a second ferrite core element having a rectangular portion, so as to close an opening of the C-shaped portion with the rectangular portion, thereby forming a first integral core assembly having a generally annular magnetic circuit which includes a coil-winding aperture defined by and between the first and second ferrite core elements, and a magnetic gap of a predetermined width defined by opposed end portions of the first and second core elements at one end of said first integral core assembly and formed transversely across an annulus of the magnetic circuit, said opposed end portions forming contact surfaces on which a magnetic recording medium is displaceable in sliding contact;
- cutting at least one inclined groove in the opposed end portions of the first and second ferrite core elements to define a width of at least one track for slidably contacting with said magnetic recording medium, said at least one inclined groove being formed in a direction from said opposed end portion on said second ferrite core element, toward said opposed end portion on said first ferrite core element, such that a bottom portion of the inclined groove is inclined with its depth decreasing toward the first ferrite core element and such that a depth of the inclined groove at the position corresponding to said magnetic gap is greater than a depth of the magnetic gap;
- preparing a second integral core assembly with at least one inclined groove by following the above recited steps

- and (b), and butting together the first and second integral core assemblies at the second ferrite core elements thereof with a predetermined clearance left therebetween such that said at least one inclined groove in the first integral core assembly is maintained in a predetermined positional relationship with said at least one inclined groove in the second integral core assembly in a direction along the length of said at least one track; and
- placing a glass material over said inclined grooves, melting the glass material to fill said inclined grooves with molten glass, and concurrently to fill said predetermined clearance with molten glass thereby bonding the first and second integral core assemblies to form the composite magnetic head core.

4,711,019

METHOD OF MAKING CORE LAMINATIONS, AND PUNCH DIE FOR CARRYING OUT THE METHOD

Bernhard Albeck, Waiblingen-Neustadt, and Siegfried Goedicke, Urbach, both of Fed. Rep. of Germany, assignors to Schwabe GmbH, Urbach, Fed. Rep. of Germany

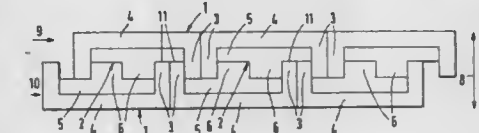
Filed Mar. 18, 1986, Ser. No. 840,919

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510854

Int. Cl.⁴ H01F 3/04

U.S. Cl. 29—609

6 Claims



1. A method of making, from a flat strip of electrical sheet steel, core laminations for an electrical inductive element, such as a ballast, choke, or transformer, in which the core laminations include:

- essentially U-shaped integral laminae having two parallel projecting side, or outer, legs (3) and a connecting or middle leg (4) therebetween, and
- essentially T-shaped integral laminae having a projecting center leg (6) and a cross leg (5), comprising, in accordance with the invention, the combination of the steps of
- punching the essentially U-shaped laminae (1) in interdigitated positions in which the respective outer edges of the connecting legs (4) define opposite sides of the punching strip; and
- defining for the essentially T-shaped laminae, positions in which a first essentially T-shaped lamina has its center leg (6) projecting - with respect to the width (8) of the strip - in a direction opposite to the direction of projection of the side leg (3) of a first U-shaped lamina (1), and punching the first essentially T-shaped lamina in a position in which
- a one side of the center leg (6) fits against an inner edge of the side leg (3) of said first essentially U-shaped lamina (1), and
- the other side of the center leg (6) fits against a side of a center leg of a neighboring essentially T-shaped lamina, and in which the neighboring T-shaped lamina has its center leg projecting in a direction opposite the direction of projection of the center leg of the first lamina.

4,711,020

TOP END-STOP ATTACHING MACHINE WITH IMPROVED TOP END-STOP SUPPLYING APPARATUS
Kojo Watanabe, Kurobe; Akiyoshi Kando, Uozu, and Yoshiyuki Horita, Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

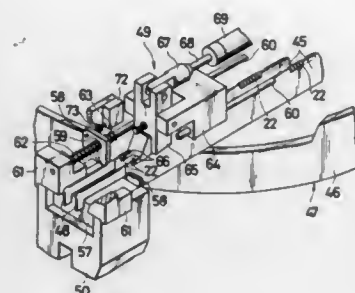
Filed Aug. 29, 1986, Ser. No. 901,658

Claims priority, application Japan, Sep. 5, 1985, 60-196628; Sep. 13, 1985, 60-140105[U]

Int. Cl.⁴ A41H 37/06

U.S. Cl. 29—767

14 Claims



1. A top end-stop attaching machine including an apparatus for supplying top end stops of a substantially U-shape one at a time to a holding portion of the attaching machine, said apparatus comprising:

- a vibrating parts feeder;
- a first elongate guide rail cantilevered to said parts feeder and extending therefrom toward the holding portion, said first guide rail having an upper longitudinal edge along which the top end stops are fed successively from said parts feeder toward a free end of said cantilevered first guide rail by the vibration of said parts feeder and said first guide rail;
- a reciprocable second elongate guide rail disposed between the holding portion and said first guide rail and having an upper longitudinal edge normally extending flush with said upper longitudinal edge of said first guide rail, said second guide rail being reciprocally movable between a receiving position in which one end of said second guide rail is held in contact with said free end of said first guide rail, and a delivery position in which the other end of said second guide rail is held in registry with the holding portion, said second guide rail being normally held in said receiving position; and
- a delivery unit disposed above said first guide rail and reciprocally movable toward and away from the holding portion to deliver a leading top end stop from said first guide rail by way of said second guide rail to the holding portion, said delivery unit being engageable with said second guide rail within a limited range of its reciprocating stroke for moving said second guide rail from said receiving position to said delivery position.

4,711,021

METHOD OF INSTALLING A FEMALE ELEMENT TO A PANEL AND INSTALLATION APPARATUS

Rudolph R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

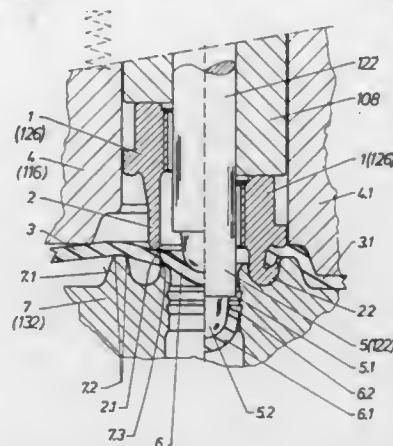
Continuation-in-part of Ser. No. 869,507, Jun. 2, 1986, which is a division of Ser. No. 657,570, Oct. 4, 1984, Pat. No. 4,610,072, which is a continuation-in-part of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, which is a continuation-in-part of Ser. No. 229,274, Jan. 28, 1981, abandoned, said Ser. No. 563,833 is a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, which is a division of Ser. No. 229,274, Jan. 28, 1981, abandoned. This application Oct. 27, 1986, Ser. No. 923,526

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610675

Int. Cl.⁴ B23P 11/00, 19/00

U.S. Cl. 29—798

10 Claims



1. A method of attaching a female element to a panel, said female element including a body portion having a bore therethrough and a generally annular piercing and riveting portion extending from said body portion in general coaxial alignment with said body portion bore, said piercing and riveting portion including a free end and a piercing surface adjacent said free end, said method including the following steps:

- supporting a panel on a die member, said die member including an annular die cavity surrounding a projecting annular die portion, said die portion surrounding a central die bore and having a die cutting edge adjacent its upper surface and located at the inner edge of said annular die cavity, and a panel supporting surface generally surrounding said annular die cavity supporting said panel, said upper surface of said annular die portion being spaced below the plane of said panel supporting surface;
- biasing said annular piercing and riveting portion free end against said panel with said piercing and riveting portion piercing surface in general coaxial alignment with said die cutting edge;
- driving the free end of a punch having a rounded end surface through said female element bore and said annular piercing and riveting portion thereby doming a first panel portion into said central die bore;
- driving said annular piercing and riveting portion piercing surface against said panel and said die cutting edge thereby piercing said domed first panel portion from said panel forming a pierced panel opening and a panel slug, and said punch driving said domed first panel portion slug into said central die bore; and
- continuing to drive said female element piercing and riveting portion free end against said panel adjacent the pierced edge of said panel, through said pierced panel opening into said annular die cavity, deforming said piercing and riveting portion free end and said panel, forming a mechanical interlock between said female element piercing and riveting portion and said panel.

4,711,023

PROCESS FOR MAKING SINGLE-IN-LINE INTEGRATED ELECTRONIC COMPONENT

Giuseppe Marchisi, and Carlo Cognetti De Martiis, both of Milan, Italy, assignors to SGS-Antes Componenti Elettronici S.p.A., Catania, Italy

Division of Ser. No. 701,221, Feb. 13, 1985, Pat. No. 4,649,460.

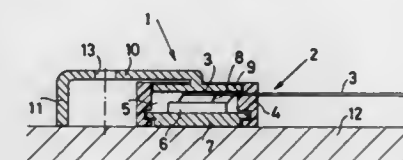
This application Dec. 15, 1986, Ser. No. 941,336

Claims priority, application Italy, Feb. 17, 1984, 19668 A/84

Int. Cl.⁴ H01R 43/00

U.S. Cl. 29—827

2 Claims



1. A process for making a single-in-line integrated electronic component comprising:

- providing a metallic frame with electric contacts, molding an insulating package on said metallic frame to form an inner space,
- providing a heat dissipator at the bottom of said inner space, mounting a semiconductor chip on said heat dissipator in said inner space and electrically connecting said semiconductor chip to said contacts, and
- arranging an insulating cover at the top of said inner space, said insulating cover being provided with a lateral extension having a turned end flush with the package bottom and at least one bore for the passage of a fastening means for the fastening of the component to a support surface.

4,711,024

METHOD FOR MAKING TESTABLE ELECTRONIC ASSEMBLIES

Robert J. Russell, Boston, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 564,977, Feb. 3, 1984, abandoned, which is a division of Ser. No. 315,594, Oct. 30, 1981, Pat. No. 4,556,840. This application Nov. 21, 1985, Ser. No. 800,488

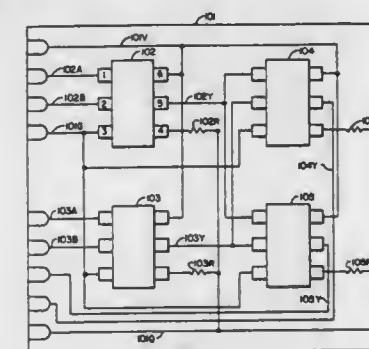
The portion of the term of this patent subsequent to Dec. 3, 2002,

has been disclaimed.

Int. Cl.⁴ H05K 3/30

U.S. Cl. 29—832

1 Claim



4,711,022

METHOD FOR WIRE INSULATION

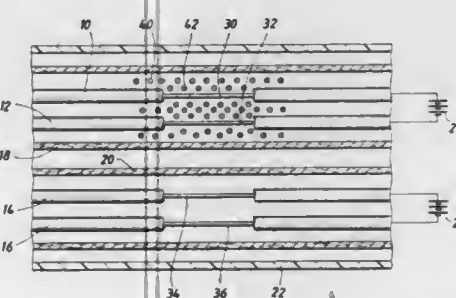
Clarence S. Freeman, and Katherine M. Freeman, both of 16242 Katherin Ln., Channelview, Tex. 77530

Filed Mar. 26, 1986, Ser. No. 844,144

Int. Cl.⁴ H01R 43/00

U.S. Cl. 29—825

4 Claims



1. The process of electrochemically coating a metallic wire made of a metal having a positive ionic disposition, which comprises

- preparing a water solution including in solution a polymer with anionic groups and at least one noninvolved cationic substance,
- placing the length of the wire to be insulation coated in the solution, and
- passing a small dc current through the solution so that the wire in solution becomes an anode, the substance with cations being left in solution and a hydrophobic insulation being chelated on the wire, there being an anionic-cationic linkage established between said polymer and the metal of the wire.

1. A method of making an electronic assembly that can be tested using a reciprocal quiescence testing technique comprising the steps of:

- manufacturing a printed circuit board having means for mounting electronic components, and having means for electronically connecting predetermined terminals of said electronic components;
- only mounting electronic components on said electronic assembly that have one or more quiescence control inputs

which can be optionally removed wherein if said optional removable quiescence control inputs are removed said electronic component will be in a functional state;

- C. connecting said one or more quiescent control inputs of each of said electronic components to receive one or more quiescent control signals;
- D. providing means for placing each of said electrical components in a functional state during normal operation;
- E. providing means for placing all but one of said electronic components in a quiescent state when using said reciprocal quiescence testing technique; and
- F. providing means for placing said one of said electronic components in said state when using said reciprocal quiescence testing technique; whereby during normal operation all electronic components are in a functional state, but during the testing of said electronic assembly, all said electronic components can be placed in a quiescent state at one time by application of said one or more quiescent control signals to said one or more quiescent control inputs yet allowing each electronic component to be placed in a functional state when that particular electronic component is a target component being tested whereby said target component can be tested in selective isolation from other electronic component connected to said target component's inputs or outputs, and whereby said testing can be conducted with little or no analysis of the interconnection of said electronic components within said electronic assembly.

4,711,025

METHOD AND APPARATUS FOR FORMING ELECTRICAL HARNESES

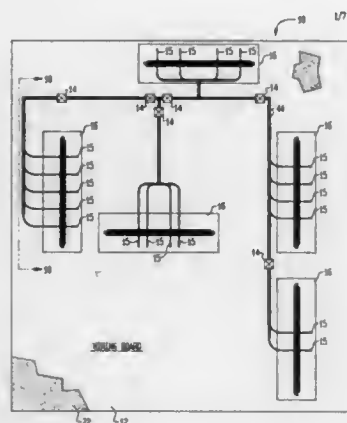
Joseph J. DeSanto, 14 Hillcrest Rd., Belle Mead, N.J. 08502

Filed May 5, 1986, Ser. No. 860,004

Int. Cl.⁴ H01R 43/00; H02G 3/00

U.S. Cl. 29—854

14 Claims U.S. Cl. 29—850



1. A method for assembling an electrical wire harness comprising the steps of:
 - locating wire end terminating means having a Velcro®-like base on a wiring board at locations where wires are to begin and end;
 - locating wire gathering units having Velcro®-like surfaces on their bases on said wiring board along the path where the wires of the electrical harness will pass;
 - routing wires from wire end terminator units through wire gathering units until the complete wire harness is formed;
 - tightening the wire gathering units so that the wires of the electrical harness stay in place;
 - removing the assembled electrical harness and wire gathering units assembly from said wiring board;
 - placing the assembled electrical harness in an electrical chassis having electronic components therein so that the Velcro®-like surfaces of the wiring gathering mate units

with Velcro®-like targets on the electrical chassis thereby securing the harness to the electrical chassis; and, connecting the free wire ends of the electrical harness to the electrical components on the electronic chassis.

5. An apparatus for forming a wire harness comprising:
 - a board having a surface;
 - a first type of attaching means covering at least a portion of said board surface for mating with a second type of attaching means;
 - wire gathering means attached to said second type of attaching means for gathering and holding one or more electrical wires;
 - wire end holding means also attached to said second type of attaching means for holding the end of one or more of said electrical wires,
 wherein one of said two types of attaching means comprises a hook material and the other of said two types of attaching means comprises a loop material so that said wire gathering means and said wire end holding means may be selectively attached to the surface of said board and a wire harness formed by running at least one of said electrical wires from one wire end holding means through at least one wire gathering means to at least one other wire end holding means.

4,711,026

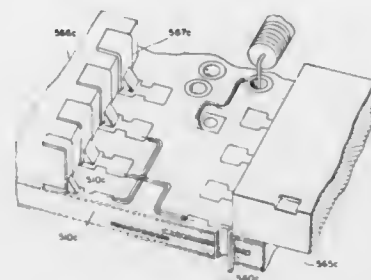
METHOD OF MAKING WIRES SCRIBED CIRCUIT BOARDS

Brian E. Swiggett, Huntington; Ronald Morino, Sea Cliff; Raymond J. Keogh, Huntington, all of N.Y.; Jonathan C. Crowell, Lakeville, Mass.; George Czencky, Northport, N.Y.; Andrew J. Schoenberg, Huntington, N.Y., and Marja L. Friedrich, Babylon, N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jul. 19, 1985, Ser. No. 756,722

Int. Cl.⁴ H01K 3/10

34 Claims



1. A process for scribing at least one conductor onto a surface of a substrate in a predetermined pattern between two points spaced apart on the surface each defining a terminal point comprising:
 - a. providing a conductor having an adhesive coating, which is normally non-tacky and non-blocking prior to curing, which can be activated by applying energy thereto, said adhesive coating rapidly reverting to a solid non-tacky condition within about 0 to about 200 milliseconds after activation;
 - b. scribing the conductor onto the surface of the substrate from a first terminal point along a predetermined path to a second terminal point;
 - c. activating at least a portion of the adhesive coating on the conductor prior to, or simultaneously with contact with the substrate surface so that a bond is formed adhering the conductor to the surface of the substrate when said activated adhesive reverts to said solid non-tacky condition;

- said reversion of said adhesive to a non-tacky state within about 0 to 200 milliseconds permitting the scribing speed along a straight path to reach a potential speed of at least 120 inches per minute while simultaneously substantially

avoiding relative movement of the bonded conductors with respect to each other and the substrate surface.

4,711,027

IMPLANTABLE LEAD CONSTRUCTION

Donald L. Harris, Key Largo, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 672,334, Nov. 16, 1984, Pat.

No. 4,627,439, which is a continuation-in-part of Ser. No.

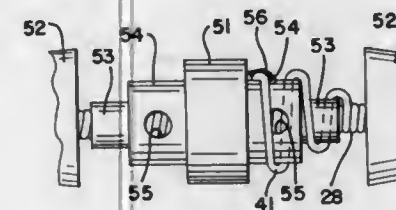
561,648, Dec. 15, 1983, Pat. No. 4,567,901. This application Aug.

4, 1986, Ser. No. 892,959

Int. Cl.⁴ H01R 43/00

U.S. Cl. 29—869

23 Claims



1. A method for constructing an implantable lead, comprising:
 - positioning a first section of flexible insulating polymeric sheath over a coiled conductor member having an insulator coating;
 - providing a short annular sheath over said coiled conductor member, said short annular sheath being radially recessed with respect to and axially extending beyond said first insulating sheath section;
 - uncoiling a length of said coiled conductor member and removing a portion of its insulator coating to form a free conductor length having an uninsulated portion;
 - wrapping at least a portion of said free conductor length generally around at least a portion of said short annular sheath;
 - engaging an electrode member into electrical communication with said uninsulated portion of said free conductor length;
 - butting together said electrode member and said first section of flexible insulating polymeric sheath until one axial face of said electrode member engages an axial face of said first section of insulating polymeric sheath; and
 - sliding a second section of flexible insulating polymeric sheath over said coiled conductor member and butting together said electrode member and said second section of flexible insulating polymeric sheath until another axial face of said electrode member engages an axial face of said second section of insulating polymeric sheath.

4,711,028

DRY-SHAVING APPARATUS WITH A HOLDER FOR CIRCULAR CUTTING UNITS

Wijitje Bergsma, and Klaas T. Oord, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1986, Ser. No. 944,299

Claims priority, application Netherlands, Jan. 24, 1986, 8600154

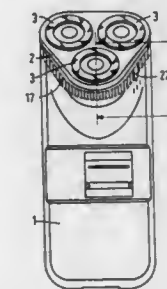
Int. Cl.⁴ B26B 19/14

U.S. Cl. 30—43.6

6 Claims

1. A dry-shaving apparatus comprising a holder for a circular cutting unit; said cutting unit including an external cutting member formed with hair-entry apertures, having an outwardly extending annular flange portion, and movable transversely relative to the holder, and an internal cutting member rotatably drivable relative to the external cutting member; a retaining plate positioned inside the holder; means to detachably secure the external cutting member to the retaining plate, the internal cutting member being retained between the external cutting member and the retaining plate, said means includ-

ing two resilient arms engaging around the flange portion of the external cutting member and secured to the retaining plate;



and spring means associated with the retaining plate to move the same transversely relative to the holder.

4,711,029

COOKERY IMPLEMENT

John B. Somerset, Armadale, Australia, assignor to McPherson's Limited, Australia

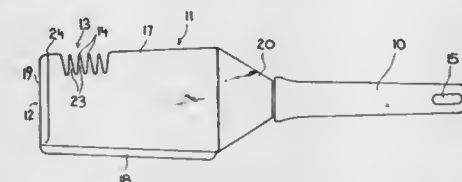
Filed Aug. 21, 1986, Ser. No. 899,214

Claims priority, application Australia, Aug. 21, 1985, PH2062

Int. Cl.⁴ C21D 1/00

U.S. Cl. 30—148

3 Claims



1. A cookery implement comprising a handle having a predetermined width, a substantially flat blade lying in a predetermined plane and having a first end and a second end defining a longitudinal axis for said blade, said blade including first and second side edges extending substantially along said longitudinal axis, a connecting portion for connecting said handle to said first end of said blade, said connecting portion extending angularly upwards and away from said first end of said blade out of said predetermined plane so that said handle is offset from said blade, said blade extending from said connecting portion substantially along said longitudinal axis and having a width transverse to said longitudinal axis which is substantially greater than said predetermined width of said handle, a first cutting edge formed along said first side edge of said blade, a second cutting edge formed along said second end of said blade, and a plurality of spaced prongs provided at said second side edge of said blade, said plurality of spaced prongs being located in spaced relationship from said first and second second ends of said blade so that at least a portion of said second side edge extends on both sides of said plurality of spaced prongs, each of said plurality of prongs extending generally transversely to said second side edge and being generally contained within the predetermined plane of said blade and having a narrow tip at its extremity which does not project substantially beyond said second side edge of said blade.

4,711,030

VARIABLE SPEED FILLET KNIFE

Robert B. Ruston, Sr., P.O. Box 357, Merryville, La. 70653

Filed May 5, 1986, Ser. No. 859,463

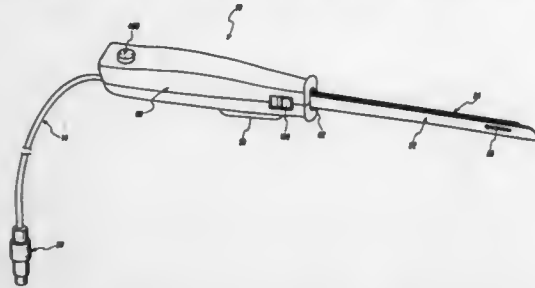
Int. Cl.⁴ B26B 7/00

U.S. Cl. 30—272 A

6 Claims

1. A portable, hand-held electric knife having dual cutting blades, a DC electric motor, power conductors electrically connected to the DC electric motor for conducting current

from a remote storage battery, the DC electric motor including an armature shaft and a gear assembly mechanically coupling the dual cutting blades to the armature shaft, the gear assembly including a support shaft, a pair of bevel gears mounted for rotation on opposite ends of said support shaft, a beveled pinion gear engaged with said first and second bevel gears, said beveled pinion gear being mechanically coupled to the armature shaft of said DC electric motor, each cutting blade includ-



ing a force transmitting end member movably coupled to one of the beveled gears for converting rotary motion of said armature shaft to linear counter-reciprocating motion of said cutting blade, each cutting blade having an elongated slot formed intermediate the force transmitting member and the cutting end, with the respective elongated slots being disposed in overlapping alignment with each other; and, a fulcrum shaft lodged within said housing and projecting through said overlapping slots.

4,711,031

ENVELOPE OPENER

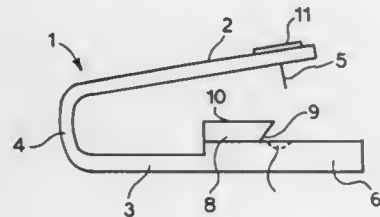
Joan Anello, Landisville, N.J., assignor to Paul Joseph Anello, Landisville, N.J.

Filed Jul. 16, 1986, Ser. No. 886,228

Int. Cl.⁴ B67B 7/00

U.S. Cl. 30—294

8 Claims



1. A device for opening an envelope, comprising:

- a body of generally U-shaped longitudinal cross-section, comprising first and second walls each having first and second ends, said first and second walls being joined at the first ends, the second ends being free, said second ends being capable of movement toward each other, said walls each comprising a first surface facing toward the other wall and a second surface facing away from the other wall;
- a cutting blade fixedly attached to the first surface of said first wall and projecting therefrom;
- a thickened end portion formed on the first surface of said second wall and extending toward the second end of the second wall, said thickened end portion forming a flat guiding surface for the envelope;
- an abutment means attached to the thickened end portion, comprising a substantially planar abutment edge which forms an acute angle with respect to the guiding surface and which guides the envelope therealong, and an upper surface for engaging the first wall when said first and second walls are pressed toward each other, said blade

having a length which is greater than the thickness of the abutment means;

a hole formed in the thickened end portion which is located to receive the cutting blade when the first and second walls are pressed toward each other, said hole having a depth which is greater than the difference between the distance the blade projects from the first wall and the thickness of the abutment means;

wherein when said first and second walls are pressed together, the cutting blade and abutment edge are spaced from each other a pre-determined distance apart corresponding to the width of a slice to be cut off the envelope, the location and dimensions of the hole being such that the blade does not contact the perimeter of the hole.

4,711,032

PORTABLE SAW MILL

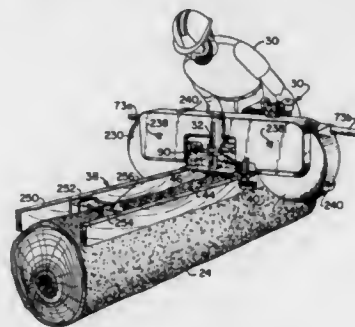
Clifford P. Rickmers; Robert D. Donovan, both of Tupelo, Miss., and Louis C. Brickner, Jr., Pittsburgh, Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Sep. 5, 1985, Ser. No. 772,898

Int. Cl.⁴ B27B 15/02

U.S. Cl. 30—372

10 Claims



1. A portable saw mill for cutting lumber from a log, comprising:

- (a) a frame adapted to be disposed transversely of the log;
- (b) a pair of horizontally spaced apart wheels adapted to straddle the log, the wheels being rotatably supported by the frame for rotation in a vertical plane;
- (c) a band saw blade positioned around the wheels for movement transversely of the log;
- (d) means for rotating at least one of the wheels to cause the blade to form a cut in the log as the frame is moved longitudinally along the log;
- (e) vertically adjustable support base means for supporting the frame relative to a top surface of the log so as to enable vertical adjustment of the band saw blade relative to the top surface of the log, the support base means including a platen, a pedestal interconnected to the platen having a plurality of substantially horizontal, vertically adjustable legs for supporting and leveling the platen, and handle means interconnected to the pedestal for vertical adjustment of the support base;
- (f) a guide roller interconnected to the frame and adaptable to various shaped logs, said roller being movable longitudinally upon the log as it is being cut for guiding the frame along the log as the frame advances whereby the blade is kept in a zone of cutting as the blade cuts the log lengthwise; and
- (g) handle means interconnected to the frame for facilitating movement of the frame longitudinally of the log by a user.

4,711,033

APPARATUS FOR AND METHOD OF SETTING THE HEIGHT OF A DESK CHAIR

Peter P. Mitchell, 210 Sylvan Dr., Englewood Cliffs, N.J. 07632

Filed Dec. 29, 1986, Ser. No. 947,902

Int. Cl.⁴ G01B 5/00

U.S. Cl. 33—169 R

9 Claims



1. An apparatus for setting the height of a desk chair for a person, the apparatus comprising:

- a base adapted to stand on the floor;
- a guide fixed to and extending vertically up from the base;
- a support vertically slidable in the guide;
- clamp means for arresting the support in the guide at any of a multiplicity of vertically offset positions therealong;
- a rigid arm extending horizontally from the support and having an outer end;
- a dependent gauge element displaceable between a horizontal position nested in the arm and a vertical position depending straight down from the arm outer end and having a lower end 1 in to 2 in below the outer end of the arm in the vertical position.

4,711,034

ELECTRONIC MEASURING DEVICE

Hiroshi Koizumi, Kawasaki, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

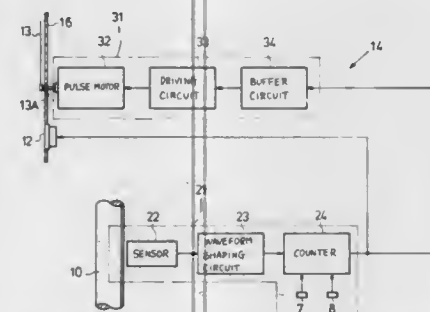
Filed Nov. 12, 1986, Ser. No. 929,042

Claims priority, application Japan, Nov. 13, 1985, 60-254292; Nov. 15, 1985, 60-256205; Nov. 15, 1985, 60-256206

Int. Cl.⁴ G01B 3/22

U.S. Cl. 33—172 E

8 Claims



1. An electronic measuring device comprising:

a spindle slidably disposed in the axial direction in the main body and having at its tip a probe;

counter means having a sensor whose elements are disposed on said main body and on said spindle in corresponding positions and are adapted for converting relative displacement therebetween into an electrical signal, said counter means operating to count the number of pulses in said electrical signal supplied from the sensor, said pulses corresponding to said relative displacement;

a digital indicator for indicating a measured value in a digital form on the basis of said counted value supplied from said counter device;

pointer rotating means including a pulse motor and a driving circuit for rotatingly driving a pointer on the basis of said counted value supplied from said counter device to said driving circuit, said pointer rotating means further including a buffer circuit for controlling the rate of supplying pulses to said driving circuit; and

a scale for enabling said measured value to be read by cooperating with said pointer, said measured value thereby being read from the outside of said main body by means of said pointer and said scale, and said digital indicator.

4,711,035

METHOD AND APPARATUS FOR MAKING A PATTERN FOR A LENS OPENING IN AN EYEGLASS FRAME

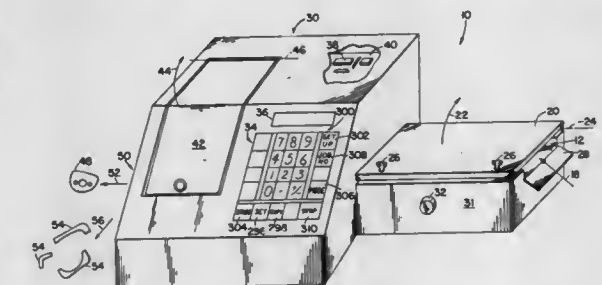
David J. Logan, Glastonbury; Kenneth O. Wood, Ellington; William Hernandez, Madison, and Richard L. Edwards, Windsor Locks, all of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Filed Dec. 8, 1987, Ser. No. 896,615

Int. Cl.⁴ G02C 7/02

U.S. Cl. 33—200

16 Claims



1. Apparatus for generating a pattern for a lens opening in an eyeglass frame, said apparatus comprising:

means for containing an instruction set to control the operation of said apparatus;

means for providing a plurality of data points collectively representative of the size and shape of an associated lens opening in an eyeglass frame;

means for feeding a blank from a supply of blanks to a work station associated with said pattern generating apparatus;

means for fixturing the blank at the work station;

means for rotating the blank fixtured at the work station;

cutter means located in the region of the work station for cutting the blank fixtured at the work station, and

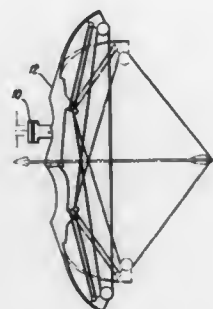
means for moving said cutter toward and away from the fixtured blank in accordance with the instruction set as the fixtured blank rotates relative to said cutter movement to make a pattern having the size and shape of the associated lens opening corresponding to said plurality of data points.

4,711,036

PENDULUM OPERATED OSCILLATING BOW SIGHT
Eddy Morris, Box 17, Level Acres, Eufaula, Ala. 36027
Filed Jan. 23, 1986, Ser. No. 821,892
Int. Cl.⁴ F41G 1/46

U.S. Cl. 33—265

11 Claims



1. An oscillating bow sight for use in aiming a bow and arrow comprising a plate member for connection to the bow, said plate member having means defining an elongated track therein, a lower means mounted on said plate member for rotation relative thereto and having a weighted means and an arm means secured thereto and disposed approximately ninety degrees from one another, said arm means having a carriage means secured thereto and received in said elongated track, and sighting means projecting radially from said carriage means and disposed in the line of sight of an archer using the bow.

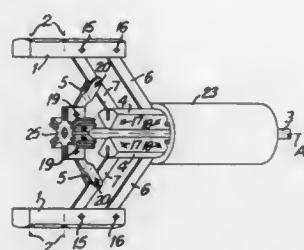
4,711,037

DEVICE FOR MEASURING DIMENSIONS OF OBJECTS
Mohammad M. Saadat, 219 Cherry St., Katonah, N.Y. 10536
Continuation of Ser. No. 712,684, Mar. 18, 1985, abandoned.
This application Aug. 26, 1986, Ser. No. 902,062
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1984, 3412253

U.S. Cl. 33—520

Int. Cl.⁴ G01B 5/00

17 Claims



1. A measuring device, for measuring dimensions of objects, comprising
a guide linkage comprising
a sliding rod,
a coupler having a first sensing element adapted to engage an object to be measured,
a slider slidably mounted on said sliding rod,
two links pivotally connected adjacent respective ends thereof to said slider and to said coupler at respective first pivot points forming at least approximately a parallelogram, and
a crank operatively pivotally connected adjacent respective ends thereof to said sliding rod and to a center of one of said links at respective second pivot points, the crank having a length between said second pivot points equal to half the length of said one link between said first pivot points of said one link;

means comprising an indicator for indicating position of said coupler relative to said sliding rod; and
means for biasing said coupler by spring force in a direction with respect to the object to be measured such that said indicator is responsive to relative movement of said coupler with respect to said sliding rod.

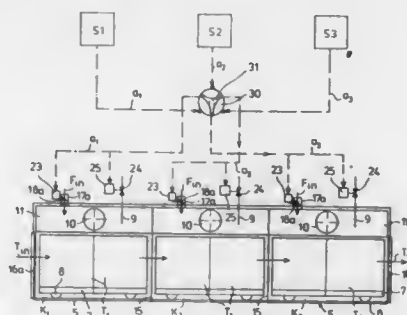
4,711,038

RUN-THROUGH BRICK DRYING PLANT AND METHOD FOR THE CONTROL OF ITS OPERATION
Matti Uimonen, Lahti, Finland, assignor to Tekma Oy, Lahti, Finland
PCT No. PCT/FI83/00072, § 371 Date Jun. 21, 1985, § 102(e)
Date Jun. 21, 1985, PCT Pub. No. WO85/02249, PCT Pub. Date May 23, 1985

PCT Filed Nov. 15, 1983, Ser. No. 749,537
Int. Cl.⁴ F26B 3/04

U.S. Cl. 34—25

7 Claims



1. A run-through brick drying apparatus which operates stepwise by the chamber dryer principle comprising a plurality of drying chambers connected in a series with one of said chambers being the first and one being the last drying chamber in said series, a plurality of brick load conveying means, means for moving each conveying means through said chambers, means for controlling the movement of said conveying means pursuant to a selected drying schedule so that, for each conveying means, a selected dwell time in each drying chamber and a selected drying temperature in each chamber is effected whereby drying of each brick load is completed in the last chamber, said conveying means comprising dryer wagons and each said wagon being provided with a vertical wall which functions as a partition wall between said chambers as each said wagon is moved through said chambers.

4,711,039

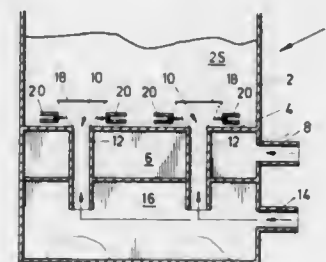
FLUIDIZED BEDS

Brian A. Napier, Evesham, and Maurice J. Fisher, Upton upon Severn, both of England, assignors to Coal Industry (Patents) Limited, United Kingdom

Filed Oct. 27, 1986, Ser. No. 923,268
Claims priority, application United Kingdom, Nov. 12, 1985, 8527860

U.S. Cl. 34—57 A
Int. Cl.⁴ F26B 17/10

6 Claims



1. Fluidised bed apparatus including a body adapted to

contain a fluidised bed of particulate material supported by a gas permeable distributor, inlet means for fluidising gas, at least one discharge port means associated with the distributor, a deflector plate disposed in spaced relation above the discharge port means, a gas ejector means associated with the discharge port means, a classifier connected to the discharge port means, and an inlet means to the classifier for classifying air.

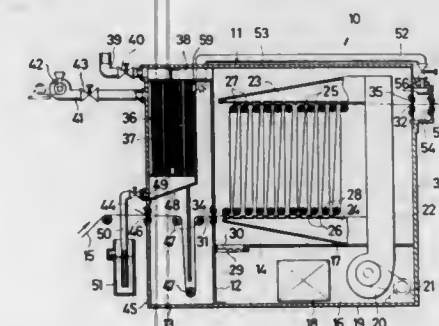
4,711,040

APPARATUS FOR CONTINUOUSLY THERMALLY TREATING ELONGATE TEXTILE PRODUCTS
Keizo Hatta, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 1, 1986, Ser. No. 858,001
Claims priority, application Japan, May 15, 1985, 60-71888[U]; May 17, 1985, 60-73312[U]; May 24, 1985, 60-77369[U]

U.S. Cl. 34—73

10 Claims



1. An apparatus for continuously thermally treating an elongate textile product having oil, comprising:
(a) a housing having a preheating chamber for preheating the elongate textile product and a main heating chamber for heating the elongate textile product to give off an oily smoke after it has been preheated;
(b) a heat exchanger disposed in said preheating chamber for condensing and collecting solidified tar thereon from the oily smoke;
(c) an outlet tube connected to said heat exchanger for discharging heated oily air from said main heating chamber through said heat exchanger, said outlet tube having a first regulating valve;
(d) an intake tube connected to said heat exchanger for introducing external air through said heat exchanger into said preheating chamber, said intake tube having a second regulating valve; and
(e) a tar collector connected to said heat exchanger for periodically melting and collecting melted tar which flows off said heat exchanger when it is melted by heat produced at an interval of time when said first regulating valve is substantially open and said second regulating valve is closed.

4,711,041

ROTARY DRIER WITH LIFTING ELEMENT

Henrik Ullum, Karlslunde, Denmark, assignor to A/S Atlas, Ballerup, Denmark

PCT No. PCT/DK85/00091, § 371 Date Jun. 20, 1986, § 102(e)
Date Jun. 20, 1986, PCT Pub. No. WO86/02150, PCT Pub. Date Apr. 10, 1986

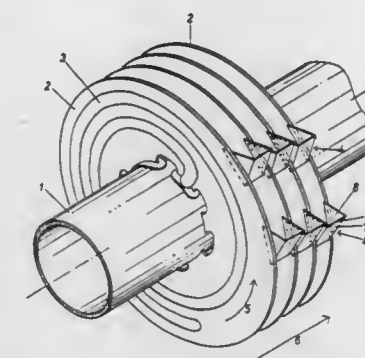
PCT Filed Oct. 2, 1985, Ser. No. 876,883
Claims priority, application Denmark, Oct. 4, 1984, 4753/84
Int. Cl.⁴ F26B 11/04

U.S. Cl. 34—179

7 Claims

1. Drier for the heating and drying of wet, comminuted materials, mainly organic materials, said drier comprising at least a stationary housing with a revolving, hollow rotor with an inlet and outlet for a heating medium, said rotor including a

plurality of annular drying elements disposed at intervals therealong and which are heated by the heating medium, at least one lifting element located between and secured to two



adjacent drying elements and spanning same, said lifting elements including at least a pair of securing members secured to and extending generally radially from said lifting element and a support portion bridging said securing members.

4,711,042

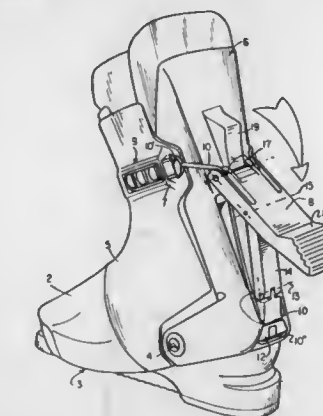
CLOSING AND TIGHTENING APPARATUS FOR A REAR-ENTRY SKI BOOT

Joseph Morell, Annecy, and Jean-Louis Demarchi, Duingt, both of France, assignors to Salomon S.A., Annecy, France

Filed Sep. 20, 1985, Ser. No. 778,204
Claims priority, application France, Sep. 26, 1984, 84 15260
Int. Cl.⁴ A43B 5/04; A43C 11/00

U.S. Cl. 36—50

74 Claims



1. An apparatus for closing and tightening a boot on the foot and leg of a skier, wherein said boot comprises a rigid shell base and an upper, wherein said upper comprises first and second parts, wherein said upper is at least partially journaled on said shell base, wherein said first part comprises a cuff and said second part comprises a rear spoiler, wherein one of said parts is journaled relative to said shell base and is pivotable in the longitudinal direction of said boot wherein one of said parts is displaceable with respect to the other of said parts, and wherein said apparatus comprises:

(a) at least one linking element comprising first and second portions, wherein said first portion is attached to said first part of said boot at a first attachment position, wherein said second portion is attached to one of said second part of said boot and said foot of said skier at a second attachment position;
(b) traction means for applying a traction force to said at least one linking element, said traction means being movably mounted relative to the part of said boot on which it is positioned; and

(c) means for changing the direction of said at least one linking element as said least one linking element extends from said first part of said boot around said direction changing means along a second direction to one of said second part of said boot and said foot, wherein said direction changing means is positioned on said traction means intermediate said first and second attachment positions, to direct said linking element along said second direction.

4,711,043

TRAINING DEVICE FOR KICKING A FOOTBALL OR SOCCER BALL

Dennis M. Johnson, 1038 Carria Dr., and H. Skeet Surrency, 726 E. Jefferson St., both of Tallahassee, Fla. 32301

Filed Oct. 1, 1986, Ser. No. 913,932

Int. Cl.⁴ A43B 23/00

U.S. Cl. 36—139

1 Claim



1. An impact audible signal device adapted to be removably attached over the shoe lace of a soccer ball player's shoe, or the like, the combination of:

means for generating an audible signal upon impact with a ball; said means being attached to a support material; upper elastic flap means attached to the support material which are adapted to extend behind the ankle of a player and connect by fastening means; a bottom elastic flap means attached to the support material and designed to be wrapped around the bottom lace of a player's shoe and connected by fastening means; said means for generating an audible signal being adjustably secured to a shoe of a player by said upper and bottom flap means so as to position the signal means over the desired area of the shoe.

4,711,044

"NEON LOOK" LIGHTING

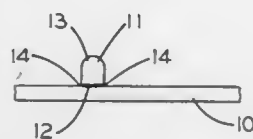
Barbara Danjell, Columbus, Ohio, assignor to Danjell Creations, Inc., Columbus, Ohio

Filed Oct. 2, 1985, Ser. No. 782,978

Int. Cl.⁴ G09F 13/00

U.S. Cl. 40—543

8 Claims



1. A lighting fixture simulating the appearance of a neon lamp comprising:

a base panel to which there is applied a three dimensional mass of a fluorescent pigmented cast polymeric material in a predetermined pattern, said mass of pigmented polymeric material simulating a neon glow when activated by an activating lamp, said base panel and said mass of cast polymeric material being further intrinsically adhesively bonded at the interface of the panel and the mass of cast polymeric material, said interface being an abraded area

on the base panel corresponding substantially to the predetermined pattern of the mass, and an activating lamp located in a proximate relationship to said panel, whereby the radiation from said lamp is directed to the pattern of the mass of pigmented polymeric material to produce a simulated neon glow.

4,711,045

APPARATUS FOR DOCUMENTLESS ORDER PICKING OF GOODS

Dieter Specht, Wermelskirchen, Fed. Rep. of Germany, assignor to Interroll Fordertechnik GmbH & Co. KG, Wermelskirchen, Fed. Rep. of Germany

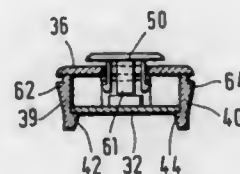
Filed Jul. 14, 1986, Ser. No. 885,149

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526867

U.S. Cl. 40—564

Int. Cl.⁴ H01R 33/00

7 Claims



1. An electronic display and switch apparatus to enable documentless order picking of goods from at least one storage location, said apparatus comprising:

a board having a printed circuit thereon; a digital luminous display mounted to the board and electrically connected to at least a portion of the circuit thereon; a cover having a transparent display face and being disposed in snap fit mounting relationship to said board and covering at least the portion of the board to which the digital luminous display is mounted; a switch mounted to the board and in proximity to the digital luminous display; an actuator button mounted in snap fit relationship to the cover for limited movement relative thereto, said actuating button being disposed to selectively contact and actuate the switch; means for snap fitting the cover and the board to the storage location, whereby the digital luminous display may be operated to produce a signal relating to the goods to be picked and whereby the actuating button may be actuated to operate the switch and generate a signal.

4,711,046

LIGHTWEIGHT MULTI-PANEL DISPLAY

Donald E. Herrgord, P.O. Box 1266, Muskegon, Mich. 49443

Filed Feb. 27, 1985, Ser. No. 706,107

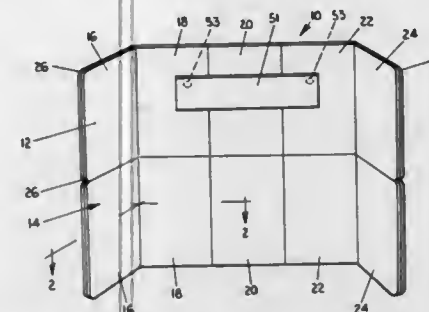
Int. Cl.⁴ G09F 7/00

U.S. Cl. 40—605

21 Claims

1. A free standing multi-panel display comprising: a plurality of panels having front and back surfaces and top, bottom, and side edges, the panels being arranged side-by-side, each panel having longitudinal slots in at least the side edges facing adjacent panels; pliable strip hinges interconnecting the side edges of adjacent panels, each strip hinge comprising an elongated strip of readily flexible sheet material having side edges that are fastened in slots in the opposing side edges of adjacent panels, leaving a flexible intermediate portion of the strip between the panels that serves as a hinge, the intermediate portion being wide enough to permit adjacent panels to be folded flat against each other in either direction such that either the front or back surfaces of the panel abut each other; and

a display surface formed of flexible sheet material affixed to at least the front surface of the panel display and extending



over adjacent panels and their connecting strip hinges so as to form a continuous surface over the multi-panel display.

4,711,047

SIGNAL FLARE CARTRIDGE

Yehuda Meller, Holon, Israel, assignor to The State of Israel, Ministry of Defence, Israel Military Industries, Israel

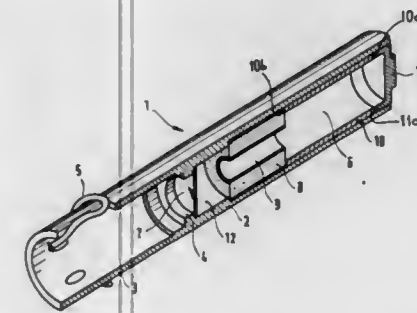
Filed Aug. 2, 1985, Ser. No. 761,798

Claims priority, application Israel, Jan. 24, 1985, 74148

Int. Cl.⁴ F42B 4/26

U.S. Cl. 42—1.15

9 Claims



1. A cartridge unit for producing a flare signal, comprising a launcher tube constituted by a tubular body, means for tightly mounting one end of said tubular body on a barrel of a firearm such that the inner tubular spaces of said barrel and launcher tube are in alignment, a tubular flare body situated entirely within said launcher tube, and means for normally fixing said flare body within said launcher tube, said means including a circumferential annular shoulder formed in an inner surface of said launcher tube and a cylindrical bushing extending axially within said launcher tube having a rear end, said flare body being situated between said shoulder and said rear end of said bushing, said flare body being adapted to enable the unobstructed passage of a bullet from an ammunition round fired by said firearm and to be directly ignited and ejected from said launcher tube by the propellant gases from said fired ammunition.

4,711,048

ANTIPERSONNEL SHOTGUN CHOKE

Clifford L. Ashbrook, P.O. Box 13237, San Antonio, Tex. 78213

Continuation of Ser. No. 695,096, Jan. 25, 1985. This application

Feb. 19, 1987, Ser. No. 18,804

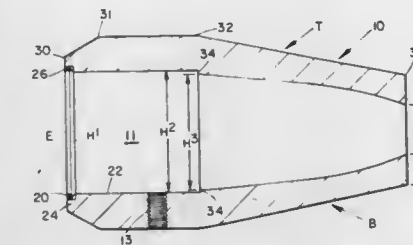
Int. Cl.⁴ F41C 21/18

U.S. Cl. 42—79

4 Claims

1. A choke for effecting the projectile path of a plurality of projectiles fired substantially simultaneously from a weapon, comprising:

a tubular member; the interior surface of said member defining a hollow, interior space through the length of the choke; the interior surface remaining substantially constant in diameter in a first plane along the length of the choke;



the interior surface remaining substantially constant in diameter over a portion of its length and tapering substantially parabolically over the remainder of its length in a second plane; the first plane and the second plane being substantially perpendicular to one another.

4,711,049

ANIMAL TRAP

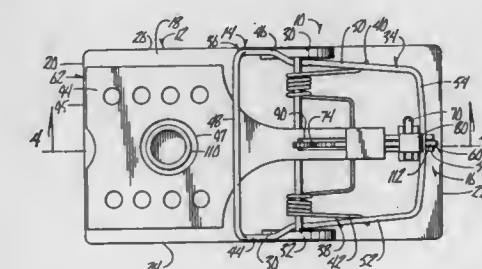
Lester E. Kness, Granger, Iowa, assignor to Kness Manufacturing Co., Inc., Albia, Iowa

Filed Sep. 25, 1986, Ser. No. 912,789

Int. Cl.⁴ A01M 23/30

U.S. Cl. 43—81

1 Claim



1. An animal trap comprising:

a base having an upper surface, opposite sides, and opposite ends; a jaw frame pivotally mounted on said base for pivotal movement about a horizontal jaw frame axis between a cocked position and a sprung position; first spring means yieldably urging said jaw frame towards said sprung position; a catch member pivotally mounted to said base for pivotal movement about a horizontal catch member axis between a catch position and a release position, said catch member having a catch pawl thereon for retentively engaging said jaw frame when said jaw frame and said catch member are in said cocked position and said catch position, respectively, said catch member being pivotal to said release position for moving said catch pawl out of retentive engagement with said jaw frame, thereby freeing said jaw frame for movement to said sprung position; a trip member pivotally mounted to said base for pivotal movement about a horizontal trip member axis between a set position and a trip position, said trip member having a catch receiving surface; said catch receiving surface of said trip member retentively engaging said catch member when said catch member and said trip member are in said catch positions and said set positions, respectively;

said catch receiving surface of said trip member moving out of retentive engagement with said catch member whenever said trip member moves to said trip position, thereby freeing said catch member for movement to said release position to permit said jaw frame to move to said sprung position;

said jaw frame engaging said trip member and yieldably holding said trip member in said trip position whenever said jaw frame is in said sprung position, thereby freeing said catch member to move to said release position;

a second spring engaging said trip member and yieldably urging said trip member toward said set position, said second spring comprising a long leg having first and second portions, a cross leg extending perpendicular to said first portion of said long leg, and a short leg extending parallel to and in the same direction as said first portion of said long leg, said second portion of said long leg extending upwardly and engaging said trip member and yieldably urging said trip member toward said set position with a force which is less than and yieldable in response to the force exerted by said jaw frame on said trip member when said jaw frame is in said sprung position.

4,711,050 LOBSTER POT

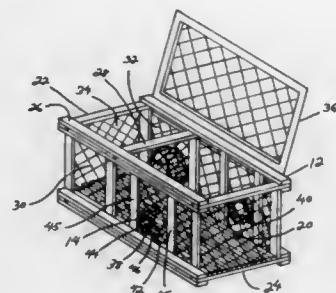
Thomas C. Galgana, Quincy, Mass., assignor to Wilfred Norris, Plymouth, Mass.

Filed Apr. 7, 1986, Ser. No. 849,022

Int. Cl.⁴ A01K 71/00

U.S. Cl. 43-102

6 Claims

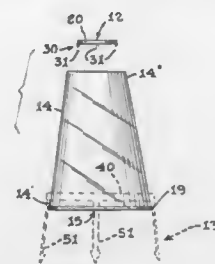


1. A lobster pot comprising a unitary plastic kitchen head, a unitary plastic parlor head and a housing, the parlor head mounted completely within the housing, the kitchen head is generally frustoconical in configuration and includes an entry collar, an exit collar and a side, the side having a first end and a second end, the exit collar integral with the first end and the entry collar integral with the second end, the parlor head is generally frustoconical in configuration and includes an entrance collar, an egress collar and a side, the side having a first end and a second end, the egress collar integral with the first end and the entrance collar integral with the second end, the housing including a plastic lath frame, a series of wire mesh sections and the kitchen head being attached to a wire mesh section, the plastic lath frames providing a pair of top channel members and a pair of bottom channel members, each of the top and bottom channel members being configured as a rectangular strip having a first support face formed on one long side and a second support face formed on another long side in right angle relation to the first long side and having a first terminal end and a second terminal end, each of the first support faces having a centrally positioned, longitudinally extending first side mesh support channel formed therein and each of the second support faces having a centrally positioned, longitudinally extending second mesh support channel formed therein whereby the sections of wire mesh are adapted to be engaged within the first and second side mesh support channels.

4,711,051 NESTABLE MINI-GREENHOUSE APPARATUS Sachi M. Fujimoto, 901 Raton Ave., La Junta, Colo. 81050 Filed Nov. 4, 1986, Ser. No. 926,743 Int. Cl.⁴ A01G 9/00

U.S. Cl. 47-17

3 Claims



1. A mini-greenhouse apparatus for use in both an indoor environment with potted plants and an outdoor environment with fertile garden soil; wherein, the apparatus consists of:

a receptacle unit comprising a tapered receptacle member having an enlarged opening formed on one end, and an enlarged central aperture formed on its other end; wherein, said one end of said tapered receptacle comprises the larger end which is further provided with an outwardly projecting lip element which surrounds the enlarged opening; and, said other end of said tapered receptacle member comprises the smaller end which is provided with a shoulder element which surrounds the enlarged central aperture, wherein said shoulder element is further provided with a plurality of smaller apertures which surround the periphery of said enlarged central aperture;

a cap unit comprising a cap member having a diameter that is greater than the diameter of said enlarged central aperture on the smaller end of the receptacle member; wherein the cap member is provided with a plurality of deformable stem elements which are dimensioned to cooperate with said plurality of apertures on the shoulder element of the receptacle member; whereby, the cap unit may be disposed with respect to the enlarged central aperture in the receptacle member in a selected one of the following modes of disposition: totally disengaged partially engaged; and, fully engaged; and,

an anchor unit comprising a collar element provided with a plurality of downwardly depending ground penetrating spike elements; wherein, the inside diameter of said collar element is approximately equal to, but less than, the outside diameter of the lip element on said receptacle member; whereby, the anchor unit may optionally engage the collar element of said receptacle unit in either a ground penetrating mode or a storage mode.

4,711,052 VEHICLE DOOR STRUCTURE

Tatsuo Maeda, and Takeji Ohya, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Dec. 3, 1986, Ser. No. 937,543

Claims priority, application Japan, Dec. 5, 1985, 60-274418

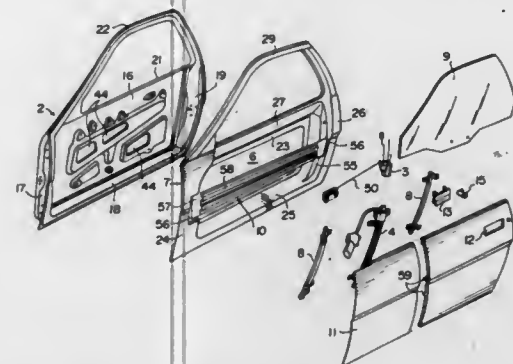
Int. Cl.⁴ B60J 5/04

U.S. Cl. 49-502

16 Claims

1. A vehicle door structure comprising an inner panel on which functional parts are to be mounted, and an outer panel having a central opening, the inner panel and the outer panel being lap-bonded together at the front edge, the bottom edge and the rear edge, the portion of the outer panel surrounding

the central opening being bonded to the inner panel, at least front and rear edge portions of the door body being formed of



closed cross-section portions, and the outer side of the outer panel being covered with an outer plate of synthetic resin.

4,711,053 APPARATUS FOR END FINISHING A LIGHTGUIDE FIBER TERMINATION

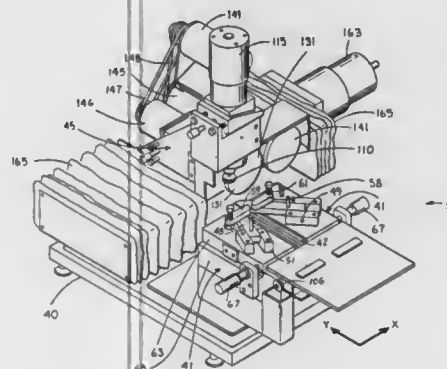
Donald Q. Snyder, Marietta, Ga., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 793,948, Nov. 1, 1985, Pat. No. 4,649,670, which is a continuation of Ser. No. 496,163, May 19, 1983, abandoned. This application Oct. 31, 1986, Ser. No. 925,575

Int. Cl.⁴ B24B 13/00

U.S. Cl. 51-3

11 Claims



1. An apparatus for preparing an assembly, which includes at least one lightguide fiber and a terminator, for connection with another assembly, said apparatus comprising:

nest means for holding the assembly in a position along a reference axis with a length of the fiber which is disposed within the terminator being parallel to the axis;

a first tool which is adapted to provide the assembly with an end portion having a predetermined profile;

moving means for causing relative motion between the assembly and the first tool along a path of travel which is normal to the reference axis;

means for controlling the first tool to remove portions of the terminator and of the fiber to provide the assembly with the end portion having the predetermined profile;

means for preventing movement of the assembly along the reference axis during the formation of the end portion having the predetermined profile and for then releasing the assembly for movement along the axis;

a second tool which is adapted to finish a surface of the end portion and an end of the fiber which terminates in the surface;

means for applying resilient biasing forces to the assembly to hold the surface of the end portion in engagement with

said second tool to provide a controlled pressure between the surface and said second tool; and

means for causing relative motion between the assembly and said second tool in a direction normal to the reference axis to allow the second tool to finish the surface of the end portion and the end of the fiber.

4,711,054 GRINDING MACHINE WITH A STEADY REST Toshio Tsujiuchi, Yoshinori Shinmura, and Yukio Oda, all of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

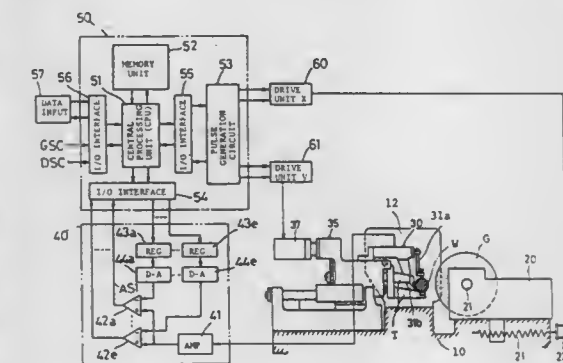
Filed Oct. 30, 1986, Ser. No. 924,777

Claims priority, application Japan, Nov. 4, 1985, 60-247816

Int. Cl.⁴ B24B 49/02

U.S. Cl. 51-165.77

6 Claims



1. A grinding machine wherein a sizing device is provided for outputting a sizing signal when a cylindrical workpiece is ground to a set size, and wherein in response to said sizing signal from said sizing device, the infeed movement of a wheel head rotatably carrying a grinding wheel is halted and the feed movement of a jaw of a steady rest is started to infeed said workpiece against said grinding wheel, the improvement comprising:

register means for storing said set size;

initial size setting means operable each time said grinding wheel is trued, for setting in said register means an initial set size larger than a theoretical size which determines the time point to output said sizing signal;

size modification means for diminishing said initial set size stored in said register means, gradually with the increase in number of workpieces ground by said grinding wheel; and

comparison means responsive to said set size stored in said register means for generating said sizing signal when said workpiece is ground to said set size stored in said register means.

4,711,055 DISPLACEABLE PROTECTIVE COVER FOR HANDTOOLS PROVIDED WITH ROTATABLE DISC-SHAPED TOOLS

Kaj Mickos, Prinsvagen 10, S-131 46 Nacka, Sweden
PCT No. PCT/SE86/00068, § 371 Date Sep. 22, 1986, § 102(e)
Date Sep. 22, 1986, PCT Pub. No. WO86/04855, PCT Pub.
Date Aug. 28, 1986

PCT Filed Feb. 18, 1986, Ser. No. 909,578

Claims priority, application Sweden, Feb. 25, 1985, 8500931

Int. Cl.⁴ B24B 55/04

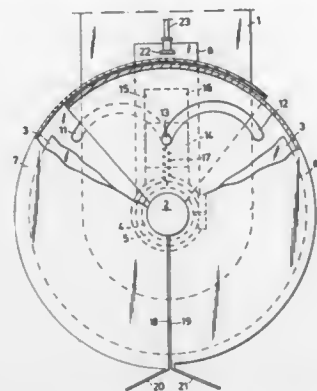
U.S. Cl. 51-268

3 Claims

1. A rotatably displaceable protective cover for a handtool having a driven shaft and a disc-shaped tool mounted on the driven shaft for rotation therewith,

said protective cover including a pair of telescoping cover-

halves mounted for rotation about the driven shaft from a fully closed position in which they fully enclose the disc-shaped tool to an open position where the cover-halves telescope inside each other to expose the disc-shaped tool,



means to prevent one cover-half from opening substantially more than the other cover-half when a force is applied to only one of the cover-halves, while permitting the cover-halves to open by telescoping into each other in a synchronized rotational movement when substantially equal forces are applied to each cover-half.

4,711,056

ABRASIVE FLUID JET RADIUS EDGE CUTTING OF GLASS

Richard A. Herrington, Walbridge; Thomas G. Kleman, Graytown, and Ermelinda A. Apollinar, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio
Continuation of Ser. No. 776,377, Sep. 16, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 930,957

Int. Cl.⁴ B24C 5/04, 1/00

U.S. Cl. 51—410

19 Claims



1. A method of forming a rounded edge in cutting a glass sheet along a desired path with an abrasive liquid jet, comprising advancing the liquid jet in which abrasive particles are entrained through an elongated cylindrical passageway to collimate said liquid jet, discharging said collimated liquid jet closely adjacent said sheet, allowing said liquid jet to diverge within confined limits immediately prior to being discharged against said sheet, the distance said liquid jet travels through said cylindrical passageway being at least two and one-half times the distance traversed in diverging within confined limits, and moving said liquid jet and said sheet relative to one another along the desired path for the cut.

4,711,057 SUBASSEMBLY FOR GEODESICALLY REINFORCED HONEYCOMB STRUCTURES

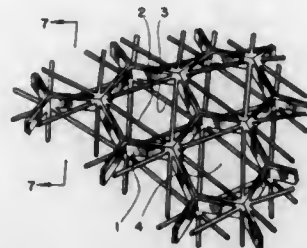
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Michael Stranahan, Woody Creek, Colo., assignors to Jang G. Lew and Hyok S. Lew, both of Arvada, Colo.

Continuation-in-part of Ser. No. 682,675, Dec. 17, 1984, Pat. No. 4,603,519. This application Aug. 4, 1986, Ser. No. 892,592

Int. Cl.⁴ E04B 1/32

U.S. Cl. 52—81

20 Claims



1. A subassembly for geodesically reinforced honeycomb structure comprising in combination:

- (a) one or more elongated structural members capable of bearing a shearing force and bending moment arranged into a hexagonal assembly;
- (b) one or more elongated structural members capable of bearing an axial loading arranged into a first triangular assembly disposed within said hexagonal assembly wherein each corner of said first triangular assembly is connected to each alternating corner of said hexagonal assembly;
- (c) one or more elongated structural members capable of bearing an axial loading arranged into a second triangular assembly disposed within said hexagonal assembly wherein each corner of said second triangular assembly is connected to each alternating corner of said hexagonal assembly, said alternating corner being different from the corners of said hexagonal assembly connected to corners of said first triangular assembly; and
- (d) means included in said hexagonal assembly for accommodating connection means for connecting said hexagonal assembly to other hexagonal assemblies included in adjacent subassemblies to form a geodesically reinforced honeycomb structure.

4,711,058

INSULATED CONCRETE FORM

Edward J. Patton, Murrieta, Calif., assignor to Ahamco Investments, Inc., Rancho California, Calif.

PCT No. PCT/US84/00924, § 371 Date Feb. 6, 1986, § 102(e)

Date Feb. 6, 1986, PCT Pub. No. WO86/00101, PCT Pub.

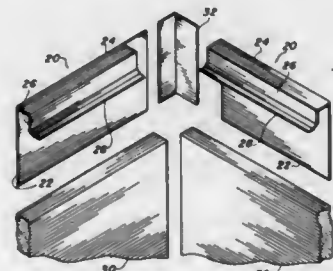
Date Jan. 3, 1986

PCT Filed Jun. 11, 1984, Ser. No. 864,999

Int. Cl.⁴ E04B 1/72

U.S. Cl. 52—101

3 Claims



1. An insulated concrete form for slab flooring comprising:
(a) a metallic protective sheath in linear form having a verti-

- cal front leg, a horizontal top, a vertical back, and an angular locking flange and bug barrier;
- (b) an insulated barrier of rigid block foam in linear rectangular shape having a front, back, top, and bottom, partially contiguous on the front with said sheath vertical front leg, the top contiguous with said sheath horizontal top, and the upper portion of the back contiguous with said sheath vertical back, all being in intimate contact;
- (c) adhesive bonding said protective sheath to said insulated barrier in constant relationship defining a self-contained permanent form to receive concrete in the liquified state when poured into a slab floor configuration becoming an integral part of the periphery when the concrete is solidified with said angular locking flange and bug barrier secured within the concrete and the top planar with the horizontal surface of the slab; and,
- (d) an angular corner formed by notching said sheath horizontal top, vertical back, and angular locking flange of one linear form in such a manner as to abut with an unnotched form at right angles having said sheath covering the entire corner without overlapping or exposing said insulated barrier.

4,711,059

DOCK SEAL WITH LIP FOR SEALING DOOR HINGE GAP

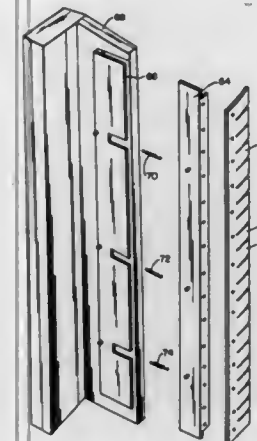
Richard C. Layne, Columbus, Ohio, assignor to Gladys M. Sahr, Columbus, Ohio

Filed Mar. 11, 1985, Ser. No. 710,490

Int. Cl.⁴ E04H 14/00

U.S. Cl. 52—173 DS

8 Claims



1. An improved dock seal or shelter for sealing between a dock opening and a truck body and for sealing a space between an opened rear truck door and the door frame of the truck body, the seal being of the type having a movable panel which, in its disengaged position, extends generally toward the center of the dock opening and is movable back toward the opening upon engagement against the exterior of a truck, wherein the improvement comprises:

a generally vertically straight, elongated lip panel means attached to the movable panel near and running along its inner edge and, in said disengaged position, extending generally away from the dock opening, for being deflected into contacting and sealing engagement against the space between an opened truck door and the truck body by the movement of the truck body against the movable panel and the lip panel.

4,711,060

FALSE CEILING OR FALSE WALL CONSTITUTED BY A STRETCHED SHEET FASTENED

Fernand Scherrer, 2, rue Georges Bizet, 68170 Rixheim, France

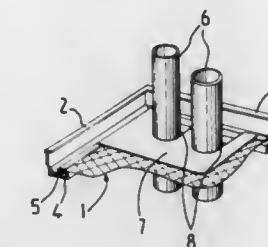
Filed Sep. 9, 1986, Ser. No. 905,781

Claims priority, application France, Sep. 13, 1985, 85 13620

Int. Cl.⁴ E04B 1/00

U.S. Cl. 52—222

12 Claims



1. A false ceiling or false wall assembly for a room, comprising:

- a frame adapted to be secured to said ceiling or wall, said frame extending all around said room, said frame comprising a horizontal member having a horizontal terminal shoulder;
- a sheet having edges secured to said frame, said edges having along at least part of their length hook-shaped terminal portions secured to said shoulder to stretch said sheet in said frame;
- at least one opening in said sheet extending toward said frame to allow passage therein of a duct; and
- a reinforcing plate fixed on the top of said sheet; said plate having an opening superimposed on said sheet opening in registry therewith and having at least a terminal portion thereof on said sheet over said shoulder of said frame.

4,711,061

ROOF AND A METHOD OF PROVIDING A BUILDING WITH A ROOF

John Wilkinson, Dursley, and Nicholas Holbrook, Camberley, both of United Kingdom, assignors to Jacqueline M. Ashfield and Michele Ashfield, both of Bristol, United Kingdom

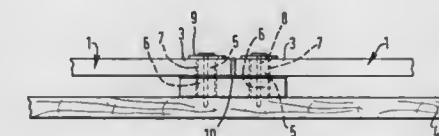
Filed Nov. 19, 1985, Ser. No. 799,431

Claims priority, application United Kingdom, Nov. 19, 1984, 8429194; Aug. 14, 1985, 8520339

Int. Cl.⁴ E04B 7/00, 1/66

U.S. Cl. 52—410

5 Claims



1. A roof, or a portion of a roof, resiliently securable to a substructure of a building, the roof or roof portion comprising:
a panel;
a strip which is overlapped by and supports the panel along at least a portion of the edge regions thereof;
respective fixing means, each extending through a respective aperture in the panel and a corresponding respective aperture in the strip to secure the roof, or the roof portion, to the substructure of the building whilst permitting relative movement between the panel, strip and substructure;
an intermediate layer of a resilient sealing material which spaces the panel from the strip such that the panel is capable of relative movement with respect to the strip whilst sealing the panel with respect to the strip, the resilient

sealing material being chosen from those materials which are liquid before assembly of the roof and which are capable of setting, after assembly of the roof, to provide the intermediate layer;

an array of said panels, each panel being resiliently secured to an adjacent panel of the array along their adjacent edge regions;

at least one strip which is overlapped by, and is fixed to, said adjacent edge regions to secure the adjacent panels together;

a plurality of fixing means, each extending through a respective aperture in the panel and a corresponding respective aperture in the strip to secure the roof, or the roof portion, to the substructure of the building whilst permitting relative movement between the panels, the at least one strip and substructure;

wherein the at least one strip, the edge regions of the panels which overlap the at least one strip, and adjacent edges of the panel are spaced-apart by an intermediate layer of a resilient sealing material, the resilient sealing material being chosen from those materials which are liquid before assembly of the roof and which are capable of setting, after assembly of the roof, to provide the intermediate layer; and wherein the panels are capable of relative movement with respect to each other and with respect to the at least one strip, whilst a seal is provided between those components between which there may be relative movement, and wherein a sleeve is aligned in the said apertures and each fixing means extends through a respective sleeve.

4,711,062

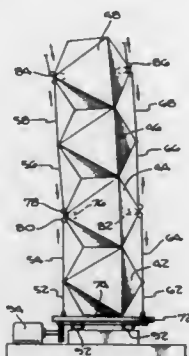
OCTET STRUCTURES USING TENSION AND COMPRESSION

Tony S. Gwilliam, 151 N. Alvarado, Ojai, Calif. 93023, and Russell Obu, 2400 Beverly Ave., #18, Santa Monica, Calif. 90405

Filed Dec. 17, 1986, Ser. No. 943,559
Int. Cl.⁴ E04H 12/18

U.S. Cl. 52—646

20 Claims



1. An octet structure having a high strength-to-weight ratio comprising:

a plurality of octahedral modules, each including three compression struts and a plurality of flexible tension members interconnecting the ends of said struts;

means for joining a plurality of said octahedral modules along edges thereof shared in common by at least two of said modules; and

means including additional flexible tension members forming tetrahedral cells adjacent said octahedral modules.

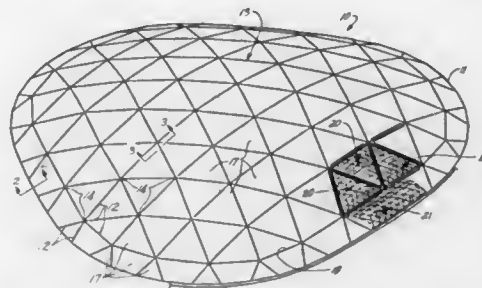
4,711,063

LARGE SPAN DOME

Donald L. Richter, Rolling Hills Estates, Calif., assignor to Temcor, Torrance, Calif.
Division of Ser. No. 730,164, May 3, 1985, Pat. No. 4,611,442.
This application Apr. 16, 1986, Ser. No. 852,561
Int. Cl.⁴ E04B 1/00

U.S. Cl. 52—741

6 Claims



1. A method of erecting a large clear-span dome structure over a space having a perimeter of selected planform configuration, such as the space within an athletic stadium, the method comprising the steps of:

- providing horizontal and vertical load supporting means along the perimeter;
- spanning the space by interconnecting between the supporting means a principal network of structural members which define a principal dome curvature, and subdividing the principal curvature into a plurality of openings in the network;
- closing each said opening with a secondary dome structure having a curvature substantially greater than the principal dome curvature; and
- connecting each secondary dome structure substantially along the perimeter thereof to the network for transfer of forces developed in the secondary dome due to its own structure and of loads applied to it to the network members and across the network members to adjacent secondary dome structures.

4,711,064

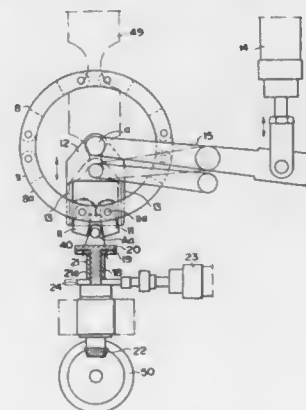
BINDING APPARATUS FOR SEALING BAGS OR THE LIKE

Masaaki Tsuda, Yokohama, Japan, assignor to Kabushiki Kaisha Takara, Osaka, Japan

Filed Jan. 27, 1987, Ser. No. 7,112
Claims priority, application Japan, Sep. 17, 1986, 61-219055
Int. Cl.⁴ B65B 51/08

U.S. Cl. 53—137

4 Claims



1. A binding apparatus for sealing the bags or the like, comprising:

bag carrying/gathering means composed of a pair of intermittently moving chains each having pushers disposed as regularly spaced and projecting thereon and which are disposed parallelly to a bag carrying conveyor;

tie delivering means having a drum located right above said bag neck gathering position and on the outer circumference of which disposed are stationary gather receivers and moving tie keep pins, and a pair of swing levers to bend the tie into a reversed U-shape at the body of said drum;

a pushing member having legs to push down directly said swing levers provided within said drum, and a tie cutter of which the end is forced to the outer circumferential surface of the drum to cut the tie; and

tie twisting means to catch and twist the tie placed right below said tie delivering means and also below said bag neck carrying means.

4,711,065

APPARATUS FOR PRODUCING PACKS, ESPECIALLY CIGARETTE CARTONS

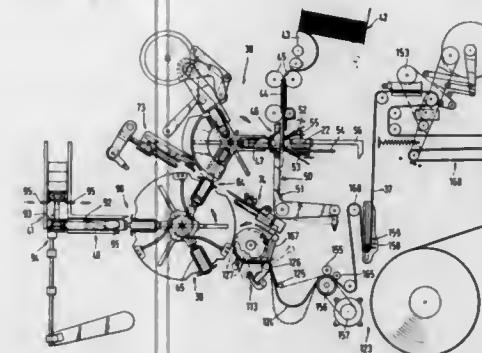
Heinz Focke; Horst Langer, both of Verden, and Hans-Jürgen Bretthauer, Bremen, all of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH), Verden, Fed. Rep. of Germany
Continuation of Ser. No. 649,024, Sep. 10, 1984, abandoned. This application May 22, 1986, Ser. No. 868,155

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333053

Int. Cl.⁴ B65B 11/32

U.S. Cl. 53—170

17 Claims



1. An apparatus for selectively wrapping packs (22) in at least one of two blanks (23, 24) and for discharging said packs wrapped in only a first blank, in only a second blank, or in both said first and second blanks, comprising:

- first (38) and second (39) wrapping turrets arranged one above the other with their rotational axes parallel to each other all of said packs passing through both of said first and second wrapping turrets;
- each of said wrapping turrets including only three pockets (47, 65), each of said pockets being open at an end thereof to receive one pack (22);
- means for synchronously rotating said first and second turrets in the same direction;
- feeding means including a transfer station (64) between the two turrets for feeding all of said packs to be wrapped either in the first, the second, or both of said blanks first through said first turrets, then through said transfer station (64) and then through said second turret, said feeding means including means for pushing a pack (22) in a pocket (47) of said first turret out of said first turret pocket and directly into a pocket (65) of said second turret;
- first supply means (42) for selectively supplying said first blanks (23) to said first turret;
- second supply means (123) for selectively supplying said second blanks (24) to said second turret; and
- a sole discharge means (40, 41) fixedly arranged to receive only packs discharged from said second turret wrapped only in said first blank, only in said second blank, or in

both said first and second blanks depending upon which of said supply means have supplied blanks to their respective turrets.

4,711,066

METHOD AND APPARATUS FOR PACKAGING MEDICAL GAUZE SPONGES

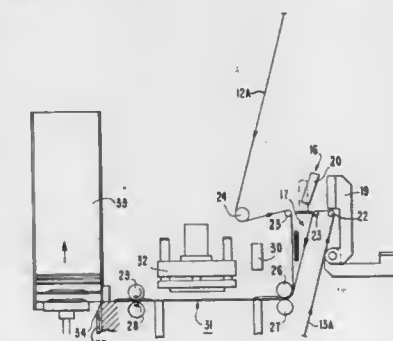
Lester A. Fox, and Paul E. Zielinski, both of Augusta, Ga., assignors to The Surgimach Corporation, Augusta, Ga.

Filed Sep. 9, 1986, Ser. No. 905,130

Int. Cl.⁴ B65B 9/02, 35/50, 63/02

U.S. Cl. 53—436

11 Claims



1. The method of manufacturing packaged deformable articles of a shape in which the articles have major faces that are generally disposed in a flat plane with a stacked array thereof contained between two webs of packaging material, comprising the steps of:

- forming the articles in a machine,
- delivering a fixed number of at least two of the articles from the machine in a stacked array with major faces of the articles vertically disposed in a side-by-side, contacting relationship,
- converging two webs of the packaging material into a substantially V-shaped, vertically disposed reception slot defining a pocket open in an upward direction and adapted to receive the stacked array,
- dropping the stacked array vertically downwardly into the reception slot so that the stacked array is substantially wedged therebetween,
- synchronously moving the webs of packaging material as the stacked array is received thereinto for moving the stacked array away from said slot while the array is between the webs and for containing and holding said stacked array as a unit,
- sealing the webs together about the stacked array therebetween to form a sealed package, and
- separating the sealed webs between successive stacked arrays to form individual sealed packages containing a plurality of the deformable articles in side-by-side relationship.

4,711,067

METHOD OF PACKAGING A SINGLE MATTRESS TO A SMALL SIZE TO BE CONVENIENTLY CARRIED

Giuliano Magni, Roma 512-Fontanelli, Prato, Firenze, Italy (50047), assignor to Giuliano Magni and Dino-Franco Magni, both of Prato, Italy

Continuation-in-part of Ser. No. 576,709, Feb. 3, 1984, abandoned. This application Apr. 16, 1985, Ser. No. 724,034
The portion of the term of this patent subsequent to Dec. 8, 2002, has been disclaimed.

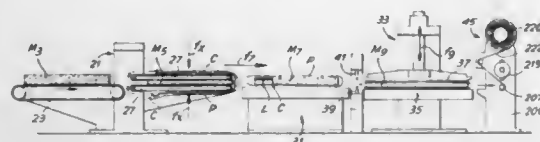
Int. Cl.⁴ B65B 63/02

U.S. Cl. 53—439

13 Claims

1. A method of individually forming and packaging a mattress, including the steps of:

reducing the thickness of an elastic structure of the mattress by pressing and feeding means cantileverly projecting; fitting a cover on said structure and on said pressing means to complete the mattress, said cover comprising foam padding with inside film and a closure means; fitting a flexible and substantially air-tight wrapper on the outside of said cover; moving away the mattress with said cover and said wrapper from said pressing and feeding means; closing the cover by said closure means; flattening the mattress together with its cover and the flexible wrapper; engaging a ribbon-shaped film to a rolling-up mandrel arranged to cooperate with a cylinder operating the compression by rolling and being elastically pushed toward said mandrel;



inserting the flattened mattress between said mandrel and said compressing cylinder; rotating said mandrel and rolling up on said mandrel said ribbon-shaped film and said flattened mattress by compressing it by means of said cylinder which performs compression by rolling; continuing the rolling up of said ribbon-shaped film for at least a convolution around the mattress being rolled-up on the mandrel and cutting said film; circularly applying at least two adhesive ribbon-shaped strings at spaced apart positions on said at least one convolution of ribbon-shaped film around the rolled mattress in order to stabilize it; axially withdrawing the mandrel from the rolled mattress and putting said mattress in a box-like container.

4,711,068

PACKAGING MACHINES AND WEAR STRIPS THEREFOR

Ben Dominguez, Pasadena, Tex., assignor to Formers of Houston, Inc., Pasadena, Tex.

Filed Dec. 4, 1986, Ser. No. 938,044

Int. Cl.⁴ B65B 9/08, 9/12

U.S. Cl. 53—551

24 Claims



1. In a form, fill and seal packaging machine comprising; a source of flexible packaging material in the form of a rolled elongated strip of packaging material, a tube former adapted to receive said strip material and progressively form the same to a depending and upwardly open tubular configuration, opposite longitudinal edge

portions of the material being progressively juxtaposed by said former in parallel vertically extending relationship, a tubular fill pipe associated with said former and depending therefrom, the formed tubular configuration surrounding the exterior surface and through which measured quantities of product are passed, product dispensing means associated with said former and operable for the gravity discharge of measured quantities of product through said fill pipe to the formed tube interior through its upwardly open end, longitudinal seam sealing means disposed beneath said former adjacent said fill pipe and movable relative thereto into and out of sealing engagement with the juxtaposed edge portions of the tubular configuration, intermittently operable tube advancing means adjacent said wear means cooperative therewith to draw said tube downwardly therebetween whereby successively to present integral blanks in tubular form at said longitudinal seam sealing means, and end sealing means disposed beneath said fill pipe and operable intermittently to seal transversely end portions of said tubular blanks whereby to form product bearing packages, the combination with said fill pipe of wear means completely overlying and removably secured on the outer surface of said fill pipe across which the interior surface of the surrounding formed tubular configuration passes in frictional contact therewith and including means to secure said wear means to said pipe.

4,711,069

STRETCH FOIL WRAPPING ARRANGEMENT

Peter Silbernagel, Ochtrup, Fed. Rep. of Germany, assignor to B. Hagemann & Co., Steinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 663,392, Oct. 22, 1984, abandoned.

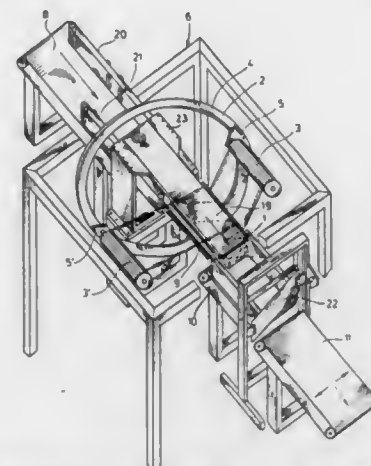
This application Jul. 25, 1986, Ser. No. 889,590

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338036

Int. Cl.⁴ B65B 53/00

U.S. Cl. 53—556

13 Claims



1. A stretch foil wrapping arrangement comprising: a wrapping station structure defining a place whereat an object is to be wrapped with a stretch foil; belt feeder means for conveying said object to said wrapping station; a transition bridge for receiving said object from said belt feeder means and conveying it through said wrapping station, said transition bridge including first and second transition conveyors positioned so as to be substantially parallel to one another, each transition conveyor including an internal roller plane having an inner portion or an internal roller plane of the other transition conveyor, and an external belt located on a side of each of said first and

second transition conveyors opposite said inner portion of said internal roller plane, each said roller plane being adapted to permit the conveyance of said object; means for wrapping stretch foil around said transition bridge and said external belts associated therewith so as to form a continuous tube of foil; means for driving said external belts; said object being conveyed with said tube by edgewise contact with said continuous tube of foil; and a cutting station, positioned substantially adjacent to said transition bridge, for receiving said continuous tube with said object therein and cutting said tube, the stretch foil then adhering closely to said object.

4,711,070

BAG PACKAGING MACHINE AND METHOD

Andre Massa, Mions, and Guy Dupasquier, Villeurbanne, both of France, assignors to Atochem, France

PCT No. PCT/FR85/00219, § 371 Date Jun. 23, 1986, § 102(e)

Date Jun. 23, 1986, PCT Pub. No. WO86/01486, PCT Pub.

Date Mar. 13, 1986

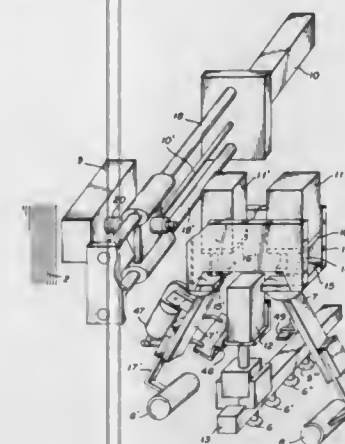
PCT Filed Aug. 13, 1985, Ser. No. 870,279

Claims priority, application France, Aug. 22, 1984, 84 13055

Int. Cl.⁴ B65B 43/30

U.S. Cl. 53—573

12 Claims



1. In a machine having a fixed portion and fitted with at least one pneumatic cylinder and piston, which cylinder and piston is activated by a nominal-pressure supply and forms part of a subassembly which moves with respect to said fixed portion of the machine, the improvement comprising:

- a counter-pressure system for each working phase of said at least one cylinder and piston of said moving subassembly, including means for counter-acting the nominal-pressure supply to said subassembly cylinder to reduce jerking movements thereof during operation;
- a speed-control unit for providing said nominal-pressure to said subassembly cylinder having a variable throttling valve and an anti-return valve for said subassembly cylinder, which speed-control unit is affixed to said fixed portion of said machine separate from said subassembly; and
- flexible lines between said subassembly cylinder and said speed-control unit, thereby reducing the mass of said moving subassembly to further reduce jerking movements thereof during operation.

4,711,071

APPARATUS TO STRAP A TAPE AROUND AN OBJECT

Bruno Kägi, Uezwil, Switzerland, assignor to Strapex AG, Switzerland

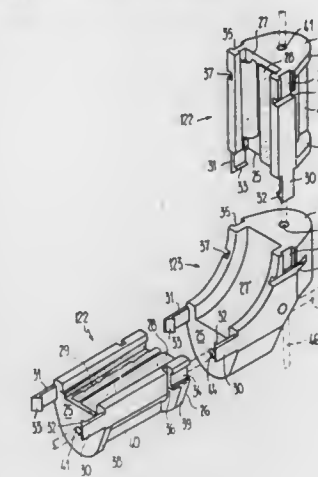
Filed Nov. 6, 1986, Ser. No. 927,642

Claims priority, application Switzerland, Nov. 6, 1985, 4769/85

Int. Cl.⁴ B65B 13/06

U.S. Cl. 53—589

10 Claims



1. In an apparatus for strapping objects with a tape, disposed to bridge in the manner of an arch an object to be taped, for guiding the tape around the object as the tape is advanced and releasing the tape when the tape is tensioned and clamped around the object, a tape guidance duct, comprising:

a detachably linked sequence of tape guidance segments, including rectilinear segments and arcuate segments, each of said guidance segments having a monolithic structure of a plastics material formed to provide a low-friction passage for the tape, each of said guidance segments also being formed to have at a first end two integral arms projecting beyond the first end, each of the arms comprising a snap-in tooth, and two recessed clearances extending from a second end toward the first end, such that each two neighboring guidance segments in the linked sequence under external force engage each other securely with the arms of one segment spreading to slide along corresponding recesses of the other until the snap-in teeth fully engage therein and said two neighboring segments butt together with firm contact at end faces formed orthogonal to the direction in which the guided tape advances around the object, wherein the cross-section of said tape passage through each of said rectilinear segments reduces in width and height to form a narrowing tapered passage in the direction of tape advance.

4,711,072

GRASS CUTTING ATTACHMENT FOR TRACTOR

Edward J. Aldred, Ipswich, England, assignor to Ransomes Sims & Jefferies PLC, Ipswich, England

Filed Jan. 17, 1986, Ser. No. 819,852

Claims priority, application United Kingdom, Jan. 18, 1985, 8501269

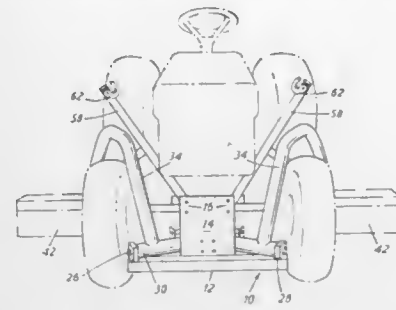
Int. Cl.⁴ A01D 34/24, 34/06

U.S. Cl. 56—6

10 Claims

1. A grass cutting attachment comprising a frame adapted for fixed mounting to a tractor with a frame part positioned forwardly of the tractor front axle; two support arms each pivotally mounted at one end thereof to the frame part at a location therein forwardly of the tractor front axle and carrying at the other end a cutting unit, the support arms extending rearwardly past the tractor front axle to position the associated

cutting units between front and rear tractor wheels, the arrangement being such that pivotal movement of each support



arm relative to the frame effects bodily movement of the associated cutting unit from the ground.

4,711,073

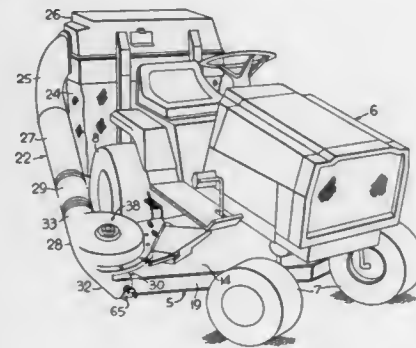
CLIPPING PROPULSION MEANS FOR TRACTOR MOWER

Edward Freier, Jr., and Daniel W. Schaefer, both of Port Washington, Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Jun. 30, 1986, Ser. No. 880,204
Int. Cl.⁴ A01D 34/70

U.S. Cl. 56—13.3

9 Claims



1. Mowing apparatus comprising a riding vehicle, a mower carried by said vehicle that comprises a mower housing having a top wall and having at one side thereof a clipping outlet that lies substantially in a vertical plane, and at least one cutting blade rotatable in a disc-like blade orbit about an upright blade axis which is so spaced in an inward direction from said plane that said blade orbit is substantially wholly within the housing and has a portion adjacent to said plane, a clipping receptacle near a rear end of the vehicle, a clipping duct for conducting clippings from the clipping outlet to the receptacle, and impeller means for propelling clippings along said clipping duct, said mowing apparatus being characterized by:

- A. said clipping duct having a front section that defines a passage
- (1) which extends upwardly and rearwardly from said clipping outlet and
 - (2) a portion or which is spaced from said plane in the direction away from said blade axis and is above the level of said top wall of the mower housing;
- B. said impeller means comprising
- (a) a rotor having
 - (a) a rotor axis and
 - (b) a plurality of vanes, each of which has a tip portion that extends edgewise substantially radially and parallel to said rotor axis, said vanes being rotatable about said rotor axis for movement of their tip portions in a vane orbit,

- (2) means rotatably mounting said rotor above the top wall of the housing with the rotor axis
- (a) upright and
- (b) so located between said plane and said blade axis that
- (i) one portion of said vane orbit is in said portion of said passage and
- (ii) a substantially opposite portion of said vane orbit overlies said portion of said blade orbit, and
- (3) an impeller housing above said top wall of the mower housing, defining a chamber which surrounds said substantially opposite portion of the vane orbit and which opens to said passage to cooperate therewith in enclosing the rotor; and
- C. drive means for rotating the rotor in the direction such that the tip portions of its vanes move substantially rearwardly in said one portion of the vane orbit.

4,711,074

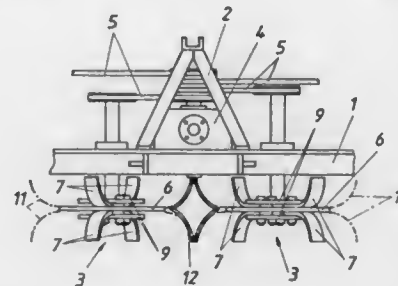
MOWING AND CHOPPING MACHINE

Franz Jetzinger, Schindau 31, A-3364 Neubofen, a.d. Ybbs, Austria

Filed Feb. 11, 1986, Ser. No. 828,640
Int. Cl.⁴ A01D 34/66, 34/73

U.S. Cl. 56—13.6

18 Claims



1. A mowing and chopping machine comprising
- (a) a frame adapted to travel in a predetermined direction of travel over a crop to be mowed,
 - (b) two rotors mounted in said frame for rotation in opposite directions about respective vertical axes, the vertical axes being spaced apart transversely to said direction of travel, and each of said rotors comprising
 - (1) a cutting tooth-carrying disc extending in a horizontal plane common to said discs,
 - (2) two additional discs coaxial with, and vertically spaced apart from said tooth-carrying disc, the additional discs being disposed above and below an upper side and an underside of said tooth-carrying disc, respectively,
 - (3) a first set of angularly spaced apart cutting teeth having a radially inner portion and a portion protruding from the periphery of the discs downwardly curved below said common plane, the inner portions of the teeth being pivoted to said tooth-carrying disc by vertical pins and extending between, and being in sliding contact with, the underside of said tooth-carrying disc and an adjacent one of said additional discs,
 - (4) a second set of angularly spaced apart cutting teeth having a radially inner portion and a portion protruding from the periphery of the discs upwardly curved above said common plane, the inner portions of the teeth being pivoted to said tooth-carrying disc by vertical pins and extending between, and being in sliding contact with, the upper side of said tooth-carrying disc and an adjacent one of said additional discs, and
 - (5) said rotors being rotatable about said vertical axes and said rotors and cutting teeth being so arranged that said cutting teeth describe respective flight paths closely spaced apart in a vertical projection and defining therebetween a space of generally triangular horizontal cross

- section, said space trailing a like space between the flight paths in the directions of rotation of the rotors, and
- (c) a backing cutter fixed to said frame and disposed in said trailing triangular space, the backing cutter having
- (1) at least four knife edges adapted to cooperate with said cutting teeth.

4,711,075

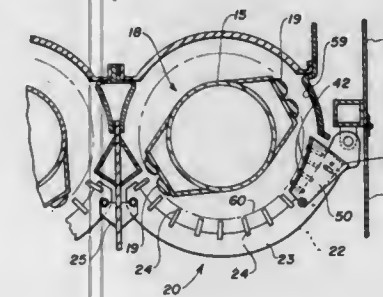
INTEGRALLY MOUNTED POSITIONABLE CONCAVE EXTENSION

Russell W. Strong, Brugge, Belgium, assignor to New Holland Inc., New Holland, Pa.

Filed May 1, 1986, Ser. No. 858,159
Int. Cl.⁴ A01F 12/00

U.S. Cl. 130—27 J

11 Claims



1. In an axial flow combine harvester having a mobile frame adapted for movement over the ground and a threshing and separating rotor rotatably supported by said frame and including rasp bar assemblies cooperable with circumferentially mounted concaves to remove grain from crop material fed between said concave and said rotor, said concave having a plurality of rub bars mounted between spaced-apart arcuate frame members supported by said mobile frame adjacent said rotor, the improvement comprising:

a concave extension having a number of rub bars mounted in a subframe assembly and detachably connectable to said concave frame member, said concave extension having a first end provided with engagement means cooperable with each of at least two mounting members carried by each of said concave frame members and radially spaced with respect to said rotor to permit a rotative movement of said subframe assembly about said concave frame members and a second end provided with a hole therethrough and alignable with a number of spaced apart openings in said concave frame members upon rotation of said subframe assembly about said engagement means, both said first end and said second end of said concave extension being selectively positionable relative to said concave by the selective mounting of said engagement means on a selected one of said mounting members and by a fastener interengaging said hole and one of said aligned openings such that the concave extension rub bars are positionable as a unit in variable configurations with respect to the concave rub bars.

4,711,076

CUTTING BLADE AND METHOD OF USE

Frederick N. Long, 2915 Hillview St., Sarasota, Fla. 33579

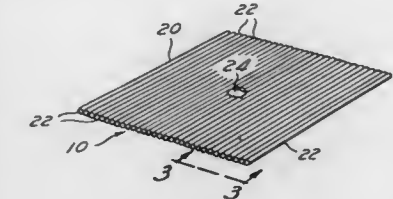
Filed Mar. 5, 1986, Ser. No. 836,250

U.S. Cl. 56—295

19 Claims

1. An improved cutting blade device for use on rotary vegetation cutting equipment comprising;
- a substantially planar member formed of a multiplicity of

elongate tubular segments interconnected in a side by side orientation; and



means formed on said planar member for mounting said planar member to rotary vegetation cutting equipment for rotational movement therewith.

4,711,077

CUTTER HOUSING FOR POWER-DRIVEN LAWN MOWER

Mitsuhiro Kutsukake; Takahiko Murata; Gunji Salto; Takeshi Komatsuzaki; Kuniaki Uehara; Toshinobu Kato; Takeo Hattori, all of Saitama, and Morimasa Hayashida, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

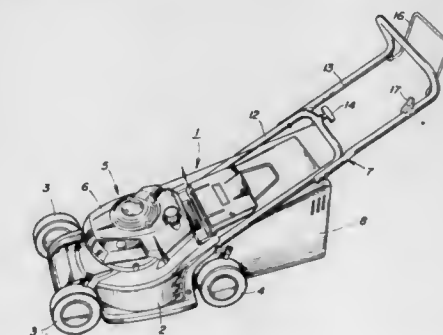
Filed Dec. 2, 1985, Ser. No. 803,720

Claims priority, application Japan, Nov. 30, 1984, 59-253175; Nov. 30, 1984, 59-253177; Nov. 30, 1984, 59-181816[U]; Dec. 1, 1984, 59-254499; May 16, 1985, 60-72757[U]; May 17, 1985, 60-105318; May 17, 1985, 60-73153[U]; May 17, 1985, 60-73160[U]

Int. Cl.⁴ A01D 67/00

U.S. Cl. 56—320.2

13 Claims



1. A cutter housing for use in a power-driven lawn mower having an engine for driving a cutter blade, comprising:
- a substantially cylindrical skirt wall which opens rearwardly;
- a top wall substantially closing the upper end of said skirt wall;
- said top wall having a substantially central recess for accommodating the engine therein and including a pair of half members positioned one on each side of said recess and lying substantially flush with each other in symmetrical and contiguous relation;
- a rear housing portion extending rearwardly from said skirt and top walls in contiguous relation;
- a partition disposed in said rear housing portion and dividing the same into two spaces; and
- said skirt wall, said top wall, said rear housing portion, and said partition being integrally molded of synthetic resin.

4,711,078

BALER AND PROCESS FOR MAKING BALES OR FOR OPERATING THE BALER

Siegfried Schaible, Singen/Htwl; Heinz Hohlwegler, Gottmadingen, and Bernhard Kohl, Winkelhaid, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Dentz AG, Gottmadingen, Fed. Rep. of Germany

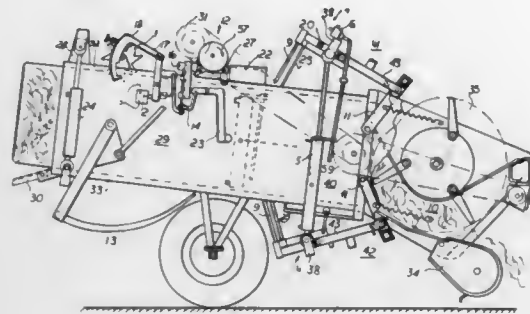
Filed Oct. 3, 1985, Ser. No. 783,876

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1984, 3436883

Int. Cl.⁴ A01D 39/00

U.S. Cl. 56—341

16 Claims



1. In a process for making rectangular bales from crop material from grass, cultivated plants and the like in a baler wherein said crop material is fed into a chamber for pressing and binding by a feed mechanism from an intake mechanism, said bales being bound by cord in said chamber, the improvement wherein said crop material from grass, cultivated plants, and the like is fed continuously in a strand into said baler, and in a predetermined time interval a bale separator is operated to cut away one of said bales from said strand, thereafter said bale separator acting to retain said crop material and simultaneously sliding forward in the feed direction of said bale, said bale separator by continuous additional supply of said crop material also being pushed forward in said feed direction until a binding position for said cut away one of said bales has been reached forming a gap between said cut away one of said bales and said continuous additional supply of said crop material, and after reaching said binding position the process of binding said cut away one of said bales with cord is activated by a binding control mechanism, and after said process of binding is complete said cut away one of said bales which has been bound is pushed out of said binding position by the next one of said bales formed by said bale separator of the bales being separated from the strand of said crop material fed into said baler by plunging into said crop material two separator units from above and below each comprising a plurality of pronglike first separating elements and pronglike second separating elements attached to each of said separator units, wherein said separator units are structured so that a part of said separator units can be slid forward in said feed direction with respect to said crop material and another fixed part of said separator units, whereby cord is put around three sides of said cut away one of said bales, said cord being at the entrance of said binding chamber extending between a plurality of rotatable tiers positioned above said binding chamber and cord guide arms positioned below said binding chamber, and pushing said bale, when completely formed, out of said baler by said next one of said bales being formed.

4,711,079
ROVING BLENDING FOR MAKING SHEATH/CORE SPUN YARN

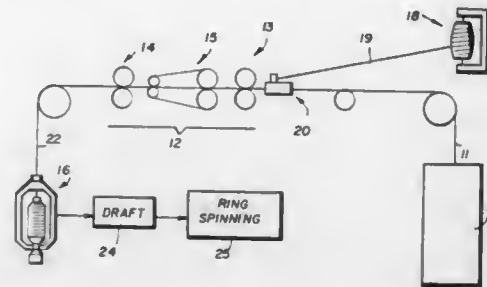
Feaster H. Newton, Asheboro, and Kenneth Y. Wang, Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 31, 1986, Ser. No. 824,788

Int. Cl.⁴ D02G 3/04, 3/38; D01H 5/00

U.S. Cl. 57—12

19 Claims



1. A method of producing a yarn having a sheath and core configuration, utilizing a drafting apparatus comprising front and back rollers, with an apron therebetween, comprising the steps of:

- feeding a sliver of first fibers, and a roving of second fibers, the second fibers having distinctly different properties than the first fibers, to the drafting apparatus so that the roving of second fibers is at the center line of, and on top of, the sliver of first fibers;
- passing the roving and sliver together through the rear rolls, apron, and front rolls of the drafting apparatus to produce a drafted composite sliver; and
- mechanically imparting a twist to the drafted composite sliver to produce a roving having a core and a sheath covering the core, the roving of second fibers being a roving having a twist multiple of about 0.25–0.8 turns per inch.

4,711,080

SPUN YARN AND METHOD AND APPARATUS FOR FORMING SPUN YARN

Toshimi Shibasaki, Takarazuka, and Teruo Nakayama, Ohtsu, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

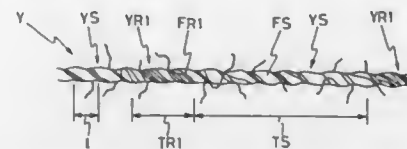
Filed Feb. 5, 1986, Ser. No. 826,284

Claims priority, application Japan, Feb. 8, 1985, 60-23960

Int. Cl.⁴ D02G 3/00, 3/38, 1/16

U.S. Cl. 57—207

22 Claims



1. A bound spun yarn comprising substantially twistless core fibers and wound fibers wound spirally around the core fibers, said core fibers and said wound fibers differing from one another with respect to at least one physical characteristic, the number of said wound fibers varying randomly in the longitudinal direction of the yarn.

4,711,081

THREAD BRAKE MECHANISM FOR A SPINDLE ASSEMBLY OF A THREAD PROCESSING MACHINE
Johannes Frentzel-Beyme, Monchen-Gladbach, and Heinz Stenmans, Grefrath, both of Fed. Rep. of Germany, assignors to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

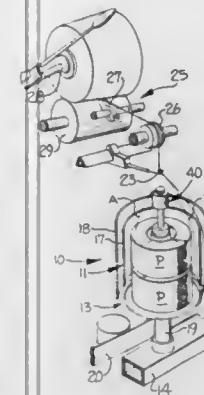
Filed Feb. 6, 1987, Ser. No. 11,923

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605193

Int. Cl.⁴ D01H 7/86, 13/10, 15/00; B65H 59/26

U.S. Cl. 57—279

16 Claims



1. A thread brake mechanism adapted to be attached to a spindle assembly of a thread processing machine, particularly a thread entry tube of a two-for-one twister, and characterized by a construction for use with two independent individual threads which may be fed into the spindle assembly at varying tensions and which applies respective braking forces to the individual threads depending upon the respective feeding tension thereof; said thread brake mechanism comprising:

- a tubular brake housing including means for attaching said brake mechanism to the spindle assembly of a thread processing machine and defining on the upper end thereof a thread entry aperture aligned with the longitudinal central axis thereof;
- a brake ring member positioned inside said brake housing and being aligned with the longitudinal central axis of said brake housing and axially spaced from said thread entry aperture and defining an inside inclined braking surface extending downwardly and inwardly in an axially-symmetrical manner over the entire braking surface; and
- a disc-shaped brake body member movably positioned inside said brake housing and supported by said brake ring member on said braking surface thereof for axial and radial movement and having a convexly curved outside edge braking surface for cooperating with said braking surface of said brake ring member for receiving the two threads therebetween and applying respective braking forces thereto.

3. In a tow-for-one twister textile yarn processing machine having a plurality of spindle assemblies, each including a thread entry tube and an elongate thread passageway extending from said thread entry tube through said spindle assembly and including a selectively-operated pneumatic threading mechanism having a compressed air-operated injector nozzle for sucking thread into said thread entry tube and blowing thread out through said passageway for automatically threading the thread through said spindle assembly during a thread-up operation; the combination therewith of a thread brake mechanism attached to said yarn entry tube and characterized by a construction for use with two independent individual threads which may be fed into said spindle assembly at varying tensions and which applies respective braking forces to the individual threads depending upon the respective feeding tension thereof, said thread brake mechanism comprising a tubular brake housing including means for attaching said

brake mechanism to said thread entry tube of said spindle assembly and defining on the upper end thereof a thread entry aperture aligned with the longitudinal central axis thereof;

- a brake ring member positioned inside said brake housing and being aligned with the longitudinal central axis of said brake housing and axially spaced from said thread entry aperture and defining an inside inclined braking surface extending downwardly and inwardly in an axially-symmetrical manner over the entire braking surface;
- a disc-shaped brake body member movably positioned inside said brake housing and supported by said brake ring member on said braking surface thereof for axial and radial movement and having a convexly curved outside edge braking surface for cooperating with said braking surface of said brake ring member for receiving the two threads therebetween and applying respective braking forces thereto; and
- pneumatically-operated piston means having a central thread passageway therethrough and carrying said brake ring member and being movably positioned in said tubular brake housing in alignment with the longitudinal central axis thereof for movement, upon actuation of said compressed air-operated injector nozzle of said threading mechanism, from an upper braking position of said brake ring member to a lower threading position in which said braking surface of said brake ring member is out of engagement with said braking surface of said brake body member, said piston means including spring means normally biasing said piston means and said ring brake member into the upper braking position.

4,711,082

METHOD AND APPARATUS FOR STARTING UP A FRICTION SPINNING ASSEMBLY

Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

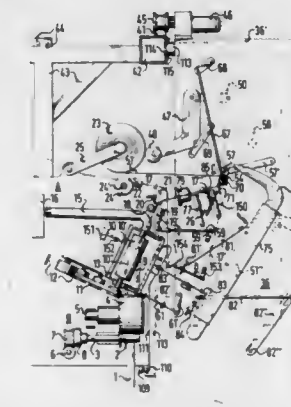
Filed Oct. 15, 1986, Ser. No. 919,181

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536911

Int. Cl.⁴ D01H 15/02

U.S. Cl. 57—263

8 Claims



1. In a friction spinning assembly including: friction surfaces movable in opposite directions forming a spinning wedge, at least one of the friction surfaces being a perforated drum having a suction device with a suction nozzle acting on the spinning wedge by suctioning air through the wall of the at least one perforated drum; at least one suction device acting on the spinning wedge; and an automatic startup device performing a thread joining operation; a method for starting up the friction spinning assembly, which comprises: inserting a thread for thread joining into the spinning wedge; suctioning air through the at least one perforated drum; and simultaneously feeding

fibers to the spinning wedge with a fiber feeding device, moving the friction surfaces and drawing-off thread from the spinning wedge with a thread drawing-off device, at a given normal spinning operation speed.

4,711,083

FRICION SPINNING APPARATUS

Douglas O. Clough, Rossendale, England, assignor to Hollingsworth UK, Ltd., Accrington, England

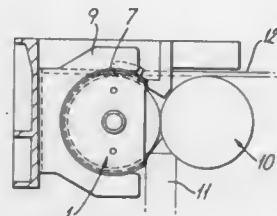
Filed Jul. 7, 1986, Ser. No. 882,322

Claims priority, application United Kingdom, Nov. 22, 1985, 8528845

Int. Cl.⁴ D01H 7/885

U.S. Cl. 57—301

8 Claims



1. Friction spinning apparatus including:

- (a) a pair of parallel adjacently arranged first and second friction spinning rollers;
- (b) means driving said first and second friction spinning rollers in the same sense and defining a spinning nip;
- (c) means for feeding fibres to said spinning nip;
- (d) an air discharge nozzle directed to discharge air at the periphery of said first friction spinning roller with a first component of movement along, and close to, the surface of at least said first friction spinning roller, and a second component of movement circumferentially around the said first friction spinning roller, for urging unwanted fibres along the nip towards one end thereof;
- (e) a cylindrical shroud closely surrounding said first friction spinning roller; and
- (f) means defining an annular clearance defined between said shroud and said first friction spinning roller; said air-discharging nozzle being arranged to discharge a jet of air into said annular clearance with said second component of movement opposed to the direction of movement of said first friction spinning roller in use of the spinning apparatus.

4,711,084

EJECTOR ASSISTED COMPRESSOR BLEED

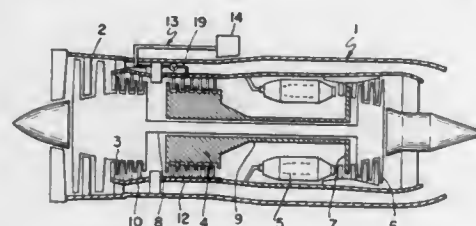
Walter D. Brockett, North Haven, Conn., assignor to Avco Corporation, Providence, R.I.

Filed Nov. 5, 1981, Ser. No. 318,302

Int. Cl.⁴ F02C 6/18, 3/00

U.S. Cl. 60—39.07

1 Claim



1. Apparatus for bleeding air from a low pressure stage of a multi-stage compressor in a gas turbine engine comprising: a shroud surrounding the low pressure compressor stage,

said shroud being constructed with at least one bleed aperture;

a manifold mounted on the shroud and enclosing a reservoir communicating with the bleed aperture, said manifold having at least one outlet passage communicating with said reservoir;

an ejector nozzle mounted in the outlet passage of the manifold in a direction away from the manifold, said nozzle being connected to a source of bleed air from a high pressure compressor stage of the gas turbine engine, said nozzle being constructed and positioned within the outlet passage to draw air from the reservoir when high pressure bleed air flows from the nozzle; and means controlling the flow of high pressure bleed air through the nozzle.

4,711,085

GAS TURBINE ENGINE FUEL SYSTEMS

Michael R. Lyons, Leicester, England, assignor to Rolls-Royce plc, London, England

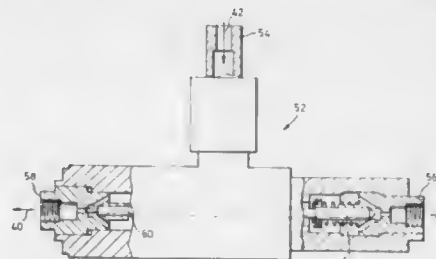
Filed Feb. 18, 1986, Ser. No. 830,138

Claims priority, application United Kingdom, Apr. 25, 1985, 8510568

Int. Cl.⁴ F02C 7/26

U.S. Cl. 60—39.141

3 Claims



1. A fuel system for a gas turbine engine comprising:

- at least one primary fuel injector;
- at least one secondary fuel injector;
- a primary fuel supply line operatively connected to said at least one primary fuel injector;
- a secondary fuel supply line operatively connected to said secondary fuel injector;
- means for supplying fuel to said primary fuel supply line and to said secondary fuel supply line;
- fuel flow restricting means in each of said primary and said secondary fuel supply lines; and
- valve means operatively connected to said fuel supply means and to said primary and secondary fuel supply lines downstream of said fuel flow restricting means in each, said valve means comprising a solenoid valve arranged in parallel with said flow restricting means in each of said primary and secondary fuel supply lines where said valve means is selectively operable to direct fuel to bypass said fuel flow restricting means in one of said primary and secondary fuel lines.

4,711,086

TRIDENT II FIRST AND SECOND STAGE INTERNAL INSULATION

Darrell L. Offe, Guernsey, Wyo., and R. Gregory Martin, South Jordan, Utah, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1986, Ser. No. 921,571

Int. Cl.⁴ F02K 9/00; B29C 71/00

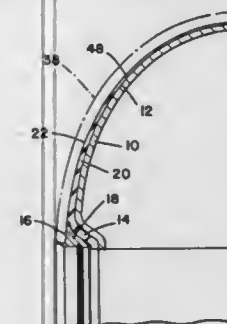
U.S. Cl. 60—253

1 Claim

1. A rocket motor insulator assembly comprised of a forward and an aft insulator assembly joined by a vulcanized bond to form a cylinder having forward and aft contoured domes and a stress relief flap wherein:

said forward insulator assembly comprises a forward insulator of varied thickness having an outside contour and an inside surface, said forward insulator being formed by laying rubber stock on a first mandrel followed by curing and grinding said outside contour to the desired configuration, a forward bearing ring and a first and a second forward insulator element bonded to said forward bearing ring and concurrently joined by vulcanization to said forward insulator;

said aft insulator assembly comprises an aft insulator of varied thickness having an outside contour, said aft insulator being formed by laying rubber stock on a second mandrel, followed by curing and grinding said outside contour to the desired configuration, an aft bearing ring



and a first and a second aft insulator element bonded to said aft bearing ring and concurrently joined by vulcanization to said aft insulator;

said vulcanized bond is formed by removing said forward and said aft insulator assemblies from said first and said second mandrels, placing said assemblies on a collapsible mandrel in such a manner so that said forward and said aft insulators are adjacent and form a junction having a gap and placing a filler of uncured rubber in said gap and a strip of uncured rubber at said junction to splice said forward and said aft insulators; and

said stress relief flap comprises a free-moving flap element and a rubber bulb having a stress relief groove formed by a silicone extrusion, said bulb lying adjacent to and bonded to said inside surface of said forward insulator.

4,711,087

EMISSIONS FILTER REGENERATION SYSTEM

Hideo Kawamura, Kanagawa, Japan, assignor to Isuzu Motors, Ltd., Japan

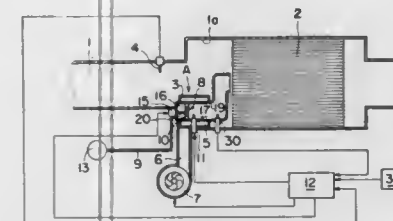
Filed Jun. 23, 1986, Ser. No. 877,493

Claims priority, application Japan, Jun. 26, 1985, 60-137838

Int. Cl.⁴ F01N 3/02

U.S. Cl. 60—286

7 Claims



1. An emissions filter regeneration system comprising:
- a particulate matter filter having an inlet connected by an exhaust pipe to an exhaust manifold of an engine;
 - a pressure sensor disposed to sense the pressure at said inlet of said filter;
 - a cylindrical combustion chamber having an outlet opening disposed to discharge gases into said inlet;
 - a cylindrical vaporization chamber axially aligned with and

separated from said combustion chamber by an apertured fuel distribution plate;

fuel supply means for introducing fuel into said vaporization chamber;

air supply means for introducing air into said combustion chamber, said air supply means comprising a cylindrical member defining an annular air chamber surrounding said combustion chamber and communicating therewith through openings therein;

ignition means for igniting a fuel and air mixture in said combustion chamber;

an electric heater disposed in said plate to vaporize fuel transmitted from said vaporization chamber to said combustion chamber;

a revolution sensor for sensing the revolution rate of the engine; and

control means for activating said fuel supply means, said air supply means, and said ignition means in response to sensing by said pressure sensor of a pressure at said inlet above a selected predetermined value determined by the revolution rate sensed by said revolution sensor.

4,711,088

LIQUID COOLED EXHAUST MANIFOLD

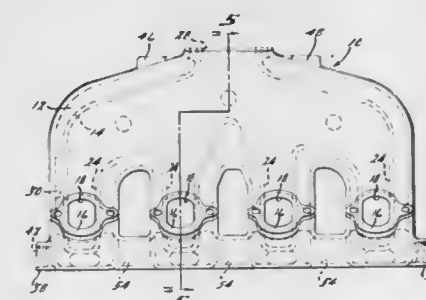
Donald J. Berchem, West Bend, and James R. Meininger, Plymouth, both of Wis., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jan. 8, 1987, Ser. No. 1,500

Int. Cl.⁴ F01N 3/02, 7/10

U.S. Cl. 60—321

3 Claims



1. For an internal combustion engine, a liquid cooled exhaust manifold of the type having individual exhaust gas inlets positioned in a low portion of the manifold and fluidly connected to passages extending upwards to an exhaust gas outlet at a higher portion of the manifold, comprising:

- a manifold housing having spaced inner and outer wall means, the inner wall means defining individual exhaust gas inlets and passages extending generally upward;
- the wall means further defining a common exhaust gas collector portion fluidly connected to the individual gas passages and further defining an outlet aperture located higher in the exhaust manifold than the inlet apertures;
- the spaced inner and outer wall means defining a coolant flow passage therebetween including individual coolant passages about each individual exhaust gas passage;
- inlet means for liquid coolant located low in the manifold to introduce coolant to the individual coolant flow passages;
- outlet means for liquid coolant located higher in the exhaust manifold than the inlet means to discharge coolant from the manifold;
- a transversely extending passage forming means extending normally to the upward flow passages low on the manifold and fluidly connected to the individual coolant flow passages whereby the transverse passage means distributes coolant evenly to each individual coolant flow passage.

4,711,089

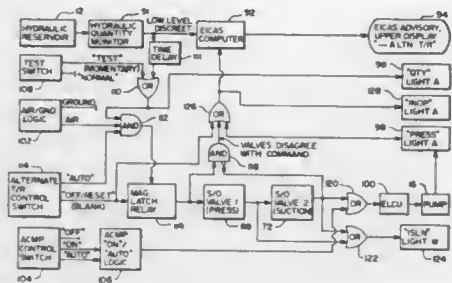
HYDRAULIC SYSTEM FOR AIRCRAFT

Ralph Archung, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 16, 1984, Ser. No. 631,225
Int. Cl.⁴ F16D 31/02

U.S. Cl. 60—405

18 Claims



1. A hydraulic system for an aircraft, said system comprising:

- a fluid reservoir comprising a containing structure defining a fluid containing chamber and having a top wall and a bottom wall, said reservoir further comprising a first fluid inlet means having a first fluid inlet opening located at a position spaced above said bottom wall and below said top wall, said chamber having an upper chamber portion located above said first inlet opening, and a lower chamber portion located below said first inlet opening, a second fluid inlet means having a second fluid inlet opening located below said first inlet opening at an inlet location at a lower part of said lower chamber portion;
- a first hydraulic power outlet means;
- a second hydraulic power outlet means;
- a pump means to draw fluid from the reservoir and to deliver fluid to the first and second power outlet means, said pump means having an operative flow connection with said reservoir which is characterized in that with a low level fluid condition in said reservoir and with said pump not operating, fluid would flow from said pump means to said reservoir;
- a first supply isolation valve having a first position and a second position, and being operatively connected to the first and second inlet means and to the pump means, said supply isolation valve in its first position delivering fluid from said first inlet means to the pump means, said supply isolation valve in its second position delivering fluid from the second inlet means to the pump means;
- a second pressure isolation valve operatively connected to the pump means and having a first position and a second position, said pressure isolation valve in its first position permitting flow from the pump means to the first power outlet means, and in its second position blocking flow from the pump means to the first power outlet means, while permitting flow from the pump means to the second power outlet means;
- fluid level monitoring means to detect when fluid level in said chamber is at or below a predetermined caution level and to produce a corresponding low level signal;
- control means to become operative in response to said low level signal to move said first and second valves to their second positions, and to cause said pump means to operate;

whereby in the event of fluid loss in the system, said pressure isolation valve in its second position is able to alleviate loss of fluid for said pump means, and said supply isolation valve in its second position is able to direct fluid from said lower chamber portion to said pump means, with operation of said pump means preventing loss of fluid from said pump means.

4,711,090

METHOD OF AND DEVICE FOR ADJUSTING THE FEED MOVEMENT OF A DRILL ROD FOR DRILLING A ROCK

Eero Hartiala, Kangasala; Jaakko Knusento, Tampere, and Hannu Paasonen, Nokia, all of Finland, assignors to Oy Tampella Ab, Tampere, Finland

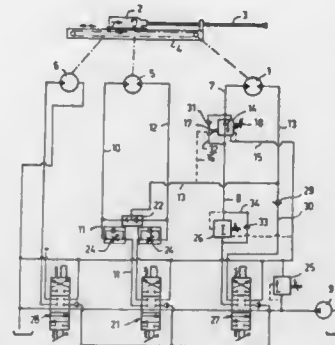
Continuation of Ser. No. 617,624, Jun. 6, 1984, abandoned. This application Apr. 22, 1987, Ser. No. 41,644

Claims priority, application Finland, Jun. 14, 1983, 832145

Int. Cl.⁴ F16D 31/02

U.S. Cl. 60—422

9 Claims



1. A device for adjusting feed movement of a drill rod for drilling rock, comprising:

- a pressure-medium-operating rotary motor (5) for rotating a drill rod, the rotary motor having a pressure side (10) for a pressure medium, the pressure of the pressure medium at the pressure side (10) changing in response to a change in rotation resistance on the rotary motor;
 - a pressure-medium-operated feed motor (1) for feeding the drill rod in a drilling direction and an opposite direction of feed movement, the feed motor having a pressure side (7) and an outlet side (13) for the pressure medium for the feed motor (1) to respond to a higher pressure of the pressure medium at the pressure side (7) thereof relative to a lower pressure of the pressure medium at the outlet side (13) thereof with feed movement of the drill rod in the drilling direction and, vice versa, the opposite direction;
- pressure-medium connection means for supplying the pressure medium to the pressure sides (10,7) of the rotary and feed motors (5,1), connecting the pressure side (10) of the rotary motor (5) to the outlet side (13) of the feed motor (1), and (14,16; 14,20) acting the pressure change of the pressure medium of the pressure side (10) of the rotary motor (5) oppositely on the pressure medium of the pressure and outlet sides (7,13) of the feed motor (1) in inverse and direct dependence on the pressure change, respectively.

4,711,091

APPARATUS FOR PREVENTING THE RISE OF OIL IN A STIRLING ENGINE

Kazuhiko Kawajiri; Michio Fujiwara; Kazunori Tsuchino, and Youichi Hisamori, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 18, 1987, Ser. No. 15,979

Claims priority, application Japan, Feb. 21, 1986, 61-37748; Feb. 21, 1986, 61-37749

Int. Cl.⁴ F02G 1/04

U.S. Cl. 60—517

4 Claims

1. An apparatus for preventing lubricating oil from rising to the working spaces of a Stirling engine, the Stirling engine having a rod which reciprocates inside a cylindrical member, comprising:

- a first oil-absorbing member which has an annular shape and which is secured to said rod so as to reciprocate therewith, the outer periphery of said first oil-absorbing member

4,711,093

COGENERATION OF ELECTRICITY AND REFRIGERATION BY WORK-EXPANDING PIPELINE GAS

Stephen J. Markbreiter, Edison, N.J., and Daniel J. Dessanti, Brooklyn, N.Y., assignors to Kryos Energy Inc., New York and The Brooklyn Union Gas Company, Brooklyn, both of, N.Y.

Filed Feb. 27, 1987, Ser. No. 19,924

Int. Cl.⁴ F25B 9/00

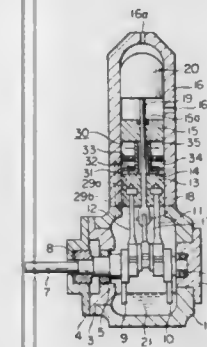
U.S. Cl. 62—87

10 Claims

being in sliding contact with the inner surface of said cylindrical member;

an oil scattering-preventing plate which has an annular shape and which is mounted on said rod above said first oil-absorbing member in intimate contact with said first oil-absorbing member, the outer diameter of said scattering-preventing plate being smaller than the inner diameter of said cylindrical member;

a second oil-absorbing member which has an annular shape, which is permeable to air, and which is secured along its outer periphery to the inner surface of said cylindrical member above and separated from said oil scattering-pre-



venting plate, the inner periphery of said second oil-absorbing member being in sliding contact with the outer surface of said rod;

means for making the flow speed of gas which through said second oil-absorbing member during the operation of said Stirling engine higher from above to below said second oil-absorbing member than from below to above said second oil-absorbing member; and

an annular baffle which is secured to said rod above and separated from said second oil-absorbing member, the outer diameter of said annular baffle being smaller than the inner diameter of said cylindrical member.

4,711,092

LIGHT SWITCH AND BRAKE LINE CONNECTOR ASSEMBLY

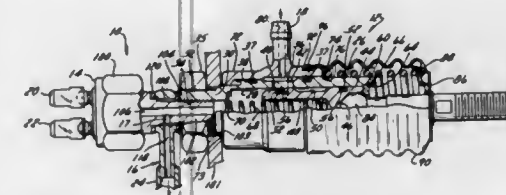
Allan E. Prusak, Washington, Wis., assignor to Hayes Industrial Brake, Inc., Mequon, Wis.

Filed Aug. 6, 1986, Ser. No. 893,623

Int. Cl.⁴ B60T 17/22

U.S. Cl. 60—534

8 Claims



1. The combination with a master cylinder having a threaded passage connected to the high pressure chamber on the master cylinder and a pressure actuated brake light switch and brake line connector assembly, said assembly comprising

a housing having a tubular stem forming a passage to said housing, said stem having a threaded section at the end for mounting on the threaded passage of the master cylinder, an annular groove around said stem,

a port in said stem connecting said groove to said passage in said stem,

a shoulder at the inner end of the stem, and

a Banjo type connector assembly mounted on the stem in abutting relation to such shoulder for connecting the groove to the brake line.

1. The process for the cogeneration of electricity and commercially saleable refrigeration by expanding pressurized pipeline gas with the performance of work which comprises:

injecting methanol into said pipeline gas;

passing said pipeline gas containing said methanol through a turbo-expander coupled to an electrical generator to reduce the pressure of said pipeline gas at least 100 psi but not reducing said pressure enough to drop the temperature of the resulting cold expanded gas below about -100° F., said electrical generator simultaneously yielding said electricity;

separating aqueous methanol condensate from said cold expanded gas and introducing said condensate into a distillation column for separation into discard water and recycle methanol for injection into said pipeline gas;

recovering said saleable refrigeration from said cold expanded gas;

adding reboiler heat to said distillation column in an amount required to warm said expanded gas after the recovery of said saleable refrigeration therefrom to a predetermined temperature above 32° F.; and

passing said expanded gas after the recovery of said saleable refrigeration therefrom in heat exchange with methanol vapor rising to the top of said distillation column to condense said methanol vapor so that liquid methanol is obtained partly for reflux in said distillation column and partly for said recycle methanol and simultaneously said expanded gas is warmed to said predetermined temperature above 32° F.

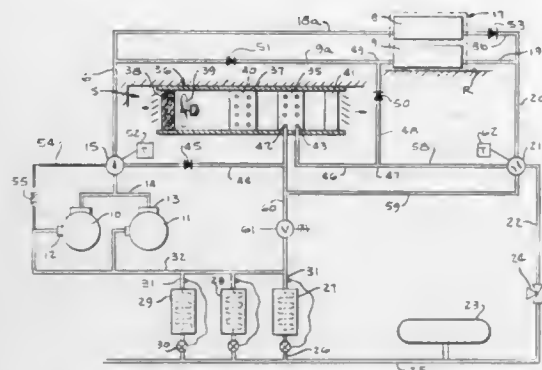
4,711,094

REVERSE CYCLE HEAT RECLAIM COIL AND SUBCOOLING METHOD

Roland A. Ares, St. Charles County; Robert A. Jones, Franklin County, and Norman E. Street, St. Charles County, all of Mo., assignors to Hussmann Corporation, Bridgeton, Mo.
Filed Nov. 12, 1986, Ser. No. 929,422
Int. Cl.⁴ F25D 17/08

U.S. Cl. 62—90

21 Claims



18. In combination with a refrigeration system including compressor means having discharge and suction sides, condenser means, receiver means and multiple evaporator means, a heat reclaim coil disposed in an air handler unit adapted to seasonally condition air for heating and cooling space air in a building, said heat reclaim coil having first and second piping connections and being selectively connected in said refrigeration system for reverse cycle operation between a heating mode and a subcooling mode, a first reversing valve located on the discharge side of said compressor means and having a summer position connecting said discharge side to said condenser means and a winter position for connecting said discharge side to said first piping connection of said heat reclaim coil, a second reversing valve located upstream of said receiver means and having a summer position and a winter position, said second reversing valve connecting said condenser means to the second piping connection of said heat reclaim coil and the first piping connection of said heat reclaim coil to said receiver means in the summer position thereof, and said second reversing valve connecting said condenser means to said receiver means in the winter position thereof.

4,711,095

COMPARTMENTALIZED TRANSPORT REFRIGERATION SYSTEM

Leland L. Howland, Belle Plaine, and Jayaram Seshadri, Minneapolis, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Oct. 6, 1986, Ser. No. 915,827
Int. Cl.⁴ B60H 1/32

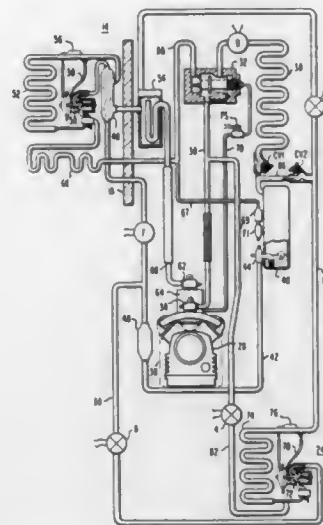
U.S. Cl. 62—117

8 Claims

1. In a compartmentalized transport refrigeration system, a method of controlling the temperature in a first compartment of a trailer to a first set point via a host refrigeration unit having a compressor, condenser, receiver, evaporator, and accumulator, and the temperature of a second trailer compartment to a second set point via a remote evaporator having liquid, hot gas and suction lines selectively connectable to the host refrigeration unit, the steps of:

preventing the host unit from going into a heating mode when the host unit requires heat to maintain the first set point, in response to predetermined conditions which include the remote unit requiring cooling to maintain the second set point while the host unit is controlling to a first set point which is below a predetermined value,

and directing all discharge gas from the compressor to the remote evaporator when the remote evaporator requires



heat to maintain the second set point, while the host unit is not in a heating mode.

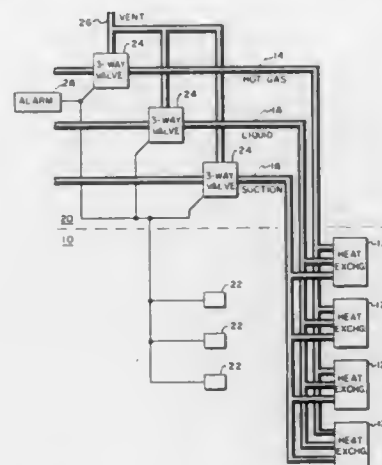
4,711,096

LEAK DETECTION AND REFRIGERANT PURGING SYSTEM

Herman F. Krantz, 728 Benton Ct., Elmhurst, Ill. 60126
Continuation of Ser. No. 840,158, Mar. 17, 1986, abandoned.
This application Mar. 13, 1987, Ser. No. 23,898
Int. Cl.⁴ F25B 45/00; F16F 1/34

U.S. Cl. 62—129

3 Claims



1. Apparatus responsive to refrigerant leaks occurring in that portion of a refrigerant system disposed within a refrigerated environment comprising

at least one sensor disposed within said refrigerated environment for detecting leakage of refrigerant into said environment and producing an output signal in response thereto; and

valve means disposed in the path of refrigerant flow, coupled to said sensor, and operative in response to said output signal to interrupt the flow of refrigerant to that portion of said refrigeration system within said environment and for venting only that refrigerant as may be in said portion of said system to the outside of said environment.

4,711,097

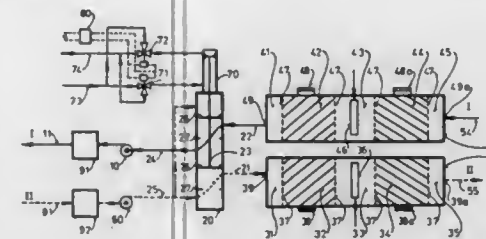
APPARATUS FOR SORPTION DEHUMIDIFICATION AND COOLING OF MOIST AIR

Ferdinand Besik, 2562 Oshkin Crt., Mississauga, Ontario, Canada L5N 3Z3

Filed Oct. 24, 1986, Ser. No. 922,887
Int. Cl.⁴ F25D 23/00

U.S. Cl. 62—271

8 Claims



1. An apparatus for dehumidifying and cooling moist air comprising:

two identical fixed bed treatment units providing dehumidification and cooling of said moist air, said treatment units each being a closed vessel provided with an air intake and an air exit openings located on its opposite end walls, said vessel having its inside space separated by four parallel build in screens into five consecutive chambers permitting a straight line flow of said moist air through said five consecutive chambers, said first and fifth chambers being empty chambers, said second chamber being equipped with two flanged openings located on one of its side walls and being provided for filling in and for removing from said chamber a solid heat exchanging material, said second chamber being filled with said heat exchanging material to provide a fixed bed of said heat-exchanging material of a specific fixed bed porosity, said fixed bed of heat exchanging material being provided for transferring heat from said dehumidified moist air stream into a second air stream, said second air stream being used as regenerant air stream, said third chamber being equipped with a build in air heater providing heating of said second air stream, said fourth chamber being equipped with two flanged openings located on one of its side walls and provided for filling in and removing from said fourth chamber a solid sorbent material, said fourth chamber being filled with said solid sorbent material to provide a fixed bed of said sorbent material of specific porosity, said fixed bed of said sorbent material providing the removal of moisture from said moist air, said two fixed bed treatment units being provided with valving means, said valving means providing switching of said moist air stream and said second air stream between said two fixed bed treatment units in the middle of the operating cycle in a manner permitting continuous countercurrent cyclic operation of said two treatment units, said cyclic operation having an operating cycle comprising a sorption period followed by a desorption period, said operating cycle having its duration controlled by a solid state on-off cyclic timer actuating said valving means, said sorption period being provided for removing moisture from said moist air stream in said fixed bed of said sorbent material and for cooling of said dehumidified moist air stream in said fixed bed of said heat exchanging material, said desorption period being provided for preheating of said second air stream in said fixed bed of said heat exchanging material and for heating of said second air stream by said air heater, and for desorption of said moisture from said fixed bed of sorbent material accumulated by said sorbent material during said sorption period and for discharging of said desorbed moisture out of said apparatus,

two air blowers for pumping said moist air and said second air streams through said treatment units, said moist air and second air streams flowing continuously through said two treatment units countercurrently to each other with said

moist air stream flowing through said one treatment unit while said second air stream flowing through said other treatment unit during the first half of the operating cycle, with the flow of said moist air and second air streams being switched between said two treatment units in the middle of said operating cycle by said valving means in a manner permitting a cyclic countercurrent sorption-desorption and heat transfer to occur in said fixed bed treatment units.

4,711,098

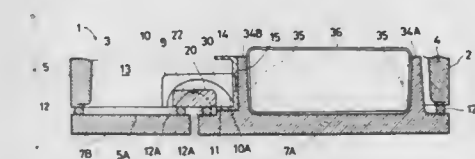
REFRIGERATOR

Takashi Kuwabara, Ohizumi; Yoshiharu Shimura, Ota; Yuko Hayashi, Ohizumi; Toshiyuki Hanamura, Ohizumi; Kaoru Kanemori, Ohizumi, and Yoshihiro Yamakawa, Ota, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Oct. 10, 1986, Ser. No. 917,398

Claims priority, application Japan, Oct. 11, 1985, 60-155838[U]; Nov. 6, 1985, 60-171075[U]
Int. Cl.⁴ F25D 11/02

U.S. Cl. 62—441

5 Claims



1. A refrigerator comprising:

an insulated box having an opening and a cooling mechanism;

first and second doors of French door type pivotally mounted on said opening and having gaskets at the rear fringe thereof which come in contact with the edge of said opening to close said opening;

guide grooves formed at guide members protruding from the edges of the opening of the insulated box on the non-supporting side of said doors, consisting of a projecting part having a flat front with a surface formed to become nearly the same as that of the opening of the insulated box and a back composed of a semi-circular curve and a jetty formed behind said projecting part at a distance and having a curved surface facing the curved surface of said projecting part and having a curvature of a predetermined configuration;

a partition pivotally supported at the rear on the nonsupporting side of said first door, extending in the direction of the rotating axis of said first door with length nearly reaching the edges of said opening and having at both ends thereof engaging parts rotating along said guide grooves with the closing movement of said first door, and forming the contact surface of said gaskets with the surface of its front nearly joining the edges of said opening when the partition is rotated, and

a housing part provided at the rear of said first door and housing and holding said partition with said engaging parts protruded when said first door is open.

4,711,099

PORTABLE QUICK CHILLING DEVICE

George S. Polan, North Wales, Pa., and Hermann R. Glincke, Morrisville, N.J., assignors to Central Sprinkler Corporation, Lansdale, Pa.

Continuation-in-part of Ser. No. 893,505, Aug. 5, 1986, abandoned. This application Aug. 29, 1986, Ser. No. 902,242
Int. Cl.⁴ F25D 3/08

U.S. Cl. 62—457

23 Claims

1. A portable chiller device comprising:

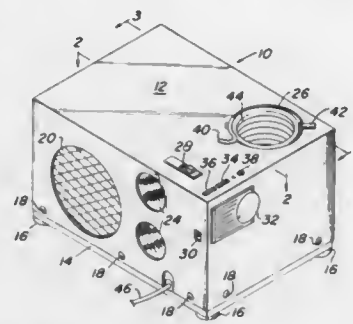
compressing means for compressing a refrigerant; condenser means for condensing said refrigerant, said con-

condensor means being operatively connected to said compressing means such that compressed refrigerant is received from said compressing means by said condensing means;

accumulating means for accumulating said refrigerant, said accumulating means being operatively connected to said condenser means such that condensed refrigerant is received from said condenser means by said accumulating means;

expanding means for expanding said refrigerant, said expanding means being operatively connected to said accumulating means such that condensed refrigerant in said accumulator means can escape through said expanding means, said expanding means being a capillary tube having a free end; and

evaporating means for evaporating said refrigerant, said



evaporating means being operatively connected to said expanding means such that escaping condensed refrigerant will evaporate in said evaporating means, said evaporating means being operatively connected to said compressing means such that evaporated refrigerant can pass from said evaporating means to said compressor means, said evaporating means including a coil of tubing shaped to receive a generally cylindrical object which is to be chilled each ring of said coil being in direct contact with an adjacent ring, an inwardly facing surface of each ring being flattened so as to contact the object over a flattened surface, said coil being angularly rotatable such that when said coil is rotated in a first direction, said coil expands in a radial direction, and when said coil is rotated in a second direction, said coil contracts, said expansion and contraction thereby allowing said cylindrical object to be placed in, removed from or locked into said coil.

4,711,100

CIRCULAR WEFT KNITTING MACHINE

E. C. Tibbals, Jr., Rt. 2, Box 386, High Point, N.C. 27260
Continuation of Ser. No. 761,764, Nov. 26, 1985, abandoned,
which is a division of Ser. No. 398,303, Jul. 14, 1982, Pat. No.
4,608,839. This application Feb. 4, 1987, Ser. No. 14,205

Int. Cl.⁴ D04B 15/24, 15/32

U.S. Cl. 66—55

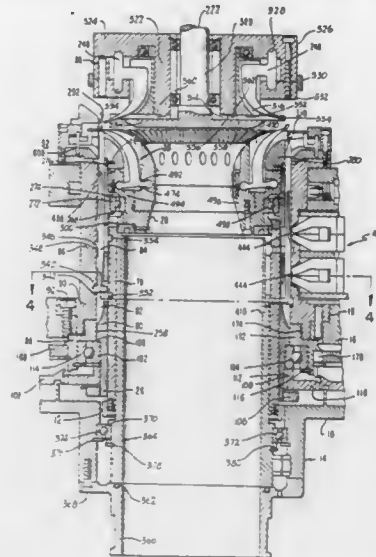
4 Claims

1. In the circular weft knitting of articles, the steps of downwardly displacing the hooked end of a reciprocable needle element from a fixed upper limit to a fixed lower limit to engage and draw down a loop of yarn while said needle is being displaced away from a yarn feed location concurrent with horizontal rotational displacement of a needle supporting rotatable knitting cylinder in either direction perpendicular to the path of said downward needle displacement,

concurrently radially inwardly and upwardly displacing a yarn engaging sinker element having at least first and second discrete yarn engaging land surfaces thereon in a first predetermined path relative to said knitting cylinder in conjoint timed relation with said downwardly moving hooked end of said needle element to engage the yarn on said first land surface and to maintain said yarn engagement therewith at least during a first predetermined de-

gree of downward displacement of said hooked end of said reciprocable needle element from said upper limit toward said lower limit to cooperatively draw a loop of yarn of predetermined length and

the succeeding step of selectively displacing said yarn engaged sinker element in the radially outward and upward directions in a second predetermined path relative to said



knitting cylinder during a second predetermined and continued degree of downward displacement of said hooked end of said reciprocable needle element in approach of the lower limit of displacement thereof to shift the point of yarn engagement on said sinker element from said first land surface to said second land surface while maintaining said predetermined length of drawn loop of yarn substantially constant.

4,711,101

FLAT-BED KNITTING MACHINE

Ernst Goller, Adam Müller, and Udo Hermann, all of Reutlingen, Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

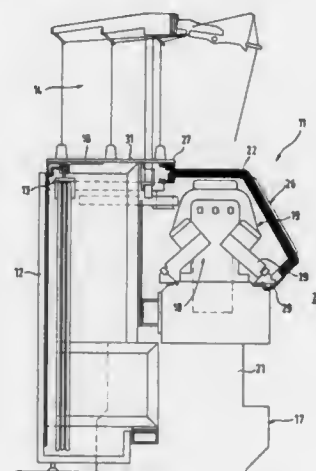
Filed Jul. 29, 1986, Ser. No. 890,265

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528694

Int. Cl.⁴ D04B 7/04

U.S. Cl. 66—64

24 Claims



1. A flat-bed knitting machine, comprising:

a needle bed apparatus and associated carriage apparatus movable longitudinally on the machine;
cams and selector units; and

a data processing unit for controlling the cams and selector units and for storing pattern information in memory, said data processing unit having an input keyboard disposed at the level of and in the area in front of the needle bed apparatus and associated carriage apparatus, said keyboard being movable in the longitudinal direction of the machine to any position along the machine and independently of the needle bed apparatus and associated carriage apparatus.

4,711,102

WET HEAT TREATING APPARATUS OF A CLOTH FOR PERFORMING DYEING AND WASHING IN COMBINATION

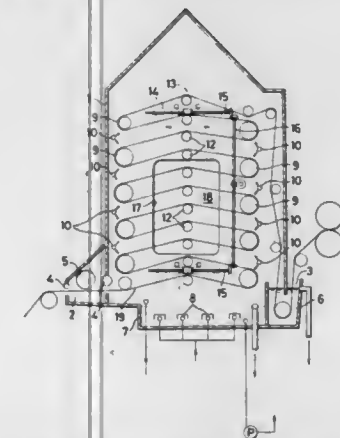
Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd.

Filed Apr. 8, 1986, Ser. No. 849,572

Int. Cl.⁴ D06B 3/12

U.S. Cl. 68—5 E

2 Claims



1. A wet heat treating apparatus of a cloth for performing dyeing and washing where the apparatus can be changed over between dyeing and washing and where the apparatus can be cleaned in making the changeover, comprising an enclosed wet heat treating chamber having a pair of oppositely disposed and spaced apart substantially vertically extending side walls and a pair of oppositely disposed and spaced apart end walls extending transversely of said side walls, a ceiling forming an upper closure for said chamber and extending between said side walls, a cloth inlet in a lower part of one of said side walls and a cloth outlet in a lower part of the other of said side walls, a first group of substantially horizontal guide rolls located within said chamber and spaced apart in the vertical direction and located adjacent to the one said side wall and extending in the direction between said end walls, a second group of substantially horizontal guide rolls located within said chamber and spaced apart in the vertical direction and located adjacent the other said side wall and extending in the direction between said end walls, said second group of guide rolls located in paired horizontally spaced relation with said first group of guide rolls, a group of liquid supply means located within said chamber for supplying a high pressure hot liquid to the cloth guided to said chamber and passing over said first and second groups of guide rolls, a group of intermediate substantially horizontal guide rolls spaced apart in the vertical direction and spaced between and in paired relation with said first and second groups of guide rolls, means for supporting said group of intermediate guide rolls, a transfer mechanism for moving said supporting means and said group of intermediate guide rolls in generally the horizontal direction toward one or the other of said first and second groups of guide rolls, and a doorway in one of said end walls located in general alignment with said group of intermediate rolls whereby said group of intermediate

4,711,103

CONTROLLING DEVICE FOR CLOTHES WASHING MACHINE

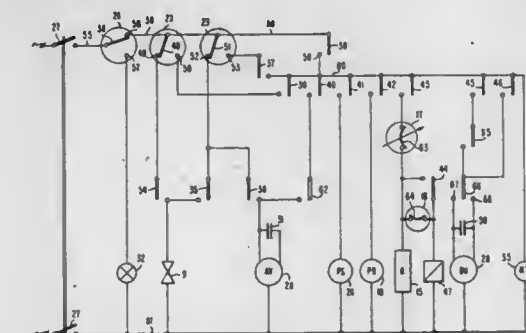
Maurizio Mori; Piero Babuin, both of Pordenone, and Giuseppe Cargnel, Treviso, all of Italy, assignors to Zanussi Elettrodomestici S.p.A., Pordenone, Italy

Filed May 13, 1986, Ser. No. 862,801

Claims priority, application Italy, May 24, 1985, 45715 A/85
Int. Cl.⁴ D06F 33/02

U.S. Cl. 68—12 R

7 Claims



1. In a controlling device for controlling the operation of a laundry washing machine of the type including a tub, a rotatable drum within said tub, a solenoid valve for controlling the introduction of washing liquid into said tub, a wash liquid collector communicating with a lower side of said tub through a flexible conduit and with an upper side of said tub through a pipe and a circulating pump for circulating washing liquid through said tub, a filtering element in said collector for filtering soil from the recirculated washing liquid, and an electric heating element in said collector for heating said recirculated washing liquid, said controlling device comprising thermostatic control means for controlling said heating element and level control means for controlling the level of said washing liquid, the improvement comprising:

said thermostatic control means comprising at least first and second thermostats calibrated at a fixed tripping temperature and at adjustable tripping temperatures, respectively; said level control means comprising first and second pressure switches selectively connectable with said solenoid valve and calibrated to determine that the washing liquid is fed to a predetermined level in said tub and to a lower level in said collector and a third pressure switch connectable with both said first and second pressure switches and calibrated to detect the pressure of the washing liquid circulating upstream of said filtering element;

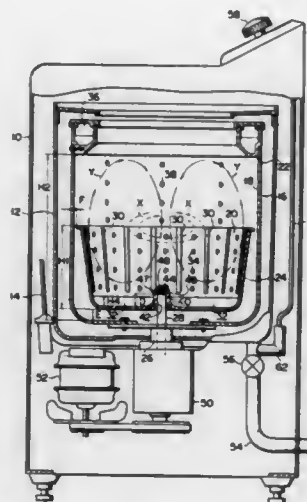
means for selectively connecting said first and second pressure switches to said heating element, in parallel with said circulating pump, through said first and second thermostats; and

control relay means responsive to said first and second thermostats for controlling operation of a program unit of the laundry machine.

4,711,104 WASHING MACHINE

Yoshio Ikeda, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 618,349, Jun. 7, 1984, abandoned. This application Apr. 9, 1986, Ser. No. 850,078
Claims priority, application Japan, Jun. 9, 1983, 58-104504; Aug. 9, 1983, 58-145551; Aug. 22, 1983, 58-128421
Int. Cl.⁴ D06F 23/04
U.S. Cl. 68—23 R

18 Claims

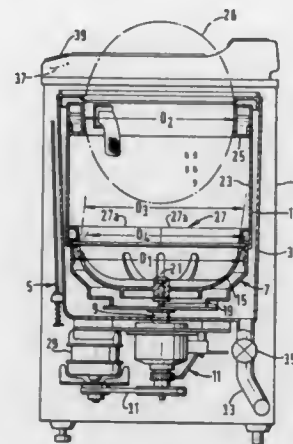


4,711,105 WASHING MACHINE HAVING ROTARY BASKET IN WASHING TUB

Susumu Oida, Komaki; Yoshikazu Munemoto, Tajimi; Masami Ueda, Ichinomiya, and Michiaki Ito, Seto, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 31, 1985, Ser. No. 793,339
Claims priority, application Japan, Dec. 18, 1984, 59-266892; Jan. 9, 1985, 60-1899; Jan. 11, 1985, 60-3802; Jan. 25, 1985, 60-9565[U]

Int. Cl.⁴ D06F 23/04, 37/24
U.S. Cl. 68—23.2

13 Claims



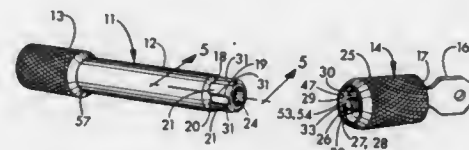
1. A clothes washing machine comprising:
 - a housing including a fixed tub disposed therein;
 - a washing tub disposed in said fixed tub for receiving clothes to be washed;
 - a bowl-shaped agitator disposed in a lower part of said washing tub;
 - a ring-shaped frame element attached to an inner surface of said washing tub, said frame element covering a gap between said inner surface of said washing tub and an outer surface of said bowl-shaped agitator to prevent clothes from being drawn into said gap; and
 - a motor, provided in said housing, for driving said bowl-shaped agitator during washing and rinsing.

4,711,106 LOCKING DEVICE

Clyde T. Johnson, P.O. Drawer 100, Escanaba, Mich. 49829
Filed Dec. 31, 1986, Ser. No. 392
Int. Cl.⁴ E05B 67/36

U.S. Cl. 70—34

14 Claims



1. A locking device comprising:
 - (a) a stud including a first threaded surface and a keyed portion having at least one key; and
 - (b) a knob which locks over a forward portion of the stud, including
 - (i) a casing having an inner surface which defines a hole and at least one keyway extending axially through the casing such that when the knob is placed over a forward portion of the stud, each keyway receives the corresponding key on the stud to prevent rotation of the casing with respect to the stud;
 - (ii) a tumbler housing which is mounted in an axially fixed

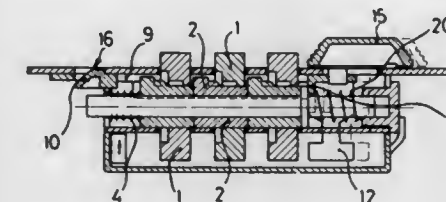
1. A washing machine comprising:
 - an outer casing open at a top end thereof;
 - a cylindrical washing tub coaxially disposed in said outer casing and rotatable about a fixed vertical axis, said washing tube formed with (1) a constant diameter upper peripheral wall section located at an upper region thereof, and (2) a stirring member, provided beneath said upper peripheral wall section and separately rotatable therefrom, with the only portion of said stirring member being said constant diameter upper section, said stirring member extending substantially halfway up the height of said washing tub, and having an inner peripheral surface formed such that its diameter gradually linearly increases from its lower portion toward its upper portion; and
 - means for rotating: (a) said stirring member and said tub together during a dehydration operation, and (b) said stirring member alternately in opposite directions during a washing operation while holding said tube stationary, said stirring member thereby rotating a bottom-most portion of said washing machine, while said upper peripheral wall remains stationary, which washes laundry due to the friction between the laundry and the rotating stirring member, and between the rotating laundry and the stationary upper peripheral wall, the varying diameter of said stirring member causing vertical motion of said laundry and increasing the washing effect.

4,711,108 COMBINATION LOCK

Jose P. Garro, Bo Ventas s/n. Carr., Oyarzun, Irun (Guipuzcoa), Spain
Continuation of Ser. No. 510,083, Jun. 30, 1983, abandoned. This application Jun. 19, 1986, Ser. No. 878,395
Claims priority, application Spain, Jun. 30, 1982, 513,592
Int. Cl.⁴ E05B 37/02

U.S. Cl. 70—312

5 Claims



- position within a forward section of the casing hole, the tumbler housing including a plurality of locking key-operated slide tumblers which are substantially contained within the housing to permit rotation of the housing within the casing, and which are operatively extendable outside of the housing to engage a said keyway in the casing to prevent rotation of the housing within the casing; and
- (iii) a second threaded surface connected to a rearward end of the tumbler housing such that when the knob is placed over a forward portion of the stud rotation of the tumbler housing in one direction causes the second threaded surface to engage the first threaded surface of the stud so that the forward portion of the stud is drawn into the rearward section of the casing hole.

4,711,107 LAMP

John H. Drane, London, England, assignor to Duracell Inc., Bethel, Conn.

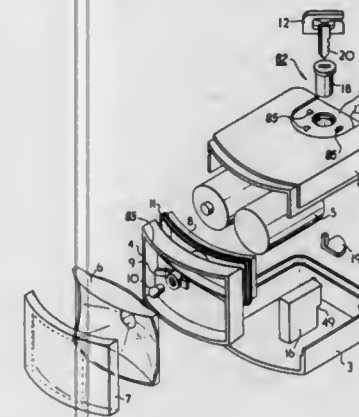
Filed Feb. 4, 1986, Ser. No. 826,166

Claims priority, application United Kingdom, Feb. 7, 1985, 8503064

Int. Cl.⁴ E05B 73/00; F21Y 29/00

U.S. Cl. 70—233

13 Claims



1. In combination, an electrical accessory for a cycle, and a bracket for mounting the said accessory on a cycle, in which:
 - said accessory comprising a housing, an electrical switch in said housing for operating said accessory, a receptacle incorporated in and open to the exterior of the housing, a lock incorporated in said housing which lock is lockable and releasable by a removable key, said lock being operatively coupled to said switch, and a locking member in said housing adjacent said receptacle and operatively coupled to said lock for movement by said key relative to said receptacle;
 - said bracket comprises a body portion, clamping means such that said body portion can be clamped onto a cycle, and a projection extending from said body portion which projection has a configuration complementary to said receptacle and locking member and is receivable in said receptacle such that said accessory is mounted removably on said bracket;
 - and said locking member is movable by said key to a first position in which said locking member is clear of said receptacle and thereby permits said projection to be inserted in and removed from said receptacle, and a second position such that said locking member positively engages and retains said projection when inserted in said receptacle whereby said accessory and bracket are rendered inseparable, said operating member being removable from said accessory at least when said locking member is in said second position.

1. A combination lock having a selectable combination comprising a slidable shaft, a plurality of sockets rotatable about said slidable shaft, said sockets being axially movable with said shaft and maintaining their relative axial position on said shaft, a plurality of rollers connected to said sockets wherein each roller has one of said sockets associated therewith, said sockets and said shaft being axially movable with respect to said rollers, said sockets normally coupled to the roller for common rotation therewith, and when said sockets are moved axially with respect to the rollers said rollers are rotatable about said sockets wherein rotating at least one roller relative to its associated socket varies the combination;
- an axially movable frame, means attached to said frame to axially move said frame, said frame being movable when said lock is in an on-key position, said frame being movable in a first direction from a rest position to an unlocking position, said frame also movable in a second direction opposite said first direction from said rest position to a combination-changing position, said frame having means to axially move said slidable shaft and said sockets to disassociate said sockets from said rollers to permit the rotation of said rollers about said sockets and to permit the combination of said lock to be changed;
- bolt means attached to the frame, said bolt means including projection means which restrains said frame in the combination changing position once said combination changing position has been attained; and
- prong means attached to said frame and engagable by an oscillating bridge means, said oscillating bridge means blocking said prong means when said lock is in an off-key position, wherein said operating means is rendered immobile in said rest position when said prong means is so blocked.

4,711,109 CONTROLLING THICKNESS AND PLANARITY OF HOT ROLLED STRIPS

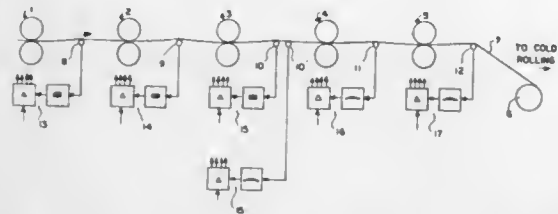
Wolfgang Robde, Dormagen, and Jürgen Klöckner, Netphen, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag, A.G., Dusseldorf, Fed. Rep. of Germany
Continuation of Ser. No. 589,409, Mar. 14, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 845,478
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1983, 3309040; Jan. 20, 1984, 3401894
Int. Cl.⁴ B21B 37/00

U.S. Cl. 72—8

7 Claims

1. A method for hot rolling strip metal comprising the steps of:
 - (a) determining the critical thickness of the metal in process

- at which reductions in thickness do not bring about a substantial increase in width;
- (b) hot rolling strip stock of said metal, said stock having a thickness substantially thicker than said critical thickness, sequentially through a first and second rolling stage in each of which stage said stock is passed through a roll pass comprising at least one deforming nip of at least one roll stand;
- (c) reducing the thickness of said stock in said first stage to substantially said critical thickness;



- (d) controlling the thickness reduction of said stock in said first stage by sensing the thickness of said stock downstream of said first stage and adjusting the height of said nip at at least the final roll stand in said first stage in response to the thickness measured;
- (e) sensing the planarity of said stock at said second stage at at least one point downstream of the roll pass thereof; and
- (f) reducing the thickness of said stock in said second stage to a thickness substantially below the thickness of said critical thickness while controlling the roll pass of that stage only in response to said planarity sensor.

4,711,110

APPARATUS FOR CRIMPING PIPE

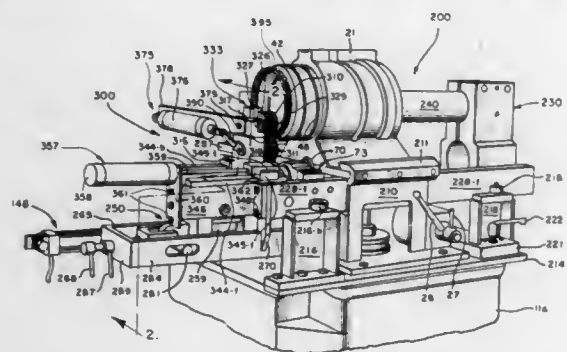
Wilhelmus P. H. Castricum, Rolling Meadows, Ill., assignor to Spiro America Inc., Wheeling, Ill.

Filed Oct. 24, 1986, Ser. No. 922,749

Int. Cl. B21D 19/04

U.S. Cl. 72-49

20 Claims



1. For use with a machine for continuously producing spiral seamed pipe from a metal strip including drive means for continuously feeding the strip through the machine, means for forming the strip into a spiral cylinder so that the outer edges of the strip are adjacent each other, means for joining the adjacent edges to produce a pipe having a spiral lockseam, and the leading edge of the continuously produced pipe moving in an axial direction as it rotates, an apparatus for crimping the leading edge of the pipe comprising:
- means for holding a plurality of rollers;
- first and second rollers rotatably mounted in the holding means adjacent each other, each roller having a corrugated circumferential edge;
- guide means for carrying the holding means and being slidable in the axial direction of the pipe;
- means for moving the holding means between a first position where the continuously produced pipe can move freely by

the holding means and rollers, and a second position where the leading edge of the pipe will pass between the corrugated edges of the first and second rollers; and means for lifting the first roller towards the second roller when the holding means is in the second position and the leading edge of the pipe is between the rollers, so that the corrugated edges of the rollers cooperate to crimp the pipe's leading edge, and whereby the moving pipe exerts a force on the rollers and holding means which causes the guide means to slide in the axial direction of the pipe, and the pipe's leading edge rotates between the first and second rollers as it moves axially so that the rollers can crimp the circumference of the leading edge.

4,711,111

FORMING PRESS MAT UTILIZES TRAYS FORMED OF THIN BOTTOM PLATES AND SEPARATE ANNULAR FRAMES

Keijo Helligren, Västerås, Sweden, assignor to Asea AB, Västerås, Sweden

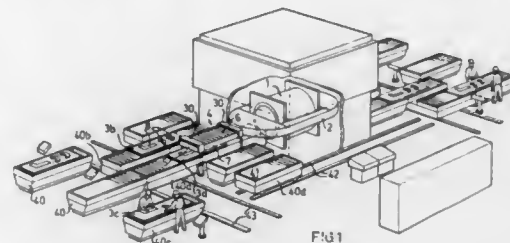
Filed May 30, 1986, Ser. No. 868,432

Claims priority, application Sweden, Mar. 25, 1986, 8601382

Int. Cl. B21P 22/12

U.S. Cl. 72-63

4 Claims



1. An apparatus for pressing work pieces, said apparatus comprising
- a forming press of a pressure cell type, said forming press including a press stand having an upper force-absorbing element, a lower force-absorbing element, a press plate having channels for a pressure medium positioned between said upper and lower force-absorbing plates, and a diaphragm positioned between said press plate and said lower force-absorbing element, said diaphragm and said lower force-absorbing element providing a parallel-pipedical working space therebetween which has opposite ends that are open,
- a tray for carrying forming tools and work pieces into and out of said working space, said tray consisting of a thin bottom plate and a rectangular frame resting on said bottom plate, said frame having thin long sides and thick short ends, said thick short ends acting to close said open ends of said working space when said tray is located in said working space,
- transport means for horizontally moving said tray into and out of said working space through the open ends thereof, and
- load-absorbing means located outside of said press stand and movable from a first position wherein it blocks at least one of the open ends of said working space to absorb an axial load induced on the short ends of the rectangular frame of said tray when said tray is located in said working space and the diaphragm of said press stand is moved toward said lower force-absorbing element by pressure medium passing through the channels in said press plate, or to a second position wherein it allows full access to the open ends of said working space to enable said tray to be moved into or moved out of said working space.

4,711,112

STRAIGHTENING MACHINES AND METHODS

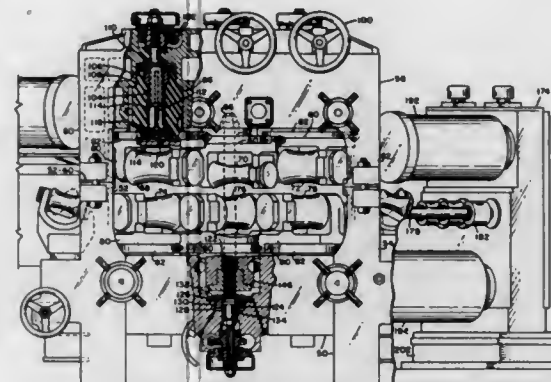
Einar W. Nilsson, 705 E. Curtin St., Bellefonte, Pa. 16823

Continuation-in-part of Ser. No. 280,372, Jul. 6, 1981, Pat. No. 4,494,394. This application Oct. 10, 1984, Ser. No. 659,087

Int. Cl. B21D 3/04

U.S. Cl. 72-98

6 Claims



1. A method for maintaining stock in a curved pass of a cross-roll straightener having a female roll of larger diameter than an opposed male roll, both of which are normally driven at substantially equal peripheral speeds, said method comprising:

temporarily rotating the smaller male roll at a higher peripheral velocity than the female roll such that the surface speed of the male roll is greater than the surface speed of the female roll and the female roll is driven by engagement with the stock as it enters the roll pass;

driving the female roll by a drive means when the stock has traveled beyond the center of the pass such that the surface speed of the male and female rolls are substantially the same; and

sensing the leading end of the stock and causing a temporary drag on the female roll when the stock is being entered into the pass between said rolls.

4,711,113

APPARATUS FOR REDUCING CORE LOSSES OF GRAIN-ORIENTED SILICON STEEL

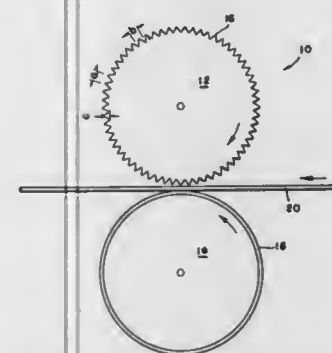
James G. Benford, Pittsburgh, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 714,587, Mar. 21, 1985, abandoned, which is a division of Ser. No. 683,839, Dec. 19, 1984, Pat. No. 4,533,409. This application Jun. 10, 1986, Ser. No. 873,111

Int. Cl. B21B 15/00, 45/00

U.S. Cl. 72-197

2 Claims



1. An apparatus for improving core loss of grain-oriented silicon steel comprising:
- a freely-rotatable roll set through which cold-rolled final gauge silicon steel sheet product is passed for scribing

substantially transverse to the rolling direction; the roll set including an anvil roll and a scribing roll;

the scribing roll having a roll surface which includes a plurality of projections thereon in a direction substantially parallel to the axis of the roll, the scribing roll being constructed of metal, the projections being spaced apart from 2 to 10 mm;

the anvil roll having a roll surface for contacting the steel sheet opposite the side being scribed, the surface being constructed from a material that is relatively more elastic than the metal material of the scribing roll, the anvil roll material having a shear modulus of elasticity of 2 to 5×10^2 psi, said rolls being spaced apart at a distance smaller than the steel thickness to effectively scribe the steel to a depth of less than about 6×10^{-3} mm thereby inducing localized strains in the steel surface without overscribing the steel.

4,711,114

METHOD OF AND APPARATUS FOR THE PRODUCTION OF WIDE STRIP

Wolfgang Rohde, Dormagen, and Manfred Kolakowski, Erkrath, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,084

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517090

Int. Cl. B21B 13/08

U.S. Cl. 72-234

11 Claims



6. An apparatus for producing wide strip, comprising:
- means for feeding a succession of roughed-out lengths of strip along a path to a finish-hot-rolling line having a plurality of rolling stands therealong;
- means for affixing the successive lengths end to end before said lengths enter the stands of said finish-hot-rolling line to form a continuous band;
- means for finish-hot-rolling said strip to a given thickness by passing said band through the stands of said line; and
- means for thereafter separating the lengths from one another.

4,711,115

METHOD FOR FORMING MEMORY DISCS BY FORGING

Israil M. Sukonnik; John S. Judge, both of Sidney, Ohio, and Colin H. Kilgore, New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 30, 1985, Ser. No. 814,310

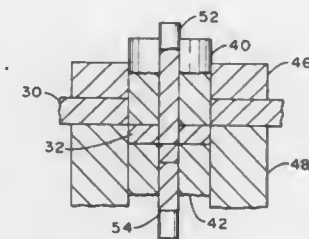
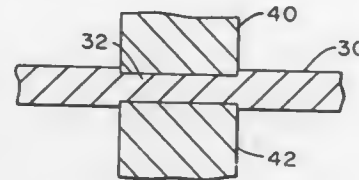
Int. Cl. B21D 28/26; B21K 1/76

U.S. Cl. 72-329

8 Claims

1. A method of making a flat and smooth metal memory disc for a data storage system which comprises:
- (a) pressing opposite surfaces of a metal member at a pressure of up to 2,200 KSI to form surfaces characterized by a maximum difference of 50 to 300 micro-inches from the lowest spot to the highest spot and a smoothness defined as Ra equal to or less than 350 Angstroms by flowing the metal member radially outward from a central neutral zone of roughness; and
- (b) subsequently removing said neutral zone of roughness formed during said pressing step by forming a central opening in said metal member of a diameter sufficient to remove said neutral zone of roughness;

whereby said memory disc will be formed sufficiently smooth and flat to permit use of said memory disc without further



machining of said surfaces to achieve said flatness and smoothness.

4,711,116

METHOD OF OPERATING A FOUR-HIGH ROLL STAND WITH BENDABLE AND AXIALLY SHIFTABLE ROLLS
Wilfried Bald, Hilchenbach, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

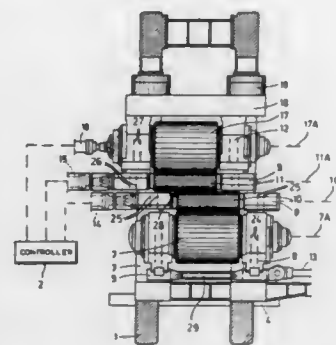
Continuation of Ser. No. 558,165, Dec. 5, 1983, Pat. No. 4,669,296. This application Sep. 25, 1986, Ser. No. 911,959
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1982, 3245090

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.⁴ B21B 31/18, 31/32

U.S. Cl. 72—366

3 Claims



1. A method of operating a four-high roll stand comprising: a frame;

a pair of small-diameter and substantially parallel work rolls defining a workpiece nip;

respective journal blocks supporting the work rolls in the frame for rotation about substantially parallel axes flanking the nip;

means for axially shifting the work-roll journal blocks and the respective work rolls in the frame;

respective means for bending the work rolls positively and negatively;

a pair of large-diameter and substantially parallel backup

rolls flanking and bearing toward the nip on the work rolls;

respective journal blocks supporting the backup rolls in the frame for rotation about substantially parallel axes flanking and generally coplanar with the work-roll axes; and means for axially shifting the backup-roll journal blocks and the respective backup rolls in the frame; the method comprising the steps of:

axially positioning the backup rolls relative to each other according to the width of a strip workpiece to be rolled and maintaining the same relative axial positions of the backup rolls for all workpieces of equal width;

axially positioning the work rolls relative to each other in a position that differs from their positions during previous strip runs for strips of equal width;

thereafter passing a strip workpiece through the nip perpendicular to the plane of the roll axes while pressing the work rolls against the strip workpiece to reduce its thickness and while maintaining the relative axial position of the work rolls unchanged;

after having completed the run of the strip workpiece, axially displacing the work rolls relative to the next strip workpiece and thereby changing the region of contact between the workpiece edges and the work rolls during a following run with the next strip workpiece; and

bending the work rolls by bending the backup rolls independently of the axial position of the work rolls to such an extent as to generate a predetermined rolled strip profile in the workpieces.

4,711,117

SIDE ARM FLUID LEVEL GAUGE WITH SPACED-APART SENSORS FOR DENSITY ERROR COMPENSATION

Harry F. Cosser, Fleet, England, assignor to Schlumberger Electronics, Inc., Hants, England

Filed May 6, 1985, Ser. No. 730,537

Claims priority, application United Kingdom, May 16, 1984, 8412460

Int. Cl.⁴ G01F 23/02, 23/22

U.S. Cl. 73—1 H

4 Claims



1. Fluid level measurement apparatus for the measurement of fluid level in a container under normal operating conditions comprising: a pressure vessel connected to and communicating with the container through at least one conduit and arranged such that fluid in the container may enter the vessel so that fluid level in the vessel is representative of fluid level in the container; and a plurality of spaced apart fluid sensitive sensors mounted in the vessel, the apparatus calibrated such that spacings between at least two different vertically disposed pairs of sensors are unequal to each other and correspond to and differ from preselected increments of fluid level to be measured,

wherein the calibrated spacings between sensors on the container are selected from values determined from known level errors arising from density difference between fluid in the container and fluid in the vessel as a result of temperature and pressure differences in the container and vessel, to compensate for said errors in fluid level measured by said apparatus.

4,711,118

DETECTION OF WATER ENTRAPPED IN ELECTRONIC COMPONENTS

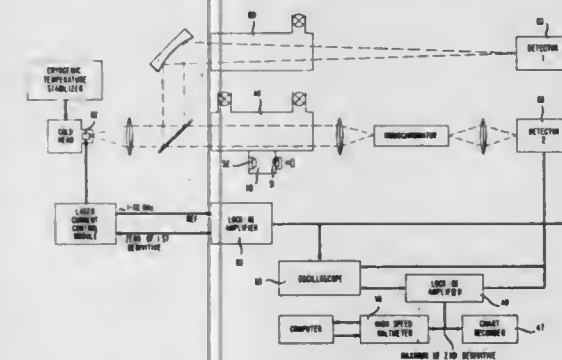
Peter R. Bossard, Langhorne, Pa., and John A. Mucha, Madison, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 5, 1981, Ser. No. 318,330

Int. Cl.⁴ G01N 21/00; G01M 3/00

U.S. Cl. 73—73

6 Claims



1. A process comprising the steps of (1) choosing a representative sample of devices from a batch of devices (2) measuring the encapsulated water vapor present in said representative sample of devices and (3) accepting said batch if said measured water vapor is less than a chosen value characterized in that from the instant that said water vapor is freed from said device the measurement that determines said water vapor level is made in a time period less than the time required for significant adsorption interaction of water with the walls of the measurement chamber.

4,711,119

PEAK COMBUSTION PRESSURE SIGNAL PROCESSING CIRCUIT WITH DIAGNOSTIC CAPABILITY

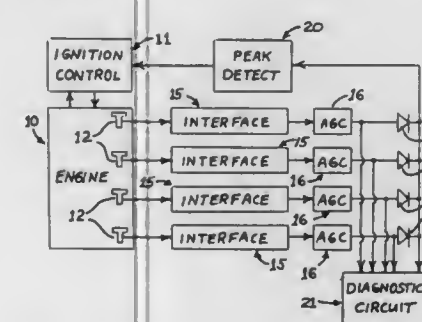
Glen C. Hamren, Greentown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1986, Ser. No. 939,184

Int. Cl.⁴ G01M 15/00

U.S. Cl. 73—115

3 Claims



1. A peak combustion pressure signal processing circuit for an internal combustion engine having a plurality of combustion chambers with combustion pressure sensors comprising, in combination:

an operational amplifier for each sensor having an input receiving a voltage derived from the sensor and an output

connected through a diode to a common junction to produce a voltage representing the highest combustion pressure of the engine at the common junction, each operational amplifier further having a feedback circuit from the common junction to its input effective to cause its output voltage to decrease by more than a diode drop so as to reverse bias its output diode when the voltage on the common junction exceeds the voltage derived from the associated sensor, whereby only the diode passing the signal derived from the sensor sensing the maximum combustion pressure is forward biased and all the other diodes are reverse biased; and

a logic circuit having inputs from the common junction and the outputs of at least all but one of the operational amplifiers, the logic circuit being effective to compare the voltage levels of the outputs of the operational amplifiers to the voltage on the common junction and thus determine which diode is forward biased, the logic circuit further defining a plurality of identifiable output states, one such state being unique to each diode being forward biased.

4,711,120

METHOD OF WEAR MONITORING USING ULTRASONIC PHASE COMPARISON

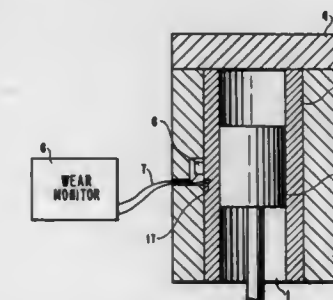
Hegeon Kwun; Anmol S. Birring; Gurvinder P. Singh; Gary J. Hendrix, and David G. Alcazar, all of San Antonio, Tex., assignors to Association of American Railroads, Washington, D.C.

Filed Oct. 6, 1986, Ser. No. 915,382

Int. Cl.⁴ G01M 15/00

U.S. Cl. 73—119 R

11 Claims



1. A method of monitoring cylinder wall wear in an engine comprising the steps of introducing ultrasonic waves in cylinder wall of the engine at least at intermittent times during the life of the engine so that the waves travel through the cylinder wall, determining a change in the traveling time of the ultrasonic waves traveling through the cylinder wall due to cylinder wall wear by phase comparison of the traveling ultrasonic waves, and calculating the amount of wear of the cylinder wall by multiplying the velocity of the ultrasonic waves in the cylinder wall by the traveling time change due to cylinder wall wear to thereby provide an indication as to whether engine overhaul or replacement is needed.

4,711,121

METHOD AND EQUIPMENT FOR DETECTING PINHOLES OF HOLLOW FILAMENT

Yasuteru Tahara, and Kazuyoshi Koike, both of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,430

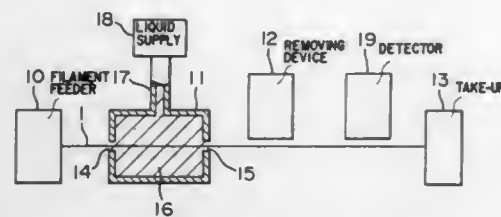
Int. Cl.⁴ G01M 3/00

U.S. Cl. 73—37.7

4 Claims

1. An improved method for detecting a pinhole in a hollow filament, wherein the improvement comprises passing the hollow filament through water maintained at a pressure higher than the pressure in the interior of said hollow filament to allow said water to intrude through any pinhole in said hollow

filament and into the interior of the hollow filament and, through the detection of said intruded water in the interior of



said hollow filament, detecting a pin hole in said hollow filament.

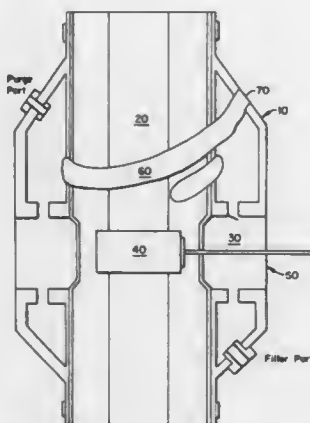
4,711,122 FLEXIBLE MUD EXCLUDER FOR BOREHOLE TELEVIEWER

Jorg A. Angehrn, Brea, and Dennis J. Fischer, Walnut Creek, both of Calif., assignors to Chevron Research Co., San Francisco, Calif.

Filed Aug. 21, 1986, Ser. No. 898,557
Int. Cl.⁴ G01V 1/40

U.S. Cl. 73—151

7 Claims



1. A mud excluder fitted around a rotating acoustic transducer of a borehole televiewer to exclude mud from said borehole televiewer, wherein said mud excluder comprises:

- a flexible casing means attached to said borehole televiewer to form a fluid cavity adjacent to said rotating acoustic transducer;
- an acoustically transparent fluid located within said fluid cavity;
- an acoustic window means opposite said transducer and adjacent to said fluid cavity; and
- a pressure compensating means within the fluid cavity to equalize the pressure within said fluid cavity with the pressure on the outside of said flexible casing means.

4,711,123 BUNDLE TYPE DOWNHOLE GAUGE CARRIER

Jon B. Christensen, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 25, 1985, Ser. No. 801,656
Int. Cl.⁴ E21B 47/06

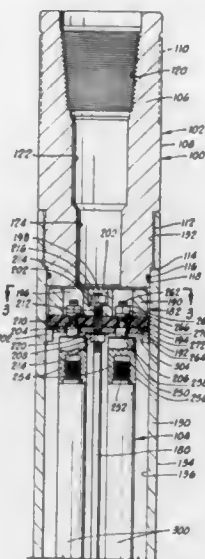
U.S. Cl. 73—151

11 Claims

9. A method of loading a plurality of gauges in a downhole gauge carrier, comprising:

- providing a carrier case assembly having an interior cavity;
- providing a support assembly to be removably disposed in said cavity;

(c) securing said plurality of gauges in said support assembly; and



(d) disposing said support assembly with said plurality of gauges secured therein in said interior cavity of said case assembly.

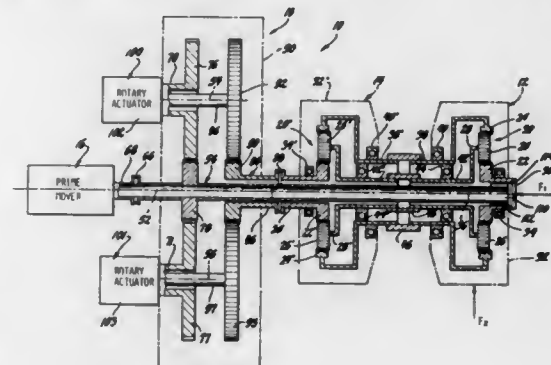
4,711,124 TORQUE APPLIER

Philip V. Cagle, Plainfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1986, Ser. No. 843,495
Int. Cl.⁴ G01M 13/02

U.S. Cl. 73—162

3 Claims



1. In an endurance test system for a test gear box of predetermined rated horsepower capacity at a rated input speed having a pair of concentric output shafts and a colinear input shaft, said test system including a slave gear box having a pair of concentric output shafts aligned with and connected to respective ones of said test gear box output shafts for rotation as units therewith and a colinear input shaft, rotation of said test gear box input shaft effecting concurrent rotation of said slave gear box input shaft in the same direction and at the same speed and oppositely directed torsional moments on said test gear box input shaft and said slave gear box input shaft simulating torque transfer through said test gear box, and

a prime mover having a horsepower rating not exceeding about ten percent of said test gear box rated horsepower and a power shaft aligned with said test gear box input shaft and said slave gear box input shaft and rotatable at said test gear box rated input speed, a torque applier comprising:

a torque applier housing disposed between said prime mover and said test gear box and defining a main axis, a torque applier main shaft means aligned on said main axis and extending through said torque applier housing drivingly connecting said prime mover power shaft and said test gear box input shaft whereby said test gear box input shaft is rotated at said rated input speed, an intermediate shaft means on said housing rotatable about said main axis, means connecting said intermediate shaft means and said slave gear box input shaft for unitary rotation, a plurality of rotary actuators each having a housing and a center shaft interconnected by means operative to develop equal and opposite torsional moments between respective pairs of said housings and said center shafts while said housings and said center shafts rotate in the same direction at the same speed, means mounting each of said rotary actuators on said torque applier housing in a circumferential array around said main axis, first combining gear means within said torque applier housing between said main shaft means and each of said rotary actuator housings rotating each of said rotary actuator housings at a reduced speed relative to said main shaft means, and second combining gear means on said torque applier housing between said intermediate shaft means and each of said rotary actuator center shafts rotating each of said rotary actuator center shafts at the same speed as said rotary actuator housings and in the same direction, said first and said second combining gear means simultaneously multiplying and summing the torsional moments developed by each of said rotary actuators while said test and said slave gear box input shafts rotate thereby to simulate torque transfer through said test gear box at said rated input shaft speed.

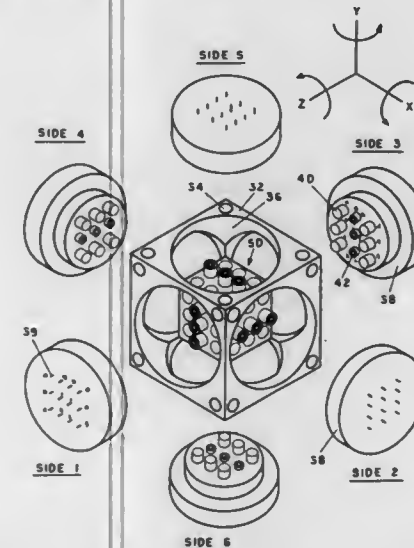
4,711,125 INERTIAL MEASUREMENT UNIT

Melvin M. Morrison, 6530 Independence Ave. #207, Canoga Park, Calif. 91303

Filed Nov. 6, 1985, Ser. No. 795,456
Int. Cl.⁴ G01C 21/12

U.S. Cl. 73—178 R

19 Claims



1. An apparatus for use in an inertial measurement unit for sensing motion in plural independent mutually orthogonal linear axes and plural independent mutually orthogonal angular axes of operation comprising: an outer assembly having a plurality of parallel opposing

interior surfaces and a sensor mass disposed within said outer assembly, said outer assembly including:

- a first set of suspension elements for suspending said sensor mass along each axis of operation including two face-to-face suspension elements disposed on opposing interior surfaces of said outer assembly and
- a first set of sensing elements for sensing motion of said outer assembly relative to said sensor mass along each axis of operation including two face-to-face pairs of sensing elements, each pair of elements being disposed on opposing interior surfaces of said outer assembly, with the corresponding suspension elements disposed between each pair of sensing elements and

said sensor mass including:

- a second set of suspension elements cooperative with said first set of suspension elements to suspend said sensor mass relative to said outer assembly along each axis of operation including two back-to-back suspension elements on opposing exterior surfaces of said sensor mass and
- a second set of sensing elements cooperative with said first set of sensing elements to sense motion of said sensor mass relative to said outer assembly along each axis of operation including two back-to-back pairs of sensing elements each pair of sensing elements being disposed on opposing exterior surfaces of said sensor mass with the corresponding suspension element disposed between each pair of sensing elements

whereby each suspension element and each sensing element on the sensor mass faces a corresponding suspension or sensing element respectively of said outer assembly such that the sensor mass is suspended within the outer assembly for movement in said axes of operation mechanically independent thereof.

4,711,126 SENSOR FOR THE MEASUREMENT OF THE REFRACTIVE INDEX OF A FLUID AND/OR PHASE BOUNDARY BETWEEN TWO FLUIDS BY MEANS OF VISIBLE OR INVISIBLE LIGHT

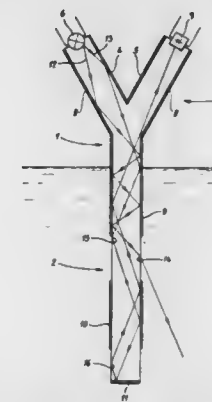
Pieter M. Houpt, and Ralph T. Wielandt, both of The Hague, Netherlands, assignors to 501 Nederlandse Centrale Organisatie Voor Toegepast-Enschappelijk Onderzoek, The Hague, Netherlands

Filed Mar. 12, 1986, Ser. No. 838,675
Claims priority, application Netherlands, Mar. 13, 1985, 8500726; Oct. 8, 1985, 8502744

Int. Cl.⁴ G01F 23/28

U.S. Cl. 73—293

17 Claims



1. A rechargeable battery comprising a rechargeable fluid-containing cell and a sensor for obtaining measurements of at least one fluid associated with said cell, the sensor comprising a light guide having a refractive index greater than that of the fluid, the light guide being a fork-shaped rod having a

portion at one end thereof adapted for immersion in the fluid, the opposite end of the rod being adapted for connection thereto a light source for directing visible or invisible light into the light guide and means for detecting reflected light,

a cladding bonded to the peripheral surface of the rod, the cladding comprising a coating of reflective material, and one or more window cut outs in the reflective coating bonded to the portion of the rod adapted for immersion in the fluid, whereby when the rod is immersed, the windows are in direct contact with the fluid.

4,711,127

METHOD AND APPARATUS FOR MEASURING THE PRESSURE OF A FLUID

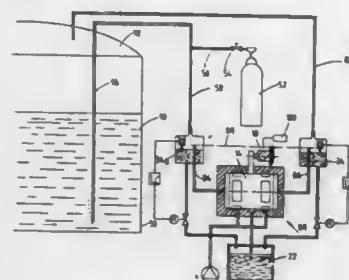
Hans W. Häfner, Aichach-Walchshofen, Fed. Rep. of Germany, assignor to Pfister GmbH, Augsburg, Fed. Rep. of Germany
Filed Mar. 21, 1986, Ser. No. 842,650

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514911

Int. Cl.⁴ G01F 23/14; G01L 7/16

U.S. Cl. 73—302

31 Claims



8. An apparatus for determining the height, volume, density and/or mass of liquid contained in a storage tank, comprising:

- a piston having two opposite face surfaces, slidably guided in a cylinder essentially without friction by hydrostatic bearings;
- a means for supplying, under pressure, hydrostatic liquid to said hydrostatic bearings;
- a gas supply means;
- at least one bubble tube means connectable to said gas supply means for releasing gas into said liquid at a predetermined level;
- at least one pressure chamber formed within said cylinder, one wall of said pressure chamber being a face surface of said piston, said pressure chamber having applied thereto a pressure existing in said bubble tube when supplied with gas from said gas supply means;
- a force measuring element engaging said piston and adapted to generate a signal indicative of the pressure existing in said bubble tube means;
- at least one receptacle connected to said pressure chamber for receiving any of said hydrostatic liquid that penetrates into said pressure chamber;
- a means for controlled removing of hydrostatic liquid from said receptacle such that said hydrostatic liquid is maintained at a predetermined level in said receptacle; and
- evaluation means for calculating on the basis of said signal said height, volume, density and/or mass of said liquid in said storage tank.

4,711,128

MICROMACHINED ACCELEROMETER WITH ELECTROSTATIC RETURN

André Boura, Chatelleraut, France, assignor to Societe Francaise d'Equipements pour la Aerienne (S.F.E.N.A.), France

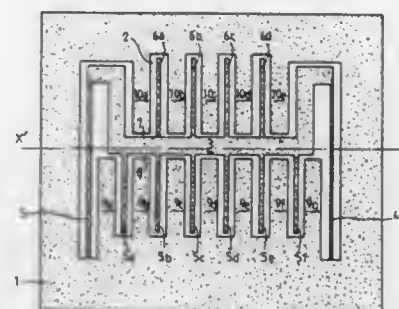
Filed Apr. 14, 1986, Ser. No. 851,639

Claims priority, application France, Apr. 16, 1985, 85 05690

Int. Cl.⁴ G01P 15/13, 15/125

U.S. Cl. 73—517 B

9 Claims



1. An accelerometer sensor comprising a flat pendular structure made from one and the same crystalline wafer, said structure having in a same plane, a flat fixed part, at least two parallel blades flexible in the same plane and delimiting therebetween a space, each of said blades having a first end portion fixedly connected to said fixed part, and a second end portion, said structure further comprising a flat test body connected to the second end portions of said blades so as to be suspended from the flat fixed part and to be able to move in translation in the same plane along a sensitive axis under the effect of an acceleration with a position which varies in relation with said acceleration, said flat test body extending at least partially into said space, wherein said flat test body comprises at least a first edge which carries a first metallization having first and second opposite faces and said flat fixed part comprises at least a second and a third edge carrying respectively a second and a third metallizations, said second and third metallizations respectively facing said first and second opposite faces, so as to form two capacitors whose capacities vary depending on the position of said test body, said first metallization being brought to a first voltage V_0 , whereas the second and the third metallizations are respectively brought to a second and third voltages V_1 and V_2 which are capable of generating an electrostatic return force on the flat test body.

4,711,129

PRESSURE SENSOR

Johann Stubenberg, Gleichenberg; Helmo Denk, and Rudolf Zeiringer, both of Graz, all of Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr. Dr. h.c. Hans List, Graz, Austria

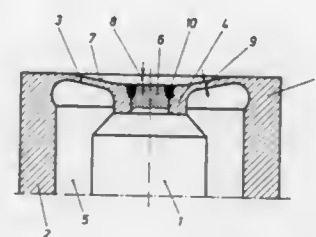
Filed Mar. 3, 1986, Ser. No. 835,214

Claims priority, application Austria, Mar. 5, 1985, 655/85

Int. Cl.⁴ G01L 7/08, 19/04

U.S. Cl. 73—708

2 Claims



1. A pressure sensor comprising a housing which defines an

interior, a measuring element situated in the interior of said housing, and a plate membrane which has a center area, an annular area around the center area and a peripheral area around the annular area, said peripheral area of said plate membrane being permanently attached to said housing such that said housing is sealed against a medium whose pressure is to be measured, said plate membrane also being connected to said measuring element so as to transmit the pressure to be measured to said measuring element, adjacent to its periphery along which it is connected to said housing having an annular area bordering on a center area, and said annular area of said plate membrane, in its unloaded condition, having a curved or conical shape and extending into the interior of said housing, and said annular area of said plate membrane being higher in its non-assembled state than after assembly, such that it is pressed against said measuring element with a positive pretension in its assembled state.

4,711,130

PRESSURE MEASURING ELEMENT

Hans J. Glas, Tamm; Hans Hecht, Korntal-Münchingen; Klaus Müller, Tamm; Kurt Spitzenberger, Weil der Stadt, and Günther Stecher, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

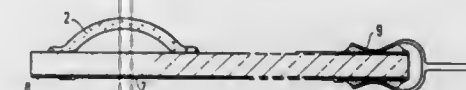
Filed Jun. 30, 1986, Ser. No. 880,006

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1985, 3528520

Int. Cl.⁴ G01L 7/08, 9/12, 19/04

U.S. Cl. 73—708

7 Claims



1. In a pressure measuring element, particularly for measuring intake air pressure in an internal combustion engine of a motor vehicle, comprising a membrane made of ceramic material and deformable in response to an intake air pressure; and a substrate formed as a plate and having an upper side to which said membrane is rigidly connected at a peripheral area thereof, said substrate having an underside; the improvement comprising an electrical heating resistance element mounted immediately on said underside, whereby said substrate is maintained at constant temperature.

4,711,131

METHOD AND APPARATUS FOR DETERMINING CRACK INITIATION AND PROPAGATION IN METALS

Daniel N. Hopkins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 3, 1986, Ser. No. 815,847

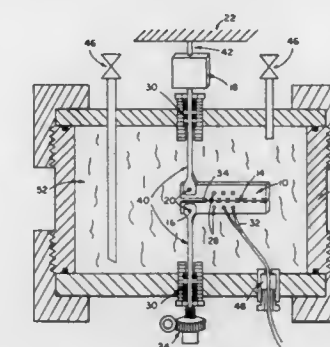
Int. Cl.⁴ G01N 19/00

U.S. Cl. 73—799

51 Claims

- An apparatus with an enclosed environment conducive to crack initiation and propagation comprising:
 - means for supporting a metal specimen in said enclosed environment;
 - a specimen of a generally rectangular planar and cross sectional configuration having two longitudinal arms with a space therebetween for a substantially short distance terminating in oppositely disposed longitudinal grooves for the remainder of the distance therebetween which grooves define a narrowed longitudinal section;
 - means for applying a force, while said specimen is in said enclosed environment by a rod means interconnected to each of said arms in combination with said enclosed environment, sufficient to initiate and propagate a longitudinal crack in said longitudinal section; and
 - a means for detecting strain via strain sensors and a mean

for measuring said detection results from said crack initiation and propagation in said specimen which enables the



prediction of the metal behavior under actual conditions of use.

4,711,132

APPARATUS FOR MASS FLOW RATE AND DENSITY MEASUREMENT

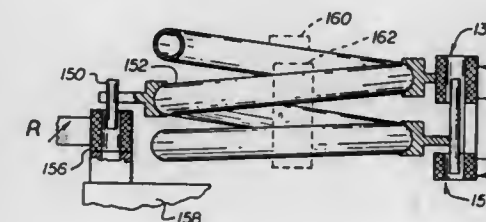
Erik B. Dahlin, San Jose, Calif., assignor to Exac Corporation, Campbell, Calif.

Continuation-in-part of Ser. No. 616,808, Jun. 4, 1984, abandoned and PCT US85/01046 filed Jun. 3, 1985, published as W085/05677, Dec. 19, 1985. This application Sep. 13, 1985, Ser. No. 775,739

Int. Cl.⁴ G01F 1/84

U.S. Cl. 73—861.38

20 Claims



1. A flow meter for measuring the mass flow rate in a stream of flowing material, comprising:

- tubular conduit means arranged to form at least one loop having an entrance portion, an exit portion crossing said entrance portion in spaced apart relationship, an actuated portion, a first detection portion coupling said entrance portion and said actuated portion, and a second detection portion coupling said actuated portion and said exit portion, said conduit means being adapted to receive, conduct and then emit said stream of flowing material and having a natural frequency of oscillation in the Coriolis mode of w_C and a natural frequency of oscillation in the drive mode of w_D , where w_D is substantially different from w_C ;
- actuating means for causing said actuated portion to oscillate between positions on opposite sides of a rest position;
- damping means coupled to said tubular conduit means for allowing selective adjustment of the damping coefficient thereof;
- detection means for detecting motive differences occurring between said entrance portion and said exit portion caused by Coriolis forces induced in said first detection portion of said second detection portion as said actuating means causes said actuated portion to oscillate; and
- computing and indicator means responsive to said detection means and operative to indicate the mass flow rate of material flowing through said tubular conduit means.

4,711,133

NON-CONTACT WEB TENSION METER

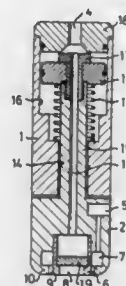
Per Roode Berglund, Musserongängen 18, S-13534 Tyresö, Sweden

PCT No. PCT/SE85/00319, § 371 Date May 9, 1986, § 102(e) Date May 9, 1986, PCT Pub. No. WO86/01890, PCT Pub. Date Mar. 27, 1986

PCT Filed Aug. 28, 1985, Ser. No. 862,351

Claims priority, application Sweden, Sep. 10, 1984, 8404531 Int. Cl.⁴ G01L 5/08

U.S. Cl. 73—862.07



1. A non-contact web tension meter for measuring the tension of a web of material having a breadth and drawn under tension between two guide means, said meter incorporating means for supplying a pressurized gas to a space therein which is open in one direction and which is delimited by one side of said web placed in close proximity to said space, and a pressure gauge adapted to measure the gas pressure near said web at a side of said space, said meter being freely movable across the breadth of said web, and comprising a holder (3), having a measuring head attached to said holder and incorporating a pressurized-gas inlet (4), a gas passage (11) connected to said inlet and extending to said space (8), and an annular chamber (7) surrounding said space (8), and having an annular opening (9), said space (8) and said opening (9) terminating adjacent an end plane in said measuring head, and said annular chamber being connected to a pressure sensor.

4,711,134

TORQUE DETECTOR

Toru Kita, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

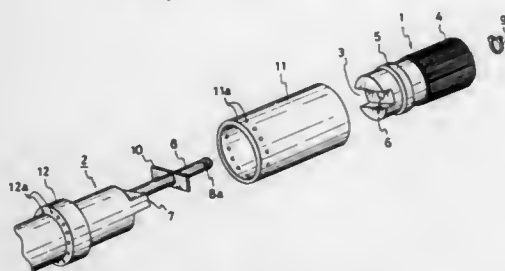
Filed Aug. 9, 1985, Ser. No. 764,075

Claims priority, application Japan, Aug. 13, 1984, 59-123856[U]

Int. Cl.⁴ G01L 3/10

U.S. Cl. 73—862.36

9 Claims



1. A torque detector for detecting torque transmitted between first and second shafts with their axes on the same line comprising:

stopper means for preventing angular relative movement between the first and second shafts beyond a predetermined value;

said stopper means having a groove diametrically disposed in the first shaft at one end thereof and a projection dis-

posed in the second shaft at one end thereof, the projection being fitted into the diametric groove;
a magnetostrictive member for transmitting torque between the first and second shafts and coupled in a flexible manner to at least one of the first and second shafts; and
a magnetic sensor for detecting magnetic variations produced in said member by the transmitted torque.

4,711,135

VIBRATION DAMPING STRUCTURE OF SHIFT LEVER RETAINER

Yusuke Horiuchi, and Masaki Inui, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

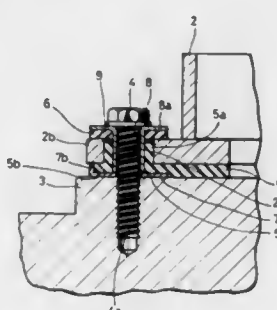
Filed Nov. 20, 1985, Ser. No. 800,048

Claims priority, application Japan, Dec. 10, 1984, 59-187866[U]

Int. Cl.⁴ G05G 9/12

U.S. Cl. 74—473 R

2 Claims



1. In a shift lever retainer mounting structure including a shift lever retainer for spherically supporting a shift lever, a first vibration damping member interposed between said shift lever retainer and a transmission case, a bolt for fixing said shift lever retainer to said transmission case, a second vibration damping member interposed between said bolt and said shift lever retainer, and a bushing for receiving said bolt, said bushing having an upper flange arranged between a head portion of said bolt and said second vibration damping member, said first and second vibration damping members having a thickness such that vibration from said transmission case may be sufficiently absorbed;

a vibration damping structure comprising a first stopper means for preventing horizontal deformation of said first vibration damping member greater than a predetermined amount, and a second stopper means for preventing vertical deformation of said first vibration damping member greater than a predetermined amount, wherein said first stopper means comprises a rigid ringlike member engaged with said bushing and located between said first and second vibration damping members, and wherein said second stopper means comprises an upward projection projecting from a plate engaged with said bolt and fixed on an upper surface of said transmission case such that a portion of said plate is interposed between said first vibration damping member and said transmission case.

4,711,136

POWER TRANSFER DEVICE FOR FOUR-WHEEL DRIVE

Toshio Yoshinaka; Toshikatsu Taniguchi; Shuichi Ida; Shuji Nagano; Shigeru Kimura, and Yasuo Tanaka, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 7, 1986, Ser. No. 837,268

Claims priority, application Japan, Mar. 12, 1985, 60-48920

Int. Cl.⁴ F16H 37/06; B60K 23/08

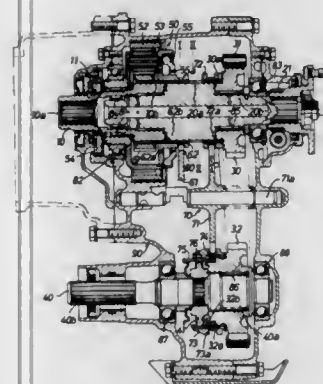
U.S. Cl. 74—665 GA

11 Claims

5. A power transfer device adapted for use in combination

with a power transmission for an automotive vehicle, comprising:

- a housing;
- an input shaft rotatably mounted within said housing for connection to an output shaft of said power transmission;
- a first output shaft rotatably mounted within said housing coaxially with said input shaft, said first output shaft having an inner end rotatably coupled within said input shaft and having an output end for drive connection to a pair of rear-wheel or front-wheel axles;
- a second output shaft rotatably mounted within said housing in parallel with said first output shaft and having an output end for drive connection to a pair of front-wheel or rear-wheel axles;
- a drive member rotatably mounted on said first output shaft and connectable to said first output shaft;
- a driven member rotatably mounted on said second output shaft and connectable to said second output shaft, said driven member being drivingly connected to said drive member;
- a change-speed mechanism mounted on said input shaft and having an input element connected with said input shaft



and an output element for providing a low speed drive power train;

- a first changeover mechanism including a clutch sleeve mounted on said first output shaft between said change-speed mechanism and said drive member and shiftable between a first position wherein said clutch sleeve is retained to directly connect the input shaft to said first output shaft and a second position where said clutch sleeve is retained to connect the output element of said change-speed mechanism to said first output shaft; and
- a second changeover mechanism including a pair of second clutch sleeves each mounted on said first and second output shafts respectively and arranged adjacent said drive and driven members, said second clutch sleeves being shiftable between a first position where both said second clutch sleeves are retained to connect said drive and driven members to said first and second output shafts respectively for rotation therewith and a second position where both said second clutch sleeves are retained to disconnect said drive and driven members from said first and second output shafts respectively, wherein said drive and driven gears remain substantially stationary as said first and second shafts rotate.

4,711,137

MECHANICAL AUTOMATIC TRANSMISSION

Walter E. Welander, P.O. Box 449, Virginia, Minn. 55792

Filed Dec. 16, 1985, Ser. No. 809,206

Int. Cl.⁴ F16H 3/74

U.S. Cl. 74—751

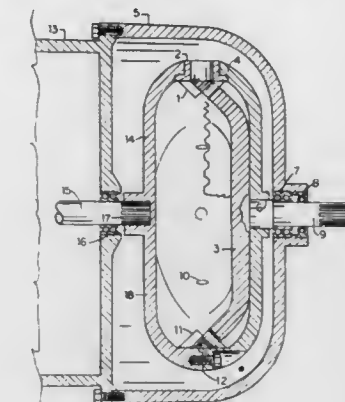
5 Claims

1. Power transfer apparatus comprising:

- (a) a first lubricant containing housing;
- (b) a second housing rotatively mounted in said first housing

including a pair of concave mating halves joined together to form a hollow interior cavity;

- (c) an input shaft rotatively journaled through said first housing and spline coupled to one side of said second housing;
- (d) a plurality of planetary gears rotatively mounted to project interiorly of said second housing;



- (e) a side differential gear of a diameter substantially the same as said second housing and including a plurality of teeth mounted in intermeshed engagement with each of said planetary gears; and
- (f) an output shaft fixedly coupled to said side differential gear and rotatively journaled through said first and second housings.

4,711,138

AUTOMATIC TRANSMISSION MECHANISM

Masakatsu Miura, Kariya, and Hideyuki Aoki, Anjo, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

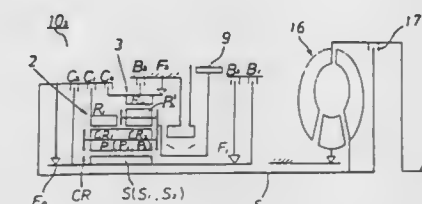
Filed Feb. 26, 1986, Ser. No. 833,377

Claims priority, application Japan, Oct. 16, 1985, 60-230809; Dec. 16, 1985, 60-282584

Int. Cl.⁴ F16H 57/10; F16D 25/10

U.S. Cl. 74—761

7 Claims



7. An automatic transmission mechanism comprising:

- a single planetary gear unit;
- a dual planetary gear unit;
- carriers of both of the planetary gear units that are connected to one another;
- sun gears of both of the planetary gear units that are connected to one another;
- an output member to which the carriers are connected;
- an input member connected to a ring gear of the single planetary gear unit through a first clutch, to the sun gears through a second clutch, and to a ring gear of the dual planetary gear unit through a third clutch;
- brake means for braking rotation of the sun gears, and the ring gear of the dual planetary gear unit;
- a hydraulic actuator for actuating the first, the second and the third clutches,
- the clutches and the hydraulic actuator being disposed at an

end portion of the hydraulic automatic transmission mechanism;
 the hydraulic actuator having a flange portion, the flange portion comprising a cylinder of the hydraulic actuator for actuating the first clutch, another cylinder of the hydraulic actuator for actuating the third clutch, and a connecting member for connecting the input member to the respective clutches;
 the flange portion having a non-rotatable movable member for moving in an axial direction that extends along an axis of the automatic transmission mechanism;
 the movable member comprising a piston of the hydraulic actuator for actuating the first clutch, and a cylinder of the hydraulic actuator operatively connected to the second clutch for actuating the second clutch;
 the movable member having a piston member that is movable in the axial direction;
 the piston member comprising a piston of the hydraulic actuator for actuating the second clutch; and
 a return spring for biasing the piston member, the return spring biasing the hydraulic actuator for actuating the first and the second clutches to a return position.

4,711,139

INFINITELY VARIABLE ROTARY DRIVE TRANSMISSION

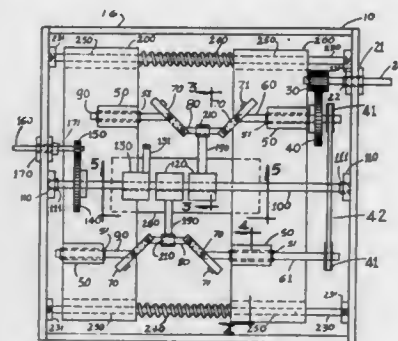
Egas J. Desousa, 8373 Meadowdale, Grand Blanc, Mich. 48439

Filed Jun. 11, 1986, Ser. No. 873,593

Int. Cl.⁴ F16H 35/08

U.S. Cl. 74-837

8 Claims



1. An infinitely variable rotary drive transmission comprising:

- a housing;
- an input member rotatably mounted to said housing;
- a pair of articulated drive shafts mounted for rotation within said housing, each of said pair of drive shafts rotatable about longitudinal axis and having a crank portion, said crank portion having a pair of ends, each of said pair of ends of said crank portion pivotally mounted to a link member, said crank portion being radially movable to and away from said longitudinal axis to vary the throw of said crank portion;
- means for drivingly connecting said input member to one of said pair of drive shafts;
- means for drivingly connecting said pair of drive shafts together for synchronous rotation of said pair of drive shafts;
- means for reciprocally moving said crank portion to and away from said longitudinal axis of each of said pair of drive shafts;
- an intermediate shaft rotatably mounted to said housing;
- a pair of overrunning clutch assemblies mounted to said intermediate shaft such that said shaft rotates in only one direction;
- means for drivingly connecting said crank portion of each of said pair of drive shafts to said a respective one of said pair of overrunning clutch assemblies of said intermediate

shaft, for continuous revolution of said intermediate shaft, each said crank portion alternately driving said intermediate shaft for one half revolution of said pair of drive shafts, said means for drivingly connecting said crank portion of each of said pair of drive shafts acting in response to a change in the throw of said crank portion of each of said pair of drive shafts to vary the speed of rotation of the intermediate shaft;

an output member rotatably connected to said housing; and means for drivingly connecting said intermediate shaft to said output.

4,711,140

THROTTLE VALVE SYSTEM FOR AUTOMATIC TRANSMISSIONS

Gilbert W. Younger, 2621 Merced Ave., El Monte, Calif. 91733

Filed Dec. 27, 1985, Ser. No. 813,729

Int. Cl.⁴ B60K 41/06, 41/16

U.S. Cl. 74-865

13 Claims



1. A throttle valve system for automatic transmissions including a throttle valve member movable within a bore between two predetermined positions, a plunger for driving the throttle valve member in said bore, a throttle valve spring disposed between the plunger and the valve member for transmitting the force exerted by the plunger to the throttle valve member, and

a rigid spacer element freely mounted within the throttle valve spring, said spacer element being of a length less than the length of said throttle valve spring when said spring is in its normal operative position, said spacer element adapted to exert a force directly on said throttle valve member if said valve member sticks in said bore and is no longer movable with said throttle valve spring, said spacer element directly abutting against said valve member and applying a force thereagainst, under the urging of said plunger, only if said valve member is stuck in said bore and said throttle valve spring is compressed to a length substantially equal to the length of said spacer element, said spacer element not directly abutting against said valve member during normal operation of said throttle valve system.

4,711,141

METHOD FOR CONTROLLING AMT SYSTEM INCLUDING AFTER TRANSMISSION GEAR CHANGE CLUTCH AND FUEL CONTROL

Donald Speranza, Canton, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 30, 1986, Ser. No. 858,131

Int. Cl.⁴ B60K 41/02, 41/28

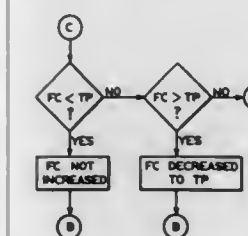
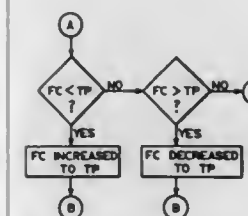
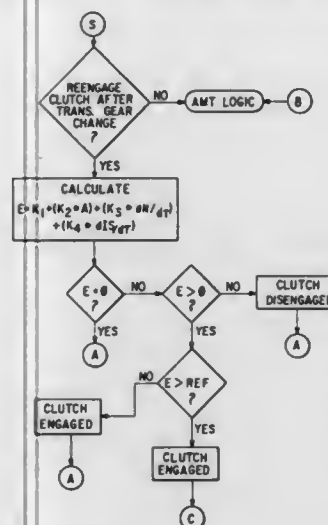
U.S. Cl. 74-866

10 Claims

1. A method for controlling a vehicle automatic mechanical transmission system for devices having an operator actuated throttle pedal, a throttle-controlled engine, a transmission having a plurality of gear ratio combinations selectively engageable between a transmission input shaft and a transmission output shaft, said transmission input shaft being operatively connected to said engine by means of a selectively engageable and disengageable friction coupling, said automatic mechanical transmission system comprising an information processing unit having means for receiving a plurality of input signals including (1) an input signal indicative of the rotational speed of the engine; (2) an input signal indicative of the operator's setting of the throttle pedal; and (3) an input signal indicative of the rotational speed of the input shaft, said processing unit including means for processing said input signals in accordance with

a program for generating output signals whereby said transmission system is operated in accordance with said program, and means associated with said transmission system effective to actuate said transmission system to effect engagement of said gear ratio combinations in response to said output signals from said processing unit,

said processing unit having means to sense friction coupling engagement after a transmission gear change operation and, in a friction coupling engagement after a transmission gear change operation, issuing output signals to control means for controlling the amount of engagement of said friction coupling, said control means having a first state in which said friction coupling is completely disengaged, a second state in which said friction coupling is completely engaged and a third state occurring during the transition



from said first state to said second state, when said friction coupling engageable elements are partially engaged, said control means being operative during said third state to engage said coupling elements sufficiently to maintain the speed of rotation of said engine at a value in predetermined relation to the adjustment position of said throttle whereby the function E is minimized where E is a function of the throttle position, rate of change of engine speed and rate of change of input shaft speed; the method characterized by:
 calculating the value of E;
 comparing the value of E to a predetermined reference value; and
 preventing increased supply of fuel to the engine, regardless

of the throttle pedal setting, if E is equal to or greater than said reference value.

4,711,142

SAW SHARPENING APPARATUS

Anthony J. Pawlosky, R.D. #1, Hickory, Pa. 15340

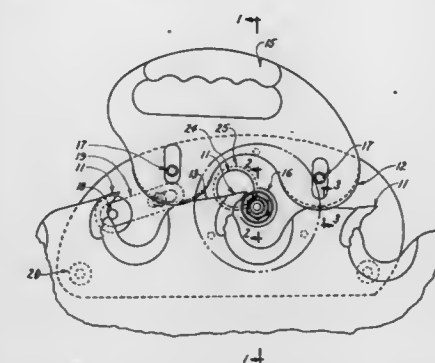
Continuation-in-part of Ser. No. 855,721, Apr. 25, 1986,

abandoned. This application Jan. 22, 1987, Ser. No. 5,789

Int. Cl.⁴ B23D 63/14

U.S. Cl. 76-37

9 Claims



1. A hand-held, motor driven apparatus for sharpening saw blades consisting of a body member having a slotted opening partially therethrough such that said body member will straddle a saw blade to be sharpened in a saddle back manner to provide a side shield on each side of said saw blade adjacent to the tooth on said saw blade being sharpened, a motor attached to said body member such that the shaft on the motor extends transversely into the slotted opening, and a cylindrical grinding drum secured over the motor shaft as will provide a hollow ground sharpening action on the teeth of the saw blade being sharpened.

4,711,143

ROCK BIT ASSEMBLY METHOD

Jesse J. Loukanis, Houston, Tex.; Will W. Mathews, Germantown, Tenn., and Raymond L. Tune, Houston, Tex., assignors to NL Industries, Inc., New York, N.Y. and Cummins Engine Co., Columbus, Ind.

Filed Jul. 25, 1986, Ser. No. 890,718

Int. Cl.⁴ E21B 10/08

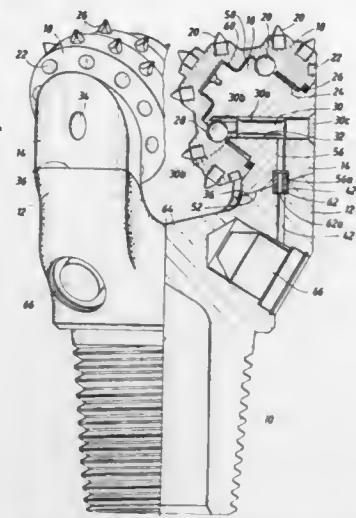
U.S. Cl. 76-108 A

59 Claims

1. A method of assembling a roller cone type rock bit comprising the steps of:

- on a main body member having a tool joint portion adjacent one end and at least one leg portion adjacent the other end, providing said leg portion with a longitudinally outer surface which is inclined longitudinally inwardly from its radially outer extremity to its radially inner extremity;
- on a base for a cone assembly, providing an end surface configured to mate with said outer surface of said leg portion of said main body member;
- rotatably mounting a roller cone on said base distal said end surface to form a cone assembly;

mating said end surface of said base with said outer surface of said leg portion;



and welding said base to said leg portion along the juncture of said mating surfaces to mount said cone assembly on said leg portion.

4,711,144

DRILL BIT AND METHOD OF MANUFACTURE

John D. Barr, Cheltenham, and Haydn R. Lamb, Gloucester, both of United Kingdom, assignors to NL Industries, Inc., New York, N.Y.

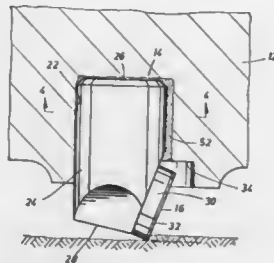
Division of Ser. No. 575,555, Jan. 31, 1984, Pat. No. 4,605,157. This application Jun. 3, 1986, Ser. No. 870,075

The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.

Int. Cl.⁴ E21B 10/58

U.S. Cl. 76—108 A

13 Claims



1. A method of mounting a cutter device having a stud portion defining one end thereof and a cutting formation generally adjacent the other end, in a pocket in a drill bit body member, said method comprising the steps of:

installing spring means cooperative between said cutter device and said bit body member for retaining said stud portion in said pocket; said spring means being oriented so as to resiliently urge said stud portion toward a trailing side of said pocket.

then brazing said stud portion into said pocket.

6. A well drilling bit body member having a working face and a plurality of pockets extending into said working face, each of said pockets having wall means with leading and trailing portions with respect to an intended direction of rotation of said bit body member in use;

a plurality of cutter devices each having a stud portion defining one end thereof and a cutting formation generally adjacent the other end, each of said cutter devices having its stud portion disposed in a respective one of said pockets in abutment with said trailing portion of said wall means;

spring means in each of said pockets generally adjacent said leading portion of said wall means and cooperative be-

tween said wall means and said cutter device; for resiliently urging said stud portion toward said trailing portion during brazing and
brazing material in each of said pockets between said stud portion of said cutter device and said wall means affixing said cutter device to said bit body member.

4,711,145

RATCHET HANDLE

Isao Inoue, 11-14, Sanchiku 1-chome, Sanjo-shi, Niigata-ken, Japan

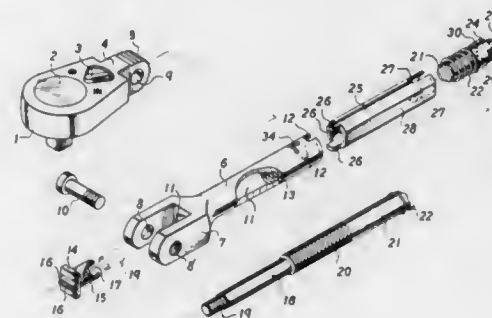
Filed Aug. 19, 1986, Ser. No. 897,856

Claims priority, application Japan, Jul. 24, 1986, 61-174546

Int. Cl.⁴ B25B 23/16

U.S. Cl. 81—177.1

6 Claims



1. A ratchet handle comprising a head, a handle connected to said head by a pin, an operation rod having inner, central and outer portions, said operation rod having said inner and central portions located within said handle, said operation rod having first threads on said inner portion and second threads on said central portion, a moving part having threads engaging said first threads on said operation rod, said handle having threads in engagement with said second threads on said operation rod, means for providing a locking engagement between said moving part and said head, said first and second threads being formed in opposite directions, and a grip enclosing said outer portion of said operation rod.

4,711,146

METHOD FOR REPROFILING PROFILES OF WHEEL SETS

Dieter Lung, Herzogenrath; Werner Kluft, Aachen; Jochen Fabry, Rückersdorf; Helmut Wittkopp; Theodor Dombrowski, both of Erkelenz, and Hartwig Klosterhalfen, Düren, all of Fed. Rep. of Germany, assignors to W. Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Continuation of Ser. No. 732,440, May 9, 1985, abandoned. This application Mar. 17, 1987, Ser. No. 27,994

Claims priority, application European Pat. Off., May 10, 1984, 84105312.7; Mar. 22, 1985, 85103378.7

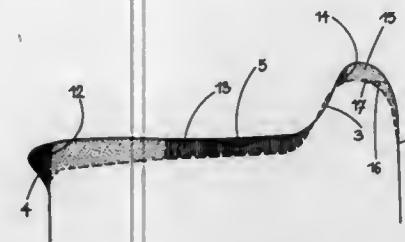
Int. Cl.⁴ B23B 5/28

U.S. Cl. 82—1 C

3 Claims

1. Method for reprofiling profiles of wheel sets by machining with a lathe using cutting data, which comprises providing cutting data specific to the profile with a machine control unit (43-50), visually subdividing the profile of the wheel sets into regions where cutting materials are not expected to be subjected to a sudden load and remaining regions, rotating the wheel sets, reprofiling the wheel sets by alternating machining the profile using heavy-duty cutting materials at the regions of

the profile where a sudden load is not expected and using shock-insensitive cutting materials at the remaining regions,



and adapting the cutting data to the cutting material being used at each moment with the machine control unit (43-50).

4,711,147

DEVICE FOR SCORING WORKPIECES

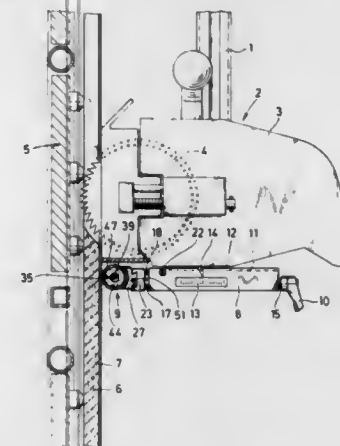
Alfred Dettelbach, and Werner Binder, both of Stuttgart, Fed. Rep. of Germany, assignors to Reich Spezialmaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 26, 1985, Ser. No. 813,517

Int. Cl.⁴ B27B 5/06

U.S. Cl. 83—863

10 Claims



1. An apparatus for scoring laminated workpieces, comprising:

sawing means mounted in a frame relative to the workpiece, for cutting the workpiece along a saw line;

scoring head mounted on a slidable and lockable holder substantially normal to a workpiece surface, said holder affixed to said frame with said scoring head positioned to precede said sawing means along a saw line cut into said workpiece surface;

a pair of opposed, adjustably spaced scoring knives, each individually held by said scoring head against the workpiece under pressure, penetrating said surface thereof, said scoring knives characterized by opposed, beveled interior surfaces and flat exterior surfaces,

a pair of knife carriers for transversely adjusting said knife spacing relative to said saw line cut, each of said knife carriers being held by a screw adjustable slide guiding means; and

each of said knife carriers being screw clampable on said scoring head means and connected to each other by adjusting screw mechanisms having threaded sections of different pitch engaging said knife carriers.

4,711,148

FRACTIONAL RANGE SELECTABLE MUSICAL TONE GENERATING APPARATUS

Fumiteru Takeda; Katsuhiko Hirano, and Yoshihiro Inagaki, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

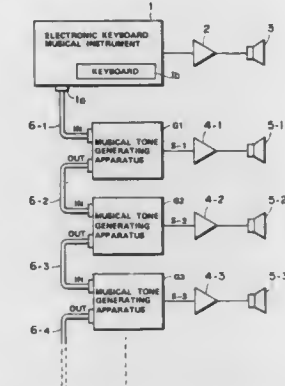
Filed Nov. 13, 1985, Ser. No. 797,442

Claims priority, application Japan, Nov. 14, 1984, 59-172779[U]

Int. Cl.⁴ G10H 1/18, 1/36

U.S. Cl. 84—1.01

9 Claims



9. In a musical tone generating apparatus which is independent and separate from an electronic musical instrument having a plurality of keys and generating key information signals, said musical tone generating apparatus receiving said key information signals and generating musical tone signals separate from tone signals generated by the electronic musical instrument in response to depression of keys of the electronic musical instrument, the improvement wherein the tone generating apparatus includes means for selectively restricting the operation thereof and selectively setting a key range thereof that includes a variable number of less than all of the keys of the electronic musical instrument to generate tones only in response to the depression of keys of the electronic musical instrument within the selected key range.

4,711,149

ELECTRIC GUITAR PICKUP SWITCHING SYSTEM

Harvey W. Starr, 21668 Wohelo Trail, Chatsworth, Calif. 91311

Filed Jul. 12, 1985, Ser. No. 754,402

Int. Cl.⁴ G10H 3/18; G09B 15/02

U.S. Cl. 84—1.16

11 Claims



7. A switching assembly for an electric guitar having at least two pickups and an output circuit for substituting different electrical pickups of the electric guitar into the output circuit of the electrical guitar comprising:

a plurality of manually operated electrical switches, one for

each desired combination of pickups to be connected at any one time to the output circuit of the electric guitar; electrical signal combining means connectable to each of said plurality of manually operated switches and the electrical pickups of said guitar and to said output circuit; and indicator means controlled by said manually operated switches for indicating which of the electrical pickups of said guitar are connected to the output circuit of said guitar.

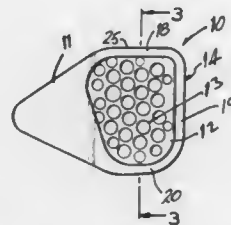
4,711,150

PICK FOR STRINGED INSTRUMENTS

Steven J. Hyduck, 17 Saltaire Dr., Saybrook, Conn. 06475
Filed Dec. 4, 1984, Ser. No. 677,989
Int. Cl.⁴ G10D 3/16

U.S. Cl. 84—322

10 Claims



1. A musicians' pick for a stringed instrument comprising a member consisting of a gripping portion and a picking portion, said picking portion being of generally triangular shape extending from said gripping portion and tapering to a picking end, said gripping portion having opposed surfaces and on one surface thereof having a generally rectangularly shaped depression for a thumb bounded by rims on three sides and the picking portion on the fourth side, one of said rims being substantially perpendicular to the length of a gripping thumb at the outer end of the gripping thumb, an oppositely disposed rim bounding said thumb depression inwardly of the outer end of a thumb from said one rim, said gripping portion on the opposite surface thereof having a generally linearly directed depression and having a nominal center line at a substantial transverse angle to the length of said thumb depression but less than ninety degrees.

4,711,151

MISSILE LAUNCHER

Dennis Griffin, Guildford, and Charles A. Field, Kingston-upon-Thames, both of England, assignors to Frazer-Nash Ltd., Surrey, England

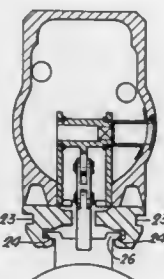
Filed Jan. 23, 1986, Ser. No. 824,559

Claims priority, application United Kingdom, Oct. 30, 1984, 8427444

Int. Cl.⁴ F41F 3/04

U.S. Cl. 89—1,805

10 Claims



1. An airborne missile launcher of modular construction comprising:

(a) a main module, comprising an intermediate main body section having first and second oppositely disposed sur-

faces and first and second oppositely disposed ends said intermediate main body section usable with all the types of missile to be carried and of a length less than full body length, said main body being adapted for fixing to an aircraft along its first surface, said main body section having a first member of a first cooperating attachment element located proximate to said first end, a first member of a second cooperating attachment element located proximate to said second end and a first member of a third cooperating attachment element proximate to said second surface said main body further adapted to receive a nose section and a tail section to complete the body length;

(b) a forward module, comprising a nose section and a second member of the first attachment element which cooperates with the first member to connect the nose section to the main body section in a manner where the nose section is releasably affixed to the first end of the main body section;

(c) an aft module, comprising a tail section and a second member of the second attachment element which cooperates with the first member to connect the tail section to the main body section in a manner where the tail section is releasably affixed to the second end of the main body section;

(d) a sub-rail adapted to carry a missile and a second member of the third attachment element which cooperates with the first member to connect the sub-rail to the main body section in a manner where the sub-rail is releasably attached to said main body section;

(e) sub-rail locking means;

(f) retracting means for a missile umbilical connection;

(g) retraction means for missile striker points;

(h) retractable missile hook snubbers; and

(i) a nitrogen bottle with a nitrogen supply regulator carried right forward of said main body section.

4,711,152

APPARATUS FOR TRANSMITTING DATA TO A PROJECTILE POSITIONED WITHIN A GUN TUBE

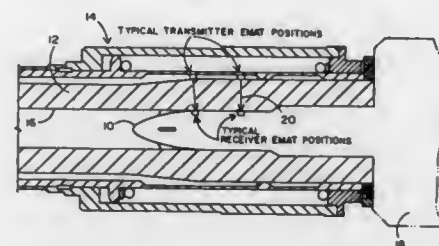
Chris M. Fortunko, Newport Beach, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.

Filed Oct. 30, 1986, Ser. No. 925,280

Int. Cl.⁴ F42C 17/00

U.S. Cl. 89—6.5

20 Claims



1. An apparatus for transmitting data to a projectile positioned within the bore of a gun tube; the apparatus comprising: at least two ultrasonic transducers, a first such transducer positioned adjacent the inner surface of said gun tube within said bore, and a second such transducer positioned adjacent the outer surface of said gun tube;

means for applying a data modulated radio frequency electromagnetic signal to said second transducer for transmitting a corresponding ultrasonic signal from said second transducer to said first transducer through said gun tube; and

means connected to said first transducer for demodulating said corresponding ultrasonic signal for use of said data in said projectile.

4,711,153
SEAL

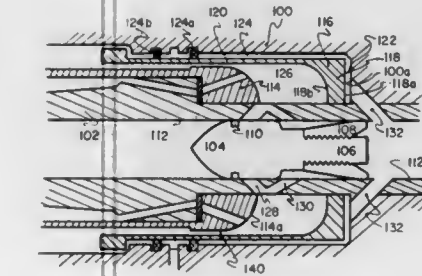
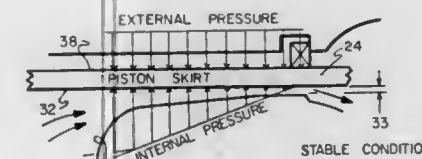
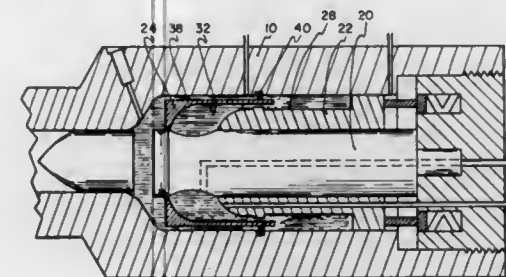
Melvin J. Bulman, Colchester, Vt., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 15, 1986, Ser. No. 941,909

Int. Cl.⁴ F41F 1/04

U.S. Cl. 89—7

8 Claims



1. A sealing mechanism for a pump having:

a central journal;

a piston having a piston head and a skirt defining a central cavity, said skirt having its distal region disposed on said central journal with one end of said journal projecting into said cavity to define:

a pumping chamber between said projecting one end of said journal and said piston head, and

a clearance gap between said journal and said piston skirt distal region and in fluid communication with said pumping chamber,

characterized in that:

said skirt is so constructed and arranged as to be distorted centrifugally when the pressure within said gap is greater than the pressure external to said skirt and centripetally when the pressure within said gap is less than the pressure without said skirt, and

having a mode of operation such that during compression of fluid within said pumping chamber a fluid pressure is developed within said pumping chamber which is greater than the pressure outside said piston and a flow of fluid leaks from said pumping chamber into and through said clearance gap whereby as such flow of fluid passes along the length of said clearance gap it develops a progressively lower pressure, becoming lower than said pressure outside said piston, whereby the distal region of said skirt is distorted centripetally to tend to close said clearance gap to tend to halt such flow.

4,711,154

COMBUSTION AUGMENTED PLASMA PRESSURE AMPLIFIER

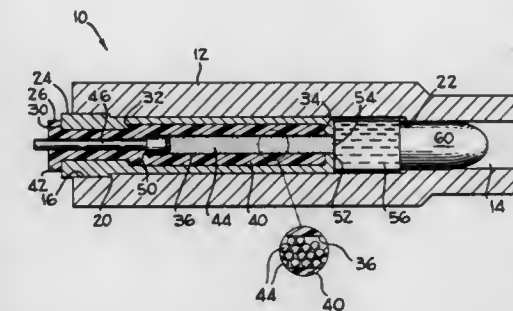
George Chrysomallis, Golden Valley, and Robert S. Griffing, Andover, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 31, 1985, Ser. No. 795,033

Int. Cl.⁴ F41F 1/04

U.S. Cl. 89—7

13 Claims



1. A propulsive charge for use in projecting a projectile comprising:

a cartridge having a plurality of chambers including a fuel chamber from which a plasma fuel may be generated and an oxidizer chamber; said fuel chamber containing a dielectric, a first conductive means surrounded by said dielectric and an inwardly extending projection electrically communicative with said cartridge formed to provide an orifice between said fuel chamber and said oxidizer chamber, said cartridge having an outer electrically conductive body;

said oxidizer chamber adjacent said fuel chamber and communicable therewith through said orifice, said oxidizer chamber containing an oxidizer material capable of reacting chemically with said plasma fuel exhausted from said fuel chamber when said fuel is delivered to said oxidizer chamber.

4,711,155

HYDRAULIC CONTROL DEVICE

Rudolf Brunner, Baldham, Fed. Rep. of Germany, assignor to Heilmeler & Weinlein Fabrik fur Oel-Hydraulic GmbH & Co. KG, Munich, Fed. Rep. of Germany

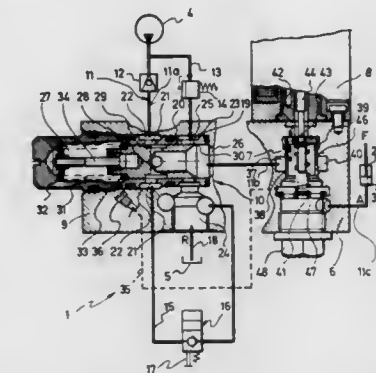
Filed Oct. 7, 1986, Ser. No. 916,171

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536219

Int. Cl.⁴ F15B 13/044

U.S. Cl. 91—446

17 Claims



1. A hydraulic control device (1, 1', 1'') for a hydraulic motor (2) working one-sidedly against a load (F), comprising a working pressure line (11) connecting a pressure source (4) via

line sections (11a, 11b) with a hydraulic motor (2) and containing a non-return valve (12) from which a bypass line (15, 15') to a tank (5) is branched off, a three-way flow controller with proportional magnetic actuation, which is connected to the tank with its control outlet, a two-way flow controller in the bypass line (15), the three-way flow controller being actuated upon non-actuated two-way flow controller for the working of the hydraulic motor against the load (F) and the two-way flow controller being actuated upon non-actuated three-way flow controller for the working of the hydraulic motor under the load for controlling the speed, and a measuring orifice (7), a pressure balance and a proportional magnet being in each case allocated to the three-way and the two-way flow controller, characterized in that a single measuring orifice (7) being common to both pressure balances (10; 53, 54) with a single proportional magnet (8) is provided in the working pressure line (11).

4,711,156

ACTUATOR FOR CONVERTING LINEAR MOTION TO ROTARY MOTION AND VICE VERSA

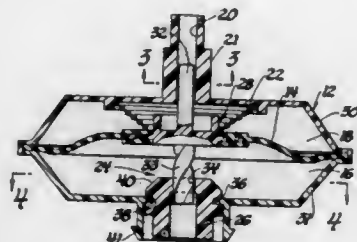
Fariborz Kayyod; Richard J. Stuart, and Jeffrey D. Ogden, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 741,467, Jun. 5, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 6,357

Int. Cl.⁴ F01B 3/00

U.S. Cl. 92—31

1 Claim



1. A linear to rotary actuator having a fluid pressure operated diaphragm whose linear movement is translated into rotary movement of an output member by a helical coupling therebetween characterized by such coupling comprising a coupling member joined to the diaphragm so as to extend therethrough and interlock therewith while preventing fluid from passing from one diaphragm side to the other, said coupling member having a helix extending from one side of the diaphragm slidably engaging in a slot in the output member so as to effect rotary movement thereof with linear non-rotational movement of said coupling member, and said coupling member further having a centrally located stem of non-circular cross-section extending from the other side of the diaphragm slidably engaging a stationary guide in an elongated aperture therethrough, said guide and aperture having sides that cooperate to guide linear movement while preventing rotational movement of said coupling member and, the sides of said guide and aperture also cooperating to form a discrete singular fluid passage from the exterior of the actuator to said other side of the diaphragm.

4,711,157

ACTUATOR FOR CONVERTING LINEAR MOTION TO ROTARY MOTION AND VICE VERSA

Fariborz Kayyod; Richard J. Stuart, and Jeffrey D. Ogden, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 741,467, Jun. 5, 1985, abandoned. This application Sep. 15, 1986, Ser. No. 907,231

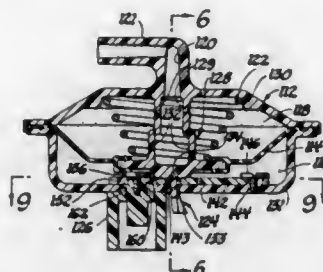
Int. Cl.⁴ F01B 3/00

U.S. Cl. 92—31

2 Claims

1. A linear to rotary actuator having a fluid pressure operated diaphragm whose linear movement is translated into rotary movement of an output member by a helical coupling

therebetween characterized by such coupling comprising a coupling member joined to the diaphragm so as to extend therethrough, a first gear, said coupling member having a helix extending from one side of the diaphragm slidably engaging in a slot in said first gear so as to effect rotary movement thereof with linear non-rotational movement of said coupling member, a second gear meshing with said first gear and connected to said output member, said coupling member further having a centrally located integral stem of non-circular cross-section



4,711,158

LINEAR MOTION ACTUATOR WITH SPRING CENTERING MEANS

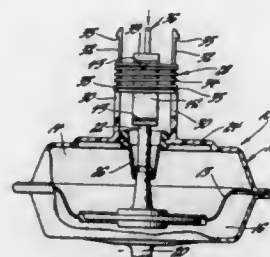
Fariborz Kayyod, Anderson, Ind., and Donald E. Hoffman, W. Seneca, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 11, 1985, Ser. No. 807,595

Int. Cl.⁴ F01B 19/00; F16J 3/00

U.S. Cl. 92—94

3 Claims



1. An actuator having a casing with an interior divided into two chambers by a diaphragm, an output member connected to the diaphragm and extending out through one side of the casing, and the diaphragm being operable in response to pressures in the chambers to move the output member linearly in both an extending direction and a retracting direction, characterized by a centering mechanism comprising a pair of spring seats fixed to the one side of the casing and spaced apart longitudinally of the output member, a pair of spring seats fixed to the output member and spaced apart the same distance as those on the casing so as to be angularly arranged between and radially aligned with the respective seats on the casing, a compression spring arranged between and normally simultaneously seating at opposite ends thereof on the pairs of seats on both the casing and the output member, and the seats on the casing and output member located relative to the extent of output member travel so that the spring operating through all of the seats normally locates and yieldingly holds the output member

in mid-position and is compressed between one of the seats on the casing and one of the seats on the output member on pressure induced movement of the output member in both the extending and retracting direction and then on discontinuance of the pressure induced movement operates to return the output member to the mid-position.

4,711,159

BUILT-IN VEHICLE AIR FILTRATION SYSTEM

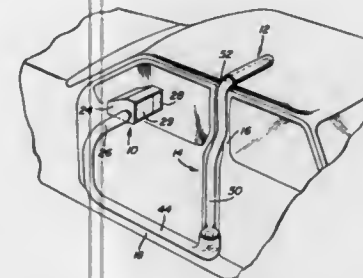
Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064

Filed Sep. 23, 1986, Ser. No. 910,636

Int. Cl.⁴ B60H 3/06

U.S. Cl. 98—2.11

14 Claims



1. An air filtration and purification system for the interior of a vehicle comprising an air intake adjacent the center portion of the headliner of a vehicle, an air duct extending downwardly within the side pillar of the vehicle and forwardly within the rocker panel of the vehicle, a housing located under the dashboard of the vehicle with the duct connected thereto, said housing including a foam plastic filter and carbon filter through which air passes, a heat exchange coil inwardly of the filters through which air passes, fan means circulating air through the housing, and discharge means from the housing for discharging air into the interior of the vehicle after the air has been cleaned and purified by passing through the filters and conditioned by passing through the heat exchange coil.

4,711,160

TWO-PIECE FOUNDATION VENTILATOR

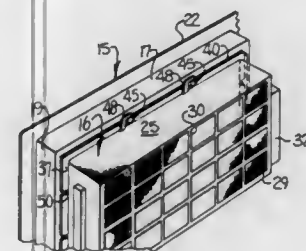
Alvin E. Witten, and Erik H. Witten, both of Gastonia, N.C., assignors to Witten Automatic Vent Company, Inc., Gastonia, N.C.

Filed May 11, 1987, Ser. No. 48,258

Int. Cl.⁴ F24F 7/00

U.S. Cl. 98—29

16 Claims



1. In a molded plastic two-piece foundation ventilator including a rectangular mounting cover frame of predetermined width and height and adapted to be mounted in a rectangular opening in a foundation wall, a peripheral flange integrally molded with the outside of said mounting cover frame and adapted to extend around and cover the opening in the foundation wall, and a rectangular shutter support housing of predetermined width and height of lesser dimensions than said predetermined width and height dimensions of said mounting cover frame, the combination therewith of means for remov-

ably maintaining said shutter support housing and said mounting cover frame in assembled condition and comprising

(a) integrally molded flanges extending outwardly from opposite sides of said shutter support housing, and
(b) upstanding clip members integrally molded along opposite sides of said mounting cover frame, said clip members including inwardly extending locking portions being positioned in overlying engagement with said integrally molded flanges of said shutter support housing to maintain said shutter support housing and said mounting cover frame in assembled condition and to permit said shutter support housing to be removed from said mounting cover frame by sliding said shutter support housing longitudinally along said mounting cover frame until said flanges move out of engagement with said inwardly extending locking portions of said clip members.

4,711,161

DUCTLESS AIR TREATING DEVICE WITH ILLUMINATOR

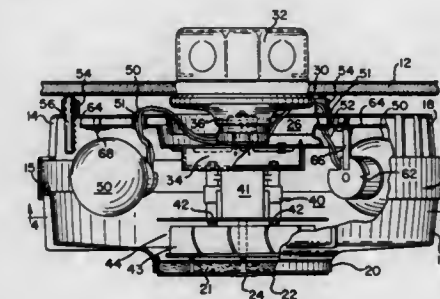
Richard E. Swin, Sr., Burr Ridge, and Anwar A. Atalla, Willowbrook, both of Ill., assignors to Tec-Air, Inc., Willow Springs, Ill.

Continuation of Ser. No. 57,592, Jul. 16, 1979, abandoned. This application Nov. 5, 1981, Ser. No. 318,683

Int. Cl.⁴ F24F 7/00

U.S. Cl. 98—31.5

13 Claims



1. A ductless unitized air treating and illuminating module to be electrically coupled to and suspended from a ceiling electrical socket having an internally threaded electrical contact comprising

a housing having an air inlet and an air outlet with a path of air flow defined therebetween,
an externally threaded electrical contact fixedly secured on an outer portion of said housing and directly engagable into a ceiling mounted electrical socket having an internally threaded electrical contact for coupling a source of electrical power to within said housing,
said externally threaded electrical contact fixedly secured on the outer portion of said housing to directly engage the internally threaded contact comprising an electrical contact for coupling a source of electrical power to within said housing and a support for physically connecting said housing directly to the internally threaded electrical socket when threadingly engaged therewith,
air circulating means carried by said housing for drawing air thereinto through said air inlet and discharging the air drawn thereinto out through said air outlet,
said air circulating means being electrically coupled to said externally threaded electrical contact fixedly secured on an outer portion of said housing, and
illuminating means carried by said housing and actuable to emit light therefrom,
said illuminating means being electrically coupled to said externally threaded electrical contact and positioned in thermal contact with said path of air flow to dissipate heat generated upon the actuation thereof.

4,711,162

METHOD OF VENTILATING ROOMS

Mats Eriksson, Ski, Norway, assignor to Flakt, AB, Stockholm, Sweden

PCT No. PCT/NO85/00069, § 371 Date Jun. 11, 1986, § 102(e) Date Jun. 11, 1986, PCT Pub. No. WO86/02710, PCT Pub. Date May 9, 1986

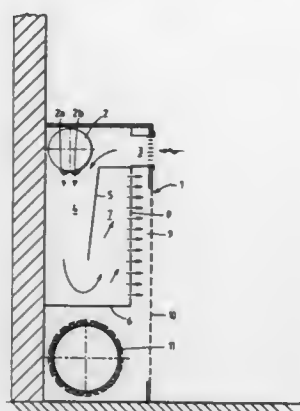
PCT Filed Oct. 28, 1985, Ser. No. 878,375

Claims priority, application Norway, Oct. 30, 1984, 844320

Int. Cl.⁴ F24F 13/04

U.S. Cl. 98—38.3

7 Claims



3. A method of ventilating a room having a floor and a ceiling located a preset height above the floor, the method comprising the steps of:

- conducting at least a first jet of fresh air at a high velocity into an induction chamber;
- drawing air into the induction chamber from the room at an input level, said input level being above the floor and no higher above the floor than $\frac{1}{2}$ if the preset height;
- mixing the fresh air and the room air in the induction chamber to produce a supply of mixed air;
- conducting the mixed air from the induction chamber essentially horizontally into the room, by means of a diffuse air supply, said mixed air being conducted into the room at a level below the input level and at or near the level of the floor; and
- exhausting air from the room at or near the level of the ceiling.

4,711,163

ACETIC ACID FERMENTATION PROCESS AND APPARATUS

Giuseppe Capuano, Via Miliscola 131, Arco Felice (Pozzvoli), Italy

Filed Jun. 4, 1986, Ser. No. 870,475

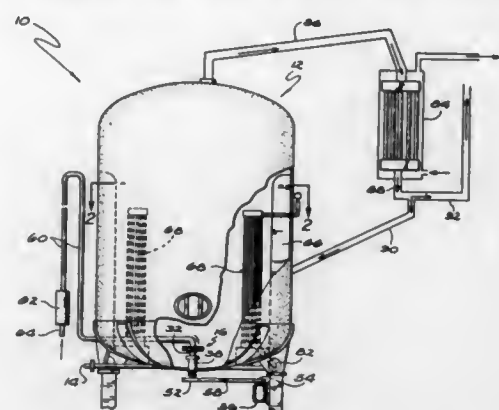
Int. Cl.⁴ A23L 1/18

U.S. Cl. 99—323.12

16 Claims

- 1. An acetic acid fermentation apparatus comprising: a substantially enclosed receptacle which can be partially filled with wine.
- port means through which said wine charged to and/or discharged from said receptacle;
- temperature regulating means interiorly positioned said receptacle for maintaining said wine below a desired temperature during the fermentation of said wine;
- aerating means for impregnating and dispersing an oxygen-bearing gas into said wine at a predefined gas flow rate and in a multidirectional circulation flow sufficient enough to substantially saturate said wine with said gas; and

condensing means for returning to said wine in said receptacle substantially all of any vaporized and/or entrained



ethanol and acetic acid carried by any exhaust gas coming off of said wine.

4,711,164

OVEN FOR PREPARING FRIED FOOD PRODUCTS

Fausto C. Mendoza, Calzada San Esteban Num 57, Nancalpan de Juarez, Mexico

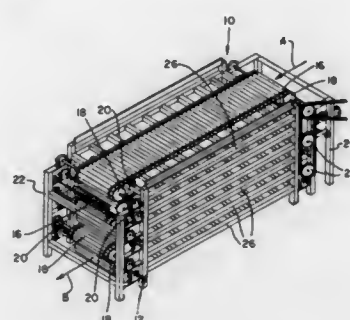
Filed Feb. 27, 1986, Ser. No. 834,400

Claims priority, application Mexico, Apr. 19, 1985, 205,029

Int. Cl.⁴ A21B 1/42

U.S. Cl. 99—339

5 Claims



1. An improved oven for preparing fried products, comprising:

- (a) a frame structure;
- (b) a plurality of sets of burners disposed at different levels of said structure, said sets of burners being operable to produce different temperatures at said different levels of said structure; and
- (c) a plurality of transport belts mounted across said structure and being operable to traverse said structure and carry product along a serpentine path through said sets of burners at said different levels, each of said belts having an upper run and a lower run, said lower and upper runs of some of said belts being disposed closely adjacent respective upper and lower runs of others of said belts and having laterally spaced apart raised separator elements thereon which form elongated hollow chambers between said adjacent runs of separate belts and adjacent given ones of said sets of burners at respective ones of said levels of said structure which chambers by themselves constitute mini-ovens at said respective levels.

4,711,165

LASAGNA PRODUCT

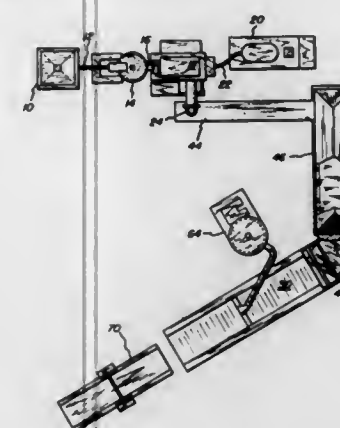
Leno Codino, 8 Rivercrest Dr., Rexford, N.Y. 12148

Continuation of Ser. No. 788,083, Oct. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 683,356, Dec. 19, 1984, Pat. No. 4,569,849. This application May 13, 1987, Ser. No. 51,250

Int. Cl.⁴ A23L 1/16; A23P 1/00

U.S. Cl. 99—353

10 Claims



1. A machine for the production of precooked lasagna comprising:

- means for mixing flour and eggs to a predetermined consistency;
- an extruder for receiving said flour and egg mixture and extruding at least two continuous strips of broad lasagna type noodles;
- means for transporting the strips being extruded through a cooker;
- a cooling tank in close proximity to the cooker for reception of the noodles as they exit from the cooker, said tank being of sufficient size to contain a predetermined amount of noodles so as to provide slack and prevent breaking of the noodle strips;
- means for suspending the noodle strips above the tank as said strips are drawn from the tank thereby allowing said strips to unwind;
- means for aligning one of the strips on top of the other;
- means for filling the space between the noodle strips with a previously chose filler; and
- means for cutting the now precooked lasagna into pieces of predetermined size.

4,711,166

AUTOMATIC MACHINE FOR MAKING STONE FRUIT BISCUIT

Tsai A. Chen, 201 Sec. 3, Ba-Dar Road, Taipei, Taiwan

Filed Mar. 5, 1987, Ser. No. 22,367

Int. Cl.⁴ A47J 37/00

U.S. Cl. 99—353

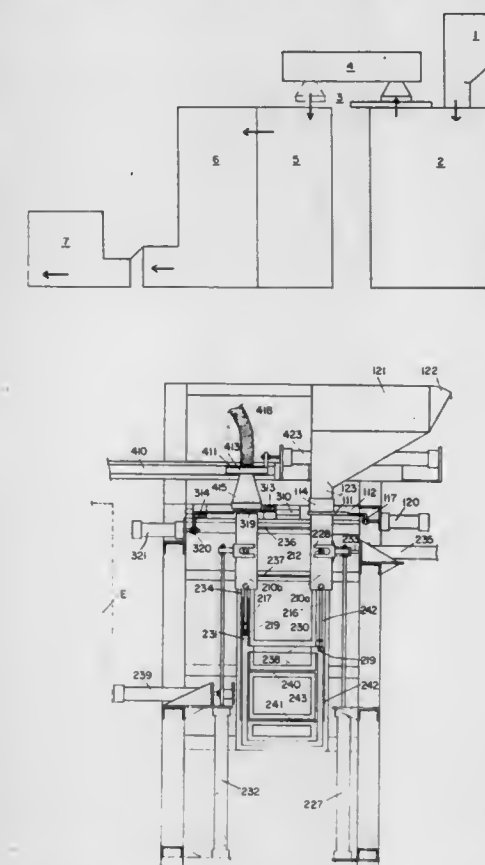
5 Claims

1. An automatic machine for making stone fruit biscuit comprising

- a material reserving means which comprises a material reserving chamber, a supporting plate secured onto the walls of said material reserving chamber, a plurality of perforations bored on said supporting plate, a plurality of tubes in a row each brazed with one end onto said perforation, a plurality of blade guiding grooves on the bottom side of said supporting plate, said blade guiding grooves extending past said perforations, a plurality of blades extending into said guiding grooves, an actuating plate 117 on which said blades are mounted, at least an air cylinder to drive said actuating plate, a hopper secured onto the walls of said material reserving chamber above said tubes,

said hopper being provided with a plurality of stone fruit conduits in a row inserted within said tubes;

- a material restoring means which comprises a material restoring chamber next to said material reserving chamber, two opposite track frames securedly mounted on the walls of said material restoring chamber, two material conveying tube rows mounted between said two opposite track frames, two transverse air cylinders and two perpendicular air cylinders mounted on the walls of said material restoring chamber to alternatively drive said material conveying tube rows perpendicularly and horizontally,
- a planing means above said track frames, said planing means comprising a planing chamber, two track plates opposite to each other, said two track plates being secured onto the walls of said planing chamber, an upper blade seat both ends of which are respectively secured onto the upper portions of said two track plates, a lower blade seat both ends of which are respectively secured onto the lower



portions of said two track frames, an upper blade secured onto the bottom of said upper blade seat, a cutting blade secured onto the surface of said lower blade seat, a driving plate secured onto the bottom of said lower blade seat and an air cylinder connected with said driving plate;

- a suction means above said planing means, said suction means comprising a suction chamber, two horizontal track bars secured on the walls of said suction chamber, a sliding board secured with at least two rollers at each end thereof, said rollers being movably received within the tracks of said track bars, a bore approximately at the middle portion of the sliding board, a tube connector secured onto the surface of said sliding board above said bore, a suction tube sleeved onto said tube connector, a trapezoidal suction frame secured onto the bottom of said sliding board beneath said bore, a suction plate secured onto the lower portion of said trapezoidal suction frame, said suction plate being bored a plurality of perforations thereon, a dust collector connected to one end of said

suction tube, and an air cylinder on one side of said sliding board;

a moulding means under said suction means, said moulding means comprising a moulding chamber, a driving shaft driven by a motor, said driving shaft being movably supported on the walls of said moulding chamber, a pair of chain wheels securedly mounted on both ends of said driving shaft, an upper driven shaft movably mounted on the walls of said moulding chamber, a pair of upper chain wheels securedly mounted on both ends of said driven shaft, a base dough barrel mounted on the upper wall of said moulding chamber, a surface dough barrel mounted on the upper wall of said moulding chamber, said base dough barrel and surface dough barrel being adjacent to each other, two chains running across said lower and upper chain wheels and a plurality of moulding plates each suspended between said chains;

a baking means horizontally next to said moulding means, said baking means comprising a baking chamber next to said moulding chamber, an upper gap provided at the upper portion of the perpendicular wall which separate said moulding chamber and said baking chamber whereby said moulding plates may enter therethrough, a reversing chamber next to said baking chamber, a lower gap provided at the wall between said baking chamber and said reversing chamber whereby said moulding plates may pass through, a plurality of heating coil frames horizontally mounted on the walls of said baking chamber, a plurality of heating coils on said heating coil frames, said heating coils being connected with a power supply, a plurality of pairs of chain wheels mounted on the walls of said baking chamber, each pair being at each turning position of said chains which runs from said chain wheels in said moulding chamber, a plurality of releasing heads in a row driven by a motor, said releasing heads extending into said reversing chamber, a pair of chain wheels mounted at the upper left end of said reversing chamber for said chains to run from said baking chamber into said reversing chamber and back to said chain wheels in said moulding chamber, a releasing plate mounted between the upper left end of said reversing chamber, a slide extending into said opening, said slide having a curved plate at the upper end thereof, and a cleaning and oil coating apparatus mounted on the base of said reversing chamber; and

a cooling means next to said reversing chamber, said cooling means comprising a cooling chamber, a plurality of chain wheels mounted on the walls of said cooling chamber, a transmission shaft on both ends of which a pair of chains are respectively mounted, said transmission shaft being driven by said motor which drives said driving shaft in said moulding chamber, a plurality of shaping plates suspended between said pair of chains, a plurality of cooling air tubes extending into said cooling chamber, a checking plate mounted on the walls of said cooling chamber at the lower portion thereof, an outlet opened on one wall of said cooling chamber at the rear end of said checking plate, a conveyor immediately outside of said outlet.

4,711,167

FRUIT JUICE SQUEEZER

Takashi Sano, Tokyo, Japan, assignor to Pigeon Corp., Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,689

Claims priority, application Japan, Sep. 10, 1984, 59-136246[U]; Sep. 10, 1984, 59-188061

Int. Cl.⁴ A23N 1/00

U.S. Cl. 99—510

5 Claims

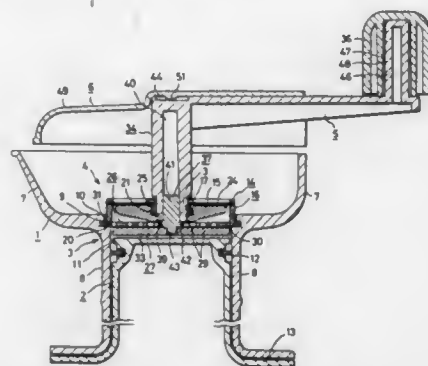
1. A fruit juice squeezer for obtaining fruit juice from fruit by pressing and cutting, comprising:

a squeezer body having a reservoir means for storing said fruit juice;

a handle rotatable with respect to said body;

mincer means being operable by the turning of said handle and filter means being fixed to said squeezer body,

wherein said mincer means comprises a cutter means connected to said handle for rotational movement coaxial with said filter means; and



a fruit loading means axially movably disposed adjacent said cutter means for accommodating said fruit to be squeezed, and wherein said fruit loading means moves towards said cutter means when said squeezer is in operation.

4,711,168

SEALING ARRANGEMENT FOR A DOUBLE BAND PRESS

Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

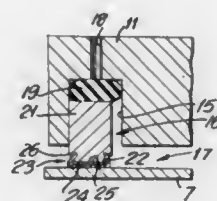
Filed Dec. 13, 1985, Ser. No. 808,935

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445636

Int. Cl.⁴ B30B 5/06

U.S. Cl. 100—154

11 Claims



1. Double band press for pressing a continuously running sheet material comprising a rigid press frame, bearing supports mounted on said press frame, reversing drums mounted in said bearing supports and arranged as at least one pair of spaced upper drums and at least one pair of spaced lower drums, an upper endless press belt entrained around said upper drums and a lower endless press belt entrained around said lower drums, each said press belt having an outer surface and an inner surface with said outer surfaces disposed in facing relationship forming a reaction zone therebetween through which the sheet material passes a pressure plate located within each said press belt and extending in the direction between said reversing drums, said pressure plates spaced closely from the inside surfaces of said press belts adjacent to said reaction zone, said pressure plates each having a surface facing the associated inner surface of said press belt and said surface being bordered by an edge, a groove formed in said surface of said pressure plate and spaced inwardly from said bordering edge, a sliding seal located within said groove and extending out of said groove into contact with said inner surface of the associated said press belt, means within said groove for pressing said seal against the inner surface of said press belt, the combination of the surface of said pressure plate facing the inner surface of the associated said press belt and said sliding seal forming a pressure chamber, fluid pressure means within said pressure cham-

ber for pressing said press belt toward said reaction zone, wherein the improvement comprises that said sliding seal comprises a body formed of metal located within said groove and being displaceable within said groove toward the inner surface of the associated press belt, said sliding seal having a first surface facing the inner surface of said press belt, a dry metal layer forming the first surface of said sliding seal and arranged to engage the inner surface of said press belt in sliding contact, said dry metal layer is supported on said body and is formed of a different metal than said body.

4,711,169

BALANCING DEVICE FOR PRESS

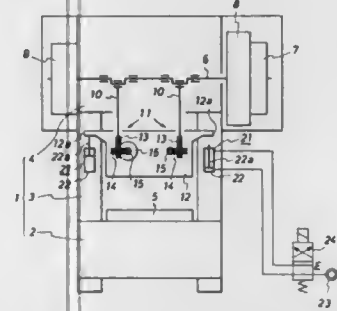
Shozo Imanishi, and Mitsuo Sato, both of Sagamihara, Japan, assignors to Aida Engineering Co., Ltd., Kanagawa, Japan

Filed Nov. 25, 1985, Ser. No. 802,340

Int. Cl.⁴ B30B 5/00

U.S. Cl. 100—257

5 Claims



1. A balancing device for a press of the type in which a slide moves up and down with respect to a bolster during operation of the press and in which the position of the slide at the end of its downward movement with respect to the bolster is adjustable relative to the bolster to adjust a die height clearance of the press, said balancing device comprising an upward urging means mounted on said press and engagable with the slide, said upward urging means engaging the slide for urging the slide upwardly when the die height clearance is adjusted, said upward urging means being disengaged from the slide when the slide moves up and down with respect to the bolster during operation of the press.

4,711,170

PRINTING WIRE DRIVING DEVICE IN WIRE DOT PRINTER

Morio Yamaguchi, Tokyo, Japan, assignor to Max Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1985, Ser. No. 813,934

Claims priority, application Japan, Dec. 27, 1984, 59-200760[U]; Nov. 29, 1985, 60-182910[U]

Int. Cl.⁴ B41J 3/12

U.S. Cl. 101—93.05

17 Claims

1. A printing wire driving device in a wire dot printer for printing on a surface, comprising:

a printing wire, one end of which is adapted to be operatively engaged and hammered for printing;

a wire driving means for operatively engaging and hammering the one end of said printing wire;

an eccentric cam for driving said wire driving means from an original position spaced from said surface toward operative engagement with the printing wire;

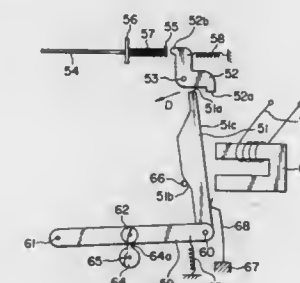
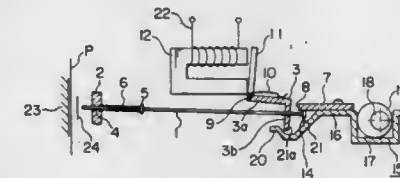
a first elastic member for returning said printing wire to an original position after said wire has been hammered by said wire driving means;

a printing wire support member for slidably supporting said printing wire;

a second elastic member for urging said printing wire support member so as to urge at least one of said wire driving means and said printing wire into a displaced orientation

when said wire driving means is driven in a direction for hammering said printing wire so that said one end of said printing wire and said wire driving means cannot be operatively engaged;

guide means operatively coupled to said wire driving means for aligning said wire driving means and said one end of said printing wire against the force of said second elastic member in synchrony with an operation of said wire driving means by supporting said printing wire support member when said wire driving means is returned to the original position thereof;



maintaining means for maintaining a position of said printing wire support member so as to operatively maintain said wire driving means and said one end of said printing wire in operative alignment with each other, against the force of said second elastic member, in response to a printing command; and

whereby, the portion of said printing wire supported by said printing wire support member is moved toward the maintaining position provided by said maintaining means due to the action of said guide means when said wire driving means is returned to the original position thereof and power is supplied to said maintaining means according to the printing command.

4,711,171

SYSTEM FOR LATERAL TRANSPORT OF LIQUID ALONG A PRINTING MACHINE ROLLER

Klaus Theilacker, Friedberg, Fed. Rep. of Germany, assignor to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,736

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3540912

Int. Cl.⁴ B41L 23/00, 25/00

U.S. Cl. 101—148

9 Claims

1. In a printing machine having a liquid roller (1) with a surface adapted to be coated with a liquid, an arrangement to transport excess liquid axially along the liquid roller, comprising, in accordance with the invention, a transport roller (2) in engagement with the surface of the liquid roller (1), said transport roller having a surface formed by two conical portions (4, 5) positioned with the smaller diameters of the conical portions being located adjacent axial end portions of the transport roller;

means (16, 17) for axially oscillating or reciprocating the transport roller (2) with respect to the liquid roller (1); and means for alternately engaging the respective conical portions of the transport roller with the liquid roller (1) in synchronism with the oscillating or reciprocating movement of the transport roller, by engaging that one (see

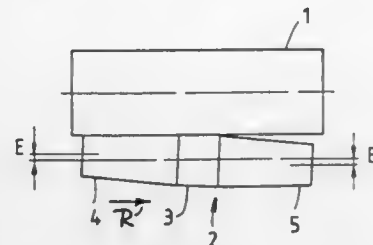


FIG. 1: 4) of the conical portions of the transport roller with the liquid roller (1) which is moving with respect to the liquid roller in a direction (R) towards the center of the liquid roller to move liquid on the liquid roller from the end or edge regions thereof towards the center region by alternate engagement of the conical portions of the transport roller with the surface of the liquid roller.

4,711,172

MACHINE HAVING A PLURALITY OF WORKING STATIONS FOR SUCCESSIVELY PROCESSING A SHEET OF MATERIAL RUNNING THROUGH THE MACHINE
Bernard Capdeboec, Saint Just Chaleysin, France, assignor to Martin S.A., Villeurbanne, France

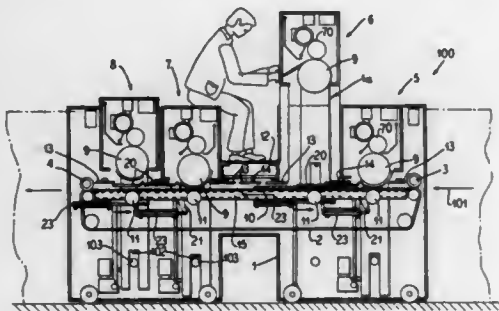
Filed Jul. 25, 1986, Ser. No. 890,836

Claims priority, application France, Jul. 26, 1985, 85 11655

Int. Cl.⁴ B41F 9/02

U.S. Cl. 101—152

10 Claims



1. In a machine for successively processing cardboard sheets running through a machine having a plurality of printing stations, said machine including a main frame having main conveyor means extending from an inlet to an outlet including a suction belt, a pressure cylinder acting on the belt at the inlet and a pressure cylinder acting on the belt at the outlet, a plurality of printing stations being mounted along the suction belt of the conveyor means with each printing station having one printing cylinder mounted in an active part of the station and a counter cylinder mounted in the frame below the suction belt to cooperate with the printing cylinder, the improvements comprising the printing stations being arranged in pairs with a transverse foot bridge extending between two pairs of printing stations, the active parts including the printing cylinder of each printing station being mounted on slides for movement in a vertical direction on the frame, lifting means for each station for moving the slides in a vertical direction to shift the printing cylinder between a working position for engaging a sheet carried by said suction belt through a standby position with the cylinder out of engagement with a sheet on said belt to a preparative position enabling a worker standing on the foot bridge

to gain access to the active parts of the printing station, the counter cylinders of each station being fixed in a permanent and unchanged vertical position during movement of the printing cylinder in the vertical direction, and means for insuring the guiding of the upper surface of a sheet through the printing station while said printing station is in one of the standby and preparative positions.

4,711,173

CHANGING DRIVE FOR THE DISTRIBUTING ROLLERS OF AT LEAST ONE INKING UNIT OF A PRINTING UNIT OF AN OFFSET ROTARY PRESS

Helmuth Emrich, Offenbach am Main; Josef Mathes, Offenbach; Heinrich Ochs, Sinntal-Oberzell, and Janko Despot, Offenbach am Main, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

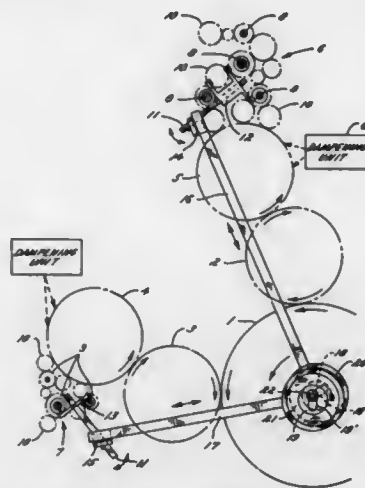
Filed Jan. 28, 1986, Ser. No. 823,345

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 3502863

Int. Cl.⁴ B41F 31/14

U.S. Cl. 101—349

5 Claims



1. In a rotary printing press including an impression cylinder having an end portion, two plate cylinders associated with the impression cylinder, and respective inking units associated with the plate cylinders, each inking unit having a respective set of ink distributing rollers, a mechanism for axially reciprocating said ink distributing rollers, said impression cylinder having twice the diameter of the associated plate cylinders, so that the axial reciprocation of the sets of ink distributing rollers is derived in synchronism with the rotation of the impression cylinder and in a ratio of 1:2 to the rotation of the associated plate cylinders, said reciprocating mechanism generating reciprocating motions transmitted by coupling elements to the ink distributing rollers, wherein the improvement comprises, first and second rotating eccentric drives for axially reciprocating the respective sets of ink distributing rollers, each of said rotating eccentric drives being adjustable in the amount of travel and the phase of the reciprocation and being connected to the end portion of the impression cylinder, said first rotating eccentric drive including a first drive disk fastened concentrically on the end portion of the impression cylinder and adjustable in the circumferential direction and a first eccentric disk fastened to said first drive disk and adjustable in the radial direction, said first eccentric disk having mounted thereon a first swing bearing that carries a first oscillating lever for a first one of said inking units, and said second rotating eccentric drive including a second drive disk fastened concentrically on the end portion of the impression cylinder and adjustable in the circumferential direction and a second swing bearing that carries a second oscillating lever fastened to said

second drive disk and adjustable in the radial direction for a second one of said inking units.

4,711,174

DEVICE FOR ENGAGING AND DISENGAGING THE FORM ROLLERS IN AN INKING UNIT OF A PRINTING MACHINE

Hermann Beisel, Walldorf, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

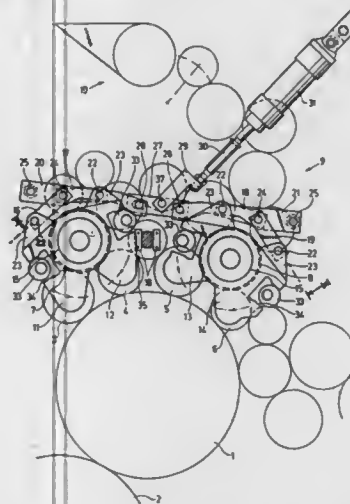
Filed Sep. 23, 1985, Ser. No. 779,234

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434645

Int. Cl.⁴ B41F 31/00, 31/14

U.S. Cl. 101—352

3 Claims



1. Device for alternately engaging form rollers in an inking unit of a printing machine with a plate cylinder of the printing machine and for disengaging the form rollers therefrom, including bearing levers for the form rollers disposed at both side frames of the printing machine, an adjustable stop element engageable with each of said bearing levers the form rollers being pivotable on bearings of mutually adjacent distributor rollers and being engageable with and disengageable from the plate cylinder by an adjustment element, a pair of control levers at each side frame spaced from one another and pivotally mounted on respective stud bolts at the side frames of the machine; the two bearing levers at each side frame, being articulately connected via respective straps to each of said control levers, a compensating web, respectively, coupling said pair of control levers at each of the side frames; and a respective control cylinder supported on one of the side frames and engaging said compensating web for moving said control levers to force the respective form rollers alternately into engagement with the plate cylinder.

4,711,175

INK DISPENSING MEANS FOR PRINTING PRESSES
Peter Hummel, Offenbach am Main, and Joachim Stener, Offenbach, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 4, 1986, Ser. No. 826,143

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1985, 3503736

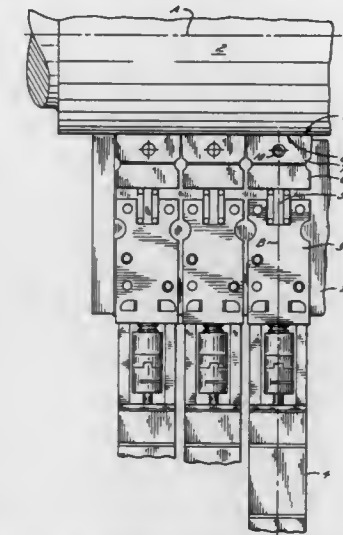
Int. Cl.⁴ B41F 31/04

U.S. Cl. 101—365

13 Claims

1. An inking unit disposed in the ink duct of a printing press for regulating the quantity of ink dispensed on a duct roller of the press comprising in combination, a plurality of zone dispensing elements, each having a longitudinal axis and each dispensing element being adjustably mounted for movement

along said longitudinal axis substantially radially relative to the duct roller, a blade disposed on each of said zone dispensing elements and each blade defining a dispensing edge cooperating with the duct roller to define a dispensing gap, each of said blades having a mounting surface and being adjustably mounted on said zone dispensing element for movement in a plane determined by the direction of dispensing element movement along said longitudinal axis and by the duct roller genera-



trix contacted by the dispensing edge, means for defining a fulcrum for said blade disposed perpendicular to said mounting surface of said blade and said longitudinal axis of said zone dispensing element, and means for releasably retaining said blade on said dispensing element for limited swinging movement of said blade about said fulcrum relative to said longitudinal axis so as to maintain said dispensing gap substantially uniform.

4,711,176

INK FOUNTAIN INCORPORATING INDIVIDUALLY REGULATED METERING SEGMENTS

Armelin Michel, London, United Kingdom, assignor to Machines Chambon, Orleans, France

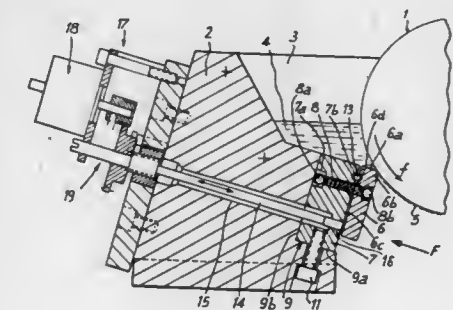
Filed Mar. 20, 1986, Ser. No. 841,857

Claims priority, application France, Mar. 22, 1985, 85 04283

Int. Cl.⁴ B41F 31/02

U.S. Cl. 101—365

5 Claims



1. An ink fountain incorporating individually adjusted metering segments, for a printing machine, comprising a vat containing ink defined on one side by a horizontal inking roller driven in rotation and, on the other side, by a body extending parallel to the inking roller, and laterally by two vertical cheeks, the body of the ink fountain bearing, in the vicinity of the peripheral surface of the inking roller, a series of metering segments aligned parallel to the inking roller and each having

a front face close to the inking roller, said front faces each having a wiping edge parallel to the inking roller and which determines with the peripheral surface of the inking roller, a gap, means to adjust the width of the gap to determine the thickness of the film of ink formed on the inking roller downstream of each metering segment, springs acting on said metering segments adjusting pusher member mounted to slide in the body of the ink fountain and acting against said spring on the individual metering segments, and means associated respectively with the various pusher members for displacing the latter as a function of the desired thickness of the film of ink, all the metering segments being mounted to pivot about a common axis parallel to the inking roller, each metering segment forming a lever of the first type comprising a short first lever arm, between the wiping edge of the metering segment and the pivot axis thereof, and a longer second lever arm between the point of application of the effort of the pusher member on the metering segment and the pivot axis, each of said metering segments having a horizontal groove, and a horizontal groove in said body of the ink fountain aligned with the grooves in said metering segments, the common pivot axis of the metering segments being constituted by a rod maintained clamped between said aligned horizontal grooves of the various adjacent metering segments and said horizontal groove in the body of the ink fountain.

4,711,177

AUXILIARY BOOSTER

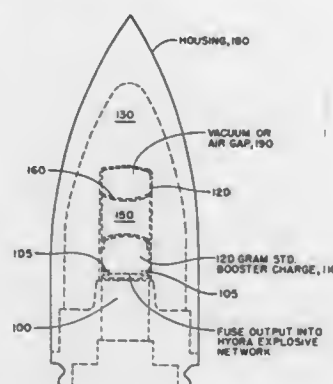
Joseph C. Foster, Jr., Ft. Walton Beach, and Andrew G. Bilek, Valparaiso, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 6, 1986, Ser. No. 893,846

Int. Cl.⁴ F42C 19/08

U.S. Cl. 102-204

6 Claims



1. A detonation system, comprising:
 - a housing having a fuse well which has a front end and back end, and in which said front end of said fuse well is constructed of materials selected from a group containing cerium aluminum alloys and zirconium;
 - a main charge which is housed in said housing adjacent to said fuse well;
 - a booster charge which is housed in the back end of said fuse well, said booster charge being capable of detonation when ignited to produce a detonation wave;
 - a means for igniting said booster charge;
 - an auxiliary booster charge which is housed in said fuse well adjacent to said booster charge, said auxiliary booster charge being sequentially detonated by the detonation of said booster charge to ignite said main charge and initiate its detonation; and
 - a flyer plate which is fixed in said fuse well between its front end and said auxiliary booster charge, said flyer plate being accelerated by the detonation of said auxiliary booster charge so that it strikes said front end with a high velocity and generates thereby vaporific effects which

entail jets of very hot metal particles that enhance the detonation of the main charge, and wherein said flyer plate comprises a tapered metal liner which is fixed in said fuse well to said booster charge, said tapered metal liner being constructed of materials selected from a group containing cerium aluminum alloys and zirconium, said group having known pyrophoric characteristics which enhance the detonation of said main charge.

4,711,178

AMMUNITION INCORPORATING SEARCHING FUSE WITH TRAJECTORY CORRECTABLE DURING ITS FINAL FLIGHT PHASE AND METHOD FOR COMBATING ARMORED TARGET OBJECTS

Nikolaus Argyrakos, Nuremberg, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

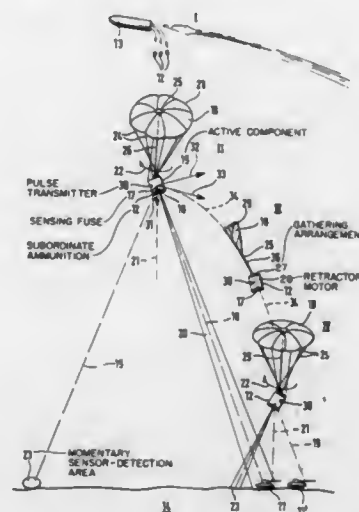
Filed Apr. 22, 1986, Ser. No. 855,078

Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516673

Int. Cl.⁴ F42B 25/24

U.S. Cl. 102-384

5 Claims



1. In an article of ammunition including a sensing fuse, and a parachute, wherein the trajectory of the article is correctable during the final phase of flight thereof, the improvement comprising: said ammunition having a pulse transmitter for producing an offsetting directional component in a direction towards the sideways offset position of a target object which is detected by the sensing fuse; means for suspending the action of the parachute during approach of the ammunition towards a target along a quasi-ballistic trajectory; and a sensor-guidable gathering arrangement operatively connected to said parachute for respectively suspending and reinstating the action of said parachute.

4,711,179

ARRANGEMENT IN A MINE WHICH IS CAPABLE OF BEING NEUTRALIZED

Sten Sundberg, Stig Risberg, both of Eskilstuna, and Ulf Eriksson, Ödeshög, all of Sweden, assignors to Affärsverket FFV, Eskilstuna, Sweden

PCT No. PCT/SE85/00489, § 371 Date Oct. 17, 1986, § 102(e)

Date Oct. 17, 1986, PCT Pub. No. WO86/03827, PCT Pub.

Date Jul. 3, 1986

PCT Filed Nov. 27, 1985, Ser. No. 916,970

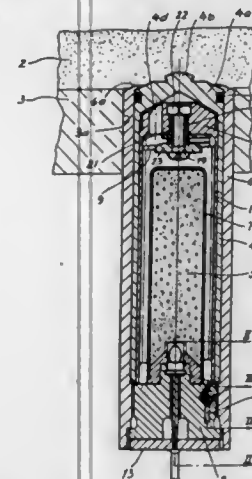
Int. Cl.⁴ F42B 23/24

U.S. Cl. 102-426

4 Claims

1. An arrangement in a mine which is capable of being neutralized and which is intended for burial in the ground, including detecting means (33) operative to detect a neutraliza-

tion of the mine, initiator means (30) adapted to initiate detonation of a spotter charge (5) incorporated in the mine in response to the detection of a neutralization, and a spotter (1) which is arranged to be driven by the detonated charge from the mine to the surface of the overlying ground, in order to disclose the location of the mine, characterized in that a penetrator (4), which is intended to drive a pathway through the



ground to facilitate passage of the spotter (1), is arranged forwardly of the spotter as seen in its direction of travel, said spotter being capable of driving the penetrator in said direction during a first phase of the spotter firing sequence; and in that the arrangement further includes a separating device (9) which is intended to separate the spotter from the penetrator during a second phase of the firing sequence.

4,711,180

MORTAR TRAINING DEVICE WITH FUNCTIONAL SIMULATED PROPELLING CHARGES

John Smolnik, 81 Leamoor Dr., Parsippany, N.J. 07054

Filed Oct. 6, 1986, Ser. No. 915,566

Int. Cl.⁴ F42B 13/22

U.S. Cl. 102-445

6 Claims



1. A mortar training device similar to a service mortar cartridge for use in a standard mortar comprising, in combination:
 - a reusable sabot projectile of nominal mortar bore diameter including a body having a small caliber bore, a hollow boom joined axially to said body, a fin section joined axially to said boom;

a subprojectile accommodated within said small caliber bore of said sabot projectile body;

- a propelling gas means for propelling said subprojectile including a propellant charge, said propelling gas means contained in said sabot projectile;
- a charge initiating means including a percussion primer located aft of said propelling gas means;
- a subchamber comprised of free volume within said sabot projectile aft of said subprojectile wherein subchamber gases are received from said propellant charge to propel said subprojectile;
- a mortar chamber comprised of free volume within said mortar adjacent said sabot projectile;
- a propelling gas egress means including a plurality of gas control ports connecting said subchamber and said mortar chamber for reducing subchamber gas pressure;
- a plugging means including manually and individually removable plugs to block said gas control ports;
- a plug retaining means to prevent said plugs from being dislodged by said subchamber gas pressure;
- a sabot projectile expelling means including said propelling gas means, and a supplemental gas port means for discharging gases into said mortar chamber to eject said sabot projectile, said sabot projectile expelling means being essential when all said gas control ports are plugged.

4,711,181

WARHEAD WITH ROTATIONALLY-SYMMETRICAL HOLLOW CHARGE

Konrad Ringel, Leinburg, and Karl Rudolf, Schrobhausen, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

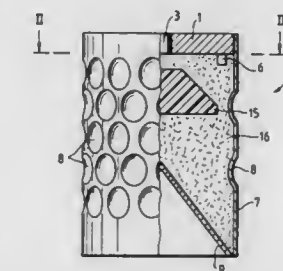
Filed Dec. 3, 1986, Ser. No. 937,221

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544747

Int. Cl.⁴ F42B 3/08

U.S. Cl. 102-476

1 Claim



1. A warhead comprising a rotationally-symmetrical hollow charge with selective central or eccentric triggering through a plurality of pre-determinedly positioned detonators; said warhead including a generally cylindrical casing having projectile-forming coverings thereon; a base plate closing one end of said casing; a jet-forming insert closing the opposite end of said casing; an explosive material filling said casing and adapted to be triggered by said detonators; said plurality of detonators being arranged in said base plate and including a central detonator and two additional detonators symmetrically spaced relative to said central detonator in a central principal plane longitudinal extending through said casing; and a rotationally-symmetrical deflector member being centrally arranged within the explosive material.

4,711,182

MAGNETIC SUSPENSION FOR A VEHICLE

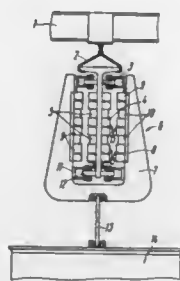
Adolf M. Alexandrov, ulitsa Chelyabinskaya, 19, korpus 4, kv. 457, Moscow; Evgeny G. Vasiliev, ulitsa Novogireevskaya, 6, kv. 13, Moskovskaya oblast, Rentovo; Alexandr A. Iskanderov, ulitsa, 7, kv. 20, Bashilovskaya, Moscow; Vladimir S. Magdenko, ulitsa Vinokurova, 16, kv. 23, Moscow; Semen G. Melikov, Yasenevo, mikroraiion, 9, korpus 64, kv. 592, Moscow; Eduard R. Avsharov, ulitsa Solnechnaya, 11, kv. 94, Moskovskaya oblast, Odintsovo; Jury A. Tsimbler, Sojuzny prospekt, 10, kv. 261, Moscow, and Vladimir I. Presnyakov, ulitsa Gagarina, 22, kv. 17, Moskovskaya oblast, Orekhovo-Zuevo, all of U.S.S.R.

Filed Apr. 25, 1985, Ser. No. 727,272

Int. Cl.⁴ B60L 13/04

U.S. Cl. 104—283

16 Claims



1. A magnetic suspension for a vehicle for passenger and freight transportation along a track, comprising:
at least one guide rail vertically installed on the track, and having lateral sides of a magnetically conducting material; an underframe surrounding said lateral sides of said guide rail and having a magnetic system;
a means for laterally stabilizing the position of said underframe;
first strips of permanent magnets extending in a longitudinal direction along the guideway, said first strips comprising a plurality of strips having pole facets which are arranged in an alternating polarity configuration in a vertical array;
second strips of permanent magnets extending in a substantially longitudinal direction of the vehicle, said second strips comprising a plurality of strips having pole facets which are arranged in an alternating polarity configuration in a vertical array;
said pole facets of said first strips having identical vertical spacing as said pole facets of said second polarity of the two sets of strips of permanent magnets interact to prevent excessive vertical displacement of the vehicle due to the proximity of the magnets to magnets of the opposite set of strips having the same polarity, the pole facets of said first and second strips which are horizontally spaced from each other having opposing polarity.
whereby the alternating polarity of the two sets of strips of permanent magnets interact to prevent excessive vertical displacement of the vehicle due to the proximity of the magnets to magnets of the opposite set of strips having the same polarity.

4,711,183

SHELVING ASSEMBLY WITH DROP-IN SHELF

Milton E. Handler, Northbrook, and Herbert Baisch, Palatine, both of Ill., assignors to Hirsch Company, Skokie, Ill.

Filed Aug. 1, 1986, Ser. No. 892,700

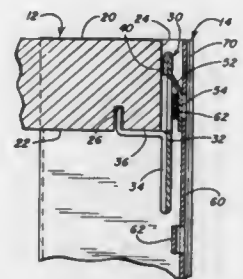
Int. Cl.⁴ A47B 57/24

U.S. Cl. 108—111

4 Claims

1. A shelving assembly comprising:
at least one shelf, said shelf having a generally planar bottom horizontal surface, said shelf defining a groove that is parallel to said shelf margin and that opens to said shelf planar bottom horizontal surface;
a shelf support member engaging said shelf along a margin

thereof, shelf support member including a generally planar vertical wall perpendicular to the plane of said shelf, said vertical wall having a top margin and a bottom margin, said shelf support member including a tab between said top and bottom margins of said vertical wall, said tab having an outwardly projecting portion and a downwardly extending portion spaced outwardly of, and parallel to, said shelf support member vertical wall, said shelf support member comprising a sheet of metal that defines said shelf support member vertical wall and that is folded over along said bottom margin to define another wall adjacent and parallel to said shelf support member vertical wall, said sheet being folded outwardly 90 degrees along



the upper edge of said other wall to define a generally horizontally oriented flange that is perpendicular to said shelf support member vertical wall, and said sheet being folded upwardly 90 degrees along the edge of said flange to define a lip that is generally perpendicular to said flange for being received in said shelf groove; and
vertical posts each including at least one vertical wall that is oriented generally parallel to said shelf support member vertical wall and each post including a receiving means on said post vertical wall for receiving said downwardly extending portion of one of said tabs with at least the distal end of said downwardly extending portion of said one tab being disposed adjacent said post vertical wall.

4,711,184

ARRANGEMENT FOR A DESK COMPRISING A DESK-TOP WHICH CAN BE RAISED AND LOWERED

P. O. Thomas Wallin; Bengt H. Warell; A. Pedar Svensson, all of Televerket, S-123 86 Farsta; Kurt A. Lundström, Televerket Industridivisionen, Svedjev 12, S-931 36 Skellefteå, and Lars A. Johansson, Kamomillgängen 25, 61145 Nyköping, all of Sweden

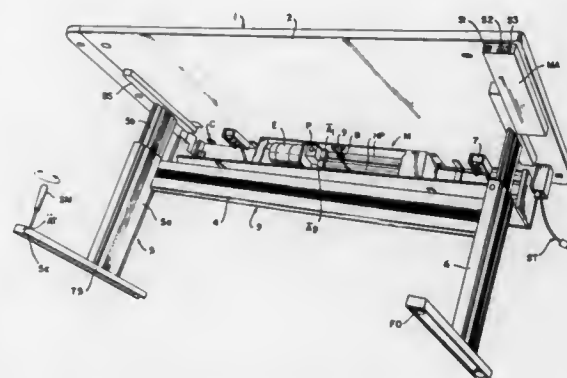
Filed Nov. 18, 1985, Ser. No. 803,759

Claims priority, application Sweden, Mar. 16, 1984, 8401480

Int. Cl.⁴ A47B 9/00

U.S. Cl. 108—144

4 Claims



1. An improved height adjustable desk comprising:

a desk top;
at least two telescopic legs for raising and lowering said top with respect to a reference level, said telescopic legs having inner and outer parts;
a hydraulic cylinder including an associated piston extending inside each of said telescopic legs, said cylinder being fixed to the top and said piston being fixed to said outer part of said telescopic leg, said inner part being detachably connected to a first bar member releasably attached to the underside of the desk top;
means for actuating the hydraulic cylinders; and, wherein said inner and outer parts of said telescopic legs are made of closed profiles, an outer closed profile having a cross-section including a central substantially rectangular portion and two substantially rectangular side portions of reduced dimensions on each side of said central portion, and inner closed profile having a cross-section forming a corresponding central substantially rectangular portion and side portions on each side of said central portion, the inner walls of said central and side portions of said outer profile and outer walls of said corresponding central and side portions of said inner profile forming longitudinally extending mutually-coacting guiding surfaces counteracting jamming when said inner and outer parts are longitudinally movable with respect to each other for height adjustment of said desk.

4,711,185

PROCESS AND APPARATUS FOR THE DECOMPOSITION OF HALOGEN AND/OR PHOSPHORIC CONTAINING ORGANIC MATERIALS

Jürgen Hofmann, Bad Orb; Hans Huschka, Hanau, and Daniel Neupert, Karlstein, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

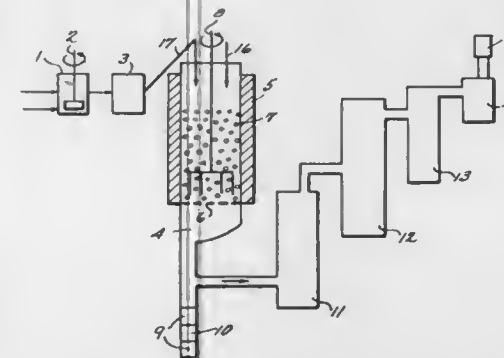
Filed Jul. 27, 1981, Ser. No. 287,120

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028193

Int. Cl.⁴ F23G 7/00; F23B 7/00; G21F 9/14

U.S. Cl. 110—215

2 Claims



1. An apparatus suitable for the pyrolytic decomposition of an organic compound containing at least one element from the group consisting of halogen and phosphorus present in a waste material comprising a fixed bed reactor, a charge of substantially spherical ceramic structures resting on a sieve plate in said reactor, means for mechanically stirring said charge, means for supplying the organic compound into the upper part of the reactor, means for separately discharging the reaction gases and the solid reaction product formed in the reactor at the lower part of the reactor.

4,711,186

REFRACTORY ANCHOR

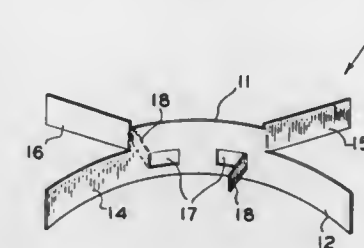
Te H. Chen, Florham Park; Dominic Cicchino, Morris Plains, and Peter J. Shadbolt, Morristown, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 22, 1986, Ser. No. 944,445

Int. Cl.⁴ E04B 1/24

U.S. Cl. 110—336

9 Claims



1. A composite structure comprising: a metal surface; a refractory lining for providing thermal protection to said surface; and, a plurality of metal anchors welded to said surface in spaced apart relationship for providing crack control of said refractory lining during thermal cycling thereof, each of said anchors having a generally curved central web and curved legs extending from said central web, said central web and said legs defining substantially a semi-circle, straight arms extending upwardly from said curved central web, the total width of said anchor being substantially equal to the thickness of said refractory lining, said arms extending at a predetermined angle with respect to the diameter of said semi-circular web and leg portion of said anchor, said anchor having at least 1 hole and tab in said central web.

4,711,187

FERTILIZER APPLICATOR KNIFE AND ITS USE

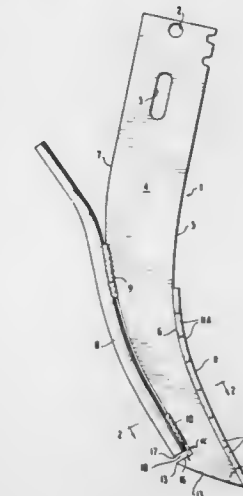
Daryl Schultz, R.R. 2, Box 92-A, Rensselaer, Ind. 47979

Filed Sep. 23, 1985, Ser. No. 779,014

Int. Cl.⁴ A01C 23/02

U.S. Cl. 111—7

23 Claims



1. A fertilizer knife for subsurface application of fertilizer in liquid or vapor form in a ground furrow, said knife comprising: narrow, elongated blade means having a width W_1 , a leading edge with a soil breaking segment and a trailing edge; an elongated, hollow, fertilizer conduit means having a width W_2 , wherein said conduit means is behind the trailing edge and is shaped to correspond to the trailing edge; a foot portion on said blade means having a bottom edge

extending from the leading edge upwardly toward and beyond said trailing edge to form a rearwardly extending shoulder means therewith, wherein the shoulder means has an upwardly facing top surface that forms an obtuse angle with the vertical when the knife is in operating position;

wherein said conduit means terminates above and is spaced from said shoulder means to prevent back pressure in said conduit during movement of the knife through the furrow and to direct flow of fertilizer away from vertical walls of said furrow;

pieces of hard, abrasion-resistant material rigidly secured to and covering said soil-breaking segment forming a substantially flat surface generally perpendicular to the direction of travel having a width W_3 on the leading edge; soil contacting surfaces rearwardly of said inserts on said blade and conduit, wherein the soil contacting surfaces are covered by a dried, abrasion-resistant coating; and wherein $W_1 \geq W_2$ and $W_3 > W_1$.

4,711,188

PREPARATORY DEVICES FOR A POCKET SEWING MACHINE

Katsuki Yoneda, Nishinomia, Japan, assignor to Satoh Seiki Co., Ltd., Japan

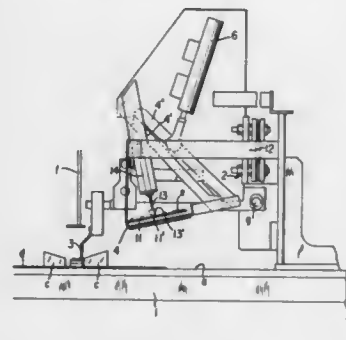
Filed Dec. 19, 1985, Ser. No. 810,504

Claims priority, application Japan, Jan. 17, 1985, 60-6737

Int. Cl.⁴ D05B 3/12, 33/00

U.S. Cl. 112—104

1 Claim



1. A pocket sewing machine comprising a sewing station and a preparatory device, said sewing station comprising a sewing needle, a cut knife, a triangle knife for an end cut, a stacker, a pair of base presses, a T-shaped center press and a cloth folder; said preparatory device being moveable along a sewing line of the sewing machine and comprising a press means for pressing a suit fabric and a supply means for supplying a pocket cloth, said sewing station and said preparatory device cooperating with each other such that while the pair of base presses of the sewing station are away from the starting position of the sewing machine, the press means of the preparatory device presses a suit fabric at the starting position of the next sewing cycle of the sewing machine and the pair of base presses return to said starting position and move upwards as the supply means for a pocket cloth moves downwardly.

4,711,189

SEWING ARRANGEMENT WITH FEED DEVICE

Richard Müller, Mehlbach; Roland Leis, and Axel Zinssmeister, both of Rothsberg, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 2, 1987, Ser. No. 20,593

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1986, 3607107

Int. Cl.⁴ D05B 21/00, 27/00

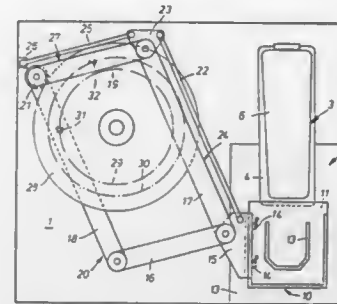
U.S. Cl. 112—121.12

8 Claims

1. A sewing arrangement including a sewing machine, a workpiece feed device including a workpiece holder, a support

connectable to said workpiece holder, a workpiece drive device, a pitman drive connected to said workpiece drive device into said support, said pitman drive including parallel guide means pivotally connected to said support.

4. A device for moving a workpiece to accurately to move it through positions for sewing seams thereon, comprising a



sewing machine having a support, a work holder movable over said support with the work for moving the work in association with the sewing machine support and a pitman drive including a pivotal pitman support connected to said work holder, said pitman drive being connected to said pitman support and including a drive member, and parallel guiding means connected between said drive member and said pitman support.

4,711,190

DECORATIVELY STITCHED TRIM PART AND METHOD

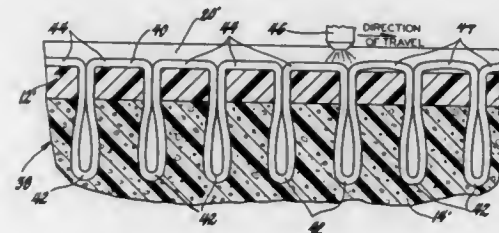
Jack E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 648,300, Sep. 6, 1984, abandoned, which is a division of Ser. No. 552,408, Nov. 16, 1983, Pat. No. 4,488,498. This application Aug. 22, 1986, Ser. No. 899,051

Int. Cl.⁴ D05C 15/00

U.S. Cl. 112—266.2

1 Claim



1. A method of providing a series of decorative stitches of continuous heat shrinkable thread on the visible outer surface of a trim part having an underlying substrate of relatively thicker resilient material with a hollow needle having a slanted end providing a leading piercing edge and a trailing notch, said series of decorative stitches including visible loops joined by intermediate loops embedded within said substrate so as to maintain said visible loops tensioned against said visible outer surface, comprising the steps of,

piercing the outer surface of said trim part with said needle piercing edge while capturing a portion of said thread on said notch,

penetrating said trim part with said needle and captured thread portion to an embedment distance less than the thickness of said trim part so as to position said captured thread portion in frictional retaining contact with said underlying substrate,

withdrawing said needle from said trim part a withdrawal distance above the outer surface thereof so as to leave an embedded loop in said substrate while continuously feed-

ing a sufficient length of thread through said hollow needle in response to the frictional retention of said thread portion to provide the combined length of a visible loop and one half the next embedded loop, indexing said needle the length of a visible loop, again penetrating said trim part with said needle and captured thread portion to said embedment distance so as to again position said captured thread portion in frictional retaining contact with said underlying substrate with said visible loop between said captured thread portions substantially tensioned against said visible outer surface, repeating the foregoing steps until the desired series of decorative stitches is obtained, and applying heat to said substantially tensioned visible loops so as to shrink them into tighter tension against said visible outer surface.

4,711,191

MONOFILAMENT-WRAP TEXTURIZING METHOD AND PRODUCT

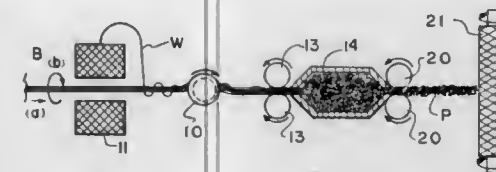
Nathan G. Schwartz, Bryn Mawr, Pa., assignor to Techniser-vice, Kennet Square, Pa.

Filed Nov. 4, 1986, Ser. No. 926,800

Int. Cl.⁴ D05C 17/02; D02G 1/12, 3/24, 3/36

U.S. Cl. 112—410

8 Claims



1. A stiff, pliable texturized yarn product comprising a bundle of heavy denier thermoplastic monofilaments, said filaments having a denier per filament of at least about 50 and being too stiff to be maintained as a bundle by air entangling for subsequent fabrication, and a wrapper yarn substantially continuously wrapped around said bundle,

said plurality of the monofilaments in said wrapped bundle having a multiplicity of heat-set bends repeating lengthwise along the lengths of said monofilaments.

7. A tufted woven floor covering comprising a base and a multiplicity of tufts having spring-like quality extending from said base, said tufts comprising stiff, pliable texturized yarn products as defined in claim 1.

4,711,192

RUDDER ASSEMBLY

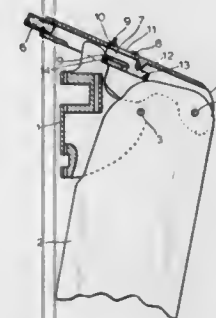
Wayne J. Kooy, Box 292, Galien, Mich. 49113

Filed Apr. 30, 1986, Ser. No. 857,247

Int. Cl.⁴ B63H 25/06

U.S. Cl. 114—162

3 Claims



1. An improved rudder assembly of the type comprising a rudder support frame (1), a rudder blade (2) pivotally attached to said rudder support frame (1) with a first pivot join (3) and

a tiller frame (4) pivotally attached to said rudder blade (2) with a second pivot join (5), wherein the improvement comprises

a pivot bracket (7) attached to said tiller frame (4), and a lever (12) pivotally attached near a first end with a third pivot join (14) to said rudder support frame (1) and pivotally attached near a second end with a fourth pivot join (13) to said pivot bracket (7) and rotatable about said third pivot join (14) from a first, substantially horizontal forward position having said fourth (13), third (14) and second (5) pivot joins in approximately a straight line to a second, substantially horizontal rearward position having said second (5), fourth (13) and third (14) pivot joins defining an obtuse angle approximating a straight line.

4,711,193

SELF-CONTAINED VENTILATION SYSTEM UNITS FOR SUPPLYING SPACES BETWEEN BULKHEADS WITH INDIVIDUALLY CIRCULATED VENTILATION AIR

Joachim Latza, Hamburg-Norderstedt, and Günther Möck, Hamburg, both of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

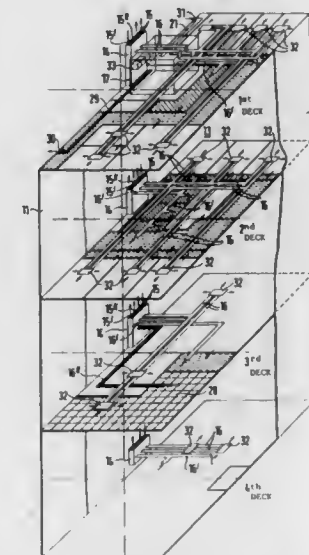
Filed May 30, 1986, Ser. No. 868,940

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519394

Int. Cl.⁴ B63J 2/14

U.S. Cl. 114—211

21 Claims



1. A ship with an air conditioning system, said ship comprising a plurality of vertically-shaped decks and a ship bottom within a hull, said decks comprising an uppermost deck and at least one lower deck, said at least one lower deck comprising at least one deck adjacent said uppermost deck;

said hull having a longitudinal direction and a transverse direction;

a plurality of bulkheads disposed vertically within said hull for dividing said hull into a plurality of separate spaces one behind the other along said longitudinal direction of said hull;

first means for providing air for ventilation solely to at least a first of said plurality of separate spaces between at least two of said bulkheads;

said first air providing means having ducting;

first means for conducting and removing ventilation air solely to at least said first space;

second means for conducting and removing ventilation air; said first air conducting and removing means disposed for providing air solely to said first of said plurality of separate spaces;

said second air conducting and removing means being disposed to conduct and remove ventilation air solely from at least a second of said plurality of said separate spaces other than said first of said separate spaces; and said first air conducting and removing means having a portion thereof disposed solely between and other than through any of said at least two bulkheads of said at least first space, whereby air conducted into and discharged from said first space is excluded from at least said second space and air conducted and discharged from said second space is excluded at least from said first space; said first and said second separate air providing means each having separate ducting, wherein said ducting of each of said separate air providing means comprises at least one substantially vertical air shaft which extends through all said vertically-spaced decks for ventilation of deck spaces thereinbetween; each said at least one shaft having substantially adjacent, substantially vertical ducts for incoming air, circulating air and exhaust air, and also each said substantially vertical duct having its corresponding horizontal duct connected thereto for incoming air, circulating air and exhaust air respectively, said horizontal ducts branching off solely from corresponding ones of said vertical ducts, of their corresponding separate air providing means, into individual ones of said deck spaces; each of said first and said second air providing means having its own separate air conditioner unit for air conditioning at least said circulating air and means for connecting each said air conditioning unit to its corresponding air ducts.

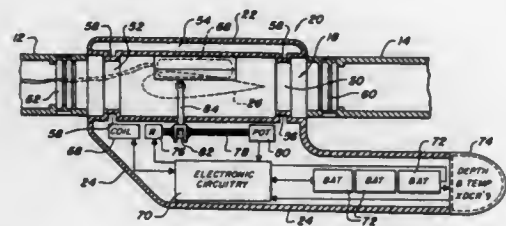
4,711,194

STREAMER INTERFACE ADAPTER CABLE MOUNTED LEVELER

John T. Fowler, Marblehead, Mass., assignor to The Laltram Corporation, New Orleans, La.
Continuation-in-part of Ser. No. 444,073, Nov. 24, 1982, and a continuation-in-part of Ser. No. 585,027, Mar. 5, 1984. This application Jan. 11, 1985, Ser. No. 690,867
Int. Cl.⁴ B63G 8/14

U.S. Cl. 114—245

12 Claims



1. A cable leveling device adapted to be attached to a streamer cable comprising:
an adapter module adapted to be secured between two streamer cable sections, said module including an inner housing adapted to be attached at either end to a section end and an overlying housing adapted to rotate about said inner housing and including wings mounted to said overlying housing for rotation about a horizontal axis, said overlying housing including, an elongated weighted pod-like structure containing apparatus operably connected to control said wings, wherein:
said adapter module includes a first coil electrically connected to said streamer cable,
said overlying housing includes a second coil inductively coupled to said first coil and connected to electro-mechanical means, permitting an exchange of signals between said cable at said electro-mechanical means.

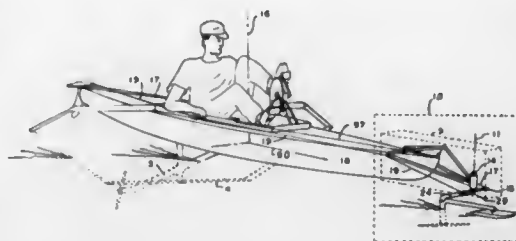
4,711,195

HYDROFOIL APPARATUS

Sidney G. Shutt, 612 Briarwood Dr., Brea, Calif. 92621
Filed Apr. 10, 1987, Ser. No. 37,156
Int. Cl.⁴ B63B 35/00

U.S. Cl. 114—274

12 Claims



1. A hydrofoil apparatus for attachment to a marine vessel comprising:
a first pivot means for positioning the rotational axis of a gooseneck shaft substantially parallel to the yaw axis of the hull of said marine vessel,
a trailing load support having a forward end pivotally coupled to said gooseneck shaft for rotation on said yaw axis, and an aft end;
a planing surface sensor having a planing surface in contact with the water surface, said planing surface providing a hydrodynamic force to hold said planing surface on the water surface in response to vessel forward velocity,
an elongated body member having a forward end and an aft end, said forward end being pivotally coupled to rotate on a first pitch axis with respect to said planing surface sensor, said elongated body member being pivotally coupled to rotate on a second pitch axis passing through a point located between said elongated body forward and aft ends and said trailing load support aft end,
a vertical fin coupled to elongated body member, said fin being responsive to the forward motion of said marine vessel to maintain said planing surface sensor forward of said second pitch axis,
a lifting foil coupled to said vertical fin, said lifting foil being responsive to the forward motion of said marine vessel to raise the bow of said marine vessel by provide a lifting force via said second pitch axis to balance the lifting force provided by said planing surface sensor applied to said first pitch axis.

4,711,196

MARINE SURVIVAL SYSTEM

Thomas M. Wilks, Lymington, United Kingdom, assignor to Laggan Marine Developments Limited, Lymington, United Kingdom
Continuation-in-part of Ser. No. 813,371, Dec. 26, 1985, abandoned. This application Nov. 25, 1986, Ser. No. 934,845
Claims priority, application United Kingdom, Jan. 7, 1985, 8500359

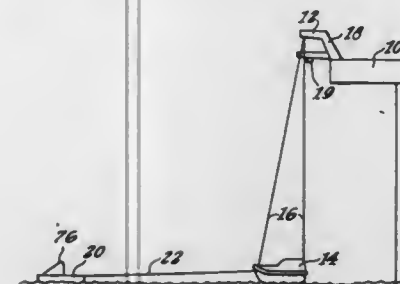
Int. Cl.⁴ B63B 23/00

U.S. Cl. 114—365

17 Claims

1. A marine survival system for a vessel (including a marine platform) comprising:
a lifecraft;
an unmanned tug having a bow and a stern between which is defined a fore-and-aft direction of said tug;
a towline connected between the bow of the lifecraft and a center of neutral steer of the tug;
a first launching means by which the lifecraft is stowed on the vessel, said first launching means including releasable falls and braked winch means controlling pay-out of the falls so that the lifecraft is lowered slowly to the sea;
a second launching means by which the tug is stowed on the

vessel, said second launching means including a release permitting the tug to drop to the sea;
autopilot means in said tug operatively connected to a rudder of the tug to angle the rudder as called for by a predetermined compass heading;
a sensor in the tug responsive to a direction of pull in the towline and having an output a state of which changes depending upon a magnitude and a direction of a deviation of said pull from the fore and aft direction of the tug;



a trim control of the autopilot means responsive to the state of the sensor output to adjust an effective compass heading to maintain the tug on a predetermined track relative to the lifecraft; and
release means operably connected to the winch means and to the tug release so that on actuation of the release means the tug falls into the sea and deploys to an extremity of the towline on the predetermined compass heading and track as the lifecraft is slowly lowered to the sea and on release of the falls tows the lifecraft away from the vessel.

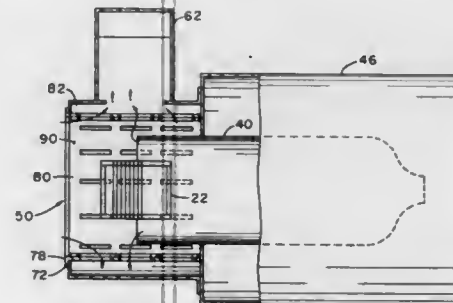
4,711,197

GAS SCAVENGER

Jerry A. Taylor, Sr., Corona, Calif., assignor to Thermco Systems, Inc., Orange, Calif.
Filed Oct. 16, 1986, Ser. No. 919,736
Int. Cl.⁴ C23C 16/00

U.S. Cl. 118—715

8 Claims



1. A gas scavenger for educting gas away from semiconductor wafers as the wafers are withdrawn from a processing chamber along a path, comprising:
a peripheral outer wall defining a plenum having opposite ends, the one end in gas flow communication with the processing chamber and the second end in gas flow communication with the atmosphere, the outer wall having a gas exhaust port in gas flow communication with a gas exhaust system, and
an interior wall dividing the plenum into a first chamber through which the wafers travel and a second chamber in gas flow communication with the gas exhaust port in the outer wall, the interior wall having apertures about the path of wafer travel.

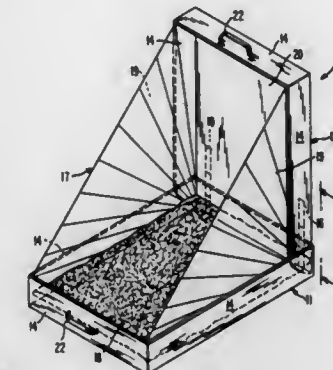
4,711,198

THROW AWAY CAT LITTER BOX

George R. Mossbarger, 7000 Ebenezer Church Rd., Raleigh, N.C. 27612
Filed May 27, 1986, Ser. No. 866,947
Int. Cl.⁴ A01K 1/00

U.S. Cl. 119—1

11 Claims



1. A disposable cat litter container having prepackaged cat litter therein for receiving and collecting cat waste comprising: a cardboard box structure including upper and lower mating half sections wherein the upper half section includes a top panel with a surrounding side wall structure and wherein the lower half section includes a bottom panel with a surrounding side wall structure; means for pivotally mounting the upper and lower sections together to enable the upper half section to move between a generally horizontal closed position and a generally vertical upper position; an impervious flexible liner secured internally to the upper and lower half sections and including a bottom portion extending over the bottom panel and an upper portion secured to the upper half section; said flexible liner forming a pair of flexible and collapsible side walls that extend vertically between the upper and lower half sections when the upper half section assumes the open position, each flexible side wall assuming generally triangular shape and functioning to close opposite sides of the cardboard box structure when the same is in the open position; and cat litter overlying the bottom portion of the liner and disposed within the cardboard box structure.

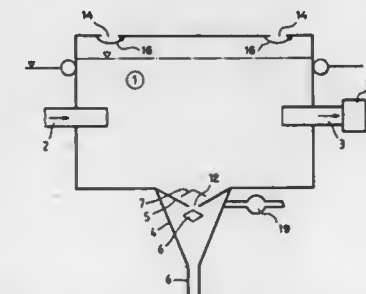
4,711,199

DEVICE FOR BREEDING FISH AND SHELLFISH

Lars-Erik Nyman, Enebyberg, Sweden, assignor to Flygt AB, Solna, Sweden
Filed Aug. 21, 1986, Ser. No. 899,200
Claims priority, application Sweden, Aug. 23, 1985, 8503939
Int. Cl.⁴ A01K 61/00

U.S. Cl. 119—3

2 Claims



1. In a system of tanks for breeding fish and the like for use in a liquid environment, apparatus comprising in combination: a first cylindrical fish tank of a non-rigid material having a first inlet and a first outlet, said first inlet and outlet being

below the surrounding liquid line and dimensioned so that the liquid in said first tank is at a level higher than the liquid environment surrounding said first tank, and said first inlet is directed tangentially to said first tank and said first outlet is directed tangentially from said first tank, whereby a rotating liquid flow is created in said first tank; first means extending from the bottom of said first tank for collecting sludge and gas, said first means including a first conically shaped hopper having a first cover inclined toward the center of the hopper and defining a first central hole, a first screening member located adjacent said first central hole for preventing gas from entering said tank and for permitting collection and evacuation of the gas at the upper interior periphery between said first hopper and cover walls, a first protection screen positioned over said first central hole to prevent dead fish and the like from falling into said hopper, and a first sludge outlet extending from the narrow portion of said conical hopper; a feed line coupled to said first inlet; and a sludge line coupled to said first sludge outlet to transport the sludge to a collecting tank.

4,711,200

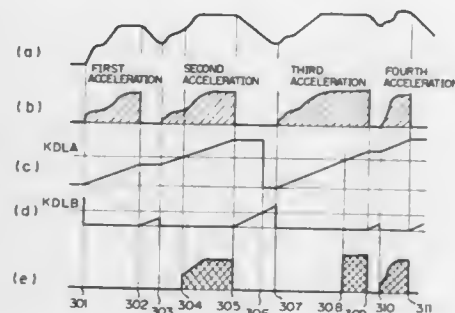
AUTOMOTIVE-ENGINE FUEL SUPPLY SYSTEM
Yoshiaki Kinoshita, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 11, 1986, Ser. No. 906,313

Claims priority, application Japan, Sep. 13, 1985, 60-201831 Int. Cl.⁴ F02D 41/10

U.S. Cl. 123—492

2 Claims



1. An electronically controlled fuel supply system for an internal combustion engine, which comprises:
 - (a) means responsive to a volume of intake air per revolution of the engine for computing a basic fuel supply amount per revolution;
 - (b) means responsive to engine speed and engine load for computing an additional fuel supply amount;
 - (c) means responsive to an accelerating condition of the engine for monitoring a time interval between successive acceleration cycles of the engine;
 - (d) means, responsive to said means for monitoring a time interval between successive acceleration cycles, for setting a variable delay time which increases in response to an increase in said time interval; and
 - (e) electronically operated fuel supply means, responsive to said means for setting a variable delay time, for supplying the engine for each revolution thereof with fuel in an amount substantially equal to said basic fuel supply amount when an actual acceleration period counted from commencement of each acceleration cycle is less than said delay time and in an amount substantially equal to a sum of said basic and additional fuel supply amounts when the actual acceleration period from the commencement of an acceleration cycle exceeds said delay time.

4,711,201

TWO-CYCLE ENGINE

Kazuo Ooyama, Nizsa; Kenji Ooki, Asaka, and Toshio Mizushima, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

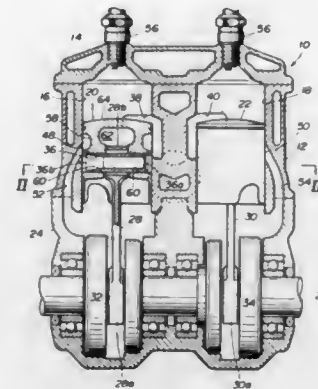
Filed Feb. 12, 1986, Ser. No. 828,856

Claims priority, application Japan, Feb. 15, 1985, 60-27952; Feb. 15, 1985, 60-27954

Int. Cl.⁴ F16J 1/14

U.S. Cl. 123—73 A

9 Claims



1. A two-cycle engine comprising:
 - (a) an engine body having at least one cylinder, said cylinder having an exhaust port and at least one scavenge port disposed generally in opposed relation to said exhaust port;
 - (b) a crankshaft rotatably mounted on said engine body;
 - (c) a piston received in said cylinder for reciprocal movement therealong and having an outer peripheral surface for closing said exhaust and scavenge ports during the reciprocal movement thereof, said piston having a transverse bore extending therethrough with opposite ends of said transverse bore opening to the outer peripheral surface of said piston, and the opposite ends of said transverse bore being positioned so as to come into facing relation to said opposed exhaust and scavenge ports, respectively, during the reciprocal movement of said piston;
 - (d) a hollow wrist pin received in said transverse bore and retained therein, one end of said wrist pin being closed and being positioned so as to come into facing relation with said exhaust port; and
 - (e) a connecting rod connected between said crankshaft and said wrist pin for moving said piston along said cylinder upon rotation of said crankshaft.

4,711,202

DIRECT ACTING CAM-VALVE ASSEMBLY

Steven F. Baker, Bellevue, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1986, Ser. No. 924,826

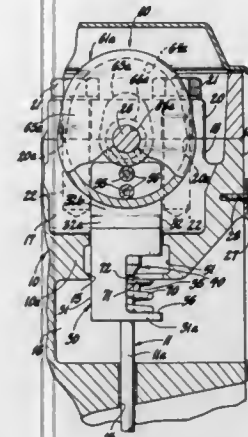
Int. Cl.⁴ F01L 1/30

U.S. Cl. 123—90.26

3 Claims

1. A direct acting cam-valve assembly for an internal combustion engine having an engine block means defining a cylinder with a port and a valve with a valve stem reciprocally guided in said engine block means and located for axial movement in said port, a camshaft with a double cam rotatably supported by the engine block means in a position above and in spaced apart relationship to said valve, said double cam including therein an internal track means defining an cam means and an outermost cam means, a follower guide bore in said engine block means, a cam follower reciprocally journaled in said follower guide bore, first and second sets of roller followers spaced parallel to each other operatively connected adjacent to one end of said cam follower with said first set of said roller

followers operatively engaging said innermost cam means and said second set of said roller followers operatively engaging said outermost cam means whereby said cam follower is reciprocated during rotation of said camshaft, the opposite end of said cam follower having a stepped bore therethrough defining in succession from its outboard end a cylinder lower wall to



loosely receive a free end of said valve stem of said valve, a spring cavity and a hub wall, a hydraulic lash adjuster operatively positioned in said hub wall in position whereby one end thereof will abut against the free end of said valve stem, and a spring operatively positioned in said spring cavity and operatively connected to said valve stem to normally bias said valve in an axial direction toward said one end of said cam follower.

4,711,203

TIMING CASE FOR A CYLINDER HEAD OF INTERNAL COMBUSTION ENGINES HAVING GAS CHANGING VALVES ARRANGED ESSENTIALLY IN PARALLEL TO ONE ANOTHER

Jiri Seidl, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany
PCT No. PCT/EP85/00521, § 371 Date Jun. 12, 1986, § 102(e)
Date Jun. 12, 1986, PCT Pub. No. WO86/02700, PCT Pub. Date May 9, 1986

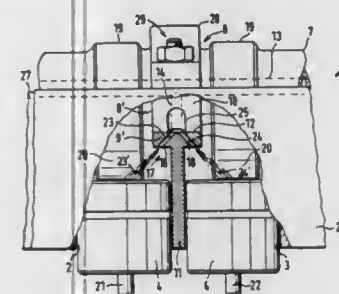
PCT Filed Oct. 5, 1985, Ser. No. 874,163

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1984, 3439553

Int. Cl.⁴ F01M 1/06

U.S. Cl. 123—90.34

7 Claims



1. A timing case for a cylinder head of internal-combustion engines having gas changing valves arranged essentially in parallel to one another that are actuated by separate cams on a single camshaft disposed in the timing case, via tappets that are guided by breakthroughs of the timing case, said breakthroughs being arranged adjacently while leaving a web, and said web, on a side of the camshaft being connected with a bottom part of a divided camshaft bearing, an axial width of said camshaft bearing in an area of the smallest wall thickness of the web, exceeding said smallest wall thickness, wherein the timing case is developed separately from the cylinder head,

and wherein the breakthroughs disposed transversely with respect to the camshaft bearing end approximately in the area of the smallest wall thickness of the web at a predetermined distance from the bearing surface in the bottom part of the bearing in such a way that on both sides of the web a bearing wall remains at the bottom part of the bearing that has said bearing surface, said bearing wall being integral with the web.

4,711,204

APPARATUS AND METHOD FOR COLD WEATHER PROTECTION OF LARGE DIESEL ENGINES

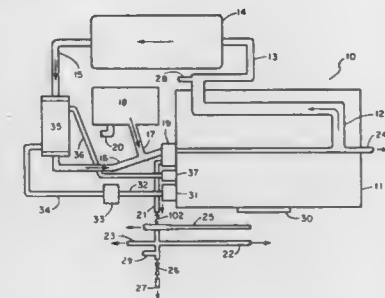
David M. Rusconi, P.O. Box 2846, Redwood City, Calif. 94064

Filed Aug. 8, 1983, Ser. No. 521,436

Int. Cl.⁴ F02N 17/02

U.S. Cl. 123—142.5 R

12 Claims



9. Method as in claim 8 further providing that said small diesel engine is capable of providing a second powered drive shaft available for other optional purposes.

4,711,205

INJECTION START ADVANCER FOR FUEL INJECTION PUMP ASSEMBLY OF THE FUEL DISTRIBUTION TYPE

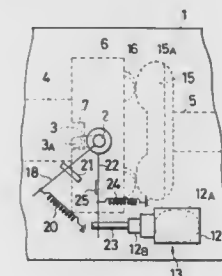
Satoru Ito, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1986, Ser. No. 946,185

Claims priority, application Japan, Jan. 20, 1986, 61-5125[U] Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—179 L

3 Claims



1. An injection start advancer in a fuel injection pump assembly of the distribution type, comprising:
 - a pump housing;
 - a drive shaft rotatably supported by said pump housing;
 - a plunger coupled to said drive shaft and rotatable and reciprocable thereby for delivering fuel under pressure;
 - injection timing control means disposed between said drive shaft and said plunger for controlling timing for axial displacement of said plunger;
 - a shaft extending through said pump housing and rotatably supported thereby;
 - engagement means fixed to a portion of said shaft within said pump housing for engaging said injection timing control means;

- a first lever fixed to a portion of said shaft outside of said pump housing;
- a first spring acting on said first lever for normally urging said injection timing control means in a direction to advance fuel injection;
- a second lever loosely fitted over said shaft;
- a heat-sensitive material contractable and expandable according to ambient temperature; and
- a second spring acting on said second lever for normally urging the same in a direction to apply a pressure to said heat-sensitive material, said second lever serving as a stopper for limiting an angular position of said first lever.

4,711,206

TWO-CHAMBER ENGINE MOUNT WITH HYDRAULIC DAMPING

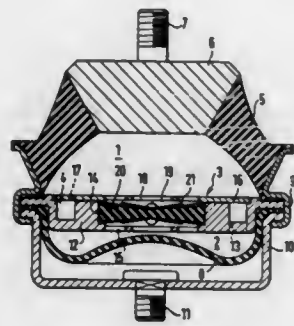
Rainer Andri, Limburg, and Manfred Hofmann, Hünfelden, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany
Filed Jul. 25, 1986, Ser. No. 889,478

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526686

Int. Cl.⁴ F02B 75/06

U.S. Cl. 123—192 R

7 Claims



1. Two-chamber engine mount with hydraulic damping, comprising rubber-elastic peripheral walls, a rigid intermediate plate disposed within said peripheral walls defining two chambers along with said peripheral walls being acted upon by vibrations induced in a given direction, hydraulic fluid filling said chambers, said intermediate plate having substantially planar upper and lower surfaces, said intermediate plate having a channel formed therein interconnecting said chambers, said intermediate plate having another chamber formed therein, said upper and lower surfaces of said intermediate plate having perforations formed therein above and below said other chamber defining a liquid-permeable cage, and a circular rubber-elastic membrane disc having two sides and a center with a reduced thickness, said membrane disc being loosely disposed in said other chamber, both of said sides of said membrane disc being acted upon by said hydraulic fluid moving said membrane disc parallel to said given direction for combined frequency and amplitude decoupling.

4,711,207

VALVE DEACTIVATOR MECHANISM

Duane J. Boavallet, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1987, Ser. No. 35,181

Int. Cl.⁴ F02D 13/06; F01L 13/00

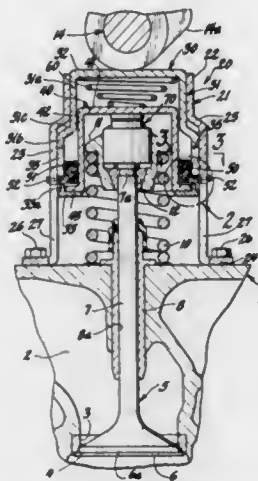
U.S. Cl. 123—198 F

4 Claims

1. A valve deactivator mechanism for use in an internal combustion engine of the type having an engine block means defining a cylinder with a port, a poppet valve operatively positioned to control flow through the port and having a valve stem reciprocally journaled in the cylinder head with one end thereof extending outboard of the cylinder head with a valve spring associated therewith to normally bias the poppet valve to a valve closed position in the port, and an engine driven

valve actuator means spaced from the poppet valve, the improvement comprising:

- a tubular cam follower guide housing means operatively fixed to the cylinder head substantially concentric with and encircling the valve stem of the poppet valve; a cam follower of inverted cup-shaped configuration slidably journaled for reciprocation in said cam follower guide housing means, said cam follower having a foot at one end thereof positioned to be engaged by the valve actuator means and a radially inward extending annular flange at its opposite end to define a solenoid pole piece; a valve actuator of inverted cup-shaped loosely positioned in said cam follower and operatively connected to the valve stem of the poppet valve, said valve actuator having a closed end at one end thereof and having at its open end a radially



outward extending annular flange defining an armature; a spring means operatively positioned between said closed end of said valve actuator and the foot of said cam follower to normally bias the said flanges of said cam follower and of said valve actuator into abutment with each other; and, a solenoid coil and bobbin means fixed to said cam follower guide housing means so as to loosely encircle said valve actuator and positioned to generate an electromagnetic flux path when said solenoid coil is energized that passes through the opposed working surfaces of said flanges whereby said valve actuator is electromagnetically connected to said cam follower for movement therewith, the arrangement being such that when the said solenoid coil is deenergized, said valve actuator is operatively uncoupled from said cam follower to effect deactivation of the poppet valve.

4,711,208

PISTON FOR INTERNAL COMBUSTION ENGINES

Wilfried Sander, and Siegfried Mielke, both of Neckarsulm, Fed. Rep. of Germany, assignors to Kolbenschmidt AG, Neckarsulm, Fed. Rep. of Germany

Continuation of Ser. No. 641,532, Aug. 16, 1984, abandoned.

This application Apr. 11, 1986, Ser. No. 851,881

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330554

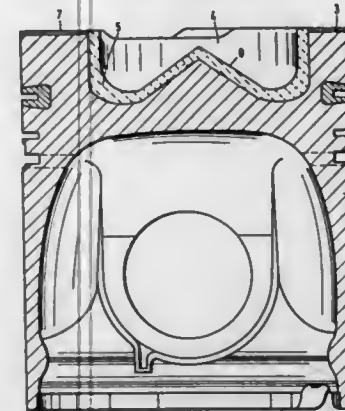
Int. Cl.⁴ F02B 19/00

U.S. Cl. 123—271

13 Claims

1. In a piston for an internal combustion engine, particularly for a supercharged diesel engine, comprising a piston head with a combustion chamber recess and having a heat-insulating layer of ceramic material having a low heat conductivity, the improvement wherein the piston head has a portion surrounding the recess and the recess includes an upwardly extending central conical walled portion and one part of the heat-insulating layer comprises a solid ceramic insert having a wall thick-

ness of 3 mm to 10 mm wherein all of the combustion chamber recess is defined by the ceramic insert and the ceramic insert held in position by shrinkage fit and by form-locking, and another part of the heat insulating layer comprises a ceramic



coating separate from said insert and having a thickness of 0.6 to 2 mm which is disposed on a top surface of the piston head surrounding the recess and the ceramic coating extends from the combustion chamber recess at least to an edge of the piston head and is firmly adhered to the piston top surface.

4,711,209

FUEL INJECTION SYSTEM FOR SELF-IGNITION INTERNAL COMBUSTION ENGINES

Dietmar Henkel, Neumarkt, Fed. Rep. of Germany, assignor to MAN Nutzfahrzeuge GmbH, Nuremberg, Fed. Rep. of Germany

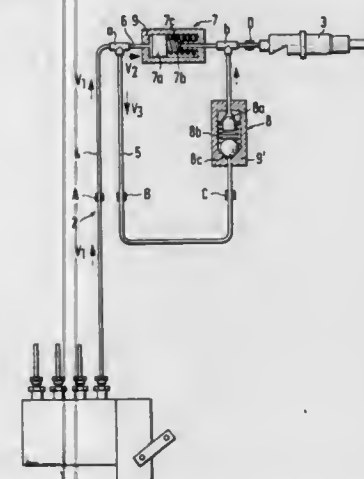
Filed May 8, 1986, Ser. No. 861,056

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516537

Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—300

11 Claims



1. In a fuel injection system combined into one unit, for self-ignition internal combustion engines operative with speed and load of such engine respectively, that includes an injection pump which delivers metered fuel quantities with a level and a time pattern of pump pressure, at periodic intervals, via a connecting line to an injection means including a main injection feed line having an outlet end, with at least part of said connecting line comprising two different-length circuits which are connected in parallel and which cause the fuel quantity supplied to the feed line to be divided such that, on the one hand, a small fuel quantity in a first pre-injection phase (pre-injection quantity) passes through the shorter circuit to said injection means and, on the other hand, a larger fuel quantity in

a second main injection phase (time-delay circuit), with the two fuel quantities of the first and second phases respectively reaching said injection means with an exact time lag relative to one another, the improvement therewith comprising:

- a metering valve unit disposed in said shorter circuit to permit a quantity of fuel for the pre-injection phase to be metered which remains constant at all times subject to point of commencement of the pre-injection phase being accurately set practically independent of the level and the time pattern of the pump pressure and being practically independent of speed and load of the engine; and
- a check valve unit disposed in said longer time-delay circuit at that end thereof closest to said injection means, with the ratio of the diameter of said feed line, including said shorter circuit, to the diameter of said time-delay circuit being in a range of between 1 and 2, said check valve unit ensuring satisfactory hydraulic uncoupling of the two fuel injection phases (pre-injection and main injection quantities) effected at the same time intervals at all times, said check valve unit also preventing pressure and volume waves of the first pre-injection phase from entering the outlet end of the main injection feed line and as a result no volume losses of the pre-injection quantity and metering inaccuracies liable to be produced therewith will occur nor are there any multiple reflections of pressure waves alternately entering into either line and any resultant interference with pre-injection and main injection phases can be successfully avoided.

4,711,210

COMPRESSION BRAKING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

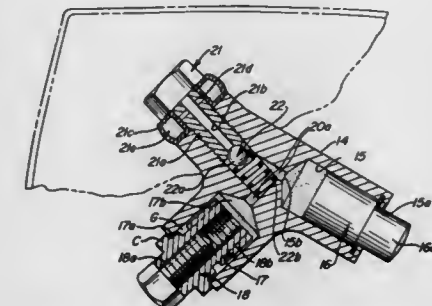
Dean H. Reichenbach, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 29, 1986, Ser. No. 946,815

Int. Cl.⁴ F02D 13/04

U.S. Cl. 123—321

6 Claims



1. In a multi-cylinder internal combustion engine having fuel injecting means for each cylinder, first actuating means for operating the fuel injecting means, exhaust valve means for each cylinder biased to assume a closed position, and second actuating means for opening the exhaust valve means; a compression braking system comprising a housing for disposition proximate the first and second actuating means of each cylinder, said housing including a first cavity in which a first piston is reciprocally mounted, a portion of said first piston protruding from one end of the first cavity and being engaged and moved by said first actuating means, a second cavity angularly disposed relative to said first cavity and proximate a second end of said first cavity, a second piston reciprocally mounted within said second cavity and having a portion thereof protruding from one end of the second cavity for engaging and moving the second actuating means when the engine is in a compression braking mode, and a third cavity proximate said first and second cavities and having a portion thereof forming a linkage passage interconnecting a second end of the second cavity to the second end of the first cavity; normally closed

check valve means disposed within said third cavity; a connector piece having a first section provided with an elongated first passage and disposed within said third cavity and on the opposite side of said check valve means from the linkage passage, and a protruding second section having a second passage communicating with the first passage formed in said first section, said second passage forming a segment of a flow circuit through which hydraulic fluid circulates; during a predetermined engine operating mode, said linkage passage being filled with hydraulic fluid from the flow circuit whereby inward movement of said first piston into the said first cavity is transmitted via the linkage passage hydraulic fluid to said second piston affecting outward movement thereof whereby said second actuating means opens the cylinder exhaust valve means.

4,711,211

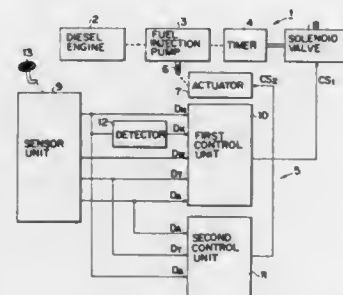
FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Hidekazu Oshizawa, and Kenji Okamoto, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd.
Continuation of Ser. No. 692,391, Jan. 17, 1985, abandoned. This application Jul. 7, 1986, Ser. No. 883,294

Claims priority, application Japan, Jan. 19, 1984, 59-6351
Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—357

4 Claims



1. A fuel injection apparatus for an internal combustion engine in which the fuel injection timing and the amount of fuel injection are controlled in response to at least one condition signal indicating the operating condition of the engine, comprising:

- a first control means responsive to the condition signal for calculating and outputting a target timing data representing an optimum timing of fuel injection;
- a timer means responsive to the target timing data for adjusting the fuel injection timing so as to obtain the optimum timing;
- a data producing means responsive to the condition signal for producing a quantity data representing the amount of fuel injection required for the operating condition of the engine;
- a second control means responsive to a signal indicating an engine speed at each instant and to the target timing data for calculating and outputting a full amount data indicating a maximum fuel injection quantity for the operating condition of the engine at each instant which is determined so that the amount of smoke produced at the maximum fuel injection quantity determined by the full amount data is a predetermined upper limit;
- a selecting means responsive to the quantity data and the full amount data for selecting the lesser of the two data; and
- an actuator means responsive to an output of said selecting means for controlling the fuel injection quantity, whereby the amount of smoke produced by the fuel injection quantity does not exceed the predetermined upper limit during each adjustment of the fuel injection timing by said first control means and said timer means and a full power condition can be obtained with a minimum of smoke irrespective of changes in the fuel injection timing.

4,711,212 ANTI-KNOCKING IN INTERNAL COMBUSTION ENGINE

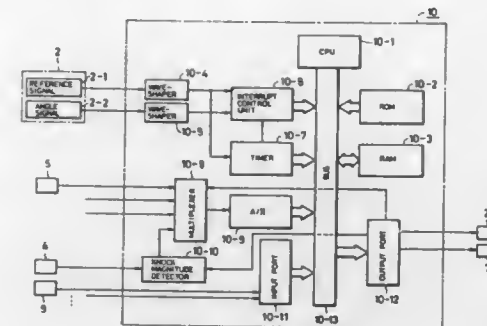
Hiroshi Haraguchi, Kariya, and Koji Sakakibara, Hekinan, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Nov. 21, 1986, Ser. No. 933,611

Claims priority, application Japan, Nov. 26, 1985, 60-266989; Dec. 4, 1985, 60-273097; Jun. 12, 1986, 61-137152; Jul. 31, 1986, 61-181795

Int. Cl.⁴ F02P 5/145

U.S. Cl. 123—425

21 Claims



1. A system for controlling knocking in an internal combustion engine, comprising:

- a knock sensor for outputting a signal in response to the vibrations in said engine;
- means for deriving a knock magnitude value from the output signal of said knock sensor generated within a predetermined engine rotational angle at an interval thereby obtaining a plurality of knock magnitude values, said knock magnitude value corresponding to the magnitude of a knock component of said output signal of said knock sensor;
- means for determining a pattern of distribution of said plurality of said knock magnitude values on the basis of the results of comparison between the frequency that said knock magnitude value exceeds an upper threshold value and the frequency that the knock magnitude value goes below a lower threshold value;
- means for detecting a knocking condition of said engine in accordance with the determined distribution pattern; and
- means for controlling said engine to prevent the knocking in accordance with the detected knocking condition.

4,711,213 KNOCK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Koji Sakakibara, Hekinan, and Hiroshi Haraguchi, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Apr. 10, 1986, Ser. No. 850,164

Claims priority, application Japan, Apr. 11, 1985, 60-77066

Int. Cl.⁴ F02P 5/04

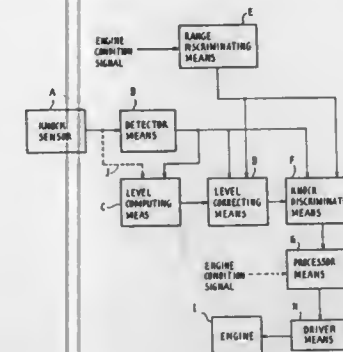
U.S. Cl. 123—425

13 Claims

1. A knock control system for use with an internal combustion engine, comprising:

- a knock sensor for detecting knock produced by the internal combustion engine;
- knock discriminating means for discriminating knock based on an output signal from said knock sensor;
- processor means responsive to the result of knock discrimination for computing a control value to control a knock control factor for the internal combustion engine;
- driver means responsive to said control value for varying said knock control factor;
- detector means for detecting the maximum value of said output signal from said knock sensor during a prescribed period of time;
- level computing means for computing a knock discrimination level to be compared with said maximum value;

range discriminating means for ascertaining whether the operating condition of the internal combustion engine is in or outside of a knock control range in which knock is substantially produced, and for enabling said processor means to control said knock control factor according to the result of knock discrimination by said knock discriminating means when the operating condition of the internal combustion engine is in said knock control range; and



level correcting means for correcting said knock discrimination level such that a probability that said maximum value will exceed said knock discrimination level is greater in said knock control range than outside of said knock control range, said knock discriminating means being arranged to discriminate knock in said knock control range according to the knock discrimination level as corrected by said level correcting means.

4,711,214 ANTI-KNOCKING CONTROL IN INTERNAL COMBUSTION ENGINE

Koji Sakakibara, Hekinan; Hiroshi Haraguchi, and Hideki Yukumoto, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 735,108, May 17, 1985, Pat. No. 4,617,895. This application Jul. 31, 1986, Ser. No. 891,165

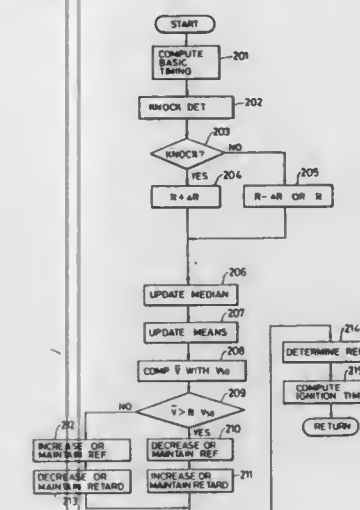
Claims priority, application Japan, May 17, 1984, 59-99898; Dec. 13, 1984, 59-264256; Mar. 4, 1985, 60-43223

The portion of the term of this patent subsequent to Oct. 2, 2003, has been disclaimed.

Int. Cl.⁴ F02P 5/15

U.S. Cl. 123—425

12 Claims



1. Apparatus for controlling knocking in an internal combustion engine, comprising:

a knock sensor for generating a signal in response to the vibrations in said engine;

means for measuring a predetermined magnitude of said knock sensor signal generated within a predetermined engine rotational angle at an interval thereby obtaining a plurality of said magnitudes;

means for determining a pattern of distribution of a plurality of logarithmic values corresponding to said plurality of magnitudes; and

means to control said engine to prevent said knocking in accordance with said distribution pattern.

4,711,215

LPP COMBUSTION CONTROL FOR IC ENGINE WITH ABNORMAL COMBUSTION

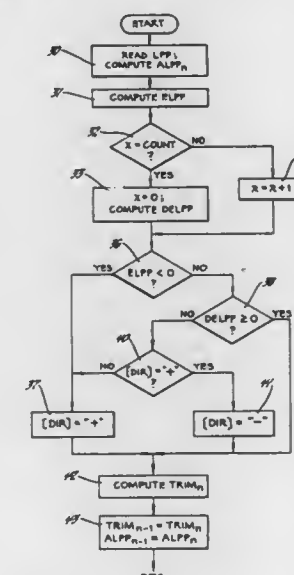
Kenneth J. Cimpinski, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1986, Ser. No. 923,577

Int. Cl.⁴ F02P 5/15

U.S. Cl. 123—425

3 Claims



1. An LPP ignition timing control for an internal combustion engine including a combustion chamber, means effective to ignite a combustible charge within the combustion chamber and power output apparatus including a rotating crankshaft driven in response to the expansion of the combustible charge following the ignition thereof and having a predefined TDC rotational reference position, the ignition timing control comprising, in combination:

- means for periodically sensing LPP in the combustion chamber and generating an average LPP value therefrom;
- means for generating a DLPP value indicating a desired LPP;
- means responsive to both of the aforementioned means for periodically adjusting ignition timing (1) in the advance direction if the average LPP value is retarded with respect to the DLPP value, (2) in the same direction as the previous adjustment if the average LPP is advanced and becoming less advanced with respect to the DLPP value, or (3) in the opposite direction from that of the previous adjustment if the average LPP is advanced and becoming more advanced with respect to the DLPP value, whereby MBT timing is maintained in spite of a foldover effect in the relationship between LPP and ignition timing.

4,711,216 FUEL SUPPLY DEVICE FOR AN INTERNAL COMBUSTION ENGINE

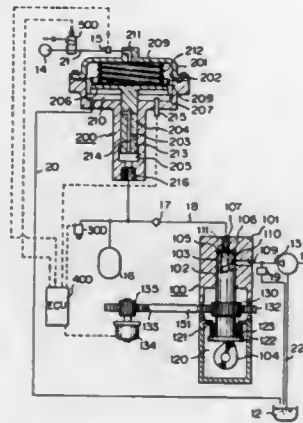
Yasuhiro Takeuchi, Okazaki; Yasuyuki Sakakibara, Nishio; Toshihiko Igashira, Toyokawa, and Hidetaka Nohira, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed May 14, 1986, Ser. No. 863,151

Claims priority, application Japan, May 16, 1985, 60-102742
Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—447

13 Claims



1. A fuel supply device for a diesel engine comprising: first sensing means for sensing an accelerator position of said diesel engine; second sensing means for sensing a rotational speed of said diesel engine; pump means for pressurizing fuel to a high pressure and discharging the highly pressurized fuel; regulator means for regulating the pressure of said highly pressurized fuel discharged from said pump means, said regulator means including an electrically-operated member for varying the pressure of said highly pressurized fuel in accordance with a first electrical signal applied thereto; electrically-operated injector means for injecting said highly pressurized fuel regulated by said regulator means into said diesel engine in accordance with a second electrical signal applied thereto; and control means for controlling said electrically-operated member and said injector means, said control means producing said first electrical signal in accordance with the rotational speed sensed by said second sensing means so that the pressure of said highly pressurized fuel discharged from said pump means regulated to a higher pressure as the sensed rotational speed is increased, and said control means producing said second electrical signal in accordance with the rotational speed sensed by said second sensing means and the accelerator position sensed by said first sensing means so that a timing and interval of a fuel injection by said injector means are varied in accordance with the sensed rotational speed and the sensed accelerator position.

4,711,217 FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES AT LOW TEMPERATURE

Hidekazu Kano, Higashimatsuyama; Takashi Shinichi, Kawagoe, and Shuichi Hosoi, Ichikawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1986, Ser. No. 840,460

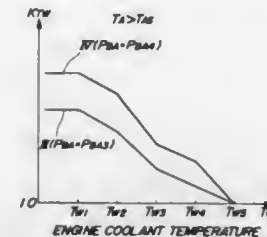
Claims priority, application Japan, Mar. 18, 1985, 60-052508
Int. Cl.⁴ F02D 41/06; F02M 51/00

U.S. Cl. 123—491

5 Claims

1. A method of controlling the quantity of fuel being supplied to an internal combustion engine in a cold state, wherein a basic value of the quantity of fuel being supplied to said

engine is corrected by the use of a first correction value which is set based upon a difference between a predetermined value and an actual value of temperature of intake air being supplied to said engine and a second correction value which is set based upon a temperature of said engine and a load on said engine, said second correction value being applied when said engine is



in said cold state, to correct said basic value of the quantity of fuel to an increased value, said method comprising the steps of: (1) detecting a temperature of intake air being supplied to said engine, and (2) correcting said second correction value by said intake air temperature detected in a manner such that said second correction value is corrected to a larger value as said intake air temperature detected is lower.

4,711,218 ACCELERATION ENRICHMENT FUEL CONTROL

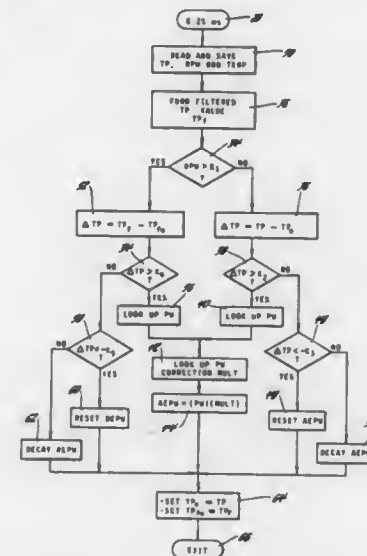
Daniel F. Kabasin, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 5, 1987, Ser. No. 11,292

Int. Cl.⁴ F02D 41/10

U.S. Cl. 123—492

3 Claims



1. A fuel supply system for an internal combustion engine having a throttle for controlling its air input, the engine being characterized in that its steady state operating fuel requirements vary from its transient operating fuel requirements, the fuel supply system comprising: means for measuring engine speed; means for measuring throttle position; means for filtering the measured throttle position; means for sensing an engine transient operating condition representing an engine acceleration enrichment fuel requirement in response to (A) the rate of change in the measured throttle position when the engine speed is less than a predetermined threshold and (B) the rate of change in the filtered throttle position when the engine speed is greater than the predetermined threshold; and means for supplying acceleration enrichment fuel to the

engine when an engine transient operating condition is sensed, whereby the transient operating fuel requirements of the engine are provided in response to changes in the throttle position over the full operating speed range of the engine.

4,711,219 THROTTLE-POSITION SIGNAL GENERATOR FOR AN ELECTRONIC FUEL-INJECTION SYSTEM

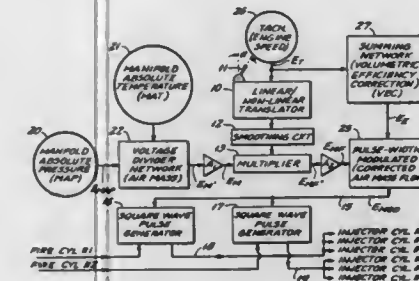
Richard E. Staerz, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 24, 1986, Ser. No. 889,080

Int. Cl.⁴ F02D 41/18

U.S. Cl. 123—494

7 Claims



1. In combination, for use in generation of a fuel-injection control signal which is a non-linear function of throttle position, throttle-tracking means linearly tracking throttle position and producing an analog output voltage which is a linear function of throttle position, an oscillating sawtooth generator producing an output sawtooth voltage of amplitude which is a submultiple of said analog output voltage at full-throttle position, summing means connected to said throttle-tracking means and to said sawtooth generator and producing a summed-voltage output, a multi-step analog switch having an input connected to said summed-voltage output, the number of steps of said switch being equal to said submultiple, said switch having a least an output connection for each of said steps, and a resistance network comprising individual resistors of differing value connected at first ends to the respective outputs of said switch, said network having an output connection in common to the opposite ends of said resistors.

4,711,220 PRESSURE OIL GUIDE DEVICE FOR INJECTION PUMP SHAFT

Ulrich Letsche, Stuttgart, Fed. Rep. of Germany; Wolfgang Rapp, deceased, late of Esslingen, Fed. Rep. of Germany by Glisea Rapp, heir; Guenther Haefner, Berglen, and Wilhelm Tonhaeuser, Korb, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 4, 1985, Ser. No. 794,539

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440053; Jan. 8, 1985, 3520667

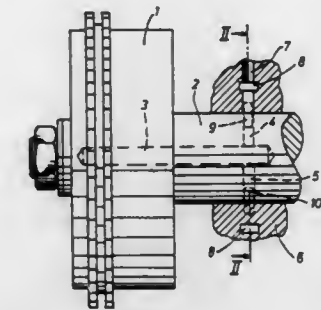
Int. Cl.⁴ F02M 59/20

U.S. Cl. 123—502

17 Claims

1. A hydraulic oil feeding device comprising: a pump shaft, a portion of said pump shaft being disposed in an injection pump housing; a pump feeding means in said injection pump housing; a passage forming means in said pump shaft for forming a passage between said pump housing feeding means and an injection timing mechanism, said passage forming means including a centrally extending axial bore in said pump shaft and at least one radial bore in said pump shaft con-

necting said axial bore to said pump housing feeding means, said passage forming means having an interrupted



passage position during an injection process and an open passage position in between injection processes.

4,711,221 FUEL INJECTION PUMP

Helmut Laufer, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

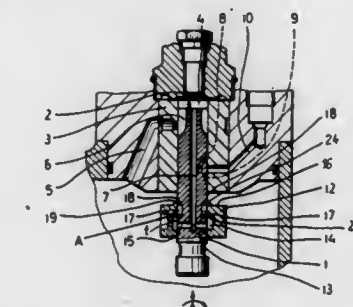
Filed Apr. 30, 1986, Ser. No. 857,660

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516455

Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—503

9 Claims



1. A fuel injection pump for internal combustion engines having a reciprocating pump piston defining one end of a pump work chamber and arranged to control an injection quantity by opening a pump work chamber relief conduit, provided in the pump piston for discharge into a jacket face thereof, said discharge occurring during a compression stroke of the pump piston via a regulating slide disposed on the pump piston, said slide being axially displaceable thereon to vary the injection quantity, the pump work chamber relief conduit being arranged to discharge into outflow means, said outflow means comprising a relief conduit outlet adjoining said relief conduit, a first recess provided on the pump piston and a second recess provided on the regulating slide, said relief conduit outlet comprising a bore disposed in said pump piston and arranged to exit said jacket face adjacent to said first recess, said recesses being adapted for communication and for selective coincidence therebetween during an opening stroke of said pump piston, said pump piston being arranged to assume a first position wherein the outflow conduit means is fully opened and a second position wherein the outflow conduit means is throttled.

4,711,222

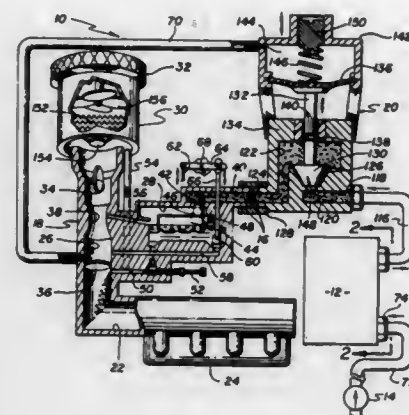
INTERNAL COMBUSTION ENGINE POLLUTANT CONTROL SYSTEM

Kelly R. Rawlings, Big Bear Lake, Calif., assignor to Anti-P, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 729,656, May 2, 1985, abandoned. This application Apr. 23, 1986, Ser. No. 853,425
Int. Cl.⁴ F02M 31/12

U.S. Cl. 123—555

32 Claims U.S. Cl. 123—557



1. A pollutant control system for an internal combustion engine including, among other things, a fuel pump, an air intake means, and an intake manifold for passing an air/fuel mixture to a combustion chamber means, the pollutant control system comprising, in combination:

a carburetor having a venturi mixing throat in fluid communication with the air intake means at one end and the intake manifold at the other end, a fuel float chamber, an first fuel passageway from the float chamber to the mixing throat, and a second fuel passageway between the float chamber and the mixing throat;

means for heating air drawn through the air intake means before entering the carburetor mixing throat, the heating means heating the air to a temperature within the range 160° F. to 180° F.;

means for heating and vaporizing fuel received from the fuel pump prior to entering the float chamber into a mixture of approximately 30% liquid fuel and approximately 70% vaporized fuel by volume at an outlet end of the heating and vaporizing means, the temperature of the fuel mixture at the outlet of the heating and vaporizing means being within the range of 115° F. to 125° F.; and

means for controlling the flow of the mixture of liquid and vaporized fuel from the heating and vaporizing means being connected to ported vacuum pressure in the carburetor and responsive to that pressure to increase the flow of the mixture of liquid and vaporized fuel when the pressure decreases, and decrease the flow of the mixture of liquid and vaporized fuel when the pressure increases, whereby during an engine idle condition the float chamber will remain substantially full of liquid fuel and the liquid fuel escaping therefrom through the first fuel passageway is replenished with fuel heated by the heating and vaporizing means, and as the engine speed is increased the flow controlling means will cause the liquid fuel level to drop within the float chamber sufficiently to permit vaporized fuel to pass through the second fuel passageway into the mixing throat for mixing with heated air drawn through the air intake means.

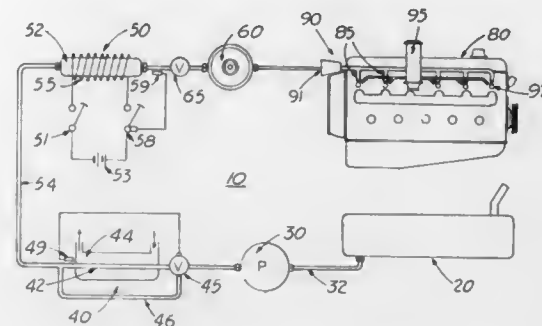
4,711,223

ALCOHOL FUEL CONVERSION APPARATUS

Bruce I. Carroll, 6137 Denton, Boise, Id. 83704

Continuation-in-part of Ser. No. 297,215, Aug. 28, 1981, Pat. No. 4,635,608. This application Aug. 18, 1986, Ser. No. 897,791
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.Int. Cl.⁴ F02M 31/02

12 Claims



1. Alcohol fuel conversion apparatus for internal combustion engines comprising:

fuel storage means for containing an alcohol fuel;
primary heat exchange means in fluid communication with said fuel storage means for transferring heat to pressurized alcohol contained within said heat exchange means;

a heat source for heating said primary heat exchange means;
pressure relief valve means in closed fluid communication with said primary heat exchange means for releasing heated pressurized alcohol into an expansion chamber;

converter means including said expansion chamber in fluid communication with said pressure relief valve means for receiving the heated pressurized alcohol and for the vaporization of the alcohol;

fuel injection means in fluid communication with said converter means for injecting vaporized alcohol into the cylinders of an internal combustion engine for mixing with air within the cylinders for proper combustion; and

pump means for pressurized pumping of alcohol from said 23 fuel storage means to said primary heat exchanger means, converter means, fuel injector means, and to the engine.

4,711,224

CHECK VALVE IN AUXILIARY VACUUM SYSTEM

Dennis C. Eckhardt, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 2, 1986, Ser. No. 902,663

Int. Cl.⁴ F02B 25/06

U.S. Cl. 123—572

3 Claims

1. In an auxiliary vacuum system of an automotive vehicle having a vacuum operated device and an internal combustion engine with a crankcase scavenged at a predetermined airflow rate by a crankcase ventilation system of said engine,

said auxiliary vacuum system including
a rotary vane type vacuum pump having an intake and an exhaust,

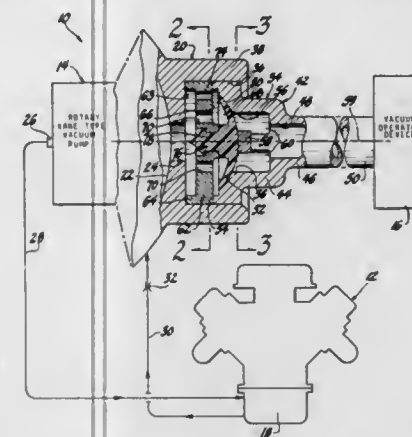
a first duct between said vacuum pump intake and said vacuum operated device whereby air is exhausted from said vacuum operated device at a normal airflow rate less than said predetermined scavenge airflow rate, and
a second duct between said vacuum pump exhaust and said engine crankcase whereby air is discharged from said vacuum pump into said crankcase,

in said auxiliary vacuum system, a check valve comprising:
means defining a valve chamber connected to said first duct and to said vacuum pump intake,

means defining an inlet port between said valve chamber and said first duct,

means defining an outlet port between said valve chamber and said vacuum pump intake,
means defining a control orifice between said valve chamber and said vacuum pump intake having a flow area substantially less than the flow area of said outlet port and predetermined to limit airflow therethrough to less than said predetermined scavenge airflow rate,

a valve element,
means mounting said valve element in said valve chamber for movement between a closed position covering said inlet port to prevent backflow of air to said vacuum operated device and a normal open position permitting airflow to said vacuum pump intake through both said control orifice said outlet port and a control open position closing



said outlet port and limiting airflow to said vacuum pump to only said control orifice, and

means biasing said valve element to said closed position, a normal pressure difference across said valve element corresponding to operation of said vacuum pump with the integrity of said vacuum system intact being operative to move said valve element from said closed to said normal open position and a larger pressure difference across said valve element corresponding to operation of said vacuum pump with the integrity of said auxiliary vacuum system breached being operative to move said valve element to said control open position thereby to limit the flow rate of air through said vacuum pump to less than said predetermined scavenge airflow rate.

4,711,225

CONNECTING PIECE BETWEEN THE CARBURETOR AND THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Hans Holderle, Freiberg; Jürgen Wolf, Stuttgart; Horst Eckhart, Auenwald, and Werner Vonderau, Waldrems, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

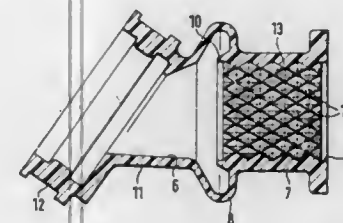
Filed Mar. 2, 1987, Ser. No. 20,670

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1986, 3606708

U.S. Cl. 123—590

Int. Cl.⁴ F02M 29/00

11 Claims



1. A connecting piece for connecting a carburetor to the

combustion chamber of the engine of a power-driven tool such as a motor-driven chain saw or the like, the connecting piece conducting the air-fuel mixture in a primary flow direction from the carburetor to the combustion chamber, the connecting piece comprising: an annular conduit-like member defining a longitudinal axis and having an inner wall surface; and, a thick plurality of protrusions formed over a substantial portion of said inner wall surface, said protrusions being disposed one behind the other as seen in said flow direction in a manner so as to prevent the formation of channels in a direction parallel to said axis.

4,711,226

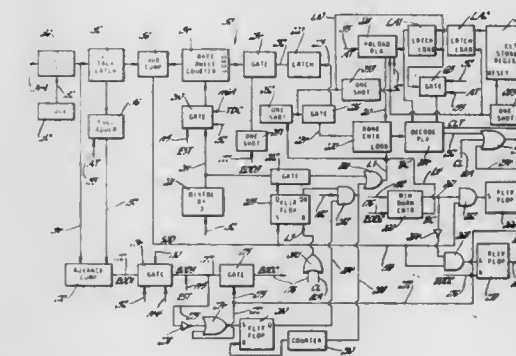
INTERNAL COMBUSTION ENGINE IGNITION SYSTEM
Michael A. Neuhalfen, Galveston; Frank E. Ridoux, Kokomo, and John S. Edenborough, Carmel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1987, Ser. No. 5,652

Int. Cl.⁴ F02P 9/00

U.S. Cl. 123—609

3 Claims



1. An ignition system for an internal combustion engine comprising, an ignition coil having a primary winding and a secondary winding, a spark plug connected to said secondary winding, a means for energizing and deenergizing said primary winding comprising a semiconductor switching means connected to said primary winding that is biased conductive and nonconductive, said semiconductor switching means being biased conductive by a start of dwell signal SOD and nonconductive by an end of dwell signal EOD, said signals being developed in synchronism with operation of said engine, current sensing means for sensing primary winding current, means coupled to said current sensing means for biasing said semiconductor switching means to a current limiting mode when the magnitude of the primary current attains a current limit value, means for developing a signal RT that is a function of the time period between the occurrence of the SOD signal and the point in time where primary current reaches said current limit value, means for controlling the time period between the occurrence of the EOD signal and the SOD signal as a function of the magnitude of said RT signal, a control circuit having an output connected to said semiconductor switching means for at times developing said EOD signal to cause said semiconductor means to be biased nonconductive, means for developing a spark timing signal and for applying said signal to the input of said control circuit, said control circuit including means operative in a first mode for developing said EOD signal substantially when said spark timing signal occurs or in a second mode wherein said EOD signal is developed at a time delayed from the occurrence of said spark timing signal, means for developing a current limit signal when primary winding current attains said current limit value, means for developing a minimum ramp time signal that is developed whenever the time period that the primary winding is energized exceeds a predetermined value, and means for causing said control circuit to operate in said first mode when either said ramp time signal or said current limit signal occurs before the occurrence of said spark timing

signal and in said second mode if said signals occur after the occurrence of said spark timing signal, said system when operating in said second mode causing said EOD signal to be developed substantially at the first to occur of said current limit and minimum ramp time signals.

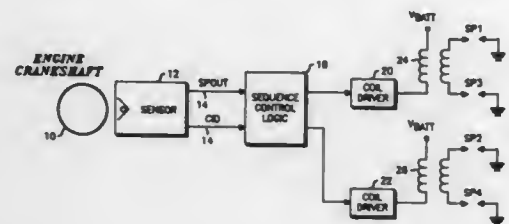
4,711,227 APPARATUS AND METHOD FOR ELECTRONIC IGNITION CONTROL

Edward L. Roselle, Leonard Foss, Lombard, and David Cousins, Carol Stream, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1986, Ser. No. 896,981
Int. Cl.⁴ F02P 5/145, 11/00

U.S. Cl. 123—643

31 Claims



1. In an ignition system employing a crankshaft and spark plugs, wherein at least one identifier signal is generated which is indicative of a crankshaft angle position and which may be used to identify a spark plug firing sequence, a method for selecting ones of the spark plugs to fire, comprising the steps of:

- determining whether or not a transition in the identifier signal has occurred;
- generating, in response to the absence of the identifier signal, a replacement signal independent of the crankshaft angle position; and
- selecting at least one of the spark plugs to fire from said generating replacement signal.

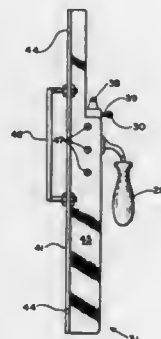
4,711,228 VERTICAL CROSS BOW AND REMOVABLE STOCK ASSEMBLY THEREFOR

Noah N. Gillespie, 58 Dobbins Rd., Waverly, Ohio 45690

Filed Jan. 12, 1987, Ser. No. 2,567
Int. Cl.⁴ F41B 5/00

U.S. Cl. 124—25

4 Claims



1. A crossbow comprising:

- a compound bow comprised of a rigid handle having an arrow rest disposed upon one side thereof, paired spring-like metal limbs attached to the extremities of the handle, paired pulley wheels associated with the free distal extremities of said limbs, and a bowstring having its extremities anchored to the handle and extending to engagement with said pulley wheels whereby the distance between

opposed pulley wheels is traversed twice in crossing relationship within the space embraced by the limbs, and traversed once in an outer wrap adapted to be drawn rearwardly away from the bow, and

- a stock assembly adapted to be removably attached to said handle to dispose said bow vertically, said stock assembly comprising:

- (1) an elongated rigid stock of substantially monolithic construction having a rearwardly disposed shoulder portion, and a forearm portion extending continuously from said shoulder portion to a forward extremity, said stock having opposed first and second side surfaces,
- (2) a trigger mechanism positioned at the junction of said shoulder and forearm portions,
- (3) a gripping handle attached to said first side surface within said forearm portion and extending laterally away from said side surface,
- (4) attachment means for removably attaching the stock assembly to the handle of the bow, and comprised of a vertically disposed sideplate bolted to said second side surface and an end plate perpendicularly emergent from said sideplate and bolted to the forward extremity of said stock, and
- (5) guide means associated with the first side surface for constraining the path of movement of the outer wrap of the bowstring to the path it would have in the absence of said stock assembly.

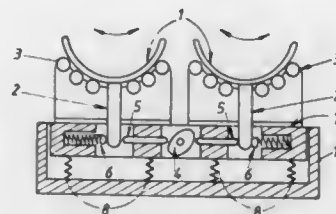
4,711,229 MASSAGING APPARATUS FOR THE LOWER EXTREMITIES OF THE BODY

Gerhard G. Hengl, Jneptnergasse 17/1/14, A-1220 Vienna, Austria

Filed May 7, 1986, Ser. No. 860,505
Int. Cl.⁴ A61H 7/00

U.S. Cl. 128—49

5 Claims



1. Apparatus for massaging the legs of a user, comprising a pair of arcuate massage components, each of said pair being formed as an axial section of an open-ended cylinder and having a concave surface adapted to receive a leg of a user and an oppositely disposed convex surface facing inwardly of said apparatus, a casing, a lever integrally mounted on said convex surface of each of said pair of massage components and having an end extending into said casing, first cam means adapted to act on said lever ends for displacing said levers along and opposite a first direction substantially perpendicular to the extent of said levers, motor means for driving said first cam means, and an arcuate array of cylindrical bearings individual to each of said pair of massage components and mounted on said casing, each said array of cylindrical bearings extending parallel to the axis of and contacting said convex surface of its corresponding massage component, whereby displacement of said levers along and opposite said first direction is translated into pivotal displacement of said pair of massage components about their respective axes.

4,711,230 CHIROPRACTIC ADJUSTMENT DEVICE

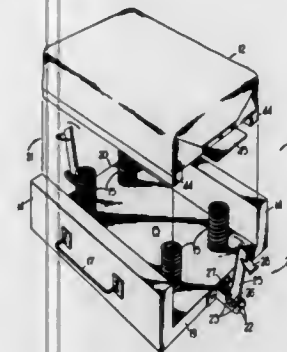
Michael Berke, and Matthew Rosman, both of 2070 Hidden Glen Dr., Marietta, Ga. 30067

Filed Jan. 2, 1986, Ser. No. 869,734

Int. Cl.⁴ A61F 5/00

U.S. Cl. 128—69

8 Claims



5. A chiropractic adjustment device comprising a base, a pair of catches pivotally mounted to opposite sides of said base, a set of springs mounted atop said base; a headrest mounted upon said set of springs; a pair of latch bars mounted to opposite sides of said headrest in engagement with said pair of catches, and wherein each of said catches includes an elongated bar spring biased against one of said latch bars that has a linear series of teeth configured to catch and hold said latch bars at a plurality of headrest positions under bias of said set of springs.

4,711,231 IMPLANTABLE PROSTHESIS SYSTEM

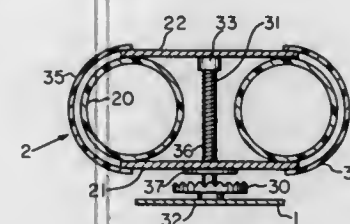
Aaron N. Finegold, 136 Beechwood La., Pittsburgh, Pa. 15206, and Maurice E. Taylor, Monroeville, Pa., assignors to Aaron N. Finegold, Pittsburgh, Pa.

Filed Nov. 3, 1986, Ser. No. 926,186

Int. Cl.⁴ A61F 2/26

U.S. Cl. 128—79

20 Claims



1. A surgically implantable prosthesis system including at least one flexible inflatable member, an impermeate housing, a flexible combination reservoir and pump means located within said housing for storing liquid when said inflatable member is deflated and for pumping liquid into said inflatable member to inflate said inflatable member, a flexible connecting means extending out of said housing from said combination reservoir and pump means to said inflatable member for permitting the passage of liquid between said combination reservoir and pump means and said inflatable member, a battery operated power means located within said housing, drive means located within said housing operatively connecting said power means to said combination reservoir and pump means to collapse said combination reservoir and pump means to force liquid out of said combination reservoir and pump means through said connecting means into said inflatable member and to expand said combination reservoir and pump means to receive liquid from said inflatable member, a battery located within said housing, an electric circuit located within said housing connecting said

battery to said power means and a pair of switches located outside of said housing and connected in said electric circuit between said battery and said power means to operate said power means, whereby closing one of said switches operates said power means and said drive means to collapse said combination reservoir and pump means to force liquid out of said combination reservoir and pump means into said inflatable member and closing the other of said switches operates said power means and said drive means to expand said combination reservoir and pump means so that liquid flows from said inflatable member into said combination reservoir and pump means.

4,711,232 BONE FASTENER AND METHOD OF INSTALLING SAME

Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3, and Wolfgang Kramer, Oberjettingen, both of Fed. Rep. of Germany, assignors to Artur Fischer, Waldachtal, Fed. Rep. of Germany

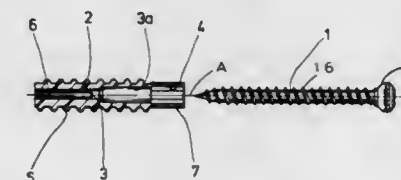
Filed Dec. 23, 1985, Ser. No. 813,224

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524946

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 YF

4 Claims



1. In a combination comprising a fastener and a threaded bore in a bone in which the fastener is anchored, the fastener being utilizable with hard and soft bones and comprising:

- a screw having a substantially cylindrical outer surface formed with a helical screw thread, the screw having at its screw thread a thread diameter and between the turns of the thread at the surface a root diameter smaller than the thread diameter; and
- an anchor sleeve of a resilient synthetic resin, defining and extending along an axis, normally fitted in the bore, of an outside diameter corresponding generally to the diameter of the bore, and having
- an outer end formed with an outwardly open polygonal-section recess,
- an inner end formed with an inwardly open and transversely throughgoing slot,
- an outer end portion of an inside diameter greater than the root diameter but smaller than the thread diameter,
- an inner end portion of an inside diameter smaller than the root diameter, and
- an external helicoidal screw thread extending about two-thirds of the length of the sleeve from its inner end toward its outer end,
- the screw thread of the sleeve having a rounded outer edge and the outer surface being rounded between the turns thereof.

4,711,233 METHOD AND APPARATUS FOR CEMENTING AN ACETABULAR CUP TO AN ACETABULUM

Byron L. Brown, 2315 Hendricks, Fort Smith, Ark. 72903

Filed Jun. 26, 1985, Ser. No. 748,856

Int. Cl.⁴ A61F 5/04

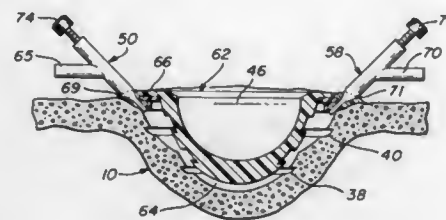
U.S. Cl. 128—92 VP

33 Claims

1. A method of attaching an acetabular cup to an acetabulum comprising the steps of:

- preparing said acetabulum for receiving said cup,
- cementing a retaining ring to said acetabulum in a substantially air tight placement such that a support for said cup

- is formed to hold said cup in spaced relationship with said acetabulum,
 c. placing said cup in said acetabulum supported by said ring,
 d. rigidly fastening said ring and said cup to said acetabulum,



- e. filling said space between said cup and said acetabulum with flowable cement under pressure, and
 f. maintaining said pressure until said flowable cement hardens thereby retaining said cup in said acetabulum in a fixed relationship.

4,711,234

BIO-COMPATIBLE RETENTION PIN, AND A PROSTHESIS INCLUDING SUCH A PIN

Michel Vives, Eynes, and Bernard Buttazzoni, Marseilles, both of France, assignors to Societe Europeen de Propulsion, Suresnes, France

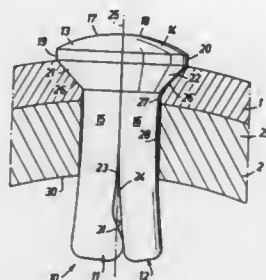
Filed Feb. 10, 1987, Ser. No. 14,375

Claims priority, application France, Feb. 11, 1986, 86 01840

Int. Cl.⁴ A61F 5/04, 2/28; F16B 15/00

U.S. Cl. 128—92 YF

6 Claims



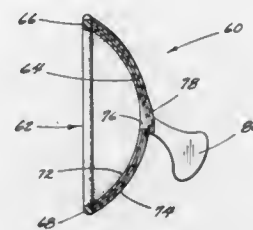
1. A retention pin for fixing a support plate or other prosthesis onto bone tissue, e.g. onto the cortical wall of a bone, said pin being made of a material which is bio-compatible with human tissue and comprising two half-pins each having a respective half-head for bearing against the plate, and a retention shank of generally semi-cylindrical outline, said half-pins being generally symmetrical to each other about a radial separation plane passing at least in part along the pin axis and extending up to the inside face of each half-head from which the respective retention shanks project, each shank being sufficiently long to pass through a wall of bone and to project therebeyond by a distance which is not less than the diameter of the fixing hole through said wall of bone, each shank also including locking means in the vicinity of the free end of the pin suitable for urging the two half-pins apart from each other so as to press them resiliently over at least a portion of their length against the inside wall of the fixing hole.

4,711,235
 INTRAVAGINAL DEVICE
 Robert E. Willis, 6606 N. Saginaw, Flint, Mich. 48505
 Continuation of Ser. No. 658,279, Oct. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 452,449, Dec. 23, 1982, abandoned, which is a continuation of Ser. No. 215,624, Dec. 12, 1980, abandoned. This application Aug. 13, 1986, Ser. No. 896,316

Int. Cl.⁴ A61F 5/46

U.S. Cl. 128—130

8 Claims



1. An intravaginal device comprising:
 a sheet member of flexible, fluid-impermeable material;
 a normally closed flap valve formed in said sheet member, said flap valve having an extension for actuating said flap valve between said normally closed position and an open position; and
 a supporting ring formed of a first resilient material attached to a border of said sheet material to force said sheet material into a cup-shape with four sides, one pair of opposing ones of said sides including a core formed of a second resilient material defining said ring sides as inwardly bent in a central area thereof, and another pair of said sides opposite one another formed entirely of said first resilient material, one said side being outwardly rounded and the other said side having an inwardly rounded configuration.

4,711,236

SURGICAL DRAPE

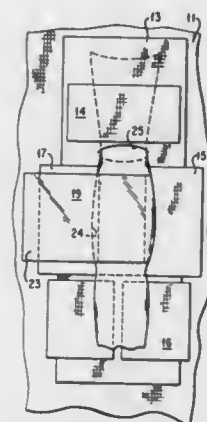
Jacob A. Glassman, 1680 Michigan Ave., Miami Beach, Fla. 33139

Continuation-in-part of Ser. No. 395,803, Jul. 6, 1982, Pat. No. 4,524,767. This application Feb. 25, 1985, Ser. No. 698,162

Int. Cl.⁴ A61F 13/00

U.S. Cl. 128—132 D

6 Claims



1. A surgical drape comprising a main drape and at least one absorbent sheet overlying and secured to said main drape, a common opening extending through the main drape and said absorbent sheet to receive a human limb extended there-through whereby an operable portion of said limb lies over the absorbent sheet, a plurality of sheets of liquid-absorbent towel secured to the absorbent sheet and surrounding said opening, a sterile incise drape comprising a transparent bacteriocidal

dal top sheet, an adhesive coating on the under surface of the top sheet, a protective bottom sheet adhesively joined to the top sheet face-to-face, a detachable flap on one edge of the top sheet adapting said incise drape to be secured to any site on the main drape, said top and bottom sheets of said incise drape being separable to expose the adhesive on its under surface, and a line of perforations dividing said transparent top sheet from the attached flap to permit complete separation of the transparent top sheet from the said flap, whereupon the freed sterile incise top sheet may be wrapped around and adhesively secured to the operable portion of the limb to completely and sterily enclose said operable portion.

4,711,237

PROTECTIVE SANITARY BARRIER FOR CPR DOLL

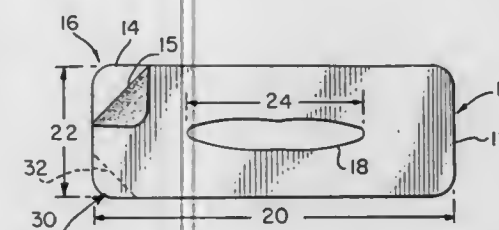
June Kaiser, 333 E. Ontario 813 B, Chicago, Ill. 60611

Filed Jan. 22, 1986, Ser. No. 821,462

Int. Cl.⁴ A61M 16/00

U.S. Cl. 128—136

7 Claims



1. A protective barrier adapted to be adhered onto the lips and lip region proximate thereto defining the oral opening of a CPR doll made of rubber-like plastic the barrier comprising a protective sheet of material substantially impervious to germs and bacteria sized to completely cover the lips and lip region of said CPR doll, said protective sheet having a central opening corresponding to the oral opening of said CPR doll and having an adhesive covering substantially all of one surface thereof; said adhesive being compatible with said rubber-like plastic of said CPR doll, being easily releasable from said CPR doll, and being removable therefrom such that any residue remaining on said CPR doll is easily removable therefrom; said protective sheet having a permanently affixed backing tab at a peripheral location on said one surface in order to facilitate the removal of said protective sheet from said CPR doll.

4,711,238

MENISCAL CUTTING DEVICE

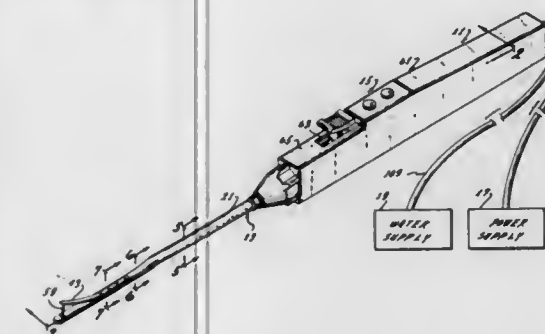
Frank W. Cunningham, 1801 Via Estudillo, Palos Verdes Estates, Calif. 90274

Filed Mar. 14, 1985, Ser. No. 712,378

Int. Cl.⁴ A61B 17/36

U.S. Cl. 128—303.14

19 Claims



1. An electrosurgical device comprising:

- an elongated probe having a distal end portion for insertion into an incision;
 first and second electrode supports;
 means for mounting the electrode supports on the probe, said first and second electrode supports being movable relative to each other to vary the spacing between the first and second electrode supports;
 a variable length flexible electrode for electrosurgery extending between the first and second electrode supports so that the length of the electrode can be varied by varying the spacing between the first and second electrode supports;
 means for controlling the spacing between the first and second electrode supports to thereby control the length of the electrode;
 means couplable to an electrical power supply for supplying electrical energy to the electrode for electrosurgery; and
 the first electrode support includes a resilient leaf spring, said mounting means couples the leaf spring to said probe so that the leaf spring has a free end which is resiliently movable relative to said second electrode support, and said electrode is coupled to said leaf spring adjacent said free end whereby the leaf spring can tension the electrode.

4,711,239

ELECTROSURGICAL INSTRUMENT

Oleg A. Sorochenko, ulitsa Chaikovskogo, 33b, kv. 105, and Igor F. Kondratiev, pereulok Jurievsky, 9, both of Kharkov, U.S.S.R.

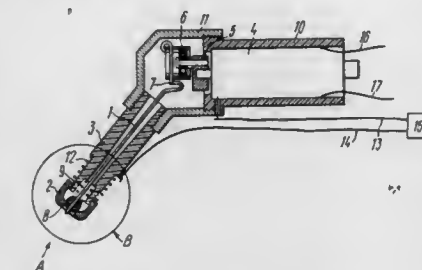
PCT No. PCT/SU85/00009, § 371 Date Aug. 26, 1986, § 102(e) Date Aug. 26, 1986, PCT Pub. No. WO86/04226, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 25, 1985, Ser. No. 915,248

Int. Cl.⁴ A61B 17/39

U.S. Cl. 128—303.14

3 Claims



1. An electrosurgical instrument, comprising:
 a cylinder-shaped body having an interior;
 a passive outer electrode mounted to an end of the cylinder-shaped body in coaxial relation therewith and made as a nut thread-joined with the body;
 an active central electrode shaped as a needle located in the interior of the cylinder-shaped body coaxially with the outer electrode and traversable with respect to the outer electrode;
 means for cleaning carbon deposits from said central electrode, said means including an insert made of an insulating material and accommodated inside the outer electrode, the insert being made as a spring-actuated ball having a central hole through which the central electrode is passed, the ball hole having an axis and a diameter equal to the diameter of the central electrode; and
 a power actuator rigidly coupled to the central electrode to impart reciprocating motion to the central electrode along the axis of the ball hole.

4,711,240

SURGICAL DISSECTOR

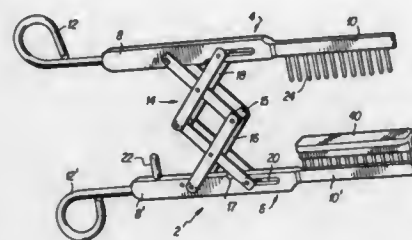
Benad Goldwasser, Rochester, Minn., and Culley Carson, Durham, N.C., assignors to Duke University Patents Foundation, Durham, N.C.

Filed May 15, 1986, Ser. No. 863,446

Int. Cl.⁴ A61B 17/00

U.S. Cl. 128—319

9 Claims



1. A surgical dissector for crushing friable organ tissue, comprising:
 - first and second parallel arms, each having an essentially planar surface;
 - means for moving said first and second arms toward and away from one another while maintaining said arms parallel to one another; and
 - a plurality of mutually parallel and cylindrical teeth mounted on and projecting from said planar surface of each of said first and second arms, said teeth on each of said arms projecting from said arm in a direction transverse to a length of said arm and forming an array extending along the length of said arm, all of said teeth having rounded distal ends and being positioned on said arms so as to be mutually interdigitated when said arms are moved toward one another to a closed position, wherein said teeth are positioned on said arms such that spaces are provided between said interdigitated teeth.

4,711,241

SURGICAL FILAMENT COATING

Leonard T. Lehmann, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

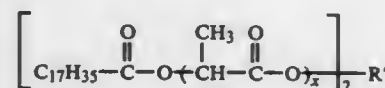
Filed Sep. 5, 1986, Ser. No. 903,799

Int. Cl.⁴ A61L 17/00

U.S. Cl. 128—335.5

1 Claim

1. A surgical filament comprising in combination a bioabsorbable suture or ligature manufactured from a copolymer containing at least one glycolic acid ester and trimethylene carbonate linkage, and having on the surface thereof a coating comprising a compound of the formula:



wherein x is at least 2 and R' is an alkaline-earth metal ion.

4,711,242

CONTROL SYSTEM FOR KNEE JOINT

Jerrold S. Petrofsky, Beavercreek, Ohio, assignor to Wright State University, Dayton, Ohio

Filed Feb. 18, 1986, Ser. No. 829,722

Int. Cl.⁴ A61N 1/32

U.S. Cl. 128—419 R

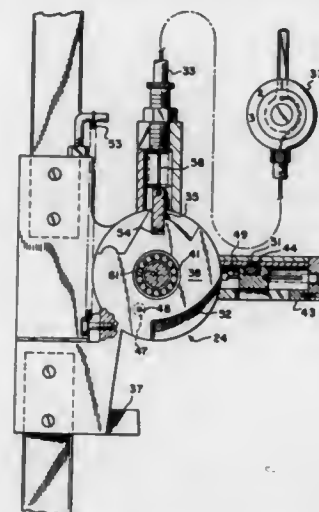
8 Claims

1. Apparatus for stimulated control of a knee joint in a paralyzed human leg comprising:
 - a brace for said leg; said brace being provided with an over-center hinge which opens when said knee joint flexes and which tends to lock under a vertically applied load if

opened less than a first predetermined angle when said load is applied,

a sensor for sensing the angle of opening of said hinge and generating a sensing signal indicative thereof,

control means connected for receiving said sensing signal, generating a reference signal representing a desired value for said angle of opening, and generating a command signal related to the difference between said sensing and



said reference signal; said command signal being non-responsive to changes in said sensing signal when said angle of opening is less than a second predetermined angle which is greater than zero and not greater than said first predetermined angle, and

stimulation means responsive to said command signal for stimulating muscles of said leg connected for causing extension of said knee joint.

4,711,243

CORTICAL HEARING AID

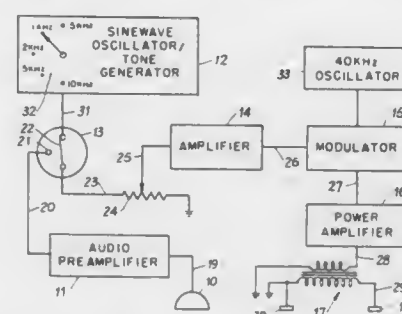
Curtiss R. Schafer, Norfolk, Conn., assignor to Cortronix, Inc., Newtown, Conn.

Filed Jul. 28, 1986, Ser. No. 890,027

Int. Cl.⁴ A61N 1/30

U.S. Cl. 128—420.5

18 Claims



1. A hearing aid comprising:
 - a microphone means (10) for detecting sound and producing an audio frequency signal representative of the detected sound;
 - a sinewave oscillator/tone generator means (12) for producing an audio frequency test signal;
 - variable resistance means (24);
 - switch means (13) operatively connected for selectively coupling said audio frequency signal and said audio frequency test signal to said variable resistance means;
 - amplifier means (14) operatively coupled to said variable

resistance means for amplifying said audio frequency signal and said audio frequency test signal;

amplitude modulator means (15) including an unbalanced bridge rectifier (34) operatively coupled to said amplifier means, and including a carrier frequency generator means (33) for producing a carrier frequency in the range of about 40 KHz, and including a first transformer means (35) operatively coupled to said carrier frequency generator means and to said unbalanced bridge rectifier for producing a composite signal;

power amplifier means (16) operatively coupled to said amplitude modulator means and being responsive to said composite signal for producing an amplifier composite signal;

second transformer means (17) operatively coupled to said power amplifier and being responsive to said composite signal for producing a stepped-up voltage signal representative of said amplified composite signal;

probe means (18, 30) responsive to said voltage signal for producing a probe signal representative of said voltage signal and for impressing said probe signal on the person of the user.

4,711,244

DIGITAL MOISTURE DERMATOMETER

David J. Kuzara, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

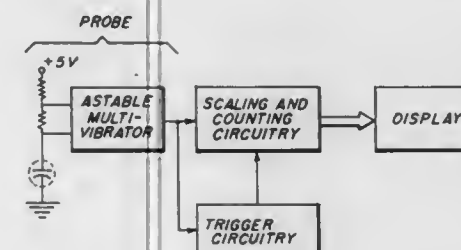
Continuation of Ser. No. 331,729, Dec. 17, 1981, abandoned.

This application Sep. 12, 1985, Ser. No. 775,939

Int. Cl.⁴ A61B 5/00

U.S. Cl. 128—632

5 Claims



1. An improved instrument of the type for making random, on demand measurements on the stratum corneum of the skin, said instrument having a stray field capacitance transducer for making said measurements, the improvement which comprises
 - (a) an oscillator circuit, comprising an oscillator of predetermined frequency and said stray field capacitance transducer, whereby said oscillator frequency varies in accordance with the capacitance measurement of said transducer,
 - (b) a readout means adapted to receive and display said oscillator frequency, and
 - (c) a trigger means coupled to said oscillator circuit and said readout means for obtaining a reading on said readout means, said trigger means comprising means to provide a fixed frequency, means to compare said fixed frequency to said oscillator frequency, and means to enable said readout means when said oscillator frequency exceeds said fixed frequency.

4,711,245

SENSOR FOR COMPONENTS OF A LIQUID MIXTURE

Irving J. Higgins, Bedford; Hugh A. O. Hill, Oxford, and Elliot V. Plotkin, Bedford, all of United Kingdom, assignors to Genetics International, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 436,106, Oct. 22, 1982, Pat. No. 4,545,382. This application May 7, 1984, Ser. No. 607,699

Claims priority, application United Kingdom, May 5, 1983, 8312259; Feb. 29, 1984, 8405262; Feb. 29, 1984, 8405263; Oct. 23, 1984, 813034

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.⁴ A61B 5/00

U.S. Cl. 128—635

27 Claims



1. An electrode sensor system for sensing the presence of at least one selected component of a mixture of components, said sensor system comprising:
 - (a) at least two electrically conducting means insulated from each other, each said conducting means having an electrically conductive surface for transferring electrical signals, each said surface being adapted to be in electrical contact with said mixture,
 - (b) an enzyme, the catalytic activity of said enzyme being indicative of the presence of said component,
 - (c) a mediator compound which transfers electrons between said enzyme and one said conductive surface when said enzyme is catalytically active, said mediator being an organometallic compound which comprises at least two organic rings, each of which is characterized by at least two double bonds that are conjugated and a metal atom in electron-sharing contact with each of said rings, and
 - (d) means for measuring current resulting from said electron transfer at said one conductive surface, said measuring means being electrically connected to each of said electrically conducting means.

4,711,246

FIBER OPTIC COUPLED PRESSURE TRANSDUCER USING SINGLE FIBER AND METHOD OF FABRICATION

Richard Alderson, Phoenix, Ariz., assignor to Fiberoptic Sensor Technologies, Inc., Ann Arbor, Mich.

Filed Sep. 2, 1986, Ser. No. 902,666

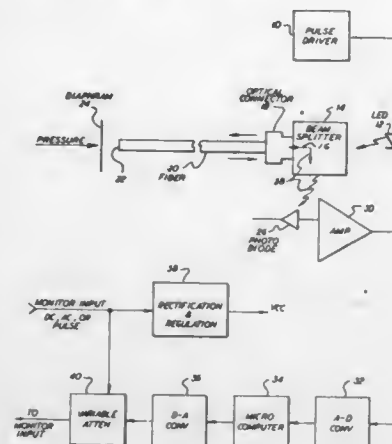
Int. Cl.⁴ A61B 5/02

U.S. Cl. 128—667

10 Claims

1. A fiber optic pressure transducer comprising:
 - (a) light generating means;
 - (b) an elongated, optical fiber having a first terminal end positioned to receive light from said generating means and a second terminal end to which said light is carried through said fiber;
 - (c) a deformable member having a first, light reflecting surface positioned in opposed, spaced relation to said second terminal end and movable with respect thereto in accordance with the pressure exerted on the opposite side of said deformable member from first surface;
 - (d) a layer of light absorptive material interposed between said second terminal end and said light reflecting surface and having a plurality of openings therethrough, whereby a portion of said light carried through said fiber to said second terminal end passes through said openings and another portion is intercepted by said layer, and a portion

of the light passing through said openings and reflected by said reflecting surface passes back through said openings and is carried back through said fiber and another portion is intercepted by said layer; and



(e) means for generating an electrical signal commensurate with the intensity of light carried back through said fiber, said intensity being a function of the distance between said second terminal end of said fiber and said reflecting surface and thereby of said pressure exerted on said opposite side of said deformable member.

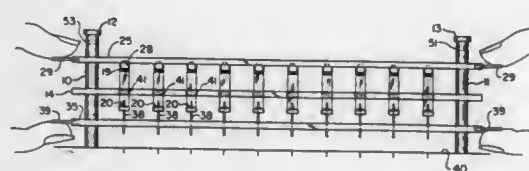
4,711,247

ALLERGY TESTING METHOD AND APPARATUS
Henry Fishman, 5173 Linnean Ter. NW., Washington, D.C. 20008

Filed Apr. 18, 1986, Ser. No. 853,710
Int. Cl.⁴ A61B 15/00, 17/20

U.S. Cl. 128-743

24 Claims



13. A method of testing a patient for a plurality of allergies at substantially the same time, comprising:

providing a plurality of allergen sources and a plurality of spaced apart movable pricking means for pricking the skin of a patient when said pricking means are moved from an inactive position out of contact with the skin of the patient, to an active position in contact with the skin of the patient, each of said pricking means being associated with a respective one of said allergen sources;

said allergen sources and pricking means being mounted and supported on a carrier means, an actuating means being movably coupled to said carrier means for relative movement therebetween;

placing at least a portion of said carrier means on the skin of a patient and placing said pricking means adjacent to the skin of the patient in said inactive position out of contact with said skin; and

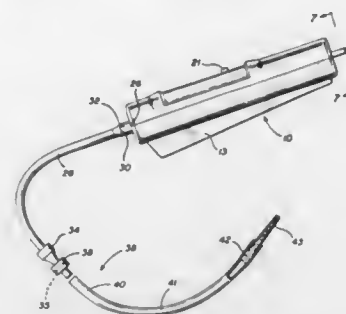
moving said actuating means relative to at least a portion of said carrier means for substantially simultaneously moving each of said pricking means from said inactive position to said active position thereof to prick the skin of the patient and for applying an allergen from respective allergen sources to the skin of the patient via said associated pricking means.

4,711,248 PHYSIOLOGICAL PRESSURE MONITOR

Robert R. Steuer, Salt Lake City, Utah, and David H. Harris, Boise, Id., assignors to Biokinetics, Inc., Salt Lake City, Utah
Filed Dec. 1, 1983, Ser. No. 556,912
Int. Cl.⁴ A61B 5/00, 5/04

U.S. Cl. 128-748

7 Claims



1. A physiological pressure device for continuously monitoring a muscle compartment of a patient, said device comprising: a portable housing including means for attaching said housing in proximity to a muscle bundle associated with the muscle compartment of the patient being monitored; an elongated implantable catheter having one end terminating in a probe exhibiting wicking action, said probe adapted to be implanted within the muscle compartment of the patient;

pressure sensing means disposed in said portable housing means and connected to the other end of said catheter means for sensing pressure in said muscle compartment by way of said implanted probe;

means within said housing and responsive to said pressure sensing signal for providing a first information signal indicative of the pressure inside said muscle compartment; stimulating means including electrode means mounted on the skin of the patient adjacent said muscle compartment for controllable delivering a shock to the exterior skin in the vicinity of the muscle compartment being monitored; pick-up means contacting the exterior skin adjacent the muscle compartment of the patient for sensing the action potential developed when said stimulating means is delivering a shock;

means within said housing and responsive to the output of said pick-up means for providing a second information signal indicative of the amplitude of the action potential of said muscle bundle;

means within said housing and responsive to said second information signal for providing a third information signal indicative to the nerve conduction velocity through said muscle bundle;

display means for displaying said information signals in eye-readable form; and means for selectively passing said information signals to said display means.

4,711,249

CIRCUMFERENTIAL MEMBRANE, FLUID COUPLED CATHETER

Albert E. Brooks, 1730 Ocean Oaks, Carpinteria, Calif. 93013
Filed Jul. 23, 1986, Ser. No. 889,103
Int. Cl.⁴ A61B 5/00

U.S. Cl. 128-748

6 Claims

1. A fully circumferentially responsive medical catheter having a longitudinal axis, and comprising: a longitudinally elongated circularly sectioned support tube for insertion into a body region to be investigated, said support tube having an internal lumen with an internal wall, and being divided into a plurality of lengths, each length having an end;

a rigid insert inserted into the lumen of two adjacent lengths, making a sealing fit therewith, portions of said lengths overlapping said insert with their ends spaced apart from one another to leave a spacing between them, said insert having a cylindrical outer wall and an internal chamber, there being a port through said wall interconnecting said chamber and closing said spacing, and a closure at each end of said chamber closing the same, one closure being rigid and the other closure being elastically flexible to respond to pressure changes in the chamber;



a flexible membrane extending entirely around said spacing and overlapping said ends of said lengths, whereby to close said spacing, leaving the spacing as a continuous peripheral cavity and retain a liquid within said spacing and chamber, said spacing and chamber thereby containing said liquid as an encapsulation inside said membrane; insert and closures; sensor means responsive to flexure of the flexible closure and thereby to pressure in said chamber; and connector means connected to said sensor means adapted to connect the sensor means to means for providing a signal proportional to pressure in said chamber.

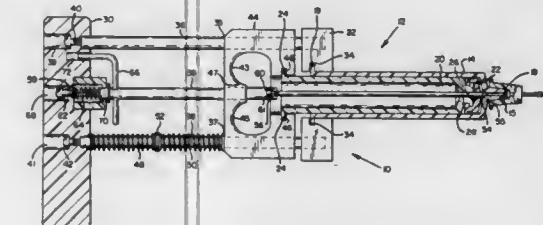
4,711,250

HAND-HELD MEDICAL SYRINGE ACTUATOR DEVICE
James H. Gilbaugh, Jr., 2902 SW. Canterbury, Portland, Oreg. 97201, and Charles B. Willock, 16222 SE. Oatfield Rd., Milwaukie, Oreg. 97222

Filed Sep. 9, 1986, Ser. No. 905,788
Int. Cl.⁴ A61M 5/00

U.S. Cl. 128-765

11 Claims



1. A syringe-type medical device for holding a syringe of the type having a syringe cylinder which slidably receives a plunger, the device comprising:

a frame; the frame including means for removably holding the syringe cylinder; a movable finger-engaging member slidable on the frame from an initial position to a retracted position, the movable finger-engaging member having means for removably holding the plunger; a movable valve stem mounted on the frame; a spring urging said valve stem in a predetermined direction for valve seating purposes; and finger engaging means for applying a retracting and unseating force to the valve stem.

4,711,251

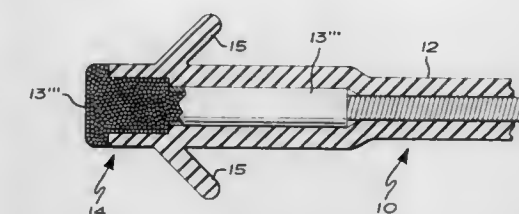
BODY IMPLANTABLE LEAD

Kenneth B. Stokes, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 182,963, Sep. 2, 1980, abandoned. This application Mar. 31, 1983, Ser. No. 480,913
Int. Cl.⁴ A61N 1/04

U.S. Cl. 128-784

3 Claims



1. In a body implantable lead for the delivery of stimulation energy to a desired body site of the type having at least one electrode carried by the lead, said electrode being adapted for positioning at least adjacent to said desired body site, the improvement wherein said lead further comprises drug dispensing means carried by said lead and includes means for storing a drug to be dispensed while allowing dispensing of said drug at least adjacent the distal end of said lead to counter undesirable interactions between said lead and the body and wherein said drug is compounded into a solid material, said solid material being carried by said lead adjacent said distal end.

4,711,252

METHOD AND APPARATUS FOR MOUNTING CONCAVES

Richard P. Bernhardt, Leola, and Robert L. Bowman, Ephrata, both of Pa., assignors to New Holland Inc., New Holland, Pa.

Filed Apr. 7, 1986, Ser. No. 848,507
Int. Cl.⁴ A01F 12/28

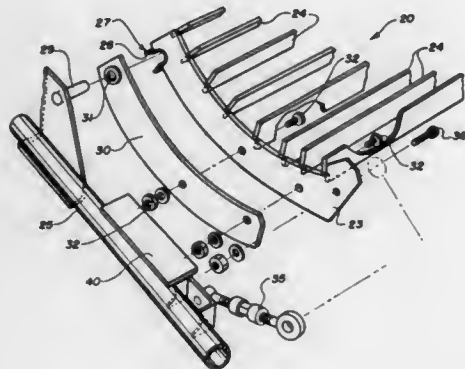
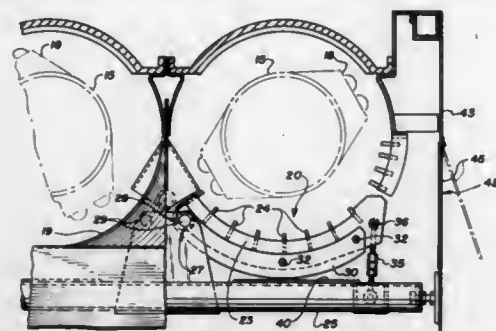
U.S. Cl. 130-27 S

14 Claims

1. In an axial flow combine harvester having a mobile frame supporting a pair of transversely spaced side sheet and a threshing and separating rotor supported by said frame and extending in a generally longitudinally extending direction, said rotor being cooperable with a concave peripherally positioned relative to said rotor and having transversely extending, longitudinally spaced concave frame members supporting longitudinally extending rub bars cooperable with said rotor to harvest grain from crop material fed between said rotor and said concave, said concave being adjustably supported on a mounting frame to permit movement of said concave relative to said rotor, the improvement comprising:

said concave being provided with clevis means to permit engagement thereof from a transverse direction with longitudinally extending mounting pins supported by said mounting frame to permit the mounting of said concave on said mounting frame from an access opening in one of said side sheets transversely opposite said mounting pins, said concave being detachably fastened to said mounting frame by connecting links at locations spaced from said mounting pins and said concave further includes linkage

means detachably connected to said concave frame members and associated with said clevis means to positionally



retain said clevis means on said mounting pins during operation of said combine harvester.

4,711,253

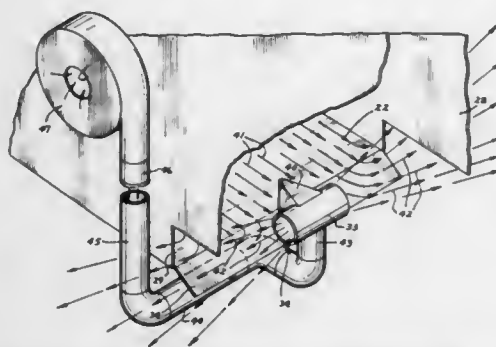
CHAFF BLOWER FOR COMBINES

Joseph A. Anderson, Jamestown, N. Dak., assignor to Haybuster Manufacturing, Inc., Jamestown, N. Dak.
Filed May 19, 1986, Ser. No. 864,713

Int. Cl.⁴ A01F 12/48, 29/12

U.S. Cl. 130-27 R

10 Claims



1. In a combine having means for separating grain, including a chaff seive extending in fore and aft directions which discharges chaff outwardly at the rear end of the combine, the improvement comprising:

means for spreading the chaff laterally of the width of the chaff seive comprising a nozzle member;

means to mount said nozzle member substantially centered on the central longitudinal center line of said combine, said nozzle member having openings facing in opposite directions and forming an air path that is on a nozzle

member center line generally perpendicular to the longitudinal axis of the combine; and
air supply means to provide a high pressure flow of air from said nozzle along the nozzle member center line in opposite directions laterally from the longitudinal centerline of said combine to cause spreading of chaff coming off the chaff seive laterally from said longitudinal centerline.

4,711,254

CIGAR HOLDER

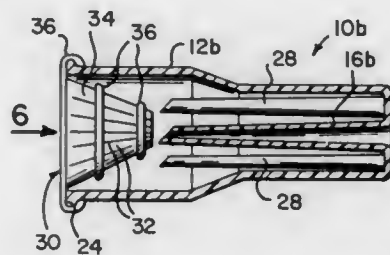
Nathaniel Fleisher, 8361 NW 29th Street, Sunrise, Fla. 33322, and George Spector, 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Mar. 14, 1986, Ser. No. 839,640

Int. Cl.⁴ A24F 7/02, 13/08

U.S. Cl. 131-189

2 Claims



1. A cigar holder comprising a thin cylindrical shaped tube formed of pliable material and adapted at a first open end to receive the butt end of a cigar, said tube further having a second closed mouth end having a plurality of apertures formed therein, said tube further having a plurality of substantially parallel hollow tubular punch members, each punch member extending inwardly from one of said apertures and being provided with a beveled point at the inward end thereof adapted to pierce the butt end of said cigar and to allow free drawing of smoke through the respective punch, one of said punch members substantially coaxial with said tube, said tube further having a drip ring formed around the outer portion of said first open end adapted to prevent moisture from the mouth of the user from wetting the cigar, said tube having a reduced cross section toward the second mouth end thereof, a funnel shaped adapter extending centrally inwardly from said first end and having means for removably securing the adapter onto said drip ring, said adapter further having a plurality of slots forming fingers therebetween, thereby providing a means for holding variously sized cigars, said adapter also being provided with elastic bands around said fingers.

4,711,255

METHOD AND SYSTEM FOR EFFECTING SENSORY EVALUATION OF A SMOKING PRODUCT

Anne S. Syvarth, Kernersville; Harvey H. Gordin, Winston-Salem; Paul D. Early, Jr., Winston-Salem; Kathy A. Needs, Pfafftown, and Thomas A. Perfetti, Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sep. 15, 1986, Ser. No. 907,555

Int. Cl.⁴ A24F 13/00

U.S. Cl. 131-330

14 Claims

8. A method for effecting sensory evaluation of a smoking product having an end adapted for insertion into the mouth of a smoker and containing an elongated body of smokable material that is gradually consumed by a fire cone which moves toward the mouth end during the smoking process, said method comprising the steps of

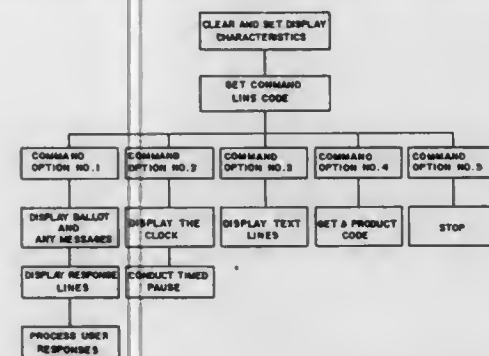
(a) providing a computer and associated display screen having touch sensitive capabilities for communicating instructions and prompts to a sensory evaluation panelist and for receiving responses from said panelist by a stimu-

lus brought into contact with or close proximity to a portion of the display screen,

(b) programming said computer with specific routines and information to generate a predetermined sequence of instructions and prompts on said display screen and to receive responses from said sensory evaluation panelist via the touch sensitive display screen,

(c) presenting said sensory evaluation panelist with a smoking product to be smoked and specifying an attribute to be evaluated,

(d) designating a plurality of segments of predetermined lengths along the elongated body of smokable material,



(e) instructing said sensory evaluation panelist to assign a rating to said attribute as the fire cone moves through each segment designated along said elongated body of smokable material, said rating to be assigned reflecting the intensity of the attribute perceived by said panelist,

(f) receiving a sensory evaluation rating from said panelist for each of said segments reflecting the intensity of said attribute perceived by the panelist as the fire cone moves through each segment and

(g) arranging the sensory evaluation ratings received from said panelist to show any variation in the perceived intensity of said attribute during the smoking process.

4,711,256

METHOD AND APPARATUS FOR REMOVAL OF SMALL PARTICLES FROM A SURFACE

Robert Kaiser, 12 Glengarry, Winchester, Mass. 01890

Filed Apr. 19, 1985, Ser. No. 725,062

Int. Cl.⁴ B08B 3/02, 30/00, 3/12

U.S. Cl. 134-25.4

14 Claims

1. A method for the removal of sub-micron particles from a surface, which comprises the steps of:

A. washing the surface in a solution of at least about 0.1 weight percent of a high-molecular-weight highly-fluorinated organic surfactant in a non-polar highly-fluorinated organic carrier liquid to remove the particles from the surface and disperse them in the solution;

B. subsequently rinsing the surface in a rinsing liquid consisting of a highly-fluorinated organic liquid to remove the surfactant residue therefrom; and

C. removing the rinsing liquid from the surface.

4,711,257

VEHICLE WASHING APPARATUS

Minoru Kobayashi, Tokyo, Japan, assignor to Nisshin Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 873,775

Int. Cl.⁴ B08B 3/00; B24B 5/00

U.S. Cl. 134-56 R

2 Claims

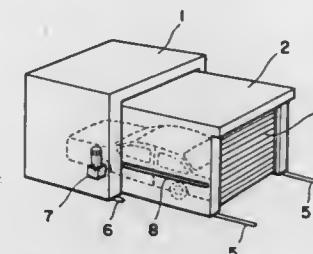
1. An apparatus for washing an automotive vehicle, said apparatus comprising:

an outer hood having an open front end and a closed rear end;

an inner hood within said outer hood and movable in and out of said outer hood through the open end thereof,

said inner hood having an open front end and an open rear end, and a shutter for closing over the front end thereof, the outer hood and the inner hood with the shutter closed over the front end thereof defining a washing chamber in which the vehicle is washed;

a pair of parallel guide rail means along which said inner hood moves in and out of said outer hood through the open end thereof; and



washing liquid spraying means within said outer and said inner hood for spraying water on the vehicle in the washing chamber during a first cleaning stage, for spraying water containing a powder onto the vehicle during a second cleaning stage, and for spraying fresh water onto the vehicle during a third cleaning stage at a pressure that is high enough to cause the powder sprayed onto the vehicle during the second stage to move on the surface of the vehicle to remove any dust from the surface of the car.

4,711,258

APPARATUS FOR CLEANING PAINT ROLLER

Richard F. Rossborough, Gladstone Park, and Graeme Whitty, Springvale South, both of Australia, assignors to M. J. Chapman; G. K. Sherlock; J. F. Kilby and R. W. Robertson, all of Victoria, Australia

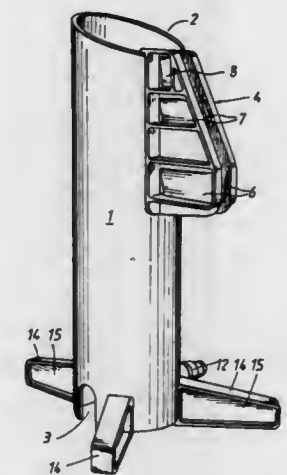
Filed Jul. 7, 1986, Ser. No. 882,405

Claims priority, application Australia, Jul. 5, 1985, PH01338; Aug. 13, 1985, PH01917

Int. Cl.⁴ B08B 3/02

U.S. Cl. 134-138

12 Claims



11. An apparatus for cleaning a paint roller having a connecting arm and a paint roller cover and a connecting arm, comprising:

an elongated housing for receiving the paint roller cover therein;

a liquid outlet member having a plurality of holes opening into the housing and from which, in use, liquid may emerge under pressure;

a drainage opening in the housing through which, in use, liquid may drain from the housing; and
 a locating member on the housing for locating the connecting arm of the roller such that, in use, the paint roller cover may be positioned within the housing where liquid emerging from the liquid outlet member holes may strike the roller causing the roller to rotate, the locating member including a plurality of pairs of resiliently flexible fingers, the fingers of each pair being arranged in spaced-apart relationship so as to define a gap therebetween in which, in use, the connecting arm may be received for being releasably gripped between the fingers, so that the connecting arm may be manually slid between the fingers, while remaining gripped therebetween, in directions across and along the fingers for altering longitudinal and lateral disposition of the paint roller cover within the housing relative to the outlet member holes.

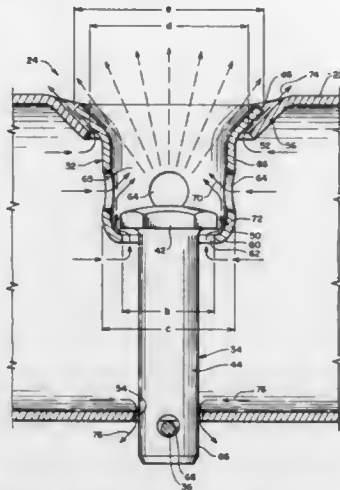
4,711,259

MILK TANK CLEANING APPARATUS AND METHOD
 Timothy J. Martin, Jr., Lynden, and Richard T. Henry, Bellingham, both of Wash., assignors to Light Industrial Design Company, Lynden, Wash.

Filed Dec. 5, 1984, Ser. No. 678,268
 Int. Cl.⁴ B08B 3/02

U.S. Cl. 134—166 R

38 Claims



1. A spray assembly adapted to wash an interior of a tank, such as a milk tank, said assembly comprising:

- a. a pipe which is adapted to be positioned in said tank, said pipe having a lengthwise axis and comprising a pipe wall defining a flow passageway, said pipe having first and second through apertures formed in the pipe wall, said apertures being aligned with each other along an axis of alignment which has a substantial alignment component generally perpendicular to the lengthwise axis of the pipe;
- b. a nozzle assembly comprising:

1. a discharge nozzle adapted to be mounted in an operating position at said first aperture, said discharge nozzle comprising a side wall having an upper circumferential edge defining a substantially unobstructed upper outlet, said sidewall defining and extending substantially around an impact chamber positioned below the outlet and immediately adjacent thereto, said sidewall having first opening means arranged to direct streams of water radially inwardly into said impact chamber, said first opening means being positioned below the upper circumferential edge of the side wall at a predetermined location so that said streams interact in the impact chamber to form an expanding liquid spray that proceeds directly from the impact chamber upwardly and laterally outwardly from the outlet in an expanding spray pattern;

2. a locating member having a first connecting end ar-

ranged to be engaged to said nozzle, a body portion, and a retaining end adapted to extend to said second aperture;

3. a retaining member adapted to releasably engage the retaining end of the locating member to retain the locating member in the pipe and thus maintain the nozzle positioned at the first aperture;

whereby, when the spray assembly is in its operating position, the discharge nozzle is positioned at the first aperture and engaged by the locating member, the retaining member engaging the retaining end of the locating member to maintain the nozzle positioned in the first aperture, and liquid flowing in said pipe can be discharged through said nozzle, and by releasing the retaining member from engagement with the locating member, the nozzle, locating member and retaining member can be removed from the pipe.

4,711,260

APPARATUS WHICH IS CONVERTIBLE BETWEEN AN UMBRELLA AND A GOLFING BACKSTOP

Terry G. Wleas, 1814 196th Street, Langley, British Columbia, Canada V3A 4P4, and William L. Featherston, P.O. Box 1939, Squamish, British Columbia, Canada V0N 3G0

Filed May 23, 1986, Ser. No. 866,784

Int. Cl.⁴ A45B 3/00

U.S. Cl. 135—16

11 Claims



1. An apparatus having a first operational mode for use as an umbrella and a second operational mode for use as a backstop to interrupt the travel of a ball, said apparatus comprising:

- a. canopy means including (i) a canopy cover having a middle portion, an outer radial portion, and an upper surface, and (ii) a plurality of flexible canopy support ribs, each of which has an inner end portion and an outer end portion, said canopy cover being connected to said canopy ribs in a manner that the inner end portions of the ribs support the middle portion of said canopy cover and the outer end portions of the ribs support the outer radial portion of said canopy cover;

- b. a support shaft including (i) a lower handle end, and (ii) an upper canopy end to which the inner end portions of said canopy support ribs are pivotally connected; and

- c. actuating means for moving said canopy means between (i) a closed position where said canopy ribs have a substantially unbended configuration and said canopy ribs extend in a first downward direction toward said handle end, (ii) an open position in which said canopy ribs have a bended configuration and the outer radial portion of said canopy cover extends downwardly from said middle portion, (iii) a first open inverted position where said canopy ribs extend upwardly in a substantially unbended manner toward said canopy end and the outer radial portion of said canopy cover extends upwardly from said middle portion of said canopy cover, and (iv) a second open inverted position where said canopy ribs have a bended configuration and said outer radial portion of said canopy cover extends upwardly from said middle portion of said canopy cover so that said upper surface of said canopy cover has a concave-like configuration, said canopy actuating means including extension and retraction means which are operatively engaged to said canopy ribs at respective first connecting locations between said inner end portions and said

outer end portions of said canopy ribs for operation in a manner so that upward movement of said extension and retraction means toward said canopy end causes pivotal movement of said canopy ribs in a radial direction outwardly from said shaft to a location where the apparatus is secured in said first open position and in said first operational mode, and that further upward movement of said canopy extension and retraction means causes said canopy cover to cross an overcenter location and to occupy said first open inverted position, and then opposite downward movement of said extension and retraction means from open inverted position toward said handle end without crossing the overcenter location displaces said first locations of said canopy ribs downward toward said handle end to place said canopy means in said second open inverted configuration for use in said second operational mode; and

- d. fastening means which are connected to said shaft and which engage said extension and retraction means when said canopy means is in (i) the first open position, and (ii) the second open inverted position, to prevent movement of said extension and retraction means in the upward or downward direction and to secure said apparatus in the first and second operational modes, respectively.

4,711,261

CUSHIONING CRUTCH SUPPORT COVERING
 Carol S. Rosenberg, 14 Red Rock Trail, Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 628,256, Jul. 6, 1984, abandoned. This application Nov. 18, 1985, Ser. No. 798,984

Int. Cl.⁴ A61H 3/02

U.S. Cl. 135—72

6 Claims



1. A cushioning covering for a load bearing member of a medical crutch, the crutch having a pair of transversely spaced columns, and the load bearing member comprising an underarm support fixed generally between the upper ends of the columns and a cushion disposed upon the underarm support, said cushioning covering comprising:

an enclosed-volume-defining element formed of a cushioning fabric that is washable, soft to the touch and perspiration absorbent, said element having top and side portions sized to tightly engage the top and side portions of said cushion and first and second end portions between said side portions, said end portions having first and second peripheral portions, said element having an opening provided by said side portions and said peripheral portions of said end portions and sized and adapted for passage of the underarm support and cushion through said opening into the volume of said element defined by said top, side, and end portions, and means disposed adjacent said opening for releasably securing said cushioning covering tightly about the entire surface

of the load-bearing member, said securing means comprising:

elastic means for gathering said first and second peripheral portions beneath an underarm support, about exposed, outer edges of crutch columns, and
 first and second elongated flaps extending from said side portions and adapted for overlapping interengagement along the lengths of said elongated overlapping flaps beneath the underarm support, between opposed inner edges of crutch columns, to provide tight secured fitting of said covering entirely around said load bearing member.

4,711,262

UNI-DIRECTIONAL/BI-DIRECTIONAL GATE VALVE
 Don B. Wafer, and Claud C. Barrington, both of Houston, Tex., assignors to FMC Corporation, Chicago, Ill.

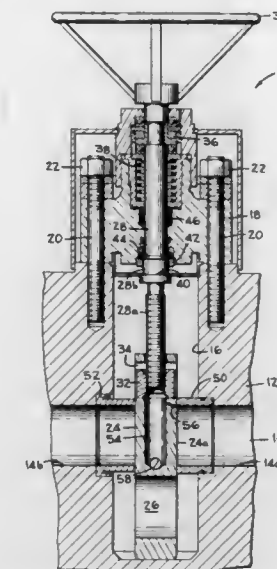
Continuation of Ser. No. 696,959, Jan. 31, 1985, abandoned.

This application Mar. 3, 1986, Ser. No. 837,317

Int. Cl.⁴ F17D 1/18

U.S. Cl. 137—14

2 Claims



1. A method of changing the sealing mode of a gate valve from bi-directional to uni-directional, said gate valve comprising:

- (a) a valve body with a flow passage, a gate valve chamber intersecting said flow passage, a bi-faced valve gate in the chamber, and valve seat means;
- (b) the valve gate being positionable in a range of bi-directional flow positions to pass fluid flow in the passage;
- (c) the valve gate, in cooperation with the valve seat means, operable in a first position to provide bi-directional sealing;
- (d) the valve gate having relief port means operable in a second position of the valve gate to provide communication between the gate valve chamber and a first face of the valve gate, the valve seat means cooperating with a second face of the valve gate to block fluid flow directed out from the second face into the passage in the case of the first face facing upstream and the second face facing downstream, but to let fluid flow in the opposite direction past said second face into the gate chamber and thence through the relief port means and out from the first face; and

(e) means for moving the valve gate between the positions; the method comprising the steps of:

- (1) operating the moving means for placing the valve gate in one of the bi-directional flow positions or the first position; and
- (2) operating the moving means to station the valve gate in the second position for uni-directional sealing.

4,711,263

DOUBLE-ACTING VALVE SYSTEM FOR UNDERWATER BREATHING OR THE LIKE

Nils T. Ottestad, Lyngun 27, 3100 Tønsberg, Norway, assignor to Nils T. Ottestad, Tønsberg and Den Norske Stats Oljeselskap A.S., Stavanger, both of, Norway

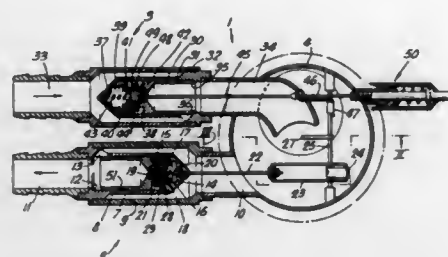
Filed Sep. 15, 1986, Ser. No. 907,102

Claims priority, application Norway, Sep. 18, 1985, 853654

Int. Cl.⁴ A62B 7/04

U.S. Cl. 137-102

4 Claims



1. A double-acting valve device, especially a demand breathing regulator for divers, comprising
a chamber having a flexible diaphragm arranged therein and forming a wall of the chamber,
an inhalation valve and an exhalation valve of which each is in communication with said chamber, and
operating means including a transmission mechanism interconnecting said diaphragm and said valves, the mechanism being arranged to open the inhalation valve upon movement of said diaphragm inwardly in the chamber from an intermediate position, and to open the exhalation valve upon movement of said diaphragm outwardly in the chamber from said intermediate position,
said valve being oppositely oriented in relation to said chamber and each of said valves having an inlet side and an outlet side and being of the type comprising
a valve body in the form of a main piston which is slidably arranged in a piston guide, a sealing seat for the piston at one end of the piston guide, and the other end of the piston guide having a closed end portion and defining together with an end face of the piston, a chamber communicating through a narrow passage with the outlet side, the piston being provided with a pressure-equalizing channel between the chamber and the outlet side, and a control valve arranged to close and open said channel by an operating means connected to said transmission mechanism and arranged to move the piston away from its seat only after having opened said control valve,
said control valve comprising a piston-shaped valve stem which is slidable in a cylindrical guide in the main piston and cooperates with a seat in said end face of the main piston, and said valve stem being connected to said operating means, and an axial lost-motion connection between said valve stem and the main piston, said lost-motion connection comprising at least one protruding pin carried by said valve stem within a short axial slot in the main piston.

4,711,264
PLUG VALVE

Richard J. Medvid, Cookeville, Tenn., assignor to The Duriron Company, Inc., Dayton, Ohio

Filed Nov. 13, 1986, Ser. No. 930,195

Int. Cl.⁴ B08B 3/00, 9/00; F16K 51/00

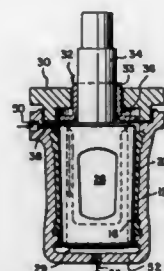
U.S. Cl. 137-241

3 Claims

1. A plug valve providing internal sterilization of the plug without disassembly, including a casing having a plug cavity and inlet and an outlet port opening into said cavity, a plug having upper and lower end surfaces and a side wall, said plug received in said casing having a through port through said side wall selectively alignable with said casing ports, and seal

means in said casing cooperating with said plug side wall and isolating said ports with respect to said plug, the improvement comprising:

means in said plug defining a pair of steam passages extending generally longitudinally through the interior of said plug in non-intersecting and adjacent relation to said through port, one each of said steam passages on each side of said through port, and each said passage opening at one of said plug end surfaces,



means in said casing for conducting sterilizing steam to said pair of passages at said one plug end surface for sterilizing the exterior of the plug, the through port, and the seal means by heat conduction without direct steam sterilization being applied to the exterior of the plug, the through port, and the seal means to prevent the possibility of contamination, and
means in said casing for removing steam from said passages.

4,711,265
SPRING AND WASHER DEVICE

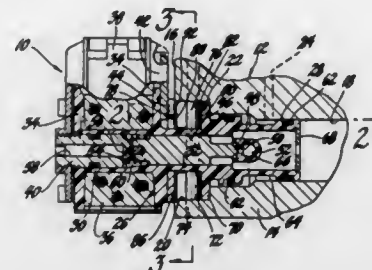
Ronald G. Davis, Anderson; Charles D. Denniston, Middletown, and Richard K. Van Skyock, Yorktown, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 16, 1987, Ser. No. 26,192

Int. Cl.⁴ F15B 13/044

U.S. Cl. 137-454.2

3 Claims



1. In a pin-type cantilever mounting arrangement for a solenoid valve on a control valve body;
said control valve body including a planar wall, a fluid pressure bore perpendicular to and intersecting said planar wall, and a counterbore in said planar wall around said fluid pressure bore; and
said solenoid valve including a tubular plastic body having an O-ring end and a coil end separated by a minimum wall thickness flux gap portion, an annular plastic flange on one side of said flux gap portion, and a coil body rigidly connected to said sleeve on the other side of said flux gap portion at said coil end;
said O-ring end of said sleeve being plugged into said pressure bore with said annular flange abutting the bottom of said counterbore whereby said coil body end and said flux gap portion of said plastic body are supported on said control valve body in cantilever beam fashion with said flux gap portion in said counterbore;

4,711,267

HYDRAULIC CONTROL BLOCK

Hans Schwelm, Howald, Fed. Rep. of Germany, assignor to Hydrolux S.a.r.l., Luxembourg

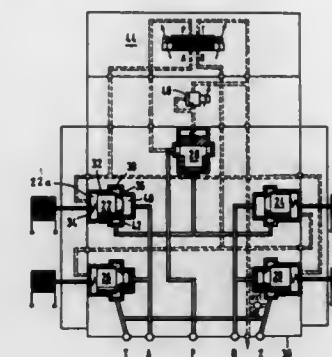
Filed Feb. 12, 1986, Ser. No. 833,485

Claims priority, application Luxembourg, Feb. 13, 1985, 85774

Int. Cl.⁴ F15B 13/043

U.S. Cl. 137-596.15

4 Claims



1. A hydraulic control block for hydraulic units, especially for controlling double-acting hydraulic cylinders, comprising a valve housing block having a base surface and having four bores each forming a respective one of four seat valves arranged in pairs above one another and opposite one another in first and second planes parallel to the base surface of the housing block, each seat valve comprising a cylindrical bore portion defined by a respective one of said bores providing a piston space and a piston member having a cylindrical bore portion slidable in said piston space guided by and in surface contact with the cylindrical bore portion, the piston member having a conically tapered end portion and said bores each having a smaller diameter cylindrical valve space extending from an end of said piston space and defining a circular valve seat against which the tapered end portion of the piston member seats in closed position, a spring urging each piston member towards said closed position, and each bore having and annular space outwardly encircling the cylindrical bore portion adjacent the associated valve seat; the housing block having internal conduits including a pump conduit and a pressure-reducing valve connected thereto and through conduits in the housing block to the annular spaces of the pair of valve bores in said first plane, a tank conduit in said block connected to the annular spaces of the pair of valve bores in said second plane and to a pilot valve, first and second working line conduits connected to the valve spaces of each respective pair of upper and lower valve bores arranged one above another, and working line conduits cross-connected between the piston spaces of each upper valve bore of said first plane and the opposite lower valve bore of said second plane for selective connection to said pilot valve, whereby the valves located diagonally opposite one another are controllable in pairs by the pilot valve and by the pressure reducing valve.

4,711,268
VALVE MANIFOLD

Edward R. Coleman, 192 Deerbow Circle SE., Calgary, Alberta, Canada

Filed Feb. 19, 1986, Ser. No. 830,830

Claims priority, application Canada, Jan. 28, 1986, 500501

Int. Cl.⁴ F16K 11/22

U.S. Cl. 137-597

8 Claims

1. A four valve manifold for use with a flow meter or other instrument comprising body means, a flow passage extending longitudinally through said body means; a pair of inlet passages in said body means for introducing process fluid into said flow passage; a pair of outlet passages in said body means for discharging process fluid from said flow passage; a pair of line

said plastic body being retained in said pressure bore by a pair of retaining pins disposed on said control valve body and intersecting said counterbore on opposite sides of said plastic body adjacent said annular flange of said plastic body;

a combination spring and washer device comprising:
a C-shaped planar flat washer portion disposed around said flux gap portion of said plastic body between said annular flange and each of said retaining pins,
said flat washer portion distributing compression forces between said retaining pins and said annular flange across said annular flange to prevent plastic creep,
a pair of integral webs at diametrically opposite locations on said flat washer portion extending generally perpendicular to the plane of said flat washer portion, and
a pair of spring arms integral with respective ones of said webs extending radially inward toward said plastic body and resiliently engaging said coil body thereby to impose preload tensile forces on said plastic body across said flux gap portion,
the magnitudes of said preload tensile forces being calculated to substantially equal dynamic compression forces on said plastic body produced by cantilever beam bending of said plastic body due to concentration of the mass of said coil body at said coil end of said plastic body.

4,711,266

VALVE ARRANGEMENT

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

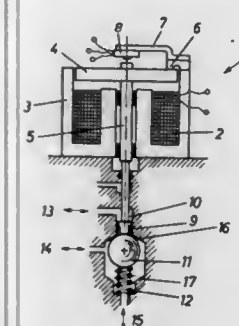
Filed Sep. 3, 1982, Ser. No. 415,613

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3213008

Int. Cl.⁴ F16K 37/00, 31/02

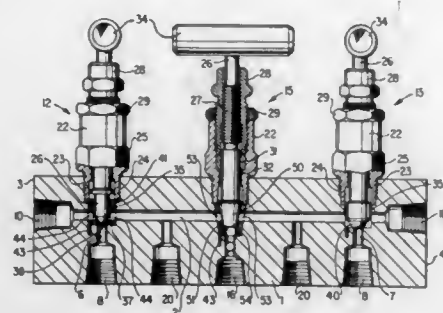
U.S. Cl. 137-554

6 Claims

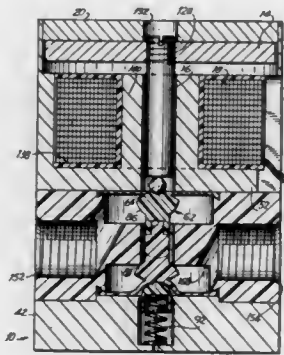


1. A valve arrangement,
said valve arrangement including a valve body adapted to assume at least two positions in a flow chamber for the purpose of controlling fluid flow through a fluid flow passage,
a monitor means for monitoring said at least two positions of said valve arrangement for determining in which position said valve arrangement is positioned,
a slide means secured to said valve body and movable in said fluid flow passage when said valve body is unseated from said fluid flow passage and moved to one of said at least two positions,
said slide means closing said fluid flow passage against fluid flow until said slide means is free of said fluid flow passage.

block valves for opening or closing said inlet passages while permitting process fluid to flow through said flow passage; a vent passage in fluid communication with said flow passage, and a vent valve for controlling the venting of fluid from said



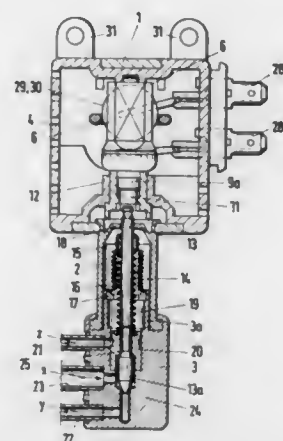
4,711,269
SOLENOID VALVE
Akos Sule, 4 Gates Ave., Roseland, N.J. 07068
Continuation-in-part of Ser. No. 318,846, Nov. 6, 1981,
abandoned. This application Jul. 18, 1985, Ser. No. 756,845
Int. Cl.⁴ F15B 13/044; F16K 31/06, 7/00
U.S. Cl. 137—625.5 26 Claims



1. A solenoid valve comprising a valve body having a valve cavity, first port means disposed on said valve body and communicating with said valve cavity, second port means disposed on said valve body and communicating with said valve cavity, an orifice member having an orifice, with said orifice member mounted in said valve cavity and disposed separating said first and second ports, electrically operated solenoid means mounted on said valve body and including a solenoid coil and armature means disposed for actuation by said solenoid coil, diaphragm means mounted in said valve cavity, poppet means formed as part of said diaphragm means with said poppet means operative to close said orifice, with said diaphragm means and said poppet means comprising an integrally formed unitary member and with said poppet means comprising a semi-spherical end portion and a conical portion with said conical portion having a larger diameter and a smaller diameter and with said larger diameter of said conical portion disposed adjacent said semi-spherical end portion, and said smaller diameter disposed adjacent said diaphragm, resilient means mounted in said valve cavity and disposed to

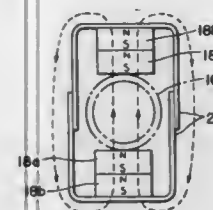
bear on said diaphragm means and bias said diaphragm means and said poppet means in a first direction, pressure plate means disposed in said valve cavity and supporting a portion of said diaphragm means thereby enhancing the ability of said diaphragm means to withstand fluid pressure and with said solenoid means capable of biasing said diaphragm and poppet means in a second direction which is opposite to said first direction.

4,711,270
THERMOELECTRIC VALVE FOR CHANNELING REFRIGERANT GASES INTO DIFFERENT TUBES IN REFRIGERATION DEVICES
Paolo Fornasari, Casale Monferrato, Italy, assignor to Eltek S.p.A., Alessandria, Italy
Filed Dec. 31, 1986, Ser. No. 948,416
Claims priority, application Italy, Jan. 27, 1986, 67062 A/86
Int. Cl.⁴ F16K 31/68 7 Claims



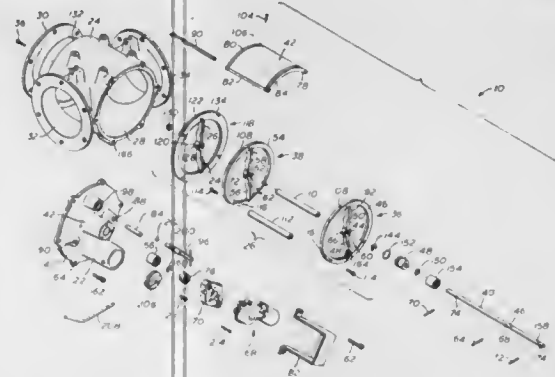
1. A thermoelectric valve assembly for channeling refrigerant gases into different tubes of refrigeration devices comprising two assembled elements, said elements being a thermoelectric and a mechanical element, said thermoelectric element comprising a casing hermetically enclosing a thermally expandable waxy mass, a plunger for being acted upon by said waxy mass, and a ceramic dish for being acted upon by said plunger, said casing being sealed by an elastic seal axially associated with said plunger and ceramic disk, and an outer portion of said casing having two thermistors attached to it and connected to two terminals (28,28a) providing electric power, said mechanical element comprising a tube connecting said thermoelectric element, a three-way needle valve having a body, a needle head being comprised in the mechanical element; and a rod that is axial with said ceramic disk and plunger and passes through a perforated base of said tube, a metal bellows hermetically containing a cylindrical spring together with said rod, wherein the needle head is mounted so it can move in a bushing contained in the body of said three-way needle valve, the ends of said bellows are welded on an outer circumference of said rod and on a collar contained in said tube connecting the rest of said three-way needle to a bracket, and said bracket supports a housing made of insulating material enclosing the thermoelectric element.

4,711,271
MAGNETIC FLUID CONDITIONER
Gale M. Weisenbarger, 140 Woodland Dr., Eaton, Ohio 45320, and John C. Moran, 3124 Lake Ave., Fort Wayne, Ind. 46805
Filed Dec. 15, 1986, Ser. No. 942,003
Int. Cl.⁴ F15C 1/04
U.S. Cl. 137—827 12 Claims



1. A magnetic fluid conditioner for acting on a fluid being transmitted through a conduit, said fluid conditioner comprising:
(a) a housing having an open top side and a closed bottom side and closed ends, the closed ends each having an aperture therethrough in co-axial alignment;
(b) an elongated conduit passing through the apertures in the ends of said housing and extending from both ends thereof;
(c) at least two permanent bar magnets in said housing positioned in opposition at the periphery of said conduit, and with a pole on each magnet positioned along said conduit being directly adjacent to the periphery of said conduit; and
(d) a plurality of magnetic metallic pole pieces bridging the magnets on opposing sides of said conduit to provide a metallic flux path between said magnets; said conduit, magnets, and pole pieces being retained in fixed relationship within said housing.

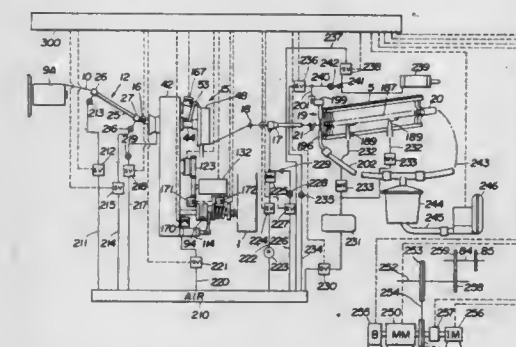
4,711,272
SURGE IRRIGATION VALVE
Michael D. Wiseman, Houston, Tex., assignor to Hydro-Pulse, Inc., Houston, Tex.
Filed Jan. 12, 1987, Ser. No. 2,750
Int. Cl.⁴ F16K 11/07
U.S. Cl. 137—887 17 Claims



1. A valve for use in distributing irrigation water in a surge irrigation system, comprising:
(a) a valve body having a cylindrical cavity, an inlet port and a plurality of outlet ports, said cylindrical cavity and said inlet port being substantially in coaxial alignment; and
(b) a diverter member rotatably and coaxially mounted within said cylindrical cavity, said diverter member comprising:
(1) a pair of circular support rings, each of said support rings having a central hub, an outer ring, and a first and

second spoke radiating from said central hub to said outer ring,
(2) an axially aligned central shaft extending through said diverter member centrally and spatially supporting said circular support rings, and
(3) an arcuate diverter plate conforming to the curvature of said cylindrical cavity mounted to the periphery of said support rings on said outer rings in a spatial relationship with respect to the cylindrically arcuate interior surface of said valve body, said diverter plate being selectively aligned with one of said outlet ports upon rotation of said diverter member so as to cover and restrict the flow of irrigation water through said aligned outlet port and so as to divert the flow to the remaining outlet ports.

4,711,273
LOOM
Takatsugu Kato, Tokyo, and Takao Takahashi, Hachioji, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Continuation of Ser. No. 686,702, Dec. 27, 1984. This application Sep. 2, 1986, Ser. No. 903,876
Claims priority, application Japan, Dec. 28, 1983, 58-245211; Apr. 6, 1984, 59-67383
Int. Cl.⁴ D03D 47/30
U.S. Cl. 139—116 9 Claims



1. A loom having a weft inserting nozzle and a reed, comprising:
means defining a guide space through which a weft yarn projected from the weft inserting nozzle passes to be picked, said guide space defining means being movable together with the reed and locatable between the weft inserting nozzle and warp yarns;
means defining an air flow passage merging in said guide space; and
means developing an air stream for forcing the weft yarn lying in said guide space into said air flow passage, said air stream developing means including an air ejection means for ejecting air through said guide space into said air flow passage, and an air suction means for sucking air within said guide space into said air flow passage, said air ejection means including a second pipe member connected at its first end to said first pipe member and fluidly connected at its second end to a pressurized air source, said air suction means including a third pipe member connected at its first end to said first pipe member and fluidly connected at its second end to an air suction source;
wherein said air flow passage defining means includes a first pipe member which is connected to said guide member and whose axis is generally perpendicular to the weft yarn lying in said guide space; and
wherein said guide member is flattened pipe having opposite parallel pipe walls, said parallel pipe walls being formed with openings, respectively, whose axes are aligned with each other and substantially parallel with the weft yarn

lying in said guide space, each pipe wall opening forming part of said guide space.

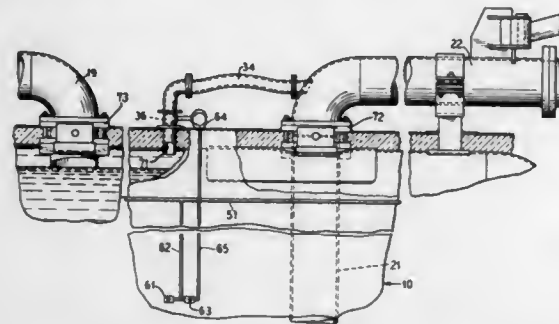
the compressors are operated simultaneously; and pressure sensing means connected to the control means for switching

4,711,274

EXTERNAL PURGE SYSTEM FOR A TANK TRAIN
Erling Mowatt-Larsen, Valparaiso, Ind., assignor to General American Transportation Corporation, Chicago, Ill.
Continuation of Ser. No. 851,868, Apr. 11, 1986, abandoned, which is a continuation of Ser. No. 631,080, Jul. 16, 1984, abandoned. This application Mar. 26, 1987, Ser. No. 31,181
Int. Cl.⁴ B65B 1/04

U.S. Cl. 141-5

2 Claims



1. A method of filling and purging a string of tank cars which are interconnected by conduits comprising the steps of, supplying lading into the bottom of a first tank car at a first end of said first tank car to fill said first tank car through a first conduit, supplying lading into the bottom of a second tank car at a first end of said second tank car from the top of the second end of said first tank car through a second conduit to fill said second tank car and so on down the string of tank cars until they are all filled, opening a plurality of valves which can be positively opened and closed in said first and second conduits and which have outlets at said first ends at the top of said first and second tank cars, said valves being opened by an operator from a position remote from the valves, and supplying a purge gas at said first end into the top of said first car through said valve in said first conduit and into the first end at the top of said second tank car through said valve in said second conduit so as to purge the second conduit between the first and second tank cars and so on down the string of tank cars until all of the conduits have been purged.

4,711,275

AIR SUPPLY AND CONTROL APPARATUS FOR INFLATABLE MATTRESS

Victoria L. Ford, Southsea, and Bryan J. Morgan, London, both of England, assignors to Pegasus Airwave Limited, Portsmouth, United Kingdom

Filed Dec. 1, 1986, Ser. No. 936,229

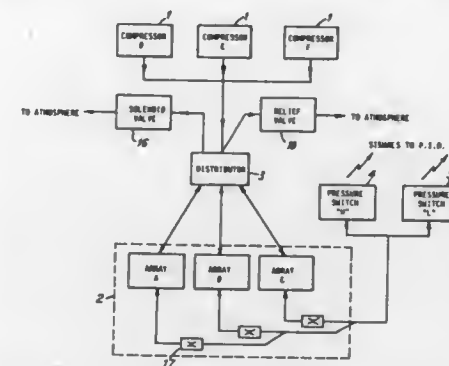
Claims priority, application United Kingdom, Dec. 4, 1985, 8529809

Int. Cl.⁴ B67C 3/12

U.S. Cl. 141-95

12 Claims

1. Air supply and control apparatus for an inflatable mattress comprising a plurality of air compressors for inflating the mattress; control means providing a first mode of operation in which the compressors are operated sequentially and cyclically, and a second mode of operation in which at least two of



from said first to said second mode of operation if the pressure in the mattress falls below a higher preset level.

4,711,276

FILLING DEVICE WITH INTERCHANGEABLE VALVE MEMBER FOR CANS OF DIFFERENT DIAMETERS
Adriano Simonazzi, Via La Spezia 241/a, 43016 Parma, Italy

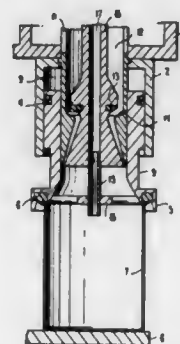
Filed Apr. 23, 1986, Ser. No. 854,974

Claims priority, application Italy, Apr. 29, 1985, 3422 A/85

Int. Cl.⁴ B67C 3/34

U.S. Cl. 141-286

5 Claims



1. A filling device for cans having different diameters comprising:
filling means including a cylindrical filling tube having valve means and air passage means disposed therein;
a downwardly opening cylindrical housing surrounding said filling means coaxially therewith and defining an annular thrust chamber therebetween; and
a cylindrical valve member slidably mounted in said thrust chamber and having sealing means at the lower end thereof adapted to engage the upper rim of a can supported below the filling tube.

4,711,277

FILLER NOZZLE WITH CAPILLARY ACTION AND ITS METHOD OF OPERATION

Robert J. Clish, Mobile, Ala., assignor to International Paper Company, Purchase, N.Y.

Filed Jul. 23, 1982, Ser. No. 401,254

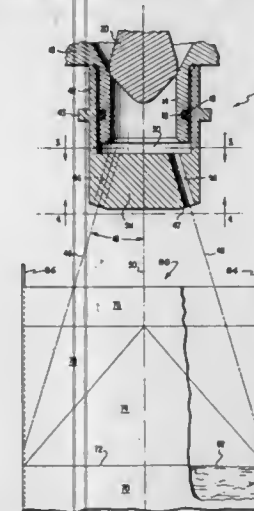
Int. Cl.⁴ B65B 3/04; B67C 3/22

U.S. Cl. 141-311 A

9 Claims

1. A filling nozzle particularly adapted to fill containers with potable liquids containing pulp fibers therein, such as fruit juices, the containers having top seal areas and a maximum intended fill level, which is below the top seal area, the nozzle being adapted for mounting on a valve, the valve having a

valve seat for closing the valve when it is desired to stop flow through the nozzle, the nozzle including an orifice head having upper and lower surfaces, wherein the orifice head has an imaginary longitudinal axis, the orifice head having a plurality of spaced-apart fluid passageways extending completely through the orifice head, each said passageway being angled such that the stream of liquid flowing therethrough strikes the container at an inside wall portion thereof at a point above said maximum intended fill level of the container, each such passageway having an uppermost part and an exit end, the uppermost part of each said passageway lying in the same plane as the upper surface of said orifice head, said plane being perpendicular to the imaginary longitudinal axis of said orifice head and wherein the spacing between the uppermost portions of said angularly disposed passageways is at least about 1/32 of an inch, whereby a land portion of about 1/32 of an inch is de-



finer between the uppermost portions of said passageways to thereby inhibit the build-up of pulp fibers which may be in said potable liquid flowing through the nozzle, and wherein the angle between the longitudinal axes of the exit end of the passageways and said imaginary longitudinal axis of the nozzle is less than 90°, the ratio of the length of the passageways to their diameter or width having a minimum value of four, and being such that when the valve is shut off to stop the flow of liquid through the valve and through the nozzle, capillary attraction of the liquid within the passageways is great enough to prevent further flow through the passageways, whereby closing the valve will not only stop fluid flow through the valve, but will also prevent dripping and drooling of the liquid through the passageways of the orifice head, until such time as the valve is again opened and fluid flow through the passageways recommences.

4,711,278

TREE PRUNING MACHINE

Tanitomi Fuminao, Houtaku, Japan, assignor to Kaisel Kogyo Corporation, Japan

Filed Sep. 10, 1986, Ser. No. 905,989

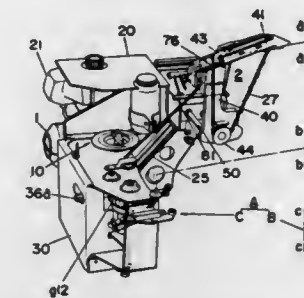
Int. Cl.⁴ A01G 23/02; B27L 1/00

U.S. Cl. 144-2 Z

6 Claims

1. A tree pruning machine comprising:
a generally annular body;
means for elevating the body vertically on the tree;
a cutting unit mounted on the body;
means for rotating the cutting unit around a periphery of the body;
means, connected to the cutting unit, for detecting resistance to the cutting unit by a branch; and

means, controlled by the resistance detecting means, for reducing the speed of rotation of the cutting unit around



the periphery of the body when a prescribed branch cutting resistance is detected.

4,711,279

DEVICE FOR SHAVING THE SIDES OF TREE TRUNKS
Alfred Reuter, Oberkirch, Fed. Rep. of Germany, assignor to Gebrüder Linck Maschinenfabrik und Eisengleiserei "Gatterlinck", Oberkirch, Fed. Rep. of Germany

PCT No. PCT/EP85/00185, § 371 Date Dec. 30, 1985, § 102(e) Date Dec. 30, 1985, PCT Pub. No. WO85/05063, PCT Pub. Date Nov. 21, 1985

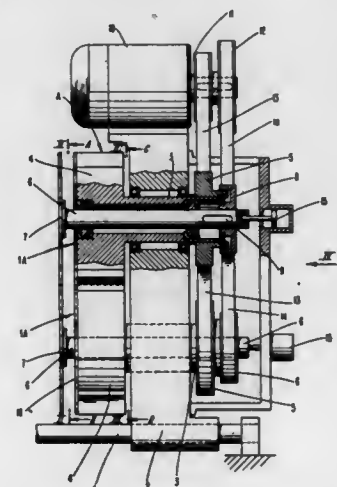
PCT Filed Apr. 25, 1985, Ser. No. 822,304

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415932

Int. Cl.⁴ B27C 9/04

U.S. Cl. 144-39

5 Claims



1. Apparatus for cutting wood logs for the production of sideboards and chips comprising:
means for displacing wood logs,
an upstream log cutter including a pair of upstream side cutters for cutting opposite first sides of a log as the log is displaced, and
a downstream log cutter arranged downstream of said upstream log cutter and including a pair of downstream side cutters for cutting opposite second sides of the log.
each of said upstream and downstream side cutters comprising two cooperating rotary tools rotatable about parallel axes, said axes oriented at acute angles relative to vertical, each of said tools including:
a knife head carrying a plurality of circumferentially spaced cutting edges,
a first circular saw blade mounted coaxially at an end of said knife head and including a plurality of circumferentially spaced cutting edges, and
a second circular saw blade spaced coaxially from said

first saw blade and including a plurality of circumferentially spaced cutting edges, said two knife heads of each said side cutter having their cutting edges circumferentially offset and in intermeshing relationship, said two first saw blades of each side cutter having their cutting edges circumferentially offset and in intermeshing relationship, said two second saw blades of each side cutter having their cutting edges circumferentially offset and in intermeshing relationship.

4,711,280

VERTICAL FLAIL DELIMBER

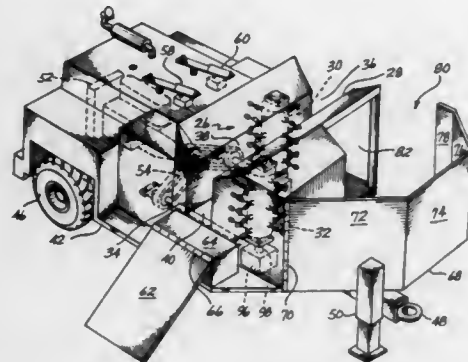
Phillip A. Schmidt, Des Moines Marina, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jul. 14, 1986, Ser. No. 885,353

Int. Cl.⁴ B27L 1/00

U.S. Cl. 144—208 J

12 Claims



1. A flailing apparatus for substantially delimbing and/or debarking at least one elongated tree stem comprising:
 - a housing having at least front and rear openings,
 - at least two rotatable flail members mounted in the housing with one being longitudinally and laterally offset from the other and each being substantially vertically upstanding within the housing,
 - a plurality of flexible flail segments mounted on each flail member sized so that the segments will extend a distance greater than half the lateral dimension of the opening extending through the housing when the flail members are rotated, and
 - means for rotating the flail members.

4,711,281

CURVED WOOD BENDING MACHINE

Michael Kessel, 138 Preston Rd., Milford, N.J. 08848; Erwin Kessel, 124 Old Croton Rd., Flemington, N.J. 08822, and Eugene Schneider, R.D. 3, Box 474, White House Station, N.J. 08889

Filed Mar. 5, 1986, Ser. No. 836,476

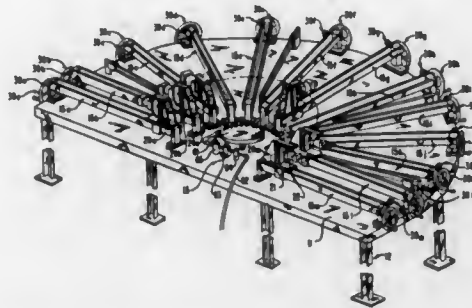
Int. Cl.⁴ B27H 1/00

U.S. Cl. 144—256.1

14 Claims

1. A curved wood bending machine for bending elongated wooden members into predetermined shapes comprising,
 - a support means,
 - a plurality of circumferentially spaced guide rails connected to the support means and each of said guide rails disposed to extend radially outward on said support means from a predetermined center point so the longitudinal line of each rail lies parallel to a predetermined radial plane,
 - said guide rails having, an inner end and an outer end,
 - a clamping assembly slidably mounted on each of said plurality of guide rails, and
 - actuating means on each of said guide rails operatively connected to the associated clamping assembly on said guide rails to move the clamping assembly to and fro along the longitudinal line of the associated guide rail to enable the clamping assembly to be positioned relative

each clamping assembly on the associated plurality of circumferentially spaced guide rails to establish a prede-



termined curved shape for bending said elongated wooden member in said curved wood bending machine.

4,711,282

PORTABLE AND COLLAPSIBLE STAIR

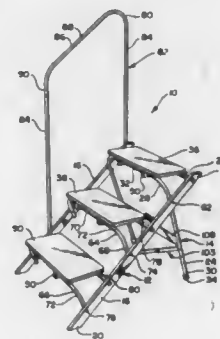
Stanley J. Frazier, 1523 125th Ave. SE., Bellevue, Wash. 98005, and Blaine Sorenson, 18813 SE. Lake Holm Rd., Anburn, Wash. 98002

Filed Jun. 6, 1986, Ser. No. 871,716

Int. Cl.⁴ E06C 1/383

U.S. Cl. 182—106

17 Claims



1. A collapsible stair comprising:
 - a first inverted U-shaped support member comprising two laterally spaced first legs, each having a first lower support end and a first upper end, and a first cross member interconnecting the first upper ends;
 - a second inverted U-shaped support member having two second legs, each having a second lower support end and a second upper end, and a second cross member interconnecting the second upper ends of the second legs, said first and second legs being pivotally connected to one another at a first pivot axis located between the upper and lower ends of the first and second legs;
 - said first and second U-shaped members having a collapsed position where each of said first legs is adjacent to, and generally parallel to, an adjacent one of said second legs, and an operating position where the first legs are crossed with the second legs at an angle, with the first and second cross members being spaced from one another and lying in a common generally horizontal plane, and the lower first ends being positioned forwardly of the lower second ends;
 - a first upper support platform having a rear edge portion hinge connected to said first cross member at a second pivot axis, and being movable between a first stowed position, where the upper platform extends downwardly from the first cross member so as to be adjacent to, and generally parallel to, said first legs, and a second horizon-

- a third inverted U-shaped member comprising two third legs having lower ends pivotally connected to the first legs at a third pivot axis positioned below said first pivot axis, and a third cross member connected to and extending between upper ends of the third legs, said third U-shaped member having a third stowed position where the third legs are positioned adjacent to, and parallel to, the first legs, and a fourth support position where the third legs extend from the third pivot axis upwardly from the first legs;
- a second lower support platform having a rear edge portion pivotally mounted to and positioned between said first legs at a fourth pivot axis located between the upper and lower ends of the first legs, and being movable between a fifth stowed position, where the lower platform extends downwardly from said fourth pivot axis so as to be adjacent to, and parallel to, said first legs, and a sixth horizontal support position where a front edge portion of the second platform is supported from said third inverted U-shaped member in its support position;
- said second lower platform having mounting member means connected thereto and defining an elongate slot means having a substantial lengthwise alignment component generally parallel to a plane occupied by said second lower platform, said third cross member of said third inverted U-shaped member being positioned in said slot means in a manner to be movable from a rear end of said slot means, at which said third cross member is positioned when the second lower platform is in its fifth stowed position, to a second forward end of said slot means at which said third cross member is positioned when the second lower platform is in its horizontal support position;
- said stair being characterized in that a first distance between a portion of said third cross member located in said slot means to said third pivot axis is less than a distance between said third pivot axis and said fourth pivot axis, whereby when said second lower platform moves from said sixth support position to said fifth stowed position, said second lower platform rotates about said fourth pivot axis downwardly toward said third pivot axis; and
- said stair being further characterized in that with said third U-shaped member in said fourth support position, said third legs have a substantial vertical alignment component greater than any horizontal alignment component of the third legs, whereby said third legs are positioned to effectively carry compression loading vertically from said second platform.

4,711,283

HEAVY DUTY PNEUMATIC TIRE TREAD WITH LUG AND BLOCK PATTERN

Mark L. Bonko, Hartsville, and Loran C. Lopp, Jr., Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 30, 1987, Ser. No. 8,690

Int. Cl.⁴ B60C 11/11

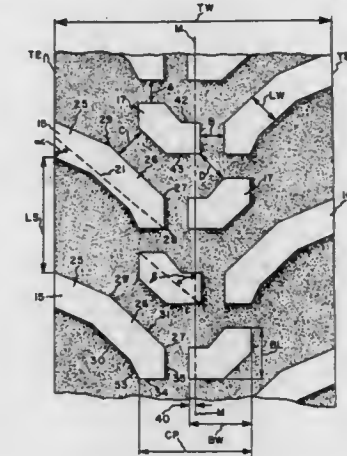
U.S. Cl. 152—209 B

20 Claims

1. A pneumatic tire comprising a radial ply carcass and a belt structure extending circumferentially about the axis of rotation of the tire, a tread portion extending circumferentially around said carcass and belt structure, and said tread portion comprising:
 - (a) two sets of traction lugs, each lug of said first set of traction lugs extending from a first lateral edge of the tread towards the mid-circumferential plane of the tire at a general inclination in the range of 45° to 60° with respect to the mid-circumferential plane of the tire to an axially inner end located an axial distance of 35% to 45% of the tread width from said first lateral edge of the tread, and each lug of said second set of traction lugs being similar to the lugs of the first set of traction lugs but opposite in hand and extending from a second lateral edge of the tread,

each lug of said second set being offset circumferentially of said tire with respect to the next adjacent pair of lugs of the first set of traction lugs; and

- (b) a plurality of block elements disposed in a central portion of the tread, each of said traction lugs having a single block element circumferentially aligned with an edge or edges of the traction lug connecting a leading and a trailing edge of the traction lug at the axially inner end of the traction lug, each block element being oriented at an angle



in the range of 45° to 60° with respect to the mid-circumferential plane of the tire, between 80% to 90% of the axial extent of each block element being disposed on the opposite side of the mid-circumferential plane from said circumferentially aligned traction lug, and each block element having a radially outer surface which communicates with a base portion of the tread by means of a wall or walls, the radially measured height of said wall or walls varying by not more than 25% around the periphery of said block element.

4,711,284

PNEUMATIC TIRE

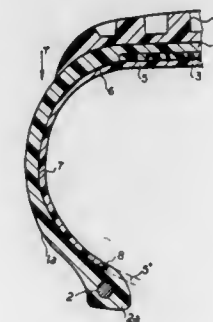
Oskar Schmidt, Bruck an der Leitha, Austria, assignor to Lim Kunststoff Technologie Gesellschaft m.b.H., Kittsee, Austria

Filed Apr. 4, 1985, Ser. No. 719,758

Int. Cl.⁴ B60C 9/00, 1/00; B32B 27/40

U.S. Cl. 152—452

8 Claims



1. A reinforced side wall pneumatic tire comprising:
 - an outer elastomeric tire body having a tread along its outer periphery, opposing side walls adjoining said tread, and respective beads along inner peripheries of said side walls;
 - a bead core embedded in each of said beads;
 - an inner elastomeric body embedded in said outer body along said tread and said side walls and in continuous contact therewith, the elastomer of said inner elastomeric body having a hardness and modulus of elasticity which

are each less than the hardness and modulus of elasticity of the elastomer of said outer elastomeric body;
a radial reinforcement embedded in said inner body and thereby incorporated in the tire as the side wall reinforcement thereof; and
anchor elements embedded in said inner elastomeric body proximal to said beads and around which said radial reinforcement is looped.

4,711,285

HIGH-PERFORMANCE PNEUMATIC TIRE HAVING BEAD FILLERS OF ANISOTROPIC ELASTICITY

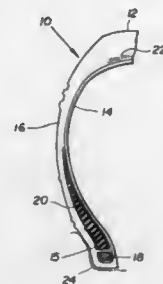
Masaki Ogawa, and Takahumi Kudo, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,949

Claims priority, application Japan, Jul. 16, 1984, 59-145919
Int. Cl.⁴ B60C 9/06, 9/08, 15/06

U.S. Cl. 152-458

9 Claims



1. A high-performance pneumatic tire comprising:
a tread;
side walls;

a carcass which comprises layers of rubberized cords laid parallel and is wrapped around a bead in each edge portion thereof so as to provide a turn-up portion; and
a bead filler for each bead, which fills up a space between the turn-up portion of the carcass and a major portion of the carcass and extends along the outer side of the carcass toward the tread, each bead filler comprising a rubber composition which comprises about 100 parts by weight of a rubber component and from about 15 to 70 parts by weight of short fiber filaments having a mean diameter of less than about 1 μ m wherein the material of said short fiber filaments comprises a thermoplastic polymer, said fibers being oriented to an extent sufficient so that the rubber composition is anisotropic to a degree that the modulus of elasticity of the bead filler measured under tension in the circumferential direction of the tire to the extent of about 20% stretch is greater than about 40 kg/cm² and is in a range of between about 2 and about 6 times as high as the modulus of elasticity of said bead filler measured under tension in the radial direction of the tire to the extent of about 20% stretch.

4. A high-performance pneumatic tire comprising:
a tread;
side walls;

a carcass which comprises layers of rubberized cords laid parallel and is wrapped around a bead in each edge portion thereof so as to provide a turn-up portion; and
a bead filler for each bead, which fills up a space between the turn-up portion of the carcass and a major portion of the carcass and extends along the outer side of the carcass toward the tread, each bead filler comprising a rubber composition which comprises about 100 parts by weight of a rubber component and from about 15 to 70 parts by weight of short fiber filaments having a mean diameter of less than about 1 μ m wherein the material of said short fiber filaments comprises a thermoplastic polymer having an acid amide bond represented by the formula:



said rubber composition being anisotropic such that the modulus of elasticity of the bead filler measured under tension in the circumferential direction of the tire to the extent of about 20% stretch is greater than about 40 kg/cm² and is in a range of between about 2.0 and about 6.0 times as high as the modulus of elasticity of said bead filler measured under tension in the radial direction of the tire to the extent of about 20% stretch.

4,711,286

PNEUMATIC RADIAL TIRE FOR PASSENGER CAR

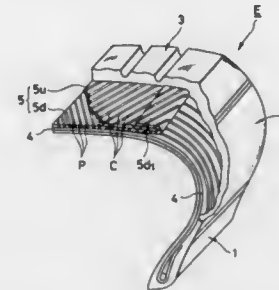
Kazuyuki Kabe, Hiratsuka; Tunes Morikawa, Hadano, and Shuji Takahashi, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1986, Ser. No. 843,432

Int. Cl.⁴ D02G 3/48; B60C 9/26

U.S. Cl. 152-527

7 Claims



1. In a pneumatic radial tire with improved high speed performance and driving comfortableness for a passenger car of the type which consists of a pair of right and left bead portions, a pair of right and left side wall portions continuing said bead portions, respectively and a tread portion interposed between said side wall portions, and in which a carcass layer having a cord angle in the range of 70° to 90° to a tire circumferential direction is mounted between said bead portions and a plurality of belt layers crossing one another and at cord angles in the range of 10° to 35° to the tire circumferential direction are disposed on said carcass layer at said tread portion, the improvement wherein:

- (1) among said belt layers, a belt layer consisting of aromatic polyamide fiber cords is disposed on the side of said carcass layer, and a belt layer consisting of carbon fiber cords is disposed on the side of said tread portion in the proximity of said belt layer on the carcass layer side; and
- (2) the end portions of at least one belt layer consisting of the aromatic polyamide fiber cords on the side of said carcass layer are bent so that the bent portions cover the end portions of said belt layer consisting of the carbon fiber cords on the side of said tread portion.

4,711,287

CASTING METHOD

Hideki Kuwabara, Hadano; Masato Naito, Hiratsuka; Teishiro Watanabe, and Tadatsugu Hamada, both of Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Japan Styrene Paper Corporation, both of Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 830,730

Claims priority, application Japan, Feb. 27, 1985, 60-38511; Feb. 28, 1985, 60-39873; Mar. 19, 1985, 60-53310; Mar. 19, 1985, 60-53311

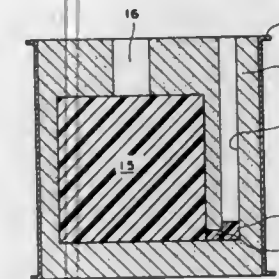
Int. Cl.⁴ B22C 7/02, 9/04

U.S. Cl. 165-34

10 Claims

1. A method of casting, comprising the steps of:
providing a pattern formed of an expanded polyolefin resin

and having a bulk density of 0.025-0.012 g/cm³, said polyolefin resin being selected from the group consisting of (a) non-crosslinked polypropylene resins which are ethylene-propylene random copolymers having an ethylene content of 0.5-10% by weight and having secondary crystals, (b) crosslinked polypropylene resins which are ethylene-propylene random copolymers having an ethyl-



ene content of 1-10% by weight, (c) crosslinked high density polyethylenes having a density of 0.94 g/cm³ or more and (d) mixtures thereof;
embedding said pattern in a mold body;
forming in said mold body a gating system leading to said embedded pattern; and
pouring in said gating system molten metal for volatilizing and replacing said embedded pattern in said mold body.

4,711,288

HALIDE TREATMENT FOR ALUMINUM LOST FOAM CASTING PROCESS

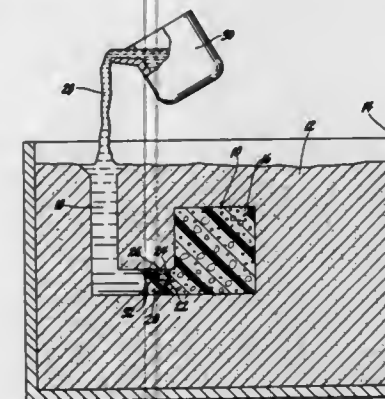
Douglas J. Harvey, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1987, Ser. No. 10,239

Int. Cl.⁴ B22C 9/04; B22D 27/00

U.S. Cl. 164-34

3 Claims



1. In a lost foam process for casting aluminum comprising embedding an expendable pattern formed of a thermally decomposable polymeric material into a refractory mold and casting aluminum melt into said mold to progressively decompose and replace the pattern, said melt forming a front adjacent the decomposing pattern, the improvement comprising incorporating a halide salt flux material within the pattern for dispersion onto said melt front as said front progressively decomposes said pattern, said flux being composed of a halide salt effective to inhibit formation of oxide fold defects in the cast product.

4,711,289

CASTING METHOD AND APPARATUS

Kunihiko Kanoh, Togura; Kanji Matsuki; Kazuhisa Ohta, both of Nagano, and Tadaomi Sanohara, Kohshoku, all of Japan, assignors to Morikawa Sangyo Kabushiki Kaisha, Nagano, Japan

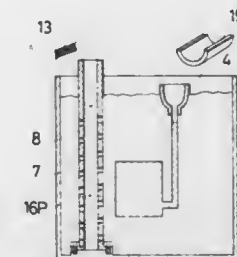
Filed Mar. 6, 1987, Ser. No. 22,764

Claims priority, application Japan, Mar. 14, 1986, 61-56272; Apr. 2, 1986, 61-49276

Int. Cl.⁴ B22C 9/04

U.S. Cl. 164-34

8 Claims



1. A casting method comprising:
filling a flask with a heat resistant filling material to embed therein a pattern of the type which melts down and generates combustible gas when it is heated, a runner connected to said pattern and provided with a sprue and a hollow venting device having an open upper end and a sidewall provided with at least one vent opening;
pouring a molten metal into said sprue so that said molten metal reaching said pattern through said runner may heat said pattern and cause it to melt down and generate gas, may occupy a cavity formed by the meltdown of said pattern and may drive out said gas into said venting device through said filling material and said vent opening; and
burning said gas at said upper end of said venting device.
3. A casting apparatus comprising:
at least one flask filled with a heat resistant filling material;
a pattern embedded in said filling material and forced from a material which melts down and generates combustible gas when it is heated;
a runner connected to said pattern and provided with a sprue;
a vertically disposed hollow venting device embedded in said filling material and having an open upper end located above said filling material and a sidewall provided with at least one vent opening; and
a device provided adjacent to said upper end of said venting device for igniting said gas.

4,711,290

METHOD AND APPARATUS FOR CASTING IRON TREATED WITH MAGNESIUM

Rolf Rietzsch, Mettmann; Stefan Dersch, Solingen, both of Fed. Rep. of Germany, and Max Riethmann, Ermatingen, Switzerland, assignors to George Fischer Ltd., Schaffhausen, Switzerland

Filed Feb. 18, 1986, Ser. No. 830,104

Claims priority, application Switzerland, Feb. 18, 1985, 735/85

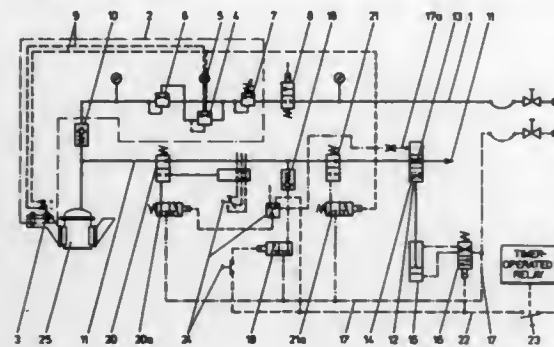
Int. Cl.⁴ B22D 23/00

U.S. Cl. 164-66.1

12 Claims

4. A method of casting iron treated with magnesium in a casting apparatus operated with gas under pressure, the apparatus being of the type having a casting furnace and a piping system for delivering an inert gas under pressure to the casting furnace and wherein inert gas flowing back from the casting furnace is enriched with magnesium, comprising restricting the backflow of inert gas to a selected, limited portion of the piping system so that magnesium condensing out of the gas is restricted to the selected portion; and

periodically oxidizing condensed magnesium in the selected portion of the piping system without interrupting the casting process by automatically flowing an oxidizing gas



through the selected portion of the piping system and concurrently blocking gas flow between the selected portion and the casting furnace.

4,711,291

A METHOD FOR MAKING A ROLL FOR PROCESSING A WEB OR STRIP OF MATERIAL

Klaus Reinhold, Lienener Strasse 59, 4540 Lengerich, Fed. Rep. of Germany

Division of Ser. No. 711,866, Mar. 14, 1985, Pat. No. 4,683,627.

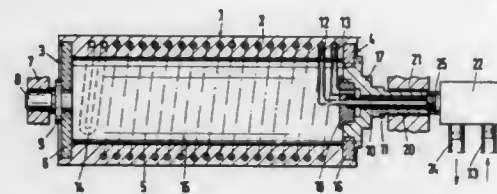
This application Aug. 28, 1986, Ser. No. 901,487

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 8409106

Int. Cl.⁴ B21B 31/08; B22D 19/00

U.S. Cl. 164-98

4 Claims



1. A method for making a roll used for processing material in the form of a web or strip comprising the steps of forming a metal tube into a spiral, centrifugally casting a metal of distinctly lower melting temperature than that of said spiral tube about said spiral tube and thereby forming a cylindrical hollow body about said spiral tube such that the spiral tube is embedded in the walls of the cylindrical body, shrinking said cylindrical body onto said spiral tube during cooling of the cylindrical body to thereby provide intimate contact between the spiral tube and the cylindrical body and to thereby rigidly embed said spiral tube within the walls of said cylindrical body, and precluding said spiral tube from softening and melting during said centrifugal casting to thereby prevent welding between said spiral tube and said cylindrical body such that the shape and configuration of the spiral tube is retained during the forming of the roll.

4,711,292

CORE AND SHELL SHOOTER

Reiner Rommel, and Werner Landau, both of Mannheim, Fed. Rep. of Germany, assignors to Adolf Hüttinger Glessner und Maschinenbau GmbH

Continuation of Ser. No. 745,915, Jun. 18, 1985, abandoned.

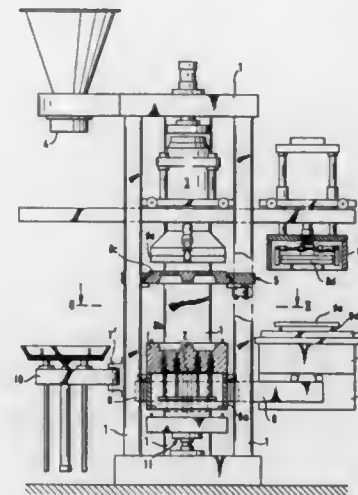
This application Apr. 13, 1987, Ser. No. 37,613

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422687

Int. Cl.⁴ B22C 13/08, 13/12, 15/26

U.S. Cl. 164-200

1 Claim



1. A core and shell blowing machine comprising a machine frame, a cope eject device, a blow device, and a related blow-plate removal device, a sand fill assembly, a cope arrestor, a lift device, and a core-box change device consisting of twin core-box supports, characterized in that the core-box change device is arranged to be swung horizontally about a vertical axis, bringing the core-box out of the machine and, simultaneously, a new core-box into the machine above the lift device.

4,711,293

VENTILATOR OF THE HEAT EXCHANGE TYPE

Kiyomi Niwa, and Yutaka Kozawa, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

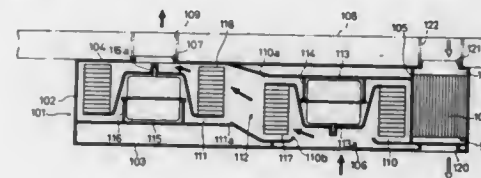
Filed Mar. 10, 1987, Ser. No. 24,176

Claims priority, application Japan, Aug. 28, 1986, 61-202198; Aug. 29, 1986, 61-203932; Aug. 29, 1986, 61-203933

Int. Cl.⁴ F28D 19/00

U.S. Cl. 165-4

6 Claims



6. A ventilator of the heat exchange type comprising: (a) an air passageway communicating between an interior of a room to be ventilated and the outdoors; (b) a first centrifugal fan for introducing outdoor air to the interior of the room and a second centrifugal fan for discharging indoor air outdoors, both said first and second centrifugal fans being disposed before and behind within said air passageway in the direction of air flows; (c) at least any one of said first and second centrifugal fans being formed of a heat-accumulative material so that heat contained in the exhaust air is accumulated in said centrifugal fan formed of the heat-accumulative material and

that the heat accumulated therein is dissipated to the suction air; and (d) means for driving said first and second centrifugal fans alternately.

4,711,294

TEMPERATURE AND HUMIDITY CONTROL SYSTEM

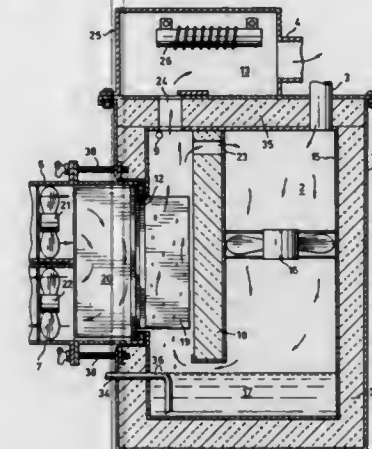
Alphonse F. Jacobs, 4271 Longmoor Drive, Burlington, Ontario, Canada L7L 5A4, and James R. Paxton, 162 Manse Road, Scarborough, Ontario, Canada M1E 3V1

Filed Aug. 14, 1985, Ser. No. 765,591

Int. Cl.⁴ F24F 3/153; B01D 47/06

U.S. Cl. 165-19

9 Claims



1. Apparatus for controlling the temperature and humidity of air within an enclosed space comprising:

- (a) a thermally insulated chamber;
- (b) a water bath at the bottom of said chamber;
- (c) a partial wall extending from the top of said chamber to a point near the surface of said water bath dividing said chamber into a first side and a second side;
- (d) inlet means to conduct air from said enclosed space to the upper part of said first side of said chamber and outlet means to conduct air from the upper part of the second side of said chamber to said enclosed space;
- (e) a fan mounted part-way down said wall on said first side to induce a flow of air down said first side and under said wall and over said water bath;
- (f) means in said second side of said chamber to cool said flow of air to a predetermined temperature;
- (g) an opening in said wall above said fan permitting a first portion of said flow of air to return from the second side of the chamber to the first side of the chamber;
- (h) wherein said outlet means permits a second portion of said flow of air to return to said enclosed space; and
- (i) means to heat said second portion of said flow of air to a predetermined temperature.

4,711,295

AIR CONDITIONER SYSTEM FOR AUTOMOBILES

Yoshihiko Sakurai, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1985, Ser. No. 758,963

Claims priority, application Japan, Jul. 25, 1984, 59-154224

Int. Cl.⁴ F24F 3/00

U.S. Cl. 165-22

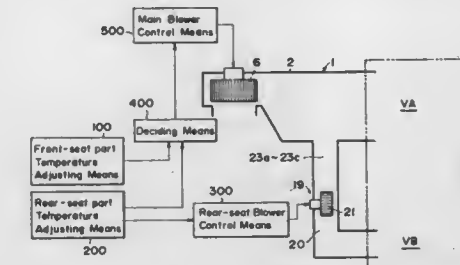
3 Claims

1. An air conditioner system for vehicle including a passenger compartment having a front-seat part and a rear-seat part, said air conditioner system comprising:

- (a) a front-seat air conditioner unit including a main duct, a blower disposed in said main duct for forcing air therethrough to said front-seat part, an evaporator disposed in

said main duct and a heater core disposed in said main duct;

- (b) a rear-seat blower unit including a rear-seat duct and a rear-seat blower disposed in said rear-seat duct for forcing air therethrough to the rear-seat part;
- (c) at least one connecting passage interconnecting said main duct downstream of said main blower and said rear-seat duct upstream of said rear-seat blower;
- (d) a means for setting a temperature of said front-seat part;
- (e) a means for setting a temperature of said rear-seat part;



- (f) a means for controlling said rear-seat blower according to control patterns which are dependant upon at least an output signal of said means for setting a temperature of said rear-seat part;
- (g) a means for determining if said set temperature of said means for setting a temperature of said front-seat part and said means for setting temperature of said rear-seat part are at maximum or minimum values;
- (h) a means for controlling said main blower according to control patterns which are dependant upon said means for determining.

4,711,296

APPARATUS FOR AVOIDING THERMAL STRESSES IN GLASS LINED VESSELS

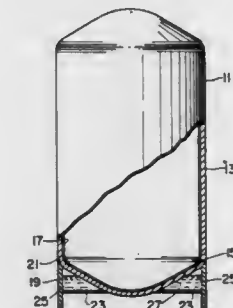
Erwin J. Nunlist, Penfield, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Nov. 5, 1984, Ser. No. 668,604

Int. Cl.⁴ F24H 3/00; B65D 90/04, 90/06, 90/12

U.S. Cl. 165-47

7 Claims



1. A vertically arranged cylindrical shaped, glass lined vessel comprising:

- (a) side and end walls, said side and bottom end walls connected by a knuckle radius;
- (b) an annular support skirt attached to said side wall contiguous to said knuckle radius and extending downward from and generally aligned with said side wall beyond the contour of the bottom of said vessel, said support skirt having sufficient dimensional stability to support said vessel in a vertical position;
- (c) a bottom plate attached to the inside of said skirt and connecting to the outside of said bottom portion of said vessel forming an enclosed annular heat transfer compartment surrounding said knuckle radius of said vessel; and

(d) a heat transfer medium within said compartment placing the lower portion of said vessel in heat transfer relation to said skirt.

4,711,297

ROTARY TUBE COOLER CONSTRUCTION

Heinz Haacker, Kreuztal-Ferndorf, and Helmut Wensing, Essen, both of Fed. Rep. of Germany, assignors to MAN Gutehoffnungshütte GmbH, Fed. Rep. of Germany

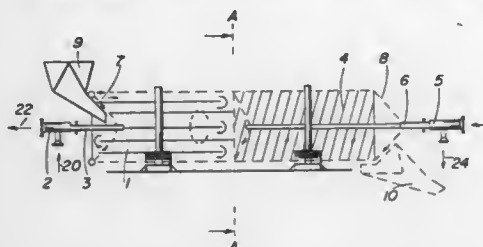
Filed Sep. 30, 1986, Ser. No. 913,745

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3534991

Int. Cl.⁴ F28D 11/08

U.S. Cl. 165—88

10 Claims



1. A rotatable heat exchanger drum having a wall formed of a continuous tube arranged in a particular pattern defining a continuous flow path and includes a longitudinally extending tube portion at one end and a spirally extending tube portion at the other end.

4,711,298

HEAT EXCHANGERS MOLDED FROM REFRACTORY MATERIAL

Serge Rogier, Avignon, and Jacques Guigonis, Entraigues Sorgue, both of France, assignors to Societe Europeenne des Produits Refractaires, Courbevoie, France

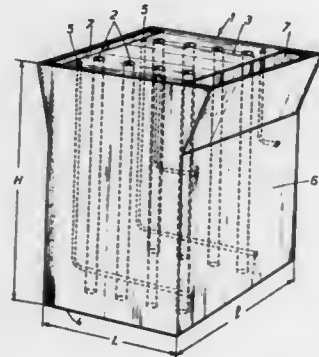
Continuation of Ser. No. 628,911, Jul. 9, 1984, abandoned. This application Oct. 3, 1986, Ser. No. 914,571

Claims priority, application France, Jul. 11, 1983, 83 11495

Int. Cl.⁴ F28D 7/02

U.S. Cl. 165—165

12 Claims



1. A heat exchanger consisting essentially of a one-piece body of oxide-based refractory material, said body having a plurality of surface portions and comprising a plurality of first tubular, continuous channels for a first fluid extending therethrough and a plurality of second tubular, continuous channels for a second fluid extending therethrough, said first and second channels being distributed within the cross-section of said body in a mutual heat-exchange relationship and having middle portions which are mutually parallel, said first channels having first ends for connection to an inlet of said first fluid and second ends for connection to an outlet of said first fluid, said second

channels having first ends for connection to an inlet of said second fluid and second ends for connection to an outlet of said second fluid, at least one of said first and second channels having at least one bend said bend having a radius of curvature, and said first ends of said first channels, said second ends of said first channels, said first ends of said second channels and said second ends of said second channels opening on different surface portions of said body, said body being molded from an oxide-based refractory casting composition which sets at ambient temperature and exhibits a shrinkage lower than 0.5% upon setting.

4,711,299

APPARATUS AND METHODS FOR PUMPING SOLIDS AND UNDESIRABLE LIQUIDS FROM A WELL BORE

Donald B. Caldwell, Enid, and Robert J. Spring, Oklahoma City, both of Okla., assignors to The Adaptable Tool Company, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 750,050, Jun. 26, 1985, Pat. No. 4,621,693. This application Nov. 10, 1986, Ser. No. 929,397

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.⁴ E21B 37/00

U.S. Cl. 166—105.1

6 Claims



1. An apparatus for removing debris from a well comprising: an elongate string connectable to a source of reciprocating and rotating motion located at the surface, the string including:

- a vertically extending debris-receiving tubing portion having an outlet at the upper end thereof, and an inlet at the lower end thereof;
- a debris retaining check valve sub positioned in said elongated string below said vertically extending debris-receiving tubing portion, and including a debris retaining check valve positioned to close said inlet to said debris-receiving tubing portion;
- a lower downhole pump in fluid communication with the outlet of said debris-receiving tubing portion and connected to the upper end of said debris-receiving tubing portion, and including a lower pump cylinder, an apertured lower pump piston and a hollow lower pump piston rod, said lower pump piston connected by said hollow lower pump piston rod to the outlet of said debris-receiving tubing, and said lower pump cylinder retained in the string for reciprocation upwardly and downwardly around said apertured lower pump piston, and forming the upper end of said lower downhole pump;

an intermediate check valve sub connected to the upper end of said lower pump cylinder, and vertically reciprocable

with said cylinder, said intermediate check valve sub including a check valve preventing retrograde flow of fluid downwardly into said lower pump cylinder;

an upper downhole pump connected to said intermediate check valve sub above said intermediate check valve sub in said string, and on the opposite side of said intermediate check valve sub from said lower downhole pump, said upper downhole pump including an upper pump cylinder and an apertured upper pump piston and a hollow upper pump piston rod, said apertured upper pump piston being connected by said upper pump hollow piston rod to the upper end of said intermediate check valve sub, and said upper pump cylinder being retained in the string for reciprocation upwardly and downwardly around said apertured upper pump piston, and forming the upper end of said upper downhole pump;

an upper portion of said string communicating with said upper downhole pump and connectable to said surface-located source of reciprocating and rotating motion on one end, and to said upper downhole pump cylinder on the other end, said upper pump cylinder being keyed to said hollow upper pump piston rod to communicate the rotation motion of said upper portion of said string via said hollow upper pump piston rod, and via said lower pump cylinder and via said lower pump piston rod keyed to said lower pump cylinder to said debris-receiving tubing located below said upper downhole pump and below said lower downhole pump;

said lower pump piston rod and lower pump piston including an internal passageway open and unobstructed from one end to the other thereof and establishing fluid communication between said lower pump cylinder and said debris retaining portion;

said hollow upper pump piston rod and apertured upper pump piston including an internal passageway open and unobstructed from one end to the other and establishing fluid communication between said upper pump cylinder and, through said intermediate check valve sub, with said lower pump cylinder of said lower downhole pump; and an upper check valve sub located above said upper downhole pump and connected to said upper pump cylinder and to said upper portion of said string for permitting flow of fluid through said last-mentioned internal passageway and through said upper pump cylinder into said upper portion of said string at a location above said upper check valve sub, and to prevent fluid flow in the reverse direction.

4,711,300

DOWNHOLE CEMENTING TOOL ASSEMBLY

Louis J. Wardlaw, III, P.O. Box 219061, Houston, Tex. 77218, and Joe A. Young, 100 Bastrap St., Lafayette, La. 70583

Filed May 14, 1986, Ser. No. 863,239

Int. Cl.⁴ E21B 33/16

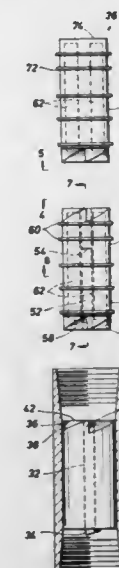
U.S. Cl. 166—153

6 Claims

1. A cementing apparatus for use in cementing a casing string in a well bore, comprising:

- (a) a float collar incorporated in the casing string, said float collar including a passage extending therethrough;
- (b) a cementing plug having a cylindrical body including an axial passage extending therethrough, said cementing plug body further including closure means extending across said axial passage;
- (c) a wiper plug having a cylindrical body including wiper means extending about said wiper plug body for wiping the casing as said wiper plug is advanced through the casing;
- (d) cooperative interlocking means located on said float collar, said cementing plug and said wiper plug for lock-

ing said cementing plug and said wiper plug to said float collar in a nonrotatable position; and



(e) wherein said cementing plug and said wiper plug including frangible internal cutters embedded in said cementing plug and said wiper plug.

4,711,301

VALVE ASSEMBLY FOR INFLATABLE PACKER

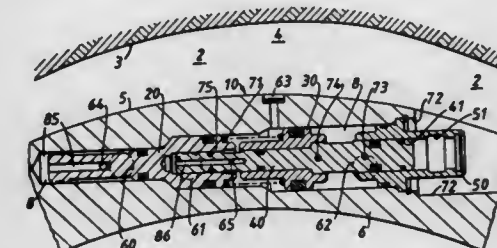
William D. Stringfellow, Houston, Tex., assignor to Weatherford U.S., Inc., Houston, Tex.

Filed Sep. 5, 1985, Ser. No. 773,410

Int. Cl.⁴ E21B 33/127

U.S. Cl. 166—187

33 Claims



1. A valve assembly for controlling the flow of fluid from within casing into a bladder element of an inflatable packer for use in a wellbore, the bladder element having bladder port means, the valve assembly mountable within a single cavity in a body member in the wall of casing or a casing coupling, the body member having casing port means communicating with the cavity for communicating casing fluid to the bladder port means so that the casing fluid can flow through the bladder port means to inflate the bladder element and the body member having overpressure port means communicating with the cavity for communicating part of the fluid flowing into the bladder element back to the cavity and to the valve assembly,

the valve assembly comprising

control piston means movably mounted within the cavity, the control piston means movable from a first position in which the control piston means closes off the casing port means and the bladder port means to the flow of casing fluid, to a second position in which casing fluid flows through the casing port means and bladder port means into the bladder element, restraint means for insuring that the control piston means

initially moves only when the pressure of the casing fluid reaches a predetermined level, and
closing piston means movably mounted within the cavity and responsive to the pressure of the fluid in the bladder element, a portion of the fluid in the bladder element communicating with the closing piston means through the overpressure port means, so that when the pressure of the fluid in the bladder element reaches a predetermined level the closing piston means moves to contact and push the control piston means back into the first position, closing off the casing port means and sealing the casing fluid within the casing and closing off the bladder port means thereby maintaining the pressure of the fluid in the bladder element, and
the control piston means and the closing piston movable about stem means disposed in the cavity.

4,711,302

GRAVEL PACK VOID REMOVAL VIA HIGH ENERGY IMPULSE

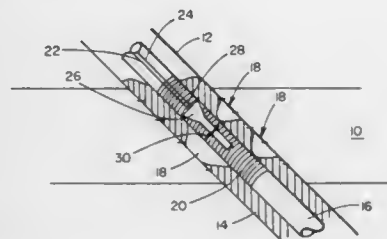
Alfred R. Jennings, Jr., Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 25, 1986, Ser. No. 900,466

Int. Cl.⁴ E21B 43/04, 43/00, 47/10

U.S. Cl. 166—250

26 Claims



8. A high energy impulse method for removing voids in an in-casing gravel pack used in producing hydrocarbonaceous fluids from a subterranean formation via a deviated wellbore comprising:

- placing within a well, a high energy impulse device in proximity to a void containing in-casing gravel pack which encompasses a perforated production string;
- igniting said device which device upon ignition generates energy sufficient to cause turbulence within said gravel pack sufficient to consolidate gravel within said pack and remove voids therefrom without fracturing the formation, damaging the pack or production string assembly;
- determining the existence of an additional void in said pack; and
- repeating steps (a), (b) and (c) until all voids are removed from said pack, thereby consolidating said pack and preventing fines from accumulating in a void.

4,711,303

METHOD AND MEANS FOR DETERMINING THE SUBSURFACE POSITION OF A BLOWING WELL WITH RESPECT TO A RELIEF WELL

Thijs Koeling, Bernd C. Lehr, and Willem Broekhuizen, all of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 26, 1984, Ser. No. 654,579

Claims priority, application United Kingdom, Oct. 11, 1983, 8327178

Int. Cl.⁴ E21B 47/00; G01V 1/40

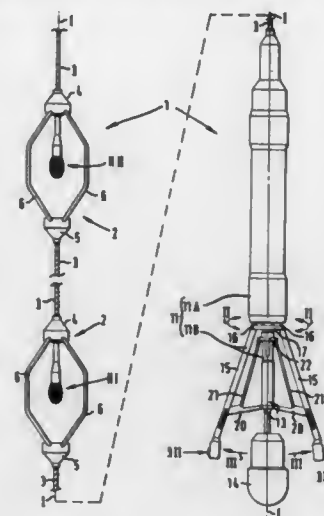
U.S. Cl. 166—250

14 Claims

1. A method for determining the subsurface position of a blowing well with respect to a relief well, said method comprising:

- detecting at a plurality of axially spaced locations along the

longitudinal axis of the relief well acoustic waves emanating from a subsurface location in the blowing well;
determining the difference in the times of arrival of said acoustic waves at said axially spaced locations;
detecting said acoustic waves at a first plurality of circumferentially spaced first locations at a predetermined axial location along the wall of said relief well, the plane of said circumferentially spaced locations being substantially normal to the axis of said relief well;
measuring the intensity of the acoustic waves arriving at said circumferentially spaced first locations;
subsequently again detecting said acoustic waves at a second plurality of circumferentially spaced second locations substantially at said predetermined axial location and located at positions rotated along the wall of said relief well from said first locations;
measuring the intensity of the acoustic waves arriving at said circumferentially spaced second locations; and



using said time difference and intensity measurements to compute the distance and azimuth between said relief well and said blowing well.

- An apparatus for determining the subsurface position of a blowing well with respect to a relief well, comprising: an array of acoustic receivers carried by an elongate support, the receivers being disposed at predetermined intervals along the longitudinal axis of the support; a frame carrying an assembly of acoustic sensors, said sensors being disposed so that each sensor is movable in a substantially radial direction with respect to a central axis of the frame; means rotatably attaching at least a portion of said frame to said elongate support for rotating at least said sensors, relative to said support, substantially on said longitudinal axis of said support; and means for measuring the angular displacement of said sensors relative to said support.

4,711,304

METHOD OF AND APPARATUS FOR INJECTION OF STEAM INTO MULTIPLE WELL ZONES

Eric J. Boeke, and Milton E. McCoy, both of Bakersfield, Calif., assignors to Camco, Incorporated, Houston, Tex.

Filed Dec. 15, 1986, Ser. No. 941,671

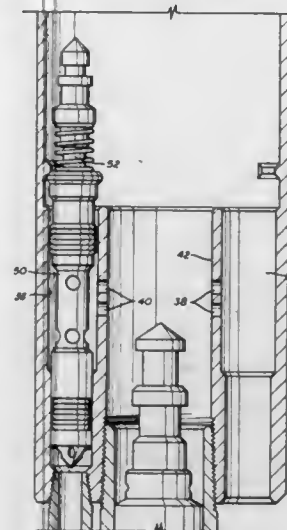
Int. Cl.⁴ E21B 36/00, 43/24

U.S. Cl. 166—303

10 Claims

- Apparatus for injection of steam containing water into first and second separated well zones comprising: a well tubing in a well extending through first and second well zones, a mandrel connected in the well tubing, said mandrel including an open bore, first and second sidepockets offset from

the open bore, flow passageways communicating between the open bore and each of the sidepockets, said passageways to each of the sidepockets being at substantially the same elevation, a flow control device positioned in at least one of the sidepockets, plug means in the open bore below the passageways for collecting any water injected into the tubing for allowing the water to build up and flow into both of the passageways, an exit port connected to one of the sidepockets and in communication with the first well zone and an exit port connected to the second of the sidepockets and in communication with the second well zone.



- The method of injecting steam containing water into first and second separated well zones comprising, injecting the steam containing water down the bore of a single well tubing, directing the steam into two different paths offset from the bore, directing one path into the first well zone, directing the other path into the second well zone, collecting any water in the bore of the well tubing, and directing substantially equal portions of the water into the two paths thereby substantially equalizing the water injected into the separated well zones.

4,711,305

MULTI-MODE TESTING TOOL AND METHOD OF TESTING

Paul D. Ringgenberg, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 596,321, Apr. 3, 1984, Pat. No.

4,633,952. This application Dec. 31, 1986, Ser. No. 948,340

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

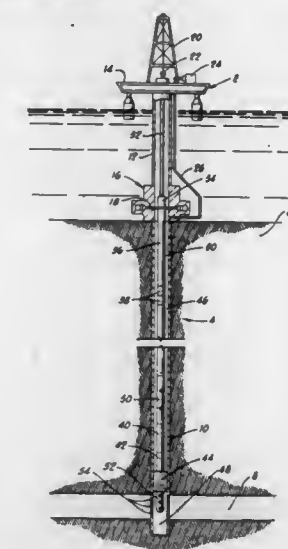
Int. Cl.⁴ E21B 49/08, 34/10

U.S. Cl. 166—336

9 Claims

- A tool for use in a testing string disposed in a well bore, comprising: tubular housing means defining a longitudinal tool bore; valve means including a tool bore closure valve disposed in said housing means; operating means, including mandrel means, adapted to selectively open and close said tool bore closure valve in re-

sponse to sequential changes in pressure proximate said tool in said well bore; and



ratchet means associated with said mandrel operating means or controlling said selective opening and closure of said tool bore closure means pursuant to a program.

4,711,306

GAS LIFT SYSTEM

Roy A. Bobo, 3636 W. T.C. Jester, Suite B, Houston, Tex. 77018

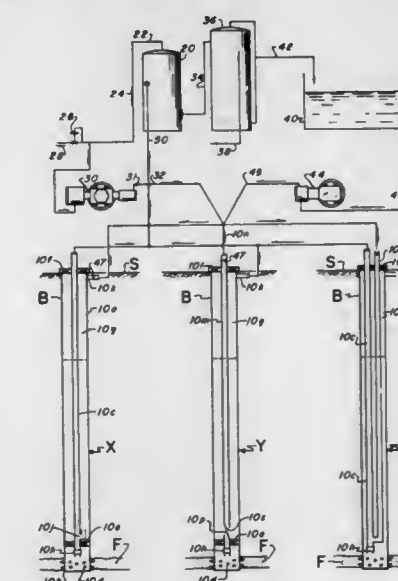
Continuation-in-part of Ser. No. 631,059, Jul. 16, 1984,

abandoned. This application Sep. 16, 1986, Ser. No. 908,106

Int. Cl.⁴ E21B 43/00

U.S. Cl. 166—372

10 Claims



- A gas lift method for lifting fluid from a borehole to the surface, comprising the steps of: mixing at the surface a pressurized injection gas with a pressurized injection liquid without any foaming substance to form a gas-liquid pressurized non-foam mixture at a predetermined pressure less than the pressure at the bottom of the borehole; said gas having a different composition than said liquid; introducing said pressurized mixture into a first elongate portion of said borehole substantially at said predetermined pressure and flowing the mixture to a point down in the borehole to cause the gas to become gradually com-

pressed more and more as the height of the gas-liquid column thereabove increases; then flowing the non-foam gas-liquid mixture at said point into a second elongate portion of the borehole which communicates with the surface to allow the gas to then gradually expand in and displace said well fluid upwardly towards the upper end of said borehole, thereby reducing the density of the well fluid in the second elongate portion and lowering the bottom hole pressure in the well; and continuing the flow of the gas-liquid mixture into the first elongate portion to cause the continuing flow into the second elongate portion of said borehole with further lowering of bottom hole pressure and resultant flow of said well fluid to the surface from the well bore through said second elongate portion with resultant stabilization of the bottom hole pressure.

4,711,307

COMPACT SELF-CONTAINED FIRE EXTINGUISHER

Harold Rosen, 3 Morwood, St. Louis, Mo. 63141

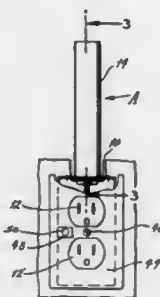
Continuation of Ser. No. 735,835, May 20, 1985, abandoned.

This application Feb. 5, 1987, Ser. No. 15,528

Int. Cl.⁴ A62C 35/02

U.S. Cl. 169—57

11 Claims



1. In combination with electrical equipment including a housing of limited space having a knock-out aperture and an interior surface surrounding the knock-out aperture, a compact, self-contained fire extinguisher for installment in the electrical equipment by mounting within the knock-out aperture characterized by the extinguisher comprising an elongated cylindrical vessel having a relatively high aspect ratio and having a diameter which at any point along the length of the vessel is less than the diameter of the knock-out aperture whereby the vessel is configured for extending through the knock-out aperture, the vessel containing a quantity of fire extinguishing substance under pressure, a nozzle at one end of the elongated vessel, thermally activatable means carried by the nozzle for permitting discharge of the fire extinguishing substance through the nozzle when thermally activated, the vessel being inserted in the knock-out aperture by extension of its nozzle-remote end through the knock-out aperture by extension of its nozzle-remote end through the knock-out aperture, and adhesive securement means including flange-defining structure at a nozzle end of the vessel for providing a securement flange presenting a securement surface of annular configuration and adhesively affixed to the securement surface for adhesively removably mounting the vessel by adhesion to the interior surface of the electrical housing surrounding the knock-out aperture with the nozzle-remote end extending exteriorly of the electrical housing and with only the nozzle, thermally activatable means and adhesive securement means extending interiorly of the electrical housing for causing discharge of the fire extinguishing substance within the electrical housing, whereby the fire extinguishing apparatus is installable and removable solely from interiorly of the electrical housing.

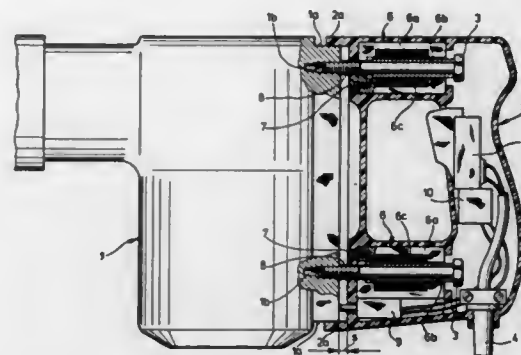
4,711,308
HAND-HELD TOOL WITH VIBRATION DAMPENING
Karl Blaas, Buchs, Switzerland, and Hansjorg Nipp, Mauren, Liechtenstein, assignors to Hilti Aktiengesellschaft
Filed Jun. 13, 1986, Ser. No. 873,971

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521808

Int. Cl.⁴ E21B 3/00

U.S. Cl. 173—162 R

8 Claims



1. A hand-held tool used as a hammer drill, a chipping hammer or the like, comprising a housing having a first end and a second end disposed in spaced relation, a driving unit in said housing supplying the driving force with the driving force acting in the direction from the second end toward the first end of said housing and generating vibrations acting along a main vibration axis extending in the direction between the second and first ends of said housing, a handle mounted on the second end of said housing and being displaceably supported in the direction of the main vibration axis between two stops spaced apart in the direction of the main vibration axis, wherein the improvement comprises that said two stops comprises a first stop means on said housing in the region of the second end of said housing for limiting movement of said handle toward said housing and a second stop means within said handle spaced in the main vibration axis direction from said housing for limiting movement of said handle away from said housing, and an electromagnet located within said handle between said first and second stop means and exerting a force acting counter to the driving force of said driving unit, and means are provided for maintaining the force of said electromagnet constant within a portion of the entire displaceable movement of said handle.

4,711,309

DRILLING APPARATUS

Robert G. Knight, Stoke Golding; Samir R. Klat, Burwood Park, and Kenneth Unwin, Moira, all of England, assignors to Nytol Enterprises Limited, Channel Islands

Continuation-in-part of Ser. No. 771,710, Sep. 3, 1985, abandoned. This application Jun. 23, 1986, Ser. No. 879,525

Claims priority, application United Kingdom, Jul. 20, 1985, 8518366; Feb. 19, 1986, 8604110

Int. Cl.⁴ E21B 4/02

U.S. Cl. 175—93

13 Claims

1. A hole forming apparatus, comprising:
(a) a bit assembly adapted to be driven from the surface in a plurality of modes, including by a pressurized fluid;
(b) a fluid pressurizing apparatus located adjacent the bit assembly and having a fluid connection therewith for supplying pressurized fluid for driving the bit assembly in the said one mode, the fluid pressurizing means and the bit assembly forming a closed hydraulic circuit operable without fluid being pumped from the surface;
(c) first drive means mechanically driving the fluid pressurizing means; and

(d) second drive means operable to drive the bit assembly in a second mode independent of the first drive means, said



first drive means being controllable at the surface independently of said second drive means.

4,711,310

ROTARY HEAD

Lam M. Luen, 5000 Marine Parade Road, Laguna Park, Blk.G 04-27, Singapore-1544, Singapore

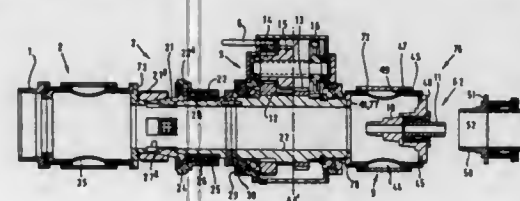
Filed Nov. 1, 1985, Ser. No. 794,017

Claims priority, application United Kingdom, Jan. 4, 1985, 8500190; Jul. 15, 1985, 8517815

Int. Cl.⁴ E21B 3/02, 21/12

U.S. Cl. 175—171

15 Claims



1. A rotary head for a drilling machine, said rotary head comprising:

means for engaging a plurality of drilling means, said engaging means including upper, intermediate and lower engaging means spaced apart on said rotary head for each engaging one or more drilling means, said upper engaging means including at least one adapter for connecting said drilling means to said rotary head, each adapter being provided with an aperture for supplying flushing liquid to or from said drilling means engaged by said engaging means, said at least one adapter includes a plurality of adapter sections, said adapter sections being of different cross-sectional areas so that said cross-sectional area of said adapter decreases in a step-wise manner, each adapter section having a surface formed with a screw-thread for engaging a screw-threaded end of said drilling means, wherein at least three adapter sections are provided and said screw-thread of at least two adjacent adapter sections extend in opposite directions;
means for rotating said drilling means engaged by said engaging means at a speed which is adjustable; and
flushing means including a plurality of flushing inlet apertures for supplying flushing fluid to or from said drilling means engaged by said engaging means, said flushing means including three flushing apertures flushing fluid to or from drilling tools engaged by said engaging means.

4,711,311

VIBRATION AND EROSION RESISTANT NOZZLE

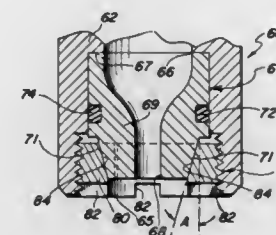
Lance D. Underwood, Mission Viejo, Calif., and Michael S. Oliver, Lafayette, La., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 20, 1986, Ser. No. 933,407

Int. Cl.⁴ E21B 10/18

U.S. Cl. 175—340

10 Claims



1. An erosion and vibration resistant nozzle retention apparatus for earth boring rock bits comprising:

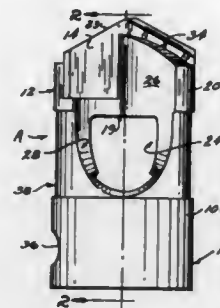
a rock bit body, said body forming a first pin end and a second cutting end, said body further forming an interior cavity that communicates with the interior of a drill string that is attachable to said first pin end of said rock bit body, said body further forms at least one nozzle cavity for directing fluid therethrough;
a nozzle body forming a first entrance end and a second exit end adapted to be inserted within said nozzle cavity, said nozzle body at said second exit end forms a conical section exteriorly of said nozzle; and
a nozzle retainer adapted to be threaded into complementary threads formed by said rock bit body adjacent said nozzle cavity, said retainer forming means therein to engage said nozzle body, said means to engage said body is a conically shaped interior portion formed by said retainer that substantially parallels said conically shaped exterior of said exit end of said nozzle body, said retainer further having means formed thereby to more tightly engage the roots and crests of said threads in said body adjacent said nozzle cavity, and to inhibit vibration and erosion of said retainer and nozzle body during rock bit operation.
8. A method to resist erosion and vibration of a nozzle and nozzle retention device for earth boring rock bits comprising the steps of:
forming a rock bit body, said body forming a first pin end and a second cutting end, said body further forming an interior cavity that communicates with the interior of a drill string, said body forming at least one nozzle cavity for directing fluid therethrough;
forming a nozzle body that is adapted to be inserted within said nozzle cavity, said nozzle body having means formed in the exterior wall of said nozzle body to accept a nozzle retainer, said means formed in the exterior wall of said nozzle is a conical section formed nearest an exit end of said nozzle; and
forming a nozzle retainer adapted to be threaded into complementary threads formed by said rock bit body adjacent said nozzle cavity, said nozzle retainer forms a complementary conical section on an interior of said retainer adapted to engage said conical section of said nozzle body, said retainer further forming means adjacent said threads to more tightly engage the roots and crests of said threads in said body adjacent said nozzle cavity.

4,711,312 DRILL BIT

Donald L. Leibe, and Owen K. Crist, both of Bedford, Pa., assignors to The Marmon Group, Inc., Chicago, Ill.
Filed Jul. 22, 1986, Ser. No. 888,302
Int. Cl.⁴ E21B 10/60

U.S. Cl. 175—393

5 Claims



1. A drill bit for use in combination with a through-the-steel drill stem, said drill bit including a drill tip and comprising a body portion having a head portion for receiving said drill tip, a lower portion, a bore through which cuttings may be removed to the drill stem, and drill ports comprising opposed axially extending openings contoured as a hemisphere with respect to said head portion and the periphery of said body portion and opening to said bore from said drill tip and extending axially along said body portion and opening from the periphery thereof to said bore below said head portion thereof.

4,711,313

FOLDABLE WEIGHING SCALE

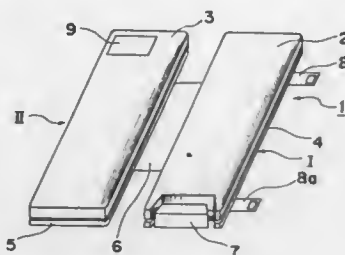
Hiroaki Iida, Fujidara, Haruhiko Murakami, Hirakata; Tsuyoshi Matsumoto, and Junzo Kashiwara, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 18, 1986, Ser. No. 943,126

Claims priority, application Japan, Dec. 19, 1985, 60-196279[U]; Feb. 19, 1986, 61-36411; Feb. 26, 1986, 61-42560; Sep. 5, 1986, 61-210360; Sep. 30, 1986, 61-233857; Sep. 30, 1986, 61-233858; Oct. 6, 1986, 61-238519; Oct. 8, 1986, 61-239893

Int. Cl.⁴ G01G 21/28, 3/14

U.S. Cl. 177—127

16 Claims



1. A foldable, strain gauge type weighing scale comprising: a pair of scale components generally identical in construction and shape, the pair of scale components being hingedly connected together for movement between folded and unfolded positions; hingedly connecting means for connecting the scale components for movement between the folded and unfolded positions; means for electrically connecting the pair of scale components; and a display unit; each of said scale components including a base,

a platform disposed above the base for relative movement both towards and away from the base, a strain inducing plate accommodated in a space delimited by the base and the platform, and supported at its opposite ends for deformation in a direction perpendicular to the strain inducing plate when a load is exteriorly applied thereto through the platform, and at least one strain gauge mounted on the strain inducing plate; said display unit being electrically connected with the strain gauges in the respective scale components for converting respective output signals from these strain gauges into a weight signal and for displaying information represented by the weight signal, and said means for electrically connecting being for connecting the strain gauges.

4,711,314

MULTI-RANGE LOAD CELL WEIGHING SCALE

Seiji Suzuki; Yoshihisa Nishiyama, and Tooru Kitagawa, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 767,781, Aug. 20, 1985, abandoned.

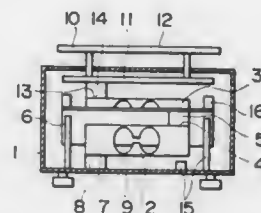
This application Dec. 24, 1986, Ser. No. 946,123

Claims priority, application Japan, Aug. 20, 1984, 59-173050

Int. Cl.⁴ G01G 23/14, 3/14

U.S. Cl. 177—164

3 Claims



1. A multi-range load cell weighing scale comprising: a casing having a top and a bottom which defines a base; a load receiving pan provided at said top of said casing; a high-range load cell disposed in said casing for a high range of weight determination; a low-range load cell disposed in said casing for a low range of weight determination said low-range load cell being parallel to said high-range load cell in a horizontal direction, and overlapping said high-range load cell in a vertical direction, said low-range load cell having one end connected to one end of said high range load cell, another end of one of said load cells remote from said one end thereof being supported on said base, while another end of the other load cell defines a load support on which said pan is supported; and a frame for connecting said one end of said low-range load cell to said one end of said high-range load cell in a stepped fashion, and a plurality of stop members provided below said connecting frame.

4,711,315

VEHICLE CAR STEERING SYSTEM

Tomimasa Kitamura, Kashiwara, Japan, assignor to Koyo Auto-Mech Co., Ltd., Nara, Japan

Filed Oct. 20, 1986, Ser. No. 921,347

Claims priority, application Japan, Oct. 19, 1985, 60-234076

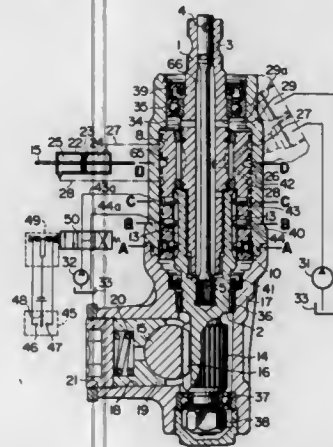
Int. Cl.⁴ B62D 5/083

U.S. Cl. 180—132

6 Claims

1. A power assisted vehicle steering system including an input member connected with a manually operated steering member, an output member connected with a vehicle steering mechanism for transmitting a manual steering force to said vehicle steering mechanism to produce a steering movement in the vehicle steering mechanism, a torsion bar connecting the

input member with the output member, a power assist cylinder provided in said vehicle steering mechanism, valve means having valve port means responsive to a relative displacement between the input member and the output member for producing a supply of hydraulic pressure to the power assist cylinder in a direction of assisting the steering movement of the vehicle steering mechanism when the relative displacement is produced between the input member and the output member as a result of a twist of the torsion bar, the improvement comprising the fact that said valve means includes a valve member means connected with said output member for selective positioning



with respect to the output member to one of a neutral position wherein the valve port means is positioned at a neutral position, a first position wherein the valve port means is offset in one direction from the neutral position so that said power assist cylinder is hydraulically biased in a first direction and a second position wherein the valve port means is offset in the other direction from the neutral position so that the power assist cylinder is biased in a second direction, means for holding the valve port means in said first position when the vehicle steering mechanism is steered in the second direction and holding the valve port means in the second position when the vehicle steering mechanism is steered in said first direction.

4,711,316

GUIDANCE SYSTEM FOR UNMANNED TRANSPORTING VEHICLE

Yukio Katon; Takehiro Suzuki, both of Tokyo, and Susumu Shimada, Kitamoto, all of Japan, assignors to Japan Tobacco, Inc., Japan

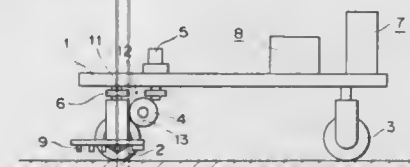
Filed Sep. 23, 1986, Ser. No. 910,833

Claims priority, application Japan, Sep. 24, 1985, 60-208873

Int. Cl.⁴ B62B 1/02

U.S. Cl. 180—168

12 Claims



1. A guidance system for an unmanned transporting vehicle which runs along a guide track comprising a belt-shaped light-reflective guide track laid out on a floor or the like, said belt-shaped light-reflective guide track having a predetermined width; and at least one unmanned transporting vehicle including body means; front wheel means and rear wheel means mounted to said body means; drive means for driving at least one of said front wheel means and rear wheel means; a steering mechanism for causing said front wheel means to swivel rightward and leftward; a plurality of photodetectors mounted to

said body means forwardly of said front wheel means and longitudinally arranged in a right-hand row and a left-hand row above a said belt-shaped light-reflective guide track, said photodetectors including plural pairs of photodetectors, each pair including a right-hand photodetector and a left hand photodetector, said right-hand and left-hand photodetectors being positioned with a spacing less than said predetermined width, said right-hand photodetector having a light projecting element set to project light onto the belt-shaped light reflective guide track and a light receiving element to receive the light reflected thereby for detection of the guide track, said left hand photodetectors having a light projecting element set to project light onto said guide track and a light receiving element to receive the light reflected thereby for detection of the guide track; control means for controlling said steering mechanism such that said front wheel means is caused to swivel leftward when photodetectors in the right-hand row fail to detect the guide track whereas said front wheel means is caused to swivel rightward when photodetectors in the left-hand row fail to detect the guide track, the degree of said swivelling of the front wheel means being substantially in proportion to the number of photodetectors which fail to detect the guide track.

4,711,317

SYSTEM FOR CONTROLLING A TRANSFER CLUTCH OF A FOUR-WHEEL DRIVE VEHICLE

Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

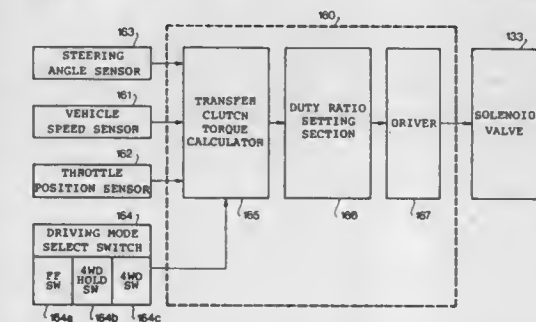
Filed Apr. 24, 1986, Ser. No. 855,989

Claims priority, application Japan, Apr. 30, 1985, 60-92974

Int. Cl.⁴ B60K 17/34

U.S. Cl. 180—197

12 Claims



1. A control system for a transfer clutch of a four-wheel drive vehicle having an engine having a crank shaft, a transmission having an input shaft, and a main clutch operatively connected to the crank shaft of the engine and to the input shaft of the transmission for transmitting output of the engine to the transmission, the transmission being connected to transmit the output of the engine to main drive axles of the vehicle through a final reduction device, and to an auxiliary drive shaft through the transfer clutch, the system comprising a vehicle speed sensor for detecting vehicle speed and for producing a variable speed signal dependent on the vehicle speed, a steering angle sensor for detecting steering angle of the vehicle and for producing a variable steering angle signal dependent on the steering angle, engine load detector means for detecting engine load and for producing a variable engine load signal dependent on engine load, means for determining torque capacity of the transfer clutch in response to the vehicle speed signal and the steering angle signal, and for producing a determined torque capacity signal, correcting mean for correcting the torque capacity of the transfer clutch in response to the engine load signal and

the determined torque capacity signal, and for producing a corrected torque capacity signal, control means for continuously controlling the torque capacity of the transfer clutch to a proper value dependent on the corrected torque capacity signal so as to prevent tight corner braking while keeping four-wheel driving of the vehicle.

4,711,318

SYSTEM FOR CONTROLLING A TRANSFER CLUTCH OF A FOUR-WHEEL DRIVE VEHICLE

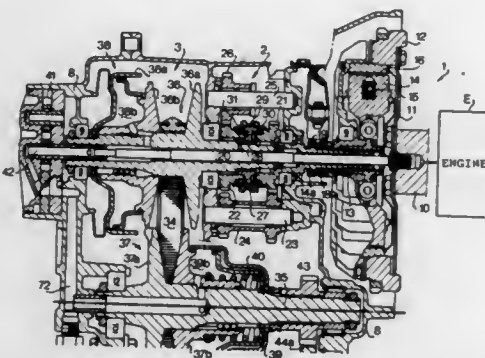
Nobumitsu Kitade, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 856,000

Claims priority, application Japan, Apr. 30, 1985, 60-92975; Apr. 30, 1985, 60-92978

Int. Cl.⁴ B60K 17/34

U.S. Cl. 180—247



1. A control system for a four-wheel drive vehicle having an engine, a transmission having a first driving range of small transmission ratios and a second driving range of large transmission ratios, a selecting device for selecting one of driving ranges, an engine clutch for transmitting the output of the engine to the transmission, main drive wheels operatively connected to an output shaft of the transmission, auxiliary drive wheels, and a transfer clutch for transmitting the output of the transmission to the auxiliary drive wheels, the system comprising:

- first detector means for detecting conditions of the engine clutch and for producing a clutch condition signal representing a clutch condition;
- second detector means for detecting a selected driving range as a driving condition of the vehicle and for producing a driving condition driving range signal dependent on the selected driving range; and
- means responsive to the clutch condition signal and to the driving range signal for controlling torque capacity of the transfer clutch so as to slip the transfer clutch in dependency on the clutch condition.

4,711,319

SAW HORSE

Carmelo Sansotta, 10 Starr Rd., East Brunswick, N.J. 08816, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Dec. 19, 1986, Ser. No. 943,631

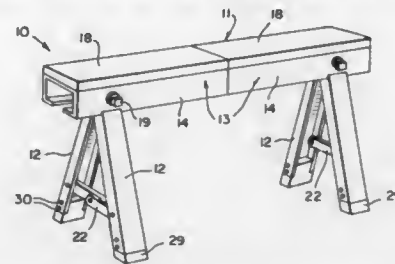
Int. Cl.⁴ B27B 21/00

U.S. Cl. 182—155

3 Claims

1. A sawhorse, comprising in combination, a backbone assembly and a plurality of four legs for supporting said backbone assembly elevated above ground or other supporting surface, means for said legs being longitudinally pivotable between a downward operative position and a stored away position inside said backbone assembly, and means for said sawhorse to stand up without wobbling upon any uneven said ground or other supporting surface, wherein the first said

means includes each pair of said legs being longitudinally pivotable on a transverse shaft near each opposite end of said assembly, a brace between said legs so to spread a lower end thereof when in said operative position, in combination with means for also pivoting said pair of legs transversely, wherein



8 Claims

said means to prevent wobbling comprises said assembly being made of two channels with ends pivotally secured together at one end thereof so to form two groups of three point supports for said sawhorse, further including resilient means for biasing said pairs of legs towards each other thereby centering and stabilizing said legs in said operative position.

4,711,320

WHEEL FLANGE AND RAIL LUBRICATOR APPARATUS

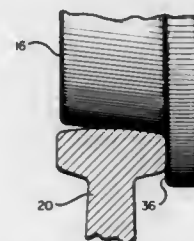
Robert M. Dombroski, McFarland, and John P. Kayser, Madison, Wis., assignors to Madison-Kipp Corporation, Madison, Wis.

Filed Oct. 8, 1985, Ser. No. 785,571

Int. Cl.⁴ B61K 3/00; F01M 5/00

U.S. Cl. 184—3.2

5 Claims



1. Lubricating apparatus for automatically lubricating the frictional contact area between a locomotive wheel flange and rail during operation of the locomotive comprising:

- a source of lubricant;
- a lubrication nozzle mounted adjacent said wheel flange and coupled to the lubricant source for directing shots of lubricant in a thin, coherent stream to the frictional contact area between the wheel flange and rail;
- distance sensing means for sensing the distance traveled by the locomotive;
- a lubrication controller including means for selecting and presetting a distance interval, D, to be traveled by the locomotive between lubrication cycles, L, said controller connected to the lubrication nozzle for controlling the application of said shots of lubricant for said preset distance interval, D, traveled by the locomotive;
- said controller responding to the distance sensing means and the preset distance, D, for actuating a corresponding lubricant cycle, L, during which said shots of lubricant are applied from the nozzle to said frictional contact area;
- said controller including preset lube amount means to preset the amount of lubricant applied during the lubrication cycle, L;
- said preset lube amount means includes lube duration preset means for selecting and presetting a lube time duration, Q, within the lubrication cycle, L, with the lube duration, Q,

corresponding to a precise, predetermined amount of lubricant; wherein said preset lube amount means further includes lube viscosity adjustment means, VIS, for selecting and presetting an adjustment in the lube time duration, Q, to compensate for the viscosity of the lubricant in the lubrication source; and, temperature sensing means for sensing the ambient temperature and providing a corresponding output signal, wherein said preset lube amount means further includes temperature adjustment means with preset temperature levels, T, responsive to said sensed temperature output signal for selecting and presetting an adjustment in the lube time duration, Q, to compensate for the ambient air temperature acting on the lubricant.

4,711,321

DEVICE FOR METERING LIQUID MEDIA, PARTICULARLY LUBRICANTS

Bo Hedland, P.O. Box 5011, S-826 05 Söderhamn, Sweden

PCT No. PCT/SE85/00488, § 371 Date Jul. 7, 1986, § 102(e) Date Jul. 7, 1986, PCT Pub. No. WO86/03290, PCT Pub. Date Jun. 5, 1986

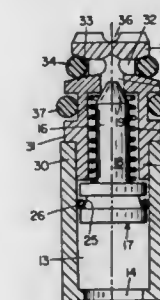
PCT Filed Nov. 27, 1985, Ser. No. 882,882

Claims priority, application Sweden, Nov. 28, 1984, 8406002

Int. Cl.⁴ G01F 11/04; F16N 27/00; F16K 21/16

U.S. Cl. 184—7.4

7 Claims



1. Device for metering liquid media, particularly lubricants, comprising a plunger body (16) acting between an inlet (14) and an outlet (15) in a chamber (13) being circular in section, said body having on one hand a suitably conical closing part (19) with the purpose to block the outlet (15) when the plunger body (16) is moved to an forward end position, and on the other hand having a piston or piston-shaped part (17,17') with a diameter that is at least somewhat smaller than the diameter of the chamber (13), so that a gap is formed between the outside of the piston and the inside of a housing (12,30,30',30'') confining the chamber, said medium being able to pass through said gap in order charge the space between the piston and the outlet (15) when the plunger body (16), suitably by means of a spring (20), is being returned to a backward end or starting position, a sealing ring (26), placed in the area of the periphery of the piston (17), being arranged to cooperate with a conically narrowing surface (25,25',44) in a way that said sealing ring is brought closer to said conically narrowing surface, (25) when the plunger body (16) is moved in the direction towards the outlet (15), in order to seal or close said gap and in that way render a backflow of the medium past the piston impossible, and on the other hand being distanced from the conically narrowing surface (25) and allowing free passage for the medium past the piston when the plunger body (16) is moved in the direction towards the inlet (14), characterized in, that the sealing ring (26,26',26'') is at least lightly pressed or clamped against a cylindrical surface (13,17') opposing the conically narrowing surface (25,25',44) in order to, in an uninfluenced condition and by means of friction, be retained in a given position in relation to said cylindrical surface.

4,711,322
ELEVATOR CAB

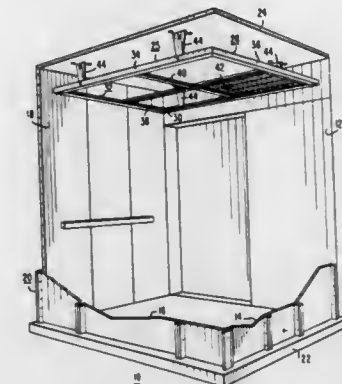
Karl B. Orndorff, Bonneauville Boro, and Paul L. Baldwin, Franklin Township, Adams County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1986, Ser. No. 863,482

Int. Cl.⁴ B66B 11/02; E04B 5/52

U.S. Cl. 187—1 R

4 Claims



1. An elevator cab, comprising: a canopy, sidewalls supporting said canopy, said canopy having lower and upper major, flat surfaces, and first openings which extend between said lower and upper flat surfaces, a frame for supporting drop ceiling panels, and hanger straps which support said frame below said canopy, each of said hanger straps being formed from a single flat sheet of metal, with each hanger strap having flat major sides disposed in parallel planes, to define an elongated, flat, single-piece metallic member having first and second ends, with the metal of each hanger strap extending continuously between said first and second ends, said second end of each hanger strap terminating in a substantially T-shaped portion having a relatively narrow stem which supports first and second lateral tab portions, means pivotally attaching the first end of each hanger strap to said frame, each of said hanger straps being pivotable about said frame-fastened first end, from a relatively flat, low profile shipping position, to an extended operating position, said first and second lateral tab portions at the second end of each hanger strap, with the hanger strap in its operative position, extending through one of said first openings in said canopy, with the metal which defines said first and second lateral tab portions being bent such that the first and second lateral tab portions are not in the parallel planes of the flat major sides of the associated hanger strap, said bent first and second lateral tab portions being adjacent to the upper flat surface of said canopy, to secure the second end of each hanger strap to said canopy.

4,711,323

DOOR DRIVE FOR DOORS OF ELEVATOR CARS
Max Haas, Kriens, Switzerland, assignor to Inventio AG, Herzwil, Switzerland

Filed Nov. 12, 1985, Ser. No. 797,383

Claims priority, application Switzerland, Nov. 22, 1984, 05 582/84

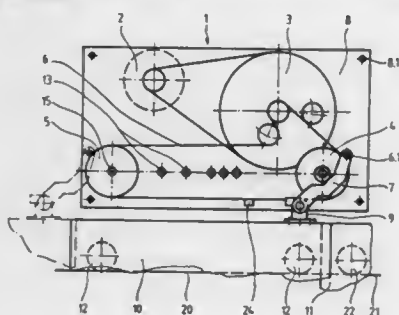
Int. Cl.⁴ B66B 13/08; E05F 15/14

U.S. Cl. 187—52 R

3 Claims

1. A door drive for horizontally opening elevator car sliding door containing at least one door panel of a selectably predetermined width, comprising:

a supporting structure fixed to the roof of said elevator car; a motor fixed to said supporting structure; two deflecting rolls arranged at said supporting structure; at least one endless belt-shaped driving means drivably connected with said motor and trained around said two deflecting rolls; said at least one endless belt-shaped driving means defining a drive run; at least one coupling bracket arranged at said drive run of said endless belt-shaped driving means and mounted at said at least one door panel of said sliding door of said elevator car; said door drive being adaptable to differently selected widths of said at least one door panel of said sliding door of said elevator car; said two deflecting rolls arranged at said supporting structure of said door drive comprising a stationary deflection roll having an axis and a positionally changeable deflection roll having an axis and containing a shaft; said supporting structure being provided with a predetermined number of fixing holes for selectively accommodating said shaft to said positionally changeable deflection roll;



said fixing holes being arranged in said supporting structure at predetermined positions relative to said stationary deflection roll such that said axes of said stationary deflection roll and said positionally changeable deflection roll are arranged at a preselected center distance when said positionally changeable deflection roll is accommodated in a preselected one of said predetermined number of fixing holes provided in said supporting structure to thus adapt the door drive and the supporting structure to a selected value of the selectively predetermine width of said at least one door panel; each deflection roll of said stationary deflection roll and said positionally changeable deflection roll having a respectively radius; and said preselected center distance between said stationary deflection roll and said positionally changeable deflection roll approximately corresponding to the selected value of the selectably predetermine width of said at least one door panel minus said respective radii of said stationary deflection roll and said positionally changeable deflection roll.

4,711,324

SERVICE INDICATING DEVICE FOR ELEVATORS

Joris Schroder, Lucerne, Switzerland, assignor to Inventio AG, Switzerland

Filed Apr. 8, 1987, Ser. No. 36,562

Claims priority, application Switzerland, Apr. 14, 1986, 01477/86

Int. Cl. B66B 3/00

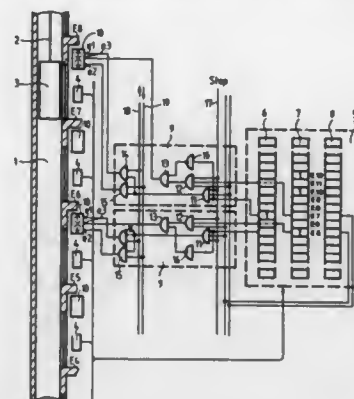
U.S. Cl. 187-135

9 Claims

1. An indicating device for the elevators of an elevator group, the elevator group including call register devices located on the floors for entering the calls for desired destination floors, and a group control device for assigning the calls to the cars of the elevator group, and where indicators are provided

at the floors, which indicate to the passengers waiting at the floors, whether the desired destination floor can or cannot be reached with the arriving car, the indicating device comprising:

a first, a second and a third indicator element, said first and second indicator elements in the form of an upward and a downward arrow respectively, and said third indicator element shaped for signalling an entry prohibition, and a



floor circuit connected by a first and a second input for activating said first and second indicator elements if the calls entered at an associated floor for desired destination floors are assigned to a car arriving at that floor, and said floor circuit connected by a third input for activating said third indicator if the calls entered at that floor for desired destination floors are not assigned to a car arriving at that floor.

4,711,325

WHEEL CHOCK ASSEMBLY

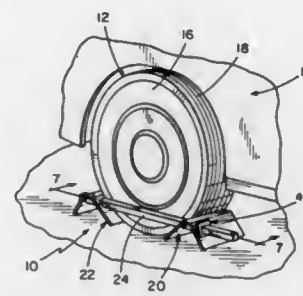
Craig E. Mountz, Wadsworth, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Jun. 16, 1986, Ser. No. 874,528

Int. Cl. B60T 3/00

U.S. Cl. 188-32

5 Claims



1. A wheel chock assembly comprising:

a pair of wedge members positionable in spaced apart relation one to another to receive a wheel therebetween; a bar cooperable with said wedge members for retaining said wedge members in fixed disposition one to another; means associated with one of said wedge members for slidably receiving a first end of said bar; means positionable on said bar for preventing relative outward movement of said wedge members; wherein a second end of said bar is fixedly attached to the second wedge member; and, wherein said means for preventing relative outward movement of said wedge members includes a movable tab having an aperture formed therein and said aperture is dimensioned to receive said bar.

4,711,326

SLIP GRIPPING MECHANISM

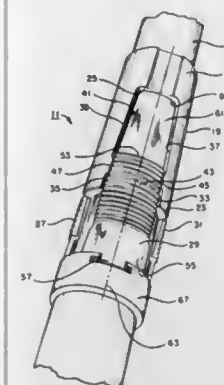
John L. Baugh, Huntsville, and Joe Foster, Spring, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Jun. 20, 1986, Ser. No. 876,515

Int. Cl. B65H 59/10; E21B 23/04, 7/18

U.S. Cl. 188-67

9 Claims



1. A slip gripping mechanism for supporting a cylindrical conduit which is run from a well surface to a downhole location within the interior bore of a circumscribing conduit in a well bore, the cylindrical conduit being made up of a plurality of joints of pipe, at least one of the joints having a cylindrical external diameter which defines a length between a threaded connecting end at one extent and an opposite threaded connecting end at another extent, the slip gripping mechanism comprising:

an elongate tubular body having a tubular end at one extent with an internal bore, the bore being sized to slidably receive the cylindrical external diameter of one of the joints of the cylindrical conduit which is to be supported from the circumscribing conduit whereby the tubular body is received directly on the cylindrical external diameter of the cylindrical conduit between the threaded connecting ends thereof, the tubular body having an opposite end provided with a plurality of circumferentially spaced longitudinally disposed slots;

a plurality of circumferentially spaced, vertically shiftable slips carried by the tubular body in the longitudinally disposed slots, each slip having side edges which engage mating profiles formed in the longitudinally disposed slots whereby the slots form guideways for the slips for shifting the slips upwardly and outwardly relative to the body between a set position engaging the circumscribing conduit and an unset position; and setting means for effecting opposite relative motion between the tubular body and the slips.

4. A slip gripping mechanism for supporting a cylindrical conduit within the interior bore of a circumscribing conduit, comprising:

an elongate body adapted to be supported in the string of cylindrical conduit, the elongate body having a tubular end at one extent and having an opposite end provided with a plurality of circumferentially spaced longitudinally disposed slots; a plurality of circumferentially spaced, vertically shiftable slips carried by the tubular body in the longitudinally disposed slots, each slip having a leading edge and a trailing edge and having side edges which engage mating profiles formed in the longitudinally disposed slots whereby the slots form guideways for the slips for shifting the slips upwardly and outwardly relative to the body between a set position engaging the circumscribing conduit and an unset position; setting means for effecting opposite relative motion between the tubular body and the slips; and wherein each slip has an arcuate lower surface as defined radially from the longitudinal axis of the cylindrical con-

duit and wherein a by-pass groove is provided in the exterior surface of the tubular body in longitudinal alignment with each slip to thereby define a fluid flow path between each slip lower surface and the cylindrical conduit and between the by-pass groove and the circumscribing conduit and wherein each slip lower surface is provided with an undercut area in the region of the trailing edge which, along with the arcuate lower surface and by-pass groove in the exterior surface of the tubular body define the fluid flow path.

4,711,327

SELF-ENERGIZING DISC BRAKES

Anthony G. Price, Croseycelllog, Wales; Roy Campbell, Bromsgrove, England, and Andrew P. Green, Pontnewydd, Wales, assignors to Lucas Industries, England

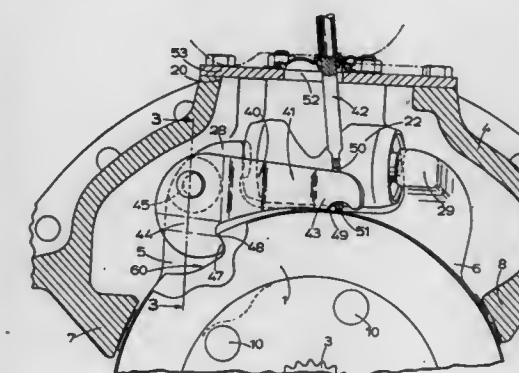
Filed Aug. 11, 1986, Ser. No. 895,201

Claims priority, application United Kingdom, Aug. 30, 1985, 8521592; Feb. 7, 1986, 8603106

Int. Cl. F16D 55/04

U.S. Cl. 188-71.4

7 Claims



1. A self-energizing disc brake comprising a housing, first and second axially spaced braking surfaces in said housing, radial pilot lugs and a drag-taking stop abutment in said housing, first and second pressure plates centred on said pilot lugs, adjacent faces of said pressure plates being provided with co-operating oppositely inclined angularly spaced recesses, rolling bodies located in complementary pairs of said recesses, a rotatable friction member disposed between each said pressure plate and an adjacent said braking surface, each said member comprising a disc, and first and second linings of friction material for engagement with said pressure plate and said braking surface carried by opposite faces of said discs, and means for moving said pressure plates angularly relative to said housing to initiate application of said brake with said pressure plates also moving axially to urge the friction members into engagement with said braking surfaces due to a tendency for said rolling bodies to ride up ramps defined by said end faces and constituting camming means, said plates being carried round with said discs until one of said plates is arrested by the engagement of a lug on that plate with said drag-taking stop abutment, whereafter continued angular movement of the other of said plates provides a servo action, wherein a mechanical brake-applying mechanism comprises a pull-rod which extends into said brake through a radial opening in said housing, said pull-rod having an inner end, a pivotally mounted lever having a radially innermost edge, a pivotal coupling for coupling said inner end to said lever, said lever being angularly movable in response to movement of said pull-rod in a generally radial direction in order to move said pressure plates angularly relative to each other to initiate application of the brake, and said coupling comprises an arcuate face defining a notch in said radially innermost edge of said lever, and a loop in said inner end of the pull-rod which receives said lever and

which has a bearing face having a rocking pivotal enagement with said arcuate face defining said notch.

4,711,328

HYDRODYNAMIC RETARDER WITH A CENTRIFUGAL ACCUMULATOR

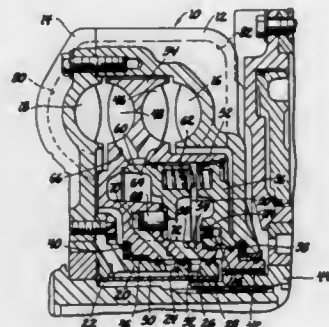
Rayman E. Bazilio; James F. Hartz, both of Indianapolis, and Anthony R. Uliana, Brownsburg, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 4, 1986, Ser. No. 937,836

Int. Cl.⁴ F16D 57/00, 57/02, 33/06, 33/00

U.S. Cl. 188—296

2 Claims



1. A hydrodynamic retarder for use with a transmission having a rotary shaft, said retarder comprising: stationary housing means including vane means; rotary housing means supported for rotation relative to said stationary housing means including drive means connected with the rotary shaft, vane means disposed in operative relation with said vane means in said stationary housing means, rotary storage chamber means disposed radially inward of said vane means for storing fluid prior to delivery to said vane means, fluid passage means connecting said rotary storage chamber means with said vane means, valve means slidably disposed in said rotary storage chamber means for permitting fluid flow from said rotary storage chamber means to said vane means when the valve means is moved to an open position, selectively operable control piston means for urging said valve means to said open position and spring means for urging said valve means to a closed position; supply passage means for distributing low pressure fluid to said rotary storage chamber means; and control means for selectively operating said control piston means for opening said valve means, said fluid stored in said rotary storage chamber means being subject to a centrifugal pressure and being available for rapid delivery to said vane means upon opening of said valve means to promote a hydrodynamic braking effect between the vane means on said stationary housing means and the vane means on said rotary housing means.

4,711,329

HYDRAULIC CIRCUIT CONSTRUCTION FOR POWER SHIFT TRANSMISSION

Shigekazu Hasegawa, Sakai; Satoshi Machida, Sannan, and Yoshimi Oota, Osaka, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 11, 1986, Ser. No. 850,861

Claims priority, application Japan, Aug. 28, 1985, 60-190156; Aug. 30, 1985, 60-192334

Int. Cl.⁴ B60K 41/22

U.S. Cl. 192—3,57

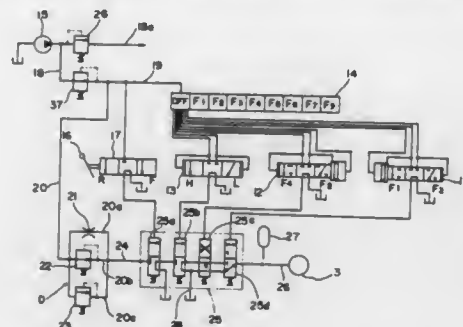
9 Claims

1. A hydraulic circuit construction for a power shift transmission having logical operation valve means mounted on a pressure oil supply passage connecting a hydraulic clutch to a pressure oil source, the logical operation valve means being operable to engage and disengage said hydraulic clutch by opening and closing the pressure oil supply passage in response to a switching operation of change speed means connected

upstream of and in series to said hydraulic clutch, said hydraulic circuit construction comprising:

pressure control means mounted on said pressure oil supply passage and including a first valve means, a second valve means and orifice means mounted parallel to one another on said pressure oil supply passage,

said first valve means being switchable from an open position to a closed position when a pilot pressure from a hydraulic clutch side reaches a first predetermined value,



said second valve means being switchable from a closed position to an open position when the pilot pressure reaches a second predetermined value greater than the first predetermined value, and accumulator means mounted on the pressure oil supply passage and between said hydraulic clutch and said pressure control means.

4,711,330

ROLLER CLUTCH WITH IMPROVED SPRING GUIDANCE

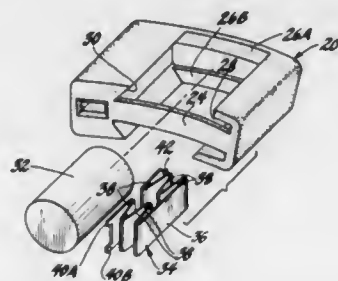
Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 5, 1986, Ser. No. 903,786

Int. Cl.⁴ F16D 15/00, 41/07

U.S. Cl. 192—45

3 Claims



1. In an overrunning clutch of the type that operates in the annular space between first and second substantially coaxial races and that has a cage installable to one of said races within said annular space, said cage including a retention pocket having an axially inwardly facing stop surface, said clutch further having a wedging element that moves circumferentially within said retention pocket and which axially engages with said stop surface as said clutch operates, and an energizing spring mounted to said cage with a resilient active portion located within said retention pocket that urges said wedging element in a selected circumferential direction and which moves circumferentially with said wedging element as said clutch operates, said spring also being subjected to forces that tend to radially dislocate said spring as said clutch operates and wear said spring against said first race, an improved guide means to prevent said spring dislocation, comprising,

a circumferentially extending guide surface on said cage extending axially outwardly from said cage stop surface

and axially outside of said retention pocket and also located radially spaced from and confronting said second race, and, a guide portion on said energizing spring extending axially outwardly away from the active portion of said spring and beyond said retention pocket stop surface so as to be trapped radially between said cage guide surface and said second race, whereby said dislocating forces will slidably engage said trapped spring guide portion on said cage guide surface as said clutch operates and thereby circumferentially guide said energizing spring to prevent it from wearing against said first race, said cage guide surface-spring guide portion slidable engagement, by virtue of being axially remote from both the active portion of said spring and from said cage stop surface, providing said circumferential guidance without substantial effect on the operation of said energizing spring and without limiting the circumferential motion of said wedging element.

4,711,331

FREEWHEEL OVERRUNNING CLUTCH, PARTICULARLY FOR A TWO-WHEEL VEHICLE

Joachim Hoffmann, Hagen, Fed. Rep. of Germany, assignor to Esjot-Werke Schiermeister & Junker GmbH & Co. KG, Ense-Niederense, Fed. Rep. of Germany

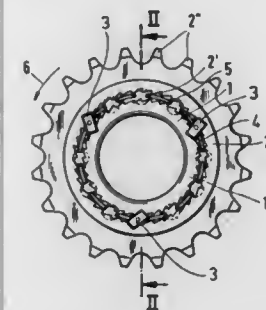
Filed Jul. 1, 1986, Ser. No. 880,890

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1985, 3523545

Int. Cl.⁴ F16D 41/28

U.S. Cl. 192—46

14 Claims



1. In a freewheel overrunning clutch for a bicycle, moped, and the like vehicle having a plurality of clutch pawls present between an outer wheel and an inner wheel which are elastically supportable on one side on a circumference of said inner wheel and on the other side on a plurality of inner teeth of said outer wheel, the improvement wherein said clutch pawls are pivotally supported in a resilient flexible supporting ring positioned between said inner and outer wheels, said pawls each having an end facing said inner wheel which end is brought into engagement with a plurality of outer teeth on said inner wheel, said flexible supporting ring being simultaneously constituted as a spacing ring for a plurality of balls of a ball bearing, said ball bearing being positioned adjacent said clutch pawls and between said outer and inner wheels.

4,711,332

DRIVE CONNECTION WITH A FREEWHEEL MECHANISM

Max Schuster, Passau, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 866,566

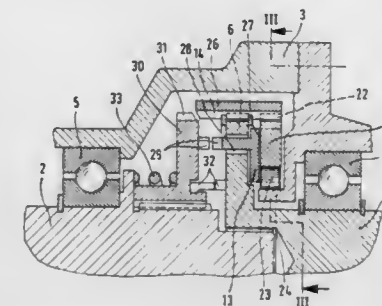
Claims priority, application PCT Int'l Appl., May 23, 1985, PCT/EP85/00246

Int. Cl.⁴ F16D 41/10

U.S. Cl. 192—48,92

3 Claims

1. A drive connection for a drive and a driven co-axial shafts having a freewheel means therebetween which is lockable in a



direction of rotation and allows the driven shaft to rotate faster than the drive shaft in said direction of rotation, said drive shaft includes a flange which pivotally supports a shift ring (13), said freewheel means is self-actuatably reversible by means of said shift ring (13) when said direction is reversed, and said shift ring (13), with the aid of a sensor of direction of rotation (22) supported on a non-rotational housing (3), can be brought from

a first position in one direction of rotation to a second position in the opposite direction of rotation and vice versa, characterized in that said sensor of direction of rotation (22) is a shift element which is retained against said housing (3) in frictional engagement only during reversing operation of said direction of rotation and is maintained out of frictional engagement with said housing (3) after the reversing operation has occurred.

4,711,333

SYSTEM FOR CONTROLLING A TRANSFER CLUTCH OF A FOUR-WHEEL DRIVE VEHICLE

Minoru Okamura, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 856,062

Claims priority, application Japan, Apr. 30, 1985, 60-92976

Int. Cl.⁴ B60K 41/04, 41/28; F16D 43/22

U.S. Cl. 192—0,076

10 Claims

1. A control system for a four-wheel drive vehicle having an engine, a transmission, means comprising a main clutch for transmitting the output of the engine to the transmission, main drive wheels operatively connected to an output shaft of the transmission, auxiliary drive wheels, means comprising a transfer clutch for transmitting output of the transmission to the auxiliary drive wheels, the transfer clutch having a controllable clutch torque capacity, the system comprising:

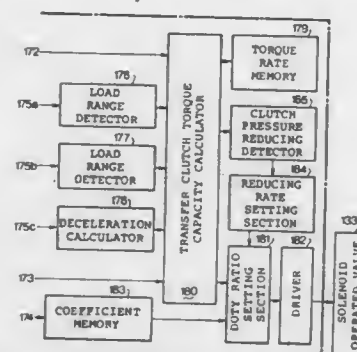
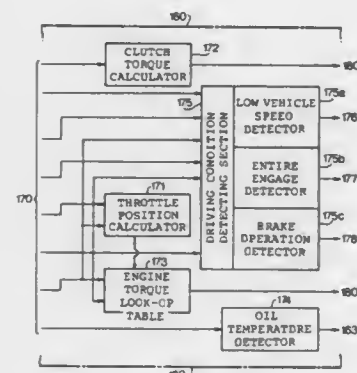
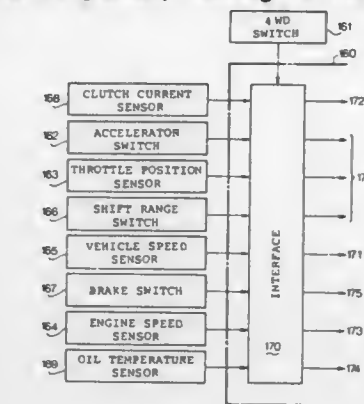
a vehicle speed sensor provided to detect vehicle speed and to produce a vehicle speed signal;

means for providing an engine torque signal representative of engine torque dependent on an operating condition of the engine;

first control means responsive to the vehicle speed signal and the engine torque signal for engaging the transfer clutch at a torque capacity which is determined by a predetermined rate of the engine torque in accordance with the vehicle speed signal;

detector means responsive to a transfer clutch torque capacity reducing signal for producing a clutch torque reducing signal;

second control means responsive to the clutch torque reducing signal for gradually reducing the torque capacity



determined by the first control means to a predetermined value.

4,711,334

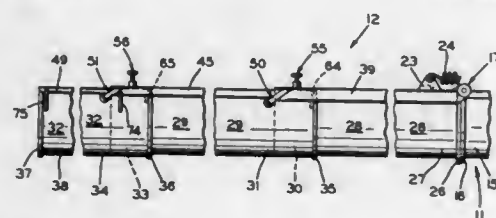
TELESCOPIC CHUTE FOR MIXER DISCHARGE
Joseph A. Barry, 701 SW. 35th Ave., Boyton Beach, Fla. 33435,
and Leo J. Barry, 225 W. Maple Ave., Bound Brook, N.J. 08805

Filed Aug. 28, 1986, Ser. No. 901,425

Int. Cl. B65G 11/14

U.S. Cl. 193-6

26 Claims



15. A telescopic extension chute assembly for a material mixer comprising:

a first chute section having a body of generally semicircular cross-section with an inlet end including means for coupling to a material mixer discharge opening;

first track means including a pair of tubular bodies of generally rectangular cross-section, each of said tubular bodies being attached to and extending along an associated upper edge of said first chute section body, each of said tubular bodies having a longitudinally extending slot formed in a bottom wall thereof;

a second chute section having a body of generally semicircular cross-section of a larger radius than said first section and a pair of upper edges extending through associated ones of said slots in said first track means;

a second track means including a pair of tubular bodies of generally rectangular cross-section, each of said second track means tubular bodies being attached to and extending along an associated one of said upper edges of said second chute section body and having a longitudinally extending slot formed in a bottom wall thereof;

wherein said first track means includes a pair of rollers rotatably attached at an end opposite said inlet end and engaging a downwardly facing outer surface of said bottom all of said second track means bodies;

a third chute section having a body of generally semicircular cross-section of a larger radius than said second section and a pair of upper edges extending through associated ones of said slots in said second track means; and

a third track means including a pair of bars of generally rectangular cross-section, each attached to and extending along an associated one of said upper edges of said third chute section body whereby said second chute telescopes over said first chute and said third chute telescopes over said second chute and said first, second and third track means cooperate to enable relative longitudinal movement among said first, second and third chutes.

4,711,335

DISPLAY DEVICE FOR AN ESCALATOR
Eiki Watanabe, Inazawa City, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

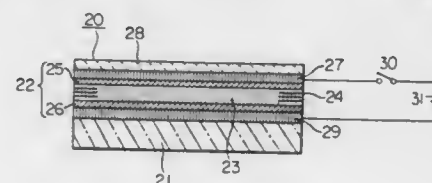
Filed Sep. 3, 1986, Ser. No. 903,378

Claims priority, application Japan, Sep. 5, 1985, 60-196224

Int. Cl. B65G 17/00; B66B 9/00

U.S. Cl. 198-324

5 Claims



1. An elevator comprising:

an escalator having balustrade side panels;
switch means mounted on one of said balustrade side panels and operable to shift said escalator between operation modes;

a display device actuable for displaying matters to be noted for operating said escalator in one of the operation modes;

circuit means connecting said switch means to supply power from an electric power source to said display device when said switch means is operated to the one of the operation modes to activate said display device, said display device comprising:

a liquid crystal layer;

a pair of electrodes disposed on the opposite sides of said liquid crystal layer, one of said electrodes being a transparent pattern electrode having a pattern corresponding to a display of the matters to be noted, the other electrode being a transparent common electrode;

wherein said switch means is connected by said circuit means between the electric power source and said electrodes and interrupts the electric power supply to said electrodes so that said liquid crystal layer does not display any indication of

the matters to be noted during another of the operation modes and connects the electric power source to said electrodes so that said liquid crystal layer displays the matters to be noted during the one of the operation modes.

4,711,336

APPARATUS FOR TRANSPORTING SUBSTANTIALLY PARALLELEPIPEDIC PACKETS

Riccardo Mattel, Bologna, Italy, assignor to G.D. Societa Per Azioni, Bologna, Italy

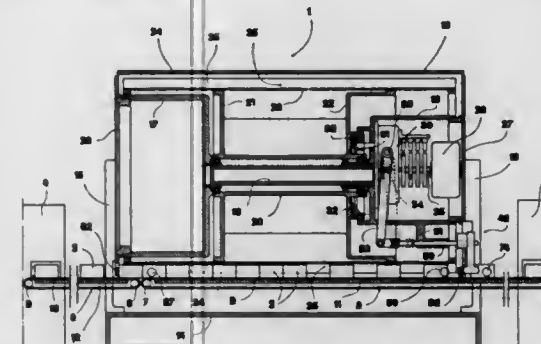
Filed Dec. 19, 1985, Ser. No. 811,096

Claims priority, application Italy, Jan. 28, 1985, 3316 A/85

Int. Cl. B65G 37/00

U.S. Cl. 198-347

12 Claims



1. An apparatus for supplying substantially parallelepipedic packets between a machine for supplying and a machine for receiving these packets, comprising at least one substantially horizontal conveyor for connection between the machines and a substantially cylindrical store having an axis parallel to the conveyor provided on its periphery with angularly uniformly spaced radial compartments, lying above the conveyor and substantially tangential thereto, such that the conveyor defines a base wall for the lower compartment of the store, means for the intermittent actuation of the store about its axis, device for intercepting the packets at both ends of the lower compartment and a cylindrical fairing winding about the store, characterised in that it comprises, in the vicinity of the lower compartment and disposed between an edge of the conveyor and an inlet edge of the fairing, a connection bridge designed to assume a first and a second position as a function of the direction of rotation of the store.

4,711,337

ARTICLE FEEDER RING FOR USE IN A VIBRATORY BOWL FEEDER

Maynard L. Bartlett, Farmington, Conn., assignor to The Arthur G. Russell Company, Inc., Bristol, Conn.

Filed Dec. 23, 1986, Ser. No. 945,783

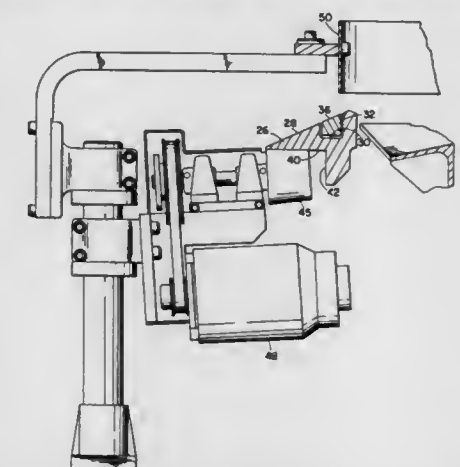
Int. Cl. B65G 27/02

U.S. Cl. 198-391

2 Claims

1. Apparatus for orienting and feeding articles of the general type having an axially elongated body portion and a radially enlarged portion axially spaced from at least one end of the body portion, said apparatus including a feeder bowl having a vertical axis, for containing a supply of the articles and having a generally helical track surface extending along the inner periphery of the bowl and which track surface has a terminal portion at the upper edge portion of the bowl and which terminal portion has a radially outer arcuate edge free of any portion of the bowl extending generally upwardly therefrom and which terminal portion of said track surface extends generally inwardly and upwardly from the arcuate outer edge, feeder bowl drive means for vibrating the bowl to move the articles onto the track surface and along the track surface in one direction of movement about the vertical bowl axis and in generally axial end-to-end relation to each other, said terminal portion of said track surface having a downstream end defining the limit of its extension in the one direction of movement about the

vertical bowl axis, an annular ring concentric with the vertical bowl axis surrounding the upper edge portion of the bowl and having a generally upward by facing annular article supporting surface with an inner circular edge closely adjacent to the outer arcuate edge of the terminal portion of the track surface, the annular article supporting surface of the ring being generally in line with the terminal portion of the bowl track surface, as seen on a vertical plane passing through the supporting surface and the terminal portion of the track surface and containing the vertical bowl axis, and extending generally outwardly and downwardly from its inner circular edge to form essentially a generally radially outward extending continuation of the terminal portion of the bowl track surface for receiving articles after they move radially outwardly beyond the terminal portion, means supporting the annular ring for rotation about the vertical bowl axis, and a stationary arcuate baffle concentric with the vertical bowl axis extending circumferentially along the length of the terminal portion of the track surface and also extending for some distance beyond the downstream end of the terminal portion of the track surface in the direction of rotation of the ring, the baffle having a lower edge spaced above the supporting surface of the ring and located radially a substantial distance outwardly from the inner edge of the support surface of the ring so that a substantial portion of the supporting surface is located radially inside of the baffle and another substantial portion of the supporting surface is located radially outside the baffle, the vertical spacing between



the lower edge of the baffle and the supporting surface of the ring being such as to allow the body portion of each article to pass through the space so formed and to prevent passage of its enlarged portion such that after an article moves radially outwardly from the terminal portion of the bowl track surface to the supporting surface of the ring, the body portion of the article will swing radially outwardly through the space between the lower edge of the baffle and the supporting surface and its radially enlarged portion will be restrained against further radial outward movement by engagement with the baffle, the baffle being so radially spaced outwardly from the inner edge of the supporting surface of the ring that after an article has its body swung radially outwardly through the space the portion of the supporting surface located radially inwardly of the baffle is of sufficient radial extent so as to entirely receive the radially enlarged portion of the article and the body portion is underlaid by a portion of the ring located radially outwardly of the baffle, the baffle some distance circumferentially downstream beyond the downstream end of the terminal portion of the track surface having a discharge point at which the lower edge no longer restrains the enlarged portions of the articles so that the articles are free to move from the ring support surface, said improvement comprising:

said annular ring article supporting surface including an annular groove concentric with the vertical bowl axis and located intermediate the inner circumferential edge of said

annular ring and the outermost radial distance beyond the inner circumferential edge, said annular ring radially outward extending article supporting surface being substantially flat and planar along the surface between said inner edge and said groove and the outermost edge and said groove;

a ring concentric with the vertical bowl axis and adapted to fit within said annular groove in said annular ring; means for holding said ring stationary with respect to the rotation of said annular ring;

said stationary ring having an upwardly facing article supporting surface, said stationary ring supporting surface being coincident with the article supporting surface of said annular ring so that the combined supporting surface of said annular ring and said stationary ring provide a substantially continuous, planar article supporting surface extending radially outwardly from said inner edge of said annular ring so that said article after its body portion has swung through said space is supported by and in close proximity to said annular ring and said stationary ring support surfaces along its length on opposite sides of said baffle whereby the body portion of an article swung through said space is prevented from wedging itself between said article support surfaces and the body portion of an article supported by said ring and said stationary ring support surfaces.

4,711,338

LID FEEDING MACHINE

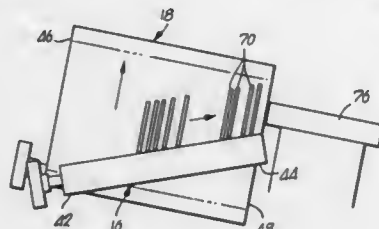
David E. Carson, and Gary A. Barnhart, both of Lawrence, Kans., assignors to Carson/Burger/Weekly, Inc., Lawrence, Kans.

Continuation of Ser. No. 698,885, Feb. 2, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 921,903

Int. Cl.⁴ B65G 47/14

U.S. Cl. 198—396

18 Claims



1. A lid feeding machine for receiving and separating a group of lids and for feeding the lids individually toward a delivery point, said machine comprising:

a first driven planar belt lying in a first plane; and
a second driven planar belt lying in a second plane, there being means for positioning said belts in a proximal relationship such that said planes intersect to define a juncture line at the intersection thereof and to define a juncture angle of less than 180° therebetween on one side of said juncture line, said first belt being driven in a first direction toward said second belt, said second belt being driven in a second direction outwardly from said one side, said belts being driven at substantially the same speed and at sufficient speed such that lids received by said machine will be driven by said first belt toward said second belt into simultaneous engagement by both of said belts and, when so engaged, will be moved to or maintained in a substantially vertical position, separated, and spun to thereby stabilize the lids in said position while being fed along both of said belts in a direction parallel to said juncture line toward the delivery point.

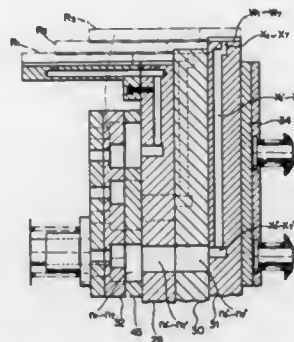
4,711,339

CIGARETTE STACKING METHOD AND APPARATUS
Tomizou Nagata; Yoshiyuki Mutoh, and Kazutaka Kobayashi, all of Tokyo, Japan, assignors to Japan Tobacco, Inc., Japan
Continuation of Ser. No. 647,903, Sep. 6, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 922,788

Claims priority, application Japan, Sep. 13, 1983, 58-167583
Int. Cl.⁴ B65G 47/26

U.S. Cl. 198—419

6 Claims



1. A cigarette stacking method using a stacking drum and a plurality of arranging drums provided in close proximity to the outer periphery thereof, comprising the steps of;
establishing different positions on said stacking drum in the axial direction thereof for cigarette pieces arranged by said plurality of arranging drums;
stacking cigarette groups formed on said arranging drums in several layers on said stacking drum in such a manner as to extend the end portions of the cigarette pieces successively in the axial direction on the stacking drum so that each layer is staggered with respect to an adjacent layer; and
absorbing and maintaining the cigarette pieces in each staggered layer by applying suction directly to the staggered end portions of each said cigarette in each said layer.

4,711,340

DEVICE TO DISCHARGE ROLLED PRODUCTS ONTO A COOLING PLATE, CLOSURE OF THE DEVICE TAKING PLACE BY POSITIVE ACTUATION

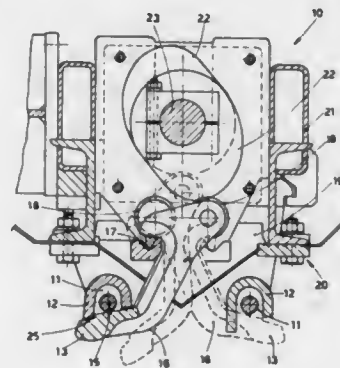
Antonino Duri, Pradamano, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Italy

Filed Jan. 23, 1986, Ser. No. 824,580

Claims priority, application Italy, Jan. 23, 1985, 83320 A/85
Int. Cl.⁴ B21B 43/12

U.S. Cl. 198—451

9 Claims



1. An apparatus cooperating with a tail-brake means for discharging rolled products onto a cooling plate, comprising: at least two channels with bottoms which comprise movable vanes capable of being opened and closed; and

a common actuating means having operable contacting cams for actuating the vanes of said at least two channels to selectively open and close said vanes, the closure and opening of said vanes being achieved by positive actuation and gravity, respectively.

4,711,341

PACKAGE SORTATION CONVEYOR

Thomas C. Yu; Robert K. Vogt, and John J. Wilkins, all of Cincinnati, Ohio, assignors to The E. W. Buschman Company, Cincinnati, Ohio

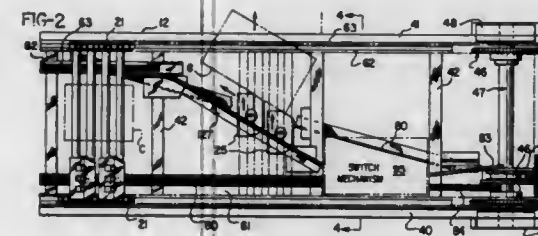
Continuation of Ser. No. 675,156, Nov. 27, 1984, abandoned.

This application Jun. 26, 1986, Ser. No. 878,734

Int. Cl.⁴ B65G 47/46

U.S. Cl. 198—372

7 Claims



1. A package conveyor system including a main line and at least one branch line leading from one side of said main line, comprising

- a frame defining said main line and at least one branch outlet therefrom,
- an endless apron supported for movement on said frame to define a top conveying run and a bottom return run,
- means for driving said apron,
- a plurality of pusher elements mounted for sliding movement on said apron from one side thereof to the other,
- each said pusher element having a guide member depending therefrom,
- primary guide means cooperating with said guide members to retain said pusher elements on the side of said frame opposite said branch outlet
- a switch member shiftably mounted on said frame upstream from said branch outlet for movement between a retracted position wherein it forms a continuation of said primary guide means and an advanced position wherein it cooperates with successive said guide members to divert successive said pusher elements away from said primary guide means,
- secondary guide means extending across said frame at an angle to the length thereof opposite said branch outlet for cooperation with said guide members on successive said diverted elements to guide said diverted pusher elements across said apron and thereby to push a package from said apron to said branch outlet,
- means downstream from said branch outlet for returning said diverted pusher elements to said primary guide means, and
- supplemental guide means responsive to incomplete movement of said switch member between said retracted and advanced positions thereof for effecting the return of each resulting incompletely diverted guide member to said primary guide means.

4,711,342

CONVEYOR TRANSFER APPARATUS FOR FOUNDRY USE AND METHOD OF CONVEYOR TRANSFER

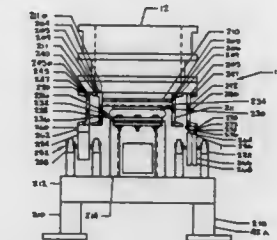
Edward D. Abraham, Brecksville, Ohio, assignor to Lucille S. Abraham, Brecksville, Ohio

Continuation-in-part of Ser. No. 339,172, Jan. 13, 1982, abandoned. This application Dec. 24, 1984, Ser. No. 685,594

Int. Cl.⁴ B65G 25/00

U.S. Cl. 198—463.3

9 Claims



7. A conveyor transfer system for use in a foundry to transfer an article along an article-travel-path including a frame, a plurality of vertically movable support members, means for attaching said support members to said frame while allowing vertical movement thereof including at least one flex plate having one end secured to said frame and another end secured to at least one of said vertically movable support members, at least one horizontally movable beam defining said article-travel-path and positioned outboard of and adjacent to said support members, means for attaching said at least one beam to said frame while allowing horizontal movement thereof, means for moving said support members in a vertical direction between a raised and a lowered position to move an article supported thereon between the raised and the lowered positions, and means for moving said at least one beam in a horizontal direction to move an article supported thereon along said article-travel-path.

4,711,343

POWER-AND-FREE CONVEYOR APPARATUS FOR HANDLING PALLET-SUPPORTED WORKPIECES

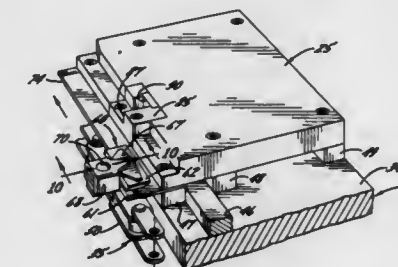
Paul A. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 864,417, May 19, 1986. This application Oct. 3, 1986, Ser. No. 915,241

Int. Cl.⁴ B65G 37/00

U.S. Cl. 198—465.2

12 Claims



1. Apparatus for handling workpieces and comprising a row of pallets each adapted to hold a workpiece, continuously driven power-and-free conveyor means for advancing said pallets in a closed circuit along a generally horizontal and endless path having opposing straight sides and opposing curved ends, said conveyor means being operable to advance said pallets through at least one work station along said path and being operable to allow said pallets to dwell along said path when said pallets are stopped during continued driving of said conveyor means, said apparatus being characterized in that said conveyor means comprise a plurality of at least four

modules located along the sides and ends of said path, each of said modules comprising (a) a generally horizontal individual track for supporting said pallets, (b) an individual power-driven endless conveyor for advancing said pallets along said track and for allowing the pallets to dwell on said track when the pallets are stopped during continued driving of the conveyor and (c) an individual motor for continuously driving said conveyor; there being two modules adjacent each end of said path with the track and conveyor of each of such modules having a curved section extending along a portion of the curved end of the path and having a straight section extending along a portion of one of the straight sides of the path, the track and conveyor of each module being disposed in end-to-end relation with the tracks and conveyors of two other modules, and means for detachably holding said modules in rigid end-to-end relation, each of said pallets including a lip extending generally along said path and projecting toward said conveyors, each of said conveyors comprising a series of spaced clamps for tightly gripping the lips of said pallets to advance said pallets along said path, said clamps slipping frictionally along the lip of each pallet when the pallet is stopped and as driving of said conveyors continues.

4,711,344

ACCURATE WEIGHT SORTING ARRANGEMENT FOR POULTRY CONVEYOR SYSTEM

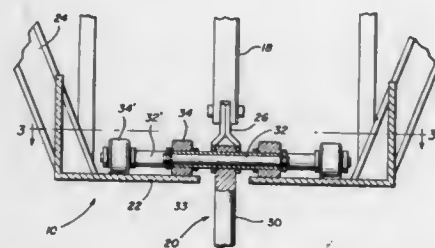
Paul J. Altenpohl, 1211 Lafayette Rd., Gladwyne, Pa. 19035

Filed Jan. 9, 1986, Ser. No. 817,407

Int. Cl.⁴ G01G 11/00

U.S. Cl. 198—504

12 Claims



4. In a weight sorting system for objects held by consecutive carriers suspended from a conveyor while traveling along a common path, said consecutive carriers being uniformly spaced from each other along said common path by a distance (S), including a fixed track, at least one platform, means operatively mounting the platform in alignment with the track for sequential loading only by non-consecutive carriers during said travel along the path and means for detecting a preset limit of said loading of the platform by the non-consecutive carriers, said platform having a length measured along said common path greater than (S).

4,711,345

COMPOSITE-MOTION DRIVE UNIT AND COMBINATORIAL WEIGHING APPARATUS EMPLOYING THE SAME

Masao Fukuda; Yukio Kakita, both of Shiga; Kenji Ueda, Kyoto; Kikichi Terashima, and Hiroshi Bochi, both of Shiga, all of Japan, assignors to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Filed Aug. 28, 1985, Ser. No. 770,063

Claims priority, application Japan, Aug. 28, 1984, 59-180142; Aug. 28, 1984, 59-131186[U]; Aug. 28, 1984, 59-131187[U]; Aug. 28, 1984, 59-131188[U]

Int. Cl.⁴ B65G 43/08

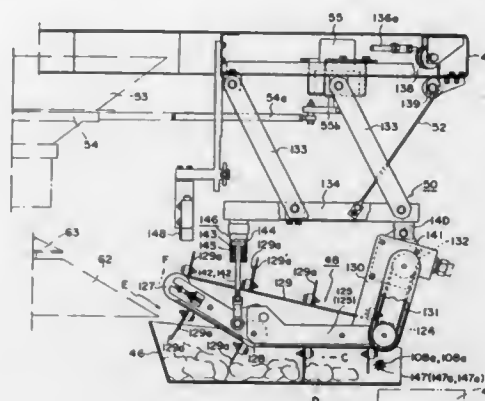
U.S. Cl. 198—572

5 Claims

1. A combinatorial weighing apparatus having a plurality of vibratory supply troughs for distributing and supplying articles therethrough to a plurality of weighing machines for effecting combinatorial weight computation, said combinatorial weighing apparatus comprising:

a plurality of sweep conveyors disposed respectively above

said supply troughs for forcibly transferring the articles from said supply troughs to said weighing machines; and means for continuously actuating said sweep conveyors until articles reach the ends of respective supply troughs when



the articles have not reached said ends of the supply troughs for a prescribed period of time at the time said supply troughs and said sweep conveyors are operated to transfer the articles toward said weighing machines.

4,711,346

PLASTIC CONVEYOR BELT WITH EXTENSION-RESISTANT REINFORCEMENT AND DRIVE GEARING

Rudolf Breher, Porta Westfalica, and Rudi Külling, Vlotho, both of Fed. Rep. of Germany, assignors to BRECO Kunststoffverarbeitungs-GmbH & Co. KG, Porta Westfalica, Fed. Rep. of Germany

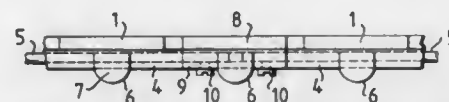
Filed Sep. 9, 1985, Ser. No. 774,124

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433379

Int. Cl.⁴ B65G 15/30

U.S. Cl. 198—844

2 Claims



1. An endless conveyor belt comprising a plurality of spaced plates of hard, rigid plastic material spaced from one another, each of said plates having a drive cog extending from the underside thereof, an elongated, soft elastically-deformable rib member attached to the underside of each of said plates to thereby connect said plates together, a tensional reinforcement means embedded in said rib member, said rib member crossing said drive cog, connecting means for connecting two ends of said rib member, said connecting means comprising an intermediate plate disposed between two of said spaced plates, an intermediate drive cog extending from the underside of said intermediate plate, a metal rib element extending through said intermediate drive cog, said metal rib element having a passage, said reinforcement means extending beyond the longitudinal ends of said rib member and extending into said passage, and clamping means on said metal rib member for clamping said reinforcement means in said passage.

4,711,347

PROTECTIVE ENVELOPE FOR OPTICAL DATA CARD

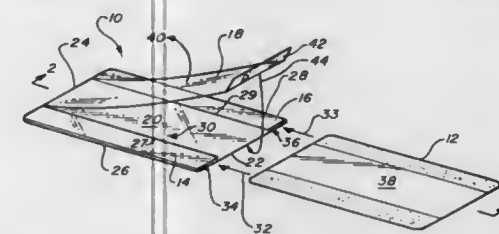
Jerome Drexler, Los Altos Hills, and Richard Haddock, Redwood City, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Filed Feb. 14, 1986, Ser. No. 829,802

Int. Cl.⁴ B65D 75/28, 85/16

U.S. Cl. 206—38

26 Claims



1. A protective envelope for use with a data card comprising, a data card having a data storage area thereon, a planar base member having front, back and opposed side edges, and a cover assembly bonded to said base at said back edge and said opposed side edges thereby forming a pocket between said base and said cover assembly for insertion of said data card.

said cover assembly being made up of a pair of fixed edge strips and at least one flap, said edge strips being spaced apart to define a data storage access area therebetween and being bonded to said base at said back edge and respective side edges, said edge strips projecting inwardly from the respective side edges and extending along substantially the entirety of the side edges, said flap being pivotally bonded to said base at said back edge and being disposed to selectively cover said data storage access area, said fixed edge strips each having a portion spaced apart from said base by the insertion of said data card to frictionally secure said data card when said flap is lifted.

4,711,348

CONTAINER FOR PRODUCT SAMPLES

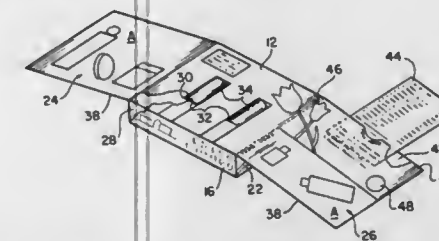
Allen Schlager, 21 W. 68th St., New York, N.Y. 10023

Filed Apr. 24, 1986, Ser. No. 855,330

Int. Cl.⁴ B65D 77/00

U.S. Cl. 206—45.29

6 Claims



1. A cardboard blank to be folded into a box for use in mailing product samples, said blank comprising a central panel delineated by upper and lower edges and opposite side edges and presenting a surface for imprinting product information on a flat surface thereof within the confines of said edges, a gluing tab extending from said lower edge and interconnected plural panels extending from said upper edge, said interconnected plural panels being adapted to be folded along said upper edge and beneath said central panel and to be adhesively secured to said gluing tab to form a box of said interconnected plural panels bounding a compartment beneath said central panel, a foam block sized to be positioned in said compartment and having at least one recess for a product sample, a cut-out in said central panel opening into said recess for positioning a product sample therein, and a pair of side panels each extending later-

ally from one said opposite side edges in contiguous relation to said central panel so as to present additional surfaces on opposite sides thereof for imprinting product information, said side panels being adapted to be folded in overlapped relation in one direction in closing movement upon said central panel and in opposite direction unfolding movement to present a display of said surfaces thereof in adjacent relation on opposite sides of said surface of said central panel, whereby any imprinting for completing said display can be applied simultaneously to said blank in the flat within said surfaces of said side and central panels and automatically will be in registration across said opposite sides edges.

4,711,349

POUCH PACK FOR TOBACCO AS WELL AS A PROCESS AND APPARATUS FOR MAKING THIS

Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

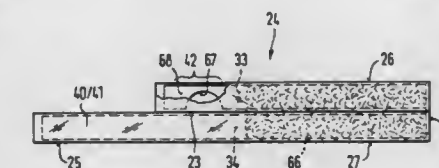
Continuation of Ser. No. 714,049, Mar. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 647,492, Sep. 5, 1984, abandoned, which is a continuation of Ser. No. 421,614, Sep. 22, 1982, Pat. No. 4,505,385. This application Mar. 23, 1987, Ser. No. 29,383

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214240

Int. Cl.⁴ B65D 85/10

U.S. Cl. 206—260

8 Claims



1. A pouch pack for fibrous material, especially cut tobacco, comprising a multi-layer blank made of plastic foils, which forms a pocket with a front wall, a rear wall, a bottom and side walls and, as a continuation of the rear wall, a closure flap, said side walls being perpendicular to said front and said rear wall when the pouch is filled with the fibrous material, and a closing strip, an orifice of the pocket being sealed by said closing strip; a flat insert (22) disposed between said foils, and extending into the region of said side walls, said insert being stiffer than said foils; wherein the closing strip (36) extends over the entire width of the spread-out blank, and lateral strip-shaped projecting lengths (40, 41) of the closure flap (25), including the closing strip (36) but excluding said walls forming said pocket, are folded over inwardly such that the closure flap has approximately the width of the front and rear walls (26, 27) of the pocket (24); wherein the projecting lengths (40, 41) form, in the region of an orifice (32) of the pocket, a smooth transition (42) to the transverse side walls (29, 30) of the pocket (24); wherein said flat insert (22) disposed between said foils has a lateral recess (67) in an edge thereof and at a location which corresponds to, and encompasses, only the area of said transition (42) and which is entirely spaced from said closing strip (36) on the pocket-side thereof.

4,711,350

INSPECTABLE ANTISTATIC CONTAINER FOR PACKING ELECTRICAL OR ELECTRONIC DEVICES

Wei Hsiung Yen, 8, Chia Ping Road, #01-01/08 S'pore, Singapore, Singapore (2261)

Filed Oct. 27, 1986, Ser. No. 923,207

Int. Cl.⁴ B65D 85/42, 65/18

U.S. Cl. 206—328

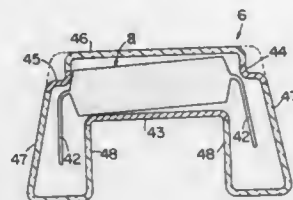
7 Claims

1. A container for electrical and electronic components

having electrical contact legs, which are susceptible to damage by static electrical discharges, comprising:

a tubular casing composed of a continuous peripheral wall of a generally uniform wall thickness, said casing being adapted to receive the component; a plurality of inset shoulder portions formed by said wall and projecting inwardly toward an interior of said casing to restrict movement of the component; said tubular casing having at least one lengthwise electrically conducting strip on an inner surface of each one of said lengthwise inset shoulder means for engaging said component;

said tubular casing having a cross-section which is generally in a "U" shape; each leg of said "U" shape being substan-



tially completely transparent; each said leg having an inner leg portion;
said tubular casing having a substantially completely transparent top portion connecting said inset shoulder portions;
said tubular casing having a leg connecting portion bridging said inner leg portions of each of said legs to form a rest for the component; said rest having an inner surface which is electrically conductive; substantially all remaining portions of said tubular casing being free of electrically conductive interior surfaces;
whereby permissible movement of the component within said tubular casing brings the component only into contact with one of said electrically conductive portions and not into direct contact with said transparent portions.

4,711,351

APPARATUS FOR STORING ELECTRONIC COMPONENTS

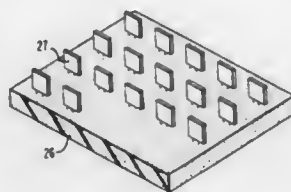
Richard S. Zucker, Ellicott City, and Philip J. Adinolfi, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 528,022, Aug. 31, 1983, abandoned. This application Dec. 17, 1985, Ser. No. 809,702

Int. Cl.⁴ B65D 73/02

U.S. Cl. 206—331

3 Claims



1. Apparatus for storing electrical components having semi-rigid leads, comprising a body of resilient gel having a substantially flat upper surface permitting components to be stored by inserting said semi-rigid leads of said electrical components into said gel, and wherein said body of resilient gel has a thickness selected such that the leads of said components do not penetrate through said body of resilient gel, the constituents of said gel being selected such that:

(1) said semi-rigid leads may be inserted into said gel without substantially bending said semi-rigid leads;

(2) said gel does not harden or otherwise substantially deteriorate with time; and
(3) such that said gel does not contaminate said component such that subsequent assembly processes are jeopardized; and the gel comprises by weight:
(a) approximately 13% castor oil based prepolymer;
(b) approximately 60% castor oil based polyol;
(c) approximately 20% dimethylpolysiloxane; and
(d) approximately 2% ammonia salt.

4,711,352

DELICATE INSTRUMENT HOLDER AND PROTECTOR

Rodger W. Williams, and Charles W. Atwood, both of Nashville, Tenn., assignors to Vextra Corp., Nashville, Tenn.

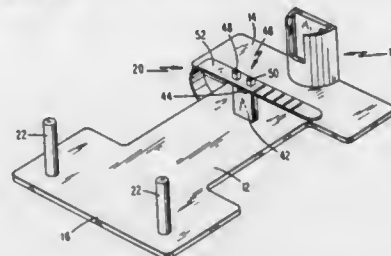
Continuation of Ser. No. 739,216, May 30, 1985, abandoned.

This application Aug. 13, 1986, Ser. No. 896,335

Int. Cl.⁴ B65D 83/10

U.S. Cl. 206—365

5 Claims



1. A device for holding and protecting a delicate instrument, comprising a generally rigid base; first means disposed on the base for securing one end of the instrument to the base; second means disposed on the base in spaced relationship from the first securing means for securing another end of the instrument to the base; said first and second securing means arranged to support the instrument in a raised position from the base; and spacing means including at least one spacer column projecting upward from the base to protect the instrument from being damaged by the application of pressure in a direction substantially perpendicular to the base, said second securing means including an opening loosely receiving said another end of the instrument, and means for preventing said another end of the instrument loosely positioned within said opening from being inadvertently dislodged from said opening.

4,711,353

SOCKET ORGANIZER

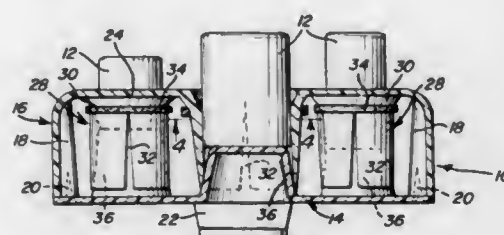
Raymond L. Rozmestor, P.O. Box 1241, Delran, N.J. 08075

Filed May 1, 1986, Ser. No. 858,166

Int. Cl.⁴ B65D 85/28

U.S. Cl. 206—378

14 Claims



1. An article holder comprising a housing having a wall, an opening in the wall, an article receiver of tubular form supported by the wall with said opening defining an open end of the receiver, the receiver being slit longitudinally to form a plurality of circumferentially spaced segments with the segments being radially expandable and contractable and resiliently resisting radial expansion whereby an article of suitable

size inserted into the receiver may resiliently expand the receiver for retention therein by a resilient radial gripping force exerted by said receiver and peripheral contracting means exerting radial inward force on the segments of the receiver.

4,711,354

ARTICLE DISPENSER FOR LIPSTICK OR THE LIKE

Robert Bennett, Easton, Conn., assignor to KJS Industries, Inc., Marlboro, N.J.

Filed Dec. 9, 1986, Ser. No. 939,733

Int. Cl.⁴ B65D 85/24

U.S. Cl. 206—385

2 Claims



1. An article dispenser comprising:
an elongated hollow cylindrical plastic container closed at one end and having an opening in the other end, the container having an inner wall, the opening in the other end being circular and having a first radius;
a plastic article consisting of an elongated plastic member having an enlargement intermediate its ends, the portion of the member between the one end and the enlargement being defined as a first section, the portion of the member between the enlargement and the other end being defined as a second section, the first section being a rod of generally circular cross section having a coating which extends from the one end toward, but spaced from the enlargement, the enlargement having a spherical shape with a second radius only slightly smaller than the first radius, the first section of the member extending into the container with the enlargement being in sonic weld sealed engagement with the opening in the other end of the container and being spaced from the wall and closed end of the container, the second section being thin and flat with a generally rectangular shape in cross section and extending entirely outside of the container whereby, when the container is held in place while the second section is rotated, the sonic weld breaks, permitting the article to be removed from the container.

4,711,355

STACKABLE BOX

Simon J. M. Veenman, P.O. Box 160, 2690 AD 's-Gravenzande, Netherlands

Filed Sep. 20, 1985, Ser. No. 778,562

Claims priority, application Netherlands, Sep. 27, 1984, 8402955; Oct. 29, 1984, 8403273

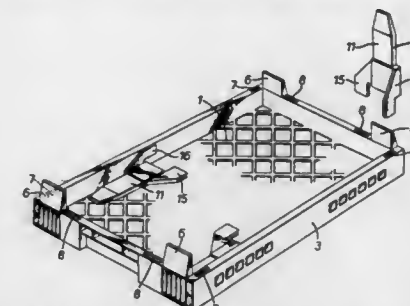
Int. Cl.⁴ B65D 21/02

U.S. Cl. 206—503

16 Claims

1. A stackable box for receiving objects, said box having a bottom and upright transverse and longitudinal sidewalls, said sidewalls having upper exposed surfaces and intersecting with one another at a common corner point, a recess in the exposed upper surface of each wall in the proximity of the said corner point, a detachable extension piece at said corner point, said extension piece having a bottom surface resting on the said upper exposed surfaces between said recesses and a pair of integral wings, each wing of said pair extending parallel with a

respective sidewall and defining with said extension piece a registering common corner point and each having a portion



extending downwardly and arranged to be inserted in and received by a respective recess.

4,711,356

CONTAINER FOR FREEZING AND STORAGE OF FOODSTUFFS

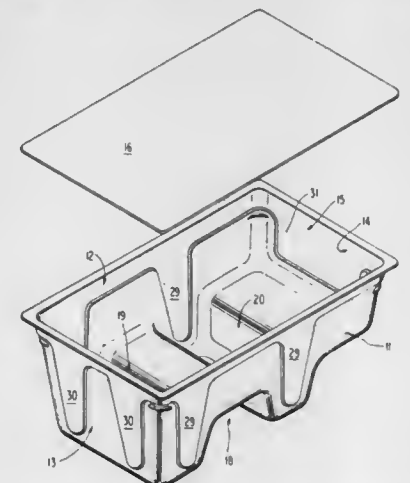
Walter J. Dunden, Eugene, Ore., assignor to Chef Francisco, Inc., Eugene, Ore.

Filed Oct. 29, 1980, Ser. No. 201,908

Int. Cl.⁴ B65D 21/02

U.S. Cl. 206—503

22 Claims



1. An article for use in the packaging, freezing and storing of fluid foodstuffs comprising:
an open-topped elongated rectangular container molded of extensible sheet plastic material to be closed by a substantially rectangular lid;
said container having a body defined by generally parallel, slightly downwardly convergent side walls and generally parallel, slightly downwardly convergent end walls, the depth of one end wall being substantially greater than the depth of the other end wall;
and a corrugated bottom joined with the side walls and end walls and defining with the side walls and said one end wall at least two downwardly depending transverse substantially parallel pockets of equal depth spaced from each other and from said other end wall and having downwardly convergent walls;
said bottom defining with the side walls and said other end wall at least two generally horizontal transverse ledges spaced from each other and disposed in the same horizontal plane, one of the ledges being disposed between a pair of said pockets;
whereby when empty, a plurality of said containers may be nested in one another, and when filled, one container may be inverted and reversed end for end so that a second similar filled container may be superposed thereupon with a ledge of the second container supported upon the apex

of an upwardly projecting pocket of said one container and with the margins of the respective tops in vertical alignment with each other;
the plastic being of a type which is extensible in response to the expansive force of the foodstuff during the freezing process and of a thickness sufficient to allow rapid transfer of heat and extensibility;
the space between a pair of said pockets exceeding the space occupied by an interfitting pocket of a superposed package sufficient to allow for the expansion of the pockets during the freezing of the contents and to permit the circulation of cooling fluid during transport or storage.

4,711,357

AUTOMATED SYSTEM AND METHOD FOR TRANSPORTING AND SORTING ARTICLES

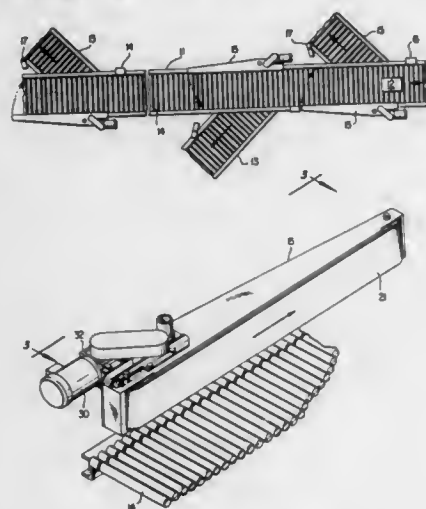
Keith A. Langenbeck, 3112 Purdue St., Dallas, Tex. 75225, and David A. Holdeman, Highland, Ill., assignors to Keith A. Langenbeck, Dallas, Tex.

Continuation of Ser. No. 644,554, Aug. 27, 1984, abandoned.

This application Dec. 18, 1985, Ser. No. 810,885

Int. Cl.⁴ B07C 5/36

U.S. Cl. 209—565



1. A control system for an article conveyor, said article conveyor having a primary track on which articles are initially loaded, a plurality of secondary tracks intersecting the primary track at selected locations therealong and diverter means associated with each of said secondary tracks for diverting articles to respective ones of said secondary tracks, said control system comprising:

means for entering into said control system track information for each article corresponding to the particular secondary track to which each article is to be diverted;
means for inputting and storing said track information for each article in parallel substantially simultaneously at selected ones of a plurality of discrete locations in said storage means, each of said discrete locations being associated with a corresponding one of said secondary tracks so that track information for each article on the primary track is stored in parallel substantially simultaneously in only those discrete locations which are associated with the particular secondary track down which the article will be diverted and those secondary tracks which intersect the primary track upstream of the particular secondary track down which the article will be diverted and each discrete location has stored therein track information for those articles which will arrive at the corresponding secondary track in a sequence corresponding to the sequence in which said articles will arrive at the corresponding secondary track;

detector means positioned in proximity to respective ones of said diverter means at selected locations along said primary track for detecting the presence of articles at said

selected locations and for generating respective electrical signals indicative thereof, each of said detector means being associated with a corresponding one of said diverter means and said secondary tracks;
means for comparing track information for the article which will be first to arrive at each secondary track with the identity of that particular secondary track; and
means responsive to said electrical signals generated by said detector means for selectively operating the diverter means to position each of the diverter means to divert said first article to arrive at the corresponding secondary track to the corresponding secondary track when the track information for said first article matches the identity of the corresponding secondary track, irrespective of the actual location of said first article on said primary track, and alternatively to position each of the diverter means to allow said first article to continue along the primary track when the track information for said first article does not match the identity of the corresponding secondary track.

4,711,358

COUNTERBALANCING TYPE CRANE

Kelichi Konishi, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

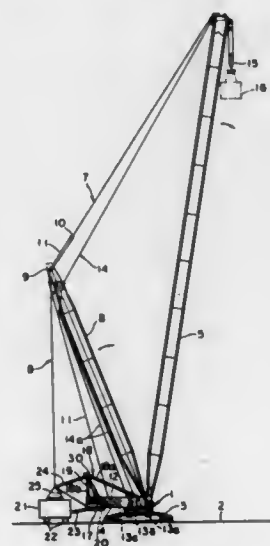
Filed Feb. 24, 1986, Ser. No. 832,411

Claims priority, application Japan, Mar. 4, 1985, 60-42426

Int. Cl.⁴ B66C 23/72

U.S. Cl. 212—178

2 Claims



1. A counterbalancing type crane, comprising:

a crane body which comprises a travelling unit and a swing unit;
a tiltable boom mounted on said crane body for hanging a load through a hoisting line;
a tiltable mast mounted on said crane body;
a boom guy line disposed between an upper portion of said mast and an upper portion of said boom, said boom guy line being changeable in length;
a mast guy line attached at an upper end thereof to the upper portion of said mast;
a gantry disposed at a rear portion of said swing unit and having a mounting portion located at an upper portion thereof; and
a counterweight car with a counterweight placed thereon; connecting arm means for vertically pivotably and removably connecting said counterweight car to the rear portion of said swing unit;
a strut connected between an upper portion of said counterweight car and an upper portion of said gantry;
a guy rope connected between the upper portion of said counterweight car and said swing unit below the gantry, wherein a lower end of said mast guy line is attached to

said counterweight car so as to be detachable therefrom and attachable to said mounting portion of said gantry.

4,711,359

CONTAINER SUCH AS A NURSING CONTAINER, HAVING PROTECTION COMPARTMENT FOR DISPENSING MEMBER

Leonard A. White, Gurnee, and Peter C. Carveth, Glen Ellyn, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 12, 1984, Ser. No. 599,414

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.⁴ A61J 9/00; B65D 25/08, 85/72

U.S. Cl. 215—11.1

18 Claims



1. A nursing container comprising:

(a) a first sheet;
(b) a second, diaphragm sheet sealed about at least a portion of its periphery to said first sheet and to a third sheet, said second, diaphragm sheet being intermediate said first sheet and said third sheet;
(c) said first sheet and said third sheet sealed about their entire peripheries and including the exterior wall of said container;
(d) nipple means including a base and a nipple, between said first and second sheets, said first and second sheets being secured to the periphery of said base at a base seal;
(e) said sheets defining a storage chamber on the base-side of said nipple means;
(f) a manually breakable line of securement between said first sheet and said second, diaphragm sheet in said storage chamber, extending across said storage chamber, subdividing said storage chamber into a storage compartment for the storage of a substance to be delivered to said nipple and a protection compartment adjacent said nipple means to segregate the stored substance from said nipple means; and
(g) a permanent line of securement between said second and third sheets in said storage chamber, extending substantially parallel to, and substantially the length of, said storage chamber breakable line of securement.

5. A container for a substance, comprising:

(a) a first sheet;
(b) a second, diaphragm sheet sealed about at least a portion of its periphery to said first sheet and to a third sheet, said second, diaphragm sheet being intermediate said first sheet and said third sheet;
(c) said first sheet and said third sheet sealed about their entire peripheries and including the exterior wall of said container;
(d) access means including a base and a dispensing member,

between said first and second sheets, said first and second sheets being secured to the periphery of said base at a base seal;

(e) said sheets defining a storage chamber on the base-side of said access means;

(f) a manually breakable line of securement between said first sheet and said second, diaphragm sheet in said storage chamber, extending across said storage chamber, subdividing said storage chamber into a storage compartment for the storage of a substance to be delivered to said dispensing member and a protection compartment adjacent said access means to segregate the stored substance from said access means; and

(g) a permanent line of securement between said second and third sheets in said storage chamber, extending substantially parallel to, and substantially the length of, said storage chamber breakable line of securement.

4,711,360

SPLASH-PROOF CLOSURE

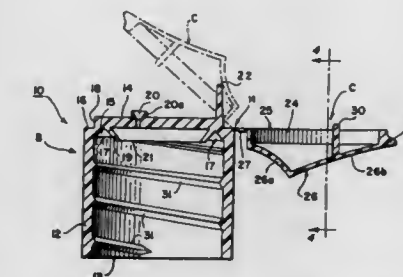
Myron Ullman, Canfield, Ohio, assignor to Boardman Molded Products, Inc., Youngstown, Ohio

Filed Feb. 26, 1987, Ser. No. 22,927

Int. Cl.⁴ B65D 43/16

U.S. Cl. 215—235

8 Claims



1. A plastic closure, primarily useful in conjunction with viscous liquid holding containers, comprising:

a body portion including a tubular skirt having a longitudinal axis, an open bottom and a closed upper wall, said skirt having an internal periphery and an external periphery, said upper wall having an external diameter and including a top surface and a bottom surface, and a dispensing aperture extending through said upper wall, said tubular skirt forming an annular shoulder at its upper end extending about said upper wall;

a cap portion, integrally formed on said body portion, including a tubular wall having a central axis, an open bottom end and a closed domed upper wall having an apex, said tubular wall having an internal diameter slightly larger than the external diameter of said body portion upper wall to provide a tight mating fit therebetween, and the bottom end of said tubular wall being adapted to seat on said annular shoulder;

a hinge, located in a plane perpendicular to said axes, for integrally joining said cap portion to said body portion, and including a thinned hinge line between said cap portion and said body portion, for allowing said cap portion to rotate thereabout close on said body portion;

a cap-stopping resilient post, integrally formed on said skirt upper wall adjacent the peripheral edge of said upper wall and extending upwardly vertically and parallel to said longitudinal axis, for preventing the movement of said cap portion toward the dispensing aperture when the closure is uncapped;

cam means, integrally formed as part of and defined by a portion of said domed upper wall lying between said hinge and said apex, for bending said cap-stopping post to an approximately 45° angle relative to said skirt upper wall

when said cap portion is closed on said body portion and for stopping against said cap-stopping resilient post when the closure is uncapped, said cam means being in a plane located approximately 45° above said skirt upper wall when said cap portion is closed on said body portion; finger-tab means, integrally formed on said tubular wall located opposite said hinge to extend radially outwardly from said tubular wall in a plane perpendicular to said central axis, for providing a region to grasp said cap portion for movement on or off of said body portion; and closing post means, integrally formed on said domed upper wall in the region between said apex and said finger-tab means and extending vertically downwardly parallel to said axes, for reception within said dispensing aperture when the closure is capped; said closing post, the dispensing aperture, said cap-stopping resilient post, said cam means and said finger-tab means all lying along a line extending through and perpendicular to the axis of said hinge.

4,711,361

INTERLOCKING MODULE HOUSING

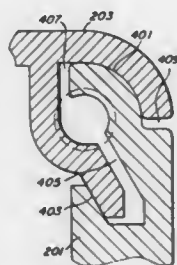
Nicholas Mischenko, Mount Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1986, Ser. No. 858,418

Int. Cl.⁴ B65D 6/24

U.S. Cl. 220—4 F

9 Claims



1. An interlocking corner joint for adjacent sides of an enclosure enabling the adjacent sides to be slidably mated at their edges, comprising:

- an inward curving edge of a first side having a first radius of inside curvature;
- an inward curving edge of a second side having an inside curvature second radius unequal to said first radius, whereby said curving edges may be concentrically nested along the length of said edges;
- a flange disposed adjacent said inward curving edge of the first side, on the same first side surface as said inside curvature, and spaced from said first side edge beyond a point where said inside curvature ceases, said flange having a curved portion curved toward said first side edge and a first lip portion at the end of said curved portion extending essentially away from said first side edge; and
- a second lip forming a groove adjacent said inward curving edge of said second side and on the same second side surface as said inside curvature, said second lip and groove shaped to receive said first lip portion when said curving edges are concentrically nested.

4,711,362

MODIFIED END CAP FOR THERMOPLASTIC CONTAINER

William H. Kercz, Houston, Tex., and Surendra N. Singhal, Tulsa, Okla., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 22, 1986, Ser. No. 909,539

Int. Cl.⁴ B65D 41/02

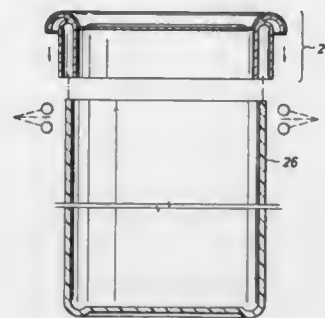
U.S. Cl. 220—67

5 Claims

1. A modified end cap for a food or beverage thermoplastic container, which may be attached to a thermoplastic container

sidewall without the necessity of flaring the thermoplastic sidewall of said container, which comprises:

- a suitable metallic end; and
- a metallic ring clip which is attached to the under portion of said end so that said ring clip can attach to the sidewalls of a thermoplastic container, said ring clip comprising:
 - a first wall having a first edge and a second edge;
 - a second wall having a first edge and a second edge, said second wall being positioned outside of and adjacent to said first wall;



a third annular wall positioned substantially perpendicular to said first wall and said second wall, and having an inner and outer edge, where said inner edge is connected to said first edge of said first annular wall, and said outer edge is connected to said first edge of said second annular wall; a fourth annular wall having an inner and outer edge, where said inner edge of said fourth annular wall is connected to said inner edge of said third annular wall; and wherein said first and second annular walls are arranged concentric to a central longitudinal axis.

4,711,363

TAMPER EVIDENCE CLOSURE

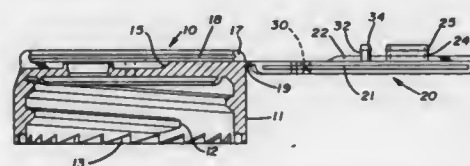
Michael Marino, New Castle, Pa., assignor to West Penn Plastic, Inc., New Castle, Pa.

Filed May 1, 1987, Ser. No. 44,786

Int. Cl.⁴ B65D 41/32

U.S. Cl. 220—266

6 Claims



1. A tamper evident closure comprising a top portion having an annularly depending flange and means thereon for attachment to a container, said top portion having an dispensing opening therethrough, lock means on said annular depending flange securing same to said container, a multiple cap for registering with said top portion, a secondary cap movable into and away from a closed portion overlying said top portion, a tubular plug carried by said secondary cap in a position to cooperate with said dispensing opening and affect a seal therewith when said cap is in closed position, an intrical, thin flexible hinge extending from said top portion to said multiple cap, means of said multiple cap for releasing said secondary cap therefrom and hinge means formed on said multiple cap to said secondary cap, a recessed area on said top portion and a corresponding registerable elongated guide rib on said secondary cap for engagement therewith, means on said secondary cap for securing same to said top portion.

4,711,364

TAMPER-EVIDENT CONTAINER AND CLOSURE

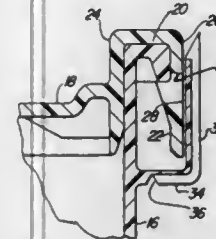
Ilja Letica, Oxford, Mich., assignor to Letica Corporation, Rochester, Mich.

Continuation-in-part of Ser. No. 869,355, Jun. 21, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 23,541

Int. Cl.⁴ B65D 17/40

U.S. Cl. 220—276

18 Claims



1. A container/closure combination comprising:
 - a container comprising a bottom and at least one side wall joined to the bottom and terminating in a peripheral seat defining an open end spaced from said bottom;
 - a closure for said container having an inverted generally U-shaped peripheral section which fits interlockingly over the peripheral seat of the container and includes a skirt portion which, when the closure is in place on said container, lies outside of said side wall;
 - means formed in said skirt portion to define at least one fracture point for splitting said skirt portion to facilitate removal thereof from the container;
 - said container/closure combination further comprising a tear strip removably attached thereto so as to cover and prevent access to the fracture point when said closure is in place on said container seat.

4,711,365

CONTAINER AND CLOSURE ASSEMBLY WITH FOLDING SEALING RIBS

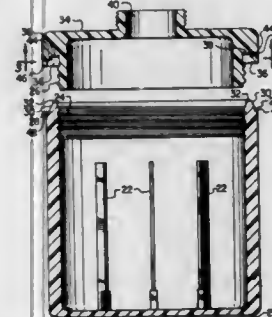
Kenneth A. Fomby, P.O. Box 636, Gainesville, Tex. 76240

Filed Feb. 9, 1987, Ser. No. 12,252

Int. Cl.⁴ B65D 41/04

U.S. Cl. 220—288

20 Claims



1. A container and closure assembly, comprising:
 - a container having an open end portion;
 - a closure member adapted to engage and cover said open end portion; and
 - cooperative means on said container and said closure member for creating a seal therebetween; said cooperative means including a spaced plurality of flexible rib members associated with one of said container and closure member and a portion of the other of said container and said closure member adapted to engage and deform said spaced plurality of rib members.

4,711,366

PRESSURE COOKER

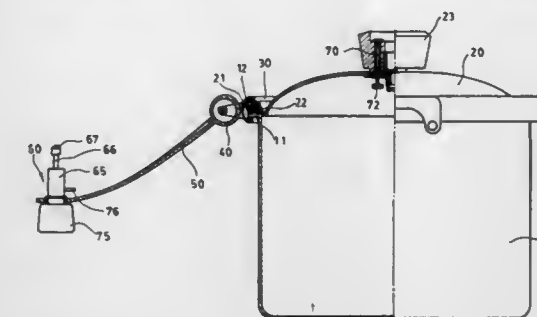
Shin-I Chen, No. 5 Lane 102 Ho-Chiang Street, Taipei, Taiwan

Filed Jul. 28, 1986, Ser. No. 890,167

Int. Cl.⁴ B65D 45/34

U.S. Cl. 220—316

1 Claim



1. A safety pressure cooker comprising:
 - a cooker body;
 - a cover for covering said cooker body;
 - an elastic connector, said connector having a C-shaped cross section, adapted to extend concentrically with respect to said cover, and said connector having a first terminus and a second terminus to define an opening which can be adjusted in width for fastening and releasing said cover;
 - an extension plate secured at each terminus to adjust the width of the opening for fastening and releasing said cover as aforesaid;
 - a grooved cam, said grooved cam having two symmetrical spiral guiding slots;
 - a center shaft passing through each extension plate of said connector and mounted with sliding fit so that rotation of said grooved cam will cause each extension plate to move subject to guiding by said two symmetrical spiral guiding slots to said grooved cam;
 - an operating handle connected to said grooved cam for turning said grooved cam, flexible, with a hole at one end;
 - a valve seat on said cover;
 - a relief valve movably installed in the hole of said operating handle, composed of (a) a valve body defining a valve seat, (b) a rod extending horizontally outside said valve body and including a tapered valve subject to thrust of a respective spring and normally contacting said valve seat for tightly closing said relief valve, and (c) a spring located in said valve body; and
 - two safety pins on said cover, rising to a high position when pressure in the cooker is high in order to restrict movement of said rod of said relief valve such that removal of said tapered valve from said valve seat is substantially precluded and opening of said cover is prevented.

4,711,367

TRASH CONTAINER

Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391

Filed Nov. 1, 1985, Ser. No. 793,848

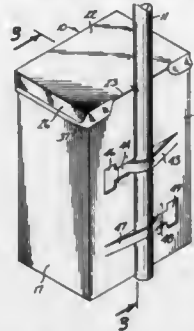
Int. Cl.⁴ B65D 90/04, 90/12, 5/60, 5/34

U.S. Cl. 220—404

17 Claims

1. A container having a chamber accommodating a bag comprising: a box having front, rear, and side walls providing a chamber, said walls having upper edges surrounding an open top, cover means movably connected to the upper edge of the rear wall with hinge means for selectively opening and closing the open top, said cover means having a top wall and front and side flanges joined to the top wall, said front and side flanges extended over upper portions of the front and side walls of the box when the cover means is in the closed position over the open top of the box, said box, cover means and hinge means are folded and shaped from a single sheet member having fold lines

to facilitate folding and shaping of the box and cover means, said hinge means having opposite ends, inwardly directed slots aligned with said opposite ends of the hinge means, said rear wall having downwardly directed slits open to the slots, said slots and slits accommodating separate portions of a bag when located in the chamber to hold the bag in engagement with the upper edges of the walls of the box, said inwardly directed slots being between the upper edge of the back wall of the box and the top wall of the cover means, said hinge means includ-



ing the fold line between the back wall of the box and the top wall of the cover means whereby the cover means is integral with the back wall of the box, a plurality of strap means joined to the rear wall to couple the box to a fixed object, each of said strap means having a first end joined to the rear wall and a second end having an enlarged cross head means, and a plurality of generally T-shaped slot means in the rear wall aligned with the strap means, said cross head means extendible through a T-shaped slot means and engageable with the rear wall to form loops used to couple the box to a fixed object.

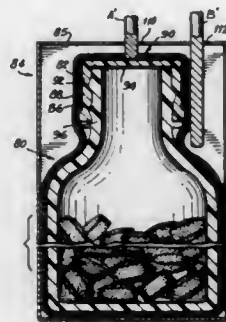
4,711,368

TAMPER PROOF PACKAGE WITH ELECTRICAL CIRCUIT

Leon Simons, 303 E. 57th St. Apt. 47-E, New York, N.Y. 10022
Continuation-in-part of Ser. No. 850,327, Apr. 11, 1986,
abandoned. This application Jul. 9, 1986, Ser. No. 883,245
Int. Cl.⁴ B65D 55/02

U.S. Cl. 220-450

7 Claims



1. A tamper-proof package for enclosing material, the package comprising:
container means for holding material, the container means having an opening through which the material may be inserted and removed;
closure means coupled to the container means for closing the opening;
circuit means having an electrical resistance of known value located on at least one of the container means and the closure means, the circuit means being so positioned that the tampering with the container means will alter the known value of the circuit means; and
terminal means connected to the circuit means on the exterior of at least one of the container means and the closure means for testing the resistance of the circuit means wherein the circuit means further comprises:
an enclosure having a first conductive layer in which at least the container means is enclosed;

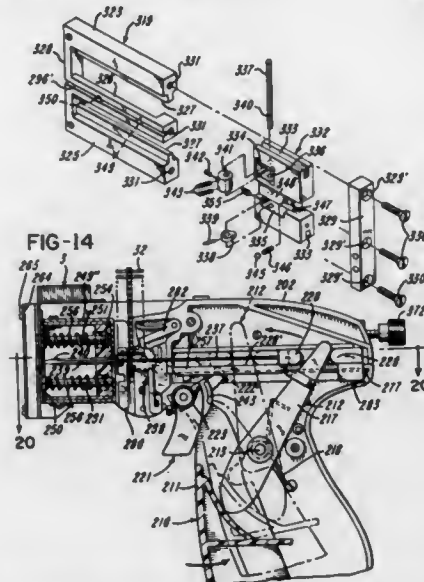
a layer of insulating material extending over the first conductive layer; and
a second conductive layer extending over the insulating layer, the known value of the resistance of the circuit means comprising a substantially open-circuit value when the envelope has not been tampered with, the open-circuit value being altered to a substantially short-circuit value when the envelope has been tampered with.
6. A tamper-proof package for holding material comprising:
container means including a receptacle for holding material and a closure member;
envelope means enclosing the container means for detecting tampering therewith, the envelope means comprising an enclosing surface having a first layer of conductive material, a second layer of insulating material, and a third layer of conductive material, at least one of the layers of conductive material being extrudable into contact with the other layer of conductive material through the layer of insulating material when the enclosing surface is penetrated; and
means for making electrical connection to the conducting layers to determine whether or not the conductive layers are in contact with each other.

4,711,369

TAB DISPENSING AND ATTACHING APPARATUS
Daniel Duchin, Long Island, N.Y., assignor to Monarch Marketing Systems, Inc., Dayton, Ohio
Division of Ser. No. 654,062, Sep. 25, 1985, Pat. No. 4,610,384, which is a continuation-in-part of Ser. No. 553,080, Nov. 18, 1983, Pat. No. 4,610,385/This application Feb. 14, 1986, Ser. No. 829,367
Int. Cl.⁴ B65H 3/22

U.S. Cl. 221-213

20 Claims



1. A tag feed mechanism adapted to use in a hand-held tag attacher of the type having a manually operated actuator, said mechanism comprising: means for moving a tag from a position remote from the attacher to a position in alignment with the attacher; means for applying a driving force to said tag moving means to move same in response to the actuation of the actuator; said tag moving means comprising a feed pin for engaging a tag and means for movably mounting the feed pin, means for mounting the feed pin for relative movement on and with respect to the mounting means, said feed pin being actuated by the application of said driving force to said feed pin to move the mounting means and the feed pin from said remote position to said aligned position; and means for resisting movement of said mounting means until said feed pin has moved relative to said mounting means into engagement with the tag.

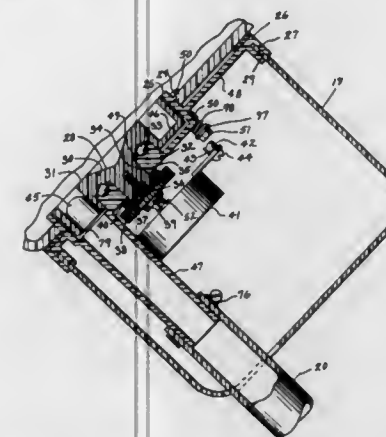
4,711,370

SEAL MEMBER FOR PELLET DISPENSER

Paul R. Goudy, Jr., and William G. Weekley, both of Milwaukee, Wis., assignors to Autotrol Corporation, Milwaukee, Wis.
Continuation of Ser. No. 655,906, Sep. 28, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,201
Int. Cl.⁴ B65G 59/06

U.S. Cl. 221-265

2 Claims



1. A seal member for a rotor assembly comprising:
a rotor member including passages for the movement of particulate material therethrough;
a housing providing a supporting surface;
a shaft member connected to said rotor member and extending from said housing;
a gear secured to said shaft member; and
a seal member operatively positioned between said gear and said housing, said seal member encompassing the area of said shaft extension from said housing, said seal member constructed in a manner and of a material to provide both an enclosure of said area and a biasing of said gear away from said housing;
wherein said gear and said shaft have angled surfaces to mate with respective inner and outer portions of said seal member with said seal member biased therebetween.

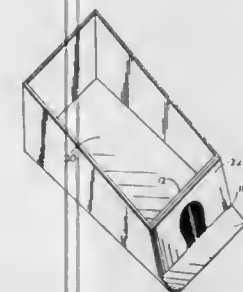
4,711,371

CARD DISPENSER GUARD APPARATUS

Donald R. Harrigan, R.D. 4, Box 243, English Creek Rd., McKee City, N.J. 08232
Filed Jul. 10, 1986, Ser. No. 884,016
Int. Cl.⁴ A47F 1/12; A63F 1/10

U.S. Cl. 221-310

7 Claims



1. A card-dispenser guard apparatus for a playing-card dealing shoe, said apparatus comprising a plate having a front side, a back side, and an opening therethrough, said opening having disposed therein a flexible closure means partable along a vertical axis thereof, wherein the flexible closure means comprises a plurality of closely adjacent tensioned strands which extend from the perimeter of the opening and whose ends meet along a vertical axis of the opening essentially mid-way between the lateral sides of said opening to thereby provide right

strands extending from the right perimeter and left strands extending from the left perimeter of the opening.

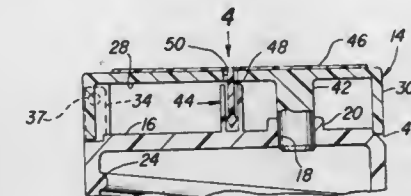
4,711,372

TAMPER INDICATING CLOSURE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.
Filed Feb. 2, 1987, Ser. No. 9,676
Int. Cl.⁴ B65D 41/32, 47/08, 55/06

U.S. Cl. 222-23

16 Claims



1. A tamper indicating dispensing closure for attachment to a container comprising, in combination: a base cap having a top with a dispensing orifice therethrough and with an upwardly projecting retention sleeve thereon and a depending annular skirt having means for attachment to a container; a lid attached to said base cap by a hinge for movement between an open dispensing position and a closed position covering said dispensing orifice; and a tamper indicating disk having a pin projecting therefrom extending through an aperture in said lid and into engagement with said cap retention sleeve when said closure is initially attached to a filled container with said lid in the closed position, said disk being a member separate from the lid, said disk having a frangible area circumscribing said pin; whereby when said lid is initially opened, the pin will be retained by said sleeve breaking away from said disk at said frangible area thereby indicating tampering or initial opening.

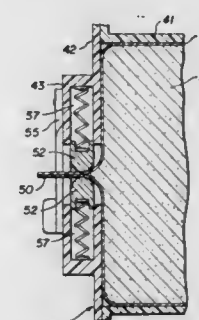
4,711,373

PORTABLE DISPENSING SYSTEM

William C. Christine, Catasauqua, Pa., assignor to Trinity Foundation, Nazareth, Pa.
Continuation-in-part of Ser. No. 850,034, Apr. 10, 1986, abandoned. This application Jun. 2, 1986, Ser. No. 869,341
Int. Cl.⁴ B65D 85/72; G01F 11/00

U.S. Cl. 222-82

7 Claims



1. A portable dispensing system comprises:
a hollow body having a first and second open end, said hollow body receiving a flexible pouch comprising a main body made of a flexible material and a flexible discharge portion integral with said main body, said pouch being filled with a flowable material;
a head removably mounted at said first end of said body and having an opening therethrough;

piston means mounted at said second end of said body for applying pressure to the flowable material in said pouch; said head including valve means adapted for opening in response to pressure created by said piston means acting on said flowable material in said pouch means, said valve means being mounted on said head adjacent said opening and comprising a casing, jaw means movably mounted on said casing for reciprocable movement between opened and closed positions, said discharge portion of the pouch passing through said opening of said head and being engaged by said jaw means, biasing means normally urging said jaw means to the closed position thereby closing said pouch and said biasing means yielding due to pressure increases on said pouch by said piston for the discharging of said flowable material.

4,711,374

LOW-COST POST-MIX BEVERAGE DISPENSER AND SYRUP SUPPLY SYSTEM THEREFOR

Lorraine E. Gaunt, Marietta; Samuel C. Crosby, Decatur; William J. Saunders, Stone Mountain, and Robert D. Bruffey, Jr., Lilburn, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

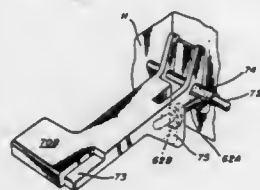
Division of Ser. No. 775,833, Sep. 13, 1985, Pat. No. 4,635,824.

This application Sep. 16, 1986, Ser. No. 907,821

Int. Cl.⁴ B67D 5/56; E03B 3/00

U.S. Cl. 222—129.1

1 Claim



1. A valve assembly for selectively dispensing a carbonated post-mix beverage or carbonated water alone from a post-mix beverage dispenser comprising:

- a syrup valve connected to a syrup supply;
- a soda valve connected to a source of carbonated water; and
- valve actuator means including a first lever for opening said soda valve and a second lever for opening said syrup valve, said first and second levers having pivot ends mounted on a pivot shaft and manually engageable actuation ends, said actuation ends being disposed in substantially the same plane, a portion of the actuation end of said first lever underlying a portion of the actuation end of the second lever in the direction of actuation, said second lever also having a protrusion in between said actuation end and said pivot end, said valve actuator means further comprising a rocker layer mounted about a second pivot shaft for operatively engaging the protrusion of said second lever, wherein said second pivot shaft lies below and substantially parallel to said first pivot shaft, whereby upon depression of said second lever the protrusion causes said rocker lever to pivot about said second pivot shaft and open said syrup valve causing syrup to be dispensed for mixing a post-mixed beverage; whereby said first lever may be actuated independently of

said second lever to open said soda valve, but actuation of said second lever also actuates said first lever, causing both said syrup and soda valves to open.

4,711,375

DEVICE FOR TREATING BURN AND SCALD WOUNDS

Karl Mäder, Pfaffikon; Guido Schönenberger, Reinach, and Carlo A. Buzzzi, Zurich, all of Switzerland, assignors to IDC-Chemie AG, Zurich, Switzerland

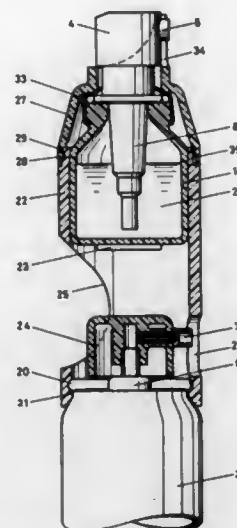
Filed Apr. 29, 1986, Ser. No. 856,990

Claims priority, application Switzerland, May 17, 1985, 2123/85

Int. Cl.⁴ B67D 5/52

U.S. Cl. 222—135

1 Claim



1. A device for treating burn and scald wounds comprising: a first container (1) which contains water (3) and has an operating button (4) of a pump (8), with a first spray nozzle (5) for spraying the water; a second container (2) which contains a coolant and has a separate valve (6) with a second spray nozzle (7) which is aligned approximately parallel with the first spray nozzle; a housing (22) connecting the first and second containers in coaxial relation with the first container positioned above the valve (6) of the second container, the housing snapping onto the second container and the housing having an access opening (25) for operating the valve (6) and a slit opening (26) diametrically opposite the access opening (25), the second spray nozzle projecting into the slit opening (26); and a snap-on guide cap (27) holding the first container (1) in the housing (22) and having a guide slit (34) into which the first spray nozzle (5) projects, the guide slit (34) being aligned with the slit opening (26).

4,711,376

DISPENSING PISTON-COCK FOR ICE CREAM MAKING MACHINES

Ezio Manfroni, Sasso Marconi, Italy, assignor to Carpigiani Bruto Macchine Automatiche, Italy

Filed Jul. 15, 1986, Ser. No. 885,680

Claims priority, application Italy, Jul. 26, 1985, 15217/85[U]

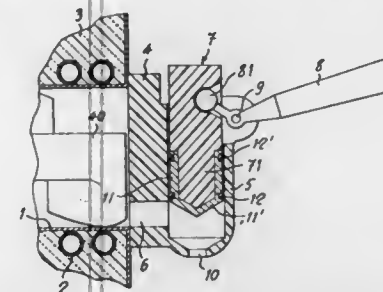
Int. Cl.⁴ B67D 5/62

U.S. Cl. 222—146.1

5 Claims

1. In a dispensing piston-cock for use in ice-cream machines having means for heating the ice-cream mix to a pasteurizing temperature, and means for refrigerating the ice-cream mix, and of the kind comprising a baseplate made of plastics material; a cylinder made of plastics material open at its upper end and provided with an ice-cream dispensing hole at its opposite

or lower end; said cylinder being integral with or formed in said baseplate; at least one communication duct formed in said baseplate and opening in proximity of the lower end of said cylinder; a piston made of plastics material slidably mounted in said cylinder; at least two spaced sealing rings on the lower end portion of said piston; means for reciprocating said piston in said cylinder from a first position wherein it closes said communication duct with its lower end portion, to a second posi-



tion wherein its lower end portion is lifted above said communication duct; the improvement according to which the said piston is covered at least over its lower end portion by a metal jacket, which metal jacket extends up along the piston to a height above the communication duct so that the jacket covers the communication duct when the piston is in said first position at which it covers the communication duct, such that during the heating of the ice-cream mix the heat is conducted, by means of said metal jacket, to the interior walls of the cylinder.

4,711,377

COUPLER AND PUMP FOR A BEVERAGE DISPENSER

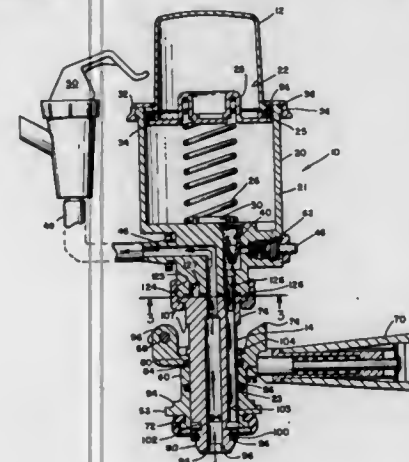
Anthony D. Brown, Woodland Hills, Calif., assignor to Grundy Dispense Systems, Inc., Canoga Park, Calif.

Filed Feb. 24, 1986, Ser. No. 832,309

Int. Cl.⁴ B67D 1/04

U.S. Cl. 222—400.7

13 Claims



1. A coupler and pump for dispensing a beverage from a container having a valve, comprising:

- a. an air pump;
- b. a coupler;
- c. said air pump further comprising a pump housing including an interior cylinder having a floor and the pump housing including a base;
- d. a piston retained within said cylinder of said pump housing for providing a source of compressed air;
- e. means for returning said piston to the top of its stroke, the returning means being retained within said pump housing;
- f. an air passage extending from the floor of said cylinder through the base of said pump housing;
- g. a beverage passage within said base of said pump housing;

h. said coupler further comprising a coupler housing including a central cylindrical bore therein;

i. a substantially cylindrical probe movably seated within said cylindrical bore of said coupler housing, wherein said probe further includes a probe head for sealing engagement with the valve of a container of beverage, a top-end remote from said probe head, a first flange adjacent the top end of the probe, a second flange delineating the end of said probe head, a recess adjacent said second flange, a central longitudinal beverage passage, an air passage parallel to but offset from said beverage passage, said air passage running from the top end of the probe to said recess adjacent to said second flange, and means for sealing said air passage and said beverage passage of said probe head relative to the container valve and from each other;

j. means for actuating said movable probe;

k. means for rotatably joining said coupler to a container valve;

l. means for aligning said air and beverage passages in said probe with said air and beverage passages in said base, respectively and preventing rotation of said probe relative to said air pump; and

m. means for joining the base of said air pump to the top end of said probe.

4,711,378

SPRAY CAP ASSEMBLY COMPRISING A BASE UNIT AND PUSH/PULL CLOSURE MEANS

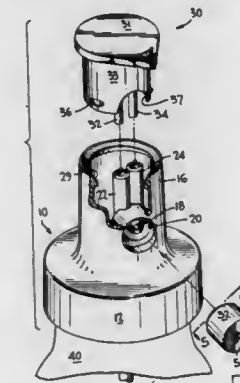
John J. Anderson, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Mar. 24, 1986, Ser. No. 842,969

Int. Cl.⁴ B65D 25/38

U.S. Cl. 222—499

4 Claims



1. A spray cap assembly for attachment to a resilient container comprising a base unit including a skirt portion for attachment to a resilient container, an annular sidewall portion positioned above said skirt portion integral therewith, a discharge chamber recessed into said sidewall portion, an orifice in said discharge chamber extending through said annular sidewall portion, a separation wall within said annular sidewall portion and extending at right angles to said annular sidewall, first and second parallel tubular passages extending through said separation wall, the first of said passages having an opening therein to place said passage in communication with said orifice and the second of said passages having an opening therein to place said passage in communication with said discharge chamber; an insert in said discharge chamber having a dispensing hole to form a product-air mixing chamber behind said insert, said hole being in communication with said orifice and with the opening in the second passage; a push/pull closure comprising a closed end, an annular closure sidewall extending downwardly from said closed end, said annular closure sidewall being positioned within said annular sidewall portion of said base unit, and parallel posts extending down-

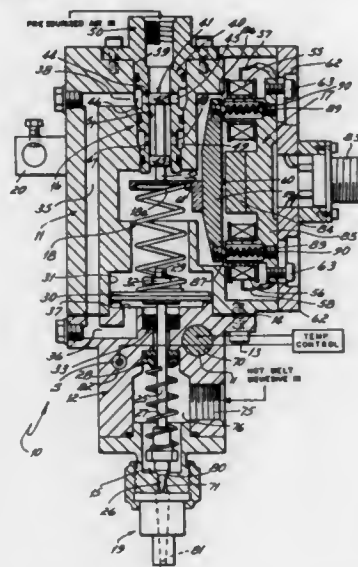
wardly from said closed end within said annular closure sidewall mated to and positioned within said first and second passages of said base unit; said base unit and closure being constructed and arranged whereby when said closure is in an open position said tubular passages are in communication with said orifice and discharge chamber through said openings therein and when said closure is in the closed position said openings in said tubular passages are sealed, and whereby said annular closure sidewall and the base unit annular sidewall portion cooperate to guide and limit movement of said closure between the open and closed positions.

4,711,379

PROPORTIONAL FLOW CONTROL DISPENSING GUN
Richard P. Price, Parma Heights, Ohio, assignor to Nordson Corporation, Westlake, Ohio
Continuation of Ser. No. 719,415, Apr. 3, 1985, abandoned. This application Mar. 17, 1986, Ser. No. 840,501
Int. Cl.⁴ B67D 5/00

U.S. Cl. 222-504

2 Claims



1. Proportional flow fluid dispensing apparatus comprising:
 - a piston;
 - a flow control valve means having a valve stem operably connected to said piston for controlling the flow of the fluid;
 - a passageway for pressurized air opening to one side of the piston;
 - an air valve means for controlling the flow of pressurized air into said passageway;
 - a direct mechanical spring feedback means;
 - a linear effort electric torque motor means operably disposed in a position between said mechanical spring feedback means and said air valve means for directly stroking said air valve means, said direct mechanical spring feedback means being operably disposed between said piston and said linear torque motor means for positioning said air valve means to block said passageway after said valve stem has been moved to a position linearly corresponding to the force exerted by said torque motor;
- wherein said air valve means comprises a valve body and a balanced, three land spool reciprocally mounted in said valve body, said valve body having an exhaust port, a supply port and a load port, the outermost of such lands being directly exposed on outwardly facing sides to atmospheric pressure, and the innermost of such lands adjacent said load port, said innermost land selectively sealing such load port and wherein one face of said innermost land is directly exposed to said supply port and one face of said innermost land is directly exposed to said exhaust port.

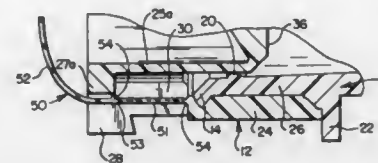
4,711,380

TAMPER-EVIDENT SEAL FOR A TOGGLE-TYPE DISPENSING VALVE

John G. Ulm, Upper Sandusky, Ohio, assignor to Liqui-Box Corporation, Worthington, Ohio
Filed Aug. 18, 1986, Ser. No. 897,464
Int. Cl.⁴ B65D 47/10

U.S. Cl. 222-541

7 Claims



1. A dispensing valve and spout assembly comprising: a hollow tubular spout having axially inner and outer ends, a valve member formed of resiliently flexible material mounted on the outer end of the spout, said valve member having spaced, hollow tubular concentric inner and outer walls, the inner and outer walls being flexible and interconnected but spaced apart sufficiently to provide a socket, said socket receiving and engaging the outer end of the spout, part of the inner wall carrying a flexible hollow extension with an outlet, the inner wall carrying adjacent its axially-inward end a transverse wall, means on the spout for forming a first seal with the inner wall of the valve member, said outer wall having an outlet positioned axially outwardly beyond the axially outer end of the spout which said outlet of said outer wall is directed radially outwardly from the axial outer end of the spout, the hollow flexible extension projecting axially outwardly beyond the axially outer end of the spout and the hollow flexible extension is connected to the outer wall at a closed upper outer end where the outlet of the flexible hollow extension is located and is directed radially outwardly towards the outlet in the outer wall with which it substantially aligns, a distorting member mounted on the transverse wall such that movement of the distorting member in one direction will cause flexing of both the transverse wall and the inner wall as well as said extension, thereby opening a dispensing passage to said outlet in the outer wall bounded by the inner wall, the spout and the extension of the inner wall, means forming a combination of an anti-tampering structure and a second seal between the valve member and the spout comprising a tear-off tab sealed in said outlet in the flexible extension to normally prevent access through that outlet into the spout and seal it to prevent leakage there-through in case of failure at the first seal means said tear-off tab comprising an outlet covering section secured by a tear line connection to the closed upper, outer end of said extension and extending axially along the extension to which it is secured and then to the adjacent outer wall to which it is secured.

4,711,381

BICYCLE RACK WITH SAFETY LIGHT

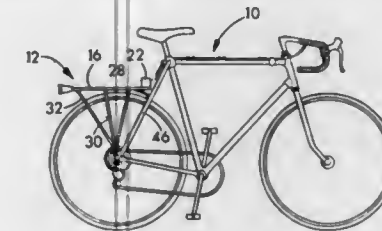
Willie L. Felder, 2475 Elliot Ave., S., Minneapolis, Minn. 55404
Filed Jul. 11, 1986, Ser. No. 884,727
Int. Cl.⁴ B62J 7/00

U.S. Cl. 224-39

6 Claims

1. An illuminated bicycle rack comprising an article supporting platform having a pair of longitudinally extending, laterally spaced apart tubular article supporting stringers defining the side edges of the article support platform, each stringer carrying a light casing at the rear end thereof, the rear end of each of the stringers having an extension connected thereto to define said light casing and supported solely by the rearward end of the stringer, each extension projects rearwardly from the stringer and has a forward end affixed to the rear end of the stringer, each said extension enclosing and supporting a light bulb socket adapted to receive a bulb,

said extensions for the bulb being spaced apart from one another behind the stringer and behind other portions of the rack connected to the stringers to define an open center area between the extensions thereby reducing the weight of the rack at its rear end and enhancing streamlining thereof,
each said extension having an opening at the rear end thereof,
said opening having a bulb cap thereon, said cap having a transparent lens therein, whereby light from the bulb can be directed rearwardly of the rack,
battery support means mounted upon the rack and con-



ected to the stringers in the vicinity of the forward ends of the stringers,
at least one electrical conductor extending through each of the hollow stringers between the light casing and the battery support means whereby the stringers support both the battery support and the lights and protect the conductors extending therebetween,
brace members extending horizontally between the stringers and connected thereto to establish the spacing therebetween, and
legs extending from the stringers downwardly and said legs being adapted to be connected to the framework of the bicycle to support the rack.

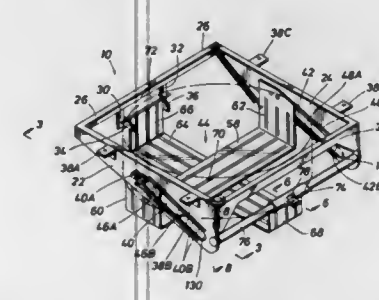
4,711,382

SPARE TIRE CARRIER

David L. Helterbrand, 3508 University Dr., Garland, Tex. 75043
Filed Oct. 17, 1986, Ser. No. 920,274
Int. Cl.⁴ B62D 43/00

U.S. Cl. 224-42.23

16 Claims



1. Apparatus adapted for supporting a spare tire on an underside of a vehicle, comprising:
 - a pair of spaced apart track members attachable to the underside of the vehicle, said track members each having an inclined path of travel;
 - a carriage having a front end directed toward the front end of the vehicle, and a rear end directed toward the rear end of the vehicle, said front end and said rear end of said carriage being spaced apart a sufficient distance to enable attachment of a spare tire to said carriage;
 - means for movably mounting said carriage to the inclined path of travel of said track members, said carriage being pivotally movable relative to said track members between

a retracted tire storage position and an extended position for providing convenient access to the spare tire; and
a guide pin fixed to said carriage and engageable with said inclined path of travel of said track members for limiting the pivotal movement of said carriage with respect to said track members.

4,711,383

CLOTHES HANGER CARRIER AND STORAGE CONTAINER

James E. Jenkins, 84678 Laughlin Rd., Eugene, Oreg. 97405
Continuation-in-part of Ser. No. 757,145, Jul. 22, 1985, abandoned. This application Jun. 30, 1986, Ser. No. 929,794
Int. Cl.⁴ A45F 3/02

U.S. Cl. 224-202

4 Claims



1. A unitarily constructed, rigid, portable carrier for clothes hangers comprising, a, walled structure having front, rear, and bottom walls and a pair of side walls, said front wall defining and opening for the reception of hanger necks and an interior defined by said walls, each of said side walls having a stiffening channel formed by interconnecting stiffening ribs for imparting rigidity to said side walls, and, a strap for supporting said walled structure,
said strap adapted to be retained in said stiffening channel when said walled structure is supported by said strap.

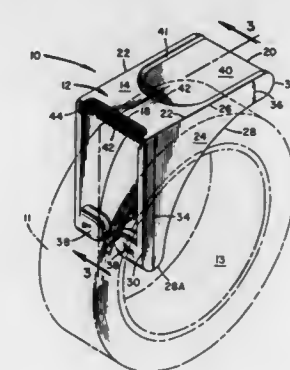
4,711,384

TAPE DISPENSING DEVICE

Rod W. Harris, 1011 Arlington Blvd. #907, Arlington, Va. 22209
Continuation of Ser. No. 675,328, Nov. 27, 1984, abandoned. This application Jan. 21, 1987, Ser. No. 8,046
Int. Cl.⁴ B65D 85/672

U.S. Cl. 225-66

13 Claims



1. A dispensing device adapted to be mounted on a core mounted roll of flexible material to facilitate manual engagement of the roll and dispensing and severing of a length of said material comprising:
 - a top wall having a top surface, a bottom surface, a front edge, a back edge and side edges, said front edge of said

top wall having cutting means for cutting a desired length of material to be dispensed, said top surface of said top wall having a user-engageable portion;

a side wall perpendicular to and extending downwardly from each of said side edges of said top wall, said side walls having a top edge, a bottom edge, a front edge, and a back edge, said bottom edge of said side walls curving ergonomically downwardly along a continuous concave arc from said back edge of said sidewall toward said front edge of said sidewall so that the downward extension of said side walls from said top wall is greater at said front edge of said side wall than at said back edge of said side wall thereby defining a downwardly curving continuous concave user-engageable bottom edge, said downwardly curving continuous concave arc allowing continuous opposing manual engagement of said user-engageable portion of said top surface of said top wall, said user-engageable portion of said downwardly curving continuous concave bottom edge of said side wall, and core when the dispensing device is mounted on a core mounted roll of flexible material; and

a shoulder perpendicular to and projecting inwardly from at least one of said side walls towards the other of said side walls, said shoulder terminating at a point spaced from said other side wall, said shoulder adapted to position and retain said device on said roll.

4,711,385

EXPLOSIVE POWDER CHARGE ACTUATED FASTENING ELEMENT DRIVING DEVICE

Peter Jochum, Meiningen, Austria, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

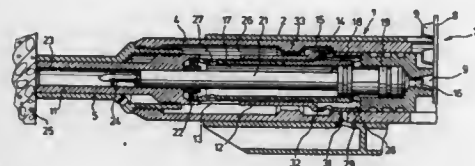
Filed Nov. 19, 1986, Ser. No. 932,658

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3540953

Int. Cl.⁴ B25C 1/14

U.S. Cl. 227—10

5 Claims



1. Explosive powder charge actuated fastening element driving device comprising a housing, an axially elongated tubular piston guide located within said housing and forming a guide bore having a first end and a second end, a driving piston displaceably mounted within said guide bore, a firing chamber located at the first end of said guide bore for receiving an explosive powder charge so that upon firing the charge propellant gases are generated and directed against said piston for displacing said piston in the direction from the first end toward the second end, said piston guide is spaced inwardly from said housing for at least an axially extending portion spaced between the first and second ends of said bore and forming a channel, said piston guide having a first aperture and a second aperture extending radially therethrough and communicating between said guide bore and said channel, said first aperture and said second aperture are spaced apart in the axial direction of said piston guide with said first aperture located closer to and spaced from the first end of said guide bore and said second aperture located closer to and spaced from the second end of said guide bore, and means located within said channel between said first and second apertures for selectively blocking flow through said channel between said first and second apertures during the operation of said driving device.

4,711,386

METHOD OF JOINING PYROLYTIC BORON NITRIDE

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 15, 1986, Ser. No. 906,877

Int. Cl.⁴ B23K 31/02

U.S. Cl. 228—121

13 Claims

1. The method of joining a pyrolytic boron nitride article to a metal or ceramic member comprising the steps of: forming the pyrolytic boron nitride article by chemical vapor deposition; placing said article and said member in position to be brazed together with a metal alloy foil therebetween, the alloy containing titanium as an active metal in an amount of about 0.5 to 2.5 weight percent; and brazing the article to the member by heating under vacuum at a temperature at which the alloy melts.

4,711,387

METHOD OF PRODUCING PIPES WITH CRACK ARRESTERS

Boris E. Paton, ulitsa Chkalova, 41a, kv. 26; Boris I. Medovar, ulitsa Anri Barbjusa, 22/26, kv. 109; Semen M. Biletsky, ulitsa Kopernika, 16b, kv. 24; Vladimir Y. Saenko, Khar'kovskoe shosse, 18, kv. 71; Vasilii I. Us, ulitsa Filatova, 1/22, kv. 9; Alisa I. Krendeleva, prospekt Pravdy, 72a, kv. 185; Jury P. Barvinko, Darnitsky bulvar, 9, kv. 41; Lev B. Medovar, ulitsa Anri Barbjusa, 5b, kv. 62; Nikolai B. Pivovarsky, ulitsa Marshala Yakubovskogo, 7, kv. 30, and Nikolai A. Astafiev, ulitsa Prirechnaya, 1a, kv. 96, all of Kiev, U.S.S.R.

PCT No. PCT/SU84/00016, § 371 Date Aug. 12, 1985, § 102(e) Date Aug. 12, 1985, PCT Pub. No. WO85/03114, PCT Pub. Date Jul. 18, 1985

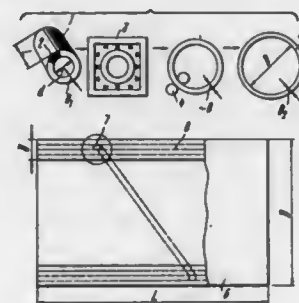
PCT Filed Mar. 21, 1984, Ser. No. 764,542

Claims priority, application U.S.S.R., Jan. 5, 1984, 3679051

Int. Cl.⁴ B23K 20/04, 20/18, 31/06; B21C 37/06

U.S. Cl. 228—143

1 Claim



1. A method of manufacturing large diameter pipes with crack arresting means therein comprising the steps of fabricating a hollow cylindrical blank with a multi-layered wall and a slot extending through the entire thickness of at least one of the layers, said blank being provided with a diameter and wall thickness that are smaller and greater, respectively, than a final diameter and wall thickness of a completed pipe, applying a fusion-preventing coating to facing surfaces of selected internal layers of said cylindrical blank at least within limited areas adjacent to said slot and spaced from end surfaces of said blank, heating and rolling said multi-layered cylindrical blank on a ring rolling mill to said final diameter and wall thickness, and fusing said layers to each other while preventing the fusion of said coated facing surfaces of said selected internal layers adjacent said slot, thereby forming a multi-layered pipe with increased resistance to crack propagation under extreme operating conditions.

4,711,388

PROCESS AND APPARATUS FOR FABRICATING OPTICAL FIBER CABLES

Joseph Winter, New Haven, and Michael J. Pryor, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

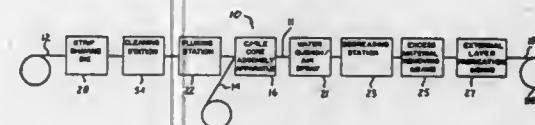
Continuation of Ser. No. 497,535, May 24, 1983, Pat. No. 4,555,054, which is a continuation-in-part of Ser. No. 413,846, Sep. 1, 1982, Pat. No. 4,508,423, which is a continuation-in-part of Ser. No. 324,242, Nov. 23, 1981, abandoned. This application

May 20, 1985, Ser. No. 736,169

Int. Cl.⁴ H04B 9/00

U.S. Cl. 228—148

15 Claims



1. A process for fabricating an optical fiber cable assembly having at least one optical fiber housed within a sealed metal or metal alloy tube, said process comprising:

forming a metal or metal alloy strip into a tube having a seam formed by spaced-apart tube portions; inserting said at least one optical fiber within said tube; sealing said seam and said tube; said sealing step comprising providing a bath of molten metallic sealing material having a composition different from that of said metal or metal alloy forming said tube, said bath having an inlet through which said tube and said at least one fiber enter said bath and an outlet through which said tube and said at least one fiber exit said bath; said sealing step further comprising pulling said tube with said at least one fiber through said bath of molten metallic sealing material without any protective structure between said tube and said bath to permit said tube to be in contact with said molten metallic sealing material as it travels from said inlet to said outlet and to permit the motion of said tube through said bath to cause said molten sealing material to flow into said seam and seal said tube and to form a coating about said tube; and rapidly solidifying said sealing material after said tube exits said bath by passing said tube through a water quench.

4,711,389

SELF-SUPPORTING AND SPILL RESISTANT FOOD CARTON

Andrew J. Alba, Warwick; James A. Griesemer, Campbell Hall, and Robert L. Gordon, Monroe, all of N.Y., assignors to International Paper Company, Purchase, N.Y.

Continuation of Ser. No. 807,891, Dec. 11, 1985, abandoned.

This application Sep. 9, 1986, Ser. No. 906,585

Int. Cl.⁴ B65D 5/18

U.S. Cl. 229—1.5 B

3 Claims

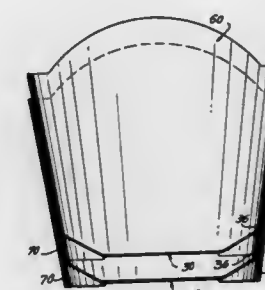
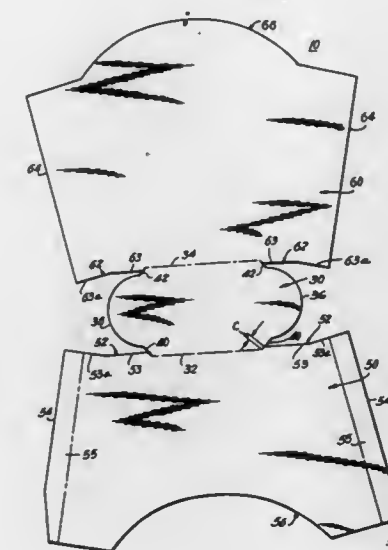
1. A one piece blank which may be erected into a generally hollow non-collapsible upright self-supporting carton which is storable in a nested and stacked arrangement, comprising:

a base panel which forms a closed flat end in erected carton, said base panel including first and second generally opposing edges each bordered by a score line, and generally arcuate connecting side edges, said first and second scored edges being formed by generally parallel spaced lines; first and second upright panels respectively hingedly connected to said first and second scored edges, said first upright panel having a greater longitudinal width than said second upright panel, said first and second upright panels each including, a bottom edge, a pair of opposing lateral edges extending outwardly from said bottom edge, and a top end edge which connects said lateral edges; each bottom edge including opposing sections which intersect and extend outwardly from said connecting side edges of the base, said sections being spaced substantially like distances inwardly from said scored base panel edges,

and provided with cuts which extend from the intersection of said connecting side edges and said sections to said scored base panel edges, said cuts being contiguous to said connecting edges;

said first and second upright panels being pivoted about said scored base panel edges, and said lateral edges of said panels, respectively, being attached to form the upright carton;

said connecting base panel edges being recessed within the carton at an approximately thirty degree angle and biased against said first and second upright panels to enhance the structural integrity and maintain the configuration of the carton;



said recessed connecting base panel edges defining a shelf which facilitates storage and separation of cartons when stacked in nested relation; said connecting base panel edges also defining vent openings between said base panel and said upright panels; said bottom edge sections raising said closing flat carton end relative to said upright panels to provide supports and a self-standing carton feature; said supports also enhancing the structural integrity of the carton when a plurality of such cartons are stacked in nested relation, said supports of each carton contacting and pressing downward on the side edges of an underlying carton to maintain the configuration of the cartons.

4,711,390

COLLAPSIBLE BOX FOR TRASH COMPACTING SYSTEM

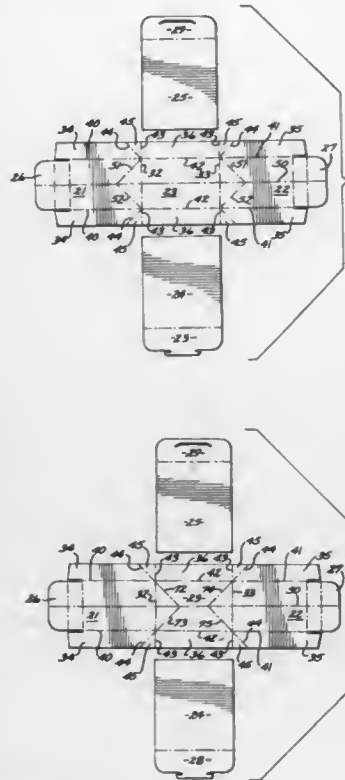
Kenneth E. Andrews, Rancho Palos Verdes, Calif.; Gary Weingardt, Las Vegas, Nev., and James L. Durbin, Valencia, Calif., assignors to A.K.G.S., Las Vegas, Nev.

Continuation-in-part of Ser. No. 635,141, Jul. 27, 1984, Pat. No. 4,620,479. This application May 28, 1986, Ser. No. 868,131

Int. Cl.⁴ B65D 5/36

U.S. Cl. 229—41 R

8 Claims



1. A collapsible box comprising:

- a. an elongated main section with a rectangularly shaped bottom panel having front, rear and side margins and upwardly folding, rectangularly shaped front and rear panels having bottom and side margins, the front and rear panels being hingedly connected at their bottom margins to the front and rear margins respectively of said bottom panel;
- b. a pair of continuous, inwardly folding flanges having inner and outer margins, with the inner margins thereof connected to the side margins of the front, rear and bottom panels of the main section, each of the inwardly folding flanges having one pair of fold lines extending from the intersection of the front and bottom panels to the outer edge of the flange, and one pair of fold lines extending from the intersection of the rear and bottom panels to the outer edge of the flange, each pair of the fold lines comprising one fold line which extends transversely across the flange, and one fold line which extends diagonally across the flange to thereby define a triangularly shaped flange section which is folded about the transverse and diagonal lines into contact with and secured to an adjacent section of the flange;
- c. a pair of opposed upstanding side panels secured to the inner side of at least the portions of the continuous inwardly folding flanges connected to side margins of the front and rear panels so that the inwardly folding flanges are on the exterior of the box; and
- d. a continuous medial fold line extending longitudinally along the central portion of the main section including the front, rear, and bottom panels to facilitate the folding of

these panels when the box is collapsed into a flattened state.

4,711,391

MAILBOX SIGNAL DEVICE

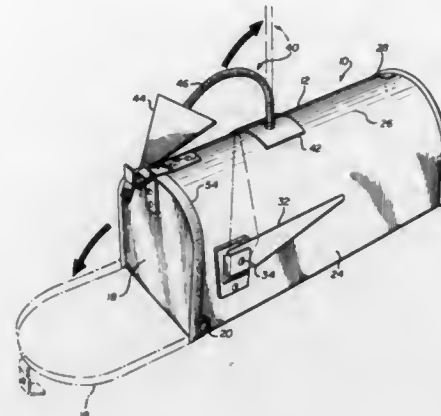
Paul Roge, 8 S. 510 River Dr., Naperville, Ill. 60565, and Ralph R. Roge, 6426 S. Richmond, Clarendon Hills, Ill. 60514

Filed Feb. 13, 1987, Ser. No. 14,686

Int. Cl.⁴ A47G 29/12

U.S. Cl. 232—35

9 Claims



1. For use on a roadside mailbox having wall structure defining an enclosure open at one end and a door hinged to the wall structure to be moved between closed and opened positions relative to the open end, a signal device comprising the combination of

- a base plate and a signal plate;
 - threaded means secured to each plate, each having an exposed end;
 - a helical coil spring, and said spring being threaded onto the exposed ends of the threaded means, for securing the base and signal plates resiliently together;
 - a tab formed off of said signal plate adjacent an edge remote from the spring, said tab being angled from the signal plate about an axis disposed transverse to the spring;
 - said base plate being adapted to be positioned with one face flush against the mailbox wall structure, at a location where the signal plate tab may be moved, against the flex of the spring, to a lowered position adjacent the open end of the mailbox, to be operatively held so lowered; and
 - adhesive means on said base plate face, adapted to secure said base plate to the wall structure at said location;
- whereby said tab may be released from said lowered position automatically upon the door being opened, and said signal plate being resiliently moved to an elevated position upstanding from the base plate and wall structure, to be visible from afar.

4,711,392

MIXING VALVE APPARATUS

Yasuo Kidouchi, Yamatokouriyama, and Hiroaki Yonekubo, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 10, 1985, Ser. No. 807,525

Claims priority, application Japan, Dec. 11, 1984, 59-261159; May 31, 1985, 60-118339; Jun. 25, 1985, 60-139326

Int. Cl.⁴ G05D 23/13; F16K 29/00

U.S. Cl. 236—12.12

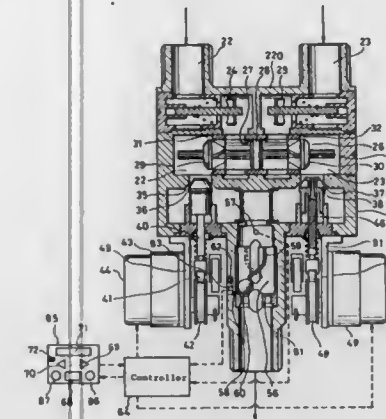
7 Claims

1. A mixing valve apparatus for mixing hot and cold water supplied from hot and cold water lines, comprising:

- pressure balancing valve means, comprising a cylinder

formed with a plurality of apertures therein, spool means having a piston mounted on a center portion thereof for isolating a hot water passageway and a cold water passageway from each other, and two valve members having twisted fins thereon which are displaced by water flow, for equalizing respective pressures of hot and cold water, said two valve members being mounted to said spool means;

- first valve means for controlling an amount of flow of hot water from said pressure balancing valve means;
- second valve means for controlling an amount of flow of cold water from said pressure balancing valve means;
- first motorized driving means for moving said first valve means;



- second motorized driving means for moving said second valve means;
- mixing conduit means for mixing hot and cold water supplied from said first valve means and said second valve means;
- temperature sensor means for detecting a temperature of mixed water mixed in said mixing conduit means;
- setting means for setting a desired temperature of said mixed water; and
- control means for controlling said first and said second motorized driving means in accordance with said temperature detected by said temperature detected by said sensor means and said desired temperature set by said setting means.

4,711,393

WATER TEMPERATURE CONTROL DEVICE

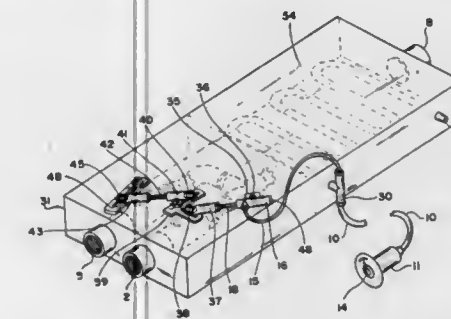
Jimmy Lee, 20 John St., Enfield, Conn. 06082

Filed Feb. 17, 1987, Ser. No. 15,081

Int. Cl.⁴ G05D 23/13

U.S. Cl. 236—12.15

1 Claim



1. A water temperature control device comprising: a cold water inlet communicating sequentially with a check valve, a ball valve, and a mixing chamber;
- a hot water inlet communicating sequentially with another

check valve, another ball valve, and the said mixing chamber;

- a tubing extending through, but not communicating with, the interior of said chamber; said tubing communicating with a temperature control cylinder housing a piston and a threaded piston rod adjustable with a vernier dial;
- said tubing also communicating with a slave cylinder housing another piston and another piston rod which is connected by a linkage means to the said ball valves such that when the slave cylinder piston rod is extended, the said linkage means opens the hot water ball valve and closes the cold water ball valve; and when the slave cylinder piston rod is compressed, the said linkage means closes the hot water ball valve and opens the cold water ball valve;
- a temperature-volume sensitive liquid within the said tubing, temperature control cylinder, and slave cylinder, such that a temperature increase within the said mixing chamber will increase the temperature of the said liquid-filled tubing extending through said chamber, leading to an increased volume of said liquid, thereupon compressing the slave cylinder piston;

wherein the said linkage means is comprised of:

- an armature with a threaded cavity into which is screwed the end of the said slave cylinder piston rod, such rod being threaded at its extended end;
- the said armature being positionally adjustable along and pivotally connected by a shoulder bolt and shoulder nut to the long section of an L-shaped plate, said L-shaped plate being firmly connected at its vertex to the rotatable axle of the said hot water ball valve;
- the short section of the said L-shaped plate being adjustably and pivotally connected by a shoulder bolt and a shoulder nut to another armature with a threaded cavity, which in turn is connected by a threaded rod to a third armature with a threaded cavity, the said third armature being adjustably and pivotally connected to a linear plate, said linear plate being firmly attached at one end to a rotatable axle of the said cold water ball valve.

4,711,394

MULTIPLE-UNIT HVAC ENERGY MANAGEMENT SYSTEM

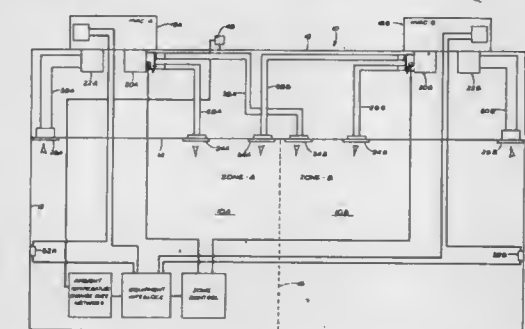
Glenn W. Samuel, 557 Crest Ave., Elk Grove, Ill. 60007

Filed Feb. 26, 1987, Ser. No. 19,417

Int. Cl.⁴ F24F 13/06

U.S. Cl. 236—49

12 Claims



11. An energy management system for use with two HVAC units for conditioning two interconnected zones, each zone having first and second supply diffusers for discharging conditioned air from the respective HVAC unit and a return diffuser for returning air back to such HVAC unit; and stat means in each zone signaling a demand for conditioned air and for operating the HVAC unit for such zone; the improved combination of

the separate zones and the respective HVAC unit, being paired, including having an additional supply air diffuser

in each zone, and means connecting such additional diffuser in each zone with the HVAC unit for the other zone; thermostat means to sense the outside ambient temperature, and a control operable when such outside ambient temperature is outside of a specific temperature range to render the energy management system inoperable;

first valve means connected between each HVAC unit and the additional diffuser in the other zone, for selectively opening and closing air flow from such HVAC unit to the other zone;

second valve means connected between each HVAC unit and the second supply diffuser in its zone, for selectively opening and closing such second diffuser;

means for locking out the operation of the HVAC for the other zone, responsive to the thermostat means signaling a demand in the first of either paired zone and for operating the HVAC unit for such first zone; and

means for opening the first valve means of the operating HVAC unit of the first zone for diverting some of the conditioned air flow from such unit to the other zone, and for closing the second valve means of the operating HVAC unit of the first zone for reducing conditioned air flow from such unit to its zone, responsive to the subsequent but concurrent demand for conditioned air in the other zone.

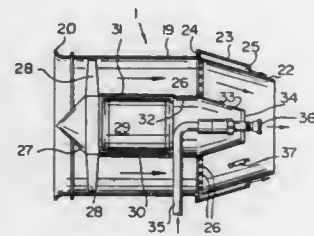
4,711,395

METHOD AND APPARATUS FOR MAKING SNOW
Louis Handfield, 95, Sault An Matelot, #5, Quebec City, Quebec, G1K 3Y9, Canada

Filed Dec. 13, 1985, Ser. No. 808,506
Int. Cl.⁴ F25C 3/04

U.S. Cl. 239—14.2

7 Claims



1. A machine for making artificial snow comprising elongated, cylindrical, tubular outer casing means; elongated, cylindrical, tubular inner casing means in and coaxial with said outer casing means; fan means carried by said inner casing means in said outer casing means for drawing air into an inlet end and discharging an initially annular converging stream of air from a discharge end of said outer casing means; turbine nozzle means on said inner casing means and located on the longitudinal axis of said outer casing means proximate the discharge end thereof for spraying water into the centre of said stream of air at said discharge end of the outer casing means to create a diverging stream of air-carried water droplets downstream of the discharge end of said outer casing means; and nucleator means mounted in said outer casing means between said outer and inner casing means proximate the discharge end of the outer casing means for mixing a jet of air and water to form very fine droplets of water, defining nuclei to promote snow formation, and for spraying said nuclei into the stream of air carried water droplets at a location at or immediately downstream of said discharge end of said outer casing means, whereby, temperature permitting, the water droplets adhere to the nuclei to form snow while airborne.

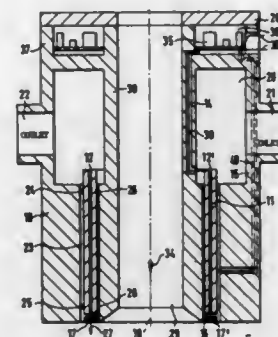
4,711,396
ELECTRICALLY ACTUATABLE FUEL-INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES
Jürgen Lange, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,483
Claims priority, application Fed. Rep. of Germany, May 13, 1985, 3517258

Int. Cl.⁴ B05B 3/14, 15/00, 7/06; H01L 41/18

U.S. Cl. 239—102.2

2 Claims



1. An electrically actuable fuel-injection throttle comprising:

- a block;
- a piezoelectric oscillator mounted within said block and being formed as a hollow cylindrical radial oscillator having a longitudinal axis;
- a plurality of continuous fuel-receiving chambers arranged within a wall of said block and extending parallel to said longitudinal axis and concentric to said longitudinal axis;
- an annular constant-volume chamber which is formed out of said block concentrically to said longitudinal axis, one end of said radial oscillator extending with said fuel receiving chamber into said annular chamber;
- a high voltage generator operatively connected to said piezoelectric oscillator;
- a constant volume chamber and a central passage bore for conduction of intake air; and
- a shielding chamber which encloses said high-voltage generator being developed annularly and concentrically to said longitudinal axis and separated from said constant-volume chamber,

said annular shielding chamber adjoining said central passage bore.

4,711,397

ELECTROMAGNETIC FUEL INJECTOR HAVING CONTINUOUS FLOW PATH

John E. Lahiff, Farmington, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Jan. 11, 1982, Ser. No. 338,799

Int. Cl.⁴ F02M 53/04

U.S. Cl. 239—125

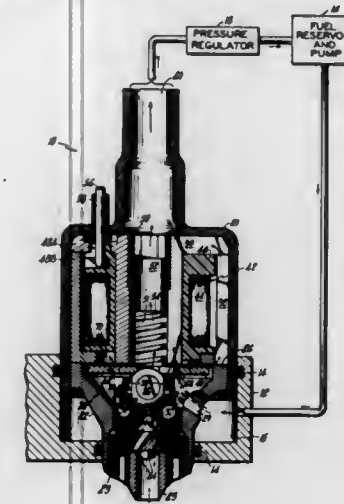
6 Claims

1. A fuel injector for use in a predetermined spatial orientation with an internal combustion engine, said injector comprising:

- substantially tubular housing means having a fuel inlet opening, a fuel discharge opening and a fuel return opening, a continuous liquid path within said housing from said inlet opening to said return opening and a valved liquid path from said inlet opening to said discharge opening;
- electromagnetic motor means supported within the housing means and including an armature, a coil, an electromagnetic frame and a tubular bobbin, said frame including at least a substantially vertically extending tubular core portion and an upper flange extending radially outward therefrom, said coil being concentrically disposed about

said bobbin and said bobbin being concentric with the axis of said housing and coaxially disposed about said frame core portion below said upper flange, at least the upper flange of said electromagnetic frame including an opening extending upwardly therethrough, said continuous liquid path extending upwardly through the core of said bobbin via said electromagnetic frame tubular core portion and in parallel through said frame upper flange;

- a valve seat operatively positioned in said valved path;
- a valve member movable between a fuel-passing open position and a fuel-blocking closed position relative to said valve seat;



said armature being operatively connected to said valve member and responsive to energization of said electromagnetic motor means for moving said valve member between said closed and said open positions for controlling the flow of fuel to said discharge opening; and the location of said fuel return opening being elevationally higher than substantially the entire remainder of said continuous liquid path and said valved liquid path when said injector is in said predetermined orientation with said engine thereby to facilitate the removal from the injector of vapors appearing therein and wherein the slope of said continuous liquid path is, for substantially its full length and in the direction of flow toward said return opening, 0 or positive relative to a horizontal axis or plane.

4,711,398

SPRAYING EQUIPMENT

Alfred D. Ganderton, and William A. Brazier, both of Bromyard, England, assignors to E. Allman & Company Limited, West Sussex, England

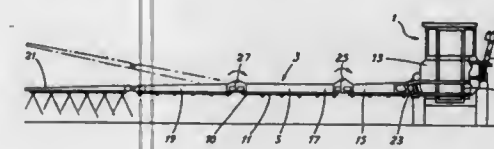
Filed Feb. 11, 1986, Ser. No. 828,297

Claims priority, application United Kingdom, Feb. 12, 1985, 8503549; Mar. 4, 1985, 8505507

Int. Cl.⁴ B05B 1/20

U.S. Cl. 239—167

21 Claims



1. A boom for spraying equipment comprising a support structure adapted for mounting on a movable vehicle, first and second arms pivotally mounted on the support structure for movement between an operative position, in which the arms extend generally horizontally outwardly on respective opposite sides of the structure, and a stowed position, each arm

comprising at least one boom section in which there is an elongate member extending lengthwise of the section, a plurality of spray nozzles fitted to an underside of the boom along the length thereof, and a spray line for connecting a tank on the said vehicle to the spray nozzles, each elongate member having an outer skin over a material which has a lower density than the skin, and the tensile and compressive strengths of the skin and the shear strength of the said material are sufficiently high for the boom to withstand tensile, compressive and shear forces to which it is subjected in use.

4,711,399

LIQUID SPRAYING DEVICES

Peretz Rosenberg, Moshav Beit Shearim, Israel

Continuation of Ser. No. 613,337, May 23, 1984, abandoned.

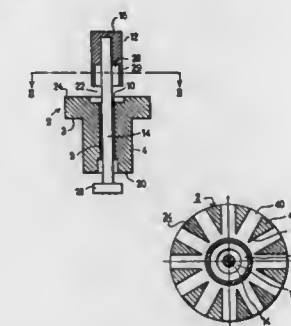
This application Aug. 13, 1986, Ser. No. 895,578

Claims priority, application Israel, Jun. 24, 1983, 69069; Jul. 1, 1983, 69144; Sep. 7, 1983, 69680

Int. Cl.⁴ B05B 1/26

U.S. Cl. 239—498

6 Claims



1. A nozzle connectible to a source of pressurized water and having a face formed with a bore defining an outlet orifice through which the water exits in the form of a jet perpendicularly to the nozzle face; a deflector member mounted close to and overlying said nozzle face and having a recess whose outer edge circumscribes the nozzle bore such that the deflector member is impinged by said jet and reflects same back towards said nozzle face;

said deflector member being mounted on a rod passing through the nozzle orifice and displaceable laterally and axially with respect to said outlet orifice so as to produce a lateral spray of water around the outlet orifice;

said nozzle face having said bore being formed with a plurality of channels extending generally radially of said nozzle to concentrate said lateral spray along said channels, said channels being defined by a plurality of triangular segments having apices spaced outwardly from said nozzle orifice and from the overlying outer edge of the recess of the deflector member so as to define an annular, flat, unchanneled surface underlying the recess of the deflector.

4,711,400

ELECTROMAGNETIC INJECTOR FOR AN I.C. ENGINE
Dario Radaelli, Legnano, and Walter Giraudi, Milan, both of Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Feb. 5, 1986, Ser. No. 826,325

Claims priority, application Italy, Feb. 7, 1985, 19421 A/85

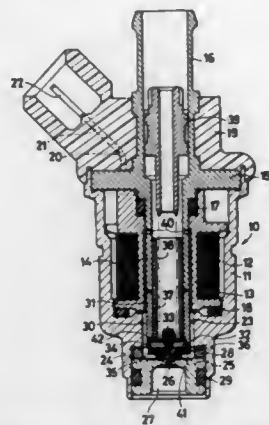
Int. Cl.⁴ B05B 1/30

U.S. Cl. 239—585

8 Claims

1. Electroinjector for an I.C. engine, said electroinjector comprising a core of ferromagnetic material, a coil surrounding the core, an injection nozzle, a small tubular movable armature positioned between the core and the injection nozzle and being coaxial with both said core and said injection nozzle, a return spring pushing the small armature towards said in-

tion nozzle, a tube, partly inserted inside the core, acting as inner guide for the small armature, a duct for delivering the fuel towards the injection nozzle, an outer shell closing the magnetic circuit together with the core and the small armature, and there being a plate and a shutter, the electroinjector being characterized in that the small armature is provided with an



end wall constituted by said plate with said plate being formed of material resistant to deformation due to impact, and directly fastened on to the cylindrical side wall of the small armature independently of said shutter, and said shutter being made of sealing material and fixedly secured directly to said plate separate and apart from said armature.

4,711,401

METHOD OF GRINDING A HYDRAULIC CEMENT

Frank G. Serafin, Peabody, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation of Ser. No. 803,380, Dec. 2, 1985, Pat. No. 4,643,362. This application Jan. 16, 1987, Ser. No. 4,356

Int. Cl.⁴ C04B 7/14; B02C 23/00

U.S. Cl. 241-16

9 Claims

1. A method comprising grinding a hydraulic cement, to reduce the particle size thereof, in the presence of an additive comprising a diester of an alkylene polyol, the amount of said additive present being sufficient to enhance the efficiency of the grinding operation.

4,711,402

APPARATUS FOR REDUCING THE SIZE OF AND/OR FOR MIXING SOLID, PASTY AND/OR LIQUID MATERIAL

Uwe Dräger, and Norbert Dräger, both of Krefeld, Fed. Rep. of Germany, assignors to DET-Dräger-Energie-Technik GmbH & Co. KG, Wachtendonk, Fed. Rep. of Germany

Filed Jul. 30, 1986, Ser. No. 891,788

Int. Cl.⁴ B02C 15/08

U.S. Cl. 241-101.2

11 Claims

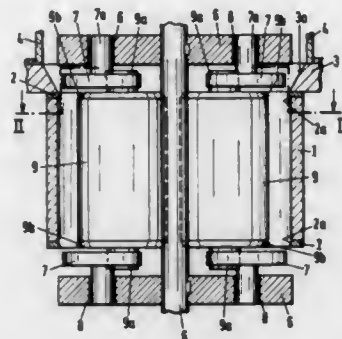
1. An apparatus for reducing the size of, and/or for mixing, solid, pasty and/or liquid material, said apparatus comprising: a cylindrical housing having an inner surface and a central axis;

at least one grinding roller, each of which cooperates with said inner surface of said housing; each grinding roller also has a central axis, with each grinding roller being rotatable about its central axis and eccentrically relative to said central axis of said housing; each grinding roller has two opposed end faces, each of which is provided with an axle end that is disposed on said central axis of that grinding roller;

two bearing disks, that are rotatably driven about said central axis of said housing, with each grinding roller being disposed between said bearing disks;

drive wheels respectively rotatably mounted on one of said bearing disks, with each of said axle ends being guided,

with play, between two drive wheels in such a way that when said bearing disks rotate, said drive wheels rotatably drive said grinding rollers, which are pressed by centrifugal force against said inner surface of said housing; and at least one guide ring provided on said housing for guiding each grinding roller in a direction parallel to its central



axis; each of said guide rings has at least one guide surface that extends at an angle to said central axis of said housing, and each guide roller is provided with correspondingly inclined contact surface means that cooperate with said guide surfaces to effect said axial guidance of said guide rollers.

4,711,403

METHOD AND APPARATUS FOR CLEANING CHICKEN MANURE FROM CHICKEN HOUSES

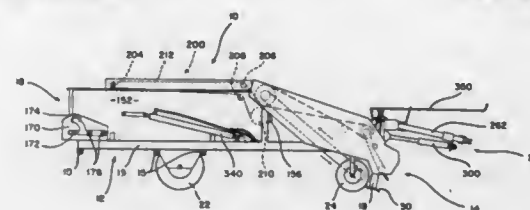
Charles E. Gregory, Sr., 1304 Chauncey Dr., Tarboro, N.C. 27886; Bertram L. Jordan, Pierce St., Box 141, Lewiston, N.C. 27849, and Charles E. Gregory, Jr., 1304 Chauncey Dr., Tarboro, N.C. 27886

Filed Mar. 10, 1986, Ser. No. 838,156

Int. Cl.⁴ B02C 21/02

U.S. Cl. 241-101.2

26 Claims



1. An in-house chicken manure handling machine for cleaning and removing chicken manure and associated litter from the floor of a chicken house wherein the chicken manure and associated litter are often caked together and form a combined layer of manure and litter on the chicken house floor, said chicken manure handling machine comprising:

- a mobile frame structure;
- a pair of rear wheels mounted about a rear portion of said frame structure and a pair of front gage wheels mounted about the front of said frame structure;
- chicken manure pick-up means mounted on front of said frame structure for scraping manure and associated litter from the floor of the chicken house, said chicken manure pick-up means including transverse blade means that extend across the front of said frame structure for engaging, scraping and lifting chicken manure and associated litter from the floor of the chicken house;
- said front gage wheels including means for adjusting the height of said blade means relative to an underlying surface so as to adjust the depth that said blade means will penetrate the layer of chicken manure and associated litter being removed;

- an elevator-shaker assembly mounted on said frame structure and disposed rearwardly of said blade means, said elevator-shaker assembly including an open-type elevator means for receiving the manure and associated litter picked up by said blade means and for conveying the chicken manure and associated litter upwardly and rearwardly therefrom toward an elevated discharge end of the conveyor means;
- said elevator-shaker assembly including shaker means for shaking said elevating means and the manure and associated litter thereon as it is transferred toward the discharge end of said conveyor means and for separating litter from the manure in the process a the shaking conveyor means tends to break up and separate litter from the manure resulting in the litter falling through the open-type conveyor means onto the floor of the chicken house as the manure handling machine is moved through the house;
- a movable load bed mounted to said same frame structure and disposed rearwardly of said elevator-shaker assembly for receiving manure and any other material discharged from the discharge end of said conveyor means;
- means for movably mounting said load bed for both fore and aft movement on said frame structure;
- load bed control means for moving said load bed fore and aftly on said frame structure between a loading position where a front end portion of said load bed underlies the discharge end of said conveyor means and a rearward dumping position; and
- said control means including means for raising the front of said load bed relative to the rear of said load bed when said load bed assumes a dumping position on said frame structure such that material within said load bed can be discharged therefrom.

4,711,404

APPARATUS FOR CUTTING A PAPER WEB

Carl H. Falk, Karlstad, Sweden, assignor to Valmet-KMW Aktiebolag, Karlstad, Sweden

PCT No. PCT/SE86/00194, § 371 Date Dec. 23, 1986, § 102(e) Date Dec. 23, 1986, PCT Pub. No. WO86/06357, PCT Pub. Date Nov. 6, 1986

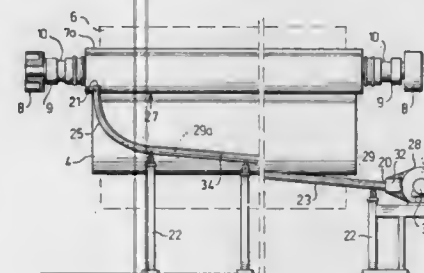
PCT Filed Apr. 29, 1986, Ser. No. 6,672

Claims priority, application Sweden, May 2, 1985, 85021186

Int. Cl.⁴ B65H 19/26

U.S. Cl. 242-56 R

11 Claims



1. An apparatus for cutting a paper web, which is wound in a drum reel-up, by means of a transverse strip moving means or the like forming a free, wedge-shaped end of the moving paper web which is passed around a new reeling drum (7a) driven by a surface winding drum (4), characterized in that it comprises a conveying channel (15) having a longitudinal, relatively wide aperture (19) facing the surface winding drum (4), a first portion (23) of the conveying channel (15) being positioned below the paper web (2) and a second curved portion (25) of the conveying channel extending to the vicinity of a nip (27) defined by the surface winding drum (4) and the new reeling drum (7a) at a place beside the paper web (2), and that said conveying channel (15) is provided with means for producing gas jets (44, 45) arranged to actuate from both sides a length of strip means (29a) inserted into the conveying channel (15) in

such a manner as to maintain it in position therein for conveyance to the nip (27).

4,711,405

METHOD AND APPARATUS FOR FIXING AN END OF A WEB ON A CORE TUBE IN A WEB REELING MACHINE

Heikki Niskanen, Järvenpää, Finland, assignor to Oy Wartsila AB, Finland

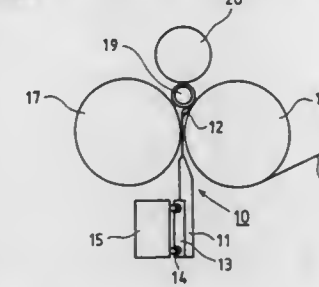
Filed Nov. 22, 1985, Ser. No. 800,977

Claims priority, application Finland, Nov. 27, 1984, 84 4653

Int. Cl.⁴ B65H 18/20, 19/28

U.S. Cl. 242-66

8 Claims



1. In a web reeling machine including a pair of spaced carrier rolls adapted to support a core tube around which the web is to be wound, a method for fixing an end of the web on the core tube, comprising the steps of:

supporting the core tube on the pair of spaced carrier rolls so that an underside of the core tube faces downwardly toward an inter-roll space defined between the spaced carrier rolls,

applying adhesive agent directly into contact with the underside of the core tube by means of direct contact of an adhesive agent applicator that extends from below the carrier rolls and that has an applicator head situated in the inter-roll space between the carrier rolls; and fixing the end of the web to the core tube at a location thereon to which the adhesive agent has been applied.

4,711,406

COREHOLDER

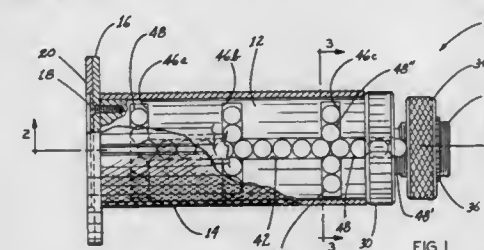
Kenneth T. Barstow, 234 Axminster Dr., Fenton, Mo. 63026

Filed Jun. 2, 1986, Ser. No. 869,272

Int. Cl.⁴ B65H 75/24; B23B 31/40; B25G 3/28

U.S. Cl. 242-72 R

9 Claims



1. Apparatus for securely holding for rotation a device having a circular central opening, comprising a coreholder body of generally cylindrical configuration, an expandable sleeve surrounding the coreholder body for receiving the device with the sleeve extending within the central opening of the device, the coreholder body defining grooves along its surface beneath the sleeve, a plurality of balls of uniform diameter extending along the lengths of the grooves in contiguous relationship, at least one of the grooves presenting an end one of the balls for pressure thereagainst, and means for selectively applying pressure against the presented ball to transfer pressure to others of the balls for causing the balls to apply pressure to the sleeve for producing outward expansion thereof for

uniformly and grippingly engaging interior surfaces of the device central opening.

4,711,407

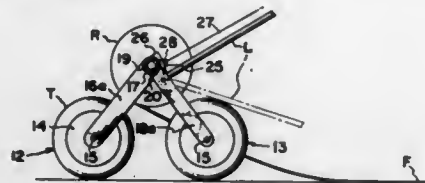
ROLL LIFTING, TRANSPORTING, AND UNROLLING DOLLY SYSTEM AND METHOD

Charles W. Boon, 515 33rd St., Fort Madison, Iowa 52627
Filed Feb. 5, 1987, Ser. No. 11,262

Int. Cl.⁴ B65H 75/40

U.S. Cl. 242—86.52

16 Claims



1. A roll lifting and transport assembly comprising:
 - a. laterally spaced apart wheeled assemblies, each comprising:
 - b. a set of front and rear ground-supported wheels;
 - c. a wheel support arm for each wheel, one of said arms of each set being formed with a journal, and the other being formed with a shaft received coaxially in said journal and mounting said arms for movement between spread loading position and a convergent, raised, transport position;
 - d. lever means swingably mounted to one of said arms in alignment vertically with one of said wheels for fulcruming engagement with the periphery of said one of said wheels to raise the arms to transport position when the lever means is swung downwardly;
 - e. a demountable roll support means extending between said assemblies and supported by said arms; and
 - f. releasable latch means for disengageably securing the arms in transport position.

4,711,408

WEBBING WIND-UP FORCE LIMITING APPARATUS

Shinji Mori, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Deiki-Seisakusho, Japan

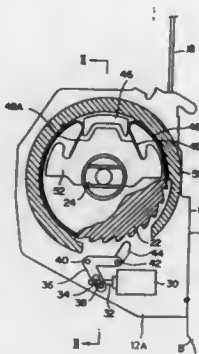
Filed Jan. 13, 1987, Ser. No. 2,976

Claims priority, application Japan, Jan. 14, 1986, 61-3439[U]

Int. Cl.⁴ B60R 22/44

U.S. Cl. 242—107

18 Claims



1. A webbing wind-up force limiting apparatus for use in a seatbelt system for a vehicle designed to restrain the body of an occupant in an emergency situation of the vehicle, comprising:
 - a pair of webbing take-up resilient members for biasing a take-up shaft for winding up an occupant restraining webbing in a direction in which said webbing is rewound;
 - a gear wheel interposed between said pair of webbing take-up resilient members;
 - a rotary member rotated together with said gear wheel and

enlarged in diameter when said gear wheel rotates in the webbing rewinding direction;

an inertia member causing the diameter of said rotary member to be enlarged when said gear wheel rotates in the webbing rewinding direction; and

resistance applying means coming into contact with said rotary member when its diameter is enlarged to apply resistance to the rotation of said gear wheel.

4,711,409

PAWL CONTROLLED REEL EXTENSION

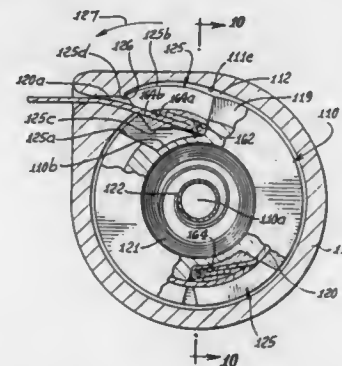
Ralph W. Jones, 1025 Avondale Rd., San Marino, Calif. 91108
Continuation-in-part of Ser. No. 766,537, Aug. 19, 1985, Pat. No. 4,638,959. This application Nov. 17, 1986, Ser. No. 931,522

The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.

Int. Cl.⁴ B65H 75/48

U.S. Cl. 242—107.4 R

21 Claims



1. In line dispensing and retracting device, comprising:
 - (a) reel having a hub about which the line is wound as the reel rotates,
 - (b) structure mounting the reel for rotation relative thereto, and about an axis,
 - (c) a generally radially movable element carried by the reel to move between an inwardly retracted position in which the reel is free to rotate, and an outwardly extended position in which the movable element prevents further dispensing of the line,
 - (d) and the line wound on the reel in operative relation with the movable element to control said element's movement in response to reel rotation,
 - (e) said line including an inner winding extending sufficiently beneath said element as to urge the element outwardly relative to the reel in response to reel rotation in a line dispensing direction,
 - (f) and said line passing through said element.

4,711,410

REEL-DRIVING DEVICE FOR A VIDEOCASSETTE RECORDER

Seong T. Gwon, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 26, 1986, Ser. No. 878,603

Claims priority, application Rep. of Korea, Jun. 26, 1985, 7727/1985[U]

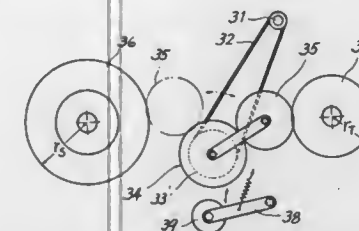
Int. Cl.⁴ G03B 1/04, 1/40; B65H 20/36

U.S. Cl. 242—201

2 Claims

1. A reel-driving device for a videocassette recorder which comprises:
 - a supply reel for supplying a tape,
 - a take-up reel for taking up the tape, said take-up reel being provided with a diameter which is larger than a diameter of said supply reel,
 - a clutch disposed between said supply reel and said take-up reel for varying driving force transmitted from a pulley to meet an evenly required torque, and

an idler transmitting the evenly varied driving force alternatively to said supply reel or said take-up reel whereby the supply reel or take-up reel drives the tape to record, with



the revolution torque required in each of a CUE (forward search) and REVIEW (backward search) mode of the videocassette recorder.

4,711,411

AIRCREW HEADGEAR EJECTION MEANS

Warren K. Copp, Fleet, England, assignor to The Secretary of State for Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

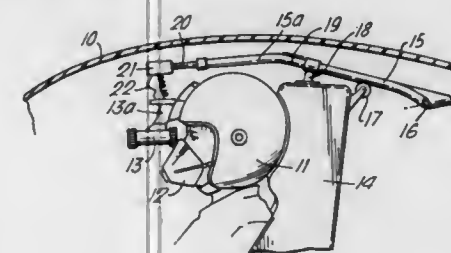
Filed Oct. 24, 1986, Ser. No. 922,881

Claims priority, application United Kingdom, Oct. 25, 1985, 8526386

Int. Cl.⁴ B64D 25/00

U.S. Cl. 244—1 R

9 Claims



1. Apparatus for ejection of aircrew helmet-mounted equipment from an aircraft cockpit, comprising an ejector arm engageable with an airman's ejection seat and having a first end pivotally mountable behind the seat, and a flexible linkage for attaching the helmet-mounted equipment to the second end of the ejector arm, so that in operation of the ejection seat, the arm is rotated about its pivot by upward movement of the ejection seat so that the equipment is detached from the airman's helmet and ejected from the cockpit by the rotating arm.

4,711,412

METHOD FOR HOMING ONTO A TARGET

Heinrich Wallermann, Lauf, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Apr. 9, 1986, Ser. No. 850,716

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524925

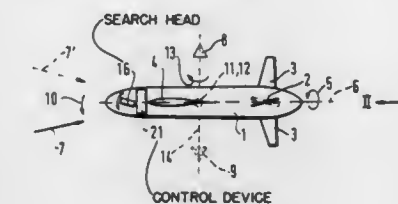
Int. Cl.⁴ F41G 7/00

U.S. Cl. 244—3.15

4 Claims

1. In a method for the homing onto a laterally forwardly detected target from a gliding flight trajectory of a projectile equipped with a search head, guidance surfaces and horizontal gliding surfaces, through the implementation of a roll motion for a yaw maneuver, the improvement comprising switching the guidance surfaces from a lift mode into a descent mode for transition from the gliding trajectory into a descending flight path incorporating said yaw maneuver wherein, at hard yaw

maneuvers under large horizontal angles of displacement from the momentary direction of flight of the projectile, there is



reduced the roll motion which is to be superimposed on a pitch guidance for the projectile.

4,711,413

TARGET TRACKING ARRANGEMENT

Lothar Stessen, Lauf, Fed. Rep. of Germany, assignor to DIEHL GmbH & Co., Nuremberg, Fed. Rep. of Germany

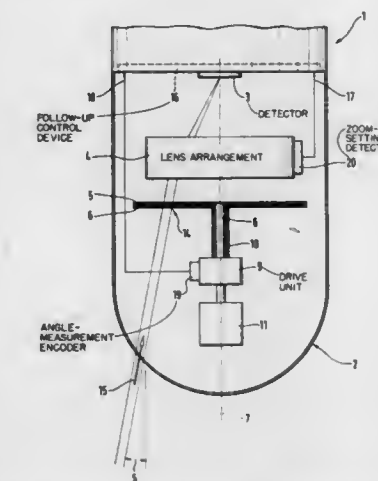
Filed Dec. 9, 1986, Ser. No. 939,539

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602456

Int. Cl.⁴ F41G 7/26

U.S. Cl. 244—3.16

8 Claims



1. A target tracking arrangement located in a search head of a guided missile, comprising a detector; a lens arrangement; said detector being positioned behind said lens arrangement; two superimposed rotatable discs rotating at different rotational speeds being interposed in the optical path of said lens arrangement, said discs possessing different eccentrically extending radiation-penetrable slits.

4,711,414

PROJECTILE WITH INTEGRATED PROPULSION SYSTEM

Michael J. Dunn, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 31, 1986, Ser. No. 846,023

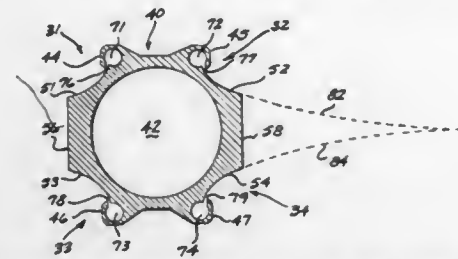
Int. Cl.⁴ F42B 15/033

U.S. Cl. 244—3.22

13 Claims

1. A projectile having an integrated propulsion system, the projectile comprising a body in which eight supersonic nozzles are positioned, the nozzles being arranged such that each nozzle can provide a reaction force having nonzero components along both a first axis and a second axis, the first and second axes being fixed with respect to the body and orthogonal to one another, the nozzles comprising first and second groups of four nozzles each, the first and second groups being spaced from one another along a third axis orthogonal to the

first and second axes, and the nozzles in each group being arranged such that for each direction along each of the first



and second axes, two nozzles of the group can each produce a reaction force having a nonzero component along that direction.

4,711,415

X-WING HELICOPTER-SCOUT ATTACK CONFIGURATION

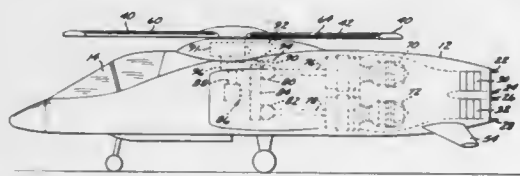
John A. Binden, Long Beach, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 30, 1985, Ser. No. 696,604

Int. Cl.⁴ B64C 27/82

U.S. Cl. 244—17.19

10 Claims

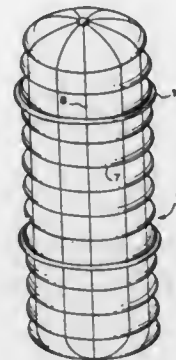


1. In an X-wing helicopter aircraft, a fuselage defining a longitudinal axis of said aircraft, a rotor assembly mounted on said fuselage for rotation at speeds below a predetermined value during helicopter phase operations and adapted to be stopped above said value to provide fixed X-wing airfoil, supplemental fixed wings attached to the fuselage, first, upper and second, lower jet engines mounted vertically one above the other and aligned vertically with respect to the longitudinal axis of the fuselage to provide symmetric and redundant flight control functions including yaw and pitch control, each of said engines providing a jet stream emanating therefrom rearwardly of said fuselage, said fuselage having a tail section including upper and lower exhaust nozzles through which said jet streams pass in straight lines, said nozzles each including means for controlling the direction of ejection of portions of the respective jet stream from said aircraft including upper engine movable upper and lower vectoring flaps and upper engine movable, port and starboard vectoring cascades, said cascades being equally proximate said upper engine jet stream, and lower engine movable upper and lower vectoring flaps and lower engine movable, port and starboard vectoring cascades, said lower engine cascades being equally proximate said lower engine jet stream, movement of said vectoring flaps in unison serving as pitch control for said aircraft, movement of vectoring flaps to close the nozzle serving as a nozzle blocker to activate the vectoring cascades for yaw control, movement of said cascades to open either port or starboard serving as primary yaw control, the movement of said vectoring flaps and cascades being equally functional in a lateral direction during helicopter phase maneuvers for either dual or engine-out operations.

4,711,416
STEERABLE LIGHTER THAN AIR BALLOON
Robert Regipa, Toulouse, France, assignor to Centre National d'Etudes Spatiales (C.N.E.S.), Paris, France
Filed Dec. 5, 1985, Ser. No. 804,887
Claims priority, application France, Dec. 6, 1984, 84 18798
Int. Cl.⁴ B64B 1/58

U.S. Cl. 244—31

12 Claims



1. A steerable aerostatic balloon comprising a first outer envelope (1) containing air and having a generally cylindrical portion (1a) and upper (3) and lower (2) poles connected by an interpolator connector (11), a grid of longitudinal reinforcements (8) extending longitudinally along said outer envelope and connected to said upper and lower poles, a grid of circumferential reinforcements (7) extending transversely around said outer envelope so as to divide said outer envelope into a plurality of longitudinal lobes separated by said circumferential reinforcements, said outer envelope having peripheral folds between said circumferential reinforcements when said outer envelope is less than fully inflated for enabling the formation of said longitudinal lobes upon inflation of said outer envelope, at least one inner envelope (12) within said outer envelope and containing a lighter-than-air gas, said inner envelope resting against said outer envelope when inflated and having upper and lower poles attached to said interpolator connector, and means for admitting air into said outer envelope and means for evacuating air from said outer envelope.

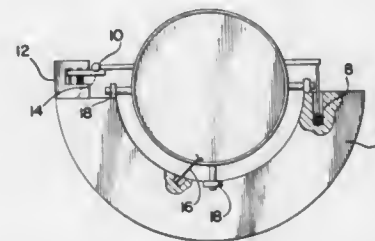
4,711,417
APPARATUS FOR EJECTION OF A SPACECRAFT
David A. Steffy, Hawthorne, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 26, 1985, Ser. No. 780,532

Int. Cl.⁴ B64G 1/22

U.S. Cl. 244—158 R

21 Claims



1. In an apparatus for the ejection of a spacecraft from a launching vehicle having a support structure with a supporting cradle, means for restraining the spacecraft to the cradle, at least one pivot point support member and an ejecting mecha-

nism for imparting a force to one side of the spacecraft to provide a rotary movement about the pivot point support member during ejection, the improvement comprising:

a pivot support assembly including a pivot seat member movably connected to the cradle;
stop means for limiting movement of the seat member; and means for biasing the seat member to a position adjacent the stop means at a predetermined force sufficient to prevent movement of the pivot seat member during ejection of the spacecraft.

4,711,418

RADIO BASED RAILWAY SIGNALING AND TRAFFIC CONTROL SYSTEM

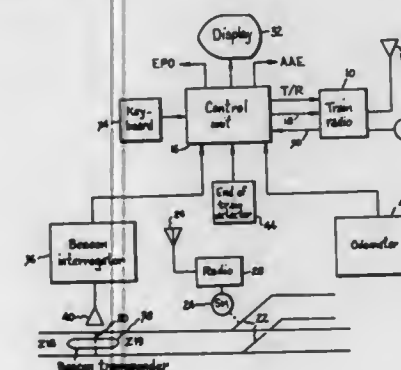
John H. Aver, Jr., Fairport, and William A. Petit, Spencerport, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Apr. 8, 1986, Ser. No. 849,614

Int. Cl.⁴ B61L 3/02

U.S. Cl. 246—5

19 Claims



1. A railway signaling and traffic control system in which the use of train stop apparatus can be avoided wherein first radio signals are transmitted from trains travelling along tracks and received at a central office and second radio signals are transmitted from the central office to the trains, said system comprising means for transmitting said first signals which represent the locations of each of said trains with respect to boundaries of successive zones along the tracks and identify the train which is transmitting said signals and the zones which the identified trains are entering and leaving, means responsive to said first signals for transmitting to identified trains said second signals which represent a signal aspect for the zone occupied by each of said identified trains and for the next zone, means on each train for displaying the aspect of the zone which it occupies and for storing the aspect for the next zone, means on each train for automatically operating said displaying means for displaying the stored aspect for the next zone ahead when the train enters the next zone, and means for automatically operating said displaying means for displaying in each train a signal aspect for said next zone more restricted than the signal aspect displayed by said displaying means in said train for the preceding occupied zone in the event that the signal aspect for said next zone is not being stored when said train enters said next zone.

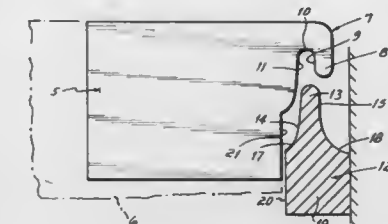
4,711,419
BOOK OR SIMILAR ARTICLE HANGING DEVICE
Charles T. Polosky, 300 Hunters Glenn Ct., Atlanta, Ga. 30328
Filed Oct. 9, 1986, Ser. No. 917,038
Int. Cl.⁴ E04G 5/06

U.S. Cl. 248—225.2

14 Claims

1. An article hanging device for removably mounting an article on a vertical surface comprising a tab-like sheet having means for securing at least one sheet side to said article, said sheet having a hook means integrally formed therein continuously along an edge thereof,

said hook means comprising a protrusion for extending generally parallel to and spaced from said vertical surface, said protrusion having a substantially planar inside portion substantially parallel to said surface terminating into a rounded channel and a convex radius, said convex radius spaced apart opposite said protrusion inside portion to



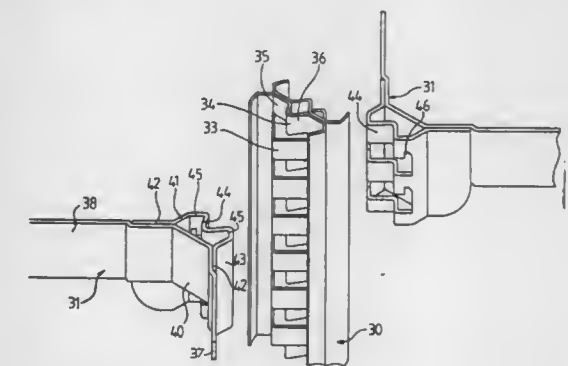
form said hook means, said protrusion inside portion, said convex radius and rounded channel adapted to mate respectively with corresponding surfaces of an elongated rail mounted on said vertical surface and to guide the hook means onto the rail for positive locking of said hook means to said rail so that said article may be mounted by cantilevering said hook means on said rail.

4,711,420
BRACKET AND POST ASSEMBLY
David J. W. Cowler, London, England, and Peter R. Lewis, 5 Station Road, Berkhamsted, Hertfordshire, England, assignors to Kenneth B. Fether; Richard Miles; Anthony Rostron and Peter R. Lewis, all of Hertfordshire, England
Filed May 8, 1985, Ser. No. 731,876
Claims priority, application United Kingdom, May 10, 1984, 8411943

Int. Cl.⁴ A47B 57/20

U.S. Cl. 248—243

9 Claims



1. A bracket and post assembly comprising a post adapted for use in an upright disposition, and a bracket detachably securable to the post, the post and bracket including complementary engagement means, comprising, on the post, longitudinally successive support portions having alternate support portions constituting outer support portions, and a wall outward of the axis of the post and having a rear contacting surface extending between two positions on the post and other alternate support portions, constituting inner support portions, each comprising an angled wall extending between two positions on the post; the complementary engagement means further comprising, on the bracket, a pair of angled walls diverging from a root portion of the bracket, each of the angled walls having an engagement slot, the two engagement slots joining at the root portion of the bracket to enable the slots to

receive one of the outer support portions of the post, the angled walls of the bracket having a lower edge surface and the wall of the outer support portion of the post having an upper edge surface, said lower edge surface and said upper edge surface being relatively contoured such that upon full introduction of the outer support portion into said engagement slot, the bracket drops through a portion of its height so that its angled walls rest on the upper edge surface of the wall of the outer support portion,

the bracket further including at its root, at least below said slots, an angled or curved engagement wall adapted to mate with an outward-facing mounting surface of the complementary shaped inner support portion of the post, to provide a rear buttress,

and said slots having at least two surfaces contacting a rear surface of the received outer support portion, said contacting surfaces being disposed so as to be subject to generally, relatively, orthogonal support forces through this contact.

4,711,421

SUPPORT FOR EXTERNAL REARVIEW VEHICULAR MIRROR

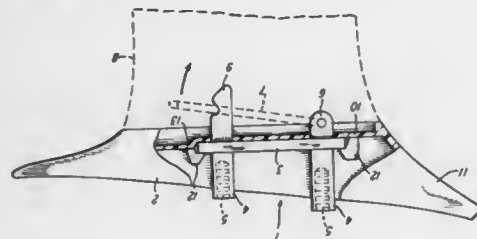
Bernhard Mittelhäuser, Am Krähenberg, D-3002 Wedemark 2, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,720

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 8530609

Int. Cl.⁴ G02B 5/08

U.S. Cl. 248—479



1. A support for an external rearview mirror for a motor vehicle, whereby said support serves for fastening of said mirror to said vehicle, and whereby a mirror housing, in which is disposed a mirror body, is pivotably connected to said support, via bracket means, in such a way that said mirror housing can tilt in the longitudinal direction of said vehicle; said support is also provided with a releasable arresting mechanism for holding said mirror body or mirror housing in its effective position; said support comprises:

- a one-piece metallic member formed of a metal plate and, connected to the latter, said arresting mechanism, a pivot connection part for said bracket means, and means for fastening said support to said vehicle; and
- a molded plastic member that substantially surrounds said metallic member and determines the external appearance of said support, with said molded plastic member being provided with catch means for connecting said metallic member with said molded plastic member.

4,711,422

GOLF CART UMBRELLA MOUNT BRACKET

Rene L. Ibanez, 3520 Jermantown Rd., Fairfax, Va. 22030

Filed Aug. 29, 1986, Ser. No. 901,637

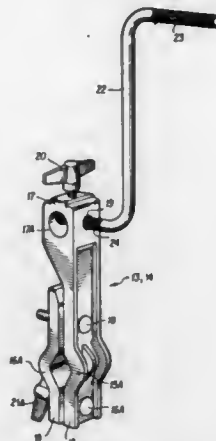
Int. Cl.⁴ F16B 2/06

U.S. Cl. 248—515

2 Claims

1. For use with a vehicle having a rounded frame part to which an umbrella may be adjustably secured, a first and a second pair of clamping elements for attaching the handle of an umbrella to the vehicle, each of said clamping elements having a pair of lockable clamp jaws at one end with complementary

dished portions and bolt means on both sides of said portions for grasping one of said umbrella and vehicle frame part and a block having two bores at right angles to each other at the other end of one of said separable clamp jaws of each clamping element, locking screws threadedly received through said block and positioned to pass through said bores, a spacer rod having positioning arms extending off each end of said spacer rod in opposite directions at an angle directed away from the axis of said spacer rod, each positioning arm being receivable through the bore in the block of each of said first and second



3-Claims

pair of clamping elements remote from said clamp jaws, said spacer rod positioning arms being cylindrical in cross-section to pass through the bore in the end of said clamping elements remote from said clamp jaws and one wall of said bore threadedly receiving a locking bolt to lock said positioning arms in place relative to their attaching clamps, said positioning arms passing through the bore in said blocks to be engaged by and locked with the locking screw passing through each said block to permit universal positioning of the umbrella relative to the point of attachment to said vehicle.

4,711,423

SHOCK AND VIBRATION MOUNT

Jaklin B. Popper, Kiryat Haim, Israel, assignor to Popper Technologies (1983) Ltd., Kiryat Haim, Israel

Filed Apr. 17, 1986, Ser. No. 853,180

Claims priority, application Israel, Apr. 21, 1985, 74976

Int. Cl.⁴ F16F 7/00

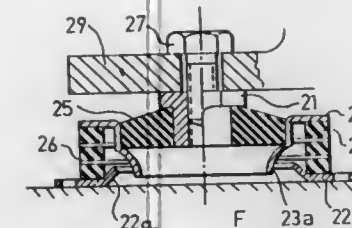
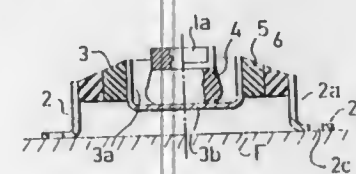
U.S. Cl. 248—635

20 Claims

1. A shock and vibration mount for mounting a supported device to a supported device, comprising:

- a first rigid end member to be mounted to one of said devices;
- a second rigid end member to be mounted to the other of said devices;
- an intermediate rigid member between said first and second rigid members;
- a first elastic member fixed between said intermediate rigid member and one of said end rigid members such as to be strained only in compression under loads along a first orthogonal axis, and to be strained only in shear under loads along a second orthogonal axis;
- and a second elastic member fixed between said intermediate rigid member and the other of said end rigid members and disposed in series with said first elastic member such as to be strained only in shear under loads along said first orthogonal axis, and to be strained only in compression under loads along said second orthogonal axis;

both said elastic members having a low shear modulus as compared to their compression modulus so as to exhibit



relatively low deflection under compression and relatively high deflection under shear.

4,711,424

COMBINATION ENERGY ABSORBING FOUNDATION

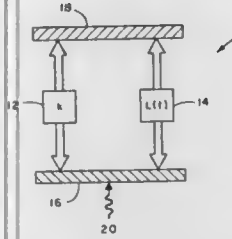
Vernon H. Neubert, Centre Hall, Pa., and Nicholas Perrone, Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 1, 1982, Ser. No. 383,871

Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—636

6 Claims



1. An energy absorbing foundation positioned between rigid support and a foundation member that uniformly absorbs mechanical energy over as broadband of mechanical energy frequencies and a wide latitude of mechanical energy amplitudes, comprising:

- first linear means including a linear spring positioned between said rigid support and said foundation member for elastically deforming in response to mechanical energy; and
- second non-linear means including a plurality of side-loaded rings, coupled to said first linear means, for plastically deforming in response to mechanical energy; wherein said first means serves to attenuate small scale vibrations and said second means serves to attenuate large scale vibrations.

4,711,425

ROTARY MOLDING SYSTEM

Albert Spiel, Yonkers, N.Y.; James Roe, Wayne, and Henry C. Spanier, West Milford, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

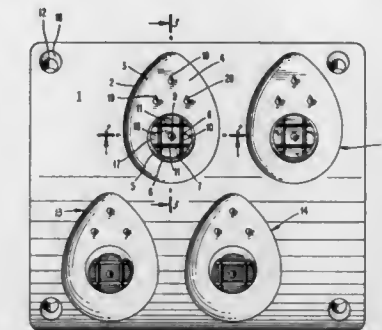
Division of Ser. No. 578,040, Feb. 8, 1984, Pat. No. 4,634,597.

This application Aug. 20, 1986, Ser. No. 898,187

Int. Cl.⁴ B29C 33/42

U.S. Cl. 249—117

5 Claims



1. A mold for use in a rotary mold, comprising: a curved plate adapted for attachment to, and use in, a rotary mold; said curved plate having at least one depression formed therein, on one side of said curved plate; each of said at least one depression being bounded along said curved plate by a perimeter; said perimeter being in the shape of an outline of an egg; each said depression having a generally planar surface located entirely within said depression, the planar surface having a generally circular perimeter and being raised above the surrounding area of said depression; said planar surface having a plurality of raised ridges thereon, each of said ridges lying entirely within said at least one depression; said raised ridges being adapted to form grooves in dough which is received in said at least one depression; whereby dough passing beneath a rotary mold having said curved plate attached thereto is received by said at least one depression so as to be shaped thereby in the shape of an outline of an egg having a depression formed in the dough at a location corresponding to the location of a yolk in an egg.

4,711,426

FLANGED VALVE CONNECTORS

Thomas R. Bodnar, 3378 MacIntyre Dr., Murrysville, Pa. 15668

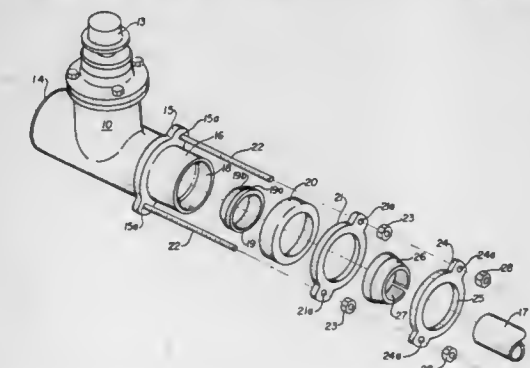
Continuation-in-part of Ser. No. 734,782, May 16, 1985,

abandoned. This application Oct. 22, 1986, Ser. No. 922,007

Int. Cl.⁴ F16K 51/00

U.S. Cl. 251—151

4 Claims



1. In combination with a valve including a valve body hav-

ing a longitudinal passageway therethrough, a closure element for said valve body intermediate its ends, operator means acting on said closure element to open and close the longitudinal passageway, a flanged valve connector comprising:

radial flange means on said valve body on at least one of the longitudinal ends thereof for securing a bolt on compression coupling assembly to said valve body;

an enlarged tubular member secured to said radial flange means and extending outwardly from said radial flange means and coaxial with said longitudinal passageway for receiving the end of pipe to be connected with said valve body;

said tubular member having a generally frusto conical end opening outwardly and sized to snugly receive a sealing gasket in sealed relationship between said tubular member and a pipe to be connected with said valve body; and

said tubular member having an axial length sufficient to be engaged by a gasket retainer having a cylindrical section sized to surround said sealing gasket and the end periphery of said tubular member and a radial section for snugly engaging said sealing gasket arranged in union with said frusto conical end opening and to receive a follower ring having a deep longitudinal flange extending over the peripheral length of said tubular member and engaging said gasket retainer, the follower ring functioning to secure the gasket retainer and gasket to said tubular member.

4,711,427

APPARATUS FOR CONNECTING A VALVE ELEMENT TO A VALVE STEM

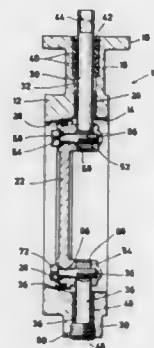
Edward G. Holtgraver, Spring, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Aug. 20, 1986, Ser. No. 898,433

Int. Cl.⁴ F16K 1/22; B21D 53/00

U.S. Cl. 251—308

7 Claims



1. In a rotary valve having a valve body a valve element, a valve stem, and a first bore in said valve element for receiving said valve stem for rotatably mounting said valve element in said valve body, the improvement comprising:

a second bore transverse to and intersecting said first bore, said second bore having a first portion on one side of said first bore and a second portion on the diametrically opposite side of said first bore;

said valve stem having a hole therethrough, said hole being in register with said second bore in said valve element, the portion of said hole adjacent said second portion of said second bore being threaded;

a retaining member received in said second bore and extending through said hole, said retaining member having a threaded shank portion, said threaded shank portion being threadedly received in said threaded portion of said hole in said valve stem, at least one of the threads of said shank portion being received in said second portion of said second bore, said second portion of said second bore being dimensioned such that said at least one thread of said threaded portion of said shank portion frictionally engages the wall of said second portion of said second bore,

said second portion of said second bore being positioned such that said threaded shank portion and said threaded hole are engaged before said at least one of the threads of said threaded shank portion is received in said second portion of said second bore.

4,711,428

HYDRAULIC LEVELING DEVICE

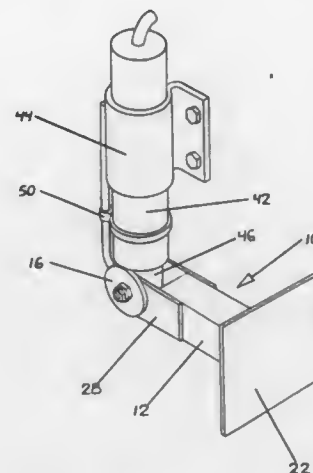
Willis M. Carpenter, Albuquerque, N. Mex., assignor to Hydraulic Level, Inc., Phoenix, Ariz.

Filed Sep. 24, 1986, Ser. No. 911,492

Int. Cl.⁴ B66F 3/24

U.S. Cl. 254—423

15 Claims



1. An apparatus for pivoting a leg relative to a hydraulic cylinder comprising:

a leg having a longitudinal axis;

means for pivotally attaching one end of said leg to one end of a hydraulic cylinder having a longitudinal axis, when provided, said means allowing said leg to pivot between an extended position substantially longitudinally aligned with the hydraulic cylinder and a storage position,

a wheel; and

attachment means for disposing said wheel on said leg near its one end at a position offset from the longitudinal axis of said leg, said wheel providing a circumferential bearing surface for contacting a selected part of the hydraulic cylinder during cylinder contraction and extension, thereby causing said leg to pivot relative to the hydraulic cylinder between said extended position and said storage position.

4,711,429

TUNDISH FOR MIXING ALLOYING ELEMENTS WITH MOLTEN METAL

David J. Diederich, and John C. Paddock, both of Lorain, Ohio, assignors to USX Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1986, Ser. No. 901,843

Int. Cl.⁴ B22D 41/08

U.S. Cl. 266—44

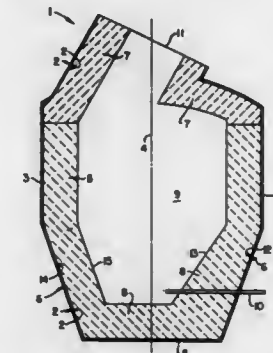
3 Claims

1. A process for mixing at least one alloying element with molten metal in a tundish, said alloying element having a density greater than that of said molten metal, said process including pouring molten metal from a ladle into a tundish having outer walls defining a cavity for containing a predetermined volume of said molten metal therein at a specified depth, said tundish being adapted to receive the stream of molten metal from said ladle at an entry station having a vertical axis displaced horizontally from the vertical axis of a first outlet opening of the tundish, adding said alloying element to the molten metal and draining the molten metal from the tundish through said first outlet opening into a casting mold,

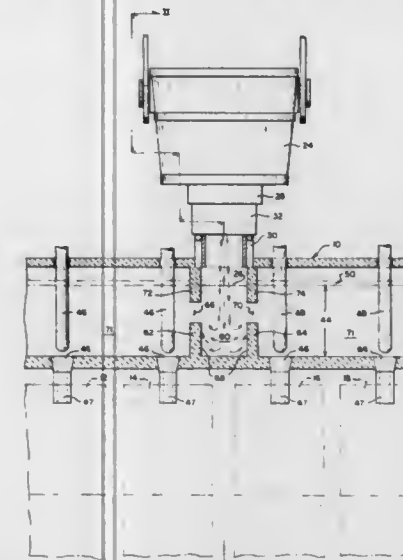
the improvement in said process for uniformly mixing said alloying element with the molten metal in said tundish which comprises:

pouring molten metal from said ladle into a tundish having a mixing zone directly below said receiving station, said mixing zone including a generally vertical first inner wall extending upwardly from a bottom surface of the tundish cavity to a height which is at least forty percent of the specified depth of molten metal in said tundish, said first inner wall extending transversely to the direction of flow of molten metal from said entry station to said first outlet opening, said first inner wall defining at least a portion of the lower periphery of at least one opening for flow of molten metal from said entry station to said first outlet opening, the lower periphery of each opening in the inner wall being at a height not less than forty percent of the specified depth of molten metal in said tundish, the aggregate

the consumable refractory lining hot face for a distance, in a direction away from the bottomwall, from the tuyere to a point, such that the lining thickness at the tuyere is at least ten



percent greater than the lining thickness at said point, whereby the thickness of the consumable refractory lining substantially constantly decreases throughout the distance from the tuyere to said point.



gate cross sectional area of said openings in the first inner wall being not less than the cross sectional area of the first outlet opening, said first inner wall being spaced from the vertical axis of said entry station a distance within the range of 20 to 65 cm in a direction normal to said first inner wall, said mixing zone including another wall essentially parallel to said first inner wall and located substantially the same distance from the vertical axis of said entry station as said first inner wall in a direction normal thereto and remote therefrom, said mixing zone including a pair of spaced generally vertical walls joining said first inner wall and said other wall at opposed ends thereof, injecting said alloying element into the stream of molten metal being poured from the ladle into said tundish, and mixing said alloying element with the molten metal in said mixing zone using the force of said stream from the ladle to create sufficient turbulence to obtain uniform distribution of said alloying element in the metal.

4,711,430

SIDE-INJECTED METAL REFINING VESSEL AND METHOD

Jonathan J. Feinstein, North Salem, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

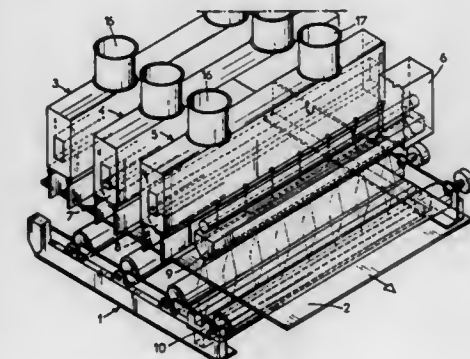
Filed Apr. 1, 1986, Ser. No. 846,801

Int. Cl.⁴ C21C 5/44, 5/48

U.S. Cl. 266—47

18 Claims

1. A metal refining vessel comprising a bottomwall, a sloped section having a lining of consumable refractory and contacting the bottomwall, and a tuyere passing through the lined sloped section proximate the bottomwall enabling side injection of gas into a metal melt during refining, the consumable refractory lining cold face having an axis angle less than that of



4,711,431

SPRAY-COOLING APPARATUS

Stéphane G. J. Viannay, Voisin-le-Bretonneux; Bernard M. Roth, Boulogne-Billancourt; Solange M. V. Mirigay, Chaville, and Georges J. B. Chastang, Colnieres, all of France, assignors to Bertin & Cie, Plaisir-Cedex, France

Filed Mar. 5, 1986, Ser. No. 836,481

Claims priority, application France, Mar. 6, 1985, 85 03281

Int. Cl.⁴ C21D 1/667

U.S. Cl. 266—114

9 Claims

1. Spray-cooling apparatus comprising, in succession, spray bar means and a plurality of suction chambers, said spray bar means being arranged between said suction chambers, said spray bar means and suction chambers each being arranged opposite the surface of a continuously horizontally moving hot sheet of material wherein free spaces are provided between said spray bar means and said chambers for intake of a secondary air flow, the distances between said spray bar means and a hot surface to be cooled and distances between two consecutive spray bar means being selected and defined so as to channel gas flow emitted by a sprayer and the secondary air flow towards the suction chamber and accompanying sprayer jets in such a way as to transport droplets which bounce off the hot surface.

4,711,432

GAS WASHING DEVICE

Michael Heinz, Saarbrücken; Joachim Lange, Hünstetten; Udo Muschner, Tönisvorst; Herbert Naefe; Hans Rothfuss, both of Wiesbaden; Manfred Winkelmann, and Hans-Joachim Winkler, both of Krefeld, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

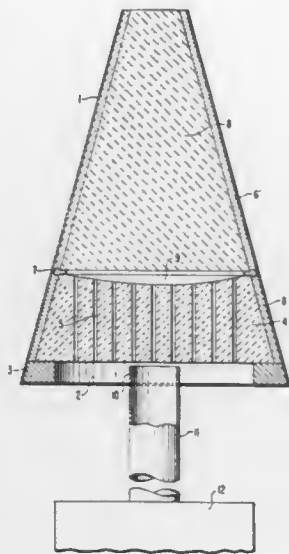
Filed Jun. 23, 1986, Ser. No. 877,971

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523171

Int. Cl.⁴ C21C 5/48

U.S. Cl. 266—220

3 Claims



1. A gas washing device for supplying gas through a metallurgical vessel to molten metal therein, said device comprising: a metal jacket to be positioned to extend through a wall of a metallurgical vessel; an inner permeable gas sink positioned within said jacket and having an inner surface to contact molten metal within the metallurgical vessel; an outer permeable gas sink positioned within said jacket at a position outwardly of said inner gas sink and to be spaced from the molten metal; gas inlet means for supplying gas from a gas supply to said jacket such that said gas flows first through said outer gas sink and then through said inner gas sink into the molten metal; sealing ring means positioned between said outer and inner gas sinks and sealing against said jacket for preventing leakage of said gas between said gas sinks; gas distribution means formed between an inner end of said outer gas sink and an outer end of said inner gas sink for ensuring that gas immersing from said inner end of said outer gas sink is supplied uniformly over substantially the entire area of said outer end of said inner gas sink; and means for detecting immediately consumption of said inner gas sink by the molten metal without interrupting the supply of gas thereto, said detecting means comprising said outer gas sink having a gas permeability greater than that of said inner gas sink such that upon consumption of said inner gas sink the flow of said gas will increase abruptly, and gas flow meter means connected to said gas supply at a position upstream of said gas inlet means for detecting said abrupt increase of gas flow.

4,711,433

COPPER CONVERTER

Motoo Goto, Nagareyama; Hiroshi Kono, Iwaki; Haruhiko Asao, Iwaki; Yukio Miyamoto, Iwaki, and Toshihiko Igarashi, Iwaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

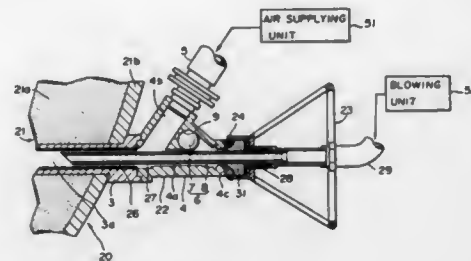
Filed Jun. 12, 1986, Ser. No. 873,784

Claims priority, application Japan, Jun. 13, 1985, 60-128970; Jun. 13, 1985, 60-128971; Jun. 13, 1985, 60-128972

Int. Cl.⁴ C21C 5/48

U.S. Cl. 266—222

8 Claims



1. A copper converter comprising:
(a) a converter body;
(b) a plurality of tuyeres provided on the converter body, each tuyere having an outer end portion;
(c) a first concentrate blowing pipe assembly provided on at least one of said tuyeres, each said first concentrate blowing pipe assembly including an introducing pipe inserted into a respective one of said tuyeres;
(d) a blowing means, connected to each said first concentrate blowing pipe assembly, for blowing a material including a concentrate through a respective said introducing pipe into the converter;
(e) air supplying means, provided on said tuyeres, for supplying pressurized air to said tuyeres; and
(f) formations provided both on said outer end of each tuyere and on each said first concentrate blowing pipe assembly and adapted to detachably interengage; each said first concentrate blowing pipe assembly comprising a radially outwardly projecting attachment member rigidly mounted around a one end portion of the respective said introducing pipe; each said interengaging formation of each said first concentrate blowing pipe assembly being formed on the respective said attachment member; each said interengaging formation provided on the outer end of each tuyere comprising a plurality of locking pins projecting radially outwards from the outer end of the respective said tuyere, said attachment member of each first concentrate blowing pipe assembly comprising a sleeve portion, rigidly mounted around the respective said introducing pipe, and a hollow cylindrical portion, having an inner diameter larger than the respective said sleeve portion and formed substantially concentrically and integrally with the respective said sleeve portion, and wherein said interengaging formation of each said attachment member comprises a plurality of slots formed in the respective said hollow cylindrical portion of the respective said attachment member, each said slot being adapted to detachably engage with a corresponding one of said locking pins.

4,711,434

SPRING DISC

Donald L. Haag, 1302 E. 18th St., Sterling, Ill. 61081

Filed Jul. 7, 1986, Ser. No. 882,410

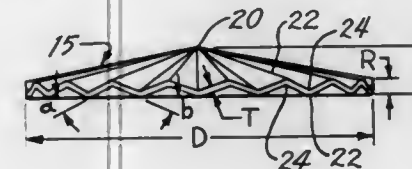
Int. Cl.⁴ F16F 1/02

U.S. Cl. 267—161

2 Claims

1. A solid spring disc made of resiliently yieldable material and having first and second oppositely facing surfaces, said

disc having a generally circular periphery and being shaped as a shallow right circular cone, each surface of said disc being defined by a plurality of angularly spaced and flat and planar triangular segments of identical size and shape disposed in adjoining side-by-side relation, each of said triangular segments having a pair of side margins, having an apex located at the apex of said cone and having a base located opposite the



apex of the segment and extending along the periphery of said disc, and adjoining segments being inclined at equal oblique angles relative to a plane extending perpendicular to the axis of said cone and being inclined relative to said plane in such a direction that adjoining side margins of adjoining segments define a crest on one surface of said disc and define a valley on the opposite surface of said disc, said crests and valleys alternating with one another around each surface of said disc.

4,711,435

APPARATUS FOR HYDRAULIC DAMPING

John L. Harris, Kila Cottage, Brighton Road, Lower Beeding, Horsham, West Sussex RH13 6NJ, England, and John F. Benyon, 6 Denning Close, Fleet, Aldershot, Hampshire GU13 9SP, England

PCT No. PCT/GB84/00199, § 371 Date Feb. 7, 1985, § 102(e) Date Feb. 7, 1985, PCT Pub. No. WO85/00209, PCT Pub. Date Jan. 17, 1985

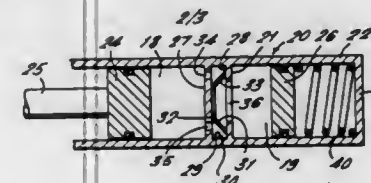
Continuation of Ser. No. 700,879, Feb. 7, 1985, abandoned. This PCT application Jun. 8, 1984, Ser. No. 891,411

Claims priority, application United Kingdom, Jun. 20, 1983, 8136722

Int. Cl.⁴ F16F 9/34, 9/50

U.S. Cl. 267—221

4 Claims



1. An apparatus for hydraulic damping comprising the combination of
a housing defining a first enclosure, a second enclosure and a chamber between said enclosures, said chamber having two surfaces facing each other, and means defining first and second ports for allowing fluid communication between said chamber and said first and second enclosures, respectively;
first piston means movable in said first enclosure in response to externally applied force for changing the effective volume of said first enclosure;
second piston means movable in said second enclosure, said housing and said first and second piston means defining an enclosed space between said piston means;
hydraulic fluid filling said space;
resilient energy storage means within said second enclosure for compression by said second piston means; and
bidirectional valve means comprising a valve member within said chamber, said valve member comprising an elastic, truncated hollow cone having a small diameter end and a large diameter end, each of said ends being closely adjacent one of said sur-

faces in the absence of a fluid pressure difference between said ports, said valve member being responsive to a difference in fluid pressure between said ports in either direction to elastically deform and flatten to allow fluid flow through said ports between said enclosures in the direction of said difference and to be progressively increasingly flattened in response to increased flow rate in either direction of fluid flow so as to provide a decreasing spring rate in either direction, and wherein flow of fluid in the direction from said second port to said first port is substantially through said conical valve member and flow of fluid in the opposite direction is substantially across the outer surface of said valve member.

4,711,436

GRID ASSEMBLY FIXTURE, RETENTION STRAP AND METHOD

Richard M. Koback, Delmont, and Ralph W. Kalkbrenner, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

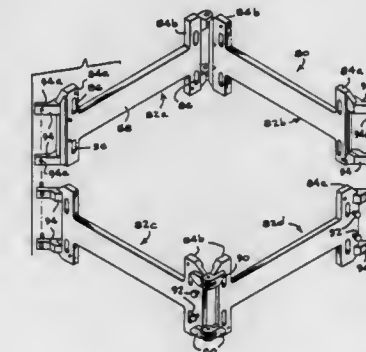
Division of Ser. No. 414,198, Sep. 1, 1982, Pat. No. 4,519,593.

This application Feb. 19, 1985, Ser. No. 703,231

Int. Cl.⁴ G21C 21/00; B25B 1/20

U.S. Cl. 269—40

4 Claims



1. A retention strap for holding in assembled relationship before welding a grid assembly comprising mating, perpendicular inner straps, and outer straps extending about said inner straps, comprising four bars, each of generally "H" shape, and including a pair of end posts connected together by a cross member, each post having openings therethrough located above and below the connecting cross member, means for hingedly connecting first and second said bars and means for hingedly connecting third and fourth said bars to provide pairs of hinged bars, and means for releasably connecting two said pairs of bars.

4,711,437

WORKPIECE SECURING APPARATUS FOR A MACHINE TOOL

Francis S. Longenecker, Kevin J. Moeder, both of Englewood, and Jeffrey L. Wolff, Dayton, all of Ohio, assignors to TE-Co., Englewood, Ohio

Filed Sep. 2, 1986, Ser. No. 902,574

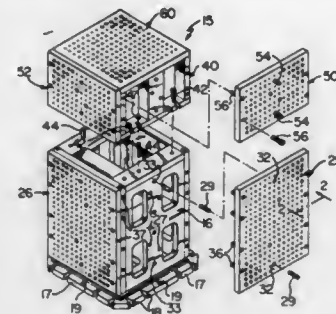
Int. Cl.⁴ B23Q 3/06

U.S. Cl. 269—91

21 Claims

1. Apparatus for securing a workpiece to a table of a machine tool, comprising a base plate including means defining an array of perpendicular rows of threaded holes and precision

bores having parallel axes and forming an X-Y grid pattern, an angularly adjustable plate including means defining an array of perpendicular rows of threaded holes and precision bores having parallel axes and forming an X-Y grid pattern, said adjustable plate also having means defining a plurality of precision angular positioning bores for selectively positioning said adjustable plate at a series of predetermined acute angles relative to said base plate, a pair of said angular positioning bores



for each predetermined angular position of said adjustable plate, each said pair of angular positioning bores in said adjustable plate being located in precise axial alignment with a corresponding pair of said precision bores forming said X-Y grid pattern of bores within said base plate when said adjustable plate is disposed at each of said predetermined angles, a pair of locating pins extending within each said pair of axially aligned bores, and means for clamping said adjustable plate to said base plate.

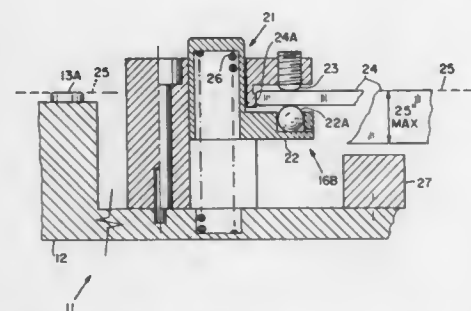
4,711,438 MASK HOLDING

Nicholas Guarino, Arlington, Mass., assignor to Micron Limited Partnership, Beverly, Mass.

Filed May 8, 1986, Ser. No. 861,132
Int. Cl.⁴ B25B 1/00

U.S. Cl. 269—152

2 Claims



1. A holder for a mask or substrate to be processed by a particle beam comprising,
a plate holder having a base and an upstanding perimetrical wall to define a recess for accommodating masks or substrates to be processed,
said wall having three spaced studs each having a top surface in a common plane parallel to said base with at least one of said studs separated from at least one other of said studs by said recess,
means defining at least one set of three clamping points on said base with at least one of said three clamping points separated from at least one other of said three clamping points by a region in said recess for accommodating a mask or substrate to be processed,
and clamping means at each of said clamping points for clamping the edges of a mask or substrate to be processed, said clamping means having means for selectively adjusting the position of the mask or substrate to be processed so

that the surface thereof away from said base coincides with said common plane.

4,711,439

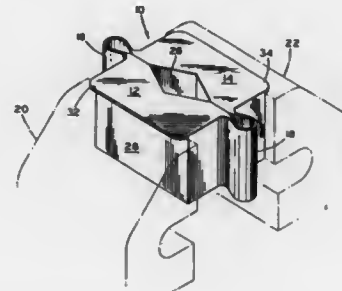
VICE JAW SUPPORT APPARATUS

Edward N. Campbell, Oklahoma City, Okla., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 29, 1986, Ser. No. 913,177
Int. Cl.⁴ B25B 1/24

U.S. Cl. 269—277

7 Claims



1. An apparatus for supporting a workpiece within a pair of vice jaws, said apparatus comprising a pair of jaw inserts, each insert comprising means for support on one jaw of said pair of vice jaws, each insert being formed of a resilient material and having coacting mating surfaces disposed for holding said workpiece, said inserts integrally joined together by means providing non-pivotal linear movement of each insert relative to the other, wherein said apparatus comprises a unitary molded construction, wherein said means of joinder of said inserts together comprises a pair of flexible webs formed as integral parts of said apparatus, said webs being integrally positioned symmetrically on opposing sides of said mating surfaces, each of said webs attached integrally to one edge of one of said surfaces, each web being disposed to deform outwardly of said inserts when said inserts are moved toward one another.

5. An apparatus for supporting a workpiece within a pair of vice jaws, said apparatus comprising a pair of jaw inserts, each being supported on one jaw of said pair of vice jaws, each insert comprising a resilient body of material having coacting mating surfaces thereon, wherein a first of the pair of inserts defines a pair of first bores therethrough, the second insert defining a pair of second bores therethrough, each one of said second bores in alignment with one of said first bores, and means slidably disposed within each set of aligned first and second bores for interconnecting said first and second inserts and providing non-pivotal, linear movement of said first and second inserts to and from one another, wherein each insert comprises a molded polyethylene, and wherein said means providing a non-pivotal, linear movement of said inserts relative to the other comprises a pair of elongated floating pins interconnecting said inserts, each pin having a head at each end, said sets of first and second bores each defining a set of coaxially positioned exterior and interior bore portions, said interior bore portions disposed for slidably piloting said floating pins, said exterior bore portions of said sets of first and second bores disposed for containment of said pin heads, wherein each interior bore portion has a smaller diameter than its associated coaxial exterior bore portion, and wherein said heads will not protrude from said exterior bores when said coacting mating surfaces of said jaw inserts are in contact with one another.

4,711,440

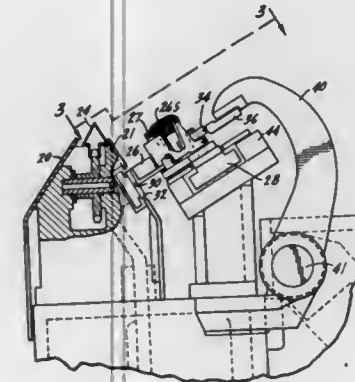
SIGNATURE MACHINE WITH COUNTERPULSE WEIGHT SHUTTLE BAR DRIVE

Raymond I. Bulka, Oak Lawn, and David J. Nowaczyk, Chicago, both of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Nov. 17, 1986, Ser. No. 931,054
Int. Cl.⁴ B42B 1/02

U.S. Cl. 270—53

16 Claims U.S. Cl. 271—6



1. In a cyclically operable signature machine having a conveyor in which signatures are collected one atop another as they are fed from hoppers to the conveyor which moves the collected signatures, constituting an unbound book, to a binder station where the signatures are joined at their backs to afford a bound book:

a set of grippers and support therefor at the stitching station, supported and guided for horizontal reciprocal shuttle action to feed the books through the stitching station;
a reciprocal drive bar connected at one end to the gripper support for producing a 360° cycle of horizontal shuttle action including a 180° forward feed stroke from starting position and a 180° nonfeed return stroke back to starting position;
a sun gear and a planetary gear coupled thereto and supported for repeated 360° revolutions relative to the sun gear;
said planetary gear being rotatable about its own axis while revolving relative to the sun gear and having a radius arm secured thereto for rotation therewith, and a counterpulse weight on a weight support extending radially outward of the axis of rotation of the planetary gear to rotate therewith;

the free end of said arm being pivotally joined to the opposite end of the drive bar so that as the planetary gear circumnavigates the sun gear through 360° the drive bar is reciprocated to reciprocate the gripper support and its mass harmonically with maximum velocity substantially at the midposition of each stroke;
and said counterpulse weight being so positioned radially that its harmonic displacement from midposition, taken as the axis of the sun gear, is approaching minimum when the displacement of the gripper bar mass from midposition is approaching maximum.

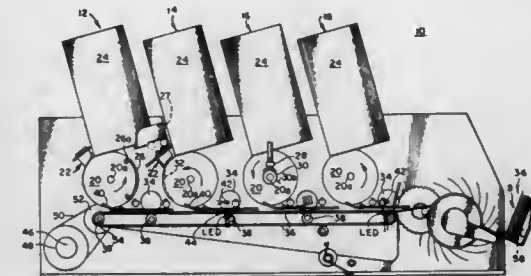
4,711,441

ELECTRONIC CONTROLLER FOR DISPENSERS AND THE LIKE

Lawrence D. Taylor, Lansdale, Pa., assignor to Brandt, Inc., Bensalem, Pa.

Division of Ser. No. 699,055, Feb. 7, 1985. This application Mar. 27, 1986, Ser. No. 844,977
Int. Cl.⁴ B65H 3/06, 7/14

3 Claims



1. Apparatus for dispensing sheets arranged in stacks provided in a plurality of dispensing devices;
a common sheet delivery means;
each of said dispensing devices including a feed roller for advancing one sheet from its associated stack to said sheet delivery means;
an output location for receiving sheets delivered thereto by the sheet delivery means;
a sensing device for each dispensing device located near a point along the sheet delivery means at which a sheet is delivered to the sheet delivery means by the associated dispensing device;
motor means for each feed roller;
a home position sensor for each feed roller to indicate the home position of its associated feed roller;
microprocessor means comprising means for a selected dispensing device for selectively driving the feed roller motor means thereof through one revolution to feed a sheet to said sheet delivery means;
means for examining the sensing device associated with the selectively driven feed roller motor means to determine if a sheet has been dispensed during a latter portion of said revolution;
a means for driving the selectively driven feed roller motor means through a subsequent revolution if the associated sensing device fails to indicate the feeding of a sheet to the sheet delivery means;
and means for examining the home position sensor associated with the selectively driven feed roller motor means during a latter portion of the revolution of the feed roller to determine if the feed roller has returned to the home position.

4,711,442

SHEET SUPPLY APPARATUS FOR TYPEWRITERS, HAVING SLEWING ROLLERS ENGAGING A PLATEN ROLL, AND METHOD

Kurt Rünzi, Küssnachterstrasse 59, CH-8126 Zumikon, Switzerland

Continuation of Ser. No. 768,199, Aug. 22, 1985, abandoned, which is a continuation of Ser. No. 536,862, Sep. 29, 1983, Pat. No. 4,558,858. This application Mar. 20, 1987, Ser. No. 29,349
Claims priority, application Switzerland, Oct. 12, 1982, 5957/82

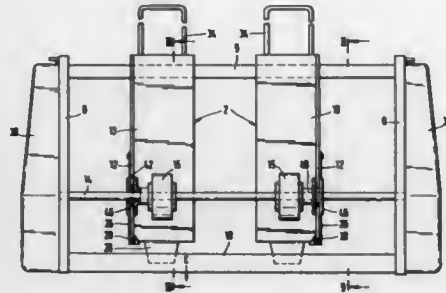
Int. Cl.⁴ B65H 3/22

U.S. Cl. 271—22

21 Claims

1. Single-sheet feed apparatus for office-type automatic writing machines, having
a frame (8,10) including spaced side elements (8),

a rotatable shaft (14) and at least two feed rollers (15) rotatable with said shaft, and comprising an assembly including two parallel rockers (2,12) each having a respective support surface (13); movable means (9) for commonly engaging the rockers (2,12) extending between the side elements (8) and securing the rockers for common movement upon motion of the movable means, said rockers being shiftably secured to the movable means to permit shifting movement of the rockers between the side elements (8) of the frame; an abutment element (18) located adjacent the end of each rocker at the leading or feeding edge of the sheet;



sheet separating elements (28) located adjacent the corners of the leading edges of the sheets and pivotably secured to, and axially movable with, the rockers, wherein each rocker (2,12) contains a spring (40) urging said respective support surface (13) against a respective one of said feed rollers (15); the rotatable shaft (14) extends transversely of the apparatus between the spaced side elements (8); and engagement elements (46,48) are provided, coupled to move with the support surfaces of the respective rockers (2,12) and further coupled to move with the respective feed rollers (15) for moving said feed rollers axially along rotatable shaft (14) conjointly with shifting of the respective rockers between said spaced side elements (8).

4,711,443 SHEET SUPPLY DEVICE

Tsutomu Fujiwara; Susumu Matsuda; Keisuke Murakami; Izumi Ogawa; Mamoru Tago; Chihiro Aoki; Masahiro Doi, and Hiroshi Anno, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 927,953

Claims priority, application Japan, Nov. 7, 1985, 60-249754; Oct. 3, 1986, 61-152347[U]

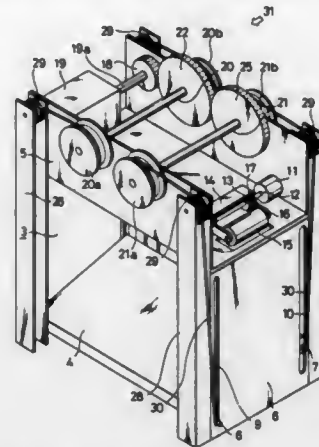
Int. Cl.⁴ B65H 1/08

U.S. Cl. 271-126

11 Claims

1. A sheet supply device, comprising:
 - a sheet stocker including a lifting table for receiving a large number of sheets accumulated in layers thereon, the sheets being different in thickness between opposite sides thereof, said sheet stocker further including a paper feed roller for contacting with an uppermost one of the sheets on said lifting table;
 - one or more string members having one end or ends fastened to each of opposite sides of said lifting table corresponding to the opposite sides of the sheets providing the difference in thickness;
 - a first take-up drum or drums located corresponding to the thicker side of the sheets and having the other end or ends of those of said string member or members corresponding to the thicker side of the sheets fastened thereto;
 - a second take-up drum or drums located corresponding to the thinner side of the sheets and having the other end or ends of those of said string member or members corre-

sponding to the thinner side of the sheets fastened thereto; and
a lifting inclining means for causing said first take-up drum



or drums to take up the string member or members at a higher taking up speed than the taking up speed at which said second take-up drum or drums take up the string member or members.

4,711,444 SHEET SORTING DEVICE

Petrus A. M. Geurts, Helden, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

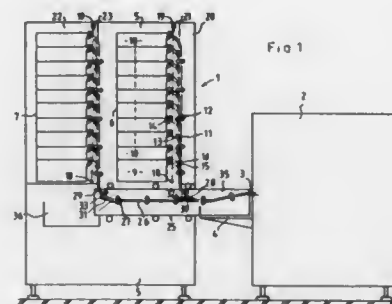
Filed Mar. 27, 1986, Ser. No. 844,883

Claims priority, application Netherlands, Mar. 29, 1985, 8500929

Int. Cl.⁴ B65H 39/10

U.S. Cl. 271-290

8 Claims



1. A sheet sorting device for use in a sheet processing machine comprising at least one sorting unit having a plurality of superposed sheet receiving bins and a first conveyor means for conveying sheets selectively to one of said sheet receiving bins and a second conveyor means positioned below and substantially normal to said first conveyor for conveying sheets from said processing machine to said first conveyor, said second conveyor means being moveably mounted to said sorting unit so as to be displaceable between a first position disposed below said receiving bins and a second position adjoining said sheet processing machine.

4,711,445 THERAPEUTIC HAND EXERCISER

Edward J. Whitehead, Lititz, Pa., assignor to Duro Med Industries, Inc., Hackensack, N.J.

Filed Sep. 3, 1981, Ser. No. 299,080

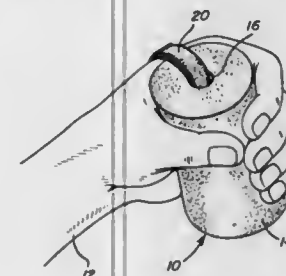
Int. Cl.⁴ A63B 21/30

U.S. Cl. 272-67

2 Claims

1. A hand exerciser comprising an elongated imperforate

cylindrical body constructed of resilient flexible material and having a substantially constant diameter throughout its length, said body including a cylindrical bore extending throughout its length and located in the center of the body, said body having flat ends perpendicular to the longitudinal axis of the body, the diameter of the body being substantially greater than the diameter of the bore to provide a radially thick body outwardly of the bore, said body having a length enabling it to extend substantially completely across the width of the palm of a hand of a user and a circumference enabling the fingers and thumb on the hand of a user to substantially encircle the body when the body is uncompressed thereby enabling the body to be compressed anywhere along its length or throughout its length by the user squeezing the body thereby exercising the hand, and a flexible retaining strap extending through the bore and encircling the back of the hand to retain the body against the palm of the hand even when the fingers and thumb are not in encir-



cling relation to the body, said strap having a width generally equal to the diameter of the bore to stabilize the strap in the bore, said body being constructed of cellular foam material with the bore through the body enabling compression of the body to a thin configuration by collapsing the bore as well as collapsing the cellulose foam material thereby enabling the hand to be tightly clinched to form a fist, said strap extending through the bore including overlapping ends and means adjustably interconnecting the overlapping ends of the strap to enable the strap to snugly encircle hands having different dimensions, the external surface of said body including a longitudinally extending ointment receiving and dispensing groove means, said groove means terminating in radially spaced relation to the bore and extending throughout the length of the body and oriented in facing contacting relation to the user's hand for applying ointment to the hand during cyclic compression of the body.

4,711,446 STILT

Orlan S. Nielsen, Box 101, Parker, Id. 83438, and Lawrence E. Nielsen, 1916 Amsterdam La., Modesto, Calif. 95356

Filed Feb. 25, 1986, Ser. No. 832,668

Int. Cl.⁴ A63B 25/00

U.S. Cl. 272-70.1

9 Claims

9. A stilt including an upright standard having upper and lower end portions and upstanding inner and outer longitudinal sides, said outer longitudinal side including transverse, horizontal outwardly opening adjustment grooves formed therein and spaced vertically along said lower end portion, a foot block including a first side opposing, abutted against and slidable along the inner side of said standard, said foot block including a second side remote from said standard, said second side including a transverse, horizontally outwardly opening support groove formed therein, an elongated closed loop-type bail closely encircled about said standard and block and including opposite end transverse portions thereof seated in one of said adjustment grooves and said support groove with said support groove spaced sufficiently below said one adjustment groove to enable one of said transverse portions to be displaced outward of the corresponding groove upon upward displacement of said block along said standard to a position with said support groove generally horizontally aligned with said one

adjustment groove, and means carried by said standard adjacent each of said adjustment grooves and operable to releas-



ably close the corresponding adjustment groove against the displacement of the corresponding end member of said loop-type bail therefrom.

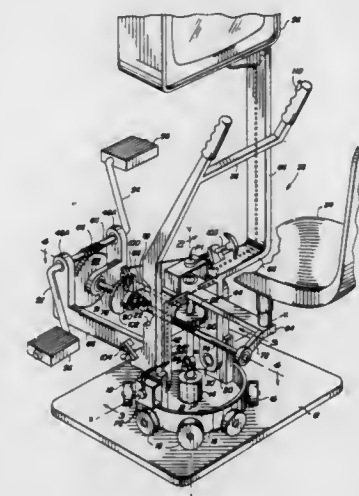
4,711,447
EXERCISE APPARATUS FOR USE WITH VIDEO GAME
Michael R. Mansfield, 3150 Shorewood La., #302, Fort Myers, Fla. 33907

Filed Dec. 23, 1985, Ser. No. 812,317

Int. Cl.⁴ A63B 21/00; A63G 31/16

U.S. Cl. 272-73

3 Claims



1. An exercise apparatus for use in combination with a video game comprising:

- a. a stationary base member disposed in a generally horizontal plane;
- b. an assembly movably mounted on said base member, including (i) a seat for an operator and (ii) support means for mounting a video game facing said seat, said assembly being movable with respect to said base member in a plurality of directions;
- c. mounting means intermediate said base and said assembly to permit said assembly to be moved relative to said base, said mounting means including a rotatable framework for supporting said assembly, said mounting means permitting 360 degrees of horizontal rotation of said framework and assembly in either of two opposing directions about a vertical axis centered on said base member;
- d. operator-powered drive means for moving said assembly with respect to said base member, said drive means including a foot-operated crank wherein pedalling of the crank

by the operator in a forward direction causes said frame-work and assembly to move in one direction, and pedalling backward causes said assembly to move in an opposing direction, such movement requiring vigorous exercise by said operator; and

- e. electrical sensing means connected to said mounting means responsive to the direction and extent of movements of said assembly with respect to said base member, for transmittal of information related to said movements to said video game.

4,711,448

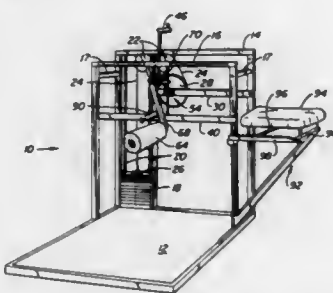
LOWER BODY EXERCISING AND WEIGHT TRAINING DEVICE

Roger E. Minkow, 735 H St., Petaluma, Calif. 94952, and Julius M. Minkow, 69 Washington St., Brooklyn 1, N.Y. 11201

Filed Apr. 11, 1985, Ser. No. 722,226
Int. Cl.⁴ A63B 21/06

U.S. Cl. 272-118

10 Claims



1. In a machine useable for exercising muscle and body joints the combination comprising:

- (a) a frame including a base, a first and a second upright vertical support member,
- (b) an adjustable set of gravity responsive weight elements movable in a vertical direction within said first upright support member,
- (c) a rotatable shaft mounted at a fixed location on said first support member, and means connected to said shaft for converting rotary movement of said shaft to vertical movement of said weight elements,
- (d) a movable rotatable shaft mounted on said second of said support members, means for moving said movable shaft vertically within said second support member,
- (e) machine user operable means adjustably supported on said movable rotatable shaft, said user operable means being adjustable in radial distance from said rotatable mounting of said rotatable shaft on said second support member, said adjustable support of said user operable means being rotatably adjustable to position said user operable means angularly about said movable rotatable shaft,
- (f) and a flexible positive mechanical connection between said fixed location of said rotatable shaft mounted on said first support member and said movable rotatable shaft mounted on said second support member,
- (g) said flexible position mechanical connection including:
 - (i) a universal joint connected to said rotatable shaft,
 - (ii) a universal joint connected to said movable rotatable shaft,
 - (iii) and an axially slideable positive connection between said universal joints,
- (h) said machine user operable means being adjustably positioned with respect to said second support member to provide vertical, rotary and radial adjustment of said user operable means,
- (i) and said machine user operable means being operable to adjust said flexible positive mechanical connection to said rotatable shaft to selectively cause vertical movement of said weight elements with either clockwise or counter-

clockwise rotation of said rotatable shaft mounted at said fixed location on said first support member.

4,711,449

WEIGHT LIFTING SAFETY DEVICE

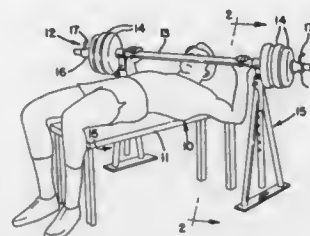
Douglas C. Ochab, 7712 W. Sunnyside Ave., Norridge, Ill. 60656

Filed Jan. 6, 1986, Ser. No. 816,625

Int. Cl.⁴ A63B 13/00

U.S. Cl. 272-123

12 Claims



1. A weight lifting safety device adapted for use in bench-pressing exercises, said device comprising:

- weight supporting bar means for grasping in a horizontal position by a user and for receiving weights on generally opposite ends thereof;
- bar and weight support means depending vertically from said bar means adjacent opposite ends thereof to support said bar means and any weights thereon in predetermined elevated position relative to a supporting surface;
- an attachment assembly fixed to the upper end of each support means and extending horizontally thereof, each said attachment assembly having a sleeve, said bar means extending through said sleeve of each of said attachment assemblies and being rotatable therein;
- locking means on said bar associated with each attachment assembly to fix the positions of said support means longitudinally on said bar; and
- each of said locking means includes a pair of opposed semi-cylindrical plates provided with external spaced abutment means, fastening means for attaching said plates to said bar, said sleeve being received about each of said locking means between said spaced abutment means, said bar and said locking means being rotatable in said sleeves.

4,711,450

MULTI-MODE EXERCISING APPARATUS

Jim McArthur, 51 Leeder Avenue, Coquitlam, British Columbia, Canada V3K 3V5

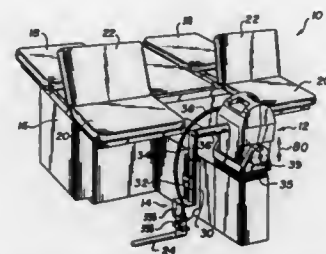
Continuation of Ser. No. 427,121, Sep. 29, 1982. This application May 28, 1985, Ser. No. 738,447

Claims priority, application Canada, Jun. 1, 1982, 404235

Int. Cl.⁴ A63B 23/04

U.S. Cl. 272-129

12 Claims



1. A multi-mode exercising apparatus comprising
- a central support housing,
- a rotary actuator mounted to said support housing and adapted to be hydraulically driven in opposite rotational directions about a rotational axis, and including an output shaft extending along said rotational axis,

hydraulic pump means for pressurizing a hydraulic fluid, servo valve means interconnected between said pressurized hydraulic fluid and said rotary actuator for controlling fluid flow in each direction through said actuator in response to an electrical input signal,

an arm extending radially with respect to said rotational axis and having one end thereof fixed to said output shaft, and an opposite end spaced radially from said rotational axis, a slider slideably mounted to said arm and including locking means for releasably positioning said slider at an adjustable location along the radial length of said arm,

a user engageable handle adapted to be engaged by the body of the user during use of said apparatus,

block means mounting said handle to said slider and such that said handle extends in a direction generally parallel to said rotational axis, said block means including load cell means for providing an electrical signal which is proportional to the magnitude of the force exerted by the user on said handle during use of said apparatus.

position sensing means for generating an electrical signal representative of the rotational position of said actuator, and

control means for controlling the input electrical signal to said servo valve means in response to the signals from said load cell means and said position sensing means and in accordance with a predetermined control program, and whereby the positioning of said load cell means immediately adjacent the user handle serves to effectively avoid any force component from the weight of said arm and said slider from being included in the output signal of said load cell means.

4,711,451

REEL MAPPING SCHEME FOR A GAMING DEVICE

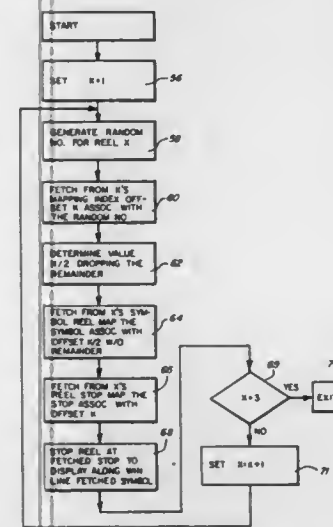
Phillip Pajak, Western Springs; Victor Salmons, and Tony Chan, both of Chicago, Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Jul. 29, 1986, Ser. No. 891,362

Int. Cl.⁴ A63B 71/04

U.S. Cl. 273-143 R

5 Claims



1. In a gaming device having a rotating symbol bearing reel with n stop positions associated with each symbol, a control system for stopping said reel to display a randomly selected symbol along a win line comprising:
- reel map means for storing, for each stop on the reel, data representing the stop at an addressable location in the reel map means corresponding to the location of the stop on the reel to provide a map of the reel stops, the data storage location for each stop having an associated, unique address offset value k which differs from the k offset values

associated with an adjacent stop or stops for the same symbol by a unit value;

symbol map means for storing, for each symbol on said reel, data representing the symbol at an addressable location in the symbol map means corresponding to the location of the symbol on the reel to provide a map of the symbols, the data storage location for each symbol having an associated, symbol address offset equal to k/n without the remainder where k is one of the n reel map offset values associated with the symbol's n stops;

mapping index means for storing one or more k offset values for each symbol on said reel where each k offset value stored in the index means points to the symbol in the symbol map means whose associated symbol address offset equals k/n without the remainder, each k offset value being stored in the mapping index means at a location having an associated index offset value;

means for randomly generating a number representing an index offset value for said mapping index means; and

means for stopping said reel at the stop position whose associated k offset value is the value stored in the mapping index means at the address having the index offset value represented by said random number to display along the win line the symbol whose associated symbol address offset value is equal to k/n without the remainder.

4,711,452

AMUSEMENT MACHINE

Peter D. Dickinson, and Robert A. Luciano, both of Reno, Nev., assignors to International Game Technology (IGT), Reno, Nev.

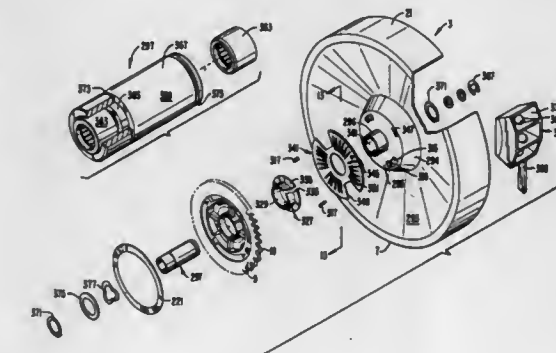
Division of Ser. No. 664,185, Oct. 24, 1984, Pat. No. 4,635,937.

This application Aug. 11, 1986, Ser. No. 895,550

Int. Cl.⁴ A63F 5/04

U.S. Cl. 273-143 R

10 Claims



1. A reel assembly for use with an amusement machine, comprising:
- a reel and sprocket mounted for relative rotational movement about a common axis;
- means bridging said reel and sprocket for preventing relative rotational movement in a predetermined rotational direction when said reel and sprocket are in a predetermined angular orientation, and for permitting relative rotational movement from said predetermined angular orientation in the opposite rotational direction;
- resilient means engaging each of said reel and sprocket for resisting relative rotational movement opposite to said predetermined direction when a force in that direction is applied and returning said reel and sprocket to said predetermined angular orientation when the force subsides;
- a clutch disc mounted coaxially with and interposed between opposing hub faces of said reel and sprocket;
- said clutch disc comprising an inner and outer portion, said inner portion contacting said opposed hub faces on both sides of said disc and said outer portion extending radially outward beyond at least one of said hub faces, said clutch disc further comprising a plurality of slots extending radi-

ally outwardly from said inner to said outer portion for discharging accumulated residue from said inner portion; and means for urging said opposed hub faces axially towards each other against said clutch disc.

4,711,453

DICE PYRAMID TALLY BOARD AND GAME

Michael H. Saint Ives, Englewood, Colo., assignor to Stephen Kal, Denver, Colo.

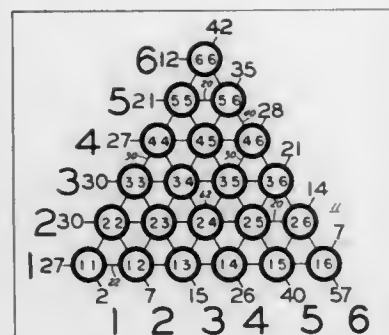
Filed Jul. 20, 1981, Ser. No. 284,926

The portion of the term of this patent subsequent to Apr. 5, 1997, has been disclaimed.

Int. Cl.⁴ A63F 3/00

U.S. Cl. 273-268

3 Claims



1. A flat playing board having a triangular grid defined by a first set of 6 parallel equidistant spaced horizontal lines which intersect a second set of 6 parallel equidistant spaced vertically oblique lines, oblique to the right with the horizontal lines, which also intersect a third set of 6 parallel equidistant spaced vertically oblique to the left lines and the 6 lines vertically oblique to the right lines, oblique to the left with the horizontal lines, the lines in each set extending at an angle to the lines of the other sets;

a row of numbers from 1 through 6 along the bottom of the triangular grid with the numbers positioned from left to right to correspond to the intersection of the 6 vertically oblique to the left lines and the 6 lines vertically oblique to the right lines with the horizontal line; and, a row of numbers from 1 through 6 along the left edge of the triangular grid with the numbers positioned from bottom to top to correspond to the intersection of the 6 horizontal lines with the 6 vertically oblique to the left lines and the 6 lines vertically oblique to the right lines.

4,711,454

BINGO GAME INVOLVING PROMOTIONAL COUPONS

Maynard E. Small, 105 Ward Pkwy., Apt. 507, Kansas City, Mo. 64112

Continuation of Ser. No. 699,311, Feb. 7, 1985, Pat. No. 4,619,457, which is a continuation-in-part of Ser. No. 385,840, Jun. 7, 1982, Pat. No. 4,509,759, which is a continuation-in-part of Ser. No. 273,259, Jun. 12, 1981, Pat. No. 4,342,457, which is a continuation of Ser. No. 79,189, Sep. 26, 1979, Pat. No. 4,285,520. This application Oct. 27, 1986, Ser. No. 923,346

Int. Cl.⁴ A63F 3/00

U.S. Cl. 273-269

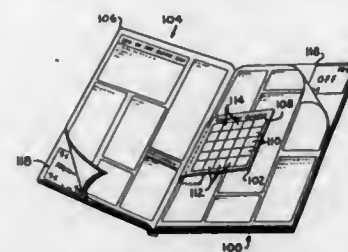
16 Claims

12. A game for players of the type known as "bingo" comprising:

- a set of free-standing advertising publications comprising a plurality of pages;
- a set of playing cards, one of said set provided with each copy of said publication; each of said cards having a playing matrix divided into several columns and rows forming a plurality of playing squares with individual area indicia contained therein;
- each of said free-standing publications including a plural-

ity of coupons common to all players printed therein; at least a portion of said coupons being positioned at various isolated locations throughout said publication; each coupon bearing individual coupon indicia;

(d) said area indicia and said coupon indicia being cooperatively related, in that selected indicia from the coupon



indicia set are matched area indicia with selected indicia from the area indicia set such that said matched area indicia describe at least a complete row or column or diagonal on said playing card grid; whereby each player is urged to scan the pages of said publication to determine the presence of said coupons in order to produce said predetermined pattern of matched area indicia.

4,711,455

GASKET FOR USE IN MANHOLES AND INCLUDING CLAMPING BAND HAVING COOPERATING PROJECTIONS AND GROOVES FOR PREVENTING RELATIVE AXIAL MOVEMENT OF THE OPPOSING ENDS OF THE CLAMPING BAND DURING INSTALLATION AND FOR FACILITATING EXPANSION BY AN EXPANSION JACK

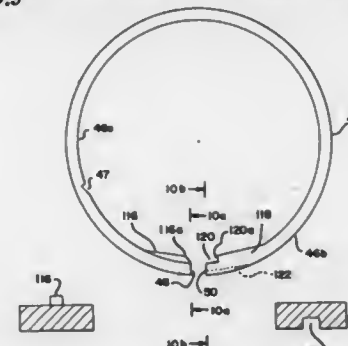
Jack Ditcher, and James A. Westhoff, both of Langhorne, Pa., assignors to A-Lok Products, Inc., Tullytown, Pa.

Filed Sep. 23, 1985, Ser. No. 778,690

Int. Cl.⁴ B23P 19/00; F16J 15/10; F16L 5/02, 21/08

U.S. Cl. 277-9.5

9 Claims



1. A gasket assembly for providing a watertight seal within an opening including an annular compressible gasket having inner and outer peripheral surfaces and an annular clamping band formed of a plastic material substantially impervious to corrosive influences normally encountered in sewage systems and arranged to be positioned to engage the inner peripheral surface of said gasket;

said clamping band having inner and outer peripheral surfaces, said outer peripheral surface engaging the inner periphery of said gasket;

said clamping band having a discontinuity to define first and second free ends thereof, whereby said first and second free ends are moved into abutment with one another when the clamping band is expanded against said gasket to maintain said clamping in a locked position and maintain said gasket under compression, the interactive forces between the compressed gasket and the clamping band serving to retain the clamping band in the locked position against the inner peripheral surface of said gasket, the

outer peripheral surface of said gasket being pressed into intimate engagement with the gasket supporting surface of said opening;

said clamping band having a projection along one of its inner and outer peripheries and adjacent to one of said free ends and a groove along the other one of its inner and outer peripheries and adjacent the remaining one of said free ends, for slidably receiving said projection when the ends of said clamping band are overlapped preparatory to expansion of the band, to prevent axial movement of the ends of the clamping band relative to one another as the clamping band is expanded towards the locked position.

4,711,456

GASKET FOR AN INTERNAL COMBUSTION ENGINE

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

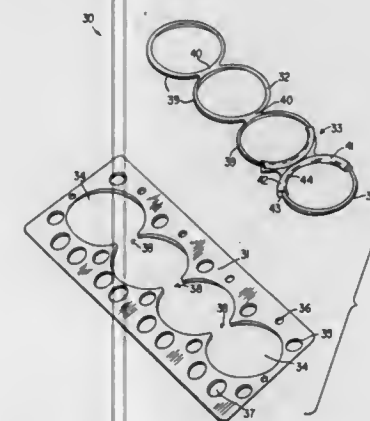
Filed Dec. 2, 1986, Ser. No. 936,866

Claims priority, application Japan, Jul. 29, 1986, 61-116114

Int. Cl.⁴ F16J 15/12

U.S. Cl. 277-235 B

13 Claims



1. A gasket for an internal combustion engine with a plurality of through holes therein, comprising:

a main seal member having a plurality of openings corresponding to the through holes of the engine, said openings being slightly larger than the through holes, and at least one communicating portion situated between the adjacent two openings, for providing communication between the two openings,

a sealing device having a plurality of cylindrical portions to be situated in the openings of the main seal member, and at least one intermediate portion to be situated in the communicating portion of the main seal member, said cylindrical portions and intermediate portion being integrally formed together, and

means for substantially covering the sealing device and securely connecting the same to the main seal member.

4,711,457

DRILL CHUCK FOR HAND-HELD TOOLS

Erich Wezel, Frickenhausen, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Jun. 6, 1986, Ser. No. 871,710

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520324

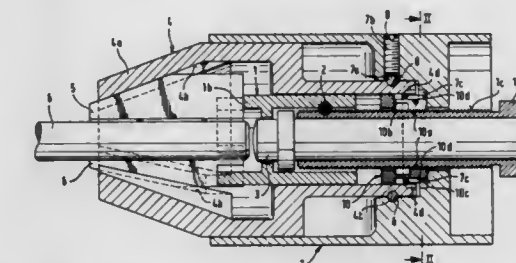
Int. Cl.⁴ B23B 31/12

U.S. Cl. 279-65

5 Claims

1. Drill chuck for securing a tool in a hand-held device, such as a percussion drill, a hammer drill or similar device, comprising an axially extending chuck member having a leading end and a trailing end, said chuck member having an axially extending radially outer surface with an axially extending thread formed in the outer surface, a guide sleeve laterally enclosing an axially extending part of said chuck member from the lead-

ing end toward the trailing end thereof, at least two clamping jaws fitted into the leading end of said chuck member and extending in the axial direction of the chuck member outwardly from the leading end thereof and located within said guide sleeve, said guide sleeve having a support surface engageable with said clamping jaws for determining the radial position of said clamping jaws, a sleeve-like adjustment adapter laterally enclosing an axially extending part of said guide sleeve and said chuck member, said adjustment adapter being axially displaceable relative to said chuck member and being secured to said guide sleeve for axially displacing said guide member and effecting radial displacement of said clamping jaws, wherein the improvement comprises a coupling member located within and in engagement with said adjustment adapter and encircling said chuck member, said coupling member



including a radially displaceable part selectively threadably engageable with said thread on said chuck member, and said thread on said member having a small pitch, said coupling member has at least one radially displaceable threaded segment for selective engagement and disengagement with said thread on said chuck member, said coupling member comprises a plurality of said threaded segments arranged serially in the circumferential direction, and said coupling member including spring means for biasing said threaded segments radially outwardly from said thread on said chuck member, and said coupling member is an axially extending sleeve-shaped member having a reduced diameter section intermediate the axial ends of said coupling member with slits formed in said coupling member for separating said threaded segments and for dividing said reduced diameter sections into individual fingers acting as spring elements for said threaded segments.

4,711,458

ROLLER SKATE

Hyun J. Shim, 350-39, Sangdo 3-dong, Dongjak-Ku, Seoul, Rep. of Korea

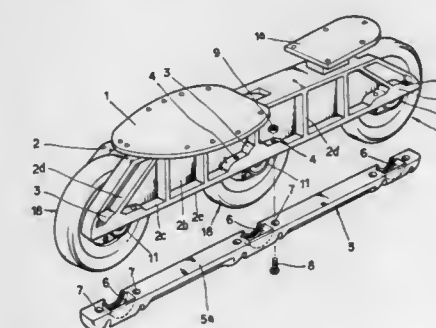
Filed Oct. 9, 1985, Ser. No. 785,946

Claims priority, application Rep. of Korea, Jul. 12, 1985, 8789/1985[U]

Int. Cl.⁴ A63C 17/04

U.S. Cl. 280-11.22

7 Claims



1. A roller skate comprising:
a bottom plate for supporting a shoe thereon;
a pair of upper frames extending longitudinally in parallel

with each other on the lower surface of said bottom plate and formed integrally with said bottom plate, each upper frame having a length longer than that of said bottom plate and three semi-circular bearing boxes disposed at the front end, rear end, and middle portions thereof;

a pair of lower frames extending along substantially the length of said corresponding upper frames attached to respective lower portions of said upper frames by means of bolts and nuts, each lower frame having an upper surface corresponding to the lower surface of each upper frame and three semi-circular bearing boxes corresponding to respective bearing boxes of each upper frame;

three bearings disposed within corresponding bearing boxes of each upper frame and each lower frame, each bearing carrying a damping pad along the upper portion thereof; and

three rollers arranged in a line between said upper and lower frames, each roller having a shaft formed to be unitary therewith, both ends of said

4,711,459

QUICK-RELEASE HUB RETENTION DEVICE

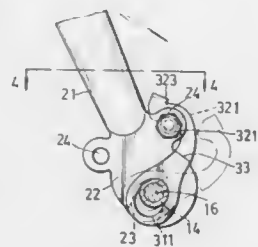
King Liu, No. 19, Shun Fan Road, Ta Cha Town, Taichung Hsien, Taiwan

Filed Dec. 29, 1986, Ser. No. 946,779

Int. Cl.⁴ B62K 25/02

U.S. Cl. 280—279

5 Claims



1. An improved safety mounting device for a bicycle quick-release hub having a wheel axle engageable in open-ended slots in the lower end portions of the legs of the front fork of the bicycle for receiving said axle, and a quick-release unit including adjustable retainer members movable relative to said axle longitudinally thereof for clampingly retaining said axle in said slots; each of said legs including a protrusion on an outward surface thereof above said slot, said safety mounting device comprising a pair of rigid clips, wherein each of said clips comprises:

a lower end pivotally mounted on said axle; and

parallel upper and lower portions extending radially of said axle, said upper portion having a curved free end for hooking over said protrusion to mount said axle on said legs of said front fork and being offset from said lower portion in an axial direction of said axle and being spaced in said axial direction from said lower portion at a distance slightly larger than the thickness of the lower end portion of said leg engaged therewith such that when said free end is hooked over said protrusion, said upper and lower portions of said clip respectively abut opposite sides of said lower end portion of said leg to prevent accidental separation of said hub from said front fork despite release of said adjustable retainer members.

4,711,460

MOUNTED IMPLEMENT HITCH FOR FARM TRACTORS

Klaus Schmittbetz, Cologne, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

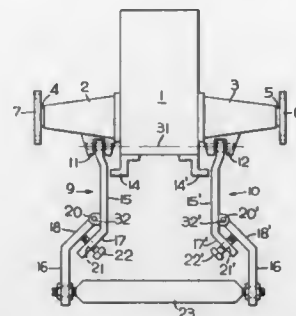
Filed May 13, 1986, Ser. No. 863,110

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517489

Int. Cl.⁴ B60D 1/00

U.S. Cl. 280—460 A

5 Claims



1. In combination with a farm tractor, an implement hitch comprising:

a pair of longitudinally extending lower draft arms with first parts connected to the tractor and second parts adapted for connection to an implement,

means pivotally interconnecting said first parts to said second parts, respectively, for relative lateral swinging movement of said second parts about first and second laterally spaced vertical axes, respectively,

a first adjustment element adjustably mounted on one of said parts of one of said draft arms at a location spaced from said first vertical axis, said first adjustment element being operatively interposed between said parts of said one draft arm and operable to adjust said parts about said first vertical axis, and a second adjustment element adjustably mounted on one of said parts of the other of said draft arms at a location spaced from said second vertical axis, said second adjustment element being operatively interposed between said parts of said other draft arm and operable to adjust said parts about said second vertical axis.

4,711,461

THREE-AXIS TRAILER HITCH HAVING IMPROVED ROTATABLE COUPLING BETWEEN VEHICLE AND TRAILER

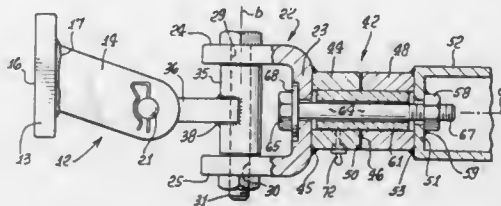
John P. Fromberg, Covina, Calif., assignor to Positive Connections, Inc., Pasadena, Calif.

Filed Apr. 17, 1986, Ser. No. 853,187

Int. Cl.⁴ B60D 1/00

U.S. Cl. 280—494

6 Claims



1. A trailer hitch for providing coupling about three independent axes between a towing vehicle and a trailer, comprising in combination:

(a) a universal coupling having a first U-shaped yoke member, a second U-shaped yoke member, and a pair of hollow cylindrical sections joined together in the form of a cross,

said first U-shaped yoke member having a base plate adapted for attachment to the towing vehicle and a pair of spaced-apart, parallel arms extending from said base plate for supporting one of said pair of joined hollow cylindrical sections for limited angular movement about a first axis; said second U-shaped yoke having a base portion and having a pair of spaced-apart, parallel arms extending from said base portion for supporting the other of said pair of joined hollow cylindrical sections for angular movement about a second axis inclined ninety degrees with respect to said first axis;

- (b) a first, short, hollow cylindrical member having a forward end portion securely joined to the base portion of said second U-shaped yoke member, said first, short, hollow cylindrical member extending from the base portion in a direction opposite to that of the pair of spaced-apart, parallel arms; said first, short, hollow cylindrical member having a smooth rear-end surface perpendicular to the longitudinal axis of said first, short, hollow cylindrical member;
- (c) a second, short, hollow cylindrical member having a smooth front-end surface perpendicular to the longitudinal axis of said second, short, hollow cylindrical member, said second, short, hollow cylindrical member having a rear-end portion adapted for secure attachment to a trailer; each of said first and second short, hollow cylindrical members having a smooth cylindrical inner wall surface forming a bore;
- (d) a hollow, cylindrical sleeve member coaxially positioned within and extending between said first and second short, hollow cylindrical members, said hollow, cylindrical sleeve member having a diameter slightly less than the diameter of the bores of said first and second short, hollow cylindrical members, and a length less than the total length of said first and second short, hollow cylindrical members; and
- (e) a bolt having a head at one end and a threaded portion at its opposite end, said bolt extending axially between the opposite ends of said first and second short, hollow cylindrical members and through the center of said hollow, cylindrical sleeve member to retain the smooth rear-end surface of said first short, hollow cylindrical member in abutment with the smooth front-end surface of said second short, hollow cylindrical member; said hollow, cylindrical sleeve member maintaining axial alignment between said first and second short, hollow cylindrical members and providing a smooth bearing surface for relative rotation of said first short, hollow cylindrical member with respect to said second short, hollow cylindrical member about a longitudinal axis perpendicular to said second axis.

4,711,462

INJECTION SKI AND A METHOD OF MANUFACTURING SAME

Keijiro Hayashi, Takatsuki, and Toshimi Awano, Ohogaki, both of Japan, assignors to Mizuno Corporation, Osaka, Japan

Continuation of Ser. No. 476,789, Mar. 18, 1983, abandoned.

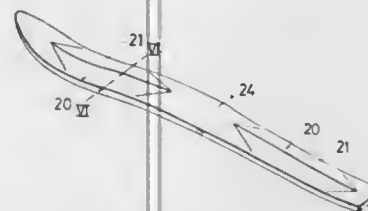
This application Jun. 25, 1986, Ser. No. 880,347

Claims priority, application Japan, Mar. 20, 1982, 57-45274

Int. Cl.⁴ A63C 5/12

U.S. Cl. 280—610

5 Claims



1. An injection ski comprising a pair of spaced upper and

lower composite elements having spaced opposite edges and having an expanded plastic interposed between said upper and lower composite elements, including said spaced edges, said upper composite element including an upper surface member and a reinforcing member bonded to one another in mating relationship, with the upper surface member and the reinforcing member both being formed with mating longitudinally spaced forward and rear convex portions, and both being of essentially planar mating construction between the longitudinally spaced forward and rear convex portions to define an essentially planar intermediate surface area where a ski binding is secured.

4,711,463

VEHICLE SUSPENSION STRUT AND UPPER MOUNT ASSEMBLY THEREFOR

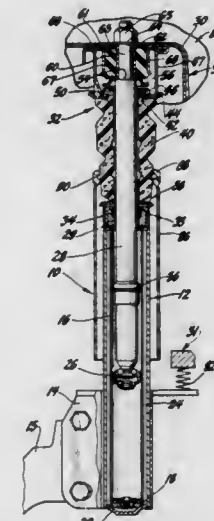
Joseph J. Knable, Fenton, Mich.; Donald C. Ferdelman, Kettering, Ohio, and Gerald M. Bojanowski, Mt. Clemens, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 9, 1986, Ser. No. 871,776

Int. Cl.⁴ B60G 11/42

U.S. Cl. 280—668

6 Claims



1. In a vehicle having suspension spring means operatively interposed between a road wheel assembly and a vehicle body, a suspension strut assembly for mounting said vehicle road wheel to support structure associated with said body and movable in jounce and rebound, a cylinder tube having a hydraulic fluid therein, a support tube disposed around said cylinder tube and having a lower end operatively connected to the vehicle road wheel assembly, a valved piston operatively mounted for reciprocating movement in said cylinder tube having a piston rod operatively connected thereto and extending out of said cylinder tube and said support tube, said piston rod being operatively connected to said vehicle body so that said piston controls vehicle ride motions, the improvement comprising an upper strut mount assembly, a first mounting plate fixed to said support structure, a piston rod bushing of resilient material having an outer wall operatively secured to said mounting plate and having an internal wall, means operatively securing said internal wall to an upper portion of said piston rod, a second mounting plate secured with respect to said support structure, resilient cushion means secured to said second mounting plate and spaced from said piston rod bushing yieldably supporting said outer support tube, a rate washer mounted on said piston rod immediately below said piston rod bushing for directly contacting and working said bushing in shear and compression during jounce motions of said strut and said piston rod while said cushion means is compressed by said cylinder tube to dissipate jounce loads said cushion means being

subjected to compression load by said rate washer to dissipate rebound loads.

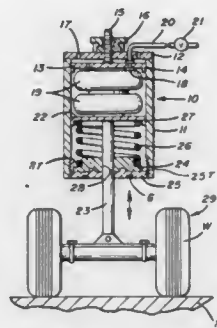
4,711,464 WHEEL LIFT

Michael Bilas, 2730 Columbian-New Castle Rd., New Springfield, Ohio 44443

Continuation-in-part of Ser. No. 743,982, Jun. 12, 1985, abandoned. This application Nov. 7, 1986, Ser. No. 927,962
Int. Cl.⁴ B60G 17/00

U.S. Cl. 280—704

7 Claims



1. An auxiliary wheel lift for use on a vehicle to provide adjustable additional load capacity comprising a housing secured to said vehicle, a vertically movable head plate within said housing and a attached lift rod extending therefrom, a partition movably positioned within said housing, an air spring positioned on one side of said head plate between said head plate and said partition, means for vertically moving said partition within said housing limiting the travel of the attached lift rod, an adjustable housing insert having a guide bore centrally located on its vertical axis registerably receiving said lift rod, a coil spring positioned on the opposite side of said head plate between said head plate and said housing insert, a wheel lift and axle assembly secured to the free end of said lift rod, means for adjustably positioning said housing insert axially in said housing, and means to activate said air spring comprising a compressed air source, supply lines and a valve in said supply lines.

4,711,465

SUSPENSION SYSTEM WITH SWAY GUIDE

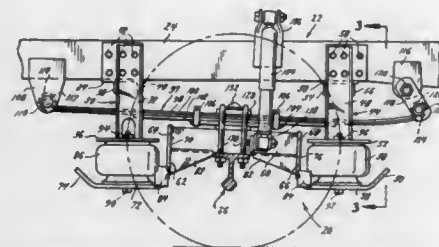
John E. Raidel, Rte. 1, Box 400-M, Springfield, Mo. 65804

Filed Jul. 8, 1985, Ser. No. 752,807

Int. Cl.⁴ B60G 11/46

U.S. Cl. 280—712

26 Claims



1. A suspension system for supporting a vehicle chassis on an axle comprising resilient spring means, means to attach a first end of the resilient spring means to the axle, means to attach a second end of the resilient spring means to the vehicle chassis, a longitudinally extending element having two ends, one end of the element being connected to the chassis and having a portion spaced from said one end and connected to the axle with a section between said one end and said portion extending between the chassis and the axle and movable vertically with vertical movements of the axle, and means comprising two rigid generally vertical, laterally spaced parallel walls sup-

ported by the chassis and positioned on opposite sides of and in close proximity to the element intermediate said portion and one of said ends, for restricting lateral movement of the element and thereby limit sway of the chassis in relation to the axle, the walls being free of connections to the element to allow substantially uninhibited vertical movement of the element.

4,711,466

METHOD AND APPARATUS FOR GAS GENERATOR INITIATION FROM EXTERNAL SENSOR

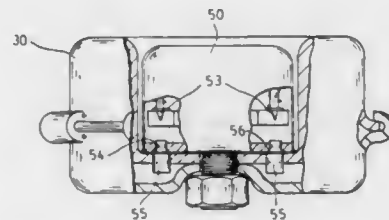
Allen K. Breed, Boonton Township, Morris County, N.J., assignor to Breed Corporation, Lincoln Park, N.J.

Filed Jun. 27, 1986, Ser. No. 879,413

Int. Cl.⁴ B60R 21/10

U.S. Cl. 280—741

13 Claims



1. A method for initiating gas generation in an airbag inflator for a vehicle which comprises:
providing a gas generating pressure vessel having at least one orifice containing a percussion primer, and at least one exit orifice for releasing gas generated within said vessel and said vessel containing a gas generating material;
providing a sensor adapted for mounting on said pressure vessel having an instrumentality to be operated in response to the crash of said vehicle whereupon said instrumentality activates said percussion primer to initiate gas generation within said pressure vessel without a passage from which generated pressurized gas can escape from said pressure vessel.

4,711,467

METHOD AND MEANS FOR LIFT TRUCK ASSEMBLY AND SERVICING

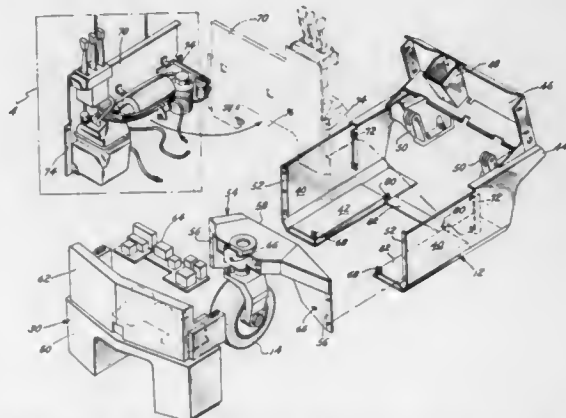
David H. Link, and Juan R. Lopez, both of Battle Creek, Mich., assignors to Clark Equipment Company, South Bend, Ind.

Continuation-in-part of Ser. No. 818,569, Jan. 13, 1986, abandoned. This application Nov. 24, 1986, Ser. No. 934,519

Int. Cl.⁴ B62D 21/12; B21D 39/00; B23P 11/00

U.S. Cl. 280—785

18 Claims



1. A method of manufacturing lift trucks comprising the

steps of moving a truck main frame from station to station along an assembly line at each of which stations one or more truck parts or assemblies is assembled on the frame, mounting on a main frame plate means remote from the assembly line a plurality of truck components, transporting to the assembly line at a preselected station thereof said main frame plate means, and mounting in the truck frame said main frame plate means with said truck components which are mounted thereon.

12. A lift truck comprising a main frame, a main frame plate means adapted to be secured to the main frame generally centrally and transversely thereof, a plurality of truck components mounted on said frame plate means, said main frame plate means being disconnectable from rigid connection with said main frame, and pivot means connecting said frame plate means to said main frame such that when disconnected said frame plate means may be pivoted in a predetermined direction.

4,711,468

GUIDE RAIL FOR SEAT BELT DEVICE

Noritada Yoshitsugu, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

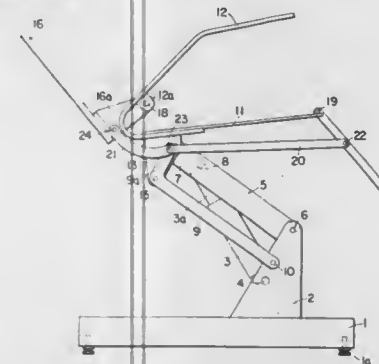
Filed Jun. 16, 1986, Ser. No. 874,646

Claims priority, application Japan, Jun. 21, 1985, 60-94333[U]

Int. Cl.⁴ B60R 21/10

U.S. Cl. 280—904

3 Claims



1. A guide rail arrangement for a seat belt device having a slider slidably movably provided in a slot of the guide rail installed on a roof side inner panel, and a webbing mounted at the end thereof on the slider for restricting an occupant, said guide rail comprising:

a recessed portion formed on the roof side inner panel and protruded toward a passenger compartment, a bottom surface of the recessed portion being inclined toward the outside of the passenger compartment at an angle greater than that of the roof side inner panel away from said passenger compartment,

the guide being rail secured to the protruded bottom surface of the recessed portion of the roof side inner panel at the side of the passenger compartment, and

a groove formed on an inner surface of the guide rail through which the slider moves, said groove being inclined toward the outside of the compartment at an angle at least as great as that of the bottom surface of the recessed portion toward the outside of the compartment.

4,711,469

BOOKCOVER AND BINDING METHOD

Gerald D. Bogar, 111 Ramble La., Suite 105, Austin, Tex. 78745

Filed Jul. 11, 1986, Ser. No. 884,477

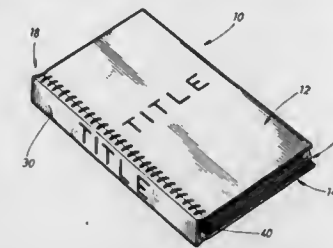
Int. Cl.⁴ B42D 1/00

U.S. Cl. 281—25 A

15 Claims

15. A bookcover comprising:
front and back interconnected sections of generally rigid material, each section having a flat spine tab, a margin

adjoining the spine tab, and a cover separated from the margin by a crease line;
a plurality of holes in each margin and cover;
mechanical binding means extending through the holes in the margins and covers for interconnecting the sections,



the cover and margin of each section being operable to shift relative to each other along said crease line to allow opening and closing of the cover, the spine tabs being overlapped and adhesively secured to each other to form a rigid, flat spine adjacent the mechanical binding means.

4,711,470

UTILITY CONNECTION BAR

Steven Seahill, 4347 Grace Ct., Rohnert Park, Calif. 94928

Filed Apr. 6, 1987, Ser. No. 34,551

Int. Cl.⁴ F16L 35/00

U.S. Cl. 285—30

8 Claims

1. A utility connection bar, which comprises a plastic bar, threaded ends perpendicular to said plastic bar and extending upward from a top of said bar, said plastic bar having a discontinuous bottom with a plurality of channels in the bottom.

4,711,471

NON-CLOCKING CONNECTOR WITH LOCKING ANTI-ROTATION TABS

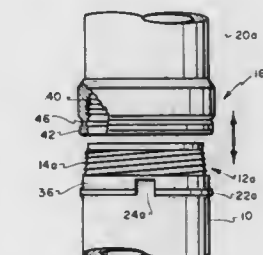
Joseph W. Pallini, Jr., and Lionel J. Milberger, both of Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Mar. 20, 1986, Ser. No. 841,655

Int. Cl.⁴ F16L 55/00

U.S. Cl. 285—81

9 Claims



1. In a connector comprising a box with internal threads and a pin with external threads adapted to be threaded together to form a joint, the improvement comprising,
an external peripheral groove on the outside of the box below the threads, said outside being otherwise a uniform uninterrupted surface until a locking tab is formed thereon,
an internal groove on the inside of the box below the threads

in the area of the external groove, said internal and external grooves thereby thinning the wall of the box and forming peripheral shear lines,

a pin with at least one longitudinal slot thereon, such that when the connector is made up, the thinned wall of the box overlaps the longitudinal slot on the pin,

a locking tab formed on said box by bending the thin wall radially inwardly into the longitudinal slot and shearing the thinned wall peripherally at said peripheral shear lines in a shear pattern whereby the locking tab engages the longitudinal slot to lock the box and pin together against relative rotation.

4,711,472

CONNECTOR FOR NON-METALLIC CONDUIT

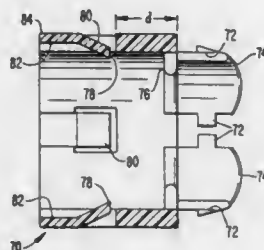
Kenneth R. Schnell, South Bend, Ind., assignor to Hubbell Incorporated, Orange, Conn.

Filed Sep. 2, 1986, Ser. No. 902,580

Int. Cl.⁴ F16L 5/00

U.S. Cl. 285—162

3 Claims



1. A connector for attaching non-metallic conduit to a wall or another conduit, the non-metallic conduit being of the type having an exterior surface characterized by a plurality of alternating annular protrusions and recesses, the connector comprising

a cylindrical sleeve having an inner diameter slightly larger than the external diameter of the conduit and an axial length at least as great as the axial length occupied by three of said annular protrusions;

a stop wall at one end of said sleeve for limiting the insertion depth of said conduit into said sleeve, said stop wall having a central opening therethrough to permit the passage of wires from within said conduit;

a latch formed in said sleeve, said latch comprising means defining a generally U-shaped slot through the wall of said sleeve, the ends of said slot pointing axially away from said stop wall, said slot forming a resilient latch tab in the wall of said sleeve, said tab being inclined inwardly from the surrounding sleeve wall so that the distal end of said tab engages a protrusion at the end of a piece of inserted conduit and resists extraction of said conduit from said sleeve;

a plurality of hook members extending axially away from the other side of said stop wall from said sleeve, said hook members being formed to engage the edges of an opening in a substantially planar barrier, each of said hook members including

an arcuate, axially extending resilient wall segment substantially concentric with said central opening in said stop wall, and

a tooth formed on the exterior of said wall segment, said tooth having an inclined surface sloping outwardly away from the distal end of said arcuate wall segment and a radial surface facing said stop wall,

said hook members together forming an annular recess to receive the wall of a junction box around an opening therethrough,

each said arcuate wall segment being spaced from the next adjacent arcuate wall segment by a gap, said connector further comprising

blocking means interposed between said wall segments adjacent each said gap for preventing a wire inserted through

said connector from passing into any of said gaps and rubbing against an exposed portion of the edges of said opening in which said connector is installed to thereby minimize the possibility of damage to the insulation of said wire.

4,711,473

COUPLING PIPES

John B. Glover, Huddersfield, Great Britain, assignor to The Hepworth Iron Company Ltd., Stocksbridge, England

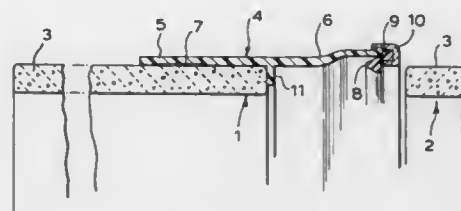
Filed Sep. 29, 1986, Ser. No. 912,822

Claims priority, application United Kingdom, Sep. 30, 1985, 8524006

Int. Cl.⁴ F16L 21/00

U.S. Cl. 285—235

14 Claims



1. A socket-ended pipe comprising a pipe length, a sleeve of flexible resilient shrinkable thermoplastic material partly embracing and partly protruding beyond an end of the pipe length, for receiving a spigot end of a further pipe length, and a resilient annular sealing member on the external circumference of the said socketed end, trapped between the external surface of the pipe length and the internal surface of the plastics sleeve, the plastics sleeve having been shrink-fitted over the said pipe end and sealing member under externally applied compressive stress whereby the said sealing member is maintained under compression.

4,711,474

PIPE JOINT SEAL RINGS

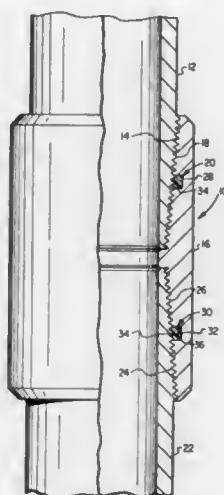
David H. Patrick, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 21, 1986, Ser. No. 921,097

Int. Cl.⁴ F16L 15/00

U.S. Cl. 285—332.3

26 Claims



1. In a threaded pipe joint comprising a pipe section including an external threaded portion and a pipe fitting including an internal threaded portion matingly engaging said external

threaded portion wherein at least one polymeric material seal ring means is positioned in at least one recess positioned in at least one of said threaded portions and matingly engages the other threaded portion, the improvement comprising positioning a softer polymeric material on the portion of said polymeric material seal ring opposite the surface of said polymeric material seal ring engaging said other threaded portion.

4,711,475

HIGH PRESSURE FITTING

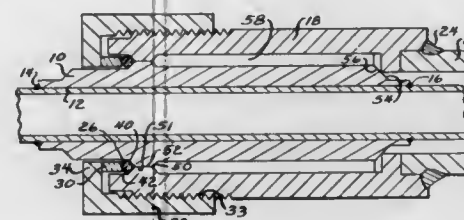
Dobrica Velisavljevic, 923 S. Jackson, Waukegan, Ill. 60085

Filed Aug. 2, 1985, Ser. No. 761,979

Int. Cl.⁴ F16L 21/04

U.S. Cl. 285—348

1 Claim



1. A coupling comprising:

a first sleeve adapted to be disposed on a first tube and sealed thereagainst, said sleeve having an exterior surface provided with an annular frusto-conical surface;

a second sleeve of larger diameter than said first sleeve and adapted to be disposed in sealed relation on a second tube of larger diameter than said first tube and nominally concentric thereabout, said second sleeve having an annular interior frusto-conical surface and being disposed about said first sleeve;

mating frusto-conical surfaces on said sleeves axially remote from said annular frusto-conical surfaces for axially aligning said annular frusto-conical surfaces to define a split, generally V-shaped annular, axially opening groove between said sleeves;

an O-ring seal in said groove and abutting both of said annular frusto-conical surfaces;

a compressing ring engaging said O-ring seal oppositely of said annular frusto-conical surfaces; and

a nut threaded to said second sleeve and engaging said compressing ring oppositely of said O-ring seal and rotatable to apply an axially directed force to said compressing ring to urge said O-ring seal into said V-shaped groove and sealing contact with both of said annular frusto-conical surfaces.

4,711,476

KNOT

Alden W. Hanson, Midland, Mich., assignor to Helen L. Hanson, Midland, Mich.

Filed Nov. 21, 1986, Ser. No. 933,153

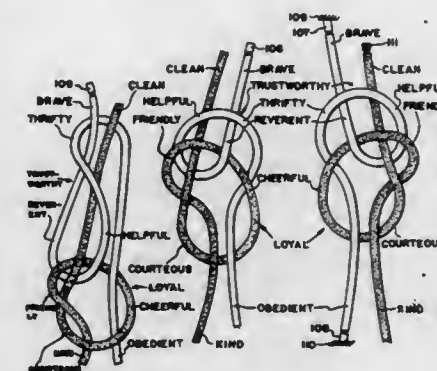
Int. Cl.⁴ D04G 5/00; B65H 69/04

U.S. Cl. 289—1.2

19 Claims

1. A knot or bend having front and rear sides and comprising an overhand knot (Loyal) forming a first bight (Cheerful) from opposite ends of which first (Clean) and second (Kind) sections extend in different directions, a crossing knot (Trustworthy) forming a second bight (Helpful) from which third (Brave) and fourth (Obedient) sections extend in different directions, said first and second bights being entwined, said first (Clean) and third (Brave) sections extending alongside one another and passing through said second bight (Helpful) in a direction from one side of said knot or bend to its other side, and said second

(Kind) and fourth (Obedient) sections extending alongside one another and passing through said first bight (Cheerful) in a



direction from said other side of said knot or bend to said one side thereof.

4,711,477

DUPLEX LATCH BOLT MECHANISM

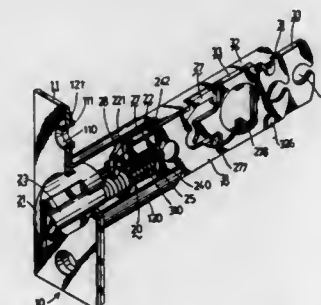
Yaw-Shin Fann, and Rong-Fan Wu, both of Chia-Yi, Taiwan, assignors to Tong Lung Metal Industry Co., Ltd., Chia-Yi, Taiwan

Filed Jan. 7, 1986, Ser. No. 817,422

Int. Cl.⁴ E05C 1/16

U.S. Cl. 292—169.14

14 Claims



either of the two positions, to stabilize the connecting device with respect to such latch-handle assembly and such door;

said telescoping means, when defining and receiving at the selectable position that is relatively closer to such door edge, being collapsed longitudinally so that the connecting device after installation does not extend substantially beyond the mounting element;

said telescoping means, when defining and receiving at the selectable position that is relatively further from such door edge, being extended longitudinally so that the connecting device for installation reaches to the mounting element;

the two selectable locations on the rear portion of the retracting means being mutually spaced apart longitudinally by a distance substantially equal to the difference between such two standard backsets; and

the two selectable positions defined by the telescoping means being mutually spaced apart longitudinally by the same distance;

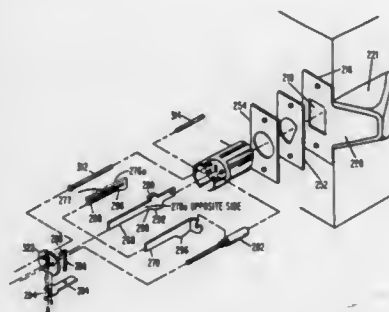
whereby such a door can be prepared for installation of the latch-bolt mechanism, in conjunction with such latch-bolt case, latch-bolt unit and latch-handle assembly, using either of the standard backsets, by forming such a longitudinal bore that does not extend substantially beyond such transverse apertures, without any mechanical modification of the mechanism and without any adjustment or modification of such case, unit or assembly.

4,711,478

HIGH SECURITY DEADLOCKING DOOR LATCH
Charles Carroll, 2900 Linden La., Falls Church, Va. 22042
Continuation-in-part of Ser. No. 550,745, Nov. 10, 1983, Pat. No. 4,623,175. This application Nov. 14, 1986, Ser. No. 931,416
Int. Cl.⁴ E05C 1/16

U.S. Cl. 292—173

16 Claims



1. An assembly including a deadlocking latch which extends one inch out of a door for normal use with standard pre-cut external doors having a transverse opening substantially 2½ inches in diameter located substantially 2½ inches from the edge of the door, and a hole substantially 15/16 inch in diameter extending from the edge of the door to said transverse opening, comprising:

- a longlatch;
- means for mounting said longlatch for movement between a fully retracted position and a position where said longlatch extends at least one inch out from the edge of a door;
- a striker plate having a flat portion with an opening to receive said longlatch, and an extended depressor means oriented at a substantial angle with respect to said flat portion for moving said longlatch to its retracted position as the door is closed;
- spring means mounted within said operating space and extending toward said longlatch from a point substantially beyond the center of the said larger transverse opening and away from the edge of the door, for normally biasing said longlatch to the fully extended position;
- said depressor means on said striker plate extending to a

distance in the order of one inch away from the plane of said flat portion thereof;

means including a knob or rotatable handle for mounting on at least one side of the door for substantial alignment with the center of the transverse opening for retracting said longlatch the full one inch extension thereof from said striker plate;

plates covering the inside and outside ends of the transverse opening, said plates being held against the door by two security bolts passing through the transverse opening and engaging both plates;

means including (1) a deadlocking plunger mounted adjacent to said longlatch for movement substantially parallel to said longlatch and (2) mechanical linkage means between said deadlocking plunger and said longlatch, to detent the longlatch when the longlatch is in its extended position and the deadlocking plunger is in its retracted position, and to release said longlatch when said deadlocking plunger is in its extended position; and

said assembly having no dimensions which significantly exceed the space provided by the openings in standard pre-cut doors as set forth hereinabove.

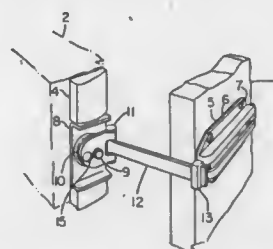
4,711,479

PIVOTING BAR LOCK

Paul M. Grandinetti, 4797 Ellery Dr., Columbus, Ohio 43227
Filed Jan. 29, 1985, Ser. No. 696,118
Int. Cl.⁴ E05C 17/20

U.S. Cl. 292—272

9 Claims



1. A door lock for securing a door to a jamb comprising:
 - (a) a door mount retainer suitable for attachment to said door;
 - (b) a locking bar; and
 - (c) a locking guide slidably affixed on said locking bar for locking and applying leverage to close said door against said jamb, said locking bar being adapted to be rotatably affixed at a first end to said jamb of said door and removably affixed at a second end to said door mount retainer, said door mount retainer being adapted to detachably engage said locking bar guide.

4,711,480

LATCH ACTUATING DOOR HANDLES

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Filed Dec. 1, 1986, Ser. No. 936,614

Int. Cl.⁴ E05B 3/00

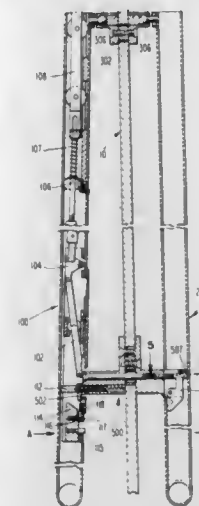
U.S. Cl. 292—336.3

10 Claims

1. A door in combination with actuating handles, comprising:
 - (a) a bar along and carried by the inside of the door;
 - (b) a bar along and carried by the outside of the door;
 - (c) pivot mounting means carried by the door adjacent a perimeter edge thereof and for mounting said bars for limited pivotal movement between positions toward and away from the door;
 - (d) a latch mechanism longitudinally disposed in said inside bar and terminating in a latch bolt at the end of the bar adjacent said door edge;
 - (e) a stationary actuator post carried by said door at a loca-

tion spaced from said pivot mounting means and operationally engagable with said latch mechanism for movement of said latch mechanism between latched and unlatched positions in response to movement of either of said bores;

- (f) a toggle member disposed within said outside bar and connected to said actuator post for pivotal movement in response to movement of said outside bar away from said door, and wherein said toggle member is operatively



coupled to said latch mechanism to move said latch mechanism to an unlatched position in response to the movement of said toggle member;

- (g) means for operatively securing said inside bar and actuator post relative to each other with said inside bar in a position toward said door, whereby said inside and outside bars are affixed in a non-movable position and wherein said latch mechanism is maintained in an unlatched position.

4,711,481

VEHICLE IMPACT ATTENUATING DEVICE

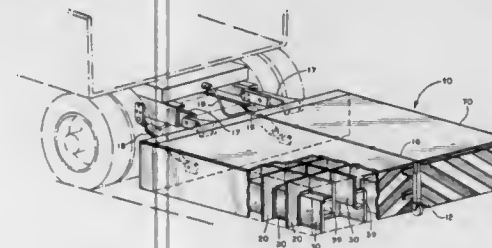
William G. Krage, Fair Oaks; Barry D. Stephens, Citrus Heights, and Owen S. Denman, Roseville, all of Calif., assignors to Energy Absorption Systems, Inc., Chicago, Ill.

Filed Oct. 25, 1985, Ser. No. 791,298

Int. Cl.⁴ B60R 19/34

U.S. Cl. 293—133

26 Claims



1. An energy absorbing device adapted to decelerate an impacting vehicle, said device comprising:

a first diaphragm;

a second diaphragm, spaced from the first diaphragm along an axial direction;

at least one pair of spaced apart, collapsible columns, each aligned with the axial direction and interposed between the first and second diaphragms such that forces applied to the first diaphragm during deceleration of an impacting vehicle cause the columns to buckle; and

means for bracing the columns diagonally with respect to the axial direction to stabilize the columns against long

column buckling and to promote short column buckling of the columns, thereby enhancing energy adsorption efficiency of the device.

4,711,482

REACHING AID FOR THE HANDICAPPED

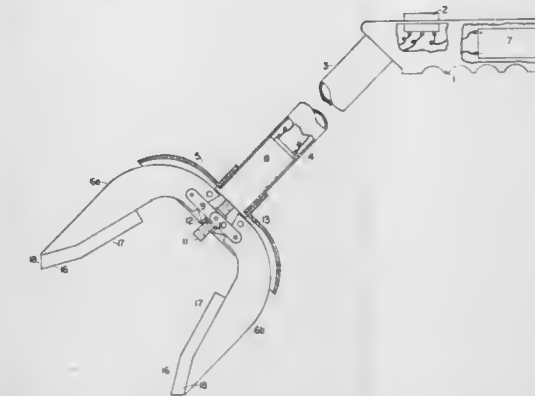
Larry D. Brown, and Kevin D. Brown, both of Sayre, Pa., assignors to N/C Industries, Sayre, Pa.

Filed Feb. 24, 1987, Ser. No. 17,994

Int. Cl.⁴ B25J 1/04

U.S. Cl. 294—19.1

7 Claims



1. A reaching aid for the handicapped, comprising:
 - a. a hollow body having two ends and a length therebetween at least sufficient for a seated person holding the body to reach the floor without bending;
 - b. a handle located on one end of the body;
 - c. gripper means for holding objects, located on the opposite end of the body from the handle, comprising:
 1. pivot block means attached to the end of the body;
 2. two jaw means each having a pivot end and a gripping end and an arm therebetween;
 3. the jaw means being pivotally attached to the pivot block means at the pivot end, whereby the jaw means as a pair may pivot on the pivot block means from a closed position wherein the gripping ends of the jaw means touch to an open position wherein the gripping ends are separated;
 - d. toggle means for driving the jaw means between the open and closed positions, comprising two toggle links each having two ends and a length therebetween, each toggle link being pivotally attached to a jaw means at one end, the point of attachment being on the arm of the jaw means near the pivot end, and being pivotally attached to the other toggle link at the other end;
 - e. the lengths of the toggle links being chosen such that when the lengths of the toggle links are aligned with each other the jaw means are in the open position, and when the ends of the toggle links which are attached to each other are drawn toward the pivot block means the jaw means are drawn into the closed position;
 - f. threaded block means pivotally attached to the two toggle links at the end of the links where they are attached to each other, having a central bore adapted to receiving a rotating motor shaft;
 - g. electric motor means having a driven rotating shaft output and an electrical input, whereby electrical power applied to the electrical input will cause the shaft to rotate in a selected direction, the motor means being located in the end of the body next to the pivot block means, with the shaft penetrating the pivot block means between the points of attachment of the jaw means;
 - h. the shaft of the motor means being threaded, and of sufficient length, diameter, and threading to operatively engage the threaded block means, whereby rotating the shaft

- acts to draw the threaded block means toward or away from the pivot block means;
- f. battery means for activating the electrical input of the motor means;
- g. control means for connecting the battery means to the electrical input of the motor means whereby the motor means may be activated in a selected direction by the user, closing or opening the jaw means.

4,711,483

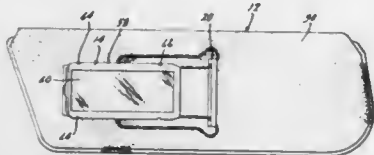
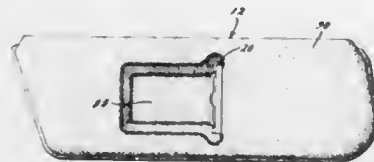
MOTOR VEHICLE VISOR WITH REMOVABLE MIRROR ASSEMBLY

Ronald S. Gulette, Farmington Hills, and Grace M. Charen, Oxford, both of Mich., assignors to Irvin Industries, Inc., Rochester Hills, Mich.

Filed Jan. 21, 1986, Ser. No. 820,078
Int. Cl.⁴ B60J 3/00

U.S. Cl. 296—97 C

8 Claims



1. A motor vehicle visor assembly comprising:
- an internal mirror housing defined by said visor assembly and a mirror guide defining a slot communicating with said internal mirror housing,
- a mirror coupled for movement in said internal mirror housing,
- said mirror movable to a first position wherein said mirror is coupled with said internal mirror housing and is stowed and enclosed by said visor assembly,
- a mirror retainer adjacent said slot, said retainer forming a guide for said mirror and including detent clip means acting upon said mirror for enabling said mirror to be retained by and released from said detent clip means,
- said mirror movable to a second position wherein said mirror is withdrawn from said visor assembly exposing said mirror and said mirror retained by said detent clip means, and
- said mirror movable to a third position wherein said mirror is detached from said detent clip means and is disconnected from said visor assembly.

4,711,484

TARP COVER SYSTEM FOR FLAT BED VEHICLES

James R. Tuerk, 5231 N. Delaware St., Indianapolis, Ind. 46220

Filed Feb. 19, 1987, Ser. No. 16,768

Int. Cl.⁴ B62D 25/06

U.S. Cl. 296—105

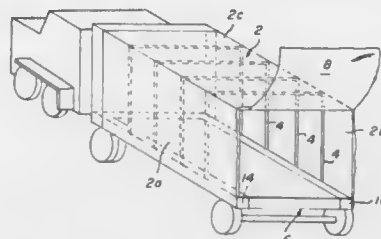
14 Claims

1. A tarp system for covering a load arranged on a flat bed vehicle, comprising:

- (a) a pair of longitudinal guide tracks adapted for mounting adjacent the opposite sides of the vehicle flat bed;
- (b) a plurality of longitudinally arranged inverted U-shaped

bow members each having a first generally horizontal portion extending transversely in spaced relation above the vehicle flat bed, and a pair of downwardly depending vertical leg portions the lower ends of which terminate adjacent said guide tracks, respectively;

- (c) a plurality of carrier means connecting the lower ends of said bow leg portions for sliding movement relative to the associated guide track, respectively, said bow members normally having an expanded vehicle-covered condition relative to each other in which said bow members are spaced longitudinally of the flat bed vehicle;
- (d) a sheet-like flexible tarp cover member supported by said bow members to enclose at least a portion of the space



above the flat bed vehicle when said bow members are in said expanded vehicle-covered condition, said tarp member having a top portion supported by said bow horizontal portions, a pair of side portions extending downwardly adjacent the external surfaces of said bow leg portions, respectively, and a pair of horizontal bottom flap portions that extend inwardly from the lower ends of said side portions beneath said carrier means and said guide rails, respectively; and

- (e) means for relatively displacing said bow members between said expanded condition and a collapsed vehicle-uncovered condition in which said bow members are adjacent each other and said tarp member is collapsed to uncover said flat bed portion.

4,711,485

OPEN TOP TYPE AUTOMOBILE BODY STRUCTURE

Jiro Maebayashi, and Masaya Hamamoto, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

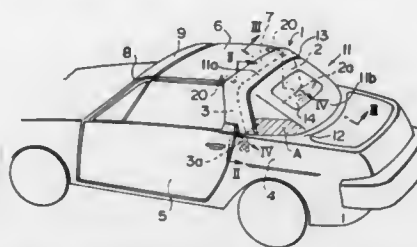
Filed Oct. 18, 1985, Ser. No. 788,955

Claims priority, application Japan, Oct. 19, 1984, 59-220256; Dec. 3, 1984, 59-183458[U]

Int. Cl.⁴ B60J 7/12, 7/14, 7/19; E05D 3/06

U.S. Cl. 296—108

38 Claims



1. An open top automobile body including a body structure having a front windshield section, opposite side panels and a rear section, a hoop member of a substantially inverted U-shape having a pair of leg portions swingably mounted respectively on the opposite side panels for movement between an erected position wherein the hoop member extends substantially upright and a retracted position wherein the hoop member is retracted in the rear section, a rigid roof panel adapted to be placed between the front windshield section and the hoop

member in the erected position, said roof panel having a rear edge portion connected through hinge means to said hoop member, foldable hood means between said rear section and the hoop member in the erected position, said hood means having a front edge portion attached to the hoop member and a rear edge portion attached to the rear section, said rear section of the body being provided with a space for receiving said roof panel, said hoop member and said hood means when they are retracted, said hinge means including a first link having one end connected with said hoop member and a second link having one end connected to said roof panel, a further portion of said second link being pivotally connected with the other end of the first link, locking means for preventing a relative rotation of the first and second links when the hoop member is in the erected position and said roof panel is placed between the front windshield and the hoop member.

4,711,486

BARBER AND BEAUTY PARLOR CHAIR

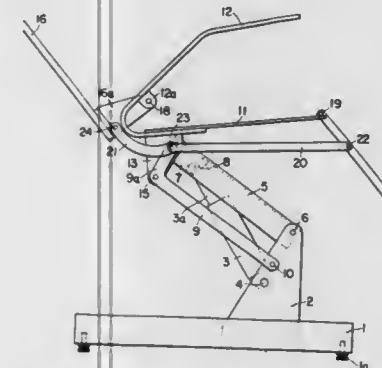
Kunio Fujiyama, New York, N.Y., assignor to Takara Company, Somerset, N.J.

Continuation of Ser. No. 755,962, Jun. 17, 1985, abandoned, which is a continuation of Ser. No. 443,564, Nov. 27, 1982, abandoned. This application Dec. 8, 1986, Ser. No. 939,223

Int. Cl.⁴ A47C 1/02

U.S. Cl. 297—71

2 Claims



1. A beauty parlor or barber shop chair, said chair having pivoted frame members manipulatable by an integral hydraulic cylinder, so that the chair is adjustable from an upright position into a reclined and substantially horizontal position, whereby back-shampooing of the head of a person sitting in the chair may be accomplished with comfort, which comprises:

- (a) a generally horizontal base member,
- (b) a substantially vertical supporting plate, said supporting plate being mounted to and extending upwards from said base member,
- (c) a hydraulic cylinder, said hydraulic cylinder having an upper plunger and being pivotally mounted to the middle region of said supporting plate,
- (d) a main link arm, one end of said main link arm being pivotally mounted to the upper end of said supporting plate, a middle region of said main link arm being pivotally mounted to the outer upper end of said plunger,
- (e) a rising bracket, said rising bracket being pivotally linked to the other end of said main link arm,
- (f) a sub link, said sub link being elbow-shaped, one end of said sub link being pivotally mounted to said supporting plate, the apex of said sub link being pivotally mounted to said rising bracket,
- (g) a foot rest plate, said foot rest plate being juxtaposed with said supporting plate,
- (h) a transverse connecting arm, said transverse connecting arm extending between a pivoted mounting at one end to said foot rest plate, and a pivoted mounting at the other end to the other end of said sub link,
- (i) a seat plate, said seat plate being adapted to receive the

weight of the torso of said person and being disposed adjacent and above said transverse connecting arm, one end of said seat plate being pivotally mounted to the upper end of said foot rest plate, the other end of said seat plate being mounted to said rising bracket,

- (j) a curved connecting arm, one end of said curved connecting arm being pivotally mounted to both the other end of said sub link and the other end of said transverse connecting arm at a unitary pivoted linkage,
- (k) a back plate, said back plate being adapted to receive and support the back region of said person,
- (l) a connecting bracket, said connecting bracket extending laterally from the lower end of said back plate, the other end of said curved connecting arm being pivotally attached to said connecting bracket, and
- (m) an arm rest plate, said arm rest plate extending from a middle pivoted attachment to said connecting bracket, the other end of said arm rest plate being attached to said seat plate, so that, when said pivoted frame members are pivoted by activation of the upper plunger of said hydraulic cylinder, said foot rest plate is pivotally raised, said seat plate is raised, and said back plate is reclined, said chair being thereby adjusted from an upright position into a reclined and substantially horizontal position where the movements of the chair resemble the movements of a human body, whereby shampooing of the back of the head of a person sitting in said chair may be accomplished.

4,711,487

EVACUATION CHAIR

Royce L. Brooks, Benicia, Calif., assignor to Norman D. Kerner, Benicia, Calif.

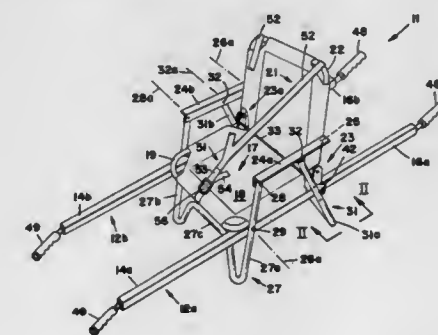
Continuation of Ser. No. 349,913, Feb. 18, 1982, abandoned.

This application Jul. 2, 1985, Ser. No. 750,993

Int. Cl.⁴ A61G 1/00

U.S. Cl. 297—183

1 Claim



1. Apparatus for manually transporting persons, comprising: a pair of spaced apart parallel linear carrier arms each having opposite end portions and a central portion situated therebetween, all of said portions of said carrier arms being coplanar,

wherein each of said pair of spaced apart parallel carrier arms has a telescopic construction in which a first of said end portions of the carrier arm is slidable into said central portion of the carrier arm to a storage position and is extendable therefrom to an operating position, and in which the other of said end portions of said carrier arm is of lesser diameter than said first carrier arm end portion, said other carrier arm end portion being slidable into both said central portion of said carrier arm and said first carrier arm end portion and being extendable therefrom to an operating position, further including detent means for latching said slidable carrier arm end portions at said extended operating positions,

- a seat member extending between said carrier arms at said central portions thereof and being secured thereto, said seat member being substantially coplanar with said carrier arms and being spaced apart from the ends thereof suffi-

ciently to enable a first carrier person to stand between said arms in front of said seat member and to enable a second carrier person to stand between said arms behind said seat member,

a back support and first pivot means for connecting said back support to said seat member and carrier arms while enabling pivoting of said back support between a storage configuration at which said back support is folded over said seat member in parallel relationship thereto at said central portions of said carrier arms and an operating position at which said back support extends upwardly therefrom,

a plurality of leg members which extend both above and below said seat member at said central portions of said carrier arms and second pivot means for inter-connecting said leg members and said seat member and carrier arms while enabling pivoting of said leg members between a storage configuration at which said leg members are substantially parallel to said seat member at said central portions of said carrier arms and an operating position at which said leg members extend upwardly and downwardly therefrom, and

linkage means for enabling joint pivoting of said back support and said leg members between said storage positions thereof and said operating positions thereof, said linkage means including a pair of arm rests such of which extends between said leg members at an opposite side of said seat member and at a location above said seat member to form a pivotable connection between said leg members at each side of said apparatus.

4,711,488

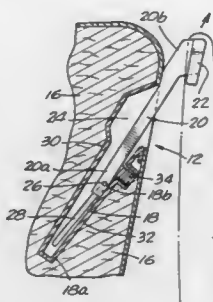
GARMENT HANGER

Stephen Ohanessian, 734 W. Hyacinth, West Covina, Calif. 91791

Filed Aug. 22, 1986, Ser. No. 899,233
Int. Cl.⁴ A47C 7/62

U.S. Cl. 297-190

4 Claims

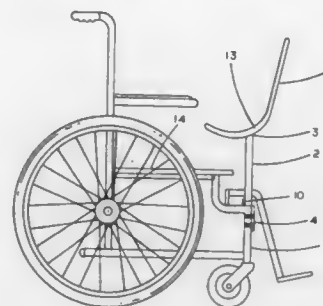


1. An upholstered chair comprising:
 - (a) a seat portion;
 - (b) a back portion connected to said seat portion, said back portion being provided with an internal chamber having spaced apart front and back walls;
 - (c) a first member having first and second ends, said first member being disposed within said internal chamber, said first end thereof being connected to said back portion;
 - (d) second member having first and second ends said second member being slidably interconnected with said first member for sliding movement between a first retracted position wherein said second member is fully disposed within said internal chamber and a second extended position wherein said second end of said second member extends rearwardly of said back; and
 - (e) garment hanging means carried proximate said second end of said second member.

4,711,489
CHILD SEAT ASSEMBLY FOR WHEELCHAIR
Hugh A. Krause, R.R. 6 Box 190 188, Bemidji, Minn. 56601
Filed Feb. 7, 1986, Ser. No. 827,385
Int. Cl.⁴ A47C 15/00

U.S. Cl. 297-243

5 Claims



1. A child seat assembly for mounting on and removal from a wheelchair frame having vertical front struts, located in front of a wheelchair occupant facing toward or away from said occupant, having first and second framework in an L-shaped configuration permanently mounted on first and second support means which are attached perpendicularly downward from horizontal legs of said framework, and having a cloth panel with fastening means secured around and suspended between said framework, with child seat assembly occupant restraint means affixed to said panel rearwardly and secured forwardly, said support means insert into and extract from first and second receiving means with stopping means affixed to said support means to halt said support means at an optimum height above said wheelchair occupant, and which said receiving means attach to said wheelchair front vertical struts using first and second adaptor means in such a manner that said receiving means and said adaptor means lie parallel with said wheelchair struts and are held in place with securement means, said framework, support means, and receiving means being made of a strong, lightweight nonferrous metal characterized by aluminum, magnesium or graphite to minimize adding undesired weight to said wheelchair, said cloth panel being of a heavy, breathable fabric to ensure durability, and said adaptor means being of a non-metal substance characterized by wood, plastic or nylon to prevent marring of said wheelchair frame, said securement means comprising at least first and second clamps for each said receiving means to dependably attach said receiving means and said adaptor means to said wheelchair frame.

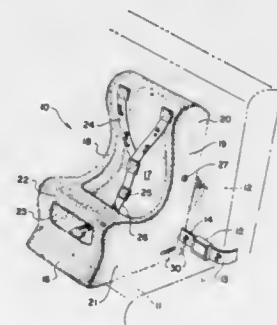
4,711,490

INFLATABLE INFANT SEAT

Harold E. Brand, 11039 Fenway, Sun Valley, Calif. 91352
Filed Oct. 23, 1986, Ser. No. 922,251Int. Cl.⁴ A47C 1/08

U.S. Cl. 297-250

3 Claims



1. In an inflatable, portable infant or child seat arrangement

for supporting a seated occupant in either an upright or a reclined position and being adapted to receive a standard seat belt for holding the seated occupant in either positioning, the combination comprising:

- a pliable fabric material arranged in a unitary construction to provide a seat, a back, opposite sides and a frontal bar connecting said opposite sides;
- said unitary seat construction defining internal pressurized air compartments establishing said seat in an expanded or inflated condition to support the occupant;
- means provided on said seat construction for inflating thereof and deflation thereof between a first operational expanded condition and a second deflated storage condition;
- slot means on said unitary seat construction cooperating with said standard seat belt securement arrangement for releasably retaining said seat construction on a conventional auto seat in either of its upright or reclined positions;
- an inflatable pouch separate from said internal pressurized air compartments carried on the exterior of said back for maintaining said unitary seat construction including the occupant in a prone third position; and
- back straps carried on said seat back for supporting said unitary seat construction from the shoulders of a person carrying said seat construction and the occupant thereof.

4,711,492

CHAIR BACK ARRANGEMENT

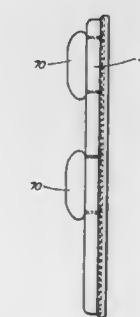
Svein Asbjornsen, and Jan Lade, both of N-6230 Sykkylven, Norway

Continuation-in-part of Ser. No. 787,362, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 576,780, Feb. 3, 1984, abandoned, which is a continuation of Ser. No. 339,459, Feb. 22, 1981, abandoned. This application May 19, 1986, Ser. No. 866,994

Claims priority, application Norway, May 6, 1980, 801328
Int. Cl.⁴ A47C 3/00

U.S. Cl. 297-284

14 Claims



1. A seating furniture back arrangement comprising a back portion having at least one receiving means attached to said back portion, said receiving means extending along said back portion in the direction substantially parallel to a longitudinal axis of the back portion,

support pillow means having engaging means, at least a portion of said engaging means protruded from one side of said support pillow means, said engaging means is adjustably receivable by said receiving means in an assembled condition of the arrangement,

said engaging means having an engaging part for engagement with said receiving means and a connecting part for connection of said engaging part to said support pillow means,

said receiving means is an elongated member having a substantially C-shaped crosssection with a front wall having an opening, a rear wall and at least two side walls connecting said front and rear walls,

said engaging means having an engaging part for engagement with said receiving means and an elastic connecting part connecting said engaging part with said support pillow means,

said engaging means and said support pillow means are retained in a predetermined position by means of inherent resilient and frictional forces of said engaging and receiving means and inherent mutual forces existing between said support pillow means and said back portion.

4,711,493

MOUNTING OR LOCKING ASSEMBLY, ESPECIALLY FOR USE WITH PIVOTABLE MOTOR VEHICLE SEATS
Ralf-H. Schrom, Rüsselsheim, and Horst Baltes, Florsheim, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 20, 1986, Ser. No. 831,179

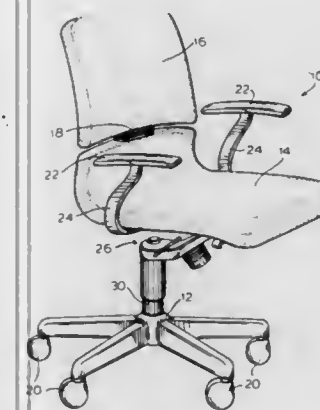
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513807

Int. Cl.⁴ B60N 1/02

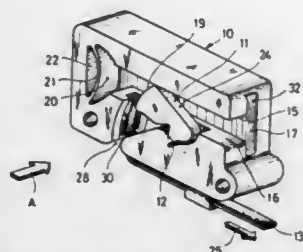
U.S. Cl. 297-379

2 Claims

1. A chair comprising:
 - a base;
 - a member mounted on said base;
 - a seat support pivotally attached to said member;
 - spring means for urging said seat support towards a rest position with respect to said member; and
 - tilting means for changing said rest position, wherein said tilting means comprises a flat member with variable thickness disposed between said member and said seat support, said flat member being shiftable to change the distance between said member and said seat support.



the seat back is moved to its upright position, a pivotal latch member carried by said housing means and which is spring biased toward a first position in which it is disposed within the guide slot means, said latch member being movable in opposition to its spring biasing force toward a second release position to enable said locking element to clear the latch member when the back rest approaches its upright position and then returned by the spring biasing force toward its first position to lock the locking element to the housing means, and a releasable means operatively associated with said latch member to enable the latter to be moved from its first position toward its second position in opposition to the spring biasing force to enable the locking element to clear the latch member and said seat back to be unlocked and moved from its upright position, the improvement being that said locking device is of a one piece molded plastic construction, that the latch member adjacent one end thereof is integral with the housing via a web hinge which functions both as a pivot for the latch member and as a spring for biasing the latch member toward its first position, the latch



member at its other end is free from the housing, has an end surface for engaging the locking member and has a side surface which is disposed within the guide slot means when in its first position and defines a side surface of the guide slot means when moved to its second release position, that the releasable means includes an actuating element extending through a slot in the housing and which is integral at one end to the other end of said latch member to enable said latch member to be moved from its first position to its second release position by pulling on said actuating element whereby the locking element can be removed from or received within the guide slot means of said housing, said latch member at said one end adjacent the web hinge having a convex surface which is shaped complementary with an adjacent concave surface in said housing such that forces applied by the locking element to the latch member in a reverse unlocking direction are transmitted directly to said housing, and said housing at the end of said guide slot means having an integrally formed convex leaf spring for resiliently engaging said locking element and holding the latter against said latch member.

4,711,494

FOLDABLE HEADREST FOR VEHICLE REAR SEAT
Manfred Duvenskamp, Trebur-Geinsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1986, Ser. No. 939,176
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1986, 3605774

Int. Cl. A47C 1/10

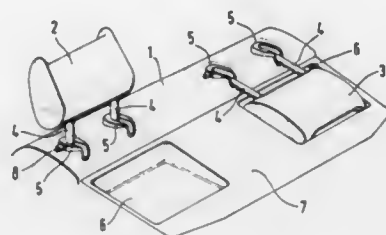
U.S. Cl. 297-403

8 Claims

1. A foldable headrest arrangement for the backrest of a vehicle seat:

- a rod supporting the headrest and having an upper rod portion connected to the rod by an unlockable pivot joint to permit the head rest and upper rod portion to be folded down,
- a sleeve-like guide means provided at the upper portion of the seat backrest and receiving the rod,
- a lift mechanism provided in the backrest including a pre-loaded spring contained within the sleeve-like guide means to permit manual slidable insertion of the rod into the sleeve-like guide means to lock the unlockable pivot

joint and activate the lift mechanism, said spring acting to raise the rod to a position in which the pivot joint is unlocked,



a latching device adapted to retain the rod in the position of insertion within the sleeve-like guide means, and a solenoid adapted to unlatch the latching device and being controlled by a circuit arranged in the vehicle.

4,711,495

UPHOLSTERED FURNITURE
Max Magder, Milton, Canada, assignor to DuBarry Furniture of Canada Limited, Toronto, Canada

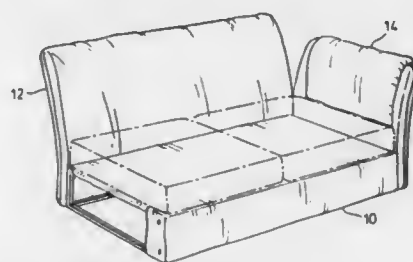
Continuation of Ser. No. 685,928, Dec. 24, 1984. This application Oct. 17, 1986, Ser. No. 920,909

Claims priority, application Canada, Dec. 14, 1984, 470175

Int. Cl. A47C 7/00

U.S. Cl. 297-440

3 Claims



1. Knock down seating furniture having:
 - a base for supporting at least one seat cushion,
 - a back element for supporting at least one back cushion, at least one end element,
 - threaded fastening means for removably securing said back element and said end element to said base,
 - said base comprising,
 - a plurality of tubular metallic members affixed to one another and defining the perimeter of a substantially rectangular prism said prism having members forming an upper seating plane and members forming a lower plane,
 - a plurality of spring wires extending between two of said tubular members in said upper seating plane to comprise a seat cushion supporting plane,
 - a sheet of resilient synthetic foamed cushioning material affixed to at least one of said tubular members and overlying said upper seating plane,
 - and upholstery fabric overlying at least said upper seating plane and said cushioning material,
 - said upholstery fabric having at least one front panel depending from said upper seating plane,
 - said front panel extending from said upper seating plane down to and around at least one of said tubular members in said lower plane and upwardly such that the panel terminates at an edge thereof which is near the said spring wires,
 - and a plurality of staple fasteners fastening the said panel and its said edge to said spring wires,
 - wherein said panel has at least one pocket along said panel

edge and said staple fasteners engage said pocket, and wherein said fabric comprises a plurality of side and back depending panels each panel having a panel edge, each panel extending around at least one of said tubular metallic members, each panel having a pocket extending along said panel edge, reinforcing means within said pockets and staple fastening means encompassing said reinforcing means and a portion of said spring wires thereby fastening said fabric to said base.

4,711,496

VEHICLE SEAT CONSTRUCTION

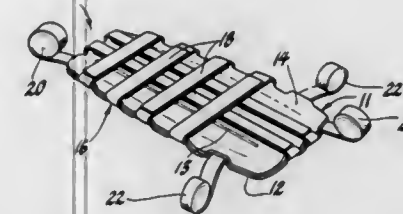
Michael W. Lathers, Metamora, and Richard P. Bruning, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1986, Ser. No. 888,714

Int. Cl. A74C 5/00, 7/00; B60R 22/12

U.S. Cl. 297-452

3 Claims



1. A motor vehicle seat construction, said construction in combination comprising:
 - a hardened pan shaped back plate assembly including inner and outer shells; and
 - a flexible sheet of material with legs projecting outwardly therefrom, the sheet being captured between said back inner and outer shells with said projecting legs bridging over said back plate assembly opposite said back outer shell to provide a cushion for a said seat, and whereby said projecting legs also provide a belt restraint for said seat.

4,711,497

SEAT FOR VEHICLES

Kenichi Kazaoka, Nagoya; Fumio Wakamatsu, Okazaki, and Yasuo Shinkai, Nagoya, all of Japan, assignors to Aisin Seiki Kabushika Kaisha, Japan

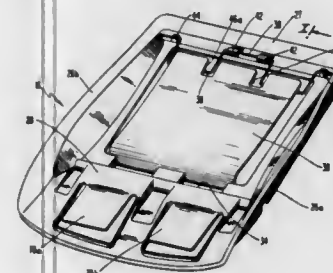
Filed Jun. 17, 1985, Ser. No. 745,421

Claims priority, application Japan, Jun. 18, 1984, 59-126220; Jun. 20, 1984, 59-128303; Jun. 20, 1984, 59-128304

Int. Cl. A47C 7/02

U.S. Cl. 297-458

10 Claims



1. A seat for mounting on a vehicle floor comprising:
 - a molded plastic seat frame having a substantially rectangular base member and including sidewalls and a rear wall extending upward from said base member for retaining a seat cushion therebetween, said seat frame having a ledge extending along said base member between said sidewalls and dividing a front portion of said frame from a rear

portion, said base member having a support surface extending forward of said ledge for supporting a forward portion of said seat cushion, said support surface defining a planar surface and including at least one cut-out section having a substantially U-shaped configuration extending upward at an angle away from said planar surface for providing flexible support for said seat cushion, said base member also having an open section and a plate member extending rearward from said ledge within said open section, said plate member being pivotally positioned about said ledge and supporting a rearward portion of said seat cushion independent of said forward portion of said seat cushion, said rear portion having a ridge member between said sidewalls along said rear wall; spring means connected to said ridge member and extending within said open section for flexibly supporting a rearward portion of said seat cushion positioned on said plate member, said plate member including means for holding said spring means in engagement with said plate member; front and rear connecting rods for firmly supporting said seat frame, said front connecting rod being aligned substantially adjacent said ledge and said rear connecting rod extending substantially adjacent said ridge member; and a backrest connected to said seat frame and supporting a backrest cushion.

4,711,498

HEIGHT ADJUSTING ARRANGEMENT FOR A GUIDE FITMENT OF A SAFETY BELT

Heinz-Dieter Adomeit, Grolmanstr. 16, D-1000 Berlin 12, Fed. Rep. of Germany

Filed Dec. 26, 1985, Ser. No. 813,741

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1984, 3447817

Int. Cl. B60R 21/10

U.S. Cl. 297-468

8 Claims



1. A height adjusting arrangement for a guide fitment which is preferably disposed on the door post of a motor vehicle for safety belts, comprising a stationary guide rail (1) of double-C-shaped configuration, a slide (2) which is slidable along the guide rail and to which the guide fitment can be mounted, and a blocking element (5) which latches the slide (2) to the guide rail (1) and extends through an opening (11) in the slide (2), characterised in that a row of arresting teeth (9, 9') is formed longitudinally of the web portion (20) which connects the C-shaped portions of the guide rail (1) against which one end (21) of the blocking element (5) disposed substantially within the guide rail (1) can be engaged, and which at the other end (22) can be brought into engagement with a lock button (8), and that the slide (2) is of substantially U-shaped cross-section, wherein the free limbs of the U-shape are guided in the respective C-shaped portion of the guide rail (1).

4,711,499

TIPPER TRAILER

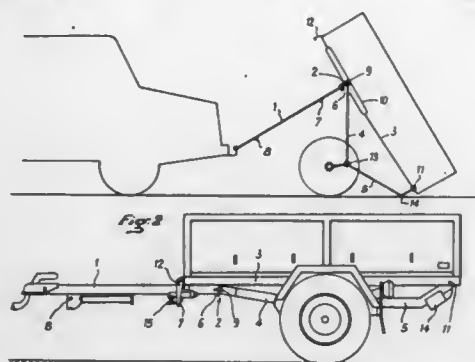
Jean-Louis Fortin, 9, rue Picard, 52410 Eurville-Bienville, France

Filed May 24, 1985, Ser. No. 737,423

Int. Cl.⁴ B60P 1/04

U.S. Cl. 298—5

8 Claims



1. A tipper trailer comprising:
 - a bed plate having a front and a rear;
 - a wheel-supporting frame including two ground-engaging wheels defining a horizontal transverse wheel axis, said frame being hinged to said bed plate proximate the rear end of said bed plate about a first hinge axis parallel to said wheel axis;
 - a longitudinally directed slide disposed under said bed plate and rigidly connected thereto slidingly receivable of a sliding hinge;
 - a sliding hinge received within said longitudinally directed slide, said sliding hinge slideable between a forward position proximate said front of said bed plate and a rearward position remote from said front of said bed plate;
 - a tow bar having a front end suitable for coupling to a towing vehicle, and having a rear end directly coupled to said sliding hinge about a second hinge axis parallel to said wheel axis, said tow bar being pivotable about said second hinge axis relative to said bed plate;
 - releasable locking means for locking said tow bar to said bed plate to prevent said tow bar for rotating relative thereto; and
 - at least one connecting rod having a first end pivotally coupled to said sliding hinge about said second hinge axis and having a second end pivotally coupled to said wheel-supporting frame about a third hinge axis parallel to said wheel axis.

4,711,500

STABILIZING APPARATUS FOR A DUMP VEHICLE

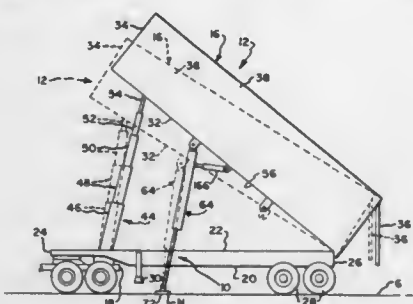
David J. Spanton, 3464 Westlake Rd., Wilson, N.Y. 14172, and Martin Schulze, 2064 Old Coomer Rd., Burt, N.Y. 14028

Filed Nov. 24, 1986, Ser. No. 933,392

Int. Cl.⁴ B60P 1/16

U.S. Cl. 298—17 S

25 Claims



1. Stabilizing apparatus for a dump vehicle having a frame, an elongated dump box supported by and connected to the frame for pivotal movement relative thereto between a low-

ered condition in which both ends of the dump box are positioned relatively low in relationship to the frame and an elevated condition in which one end of the dump box is positioned relatively high in relationship to the frame and means for pivoting the dump box relative to the frame between the lowered and elevated conditions, said apparatus comprising:

at least one leg member having two end sections connected to one another for telescopic movement, one of said end sections being connectable to the dump box adjacent one side thereof for pivotal movement relative thereto between a first condition in which the leg member is positioned generally alongside the box for storage and a second condition in which the leg member extends angularly downwardly from the box for engagement of the other end section of the leg member with the ground; and hydraulic means for telescopically moving the end sections of the leg members relatively to one another as the dump box is moved relative to the frame between the lowered and elevated conditions so that said other end section is maintained in engagement with the ground as the dump box is moved as aforesaid so that said leg member braces the dump vehicle against forces which tend to tip the dump vehicle upon one of its sides.

4,711,501

ROCK CRUSHING DEVICE

Akiya Maeda, Tondabayashi; Mituya Sakai, Kashiwara; Yukinobu Masaka; Masahiro Nomura, both of Ichinomiya; Yasuo Yamada, Seki, and Tetsuro Tatsuhama, Osaka, all of Japan, assignors to Okumura Machinery Corporation, Osaka and Seibu Polymer Kasei Kabushiki Kaisha, Tokyo, both of, Japan

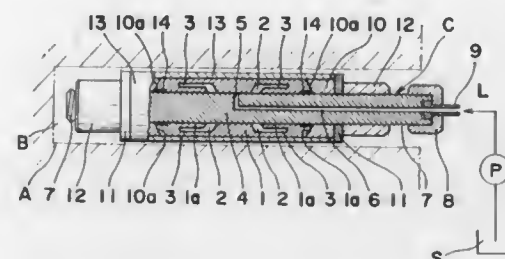
Filed Jul. 26, 1985, Ser. No. 759,361

Claims priority, application Japan, Jul. 30, 1984, 59-117790[U]; Jul. 30, 1984, 59-117791[U]

Int. Cl.⁴ F21C 37/10

U.S. Cl. 299—21

22 Claims



1. A device for crushing a rock by inserting said device into a borehole formed in said rock, comprising:
 - a cylindrically shaped expandable elastic member having cavities formed therein;
 - a shaft partially encompassed by said elastic member and having a fluid passage formed therein, one end of said fluid passage being connected to a pressure fluid source and the other end thereof communicating with said elastic member for permitting expansion of said elastic member by conveyance of fluid from said source to said cavities so as to crush said rock;
 - fixtures mounted on said shaft at end portions thereof for preventing said elastic member from expanding along an axial direction of said shaft upon conveyance of said fluid; and
 - metal rings separate from said shaft, and embedded at respective end portions of said elastic member for preventing said elastic member from warping at said end portions upon conveyance of said fluid.

4,711,502

APPARATUS FOR CUTTING EXCAVATIONS HAVING A SUBSTANTIALLY PLANAR FACE

Franz Bärthaler, Weisskirchen; Ferdinand Bedenk, Zeltweg; Otto Schetina, Zeltweg, and Alfred Zitz, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

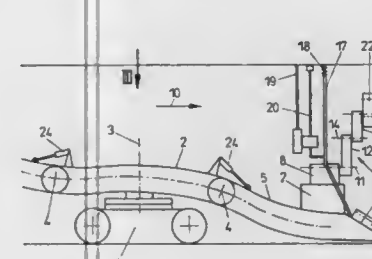
Filed Jul. 12, 1985, Ser. No. 754,214

Claims priority, application Austria, Jul. 16, 1984, 2300/84

Int. Cl.⁴ E21C 27/18; E21P 23/03

U.S. Cl. 299—33

4 Claims



1. Apparatus for cutting excavations having a substantially planar face (15), comprising a cutting tool (16), which is rotatably mounted on the jib (9), which is pivoted to a mobile machine, characterized in that the jib (9) is mounted for a pivotal movement in a plane which is transverse to the heading direction (10), the jib (9) is divided into at least two jib sections (12, 13), which are pivotally movable relative to each other about an axis (14) which is substantially parallel to a pivotal axis (11) of the jib (9), said jib being pivotable about said pivotal axis (11) and the cutting tool (16) is rotatably mounted close to or at the free end of that jib section (13) which is most remote from the pivotal axis (11) of the jib (9),

characterized further in that the jib (9) is pivotally movable about the pivotal axis (11), which is parallel to the heading direction (10),

characterized still further in that the cutting tool (16) includes a cutter drum or cutter head, which is mounted for rotation about an axis that is parallel to the pivotal axis (11) of the jib (9),

characterized in that at least one of the jib sections (12, 13), preferably the outermost jib section (13), is adapted to be angled in itself at an end portion (13A) about an axis (27) which is perpendicular to but spaced from the axis (14) on which said outermost jib section (13) is pivoted, said preceding jib section (12) being pivotable on the pivotal axis (11), said jib (9) being provided on a turning drive (8),

further comprising a loader (6) and conveyor (2, 5) and further characterized in that the turning drive (8) for the jib (9) is mounted or supported on a bracket (7), which is supported by the mobile machine on a part of the conveyor (2, 5), which part is supported on the floor and the drive means (22) for rotating the cutting tool (16) are mounted on the outermost jib section (13) and preferably at least in part inside cutting tool (16), said cutting tool being hollow,

characterized in that at least one roofhole drilling and bolt setting device (19) is supported on the bracket (7) which carries the jib (9),

characterized in that a dust-tight shield or wall (17) succeeding the jib (9) in the heading direction (10) is supported on the bracket (7) and has external edges (18) with flexible means for sealing the working face (15), and

characterized in that the loader (6) is disposed under the jib (9) and includes a loading ramp (6) which extends transversely to the heading direction.

4,711,503

REPLACEABLE TOOTH FOR A DIGGING AND BREAKING TOOL

Rütger Berchem, Gelsenkirchen, and Georg Prokscha, Recklinghausen, both of Fed. Rep. of Germany, assignors to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

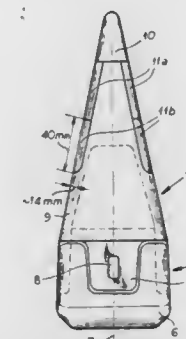
Filed Aug. 27, 1986, Ser. No. 901,269

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531787

Int. Cl.⁴ E21C 35/18; E02F 9/28; A01B 23/02

U.S. Cl. 299—79

5 Claims



4. A replaceable tooth article for a digging and breaking tool used in a suction head of an excavator consisting of an adapter and a replaceable tooth positioned over said adapter comprising:

a core composed of low alloy, temperable and hardenable steel having a truncated pyramidal outer shape and a plurality of rounded edges;

a rounded tooth peak of hard metal mounted on said core and having a central stud protruding from a base of said peak engaging in a recess in said core, said peak having a pyramidal shape modified with a rounded apex, the outer shape of said tooth being such that said edges of said core extend from said tooth peak and are at least partially bevelled; and

a plurality of edge elements for each edge composed of hard metal placed on the bevelled surfaces formed therein and said core, said tooth peak and said edge elements of said hard metal are joined together in a smooth surface.

4,711,504

ROTATING CUTTER HEAD

Rütger Berchem, Gelsenkirchen, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 901,287

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1985, 3531384

Int. Cl.⁴ E21C 35/18

U.S. Cl. 299—86

5 Claims

1. A rotating cutter head which can be moved against a surface that is to be worked on an excavating machine, said head comprising:

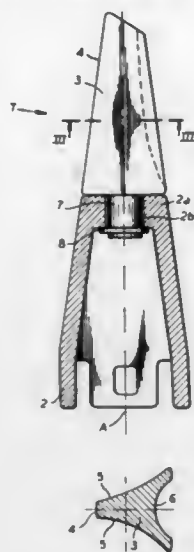
a rotatable support comprising a base ring and a plurality of helically disposed arms mounted on said ring;

a multiplicity of tool units positioned on said helically disposed arms of said support, each of said tool units comprising:

a respective mounting base secured to said arms, a respective tool member having at least one cutting edge for each said base, said tool member having a wedge-shaped cross section defining with flanking surfaces on either side of an apex of said cutting edge, said surfaces being curved in a concave manner, and

means for operatively connecting each tool member to the respective mounting base such that the tool member can carry out swiveling movement about a respective axis

of rotation, said axis being inclined with respect to an axis of rotation of said support, said swiveling move-



ment being in response to an alignment of the respective edge caused by a cutting force or reaction force in an excavating attack position.

4,711,505

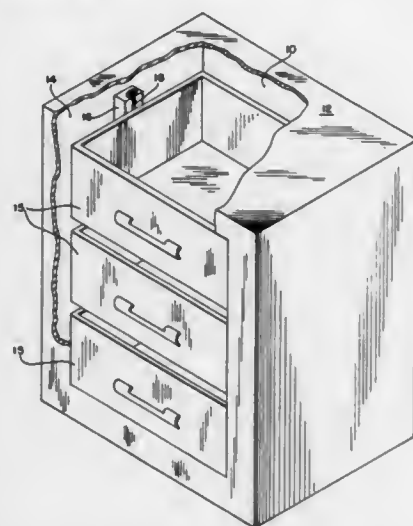
LOCKING SYSTEM

Matthew L. Lakso, 19 Bacon St., Westminister, Mass. 01473
Filed Feb. 6, 1987, Ser. No. 11,888

Int. Cl.⁴ E05C 7/06

U.S. Cl. 312-220

19 Claims

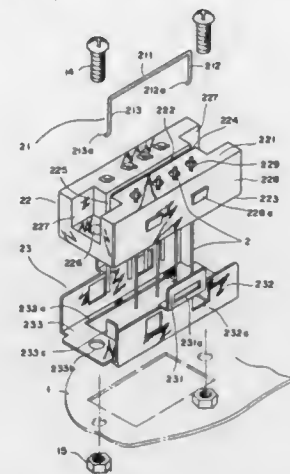


1. An interlocking system comprising a string of single, whole discrete elements, receptor means to confine said elements in said string variously in a separable and movable condition and in a contiguous and immovable position along said string, a series of at least two actuators at selectably fixed positions along said string, each actuator having an interposing means arranged to be entered by movement of said actuator at least partly between two of said elements when at least some of the elements may thus be moved along said string and both said two elements are positioned to allow such entrance of the interposing means of one said actuator operating to prevent entrance between elements of the interposing means of the other one or more actuators against movement.

4,711,506
SOCKET OF ELECTROSTATIC PROTECTION TYPE
Masanori Tanaka, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan
Continuation of Ser. No. 738,333, May 28, 1985, abandoned.
This application Jan. 13, 1987, Ser. No. 8,065
Int. Cl.⁴ H01R 4/66

U.S. Cl. 439-108

6 Claims



1. A socket for protection of circuits and the like from weak currents that will damage the main connection function of said circuits and the like, said socket comprising:

socket body means having a plug connecting surface with a plurality of contact means arranged on both sides of a groove means provided on said plug connecting surface, said socket body means having vertical cut-out means, said socket body means formed of insulating material; electrically conductive frame means into which said socket body means is tightly fitted, said frame means having metal plate means which is inserted into said vertical cut-out means of said socket body means, said metal plate means being connected to ground; and ground spring means of elastic metallic material having a back portion to be fitted into said groove means on said plug connecting surface of said socket body means and having legs which are bent at both lengthwise ends of said back portion, said legs being inserted into said vertical cut-out means of said socket body means such that said metal plate means is forcibly inserted between at least one of said legs and a wall of said vertical cut-out means of said socket body means, said at least one of said legs being grounded by being in elastic contact with said metal plate means forming an elastic engaging portion, said ground spring means being outwardly exposed at said back portion when said ground spring means is fitted into said groove means on said plug connecting surface of said socket body means.

4,711,507

ELECTRICAL CONNECTOR AND LATCHING APPARATUS THEREFOR

Peter Noorily, Bridgewater, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

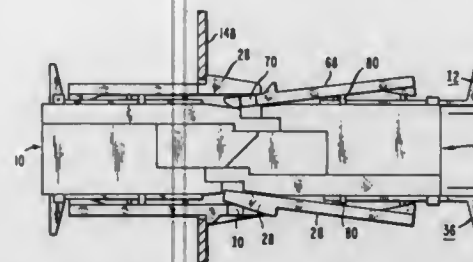
Continuation-in-part of Ser. No. 785,314, Oct. 7, 1985, abandoned. This application Jul. 17, 1986, Ser. No. 887,664
Int. Cl.⁴ H01R 13/639

U.S. Cl. 439-292

32 Claims

1. An electrical connector for cooperative engagement with a latching portion of an electrical component, comprising:
a plurality of electrical contacts;
a housing supporting said electrical contacts, said housing having a mating end for engagement with said electrical component and an opposing end;

a movable arm integrally supported on said housing, said arm having a latch facing said mating end of said housing and a cam surface facing said opposing end of said housing, said arm being pivotally supported on said housing intermediate said latch and said cam surface such that said latch is movable toward and away from said housing; and a cam actuator supported on said housing and movable from a first position to a second position, said cam actuator including cam means thereon engaging said arm cam



surface when said actuator is in said first position whereby said latch is in a non-locking relation with said latching portion of said electrical component, said actuator including spacer means thereon for pivotally moving said latch relative to said housing mating end during movement of actuator to said second position, said spacer means substantially preventing movement of said latch when said actuator is in said second position to thereby hold said latch in a locking relation with said latching portion of said electrical component.

4,711,508

TERMINAL RETAINING STRUCTURE FOR CONNECTOR

Tadahiro Sueyoshi, Kosal, Japan, assignor to Yazaki Corporation, Japan

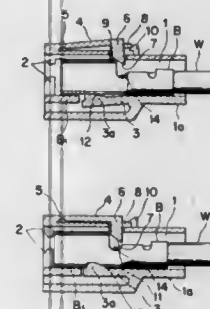
Filed Dec. 13, 1985, Ser. No. 809,069

Claims priority, application Japan, Dec. 14, 1984, 59-188819(U)

Int. Cl.⁴ H01R 11/00

U.S. Cl. 439-595

6 Claims



1. A terminal retaining connector structure for retaining an electrical terminal contact having a front end terminating in a rear shoulder comprising:

a connector housing having first and second peripheral walls, said first and second walls defining terminal receiving space means, said first wall having an opening means to open into said terminal receiving space means for receiving the front end of the terminal; and a swingable locking tongue having a forward hinge portion and a rear free end, said tongue formed integrally with said first wall to extend rearwardly from said hinge portion at an angle to said first wall and being pivotal through said angle about the hinge portion towards said first wall so as to be juxtaposed and generally parallel with respect thereto when in a locking position, said swingable tongue

having a wedge-shaped hook formed in said free end, said wedge-shaped hook having sloping surface facing forwardly, said wedge-shaped hook adapted to be inserted through said opening into said terminal receiving space means when said swingable locking tongue is bent flat over the first wall into the locking position wherein the sloping surface engages the rear shoulder so that the terminal is pushed forwardly into the connector housing by the sloping surface exerting a forwardly directed force on the rear shoulder as the tongue is bent to locking position.

4,711,509

ELECTRICAL CONNECTOR

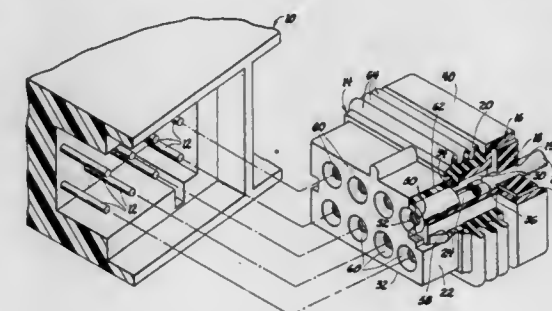
William E. Cross, Brookfield; Jeanne E. Hillestad, Niles, and Robert G. Plyler, Vienna, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1985, Ser. No. 804,934

Int. Cl.⁴ H01R 11/00

U.S. Cl. 439-587

10 Claims



1. An electrical connector comprising:
a connector body having a terminal cavity extending axially through the connector body from a forward contact end to a rearward conductor end,
said connector body having a nose portion at the forward contact end which comprises a plurality of ribs defining a channel at the forward portion of the terminal cavity, said connector body further having a lock shoulder in the terminal cavity which faces the forward contact end of the connector body,
an elastomeric ring mounted on the connector body so that a portion of the elastomeric ring extends across the channel at the forward portion of the terminal cavity for biasing a portion of a terminal inserted into the terminal cavity to an interference position with respect to the lock shoulder so as to retain the terminal in the rearward direction, and
a cap member mounted on the nose portion of the connector body to retain the terminal in the terminal cavity in the forward direction.

4,711,510

ELECTRICAL CONNECTOR FOR TRACTOR-TRAILER RIG

Alfred J. Orlando, Jr., 32 Carl Rd., Walpole, Mass. 02081

Filed May 15, 1986, Ser. No. 863,924

Int. Cl.⁴ H01R 13/625

U.S. Cl. 439-246

7 Claims

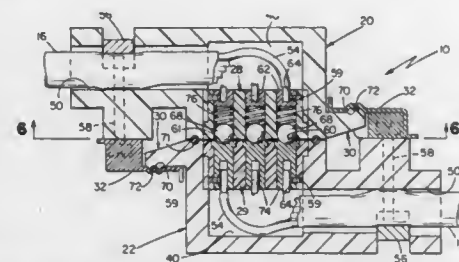
1. A multiwire electrical connector for making electrical connections, said connector comprising:
a first member with three or more first connector elements, said elements being distributed across a planar first connector face,
a second member with three or more second connector elements, said elements being distributed across a planar second connector face in a pattern matching that of said first connector elements,
said first connector elements being convex and second con-

necter elements being concave and shaped to mate with said first elements, so as to ensure mating alignment of said first and second elements when said members are in a locked position,

flange-locking means for locking said members together in said locked position, comprising on each member

a flange extending radially of an axis normal to said planar connector face,

a flange receptacle for engaging said flange of the other member when said members are pressed together along said axis and rotated relatively to one another about said axis, and



mating detent protrusions in said flanges and flange receptacles, said detent protrusions engaging in said locked position.

individual springs, at least one for each mating pair of first and second connector elements, each said spring being adapted to resist inward movement of its associated connector element into its associated member, said springs providing

an axial locking force that with said detent protrusions ensures that said members remain in said locked position and individual mating forces on each mating pair of connector elements to ensure good electrical contact between each mating pair.

4,711,511

LATCHING APPARATUS FOR AN ELECTRICAL CONNECTOR

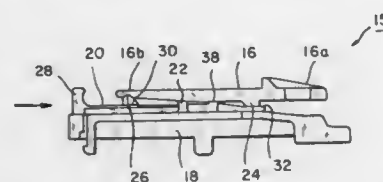
Peter Noorily, Bridgewater, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Jan. 23, 1987, Ser. No. 6,418

Int. Cl.⁴ H01R 13/639

U.S. Cl. 439—347

15 Claims



1. In an electrical connector of the type having a housing and a plurality of electrical contacts therein, latching apparatus comprising:

an elongate member deflectably supported by a pivot on said housing, said pivot being located generally intermediate said elongate member such that both longitudinal ends of said member may move generally transversely toward and away from said housing, one end of said member including a latch for latching to a latch of another mateable connecting device, and

a movable locking bar captively supported on said housing for slidable movement thereon between a first position and a second position, said locking bar and said member including cooperative locking means disposed on both sides of said pivot operative when said locking bar is in said first position to prevent transverse movement of both ends of said member and non-operative when said locking

bar is in said second position, thereby permitting transverse movement of both ends of said member.

4,711,512

COMPACT HEAD-UP DISPLAY

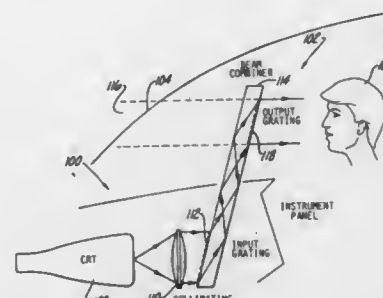
Juris Upatnieks, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Jul. 12, 1985, Ser. No. 754,406

Int. Cl.⁴ G02B 5/32, 27/10

U.S. Cl. 350—3.7

8 Claims



1. A head-up display for use in an aircraft cockpit having a windshield, comprising:

source means for producing collimated light wavefronts of an image to be displayed to the pilot;

an elongated optical element having a first end disposed in the path of the collimated light wavefronts produced by the source means, a second end disposed in the field of view of the pilot through the windshield, and operative to internally reflect optical wavefronts from the first end to the second end;

a first diffractive element supported at the first end of the optical element so that the collimated light wavefronts produced by the source means are incident upon the first diffractive element, the first diffractive element being operative to diffract the light wavefronts into the optical element, and

a second diffractive element supported at the second end of the optical element operative to diffract the light wavefronts, diffracted into the optical element by the first diffractive element, out of the optical element in the direction of the pilot's eye, while retaining the collimation thereof, the second end of the optical element and the second diffractive element being substantially transparent to light incident on the optical element from the field of view of the pilot through the windshield, whereby the pilot views in the image produced by the source means superimposed on his view through the windshield.

4,711,513

LIGHT RADIATOR FOR DIFFUSING LIGHT RAYS WHICH HAVE BEEN TRANSMITTED THROUGH AN OPTICAL CONDUCTOR

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,200

Claims priority, application Japan, Aug. 8, 1984, 59-166082 The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

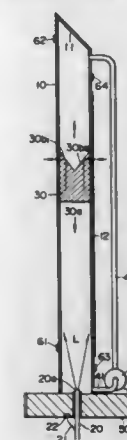
Int. Cl.⁴ C02B 6/00; F21V 7/04

U.S. Cl. 350—96.10

2 Claims

1. A light radiator comprising a transparent cylinder, an optical conductor for guiding light rays into said cylinder through one end of said cylinder, an optical means movably accommodated inside of said cylinder for reflecting said light rays guided into said cylinder from said optical conductor and radiating said light rays outside of said cylinder, and a driving means for moving said optical means along the axis of said cylinder, said optical means comprising a cylindrical transpar-

ent member, a surface of one side of said member on which the light rays impinge being formed on a plane and another surface



of the other side of said member being formed as a V-shaped concave surface.

4,711,514

PRODUCT OF AND PROCESS FOR FORMING TAPERED WAVEGUIDES

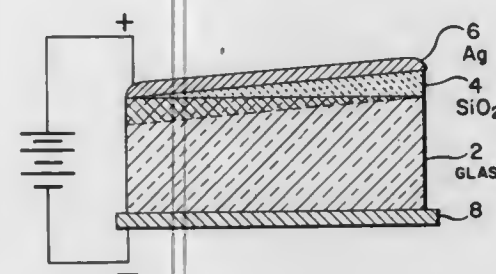
Gregory L. Tansonan, Oxnard; Huan-Wun Yen, Westlake, and David L. Persechini, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Del.

Filed Jan. 11, 1985, Ser. No. 690,792

Int. Cl.⁴ G02B 6/12

U.S. Cl. 350—96.12

30 Claims



28. A tapered optical waveguide device formed by the diffusion of metal ions into a glass substrate through a barrier material of a relatively tight matrix compared to the glass substrate, by a process comprising:

(a) coating the glass substrate with an inert removable barrier material having a tapered thickness inversely related to the sloping depth of the taper desired for the waveguide;

(b) diffusing metal ions through the barrier material into the glass substrate in the presence of elevated heat and an electrical field, the metal ions having a characteristic of increasing the refractive index in the glass substrate and the diffusion process continuing for a period of time sufficient to produce the predetermined depth and slope of the tapered waveguide in the glass substrate, and

(c) removing the barrier material and any metal on the barrier material.

4,711,515

ELECTROOPTIC POLARIZATION MULTIPLEXER/DEMULTIPLEXER

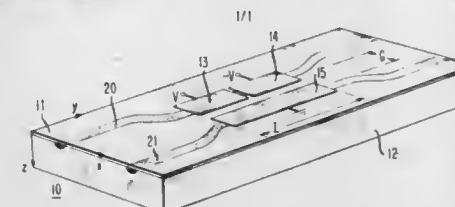
Rodney C. Alferness, Holmdel, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 29, 1984, Ser. No. 614,528

Int. Cl.⁴ G02B 6/10

U.S. Cl. 350—96.14

8 Claims



1. A polarization sensitive switching device including a substrate of birefringent, electrooptic material, a first and second dielectric waveguide embedded in said substrate and closely spaced together over a distance L, at least first and second metallic electrodes, said first and second electrode extending for said distance L in the vicinity of said first and second waveguides, respectively, said second electrode including at least first and second portions electrically disconnected from each other and having respective lengths substantially equal to L/2, and a buffer layer of insulating material intermediate to the electrodes and both the substrate and waveguides, the device characterized in that

the first and second waveguides are substantially phase matched to each other for similarly polarized modes of an input optical signal, and

said distance L is such that $1 \leq L/1_{TE} \leq 2$ and $L/1_{TM} \leq 0.5$, where 1_{TE} and 1_{TM} are transfer lengths for the TE and TM modes, respectively.

4,711,516

OPTICAL SLIP RING

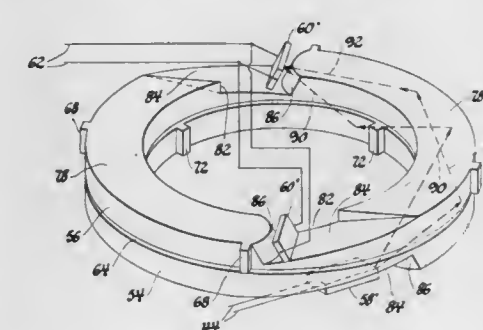
David W. Graber, Millington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1981, Ser. No. 323,757

Int. Cl.⁴ G02B 6/26, 6/42

U.S. Cl. 350—96.15

5 Claims



1. An optical slip ring for coupling light signals between two relatively rotating parts including

first and second rings of homogenous transparent material, each ring having an inner surface slightly spaced from the inner surface of the other ring and an outer surface at least partially surrounded by a medium having a lower index of refraction than the ring to facilitate internal reflection of light within the ring,

means for facilitating efficient light transmission from one ring to another, coupling means in the outer surfaces of the transparent rings

for coupling light into and out of the rings respectively, and
a pair of coaxial retainers, each fixedly mounted on one of the relatively rotating parts for movement therewith and secured to a respective one of the transparent rings for effecting relative rotation of the rings,
whereby light coupled into the first transparent ring passes through that ring, across the space between the rings, through the second transparent ring and is coupled out of the second ring irrespective of the rotation of the parts.

4,711,517

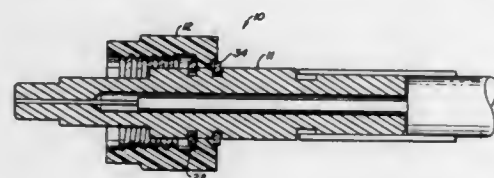
METHOD AND APPARATUS FOR INSTALLING FIBER OPTIC CABLES

Vernoa A. Fentress, 4515 Ewing Rd., Castro Valley, Calif. 94546, and Darryl A. Dawson, 798 McAllister St., San Francisco, Calif. 94102

Continuation-in-part of Ser. No. 740,189, May 31, 1985, abandoned. This application Oct. 25, 1985, Ser. No. 791,437
Int. Cl.⁴ G02B 6/36, 7/26

U.S. Cl. 350—96.20

7 Claims



1. A new and improved apparatus for use in installing fiber optic cables, said apparatus comprising:

an elongated, generally cylindrical, body with means for securely affixing said body to a fiber optic cable;
said elongated body having a longitudinal bore generally parallel to the axis of said elongated body for receiving therethrough a fiber of the fiber optic cable;

a coupling nut having means for mating with said elongated body and further means for connecting said fiber optic cable to a communication network device; and
said elongated body further having means disposed along the outer surface of said body for interacting with the mating means of said nut for receiving and securely retaining said coupling nut such that said fiber optic cable, together with said elongated body, may be connected by said nut to a communication network device; and wherein said coupling nut having an internal circumferential groove about its neck region and said groove having a diameter to contain a flexible retaining ring having an outer diameter substantially less than the outer diameter of said groove such that said ring in its expanded state is maintained in close proximity to the outer diameter of said groove;

said coupling nut receiving and retaining means of said elongated body further including at least one circumferential groove disposed about the outer mid-section surface of said elongated body; and

said elongated body groove having an inner diameter slightly less than the inner diameter of said flexible ring supported in said neck region, and said elongated body having a bevelled ramp so that when said coupling nut with said flexible ring disposed about the groove in its neck region is received by said elongated body, said flexible ring will expand as it is slidably moved over the bevelled land along the elongated body to accommodate the larger outer diameter of the elongated body until said ring and coupling nut neck region are received by the groove in said elongated body where said flexible ring will return to its relaxed state and the coupling nut will be securely mated to said elongated body.

4,711,518

FIBER OPTIC CONNECTOR

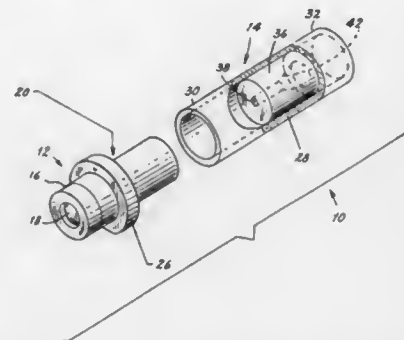
Jeffrey B. Shank; Steven E. Swanson, and Barry J. Opdahl, all of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 25, 1985, Ser. No. 801,254

Int. Cl.⁴ G02B 6/36, 6/32

U.S. Cl. 350—96.20

5 Claims



1. An optical fiber-lens connector assembly comprising: a lens body formed of transparent material, said lens body including a head end having a lens formed therein, a tail end of substantially cylindrical configuration having an axial cavity therein formed to receive an elastomeric fiber holder, and a shoulder formed intermediate said head end and said tail end and projecting radially outward from said lens body; and a connector for joining an optical fiber to said lens body, said connector comprising: a generally tubular body having a longitudinal axis and a given internal diameter formed to fittingly receive said tail end of said lens body, said tubular body being formed of a material selected from the group of fused silica quartz and borosilicate glasses having a low thermal expansion coefficient, said body having a first end and a second end; and a substantially cylindrical fiber guide positioned within said tubular body intermediate said first and second ends thereof, said fiber guide having an external diameter substantially matching said internal diameter of said tubular body and having a longitudinal, optical fiber receiving aperture therethrough, said fiber guide being formed from the same material as said tubular body.

4,711,519

ASSEMBLY INCLUDING AN OPTICAL FIBER SECURED IN A WALL

Henricus W. W. Smulders, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 802,785, Nov. 27, 1985, abandoned.

This application Dec. 29, 1986, Ser. No. 948,468

Claims priority, application Netherlands, Dec. 5, 1984, 8403692

Int. Cl.⁴ G02B 5/44

U.S. Cl. 350—96.20

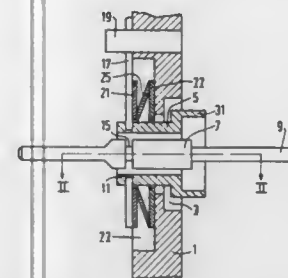
4 Claims

1. An assembly for holding an end of optical fiber, said assembly comprising:

a housing with a wall having an opening therethrough;
a hollow cylindrical holder arranged in the opening in the wall of the housing, said holder having a longitudinal axis and being rotatable around the longitudinal axis with respect to the wall of the housing, said holder having an outer surface with a circumferential groove therein, said holder having a wall with a thickness, said groove having a depth at diametrically opposed portions of the holder which exceeds the thickness of the wall of the holder so as to form two circumferentially extending elongate openings in the holder;

a tubular envelope in which the end of the fiber is secured, said envelope being arranged in the holder to slide in the longitudinal direction, said envelope having an outer

surface with a circumferential groove therein, said groove having an axial position corresponding to that of the groove in the holder; and



a substantially U-shaped spring attached to the wall of the housing, said spring having two legs pressed into the groove in the holder.

4,711,520

FIBER OPTIC CONNECTOR BACKSHELL

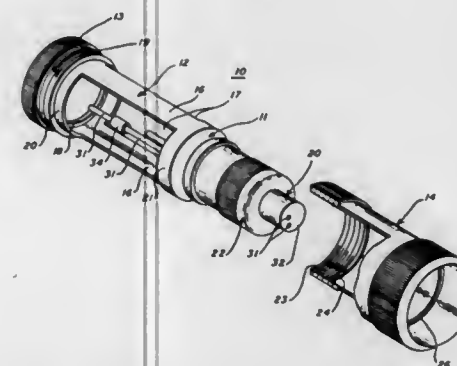
Allen J. Bernardini, Southbury, Conn., assignor to Litton Systems, Inc., Watertown, Conn.

Filed Jul. 2, 1985, Ser. No. 751,204

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.20

4 Claims



1. A field repairable fiber optic connector backshell for surrounding and protecting one or more fiber optic pairs which are joined together by fiber optic couplers, said backshell comprising:

a cylindrical body,
a coupling ring on a first end of the cylindrical body having means for coupling said backshell to an adjacent member,
a cable clamp on a second end of the cylindrical body for clamping and sealing the backshell to the outer jacket of a fiber optic cable,

an integral frame joining the first end of the cylindrical body to the second end of the cylindrical body,
a pair of opposed longitudinal struts comprising said frame,
a pair of windows defined by the struts, wherein access to the fiber optic pairs and the fiber optic couplers is provided by said windows,

a removable sleeve surrounding the frame portion and means for removably attaching the removable sleeve to the cylindrical body,
sealing surfaces on the cylindrical body on opposite ends of the windows, and

sealing means on the first end and on the second end of the removable sleeve for mating with and sealing against said sealing surfaces, whereby said removable sleeve surrounds and protects the fiber optic pairs and fiber optic couplers, and said sealing means and sealing surfaces block moisture and other contaminants from said windows when said removable sleeve is attached to the cylin-

drical body, and whereby said fiber optic pairs and couplers are exposed when said removable sleeve and said sealing means are removed from said cylindrical body.

4,711,521

METHOD OF MANUFACTURING A TERMINAL DEVICE FOR AN OPTICAL FIBER, AND DEVICE THUS OBTAINED

Jacques C. Thillays, Herouville, France, assignor to U.S. Philips Corporation, New York, N.Y.

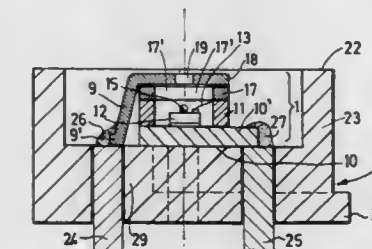
Filed Sep. 23, 1985, Ser. No. 778,651

Claims priority, application France, Sep. 28, 1984, 84 14953

Int. Cl.⁴ G02B 6/42, 6/32

U.S. Cl. 350—96.20

14 Claims



1. A method of manufacturing a terminal device for an optical fiber, including the positioning of an opto-electronic semiconductor element in a base, a ball lens being secured on said element in order to form an afocal system, as well as the making of electrical connections, characterized in that it includes the following steps:

(a) securing an assembly formed by the ball lens (15) and the opto-electronic element (12) in position on the bottom (10) of a microhousing (40);

(b) centering a central aperture (19) of a diaphragm (18) with respect to the ball lens (15), said diaphragm being supported by a lateral portion (11) of the microhousing, said central aperture having a diameter which is substantially equal to the outer diameter of an optical fiber (F) and which is larger than that of the ball lens (15);

(c) securing said diaphragm (18) thus centered in position, thus forming a micro-component (1);

(d) arranging the micro-component in said base (2, 3, 80) and positioning it with respect to a reference surface (21, 56, 88) thereof by introducing a pin (43) into said central aperture (19) of the diaphragm (18), said pin (43) itself being positioned with respect to a reference contour (41) which cooperates with the reference surface (21, 56, 88);

(e) securing the micro-component (1) thus centered in position in the base (2).

4,711,522

OPTICAL CATHETER

Ronald L. McCartney, Orange, Calif., assignor to American Hospital Supply Corporation, Deerfield, Ill.

Continuation-in-part of Ser. No. 546,500, Oct. 28, 1983,

abandoned. This application Sep. 27, 1985, Ser. No. 781,411

Int. Cl.⁴ G02B 6/38

U.S. Cl. 350—96.21

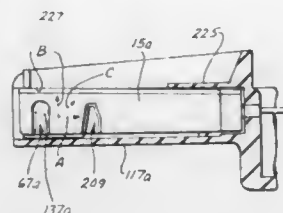
24 Claims

11. An apparatus comprising:

at least one fiber optic light conductor;
a connector body having an exterior face;
means for mounting the fiber optic light conductor on the connector body with an end of the fiber optic light conductor being adjacent the face and capable of transmitting light to or from a location on said face;

a receptacle having a cavity with an open end for receiving the connector body, a face spaced in a generally forwardly direction from said open end and partly defining

said cavity and means for transmitting light to or from a location on said face of said receptacle;
guide means at least partially on the receptacle for guiding the connector body along a path in the cavity to place said faces in confronting relationship and said locations substantially into engagement;
said connector body having a cam surface at least partially defining a recess; and
said receptacle having biasing means including a projection cooperable with said cam surface when the connector



body is in the cavity of the receptacle and said locations are nearly in engagement for urging the projection in a second direction into the recess, said projection and cam surface cooperating to urge the connector body in a direction which has components which extend farther into the cavity and in a third direction generally transverse to both the forwardly direction and the second direction whereby said locations on said faces are placed in substantial engagement and said cavity allowing the connector body to move in said third direction in response to the cooperation between the cam surface and the projection.

4,711,523

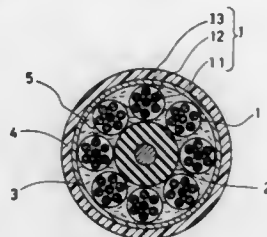
WATERPROOF OPTICAL FIBER CABLE

Eiji Iri; Takashi Kaneko; Takeshi Shintani, all of Itami; Kotaro Mito, and Yasuo Ijiri, both of Amagasaki, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Hyogo, Japan
Continuation of Ser. No. 637,540, Aug. 3, 1984, abandoned. This application Apr. 15, 1987, Ser. No. 39,806
Claims priority, application Japan, Aug. 11, 1983, 58-147792; Aug. 11, 1983, 58-147793

Int. Cl.⁴ G02B 6/44

U.S. Cl. 350—96.23

3 Claims



1. An optical fiber cable comprising a water blocking layer, an optical fiber disposed inside the water blocking layer and a water blocking material filling the space between the water blocking layer and the optical fiber, the water blocking material comprising a grease having a worked penetration of 150 to 450 at room temperature and of at least 85 at -30°C . as measured according to ASTM-D-217, said grease comprising an organic liquid having a viscosity at 40°C . of 6 to 5000 c.st. and 3 to 35 parts by weight per 100 parts by weight of said organic liquid of a thickener.

4,711,524

COMBUSTOR FIBERSCOPE

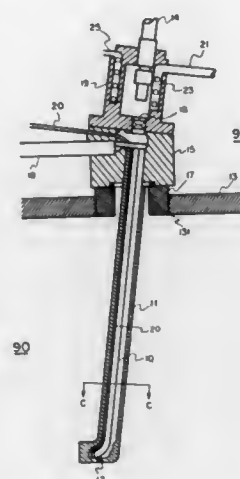
William W. Morey, West Hartford, Conn., and Elias Snitzer, Wellesley, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 6, 1985, Ser. No. 773,276

Int. Cl.⁴ G02B 6/06

U.S. Cl. 350—96.25

9 Claims



1. An apparatus for providing an interior view of a gas turbine combustor during the operation thereof, said apparatus giving access thereto via an aperture in the wall of said combustor, comprising in combination:

- a rigid image conduit composed of fused coherent optical fibers extending through said combustor wall aperture, thus having an interior and exterior end;
- a viewing lens operably positioned to form an image of said combustor interior on said interior end of said image conduit;
- a flexible coherent optical fiber bundle having one end located proximal the exterior end of said image conduit and the other end located distal therefrom;
- means for optically coupling said image conduit to said optical fiber bundle;
- means for housing said image conduit within said combustor also forming a seal with said combustor wall about said image conduit at said aperture;
- means for cooling said image conduit and said viewing lens operably integrated into said housing means; and
- means for illuminating said combustor interior co-aligned with said image conduit within said housing means.

4,711,525

POLARIZING OPTICAL FIBER WITH ABSORBING JACKET

John R. Feth, Topanga, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 8, 1985, Ser. No. 731,692

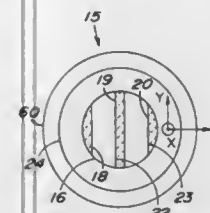
Int. Cl.⁴ G02B 6/22

U.S. Cl. 350—96.33

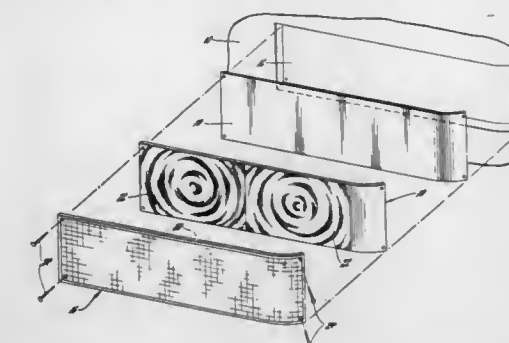
4 Claims

1. A polarizing fiber optic waveguide, comprising:
- a core formed of a fiber optic material for propagating optical signals, said core including a plurality of layers of fiber optic material, said core being formed to have a first core refractive index n_z for light polarized along a first axis and a second core refractive index n_y for light polarized along a second axis perpendicular to the first axis;
 - a cladding surrounding said core, said cladding being formed to have a cladding refractive index n_{clad} at least as large as said first core refractive index n_z and less than second core refractive index n_y , the relative magnitudes of the refractive indices n_z , n_y and n_{clad} cooperating to retain

light waves polarized along the first axis in the cladding and to radiate from the core into the cladding light waves polarized along the second axis; and



a jacket surrounding said cladding, said jacket being formed of a material which absorbs light propagating in said cladding such that said jacket absorbs light polarized along the second axis after it has radiated from said core into said cladding.



lens, and a magnifying lens sheet interposed between said light reflecting sheet and said simulated lens sheet.

4,711,526

ATTENUATING BEAM SPLITTER

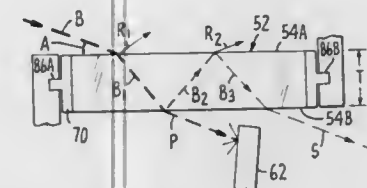
David Hennings, El Granada, and Nubar Manoukian, Cupertino, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Jul. 7, 1986, Ser. No. 882,485

Int. Cl.⁴ G02B 27/12, 27/14

U.S. Cl. 350—170

13 Claims



1. An apparatus for attenuating the power of a laser beam comprising a refractive element having a pair of spaced-apart, parallel faces, said element being at least partially transmissive to said laser beam and located such that when said laser beam enters said refractive element through one of said faces, said laser beam will be split into at least a primary laser beam and a secondary laser beam both of which exit said refractive element out of the other of said faces, with said primary laser beam exiting said refractive element along a path displaced from the incoming laser beam, and with the secondary laser beam exiting said refractive element after undergoing at least two internal reflections, with the power of the secondary laser beam being attenuated with respect to the incoming laser beam and with the secondary laser beam travelling along the same path as the incoming laser beam.

4,711,527

SIMULATED VEHICLE LAMP

Herbert D. Rimmell, Leonard, and John W. Perkins, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1985, Ser. No. 802,311

Int. Cl.⁴ G02B 17/00

U.S. Cl. 350—243

3 Claims

1. A simulated vehicle lamp for use in modeling a vehicle characterized by a light reflecting sheet, a simulated lens sheet

4,711,528

DRIVE COUPLING DEVICE FOR OPTICAL INSTRUMENTS

Makoto Ando, and Yukio Miki, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

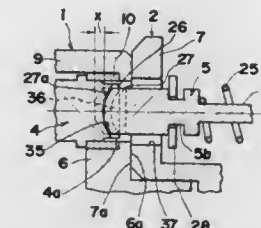
Filed Aug. 20, 1985, Ser. No. 767,460

Claims priority, application Japan, Aug. 24, 1984, 59-129123[U]

Int. Cl.⁴ G02B 7/00; F16D 1/10, 1/12

U.S. Cl. 350—257

15 Claims



1. A drive coupling device for a first optical instrument provided with a driving means and a second optical instrument provided with a load, comprising:

- a drive coupling member rotatably supported in said first optical instrument with its rotational axis extending parallel to an optical axis of said first optical instrument and rotated by said driving means;
- a driven coupling member rotatably supported in said second optical instrument with its rotational axis extending parallel to an axis of said second optical instrument and being coupled with said driving coupling member so that said driven coupling member is rotated together with said driving coupling member for shifting said load;
- motion transmitting means including a recess formed in one of the coupling members and a projection formed on the other of the coupling members for coupling with said recess when the angular positions of said coupling members are coincident with each other so as to transmit the rotation from said driving coupling member to said driven coupling member;
- means for biasing at least one of said coupling members along the rotational axis for axially coupling said coupling members with each other;
- a first guide surface formed at the tip end of said one of the coupling members so as to be brought into axial contact with said projection under a biasing force of said biasing means when the angular positions of said coupling members are not coincident with each other thereby guiding said projection therealong for aligning the rotational axes of said coupling members with each other; and

a second guide surface formed at the bottom of said recess so as to be brought into axial contact with said projection under a biasing force of said biasing means when the angular positions of said coupling member are coincident with each other thereby guiding said projection therealong for aligning the rotational axes of said coupling members with each other.

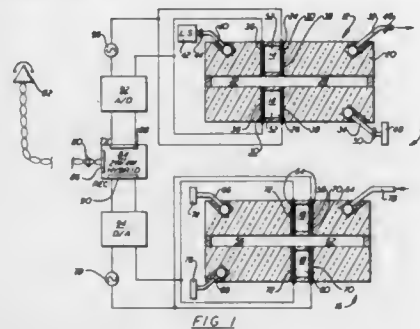
4,711,529

OPTICAL INTERFACE APPARATUS

Anthony P. Baker, New York, N.Y., assignor to ITT Defense Communications, a Division of ITT Corporation, Nutley, N.J.
Filed Nov. 5, 1985, Ser. No. 795,149
Int. Cl.⁴ G02F 1/133

U.S. Cl. 350—331 R

17 Claims



1. An optical interface apparatus comprises:
means, employing a first liquid crystal material, for modulating a carrier light beam in accordance with a time varying electrical signal;
means, employing a second liquid crystal material, for modulating an electromagnetic field in accordance with a modulated light beam; and
means for providing a time varying signal to said carrier light beam modulating means, said time varying signal providing means including an analog-to-digital converter whereby said carrier light beam is modulated in accordance with the digital output of said analog-to-digital converter.

4,711,530

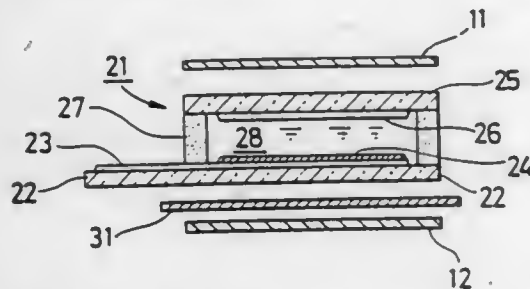
LIQUID CRYSTAL DEVICE HAVING BIREFRINGENT PLATE NEXT TO POLARIZER

Jun Nakanowatari, Miyagi, and Mitsuru Kano, Furukawa, both of Japan, assignors to Alps Electric Co., Ltd., Japan
Filed Sep. 24, 1986, Ser. No. 911,236

Claims priority, application Japan, Sep. 27, 1985, 60-214241
Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—339 R

5 Claims



1. A liquid crystal device comprising a liquid crystal cell in which a ferroelectric liquid crystal is put between two transparent substrates each formed with a transparent electrode to the inside thereof with the peripheral edges of said transparent substrates being sealed, a polymer film having a birefringent property appended on one side of said liquid crystal cell and

two sheet polarizing plates disposed on both sides of said liquid crystal cell and such that the polarizing directions thereof are perpendicular to or in parallel with each other.

4,711,531

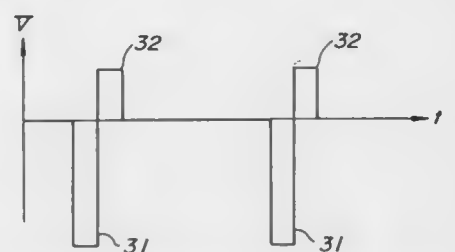
FERROELECTRIC LIQUID CRYSTAL DISPLAY APPARATUS USING A RESET VOLTAGE STEP

Sadao Masubuchi, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Aug. 30, 1985, Ser. No. 770,938

Claims priority, application Japan, Sep. 11, 1984, 59-189997
Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—350 S

4 Claims



1. A liquid crystal display apparatus comprising:
a plurality of scanning electrode means;
a plurality of signal electrode means positioned perpendicular to the scanning electrode means to form a matrix and enclosing a ferroelectric liquid crystal layer having a plurality of pixels in conjunction with the scanning electrode means;
first drive means for selecting and sequentially driving the scanning electrode means by applying write-in voltages thereto;
second drive means for driving the signal electrode means by applying voltages corresponding to display contents of the display apparatus in synchronism with the application of the write-in voltages; and,
control means coupled to the first and second drive means, for controlling the first drive means so as to apply reset voltages to the respective pixels of the ferroelectric liquid crystal layer, whereby orientation of the liquid crystal's molecule is subjected to be constant before the selection of the scanning electrode means.

4,711,532

NOVEL DIACETYLENIC AND POLYDIACETYLENIC COMPOSITIONS

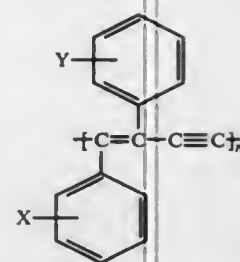
Eui W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.
Division of Ser. No. 854,273, Apr. 21, 1986, Pat. No. 5,207,116.
This application Dec. 17, 1986, Ser. No. 942,638

Int. Cl.⁴ G02B 5/23; G02F 1/01, 1/03

U.S. Cl. 350—354

5 Claims

1. An electrooptic light modulator device with a polymeric nonlinear optical component comprising an optically transparent medium of a polymer characterized by the recurring monomeric unit:



where X is an electron-donating substituent; Y is an electron-withdrawing substituent; and n is an integer of at least 3.

4,711,533

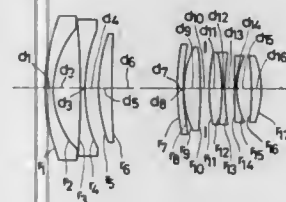
STANDARD ZOOM LENS SYSTEM HAVING A LARGE APERTURE RATIO

Yoshiharu Saito, Koganei, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Aug. 16, 1985, Ser. No. 766,422

Claims priority, application Japan, Aug. 20, 1984, 59-171509
Int. Cl.⁴ G02B 15/14, 13/18

U.S. Cl. 350—426

8 Claims



1. A standard zoom lens system with a large aperture ratio comprising a front lens group having a negative refracting power, a rear lens group having a positive refractive power, in which the airspace between said front lens group and said rear lens group is variable for effecting zooming, said zoom lens system comprising a diaphragm and a positive lens component disposed at the outer side of said diaphragm on the object side, and at least one surface of said positive lens component being aspherical satisfying the following condition (1):

$$-0.001 > \Delta x/R_A > -0.007 \quad (1)$$

where R_A represents the radius of curvature of a reference spherical surface, Δx represents the difference parallel to the optical axis between the point on said aspherical surface and that on said reference spherical surface at the maximum effective aperture of the aspherical lens.

4,711,534

ZOOM LENS ABLE TO OBTAIN FOCAL LENGTHS BEYOND THE ZOOMING RANGE

Takashi Matsushita, Kanagawa; Sadatoshi Takahashi, Tokyo; Keiji Ikemori, Kanagawa; Nozomu Kitagishi, Tokyo; Tsunefumi Tanaka, and Kikuo Momiyama, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 26, 1985, Ser. No. 705,567

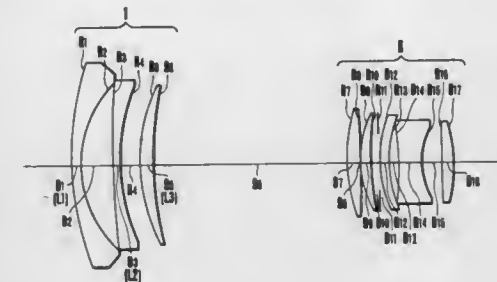
Claims priority, application Japan, Feb. 27, 1984, 59-35612
Int. Cl.⁴ G02B 7/04, 15/16

U.S. Cl. 350—426

8 Claims

1. A zoom lens comprising first lens means of negative refractive power and second lens means of positive refractive power arranged on the image side of said first lens means, the axial separation between said first lens means and said second lens means being varied to vary the focal length of the entire system in a prescribed range, when the wide angle side of the

range is reached, said first lens means is adjusted in position to focus the zoom lens to an object at a finite distance, and then at



strong meniscus element means, for reducing spherical aberrations of the principal rays and introducing chromatic aberrations, the two radius of curvatures of said weak meniscus element means differing by at least 10 percent;

said plates and elements being constructed and arranged so that both said meniscus element means reduce spherical aberrations of the principal rays in the system and introduce chromatic aberrations which are substantially cancelled by said thick, flat parallel plates.

4,711,536

COLOR SEPARATING LENS COMPOSED OF THREE LENS UNITS

Taira Kouchiwa, Kamakura, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

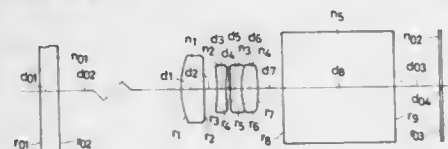
Filed Jul. 25, 1985, Ser. No. 759,055

Claims priority, application Japan, Jul. 25, 1984, 59-154949

Int. Cl.⁴ G02B 9/14

U.S. Cl. 350-476

2 Claims



4,711,552 SYNCHRONIZING ELECTROSTATIC COPY FORMATION

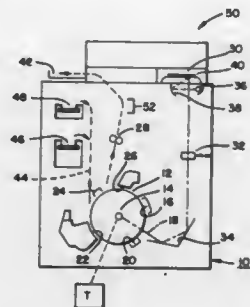
Bea A. Nilsson, Boulder, and Roger D. Shepherd, Rollinsville, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1986, Ser. No. 864,406

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—3 R

30 Claims



22. In an electrophotographic copier having an optics assembly, a method for synchronizing the movement of the leading edge of a copy sheet and the movement of the leading edge of an electrostatic image on a photoreceptor, comprising the steps of:

positioning a master document with a colored area adjacent to its leading edge and a colored area adjacent to its trailing edge on the document glass of the copier, initiating the copying cycle of the copier to produce a copy, determining the length of undeveloped area adjacent to the leading edge or trailing edge of the copy, and adjusting the start of scan of the optics assembly as a function of any such length.

29. In a device having an optics mechanism for forming visible images on cut sheets, apparatus for synchronizing the movement of the leading edge of the cut sheet and the movement of the leading edge of an electrostatic image on the photoreceptor of the device, comprising:

means to inactivate the optics mechanism of the device, means to initiate the operating cycle of the device to produce a visible image on a cut sheet with the optics mechanism inactivated, means to determine the length of undeveloped area adjacent the leading or the trailing edge of the cut sheet, and means to adjust the gating of the cut sheet as a function of any such length.

4,711,553 IMAGE FORMING APPARATUS WITH A PLURALITY OF COLORS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 6, 1986, Ser. No. 893,636

Claims priority, application Japan, Aug. 13, 1985, 60-177841; Aug. 28, 1985, 60-189237

Int. Cl.⁴ G03G 15/01

U.S. Cl. 355—4

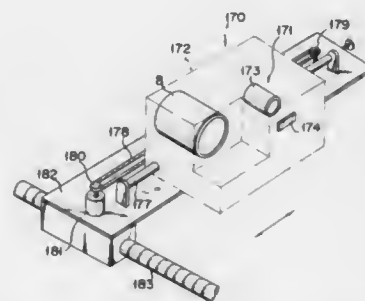
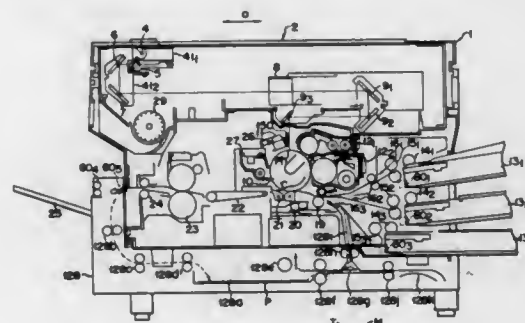
4 Claims

1. An image forming apparatus with a plurality of colors, said apparatus comprising:

an original table for placing thereon an original which possesses at least a first color and a second color; original scanning means for optically scanning an original placed on said original table, said means having an optical system to guide the image reflecting light coming from the original into a given light path;

first and second color component detection means for transmitting electric signals corresponding to said first and second colors in response to the image reflecting light, said means being movably provided on said light path

along which said image reflecting light coming from said optical system of said original scanning means passes; original color identifying means for identifying different color areas from the electric signals for said first and second colors transmitted from said first and second color component detection means and for storing the first and second color data and first and second positional data for the first and second colors in different color areas; image forming means for forming an image of given colors of the original on an image forming medium by using said image reflecting light coming from said optical system of said original scanning means and by selectively driving first and second developing units which correspond to said first and second colors, respectively; image erasing means for selectively erasing an image to be formed by said image forming means; image forming medium return means for selectively returning said image forming medium to said image forming means after formation of an image by said image forming means;



first control means for producing a first control signal to drive said original scanning means and said first and second color component detection means prior to actual formation of an image;

second control means for reading out, at the time of the first image forming operation, said first color data that have been stored in said original color identifying means to send them to said first developing unit of said image forming means as drive signals and said second position data which correspond to said second color data to send them to said image erasing means as erasure data and for producing a second control signal to said image forming medium return means as an instruction for a return operation; and

third control means for reading out, at the time of the second image forming operation, said second color data that have been stored in said original color identifying means to send them to said second developing unit of said image forming means and said first positional data which correspond to said first color data to send them to said image erasing means as erasure data.

4,711,554 SCANNING TYPE COPYING MACHINE

Kadotaro Nishimori, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

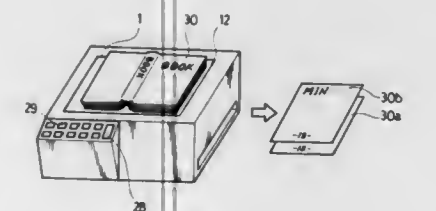
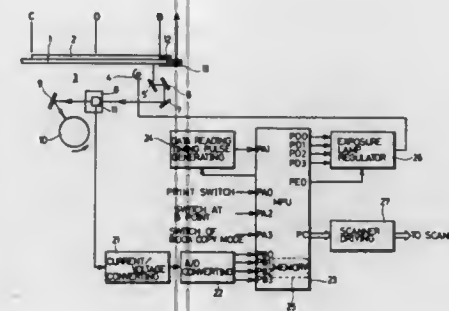
Filed Dec. 8, 1986, Ser. No. 939,366

Claims priority, application Japan, Dec. 13, 1985, 60-281525

Int. Cl.⁴ G03G 15/00, 15/28

U.S. Cl. 355—8

7 Claims



1. A scanning type copying machine comprising: imaging means comprising scanning means for scanning a document for outputting an image of the document, mode selecting means for selecting a normal copy mode and a dividing copy mode for copying said document by dividing a copy area of said document,

first control means for controlling said imaging means to copy the whole of said copy area of said document as one sheet in response to selection of said normal copy mode by said mode selecting means and to copy said document by dividing said copy area of said document into two regions in response to selection of said dividing copy mode by said mode selecting means,

image density detecting means for detecting a density of said image of said document by scanning said document by said scanning means prior to copy operation,

density control data setting means for setting density control data for the whole of said copy area of said document based on the detected output of said image density detecting means when said normal copy mode is selected by said mode selecting means, and for setting density control data for each of said divided two regions of said document based on the detected output of said image density detecting means when said dividing copy mode is selected by said mode selecting means, and

second control means for controlling said imaging means to form a copy of an appropriate density according to the density control data set by said density control data setting means.

4,711,555 IMAGE FORMING APPARATUS HAVING MEANS FOR PREVENTING DAMAGE TO A PHOTORESENSITIVE MEMBER

Kenshi Toshimitsu, Kawasaki, and Hiromasa Kohayakawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

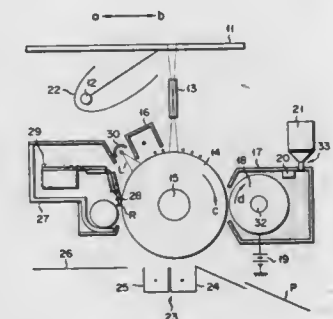
Filed Apr. 29, 1986, Ser. No. 857,033

Claims priority, application Japan, Apr. 30, 1985, 60-92563; Apr. 30, 1985, 60-93121

Int. Cl.⁴ G03G 21/00, 15/06

U.S. Cl. 355—14 R

11 Claims



1. An image forming apparatus comprising: a drum-shaped photosensitive member having an axis of rotation; drive means for rotating the photosensitive member about the rotation axis; charging means for forming an electrically charged region on the surface of the photosensitive member; latent image forming means for irradiating the charged region of the photosensitive member with a light to form an electrostatic latent image on the surface; developing means for supplying a toner to the surface of the photosensitive member to develop the electrostatic latent image into a visible image formed of the toner; a cleaning blade for removing the residual toner on the surface of the photosensitive member; blade support means adapted to bringing the cleaning blade into contact with the surface of the photosensitive member; toner adjusting means for keeping the density of the toner constant, the toner density adjusting means including sensing means for detecting the density of the toner in the developing means, and resupply means for feeding the toner to the developing means in accordance with the result of the detection by the sensing means; and control means having an initial setting mode and an operating mode, and adapted, when the initial setting mode is selected, to actuate first the drive means, charging means, and toner density adjusting means, and thereafter to energize the developing means to form the visible image on the surface of the photosensitive member and to actuate the blade supporting means to bring the cleaning blade into contact with the surface of the photosensitive member when the toner layer reaches the location of the cleaning blade.

4,711,556 COPYING MACHINE WITH AN INTERRUPT FUNCTION

Yasuo Abuyama, Ebina, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 681,572, Dec. 13, 1984, abandoned.

This application Oct. 20, 1986, Ser. No. 920,947

Claims priority, application Japan, Dec. 20, 1983, 58-238807

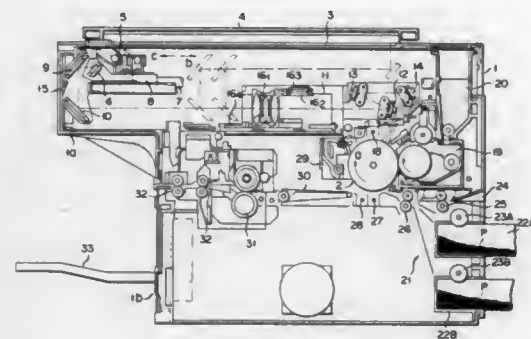
Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—14 R

6 Claims

1. A copying machine comprising: cassette holder means for detachably holding at least two

paper cassettes, each of said paper cassettes storing different size paper;
 inputting means for inputting copying instructions which at least include a cassette selection instruction, into a first memory;
 copying means for copying a document in accordance with the copying instructions stored in the first memory, for copying paper fed from a selected cassette;
 means for temporarily saving the copying instructions which



are stored in the first memory, into a second memory in accordance with a command of an interrupt copying mode;
 resetting means for resetting the copying instructions other than that of a copying paper size stored in the first memory, into standard instructions in accordance with the command of the interrupt copying mode; and
 means for loading the copying instructions from the second memory into the first memory when the interrupt copying mode is completed.

4,711,557

IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

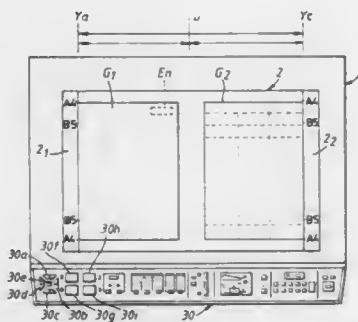
Filed Aug. 22, 1986, Ser. No. 899,029

Claims priority, application Japan, Sep. 6, 1985, 60-197124; Nov. 26, 1985, 60-265501

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—14 R

8 Claims



1. An image forming apparatus comprising:
 an original table on which first and second original documents are placed, said first original document having an item area, and said second original document having listed items arrayed thereon;
 an image carrier;
 original scanning means, movable along said original table, for optically scanning said first and second original documents placed on said original table and for forming reflected light images thereof;
 means for directing light images obtained by said original scanning means onto said image carrier;
 first image forming means for forming electrostatic latent

images corresponding to said focused images of said first and second original documents from said directing means onto said image carrier;
 second image forming means for producing visible images on an image forming medium corresponding to said electrostatic latent images;
 changing means for selectively changing the position at which said directing means directs an image corresponding to said second original document on said image carrier;
 image erasing means for selectively erasing selected portions of said electrostatic latent images formed by said first image forming means;
 image forming medium feed-back means for feeding said image forming medium after a visible image of said first original document has been produced thereon back to said second image forming means;
 memory means for storing positional data of said item area of said first original document and sizes of listed items arrayed on said second original document; and
 controlling means for: (1) controlling said original scanning means, first image forming means, and second image forming means to form a visible image of said first original document on said image forming medium, (2) controlling said image forming medium feed-back means to feed said image forming medium on which the visible image of said first original document has been formed back to said second image forming means, (3) controlling said changing means to position a light image of one of said listed items arrayed on said second original document onto said image carrier, (4) controlling said image erasing means to erase the electrostatic latent image of said second original document outside of said light image of said one of said listed items, (5) controlling said original scanning means, first image forming means and second image forming means to form a visible image of said one of said listed items directed by said directing means on an area of said image forming medium corresponding to said item area, and (6) controlling said image forming medium feed-back means to feed said image forming medium having the visible image of said first original document to cause said item area of said first original document to coincide with the visible image of said listed item on said second original document formed on said image carrier.

4,711,558

COPYING APPARATUS WITH VARIABLE IMAGE MAGNIFICATION

Hiroshi Tanioka, and Toshio Honma, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
 Continuation of Ser. No. 434,496, Oct. 15, 1982, abandoned.

This application Dec. 16, 1985, Ser. No. 811,308

Claims priority, application Japan, Oct. 19, 1981, 56-166649; Oct. 19, 1981, 56-166650; Oct. 19, 1981, 56-166652

Int. Cl.⁴ G03G 15/04, 21/00

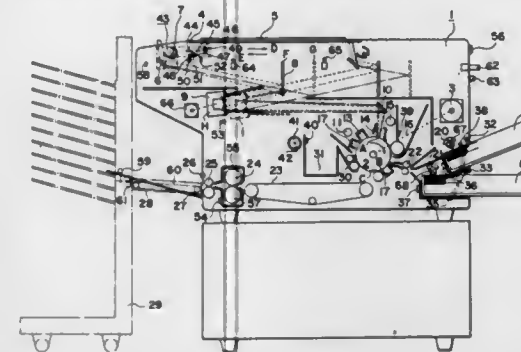
U.S. Cl. 355—14 R

15 Claims

1. A copying apparatus with variable image magnification comprising:

a light source for exposure scanning of an original;
 a photosensitive member for forming an electrostatic latent image in response to the light from said original;
 a mirror for guiding said light to said photosensitive member;
 a lens for focusing said light onto said photosensitive member; and
 control means for controlling the movements of said mirror and said lens independently so as to allow said mirror and lens to be moved individually to their respective positions for a desired image magnification and so as to allow one of said movements to be initiated after the end of the other movement;
 wherein said control means includes first discrimination means for discriminating whether the movement of said

mirror is normal or abnormal and second discrimination means for discriminating whether the movement of said lens is normal or abnormal, wherein said control means



allows formation of the electrostatic latent image only when said first and second discrimination means determines that the movements of both said mirror and lens are normal.

4,711,559

IMAGE FORMING APPARATUS

Takeshi Sambayashi, Oota, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

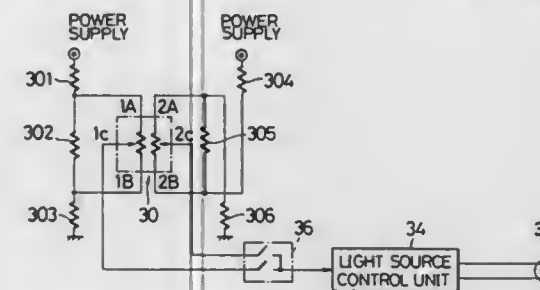
Filed Oct. 30, 1986, Ser. No. 925,065

Claims priority, application Japan, Oct. 31, 1985, 60-242841

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—14 D

8 Claims



1. An image forming apparatus for forming electrostatic latent images on an image bearing member by irradiating images from a light source and developing the electrostatic latent images to form the images on a recording body, which comprises:

first development means for normally developing the electrostatic latent image;
 second development means for inversely developing the electrostatic latent image;
 mode selecting means for selecting a first mode in which said first development means is used or a second mode in which said second development means is used; and
 image density level changing means (30,40,50) for controlling the density levels of images to a same level by a same manipulation regardless the development mode selected by said mode selecting means.

4,711,560

IMAGE PROCESSING APPARATUS

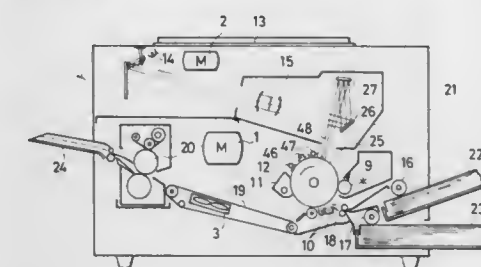
Masao Hosaka, Sagami, and Takashi Saito, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
 Continuation of Ser. No. 751,424, Jul. 3, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,626

Claims priority, application Japan, Jul. 10, 1984, 59-143476; Jul. 10, 1984, 59-143477; Jul. 10, 1984, 59-143478

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—14 C

17 Claims



1. An image processing apparatus comprising:
 image processing means for forming an image;
 means for displaying information relating to image formations;
 a memory medium storing a program for controlling said image processing means, said memory medium being removably provided in said image processing apparatus; and
 control means for reading out the program stored in said memory medium and determining a function of said image processing apparatus in accordance with the program;
 wherein said display means displays information associated with the determined image processing function and said control means includes a memory storing a monitor program that controls the program read out from said memory medium, said memory constantly storing the monitor program.

4,711,561

TONER RECOVERY DEVICE

Ryoichi Tsuruoka, Hongo Ebina, Japan, assignor to Rank Xerox Limited, London, England

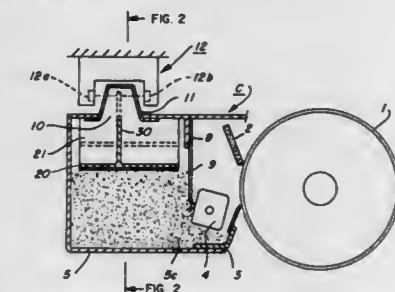
Filed Oct. 16, 1986, Ser. No. 919,732

Claims priority, application Japan, Oct. 21, 1985, 60-233411

Int. Cl.⁴ G03G 15/00, 21/00

U.S. Cl. 355—3 R

16 Claims



1. A toner recovering device for recovering residual toner from an image bearing member comprising a toner recovering box adapted for containing recovered toner therein and having a transparent or translucent window at the upper portion thereof, said recovery box containing a float member vertically movable to float on top of toner recovered in said recovery box in response to the amount of toner recovered in said recovery box, said float member having fixed to its top a flag member at a position corresponding to said window so that as the

level of toner increases said float member rises corresponding to the quantity of recovered toner and said flag member may be viewed in said window providing an indication of the amount of toner recovered in the toner recovery box.

4,711,562

IMAGE-FORMING APPARATUS

Lambertus A. Pothast, Boxmeer; Johannes P. Grootentraast, Tegelen, and Joannes F. J. Verdonchot, Nederweert, all of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

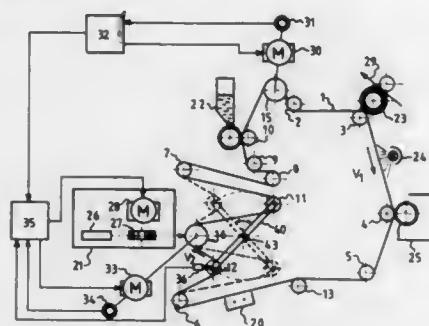
Filed Dec. 18, 1986, Ser. No. 944,233

Claims priority, application Netherlands, Dec. 24, 1985, 8503559

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355-16

5 Claims



1. An image-forming apparatus comprising:
 - (a) a belt-like medium on which an image can be formed;
 - (b) a plurality of processing stations for forming the image on the medium;
 - (c) a first system for conveying the medium past a first processing station, the first system having a plurality of mutually parallel, freely rotatable rollers and a drive device for driving the medium at a first constant speed;
 - (d) at least a second system for conveying the medium past a second processing station, the second system having a plurality of mutually parallel, freely rotatable rollers and a drive device for driving the medium at a second speed which at least temporarily differs from the first speed; and
 - (e) wherein two rollers of the second system, one of which is situated in front of and one after the second processing station when considered in the direction of medium movement, are interconnected and are secured to a rotatable lever mechanism, the axis of rotation of which is parallel to and equidistant from the two rollers and is situated in the plane defined by the two rollers.

4,711,563

PORTABLE COLLAPSIBLE DARKROOM

Bennett D. Lass, 85 Harman Rd., Edison, N.J. 08837

Filed Feb. 11, 1987, Ser. No. 13,439

Int. Cl.⁴ G03B 27/52

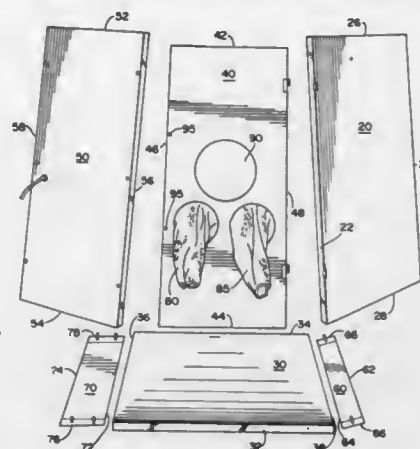
U.S. Cl. 355-21

9 Claims

1. A portable collapsible darkroom assembly for enclosing a photographic enlarger, comprising:
 - (a) left and right parallel side panels, each having a top, bottom, front and rear edge;
 - (b) a back panel removably secured to the rear edge of each of said left and right side panels;
 - (c) a door having a length slightly less than the length of said left and right side panels, said door being removably and hingedly attached to one of said left and right side panels and latchable to the front edge of the other of said left and right side panels for providing access by an operator to the inside of said darkroom assembly;
 - (d) top and bottom front panels removably attached to top and

bottom portions of the front edge of each of said left and right side panels, respectively;

a top panel removably attached to the top edge of each of said left, right, back and top front panels, thereby creating a light-tight enclosure when said door is latched to the



front edge of the other of said left and right side panels; and

first and second sleeved arm ports provided on said door for providing access by an operator to the inside of the dark-room assembly.

4,711,564

MECHANISM FOR THE DRIVE OF ACTUATION ELEMENTS MOVABLE IN SEALED REGIONS OF NON-MECHANICAL PRINTER OR COPIER MEANS

Hubert Mugrauer, Poering; Ernst Puritscher, Unterhaching, and Franz Wittmann, Isen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

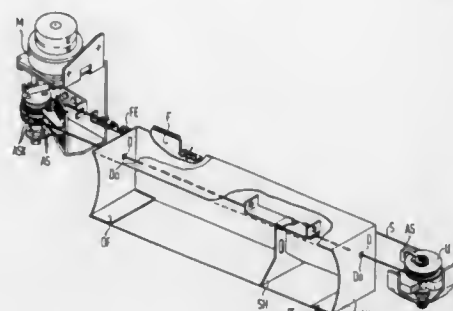
Filed Dec. 3, 1986, Ser. No. 937,490

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1985, 3542733

Int. Cl.⁴ G03B 27/52

U.S. Cl. 355-30

11 Claims



8. A mechanism for the drive of actuation elements movable in sealed regions of a printer or copier means with the assistance of a motor-driven cable roller arranged outside of a sealed region wrapper via a traction cable secured to said actuation element, comprising the improvement that said cable roller is composed of a thermoplastic synthetic and includes guide grooves on its generated surface for said traction cable, which is composed of plastic-clad steel, said guide grooves proceeding in a spiral, said cable roller being arranged on a stationary rotational axis via a thread, said rotational axis thread having the same characteristic as said guide grooves in terms of direction and pitch, and said traction cable being fixed to the generated surface of said cable roller via a clamp element, whereby during the movement of said cable roller, said traction cable is

conducted through seals of said sealed region at a relatively constant angle on a substantially straight line.

4,711,565

ADD-ON ATTACHMENT FOR HIGH-SPEED PHOTOGRAPHIC PRINTER

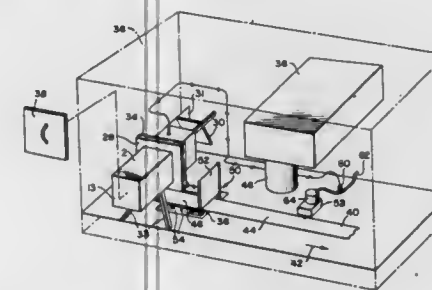
Thomas F. Franchina, Johnson City, N.Y.; Gunnar G. Gudmundson, Longmeadow, and John R. Reuss, Westfield, both of Mass., assignors to 2610 PGA Partnership, San Francisco, Calif.

Continuation of Ser. No. 843,802, Mar. 27, 1986, abandoned, which is a continuation of Ser. No. 478,612, Mar. 24, 1983, abandoned. This application Feb. 6, 1987, Ser. No. 15,500

Int. Cl.⁴ G03B 27/32

U.S. Cl. 355-39

12 Claims



1. Apparatus for use in conjunction with a high-speed photoprinter having a dark cabinet structure with an external opening in one surface thereof and a primary projection system disposed in the dark cabinet, the primary projection system periodically operating to project primary images onto a photosensitive medium disposed in the photoprinter, said apparatus comprising:

projection means for projecting secondary images onto the photosensitive medium in response to a control signal;

control means for supplying said projection means with said control signal, said control means including a circuit means which determines when each primary image is projected onto the photosensitive medium by the primary projection system and which generates said control signal in response to each projection of the primary image such that synchronization is achieved between the operation of said projection means and the operation of the primary projection system to establish a one-to-one correspondence between each primary image projected onto the photosensitive medium and each secondary image projected onto the photosensitive medium; and

a support means for retaining said projection means in a predetermined orientation relative to the primary projection system in the photoprinter such that said secondary images projected from said projection means are positioned on the photosensitive medium in the photoprinter in fixed relationship to the primary images, said support means including a support structure having an add-on configuration adapted to releasably secure said projection means in the external opening of the photoprinter dark cabinet to provide access to said projection means from outside the dark cabinet.

4,711,566

APPARATUS FOR ELECTRONIC SCANNING AND MICROFILMING OF DOCUMENTS

Bruce M. Evans, Columbia Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 31, 1985, Ser. No. 793,674

Int. Cl.⁴ G03B 27/52

U.S. Cl. 355-41

2 Claims

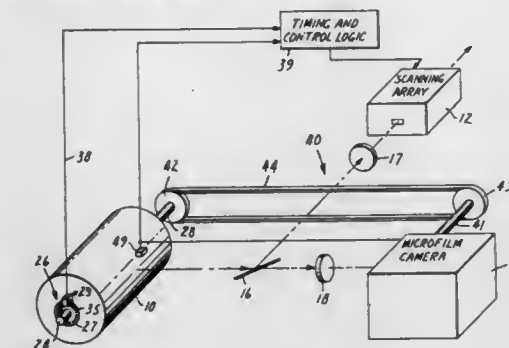
1. Apparatus for storing documents on microfilm and for

obtaining digital signals representative of the image present on a document for storage in a memory, including:

a document transport means providing a movable surface for receiving a document;

a light responsive electronic scanning array;

a microfilm camera; and



optical means for exposing a document to light when carried by said document transport means, said optical means including a beam splitter mirror for directing the light reflected from the document to said light responsive electronic scanning means for the generation of digital signals representative of the image carried on the document and to said microfilm camera for exposure of film in accordance with the light directed to said microfilm camera.

4,711,567

EXPOSURE APPARATUS

Akikazu Tanimoto, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

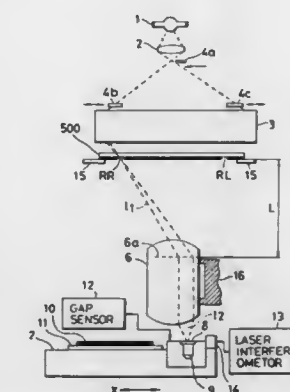
Continuation of Ser. No. 800,094, Nov. 20, 1985, Pat. No. 4,629,313. This application Aug. 18, 1986, Ser. No. 897,644

Claims priority, application Japan, Oct. 22, 1982, 57-184443; Nov. 22, 1982, 57-204856; Mar. 7, 1983, 58-35737; Jul. 11, 1983, 58-125889; Jul. 22, 1983, 58-133691

Int. Cl.⁴ G03B 27/42

U.S. Cl. 355-53

23 Claims



1. An exposure apparatus for producing semiconductor devices comprising:

- (a) a mask in which a plurality of sets of a first mark and a second mark are placed at predetermined positions, the first marks extending in one direction and the second marks extending in a direction at nearly right angles to said one direction;
- (b) means for illuminating said mask;
- (c) an optical system for forming on a given plane an image of each of a plurality of said first and second marks of said mask illuminated by said illuminating means;
- (d) light intensity detecting means having at least one first detection surface and at least one second detection surface

for detecting the images of the plurality of sets of said first mark and said second mark, said at least one first detection surface extending in a determined direction on a rectangular coordinate system intersecting the optical axis of said optical system at nearly right angles, said at least one second detection surface extending in the other direction at nearly right angles to said determined direction, said light intensity detecting means detecting the intensity of light incident on said at least one first detection surface and said at least one second detection surface and producing light intensity signals;

(e) means for moving said at least one first detection surface and said at least one second detection surface on said given plane; and

(f) means for detecting optical characteristics of said optical system in response to said light intensity signals.

4,711,568

EXPOSURE APPARATUS

Makoto Torigoe, Kawasaki; Akiyoshi Suzuki, Tokyo, and Terumasa Sakai, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

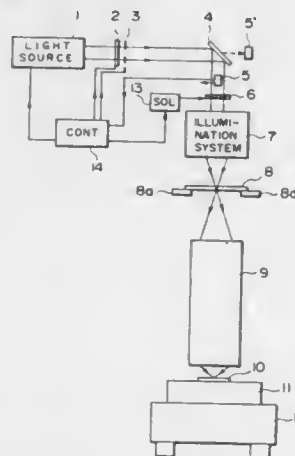
Filed Mar. 5, 1986, Ser. No. 836,630

Claims priority, application Japan, Mar. 6, 1985, 60-44206

Int. Cl.⁴ G03B 27/74, 27/80

U.S. Cl. 355—68

9 Claims



1. An exposure apparatus for exposing a first object to light passed through a second object having a pattern to transfer the pattern of the second object onto the first object, said apparatus comprising:

an intermittently emitting type light source for intermittently emitting a pulse of light to intermittently irradiate the second object with the pulse of light;

first means operative on said light source to cause the same to emit one or more pulses of light for the detection of the quantity of light from said light source;

means for detecting the quantity of light of said one or more pulses from said light source; and

second means responsive to said detecting means to adjust the quantity of light to be incident on the first object, in accordance with the detection by said detecting means.

4,711,572
ORIGINAL ILLUMINATION DEVICE WITH AN
AUTOMATIC ILLUMINATION CONTROL
Kadotaro Nishimori; Keiji Yoshida, and Tadashi Ohira, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

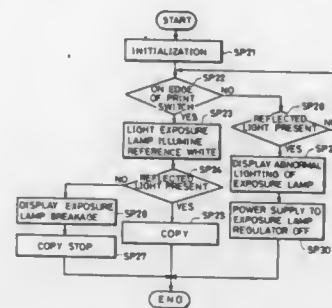
Filed Jul. 2, 1986, Ser. No. 881,460

Claims priority, application Japan, Jul. 5, 1985, 60-148968

Int. Cl.⁴ G03B 27/72

U.S. Cl. 355—69

36 Claims



1. An original illumination device comprising illuminating means including a light source for illuminating an original;

power supply means for supplying power to said light source;

automatic illumination control means including light receiving means disposed in a light path through which light from the original illuminated by said light source passes, and outputting a signal corresponding to the amount of light received, for controlling said power supply means to accommodate the amount of radiation of said light source responsive to the signal from said light receiving means; malfunction determining means for determining a malfunction concerned with said light source responsive to a signal from said light receiving means at a prescribed time; and

malfunction control means for controlling power supply to said light source to be stopped in response to the determination of malfunction by said malfunction determining means.

4,711,570

VACUUM CONTACT EXPOSURE APPARATUS

Petrus R. Nelen, Essen, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

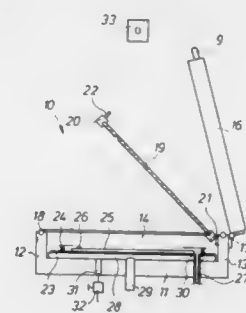
Filed Dec. 10, 1986, Ser. No. 940,067

Claims priority, application European Pat. Off., Dec. 17, 1985, 85202091.6

Int. Cl.⁴ G03B 27/20

U.S. Cl. 355—91

9 Claims



1. A vacuum contact exposure apparatus for contact-exposing a light-sensitive photographic sheet to at least one other

sheet, such apparatus comprising a flexible blanket with a peripheral sealing means, a transparent plate for positioning against said sealing means to form with said blanket a contact exposure space enclosing said sheets, and means for evacuating air from such exposure space to promote intimate contact between said sheets and between the sheets and said plate preparatory to exposure through said plate, characterised in that the apparatus incorporates a housing for air-tightly enclosing the plate-blanket assembly prior to such exposure step, aspirating means associated with said housing and by operation of which the pressure on the exterior of said plate and blanket can be reduced so that it is at sub-atmospheric during said evacuation of air from said exposure space, and means by operation of which air can be admitted into said housing while said contact exposure space remains evacuated; said housing being openable to allow contact exposure then to be effected through said transparent plate.

4,711,571

RADIANT EMISSION AND ABSORPTION MULTIGAS ANALYZER

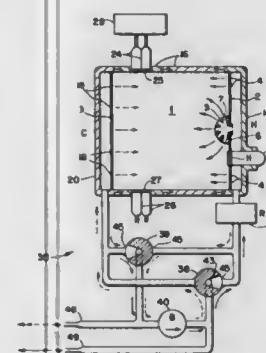
Mark Schuman, 101 G St. SW. #516, Washington, D.C. 20024

Continuation of Ser. No. 818,919, Jan. 15, 1986, abandoned, which is a continuation of Ser. No. 675,474, Nov. 29, 1984, abandoned, which is a continuation of Ser. No. 416,677, Sep. 10, 1982, abandoned. This application Mar. 16, 1987, Ser. No. 28,026

Int. Cl.⁴ G01J 3/443; G01N 21/62

U.S. Cl. 356—311

156 Claims



1. A radiant emission and absorption gas analyzer comprising a cavity reflective to electromagnetic radiation, said cavity including first and second wall surfaces pervious to fluid flow through said surfaces, said surfaces each containing one or more ports through which fluid can pass into and back out of the cavity, means for injecting fluid at a first average temperature into the cavity through said first surface while withdrawing fluid from the cavity through said second surface, then injecting fluid at a second average temperature into the cavity through said second surface while withdrawing fluid from the cavity through said first surface, means for cyclically repeating the sequence of said injections at approximately said first and second average temperatures, and further including detector means responsive to the cyclical variation in spectral electromagnetic radiance in the cavity resulting from the presence of a substance of interest in the fluid and the cyclical injections of fluid at approximately said first and second average temperatures into the cavity; the ports of said first surface being shaped and located on said first surface such that most of the first surface is pervious to fluid flow, said first surface constituting a significant fraction of the internal wall area of the cavity and being reflective to electromagnetic radiation in the cavity; said injecting means including means for maintaining a substantially constant fluid pressure in the cavity during the cycle.

4,711,572

METHOD AND ARRANGEMENT FOR MULTIELEMENT ANALYSE

Winfried Quillfeldt; Bernd Naumann, both of Jena-Lobeda, and Helmut Becker-Ross, Berlin, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

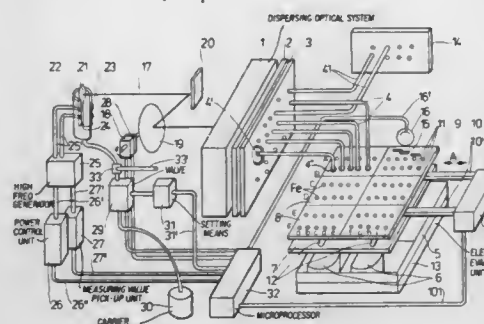
Filed Dec. 10, 1984, Ser. No. 680,220

Claims priority, application German Democratic Rep., Dec. 1, 1983, 2573606; Mar. 1, 1984, 2604567

Int. Cl.⁴ G01J 3/443

U.S. Cl. 356—311

7 Claims



1. A spectrometer arrangement for simultaneous analysis of a plurality of chemical elements comprising an excitation source for exciting a sample material to emit a radiation, reflector means,

an optical dispersing means, said reflector means being for directing said radiation upon said optical dispersing means, said optical dispersing means producing a plurality of spectral lines in dependence of the sample material to be analyzed in a first plane,

a first optical mask being associated with said optical dispersing means in a second plane and including as many exit slits in said second plane as there are spectral lines, said first plane and said second plane being substantially coincident,

a plurality of light cables having each a light entry face and a light exit face,

a means for mounting the light entry faces of said light cables in a third plane,

said third plane being in narrow spaced and parallel relation to said second plane subsequent to said second plane,

said light entry faces being optically connected via said slits to a respective one of said spectral lines, if any,

a plug-in unit being provided with a plurality of plug-in holes for insertion of the light-exit faces of said light cables,

said plug-in unit being subdivided into a plurality of sections of substantially equal size,

a second mask being arranged subsequent to said plug-in unit at a narrow distance to the latter,

said plug-in holes in said plug-in unit being substantially arranged in lines and columns being at right angles to one another,

said second mask including as many slits as there are sections in said plug-in unit, said slits being aligned in parallel to said columns of plug-in holes and an right angles to said lines, each slit being associated to a respective section of said plug-in unit,

an array of photodetectors being constituted of as many photo-detectors as there are sections in said plug-in unit, said array of photodetectors being arranged in a parallel plane subsequent to said second mask at a narrow space to the latter, said light exit faces of said light cables being optically connected via said plug-in unit and said

second mask to respective photodetectors of said array of photodetectors,
 means for displacing said plug-in unit in a fourth plane defined by said lines and columns and in directions right angles to said columns, detection means for identifying the position of a column of plug-in holes relative to the photodetectors,
 said detection means being provided at the edge portion of said plug-in unit adjacent said columns, a microprocessor, a first connection means for connecting said displacement means to said microprocessor,
 a second connection means for connecting said detection means to said microprocessor, an evaluation unit being connected to the photodetector outputs,
 said evaluation unit serving for evaluating the photodetector output signals, if any, indicative of a chemical matter contained in said sample material,
 excitation parameter adjustment means, being operatively connected to the excitation source and to said microprocessor,
 said microprocessor setting at least one excitation parameter on information from said detection means for a respective column of plug-in holes relative to the photodetectors.

4,711,573

DYNAMIC MIRROR ALIGNMENT CONTROL

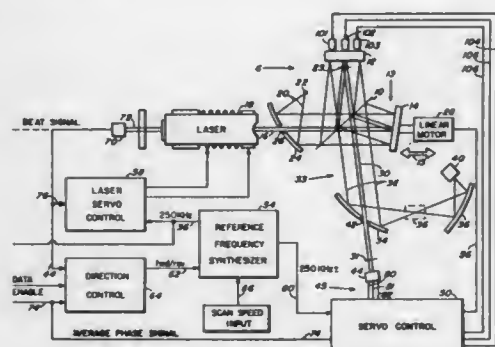
Geert Wijntjes, Belmont, and Michael Hercher, Marblehead, both of Mass., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 472,771, Mar. 5, 1983, abandoned. This application Dec. 12, 1986, Ser. No. 940,196

Int. Cl.⁴ G01J 3/45

U.S. Cl. 356—346

12 Claims



1. A closed loop servo control for dynamically aligning mirrors of an interferometer used for spectroscopic measurements, comprising:

means for producing a laser beam having a plurality of light frequencies which are heterodyned through the interferometer to obtain a continuous and constant intensity modulation of a select frequency usable to indicate the distance between the surface of a first mirror in the interferometer and a reflected image of the surface of a second mirror in the interferometer;

detector means for detecting said continuous intensity modulation in said laser beam to obtain a plurality of electrical signals each having a frequency characteristic of said intensity modulation frequency and of a modified intensity modulation when either said first or second mirror is moved relative to the other at selected locations in a cross section of said laser beam;

control means for comparing the phase of signal frequency of each of the plurality of electrical signals with the average of their phase, to obtain a plurality of correction signals, each of said correction signals indicating a correction in distance required between a portion of the surface of the first mirror and a corresponding portion of the

image of the surface of the second mirror to bring said first mirror and said image into parallel alignment; and
 a plurality of adjusting means mounting one of said mirrors and responsive to said correction signals for changing the alignment between said controllably separating the surface of said first mirror and the image of the surface of said second mirror.

4,711,574

MINIMUM DEADPATH INTERFEROMETER AND DILATOMETER

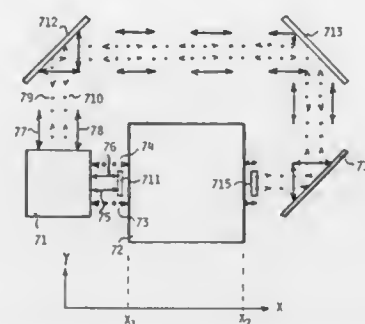
Richard R. Baldwin, Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 27, 1984, Ser. No. 604,702

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—349

4 Claims



1. A minimum deadpath interferometer comprising:

a light source;

at least one movable element including a movable first reflecting surface attached to a first side of a movable stage in a lithography apparatus;

optical means having a plurality of elements for producing from light from the light source a first beam of light and a second beam of light, for directing the first beam to reflect off of the first reflecting surface and then combine with the second beam of light to produce an output beam having a common output direction that is independent of small rotations of the first reflecting surface and of each element of the optical means, and for directing the first and second beams along paths that are common mode except for a minimal deadpath that includes the first reflecting element and that is necessary to allow movement of said first movable element;

a second reflecting element, said second beam reflecting off of the second reflecting element before the second beam is combined with the first beam in the output beam, such that the interference effects in the output beam are responsive only to the relative motion of the first surface relative to the second surface, whereby these interference effects are insensitive to equal translations and rotations of the first and second surfaces;

said second reflecting surface being as close to the first surface as is practicable without interfering with the movement of the movable stage, whereby the deadpath between the first and second reflecting elements is minimized and whereby the motion of the first surface relative to the second surface can be detected;

a third reflecting surface and a fourth reflecting surface; second beam directing means for directing the second beam from the optical means to the third reflecting surface and back to the optical means and for directing the first beam from the optical means to the fourth reflecting surface and back to the optical means;

said third reflecting surface being attached to a second side of the movable stage opposite to its first side and said fourth reflecting surface being as close to the third reflecting means as is practicable without restricting motion of the wafer stage, whereby the deadpath between the third

and fourth reflecting surfaces is minimized and whereby the interference effects in the output beam are insensitive to thermal expansion of the stage in the direction from the first side to the second side.

4,711,575

NON-PENDULOUS COUNTER-BALANCED DITHER MECHANISM FOR LASER GYRO

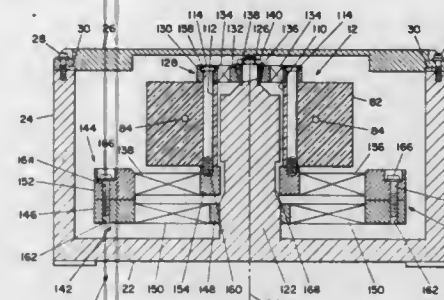
Alfred L. Butler, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 1, 1982, Ser. No. 364,328

Int. Cl.⁴ G01B 9/02; H01S 3/083

U.S. Cl. 356—350

9 Claims



1. A laser gyro assembly, comprising:

a ring laser having a sensing axis;

a case for housing said ring laser, said case having a base with a center post disposed normal thereto and coaxially with said sensing axis;

said ring laser having an aperture therethrough disposed within said case with said center post passing through said aperture;

first spring means connected between said ring laser and said center post to mount said ring laser about said sensing axis to said case;

a counterweight;

second spring means connected between said counterweight and said center post to mount said counterweight to said case;

third spring means mounting said ring laser about said sensing axis to said counterweight; and

said first spring means being disposed along said sensing axis on the opposite side of said ring laser from said second and third spring means to support said ring laser against pendulous rotation from forces normal to said sensing axis.

4,711,576

WAVE FRONT ABERRATION MEASURING APPARATUS

Mikichi Ban, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

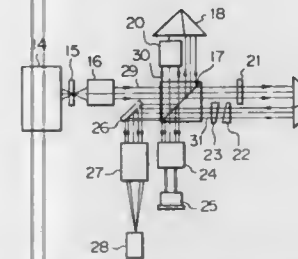
Filed Feb. 3, 1986, Ser. No. 825,596

Claims priority, application Japan, Feb. 4, 1985, 60-19443

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—353

15 Claims



1. A wave front aberration measuring apparatus comprising:

beam splitting means for splitting a light beam to be measured into a first beam and a second beam;

first converting means for deflecting a travel direction of said first beam by 180° and laterally displacing said first beam, said first converting means being able to be displaced along said travel direction for controlling the optical path length of said first beam;

second converting means for deflecting a travel direction of said second beam by 180° and laterally displacing said second beam;

a beam expander optical system disposed in the optical path of one of said first and second beams for forming an expanded beam from said one beam to obtain a reference wave front;

interference fringe forming means for superposing the first and second beams guided by said first and second converting means to form interference fringes; and

interference fringe observing means for observing the state of the interference fringes obtained by said expanded beam and the other beam of said first and second beam to measure the state of wave front of the light beam to be measured, from the state of said interference fringes.

4,711,577

OPTICAL CONFIGURATION OF FIBER OPTIC SENSOR FOR SYMMETRIC DYNAMIC RESPONSE ABOUT THE OPTICAL NULL

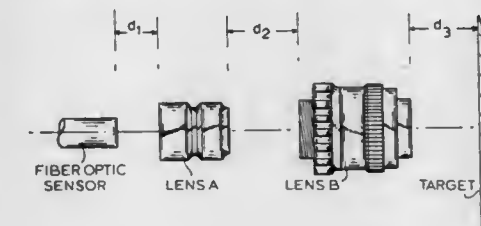
Gregory Hull-Allen, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Continuation of Ser. No. 709,560, Mar. 8, 1985, abandoned. This application May 7, 1987, Ser. No. 49,005

Int. Cl.⁴ G01B 11/14

U.S. Cl. 356—373

1 Claim



1. A method of determining the displacement of a fiber optic sensor from a target in which a first lens is spaced from the target at a first distance and a second lens is spaced from said target at a second distance which provides the greatest intensity response at said first lens to achieve the largest response slope value for a given distance and thereafter spacing said first lens from said second lens to provide symmetrical slope values of response.

4,711,578

OPTICAL DISPLACEMENT SENSORS

Jean-Claude A. Chaimowicz, London, England, assignor to National Research Development Corporation, London, England

Filed Jun. 13, 1985, Ser. No. 744,383

Claims priority, application United Kingdom, Jun. 14, 1984, 8415128

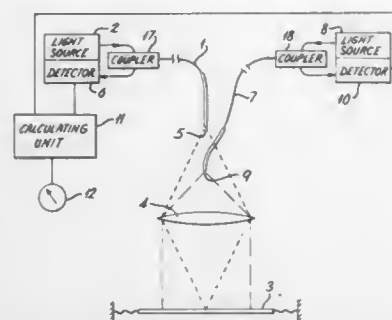
Int. Cl.⁴ G01B 11/14

U.S. Cl. 356—375

4 Claims

1. An optical displacement sensor comprising a reflector the displacement of which is to be measured, a first monochromatic radiation source coupled to a single optical fibre one end of which is directed onto the reflector so as to illuminate the reflector with radiation from the source, signal detector means for detecting and measuring radiation reflected back from the reflector to said one end and along said optical fibre and arranged so that the amount of the reflected radiation detected is a function of the position of the reflector, a further monochro-

matic radiation source, an optical path from said further monochromatic radiation source and arranged to enable radiation from said further source to illuminate said reflector, and reference detector means for detecting and measuring radiation



from said further monochromatic radiation source reflected back from the reflector, said optical path being arranged so that the amount of the reflected radiation detected in the reference detector means is independent of the position of the reflector.

4,711,579

SYSTEM FOR AUTOMATICALLY INSPECTING A FLAT WORKPIECE FOR HOLES

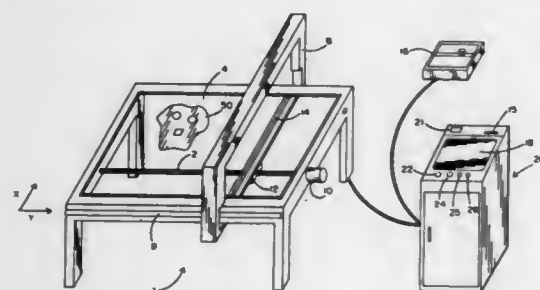
Blair E. Wilkinson, El Toro, Calif., assignor to H. Fred Johnston and Carl Grosso, both of Santa Ana, Calif.

Filed Aug. 12, 1986, Ser. No. 895,644

Int. Cl.⁴ G01B 11/14

U.S. Cl. 356-375

20 Claims



1. A system for automatically inspecting a workpiece for holes formed therein, said system comprising; an inspection table having a transparent surface upon which the workpiece is to be laid; light source means; optical detector means; and means movable across said table in a first direction and retaining said light source means and said optical detector means in alignment with one another above and below said transparent table surface; said optical detector means extending across said table in a second, perpendicular direction relative to said first direction and being responsive to optical signals received from said light source means through said transparent table surface for providing an indication, depending upon the position of said movable retaining means, of the location in the workpiece of holes formed therein through which said optical signals are transmitted.

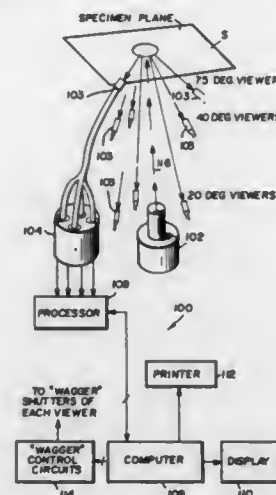
MODELING PROPERTIES OF FLAKE FINISHES USING DIRECTIONAL RESOLUTION AND STATISTICAL FLAKE ORIENTATION DISTRIBUTION FUNCTION

William H. Venable, Falls Church, Va., assignor to Hunter Associates Laboratory, Inc., Reston, Va.

Filed Jan. 28, 1985, Ser. No. 695,594

Int. Cl.⁴ G01J 3/50, 3/51; G01N 21/27; G06F 15/46
U.S. Cl. 356-406

32 Claims



1. A method for characterizing a surface painted with a paint of the type having a plurality of nearly flat reflective flakes embedded therein, said method comprising the steps of:

- (1) directing a beam of light toward said surface;
- (2) independently receiving portions of said beam of light reflected and/or scattered by said surface in a plurality of different directions;
- (3) determining the spectral content of the light reflected by said surface in each of said plurality of different directions;
- (4) in response to said determined spectral contents, characterizing the distribution of light reflected by said embedded flakes in directions other than said plurality of directions according to a statistical method describing the orientation of said flakes; and
- (5) producing and outputting electrical signals indicating said characterization.

4,711,581

ROTARY PROCESSOR FOR PLASTIC AND POLYMERIC MATERIALS PROVIDING SURGE COMPENSATION

Pradip S. Mehta, Corpus Christi, Tex.; Lefteris N. Valsamis, Stratford, and Gary S. Donolan, Naugatuck, both of Conn., assignors to Farrel Corporation, Ansonia, Conn.

Filed Mar. 4, 1987, Ser. No. 21,412

Int. Cl.⁴ B01F 7/10

U.S. Cl. 366-99

26 Claims

1. In a rotary processor having a rotor carrying a plurality of channels each encircling an axis and stationary means providing a coaxial closure cooperatively arranged with the channels for providing a plurality of enclosed processing passages, a system for reducing fluctuations in the mass flow and pressure of plastic and polymeric materials comprising:

- said rotor channels and closure surface defining at least one stabilizing passage and at least one metering passage;
- means defining a feed path leading into said stabilizing passage for feeding into said stabilizing passage a flow of such material subject to such fluctuations;
- means defining a first material transfer passage leading from said stabilizing passage to an entrance into said metering passage;
- means defining a second material transfer passage leading from an exit from said metering passage back into said stabilizing passage;

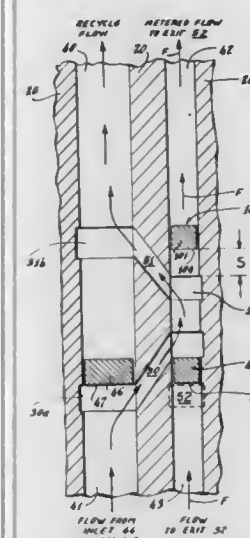
said first material transfer passage communicating with said stabilizing passage at a location downstream from the location where said feed path communicates with said stabilizing passage;

channel blocking means in said stabilizing passage downstream from said first material transfer passage and being operatively associated with said first material transfer passage for causing the material carried by said stabilizing passage to be transferred from said stabilizing passage through said first material transfer passage into said metering passage;

said exit being located downstream from said entrance;

said second material transfer passage communicating with said stabilizing passage at a location downstream from said channel blocking means;

an adjustable throttling element in said metering channel downstream from said exit for partially blocking said



metering passage for allowing a metered flow of material to be carried past said throttling element for providing a metered flow of material in said metering passage downstream from said throttling element;

said throttling element being associated with said exit for causing excess material in said metering passage exceeding said metered flow to be transferred back through said second material transfer passage into said stabilizing passage for recycling;

means defining a discharge outlet from said metering passage downstream from said throttling element; and

second channel blocking means in said metering passage operatively associated with said discharge outlet for causing said metered flow to leave said metering passage through said discharge outlet wherein the fluctuations in mass flow and pressure are substantially reduced or practically eliminated.

4,711,582

ROTARY MIXING OF TWO COMPONENT RESINS IN DISPOSABLE PLASTIC BAG

Richard B. Kennedy, 519 Branchville Rd., Ridgefield, Conn. 06877

Filed Nov. 7, 1986, Ser. No. 928,058

Int. Cl.⁴ B01F 9/00

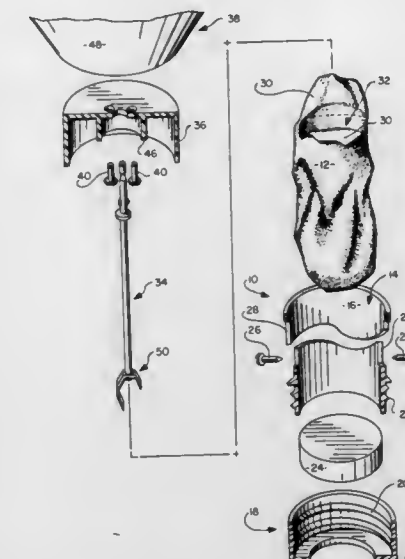
U.S. Cl. 366-279

19 Claims

1. An apparatus for mixing and agitating a liquid, the apparatus comprising:

- a rigid outer receptacle defining an interior and having an open top, the receptacle is provided with interior sidewalls that have an inwardly sloping configuration; and
- a flexible and disposable liquid resistant bag having an open top, a closed bottom and sidewalls, the bag is adapted and constructed to line the interior sidewalls of the outer

receptacle; when liquid to be mixed is deposited into the bag, the bag expands contacting the sidewalls of the outer



receptacle, a mixing element can then be placed through the open tops of the receptacle and the bag for mixing liquid contained in the bag.

4,711,583

ASTRONOMICAL WRIST-WATCH

Ludwig Oechslin, Lucerne; Urs Giger, Solothurn, and Jörg Spöring, Lucerne, all of Switzerland, assignors to Ulysse Nardin S.A., Le Locle, Switzerland

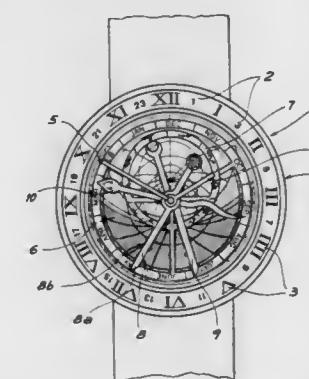
PCT No. PCT/CH85/00106, § 371 Date Nov. 5, 1986, § 102(e) Date Nov. 5, 1986, PCT Pub. No. WO86/05288, PCT Pub. Date Sep. 12, 1986

PCT Filed Jul. 1, 1985, Ser. No. 932,546

Int. Cl.⁴ G04B 19/26

U.S. Cl. 368-16

15 Claims



1. An astronomical watch comprising an epicyclic train of gearing and a temporal reference means having a mechanical output which is coupled, via said epicyclic train of gearing, to at least one astronomical magnitude indicator, said epicyclic train of gearing including gear means for each astronomical magnitude indicator, a ring gear, a driving central wheel, and a rotatable planetary wheel carrier, the ring gear and the driving central wheel of said train of gearing being coupled to said temporal reference while said planetary wheel carrier is connected to a local time indicator, and said gear means comprising multiple rotary components that are mounted on the planetary wheel carrier of the train and that have a predetermined reduction ratio.

4,711,584

MOVEMENT OF ELECTRONIC WATCH OF ANALOG DISPLAY TYPE

Masayoshi Tanazawa, Tokyo; Masaru Shoji, Saitama, and Wataru Yamada, Tokyo, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

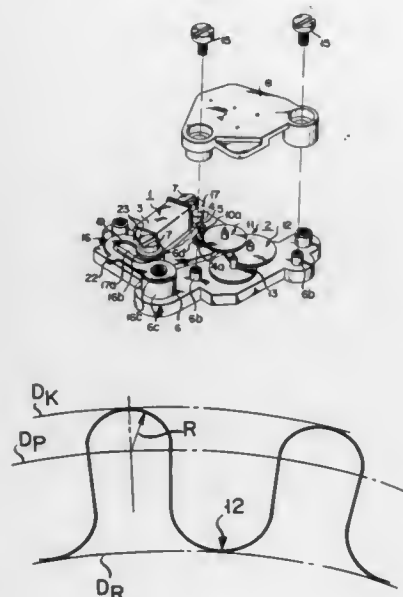
Filed May 19, 1986, Ser. No. 865,189

Claims priority, application Japan, Jun. 24, 1985, 60-94371[U]

Int. Cl.⁴ F04C 23/02

U.S. Cl. 368—88

14 Claims



1. A movement of an electronic watch of analog display type comprising:

- a baseplate made of a synthetic resin;
- a step motor mounted on said baseplate and including a rotor, a stator and a coil;
- a bearing plate made of a synthetic resin and facing and spaced apart at a predetermined distance from said synthetic resin baseplate; and
- a gear train consisting of a plurality of gears including gears journaled between said baseplate and bearing plate to transmit the rotation of said rotor of said motor to hands; said gears of said gear train being made of synthetic resin, the teeth of said gears being formed in an arc, and the radius of a top of the teeth of each of said gears is at least 0.4 times that of a module M defined by the relationship $M = \text{diameter of pitch line} / \text{divided by number of teeth}$.

4,711,585

CUEING AID FOR PRENATAL BREATHING CONTROL

Meredith L. Fresquez, Chris J. Fresquez, both of 1711 Wisteria La., Brea, Calif. 92621, and Daniel A. Porter, 1706 Fairgreen Dr., Fullerton, Calif. 92633

Filed Feb. 24, 1986, Ser. No. 832,414

Int. Cl.⁴ G04F 8/00; G04C 21/00

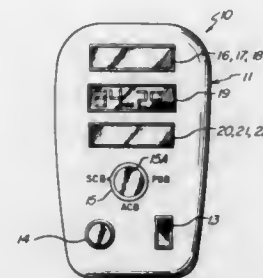
U.S. Cl. 368—109

1 Claim

1. An apparatus for producing sensory cues for use by an expectant mother to synchronize her breathing to comprising:
- (a) first electrically energizable cueing means for producing a first sensory cue;
 - (b) second electrically energizable cueing means for producing a second sensory cue;
 - (c) electronic sequencer means for cyclically and alternately energizing said first and second cueing means, said sequencer means being capable of producing a plurality of manually selectable time patterns of cyclical and alternate

energization of said first and second cueing means, at least one of which said time patterns having a duty cycle which varies automatically in a pre-determined fashion;

- (d) means for manually selecting a desired one of said plurality of patterns;
- (e) means for manually starting and stopping said sequence of alternate energization of said first and second cueing means; and



- (f) counter means for measuring and displaying the elapsed time between successive starting actuations of said starting and stopping means, said counter means including a counter responsive to first and successive odd actuations of said manual starting and stopping means in
 - (i) displaying an accumulated count proportional to elapsed time,
 - (ii) clearing said counter to zero, and
 - (iii) accumulating a new count proportional to elapsed time.

4,711,586
CLOCK

Hiroyuki Kizawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

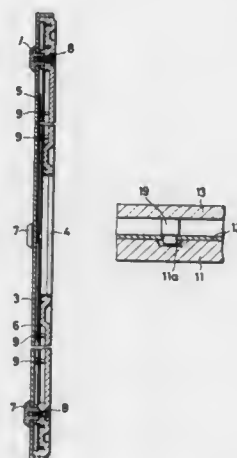
Filed Jun. 19, 1986, Ser. No. 876,373

Claims priority, application Japan, Jun. 19, 1985, 60-92484[U]; Jun. 19, 1985, 60-92485[U]

Int. Cl.⁴ G04B 19/06

U.S. Cl. 368—232

20 Claims



1. In a clock comprising a capsule having a timepiece movement therein, an install plate for firmly supporting said capsule disposed thereon, a dial having a front face and time reference members on the front face, the dial being disposed in front of said install plate, a transparent front cover having a back face and being disposed in front of said dial to define a gap between the back face of the transparent front cover and the front face of the dial, and hands disposed in the gap and driven by said timepiece movement to move relative to the time reference members to indicate time; the improvement wherein said time reference members have a height substantially corresponding

to said gap between said dial and said front cover so as to act as spacers for maintaining said gap.

4,711,587

METHOD OF AND APPARATUS FOR MEASURING THE SOFTENING POINT OF A VITREOUS SPECIMEN

Giuseppe Cocito, S. Giusto Can.se, Italy, assignor to Csel-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

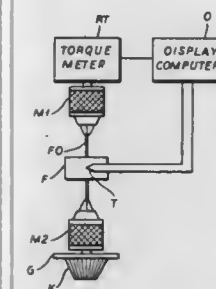
Filed Jul. 21, 1986, Ser. No. 887,275

Claims priority, application Italy, Jul. 24, 1985, 67676 A/85

Int. Cl.⁴ G01N 25/04

U.S. Cl. 374—16

6 Claims



1. A method of determining the softening point of a vitreous specimen, comprising the steps of:

- (a) imparting torsion to said specimen;
- (b) heating a portion of said specimen over a temperature range including the softening point of the specimen and measuring the temperature to which said specimen is heated;
- (c) measuring torque developed by said specimen, said torque varying with the temperature to which said specimen is heated as a function of viscosity changes in said specimen; and
- (d) obtaining from the measured torque with respect to temperature, the softening point in the temperature interval in which said viscosity drops.

4,711,588

SEQUENTIAL DRAWER SLIDE

Gene R. Clement, Grandville, Mich., assignor to Knap & Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Aug. 18, 1986, Ser. No. 897,779

Int. Cl.⁴ A47B 88/04; F16C 29/04

U.S. Cl. 384—18

25 Claims



1. A sequential drawer slide comprising:
- a cabinet slide member;
 - an intermediate slide member mounted for linear movement with respect to said cabinet slide member between extended and retracted positions;
 - a drawer slide member mounted for linear movement with respect to said intermediate slide member between extended and retracted positions; and
 - sequencing means for sequencing the operation of said slide members so that only one of said cabinet and drawer slide members is permitted to move with respect to said intermediate slide member at any given position of said slide members, said sequencing means including a control lever member shiftably supported by said intermediate slide member between first and second positions, said sequencing means further including first and second engagement

means on said drawer and cabinet slide members, respectively, said control lever member coacting with said first engagement means when in the first position and with said second engagement means when in the second position to aid in interlocking said intermediate slide member with the one of said cabinet and drawer slide members carrying the coacting engagement means, said control lever member being shiftable between the first and second positions when said intermediate rail is in its extended position and said drawer rail is in its retracted position.

4,711,589

MANUAL SEAT ADJUSTER WITH CAM LOCK

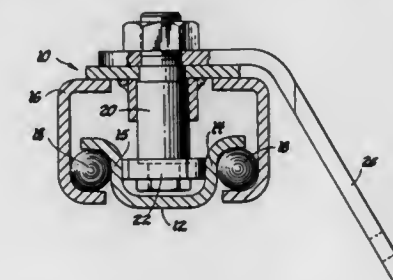
Neil G. Goodbred, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1986, Ser. No. 846,106

Int. Cl.⁴ A47C 1/00; F16C 29/12; F16M 13/00

U.S. Cl. 384—34

13 Claims



1. A vehicle seat slide structure comprising in combination:
- a floor plate for attachment to said vehicle having at least one generally straight vertical leg;
 - a seat plate slidably mounted on said floor plate having a section horizontally displaced from said floor plate;
 - a vertically oriented cam shaft connected with said seat plate with a cam plate for selectively frictionally engaging with said vertical leg; and
 - means for imparting angular movement to said camshaft.

4,711,590

SELF-ALIGNING BEARING AND OIL CAP MOUNT FOR AN ELECTRIC MOTOR

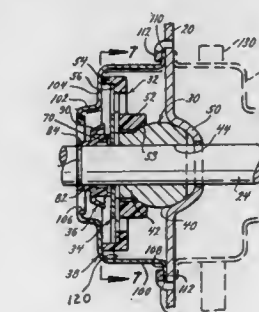
Bryan L. Lakin, Springfield, Mo., assignor to Fasco Industries, Inc., Boca Raton, Fla.

Filed Dec. 6, 1985, Ser. No. 806,028

Int. Cl.⁴ F16C 23/04, 33/74, 33/10; H02K 5/16

U.S. Cl. 384—206

54 Claims



1. In an electric motor or the like having a housing, a rotor and rotor shaft, and end shields, a self-aligning bearing mount for locating the rotor between the end shields of the motor housing, the end shields having sockets that receive self-aligning bearings for mounting the rotor shaft, said bearing mount comprising: a spacer, means securing said spacer to the rotor

shaft against axial movement relative thereto, said spacer having means defining a thrust surface; a spring having a hub portion through which the rotor shaft extends, a ring surrounding said hub, and resilient means between the hub and ring, said hub having a bearing seat, and said ring having means defining a thrust plate seat; a self-aligning bearing; and end shield having a socket therein receiving said self-aligning bearing, said bearing also seated against the bearing seat of the spring hub; a thrust plate seated within the thrust plate seat of the spring ring, said thrust plate seat locating and supporting said thrust plate in axially spaced relation to the spring hub and bearing; said thrust surface of said spacer running against a surface portion of said thrust plate spaced radially inwardly from said thrust plate seat.

4,711,591

PRINTER FOR PRINTING BY INK TRANSFER

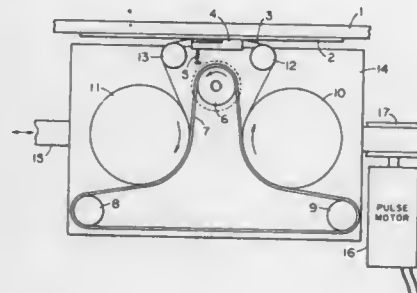
Mineo Nozaki, Kawasaki, and Osamu Asakura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 624,797, Jan. 26, 1984, abandoned, which is a continuation of Ser. No. 515,431, Jul. 18, 1983, abandoned, which is a continuation of Ser. No. 275,407, Jun. 18, 1981, abandoned. This application Feb. 10, 1986, Ser. No. 828,591

Claims priority, application Japan, Jun. 30, 1980, 55-88708; Jun. 30, 1980, 55-88709

Int. Cl.⁴ B41J 33/32

U.S. Cl. 400—225

8 Claims



1. A printer for printing on a printing medium with ink coated on a support material, said printer comprising:
a print head for transferring ink on the support material onto the printing medium by the heat of said print head;
a carriage having said print head mounted thereon, said carriage being disposed for movement in the direction of a print line;
a first motor for moving said carriage in the direction of the print line, said first motor including print signal generating means for generating two types of signals;
a second motor mounted on said carriage for feeding the support material;
driving signal generating means for generating driving signals to be supplied to said first motor and said second motor, said driving signal generating means including control means responsive to one of the two types of signals from said print signal generating means for providing a driving signal to said second motor; and
feeding means mounted on said carriage, said feeding means being operative in response to said control means for causing said second motor to feed the support material by the same amount as the movement of said carriage.

1. In a marking pen comprising:
 - (a) a sheath having an upper portion and a lower portion terminating in an open front end,
 - (b) a writing member disposed at least partially within said sheath and having a cylindrical front portion of relatively small diameter terminating in a writing tip, and a rear portion of relatively large diameter which serves as a confining reservoir for marking fluid, and
 - (c) actuating means for causing movement of the writing member between a downwardly held writing position and an upwardly held non-writing position, the improvement comprising:
 - (d) an elastic sealing member positioned within the lower portion of said sheath and comprised of:
 - (1) an upper portion having a cylindrical bore centered upon the pen axis and having a diameter permitting penetrative insertion by the front portion of said writing member,
 - (2) an annular retaining groove communicating with said cylindrical bore,
 - (3) a lower portion having at least two segments having inner and outer surfaces and adapted to move between a divergent disposition and a converged disposition adjacent said axis wherein the inner surfaces mate to form a chamber whose upper extremity communicates with said bore, and
 - (4) an intermediate portion having recesses which permit said segments to move in hinge-like manner with respect to said upper portion,
 - (e) at least one pressing shoulder inwardly directed from the lower portion of said sheath and adapted to engage the outer surfaces of said segments whereby a pressing shoulder directs the segments to their divergent disposition and a pressing shoulder directs the segments to their converged disposition,
 - (f) holding means associated with the lower portion of said sheath and adapted to hold said segments in their divergent disposition, and
 - (g) an annular activating shoulder disposed upon the front portion of said writing member and adapted to fit tightly within said annular retaining groove, whereby,
 - (h) when said writing member is moved downwardly within said sheath, said activating shoulder forces said sealing member downwardly, causing: (1) said pressing shoulder associated with divergence of the segments to act upon exterior surfaces of the segments to direct the segments to their divergent disposition, (2) said segments to become held in their divergent disposition by said holding means, (3) said activating shoulder to leave said bore, and (4) said writing tip to protrude from the open front end of the sheath, and
 - (i) when said writing member is moved upwardly within said

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CAPLESS RETRACTABLE MARKING PEN

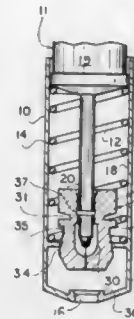
Allen R. Gregory, 3126 Tidewater Dr., Norfolk, Va. 23509

Filed Jun. 6, 1986, Ser. No. 871,469

Int. Cl.⁴ B43K 9/00

U.S. Cl. 401—107

3 Claims



sheath, said activating shoulder re-enters said bore, forcing said sealing member upwardly and causing: (1) said pressing shoulder associated with convergence of the segments to act upon exterior surfaces of the segments to direct the segments to their converged disposition, (2) placement of the writing tip within said chamber formed by the mated inner surfaces of the converged segments, and (3) sealing of the upper extremity of said chamber with the writing tip disposed therein.

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METAL FITTING

Juergen Wilhelmi, Syke-Wachendorf, Fed. Rep. of Germany, assignor to Heinrich Wilhelmi GmbH & Co., Fed. Rep. of Germany

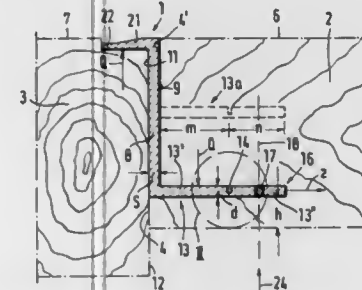
Filed Jan. 24, 1986, Ser. No. 822,062

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 3502234

Int. Cl.⁴ F16B 7/08

U.S. Cl. 403—187

5 Claims



1. A metal fitting for an end connection of a wood beam to a perpendicularly extending supporting structure, said fitting including: a web to be arranged between said end of said wood beam and said supporting structure; a supporting flange at an upper end of said web extending perpendicular to said web, said supporting flange to be received on the supporting structure; and at least one leg extending in an opposite direction to said supporting flange from the web, said leg being connectable at its free end portion to said wood beam by at least one fastening means extending perpendicularly to said leg, said leg having an upper surface being provided with a groove-like attenuation between said web and said fastening means, said attenuation extending over the full width of said leg and parallel to the web.

4,711,594

TOOL HANDLE AND HEAD ASSEMBLY

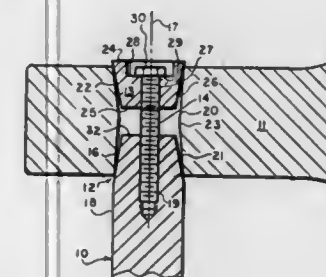
Jerry W. Agee, Rte. 1, Box 362, Paragould, Ark. 72450

Filed Feb. 24, 1987, Ser. No. 17,455

Int. Cl.⁴ B25G 3/00

U.S. Cl. 403—263

2 Claims



1. A tool assembly comprising:
(a) an elongated metal handle having a substantially straight

center axis, a generally cylindrical surface, distal and proximal extremities, a conically tapered zone associated with said distal extremity and convergent onto a flat terminal face perpendicularly disposed to said axis, and a threaded axially aligned recess which opens upon said terminal face,

- (b) a working head seated upon said distal extremity, said working head having a centered channel comprised of first and second conically tapered surfaces outwardly divergent from a site of confluence within said channel, said first tapered surface being configured to accommodate the tapered zone of said handle,
- (c) a metal plug having parallel flat upper and lower faces and a conically tapered sidewall inwardly convergent at said lower face, and having an axial bore, said plug being in tight fitting engagement within said second conically tapered surface whereby said lower face is directed toward the terminal face of said handle, and
- (d) a steel machine bolt which passes through the bore of said plug and threadably engages the recess of said handle, said bolt having a head that rests against the upper face of said plug, whereby tightening of said bolt draws both the handle and plug toward said site of confluence within the channel of said working head,
- (e) the angles of the tapers of the tapered zone of the handle and sidewall of the plug being between about 2 and 10 degrees, and
- (f) the angles of the tapers of the tapered zone of the handle and sidewall of the plug being about 1 degree greater than the taper angles of the first and second conically tapered surfaces of the channel, thereby causing a tapered annular gap to exist between the handle and working head.

4,711,595

DISMOUNTABLE STRUCTURE

Robert Magid, 83 Chalmers Gardens, West Hampstead, London NW6, England, and John Choong, 221a Victoria Rise, London SW4, England

Continuation of Ser. No. 604,905, Apr. 27, 1984, abandoned.

This application Jun. 9, 1986, Ser. No. 873,828

Claims priority, application United Kingdom, May 12, 1983, 8313067; Jan. 24, 1984, 8402148

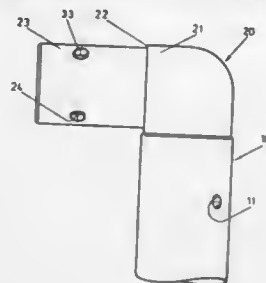
Int. Cl.⁴ F16B 7/10, 21/00

U.S. Cl. 403—108

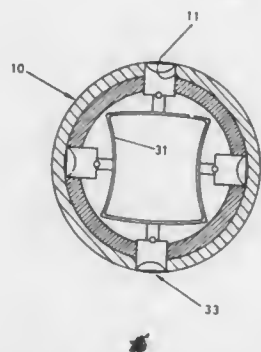
15 Claims

1. A dismountable structure comprising a first structural part including a tubular female member having a pair of diametrically opposed first holes therein and a second structural part including a tubular male member having two pairs of diametrically opposed second holes therein, said second holes being disposed in a common radial plane with the holes in each pair of second holes being circumferentially spaced from the holes in the other pair of second holes, said members being dimensioned and configured so that said male member is alternatively receivable in said female member in a first locked position wherein one of said pairs of second holes is aligned with said first holes and a second locked position wherein the other pair of said second holes is aligned with said first holes, fastening means in said male member for alternatively securing said male and female members in said first or second locked positions, said fastening means comprising a resilient carrier having two pairs of diametrically opposed locking elements, said locking elements being resiliently, inwardly displaceable and being aligned with and received in said second holes, one pair of said locking elements extending into said first holes when said members are received in said first locked position but being resiliently displaced to a position wherein they resiliently engage the inner surface of said female member when said members are in said second locked position, the other pair of said

locking elements engaging the inner surface of said female member when said members are received in said first locked



ing with respect to one another at said lower situated surface;
said housing being provided with groove means at said lower situated surface;
said bolt member being with groove means;
said security apparatus comprising a securing element displaceably guided in said groove means of said housing;
spring means for urging said securing element into engagement with said groove means of said bolt member;
an actuation pin;
means for connecting said actuation pin with said securing element; and
said actuation pin serving for displacing the securing element against the force of said spring means.



position but extending into said first holes when said members are received in said second locked position.

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APPARATUS FOR SECURING A CONNECTION

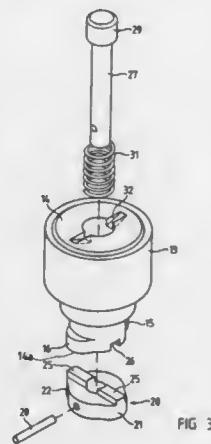
Werner Bruderer, Zürich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland
Filed Feb. 3, 1986, Ser. No. 826,145

Claims priority, application Switzerland, Feb. 14, 1985, 665/85

Int. Cl.⁴ F16D 1/06

U.S. Cl. 403—348

7 Claims



1. An apparatus for ensuring the security of a connection, especially a rotary connection, with a housing, comprising:
a bolt member inserted into said housing and having a lower situated surface;
said bolt member being connected with said housing by rotating said bolt member through a predetermined angle;
said security apparatus preventing the bolt member from unintentionally releasing itself from the housing upon unintentional rotation of said bolt member and said hous-

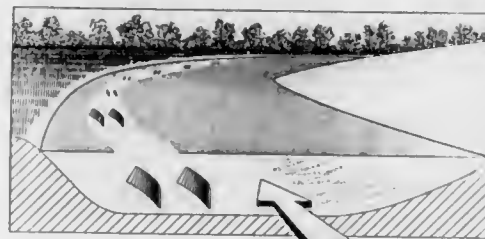
4,711,597
VANES FOR BANK PROTECTION AND SEDIMENT CONTROL IN RIVERS

A. Jacob Odgaard, and John F. Kennedy, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Jul. 18, 1986, Ser. No. 886,871
Int. Cl.⁴ E02B 3/04

U.S. Cl. 405—25

5 Claims



1. A flow-training structure for use in open-channel flow of rivers and streams comprising a vane having an upstream end and a downstream end, a top surface and a bottom surface connecting the upstream end and downstream end, a double-curved convex surface on one side between the top and bottom surfaces and upstream and downstream ends and a double-curved concave surface on the other side, the upstream end being vertical and the downstream end having its center line lying in a vertical plane and inclined to the vertical thus creating the double-curved surfaces on each side of the vane, said curved surfaces producing directional changes in the flow when the vane is positioned in a river or stream.

4,711,598

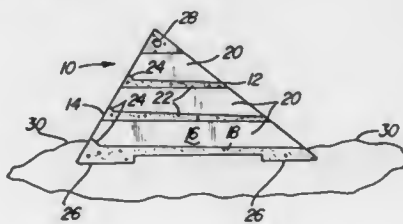
BEACH EROSION CONTROL DEVICE

Cecil Schaaf, and Craig Schaaf, both of 3015 Palmer Rd., Standish, Mich. 48658

Filed Sep. 26, 1986, Ser. No. 912,752
Int. Cl.⁴ E02B 3/04, 3/06

U.S. Cl. 405—30

6 Claims



1. In a device for protecting shoreline from erosion of the type characterized by a generally prism-shaped module intended to be positioned on a surf-area floor and at least par-

tially submerged in the surf, and having a seaward-facing front wall and a landward-facing rear wall, the module having at least one passage extending therethrough from the front wall to the rear wall, the passage having a lower surface over which water flows as it passes through the passage, the passage having a smaller cross-sectional area at its opening in the rear wall than in the front, the improvement which comprises:

the lower surface of the portion of the passage immediately adjacent the rear wall opening defining a deflector which is upwardly and rearwardly inclined at an angle of between about 35 and 65 degrees relative to the lower surface of the forwardly-located adjacent portion of the passage;
whereby said deflector surface causes landwardly flowing water in the passage to be deflected upwardly as it exits the rear wall opening of the passage.

4,711,599

PAVING BLOCK

Michael N. Glickman, London, England, assignor to McCauley Corporation Limited, London, England

PCT No. PCT/GB85/00125, § 371 Date Nov. 20, 1985, § 102(e)
Date Nov. 20, 1985, PCT Pub. No. WO85/04434, PCT Pub. Date Oct. 10, 1985

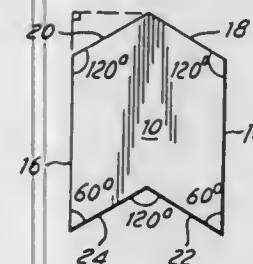
PCT Filed Mar. 28, 1985, Ser. No. 805,475

Claims priority, application United Kingdom, Mar. 29, 1984, 8408129

Int. Cl.⁴ E01C 5/00

U.S. Cl. 404—41

10 Claims



1. A paving block having six side surfaces, a substantially planar top surface and a substantially planar bottom surface, said top and bottom surfaces being substantially at right angles to each other of said side surfaces, said six side surfaces including two longer side surfaces of essentially equal length and four shorter side surfaces of essentially equal length, said longer side surfaces being essentially parallel and essentially twice as long as said shorter side surface, two of said shorter side surfaces being located at one end of said longer side surfaces and essentially making an angle of 120° with respective ones of said longer side surfaces, and the other two of said shorter side surfaces being located at the other end of said longer side surfaces and essentially making an angle of 60° with respective ones of said longer side surfaces.

4,711,600

HEATING DEVICE FOR USE WITH ASPHALT PAVEMENT RESURFACING EQUIPMENT

Larry A. Yates, 889 Gardendale Dr., Columbia, S.C. 29201

Filed Jan. 8, 1985, Ser. No. 689,717

Int. Cl.⁴ E01C 23/14

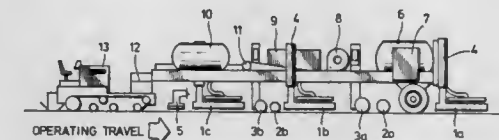
U.S. Cl. 404—95

1 Claim

1. A device, for use on an asphalt pavement resurfacing apparatus traversing across the road surface, for the nondestructive, rapid, continuous heating of a depth of asphalt pavement from a temperature where the asphalt pavement is normally in a firm state to a higher temperature where the asphalt pavement is in a pliable state, at a rate of heating in which the heat output is sufficiently high to create temperatures which very rapidly bring up the surface temperature to a point where heat transfer through the depth is efficient and expedient, and

that the elevated temperatures can be maintained with only minimal degradation of the asphalt pavement and consequential smoke, by the scrupulous exclusion of oxygen from the heated road surface, where said heating device consists of the elements of:

- equipment for generating a supply of a combustible mixture of pressurized gases to be burned in a burner assembly suspended over the road surface, said equipment consisting of a tank for holding the fuel, a means for vaporizing fuel fed from the tank, a primary pressure regulator for controlling the fuel to the burner assemblies, a secondary pressure regulator for controlling the fuel flow to an individual burner assembly, a blower for generating compressed air, an air control valve for regulating the flow of air to an individual burner assembly, a means for mixing and setting a selected ratio of fuel and air for an individual burner assembly, and a line for piping the gaseous mixture to an individual burner assembly, where the equipment enables the adjustment of the individual burner assemblies through a wide degree of turndown or ratio of gases;
- a burner assembly consisting of a structural frame onto



which are mounted in a single layer, on the underneath side of the frame, a plurality of open flame, directional burners, a plurality of insulation pans filled with high emissivity insulation interspaced among and contiguous with the burners, and a flexible skirt mounted on the perimeter of the frame, which drapes from the frame to the surface of the road, where the combined elements of the frame, the burners, the insulation pans, the insulation and the skirt, together form a pressurizable burner chamber over the road surface, and where the burners, which serve as a partial wall of that chamber, are in direct contact with the cooling, outside air;

- suspension elements for attaching the burner assembly to the asphalt pavement resurfacing apparatus, where the suspension elements enable the burner assembly to be adjusted such that the assembly follows the road contour; and when the device is in operation the heat output of the burner assemblies can be adjusted up to very high levels without seriously degrading the asphalt pavement by maintaining a pressure sufficiently positive in the burner chamber to occlude the entrance of outside air, even when said outside air is not uniformly pressurized as is the case with a wind.

4,711,601

METHOD OF INSTALLING OFFSHORE CONSTRUCTIONS

Isaac Grosman, Julian Alvarez 2427, Buenos Aires, Argentina
Continuation of Ser. No. 740,317, Jun. 3, 1985, which is a continuation of Ser. No. 536,249, Sep. 27, 1983, abandoned. This application Jul. 28, 1986, Ser. No. 892,878

Int. Cl.⁴ E02B 17/00; E02D 5/00

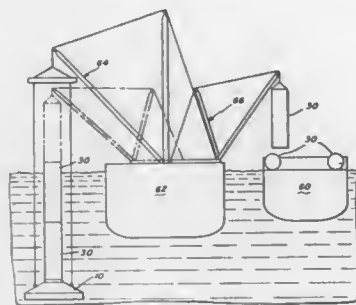
U.S. Cl. 405—204

22 Claims

1. A method of constructing and installing an offshore gravity structure type construction in a body of water, by assembling columns one-by-one using column sections for each individual column, comprising the steps of:

- providing a number of hollow, unconnected supporting column sections;
- transporting a plurality of said unconnected column sections to a construction site on a sea going vessel;
- providing only one construction vessel with at least two hoisting systems thereon;
- arranging, with one hoisting system on said one construc-

- tion vessel, a single first one of the column sections for a single column near the surface of a body of water;
- (e) at least partly submerging with said one hoisting system the single first column section for said single column in the body of water by a certain amount;
- (f) placing, with another of said at least two hoisting systems, a single second one of the column sections on the top of the first column section and joining the top of the first column section to the bottom of the single second column section near the surface of the body of water to thereby build up a single column;
- (g) at least partly submerging with said one hoisting system the second column section as jointed to the first column section by a depth substantially equal to the length of the second column section;
- (h) repeatedly placing with said another hoisting system on



said one construction vessel additional single ones of the column sections, one-by-one, on top of each of the column sections after each column section is at least partly submerged with said one hoisting system on said one construction vessel, and joining the tops of the partly submerged column sections to the bottoms of the additional column sections near the water's surface until a single column of desired height, and having its bottom resting by gravity on the bed of the body of water, is formed by the joined column sections; and

- (i) repeating steps (d) to (h) to form at least a second individual column of desired height by joining a plurality of column sections one-by-one, said second column being spaced from said first mentioned column, said steps (d) to (h) being repeated until a desired plurality of columns are erected in a desired arrangement relative to each other with only said single construction vessel.

4,711,602

TURBULENT FLOW GATE FOR THE INJECTION MOLDING OF TUBULAR PARTS, INCLUDING PARISONS SUITABLE FOR BLOW MOLDING

W. Howard Baker, Hartsville, Tenn., assignor to Precision Rubber Products Corporation, Lebanon, Tenn.

Filed Jan. 17, 1986, Ser. No. 886,459

Int. Cl.⁴ B29C 31/04

U.S. Cl. 425—206

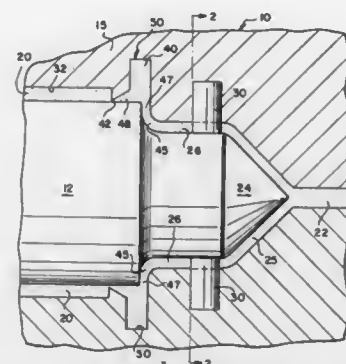
6 Claims

1. Injection apparatus for forming a molded part such as a parison free of weld lines in a mold cavity about a core by injection of plastic material into said cavity through an annular gate surrounding said core from an annular lead-in passage, and in which said core is supported on one or more core pins, which core pins extend through the annular lead-in passage and cause a parting of the plastic material flowing through said passage to said gate, the improvement comprising:

means in said injection apparatus between said passage and said gate defining an annular mixing chamber opening into said passage at a radially inner portion of said chamber, said mixing chamber communicating with said gate at a radially inner portion thereof axially spaced from said annular passageway,

said mixing chamber having a volume which is at least twice the volume defined by said annular lead-in passage down-

stream of said core pins, providing for a volumetric expansion and dwell of plastic material entering therein from said passage accompanied by reversal of direction of



movement of said material creating shear in said material and the remixing of said material across the weld lines formed by said core support pins.

4,711,603

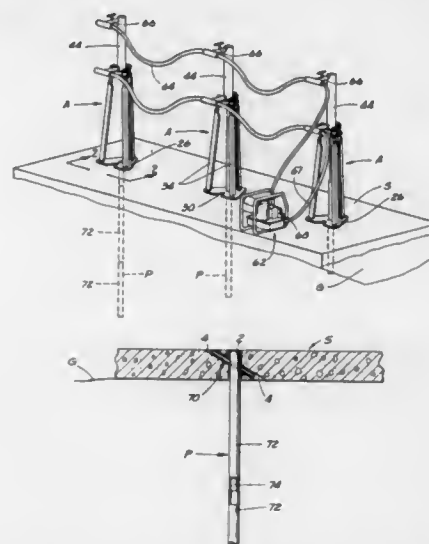
SLAB JACKING PROCESS AND APPARATUS Dondeville M. Rippe, Jr., Edgewater, and David T. Scaturro, Littleton, both of Colo., assignors to Magnum Piering, Inc., St. Louis, Mo.

Filed Feb. 25, 1985, Ser. No. 705,202

Int. Cl.⁴ E02D 7/02

U.S. Cl. 405—230

17 Claims



1. A process for stabilizing and supporting a slab of concrete that extends over underlying ground, said process comprising: boring a vertical hole entirely through the slab at a location where the slab is to be supported; boring an oblique hole into the slab from the upper surface thereof, with the oblique hole intersecting the vertical hole and being substantially smaller in diameter than the vertical hole; driving a pier through the vertical hole and into the underlying ground, the pier being small enough to pass through the vertical hole; exerting a downwardly directed force on the pier while at the same time resisting that force with an upwardly directed counterforce applied to the slab in the region of the vertical hole; thereafter while the force and counterforce are applied, drilling a hole transversely through the pier with that hole being axially aligned with the oblique hole in the slab; thereafter while the force and counterforce are applied, inserting a pin through the

oblique hole in the slab and into the transverse hole of the pier such that the pin projects from the transverse hole into the oblique hole; and thereafter releasing the force and counterforce, whereby the slab in the region of the vertical hole is supported by the pier.

4,711,604

METHOD OF AND APPARATUS FOR INSTALLING AN ANCHOR MEMBER BELOW WATER LEVEL THROUGH A WALL INTO A SOIL FORMATION

Harald Heimsoth, Hamburg, and Thomas Herbst, Wessling, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft

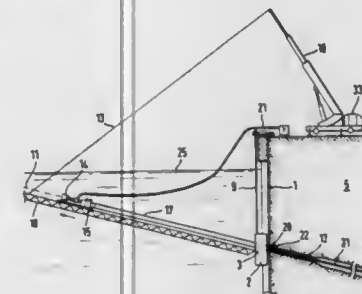
Filed Oct. 3, 1986, Ser. No. 915,318

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535319

Int. Cl.⁴ E02D 29/06

U.S. Cl. 405—260

21 Claims



1. Method of installing an anchor member, such as a rod, cable or pipe, into a soil formation retained by a wall where the installation can be effected through the wall below a water level, comprising the steps of mounting a retaining member on the wall at the location where the anchor member is to be installed through the wall into the soil formation, positioning an elongated drill mount having a first end and a second end on the retaining member, supporting a drilling member on the drill mount, drilling an opening through the wall by means of the drilling machine, inserting the anchor member through the opening in the wall and into the soil formation, and anchoring the anchor member within the soil formation, wherein the improvement comprises, after adjusting and attaching the retaining device to the wall, supporting the first end of the drill mount on the retaining device for pivotal movement about a horizontal axis, lifting the drill mount adjacent the second end thereof above the water level into a loading position, pivoting the drill mount about the horizontal axis at the first end thereof, arranging the drilling member adjacent the second end of said drill mount and placing a first drilling tool in the drilling member in the loading position, lowering the drill mount into a drilling position inclined downwardly toward the wall, moving the drilling member toward the wall and drilling the opening through the wall using the drilling member and the first drilling tool, withdrawing the drilling member away from the wall after the opening has been formed and lifting the drill mount upwardly to the loading position so that the second end of the drill mount is located above the water level, replacing the first drilling tool above the water level with a borehole pipe and attaching the borehole pipe to the drilling member, lowering the drill mount from the loading position into the drilling position and driving the borehole pipe through the opening in the wall and for the desired depth into the soil formation and forming a borehole within the soil formation, inserting the anchor member for the desired depth into the borehole pipe, and after the insertion of the anchor member withdrawing the borehole pipe and at the same time injecting a settable grout material into the space between the borehole and the anchor member, and lifting the drilling mount into the loading position for removing the borehole pipe.

4,711,605

KEY APPARATUS

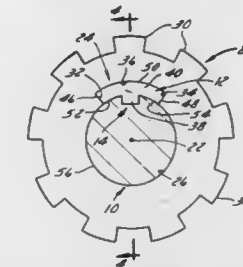
Wasyly G. Hodlewsky, Greendale, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed May 29, 1986, Ser. No. 869,159

Int. Cl.⁴ F16D 1/08; F16H 55/12

U.S. Cl. 403—355

13 Claims



1. A key apparatus for transferring rotating force having a predetermined direction between first and second rotatable members engaging each other and respectively including first and second facing keyways having lengths transverse to the direction of the rotating force, the second keyway having a side positioned transversely to the direction of the rotating force, comprising:

a key including:

a leg portion having a width and being positioned in the first keyway; and

a cross portion integral with the leg and having a width greater than the width of the leg, the cross portion being positioned in the second keyway of the second rotatable member and having an end engaging said transverse side of the second keyway at an angular distance from the leg portion whereby rotating force applied to one of the rotatable members is transferred to the other member through the keyways and through the leg and cross portions including the transverse side of the key.

4,711,606

SHAPED (CONCRETE) BLOCK FOR RETAINING WALLS AND ALSO A RETAINING WALL

Menno Leling, Bremen, and Gerbard Hagenah, Worpswede, both of Fed. Rep. of Germany, assignors to SF-Vollverbundstein-Kooperation GmbH, Bremen, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 824,804

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1985, 3505530; European Pat. Off., Nov. 4, 1985, 85114011.1

Int. Cl.⁴ E02D 29/02

U.S. Cl. 405—286

14 Claims



1. A shaped block of concrete for making a retaining wall (20) which is inclined, relative to the vertical, towards an earth backfill, and which consists of shaped blocks which are arranged one above the other in layers and which have upper

sides and under sides in engagement with one another, characterized in that:

the upper side (23) of the shaped block has three parallel planar seating surfaces (27,28,46) and two stop surfaces (30,48);

the seating surfaces of the upper side (23) comprise a main surface (27) and smaller first and second surfaces (28,46) at first and second ends of the block and lying in planes equally displaced below and above the plane of the main surface (27);

the stop surfaces (30,48) of the upper side (23) extend, respectively, between the main surface (27) and the first end surface (28) of the upper side (23) and between the main surface (27) and the second end surface (46) of the upper side (23);

the under side (24) of the shaped block has three parallel planar seating surfaces (31, 32, 51) and two stop surfaces (34,52);

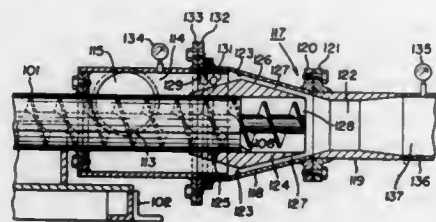
the seating surfaces of the under side (24) comprise a main surface (31), extending parallel to the main seating surface (27) of the upper side (23), and smaller first and second end surfaces (32,51) at the first and second ends of the block and lying in planes equally displaced below and above the plane of the main surface (31) of the under side (24) to the same extent that the first and second end surfaces (28,46) of the upper side (23) are displaced from the plane of the main surface (27) of the upper side (23); and the stop surfaces (34,48) of the under side (24) extend, respectively, between the main surface (31) and the first end surface (32) of the under side (24) and between the main surface (31) and the second end surface (52) of the under side (24), and are separated from each other to the same extent as the stop surfaces (30,48) of the upper side (23).

4,711,607

HIGH SPEED AUGER VENTURI SYSTEM AND METHOD FOR CONVEYING BULK MATERIALS
Charles E. Wynosky, Minersville, Pa., and Joseph Mraz, Plant City, Fla., assignors to Coalair Systems, New York, N.Y.
Filed Oct. 22, 1985, Ser. No. 790,056
Int. Cl. B65G 53/48, 53/66

U.S. Cl. 406—30

14 Claims



1. A conveying system for particulate material comprising: a cylindrical barrel having first and second ends; an auger conveyor rotatably mounted within the barrel; means for supplying the particulate material to the auger conveyor; means for rotating the auger conveyor in an appropriate direction so as to transport the particulate material towards the first end of the barrel; a plenum chamber surrounding the barrel adjacent the first end thereof; a venturi pipe coupled to the plenum chamber and enclosing the first end of the barrel, the venturi pipe having a first tapered section leading directly to a relatively short constriction located beyond the first end of the barrel and a second tapered section of increasing cross-sections directly downstream of the constriction; a jet member within the venturi pipe coupled to the first end of the barrel and extending substantially adjacent to the constriction, the jet member having an outer surface appropriately shaped to conform with the interior surface of the first tapered section of the venturi pipe to form a

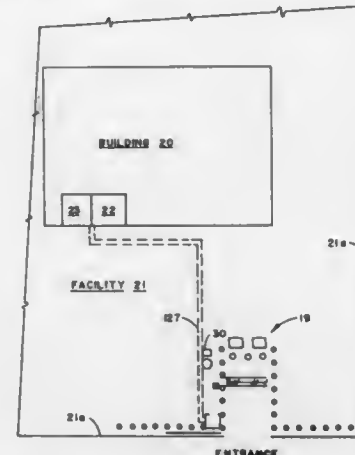
relatively narrow annular passage from the plenum chamber to the constriction, the jet member having an axial bore for channeling the particulate material transported by the auger conveyor into a region substantially adjacent the constriction of the venturi pipe; means for introducing a pressurized gas into the plenum chamber; and means for coupling the venturi pipe to a conduit.

4,711,608

VEHICLE ACCESS CONTROL SYSTEM
Abdallah E. Ghann, 2819 San Juan Blvd., Belmont, Calif. 94002
Filed Jun. 27, 1985, Ser. No. 749,225
Int. Cl. E01F 13/00

U.S. Cl. 404—6

18 Claims



1. A failsafe system for protecting a facility from unauthorized entry by a road vehicle, the system including: an enclosing vehicle-impervious barrier for surrounding the perimeter of the facility, at least one controlled entry and exit vehicle lane for road vehicles extending through the barrier at a predetermined location, the lane including: plural spaced apart fixed lane delineation means for defining the right and left boundaries of the lane through the barricade, the lane delineation means being reinforced, slightly wider than the widest of road vehicles authorized access to the facility and of a height above a road surface of the lane for effectively blocking and preventing travel of a road vehicle except over the surface of the lane between the right and left boundaries thereof, the delineation means including physical obstructions for constraining vehicular traffic to a predetermined passageway adjacent said facility, a series of operably releasable reinforced barricades placed in the lane, each barricade having an obstruction position effective to block vehicle movement therebeyond, the barricades being arranged successively in the lane, so that if a first barricade in its obstruction position is passed by an unauthorized vehicle, a second barricade in its obstruction position remains in its path, and if the second barricade in its obstruction position is passed, a third barricade in its obstruction position remains in its path, a series of prime movers, each prime mover being connected to operate a said barricade so that it may be released and withdrawn under positive control from its obstruction position; the system further including integrated controller means for controlling the operations of the prime movers so that the barricades may be emplaced in their obstruction positions and may be released from their obstruction positions to enable a single authorized vehicle at a time to pass said barricades, the integrated controller means being adapted

to emplace and maintain the barricades in their respective obstruction positions in a failsafe mode in the absence of a control signal generated to permit passage over the lane by an authorized vehicle; and, a bullet-proof observation booth that houses the primary controls for the entire security system and from which an operator may see all vehicular traffic approaching and entering said lane and from which said single controller means may be controlled.

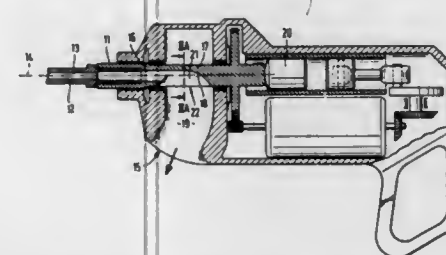
4,711,609
DRILL TOOL

U. Christian Seefluth, Hamburg, Fed. Rep. of Germany, assignor to Sita Baulemente GmbH, Pinneberg, Fed. Rep. of Germany
Filed Jun. 29, 1983, Ser. No. 509,049

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224141; Jul. 8, 1982, 3225519; Oct. 12, 1982, 3237721
Int. Cl. B23Q 11/00

U.S. Cl. 408—68

4 Claims



1. A power tool including a drive means, a housing means for accommodating said drive means, a drilling tool, and means for detachably connecting the drilling tool to the power tool, the drilling tool comprising a shank portion, a drill head means provided on said shank portion, a continuous bore means extending through said drill head means and said shank portion for receiving a discharging core material, the continuous bore means are disposed concentrically to a longitudinal center axis of the drilling tool and extend along an entire axial length of the shank portion, a further bore means is provided in a portion of said drive means and forms an extension of said continuous bore means, said further bore means includes a recess portion having a substantially circularly shaped deflection surface terminating in an outwardly directed opening in a portion of said drive means at a position shortly behind a mounting position of the drilling tool in the power tool, said outwardly directed opening being in communication with a discharge space defined by a portion of the housing means of the power tool and having a substantially radially outwardly directed outlet through which the core material from the continuous bore means and said further bore means is discharged from the power tool, and wherein said discharge space has a diameter greater than a diameter of said continuous bore means and said further bore means.

4,711,610

BALANCING CHUCK

Roger W. Riehl, Parsippany, N.J., assignor to Machine Technology, Inc., Parsippany, N.J.

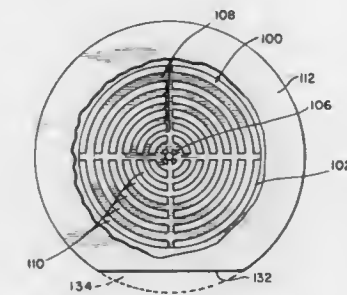
Filed Apr. 4, 1986, Ser. No. 848,806
Int. Cl. B23Q 3/00

U.S. Cl. 409—141

35 Claims

1. A chuck for balancing a rotating object comprising a housing securing said object for rotation therewith, an annular race within said housing, a counterweight positionable within said race, said race having a first region provided with a plurality of retaining means for releasably retaining said counterweight at a selected location within said first region during rotation of said housing and a second region constructed to permit relative movement between said counterweight and said housing, and control means for controlling the movement

of said counterweight between said first region and said second region for arranging said counterweight in retained association



with a selected one of said retaining means at a location corresponding to a selected portion of said object.

4,711,611

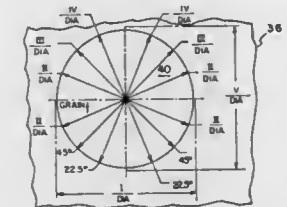
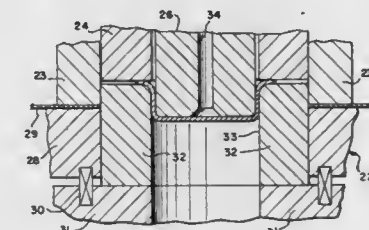
METHOD AND APPARATUS FOR FABRICATING A CAN BODY

Henry C. Bachmann, and Eral C. Frazee, both of Dayton, Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio
Filed Jul. 23, 1986, Ser. No. 889,054

Int. Cl. B21D 51/28

U.S. Cl. 413—69

16 Claims



1. A method of fabricating from ductile sheet metal a can body with an integral bottom wall, comprising the steps of: forming a rounded non-circular blank having an outer edge from a sheet of ductile metal, said outer edge being continuously rounded, said blank having a greater width across the grain of the metal than along such grain; forming said blank into a cup-shaped receptacle having a bottom wall and a side wall of not less than the desired inside diameter of the can body, said side wall having an axial dimension substantially less than the desired axial dimension of the can body with the side wall of said receptacle substantially thicker than the thickness desired in the finished can body; and thinning the side wall of said receptacle to the desired thickness of the can body so as to lengthen the side wall in the axial direction to at least the desired axial dimension of the can body.

4,711,612 PALLETING DEVICE

Gerd-Georg Kwauka, Gutersloh, Fed. Rep. of Germany, assignor to Mohndruck Graphische Betriebe GmbH, Fed. Rep. of Germany

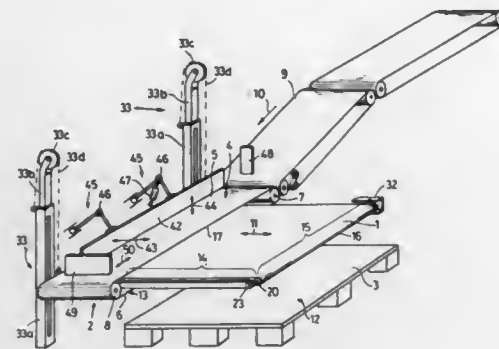
Filed Mar. 26, 1985, Ser. No. 716,362

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411295

Int. Cl.⁴ B65G 57/24

U.S. Cl. 414—68

20 Claims



1. In a device for the palleting of slab-form products, especially of book blocks or books, provided with a first arrangement for feeding the products, a second arrangement for forming the products into a product row, and a third arrangement for receiving a product set consisting of several product rows, with the third receiving arrangement being provided with drive means for advancing and retracting the third receiving arrangement relatively to the second forming arrangement, an improvement comprising:

said third receiving arrangement including a double rolling band;

said double rolling band including a first endlessly guided upper band and a second endlessly guided lower band; said first upper band having upper and lower band portions; said second lower band having upper and lower band portions;

said lower band portion of said second lower band being spaced below said upper band portion of said first upper band;

said first upper band being provided with a first coupling, and said second lower band being provided with a second coupling;

each of said first and second couplings having an out-of-engagement arrangement with respect to said drive means so that the double rolling band is not driven during said advancing of said third arrangement and so that said first upper band remains stationary relatively to said second lower band; and

each of said first and second couplings further having an in-engagement arrangement with respect to said drive means for driving said first upper and second lower bands in opposite directions during said retracting of said third receiving arrangement in such a manner that an upper surface of said upper band portion of said first upper band remains stationary relatively to a lower surface of said lower band portion of said second lower band and to said second forming arrangement to provide a roll-off relationship between said upper band portion of said first upper band and the product set when the product set is disposed on said upper surface so that said upper band portion of said first upper band rolls off from under the product set when said third receiving arrangement is retracting, and to also provide a roll-off relationship between said lower band portion of said second lower band and a pallet on which said lower surface rests so that said lower band portion of said second lower band rolls off from above

said pallet in order for said pallet to receive the product set thereon.

4,711,613 VEHICLE LIFT DEVICES

Percy Fretwell, Rochdale, England, assignor to Henderson Doors Limited, Romford, England

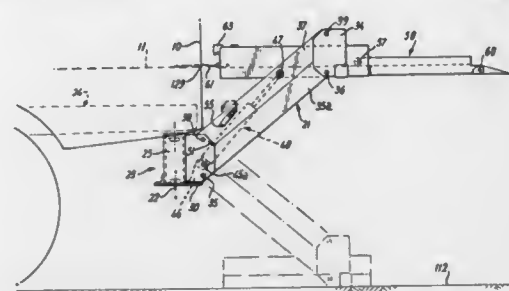
Filed Apr. 23, 1984, Ser. No. 602,734

Claims priority, application United Kingdom, Apr. 28, 1983, 8311632

Int. Cl.⁴ B60P 1/44

U.S. Cl. 414—550

8 Claims



1. A vehicle comprising a floor, and a lift device including a platform, means mounting the lift device below the level of the floor for rotation about an upright axis between an operative position, in which the lift device extends from the vehicle, and an inoperative position, in which the platform is beneath the floor, said lift device including means for moving the platform up and down in the operative position, and a parallel linkage for connecting the platform to the mounting means, said upright axis being located beneath the floor, said means for moving being substantially wholly outwards of the upright axis in the operative position and extending between said mounting means and said parallel linkage.

4,711,614

LIFT MAST MOUNTING ARRANGEMENT AND METHOD FOR REMOVAL

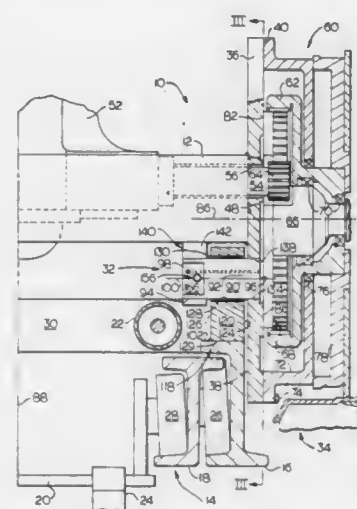
James W. Erker, Concord; Michael J. Scotese, Willoughby, and Jay B. Stotts, Mentor, all of Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Feb. 24, 1985, Ser. No. 832,495

Int. Cl.⁴ B66F 9/08

U.S. Cl. 414—641

15 Claims



1. A mounting arrangement for pivotally connecting a lift

mast assembly to a vehicle having a frame member, comprising:

a support flange having first and second opposed sides, and being connected at said first side to the frame member; a spindle having a first end, a spindle axis, and being connected at the first end to the support flange second side; a lift mast upright guide member having a first end portion; a shaft having first and second spaced apart end portions, first and second ends, and a longitudinal axis extending between said shaft first and second ends;

first means for pivotally connecting the first end portion of the lift mast upright guide member to the shaft;

second means for connecting the first end portion of said shaft to the support flange and guiding said shaft for slidable axial movement in directions substantially parallel to said spindle axis, said second means including an aperture disposed in said support flange and opening at the first and second sides of the support flange, said shaft first end portion being disposed in said aperture and slidably engaged with a surface defined by said aperture in said support flange, said spindle first end being positioned in a covering and closing relationship relative to the support aperture opening at said flange second side;

third means for connecting the second end portion of said shaft to said frame member and maintaining said shaft from slidable axial movement in said directions substantially parallel to the spindle axis and relative to the first side of the support flange.

4,711,615

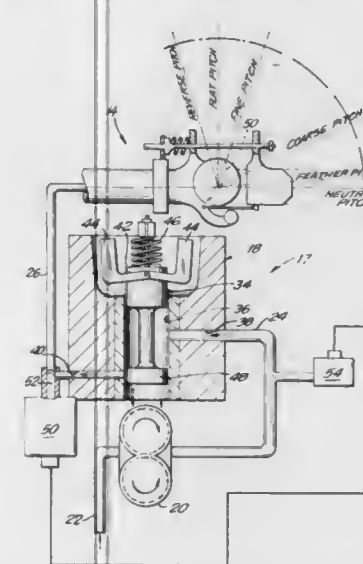
TURBOPROP OVERSPEED PROTECTION SYSTEM
Radu Rusu, Bridgeport, Conn., assignor to Textron/Auca Corp., Providence, R.I.

Filed May 19, 1986, Ser. No. 864,602

Int. Cl.⁴ B64C 11/40

U.S. Cl. 416—46

15 Claims



1. An overspeed protection system for a turboprop engine comprising a turbine, an array of propeller blades rotatably driven by gear reduction drive means operatively engaged with said turbine, a fluid actuated pitch adjustment means mounted to said array for adjusting the pitch of the propeller blades, and a source of fluid in communication with said pitch adjustment means, said overspeed protection system comprising:

a governor pump in communication with the source of fluid for producing a constant pressure flow of the fluid from said source;

a constant speed governor in communication with and intermediate said governor pump and the pitch adjustment means for directing flow of the fluid to the pitch adjust-

ment means at a pressure proportional to the speed of the turbine;

pressure stabilizing means disposed intermediate said constant speed governor and said pitch adjustment means operable for preventing variations in pressure between said pressure stabilizing means and said pitch adjustment means; and a pressure sensing means disposed intermediate said governor pump and said constant speed governor for sensing a reduction in the pressure of the fluid produced by said governor pump by reason of failure of the gear reduction drive means, said pressure sensing means being operatively connected to said pressure stabilizing means such that a pressure change sensed by said pressure sensing means activates said pressure stabilizing means to prevent variations in pressure intermediate said pressure stabilizing means and said pitch adjustment means.

4,711,616

CONTROL APPARATUS FOR A VARIABLE DISPLACEMENT PUMP

Kenji Tsukahara, Obu, and Taizou Abe, Chiryu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

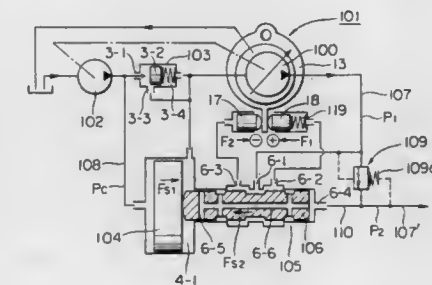
Filed Dec. 12, 1985, Ser. No. 808,836

Claims priority, application Japan; Dec. 13, 1984, 59-264257; Dec. 17, 1984, 59-267121

Int. Cl.⁴ F04B 1/06

U.S. Cl. 417—216

11 Claims



1. A control apparatus for a variable displacement pump which comprising:

a variable displacement pump rotatably driven by an external engine;

means for varying an amount of displacement of said pump; valve means for switching operational fluid which is to be applied to and to operate said varying means;

means for generating a control pressure the magnitude of which is proportional to the rotational speed of said external engine;

means for transducing the control pressure from said generating means into a force and for applying said force to one end of said valve means;

a discharge line connecting said discharge port of said pump with an external load;

a pilot line branched off from said discharge line into said valve means for applying a pressure in said discharge line to the other end of said valve means; and

said transducing means including a balance piston having a detecting surface to which said control pressure from said generating means is applied and an opposite surface contacting the valve means, and wherein the area of said detecting surface is greater than the area of the other end of said valve means.

4,711,617

ROTARY COMPRESSOR

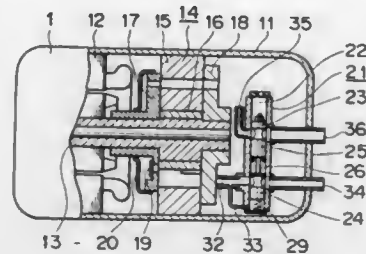
Kazutomo Asami; Fumiaki Sano; Fumio Wada, and Koji Ishijima, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1987, Ser. No. 38,166

Int. Cl.⁴ F04B 49/00

U.S. Cl. 417-295

10 Claims



1. In a rotary compressor including a closed container, an electric motor accommodated in said closed container, a compressor element accommodated in said closed container and adapted to be rotated by said electric motor, a first intake passage connected to said closed container for receiving a refrigerant gas, and a first discharge passage connected to said closed container for discharging said refrigerant gas after compressed by said compressor element from said closed container to a refrigerating cycle; the improvement comprising a cylindrical member provided inside said closed container and communicated with said first intake passage and with said first discharge passage; a second intake passage communicated with said cylindrical member and with said compressor element; a second discharge passage communicated with said cylindrical member and within said closed container; a first communication passage for communicating said second intake passage with one end of said cylindrical member; a second communication passage for communicating said closed container with the other end of said cylindrical member; a valve member provided in said cylindrical member; and a spring which urges the end of said valve near said first communication passage; said valve member being moved to a first position to communicate said first intake passage with said second intake passage and also communicate said first discharge passage with said second discharge passage when one end of said valve member is urged by a discharge pressure of said refrigerant gas through said second communication passage, while said valve member being moved to a second position to make said first intake passage out of communication with said second intake passage and also make said first discharge passage out of communication with said second discharge passage when the other end of said valve member is urged by a reverse current pressure of said refrigerant gas from said first communication passage and a spring pressure.

4,711,618

FUEL INJECTION PUMPS

Raymond E. Abinett, Rochester, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jun. 1, 1987, Ser. No. 56,542

Claims priority, application United Kingdom, Jun. 3, 1986, 8613409

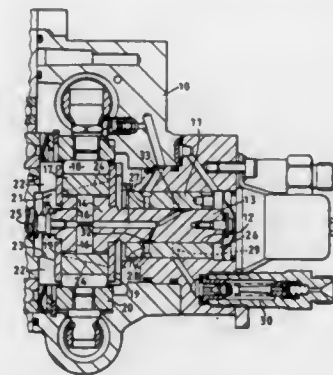
Int. Cl.⁴ F04B 19/22, 29/00, 49/00

U.S. Cl. 417-462

1 Claim

1. A rotary distributor fuel injection pump comprising a rotary distributor member which is mounted within a cylindrical bore defined in a fixed body part, the distributor member defining a plunger bore in which is mounted a reciprocable plunger, the plunger during inward movement under the action of cam means displacing fuel from said plunger bore, a passage in the distributor member which receives fuel from the bore during the inward movement of the plunger, a plurality of angularly spaced outlet ports formed in the body and opening

onto the surface of the cylindrical bore, a delivery groove on the periphery of the distributor member, said delivery groove registering with said outlet ports in turn during successive inward movements of the plunger, a plurality of angularly spaced inlet ports formed in the body and opening onto the surface of the cylindrical bore, the inlet ports and outlet ports being disposed in axially spaced planes respectively, said inlet ports communicating with a source of fuel under pressure, at least one inlet groove on the periphery of the distributor member and positioned to register in turn with said inlet ports to allow fuel to flow into said plunger bore during the time the



plunger is allowed to move outwardly by said cam means, stop means for limiting the outward movement of the plunger, said stop means being constructed so that the extent of outward movement of the plunger depends upon the axial position of the distributor member within the cylindrical bore, first and second balancing grooves formed on the periphery of the distributor member for communication with the inlet ports and outlet ports respectively, a passage extending within the distributor member and interconnecting the balancing grooves, said balancing grooves effecting communication as the distributor member rotates, between each outlet port and an inlet port to stabilise the fuel pressure in the outlet ports.

4,711,619

VANE FUEL PUMP HAVING REDUCED DISPLACEMENT AT HIGH SPEEDS

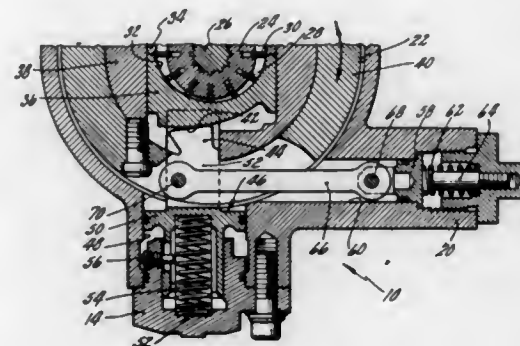
Jack G. Sundberg, Meriden, and Godwin L. Noell, Winsted, both of Conn., assignors to Colt Industries Inc., New York, N.Y.

Filed Nov. 21, 1986, Ser. No. 933,664

Int. Cl.⁴ F03C 2/00; F04C 2/00, 15/04

U.S. Cl. 418-27

4 Claims



2. An improved variable displacement vane pump of the type having: a housing; a rotor with a plurality of radially movable vanes mounted for rotation in the housing; a first track element and a second track element mounted in the housing in confronting relationship and defining a smooth track surface for the vanes, the first and second track elements being mov-

able toward and away from the rotor and the track elements having respective cam surfaces thereupon; an actuation structure, having a two cam followers, mounted in the housing such that the cam followers respectively engage the cam surfaces for controlling the position of the track elements to vary the pump displacement, wherein the improvement comprises:

the cam surfaces and cam followers being engagable such that movement of the track elements away from the rotor produces a corresponding movement of the actuation structure;

bias force means to apply a bias force to the actuation structure to prevent movement of the actuation structure and the track elements until the fluid pressure forces and vane forces acting on the track elements cause the cam surfaces to exert a greater force on the actuation structure in opposition to that of the bias force and to thereafter permit predetermined respective movement of track elements to new positions, the bias force means comprising:

two links in the housing pivotally connected to the actuation structure;

two pistons mounted in the housing for axial movement and respectively connected to the links; and

two compression springs mounted in the housing in respective engagement with the pistons for applying forces on the pistons in opposition to those applied thereto by the link.

4,711,620

MOVING VANE TYPE COMPRESSOR

Yukio Takahashi; Isao Hayase, both of Katsuta; Keijiro Amano, Mito; Masao Mizukami, and Masaaki Ishiguri, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuta, both of, Japan

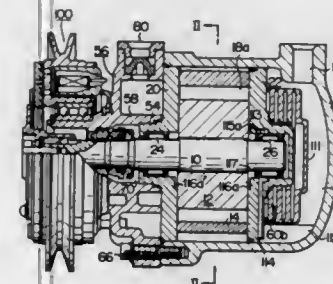
Filed May 28, 1985, Ser. No. 738,266

Claims priority, application Japan, May 28, 1984, 59-106617

Int. Cl.⁴ F04C 18/344

U.S. Cl. 418-96

1 Claim



1. A moving vane type compressor for an automotive air conditioner comprising: a rotor fixed to a rotor shaft; a cylinder having an inner peripheral surface surrounding an outer peripheral surface of said rotor and of a curvature different from that of the outer peripheral surface of said rotor; a pair of side plates on both end surfaces of said cylinder and substantially hermetically sealing an interior of said cylinder; and vanes respectively slidably received in a plurality of radially extending vane grooves formed in said rotor and adapted to be moved into and out of said vane grooves while rotating together with said rotor in sliding contact with the inner peripheral surface of said cylinder, said rotor, said cylinder, said side plates and said vanes in cooperation defining work chambers volumes of which are changed as a result of movement of said vanes into and out of said vane grooves such that a gas is drawn into said working chambers and compressed and then discharged from said working chambers, of a sintered alloy having a plurality of pores; a blocking liquid is supplied from the outer peripheral surface of said cylinder into said pores so as to block said pores, said blocking liquid being a lubricating oil; a casing for cooperating with said cylinder and said side plates for defining a chamber for holding said lubricating oil on

the outer peripheral surface of said cylinder so that the lubricating oil blocks said pores of the sintered alloy of the cylinder and to prevent a leakage of compressed gas out of said cylinder; a liquid separating means separating said liquid from said compressed gas when said compressed gas is discharged to the interior of said casing; and for collecting said liquid in said chamber reserving said liquid and a liquid collecting and supply means is provided for supplying said liquid into said pores of said sintered alloy constituting said cylinder from the outer peripheral surface of said cylinder.

4,711,621

INJECTION MOLDS INTENDED FOR THE PRODUCTION OF COMPOSITE BODIES SUCH AS MULTICOLORED LIGHT COVERS OR COMPONENTS MADE OF SEVERAL DIFFERENT MATERIALS

Jacques Schomblond, Montagnieu, France, assignor to Cartier Industrie, Thyez, France

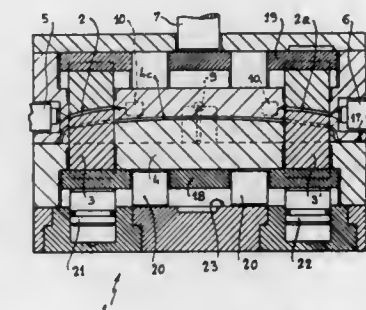
Filed Mar. 20, 1986, Ser. No. 841,930

Claims priority, application France, Mar. 22, 1985, 85 04518

Int. Cl.⁴ B29C 39/12, 45/10, 45/16

U.S. Cl. 425-120

10 Claims



1. An apparatus for molding composite bodies having at least three separately injected sections formed of separate molding materials which are joined along aligned intersections comprising, a first molding block means of two mold members defining a first mold cavity therebetween, first and second adjustable molding block means movable relative to said first molding block means and having second and third cavities therein, respectively, at least said first adjustable molding block means being in slideable engagement with said first molding block means, means for moving said first and second adjustable molding block means between first positions in which said second and third cavities are closed and remotely spaced from said first cavity and second positions wherein said second and third cavities are aligned in open communication with said first cavity, first injector means for introducing molding material into said first cavity, second injector means spaced from said first injector means introducing molding material into said second cavity when said first adjustable block means is in said first position and third injector means for introducing molding material into said third cavity whereby the material is introduced into said second cavity when said second cavity is remote from said first cavity to form one of the three sections of the composite body and thereafter moved into alignment with said first cavity.

4,711,622

PELLET MILL

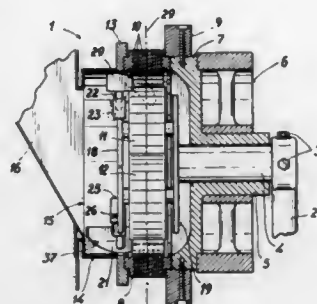
Hanspeter Schaffner, Niederuzwil, Switzerland, assignor to Gebrüder Buhler AG, Uzwil, Switzerland

Filed Jun. 12, 1985, Ser. No. 744,056

Claims priority, application Switzerland, Jul. 4, 1984, 3220/84 Int. Cl.⁴ B28B 3/20

U.S. Cl. 425—331

29 Claims



26. A pellet mill, which comprises:

- a perforated cylindrical die mounted for rotation about a longitudinal axis, said die having an inner surface of predetermined axial width and an open front end, said width being divided in half by a vertical transverse plane intersecting said longitudinal axis;
- means for effecting rotation of said die in a predetermined direction about the longitudinal axis;
- a cover secured to the front end of said die for rotation therewith, said cover including upper and lower ends and an inlet opening;
- a pair of rotatable press rollers located in the interior of said die and engaging opposite locations on the inside surface thereof, said press rollers being arranged diagonally;
- means for feeding material to be pelleted through the inlet opening of said cover for pressing by said rollers through said perforated die to form pelleted material;
- a lower deflector positioned in the bottom end of said cover and across the lower front end of said die, said lower deflector having a bottom arcuate edge of similar curvature to said cover and being of sufficient height and width to substantially block further flow of material into said die when said die is not rotating;
- said lower deflector including a straight portion extending diagonally across said cover, and a bent portion extending generally parallel to said transverse plane; and
- means for adjustably supporting said lower deflector in fixed position but at a predetermined acute angle between about 20° and 40° relative to a central transverse plane bisecting said die in the direction of rotation of the adjacent die portion.

4,711,623

ANNULAR EXTRUSION DIE WITH INTERNAL CHOKE RING AND SPIDER MANDREL

Jonathan Gross, Canandaigua, and O. James Marten, Stanley, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 13, 1986, Ser. No. 862,729

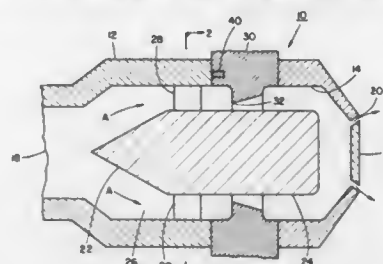
Int. Cl.⁴ B29C 47/20

U.S. Cl. 425—376 A

8 Claims

1. An annular extrusion die for the extrusion of a thermoplastic material, such as foamed plastic and the like, comprising a die body having an elongated cylindrical cavity having one end communicating with a source of thermoplastic melt and with an extrusion die orifice for extruding tubular product at the opposite end thereof; an elongated cylindrical mandrel centrally arranged within said cavity and defining and elongate annular flow passageway therebetween; a plurality of circumferentially spaced said spider means extending radially across said flow passageway for fastening said mandrel to said die

body; and a choke ring interposed in said annular flow passageway downstream of said spider means to form an annular restriction in the cross-section of said flow passageway and producing a back pressure on the thermoplastic material upstream of said restriction, said choke ring having a land extending in the flow direction of said passageway, said land having



a height extending parallel to said flow direction of said passageway and said land continually varying in height about the circumference thereof so as to impart a predetermined varying back pressure distribution along the circumference of said restriction to the thermoplastic material conveyed through said restriction.

4,711,624

APPARATUS FOR HEAT-SETTING A TUBULAR ARTICLE OF CRYSTALLIZABLE POLYMER

Martin J. Watson, Wantage, England, assignor to Metal Box p.l.c., Reading, England

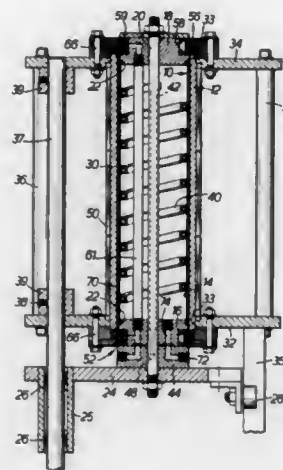
Filed Mar. 7, 1986, Ser. No. 837,533

Claims priority, application United Kingdom, Mar. 18, 1985, 8506932

U.S. Cl. 425—384

Int. Cl.⁴ B29C 55/22

11 Claims



1. Apparatus for heat setting a preformed thermoplastic tubular article of a crystallisable polymer, which is open at both ends and which will be dimensionally stable up to a specific elevated temperature, comprising a mandrel, cooling means for cooling the mandrel to a temperature below the glass transition temperature of the tubular article, a mould having a cavity of complementary shape to that of the mandrel and surrounding the mandrel with a small clearance between the mandrel and mould, heating means for heating the mould to a temperature higher than said specific elevated temperature, clamping means for clamping each end of said article between the mandrel and mould for axially restraining said article and expansion means for elastically expanding the tubular article into contact with the mould.

4,711,625

NOZZLE CARTRIDGE FOR INJECTION MOLDING

Joachim F. Knauer, Deuil la Barrestr. 17, 6000 Frankfurt, Fed. Rep. of Germany (6000), and Martin Freimath, Downey, Calif., assignors to Joachim F. Knauer, Frankfurt, Fed. Rep. of Germany

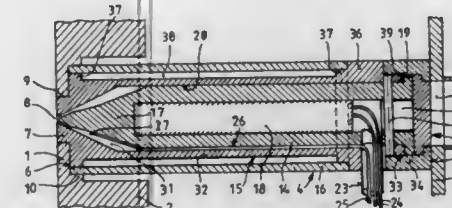
Filed Mar. 27, 1986, Ser. No. 844,933

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525735; Dec. 19, 1985, 3545017

Int. Cl.⁴ B29C 45/20

U.S. Cl. 425—549

18 Claims



1. In a hot-runner injection-molding machine including a nozzle cartridge installed between a wall delimiting a mold cavity and a counter platen, the nozzle cartridge having a shell and a spreader supported in the shell terminating in a pointed configuration at an outlet region of the nozzle cartridge, the improvement comprising:

- a spreader having front and rear ends;
- a shell extending over the spreader up to said rear end of the spreader and having front and rear end portions;
- a planar rear end face on said rear end portion of the shell for abutting engagement with a planar region on the counter platen;
- a forwardly projecting extension on said front end portion of the shell having a step shape with at least one cylindrical surface thereon engageable in an opening in the wall delimiting the mold cavity, said opening communicating with the mold cavity;
- a nozzle opening in said forwardly projecting extension;
- a pointed tip on said front end of the spreader disposed in said nozzle opening;
- an entry fitting at the rear of the spreader extending radially through the shell and having a passage therein;
- a heating means being provided in said spreader having power leads extending through said passage;
- a temperature sensor hole provided through the entry fitting; and
- a temperature sensor sheath containing a temperature sensor being provided extending between said spreader and said shell to the outlet region from the temperature sensor hole and said passage;
- the nozzle-cartridge being in contacting engagement with other parts of the machine only at said at least one cylindrical surface and said planar rear end face on said shell.

4,711,626

DAMPER MOUNTING ASSEMBLY

Clifford L. Hoyme, P.O. Box 1485, Camrose, Alberta, Canada (T4V 1X3)

Continuation-in-part of Ser. No. 506,882, Jun. 21, 1983, Pat. No. 4,538,980, which is a continuation-in-part of Ser. No. 225,729, Jan. 15, 1981, Pat. No. 4,426,993. This application Jun. 18, 1985, Ser. No. 746,187

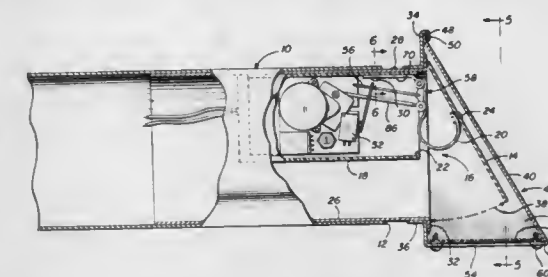
Int. Cl.⁴ F24C 3/00

U.S. Cl. 431—20

14 Claims

1. In combination with an elongated duct having an open end, a damper element and an operating unit having pivot means for suspending the damper element and transmitting means operatively connected to the damper element for signal controlled movement thereof from a closed position to an open position, installational means for mounting the operating unit and the damper element on the duct, said installational means comprising a housing protectively enclosing the operating

unit, means for supporting the housing within the duct with the pivot means projecting from the housing through the open end of the duct, sealing means connected to the supporting means independently of the pivot means and spaced externally of the



duct for engagement by the damper element in the closed position thereof and a hood mounted on the sealing means in enclosing relation to the damper element, said hood having an opening aligned with a plane transverse to the open end of the duct.

4,711,627

DEVICE FOR THE THERMAL SPRAY APPLICATION OF FUSIBLE MATERIALS

Manfred Oeschle, Bad Homburg; Uwe Szieslo, Waldems; Karl-Peter Streb, Markt Mombria, all of Fed. Rep. of Germany, and Wolfgang Simm, Ecublens, Switzerland, assignors to Castolin S.A., Lausanne, Switzerland

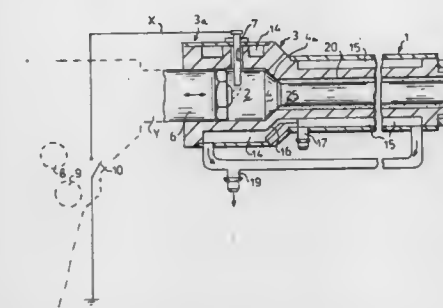
PCT No. PCT/DE84/00173, § 371 Date Apr. 24, 1985, § 102(e) Date Apr. 24, 1985, PCT Pub. No. WO85/00991, PCT Pub. Date Mar. 14, 1985

PCT Filed Aug. 27, 1984, Ser. No. 731,999

Int. Cl.⁴ F23N 5/00; F23C 5/06

U.S. Cl. 431—30

14 Claims



1. A device for the thermal spray application of a fusible material, which comprises

- (a) a nozzle defining an elongated, axially extending spray channel,
- (b) an inlet leading to said spray channel and coaxial therewith, the inlet having a flow-accelerating contour,
- (c) a combustion chamber leading to the inlet and coaxial therewith, the combustion chamber having a diameter larger than that of the spray channel,
- (d) a nozzle head displaceably mounted in the combustion chamber and axially adjustable with respect to the inlet, the nozzle head carrying
 - (1) a burner nozzle,
 - (2) respective conduit means for feeding a combustion gas and a spray channel flushing gas into the combustion chamber, and
 - (3) means for feeding the fusible material into the combustion chamber,
- (e) an ignition electrode projecting into the combustion chamber and being arranged for adjustment with respect

- to the burner nozzle in a direction transverse to the axis, and
- (f) a control circuit controlling the feeding of the combustion gas and the feeding of the flushing gas through the respective conduit means, the control circuit including
- (1) a switching element for supplying electric current to the ignition electrode whereby a spark is formed between the ignition electrode and the burner nozzle for igniting the combustion gas in the combustion chamber, the control circuit being arranged to actuate the switching element for supplying the electric current to the ignition electrode after feeding the flushing gas and prior to feeding the combustion gas.

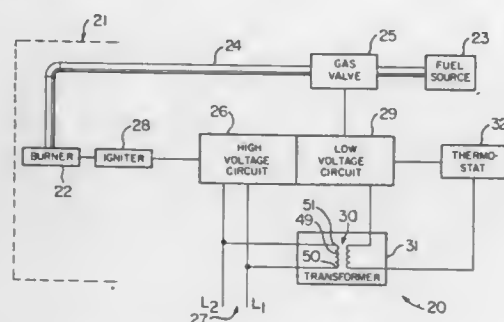
4,711,628

HOT SURFACE IGNITION SYSTEM FOR A GAS FURNACE AND METHOD OF MAKING THE SAME
 Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jul. 18, 1986, Ser. No. 887,860
 Int. Cl.⁴ F23N 5/00

U.S. Cl. 431—31

17 Claims



1. In a hot surface ignition system for a gas furnace and comprising a high voltage circuit for being connected to a source of high voltage AC current, said high voltage circuit having a hot surface igniter means therein and disposed in the path of gas issuing from a burner means that is adapted to be fed said gas from a source thereof through an electrically operated gas valve, a low voltage circuit for being connected to a source of low voltage AC current, said low voltage circuit having said gas valve therein and having thermostatic switch means therein controlling the energization of said low voltage circuit with said low voltage AC current, first relay means having contact means in said high voltage circuit and controlling the energization of said igniter means with said high voltage AC current, and other relay means having contact means in said low voltage circuit and controlling the energization of said gas valve, the improvement wherein said other relay means comprises two separate relays respectively having contact means that are disposed in series in said low voltage circuit whereby the contact means of said two relays must be in the same condition thereof to energize said gas valve.

4,711,629

FLARE STACK IGNITOR

Roderick J. MacDonald, #8, Site 14, R.R. #1, Red Deer, Alberta, Canada T4N 5E1

Filed Jul. 25, 1985, Ser. No. 758,689

Claims priority, application Canada, Jan. 8, 1985, 471702

Int. Cl.⁴ F23Q 3/00

U.S. Cl. 431—264

1 Claim

1. A flare stack ignitor comprising a pair of hollow elongated electrodes movably mounted on a flare stack, each of said electrodes including venturi means comprising a casing member having a hollow upper section telescopically mounted in a hollow lower section, an electrical insulator between said upper and lower sections for electrically isolating said sections, said lower section including means for securing said casing to

a support, said upper section having an open upper end and including means for connecting said upper section to an electric circuit for generating a spark between said electrodes, said upper section further including a venturi member having a central axial duct portion axially aligned in said upper section and a plurality of radially spaced radially extending duct por-



tions inclined downwardly and away from said upper section for drawing combustion air into said central axial duct portion and conveying said air to the open upper end of said upper section, said electrodes being so connected to said electric circuit and so positioned with respect to each other as to create a spark therebetween for igniting gases in said flare stack.

4,711,630

DENTAL HANDPIECE ASSEMBLY

Walter Dürr, Bulachweg 14, 7250 Leonberg (Warmbronn), Fed. Rep. of Germany

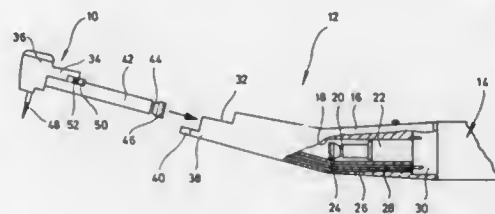
Filed Apr. 8, 1986, Ser. No. 849,405

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 8510667[U]

Int. Cl.⁴ A61C 1/10

U.S. Cl. 433—82

10 Claims



1. A dental assembly which comprises:
- (a) a handgrip having front and rear ends,
- (b) a handgrip shaft having front and rear ends, the rear end thereof being adapted to be connected to a motor unit,
- (c) a headpiece having front and rear ends, the rear end thereof being detachably connected to the front end of said handgrip in a partially overlapping manner,
- (d) a headpiece shaft having front and rear ends mounted within said headpiece,
- (e) tool holding means adapted to receive a dental tool and being connected to the front end of the headpiece shaft so that a tool inserted therein will face downwardly,
- (f) the front end portion of said handgrip including an arm portion which engages from below an overlying face of said headpiece that faces downwardly in the same direction that an inserted dental tool faces,
- (g) at least two pairs of outlets for cooling water and cooling air, said outlets being located near the front end of said

- handgrip in an area closely adjacent to the axis of an inserted dental tool, said outlets being circumferentially staggered about the axis of an inserted dental tool, and
- (h) at least one of said pairs of outlets for cooling water and cooling air being arranged to exit downwardly from said arm portion of said handgrip and in generally the same direction that an inserted dental tool faces, so that said outlets for cooling water and air are close to an inserted tool axis but do not belong to the detachable headpiece.

4,711,631

ARRANGEMENT FOR JOINING DENTURE COMPONENTS BY ADHESION (DEVICE FOR BINDING PARTS OF DENTAL PROSTHESIS BY ADHESION)

Peter K. Thomsen, Wiesenweg 7, 2300 Molfsee/Schulensee, Fed. Rep. of Germany

PCT No. PCT/EP84/00348, § 371 Date Jun. 28, 1985, § 102(e) Date Jun. 28, 1985, PCT Pub. No. WO85/01872, PCT Pub. Date May 9, 1985

PCT Filed Nov. 2, 1984, Ser. No. 756,971

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3340016; Sep. 4, 1984, 3432486

Int. Cl.⁴ A61C 13/22

U.S. Cl. 433—181

12 Claims



1. An arrangement for joining denture components to be located laterally with respect to one another comprising: a pair of joining elements (1, 6) each one of the elements being connectable at one end to one of the components to be joined, and joined at their other ends to each other by interengagement of an internal part having an outer surface (11) and an external part having an inner surface (10), at least a portion of the inner surface being undercut with respect to the joining and loosening direction and at least a portion of the outer surface having a shape complementary to the undercut, the engagement of the internal and external parts enclosing an intermediate space (12) therebetween which permits adjustment of the components to be joined (13; 17, 18; 17, 21) during assembly of the arrangement, the intermediate space being filled with a hardening sealing compound, whereby after the compound has hardened, the inner and outer surfaces act in a positive manner to apply a compressive force on the sealing compound against the portions of the surface which are undercut in respect of the loosening direction to prevent loosening therebetween.

4,711,632

COMPATIBILITY/INCOMPATIBILITY FORECASTING DEVICE

Jeffrey C. Detrick, P.O. Box 3155, Shawnee Mission, Kans. 66203

Filed Jul. 30, 1986, Ser. No. 891,779

Int. Cl.⁴ G09B 19/00

U.S. Cl. 434—106

9 Claims

1. An educational/forecasting astrological device making use of the twelve astrological signs, said device consisting essentially of:

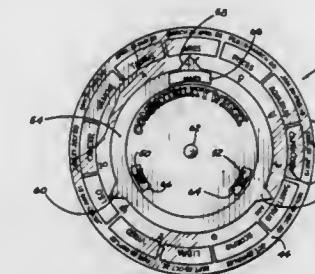
a flat central section having a pair of opposed faces; first and second flat members rotatably mounted to said central section and respectively in proximal, face-to-face relationship with one of the faces of said central section, said central section, and said first and second members, each being cooperatively configured to expose a portion of each of the faces of said central section,

said central section and first and second members rotatably

mounted thereto cooperatively presenting first and second opposed side surfaces, each of said side surfaces being defined by a outer face of the corresponding member remote from said central section, and an exposed portion of an adjacent face of said central section;

indicia means on said first side surface including, on one of said first member outer face and said exposed portion of the adjacent face of the central section, three spaced apart compatibility indicator means located in fixed relationship to each other, and, on the other of said first member outer face and the exposed portion of the adjacent face of the central section, astrological indicia representing the twelve astrological signs,

said three indicator means being oriented with respect to said first side surface astrological indicia for alignment of the three indicator means with four respective three-mem-



bered sets of said first side surface astrological indicia upon relative rotation between said central section and first member;

indicia means on said second side surface including, on one of said second member outer face and said exposed portion of the adjacent face of the central section, four spaced apart incompatibility indicator means located in fixed relationship to each other, and, on the other of said second member outer face and exposed portion of the adjacent face of the central section, astrological indicia representing the twelve astrological signs,

said four indicator means being oriented with respect to said second side surface astrological indicia for alignment of the four indicator means with three respective four-membered sets of said second side surface astrological indicia upon relative rotation between said central section and second member.

4,711,633

INSTRUCTIONAL DEVICE FOR TENNIS PLAYERS

Michael A. Dombrowski, 1330 5th Ave., NE., 187 Tara Woods, Hickory, N.C. 28603, and Nancy M. Eikeland, Brevard, N.C., assignors to Michael A. Dombrowski, Hickory, N.C.

Filed Mar. 31, 1986, Ser. No. 846,006

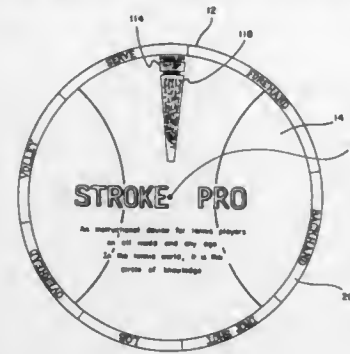
Int. Cl.⁴ G09B 1/22

U.S. Cl. 434—247

10 Claims

1. An instructional device for tennis players comprising: a base member; first indicia on said base member indicating a plurality of stroke problems related to plurality of different strokes; second indicia on said base member indicating the possible cause or causes of each said stroke problem; a second member movably secured to said base member and having a first window for alignment with said first indicia and a second

window for alignment with said second indicia whereby when a player aligns said first window with a selected stroke prob-



lem indicia, corresponding cause indicia will be visible through said second window.

4,711,634

WALL OUTLET COVER PLATE ASSEMBLY

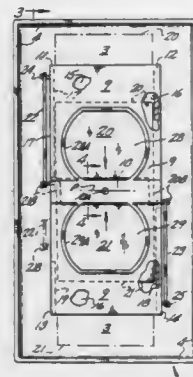
Wayne L. Antone, II, 89864 Terretorial Rd., Elmira, Oreg. 97437, and Dennis C. Finnell, 26732 Patterson Dr., Monroe, Oreg. 97456

Continuation-in-part of Ser. No. 822,835, Jan. 27, 1986, abandoned. This application Nov. 3, 1986, Ser. No. 926,334

Int. Cl.⁴ H01R 13/44

U.S. Cl. 439-136

5 Claims



1. A wall outlet cover plate assembly for attachment to a wall mounted electrical wall outlet having a pair of sockets, said cover plate assembly comprising in combination, a cover plate defining plug receiving openings, guide means in place on said cover plate and defining with said cover plate a pair of guideways, closures for said plug receiving openings one each slidably confined in each of said guideways, said closures adapted for independent finger actuated sliding movement away from a transverse medial plane of the cover plate, and tensionable members having fixed and movable ends the latter coupled to each of said closures and biasing same toward said medial plane to close the plug receiving openings to the cover plate, the fixed end of each tensionable member being located on one side of said medial plane opposite from the closure biased thereby located on the remaining side of the medial plane.

4,711,635

QUICK CHANGE SELF-OILING SPROCKET HUB

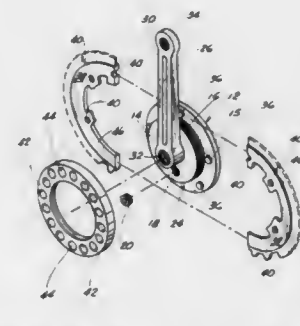
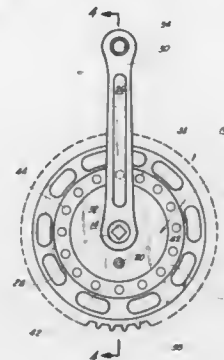
John W. Arnce, Wichita, Kans., assignor to Richard Lee Plush, Jr., Topeka, Kans.

Filed Sep. 10, 1985, Ser. No. 774,487

Int. Cl.⁴ F16H 55/30

U.S. Cl. 474-152

23 Claims



1. A quick change self-oiling sprocket hub comprising a hub means including a first ring means having an essentially hollow structure with a threaded circumference and defining an oil input aperture for filling the hollow structure with oil and an oil discharge aperture for dispensing oil, and a second ring means concentrically integrally bound to the first ring means and having a greater diameter than said first ring means, such that the overlap of the second ring means to the first ring means defines a second ring flange means:

at least one locating pin means secured to said second ring flange means for releasably holding at least one sprocket means to said second ring flange means; and a compressor ring retainer means with a plurality of ring apertures circumferentially disposed on its perimeter and threadably engaged to the threaded circumference of the first ring means.

4,711,636

CATHETERIZATION SYSTEM

Steven F. Bierman, 143 Eighth St., Del Mar, Calif. 92014

Filed Nov. 8, 1985, Ser. No. 796,301

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604-180

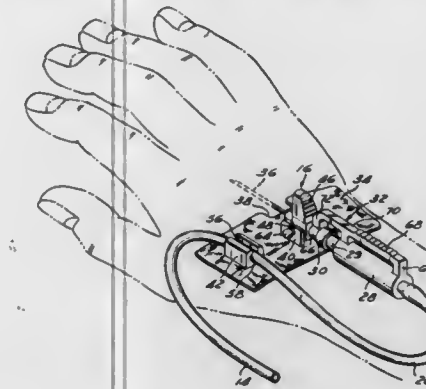
20 Claims

1. A catheterization system adapted for insertion into the arm, hand, or other location in the body of a patient for delivering fluids through a conduit to said patient, comprising:

a cannula for insertion into said patient at a particular location, said cannula passing said fluids into said patient, the proximal end of said cannula having means for receiving said conduit;

means for adapting said conduit for engagement with said receiving means on said cannula, said adapting means being rotatable with respect to said receiving means to

relieve rotational forces in said conduit, said adapting means insulating said cannula from rotational movement of said conduit in order to avoid injury or discomfort to said patient; and means for mounting said cannula on said patient, said mounting means comprising snap-fit engagement means with said cannula for removably anchoring said cannula on said



patient, said removable snap-fit engagement obviating the necessity for the time-consuming application of surgical tape or other apparatus, said adapting means being solely engageable and disengageable with said receiving means on said cannula in order to facilitate the frequent replacement of said conduit without requiring the removing of said cannula from said mounting means.

4,711,637

SYRINGE LOCK

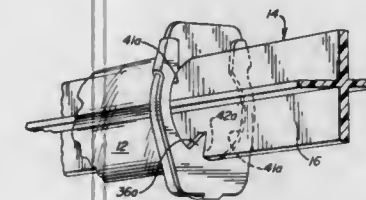
Harold G. Leigh, Creve Coeur, and Eli Schachet, St. Louis, both of Mo., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 4, 1986, Ser. No. 825,823

Int. Cl.⁴ A61M 5/315

U.S. Cl. 604-220

12 Claims



1. A lock for a syringe, which comprises:

a single sheet of generally U-shape, said sheet defining a central, cutaway portion extending through the edge of said sheet, and attachment means positioned on said sheet, whereby a syringe plunger comprising radially extending vanes can be placed to extend through the central, cutaway portion, and the attachment means may be secured to a syringe barrel which carried the plunger so that rotation of the plunger in one direction causes at least one sheet edge portion defining the central, cutaway portion to dig into a vane of the plunger, to cause retention of the plunger and barrel in a fixed position relative to each other, and rotation of the retained plunger in the opposite direction frees the plunger from its retained relation, the attachment means comprising a foldable first and second tab positioned respectively at the end of each arm of said U-shaped sheet, and a third foldable tab positioned at the end of said sheet opposed to said first and second tabs.

4,711,638

INTRAOCULAR LENS

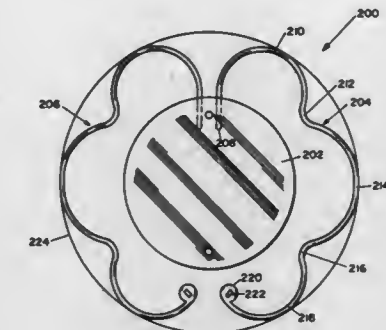
Richard L. Lindstrom, 1065 W. Ferndale Rd., Wayzata, Minn. 55391

Filed May 12, 1986, Ser. No. 861,707

Int. Cl.⁴ A61F 2/16; A61B 17/00

U.S. Cl. 623-6

5 Claims



1. Intraocular lens comprising:

a. lens optic; and
b. two haptic loops, said haptic loops secured substantially adjacent to each other near a common point of securement at an edge of said lens optic and extending outwardly from said edge at an increasing angle, said haptic loops being symmetrical, double-opposing, cantilevered, compressible and mirror images of each other extending from said point of securement around and about said edge of said lens to a point substantially diametrically opposed from said point of securement for symmetrically supporting said lens in said eye, and each of said haptic loops including three semi-circular segments and two inward curved segments connecting each of said semi-circular segments together.

4,711,639

ANCHORAGE FOR TIBIA PLATES

Hans Grundel, Lübeck, Fed. Rep. of Germany, assignor to S+G Implants GmbH, Lubeck, Fed. Rep. of Germany

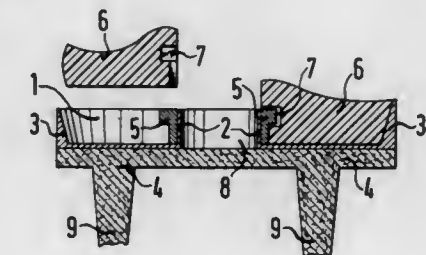
Filed Sep. 10, 1985, Ser. No. 774,577

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433264

Int. Cl.⁴ A61F 2/38

U.S. Cl. 623-20

4 Claims



1. An anchorage for plastic tibia plates of a knee joint endoprosthesis, said anchorage disposed in an upper part of a shin bone on both sides of a central web or ridge thereof extending from the front of the knee joint towards the rear thereof, said central web or ridge having parallel planar side faces, said anchorage comprising a metal tray for carrying a tibia plate, the tray being provided on the base thereof with a metallic open-cell layer permitting growth of bone tissue into the cells thereof, and the tray having a planar wall perpendicular to the base thereof and bearing against one of said planar side faces of the central web or ridge, which planar wall is provided on the inside surface thereof with a T-shaped projection, and a cone-

shaped arcuate side wall the thickness of which increases conically on the inside of the tray from top to bottom of the tray, the tibia plate having a conical profile that matches the profile of the inner surface of the tray and being provided with a flat base and a planar side wall perpendicular to the flat base and having a T-shaped recess facing and matching the T-

shaped projection of said planar wall of the tray, the tibia plate being engageable with the tray so that the tibia plate can be firmly and detachably fitted into the tray of said anchorage.

CHEMICAL

4,711,640

PROCESS FOR CROSSDYEING CELLULOSIC FABRICS
Robert J. Harper, Jr., Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 25, 1986, Ser. No. 878,106
Int. Cl.⁴ D06P 5/00

U.S. Cl. 8—481

23 Claims

1. A process for crossdyeing a cellulosic fabric comprising:
 - (a) treating preselected areas of a cellulosic fabric with an aqueous cationic solution of sufficient concentrations of: N-methylol crosslinking agent, acid catalyst and a choline quaternary, and drying and curing said fabric for sufficient time and temperature to impart cationic properties to said treated areas of fabric;
 - (b) immersing the fabric in an acidic dyebath containing an anionic dye for sufficient time to allow the anionic dye to react with the cationic areas and thereby produce a fabric which is dyed only in the treated areas and washing the fabric to remove unreacted dyestuffs from the fabric; then,
 - (c) immersing the fabric in an alkaline dyebath containing a reactive dyestuff of different color than that of step (b) for sufficient time to dye the fabric and thereby produce a bicolored fabric.

4,711,641

REACTIVE DYE COMPOSITION: MIXTURE OF REACTIVE COPPER PHTHALOCYANINE DYES: DICHLORO-TRIAZINYL DYE AND VINYL SULPHONYL TYPE DYE

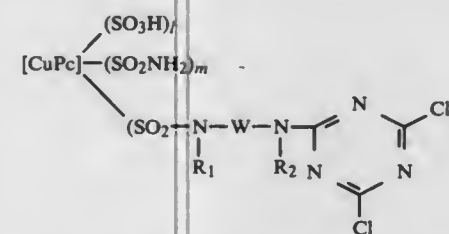
Toshio Nakamatsu, Ibaraki; Tetsuya Miyamoto, Takatsuki, and Kunihiro Imada, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 12, 1986, Ser. No. 839,030
Claims priority, application Japan, Mar. 29, 1985, 60-67161
Int. Cl.⁴ C09B 62/10, 67/22; D06P 1/38

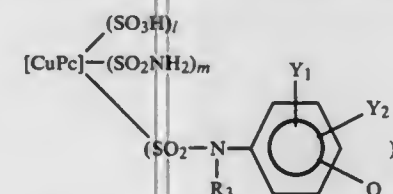
U.S. Cl. 8—524

9 Claims

1. A reactive dye composition, which comprises a phthalocyanine dye represented by a free acid of the following formula (I),



wherein CuPc is a copper phthalocyanine nucleus, W is a C₂-C₄ alkylene group or a 1,3- or 1,4-phenylene group having one or two sulfo groups, R₁ and R₂ are independently a hydrogen atom or a lower alkyl group, l is a number of 1 to 3, m is a number of 0 to 2, and n is a number of 1 to 3, provided that the total number of l, m and n is 4 or less, and a phthalocyanine dye represented by a free acid of the following formula (II),



wherein CuPc, l, m and n are as defined above, Y₁ and Y₂ are independently a hydrogen atom or a methyl, methoxy or sulfo group, R₃ is a hydrogen atom or a lower alkyl group, and Q is —SO₂CH=CH₂ or —SO₂CH₂CH₂Z in which Z is a splittable group by the action of an alkali, the mixing weight ratio of the

dyes (I) to (II) in terms of a copper content being from 80 through 20 to from 20 through 80.

4,711,642

LIQUID, WATER CONTAINING MONO-FLUORO-TRIAZINYL REACTIVE DYESTUFF PREPARATION WITH PH 8-12

Joachim Wolff, Bergisch Gladbach, and Karlheinz Wolf, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,352
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534729

Int. Cl.⁴ C09B 67/00, 67/26, 62/04; D06P 1/382

U.S. Cl. 8—527

11 Claims

1. A liquid water-containing preparation of reactive dyestuffs with a monofluorotriazinyl reactive radical, characterized by a pH value of at least 8.

4,711,643

STABILIZED COAL OIL MIXTURES

Paul C. Kemp, Catlettsburg, and Walter Lyons, Ashland Ricky E. Music, Catlettsburg, are of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

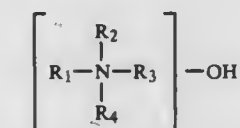
Filed Dec. 14, 1981, Ser. No. 331,444

Int. Cl.⁴ C10L 1/32

U.S. Cl. 44—51

8 Claims

1. A stable, combustible coal-oil mixture comprising about 30 to about 50% by weight of a solid particulate carbonaceous material, a liquid hydrocarbon fuel, about 0.05 to 5.0% by weight of a stabilizer having the following structural formula:



wherein R₁, R₂, R₃ and R₄ are alkyl groups having from 1 to 25 carbon atoms.

4,711,644

CERAMIC MATERIAL AND METHOD OF MANUFACTURE

Russel L. Yeckley, Oakham, Mass., and Bernard North, Greensburg, Pa., assignors to Kennametal Inc., Latrobe, Pa.
Continuation of Ser. No. 867,910, May 23, 1986, abandoned, which is a continuation of Ser. No. 800,955, Nov. 22, 1985, abandoned, which is a division of Ser. No. 466,716, Feb. 15, 1983, Pat. No. 4,563,433, which is a continuation-in-part of Ser. No. 351,289, Feb. 22, 1982, abandoned. This application Nov. 3, 1986, Ser. No. 926,849

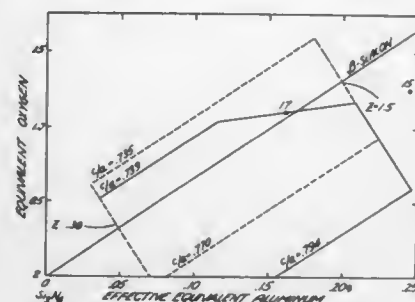
Int. Cl.⁴ C04B 35/58

U.S. Cl. 51—307

7 Claims

1. A metalcutting insert made by the method of producing a ceramic product, comprising the steps of forming a powder mixture consisting essentially of a first component consisting of compounds containing the elements of silicon, aluminum, oxygen and nitrogen in proportions such that the ratio of the total number of silicon and aluminum atoms to the total number of oxygen and nitrogen atoms lies in the range 0.735 to 0.77 and such that said compounds react together with the second component during the subsequent sintering process to produce a double phase ceramic material wherein a first phase obeys the general formula: Si₆₋₂Al₂O₂N₈₋₂ where z is between 0.38 and 1.5; wherein a second phase obeys the general formula (Si, Al)₁₂M_x(O, N)₁₆; and wherein up to 10 percent by weight of a second component is in the form of an oxide of at least one of the further elements, yttrium, scandium, cerium, lanthanum and the metals of the lanthanide series; and wherein sintering

said mixture in a non-reactive environment comprises placing said mixture in a graphite pot and covering with a mixture of boron nitride and silicon nitride powders while surrounding said graphite pot and said silicon nitride and boron nitride powders with a nitrogen gas, with or without the application of pressure, at a temperature between 1600 degrees Centigrade



and 2000 degrees Centigrade and for a time, decreasing with increasing temperature, of at least ten minutes to at least five hours so as to produce a ceramic material containing said double phase ceramic material together with a second phase containing said at least one further element, which is a glassy phase.

4,711,645

REMOVAL OF WATER AND CARBON DIOXIDE FROM ATMOSPHERIC AIR

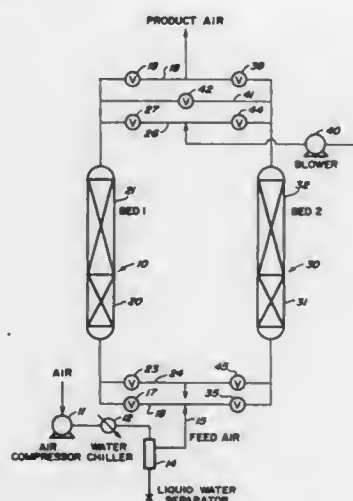
Ravi Kumar, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 10, 1986, Ser. No. 828,008

Int. Cl.⁴ B01D 53/04

U.S. Cl. 55-26

7 Claims



1. The method of removing moisture and carbon dioxide from atmospheric air which comprises the steps of:

- passing the air at an inlet temperature in the range of about 70°-120° F. and at an inlet pressure in the range of about 50 to 150 psia through a first bed of adsorbent selective in removal of water from an air stream and then through a second bed of adsorbent effective in selective removal of carbon dioxide; then regenerating said first and second adsorbent beds by
- reducing the pressure in said beds by gas withdrawal therefrom in a direction opposite that of step (a) to about atmospheric pressure level;
- and at the attained pressure level of step (b) purging both said beds with a gas stream freed of water and carbon dioxide, said gas stream being introduced into and passed

through said second bed into and through said first bed; followed by

- repressuring both said beds to a level in the range of 50-150 psia with product gas freed of water and carbon dioxide, passed into said beds in the same flow direction as step (c).

4,711,646

SINGLE COMPONENT ADSORPTION PROCESS

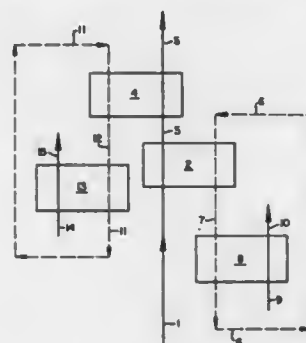
Arun Acharya, East Amherst, and William E. Bevier, Kenmore, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 796,102, Nov. 8, 1985, abandoned. This application Mar. 26, 1987, Ser. No. 30,705

Int. Cl.⁴ B01D 53/04, 53/06

U.S. Cl. 55-33

20 Claims



1. A process for the removal by adsorption of a single component from a gaseous stream comprising:

- passing a gaseous stream containing a component to be removed in contact with a first mass of adsorbent to transfer the majority of said component to the first mass of adsorbent and reduce the concentration of said component in the gaseous stream to within the range of from 5 to 50 ppm;
- passing the resulting gaseous stream in contact with a second mass of adsorbent, separate from the first mass of adsorbent, to transfer remaining component to the second mass of adsorbent and reduce the concentration of said component in the gaseous stream to less than 5 ppm;
- loading each of the adsorbent masses to at least 90 percent of its capacity;
- regenerating the first adsorbent mass to a high residual loading; and
- regenerating the second adsorbent mass to a low residual loading.

4,711,647

PROCESS AND APPARATUS FOR DEGASSING LIQUIDS, ESPECIALLY POLYMER MELTS AND SOLUTIONS

Egon Gathmann, Remscheid, Fed. Rep. of Germany, assignor to Barmag Aktiengesellschaft, Remscheid-Lennep, Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 855,094

Claims priority, application Fed. Rep. of Germany, May 2, 1985, 3515785; Aug. 20, 1985, 3529708

Int. Cl.⁴ B01D 19/00

U.S. Cl. 55-52

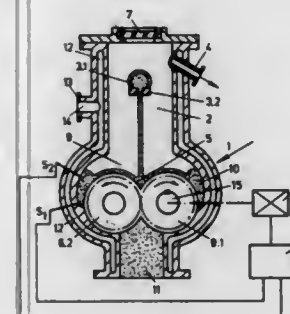
15 Claims

- In a process for the degassing of liquids, including polymer melts and solutions, to be processed or manufactured into finished products, the improvements which comprises: conveying the liquid as a pressure-independent stream, which contains pressure-releasable impurities of substantially lower boiling point, under expansion of pressure for introduction into the feed chamber of a gear wheel pump having paired gear wheels oppositely rotating with an

upwardly opening nip which transports said liquid outwardly and then downwardly into an entry zone formed between an outer circumferential part of each gear wheel and the adjacent peripheral wall of the pump, said liquid being introduced at a pint located directly above said opening nip in said feed chamber; withdrawing from the feed chamber the impurities which are released as a gas by said expansion; allowing the liquid to flow under the influence of gravity to form a pool on the gear wheels of the pump as the liquid is transported outwardly by said gear wheels into said entry zone and then downwardly to an exit zone of higher pressure; and controlling the filling position of the liquid pool in the feed chamber to a partial filling such that only a thin melt film forms on the upper circumference of the gear wheels.

11. Apparatus for the degassing of high-boiling liquids, including polymer melts and solutions, to remove substantially lower boiling liquids and gases as impurities therefrom, which apparatus comprises:

a gear wheel pump having a housing with liquid inlet and liquid outlet lines connected thereto, said housing enclosing paired gear wheels disposed between the inlet and outlet lines, said gear wheels being engaged for opposite rotation with an upwardly opening nip facing a feed



chamber arranged above said gear wheels on the inlet side of the housing, and each of said gear wheels forming a liquid entry pocket between an outer circumferential part of the wheel and the adjacent peripheral wall of said feed chamber;

nozzle means to introduce liquid under release of pressure into said feed chamber at a point which lies above the upwardly opening nip of the paired gear wheels, allowing the liquid to flow downwardly under the influence of gravity onto said gear wheels;

means to oppositely rotate said gear wheels upwardly and outwardly from the opening nip to transport liquid outwardly and the downwardly into said entry pocket while passing the liquid from said inlet side under increasing pressure to said outlet line;

regulating means to control the relative rate of introduction of the liquid with reference to its rate of transport by the gear wheels such that the liquid level in the feed chamber is maintained at a preset level only partially filling said feed chamber; and

a pressure relief connection on said feed chamber at a position upstream from the preset liquid level and far enough away from the liquid inlet for removal of the impurities in gas form without removing any significant portion of the liquid.

4,711,648

PROCESS FOR PURIFICATION OF GASES

Werner Konkol, Oberhausen; Helmut Bahrmann, Hamminkeln-Brünen; Georg Dämbkes, Dinslaken; Wilhelm Glck, Duisburg; Ernst Wiebus, Oberhausen, and Hanswilhelm Bach, Duisburg, all of Fed. Rep. of Germany, assignors to Ruhrechemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,455

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532955

Int. Cl.⁴ B01D 19/00

U.S. Cl. 55-73

19 Claims

- A process for the removal of at least one contaminant selected from the group consisting of hydrogen sulfide, carbonyl sulfide and hydrogen cyanide from a gas containing the same comprising contacting said gas with at least one liquid aliphatic aldehyde at a temperature of 30° C.-100° C. to absorb the contaminant(s) from the gas, said gas being inert to the aldehyde and recovering the contaminant depleted off gas.

4,711,649

AIR FILTER AND METHOD

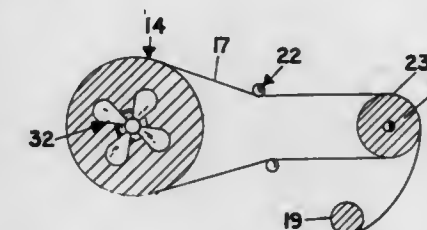
Robert A. Berryhill, Stokesdale, N.C., assignor to Austin-Berryhill Fabrication, Inc., Greensboro, N.C.

Filed Sep. 2, 1986, Ser. No. 902,492

Int. Cl.⁴ B01D 46/20

U.S. Cl. 55-97

14 Claims



- A filter comprising: a filter medium support drum, a filter medium supply positioned proximate said support drum, a take-up roller positioned proximate to said filter medium supply and filter medium extending from said medium supply over said support drum and back into engagement with said medium supply and thereafter onto said take-up roller.

4,711,650

SEAL-LESS CRYOGENIC EXPANDER

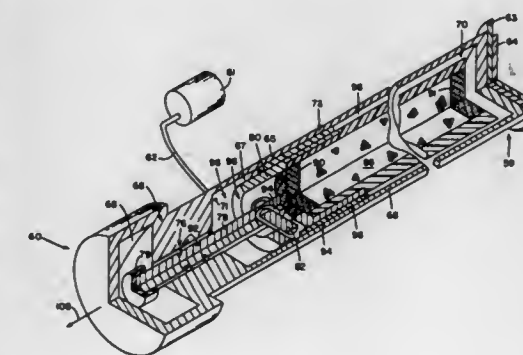
Lawrence E. Faria, Hodson, and Earl H. Christopher, Lynnfield, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 4, 1986, Ser. No. 903,540

Int. Cl.⁴ F25B 9/00

U.S. Cl. 62-6

20 Claims



- In an expander for use in a split Stirling cycle refrigeration system of the type wherein a displacer moves with reciprocating

ing motion inside an expander housing, and wherein a plunger force and a regenerator force are formed on the displacer, the plunger force cyclically varying and having a time of minimum and maximum plunger force amplitude, and the regenerator force cyclically varying and having a time of minimum and maximum regenerator force amplitude, the improvement comprising:

- (a) means for maintaining displacer forces, such that the maximum plunger force amplitude is substantially equal to the maximum regenerator force amplitude; and
- (b) means for adjusting a time difference, the time difference being the time between the time of maximum plunger force and the time of maximum regenerator force such that a measure of the cooling power of the refrigeration system is maximized.

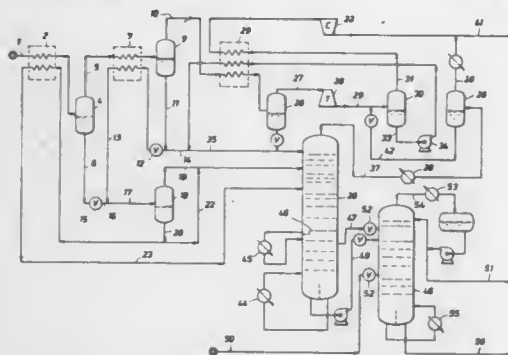
4,711,651

PROCESS FOR SEPARATION OF HYDROCARBON GASES

Shanmuk Sharma, Houston; Donnie K. Hill, Woodlands, and Charles A. Durr, Houston, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Dec. 19, 1986, Ser. No. 944,274
Int. Cl.⁴ F25J 3/02

U.S. Cl. 62—34



1. A process for separation of a high pressure gaseous stream containing mixed light hydrocarbons which comprises:

- (a) cooling the high pressure gaseous stream and introducing the resulting cooled high pressure stream to a first, single equilibrium, separation zone;
- (b) recovering a first vapor stream and a separate first liquid stream from the first, single equilibrium, separation zone;
- (c) expanding the first liquid stream to form a first intermediate pressure stream;
- (d) cooling the first vapor stream and introducing the resulting cooled stream to a second, single equilibrium, separation zone operated at substantially the same pressure as the first, single equilibrium, separation zone;
- (e) recovering a second liquid stream from the second, single equilibrium, separation zone;
- (f) expanding at least a major portion of the second liquid stream to form a second intermediate pressure stream;
- (g) combining the first and second intermediate pressure streams to form a mixed intermediate pressure stream; and
- (h) recovering refrigeration from at least a portion of the mixed intermediate pressure stream.

4,711,652

METHOD OF PRODUCING HALIDE GLASS, ESPECIALLY FOR OPTICAL COMMUNICATIONS

Giacomo Roba, Genova, and Eros Modone, Turin, both of Italy, assignors to Cseit-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

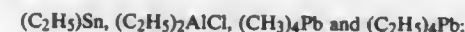
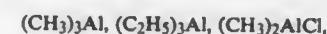
Filed Mar. 17, 1986, Ser. No. 840,422

Claims priority, application Italy, Apr. 3, 1985, 67325 A/85
Int. Cl.⁴ C03B 19/06, 37/018

U.S. Cl. 65—18.2

5 Claims

1. A process for manufacturing a halide glass which comprises the steps of:
reacting an organometallic compound selected from the group which consists of:



with an interhalide or halide-derived compound selected from the group which consists of:



in liquid phase, in amounts and at a temperature at which a glass-forming solid salt is precipitated and all remaining elements of the reacted compounds are volatilized as reaction products; and

vitrifying said glass-forming solid salt to form a glass article.

4,711,653

INNOVATIVE PRESS BENDING OF THERMOPLASTIC SHEETS

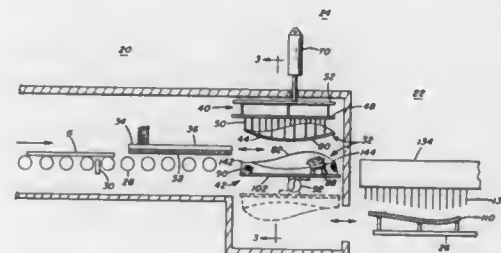
Robert G. Frank, Franklin Township, Butler County; George R. Claassen, New Kensington; Thomas L. Waterloo, Allison Park; Stephen J. Schultz, Indiana Township, West Moreland County, and Michael T. Fecik, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1986, Ser. No. 947,253

Int. Cl.⁴ C03B 23/03

U.S. Cl. 65—106

24 Claims



1. An apparatus for shaping heat softened sheet material comprising:

- means to heat said sheet to its heat softening temperature;
- a shaping station including an upper mold with a downwardly facing shaping surface and a lower vacuum mold with an apertured upwardly facing shaping surface wherein said upwardly facing shaping surface complements said downwardly facing shaping surface;
- means to provide a vacuum to said lower mold;
- means to transfer said heat softened sheets from said heating means to said shaping station;
- means to shape said sheets between said upper and lower molds;
- means to rotate said lower mold and said shaped sheet held thereagainst by vacuum from a first position wherein said shaping surface of said lower mold faces upward and is in

opposing relation to said shaping surface of said upper mold, to a second position wherein said shaping surface of said lower mold faces downward; and
means to remove said sheet from said shaping station.

18. A method of shaping heat softened sheet material comprising:

- heating said sheet to its heat softening temperature;
- depositing said heat softened sheet at a shaping station;
- shaping said heat softened sheet between an upper mold and lower mold at said shaping station;
- holding said shaped sheet against said lower mold;
- rotating said lower mold with said shaped sheet held thereagainst from a first position wherein said sheet is above said lower mold to a second position wherein said sheet is below said lower mold; and
- removing said shaped sheet from said shaping station.

4,711,654

APPARATUS FOR SHAPING GLASS SHEET

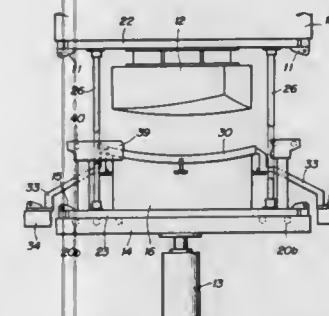
Naohiro Iida, Osaka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jan. 30, 1987, Ser. No. 9,271

Claims priority, application Japan, Feb. 3, 1986, 61-21627
Int. Cl.⁴ C03B 23/023

U.S. Cl. 65—172

6 Claims



1. An apparatus for shaping a curved reinforced glass sheet by bending a glass sheet which has been heated by a heating furnace up to a softening point and thereafter cooling the bent glass sheet with a cooling medium and imparting a prescribed stress to the glass sheet, said apparatus comprising:

- upper and lower mold members for bending the glass sheet;
- a frame assembly having a top plate, a bottom plate, and a plurality of posts vertically connected between said top and bottom plates;
- a first vertically displacing device mounted on said top plate;
- an upper surface plate coupled to said first vertically displacing device and vertically movable thereby in said frame assembly;
- a second vertically displacing device mounted on said bottom plate;
- a lower surface plate coupled to said second vertically displacing device and vertically movable thereby in said frame assembly;
- a first common plate fixed to said upper mold member and detachably secured to said upper surface plate by fixing means;
- a second common plate fixed to said lower mold member and detachably secured to said lower surface plate by fixing means;
- positioning means disposed between said first and second common plates for positioning said upper and lower mold members with respect to each other; and
- a carrier for carrying a unit assembly comprising said upper and lower mold members and said first and second common plates upon replacement of the upper and lower mold members.

4,711,655

ADJUSTABLE QUENCH FOR TEMPERING A GLASS SHEET

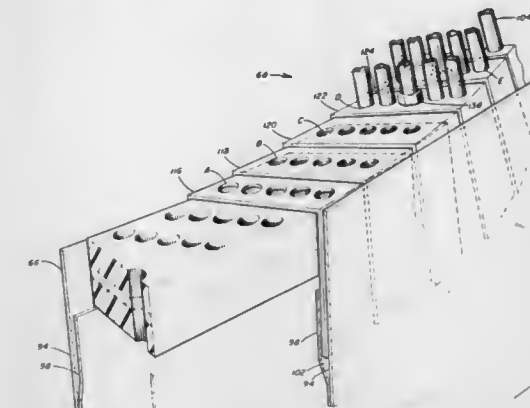
Stephen J. Schultz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 9, 1986, Ser. No. 871,937

Int. Cl.⁴ C03B 27/04

U.S. Cl. 65—351

26 Claims



1. An apparatus for cooling a shaped glass sheet comprising:
a nozzle box;
a plurality of overlapping covers each having center portions overlying a flexible support and opposing leg portions extending along walls of said nozzle box such that said flexible support and covers are slidably engaged with said nozzle box to seal said box;
a plurality of nozzles extending from said flexible support, through openings in said center portions of said covers towards a major surface of said glass sheet wherein nozzle portions adjacent said major surface form a quench surface; and
means to adjustably bend said flexible support so as to modify the curvature of said quench surface formed by said nozzles.

4,711,656

ENHANCEMENT OF NITROGEN-FIXATION WITH RHIZOBIAL TAN VARIANTS

Tsuneo Kaneshiro, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 1, 1986, Ser. No. 891,939

Int. Cl.⁴ C05F 11/08

U.S. Cl. 71—7

4 Claims

1. A method of improving the capacity of a leguminous plant for fixation of atmospheric nitrogen in symbiosis with a Bradyrhizobium bacterium comprising inoculating the plant or the locus of the plant with a tan variant of the parental strain of said bacterium and culturing the plant in an environment conducive to symbiosis.

4,711,657

SUBSTITUTED TRIAZOLYMETHYL TERT.-BUTYL KETONE COMPOUNDS AND PLANT PROTECTION AGENTS

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Klaus Lürssen, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

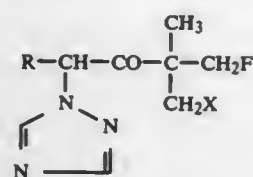
Continuation of Ser. No. 321,291, Nov. 13, 1981, abandoned, which is a continuation of Ser. No. 213,706, Dec. 5, 1980, abandoned. This application Dec. 21, 1984, Ser. No. 684,973 Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951164

Int. Cl.⁴ C07D 249/10; A61K 43/653

U.S. Cl. 71-92

19 Claims

1. A substituted triazolymethyl tert.-butyl ketone compound of the formula



wherein

R is cyclohexylmethyl, 4-chlorobenzyl, 2,4-dichlorobenzyl or 3,4-dichlorobenzyl, and X is hydrogen or fluorine;

and the hydrochloric acid addition salts thereof.

4,711,658

5-PERFLUOROACYLAMINO-4-NITRO-1-ARYL-PYRAZOLE SALTS, PLANT GROWTH REGULATING AND HERBICIDAL COMPOSITION CONTAINING THEM, AND PLANT GROWTH REGULATING AND HERBICIDAL METHOD OF USING THEM

Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jörg Stetter, Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, and Klaus Lürssen, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 934,047

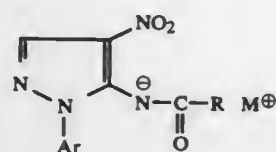
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543034

Int. Cl.⁴ A01N 43/56; C07D 231/40, 401/04

U.S. Cl. 71-92

11 Claims

1. A 5-perfluoroacylamino-4-nitro-1-arylpyrazole salt of the formula



in which

R represents a straight-chain or branched perfluoroalkyl radical with 1 to 8 carbon atoms,

M[⊕] represents one equivalent of an alkali metal, alkaline earth metal or transition metal cation, or represents an ammonium ion which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of straight-chain or branched alkyl with 1 to 18 carbon atoms and benzyl and

Ar represents phenyl which is optionally mono- or polysubstituted by identical or different substituents, or represents 2-pyridyl, 3-pyridyl or 4-pyridyl, in each case optionally mono- or polysubstituted by identical or different substitu-

ents, possible substituents in each case being selected from the group consisting of cyano, nitro, halogen, in each case straight-chain or branched alkyl, alkoxy and alkoxy-carbonyl with in each case up to 4 carbon atoms, in each case straight-chain or branched halogenoalkyl and halogenoalkoxy with in each case up to 4 carbon atoms and up to 9 identical or different halogen atoms and a radical —S(O)_m—R¹, wherein

R¹ represents amino, or represents in each case straight-chain or branched alkyl, alkylamino, dialkylamino or halogenoalkyl with in each case up to 4 carbon atoms in the individual alkyl parts and, in the case of the halogenoalkyl, with up to 9 identical or different halogen atoms and

m represents the number 0, 1 or 2.

10. A method of killing or regulating the growth of plants which comprises applying to such plants or to a locus in which such plants are grown or to be grown an amount effective therefor of a salt according to claim 1.

4,711,659

ATTRITION RESISTANT CONTROLLED RELEASE FERTILIZERS

William P. Moore, P.O. Box 1270, Hopewell, Va. 23860

Filed Aug. 18, 1986, Ser. No. 897,160

Int. Cl.⁴ A01N 37/38, 43/48, 43/64; C05C 9/00

U.S. Cl. 71-93

25 Claims

1. An attrition resistant, controlled release, fertilizer particle composition, comprising:

(a) a water soluble central mass of a plant food compound containing NH₂ functional groups amounting to at least 10 percent;

(b) a base coating, surrounding and chemically bonded to the central mass and consisting of substituted ureas, formed by reacting a molecular excess of a liquid polyfunctional isocyanate with the NH₂ functional groups of the central mass; and

(c) a water insoluble sealing layer, surrounding and chemically bonded to the base coating, formed by the reaction and polymerization of the excess polyfunctional isocyanate of the base coating with an amount of anhydrous organic polyol sufficient to produce a NCO to OH moiety ratio between 1 and 3.

4,711,660

SPHERICAL PRECIOUS METAL BASED POWDER PARTICLES AND PROCESS FOR PRODUCING SAME

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1986, Ser. No. 905,013

Int. Cl.⁴ B22F 1/00

U.S. Cl. 75-0.5 B

28 Claims

1. A process comprising:

(a) mechanically reducing the size of a precious metal based material to produce a finer powder, the major portion of which has a particle size of less than about 20 micrometers;

(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet, to melt at least about 50% by weight of said finer powder to form essentially fine spherical particles of said melted portion;

(c) rapidly and directly solidifying the resulting high temperature treated material while in flight to form fine spherical particles having a particle size of less than about 20 micrometers in diameter, said particles being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends.

4,711,661

SPHERICAL COPPER BASED POWDER PARTICLES AND PROCESS FOR PRODUCING SAME

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1986, Ser. No. 905,011

Int. Cl.⁴ B22F 1/00

U.S. Cl. 75-0.5 B

22 Claims

1. A process comprising:

(a) mechanically reducing the size of a copper based material to produce a finer powder, the major portion of which has a particle size of less than about 20 micrometers;

(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet to melt at least about 50% by weight of said finer powder to form essentially spherical particles of said melted portion; and

(c) rapidly and directly resolidifying the resulting high temperature treated material while in flight to form fine spherical particles having a particle size of less than about 20 micrometers in diameter, said particles being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends.

4,711,662

PROCESS FOR THE SIMULTANEOUS TREATMENT OF DUST, SLUDGE AND STEEL SLAG

Akihisa Harada, Kitakyushu, Japan, assignor to Nippon Jiryoku Senko Co., Ltd., Fukuoka, Japan

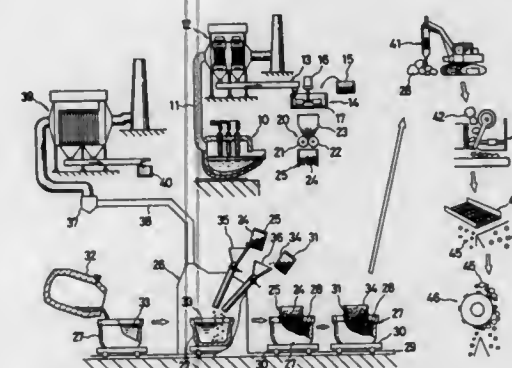
Filed Oct. 14, 1986, Ser. No. 918,192

Claims priority, application Japan, Jun. 11, 1986, 61-136721

Int. Cl.⁴ C22B 1/00

U.S. Cl. 75-1 R

10 Claims



1. A process for the simultaneous treatment of dust, sludge and steel slag which comprises the first step of adding 5 to 20% by weight of a reducing agent to dust and sludge generated in the steel-manufacturing step, followed by kneading, the second step of converting the mixture kneaded in the first step into a lump having a particle size of 5 to 80 mm with a lumping device, the third step of adding the lump prepared in the second step and 5 to 20% by weight, based on the amount of the molten steel slag to be treated, of a silicate mineral containing water of crystallization to the molten steel slag to carry out the modification of the slag with bubbling due to the decomposition of the silicate mineral containing water of crystallization, and the fourth step of cooling the steel slag treated in the third step to recover a metal component by an ordinary mineral dressing method.

4,711,663

PROCESS FOR THE AUTOMATIC FORMING OF CONTINUOUS METAL TUBE FILLED WITH POWDERED MATERIALS, ITS DIRECT INTRODUCTION IN TO LIQUID METAL, AND RELATED EQUIPMENT

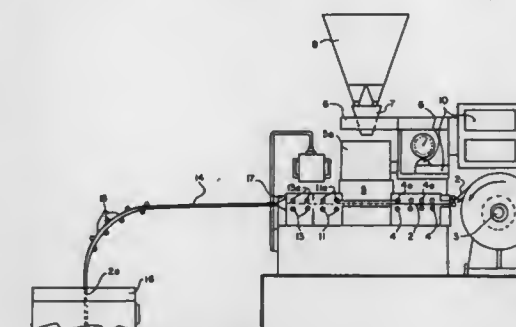
Lorenzo Ferrari, Lugano, Switzerland, assignor to Kinglor-Ltd, Lugano, Switzerland

Filed Dec. 10, 1986, Ser. No. 940,115

Int. Cl.⁴ C21C 7/02

U.S. Cl. 75-53

9 Claims



1. A process for treating molten metal with additives, comprising the steps of:

unrolling a flat metallic sheet from a roll;

positioning said sheet adjacent a means for metering, weighing and feeding said additives onto said metallic sheet;

metering and weighing the amounts of said additives prior to feeding onto said metallic sheet;

controlling the discharge time sequence of said metering means onto said weighing means by a computer means capable of being programmed to select predetermined weights of said additives based on the type, quantity, and determined characteristics of said molten metal;

depositing said predetermined weighted additives onto said sheet;

advancing said sheet and then folding the side flanges thereof to form a generally U-shaped channel, then overlapping said side flanges such that said additives are compacted and said sheet forms, in situ, a continuous tubular member; and

immediately introducing said continuous tubular member into said molten metal.

4,711,664

PROCESS FOR PRODUCING ZIRCONIUM SPONGE WITH A VERY LOW IRON CONTENT

Young J. Kwon, Fruit Heights, and Susan M. Schulte, Ogden, both of Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 23, 1987, Ser. No. 30,007

Int. Cl.⁴ C22B 34/10

U.S. Cl. 75-84.5

6 Claims

1. In a process for vacuum distilling zirconium sponge containing residual magnesium and magnesium chloride in a stainless steel lined vessel to remove said magnesium and magnesium chloride, the improvement of distilling same at a temperature below about 940° C. to prevent pickup of iron by the zirconium from the stainless steel lined vessel.

4,711,665

OXIDATION RESISTANT ALLOY

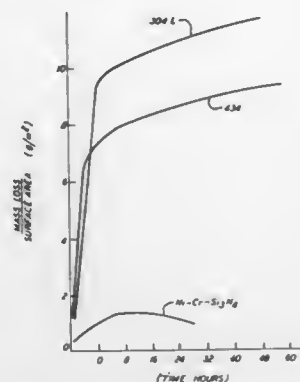
George Simkovich, State College, Pa., assignor to Pennsylvania Research Corporation, University Park, Pa.

Filed Jul. 26, 1985, Ser. No. 759,547

Int. Cl.⁴ C22C 38/18

U.S. Cl. 75-244

4 Claims



1. An oxidation resistant alloy consisting essentially of: about 8 to 12 percent Cr by weight; about 3 to 20 percent Si₃N₄ by volume; about 1 to 2 percent Si by weight; up to about 0.2 percent by weight of a reactive element selected from the group consisting of Y, Sc, Th, La, and other rare Earth elements; and the balance selected from the group consisting of Fe, Ni, Co, a Fe-based alloy, a Ni-based alloy and a Co-based alloy.

4,711,666

OXIDATION PREVENTION COATING FOR GRAPHITE

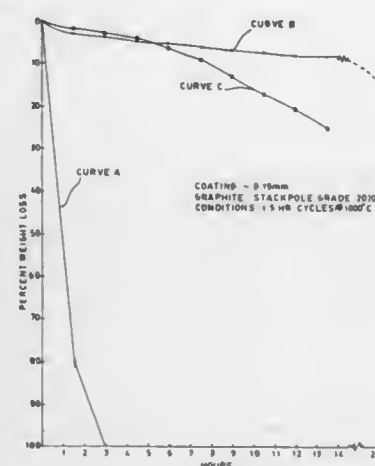
Lloyd R. Chapman, Anderson County, and Cressie E. Holcombe, Jr., Knox County, both of Tenn., assignors to ZYP Coatings, Inc., Oak Ridge, Tenn.

Filed Feb. 2, 1987, Ser. No. 9,716

Int. Cl.⁴ C09K 15/02, 15/32

U.S. Cl. 106-14.12

15 Claims



1. A binder/suspension liquid for use in preparing a protective coating to substantially prevent oxidation of graphitic materials up to at least 1000 degrees Centegrade, which comprises:

a substantially pure colloidal silica solution of a selected volume;

a substantially pure mono-aluminum phosphate solution of a selected volume, said selected volume of said mono-aluminum phosphate solution being from about 0.54 to about 1.86 times said selected volume of said colloidal

silica solution, said colloidal silica solution and said mono-aluminum phosphate solution being intimately mixed; and substantially pure ethyl alcohol of a selected volume, said selected volume of said ethyl alcohol being from about 0.05 to 0.45 times the combined selected volumes of said colloidal silica solution and said mono-aluminum phosphate solution, said ethyl alcohol intimately mixed with said mixed colloidal silica solution and mono-aluminum phosphate solution.

4,711,667

CORROSION RESISTANT ALUMINUM COATING

John W. Bibber, Batavia, Ill., assignor to Sanchem, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 902,150, Aug. 29, 1986, abandoned. This application Sep. 18, 1986, Ser. No. 908,827

Int. Cl.⁴ C23F 11/18

U.S. Cl. 106-14.21

36 Claims

1. A basic pH aluminum coating composition to provide a protective conversion coating for aluminum and aluminum alloys comprising as the essential ingredient thereof an alkali metal permanganate and a buffer compound selected from the group consisting of an alkali metal tetraborate, alkali metal metaborate, benzoic acid, alkali metal benzoate, alkali metal carbonate, and a mixture of the alkali metal tetra and metaborate.

4,711,668

AQUEOUS INK COMPOSITION

Masaru Shimada, Shizuoka; Toshiyuki Kawanishi, Numazu; Kakuji Murakami, Shizuoka; Tamotsu Aruga, Numazu; Hiroyuki Uemura, Numazu, and Kiyofumi Nagai, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 14, 1986, Ser. No. 851,248

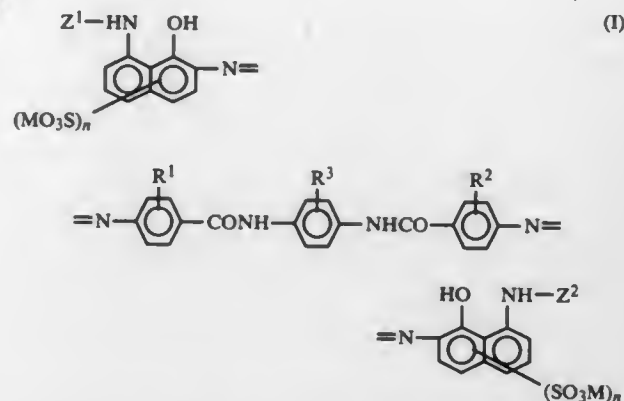
Claims priority, application Japan, Apr. 17, 1985, 60-080055

Int. Cl.⁴ C09D 11/02

U.S. Cl. 106-22

8 Claims

1. An aqueous ink composition comprising (i) a water-soluble dye having the formula (I) in an amount sufficient for ink printing and (ii) water,



wherein R¹ and R² each represent hydrogen, a lower alkyl group, a lower alkoxy group or halogen; R³ represents hydrogen, a lower alkyl group, a lower alkoxy group, halogen, a sulfonic acid group or a sulfonate group; Z¹ and Z² each represent hydrogen, a lower alkyl group, a phenyl group, an acetyl group, an alkyl sulfonyl group, a benzoyl group which may have a substituent selected from the group consisting of a lower alkyl group, a lower alkoxy group and halogen, a benzenesulfonyl group which may have a substituent selected from the group consisting of a lower alkyl group, a lower alkoxy group and halogen, or a 1,3,5-triazine group which may have a substituent selected from the group consisting of an alkyl group, an alkoxy group, a hydroxyl group, halogen, a hydroxyalkyl amino group, an alkyl amino group and an aro-

matic amino group; M represents hydrogen, an alkali metal or NH₄⁺; and n is an integer of 1 or 2.

4,711,669

METHOD OF MANUFACTURING A BONDED PARTICULATE ARTICLE BY REACTING A HYDROLYZED AMYLACEOUS PRODUCT AND A HETEROCYCLIC COMPOUND

Albert P. Paul, Teaneck, N.J.; Richard A. Szarz, Medinah, Ill., and Roger J. Card, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 5, 1985, Ser. No. 795,068

Int. Cl.⁴ B28B 7/28; C08L 1/00

U.S. Cl. 106-38.51

25 Claims

1. A method of manufacturing a bonded particulate article comprising the steps of

- (i) admixing particulate material with a binder system, the binder system being formed by admixing a polyol comprising a hydrolyzed, gelatinized amylaceous material, a crosslinker for said polyol (ii) comprising the reaction product of gloxal, urea and formaldehyde, alone, or in further combination with ethylene glycol, a solvent, and an acid wherein said reaction is carried out at a pH of below about 7;

- (ii) forming the admixture into a shape; and
- (iii) curing to produce the bonded article.

4,711,670

MOISTENING AGENT FOR OFFSET PRINTING PLATES

Walter R. Müller, Dreieich, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Nov. 19, 1985, Ser. No. 799,400

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505452

Int. Cl.⁴ C08L 89/00, 89/06; B41N 1/00

U.S. Cl. 106-155

4 Claims

1. A moistening agent for an offset printing form comprising as active component 0.01 to 3 wt.-% of at least one organic polymer selected from the group consisting of non-crosslinked elastin or native, non-crosslinked collagen in aqueous medium having a pH of from 4.5 to 5.5 and 0.05 to 1.0 weight percent of longer-chain (6 ≤ n ≤ 12), nonpolymeric alcohols and/or alkanediols with hydroxyl groups in the 1,2 or 1,3 positions.

4,711,671

STORAGE STABLE PAPER SIZE COMPOSITION CONTAINING ETHOXYLATED LANOLIN

Emil D. Mazzarella, Mountainside; Walter Maliczyszyn, Somerville, and Jeffrey Atkinson, Neshanic Station, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

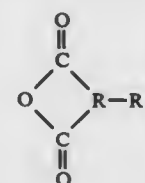
Continuation of Ser. No. 783,904, Oct. 3, 1985, abandoned. This application Apr. 27, 1987, Ser. No. 49,033

Int. Cl.⁴ C08L 91/00

U.S. Cl. 106-243

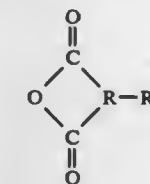
4 Claims

1. A paper size comprising a self-emulsifiable mixture of 80 to 99 parts by weight of a cyclic dicarboxylic acid anhydride having hydrophobic substitution and 1 to 20 parts by weight of an ethoxylated lanolin containing at least 15 moles ethylene oxide per mole lanolin wherein the cyclic dicarboxylic acid anhydride is represented by the formula:



wherein R represents a dimethylene or trimethylene radical

and wherein R¹ is a hydrophobic group containing more than 4 carbon atoms which may be selected from the class consisting of alkyl, alkenyl, aralkyl, or aralkenyl groups.



4,711,672

ASPHALTIC COMPOSITION

Helen R. Gorter; Lyle E. Moran; Warren D. Robertson, all of Sarnia, and Shaunalea Savard, Guelph, all of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 21, 1986, Ser. No. 853,925

Int. Cl.⁴ C08L 95/00

U.S. Cl. 106-281 R

17 Claims

1. An improved asphaltic composition comprising asphalt, a mineral acid, a filler and a stabilizing agent selected from the group consisting of Group IA and/or Group IIB sulfates.

4,711,673

COMBINATION OF SURFACE MODIFIERS FOR POWDERED INORGANIC FILLERS

Lawrence L. Musselman, Apollo, and Thomas L. Levendusky, Greensburg, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 3, 1985, Ser. No. 783,863

Int. Cl.⁴ C08K 9/04, 9/06, 9/00

U.S. Cl. 106-287.17

9 Claims

1. A filler composition containing a combination of surface modifiers, said composition comprising

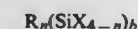
- (a) a powdered inorganic filler having a median particle size of less than about 15 microns, said filler being selected from the group consisting of alumina hydrate and bauxite, and

- (b) surface modifiers for the filler comprising

- (1) about 0.25 to 2.5 wt % of a mixture of saturated carboxylic acids consisting essentially of about 16 to 20 carbon atoms, said mixture having an iodine value of about 15 or less, and

- (2) about 0.25 to 2.5 wt % of an organosilane comprising

- (i) an organosilane of the formula



wherein R is selected from the group consisting of alkyl radicals containing 1 to 8 carbon atoms, alkenyl and alkynyl radicals containing 2 to 8 carbon atoms, and phenyl radicals, X is a hydrolyzable group; n=0 or 1; and b is at least 1 and not greater than 4, or

- (ii) an organosilane of the formula



wherein R₁ is selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms, phenyl radicals, alkenyl radicals having 2 to 8 carbon atoms, and fluoroalkyl radicals having 3 to 8 carbon atoms, and R₂ is selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms, or

- (iii) an organosilane of the formula





wherein R_1 and R_2 are defined above.

4,711,674

NON-BRONZING REDDISH LAKE PIGMENT

Hirohito Ando, Itako; Zenji Takada, Kamisu, and Yuko Shigeta, Choshi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

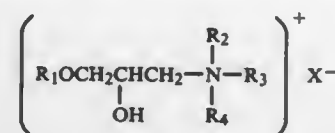
Filed Nov. 4, 1986, Ser. No. 926,530

Claims priority, application Japan, Nov. 8, 1985, 60-248918
Int. Cl.⁴ C09C 3/00

U.S. Cl. 106—289

11 Claims

1. A non-bronzing reddish lake pigment obtained by treating a reddish lake pigment with an N-(3-alkoxy-2-hydroxypropyl)-trialkylammonium salt represented by the general formula



wherein each of R_1 , R_2 , R_3 and R_4 represents an alkyl group having 1 to 30 carbon atoms, and X represents a halogen atom, a sulfonic acid radical, an acetic acid radical or a formic acid radical.

4,711,675

PROCESS FOR IMPROVING THE SAG-RESISTANCE AND HARDENABILITY OF A SPRING STEEL

Toshiro Yamamoto, Tokai; Ryohel Kobayashi, Chita; Mamoru Kurimoto, Tokonabe, and Toshio Ozone, Nagoya, all of Japan, assignors to Aichi Steel Works, Ltd., Tokai and Chuo Hatsujo Kabushiki Kaisha, Nagoya, both of Japan

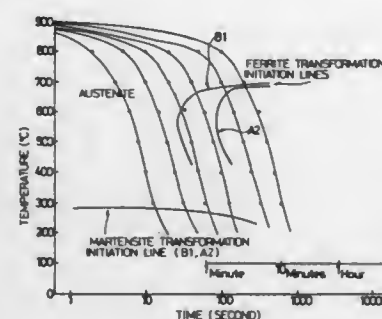
Division of Ser. No. 405,802, Aug. 6, 1982, Pat. No. 4,544,406.

This application Jul. 18, 1985, Ser. No. 756,196

Claims priority, application Japan, Aug. 11, 1981, 56-126280
Int. Cl.⁴ C21D 1/18

U.S. Cl. 148—144

8 Claims



1. A process for improving the sag-resistance and hardenability of a spring steel, comprising the steps of: preparing a steel alloy to include by weight 0.50-0.80% carbon, 1.50-2.50% silicon, 1.60-2.50% manganese and at least one member selected from the group consisting of 0.05-0.50% vanadium, 0.05-0.50% niobium and 0.05-0.50% molybdenum, the remainder being iron together with impurities; rapidly heating the steel alloy at a heating rate of above 500° C./min to an austenitizing temperature from about 900° C. to 1200° C. for dissolving carbide of the member in the austenite structure; and quenching and tempering the alloy at a tempering temperature between about 400° to 580° C. for precipitating dis-

solved carbide of the member as a fine carbide of the member in the martensite structure.

4,711,676

CARBURIZED PIN FOR CHAIN

Tadahiro Kitaori; Tsutomu Haginoya, both of Iruma, and Nobuto Kozakura, Hanno, all of Japan, assignors to Tsubakimoto Chain Company, Osaka, Japan

Filed Jul. 28, 1986, Ser. No. 890,866

Int. Cl.⁴ C22C 38/22

U.S. Cl. 148—319

4 Claims

1. A surface hardened pin for a chain comprising a core formed of a ferrous alloy containing manganese, silicon, chromium, molybdenum, about 0.1 to 0.4% carbon, and the balance essentially iron; and a hardened surface layer formed on said core, said hardened surface layer containing chromium and 0.6 to 0.9% carbon and having a plurality of carbide particles dispersed therethrough.

4,711,677

HIGH TEMPERATURE BUSHING ALLOY

Ralph A. Mendelson, Anaheim, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 18, 1986, Ser. No. 888,188

Int. Cl.⁴ C22C 38/48

U.S. Cl. 148—325

14 Claims

1. A cast austenitic stainless steel bushing having a good oxidation resistance and strength at operating temperatures up to 2000° F. and a coefficient of thermal expansion of at least 15×10^{-6} cm/cm/°C. and consisting essentially of about 29-32% chromium, 4-8% nickel, 1.3-1.7% carbon, 0.25-0.45% sulfur, 0.3-0.4% nitrogen, up to 1.0% manganese, up to 2.0% silicon, up to 1.0% molybdenum, up to 0.1% phosphorus, balance iron.

4,711,678

PROCESS FOR THE PREPARATION OF A WATER-IN-OIL EMULSION EXPLOSIVE AND A FUEL PHASE FOR USE IN SUCH PROCESS

Hans Ehrnström, Gyttop, Sweden, assignor to Nitro Nobel AB, Gyttop, Sweden

Filed Apr. 29, 1986, Ser. No. 857,138

Claims priority, application Sweden, May 8, 1985, 8502282

Int. Cl.⁴ C06B 45/00

U.S. Cl. 149—2

20 Claims

1. Fuel phase for use as a continuous phase together with a discontinuous aqueous oxidizing salt phase in water-in-oil emulsion explosives, comprising a carbonaceous fuel and distributed therein a fuel phase component comprising at least one but not all components of a gassing system, the fuel and fuel phase component being adapted to product gas or bubbles throughout the emulsion when combined with an aqueous oxidizing phase containing remaining components of the gassing system.

4,711,679

HEXAKIS (2-NITROXYETHYL) MELAMINE USEFUL AS AN ENERGETIC PLASTICIZER

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 22, 1985, Ser. No. 923,447

Int. Cl.⁴ C06B 25/22; C07D 251/54

U.S. Cl. 149—96

2 Claims

1. Hexakis(2-nitroxyethyl)melamine.
2. A mixture of equal weights of nitrocellulose and hexakis(2-nitroxyethyl)melamine.

4,711,680

PURE FLUORINE GAS GENERATOR

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 23, 1983, Ser. No. 497,287

Int. Cl.⁴ D03D 23/00; C01B 7/20

U.S. Cl. 149—109.4

21 Claims

1. A solid grain pure fluorine gas generator, comprising: a stable salt containing an anion derived from a thermodynamically unstable high-oxidation state transition metal fluoride; and at least one Lewis acid which is stronger than said transition metal fluoride and stably solid at ambient temperatures, but which melts or sublimates at temperatures moderately above ambient.
21. A method of generating pure fluorine, comprising the steps of: mixing a stable salt containing an anion derived from a thermodynamically unstable high-oxidation state transition metal fluoride with a Lewis acid, wherein said Lewis acid is stronger than said transition metal fluoride and melts or sublimates at temperatures moderately above ambient; causing the temperature of said mixture to reach the melting or sublimation temperature of said Lewis acid; reacting said melting or subliming Lewis acid with said stable salt containing an anion derived from a thermodynamically unstable high-oxidation state transition metal fluoride to generate a thermodynamically unstable high-oxidation state transition metal fluoride which decomposes into a lower oxidation state fluoride and pure fluorine.

4,711,681

FASTENING OF A COVERING MATERIAL TO A SUBSTRATUM

Jürg Grossmann, Birrwaldstr. 19, CH-8135 Langnau a. A., and Marcel Grossmann, Maeschackerstr. 196, CH-8911 Rotenschwil, both of Switzerland

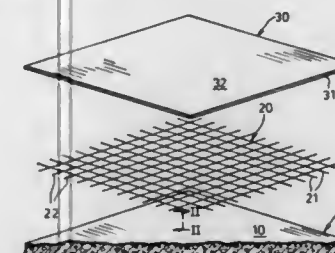
Filed Feb. 17, 1984, Ser. No. 581,312

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306627; Feb. 25, 1983, 3306630; Feb. 25, 1983, 3305304[U]

Int. Cl.⁴ B32B 31/12

U.S. Cl. 156—71

7 Claims



1. A method of fastening a floor covering material to the surface of a substratum by means of a discrete bonding layer which comprises: providing a bonding layer in a non-adhesive state, said bonding layer comprising chemically passive adhesive particles mixed with a plasticizer in an aqueous solution presenting, in the fused state, cohesive forces which are greater than adhesive forces thereof; applying said bonding layer to a supporting mesh of non-metallic, graphite free filaments by immersion of said mesh of filaments in said solution, drying said bonding layer at a temperature below 66° C. to remove water; placing said bonding layer-mesh as a composite between said floor covering material and said substratum surface as an interlayer between said covering material and said substratum; adjusting said floor covering material substantially to its desired position relatively to said substratum; activating said adhesive particles by heat; and subsequently cooling to pro-

duce a firm bond whereby the adhesive forces of said bonding layer exceed said cohesive forces.

4,711,682

WALLPAPER APPLICATOR DEVICES AND METHOD FOR ITS USE

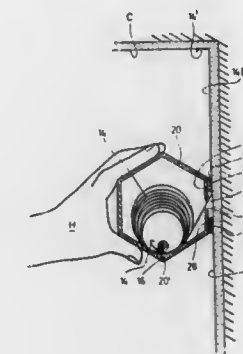
Christian Barbe, 3593 Jacqueline, and Richard Barbe, 3591 Jacqueline, both of Laval, Quebec, Canada (H7P 5A6)

Filed Nov. 10, 1986, Ser. No. 929,000

Int. Cl.⁴ E04F 13/00; B44C 7/06

U.S. Cl. 156—71

6 Claims



1. An applicator device for applying wallpaper on a flat surface, including an elongated casing defining a cross-sectionally polygonal structure, the casing consisting of at least two flat side walls and a third side wall having an intermediate longitudinal slot, end plates closing both ends of said casing, each end plate having a notch registering with said slot and a central through-bore through which a rolled web of said wallpaper is insertable into said casing with the leading edge portion of said wallpaper extending through said longitudinal slot, and further including a weight rod adapted to extend inside said casing between said end plates and through the cylindrical hollow defined by the rolled wallpaper web to bias the latter against a pair of adjacent flat side walls of said casing, the exterior face of said third side wall having resilient presser members longitudinally extending on either side of said slot spacedly thereof and adapted to press said wallpaper against said flat surface upon said applicator device being slidably applied against said flat surface.

6. A method for applying wallpaper on a flat surface with an applicator device, including the following steps:

- (1) tightly rolling into a web a wallpaper having a preglued face;
- (2) engaging said web into an elongated casing through a bore at one end thereof, to constitute said applicator device;
- (3) pulling the leading edge portion of the wallpaper outwardly therefrom through a longitudinal slot formed along a wall of said casing;
- (4) immersing the said applicator device into a water basin and then releasing the tightly rolled web, whereby said web partially unrolls and thereby produces a counter-rotational circulation of water within said casing which moistens all of the said preglued surface of the wallpaper;
- (5) removing same from the basin;
- (6) inserting a weight rod within the rolled web;
- (7) applying said wallpaper leading portion against a surface; and
- (8) displacing said casing along said surface while pressing said casing thereagainst.

4,711,683

METHOD AND APPARATUS FOR MAKING ELASTIC DIAPERS

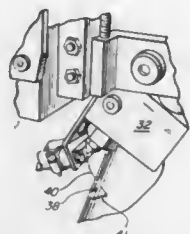
John R. Merkatoris, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Mar. 9, 1987, Ser. No. 23,136

Int. Cl.⁴ B32B 31/08

U.S. Cl. 156—164

14 Claims



1. In a method applying a leg elastic ribbon to an elongated moisture-imperious web adapted to form a series of diapers, the steps of delivering a continuous stream of adhesive to a point adjacent to but spaced from said web, directing a first air stream adjacent said adhesive stream to entrain and draw said adhesive stream onto said web along a first longitudinal line, intermittently directing a second air stream adjacent said adhesive stream at an angle to said first air stream to shift said adhesive stream laterally to a second longitudinal line, and applying a stretched elastic ribbon to said web on said first longitudinal line.

4,711,684

METHOD AND APPARATUS FOR USE IN PRODUCING RECONSOLIDATED WOOD PRODUCTS

John D. Coleman, Victoria, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU84/00241, § 371 Date Jul. 23, 1985, § 102(e) Date Jul. 23, 1985, PCT Pub. No. WO85/02367, PCT Pub. Date Jun. 6, 1985

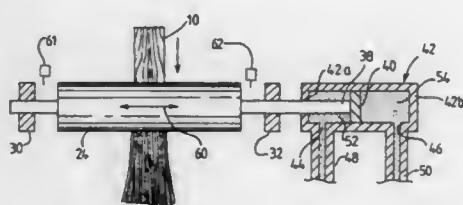
PCT Filed Nov. 23, 1984, Ser. No. 765,309

Claims priority, application Australia, Nov. 23, 1983, PG2514

Int. Cl.⁴ B32B 31/00

U.S. Cl. 156—196

23 Claims



1. A process for forming a flexible open lattice work web of naturally interconnected wood strands which are generally aligned along a common grain direction with a substantial portion of said strands being substantially discrete but incompletely separated from each other comprising passing natural wood between a pair of rotating rollers the axes of which are disposed substantially parallel to each other so as to rollingly engage and rend the natural wood while simultaneously reciprocating at least one of said rollers relative to the other roller in a direction substantially parallel to the axes of said rollers to further spread the lattice work web without breaking said interconnected wood strands and damping the reciprocating movement of at least one of said rollers towards the end of each reciprocating movement to prevent damage to the web and the individual strands thereof.

4,711,685

SOFT TEXTURED REVEAL EDGE CEILING BOARD AND PROCESS FOR ITS MANUFACTURE

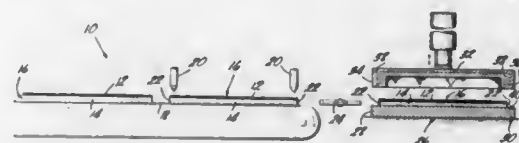
Theodore E. Hillman, Cloquet, Minn., assignor to USG Acoustical Products Company, Chicago, Ill.

Continuation of Ser. No. 395,586, Jul. 6, 1982, abandoned. This application Oct. 30, 1986, Ser. No. 924,124

Int. Cl.⁴ B32B 5/02, 31/20, 31/22

U.S. Cl. 156—220

14 Claims



1. A process for manufacturing a reveal edge fabric surfaced ceiling board having pressed and non-pressed portions comprising the steps of:

- (a) bonding a fabric to one face of a preformed ceiling board, said ceiling board comprising wood fibers or mineral fibers and a re-activatable binder to form a laminate of said fabric and said preformed ceiling board; and
- (b) simultaneously heating and pressing the periphery portion of the ceiling board while said reactivatable binder in said periphery portion is in a reactivatable condition to form a reveal edge ceiling board, said reveal edge being a portion of reduced height, higher density and greater strength as compared to a non-pressed portion of the ceiling board.

4,711,686

METHOD OF MAKING LABELS

David J. Instance, Guinea Hall, Sellindge, Kent, United Kingdom

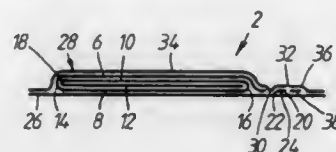
Filed Feb. 18, 1986, Ser. No. 829,909

Claims priority, application United Kingdom, Feb. 18, 1985, 8504114

Int. Cl.⁴ B32B 31/18

U.S. Cl. 156—227

14 Claims



1. A method of producing a succession of self-adhesive labels carried on a backing of release material, comprising the steps of:

- (a) applying a succession of folded labels to the adhesive surface of a first web of a pressure-sensitive self-adhesive material;
- (b) applying, over the succession of applied folded labels and the adhesive surface, a second web comprising a self-adhesive support web having a backing of release material and being adhered to regions of the adhesive surface of the first web which are not covered by the applied folded labels;
- (c) cutting through the layers of the webs other than the backing of release material so as to form a succession of self-adhesive labels on the backing of release material; and
- (d) cutting, either before, after or simultaneously with step (c), a succession of elongate cuts or weakened tear lines through the first web so that in each resultant self-adhesive label the cut or weakened tear line extends around a portion of the edge of the applied folded label so that separation of the first web along the cut or weakened tear

line permits access to the interior of the applied folded label.

4,711,687

METHOD OF USING PRECISION CAN LABELER WITH OPTIONAL TAX STAMP APPLICATOR

Eugene H. Paules, Huntington, Conn., assignor to United States Tobacco Company, Greenwich, Conn.

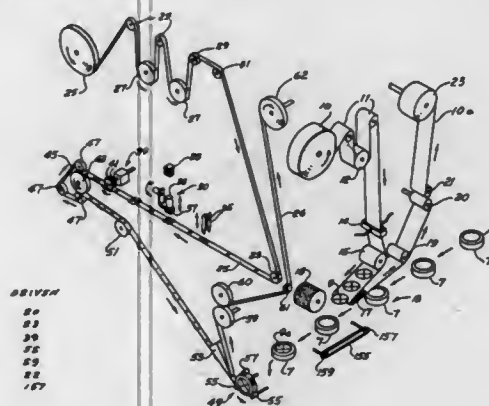
Division of Ser. No. 820,940, Jan. 21, 1986, Pat. No. 4,657,622.

This application Nov. 12, 1986, Ser. No. 930,343

Int. Cl.⁴ B44C 1/17, 1/00

U.S. Cl. 156—235

2 Claims



1. A method for labeling a container such as a can and the like a top or bottom label and a side label, comprising the steps of:

- (a) feeding a container into a top or bottom labeling station;
- (b) advancing synchronously a chain conveyor with a container thereon and a label carrier strip;
- (c) applying said top or bottom label on said container as said chain conveyor and said label carrier strip are being driven;
- (d) interrupting the driving of said label carrier strip while said conveyor is being driven;
- (e) admitting to a side positioning zone a container which has been top or bottom labeled while said conveyor is being driven;
- (f) positioning on a side said container;
- (g) feeding a side label into said positioning zone;
- (h) rotating said container on a side; and
- (i) joining said rotating container with said side label under stagewise increased pressure on said side label.

4,711,688

METHOD FOR ENCAPSULATING SEMICONDUCTOR COMPONENTS MOUNTED ON A CARRIER TAPE

Seppo Pienimaa, Virkkala, Finland, assignor to Oy Lohja AB, Virkkala, Finland

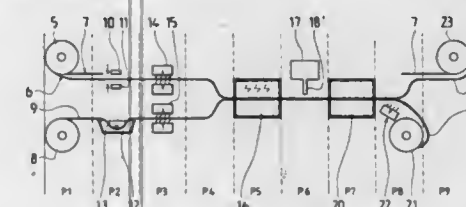
Filed Mar. 6, 1985, Ser. No. 708,785

Claims priority, application Finland, Mar. 9, 1984, 840981

Int. Cl.⁴ B29C 39/18, 33/58

U.S. Cl. 156—244.12

6 Claims



1. A method for encapsulating electronic components with an encapsulating polymer, wherein the components have con-

ductors mounted on a carrier tape having an annular support area for each component, characterized by the steps of pressing a mixture of a solvent and of a polymer of low surface energy onto the support area for each component from both sides of the carrier tape, wherein the mixture prevents spreading of the encapsulating polymer, subjecting the carrier tape bearing the solvent and polymer mixture to a warm-air blast, during which the solvent evaporates such that polymer films of low surface energy remain on both sides of the support area, guiding an encapsulating tape which has been moistened with a polymer of low surface energy and dried by means of warm-air treatment to the bottom of the components mounted on the carrier tape, pressing the encapsulating tape evenly against the bottom of the components, heating the combined assembly of carrier and encapsulating tapes in a first heating zone, spreading encapsulating polymer onto the face of the component and onto an area between the support area and the component by means of a dispensing and spreading device, heating the combined assembly of tapes including the encapsulating polymer in a second heating zone in order to harden the polymer encapsulation, and detaching the encapsulating tape from the carrier tape, now containing the encapsulated components, so as to leave the bottom of the components unprotected.

4,711,689

PROCESS FOR RECONSOLIDATED WOOD PRODUCTION

John D. Coleman, Surrey Hills, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU84/00240, § 371 Date Jul. 23, 1985, § 102(e) Date Jul. 23, 1985, PCT Pub. No. WO85/02366, PCT Pub. Date Jun. 6, 1985

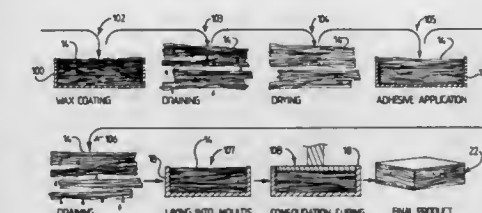
PCT Filed Nov. 23, 1984, Ser. No. 765,307

Claims priority, application Australia, Nov. 23, 1983, PG2513

Int. Cl.⁴ B32B 31/00

U.S. Cl. 156—257

12 Claims



1. A process for forming a reconsolidated wood product from a plurality of flexible open lattice work webs each of naturally interconnected wood strands, each said web being formed by partially rending natural wood so that said strands thereof are generally aligned along a common grain direction, a substantial proportion of said strands of each web being substantially discrete but incompletely separated from each other, said process comprising superposing said webs, compressing the superposed webs to consolidate the strands whilst maintaining them such as to substantially extend in said original grain direction and bonding said strands and webs together to hold them in juxtapositions assumed pursuant to said consolidation, wherein said bonding process comprises coating the strands of the webs with wax, applying a bonding agent to the strands whose impregnation into the natural wood of the strands is restricted by the wax coating, removing excess bonding agent from the superposed webs and curing the bonding agent during said compression and consolidation of the strands of the superposed webs.

4,711,690

METHOD FOR MAKING AN IDENTIFICATION CARD HAVING FEATURES FOR TESTING IN INCIDENT AND TRANSMITTED LIGHT

Yahya Haghighi-Tehrani, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany

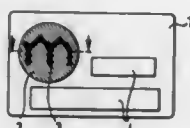
Continuation of Ser. No. 521,264, Aug. 8, 1983, abandoned. This application Dec. 18, 1985, Ser. No. 809,854

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 3231460

Int. Cl.⁴ B32B 5/00, 27/00

U.S. Cl. 156—309.6

13 Claims



1. A method of producing an identification card comprising the steps of:
 - providing at least two layers of synthetic material, said layers differing with respect to transparency and softening temperature;
 - providing at least one surface of the layer having the higher softening temperature with a relief structure without throughgoing openings said structure corresponding to a pattern or characters and said relief structure being provided by either excavation or deformation of said layer up to a certain depth;
 - superposing said at least two layers such that the at least one surface of the layer being provided with said relief structure is adjacently situated to said layer having the lower softening temperature;
 - applying heat and pressure all over the surface of the superposed layers for laminating said layers, wherein the heat is applied such that the temperature within the superposed layers during the laminated process is higher than the softening temperature of the layer having the lower softening temperature but said temperature being lower than the softening temperature of the layer being provided with said relief structure such that the layer having the lower softening temperature equalizing said relief structure by at least partially filling impressions of the surface relief structure such that the laminated structure has a constant thickness with respect to its outer dimensions, said layers having different transparencies locally varying with respect to the thickness such that when subjected to transmitted light the areas of greater thickness within the layer of less transparency appear to be darker than the surrounding areas whereas when subjected to incident light said areas having a higher color-intensity than the surrounding areas and wherein said layers are provided within said identity card such that the relief structure is covered at one face thereof only by transparent layers such that said relief structure is visible from the outside of the card.

4,711,691

TIRE BUILD-UP MACHINE

Hans Menell, Hanover; Hubert Ringhoff, Seelze, and Jürgen Ramp, Garbsen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

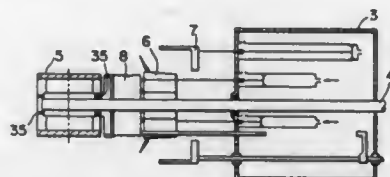
Filed Nov. 14, 1985, Ser. No. 798,173

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 3442302

Int. Cl.⁴ B29D 30/24

U.S. Cl. 156—415

4 Claims



1. A tire build-up machine having a core-loading machine and a build-up drum that is interchangeable quickly for build-up drums of different width to produce tires of different width and that is removably mounted on a drive shaft with the drum having a central rotational axis, with operating and control elements bearing against the end walls of said build-up drum which has a middle plane perpendicular to the rotational axis of the drum as an axial reference plane; the improvement in combination therewith comprising:

means including a respective spacer and abutment sleeve along with the core-loading mechanism as an auxiliary device positioned always with reproducible accuracy as corresponding to width of the respectively installed build-up drum associated therewith and as interposed between each of said end walls of said drum on the central rotational axis, and said operating and control elements being axially movable, for receiving the bearing pressures of the latter and being engageable as to the core-loading mechanism directly in a constantly uniform orientation that is always the same relative to the middle plane of the build-up drum as said axial reference plane and for exact positioning thereof during interchange as to different drum widths to convert production from narrow tire size to wide tire size without any great mounting and adjustment expenditure being necessary consequently to simplify and accelerate removal and exchange of build-up drums.

4,711,692

DEVICE FOR SMOOTHING SEALING COMPOUNDS IN INSULATING GLASS

Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria

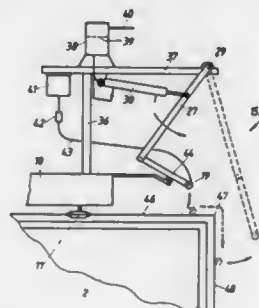
Filed Jul. 5, 1985, Ser. No. 752,065

Claims priority, application Austria, Jul. 5, 1984, 2172/84

Int. Cl.⁴ B32B 31/04

U.S. Cl. 156—486

25 Claims



1. Device for smoothing the surfaces of filling material introduced into edge joints of insulating glass panes in corner

4,711,694

PROCESS FOR PRODUCING A LAYER HAVING A HIGH MAGNETIC ANISOTROPY IN A FERRIMAGNETIC GARNET

Thierry Capra, Lyons, and Philippe Gerard, St. Ismier, both of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Filed Oct. 28, 1985, Ser. No. 792,202

Claims priority, application France, Nov. 12, 1984, 84 17200

Int. Cl.⁴ C30B 1/02, 19/00; G11C 19/08; B05D 3/06

U.S. Cl. 156—603

11 Claims

1. A process for producing a ferrimagnetic garnet layer, which has a high magnetic anisotropy, on an amagnetic substrate, comprising the steps of:

- forming at least one ferrimagnetic garnet layer by epitaxial growth on said amagnetic substrate;
- implanting a high dose of ions derived from a gaseous element in said ferrimagnetic garnet layer which does not make the implanted portion of the ferrimagnetic layer amorphous, in order to produce defects within the garnet layer; and
- heating the entity in the presence of a reducing agent to a temperature ranging from 250° to 292° C.

4,711,693

ANVIL FOR ULTRASONIC SLITTING APPARATUS

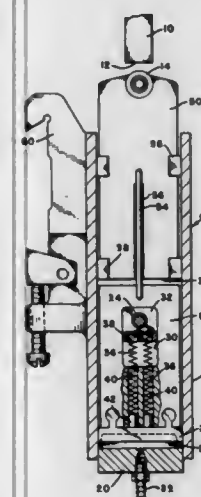
Ernest P. Holze, Jr., Brewster, N.Y., assignor to Branson Ultrasonics Corp., Danbury, Conn.

Filed Jul. 7, 1986, Ser. No. 882,464

Int. Cl.⁴ B29C 65/08

U.S. Cl. 156—580.1

5 Claims



1. An anvil for an ultrasonic slitting device operative in conjunction with a horn dimensioned to be resonant at a predetermined ultrasonic frequency comprising:

- a housing;
- a piston slidably mounted in said housing for limited motion in said housing;
- a mass, dimensioned to be resonant as a half wavelength resonator for ultrasonic energy traveling longitudinally therethrough at a frequency not lower than the resonant frequency of said horn, coupled to said piston for motion therewith;
- a slitting implement fastened to one end of said mass in position for being urged into contact with said horn;
- means coupled to said housing for causing responsive to fluid pressure said piston to be driven toward contact between said slitting implement and said horn, and
- said mass coupled to said piston by a centrally disposed rod secured with one end to said piston and with the other end to said mass substantially at a nodal region of said mass.

4,711,695

APPARATUS FOR AND METHOD OF MAKING CRYSTALLINE BODIES

Richard W. Stormont, Warwick, R.I., and Lawrence Eriss, Sudbury, Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

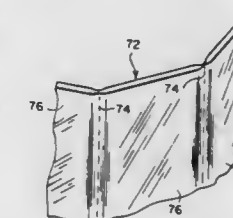
Division of Ser. No. 495,998, May 19, 1983, Pat. No. 4,647,437.

This application Aug. 7, 1986, Ser. No. 894,294

Int. Cl.⁴ C30B 29/60, 15/34; H01L 21/208

U.S. Cl. 156—608

2 Claims



1. In method of producing a plurality of bodies of a substantially monocrystalline material from a hollow tube of said crystalline material, said method including the steps comprising growing said body from a pool of said melt provided by a die end of a die member, and cutting said tube into said plurality of bodies of said crystalline material, wherein the improvement comprises:

- growing said tube from said die end of said die member so that said tube is thinner in cross section along predetermined lines than the remaining portions of said tube as said tube is being grown; and
- cutting said tube along said predetermined lines so as to separate said hollow tube into said plurality of bodies of said crystalline material.

4,711,696

PROCESS FOR ENHANCING TiAl_2O_3 TUNABLE LASER CRYSTAL FLUORESCENCE BY CONTROLLING CRYSTAL GROWTH ATMOSPHERE

Milan R. Kokta, Washougal, Wash., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 736,000, May 20, 1985, abandoned. This application Mar. 11, 1986, Ser. No. 838,605 Int. Cl.⁴ C30B 15/10

U.S. Cl. 156—617 SP

7 Claims

1. A method for making a Ti doped Al_2O_3 crystal suitable as a laser material comprising:

- making a solid phase mixture of a doping amount of TiO_2 in Al_2O_3 to provide a melt under a non-reactive atmosphere;
- introducing carbon monoxide into said non-reactive atmosphere while the melt is in the solid phase;
- purging said non-reactive atmosphere of carbon monoxide and its reactive gaseous products prior to liquifaction of said solid phase mixture;
- introducing a reducing agent other than carbon monoxide into said non-reactive atmosphere as a substitute for said carbon monoxide; and
- heating said melt to a sufficiently high temperature under said non-reactive atmosphere to form a TiAl_2O_3 crystal.

4,711,697

METHOD FOR INVESTIGATING THE FORMATION OF CRYSTALS IN A TRANSPARENT MATERIAL

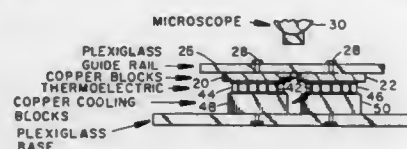
William F. Kaukler, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 21, 1985, Ser. No. 800,194

Int. Cl.⁴ B01J 17/08; B01D 9/00

U.S. Cl. 156—621

20 Claims



1. A method of investigating the formation of crystals in a transparent specimen material comprising the steps of:

- melting the transparent specimen material in a fixed position heating zone;
- forming a freezing isotherm to freeze the transparent specimen material in a gap positioned between a fixed position cooling zone which is separated from said heating zone by said gap by a predetermined distance capable of containing said freezing isotherm with suitable temperatures of said heating and cooling zones;
- moving the transparent specimen material from said heating zone to said cooling zone;
- varying the temperature of said heating zone and said cooling zone to create a variable temperature gradient across said gap and to maintain the freezing isotherm of said transparent specimen material in said gap in a substantially fixed position relative to said heating and cooling zones; and
- observing the freezing isotherm of the transparent specimen material through an optically enlarging means to watch and analyze the formation of dendrites in said freezing isotherm of said transparent specimen material as the temperature of said heating and cooling zones are varied to produce said variable temperature gradient across said gap and therefore across said freezing isotherm.

4,711,698

SILICON OXIDE THIN FILM ETCHING PROCESS

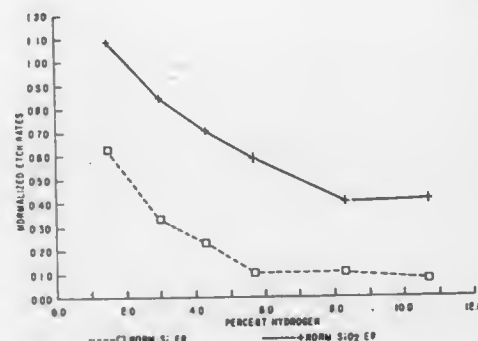
Monte A. Douglas, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 15, 1985, Ser. No. 755,140

Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06; C23F 1/02

U.S. Cl. 156—643

25 Claims



1. A method for selectively etching silicon oxides, comprising the steps of:

- providing a substrate having thereon a thin film of silicon oxides which must be selectively etched with respect to another thin film layer on said substrate;
 - creating a glow discharge in proximity to said substrate; and
 - passing an etchant gas mixture through said glow discharge, wherein the atomic percentage or carbon in said etchant gas mixture is less than 5% atomic;
- and wherein the atomic ratio of fluorine to carbon in said etchant gas mixture is substantially greater than 2:1; and wherein the percentage in said etchant gas mixture of all atomic species which form (in a glow discharge) molecules and radicals capable of adsorbing onto and reducing silicon oxides is in the range of 5% atomic to 50% atomic of said etchant gas mixture;
- all of said atomic percentages being counted over all the component species of said etchant gas mixture which contain hydrogen, carbon, or fluorine, but disregarding inert gas components.

4,711,699

PROCESS OF FABRICATING SEMICONDUCTOR DEVICE

Haruo Amano, Tokyo, Japan, assignor to NEC Corporation, Japan

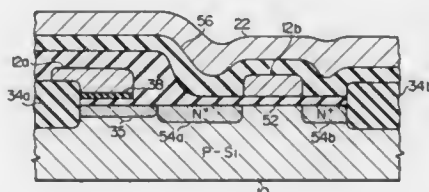
Filed Apr. 24, 1986, Ser. No. 855,756

Claims priority, application Japan, Apr. 25, 1985, 60-89316

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 437—52

6 Claims



1. A process of fabricating a semiconductor device, comprising the steps of:

- preparing a silicon substrate having a surface portion,
- forming a first thermally grown silicon oxide film on said surface portion of the silicon substrate,
- forming a silicon nitride film on said silicon oxide film,

- forming a first polysilicon layer on said silicon nitride film,
- selectively etching away the polysilicon layer to leave a polysilicon conductor region, the polysilicon conductor region having a step portion over the silicon substrate,
- etching the silicon nitride and oxide films with said polysilicon conductor region used as a mask to expose said silicon substrate outside the polysilicon conductor region,
- forming a second thermally grown silicon oxide layer in part on said polysilicon conductor region and in part on an exposed surface portion of the silicon substrate, the second silicon oxide layer having a portion overlying the step portion of said polysilicon conductor region and an overhang portion located over said substrate in proximity to said step portion,
- forming a second layer of polysilicon having a portion overlying said step portion of said polysilicon conductor region and fully covering said overhang portion of said silicon oxide layer, and
- thermally oxidizing the second layer of polysilicon for forming a polysilicon oxide layer having a portion resulting substantially from said portion overlying said step portion of the polysilicon conductor region, said portion of the polysilicon oxide layer being thicker than another portion of the polysilicon oxide layer and becoming thinner away from said step portion.

4,711,700

METHOD FOR DENSIFYING LEADFRAME CONDUCTOR SPACING

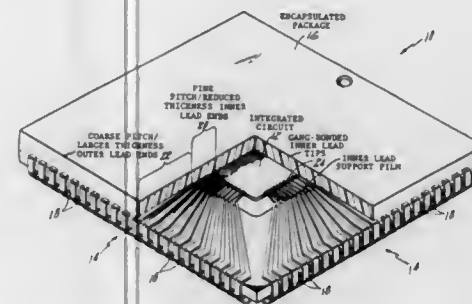
Michael D. Cusack, Monument, Colo., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 751,637, Jul. 3, 1985, abandoned. This application May 8, 1986, Ser. No. 861,208

Int. Cl.⁴ C23F 1/02; B44C 1/22

U.S. Cl. 156—651

3 Claims



- The method of fabricating a lead frame assembly, having bifurcated conductors with outer lead end regions of first thickness joined to a common tie-bar and inner lead end regions extending inwardly at a second thickness less than the first thickness to the assembly center portion, from a precut metal foil workpiece having first and second major surfaces spaced apart at a workpiece thickness, comprising the steps of:
 - applying a first step hardened photoresist pattern to the first and second major surfaces of the workpiece to expose on the first major surface a first area corresponding in size to the sum area of the center portion, the conductor inner end regions, and the gaps between inner end regions of adjacent conductors, and to expose on the second major surface a first area corresponding to the sum area only of the center portion and to said inner end region gaps;
 - first step etching both major surfaces simultaneously to remove approximately one-quarter of the workpiece thickness from each exposed area;
 - removing said first step photoresist pattern and applying a second step hardened photoresist pattern to again expose said first area of the first major surface and to expose a second area of the first major surface corresponding in size to the area of the gaps between outer end regions of

adjacent conductors, and to expose on the second major surface a second area likewise corresponding in size to the area of said outer end region gaps, in register with said second area of the first major surface; and

second step etching both major surfaces simultaneously to remove one-half the workpiece material thickness from said exposed areas on each major surface, to provide the bifurcated conductor leadframe assembly.

4,711,701

SELF-ALIGNED TRANSISTOR METHOD

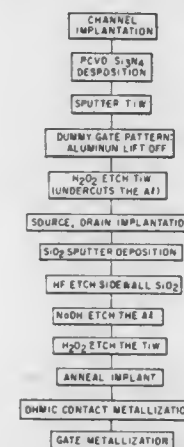
William V. McLevee, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1986, Ser. No. 908,071

Int. Cl.⁴ H01L 21/306; C23F 1/00; B44C 1/22; C03C 15/00

U.S. Cl. 437—41

10 Claims



1. A method of self-aligned semiconductor device fabrication, comprising the steps of:

- form a layer of a first dielectric on a semiconductor substrate;
- form a layer of a first metal on said layer of first dielectric;
- form patterned layer regions of a second metal on said first metal;
- etch said first metal with an etchant that does not substantially etch said second metal or said first dielectric; said etching continued until all of said first metal is removed except for that portion of said first metal which is both beneath said patterned layer regions and at least a predetermined distance from the closest edge of said patterned layer regions;
- implant dopants through said layer of first dielectric into said substrate to form doped regions in said substrate, said patterned layer regions and said first metal acting as an implant mask;
- deposit a second dielectric on the exposed portion of said layer of first dielectric;
- remove all of said first metal, thereby leaving an opening in said second dielectric which is aligned with said doped regions and is said predetermined distance from them;
- remove the exposed portion of said layer of first dielectric to extend said opening to said substrate;
- deposit a first contact in said opening and contacting said substrate; and
- form further contacts to portions of said substrate away from said first contact.

4,711,702

PROTECTIVE CONTAINERBOARD

Paul F. Hood, Stamford, Conn., assignor to Stone Container Corporation, Chicago, Ill.

Filed Sep. 25, 1985, Ser. No. 779,968
Int. Cl.⁴ D21F 11/00; D21H 3/78

U.S. Cl. 162—123

12 Claims

1. A containerboard of improved strength for protecting electrostatic discharge sensitive devices against static electricity damage, electromagnetic damage and physical damage; said containerboard being formed from an alkaline pulp, including a mixture of beaten cellulosic fibrous material, alkylketene dimer size and uncombined carbon powder and being characterized, when measured from a sample having a caliper of 10(±1) mils, by the following properties:

wherein said alkylketene dimer is present in an amount sufficient to fix said uncombined carbon powder within the range of from 0.3 to 3.5 percent by weight, a Mullen burst strength which exceeds 90(±1) pounds per square inch and a surface resistivity within the range of from 10³ to 10⁹ ohms per square.

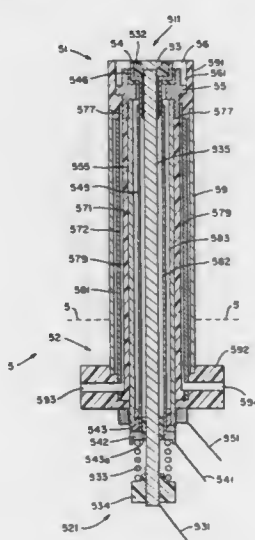
4,711,703

THERMAL PROTECTION METHOD FOR ELECTROANALYTICAL CELL

Harry D. Wright, Collonge-Bellerive; John M. Hale, Meinier, and Eugen Weber, Hinwil, all of Switzerland, assignors to Orbisphere Corporation Wilmington, Succursale de Collonge-Bellerive, Collonge-Bellerive, Switzerland
Division of Ser. No. 691,519, Jan. 14, 1985, Pat. No. 4,585,542, which is a continuation of Ser. No. 345,536, Feb. 3, 1982, Pat. No. 4,518,477. This application Jan. 23, 1986, Ser. No. 821,747
Int. Cl.⁴ G01N 27/46

U.S. Cl. 204—1 T

7 Claims



1. A method of thermally protecting an amperometric electroanalytical cell of the type comprising an electrolyte within an electrolyte space in contact with at least two electrodes and enclosed by a membrane that is substantially impermeable to said electrolyte but is permeable to an electroactive species, said membrane defining a sensor face for exposure to an ambient medium containing said electroactive species, said cell having an operative temperature range and being exposed temporarily to temperatures outside of said operative temperature range, said method comprising the steps of:

effecting a heat exchange within said cell for controlled heat compensation of said electrolyte when at least said sensor face of said cell is exposed to said temperatures outside of said operative temperature range;

said heat exchange step including passing a stream of heat transfer fluid through said cell;
said heat transfer fluid being passed through said cell to contact at least one heat conductive member therein that is in contact with said electrolyte space;
said heat conductive member being an electrode;
said electrode being the outermost electrode of a substantially coaxial electrode arrangement comprising a central electrode and at least one peripheral electrode around said central electrode;
said heat transfer fluid being passed through a substantially annular confined channel sealed from said electrolyte space but maintained in heat exchange contact therewith by said peripheral electrode; and
a conduit means being provided within said cell for passing said heat transfer fluid for an external source through said confined channel.

4,711,704

METHOD OF TINNING METAL STRIP

Jacques van Breda, Hillegom, and Cornelis Pronk, Castricum, both of Netherlands, assignors to Hoogovens Groep B.V., IJmuiden, Netherlands

Filed Feb. 17, 1987, Ser. No. 15,386

Claims priority, application Netherlands, Feb. 18, 1986, 8600404

Int. Cl.⁴ C25D 7/06

U.S. Cl. 204—28

12 Claims

1. A method of electrolytic tinning of a metal strip in a tinning line having a plurality of tinning tanks through which the strip moves in series while electrolyzing current is passed, and having at at least one of the entry side and the exit side of the series of tinning tanks at least one buffer apparatus for storing a variable amount of the moving strip so that the strip speed in the tinning tanks can be temporarily different from the strip speed at the line entry or exit, the method being characterized in that the current passing in each tinning tank is adjusted during tinning for portions of the strip in accordance with its determination by the following steps:

- determination of a value for the thickness of the tin layer on the strip portion as it enters the tinning tank;
- determination of a value for the desired thickness of the tin layer on the strip portion as it leaves the tinning tank;
- from the difference of the values determined in steps (a) and (b), determination of a value g for the desired increase in the tin layer thickness on the strip portion in the tinning tank; and
- determination of the instantaneous required value of the current I in the tinning tank for the portion of the strip in dependence on the value g from step (c) and the instantaneous speed v of the strip through the tank.

4,711,705

ACTIVATION COMPOSITION AND METHOD FOR FORMING ADHERENT CHROMIUM ELECTRODEPOSITS ON FERROUS METAL SUBSTRATES FROM HIGH ENERGY EFFICIENT BATHS

Nicholas M. Martyak; John A. Corsentino, both of Hazlet, and Warren H. McMullen, E. Brunswick, all of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jan. 15, 1987, Ser. No. 4,374

Int. Cl.⁴ C25D 5/36; C25F 3/06

U.S. Cl. 204—34

16 Claims

1. An activation composition for preparing a metal substrate to receive an adherent chromium electrodeposit thereon comprising a solution of iodate and fluoroborate ions.

4,711,706

METHOD OF PRODUCING GROOVE/LAND PATTERNS FOR DYNAMIC BEARINGS

Horst P. Wasel, Bornheim, and Horst W. Grollius, Cologne, both of Fed. Rep. of Germany, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jan. 3, 1986, Ser. No. 870,170

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521181

Int. Cl.⁴ C25F 3/16

U.S. Cl. 204—129.65

4 Claims

1. A method of journaling a rotatable member relative to another member, said members having juxtaposed surfaces, consisting essentially of:

- laying out a pattern of dynamic-bearing lands and grooves on a metallic one of said surfaces;
- masking lands of said pattern;
- electropolishing said one of said surfaces after the masking of said lands of said pattern to form dynamic-bearing grooves of a depth sufficient to provide a dynamic fluid bearing layer between said surfaces and up to about 100 micrometers, thereby simultaneously forming dynamic-bearing lands between said grooves;
- juxtaposing said surfaces for relative rotation; and
- admitting a dynamic bearing fluid between said surfaces whereby the grooves and lands resulting from electropolishing form a dynamic bearing between said surfaces upon relative rotation of said members, said rotatable member being a bearing in an expansion turbine.

CHEMICALLY MODIFIED ELECTRODES FOR THE CATALYTIC REDUCTION OF CO₂

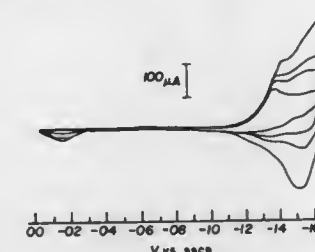
Thomas J. Meyer; Terrence R. O'Toole, both of Chapel Hill, N.C.; Lawrence D. Margerum, Los Angeles; T. David Westmoreland, San Mateo, both of Calif.; William J. Vining, Racine, Wis.; Royce W. Murray, and B. Patrick Sullivan, both of Chapel Hill, N.C., assignors to Gas Research Institute, Chicago, Ill.

Filed Oct. 9, 1986, Ser. No. 917,383

Int. Cl.⁴ B01D 57/02; C25B 7/00

U.S. Cl. 204—280

12 Claims



- An electrode comprising a polymeric film adsorbed to said electrode, said film being formed by electropolymerization of (vbpy)Re(CO)₃Cl or [(vbpy)Re(CO)₃(MeCN)]⁺, said film acting as an electrocatalyst for reducing CO₂ to CO within a solution.

4,711,709

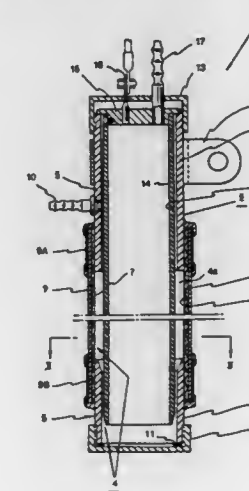
DIAPHRAGM-ELECTRODE SYSTEM FOR ELECTROCOATING

Akito Inoue, 3-7-3, Sunagawa-cho, Tachikawa, Tokyo, Japan
Continuation-in-part of Ser. No. 499,818, Jun. 1, 1983. This application Oct. 4, 1985, Ser. No. 784,525

Claims priority, application Japan, Jun. 2, 1982, 57-82002
Int. Cl.⁴ C25D 13/00

U.S. Cl. 204—282

2 Claims



- A diaphragm-electrode system for electrocoating paint onto a substrate and for removing neutralizers comprising an

4,711,707

METHOD FOR REMOVAL OF SCALE FROM HOT ROLLED STEEL

Kaoru Kikuchi, Ibaraki, and Nobuo Shikata, Tokyo, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

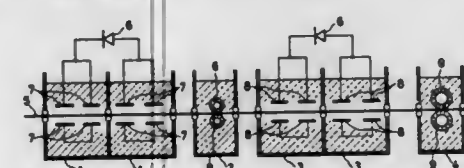
Filed Jan. 16, 1987, Ser. No. 3,821

Claims priority, application Japan, Jan. 17, 1986, 61-8624

Int. Cl.⁴ C25F 1/06

U.S. Cl. 204—145 R

4 Claims



- A method for the removal of scale from hot rolled steel, which comprises subjecting said steel covered with scale to anode electrolysis in an aqueous 5 to 20% sodium sulfate solution at a current density in the range of 0.2 to 1.2 A/cm² for a period of 30 to 60 seconds, and then subjecting said steel resulting from said anode electrolysis to anode electrolysis in an aqueous 5 to 20% sodium chloride solution at a current density in the range of 0.3 to 0.5 A/cm² for a period of 30 to 60 seconds.

electrode provided as a counterpart electrode corresponding to said substrate functioning as an electrode, and a diaphragm serving to separate the counterpart electrode from said substrate electrode as well as from paint components in an aqueous solution for electrodeposition characterized in that:

said diaphragm is wound around an outer surface of a tubular form diaphragm backing member made of an insulating material provided with a liquid permeable structure;

said counterpart electrode is hollow and is encased within said diaphragm backing member so as to define a narrow gap channel of less than 25 millimeters between said counterpart electrode and said diaphragm backing member;

a water running mechanism to forcibly flow water through said narrow gap channel wherein water is introduced under a positive pressure through an inlet at one end of said hollow counterpart electrode, flows inside of said hollow electrode to the other end of said electrode, flows into the said narrow gap channel and flows through said channel creating a turbulent flow to said one end at which point the water flows out of the diaphragm-electrode system through an outlet, said inlet and outlet for the water being provided on the same side of the diaphragm-electrode system and

said counterpart electrode disposed in said diaphragm backing member is installed in a manner to be easily inserted or detached;

whereby paint neutralizers are removed from the aqueous solution and a diaphragm-electrode system for electrocoating paint onto a substrate in which the diaphragm and counterpart can be easily replaced is provided.

4,711,712

CLOSED CYCLONE FCC SYSTEM WITH PROVISIONS FOR SURGE CAPACITY

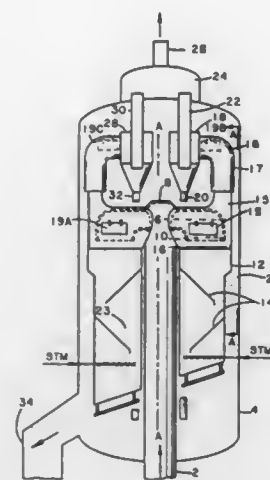
Klaus W. Schatz, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 812,429, Dec. 23, 1985, abandoned, which is a division of Ser. No. 529,451, Sep. 6, 1983, Pat. No. 4,581,205. This application Nov. 12, 1986, Ser. No. 930,044

Int. Cl.⁴ C10G 11/18

U.S. Cl. 208—153

14 Claims



1. A process for the fluid catalytic cracking of a hydrocarbon feed whereby the hydrocarbon feed is catalytically cracked by passing a suspension of hydrocarbon feed and catalyst through a riser conversion zone under cracking conditions into a disengaging vessel, the catalyst recovered from said riser conversion zone is thereafter regenerated to remove carbonaceous deposits before return of the regenerated catalyst to said riser conversion zone, and the hydrocarbon feed catalyst suspension is separated upon discharge from the riser conversion zone, comprising the following steps:

(a) discharging the suspension outwardly through an opening in the upper periphery of the riser and through a radially extending restricted passageway having an opening at the bottom side of the outer extremity thereof whereby a substantially confined catalyst stream discharges in a downward direction generally separate from the cracked hydrocarbon feed vapors, said restricted passageway being curved downwardly adjacent the outer end thereof to induce a downward movement of said confined catalyst stream in said passageway sufficient to direct said stream downwardly into the open upper end of a catalyst stripping passageway positioned beneath said outer end to maintain catalyst, so collected and directed, separate from said discharged cracked hydrocarbon feed vapors, and said radially extending restricted passageway being surrounded and contained by a vertically disposed elongated restricted passageway in spaced relationship thereto, and the elongated restricted passageway being in fluid communication, at its upper end, with the inlet of a first cyclone separation means, and, at its lower end, with the catalyst stripping passageway and said vertically disposed passageway being attached to the catalyst stripping passageway to form a closed conduit,

(b) passing the cracked hydrocarbon feed vapors through the disengaging vessel to the upper portion thereof and

4,711,710

PROCESS FOR MAKING IMPROVED LUBRICATING OILS FROM HEAVY FEEDSTOCK

Nai Y. Chen, Titusville, N.J.; Thomas F. Degnan, Jr., Yardley, Pa.; Susan M. Leiby, Mantua, N.J.; Stephen M. Oleck, Moorestown, N.J., and Bruce P. Pelrine, Lawrenceville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 778,748, Sep. 23, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 938,214

Int. Cl.⁴ C10G 11/05, 11/10, 45/64, 47/16

U.S. Cl. 208—111

24 Claims

20. A process for dewaxing a hydrocarbon feedstock characterized by an initial boiling point of at least 700° F. and a 50 volume percent boiling point of at least 900° F. in which the hydrocarbon feedstock is contacted in a fixed bed in the presence of added hydrogen at a temperature of 450° F. to 800° F. with a particulate composite dewaxing catalyst comprising an aluminosilicate zeolite having a silica:alumina ratio of greater than 12:1 and a Constraint Index of 1 to 12 composited with an inorganic oxide binder, the particles of the catalyst composite having a maximum diffusion distance of less than 0.025 inch.

4,711,711

Patent Not Issued For This Number

into the entrance of the first cyclone separation means by discharging the cracked hydrocarbon feed vapors from the outer extremity of the radially extending restricted passageway to said vertically disposed elongated restricted passageway and passing the cracked hydrocarbon feed vapors from the vertically disposed elongated passageway into the first cyclone separation means without passing into the atmosphere of said vessel during steady state catalyst flow, said elongated restricted passageway comprising a surge capacity means, upstream of said first cyclone, for accommodating a sudden increased rate of flow of said catalyst stream within said elongated restricted passageway, said surge capacity means being closed during steady state rate of flow of said catalyst within said elongated restricted passageway, thereby preventing catalyst flow therethrough but allowing stripping gas flow therethrough.

4,711,714

METHOD FOR THE SEPARATION OF GAS FROM OIL Ian C. Callaghan, Wokingham; Clive M. Gould, Colnbrook, both of England, and Wojciech Grabowski, Versoix, Switzerland, assignors to The British Petroleum Company p.l.c., London, England

Filed Jun. 21, 1985, Ser. No. 747,275

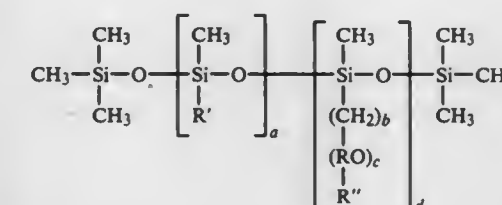
Claims priority, application United Kingdom, Jun. 30, 1984, 8416697

Int. Cl.⁴ B01D 19/04

U.S. Cl. 208—348

8 Claims

1. A method for separating crude oil containing associated gas into liquid oil and free gas in the presence of an anti-foam agent characterised by the fact that the anti-foam agent is a water-insoluble polysiloxane polyoxyalkylene graft copolymer



wherein

R is an ethylene, propylene or butene group or a mixture thereof;

R' is a hydrocarbyl group containing 1 to 8 carbon atoms;

R'' is a hydroxyl group, an alkoxy group or an alkyl group containing 1 to 8 carbon atoms;

(a) is a number in the range of 100 to 250;

(b) is a number in the range of 1 to 6;

(c) is a number in the range of 1 to 10; and

(d) is a number in the range 10 to 100.

4,711,713

PROCESS FOR ENHANCING THE CETANE NUMBER AND COLOR OF DIESEL FUEL

Hossein Zarrineghal, and Charles W. Quinlan, both of Amherst, Mass., assignors to REI Technologies, Inc., Concord, Mass.

Continuation-in-part of Ser. No. 832,196, Feb. 24, 1986, Pat. No. 4,463,820. This application Feb. 9, 1987, Ser. No. 12,466

Int. Cl.⁴ C10G 17/00, 19/02, 29/02

U.S. Cl. 208—222

58 Claims

1. A process for enhancement of the cetane number of a diesel fuel comprising:

- (1) treating a diesel oil with a nitrogenous treating agent in a nitrogen amount, equivalent on a 100% nitric acid basis, of about 10 weight percent or less of the diesel oil feed;
- (2) separating unreacted nitrogenous treating agent from the diesel oil of step (1);
- (3) treating the diesel oil of step (2) with an inorganic alkali to produce a treated diesel oil; and
- (4) blending the treated diesel oil of step (3) with an untreated diesel oil which has not been treated as in step (1) above to produce a blended diesel fuel such that the added nitrogen content in the blended diesel fuel is
 - (a) about 300 ppm or less nitrogen added when the diesel oil treated in step (1) is obtained from virgin diesel oil stock; or
 - (b) about 450 ppm or less nitrogen added when the diesel oil treated in step (1) is obtained from hydrotreated diesel oil stock.

4,711,715

APPARATUS FOR EXTRACORPOREAL TREATMENT OF BLOOD

Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 599,883, Apr. 13, 1984, abandoned. This application Jan. 29, 1986, Ser. No. 823,887

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313421

Int. Cl.⁴ A61M 1/34

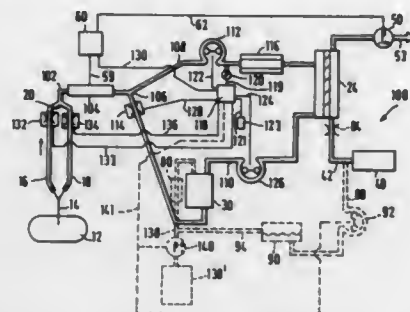
U.S. Cl. 210—103

13 Claims

1. In a hemodialysis apparatus comprising a first chamber, a second chamber, a dialysis solution circuit, a blood circuit, means for preparing a fresh dialysis solution, and means for withdrawing ultrafiltrate from said dialysis circuit, said first chamber being separated by means of a membrane from said second chamber, said first chamber being connected into said dialysis solution circuit, and said second chamber being connected into said blood circuit, said blood circuit including a first blood side upstream of said second chamber and a second

blood side downstream of said second chamber, the improvement comprising:

- a single sensor coupled between a single connection with a patient and a branch of said blood circuit into said first and second blood sides, said sensor alternately sensing inflowing blood quantities and outflowing blood quantities;
- an ultrafiltrate controller coupled to said sensor for receiving signals from said sensor and being operative during a first time interval to recognize a first output signal from said sensor representing outflowing blood quantities and being operative during a second time interval to recognize a second output signal from said sensor representing in-



flowing blood quantities and being operative after said first and second time intervals to compare said first output signal with said second output signal to determine the actual ultrafiltration rate;

- a control unit connected to said ultrafiltrate controller, said control unit having input means for inputting a predetermined ultrafiltration rate; and
- a dialysis solution pump coupled in said dialysis circuit downstream of said first chamber and operatively coupled to said ultrafiltrate controller for changing the pressure in said dialysis solution circuit, thereby changing the transmembrane pressure to cause the actual ultrafiltration rate to approach said predetermined ultrafiltration rate.

4,711,716

DECANTING APPARATUS

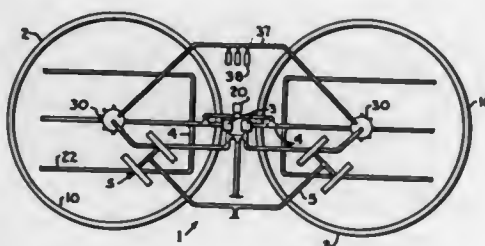
Glen R. Calltharp, 16006 Beckett La., Olathe, Kans. 66062; Kenneth L. Norcross, III, 1240 W. 70th Terr., Kansas City, Mo. 64113, and Dennis L. Nelson, 147 S. Normandy Dr., Olathe, Kans. 66061

Continuation-in-part of Ser. No. 778,323, Sep. 20, 1985, Pat. No. 4,648,967. This application Jan. 29, 1987, Ser. No. 939,008. The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.⁴ B01D 45/02

U.S. Cl. 210—136

8 Claims



1. A decanting apparatus for removing an upper fluid layer from a wastewater treatment reservoir; said apparatus comprising:

- (a) a fluid receiver having an interior chamber;
- (b) support structure means for mounting said receiver in the reservoir;
- (c) said support structure means cooperating with said receiver for maintaining said receiver at a generally

constant depth relative to an upper fluid level within the reservoir during decanting;

- (c) an aperture in said receiver for communicating between said receiver interior chamber and fluid in the reservoir; said aperture being located on a lower side of said receiver;
- (d) means designed for preventing sludge from entering said interior chamber when not decanting including:
 - (1) flap means selectively covering said receiver aperture and being connected on one side of said aperture to said receiver and being swingable away from said receiver on an opposite side of said aperture; and
 - (2) biasing means cooperating with said flap means to selectively cover said aperture with said flap when not decanting such that said flap means operatively prevents entry of fluid into said receiver through said aperture when decanting is not occurring and such that said flap means allows flow of fluid into said chamber through said aperture when decanting is occurring, and said flap preventing substantial quantities of sludge from accumulating in said receiver when fluid in said reservoir containing sludge is being agitated between decanting periods.

4,711,717

FILTER CARTRIDGE FOR FLUIDS

Joachim Wolf, Malmshelmer Strasse 67, 7252 Weil der Stadt, Fed. Rep. of Germany

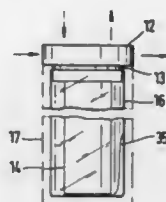
Filed Apr. 18, 1986, Ser. No. 853,426

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520139

Int. Cl.⁴ B01D 27/08

U.S. Cl. 210—137

19 Claims



1. A filter device for fluid media, comprising:

- a filter cartridge with an inflow surface and a flow-off surface;
- a filter bowl having a side wall with a free end region and a bottom region;
- a disk-shaped adaptor located at one end of said filter cartridge, having an adapter face adjacent to said free end region of said side wall of said filter bowl, means defining at least one first orifice for inflowing unfiltered medium, and means defining at least one second orifice for flowing-off filtered medium;
- a sealing device between said adaptor and said free end region of said side wall of said filter bowl; and
- a media-proof hose having a first end region connected in a sealed manner to said adaptor face and a second end region that is closed at least during the operation of the filter device;
- said hose being arranged and adapted to receive said filter cartridge at least over part of its length;
- said hose being comprised of material of adequate strength to be detached from said bowl and said filter cartridge without tearing, with filtrate and media contained in said hose.

4,711,718

ION-SELECTIVE WATER FILTER

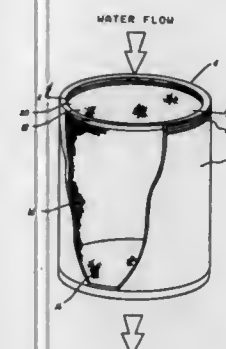
Sidney G. Nelson, Jr., Hudson, Ohio, assignor to Sanitech, Inc., Twinsburg, Ohio

Filed Jan. 20, 1987, Ser. No. 5,215

Int. Cl.⁴ B01D 27/02

U.S. Cl. 210—282

2 Claims



1. A device for removing dissolved lead and copper ions from drinking water consisting of a vessel that attaches to the outlet section of a water dispensing faucet; a bed containing catechol siderophore modified by substituting bromine, chloride or nitrogen oxide in the benzene ring of the catechol that selectively removes and absorbs lead and copper ions from waters passing through it; and porous support means for holding said bed in place in said vessel and for allowing water to flow through the bed.

4,711,719

PROCESS FOR THE PRODUCTION OF CRACK-FREE SEMI-PERMEABLE INORGANIC MEMBRANES

Adriaan F. M. Leenaars, Anthonie J. Burggraaf, and Klass Keizer, all of P.O. Box 217, 7500 AE Enschede, Netherlands

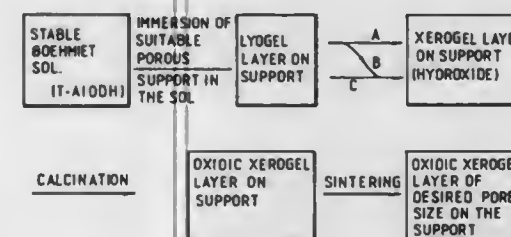
Filed Sep. 5, 1984, Ser. No. 647,545

Claims priority, application Netherlands, Sep. 5, 1983, 8303079

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—500.26

7 Claims



1. A process for the production of dry, crack-free mechanically and chemically stable, semi-permeable inorganic membranes by coating a microporous support of sintered α - Al_2O_3 by contacting the support with a sol containing particles of Al_2O_3 and drying and heating the coated support, characterized in that

- (a) the support has a thickness from 50μ to 5 mm ;
- (b) the sol comprises as Al_2O_3 particles Boehmite particles with a size of from 3 nm to 2μ , dispersed in water in a concentration from 0.01 to 25% by weight, the water also containing HNO_3 or HClO_4 in a concentration of 0.01 to 0.20 mol per mol Boehmite;
- (c) said support is immersed in a dry state in said sol for from 1 to 5 seconds; and
- (d) said contacted support after being dried in air is heated to a temperature of at least 390°C . and at most 1500°C .

wherein said membrane is less than 20μ in thickness.

7. An inorganic membrane produced by the process of claim 1.

4,711,720

TANGENTIALLY STAGED HYDROCYCLONES

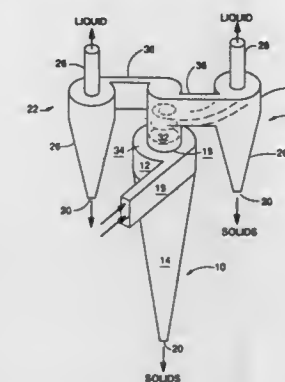
Grant A. Young, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Jul. 18, 1986, Ser. No. 888,171

Int. Cl.⁴ B01D 17/038

U.S. Cl. 210—512.2

9 Claims



1. A hydrocyclone separation system for separating a fluid mixture into at least two separate density components, and for precluding remixing of semiseparated higher density components, comprising:

- a primary separation chamber having an upper portion and a conical lower portion, the upper portion including a tangential fluid inlet and a fluid outlet, and the conical lower portion including a fluid outlet;
- at least one secondary separation chamber having an upper portion and a conical lower portion, the upper portion including a tangential fluid inlet and a fluid outlet, and the conical lower portion including a fluid outlet; and
- means for precluding remixing of semiseparated higher density components, comprising a flow direction conduit extending tangentially from the fluid outlet in the upper portion of the primary separation chamber to the tangential fluid inlet of the at least one secondary separation chamber.

4,711,721

WASTE WATER SLUDGE THICKENER WITH ODOR CONTROL

Bernard Jamonet, Bourg de Peage; Alain Rigouard, Echiroles; Jean-Pierre Bouchez, Les Eymes, and Jean Duc, Versailles, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

Division of Ser. No. 577,742, Feb. 7, 1984, abandoned, which is a continuation of Ser. No. 381,622, May 24, 1982, abandoned.

This application Jun. 25, 1985, Ser. No. 748,697

Claims priority, application France, May 25, 1981, 81 10315

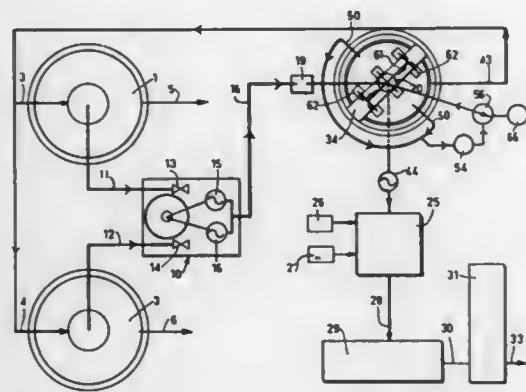
Int. Cl.⁴ C02F 1/72

U.S. Cl. 210—607

1 Claim

1. A process for thickening waste water sludge issued from a clarifier for waste water, comprising the steps of: introducing fresh waste water sludge, issued from a clarifier, into a central upper part of a thickening tank of circular shape having a lower part having a bottom in the form of an upwardly opening cone and having scraper means rotatable at low speed in said lower part of the tank and having arms extending upwardly from said lower part of the tank, thereby to form a lower thickened sludge layer and an upper supernatant layer upon rotation of said scraper means, while at the same time imparting only a minimum of agitation to the sludge layer and

to the supernatant layer above it; removing thickened sludge through a central aperture in said bottom of the tank; withdrawing supernatant from said supernatant layer at at least one first upper peripheral portion of said tank and recycling it to an input of said clarifier, and further withdrawing supernatant from said supernatant layer at opposite second upper peripheral portions of the tank substantially at the surface of said supernatant layer and oxygenating this further withdrawn supernatant in an oxygenation device, and reintroducing said oxygenated, further withdrawn supernatant into said supernatant layer in said tank by means of a plurality of diffusers



mounted on and distributed along a support extending transversely across said circular tank and disposed above said supernatant layer, said diffusers extending downwardly from said support into said supernatant layer and said support being disposed intermediate said opposite second upper peripheral portions of said tank and extending perpendicular to a line interconnecting said opposite second upper peripheral portions, in order both to minimize agitation of said supernatant layer in said tank and to avoid any direct mixing of said further withdrawn supernatant with the supernatant layer in the tank in the vicinity of said first and second peripheral portions.

4,711,722 METHOD FOR PREVENTING FOULING OF ELECTRODIALYSIS MEMBRANE

Seiji Toyoshi, Saga; Tomoya Yoshizumi, Kawasaki; Masaru Saeki, Fujisawa, and Tetsuya Kawakita, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Continuation of Ser. No. 561,570, Dec. 15, 1983, abandoned.

This application Jan. 27, 1986, Ser. No. 821,882
Claims priority, application Japan, Oct. 12, 1983, 58-190193
The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—638

3 Claims

1. In a method of preventing fouling of an electrodialysis membrane during desalting by membrane electrodialysis of a fermentation liquor comprising an inorganic salt and an amphoteric electrodialysis membrane fouling substance, wherein the fermentation liquor is obtained from molasses selected from the group consisting of cane molasses and beet molasses, and contains material of isoelectric point within the range of pH 3-4 as the amphoteric electrodialysis membrane fouling substance, the improvement consisting of:

- adjusting the pH of the solution to about the isoelectric point of the fouling substance prior to desalting to produce a pH adjusted fermentation liquor and thereafter,
- subjecting the pH adjusted fermentation liquor retaining the electrodialysis membrane-fouling substances in a non-charged state to the electrodialysis desalting procedure, and
- recovering a desalted fermentation liquor.

4,711,723 WATER PURIFICATION SYSTEM

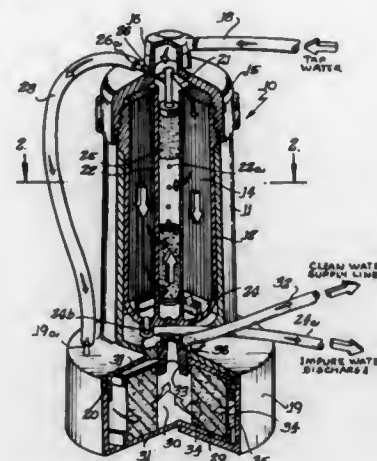
Donald T. Bray, Escondido, Calif., assignor to Nimbus Water Systems, Inc., Escondido, Calif.

Filed May 27, 1986, Ser. No. 867,480

Int. Cl.⁴ C02F 9/00

U.S. Cl. 210—652

6 Claims



1. A self-contained water purification device having an integral, free-standing housing, including a base for supporting the device, comprising, in combination, a pressure vessel supported in the housing and including first tubing means for receiving supply water at a pressure between approximately 20 and 100 psig, a reverse-osmosis filter element having a semipermeable membrane with a surface area of at least 2 sq. cm per cu. cm of volume of the reverse-osmosis filter element supported within the pressure vessel, means for discharging from the pressure vessel a portion of the supply water and impurities unable to pass through the reverse-osmosis filter element, second tubing means for receiving product water that has passed through the reverse-osmosis filter element, second tubing means exiting from the pressure vessel and terminating at an inlet to a carbon unit located within the base containing between approximately 10 and 1,000 grams of activated carbon, within which the product water has a residence time of between approximately 5 and 30 minutes, a flow passage within the base causing the product water to flow through the activated carbon, and third tubing means receiving the product water after it has flowed through the activated carbon, the third tubing means terminating in a region exterior of the housing.

5. A continuous method of purifying tap water comprising passing tap water at a pressure of between approximately 20 and 100 psig through a reverse-osmosis filter membrane, flowing the filtered water at a rate of between approximately 5 and 100 milliliters per minute through between approximately 10 and 1,000 grams of activated carbon, maintaining the filtered water in contact with the activated carbon between approximately 15 and 30 minutes, and flowing the water out of the activated carbon for use.

4,711,724

METHOD FOR PREVENTION OF PHOSPHONATE DECOMPOSITION BY CHLORINE

Donald A. Johnson, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 776,551, Sep. 16, 1985, Pat. No. 4,642,194. This application Oct. 23, 1986, Ser. No. 922,215

The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

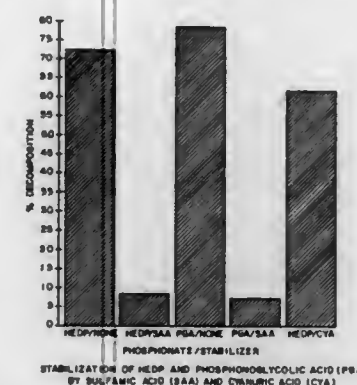
Int. Cl.⁴ C02F 5/14

U.S. Cl. 210—699

2 Claims

1. A method of preventing the decomposition of phosphonates from the group consisting of 1,1-hydroxyethylidene

diphosphonic acid, tris aminomethane phosphonic acid, 1-phosphono glycolic acid, ethylene diamine tetra (methylene phosphonic acid), hexamethylene diamine tetra (methylene phosphonic acid), and diethylene triamine penta (methylene



phosphonic acid) which are present in an effective amount to prevent scale in industrial cooling waters which contain an effective amount of chlorine for microbiological control which comprises treating such waters with at least 1 ppm of cyanuric acid.

4,711,725

METHOD OF STABILIZING AQUEOUS SYSTEMS

David R. Amick, Chalfont; William M. Hann, Pennsburg, and John Natoli, Ambler, all of Pa., assignors to Rohm and Haas Co., Philadelphia, Pa.

Continuation-in-part of Ser. No. 749,059, Jun. 26, 1985, abandoned. This application May 7, 1986, Ser. No. 861,732
Int. Cl.⁴ C02F 5/12

U.S. Cl. 210—701

9 Claims

1. A method for stabilizing an aqueous system by inhibiting the precipitation of calcium phosphate with and without the presence of iron contamination in such an aqueous system comprising adding to said aqueous system an effective amount of a water soluble polymer comprising from about 42 to about 84 weight percent (meth)acrylic acid and salts thereof, greater than about 11 to less than about 40 weight percent 2-acrylamido-2-methyl propane sulfonic acid or salts thereof, and from at least about 5 to about 30 weight percent of one or more units selected from the group consisting of vinyl esters, vinyl acetate and substituted acrylamide, and where said water soluble polymer a weight average molecular weight ranging from about 3000 to about 25,000.

4,711,726

CARBOXYLATE N-VINYLAMIDE COPOLYMERS FOR INTERNAL SCALE CONTROL AND PASSIVATION IN HIGH PRESSURE BOILER SYSTEMS

Claudia C. Pierce; Robert S. Robinson, both of Naperville, and James F. Kneller, LaGrange Park, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Dec. 29, 1986, Ser. No. 947,060

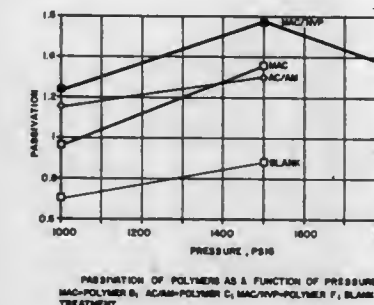
Int. Cl.⁴ C02F 5/12

U.S. Cl. 210—701

2 Claims

1. A method of treating boiler waters having a pH of at least 8.5 which are in contact with heat transfer surfaces to prevent formation of scale on, to remove previously formed scale from, and to form a corrosion resistant surface on these heat transfer surfaces which comprises treating the boiler waters which are found in boilers operating at a pressure of at least 800 psi with

at least 3 ppm of a water-soluble copolymer which contains from 60-95 mole percent of methacrylic acid, and 5-40 mole



percent of N-vinylpyrrolidone, said copolymer having a molecular weight within the range of 10,000-50,000.

4,711,727

COMPOSITIONS COMPRISING MINERAL PARTICLES IN SUSPENSION AND METHOD OF TREATING AQUEOUS SYSTEMS THEREWITH

Kenneth B. Matthews, Swanscombe; Christine A. Beckett, Higham; David E. Smith, New Barn, and Richard R. Davidson, Cambridge, all of England, assignors to Blue Circle Industries, PLC, London, England

Division of Ser. No. 790,632, Oct. 22, 1985, Pat. No. 4,610,801, which is a continuation of Ser. No. 534,561, Sep. 22, 1983, abandoned. This application Jul. 29, 1986, Ser. No. 891,472
Claims priority, application United Kingdom, Sep. 24, 1982, 8227366

Int. Cl.⁴ C02F 1/56

U.S. Cl. 210—727

13 Claims

1. A method of treating an aqueous system in order to effect flocculation of particulate matter within the treated system, which method comprises the steps of (1) taking a composition comprising (a) an aqueous slurry of mineral particles of at least 40% m/m mineral solids concentration and (b) an agent or mixture of agents that at least substantially maintains the mobility of the slurry, such that the apparent viscosity of the slurry does not exceed 500 cP (as measured at a shear rate of 600 s⁻¹), and that exerts a flocculating action upon dilution of the composition with or into water at a dilution ratio of at least 20:1 (m/m), said agent(s) being selected from cationic polyelectrolytes that have nitrogen-containing groups, amphoteric polyelectrolytes that have nitrogen-containing groups and, provided that the said mineral particles include calcium hydroxide particles, anionic polyacrylamides, (2) adding to the aqueous system an amount of the said composition effective to cause flocculation of particulate matter in the resultant mixture and (3) separating the resultant flocculated particulate matter from the water of the aqueous system.

4,711,728

TREATING SPENT FILTER MEDIA

Roger E. M. Remacle, Lasne, and Alain A. J. Verbeeck, Brussels, both of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Jan. 13, 1986, Ser. No. 817,953

Int. Cl.⁴ B01D 41/02

U.S. Cl. 210—772

15 Claims

1. A process for treating additive-laden siliceous filter material, previously used to filter lubricating oil additives, to recover the sorbed additives therein, said process comprising the steps of:

- forming at room temperature, a slurry of the additive-laden siliceous filter material and an aromatic solvent, said solvent being added in sufficient amounts to give a weight ratio of solvent to additive of from about 0.25 to about 20;

4,711,738

MECHANICAL DISHWASHING RINSE COMPOSITION HAVING A LOW FOAMING SULFONIC ACID RINSING AGENT AND A SOURCE OF ACTIVE HALOGEN

James L. Copeland, Burnsville, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Continuation of Ser. No. 646,257, Aug. 29, 1984, abandoned.

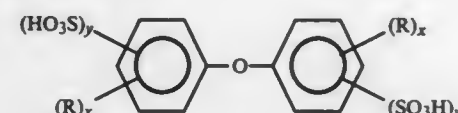
This application Jan. 21, 1986, Ser. No. 821,412

Int. Cl.⁴ F01B 19/00; F16J 3/00

U.S. Cl. 252-95

18 Claims

1. A low foaming and sanitizing or bleaching rinse composition for machine warewashing which consisting essentially of:
 - (a) a major portion of an aqueous medium;
 - (b) about 2.5-15 wt-% based on the total weight of the composition of an active halogen compound; and
 - (c) an effective amount of a low foaming sulfonate rinse agent of the formula:



and the alkali metal or alkaline earth metal salts thereof, wherein x is 0 to 4, y is 0 to 4, the sums of x and y are at least one, and the sum of x and y is less than or equal to 6; and each R is independently a hydrogen or a C₁-C₉ alkyl group, at least one R is alkyl; and wherein the rinse composition is free of significant amounts of alkaline detergent builder salts.

4,711,739

ENZYME PRESPOTTER COMPOSITION STABILIZED WITH WATER INSOLUBLE POLYESTER OR POLYETHER POLYOL

Thomas V. Kandathil, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 18, 1986, Ser. No. 943,226

Int. Cl.⁴ C11D 3/20, 3/37, 3/38; C12N 9/96

U.S. Cl. 252-139

14 Claims

1. An improved water-in-oil prespotter laundry composition comprising:

- (a) from about 0.1 to 1% by weight of at least one enzyme;
- (b) from about 5 to 30% by weight of at least one ethoxylated nonionic surfactant;
- (c) from about 0.2 to 5% by weight of at least one of a water insoluble polyester polyol having a hydroxyl number from about 28 to 690 or a water insoluble polyether polyol having a hydroxyl number from about 28 to 690;
- (d) from about 0.1 to 10% by weight of at least one builder salt;
- (e) from about 5 to 70% by weight of at least one hydrocarbon solvent; and
- (f) the balance water; and having a pH in the range from about 5 to 9.

8. A method for producing an improved water-in-oil prespotter laundry composition having a pH in the range from about 5 to 9 comprising the steps of:

- (1) mixing:
 - (a) from about 0.1 to 1% by weight of at least one enzyme;
 - (b) from about 5 to 30% by weight of at least one ethoxylated nonionic surfactant;
 - (c) from about 0.2 to 5% by weight of at least one of a water insoluble polyester polyol having a hydroxyl number from about 28 to 690 or a water insoluble polyether polyol having a hydroxyl number from about 28 to 690; and
 - (d) from about 5 to 70% by weight of at least one hydrocarbon solvent;
- (2) blending from about 0.1 to 10% by weight of at least one builder salt in an aqueous carrier; and
- (3) adding the mixture of (1) to the blend of (2).

4,711,740

DETERGENT COMPOSITIONS

Malcolm N. A. Carter, and Reginald V. Scowen, both of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 599,376, Apr. 12, 1984, abandoned.

This application May 23, 1986, Ser. No. 870,298

Claims priority, application United Kingdom, Apr. 22, 1983, 8311002

Int. Cl.⁴ C11D 3/37

U.S. Cl. 252-174.24

7 Claims

1. A detergent composition comprising:
 - (i) from 5 to 40% by weight of a detergent active material;
 - (ii) from 10% to 40% by weight of a water-soluble carbonate material;
 - (iii) from 5% to 60% of a water-insoluble carbonate material; and
 - (iv) from 0.2% to 5% by weight of a copolymer of maleic anhydride and a monomer selected from the group consisting of sulfonated styrene and 2-acrylamido-2-methyl propane sulfonic acid, wherein the weight ratio of said monomer to said maleic anhydride is about 3:1, said copolymer having a molecular weight of between 1,000 and 500,000.

4,711,741

DISOXIDANT COMPOSITION

Daishiro Fujishima, and Shinichiro Fujishima, both of 18-12, Asahi-cho, Sagami-hara-shi, Kanagawa-ken, Japan

PCT No. PCT/JP84/00378, § 371 Date Mar. 25, 1985, § 102(c) Date Mar. 25, 1985, PCT Pub. No. WO85/00537, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 26, 1984, Ser. No. 718,019

Claims priority, application Japan, Jul. 26, 1983, 58-136273

Int. Cl.⁴ C09K 3/00

U.S. Cl. 252-188.28

10 Claims

1. A disoxidant composition comprising, in combination, a metal component selected from the group consisting of iron, iron carbide and mixtures thereof possessing a disoxidation activity, and an electrolyte component comprising a halogen-containing oxyacid salt selected from the group consisting of sodium chlorite and calcium hypochlorite.

4,711,742

SOLUTION PROCESSIBLE FORMS OF NEUTRAL AND ELECTRICALLY CONDUCTIVE POLY(SUBSTITUTED HETEROCYCLES)

Kwan-Yue A. Jen, Flanders, and Ronald L. Elsenbaumer, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

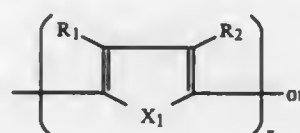
Continuation-in-part of Ser. No. 740,131, May 31, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 2,529

Int. Cl.⁴ H01B 1/20

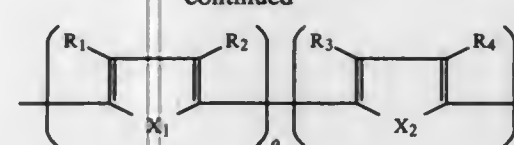
U.S. Cl. 252-500

58 Claims

1. An electrically conductive solution comprising:
 - (a) an organic solvent other than a chloroalkane;
 - (b) a dopant solute; and
 - (c) a doped homopolymer or co-polymer of film forming molecular weight, said polymer of the formula



-continued



wherein:

- n is a natural number and greater than 100;
- o and m are the same or different and are natural numbers wherein the sum of o and m is greater than 100, wherein the ratio of m to o can vary from zero to infinity;
- R₁ is alkyl, alkenyl, alkoxy, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, alkylaryl, arylalkyl, cycloalkyl, alkylsulfinyl, alkylsulfonyl, aryl, arylthio, cycloalkenyl, arylsulfinyl, arylsulfonyl, or alkyl substituted with a sulfonic acid, halo, nitro, cyano, carboxylic acid or epoxy moiety;
- R₂, R₃, and R₄ are the same or different and are hydrogen, methyl or R₁; or any of
- R₁ and R₂, or R₃ and R₄ substituents taken together are an alkylene or alkenylene group completing a 3, 4, 5, 6 or 7 membered ring system, which ring may optionally include one or more divalent heteroatoms of sulfur, sulfinyl, sulfonyl or oxygen; and
- X₁ and X₂ are the same or different and are divalent S, O, Se, NR⁵ or PR⁵, wherein R⁵ is hydrogen, alkyl or aryl.

4,711,743

PROCESS FOR PRODUCING ANTHRAQUINONE-1-SULPHONIC ACID BY SULPHONATION WITH PALLADIUM CATALYST

Feng-Feng Wey, Hsinchu, Taiwan, assignor to 501 China Technical Consultants, Inc., Taipei, Taiwan

Filed Jan. 21, 1987, Ser. No. 5,996

Int. Cl.⁴ C07C 143/36

U.S. Cl. 260-370

9 Claims

1. In a process for the production of anthraquinone-1-sulphonic acid by sulphonating anthraquinone with a sulphonating agent in the presence of palladium catalyst in a solvent, an improvement comprising: before sulphonation, mixing the palladium with nitric acid or mineral acids containing nitric acid at room temperature and then removing the acid from the treated palladium.

4,711,744

STARTING AID FOR SMALL INTERNAL COMBUSTION ENGINES

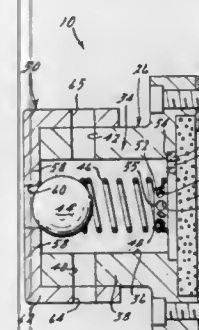
William A. Scott, Mt. Zion, and Carl Duli, Decatur, both of Ill., assignors to Tillotson, Ltd., Tralee, Ireland

Filed Apr. 4, 1986, Ser. No. 848,409

Int. Cl.⁴ F02M 1/14

U.S. Cl. 261-64.4

4 Claims



1. An improved choke for small internal combustion engines having a carburetor, a bore operatively associated with the carburetor, the bore having one end in communication with a

source of combustion air and another end of the bore in communication with a piston cylinder of the internal combustion engines, said choke comprising:

- means coupled with said bore for controlling an amount of combustion air entering the bore, said means including a first member coupled with the combustion air end of said bore for enabling combustion air to enter said bore upon start-up of said engine, an inertia valve means positioned in said bore and associated with said first member for controlling said amount of combustion air entering said bore upon start-up of said engine, a second member coupled with the combustion air end of said bore for enabling combustion air to enter said bore after start-up of said engine, and
 - resilient biasing means for securing in said bore for resiliently securing said inertia valve means in said bore and in association with said first member,
- wherein said inertia valve means is responsive to vibration of said internal combustion engine to nonlinearly control said amount of combustion air entering said bore subsequent to combustion in said engine.

4,711,745

HIGH TURNDOWN BUBBLE CAP TRAY

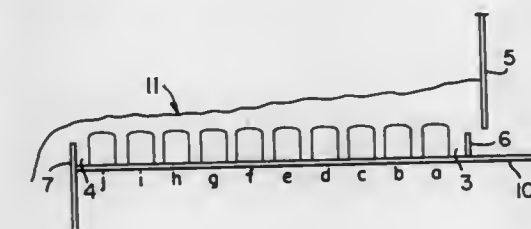
Michael J. Lockett, Grand Island; Daniel R. Summers, North Tonawanda, both of N.Y.; Vinson C. Smith, and James C. Upchurch, both of Houston, Tex., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 8, 1987, Ser. No. 1,419

Int. Cl.⁴ B01F 3/04

U.S. Cl. 261-114.2

8 Claims



1. A bubble cap tray having a tray deck, a liquid inlet zone having an inlet weir and a liquid outlet zone having an outlet weir, capable of establishing a liquid level on the tray deck which generally decreases in height from the inlet zone to the outlet zone, and a plurality of bubble caps disposed in rows which are serially disposed on the tray deck from the inlet zone to the outlet zone, characterized by:

- (a) each bubble cap having a plurality of triangular-shaped openings;
- (b) the total area of said openings on each bubble cap being substantially equal;
- (c) each row not proximate the inlet zone having bubble caps with openings whose uppermost portion is at about the same distance beneath the liquid level; and
- (d) each row proximate the inlet zone having bubble caps with openings whose uppermost portion is closer to the liquid level than is the uppermost portion of the openings of the bubble caps in rows not proximate the inlet zone.

4,711,746

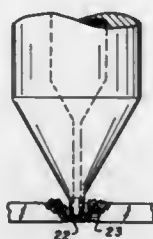
PROCESS FOR WELDING THERMOPLASTIC BY INJECTION

Clarence H. Drader, 52073 Highway 21, Sherwood Park, Alberta, Canada T8B 1J4

Continuation-in-part of Ser. No. 669,075, Nov. 7, 1984, abandoned. This application Oct. 24, 1985, Ser. No. 791,148 Int. Cl.⁴ B29C 35/02, 45/14, 65/02; B32B 35/00

U.S. Cl. 264—36

2 Claims



1. A process for welding a crack or junction line in a workpiece formed of thermoplastic material using a dispensing device comprising a barrel forming an internal chamber and having a nozzle forming a restrictive orifice outlet in its tip, said tip having a thickness greater than that of the crack or junction line, said device comprising means for forcing filler plastic into the chamber, and means for heating the barrel including its nozzle tip, comprising:

- (a) filling the chamber with filler plastic;
- (b) heating the chamber contents and nozzle sufficiently to render molten the plastic in the chamber and to render molten the workpiece plastic immediately adjacent the crack or junction line at the nozzle tip when the tip is applied thereto;
- (c) penetrating the hot nozzle tip into the workpiece at the crack or junction line to render molten said adjacent workpiece plastic and submerge the tip therein and simultaneously feeding additional filler plastic into the chamber at a rate sufficient to cause molten filler plastic to be injected at high pressure through the orifice outlet of the submerged tip into the molten workpiece plastic, to fuse therewith; and
- (d) drawing the tip along the crack or junction line while maintaining the steps and conditions of paragraph (c), to effect the weld.

4,711,747

METHOD OF PRODUCING BLOWN THERMOPLASTIC FOIL WITH LOW THICKNESS TOLERANCES

Hartmut Halter, Ruppichterth, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co., Troisdorf, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,170

Claims priority, application Fed. Rep. of Germany, May 21, 1985, 3518155

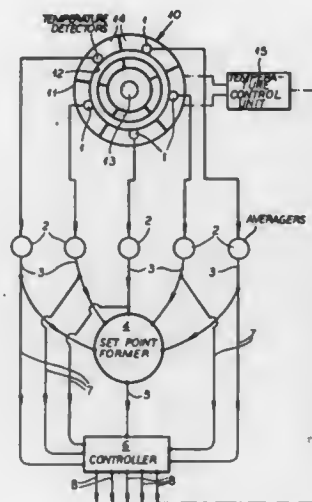
Int. Cl.⁴ B29C 47/92

U.S. Cl. 264—40.2

10 Claims

1. A method of producing a thermoplastic synthetic resin foil with reduced thickness tolerances, comprising the steps of: extruding a tubular stream of hot thermoplastic synthetic resin through an annular nozzle of a foil blowing head; blowing the tubular stream emerging from said nozzle to expand said stream into a thin-wall foil tube and thereafter cooling said tube to stabilize the resulting foil; subdividing said nozzle into a plurality of independently temperature controllable sectors around the periphery of said stream and the temperatures of which control at least in part the thickness of said foil tube in corresponding regions; detecting the temperature of a mass flow of the hot thermoplastic synthetic resin emerging from said annular nozzle

around the periphery of said mass flow and at a location upstream of complete expansion of said tubular stream; averaging said temperature of said mass flow for specific regions thereof corresponding to said sectors to form respective average values; forming a set point value from at least one of said average values;



comparing each of said average values with said set point value and generating a respective control signal for each sector upon deviation of said average values from said set point value; and controlling the temperature of each of said sectors with the respective control signals.

4,711,748

PREPARATION OF BLEACH CATALYST AGGREGATES OF MANGANESE CATION IMPREGNATED ALUMINOSILICATES BY HIGH VELOCITY GRANULATION

Charles F. Irwin, Randolph, N.J.; William Karpusiewicz, Floral Park, and Patricia Liberati, Yonkers, both of N.Y., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 805,529, Dec. 6, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 926,708 Int. Cl.⁴ B01J 29/16, 37/02; B29C 67/02; C11D 3/395

U.S. Cl. 264—117

20 Claims

1. A process for the preparation of bleach catalysts in aggregate form, exclusive of any peroxide compound within the aggregate, comprising the steps of:

- (i) adsorbing a manganese (II) cation onto an aluminosilicate support material having an average diameter size of about 2 to 10 microns, the ratio of manganese (II) cations to aluminosilicate ranging from about 1:1000 to 1:10, the combined weight of manganese (II) cation and aluminosilicate support material being from 1 to 99% of the total catalyst;
- (ii) granulating a wet mass by subjecting aggregates of said wet mass to collisions having a velocity greater than 10 meters/sec said wet mass comprising aluminosilicate support material, with manganese (II) cations adsorbed thereon, in the presence of from about 0.1 to 40% of a binder, the amount based on a dry solids weight content of the total aggregate, and wherein neither the aggregates nor their components have a pH of more than 10; and
- (iii) drying the resultant aggregates and wherein at least 70% of said dried aggregates have a diameter size ranging from at least 250 to about 2000 microns.

4,711,749

PROCESS FOR PRODUCING MICROCAPSULES

Takao Kosaka, Himeji; Fumio Okumura, Takasago, and Hirokazu Tsukahara, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,874

Int. Cl.⁴ B01J 13/02

U.S. Cl. 264—4.7

6 Claims

1. A process for producing microcapsules containing a hydrophobic material as core material, which comprises polymerizing at least one water-soluble vinyl monomer in an aqueous solution of oil-soluble vinyl monomer-maleic anhydride-maleic ester multipolymer to prepare a water-soluble resin, dispersing or emulsifying a hydrophobic material in an acidic aqueous solution of the resulting water-soluble resin to form fine discrete particles, combining an amino resin precursor separately prepared with the dispersion or emulsion, and reacting the precursor by heating the mixture in an acidic state to form capsule walls, whereby the capsule emulsion produced has low viscosity and high whiteness and is useful for preparing recording sheets substantially free from black spots.

4,711,750

ABRASIVE CASTING PROCESS

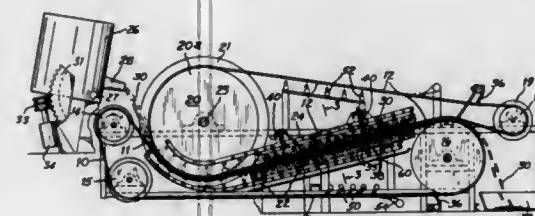
John J. Scott, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

Division of Ser. No. 30,501, Apr. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 861,836, Dec. 19, 1977, abandoned. This application Jul. 15, 1981, Ser. No. 283,600

Int. Cl.⁴ B29B 9/04

U.S. Cl. 264—144

4 Claims



1. Process for rapidly chilling molten metal oxide to form thin fractured sheets of finely crystalline solid oxide, comprising the steps of advancing a pair of metallic belts into face-to-face position, applying a cooling liquid to the back surfaces of the belts as they move into face-to-face position, pouring a molten oxide into the nip between the approaching faces of the belts, and advancing said belts from the pouring position to a discharge position where the belts are separated and the solidified oxide sheets are discharged therefrom, the belts being passed around a convex surface as they leave the pouring position so that in the absence of poured oxide the belts would be in face-to-face contact, whereby the spacing between the belts as they pass around the convex surface is controlled by the amount of oxide poured into the nip and the speed of movement of the belts.

4,711,751

PROCESS AND APPARATUS FOR STRETCHING TUBULAR EXTRUDED PLASTIC MATERIAL

Lance W. Tipton, Ashtabula, Ohio, assignor to Thermo Plastic Research Co., Ltd.

Filed Jan. 11, 1985, Ser. No. 690,680

Int. Cl.⁴ B29C 55/26

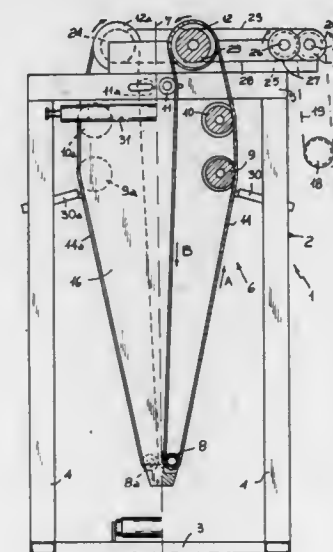
U.S. Cl. 264—159

10 Claims

1. A process of stretching tubular extruded plastic material comprising the steps of placing a substantial portion of a wedge-shaped means having a vertex end and a base end into a fluid heating means, said wedge-shaped means being formed by belt means traveling over appropriate pulleys, with a first pair of pulleys forming a vertex end, and a second pair of pulleys forming the base of the wedge-shaped means, dipping

the tubular plastic material into said heating means and onto the vertex end of said wedge-shaped means, driving the first pair of pulleys at a circumferential speed less than the second pair of pulleys, said belt means accommodating the speed differential between the first and second pair of pulleys, contacting the inner surface of the plastic tube with the belt means to move the plastic tube toward the base of the wedge-shaped means and thereby stretching the plastic tube, cutting said tube moving forward along the wedge-shaped member close to both sides of said wedge-shaped member by means of cutting means disposed in the vicinity of the base of the wedge to provide two separate plastic sheets; and finally moving the two separate sheets thus obtained over idler rollers.

5. Apparatus for stretching tubes made or extruded plastic material coming out of an extruder comprising: a substantially flat and wedge-shaped means disposed on a bearing casing, said wedge-shaped means being formed by a plurality of driving and idler pulleys disposed symmetrically two by two with respect to a vertical median plane and substantially defining a wedge with a vertex end and a base end, said vertex end being



formed by a first pair of pulleys being separated by said vertical median plane, said first pair of pulleys being sized and spaced a predetermined distance apart so as to fit within the extruded plastic tube placed thereover, said base end being formed by a second pair of pulleys spaced a predetermined distance apart and further apart than said first pair of pulleys to form a wedge-shape which will stretch the plastic tube, belt means connecting the pulleys to each other, said belt means being adapted to contact the inner surface of the extruded plastic tube to move said plastic tube from the vertex toward the base of the wedge-shaped means, said first pair of pulleys being driven at a lesser circumferential speed than the second pair of pulleys and said belt means accommodating the speed differential between the first and second pair of pulleys, a pair of cutting members positioned a predetermined distance above said vertex and adapted to cut the extruded plastic tube into two distinct sheets after it is stretched, a pair of idler rollers disposed on two opposite faces of the wedge-shaped means in order to move the two distinct sheets away from the processing area in opposite directions, and drive means being provided for driving the pulleys.

4,711,752

METHOD AND APPARATUS FOR MOLDING FIBER OPTIC CONNECTOR FERRULE

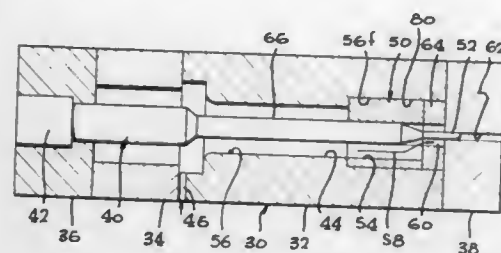
George R. Deacon, Corona Del Mar, and William R. Cranford, Irvine, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,301

Int. Cl.⁴ B29C 45/36

U.S. Cl. 264—328.12

7 Claims



1. A method for forming a fiber optic connector ferrule, comprising:

mounting the rear of an elongated corepin on the rear end of an injection mold which has an elongated mold cavity, so the corepin extends throughout the length of the mold cavity, said corepin having a reduced-diameter forward section of about the same diameter as the bare fiber of an optical fiber cable that is to be held by the ferrule and a middle section rearwardly spaced from the forward end of the corepin and having a greater diameter than said forward section;

installing a bushing which has a ring-shaped outside and at least three radially-inwardly extending arms, within said mold cavity, with the radially inner ends of the arms closely surrounding the front of the middle section of the corepin, and with the inner surface of a group of tying portions of the bushing which connect the radially outer ends of the arms, forming an interrupted cylinder which is precisely concentric with the inner ends of said arms;

injecting a molten plastic into the mold cavity from a location which is rearward of said bushing, and flowing said plastic forwardly through the spaces between the arms of said bushing to form a plastic ferrule; and

removing said ferrule from said mold cavity, removing said corepin from said bushing, and removing bushing from around said ferrule.

2. Apparatus for molding a fiber optic connector ferrule so its inside can hold the optic fiber, lying at the forward end of a stripped optical fiber cable, precisely concentric with a substantially cylindrical mating surface near the end of the ferrule, comprising:

a mold which forms an elongated mold cavity defining most of the periphery of a ferrule, said mold cavity including a largely forward portion;

an elongated corepin for forming most of the inside of the ferrule, said corepin having a rearward end mounted on said mold and having a substantially cylindrical middle section and a smaller reduced diameter forward section of substantially the same size as an optic fiber; and

a bushing lying within the forward portion of said mold cavity and surrounding said cylindrical middle section of said corepin, said bushing having a plurality of radially-extending arms that have radially-inner ends that closely surround said corepin and radially outer ends, said radially outer ends lying radially opposite the radially-inner ends where the radially-inner ends closely surround said corepins and said radially outer ends being closely received within said mold, said arms being angularly spaced apart substantially at their radially inner ends to leave gaps through which molding material can flow forwardly to enter the extreme forward portion of said cavity.

4,711,753

CALIBRATION OF A NUCLEAR REACTOR CORE PARAMETER PREDICTOR

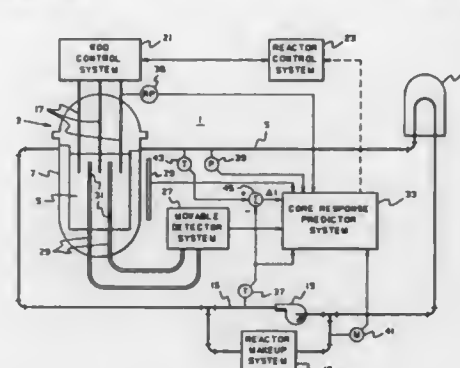
Albert J. Implink, Jr., Murrysville; Toshio Morita, Wilkensburg; Reno W. Miller, Penn Hills, and Louis R. Grobmyer, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 19, 1986, Ser. No. 841,498

Int. Cl.⁴ G21C 7/36

U.S. Cl. 376—216

25 Claims



1. A method of calibrating, for neutron balance and power distribution, an on-line nuclear reactor core performance predictor which utilizes a one dimensional diffusion theory core model incorporating elevation dependent neutronics parameters including macroscopic cross-sections, diffusion coefficients and transverse buckling factors, said method comprising the steps of: periodically adjusting the buckling factors by:

measuring the power distribution with the core in equilibrium at power;

concurrently measuring a set of controllable parameters which influence overall neutron balance in the core;

selecting a distribution expression for the elevation dependent transverse buckling factors having-expansion coefficients which include a coefficient correlated to the overall neutron balance and the remainder correlated to power distribution; and

adjusting said expansion coefficients such that the overall neutron balance and power distribution generated by said one dimensional diffusion theory core model, using said selected transverse buckling distribution expression, agree within preset tolerances with the measured power distribution and the overall neutron balance for actual core conditions represented by the measured values of said set of controllable parameters.

4,711,754

METHOD AND APPARATUS FOR IMPACTING A SURFACE WITH A CONTROLLED IMPACT ENERGY

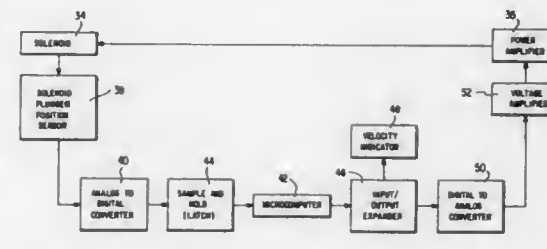
Fred H. Bednar, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1985, Ser. No. 788,981

Int. Cl.⁴ G21C 17/00; C05F 3/00

U.S. Cl. 376—245

16 Claims



7. Apparatus for impacting a surface with a desired kinetic impact energy comprising, in combination:

first means for applying a controllable impact force, corresponding to the magnitude of an input signal, to an adjacent surface;

second means, responsive to an input control signal, for supplying an input signal of a preset magnitude to said first means to produce said impact force;

third means for determining the kinetic energy of the impact;

fourth means for comparing the kinetic energy of the impact with a desired kinetic energy value and for producing an output signal corresponding to any difference;

fifth means for indicating the results of such comparison;

sixth means, responsive to said output signal from said fourth means for adjusting said preset magnitude of said input control signal to reduce any error; and

seventh means for supplying said input control signal at desired times to initiate an impact.

4,711,755

HANDLING TOOL FOR, AND METHOD OF USE OF, ICE BASKET REMOVABLE CRUCIFORM

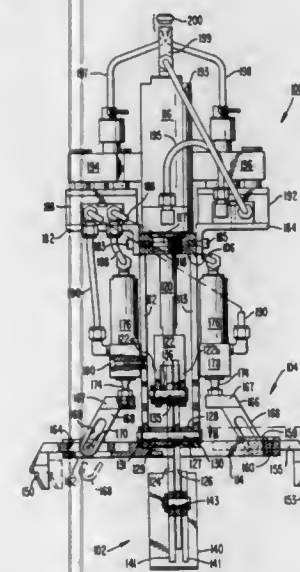
Charles M. Scrabis, Pittsburgh; Gregory E. Mazza, Bethel Park; Leonard R. Golick, Levelgreen, and Paul Pomaibo, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1986, Ser. No. 827,116

Int. Cl.⁴ G21C 19/00

U.S. Cl. 376—260

8 Claims



3. A method for selectively installing and removing a removable cruciform of a resiliently compressible type, in and from the interior of a generally cylindrical, elongated and vertically oriented ice containment structure, which interior is accessible from an open, upper end thereof, each such removable cruciform comprising a central housing defining an axis of compression and expansion, means normally biasing said housing in the direction of expansion, legs extending from said housing in a generally radially oriented direction and means on the outer edges of said legs configured to engage a corresponding stiffening ring rigidly secured on the interior of the cylindrical side-wall of the ice basket, comprising:

providing a handling tool having an elongated frame defining an axis, guide means connected to said frame and comprising at least first and second guide fingers extending radially from said axis and angularly displaced thereabout and selectively moveable between retracted and extended positions, and clamping means mounted to said frame and extending axially outwardly therefrom, said clamping means comprising a pair of clamping shoes selectively moveable in complementary directions relatively to the frame axis, radially inwardly to engaged positions and radially outwardly to disengaged positions,

the radially outward and disengaged positions thereof being of lesser extent than the radially outward extent of said first and second guide fingers in either of said retracted and extended positions thereof;

positioning said tool, with said clamping shoes in said disengaged positions, in axial alignment with and disposed radially outwardly about the central housing of a removable cruciform of said resiliently compressible type;

selectively actuating said clamping means to said engaged positions of said clamping shoes for engaging and compressing the central housing of the cruciform and retracting the legs thereof;

lowering the tool with the cruciform engaged thereby, axially downwardly through the ice basket to a desired elevation;

selectively actuating said guide fingers of said tool to the extended positions thereof for engaging said guide fingers on a stiffening ring of the ice containment structure at the desired elevation;

selectively actuating the clamping means for moving said clamping shoes to the disengaged positions thereof to enable the central housing of the cruciform to expand and project the legs thereof radially outwardly for engaging the stiffening ring at the desired elevation;

selectively actuating said guide fingers to the retracted position thereof for releasing same from the stiffening ring; and

vertically axially withdrawing the tool from within the ice containment structure.

4,711,756

CONTROL ROD DISPLACEMENT

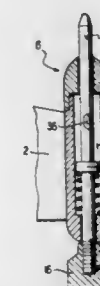
Susumu Nakazato, Tokyo, Japan, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 763,722, Aug. 8, 1985, abandoned. This application Feb. 24, 1987, Ser. No. 18,820

Int. Cl.⁴ G21C 7/10

U.S. Cl. 376—327

9 Claims



1. In a nuclear reactor including a core, a plurality of cylindrical control rods, a single support means supporting said plurality of control rods from their upper ends in spaced apart positions and movable for displacing said control rods in their longitudinal direction between a first end position in which said control rods are fully inserted into said core and a second end position in which said control rods are retracted from said core, and guide means contacting discrete regions of the outer surface of each said control rod at least when said control rods are in the vicinity of the second end position, said control rods being supported by said support means for longitudinal movement without rotation into and out of said core relative to the guide means to thereby cause the outer surface of said control rods to experience wear as a result of sliding contact with the guide means, said support means being so arranged with respect to said core and said guide means that it is incapable of rotation relative to said guide means, the improvement comprising a plurality of displacement means each of said plurality of displacement means being operatively coupled to a respective one of said control rods for periodically rotating said

control rod in a single angular direction through an angle selected to change the locations on the outer surfaces of said control rods at which said control rods are contacted by said guide means during subsequent longitudinal movement of said control rods.

4,711,757

POSITION INDICATING DEVICE

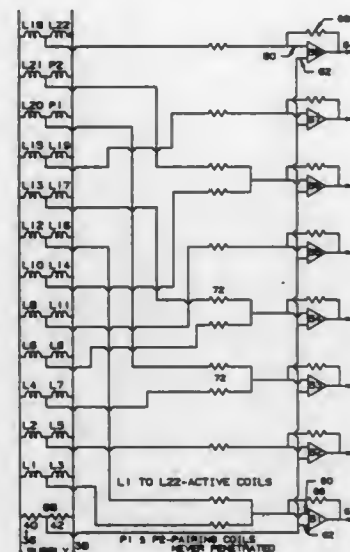
Michal M. Felchenfeld, Pittsburgh, and Grant R. Connors, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1986, Ser. No. 833,933

Int. Cl.⁴ G21C 17/00; G01R 33/00

U.S. Cl. 376—258

9 Claims



1. Position indicating device for producing an indication of the position of a displaceable structure, said device comprising:

- a position representing member mounted for movement in response to displacement of the structure, said member being movable along a defined path from a starting point such that the distance to which said member extends from the starting point corresponds to the position of the structure;
- a plurality of sensing elements spaced apart along the defined path such that each said element is associated with a respective location along the defined path, each said element being operative to respond to the presence of said member when said member extends from the starting point to the respective location associated with that said element;

means operatively coupling said elements into respective pairs of elements, said means having, for each pair of elements, an output producing a signal only when a single element of its respective pair is responding to the presence of said member, said elements of each said pair being spatially separated from one another by at least one said element of a different said pair;

- a plurality of signal producing members each operative for producing a signal representing a predetermined logic state in response to a predetermined input signal, the number of said signal producing members being smaller than the number of said sensing elements; and
- circuit means operatively connecting said outputs to said signal producing members for causing a signal at each said output to produce a predetermined input signal at a corresponding signal producing member and for causing a predetermined input signal to be produced at at least one said signal producing member whenever a signal is present at either one of at least two of said outputs.

4,711,758

SPENT FUEL STORAGE CASK HAVING BASKET WITH GRID ASSEMBLIES

Octavio J. Machado; David A. Daugherty, both of Pensacola; Ronnie H. Andrews, Cantonment, and Larry E. Efferding, Pensacola, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

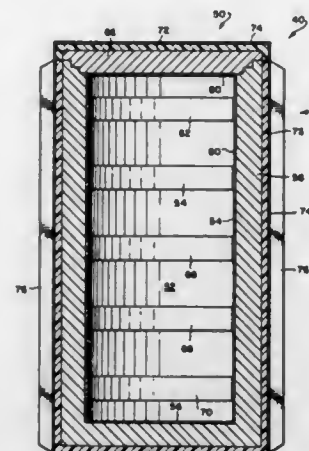
Continuation-in-part of Ser. No. 686,041, Dec. 24, 1984,

abandoned. This application Feb. 21, 1985, Ser. No. 703,855

Int. Cl.⁴ G21C 19/32; G21F 5/00

U.S. Cl. 376—272

19 Claims



1. A cask for storage of nuclear fuel, comprising:

- a container having a cavity therein, the cavity including a top portion, a bottom portion defining a floor, and a generally cylindrical side wall extending between the top and bottom portions, the side wall having a plurality of annular regions with different inner diameters; and
- basket means for providing a plurality of elongated storage slots to receive the nuclear fuel, said basket means including a plurality of grid assemblies with circular peripheries and different diameters, and means for coaxially mounting said grid assemblies at spaced-apart positions so that the periphery of each grid assembly faces a respective annular region, said grid assemblies being dimensioned to permit insertion of said basket means into said cavity and to expand into pressing contact with said annular regions during storage of the nuclear fuel in order to facilitate the transfer of heat from said basket means through the peripheries of said grid assemblies to said annular regions, the pressing contact extending for 360° about the periphery of each grid assembly,

wherein the diameters of said grid assemblies and the inner diameters of said annular regions decrease from the top portion to the bottom portion of said container.

4,711,759

REMOVABLE CRUCIFORM FOR ICE CONDENSER ICE BASKET

Charles M. Scrabis, Pittsburgh; Gregory E. Mazza, Bethel Park; Leonard R. Golick, Levelgreen, and Paul Pomaibo, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1986, Ser. No. 827,113

Int. Cl.⁴ G21C 9/00

U.S. Cl. 376—284

12 Claims

1. A removable cruciform for use in an ice basket having a generally cylindrical sidewall defining a central, vertical axis of the ice basket and plural, generally annular retaining rings secured to the interior of the cylindrical sidewall of the ice basket at predetermined, spaced elevations throughout the axial height of the ice basket, comprising:

- a pair of brackets, each comprising a central, base portion having parallel longitudinal edges and a pair of integral

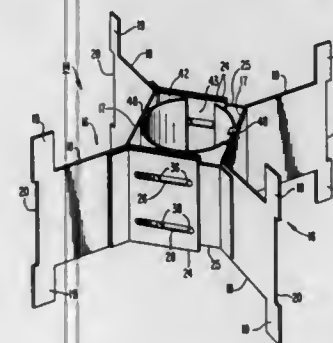
legs extending at corresponding angles relative to said base portion from the respective parallel longitudinal edges thereof;

a pair of support plate assemblies secured to and extending in parallel, spaced relationship from one of said pair of brackets, generally perpendicular to said base portion thereof, each said support plate assembly defining a corresponding slide channel;

a pair of slide support plates secured to the other of said pair of brackets and extending therefrom in spaced, parallel relationship, and received in telescoping, sliding relationship in the corresponding slide channels of the pair of respective support plate assemblies of said one of said brackets thereby to dispose said base portions of said pair of brackets in parallel, spaced relationship and defining therewith a housing of nominally, generally square configuration; and

spring means received within said housing and engaging said base portions of said brackets and applying a resilient biasing force thereto for maintaining said spaced relationship thereof.

7. A nuclear reactor system having an array of ice baskets disposed thereabout, each said ice basket having a generally cylindrical sidewall and plural, annular retaining rings secured to the interior surface of the sidewall at predetermined, spaced elevations throughout the axial height of the ice basket, removable cruciforms being mounted within said ice basket at predetermined, spaced elevations therewithin displaced from the



open, upper end of the ice basket and defining therewithin corresponding compartments, each to be charged with ice, each said removable cruciform, when so mounted, engaging a corresponding, annular retaining ring for supporting a charge of ice received in the corresponding compartment thereabove, and comprising:

- a pair of brackets, each comprising a central, base portion having parallel longitudinal edges and a pair of integral legs extending at corresponding angles relative to said base portion from the respective parallel longitudinal edges thereof;

a pair of support plate assemblies secured to and extending in parallel, spaced relationship from one of said pair of brackets, generally perpendicular to said base portion thereof, each said support plate assembly defining a corresponding slide channel;

a pair of slide support plates secured to the other of said pair of brackets and extending therefrom in spaced, parallel relationship, and received in telescoping, sliding relationship in the corresponding slide channels of the pair of respective support plate assemblies of said one of said brackets thereby to dispose said base portions of said pair of brackets in parallel, spaced relationship and define therewith a housing of nominally, generally square configuration; and

spring means received within said housing and engaging said base portions of said brackets and applying a resilient force thereto for maintaining said spaced relationship thereof.

4,711,760

NUCLEAR REACTOR INCORPORATING LOCKING DEVICE FOR THREADED BOLT CONNECTIONS

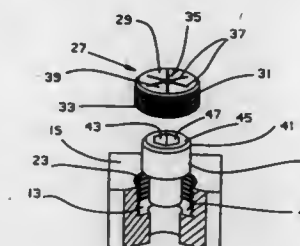
Ronald M. Blaushild, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1986, Ser. No. 834,094

Int. Cl.⁴ G21C 1/01; F16B 37/04

U.S. Cl. 376—399

19 Claims



1. A nuclear reactor having a pressure vessel and a first element comprising a core barrel situated within the pressure vessel, the core barrel having a baffle former secured in and to said core barrel by bolted connections, and a second element comprising a plurality of baffle plates secured to the inner surface of said baffle former by bolted connections, with a locking device to prevent loosening of bolted connections between the baffle former and at least one of said elements, where the baffle former and said at least one element are held together by a headed, threaded bolt engaged in a bore coaxially extending in said baffle former and said at least one element and threadedly engaged in a threaded section in at least said baffle former, said threaded section having first threaded of a first direction, with the head of the bolt engaged with a shoulder about the bore in said at least one element to hold said baffle former and said at least one element together, the head of said bolt having a first diameter and a cavity, having an unsymmetrical wall thereabout, in the end surface thereof, comprising:

- a recess in said at least one element coaxial with said bore forming a wall thereabout and extending inwardly from the outer surface of said at least one element, said recess having a second diameter greater than said first diameter, with said at least one element having second threads in said wall of a direction opposite the direction of the first threads of said threaded bore;

a locking nut having a base with a downwardly depending cylindrical wall thereabout, the outer surface of the cylindrical wall having threads engageable with the second threads on the wall of said recess and of the same direction thereof; the base having a central aperture therethrough and downwardly extendable projections on said base adjacent said aperture, such that said downwardly extendable projections, when the base of said lock nut is positioned flush with the end surface of said bolt, engage with the unsymmetrical walls of the cavity in the head of said bolt.

12. A locking device to prevent loosening of a bolted connection between first and second components where the two components are held together by a headed, threaded bolt engaged in a bore coaxially extending in said components and threadedly engaged in a threaded section in at least said first component, said threaded section having first threads of a first direction, with the head of the bolt engaged with a shoulder about the bore in the second said component to hold said components together, the head of said bolt having a first diameter and a cavity, having an unsymmetrical wall thereabout, in the end surface thereof, comprising:

- a recess in said second component coaxial with said bore forming a wall thereabout and extending inwardly from the outer surface of said second component, said recess having a second diameter greater than said first diameter, with said second component having second threads in said

wall of a direction opposite the direction of the first threads of said threaded bore;

a locking nut having a base with a downwardly depending cylindrical wall thereabout, the outer surface of the cylindrical wall having threads engageable with the second threads on the wall of said recess and of the same direction thereof; the base having a central aperture therethrough and downwardly extendable projections on said base adjacent said aperture, such that said downwardly extendable projections, when the base of said lock nut is positioned flush with the end surface of said bolt, engage with the unsymmetrical walls of the cavity in the head of said bolt.

4,711,761

DUCTILE ALUMINIDE ALLOYS FOR HIGH TEMPERATURE APPLICATIONS

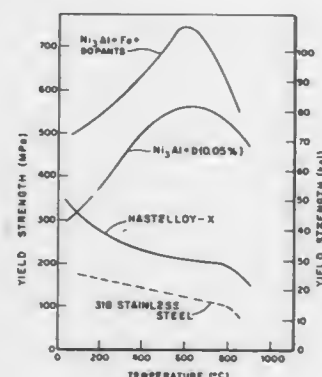
Chain T. Liu, and Carl C. Koch, both of Oak Ridge, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Aug. 3, 1983, Ser. No. 519,941

Int. Cl.⁴ C22C 19/00

U.S. Cl. 420—459

5 Claims



2. An alloy consisting essentially of about 9.0 to 11.5 wt.% aluminum, about 6.0 to 16 wt.% iron, about 0.01 to 0.07 wt.% boron, and the balance nickel.

4,711,762

ALUMINUM BASE ALLOYS OF THE Al-Cu-Mg-Zn TYPE

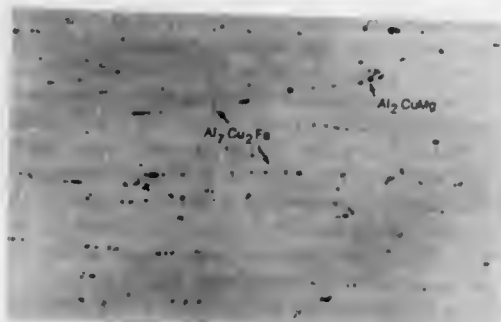
William D. Vernam, and Bernard W. Lifka, both of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 22, 1982, Ser. No. 421,341

Int. Cl.⁴ C22C 21/10

U.S. Cl. 420—532

26 Claims



1. An improved aluminum base alloy product consisting essentially of 1.0 to 2.6 wt.% Cu, max. 0.3 Mn, 1.0 to 3.1 wt.% Mg, 4.0 to 8.2 wt.% Zn, 0.005 to 0.5 wt.% Sr, max. 0.18 Zr,

max. 0.25 Cr, max. 0.4 Fe, max. 0.5 Si, the remainder aluminum and incidental elements and impurities.

4,711,763

SULFIDATION-RESISTANT CO-CR-NI ALLOY WITH CRITICAL CONTENTS OF SILICON AND COBALT

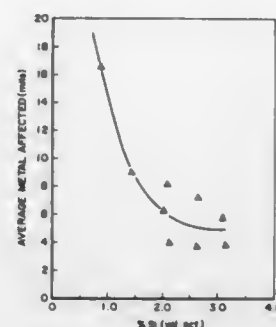
George Y. Lai, Carmel, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Dec. 16, 1986, Ser. No. 942,322

Int. Cl.⁴ C22C 30/00

U.S. Cl. 420—585

4 Claims



1. An alloy eminently suited for sulfidation resistance consisting essentially of, in percent by weight, 25 to 40 cobalt, 25 to 35 chromium, up to 20 iron, more than 2 to 4 silver, up to 8 each molybdenum and tungsten but not over 12 molybdenum plus tungsten, columbium plus tantalum up to 1, aluminum up to 1.3, titanium up to 1.3, carbon up to 2, Rare Earth Metals up to 0.2, zirconium and boron each up to 0.1, manganese up to 2, balance nickel plus impurities whereby the critical contents of cobalt and silicon are present to provide improved sulfidation resistance.

4,711,764

AUTOMATIC SAMPLE INJECTOR AND DISPOSABLE SAMPLE CASSETTE

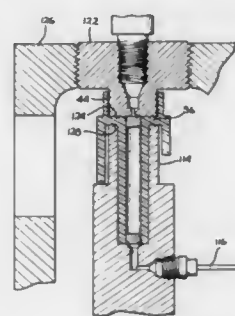
Thomas J. Good, Sierra Madre, Calif., assignor to Analytichem International, Inc., Harbor City, Calif.

Continuation of Ser. No. 433,514, Oct. 8, 1982, abandoned. This application Oct. 24, 1985, Ser. No. 790,861

Int. Cl.⁴ G01N 31/08

U.S. Cl. 422—65

5 Claims



1. For use in an automatic sample injector for high pressure chromatography, the combination comprising: a unitary molded plastic sample holder having a plurality of integral cylindrical sample columns disposed in a row therein open at both ends thereof and being supported in the sample holder by a single common flange surrounding each sample column, said flange disposed adjacent one end of said sample columns; receiving means for receiving said sample holder; sealing means for controllably sealably engaging one of said

plurality of sample columns at said single common flange and for releasing said sample column for controlled communication with each open end thereof, said sealing means having a substantially rigid top member and bottom member for directly engaging and pressing into opposite surfaces of said flange adjacent to and integral with said sample column to provide a positive sealing grip with each of the opposite surfaces of the flange to allow high pressure sample extraction from sample column said bottom member enclosing a lower portion of said sample column when engaging said flange to aid in the containment of high pressures;

advancing means for controllably advancing said unitary sample holder along said receiving means to sequentially bring each of said plurality of sample columns on said unitary holder into alignment with said sealing means; and control means coupled to said sealing means and said advancing means for sequentially causing said advancing means to repetitively and sequentially (i) advance said sample holder to a next sample column, (ii) cause said sealing means to sealably engage the two opposite surfaces of the flange said of next sample column for sample extraction, and (iii) to release said next sample column in readiness for repetition of the sequence.

4,711,765

SORPTION/DESORPTION GAS ANALYSIS APPARATUS

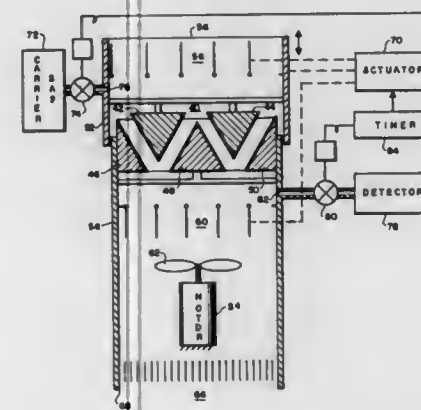
Marion H. Cates, and Eugene L. Szonntag, both of Largo, Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 2, 1986, Ser. No. 881,362

Int. Cl.⁴ G01N 1/18, 30/02; B01D 35/18, 53/14

U.S. Cl. 422—89

20 Claims



1. A sorption/desorption analysis apparatus comprising sorption/desorption bed means having a first tapered bed element and a second tapered bed element arranged to mate with said first bed element said first and second tapered bed elements forming a fluid flow path therebetween, inlet passage means for directing a fluid to be analyzed to said flow path across said bed means between said first and second bed elements to produce a sorption of the fluid to be analyzed by the sorption bed means, means for desorbing a sorbed sample from said bed means detector means for receiving and analyzing a desorbed sample from said bed means, means for directing a flow of a desorbed sample from said bed means to said detector means, drive means for displaying and second bed element relative to said first bed element for selectively transferring said bed means from a high flow volume condition during a sorption operation to a low flow volume condition during a desorption operation by a relative movement of said first and second bed elements to produce a volume reduction in the fluid flow path across said bed means and means for operating said means for desorbing, said means for

directing and said drive means to transfer the apparatus between the sorption operation and the desorption operation.

4,711,766

APPARATUS FOR MIXING CRACKING CATALYST WITH A FLUID HYDROCARBON

Robert R. Cartmell, Crown Point, Ind., and Carl J. Horecky, Elmhurst, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

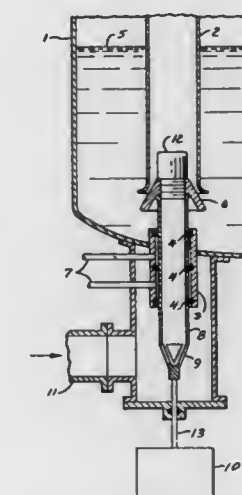
Division of Ser. No. 629,070, Jul. 9, 1984, Pat. No. 4,624,836.

This application Nov. 25, 1986, Ser. No. 934,746

Int. Cl.⁴ C10G 11/18

U.S. Cl. 422—140

3 Claims



1. An apparatus for immediately and intimately mixing fluidizable cracking catalyst with a fluid hydrocarbon feedstock which comprises:

- means defining a chamber for containing a cracking catalyst;
- a riser reactor situated within said chamber having an access opening defined at its upstream end for receiving the cracking catalyst and the feedstock;
- a plug valve having: (i) a generally upright tubular valve stem, adapted to carry the feedstock (ii) a hollow plug secured to said valve stem which is engageable in a reciprocating fashion from a closed position for blocking said access opening to an open position for permitting the flow of the cracking catalyst from said chamber through said access opening into said riser reactor to mix with the feedstock; and
- a nozzle means secured to said plug valve for injecting the feedstock into said riser from said plug valve.
- a stationary guide tube positioned concentrically and externally around a portion of said tubular valve stem, said guide tube defining an upper annular compartment and a lower annular compartment said annular compartments separated by at least one bushing, said upper annular compartment bounded at its upper end by an upper bushing and said lower annular compartment bounded at its lower end by a lower bushing, each annular compartment having a bleed medium conduit connected thereto.

4,711,775

COSMETIC COMPOSITIONS

Walter Dittmar, Hofheim; Eberhard Futterer, and Gerhard Lohaus, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 478,857, Mar. 25, 1983, abandoned, which is a continuation of Ser. No. 21,948, Mar. 19, 1979, abandoned, which is a division of Ser. No. 605,210, Aug. 15, 1975, Pat. No. 4,185,106, which is a continuation of Ser. No. 377,440, Jul. 9, 1973, abandoned. This application Dec. 4, 1984, Ser. No. 677,891

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1972, 2234009

Int. Cl.⁴ A61K 7/06

U.S. Cl. 424—70

12 Claims

1. An anti-dandruff shampoo comprising a surfactant and, as the active anti-dandruff agent therein, from 0.2 to 10 percent of 1-hydroxy-4-methyl-6-(2,4,4-trimethylphenyl)-2-pyridone, a salt thereof, or a mixture of said pyridone with said salt.

4,711,776

HAIR COSMETIC COMPOSITION

Toshio Suzuki, Ichikawa, and Kazuyuki Yahagi, Tokyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,198

Claims priority, application Japan, Nov. 6, 1984, 59-233761

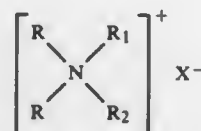
Int. Cl.⁴ A61K 7/06, 7/08, 9/12

U.S. Cl. 424—70

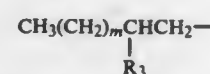
3 Claims

1. A hair cosmetic composition comprising:

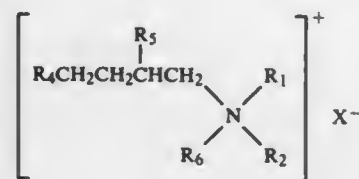
(A) 0.01–20 wt. % of one or more of branched quaternary ammonium salts represented by the following formula (i) or (ii):



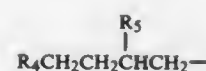
wherein R is an alkyl group selected from (a) branched alkyl groups represented by



and (b) linear alkyl groups represented by $\text{CH}_3-(\text{CH}_2)_n$, R_3 being a methyl or ethyl group, $m=3-12$ and $n=7-15$, the degree of branching of the group R, defined as (a)/(a)+(b) is 10–100 wt. %, R_1 and R_2 denote independently an organic group selected from the group consisting of a benzyl group, alkyl groups having 1–3 carbon atoms and hydroxyalkyl groups having 1–3 carbon atoms, and X^- means a halogen or organic anion,



wherein R_4 and R_5 are independently an alkyl group having 2–12 carbon atoms, R_6 means a group



or an alkyl group having 1–3 carbon atoms, and R_1 , R_2 and X^- have the same meanings as defined above; and (B) 0.1–30 wt. % of oils and fats selected from the group consisting of a higher alcohol containing a linear or branched alkyl or alkenyl group having 12–26 carbon atoms and a fatty acid monoglyceride derived from saturated or unsaturated, linear or branched fatty acids having 12–24 carbon atoms.

4,711,777

PHARMACEUTICAL TABLETS

Hong S. Tan, Bleiswijk, and Bernardus B. M. Wegman, Hoofddorp, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Apr. 30, 1986, Ser. No. 858,013

Claims priority, application European Pat. Off., 05021985, May 2, 1985, 85200692.3

Int. Cl.⁴ A61K 9/20, 31/74

U.S. Cl. 424—79

10 Claims

1. A tablet consisting essentially of granules formed by wet granulation of (a) 80 to 98% by weight of a mixture of trimethoprim and/or an acid addition salt thereof and a sulfonamide and/or a salt thereof in a weight ratio of 1:20 to 20:1 and (b) 1 to 8% by weight of a pharmaceutically acceptable synthetic ion exchange resin.

4,711,778

INACTIVATED RABIES VACCINE FOR VETERINARY USE

Edmund P. Bass, and Richard L. Sharpee, both of Lincoln, Nebr., assignors to Norden Laboratories, Inc., Lincoln, Nebr. Division of Ser. No. 376,905, May 10, 1982, abandoned, which is a division of Ser. No. 174,306, Jul. 30, 1980, Pat. No. 4,347,239. This application May 22, 1985, Ser. No. 736,900

Int. Cl.⁴ A61K 39/12; C12N 7/00

U.S. Cl. 424—89

5 Claims

1. A combination vaccine capable of inducing immunity in feline animals without serious side effects comprising vaccinal amounts of inactivated HCP-SAD strain of rabies virus which has been adapted to grow, before inactivation, in swine testicle cell culture by at least one passage in said cell culture and one or more vaccinal feline viruses selected from modified feline viral rhinotracheitis virus, calicivirus and panleukopenia virus, and a carrier therefor.

4,711,779

GLYCOPROTEINIC CONJUGATES HAVING TRIVALENT IMMUNOGENIC ACTIVITY

Massimo Porro, Localita' Collanza, and Paolo Costantino, Colle Val d'Elsa, both of Italy, assignors to Sclavo S.p.A., Siena, Italy

Filed Jul. 2, 1986, Ser. No. 881,091

Claims priority, application Italy, Jul. 5, 1985, 21451 A/85

Int. Cl.⁴ C07K 17/10; A61K 39/385

(ii) U.S. Cl. 424—92

12 Claims

1. Glycoprotein conjugates having trivalent immunogenic activity, obtained by covalently binding a protein antigen selected among CRM 197, tetanus toxoid, and pertussis toxin, with at least one first oligosaccharidic hapten obtained from the capsular polysaccharide of a gram-positive bacterium, and with at least one second oligosaccharidic hapten obtained from the capsular polysaccharide of a gram-negative bacterium, said first and second oligosaccharidic haptens having been preliminarily activated by the introduction of terminal ester groups.

4,711,780

COMPOSITION AND PROCESS FOR PROMOTING EPITHELIAL REGENERATION

Mostafa S. Fahim, 500 Hulen Dr., Columbia, Mo. 65201

Continuation-in-part of Ser. No. 619,004, Jun. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 341,544, Jan. 21, 1982, abandoned. This application May 12, 1986, Ser. No. 862,051

Int. Cl.⁴ A61K 33/30, 31/195

U.S. Cl. 424—145

16 Claims

1. A medication for treating epithelial tissue comprising vitamin C, a zinc salt and a sulfur amino acid in an amount sufficient to stimulate cell proliferation and new cell formation.

4,711,781

MEDICINAL SELF-ADHESIVE PLASTER

Erich Nick, Eichhornchenweg 2, D-2080 Pinneberg; Günter Guse, Lilienstr. 30, D-2000 Hamburg 73, and Bodo Asmussen, Dorotheenweg 1a, D-2071 Ammerbek 2, all of Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,170

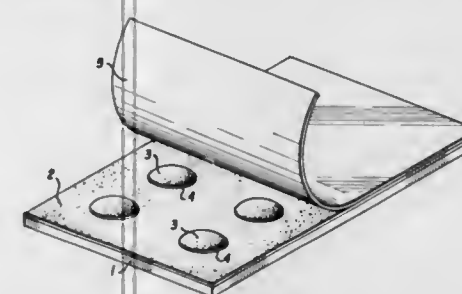
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423293

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.⁴ A61L 15/03, 15/06; A61F 13/02; A61K 31/505

U.S. Cl. 424—446

22 Claims



1. A self-adhesive medicinal plaster in which the medication is isolated from the adhesive, comprising:

- a carrier web;
- a continuous adhesive coating on one surface of said carrier web;
- a plurality of non-permeable, separating film elements spaced from each other on the surface of said adhesive coating; in a predetermined pattern; and
- a plurality of active ingredient elements containing at least one medication, each disposed on the surface of and within the perimeter of one of said separating film elements, said active ingredient elements each having a maximum surface dimension of about 5000 μm .

4,711,782

PROLONGED RELEASE MICROCAPSULES AND THEIR PRODUCTION

Hiroaki Okada; Yasuaki Ogawa, both of Osaka, and Takatsuka Yashiki, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 667,096, Nov. 1, 1987, Pat. No. 4,652,441.

This application Dec. 11, 1986, Ser. No. 940,614

Claims priority, application Japan, Nov. 4, 1983, 58-207760

Int. Cl.⁴ A61K 9/52; B01J 13/02

U.S. Cl. 424—455

13 Claims

1. A prolonged release microcapsule having an average diameter of about 0.5 to 400 μm for injection, which is produced by preparing a water-in-oil emulsion comprising an inner aqueous layer containing a water-soluble and non-polypeptidic drug, a drug retaining substance therefor selected from a member of the group consisting of gelatin, albumin, pectin and agar and an oil layer containing a polymer substance

of lactic acid-glycolic acid copolymer or lactic acid polymer, then thickening or solidifying said inner aqueous layer to a viscosity of not lower than about 5000 centipoises and finally admixing the resulting emulsion with third aqueous layer to give a water/oil/water ternary layer emulsion and then desorbing the solvent in the oil layer.

4,711,783

FORMS OF MICROENCAPSULATION OF MEDICINAL SUBSTANCES BY HOMOGENEOUS LAYERS OF NATIVE COLLAGEN

Alain Huc, Ste Foy-les-Lyons; Rene Gimeno, Pelussin, and Daniel Herbage, Lyons, all of France, assignors to Bloetica, S.A., Lyons, France

Filed Apr. 3, 1984, Ser. No. 596,422

Int. Cl.⁴ A61K 9/38, 9/64, 9/22, 9/52

U.S. Cl. 424—460

5 Claims

1. A sustained-release, coated pharmaceutical composition, suitable for oral administration, which consists essentially of:

- a pharmaceutically effective amount of an orally-administered medicament in granular form; and
- a layer of homogeneous, native collagen coating said granules of medicament, said layer of homogeneous, native collagen applied to the granules of medicament by the following steps:
 - forming an acid-soluble methanolic solution of native collagen having a mean molecular mass equal to or greater than 300,000 Daltons, the collagen macromolecule having a width greater than 15 angstrom units and a length greater than 2990 angstrom units, constituted by 3 peptide chains wound around each other in a common helical axis, each having a molecular mass of 10,000 Daltons wherein every third amino acid residue is a glycine residue and having a high number of hydroxy-proline residues, between each of said peptide chains there exist covalent chemical bonds which are bonded on at least one side to the end of a peptide chain called a telopeptide, said telopeptide not present in the common helical axis and having a length of about 50 angstrom units, thereby providing a collagen that is partially insoluble and resistant to enzymes;
 - applying the methanolic solution of native collagen formed in step (a) to the orally-administered medicament in granular form to cover the granular medicament with a homogeneous layer of native collagen;
 - air-drying the coating on said granular medicament to a homogeneous layer of native collagen; and
 - subjecting the granular medicament coated during step (c) and after air-drying to a thermal treatment under vacuum at 100° C. for 24 hours, to assure reticulation of the collagen.

4,711,784

ENCAPSULATION COMPOSITION FOR USE WITH CHEWING GUM AND EDIBLE PRODUCTS

Robert K. Yang, Randolph, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 7, 1986, Ser. No. 816,769

Int. Cl.⁴ A23G 3/30

U.S. Cl. 426—5

19 Claims

1. A chewing gum composition containing a sweetener encapsulated in a solvent-free encapsulation composition, wherein the encapsulation composition comprises a blend of high molecular weight polyvinyl acetate having a molecular weight of about 20,000 to about 100,000 MWU and a hydrophobic plasticizer, said polyvinyl acetate and hydrophobic plasticizer being present in a ratio of about 5:1 to about 1:5, and wherein said blend is capable of forming an encapsulating film.

4,711,785

PROCESS OF VINIFICATION

Guy Bruch, 48 rue Rosa Bonheur, 33000 Bordeaux, France
Division of Ser. No. 471,466, Mar. 2, 1983, Pat. No. 4,593,611.
This application Dec. 5, 1985, Ser. No. 794,229
Claims priority, application France, Mar. 12, 1982, 82 04564;
Feb. 18, 1983, 83 02664

Int. Cl.⁴ C12G 1/02

U.S. Cl. 426—15

5 Claims

1. A vinification process for the manufacture of wine or wine products through fermentation in a vat, said process comprising the steps of:

- introducing in the vat a must obtained by pressing fruits, said must comprising a liquid phase having an upper level and a lower level and a solid component said solid component constituting a cap occupying the upper level of the liquid phase;
- extracting at least a portion of liquid phase during the fermentation;
- thermally treating said extracted liquid phase by exchanging selectively thermal energy with respect to the extracted liquid phase;
- after thermal treatment, reinserting the thermally treated extracted liquid phase at a selected point with respect to the liquid phase in the vat;
- measuring the temperature of the liquid phase at selected points in said vat; and
- controlling the thermal exchange with the extracted liquid phase over a period of time as a function of the measured temperatures of the liquid phase to create a desired temperature gradient of the liquid phase in the vat and a desired temperature evolution as a function of time, whereby a wine of desired quality is produced.

4,711,786

HIGH FIBER BREAD AND EXTRUDED PRODUCTS

Edward D. Schmidt, Minneapolis, Minn., assignor to E.D.S. Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 486,357, Apr. 19, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 756,400

Int. Cl.⁴ A21D 2/00, 8/02

U.S. Cl. 426—19

28 Claims

1. A composition for making high fiber content edible products, comprising 100 parts by weight of a cereal grain flour and a premix that includes about 5 to 32 parts by weight of pea hull fibers and triticale hull fibers with the ratio of pea hull fibers to triticale fibers being in the range of about $\frac{1}{2}$ to $\frac{6}{1}$.

4,711,787

LIVESTOCK FEED AND MANUFACTURING METHOD THEREOF

Keikichi Odaira, Tokyo, Japan, assignor to Yojigen Agricultural Corporation, Tokyo, Japan

Continuation of Ser. No. 632,529, Jul. 19, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 836,220

Claims priority, application Japan, Aug. 4, 1983, 58-142827

Int. Cl.⁴ A23K 1/00

U.S. Cl. 426—31

11 Claims

1. A method of manufacturing a livestock feed which consists essentially of the steps of
mixing okara with cereal husks to form a mixture containing from 10 to 20% by weight lignin as measured on the dry basis, and 60 to 70% water
sterilizing the mixture to provide a medium for the growth of edible white-rotting fungi; and
adding edible white-rotting fungi which have a substantial mycorrhiza-forming function selected from the group consisting of agaric (*Pleurotus ostreatus*), *Lentinus edodes* (*Cortinellus shiitake*) and *Lyophyllum aggregatum* to said mixture and cultivating said fungi to convert said mixture containing okara which is not useful as a livestock feed into a valuable livestock feed.

4,711,788

COOKIE FILLER COMPOSITIONS

Sam J. Porcello, Toms River; James M. Manna, Glenwood, both of N.J.; Kenneth W. Player, Dublin, and Lonny L. Wilson, Brunswick, both of Ohio, assignors to Nabisco Brands, Parsippany, N.J.

Filed Sep. 17, 1984, Ser. No. 651,088

Int. Cl.⁴ A23D 5/00; A23G 3/00

U.S. Cl. 426—94

7 Claims

1. A filler cream having complete melting and rapid get away properties at body temperature, comprising:

- an oleaginous composition containing a plurality of oils, said oils being selected from the group consisting of palm kernel oil, cotton seed oil, and soybean oil, said oleaginous composition having a solid fat index wherein there is:
(i) 39 percent solid at 50° F.;
(ii) 17 percent solid at 70° F.;
(iii) 7 percent solid at 80° F.;
(iv) 1 percent solid at 92° F.;
(v) 0 percent solid at 104° F.; and
- a sugar mixed into the oleaginous composition, the filler cream having a specific gravity of between about 0.70 and about 0.82.

4,711,789

PROLONGING THE SHELF LIFE OF PRE-CUT FRESH CELERY

Avigdor Orr, Highland Park, and John O. Spingler, Plainsboro, both of N.J., assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Filed Oct. 29, 1985, Ser. No. 792,338

Int. Cl.⁴ A23B 7/14, 7/148; A23L 1/212; B65B 31/00

U.S. Cl. 426—326

6 Claims

1. A process to maintain in a viable form a fresh vegetable having enlarged petioles as a predominant feature which comprises:

- selecting a petiole of a vegetable having enlarged petioles as a predominant feature, said petiole having chemical and physiological properties characteristic of the petioles of the vegetable in its market mature state which provide acceptable shelf life, the chemical properties including protein of about 0.98% by weight and above and ash of less than about 0.85% by weight, and the physiological properties including tissue cells having a size of about 9 to about 12 cells per mm and a lack of pithiness in the cut surface of the petiole,
- cutting said selected petiole into pieces in a manner effective to minimize bruising throughout the cut piece and damaging of tissue in the vicinity of the cut surfaces,
- contacting said petiole pieces with water at about 1° C. to about ambient temperature for about 2 to about 5 minutes,
- removing surface water from said petiole pieces, and
- packaging said petiole pieces in a sealed container effective to prevent microbial recontamination of said petiole pieces, said container having a gas permeability and a ratio of the mass of said petiole pieces to the container surface effective to maintain said petiole pieces in a viable condition, the gas permeability being about 50 to about 300 cc of O₂/100 in²·atm. - 24 hrs., about 200 to about 800 cc of CO₂/100 in²·atm. - 24 hrs., and a moisture transmission rate of less than about 1.5 g/100 in²·24 hrs. - 90% R.H., 70° F. and the ratio of the mass of said petiole pieces to the container surface being about 1 to about 6 g/in².

4,711,790

OPTICAL CVD METHOD WITH A STRONG OPTICAL INTENSITY USED DURING AN INITIAL PERIOD AND DEVICE THEREFOR

Yukio Morishige, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

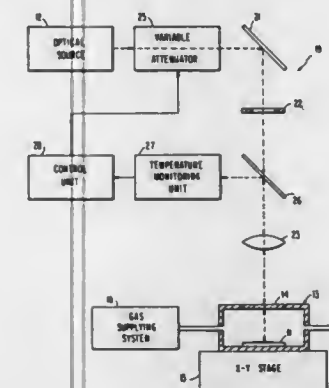
Filed Jul. 16, 1986, Ser. No. 886,125

Claims priority, application Japan, Jul. 17, 1985, 60-155962; Jul. 17, 1985, 60-155963; Mar. 7, 1986, 61-49616

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—10

9 Claims



1. A method of depositing a thin film on a predetermined area of a substrate exposed to a gas susceptible of photochemical reaction, said method including the step of irradiating said area by a pulsed optical beam of an optical intensity, wherein the improvement comprises the step of controlling said intensity during deposition of said film to a range determined by a thickness to which said film is deposited.

4,711,791

METHOD OF MAKING A FLEXIBLE MICROCIRCUIT

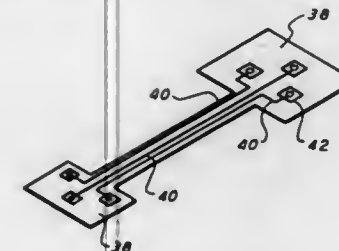
Charles D. Wiseman, Cottage Grove, and William M. Theisen, Madison, both of Wis., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Aug. 4, 1986, Ser. No. 892,514

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—96

5 Claims



1. A method of making a flexible microcircuit having a plurality of holes for electrical connections and having conductive runs joining the holes comprising the steps of:

- coating base polyimide material on to a substrate,
- creating a photoresist mask surface on the base polyimide in all areas except where conductive runs are desired,
- coating aluminum over the entire polyimide surface,
- removing the photoresist mask surface to remove the aluminum coating in all areas but the desired aluminum runs on the polyimide surface,
- coating the entire polyimide surface and aluminum runs with chromium,
- creating a photoresist mask surface of predetermined shape on the chromium surface outlining the desired form

of the flexible microcircuit and desired holes in the aluminum runs,

- removing the chromium in the areas outlining the microcircuit and at the desired holes to be formed in the aluminum runs, thereby exposing a portion of the aluminum runs in the shape of the desired holes,
- removing the exposed aluminum in the shape of the desired holes, thereby exposing the polyimide material in the shape of the desired holes,
- removing the exposed polyimide to create the desired holes through the polyimide,
- removing the chrome surface to thus remove the polyimide microcircuit from the substrate.

4,711,792

ELASTOMER-COATED BIAS REINFORCEMENT FABRIC AND METHOD FOR PRODUCING SAME

Delmar D. Long, Rock Hill, S.C., assignor to Dayco Products, Inc., Dayton, Ohio

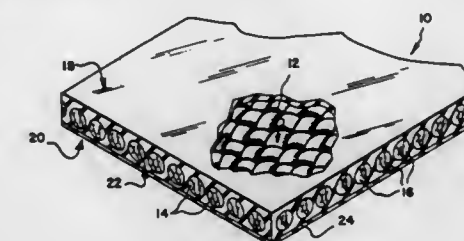
Division of Ser. No. 787,830, Oct. 15, 1985, Pat. No. 4,637,940, which is a division of Ser. No. 652,394, Sep. 20, 1984, Pat. No. 4,565,715, which is a division of Ser. No. 533,098, Sep. 16, 1983, Pat. No. 4,490,428, which is a continuation-in-part of Ser. No. 350,969, Feb. 22, 1982, Pat. No. 4,501,771. This application Aug. 1, 1986, Ser. No. 892,517

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.⁴ B05D 3/12

U.S. Cl. 427—176

1 Claim



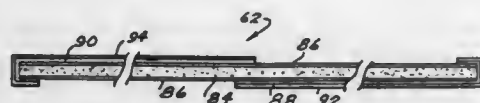
1. In a method for manufacturing elastomer-coated, fabric means comprising:

- transversely stretching a fabric means,
- applying an elastomeric latex composition to said fabric means while said fabric means is maintained transversely stretched, such that said composition substantially penetrates said fabric means and provides an elastomeric coating of substantially uniform thickness, and
- drying said coated latex composition, the improvement which comprises:
prior to stretching said fabric means, pre-impregnating said fabric means with a liquid non-elastomeric composition which facilitates the impregnation of said fabric means by an elastomer but does not stabilize the orientation of said fabric means, said liquid non-elastomeric composition comprising water and an impregnation facilitating agent disposed in said water.

through the substrate from said top surface to said bottom surface said apertures being arranged in a predetermined pattern, and
 (b) at least one thread which is stitched through said apertures to form a predetermined needlecraft pattern on said top surface.

4,711,801

METHOD AND MACHINE FOR CONVOLUTE OR SPIRAL WINDING OF COMPOSITE MATERIALS
 Leo Kadance, Morrisville, Pa., assignor to Steeltin Can Corporation, Baltimore, Md.
 Division of Ser. No. 663,211, Oct. 22, 1984, Pat. No. 4,629,529.
 This application Nov. 29, 1985, Ser. No. 802,740
 Int. Cl.⁴ C09J 7/02; B32B 15/08, 27/10
 U.S. Cl. 428—192 7 Claims



1. A composite blank for use in forming a cylindrically shaped body, for subsequent use as a container comprising a paper board forming a core for the blank, a heat activatable adhesive coating on at least portions of both sides of the board and adapted to provide an adhesive upon heating the blank, an aluminum foil sheet covering slightly more than half of the said coating on one side of the board and extending around a leading edge of the board, and a sealing coating applied to said aluminum foil sheet.

4,711,802

AQUEOUS INK FOR USE ON FLUOROCARBON SURFACES
 Harvey P. Tannenbaum, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
 Filed Aug. 14, 1986, Ser. No. 896,192
 Int. Cl.⁴ B32B 5/16, 27/08
 U.S. Cl. 428—207 2 Claims

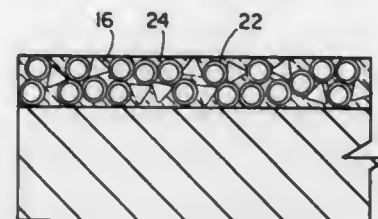
1. An aqueous ink having a viscosity of from 3,000 to 8,000 centipoises containing from 1.5 to 4.0 parts of an acrylic copolymer thixotropic agent, from 2.0 to 3.0 parts of finely divided fluorocarbon resin particles, from 1.3 to 3.3 parts of a non-ionic surfactant, from 4.0 to 5.0 parts of an alcohol containing 7 to 12 carbon atoms, from 10 to 15 parts of ethylene glycol, up to 10 parts of an inert colorant and about 20 to about 50 parts of water.

4,711,803

MEGOHM RESISTOR PAINT AND RESISTORS MADE THEREFROM
 Charles C. Y. Kuo, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.
 Continuation-in-part of Ser. No. 750,029, Jul. 1, 1985. This application Aug. 22, 1985, Ser. No. 768,058
 Int. Cl.⁴ H01B 1/06; H01C 7/10; B32B 17/06
 U.S. Cl. 428—209 14 Claims

1. A base metal, resistive composition, which comprises: a base metal powder coated with a resinate solution selected from at least one of a manganese resinate solution and a tantalum resinate solution, the resinate coated powder pre-fired in air, then reduced in a reducing atmosphere to form a pre-reacted powder therefrom;
 a glass frit;
 a screening agent; and
 two to twelve percent of an oxide of hafnium, well mixed with the pre-reacted powder, the glass frit and the screen-

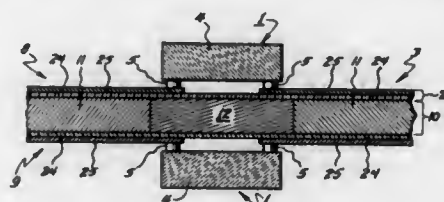
ing agent to form the composition having a sheet resistivity selected from a range of 500,000 ohms to five megohms



per square, when screened upon a substrate and fired in an inert atmosphere to form a base metal resistor therefrom.

4,711,804

CIRCUIT BOARD CONSTRUCTION
 James F. Burgess, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
 Filed Jul. 2, 1986, Ser. No. 881,543
 Int. Cl.⁴ B32B 3/00; H02B 1/00; H01B 7/34; H05K 3/34
 U.S. Cl. 428—210 12 Claims



1. An integrated circuit board assembly comprising: a leadless integrated circuit chip carrier; a plurality of conductive terminals associated with said carrier and extending along one face of said carrier; a printed circuit laminate including a plurality of contact strips, said strips electrically coupled to said terminals via electrical connections; and an inner core on which said laminate is supported, said core including a highly thermally conductive plate having openings therein, said openings located juxtaposed to said one face of said chip carrier and containing inserts having a thermal coefficient of expansion closely matching that of said carrier.

4,711,805

PROCESS FOR TREATING THE SURFACE OF A TRANSPARENT SHEET OR FILM HAVING ANTILACERATION AND SELF-HEALING PROPERTIES AND THE PRODUCT MADE THEREBY
 Rüdich Helmer, Aachen, and Esser Günther, Herzogenrath, both of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Aubervilliers, France
 Filed Jun. 25, 1984, Ser. No. 624,284
 Claims priority, application France, Jul. 4, 1983, 83 11056
 Int. Cl.⁴ B32B 5/16, 17/10, 27/40; B05D 5/06
 U.S. Cl. 428—323 12 Claims

1. A process for the treatment of the thermosetting polyurethane surface of a transparent sheet or film having antilacerative and self-healing properties, wherein said sheet or film comprises a thermosetting polyurethane material obtained by the reaction of a polyether polyol having free OH groups in the amount of 10.5 to 12 wt. % with a biuret of 1,6-hexanediisocyanate, wherein said polyether polyol is prepared by the reaction of epoxypropane with 1,5-dihydroxy-3-hydroxymethylpentane, and wherein said diisocyanate contains about 21 to 25 wt.

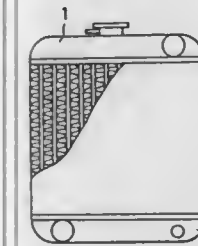
% of isocyanate groups, and further wherein the ratio of the polyether polyol component to the diisocyanate component in the reaction mixture is 0.9 to 1.1 by weight said sheet or film with the polyurethane surface exposed being employed as an external layer on a laminated glass or laminated plastic sheet, which process comprises depositing a solution, dispersion or emulsion of wax or a wax-like substance and a silicone oil; or a solution, dispersion or emulsion of wax or a wax-like substance, a silicone oil and a fine-grained polishing agent on the polyurethane surface to be treated wherein said solutions, dispersions or emulsions of wax comprise a solvent or solvents for said wax or wax-like substances which boil within the range of 40° to 300° C., and wherein said solutions, dispersions or emulsions have silicone oil in an amount of less than 4% by wt. when no polishing agents are present and in an amount of from about 2 to about 10% by wt. when said solutions, dispersions or emulsions contain said fine-grained polishing agents, and allowing the deposited solution, dispersion or emulsion to dry.

12. A transparent sheet or film which has been treated by the process according to claim 1.

4,711,806

PLASTIC PART RESISTANT TO DEICING SALT
 Hiroyuki Wakabayashi, Kariya, and Tamotsu Matsubara, Chiryu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
 Division of Ser. No. 622,556, Jun. 20, 1984, Pat. No. 4,582,763.
 This application Nov. 20, 1985, Ser. No. 799,863
 Claims priority, application Japan, Jun. 27, 1983, 58-115608
 The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.
 Int. Cl.⁴ B32B 15/00 3 Claims

U.S. Cl. 428—334



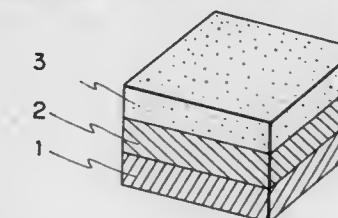
1. A plastic part resistant to deicing salts,
 (i) having one side in contact with water or a moist atmosphere and the other side in contact with ambient air and, in use is subjected to repeated heating to a temperature higher than 60° C., or
 (ii) having a thickness greater than 1.0 mm and, in use, is subjected to repeated heating to a temperature higher than 60° C.,

wherein said plastic part is composed of a resin selected from the group consisting of a polyamide resin, which has a saturation water absorbability less than 6.0%, and a mixture composed mainly of a polyamide resin and having a saturation water absorbability less than 6.0%, wherein said mixture is composed of 6-nylon, 6,6-nylon or a mixture thereof and at least 30 wt. % of resin which is mutually soluble with said 6-nylon or 6,6-nylon, the resin selected from the group consisting of a polyamide resin (i) which is produced by polycondensation of a diamine containing at least 6 carbon atoms and a dicarboxylic acid containing at least 7 carbon atoms, a polyamide resin (ii) which is produced by polycondensation of an amino acid containing at least 7 carbon atoms, and a polyamide resin (iii) which is produced by ring-opening polymerization of a lactam containing at least 7 carbon atoms, an olefinic ionomer (in and mixture thereof).

4,711,807
INSULATING MATERIAL OF NON-SINGLE CRYSTALLINE SILICON COMPOUND

Kenji Yamamoto; Takehisa Nakayama, and Yoshihisa Tawada, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
 Filed Nov. 25, 1985, Ser. No. 802,101
 Claims priority, application Japan, Nov. 28, 1984, 59-250869
 Int. Cl.⁴ B32B 15/00 8 Claims

U.S. Cl. 428—334

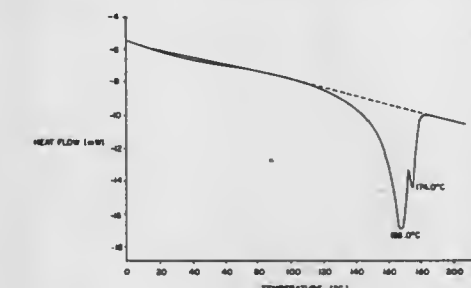


1. An insulating material comprising a non-single crystalline silicon compound having an argon content greater than or equal to 0.01 and less than or equal to 10 atomic %, and having a breakdown voltage of not less than 50 V/μm.

4,711,808

BETA PHASE PVF₂ FILM FORMED BY CASTING IT ONTO A SPECIALLY PREPARED INSULATING SUPPORT

Michael A. Marcus, Honeoye Falls, and John E. Benson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
 Filed Feb. 19, 1986, Ser. No. 830,803
 Int. Cl.⁴ B32B 27/08; B05D 3/06
 U.S. Cl. 428—336 3 Claims



1. A film of unstretched, unpoled polyvinylidene fluoride having the following properties:
 (a) a thickness no greater than about 10 μm,
 (b) a crystalline structure which is predominantly beta phase and,
 (c) a subsurface structure that contains less weight % of fluorine atoms than is the case for PVF₂ which itself has been subjected to D. C. corona discharge treatment.

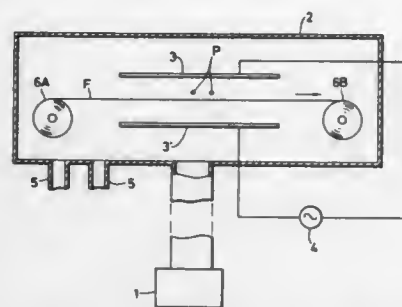
4,711,809

MAGNETIC RECORDING MEDIUM
 Yasuo Nishikawa; Tsutomu Okita; Yoshito Mukaida, all of Kanagawa; Masahiro Niinomi, Tokyo; Kenji Yanagihara, Tokyo, and Mituo Kimura, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
 Filed Sep. 25, 1984, Ser. No. 654,286
 Claims priority, application Japan, Sep. 26, 1983, 58-176388; Sep. 26, 1983, 58-176389
 Int. Cl.⁴ G11B 5/72 5 Claims

U.S. Cl. 428—336

1. A magnetic recording medium comprising a support having provided thereon a thin magnetic metal film, and a

plasma polymerized layer provided on the thin magnetic film, wherein said plasma polymerized layer is formed in a monomer gas or in a gas containing the monomer gas, wherein the monomer gas or in a gas containing the monomer gas, wherein the monomer gas is at least one of 1,1-difluoroethylene, trifluoro-



ethylene, 1,1-difluoroethylene, and hexafluorobutadiene, wherein said plasma polymerized layer is formed at a pressure of 10^{-3} Torr to 1 Torr, wherein the thickness of the plasma polymerized layer is from 2 nm to 100 nm, and wherein the plasma polymerized layer is homogeneous in nature.

4,711,810

MAGNETIC MEDIUM FOR HORIZONTAL MAGNETIZATION RECORDING AND METHOD FOR MAKING SAME

Toshio Ando, Fujisawa; Toshikazu Nishihara, Zama, and Akihiro Kimura, Sagami, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

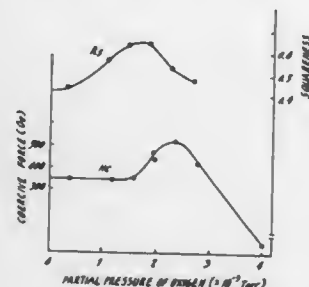
Filed Oct. 28, 1985, Ser. No. 792,046

Claims priority, application Japan, Oct. 29, 1984, 59-225830; Nov. 12, 1984, 59-236598

Int. Cl.⁴ G11B 5/64; H01F 10/00

U.S. Cl. 428-336

3 Claims



1. A magnetic medium for horizontal magnetization recording which comprises a non-magnetic substrate and a magnetic recording film formed on at least one side of the substrate, said magnetic recording film consisting essentially of an amorphous Co-Cr alloy containing from 5 to 15 atomic percent of oxygen atoms, and the predominant magnetic anisotropy of the magnetic recording film being a shape magnetic anisotropy along an in-plane direction of the magnetic recording film.

4,711,811

THIN WALL COVER ON FOAMED INSULATION ON WIRE

Stuart K. Randa, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 22, 1986, Ser. No. 924,301

Int. Cl.⁴ B32B 27/00

U.S. Cl. 428-383

5 Claims

1. A wire substantially covered with a fluoropolymer foam made of a melt-processible perfluorinated copolymer of tetrafluoroethylene and an unfoamed skin around the foam com-

prising ethylene/chlorotrifluoroethylene copolymer or ethylene/tetrafluoroethylene copolymer.

4,711,812

DELUSTERED NYLON FIBER CONTAINING SEGMENTED STRIATIONS OF POLYPROPYLENE

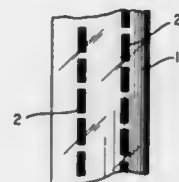
John T. Burns, Seaford, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 683,242, Dec. 18, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 800,041

Int. Cl.⁴ D02G 3/00

U.S. Cl. 428-401

4 Claims



1. Delustered nylon filaments containing from about 0.1 to 5% by weight of polypropylene having a melting point above 120° C., molecular weight of 2,000-40,000, and viscosity of 200-10,000 cp at 190° C., said polypropylene being present in generally cylindrical segmented striations, each striation having a uniform diameter throughout its length, an L/D ratio of from 1 to 10 and running generally parallel to the fiber axis.

4,711,813

POLYETHYLENE COMPOSITES CONTAINING A PHASE CHANGE MATERIAL HAVING A C14 STRAIGHT CHAIN HYDROCARBON

Ival O. Salyer, Dayton, Ohio, assignor to University of Dayton, Dayton, Ohio

Filed Nov. 22, 1985, Ser. No. 801,127

Int. Cl.⁴ C08K 5/01, 9/12; C09K 5/06, 3/18

U.S. Cl. 428-402

36 Claims

1. A composite useful in thermal energy storage, said composite being formed of a polyethylene matrix containing at least about 10% by weight of a straight chain alkyl hydrocarbon phase change material having at least 14 carbon atoms incorporated therein, said polyethylene being crosslinked to such a degree that said polyethylene matrix is capable of absorbing at least 10% by weight of said straight chain alkyl hydrocarbon phase change material.

4,711,814

NICKEL PARTICLE PLATING SYSTEM

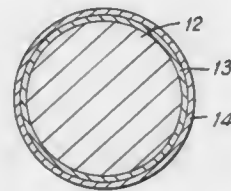
Robert J. Teichmann, 152 Bell St., Belleville, N.J. 07109

Filed Jun. 19, 1986, Ser. No. 875,964

Int. Cl.⁴ B05D 5/12, 7/00; B32B 5/16; H01B 1/02

U.S. Cl. 428-403

9 Claims



1. A particulate material for an electroconductive body, the material comprising, in combination:

a multiplicity of nickel particles of a size, on average, of from 1 to 300 microns in maximum dimension; a silver coating on each of the nickel particles, the silver coating having a maximum thickness of about 10 percent of the maximum particle dimension and being about 4 percent to about 60 percent by weight of the particle; and a gold coating surrounding the silver coating on each of said nickel particles, the gold coating on each particle having a maximum thickness of about 5 percent of the maximum particle dimension and being about 1 percent to about 15 percent by weight of the particle.

4,711,815

RECORDING MEDIUM

Nobuyuki Yoshiike, Ikoma, and Shigeo Kondo, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 3, 1986, Ser. No. 835,787

Claims priority, application Japan, Mar. 7, 1985, 60-45414; Mar. 12, 1985, 60-49022; Mar. 15, 1985, 60-53110; Mar. 15, 1985, 60-53116; Mar. 15, 1985, 60-53117

Int. Cl.⁴ B32B 9/04; G01D 15/10, 9/00, 15/24

U.S. Cl. 428-411.1

10 Claims



1. A recording medium characterized in that a coloring layer comprising a transition metal oxide is deposited on a substrate, and the said color developing layer or an upper layer adjacent to the said coloring layer contains a proton donor.

4,711,816

TRANSPARENT SHEET MATERIAL FOR ELECTROSTATIC COPIERS

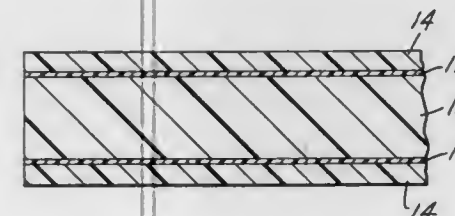
Bruce W. Wittnebel, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1986, Ser. No. 846,274

Int. Cl.⁴ B32B 27/36

U.S. Cl. 428-412

11 Claims



1. Transparent sheet material comprising:
(a) a flexible, transparent, heat resistant, polymeric film sheet base,
(b) a layer of electrically conductive prime coat coated upon at least one major surface of said film sheet base, said prime coat having a surface resistivity below 1×10^{13} ohms/square, and
(c) an electrically conductive image receiving layer coated upon the surface of said prime coat layer, said image receiving layer having a surface resistivity from about 1.7×10^{10} to about 7×10^{12} ohms/square.

4,711,817

CARBOXYLIC ACID-GRAFTED PHENOXY RESINS

George A. Salensky, Hunterdon County, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 725,535, Apr. 22, 1985, Pat. No. 4,638,038.

This application Oct. 2, 1986, Ser. No. 914,795

Int. Cl.⁴ G03G 5/87; G11B 5/70

U.S. Cl. 428-418

4 Claims

1. A phenoxy coating composition comprising:
(a) a phenoxy resin having pendant secondary hydroxyl groups of which about 3 to about 50% of such hydroxyl groups have been reacted to produce moieties having pendant carboxyl groups, and
(b) a carrier for said phenoxy resin, said coating composition when coated onto steel, having improved adhesion to the steel under high humidity conditions as compared to said phenoxy resin not so reacted.

4,711,818

FUSING MEMBER FOR ELECTROSTATOGRAPHIC REPRODUCING APPARATUS

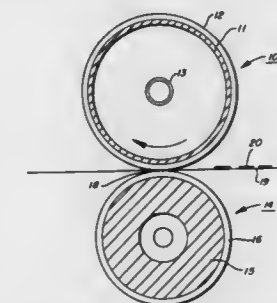
Arnold W. Henry, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 27, 1986, Ser. No. 866,666

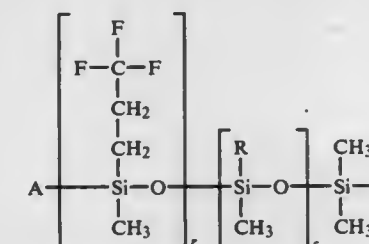
Int. Cl.⁴ B32B 27/00, 9/04, 15/04

U.S. Cl. 428-421

22 Claims



1. A thermally conductive dry release fuser member for use in an electrostatographic reproducing machine without the application of a release agent comprising a base support member and a thin deformable layer of a composition coated thereon, said composition comprising the crosslinked product of a mixture of about;
(a) 100 parts by weight of at least one liquid addition curable vinyl terminated or vinyl pendant polyfluoroorganosiloxane having the formula:



where A and D are methyl or vinyl, R is methyl, vinyl or trifluoropropyl provided that the vinyl functionality is at least 2,

$$0 < \frac{s}{r} \leq 1,350 < r + s < 2700$$

(b) from about 2 to about 300 parts by weight filler,

- (c) from about 0 to about 5 parts by weight of a heat stabilizer,
 (d) a crosslinking agent and a crosslinking catalyst, said crosslinking agent and catalyst being present in an amount sufficient to promote crosslinking of said at least one polyfluoroorganosiloxane.

4,711,819

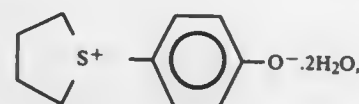
MAGNETIC RECORDING MEDIUM

Kazuko Hanai, and Yasuyuki Yamada, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
 Continuation of Ser. No. 592,981, Mar. 23, 1984, abandoned.
 This application Oct. 10, 1985, Ser. No. 786,179
 Claims priority, application Japan, Apr. 19, 1983, 58-67856
 Int. Cl.⁴ G11B 5/702

U.S. Cl. 428—425,9

2 Claims

1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer coated thereon in which a ferromagnetic powder is dispersed in a binder, which is a binder system comprising at least one member selected from the group consisting of vinyl chloride copolymers and nitrocellulose as a predominate binder component mixed with a polyisocyanate in a proportion of 10 to 150 wt % to the binder and at least one isocyanate reaction accelerating compound in a proportion of from 0.1 to 20 wt % to the isocyanate in the binder, said component selected from the group consisting of stannic chloride, cobalt naphthenate, ferrous acetylacetonate, 2-methylbenzoic acid, monochloroacetic acid, glutamic acid and,



and added just before coating the non-magnetic support with the magnetic recording layer.

4,711,820

METHOD OF SILICONIZATION OF SURFACES WITH LOWER ALKYL SILANES

Barry C. Arkles, Ambler, and William S. Brinigar, Bala Cynwyd, both of Pa., assignors to Petrarch Systems Inc., Bristol, Pa.

Filed Jun. 17, 1986, Ser. No. 875,149

Int. Cl.⁴ C03C 17/00, 25/02; B32B 9/04, 17/06

U.S. Cl. 428—429

20 Claims

1. A method of treating a surface to be contacted by a protein-containing fluid to reduce protein adsorption to the surface, the method comprising coating the surface with a lower alkyl silane selected from the group consisting of monoalkyl silanes of the formula $RSiX_3$, wherein R is selected from ethyl and branched (C_3 - C_5) alkyl and X is a hydrolyzable group, and dialkyl silanes of the formula R_2SiX_2 , wherein R' is (C_2 - C_5) alkyl and X is as described above.

2. A method according to claim 1 wherein the surface is selected from glass and synthetic polymer surfaces.

4. A method according to claim 2 wherein the surface is a borosilicate glass surface.

14. A surface treated according to the method of claim 4.

4,711,821

OPTO-MAGNETIC RECORDING MEDIUM

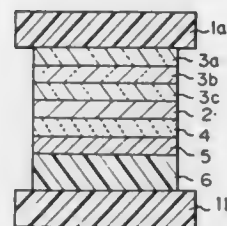
Kazuhiko Kikuchi, Kawasaki; Kazuoki Hooguu, and Mitsuharu Sawamura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1985, Ser. No. 749,631

Claims priority, application Japan, Jul. 13, 1984, 59-144402
Int. Cl.⁴ G11B 7/24

U.S. Cl. 428—457

5 Claims



1. An opto-magnetic recording medium comprising:

a transparent plastic substrate;

a magneto-optic recording layer provided on said plastic substrate; and

two or more thin film layers provided between said plastic substrate and said magneto-optic recording layer and decreasing the reflectance of said magneto-optic recording layer for light entering from the substrate side, said thin film layers including a layer formed of SiO which is in contact with said plastic substrate and a layer formed of Si_3N_4 which is interposed between said layer formed of SiO and said magneto-optic layer.

4,711,822

METAL CORE PRINTED CIRCUIT BOARDS

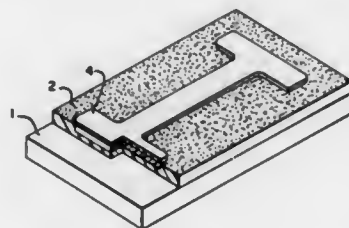
Wolfgang J. Choyke, Pittsburg; Susan Wood, Wilkinsburg; Luciano C. Scala, Murrysville; Melvin P. Zussman, Wilkinsburg; Leslie A. Doggrell, Penn Township, Westmoreland County, and Janet S. Lauer, Wilkinsburg, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1986, Ser. No. 818,949

Int. Cl.⁴ B32B 15/08, 27/00; B05D 5/12, 1/18

U.S. Cl. 428—458

22 Claims



19. A coated substrate comprising:

(A) a conductive surface; and

(B) an imide polymeric coating applied by a conventional technique other than spin coating on said surface, only a portion of which has been exposed to an ion beam, then treated by wet blasting.

20. A substrate according to claim 19 including a metal coating electrolessly deposited over said portion.

4,711,823

HIGH STRENGTH STRUCTURAL MEMBER MADE OF AL-ALLOY

Haruo Shiina, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,586

Claims priority, application Japan, Nov. 12, 1984, 59-236734
Int. Cl.⁴ C21D 1/06; C22C 21/04; B22F 3/14

U.S. Cl. 428—547

4 Claims

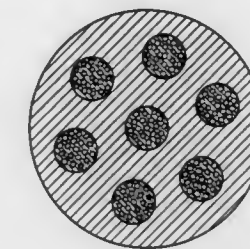
1. A high strength structural member made of Al-alloy produced by the process comprising:

(a) pulverizing an aluminum alloy containing between 10 and 30 weight percent Si and between 4 and 33 weight percent Fe as solids in the supersaturated state through an atomizing process and quenching at a rate greater than $10^{30}^{\circ}C./sec$ so as to produce particles of non-aluminum components smaller than $10\mu m$;

(b) pressing said powder in a mold;

(c) sintering by extrusion at a temperature between $330^{\circ}C.$ and $520^{\circ}C.$; and

(d) subjecting the surface of the sintered body to a remelting-solidifying treatment using a high-density energy source to reduce the size of the crystal grains of non-aluminum compounds in the treated area to less than or equal to $1\mu m$.



which said alloy comprises an aluminum-iron-cerium alloy matrix.

4,711,824

HETEROGENEOUS WIRE AND PANE PROVIDED WITH SUCH A WIRE

Isidoor K. Van Hoof, and Herman J. C. M. Aarts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

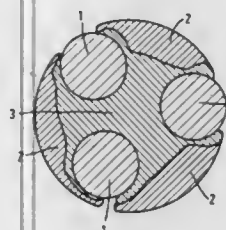
Filed Nov. 12, 1986, Ser. No. 929,939

Claims priority, application Netherlands, Nov. 15, 1985, 8503141

Int. Cl.⁴ B32B 15/00; B21C 37/00

U.S. Cl. 428—607

2 Claims



1. A composite, heterogeneous wire having a diameter of less than $50\mu m$ and consisting of a core consisting of a eutectic mixture of silver and copper which is connected by fusion to a cladding comprising tungsten wires and copper wires distributed around the circumference of said core.

4,711,825

COMPOSITE ALUMINUM CONDUCTOR FOR PULSED POWER APPLICATIONS AT CRYOGENIC TEMPERATURES

Charles E. Oberly, Urbana; Harold L. Gegal, Kettering, both of Ohio, and James C. Ho, Wichita, Kans., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 10, 1986, Ser. No. 849,989

Int. Cl.⁴ H01B 1/02

U.S. Cl. 428—614

4 Claims

1. A conductor for use at cryogenic temperatures comprising high-purity aluminum filaments embedded in an aluminum

4,711,826

IRON-NICKEL ALLOYS HAVING IMPROVED GLASS SEALING PROPERTIES

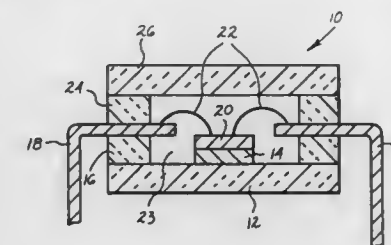
Eugene Shapiro, Hamden, Conn., and Michael L. Santella, Knoxville, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 27, 1986, Ser. No. 822,973

Int. Cl.⁴ C22C 38/08, 30/00; H05K 5/06

U.S. Cl. 428—630

16 Claims



1. An iron-nickel alloy having improved glass sealing ability, said alloy consisting essentially of from about 33% to about 60% nickel, from about 0.9% to about 3% silicon, from about 0.5% to about 3.5% aluminum and the balance essentially iron.

4,711,827

X-RAY INTENSIFYING SCREEN WITH IMPROVED TOPCOAT

Theodore P. Christini, Dushore, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1986, Ser. No. 833,537

Int. Cl.⁴ G01J 1/58; G03B 11/00

U.S. Cl. 428—690

10 Claims

1. In an X-ray image intensifying screen comprising a support, an active layer containing fluorescent phosphor particles dispersed in a binder, and a protective topcoat covering said active layer, the improvement wherein said protective topcoat is a copolymer prepared from a mixture of approximately 5 to 50 weight percent acrylonitrile and 95 to 50 weight percent styrene.

4,711,828

CARBON MONOXIDE-OXYGEN FUEL CELL

Tetsuyoshi Ishida; Kenji Okiura; Fumihiko Hanayama; Mutsuo Yamada, all of Kure, and Yoshiji Arikawa, Yokohama, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

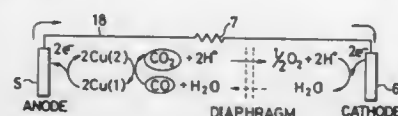
Filed May 23, 1986, Ser. No. 866,400

Claims priority, application Japan, May 27, 1985, 60-113852; Sep. 26, 1985, 60-213403; Mar. 13, 1986, 61-55296

Int. Cl.⁴ H01M 8/08

U.S. Cl. 429-12

19 Claims



1. In a carbon monoxide-oxygen system fuel cell provided with a diaphragm between an anode and a cathode to separate the two electrodes, an improvement which comprises using a solution containing at least a monovalent copper and a halide as a complexing agent for said copper as the electrolytic solution for said anode, and reacting carbon monoxide in the form of a carbonyl complex of said monovalent copper in said electrolytic solution.

4,711,829

ORDERED TERNARY FUEL CELL CATALYSTS CONTAINING PLATINUM AND COBALT

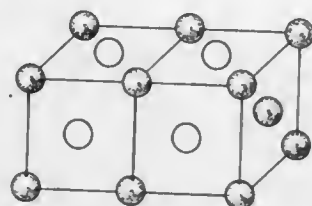
Francis J. Luczak, Glastonbury, and Douglas A. Landsman, West Hartford, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Division of Ser. No. 812,106, Dec. 23, 1985, which is a continuation-in-part of Ser. No. 575,360, Jan. 30, 1984, Pat. No. 4,613,582, which is a division of Ser. No. 459,002, Jan. 17, 1983, Pat. No. 4,447,506. This application Mar. 16, 1987, Ser. No. 26,245

Int. Cl.⁴ H01M 4/92

U.S. Cl. 429-44

3 Claims



1. A fuel cell having an anode and a cathode with an electrolyte disposed therebetween, wherein the improvement comprises a ternary alloy cathode catalyst of cobalt, a noble metal, selected from the group consisting of platinum, iridium, rhodium and palladium and an element selected from the group consisting of transition Groups IV, V, VI, and VII supported on an electrically conductive carbon support, said catalyst having a structure which is an ordered solid solution and a catalytic activity for the electrochemical reduction of oxygen at least twice that of an unalloyed platinum catalyst supported on the same electrically conductive carbon-support.

4,711,830

IMAGE RECORDING MATERIAL COMPRISING PHOTSENSITIVE LAYER AND RECORDING LAYER ON ELECTROCONDUCTIVE BASE

Masahiro Haruta; Yoko Kuwae, both of Tokyo; Satoshi Yuasa, Yokohama, and Toshihiko Miyazaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1986, Ser. No. 820,800

Claims priority, application Japan, Jan. 24, 1985, 60-9843; Jan. 24, 1985, 60-9844

Int. Cl.⁴ G03C 1/54, 1/71, 1/733

U.S. Cl. 430-52

19 Claims

1. An image forming material comprising in sequence:
 - (a) an electroconductive base plate;
 - (b) a recording layer comprising an electrolytically polymerized film; and
 - (c) a photosensitive layer comprising a polymer complex formed of an acidic polymer and a basic polymer.

4,711,831

SPECTRAL SENSITIZATION OF AMORPHOUS SILICON PHOTOCONDUCTIVE ELEMENTS WITH PHTHALOCYANINE AND ARYLAMINE LAYERS

Paul M. Borsenberger, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1987, Ser. No. 7,030

Int. Cl.⁴ G03G 5/09

U.S. Cl. 430-95

14 Claims

1. A multi-layer photoconductive element having a high degree of photosensitivity in both the visible and near infrared regions of the spectrum, said element comprising:
 - a support;
 - a layer of hydrogenated amorphous silicon;
 - a sensitizing layer comprising a phthalocyanine that serves as a spectral sensitizing agent;
 - and a supersensitizing layer comprising an arylamine that serves as a chemical sensitizing agent;
 said supersensitizing layer being interposed between and in contact with both said layer of hydrogenated amorphous silicon and said sensitizing layer.

4,711,832

COLORED ELECTROSCOPIC TONERS CONTAINING QUENCHED ESTERIFIED RHODAMINE DYES

William T. Gruenbaum; Julie P. Harmon, and Luther C. Roberts, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 5, 1986, Ser. No. 859,584

Int. Cl.⁴ G03G 9/08, 9/10

U.S. Cl. 430-106

14 Claims

1. An electroscopic toner comprising:
 - (a) a compatible polymeric binder;
 - (b) a rhodamine dye having a non-lactonizing ester-containing phenyl group in the 9-position; and
 - (c) a fluorescence-quenching dye.

4,711,833

POWDER COATING PROCESS FOR SEAMLESS SUBSTRATES

T. Brian McAneney, Burlington; Rafik O. Loutfy, Willowdale, both of Canada; Joseph Mammino, Penfield, N.Y.; Deborah J. Nichol-Landry, Rochester, N.Y., and Donald S. Sypula, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1986, Ser. No. 842,964

Int. Cl.⁴ G03G 5/14

U.S. Cl. 430-131

58 Claims

1. A process for the fabrication of seamless substrates which comprises (1) providing a substrate with a release coating composition thereover; (2) depositing thereon by electrostatic powder spraying a polymer; (3) melting the polymer; (4) cooling the melted polymer; and (5) subsequently separating the formed seamless substrate.

4,711,834

LASER-IMAGEABLE ASSEMBLY AND PROCESS FOR PRODUCTION THEREOF

Alan Butters, Ipswich; Roger N. Barker, Clacton-on-Sea, and Stuart C. Rennison, Hadleigh Nr Ipswich, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 8, 1985, Ser. No. 721,183

Claims priority, application United Kingdom, Apr. 25, 1984, 8410515

The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.

Int. Cl.⁴ G03C 1/72; G03F 1/00, 7/10

U.S. Cl. 430-201

9 Claims

1. A multiple-layer laser-imageable assembly comprising a transparent substrate and an associated energy absorbent transfer layer comprising particles which absorb laser energy dispersed in a heterogeneous resin layer having physical discontinuities in the outermost surface and wherein the assembly comprises at least one further layer selected from

- (a) an intermediate priming layer between the substrate and transfer layer,
- (b) a hydrophilic protective coating layer on a surface of the transfer layer remote from the substrate, and
- (c) a lubricant coating layer remote from the substrate.

7. A method of making a multiple layer laser-imageable assembly comprising applying to a transparent substrate sequential layers of flowable coating media and drying each applied layer of coating medium before applying a subsequent flowable layer, wherein the sequentially applied layers comprise a transfer layer associated with the substrate, said transfer layer comprising laser energy absorbent particles dispersed in a heterogeneous resin binder layer having physical discontinuities in the outermost surfaces, and at least one further layer selected from:

- (a) an intermediate priming layer between the substrate and transfer layer,
 - (b) a hydrophilic protective coating layer on a surface of the transfer layer remote from the substrate, and
 - (c) a lubricant coating layer remote from the substrate, the applied energy absorbent transfer medium being dried
- (1) at a sufficiently low temperature, and optionally,
 - (2) in the presence of a non-solvent for the resin binder, to develop a heterogeneous resin transfer layer associated with the substrate.

8. A method of making an imaged printing plate by placing the coated surface of an assembly according to claim 1, or made according to claim 7, in intimate contact with a surface of a printing plate former and directing a laser beam image pattern through the transparent substrate of the assembly to transfer a portion of the coated surface corresponding to the image pattern from the substrate to the printing surface, then, optionally, effecting cross-linking of the transferred portion.

4,711,835

PROCESS FOR PHOTOLITHOGRAPHING A THICK LAYER OF PASTE DEPOSITED ON A SUBSTRATE

Michel Dufour, Malesherbes, France, assignor to Thomson-CSF, Paris, France

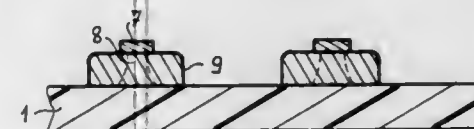
Filed Dec. 4, 1985, Ser. No. 804,596

Claims priority, application France, Dec. 7, 1984, 84 18776

Int. Cl.⁴ H05K 3/02

U.S. Cl. 430-314

9 Claims



1. A process for photolithographing a thick layer of paste deposited on a flat substrate, the paste being formed of solid

particles which have an electric function (conductive, resistive, dielectric) or a mechanical protective function, and an organic binder, comprising the following operations:

- (1) the thick layer is dried at 80°-120° C.,
- (2) a layer of photosensitive resin is deposited on the thick layer, and then is exposed to ultraviolet radiation through a high definition photographic mask and developed,
- (3) the parts of the thick layer which are not protected by the remaining patterns of the photosensitive resin mask are chemically dissolved using a mixture of organic solvents, said mixture of organic solvents having a differential solubility with respect to the organic binder of the thick paste layer and with respect to the photosensitive resin, the solubility of the thick layer being greater than the solubility of the photosensitive resin, said chemical dissolution of the organic binder of the thick layer being accompanied by mechanical sweeping of the solid particles, the mixture of solvents being sprayed on the thick layer at a pressure between 5 and 25 kg/cm² and at an angle between 0° to 30° with respect to the plane of the substrate,
- (4) the thick layer is baked at 850° C. for sintering it and eliminating the photosensitive resin mask.

4,711,836

DEVELOPMENT OF POSITIVE-WORKING PHOTORESIST COMPOSITIONS

Lawrence Ferreira, Fall River, Mass., assignor to Olin Hunt Specialty Products, Inc., Palsades Park, N.J.

Division of Ser. No. 648,568, Sep. 10, 1984. This application

Aug. 11, 1986, Ser. No. 895,628

Int. Cl.⁴ G03C 5/00; G03F 7/26

U.S. Cl. 430-326

12 Claims

1. A method of developing an imagewise-exposed layer of positive-working photoresist composition comprising the steps of:

- applying a layer of a positive-working photoresist composition to a substrate; said photoresist composition comprising an admixture of a novolak-type resin and diazoketone photosensitive agent;
- subjecting said photoresist layer to an imagewise-exposure of radiation;
- contacting the imagewise-exposed layer to an aqueous alkaline developing solution comprising an admixture of a quaternary ammonium hydroxide developing agent with an effective amount of an additive compound selected from the group consisting of 1,3,5-trihydroxybenzene, 4-methyleculetin, and mixtures thereof;
- removing the imagewise-exposed areas of said photoresist compositions without leaving exposed residual photoresist material at the interface of the edges of the unexposed areas of the photoresist layer and the substrate.

4,711,837

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Seiji Ichijima; Mitsunori Ono; Isamu Itoh; Keiji Mihayashi; Koji Tamoto, and Yoshisada Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1985, Ser. No. 769,903

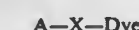
Claims priority, application Japan, Aug. 27, 1984, 59-177670

Int. Cl.⁴ G03C 1/40, 7/32, 7/26

U.S. Cl. 430-548

46 Claims

1. A silver halide color photographic material comprising a support having provided thereon at least one silver halide emulsion layer, wherein the photographic material contains a compound represented by the general formula (I):



(I)

wherein A represents a group capable of releasing X-Dye upon reaction with the oxidation product of a developing agent selected from the group consisting of a yellow coupler residue,

a magenta coupler residue, a cyan coupler residue, a non-color forming coupler residue or a hydroquinone; X represents an oxygen atom, a sulfur atom or an imino group directly attached to the coupling position of A; and Dye represents a dye residue which has X as an auxochrome; and A and Dye may have a connection other than X to form a cyclic structure; and said compound represented by the general formula (I) may be a bis-type coupler or a polymer coupler which compound has a dye portion in which the maximum absorption wavelength is shifted by a bond that is cleaved upon reaction with an oxidation product of a developing agent and is capable of forming a diffusion resistant compound having a dye portion possessing the maximum absorption wavelength which is not shifted as a result of the reaction with an oxidation product of a developing agent.

4,711,838

PHOTOGRAPHIC ELEMENTS SENSITIVE TO NEAR INFRARED

Nicholas E. Grzeskowiak, Harlow, Great Britain, and James B. Philip, Jr., St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 26, 1985, Ser. No. 769,596

Int. Cl.⁴ G03C 1/02, 1/76, 1/84, 1/06

U.S. Cl. 430—568

27 Claims

1. A photographic element comprising a support transparent to near infrared radiation, one or more layers of a silver halide emulsion having grains of an average diameter of not more than 0.4 micron, sensitized to near infrared radiation, characterized in the element comprises one or more of:

- a topcoat layer which is an outermost layer on the same side of the support as the photosensitive emulsion which topcoat layer is a diffuse transmitting layer with respect to near infrared radiation,
- a backing layer which is an outermost layer on the side of the support remote from the photosensitive emulsion which backing layer is a diffuse reflecting layer or absorbing layer with respect to near infrared radiation,
- a subbing layer which is positioned between the support and the photosensitive emulsion which subbing layer is a diffuse transmitting or absorbing layer with respect to near infrared radiation, said absorbing layer having an optical density of at least 0.75 within the range of 750 to 1500 nm in the absence of a diffuse transmitting layer and an optical density of at least 0.3 within the range of 750 to 1500 nm in combination with a diffuse transmitting layer, whereby the element may be imaged by a laser scanning system emitting near infrared radiation substantially without formation of non-contact interference fringes.

4,711,839

IMMUNE COMPLEX ASSAY

Anil K. Singhal, Edmonds, Wash., assignor to IMRE Corporation, Seattle, Wash.

Filed Jan. 11, 1985, Ser. No. 690,556

Int. Cl.⁴ G01N 33/53, 33/564, 33/543; C12Q 1/00

U.S. Cl. 435—4

11 Claims

1. A method for detecting immune complexes containing a specific antigenic marker in a plasma or serum sample, said method comprising:

- enriching immune complexes relative to other proteins in the sample by a factor of at least 1.2 by passage of the sample through an immunoadsorbent column capable of specifically binding the immune complexes, followed by elution of the enriched sample from the column;
- separating intact immune complexes from the enriched sample by binding to Raji cells or Clq; and
- detecting the specific antigenic marker in the intact complexes separated from the enriched sample.

4,711,840

POLYMERIZATION-INDUCED SEPARATION IMMUNOASSAYS

Robert C. Nowinski, and Allan S. Hoffman, both of King County, Wash., assignors to Genetic Systems Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 574,558, Jan. 27, 1984, which is a continuation-in-part of Ser. No. 550,929, Nov. 10, 1983, Pat. No. 4,511,478. This application Nov. 7, 1984, Ser. No. 668,247

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.⁴ G01N 33/537; C12Q 1/68

U.S. Cl. 435—7

15 Claims

1. An immunoassay method for determining the presence of more than one analyte in a fluid sample suspected of containing one or more of said analytes, comprising:

- combining said fluid sample with an addition monomer/analyte conjugate for each analyte being determined to form a fluid sample mixture;
- combining said mixture with reporter/reactant conjugates specific for bonding to each analyte thought to be contained in said fluid sample mixture under conditions favorable for the formation of the reporter-labelled analyte complexes and reporter-labelled monomer/analyte complexes, each reporter/analyte conjugate providing a detectably different signal from every other reporter present in said fluid sample mixture;
- separating said reporter-labelled monomer/analyte-conjugate complexes by initiating addition polymerization in said mixture; and
- detecting the incorporation of each reporter into each said polymerized complex as a measure of the analytes present in the sample.

4,711,841

METHOD FOR DETERMINING ONE OR MORE ANTIGENS IN A SAMPLE

Hans C. G. Kronvall, Lund, Sweden, assignor to Pharmacia Aktiebolaget, Upsala, Sweden

Continuation of Ser. No. 358,814, Mar. 16, 1982, abandoned, which is a continuation of Ser. No. 905,389, May 12, 1978, abandoned, which is a continuation of Ser. No. 647,269, Jan. 7, 1976, abandoned, which is a continuation of Ser. No. 409,560, Oct. 25, 1973, abandoned. This application Oct. 10, 1984, Ser. No. 659,424

Claims priority, application Sweden, Nov. 6, 1972, 14328/72; Feb. 8, 1973, 73017774

Int. Cl.⁴ G01N 33/53, 33/554

U.S. Cl. 435—7

11 Claims

1. A method for testing for the presence of a suspected specific antigen in a biological specimen of animal origin, comprising the step of combining the specimen containing the suspected antigen with a protein-A-containing, microbial cell suspension sensitized with an IgG antibody specific to the suspected antigen so that the Fc-part of the antibody is attached to protein A which in turn is attached to the microbial cell, whereby agglutination occurs if the test is positive, said antibody showing substantially no tendency toward self-agglutination of the microbial cells.

4,711,842

METHOD FOR PRODUCTION OF BIOLOGICALLY ACTIVE SUBSTANCES

Tadayoshi Taniyama, Tokyo, and Koichi Yoshida, Shizuoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1984, Ser. No. 589,832

Claims priority, application Japan, Mar. 15, 1983, 58-41409

Int. Cl.⁴ C12P 21/00; C12N 15/00

U.S. Cl. 435—68

5 Claims

1. A method of producing a biologically active substance produced by a macrophage which comprises culturing a hy-

brid cell line obtained by fusing (1) a human tumor cell line derived from THP-1 or U-937 and which does not grow in a medium containing aminopterin, azaserine, or aminopterin and azaserine or a cell line derived therefrom with (2) a human non-tumor macrophage capable of producing said biologically active substance.

4,711,843

METHOD AND VECTOR ORGANISM FOR CONTROLLED ACCUMULATION OF CLONED HETEROLOGOUS GENE PRODUCTS IN *BACILLUS SUBTILIS*

Shing Chang, Hercules, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 221,800, Dec. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 128,537, Mar. 10, 1980, abandoned. This application Jan. 26, 1983, Ser. No. 461,248

Int. Cl.⁴ C12P 21/00, 21/02, 21/04, 19/34; C12N 15/00, 9/86, 1/00, 1/20; C12R 1/125, 1/19; C07H 21/04

U.S. Cl. 435—68

40 Claims

1. A method for producing a predetermined protein comprising providing growth conditions in a growth medium for Gram-positive bacteria containing hybrid cloning vectors, said vectors having a gene therein for said predetermined protein, said predetermined protein being non-indigenous to the Gram-positive bacteria, said gene being located and oriented in said vector such as to be under the control of an operator, promoter, and ribosomal binding site sequence, said predetermined protein being under the control of a transport mechanism comprising a portion of a *Bacillus* secretion leader sequence that functions for secretion by which said predetermined protein is secreted by said Gram-positive bacteria, culturing said bacteria under conditions suitable for the production and secretion of said predetermined protein, and recovering said predetermined protein from said growth medium.

4,711,844

MODIFIED SIGNAL PEPTIDES

Shing Chang, Hercules, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Filed Mar. 9, 1983, Ser. No. 473,820

Int. Cl.⁴ C12N 15/00, 1/20, 1/00; C12P 21/00

U.S. Cl. 435—317.1

6 Claims

1. A plasmid comprising a DNA sequence encoding a signal sequence comprising the sequence met lys leu trp phe ser thr leu lys leu lys lys ala ala val leu leu phe ser cys val ala leu ala gly ser ala asn gln thr asn ala.

4,711,845

PORTABLE TEMPERATURE-SENSITIVE CONTROL CASSETTE

David H. Gelfand, and Frances C. Lawyer, both of Oakland, Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 646,693, Aug. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 578,133, Feb. 8, 1984, abandoned. This application Dec. 24, 1984, Ser. No. 685,312

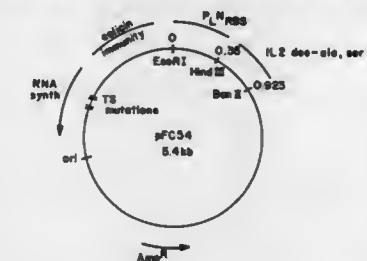
Int. Cl.⁴ C12P 21/00, 19/34; C12N 15/00, 1/20, 1/00; C07H 17/00

U.S. Cl. 435—68

26 Claims

2. A portable, regulatable control cassette for expression of a heterologous in prokaryotic hosts which cassette comprises: a first DNA sequence which is the *P_L* promoter operably linked to a second DNA sequence corresponding to *N_{RBS}*, both aforesaid DNA sequences operably linked to

an ATG start codon, all upstream of a third DNA sequence having a restriction site which is not present else-



where in the cassette and which permits cleavage within 6 bp downstream of the G of the ATG start codon.

4,711,846

PROCESS FOR THE PRODUCTION OF L-ASPARTYL-L-PHENYLALANINE METHYL ESTER OR L-ASPARTYL-L-PHENYLALANINE

Kenzo Yokozeki, and Koji Kubota, both of Kawasaki, Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Apr. 27, 1984, Ser. No. 604,523

Claims priority, application Japan, Apr. 28, 1983, 58-75558; Apr. 28, 1983, 58-75559

Int. Cl.⁴ C12P 21/02; C12R 1/19; A23L 1/236

U.S. Cl. 435—70

4 Claims

1. A process for the production of a sweetening agent, which comprises:

- contacting in an aqueous medium L-aspartic acid and L-phenylalanine methyl ester with at least one *E. coli* FERM-BP477 microorganisms or a protein-containing material isolated from said microorganism, said microorganism or protein-containing material isolated therefrom containing one or more enzymes capable of forming L-aspartyl-L-phenylalanine methyl ester by the condensation of L-aspartic acid and L-phenylalanine methyl ester; and
- isolating said L-aspartyl-L-phenylalanine methyl ester formed in said aqueous medium.

4,711,847

PREPARATION OF SECRETIN

Wolfgang König, Hofheim am Taunus; Joachim Engels, Kronberg; Eugen Uhlmann, Königstein, and Waldemar Wetekamp, Eppstein, all of Fed. Rep. of Germany, assignors to 501 Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,789

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328793

Int. Cl.⁴ C12P 21/02, 21/06; C12N 15/00, 9/78

U.S. Cl. 435—70

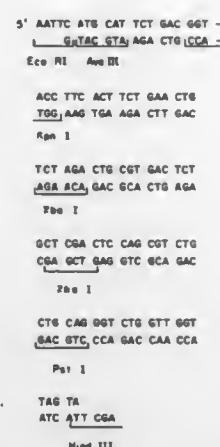
5 Claims

1. A process for preparing a polypeptide of formula I



(I)

in which Y is methionine or a radical of a bacterial protein bonded via methionine to R, and R is the amino acid sequence of secretin wherein said process comprises (1) producing by using recombinant DNA techniques a polypeptide of formula II



in which Y and R are defined as above, and (2) enzymatically converting the polypeptide of formula II into the polypeptide of the formula I with an amidating enzyme.

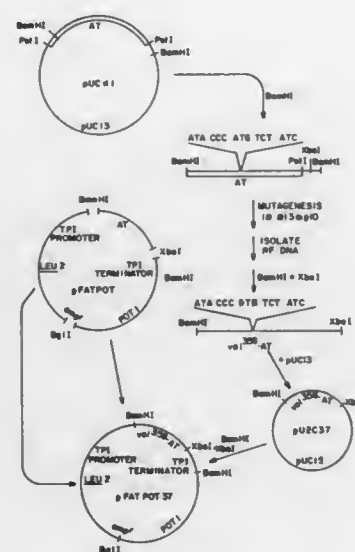
4,711,848 SITE SPECIFIC MUTAGENESIS IN ALPHA-1-ANTITRYPSIN

Margaret Y. Insley, Woodinville, and Glenn Kawasaki, Seattle, both of Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 589,410, Mar. 14, 1984, abandoned. This application Mar. 7, 1985, Ser. No. 709,382
 Int. Cl.⁴ C12P 19/34, 21/02; C12N 15/00, 1/00

U.S. Cl. 435-91

17 Claims



1. A method for producing closed circular DNA molecules coding for a human structural gene for X³⁵⁸-alpha-1-antitrypsin wherein X is alanine, valine, glycine, phenylalanine, arginine or lysine, comprising the steps of:

- preparing a circular single-stranded cDNA molecule comprising the coding sequence or the complement of the structural gene for wild-type human alpha-1-antitrypsin;
- annealing to said single-stranded cDNA (1) a linear oligonucleotide, characterized as being complementary to a segment of said single-stranded DNA, and comprising a codon mismatch corresponding to the amino acid in position 358 of said wild-type alpha-1-antitrypsin, wherein

- said mismatch comprises a codon for alanine, valine, glycine, phenylalanine, arginine or lysine; and (2) a primer;
- extending said oligonucleotide and primer;
- ligating the termini of said extended oligonucleotide and primer to form a gapped circular double-stranded DNA molecule;
- transfecting said double-stranded gapped circular DNA into a host microorganism to form said closed circular DNA molecule comprising said structural gene coding for human X³⁵⁸-alpha-1-antitrypsin.

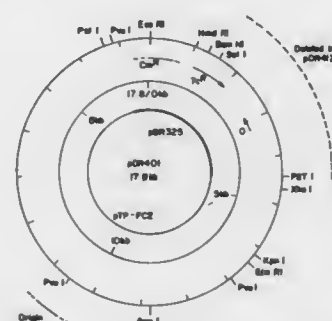
4,711,849 CONSTRUCTION OF SELECTABLE SHUTTLE CLONING VECTORS FOR THIOBACILLUS FERROOXIDANS

Douglas E. Rawlings, and David R. Woods, both of Rondebosch, South Africa, assignors to General Mining Union Corporation, Limited, Johannesburg, South Africa

Filed Nov. 1, 1984, Ser. No. 667,254
 Int. Cl.⁴ C12P 19/34; C12N 15/00, 7/00

U.S. Cl. 435-91

6 Claims



1. A method of constructing resistance vectors for Thiobacillus ferrooxidans which includes the steps of;

- extracting a cryptic DNA plasmid from a *T. ferrooxidans* strain, cleaving the *T. ferrooxidans* plasmid and a second plasmid which contains a chloramphenicol resistance gene and an *E. coli* origin of replication with the same restriction enzyme, and ligating the plasmids to form a recombinant plasmid;
- transforming *E. coli* cells with the recombinant plasmid and selecting for chloramphenicol resistant transformants capable of replication in *E. coli* and;
- removing the *E. coli* origin of replication from the recombinant plasmid by cleavage with a restriction enzyme to form a deleted recombinant plasmid, capable of replication both in *E. coli* and *T. ferrooxidans*.

4,711,850 PSEUDORABIES VIRUS MUTANTS, VACCINES CONTAINING SAME, METHODS FOR THE PRODUCTION OF SAME AND METHODS FOR THE USE OF SAME

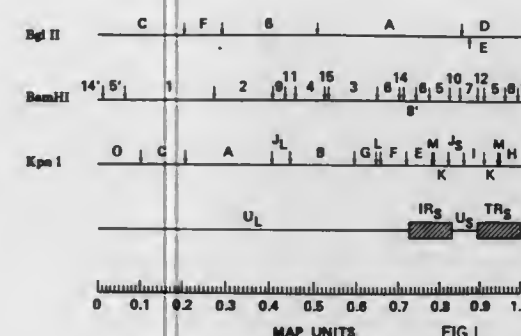
Malon Kit, and Saul Kit, both of Houston, Tex., assignors to NovaGene, Inc. and Baylor College of Medicine, both of Houston, Tex.

Filed Jan. 28, 1986, Ser. No. 823,439

Int. Cl.⁴ C12N 7/00; A61K 39/205

U.S. Cl. 435-235

63 Claims



1. A pseudorabies virus which fails to produce any antigenic g92 polypeptides as a result of a deletion, an insertion or both a deletion and an insertion in the g92 gene.

4,711,851 TEST APPARATUS FOR DETERMINING A METABOLIC CHARACTERISTIC OF MICROORGANISMS

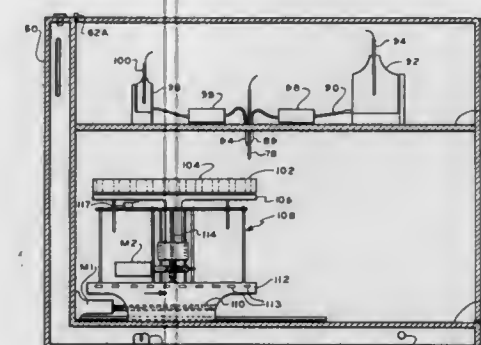
Thomas F. McNamara, Port Jefferson, and Fred Confessore, St. James, both of N.Y., assignors to State University of New York, Albany, N.Y.

Filed May 21, 1984, Ser. No. 612,462

Int. Cl.⁴ C12M 1/00

U.S. Cl. 435-287

19 Claims



1. A tester for determining a metabolic characteristic of microorganisms suspended in a medium comprising: a housing means having an internal ambient temperature; a reagent supply mounted in said housing means and containing a quantity of at least one test reagent; a probe means mounted in said housing means and sized to be inserted into said medium, there existing a probe temperature at said probe means, said probe means providing a reaction signal signifying the probe temperature at said probe means; a dispensing means coupled between said reagent supply and said probe means for delivering at the probe means from the reagent supply said test reagent; reference means mounted in said housing means for providing a reference signal responsive to said ambient temperature.

ture, said reference means being spaced from said probe means to preclude insertion into said medium; and control means coupled to said probe means, said reference means and said dispensing means for controlling the amount of said test reagent dispensed by said dispensing means and for indicating the relative variation between said reaction signal and said reference signal after delivery of said test reagent at said probe means.

4,711,852 CONTROL FOR BLOOD GAS ANALYZERS AND HEMOGLOBIN ANALYSIS

Walter Jacobson, Denville; Stephen C. Riggio, Milford, and James E. Turner, Boonton, all of N.J., assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 5, 1984, Ser. No. 667,947

Int. Cl.⁴ G01N 31/00

U.S. Cl. 436-15

22 Claims

1. A process for stabilizing mammalian erythrocytes for use in a blood gas-hemoglobin analysis control whereby specific hemoglobin values for oxyhemoglobin, carboxyhemoglobin and methemoglobin are maintained which comprises:

- suspending said erythrocytes in a buffered fixing medium comprising a water solution of a buffering agent, said medium having a pH of about 7.3 to about 11.3;
- contacting the erythrocytes with a gas, wherein the gas is, oxygen or carbon monoxide, in the presence of a protein cross-linking agent at a temperature 20° C. to about 30° C. for a reaction time of about 15 minutes to about 60 minutes; and
- recovering the stabilized erythrocytes.

4,711,853 METHOD OF DETECTING POTASSIUM IONS USING TRIFLUOROMETHYL-SUBSTITUTED CHROMOGENIC CROWN ETHERS

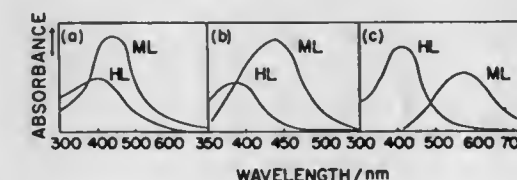
Gilbert E. Pacey, Oxford, Ohio, and Bernard P. Bubn's, Reston, Va., assignors to The President and Trustees of the Miami University, Oxford, Ohio

Continuation-in-part of Ser. No. 559,478, Dec. 8, 1983, abandoned, which is a division of Ser. No. 386,066, Jun. 7, 1982, Pat. No. 4,436,923. This application Dec. 18, 1985, Ser. No. 810,855

Int. Cl.⁴ G01N 21/75, 33/50

U.S. Cl. 436-74

17 Claims



1. An organic reagent for extracting potassium from an aqueous solution comprising:

- a spectroscopic quality chloroform solvent; and
- the crown ether, 4'-(2',4'-dinitro-6'-trifluoromethylphenyl) aminobenzo-15-crown-5, dissolved in said chloroform solvent, and wherein the concentration of said crown ether in said solvent is in the range 1×10^{-4} molar to 1×10^{-2} molar.

4,711,854

METHOD OF MEASURING MOISTURE IN A BURNABLE ABSORBER

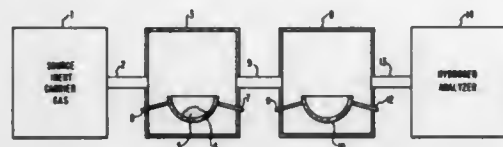
Richard A. Pregall, Columbia, and Archie M. LeGrand, Jr., Sumter, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1986, Ser. No. 857,011

Int. Cl.⁴ G01N 33/18

U.S. Cl. 436-144

3 Claims



1. A method of measuring the amount of moisture contained in a sample of a burnable absorber having a moisture content in excess of 100 ppm comprising:

- (1) heating said sample in a first enclosed chamber in the presence of a water dissociation catalyst, whereby water in said sample is dissociated into hydrogen and oxygen;
- (2) passing vapors from said first enclosed chamber to a second enclosed chamber which contains a water dissociation catalyst, whereby water in said vapors is dissociated into hydrogen and oxygen;
- (3) analyzing said vapors from said second enclosed chamber to determine their hydrogen content.

4,711,855

DERIVATIVES OF 3,5,3'-TRIODOOTHYRONINE

Richard R. Feinberg, Sharon, Mass., assignor to Ciba Corning Diagnostics Corp., Medfield, Mass.

Filed Feb. 5, 1985, Ser. No. 698,108

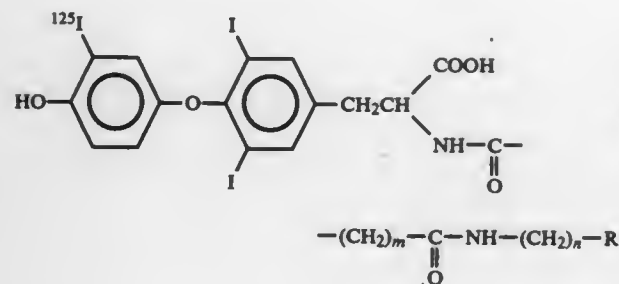
Int. Cl.⁴ G01N 33/534, 33/543; C07D 233/00, 239/00

U.S. Cl. 436-500

12 Claims

5. An immunoassay for the direct measurement of free 3,5,3'-triiodothyronine in a liquid sample in which the 3,5,3'-triiodothyronine is present in both free and bound states, which immunoassay comprises the steps of:

- A. combining the sample with a radiolabeled derivative of 3,5,3'-triiodothyronine and antibody specific for 3,5,3'-triiodothyronine said antibody being immobilized on a solid phase;
- B. incubating the mixture which results from step A;
- C. separating the solid phase from the liquid phase;
- D. measuring the amount of the radiolabeled derivative of 3,5,3'-triiodothyronine present in either phase; wherein the radiolabeled derivative of 3,5,3'-triiodothyronine has the following general formula:



in which m is an integer from 2 to 4, n is an integer from 1 to 4, and R is a monovalent, unsubstituted, fully unsaturated five- or six-membered monocyclic heterocyclic group containing either one or two nitrogen atoms as the only hetero atoms; and E. determining the free 3,5,3'-triiodothyronine from the measurement of the derivative of 3,5,3'-triiodothyronine.

4,711,856

NUCLEAR BINDING ASSAY FOR STEROID RECEPTOR FUNCTIONALITY IN CANCEROUS CELLS

Thomas C. Spelsberg, Rochester, Minn., assignor to Mayo Medical Resources, Rochester, Minn.

Filed Sep. 19, 1984, Ser. No. 652,295

Int. Cl.⁴ G01N 33/567

U.S. Cl. 436-504

18 Claims

1. A method for rapidly determining the presence of functional cellular steroid receptors by assaying a tissue sample for nuclear steroid binding comprising:

- (a) fragmenting said tissue sample;
- (b) digesting said fragmented tissue with collagenase;
- (c) isolating the cells from said digested tissue;
- (d) incubating said cells with an amount of a radiolabeled steroid capable of complexing with and saturating said receptors;
- (e) isolating the cellular nuclei; and
- (f) measuring the bound radioactivity and the total DNA of said nuclei.

4,711,857

TAILORABLE INFRARED SENSING DEVICE WITH STRAIN LAYER SUPERLATTICE STRUCTURE

Li-Jen Cheng, LaCrescenta, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 28, 1986, Ser. No. 901,114

Int. Cl.⁴ H01L 31/04, 29/12, 31/06

U.S. Cl. 437-3

16 Claims

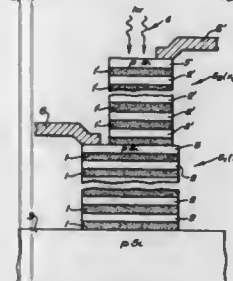
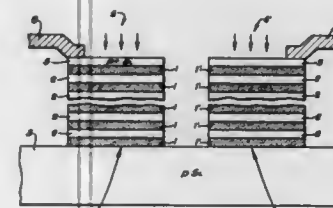
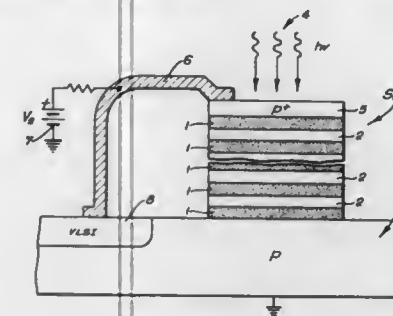
1. A method for fabricating a photodetector with a tunable wavelength detection range, comprising:

- growing a Ge_xSi_{1-x}/Si superlattice, wherein Ge_xSi_{1-x} layers of the superlattice are doped with a p-type impurity and Si layers of the superlattice are intrinsic; and
- controlling the value of x to establish a desired valence band energy difference between the valence band of the p-doped Ge_xSi_{1-x} superlattice layers and the valence band of the intrinsic Si superlattice layers to thereby tune the wavelength detection range of the Ge_xSi_{1-x}/Si superlattice.

4. A method for manufacturing a photodetector with tailorable wavelength sensitivity comprising:

- growing a superlattice including two different layers joined to form a semiconductive heterojunction, one of the layers being a p-impurity doped semiconductive alloy of the general ternary form $(A_xB_{1-x})_yC_{1-y}$ whose energy band characteristics are a function of x, and the other of the layers being an intrinsic semiconductor having a valence

band of lower energy than the valence band of the $(A_xB_{1-x})_yC_{1-y}$ layer; and



controlling the value of x to adjust the energy difference between the valence bands of said two different layers to thereby tailor the wavelength sensitivity of the superlattice.

4,711,858

METHOD OF FABRICATING A SELF-ALIGNED METAL-SEMICONDUCTOR FET HAVING AN INSULATOR SPACER

Christoph S. Harder, Zurich; Heinz Jaekel, Kilchberg, and Hans P. Wolf, Zurich, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

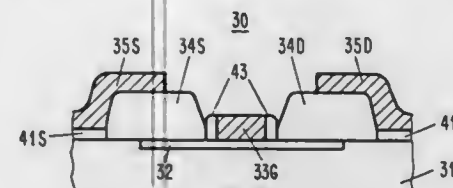
Filed Jun. 18, 1986, Ser. No. 875,835

Claims priority, application European Pat. Off., Jul. 12, 1985, 85108694.2

Int. Cl.⁴ H01L 21/302

U.S. Cl. 437-99

10 Claims



1. A method of fabricating a self-aligned metal-semiconductor field effect transistor, the transistor being formed on a semi-insulating semiconductor substrate and comprising a current channel and associated source, gate and drain electrodes, characterized in that it comprises the following steps:

forming an active channel layer at the surface of said semiconductor substrate, depositing a refractory metal gate layer over said substrate surface, selectively etching said gate layer to form said gate electrode, depositing a thin dielectric layer over said gate electrode and over said substrate surface, etching said dielectric layer so as to form an insulating sidewall layer on the vertical edges of said gate electrode, forming a highly doped continuous semiconductor contact layer over said substrate surface, over said gate electrode and over said insulating sidewall layer, said contact layer being mono-crystalline material over said substrate surface and poly-crystalline material over said gate electrode and over said insulating sidewall layer, removing said poly-crystalline material, and depositing and selectively etching a metal layer over said mono-crystalline material to form said source and said drain electrodes.

4,711,859

METHOD FOR FORMING AN INSULATOR HAVING A CONDUCTIVE SURFACE

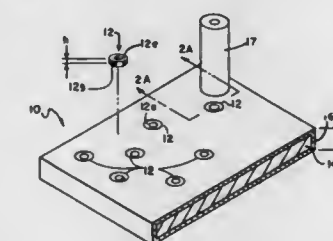
Dino E. Argentini, Danvers, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 24, 1984, Ser. No. 614,097

Int. Cl.⁴ H01L 23/02

U.S. Cl. 437-209

9 Claims



1. A method of providing a conductive layer on a first one of a pair of opposing surfaces of a spacer member comprising the steps of:

- masking the second one of the pair of opposing surfaces and sidewall surfaces of the member with a conformable masking material while leaving the first one of the pair of opposing surfaces exposed; and
- providing the conductive layer on the exposed, first opposing surface of the member.

4,711,860

MODIFIED CORDIERITE GLASS CERAMIC COMPOSITE

Kishor P. Gadkaree, Big Flats; William L. Haynes, and Kun-Er Lu, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 12, 1986, Ser. No. 838,806

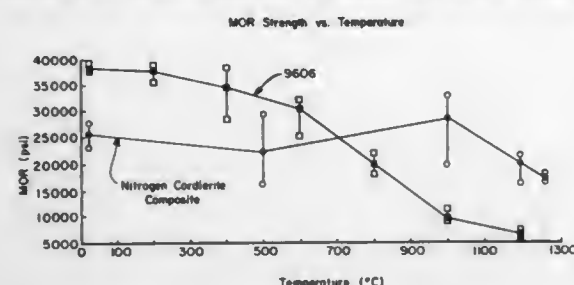
Int. Cl.⁴ C03C 10/08

U.S. Cl. 501-9

23 Claims

1. A glass ceramic composite material comprising Si_3N_4 .

whiskers in a nitrogen doped cordierite glass ceramic wherein the material comprises between about 5 and about 50 weight



percent Si_3N_4 whiskers and between about 50 and 95 weight percent nitrogen doped cordierite glass ceramic.

4,711,861

SINTERED ALUMINUM NITRIDE BODY AND METHOD FOR MAKING

Kentaro Sawamura, Yoshio Kosaka, and Masayasu Yamaguchi, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 787,091, Oct. 15, 1985, abandoned.

This application Feb. 20, 1987, Ser. No. 16,957

Claims priority, application Japan, Oct. 15, 1984, 59-215971; Dec. 17, 1984, 59-265852; Dec. 17, 1984, 59-265853; Dec. 17, 1984, 59-265855; Dec. 17, 1984, 59-265856

Int. Cl.⁴ C04B 35/58

U.S. Cl. 501—98

14 Claims

1. A sintered aluminum nitride body prepared by sintering aluminum nitride in admixture with a sintering aid selected from the group consisting of borides, carbides, of calcium, strontium, barium and rare earth metals, and mixtures thereof.

4,711,862

DIELECTRIC CERAMIC COMPOSITIONS

Yoichiro Yokotani, Ibaraki; Janichi Kato; Masamitsu Nishida, both of Osaka; Syunichiro Kawashima, Nishinomiya, and Hiromu Ouchi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

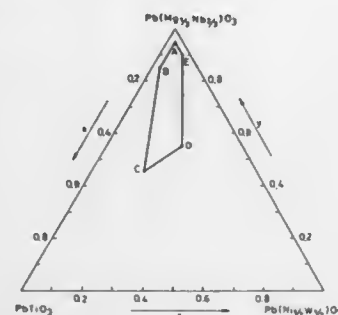
Filed Dec. 26, 1985, Ser. No. 813,521

Claims priority, application Japan, Dec. 27, 1984, 59-280317; Jan. 28, 1985, 60-13685; Feb. 19, 1985, 60-30910

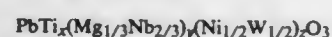
Int. Cl.⁴ C04B 35/46

U.S. Cl. 501—136

3 Claims



1. A ceramic compositions comprising a substance represented by the formula



wherein $x+y+z=1$ and the values of x, y and z fall within the ranges represented by the polygon ABCDE in the accompanying composition diagram of PbTiO_3 - $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ - $\text{Pb}(\text{Ni}_{1/2}\text{W}_{1/2})\text{O}_3$ ternary system.

4,711,863

IMMOBILIZED EXTRACTANTS

Michael Streat, Wembley, England, and Sofia Belfer-Canterman, Beer-Sheva, Israel, assignors to National Research Development Corporation, England

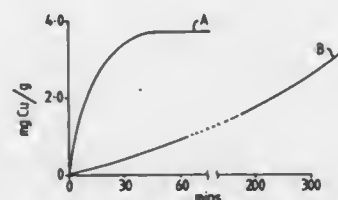
Filed Mar. 10, 1986, Ser. No. 838,298

Claims priority, application United Kingdom, Mar. 12, 1985, 8506335

Int. Cl.⁴ B01J 37/34, 20/26; B05D 3/06; C08J 5/24

U.S. Cl. 502—5

14 Claims



1. A process for the production of a solid, particulate immobilized extractant, which process comprises adsorbing (a) a liquid extractant which is not homopolymerizable onto (b) a porous, solid, particulate, substrate; adsorbing (c) a monomer onto the substrate; and polymerizing the adsorbed monomer (c) by subjecting the monomer (c) to irradiation, thereby entrapping the liquid extractant (a) on substrate (b).

12. A process for the production of a solid, particulate immobilized extractant, which comprises adsorbing (a) a liquid extractant which is not homopolymerizable selected from the group consisting of organic neutral or acid esters of phosphorous, organic phosphine oxides, amines, amino acids and chelate compounds onto (b) a porous, solid particulate inorganic substrate; adsorbing (c) a monomer selected from the group consisting of monovinyl compounds and mixtures thereof onto the substrate; and polymerizing the adsorbed monomer (c) by subjecting the monomer (c) to irradiation, thereby entrapping the liquid extractant (a) on substrate (b).

14. An immobilized extractant whenever prepared by the process of claim 12.

4,711,864

CATALYTIC CRACKING CATALYST

Regis J. Pellet, Croton-On-Hudson, and Richard J. Hinchey, Thornwood, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 500,446, Jun. 2, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 721,894

Int. Cl.⁴ B01J 29/08

U.S. Cl. 502—65

20 Claims

1. The zeolitic aluminosilicate having a mole ratio of oxide in the dehydrated state of:



wherein M is a cation having valence "n"; "X" has a value greater than 6.0, has an X-ray powder diffraction pattern having at least the d-spacings of Table A; has extraneous silicon atoms in the crystal lattice in the form of framework SiO_4 tetrahedra; and has at least one Group IIIA cation per unit cell.

4. The zeolitic aluminosilicate of claim 1 wherein the Group IIIA cation is aluminum.

6. A catalyst for cracking hydrocarbons comprising between about 1 percent and about 99 percent by weight of an inorganic matrix and about 1 percent and about 99 percent by weight of the zeolitic aluminosilicate of claim 1.

7. The zeolitic aluminosilicate according to claim 1 wherein the aluminosilicate contains an effective amount of at least one multivalent cation selected from the group consisting of cerium, lanthanum, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, hol-

mium, erbium, thulium, ytterbium, lutetium and mixtures thereof.

4,711,865

OLEFIN POLYMERIZATION CATALYSTS, PRODUCTION AND USE

Anthony N. Specia, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 18, 1986, Ser. No. 944,306

Int. Cl.⁴ C08F 4/62, 4/64, 4/68

U.S. Cl. 502—116

3 Claims

1. An olefin polymerization catalyst component obtained by A. contacting in an inert hydrocarbon solvent an inorganic metal oxide catalyst support material of a Group IIA, IIIa, IVa, or IVb metal in finely divided form with (a) an organometallic compound of a Group IIA, IIB, or IIIa metal and (b) an oxygen containing compound selected from the Group consisting of alcohols, aldehydes, siloxanes, and ketones; B. drying the contact product; C. treating the dried contact product in an inert solvent with an acyl halide, at least one transition metal compound of a Group IVb, Vb, VIb, or VIII metal, and a halogen or interhalogen, and D. treating with an organometallic compound of a Group IIA, IIB, or IIIa metal.

4,711,866

ADAMANTANE POLYMERIZATION CATALYST

Irving Kuntz, Linden, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 5, 1986, Ser. No. 826,244

Int. Cl.⁴ C08F 4/52, 4/14, 4/74

U.S. Cl. 502—152

9 Claims

1. A catalyst system for the preparation of isoolefin polymers and copolymers comprising a haloadamantane and Lewis acid wherein the haloadamantane is a bromo- or chloroadamantane.

4,711,867

CATALYTIC COMPOSITION

Masakatsu Hatano, Yokohama; Kazunori Oshima, Tokyo; Tatsuya Ihara, Kurashiki, and Kenichi Kiyono, Hachioji, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,279

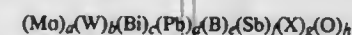
Claims priority, application Japan, Mar. 7, 1985, 60-45186

Int. Cl.⁴ B01J 21/02

U.S. Cl. 502—205

3 Claims

1. A catalyst composition for the production of acrylonitrile from propylene, ammonia and oxygen or an oxygen-containing gas of the formula:



wherein X is chromium or iron; a, b, c, d, e, f, g and h respectively denote the number of atoms of molybdenum, tungsten, bismuth, lead, boron, antimony, element X and oxygen, wherein, given that $a+b=12$,

$$0 \leq b \leq 7,$$

$$0.4 \leq c \leq 7,$$

$$2 \leq d \leq 12,$$

$$0.2/22 \leq e/a \leq 40/22,$$

$$0 \leq f/a \leq 25/22,$$

$$0 \leq g/a \leq 3/22; \text{ and}$$

h denotes the number of oxygen atoms necessary to satisfy the valencies of the remaining constituent elements of the catalyst.

4,711,868

PROCESS FOR PREPARING SILICA-ALUMINA

Yen-Shin Shyr, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 736,183, May 20, 1985, Pat. No. 4,617,108.

This application May 23, 1986, Ser. No. 866,551

Int. Cl.⁴ B01J 21/12

U.S. Cl. 502—235

22 Claims

12. A composition of matter prepared by the process comprising the steps of

(A) mixing a first aqueous solution consisting essentially of water, an aluminum salt and an ammonium salt of an acid having a pKa of less than 2 with a second aqueous solution containing an alkali metal silicate, wherein the mol ratio of the alkali metal silicate to the aluminum salt is in the range of from about 2:1 to about 20:1, and the amount of the ammonium salt in said first solution is such that a coprecipitated silica-alumina hydrogel is formed at a pH in the range of from about 3 to about 6 after said mixing;

(B) separating said coprecipitated silica-alumina hydrogel from the mixture of said first and second aqueous solutions; and

(C) calcining said coprecipitated silica-alumina hydrogel obtained in step (B) under such conditions as will result in the formation of an acidic silica-alumina.

20. A composition of matter in accordance with claim 12, wherein said process comprises the additional steps of:

(E) impregnating the calcined silica-alumina obtained in step (C) with a solution containing at least one compound of at least one transition metal selected from metals belonging to Groups VB, VIB, VIIB, VIII and IB of the Periodic Table, and

(F) calcining said impregnated silica-alumina composition under such conditions as to convert said metal compounds to metal oxides.

4,711,869

SILICA-TITANIA HYDROCARBON CONVERSION CATALYST

Leonard A. Cullo, Greensburg, and Francis J. Shiring, III, Hampton Township, Allegheny County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Nov. 8, 1985, Ser. No. 796,136

Int. Cl.⁴ B01J 21/14, 21/06

U.S. Cl. 502—239

10 Claims

1. Method of making a catalyst useful in hydrocarbon conversion reactions comprising

(a) combining about one part of an aqueous sodium silicate solution containing about 12% to about 13% SiO_2 , at a SiO_2 to Na_2O weight ratio of about 3.22 with about 0.94 parts of a second, clear aqueous solution of an organo-titanate chelate containing 0.18 to 0.32% titanium as TiO_2 and wherein the titanium has a coordination number of at least 5, 0.24 to 0.26 gram-equivalents per liter of a tetra-alkyl ammonium halide or hydroxide, up to 0.12 gram-equivalents per liter of a magnesium salt, and about 3.3 to about 3.5 gram-equivalents per liter of sodium chloride, to form a gel,

(b) crystallizing the gel by extended hydrothermal treatment,

(c) washing the crystallized gel,

(d) calcining the washed crystallized gel, and

(e) removing residual alkali metal therefrom.

4. A calcined crystalline titania-silica catalyst having a molar ratio of 0.015 to 0.04 TiO_2 :1.0 SiO_2 and an X-ray diffraction pattern characterized by peaks as follows:

2θ	d (Å)	L/To × 100
7.75	11.39	49
8.30	10.64	13
8.70	10.16	100
13.70	6.46	13.

5. A calcined crystalline titania-magnesia-silica catalyst having molar ratios of 0.015 to 0.04 TiO₂:1.0 SiO₂ and 0.08 to 0.17 MgO, and an X-ray diffraction pattern characterized by peaks as follows:

2θ	d (Å)	L/To × 100
7.90	11.18	31
8.80	10.04	20
20.70	4.29	17
21.90	4.06	100.

4,711,870

EXHAUST GAS PURIFYING CATALYST

Chikara Yamada, Higashimurayama; Yoji Watabe, Hachioji; Koichi Irako, deceased, late of Higashimurayama by Sanae Irako, legal heir, and Yuichi Murakami, Nagoya, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Apr. 25, 1986, Ser. No. 855,943

Claims priority, application Japan, Apr. 27, 1985, 60-92072; Dec. 13, 1985, 60-279219

Int. Cl.⁴ B01J 21/04, 23/10, 23/22, 23/72

U.S. Cl. 502—303

11 Claims

1. A catalyst suitable for assisting in purifying exhaust gases consisting essentially of

- at least one member selected from the group consisting of copper and copper compounds;
- at least one member selected from the group consisting of vanadium and vanadium compounds; and
- at least one member selected from the group consisting of zirconium, aluminum, iron, lanthanum, lead, cerium and compounds thereof.

4,711,871

CATALYSTS COMPRISING RUTHENIUM ON TITANIA SURFACE MODIFIED WITH GROUP VA OXIDE OF VANADIUM, NIOBIUM OR TANTALUM

Israel E. Wachs, Bridgewater, N.J., and Darchun B. Yang, Houston, Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 626,457, Jun. 29, 1984, abandoned. This application Dec. 11, 1985, Ser. No. 808,008

Int. Cl.⁴ B01J 21/06, 23/46, 23/64

U.S. Cl. 502—325

6 Claims

1. A process for preparing a catalyst comprising ruthenium supported on a surface-modified titania support wherein said support comprises an oxide of a metal selected from the group consisting of niobium, vanadium, tantalum or mixture thereof, in a non-crystalline form, supported on said titania wherein said process comprises the sequential steps of:

- forming said support comprising titania whose surface has been modified with and supports an oxide of a metal selected from the group consisting of niobium, tantalum, vanadium or mixture thereof wherein said supported, modifying oxide is a non-crystalline form;
- impregnating said so-formed surface modified titania support with a solution of a ruthenium precursor compound; and,
- converting said ruthenium precursor compound to ruthenium to form said catalyst.

4,711,872

CATALYST FOR COMBUSTION AND PROCESS FOR PRODUCING SAME

Yasuyoshi Kato; Nobue Teshima, both of Kure; Masao Ohta, Hiroshima, and Kunihiko Konishi, Kure, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Japan
Filed Apr. 24, 1986, Ser. No. 855,484

Claims priority, application Japan, Apr. 25, 1985, 60-89196
Int. Cl.⁴ B01J 21/04, 23/58

U.S. Cl. 502—328

6 Claims

1. A catalyst for combustion comprising a compound expressed by a composition formula BaAl₁₂O₁₉ having Pd supported thereon.

4,711,873

PROCESS FOR PREPARING SOLID BASE CATALYST

Gohfu Suzukamo, Ibaraki; Masami Fukao, Shiga; Masao Minobe, Niigata, and Akemi Sakamoto, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 15, 1986, Ser. No. 896,951

Claims priority, application Japan, Aug. 16, 1985, 60-180869; Nov. 12, 1985, 60-253568

Int. Cl.⁴ B01J 21/04, 23/04

U.S. Cl. 502—344

16 Claims

1. A process for preparing a solid base which comprises reacting alumina with an alkali metal hydroxide in a reaction system at a temperature of from 200° to 500° C. to form a reaction product; adding an alkali metal to the reaction system; and reacting the reaction product with the added alkali metal at a temperature of from 180° to 350° C. or reacting water-containing alumina with an alkali metal in such an amount that corresponds to a molar equivalent of water contained in the alumina in a reaction system at a temperature in a range between the melting point of the alkali metal and 500° C. to form a reaction product; adding an alkali metal to the reaction system; and reacting the reaction product with the added alkali metal in such an amount that the total amount of alkali metal corresponds to 1.01 to 2 times molar equivalent of water contained in the water-containing alumina, at a temperature of from 180° to 350° C., to form the solid base.

4,711,874

THERMOSENSITIVE RECORDING ADHESIVE SHEET

Yukihiro Yayama; Takanori Motosugi; Yasuhiro Honda, and Akira Ichikawa, all of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

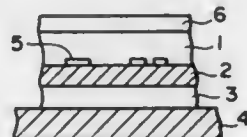
Filed Aug. 20, 1985, Ser. No. 767,432

Claims priority, application Japan, Aug. 20, 1984, 59-126089[U]; Dec. 20, 1984, 59-193475[U]

Int. Cl.⁴ B41M 5/18

U.S. Cl. 503—206

9 Claims



1. In a thermosensitive recording adhesive sheet capable of forming colored images thereon upon application of heat, comprising:

- a support material,
- a thermosensitive coloring layer formed on said support material,
- an adhesive layer formed on the back side of said support material, opposite to the thermosensitive coloring layer, the
- a disposable backing sheet which is attached to said adhesive layer and can be peeled off said adhesive layer when said thermosensitive recording adhesive label is

used, the improvement which comprises preprinted print patterns located solely on one side of said support material, and said preprinted print patterns are visible through said thermosensitive coloring layer.

4,711,875

COMPOSITION ESSENTIALLY CONSISTING OF TRANS-1-(2,6,6-TRIMETHYLCYCLOHEXYL)-HEXAN-3-OL

Karl-Heinrich Schulte-Elte, Onex; Günther Ohloff, Bernex; Bernard L. Müller, Geneva, and Wolfgang K. Giersch, Bernex, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 584,501, Feb. 28, 1984, Pat. No. 4,623,750. This application Oct. 17, 1985, Ser. No. 788,314

Claims priority, application Switzerland, Mar. 9, 1983, 1259/83

Int. Cl.⁴ A61K 7/46; C07C 35/08

U.S. Cl. 512—1

12 Claims

1. A perfume composition comprising an odorous effective amount of an odorous composition containing from 50% to 100% of trans-1-(2,6,6-trimethylcyclohexyl)hexan-3-ol- and not more than 50% of cis-1-(2,6,6-trimethylcyclohexyl)hexan-3-ol.

4,711,876

PROCESS FOR THE TREATMENT AND REMISSION OF AIDS (ACQUIRED IMMUNE DEFICIENCY SYNDROME)

Salvatore J. Catapano, 66 S. Brush Dr., Valley Stream, N.Y.

11581

Filed Dec. 5, 1985, Ser. No. 804,858

Int. Cl.⁴ A61K 39/00, 39/02

U.S. Cl. 514—2

6 Claims

1. A method of treating a human patient to effect the remission of symptoms associated with AIDS, which comprises parenterally administering, in multiple injections, to the patient in need of such treatment typhoid vaccine in a therapeutically effective amount which is sufficient to provide immunostimulating activity.

4,711,877

6-PEN-VASOPRESSIN COMPOUNDS

Michael L. Moore, Media, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

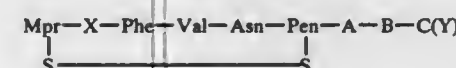
Filed Sep. 18, 1985, Ser. No. 777,385

Int. Cl.⁴ A61K 37/34; C07K 7/16

U.S. Cl. 514—11

15 Claims

1. A polypeptide compound having the formula:



in which:

X is a D or L isomer of Ile, Phe(Alk), Tyr or Tyr(Alk);
A is Pro or a single bond;
B is a D or L isomer of Arg or Lys;
C is a D or L isomer of Arg, Lys or Gly or a single bond; and
Y is OH or NH₂, or a pharmaceutically acceptable salt or ester prodrug thereof.

4,711,878

NOVEL PEPTIDES AND PROCESSES FOR PREPARING THE SAME

Hiroshi Sugano, Nara; Ryuichi Ishida, Suita, and Michio Yamamura, Tondabayashi, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Feb. 5, 1986, Ser. No. 826,265

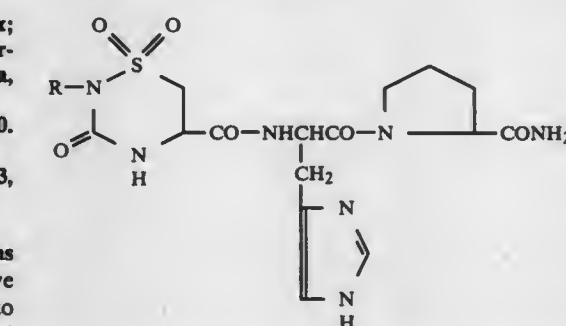
Claims priority, application United Kingdom, Feb. 20, 1985, 8504357

Int. Cl.⁴ A61K 37/24; C07K 7/02, 5/08

U.S. Cl. 514—18

8 Claims

1. A compound of the formula:



wherein R is hydrogen or a lower alkyl group, or a pharmaceutically acceptable salt thereof.

4,711,879

ACYLATED SUGAR DERIVATIVES, PROCESSES FOR THEIR MANUFACTURE, AND THEIR USE

Gerhard Baschang, Bettingen, Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany, and Oskar Wacker, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 739,269, May 29, 1985, Pat. No. 4,640,911. This application Nov. 7, 1986, Ser. No. 928,493

Claims priority, application Switzerland, May 29, 1984, 2635/84

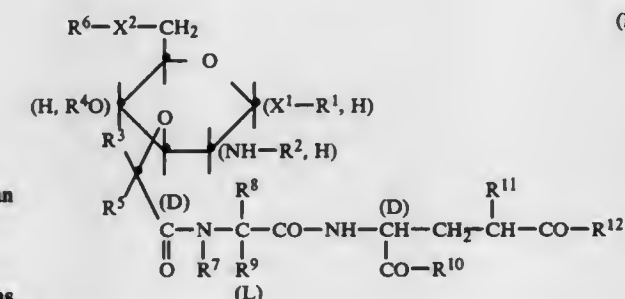
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ A61K 31/70; C08G 18/08

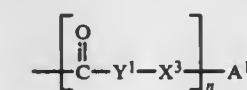
U.S. Cl. 514—42

25 Claims

1. A sugar derivative of the formula I

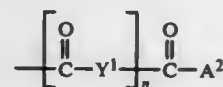


in which the sugar moiety is derived from D-glucose, D-mannose or D-galactose; X¹ represents oxygen, sulphur or the group NH; X² represents oxygen or the group NH; R¹, R⁴ and R⁶ each represents, independently of the others, (a) hydrogen, (b) lower alkanoyl, (c) a radical of the formula Ia,

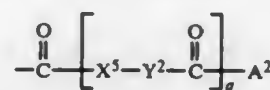
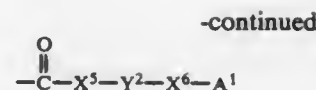
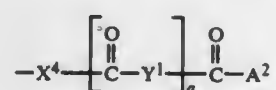
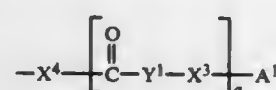


in which n represents 0 or 1; Y¹ represents alkylene having up

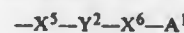
to an including 18 carbon atoms which may be interrupted by carbonylimino or carbonyloxy and which is unsubstituted or substituted by at least one substituent selected from carboxy, benzyloxycarbonyl, lower alkoxy, amino, lower alkanoylamino, hydroxy and lower alkanoyloxy; X^3 represents oxygen or the group NH; and A^1 represents the acyl radical of a carboxylic acid selected from the group consisting of 6-chloro-5-cyclohexylindan-1-carboxylic acid, 2-[4,5-bis-(4-methoxyphenyl)-oxazol-2-yl]-propionic acid, 2-(5-chloro-4-cyclohexyl-2-hydroxyphenyl)-acetic acid, 2-[4,5-bis-(4-methoxyphenyl)-oxazol-2-yl]-2-methyl-propionic acid, 2-(3-fluoro-4-phenylphenyl)-propionic acid, (\pm)-5-benzoyl-3H-1,2-dihydro-pyrrolo [a]pyrrole-1-carboxylic acid, 2-[4-(1,3-dihydro-1-oxo-2H-isindol-2-yl)-phenyl]-propionic acid, 2-[2-(2,6-dichlorophenyl)-amino]-phenyl]-acetic acid, 2-[2-(2,6-dichloro-4-fluorophenyl)-amino]-5-fluorophenyl]-acetic acid, 2-(2,3-dimethylphenyl)-aminobenzoic acid, 2-[4,5-bis-(4-methoxyphenyl)-imidazol-2-yl]-2-methylpropionic acid, 2-[2-(2,6-dichlorophenyl)-amino]-5-fluorophenyl]-acetic acid, 2-(3-benzoylphenyl)propionic acid, 2-S-[4,5-bis-(4-methoxyphenyl)-thiazol-2-yl]mercaptopropionic acid, 3-S-[4,5-bis-(4-methoxyphenyl)-thiazol-2-yl]-mercaptopropionic acid, 2-[2-(2,6-dichloro-4-fluorophenyl)-amino]-phenyl]-acetic acid, 5-(2,4-difluorophenyl)-2-hydroxybenzoic acid, 2-(6-chloro-9H-carbazol-2-yl)-propionic acid, 2-(4-isobutylphenyl)-propionic acid, 1-(4-chlorobenzoyl)-5-methoxy-2-methylindol-3-ylacetic acid, 2-(6-methoxynaphth-2-yl)-propionic acid, 2-[3-chloro-4-(3-pyrrolin-1-yl)-phenyl]-propionic acid, 2-(5H-[1]benzopyrano[2,3-b]-pyridin-7-yl)-propionic acid, 5-(4-methylbenzoyl)-1-methylpyrrol-2-ylacetic acid, 2-[4,5-bis-(4-methoxyphenyl)-oxazol-2-yl]-acetic acid, 1-benzoyl-5-methoxy-2-methylindol-3-ylacetic acid, 2-[3-(hydroxybenzyl)-phenyl]-propionic acid and 2-[3-chloro-4-(pyrrol-1-yl)-phenyl]-propionic acid, or (d) radical of the formula Ib



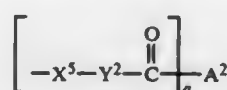
in which n and Y^1 have the meanings mentioned above and A^2 represents lower alkoxy selected from the group consisting of 2-[4,5-bis-(4-methoxyphenyl)-thiazol-2-ylthio]-ethoxy, 2-[4,5-bis-(4-methoxyphenyl)-imidazol-2-yl]-2-methylpropoxy and 3-[4,5-bis-(4-methoxyphenyl)-thiazol-2-ylthio]-propoxy; or R^1 alternatively represents benzyl which is unsubstituted or substituted in the phenyl moiety by lower alkyl, hydroxy, lower alkoxy or halogen; R^2 represents unsubstituted or hydroxy-substituted lower alkanoyl, benzoyl which is unsubstituted or substituted by at least one substituent selected from lower alkyl, lower alkoxy, halogen, lower alkanoyloxy and lower alkanoylamino, or R^2 represents one of the above-mentioned radicals of the formulae Ia and Ib; R^3 represents hydrogen or lower alkyl and R^5 represents hydrogen, or R^3 and R^5 together represent lower alkylidene, unsubstituted benzyldiene or benzyldiene the phenyl radical of which is halogenated or substituted by lower alkyl; R^7 represents hydrogen or lower alkyl, or R^7 and R^9 together represents trimethylene; R^8 represents hydrogen or lower alkyl; R^9 represents hydrogen or lower alkyl that is unsubstituted or substituted by hydroxy, mercapto, lower alkylthio, carboxy, lower alkoxy, carbamoyl, or by a radical of the formula Ic, Id, Ie or If



in which q represents 0 or 1; X^4 represents oxygen or sulphur; and X^5 and X^6 each represents, independently of the other, oxygen or the group NH; Y^2 represents alkylene having up to and including 18 carbon atoms in which a methylene group may have been replaced by oxygen, sulphur or sulphonyl or which may be interrupted by carbonylimino or carbonyloxy, said alkylene radical Y^2 being unsubstituted or substituted by at least one substituent selected from carboxy, benzyloxycarbonyl, lower alkoxy, amino, lower alkanoylamino, hydroxy and lower alkanoyloxy, and the other substituents have the meanings mentioned above; R^{10} and R^{12} each represents, independently of the other, (a) lower alkoxy, (b) hydroxy, (c) amino, (d) lower alkylamino that is substituted by carboxy, by carbamoyl or by lower alkoxy, and that may be additionally substituted by at least one substituent selected from amino, hydroxy, carboxy, 2-aminomethylthio, 2-aminoethoxy and the sulpho group $-\text{SO}_3\text{H}$, (e) a radical of the formula Ig,



in which the substituents have the meanings mentioned above, or (f) a radical of the formula Ih,



in which q, X^5 , Y^2 and A^2 have the meanings mentioned above; and R^{11} represents hydrogen, carboxy, lower alkoxy, carbamoyl, said compound of the formula I having a minimum of one and a maximum of three radicals selected from A^1 and A^2 , or a pharmaceutically acceptable salt of such a compound having at least one salt-forming group.

4,711,880

CRYSTALLINE DISODIUM

3-AMINO-1-HYDROXYPROPANE-1,1-DIPHOSPHONATE PENTAHYDRATE

Peter H. Stahl, Freiburg, Fed. Rep. of Germany, and Beat Schmitz, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Division of Ser. No. 759,985, Jul. 29, 1985, Pat. No. 4,639,338. This application Sep. 8, 1986, Ser. No. 905,097

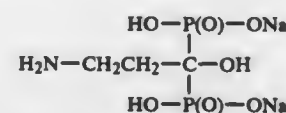
Claims priority, application Switzerland, Aug. 6, 1984, 3768/84

Int. Cl. A61K 31/045, 31/66; C07F 9/38

U.S. Cl. 514-108

9 Claims

1. Disodium 3-amino-1-hydroxypropane-1,1-diphosphonate of the formula



in a crystalline form that contains water of crystallisation.

9. Pharmaceutical preparations intended for enteral administration to warm-blooded animals, containing disodium 3-amino-1-hydroxypropane-1,1-diphosphonate in addition to

-continued

(Ie)

(If)

(Ih)

customary pharmaceutical auxiliaries, characterised in that they contain the mentioned active ingredient in a crystalline form that contains water of crystallisation according to claim 1.

4,711,881

1 α ,25-DIHYDROXY-26,27-DIMETHYLCHOLECALCIFEROL AND ITS USE IN THE TREATMENT OF CALCIUM PATHOBOLISM

Nobuo Ikekawa, Musashino, Japan, assignor to Taiho Pharmaceutical Co., Ltd., Tokyo, Japan

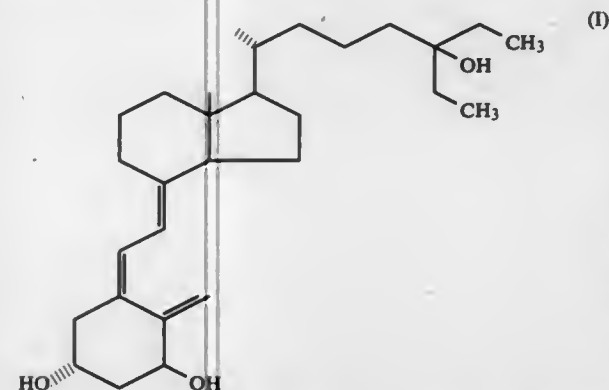
Filed Aug. 7, 1985, Ser. No. 763,568

Claims priority, application Japan, Aug. 10, 1984, 59-167552 Int. Cl. A61K 31/59; C07J 9/00

U.S. Cl. 514-167

3 Claims

1. 1 α ,25-Dihydroxy-26,27-dimethylcholecalciferol represented by formula:



3. A method for the prevention or treatment of calcium pathobolism or osteoporosis, which comprises administering to a mammal an effective amount of 1 α ,25-dihydroxy-26,27-dimethylcholecalciferol.

4,711,882

OCTAHYDRO-6-AZAINDOLE COMPOUNDS, COMPOSITIONS AND USE

Simon F. Campbell, Deal, and Ryszard J. Kobylecki, Sandwich, both of England, assignors to Pfizer Inc., New York, N.Y.

Filed Dec. 19, 1985, Ser. No. 811,253

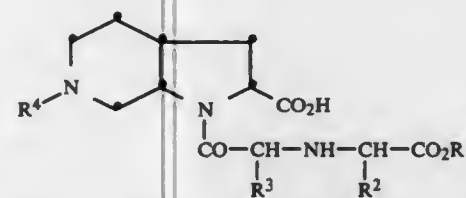
Claims priority, application United Kingdom, Dec. 21, 1984, 8432532; Jun. 10, 1985, 8514634

Int. Cl. A61K 31/435, 31/535; C07D 471/04

U.S. Cl. 514-228

20 Claims

1. An octahydro-6-azaindole dipeptide derivative of the formula:



or a pharmaceutically acceptable salt thereof, wherein:

R^1 is hydrogen, C_1 - C_6 alkyl, C_2 - C_6 alkenyl or aryl- $(C_1$ - C_4 alkyl);

R^2 is C_1 - C_6 alkyl, C_2 - C_6 alkenyl, C_3 - C_7 cycloalkyl or substituted C_1 - C_6 alkyl in which the substituent is halogen, hydroxy, C_1 - C_6 alkoxy, aryl, aryloxy, aryl- $(C_1$ - C_4 alkoxy), C_1 - C_4 alkylthio, arylthio, aryl- $(C_1$ - C_4 alkyl)thio, C_3 - C_7 cycloalkyl, $-\text{NR}^5\text{R}^6$, $-\text{NHCOR}^7$, $-\text{NHCOOR}^7$, guanidino or a heterocyclyl group;

R^3 is C_1 - C_6 alkyl, C_3 - C_7 cycloalkyl or substituted C_1 - C_6 alkyl in which the substituent is halogen, hydroxy, C_1 - C_4

alkoxy, C_1 - C_4 alkylthio, C_3 - C_7 cycloalkyl, $-\text{NR}^5\text{R}^6$, $-\text{NHCOR}^7$, $-\text{NHCOOR}^7$, $-\text{COOH}$, $-\text{COO}(C_1$ - C_4 alkyl), $-\text{CONR}^5\text{R}^6$, guanidino, aryl or a heterocyclyl group; and

R^4 is $-\text{SO}_2\text{R}^7$ or $-\text{SO}_2\text{NR}^5\text{R}^6$, wherein

R^5 and R^6 are each independently hydrogen, C_1 - C_6 alkyl, C_3 - C_7 cycloalkyl, aryl, heterocyclyl or a substituted C_1 - C_6 alkyl group in which the alkyl group is substituted by one or more halogen atoms or an hydroxy or a C_3 - C_7 cycloalkyl, aryl, heterocyclyl or $-\text{NR}^8\text{R}^9$ group wherein R^8 and R^9 are each independently hydrogen, C_1 - C_4 alkyl, $-\text{CO}(C_1$ - C_4 alkyl) or aryl; and

R^7 is C_1 - C_6 alkyl, C_3 - C_7 cycloalkyl, aryl, heterocyclyl or a substituted C_1 - C_6 alkyl group in which the alkyl group is substituted by one or more halogen atoms or an hydroxy or a C_3 - C_7 cycloalkyl, aryl, heterocyclyl or $-\text{NR}^8\text{R}^9$ group;

said aryl groups in the definition of R^1 , R^2 , R^3 and R^4 having up to ten carbon atoms in the nuclear ring; and said heterocyclyl groups in the definition of R^2 , R^3 and R^4 being pyridyl, furyl, thienyl, benzothienyl, indolyl, imidazolyl, thiazolyl, pyrrolidinyl, piperidino, morpholino or piperazinyl, with said groups being optionally substituted with halogen, hydroxy, oxo, C_1 - C_4 alkyl, carbamoyl, amino or mono- or di- $(C_1$ - C_4 alkyl)amino groups.

19. A pharmaceutical composition suitable for oral or parenteral administration comprising a pharmaceutically acceptable carrier and an effective antihypertensive amount of a compound of a compound as claimed in claim 1.

4,711,883

SUBSTITUTED

3-(4-PHENYL-1-PIPERAZINYL)ALKYLQUINAZOLIN-2,4-(1H,3H) DIONES, METHODS OF PREPARATION, COMPOSITIONS AND METHOD OF USE

Victor T. Bandurco, Bridgewater; Charles F. Schwender, California; Robert Falotico, Belle Mead, all of N.J., and Alfonso J. Tobia, Doylestown, Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

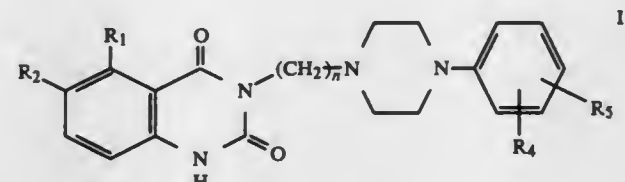
Filed Sep. 30, 1985, Ser. No. 782,241

Int. Cl. A61K 31/505; C07D 403/06

U.S. Cl. 514-253

12 Claims

12. A method of treating hypertension, which comprises administering an effective antihypertensive amount in a pharmaceutically acceptable carrier of a compound of the formula



wherein

R_1 is hydroxy or alkoxy having 1-4 carbon atoms;

R_2 is hydroxy or alkoxy having 1-4 carbon atoms; or when R_1 or R_2 are taken together they are loweralkylenedioxy; n is an integer from 2 to 6;

R_4 and R_5 are the same or different and are hydrogen, hydroxy, alkyl having 1-4 carbon atoms, alkoxy having 1-4 carbon atoms, halo, or trifluoromethyl, or when R_4 and R_5 are taken together they are loweralkylenedioxy;

or the pharmaceutically acceptable salts thereof.

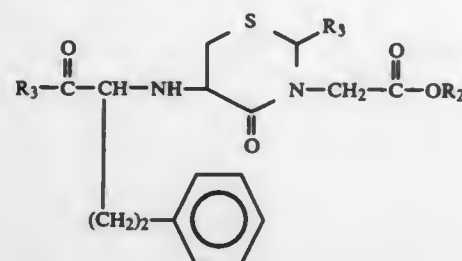
4,711,884

THIAZINE AND THIAZEPINE CONTAINING COMPOUNDS

Donald S. Karanewsky, East Windsor, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.
Continuation-in-part of Ser. No. 470,882, Feb. 28, 1983, Pat. No. 4,460,579. This application Dec. 77, 1983, Ser. No. 565,498
Int. Cl.⁴ C07D 279/06, 281/02; A61K 31/54, 31/55
U.S. Cl. 514-226

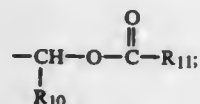
6 Claims

1. A compound of the formula:



and a pharmaceutically acceptable salt thereof wherein:

R₃ is hydroxy, ethoxy, or -O-alkali metal salt ion;
R₅ is hydrogen or phenyl;
R₂ is hydrogen, alkali metal salt ion, or



R₁₀ is hydrogen, straight or branched chain lower alkyl of 1 to 4 carbons, or cyclohexyl; and
R₁₁ is straight or branched chain lower alkyl of 1 to 4 carbons.

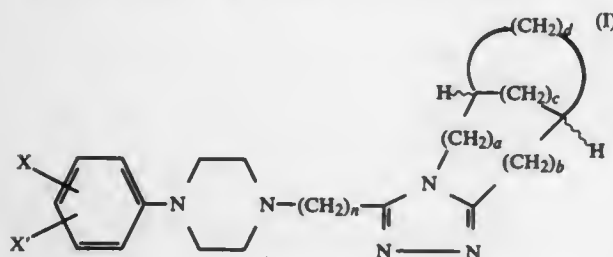
4,711,885

N-(N'-PHENYLPIPERAZINE)-ALKYL TRIAZOLE COMPOUNDS HAVING ANXIOLYTIC AND ANALGESIC PROPERTIES

Michel Wierzbicki, Puteaux; Pierre Hugon, Rueil Malmaison, and Jean-Claude Poignant, Bures S/Yvette, all of France, assignors to Adir et Compagnie, Neuilly-sur-Seine, France
Filed Apr. 1, 1986, Ser. No. 846,911
Claims priority, application France, Apr. 17, 1985, 85 05762
Int. Cl.⁴ A61K 31/495; C07D 403/14, 401/14
U.S. Cl. 514-253

10 Claims

1. A compound selected from the group consisting of: triazole compounds of the formula:



in which:

X and X', which are the same or different, are each selected from the group consisting of hydrogen, halogen, trifluoromethyl, and alkyl and alkoxy each having from 1 to 5 carbon atoms inclusive, and
X and X' together represent methylenedioxy,
n is selected from the group consisting of integers of from 1 to 6,

a is selected from the group consisting of 0, 1 and 2,
b is selected from the group consisting of 0, 1, 2 and 3,
c is selected from the group consisting of 0, 1 and 2, and
d is selected from the group consisting of 2, 3, 4 and 5 such that the sum of a+b+c+d is equal to 4, 5, 6 or 7, and physiologically tolerable acid addition salts thereof.
10. A method for treating a living animal body afflicted with pain or anxiety comprising the step of administering to the said living animal an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

4,711,886

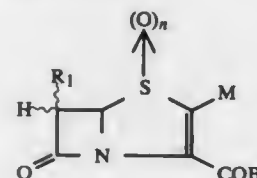
β-LACTAM DERIVATIVES AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

Paul E. Finke, Milltown; James B. Doherty, New Milford; Morris Zimmerman, Watchung; Bonnie M. Ashe, Scotch Plains, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Jul. 2, 1984, Ser. No. 627,166
Int. Cl.⁴ C07D 499/00; A61K 31/425

U.S. Cl. 514-195

6 Claims

1. A method of treating or managing elastase-mediated diseases comprising the administration to a mammalian species in need of such treatment an effective amount of a compound of structural formula:

wherein
M is:

- (1) -OR wherein R is as defined below;
- (2) -SR;
- (3) -SOR;
- (4) -SO₂R;
- (5) -COOR;
- (6) -OCOR;
- (7) phenyl;
- (8) -CH₂A wherein A represents:

- (a) hydrogen;
- (b) C₁-alkyl;
- (c) phenyl;
- (d) OR;
- (e) halo;
- (f) OCOR;
- (g) SR or S(CS)OR_a wherein R_a is C₁-alkyl or H;
- (h) SCOR;
- (i) CH₂NHCHO;
- (j) CH₂N₃;
- (k) CH₂NH₂; or
- (l) CH₂OH;
- (9) hydrogen;

R is:

- (a) hydrogen;
- (b) C₁-alkyl;
- (c) phenyl;
- (d) -CH₂CH₂NH₂;
- (e) -CH₂CH₂NHCOOCH₃;
- (f) -CH₂CH₂OCH₃;
- (g) tetrazolyl; or
- (h) C₆H₅CH₂-;

R₁ is:

- (1) hydrogen;
- (2) C₁-alkyl;
- (3) OR;
- (4) SR;
- (5) C₁-hydroxyalkyl;
- (6) C₁-alkoxycarbonyl-C₁-alkyl;

4,711,888

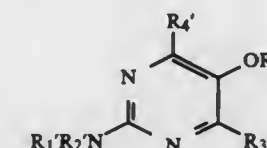
HYDROXY AND ALKOXY PYRIMIDINES

Frederick J. Walker, Groton, and John L. LaMattina, Ledyard, both of Conn., assignors to Pfizer Inc., New York, N.Y.
Filed Jul. 24, 1985, Ser. No. 758,199
Int. Cl.⁴ A61K 31/505; C07D 239/47, 401/04

U.S. Cl. 514-269

17 Claims

13. A composition for the treatment of pulmonary, asthmatic, allergic or inflammatory diseases which comprises a compound of the formula



- (7) C₁-alkoxycarbonyloxy-C₁-alkyl;
 - (8) benzoylcarbonyloxy-C₁-alkyl; or
 - (9) phenoxycarbonyloxy-C₁-alkyl;
- B is OB₁ or NB₂B₃ wherein B₁ and B₂ independently are
- (1) benzyl;
 - (2) phenyl;
 - (3) straight or branched C₁-alkyl;
 - (4) straight or branched C₂-alkenyl;
 - (5) C₃-cycloalkyl;
 - (6) C₁-alkanoyloxy C₁-alkyl;
 - (7) C₁-alkanoyl C₁-alkyl;
 - (8) C₁-alkoxy C₁-alkyl; or
 - (9) halo-C₁-alkyl;

the above groups (1)-(9) can optionally be substituted by radicals selected from a group consisting of C₁-alkyl, hydroxy, C₁-alkoxy, halo, nitro, mercapto, amino, cyano, carboxy, sulfoamino, carbamoyl, carbamoyloxy C₁-alkyl or amino sulfonyl, C₁-alkylamino, sulfamoyl, azido, carboxamido or N-C₁-alkylcarboxamido: n is 0, 1 or 2.

4,711,887

HYDRAZINOPYRIDAZINE COMPOUNDS

Malcolm T. Briggs, Macclesfield; Robert I. Dowell, Congleton, and Craig W. Thornber, Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 28, 1983, Ser. No. 479,913

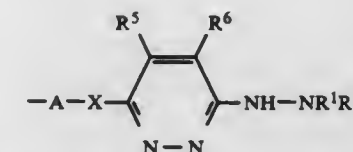
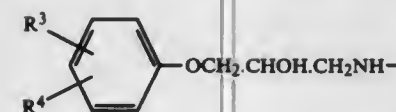
Claims priority, application United Kingdom, Apr. 23, 1982, 8211760

Int. Cl.⁴ C07D 237/20; A61K 31/50

U.S. Cl. 514-247

10 Claims

1. A compound of the formula:



wherein A stands for an alkylene radical of from 2 to 6 carbon atoms, wherein either R¹ stands for hydrogen and R² stands for hydrogen or for an alkoxy carbonyl radical of from 2 to 6 carbon atoms or an alkoxy carbonyl radical of from 8 to 12 carbon atoms, or R¹ and R² together form an alkylidene radical of from 7 to 12 carbon atoms, or an alkoxy carbonyl or alkoxy carbonyl-alkylidene radical of, respectively, from 4 to 10 or from 9 to 15 carbon atoms; wherein R³ and R⁴, which may be the same or different, each stands for a hydrogen or halogen atom, a hydroxy, amino, nitro, trifluoromethyl, carbamoyl or cyano radical, an alkyl, hydroxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl radical each of up to 6 carbon atoms, or an aryl, aryloxy or dialkylamino radical each of up to 12 carbon atoms; or wherein R³ and R⁴ together form the trimethylene, tetramethylene, 1-oxotetramethylene, propylene, but-2-enylene or buta-1,3-dienylene radical such that together with the adjacent benzene ring they form respectively the indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl radical; wherein R⁵ and R⁶, which may be the same or different, each stands for a hydrogen atom or for an alkyl radical of up to 6 carbon atoms, or wherein R⁵ and R⁶ together form the buta-1,3-dienylene radical such that together with the adjacent pyridazine ring they form the phthalazinyl radical; and wherein X stands for the oxygen atom; or an acid-addition salt thereof.

4,711,889

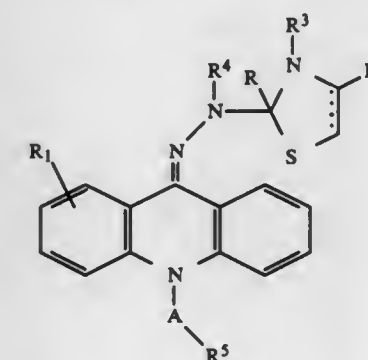
SCHISTOSOMICIDAL ACRIDANONE HYDRAZONES

Urs Brombacher, Riehen; Helmut Link, and Marc Montavon, both of Basel, all of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.
Continuation of Ser. No. 551,808, Nov. 15, 1983, abandoned.
This application Jul. 18, 1986, Ser. No. 887,580
Int. Cl.⁴ A61K 31/47; C07D 219/10

U.S. Cl. 514-297

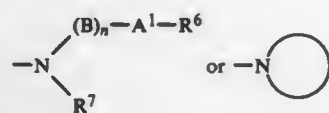
34 Claims

1. A compound of the formula

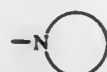


wherein the dotted line is an optional bond,
R¹ is hydrogen, halogen or nitro,

R^2 is hydrogen or lower alkyl,
one of R^3 and R^4 is hydrogen or lower alkyl and the other
together with R is an additional bond,
A is lower alkylene,
 R^5 is a 5-membered, optionally lower alkyl-substituted aromatic heterocycle, containing one or two nitrogen atoms or one nitrogen atom and an oxygen or sulfur atom linked with group A via a carbon atom or via a nitrogen of the heterocycle, amino or the group

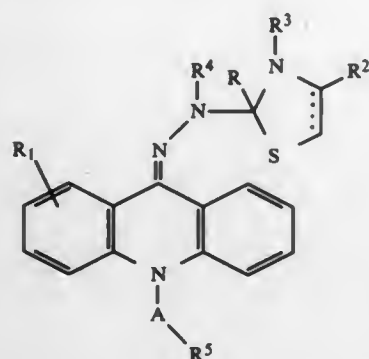


the symbol

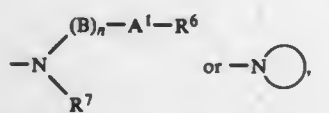


is an unsubstituted heterocycle selected from the group consisting of 1-pyrrolidinyl, 1-piperidinyl, 4-morpholino, 1-piperazinyl and 1-piperazinyl substituted on the second nitrogen atom by the group $-(B)_n-A^1-R^6$; or a lower-alkyl substituted heterocycle selected from the group consisting of 1-pyrrolidinyl, 1-piperidinyl, 4-morpholino, 1-piperazinyl and 1-piperazinyl substituted on the second nitrogen atom by the group $-(B)_n-A^1-R^6$ wherein B is $-CO-$, $-COO-$ or $-SO_2-$, n is the integer 0 or 1, A^1 is lower alkylene, R^6 is hydrogen, amino, lower alkyl-amino or di(lower alkyl) amino and R^7 is hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof.

25. A schistosomicidal composition comprising a schistosomicidally effective amount of a compound of the formula



wherein the dotted line is an optional bond,
 R^1 is hydrogen, halogen or nitro,
 R^2 is hydrogen or lower alkyl,
one of R^3 and R^4 is hydrogen or lower alkyl and the other together with R is an additional bond,
A is lower alkylene, R^5 is a 5-membered, optionally lower alkyl-substituted aromatic heterocycle, containing one or two nitrogen atoms or one nitrogen atom and an oxygen or sulfur atom linked with group A via a carbon atom or via a nitrogen of the heterocycle, amino or the group



the symbol



is an unsubstituted heterocycle selected from the group consisting of 1-pyrrolidinyl, 1-piperidinyl, 4-morpholino, 1-piperazinyl and 1-piperazinyl substituted on the second nitrogen atom by the group $-(B)_n-A^1-R^6$; or a lower-alkyl substituted heterocycle selected from the group consisting of 1-pyrrolidinyl, 1-piperidinyl, 4-morpholino, 1-piperazinyl and 1-piperazinyl substituted on the second nitrogen atom by the group $-(B)_n-A^1-R^6$ wherein B is $-CO-$, $-COO-$ or $-SO_2-$, n is the integer 0 or 1, A^1 is lower alkylene, R^6 is hydrogen, amino, lower alkyl-amino or di(lower alkyl) amino and R^7 is hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof, and an inert pharmaceutical carrier.

4,711,890

PHARMACEUTICAL COMPOSITIONS CONTAINING AZANAPHTHALENE-CARBOXAMIDE DERIVATIVES, AZANAPHTHALENE-CARBOXAMIDE DERIVATIVES AND PROCESS FOR THEIR USE

Marie-Christine Dubrocq, Enghien-les-Bains; Gerard R. Le Fur, Le Plessis-Robinson, and Christian L. A. Renault, Taverny, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Dec. 22, 1983, Ser. No. 564,322

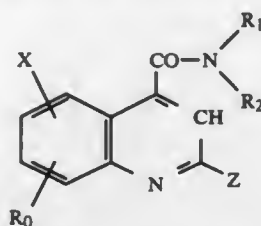
Claims priority, application France, Dec. 24, 1982, 82 21758

Int. Cl.⁴ A61K 31/47; C07D 215/22

U.S. Cl. 514—311

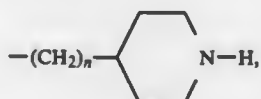
12 Claims

1. A pharmaceutical composition useful in the treatment of anxiety states or of pulmonary, renal, circulatory or cardiovascular disorders, which comprises as active ingredient, an effective amount of a compound of the formula:



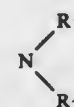
(I)

in which R_1 represents a linear or branched alkyl group having 1 to 6 carbon atoms, a phenyl group, a cycloalkyl group having 3 to 6 carbon atoms, a phenylalkyl group, the alkyl moiety of which has 1 to 3 carbon atoms, a cycloalkyl-alkyl group, the cycloalkyl moiety of which has 3 to 6 carbon atoms and the alkyl moiety of which has 1 to 3 carbon atoms, R_2 represents a linear or branched alkyl group having 1 to 6 carbon atoms, a phenyl group, a cycloalkyl group having 3 to 6 carbon atoms, a phenylalkyl group, the alkyl moiety of which has 1 to 3 carbon atoms, a cycloalkyl-alkyl group, the cycloalkyl moiety of which has 3 to 6 carbon atoms and the alkyl moiety of which has 1 to 3 carbon atoms or a



in which n is 0, 1, 2 or 3, or R_1 and R_2 together with the nitrogen atom to which they are attached represent a pyrrolidinyl, piperidino, 4-oxopiperidino or piperidino group substituted by one or two alkyl groups having 1 to 3 carbon atoms, by a hydroxyl group in the 3- or 4-position or by hydroxyalkyl, dimethylaminoalkyl or diethylaminoalkyl groups, the alkyl

moiety of which has 1 to 3 carbon atoms, Z represents a phenyl, pyridinyl, thienyl or thiazol-2-yl group or a phenyl group substituted by one or two substituents selected from amongst halogen atoms, alkyl, alkoxy and alkylthio groups having 1 to 3 carbon atoms, the trifluoromethyl group and the nitro group, X and R_0 are identical or different and represent hydrogen atoms or halogen atoms, alkyl or alkoxy groups having 1 to 3 carbon atoms or nitro or trifluoromethyl groups, with the exception of a said compound in which Z represents a phenyl group, the



is N,N-diethyl and X and R_0 both represent hydrogen atoms, or a stereoisomer or mixture of stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof, in association with a pharmaceutically acceptable carrier or coating.

4,711,891

USE OF TERGURIDE AS A GERIATRIC AGENT

Bernd Aufdembrinke; Rainer Dorow; Reinhard Horowski; Irmgard Sachy; Gertrud Schroeder; Helmut Wachtel; Wolfgang Kehr, and Günter Stock, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,779

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522894

Int. Cl.⁴ A61V 31/47

U.S. Cl. 514—313

27 Claims

1. A method of treating a cognition decline or a decline or disturbance in motor function or vigilance in a geriatric patient comprising administering to the patient an effective amount of terguride or a pharmacologically acceptable salt thereof.

4,711,892

CERTAIN 5-NITRO-2-FURYL DERIVATIVES OF PYRIDYLPROPENOIC ACID HYDRAZIDES WHICH ARE USEFUL IN TREATING BACTERIAL, FUNGAL, PROTOZOAL, PARASITIC AND INTESTINAL INFECTIONS

Philippe Manoury, Verrieres le Buisson; Daniel Obitz, Antony, and Michel Peynot, L'Hay les Roses, all of France, assignors to Synthelabo, Paris, France

Filed Apr. 10, 1986, Ser. No. 851,113

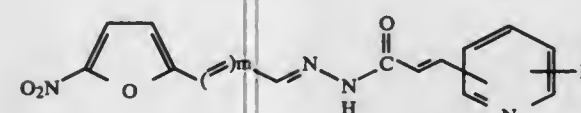
Claims priority, application France, Apr. 11, 1985, 8505424

Int. Cl.⁴ C07D 405/12; A61K 31/44

U.S. Cl. 514—336

8 Claims

1. A compound of formula (I)



in which

m is 0 or 1 and

R is hydrogen or (C_{1-4}) alkoxy.

4,711,893

USE OF HYDROXYINDOLE DERIVATIVES IN LOWERING BLOOD PRESSURE

Hans-Heinrich Hausberg, Ober-Ramstadt; Henning Böttcher; Christoph Seyfried, both of Darmstadt, and Rolf Bergmann, Reichelsheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 738,329, May 28, 1985, abandoned. This application Sep. 16, 1986, Ser. No. 907,909

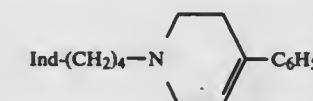
Claims priority, application Fed. Rep. of Germany, May 28, 1984, 3419935

Int. Cl.⁴ A61K 31/44

U.S. Cl. 514—339

10 Claims

1. A method of lowering blood pressure in a patient in need of such treatment comprising administering to the patient an effective amount of an hydroxyindole of the formula



wherein Ind is 4-, 5-, 6- or 7-hydroxyindole-3-yl, or 4-, 5-, 6- or 7-hydroxyindole-3-yl substituted in the 2-position by C_{1-3} alkyl, or monosubstituted or disubstituted in the benzene ring by C_{1-3} alkyl, F, Cl, Br or CN, or a physiologically acceptable acid addition salt thereof.

4,711,894

STABILIZED TOCOPHEROL IN DRY, PARTICULATE, FREE-FLOWING FORM

Bruce E. Wenzel, Bloomington, and James P. Clark, Richfield, both of Minn., assignors to Henkel Corporation, Ambler, Pa.

Filed Jan. 16, 1986, Ser. No. 819,779

Int. Cl.⁴ A61K 31/355

U.S. Cl. 514—458

8 Claims

1. In a dry, potency stabilized, particulate, free-flowing tocopherol composition of a carrier and a tocopherol compound, the improvement wherein said tocopherol compound is d- or d,l-alpha-tocopherol and said composition contains a potency stabilizer selected from the group consisting of ascorbic acid, a mixture of ascorbic acid and cysteine and a mixture of citric acid and cysteine said potency stabilizer being present in an amount of about 2-50% by weight based on the total weight of tocopherol and stabilizer and wherein the weight ratio of tocopherol to stabilizer is from 98:2 to about 1:1.

4,711,895

4-HYDROXY-2-CYCLOPENTENONE, PROCESS FOR PRODUCTION THEREOF, PHARMACEUTICAL COMPOSITION COMPRISING IT

Atsuo Hazato; Satoshi Sagiura, both of Hino; Seizi Kurozumi, Kokubunji, and Ryoji Noyori, Aichi, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 22, 1985, Ser. No. 791,156

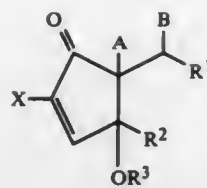
Claims priority, application Japan, Oct. 22, 1984, 59-220475; Oct. 22, 1984, 59-220476; Feb. 18, 1985, 60-28429; Jun. 18, 1985, 60-130845

Int. Cl.⁴ A61K 31/19

U.S. Cl. 514—530

9 Claims

1. A 4-hydroxy-2-cyclopentenone represented by the following formula (I)



wherein X represents a hydrogen or halogen atom, A represents a hydrogen atom and B represents a hydroxyl group, or A and B are bonded to each other to represent a bond, R¹ represents a substituted or unsubstituted alkyl, alkenyl or alkynyl group having 1 to 10 carbon atoms, R² represents a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, and wherein the substituents on the group R¹ and R² may be identical or different from each other and are selected from a group of the formula —COOR⁴ in which R⁴ represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or one equivalent of a cation; a group of the formula —OR⁵ in which R⁵ represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms which may be substituted by a halogen atom, a carboacyl group having 1 to 7 carbon atoms, or a phenyl group, the phenyl group being optionally substituted by a halogen atom, an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms; a phenyl group which may be substituted by a halogen atom, an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms; a cycloalkyl group having 3 to 8 carbon atoms which may be substituted by a halogen atom, an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms; or a residue or a carbohydrate, and R³ represents a hydrogen atom, a carboacyl group having 2 to 7 carbon atoms, a tri(C₁-C₇)hydrocarbonsilyl group, or a group forming an acetal linkage together with the oxygen atom of the hydroxyl group.

7. A pharmaceutical composition comprising a pharmaceutically effective amount of a least one 4-hydroxy-2-cyclopentenone of claim 1 and a pharmaceutically acceptable carrier.

4,711,896

α, ω-DICARBOXYLIC ACIDS AND MEDICAMENTS WHICH CONTAIN THESE COMPOUNDS

Jacob Bar-Tana, Jerusalem, Israel; Ernst-Christian Witte, Mannheim, Fed. Rep. of Germany; Bernd Hagenbruch, Lambertheim, Fed. Rep. of Germany; Johannes Pill, Leimen, Fed. Rep. of Germany, and Karlheinz Stegmeier, Heppenheim, Fed. Rep. of Germany, assignors to EPIS S.A., Zug, Switzerland
PCT No. PCT/EP85/00288, § 371 Date Feb. 21, 1986, § 102(e) Date Feb. 21, 1986, PCT Pub. No. WO86/00298, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 15, 1985, Ser. No. 840,563

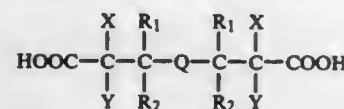
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3423166

Int. Cl.⁴ A61K 31/19; C07C 121/48, 121/50, 57/34

U.S. Cl. 514—570

8 Claims

1. An α,ω-dicarboxylic acid compound of formula I'



in which R₁ and R₂, which can be the same or different, signify a C₁-C₆ lower alkyl group, which is unsubstituted or is substituted by hydroxyl, C₁-C₆ lower alkoxy, halogen, phenyl or phenyl substituted one or more times by hydroxyl, C₁-C₆

lower alkoxy, C₁-C₆ lower alkyl or halogen, a C₂-C₆ lower alkenyl or C₂-C₆ alkynyl group; a C₃-C₇ cycloalkyl group, a phenyl group, or a phenyl group substituted by hydroxyl, halogen, C₁-C₆ lower alkyl or C₁-C₆ lower alkoxy,

X and Y, which can be the same or different, signify hydrogen, C₁-C₆ lower alkyl, C₁-C₆ lower alkoxy, hydroxyl, cyano, halogen, carboxyl, C₁-C₆ lower alkoxy carbonyl or carbamoyl, and

Q represents a —(CH₂)_n—cyclohexylidene—(CH₂)_n—, a —(CH₂)_m—phenylene—(CH₂)_m—, a —CH₂—CH=CH—phenylene—CH=CH—CH₂— or a —CH₂—CH=CH—CH₂—phenylene—CH₂—CH=CH—CH₂—group, n is 2, 3 or 4 and m is 3 or 4,

or an in vivo hydrolysable carboxylic acid derivative thereof.

7. A pharmaceutical composition comprising a lipid sinking or antidiabetic effective amount of the compound of claim 1 in admixture with usual carrier and adjuvant materials.

4,711,897

ANIMAL FEED METHODS AND COMPOSITIONS USING CYSTEAMINE

Thomas O. Lindsey, Coatesville, Pa., and Michael T. Zavy, El Reno, Okla., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Apr. 24, 1985, Ser. No. 726,751

Int. Cl.⁴ A23K 1/16

U.S. Cl. 514—665

4 Claims

1. An animal feed composition comprising a whole animal feed ration or a premix and cysteamine as a supplement consisting essentially of said supplement in an amount effective for increasing the growth rate of an immature, meat producing, monogastric animal but which is not toxic to said animal, said amount being from about 25 to 250 ppm of cysteamine base.

4,711,898

4-QUINOLONE DERIVATIVES HAVING ANTI-INFLAMMATORY, ANTI-ALLERGIC, ANTITUSSIVE, EXPECTORANT AND ANTITHROMBOTIC ACTIVITY

Hiroshi Enomoto, Nagoakakyo; Tadatoshi Nomura, Uji; Yoshiaki Aoyagi, Otsu; Sholchi Chokai, Kameoka; Yukio Fujita, Takatsuki; Tatsuhiko Kono, Suita; Masao Murase, Kusatsu; Kichiro Inoue, Kyoto, and Masahiro Adachi, Hirakata, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan
Continuation of Ser. No. 504,246, Jun. 14, 1983, abandoned.
This application Sep. 27, 1985, Ser. No. 781,142

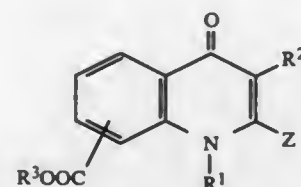
Claims priority, application Japan, Jun. 14, 1982, 57-102592

Int. Cl.⁴ A61K 31/47; C07D 215/48

U.S. Cl. 514—312

17 Claims

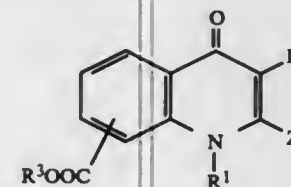
1. A compound of the formula (I):



or a pharmaceutically acceptable salt thereof, wherein R¹ and R² are each hydrogen, alkyl of 1 to 8 carbon atoms or alkenyl of 2 to 4 carbon atoms; R³ is hydrogen, alkyl of 1 to 8 carbon atoms unsubstituted or substituted by one or two hydroxyl moieties, alkyl of 3 to 10 carbon atoms with one or two ether bonds unsubstituted or substituted by 1 hydroxyl group or —(CH₂)_nA wherein n is an integer of 1 to 3 and A is acetyl, acetoxy, ethoxycarbonyl, ethoxycarbonylacetyl, cyano or phenoxy, phenylethyl or allyl; and Z is phenyl unsubstituted or substituted by one or two halo atoms, one or two alkyl moieties of 1 to 8 carbon atoms, haloalkyl of 1 to 3 carbon atoms, one or two alkoxy moieties of 1 to 4 carbon atoms or COOR⁴ wherein

R⁴ is hydrogen or alkyl of 1 to 4 carbon atoms; or Z is pyrrolyl, pyrrolinyl, pyridyl, furyl or thienyl.

5. A method of effecting anti-inflammatory, anti-allergenic, antitussive, expectorant and antithrombotic action in humans and animals which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula (I):



or a pharmaceutically acceptable salt thereof, wherein R¹ and R² are each hydrogen, alkyl of 1 to 8 carbon atoms or alkenyl of 2 to 4 carbon atoms; R³ is hydrogen, alkyl of 1 to 8 carbon atoms unsubstituted or substituted by one or two hydroxyl moieties, alkyl of 3 to 10 carbon atoms with one or two ether bonds unsubstituted or substituted by 1 hydroxyl group or —(CH₂)_nA wherein n is an integer of 1 to 3 and A is acetyl, acetoxy, ethoxycarbonyl, ethoxycarbonylacetyl, cyano or phenoxy, phenylethyl or allyl; and Z is phenyl unsubstituted or substituted by one or two halo atoms, one or two alkyl moieties of 1 to 8 carbon atoms, haloalkyl of 1 to 3 carbon atoms, one or two alkoxy moieties of 1 to 4 carbon atoms or COOR⁴ wherein R⁴ is hydrogen or alkyl of 1 to 4 carbon atoms; or Z is pyrrolyl, pyrrolinyl, pyridyl, furyl or thienyl, in combination with a pharmaceutically acceptable carrier.

4,711,899

2-(4-BENZOYL-1-PIPERIDYL)-1-PHENYLALKANOL DERIVATIVES

Bernard Gaudilliere, Nanterre, and Jean Rousseau, Bourg La Reine, both of France, assignors to Synthelabo, Paris, France
Filed May 13, 1986, Ser. No. 862,715

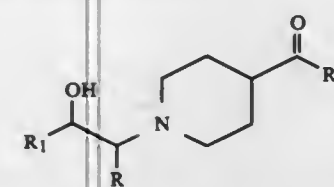
Claims priority, application France, May 14, 1985, 85 07270

Int. Cl.⁴ A61K 31/445; C07D 211/32

U.S. Cl. 514—330

9 Claims

1. A compound of formula (I)



in which R is hydrogen or methyl, R₁ is unsubstituted phenyl, 4-methoxy-3,5-dimethyl phenyl or phenyl substituted at one of the 2-, 3- or 4-positions by halogen, C₁-4 alkyl, C₁-4 alkoxy, hydroxy, benzyloxy, trifluoromethyl, cyano, nitro, amino, acetamino, methylthio, methylsulphonyl or aminosulphonyl and R₂ is unsubstituted phenyl, 2,4,6-trimethoxyphenyl or phenyl substituted at either the 3- or the 4-position by fluorine, chlorine, methyl or methoxy, or a pharmaceutically acceptable, acid addition salt thereof.

6. A method for treating humans or non-human animals suffering from anoxia comprising administering an amount of a compound of formula (I) as defined in claim 1 to a human or animal in need thereof effective for the treatment of anoxia.

4,711,900 CERTAIN ARYLALKYL OR PYRIDYLALKYL HYDROXAMATES USEFUL FOR TREATING ALLERGIES AND ASTHMA

Ravi K. Varma, Belle Mead, and Eric M. Gordon, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

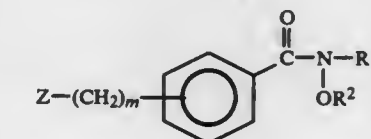
Filed Jul. 23, 1986, Ser. No. 888,616

Int. Cl.⁴ C07C 83/10; C07D 213/64; A61K 31/235, 31/44

U.S. Cl. 514—351

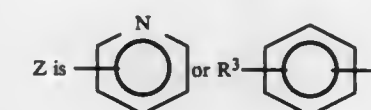
13 Claims

1. A compound having the structure



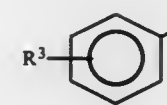
wherein

R¹ is H, alkyl, aryl, lower alkenyl having 3 to 8 carbons, cycloalkyl having 3 to 12 carbons, or aryl-alkyl; R² is H, alkyl, aryl, cycloalkyl having 3 to 12 carbons, alkanoyl or aryl; m is 2 to 8;



wherein

R³ is COOH; and (CH₂)_m is unsubstituted or substituted with 1 or 2 alkyl and/or 1 or 2 halogen substituents; and where Z is



including pharmaceutically acceptable basic salts thereof, wherein the term alkyl by itself or as part of another group is a straight chain or branched chain radical having 1 to 12 carbons and is unsubstituted or substituted with halogen, CF₃, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkyl-cycloalkyl, hydroxy, alkylamino, alkanoylamino, arylcarbamoylamino, nitro, cyano, thiol or alkylthio; and the term aryl by itself or as part of another group is a monocyclic or bicyclic aromatic group having 6 to 10 carbons in the ring portion and is unsubstituted or substituted with 1 or 2 alkyl groups, 1 or 2 halogens, 1 or 2 alkoxy groups, an aryl group, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbamoylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups.

13. A method for treating asthma in a mammalian species in need of such treatment, which comprises administering to a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,711,901

1-6-NAPHTHYRIDINE DERIVATIVES USEFUL IN THE TREATMENT OF BLOOD VESSEL DISEASES

Gerhard Satzinger, Im Mattenbühl 7, 7809 Denzlingen; Johannes Hartenstein, Föhrenbühl 23, 7801 Stegen-Wittental; Karl Mannhardt, Pfauenstr. 14, 7807 Elzach-Oberprechtal; Jürgen Kleinschroth, Frefburger Str. 13, 7809 Denzlingen; Hartmut Oswald, Kieferweg 1, 7808 Waldkirch 2; Günter Weinheimer, Sachsenstr. 4, 7809 Denzlingen, and Edgar Fritschl, Am Scheuerwald 2, 7811 St. Peter, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 767,989, Aug. 21, 1985, abandoned. This application Jul. 30, 1986, Ser. No. 891,712

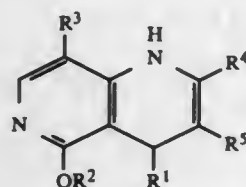
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431303; Jan. 29, 1985, 3502790

Int. Cl.⁴ A61K 31/44; C07D 471/04

U.S. Cl. 514—300

12 Claims

1. A compound of the formula



wherein R¹ is a phenyl radical which is unsubstituted or is mono or disubstituted by halogen, cyano, nitro, lower alkyl, lower alkoxy, difluoromethoxy, trifluoromethoxy, lower alkenedioxy, lower alkylamino, methylthio, difluoromethylthio or trifluoromethyl or R¹ is a thienyl, pyridyl or 2, 1, 3-benzoxadiazolyl radical, R² is a straight-chained or branched alkyl radical containing up to four carbon atoms or a benzyl radical, R³ is a hydrogen atom, a straight-chained or branched alkyl radical containing up to four carbon atoms or an alkoxy-carbonyl radical containing up to five carbon atoms, R⁴ is a straight-chained or branched alkyl radical containing up to four carbon atoms, and R⁵ is a carboxyl group or a straight-chained, branched or cyclic alkoxy-carbonyl radical which contains up to 17 carbon atoms and which chain may be interrupted by an oxygen, sulphur, or nitrogen atom, or a pharmacologically acceptable salt thereof.

9. A compound having the name 2-(N-benzyl-N-methylamino)-ethyl(±)-1,4-dihydro-5-isopropoxy-2-methyl-4-(2-trifluoromethylphenyl)-1,6-naphthyridine-3-carboxylate or a pharmacologically acceptable salt thereof.

4,711,902

MEDICAMENT FORMULATION

Peter Serno, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,469

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339236

Int. Cl.⁴ A61K 31/44, 31/41, 31/415, 31/24

U.S. Cl. 514—356

24 Claims

1. A medicament formulation in the form of a lipid emulsion for intravenous injection comprising a medicinally active compound, a lipid phase, a physiologically tolerated emulsifier and water, the lipid phase being present in an amount of 5 to 20% by weight, the emulsifier being present in about 0.1 to 10% by weight, and water being present up to 100%, the lipid phase containing up to about 50% by weight of a sparingly soluble medicinally active compound, and an ester component said ester component being

at least one ester of at least one C₆ to C₁₂ fatty acid.

4,711,903

PHENOLIC THIOETHERS AS INHIBITORS OF 5-LIPOXYGENASE

Richard A. Mueller, Glencoe; Richard A. Partis, Evanston, and James R. Deason, Wilmette, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

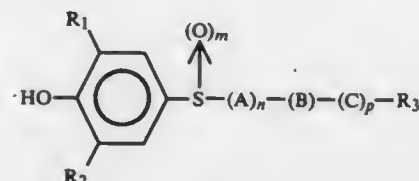
Filed Jan. 31, 1986, Ser. No. 824,984

Int. Cl.⁴ C07C 149/40; A61K 37/10

U.S. Cl. 514—381

20 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof wherein R₁ and R₂ are the same or different and independently represent tert-alkyl or phenyl; A represents methylene or methylene substituted by alkyl, dialkyl or hydroxy, provided that when A includes hydroxymethylene, the hydroxymethylene group is not adjacent to a heteroatom; B represents sulfur, sulfoxide, sulfone, oxygen, —NH— or nitrogen substituted by alkyl, phenyl, benzyl, phenyl substituted by one or two substituents which may be the same or different and are independently selected from the group consisting of halogen, C₁–C₆ alkyl, hydroxy, C₁–C₆ alkoxy, acetoxy, carboxylic acid and C₁–C₆ alkyl esters thereof, nitro or phenyl or benzyl substituted by one or two substituents which may be the same or different and are independently selected from the group consisting of halogen, C₁–C₆ alkyl, hydroxy, C₁–C₆ alkoxy, acetoxy, carboxylic acid and C₁–C₆ alkyl esters thereof, nitro or phenyl; C represents methylene or methylene substituted by alkyl; R₃ represents CO₂H, CO₂-alkyl, or a tetrazole group; m is 0 or 1, n is 2, 3, or 4 and p is 1, 2, or 3.

11. A pharmaceutical composition for the treatment of inflammation and allergy conditions comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,711,904

METHOD OF TREATING SKIN DISORDERS

Louis A. Luzzi, and Joyce K. Luzzi, both of 165 Sakonnet Blvd., Narragansett, R.I. 02882

Filed Aug. 4, 1986, Ser. No. 893,049

Int. Cl.⁴ A61K 31/36

U.S. Cl. 514—464

8 Claims

1. A method of treating skin tissue for a skin disorder of a viral, bacterial or fungal nature comprising applying thereto an effective amount of composition wherein the main active ingredient comprises dimethyl isosorbide.

4,711,905

2,4-DIHALOGENOBENZOYL-(THIO)UREA INSECTICIDES

Wilhelm Sirrenberg, Sprockhoevel; Erich Klauke, Odenthal; Ingeborg Hammann, Mulheim, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 489,901, Apr. 28, 1983, abandoned. This application Jun. 19, 1985, Ser. No. 746,554

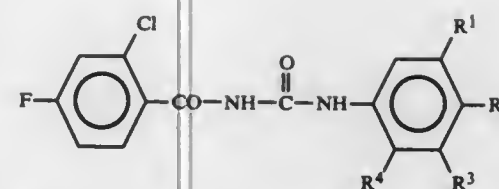
Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217619

Int. Cl.⁴ A01N 47/34; C07C 127/22

U.S. Cl. 514—522

14 Claims

1. A 2,4-dihalo-nobenzoyl-(thio)urea of the formula



in which

R¹ represents hydrogen, halogen, or an optionally halogen-substituted radical from the series comprising C₁–C₆-alkyl, C₁–C₆-alkoxy and C₁–C₆-alkylthio,

R² represents a phenoxy which is optionally substituted by halogen, cyano, nitro, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, C₁–C₄-alkyl, C₁–C₄-alkylthio, C₁–C₄-alkylthioalkyl, C₁–C₄-alkylsulphonyloxy, phenyl and/or C₁–C₄-alkoxycarbonyl,

R³ represents hydrogen, halogen, or an optionally halogen-substituted C₁–C₆-alkyl, C₁–C₆-alkoxy or phenoxy radical, and

R⁴ represents hydrogen, halogen, or optionally halogen-substituted radicals from the series comprising C₁–C₆-alkyl, C₁–C₆-alkylthio and C₁–C₆-alkoxy.

13. A method of combating insects which comprises applying to such insects an insecticidally effective amount of a compound according to claim 1.

4,711,906

LIQUID DICLOFENAC PREPARATIONS

Otto von Stetten, Schellklingen, Fed. Rep. of Germany; Pyare L. Seth, Aesch, Switzerland; Franz Schmid, Pfaffenhofen, and Kurt Ranche, Blaubeuren, both of Fed. Rep. of Germany, assignors to Merckle GmbH, Blaubeuren, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,424

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446873

Int. Cl.⁴ A61K 09/06, 27/00

U.S. Cl. 514—561

19 Claims

1. A stable, liquid diclofenac preparation, especially for the parenteral application, consisting of a solution of diclofenac or one of its salts in an amount of 1.5–6.0 weight % diclofenac in a solvent, wherein the solvent consists of 10–70 weight % of a mixture of (a) propylene glycol and (b) polyethylene glycol and 30–90 weight % water, and the weight ratio of (a) propylene glycol to (b) polyethylene glycol is between 9.5:0.5 and 0.5:9.5.

4,711,907

MEMBRANES OF SUBSTANTIALLY NON-CROSSLINKED ORGANIC POLYMERS WHICH CONTAIN BONDED IONOGENIC GROUPS

Hans-Josef Sterzel, Dannstadt-Schanernheim, and Axel Sanner, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 705,718

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407719

Int. Cl.⁴ C08P 5/20

U.S. Cl. 521—27

7 Claims

1. An electrolysis membrane which comprises: a substantially non-crosslinked acid and base resistant organic polymer containing aromatic structural elements and having a softening point above 80° C. and alkylene radicals bonded to the aromatic structural elements of the polymer chain, said alkylene radicals containing ionogenic groups attached to the alkylene radicals at intervals of not less than 4 carbon atoms from the polymer chain.

4,711,908

SKINLESS POROUS PARTICLE PVC RESIN AND PROCESS FOR PRODUCING SAME

Roman B. Hawrylko, North Olmsted, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 14, 1987, Ser. No. 38,099

Int. Cl.⁴ C08J 9/28

U.S. Cl. 521—56

24 Claims

1. An agitated aqueous suspension process for producing porous, skinless, agglomerated polyvinyl chloride resin particles comprising polymerizing vinyl monomer in the presence of from about 0.01 part by weight to about 0.1 part by weight per 100 parts by weight of polymerizable monomer of at least one ionic sensitive primary dispersant capable of thickening water, and at least one secondary dispersant, wherein an a monovalent inorganic or organic ionic compound in amounts sufficient to desorb a substantial amount of said primary dispersant off the monomer droplets, is charged to the polymerization medium at from about 1% to about 5% conversion of monomer to polymer, thereby producing a skinless, agglomerated, porous PVC resin in particulate form, said resin particles having a mercury porosity of from about 0.1 cc/g to about 0.7 cc/g, and a particle size of from about 70 microns to about 1000 microns, and a friability of less than about 2, and a powder mix time of less than about 400 seconds, and a shape factor less than about 0.85 and wherein greater than about 20% of the area of the surface of said particle is PVC as measured by ESCA.

4,711,909

NEW DISPERSIONS AND THE PREPARATION OF FOAMED RESINS THEREFROM

Ronald L. Pastorino, San Anselmo, and Lawrence A. Bock, Walnut Creek, both of Calif., assignors to Witco Corporation, New York, N.Y.

Division of Ser. No. 934,734, Nov. 25, 1986. This application Apr. 3, 1987, Ser. No. 33,680

Int. Cl.⁴ C08J 9/08

U.S. Cl. 521—69

10 Claims

1. In the method for making a foamed polyester resin by curing and crosslinking unsaturated polyester resin and expanding the resin into a cellular structure with a gas, the improvement which comprises incorporating into the resin an aqueous dispersion comprising a symmetrical or asymmetrical aromatic diacyl peroxide; an alkali metal carbonate or bicarbonate or mixtures thereof; a dispersion stabilizing amount of magnesium aluminum silicate and alkali metal carboxymethyl cellulose and sufficient water to form an aqueous dispersion in an amount sufficient to effect curing and foaming of the unsaturated polyester resin.

4,711,910

PREPARATION OF FIRE RETARDANT FLEXIBLE POLYESTER BASED POLYURETHANE FOAMS HAVING REDUCED DISCOLORATION AND SCORCH

Gary L. Statton, West Chester, and James M. Gaul, Exton, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 24, 1986, Ser. No. 922,629

The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.

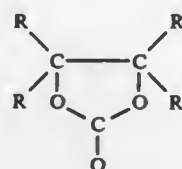
Int. Cl.⁴ C08G 18/14, 18/16, 18/30

U.S. Cl. 521—107

11 Claims

1. A method for the preparation of a scorch and discoloration stabilized fire retarded flexible polyurethane foam which comprises reacting an organic di- or polyisocyanate with a polyester polyol having a hydroxyl number of about 25 to 75 and a functionality of 2 to 3 in the presence of a fire retardant compound, a polyalkylene oxide siloxane block copolymer surfactant, a tertiary amine or organic metal salt catalyst, a blowing agent selected from the group consisting of water which reacts with the di- or polyisocyanate to generate carbon

dioxide and fluorocarbons having a boiling point below 60° C. mixed with water and methylene chloride mixed with water and from about 1 to about 12 parts by weight based on the polyester polyol of a cyclic alkylene carbonate of the formula



wherein R is independently hydrogen, an alkyl group having from 1 to 8 carbon atoms, an alkenyl group having from 1 to 8 carbon atoms or a phenyl group.

4,711,911

PROCESS FOR THE PRODUCTION OF PHENOLIC RESINS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120
Filed Dec. 22, 1986, Ser. No. 944,969

Int. Cl.⁴ C08V 9/00

U.S. Cl. 521—123

21 Claims

1. The process for the production of a foamed phenolic resin by mixing and reacting the following components:

- (A) Substituted organic compound which contains a hydroxyl radical or an epoxy radical and the substituent selected from the group consisting of halogens, acid sulfate, nitrate, acid phosphate, bicarbonate, formate, acetate, propionate, laurate, oleate, stearate, oxalate, acid malonate, acid tartrate, acid citrate, and mixtures thereof, in the amount of 10 to 100 parts by weight;
- (B) Monohydric phenol, selected from the group consisting of phenol, ortho-cresol, meta-phenol, para-cresol and mixtures thereof in the amount of 10 to 50 parts by weight;
- (C) Alkali salt-forming compound in the amount of 1 to 50 parts by weight; and
- (D) a blowing agent.

4,711,912

POLYISOCYANURATE FOAMS FROM DIGESTION PRODUCTS OF POLYALKYLENE TEREPHTHALATE POLYMERS AND POLYOLS

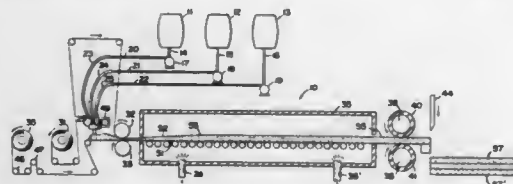
Scott C. Snider, Pinellas Park, and Alberto DeLeon, Clearwater, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Apr. 29, 1982, Ser. No. 372,904

Int. Cl.⁴ C08G 18/00, 18/14

U.S. Cl. 521—125

35 Claims



1. A polyisocyanurate foam comprising the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst, and a minor amount of a polyol mixture prepared by digesting polyalkylene terephthalate with a polyol, wherein the equivalent ratio of said organic polyisocyanate to said polyol mixture is at least 1.5:1.

4,711,913

INTERPENETRATING POLYMER NETWORK COMPOSITIONS EMPLOYING RUBBER-MODIFIED POLYMERS

Louis H. Tateosian, and W. Donald Wilson, both of York, Pa., assignors to Dentsply International Inc., York, Pa.
Continuation-in-part of Ser. No. 552,300, Nov. 16, 1983, Pat. No. 4,551,486. This application Sep. 25, 1984, Ser. No. 654,860
The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.⁴ C08F 2/50; C08K 3/08; C08L 31/06, 51/04

U.S. Cl. 522—14

10 Claims

1. A polymerizable composition comprising:

- (a) from about 10 to about 70 weight percent of di- or poly-functional crosslinking composition;
- (b) from about 3 to about 70 weight percent of polymer composition comprising:
 - (1) from about 1 to about 90% by weight of polymer composition of ethylenically crosslinked addition polymer in the form of discrete particles having average diameters up to about 500 microns and being swellable in the crosslinking composition; and
 - (2) at least about 10% by weight of polymer composition of rubber-modified polymer comprising particles of an elastomer having a glass transition temperature below about 0° C. and having average diameters less than about 5 microns, said particles being overpolymerized with from about 10% to about 80%, by weight of the resulting overpolymerized particles, of monomeric species, said overpolymerized particles being subsequently polymerized with the same or different monomeric species to form macroparticles comprising from about 80% to about 98% of said same or different monomeric species, the macroparticles having average diameters less than about 200 microns.

4,711,914

MICROBIOCIDAL COMPOSITIONS COMPRISING AN ARYL ALKANOL AND A MICROBIOCIDAL COMPOUND DISSOLVED THEREIN

Nano M. Rei, Boxford, and Ronald C. Wilson, Wenham, both of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.
Division of Ser. No. 724,463, Apr. 22, 1985, Pat. No. 4,683,080, which is a continuation-in-part of Ser. No. 619,092, Jun. 11, 1984, Pat. No. 4,663,077. This application Feb. 20, 1987, Ser. No. 17,382

Int. Cl.⁴ C08K 5/34, 5/47, 5/56

U.S. Cl. 523—122

22 Claims

1. A process for imparting microbiocidal properties to a polymer composition comprising adding to the polymer composition, in an amount at least sufficient to impart microbiocidal properties to the polymer composition, a microbiocidal composition comprising a polymer processing aid, and from about 5% to about 20% by weight based on the total weight of the microbiocidal composition, of a microbiocidal compound, said microbiocidal compound being present at the solute in an aryl alkanol solvent, and the aryl alkanol solvent being present in an amount such that the weight ratio of the aryl alkanol solvent to microbiocidal compound is from about 3/1 to about 5/1.

4,711,915

SURFACE COATING COMPOSITIONS CONTAINING SUBSTITUTED 1,3,4-THIADIAZOLES

Lester A. Doe, Jr., Newtown, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed Apr. 7, 1986, Ser. No. 848,535

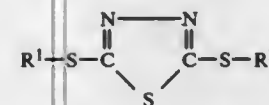
Int. Cl.⁴ C08K 5/46; C07D 285/12; C09D 5/14

U.S. Cl. 523—122

5 Claims

1. An improved surface coating composition comprising a binder selected from the group consisting of alkyd resins and acrylic resins, and about 0.1 to 5.0 percent by weight of the

composition of an antimicrobially active compound having the structural formula



wherein R¹ and R² each represent an alkyl group having 1 to 8 carbon atoms to inhibit the growth of microorganisms on the dry film formed from said coating composition.

4,711,916

INORGANIC FILLER DISPERSED-RESIN COMPOSITION

Takeshi Hagiwara; Masataka Matsuo, both of Fukuoka; Tanezoh Tamehiro, Hyogo; Taizo Tamehiro, Hyogo, and Kakuichi Murakami, Hyogo, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Harima Refractory Co., Ltd., Takasago, both of Japan

Continuation of Ser. No. 537,441, Sep. 30, 1983, abandoned. This application Feb. 10, 1986, Ser. No. 828,094

Claims priority, application Japan, Sep. 30, 1982, 57-172266

Int. Cl.⁴ C08K 3/36, 3/22

U.S. Cl. 523—223

9 Claims

1. A ceramic filler dispersed resin composition comprising a resin matrix and fine spherical ceramic particles dispersed in the resin matrix, said ceramic spherical filler particles having been prepared by passing ceramic particles through a flame of propane-oxygen at a temperature not lower than 2,000° C.

4,711,917

CATIONIC COATING COMPOSITIONS FOR ELECTRODEPOSITION OVER ROUGH STEEL

Gregory J. McCollum, Glenshaw; Roger L. Scriven, Gibsonia; Roger M. Christenson, Gibsonia; George W. Maner, Gibsonia, and Robert R. Zwack, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 698,993, Feb. 7, 1985, Pat. No. 4,615,779. This application Jun. 27, 1986, Ser. No. 879,709

Int. Cl.⁴ C08L 63/00

U.S. Cl. 523—400

9 Claims

1. An electrocoating composition comprising a cationic resin containing blocked polyisocyanate functionality, said cationic resin being derived from a polyepoxide having a 1,2-epoxy equivalency greater than one and having cationic groups selected from amine salt groups, quaternary ammonium base groups, quaternary phosphonium groups and ternary sulfonium groups, said cationic resin having a weight average molecular weight less than 50,000 as determined by gel permeation chromatography; the blocking agent for the polyisocyanate being volatile under curing conditions and having an average molecular weight of 76 or less; said electrocoating composition being pigmented in which the pigments have a size of 6 to 8 as determined with a Hegman grinding gauge, the pigment to resin weight ratio being less than 0.4:1; said electrocoating composition being further characterized such that upon electrodeposition and heating to maximum flow, the incompletely cured coating has a profile of less than 0.160 microns, and upon heating to complete cure, the percentage cured film weight loss is less than 10, and the product of the profile and the square of the percentage cured film weight loss is less than 7.5.

4,711,918

USE OF POLYISOCYANATES OR POLYISOCYANATE MIXTURES AS ADDITIVES FOR AQUEOUS EMULSION PAINTS

Werner Kubitz, and Gerhard Mennicken, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 892,220

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529249

Int. Cl.⁴ C08K 5/29

U.S. Cl. 524—196

8 Claims

5. A process for improving the coatings properties of an aqueous emulsion paint having a binder comprising a homo or copolymer of olefinically unsaturated monomers substantially free from urethane groups which comprises adding to said aqueous emulsion paint, without adding a formaldehyde-based condensation resin, an organic polyisocyanate component having aliphatically and/or cycloaliphatically bound isocyanate groups, a viscosity at 23° C. of about 50 to 4000 mPa.s and an average isocyanate functionality of at least 2.2, wherein said organic polyisocyanate component comprises at least a portion of an organic polyisocyanate having an isocyanate functionality of at least 3.

4,711,919

WATER-SOLUBLE POLYMERS PLUS NATURAL RESINS SIZING AGENT

Reinmar Peppmüller, Krefeld, and Friedlieb Koschier, Slippersfeld, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,064

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1984, 3405019

Int. Cl.⁴ C08L 93/00, 93/04

U.S. Cl. 524—77

10 Claims

1. A mixture comprising
(A) a polymer comprising by weight at least 80% of at least one of acrylamide or methacrylamide, up to 5% of at least one of acrylonitrile, methacrylonitrile, vinyl acetate, maleic acid, diisobutane, or a (meth)acrylic acid ester of a monovalent primary alcohol with 1 to 5 carbon atoms, and 5 to 20% of at least one of acrylic acid or methacrylic acid, and at least one of
(B) a completely saponified rosin, balsam resin or wood resin or
(C) a partially saponified rosin, balsam resin or wood resin, (A) being present in 3 to 50% and (B), (C) or (B) plus (C) being present in 97 to 50% by weight of (A) plus (B), (C) or (B) plus (C).

4,711,920

STABILIZERS FOR HALOGEN-CONTAINING POLYMERS COMPRISING THE PRODUCT OF A DIORGANOTIN OXIDE, AN ETHYLENICALLY UNSATURATED DICARBOXYLIC ACID ESTER AND A MERCAPTAN

Thomas G. Kugele; Keith A. Mesch; Karl R. Wursthorn, and Gary M. Conroy, all of Cincinnati, Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Jul. 23, 1986, Ser. No. 889,323

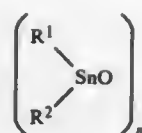
Int. Cl.⁴ C08K 5/57, 5/58; C07F 7/22

U.S. Cl. 524—178

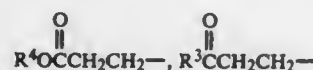
26 Claims

1. A stabilizing composition for stabilizing halogen-containing organic polymers against the deteriorative effect of heat, light and weathering, said composition comprising the reaction product produced by combining:

A. a diorganotin oxide compound containing organic groups linked to tin only through carbon and having the formula:

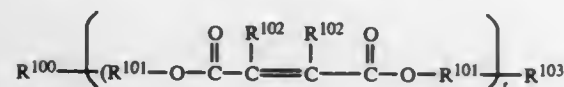


wherein n is an integer of from 1 to 8 and each of R¹ and R², have from about one to about twenty carbon atoms and are selected from the group consisting of alkyl, alkylene, alkenyl, aryl, cycloalkyl, alkylcycloalkyl, arylalkyl,



and N=CCH₂CH₂- wherein R³ is selected from alkyl, alkylene, alkenyl, aryl, cycloalkyl, alkylcycloalkyl and aralkyl and R⁴ is selected from hydrogen and R³;

B. an ethylenically unsaturated dicarboxylic acid ester compound having one carboxyl group on each atom of the ethylene group and being selected from the group consisting of compounds of the formulas:

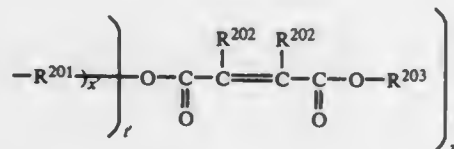
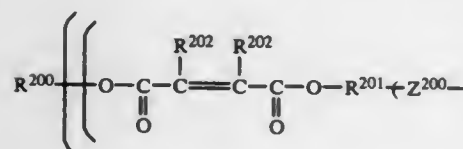


wherein:

R¹⁰⁰ and R¹⁰³ are the same or different, and are at each independent occurrence alkyl, alkenyl, cycloalkyl, cycloalkenyl, or a multivalent hydrocarbyl or hydroxyl-substituted hydrocarbyl group;

R¹⁰¹ is at each independent occurrence a carbon-oxygen bond, alkylene or alkenylene, with the proviso that the total number of carbon atoms in R¹⁰⁰ plus R¹⁰¹ is from 1 to 10 and to total number of carbon atoms in R¹⁰³ plus R¹⁰¹ is from 1 to 10;

R¹⁰² is at each independent occurrence selected from hydrogen, alkyl and alkylene; and t is an integer of from 1 to about 20, and



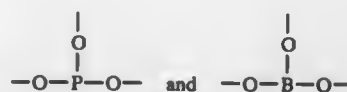
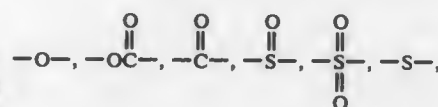
wherein:

R²⁰⁰ has from 1 to 10 carbon atoms and is at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl, a multivalent hydrocarbyl group having a valence equal to z', a multivalent hydroxyl-substituted hydrocarbyl group having a valence equal to z', and -R²⁰¹-Z²⁰⁰;
R²⁰¹ is at each independent occurrence selected from alkylene, alkenylene, cycloalkylene, cycloalkenylene, a multivalent hydrocarbyl group and a multivalent hydroxyl-substituted hydrocarbyl group;

R²⁰² is at each independent occurrence selected from hydrogen, alkyl and alkylene;

R²⁰³ has from 1 to 10 carbon atoms and is at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl, a multivalent hydrocarbyl group having a valence equal to z', a multivalent hydroxyl-substituted hydrocarbyl group having a valence equal to z', and -R²⁰¹-Z²⁰⁰;
R²⁰⁴ is at each independent occurrence selected from hydrogen and alkyl;

dent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl and -R²⁰¹-Z²⁰⁰;
R²⁰⁴ is at each independent occurrence selected from hydrogen and alkyl;
Z²⁰⁰ is at each independent occurrence selected from



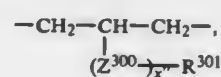
t' is zero or an integer from 1 to about 20;

x' is zero or an integer from 1 to about 20 with the proviso that if x'=0 or t'=0 then R²⁰⁰ is -R²⁰¹-Z²⁰⁰;
y' is an integer from 1 to 10; and
z' is an integer from 1 to 4, and

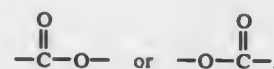
C. a mercaptan containing organic compound of the formula:



wherein R³⁰⁰ is alkylene or



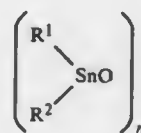
Z³⁰⁰ is



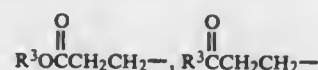
x'' is 0 or 1, t'' is 1 or 2 and R³⁰¹ is hydrogen, hydroxy, alkyl, alkenyl, cycloalkyl, alkylene, alkenylene, aryl and arylalkyl, wherein the chemical equivalence of the mercaptan is less than the chemical equivalence of the diorganotin oxide and the chemical equivalence of the diorganotin oxide is less than the equivalence of the ester compound.

13. A composition comprising a halogen-containing organic polymer and, in an amount sufficient to stabilize said polymer against the deteriorative effects of heat, light and weathering, a stabilizer composition comprising the reaction product produced by combining:

A. a diorganotin oxide compound containing organic groups linked to tin only through carbon and having the formula:



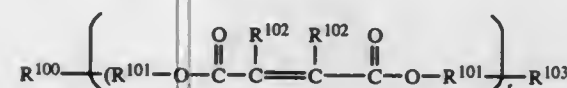
wherein n is an integer of from 1 to 8 and each of R¹ and R², have from about one to about twenty carbon atoms and are selected from the group consisting of alkyl, alkylene, alkenyl, aryl, cycloalkyl, alkylcycloalkyl, arylalkyl,



and N=CCH₂CH₂- wherein R³ is selected from alkyl,

alkylene, alkenyl, aryl, cycloalkyl, alkylcycloalkyl and aralkyl;

B. an ethylenically unsaturated dicarboxylic acid ester compound having one carboxyl group on each atom of the ethylene group and being selected from the group consisting of compounds of the formulas:

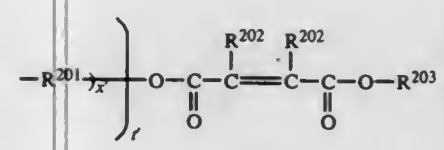
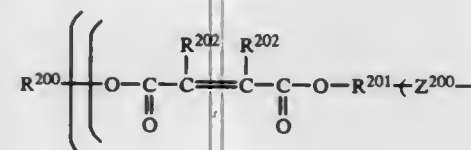


wherein:

R¹⁰⁰ and R¹⁰³ are the same or different, and are at each independent occurrence alkyl, alkenyl, cycloalkyl, cycloalkenyl, or a multivalent hydrocarbyl or hydroxyl-substituted hydrocarbyl group;

R¹⁰¹ is at each independent occurrence a carbon-oxygen bond, alkylene or alkenylene, with the proviso that the total number of carbon atoms in R¹⁰⁰ plus R¹⁰¹ is from 1 to 10 and to total number of carbon atoms in R¹⁰³ plus R¹⁰¹ is from 1 to 10;

R¹⁰² is at each independent occurrence selected from hydrogen, alkyl and alkylene; and t is an integer of from 1 to about 20, and



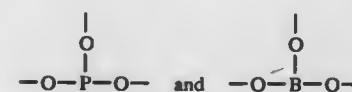
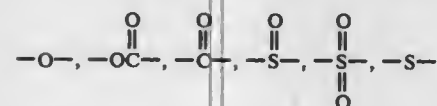
wherein:

R²⁰⁰ has from 1 to 10 carbon atoms and is at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl, a multivalent hydrocarbyl group having a valence equal to z', a multivalent hydroxyl-substituted hydrocarbyl group having a valence equal to z', and -R²⁰¹-Z²⁰⁰;
R²⁰¹ is at each independent occurrence selected from alkylene, alkenylene, cycloalkylene, cycloalkenylene, a multivalent hydrocarbyl group and a multivalent hydroxyl-substituted hydrocarbyl group;

R²⁰² is at each independent occurrence selected from hydrogen, alkyl and alkylene;

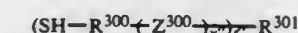
R²⁰³ has from 1 to 10 carbon atoms and is at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl and -R²⁰¹-Z²⁰⁰;
R²⁰⁴ is at each independent occurrence selected from hydrogen and alkyl;

Z²⁰⁰ is at each independent occurrence selected from

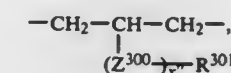


t' is zero or an integer from 1 to about 20;

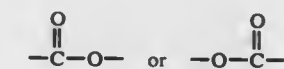
x' is zero or an integer from 1 to about 20 with the proviso that if x'=0 or t'=0 then R²⁰⁰ is -R²⁰¹-Z²⁰⁰;
y' is an integer from 1 to 10; and
z' is an integer from 1 to 4, and
C. a mercaptan containing organic compound of the formula:



wherein R³⁰⁰ is alkylene or



Z³⁰⁰ is



x'' is 0 or 1, t'' is 1 or 2 and R³⁰¹ is hydrogen, hydroxy, alkyl, alkenyl, cycloalkyl, alkylene, alkenylene, aryl and arylalkyl, wherein the chemical equivalence of the mercaptan is less than the chemical equivalence of the diorganotin oxide and the chemical equivalence of the diorganotin oxide is less than the equivalence of the ester compound.

4,711,921

STABILIZATION OF VINYL CHLORIDE POLYMERS
Marvin H. Lehr, Bath, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 440,887, Nov. 12, 1982, abandoned.
This application Oct. 10, 1986, Ser. No. 917,879
Int. Cl. C08K 5/57

U.S. Cl. 524-180

9 Claims

1. A composition comprising a post-chlorinated vinyl chloride polymer and a heat stabilization system comprised of one of particulate barium carbonate and cadmium carbonate, said barium carbonate or cadmium carbonate having a surface area of at least 2 square meters per gram and is present at a concentration range of from about 2.0 to 15.0 parts per 100 parts by weight of the polymer and as a second stabilizer, a dialkyltin compound which is present within the quantity range of 0.5 and 5.0 parts per 100 parts by weight of the polymer.

4,711,922

CITRATE ESTERS AND METHODS

Ezekiel H. Hull, Greensboro, and Edward P. Frappier, Kernersville, both of N.C., assignors to Morflex Chemical Company, Inc., Greensboro, N.C.

Continuation of Ser. No. 735,149, May 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,583, Jun. 11, 1984, abandoned. This application May 21, 1986, Ser. No. 865,874

Int. Cl. C07C 67/08; C08K 5/11

U.S. Cl. 524-310

16 Claims

1. A polyvinyl chloride composition comprising a polyvinyl chloride resin and a plasticizing amount of n-butyltri-n-hexyl citrate, said n-butyltri-n-hexyl citrate having heat stability characteristics, when tested at 150° C. for two hours, of a color not greater than 50-60 apha, and a mild odor at 25° C., and also having an aconitate level of less than about 0.2% when the esterification mixture from which said citrate is produced tests 0.5% maximum acidity calculated as citric acid.

4. A medical article formed from a polyvinyl chloride composition comprising a polyvinyl chloride resin, a plasticizing amount of n-butyltri-n-hexyl citrate, a stabilizer and a lubricant, said citrate having heat stability characteristics, after heating at 150° C. for two hours, of a color not greater than

50-60 apha, and a mild odor at 25° C., and also having an aconitate level of less than about 0.2 percent when the esterification mixture from which said citrate is produced tests 0.5 percent maximum acidity calculated as citric acid.

5. A medical article as claimed in claim 4 comprising a blood bag.

8. A method of producing acetyltri-n-hexyl citrate comprising the steps of: heating n-hexyl alcohol and citric acid in the presence of an organic titanate at a temperature of approximately 140° C. to effect esterification, removing the excess n-hexyl alcohol, and acetylating the ester by adding acetic anhydride and sulfuric acid while maintaining the temperature below approximately 110° C. until the acetylation reaction is complete, wherein the acetyltri-n-hexyl citrate produced has heat stability characteristics, after heating at 150° C. for two hours, of a color not greater than 50-60 apha, and a mold odor at 25° C.

4,711,923

COLOR OF POLYMERS

Vaclav G. Zboril, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Calif.

Division of Ser. No. 847,309, Apr. 2, 1986, Pat. No. 4,666,994.

This application Dec. 31, 1986, Ser. No. 948,131

Claims priority, application United Kingdom, Apr. 2, 1985, 8509452

Int. Cl.⁴ C08K 5/13, 5/05

U.S. Cl. 524—323

8 Claims

1. A composition comprising a high molecular weight polymer selected from the group consisting of homopolymers of ethylene or alpha-olefin homologues thereof and copolymers of ethylene with alpha-olefin homologues thereof, an antioxidant and an organozirconium compound, said antioxidant being a hindered phenolic antioxidant and said organozirconium compound being selected from compounds of the formula $ZrO_m(OCOR')_n(OR'')_{p-n}$ where R' and R'' are independently selected from the group consisting of alkyl and cycloalkyl having 1-20 carbon atoms and m=0 or 1, provided that when m=0, p is 4 and n is 0-4 and when m=1, p is 2 and n=0-2.

4,711,924

CARBOXYLIC ACID-GRAFTED PHENOXY RESINS

George A. Salensky, Hunterdon County, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 725,535, Apr. 22, 1985, Pat. No. 4,638,038.

This application Oct. 2, 1986, Ser. No. 914,796

Int. Cl.⁴ C08K 3/30

U.S. Cl. 524—402

14 Claims

1. An aqueous emulsion comprising:

- (a) a phenoxy resin having pendant secondary hydroxyl groups of which about 3 to about 50% of such hydroxyl groups have been reacted to produce moieties having pendant carboxyl groups, at least some of which carboxyl groups have been neutralized;
- (b) water.

4,711,925

PROCESS FOR PREPARING POLYAMIDE-BASED, PULVERULENT COATING COMPOSITIONS FOR HIGH MOLECULAR WEIGHT POST CONDENSATION, EMPLOYING THE PRECIPITATION PROCEDURE

Salih Mumcu, Marl; Hans J. Panoch, Haltern, and Joern Ruetter, Marl, all of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 18, 1986, Ser. No. 840,792

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1985, 3510690

Int. Cl.⁴ C08G 69/46

U.S. Cl. 524—417

12 Claims

1. In the method of producing polyamide powder from polyamide produced in the absence of a molecular weight regulator having a relative viscosity of 1.7 to 2.0 as measured

in 0.5% meta-cresol solution at 25° C. and at least 70% of said polyamide consisting of polyamide with at least ten aliphatically bound carbon atoms per carbonamide group, comprising:

- (a) dissolving said polyamide in at least twice the amount by weight of ethanol in a closed vessel at a temperature between about 130° to 150° C. to form a solution of said polyamide;
- (b) cooling said solution to a precipitation temperature between about 100° and 125° C.;
- (c) precipitating said polyamide powder from said cooled solution of (b) with agitation and under an inert gas atmosphere; and
- (d) separating said precipitated polyamide powder of (c) from said ethanol,

the improvement comprising:

- (e) rapidly cooling said solution of about 130° to 150° C. to a saturation limit of about 125° C. inside temperature with stirring and distillation of said ethanol under its own pressure;
- (f) further cooling said solution below said saturation limit with distillation of said ethanol and cooling with a jacket wherein the jacket temperature is at most 3° C. below said inside temperature up until a precipitation temperature within the range 90° to 113° is reached; and
- (g) maintaining said solution in the isothermal state during the ensuing precipitation stage by further distillation of ethanol,

the further improvement comprising:

- (h) said polyamide containing not more than 0.2% by weight of phosphoric acid; and
- (i) adding 0.3 to 1.2% by weight of phosphoric acid referred to the weight of said polyamide after step (a).

4,711,926

COMPOSITION FOR ELECTRODEPOSITION PAINT

Masaki Kojima, Himeji, and Seiji Munekata, Tokyn, both of Japan, assignors to Honny Chemicals Company Ltd., Kobe and Asahi Glass Company Ltd., Tokyo, both of Japan

Filed Sep. 5, 1986, Ser. No. 903,951

Claims priority, application Japan, Sep. 9, 1985, 60-197610

Int. Cl.⁴ C08L 61/00

U.S. Cl. 524—512

3 Claims

1. A composition for electrodeposition paint, comprising (a) a water-dispersible and electrophoretic fluoropolymer obtained by neutralizing with a basic compound at least a part of the carboxyl groups of a carboxyl and hydroxyl group-containing fluoropolymer having an acid value of from 5 to 30 and a OH value of from 30 to 150 and (b) an aminoplast, which are dispersed in an aqueous medium in a weight ratio of component (a)/component (b) of from 50/50 to 97/3, wherein the aminoplast is a melamine resin, a guanamine resin or a urea resin.

4,711,927

AQUEOUS INK COMPOSITION

Mark S. Pavlin, and James C. West, both of Lawrenceville, N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 12, 1986, Ser. No. 929,458

Int. Cl.⁴ C08F 255/08

U.S. Cl. 524—531

4 Claims

1. An ink composition, which comprises:

- (a) a coloring proportion of a colorant;
- (b) a resin binder selected from the group consisting of the Diels-Alder adduct of maleic anhydride and a poly(alloocimene) having chain units comprised of a mixture of greater than 50 percent 2,3- and 6,7-poly(alloocimene) and less than 50 weight percent 4,7-poly(alloocimene) chain units, or the partial-esters thereof; and
- (c) water in a sufficient proportion and containing a sufficient proportion of alkali or organic base to solvate the binder.

4,711,928

MOISTURE CURED ONE-PART RTV SILICONE SEALANT

Chi-long Lee, and Myron T. Maxson, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1986, Ser. No. 835,578

Int. Cl.⁴ C08L 83/04

U.S. Cl. 524—860

8 Claims

1. A method of producing a one-part silicone sealant stable in the absence of moisture which cures on exposure to moisture having an in situ treated filler comprising

(A) mixing

- (1) 100 parts by weight of a diorganovinylsiloxane end-blocked polydiorganosiloxane where the viscosity of the siloxane is from 0.5 to 500 Pa.s at 25° C.,
- (2) from 5 to 100 parts by weight of a reinforcing filler having a surface area of from about 50 to 400 m²/g, and
- (3) from 0.5 to 4.0 parts by weight of a silazane of the formula (RR'')₂SiNH, where R is methyl, ethyl, propyl, phenyl, or trifluoropropyl, R'' is methyl or vinyl, and where, if vinyl is present, the ratio of methyl to vinyl is from 1:1 to 50:1, for each 10 parts of filler (2),
- (B) heating the mixture to a temperature of 175° C., with a nitrogen, purge over the container to treat the filler,
- (C) cooling, then adding
- (4) sufficient silane of the formula



where R is methyl, ethyl, propyl, phenyl or trifluoropropyl, R'' is methyl or ethyl, a is 0 or 1, and b is 0 or 1, to give a ratio of 1 to 3 mols of silane per mol of vinyl radical in polydiorganosiloxane (1),

- (5) from 1 to 50 parts by weight of platinum per million parts by weight of polydiorganosiloxane (1) as platinum catalyst, then heating for from 30 to 60 minutes at a temperature of from 65° C. to 125° C., then
- (D) applying a vacuum and cooling to room temperature, then
- (E) admixing in the absence of moisture,
- (6) from 3 to 15 parts by weight of a crosslinker of the formula



where R' is methyl or phenyl, R'' is methyl or ethyl, and a is 0 or 1 and

- (7) from 0.2 to 2.0 parts by weight of a titanium catalyst, and
- (F) storing the mixture in the absence of moisture.

4,711,929

ACRYLOURETHANE REACTION PRODUCT

Andrew P. Stamegna, Wilmington, Del., and Clifford H. Strolie, Springfield, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 712,768, Mar. 18, 1985, Pat. No. 4,659,780.

This application Nov. 25, 1986, Ser. No. 934,824

Int. Cl.⁴ G08F 265/02

U.S. Cl. 525—131

4 Claims

1. The ungelled reaction product, by weight based on total polymer solids, of

- (a) 50-70% of an acrylic prepolymer having a number average molecular weight of 2,000-10,000 and an average of 5-15, hydroxyl groups per chain, said prepolymer comprising the following monomers in percent by weight based on the prepolymer;
- 40-60% of one or more of butyl methacrylate or butyl acrylate
- 10-30% lauryl methacrylate
- 20-40% of one or more of hydroethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate or hydroxypropyl methacrylate, and

0-30% of one or more of styrene, methyl methacrylate and ethyl methacrylate,

(b) 20-35% of at least one of a monomeric diol and an oligomeric diol having a number average molecular weight of 200-2,000,

(c) 5-15% of an aliphatic or aromatic diisocyanate, and

(d) 1.0-4.0% of a monofunctional alcohol, said reaction being performed by first forming the acrylic prepolymer of (a) then mixing with (a) the diol of (b) and the alcohol of (d), then mixing therewith the diisocyanate of (c) in which 5-50% of the hydroxyl groups on the acrylic prepolymer have reacted with diol or diisocyanate, which has been further reacted with enough of an anhydride to give an acid number of at least 10.

4,711,930

HONEYCOMB CATALYST AND ITS PREPARATION

Wolfgang Hoelderich; Werner Biffar, both of Frankenthal; Matthias Irgang, Heidelberg; Wolf D. Mross, Frankenthal; Michael Kroener, Mannheim, and Eberhard Ambach, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,572

Int. Cl.⁴ B01J 23/84, 27/18

U.S. Cl. 502—209

6 Claims

1. A honeycomb catalyst essentially consisting of catalytically active materials, said materials comprising

- (a) 30 to 95% by weight, calculated as Fe₂O₃, of an iron compound;
- (b) from 0.1 to 60% by weight, calculated as Al₂O₃, CeO₂ or Cr₂O₃, of an aluminum, cerium or chromium compound or a mixture of 2 or 3 of said compounds; and
- (c) and (f) from 0.1 to 20% by weight, calculated as V₂O₅ or P₂O₅, of a compound of vanadium or a compound of phosphorus or a mixture of a vanadium and a phosphorus compound.

4,711,931

FLAME RETARDED POLYCARBONATE POLYMERS

Joseph Green, East Brunswick, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 706,709, Feb. 28, 1985, abandoned. This application Mar. 4, 1986, Ser. No. 835,909

Int. Cl.⁴ C08G 65/48; C08L 71/04

U.S. Cl. 525—394

5 Claims

1. A polycarbonate polymer composition rendered flame retardant by having combined therewith an effective amount of a phosphorus containing polyester polymer containing 3% to 9% phosphorus and having a molecular weight of up to 17,000 which is the polycondensation product of a glycol, phthalate and a phosphine oxide of the formula:



wherein R₁ may be the same or different radicals selected from the group consisting of hydrogen and methyl radicals and R₂ is a radical of 2 to 8 carbon atoms.

4,711,932

POLYETHER-POLYESTER GRAFT COPOLYMER

Vernon L. Bell, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

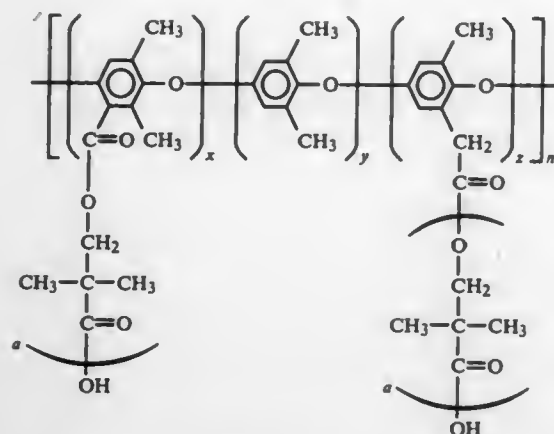
Filed Apr. 24, 1986, Ser. No. 855,879

Int. Cl.⁴ C08L 71/04

U.S. Cl. 525—397

6 Claims

1. A graft copolymer composition comprising a compound having the formula:



where n is an integer ranging from 10 to 10,000; x + y + z = 1; x, y, and z are each greater than 0; m is a positive real number corresponding to the number of moles of pivalolactone consumed in the synthesis of this compound; and a is at least 1 and equal to

$$\frac{m}{(x+z)n}$$

4,711,933

POLYETHERIMIDE ESTERS

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.
Filed Nov. 10, 1986, Ser. No. 928,954
Int. Cl.⁴ C08G 63/76

U.S. Cl. 525—415

51 Claims

1. A polyetherimide ester composition comprising the reaction products of:
 - (i) a mixture of at least one low molecular weight diol and at least one high molecular weight hydroxy terminated poly-lactone; and
 - (ii) a set of reactants selected from
 - (a) (i) at least one high molecular weight poly(oxy alkylene)diamine, and (ii) at least one tricarboxylic acid or a derivative thereof, or
 - (b) at least one high molecular weight polyoxyalkylene diimide diacid.

4,711,934

SELF-CROSSLINKING CATIONIC PAINT BINDERS CONTAINING UREA GROUPS AND PROCESS OF MANUFACTURE

Willibald Paar, Michael Hönel, and Johann Gmoser, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Jul. 22, 1986, Ser. No. 887,934

Claims priority, application Austria, Jul. 22, 1985, 2157/85; Sep. 18, 1985, 2712/85; Sep. 25, 1985, 2786/85; Dec. 18, 1985, 3650/85; Jun. 27, 1986, 1743/86

Int. Cl.⁴ C08F 40/00; C08L 61/00

U.S. Cl. 525—452

14 Claims

1. Self-crosslinking cationic paint binders, water-dilutable on protonation, comprising the reaction product of component (A) and component (B) wherein component (A) is
 - (A-1) an aminoalkylation product carrying an average of at least one NH-group per molecule, of a phenol compound, an amino compound selected from the group consisting of a primary alkylamine, a primary alkanolamine, an alkylenediamine and mixtures thereof and formaldehyde subsequently reacted with a semi-blocked diisocyanate or
 - (A-2) a semi-blocked diisocyanate reacted with an amino compound selected from the group consisting of a primary alkyl-

amine, a primary alkanolamine, and an alkylenediamine, and the resulting substituted urea thereafter reacted with formaldehyde and a phenol compound, and component (B) is an epoxy compound having an epoxy equivalent weight of from about 50 to 2000 and wherein from about 50 to 100% of the phenolic hydroxy groups of component (A) are reacted with component (B) to provide a product having an amine value of at least 30 mg KOH/g.

4,711,935

SELF-CROSSLINKING CATIONIC PAINT BINDERS CONTAINING UREA AND URETHANE GROUPS AND PROCESS OF MANUFACTURE

Johann Gmoser, Radegunderstrasse; Willibald Paar, Richard Wagnersgasse, and Michael Hönel, Humboldtstrasse, all of Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Jul. 22, 1986, Ser. No. 887,950

Claims priority, application Austria, Sep. 16, 1985, 2689/85; Sep. 18, 1985, 2712/85; Sep. 25, 1985, 2786/85; Jun. 27, 1986, 1743/86

Int. Cl.⁴ C08F 40/00; C08L 61/00

U.S. Cl. 525—452

9 Claims

1. Self-crosslinking cationic paint binders, water-dilutable on protonation, comprising the reaction product of components (A), (B), and (C) wherein component (A) is
 - (A-1) an aminoalkylation product carrying an average of at least one NH-group per molecule, of a phenol compound, an amino compound selected from the group consisting of a primary alkylamine, a primary alkanolamine, an alkylenediamine and mixtures thereof and formaldehyde subsequently reacted with a semi-blocked diisocyanate or
 - (A-2) a semi-blocked diisocyanate reacted with an amino compound selected from the group consisting of a primary alkylamine, a primary alkanolamine, and an alkylenediamine, and the resulting substituted urea thereafter reacted with formaldehyde and a phenol compound, component (B) is a mono-1,2-epoxy compound having an epoxy equivalent weight of from about 50 to 2000, and component (C) is a polyisocyanate, wherein from about 50 to 100% of the phenolic hydroxy groups of component (A) are reacted with component (B) and 50 to 100 mole-% of the aliphatic hydroxy groups set free through the reaction with the mono-1,2-epoxy compound of component (B) are reacted with equivalent quantities of the polyisocyanate of component (C) to provide a product having an amine value of at least 30 mg KOH/g.

4,711,936

CURING AGENT FOR EPOXY RESIN AND METHOD FOR CURING EPOXY RESIN

Ichiro Shibasaki, Tokyo, and Kenji Nakamura, Osaka, both of Japan, assignors to Japan Liquid Crystal Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00135, § 371 Date Nov. 13, 1985, § 102(e) Date Nov. 13, 1985, PCT Pub. No. WO85/04411, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 19, 1985, Ser. No. 803,289

Claims priority, application Japan, Mar. 27, 1984, 59-57462
Int. Cl.⁴ C08G 59/68

U.S. Cl. 525—485

7 Claims

1. A curing agent for an epoxy resin, comprising a mixture of a cyclodextrin clathrate compound of an organic compound reactive with an epoxy group, and a trace amount of amylase.

4,711,937

SELF-CROSSLINKING PAINT BINDERS AND PROCESS FOR THEIR MANUFACTURE

Willibald Paar, Graz, Austria, assignor to Vianova Kunstharz, A.G., Graz, Austria

Filed Dec. 17, 1986, Ser. No. 942,829

Claims priority, application Austria, Dec. 20, 1985, 3695/85
Int. Cl.⁴ C08G 8/28; C08L 61/08

U.S. Cl. 525—489

10 Claims

1. Self-crosslinking cationic paint binders water-dilutable upon protonation comprising the reaction product of components A-B and C wherein component A-B is the reaction product of (A) an amino alkylation product carrying an average of at least one NH-group per molecule of a phenol compound, an amino compound selected from the group consisting of a primary alkylamine, a primary alkanolamine, and an alkylenediamine, and formaldehyde subsequently reacted with a semi-blocked diisocyanate; and (B) formaldehyde wherein said formaldehyde is reacted with (A) in a maximum quantity corresponding to the number of formaldehyde reactive hydrogen sites on the phenol and urea groups of (A), and wherein component C is an epoxy compound having an epoxy equivalent weight of from about 50 to 2000, and wherein the quantity of component C is selected so that the maximum number of epoxide groups available corresponds to the sum of phenolic hydroxy groups and the methylol groups formed through the reaction with formaldehyde, said binder having basic amino groups corresponding to an amine value of at least 30 mg KOH/g.

4,711,938

PROCESS FOR PRODUCING POLYMETHYL METHACRYLATE

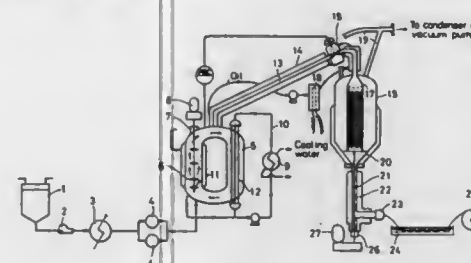
Motoshi Suka, 8-53, Fujimicho 3-chome, Higashimurayama-shi, Tokyo, and Shinzo Omi, Tokyo, both of Japan, assignors to Motoshi Suka, Tokyo, Japan

Filed Feb. 13, 1986, Ser. No. 829,379

Claims priority, application Japan, Feb. 19, 1985, 60-29237
Int. Cl.⁴ C08F 2/02, 120/14, 220/14

U.S. Cl. 526—88

5 Claims



1. A continuous process for thermally producing polymethyl methacrylate (PMMA) or a copolymer in which methyl methacrylate (MMA) is a monomer thereof, which comprises pre-cooling a monomeric feedstock comprising MMA or a mixture of MMA and up to 10 mol% of a monomer highly capable of forming thermal radicals, forcing the feedstock into a reactor wherein a charge consisting of the monomers and polymerization product thereof is being circulated under pressure while being cooled externally, instantaneously mixing the feedstock and the charge while cooling the charge by dint of the sensible heat of the feedstock, thoroughly mixing the charge, continuously taking out from the reactor a portion of the charge consisting essentially of unreacted feedstock and the polymerization product at a polymerization product proportion of 50% by weight or less, conducting the portion, while preheating the same, into a vacuum vessel, removing therein remaining monomer or monomers by evaporation, and thereafter recovering the polymerization product.

4,711,939

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Masafumi Imai; Tadashi Yamamoto; Hiroyuki Furuhashi; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 642,462, Aug. 20, 1984, Pat. No. 4,652,541.
This application Oct. 30, 1986, Ser. No. 924,961

Claims priority, application Japan, Aug. 30, 1983, 58-157093
Int. Cl.⁴ C08F 4/64

U.S. Cl. 526—124

6 Claims

1. A process for the polymerization of olefins which comprises homopolymerizing ethylene or copolymerizing ethylene with an alpha-olefin in the presence of a catalyst system comprising
 - (a) a titanium containing catalyst component obtained by reacting (A) Mg(OR)(OR') with (B) a silicon compound having at least one silicon-hydrogen bond, contacting the reaction product with (C) a carboxylic acid halide, a carboxylic acid anhydride, or mixtures thereof, and contacting the resulting contact product with a divalent, trivalent, or tetravalent titanium compound selected from titanium halides, alkoxy titanium compounds and haloalkoxy titanium compounds, wherein R and R' are radicals selected from alkyl, alkenyl, cycloalkyl, aryl, and aralkyl radicals and R and R' may be the same or different
 - (b) and an organoaluminum cocatalyst.

4,711,940

PROCESS FOR PREPARING CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Tadashi Yamamoto; Masafumi Imai; Hiroyuki Furuhashi; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to TOA Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 705,770, Feb. 26, 1985, Pat. No. 4,654,318.
This application Oct. 29, 1986, Ser. No. 925,843

Claims priority, application Japan, Feb. 28, 1986, 59-35183
Int. Cl.⁴ C08F 4/64

U.S. Cl. 526—124

14 Claims

1. A process for the polymerization of olefins which comprises polymerizing one or more olefins in the presence of a catalyst comprising
 - (a) a titanium containing catalyst component obtained by contacting
 - (i) Component A, a magnesium dialkoxide soluble in inert solvents represented by the formula Mg(OR)(OR') where R and R' are the same or different branched alkyls or alkyl substituted cycloalkyls, each R and R' having 7 or more carbon atoms.
 - (ii) Component B, a silicon compound having a hydrogen-silicon bond.
 - (iii) Component C, an electron donor compound, and
 - (iii) a titanium compound
 with the proviso that Component A, B and C are contacted with one another in an inert solvent prior to contact with the titanium compound and
 - (b) and organo metal compound of Groups I-III metals of the Periodic Table.

4,711,941

FLAME-RETARDANT MOLDED COMPOSITION WHICH INCORPORATES A POLY(STYRENE-CO-MALEIC ANHYDRIDE-CO-DIBROMOSTYRENE) COPOLYMER

Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Co., Los Angeles, Calif.

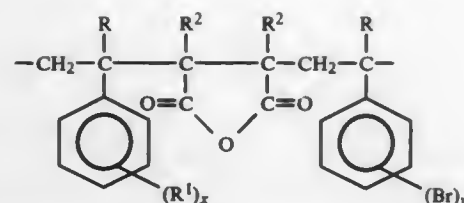
Division of Ser. No. 685,366, Dec. 24, 1984, Pat. No. 4,634,731.
This application Oct. 16, 1986, Ser. No. 919,737

U.S. Cl. 526—272

Int. Cl.⁴ C08F 12/16

7 Claims

1. A random copolymer comprised of the following recurring units:



wherein each R separately represents $-H$, $-CH_3$, or $-CH_2CH_3$; R^1 represents $-CH_3$, $-CH_2CH_3$, $-CH(CH_3)_2$, $-C(CH_3)_3$, $-OH$, $-OCH_3$, $-CO_2H$, $-CONH_2$, or $-CON(CH_3)_2$; each R^2 separately represents $-H$ or $-CH_3$; x represents an integer of from 0 to 3; and, wherein y represents an integer of from 1 to 3.

4,711,942

"LIVING" POLYMERS AND PROCESS FOR THEIR PREPARATION

Owen W. Webster, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 549,409, Nov. 7, 1983, Pat. No. 4,508,880, which is a continuation-in-part of Ser. No. 389,110, Jun. 17, 1982, Pat. No. 4,417,034, which is a continuation-in-part of Ser. No. 279,025, Jun. 30, 1981, abandoned. This application

Oct. 18, 1984, Ser. No. 660,588

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.⁴ C08F 4/52, 4/44, 4/16

U.S. Cl. 526—185

3 Claims

1. Process of preparing a "living" polymer, the process comprising contacting under polymerizing conditions at least one polar acrylic or maleimide monomer with (i) a tetracoordinate organosilicon, organotin or organogermanium polymerization initiator having at least one initiating site, and (ii) a co-catalyst which is a source of fluoride, cyanide or azide ions or a suitable Lewis acid.

4,711,943

HYDROPHILIC SILOXANE MONOMERS AND DIMERS FOR CONTACT LENS MATERIALS, AND CONTACT LENSES FABRICATED THEREFROM

Thomas B. Harvey, III, Scottsdale, Ariz., assignor to Sola U.S.A. Inc., Phoenix, Ariz.

Filed Apr. 26, 1985, Ser. No. 727,501

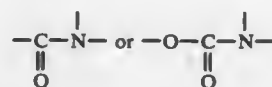
Int. Cl.⁴ C08F 130/08, 230/08

U.S. Cl. 526—279

73 Claims

1. A non-fibrous polymeric contact lens material having improved oxygen permeability and stability, said polymeric contact lens material comprising a monomer having the following structural formula:

first portion for increasing wettability, said first portion being hydrophilic and including a side-chain functionality selected from the group including the following structural formulae:



and

a second portion for increasing oxygen permeability, said second portion including a siloxane;

wherein: said material has a water content of about 15–60%; DK greater than or equal to about 25×10^{-10} ; tear strength greater than or equal to about 1.0 g/mm²; and percent elongation greater than or equal to about 80%.

4,711,944

HUMIDITY RESISTANT COATING EMPLOYING BRANCHED POLYMERS OF T-BUTYL ACRYLATE

Maynard A. Sherwin, St. Albans, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 408,916, Aug. 17, 1982, abandoned.

This application Aug. 15, 1985, Ser. No. 765,692

Int. Cl.⁴ C08F 220/06, 220/28, 220/54

U.S. Cl. 526—318.42

9 Claims

1. A copolymer which has been produced by bulk polymerization, comprised of:

- from about 10 to about 95 weight percent of t-butyl acrylate;
- from about 0.1 to about 3 weight percent of a polyfunctional acrylate that is an ester of acrylic acid or methacrylic acid which possesses two or more ethylenically unsaturated double bonds;
- from about 1 to about 30 weight percent of at least one ethylenically unsaturated functional comonomer which is copolymerizable with said t-butyl acrylate and said polyfunctional acrylate, said at least one ethylenically unsaturated functional comonomer containing at least one cross-linking site selected from the group consisting of carboxyl, hydroxyl, amide and mixtures thereof;
- from 0 to about 80 weight percent of at least one other ethylenically unsaturated monomer which is capable of polymerizing with said t-butyl acrylate and polyfunctional acrylate.

9. A copolymer comprised of:

- from about 30 to about 60 weight percent t-butyl acrylate;
- from about 0.5 to about 2 weight percent trimethylol propane triacrylate;
- from about 5 to about 20 weight percent of one of acrylic acid, methacrylic acid, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate, hydroxypropyl methacrylate and mixtures thereof; and
- from about 5 to about 60 weight percent of other ethylenically unsaturated monomers which are capable of polymerizing with t-butyl acrylate and polyfunctional acrylates.

4,711,945

POLYKETONE

James A. Daniels, Cheshire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Nov. 25, 1985, Ser. No. 801,404

Claims priority, application United Kingdom, Nov. 23, 1984, 8429609

Int. Cl.⁴ C08G 65/40

U.S. Cl. 528—86

10 Claims

1. A process for the preparation of an aromatic polymer which comprises

- effecting the condensation of at least one halophenol; or
- effecting the condensation of a mixture of at least one bisphenol with at least one dihalo-benzenoid compound; or
- effecting the condensation of (i) at least one halophenol and (ii) a mixture of at least one bisphenol with at least one dihalobenzenoid compound in the presence of at least one base and at least one copper compound wherein the base is in a stoichiometric excess relative to the phenolic groups in (a), (b) or (c), at least one of the compounds in (a), (b) or (c) is a compound containing a ketone group, and in the halophenol or the dihalo-benzenoid compound the, or each, halogen atom is activated by an inert electron-withdrawing group in at least one of the positions ortho- or para- to the halogen atom.

4,711,946

ELECTROACTIVE HETEROCYCLIC AROMATIC POLYMERS

Samson A. Jenekhe, Bloomington, and Marcia K. Hansen, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

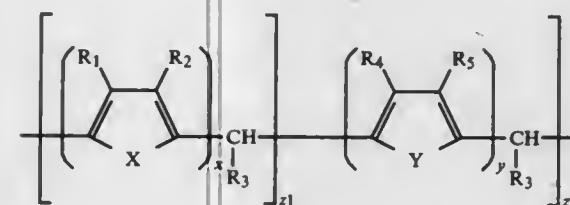
Filed Sep. 8, 1986, Ser. No. 904,747

Int. Cl.⁴ C08G 16/02; H01B 1/00

U.S. Cl. 528—251

44 Claims

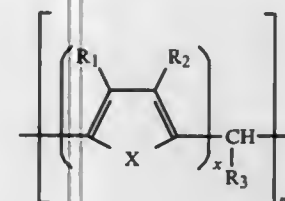
1. Electroactive polymers of the structure



wherein:

- X and Y are selected from S, N—H, N-lower alkyl (C=1–7), N-phenyl, O, Se or Te;
 R_1 , R_2 , R_4 and R_5 are selected from H and lower alkyls (C=1 to 7);
 R_3 is selected from the class consisting of aliphatic, aromatic and heterocyclic groups derivable from aldehydes of the formula R_3CHO ;
 x and y are positive integers having a value between 1 and 5; at least one or both of Z_1 and Z_2 are positive integers having a value between 1 and 10,000.

11. Electroactive polymers of the structure



wherein:

- X is selected from S, N—H, N-lower alkyl (C=1–7), N-phenyl, O, Se or Te;
 R_1 and R_2 are selected from H and lower alkyls (C=1–7);
 R_3 is selected from the class consisting of aliphatic, aromatic and heterocyclic groups derivable from aldehydes of the formula R_3CHO ;
 x is a positive integer having a value from 1 to 5; and
 n is a positive integer having a value between 2 and 10,000.

4,711,947

TRANSLUCENT POLYETHERIMIDE ESTER COMPOSITIONS

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Sep. 30, 1986, Ser. No. 913,397

Int. Cl.⁴ C08G 63/44, 69/44

U.S. Cl. 528—288

30 Claims

1. A translucent polyetherimide ester composition comprising the reaction products of:

- at least one cyclohexane dimethanol;
- at least one cyclohexane dicarboxylic acid or an ester forming reactive derivative thereof; and
- a set of reactants selected from
 - at least one high molecular weight poly(oxy alkylene)diamine, and (ii) at least one tricarboxylic acid or a derivative thereof, or
 - at least one poly(oxy alkylene)diimide diacid.

4,711,948

POLYETHERIMIDE ESTERS EXHIBITING IMPROVED TENSILE ELONGATION

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Sep. 30, 1986, Ser. No. 913,395

Int. Cl.⁴ C08G 63/44, 69/44

U.S. Cl. 528—288

35 Claims

1. A polyetherimide ester composition comprising the reaction products of:

- a mixture of butanediol and butenediol wherein the amount of butenediol present in said mixture is less than 70 mole percent;
- at least one dicarboxylic acid or an ester forming reactive derivative thereof; and
- a set of reactants selected from
 - (i) at least one high molecular weight poly(oxy alkylene)diamine, and (ii) at least one tricarboxylic acid or a derivative thereof, or
 - (b) at least one poly(oxyalkylene)diimide diacid.

4,711,949

METHOD OF CONVERTING FLUORINE-CONTAINING HIGH POLYMER INTO LOWER MOLECULAR WEIGHT POLYMER

Minoru Aramaki, and Hiroaki Sakaguchi, both of Ube, Japan, assignors to Central Glass Company Limited, Ube, Japan

Filed Nov. 13, 1985, Ser. No. 797,463

Claims priority, application Japan, Nov. 14, 1984, 59-238234; Jan. 10, 1985, 60-1461

Int. Cl.⁴ C08F 8/22

U.S. Cl. 525—356

4 Claims

1. A method of converting a fluorine-containing solid high polymer selected from the group consisting of polytetrafluoroethylene, polychlorotrifluoroethylene, poly(vinylidene fluoride), poly(vinyl fluoride), copolymers of tetrafluoroethylene and hexafluoropropylene, copolymers of tetrafluoroethylene and perfluoroalkoxyethylene and copolymers of ethylene and tetrafluoroethylene into a lower molecular weight polymer, the method comprising the step of subjecting said high polymer to contact reaction with a gas comprising at least one fluorine source material selected from the group consisting of molecular fluorine and binary compounds of fluorine and nitrogen at a temperature in the range from about 350° C. to about 500° C.

4,711,950

POLYETHER POLYMER OR COPOLYMER, MONOMER THEREFOR, AND PROCESS FOR PRODUCTION THEREOF

Katsuhito Miura, Amagasaki, and Tetsuya Nakata, Ibaraki, both of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed Oct. 31, 1986, Ser. No. 925,270

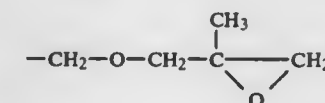
Claims priority, application Japan, Nov. 5, 1985, 60-247712; Dec. 10, 1985, 60-278560; Jan. 20, 1986, 61-10763

Int. Cl.⁴ C08G 59/02, 59/32

U.S. Cl. 528—409

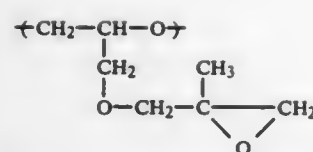
6 Claims

1. A polyether polymer or copolymer with a pendant group of the formula



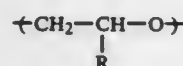
in its molecule, said polymer or copolymer consisting essentially of

- 1 to 100 mole % of recurring units represented by the following formula (I)



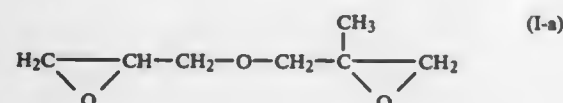
and

(2) 0 to 99 mole % of at least one type of recurring units represented by the following formula (II)

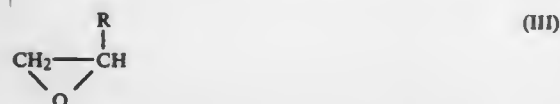


wherein R represents a member selected from the class consisting of a hydrogen atom, substituted or unsubstituted C₁-C₁₈ alkyl groups, substituted or unsubstituted C₂-C₁₈ alkenyl groups, substituted or unsubstituted C₃-C₈ cycloalkyl groups and substituted or unsubstituted C₆-C₁₄ aryl groups, and having a reduced viscosity η_{red} , determined at 45° C. in its 0.1% benzene solution or at 80° C. in its monochlorobenzene solution, of at least 0.01.

4. A process for producing the polyether polymer or copolymer of claim 1, which comprises polymerizing 2,3-epoxypropyl-2',3'-epoxy-2'-methylpropyl ether of the following formula (I-a)



or copolymerizing it with a compound the following formula (III)

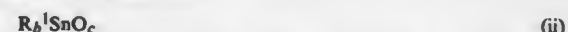


wherein R represents a member selected from the class consisting of a hydrogen atom, substituted or unsubstituted C₁-C₁₈ alkyl groups, substituted or unsubstituted C₂-C₁₈ alkenyl groups, substituted or unsubstituted C₃-C₈ cycloalkyl groups and substituted or unsubstituted C₆-C₁₄ aryl groups, in the presence of, as a catalyst, a heat-reaction product of (A) an organotin compound and (b) a complete or partial ester compound of the formula (HO)₃PO, said organotin compound (A) being selected from the group consisting of compounds of the following formulae (i) to (iv)



wherein R¹ represents a C₁-C₁₂ alkyl group unsubstituted or substituted by a substituent selected from halogen, hydroxy, C₁-C₁₀ alkoxy and C₁-C₁₀ alkylthio, a C₂-C₈ alkenyl group unsubstituted or substituted by a substituent selected from halogen, hydroxy, C₁-C₁₀ alkoxy, C₁-C₁₀ alkylthio, and optionally substituted C₆-C₁₄ aryl, a C₃-C₈ cycloalkyl group unsubstituted or substituted by a substituent selected from halogen, hydroxy, C₁-C₁₂ alkyl, C₁-C₁₀ alkoxy, C₁-C₁₀ alkylthio and optionally substituted C₆-C₁₄ aryl, a C₆-C₁₄ aryl group unsubstituted or substituted by a substituent selected from halogen, hydroxy, C₁-C₁₂ alkyl, C₁-C₁₀ alkoxy, C₁-C₁₀ alkylthio and optionally substituted C₆-C₁₄ aryl, or a C₇-C₁₈ aralkyl group unsubstituted or substituted by a substituent selected from halogen, hydroxy, C₁-C₁₂ alkyl, C₁-C₁₀ alkoxy and C₁-C₁₀ alkylthio; x represents an atom or group selected from halogen atoms, C₁-C₁₂ alkoxy groups, aryloxy groups having C₆-C₁₄ aryl, acyloxy groups having C₂-C₁₂ acyl and residues of partial esters of phosphoric acid; and a is an integer

of 1 to 4, provided that when a is an integer of 2 to 4, R¹ groups may be identical or different, and when a is 1 or 2, the X's may be identical or different;



wherein R¹ is as defined with regard to formula (i), b is 1 or 2, and when b is 1, c is 3/2 or when b is 2, c is 1, the compound of formula (ii) may form a complex with the compound of formula (i);



wherein R¹ is as defined with regard to formula (i), R² is as defined with regard to R¹ and X, and the two R² groups may be identical and different; and



wherein R² is the same as defined with regard to formula (iii) provided that at least one of the three R² groups is a group selected from the groups defined for R¹ in formula (i); X' is a member selected from the group consisting of a carbonate group, a phosphorus or oxyacid group, a polybasic carboxylic acid group and a residual moiety of a polyhydric alcohol; and d is a number greater than 1 and corresponds to the basicity of the member X'.

4,711,951 THERAPEUTICALLY ACTIVE COMPOUND AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Rolf E. A. V. Axén, and Jan P. E. Carlsson, both of Uppsala, Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden
Continuation of Ser. No. 364,675, Apr. 2, 1982, abandoned. This application Mar. 29, 1984, Ser. No. 594,981

Claims priority, application Sweden, Apr. 6, 1981, 8102194
Int. Cl.⁴ C07K 5/02, 7/02

U.S. Cl. 530—323 12 Claims

1. The method for prolonging the activity of organic base compounds of polypeptide structure having known therapeutic activity, which known compounds contain

- one or more carboxy groups, and/or
- one or more primary and/or secondary amino groups, and/or
- one or more SH-groups and/or inner —S—S— bridges such method of prolonging the activity comprising substituting a group comprising the structure —S'—S"—R for the groups (a) or (b) or transforming one of the groups of (c) into the structure —S'—S"—R, wherein R is selected from the group consisting of
 - 2-benzothiazolyl,
 - 5-nitro-2-pyridyl
 - 2-pyridyl
 - 4-pyridyl
 - 5-carboxy-2-pyridyl and
 - the N-oxides of any of (2) to (5)
 and S' is bound to an aliphatic carbon atom, such substitution or transformation having no profound negative effects on therapeutic activity.

4,711,952

SERUM THYMIC FACTOR PEPTIDE ANALOGS AND PROCESS FOR THE PREPARATION THEREOF
Evzen Kasafirek; Martin Cerny; Petr Kocis; Jiri Krepelka, all of Prague, and Jozef Rovinsky, Piestany, all of Czechoslovakia, assignors to SPOFA, spolene podniky pro zdravotnickou výrobu, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 810,030, Dec. 17, 1985, abandoned. This application Jun. 17, 1986, Ser. No. 875,230
Claims priority, application Czechoslovakia, Dec. 17, 1984, 9887-84

Int. Cl.⁴ C07K 7/06, 7/48

U.S. Cl. 530—327 10 Claims
1. Serum thymic factor peptide analog of the general formula I



in which A is pGlu, Gln, Ala-Lys-Ser-Gln, pGlu-Ala-Lys-Ser-Gln or Gln-Ala-Lys-Ser-Gln, B and C are the same or different and are each Gly, Phe, Leu, Ala or a direct bond, and R is H, an alkyl with 1 to 6 carbon atoms or a 2-phenylethyl group.

4,711,953

PROCESS FOR OBTAINING AN ALPHA-LACTALBUMIN ENRICHED PRODUCT FROM WHEY AND USES THEREOF

Loïc Roger, Rennes; Jean-Louis Manbois, La Barre-Guibourg; Gérard Brulé, Rennes, and Michel Piot, Rennes, all of France, assignors to Institut De La Recherche Agronomique, Paris, France

Continuation of Ser. No. 647,069, Sep. 4, 1984, abandoned, which is a continuation of Ser. No. 338,136, Jan. 8, 1982, Pat. No. 4,485,040, which is a continuation of Ser. No. 162,641, Jun. 24, 1980, abandoned. This application Jul. 9, 1986, Ser. No. 883,019

Claims priority, application France, Jun. 26, 1979, 79 16482
Int. Cl.⁴ C07K 3/26

U.S. Cl. 530—366 16 Claims

1. A process for obtaining an alpha-lactalbumin enriched product from sweet whey, comprising:

- adjusting the pH of the whey to about 6.6, whereby a pH-adjusted whey is obtained;
- subjecting the pH-adjusted whey to a first ultrafiltration at a temperature in the range of 45°-60° C. on a membrane having a molecular weight cut-off adapted to retain soluble proteins, whereby a first ultrafiltrate is obtained;
- separating the first ultrafiltrate;
- subjecting the first ultrafiltrate to a second filtration on a membrane having a molecular weight cut-off adapted to retain alpha-lactalbumin and whereby a retentate is formed; and
- collecting the retentate.

4,711,954

3-THIENYLAZO DYES WITH A GAMMA-ACID COUPLER

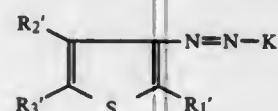
Holger Heidenreich, Cologne, and Gerhard Wolfrum, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Mar. 4, 1986, Ser. No. 836,047

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510410

Int. Cl.⁴ C09B 29/033, 29/30; D06P 1/39, 3/24

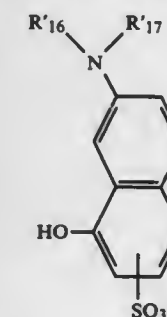
U.S. Cl. 534—780 4 Claims

1. An azo dyestuff of the formula



wherein

R₁' stands for CN, COOX' or CONH2'
R₂' stands for hydrogen, C₁-C₄-alkyl, or phenyl which is unsubstituted or substituted 1 to 3 times by C₁-C₄-alkyl, Cl or C₁-C₄-alkoxy or substituted once by SO₃H,
R₃' stands for C₁-C₄-alkyl or phenyl which is unsubstituted or substituted 1 to 3 times by C₁-C₄-alkyl, Cl or C₁-C₄-alkoxy or substituted once by SO₃H,
K' stands for a radical of the formula



wherein

R₁₆' is hydrogen, C₁-C₄-alkyl, cyclohexyl or phenyl which is unsubstituted or substituted 1 to 3 times by C₁-C₄-alkyl, Cl or C₁-C₄-alkoxy or substituted once by SO₃H,
R₁₇' is hydrogen or C₁-C₄-alkyl, and
X' denotes cyclohexyl or C₁-C₄-alkyl.

4,711,955

MODIFIED NUCLEOTIDES AND METHODS OF PREPARING AND USING SAME

David C. Ward, Guilford, Conn.; Pennina R. Langer, Monsey, N.Y., and Alexander A. Waldrop, III, Charlottesville, Va., assignors to Yale University, New Haven, Conn.

Continuation of Ser. No. 255,223, Apr. 17, 1981, abandoned.

This application May 23, 1983, Ser. No. 496,915

Int. Cl.⁴ C07H 17/02, 19/06, 19/02

U.S. Cl. 536—29 21 Claims

1. A nucleotide or oligo- or polynucleotide sequence comprising at least one of a moiety having the structure: wherein B represents a 7-deazapurine or a pyrimidine moiety; wherein A represents a moiety selected from the group consisting of biotin and iminobiotin; provided that if B is a 7-deazapurine, A is attached to the 7-position of the deazapurine, and if B is a pyrimidine, A is attached to the 5-position of the pyrimidine, A being attached to B directly or through a linkage group, said linkage group not interfering substantially with the characteristic ability of A to form a detectable complex with one of avidin, streptavidin or antibodies to biotin or iminobiotin.

4,711,956

PENICILLIN DERIVATIVES

Ivanka A. Atanasova; Marieta A. Haimova; Vesselin B Chavdarova, all of Sofia; Anton I. Nakov; Nedelcho G. Petkov, both of Razgrad, and Ruska S. Avramova, Sofia, all of Bulgaria, assignors to TPO "Pharmachim", Sofia, Bulgaria
Filed Jul. 17, 1985, Ser. No. 756,018

Int. Cl.⁴ C07D 499/76, 499/46

U.S. Cl. 540—327 22 Claims

1. Sodium salt of 6-[2'-methyl-1'(2'H)-isoquinolinone-4'-carboxylamide]-2,2-dimethyl-penam-3-carboxylic acid.

4,711,957

SYNTHESIS OF 2-KETO-1,4-DIAZACYCLOALKANES

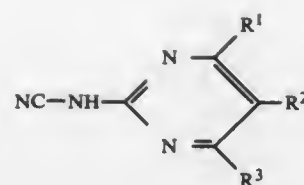
John T. Lal, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Division of Ser. No. 57,238, Jul. 13, 1979, Pat. No. 4,297,497, which is a continuation-in-part of Ser. No. 916,640, Jun. 19, 1978, Pat. No. 4,167,512, which is a continuation-in-part of Ser. No. 835,066, Sep. 21, 1977, abandoned. This application Jul. 18, 1981, Ser. No. 274,996

Int. Cl.⁴ C07D 241/44, 241/18, 241/38, 403/08

U.S. Cl. 544—231

3 Claims

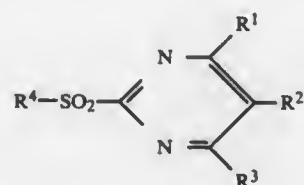
1. A method for preparing a polysubstituted 2-keto-1,4-diazacycloalkane trans-isomer, comprising dissolving a trans-1,2-diaminocycloalkane in water, adding a predetermined amount of an α -hydroxy fatty acid nitrile selected from the group consisting of aliphatic cyanohydrins, araliphatic cyanohydrins, and cycloaliphatic cyanohydrins to form an aqueous mixture, heating said mixture to cause reactants in said mixture to form said trans-isomer, and recovering said trans-isomer from said mixture.



in which

R¹ is hydrogen, halogen, optionally substituted alkyl or optionally substituted alkoxy,
R² is hydrogen, alkyl or halogen, and
R³ is hydrogen, halogen, optionally substituted alkyl or optionally substituted alkoxy,

comprising reacting a 2-alkylsulphonyl-pyrimidine of the formula



in which

R⁴ is optionally substituted alkyl, with cyanamide or with a metal salt of cyanamide at a temperature between 0° and 150° C.

4,711,958
MORPHOLINE CONTAINING AMINO ACID
DERIVATIVES

Kinji Iizuka; Tetsuhide Kamijo; Tetsuhiro Kubota; Kenji Akahane, all of Nagano; Hideaki Umeiyama, Chiba, and Yoshiaki Kiso, Osaka, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd., Nagano, Japan

Filed Apr. 1, 1987, Ser. No. 32,693

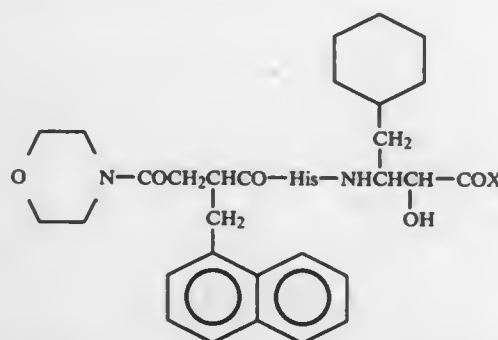
Claims priority, application Japan, Apr. 1, 1986, 61-74511; Jul. 10, 1986, 61-162563

Int. Cl.⁴ C07D 295/18

U.S. Cl. 544—139

3 Claims

1. Amino acid derivatives represented by formula (I):



wherein His represents an L-histidyl group, X represents a straight or branched alkoxy group having 1 to 7 carbon atoms, a straight or branched alkylamino group having 1 to 7 carbon atoms, a cycloalkyloxy group having 3 to 7 carbon atoms, a morpholino group, said alkoxy group having one or more halogen atoms as substituents; or a pharmaceutically acceptable salt.

4,711,959

2-CYANOAMINO-PYRIMIDINES

Joachim Klath, Langensfeld; Klaus-Helmut Müller, Dueseldorf, and Theodor Pfister, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 11, 1986, Ser. No. 884,710

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3525977

Int. Cl.⁴ C07D 239/42, 239/47, 239/46

U.S. Cl. 544—320

12 Claims

1. A process for the preparation of a 2-cyanoamino-pyrimidine of the formula

4,711,961

BENZISOSELENAZOLETHIONES AND PROCESS FOR THE TREATMENT OF VARIOUS DISEASES IN HUMANS

André Welter; Sigurd Leyck, both of Pulheim, and Eugen Etzschberg, Cologne, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany
Filed Feb. 26, 1985, Ser. No. 705,672

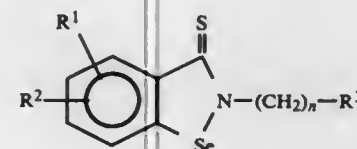
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407511

Int. Cl.⁴ C07D 293/12

U.S. Cl. 548—121

4 Claims

1. Benzoselenazothiones of the general formula I



wherein R¹ and R² which can be identical or different, independently of one another are members selected from the group consisting of hydrogen, halogen, C₁-C₄-alkyl, C₁-C₄-alkoxy, trifluoromethyl and nitro, and, R¹ and R² together, methylenedioxy, n is zero or an integer from 1 to 4, R³ is a member selected from the group consisting of hydrogen, unsubstituted phenyl, the phenyl groups monosubstituted and those disubstituted by a member selected from the group consisting of halogen, alkyl, alkoxy, trifluoromethyl, nitro and methylenedioxy, and the heterocyclic groups selected from the group consisting of the unsubstituted thiophene, thiazole, isothiazole, imidazole, pyrazole, thiazadiazole, pyridine, pyrimidine, pyrazine, pyridazine, benzothiazole, benzimidazole, benzotriazine, benzothiothiophene, benzothiadiazole, triazine, triazole, tetrazole, quinoline, isoquinoline, indole and indazole groups and such groups being monosubstituted by a member of the group consisting of halogen, C₁-C₄-alkyl, C₁-C₄-alkoxy, mercapto, C₁-C₄-alkylmercapto, phenyl, nitro and trifluoromethyl, and such groups being identically or differently disubstituted by a member of the group consisting of halogen, C₁-C₄-alkyl, C₁-C₄-alkoxy, mercapto, C₁-C₄-alkylmercapto, phenyl, nitro and trifluoromethyl.

4,711,962

PROCESS FOR SELECTIVE PREPARATION OF RATIOS OF ISOMERS FORMED ON N-SUBSTITUTION OF ASYMMETRIC IMIDAZOLES

Andrea Leone-Bay, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 662,009, Oct. 18, 1984, Pat. No. 4,595,400, and a continuation-in-part of Ser. No. 730,964, May 6, 1985, Pat. No. 4,571,257. This application Oct. 2, 1985, Ser. No. 782,676

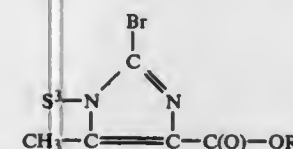
The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.⁴ C07D 233/90

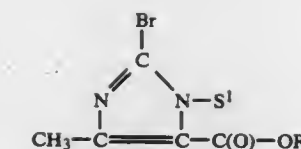
U.S. Cl. 548—337

35 Claims

1. A process for selectively preparing a mixture of two compounds C3A and C3B, wherein C3A is a regioisomer of C3B, and wherein C3A is an asymmetric imidazole derivative having the structural formula:



and C3B has the structural formula:

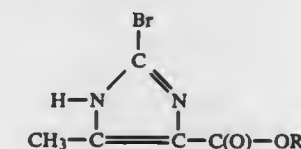


wherein:

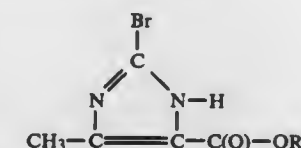
S¹ or S³ is C₁-C₁₀ alkyl or C₃-C₁₀ allyl or cyanoethyl; or C₁-C₁₀ alkoxyethyl or C₁-C₁₀ thiomethyl or C₁-C₁₀ sulfoxymethyl or C₁-C₁₀ sulfonmethyl; and R is C₁-C₁₀ alkyl; C₃-C₈ cycloalkyl; C₃-C₈ cycloalkylalkyl, wherein the alkyl has 2 to 8 carbon atoms; allyl or 2-methyl-3-butenyl-1; C₅-C₈ cycloalkyl; benzyl or mono- or disubstituted benzyl, wherein the substituent is C₁-C₄ alkyl, halogen, nitro or C₁-C₄ haloalkyl

which comprises the steps of:

(1) reacting a tautomeric mixture of two compounds, C1A and C1B, with an equimolar amount of a base, B, in the presence of a solvent, S, thereby forming a mixture of two compounds C2A and C2B, wherein C2A is a salt of C1A and B; and C2B is a salt of C1B and B; and C1A has the structural formula:



and C1B has the structural formula:



wherein:

R is as previously defined;
B is a hydride of an alkali metal or an alkaline earth metal, M, or mixtures thereof;
S is a tetrahydrofuran solvent;
thereby forming a mixture of regioisomeric salts, C2A and C2B, and hydrogen; and then
(2) adding a preselected amount of an N-substituting agent, ZS³, selected from an alkylating agent, an alkenylating agent, or a cyanoethylating agent to the mixture of regioisomeric salts C2A and C2B;

wherein:

S³ is as previously defined; and, Z is selected from alkyl, aryl, sulfonyl, alkoxyalkyl, benzyl, haloalkyl, and thioalkyl; thereby forming a mixture of C3A and C3B in a ratio, r, of percentage amounts C3A/C3B within the range from 50/50 to 100/0.

4,711,963

4-AMINO-2-METHYL-3-PHENYL-1-(2,4,6-TRICHLORO-PHENYL)-3-PYRAZOLIN-5-ONE

Yoshio Inagaki, and Tadao Shishido, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 459,028, Jan. 18, 1983, abandoned. This application Apr. 29, 1986, Ser. No. 858,830

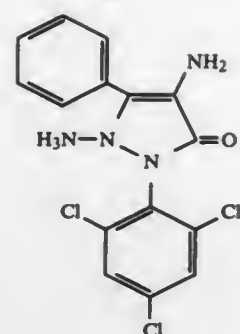
Claims priority, application Japan, Jan. 18, 1982, 57-6606

Int. Cl.⁴ C07D 231/46

U.S. Cl. 548—365

6 Claims

1. 4-amino-2-methyl-3-phenyl-1-(2,4,6-trichlorophenyl)-3-pyrazolin-5-one represented by the following formula (1):

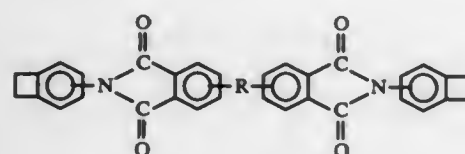


4,711,964
BISDIENE FROM BIS-BENZOCYCLOBUTENE
COMPOUND

Loon-Seng Tan, and Fred E. Arnold, both of Centerville, Ohio, assignors to University of Dayton, Dayton, Ohio
Filed May 8, 1986, Ser. No. 861,020
Int. Cl.⁴ C07D 209/48

U.S. Cl. 548—461

1. A compound of the formula



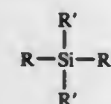
where R is divalent linking group.

4,711,965
PREPARATION OF ALKYL SILANES
Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 24, 1987, Ser. No. 17,852
Int. Cl.⁴ C07F 7/08

U.S. Cl. 556—478

1. Process for the preparation of a tetraalkylsilane having the formula:



wherein R and R' alkyl radicals and the radicals R' are alike or different, such that R has up to about 4 carbon atoms, and each radical designated by R' has from about 8 to about 14 carbon atoms; said process comprising contacting reactants (a) and (b) wherein:

- (a) is an alkali metal aluminum tetraalkyl having the formula MAIR₄, wherein M is lithium, sodium, or potassium, and R' has the same significance as above, and
(b) is an alkyltrialosilane having the formula RSiX₃, wherein X is a halide radical selected from fluoride, chloride and bromide, and R has the same significance as above;

said process being conducted such that the mole ratio of reactant (a) to reactant (b) is from about 0.75 to 1.0, to about 1 to 1, and the reaction temperature is from about 180° C. to about 230° C.

4,711,966
PREPARATION OF ALKYL SILANES
Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 19, 1987, Ser. No. 27,897
Int. Cl.⁴ C07F 7/08

U.S. Cl. 556—478

8 Claims

1. A process for preparing a product composition comprising a compound having the formula RSiR'₃ wherein R is a lower alkyl radical of 1-4 carbon atoms, and each R' is an alkyl radical of from about 8 to about 14 carbon atoms, said process comprising reacting (a) a silicon tetrahalide having the formula SiX₄, wherein each X is a halide radical selected from the class consisting of fluoride, chloride and bromide, with (b) a trialkylaluminum R₃Al, and (c) an alkali metal aluminum tetraalkyl MAIR₄ reactant, wherein M is selected from lithium, sodium, or potassium, said process being conducted at a temperature of from about 80° C. to about 230° C., and such that for each mole portion of SiX₄, there is employed about a 1/2 mole portion of R₃Al, and about a 1/2 mole portion of MAIR₄.

4,711,967
PRODUCTION OF S-ARYL S-ALKYL
DITHIOCARBONATES

Peter G. Urban, Kenilworth, United Kingdom, assignor to Courtaulds PLC, London, England

Filed Apr. 28, 1986, Ser. No. 856,505

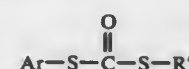
Claims priority, application United Kingdom, May 2, 1985, 8511143

Int. Cl.⁴ C07C 154/02

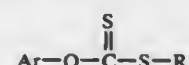
U.S. Cl. 558—243

9 Claims

1. A process for the preparation of an S-aryl S-alkyl dithiocarbonate of the formula



where Ar is a phenyl or naphthyl group which may be substituted, and R' is an alkyl group, wherein an O-aryl S-alkyl dithiocarbonate of the formula



where Ar and R' are as previously stated is pyrolytically isomerised at a temperature in the range from 200° to 600° C. to produce said S-aryl S-alkyl dithiocarbonate.

4,711,968
PROCESS FOR THE HYDROFOMYLATION OF
SULFUR-CONTAINING THERMALLY CRACKED
PETROLEUM RESIDUA

Alexis A. Oswald, Clinton Township, Hunterdon County, N.J., and Ram N. Bhatia, Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham, N.J.

Filed Oct. 3, 1986, Ser. No. 914,802

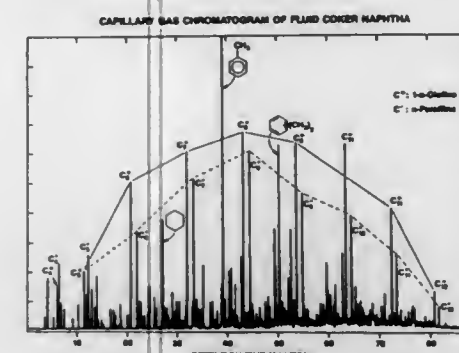
Int. Cl.⁴ C07C 45/50

U.S. Cl. 568—454

31 Claims

1. A hydroformylation process comprising reacting an olefinic cracked petroleum distillate feed produced from petroleum residua by high temperature thermal cracking, and containing 1-n-olefins as the major type of olefin components and organic sulfur compounds in concentrations exceeding 0.1 percent sulfur with carbon monoxide and hydrogen at temperatures between about 50° and 250° C. and pressures in the range of 50 and 6000 psi

in the presence of a Group VIII transition metal carbonyl complex catalyst in effective amounts



to produce aldehydes and/or alcohols of semilinear character having an average of less than one alkyl branch per molecule.

4,711,969
OLIGOMERIZATION OF ETHYLENE IN METHANOL
AND WATER

David L. Beach, Kingwood, Tex., and James J. Harrison, Novato, Calif., assignors to Chevron Research Company, San Francisco, Calif.

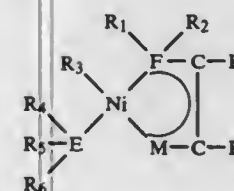
Filed Aug. 25, 1986, Ser. No. 900,204

Int. Cl.⁴ C07C 2/32

U.S. Cl. 585—511

28 Claims

1. A process for oligomerizing ethylene to normal alpha olefins and recovering said olefins from the reaction product which comprises reacting ethylene in a methanol-water mixture containing 0.5 to 20 wt % water under oligomerization conditions in contact with a nickel ylide defined by the following formula:



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇ and R₈ are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about 1 to about 24 carbon atoms, aryl radicals having from about 6 to about 20 carbon atoms, alkenyl radicals having from about 2 to about 30 carbon atoms, cycloalkyl radicals having from about 3 to about 40 carbon atoms, aralkyl and alkaryl radicals having from about 6 to about 40 carbon atoms, halogen radicals, hydroxyl, alkoxy and aryloxy groups, and hydrocarbyl groups carrying halogen, hydroxyl, alkoxy or aryloxy groups, provided that at least one of each R₁ to R₈ radicals is a sulfonato group or an alkyl, aryl,

alkenyl, cycloalkyl, aralkyl or alkaryl carrying a sulfonato group, M is sulfur or oxygen, E is phosphorus, arsenic, antimony or nitrogen and F is phosphorus, arsenic or antimony, to obtain a reaction product containing (A) a methanol-water phase having dissolved therein said nickel ylide and (B) an alpha olefin phase and then separating said phases from each other to recover said alpha olefin phase.

4,711,970
CATALYTIC CONVERSION
Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 493,192, May 10, 1983, Pat. No. 4,576,805, which is a continuation-in-part of Ser. No.

412,362, Aug. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 333,369, Dec. 22, 1981, abandoned. This application Jan. 8, 1986, Ser. No. 818,967
Int. Cl.⁴ C07C 2/00

U.S. Cl. 585—415

25 Claims

1. A process for converting a feedstock comprising C₂+olefins, C₂-C₇ paraffins or a mixture thereof to conversion product comprising C₃+ hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a porous inorganic crystalline composition of enhanced cation exchange capacity prepared by a method for increasing the total amount of lattice metal in the framework of a porous inorganic crystalline composition comprising 98 mole percent or more SiO₂ and 2 mole percent or less oxides of at least one initial lattice metal selected from those of Groups IIIB, IVB, VIB, VIIIB and VIII of the Periodic Table of the Elements and having anhydrous anionic framework molar composition expressed by the formula

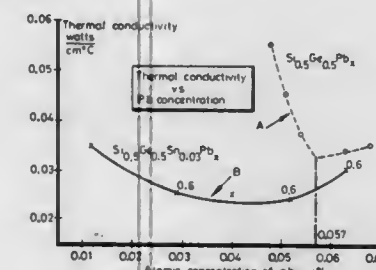


wherein x is less than or equal to 0.02, M is said initial lattice metal and n is the valance of M, which method comprises contacting in an anhydrous system said crystalline composition at a temperature of from about 100° C. to about 850° C. with a volatile compound comprising at least one metal to be coordinated in the framework of said crystalline composition for a time sufficient to increase the total amount of lattice metal in the framework of said crystalline composition wherein said total amount is greater than the amount of said initial lattice metal prior to said contacting, said volatile compound comprising said metal having a radius ratio of less than about 0.6 and a size and shape which permits said volatile compound to enter the pores of said crystalline composition at the contacting temperature,

converting said volatile compound contacted inorganic crystalline composition to the hydrogen or hydronium form, and recovering said porous inorganic crystalline composition of enhanced cation exchange capacity.

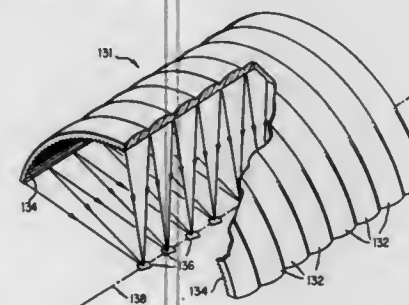
ELECTRICAL

4,711,971
THERMOELECTRIC SI-GE ALLOY COMPOSITION
 William Duncan, and Arthur J. Barlow, both of Glasgow, Scotland, assignors to The University Court of the University of Glasgow, Glasgow, Scotland
 Filed Dec. 5, 1985, Ser. No. 805,507
 Claims priority, application United Kingdom, Dec. 8, 1984, 8431071
 Int. Cl.⁴ H01L 35/20; C22C 28/00
 U.S. Cl. 136—211 19 Claims



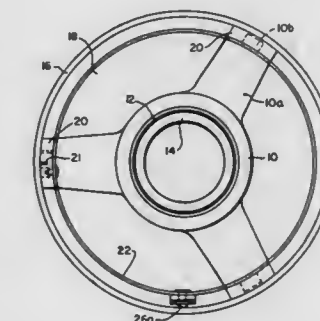
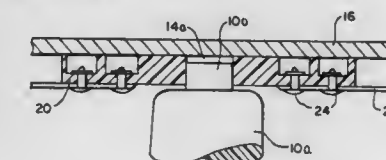
1. A thermoelectric alloy composition consisting essentially of from 5% to 95% of silicon, from 95% to 5% germanium, from 0.01% to 0.2% lead and from 0% to 0.2% of tin, all percentages being atomic percentages.

4,711,972
PHOTOVOLTAIC CELL COVER FOR USE WITH A PRIMARY OPTICAL CONCENTRATOR IN A SOLAR ENERGY COLLECTOR
 Mark J. O'Neill, Richardson, Tex., assignor to Entech, Inc., DFW Airport, Tex.
 Continuation-in-part of Ser. No. 752,023, Jul. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 653,148, Sep. 24, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 892,261
 Int. Cl.⁴ H01L 25/02
 U.S. Cl. 136—246 23 Claims



1. A radiant energy converter for converting radiant energy into electrical energy, the converter having a focal zone, comprising:
 (a) primary optical concentrator including focusing means having a preselected configuration and receiving incident radiant energy for focusing the energy onto the focal zone;
 (b) one or more photovoltaic cells individually located in the area of the focal zone, each of the cells having active material and a pattern of electrically-conducting elements positioned on and obscuring a portion of the active material, the active material for receiving the radiant energy and in response thereto generating an electrical signal; and
 (c) a cell cover for each of the cells, said cell cover having one or more refractive elements, each having a geometry selected to be compatible with the preselected configuration of the focusing means of the primary optical concentrator and further determined by the pattern of electrically conducting elements positioned on the active areas of the cells, said cell cover receiving the focused radiant energy from over a wide angular distribution from the primary optical concentrator depending on the location of the cell in the focal zone and the preselected configuration of the focusing means of the primary optical concentrator and in response thereto refracting the radiant energy away from the pattern of electrically conducting elements and onto the active area of the cells not obscured by the conducting elements.

4,711,973
GAS INSULATED TRANSMISSION LINE WITH SIMPLIFIED INSULATOR ASSEMBLY AND METHOD OF ASSEMBLING SAME
 Jeffrey R. Meyer, Pean Hill Township, Allegheny County, Pa.; Albert P. Munroe, Southborough, Mass., and Philip C. Bolin, Wilkins, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
 Filed Feb. 27, 1987, Ser. No. 20,043
 Int. Cl.⁴ H02G 5/06
 U.S. Cl. 174—14 R 8 Claims

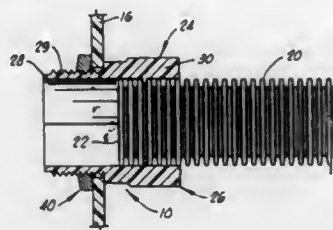


1. A gas insulated transmission line comprising:
 a cylindrical outer sheath;
 an inner conductor disposed within said outer sheath;
 an insulating gas electrically insulating said inner conductor from said outer sheath;
 support means for insulatably supporting said inner conductor within said outer sheath, said support means comprising a solid insulator having an inner portion attached to said inner conductor and an outer portion;
 a bearing block of insulating material fitting together with said outer portion of said solid insulator and having a lower dielectric constant than said insulator, said bearing block having a sliding relation with said outer sheath; and
 a metal particle trap circumferentially disposed coaxially with said outer sheath and attached to said block at locations removed from said insulator.
 8. A method of assembling a gas insulated transmission line comprising the steps of:
 providing a central conductor with at least one support insulator, extending radially therefrom;
 forming a cylindrical particle trap by wrapping a flexible metal sheet material;
 fitting a bearing block of insulating material onto an extremity of said support insulator without use of metal hardware;

fastening said particle trap to said bearing block at points spaced from said support insulator;
fastening an electrical contact to said particle trap; and
sliding said inner conductor supported on said support insulator and bearing block into an outer metal sheath.

4,711,974

ADAPTER FITTING FOR CONNECTING FLEXIBLE CONDUIT TO ELECTRICAL OUTLET BOXES
Richard J. Borsh, Chagrin Falls, Ohio, assignor to The Carlson Company, Cleveland, Ohio
Continuation of Ser. No. 665,304, Oct. 26, 1984, Pat. No. 4,616,105. This application Apr. 30, 1986, Ser. No. 857,842. The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.
Int. Cl.⁴ F16L 3/02
U.S. Cl. 174-65 R



1. An electrical conductor protective system comprising, in combination:
 - an electrical outlet box having at least one side wall defining a substantially circular opening through the one side wall and into the interior of the box;
 - an adapter fitting projecting through the circular opening through the side wall of the box and interlocked with said side wall, said adapter fitting including:
 - a pair of semi-cylindrical fitting halves each having a concave inner side and a convex outer side, and having a first end and having a second end, each of said two fitting halves further including:
 - a neck portion terminating at said first end and extending through the circular opening in the side wall of the box;
 - means preventing the neck portion from moving through said opening beyond a certain specific degree of passage therethrough;
 - a conduit-receiving portion extending from said neck portion to the second end of said fitting half, and having an external surface of greater diameter than the external diameter of said neck portion;
 - a pair of opposed, axially extending, substantially mono-planar, smooth, parallel, uninterrupted side edges extending from the first end thereof to the second end thereof, said side edges in each of said pairs lying in a common plane and slidably abutting the pair of side edges of the other of said fitting halves whereby said semi-cylindrical fitting halves may be slid axially relative to each other as said opposed side edges slide against each other to thereby axially offset one of the fitting halves relative to the other and thereby cause said neck portion of one said semi-cylindrical fitting halves to project a shorter distance into said electrical outlet box than the other of said neck portions projects thereinto to facilitate connecting electrical conductors to terminals within said electrical outlet box;
 - a radially inwardly projecting, circumferentially extending rib carried on the concave inner side of the respective fitting half; and
 - a flexible, synthetic resin corrugated conduit including a plurality of contiguous circular ridges each separated from the two adjacent circular ridges by a pair of grooves, at least one of said grooves receiving one of said radially

1 Claim

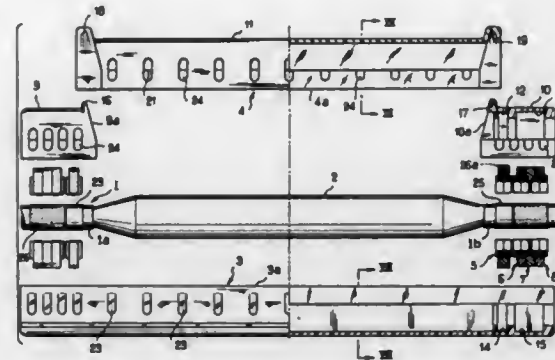
inwardly projecting ribs to retain said corrugated conduit interlocked with said adapter fitting in a preselected position relative to said box.

4,711,975

PROTECTIVE SLEEVE AND A METHOD FOR PROTECTING CABLE SPLICES

Jacques Morel, Fontaine Les Ribouts, and Didier Morel, Favières, both of France, assignors to Etablissements Morel - Ateliers Electromecaniques de Favières, Chateaufort En Thymerais, France
Filed May 12, 1986, Ser. No. 863,828
Claims priority, application France, May 31, 1985, 85 08219
Int. Cl.⁴ H02G 15/113
U.S. Cl. 174-92

15 Claims



1. A sleeve for protecting cable splices in particular for telephone cables, comprising at least two half-shells (3, 4) to be assembled together along their longitudinal edges (3a, 4a) around at least one cable splice (2), opposite ends of the sleeve being provided with separate jaws (5, 6, 7, 8) held together by the half-shells for radially clamping and axially retaining two cable ends (1a, 1b) which are to be connected by means of the splice (2), means for forming a tight seal between the at least two half-shells (3, 4), between the cable ends (1a, 1b) and the jaws and between the at least two half-shells and the jaws, one of the half-shells (3) being formed in one piece, the second half-shell (4) having two end elements (9, 10) for covering the clamping jaws (5, 6, 7, 8), thereby to realize a tight seal between the cable ends (1a, 1b) and the jaws (5, 6, 7, 8) and between the jaws, the respective end elements (9, 10) and the lower half-shell, and a central element (11) separate from said end elements (9, 10), which is adapted to be placed between the at least two end elements and covers the edges (9a, 10a) of said end elements which are adjacent to it, thereby to realize a tight seal between the half shells (3, 4).

13. A method for protecting a cable splice in particular for a telephone cable by means of a sleeve comprising at least two half-shells (3, 4) to be assembled together along their longitudinal edges (3a, 4a) around at least one cable splice (2), opposite ends of the sleeve having separate jaws (5, 6, 7, 8) held together by the half-shells for radially clamping and axially retaining two cable ends (1a, 1b) which are connected by means of the splice (2), means being provided for forming a tight seal between the at least two half-shells (3, 4), between the cable ends (1a, 1b) and the jaws, and between the at least two half-shells and the jaws, one of the half-shells (3) being formed in one piece, wherein the second half-shell (4) is provided with two end elements (9, 10) for covering the clamping jaws (5, 6, 7, 8), thereby to realize a tight seal between the cable ends (1a, 1b) and the jaws (5, 6, 7, 8) and between the jaws, the respective end elements (9, 10) and the lower half-shell and a central element (11), separate from said end elements (9, 10), which is to be placed between the at least two end elements, thereby to realize tight seal between the half-shells (3, 4), wherein said method comprises the following steps:

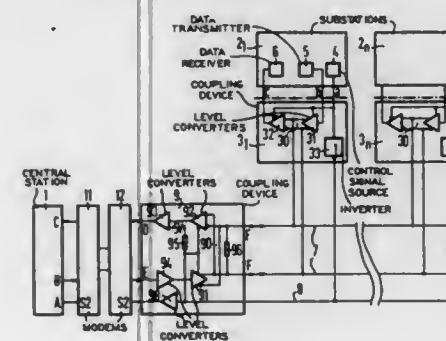
- placing a first series of jaw elements (5a, 6a, 7a, 8a) at the opposite ends of the first half-shell (3);
- placing two cable ends (1a, 1b) which have not yet been joined together on the corresponding jaw elements located at each end of the half-shell (3);
- placing a second series of jaw elements (5b, 6b, 7b, 8b) on the cable ends (1a, 1b) opposite to the first series of jaw elements;
- covering said second series of jaw elements by the two end elements (9, 10) of the second half-shell and fixing said end elements on said first half-shell (3);
- forming a splice (2) between the two cable ends;
- placing the central element (11) of the second half-shell between the two end elements (9, 10) aforesaid and on the first half-shell (3), and then fastening together these components.

4,711,976

DATA TRANSMISSION FACILITY

Ferdinand Narjes, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Dec. 3, 1985, Ser. No. 804,094
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444361
Int. Cl.⁴ H04Q 1/30; H04L 15/00
U.S. Cl. 178-2 C

9 Claims



1. A data transmission facility comprising:
 - a data bus;
 - a central station for transmitting and receiving data including a transmitting output and a receiving input;
 - a first level converter device connected between said transmitting output, said receiving input and said data bus, said first level converter device comprising a transmitting level converter, a receiving level converter and a control input connected to said level converters for receiving first and second control signals, said level converters responsive to said first control signal to condition said first level converter device for the transmission of data from said transmitting output to said data bus and responsive to said second control signal to condition said first level converter device for passing data received from said data bus to said receiving input;
 - a plurality of substations each including a data transmitter and a data receiver;
 - a plurality of second level converter devices each connected between a respective substation and said data bus, each of said second level converter devices comprising a transmitting level converter, a receiving level converter and a control input for receiving said first and second control signals, and responsive to said first control signal to condition said second level converter device to pass data received from said data bus to said data receiver and responsive to said second control signal to condition said second level converter device to pass data from the respective data transmitter to said data bus; and
 - control signal means connected to said control signal inputs

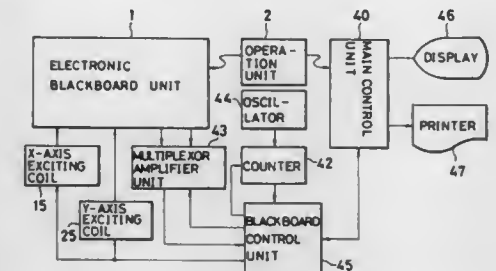
of said first and second level converter devices and operable to produce said first and second control signals.

4,711,977

ELECTRONIC BLACKBOARD APPARATUS

Nobuyuki Miyamori; Yoshiaki Tomofuji; Kiyosato Izawa, and Youichi Tsuchida, all of Kuki, Japan, assignors to Wacom Co., Ltd., Saitama, Japan
Filed Jan. 9, 1987, Ser. No. 1,740
Claims priority, application Japan, Jan. 9, 1986, 61-2736; Jan. 24, 1986, 61-13515
Int. Cl.⁴ G08C 21/00
U.S. Cl. 178-18

5 Claims



1. An electronic blackboard apparatus, comprising:
 - an electronic blackboard unit having a surface plate made of a non-magnetic material, the surface of which is formed as a writing surface capable of being used repeatedly, and a position-detecting tablet for detecting position coordinates of a local magnetic bias applied via said surface plate;
 - a writing instrument having a core member for displaying video information including characters and figure on said writing surface and a magnetism generator for applying a magnetic bias to said position-detecting tablet when said core member is in contact with said writing surface;
 - an eraser having an erasing member for erasing said video information including said characters and figure on said writing surface and a magnetism generator for applying a magnetic bias to said position-detecting tablet when said erasing member is in contact with said writing surface;
 - a position detecting control unit for driving said position-detecting tablet and for computing the position coordinates of said writing instrument and said eraser; and
 - an output section for outputting said video information of said writing surface.

4,711,978

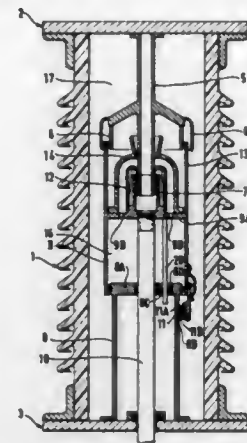
SULFUR HEXAFLUORIDE CIRCUIT-BREAKER FOR OPERATING IN A VERY LOW TEMPERATURE ENVIRONMENT

Robert Jeanjean, St-Lambert; Daniel Demissy, Montreal; Guy Saint-Jean, Longueuil, and Michel Landry, Ste-Julie, all of Canada, assignors to Cegelec Industrie Inc., Lapraire, Canada
Filed Jan. 29, 1987, Ser. No. 8,446
Claims priority, application France, Jan. 29, 1986, 86 01252
Int. Cl.⁴ H01H 33/88

4 Claims

1. In a sulfur hexafluoride circuit-breaker for operating in a very low temperature environment, the circuit-breaker comprising a sealed enclosure closed by first and second end plates and filled with sulfur hexafluoride, a set of fixed contacts, a set of moving contacts driven by an operating rod, means including a moving assembly coupled to said operating rod for defining a blast volume which is mechanically compressed when the operating rod is displaced to open the circuit-breaker contacts, and a blast nozzle for directing said compressed gas from said volume onto the arc, the improvement comprising means including two parts constituting two electrodes for creating an

arc in said blast volume during a portion of the time that the moving assembly is moving, by diverting the current to be



interrupted so that it flow through said two parts constituting said two electrodes.

4,711,979

MICROWAVE OVEN VIDEO VIEWING DEVICE

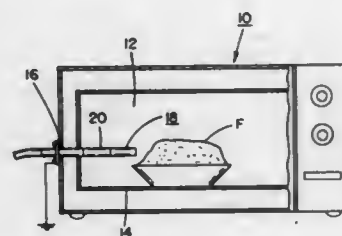
George M. Glasser, Irvington; Robert P. DeRobertis, Mahopac; John H. Smithwick, Mt. Vernon, and William J. Kelly, Tarrytown, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 27, 1986, Ser. No. 834,090

Int. Cl.⁴ H05B 6/76

U.S. Cl. 219-10.55 D

13 Claims



1. An arrangement for the internal viewing of the preparation of a food product or the like in a microwave oven; comprising a telescopic tubular member insertable through an aperture in a wall of said microwave oven so as to position the leading end of said tubular member in proximity to the food product in said microwave oven; a generally cylindrical optical viewing device being inserted in said tubular member in coaxially concentric relationship therewith, said viewing device having an outer diameter which is smaller than the inner diameter of said tubular member to form an annular space therebetween; at least one ring-shaped apertured disc extending transversely in the space between said viewing device and said tubular member for radially supporting said device within said tubular member; and a mesh structure being positioned in said tubular member to extend transversely in front of the leading end of said viewing device in said microwave oven so as to form a radiation screen inhibiting the leakage of microwave radiation therethrough.

4,711,980

NAIL COLLATOR AND WELDER

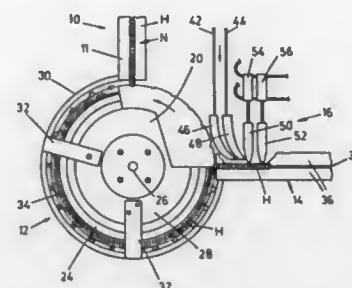
Walter H. Leistner, Willowdale, Canada, assignor to Sigma Tool & Machine Limited, Scarborough, Canada

Filed Feb. 18, 1986, Ser. No. 829,989

Int. Cl.⁴ B23K 11/00; B65B 19/34, 35/58; B65G 47/24

U.S. Cl. 219-56

5 Claims



1. Apparatus for forming nails into a nailing strip for use with nails having nail heads, each having a registering formation for registering with the shank of an adjacent nail, in which such nails are welded to at least one wire, said nails extending diagonally to said strip with the registering formation of each said nail head registering with the shank of an adjacent nail, said apparatus comprising:

a nail feed mechanism for feeding said nails with their nail heads arranged in a random orientation;
a nail indexing and transfer wheel receiving said nails from said nail feed mechanism and indexing them into predetermined nail spacings;
a nail handling slide mechanism for receiving said nails from said indexing and transfer wheel;

rotation means associated with said nail indexing and transfer wheel and comprising friction means for engaging said nails to rotate said nails as said indexing and transfer wheel moves them from said nail feed mechanism to said nail handling slide to bring said heads into a predetermined orientation and holder means for holding said nails in said predetermined orientation once their heads have been rotated into said predetermined orientation;

pusher means operable to push said nails from said nail indexing and transfer wheel and into and along said slide mechanism in strip disposition therein with the shank of each said nail registering with the registering formation of the head of an adjacent nail, and with said shanks of said nails lying on parallel axes which extend diagonally to the axis of said strip;

at least one wire feed means for feeding said at least one wire to one side of said nails in said nail handling slide, said at least one wire extending along an axis parallel to the axis of said strip and diagonally to said shanks of said nails;

electrical welding contact means for contacting said at least one wire and pressing the same sequentially against each said nail and passing a welding current therethrough sufficient to weld said at least one wire to said nail; and movement means for moving said welding contact means towards and away from said nails in said nail handling slide, said pusher means being operable to move said nails along said nail handling slide in timed relation to the operation of said welding contact means whereby to sequentially weld said at least one wire to each said nail so to from said nailing strip.

4,711,981

COMBINED WIRE ELECTRODE ELECTRICAL DISCHARGE MACHINE AND INITIAL HOLE FORMING DEVICE

Toshiyuki Aso, and Tamotsu Ishibashi, both of Hino, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP85/00176, § 371 Date Dec. 3, 1985, § 102(e)

Date Dec. 3, 1985, PCT Pub. No. WO85/04608, PCT Pub.

Date Oct. 24, 1985

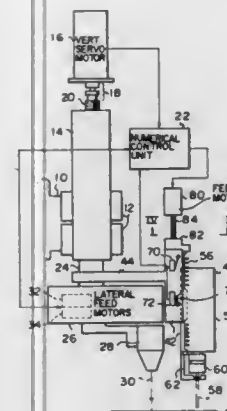
PCT Filed Apr. 8, 1985, Ser. No. 815,090

Claims priority, application Japan, Apr. 7, 1984, 59-68378

Int. Cl.⁴ B23H 7/02

U.S. Cl. 219-69 W

7 Claims



1. A wire electrode electrical discharge machine including an initial hole forming device comprising:

an electrical discharge machine having wire guiding means for guiding a wire electrode, said machine including vertical feed means for vertically moving the wire guiding means toward and away from a workpiece and a lateral feed mechanism supported on said vertical feed means for laterally moving said wire guiding means;

frame means attached to said vertical feed means to be vertically moved thereby;

an initial hole forming head attached to the frame means so as to be vertically slidable relative to the frame means, said initial hole forming head being provided at the lower end thereof with a rotary chuck for holding a hollow bar electrode;

operating means for vertically shifting said initial hole forming head on said frame means between a first initial hole forming position near said wire guiding means and a second resting position to which said initial hole forming head is retracted upward from said first initial hole forming position;

position detecting means on said frame means for detecting positions of said initial hole forming head and providing detection signals indicating positioning of said initial hole forming head and each of said first and second positions; and

control means responsive to said detection signals and operative to inhibit operation of said lateral feed mechanism of said wire guiding means while a detection signal provided by said position detecting means indicates that said initial hole forming head is positioned at said first position, and to permit operation of said lateral feed mechanism of said wire guiding means when a detection signal indicates that said initial hole forming head is positioned at said second position.

4,711,982

PLASTIC MICROWAVE OVEN DOOR

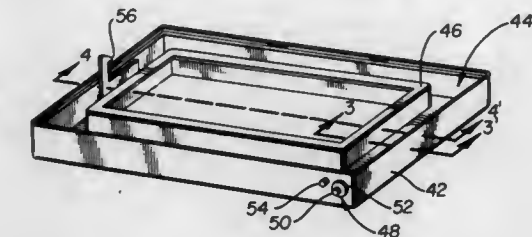
Ronald W. Millman, Bloomington, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 30, 1986, Ser. No. 869,212

Int. Cl.⁴ H05B 6/64

U.S. Cl. 219-10.55 D

26 Claims



1. A microwave oven door structure comprising:
a unitary frame circumscribing a central viewing aperture and formed of a plastic material having a channel cross-section adapted to face a microwave oven cavity opening;
a microwave-impermeable viewing window positioned across the central viewing aperture secured to said frame to permit visual inspection of the interior of a microwave oven cavity; and
a hinge means formed as a single piece with said frame for pivotally connecting one side of the frame to a microwave oven;
wherein the frame channel is provided with a microwave impermeable coating.

4,711,983

FREQUENCY STABILIZED MICROWAVE POWER SYSTEM AND METHOD

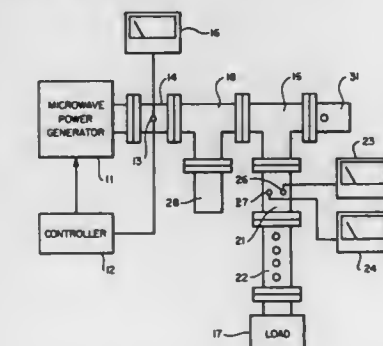
John E. Gerling, 1648 Kansas Ave., Modesto, Calif. 95351

Filed Jul. 7, 1986, Ser. No. 882,223

Int. Cl.⁴ H05B 6/70

U.S. Cl. 219-10.55 A

9 Claims



1. In a system for applying different levels of microwave power to a work load at a substantially constant frequency from a microwave power source which operates at different frequencies at different power levels: a dummy load, means for applying microwave power from the source to the dummy load and to the work load, and means for varying the relative amounts of the microwave power delivery to the dummy load and to the work load to adjust the amount of power delivered to the work load without changing either the level at which the source operates or the frequency of the power delivered to the work load.

4,711,984

ULTRASONIC METHOD AND APPARATUS FOR SPOT WELD CONTROL

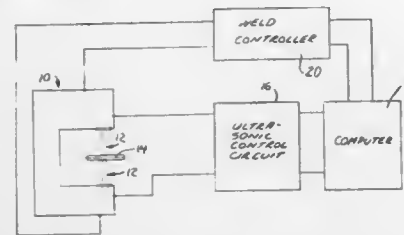
Umit Bilge, Clawson; August F. Scarpelli; Ronald E. Schwartz, both of Warren, all of Mich., and John J. Ross, Dunedin, Fla., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 9, 1987, Ser. No. 23,250

Int. Cl.⁴ B23K 11/24

U.S. Cl. 219—110

5 Claims



1. The method of controlling a resistance spot weld comprising the steps of: transmitting ultrasonic pulses between spot weld tips during a weld cycle, measuring the transit time of the ultrasonic pulses to obtain weld progress information, the transit time of each pulse being a function of temperature and nugget growth, determining the rate of change of transit time from the transit times of at least two pulses, comparing the rate of change of transit time to a preset range during the early portion of the weld cycle and, when there is a discrepancy, adjusting the weld current to conform the measured rate to the preset range, and comparing the rate of change of transit time to a preset rate during a later portion of the weld cycle and, when the measured rate falls below the preset rate, terminating the weld current.

4,711,985

INTERFERENCE DETECTOR FOR LASER CUTTING MACHINE

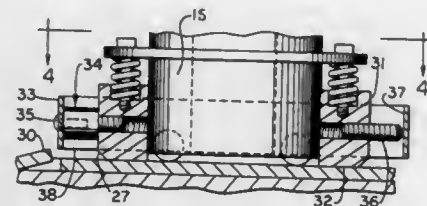
James R. Wilkerson, Morrow, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 24, 1986, Ser. No. 946,264

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121 LB

3 Claims



1. In a coordinate laser cutting machine having: means for supporting sheet stock in a work plane; a laser beam focusing unit and nozzle oriented to direct a laser cutting beam normal to said work plane, said nozzle being positionable proximal to said sheet stock; and means for moving said sheet stock in a plurality of directions along said work plane while said nozzle is positioned proximal to said sheet stock, a protection device for said nozzle, comprising:

- a circular nozzle ring of conductive material, carried by said nozzle proximal to said sheet stock;
- a deflectable circular spring ring of conductive material, concentrically affixed to said circular nozzle ring by at least one radial standoff, said circular spring ring biased to

form a non-conductive gap between said circular nozzle ring and said circular spring ring; electric power source means connected to said circular nozzle ring and said circular spring ring for generating an electric signal when said circular nozzle ring and said circular spring ring contact each other; and means responsive to said electric signal for automatically inhibiting machine movement when said circular nozzle ring and said circular spring ring contact each other.

4,711,986

METHOD AND APPARATUS FOR MEASURING WELD PENETRATION IN AN ARC WELDING PROCESS

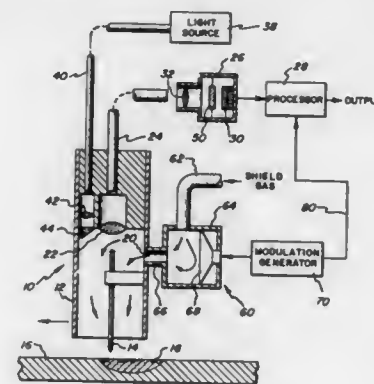
Robert D. Lillquist, Schenectady, and Allen W. Case, Jr., Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 24, 1986, Ser. No. 934,522

Int. Cl.⁴ B23K 9/10

U.S. Cl. 219—130.01

17 Claims



1. An apparatus for continuously monitoring an arc welding process in which an electrical current forms an arc between an electrode of a moving welding torch and a workpiece to create a weld pool in the workpiece, the apparatus comprising optical means on said welding torch for sensing light reflected from the pool at a non-specular angle and for providing a signal representative of the light sensed; means for exciting the pool at a plurality of different frequencies so as to induce spatial oscillations in the pool; and means responsive to the signal from the sensing means for determining the natural frequency of oscillation of the pool and detecting the transition from partial to full penetration of said weld pool.

4,711,987

HEAT SOURCE CIRCUITRY FOR BIOLOGICAL MATERIAL ANALYSIS

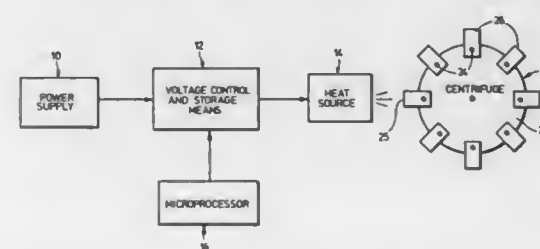
G. Thomas Ritter, Palatine, and Mitchell Budniak, Skokie, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 1, 1985, Ser. No. 707,720

Int. Cl.⁴ H05B 3/00; G01N 25/00

U.S. Cl. 219—358

18 Claims



2. An apparatus, adapted for heating samples of biological material to be analyzed, having a rotatable surface comprising:

a plurality of mounting means, spaced about the periphery of said rotatable surface, each adapted to carry a sample of biological material which may be at a different temperature;

a heat source located adjacent said rotatable surface adapted to convert electrical energy into heat;

an electrical power supply for producing an electrical output;

electrical storage means, coupled between said heat source and said power supply, adapted to convert said electrical output into stored electrical energy for subsequent application to said heat source, the electrical storage means producing a storage capacity signal representative of the amount of electrical energy stored in said electrical storage means;

signal control means adapted to receive the storage capacity signal and to produce a control signal to control the application of said electrical output to said electrical storage means;

amplitude control means for regulating the control signal to determine the amount of electrical energy stored in the electrical storage means;

means adapted to develop a positioning signal when a selected sample of said biological material is moved into proximity of said heat source;

triggering means, coupled to said heat source, adapted to cause said stored energy to be applied to said heat source upon generation of said positioning signal so that said heat source converts said stored electrical energy into heat and applied said heat to said selected sample of said biological material as said sample is moved past said heat source so that each sample may be raised to a respective temperature; and

signal control disable means for preventing the further application of said electrical output to said electrical storage means when said stored electrical energy is applied to said heat source.

4,711,988

ELECTRIC HAIR DRYER WITH MULTI-MODE SWITCH FOR AIR TEMPERATURE AND FLOWRATE CONTROL

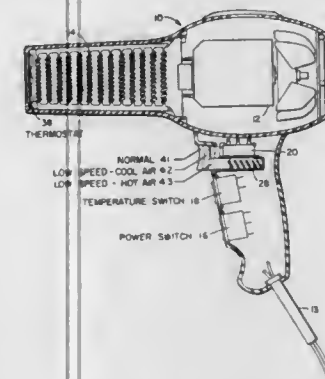
Arnold Thaler, Plantation, Fla., and P. C. Yip, Kowloon, Hong Kong, assignors to Windmere Corporation, Hialeah, Fla.

Filed Oct. 1, 1985, Ser. No. 782,386

Int. Cl.⁴ H05B 1/02; A45D 20/00; F24H 3/04

U.S. Cl. 219—364

19 Claims



1. A hair dryer comprising: blower means for generating a current of air through the hair dryer; heater means for heating said current of air; mode switch means and associated circuitry for controlling said heater means and said blower means to operate in a plurality of modes, said mode switch means being actuated by a single button for selecting each of said modes, said plurality of modes includes a first mode wherein said heater means generates heat at a first heating rate and said blower means generates a current of air at a first flow rate, and a second mode wherein said heater means generates heat at a

second heating rate lower than said first heating rate and said blower means generates a current of air having a second flow rate which is less than or equal to the first flow rate.

4,711,989

DIFFUSION FURNACE MULTIZONE TEMPERATURE CONTROL

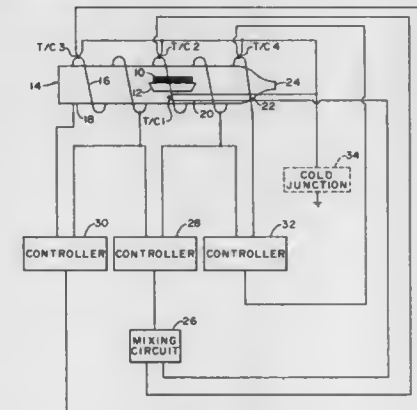
Chong-Tao Yu, Placentia, Calif., assignor to Thermco Systems, Inc., Orange, Calif.

Filed May 19, 1986, Ser. No. 864,676

Int. Cl.⁴ H05B 3/64

U.S. Cl. 219—390

6 Claims



1. A method for recovering the atmospheric temperature in a multi-zone diffusion tube containing a freshly loaded batch of wafers, said tube having resistance heating elements disposed around its periphery, comprising the steps of:

- (a) providing at least one central zone between a load end zone and a source end zone;
- (b) loading a batch of wafers into the central zone;
- (c) heating the tube atmosphere toward a predetermined temperature;
- (d) sensing the temperature of a heating element in the central zone;
- (e) sensing the temperature of the tube atmosphere in the central zone;
- (f) controlling the heat input to the heating elements disposed around the central zone in response to a ratio average of the sensed temperatures of the heating element in the central zone and the tube atmosphere in the central zone.

4,711,990

CERAMIC HEATER

Hiroki Hoshizaki; Nobuaki Kawahara, both of Anjo; Hirofumi Suzuki, Kariya, and Kazuo Oyobe, Ohbu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 7, 1986, Ser. No. 816,868

Claims priority, application Japan, Jan. 11, 1985, 60-3459

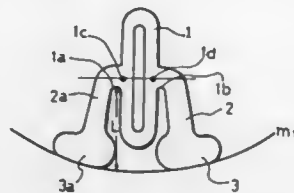
Int. Cl.⁴ H05B 3/10; H01B 1/06

U.S. Cl. 219—552

8 Claims

1. A ceramic heater capable of being cantilevered comprising: heat generating means having a closed loop portion and two leg portions integrally connected to said closed loop portion at two connecting portions which approximately bisect the closed loop portion; two electrode portions being provided at fore ends of said

two leg portions respectively and being disposed in the same plane constituted by said closed loop portion;



said closed loop portion and said two electrode portions conjointly forming a triangle.

4,711,991 COUNTING APPARATUS

Andreas Haller, Werner Pfundstein, both of VS-Schwenningen, and Heinrich Hall, VS-Villingen, all of Fed. Rep. of Germany, assignors to IVO Irion & Vosseler Zahlerfabrik GmbH & Co., Schwenningen, Fed. Rep. of Germany

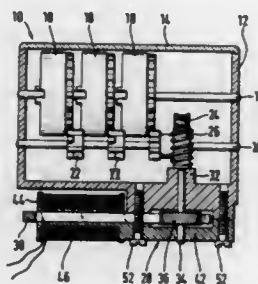
Filed Jan. 7, 1987, Ser. No. 1,222

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 8600748[U]

Int. Cl.⁴ G06F 15/18

U.S. Cl. 235—132 E

7 Claims



1. A counting apparatus comprising:

- (a) a drum counting mechanism comprising a gear, rotatable indicating drums, the gear drivingly connected with one of said drums, and switching drives for decadic indexing of other indicating drums;
- (b) a step motor for driving said counting apparatus including a stator coil, a magnet yoke, a rotor driven by said magnet yoke and having a rotor shaft, means drivingly connecting said rotor shaft to said gear, and
- (c) a housing for said drum-counting mechanism including a wall, said wall forming a part of a housing for said step motor, another part of the step motor housing having an extending portion, said stator coil being around and on said extending portion.

4,711,992

ELECTRONIC INSTRUMENT

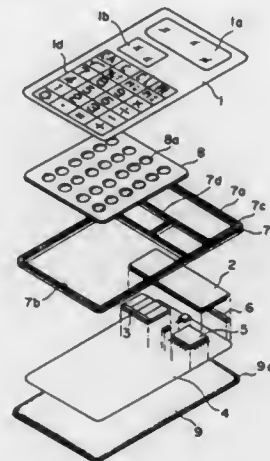
Kazumi Sekine, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 728,161, Apr. 30, 1985, Pat. No. 4,567,354, which is a continuation-in-part of Ser. No. 525,211, Aug. 22, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,175

Claims priority, application Japan, Aug. 30, 1982, 57-149170 Int. Cl.⁴ G06C 7/02; H01H 9/26

U.S. Cl. 235—145 R

7 Claims



1. An electronic instrument, comprising: solar battery means for converting light energy into electric energy; display means for displaying information; an upper member having front and back sides, said upper member comprising a flexible sheet, said solar battery means and said display means being mounted in the region of said back side, said upper member further having a first portion permitting light to be incident on said solar battery means and a second portion permitting information displayed on said display means to be perceived from the exterior of said instrument, said upper member further comprising at least one key symbol; a circuit substrate having an area smaller than that of said upper member and comprising a circuit pattern including at least one fixed contact, corresponding to said at least one key symbol, used for key input; an integrated circuit element connected to said at least one fixed contact; movable contact means positioned between said upper member and said circuit substrate, a key input to said integrated circuit element being obtained by contact of said movable contact means with said at least one fixed contact; spacing means normally for maintaining said movable contact means spaced from said at least one fixed contact of said circuit substrate when said at least one key symbol of said upper member is not depressed and for permitting said movable contact means to contact said at least one fixed contact of said circuit substrate to produce a key input when said at least one key symbol is depressed; a lower member provided at a position to sandwich said circuit substrate between at least a portion of said lower member and at least a portion of said upper member, said lower member having a recessed area formed within the periphery thereof, said recessed area receiving said circuit substrate, said solar battery means, said display means and said spacing means within the height of said lower means; and means for adhesively securing said upper member to the periphery of said lower member.

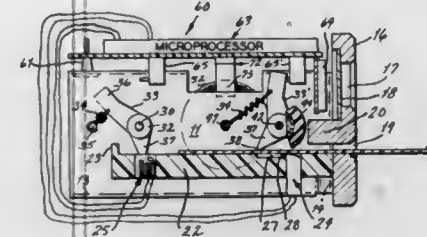
4,711,993

FRAUD-RESISTANT MANUAL MAGNETIC READER-WRITER SYSTEM FOR DEBIT CARD USE
Joseph F. Kosednar, 2030 Seven Pines Dr., Creve Coeur, Mo. 63041, and Marilyn W. Barth, 729 W. Lockwood, Glendale, Mo. 63122

Continuation-in-part of Ser. No. 568,384, Jan. 5, 1984, Pat. No. 4,599,510. This application May 20, 1985, Ser. No. 736,113 Int. Cl.⁴ G06K 5/00

U.S. Cl. 235—380

11 Claims



1. For accepting commands for transactions involving debiting the amount of credit encoded on a magnetic stripe card which if valid is also encoded with a validity indication, a manual card reader-writer comprising means to establish a linear path for card insertion and reading, and a co-linear path for card writing and withdrawal, means to fix a rest position at the end of such card reading path, card sensor means to respond when such card has reached such rest position, means including card read head means, effective on card movement along such path for insertion, to read and store in memory such credit amount and such validity indication, if the latter be present, means, effective on such response of the card sensor means and on completion of such storage in memory, to eradicate at least such validity indication, means to output from memory and display at least the credit amount so read and stored, means to receive an external command to debit such credit amount, and to accept such command if not in excess of the credit amount then present and if such a validity indication has been stored, and to calculate a revised credit balance effective on such acceptance and to substitute same in the storage and display, and means including card write head means, effective on withdrawal movement of such card out of said rest position and along said write path, to recall out of storage such credit balance as revised and write same on such card in place of the original credit amount, and thereafter, if a validity indication has been so stored, to rewrite such stored validity indication and cancel all such storage, whereby should a user manage to remove a card without rewriting its credit balance out of storage, such card would lack a validity indication and be incapable of reuse.

4,711,994

SECURITY SYSTEM FOR CORRELATING PASSENGERS AND THEIR BAGGAGE

Joel S. Greenberg, Princeton, N.J., assignor to Princeton Synergetics, Inc., Princeton, N.J.

Filed Jan. 17, 1986, Ser. No. 819,805

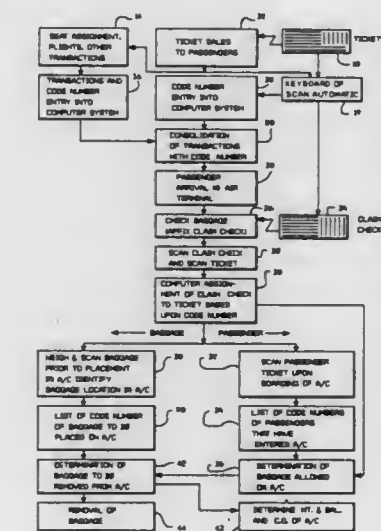
Int. Cl.⁴ G06F 15/26; G06K 19/06

U.S. Cl. 235—384

12 Claims

1. A security system for maintaining a close surveillance over both passengers and their baggage to be loaded aboard a public conveyance, comprising: a passenger ticket having a uniquely distinctive, machine readable code number printed thereon, for issuance to an airline ticket agent or travel agency; a baggage claim check having a tag portion and a receipt

portion, both portions having a uniquely distinctive, similarly machine readable code number printed thereon, for issuance to baggage handlers; means for initially recording and storing the ticket and claim check code numbers, to indicate the airline ticket agent or travel agency to whom the ticket was issued and to indicate the baggage handler to whom the claim check was issued; means for recording and storing the code number printed on the ticket, when the ticket is issued to a passenger; means for recording and storing the code number printed on the claim check, when the tag portion thereof is affixed to baggage, at the time the passenger presents baggage to be checked in;



means for re-recording and re-storing the passenger ticket code number, at the time the passenger presents the baggage to be checked in, to identify and associate each passenger with specifically identified baggage; means for again recording and storing the ticket code number, as the passenger boards the conveyance, to identify and confirm the presence of each passenger aboard the conveyance; a first list of passengers who have boarded the conveyance generated by the storage means; a second list of identified baggage associated with a specific boarded passenger generated by the storage means; and the second list indicating which of the baggage is or is not allowed to be loaded aboard the conveyance.

4,711,995

ELECTRONIC KEY CODE RECORDING DEVICE

Leonard J. Genest, 1331 E. Edinger St., Santa Ana, Calif. 92705
Filed Jul. 10, 1986, Ser. No. 884,132

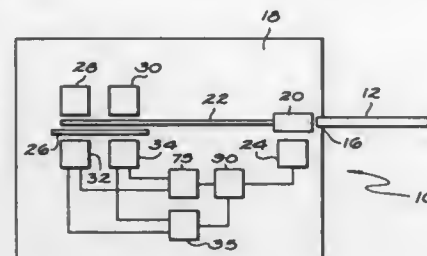
Int. Cl.⁴ G06K 7/08

U.S. Cl. 235—449

8 Claims

1. A device for recording a code on a key which is used for electronic locks, the recording device comprising: a housing having an opening for receiving the key; a first transparent material having a series of alternate opaque lines and transparent spaces, said first transparent material being stationary in said housing; a second transparent material having a series of alternate opaque lines and transparent spaces, said second transparent material being adjacent and parallel to said first transparent material, said second transparent material being adapted to be moved with respect to said first transparent material by the insertion of the key through said opening; and

means for recording the code on the key as a function of distance traveled by the key as the key is inserted through a source for directing a light beam from said optical source along a predetermined path, and means positioned a predetermined



said opening, said recording means being permanently positioned in said housing.

4,711,996

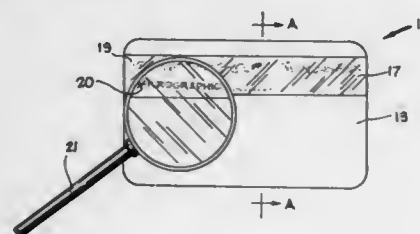
REDUNDANT OPTICAL RECORDING OF INFORMATION IN DIFFERENT FORMATS

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.
Continuation-in-part of Ser. No. 693,856, Jan. 22, 1985, which is a continuation-in-part of Ser. No. 443,596, Nov. 22, 1982, Pat. No. 4,503,135, which is a continuation-in-part of Ser. No. 238,832, Feb. 27, 1981, Pat. No. 4,360,728, and a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Apr. 9, 1985, Ser. No. 721,382. The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

Int. Cl.⁴ G06K 7/10

U.S. Cl. 235-468

28 Claims



1. A method for recording information in situ on a card comprising, disposing at least one strip of optical contrast direct-read-after-write laser recording material in a carrier and recording information indicia onto said strip, in situ, by means of a laser, at least some of said information indicia being microscopically eye readable information, the other information being machine readable information, the eye readable information being redundant with at least some of the machine readable information.

4,711,997

OPTICAL INTERCONNECTION OF DEVICES ON CHIPS

David A. B. Miller, Fair Haven, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 14, 1986, Ser. No. 930,672

Int. Cl.⁴ H01J 3/14

U.S. Cl. 250-216

6 Claims

1. In combination, a chip having at least one optical source for providing a light beam out of said chip and at least one optical detector for receiving light coupled to said chip at a point that is spatially remote from said optical source, diffracting means fabricated in material grown over said optical

distance from said diffracting means for reflecting the directed light beam to said optical detector.

4,711,998

DIRECTION FINDER SYSTEM WITH MIRROR ARRAY

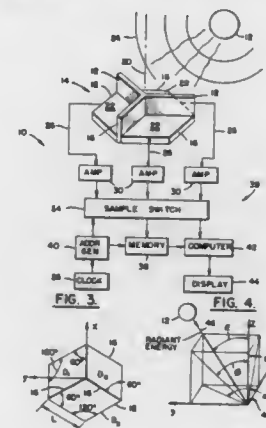
Fritz J. Malek, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 5, 1985, Ser. No. 804,720

Int. Cl.⁴ G01B 11/26

U.S. Cl. 250-203 R

5 Claims



1. A direction finder system comprising: an array of three radiation detectors and three mirrors disposed between the detectors, said detectors being positioned in a plane about a central axis of the array for detecting an incoming wave of radiant energy from a source of the radiant energy located in a sector of space including said central axis, each of said detectors producing a signal upon detection of an incident wave of the radiant energy; each of said mirrors having front and back reflecting surfaces for reflection of the radiant energy upon individual ones of said detectors located before and behind the mirror, said mirrors lying in planes which intersect at and include said central axis thereby to extend forward of the plane of said detectors for interception of rays of radiation directed towards the plane of said detectors, said interception of rays by a mirror introducing a shading of one of said detectors during a reflection of radiation upon a second of said detectors; the strength of each signal depending on the orientation of a radiation-receiving surface of the corresponding detector and the orientation of reflecting surfaces of adjoining mirrors relative to the direction of propagation of said wave, including increments in signal strength introduced by reflection and shading functions of the mirrors; and means for combining the signals of said detectors to obtain the direction of a source of said wave, said combining being based on a continuously variable ratio of signals of respective ones of said detectors to accomplish normalization of respective ones of the detector signals.

4,711,999

APPARATUS FOR PHOTOMETRICALLY DETECTING AN OPTICALLY FOCUSED CONDITION OF AN OPTICAL SYSTEM

Yoshio Shishido, Fochinobe Sagami-hara; Susumu Takahashi, Hachioji; Kazumasa Matsuo, Tama; Atsushi Miyazaki, Hachioji; Shinichi Nishigaki, Hachioji; Shinichi Kato, Hachioji; Takeaki Nakamura, Hino, and Akibumi Ishikawa, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

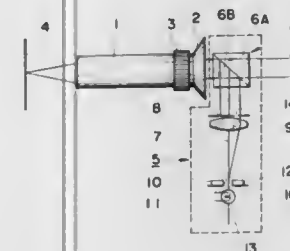
Continuation of Ser. No. 500,964, Jun. 3, 1983, abandoned. This application Jan. 14, 1987, Ser. No. 5,282

Claims priority, application Japan, Jun. 5, 1982, 57-96534; Jun. 5, 1982, 57-96535

Int. Cl.⁴ G01J 1/20

U.S. Cl. 250-204

6 Claims



1. An apparatus for photometrically detecting a focused condition of an image-forming optical system having a first optical axis, comprising:

light projection means for projecting a definitely-shaped beam of light into an object to be imaged; means for conducting light reflected from said object along said first optical axis of said image-forming optical system; beam-splitting means arranged along said first optical axis of said image-forming optical system for partially deflecting said light being reflected from said object along said first optical axis along a second optical axis and for providing a first light path along said second optical axis; aperture means provided at a location eccentrically of said second optical axis for providing a second light path intersecting said first light path at a point along said second optical axis; and light-receiving means having first and second sides arranged along said second optical axis at a fixed location therealong corresponding to a focal position along said first optical axis of said image-forming optical system and including at least two photoelectric sensor means on said first side having respective photoelectric surfaces thereof arranged perpendicularly to said second optical axis and having a gap between said two photoelectric sensor means for projecting light from said light projecting means through said gap of said light-receiving means, said light projecting means being positioned on said second side of said light-receiving means, wherein a focused condition of said image-forming optical system may be detected photometrically by said light-receiving means in accordance with comparison of respective outputs of said at least two photoelectric sensor means.

4,712,000

ROTARY ENCODER WITH SOURCE-ADJACENT LIGHT SAMPLING AND CONTROL

Junichi Yoshikawa, and Masahiro Rachi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

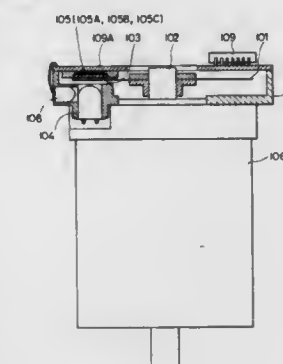
Filed Oct. 17, 1984, Ser. No. 661,822

Claims priority, application Japan, Oct. 21, 1983, 58-196178; Oct. 21, 1983, 58-196179; Feb. 23, 1984, 59-31505; Feb. 23, 1984, 59-31506; Mar. 23, 1984, 59-54507; Mar. 23, 1984, 59-54508

Int. Cl.⁴ G01V 1/32

U.S. Cl. 250-205

6 Claims



1. A rotary encoder comprising: a light emitting device; a photosensor; sampling means disposed between said light emitting device and said photosensor for intercepting light from said light emitting device as said sampling means is rotated; monitoring means disposed on a side of said sampling means adjacent to said light emitting device for sensing a portion of the light from said light emitting device to produce a signal representing a light intensity sensed; and means for controlling the light intensity of said light emitting device in accordance with an output from said monitoring means.

4,712,001

TRANSIENT ANALYSIS SYSTEM USING A PHOTONIC SAMPLER DEVICE

Etienne d'Humieres, Versailles; Jean M. Bernet, La Celle St. Cloud, and Claude Imhoff, St. Germain en Laye, all of France, assignors to Thomson CSF, Paris, France

Filed Dec. 12, 1985, Ser. No. 808,032

Claims priority, application France, Dec. 14, 1984, 84 19196

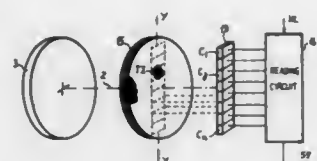
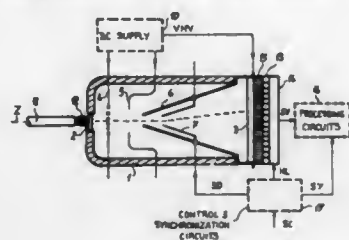
Int. Cl.⁴ H01J 31/50

U.S. Cl. 250-213 VT

9 Claims

1. A transient analysis system comprising: photonic sampler means including a tube having a vacuum enclosure and input and output ends, said input end including a photocathode for receiving light signals to be analyzed and for transforming the light signals into an electron beam, said output end including a fluorescent screen and said vacuum enclosure containing deflection electrodes provided for deflecting the electron beam received from said photocathode in a predetermined direction thereby producing a light plot of transient phenomena resulting from the deflected electron beam striking said fluorescent screen, said photonic sampler means providing light intensification of a predetermined gain by said tube being optically coupled on the input end to a single optical analysis channel allowing said photocathode to be of reduced dimensions for receiving the light plot corresponding to the optical signal to be processed; and image detector means including a solid state detector strip optically coupled to said fluorescent screen of said photonic sampler means, said detector strip being disposed

parallel to the deflection direction and centered substantially along a diameter of said tube which corresponds to



the light plot scanning range caused by the electron beam deflection.

4,712,002

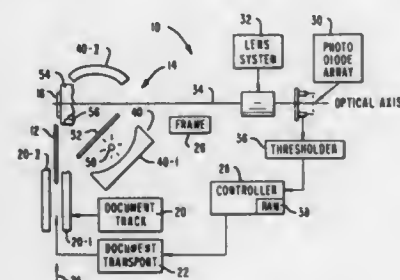
IMAGING SYSTEMS EMPLOYING APPARATUS FOR EVENLY ILLUMINATING OBJECTS TO BE SCANNED
Tuan-Kay Lim, Waterloo, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 9, 1986, Ser. No. 917,332

Int. Cl.⁴ G03B 27/54; H01J 3/16

U.S. Cl. 250-216

16 Claims



9. A system for imaging documents comprising:
a scanning plane having a scanning line therein;
means for presenting a said document at said scanning plane;
an elliptical cylindrical mirror means for directing light evenly on said document along said scanning line;
said elliptical cylindrical mirror means having first and second focal lines and comprising:
a first elliptical cylindrical section having said first focal line adjacent thereto; and
a second elliptical cylindrical section having said second focal line adjacent thereto and also cooperating with said first elliptical cylindrical section for directing light from said first focal line to said second focal line;
said elliptical cylindrical mirror means being positioned relative to said scanning plane to enable said second focal line to be substantially coincident with said scanning line;
said second elliptical cylindrical section having a non-reflecting area facing said second focal line and being located substantially at the center of said second elliptical cylindrical section as measured along the direction of said second focal line;
first and second planar mirrors located in substantially spaced parallel relationship to each other at opposed ends of said scanning line at said scanning plane and positioned substantially perpendicular to said scanning plane;

a linear-type source of illumination positioned at said first focal line;
an optical axis which is located substantially perpendicularly to said scanning plane at said scanning line and passes between said first and second elliptical cylindrical sections;
a light detector array located on said optical axis; and
a lens system located on said optical axis for directing light reflected from said document along said scanning line to said light detector array.

4,712,003

BLIND PERSON GUIDE DEVICE

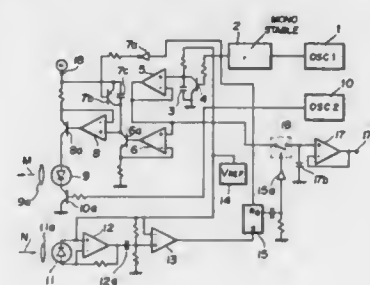
Itsuki Ban, 3-50-18 Higashi-Oizumi, and Yuji Mitsuta, 4-28-17 Shimoshakujii, both of Nerima-ku, Tokyo, Japan
Continuation of Ser. No. 632,668, Jul. 20, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 18,740

Claims priority, application Japan, Jul. 27, 1983, 58-115612[U]; Jun. 6, 1984, 59-82961[U]

Int. Cl.⁴ G01S 17/06

U.S. Cl. 250-221

5 Claims



1. A blind person guide device comprising:
a source for emitting a beam of pulse-shaped infrared radiation of a peak value that is limited in a forward direction;
a photoelectric element for receiving infrared radiation reflected from an object irradiated by said beam;
an electric circuit having means for removing an influence of a disturbance light such as sunlight or illumination light from the illuminance or received radiation on said photoelectric element by modulating said infrared radiation at an audio frequency between 100 and 1000 Hz, and means for sampling-and-holding the signal from said influence removing means, the resulting held signal corresponding to information as to a distance to the object;
an oscillator for generating electric vibrations having a frequency and an amplitude which are dependent on the distance information produced by said electric circuit; and
a power supply switch for energizing and de-energizing said electric circuit and said oscillator, said power supply switch having a pressor comprising a vibrator which is vibratable in response to said electric vibrations and against which a human skin can be pressed.

4,712,004

METHOD AND APPARATUS FOR COMPENSATING FIBER OPTIC LEAD AND CONNECTOR LOSSES IN A FIBER OPTIC SENSOR BY USING A BROADBAND OPTICAL SOURCE AND MULTIPLE WAVE RETARDATION

William B. Spillman, Jr., Charlotte, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Aug. 20, 1986, Ser. No. 898,318

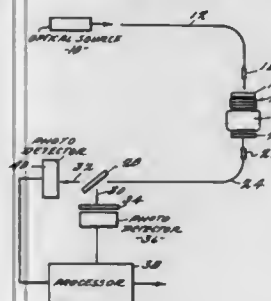
Int. Cl.⁴ H01J 5/16

U.S. Cl. 250-227

27 Claims

1. Optical sensor apparatus, comprising:
optical source means for providing a broadband source light beam including a plurality of spectral components, each spectral component having a different wavelength;

polarizer means for receiving said source light beam and polarizing it to provide a polarized light beam including said plurality of spectral components;
multiple wave retardation means for receiving said polarized light beam and retarding said plurality of components to provide a retarded light beam having a plurality of retarded components;
optical transducer means for (a) receiving said retarded light beam, (b) modulating said retarded components in accordance with an externally applied condition, each retarded component being modulated by an amount corresponding to the wavelength associated with each retarded component, and (c) providing an output light beam having a plurality of modulated components;
analyzer means for receiving said output light beam and providing an analyzed light beam having a plurality of analyzed components corresponding to said plurality of



modulated components, a total light intensity of said analyzed light beam remaining effectively unresponsive to said externally applied condition;
filter means for (a) receiving said analyzed light beam (b) providing a first optical signal having only one portion of said analyzed components, said one portion including an analyzed component which varies according to said externally applied condition, and (c) providing a second optical signal including said plurality of analyzed components;
photodetector means for (a) receiving said first and second optical signals, (b) converting said optical signals into electrical signals, (c) providing a first electrical signal corresponding to an intensity of said first optical signal, and (d) providing a second electrical signal corresponding to an intensity of said second optical signal; and
processing means for receiving said first and second electrical signals and providing an output signal corresponding to a ratio of said first and second electrical signals.

4,712,005

FLOATING MASK ENCODER WITH ASSEMBLY SPACER

Lalit J. Savla, Nesconset, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Dec. 19, 1985, Ser. No. 810,605

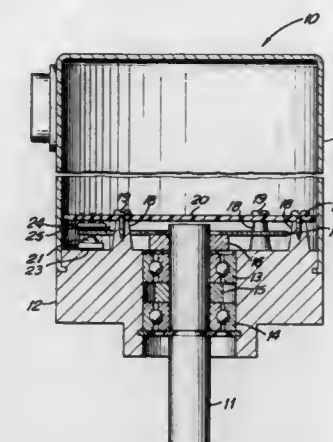
Int. Cl.⁴ G01D 5/34

U.S. Cl. 250-231 SE

8 Claims

1. A method of manufacturing a shaft position encoder requiring a minimum of precision machining and exhibiting simplified alignment characteristics and which is of the type including a rotary encoded disk including position markings thereon and a stationary detector having a mask disposed thereon for reading said position markings to produce electrical signals indicative of shaft position, comprising the steps of:
mounting the encoded disk for rotation with the shaft;
mounting a circuit board near the encoded disk;
placing the detector between the encoded disk and the circuit board with the leads thereof passing through apertures in the circuit board;
aligning the detector and the encoded disk with the surface of said mask and the surface of said disk in parallel with each other and with an air gap of less than 0.005" between

their surfaces using a spacer between the detector and the encoded disk surface;



mechanically securing the detector leads to the circuit board with the spacer in place; and
thereafter removing the spacer.

4,712,006

STEAM QUALITY MEASUREMENT APPARATUS AND METHOD

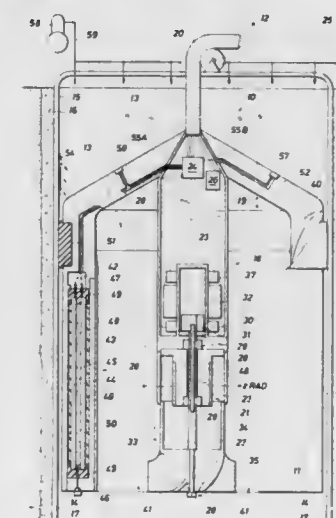
Bernard Zemel, and Philip J. Ciosmann, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 27, 1985, Ser. No. 770,115

Int. Cl.⁴ G01V 5/08

U.S. Cl. 250-269

10 Claims



1. A steam quality measurement apparatus for use in monitoring the steam quality of a steam-water mixture passing down the throughbore of a steam injection well, said steam quality measurement apparatus comprising:
emitter means centrally located with respect to a central longitudinal axis, said emitter means having; electrical conduit means connected to said emitter means, an emitter source characterized by the emission of radiation, said emitter source formed from selected radioactive material positioned about said central longitudinal axis of said emitter means, signal processing means located in the emitter means to process an output signal so as to monitor the steam quality,
radiation detection means capable of providing said output signal substantially proportional to the amount of radiation

tion received from said emitter means, said radiation detection means having;

a radiation detector providing said output signal and located in a tubular manner and extending longitudinally along-side and at a spaced distance from said central longitudinal axis,

a packer formed about an outer circumference of said radiation detector, said packer carried by said detector and operatively contacted with said well throughbore so as to form a seal between said well throughbore and said detector, and

a tubular aperture defined in an annular manner between said emitter means and said radiation detection means and located at an upper and so as to direct substantially all of said steam-water mixture passing downward through said throughbore.

4,712,007

PULSED NEUTRON LOGGING METHOD USING CUMULATIVE COUNT CURVES

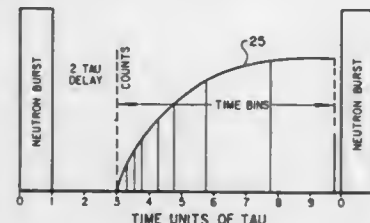
Michael A. Ondrik, Albuquerque, N. Mex., assignor to S.I.E., Inc., Fort Worth, Tex.

Filed Apr. 1, 1985, Ser. No. 718,521

Int. Cl.⁴ G01V 5/10

U.S. Cl. 250—270

5 Claims



1. A method of measuring earth formation characteristics, comprising in combination:

repetitively irradiating the earth formations with pulses of neutrons; then

detecting gamma rays emanating from the irradiated formations; and

cumulatively counting for a preselected counting period following each pulse the total gamma rays detected in a plurality of separate time bins, and adding the total count from each preceding bin to the count from a next bin, the cumulative counts for each pulse defining points on a cumulative count versus time curve which has a mathematical expression; and

computing from the cumulative counts of the time bins variables in the mathematical expression which correspond to characteristics of the earth formations.

4,712,008

ION MOBILITY SPECTROMETER

Kishore N. Vora, Herndon, Va.; John P. Carrico, Sr., Baltimore, Md.; Glenn E. Spangler, Lutherville, Md.; Donald N. Campbell, and Charles E. Martin, both of Timonium, Md., assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 18, 1986, Ser. No. 908,840

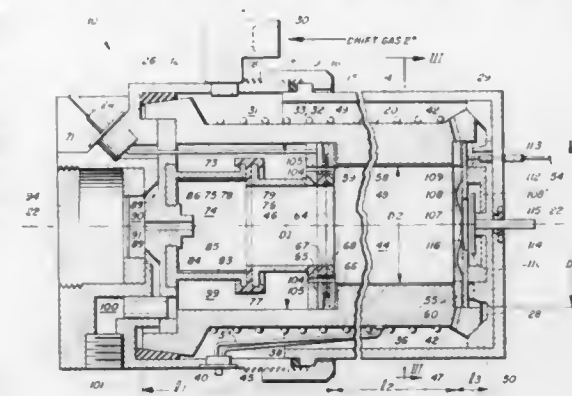
Int. Cl.⁴ H01J 49/40

U.S. Cl. 250—287

8 Claims

1. An ion mobility spectrometer comprising a cylindrical tube containing a reaction region, a shutter assembly, a drift region, an aperture grid, and collector; a housing including means for inserting said cylindrical tube therein and having a space between said side walls of said housing and the outside surface of said cylindrical tube, an inlet in said housing for introducing drift gas into said space, a heating element in said space for heating said cylindrical tube and said drift gas and means for introducing said drift gas from said space into said drift region, said cylindrical tube having a first length having at

least a first inside diameter and a second length having a second inside diameter less than said first inside diameter forming a first interior annular ledge between said first and second lengths, said ledge having a first conductive layer thereon, the inside surface of said second length having a resistive layer



thereon and in electrical contact with said first conductive layer, a shutter assembly positioned against said first interior annular ledge having electrical contacts at its periphery in contact with said first conductive layer on said first interior annular ledge.

4,712,009

APPARATUS FOR SCANNING SHEET-SHAPED RECORDING MEDIUM

Makoto Ohgoda, and Kaoru Tamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

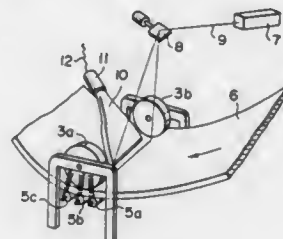
Filed Nov. 20, 1984, Ser. No. 673,443

Claims priority, application Japan, Nov. 21, 1983, 58-219312

Int. Cl.⁴ G03C 5/16

U.S. Cl. 250—327.2

2 Claims



1. An apparatus for scanning a sheet-shaped stimuable phosphor recording medium, the apparatus comprising:

- a conveyance means comprising a conveying roller and a plurality of nip rollers for forming nips for conveying said sheet-shaped stimuable phosphor recording medium in co-operation with said conveying roller by contacting the surface of said conveying roller, and
- a scanning optical system for scanning said sheet-shaped stimuable phosphor recording medium, which is conveyed by said conveyance means, by a light beam in a scanning direction approximately normal to the conveyance direction of said sheet-shaped stimuable phosphor recording medium,
- one of said conveying roller and said nip rollers being fabricated as edge rollers contacting the other of said conveying roller and said nip rollers only near both end portions of the other,
- said scanning optical system being positioned on the side of said edge rollers for scanning between said edge rollers.

4,712,010

RADIATOR SCANNING WITH IMAGE ENHANCEMENT AND NOISE REDUCTION

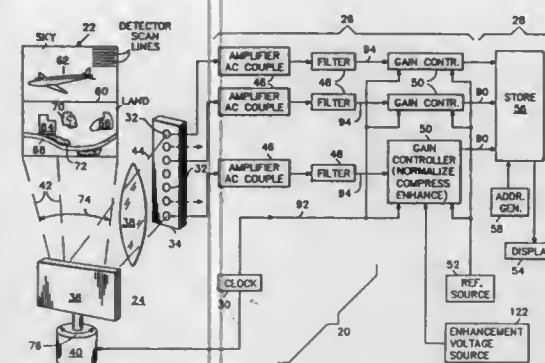
Ake W. Alm, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 30, 1986, Ser. No. 824,350

Int. Cl.⁴ H04N 5/33

U.S. Cl. 250—334

21 Claims



1. An imaging system comprising:

an array of radiation detectors arranged along the vertical dimension of a scanning pattern;

means for directing radiation from a subject, distant from said system, toward said array of detectors to permit a viewing of said subject by said system, said directing means including means for scanning said radiation along a set of scan lines sweeping out adjacent regions of the subject with a scan interval of predetermined duration to provide a two-dimensional raster scan of a scene including said subject, each of said detectors providing a signal in response to radiation incident upon the detector;

means for displaying data to be carried by signals of respective ones of said detectors to present an image of the scene containing said subject;

signal processing means interconnecting said displaying means with said array of detectors, said signal processing means including gain normalizing means for amplifying individual ones of said detector signals with a gain varying inversely to average signal strength;

wherein said normalizing means is configured as a feedback loop and includes nonlinear means for introducing a nonlinear gain characteristic, said normalizing means including enhancement means for clarifying edge lines of said subject, said nonlinear means coacting with said enhancement means to provide an adaptive enhancement characteristic dependent on the strength of signals from the corresponding detectors; and

wherein said normalizing means includes noise reduction means coupled to said enhancement means for reducing the gain of said gain characteristic for near-zero incremental values of a detector signal.

4,712,011

X-RAY IMAGE INTENSIFIER TUBE INCLUDING A LUMINESCENT LAYER WHICH ABSORBS SECONDARY RADIATION

Johannes A. J. Van Leunen, Heerlen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1986, Ser. No. 847,808

Claims priority, application Netherlands, Apr. 3, 1985, 8500981

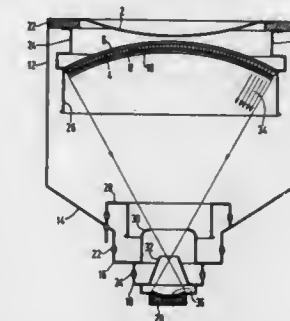
Int. Cl.⁴ G01T 1/20

U.S. Cl. 250—361 R

20 Claims

1. An X-ray image intensifier tube which includes an entrance screen with a layer of luminescent material provided on a substrate as well as a photocathode, and also includes an electron-optical system for imaging photoelectrons, to be emitted

by the photocathode, on an exit screen of the tube, characterized in that the layer of luminescent material includes an absorption material which contains an element having a com-



paratively high absorption for characteristic X-rays emitted by the luminescent material the absorption material amounting to from approximately 1 to 5 percent by weight of the layer of luminescent material.

4,712,012

CHARGE CONVERSION UNIT FOR NEGATIVE ION SOURCE

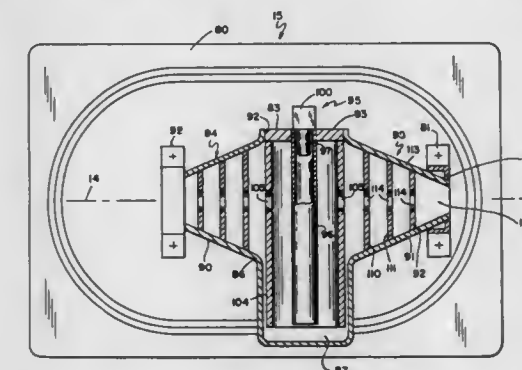
Harry Naylor, Richmond, New Zealand, assignor to General Ionex Corporation, Newburyport, Mass.

Filed Jul. 26, 1985, Ser. No. 759,464

Int. Cl.⁴ H01J 27/00

U.S. Cl. 250—423 R

4 Claims



1. A charge conversion apparatus for converting positive ions to negative ions by passing the positive ions through a converting material in the vapor state, said apparatus including:

- a supporting structure,
- a housing with a central portion having barriers thereby to form a substantially isothermal volume and apertures in the wall thereof through which the ion beam passes,
- a reservoir at the bottom of said central portion for accumulating the converting material in the liquid state,
- heater means located in the central portion for continuously vaporizing the converting material in the reservoir,
- thermally conductive conical sections extending from said central region thereby to produce a thermal gradient to a supporting structure, and;
- a plurality of transverse baffles within said conical sections, each having an aperture aligned on the beam axis for condensing the vapor, the liquid returning to the reservoir through gravity.

4,712,013

METHOD OF FORMING A FINE PATTERN WITH A CHARGED PARTICLE BEAM

Eiji Nishimura, Tadahiro Takigawa, and Yoshihide Kato, all of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

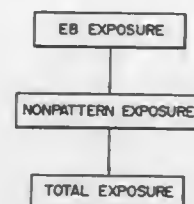
Continuation of Ser. No. 778,795, Sep. 23, 1985, abandoned. This application May 4, 1987, Ser. No. 45,160

Claims priority, application Japan, Sep. 29, 1984, 59-204426; Sep. 29, 1984, 59-204437; Mar. 5, 1985, 60-43448

Int. Cl.⁴ H01J 37/00

U.S. Cl. 250-492.2

17 Claims



1. A method of forming a fine pattern with a charged beam, comprising the steps of:

performing a first irradiation of a predetermined region of a sample with a charged beam to form an exposed pattern on the sample; and

performing a second irradiation of a region around the pattern with either of a charged beam or an electromagnetic wave, and at a dose smaller than the dose for forming the exposure pattern, to perform an auxiliary exposure, the auxiliary exposure being such that a molecular amount distribution remains substantially unchanged along the direction of thickness of said region around the pattern of the sample wherein the step of performing the auxiliary exposure occurs at a voltage of not less than 30 keV.

4,712,014

RADIATION LAMP UNIT

Helmut Eich, Uhlandstrasse 7, 7417 Reutlingen-Pfullingen, Fed. Rep. of Germany

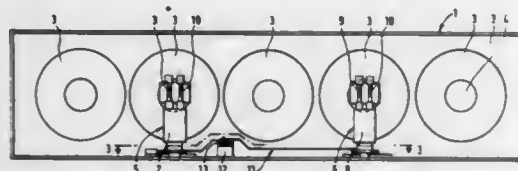
Filed Jun. 6, 1986, Ser. No. 871,347

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1985, 3520659

Int. Cl.⁴ G21G 4/00; A61N 00/00

U.S. Cl. 250-494.1

7 Claims



1. A radiation lamp unit, comprising: an elongate housing (1), a plurality of highly-polished concave reflectors (3) mounted in the housing, an equal plurality of light-orange radiation lamps (4) individually disposed at focal point areas of the reflectors, and two UV lamp units (9, 10) secured to mounting bases (7, 8) spaced apart from each other and symmetrically disposed about a center axis of the housing.

4,712,015

SHIELDS FOR NUCLEAR REACTORS

Garth J. Aspdon, Bolton, England, assignor to National Nuclear Corporation Limited, Knutsford, England

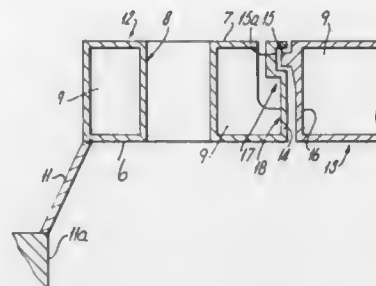
Filed Nov. 19, 1985, Ser. No. 799,579

Claims priority, application United Kingdom, Dec. 17, 1984, 8431754

Int. Cl.⁴ G21C 13/06, 9/00

U.S. Cl. 250-517.1

6 Claims



1. A roof shield for a nuclear reactor comprising a normally fixed radially outer portion having a radially inner wall, a radially inner portion rotatable about a vertical axis, and a connection between the inner and outer portions which permits relative angular movement between the portions without loss of containment, the connection being on the radially inner side of an upper portion of the radially inner wall of the outer portion, the upper portion of the inner wall being connected to the outer portion only at the lower end of the upper portion and the upper portion being so arranged that on upward movement of the inner portion the upper portion of the inner wall receives substantially no angular movement, the lower end of the upper portion being at a position below the connection and below the level of the upper surface of the outer portion.

4,712,016

ALIGNMENT SYSTEM ALLOWING ALIGNMENT WHEN ALIGNMENT MARKS ARE ABSENT

Takashi Matsumura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

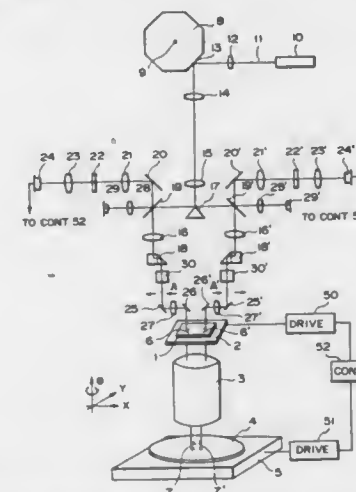
Filed Jan. 29, 1986, Ser. No. 823,736

Claims priority, application Japan, Jan. 30, 1985, 60-014485

Int. Cl.⁴ G01B 11/00

U.S. Cl. 250-548

7 Claims



1. An alignment system for sequentially aligning individual portions of a first object with respect to a second object by use of alignment marks provided for the respective portions of the first object, said system comprising:

driving means for moving stepwise the first object relative to the second object;

means for detecting an alignment mark provided for such one of the portions of the first object that is positioned by the stepwise movement by said driving means so as to be correlated with the second object;

aligning means for adjusting the relative position of the first and second objects on the basis of the detection by said detecting means so that the aforesaid one portion of the first object is placed in alignment with the second object, said aligning means adjusting the relative position of the first and second objects to align the aforesaid one portion of the first object with the second object on the basis of the detection, by said detecting means, of an alignment mark provided for another portion of the first object in the neighborhood of the aforesaid one portion, when the alignment mark provided for the aforesaid one portion is not detected by said detecting means.

4,712,017

PHOTOCOUPLER DEVICE HAVING REFLECTING SURFACE ENHANCE SIGNAL TRANSMISSION

Keiji Kamasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

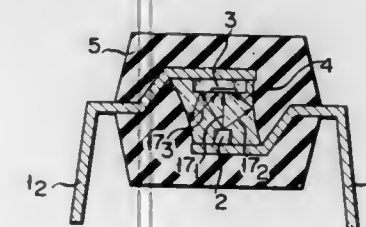
Filed Jun. 27, 1985, Ser. No. 749,382

Claims priority, application Japan, Oct. 16, 1984, 59-217103

Int. Cl.⁴ G02B 27/00

U.S. Cl. 250-551

7 Claims



1. A photocoupler device, comprising: a light-emitting element for emitting light; a semiconductor light-receiving element having a light-receiving planar surface region for receiving light emitted from said light-emitting element, said light-receiving planar surface region having an effective portion and an ineffective portion, said effective portion converting light impinging thereon into an electric signal; and a light-reflecting layer formed on said ineffective portion of said light-receiving planar surface region for reflecting at least a portion of said light emitted from said light-emitting element onto said effective portion of said light-receiving planar surface region, thereby making an effective use of said reflected light to generate said electric signal.

4,712,018

METHOD AND APPARATUS FOR FABRICATING FULL WIDTH SCANNING ARRAYS

James C. Stoffel, Rochester, and Jagdish C. Tandon, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 462,593, Jan. 31, 1983, Pat. No. 4,690,391. This application Mar. 26, 1987, Ser. No. 30,308

Int. Cl.⁴ H01J 40/14

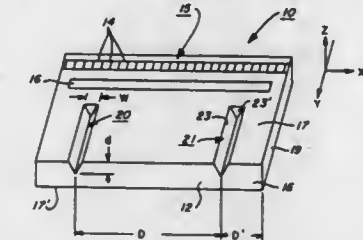
U.S. Cl. 250-578

3 Claims

1. A short linear scanning array adapted to be assembled with like ones of said short arrays in end to end abutting relationship to provide a longer linear scanning array, said short array including a base and at least one row of image processing elements, the improvement comprising:

at least two array aligning formations on said short array

base, said array aligning formations being disposed at preset locations on said short array base, said array aligning formations being adapted to associate with stationary



array aligning formations disposed in predetermined array aligning locations to permit assembly of said short array with others of said short arrays to provide said longer array.

4,712,019

PROGRAMMABLE ELECTRONIC PLUG-IN TIMER

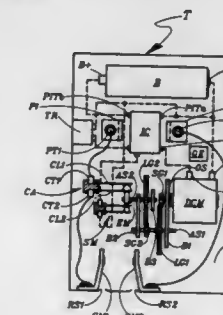
Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Apr. 10, 1985, Ser. No. 721,670

Int. Cl.⁴ H01H 43/00

U.S. Cl. 307-141

20 Claims



1. A combination comprising: contactor means having a pair of electrical terminals and being operable to exist in either of two states: (i) a state wherein electric current is permitted to flow freely between said terminals, and (ii) a state wherein electric current is prevented from flowing freely between said terminals; said contactor means being operable at any given time, on receipt of a mechanical actuation input, to change from one of said states to the other of said states, regardless of the nature of the particular state in which it exists at said given time; actuator means operable each time on receipt of a discrete electrical actuation input to provide said mechanical actuation input; electric energy means operative to supply electric power without having to be connected with an electric utility power line; clock means connected with said electric energy means and operable to provide an accurate clock signal; programming means connected with said electric energy means and with said clock means, and operative to provide said discrete electrical actuation input repeatedly in accordance with a presettable program referenced to time-of-day; and structure means operative to support and hold together in substantially rigid relationship said contactor means, said clock means, and said programming means; whereby said contactor means is at certain selected times caused to permit current to flow freely between said terminals, and at certain other times caused to prevent such flow of current.

4,712,020

BIAS CONTROL CIRCUIT FOR RF SWITCH

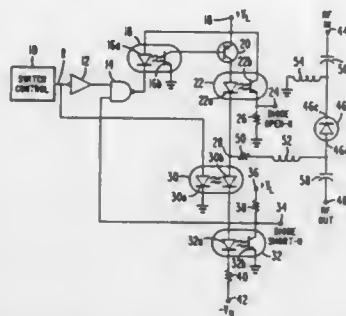
Philip C. Basile, Turnersville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 20, 1986, Ser. No. 876,984

Int. Cl.⁴ H03K 17/74, 19/14

U.S. Cl. 307-256

19 Claims



1. An apparatus for controlling a switching diode by the selective application of forward bias current and reverse bias voltage thereto, said reverse bias voltage being of such a magnitude as to cause a reverse leakage current through said diode which has a magnitude less than a predetermined magnitude when said diode is in a normal operating condition, and to cause a reverse leakage current through said diode which has a magnitude substantially greater than said predetermined magnitude when said diode is in a shorted condition said apparatus comprising:

- a first bias circuit for coupling forward current to said diode;
- a second bias circuit for applying reverse voltage to said diode, said reverse voltage producing said reverse leakage current flow through said diode, said second bias circuit including means responsive to said reverse leakage current flow through said second bias circuit which has a magnitude substantially greater than said predetermined magnitude for latching said reverse leakage current there-through;
- first generating means responsive to said reverse leakage current flow through said second bias circuit for generating a diode alarm signal; and
- means for selectively enabling said first and second bias circuits, said diode alarm signal being coupled to said enabling means for disabling said first bias circuit.

4,712,021

CMOS INVERTER

Wolfgang Gollinger, Gundelfingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,353

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 85108065[U]

Int. Cl.⁴ H03K 5/24, 19/017, 19/094

U.S. Cl. 307-355

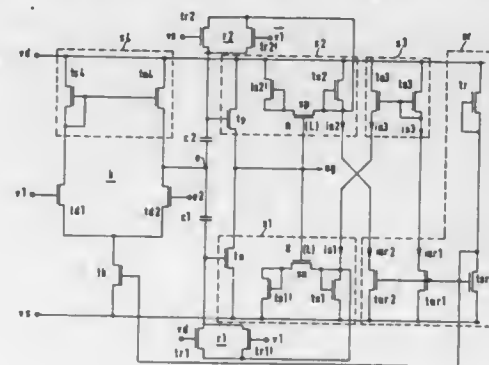
12 Claims

1. An inverter comprising:
- an inverter input terminal;
 - an inverter output terminal;
 - a first current mirror having an output transistor taking the form of an n-channel CMOS second transistor having a gate and a controlled current path, said first current mirror having a drive input;
 - a second current mirror having an output transistor taking the form of a p-channel CMOS first transistor having a gate and a controlled current path, said second current mirror having a drive input;
 - means for connecting to a voltage source, said controller current paths of said first and second transistors being connected in series between positive and negative terminals

nals of said means for connecting to a voltage source and having a junction therebetween;

said inverter output terminal being connected to said junction between the controlled current paths of said first and second transistors to provide an output signal of said inverter;

- a first capacitor connecting said input terminal to the gate of said first transistor;
- a second capacitor connecting said input terminal to the gate of said second transistor;
- a third current mirror having a drive input and a first current output, said first current output of said third current mirror being connected for providing drive current to said first current mirror drive input;
- a reference current mirror having a second current output, said second current output of said reference current mirror being connected for providing drive current to said third current mirror, and having a third current output



- connected for providing drive current to said second current mirror;
 - first resistor means coupling the gate of said n-channel CMOS second transistor to said first current mirror drive input; and
 - second resistor means coupling the gate of said p-channel CMOS first transistor to said second current mirror drive input;
- wherein output currents of said first and second current mirrors are switched between a high and low current value depending on output levels of said inverter such that said first current mirror has a low output current value when said output level is a first level and has a high output current value when said output level is a second level, while said second current mirror has a high output current value when said output level is said first level and has a low output current value when said output level is said second level.

4,712,022

MULTIPLE INPUT OR-AND CIRCUIT FOR FET LOGIC

Tho T. Vu, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 28, 1985, Ser. No. 750,107

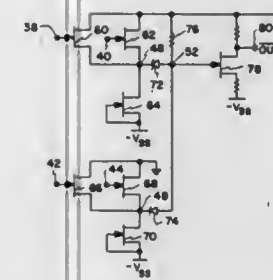
Int. Cl.⁴ H03K 19/094, 17/16, 5/08, 3/26

U.S. Cl. 307-448

19 Claims

1. A logic circuit for applying a logic signal to the control gate of a switching FET, said circuit including a reference node, comprising:
- a first logic node;
 - a first FET having a drain region, a source region and a control gate, wherein the drain region of said first FET is connected to said reference node, said first logic node is connected to the source region of said first FET, and data is input to the control gate of said first FET;
 - first load means connected to said first FET;
 - a first diode having an anode and a cathode, wherein the

- cathode of said first diode is connected to said first logic node;
- a second logic node;
- a second FET having a drain region, a source region and a control gate, wherein the drain region of said second FET is connected to said reference node, said second logic node is connected to the source region of said second FET, and data is input to the control gate of said second FET;
- second load means connected to said second FET;



- a second diode having an anode and a cathode, wherein the cathode of said second diode is connected to said second logic node;
- third load means; and
- a third logic node, wherein the anodes of said first and second diodes are each connected to said third logic node, wherein said third load means is connected to and between said reference node and said third logic node and wherein said third logic node is connected to said control gate of said switching FET.

4,712,023

BUFFERED FET LOGIC GATE USING DEPLETION-MODE MESFET'S.

Tatsuo Otsuki, Takatsuki; Akio Shimano, Osaka; Hiromitsu Aoki, and Ikuko Aoki, both of Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

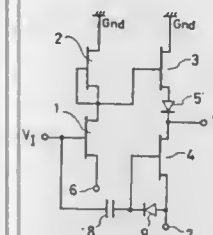
Filed Nov. 13, 1986, Ser. No. 929,844

Claims priority, application Japan, Nov. 13, 1985, 60-254124

Int. Cl.⁴ H03K 19/017, 19/094

U.S. Cl. 307-450

18 Claims



1. A gate circuit comprising:
- a first power source terminal to be supplied with a first potential,
 - a second power source terminal to be supplied with a second potential,
 - a third power source terminal to be supplied with a third potential,
 - a first FET connected by its gate to an input terminal and by its source to said first power source terminal,
 - a second FET connected by its gate and source to the drain of said first FET and by its drain to said third power source terminal,
 - a third FET connected by its gate to the drain of said first FET and the source and the gate of said second FET and by its drain to said third power source terminal,

- a first diode connected by its one electrode to the source of said third FET,
- a fourth FET connected by its drain to the other electrode of said first diode and by its source to the second power source terminal,
- an output terminal connected to junction point between said other electrode of said first diode and the drain of said fourth FET,
- a second diode connected by its one electrode to the source of said fourth FET and by its other electrode to the gate of said fourth FET, and
- a capacitive element connected across a junction between the gate of said fourth FET and said other electrode of said second diode and the gate of said first FET.

4,712,024

ACTIVE BALUN STAR MIXER

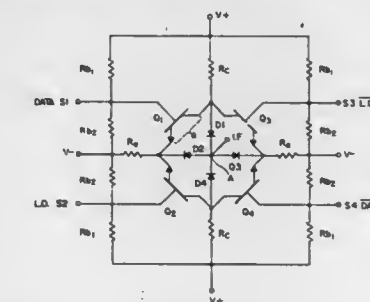
Charles F. McGuire, Kaysville; David J. Weber, Sandy, and Gordon C. Steyaert, Salt Lake City, all of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Aug. 16, 1985, Ser. No. 766,187

Int. Cl.⁴ G06G 7/00; H03K 9/06

U.S. Cl. 307-529

13 Claims



1. A mixer circuit comprising,
- first and second diodes having a respective cathode thereof connected together,
 - third and fourth diodes having a respective anode thereof connected together and to the cathodes of said first and second diodes at a common junction to provide an output terminal,
 - first source means connected to each respective anode of said first and second diodes,
 - second source means connected to each respective cathode of said third and fourth diodes,
 - first transistor means having its emitter-collector conduction path connected between the anode of said first diode and the cathode of said fourth diode,
 - second transistor means having its emitter-collector conduction path connected between the anode of said second diode and the cathode of said third diode,
 - third transistor means having its emitter-collector conduction path connected between the anode of said third diode and the cathode of said fourth diode,
 - fourth transistor means having its emitter-collector conduction path connected between the anode of said second diode and the cathode of said third diode,
 - first input means supplying switching signals to the control electrode of each of said second and third transistor means, and
 - second input means supplying oscillator signals to the control electrode of each of said first and fourth transistor means.

4,712,025

ANALOG SWITCH

Frederick G. Weiss, Portland, Oreg., assignor to Triquint Semiconductor, Inc., Beaverton, Oreg.

Filed Apr. 26, 1985, Ser. No. 727,483

Int. Cl.⁴ H03K 17/16, 17/687

U.S. Cl. 307—571



1. A switch circuit comprising:

a switch element having first and second controlled current terminals, and switch control terminal connected to a first node of the switch circuit and further connected through a resistive load element to a first reference potential source, for receiving control current from said first reference potential source, said switch element having a conductive state, in which current flows between the first controlled current terminal and the second controlled current terminal, and a non-conductive state, in which current flow between the first controlled current terminal and the second controlled current terminal is prevented, said switch element being placed in its conductive state when the potential at the switch control terminal bears a predetermined relation to the potential at at least one of said first and second controlled current terminals, and being placed in its non-conductive state when the potential at the switch control terminal does not bear said predetermined relation to the potential at said at least one controlled current terminal,

a follower device having a first follower terminal connected to said first reference potential source, a second follower terminal connected to the first controlled current terminal of the switch element and also having a third follower terminal, said follower device having the property that the potentials at its second and third follower terminals remain in substantially fixed relation when current is conducted through the device from the first follower terminal to the third follower terminal,

a first unidirectionally-conductive element connected between the first node of the switch circuit and a second node of the switch circuit for conducting current into said second node of the switch circuit from the switch control terminal of the switch element,

a second unidirectionally-conductive element connected between the third follower terminal and the second node of the switch circuit for conducting current into said second node of the switch circuit from said third follower terminal,

at least one additional unidirectionally-conductive element connected anti-parallel to said first unidirectionally-conductive element between said first and second nodes of the switch circuit,

a constant current source connected to a control current terminal, for delivering current to a second reference potential source, and

current-steering means for connecting the constant current source selectively to the first node of the switch circuit, whereby the switch element is placed in its non-conductive state, or to the second node of the switch circuit, whereby the switch element is placed in its conductive state and the potential at the switch control terminal of the switch element is maintained in a fixed relation to that at the first controlled current terminal of the switch element by the action of the follower device.

4,712,026

DELAY CIRCUIT

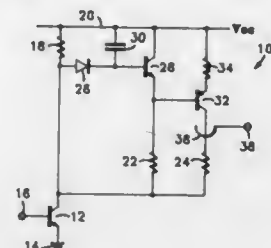
John M. Pigott, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1986, Ser. No. 926,498

Int. Cl.⁴ H03K 5/13

12 Claims U.S. Cl. 307—600

5 Claims



1. An integrated circuit responsive to an input signal for providing an output signal a predetermined time interval thereafter, comprising:

first and second power supply conductors to which an operating potential and a ground reference potential are respectively supplied;

a charge storage device coupled between said first power supply conductor and a first circuit node;

discharge circuit means connected between said first circuit node and said first power supply conductor for providing a discharge current path for said charge storage device when enabled;

charge circuit means coupled between said first power supply conductor and a second circuit node and having an input coupled to said first circuit node for providing a current path for charging said charge storage device when enabled;

a first transistor having a base coupled to an input of the circuit, an emitter coupled to said second power supply conductor and a collector coupled both to said discharge circuit means and said second circuit node, said first transistor being responsive to the input signal for disabling said discharge circuit means while enabling said charge circuit means, said discharge circuit means being enabled when said first transistor is rendered nonconductive; and a comparator means having an input coupled to said charge circuit means and being responsive to said charge storage device being charged to a predetermined level for providing the output signal at an output a predetermined time interval after the input signal is applied to the delay circuit.

4,712,027

RADIAL POLE LINEAR RELUCTANCE MOTOR

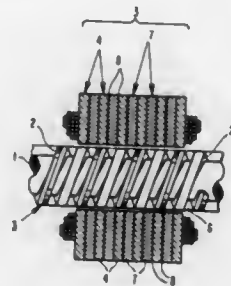
John P. Karidis, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1986, Ser. No. 842,527

Int. Cl.⁴ H02K 41/00

U.S. Cl. 310—12

12 Claims



1. A linear variable reluctance motor having relatively mov-

able armature and stator members, and electromagnetic windings on at least one of said members forming an electromagnetically active envelope of said first and second members, characterized in that:

a first one of said members comprises a stack of laminar pairs of alternate radial pole ferromagnetic laminar plates and nonferromagnetic laminar spacers, with a smooth internal channel having an inside diameter complementary to the outside diameter of said first member to allow a sliding relationship within the electromagnetically active envelope of said first and second members, each laminar pair of laminar pole plate and laminar spacer together with related cement being dimensioned in total thickness substantially equal to one tooth interval, said laminar pole plate and laminar spacer being separated by at least one insulating layer to minimize eddy currents, the total aggregate thickness of said laminar pairs and spacing cement being equal to nominal stack length,

whereby the teeth are positioned with their average linear tooth interval equal to the nominal tooth spacing.

4,712,028

MAGNETICALLY ASSISTED STEPPING MOTOR

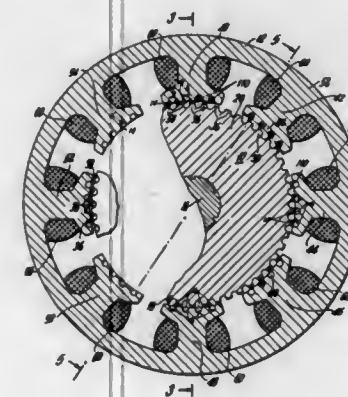
Ralph W. Horber, Marshfield, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Filed May 21, 1984, Ser. No. 612,563

Int. Cl.⁴ H02K 37/00

U.S. Cl. 310—49 R

16 Claims



1. A stepping motor, comprising:

a stator

a plurality of poles on said stator,

a plurality of spaced stator teeth on each of said poles;

winding means for energizing each of said poles so as to magnetize the plurality of teeth on any one of said poles in the same direction at any one time;

a rotor movable relative to said stator;

said rotor having a plurality of spaced rotor teeth located for movement along a first direction past said stator pole teeth;

said rotor teeth and said stator teeth forming spaces having widths along a path of relative rotor-stator movement and depths transverse to the path of movement;

a plurality of permanently magnetized structures located adjacent to the plurality of rotor teeth or the plurality of stator teeth and poled in the direction of the depth of the spaces;

said structures being located in spaces adjacent the stator teeth;

said rotor teeth being skewed relative to the transverse direction of the path of movement by a fraction of a tooth pitch;

said permanently magnetized insert including a neodymium-boron alloy.

4,712,029

GENERATOR HIGH TEMPERATURE ELECTRICAL LEAD ASSEMBLY

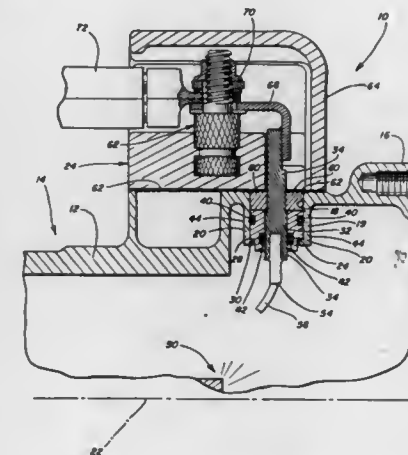
Robert D. Nold, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 22, 1986, Ser. No. 945,033

Int. Cl.⁴ H02K 5/10, 9/00; H01B 17/30

U.S. Cl. 310—71

11 Claims



1. A terminal assembly for connecting a stator signal to the exterior of the housing of a gas-filled, oil-cooled generator, comprising:

a terminal insulator extending through an opening in the generator housing, said insulator having an opening therethrough and said housing opening further extending through a boss projecting into the housing;

means for supplying coolant around said boss;

a first O-ring providing a seal between the insulator and the boss;

a conductor extending through the terminal insulator opening and being connected to the generator stator; and

a second O-ring providing a seal between the conductor and the insulator within the portion of the opening located within said boss.

4,712,030

HEAT SINK AND MOUNTING ARRANGEMENT THEREFOR

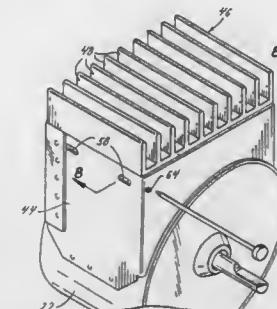
Bryan L. Lakin, and William P. Wharton McDaniel, both of Springfield, Mo., assignors to Fasco Industries, Inc., Boca Raton, Fla.

Division of Ser. No. 805,965, Dec. 6, 1985. This application Nov. 14, 1986, Ser. No. 930,393

Int. Cl.⁴ F01P 1/06; H02K 9/00

U.S. Cl. 310—89

11 Claims



1. In a dynamoelectric machine having a conduit box and an associated electronic circuit mounted on a PC board, the improvement comprising means to mount said PC board to the conduit box, said mounting means comprising means defining a

channel along at least one edge of the PC board, and means defining at least one tab in the conduit box so that said PC board may be releasably mounted therein by deforming the tab into the channel.

4,712,031

UNIT BEARING MOTOR WITH HYDRODYNAMIC LUBRICATING SYSTEM

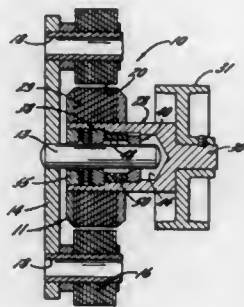
Linda K. Anderson, Roscoe, Ill., assignor to Ancor Industries, Inc., Rockford, Ill.

Filed Nov. 12, 1986, Ser. No. 930,685

Int. Cl.⁴ H02K 5/16; F16C 3/14, 33/10

U.S. Cl. 310—90

15 Claims



1. An electric motor having a stator assembly with a stationary cylindrical shaft extending outwardly therefrom, a rotor having a centrally located tubular housing telescoped over said shaft, first and second axially spaced sleeve bearings of porous material fixed tightly within said housing and rotatable on said shaft, each of said bearings having inner and outer walls and having inboard and outboard faces, said housing and the outboard face of said first bearing coacting to define an oil reservoir, a tubular liner of absorbent material telescoped into said housing and over said shaft and sandwiched between the inboard faces of said bearings, there being substantial radial clearance between said liner and said shaft whereby the space between said liner and said shaft defines an annular oil chamber, said reservoir and said chamber communicating with one another and being completely filled with oil, means adjacent the outboard face of said second bearing for substantially sealing said chamber outboard of said second bearing whereby said reservoir and said chamber define a substantially sealed system, the inner wall of each bearing including a cylindrical portion of predetermined diameter and length telescoped over said shaft with a close but rotatable fit, the cylindrical portion of the inner wall of each bearing terminating short of the inboard face of the bearing, and the inner wall of each bearing having a substantially circumferentially continuous enlarged diameter portion of circular cross-section extending from said cylindrical portion to the inboard face of such bearing whereby centrifugal force created by rotation of said housing and said bearings causes oil to circulate within said reservoir and said chamber and whereby said enlarged diameter portions of said bearings promote the flow of oil between said shaft and said cylindrical portions of the inner walls of said bearings.

4,712,032

LIQUID METAL CIRCULATION IN AN ACYCLIC GENERATOR COLLECTOR

Burton D. Hatch, Ballston Lake, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1986, Ser. No. 939,500

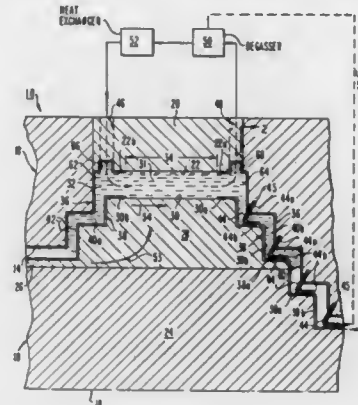
Int. Cl.⁴ H02K 31/00

U.S. Cl. 310—178

12 Claims

1. An acyclic generator comprising, in combination:
A. a stator;
B. a rotor mounted for rotation about an axis relative to said stator;

C. an annular rotor collector surface formed on a circumferential surface of said rotor;
D. an annular stator collector surface formed in a circumferential surface of said stator in closely spaced relation with said rotor collector surface to define therebetween an annular collector gap;
E. a first stepped surface formation formed in said stator circumferential surface axially to at least one side of said stator collector surface;
F. a second stepped surface formation formed in said rotor circumferential surface axially to said one side of said stator collector surface, said first and second stepped surface formations being in conforming, closely spaced



relation to define therebetween a containment gap in fluid communication with said collector gap;

G. insulative coatings covering said first and second stepped surface formations;
H. liquid metal filling said collector gap and at least a portion of said containment gap; and
I. at least one annular fluid flow impedance member immersed in said liquid metal and spanning said containment gap to retard the communication of pressure fluctuations generated in said liquid metal in said collector gap resulting from variations in current transiting said collector gap to said liquid metal beyond said impedance member from said collector gap.

4,712,033

ACYCLIC GENERATOR WITH LIQUID METAL CURRENT COLLECTORS HAVING CIRCULATING CURRENT BARRIERS

Manoj R. Shah, Latham, and Henry G. Lenz, Scotia, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 22, 1986, Ser. No. 945,153

Int. Cl.⁴ H02K 31/00

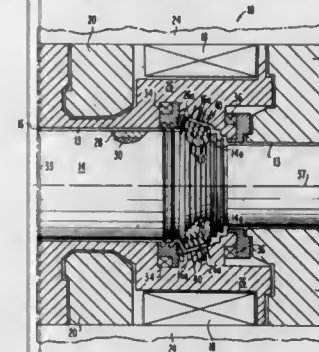
U.S. Cl. 310—178

11 Claims

1. An acyclic dynamoelectric machine comprising, in combination:

A. a stator having a bore;
B. a rotor mounted for rotation about its axis within said bore and separated from said stator by an annular air gap;
C. a set of field windings for developing and excitation magnetic field;
D. a collector region including opposed, conforming annular collector surfaces of said rotor and said stator separated by a segment of said air gap, and liquid metal disposed within said air gap segment to conduct main current between said stator and said rotor collector surfaces; and
E. a plurality of insulative current barriers incorporated in said collector region to interrupt the continuity of at least one of said collector surfaces at the interface thereof with said liquid metal, whereby to separate said main current into multiple parallel paths at said interface and to increase

the resistance to circulating current in said collector region by forcing the circulating current in circumventing



said insulative current barriers to flow in a serpentine path into and out of said liquid metal.

4,712,034

MULTIPLE RING ARMATURE CORE FOR DIRECT CURRENT MOTOR

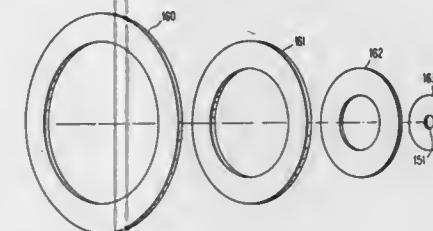
Shinichiro Iwasaki, Troy, Mich., assignor to Aisin Seiki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 595,483, Mar. 30, 1984, Pat. No. 4,553,058. This application Nov. 12, 1985, Ser. No. 797,036

Int. Cl.⁴ H02K 15/02

U.S. Cl. 310—217

23 Claims



1. An armature core for a direct current motor, said core comprising:

a plurality of laminated sheets, each sheet being formed of at least two coplanar and concentrically interfitted component parts with a space therebetween, said component parts being made of magnetic material and being washer shaped in construction, said space being filled with a first insulating material.

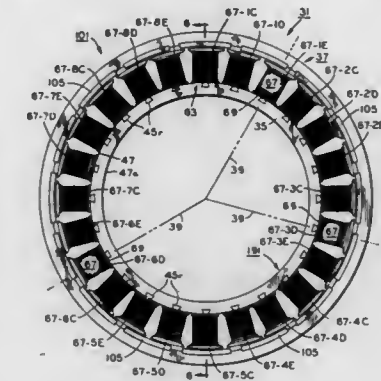
4,712,035
SALIENT POLE CORE AND SALIENT POLE ELECTRONICALLY COMMUTATED MOTOR
Franklin L. Forbes, and Harold B. Harms, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Nov. 12, 1985, Ser. No. 796,779

Int. Cl.⁴ H02K 15/02

U.S. Cl. 310—269

40 Claims



10. A salient pole core for a dynamoelectric machine comprising:

an edgewise wound yoke including an edgewise and helically wound strip of generally thin ferromagnetic material arranged generally in aligned relation in a generally annular stack and having at least one edge defining an outer circumferential surface on said edgewise wound yoke and extending generally axially thereacross; and
a set of salient pole pieces secured in displacement preventing engagement to said edgewise wound yoke at least generally adjacent its outer circumferential surface so as to retain said wound strip against displacement from said annular stack and extending generally outwardly from said outer circumferential surface about a set of preselected pitch axes, respectively.

4,712,036

PRESSURE TRANSDUCER HAVING A PIEZOELECTRIC ELEMENT FOR PRESSURE MEASUREMENTS AT HIGH TEMPERATURES PARTICULARLY FOR THE COMBUSTION CHAMBER PRESSURE OF INTERNAL COMBUSTION ENGINES

Gunter L. Gürlich, Aachen, Fed. Rep. of Germany, assignor to FEV Forschungsgesellschaft für Energie-Technik und Verbrennungsmotoren mbH, Aachen, Fed. Rep. of Germany

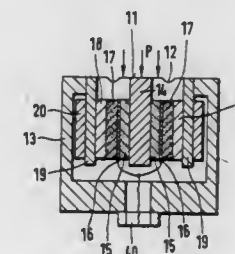
Filed Dec. 16, 1986, Ser. No. 942,402

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545682

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—333

8 Claims



1. A pressure transducer for pressure measurement at high temperature, particularly for the combustion chamber pressure of an internal combustion engine, comprising a housing, at least

two piezoelectric flat plates loaded in shear mode and arranged laterally on opposite sides of a central stamp element, pressure distribution elements bearing externally on the piezoelectric plates, abutment elements bearing externally on said pressure distribution elements, and a prestress spring element surrounding said abutment elements and applying compressive forces to said pressure distribution elements and for retaining said plates in place, said abutment elements being connected to said housing, whereby the axial force exerted against the stamp elements by pressure to be measured exerts a thrust on both said piezoelectric plates which thrust is absorbed by said abutment elements and transferred to said housing without affecting said prestress element.

4,712,037

RESONANT PIEZOELECTRIC SENSOR

Pieter W. Verbeek, Nootdorp; Theodorus A. Klaase, Voorburg, and Arne Theil, Delft, all of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

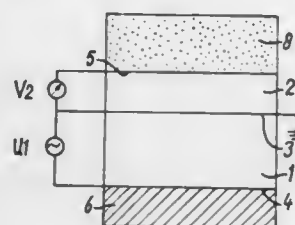
Filed Jun. 26, 1986, Ser. No. 879,213

Claims priority, application Netherlands, Jul. 3, 1985, 8501908

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—323

14 Claims



1. Sensor comprising a transmitting layer and a receiving layer located thereon of piezoelectric material, which are provided with electrodes for supplying and deriving electrical signals to said transmitting layer or from said receiving layer respectively, wherein in order to obtain a standing wave in a unit of transmitting and receiving layer, a sum of the thicknesses of said transmitting and receiving layers is selected such that with a high acoustic impedance of a boundary medium adjacent to said transmitting layer and a low acoustic impedance of a boundary medium adjacent to said receiving layer or vice versa, said sum is an odd number of $v/4f$, and with similar impedances, either low or high, of the said boundary media said sum is an even number of $v/4f$, where v is a propagation velocity of acoustic vibration in a material of said transmitting and receiving layers and f is a frequency of a signal supplied and wherein said receiving layer detects a change of a resonance mode or resonance frequency of said sensor as a unit, said change being produced by a change of environmental conditions of said sensor and on its turn producing a change of sensed amplitude.

4,712,038

COLOR CATHODE RAY TUBE WITH PLURAL ELECTRON GUN ASSEMBLIES

Shigeo Takenaka; Eiichi Kamohara, and Takashi Nishimura, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 12, 1986, Ser. No. 861,842

Claims priority, application Japan, May 10, 1985, 60-97902

Int. Cl.⁴ H01J 29/07, 29/50, 29/82, 29/86

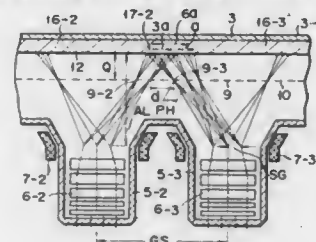
U.S. Cl. 313—2.1

7 Claims

1. A color cathode ray tube comprising:

a vacuum envelope including a single faceplate, a panel having a skirt extending from said faceplate, a plurality of

funnels coupled to said panel, and a plurality of necks respectively extending from said plurality of funnels;
a plurality of electron gun assemblies respectively accommodated in said plurality of necks and having central axes, said plurality of electron gun assemblies each being adapted to emit a plurality of electron beams;
a plurality of deflection units, respectively mounted around said plurality of funnels, each of said deflection units deflecting the electron beams emitted from said corresponding electron gun assembly in a deflection plane defined by each of said deflection units;
a shadow mask received in said envelope and faced to said faceplate and having apertures of predetermined pitch Ph for allowing passage of deflected electron beams there-through; and
a screen formed on an inner surface of said faceplate and including phosphor elements on which the deflected electron beams passing through said apertures land and which



emit light rays of different colors, said screen being defined by a plurality of continuous segment regions each of which is scanned with the electron beams emitted from said corresponding electron gun assembly and deflected by said corresponding deflection unit
wherein said electron gun assemblies adjacent each other are so arranged as to have a relative distance GS between the central axes thereof:

$$GS = m \cdot SG[(n-1)Ph + d]/Ph$$

where SG is a relative distance on the deflection plane, between the electron beams emitted from each of said electron gun assemblies, d is a distance between predetermined effective apertures of the shadow mask through which the predetermined electron beams pass, the predetermined electron beams landing on endmost adjacent effective phosphor elements in each two adjacent ones of said segment regions, and m and n are integers, respectively.

4,712,039

VACUUM INTEGRATED CIRCUIT

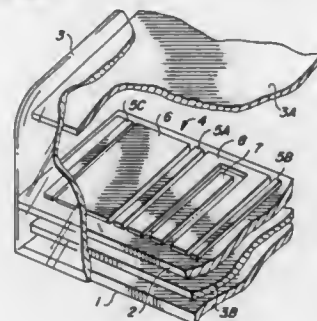
Lazaro M. Hong, 931 Kingston Dr., Fort Collins, Colo. 80525

Filed Apr. 11, 1986, Ser. No. 850,945

Int. Cl.⁴ H01J 1/46, 21/10; H01K 11/00

U.S. Cl. 313—307

16 Claims



1. A vacuum integrated circuit comprising:
(a) an insulating substrate;

- (b) a vacuum envelope for producing a vacuum over a surface of the substrate;
- (c) cathode means on the surface for emitting electrons into the vacuum;
- (d) grid means on the surface adjacent to the cathode means for controlling the velocity of emitted electrons;
- (e) anode means on the surface adjacent to the grid means for collecting emitted electrons to produce an anode current; and
- (f) electrostatic lens means on the surface adjacent to and in spaced relationship to the cathode means, grid means, and anode means for producing an electric field in the vacuum to control the trajectories of electrons emitted from the cathode means so that the electrons travel to the anode means and for preventing emitted electrons that are not collected by the anode means from charging up other surfaces in the vacuum.

4,712,040

CONNECTOR FOR HIGH PRESSURE LAMPS

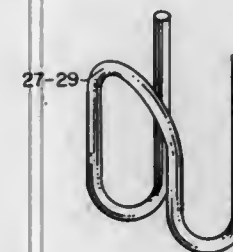
Samuel A. Carleton, Bath, and Norman R. King, Hammond-sport, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 19, 1985, Ser. No. 799,526

Int. Cl.⁴ H01J 5/50

U.S. Cl. 313—331

4 Claims



1. A high pressure discharge lamp comprising an arc tube disposed within an outer jacket, an electrode assembly at each end of said arc tube and a separate electrical connection to each of said electrode assemblies, each said connection for connecting said arc tube from the inside to the outside of the outer jacket, each said connection inside the jacket including wire connector means fixedly connected to its associated electrode assembly, each said wire connector means being formed of a bent wire having two separated legs joined at a common point and comprising a U-shaped wire with the bottom of the U bent back toward its open end, each said wire connector means being so disposed relative to its associated electrode assembly that expansion of said arc tube when the lamp is turned on forces said legs of said connector means closer together and contraction of said arc tube when the lamp is turned off forces said legs apart.

4,712,041

COLOR CRT TENSION MASK SUPPORT ASSEMBLY WITH A GLASS FRAME

Siegfried M. Greiner, Crystal Lake, and Kazimir Palac, Carpentersville, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 20, 1985, Ser. No. 754,787

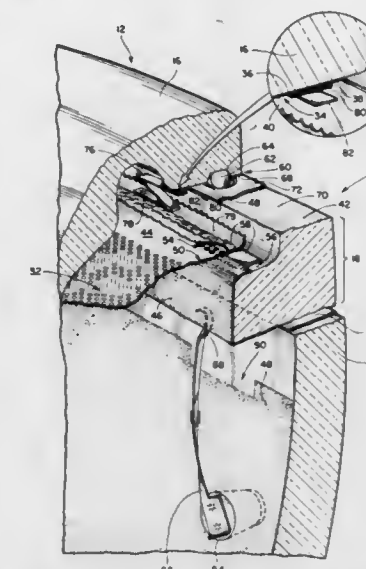
Int. Cl.⁴ H01J 29/07, 29/88

U.S. Cl. 313—407

11 Claims

1. A front assembly for use in a color cathode ray tube, comprising:
a glass faceplate having a target area with patterns of phosphor deposits thereon covered with an electron-pervious electrically conductive metallic film;
a shadow mask support assembly including a glass frame for supporting a mask in precise spaced adjacency to said

target area, said frame having at least a surface portion which is electrically conductive;
an electrically conductive foil shadow mask adapted to be charged with a high voltage and mounted in tension on said frame in electrical contact with said surface portion thereof; and



electrically conductive spring means supported by and in electrical contact with said mask and engaging said metallic film on said target area or a conductive extension thereof, for conducting high voltage on said mask to said metallic film.

4,712,042

VARIABLE FREQUENCY RFQ LINEAR ACCELERATOR

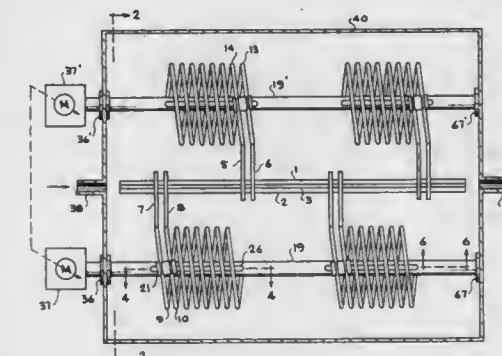
Robert W. Hamm, Pleasanton, Calif., assignor to AccSys Technology, Inc., Pleasanton, Calif.

Filed Feb. 3, 1986, Ser. No. 825,273

Int. Cl.⁴ H05H 9/02, 7/12

U.S. Cl. 315—5.41

54 Claims



1. A variable frequency RFQ linear accelerator for accelerating, focusing or bunching a beam of charged particles, comprising:
an evacuated vessel through which said beam of charged particles travels;
an even-numbered plurality of elongated electrodes, supported within said vessel in parallel relation to the trajectory of said beam of charged particles, said electrodes being disposed azimuthally around said trajectory, said electrodes further having a structure such that they produce an RFQ electric field useful for accelerating, focusing or bunching said beam of charged particles;

power supply means connected to said electrodes for supply radio-frequency electrical power thereto, such that said electrodes are caused to generate said RFQ electric field by said power supply means;

variable inductance means having an inductance which may be varied over a substantial range, said variable inductance means being electrically communicative with said electrodes, such that said variable inductance means and said electrodes form an LC resonant circuit which oscillates at the frequency desired for said RFQ electric field, and said frequency may be varied by varying the inductance of said variable inductance means; and

inductance control means connected to said variable inductance means such that the inductance of said variable inductance means may be controlled from the exterior of said evacuated vessel.

4,712,043

ELECTRON GUN WITH LARGE APERTURE AUXILIARY ELECTRODE

Shigeo Takenaka, and Eiji Kamohara, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

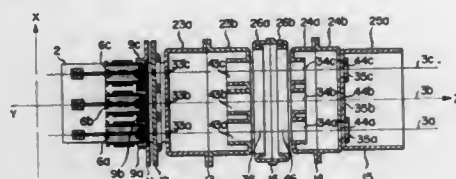
Filed Feb. 19, 1985, Ser. No. 702,725

Claims priority, application Japan, Feb. 20, 1984, 59-28611; Feb. 20, 1984, 59-28612; Mar. 29, 1984, 59-59441

Int. Cl.⁴ H01J 29/46, 29/56

U.S. Cl. 315—15

11 Claims



1. An electron gun comprising:

means for emitting three electron beams;

main lens means for focusing the electron beams, the main lens means having electron beam paths through which said electron beams pass and including first and second electrodes arranged along the beam paths, said first and second electrodes each having three apertures through which the respective electron beams pass, said main lens means further including an auxiliary electrode located between the first and second electrodes and having an aperture through which each of the electron beams pass, the diameter of the aperture of the auxiliary electrode being greater than the respective sums of the diameters of the three apertures of the first and second electrodes; and

voltage applying means for respectively applying first, second and auxiliary voltages to the first, second and auxiliary electrodes, the first, second and auxiliary voltages having different first, second and third voltage levels, respectively, thereby forming an electrostatic field between the first and second electrodes, wherein the third voltage level is higher than the first voltage level and lower than the second voltage level.

4,712,044

CIRCUIT FOR SEQUENTIALLY TURNING ON LAMPS ON AN AUTOMOBILE

Mark S. Phillips, 510 Budd Ave., Campbell, Calif. 95008

Filed Dec. 17, 1985, Ser. No. 810,108

Int. Cl.⁴ B60Q 1/02

U.S. Cl. 315—82

10 Claims

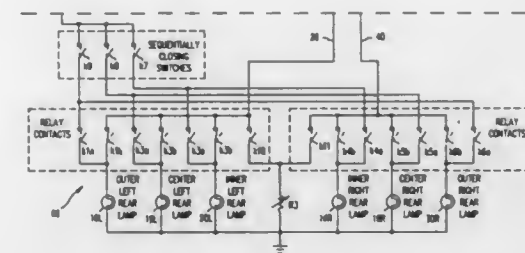
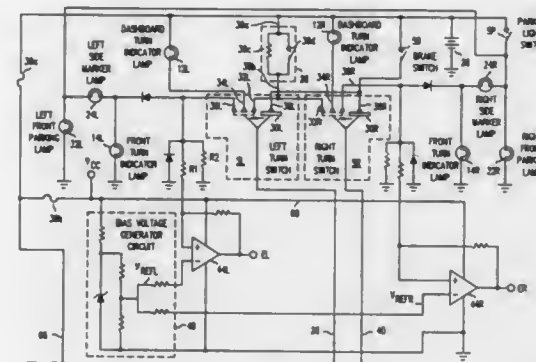
1. A circuit for controlling lamps mounted on a vehicle comprising:

a first lamp for indicating a turn;

a manually actuatable switch for signaling a turn, said manu-

ally actuatable switch coupling said first lamp to a voltage source when a turn is signaled;

means for sensing the voltage across said first lamp and generating a digital signal in response thereto when a turn is signaled;



4,712,045

ELECTRIC ARRANGEMENT FOR REGULATING THE LUMINOUS INTENSITY OF AT LEAST ONE DISCHARGE LAMP

Johannes M. Van Meurs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1986, Ser. No. 821,107

Claims priority, application Netherlands, Jan. 22, 1985, 8500155

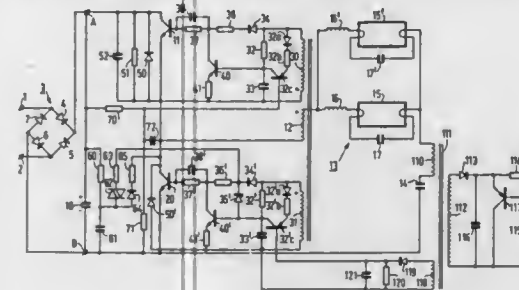
Int. Cl.⁴ H05B 37/02

U.S. Cl. 315—224

9 Claims

1. An electric arrangement for regulating the luminous intensity of at least one discharge lamp comprising: a DC/AC converter circuit for the supply of high frequency energy to the discharge lamp, said DC/AC converter circuit having an input coupled to a source of supply voltage, at least one switching transistor and a first winding arranged to surround a core of magnetizable material, said winding being included in an electric circuit for the supply of the discharge lamp and said core further having a second winding coupled magnetically to the first winding, the core of magnetizable material having a third winding which is magnetically coupled to the second winding and is connected to a control device which controls the switching of the switching transistor of the DC/AC converter, the third winding being magnetically coupled to the

first winding, and a series-combination of a non-capacitive variable impedance and a diode connected between the ends of



the second winding in a manner such that a manual adjustment of the variable impedance determines the voltage developed across the third winding.

4,712,046

QUADRATURE-COUPLED MICROWAVE ELECTRODELESS LAMP

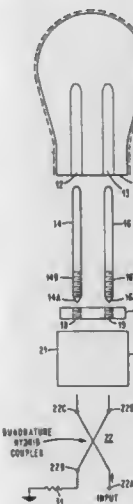
Scott J. Butler, Rochdale; Robert K. Smith, Woburn, and Mehdy Abdollahian, Easton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 14, 1986, Ser. No. 930,487

Int. Cl.⁴ H05B 41/16, 41/24

U.S. Cl. 315—248

9 Claims



1. Electrodeless lamp apparatus adapted to operate at a microwave frequency f , having a wavelength λ which is proportional to the free space wavelength λ_0 , said electrodeless lamp apparatus comprising

- a first conductor having a first end and a second end, said first conductor having a length L_1 ;
- a second conductor having a first end and a second end, said second conductor having a length L_2 ;
- an electrodeless lamp having an envelope made of light transmitting substance and a volatile fill material enclosed within said envelope, the fill material emitting light upon breakdown and excitation, said envelope having a pair of recesses for receiving the first ends of said conductors therewithin;
- a conductive mesh enclosing substantial portions of said electrodeless lamp;
- means for coupling said conductive mesh to a point of reference potential;
- means for applying a first voltage, at said wavelength λ , to the second end of said first conductor; and
- means for applying a second voltage, at said wavelength λ , to the second end of said second conductor, whereby

said first voltage and said second voltage are displaced from each other by ninety degrees.

4,712,047

POWER ON DEMAND BEAM DEFLECTION SYSTEM FOR DUAL MODE CRT DISPLAYS

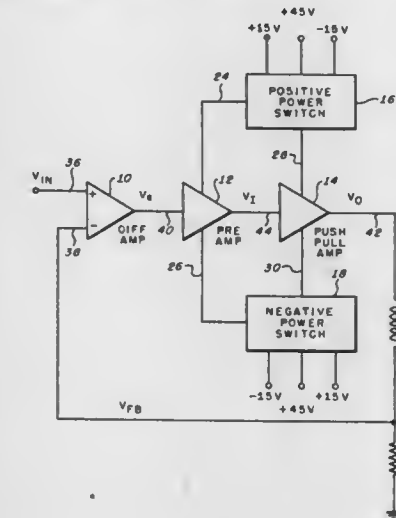
Paul F. L. Weindorf, Albuquerque, N. Mex., assignor to Sperry Corporation, Great Neck, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,730

Int. Cl.⁴ H01J 29/70

U.S. Cl. 315—397

7 Claims



1. An electron beam magnetic deflection system for a display system controllably operable to provide deflection in a stroke mode for random deflection of the beam, a raster mode for periodic deflection of the beam, and a slew mode for traversing the beam at a maximum deflection rate, comprising:

input means, having an input terminal responsive to an input signal indicative of a desired deflection of the beam, for providing an output signal responsive to said input signal; preamplifier means, comprising a buffer amplifier responsive to said output signal and providing an output current indicative of the magnitude and sense of said output signal, current source means, responsive to said output current, for providing a further output current opposite in sense to said output current, a plurality of cascaded diodes providing predetermined voltage drops and coupled to receive said further output current, for providing a plurality of predetermined bias voltages and a variable bias signal responsive to said input signal for energizing a deflection amplifier means;

said deflection amplifier means having first and second cascaded sections, coupled to receive ones of said bias voltages, for applying current to a deflection coil operatively coupled to said electron beam, and for providing a desired beam deflection in accordance with the sense and rate of change of said input signal;

a plurality of switch means, operable in non-saturated switching mode for selectively applying voltage sources of positive and negative polarity to said first and second cascaded sections, responsive to said further output current, from said preamplifier means, to said current in said deflection coil, and to a source of voltage derived from a difference of a voltage developed across said deflection coil and a voltage drop across one of said first or second sections of said deflection amplifier means, a predetermined one of said switch means being activated for a predetermined polarity of said deflection current when said derived voltage attains a first predetermined magnitude and polarity and deactivated when said derived voltage attains a second predetermined magnitude and

polarity, said first section of said deflection amplifier means coupled to ones of said switch means for energizing said electron beam in a first predetermined direction and said second section coupled to further ones of said plurality of switches for energizing said electron beam in a second predetermined direction; and

a plurality of voltage sources of predetermined magnitudes and first and second polarities, ones of said voltage sources coupled respectively to ones of said plurality of switch means, whereby a voltage source of sufficient magnitude is provided to said deflection amplifier means which allows sufficient current to flow through said deflection coil to accomplish the desired rate of change of beam deflection while maintaining linear operation of said deflection amplifier means and minimizing power consumption thereof, independent of the mode of operation of said display system.

4,712,048

PROCESS AND APPARATUS FOR CONTROLLING THE SPINDLE SPEED OF A GEAR CUTTING MACHINE

Roland Rebsamen, Greifensee, Switzerland, assignor to Reishauer AG, Zurich, Switzerland

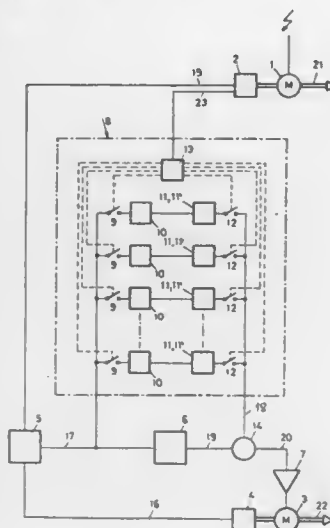
Filed Jun. 19, 1986, Ser. No. 876,156

Claims priority, application Switzerland, Jun. 26, 1985, 2735/85

Int. Cl.⁴ H02P 5/46

U.S. Cl. 318—85

9 Claims



1. An apparatus for controlling the rate of rotation of a spindle of a gear generating machine comprising a first spindle having a first angle of rotation transmitter connected thereto and a second spindle having a second angle of rotation transmitter connected thereto, controller means providing an output signal controlling a drive of the first spindle and storage circuit means including means for generating and storing a variable signal in discrete time intervals within a cycle (T) and adding circuit means for adding the storage content to the output signal of said controller means synchronously with an independent signal, wherein said storage circuit means comprises several storages and a multiplexer circuit which is controlled by said independent signal and is connected in series to said storages.

4,712,049

OPERATION COMPLETION DETECTION MEANS

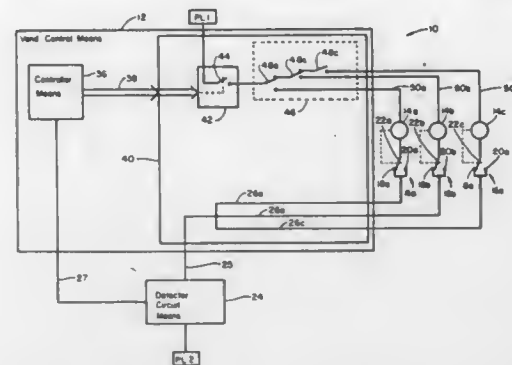
Raymond L. Houserman, St. Louis, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Aug. 22, 1986, Ser. No. 899,495

Int. Cl.⁴ H02P 3/06

U.S. Cl. 318—112

8 Claims



1. Operation completion detection means for a vend system including one or more individually controllably operable motors for performing a given type of operation, said operation completion detection means comprising power leads, vend control means including means for completing a circuit across said power leads through a given motor, cam operated switch means associated with and connected in series circuit with each motor, each cam operated switch means including first and second poles and a controllably movable contact normally in electrical contact with said first pole and responsive to operation of the motor with which such cam operated switch means is associated to switchably cycle between said poles during a complete operational cycle of such motor, said first and second poles being connected in common, and a detector circuit means having a monitor portion thereof operatively connected in common circuit to all of such motors and their associated cam operated switch means and in series circuit with each respective motor and its associated cam operated switch means, said vend control means being operable to effect the establishment of a power drive circuit to a given motor and its associated cam operated switch means and to thereby complete a motor driving circuit through said given motor and its associated cam operated switch means, such motor driving circuit initially comprising a first power circuit through said given motor and through the movable contact and first pole of the cam operated switch means associated therewith, the completion of said first power circuit initiates operation and the commencement of an operational cycle of such given motor, operation of such given motor thereafter effecting switchable movement of said movable contact of said associated cam operated switch means from said first pole to said second pole to break said first power circuit and to establish a second power circuit through such given motor and the movable contact and second pole of said associated cam operated switch means, whereupon said motor driving circuit comprises said second power circuit, further operation of such given motor effecting switchable movement of said movable contact from said second pole back to said first pole to break said second power circuit and to re-establish said first power circuit through such given motor and through the movable contact and first pole of the cam operated switch means associated therewith, whereupon said motor driving circuit again comprises said first power circuit, said switchable movement of said movable contact from said second pole to said first pole momentarily interrupting the motor driving circuit through said given motor and its associated cam operated switch means, said momentary circuit interruption of said motor driving circuit upon the movement of said movable contact from said second to said first pole being detectable by said detector

circuit means, said detector circuit means responsive to said momentary circuit interruption upon the movement of said movable contact from said second to said first pole to produce a home detection signal, said vend control means operatively connected to receive said home detection signal and responsive thereto to effect disestablishment of said power drive circuit to said given motor and its associated cam operated switch means.

4,712,050

CONTROL SYSTEM FOR BRUSHLESS DC MOTOR

Kiyoshi Nagasawa; Toru Inoue, both of Tochigi, and Susumu Kashiwazaki, Utsunomiya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

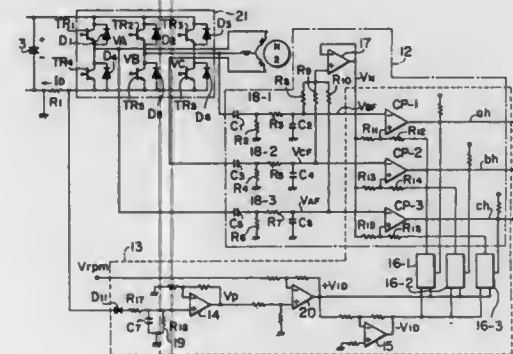
Filed Jan. 30, 1987, Ser. No. 9,290

Claims priority, application Japan, Mar. 17, 1986, 61-56804

Int. Cl.⁴ H02K 29/06

U.S. Cl. 318—254

11 Claims



1. A control system for brushless DC motors comprising: a brushless DC motor having a field rotor and a plurality of stator windings;
- a position detecting circuit for detecting counter electromotive force voltage signals generated in said stator windings as said field rotor rotates and generating rotor position detection signals on the basis of said counter electromotive force voltage signals;
- a driver circuit connected to said stator windings of said motor and being responsive to said rotor position detection signals to control conduction of current from a DC power supply to said stator windings;
- a current detecting circuit for detecting an input current to said driver circuit from said DC power supply;
- a hold circuit for holding a maximum value of the detected input current; and
- a phase correcting circuit for correcting the phase of said rotor position detection signal in accordance with the held value of said input current.

4,712,051

ADAPTER FOR SWITCHING FROM PRIMARY TO STANDBY DEVICE UPON FAILURE OF PRIMARY DEVICE

Saul S. Fathi, Huntington, N.Y., assignor to Ultima Electronics Ltd., Farmingdale, N.Y.

Filed Jun. 2, 1986, Ser. No. 869,564

Int. Cl.⁴ H05B 39/10; G05B 9/02

U.S. Cl. 318—564

5 Claims

1. An appliance adapter for maintaining in continuous, alternate operation primary and standby power consuming devices, comprising: input terminals for applying alternating voltages from an external A.C. power source;

a full wave rectifier connected to said input terminals for rectifying said alternating voltage, said rectifier having a pair of output terminals;

first circuit means connected to said output terminals of said rectifier for applying rectified voltage to a primary power

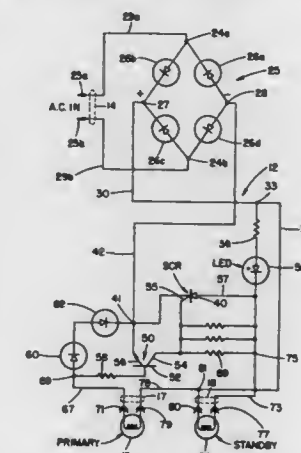
consuming device to keep the same in continuous operation;

second circuit means connected to said output terminals of said rectifier for applying rectified voltage to a standby power consuming device; and

automatic switching means connected in circuit with said first and second circuit means,

said automatic switching means comprising:

a transistor having a collector connected to said standby power consuming device, and an emitter connected to one of said rectifier output terminals and a base connected to said primary consuming device whereby said transistor is biased to cutoff when said primary consuming device is in operation and is biased to conduct when said primary consuming device fails, or is removed from said adapter;



4,712,052

DIGITAL SERVO-CONTROL SYSTEM

Tsutomu Omae, Hitachi; Sanshiro Obara, Ibaraki; Kenji Kubo, and Masahiko Watanabe, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,362

Claims priority, application Japan, Oct. 5, 1984, 59-208208

Int. Cl.⁴ G05B 11/32

U.S. Cl. 318—625

3 Claims

1. A digital servo-control system comprising: a plurality of motors for driving a plurality of drive shafts of a machine, respectively;

position detection means for detecting a position of each of said plurality of drive shafts and producing a position signal;

multi-axis position commanding means for producing a position command signal indicative of a position command value for each of said plurality of drive shafts;

digital type multi-axis position control means for receiving said position signal and said position command signal, for computing a torque command value for each drive shaft on the basis of a position detection value contained in said

4,712,057

METHOD OF EXAMINING AND TESTING AN ELECTRIC DEVICE SUCH AS AN INTEGRATED OR PRINTED CIRCUIT

Louis F. Pau, Grand-Lancy, Switzerland, assignor to Battelle Memorial Institute, Carouge/Geneva, Switzerland
PCT No. PCT/CH84/00081, § 371 Date Jan. 18, 1985, § 102(e) Date Jan. 18, 1985, PCT Pub. No. WO84/04819, PCT Pub. Date Dec. 6, 1984

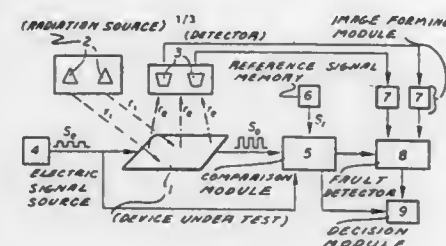
PCT Filed May 22, 1984, Ser. No. 705,341

Claims priority, application Switzerland, May 25, 1983, 2842/83

Int. Cl.⁴ G01R 31/02

U.S. Cl. 324—73 R

28 Claims



1. A method of examining and testing a layered electric circuit device having signal processing capability at discontinuities contained internally of its layers of structure in which radiation emitted by the device itself, after stimulation, is detected by scanning, electric signals characteristic of the detected radiation are formed and the signals are compared with reference signals, said method being characterized in that:

said stimulation of the device comprises, in combination, sending a given electric signal through the device for signal processing therewithin and simultaneously irradiating the device with penetrating radiation from at least one source of radiation of a predetermined type and having predetermined characteristics, the said radiation emitted by the device being the result of interaction of the applied irradiation with the material of the device structure through which the given electric signal travels at places where the structure has discontinuities.

4,712,058

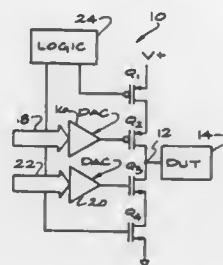
ACTIVE LOAD NETWORK

Christopher W. Branson, and Steven K. Sullivan, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Jul. 22, 1986, Ser. No. 888,908

Int. Cl.⁴ G01R 19/00

U.S. Cl. 324—23 R

8 Claims



1. An active load network for a digital test system comprising:

- logic circuit means for providing control signals based upon the expected logic output state of a device under test;
- a first active load circuit responsive to said control signals for providing a source of current to said device under test when a low level logic output signal is expected from said device under test;
- a second active load circuit responsive to said control

signals for providing a current sink for said device under test when a high level logic output signal is expected from said device under test; and

- said first and second active load circuits each comprising a pair of CMOS transistors connected in series wherein one transistor in each CMOS transistor pair comprises a variable impedance gate for regulating the flow of current through each of said first and second active load circuits, and the other transistor in each CMOS transistor pair comprises an on/off switch for each respective active load circuit.

4,712,059

BROADBAND OPTICAL PROCESSOR FOR DETERMINATION OF FREQUENCY AND TIME OF ARRIVAL OF MULTIPLE SIGNALS

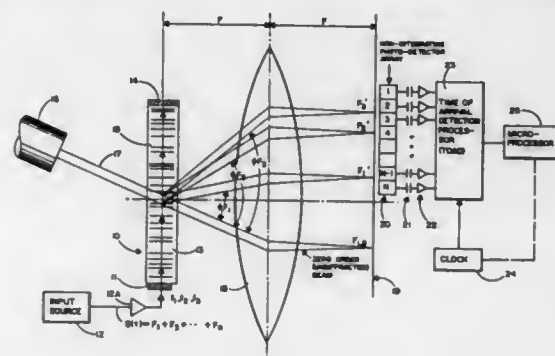
Joseph H. Labrum, West Jordan, Utah, assignor to Sperry Corporation, Blue Bell, Pa.

Filed Nov. 12, 1985, Ser. No. 796,997

Int. Cl.⁴ G01R 23/16

U.S. Cl. 324—77 K

14 Claims



1. An optical signal processor comprising, light source means, an acousto-optic cell disposed to receive and selectively transmit light beams from said light source means, signal source means connected to said acousto-optic cell to generate acoustic waves through said acousto-optic cell transverse to said light beam in order to affect the transmission of light beams through said acousto-optic cell, a Fourier transform lens adjacent to said acousto-optic cell to focus the light beams transmitted by said acousto-optic cell, a photodetector array means disposed at the Fourier transform focal plane of said lens and operative to produce electrical signals in response to receipt of light beams, differentiating means connected to said photodetector array means and operative to differentiate said electrical signals produced by said photodetector array means, and a time of arrival processing system connected to receive signals from said array means via said differentiating means and to process the signals in the order of arrival.

4,712,060

SAMPLING AVERAGE PHASE METER

Rick S. Bailey, and Arthur C. Holly, both of Austin, Tex., assignors to Board of Regents The University of Texas System, Austin, Tex.

Filed Aug. 29, 1986, Ser. No. 902,187

Int. Cl.⁴ G01R 25/00

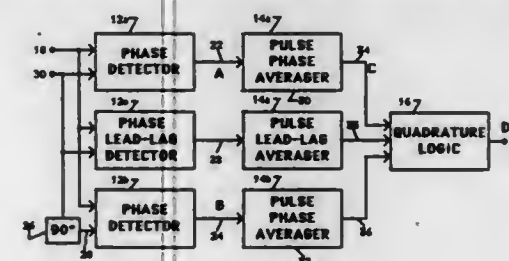
U.S. Cl. 324—83 R

2 Claims

1. A phase measurement device for measuring the phase of a pulsed single-frequency sinusoidal input signal, the device comprising:

- a first zero-crossing detector means responsive to the input

- signal for generating a first square wave having the same phase as the phase of the input signal;
- a second zero-crossing detector means responsive to a reference signal for generating a second square wave having the same phase as the phase of the reference signal;
- shifting means responsive to the reference signal for generating a quadrature signal wherein the phase of the quadrature signal is shifted 90° from the phase of the reference signal;
- a third zero-crossing detector means responsive to the quadrature signal for generating a third square wave having the same phase as the phase of the quadrature signal;
- a first exclusive-or means electrically coupled to the first and second zero-crossing detector means and responsive to the first and second square waves for generating a first pulse train having pulse widths proportional to the absolute value of the phase difference between the first and second square waves;
- a second exclusive-or means electrically coupled to the second and third zero-crossing detector means and responsive to the second square wave and the third square wave for generating a second pulse train having pulse widths proportional to the absolute value of the phase difference between the second and third square waves;



- sign means electrically coupled to the first and second zero-crossing detector means and responsive to the first and second square waves for generating the sign of the phase of the input signal;
- a first analog averager means electrically coupled to the first exclusive-or means and responsive to the first pulse train for generating a first average pulse train proportional to the phase difference between the input signal and the reference signal;
- a second analog averager means electrically coupled to the second exclusive-or means and responsive to the second pulse train for generating a second average pulse train proportional to the phase difference between the input signal and the quadrature signal;
- a first analog pulse integrator means electrically coupled to the first averager means and responsive to the first average pulse train for generating a first average;
- a second analog pulse integrator means electrically coupled to the second averager means and responsive to the second average pulse train for generating a second average;
- an analog quadrature logic means responsive to the first and second average for generating a voltage proportional to the phase of the input signal.

4,712,061

SMALL PROPAGATION DELAY MEASUREMENT FOR DIGITAL LOGIC

Lawrence E. Lach, Chicago, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 24, 1986, Ser. No. 831,898

Int. Cl.⁴ G01R 25/00

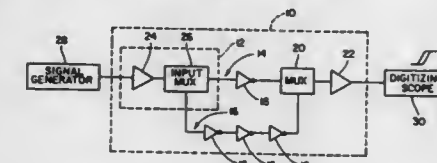
U.S. Cl. 324—83 D

28 Claims

1. A circuit for measuring small propagation delays associated with a digital logic circuit comprising:

- first signal path in the digital logic circuit having at least a

- first predetermined number of devices and having an input and an output;
- second signal path in the digital logic circuit having at least a second predetermined number of devices different from said first predetermined number of devices and having an input and an output;
- input means for supplying a predetermined input signal to said inputs of said first and second signal paths, thereby producing first and second output signals on said outputs of said first and second signal paths;



- output means operatively connected to said outputs of said first and second signal paths for multiplexing said first and second output signals to alternately combine said first and second output signals into a multiplexed output signal; and means for comparing said output signals in said multiplexed output signal operatively connected to an output of said output means for multiplexing to produce an average propagation delay of said devices in said first and second signal paths.

4,712,062

GROUND SHIELD APPARATUS FOR GIGA-HERTZ TEST JIG

Henry K. Takamine, Gardena, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

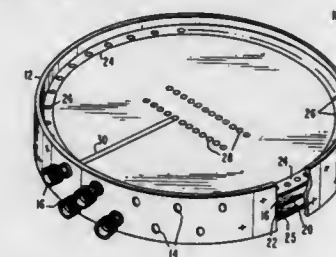
Filed Dec. 20, 1984, Ser. No. 684,767

The portion of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.⁴ G01R 1/04, 31/02

U.S. Cl. 324—158 F

11 Claims



1. A test jig comprising:
 - a disc of metal having two substantially planar major surfaces;
 - a first substantially coextensive dielectric layer on one surface of the disc, said first dielectric layer having a plurality of signal traces formed on an outer surface of the layer which generally radiate outwardly from a centrally located test device receiving area, and the layer further including metallic ground means on peripheral portions thereof;
 - a second substantially coextensive dielectric layer on an opposite major surface of the disc, said second dielectric layer having a plurality of signal traces and metallic ground means on peripheral portions of said second dielectric layer;
 - a metallic annular member surrounding said disc and dielectric layers having a wall extending in a direction transverse thereto;
 - means for physically and electrically connecting the wall of the annular member to edges of the disc and the metallic ground means on the first and second dielectric layers;

a plurality of external connectors mounted in the wall, each connector being coupled to a given trace on one of the dielectric layers; and
a ground shield means disposed between signal traces on the dielectric layers for providing electrostatic and electromagnetic isolation.

4,712,063

METHOD AND APPARATUS FOR MEASURING AREAS OF PHOTOELECTRIC CELLS AND PHOTOELECTRIC CELL PERFORMANCE PARAMETERS

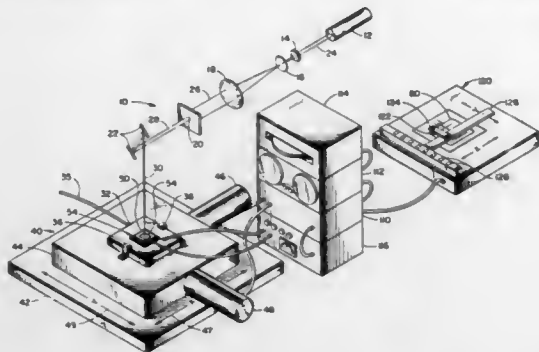
Carl R. Osterwald, Lakewood, and Keith A. Emery, Fort Collins, both of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 29, 1984, Ser. No. 614,506

Int. Cl.⁴ G01R 31/26; H01J 3/14

U.S. Cl. 324—158 D

18 Claims



1. Apparatus for mapping and quantifying effective current-producing cell area of a photovoltaic device in response to irradiation of the device, comprising:

translation stage means for supporting the photovoltaic device thereon, said translation stage means including drive means for moving said photovoltaic device intermittently in precisely measured spacial increments in orthogonal directions in response to motion implementing signals;

radiation producing means adjacent said translation stage for producing a coherent beam of radiation in a fixed position directed substantially normal to said translation stage onto said photovoltaic device in a focused incident spot having a precise, unvarying diameter, a precise, unvarying shape, and a precise unvarying intensity on the photovoltaic device;

signal generating means connected to said drive means for producing intermittent motion implementing signals for said drive means to sequentially move said translation stage in uniform precisely spaced discrete increments of distance in selected orthogonal directions not less than the diameter of said incident spot and for stopping the movement after each discrete increment of distance for an increment of time, such that said incident spot is focused sequentially on adjacent discrete areas of uniform size on said photovoltaic device for fixed increments of time;

electronic sensing means for sensing and measuring the magnitude of electric current response produced by said photovoltaic device in response to irradiation of said photovoltaic device by said beam of radiation at each geometric position on said photovoltaic device between incremental movements thereof; and

computer means for producing said motion implementing signal, for correlating and storing measured current response along with said respective geometric positions, for sorting into a group specific geometric positions from which current response is measured, utilizing the increments of movement for determining the dimensions and area of each of such geometric positions from which

current response is measured, and totalling the areas of such geometric positions to obtain a total area of the photovoltaic device from which current response is produced.

4,712,064

MAGNETORESISTIVE SENSOR FOR DETECTING POSITION OR SPEED OF A FERROMAGNETIC BODY

Dieter Eckardt, Nuremberg, and Gerhard Hettich, Rosstal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE85/00132, § 371 Date Feb. 26, 1986, § 102(e) Date Feb. 26, 1986, PCT Pub. No. WO86/00877, PCT Pub. Date Feb. 13, 1986

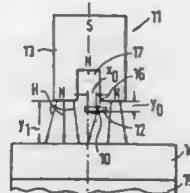
PCT Filed Apr. 25, 1985, Ser. No. 852,629

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426784

Int. Cl.⁴ G01B 7/14; G01R 33/02; H01L 43/00

U.S. Cl. 324—208

16 Claims



1. Magnetoresistive sensor for detecting position or speed of a movable ferromagnetic body, comprising at least one stationary magnetoresistive strip arranged in a plane; a stationary source of a constant magnetic field (H) whose main magnetic field component (Hy) extends substantially perpendicularly to the plane of said strip and whose relatively small secondary magnetic field component (Hx) extends in said plane; means for feeding a measuring electric current in one direction through said strip; said ferromagnetic body being movable from a starting position opposite said plane of the strip to produce therein, in combination with said secondary magnetic field component, a measuring magnetic field component (Ht) whose direction varies in dependence on position changes of said ferromagnetic body, thus causing a corresponding change of said measuring electric current.

4,712,065

MAGNETIC FIELD SENSORS, IN PARTICULAR OPTICAL FIBER MAGNETOMETERS

Gillies D. Pitt, Hewelsfield; Philip Extance, Shirley, and Roger E. Jones, Little Shelford, all of England, assignors to STC plc, London, England

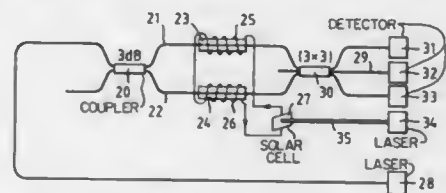
Filed Feb. 20, 1986, Ser. No. 831,263

Claims priority, application United Kingdom, Feb. 23, 1985, 8504727

Int. Cl.⁴ G01R 33/02; G02B 5/30; G02F 1/29, 1/31

U.S. Cl. 324—244

8 Claims



1. A magnetic field sensor including a signal mode optical fiber, a portion of which is magnetically sensitized by being associated with magnetostrictive material, and means for gen-

erating a bias magnetic field at said portion, which means is optically powered.

4,712,066

METHOD FOR THE SELECTIVE EXCITATION OF A VOLUME IN AN OBJECT

Peter R. Layten, and Jan A. Den Hollander, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 7, 1986, Ser. No. 894,247

Claims priority, application Netherlands, Aug. 12, 1985, 8502223

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—309

6 Claims

1. In a method for selective excitation of a region of an object which is arranged in a uniform, static magnetic field wherein r.f. electromagnetic pulses and gradient magnetic fields are generated for selective excitation of said region, the improvement comprising generating a non-selective 90° pulse, applying a gradient magnetic field which dephases spin nuclei, then generating a non-selective 180° pulse and subsequently generating a selective 90° pulse in the presence of a similar gradient field.

4,712,067

R.F. COIL SYSTEM FOR GENERATING AND/OR RECEIVING ALTERNATING MAGNETIC FIELDS

Peter Roschmann, Hamburg, Fed. Rep. of Germany, and Howard E. Simon, Monroe, Conn., assignors to U.S. Philips Corporation, New York, N.Y.

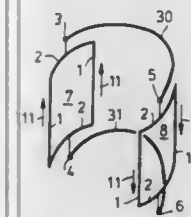
Filed Dec. 20, 1984, Ser. No. 684,199

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347597

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—318

40 Claims



1. An RF coil system for generating and/or receiving substantially homogeneous alternating magnetic fields, said system comprising at least four elongated conductor segments disposed about an approximately cylindrical space having a central, longitudinal axis, said conductor segments extending approximately parallel to said central axis and being arranged symmetrically with respect to at least one symmetry plane which extends through said central axis, and means for interconnecting said conductor segments so as to form a closed loop, said interconnecting means comprising a plurality of conductor elements which interconnect adjacent ends of said conductor segments so as to form at least two conductor groups and a plurality of connecting lead which interconnect said conductor groups, said connecting leads being connected to respective conductor elements and having a length such that when an RF current is applied to said coil system, there is a RF current amplitude maximum at approximately the center of each conductor segment and at least one RF current amplitude minimum on each connecting lead.

4,712,068 RF COIL ARRANGEMENT FOR NMR EXAMINATION APPARATUS

Matti Savelainen, Espoo, Finland, assignor to Instrumentarium Corp., Finland

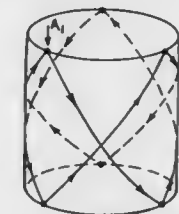
Filed Jul. 6, 1984, Ser. No. 628,478

Claims priority, application Finland, Jul. 7, 1983, 832499

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—318

11 Claims



1. A radio frequency coil arrangement for an NMR apparatus for examining a target, said apparatus having a homogeneous basic magnetic field, said coil arrangement receiving the target and being coupleable to an rf generator for transmitting an rf signal and to an rf receiver for receiving and detecting an NMR signal generated in the target, said coil arrangement comprising:

a coil form having a central axis of revolution, first and second circular ends spaced along said central axis, and a surface of revolution extending between said spaced coil form ends, said coil form being positionable in the NMR apparatus with said axis of revolution lying parallel to the basic magnetic field;

a coil formed of rf transmission line applied to said surface of revolution, said coil having a plurality of turns, each of said turns comprising a pair of series connected segments, one of said segments extending from said first coil form end to said second coil form end, the other of said segments extending from said second coil form end to said first coil form end, said segments of each turn lying at angles to each other and being skewed with respect to the axis of revolution, the turns of said coil being circumferentially spaced about said surface of revolution with the corresponding segments of the turns lying generally parallel to each other, all said segments lying on said coil form and forming active elements of said coil, said transmission line having ends, said transmission line ends being coupled together; and

means for energizing said coil to produce a rotating rf field by utilizing phase differences created in said transmission line, said rotating rf field lying at an angle to the basic magnetic field.

4,712,069 MAGNETIC RESONANCE IMAGING APPARATUS INCLUDING TWO ORTHOGONAL R.F. COILS

Rudolf Kemner, and Hilco T. Kalmijn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 18, 1986, Ser. No. 841,132

Claims priority, application Netherlands, Mar. 22, 1985, 8500844

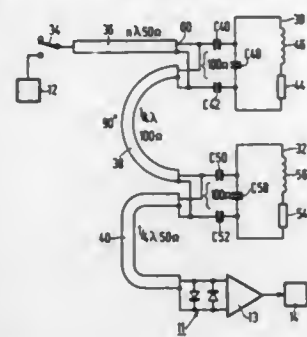
Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—322

7 Claims

1. A magnetic resonance imaging apparatus comprising a system of magnets for generating a static main magnetic field, an r.f. coil system which includes two mutually orthogonal coils for excitation and detection of magnetic resonance signals, a source of r.f. power, means for detecting the resonance signals and connecting means for connecting the r.f. coil system to the r.f. power source and to the detecting means, said

connecting means including a first $\lambda/4$ conductor which interconnects the two orthogonal coils and a second $\lambda/4$ conductor



which connects one of the two orthogonal coils to said detecting means.

4,712,070

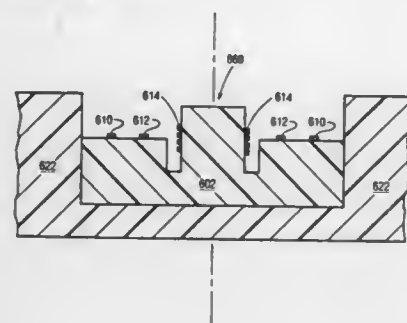
APPARATUS FOR MICROINDUCTIVE INVESTIGATION OF EARTH FORMATIONS

Brian Clark, Ridgefield, and Weng C. Chew, Danbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed May 31, 1984, Ser. No. 616,323
Int. Cl.⁴ G01V 3/12

U.S. Cl. 324—338

21 Claims



1. An apparatus for investigating a characteristic of earth formations traversed by a borehole, comprising:
 - a body having a borehole wall-engaging face;
 - means for applying said body to the borehole wall with said exterior face against the borehole wall;
 - an antenna set for coupling electromagnetic energy with a formation engaged by said wall-engaging face, and mounted in said body, comprising:
 - a first antenna element for coupling electromagnetic energy;
 - a second antenna element having a first location selected with respect to said first antenna element, for coupling electromagnetic energy; and
 - a third antenna element having a second location selected with respect to said first antenna element, for coupling electromagnetic energy; wherein said first and second locations are selected to place said second and third antenna elements in electromagnetic symmetry relative to said first antenna element and parallel thereto; and
 - means for differentially coupling said second and third antenna elements.

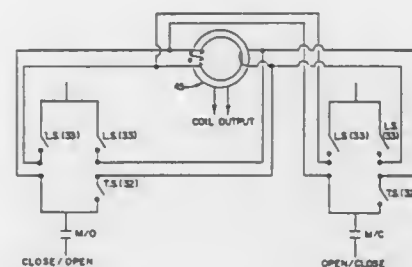
4,712,071 MOTOR OPERATED VALVE ANALYSIS AND TESTING SYSTEM

Arthur G. Charbonneau, Marietta; Dwaine A. Godfrey, Fulton; John A. McNennamy, Cobb, and Steven Nafziger, Gwinnett, all of Ga., assignors to Charbonneau & Godfrey Associates, Marietta, Ga.

Division of Ser. No. 741,861, Jun. 6, 1985, Pat. No. 4,690,003, which is a continuation of Ser. No. 515,358, Jul. 19, 1983, Pat. No. 4,542,649. This application Feb. 24, 1987, Ser. No. 17,937
Int. Cl.⁴ G01R 19/00; G01M 19/00

U.S. Cl. 324—415

4 Claims



1. A switch position indicating circuit for detecting the open and closed positions of limit switches and torque switches within the valve operator of a valve system, wherein the valve operator includes a close-to-open circuit and an open-to-close circuit each of which includes a first circuit branch in parallel with a second circuit branch, a first limit switch positioned in said first circuit branch and a series combination of a second limit switch and a torque switch positioned in said second circuit branch and wherein current is allowed to flow only in the alternative through the close-to-open circuit and the open-to-close circuit to open the valve and close the valve, respectively; said switch position indicating circuit comprising:
 - a coil means for generating a measurable coil output,
 - said coil means including a core element, a first wire element wrapped about said core element, and a second wire element wrapped about said core element,
 - said first wire element being wrapped about said core element more times than is said second wire element;
 - first current conducting means for connecting said first wire element to the first circuit branch of the close-to-open circuit, whereby if current flows through the first limit switch current also flows through said wire element,
 - second current conducting means for connecting said second wire element to the second circuit branch of said close-to-open circuit, whereby if current flows through said second circuit branch current also flows through said second wire element; and
 - means for measuring said coil output generated by said coil means in response to the current flow through said first and second wire elements.

4,712,072

TIMER APPARATUS

Tetsuya Kawanabe, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,493

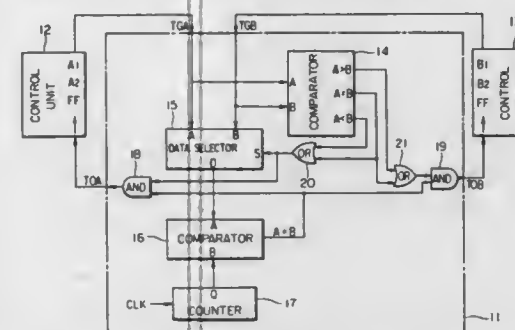
Claims priority, application Japan, Oct. 30, 1984, 59-226647
Int. Cl.⁴ G06M 3/02, 3/08

U.S. Cl. 328—130.1

5 Claims

1. A timer apparatus comprising:
 - a plurality of control means for requesting timer services;
 - data selecting and comparing means coupled to said plurality of control means which upon receiving control means requests, compares them and prioritizes the timer services according to an ordered hierarchy of time determined

from said plurality of control means and provides a data output and a first control signal, respectively; timer means for providing timing data according to a time period; comparator means for comparing data from said selecting and comparing means and providing a second control signal with data from said timer means; and



output means for outputting a signal to respective control means to execute control means services upon coincidence of the first and second control signals from said comparator means and said data selecting and comparing means, respectively.

4,712,073

FREQUENCY MULTIPLYING CIRCUIT

Herman W. Van Rump, Eindhoven, Netherlands, and Charles J. H. Razzell, Cambridge, United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

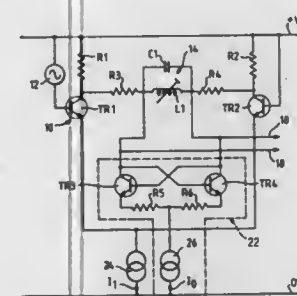
Filed Oct. 9, 1984, Ser. No. 658,834

Claims priority, application United Kingdom, Oct. 7, 1983, 8326823

Int. Cl.⁴ H03B 1/26; H03F 3/10

U.S. Cl. 328—160

5 Claims



1. A frequency multiplying circuit comprising a differential amplifier circuit including first and second active elements of the same conductivity type, each of said first and second active elements having a control electrode, an input electrode and an output electrode, an oscillator circuit connected to the control electrode of the first active element, a resonant circuit coupled between the output electrodes of the first and second active elements, the resonant circuit being tunable to the oscillator's frequency or to an odd harmonic thereof, an output being derived from ends of said resonant circuit, and a negative resistance circuit being connected across first and second ends of said resonant circuit to reduce the effect of a load of a following stage connected to the output, said negative resistance circuit comprising third and fourth active elements of the same conductivity type, each of said third and fourth active elements having an input electrode, an output electrode and a control electrode, a current source coupled to said input electrodes of the third and fourth active elements, the output electrodes of said third and fourth active elements are connected one to each end of the resonant circuit and the control electrodes of said third and fourth active elements are cross-

connected to the output electrode of the other of the third and fourth active elements, and resistive devices connected respectively between the input electrodes of the third and fourth active elements and said current source.

4,712,074

VACUUM CHAMBER FOR CONTAINING PARTICLE BEAMS

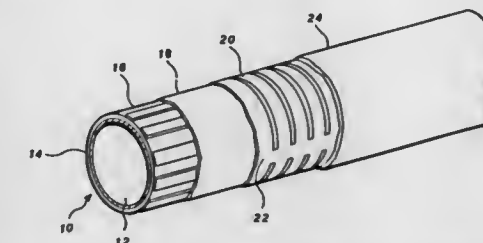
Alexander Harvey, Los Alamos, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 26, 1985, Ser. No. 801,881

Int. Cl.⁴ H05H 1/10, 13/04; H01J 5/02

U.S. Cl. 328—233

17 Claims



1. A vacuum chamber for containing and stabilizing a charged particle beam in a rapidly changing magnetic environment comprising:

- a. a ceramic pipe;
- b. conducting strips oriented substantially parallel to and coaxial with the longitudinal axis of said pipe; and
- c. circumferential conducting bands insulatively separated from said conducting strips, oriented in a direction perpendicular to the longitudinal axis of said pipe, and joined together by a single longitudinal electrical connection.

4,712,075

OPTICAL AMPLIFIER

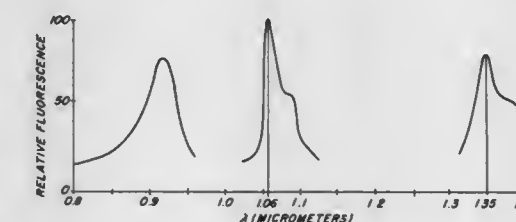
Elias Snitzer, Wellesley, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 27, 1985, Ser. No. 802,369

Int. Cl.⁴ H01S 3/00

U.S. Cl. 330—4.3

18 Claims



1. A device for amplifying optional signals within a select communication band, said device comprising a resonant optical waveguide cavity having a core containing an active gain material with given absorption and fluorescence spectrums, said active gain material having at least two emission bands which originate from the same upper energy level with one of said emission bands encompassing said select communication band, and said cavity being structured for resonating wavelengths in both said emission bands and for providing a more favorable combination of cavity Q and gain coefficient for resonant wavelengths in said other band than for resonant wavelengths corresponding to said select communication band such that, upon introduction into said cavity of pumping energy within said absorption band and at or above laser threshold for said other emission band, said cavity lases at wavelengths in said other emission band and thereby retains the

atomic population of said emission band corresponding to said select communication band at a value below its lasing threshold for amplifying, independent of the level of pump power introduced into said cavity, signals which are within said select communication band and present in said cavity.

4,712,076

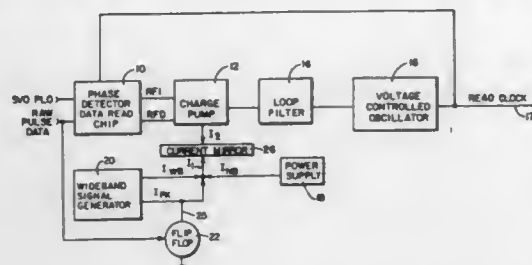
CIRCUIT FOR PHASE LOCKING A CLOCK SIGNAL TO A SERIES OF PULSES

Robert D. Cronch, and Larry J. Koudele, both of Oklahoma City, Okla., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Oct. 27, 1986, Ser. No. 923,784
Int. Cl.⁴ H03L 7/08

U.S. Cl. 331-16

20 Claims



1. A circuit for phase locking a clock signal to the phase of a series of sync pulses, comprising:
 - means for producing a clock signal having a frequency responsive to a first signal;
 - means for comparing the phase of the clock signal to the phase of the series of sync pulses and producing a second signal responsive to the phase relation of the clock signal and the series of sync pulses;
 - means for generating a third signal of decreasing value during the presence of the sync pulses;
 - means for providing a fourth signal; and
 - means for adjusting the level of said first signal in response to the second, third, and fourth signals.

4,712,077

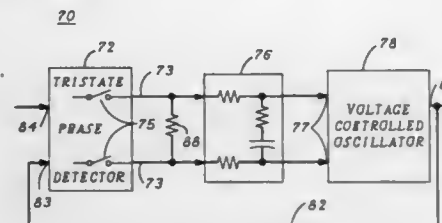
TRISTATE PHASE-LOCK LOOP PREVENTS FALSE LOCK

Henry G. Ansell, Exeter Township, Berks County, Pa., and Jeffrey H. Saunders, Methuen, Mass., assignors to American Telephone and Telegraph Company, AT&T Bell Labs, Murray Hill, Pa.

Filed Dec. 22, 1986, Ser. No. 945,032
Int. Cl.⁴ H03L 7/10

U.S. Cl. 331-25

12 Claims



1. A phase-lock loop comprising
 - a tristate phase detector having a data input terminal, a feedback terminal and an output terminal;
 - a filter having input and output terminals, the filter input terminal being connected with the output terminal of the tristate phase detector for receiving a control signal while ones are being applied to the data input terminal and being disconnected from the output terminal of the tristate phase

detector while zeros are being applied to the data input terminal;

a voltage-controlled oscillator having a tuning control signal input terminal and regenerating a clock signal within a desired frequency range independent of the ones density applied to the data signal input terminal, the tuning control signal input terminal being connected with the output terminal of the filter for receiving a tuning control signal;

means for coupling the clock signal from the clock output terminal to the feedback terminal of the tristate phase detector; and

an impedance coupling a reference voltage to the input terminal of the filter as a supplementary control signal for clamping the tuning control signal and thereby forcing the oscillator to oscillate at a frequency within the desired frequency range independent of the ones density in the digital sequence applied to the data signal input terminal of the phase-lock loop.

4,712,078

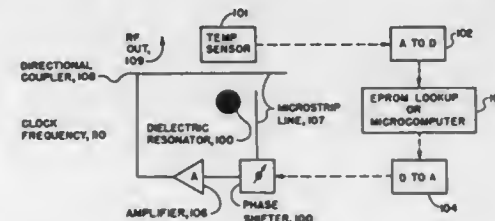
DIELECTRIC RESONATOR OSCILLATORS WITH DIGITAL TEMPERATURE COMPENSATION

Andrew J. Slobodnik, Jr., Londonderry, N.H.; Martin R. Stiglitz, Lexington, Mass.; George A. Roberts, Weston, Mass., and Richard T. Webster, Bedford, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1985, Ser. No. 716,729
Int. Cl.⁴ H03B 5/18; H03L 1/02

U.S. Cl. 331-99

13 Claims



1. In combination with a dielectric resonator oscillator including a dielectric resonator which oscillates to produce a radio frequency (RF) clock signal which has phase shift characteristics corresponding to a resonant frequency, said resonant frequency having a frequency drift with changes in ambient temperature, said dielectric resonator oscillator including microstrip lines which are electrically connected in series with a directional coupler, said microstrip lines being placed in proximity to said dielectric resonator which couples said radio frequency clock signal between said microstrip lines thus closing the oscillator loop, a temperature compensation feedback circuit which reduces temperature sensitivity and frequency drift in said clock signal, said temperature compensation feedback circuit comprising:
 - a temperature sensing means which produces an output signal which indicates the ambient temperature, said output signal being a temperature reading;
 - a correlation means which is electrically connected in series with said temperature sensing means, and which receives said temperature reading from said temperature sensing means, and produces an output signal which indicates an amount of phase adjustment which is necessary in said clock signal to eliminate frequency drift due to changes in the ambient temperature;
 - a digital-to-analog converter which is electrically connected in series with said correlation means, and which receives said output signal from said correlation means, and converts it into an analog signal;
 - a phase shifter which is electrically connected in series with said digital-to-analog converter, and which receives said clock signal and said analog signal from said digital-to-

analog converter, said phase shifter also being electrically connected with said microstrip lines, and outputting an adjusted clock signal which compensates for the phase shift in the dielectric resonator due to changes in the ambient temperature; and

an amplifier which is electrically connected in series between said phase shifter and said directional coupler, and which produces an output by receiving and amplifying said adjusted clock signal from said phase shifter.

4,712,079

MOTOR CONTROLLER AUXILIARY CONTACT UNIT WITH FLEXURE MEMBER

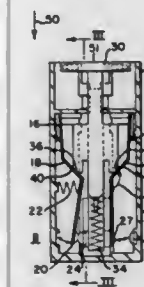
Terry L. Marquardt, Batavia, Ill., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1986, Ser. No. 858,136

Int. Cl.⁴ H01H 67/02

U.S. Cl. 335-132

3 Claims



1. An auxiliary contact assembly of the type which is detachably attached to an electrical apparatus which has a movable portion for mechanically engaging and linearly moving a portion of the auxiliary contact assembly for causing contact status within said auxiliary contact assembly to change, comprising:
 - insulating base means;
 - spaced terminal means disposed on said insulating base means;
 - electrically conducting flexure means with an offset portion disposed on said insulating base means in a disposition of fixed electrical continuity with one of said spaced terminal means and controllable flexed electrical continuity with the other of said spaced terminal means for establishing electrical continuity therebetween; and
 - stroker means linearly movable within said insulating base means in cooperation with said movable portion and having a cam surface which intercepts said offset portion and moves said flexure means for affecting the establishment of said electrical continuity between said spaced terminal means and for remaining in a disposition of interception with said offset portion after said electrical continuity has been established and while said stroker means continues linear movement for causing further flexing of said flexure means for wiping said other of said spaced terminal means.

4,712,080

DEFLECTING YOKE

Akito Katon, Ashiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 24, 1986, Ser. No. 945,952

Claims priority, application Japan, Dec. 25, 1985, 60-201802[U]

Int. Cl.⁴ H01F 5/02

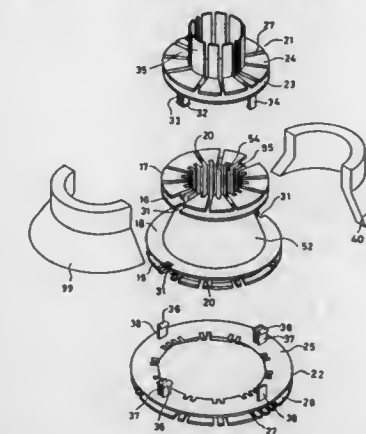
U.S. Cl. 335-213

6 Claims

1. A deflecting yoke comprising:
 - a coil form for holding a horizontal deflection coil and a vertical deflection coil in plural slots extended along the inside of said coil form shaped so as to flare outwardly with respect to a direction along a central longitudinal axis, and having coil head chambers for winding one of the horizontal deflection coil and the vertical deflection

coil, which are formed by walls disposed on both end parts of said slots,

a rear bobbin connected to said coil form by connecting means for winding one of the horizontal deflection coil and the vertical deflection coil in a coil head chamber



1. A blade fuse assembly comprising:
 - formed by two walls disposed around said rear bobbin, and
 - a front bobbin connected to said coil form by connecting means for winding one of the horizontal deflection coil and the vertical deflection coil in a coil head chamber formed by two walls disposed around said front bobbin.

4,712,081

BLADE FUSE ASSEMBLY WITH INDICATOR
Sydney S. Bosley, 67 Holly Ave., New-Haw, Weybridge, Surrey, England

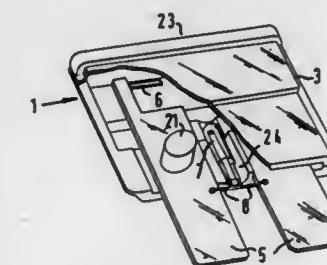
Filed Jul. 11, 1986, Ser. No. 884,380

Claims priority, application United Kingdom, Jul. 12, 1985, 8517590

Int. Cl.⁴ H01H 85/32

U.S. Cl. 337-266

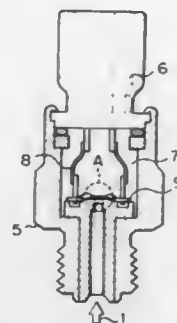
10 Claims



1. A blade fuse assembly comprising:
 - (a) a light conducting fuse housing including a top portion and a base portion,
 - (b) a pair of spaced apart contact legs disposed partially within said fuse housing and having end portions extending outwardly from said base portion of said fuse housing for effecting electrical contact,
 - (c) a fusible member disposed within said fuse housing electrically connecting said contact legs to one another,
 - (d) said fuse housing having structure defining a pocket therewithin, said pocket being disposed between said contact legs and in said base portion of said fuse housing below said fusible member, and
 - (e) an electrically activatable light emitting member positioned within said pocket and electrically connecting said contact legs in parallel with said fusible member, wherein upon failure of said fusible member, said light emitting member will activate to emit light within said fuse housing causing said entire light conducting fuse housing to glow.

4,712,082 PRESSURE SENSOR

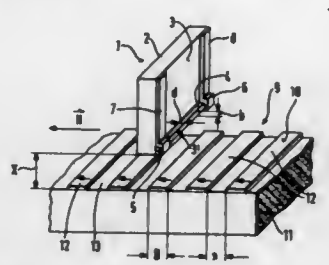
Novuei Ito; Minoru Nishida, both of Okazaki; Naohito Mizuno, Nishio, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Mar. 21, 1986, Ser. No. 842,175
Claims priority, application Japan, Mar. 25, 1985, 60-58499
Int. Cl.⁴ G01L 1/22; H01L 10/10
U.S. Cl. 338—4



1. A pressure sensor comprising:
 - a metal tube having one end portion open and the other end portion closed by a metal diaphragm having a thermal expansion coefficient ranging from about $2.0 \times 10^{-6} \text{C}^{-1}$ to about $6.0 \times 10^{-6} \text{C}^{-1}$, a pressure to be inspected being introduced into said open end portion of said metal tube and applied to said metal diaphragm;
 - a glass layer bonded to a surface of said metal diaphragm opposite to the pressure application side of the metal diaphragm, the thermal expansion coefficient of said glass layer ranging from about $2.0 \times 10^{-6} \text{C}^{-1}$ to about $6.0 \times 10^{-6} \text{C}^{-1}$; and
 - a semiconductor chip acting as a semiconductor strain gauge bonded to the surface of said glass layer opposite said diaphragm.

4,712,083 POSITION SENSOR

Wolfgang Heck, Gerlingen; Peter Kersten, Leonberg, and Hans Volz, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Alcatel N. V., Amsterdam, Netherlands
Filed Dec. 23, 1985, Ser. No. 812,170
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447325
Int. Cl.⁴ H01L 43/00
U.S. Cl. 338—32 R

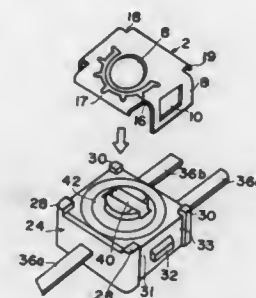


1. A position sensor comprising a first support, at least one flat, magnetic-field-dependent resistor in stripe form deposited on said support, said resistor having a longitudinal axis and ends connectable to an output voltage, and a magnetizable device which is movable relative to the magnetic-field-dependent resistor and has portions transverse to the direction of movement which exhibit alternately different space permeabilities, with the magnetic-field-dependent resistor extending parallel to and at a distance from said portions, said resistor

having a uniaxial anisotropy, with the easy-axis direction being parallel to the longitudinal axis of said stripe.

4,712,084 POTENTIOMETER

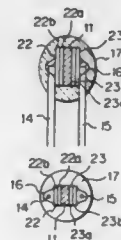
Atsushi Okazaki, Iruma; Masahiko Igarashi, Mitaka, and Tsuneo Horie, Iruma, all of Japan, assignors to Copal Electronics Co., Ltd., Tokyo, Japan
Filed Mar. 19, 1986, Ser. No. 841,455
Claims priority, application Japan, Mar. 22, 1985, 60-57863; Mar. 22, 1985, 60-57868; Mar. 22, 1985, 60-57864
Int. Cl.⁴ H01C 1/02
U.S. Cl. 338—184



1. A potentiometer in which a rotor is disposed within a chamber thereof, said potentiometer comprising:
 - a housing having a pair of housing side walls, each of said housing side walls having a side wall projection extending therefrom, a pair of corner projections each of which extends from a respective end thereof, and a pair of grooves each of which extends between said side wall projection and a respective one of said corner projections; and
 - a case having a pair of bent legs each of which has a hole extending therethrough, and a pair of short bent walls covering the top of the housing,
 said case engaging said housing in a snap-fit manner with the side wall projections of the respective housing side walls extending through the holes and the bent legs of the case extending in the pairs of grooves of the respective housing side walls, whereby said case and said housing may be assembled by one operation in which said case is pressed down over said housing.

4,712,085 THERMISTOR ELEMENT AND METHOD OF MANUFACTURING THE SAME

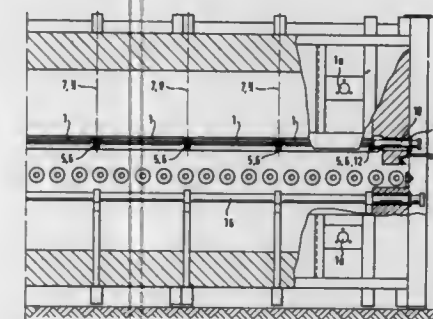
Nobuyuki Miki; Hiroshi Yamaoka, both of Tokyo, and Yoichi Tanaka, Chiba, all of Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Oct. 29, 1985, Ser. No. 792,456
Claims priority, application Japan, Oct. 30, 1984, 59-228437; Oct. 30, 1984, 59-228438
Int. Cl.⁴ H01C 7/10
U.S. Cl. 338—22 SD



1. A thermistor element comprising:

a sintered thermistor chip in wafer form with two principal opposite respective surfaces;
thin film electrodes evaporated on said principal opposite respective surfaces of the thermistor chip;
lead wires each having one end which is respectively adhered to each of the thin film electrodes with heat-resisting conductive material; and
a glass body for sealing the thermistor chip, the thin film electrodes and the adhered ends of the lead wires;
wherein each of the thin film electrodes comprises a lower layer film and an upper layer film, and the lower layer film is formed by evaporating at least one metal selected from a group consisting of W, Mo, Ti, Ta, Cu, Ag, Au, Pt and Pd, and the upper layer film is formed by at least one metal selected from a group consisting of Ag, Au, Pt and Pd, and the material for the upper layer film is different from the material for the lower layer film.

4,712,086
SUPPORT FRAME FOR RESISTOR ELEMENTS IN A HEATING FURNACE FOR GLASS SHEETS
Pauli T. Reunamäki, Nattari; Erkki P. J. Yli-Vakkuri, and Kauko K. Anttonen, both of Tampere, all of Finland, assignors to O/Y Kyro A/B Tamglass, Tampere, Finland
Filed Dec. 16, 1985, Ser. No. 809,340
Claims priority, application Finland, Jan. 3, 1985, 850025
Int. Cl.⁴ F27B 9/06, 9/30
U.S. Cl. 338—315



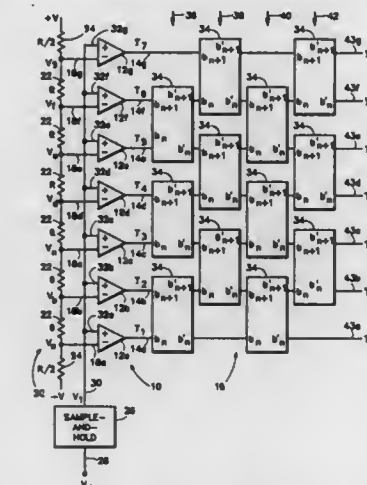
1. A support frame for resistor elements in a heating furnace for glass sheets, said frame being mounted in suspension and comprising a plurality of support frame elements each having an elongated rest surface and connection means for connecting each of the support frame elements to adjacent support frame elements in an articulatory end-to-end arrangement in which the articulation of the elements occurs around axes in the horizontal plane, the plurality of elongated rest surfaces being aligned to form a substantially continuous resistor element support.

4,712,087
ANALOG-TO-DIGITAL CONVERTER ERROR CORRECTION CIRCUIT
Einar O. Traa, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Feb. 9, 1987, Ser. No. 12,752
Int. Cl.⁴ H03M 1/06
U.S. Cl. 340—347 CC

1. In a flash analog-to-digital converter having plural comparators and a reference circuit with plural DC reference signals of different amplitudes, each of the comparators having an analog signal input, a reference signal input, and a logic signal output, the analog signal inputs receiving an analog signal, each of the reference signal inputs receiving a different one of the DC reference signals, and the output signal of each comparator defining one bit of a digital thermometer code which bit is in a first logic state whenever the amplitude of the analog signal is greater than that of the DC reference signal and is in a second logic state whenever the amplitude of the

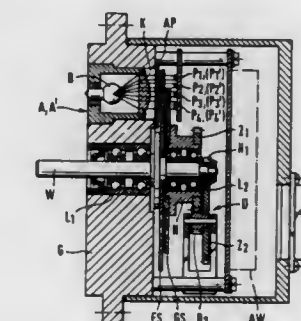
analog signal is less than that of the DC reference signal, a method of determining the presence of and correcting errors in the thermometer code, comprising:

arranging the comparator outputs in an order that defines a digital thermometer code in which the outputs of comparators receiving DC reference signals of increasing amplitudes represent thermometer code bits of increasing order, the thermometer code having X number of bits in the first logic state and Y number of bits in the second logic state in response to the amplitude of the analog signal;



determining whether there is more than one transition between the first and second logic states for adjacent bits in the thermometer code, the transition for adjacent bits of lowest order defining a lowest order transition; and
upon detection of transitions other than the lowest order transition, providing a corrected digital thermometer code having X number of bits in the first logic state and Y number of bits in the second logic state but having only one transition between the first and second logic states.

4,712,088
MULTISTAGE ANGLE ENCODER WITH AN IMPROVED ALLOCATION OF COARSE CODE INFORMATION TO FINE CODE INFORMATION
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany
Filed Nov. 21, 1984, Ser. No. 674,229
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342940
Int. Cl.⁴ H03M 1/26
U.S. Cl. 340—347 P



1. In a multistage angle encoder of the type comprising a drive shaft, a fine code disc coupled to the drive shaft, means for defining fine code information on the fine code disc, a gear drive coupled to the drive shaft, at least one coarse code disc

coupled to the gear drive, means for defining coarse code information on the coarse code disc, and a scanning unit defining at least one scanning axis and positioned to scan the fine and coarse code discs, the improvement comprising:

means for defining control information on the fine code disc, positioned to be superposeable over the coarse code information of the coarse code disc along the scanning axis such that the control information and the coarse code information can be directly and commonly scanned by the scanning unit, said control information adapted to allocate the coarse code information to the fine code information clearly and unambiguously.

4,712,089

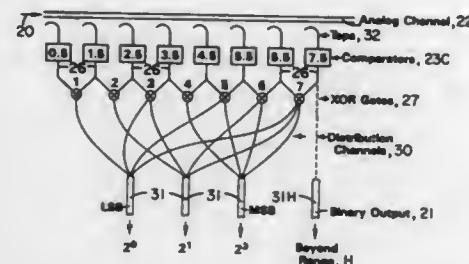
ALL-OPTICAL A/D CONVERSION USING INTEGRATED NONLINEAR GUIDED WAVE OPTICAL CIRCUITRY
Carl M. Verber, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Oct. 11, 1985, Ser. No. 786,770

Int. Cl.⁴ H03M 1/36

U.S. Cl. 340—347 AD

16 Claims



1. A method for receiving an analog optical input signal and for providing a digital optical output signal indicative of the intensity of the analog input signal, comprising:

directing the analog optical input signal along a path comprising a series of level sensing means for determining whether the intensity of the analog input signal is above a predetermined threshold and for providing a first binary optical threshold signal of a first predetermined intensity within a first predetermined range of intensities when the intensity of the analog signal is above the threshold, and for providing a second binary optical threshold signal of a second predetermined intensity within a second predetermined range of intensities substantially separated from the first range when the intensity of the analog input signal is not above the threshold;

the first level sensing means providing a signal indicating whether the intensity of the input signal is greater than a first (lowest) designated intensity, the second level sensing means providing a signal indicating whether the intensity of the input signal is greater than a second (next to the lowest) designated intensity, the third level sensing means providing a signal indicating whether the intensity of the input signal is greater than a third (next higher, ie next to the next lowest) designated intensity, the fourth level sensing means providing a signal indicating whether the intensity of the input signal is greater than a fourth (next higher) designated intensity, and so on to the last level sensing means providing a signal indicating whether the intensity of the input signal is greater than a last (highest) designated intensity;

directing a predetermined portion of the threshold signals from the first and second level sensing means to first exclusive-or gate (XOR) means, directing a predetermined portion of the threshold signals from the second and third level sensing means to second XOR means, directing a predetermined portion of the threshold signals from the third and fourth level sensing means to third XOR means, and so on, directing a predetermined portion of the threshold signals from the next-to-last and last level

sensing means to a last XOR means (in number one less than that of the last level sensing means);

each XOR means comprising means for providing a first binary optical signal (indicating inequality) of a third predetermined intensity within a third predetermined range of intensities when one of the threshold signals directed to it has the first predetermined intensity and the other threshold signal directed to it has the second predetermined intensity, and for providing a second binary optical signal (indicating equality) of a fourth predetermined intensity within a fourth predetermined range of intensities substantially separated from the third range when both of the threshold signals directed to it have the first predetermined intensity and when both of the threshold signals directed to it have the second predetermined intensity; and

directing the digital optical signal from each XOR means to at least one of a plurality of individual optical output means according to a designated digital coding system, whereby each available combination of signals in the plurality of individual output means provides a digital indication of the specific range of optical intensities within which is the intensity of the analog optical input signal.

4,712,090

DATA CONTROL CIRCUITS

Kouichi Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

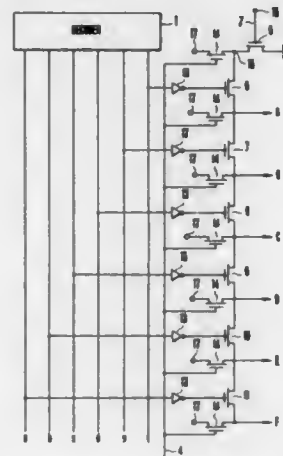
Filed Nov. 19, 1984, Ser. No. 672,621

Claims priority, application Japan, Nov. 18, 1983, 58-217323

Int. Cl.⁴ H03M 7/00

U.S. Cl. 340—347 DD

5 Claims



1. A circuit for encoding an output signal of a decoder which has N output signal lines, one of the N output signal lines being at a first voltage level in accordance with decoded information, the remaining output signal lines being at a second voltage level different from said first voltage level, comprising:

a first circuit having N transistors connected in series; means for coupling an input electrode of each of said transistors to a corresponding output signal line of said decoder; N output terminals, each of which is connected to a respective transistor of said first circuit; means coupled to said N output terminals for charging each of the N output terminals to the first voltage level during a precharge cycle; and

a discharge means coupled to said first circuit for discharging at least one output terminal from the first voltage level to the second voltage level during a discharge cycle such that, during the discharge cycle, only the transistor coupled to the output signal line at the first voltage level is turned off while the remaining transistors are turned on, so that output terminals between the turned off transistor and said discharge means are at the second voltage level,

and the remaining output terminals are at the first voltage level.

4,712,091

DIGITAL/ANALOG CONVERTER HAVING A SWITCHABLE REFERENCE CURRENT

Franciscus A. C. M. Schoofs; Martinus P. M. Blerhoff; Job F. P. Van Mil, and Albert H. Slomp, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

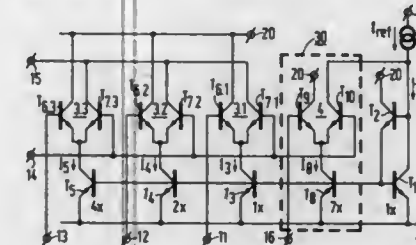
Filed Dec. 20, 1985, Ser. No. 811,237

Claims priority, application Netherlands, Jan. 16, 1985, 8500086

Int. Cl.⁴ H03M 1/70

U.S. Cl. 340—347 DA

9 Claims



1. A digital-to-analog converter for converting a digital input code into an analog output current, comprising:

a reference-current source for supplying a reference current, a reference transistor coupled to the reference current source,

a plurality of first current source transistors coupled to the reference transistor so that the respective collector-emitter currents thereof are each in a given ratio to the collector-emitter current in the reference transistor,

a plurality of first switching devices equal in number to and individually coupled to the plurality of first current-source transistors so that the switching devices each switch a current from an associated current-source transistor to a summing point at which the analog output current is obtained, or to a point of constant potential, depending on the digital input code applied to respective switching inputs of the switching devices, and

a control device which controls the collector-emitter current in the reference transistor to increase in steps from a fraction of to substantially the full reference current from the reference current source, between a first value of the digital input code corresponding to the minimum analog output current, and a second value of the digital input code corresponding to the maximum analog output current.

4,712,092

PARALLEL ENCODED PIEZOELECTRIC KEYBOARD SWITCH AND ARRAY

Austin Boldridge, Jr., Freehold, N.J.; Scott Buell, Harpers Ferry, W. Va., and James M. Graham, Westminster, Md., assignors to Aaron J. Gellman and Samuel H. Levinson, both of Glencoe, Ill.

Filed Dec. 20, 1983, Ser. No. 563,525

Int. Cl.⁴ G06F 3/02

U.S. Cl. 340—365 A

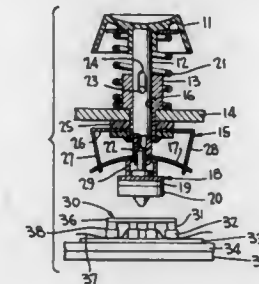
25 Claims

19. In an electrical keyboard assembly of the type wherein individual keyboard switches in an array are selectively actuable to apply an n-bit binary number in parallel on n respective common data lines, a processing circuit for processing said n-bit binary numbers comprising:

n resettable latch means, each connected to a respective data line to receive signals appearing on that line and provide a data signal representing the binary state of the received signals;

n clocked register means, each responsive to application of a

gating signal thereto for entering therein the data signal provided by a respective latch means; and timer means responsive to application of a trigger signal thereto for providing said gating signal after elapse of a first predetermined time interval following application of



said trigger signal, and for providing a reset signal to reset each of said latch means after elapse of a second predetermined time interval following application of said trigger signal, said second predetermined time interval being longer than said first predetermined time interval.

4,712,093

AUDIBLE AUDIO LEVEL INDICATOR

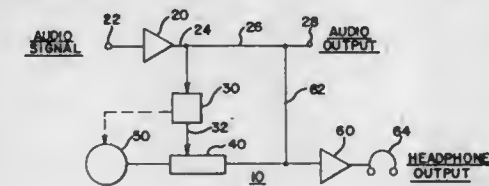
Kenneth R. Reichel, Hudson, and Steve Hebrock, Akron, both of Ohio, assignors to Audio Technica U.S., Inc., Stow, Ohio

Filed Apr. 10, 1986, Ser. No. 850,251

Int. Cl.⁴ G08B 3/00

U.S. Cl. 340—540

12 Claims



1. A system for directly monitoring the level of an intelligence-containing electrical audio frequency signal prior to conversion to audible sound wherein an operator audibly monitors the audio frequency signal by means of a sound transducer, comprising:

threshold detection means for comparing the level of the intelligence-containing audio frequency signal to a preselected threshold level, and for generating a control signal in response to the level of the intelligence-containing audio frequency signal exceeding the preselected threshold level;

tone generating means for continuously generating an audio frequency tone signal of preselected frequency; and gating means for coupling the audio frequency tone to the sound transducer in response to the control signal.

4,712,094

SELF-ORIENTING PASSIVE MARKER STRUCTURE

John H. Bolson, Sr., Conyers, Ga., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 29, 1986, Ser. No. 868,784

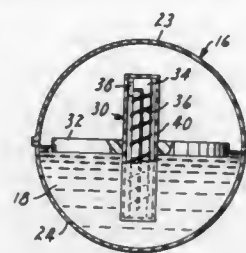
Int. Cl.⁴ G08B 13/18

U.S. Cl. 340—572

6 Claims

1. A passive marker including: an inductance-capacitance tuned circuit wherein said inductance includes a coil having an axis; a hollow sphere partially filled with a liquid; and

a buoyant carrier carrying said tuned circuit and floating freely in said liquid for positioning said axis of said coil



closer to the vertical than the horizontal when said buoyant carrier is floating freely in said liquid.

4,712,095

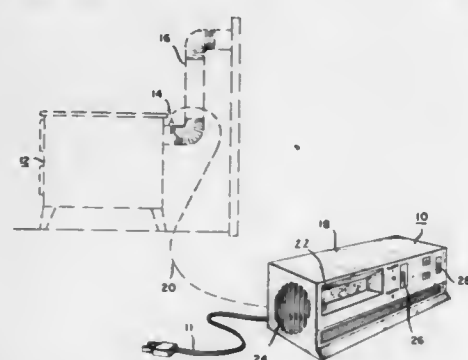
REMOTE TEMPERATURE ALARM FOR STOVES
Paul F. Georgis, II, 23 S. 11th St., Easton, Pa. 18042

Filed Aug. 1, 1986, Ser. No. 891,630

Int. Cl.⁴ G08B 17/06

U.S. Cl. 340—584

8 Claims



1. A remotely located temperature alarm for stoves comprising:

- (a) a temperature probe for insertion into a stove pipe of said stove;
- (b) electrical connection means between said temperature probe and a remotely located portion of said alarm; and
- (c) alarm means in said remotely located portion including a visual temperature display and an audible alarm means, said audible alarm means generating an audible alarm signal during the presence of either one of a "low" temperature and a "high" temperature alarm condition at said stove pipe.

4,712,096

CONDITION RESPONSIVE DETECTION SYSTEM AND METHOD

John M. Cholin, Oakland, N.J.; Jeffrey G. Cholin, Pound Ridge, N.Y., and Ray Voorhis, Midland Park, N.J., assignors to Firetek Corporation, Hawthorne, N.J.

Filed May 10, 1985, Ser. No. 732,875

Int. Cl.⁴ G08B 17/02

U.S. Cl. 340—590

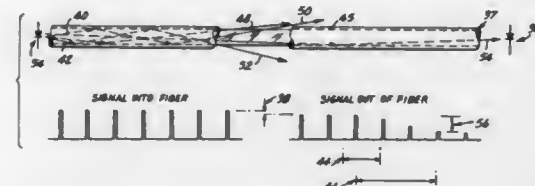
18 Claims

1. A condition responsive detection system for detecting the occurrence of a predetermined errant environmental condition, comprising

- (a) a length of optical fiber having a first and second end, said length of optical fiber including a core and core-cladding material, said cladding material reflecting the radiant power incident thereon, said optical fiber selectively chosen to include a cladding material whose chemical structure irreversibly deteriorates upon exposure to the errant environmental condition sought to be monitored,

the irreversible deterioration resulting in the otherwise incident and reflected radiant power to be lost there-through, said optical fiber having a modal dispersion ratio (MDR) less than a predetermined number to maximize the radiant reflectively incident on said cladding material;

(b) radiant power source means for illuminating said first end; and



(c) means, disposed at the second end, for detecting the reduction in the amount of radiant power received at the second end, below a nominal level, when the chemical structure of said cladding material is irreversibly altered such that substantially all of the reflected radiant power is lost through the alteration in the cladding material.

4,712,097

AUTOMATIC MEASURING/ALARM APPARATUS FOR MEASURING RADIOACTIVE CONCENTRATION OR THE LIKE

Kazuo Hashimoto, 28-2, Komazawa 2-chome, Setagaya-ku, Tokyo, 154, Japan

PCT No. PCT/JP84/00111, § 371 Date Nov. 2, 1984, § 102(c) Date Nov. 2, 1984, PCT Pub. No. WO84/03775, PCT Pub. Date Sep. 27, 1984

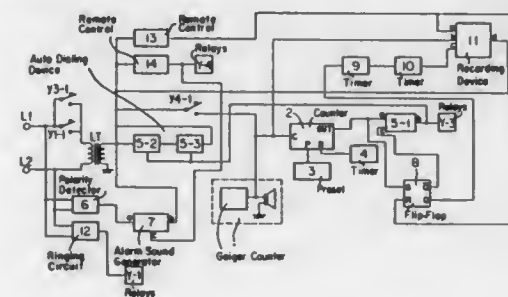
PCT Filed Mar. 16, 1984, Ser. No. 674,156

Claims priority, application Japan, Mar. 18, 1983, 58-45594

Int. Cl.⁴ G08B 17/12

U.S. Cl. 379—40

3 Claims



1. An automatic measuring/alarm apparatus for measuring a radioactive concentration or the like, characterized by comprising:

- a measuring device for expressing a change in a physical quantity such as the radioactive concentration by an audible frequency;
- a preset counter for generating a count output when a number of pulse sounds from said measuring device exceeds a predetermined value;
- timer means for resetting said preset counter for every predetermined time interval;
- an automatic dial device for performing automatic dialing of a preset telephone number in response to the output from said preset counter;
- means for forming a loop of a telephone line upon automatic dialing;
- a polarity detector for inverting a polarity of the telephone line when a telephone set of a called party is taken off-hook;
- means for sending an alarm sound onto the telephone line in response to an output from said polarity detector; and

a remote control circuit for detecting a remote control signal sent through the telephone line and generating an output; and

means for sending the pulse sounds received from said measuring device onto the telephone line in response to an output from said remote control circuit.

4,712,098

INERTIA SENSITIVE DEVICE

John Laing, Gillingham, England, assignor to Tapeimp Limited, North Yorkshire, England

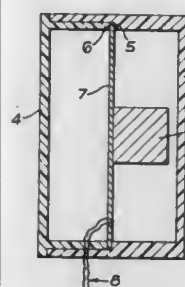
Filed Jul. 25, 1986, Ser. No. 890,493

Claims priority, application United Kingdom, Jul. 27, 1985, 8519026

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340—669

8 Claims



1. An inertia sensitive device comprising a piezoelectric plate, a housing gripping the plate along at least a major part of the periphery of said plate, a weight supported by the plate at a position in the region of the centre of said plate, and means for detecting electrical signals generated by said plate.

4,712,099

COLOR-SIGNAL CONVERTING CIRCUIT

Satoru Maeda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

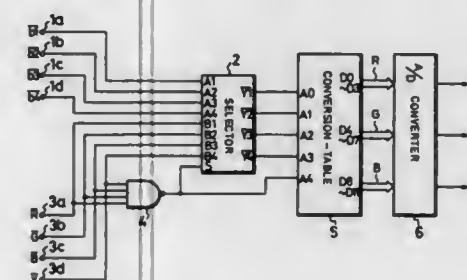
Filed Jan. 13, 1984, Ser. No. 620,394

Claims priority, application Japan, Jun. 13, 1983, 58-105384

Int. Cl.⁴ G09G 1/28

U.S. Cl. 340—703

16 Claims



1. Color-signal converting apparatus for producing primary-color display signals, said apparatus comprising:

- selector means receiving a first binary data signal for use with a look-up table, said first binary data signal representing a first color-signal, and a second binary data signal for use in direct display of a second color-signal, said selector means selectively supplying as outputs one or the other of said first and second binary data signals;
- logic circuit means responsive to said second binary data signal for producing a logic output signal fed to said selector means to control the operation thereof, said logic output signal having a state depending on the condition of said second binary data signal; and
- conversion means receiving said outputs from said selector

means and receiving said logic output signal from said logic circuit means for generating said primary-color display signals from said outputs of said selector means in response to said logic output signal;

wherein said logic circuit means includes a logical NAND gate responsive to said second binary data signal for producing said logic output signal in response thereto.

4,712,100

COORDINATE INPUTTING APPARATUS USING MULTIPLE SENSORS

Masao Tsunekuni, and Yasuhisa Ishizawa, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

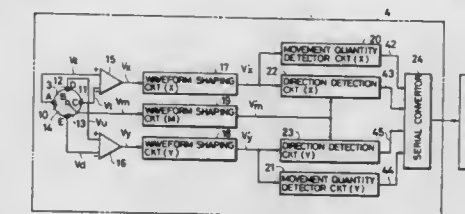
Filed May 13, 1985, Ser. No. 733,390

Claims priority, application Japan, May 18, 1984, 59-98537

Int. Cl.⁴ G09G 1/00

U.S. Cl. 340—710

8 Claims



1. A coordinate inputting apparatus comprising: an information plate in which a plurality of patterns are provided at equal intervals in the form of a matrix, at least one said pattern having a periphery and a center and each of said patterns being symmetrical with respect to its center;

a plurality of first sensing means arranged relative to positions which are symmetrical with respect to said center of said pattern and which are substantially on said periphery of said pattern on said information plate;

second sensing means arranged relative to a position substantially corresponding to said center of said pattern;

movement distance detecting means for detecting a movement distance in response to a change of an output from said first sensing means; and

movement direction detecting means for detecting a movement direction in response to a change of an output from said second sensing means.

4,712,101

CONTROL MECHANISM FOR ELECTRONIC APPARATUS

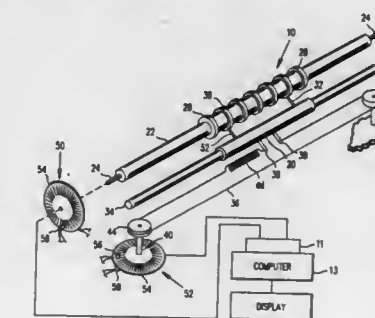
Craig F. Culver, Woodside, Calif., assignor to Cheetah Control, Inc., Woodside, Calif.

Filed Dec. 4, 1984, Ser. No. 677,703

Int. Cl.⁴ G09G 1/00

U.S. Cl. 340—710

21 Claims



1. A mechanism for controlling by hand the movement of a

cursor or pointer of a computer display in conjunction with a keyboard comprising:

- a longitudinal rotatable shaft;
- a housing for supporting said rotatable shaft;
- a cylindrical member mounted coaxially around a portion of said shaft, said member being slidable axially along said shaft and rotatable about said shaft;
- first and second encoding means coupled to said shaft and cylindrical member respectively for sensing rotation of said shaft and linear movement of said cylindrical member along said shaft and for generating output signals representing the magnitudes and directions of such rotation and linear movement respectively, so that the motions of said shaft and said member enable the adjustment of said output signals with a resultant change in the position of said cursor or pointer.

4,712,102

METHOD AND APPARATUS FOR DISPLAYING ENLARGED OR ENHANCED DOT MATRIX CHARACTERS

Demetrios Troupes, and Randall W. Alexander, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 695,997, Jan. 29, 1985, Pat. No. 4,586,835, which is a continuation-in-part of Ser. No. 602,248, Apr. 20, 1984, abandoned. This application Jul. 3, 1985, Ser. No. 752,176

Int. Cl.⁴ G09G 3/00

U.S. Cl. 340—790

58 Claims



1. A method of displaying enlarged dot matrix characters comprised of selected binary data elements representing either a dot or a blank in a matrix of positions arranged in horizontal rows and vertical columns, the method comprising

- (a) storing sets of binary data elements, each set defining a respective character having horizontal linear components of a high density and vertical and diagonal linear components of a low density;
- (b) performing logical operations on a set of the stored binary data elements to generate associated additional binary data elements which enlarge the size of the respective character in at least one of the vertical and horizontal directions by lengthening the diagonal linear components and the selected vertical or horizontal linear components; and
- (c) selectively using the generated associated additional binary data elements together with the stored binary data elements to display characters in which the diagonal and selected vertical or horizontal linear components thereof are lengthened to display a character of enlarged size.

4,712,103

DOOR LOCK CONTROL SYSTEM

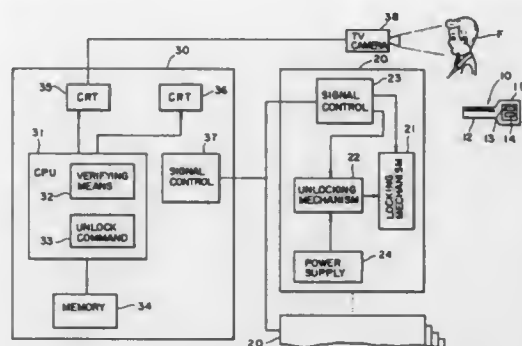
Motohiro Gotanda, 1802-10, Nakabyo, Abiko-shi, Chiba-ken, Japan

Filed Dec. 3, 1985, Ser. No. 804,083

Int. Cl.⁴ G06F 7/04; G07D 7/00; G06K 9/00

U.S. Cl. 340—825.31

3 Claims



1. A door lock control system comprising:

- door lock means having a keyhole;
- plurality of keys owned by respective predetermined key owners, assigned with respective predetermined key numbers, each adapted for insertion into the keyhole and each having a memory storing information of the owner's face as video data and information of the key number;
- information storage means storing information of a predetermined portion of the video data stored in the memory of each of said keys and correlated to each key number;
- processing means adapted for being electrically coupled to the memory of said key inserted into the keyhole and for reading out
 - (A) the information of the key owner's face stored in the memory of said key inserted into the keyhole,
 - (B) the information of the key number stored in the memory of said key inserted into the keyhole,
 - (C) selected one of the information of the predetermined portions of the video data stored in the information storage means according to the information (B) of the key number, and
 - (D) information of the predetermined portion of the video data stored in the memory of said key inserted into the keyhole;

the predetermined portion of the video data being video signals of a predetermined scan line of the video data;

verifying means coupled to the processing means to verify whether or not the information (C) read out from the information storage means by the processing means corresponds to the information (D) read out from the memory of the key by the processing means;

first display means coupled to the processing means for displaying said key owner's face according to the information (A) read out by the processing means;

a television camera disposed outside of the door for taking the face image of the person who has inserted said key into the keyhole; and

second display means coupled to said television camera for displaying the face image of said person taken by said television camera, to permit comparison of the displayed face images of said first and second display means, and determination whether or not said person inserting the key is the same as the predetermined owner of said key and, from the verifying means a determination whether or not the key inserted into the keyhole is one of those owned by the predetermined key owners.

4,712,104

REMOTE CONTROL BLIND SYSTEM

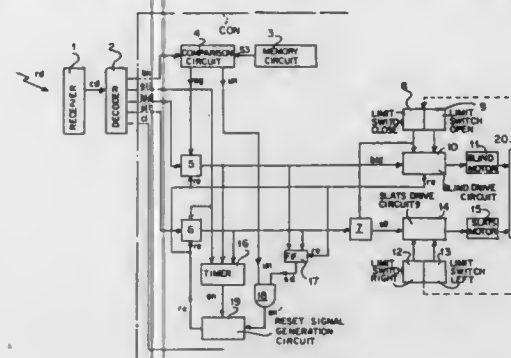
Masahiko Kobayashi, Nagaoka, Japan, assignor to Kuron Kabushiki Kaisha, Niigata, Japan

Filed Apr. 19, 1985, Ser. No. 724,998

Int. Cl.⁴ H04Q 7/00; G08C 19/00; E05F 11/00

U.S. Cl. 340—825.52

8 Claims



1. A remote control blind system comprising:

- a plurality of blinds which can be freely opened and closed;
- a plurality of control units provided for each of said blinds, for independently opening and closing each of said blinds;
- receiving means for receiving and processing radio signals and for transmitting said signals to said control units; and transmitting means provided separately from said receiving means, for transmitting said radio signals;
- each of said control units at least comprising:
 - means for storing a blind number to specify said blind;
 - means for comparing a signal of said stored blind number with a designation signal of the blind number that was received and processed, from said radio signal and for transmitting an agreement signal of the blind number when said signals agree;
 - a holding type open/close gate which is set by said agreement signal and which transmits an operation signal of the blind to a drive means for opening and closing the blind;
 - a retriggerable timer which is triggered by the blind operation signal and which transmits a stop signal of the blind operation when said timer is not retriggered for a predetermined period of time; and
 - reset signal generating means which resets the holding type open/close gate when the stop signal of the blind operation is transmitted.

4,712,105

REMOTE CONTROL HAND APPARATUS FOR OPERATING DIFFERENT MODULES

Hans E. P. Köhler, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 30, 1985, Ser. No. 729,008

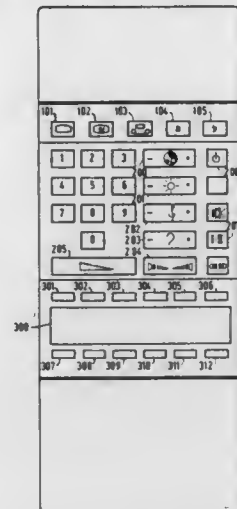
Claims priority, application Netherlands, Mar. 12, 1985, 8500690

Int. Cl.⁴ H04Q 1/00

5 Claims

1. A remote control hand apparatus for generating control signals for controlling several functions of a plurality of modules coupled to the hand apparatus via a transmission channel, said hand apparatus comprising, a plurality of multi-functional keys to which one of a plurality of control functions is selectively assignable and of which the control function operable thereby is dependent on the module to be operated; a plurality of module keys each of which is assigned to a module; display means; a control circuit coupled to said module keys and to said multi-functional keys, said control circuit selecting, in dependence on the module to be operated, one of the assignable control functions for assigning a specific function to the

multi-functional key and for displaying said operating function on the display means, characterized in that a user can only gain access to a relevant module via said plurality of module keys and the control circuit; that the display means comprise one single display device of the dot-matrix type around which all of the multi-functional keys are arranged in registry with adjacent portions of the display device assigned to respective ones



of the multi-functional keys and on which display device a plurality of symbols indicating the actual control functions associated with the module selected to be operated and assigned to the multi-functional keys are simultaneously displayed for all of the specific control functions assigned to their respective adjacent multi-functional keys upon actuation of a particular module key and under the control of the control circuit.

4,712,106

PHASE ANALOG ENCODING SYSTEM WITH COMPENSATION

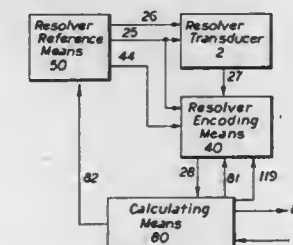
Paul F. McNally, Gibsonia, Pa., assignor to International Cybernetics Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 827,475, Feb. 5, 1986, abandoned, which is a continuation of Ser. No. 560,658, Dec. 12, 1983, abandoned. This application Nov. 20, 1986, Ser. No. 933,301

Int. Cl.⁴ G08C 19/06, 15/06; G01C 25/00

U.S. Cl. 340—870.32

19 Claims



1. A resolver based phase analog encoding system for indicating position with compensation for an inherent electrical phase shift across said resolver comprising:

- (a) a resolver transducer;
- (b) a resolver reference means electrically connected to said resolver transducer for generating and applying a plurality of reference signals to said resolver transducer;
- (c) a resolver encoding means electrically connected to said resolver transducer and said resolver reference means for measuring a sum $(\phi + \alpha)$ of a mechanical displacement ϕ and an inherent electrical phase shift across said resolver transducer α , or an inherent electrical phase shift across said resolver transducer α independent of the mechanical

1. An antenna comprising a plurality of sequentially wound separate conductive windings on a magnetic core, each winding being connected in series with a corresponding capacitor to form a plurality of series circuits, the series circuits being connected in parallel with each other in parallel aiding direction.

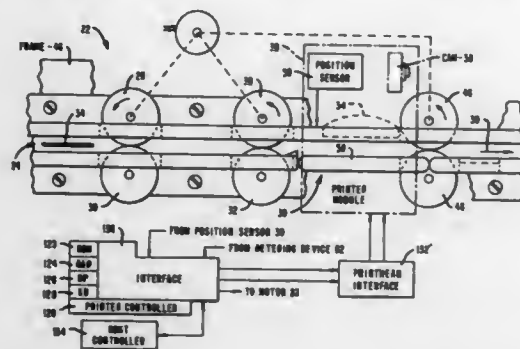
4,712,113

THERMAL TRANSFER RIBBON MECHANISM AND RECORDING METHOD

Ralf M. Brooks, Waterloo; Brian P. Coanell, Elmira; Dennis T. Sonnenburg, Waterloo, and Stefan J. Pagowski, Kitchener, all of Canada, assignors to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Jul. 17, 1986, Ser. No. 886,488

Int. Cl.⁴ G01D 15/10; B41J 33/34; G11B 15/32
U.S. Cl. 346-1.1 17 Claims



16. A method of thermal recording employing a thermal transfer ribbon carrying ink material which is transferred to a document by thermal means, comprising the following steps:

- advancing the ribbon a predetermined amount in a recording direction by a stepping motor during each recording operation to provide a fresh ribbon for the transferral of ink to a document to be recorded upon;
- sensing and measuring the number of steps of the stepping motor required for movement of the ribbon a given distance in said recording direction; and
- reversing the ribbon by a predetermined amount during each recording cycle by operation of the stepping motor in a reverse direction a number of steps determined by utilizing the number of steps taken by the stepping motor for movement of the ribbon a given distance in said recording direction, to provide ribbon slack for the prevention of document smudging and ribbon breakage.

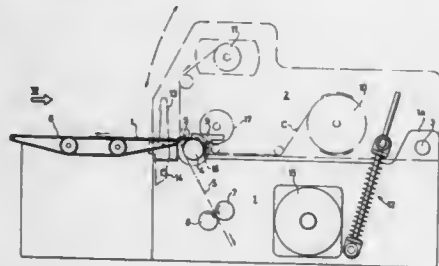
4,712,114

LABEL FEEDING APPARATUS FOR A THERMAL LABEL PRINTER

Hidenori Kikuchi, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Sep. 26, 1986, Ser. No. 912,794

Claims priority, application Japan, Sep. 28, 1985, 60-213668
Int. Cl.⁴ G01D 15/10; B65C 9/18; B41J 3/20; B65H 43/04
U.S. Cl. 346-76 PH 13 Claims



- A thermal label printer comprising:
 - a print head for printing data on labels and means for conveying an elongated backing sheet supporting the labels which are detachably adhered to the backing sheet past the print head;
 - a peeling member located past the print head along a travel direction of the backing sheet, the peeling member having

a configuration which causes the labels to peel off the backing sheet when the travelling direction of the backing sheet changes sharply as the backing sheet travels past the peeling member; and

conveyor belt means extending to the peeling member for carrying printed labels out of the thermal printer, the conveyor belt means including means for adjusting the position of the conveyor belt means relative to the peeling member to create a clearance which facilitates loading and insertion of the backing sheet between the peeling member and the conveyor belt means.

4,712,115

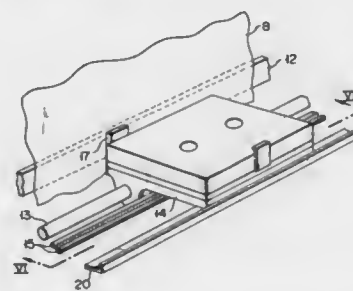
THERMAL-TRANSFER PRINTER

Hisao Tatsumi; Haruhiko Kayata; Kenji Yamamori, all of Nagoya; Toshio Kakizawa, Kuwana, and Toshiaki Mogi, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 5, 1986, Ser. No. 860,008

Claims priority, application Japan, May 10, 1985, 60-100325; May 10, 1985, 60-100326; May 22, 1985, 60-110024

Int. Cl.⁴ G01D 15/10; B41J 3/20
U.S. Cl. 346-76 PH 13 Claims



- A thermal-transfer printer for printing input information on a record medium by using a ribbon cassette which includes a pair of reels and a repeatedly usable ink ribbon wound on the reels, comprising:

thermal head means arranged for reciprocation along the record medium, for, during both advancing and returning strokes, heating the ink ribbon to thermally transfer ink of the ribbon to the record medium in accordance with the input information, thereby printing lines alternately in advancing and returning directions;

ribbon transport means for rotating the reels to transport the ink ribbon in a desired direction; and

control means for supplying a transport control signal to said ribbon transport means to transport the ink ribbon in a predetermined direction so that the ink ribbon does not move relatively to the record medium during the printing by the thermal head, and for supplying a take-up control signal to said ribbon transport means so that so that the starting end side of the ribbon is taken up for a predetermined length every time one line or a few lines are printed.

4,712,116

MEANS AND METHOD OF SYMMETRICAL ENERGIZATION OF INDIVIDUAL ARRAY LED'S FOR IMAGE EXPOSURE

Hans Reinten, Velden, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

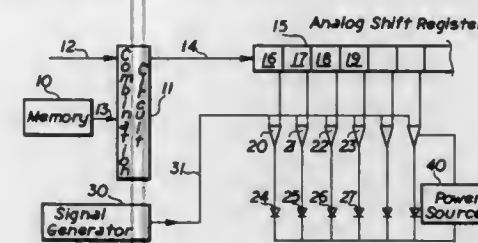
Filed Dec. 23, 1985, Ser. No. 812,175

Claims priority, application Netherlands, Dec. 24, 1984, 8403926

Int. Cl.⁴ G01D 9/42, 9/00; H04N 1/21
U.S. Cl. 346-107 R 7 Claims

- In an exposure device for exposing a movable light-sensitive layer comprising a straight array of individual LED's for

line-wise exposure of said light-sensitive layer, said array extending perpendicularly to the direction of movement of said light-sensitive layer; and means for energizing for a variable time each individual LED in said array for each image line,



wherein said time variation corresponds to corrected image signals, the improvement comprising a circuit means for energizing each individual LED in said array symmetrically with respect to an imaginary line extending parallel to said array for each image line.

4,712,117

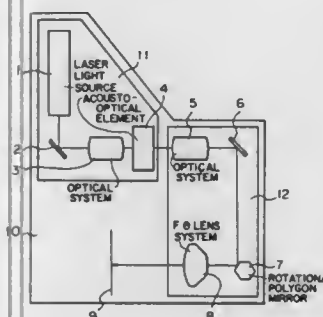
ADJUSTING APPARATUS FOR LASER SCANNING SYSTEM WITH ACOUSTO-OPTICAL ELEMENT

Fumiaki Kawaguchi, Tokyo; Toshikazu Shimazu, and Kazuhisa Takahashi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1985, Ser. No. 792,583

Claims priority, application Japan, Nov. 15, 1984, 59-241426

Int. Cl.⁴ G01D 9/42 5 Claims



- A laser recording apparatus having:
 - a laser light source;
 - an acousto-optical element for optically modulating the laser beam from said laser light source;
 - a beam expander;
 - a scanning optical system for optically scanning a diffracted light emerging from said acousto-optical element toward a recording surface;
 - an f θ lens system for imaging the light passed through said scanning optical system on the recording surface;
 - a first plate on which said laser light source and said acousto-optical element are disposed as a first unit; and
 - a second plate on which said beam expander, said scanning optical system and said f θ lens system are disposed as a second unit, the relative position of said second plate and said first plate being adjustable.

4,712,118

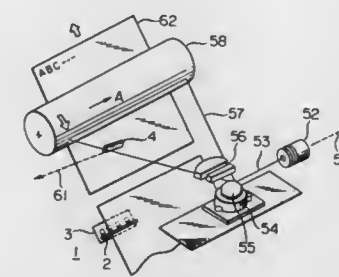
LASER BEAM PRINTER

Kaoru Seto, Chigasaki; Yoshihide Ushio, Higashi; Kenjiro Hori, Yokohama; Hiroshi Hashimoto; Toshio Yoshimoto, both of Tokyo, and Kiyoshi Kanaiwa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 897,818

Claims priority, application Japan, Aug. 26, 1985, 60-185912; Jan. 22, 1986, 61-10010; Jan. 22, 1986, 61-10013; Jan. 22, 1986, 61-10014

Int. Cl.⁴ G01D 9/42, 15/14
U.S. Cl. 346-108 14 Claims



- A laser beam printer comprising:
 - a recording medium for forming an image;
 - scanning means for scanning a beam modulated by an image signal on said recording medium; and
 - means for detecting the position of said beam scanned by said scanning means;
 wherein said detecting means outputs a plurality of synchro signals for defining the record start position on said recording medium.

4,712,119

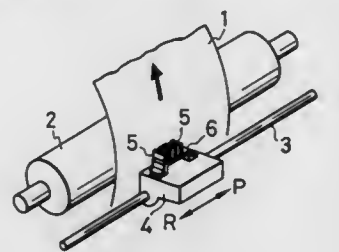
RECORDING APPARATUS HAVING PLURAL ADJUSTABLE RECORDING HEADS

Takehiko Kiyohara, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1985, Ser. No. 797,522

Claims priority, application Japan, Nov. 19, 1984, 59-244046; Nov. 19, 1984, 59-244047

Int. Cl.⁴ G01D 15/16 8 Claims



- A recording apparatus comprising:
 - a platen for recording;
 - a carriage movable along said platen;
 - a plurality of recording heads, each having a mounting surface and a projecting portion projected from said mounting surface;
 - a head mounting member disposed on said carriage to mount thereon said plurality of recording heads, said head mounting member having a supporting surface contacting said mounting surface and a plurality of openings into each of which a corresponding said projecting portion tightly fits;
 - a plurality of head supporting members for pressing respec-

tive said recording heads against a side surface of said corresponding opening; and
adjusting means for adjusting the distance and the angular orientation of said head mounting member with respect to said platen.

4,712,120

LASER MATERIALS TREATMENT SYSTEM

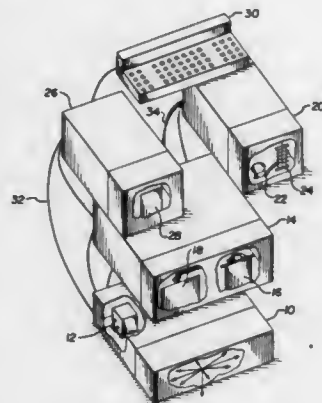
William Latto, Kissimmee, Fla., assignor to C-E Industrial Lasers, Incorporated, Somerville, Mass.

Filed Mar. 17, 1986, Ser. No. 840,500

Int. Cl.⁴ G01D 15/00

U.S. Cl. 346—145

1 Claim



1. A modular laser materials marker assembly comprising:

- a. a plurality of separate, modularized units including a first unit comprising a laser head and delivery optics assembly unit, a second unit comprising a power supply unit, a third unit comprising a cooling unit, a fourth unit comprising a microprocessor unit, and a fifth unit comprising a keyboard and display unit, each of said units being relatively positionable with respect to the others of said units whereby the spatial configuration of said assembly may be arranged in various ways;
- b. removable fluid conveying means for interconnecting the laser head and delivery optics assembly unit; and
- c. removable electrical connecting means for electrically connecting the power supply unit to the laser head and delivery optics assembly unit, the power supply unit to the cooling unit, the power supply unit to the microprocessor unit, the microprocessor unit to the keyboard and display unit, and the microprocessor unit to the laser head and delivery optics assembly unit.

4,712,121

HIGH-SPEED SEMICONDUCTOR DEVICE

Naoki Yokoyama, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1985, Ser. No. 754,416

Claims priority, application Japan, Aug. 30, 1984, 59-179178

Int. Cl.⁴ H01L 27/12, 29/161, 29/72

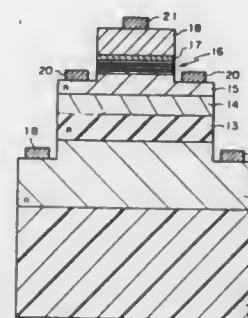
U.S. Cl. 357—4

12 Claims

1. A high-speed semiconductor device, comprising:

- an emitter layer having a conduction band with a first energy level;
- a base layer formed under said emitter layer and having a conduction band with a second energy level;
- superlattice means, disposed between said emitter layer and said base layer, carriers tunneling therethrough, said superlattice means comprising:
- a first potential barrier layer forming a heterojunction with said emitter layer and having a conduction band with a third energy level, said third energy level being higher than said first energy level so that the conduction band of

said emitter layer and the conduction band of said first potential barrier layer have a discontinuity therebetween; a quantum well layer forming a heterojunction with said first potential barrier layer and having a fourth conduction band with a fourth energy level, said fourth energy level being lower than said third energy level; and
a second barrier layer forming a heterojunction with said quantum well layer and said base layer and having a conduction band with a fifth energy level, said fifth energy



level being higher than said fourth and second energy levels;

said first and second barrier layers having a thin thickness for tunneling carriers therethrough, and said quantum well layer having a thin thickness so as to have a sub-band therein;

- a collector semiconductor layer formed under said base layer; and
- a collector side potential-barrier means disposed between said base layer and said collector semiconductor layer.

4,712,122

HETEROJUNCTION GATE BALLISTIC JFET WITH CHANNEL THINNER THAN DEBYE LENGTH

Junichi Nishizawa, 6-16, Komegafukuro 1-chome, and Kaoru Motoya, 1-9-406, Komegafukuro 2-chome, both of Sendai-shi, Miyagi-ken, Japan, assignors to Research Development Corp.; Junichi Nishizawa and Kaoru Motoya, all of, Japan

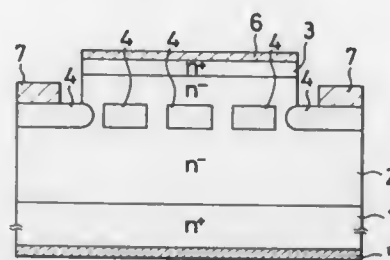
Filed Jul. 25, 1985, Ser. No. 759,090

Claims priority, application Japan, Jul. 26, 1984, 59-153969; Jul. 26, 1984, 59-153972

Int. Cl.⁴ H01L 29/80

U.S. Cl. 357—22

5 Claims



1. A static induction transistor of thermionic emission type comprising a channel region made of a semiconductor and having first and second sides, a source region and a drain region having a high impurity concentration and each formed in contact with a respective side of said channel region, and a gate region making contact with at least part of said channel region, the gate region being formed of a semiconductor having a forbidden band gap larger than that of the semiconductor forming said channel region, the distance from said source region to the gate region being selected to be smaller than the mean free path of carriers, and the gap of said channel region being selected to be smaller than $2\lambda_D$, where λ_D is the Debye

length determined by the impurity concentration of said channel region.

4,712,123

DYNAMIC MEMORY DEVICE

Hideshi Miyatake; Kazuyasu Fujishima, both of Itami; Tsutomu Yoshihara, Amagasaki; Masaki Kumanoya; Hideto Hidaka, both of Itami, and Katsumi Dosaka, Nishinomiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

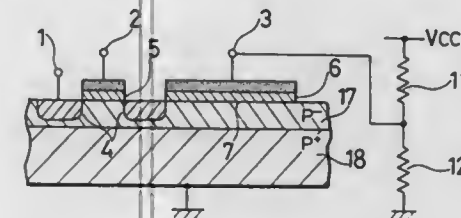
Filed Aug. 30, 1985, Ser. No. 771,023

Claims priority, application Japan, Aug. 31, 1984, 59-183074

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.6

3 Claims



1. A dynamic MOS memory device including a plurality of memory cells of the 1-transistor, 1-capacitor type, each memory cell comprising:

- a semiconductor substrate;
 - an epitaxial active layer formed on said substrate;
 - a plurality of diffusion layers formed in said epitaxial layer at an area corresponding to a MOS transistor;
 - an oxide film formed over said epitaxial layer except at locations where said diffusion layers are formed;
 - a word line electrode formed on said oxide film at said area corresponding to a MOS transistor; and
 - a cell plate electrode formed on said oxide film at an area corresponding to a MOS capacitance,
- a half value of a writing voltage being applied to said cell plate electrode, and a constant voltage being applied to said substrate.

4,712,124

COMPLEMENTARY LATERAL INSULATED GATE RECTIFIERS WITH MATCHED "ON" RESISTANCES

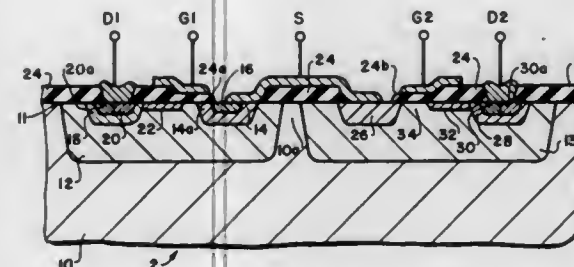
Edward H. Stupp, Spring Valley, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 22, 1986, Ser. No. 945,420

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.4

2 Claims



1. A complementary Lateral Insulated Gate Rectifier (LIGR), which comprises:

- a semiconductor substrate of a first conductivity type and having a major surface;
- first and second adjacent surface-adjointing semiconductor wells of a second conductivity type opposite to that of said first type in said substrate and separated from each other by a portion of said substrate;
- a first surface-adjointing semiconductor region of the first conductivity type in said first well and a shallower, sur-

face-adjointing first source region of the second conductivity type in said first semiconductor region;

a first surface-adjointing drain region of the second conductivity type in said first well and a second, shallower surface-adjointing drain region of the first conductivity type in said first drain region;

a first surface-adjointing drain extension region of the first conductivity type in said first well and extending from said first drain region toward said first semiconductor region;

an insulating layer on said major surface and having a first insulating layer portion over said first well and covering at least a portion of said first semiconductor region between said first source region and said first drain region;

a first gate electrode on said first insulating layer portion, over at least said portion of the first semiconductor region, and insulated from said substrate;

a second surface-adjointing source region of the first conductivity type in said second well;

a third surface-adjointing drain region of the first conductivity type in said second well and a fourth, shallower surface-adjointing drain region of the second conductivity type in said third drain region;

a second surface-adjointing drain extension region of the first conductivity type in said second well and extending from said third drain region toward said second source region;

a second insulating layer portion of said insulating layer on said major surface over said second well and covering at least a portion of said second well between said second source region and said second drain extension region;

a second gate electrode on said second insulating layer portion, over at least said portion of said second well, and insulated from said substrate;

first and second drain electrodes connected, respectively, to said second and fourth drain regions; and

a source electrode connected to said first semiconductor region, said first source region and said second source region.

4,712,125

STRUCTURE FOR CONTACTING A NARROW WIDTH PN JUNCTION REGION

Harsaran S. Bhatia; Satyapal S. Bhatia, both of Wappingers Falls; Jacob Riseman, Poughkeepsie, and Emmanuel A. Valamakis, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 405,844, Aug. 6, 1982, Pat. No. 4,507,171.

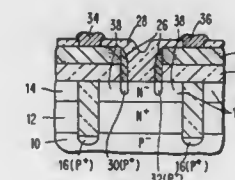
This application Oct. 18, 1984, Ser. No. 661,999

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ H01L 29/04

U.S. Cl. 357—59

24 Claims



1. An integrated circuit structure comprising:

- a semiconductor body having surface regions thereof isolated from other such regions by a pattern of isolation;
- a narrow width PN junction region within at least one of said surface regions having a width dimension substantially that of its electrical contact;
- a substantially vertical conformal conductive layer of submi-

cron thickness in said electrical contact to said PN junction region;

- a substantially horizontal conductive layer in electrical contact with an upper vertical edge portion of said vertical conductive layer and separated from said surface regions by a first electrical insulating layer, said horizontal conductive layer being substantially thicker than said vertical conductive layer;
- a second electrical insulating layer over said horizontal conductive layer; and
- an electrical contact to said horizontal conductive layer through an opening in said second electrical insulating layer which effectively makes electrical contact to said narrow width PN junction region through said horizontal conductive layer and said vertical conductive layer.

4,712,126

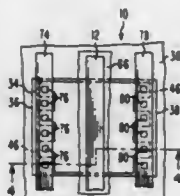
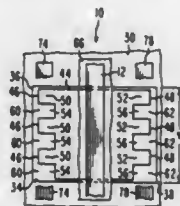
LOW RESISTANCE TUNNEL

Francis R. Slattery, Lower Providence Township, Montgomery County, Pa., assignor to RCA Corporation, Somerville, N.J.
Filed Mar. 17, 1986, Ser. No. 839,954

Int. Cl.⁴ H01L 29/46, 23/50, 29/04, 29/44

U.S. Cl. 357-71

6 Claims



1. A low resistance conductor for interconnecting two points on opposite sides of an intervening conductor comprising:

- (a) a first layer of doped silicon having a first edge and a second edge spaced from said first edge;
- (b) a second layer of doped silicon having a third edge and a fourth edge spaced from said third edge, said second layer being disposed directly over said first layer;
- (c) a first metal conductor in ohmic contact with said first layer adjacent said first edge and said second layer adjacent said third edge; and
- (d) a second metal conductor in ohmic contact with said first layer adjacent said second edge and said second layer adjacent said fourth edge, said first and second metal conductors being disposed on opposite sides of said intervening conductor wherein said second layer includes, along said third edge and along said fourth edge, (1) a plurality of openings through which said first and second metal conductors extend to be in said ohmic contact with, respectively, said first and second edges of said first layer, and (2) an area of contact to the adjacent metal conductor, each area being disposed between each pair of said openings.

4,712,127

HIGH RELIABILITY METAL AND RESIN CONTAINER FOR A SEMICONDUCTOR DEVICE

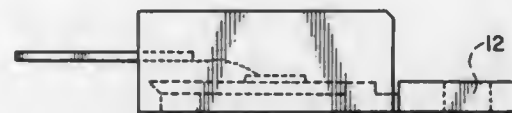
Piero Colombo, Monza; Marino Cellai, Bresso, and Carlo Cognetti de Martiis, Milan, all of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Milan, Italy

Filed Nov. 29, 1983, Ser. No. 556,159

Claims priority, application Italy, Dec. 1, 1982, 24533 A/82
Int. Cl.⁴ H01L 23/12

U.S. Cl. 357-72

4 Claims



1. A container for a semiconductor device comprising a metal plate and a body of synthetic resin which encapsulates part of said plate so as to keep a surface of said plate exposed, said plate being arranged such that an area of said plate has two opposed side notches and at least one groove connecting said two notches together and said body of synthetic resin projects into said two opposed side notches and said at least one groove without projecting beyond said two opposed side notches.

4,712,128

SEMICONDUCTOR DEVICES HAVING CONTACT ARRANGEMENT

Roger F. C. Bennett, Melksham, United Kingdom, assignor to Westinghouse Brake and Signal Co., Ltd., Chippenham, United Kingdom

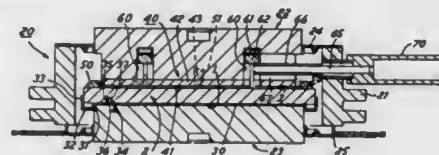
Filed Jul. 15, 1985, Ser. No. 755,249

Claims priority, application United Kingdom, Jul. 24, 1984, 8418823

Int. Cl.⁴ H01L 23/42, 29/74, 23/48

U.S. Cl. 357-79

17 Claims



1. A semi-conductor device comprising a semiconductor element positioned in a housing having on a first of two opposing major faces concentric outer and inner annuli of a first region of conductivity and positioned therebetween an annulus of a second region of conductivity, a disk shaped electrical connector sandwiched between that surface of the semiconductor element defining the first region of conductivity and a contact member that forms a part the housing of the device, the disk shaped electrical connector and the contact member both formed to extend out over an outer peripheral area of that surface of the semiconductor element radially outward of the concentric outer annuli of the first region of conductivity, both the disk shaped electrical connector and the contact member are supported to inhibit rotational and radial movement with respect to the semi-conductor element, the disk shaped electrical connector being formed with apertures therethrough which apertures are aligned with the annulus of the second region of conductivity, a plurality of electrically interconnected electrical connections supported in said housing adjacent the contact member to extend outward through the apertures of the disk-shaped electrical connectors, a resilient means which is located between each of the electrically interconnected electrical connections and the contact member for resiliently urging the electrically interconnected electrical connections through the apertures and into engagement with

the annulus of the second region, a means for electrically insulating the resilient means from the contact member, and an electrical contact extending externally of the housing which is electrically connected to the electrically interconnected electrical connections, and wherein the plurality of the electrically interconnected electrical connections are formed from an electrically conductive tubular member which has a plurality of circumferentially separated slots formed to extend through said tubular member from an open end with the externally extending electrical contact being electrically connected to the tubular member.

4,712,129

INTEGRATED CIRCUIT DEVICE WITH TEXTURED BAR COVER

John W. Orcutt, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

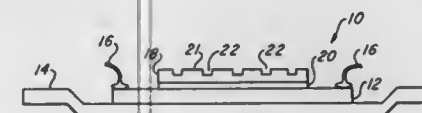
Continuation of Ser. No. 560,765, Dec. 12, 1983, abandoned.

This application Sep. 30, 1985, Ser. No. 781,175

Int. Cl.⁴ H01L 23/28, 25/04, 23/02

U.S. Cl. 357-84

16 Claims



1. An integrated circuit device comprising:
support means;

- a semiconductor bar affixed to said support means;
- adhesive means for providing an adhesive layer; and
- a rigid planar member having a smooth surface, and a textured surface for locking to an encapsulating medium with the smooth surface being affixed to a surface of said bar opposite said support means by the adhesive layer, the adhesive layer being dispersed between the smooth surface and the surface of said bar.

4,712,130

CHROMINANCE SIGNAL FREQUENCY CONVERTER AS FOR A PIX-IN-PIX TELEVISION RECEIVER

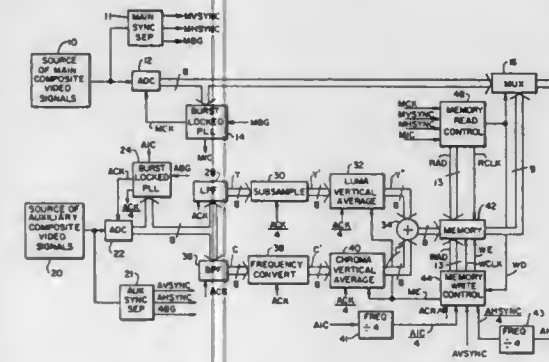
Robert F. Casey, Oradell, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 29, 1986, Ser. No. 901,631

Int. Cl.⁴ H04N 5/265

U.S. Cl. 358-22

6 Claims



1. A video signal processing system comprising:

- an input terminal for applying a sampled data signal representing a chrominance signal which includes a baseband color information signal modulating a subcarrier signal having a predetermined frequency, wherein the sampling frequency of said sampled data signal is substantially equal

to N times said predetermined frequency, where N is a real number not less than two;
sample interpolating means, coupled to said input terminal for interpolating between a plurality of selected pairs of samples of said sampled data signal to develop a plurality of interpolated samples; and
means, coupled to said sample interpolating means, for selecting samples from among said interpolated samples and the samples of said sampled data signal to develop a further sampled data signal representing said color information signal modulating a further subcarrier signal having a frequency that is less than said predetermined frequency.

4,712,131

SYNC APPARATUS FOR IMAGE MULTIPLEX TRANSMISSION SYSTEM

Toshiyuki Tanabe, Ageo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

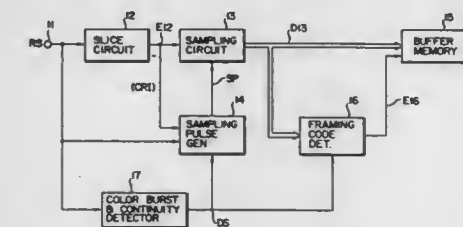
Filed Jul. 17, 1986, Ser. No. 886,553

Claims priority, application Japan, Jul. 19, 1985, 60-159341

Int. Cl.⁴ H04N 7/08, 7/087, 7/093

U.S. Cl. 358-142

11 Claims



1. A sync apparatus for an image multiplex transmission system, comprising:

- image information fetch means, responsive to a data packet contained in a transmission signal, for extracting the data packet from the transmission signal and fetching the contents of the data packet;
- fetch phase determination means, coupled to said image information fetch means, for determining first phase data which defines the timing of fetching the contents of each said data packet, said fetching being performed in accordance with an actual phase of each said data packet by said image information fetch means;
- continuity detection means, responsive to a specific signal component (color burst, data packet, etc.) of said transmission signal, for detecting the continuity of said specific signal component to provide a continuity detection signal; and
- fetch phase exchange means, coupled to said fetch phase determination means and to said continuity detection signal is provided, said second phase data being prefixed and free of said first phase data.

4,712,132

DEVICE AND METHOD FOR REDUCING THE AMPLITUDE RANGE OF SIGNALS REPRESENTING AN IMAGE

Serge Soca, Ile Saint Louis, France, assignor to Thomson Video Equipment, Gennevilliers, France

Filed Jan. 8, 1986, Ser. No. 817,260

Claims priority, application France, Jan. 8, 1985, 85 00182

Int. Cl.⁴ H04N 9/68

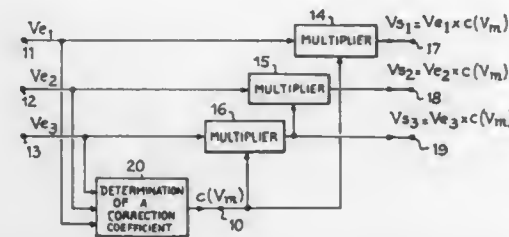
U.S. Cl. 358-37

42 Claims

1. A device for reducing the amplitude range of a plurality of input signals representing an image, comprising:

- means for determining at each instant a correction signal whose instantaneous value is a predetermined non-linear

function of the present input signal having the highest value at that instant; and means for applying the correction signal to each of the input signals so as to generate a second, like-numbered plurality



of output signals, the output signals having reduced amplitude ranges relative to the input signals, but the ratios among the respective output signals equalling the ratios among corresponding input signals.

4,712,133 ENDOSCOPIC APPARATUS

Katsuya Kikuchi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

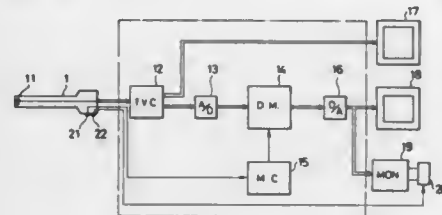
Filed Oct. 2, 1986, Ser. No. 914,664

Claims priority, application Japan, Oct. 3, 1985, 60-219075

Int. Cl.⁴ A61B 1/04

U.S. Cl. 358—98

16 Claims



1. An endoscopic apparatus, comprising:
 - (a) an image pickup optical system;
 - (b) a solid state image pickup element for converting an optical image of an object formed by said optical system to electrical signals;
 - (c) a television circuit unit for converting the output signal from said solid state image pickup element to a video signal;
 - (d) memory means for memorizing the video signal from said television circuit unit;
 - (e) means for supplying a freeze command signal to display the video signal under frozen condition;
 - (f) display means for displaying a real image and/or a frozen image; and
 - (g) a memory controller for controlling writing and reading for said memory means to display both of the real image and the frozen image on said display means when a freeze command signal is supplied from said freeze command signal supply means, and to display the real image alone when no freeze command signal is supplied, whereby the real image is displayed in said display means all the time irrespective of the presence or absence of the freeze command signal.

4,712,134 IMAGE READER WITH PLURAL PICKUP ELEMENTS READING OVERLAPPING IMAGE REGIONS OF AN ORIGINAL IMAGE

Shigeo Murakami, Fushimi, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

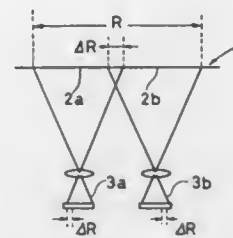
Filed May 21, 1986, Ser. No. 865,985

Claims priority, application Japan, May 31, 1985, 60-119348

Int. Cl.⁴ H04N 3/14, 1/415

U.S. Cl. 358—213.13

6 Claims



1. An image reader for reading image data of the original, said image reader comprising:
 - a plurality of image pickup elements for reading said image data of said original, said elements reading partially overlapping image regions to provide image pickup signals;
 - density change detecting means for detecting a pixel array having small spatial density changes with respect to that of adjacent pixels from among pixels located within an overlapping image region on the basis of said image pickup signals supplied from said image pickup elements and specifying the detected pixel as a switching pixel; and
 - image pickup signal connecting means for connecting respective said image pickup signals supplied from said plurality of image pickup elements at said switching pixel and outputting the connected image signals to desired image processing system.

4,712,135 IMAGE PICKUP APPARATUS

Seiji Hashimoto, Yokohama; Takao Kinoshita, and Nobuyoshi Tanaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

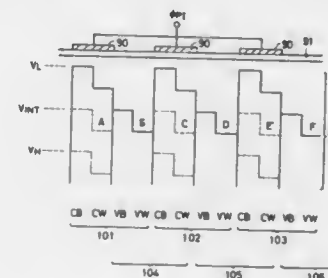
Continuation of Ser. No. 873,067, Jun. 4, 1986, abandoned, which is a continuation of Ser. No. 560,836, Dec. 13, 1983, abandoned. This application Oct. 17, 1986, Ser. No. 922,812

Claims priority, application Japan, Dec. 22, 1982, 57-225628

Int. Cl.⁴ H04N 3/14

U.S. Cl. 358—213.22

34 Claims



1. An image pickup apparatus comprising:
 - (a) a radiation receiving section including a plurality of picture elements adapted to receive radiation from an object;
 - (b) at least one electrode for controlling a potential in each picture element; and
 - (c) control means having a first mode in that said electrode

is controlled so as to respectively form one potential well in each picture element for charge accumulation, and a second mode in that said electrode is controlled so as to respectively form a plurality of potential wells in each of said picture elements for charge accumulation.

4,712,136 SIGNAL PROCESSING CIRCUIT OF SOLID STATE IMAGE PICKUP DEVICE

Tokuichi Tsunekawa, Yokohama, and Yulchi Sato, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

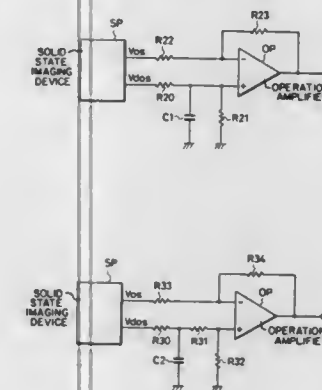
Filed Sep. 10, 1986, Ser. No. 906,273

Claims priority, application Japan, Sep. 12, 1985, 60-202437

Int. Cl.⁴ H04N 5/335

U.S. Cl. 358—213.15

15 Claims



1. A signal processing circuit of a solid state image pickup device having a signal voltage output circuit for outputting a charge signal as voltage information through a charge voltage converter and a correction voltage output circuit for generating a reference voltage into which no signal charge is input and which has a circuit arrangement similar to said signal voltage output circuit, wherein an output of said correction voltage output circuit is provided with a time constant circuit, and said signal processing circuit has a circuit for differentially amplifying a correction voltage output which is derived through said time constant circuit and an output of said signal voltage output circuit.

4,712,137 HIGH DENSITY CCD IMAGER

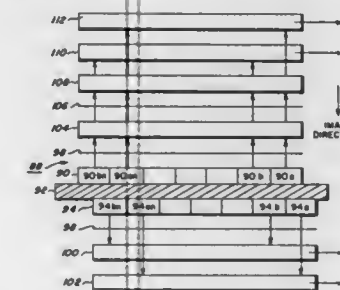
Narayan K. Kadekodi, Torrance; Abd-El-Fattah A. Ibrahim, Palos Verdes Estates; Roland J. Handy, Northridge, all of Calif., and Jagdish C. Tandon, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 285,250

Int. Cl.⁴ H04N 3/14

U.S. Cl. 358—213.29

10 Claims



1. A high density charge coupled device imaging array (88)

on a single integrated circuit chip, wherein the improvement is characterized by:

- a first row (90) of photosites deposited on said integrated circuit chip, said photosites being sensitive to applied light information,
- a second row (94) of photosites deposited on said integrated circuit chip parallel to but separated from said first row (90) of photosites, said second row (94) of photosites being offset from said first row of photosites approximately one-half the length of the individual photosites in said first row such that said second row of photosites are sensitive to applied light information intermediate the photosites in said first row of photosites, said first and second rows of photosites comprising a bilinear array of said photosites, shield or opaque means between said first (90) and second (94) rows of photosites to shield said imaging array from any said applied light in the area defined by said shield or opaque means,
- a first storage register (104) deposited on said integrated circuit chip adjacent to said first row (90) of photosites to receive and store the bits of light information detected by said first row of photosites (90) and converted to electronic charge information,
- a second storage register (108) deposited on said integrated circuit chip adjacent to said first storage register (104) to receive and store said bits of light information received and stored by said first storage register (104),
- a third storage register (110) deposited on said integrated circuit chip adjacent to said second storage register (108) to receive and store alternate bits of said light information received and stored by said second storage register (108),
- a fourth storage register (112) deposited on said integrated circuit chip adjacent to said third storage register (110) to receive and store the remaining bits of said light information received and stored by said second storage register,
- a fifth storage register (100) deposited on said integrated circuit chip adjacent to said second row (94) of photosites to receive and store alternate intermediate bits of light information detected by said second row (94) of photosites converted to electronic charge information, and
- a sixth storage register (102) deposited on said integrated circuit chip adjacent to said fifth storage register (100) to receive and store the remaining intermediate bits of said light information detected by said second row (94) of photosites converted to electronic charge information.

4,712,138 LOW-NOISE APPARATUS FOR IMAGE PICKUP AND COMBINATION OF LIGHT AND ELECTRIC SIGNALS

Kenji Kyuma, Kawasaki, and Teruo Hieda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

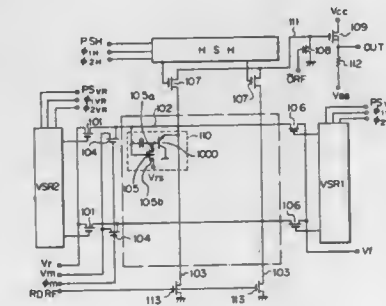
Filed Dec. 26, 1985, Ser. No. 813,484

Claims priority, application Japan, Dec. 28, 1984, 59-276977

Int. Cl.⁴ H04N 3/14

U.S. Cl. 358—213.31

18 Claims



1. An image pickup apparatus comprising:
 - (a) an image pickup element including a plurality of ar-

ranged non-destructively readable photoelectric conversion elements; and
 (b) input means for inputting electric charges to each of said photoelectric conversion elements, said input means including an input member selectively connected to a variable electrical signal source and conversion means for inputting electric charges corresponding to said variable electrical signal to each of said photoelectric conversion elements.

4,712,139

IMAGE COMMUNICATION APPARATUS

Yoshiaki Kato, Kurume, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

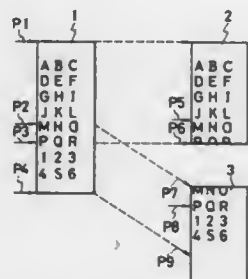
Filed Oct. 24, 1984, Ser. No. 664,305

Claims priority, application Japan, Oct. 28, 1983, 58-200752; Oct. 28, 1983, 58-200753; Jan. 25, 1984, 59-010337

Int. Cl.⁴ H04N 1/32

U.S. Cl. 358—257

12 Claims



1. An image communication apparatus comprising:
 reading means for reading an image on an original for conversion to electrical signals;
 transmission means for transmitting the image data read by said reading means;
 first discrimination means for discriminating a shape of a recording member on a reception side;
 second discrimination means for discriminating, in the case that a recording member on the reception side is a cut-sheet-like recording member, whether or not the single original image can be recorded on the single cut-sheet-like recording member; and
 control means, responsive to a discrimination result of said second discrimination means, for controlling said apparatus such that the single original image is divided to be recorded on a plurality of such cut-sheet-like recording member and in the divisional recording the original image is recorded with partial overlapping.

4,712,140

IMAGE REDUCTION METHOD

Frederick C. Mintzer, Shrub Oak, and Karen L. Anderson, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 567,310, Dec. 30, 1983, abandoned.

This application Mar. 17, 1986, Ser. No. 840,627

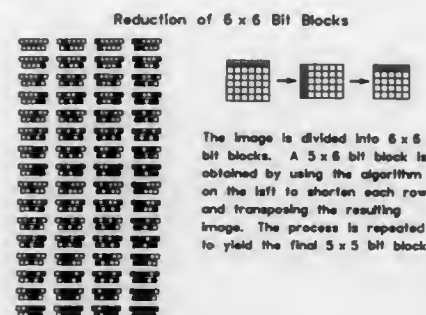
Int. Cl.⁴ H04N 7/18

U.S. Cl. 358—260

20 Claims

1. A method for reducing the size of a binary image in a general-purpose computer comprising the steps of:
 storing said binary image in bit sequence in said computer
 dividing said image into transposable blocks of $n \times i$ bits
 transposing for each block, each string of n bits along a first

axis to a string of m bits along a second axis where m is less than n ;



transposing for each transposed block, each string of i bits along said first axis to a string of j bits along said second axis, where j is less than or equal to i ; and
 storing said transposed blocks.

4,712,141

METHOD AND APPARATUS FOR INTERPOLATING IMAGE SIGNALS

Kunio Tomohisa; Masamichi Cho, and Yasuo Kuruu, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

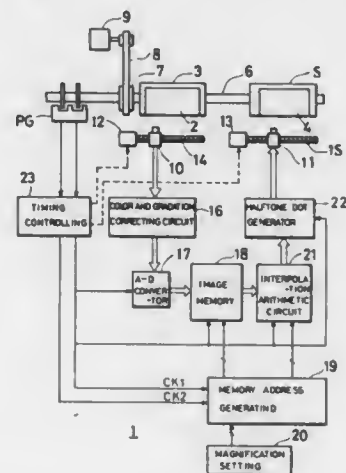
Filed Mar. 20, 1986, Ser. No. 841,466

Claims priority, application Japan, Mar. 30, 1985, 60-67865; Mar. 30, 1985, 60-67867

Int. Cl.⁴ H04N 1/40

U.S. Cl. 358—280

13 Claims



1. An apparatus for interpolating image signals, comprising:
 memory means for storing data on at least two adjacent pixels of an input image;
 interpolation data generating means for interpolating between said two pixels to generate at least one interpolation data;
 timing control means for controlling output timings so that said image data on said two adjacent pixels and said generated interpolation data are outputted in a mode ordered in accordance with an array of pixels of an output image;
 a one-dimensional photoelectric conversion element array device for photoelectrically scanning an original, input resolution by said one-dimensional photoelectric conversion element array device being set to be lower than output resolution; and
 an A-D converter for converting input image signals from said one-dimensional photoelectric conversion element array device into digital image data, wherein said memory means includes a first memory means for stor-

ing a pair of image data adjacent in the main scanning direction and a second memory means for storing image data on a pair of scanning lines adjacent in the vertical scanning direction, and
 said interpolation data generating means includes a first interpolation data generating means for generating interpolation data for said image data stored in said first memory means and a second interpolation data generating means for generating interpolation data for said image data stored in said second memory means,
 said first memory means storing image data from said A-D converter and said second memory means storing said image data stored in said first memory means and said interpolation data generated by said first interpolation data generating means in compliance with said order by said timing control means.

4,712,142

IMAGE PICKUP APPARATUS WITH RANGE SPECIFICATION OF DISPLAYED IMAGE

Satoru Tomita, and Mitsunori Adachi, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

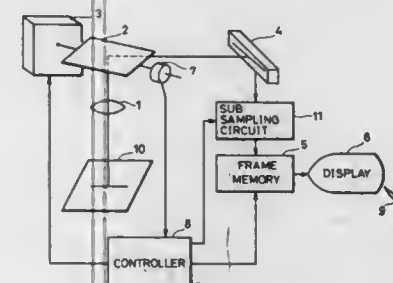
Filed Jul. 10, 1986, Ser. No. 884,295

Claims priority, application Japan, Aug. 27, 1985, 60-190738; Aug. 27, 1985, 60-190739

Int. Cl.⁴ H04N 1/10

U.S. Cl. 358—285

6 Claims



1. An image pickup apparatus for acquiring an image of an object, said image pickup apparatus comprising:
 a rotary scanning mirror stepwisely rotated to scan said object;
 driving means for driving said rotary scanning mirror;
 an image sensor for sensing said image on said object scanned by said rotary scanning mirror;
 detecting means for detecting rotation angles of said rotary scanning mirror;
 frame memory means for storing picture signals outputted from said image sensor in addresses corresponding to said rotation angles detected by said detecting means;
 position indicating means for specifying a scanned range on said object; and
 control means for supplying rotation angles of said rotary scanning mirror to said driving means so that said rotary scanning mirror scans said specified scanned range on the basis of a position indicating signal for specifying said scanned range specified by said position indicating means while varying the step size of said rotary scanning mirror thereby to vary resolution.

4,712,143

APPARATUS FOR MONITORING A TIMEBASE COMPRESSED COLOR VIDEO SIGNAL

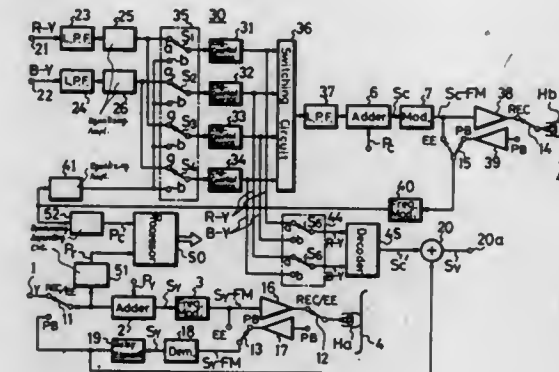
Hiroshi Kawakami, Tokyo, and Kazuo Ishizaka, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,984

Claims priority, application Japan, Jun. 14, 1984, 59-122701 Int. Cl.⁴ H04N 9/79

U.S. Cl. 358—311

5 Claims



1. A video tape recorder of the kind that records a color video signal in which a luminance signal and a chrominance signal are recorded on separate channels in combination with a timebase circuit wherein at least two chrominance component signals are compressed in timebase and alternately arranged in turn to be recorded on one track as said chrominance signal, for monitoring in an edit mode a compressed chrominance signal prior to recording the latter comprising:

a control signal processor receiving said color video signal and producing video display control signals therefrom;
 the timebase circuit including timebase compressing and expanding means having first and second inputs receiving at said first inputs said chrominance component signals and control signals from said control signal processor for inputting therein to said chrominance component signals in response to a first control signal from said control signal processor and for outputting said chrominance component signals in response to a second control signal from said control signal processor with a frequency that is an integral number of times higher than that of said first control signal to thereby produce in a recording mode timebase compressed chrominance component signals; and
 coupling means for use in the edit mode for supplying said chrominance component signals, which are derived from an output of said timebase compressing and expanding means under control of said second control signal, to said second inputs of said timebase compressing and expanding means whereby said timebase compressed chrominance component signals are input in said timebase compressing and expanding means by said second control signal, wherein when succeeding chrominance component signals are input into said timebase compressing and expanding means at said second inputs by said second control signal, said timebase compressed chrominance component signals that are re-input in said timebase compressing and expanding means are output therefrom by said first control signal so as to produce normal timebase chrominance component signals for monitoring in the edit mode.

4,712,144

METHOD AND APPARATUS FOR READING RECORDED DATA BY A MAGNETORESISTIVE HEAD

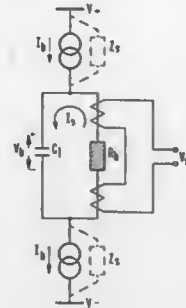
Klaas B. Klaassen, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 20, 1985, Ser. No. 767,549

Int. Cl.⁴ G11B 5/02, 5/127

U.S. Cl. 360—67

10 Claims



1. A method for detecting magnetic fields having encoded information, comprising the steps of:
 - (a) exposing a magnetoresistive element to the magnetic fields; and
 - (b) directly sensing the ratio of the instantaneous value of change in the resistance of the magnetoresistive element to the total resistance of the magnetoresistive element.

4,712,145

OPERATING MECHANISM FOR SMALL PORTABLE CASSETTE TAPE PLAYER

Toshimasa Naruki, Fukushima, and Toshihisa Goto, Tokyo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 705,933, Feb. 26, 1985, abandoned.

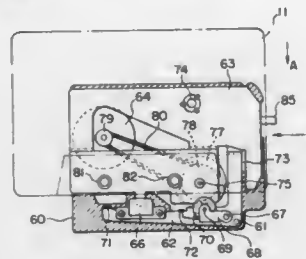
This application Jul. 16, 1986, Ser. No. 886,124

Claims priority, application Japan, Mar. 1, 1984, 59-28223[U]; Mar. 1, 1984, 59-28224[U]; Mar. 1, 1984, 59-28225[U]; Mar. 1, 1984, 59-28226[U]; Mar. 1, 1984, 59-28227[U]

Int. Cl.⁴ G11B 15/00

U.S. Cl. 360—96.5

3 Claims



1. An operating mechanism for a portable cassette tape player, comprising:
 - receiving means for receiving a cassette, including a first movable substrate on which at least a reproducing head of said cassette tape player is mounted;
 - guiding means for guiding said cassette to a loaded position by pushing said cassette towards a front end of said portable cassette tape player in which an opening for exposing a magnetic tape is formed, said guiding means including a second movable substrate; and
 - holding means for selectively holding said cassette at said loaded position and releasing said cassette from said loaded position wherein:
 - when a rear end of said cassette is pushed a first time, said cassette is guided to and held at said loaded position by said guiding means and said holding means, respectively,
 - said second movable substrate being moved toward said

first movable substrate, and said portable cassette tape player is placed in a signal reproducing state, and when said rear end of said cassette is pushed a second time, said cassette is released from said loaded position and is shifted to a nonloaded position, said second movable substrate being moved away from said first movable substrate and said portable cassette tape player is placed in a stop state, and wherein said holding means operates in a push-push manner without operating buttons for initiating and terminating a playing operation.

4,712,146

THIN AND COMPACT MICRO-WINCHESTER HEAD AND DISK ASSEMBLY

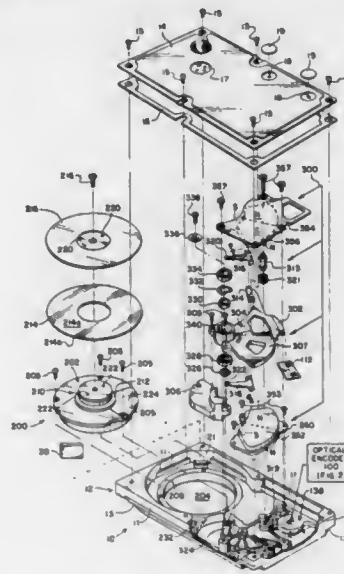
William G. Moon, Sunnyvale; Donald C. Westwood, Cupertino, and Thomas R. Stone, Pleasanton, all of Calif., assignors to Plus Development Corporation, Milpitas, Calif.

Filed Jun. 4, 1985, Ser. No. 741,178

Int. Cl.⁴ G11B 5/012

U.S. Cl. 360—97

13 Claims



1. A compact, sealed head and disk assembly for a rotating non-removable disk data storage subsystem comprising:
 - a flat and thin rigid generally rectangular box housing for aligning, mounting and substantially enclosing the elements providing said head and disk assembly without protrusions extending therefrom;
 - a thin spindle motor mounted in a well formed in a floor of said housing and having a spindle rotatable at a predetermined angular velocity;
 - at least one magnetic media data storage disk in said housing and mounted directly to said spindle for rotation;
 - a limited angular displacement rotary actuator subassembly journaled to a post extending from the floor in said housing adjacent to the magnetic media data storage disk and including:
 - a rotary actuator motor located oppositely away from the data storage disk and comprising:
 - a coil,
 - a first flux return plate mounted to said housing,
 - a first permanently magnetized flux-providing flat plate magnet mounted adjacent to and within the locus of movement of said coil, said first magnet having a plurality of magnetic pole regions at a major surface thereof facing said coil, said first magnet being mounted to said first flux return plate so that said plate returns the flux between pole regions of said first magnet at a surface facing said first plate,
 - a second flux return plate mounted to said housing in

alignment with and spaced away from said first flux return plate and first magnet,

a second permanently magnetized flux-providing flat plate magnet mounted adjacent to and within the locus of movement of said coil, and having a major surface facing the major surface of said first magnet across a gap slightly greater than the thickness of said coil and having a plurality of magnetic pole regions on said major surface complementary with the oppositely facing poles of said first magnet,

said coil being freely moveable along its locus of limited displacement in said gap and having windings disposed to cut the flux of said regions,

whereby said first and second magnets provide a magnetic flux field in said gap the lines of which are cut by the coil and said flux return plates contain said flux to the vicinity of said gap and prevent said flux from reaching said data storage disk; and,

a unitary planar frame journaled to the post fixed in said housing and rotatable in alignment with the plane of said data storage disk, said frame comprising:

- a hub for containing a plurality of bearing means for providing a rotatable journal with said post,
- a first region extending from the hub oppositely away from the data storage disk for supporting said coil of said rotary actuator motor,
- a second region extending from the hub for supporting a data transducer arm carrying a data read and write transducer in close proximity to concentric data tracks formed on said disk surface, there being a single transducer for each data surface of said data storage disk, and
- a third region carrying a counterweight for counteracting any imbalances presented by the presence of said first and second regions, thereby presenting a constant torque load to said rotary actuator motor irrespective of orientation of said head and disk assembly, the counterweight disposed in part in vertical interlaid arrangement with respect to said data storage disk; and

a cover for closing and sealing said housing.

4,712,147

TAPE TRANSPORT CYLINDER WITH STRESS-RELIEVED BEARING RECESS

Kiyoshi Chikashige, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

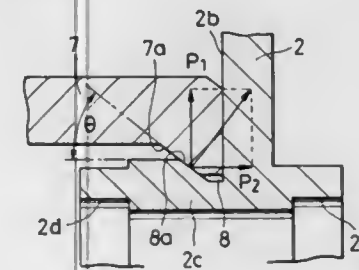
Filed Mar. 12, 1984, Ser. No. 588,520

Claims priority, application Japan, Mar. 16, 1983, 58-42095; Mar. 17, 1983, 58-43048

Int. Cl.⁴ G11B 15/60

U.S. Cl. 360—130.24

4 Claims



1. In a magnetic tape guiding cylinder device including: an upper cylinder adapted to receive a magnetic tape at the periphery of the cylinder, and a fixed lower cylindrical assembly, the improvement in said lower cylindrical assembly wherein it includes an outer cylindrical shell connected by a radially extending wall to an inner cylindrical tubular portion projecting axially from said radially extending wall and being coaxial with said outer cylindrical shell, said inner cylindrical tubular portion being provided with at least a first bearing recess on the interior thereof; a bearing disposed in said recess, said bearing closely fitting along substantially its entire periphery in

the bearing recess; a drive shaft in said cylindrical tubular portion axially attached at one end to said upper cylinder for imparting a rotary motion thereto and rotatably supported at least by said bearing, said tubular portion having a chuck engagement groove disposed along the outer circumference of said cylindrical tubular portion and between said radially extending wall and first bearing recess at the end of said tubular portion, said groove being configured to be engageable with inwardly movable jaws of a machining holding chuck, the ends of which also engage said radially extending wall so that, upon inward pressure created by entry of said jaws into said groove, said jaws also a but said radially extending wall to produce a holding force having a radial component applied against said tubular portion and an axial component against said radially extending wall to distribute the clamping forces in both radial and axial directions to mitigate substantial distortion of said tubular portion.

4,712,148

MAGNETIC TAPE CASSETTE WITH EQUALIZATION OF ELECTROSTATIC CHARGES

Werner Balz, Limburgerhof; Wulf Muenzner, Frankenthal; Klaus D. Schomann, Ludwigshafen; Heinz Berger, Kehl, and Roland Roos, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

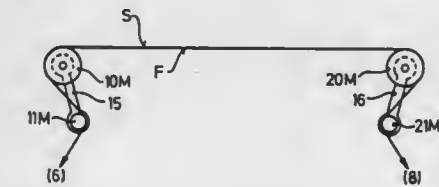
Division of Ser. No. 411,606, Aug. 25, 1982. This application Jul. 3, 1986, Ser. No. 881,855

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 8125650[U]; Dec. 23, 1981, 8137551[U]

Int. Cl.⁴ G11B 23/08, 15/60

U.S. Cl. 360—132

3 Claims



1. A magnetic tape cassette, particularly video tape cassette, having a substantially rectangular housing of plastic material comprising front side along which the scanning of the tape takes place and, in said housing, two tape reels and two sets of guide means for guiding the tape from one of said tape reels via one of said sets of guide means, over a path parallel to the front of said housing, and via the other set of guide means onto the other reel, said tape having a magnetic layer (front) face and an electrically insulating plastics film (back) face, and each of said sets of guide means including a deflecting element adjacent the respective front corner of said housing, said deflecting elements contacting the back face of the tape, and each also including a guide element contacting the front face of the tape, said deflecting elements and the guide element of at least one of said sets being at least partially of electrically conductive material, and said housing also including a connector element or connector elements electrically connecting at least said one guide element with at least the associated deflecting element, so as to equalize electrostatic charges between the two faces of the tape by way of said connector element(s) and thus counteract sticking of the tape to said deflecting elements due to electrostatic attraction therebetween and counteract the build-up of electrostatic charges along the tape path parallel to the front of the housing due to the transporting of such charges from the deflecting elements as a result of the tape travel.

4,712,149

RECORDING TAPE CASSETTE

Shinichi Goto, Kyoto, and Kenji Ogino, Yokohama, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka and Hitachi, Ltd., Tokyo, both of Japan

Continuation of Ser. No. 553,070, Nov. 18, 1983, abandoned.

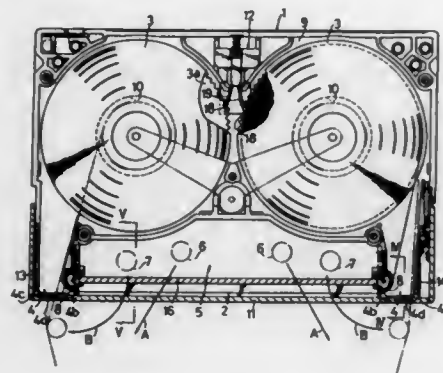
This application Aug. 29, 1986, Ser. No. 902,113

Claims priority, application Japan, Nov. 20, 1982, 57-175777[U]

Int. Cl.⁴ G11B 23/02

U.S. Cl. 360—132

4 Claims



1. A recording tape cassette comprising a top section and bottom section having a recording tape wound on a pair of tape reels and a pair of tape drawing openings each of which is defined at a front left end and a front right end of a front portion of the tape cassette by top front walls, bottom front walls, and a pair of generally vertical side walls, said recording tape being drawn out of said tape cassette from one of said tape drawing openings and returned to the tape cassette passed through a second tape drawing opening, said recording tape cassette comprising within each of said defined tape drawing openings inner vertical guide walls projecting from said bottom front wall, a top end thereof contacting a lower surface of said top front walls, each of said inner vertical walls having a hollow semi-cylindrical surface along a front end portion thereof for guiding said recording tape in a vertical attitude, a front edge of each of said top front walls being set back from a frontmost portion of said cylindrical surfaces where said lower surfaces of said top walls contact said top ends of said vertical guide walls thereby providing added support to said guide walls preventing bending thereof under force applied by said recording tape, said set back feature preventing damage to said tape if displaced in an upward direction.

4,712,150

TAPE CASSETTE HAVING A LOCK MECHANISM FOR LOCKING A TAPE PROTECTIVE LID

Albert Pertzsch, Munich; Ludwig Zeroni, Ottobrunn, and Hubert Brunner, Weil, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 824,531

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504965

Int. Cl.⁴ G11B 23/087

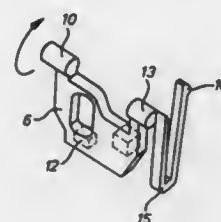
U.S. Cl. 360—132

4 Claims

1. In a cassette for a magnetic video tape, the combination of a two part housing with an upper housing, a lower housing, said upper and lower housings each having a front wall formed with apertures and side walls, a front panel pivotally mounted on the side walls so constructed and arranged as to have an open position and a closed position with respect to the apertures,

side parts of the front panel partly overlapping the side walls a locking plate mounted on an inner wall of the lower housing half,

a journal bearing on said locking plate rotatably supported in recesses in said inner wall of the lower housing half providing means for hinging said locking plate on the axis of rotation of said journal bearing so constructed and arranged that the plate is positioned inside the front part of the side walls and the side parts of the front panel, spring means mounted on the inside of the side part of said front panel under torque and engaging the front panel so



constructed and arranged to tend to move the front panel from closed to open position, means on the plate for engaging the front panel so constructed and arranged as to close the panel over the apertures and to be disengageable upon hinging of the plate, a U-shaped spring integral with said journal bearing having an arm with a free end positionable on and engageable with the upper housing half so constructed and arranged as to apply a force to the journal bearing tending to produce an angular moment in the plate and engage the plate with the front panel.

4,712,151

SYSTEM FOR DETECTION OF GROUND FAULTS IN CIRCUIT BREAKERS

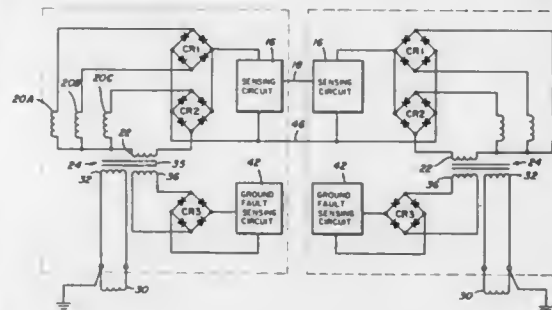
Robert F. Dvorak, Mount Vernon, Iowa, assignor to Square D Company, Palatine, Ill.

Filed Apr. 5, 1985, Ser. No. 720,195

Int. Cl.⁴ H02H 3/16

U.S. Cl. 361—47

11 Claims



1. An electric circuit breaker connected to an electrical system having three phase conductors and a neutral conductor, said circuit breaker giving an indication upon the occurrence of a ground fault, said circuit breaker comprising:

a first terminal connected to each of the phase conductors; a second terminal connected to each of the phase conductors; a current path between each respective pair of said first terminals and said second terminals, each of said current paths including a pair of separable contacts; three phase current transformers, each separately magnetically coupled to one of said phase conductors, each said phase current transformer having a secondary winding

producing a current proportional to the current through its related phase conductor;

a neutral current transformer magnetically coupled to the neutral conductor, the neutral current transformer having a secondary winding producing a current proportional to the current through the neutral conductor, said neutral current transformer secondary winding being electrically connected to circuit ground, and said secondary winding of said neutral current transformer being electrically isolated from the secondary windings of said phase current transformers; and

a ground fault summing transformer having a first primary winding and a second primary winding electrically isolated from one another, the sum of the currents produced by the phase current transformers being applied to said first primary winding by connecting the secondary windings of said phase current transformers to said first primary winding, and the current produced by the neutral current transformer being applied only to said second primary winding, said summing transformer having a secondary winding producing a signal indicating the occurrence of a ground fault when the sum of the currents received through said phase current transformers and said neutral current transformer does not equal zero.

4,712,153

POWER CIRCUIT AND TRIGGER DEVICE COMPRISING SAME

Christian Marget, Verneuil-en-Halatte, and Gérard Rose, Villers St Paul, both of France, assignors to Charbonnages de France, Paris, France

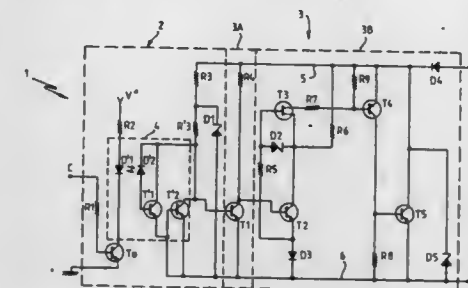
Filed Sep. 3, 1985, Ser. No. 771,680

Claims priority, application France, Sep. 3, 1984, 84 13571

Int. Cl.⁴ H02H 3/20

U.S. Cl. 361—91

20 Claims



1. Power circuit comprising a main circuit having a current amplifier circuit connected between a minimum potential line and a maximum potential line, a protection circuit connected between said minimum potential line and said maximum potential line and in series with said current amplifier circuit, said protection circuit having a control terminal, and a trigger and distributor circuit connected in parallel with said main circuit and said protection circuit adapted to neutralize said protection circuit via its control terminal when the voltage across said main circuit is below a threshold value and to activate said protection circuit when said voltage across said main circuit reaches said threshold value whilst maintaining said voltage across said main circuit at a substantially constant ratio to the voltage between said minimum and maximum potential lines.

4,712,152

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

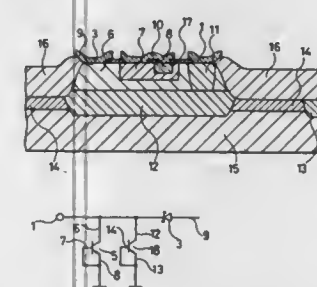
Masaya Ito, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,048

Claims priority, application Japan, Dec. 12, 1985, 60-280092

Int. Cl.⁴ H01H 9/00; H01L 27/04

U.S. Cl. 361—56



1. A semiconductor integrated circuit device comprising: at least two NPN transistors whose bases and emitters are connected to the ground and whose collectors are connected to an input terminal;

one of said NPN transistors having a lower breakdown starting voltage and a higher breakdown maintaining voltage than those of the other of said NPN transistors; and

an input portion which has a breakdown maintaining voltage at a high surge voltage breakdown which occurs due to an application of a high surge voltage input to said input terminal which is lower than that at a low input voltage breakdown which occurs due to an application of a low surge voltage or an input voltage which rises up gradually.

4,712,154

SHOCK PROTECTIVE CIRCUIT WITH MECHANICAL LATCH FOR SMALL APPLIANCES

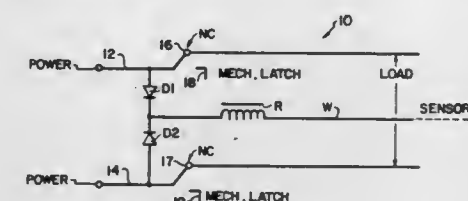
Elmer W. Madsen, Bristol, Conn., assignor to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 835,125, Feb. 28, 1986, abandoned. This application Jun. 27, 1986, Ser. No. 880,643

Int. Cl.⁴ H01H 47/12

U.S. Cl. 361—178

17 Claims



1. A simple and reliable shock protection circuit for use within small, hand-held electrical appliances having at least a two wire power cord and a housing comprising:

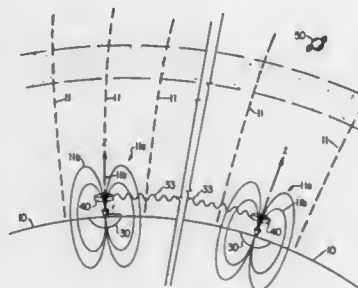
an electrical connection with two opposed diodes positioned between the two power wires of a small electrical appliance said connection being between a plug connection for a power source and a load; conductive sensor means within the housing of said appliance and connected to said electrical connection between said opposed diodes to detect the presence of a leakage current within said appliance when said appliance comes into contact with a conductive fluid and to conduct said current to ground;

said sensor means being positioned within said housing such that said sensor means is the first electrical element of said appliance to come into contact with said conductive fluid; circuit opening means connected to said sensor means and to said electrical connection between said opposed diodes to interrupt said power wires when a leakage current above a threshold limit is detected; means to latch said power wires in an open state when interrupted; and means to limit the current through said sensor means to a safe level below said threshold limit and to maintain said latch in its open state.

4,712,155

METHOD AND APPARATUS FOR CREATING AN ARTIFICIAL ELECTRON CYCLOTRON HEATING REGION OF PLASMA

Bernard J. Eastlund, Spring, Tex., and Simon Ramo, Beverly Hills, Calif., assignors to APTI, Inc., Los Angeles, Calif.
Filed Jan. 28, 1985, Ser. No. 695,517
Int. Cl.⁴ H05B 6/64; H05C 3/00; H05H 1/46
U.S. Cl. 361-231 11 Claims



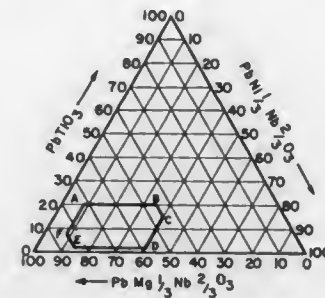
1. A method of creating an artificial electron cyclotron resonance heating region of plasma at about 50 km above the earth's surface in which the collision rate of the electrons in said plasma is greater than the cyclotron frequency of said electrons, said method comprising:

- establishing a first artificial magnetic field having a plurality of artificial field lines which extend from the surface of the earth through said region of plasma by positioning a circular loop of an electrical conductive cable at the surface of the earth so that the center of said loop will be colinear with the said artificial magnetic field lines; passing an electric current through said loop to establish said artificial magnetic field having a magnetic field strength of about 10 fold greater than the field strength naturally occurring in said region; and transmitting first circularly polarized electromagnetic radiation having a frequency from 10 kilohertz to 30 gigahertz from the earth's surface, said transmitting being conducted essentially at the outset of transmission substantially parallel to and along said field lines of said artificial magnetic field, adjusting the frequency of said first radiation to a value which will excite electron cyclotron resonance at an initial altitude of about 50 km above the earth's surface, whereby in the region in which said electron cyclotron resonance takes place heating, further ionization, and movement of both charged and neutral particles is effected.

4,712,156

STABILIZED FERROELECTRICS

Pronob Bardhan, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Feb. 11, 1987, Ser. No. 13,335
Int. Cl.⁴ H01B 3/12; C04B 35/46
U.S. Cl. 361-321 19 Claims



1. A dielectric ceramic composition consisting essentially of $\text{PbMg}_{1/3}\text{Nb}_{2/3}\text{O}_3$, $\text{PbNi}_{1/3}\text{Nb}_{2/3}\text{O}_3$, and PbTiO_3 within respective ranges of 45-85 m/o, 8-40 m/o and 2-20 m/o.

4,712,157

STUD MOUNTED NON-METALLIC ELECTRIC ENCLOSURE

Dale E. Simonson, and Donald H. Stoll, both of Mankato, Minn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 16, 1987, Ser. No. 26,321
Int. Cl.⁴ H02B 1/04; H05K 7/20
U.S. Cl. 361-357 9 Claims



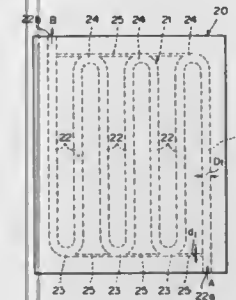
1. A molded plastic enclosure comprising: a plastic case having electrical access means formed therein; a molded plastic cover having means for removable attachment to said case; electric circuit control means attached to a bottom interior of said case; recess means formed within said bottom on an interior surface thereof and extending outward from an exterior surface of said bottom; and metal mounting means inserted within said recess means, a fastening member passing through said metal mounting means into support.

4,712,158

COOLING SYSTEM FOR ELECTRONIC CIRCUIT COMPONENTS

Shunichi Kikuchi, Yokohama; Haruyuki Matsunaga, Atsugi; Hideo Katsumi, Sagami, and Koji Katsuyama, Yokohama, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 26, 1986, Ser. No. 843,947
Claims priority, application Japan, Mar. 28, 1985, 60-064391
Int. Cl.⁴ H05K 7/20
U.S. Cl. 361-385 11 Claims



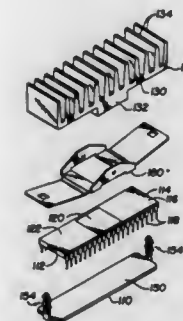
1. A cooling system for electronic circuit components mounted on a printed circuit board, including a cooling plate arranged substantially in parallel with said printed circuit board, said cooling plate having therein one or more coolant passages, thermal contact elements arranged on said cooling plate so as to be in resilient contact with the surfaces of the electronic circuit components, and means for supplying and circulating liquid coolant, through said coolant passage, so that the electronic circuit components are cooled via said thermal contact elements by said liquid coolant, characterized in that, said cooling plate has one or more shortcut passages, the cross-sectional area of which is smaller than that of said coolant passage, to mutually connect predetermined portions of said coolant passage.

4,712,159

HEAT SINK CLIP ASSEMBLY

Donald L. Clemens, The Colony, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 851,928, Apr. 14, 1986, abandoned. This application Jul. 17, 1986, Ser. No. 886,386
Int. Cl.⁴ H05K 7/20
U.S. Cl. 361-386 9 Claims



3. Heat sink apparatus for use in connection with DIP components comprising: (a) an elongated electrically insulating member adapted for placement between the rows of leads adjacent the underside of a DIP and to extend beyond both ends of the DIP; (b) a heat sink having a base portion adapted to contact the DIP on the top side thereof; and (c) latching means adapted to secure each end of said elongated insulating member to said heat sink and maintain it in contact with the base portion of the DIP.

said DIP securely fastened between said elongated insulating member and said base portion of said heat sink.

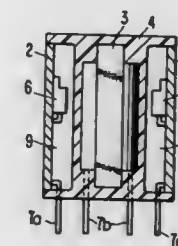
4,712,160

POWER SUPPLY MODULE

Toshiaki Sato, Hirakata; Hisako Mori; Yashuhiko Horio, both of Osaka; Kastumi Tabuchi, Hirakata; Nobuo Matsumoto, Hirakata, and Kazuhiko Nishii, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 30, 1986, Ser. No. 880,315

Claims priority, application Japan, Jul. 2, 1985, 60-145559; Jul. 9, 1985, 60-150738
Int. Cl.⁴ H05K 7/20 8 Claims

U.S. Cl. 361-388



1. A power module comprising:

- a primary circuit board one major surface of which is an element mounting surface on which circuit elements of a primary circuit of a power circuit are mounted, the other major surface of said primary circuit board being a heat radiating surface on which no circuit element is mounted;
- a secondary circuit board one major surface of which is an element mounting surface on which circuit elements of a secondary circuit of said power circuit are mounted, the other major surface of said secondary circuit board being a heat radiating surface on which no circuit element is mounted, said primary and secondary circuit boards being spaced apart from each other and disposed so that the respective element mounting surfaces face each other;
- a converter transformer disposed in parallel with and adjacent to said primary and secondary circuit boards; and
- a resin body of electrically insulating and thermally conductive resin embedding therein said primary and secondary circuit boards and said converter transformer so that said primary and secondary circuit boards and said converter transformer are three-dimensionally joined only with said resin body, said heat radiating surfaces of said primary and secondary circuit boards being exposed outside to form parts of opposite outer walls of said power module, wherein a clearance is provided within said resin body along each of said element mounting surfaces of said primary and secondary circuit boards, said clearance being filled with an electrically insulating and thermally low conductive material for preventing heat generated on each of said primary and secondary circuit boards from being transmitted through said resin body to said converter transformer.

4,712,161

HYBRID AND MULTI-LAYER CIRCUITRY

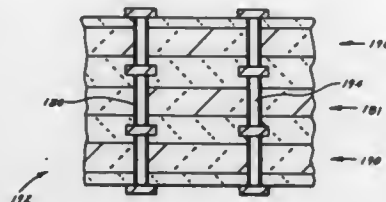
Michael J. Pryor, Woodbridge; Charles J. Leedecke, Northford, and Norman G. Masse, Wallingford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 715,446, Mar. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 707,633, Mar. 4, 1985, abandoned. This application Dec. 20, 1985, Ser. No. 811,905

Int. Cl.⁴ H05K 7/06

U.S. Cl. 361—411

29 Claims



13. A circuit assembly, comprising:
a ceramic substrate,
a layer of copper alloy foil, said copper alloy selected from the group consisting of oxygen free and deoxidized copper alloy; and
a layer of bonding glass which forms a flowable mass at a temperature below about 1000° C. bonding the ceramic substrate to said layer of alloy foil.

4,712,162

CAPACITOR HOLD-DOWN STRAP

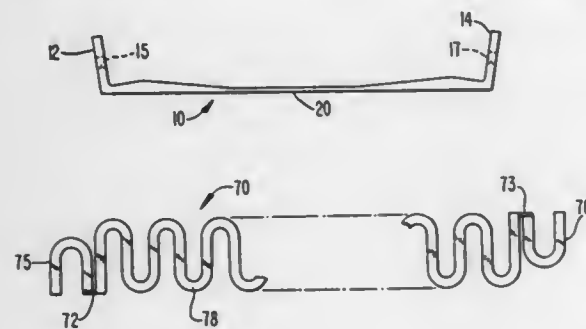
Honesto D. Quiogue, Blacksburg, Va., assignor to Hubbell Incorporated, Orange, Conn.

Filed Dec. 4, 1986, Ser. No. 937,702

Int. Cl.⁴ H05K 7/02

U.S. Cl. 361—417

2 Claims



1. A capacitor hold-down strap in combination with a mounting surface against which a capacitor is to be held and fastener means attached to the mounting surface at two spaced locations between which the capacitor is to be held, the strap comprising first and second L-shaped end brackets, each said bracket having two legs and means defining an opening in one leg thereof for receiving said fastener means,
said one leg being substantially flat and said opening passing therethrough perpendicular to the plane containing said one leg,
each of said end brackets being substantially rigid and non-resilient; and
and intermediate flexible and elastic elongatable strap portion extending between said end brackets for partially encompassing a capacitor positioned between said fastener means, each end of said strap portion being integrally and non-detachably connected to the other leg of one of said end brackets for elastically engaging and holding said capacitor against said

surface, said intermediate strap portion comprising an elongated band of spring steel shaped to lie along a sinuous path and contained in a single plane.

4,712,163

INDICATOR LAMPS

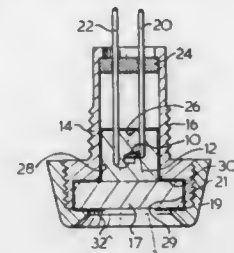
Robert F. Oxley, 89a Route de Florissant, 1206 Geneva, Switzerland

Filed Aug. 28, 1981, Ser. No. 297,319

Int. Cl.⁴ G01D 11/28

U.S. Cl. 362—29

5 Claims



1. In an indicator lamp having a LED light source embedded within a transparent plastics encapsulation, the improvement wherein substantially all of the surfaces of said transparent plastics encapsulation surrounding the LED are coated black except for a portion of said surfaces through which emitted light from the LED passes outwardly to the viewer.

4,712,164

VEHICLE HEADLAMP ASSEMBLY

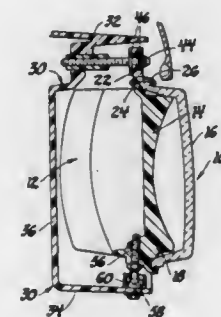
David R. McMahan; Leslie H. Hallgarth, both of Anderson, and Gary L. Miller, Lapel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 30, 1986, Ser. No. 824,197

Int. Cl.⁴ B60Q 1/06; F16C 11/00

U.S. Cl. 362—66

2 Claims



1. A vehicle lamp assembly comprising a support frame formed with upper and lower walls and a back wall, a lamp body received between said frame walls, pivot means on said upper and lower frame walls and said lamp body aligned on a vertical axis about which said lamp body is adapted for rotatable adjustment relative to said frame, means defining a pair of guidance slots in said lower walls of said frame at opposite sides of said vertical axis and each generally aligned on an arc originating on said axis and contained in generally horizontal plane, a pair of support shoes slidably received in said slots to support the mass of said lamp body on said lower wall of said frame for said rotatable adjustment relative thereto about said vertical axis, means combined with each of said pair of support shoes for allowing rotatable adjustment of said lamp body about a horizontal axis, and adjustment means including a pair of angularly arranged rotatable shafts journaled on said frame and interconnected by bevel gears, one of said shafts being vertically orientated and having a head adjacent said upper

wall of said frame at a location easily manipulated from above the lamp assembly, the other of said shafts being generally horizontally disposed and having thread means engaged with one of said shoes to effect adjustment of said lamp body about said vertical axis upon selected rotation of said head of said one of said shafts.

4,712,165

TUBULAR OVERHEAD LIGHTING SYSTEM

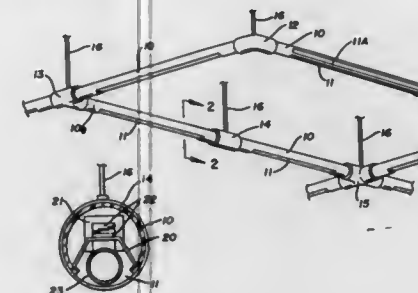
Vincent B. Cetrone, 442 Fairway Dr. NE., Warren, Ohio 44483

Filed Sep. 5, 1986, Ser. No. 903,599

Int. Cl.⁴ H01H 47/00

U.S. Cl. 362—147

1 Claim



1. In a tubular lighting system having at least one plastic pipe of a known circumference with a longitudinally extending slot therein of a width at least equal to one-fourth of said known circumference of said plastic pipe and means for suspending said plastic pipe from an overhead support, the improvement comprising longitudinally spaced inverted generally U-shaped brackets positioned in said plastic pipe and straddling said slot therein, a tubular light source in said plastic pipe supported by said generally U-shaped brackets, said tubular light source being in partial registry with said elongated slot and means including an electric circuit for energizing said tubular light source.

4,712,166

LIGHT FIXTURE MOUNTING

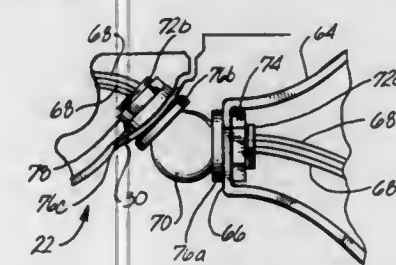
Alva N. Stewart, Newport, Ark., assignor to Brown Jordan Company, El Monte, Calif.

Filed Feb. 24, 1986, Ser. No. 832,140

Int. Cl.⁴ F21S 1/02

U.S. Cl. 362—147

1 Claim



1. In a light fixture that mounts on a vertical wall and which has a top, an enclosure for a light, and a bottom, an improvement comprising:
a canopy having a base for bearing on the vertical wall, a neck extending horizontally from the base and reducing in diameter with distance from the base, and a vertical canopy end wall at the small end of the neck and having a hole through it;
the bottom of a fixture having a stamping that has a wall extending at about 45° to the horizontal, the wall having a hole through it proximate to the end wall of the canopy; and
a rigid joint connecting the stamping to the canopy, the joint

having a first male threaded coupler extending through the hole in the end wall of the canopy, a second male threaded coupler 135° to the first coupler and extending through the hole in the stamping wall, a spherically curved surface between the end wall of the canopy and the stamping, a first washer on the first male threaded coupler holding the joint and the canopy together, a second washer on the second male threaded coupler between the stamping and the spherically curved surface, and a second nut on the second male threaded coupler holding the joint and the stamping together.

4,712,167

REMOTE CONTROL, MOVEABLE LIGHTING SYSTEM

Myron K. Gordin, and James L. Drost, both of Oskaloosa, Iowa, assignors to Mycro Group Co., Oskaloosa, Iowa

Filed Jun. 30, 1986, Ser. No. 880,187

Int. Cl.⁴ F21P 5/02

U.S. Cl. 362—233

16 Claims



1. A self-powered, mobile, controllable, and variable effect lighting device for high power, high intensity large scale lighting applications comprising:
a mobile base platform which is moveably positionable along the ground;
a boom mounted upon said base platform and having an outer end which is adjustably swivelable, tiltable, collapsible and extendable with respect to said base platform;
a lighting array frame adjustably mounted to said outer end of said boom, said lighting array frame being indepen-

dently tiltable in addition to being orientational according to the adjustable positioning of said boom;
at least one luminaire assembly unit, each producing a light beam and being adjustably mounted to said lighting array frame, each said luminaire assembly unit being independently pannable and tiltable in addition to being orientational according to the adjustable positioning of said boom;

luminaire mounting means connected between each said luminaire assembly unit and said lighting array frame for adjustably mounting each said luminaire assembly unit to said lighting array frame to allow independent panning and tilting of each luminaire assembly unit;

actuator means operatively associated with said luminaire mounting means and said lighting array frame for causing adjustable panning and tilting of each said luminaire assembly unit with respect to said lighting array frame;

first motor means operatively associated with the said lighting array frame for causing the adjustable movement of said lighting array frame with respect to said boom;

second motor means operatively associated with each said luminaire assembly unit for allowing selective adjustment of the width of said corresponding light beam;

power means operatively associated with said boom for causing adjustable movement of said boom with respect to said base platform;

generator means on said mobile base platform for producing different electrical power levels, including sufficient electrical power to operate the high power, high intensity large scale lighting of each said luminaire assembly unit, and for producing sufficient electrical lower-levels of power for other elements of the lighting device, and for auxiliary devices;

control circuitry mounted to said base platform for supplying operating power from said generator means to each said luminaire assembly unit, actuator means, first and second motor means, and power means;

ballast means secured to said mobile base platform to provide ballast between said generator means and each of said luminaire assembly unit;

switching means operatively connected between said generator means and said ballast means to provide switching for the high electrical power for each said high intensity, large scale lighting luminaire assembly unit, said switching means being controlled by signals from said control circuitry; and

control means associated with and in operative communication with said control circuitry for allowing control of the beam of orientation of each luminaire assembly unit and of the vertical and horizontal positioning of said lighting array frame, said control means including first and second manual control panels, said first control panel being positioned on said mobile base platform and operatively connected by electrical conduits to said control circuitry, said second control panel being operatively connected to said control circuitry and being manually moveable to a location away from said mobile base platform.

16. A method of providing self-powered, moveable, controllable, variable lighting, high power, high intensity large scale lighting applications for target areas such as for movie sets and the like comprising:

moving a moveable base including an adjustably positionable swivelable, tiltable, collapsible and extendable boom with and adjustably positionable lighting array frame having a plurality of adjustably positionable luminaire assembly units mounted thereon to a desired position relative to said target area said luminaire assembly units being independently pannable and tiltable in addition to being orientational according to adjustable positioning of the lighting array frame and the boom;

adjusting said boom to a desired position relative to said target area;

orienting said lighting array frame to a desired position

relative to said target area by remote control at a position remote from said lighting array frame;

orienting at least one of said luminaire assembly units as desired with respect to said target area by remote control at a position remote from said luminaire assembly unit;

generating electrical power from a generator means positioned on said moveable base to deliver sufficiently high power to operate each said luminaire assembly unit and to deliver sufficient power to various other power levels for use by electrical activators and motors to adjustably position said boom, lighting array frame, and each luminaire assembly unit to desired orientations;

producing a light beam for each utilized luminaire assembly unit according to desire with respect to said target area by remote control at a position remote from said luminaire assembly unit; and

adjusting the beam characteristics or orientation of any said luminaire assembly unit, the position of said lighting array frame or boom, or the position of said moveable base with respect to said target area to achieve the desired lighting characteristics at said target area by remote control at a position remote from any said luminaire assembly unit, said lighting array frame, and said boom.

4,712,168

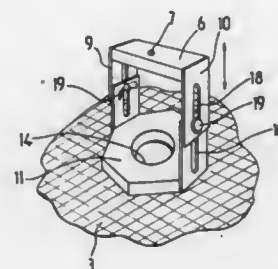
SPOTLIGHT BRACKET FOR A FALSE CEILING OR A FALSE WALL

Fernand Scherrer, 2, rue Georges Bizet, 68170 Rixheim, France
Filed Sep. 9, 1986, Ser. No. 905,780

Claims priority, application France, Sep. 13, 1985, 85 13619
Int. Cl.⁴ F21S 1/02

U.S. Cl. 362-427

12 Claims



1. Spotlight bracket for a false ceiling or a false wall, comprising:

upper and lower parts adjustable relatively to each other, said upper part being adapted for fixing to a ceiling or wall, and said lower part being adjustable both in height and in inclination relative to said upper part;

said lower part including a base plate having a hole pierced therethrough for the passage of a spotlight borne by the bracket.

4,712,169

CIRCUIT ARRANGEMENT FOR FORMING A DIRECT VOLTAGE FROM A SINUSOIDAL INPUT VOLTAGE

Manfred Albach, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1986, Ser. No. 929,469

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541308

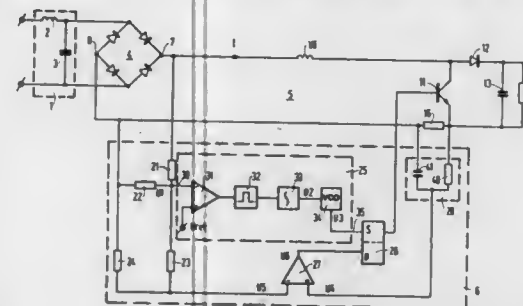
Int. Cl.⁴ H02M 3/156

U.S. Cl. 363-89

11 Claims

1. A circuit arrangement for forming a direct voltage from an essentially sinusoidal input voltage comprising: a filter for suppressing high-frequency interference signals, a switched mode power supply part which includes a diode, a coil, a capacitor and a transistor and is coupled to the filter through a rectifier, the elements of the switched mode power supply

being coupled together in circuit so that, in the conductive state of the transistor the diode is cut off and the coil current flows at least through the transistor, and in the transistor cut-off state the current flows through the diode and a parallel arrangement of a load and the capacitor, and a pulse generator responsive to the input voltage to derive switching pulses for the transistor whose frequency is varied uniformly in time between a minimum frequency at the maximum value of a rectified input voltage and a maximum frequency at the minimum value, characterized in that the pulse generator comprises a voltage-to-frequency converter which forms, from the input



voltage, starting pulses, which determine the beginning of the switching pulses and whose frequency is varied between the extreme values in such a manner that the second derivative of the frequency with respect to time is always zero or negative, in that the pulse generator further comprises a first comparison circuit and a first integrator, which integrator produces an output signal proportional to the integrated output current of the rectifier and whose time constant is smaller than the reciprocal value of the maximum frequency, and in that the first comparison circuit produces a signal for terminating a switching pulse when the output signal of the first integrator is larger than a signal proportional to the rectified input voltage.

4,712,170

POWER SUPPLY HAVING TUNED RADIO FREQUENCY CIRCUIT

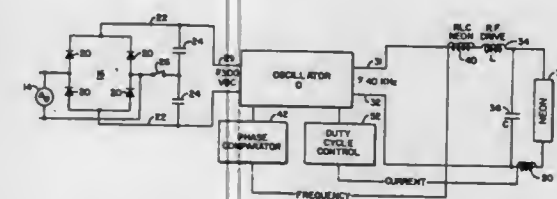
Alan G. V. Grace, San Bruno, Calif., assignor to Power Modifications Incorporated, Hayward, Calif.

Continuation-in-part of Ser. No. 727,180, Apr. 25, 1985. This application Feb. 6, 1986, Ser. No. 826,942

Int. Cl.⁴ H02P 13/20

U.S. Cl. 363-98

12 Claims



1. A tuned radio frequency power supply for powering a load comprising in combination:

an oscillator having a variable frequency and variable power driving source;

an RLC circuit having a load connected thereto and including a first inductance reactance element and a second capacitance reactance element said RLC circuit connected to the output of said oscillator, said inductance reactance element being a transformer, said transformer sized to emphasize the third harmonic of the frequency of said RLC circuit;

a frequency sensor connected across the current flow in the RLC circuit outputting to a phase comparator;

a phase comparator for comparing the phase of the oscillator with the phase of the circuit for changing the frequency of

the oscillator to tune said circuit for minimum reactance load and maximum resistive load;

a sensor operatively connected to the power driving source of the oscillator for sensing the power sufficient to drive the load and varying the variable power driving source to said oscillator, said sensor outputting to the variable power driving source to cause said oscillator to have an amplitude sufficient to force a required level of voltage and current through the RLC circuit.

4,712,171

ELECTRICAL POWER SOURCE

Toshihiko Yamashita, Osaka, Japan, assignor to Uniqey (Hong Kong) Limited, Hong Kong

PCT No. PCT/GB86/00152, § 371 Date Jan. 15, 1987, § 102(e) Date Jan. 15, 1987, PCT Pub. No. WO86/05636, PCT Pub. Date Sep. 25, 1986

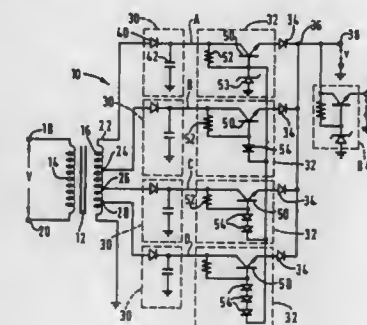
PCT Filed Mar. 14, 1986, Ser. No. 939,516

Claims priority, application United Kingdom, Mar. 15, 1985, 8506739

Int. Cl.⁴ H02M 1/10

U.S. Cl. 363-142

5 Claims



1. An electrical power source capable of accepting an input within a range of AC input voltages and providing a substantially constant DC output supply, comprising converter means for providing from the AC input supply a number of outputs of differing voltages each proportional to the input voltage, each of these outputs being connected respectively to one of a number of parallel circuit lines each of which includes a rectifier, a maximum voltage regulator and non-return current device, the outputs of these lines being connected to a common output intended to provide the substantially constant DC voltage supply, each voltage regulator having a set regulating voltage which is one of a discrete range of voltage steps close to the required substantially constant DC voltage, the lowest of the steps being no greater than the voltage reached for the line connected to the highest output from the converter means when the input supply is at the low end of the range of AC voltages, the next of the steps being greater than the lowest and being reached for the line connected to the next highest output from the converter means, and, if there are more than two parallel circuit lines, the next step being greater and being reached for the line connected to the next highest output from the converter means and so on, so as to cover the whole range of possible input AC voltages.

4,712,172

METHOD FOR PREVENTING NON-DISCHARGE IN A LIQUID JET RECORDER AND A LIQUID JET RECORDER

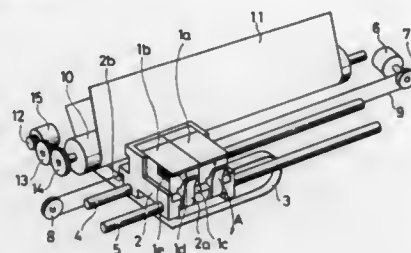
Takehiko Kiyohara, Zama; Koji Terasawa, Mitaka, and Akira Miyakawa, Tanashi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,396

Claims priority, application Japan, Apr. 17, 1984, 59-75866
Int. Cl.⁴ G01D 15/16

U.S. Cl. 346-1.1

18 Claims



1. A method for preventing non-discharge of liquid in a liquid jet recorder, comprising the steps of: providing a recorder having a record head for discharging liquid to record dots, said record head having a discharge energy generating element for generating heat when energized arranged on a substrate, a liquid discharge port arranged in relation to the discharge energy generating element to discharge liquid when the energy generating element is energized in a discharge mode and a liquid path for supplying liquid to the liquid discharge port; and energizing the discharge energy generating element in a non-discharge mode, wherein liquid is not discharged, when the recorder is powered on and/or when the time during which the recorder has not operated in the discharge mode exceeds a predetermined time period.

4,712,173

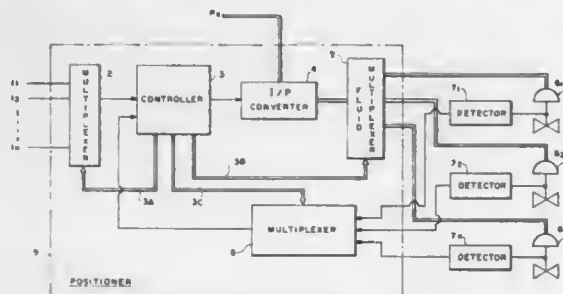
MULTICONTROL PROCESS CONTROL SYSTEM
Masatoshi Fujiwara, Yokoshuka; Masato Kuroda, Fujisawa, and Tatsuhide Shiga, Zushi, all of Japan, assignors to Yamatake Honeywell, Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 777,987

Claims priority, application Japan, Oct. 1, 1984, 59-204174;
Oct. 9, 1984, 59-210391Int. Cl.⁴ G06F 15/46

U.S. Cl. 364-138

20 Claims



1. A multicontrol system comprising an input multiplexer for selecting a plurality of input signals, a detecting multiplexer for selecting detected signals indicative of the condition in which a plurality of devices respond, an output multiplexer for selectively delivering a control output to the plurality of devices to be controlled and a controller for controlling the multiplexers for successive and repeated selective operation, for effecting a control-

ling arithmetic operation on an input signal fed through said input multiplexer and a detected signal fed through said detecting multiplexer, and for delivering a control signal resulting from said controlling arithmetic operation as an input to said output multiplexer.

4,712,174

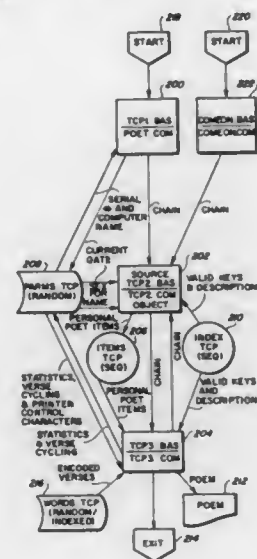
METHOD AND APPARATUS FOR GENERATING TEXT
Jackson D. Minkler, II, Phoenix, Ariz., assignor to Computer Poet Corporation, Sparks, Nev.

Filed Apr. 24, 1984, Ser. No. 603,731

Int. Cl.⁴ G06F 9/06

U.S. Cl. 364-200

36 Claims



1. A method for using a computer for producing pseudorandom output text responsive to a plurality of input data set items, provided by an operator to the computer, according to the following steps: inputting a plurality of text blocks as a data base for the computer, each of said plurality of text blocks being identified as one of a plurality of characterizations; querying the operator for the plurality of input data set items, all of the plurality of input data set items being related to a single intended recipient of the pseudorandom output text, said at least single intended recipient being predetermined by and identified to the computer by the operator; producing a different portion of the pseudorandom output text in response to each of the plurality of input data set items, said responsive output portions being related to each of the plurality of input data set items by means of said plurality of characterizations, each of said responsive output portions being selected sequentially from a plurality of said responsive related output portions; and outputting the pseudorandom output text to a plotter.

4,712,175

DATA PROCESSING APPARATUS
Shunichi Torii, Musashino; Shigeo Nagashima, Hachioji, and Koichiro Omoda, Sagami-hara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,981

Claims priority, application Japan, Jul. 27, 1983, 58-135816
Int. Cl.⁴ G06F 15/347, 15/16

U.S. Cl. 364-200

9 Claims

1. A vector data processing data processing apparatus for processing vector data including a plurality of data elements comprising more than two sub-systems each including: (a) at least one operation unit for performing an arithmetical

4,712,176

SERIAL CHANNEL INTERFACE WITH METHOD AND APPARATUS FOR HANDLING DATA STREAMING AND DATA INTERLOCKED MODES OF DATA TRANSFER
Kenneth J. Fredericks; Thomas W. Guerriero, both of Poughkeepsie; Gerald H. Miracle, Pleasant Valley, and Michael R. Wiegand, Poughkeepsie, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

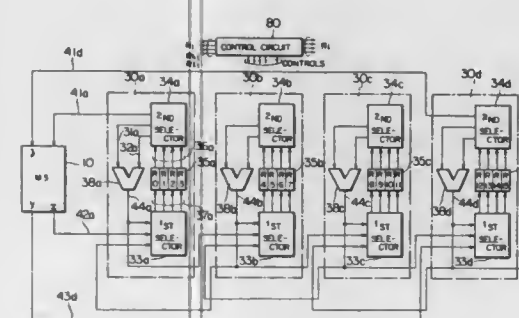
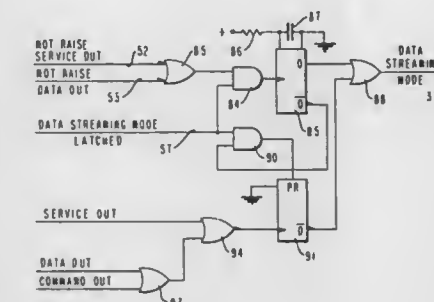
Filed Feb. 11, 1985, Ser. No. 700,355

Int. Cl.⁴ G06F 13/42

U.S. Cl. 364-200

7 Claims

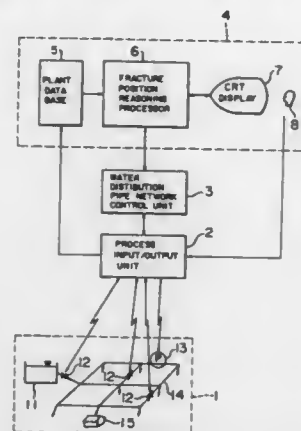
- a plurality of vector registers each for holding vector data and each being capable of performing reading and writing operation concurrently;
 - a first selector connected to input terminals of said vector registers only in the same subsystem and connected with the operation unit in the same subsystem and an operation unit in a plurality, but less than all, of the different subsystem so as to receive vector data therefrom and for selectively outputting the received vector data to one vector register only in the same subsystem; and
 - a second selector connected to output terminals of said vector registers only in the same subsystem and to a pair of input terminals of said operation unit only in the same subsystem for receiving a pair of vector data from a pair of selected vector registers in said vector registers only in the same subsystem and for outputting the received pair of vector data to said operation unit only in the same subsystem; and
- control means connected to said plurality of subsystems and responsive to program instructions for controlling operations of said first selectors and said second selectors in said



1. Apparatus (the X box or Y box) for exchanging signals between a serial link and a parallel buss connected to one of a channel and a control unit, the channel and control unit having means for transferring a series of data units on the parallel bus in a data streaming mode using alternating first and second data transfer tags from the control unit to the channel (Service In alternating with Data In) and corresponding alternative first and second tags from the channel to the control unit (Service Out alternating with Data Out) or in an interlocked mode, the serial link connecting said apparatus in both directions (Input and Output) with a similar apparatus (another X or Y box) also connected by a parallel bus to the other of said channel and control unit, said apparatus having means for receiving said data transfer tags on said parallel bus and transmitting on said serial link a frame containing the identification of the received tag and having means for receiving a serial frame containing the identification of one of said data transfer tags and raising the corresponding data transfer tag on the parallel bus, wherein the improvement comprises, means (70, 77, 79, 80) for detecting said interlocked mode of data transfer and said data streaming mode of data transfer on the parallel bus and means (71) for producing a signal (57) identifying whether the channel and control unit are operating in data streaming mode, means (35, 36, 42, 44, 46, 47) responsive to said signal identifying that said channel and control unit are operating in data streaming mode for dropping a data transfer tag on the parallel bus in response to the receipt of the next of said data transfer tags in said series of data units on the serial bus, and means responsive to said signal identifying that said channel and control unit are operating in data streaming mode for detecting the end of the data transfer and for controlling said tag dropping means to drop a last data transfer tag.

condition and the measured data so as to obtain changes in value from the data in the normal condition at junction points to the extent possible,

- (e) withdrawing junction points with said value changes which are known, regarded as those in the normal condition, other than a junction point with a maximum one of said value changes, from said set of suspected abnormal junction points, searching junction points along branches around said junction point with said maximum value change until a junction point not belonging to the initial set of suspected abnormal junction points is found, and renewing said set of suspected abnormal junction points



- with the use of junction points obtained during searching and now yet evaluated as to their condition, and including said junction point with the maximum value change,
- (f) displaying said new set of suspected junction points on a display unit for checking the condition of said network,
- (g) repeating the application of said rules via the processor to the suspected junction points in said renewed set to successively reduce the number of suspected abnormal junction points in the renewed set until the disruption point is located, and
- (h) outputting said located disruption point for repairing the same.

4,712,183

TRACKING ROBOT APPARATUS

Osamu Shiroshita; Yasuo Ishiguro, and Yoshizumi Ito, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Toyota Jidosha Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 6, 1985, Ser. No. 763,127

Claims priority, application Japan, Aug. 6, 1984, 59-163804

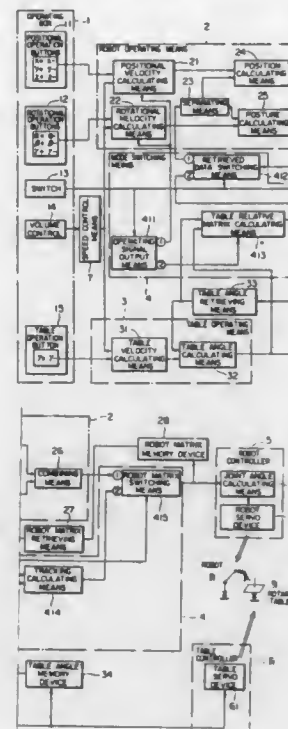
Int. Cl.⁴ G06F 15/46; G05B 19/42

U.S. Cl. 364-513

22 Claims

1. A tracking robot apparatus, comprising:
 - a robot for performing a predetermined operation;
 - a movable device for moving an object of interest;
 - a signal input device for designating operations of said robot and said movable device;
 - first operating means for receiving an input signal from said signal input device and calculating an operation instruction value of said movable device;
 - a first control device for driving said movable device in accordance with the operation instruction value;
 - second operating means for calculating a position/posture instruction value serving as an operation instruction value of said robot based upon said operation instruction value of said movable device so as to keep the relative position and posture of said robot and said movable device unchanged; and
 - a second control device for driving said robot in response to the position/posture instruction value,
- said movable device being operated in response to the signal

from said signal input device, and at the same time said robot being operated such that the relative position and



4,712,184

COMPUTER CONTROLLABLE ROBOTIC EDUCATIONAL TOY

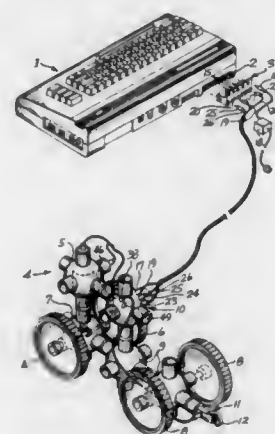
Albert R. Haugerud, 1544 Hillside Dr. Southeast, Issaquah, Wash. 98027

Filed Sep. 12, 1984, Ser. No. 649,862

Int. Cl.⁴ G06F 15/46; G09B 19/00

U.S. Cl. 364-513

9 Claims



1. In a computer-controllable robotic device using a multi-purpose microcomputer including an output port having several discrete input and output contacts, such microcomputer having programming modifiable to control the computer to provide a high or low voltage output signal to a selected single output contact of such port, and a robot having a plurality of different electrically-powered actions, the improvement comprising an interface operably connectable between such microcomputer port and such robot and including power-controlling means for receiving the output signal from such selected single output contact of the microcomputer port and for supplying electric power to the robot for effecting various

different selected electrically-powered actions of the robot as determined by the programming of the microcomputer without reference to or being affected by the voltage at any other output contact of the microcomputer output port.

4,712,185

DOT INTERPOLATION CONTROL SYSTEM

Hiroynki Aoki, Hanno, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

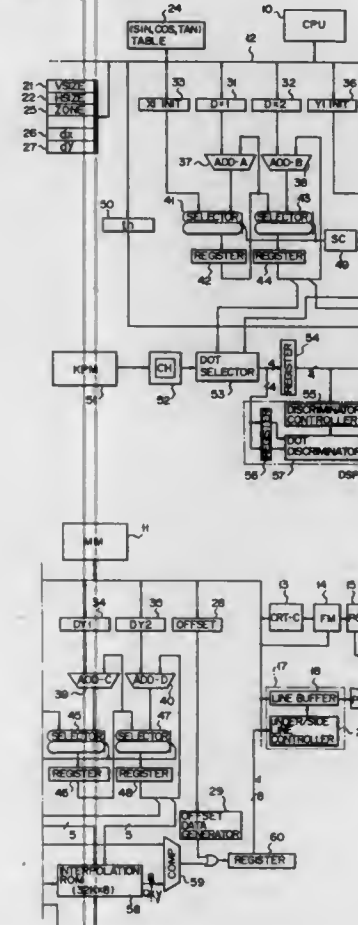
Filed Apr. 26, 1985, Ser. No. 727,910

Claims priority, application Japan, Apr. 28, 1984, 59-86371; Apr. 28, 1984, 59-86372; Apr. 28, 1984, 59-86373; Apr. 28, 1984, 59-86375; Apr. 28, 1984, 59-86376

Int. Cl.⁴ G06F 15/626; G06K 9/42

U.S. Cl. 364-518

14 Claims



1. A dot interpolation control system for dot-interpolating a character pattern comprising:
 - first operating means for calculating initial values and dot pitches along main and subscanning directions in accordance with x and y component data and angle component data;
 - first storage means for storing an initial value along said main scanning direction, calculated by said first operating means;
 - second storage means for storing an initial value along said sub scanning direction, calculated by said first operating means;
 - third storage means for storing a dot pitch along said main scanning direction calculated by said first operating means;
 - fourth storage means for storing a dot pitch along said sub scanning direction calculated by said first operating means;
 - fifth storage means for storing dot position data along said main scanning direction;

sixth storage means for storing dot position data along said sub scanning direction;

second operating means for: (1) initially loading the data stored in said first storage means and said second storage means into said fifth storage means, (2) calculating dot positions along said main scanning direction in accordance with the contents of said third and fifth storage means, and (3) storing the calculated dot positions in said fifth storage means; and

third operating means for: (1) initially loading the data stored in said first and second storage means into said sixth storage means, (2) calculating the dot positions along the sub scanning direction in accordance with the contents of said fourth and sixth storage means, and (3) storing the calculated dot positions along the sub scanning direction in said sixth storage means, so that said sixth storage means includes sub scanning direction data.

4,712,186

METHOD OF DETERMINING ROTARY SPEED OF A ROTATING ELEMENT IN A BRAKING EFFORT REGULATION SYSTEM

Georg Fromme, Sevetal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

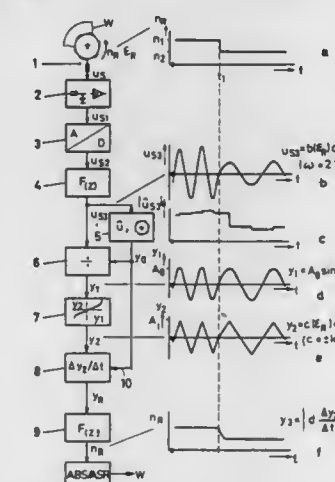
Filed Sep. 3, 1985, Ser. No. 771,983

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3432883

Int. Cl.⁴ B60K 31/00; G01P 3/00; G06G 7/70/7/76

U.S. Cl. 364-565

11 Claims



1. In a system for preventing slippage of at least one wheel of a vehicle, a method of regulating wheel braking effort as a function of rotary speed of a vehicle wheel subject to wide speed variations and of providing control output signals representative of wheel speed even under slow wheel operating conditions, said slippage-preventing system having
 - a transducer (1) which provides a transduced output signal (u_s) having a frequency representative of the speed of the wheel and an evaluation circuit (2-9) which processes said transducer output signal (u_s) and provides the control output signal (n_R) which has a characteristic value which is representative of and proportional to the speed of the wheel,
 - comprising the steps of
 - digitizing the transducer output signal (u_s) to derive a digital signal (u_{s2});
 - calculating (7) the inverse function of the digital signal to derive an essentially triangular-wave-shaped signal (y_2);
 - determining (8) the degree of slope of the essentially linear portions of the triangular-wave-shaped signal (y_2) to derive a differentiated signal (y_3), which differentiated signal is representative of the speed of the wheel;

obtaining said control output signal (n_R) from the differentiated signal (y_R); and
regulating braking effort in said slippage-preventing system as a function of said control output signal (n_R).

4,712,187

AUTOMATIC CENTERING METHOD FOR A VIDEO CAMERA

Eiji Tamura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

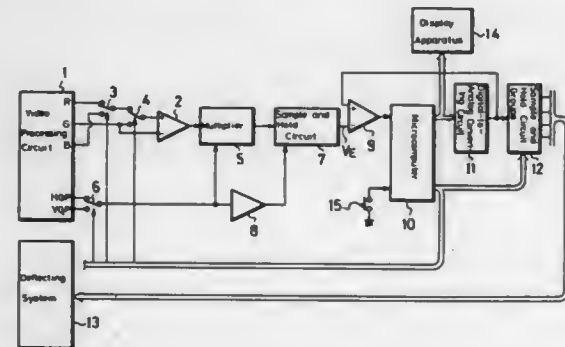
Filed Apr. 15, 1985, Ser. No. 723,288

Claims priority, application Japan, Apr. 16, 1984, 59-76278

Int. Cl.⁴ G01C 25/00; H04N 9/09

U.S. Cl. 364-571

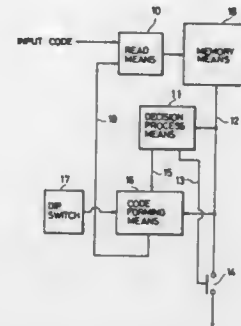
4 Claims



1. An automatic centering method for a video camera having a plurality of pick-up means producing respective outputs and respective deflection control circuit for each of said pick-up means for causing a deflection of the respective pick-up means within a predetermined centering range in response to a respective control signal, said method preventing completion of a centering operation to an erroneous centered position within said centering range, comprising the steps of:

- comparing the outputs of first and second ones of said pick-up means to generate an error signal indicative of a centering deviation between said first and second pick-up means;
- processing said error signal to generate a control signal for said first pick-up means so as to minimize said centering deviation;
- supplying the generated control signal to said deflection control circuit for said first pick-up means so that said first pick-up means is deflected to a centered position in said centering range;
- storing said generated control signal in a memory;
- changing said generated control signal supplied to said deflection control circuit for said first pick-up means by a predetermined amount so that said first pick-up means is deflected to a second position in said centering range remote from said centered position;
- repeating the above-described steps of comparing, processing and supplying to generate a new control signal minimizing centering deviation and to supply the same to said deflection control circuit for said first pick-up means;
- comparing said new generated control signal with said control signal stored in said memory to generate an error flag signal when the compared control signals do not coincide with each other; and
- indicating said error flag signal.

4,712,188
PATTERN OUTPUT APPARATUS
Masaki Nishiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 29, 1985, Ser. No. 696,052
Claims priority, application Japan, Jan. 31, 1984, 59-14296
Int. Cl.⁴ G06F 3/14
U.S. Cl. 364-900 10 Claims



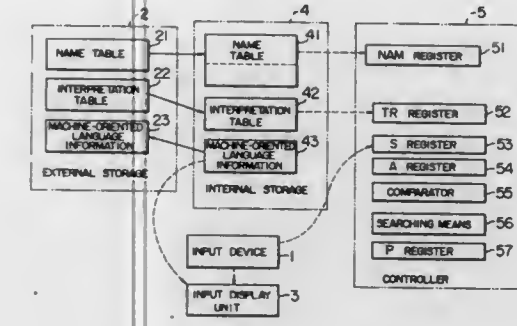
1. A pattern output apparatus comprising:
memory means for storing a plurality of pattern information;
input means for inputting code information to said apparatus;
read means connected to said memory means and to said input means for reading out said pattern information corresponding to said code information, from said memory means;
decision means connected to said memory means for discriminating a bit data within said pattern information read out by said read means to produce a discrimination result and for outputting said discrimination result; and
code information output means connected to said memory means and to said decision means for generating, in response to said discrimination result, generated code information indicating that pattern information different from said read out pattern information should be read out from said memory means, wherein said generated code information is output to said read means.

4,712,189
TABLE DRIVEN TRANSLATOR
Shunji Mohri, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 23, 1984, Ser. No. 663,944
Int. Cl.⁴ G06F 9/00

U.S. Cl. 364-900 9 Claims

1. A language processing system for translating an input statement of a selected source language into a lower-level machine-oriented language comprising:
 - (a) input means for inputting an input statement written in the selected source language of a computer;
 - (b) storage means for storing
 - a first table for storing keywords of grammar of said selected source language and characteristics of the keywords and for storing characteristics of variables used in a program coded by said selected source language;
 - a second table for storing information of control procedures for interpreting the input statement to translate the input statement into a lower-level machine-oriented language, said information being predetermined and based on syntax/grammar of the selected source language;
 - (c) control means for controlling translation processing of an input statement written in the selected source language from said input means, said control means including searching means responsive to said input statement for searching said first table to obtain a location therein at

which a desired keyword variable is stored and to obtain an attribute associated with said keyword variable;
comparing means for comparing said attribute from said searching means with a corresponding attribute stored in said second table to check whether the syntax of the input statement meets the grammar of said selected source language; and



421	422	423	424	425	426
LABEL	ATTRIBUTE	OK	OKL	OKNEXT	NONEXT
MOV 000	MOV 001	MOV 002	MOV 003	MOV 004	MOV 005
MOV 006	MOV 007	MOV 008	MOV 009	MOV 010	MOV 011
MOV 012	MOV 013	MOV 014	MOV 015	MOV 016	MOV 017
MOV 018	MOV 019	MOV 020	MOV 021	MOV 022	MOV 023
MOV 024	MOV 025	MOV 026	MOV 027	MOV 028	MOV 029
MOV 030	MOV 031	MOV 032	MOV 033	MOV 034	MOV 035
MOV 036	MOV 037	MOV 038	MOV 039	MOV 040	MOV 041
MOV 042	MOV 043	MOV 044	MOV 045	MOV 046	MOV 047
MOV 048	MOV 049	MOV 050	MOV 051	MOV 052	MOV 053
MOV 054	MOV 055	MOV 056	MOV 057	MOV 058	MOV 059
MOV 060	MOV 061	MOV 062	MOV 063	MOV 064	MOV 065
MOV 066	MOV 067	MOV 068	MOV 069	MOV 070	MOV 071
MOV 072	MOV 073	MOV 074	MOV 075	MOV 076	MOV 077
MOV 078	MOV 079	MOV 080	MOV 081	MOV 082	MOV 083
MOV 084	MOV 085	MOV 086	MOV 087	MOV 088	MOV 089
MOV 090	MOV 091	MOV 092	MOV 093	MOV 094	MOV 095
MOV 096	MOV 097	MOV 098	MOV 099	MOV 100	MOV 101
MOV 102	MOV 103	MOV 104	MOV 105	MOV 106	MOV 107
MOV 108	MOV 109	MOV 110	MOV 111	MOV 112	MOV 113
MOV 114	MOV 115	MOV 116	MOV 117	MOV 118	MOV 119
MOV 120	MOV 121	MOV 122	MOV 123	MOV 124	MOV 125
MOV 126	MOV 127	MOV 128	MOV 129	MOV 130	MOV 131
MOV 132	MOV 133	MOV 134	MOV 135	MOV 136	MOV 137
MOV 138	MOV 139	MOV 140	MOV 141	MOV 142	MOV 143
MOV 144	MOV 145	MOV 146	MOV 147	MOV 148	MOV 149
MOV 150	MOV 151	MOV 152	MOV 153	MOV 154	MOV 155
MOV 156	MOV 157	MOV 158	MOV 159	MOV 160	MOV 161
MOV 162	MOV 163	MOV 164	MOV 165	MOV 166	MOV 167
MOV 168	MOV 169	MOV 170	MOV 171	MOV 172	MOV 173
MOV 174	MOV 175	MOV 176	MOV 177	MOV 178	MOV 179
MOV 180	MOV 181	MOV 182	MOV 183	MOV 184	MOV 185
MOV 186	MOV 187	MOV 188	MOV 189	MOV 190	MOV 191
MOV 192	MOV 193	MOV 194	MOV 195	MOV 196	MOV 197
MOV 198	MOV 199	MOV 200	MOV 201	MOV 202	MOV 203
MOV 204	MOV 205	MOV 206	MOV 207	MOV 208	MOV 209
MOV 210	MOV 211	MOV 212	MOV 213	MOV 214	MOV 215
MOV 216	MOV 217	MOV 218	MOV 219	MOV 220	MOV 221
MOV 222	MOV 223	MOV 224	MOV 225	MOV 226	MOV 227
MOV 228	MOV 229	MOV 230	MOV 231	MOV 232	MOV 233
MOV 234	MOV 235	MOV 236	MOV 237	MOV 238	MOV 239
MOV 240	MOV 241	MOV 242	MOV 243	MOV 244	MOV 245
MOV 246	MOV 247	MOV 248	MOV 249	MOV 250	MOV 251
MOV 252	MOV 253	MOV 254	MOV 255	MOV 256	MOV 257
MOV 258	MOV 259	MOV 260	MOV 261	MOV 262	MOV 263
MOV 264	MOV 265	MOV 266	MOV 267	MOV 268	MOV 269
MOV 270	MOV 271	MOV 272	MOV 273	MOV 274	MOV 275
MOV 276	MOV 277	MOV 278	MOV 279	MOV 280	MOV 281
MOV 282	MOV 283	MOV 284	MOV 285	MOV 286	MOV 287
MOV 288	MOV 289	MOV 290	MOV 291	MOV 292	MOV 293
MOV 294	MOV 295	MOV 296	MOV 297	MOV 298	MOV 299
MOV 300	MOV 301	MOV 302	MOV 303	MOV 304	MOV 305
MOV 306	MOV 307	MOV 308	MOV 309	MOV 310	MOV 311
MOV 312	MOV 313	MOV 314	MOV 315	MOV 316	MOV 317
MOV 318	MOV 319	MOV 320	MOV 321	MOV 322	MOV 323
MOV 324	MOV 325	MOV 326	MOV 327	MOV 328	MOV 329
MOV 330	MOV 331	MOV 332	MOV 333	MOV 334	MOV 335
MOV 336	MOV 337	MOV 338	MOV 339	MOV 340	MOV 341
MOV 342	MOV 343	MOV 344	MOV 345	MOV 346	MOV 347
MOV 348	MOV 349	MOV 350	MOV 351	MOV 352	MOV 353
MOV 354	MOV 355	MOV 356	MOV 357	MOV 358	MOV 359
MOV 360	MOV 361	MOV 362	MOV 363	MOV 364	MOV 365
MOV 366	MOV 367	MOV 368	MOV 369	MOV 370	MOV 371
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MOV 378	MOV 379	MOV 380	MOV 381	MOV 382	MOV 383
MOV 384	MOV 385	MOV 386	MOV 387	MOV 388	MOV 389
MOV 390	MOV 391	MOV 392	MOV 393	MOV 394	MOV 395
MOV 396	MOV 397	MOV 398	MOV 399	MOV 400	MOV 401
MOV 402	MOV 403	MOV 404	MOV 405	MOV 406	MOV 407
MOV 408	MOV 409	MOV 410	MOV 411	MOV 412	MOV 413
MOV 414	MOV 415	MOV 416	MOV 417	MOV 418	MOV 419
MOV 420	MOV 421	MOV 422	MOV 423	MOV 424	MOV 425
MOV 426	MOV 427	MOV 428	MOV 429	MOV 430	MOV 431
MOV 432	MOV 433	MOV 434	MOV 435	MOV 436	MOV 437
MOV 438	MOV 439	MOV 440	MOV 441	MOV 442	MOV 443
MOV 444	MOV 445	MOV 446	MOV 447	MOV 448	MOV 449
MOV 450	MOV 451	MOV 452	MOV 453	MOV 454	MOV 455
MOV 456	MOV 457	MOV 458	MOV 459	MOV 460	MOV 461
MOV 462	MOV 463	MOV 464	MOV 465	MOV 466	MOV 467
MOV 468	MOV 469	MOV 470	MOV 471	MOV 472	MOV 473
MOV 474	MOV 475	MOV 476	MOV 477	MOV 478	MOV 479
MOV 480	MOV 481	MOV 482	MOV 483	MOV 484	MOV 485
MOV 486	MOV 487	MOV 488	MOV 489	MOV 490	MOV 491
MOV 492	MOV 493	MOV 494	MOV 495	MOV 496	MOV 497
MOV 498	MOV 499	MOV 500	MOV 501	MOV 502	MOV 503
MOV 504	MOV 505	MOV 506	MOV 507	MOV 508	MOV 509
MOV 510	MOV 511	MOV 512	MOV 513	MOV 514	MOV 515
MOV 516	MOV 517	MOV 518	MOV 519	MOV 520	MOV 521
MOV 522	MOV 523	MOV 524	MOV 525	MOV 526	MOV 527
MOV 528	MOV 529	MOV 530	MOV 531	MOV 532	MOV 533
MOV 534	MOV 535	MOV 536	MOV 537	MOV 538	MOV 539
MOV 540	MOV 541	MOV 542	MOV 543	MOV 544	MOV 545
MOV 546	MOV 547	MOV 548	MOV 549	MOV 550	MOV 551
MOV 552	MOV 553	MOV 554	MOV 555	MOV 556	MOV 557
MOV 558	MOV 559	MOV 560	MOV 561	MOV 562	MOV 563
MOV 564	MOV 565	MOV 566	MOV 567	MOV 568	MOV 569
MOV 570	MOV 571	MOV 572	MOV 573	MOV 574	MOV 575
MOV 576	MOV 577	MOV 578	MOV 579	MOV 580	MOV 581
MOV 582	MOV 583	MOV 584	MOV 585	MOV 586	MOV 587
MOV 588	MOV 589	MOV 590	MOV 591	MOV 592	MOV 593
MOV 594	MOV 595	MOV 596	MOV 597	MOV 598	MOV 599
MOV 600	MOV 601	MOV 602	MOV 603	MOV 604	MOV 605
MOV 606	MOV 607	MOV 608	MOV 609	MOV 610	MOV 611
MOV 612	MOV 613	MOV 614	MOV 615	MOV 616	MOV 617
MOV 618	MOV 619	MOV 620	MOV 621	MOV 622	MOV 623
MOV 624	MOV 625	MOV 626	MOV 627	MOV 628	MOV 629
MOV 630	MOV 631	MOV 632	MOV 633	MOV 634	MOV 635
MOV 636	MOV 637	MOV 638	MOV 639	MOV 640	MOV 641
MOV 642	MOV 643	MOV 644	MOV 645	MOV 646	MOV 647
MOV 648	MOV 649	MOV 650	MOV 651	MOV 652	MOV 653
MOV 654	MOV 655	MOV 656	MOV 657	MOV 658	MOV 659
MOV 660	MOV 661	MOV 662	MOV 663	MOV 664	MOV 665
MOV 666	MOV 667	MOV 668	MOV 669	MOV 670	MOV 671
MOV 672	MOV 673	MOV 674	MOV 675	MOV 676	MOV 677
MOV 678	MOV 679	MOV 680	MOV 681	MOV 682	MOV 683
MOV 684	MOV 685	MOV 686	MOV 687	MOV 688	MOV 689
MOV 690	MOV 691	MOV 692	MOV 693	MOV 694	MOV 695
MOV 696	MOV 697	MOV 698	MOV 699	MOV 700	MOV 701
MOV 702	MOV 703	MOV 704	MOV 705	MOV 706	MOV 707
MOV 708	MOV 709	MOV 710	MOV 711	MOV 712	MOV 713
MOV 714	MOV 715	MOV 716	MOV 717	MOV 718	MOV 719
MOV 720	MOV 721	MOV 722	MOV 723	MOV 724	MOV 725
MOV 726	MOV 727	MOV 728	MOV 729	MOV 730	MOV 731
MOV 732	MOV 733	MOV 734	MOV 735	MOV 736	MOV 737
MOV 738	MOV 739	MOV 740	MOV 741	MOV 742	MOV 743
MOV 744	MOV 745	MOV 746	MOV 747	MOV 748	MOV 749
MOV 750	MOV 751	MOV 752	MOV 753	MOV 754	MOV 755
MOV 756	MOV 757	MOV 758	MOV 759	MOV 760	MOV 761
MOV 762	MOV 763	MOV 764	MOV 765	MOV 766	MOV 767
MOV 768	MOV 769	MOV 770	MOV 771	MOV 772	MOV 773
MOV 774	MOV 775	MOV 776	MOV 777	MOV 778	MOV 779
MOV 780	MOV 781	MOV 782	MOV 783	MOV 784	MOV 785
MOV 786	MOV 787	MOV 788	MOV 789	MOV 790	MOV 791
MOV 792	MOV 793	MOV 794	MOV 795	MOV 796	MOV 797
MOV 798	MOV 799	MOV 800	MOV 801	MOV 802	MOV 803
MOV 804	MOV 805	MOV 806	MOV 807	MOV 808	MOV 809
MOV 810	MOV 811	MOV 812	MOV 813	MOV 814	MOV 815
MOV 816	MOV 817	MOV 818	MOV 819	MOV 820	MOV 821
MOV 822	MOV 823	MOV 824	MOV 825	MOV 826	MOV 827
MOV 828	MOV 829	MOV 830	MOV 831	MOV 832	MOV 833
MOV 834	MOV 835	MOV 836	MOV 837	MOV 838	MOV 839
MOV 840	MOV 841	MOV 842	MOV 843	MOV 844	MOV 845
MOV 846	MOV 847	MOV 848	MOV 849	MOV 850	MOV 851
MOV 852	MOV 853	MOV 854	MOV 855	MOV 856	MOV 857
MOV 858	MOV 859	MOV 860	MOV 861	MOV 862	MOV 863
MOV 864	MOV 865	MOV 866	MOV 867	MOV 868	MOV 869
MOV 870	MOV 871	MOV 872	MOV 873	MOV 874	MOV 875
MOV 876	MOV 877	MOV 878	MOV 879	MOV 880	MOV 881
MOV 882	MOV 883	MOV 884	MOV 885	MOV 886	MOV 887
MOV 888	MOV 889	MOV 890	MOV 891	MOV 892	MOV 893
MOV 894	MOV 895	MOV 896	MOV 897	MOV 898	MOV 899
MOV 900	MOV 901	MOV 902	MOV 903	MOV 904	MOV 905
MOV 906	MOV 907	MOV 908	MOV 909	MOV 910	MOV 911
MOV 912	MOV 913	MOV 914	MOV 915	MOV 916	MOV 917
MOV 918	MOV 919	MOV 920	MOV 921	MOV 922	MOV 923
MOV 924	MOV 925	MOV 926	MOV 927	MOV 928	MOV 929
MOV 930	MOV 931	MOV 932	MOV 933	MOV 934	MOV 935
MOV 936	MOV 937	MOV 938	MOV 939	MOV 940	MOV 941
MOV 942	MOV 943	MOV 944	MOV 945	MOV 946	MOV 947
MOV 948	MOV 949	MOV 950	MOV 951	MOV 952	MOV 953
MOV 954	MOV 955	MOV 956	MOV 957	MOV 958	MOV 959
MOV 960	MOV 961	MOV 962	MOV 963	MOV 964	MOV 965
MOV 966	MOV 967	MOV 968	MOV 969	MOV 970	MOV 971
MOV 972	MOV 973	MOV 974	MOV 975	MOV 976	MOV 977
MOV 978	MOV 979	MOV 980	MOV 981	MOV 982	MOV 983
MOV 984	MOV 985	MOV 986	MOV 987	MOV 988	MOV 989
MOV 990	MOV 991	MOV 992	MOV 993	MOV 994	MOV 995
MOV 996	MOV 997	MOV 998	MOV 999	MOV 1000	MOV 1001
MOV 1002	MOV 1003	MOV 1004	MOV 1005	MOV 1006	MOV 1007</

terminated number of bit locations each for storing a bit of data, said data comprising the same predetermined number of bits, and said random memory access means including:

1. bit enable terminal means for receiving bit enable signals each corresponding to one of said bit locations,
2. bit enable storage means connected to said bit enable terminals means and said timing signal terminal means for storing bit enable data representative of said bit enable signals at said bit enable terminal means in response to the receipt of said timing signal; said internal memory operation control signal comprising the same predetermined number of internal bit operation control signals and said control signals generating means further being connected to said bit enable storage means and generating said internal bit operation control signals in response thereto the bit enable data stored therein; and said random access memory means being responsive to said internal bit operation control signals for controlling the transmission or retrieval of data to or from corresponding bit locations of said addressed location.

4,712,191

DISPLAY SYSTEM WITH NESTED INFORMATION DISPLAY

David E. Penna, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

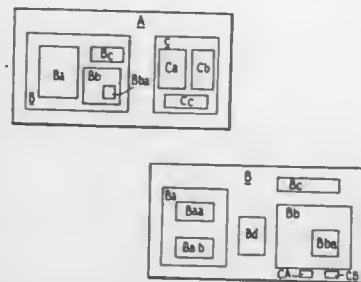
Filed Jul. 22, 1983, Ser. No. 516,020

Claims priority, application United Kingdom, Aug. 11, 1982, 8223085

Int. Cl.⁴ G06F 3/14, 15/40; G06G 1/06

U.S. Cl. 364—900

13 Claims



1. An information display system comprising: connection means for establishing selective connection between the display system and a number of different information sources to obtain information therefrom, a display device for the display of information obtained from said information sources, central processor means connected to said display device and said connection means for determining from which information source information is to be obtained and displayed, interface apparatus connected to said central processor means and operating under user control to generate and apply to said central processor means signals representing any selected point on a display area of the display device, and logic control means included in said central processor means causing the display on the display device of frames of available options which pertain to said information sources, said logic control means comprising: (a) means for producing, on initialization, a first display frame defining at least two discrete areas which are identified as pertaining to different facility options assigned to said areas, said first display frame further defining within at least one of said discrete areas at least one discrete sub-area which is identified as pertaining to

one or more further facility options assigned to said sub-area,

- (b) means for producing a second display frame in response to the selection by said interface apparatus of a point which is within one of said areas but not within a sub-area of that area, said second display frame defining at least sub-areas which are identified as pertaining to different facility options assigned to said sub-areas, and
 - (c) means for producing a third display frame in response to the selection by said interface apparatus of a point which is within a sub-area, said third display frame defining at least two discrete sub-sub-areas within said sub-area which are identified as pertaining to different facility options assigned to said sub-sub-areas, and if said selected area or sub-area pertains to a single facility option, providing a visual indication of the selection of that facility option,
- the logic control means then causing said central processor means to operate said connection means to establish connection to the information source pertaining to the selected facility option.

4,712,192

SEMICONDUCTOR MEMORY DEVICE AND FABRICATION PROCESS THEREOF

Nobuyoshi Tanimura, Musashino, and Tokumasa Yasui, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

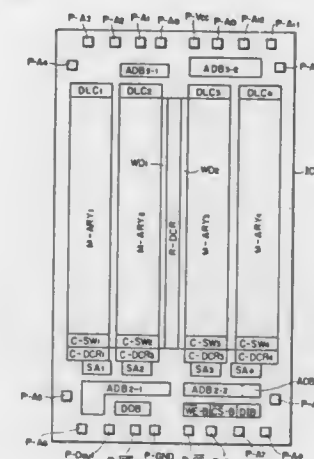
Division of Ser. No. 341,623, Jan. 22, 1982. This application Oct. 4, 1985, Ser. No. 783,959

Claims priority, application Japan, Feb. 6, 1981, 56-15733

Int. Cl.⁴ G11C 13/00

U.S. Cl. 365—51

19 Claims



1. A semiconductor memory device having MIS transistors composing memory cells, the memory cells having load devices, the load devices being connected to a power supply line, and peripheral circuits having MIS transistors, with the gate of at least one of the MIS transistors of the peripheral circuit being connected, through a protection resistor, with a bonding pad, the memory device being fabricated by a process including the steps of:

- forming a first film of an electrically conductive material, which serves as the gate of the MIS transistors composing memory cells of the semiconductor memory device, over a semiconductor material, said first film having a first resistivity;
- forming an insulation film to cover the semiconductor material which is formed with each of the MIS transistors composing said memory cells; and
- forming second films, which second films include a layer of polycrystalline silicon, which second films respectively serve as each load device of each of said memory cells, as a wiring for connecting the load device with a power

supply line and as the protection resistor through which the gate of at least one of the MIS transistors composing peripheral circuits is connected with the bonding pad, over said insulation film covering said semiconductor material, the resistivity of the second films serving as said protection resistor and as said wiring being lower than that of the second film serving as said load device and higher than that of said first film.

4,712,193

CURRENT STEERING DIFFERENTIAL WRITE CIRCUIT FOR MEMORY CELLS

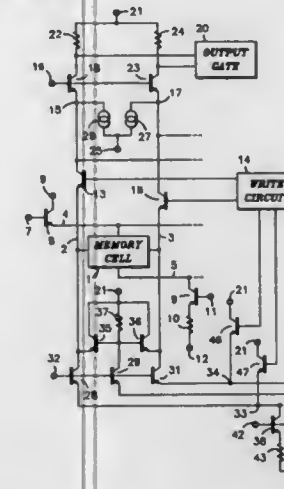
Ira E. Baskett, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 21, 1985, Ser. No. 800,240

Int. Cl.⁴ G11C 7/00

U.S. Cl. 365—190

10 Claims



1. A memory circuit having a read mode and a write mode, including a first voltage terminal and a second voltage terminal, said circuit comprising:

- a word line;
- a current drain line;
- a first bit line;
- a second bit line;
- a memory cell coupled between said word line and said current drain line and coupled between said first and second bit lines;
- first means coupled between said first voltage terminal and said first word line for selectively applying voltage to first word line;
- second means coupled between said current drain line and said second voltage terminal for sinking current from said current drain line;
- third means coupled to said first and second bit lines for sensing current in said first and second bit lines;
- fourth means coupled to said first and second bit lines for enabling current through said first and second bit lines;
- fifth means coupled between said second voltage terminal and both said first and second bit lines for sinking a read current through said first and second bit lines; and
- sixth means coupled between said first voltage terminal and said fifth means for supplying current to said fifth means when said memory cell is in said write mode.

4,712,194

STATIC RANDOM ACCESS MEMORY

Seiji Yamaguchi, Hirakata; Eisuke Ichinohe, Katano, and Johji Katsura, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

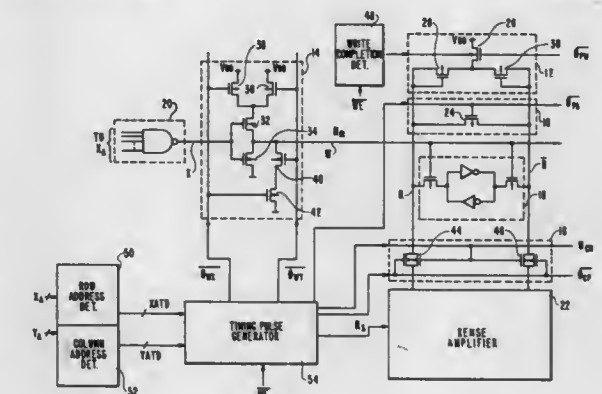
Filed May 31, 1985, Ser. No. 739,875

Claims priority, application Japan, Jun. 8, 1984, 59-118481; Jul. 16, 1984, 59-148052; Aug. 18, 1984, 59-171940

Int. Cl.⁴ G11C 7/00

U.S. Cl. 365—203

12 Claims



1. A static random access memory comprising: a first precharging means for precharging bit lines in response to a first input signal supplied thereto which occurs upon a detection of a change in an address input; a second precharging means for precharging the bit lines in response to a second input signal supplied thereto which occurs upon a detection of the completion of a write operation, a word line driving means for controlling a period in which a word line selected by a row decoder is selected in response to third and fourth input signals supplied thereto which respectively occur upon a detection of a change in at least one of a row address input and column address input; and a bit line connecting means for coupling the bit lines and a sense amplifier for a specified period in synchronism with the operation of the sense amplifier, after the data of the memory cell selected in a read-out operation has been transferred to said bit lines.

4,712,195

SOLID-STATE CUMULATIVE OPERATIONS MEASUREMENT SYSTEM

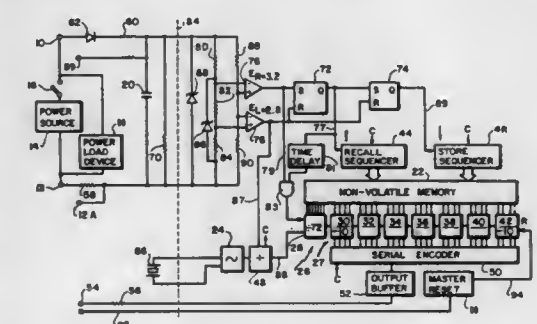
Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mt. Kisco, N.Y.

Filed May 9, 1986, Ser. No. 861,339

Int. Cl.⁴ G11C 13/00

U.S. Cl. 365—226

26 Claims



1. A cumulative operations measurement system for connection to a source of supply voltage and operable in response to

an operating voltage for accurately measuring a summation of the operations when that operating voltage is present, said system comprising a capacitor connected to be charged by the supply voltage, a volatile multiple-stage memory register connected to receive the operating voltage signals to be counted at the low order end thereof and operable to store said signals as a measure of total operations, a nonvolatile multiple-stage memory register having stages corresponding to at least some of the stages of said volatile memory register, means for detecting when the supply voltage is removed, a store sequencing means connected to be powered by the energy stored in said capacitor and connected to said last-named means and operable in response thereto to transfer the count stored in said volatile memory register into said nonvolatile memory register for storage therein, means for detecting when the supply voltage is applied, a recall sequencing means connected to said last-named means and operable in response thereto to transfer the count stored in said nonvolatile memory register into said volatile memory register.

4,712,196

DATA PROCESSING APPARATUS

Yoshinori Uesugi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

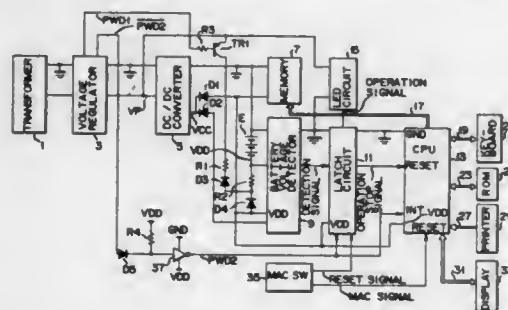
Filed Oct. 17, 1985, Ser. No. 788,251

Claims priority, application Japan, Dec. 21, 1984, 59-268545

Int. Cl.⁴ G11C 29/00

U.S. Cl. 365—229

18 Claims



1. A data processing apparatus with a memory back-up system comprising:

data storing means for storing data;
data processing means, coupled to said data storing means, for processing data stored in said data storing means;
main power supply means for supplying electrical power to said data storing means and to said data processing means;
back-up battery means;

switching means coupled to said back-up battery means for supplying electrical power of said back-up battery means to said data storing means when the electrical power of said main power supply means is not supplied to said data storing means, and for immediately supplying the electrical power of said main power supply means to said data storing means when said power of said main power supply means can be supplied to said data storing means;

detecting means, separate from and operable independently of said data processing means, for detecting when an output voltage of said back-up battery means falls below a predetermined voltage level below which said back-up battery means is incapable of supplying sufficient output voltage to enable said data storing means to retain data when the power of said back-up battery means is supplied to said data storing means, and for outputting a detection signal indicating that said output voltage of said back-up battery means has fallen below said predetermined voltage level;

retaining means for receiving and retaining said detection signal from said detecting means; and

display means for producing a predetermined display in accordance with said detection signal of said retaining means when power is supplied from said main power

supply means to thereby display that said voltage of said back-up battery means has fallen below said predetermined voltage value.

4,712,197

HIGH SPEED EQUALIZATION IN A MEMORY

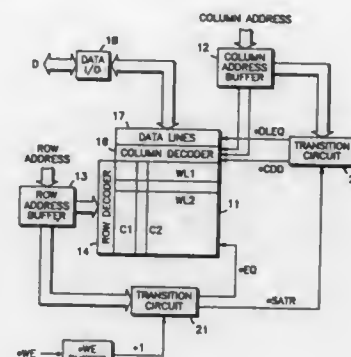
Lal C. Sood, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 28, 1986, Ser. No. 823,446

Int. Cl.⁴ G11C 8/00

U.S. Cl. 365—230

20 Claims



1. A memory having a write mode, indicated by a write enable signal being in a first logic state, for writing data into a selected memory cell via a selected bit line pair, and a read mode, indicated by the write enable signal being in a second logic state, for reading data provided onto a selected bit line pair, comprising:

a plurality of memory cells located at intersections of word lines and bit line pairs, each memory cell receiving data from or providing data to the bit line pair to which it is coupled when the word line to which it is coupled is enabled;

a row decoder, coupled to the word lines, for enabling a selected word line as determined by a row address; equalization means, coupled to the bit line pairs, for equalizing the voltages on the bit line pairs in response to receiving an equalization signal; and

transition detection means for providing the equalization signal in response to either a transition of the write enable signal from the first logic state to the second logic state or a transition of the row address or both.

4,712,198

PROCESS FOR OPTIMIZING THE FREQUENCY SPECTRUM OF PULSES EMITTED BY AN EMISSION DEVICE COMPRISING SEVERAL SEISMIC IMPLOSION FORCES

Jean-Pierre Fail, Royan, France, assignor to Institut Français du Pétrole, Rueil-Malmaison, France

Filed Jun. 17, 1985, Ser. No. 745,228

Claims priority, application France, Jun. 18, 1984, 84 09621

Int. Cl.⁴ G01V 1/38

U.S. Cl. 367—23

3 Claims



1. A process for optimizing the frequency spectrum of the

pulses emitted by an emission device formed by a plurality of seismic implosion sources and resulting from the combination of the individual pulses emitted by said implosion sources, each of said individual pulses comprising a precursor peak followed by an implosion peak, delayed by a pseudo-period with respect to the precursor peak, which precursor peak occurs a time lapse after tripping of the implosion source, said process comprising:

immersing the implosion sources at different selected depths, so as to give them distinct pseudo-periods;
determining the effective pseudo-period of each of the sources as a function of the selected depth to which the sources is immersed;

determining, for each of the sources, the propagation time interval of acoustic waves over the distance from a water surface to said source;

determining, as a function of said pseudo-period and of said respective propagation time intervals, and of said respective time lapse, time lags which should separate the tripping times of the sources for phasing the implosion peaks of the different pulses emitted after propagation, while keeping out of phase the precursor peaks of the different implosion sources, and

sequentially tripping said sources while utilizing the previously determined time lags, whereby the ratio of the amplitude of the resulting implosion peak to that of the whole of the precursor peaks is increased providing for an improved frequency spectrum.

4,712,199

PROCESS FOR CONTROLLING THE STORAGE OF DATA RECEIVED BY A SEISMIC RECORDING SYSTEM AND A DEVICE FOR IMPLEMENTING SAME

Joseph Rialan, Meudon, and Renate Bary, Rueil-Malmaison, both of France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France

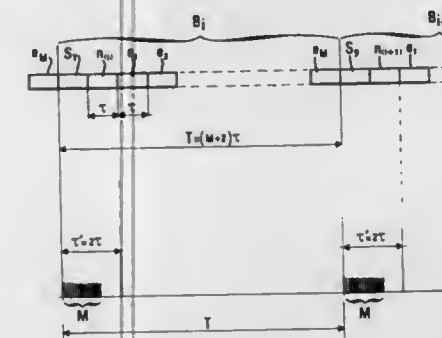
Filed Nov. 26, 1985, Ser. No. 801,764

Claims priority, application France, Nov. 30, 1984, 84 18424

Int. Cl.⁴ G01V 1/00; G06K 5/00

U.S. Cl. 367—76

8 Claims



1. A process for controlling storage by a recording system of signals derived from seismic signals emanating from subterranean discontinuities in response to waves generated by a seismic source, said seismic signals being received by sensors, and signals produced by said sensors being collected by a plurality of acquisition devices which operate to sample, digitize and store received signals in the form of a series of samples, each series of samples concerning the same signal and being associated with control signals for detection of possible transmission errors, the different series of samples stored respectively by the different acquisition devices being transmitted sequentially to the recording system, said process comprising:

subdividing each series of samples to be transmitted from an acquisition device into a plurality of blocks each containing an arbitrary number of samples which is the same for all the series, and forming a signal train for transmission in which each one of said blocks is separated from the other blocks by a timing signal and is provided with an identification signal defining its order number in the signal train;

transmitting a signal train from an acquisition device to said recording system;

first checking in said recording system for detection of the successive timing signals heading each block of a received signal train;

second checking in said recording system for detection of an identification signal associated with each block for which a timing signal has been detected to determine if a correct block has been received;

third checking in said recording system the number of samples in each received block for which the identification signal indicates that a correct block has been received; validating blocks comprising a number of received samples greater than a given value as determined in said third checking; and

transferring each of the validated blocks to a position of a recording medium previously assigned to said block, whereby seismic traces corresponding respectively to the transmitted series can be plotted, respecting exact timing of reception.

4,712,200

DEVICE FOR PROCESSING MODULATED SIGNALS RECEIVED BY A LATERAL SONAR SYSTEM

Jean-Pierre Casson, Paris, France, assignor to Institut Français du Pétrole, Rueil-Malmaison, France

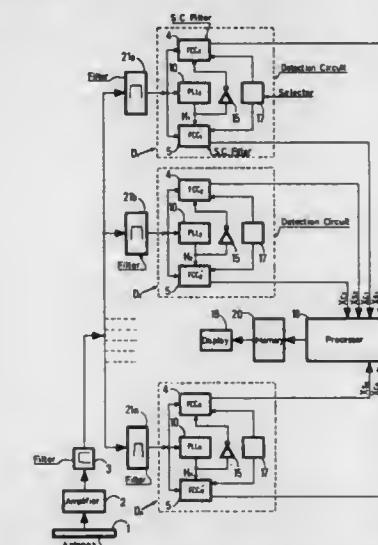
Filed Apr. 8, 1985, Ser. No. 720,793

Claims priority, application France, Apr. 6, 1984, 84 05616

Int. Cl.⁴ G01S 9/66, 9/68

U.S. Cl. 367—88

8 Claims



1. A device for processing amplitude and phase modulated signals received at each transmission-reception cycle by a side-looking sonar system, these signals being the echoes back-scattered by the surface at the bottom of a mass of water of sound pulses transmitted from a vehicle carrying said sonar system, comprising: filtering means connected to receive said amplitude and phase modulated signals for selecting at least one frequency band in the frequency spectrum of the signals received; demodulation assembly means, including local oscillator means, for producing a reference signal and combination means for generating, from said received filtered signals and from the reference signal, signals corresponding to the quadrature components of the complex amplitude of the received signals; processor means for calculating said complex amplitude from its quadrature components; and display means for representing the variations of said complex amplitude, as a function of time, at each transmission-reception cycle; wherein said local oscillator means is included in a phase locked loop circuit connected to said filtering means whereby the frequency of said reference signal depends on that of the filtered signals irrespective of any Doppler shift affecting received signals.

4,712,201

ACOUSTIC SELF-GUIDANCE SYSTEMS FOR SUBMARINE VEHICLES

Michel Lagier, Paris, France, assignor to Thomson CSF, Paris, France

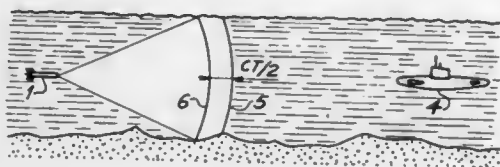
Filed Feb. 16, 1979, Ser. No. 22,115

Claims priority, application France, Feb. 17, 1978, 78 04526

Int. Cl.⁴ G01S 9/66

U.S. Cl. 367-92

11 Claims



1. A self guidance system for a submarine vehicle moving toward a target near the surface of the sea and carrying a parametric sonar comprising:

means for transmitting sound waves

means for receiving sound waves reflected from a target

means for forming r receiving beams wherein $r \geq 2$ in an angular aperture of bearing so as to define r sectors in said aperture,

means for forming $r \times q$ transmitting beams, wherein $q \geq 2$ so as to define q subsectors in said r sectors

first generator means generating a main frequency F and second generator means generating q frequencies F_1, F_2, \dots, F_q , said latter being called primary frequencies or high frequencies

switching means connected to said second generator means for selecting one of said primary frequencies F_1, F_2, \dots, F_q

a plurality of filtering means, each centered on one of secondary frequencies, such as $f_1 = F - F_1, f_2 = F - F_2, \dots, f_q = F - F_q$

first clock generator means H_1 of period T_1 , T_1 being the period of transmitting said main frequency

second clock generator means of period T_2 , T_2 being the duration of transmitting at one of said primary frequencies, both said clock generator means controlling said first and second generator means

an adding circuit connected to said first and second generator means delivering to said transmitting beams forming means signals on said main frequency and on one of said selected primary frequencies, said transmitting beams forming means being controlled by said clock signals H_2 and H_1 , forming beams in one of said $r \times q$ subsectors

said receiving means receiving sound waves reflected from a target on said secondary frequencies, being connected to said receiving beam forming means, latter being controlled by said clock signals H_2 and H_1 , forming beams in one of said r sectors, said plurality of filtering means centered on each secondary frequency receiving the signals from said receiving beam forming means and at the output of said filtering means are obtained the q receiving channels called frequential channel for each of said sectors.

4,712,202

METHOD AND APPARATUS FOR CONVERTING AN AIR GUN INTO A HYDRO GUN FOR MARINE SEISMIC IMPULSE GENERATION

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Technology Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 579,389, Feb. 13, 1984,

abandoned. This application Dec. 12, 1984, Ser. No. 680,733

Int. Cl.⁴ G01V 1/14, 1/38

U.S. Cl. 367-144

49 Claims

1. Apparatus for converting a submersible seismic source air gun of the type which includes elongated housing means hav-

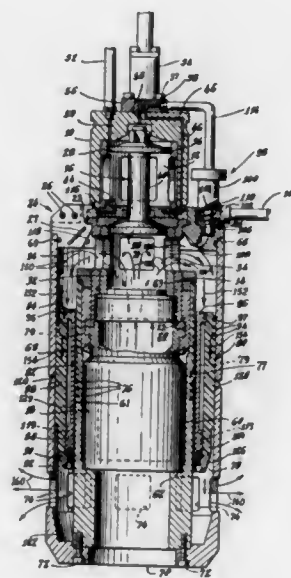
ing at least one air discharge port for impulsively discharging pressurized air therefrom in response to actuation of a firing means, into a hydro gun, which comprises:

annular cylinder head means mounted on said elongated housing means in a predetermined position near said air discharge port, said annular cylinder head means encircling said elongated housing means,

said predetermined position being on the upper side of said discharge port,

an elongated exterior cylinder secured to said annular cylinder head means and extending from said annular cylinder head means past said discharge port to a lower end of said elongated exterior cylinder remote from said annular cylinder head means,

said elongated exterior cylinder encircling said elongated housing means and being spaced outwardly away from said elongated housing means for defining an annular water cylinder space located between said elongated housing means and said elongated exterior cylinder,



said elongated exterior cylinder having at least two water ports therein communicating with said annular water cylinder space, said water ports being located near said lower end of said elongated exterior cylinder, said annular water cylinder space having a closed lower end near said lower end of said elongated exterior cylinder, a movable annular water piston located in said annular water cylinder space, annular water piston being movable between an upper position near said air discharge port and a lower position near said closed lower end of said annular water cylinder space, and

said air discharge port communicating with said annular water cylinder space in a regain between said annular cylinder head means and said annular water position for causing said annular water piston to move from said upper position to said lower position upon discharge of pressurized air through said air discharge port for expelling water from said annular water cylinder space through said water ports.

4,712,203

METHOD AND APPARATUS FOR THERMO MAGNETIC RECORDING/ERASING INFORMATION WITH PRESELECTED MAGNETIC FIELD SWITCHING

Atsushi Saito, Ichikawa; Masahiro Ojima, Tokyo; Takeshi Maeda, Kokubunji, and Tsuyoshi Kato, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

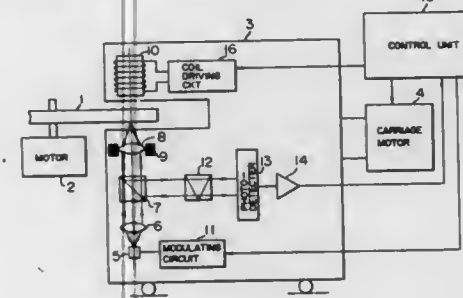
Filed Jun. 12, 1985, Ser. No. 743,974

Claims priority, application Japan, Jun. 13, 1984, 59-120000

Int. Cl.⁴ G11B 11/14, 13/04, 5/024

U.S. Cl. 369-13

8 Claims



1. A method of processing information for a recording member having a recording film capable of recording and erasing information by changing the direction of magnetization of the recording film, in which recording and erasing operations are effected on the basis of a light induced thermo-magnetic effect, and in which reproducing operation is effected on the basis of a magneto-optic effect, comprising the steps of:

providing said recording member in the form of a disk having a plurality of tracks each corresponding to the circumference of said recording member formed on said recording member, each of said tracks being divided into a plurality of sectors, and each sector having a header portion for storing a header signal which includes a sector number for identifying the sector, and a data portion following said header portion for recording magnetization information;

focusing a laser beam on said recording film so that a light spot is formed on said recording film;

applying a magnetic field to said recording film;

changing the direction of said magnetic field at least between said recording operation and said erasing operation so that a magnetic field having a desired direction corresponding to an operation which is to be performed for a desired sector is applied to said recording film, the change of the direction of said magnetic field being effected when said light spot is positioned on a sector which precedes said desired sector by a predetermined number of sectors; and

changing the intensity of said laser beam into a first level capable of extinguishing the magnetization of said recording film so as to perform at least one of said recording and erasing operations when said light spot is positioned on said desired sector.

4,712,204

OPTICAL DISK AND METHOD FOR REPRODUCING REFERENCE SIGNAL THEREFROM

Yoshinari Takemura, Osaka; Kazuaki Obara, Kadoma, and Michiyoshi Nagashima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 23, 1985, Ser. No. 768,843

Claims priority, application Japan, Aug. 31, 1984, 59-181752; Dec. 7, 1984, 59-259478

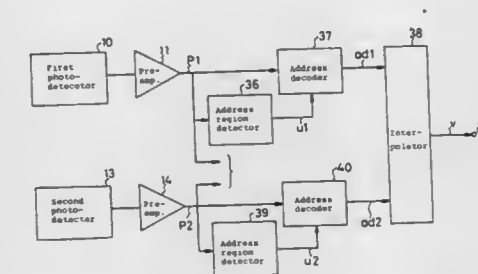
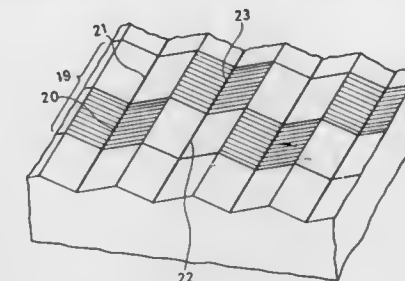
Int. Cl.⁴ G11B 7/00, 27/10

U.S. Cl. 369-32

9 Claims

1. An optical disk comprising:

a disk having grooves of helical or circular pattern thereon, each groove having a V-shaped cross-section, a plurality of header regions on said grooves, each header region having a reference signal recorded in a groove in



the form of a changed depth portion across a width of said groove; said changed depth portions being disposed so that changed depth portions of adjacent grooves are spaced apart from each other in a longitudinal direction of the grooves.

4,712,205

OPTO-ELECTRONIC FOCUSING-ERROR DETECTION SYSTEM WITH A COMPOUND WEDGE BEAM SPLITTER

Albert Smid; Peter F. Greve, and Hendrik 't Lam, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

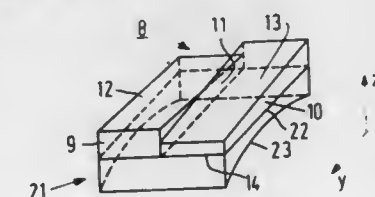
Filed Dec. 17, 1984, Ser. No. 682,226

Claims priority, application Netherlands, Oct. 5, 1984, 8403034

Int. Cl.⁴ G11B 7/00

U.S. Cl. 369-45

17 Claims



13. An apparatus for reading and/or recording information arranged in tracks on a reflective surface of a record carrier, said apparatus comprising means for producing a beam of radiation, means for focusing said beam to a spot on said reflecting surface, a beam splitting element for splitting the radiation reflected by said reflecting surface into a pair of sub-beams and a detection system having a first and second pair of detectors, each detector being adapted to convert radiation incident thereon into an electrical signal and the detectors of each pair being spaced from each other so as to form an elongated separation strip therebetween, said detectors being arranged with respect to said beam splitting means so that each of said sub-

beams is incident on a respective one of said first and second pair of detectors with the intensity of the radiation incident on at least one of said detectors having a first value when said beam is focused properly on said reflecting surface and a second value when said beam is not properly focused on said reflecting surface, and means coupled to said detectors for deriving a focusing error signal from said electrical signals, said beam splitting element being configured so that temperature changes thereof cause the radiation of the respective sub-beam to move along the associated separating strip in the longitudinal direction thereof so as to reduce the effects of temperature changes on said focusing error signal.

4,712,206

TRACKING ERROR SIGNAL DETECTING DEVICE WITH A TWO-BEAM SYSTEM FOR USE IN AN OPTICAL INFORMATION MEMORY

Shigeto Kanda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

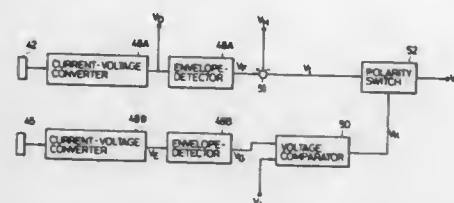
Continuation of Ser. No. 574,061, Jan. 26, 1984, abandoned. This application Feb. 27, 1987, Ser. No. 20,175

Claims priority, application Japan, Jan. 31, 1983, 58-12652

Int. Cl.⁴ G11B 7/09, 7/095

U.S. Cl. 369-46

5 Claims



1. A tracking error signal detecting device for use in an optical information memory comprising:

- means for applying a first light beam spot on a substantially central position of a track formed on an information carrying member and applying a second light beam spot on a position of said track which is spaced from the incidence position of the first light beam spot at least in a direction orthogonal to a direction of tracing of the track;
- means for independently photoelectrically converting light beams obtained from said first and second light beam spots respectively and modulated by said track;
- means for effecting envelope-detection with respect to outputs of said photoelectrically converting means to produce first and second detection signals;
- means for obtaining a difference between said first detection signal and a pre-set first reference value signal to produce an error signal;
- means for comparing said second detection signal with a pre-set second reference value signal to produce a polarity signal; and
- means for changing over the polarity of the error signal in accordance with the polarity signal to derive a tracking error signal.

4,712,207

APPARATUS FOR ERASING INFORMATION ON A REVERSIBLE OPTICAL RECORDING MEDIUM

Charles W. Reno, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 18, 1985, Ser. No. 712,678

Int. Cl.⁴ G11B 7/00

U.S. Cl. 369-121

14 Claims

1. In an optical recording system for processing information on a surface of a record medium, said recording system including source means for providing a collimated light beam of generally circular cross-sectional shape; a beam expander positioned in the path of said collimated light beam for expanding said beam, said beam expander including input and output

lenses; and an objective lens for focusing the beam passed by said beam expander to a generally circular diffraction spot on said surface of said record medium; an apparatus for elongating said generally circular diffraction spot focused on said record medium surface, said apparatus comprising:

- means for anamorphically focusing a collimated light beam, said focusing means focusing a first aspect of a cross sec-



tion of said collimated light beam at a finite distance f , and focusing a second aspect of said cross section orthogonal to said first aspect at an infinite distance; and means for positioning said focusing means intermediate said source means and said beam expander at a distance f from the principal plane of said input lens of said beam expander.

4,712,208

DISC REPRODUCING SYSTEM FOR COMPENSATING MECHANICAL IMPERFECTIONS

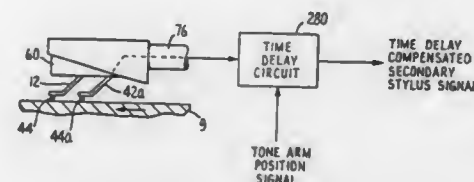
Ray M. Dolby, 50 Walnut St., San Francisco, Calif. 94118

Continuation-in-part of Ser. No. 5,992, Jan. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 859,799, Dec. 12, 1977, abandoned, and a continuation-in-part of Ser. No. 965,423, Dec. 1, 1978, abandoned. This application Feb. 2, 1981, Ser. No. 230,423

Int. Cl.⁴ G11B 3/04

U.S. Cl. 369-128

30 Claims



1. In a system for reproducing phonograph records having a movable tone arm carrying a cartridge and pickup stylus, having an arm-cartridge resonant frequency, for tracking the record groove, apparatus for deriving reference path information as to the vertical location of an unmodulated surface of the record in the vicinity of the pickup stylus comprising

- means for sensing the vertical location of the movable tone arm to provide tone arm information which includes arm-cartridge resonant effects,
- means for sensing the support arm to unmodulated record surface distance in the vicinity of the stylus to provide reference path-arm information which includes arm-cartridge resonant effects,
- means for time delaying said reference path-arm information, and
- means for combining said tone arm information and reference path-arm information out of phase to provide reference path information wherein arm-cartridge resonant effects are substantially reduced.

4,712,209

MONITORING APPARATUS CAPABLE OF MONITORING A DIGITAL EQUIPMENT BY THE USE OF A SYNCHRONIZATION SIGNAL

Kazushige Kuritani, and Tatsuhiko Nakagawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

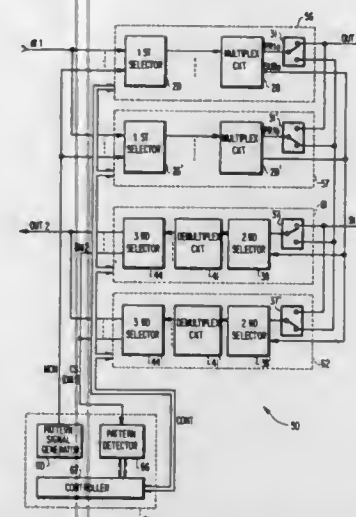
Filed Dec. 10, 1985, Ser. No. 807,082

Claims priority, application Japan, Dec. 10, 1984, 59-260532

Int. Cl.⁴ H04J 1/16, 3/12

U.S. Cl. 370-13

6 Claims



1. In a monitoring apparatus for monitoring digital equipment for multiplexing a plurality of input signals into a single output signal and for demultiplexing a single input signal into a plurality of output signals, each of said plurality of input signals including an original synchronization signal of a predetermined pattern, said single input signal including an input synchronization signal of an input pattern, each of said plurality of output signals including an output synchronization signal of an output pattern into which said input pattern is demultiplexed, said monitoring apparatus circulating a monitoring signal through said digital equipment and receiving from said digital equipment a circulated signal which results from said monitoring signal, the improvement wherein said monitoring apparatus comprises:

- signal generating means for generating as said monitoring signal a pattern signal identical with said predetermined pattern;
- signal supplying means for supplying said monitoring signal to said digital equipment, wherein said digital equipment produces said circulated signal by forming a single path for said monitoring signal; and
- monitoring means, connected to said signal supplying means, for monitoring said circulated signal to detect whether or not said circulated signal has said predetermined pattern.

4,712,210

SIGNAL CONVERSION CIRCUIT FOR INTERCONNECTING COAXIAL CABLE AND A TWISTED PAIR

Loren G. Davis, New Brighton; Steven R. Schmitz, St. Bonifacius, and Dennis L. Taner, Jordan, all of Minn., assignors to Lee Data Corporation, Eden Prairie, Minn.

Filed Sep. 7, 1984, Ser. No. 648,061

Int. Cl.⁴ H04J 3/02

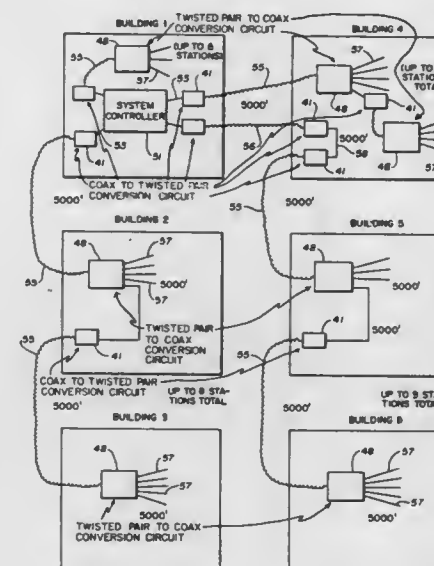
U.S. Cl. 370-77

19 Claims

1. An interface module for converting computerized data transmitted via coaxial cable to a different transmission format for transmission on a single communications medium other than coaxial cable, the interface module comprising:

- at least one coaxial connection;
- means for receiving the computerized data at high speed in a conventional bipolar coaxial format of the type having a

positive pulse immediately followed by a negative pulse, the pulse width of the true state of the signal being twice as long in duration as the pulse width of the false state; means for converting the computerized data to a bipolar digital format suitable for high speed transmission on the communications medium said bipolar transmission format being characterized by a first positive pulse followed nonsequentially by a second negative going pulse, the true and false state of the signals being determined by the time divided position of the negative going pulse; means for transmitting the digital data on the communications medium in the converted format; means for receiving data in the format transmitted on the communications medium; means for converting the data from the format of the com-



munications medium to the format suitable for high speed transmission on coaxial cable; means for transmitting data in the conventional coaxial format suitable for transmission on the coaxial cable; means for monitoring each data transmission and controlling the transmission means so that half duplex operation is achieved; and means for monitoring the signal level of previous transmissions and controlling the gain of the received signal on the communications medium based on the signal level of the previous transmissions; wherein at least one of the means for converting data comprises a bit latch connected to the received signal in the received format to determine whether a true state or a false state is to be transmitted in the converted format by at least one of the means for transmitting data.

4,712,211

NETWORK SYSTEM UTILIZING AN INTERMEDIATE SYNCHRONIZATIONS SIGNAL AND PREDETERMINED CODE STRING PATTERNS

Tadashi Suzuki, Yokohama; Kazuyoshi Okada, and Noriyuki Abe, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Mar. 5, 1986, Ser. No. 836,622

Claims priority, application Japan, Mar. 25, 1985, 60-58270; Mar. 25, 1985, 60-58271

Int. Cl.⁴ H04J 3/06; H04L 7/00

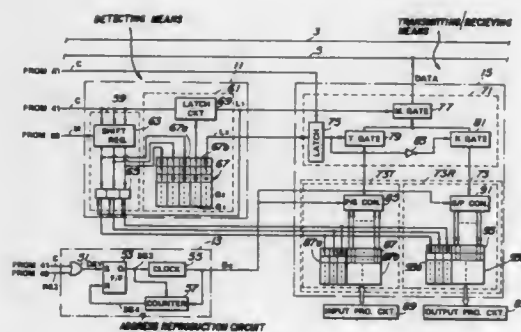
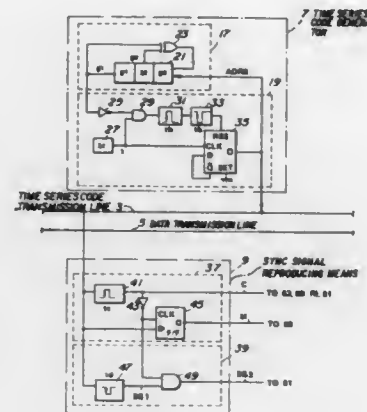
U.S. Cl. 370-100

20 Claims

1. A network system having a plurality of interconnected data processing stations, comprising:

- (a) first means for generating and transmitting a periodic first

- pulse train signal according to a predetermined time series code string;
- (b) second means for processing the first pulse train signal received from said first means to form at least one intermediate synchronization signal and one of a plurality of predetermined code string patterns sequentially together with the synchronization signal during a time slot defining at least one code of the predetermined time series code;
- (c) third means, including a data transmission and reception enable clock, for outputting a data transmission and reception enable clock signal whenever each time slot defining any one code of said predetermined time series code string is started, while correcting a frequency variation of said data transmission and reception enable clock by means of



- said intermediate synchronization signal received from said second means;
- (d) fourth means for determining whether one of said plurality of predetermined code string patterns received from said second means accords with a predetermined code indicating an address; and
- (e) fifth means for carrying out at least one of transmission and reception of a data of a predetermined number of bits in a Non-Return-To-Zero code in synchronization with said corrected data transmission and reception enable clock signal received from said third means depending on the contents of said predetermined address code when said fourth means determines that the one of said plurality of predetermined code string patterns accords with said predetermined address code.

4,712,212 TERMINAL CONTROL DEVICE FOR REFERENCE STATION IN TDMA SATELLITE COMMUNICATION SYSTEM

Haruki Takai; Mikio Ujile, and Hideki Nakamura, all of Tokyo, Japan, assignors to NEC Corporation, Japan

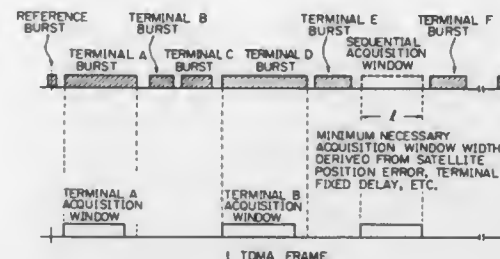
Filed Jan. 21, 1986, Ser. No. 820,602

Claims priority, application Japan, Jan. 24, 1985, 60-9815[U]

Int. Cl.⁴ H04J 3/06

U.S. Cl. 370-104

1 Claim



1. A terminal control device for a TDMA satellite communication system which includes a reference station and a plurality of TDMA terminals and causing the reference station to perform regular synchronization control and initial acquisition control for each of the terminals, said device comprising:

- a window information generator for generating information to select particular information and a particular acquisition mode responsive to a burst arrangement of the reference station and the terminals in a TDMA frame;
- a regular window generator for generating information for providing a regular synchronization control window in each of regular synchronization positions of the respective terminals in the TDMA frame;
- a parallel acquisition control window generator for generating information for providing an acquisition window particular to any one of the terminals in an acquisition control position in the TDMA frame which is particular to said terminal;
- a sequential acquisition control window generator for generating information for providing a common acquisition window in the TDMA frame which is shared by at least two of the terminals;
- a window selector for selecting one of the informations which are representative of said three terminal control windows;
- a burst receiver for receiving a burst which is sent from each of the terminals to detect a synchronizing code in the burst;
- a receive timing generator for setting up a time reference for reception at the reference station responsive to a reference burst detection output which is produced by said burst receiver and, thereby, generating various timings which the device uses;
- a burst detector for detecting whether or not a burst from any of the terminals has been received in any of the terminal control windows, and said burst detector further detecting burst position error information; and
- a control information generator for generating control information for the terminals responsive to burst receive state information which is outputted by said burst detector.

4,712,213 FLIP STATUS LINE

Alastair A. Warwick, Gloucester, United Kingdom; David P. Schenkel, Ottawa, and Kenny Y. Ng, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 11, 1985, Ser. No. 807,600

Int. Cl.⁴ G01R 31/28

U.S. Cl. 371-15

4 Claims

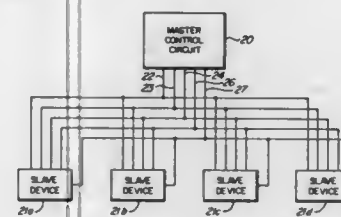


FIG. 1

STATUS	FLIP	LINE	SIGNIFICANCE
0	0	0	DOWN
1	0	0	WRITE
0	1	0	READ
1	1	0	UP
0	1	1	DOWN
1	1	1	WRITE
0	0	1	READ
1	0	1	UP

4. A method of verifying the operation of a device that is polled periodically, by a central control device, so as to report its current status, said method comprising the steps of:

- (a) polling said device and recording a first response received from said device at a central control device;
 - (b) instructing said device to invert the bits in said first response to generate a second response to reply to a successive polling of said device; and
 - (c) polling said device and determining if said second response received from said device indicates that said device has inverted the bits of its second response in relation to said first response;
- whereby a determination of the non-inversion of said bits in said second response in relation to said first response is indicative of either a fault condition or a device not present condition.

4,712,214 PROTOCOL FOR HANDLING TRANSMISSION ERRORS OVER ASYNCHRONOUS COMMUNICATION LINES

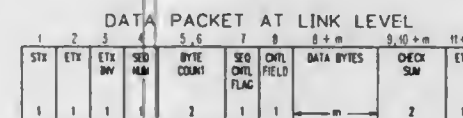
Clifford B. Meltzer, Peekskill; Krishnamurthi Kannan, Yorktown Heights; Thomas G. Burket, Pleasantville; Deborah J. Kruesi, Delmar, and Gordon W. Brandaway, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1986, Ser. No. 817,699

Int. Cl.⁴ G06F 11/10; G08C 25/00

U.S. Cl. 371-32

20 Claims



5. A method for detection of and recovery from transmission errors over asynchronous communication lines between transmitting and receiving stations, comprising the steps of:
- producing the transmissions in packets containing n bytes, with the first byte in each packet being coded as a start-of-transmission character STX;
 - selecting an end-of-transmission character ETX for each packet after the data to be transmitted in the packet has been assembled, which ETX character is different from

the remaining character codes in its respective packet and is made the second byte thereof;

making the third byte in each packet the complement of the ETX character selected for the respective packet;

making the bytes preceding the last three bytes in each packet data bytes;

making the next-to-last two bytes in each packet, checksum bytes;

making the last byte in each packet the same as the ETX character of the second byte to indicate the end of each packet, whereby the ETX character bytes are distinguishable from data bytes, and errors in either instance thereof are respectively checked by the third and second bytes in the packet, while data errors are checked by the checksums;

checking each packet for errors and halting transmission when an erroneous packet is detected;

discarding packets found to be erroneous; and

after an erroneous packet is detected and discarded, using the unique combination of said first four bytes to detect the packet with the fourth byte next following that of the last correct packet in said transmission sequence to determine the point at which transmission is to be resumed.

4,712,215 CRC CALCULATION MACHINE FOR SEPARATE CALCULATION OF CHECKBITS FOR THE HEADER PACKET AND DATA PACKET

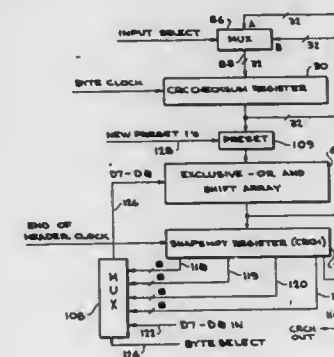
Sunil P. Joshi, Campbell, and Venkatraman Iyer, Berkeley, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1985, Ser. No. 803,367

Int. Cl.⁴ G06F 11/10

U.S. Cl. 371-37

35 Claims



16. An apparatus for calculating a first plurality of CRC bits on a header packet and a second plurality of CRC bits comprising:
- CRC checksum register means for storing a plurality of bits of data present at a plurality of inputs upon receipt of a byte clock signal at a byte clock input and for presenting the stored data at a plurality of data outputs;
 - second means for receiving the data at said data outputs and for passing it through to a plurality of data outputs except when a NEW PRESET signal is in a predetermined logic state, at which time said data outputs are forced to a logic one state;
 - calculation means for receiving data bits from said second means and raw input data bits at a raw data input and shifting predetermined bits in a predetermined fashion while performing an exclusive-OR operation between predetermined bits during predetermined shifts with predetermined signals and presenting the results at a plurality of data outputs coupled to the data inputs of said CRC checksum register means;
 - a snapshot register having a clock input for receiving and END OF HEADER clock signal, and having a plurality of inputs coupled to said data outputs of said calculation

estimating a phase error from the difference between an angle of said vector and a predetermined angle; and, adjusting the phase of a reference oscillator according to said estimated phase error for phase locking said modulated signal and said reference oscillator.

4,712,222

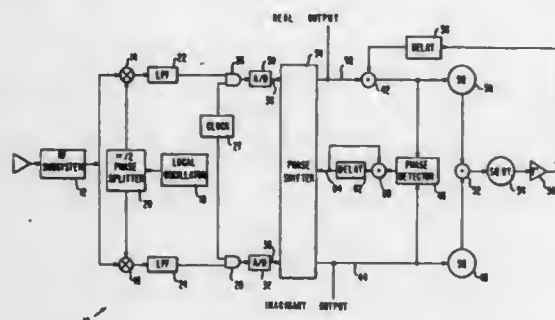
ADAPTIVE RECURSIVE PHASE OFFSET TRACKING SYSTEM

Charles M. Heard, Venice, and Frank C. Yang, Anaheim, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 328,178, Dec. 7, 1981, abandoned. This application Jun. 17, 1985, Ser. No. 745,814 Int. Cl.⁴ H03D 1/24

U.S. Cl. 375-77

6 Claims



1. An adaptive recursive phase offset tracking system for acquiring and tracking a received electromagnetic data signal comprising:

- means for generating a complex baseband signal from the received signal;
- means for sampling the baseband signal to derive a plurality of complex samples;
- first filter means for deriving a track quality indication from the complex samples;
- second filter means having a bandwidth controlled by the track quality indication for extracting a phase estimate from the complex samples; and
- means for correcting the received data signal in response to the phase estimate to substantially compensate for a phase offset in the received data signal.

4,712,223

LINEAR ALL-DIGITAL PHASE LOCKED LOOP

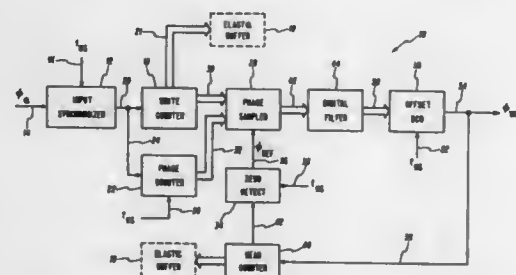
Blaine J. Nelson, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1986, Ser. No. 917,335

Int. Cl.⁴ H03L 7/18; H04L 7/02

U.S. Cl. 377-43

9 Claims



1. A linear all-digital phase locked loop for providing an output signal comprising a stable reference clock signal from a

gapped input clock signal, said digital phase locked loop comprising:

- a digitally controlled oscillator means for generating an output signal having a linear transfer function;
- a read counter means operatively coupled to receive said output signal from said digitally controlled oscillator means, said read counter means being operatively configured to provide a sampling reference signal to said linear all-digital phase locked loop at a predetermined time;
- an input synchronizer means operatively coupled to receive a gapped input clock signal and to synchronize said gapped input clock signal to a local high speed reference clock signal received by said input synchronizer means;
- means for applying the gapped input clock signal to said input synchronizer means;
- write counter means operatively coupled to receive the gapped input clock signal which is output from said input synchronizer means, said write counter means being configured to be incremented in count by the leading edge of each pulse of said received gapped input clock signal;
- phase counter means operatively coupled to receive the gapped input clock signal which is output from said input synchronizer means, said phase counter means being configured to run at a predetermined higher frequency than said write counter means such that said phase counter means counts to a predetermined integer number for each normal count of said write counter means, said phase counter means being configured to being reset to zero by the leading edge of each pulse of said gapped input clock signal;
- sampling means operatively coupled to receive an output signal from said write counter means and an output signal from said phase counter means, said sampling means being configured to add said output signals together to provide a resulting signal upon receipt of said sampling reference signal output from said read counter means and to provide said resulting signal, in the form of a digital word with integer and fractional parts, as an input to said digitally controlled oscillator means.

4,712,224

OFFSET DIGITALLY CONTROLLED OSCILLATOR

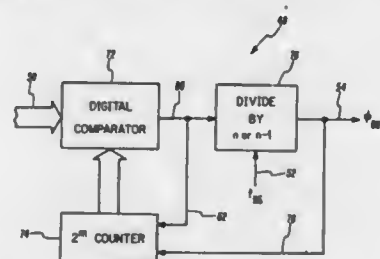
Blaine J. Nelson, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1986, Ser. No. 917,343

Int. Cl.⁴ H04L 7/02; H03L 7/18

U.S. Cl. 377-43

8 Claims



1. An offset digitally controlled oscillator for receiving an input signal representing a digital number and generating an output pulse signal having a linear transfer function, said offset digitally controlled oscillator comprising:

- divider means operatively coupled to receive a reference clock signal of a predetermined frequency and structured to divide said reference clock signal by n and provide an output pulse signal for every n cycle of the reference clock signal;
- counter means operatively coupled to receive said output pulse signal from said divider means and to provide an output signal representing the count in said counter means, said counter means structured to be incremented

by said output pulse signal received from said divider means;

digital comparator means operatively coupled to receive the output signal from said counter means and operatively coupled to receive said input signal representing a digital number, said digital comparator means operatively coupled to provide an output signal to said divider means when said output signal from said counter means is at least equal to or greater than said input signal representing a digital number; and

said divider means being structured, when receiving said output signal from said digital comparator, to divide the reference clock signal by $n-1$ and to reset the counter means to zero.

4,712,225

PHASE QUANTIZER APPARATUS

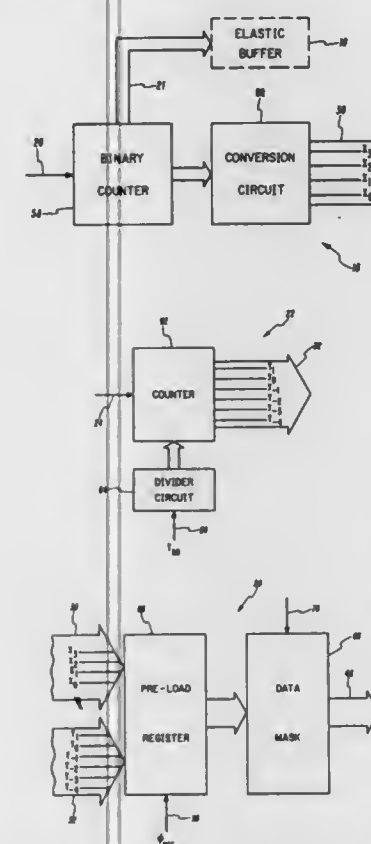
Blaine J. Nelson, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1986, Ser. No. 917,344

Int. Cl.⁴ H04L 7/02; H03L 7/18

U.S. Cl. 377-43

2 Claims



1. Phase quantizer apparatus for use in an all digital phase locked loop in a digital communications network to provide a two-part digital number representing the phase of a noncontinuous pulse train input signal relative to an output signal of the all digital phase locked loop, said phase quantizer apparatus comprising:

- a modulo m counter, said modulo m counter being structured to be incremented in count by the leading edge of each pulse in a noncontinuous pulse train input signal;
- a modulo n counter, said modulo n counter being structured to be reset to zero by the leading edge of each pulse in the noncontinuous pulse train input signal; and
- means for applying the noncontinuous pulse train input signal to said modulo m counter and said modulo n counter;
- said modulo m counter being structured to perform two separate and distinct functions and to provide a first out-

put signal and a second output signal, said modulo m counter being operatively coupled to apply said first output signal to an elastic buffer in a digital communications network to provide address information to the elastic buffer to read data into predetermined storage locations in the elastic buffer, said modulo m counter also being operatively coupled to apply said second output signal to means for combining, said second output signal being in the form of a two's complement code;

said modulo n counter being operatively coupled to receive the output signal from a high speed reference clock in the digital communications network, said modulo n counter being structured to divide said high speed reference clock signal such that the modulo n counter will count the number of cycles of the divided high speed reference clock signal between receipt of the leading edge of consecutive pulses of the noncontinuous pulse train input signal, said modulo n counter being structured to provide an output signal in the form of a digital count, said modulo n counter being operatively coupled to apply said output signal to said means for combining;

said second output signal from the modulo m counter is combined with the output signal from the modulo n counter in said means for combining to provide a representation of the phase of the noncontinuous pulse train input signal relative to the output signal of an all digital phase locked loop.

4,712,226

STEREOSCOPIC X-RAY TUBE

Heinz Horbaschek, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

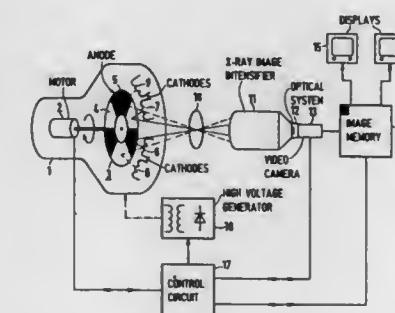
Filed Jul. 16, 1986, Ser. No. 886,081

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532822

Int. Cl.⁴ H01J 35/06

U.S. Cl. 378-134

7 Claims



1. An x-ray system having a stereoscopic x-ray tube to direct x-rays toward an examination subject, said stereoscopic x-ray tube comprising:

- an evacuated housing;
- an anode dish disposed in said housing divided into at least one pair of segments of identical size, each segment in a segment pair emitting x-radiation, means for enabling only one segment in a segment pair to substantially emit x-radiation toward said examination subject;
- at least two cathodes, wherein each cathode comprises a coil disposed in said housing, each coil having a focus associated therewith on said anode dish, the foci on said anode dish being spaced at a distance corresponding to an uneven multiple of the length of a track, which said focus would follow, within one of said segments; and
- means for rotating said anode dish.

4,712,227

X-RAY FILM HOLDER AND METHOD OF OPERATING SAME FOR OPTIONAL FLUOROSCOPIC OR RADIOGRAPHIC EXAMINATION OF A PATIENT
Hans-Erik Warden, Upplands Väsby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

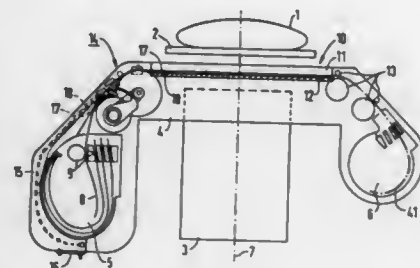
Filed Sep. 30, 1985, Ser. No. 781,451

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436427

Int. Cl.⁴ G03B 42/02

U.S. Cl. 378-173

19 Claims



9. A film changer for an X-ray diagnostics installation for supporting an X-ray film sheet between overlapping screen foils in a first mode for generating a radiographic image of a subject on said film and for use with an X-ray image intensifier in a second mode for generating a fluoroscopic image of said subject comprising:

- a recording unit disposed in front of said image intensifier and in which said film sheet is disposed for generating said radiographic image;
- a film storage magazine disposed on one side of said recording unit and communicating therewith via a film track, said film storage magazine containing at least one unexposed X-ray film sheet;
- a film take-up magazine disposed on an opposite side of said recording unit for receiving and storing exposed X-ray film sheets from said recording unit;
- means for moving a film sheet from said storage magazine to said recording unit for radiographic exposure therein;
- means for moving the exposed film sheet from said recording unit to said take-up magazine; a screen foil storage magazine disposed on said one side of said recording unit in which said screen foils are stored during said second mode;
- means for automatically moving said foils from said foil storage magazine to said recording unit in said first mode with one of said foils crossing said film track;
- means for automatically spreading said foils for receiving an unexposed film sheet therebetween via said film track from said film storage magazine; and
- means for automatically returning said foils to said foil storage magazine after a radiographic exposure of said film.

4,712,228

DAYLIGHT X-RAY CASSETTE HAVING A WEIGHT TO IMPROVE FILM RELEASE

Van B. Johnson, Towanda, and Salvatore J. Nicosia, Athens, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 8, 1986, Ser. No. 850,601

Int. Cl.⁴ G03B 42/04

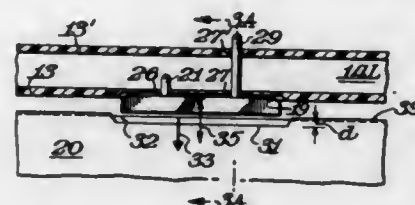
U.S. Cl. 378-185

10 Claims

1. In an X-ray cassette having a frame with inner and outer sides, a pair of plates mounted on the frame oriented to receive a film sheet therebetween, at least one of the plates being moveable.

the cassette defining an opening along a first side of the

frame for inserting and removing a film sheet relative to the plates, the improvement comprising:
a mass of at least 10 grams positioned within the cassette and movably secured to a second side of the frame opposite the first side, the mass being moveable from a second



position away from a film sheet in the cassette to a first position closer to the first side opening to engage such a film sheet and under the influence of gravity to apply a force on such a film sheet in a direction to assist its departure from the cassette through the first side opening when said side opening is facing downwardly.

4,712,229

MULTIPLE ACCESS RADIO TELEPHONE SYSTEM SELECTIVELY OPERATING ON FULL-DUPLEX AND HALF-DUPLEX MODES

Hiroyasu Nakamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

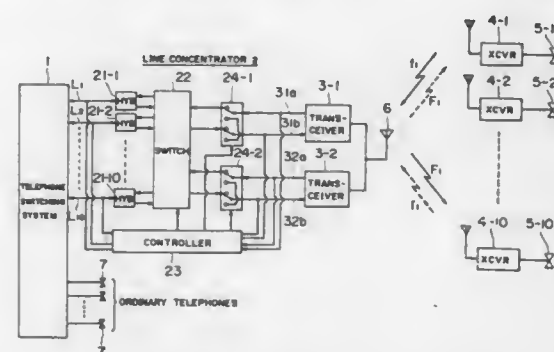
Filed Mar. 26, 1987, Ser. No. 30,400

Claims priority, application Japan, Mar. 26, 1986, 61-69279

Int. Cl.⁴ H04Q 7/01

U.S. Cl. 379-58

12 Claims



1. A multiple access radio telephone system adapted to be connected to a telecommunication switching system which provides switched connections between subscriber line terminals thereof, comprising:
means for establishing M two-way radio channels;
a group of N remote stations having N corresponding subscriber line terminals in said switching system and being accessible to a selected one of said two-way radio channels, where N is greater than M; and
a concentrator connected to said switching system and said channel establishing means for selecting an arbitrary one of said two-way radio channels and establishing a full-duplex mode connection between a switched one of said corresponding subscriber line terminals and said selected two-way radio channel in response to a first call-processing signal and establishing a half-duplex mode connection between two of said remote stations through said selected two-way radio channel in response to a second call-processing signal.

4,712,230

MONITORING AND RECORDING APPARATUS FOR CONNECTION TO A TELEPHONE LINE

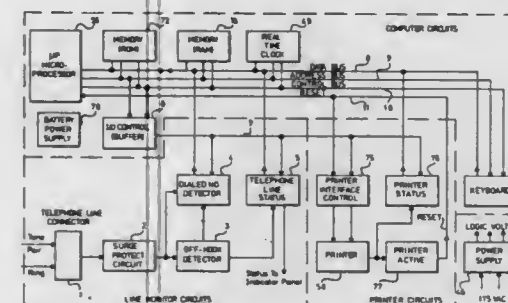
John E. Rice, 3456 El Segundo Blvd., Hawthorne, Calif. 90250; James M. Rice, 510 Roosevelt Rd., Long Beach, Calif. 90807, and Robert W. Rice, 5068 Anburn Dr., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 671,688, Nov. 15, 1984, abandoned. This application Jun. 2, 1986, Ser. No. 869,350

Int. Cl.⁴ H04M 15/04, 15/18, 15/22

U.S. Cl. 379-112

5 Claims



1. An improved telephone monitoring and recording apparatus for the purpose of monitoring multiple or single telephones for both outgoing and incoming calls, and recording desired identification of the call number, its time, data and duration, said telephone monitoring and recording apparatus comprising:

- (a) line monitor circuit means connected to the telephone line for sensing dialing, call start and completion and telephone status;
- (b) computer circuit means for processing signals from said line monitor circuit means;
- (c) printer circuit means operatively connected to said computer circuit means, for providing a record of telephone calling activities; and
- (d) a power supply; said line monitor circuit means including a telephone line input connector, a surge protect circuit, an off-hook detector circuit, a dialed number detector circuit and a telephone line status circuit; said line monitor circuit being capable of continuously monitoring outgoing and incoming telephone calls and signals created by both tone and rotary pulse dialing telephone systems, without need of manual selection or switching.

4,712,231

TELECONFERENCE SYSTEM

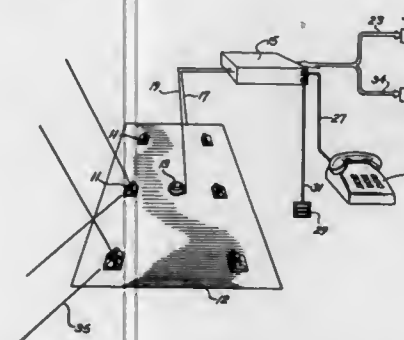
Stephen D. Julstrom, Evanston, Ill., assignor to Shure Brothers, Inc., Evanston, Ill.

Filed Apr. 6, 1984, Ser. No. 597,734

Int. Cl.⁴ H04M 1/60, 3/56

U.S. Cl. 379-202

27 Claims



1. A teleconferencing system for use with at least one communication link and for use with at least one microphone

which generates a microphone signal and for use with at least one loudspeaker for generating sound in response to a loudspeaker signal, comprising:

- input/output means for receiving from a communication link a receive signal carrying a distant speech signal which represents distant speech occurring in time, and for sending a send signal onto a communication link;
- microphone signal input means for receiving a microphone signal carrying a local speech signal which represents local speech occurring in time;
- loudspeaker output means for passing a loudspeaker signal to a loudspeaker;
- send mode/receive mode determining means for generating an electrical signal representative of a mode of suppression of either a send mode of suppression or a receive mode of suppression, said mode determining means detecting the occurrence of distant speech as represented by said distant speech signal carried by said receive signal and detecting the occurrence of local speech as represented by said local speech signal carried by said microphone signal, said determining means being responsive to the order in time of the detection of said distant speech and said local speech for generating said electrical signal representative of a said mode of suppression, said send mode/receive mode determining means including interrupt means for monitoring at least one occurrence within a predetermined time interval of both said local speech and said distant speech for switching said mode of suppression as represented by said electrical signal; and
- variable gain circuitry means for generating said loudspeaker signal, said loudspeaker signal carrying said distant speech signal in response to said receive signal, said variable gain circuitry means for generating said send signal, said send signal carrying said local speech signal in response to said microphone signal, said circuitry means including suppression means for controlling the gain of said loudspeaker signal and the gain of said send signal in accordance with the mode of suppression represented by said electrical signal.

4,712,232

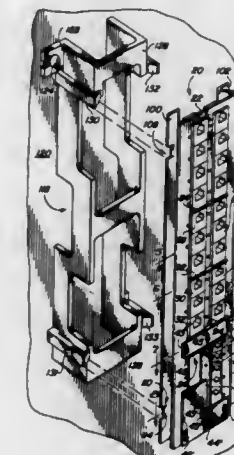
MULTIPLE TELEPHONE JACK SLIDE ASSEMBLY
E. Walter Rodgers, Glendale, Ariz., assignor to Armor Metals, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 839,740, Mar. 14, 1986, Pat. No. 4,658,418. This application Apr. 7, 1987, Ser. No. 35,517

Int. Cl.⁴ H05K 5/00

U.S. Cl. 379-329

10 Claims



1. A multiple telephone jack slide assembly for supporting a plurality of telephone jacks to be electrically interconnected with a wiring system, said assembly including:
(a) a sliding jack support member having at least one longitudinal channel formed therein, said channel being defined

by first and second generally opposing edge portions of said support member, said first and second generally opposing edge portions being separated by a predetermined distance generally corresponding to the width of said channel, said channel having an opening communicating therewith for permitting a telephone jack to be inserted into said channel;

- (b) a plurality of telephone jacks each having an upper surface opening into a cavity for releasably receiving a mating telephone cord plug, each of said telephone jacks further including a pair of opposing side walls extending downwardly from said upper surface and substantially perpendicular thereto, said opposing side walls being separated by a distance approximating the width of said channel, said opposing side walls including engaging means for slidably engaging said first and second generally opposing edge portions of said channel for permitting each of said plurality of telephone jacks to be slid into said channel from the opening thereof in order to support said plurality of telephone jacks within said channel; and
- (c) retaining means releasably fastened to said support member and abutting at least one of said plurality of telephone jacks for inhibiting further sliding movement of said plurality of telephone jacks after the same are slid into said channel.

4,712,233

MONOLITHIC TELEPHONE SUBSCRIBER LINE INTERFACE CIRCUIT

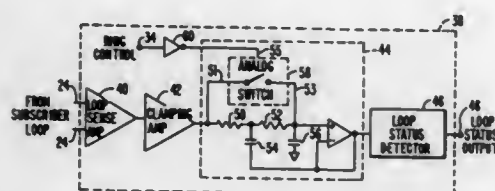
James R. Kno, Cupertino, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Apr. 22, 1985, Ser. No. 725,461

Int. Cl. H04M 3/22

U.S. Cl. 379-386

9 Claims



1. In a supervision circuit of a subscriber line interface circuit coupled to a subscriber line and having a filter, the improvement comprising:

means for detecting dialing pulses with a predetermined positive-going threshold and a predetermined negative-going threshold of approximately one-half said positive-going threshold; and

a clamping amplifier for clamping positive-going signals on said subscriber line to approximately 1.5 times said predetermined positive-going threshold.

3. In a supervision circuit of a subscriber line interface circuit having means for detecting an off-hook condition of a subscriber and dialing pulses, the improvement comprising:

a programmable filter having a first mode for attenuation of a ringing signal and adaptable to a second mode, responsive to detection of said off-hook condition, for providing said dialing pulses to said detecting means without significant attenuation.

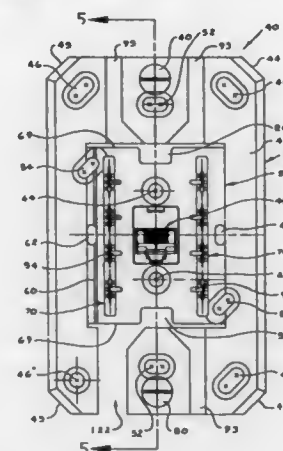
4,712,234 MULTI-PURPOSE MODULAR JACK CONNECTING BLOCK

Randy Below, Woodbury, Conn.; Howard Burke, Stone Mountain, Ga., and Stephen M. Thomas, Torrington, Conn., assignors to The Slemmon Company, Watertown, Conn.

Filed Mar. 1, 1985, Ser. No. 706,971

Int. Cl. H04M 9/00; H01R 13/502, 13/66, 13/73
U.S. Cl. 379-399

42 Claims



1. A modular jack connecting device comprising: plate means, said plate means having a front face and a rear face;
- at least one interior portion of said plate means being separable therefrom, said plate means having a central opening therethrough when said separable interior portion is separated from said plate means;
- at least one modular jack connecting means attached to said separable interior portion of said plate means, said modular jack connecting means having an opening therein to permit access to a modular plug means, said opening being in said front face of said plate means; and
- cover plate means for attachment to said separable interior portion subsequent to said separable interior portion being separated from said plate means, said cover plate means being disposed over said separable interior portion and having an opening therethrough in alignment with said modular jack connecting means opening.

4,712,235

METHOD AND APPARATUS FOR IMPROVED CONTROL AND TIME SHARING OF AN ECHO CANCELLER

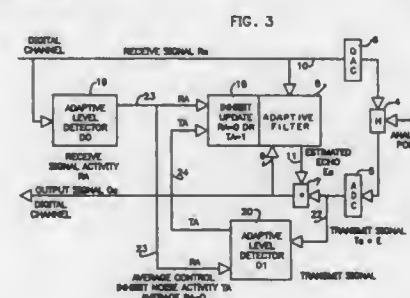
Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,968

Int. Cl. H04B 3/23

U.S. Cl. 379-410

8 Claims



1. An improved method of controlling coefficient calcula-

tion in an adaptive filter for an echo canceller comprising steps of:

- detecting received signal activity in a first adaptive level detector;
- providing an output signal from said first adaptive level detector indicative of detecting received signal activity therein;
- detecting combined noise and transmitted signal activity in a second adaptive level detector connected to receive said output signal, having an adaptive threshold level whose adaptive threshold is enabled to adapt by said output signal from said first adaptive level detector, and
- recomputing the coefficients in the adaptive filter when said first adaptive level detector indicates received signal activity and said second level detector indicates no combined noise and transmitted signal activity.

4,712,236

TELEPHONE HANDSET CONSTRUCTION

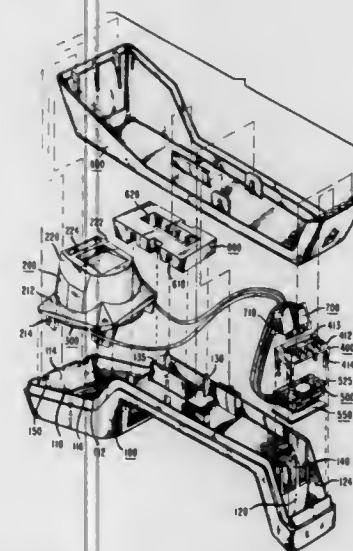
Reed S. Brown; John J. Consoli, both of Indianapolis, and Richard G. Klier, Greenfield, all of Ind., assignors to AT&T Information Systems Inc., American Telephone & Telegraph Company, Murray Hill, N.J.

Filed May 1, 1986, Ser. No. 857,865

Int. Cl. H04R 1/03

U.S. Cl. 379-433

7 Claims



1. A telephone handset comprising:
- a lower housing member having a pair of spaced transducer mounting positions;
- an individual transducer mounting member associated with each transducer mounting position, each transducer mounting member being accommodated by the associated transducer mounting position and each transducer mounting member having an upper surface that includes a recess for accommodating a bonding material;
- an individual transducer accommodated by each transducer mounting member and held in a transducer mounting position by the transducer mounting member in which it is accommodated; and
- an upper housing member adapted to mate with the lower housing member to form a handset housing, the upper housing member having pair of spaced elements that respectively extend into the recesses in the upper surface of the transducer mounting members when the upper housing member is mated to the lower housing member, the upper housing member being secured to the lower housing member by the bonding material in the recesses.

4,712,237 METHOD AND APPARATUS FOR UNSCRAMBLING SYNC-SUPPRESSED TELEVISION SIGNALS

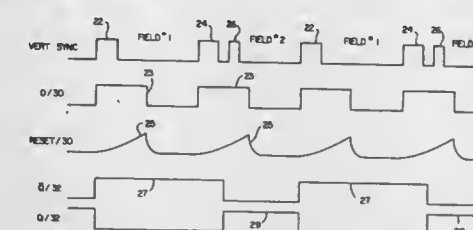
David L. Walker, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 29, 1984, Ser. No. 665,697

Int. Cl. H04N 7/167

U.S. Cl. 380-15

6 Claims



1. In combination:
- a television signal source of vertical sync signal including a field identifier in one of the fields;
- sync signal detection means for producing different output signals corresponding to each field; and
- timing signal generating means for generating timing signals for each field;
- said timing signal generating means being coupled to said sync signal detection means and responsive to said output signals.

4,712,238

SELECTIVE-SUBSCRIPTION DESCRAMBLING

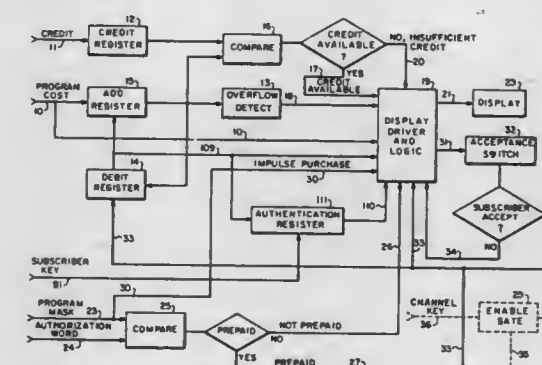
Klein S. Gilhousen; Jerrold A. Heller; Michael Van Harding, all of San Diego, and Robert D. Blakeney, II, Del Mar, all of Calif., assignors to M/A-COM Government Systems, Inc. and Cable/Home Communication Corp., both of San Diego, Calif.

Filed Jun. 8, 1984, Ser. No. 618,917

Int. Cl. H04N 7/167, 7/00; H04L 9/00

U.S. Cl. 380-20

6 Claims



1. In a subscriber communication network a system for verifying charge information furnished to a broadcast company by a given subscriber and purported by the subscriber as having been displayed at the subscriber terminal, comprising means at the subscriber terminal for providing a debit signal indicating the charges attributed to the subscriber terminal;
- means at the subscriber terminal for processing the debit signal to provide an authentication signal;
- means at the subscriber terminal responsive to the debit signal for providing to the given subscriber a display of information indicating the charges; and
- means at the subscriber terminal responsive to the authentication signal for providing to the given subscriber a display of information representative of the authentication signal; and

1. A speech recognition apparatus comprising:
conversion means for converting input speech signals to digital data;
first memory means coupled to said conversion means the digital data output of said conversion means;
second memory means for storing a plurality of standard patterns, each of said standard patterns comprising a plurality of component data;
first operation means for performing a dynamic programming operation on some of the digital output data of said conversion means and on said standard patterns;
candidate selection means coupled to said first operation means for selecting a predetermined number of candidates closest to said input speech signals based on the operation result of said first operation means;
second operation means for performing a dynamic programming operation on said standard pattern data corresponding to said candidate selected by said candidate selection means and on data stored in said first memory means; and
control means coupled to said first and second memory means and including means for coupling only some of the component data of at least some of the standard patterns stored in said second memory means to said first operation means at a predetermined cycle period, and for coupling some of the data stored in said first memory means to said first operation means at a predetermined cycle period, and means for applying all of said stored data of said first memory means and all of the components of that standard pattern data of said second memory means which corresponds to the candidate selected by said candidate selection means, to said second operation means.

4,712,244

DIRECTIONAL MICROPHONE ARRANGEMENT
Eberhard Zwicker, Icking; Thomas Beckenbauer, Muenchen, and Guenther Beer, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

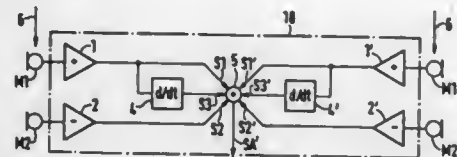
Filed Oct. 14, 1986, Ser. No. 918,497

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536885

Int. Cl.⁴ H04R 25/00, 1/20, 1/04

U.S. Cl. 381—68.1

25 Claims



1. A directional microphone system comprising: a plurality of non-directional microphones each having an electrical output; means for deriving first and second electrical signals which are 180° out of phase with respect to each other from respective outputs of said plurality of microphones; means for deriving through differentiation a third electrical signal from one of the outputs of said plurality of microphones which is 90° out of phase with respect to one of said first or second signals; and means for summing said first, second and third electrical signals thereby forming an output signal for said system.

4,712,245

IN-THE-EAR HEARING AID WITH THE OUTER WALL FORMED BY RUPTURING A TWO-COMPONENT CHAMBER

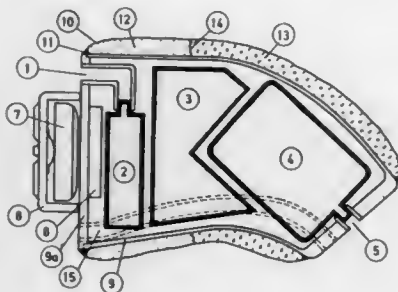
Poul E. Lyregaard, Vaerloese, Denmark, assignor to Oticon Electronics A/S, Snekkersten, Denmark

Filed Jan. 24, 1985, Ser. No. 694,286

Int. Cl.⁴ H04R 25/02, 31/00; B29B 7/00; B29C 33/40

U.S. Cl. 381—68.6

3 Claims



1. A device for improving the hearing of the wearer comprising an electroacoustic cartridge, said cartridge having ends, said cartridge being constituted by means for transducing sound to an electrical signal, means for processing said electrical signal, means for powering and regulating said processing means, and means for transducing the processed electrical signal into sound, a casing enclosing said electroacoustic cartridge, said casing being adapted for insertion into the ear canal of the wearer, an elastic layer surrounding said casing, said elastic layer having ends, the ends of said layer being sealed to the ends of said cartridge, said layer together with said casing defining a closed chamber, said chamber containing a cold-curing composition consisting of at least two components, at least one partitioning wall within said chamber for separating said components one from the other, said partitioning wall being adapted to be ruptured when subjected to pressure, said com-

ponents being adapted, when being combined upon rupture of said wall, to provide a composition which expands during an initial curing period, and then sets rigidly with a substantial form stability.

4,712,246

PUPPET SPEAKER

Alberta J. Morrison, P.O. Box 246, Eureka, Nev. 89316

Filed Dec. 14, 1984, Ser. No. 681,894

Int. Cl.⁴ G06F 3/02

U.S. Cl. 381—77

1 Claim



1. A speaker apparatus for use in a hand puppet comprising: a speaker of a size capable of being held in one palm of a person while operating a hand puppet, a housing for said speaker comprising padding means covering the rear side of said speaker, a fabric material covering said padding means, and a semi-rigid, audio-transparent plastic grill attached to said speaker and covering the front side of said speaker, a four-wire telephone cable having a first two wires connected at a first end of said cable to input connectors of said speaker, a second two wires of said cable being connected at the first end of said cable to an in-line rotary on/off switch, the first two wires being connected at a second end of said cable to a miniature plug for connection to the audio output of an audio signal source and said second two wires being connected at said second end of said cable to a subminiature plug for connection to a remote control port of said audio signal source.

4,712,247

ELECTRO-ACOUSTIC SYSTEM HAVING A VARIABLE REFLECTION/ABSORPTION CHARACTERISTIC

Petrus A. Swarte, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

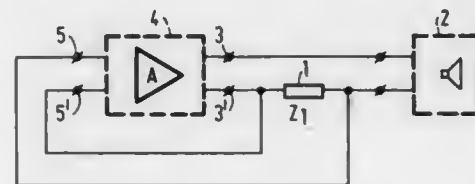
Filed Mar. 27, 1985, Ser. No. 716,774

Claims priority, application Netherlands, Apr. 3, 1984, 8401041

Int. Cl.⁴ H04R 3/00

U.S. Cl. 381—96

23 Claims



1. An electro-acoustic apparatus comprising: an audio amplifier having first and second signal input terminals and first and second signal output terminals, an electro-acoustic transducer unit which, in normal operation of the electro-acoustic apparatus, operates as both a loudspeaker and a microphone for the electro-acoustic apparatus, a first impedance, means connecting the first impedance and the transducer unit in series circuit to said first and second amplifier output terminals, and means

coupling said amplifier first and second input terminals across said first impedance so that a signal developed across said first impedance serves as the sole input to said amplifier whereby the electro-acoustic apparatus can alter at least one acoustic property of a space as a function of the amplifier gain and/or the impedance value of said first impedance.

4,712,248

METHOD AND APPARATUS FOR OBJECT IDENTIFICATION

Yasuo Hongo, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kawasaki, Japan

Continuation of Ser. No. 716,690, Mar. 27, 1985, abandoned.

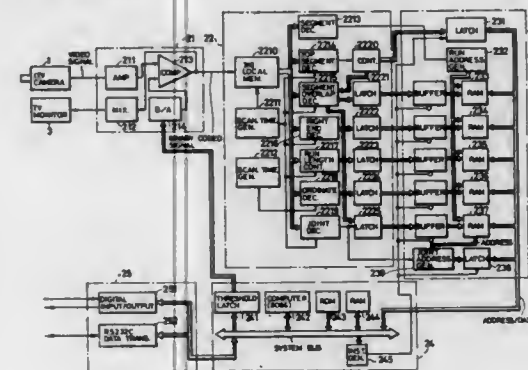
This application Apr. 3, 1987, Ser. No. 33,889

Claims priority, application Japan, Mar. 28, 1984, 59-58472

Int. Cl.⁴ G06K 9/48, 9/46

U.S. Cl. 382—22

3 Claims



1. An apparatus for identifying an object from a video signal representing an image of the object, the apparatus comprising: feature data extracting means for converting the video signal into boundary gradient and contour data representing the boundary of the object; means, coupled to said feature data extracting means, for processing said boundary gradient and contour data to identify abrupt changes in the gradient of the boundary of the object as a series of object points; means for generating primitive element data associated with each of a plurality of segments singly disposed between adjacent ones of said object points on the boundary of the object and distance map data associated with said primitive element data to represent the positional relationships of each of said segments with respect to said object points in the boundary of the object, said primitive element data comprising characteristic data to identify said associated segment as (1) a straight line, (2) a circle or circular arc, or (3) an ellipse or an elliptical arc; dictionary memory means for storing reference primitive element data and reference distance map data associated with a plurality of known, reference objects, said reference primitive element data including reference characteristic data identifying the contour of said associated reference object as one reference segment or a combination of reference segments wherein each reference segment comprises (1) a straight line, (2) a circle or circular arc, or (3) an ellipse or elliptical arc, said reference distance map data representing the positional relationships of each reference segment in the boundary of a reference object; and means, coupled to said processing means, said generating means, and said dictionary memory means for correlating said primitive element data and said distance map data associated with the object and said reference primitive element data and said reference distance map data associated with said reference objects and stored in said dictionary memory means to identify the object as the one of said reference objects with the greatest correlation with the object.

4,712,249
VALVES

Raymond Gannon, London, United Kingdom, assignor to FGL Projects Limited, London, United Kingdom

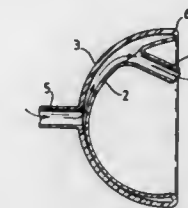
Filed Feb. 10, 1986, Ser. No. 828,057

Claims priority, application United Kingdom, Feb. 12, 1985, 8503545; Oct. 30, 1985, 8526700

Int. Cl.⁴ B65D 33/24

U.S. Cl. 383—43

8 Claims



1. A valve for use in the packaging of perishable goods comprising a chamber having two walls and an inlet and an outlet disposed obliquely with respect to each other on either of the walls and one of the walls being deformable resiliently in the direction of the other wall and when deformed the deformable wall enters into such close intimate contact with other wall that communication between the inlet and the outlet within the valve is prevented.

4,712,250

TAPE PLAYER ADAPTER FOR CAR RADIO

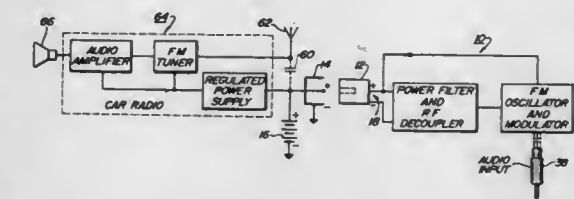
Dennis Michels, New York; Geoff Howe, Brooklyn, and Douglas Joseph, Neponsit, all of N.Y., assignors to Sound Sender, Inc., East Hanover, N.J.

Filed Aug. 12, 1985, Ser. No. 764,786

Int. Cl.⁴ H04B 7/14, 1/34

U.S. Cl. 455—20

12 Claims



1. A device for coupling an audio signal from an external source to an automobile radio, said radio including an antenna, an input stage, and an output stage having a loud speaker, and a connection to the automobile source of direct voltage, comprising: input means for connection to said audio signal source; output means for coupling an output signal to said radio input stage and for connecting said device to said direct voltage source; a modulator-oscillator stage; filter means connected to said output means and direct voltage source for providing a filtered direct voltage to operate said modulator-oscillator stage; signal coupling means for applying said audio signal from said input means to said modulator-oscillator stage; feedback means for causing radio frequency oscillation in said modulator-oscillator stage; tuning means for establishing a selected frequency of said oscillation, said oscillation frequency being modulated by said audio signal to provide an output signal; and means for connecting said output signal via said output means to apply said output signal to said radio to be heard over said radio loud speaker.

DESIGNS

DECEMBER 8, 1987

293,040

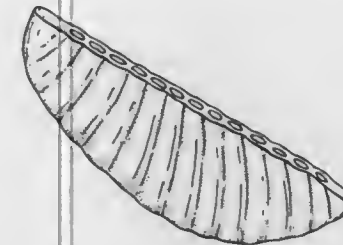
MEAT PRODUCT

Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to South-down Meat Company, Inc., West Chester, Pa.

Filed Feb. 8, 1985, Ser. No. 699,610

Term of patent 14 years

U.S. Cl. D1-125



293,041

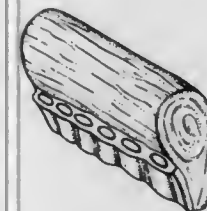
MEAT PRODUCT

Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to South-down Meat Company, Inc., West Chester, Pa.

Filed Feb. 8, 1985, Ser. No. 699,752

Term of patent 14 years

U.S. Cl. D1-199



293,042

HIGH HEEL PROTECTOR

Iris M. Martin, 9 E. Red Oak Dr., Voorhees, N.J. 08043

Filed Aug. 9, 1985, Ser. No. 764,206

Term of patent 14 years

U.S. Cl. D2-314



293,043

HAT RETAINING LEASH

William C. Zamboni, 16661 Bolero La., Huntington Beach, Calif. 92649

Filed Feb. 25, 1985, Ser. No. 705,134

Term of patent 14 years

U.S. Cl. D2-624



293,044

CAPPED CASE FOR HOLDING AND TRANSPORTING A CARPENTER'S LEVEL

Robert A. Johnson, Mequon, Wis., assignor to Johnson Level & Tool Mfg. Co., Inc., Milwaukee, Wis.

Filed Oct. 18, 1984, Ser. No. 662,990

Term of patent 14 years

U.S. Cl. D3-30.1



293,045

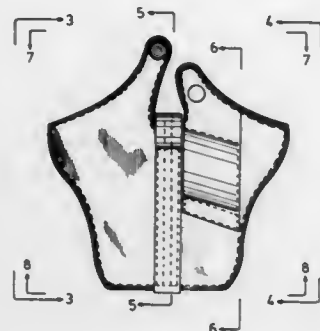
HOLSTER PRODUCTION BLANK

Michael T. Merritt, and James M. Kelly, both of 692 S. Main St., Moab, Utah 84532

Filed Feb. 19, 1985, Ser. No. 702,796

Term of patent 14 years

U.S. Cl. D3-101



293,046

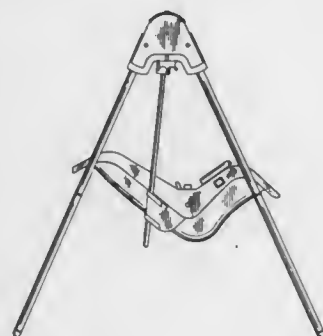
CHILD'S SWING

Merry S. Riehm, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 2, 1985, Ser. No. 762,119

Term of patent 14 years

U.S. Cl. D6-347



293,047

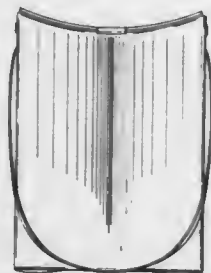
COMBINED SEAT AND CONTAINER

John W. Highfield, Heath, Ohio, assignor to Zenith Enterprises, Inc., Columbus, Ohio

Filed May 9, 1985, Ser. No. 732,270

Term of patent 14 years

U.S. Cl. D6-335



293,048

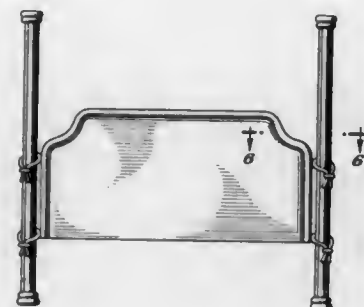
HEADBOARD FOR A BED

Phylliss B. Mann, Los Angeles, Calif., assignor to Cal-Marble Furniture Manufacturing Corporation, Los Angeles, Calif.

Filed Jul. 14, 1986, Ser. No. 885,267

Term of patent 14 years

U.S. Cl. D6-505

293,049
CHAIR

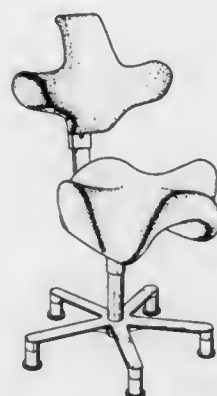
Peter Opsvik, Høgtunveien 12, 1370 Asker, Norway (1370)

Filed Oct. 22, 1984, Ser. No. 663,691

Claims priority, application Norway, May 8, 1984, 65185

Term of patent 14 years

U.S. Cl. D6-366

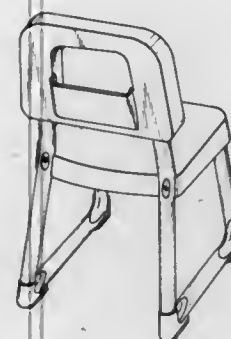
293,050
CHAIR

Gary R. Lemmeyer, East Aurora, and Gordon W. Kamman, Elma, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jul. 17, 1985, Ser. No. 756,022

Term of patent 14 years

U.S. Cl. D6-373



293,052

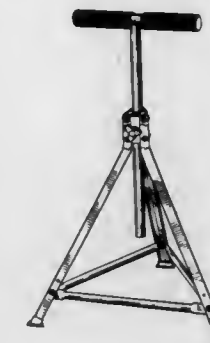
ADJUSTABLE SUPPORT STAND

Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed May 13, 1985, Ser. No. 732,915

Term of patent 14 years

U.S. Cl. D6-431



293,053

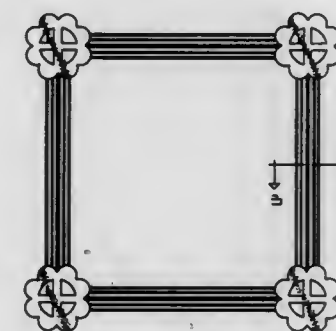
TABLE GUARD

Willie T. Goolsby, 40 Harwood Dr., Hampton, Va. 23664

Filed Jun. 3, 1985, Ser. No. 740,284

Term of patent 14 years

U.S. Cl. D6-491

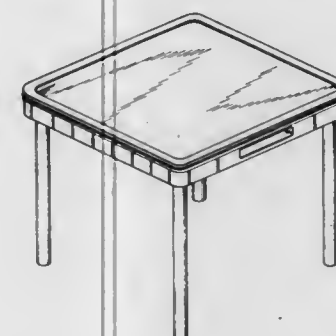
293,051
TABLE

Gary R. Lemmeyer, East Aurora, and Gordon W. Kamman, Elma, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jul. 17, 1985, Ser. No. 756,023

Term of patent 14 years

U.S. Cl. D6-484



293,054

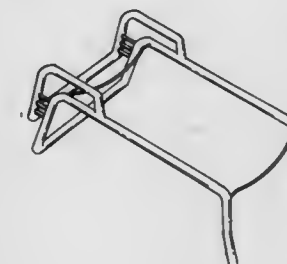
CHAISE LOUNGE FRAME OR SIMILAR ARTICLE

Babette L. Strousse, Manhattan Beach, and Stephen H. Kaminiski, Burbank, both of Calif., assignors to Samsonite Corporation, Denver, Colo.

Filed Sep. 11, 1984, Ser. No. 649,789

Term of patent 14 years

U.S. Cl. D6-499



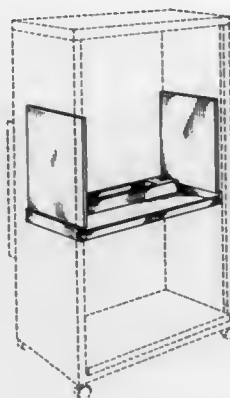
293,055

SHELF FOR COMPUTER KEYBOARD OR THE LIKE

David Wright, Shrewsbury, and Richard M. Latino, Holden, both of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Feb. 4, 1985, Ser. No. 697,680
Term of patent 14 years

U.S. Cl. D6—510



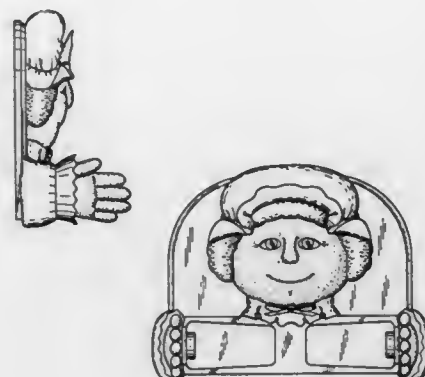
293,057

PAPER TOWEL HOLDER

Dawn M. Likness, MPO. 70L Riverside Dr., and Marvel M. LaRue, MPO. 63L Riverside Dr., both of Washongal, Wash. 98671

Filed Jun. 10, 1985, Ser. No. 743,304
Term of patent 14 years

U.S. Cl. D6—522



293,058

COMBINED DISPENSER FOR SANITARY PAPER AND BRACKET

Jan Iwarsson, Göteborg, Sweden, assignor to Moinlycke Aktiebolag, Gothenburg, Sweden

Filed Apr. 16, 1985, Ser. No. 723,933
Claims priority, application Sweden, Oct. 29, 1984, 84-2892
Term of patent 14 years

U.S. Cl. D6—523



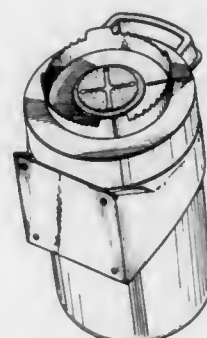
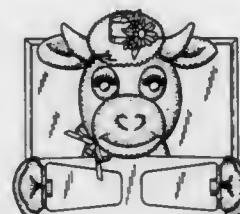
293,056

PAPER TOWEL HOLDER

Dawn M. Likness, MPO. 70L Riverside Dr., and Marvel M. LaRue, MPO. 63L Riverside Dr., both of Washongal, Wash. 98671

Filed Jun. 7, 1985, Ser. No. 742,595
Term of patent 14 years

U.S. Cl. D6—522



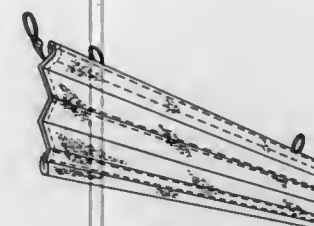
293,059

CURTAIN FOR A WATERCRAFT

Georgia D. Wells, 280 Ocean Ave., Marblehead, Mass. 01945
Filed Feb. 28, 1985, Ser. No. 706,841

Term of patent 14 years

U.S. Cl. D6—575



293,061

BEVERAGE CAN HOLDER

Dale J. Hampton, 695 Belmar Dr., Ogden, Utah 84403
Filed Jan. 10, 1985, Ser. No. 690,309

Term of patent 14 years

U.S. Cl. D7—70



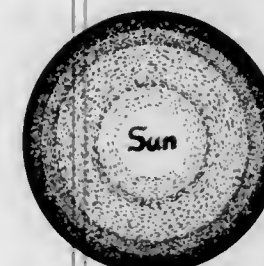
293,060

CIRCULAR TOWEL

Alain D. Boice, 11269 Columbia Pike, Silver Spring, Md. 20901
Filed Mar. 13, 1985, Ser. No. 711,110

Term of patent 14 years

U.S. Cl. D6—608



293,062

TOOTHPICK SERVER

Susan H. Levine, Richmond, Calif., assignor to Pottery by Levine, Inc., Richmond, Calif.

Filed May 24, 1985, Ser. No. 737,525
Term of patent 14 years

U.S. Cl. D7—75



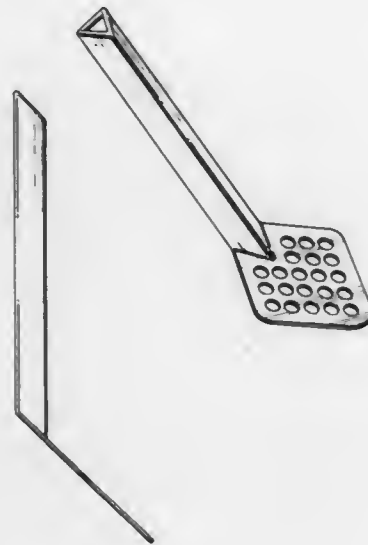
293,063

SMALL TURNER

Morgan Fern, and Karl A. Andersson, both of Malmo, Sweden,
assignors to Hammarplast AB, Tingsryd, Sweden
Filed Apr. 30, 1985, Ser. No. 729,135

Claims priority, application Sweden, Oct. 31, 1984, 842908
Term of patent 14 years

U.S. Cl. D7-102



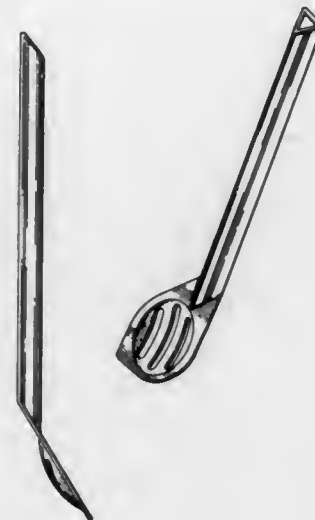
293,065

STIRRING LADLE WITH SLITS

Morgan Fern, and Karl A. Andersson, both of Malmo, Sweden,
assignors to Hammarplast AB, Tingsryd, Sweden
Filed Apr. 30, 1985, Ser. No. 729,134

Claims priority, application Sweden, Oct. 31, 1984, 2909/84
Term of patent 14 years

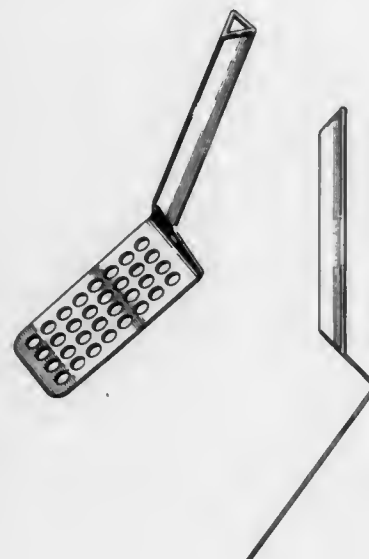
U.S. Cl. D7-104

293,064
TURNER

Morgan Fern, and Karl A. Andersson, both of Malmo, Sweden,
assignors to Hammarplast AB, Tingsryd, Sweden
Filed Apr. 30, 1985, Ser. No. 729,136

Claims priority, application Sweden, Oct. 31, 1984, 842906
Term of patent 14 years

U.S. Cl. D7-102

293,066
SKIMMER

Morgan Fern, and Karl A. Andersson, both of Malmo, Sweden,
assignors to Hammarplast AB, Tingsryd, Sweden
Filed Apr. 30, 1985, Ser. No. 729,040

Claims priority, application Sweden, Oct. 31, 1984, 2904/84
Term of patent 14 years

U.S. Cl. D7-104



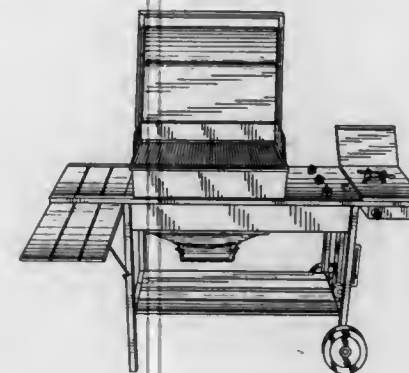
293,067

PORTABLE OUTDOOR COOKER

James C. Stephen, Arlington Heights; Charles W. Lohmeyer,
Barrington; Erich J. Schlosser, Lindenhurst, and Donald E.
Pestka, Bensenville, all of Ill., assignors to Weber-Stephen
Products Co., Palatine, Ill.

Filed Jul. 26, 1985, Ser. No. 759,525
Term of patent 14 years

U.S. Cl. D7-334



293,068

COUNTERTOP COOKING RANGE

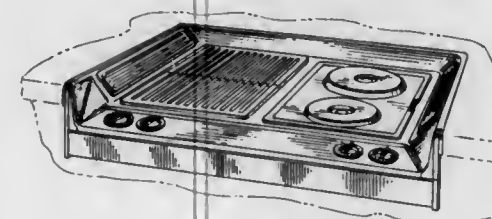
Joseph J. Cerola, Noblesville, Ind., assignor to Roper Corpora-
tion, Kankakee, Ill.

Filed Nov. 21, 1984, Ser. No. 674,108

The portion of the term of this patent subsequent to Dec. 8, 2001,
has been disclaimed.

Term of patent 14 years

U.S. Cl. D7-346



293,069

COUNTERTOP COOKING RANGE

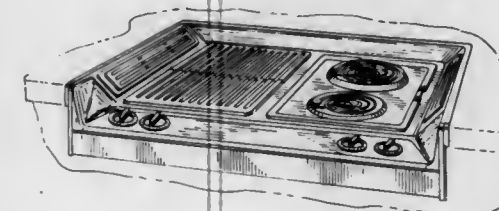
Joseph J. Cerola, Noblesville, Ind., assignor to Roper Corpora-
tion, Kankakee, Ill.

Filed Nov. 21, 1984, Ser. No. 674,199

The portion of the term of this patent subsequent to Dec. 8, 2001,
has been disclaimed.

Term of patent 14 years

U.S. Cl. D7-346



293,070

COUNTERTOP COOKING RANGE

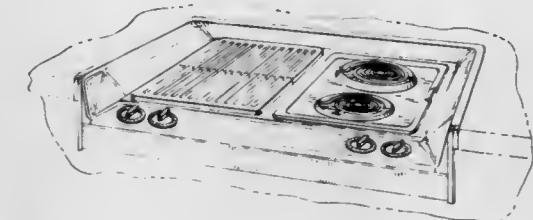
Joseph J. Cerola, Noblesville, Ind., assignor to Roper Corpora-
tion, Kankakee, Ill.

Filed Nov. 21, 1984, Ser. No. 674,198

The portion of the term of this patent subsequent to Dec. 8, 2001,
has been disclaimed.

Term of patent 14 years

U.S. Cl. D7-346



293,071

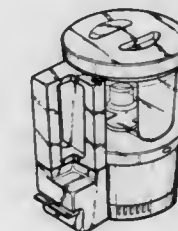
FOOD PROCESSOR

Young S. Kim, Terrace Sunnyville, Calif., assignor to Daewoo
Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 1, 1984, Ser. No. 656,540

Term of patent 14 years

U.S. Cl. D7-384



293,072

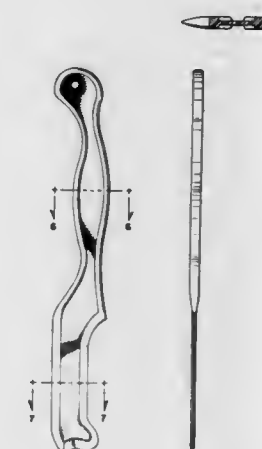
SPREADER FOR MAYONNAISE OR THE LIKE

Ronald E. Cook, 4311 Erksine Rd., Clarkston, Ga. 30021

Filed Feb. 8, 1985, Ser. No. 699,568

Term of patent 14 years

U.S. Cl. D7-99



293,073

MULTI-NEEDLE TYPE CHISEL

Naoya Kurihara, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan
 Filed Aug. 23, 1983, Ser. No. 525,747
 Claims priority, application Japan, Feb. 25, 1983, 58-7609
 Term of patent 14 years

U.S. Cl. D8—61

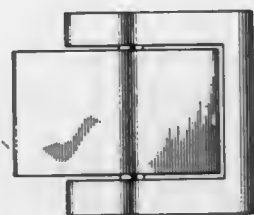


293,076

ASTRAGAL DOOR LATCH

Edward O. Stepanian, Glendale, Calif., assignor to Adams Rite Manufacturing Co., City of Industry, Calif.
 Filed Jan. 22, 1985, Ser. No. 693,249
 Term of patent 14 years

U.S. Cl. D8—331

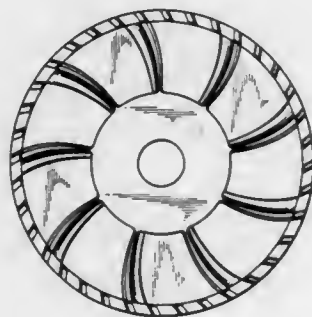


293,074

DIAMOND ABRASIVE SAW BLADE

Jiro Inoue, Sagami, Japan, assignor to D.T.R. Co., Ltd., Kanagawa, Japan
 Filed Oct. 3, 1984, Ser. No. 657,268
 Term of patent 14 years

U.S. Cl. D8—20



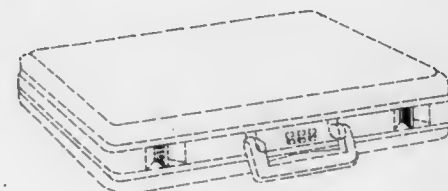
293,077

LOCK LATCH LEVER

John A. Wickman, Swansea, Mass., and M. Edward Lawing, Columbus, Ohio, assignors to American Tourister, Inc., Warren, R.I.

Filed Feb. 26, 1985, Ser. No. 705,594
 Term of patent 14 years

U.S. Cl. D8—343

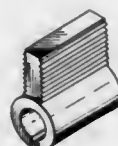
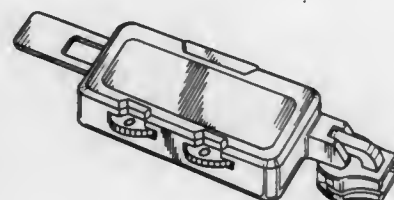


293,075

LOCK ASSEMBLY FOR ZIPPERED LUGGAGE

Urs Gisiger, Gaensbrühlweg 4, 2545 Selzach, Switzerland
 Filed Feb. 21, 1985, Ser. No. 703,870
 Term of patent 14 years

U.S. Cl. D8—330



293,078

STRIKE PLATE FOR SURFACE MOUNTED DEAD BOLT LOCK

Anthony R. Lozano, P.O. Box 7107, San Jose, Calif. 95150
 Filed Aug. 30, 1985, Ser. No. 771,564
 Term of patent 14 years

U.S. Cl. D8—344

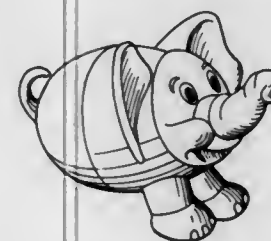


293,079

PACKAGING CONTAINER FOR CANDY OR THE LIKE

Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy
 Filed Apr. 8, 1985, Ser. No. 720,948
 Claims priority, application Italy, Oct. 15, 1984, 53924/84[U]

U.S. Cl. D9—318



293,080

BOTTLE

John C. Crawford, Lake Mahopac, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
 Filed Jun. 4, 1985, Ser. No. 741,322
 Term of patent 14 years

U.S. Cl. D9—376

293,081
BOTTLE

William J. Britt, 7 Newcastle Way, Greenville, S.C. 29615
 Filed Aug. 31, 1984, Ser. No. 646,197
 Term of patent 14 years

U.S. Cl. D9—376

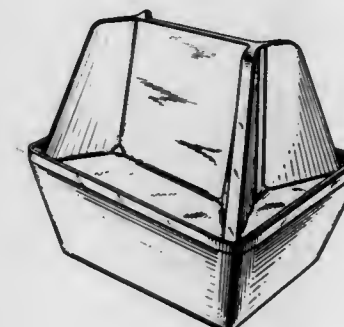


293,082

CONTAINER FOR FRUIT OR THE LIKE

John J. Butler, 411 Forest Ave., Rye, N.Y. 10580
 Filed Apr. 25, 1985, Ser. No. 726,997
 Term of patent 14 years

U.S. Cl. D9—424



293,083

COMBINED CONTAINER LID AND POUR SPOUT

Daniel O. Gloor, P.O. Box 569, Columbus, Nebr. 68601
 Filed Aug. 24, 1984, Ser. No. 644,045
 Term of patent 14 years

U.S. Cl. D9—446

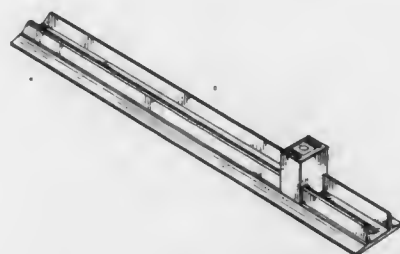


293,084
WATCH CASE

John W. Eddings, Rte. 1, Salem, Ill. 62881
Filed Sep. 26, 1984, Ser. No. 654,851
Term of patent 14 years
U.S. Cl. D10—34

293,086
RULER

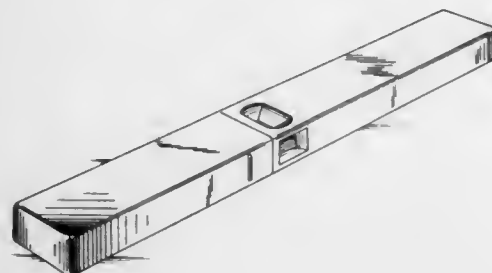
Romeo LeMarie, Hong Kong, Hong Kong, assignor to Lambda
Integral Design Limited, Kowloon, Hong Kong
Filed May 3, 1985, Ser. No. 730,771
Claims priority, application United Kingdom, Nov. 1, 1984,
1023026
Term of patent 14 years
U.S. Cl. D10—71



293,087
TANK MIXTURE PROPORTIONING GAUGE
James E. Grinde, 2401-147th La. NE., Anoka, Minn. 55303
Filed Mar. 28, 1985, Ser. No. 717,170
Term of patent 14 years
U.S. Cl. D10—101



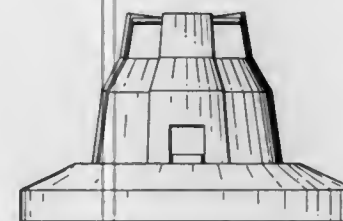
293,085
CASE FOR CLINICAL THERMOMETER
Akira Yokoyama, Iruma, Japan, assignor to Citizen Watch Co.,
Ltd., Tokyo, Japan
Filed Apr. 24, 1985, Ser. No. 726,703
Claims priority, application Japan, Dec. 26, 1984, 59-53163
Term of patent 14 years
U.S. Cl. D10—60

293,088
TRANSMITTER

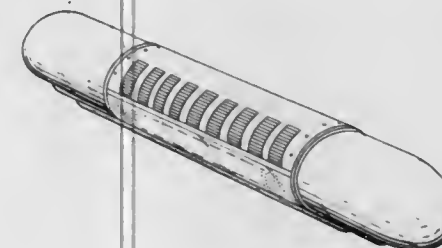
Wilbert C. Brown, Fairfield, Conn., and Roger J. Tosto, York-
town Heights, N.Y., assignors to TIE/Communications, Inc.,
Shelton, Conn.
Filed Apr. 13, 1984, Ser. No. 599,780
Term of patent 14 years
U.S. Cl. D10—106

293,089
SMOKE DETECTOR HOUSING

David B. Lederer, Rochester, N.Y., assignor to Detection Sys-
tems, Inc., Fairport, N.Y.
Filed Feb. 1, 1985, Ser. No. 697,159
Term of patent 14 years
U.S. Cl. D10—106



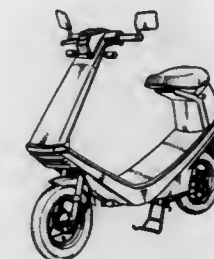
293,090
COMBINED LIGHT AND SPEAKER HOUSING FOR
EMERGENCY VEHICLE
Alberto Garnerone, Rosta, Italy, assignor to Sirena S.p.A.,
Torino, Italy
Filed Mar. 11, 1985, Ser. No. 710,355
Claims priority, application Italy, Sep. 11, 1984, 53806/84[U]
Term of patent 14 years
U.S. Cl. D10—114



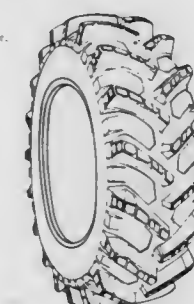
293,091
BURGLAR ALARM ROD
Darrell J. Phillips, 3217 Impala St., Bossier City, La. 71112
Filed May 7, 1985, Ser. No. 731,547
Term of patent 14 years
U.S. Cl. D10—116



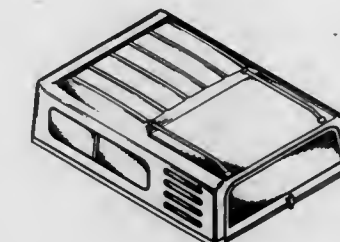
293,092
MOTORCYCLE
Kazunori Yamada, Machida; Akihiko Tanaka, Kamakura, and
Toshiyuki Sato, Fukuoka, all of Japan, assignors to Yamaha
Hatsudoki Kabushiki Kaisha, Japan
Filed Apr. 23, 1985, Ser. No. 726,107
Term of patent 14 years
U.S. Cl. D12—110



293,093
TIRE
Hideaki Nishio, and Nobuo Shimizu, both of Saitama, Japan,
assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jan. 29, 1985, Ser. No. 696,124
Claims priority, application Japan, Jul. 31, 1984, 59-32057
Term of patent 14 years
U.S. Cl. D12—147



293,094
PICK-UP TRUCK BOX COVER
Martin Brown, Box 63, Drinkwater, Saskatchewan, Canada
(SOH 1G0)
Filed Aug. 28, 1985, Ser. No. 770,217
Claims priority, application Canada, Nov. 6, 1984, 06-11-84-2
Term of patent 14 years
U.S. Cl. D12—156



293,095

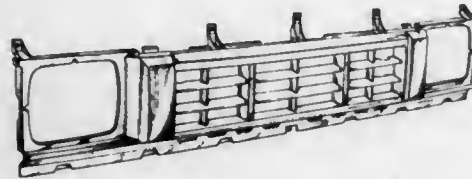
AUTOMOBILE RADIATOR GRILL

Hirofumi Ienaga, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 29, 1985, Ser. No. 792,575

Term of patent 14 years

U.S. Cl. D12—163



293,096

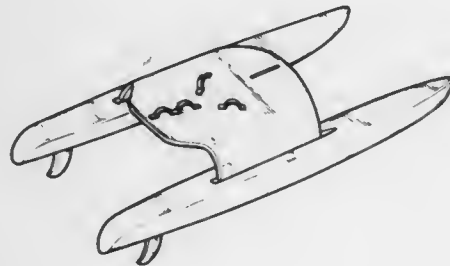
SAILING VEHICLE

Robert N. Keller, 10388 Enterprise, Davisburg, Mich. 48019

Filed Aug. 22, 1986, Ser. No. 899,322

Term of patent 14 years

U.S. Cl. D12—304



293,098

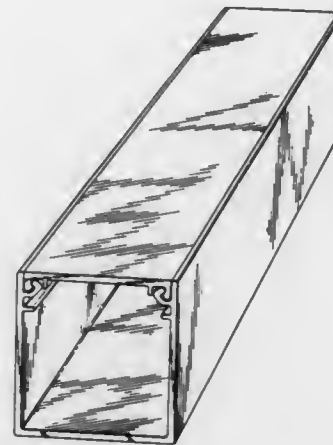
CONDUIT TRUNKING FOR PROTECTING CABLES

David E. Layton, Rhyl Clwyd, United Kingdom, assignor to EGA Limited, United Kingdom

Filed Jun. 12, 1984, Ser. No. 619,842

Term of patent 14 years

U.S. Cl. D13—13



293,099

FACEPLATE FOR ELECTRONIC CIRCUIT BOARD

Michael H. Fitzpatrick, Sunnyvale, Calif., and Michael Brown, Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 7, 1985, Ser. No. 699,337

Term of patent 14 years

U.S. Cl. D13—13



293,097

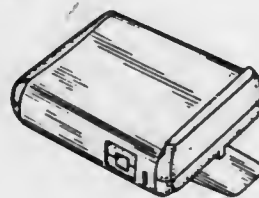
BATTERY PACK

John H. Alligood, and James M. Spires, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,460

Term of patent 14 years

U.S. Cl. D13—8

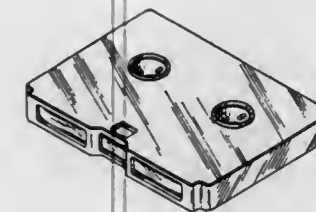
293,100
CASSETTE

Richard G. Rutkowski, Milford, and John W. Hoover, Huntington, both of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Dec. 4, 1984, Ser. No. 678,131

Term of patent 14 years

U.S. Cl. D14—11

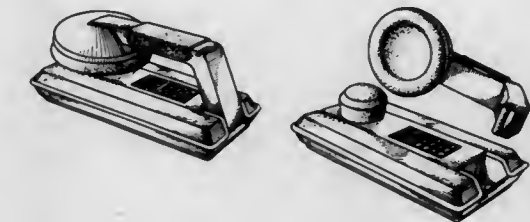
293,102
TELEPHONE SET

Brian P. Bullock, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 10, 1986, Ser. No. 842,412

Term of patent 14 years

U.S. Cl. D14—53



293,103

COMBINATION HANDSET AND STAND TELEPHONE INSTRUMENT

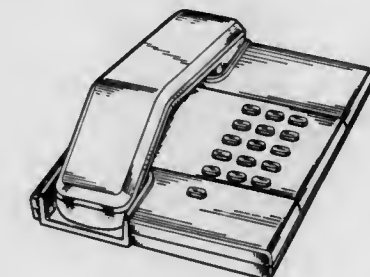
Stig Gauffin, Karlsbergsvagen 33, S-113-34 Stockholm, and Peter Lawton, Mittspret 1, S-183 47 Taby, both of Sweden

Filed Aug. 22, 1985, Ser. No. 768,425

Claims priority, application Sweden, Feb. 22, 1985, 850444

Term of patent 14 years

U.S. Cl. D14—53



293,101

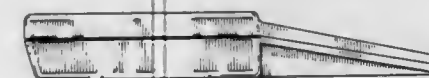
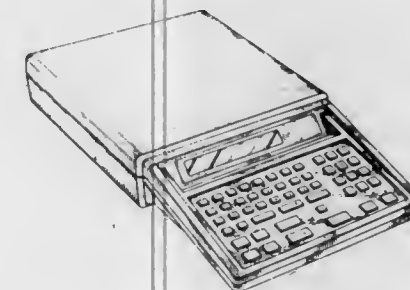
COMBINED REPERTORY TELEPHONE DIALER AND ELECTRONIC DESK DIRECTORY

William Sherrill, North Andover; H. Patrick Thornton, Acton, and Brian S. Cole, Arlington, all of Mass., assignors to Automatic Dialer Partners Ltd., Stoneham, Mass.

Filed May 9, 1985, Ser. No. 733,053

Term of patent 14 years

U.S. Cl. D14—52



293,104

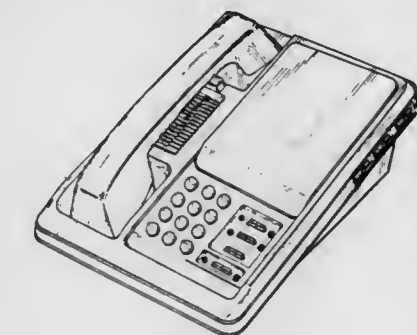
DESK TELEPHONE SET

John Maliskas, Newtown, Conn., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 23, 1985, Ser. No. 812,031

Term of patent 14 years

U.S. Cl. D14—53



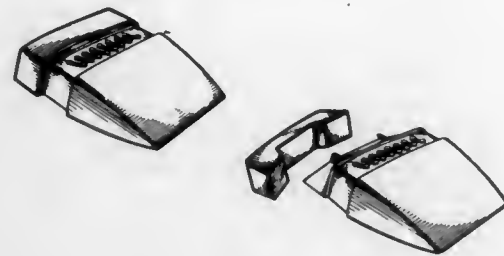
293,105

TELEPHONE SET

Brian P. Bullock, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 10, 1986, Ser. No. 842,413
Term of patent 14 years

U.S. Cl. D14—53



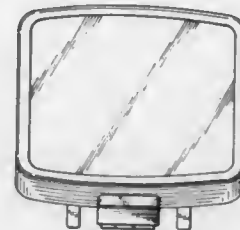
293,108

COLOR TELEVISION SET

Ennio Brion, Milan, Italy, assignor to Brionvega S.p.A., Milan, Italy

Filed Oct. 9, 1984, Ser. No. 659,098
Claims priority, application Italy, Jul. 12, 1984, 22559/84[U]
Term of patent 14 years

U.S. Cl. D14—81



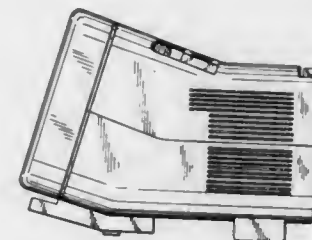
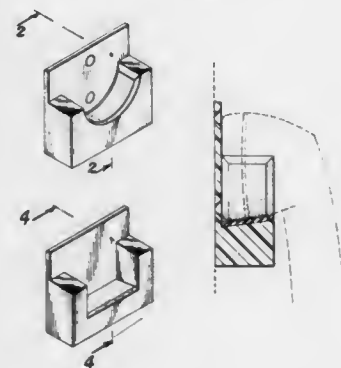
293,106

WALL MOUNT HOLDER FOR TELEPHONE HANDSET

Robert L. Renslow, 7325 Colorado North, Brooklyn Park, Minn. 55443

Filed Dec. 16, 1985, Ser. No. 809,129
Term of patent 14 years

U.S. Cl. D14—65



293,109

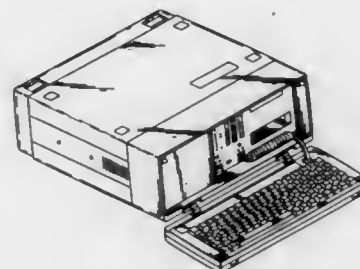
PROTOCOL ANALYZER

Peter George, Mt. Sinai, and Michael Paloian, Babylon Village, both of N.Y., assignors to Diversified Technology Partners, Ltd.-1982

Filed Mar. 8, 1985, Ser. No. 711,771
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—100



293,107

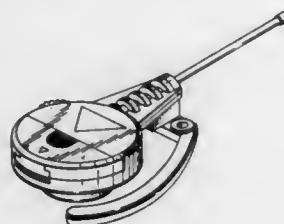
RADIO

Peter Müller, Baar, Switzerland, assignor to AS Electronics AG, Baar, Switzerland

Filed Oct. 28, 1985, Ser. No. 792,732
Claims priority, application World Int. Prop. O., Apr. 26, 1985, DM/005184

Term of patent 14 years

U.S. Cl. D14—68



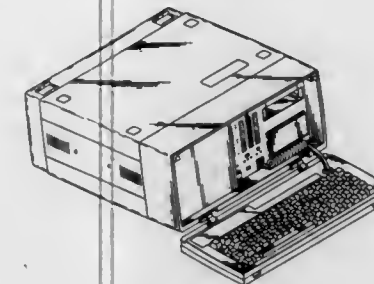
293,110

PROTOCOL/PERFORMANCE ANALYZER

Peter George, Mt. Sinai, and Michael Paloian, Babylon Village, both of N.Y., assignors to Diversified Technology Partners, Ltd.-1982

Filed Mar. 8, 1985, Ser. No. 711,772
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.

U.S. Cl. D14—100



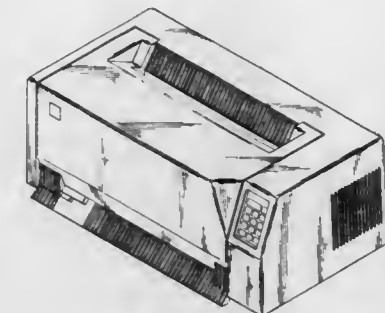
293,113

PRINTER

Hunter T. Foy, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,277

Term of patent 14 years



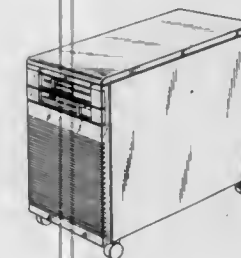
293,111

DATA PROCESSOR

Shigeru Nezu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 713,840
Claims priority, application Japan, Sep. 21, 1984, 59-39297

U.S. Cl. D14—102



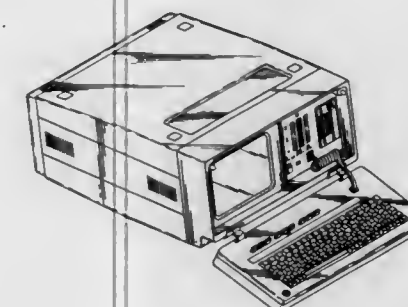
293,112

PROTOCOL ANALYZER

Peter George, Mt. Sinai, and Michael Paloian, Babylon Village, both of N.Y., assignors to Diversified Technology Partners, Ltd.-1982

Filed Mar. 8, 1985, Ser. No. 711,773
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.

U.S. Cl. D14—106



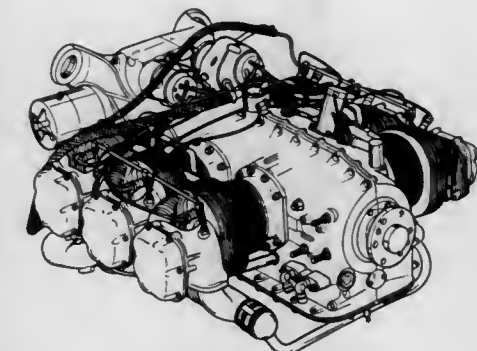
293,114

ENGINE

J. William Brogdon, Daphne, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

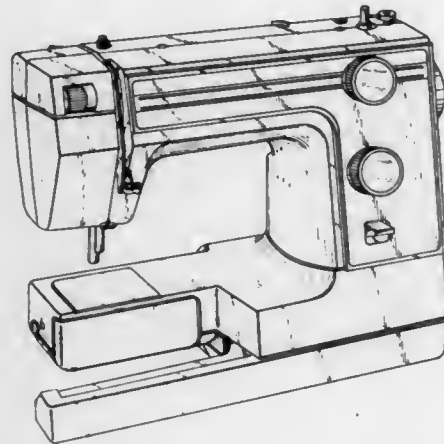
Continuation of Ser. No. 646,302, Aug. 31, 1984, abandoned.
This application Sep. 11, 1986, Ser. No. 906,649

U.S. Cl. D15—1



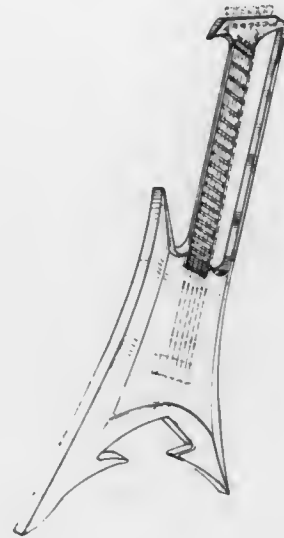
293,115
SEWING MACHINE

Nobufusa Kuroki, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Mar. 20, 1985, Ser. No. 714,109
Claims priority, application Japan, Oct. 18, 1984, 59-42844
U.S. Cl. D15—69



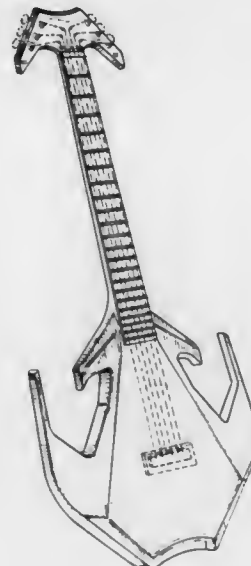
293,117
GUITAR

Floyd D. Rose, 5610 145th Ave., SE., Bellevue, Wash. 98006
Filed Jul. 29, 1985, Ser. No. 760,033
Term of patent 14 years
U.S. Cl. D17—15



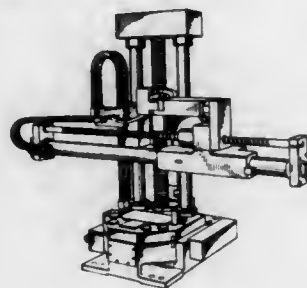
293,118
GUITAR

Floyd D. Rose, 5610 145th Ave. Southeast, Bellevue, Wash. 98006
Filed Jul. 26, 1985, Ser. No. 760,052
Term of patent 14 years
U.S. Cl. D17—19



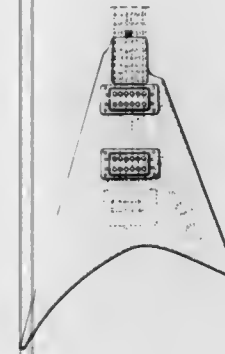
293,116
INDUSTRIAL ROBOT

Theodore H. Stackhouse; Edward J. Bailey; Roland S. Sedziol, all of Cincinnati; William E. Berry, Deer Park; Kenneth E. Schubeler, West Chester, and Michael D. Braun, Cincinnati, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Jun. 5, 1985, Ser. No. 741,411
Term of patent 14 years
U.S. Cl. D15—199



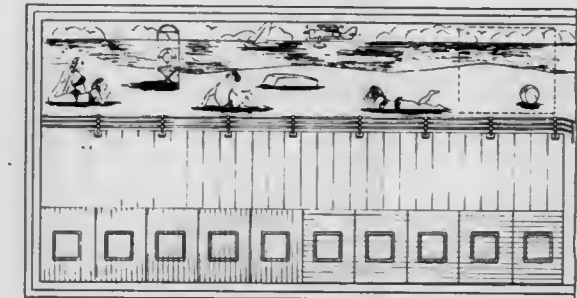
293,119
GUITAR BODY

Michael V. Powers, 1741 52nd St., Meridian, Miss. 39305, assignor to Peavey Electronics Corporation, Meridian, Miss.
Filed Dec. 27, 1985, Ser. No. 814,245
Term of patent 14 years
U.S. Cl. D17—20



293,121
GAME BOARD

Charles B. Phillips, New York, N.Y., and Edward R. Bick, Marblehead, Mass., assignors to Kenner Parker Toys Inc., Beverly, Mass.
Filed Jun. 13, 1985, Ser. No. 744,448
Term of patent 14 years
U.S. Cl. D21—25



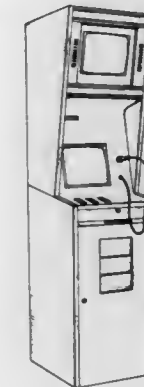
293,122
ROCKING TOY

Charlotte Devaney, 2675 Eaton Street, Vancouver, B.C., V5K 1J9, Canada
Filed Feb. 14, 1984, Ser. No. 579,944
Term of patent 14 years
U.S. Cl. D21—66



293,120
COMPUTER CONSOLE

Maurits L. De Prins, Verhoevenlei 15, Brasschaat 2130, Belgium
Filed Mar. 25, 1986, Ser. No. 845,808
Term of patent 14 years
U.S. Cl. D21—13



293,123
CLOTH BUNNY

Rhonda K. Zidell, 3903 Beacondale Dr., Austin, Tex. 78759
Filed Jun. 3, 1985, Ser. No. 740,348
Term of patent 14 years
U.S. Cl. D21—187



293,124

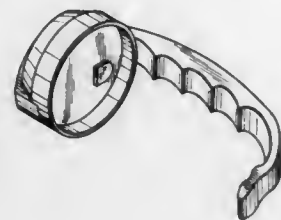
HANDLE FOR EXERCISE DEVICE

David D. Sobel, 15415 N. 22nd St., Phoenix, Ariz. 85022

Filed Apr. 19, 1985, Ser. No. 724,968

Term of patent 14 years

U.S. Cl. D21—198



293,125

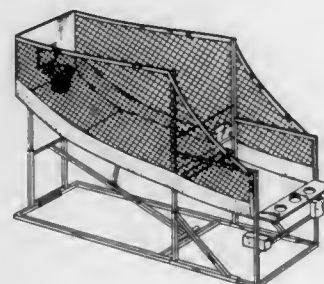
COMBINED BASKETBALL GAME GOAL AND BALL RETURN

Ken C. Cochran, P.O. Box 1073, Salina, Kans. 67402-1073

Filed Jun. 21, 1985, Ser. No. 747,238

Term of patent 14 years

U.S. Cl. D21—201



293,126

GOLF PUTTER

Dan D. Bizovi, 8171 New Bradford Dr., Sterling Heights, Mich. 48077

Filed May 20, 1985, Ser. No. 735,699

Term of patent 14 years

U.S. Cl. D21—219



293,127

FLOW CONTROL NOZZLE FOR SPRAYERS

Robert W. Heugesbach, 7886 Mentor Rd., Mentor, Ohio 44060

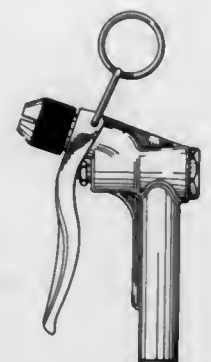
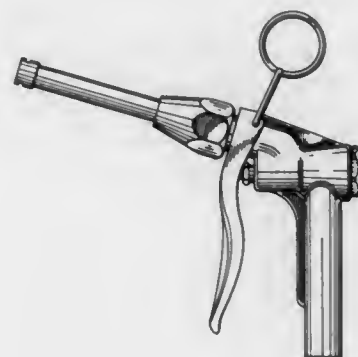
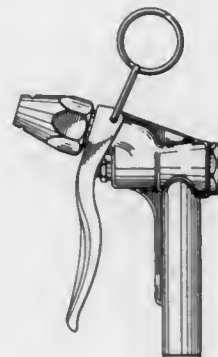
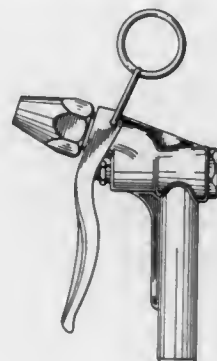
Continuation-in-part of Ser. No. 461,874, Jan. 28, 1983, Pat. No.

Des. 282,392. This application Nov. 23, 1984, Ser. No. 674,272

The portion of the term of this patent subsequent to Jan. 28, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—226



293,130

SUPPORT FLANGE FOR IV DRIP CHAMBER

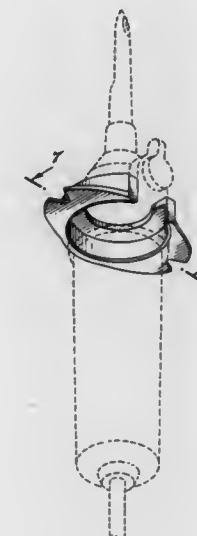
George Ashie, and Donald L. Millerd, both of San Diego, Calif.,

assignors to IVAC Corporation, San Diego, Calif.

Filed Jul. 18, 1986, Ser. No. 888,042

Term of patent 14 years

U.S. Cl. D24—53



293,128

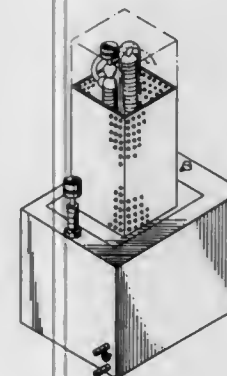
MICROWAVE DISTILLATION APPARATUS

Narbik A. Karamian, Bethesda, Md., assignor to Raf-Tan Inc., Bethesda, Md.

Filed Oct. 15, 1985, Ser. No. 787,724

Term of patent 14 years

U.S. Cl. D23—207



293,131

BALUSTER

John B. Noyce, Roswell, Ga., assignor to Manufacturers Merchandising Corp., Roswell, Ga.

Filed Nov. 16, 1984, Ser. No. 672,072

Term of patent 14 years

U.S. Cl. D25—129



293,129

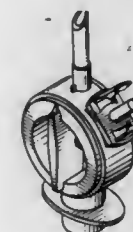
DRUG DELIVERY VALVE FOR IV FLUID INFUSION SYSTEM

Donald L. Millerd; Robert S. Alpert, and John E. Kling, all of San Diego, Calif., assignors to IVAC Corporation, San Diego, Calif.

Filed Jun. 10, 1985, Ser. No. 742,776

Term of patent 14 years

U.S. Cl. D24—53



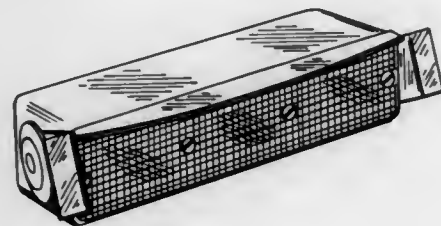
293,132
BALUSTER

John B. Noyce, Roswell, Ga., assignor to Manufacturers Merchandising Corp., Roswell, Ga.
Filed Nov. 16, 1984, Ser. No. 672,073
Term of patent 14 years
U.S. Cl. D25—128



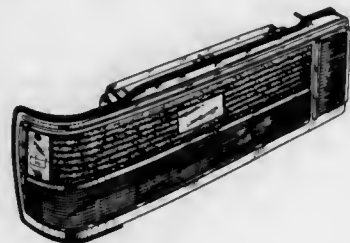
293,133

LIGHT ASSEMBLY FOR MOTOR VEHICLE
P. John Wood, Solana Beach, Calif., assignor to BAC-OFF Corporation, San Diego, Calif.
Filed May 24, 1985, Ser. No. 737,522
Term of patent 14 years
U.S. Cl. D26—28



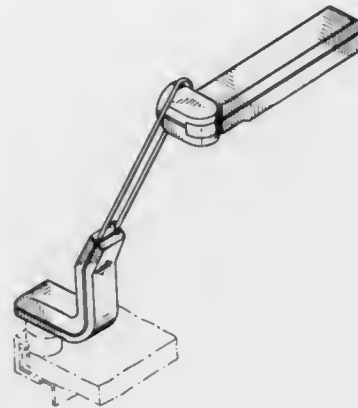
293,134

AUTOMOBILE TAILLIGHT
Shinya Mori, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Oct. 16, 1984, Ser. No. 661,530
Claims priority, application Japan, Sep. 19, 1984, 59-38891
Term of patent 14 years
U.S. Cl. D26—35



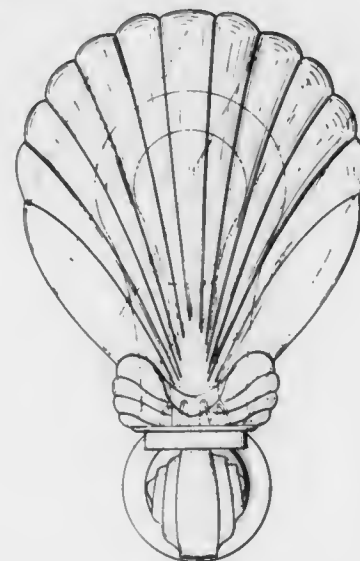
293,135
DESK LAMP

Douglas J. Medema, Pompano, Fla.; Donald J. Staufenberg, Hudsonville, and James O. Kelley, Spring Lake, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.
Filed Apr. 25, 1985, Ser. No. 727,279
Term of patent 14 years
U.S. Cl. D26—61



293,136

LIGHTING FIXTURE
Gerhard E. Joerger, Hans-Thoma-Strasse 89-99, 6800 Mannheim 25, Fed. Rep. of Germany
Filed Aug. 12, 1985, Ser. No. 764,898
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1985, MR V/1291
Term of patent 14 years
U.S. Cl. D26—87



293,137
FINGER REST

Frederick J. Loerup, 1341 SE. 6th Ave., Deerfield Beach, Fla. 33441
Filed Dec. 16, 1985, Ser. No. 809,027
Term of patent 14 years
U.S. Cl. D28—61



293,138

DRY SHAVER
Klaas T. Oord, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 20, 1985, Ser. No. 703,247
Claims priority, application Benelux, Aug. 23, 1984, 59281-03
Term of patent 14 years
U.S. Cl. D28—50



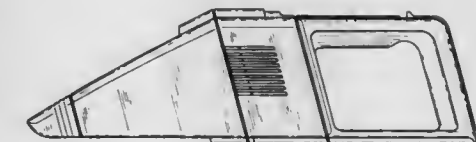
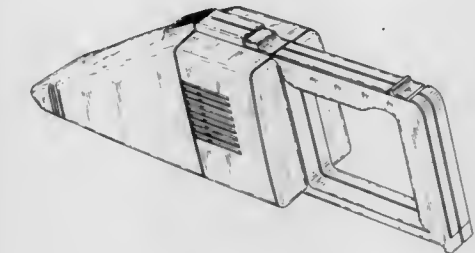
293,139

ADJUSTABLE DOG HARNESS
Milton J. Roa, 454 Redwing Rd., Chula Vista, Calif. 92011
Filed Mar. 29, 1985, Ser. No. 718,025
Term of patent 14 years
U.S. Cl. D30—152



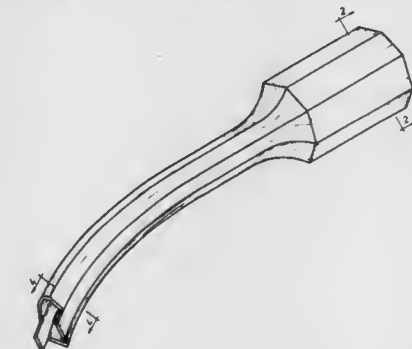
293,140
VACUUM CLEANER

Aloysius J. M. Beeren, Haren, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 9, 1985, Ser. No. 753,204
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, MR16002
Term of patent 14 years
U.S. Cl. D32—18



293,141

VACUUM CLEANER ATTACHMENT FOR CLEANING REFRIGERATOR COILS
Rick G. Blocker, 7801 Canisius, Hazelwood, Mo. 63042
Filed Jul. 13, 1984, Ser. No. 630,739
Term of patent 14 years
U.S. Cl. D32—25



293,142

CARPET SWEEPER

Akira Kubota, Ryugasaki, Japan, assignor to Hukuba Kogyo Kabushiki Kaisha, Japan

Filed Jan. 8, 1985, Ser. No. 689,669

Claims priority application Japan, 59-33321

Term of patent 14 years

U.S. Cl. D32—38



293,143

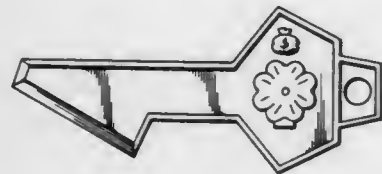
SCRAPER

Clifford B. Cornell, 7700 E. 112th Ter., Kansas City, Mo. 64134

Filed May 12, 1986, Ser. No. 862,521

Term of patent 14 years

U.S. Cl. D32—46



293,144

PAINT CONTAINER AND COVER THEREFOR

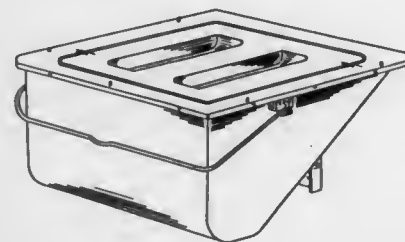
Helmut H. Papke, 125 Lincoln Road, Waterloo, Ontario, Canada N2J 2N9; Siegfried E. Arndt, R.R. #1, Moorefield, Ontario, Canada N0G 2K0; Dieter W. Arndt, 40 Manley Street, Ayr, Ontario, Canada N0B 1E0, and Claus D. Krueger, 199 King Street, St. Jacobs, Ontario, Canada N0B 2N0

Filed Dec. 21, 1984, Ser. No. 685,044

Claims priority, application Canada, Jun. 27, 1984, 27-06-84-11

Term of patent 14 years

U.S. Cl. D32—53.1



293,145

KNOCKDOWN DRYING RACK FOR SHOES AND GLOVES

Leland G. Hughes, and Jacqueline S. Hughes, both of 31929 Owl Rd., Eugene, Oreg. 97405

Filed Jul. 8, 1985, Ser. No. 752,961

Term of patent 14 years

U.S. Cl. D32—58



293,146

ELECTRIC IRON

Serge Brun, Lyons, France, assignor to Calor S.A., Lyons, France

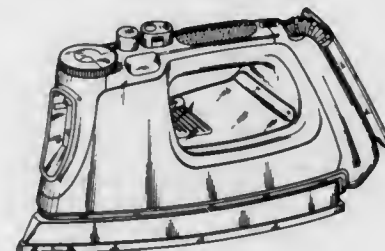
Filed Jun. 11, 1985, Ser. No. 743,655

Claims priority, application France, Dec. 19, 1984, 845,720

The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D32—70



293,147

ELECTRIC IRON

Serge Brun, Lyons, France, assignor to Calor S.A., Lyons, France

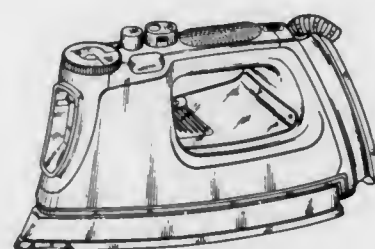
Filed Jun. 11, 1985, Ser. No. 743,654

Claims priority, application France, Dec. 19, 1984, 845,720

The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D32—70



293,148

CART

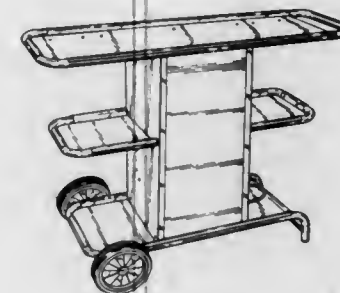
Hans Wedel, Menden, Fed. Rep. of Germany, assignor to Cramer GmbH & Co KG, Menden, Fed. Rep. of Germany

Filed Feb. 15, 1985, Ser. No. 702,372

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, MR1023

Term of patent 14 years

U.S. Cl. D34—21



293,150

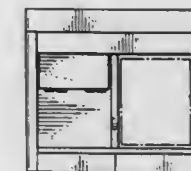
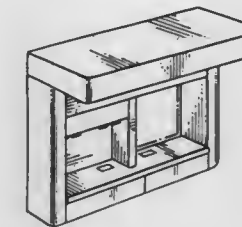
AUTOMATED TELLER SERVICE CENTER ENCLOSURE

Ernest F. J. Prinzhorn, Los Angeles, Calif., assignor to QRS Corporation, Los Angeles, Calif.

Filed May 13, 1985, Ser. No. 709,213

Term of patent 14 years

U.S. Cl. D99—28



293,151

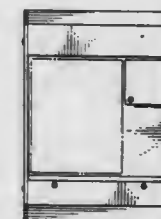
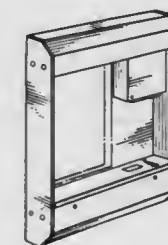
AUTOMATED TELLER SERVICE CENTER ENCLOSURE

Ernest F. J. Prinzhorn, Los Angeles, Calif., assignor to QRS Corporation, Los Angeles, Calif.

Filed May 13, 1985, Ser. No. 709,217

Term of patent 14 years

U.S. Cl. D99—28



293,149

MODULAR TISSUE DISPENSING CART

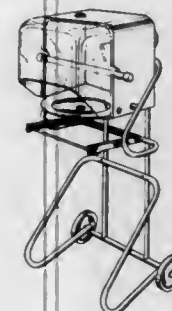
Henri Minost, Neuilly s/Seine, France, assignor to Beghin-Say, S.A., Thumeries, France

Filed Mar. 18, 1985, Ser. No. 712,516

Claims priority, application France, Sep. 17, 1984, 84,4046

Term of patent 14 years

U.S. Cl. D34—26



293,152

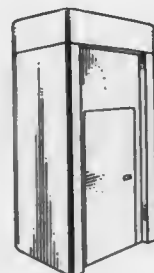
AUTOMATED TELLER ENCLOSURE

Ernest F. J. Prinzhorn, Los Angeles, Calif., assignor to QRS Corporation, Los Angeles, Calif.

Filed May 13, 1985, Ser. No. 709,218

Term of patent 14 years

U.S. Cl. D99—28



293,153

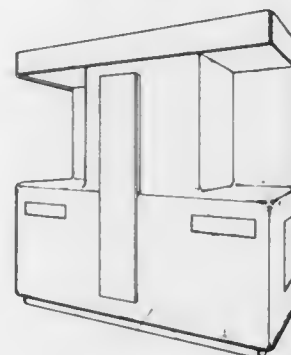
SELF-SERVICE POSTAL FACILITY OR SIMILAR ARTICLE

Mark B. McKellar, 3130 Walnut Bend, #404, Houston, Tex. 77042

Filed Apr. 23, 1985, Ser. No. 726,043

Term of patent 14 years

U.S. Cl. D99—29



293,154

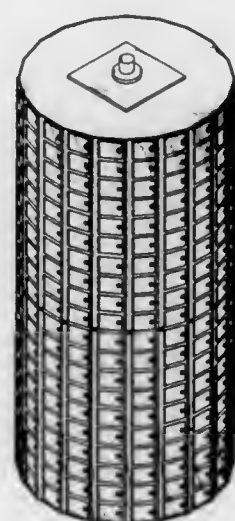
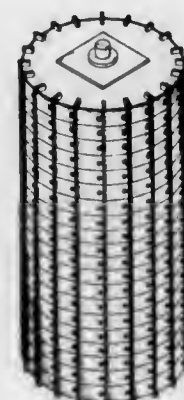
POSTAL BOX UNIT OR SIMILAR ARTICLE

Mark B. McKellar, 3130 Walnut Bend, #404, Houston, Tex. 77042

Filed Apr. 23, 1985, Ser. No. 726,026

Term of patent 14 years

U.S. Cl. D99—29

**LIST OF PATENTEEES**

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF DECEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A.K.G.S.: See—
Andres, Kenneth E.; Weingardt, Gary; and Durbin, James L., 4,711,390, Cl. 229-41.00R.
- A-Lok Products, Inc.: See—
Ditcher, Jack; and Westhoff, James A., 4,711,455, Cl. 277-9.500.
- A. Nattermann & Cie GmbH: See—
Welter, Andre; Leyck, Sigurd; and Etschenberg, Eugen, 4,711,961, Cl. 548-121.000.
- A/S Atlas: See—
Ullum, Henrik, 4,711,041, Cl. 34-179.000.
- Aarts, Herman J. C. M.: See—
Van Hoof, Isidoor K.; and Aarts, Herman J. C. M., 4,711,824, Cl. 428-607.000.
- Abbott Laboratories: See—
Ritter, G. Thomas; and Budniak, Mitchell, 4,711,987, Cl. 219-358.000.
- Abdollahian, Mehdy: See—
Butler, Scott J.; Smith, Robert K.; and Abdollahian, Mehdy, 4,712,046, Cl. 315-248.000.
- Abe, Noriyuki: See—
Suzuki, Tadashi; Okada, Kazuyoshi; and Abe, Noriyuki, 4,712,211, Cl. 370-100.000.
- Abe, Taizou: See—
Tsukahara, Kenji; and Abe, Taizou, 4,711,616, Cl. 417-216.000.
- Abinett, Raymond E., to Lucas Industries Public Limited Company. Fuel injection pumps, 4,711,618, Cl. 417-462.000.
- Abraham, Edward D., to Abraham, Lucille S. Conveyor transfer apparatus for foundry use and method of conveyor transfer, 4,711,342, Cl. 198-463.300.
- Abraham, Lucille S.: See—
Abraham, Edward D., 4,711,342, Cl. 198-463.300.
- Abuyama, Yasuo, to Kabushiki Kaisha Toshiba. Copying machine with an interrupt function, 4,711,556, Cl. 355-14.00R.
- AccSys Technology, Inc.: See—
Hamm, Robert W., 4,712,042, Cl. 315-5.410.
- Acharya, Arun; and Bevier, William E., to Union Carbide Corporation. Single component adsorption process, 4,711,646, Cl. 55-33.000.
- Adachi, Masahiro: See—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.
- Adachi, Mitsunori: See—
Tomita, Satoru; and Adachi, Mitsunori, 4,712,142, Cl. 358-285.000.
- Adaptable Tool Company, The: See—
Caldwell, Donald B.; and Spring, Robert J., 4,711,299, Cl. 166-105.100.
- Adinolfi, Philip J.: See—
Zucker, Richard S.; and Adinolfi, Philip J., 4,711,351, Cl. 206-331.000.
- Adir et Compagnie: See—
Wierzbicki, Michel; Hugon, Pierre; and Poignant, Jean-Claude, 4,711,885, Cl. 514-253.000.
- Adolf Hottinger Giesserei und Maschinenbau GmbH: See—
Rommel, Reiner; and Landau, Werner, 4,711,292, Cl. 164-200.000.
- Adomeit, Heinz-Dieter. Height adjusting arrangement for a guide fitment of a safety belt, 4,711,498, Cl. 297-468.000.
- Advanced Micro Devices, Inc.: See—
Joshi, Sunil P.; and Iyer, Venkatraman, 4,712,215, Cl. 371-37.000.
- Advanced Thermal Systems, Inc.: See—
Hannah, Daniel E.; Miliczky, Eugene W.; Bea, Clifford F.; and Hannah, Martin J., 4,711,013, Cl. 29-402.020.
- Aerojet-General Corporation: See—
Fortunko, Chris M., 4,711,152, Cl. 89-6.500.
- Affarsverket FFV: See—
Sundberg, Sten; Risberg, Stig; and Eriksson, Ulf, 4,711,179, Cl. 102-426.000.
- Agee, Jerry W. Tool handle and head assembly, 4,711,594, Cl. 403-263.000.
- Agency of Industrial Science & Technology: See—
Kikuchi, Kaoru; and Shikata, Nobuo, 4,711,707, Cl. 204-145.00R.
- Agfa Gevaert Aktiengesellschaft: See—
Pertsch, Albert; Zeroni, Ludwig; and Brunner, Hubert, 4,712,150, Cl. 360-132.000.
- AGFA-Gevaert N.V.: See—
Nelen, Petrus R., 4,711,570, Cl. 355-91.000.
- Ahamco Investments, Inc.: See—
Patton, Edward J., 4,711,058, Cl. 52-101.000.
- Aichi Steel Works, Ltd.: See—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,711,675, Cl. 148-144.000.
- Aida Engineering Co., Ltd.: See—
Imanishi, Shozo; and Sato, Mitsuo, 4,711,169, Cl. 100-257.000.
- Air Products and Chemicals, Inc.: See—
Burgoyne, William F., Jr.; and Dixon, Dale D., 4,711,737, Cl. 252-77.000.
- Kumar, Ravi, 4,711,645, Cl. 55-26.000.
- Aisin Seiki Kabushiki Kaisha: See—
Kazaoka, Kenichi; Wakamatsu, Fumio; and Shinkai, Yasuo, 4,711,497, Cl. 297-458.000.
- Aisin Seiki Kabushiki Kaisha: See—
Iwasaki, Shinichiro, 4,712,034, Cl. 310-217.000.
- Aisin-Warner Kabushiki Kaisha: See—
Miura, Masakatsu; and Aoki, Hideyuki, 4,711,138, Cl. 74-761.000.
- Ajinomoto Co., Inc.: See—
Toyoshi, Seiji; Yoshizumi, Tomoya; Saeki, Masaru; and Kawakita, Tetsuya, 4,711,722, Cl. 210-638.000.
- Yokozeki, Kenzo; and Kubota, Koji, 4,711,846, Cl. 435-70.000.
- Akahane, Kenji: See—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeiyama, Hideaki; and Kiso, Yoshiaki, 4,711,958, Cl. 544-139.000.
- Akita, Shinji: See—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.
- Aktiebolaget Bofors: See—
Dahlberg, Kurt, 4,712,181, Cl. 364-423.000.
- Akzo N.V.: See—
Jacobson, Walter; Riggio, Stephen C.; and Turner, James E., 4,711,852, Cl. 436-15.000.
- Alba, Andrew J.; Griesemer, James A.; and Gordon, Robert L., to International Paper Company. Self-supporting and spill resistant food carton, 4,711,389, Cl. 229-1.50B.
- Albach, Manfred, to U.S. Philips Corporation. Circuit arrangement for forming a direct voltage from a sinusoidal input voltage, 4,712,169, Cl. 363-89.000.
- Albeck, Bernhard; and Goedicke, Siegfried, to Schwabe GmbH. Method of making core laminations, and punch die for carrying out the method, 4,711,019, Cl. 29-609.000.
- Albertson, Robert V. Trash container, 4,711,367, Cl. 220-404.000.
- Alcatel N. V.: See—
Heck, Wolfgang; Kersten, Peter; and Volz, Hans, 4,712,083, Cl. 338-32.00R.
- Alcazar, David G.: See—
Kwon, Hegeon; Birring, Anmol S.; Singh, Gurvinder P.; Hendrix, Gary J.; and Alcazar, David G., 4,711,120, Cl. 73-119.00R.
- Alderson, Richard, to Fiberoptic Sensor Technologies, Inc. Fiber optic coupled pressure transducer using single fiber and method of fabrication, 4,711,246, Cl. 128-667.000.
- Aldred, Edward J., to Ransomes Sims & Jefferies PLC. Grass cutting attachment for tractor, 4,711,072, Cl. 56-6.000.
- Alexander, Randall W.: See—
Troupes, Demetrios; and Alexander, Randall W., 4,712,102, Cl. 340-790.000.
- Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I. Magnetic suspension for a vehicle, 4,711,182, Cl. 104-283.000.
- Alfa Romeo Auto S.p.A.: See—
Radaelli, Dario; and Giraudi, Walter, 4,711,400, Cl. 239-585.000.
- Alferness, Rodney C., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Electrooptic polarization multiplexer/demultiplexer, 4,711,515, Cl. 350-96.140.
- Allegheny Ludlum Corporation: See—
Benford, James G., 4,711,113, Cl. 72-197.000.
- Allied Corporation: See—
Jen, Kwan-Yue A.; and Eisenbaumer, Ronald L., 4,711,742, Cl. 252-500.000.
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- Alps Electric Co., Ltd.: See—
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- Ambach, Eberhard: See—
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- American Cyanamid Company: See—
- Kuzara, David J., 4,711,244, Cl. 128-632,000.
- Lehmann, Leonard T., 4,711,241, Cl. 128-335,500.
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- American Hospital Supply Corporation: See—
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- American Optical Corporation: See—
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- American Telephone and Telegraph Company, AT&T Bell Laboratories: See—
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- Bossard, Peter R.; and Mucha, John A., 4,711,118, Cl. 73-73,000.
- Miller, David A. B., 4,711,997, Cl. 250-216,000.
- Snyder, Donald Q., 4,711,053, Cl. 51-3,000.
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- American Telephone & Telegraph Company, AT&T Information Systems Inc.: See—
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- Mountz, Craig E., 4,711,325, Cl. 188-32,000.
- Amoco Corporation: See—
- Young, Grant A., 4,711,720, Cl. 210-512,200.
- Analychem International, Inc.: See—
- Good, Thomas J., 4,711,764, Cl. 422-65,000.
- Ancor Industries, Inc.: See—
- Anderson, Linda K., 4,712,031, Cl. 310-90,000.
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- Ando, Makoto; and Miki, Yukio, to Minolta Camera Kabushiki Kaisha. Drive coupling device for optical instruments. 4,711,528, Cl. 350-257,000.
- Ando, Toshio; Nishihara, Toshikazu; and Kimura, Akihiro, to Victor Company of Japan, Ltd. Magnetic medium for horizontal magnetization recording and method for making same. 4,711,810, Cl. 428-336,000.
- Andraa, Rainer; and Hofmann, Manfred, to Metzeler Kautschuk GmbH. Two-chamber engine mount with hydraulic damping. 4,711,206, Cl. 123-192,000.
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- Holderle, Hans; Wolf, Jürgen; Eckhart, Horst; and Vonderau, Werner, 4,711,225, Cl. 123-590,000.
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- Machado, Octavio J.; Daugherty, David A.; Andrews, Ronnie H.; and Efferting, Larry E., 4,711,758, Cl. 376-272,000.
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- Anno, Hiroshi: See—
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- Antone, Wayne L., II; and Finnell, Dennis C. Wall outlet cover plate assembly. 4,711,634, Cl. 439-136,000.
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- Apolinar, Ermelinda A.: See—
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- APT, Inc.: See—
- Eastlund, Bernard J.; and Ramo, Simon, 4,712,155, Cl. 361-231,000.
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- Aramaki, Minoru; and Sakaguchi, Hiroaki, to Central Glass Company Limited. Method of converting fluorine-containing high polymer into lower molecular weight polymer. 4,711,949, Cl. 525-356,000.
- Archung, Ralph, to Boeing Company, The. Hydraulic system for aircraft. 4,711,089, Cl. 60-405,000.
- Ares, Roland A.; Jones, Robert A.; and Street, Norman E., to Hussmann Corporation. Reverse cycle heat reclaim coil and subcooling method. 4,711,094, Cl. 62-90,000.
- Argentini, Dino E., to Raytheon Company. Method for forming an insulator having a conductive surface. 4,711,859, Cl. 437-209,000.
- Argyris, Nikolaus, to Diehl GmbH & Co. Ammunition incorporating searching fuse with trajectory correctable during its final flight phase and method for combating armored target objects. 4,711,178, Cl. 102-384,000.
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- Armor Metals, Inc.: See—
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- Atlantic Richfield Company: See—
- Patrick, David H., 4,711,474, Cl. 285-332,300.
- Statton, Gary L.; and Gaul, James M., 4,711,910, Cl. 521-107,000.
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- AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr. Dr. h.c. Hans List: See—
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- B. Hagemann & Co.: See—
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- Boardman Molded Products, Inc.: See—
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- Brooks, Royce L., to Koerner, Norman D. Evacuation chair. 4,711,487, Cl. 297-183.000.
- Brown, Anthony D., to Grundy Dispense Systems, Inc. Coupler and pump for a beverage dispenser. 4,711,377, Cl. 222-400.700.
- Brown, Byron L. Method and apparatus for cementing an acetabular cup to an acetabulum. 4,711,233, Cl. 128-92.0VP.
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- Bull, Rebecca L.; and Shupert, Kristine A. Mother's apron or bib with detachable multicolored two-dimensional infant toys to aid supervised baby play. 4,710,979, Cl. 2-48.000.
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- Burgoyne, William F., Jr.; and Dixon, Dale D., to Air Products and Chemicals, Inc. N-tert-butyl derivatives of toluenediamine and mixtures as antioxidant for organic materials. 4,711,737, Cl. 252-77.000.
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- Ban, Mikichi, 4,711,576, Cl. 356-353.000.
- Haruta, Masahiro; Kuwae, Yoko; Yuasa, Satoshi; and Miyazaki, Toshihiko, 4,711,830, Cl. 430-52.000.
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- Iizuka, Kiyoshi, 4,711,547, Cl. 354-471.000.
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- Kyuma, Kenji; and Hieda, Teruo, 4,712,138, Cl. 358-213.310.
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- Carr, Francis, to Siltronics Ltd. Miniature antenna with separate sequentially wound windings. 4,712,112, Cl. 343-788.000.
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- Carroll, Bruce I. Alcohol fuel conversion apparatus. 4,711,223, Cl. 123-557.000.

- Carroll, Charles. High security deadlocking door latch. 4,711,478, Cl. 292-173.000.
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- Carson, Culley: See—
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- Cartmell, Robert R.; and Horecky, Carl J., to Standard Oil Company (Indiana). Apparatus for mixing cracking catalyst with a fluid hydrocarbon. 4,711,766, Cl. 422-140.000.
- Carveth, Peter C.: See—
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- Case, Allen W., Jr.: See—
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- Casio Computer Co., Ltd.: See—
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- Tanazawa, Masayoshi; Shoji, Masaru; and Yamada, Wataru, 4,711,584, Cl. 368-88.000.
- Uesugi, Yoshinori, 4,712,196, Cl. 365-229.000.
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- Cates, Marion H.; and Szonntag, Eugene L., to Honeywell Inc. Sorption/desorption gas analysis apparatus. 4,711,765, Cl. 422-89.000.
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- Celotex Corporation, The: See—
Snider, Scott C.; and DeLeon, Alberto, 4,711,912, Cl. 521-125.000.
- Central Glass Company Limited: See—
Aramaki, Minoru; and Sakaguchi, Hiroaki, 4,711,949, Cl. 525-356.000.
- Central Sprinkler Corporation: See—
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- Centre National d'Etudes Spatiales (C.N.E.S.): See—
Regipa, Robert, 4,711,416, Cl. 244-31.000.
- Cerny, Martin: See—
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- Cetrone, Vincent B. Tubular overhead lighting system. 4,712,165, Cl. 362-147.000.
- Cetus Corporation: See—
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- Chang, Shing, 4,711,844, Cl. 435-317.100.
- Gelfand, David H.; and Lawyer, Frances C., 4,711,845, Cl. 435-68.000.
- Chaimowicz, Jean-Claude A., to National Research Development Corporation. Optical displacement sensors. 4,711,578, Cl. 356-375.000.
- Chan, Tony: See—
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- Chang, A-Shen, to Joanna Western Mills Company. Method and apparatus for making slats for window blinds and the like from a continuous web of plastic material. 4,711,005, Cl. 29-24.500.
- Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Catalytic conversion. 4,711,970, Cl. 585-415.000.
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- Chapman, Lloyd R.; and Holcombe, Cressie E., Jr., to ZYP Coatings, Inc. Oxidation prevention coating for graphite. 4,711,666, Cl. 106-14.120.
- Chapman, M. J.: See—
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- Charbonnages de France: See—
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- Charbonneau, Arthur G.; Godfrey, Dwayne A.; McNamey, John A.; and Nafziger, Steven, to Charbonneau & Godfrey Associates. Motor operated valve analysis and testing system. 4,712,071, Cl. 324-415.000.
- Charbonneau & Godfrey Associates: See—
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- Charen, Grace M.: See—
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- Chastang, Georges J. B.: See—
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- Chef Francisco, Inc.: See—
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- Chemische Fabrik Stockhausen GmbH: See—
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- Chen, Nai Y.; Degnan, Thomas F., Jr.; Leiby, Susan M.; Oleck, Stephen M.; and Pelrine, Bruce P., to Mobil Oil Corporation. Process for making improved lubricating oils from heavy feedstock. 4,711,710, Cl. 208-111.000.
- Chen, Shin-I. Pressure cooker. 4,711,366, Cl. 220-316.000.
- Chen, Te H.; Cicchino, Dominic; and Shadbolt, Peter J., to Exxon Research and Engineering Company. Refractory anchor. 4,711,186, Cl. 110-336.000.
- Chen, Tsai A. Automatic machine for making stone fruit biscuit. 4,711,166, Cl. 99-353.000.
- Cheng, Li-Jen, to United States of America, National Aeronautics and Space Administration. Tailorable infrared sensing device with strain layer superlattice structure. 4,711,857, Cl. 437-3.000.
- Chevron Research Co.: See—
Angehrn, Jorg A.; and Fischer, Dennis J., 4,711,122, Cl. 73-151.000.
- Beach, David L.; and Harrison, James J., 4,711,969, Cl. 585-511.000.
- Chew, Weng C.: See—
Clark, Brian; and Chew, Weng C., 4,712,070, Cl. 324-338.000.
- Chikashige, Kiyoshi, to Clarion Co., Ltd. Tape transport cylinder with stress-relieved bearing recess. 4,712,147, Cl. 360-130.240.
- Chinone, Naoki: See—
Ohnuki, Nobutaka; Ojima, Masahiro; Arimoto, Akira; and Chinone, Naoki, 4,712,218, Cl. 372-38.000.
- Cho, Masamichi: See—
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- Choe, Eui W., to Hoechst Celanese Corporation. Novel diacetylenic and polydiacetylenic compositions. 4,711,532, Cl. 350-354.000.
- Chokai, Shoichi: See—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.
- Cholin, Jeffrey G.: See—
Cholin, John M.; Cholin, Jeffrey G.; and Voorhis, Ray, 4,712,096, Cl. 340-590.000.
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- Choong, John: See—
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- Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., to Westinghouse Electric Corp. Metal core printed circuit boards. 4,711,822, Cl. 428-458.000.
- Christe, Karl O., to Rockwell International Corporation. Pure fluorine gas generator. 4,711,680, Cl. 149-109.400.
- Christensen, Jon B., to Halliburton Company. Bundle type downhole gauge carrier. 4,711,123, Cl. 73-151.000.
- Christenson, Roger M.: See—
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- Christine, William C., to Trinity Foundation. Portable dispensing system. 4,711,373, Cl. 222-82.000.
- Christini, Theodore P., to Du Pont de Nemours, E. I., and Company. X-ray intensifying screen with improved topcoat. 4,711,827, Cl. 428-690.000.
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- Chrysler Motors Corporation: See—
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- Chrysomallis, George; and Griffing, Robert S., to FMC Corporation. Combustion augmented plasma pressure amplifier. 4,711,154, Cl. 89-7.000.

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- Ciba Corning Diagnostics Corp.: See—
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- Ciba-Geigy Corporation: See—
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Stahl, Peter H.; and Schmitz, Beat, 4,711,880, Cl. 514-108.000.
- Cicchino, Dominic: See—
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- Cincinnati Milacron Inc.: See—
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- Cinpinski, Kenneth J., to General Motors Corporation. LPP combustion control for IC engine with abnormal combustion. 4,711,215, Cl. 123-425.000.
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- Claassen, George R.: See—
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- Clement, Gene R., to Knap & Vogt Manufacturing Company. Sequential drawer slide. 4,711,588, Cl. 384-18.000.
- Clish, Robert J., to International Paper Company. Filler nozzle with capillary action and its method of operation. 4,711,277, Cl. 141-311.00A.
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- Clough, Douglas O., to Hollingsworth UK, Ltd. Friction spinning apparatus. 4,711,083, Cl. 57-301.000.
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- Coalair Systems: See—
Wynosky, Charles E.; and Mraz, Joseph, 4,711,607, Cl. 406-30.000.
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- Cognetti de Martiis, Carlo: See—
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- Coherent, Inc.: See—
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- Coin Acceptors, Inc.: See—
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- Coleman, Edward R. Valve manifold. 4,711,268, Cl. 137-597.000.
- Coleman, John D., to Commonwealth Scientific and Industrial Research Organization. Method and apparatus for use in producing reconsolidated wood products. 4,711,684, Cl. 156-196.000.
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- Colt Industries Inc.: See—
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- Conrad, Kenneth C., to Westinghouse Electric Corp. Method and apparatus for installing free standing turbine blades. 4,711,007, Cl. 29-156.80R.
- Conroy, Gary M.: See—
Kugele, Thomas G.; Mesch, Keith A.; Wursthorn, Karl R.; and Conroy, Gary M., 4,711,920, Cl. 524-178.000.
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- Continental Gummi-Werke Aktiengesellschaft: See—
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- Copal Electronics Co., Ltd.: See—
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- Copeland, James L., to Ecolab Inc. Mechanical dishwashing rinse composition having a low foaming sulfonic acid rinsing agent and a source of active halogen. 4,711,738, Cl. 252-95.000.
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- Cordis Corporation: See—
Harris, Donald L., 4,711,027, Cl. 29-869.000.
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- Corsentino, John A.: See—
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- Cosser, Harry F., to Schlumberger Electronics, Inc. Side arm fluid level gauge with spaced-apart sensors for density error compensation. 4,711,117, Cl. 73-1.00H.
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- Cranford, William R.: See—
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- Creative Sales & Mfg. Co., Inc.: See—
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- Crema, Rolf, to Ernst Leitz Wetzlar GmbH. Film advance mechanism. 4,711,545, Cl. 354-213.000.
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- Cronch, Robert D.; and Koudele, Larry J., to Magnetic Peripherals Inc. Circuit for phase locking a clock signal to a series of pulses. 4,712,076, Cl. 331-16.000.
- Crosby, Samuel C.: See—
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- Cross, William E.; Hillestad, Jeanne E.; and Plyler, Robert G., to General Motors Corporation. Electrical connector. 4,711,509, Cl. 439-587.000.
- Crowell, Jonathan C.: See—
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- CTS Corporation: See—
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- Cunningham, Frank W. Meniscal cutting device. 4,711,238, Cl. 128-303.140.
- Cuno Incorporated: See—
Ostreicher, Eugene A.; Knight, Rodney A.; Fiore, Joseph V.; Emond, George T.; and Hou, Kenneth C., 4,711,793, Cl. 427-244.000.

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- Dainippon Screen Mfg. Co., Ltd.: See—
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- DeLeon, Alberto: See—
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- Denniston, Charles D.: See—
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- Dessanti, Daniel J.: See—
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- Detrick, Jeffrey C. Compatibility/incompatibility forecasting device. 4,711,632, Cl. 434-106.000.
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- DiVincenzo, Maureen. Needlecraft with metallic substrate. 4,711,800, Cl. 428-131.000.
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- Dixon, Dale D.: See—
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- Dixon, Paul A., to Dixon Automatic Tool, Inc. Power-and-free conveyor apparatus for handling pallet-supported workpieces. 4,711,343, Cl. 198-465.200.
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- Doherty, James B.: See—
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- Doi, Masahiro: See—
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- Douglas, Monte A., to Texas Instruments Incorporated. Silicon oxide thin film etching process. 4,711,698, Cl. 156-643.000.
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- Drader, Clarence H. Process for welding thermoplastic by injection. 4,711,746, Cl. 264-36.000.
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- Drexler, Jerome, to Drexler Technology Corporation. Redundant optical recording of information in different formats. 4,711,996, Cl. 235-468.000.
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- DuBarry Furniture of Canada Limited: See—
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- Dunn, Michael J., to Boeing Company. The. Projectile with integrated propulsion system. 4,711,414, Cl. 244-3.220.
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- Christini, Theodore P., 4,711,827, Cl. 428-690.000.
- Johnson, Van B.; and Nicosia, Salvatore J., 4,712,228, Cl. 378-185.000.
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- Tannenbaum, Harvey P., 4,711,802, Cl. 428-207.000.
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- Duro Med Industries, Inc.: See—
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- Durr, Charles A.: See—
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- Durr, Walter. Dental handpiece assembly. 4,711,630, Cl. 433-82.000.
- Dukenkamp, Manfred, to General Motors Corporation. Foldable headrest for vehicle rear seat. 4,711,494, Cl. 297-403.000.
- Dvorak, Robert F., to Square D Company. System for detection of ground faults in circuit breakers. 4,712,151, Cl. 361-47.000.
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- E.D.S. Company: See—
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- E. R. Squibb & Sons, Inc.: See—
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- Varma, Ravi K.; and Gordon, Eric M., 4,711,900, Cl. 514-351.000.
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- Early, Paul D., Jr.: See—
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- Ecklund, Lawrence M., to Motorola, Inc. Broadcast signal detected indication system. 4,712,241, Cl. 381-15.000.
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- Edenborough, John S.: See—
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- Emery, Keith A.: See—
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- Emond, George T.: See—
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- Emrich, Helmut; Mathes, Josef; Ochs, Heinrich; and Despot, Janko, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Changing drive for the distributing rollers of at least one inking unit of a printing unit of an offset rotary press. 4,711,173, Cl. 101-349.000.
- Energy Absorption Systems, Inc.: See—
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- Entech, Inc.: See—
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- Environmental Research Institute of Michigan: See—
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- Eriksson, Ulf: See—
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- Eriss, Lawrence: See—
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- Erker, James W.; Scotese, Michael J.; and Stotts, Jay B., to Caterpillar Industrial Inc. Lift mast mounting arrangement and method for removal. 4,711,614, Cl. 414-641.000.
- Ernst, Alfons, to Johannes Heidenhain GmbH. Multistage angle encoder with an improved allocation of coarse code information to fine code information. 4,712,088, Cl. 340-347.00P.
- Ernst Leitz Wetzlar GmbH: See—
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- Esser, Gunther: See—
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- Ethyl Corporation: See—
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- Etschenberg, Eugen: See—
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- Evans, Bruce M., to Minnesota Mining and Manufacturing Company. Apparatus for electronic scanning and microfilming of documents. 4,711,566, Cl. 355-41.000.
- Exac Corporation: See—
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- Extance, Philip: See—
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- Exxon Chemical Patents Inc.: See—
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- Exxon Research and Engineering Company: See—
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- Gorter, Helen R.; Moran, Lyle E.; Robertson, Warren D.; and Savard, Shaunalea, 4,711,672, Cl. 106-281.00R.
- Oswald, Alexis A.; and Bhatia, Ram N., 4,711,968, Cl. 568-454.000.
- Wachs, Israel E.; and Yang, Darchun B., 4,711,871, Cl. 502-325.000.
- Fabry, Jochen: See—
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- Fairchild Camera & Instrument Corp.: See—
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- Falk, Carl H., to Valmet-KMW Aktiebolag. Apparatus for cutting a paper web. 4,711,404, Cl. 242-56.00R.
- Falotico, Robert: See—
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- Fann, Yaw-Shin; and Wu, Rong-Faa, to Tong Lung Metal Industry Co., Ltd. Duplex latch bolt mechanism. 4,711,477, Cl. 292-169.140.
- Fanuc Ltd.: See—
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- Faria, Lawrence E.; and Christopher, Earl H., to Raytheon Company. Seal-less cryogenic expander. 4,711,650, Cl. 62-6.000.
- Farrel Corporation: See—
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- Fasco Industries, Inc.: See—
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- Featherston, William L.: See—
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- Fecik, Michael T.: See—
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- Feilchenfeld, Michal M.; and Connors, Grant R., to Westinghouse Electric Corp. Position indicating device. 4,711,757, Cl. 376-258.000.
- Feinberg, Richard R., to Ciba Corning Diagnostics Corp. Derivatives of 3,5,3-triiodothyronine. 4,711,855, Cl. 436-500.000.
- Feinstein, Jonathan J., to Union Carbide Corporation. Side-injected metal refining vessel and method. 4,711,430, Cl. 266-47.000.
- Felder, Willie L. Bicycle rack with safety light. 4,711,381, Cl. 224-39.000.
- Fentress, Vernon A.; and Dawson, Darryl A. Method and apparatus for installing fiber optic cables. 4,711,517, Cl. 350-96.200.
- Ferdelman, Donald C.: See—
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- Ferrari, Lorenzo, to Kinglor-Ltd. Process for the automatic forming of continuous metal tube filled with powdered materials, its direct introduction in to liquid metal, and related equipment. 4,711,663, Cl. 75-53.000.
- Ferreira, Lawrence, to Olin Hunt Specialty Products, Inc. Development of positive-working photoresist compositions. 4,711,836, Cl. 430-326.000.
- Feth, John R., to Litton Systems, Inc. Polarizing optical fiber with absorbing jacket. 4,711,525, Cl. 350-96.330.
- Fether, Kenneth B.: See—
Cowler, David J. W.; and Lewis, Peter R., 4,711,420, Cl. 248-243.000.
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- FGL Projects Limited: See—
Gannon, Raymond, 4,712,249, Cl. 383-43.000.
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- Field, Charles A.: See—
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- Finegold, Aaron N.; and Taylor, Maurice E., to Finegold, Aaron N. Implantable prosthesis system. 4,711,231, Cl. 128-79.000.
- Finger, Eugene P., to Curtis Instruments, Inc. Solid-state cumulative operations measurement system. 4,712,195, Cl. 365-226.000.
- Finke, Paul E.; Doherty, James B.; Zimmerman, Morris; Ashe, Bonnie M.; and Dorn, Conrad P., to Merck & Co., Inc. β -lactam derivatives as anti-inflammatory and antidegenerative agents. 4,711,886, Cl. 514-195.000.
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- Fiore, Joseph V.: See—
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- Firetek Corporation: See—
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- Fischer, Dennis J.: See—
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- Fleisher, Nathaniel; and Spector, George. Cigar holder. 4,711,254, Cl. 131-189.000.
- Flygt AB: See—
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- FMC Corporation: See—
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- Fomby, Kenneth A. Container and closure assembly with folding sealing ribs, 4,711,365, Cl. 220-288.000.
- Forbes, Franklin L.; and Harms, Harold B., to General Electric Company. Salient pole core and salient pole electronically commutated motor, 4,712,035, Cl. 310-269.000.
- Ford, Victoria L.; and Morgan, Bryan J., to Pegasus Airwave Limited. Air supply and control apparatus for inflatable mattress, 4,711,275, Cl. 141-95.000.
- Formers of Houston, Inc.: See—
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- Fornasari, Paolo, to Eltek S.p.A. Thermoelectric valve for channeling refrigerant gases into different tubes in refrigeration devices, 4,711,270, Cl. 137-625.500.
- Fortin, Jean-Louis. Tipper trailer, 4,711,499, Cl. 298-5.000.
- Fortunko, Chris M., to Aerojet-General Corporation. Apparatus for transmitting data to a projectile positioned within a gun tube, 4,711,152, Cl. 89-6.500.
- Foss, Leonard: See—
Li, Edward; Foss, Leonard; and Cousins, David, 4,711,227, Cl. 123-643.000.
- Foster, Joe: See—
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- Foster, Joseph C., Jr.; and Bilek, Andrew G., to United States of America, Air Force. Auxiliary booster, 4,711,177, Cl. 102-204.000.
- Fowler, John T., to Laitram Corporation. The Streamer interface adapter cable mounted leveler, 4,711,194, Cl. 114-245.000.
- Fox, Lester A.; and Zielski, Paul E., to Surgimach Corporation, The. Method and apparatus for packaging medical gauze sponges, 4,711,066, Cl. 53-436.000.
- Franchina, Thomas F.; Gudmundson, Gunnar G.; and Reuss, John R., to 2610 PGA Partnership. Add-on attachment for high-speed photographic printer, 4,711,565, Cl. 355-39.000.
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- Frappier, Edward P.: See—
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- Frazier, Stanley J.; and Sorenson, Blaine. Portable and collapsible stair, 4,711,282, Cl. 182-106.000.
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- Freeman, Clarence S.; and Freeman, Katherine M. Method for wire insulation, 4,711,022, Cl. 29-825.000.
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- Freier, Edward, Jr.; and Schaefer, Daniel W., to Simplicity Manufacturing, Inc. Clipping propulsion means for tractor mower, 4,711,073, Cl. 56-13.300.
- Freimuth, Martin: See—
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- Frentzel-Beyme, Johannes; and Stenmans, Heinz, to Palitex Project Company GmbH. Thread brake mechanism for a spindle assembly of a thread processing machine, 4,711,081, Cl. 57-279.000.
- Fresenius AG: See—
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- Fresquez, Chris J.: See—
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- Fretwell, Percy, to Henderson Doors Limited. Vehicle lift devices, 4,711,613, Cl. 414-550.000.
- Frezza, William; Simons, Robert; and Westerfer, Richard, to General Instrument Corporation. Security arrangement for downloadable cable television converters, 4,712,239, Cl. 380-20.000.
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- Fritsch, Edgar: See—
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- Frohberger, Paul-Ernst: See—
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- Fromberg, John P., to Positive Connections, Inc. Three-axis trailer hitch having improved rotatable coupling between vehicle and trailer, 4,711,461, Cl. 280-494.000.
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- Fuji Electric Company, Ltd.: See—
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- Fuji Jukogyo Kabushiki Kaisha: See—
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- Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, to Sanyo Electric Co., Ltd. Developing apparatus, 4,711,551, Cl. 355-3.0DD.
- Fujioka, Tadashi: See—
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- Fujishima, Daishiro; and Fujishima, Shinichiro. Disoxidant composition, 4,711,741, Cl. 252-188.280.
- Fujishima, Kazuyasu: See—
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- Fujishima, Shinichiro: See—
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- Fujita, Takeshi; and Kataoka, Hironori, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Oily phase dispersions employing an oil-miscible dispersing agent, 4,711,734, Cl. 252-52.00A.
- Fujita, Yukio: See—
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- Fujiwara, Masatoshi; Kuroda, Masato; and Shiga, Tatsuhide, to Yamatake Honeywell. Multicontrol process control system, 4,712,173, Cl. 364-138.000.
- Fujiwara, Michio: See—
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- Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, to Tokyo Electric Co., Ltd. Sheet supply device, 4,711,443, Cl. 271-126.000.
- Fujiyama, Kunio, to Takara Company. Barber and beauty parlor chair, 4,711,486, Cl. 297-71.000.
- Fujiyama, Seiki; and Lee, Myonghi, to Sillony Company Limited. Editing system of educational program for a computer assisted instruction system, 4,712,180, Cl. 364-419.000.
- Fukao, Masami: See—
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- Fuminao, Tanitomi, to Kaisei Kogyo Corporation. Tree pruning machine, 4,711,278, Cl. 144-2.00Z.
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- Furuhashi, Hiroyuki: See—
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- Futterer, Eberhard: See—
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- G. D. Searle & Co.: See—
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- G.D. Societa Per Azioni: See—
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- Gach, Peter P., to Sunbeam Plastics Corporation. Tamper indicating closure, 4,711,372, Cl. 222-23.000.
- Gadkaree, Kishor P.; Haynes, William L.; and Lu, Kun-Er, to Corning Glass Works. Modified cordierite glass ceramic composite, 4,711,860, Cl. 501-9.000.
- Galati, Gaspare; and Orsini, Mario, to Selenia Industrie Elettroniche Associate S.p.A. Device for the identification of undesirable echoes in radar systems, 4,712,109, Cl. 342-159.000.
- Galerneau, Jacques: See—
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- Galgana, Thomas C. Lobster pot, 4,711,050, Cl. 43-102.000.
- Ganderton, Alfred D.; and Brazier, William A., to E. Allman & Company Limited. Spraying equipment, 4,711,398, Cl. 239-167.000.
- Gannon, Raymond, to FGL Projects Limited. Valves, 4,712,249, Cl. 383-43.000.
- GAO Gesellschaft fur Automation und Organisation mbH: See—
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- Garvey, Christopher M.; Savoly, Arpad; and Weatherford, Thomas M., to Diamond Shamrock Chemicals Company. Drilling fluid dispersant, 4,711,731, Cl. 252-8.514.
- Gas Research Institute: See—
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- Gast, Daniel A. Game skinning device, 4,710,998, Cl. 17-21.000.
- Gathmann, Egon, to Barnag Aktiengesellschaft. Process and apparatus for degassing liquids, especially polymer melts and solutions, 4,711,647, Cl. 55-52.000.
- Gaudilliere, Bernard; and Rousseau, Jean, to Synthelabo. 2-(4-benzoyl-1-piperidyl)-1-phenylalkanol derivatives, 4,711,899, Cl. 514-330.000.
- Gaul, James M.: See—
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- Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Brufey, Robert D., Jr., to Coca-Cola Company, The. Low-cost post-mix beverage dispenser and syrup supply system therefor, 4,711,374, Cl. 222-129.100.
- Geary, Frederick J., to Robertshaw Controls Company. Hot surface ignition system for a gas furnace and method of making the same, 4,711,628, Cl. 431-31.000.
- Gebruder Buhler AG: See—
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- Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck": See—
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- Gegel, Harold L.: See—
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- Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, to Bayer Aktiengesellschaft. 5-perfluoroacylamino-4-nitro-1-arylpyrazole salts, plant growth regulating and herbicidal composition containing them, and plant growth regulating and herbicidal method of using them, 4,711,658, Cl. 71-92.000.
- Gelfand, David H.; and Lawyer, Frances C., to Cetus Corporation. Portable temperature-sensitive control cassette, 4,711,845, Cl. 435-68.000.
- Gellman, Aaron J.: See—
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- General Dynamics, Pomona Division: See—
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- General Electric Company: See—
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- General Foods Corporation: See—
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- General Instrument Corporation: See—
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- General Ionex Corporation: See—
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- General Motors Corporation: See—
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- Georgis, Paul F., II. Remote temperature alarm for stoves, 4,712,095, Cl. 340-584.000.
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- and Cable/Home Communication Corp. Selective-subscription de-scrambling. 4,712,238, Cl. 380-20.000.
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- Glassman, Jacob A. Surgical drape. 4,711,236, Cl. 128-132.00D.
- Glickman, Michael N., to McCauley Corporation Limited. Paving block. 4,711,599, Cl. 404-41.000.
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- Goedicke, Siegfried: See—
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- Goldwasser, Benad; and Carson, Culley, to Duke University Patents Foundation. Surgical dissector. 4,711,240, Cl. 128-319.000.
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- Gollinger, Wolfgang, to Deutsche ITT Industries GmbH. Cmos inverter. 4,712,021, Cl. 307-355.000.
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- Good, Thomas J., to Analytichem International, Inc. Automatic sample injector and disposable sample cassette. 4,711,764, Cl. 422-65.000.
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- Gotanda, Motohiro. Door lock control system. 4,712,103, Cl. 304-825.310.
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- Grace, Alan G. V., to Power Modifications Incorporated. Power supply having tuned radio frequency circuit. 4,712,170, Cl. 363-98.000.
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- Green, Joseph, to FMC Corporation. Flame retarded polycarbonate polymers. 4,711,931, Cl. 525-394.000.
- Greenberg, Joel S., to Princeton Synergetics, Inc. Security system for correlating passengers and their baggage. 4,711,994, Cl. 235-384.000.
- Gregory, Allen R. Capless retractable marking pen. 4,711,592, Cl. 401-107.000.
- Gregory, Charles E., Jr.: See—
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- Gross, Jonathan; and Marten, O. James, to Mobil Oil Corporation. Annular extrusion die with internal choke ring and spider mandrel. 4,711,623, Cl. 425-376.00A.
- Grossmann, Jurg; and Grossmann, Marcel. Fastening of a covering material to a substratum. 4,711,681, Cl. 156-71.000.
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- Grundei, Hans, to S+G Implants GmbH. Anchorage for tibia plates. 4,711,639, Cl. 623-20.000.
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- GTE Products Corporation: See—
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- Mizuhara, Howard, 4,711,386, Cl. 228-121.000.
- Shank, Jeffrey B.; Swanson, Steven E.; and Opdahl, Barry J., 4,711,518, Cl. 350-96.200.
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- Gudmundson, Gunnar G.: See—
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- Gulette, Ronald S.; and Charen, Grace M., to Irvin Industries, Inc. Motor vehicle visor with removable mirror assembly. 4,711,483, Cl. 296-97.00C.
- Gulley, Harold J. Coolant additive with corrosion inhibitive and scale preventative properties. 4,711,735, Cl. 252-75.000.
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- Haag, Donald L. Spring disc. 4,711,434, Cl. 267-161.000.
- Haas, Max, to Inventio AG. Door drive for doors of elevator cars. 4,711,323, Cl. 187-52.00R.
- Haddock, Richard: See—
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- Hafner, Hans W., to Pfister GmbH. Method and apparatus for measuring the pressure of a fluid. 4,711,127, Cl. 73-302.000.
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- Haginoya, Tsutomu: See—
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- Hallgarth, Leslie H.: See—
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- Ringgenberg, Paul D., 4,711,305, Cl. 166-336.000.
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- Hamamoto, Masaya: See—
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- Harmon, Julie P.: See—
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- Harper, Robert J., Jr., to United States of America, Agriculture. Process for crossyeing cellulosic fabrics. 4,711,640, Cl. 8-481.000.
- Harrigan, Donald R. Card dispenser guard apparatus. 4,711,371, Cl. 221-310.000.
- Harris, David H.: See—
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- Harris, Donald L., to Cordis Corporation. Implantable lead construction. 4,711,027, Cl. 29-869.000.
- Harris, John L.; and Benyon, John F. Apparatus for hydraulic damping. 4,711,435, Cl. 267-221.000.
- Harris, Rod W. Tape dispensing device. 4,711,384, Cl. 225-66.000.
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- Hartala, Eero; Kuusento, Jaakko; and Paasonen, Hannu, to Oy Tampella Ab. Method of and device for adjusting the feed movement of a drill rod for drilling a rock. 4,711,090, Cl. 60-422.000.
- Hartmann, Albert: See—
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- Hartz, James F.: See—
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- Haruta, Masahiro; Kuwae, Yoko; Yuasa, Satoshi; and Miyazaki, Toshihiko, to Canon Kabushiki Kaisha. Image recording material comprising photosensitive layer and recording layer on electroconductive base. 4,711,830, Cl. 430-52.000.

- Harvey, Alexander, to United States of America, Energy. Vacuum chamber for containing particle beams. 4,712,074, Cl. 328-233.000.
- Harvey, Douglas J., to General Motors Corporation. Halide treatment for aluminum lost foam casting process. 4,711,288, Cl. 164-34.000.
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- Hattori, Takeo: See—
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- Haugerud, Albert R. Computer controllable robotic educational toy. 4,712,194, Cl. 364-513.000.
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- Hayase, Isao: See—
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- Anderson, Joseph A., 4,711,253, Cl. 130-27.00R.
- Hayes Industrial Brake, Inc.: See—
- Prusak, Allan E., 4,711,092, Cl. 60-534.000.
- Haynes, William L.: See—
- Gadkaree, Kishor P.; Haynes, William L.; and Lu, Kun-Er, 4,711,860, Cl. 501-9.000.
- Hazato, Atsuo; Sugiura, Satoshi; Kurozumi, Seizi; and Noyori, Ryoji, to Teijin Limited. 4-hydroxy-2-cyclopentenone, process for production thereof, pharmaceutical composition comprising it. 4,711,895, Cl. 514-530.000.
- Heard, Charles M.; and Yang, Frank C., to Hughes Aircraft Company. Adaptive recursive phase offset tracking system. 4,712,222, Cl. 375-77.000.
- Hebrock, Steve: See—
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- Hecht, Hans: See—
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- Heck, Wolfgang; Kersten, Peter; and Volz, Hans, to Alcatel N. V. Position sensor. 4,712,083, Cl. 338-32.00R.
- Hedlund, Bo. Device for metering liquid media, particularly lubricants. 4,711,321, Cl. 184-7.400.
- Heidelberger Druckmaschinen AG: See—
- Beisel, Hermann, 4,711,174, Cl. 101-352.000.
- Heidenreich, Holger; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. 3-thienylazo dyes with a gamma-acid coupler. 4,711,954, Cl. 534-780.000.
- Heilmeyer & Weinlein Fabrik für Öl-Hydraulik GmbH & Co. KG: See—
- Brunner, Rudolf, 4,711,155, Cl. 91-446.000.
- Heimer, Malcolm L., to Cordis Corporation. Method and apparatus for calibrating internal measurements of an implanted cardiac pacer. 4,712,179, Cl. 364-417.000.
- Heimsoth, Harald; and Herbst, Thomas, to Dyckerhoff & Widmann Aktiengesellschaft. Method of and apparatus for installing an anchor member below water level through a wall into a soil formation. 4,711,604, Cl. 405-260.000.
- Heinrich Wilhelm GmbH & Co.: See—
- Wilhelmi, Jürgen, 4,711,593, Cl. 403-187.000.
- Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, to Didier-Werke AG. Gas washing device. 4,711,432, Cl. 266-220.000.
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- Held, Kurt. Sealing arrangement for a double band press. 4,711,168, Cl. 100-154.000.
- Heller, Jerrold A.: See—
- Gilhausen, Klein S.; Heller, Jerrold A.; Van Harding, Michael; and Blakeney, Robert D., II, 4,712,238, Cl. 380-20.000.
- Hellgren, Keijo, to Asea AB. Forming press mat utilizes trays formed of thin bottom plates and separate annular frames. 4,711,111, Cl. 72-63.000.
- Helterbrand, David L. Spare tire carrier. 4,711,382, Cl. 224-42.230.
- Henderson Doors Limited: See—
- Fretwell, Percy, 4,711,613, Cl. 414-550.000.
- Hendrix, Gary J.: See—
- Kwun, Hegeon; Burring, Anmol S.; Singh, Gurdinder P.; Hendrix, Gary J.; and Alcazar, David G., 4,711,120, Cl. 73-119.00R.
- Hengl, Gerhard G. Massaging apparatus for the lower extremities of the body. 4,711,229, Cl. 128-49.000.
- Henkel Corporation: See—
- Wenzel, Bruce E.; and Clark, James P., 4,711,894, Cl. 514-458.000.
- Henkel, Dietmar, to MAN Nutzfahrzeuge GmbH. Fuel injection system for self-ignition internal combustion engines. 4,711,209, Cl. 123-300.000.
- Henkel Kommanditgesellschaft auf Aktien: See—
- Stahl, Peter H.; and Schmitz, Beat, 4,711,880, Cl. 514-108.000.
- Hennings, David; and Manoukian, Nubar, to Coherent, Inc. Attenuating beam splitter. 4,711,526, Cl. 350-170.000.
- Henry, Arnold W., to Xerox Corporation. Fusing member for electrostatographic reproducing apparatus. 4,711,818, Cl. 428-421.000.
- Henry, Richard T.: See—
- Martin, Timothy J., Jr.; and Henry, Richard T., 4,711,259, Cl. 134-166.00R.
- Hepworth Iron Company Ltd., The: See—
- Glover, John B., 4,711,473, Cl. 285-235.000.
- Herbage, Daniel: See—
- Huc, Alain; Gimeno, Rene; and Herbage, Daniel, 4,711,783, Cl. 424-460.000.
- Herbst, Thomas: See—
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- Hercher, Michael: See—
- Wijntjes, Geert; and Hercher, Michael, 4,711,573, Cl. 356-346.000.
- Hermann, Udo: See—
- Goller, Ernst; Muller, Adam; and Hermann, Udo, 4,711,101, Cl. 66-64.000.
- Hermida, Felipe U. Last-case for cleaning footwear. 4,710,997, Cl. 15-268.000.
- Hernandez, William: See—
- Logan, David J.; Wood, Kenneth O.; Hernandez, William; and Edwards, Richard L., 4,711,035, Cl. 33-200.000.
- Herrigold, Donald E. Lightweight multi-panel display. 4,711,046, Cl. 40-605.000.
- Herrington, Richard A.; Kleman, Thomas G.; and Apolinar, Ermelinda A., to Libbey-Owens-Ford Co. Abrasive fluid jet radius edge cutting of glass. 4,711,056, Cl. 51-410.000.
- Hettich, Gerhard: See—
- Eckardt, Dieter; and Hettich, Gerhard, 4,712,064, Cl. 324-208.000.
- Hewlett-Packard Company: See—
- Baldwin, Richard R., 4,711,574, Cl. 356-349.000.
- Hidaka, Hideto: See—
- Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, 4,712,123, Cl. 357-23.600.
- Hieda, Teruo: See—
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- Higashi, Kazutada: See—
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- Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., to Genetics International, Inc. Sensor for components of a liquid mixture. 4,711,245, Cl. 128-635.000.
- Hill, Donnie K.: See—
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- Hill, Hugh A. O.: See—
- Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., 4,711,245, Cl. 128-635.000.
- Hillestad, Jeanne E.: See—
- Cross, William E.; Hillestad, Jeanne E.; and Plyler, Robert G., 4,711,509, Cl. 439-587.000.

- Hillman, Theodore E., to USG Acoustical Products Company. Soft textured reveal edge ceiling board and process for its manufacture. 4,711,685, Cl. 156-220.000.
- Hilti Aktiengesellschaft: See—
- Blas, Karl; and Nipp, Hansjorg, 4,711,308, Cl. 173-162.00R.
- Jochum, Peter, 4,711,385, Cl. 227-10.000.
- Wezel, Erich, 4,711,457, Cl. 279-65.000.
- Hinchey, Richard J.: See—
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- Hirano, Katsuhiko: See—
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- Hirsh Company: See—
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- Hisamori, Youichi: See—
- Kawajiri, Kazuhiko; Fujiwara, Michio; Tsuchino, Kazunori; and Hisamori, Youichi, 4,711,091, Cl. 60-517.000.
- Hitachi Automotive Engineering Co., Ltd.: See—
- Takahashi, Yukio; Hayase, Isao; Amano, Keijiro; Mizukami, Masao; and Ishiguri, Masaaki, 4,711,620, Cl. 418-96.000.
- Hitachi, Ltd.: See—
- Goto, Shinichi; and Ogino, Kenji, 4,712,149, Cl. 360-132.000.
- Mohri, Shunji, 4,712,189, Cl. 364-900.000.
- Nagasawa, Kiyoshi; Inoue, Toru; and Kashiwazaki, Susumu, 4,712,050, Cl. 318-254.000.
- Ohnuki, Nobutaka; Ojima, Masahiro; Arimoto, Akira; and Chino, Naoki, 4,712,218, Cl. 372-38.000.
- Omae, Tsutomu; Obara, Sanshiro; Kubo, Kenji; and Watanabe, Masahiko, 4,712,052, Cl. 318-625.000.
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- Tanimura, Nobuyoshi; and Yasui, Tokumasa, 4,712,192, Cl. 365-51.000.
- Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, 4,712,175, Cl. 364-200.000.
- Wakamori, Fumio; Ohata, Hideo; Miyaoka, Shinichiro; and Funabashi, Motohisa, 4,712,182, Cl. 364-507.000.
- Hitachi Maxell, Ltd.: See—
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- Ho, James C.: See—
- Oberly, Charles E.; Gegel, Harold L.; and Ho, James C., 4,711,825, Cl. 428-614.000.
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- Dittmar, Walter; Rutterer, Eberhard; and Lohaus, Gerhard, 4,711,775, Cl. 424-70.000.
- Hoechst Celanese Corporation: See—
- Choe, Eui W., 4,711,532, Cl. 350-354.000.
- Hoelderich, Wolfgang; Biffar, Werner; Irgang, Matthias; Moss, Wolf D.; Kroener, Michael; and Ambach, Eberhard, to BASF Aktiengesellschaft. Honeycomb catalyst and its preparation. 4,711,930, Cl. 502-209.000.
- Hoffman, Allan S.: See—
- Nowinski, Robert C.; and Hoffman, Allan S., 4,711,840, Cl. 435-7.000.
- Hoffman, Donald E.: See—
- Kayyod, Fariborz; and Hoffman, Donald E., 4,711,158, Cl. 92-94.000.
- Hoffman-La Roche Inc.: See—
- Brombacher, Urs; Link, Helmut; and Montavon, Marc, 4,711,889, Cl. 514-297.000.
- Hoffmann, Joachim, to Esjot-Werke Schiermeister & Junker GmbH & Co. KG. Freewheel overrunning clutch, particularly for a two-wheel vehicle. 4,711,331, Cl. 192-46.000.
- Hofmann, Jürgen; Huschka, Hans; and Neupert, Daniel, to Nukem GmbH. Process and apparatus for the decomposition of halogen and/or phosphoric containing organic materials. 4,711,185, Cl. 110-215.000.
- Hofmann, Manfred: See—
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- Hohlwegler, Heinz: See—
- Schäuble, Siegfried; Hohlwegler, Heinz; and Kohl, Bernhard, 4,711,078, Cl. 56-341.000.
- Holbrook, Nicholas: See—
- Wilkinson, John; and Holbrook, Nicholas, 4,711,061, Cl. 52-410.000.
- Holcombe, Cressie E., Jr.: See—
- Chapman, Lloyd R.; and Holcombe, Cressie E., Jr., 4,711,666, Cl. 106-14.120.
- Holdeman, David A.: See—
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- Holderle, Hans; Wolf, Jürgen; Eckhart, Horst; and Vonderau, Werner, to Andreas Stihl. Connecting piece between the carburetor and the combustion chamber of an internal combustion engine. 4,711,225, Cl. 123-590.000.
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- Clough, Douglas O., 4,711,083, Cl. 57-301.000.
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- Bailey, Rick S.; and Holly, Arthur C., 4,712,060, Cl. 324-83.00R.
- Holtgraver, Edward G., to Keystone International, Inc. Apparatus for connecting a valve element to a valve stem. 4,711,427, Cl. 251-308.000.
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- Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.
- Ooyama, Kazuo; Ooki, Kenji; and Mizushima, Toshio, 4,711,201, Cl. 123-73.00A.
- Shiina, Haruo, 4,711,823, Cl. 428-547.000.
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- Honell, Michael: See—
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- Honeywell Inc.: See—
- Cates, Marion H.; and Szonntag, Eugene L., 4,711,765, Cl. 422-89.000.
- Jenekhe, Samson A.; and Hansen, Marcia K., 4,711,946, Cl. 528-251.000.
- Vu, Tho T., 4,712,022, Cl. 307-448.000.
- Honeywell Information Systems Inc.: See—
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- Hong, Lázaro M. Vacuum integrated circuit. 4,712,039, Cl. 313-307.000.
- Hongo, Yasuo, to Fuji Electric Company, Ltd. Method and apparatus for object identification. 4,712,248, Cl. 382-22.000.
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- Honma, Toshio: See—
- Tanioka, Hiroshi; and Honma, Toshio, 4,711,558, Cl. 355-14.00R.
- Honny Chemicals Company Ltd.: See—
- Kojima, Masaki; and Munkata, Seiji, 4,711,926, Cl. 524-512.000.
- Hood, Paul F., to Stone Container Corporation. Protective container-board. 4,711,702, Cl. 162-123.000.
- Hoogovens Groep B.V.: See—
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- Hopkins, Daniel N., to Mobil Oil Corporation. Method and apparatus for determining crack initiation and propagation in metals. 4,711,131, Cl. 73-799.000.
- Horbaschek, Heinz, to Siemens Aktiengesellschaft. Stereoscopic x-ray tube. 4,712,226, Cl. 378-134.000.
- Horber, Ralph W., to Sigma Instruments, Inc. Magnetically assisted stepping motor. 4,712,028, Cl. 310-49.00R.
- Horecky, Carl J.: See—
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- Horgan, William J., Jr., to Blumcraft of Pittsburgh. Latch actuating door handles. 4,711,480, Cl. 292-336.300.
- Hori, Kenjiro: See—
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- Horio, Yasuhiko: See—
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- Horodysky, Andrew G.; and Law, Derek A., to Mobil Oil Corporation. Sulfurized olefins as antiwear/extreme pressure additives for lubricants and fuels and compositions thereof. 4,711,736, Cl. 252-47.500.
- Horowski, Reinhard: See—
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- Hoshizaki, Hiroki; Kawahara, Nobuaki; Suzuki, Hirofumi; and Oyobe, Kazuo, to Nippondenso Co., Ltd. Ceramic heater. 4,711,990, Cl. 219-552.000.
- Hosiden Electronics Co., Ltd.: See—
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- Hou, Kenneth C.: See—
- Ostreicher, Eugene A.; Knight, Rodney A.; Fiore, Joseph V.; Emond, George T.; and Hou, Kenneth C., 4,711,793, Cl. 427-244.000.
- Haupt, Pieter M.; and Wielandt, Ralph T., to 501 Nederlandse Centrale Organisatie voor Toegepast-Enschappelijk Onderzoek. Sensor for

- the measurement of the refractive index of a fluid and/or phase boundary between two fluids by means of visible or invisible light. 4,711,126, Cl. 73-293.000.
- Houser, John, Jr., to Singer Company, The. Battery charger circuit. 4,712,055, Cl. 320-35.000.
- Houser, Raymond L., to Coin Acceptors, Inc. Operation completion detection means. 4,712,049, Cl. 318-112.000.
- Howe, Geoff. See—
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- Howland, Leland L.; and Seshadri, Jayaram, to Thermo King Corporation. Compartmentalized transport refrigeration system. 4,711,095, Cl. 62-117.000.
- Hoyme, Clifford L. Damper mounting assembly. 4,711,626, Cl. 431-20.000.
- Hubbell Incorporated. See—
- Quogue, Honesto D., 4,712,162, Cl. 361-417.000.
- Schnell, Kenneth R., 4,711,472, Cl. 285-162.000.
- Huc, Alain; Gimeno, Rene; and Herbage, Daniel, to Bioetica, S.A. Forms of microencapsulation of medicinal substances by homogeneous layers of native collagen. 4,711,783, Cl. 424-460.000.
- Hughes Aircraft Company. See—
- Alm, Aké W., 4,712,010, Cl. 250-334.000.
- Heard, Charles M.; and Yang, Frank C., 4,712,222, Cl. 375-77.000.
- Steffy, David A., 4,711,417, Cl. 244-158.00R.
- Takamine, Henry K., 4,712,062, Cl. 324-158.00F.
- Tangonan, Gregory L.; Yen, Huan-Wun; and Persechini, David L., 4,711,514, Cl. 350-96.120.
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- Hull-Allen, Gregory, to Mechanical Technology Incorporated. Optical configuration of fiber optic sensor for symmetric dynamic response about the optical null. 4,711,577, Cl. 356-373.000.
- Hull, Ezekiel H.; and Frappier, Edward P., to Morflex Chemical Company, Inc. Citrate esters and methods. 4,711,922, Cl. 524-310.000.
- Huls Aktiengesellschaft. See—
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- Hummel, Peter; and Steuer, Joachim, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Ink dispensing means for printing presses. 4,711,175, Cl. 101-365.000.
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- Hydra-Level, Inc. See—
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- Hydro-Pulse, Inc. See—
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- Hydrolux S.a.r.l. See—
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- Hyduck, Steven J. Pick for stringed instruments. 4,711,150, Cl. 84-322.000.
- Ibanez, Rene L. Golf cart umbrella mount bracket. 4,711,422, Cl. 248-515.000.
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- Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Tandon, Jagdish C., 4,712,137, Cl. 358-213.290.
- Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, to Kowa Company Ltd. Ophthalmic disease detection apparatus. 4,711,542, Cl. 351-221.000.
- Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,711,837, Cl. 430-548.000.
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- IDC-Chemie AG. See—
- Mader, Karl; Schonenberger, Guido; and Buzzi, Carlo A., 4,711,375, Cl. 222-135.000.
- Igarashi, Masahiko. See—
- Okazaki, Atsushi; Igarashi, Masahiko; and Horie, Tsuneo, 4,712,084, Cl. 338-184.000.
- Igarashi, Toshihiko. See—
- Goto, Motoo; Kono, Hiroshi; Asao, Haruhiko; Miyamoto, Yukio; and Igarashi, Toshihiko, 4,711,433, Cl. 266-222.000.
- Igashira, Toshihiko. See—
- Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.
- Ihara, Tatsuya. See—
- Hatano, Masakatsu; Oshima, Kazunori; Ihara, Tatsuya; and Kiyono, Kenichi, 4,711,867, Cl. 502-205.000.
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- Iida, Naohiro, to Nippon Sheet Glass Co., Ltd. Apparatus for shaping glass sheet. 4,711,654, Cl. 65-172.000.
- Iino, Tadashi; Nagashima, Yoshikazu; and Sugita, Masaya, to Yazaki Corporation. Display system for vehicle. 4,711,544, Cl. 353-14.000.
- Iio, Masaya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device. 4,712,152, Cl. 361-56.000.
- Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeiyama, Hideaki; and Kiso, Yoshiaki, to Kissei Pharmaceutical Co., Ltd. Morpholine containing amino acid derivatives. 4,711,958, Cl. 544-139.000.
- Iizuka, Kiyoshi, to Canon Kabushiki Kaisha. Display device. 4,711,547, Cl. 354-471.000.
- Ijiri, Yasuo. See—
- Iri, Eiji; Kaneko, Takashi; Shintani, Takeshi; Mio, Kotaro; and Ijiri, Yasuo, 4,711,523, Cl. 350-96.230.
- Ikedo, Yoshio, to Kabushiki Kaisha Toshiba. Washing machine. 4,711,104, Cl. 68-23.00R.
- Ikekawa, Nobuo, to Taisho Pharmaceutical Co., Ltd. 1a,25-dihydroxy-26,27-dimethylcholecalciferol and its use in the treatment of calcium pathobolism. 4,711,881, Cl. 514-167.000.
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- Imada, Kunihiko. See—
- Nakamatsu, Toshio; Miyamoto, Tetsuya; and Imada, Kunihiko, 4,711,641, Cl. 8-524.000.
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- Imanishi, Shozo; and Sato, Mitsuo, to Aida Engineering Co., Ltd. Balancing device for press. 4,711,169, Cl. 100-257.000.
- Imhoff, Claude. See—
- d'Humieres, Etienne; Bernet, Jean M.; and Imhoff, Claude, 4,712,001, Cl. 250-213.0VT.
- Imperial Chemical Industries PLC. See—
- Briggs, Malcolm T.; Dowell, Robert I.; and Thornber, Craig W., 4,711,887, Cl. 514-247.000.
- Butters, Alan; Barker, Roger N.; and Rennison, Stuart C., 4,711,834, Cl. 430-201.000.
- Daniels, James A., 4,711,945, Cl. 528-86.000.
- IMRE Corporation. See—
- Singhal, Anil K., 4,711,839, Cl. 435-4.000.
- Inaba, Naomi. See—
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- Takeda, Fumiteru; Hirano, Katsuhiko; and Inagaki, Yoshihiro, 4,711,148, Cl. 84-1.010.
- Inagaki, Yoshio; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. 4-amino-2-methyl-3-phenyl-1-(2,4,6-trichlorophenyl)-3-pyrazolin-5-one. 4,711,963, Cl. 548-365.000.
- Inoue, Akito. Diaphragm-electrode system for electrocoating. 4,711,709, Cl. 204-282.000.
- Inoue, Isao. Ratchet handle. 4,711,145, Cl. 81-177.100.
- Inoue, Kichiro. See—
- Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.
- Inoue, Senya; and Ono, Akira, to Kanto Kagaku Kabushiki Kaisha. Calcium-phosphorus-apatite having novel properties and process for preparing the same. 4,711,769, Cl. 423-308.000.
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- Nagasawa, Kiyoshi; Inoue, Toru; and Kashiwazaki, Susumu, 4,712,050, Cl. 318-254.000.
- Insley, Margaret Y.; and Kawasaki, Glenn, to ZymoGenetics, Inc. Site specific mutagenesis in alpha-1-antitrypsin. 4,711,848, Cl. 435-91.000.
- Instance, David J. Method of making labels. 4,711,686, Cl. 156-227.000.
- Institut De La Recherche Agronomique. See—
- Roger, Loic; Maubois, Jean-Louis; Brule, Gerard; and Piot, Michel, 4,711,953, Cl. 530-366.000.
- Institut Francais du Petrole. See—
- Cassou, Jean-Pierre, 4,712,200, Cl. 367-88.000.
- Rialan, Joseph; and Bary, Renate, 4,712,199, Cl. 367-76.000.
- Institute Francais du Petrole. See—
- Fail, Jean-Pierre, 4,712,198, Cl. 367-23.000.
- Instrumentarium Corp. See—
- Savelainen, Matti, 4,712,068, Cl. 324-318.000.
- International Business Machines Corporation. See—
- Bhatia, Hansaran S.; Bhatia, Satyapal S.; Riseman, Jacob; and Valsamakis, Emmanuel A., 4,712,125, Cl. 357-59.000.
- Fredericks, Kenneth J.; Guerriero, Thomas W.; Miracle, Gerald H.; and Wiegand, Michael R., 4,712,176, Cl. 364-200.000.
- Glaire, Rene J., 4,712,216, Cl. 371-38.000.
- Harder, Christoph S.; Jaekel, Heinz; and Wolf, Hans P., 4,711,858, Cl. 437-99.000.
- Jones, Gardner D., Jr., 4,712,235, Cl. 379-410.000.

- Karidis, John P., 4,712,027, Cl. 310-12.000.
- Klaassen, Klaas B., 4,712,144, Cl. 360-67.000.
- Meltzer, Clifford B.; Kannan, Krishnamurthi; Burket, Thomas G.; Kruesi, Deborah J.; and Braudaway, Gordon W., 4,712,214, Cl. 371-32.000.
- Mintzer, Frederick C.; and Anderson, Karen L., 4,712,140, Cl. 358-260.000.
- Nilsson, Ben A.; and Shepherd, Roger D., 4,711,552, Cl. 355-3.00R.
- Pearce, Harold B.; and West, Lynn P., 4,712,221, Cl. 375-14.000.
- Troupes, Demetrios; and Alexander, Randall W., 4,712,102, Cl. 340-790.000.
- International Cybernetics Corporation. See—
- McNally, Paul F., 4,712,106, Cl. 340-870.320.
- International Fuel Cells Corporation. See—
- Luczak, Francis J.; and Landsman, Douglas A., 4,711,829, Cl. 429-44.000.
- International Game Technology (IGT). See—
- Dickinson, Peter D.; and Luciano, Robert A., 4,711,452, Cl. 273-143.00R.
- International Paper Company. See—
- Alba, Andrew J.; Griesemer, James A.; and Gordon, Robert L., 4,711,389, Cl. 229-1.50B.
- Clish, Robert J., 4,711,277, Cl. 141-311.00A.
- Interroll Fordertechnik GmbH & Co. KG. See—
- Specht, Dieter, 4,711,045, Cl. 40-564.000.
- Inui, Masaki. See—
- Horiuchi, Yusuke; and Inui, Masaki, 4,711,135, Cl. 74-473.00R.
- Inventio AG. See—
- Haas, Max, 4,711,323, Cl. 187-52.00R.
- Schroder, Joris, 4,711,324, Cl. 187-135.000.
- Irako, Koichi, deceased. See—
- Yamada, Chikara; Watabe, Yoji; Irako, Koichi, deceased; and Murakami, Yuichi, 4,711,870, Cl. 502-303.000.
- Irako, Sanae, legal heir. See—
- Yamada, Chikara; Watabe, Yoji; Irako, Koichi, deceased; and Murakami, Yuichi, 4,711,870, Cl. 502-303.000.
- Irgang, Matthias. See—
- Hoelderich, Wolfgang; Biffar, Werner; Irgang, Matthias; Mross, Wolf D.; Kroener, Michael; and Ambach, Eberhard, 4,711,930, Cl. 502-209.000.
- Iri, Eiji; Kaneko, Takashi; Shintani, Takeshi; Mio, Kotaro; and Ijiri, Yasuo, to Dainichi-Nippon Cables, Ltd. Waterproof optical fiber cable. 4,711,523, Cl. 350-96.230.
- Irvin Industries, Inc. See—
- Gulette, Ronald S.; and Charen, Grace M., 4,711,483, Cl. 296-97.00C.
- Irwin, Charles F.; Karpusiewicz, William; and Liberati, Patricia, to Lever Brothers Company. Preparation of bleach catalyst aggregates of manganese cation impregnated aluminosilicates by high velocity granulation. 4,711,748, Cl. 264-117.000.
- ISC Cardion Electronics, Inc. See—
- Schwab, Carl, 4,712,108, Cl. 342-26.000.
- Ishibashi, Tamoto. See—
- Aso, Toshiyuki; and Ishibashi, Tamoto, 4,711,981, Cl. 219-69.00W.
- Ishida, Ryuichi. See—
- Sugano, Hiroshi; Ishida, Ryuichi; and Yamamura, Michio, 4,711,878, Cl. 514-18.000.
- Ishida Scales Mfg. Co., Ltd. See—
- Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, 4,711,345, Cl. 198-572.000.
- Ishida, Tetsuyoshi; Okura, Kunio; Hanayama, Fumihiko; Yamada, Mutsuo; and Arikawa, Yoshijiro, to Babcock-Hitachi Kabushiki Kaisha. Carbon monoxide-oxygen fuel cell. 4,711,828, Cl. 429-12.000.
- Ishidoshiro, Hiroshi. See—
- Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,711,102, Cl. 68-500E.
- Ishiguri, Masaaki. See—
- Takahashi, Yukio; Hayase, Isao; Amano, Keijirou; Mizukami, Masao; and Ishiguri, Masaaki, 4,711,620, Cl. 418-96.000.
- Ishiguro, Yasuo. See—
- Shiroshita, Osamu; Ishiguro, Yasuo; and Ito, Yoshizumi, 4,712,183, Cl. 364-513.000.
- Ishijima, Koji. See—
- Asami, Kazutomo; Sano, Fumiaki; Wada, Fumio; and Ishijima, Koji, 4,711,617, Cl. 417-295.000.
- Ishikawa, Akibumi. See—
- Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.
- Ishikawa Gasket Co., Ltd. See—
- Udagawa, Tsunekazu, 4,711,456, Cl. 277-235.00B.
- Ishizaka, Kazuo. See—
- Kawakami, Hiroshi; and Ishizaka, Kazuo, 4,712,143, Cl. 358-311.000.
- Ishizawa, Yasuhisa. See—
- Tsunekuni, Masao; and Ishizawa, Yasuhisa, 4,712,100, Cl. 340-710.000.
- Iskanderov, Alexandr A. See—
- Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I., 4,711,182, Cl. 104-283.000.
- Isuzu Motors, Ltd. See—
- Kawamura, Hideo, 4,711,087, Cl. 60-286.000.
- Ito, Michiaki. See—
- Oida, Susumu; Munemoto, Yoshikazu; Ueda, Masami; and Ito, Michiaki, 4,711,105, Cl. 68-23.200.
- Ito, Novuei; Nishida, Minoru; Mizuno, Naohito; and Hattori, Tadashi, to Nippon Soken, Inc. Pressure sensor. 4,712,082, Cl. 338-4.000.
- Ito, Satoru, to Diesel Kiki Co., Ltd. Injection start advancer for fuel injection pump assembly of the fuel distribution type. 4,711,205, Cl. 123-179.00L.
- Itoh, Isamu. See—
- Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, 4,711,837, Cl. 430-548.000.
- Ito, Yoshizumi. See—
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- ITT Corporation. See—
- Deacon, George R.; and Cranford, William R., 4,711,752, Cl. 264-328.120.
- ITT Defense Communications, a Division of ITT Corporation. See—
- Baker, Anthony P., 4,711,529, Cl. 350-331.00R.
- IVO Iron & Vosseler Zahlerfabrik GmbH & Co. See—
- Haller, Andreas; Pfundstein, Werner; and Hall, Heinrich, 4,711,991, Cl. 235-132.00E.
- Iwaki, Hiroshi. See—
- Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, 4,711,551, Cl. 355-3.0DD.
- Iwasaki, Shinichiro, to Aisin Seiki Kabushiki Kaisha. Multiple ring armature core for direct current motor. 4,712,034, Cl. 310-217.000.
- Iwasawa, Minoru. See—
- Joyashiki, Hisashi; Iwasawa, Minoru; Ohigashi, Masakazu; and Terai, Masao, 4,710,995, Cl. 15-22.00R.
- Iyer, Venkatraman. See—
- Joshi, Sunil P.; and Iyer, Venkatraman, 4,712,215, Cl. 371-37.000.
- Izawa, Kiyosato. See—
- Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, 4,711,977, Cl. 178-18.000.
- J & L Associates, Inc. See—
- Wolters, Donald R., 4,711,012, Cl. 29-243.520.
- Jacobs, Alphonse F.; and Paxton, James R. Temperature and humidity control system. 4,711,294, Cl. 165-19.000.
- Jacobson, Stephen E., to BOC Group, Inc., The. Preparation of hydrogen peroxide. 4,711,772, Cl. 423-584.000.
- Jacobson, Walter; Riggio, Stephen C.; and Turner, James E., to Akzo N.V. Control for blood gas analyzers and hemoglobin analysis. 4,711,852, Cl. 436-15.000.
- Jaekel, Heinz. See—
- Harder, Christoph S.; Jaekel, Heinz; and Wolf, Hans P., 4,711,858, Cl. 437-99.000.
- Jamomet, Bernard; Rigouard, Alain; Bouchez, Jean-Pierre; and Duc, Jean, to L'Air Liquide, Societe Anonyme pour l'Exploitation des Procédes George Claude. Waste water sludge thickener with odor control. 4,711,721, Cl. 210-607.000.
- Japan Atomic Energy Research Institute. See—
- Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, 4,711,732, Cl. 252-28.000.
- Japan Liquid Crystal Co., Ltd. See—
- Shibanai, Ichiro; and Nakamura, Kenji, 4,711,936, Cl. 525-485.000.
- Japan Styrene Paper Corporation. See—
- Kuwabara, Hideki; Naito, Masato; Watanabe, Teishiro; and Hamada, Tadatsugu, 4,711,287, Cl. 165-34.000.
- Japan Tobacco, Inc. See—
- Katou, Yukio; Suzuki, Takehiro; and Shimada, Susumu, 4,711,316, Cl. 180-168.000.
- Nagata, Tomizou; Mutoh, Yoshiyuki; and Kobayashi, Kazutaka, 4,711,339, Cl. 198-419.000.
- Jeanjean, Robert; Demissy, Daniel; Saint-Jean, Guy; and Landry, Michel, to Cegelec Industrie Inc. Sulfur hexafluoride circuit-breaker for operating in a very low temperature environment. 4,711,978, Cl. 200-148.00A.
- Jen, Kwan-Yue A.; and Elsenbaumer, Ronald L., to Allied Corporation. Solution processible forms of neutral and electrically conductive poly(substituted heterocycles). 4,711,742, Cl. 252-500.000.
- Jenekhe, Samson A.; and Hansen, Marcia K., to Honeywell Inc. Electroactive heterocyclic aromatic polymers. 4,711,946, Cl. 528-251.000.
- Jenkins, James E. Clothes hanger carrier and storage container. 4,711,383, Cl. 224-202.000.
- Jennings, Alfred R., Jr., to Mobil Oil Corporation. Gravel pack void space removal via high energy impulse. 4,711,302, Cl. 166-250.000.
- Jenoptik Jena GmbH. See—
- Quillfeldt, Winfried; Naumann, Bernd; and Becker-Ross, Helmut, 4,711,572, Cl. 356-311.000.
- Jetzinger, Franz. Mowing and chopping machine. 4,711,074, Cl. 56-13.600.
- Joanna Western Mills Company. See—
- Chang, A-Shen, 4,711,005, Cl. 29-24.500.
- Jochum, Peter, to Hilti Aktiengesellschaft. Explosive powder charge actuated fastening element driving device. 4,711,385, Cl. 227-10.000.
- Johannes Heidenhain GmbH. See—
- Ernst, Alfons, 4,712,088, Cl. 340-347.00P.
- Johannes Menschner Maschinenfabrik GmbH & Co. KG. See—
- Van Dijk, Alfonsius A. J., 4,711,004, Cl. 26-15.00R.

- Johansson, Lars A.: See—
Wallin, P. O. Thomas; Warell, Bengt H.; Svensson, A. Pedar; Lundstrom, Kurt A.; and Johansson, Lars A., 4,711,184, Cl. 108-144.000.
- John O. Butler Company: See—
Tarrson, Emanuel B.; and Maric, Dane, 4,710,996, Cl. 15-105.000.
- Johnson, Clyde T.: Locking device, 4,711,106, Cl. 70-34.000.
- Johnson, Dennis M.; and Surrency, H. Skeet: Training device for kicking a football or soccer ball, 4,711,043, Cl. 36-139.000.
- Johnson, Donald A., to Nalco Chemical Company: Method for prevention of phosphonate decomposition by chlorine, 4,711,724, Cl. 210-699.000.
- Johnson, Marvin M.: See—
Shyr, Yen-Shin; and Johnson, Marvin M., 4,711,868, Cl. 502-235.000.
- Johnson, Van B.; and Nicosia, Salvatore J., to Du Pont de Nemours, E. I., and Company: Daylight x-ray cassette having a weight to improve film release, 4,712,228, Cl. 378-185.000.
- Johnson, Walter A.: See—
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,711,660, Cl. 75-0.50B.
- Kemp, Preston B., Jr.; and Johnson, Walter A., 4,711,661, Cl. 75-0.50B.
- Johnston, H. Fred: See—
Wilkinson, Blair E., 4,711,579, Cl. 356-375.000.
- Jones, Gardner D., Jr., to International Business Machines Corporation: Method and apparatus for improved control and time sharing of an echo canceller, 4,712,235, Cl. 379-410.000.
- Jones, Ralph W. Pawl controlled reel extension, 4,711,409, Cl. 242-107.40R.
- Jones, Robert A.: See—
Ares, Roland A.; Jones, Robert A.; and Street, Norman E., 4,711,094, Cl. 62-90.000.
- Jones, Roger E.: See—
Pitt, Gillies D.; Exance, Philip; and Jones, Roger E., 4,712,065, Cl. 324-244.000.
- Jordan, Bertram L.: See—
Gregory, Charles E., Sr.; Jordan, Bertram L.; and Gregory, Charles E., Jr., 4,711,403, Cl. 241-101.200.
- Joseph, Douglas: See—
Michels, Dennis; Howe, Geoff; and Joseph, Douglas, 4,712,250, Cl. 455-20.000.
- Joshi, Sunil P.; and Iyer, Venkatraman, to Advanced Micro Devices, Inc. CRC calculation machine for separate calculation of checkbits for the header packet and data packet, 4,712,215, Cl. 371-37.000.
- Joyashiki, Hisashi; Iwasawa, Minoru; Oohigashi, Masakazu; and Terai, Masao, to Sunstar Kabushiki Kaisha: Electric motor driven toothbrush, 4,710,995, Cl. 15-22.00R.
- Judge, John S.: See—
Sukonnik, Israil M.; Judge, John S.; and Kilgore, Colin H., 4,711,115, Cl. 72-329.000.
- Julstrom, Stephen D., to Shure Brothers, Inc. Teleconference system, 4,712,231, Cl. 379-202.000.
- Kabasin, Daniel F., to General Motors Corporation: Acceleration enrichment fuel control, 4,711,218, Cl. 123-492.000.
- Kabe, Kazuyuki; Morikawa, Tuneso; and Takahashi, Shuji, to Yokohama Rubber Co., Ltd., The. Pneumatic radial tire for passenger car, 4,711,286, Cl. 152-527.000.
- Kabushiki Kaisha Kobe Seiko Sho: See—
Konishi, Keiichi, 4,711,358, Cl. 212-178.000.
- Kabushiki Kaisha Sato: See—
Kikuchi, Hidenori, 4,712,114, Cl. 346-76.0PH.
- Kabushiki Kaisha Takara: See—
Tsuda, Masaaki, 4,711,064, Cl. 53-137.000.
- Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: See—
Mori, Shinji, 4,711,408, Cl. 242-107.000.
- Kabushiki Kaisha Toshiba: See—
Abuyama, Yasuo, 4,711,556, Cl. 355-14.00R.
- Aoki, Hiroyuki, 4,712,185, Cl. 364-518.000.
- Ikeda, Yoshio, 4,711,104, Cl. 68-23.00R.
- Kamasaki, Keiji, 4,712,017, Cl. 250-551.000.
- Kikuchi, Katsuya, 4,712,133, Cl. 358-98.000.
- Nishimura, Eiji; Takigawa, Tadahi; and Kato, Yoshihide, 4,712,013, Cl. 250-492.200.
- Niwa, Kiyomi; and Kozawa, Yutaka, 4,711,293, Cl. 165-4.000.
- Oida, Susumu; Munemoto, Yoshikazu; Ueda, Masami; and Ito, Michiaki, 4,711,105, Cl. 68-23.200.
- Sambayashi, Takeshi, 4,711,559, Cl. 355-14.00D.
- Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, 4,712,038, Cl. 313-2.100.
- Tanabe, Toshiyuki, 4,712,131, Cl. 358-142.000.
- Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshi; and Mogi, Toshiaki, 4,712,115, Cl. 346-76.0PH.
- Toshimitsu, Kenshi; and Kohayakawa, Hiromasa, 4,711,555, Cl. 355-14.00R.
- Watanabe, Junji, 4,711,553, Cl. 355-4.000.
- Watanabe, Junji, 4,711,557, Cl. 355-14.00R.
- Kabushiki Kaisha Toyota Chuo Kenkyusho: See—
Shiroshita, Osamu; Ishiguro, Yasuo; and Itou, Yoshizumi, 4,712,183, Cl. 364-513.000.
- Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Tandon, Jagdish C., to Xerox Corporation: High density CCD imager, 4,712,137, Cl. 358-213.290.
- Kadunce, Leo, to Steeltin Can Corporation: Method and machine for convolute or spiral winding of composite materials, 4,711,801, Cl. 428-192.000.
- Kagi, Bruno, to Strapex AG: Apparatus to strap a tape around an object, 4,711,071, Cl. 53-589.000.
- Kaisei Kogyo Corporation: See—
Fumino, Tanitomi, 4,711,278, Cl. 144-2.00Z.
- Kaiser, June: Protective sanitary barrier for CPR doll, 4,711,237, Cl. 128-136.000.
- Kaiser, Robert: Method and apparatus for removal of small particles from a surface, 4,711,256, Cl. 134-25.400.
- Kajita, Hiroshi: See—
Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, 4,711,550, Cl. 355-3.0SH.
- Kakita, Yukio: See—
Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, 4,711,345, Cl. 198-572.000.
- Kakizawa, Koichiro: See—
Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, 4,711,542, Cl. 351-221.000.
- Kakizawa, Toshi: See—
Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshi; and Mogi, Toshiaki, 4,712,115, Cl. 346-76.0PH.
- Kal, Stephen: See—
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- Kalkbrenner, Ralph W.: See—
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- Kalmijn, Hilco T.: See—
Kemper, Rudolf; and Kalmijn, Hilco T., 4,712,069, Cl. 324-322.000.
- Kamasaki, Keiji, to Kabushiki Kaisha Toshiba: Photocoupler device having reflecting surface enhance signal transmission, 4,712,017, Cl. 250-551.000.
- Kamijo, Tetsuhide: See—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeiyama, Hideaki; and Kiso, Yoshiaki, 4,711,958, Cl. 544-139.000.
- Kamohara, Eiji: See—
Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, 4,712,038, Cl. 313-2.100.
- Takenaka, Shigeo; and Kamohara, Eiji, 4,712,043, Cl. 315-15.000.
- Kanaiwa, Kiyoshi: See—
Seto, Kaoru; Ushio, Yukihide; Hori, Kenjiro; Hashimoto, Hiroshi; Yoshimoto, Toshio; and Kanaiwa, Kiyoshi, 4,712,118, Cl. 346-108.000.
- Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, to Nippon Kokan Kabushiki Kaisha; and Yushiro Chemical Industry Co., Ltd. Lubricant for the production of seamless tubes, 4,711,733, Cl. 252-29.000.
- Kanda, Shigeto, to Canon Kabushiki Kaisha: Tracking error signal detecting device with a two-beam system for use in an optical information memory, 4,712,206, Cl. 369-46.000.
- Kandathil, Thomas V., to S. C. Johnson & Son, Inc. Enzyme prespotter composition stabilized with water insoluble polyester or polyether polyol, 4,711,739, Cl. 252-139.000.
- Kando, Akiyoshi: See—
Watanabe, Kozo; Kando, Akiyoshi; and Horita, Yoshiyuki, 4,711,020, Cl. 29-767.000.
- Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—
Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, 4,711,807, Cl. 428-334.000.
- Kaneishi, Shinji: See—
Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneishi, Shinji, 4,712,219, Cl. 372-45.000.
- Kaneke, Takashi: See—
Iri, Eiji; Kaneke, Takashi; Shintani, Takeshi; Mio, Kotaro; and Ijiri, Yasuo, 4,711,523, Cl. 350-96.230.
- Kanemori, Kaoru: See—
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamura, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.
- Kaneshiro, Tsuneo, to United States of America, Agriculture: Enhancement of nitrogen-fixation with rhizobial tan variants, 4,711,656, Cl. 71-7.000.
- Kannan, Krishnamurthi: See—
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- Kano, Hidekazu; Shintani, Takashi; and Hosoi, Shuichi, to Honda Giken Kogyo Kabushiki Kaisha: Fuel supply control method for internal combustion engines at low temperature, 4,711,217, Cl. 123-491.000.
- Kano, Mitsuru: See—
Nakanowatari, Jun; and Kano, Mitsuru, 4,711,530, Cl. 350-339.00R.
- Kanoh, Kunihiko; Matsuki, Kanji; Ohta, Kazuhisa; and Sunohara, Tadaomi, to Morikawa Sangyo Kabushiki Kaisha: Casting method and apparatus, 4,711,289, Cl. 164-34.000.
- Kanto Kagaku Kabushiki Kaisha: See—
Inoue, Senya; and Ono, Akira, 4,711,769, Cl. 423-308.000.
- Kao Corporation: See—
Suzuki, Toshio; and Yahagi, Kazuyuki, 4,711,776, Cl. 424-70.000.
- Karanevsky, Donald S., to E. R. Squibb & Sons, Inc. Thiazine and thiazepine containing compounds, 4,711,884, Cl. 514-226.000.
- Karidis, John P., to International Business Machines Corporation: Radial pole linear reluctance motor, 4,712,027, Cl. 310-12.000.

- Karpusiewicz, William: See—
Irwin, Charles F.; Karpusiewicz, William; and Liberati, Patricia, 4,711,748, Cl. 264-117.000.
- Kasafirek, Evzen; Cerny, Martin; Kocis, Petr; Krepelka, Jiri; and Rovensky, Jozef, to SPOFA, spolne podniky pro zdravotnickou výrobu. Serum thymic factor peptide analogs and process for the preparation thereof, 4,711,952, Cl. 530-327.000.
- Kashihara, Junzo: See—
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- Kashiwazaki, Susumu: See—
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- Kataoka, Hironori: See—
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- Kato, Junichi: See—
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- Kato, Shinichi: See—
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- Kato, Takatsugu; and Takahashi, Takao, to Nissan Motor Co., Ltd. Loom, 4,711,273, Cl. 139-116.000.
- Kato, Toshinobu: See—
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.
- Kato Tsuyoshi: See—
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- Kato, Yasuyoshi; Teshima, Nobue; Ohta, Masao; and Konishi, Kunihiko, to Babcock-Hitachi Kabushiki Kaisha: Catalyst for combustion and process for producing same, 4,711,872, Cl. 502-328.000.
- Kato, Yoshiaki, to Canon Kabushiki Kaisha: Image communication apparatus, 4,712,139, Cl. 358-257.000.
- Kato, Yoshihide: See—
Nishimura, Eiji; Takigawa, Tadahi; and Kato, Yoshihide, 4,712,013, Cl. 250-492.200.
- Katou, Akito, to Matsushita Electric Industrial Co., Ltd. Deflecting yoke, 4,712,080, Cl. 335-213.000.
- Katou, Yukio; Suzuki, Takehiro; and Shimada, Susumu, to Japan Tobacco, Inc. Guidance system for unmanned transporting vehicle, 4,711,316, Cl. 180-168.000.
- Katsumi, Hideo: See—
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- Katsura, Johji: See—
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- Katsuyama, Koji: See—
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- Kaukler, William F., to United States of America, National Aeronautics and Space Administration: Method for investigating the formation of crystals in a transparent material, 4,711,697, Cl. 156-621.000.
- Kawaguchi, Fumiaki; Shimazu, Toshikazu; and Takahashi, Kazuhisa, to Canon Kabushiki Kaisha: Adjusting apparatus for laser scanning system with acousto-optical element, 4,712,117, Cl. 346-108.000.
- Kawahara, Nobuaki: See—
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- Kawajiri, Kazuhiko; Fujiwara, Michio; Tsuchino, Kazunori; and Hisamori, Youichi, to Mitsubishi Denki Kabushiki Kaisha: Apparatus for preventing the rise of oil in a stirling engine, 4,711,091, Cl. 60-517.000.
- Kawakami, Hiroshi; and Ishizaka, Kazuo, to Sony Corporation: Apparatus for monitoring a timebase compressed color video signal, 4,712,143, Cl. 358-311.000.
- Kawakita, Tetsuya: See—
Toyoshi, Seiji; Yoshizumi, Tomoya; Saeki, Masaru; and Kawakita, Tetsuya, 4,711,722, Cl. 210-638.000.
- Kawamura, Hideo, to Isuzu Motors, Ltd. Emissions filter regeneration system, 4,711,087, Cl. 60-286.000.
- Kawamura, Masunori: See—
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- Kawanabe, Tetsuya, to Canon Kabushiki Kaisha: Timer apparatus, 4,712,072, Cl. 328-130.100.
- Kawanishi, Toshiyuki: See—
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, 4,711,668, Cl. 106-22.000.
- Kawasaki, Glenn: See—
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- Kawashima, Syunichiro: See—
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- Kayata, Haruhiko: See—
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- Kayser, John P.: See—
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- Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., to General Motors Corporation: Actuator for converting linear motion to rotary motion and vice versa, 4,711,156, Cl. 92-31.000.
- Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., to General Motors Corporation: Actuator for converting linear motion to rotary motion and vice versa, 4,711,157, Cl. 92-31.000.
- Kayyod, Fariborz; and Hoffman, Donald E., to General Motors Corporation: Linear motion actuator with spring centering means, 4,711,158, Cl. 92-94.000.
- Kazaoka, Kenichi; Wakamatsu, Fumio; and Shinkai, Yasuo, to Aisin Seiki Kabushiki Kaisha: Seat for vehicles, 4,711,497, Cl. 297-458.000.
- Kehr, Wolfgang: See—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.
- Keizer, Klass: See—
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- Kelly, William J.: See—
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- Kemner, Rudolf; and Kalmijn, Hilco T., to U.S. Philips Corporation: Magnetic resonance imaging apparatus including two orthogonal r.f. coils, 4,712,069, Cl. 324-322.000.
- Kemp, Paul C.; and Lyons, Walter, to Ashland Oil, Inc. Stabilized coal oil mixtures, 4,711,643, Cl. 44-51.000.
- Kemp, Preston B., Jr.; and Johnson, Walter A., to GTE Products Corporation: Spherical precious metal based powder particles and process for producing same, 4,711,660, Cl. 75-0.50B.
- Kemp, Preston B., Jr.; and Johnson, Walter A., to GTE Products Corporation: Spherical copper based powder particles and process for producing same, 4,711,661, Cl. 75-0.50B.
- Kennametal Inc.: See—
Yeckley, Russel L.; and North, Bernard, 4,711,644, Cl. 51-307.000.
- Kennecott Corporation: See—
Nunlist, Erwin J., 4,711,296, Cl. 165-47.000.
- Kennedy, John F.: See—
Odgaard, A. Jacob; and Kennedy, John F., 4,711,597, Cl. 405-25.000.
- Kennedy, Richard B. Rotary mixing of two component resins in disposable plastic bag, 4,711,582, Cl. 366-279.000.
- Keogh, Raymond J.: See—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.
- Kersten, Peter: See—
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- Kessel, Erwin: See—
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- Kessel, Michael; Kessel, Erwin; and Schneider, Eugene: Curved wood bending machine, 4,711,281, Cl. 144-256.100.
- Keystone International, Inc.: See—
Holtgraver, Edward G., 4,711,427, Cl. 251-308.000.
- Kidouchi, Yasuo; and Yonekubo, Hiroaki, to Matsushita Electric Industrial Co., Ltd. Mixing valve apparatus, 4,711,392, Cl. 236-12.120.
- Kikuchi, Hidenori, to Kabushiki Kaisha Sato: Label feeding apparatus for a thermal label printer, 4,712,114, Cl. 346-76.0PH.
- Kikuchi, Kaoru; and Shikata, Nobuo, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry: Method for removal of scale from hot rolled steel, 4,711,707, Cl. 204-145.00R.
- Kikuchi, Katsuya, to Kabushiki Kaisha Toshiba: Endoscopic apparatus, 4,712,133, Cl. 358-98.000.
- Kikuchi, Kazuhiko; Honguu, Kazuoki; and Sawamura, Mitsuharu, to Canon Kabushiki Kaisha: Opto-magnetic recording medium, 4,711,821, Cl. 428-457.000.
- Kikuchi, Shunichi; Matsunaga, Haruyuki; Katsumi, Hideo; and Katsuyama, Koji, to Fujitsu Limited: Cooling system for electronic circuit components, 4,712,158, Cl. 361-385.000.
- Kilby, J. F.: See—
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- Kilgore, Colin H.: See—
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- Kimura, Akihiro: See—
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- Kimura, Mituo: See—
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- Kimura, Shigeru: See—
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- King, Norman R.: See—
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- Kinglor-Ltd: See—
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- Kinoshita, Takao: See—
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- Kinoshita, Yoshiaki, to Toyota Jidosha Kabushiki Kaisha. Automotive-fuel supply system. 4,711,200, Cl. 123-492.000.
- Kishida, Hiroo; and Takenaka, Hirofumi, to Harumoto Iron Works Co., Ltd. Method of forming a composite structural member. 4,710,994, Cl. 14-1.000.
- Kiso, Yoshiaki: See—
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- Kissei Pharmaceutical Co., Ltd.: See—
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- Kit, Malon; and Kit, Saul, to NovaGene, Inc.; and Baylor College of Medicine. Pseudorabies virus mutants, vaccines containing same, methods for the production of same and methods for the use of same. 4,711,850, Cl. 435-235.000.
- Kit, Saul: See—
Kit, Malon; and Kit, Saul, 4,711,850, Cl. 435-235.000.
- Kita, Toru, to Nissan Motor Co., Ltd. Torque detector. 4,711,134, Cl. 73-862.360.
- Kitade, Nobumitsu, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a transfer clutch of a four-wheel drive vehicle. 4,711,318, Cl. 180-247.000.
- Kitagawa, Tohru: See—
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- Kitagishi, Nozomu: See—
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- Kitamura, Tomimasa, to Koyo Auto-Mech Co., Ltd. Vehicle car steering system. 4,711,315, Cl. 180-132.000.
- Kitaori, Tadahiyo; Haginoya, Tsutomu; and Kozakura, Nobuto, to Tsubakimoto Chain Company. Carburized pin for chain. 4,711,676, Cl. 148-319.000.
- Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Recording apparatus having plural adjustable recording heads. 4,712,119, Cl. 346-140.00R.
- Kiyohara, Takehiko; Terasawa, Koji; and Miyakawa, Akira, to Canon Kabushiki Kaisha. Method for preventing non-discharge in a liquid jet recorder and a liquid jet recorder. 4,712,172, Cl. 346-1.100.
- Kiyono, Kenichi: See—
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- Kizawa, Hiroyuki, to Seikosha Co., Ltd. Clock. 4,711,586, Cl. 368-232.000.
- KJS Industries, Inc.: See—
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- Klaase, Theodorius A.: See—
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- Klaassen, Klaas B., to International Business Machines Corporation. Method and apparatus for reading recorded data by a magnetoresistive head. 4,712,144, Cl. 360-67.000.
- Klat, Samir R.: See—
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- Klauke, Erich: See—
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- Kleinschroth, Jurgen: See—
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- Kleman, Thomas G.: See—
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- Klier, Richard G.: See—
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- Klockner-Humboldt-Deutz AG: See—
Schaible, Siegfried; Hohlwegler, Heinz; and Kohl, Bernhard, 4,711,078, Cl. 56-341.000.
- Klockner, Jurgen: See—
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- Kloekner-Humboldt-Deutz AG: See—
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- Kluff, Werner: See—
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- Kluth, Joachim; Muller, Klaus-Helmut; and Pfister, Theodor, to Bayer Aktiengesellschaft. 2-cyanoamino-pyrimidines. 4,711,959, Cl. 544-320.000.
- Knable, Joseph J.; Ferdelman, Donald C.; and Bojanowski, Gerald M., to General Motors Corporation. Vehicle suspension strut and upper mount assembly therefor. 4,711,463, Cl. 280-668.000.
- Knap & Vogt Manufacturing Company: See—
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- Knauer, Joachim F.; and Freimuth, Martin, to Knauer, Joachim F. Nozzle cartridge for injection molding. 4,711,625, Cl. 425-549.000.
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- Kness Manufacturing Co., Inc.: See—
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- Knight, Robert G.; Klat, Samir R.; and Unwin, Kenneth, to Nytol Enterprises Limited. Drilling apparatus. 4,711,309, Cl. 175-93.000.
- Knight, Rodney A.: See—
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- Kobayashi, Masahiko, to Kuron Kabushiki Kaisha. Remote control blind system. 4,712,104, Cl. 340-825.520.
- Kobayashi, Minoru, to Nishin Seiki Kabushiki Kaisha. Vehicle washing apparatus. 4,711,257, Cl. 134-56.00R.
- Kobayashi, Ryohei: See—
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- Kobuck, Richard M.; and Kalkbrenner, Ralph W., to Westinghouse Electric Corp. Grid assembly fixture, retention strap and method. 4,711,436, Cl. 269-40.000.
- Kobylecki, Ryszard J.: See—
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- Koch, Carl C.: See—
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- Koeling, Thijs; Lehr, Bernd C.; and Broekhuizen, Willem, to Shell Oil Company. Method and means for determining the subsurface position of a blowing well with respect to a relief well. 4,711,303, Cl. 166-250.000.
- Koerner, Norman D.: See—
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- Kohayakawa, Hiromasa: See—
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- Kohl, Bernhard: See—
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- Kohler Co.: See—
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- Kohler, Hans E. P., to U.S. Philips Corporation. Remote control hand apparatus for operating different modules. 4,712,105, Cl. 340-825.690.
- Koike, Kazuyoshi: See—
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- Koizumi, Hiroshi, to Mitutoyo Mfg. Co., Ltd. Electronic measuring device. 4,711,034, Cl. 33-172.00E.
- Kojima, Masaki; and Munkata, Seiji, to Honny Chemicals Company Ltd.; and Asahi Glass Company Ltd. Composition for electrodeposition paint. 4,711,926, Cl. 524-512.000.
- Koka, Narasimharao: See—
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- Kokta, Milan R., to Union Carbide Corporation. Process for enhancing Ti:Al₂O₃ tunable laser crystal fluorescence by controlling crystal growth atmosphere. 4,711,696, Cl. 156-617.0SP.
- Kolakowski, Manfred: See—
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- Kolbenschmidt AG: See—
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- Koleske, Joseph V.: See—
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- Kolling, Rudi: See—
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- Kollmorgen Technologies Corporation: See—
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- Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.
- Komatsuzaki, Takeshi: See—
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- Kondo, Shigeo: See—
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- Kondratiev, Igor F.: See—
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- Konig, Wolfgang; Engels, Joachim; Uhlmann, Eugen; and Wetekam, Waldemar, to 501 Hoechst Aktiengesellschaft. Preparation of secretin. 4,711,847, Cl. 435-70.000.
- Konishi, Keiichi, to Kabushiki Kaisha Kobe Seiko Sho. Counterbalancing type crane. 4,711,358, Cl. 212-178.000.

- Konishi, Kunihiko: See—
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- Kono, Tatsuhiro: See—
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- Kooy, Wayne J. Rudder assembly. 4,711,192, Cl. 114-162.000.
- Korcz, William H.; and Singhal, Surendra N., to Shell Oil Company. Modified end cap for thermoplastic container. 4,711,362, Cl. 220-67.000.
- Kosaka, Takao; Okumura, Fumio; and Tsukahara, Hirokazu, to Mitsubishi Paper Mills, Ltd. Process for producing microcapsules. 4,711,749, Cl. 264-4.700.
- Kosaka, Yoshio: See—
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- Koschier, Friedlieb: See—
Peppmoller, Reinmar; and Koschier, Friedlieb, 4,711,919, Cl. 524-77.000.
- Kosednar, Joseph F.; and Barth, Merlyn W. Fraud-resistant manual magnetic reader-writer system for debit card use. 4,711,993, Cl. 235-380.000.
- Kotok, Alan: See—
Guglielmi, Paul M.; Melanson, Ronald J.; and Kotok, Alan, 4,712,190, Cl. 364-900.000.
- Kouchiwa, Taira, to Ricoh Company, Ltd. Color separating lens composed of three lens units. 4,711,536, Cl. 350-476.000.
- Koudele, Larry J.: See—
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- Kowa Company Ltd.: See—
Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, 4,711,542, Cl. 351-221.000.
- Koyo Auto-Mech Co., Ltd.: See—
Kitamura, Tomimasa, 4,711,315, Cl. 180-132.000.
- Kozakura, Nobuto: See—
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- Kozawa, Yutaka: See—
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- Krage, William G.; Stephens, Barry D.; and Denman, Owen S., to Energy Absorption Systems, Inc. Vehicle impact attenuating device. 4,711,481, Cl. 293-133.000.
- Kramer, Wolfgang; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lursen, Klaus, to Bayer Aktiengesellschaft. Substituted triazolylmethyl tert-butyl ketone compounds and plant protection agents. 4,711,657, Cl. 71-92.000.
- Kramer, Wolfgang: See—
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- Krantz, Herman F. Leak detection and refrigerant purging system. 4,711,096, Cl. 62-129.000.
- Krause, Hugh A. Child seat assembly for wheelchair. 4,711,489, Cl. 297-243.000.
- Kreeger, Elmer W., to Pinckney Molded Plastics, Inc. Bag tie with press release lever. 4,711,002, Cl. 24-30.50P.
- Krendelewa, Alisa I.: See—
Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasily I.; Krendelewa, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A., 4,711,387, Cl. 228-143.000.
- Krepelka, Jiri: See—
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- Kroener, Michael: See—
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- Kronvall, Hans C. G., to Pharmacia Aktiebolaget. Method for determining one or more antigens in a sample. 4,711,841, Cl. 435-7.000.
- Kruesi, Deborah J.: See—
Meltzer, Clifford B.; Kannan, Krishnamurthi; Burket, Thomas G.; Kruesi, Deborah J.; and Braudaway, Gordon W., 4,712,214, Cl. 371-32.000.
- Krusas, James J.; and Pienta, Joseph J., to American Optical Corporation. Support structure for protective mask optical insert. 4,711,539, Cl. 351-63.000.
- Kryos Energy Inc.: See—
Markbreiter, Stephen J.; and Dessanti, Daniel J., 4,711,093, Cl. 62-87.000.
- Kubitz, Werner; and Mennicken, Gerhard, to Bayer Aktiengesellschaft. Use of polyisocyanates or polyisocyanate mixtures as additives for aqueous emulsion paints. 4,711,918, Cl. 524-196.000.
- Kubo, Kenji: See—
Omae, Tsutomu; Obara, Sanhiro; Kubo, Kenji; and Watanabe, Masahiko, 4,712,052, Cl. 318-625.000.
- Kubota, Koji: See—
Yokozeki, Kenzo; and Kubota, Koji, 4,711,846, Cl. 435-70.000.
- Kubota, Ltd.: See—
Hasegawa, Shigekazu; Machida, Satoshi; and Oota, Yoshimi, 4,711,329, Cl. 192-3.570.
- Kubota, Tetsuhiro: See—
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- Kudo, Takabumi: See—
Ogawa, Masaki; and Kudo, Takabumi, 4,712,285, Cl. 152-458.000.
- Kugele, Thomas G.; Mesch, Keith A.; Wursthorn, Karl R.; and Conroy, Gary M., to Morton Thiokol, Inc. Stabilizers for halogen-containing polymers comprising the product of a diorganotin oxide, an ethylenically unsaturated dicarboxylic acid ester and a mercaptan. 4,711,920, Cl. 524-178.000.
- Kuijpers, Eugene G. M.: See—
Mesters, Carolus M. A. M.; Geus, John W.; and Kuijpers, Eugene G. M., 4,711,773, Cl. 423-655.000.
- Kumanoya, Masaki: See—
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- Kumar, Ravi, to Air Products and Chemicals, Inc. Removal of water and carbon dioxide from atmospheric air. 4,711,645, Cl. 55-26.000.
- Kuntz, Irving, to Exxon Chemical Patents Inc. Adamantane polymerization catalyst. 4,711,866, Cl. 502-152.000.
- Kuo, Charles C. Y., to CTS Corporation. Megohm resistor paint and resistors made therefrom. 4,711,803, Cl. 428-209.000.
- Kuo, James R., to Fairchild Camera & Instrument Corp. Monolithic telephone subscriber line interface circuit. 4,712,233, Cl. 379-386.000.
- Kurimoto, Mamoru: See—
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- Kuritani, Kazushige; and Nakagawa, Tatsuhiro, to NEC Corporation. Monitoring apparatus capable of monitoring a digital equipment by the use of a synchronization signal. 4,712,209, Cl. 370-13.000.
- Kuroda, Masato: See—
Fujiwara, Masatoshi; Kuroda, Masato; and Shiga, Tatsuhide, 4,712,173, Cl. 364-138.000.
- Kuron Kabushiki Kaisha: See—
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- Kurosawa, Kazuyuki: See—
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- Kurozumi, Seizi: See—
Hazato, Atsuo; Sugiura, Satoshi; Kurozumi, Seizi; and Noyori, Ryoji, 4,711,895, Cl. 514-530.000.
- Kurusu, Yasuo: See—
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- Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, to Honda Giken Kogyo Kabushiki Kaisha. Cutter housing for power-driven lawn mower. 4,711,077, Cl. 56-320.200.
- Kuusento, Jaakko: See—
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- Kuwabara, Hideki; Naito, Masato; Watanabe, Teishiro; and Hamada, Tadatsugu, to Mitsubishi Jukogyo Kabushiki Kaisha; and Japan Styrene Paper Corporation. Casting method. 4,711,287, Cl. 165-34.000.
- Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamura, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, to Sanyo Electric Co., Ltd. Refrigerator. 4,711,098, Cl. 62-441.000.
- Kuwae, Yoko: See—
Haruta, Masahiro; Kuwae, Yoko; Yuasa, Satoshi; and Miyazaki, Toshihiko, 4,711,830, Cl. 430-52.000.
- Kuzara, David J., to American Cyanamid Company. Digital moisture dermatometer. 4,711,244, Cl. 128-632.000.
- Kwaak, Gerd-Georg, to Mohndruck Graphische Betriebe GmbH. Palleting device. 4,711,612, Cl. 414-68.000.
- Kwon, Young J.; and Schulte, Susan M., to Westinghouse Electric Corp. Process for producing zirconium sponge with a very low iron content. 4,711,664, Cl. 75-84.500.
- Kwun, Hegeon; Birring, Anmol S.; Singh, Gurvinder P.; Hendrix, Gary J.; and Alcazar, David G., to Association of American Railroads. Method of wear monitoring using ultrasonic phase comparison. 4,711,120, Cl. 73-119.00R.
- Kyuma, Kenji; and Hieda, Teruo, to Canon Kabushiki Kaisha. Low-noise apparatus for image pickup and combination of light and electric signals. 4,712,138, Cl. 358-213.310.
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- Labrum, Joseph H., to Sperry Corporation. Broadband optical processor for determination of frequency and time of arrival of multiple signals. 4,712,059, Cl. 324-77.00K.
- Lach, Lawrence E., to Gould Inc. Small propagation delay measurement for digital logic. 4,712,061, Cl. 324-83.00D.
- Lade, Jan: See—
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- Laggan Marine Developments Limited: See—
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- Lagier, Michel, to Thomson CSF. Acoustic self-guidance systems for submarine vehicles. 4,712,201, Cl. 367-92.000.

Lahiff, John E., to Essex Group, Inc. Electromagnetic fuel injector having continuous flow path. 4,711,397, Cl. 239-125.000.

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Peterson, Steven H.; Lahoda, Edward J.; and Weisberg, Sharon L., 4,711,768, Cl. 423-21.500.

Lai, George Y., to Cabot Corporation. Sulfidation-resistant Co-Cr-Ni alloy with critical contents of silicon and cobalt. 4,711,763, Cl. 420-585.000.

Lai, John T., to B. F. Goodrich Company. The. Synthesis of 2-keto-1,4-diazacycloalkanes. 4,711,957, Cl. 544-231.000.

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Lakin, Bryan L.; and Wharton McDaniel, William P., to Fasco Industries, Inc. Heat sink and mounting arrangement therefor. 4,712,030, Cl. 310-89.000.

Lakso, Matthew L. Locking system. 4,711,505, Cl. 312-220.000.

LaMattina, John L.: See—
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Lamb, Haydn R.: See—
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Lammert, Michael D., to TRW Inc. Formation of buried diffusion devices. 4,711,017, Cl. 437-20.000.

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Landsman, Douglas A.: See—
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Lange, Jürgen, to VDO Adolf Schindling AG. Electrically actuatable fuel-injection valve for internal combustion engines. 4,711,396, Cl. 239-102.200.

Langenbeck, Keith A.; and Holdeman, David A., to Langenbeck, Keith A. Automated system and method for transporting and sorting articles. 4,711,357, Cl. 209-565.000.

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Focke, Heinz; Langer, Horst; and Bretthauer, Hans-Jürgen, 4,711,065, Cl. 53-170.000.

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Ward, David C.; Langer, Pennina R.; and Waldrop, Alexander A., III, 4,711,955, Cl. 536-29.000.

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Latto, William, to C-E Industrial Lasers, Incorporated. Laser materials treatment system. 4,712,120, Cl. 346-145.000.

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Horodysky, Andrew G.; and Law, Derek A., 4,711,736, Cl. 252-47.500.

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Gelfand, David H.; and Lawyer, Frances C., 4,711,845, Cl. 435-68.000.

Layne, Richard C., to Sahr, Gladys M. Dock seal with lip for sealing door hinge gap. 4,711,059, Cl. 52-173.0DS.

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Koeling, Thijs; Lehr, Bernd C.; and Broekhuizen, Willem, 4,711,303, Cl. 166-250.000.

Lehr, Marvin H., to B. F. Goodrich Company. The. Stabilization of vinyl chloride polymers. 4,711,921, Cl. 524-180.000.

Leibee, Donald L.; and Crist, Owen K., to Marmon Group, Inc., The. Drill bit. 4,711,312, Cl. 175-393.000.

Leiber, Heinz, to Robert Bosch GmbH. Valve arrangement. 4,711,266, Cl. 137-554.000.

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Chen, Nai Y.; Degnan, Thomas F., Jr.; Leiby, Susan M.; Oleck, Stephen M.; and Pelrine, Bruce P., 4,711,710, Cl. 208-111.000.

Leigh, Harold G.; and Schachet, Eli, to Baxter Travenol Laboratories, Inc. Syringe lock. 4,711,637, Cl. 604-220.000.

Leis, Roland: See—
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Leistner, Walter H., to Sigma Tool & Machine Limited. Nail collar and welder. 4,711,980, Cl. 219-56.000.

Lelling, Menno; and Hagenah, Gerhard, to SF-Vollverbundstein-Kooperation GmbH. Shaped (concrete) block for retaining walls and also a retaining wall. 4,711,606, Cl. 405-286.000.

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Shah, Manoj R.; and Lenz, Henry G., 4,712,033, Cl. 310-178.000.

Leone-Bay, Andrea, to Stauffer Chemical Company. Process for selective preparation of ratios of isomers formed on N-substitution of asymmetric imidazoles. 4,711,962, Cl. 548-337.000.

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Letica, Ilija, 4,711,364, Cl. 220-276.000.

Letica, Ilija, to Letica Corporation. Tamper-evident container and closure. 4,711,364, Cl. 220-276.000.

Letsche, Ulrich; Rapp, Wolfgang, deceased (by Rapp, Gilsea, heir); Haefner, Guenther; and Tonhauser, Wilhelm, to Daimler-Benz Aktiengesellschaft. Pressure oil guide device for injection pump shaft. 4,711,220, Cl. 123-502.000.

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Musselman, Lawrence L.; and Levendusky, Thomas L., 4,711,673, Cl. 106-287.170.

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Liao, Wei C.: See—
Denick, John, Jr.; Peters, David; Talwar, Anil K.; and Liao, Wei C., 4,711,774, Cl. 424-48.000.

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Herrington, Richard A.; Kleman, Thomas G.; and Apolar, Ermelinda A., 4,711,056, Cl. 51-410.000.

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Lillquist, Robert D.; and Case, Allen W., Jr., to General Electric Company. Method and apparatus for measuring weld penetration in an arc welding process. 4,711,986, Cl. 219-130.010.

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Schmidt, Oskar, 4,711,284, Cl. 152-452.000.

Lim, Tuan-Kay, to NCR Corporation. Imaging systems employing apparatus for evenly illuminating objects to be scanned. 4,712,002, Cl. 250-216.000.

Linde Aktiengesellschaft: See—
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Link, David H.; and Lopez, Juan R., to Clark Equipment Company. Method and means for lift truck assembly and servicing. 4,711,467, Cl. 280-785.000.

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Lisec, Peter. Device for smoothing sealing compounds in insulating glass. 4,711,692, Cl. 156-486.000.

Litton Systems, Inc.: See—
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Butler, Alfred L., 4,711,575, Cl. 356-350.000.

Feth, John R., 4,711,525, Cl. 350-96.330.

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Liu, King. Quick-release hub retention device. 4,711,459, Cl. 280-279.000.

Lockett, Michael J.; Summers, Daniel R.; Smith, Vinson C.; and Upchurch, James C., to Union Carbide Corporation. High turndown bubble cap tray. 4,711,745, Cl. 261-114.200.

Logan, David J.; Wood, Kenneth O.; Hernandez, William; and Edwards, Richard L., to Gerber Scientific Products, Inc. Method and apparatus for making a pattern for a lens opening in an eyeglass frame. 4,711,035, Cl. 33-200.000.

Lohaus, Gerhard: See—
Dittmar, Walter; Futterer, Eberhard; and Lohaus, Gerhard, 4,711,775, Cl. 424-70.000.

Long, Delmar D., to Dayco Products, Inc. Elastomer-coated bias reinforcement fabric and method for producing same. 4,711,792, Cl. 427-176.000.

Long, Frederick N. Cutting blade and method of use. 4,711,076, Cl. 56-295.000.

Longenecker, Francis S.; Moeder, Kevin J.; and Wolff, Jeffrey L., to TE-Co. Workpiece securing apparatus for a machine tool. 4,711,437, Cl. 269-91.000.

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Bonko, Mark L.; and Lopp, Loran C., Jr., 4,711,283, Cl. 152-209.00B.

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Loutfy, Rafik O.: See—
McAneney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., 4,711,833, Cl. 430-131.000.

Lu, Kun-Er: See—
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Price, Anthony G.; Campbell, Roy; and Green, Andrew P., 4,711,327, Cl. 188-71.400.

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Dickinson, Peter D.; and Luciano, Robert A., 4,711,452, Cl. 273-143.00R.

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Luen, Lam M. Rotary head. 4,711,310, Cl. 175-171.000.

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Gilhousen, Klein S.; Heller, Jerrold A.; Van Harding, Michael; and Blakeney, Robert D., II, 4,712,238, Cl. 380-20.000.

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Martyak, Nicholas M.; Corsentino, John A.; and McMullen, Warren H., 4,711,705, Cl. 204-34.000.

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Maeda, Satoru, to Sony Corporation. Color-signal converting circuit. 4,712,099, Cl. 340-703.000.

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Malek, Fritz J., to Santa Barbara Research Center. Direction finder system with mirror array. 4,711,998, Cl. 250-203.00R.

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Mammino, Joseph: See—
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Henkel, Dietmar, 4,711,209, Cl. 123-300.000.

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- Manoukian, Nubar: See—
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- Manoury, Philippe; Obitz, Daniel; and Peynot, Michel, to Synthelabo. Certain 5-nitro-2-furyl derivatives of pyridylpropenoic acid hydrazides which are useful in treating bacterial, fungal, protozoal, parasitic and intestinal infections. 4,711,892, Cl. 514-336.000.
- Mansfield, Michael R. Exercise apparatus for use with video game. 4,711,447, Cl. 272-73.000.
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- Marmon Group, Inc., The: See—
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- Marquardt, Terry L., to Westinghouse Electric Corp. Motor controller auxiliary contact unit with flexure member. 4,712,079, Cl. 335-132.000.
- Marten, O. James: See—
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- Martin, Charles E.: See—
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- Martin Marietta Energy Systems, Inc.: See—
Liu, Chain T.; and Koch, Carl C., 4,711,761, Cl. 420-459.000.
- Martin, R. Gregory: See—
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- Matsubara, Tamotsu: See—
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- Matsuda, Susumu: See—
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- Matsuki, Kanji: See—
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- Matsumoto, Nobuo: See—
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Katou, Akito, 4,712,080, Cl. 335-213.000.
- Kidouchi, Yasuo; and Yonekubo, Hiroaki, 4,711,392, Cl. 236-12.120.
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- Yamaguchi, Seiji; Ichinohe, Eisuke; and Katsura, Johji, 4,712,194, Cl. 365-203.000.
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- Maeda, Tatsuo; and Ohya, Takeji, 4,711,052, Cl. 49-502.000.
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- McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., to PPG Industries, Inc.

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- Milberger, Lionel J.: See—
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- Miles, Richard: See—
Cowler, David J. W.; and Lewis, Peter R., 4,711,420, Cl. 248-243.000.
- Miliczky, Eugene W.: See—
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- Miller, David A. B., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical interconnection of devices on chips. 4,711,997, Cl. 250-216.000.
- Miller, Gary L.: See—
McMahan, David R.; Hallgarth, Leslie H.; and Miller, Gary L., 4,712,164, Cl. 362-66.000.
- Miller, Reno W.; and Grobmyer, Louis R., to Westinghouse Electric Corp. Calibration of a nuclear reactor core parameter predictor. 4,711,753, Cl. 376-216.000.
- Millman, Ronald W., to Litton Systems, Inc. Plastic microwave oven door. 4,711,982, Cl. 219-10.55D.
- Ministry of International Trade & Industry: See—
Kikuchi, Kaoru; and Shikata, Nobuo, 4,711,707, Cl. 204-145.00R.
- Minkler, Jackson D., II, to Computer Poet Corporation. Method and apparatus for generating text. 4,712,174, Cl. 364-200.000.
- Minkow, Julius M.: See—
Minkow, Roger E.; and Minkow, Julius M., 4,711,448, Cl. 272-118.000.
- Minkow, Roger E.; and Minkow, Julius M. Lower body exercising and weight training device. 4,711,448, Cl. 272-118.000.
- Minnesota Mining and Manufacturing Company: See—
Bolson, John H., Sr., 4,712,094, Cl. 340-572.000.
- Evans, Bruce M., 4,711,566, Cl. 355-41.000.
- Grzeskowiak, Nicholas E.; and Philip, James B., Jr., 4,711,838, Cl. 430-568.000.
- Wittnebel, Bruce W., 4,711,816, Cl. 428-412.000.
- Minobe, Masao: See—
Suzukamo, Gohfu; Fukao, Masami; Minobe, Masao; and Sakamoto, Akemi, 4,711,873, Cl. 502-344.000.
- Minolta Camera Kabushiki Kaisha: See—
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- Nishimori, Kadotaro, 4,711,554, Cl. 355-8.000.
- Nishimori, Kadotaro; Yoshida, Keiji; and Ohira, Tadashi, 4,711,569, Cl. 355-69.000.
- Mintzer, Frederick C.; and Anderson, Karen L., to International Business Machines Corporation. Image reduction method. 4,712,140, Cl. 358-260.000.

- Mio, Kotaro: See—
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- Miracle, Gerald H.: See—
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- Mirigay, Solange M. V.: See—
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- Mischenko, Nicholas, to Motorola, Inc. Interlocking module housing. 4,711,361, Cl. 220-4.00F.
- Mita Industrial Co., Ltd.: See—
Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, 4,711,550, Cl. 355-3.0SH.
- Mitchell, Peter P. Apparatus for and method of setting the height of a desk chair. 4,711,033, Cl. 33-169.00R.
- Mitsubishi Chemical Industries Limited: See—
Hatano, Masakatsu; Oshima, Kazunori; Ihara, Tatsuya; and Kiyono, Kenichi, 4,711,867, Cl. 502-205.000.
- Mitsubishi Denki Kabushiki Kaisha: See—
Asami, Kazutomo; Sano, Fumiaki; Wada, Fumio; and Ishijima, Koji, 4,711,617, Cl. 417-295.000.
- Iio, Masaya, 4,712,152, Cl. 361-56.000.
- Kawajiri, Kazuhiko; Fujiwara, Michio; Tsuchino, Kazunori; and Hisamori, Youichi, 4,711,091, Cl. 60-517.000.
- Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, 4,712,123, Cl. 357-23.600.
- Naruki, Toshimasa; and Goto, Toshihisa, 4,712,145, Cl. 360-96.500.
- Tomita, Satoru; and Adachi, Mitsunori, 4,712,142, Cl. 358-285.000.
- Watanabe, Eiki, 4,711,335, Cl. 198-324.000.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—
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- Mitsubishi Kinzoku Kabushiki Kaisha: See—
Goto, Motoo; Kono, Hiroshi; Asao, Haruhiko; Miyamoto, Yukio; and Igarashi, Toshihiko, 4,711,433, Cl. 266-222.000.
- Mitsubishi Paper Mills, Ltd.: See—
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- Mitsubishi Rayon Co., Ltd.: See—
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- Mitsuta, Yuji: See—
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- Mittelhauser, Bernhard. Support for external rearview vehicular mirror. 4,711,421, Cl. 248-479.000.
- Mitutoyo Mfg. Co., Ltd.: See—
Koizumi, Hiroshi, 4,711,034, Cl. 33-172.00E.
- Miura, Katsuhito; and Nakata, Tetsuya, to Osaka Soda Co., Ltd. Polyether polymer or copolymer, monomer therefor, and process for production thereof. 4,711,950, Cl. 528-409.000.
- Miura, Masakatsu; and Aoki, Hideyuki, to Aisin-Warner Kabushiki Kaisha. Automatic transmission mechanism. 4,711,138, Cl. 74-761.000.
- Miyakawa, Akira: See—
Kiyohara, Takehiko; Terasawa, Koji; and Miyakawa, Akira, 4,712,172, Cl. 346-1.100.
- Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, to Wacom Co., Ltd. Electronic blackboard apparatus. 4,711,977, Cl. 178-18.000.
- Miyamoto, Tetsuya: See—
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- Miyamoto, Yukio: See—
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- Miyaoka, Shinichiro: See—
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- Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Dynamic memory device. 4,712,123, Cl. 357-23.600.
- Miyazaki, Atsushi: See—
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.
- Miyazaki, Toshihiko: See—
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- Mizuhara, Howard, to GTE Products Corporation. Method of joining pyrolytic boron nitride. 4,711,386, Cl. 228-121.000.
- Mizukami, Masao: See—
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- Mizuno Corporation: See—
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- Mizuno, Naohito: See—
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- Mizushima, Toshio: See—
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- Mobil Oil Corporation: See—
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- Chen, Nai Y.; Degnan, Thomas F., Jr.; Leiby, Susan M.; Oleck, Stephen M.; and Pelrine, Bruce P., 4,711,710, Cl. 208-111.000.
- Gross, Jonathan; and Marten, O. James, 4,711,623, Cl. 425-376.00A.
- Hopkins, Daniel N., 4,711,131, Cl. 73-799.000.
- Horodysky, Andrew G.; and Law, Derek A., 4,711,736, Cl. 252-47.500.
- Jennings, Alfred R., Jr., 4,711,302, Cl. 166-250.000.
- Schatz, Klaus W., 4,711,712, Cl. 208-153.000.
- Mobil Solar Energy Corporation: See—
Stormont, Richard W.; and Eriss, Lawrence, 4,711,695, Cl. 156-608.000.
- Mock, Gunther: See—
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- Modone, Eros: See—
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- Moeder, Kevin J.: See—
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- Mogi, Toshiaki: See—
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- Mohndruck Graphische Betriebe GmbH: See—
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- Mohri, Shunji, to Hitachi, Ltd. Table driven translator. 4,712,189, Cl. 364-900.000.
- Momiyama, Kikuo: See—
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- Monarch Marking Systems, Inc.: See—
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- Montavon, Marc: See—
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- Moon, William G.; Westwood, Donald C.; and Stone, Thomas R., to Plus Development Corporation. Thin and compact micro-Winchester head and disk assembly. 4,712,146, Cl. 360-97.000.
- Moore, Michael L., to SmithKline Beckman Corporation. 6-pen-vasopressin compounds. 4,711,877, Cl. 514-11.000.
- Moore, William P. Attrition resistant controlled release fertilizers. 4,711,659, Cl. 71-93.000.
- Moran, John C.: See—
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- Moran, Lyle E.: See—
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- Morel, Didier: See—
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- Morel, Jacques; and Morel, Didier, to Etablissements Morel - Ateliers Electromecaniques de Favieres. Protective sleeve and a method for protecting cable splices. 4,711,975, Cl. 174-92.000.
- Morell, Joseph; and Demarchi, Jean-Louis, to Salomon S.A. Closing and tightening apparatus for a rear-entry ski boot. 4,711,042, Cl. 36-50.000.
- Morey, William W.; and Snitzer, Elias, to United States of America, Navy. Combustor fiberscope. 4,711,524, Cl. 350-96.250.
- Morflex Chemical Company, Inc.: See—
Hull, Ezekiel H.; and Frappier, Edward P., 4,711,922, Cl. 524-310.000.
- Morgan, Bryan J.: See—
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- Mori, Hisako: See—
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- Mori, Kei. Light radiator for diffusing light rays which have been transmitted through an optical conductor. 4,711,513, Cl. 350-96.100.
- Mori, Maurizio; Babuin, Piero; and Cargnel, Giuseppe, to Zanussi Elettrodomestici S.p.A. Controlling device for clothes washing machine. 4,711,103, Cl. 68-12.00R.
- Mori, Shinji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing wind-up force limiting apparatus. 4,711,408, Cl. 242-107.000.
- Morikawa Sangyo Kabushiki Kaisha: See—
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- Morino, Ronald: See—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.
- Morishige, Yukio, to NEC Corporation. Optical CVD method with a strong optical intensity used during an initial period and device therefor. 4,711,790, Cl. 427-10.000.
- Morris, Eddy. Pendulum operated oscillating bow sight. 4,711,036, Cl. 33-265.000.
- Morrison, Alberta J. Puppet speaker. 4,712,246, Cl. 381-77.000.
- Morrison, Melvin M. Inertial measurement unit. 4,711,125, Cl. 73-178.00R.
- Morsey, Donald M. Air-water nozzle for a spa tank. 4,710,990, Cl. 4-542.000.
- Morton Thiokol, Inc.: See—
Kugele, Thomas G.; Mesch, Keith A.; Wursthorn, Karl R.; and Conroy, Gary M., 4,711,920, Cl. 524-178.000.

- Rei, Nuno M.; and Wilson, Ronald C., 4,711,914, Cl. 523-122.000.
- Mossberger, George R. Throw away cat litter box. 4,711,198, Cl. 119-1.000.
- Motorola, Inc.: See—
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- Ecklund, Lawrence M., 4,712,241, Cl. 381-15.000.
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- Mischenko, Nicholas, 4,711,361, Cl. 220-4.00F.
- Pigott, John M., 4,712,026, Cl. 307-600.000.
- Sood, Lal C., 4,712,197, Cl. 365-230.000.
- Motosugi, Takanori: See—
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- Motoya, Kaoru: See—
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- Motul S.A.: See—
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- Mowatt-Larsen, Erling, to General American Transportation Corporation. External purge system for a tank train. 4,711,274, Cl. 141-5.000.
- Mraz, Joseph: See—
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- Mross, Wolf D.: See—
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- Mucha, John A.: See—
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- Mueller, Richard A.; Paris, Richard A.; and Deason, James R., to G. D. Searle & Co. Phenolic thioethers as inhibitors of 5-lipoxygenase. 4,711,903, Cl. 514-381.000.
- Muenzner, Wulf: See—
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- Mugrauer, Hubert; Puritscher, Ernst; and Wittmann, Franz, to Siemens Aktiengesellschaft. Mechanism for the drive of actuation elements movable in sealed regions of non-mechanical printer or copier means. 4,711,564, Cl. 355-30.000.
- Mukaida, Yoshito: See—
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- Muller, Adam: See—
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- Muller, Bernard L.: See—
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- Muller, Klaus: See—
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- Muller, Klaus-Helmut: See—
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- Muller, Richard; Leis, Roland; and Zinnmeister, Axel, to Pfaff Industriemaschinen GmbH. Sewing arrangement with feed device. 4,711,189, Cl. 112-121.200.
- Muller, Rudolph R. M., to Multifastener Corporation. Method of installing a female element to a panel and installation apparatus. 4,711,021, Cl. 29-798.000.
- Muller, Walter R., to Carl Freudenberg, Firma. Moistening agent for offset printing plates. 4,711,670, Cl. 106-155.000.
- Multifastener Corporation: See—
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- Mumcu, Salih; Panoch, Hans J.; and Rueter, Joera, to Huls Aktiengesellschaft. Process for preparing polyamide-based, pulverulent coating compositions for high molecular weight post condensation, employing the precipitation procedure. 4,711,925, Cl. 524-417.000.
- Munekata, Seiji: See—
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- Munemoto, Yoshikazu: See—
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- Munroe, Albert P.: See—
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- Murakami, Yuichi: See—
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- Murakami, Haruhiko: See—
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- Murakami, Kakuichi: See—
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- Murakami, Kakuji: See—
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- Murakami, Keisuke: See—
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- Murase, Masao: See—
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- Murata Kikai Kabushiki Kaisha: See—
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- Murata, Takahiko: See—
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- Murray, Royce W.: See—
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- Musselman, Lawrence L.; and Levendusky, Thomas L., to Aluminum Company of America. Combination of surface modifiers for powdered inorganic fillers. 4,711,673, Cl. 106-287.170.
- Mutoh, Yoshiyuki: See—
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- Mycro Group Co.: See—
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- N/C Industries: See—
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- Nabisco Brands: See—
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- Nabisco Brands, Inc.: See—
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- Naefe, Herbert: See—
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- Nafziger, Steven: See—
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- Nagai, Kiyofumi: See—
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- Nagano, Shuji: See—
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- Nagasawa, Kiyoshi; Inoue, Toru; and Kashiwazaki, Susumu, to Hitachi, Ltd. Control system for brushless DC motor. 4,712,050, Cl. 318-254.000.
- Nagashima, Michiyoshi: See—
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- Nagashima, Shigeo: See—
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- Nagashima, Yoshikazu: See—
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- Naito, Masato: See—
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- Nakagawa, Tatsuhiko: See—
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- Nakamatsu, Toshio; Miyamoto, Tetsuya; and Imada, Kunihiko, to Sumitomo Chemical Company, Limited. Reactive dye composition: mixture of reactive copper phthalocyanine dyes: dichloro-triazinyl dye and vinyl sulphonyl type dye. 4,711,641, Cl. 8-524.000.
- Nakamura, Hideki: See—
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- Nakamura, Hiroyasu, to NEC Corporation. Multiple access radio telephone system selectively operating on full-duplex and half-duplex modes. 4,712,229, Cl. 379-58.000.
- Nakamura, Kenji: See—
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- Nakamura, Takeaki: See—
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- Nakamura, Yoshisada: See—
Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, 4,711,837, Cl. 430-548.000.
- Nakamura, Yukio: Method of producing propeller shafts for jet-propelled small-sized boats, 4,711,008, Cl. 29-156.80P.
- Nakanishi, Hiroshi: See—
Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, 4,711,732, Cl. 252-28.000.
- Nakanowatari, Jun; and Kano, Mitsuru, to Alps Electric Co., Ltd.: Liquid crystal device having birefringent plate neat to polarizer, 4,711,530, Cl. 350-339.00R.
- Nakata, Tetsuya: See—
Miura, Katsuhito; and Nakata, Tetsuya, 4,711,950, Cl. 528-409.000.
- Nakayama, Takehisa: See—
Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, 4,711,807, Cl. 428-334.000.
- Nakayama, Teruo: See—
Shibasaki, Toshimi; and Nakayama, Teruo, 4,711,080, Cl. 57-207.000.
- Nakazato, Susumu, to Westinghouse Electric Corp.: Control rod displacement, 4,711,756, Cl. 376-327.000.
- Nakov, Anton I.: See—
Atanasova, Ivanka A.; Haimova, Marieta A.; Chavdarova, Veselina B.; Nakov, Anton I.; Petkov, Nedelcho G.; and Avramova, Ruska S., 4,711,956, Cl. 540-327.000.
- Nalco Chemical Company: See—
Johnson, Donald A., 4,711,724, Cl. 210-699.000.
- Pierce, Claudia C.; Robinson, Robert S.; and Kneller, James F., 4,711,726, Cl. 210-701.000.
- Napier, Brian A.; and Fisher, Maurice J., to Coal Industry (Patents) Limited: Fluidized beds, 4,711,039, Cl. 34-57.00A.
- Narjes, Ferdinand; to Siemens Aktiengesellschaft: Data transmission facility, 4,711,976, Cl. 178-2.00C.
- Naruki, Toshimasa; and Goto, Toshihisa, to Mitsubishi Denki Kabushiki Kaisha: Operating mechanism for small portable cassette tape player, 4,712,145, Cl. 360-96.500.
- National Nuclear Corporation Limited: See—
Aspden, Garth J., 4,712,015, Cl. 250-517.100.
- National Research Development Corporation: See—
Chaimowicz, Jean-Claude A., 4,711,578, Cl. 356-375.000.
- Streat, Michael; and Belfer-Canterman, Sofia, 4,711,863, Cl. 502-5.000.
- National Starch and Chemical Corporation: See—
Mazzarella, Emil D.; Maliczyszyn, Walter; and Atkinson, Jeffrey, 4,711,671, Cl. 106-243.000.
- Natoli, John: See—
Amick, David R.; Hann, William M.; and Natoli, John, 4,711,725, Cl. 210-701.000.
- Naumann, Bernd: See—
Quillfeldt, Winfried; Naumann, Bernd; and Becker-Ross, Helmut, 4,711,572, Cl. 356-311.000.
- Naylor, Harry, to General Ionex Corporation: Charge conversion unit for negative ion source, 4,712,012, Cl. 250-423.00R.
- NCR Canada Ltd - NCR Canada Ltee: See—
Brooks, Ralf M.; Connell, Brian P.; Sonnenburg, Dennis T.; and Pagowski, Stefan J., 4,712,113, Cl. 346-1.100.
- NCR Corporation: See—
Lim, Tuan-Kay, 4,712,002, Cl. 250-216.000.
- NEC Corporation: See—
Amano, Haruo, 4,711,699, Cl. 437-52.000.
- Kuritani, Kazushige; and Nakagawa, Tatsuhiko, 4,712,209, Cl. 370-13.000.
- Morishige, Yukio, 4,711,790, Cl. 427-10.000.
- Nakamura, Hiroyasu, 4,712,229, Cl. 379-58.000.
- Takai, Haruki; Ujii, Mikio; and Nakamura, Hideki, 4,712,212, Cl. 370-104.000.
- Yamada, Kouichi, 4,712,090, Cl. 340-347.00D.
- Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek: See—
Verbeek, Pieter W.; Klaase, Theodorus A.; and Theil, Arne, 4,712,037, Cl. 310-323.000.
- Needs, Kathy A.: See—
Syvarth, Anne S.; Gordin, Harvey H.; Early, Paul D., Jr.; Needs, Kathy A.; and Perfetti, Thomas A., 4,711,255, Cl. 131-330.000.
- Nelen, Petrus R., to AGFA-Gevaert N.V.: Vacuum contact exposure apparatus, 4,711,570, Cl. 355-91.000.
- Nelson, Blaine J., to Rockwell International Corporation: Linear all-digital phase locked loop, 4,712,223, Cl. 377-43.000.
- Nelson, Blaine J., to Rockwell International Corporation: Offset digitally controlled oscillator, 4,712,224, Cl. 377-43.000.
- Nelson, Blaine J., to Rockwell International Corporation: Phase quantizer apparatus, 4,712,225, Cl. 377-43.000.
- Nelson, Dennis L.: See—
Calltharp, Glen R.; Norcross, Kenneth L., III; and Nelson, Dennis L., 4,711,716, Cl. 210-136.000.
- Nelson, Gunner E., to Ethyl Corporation: Preparation of alkyl silanes, 4,711,965, Cl. 556-478.000.
- Nelson, Gunner E., to Ethyl Corporation: Preparation of alkyl silanes, 4,711,966, Cl. 556-478.000.
- Nelson, Sidney G., Jr., to Sanitech, Inc.: Ion-selective water filter, 4,711,718, Cl. 210-282.000.
- Network Equipment Technologies: See—
McPherson, Thomas R., 4,712,217, Cl. 371-55.000.
- Neubert, Vernon H.; and Perrone, Nicholas, to United States of America, Navy: Combination energy absorbing foundation, 4,711,424, Cl. 248-636.000.
- Neuhalfen, Michael A.; Ridoux, Frank E.; and Edenborough, John S., to General Motors Corporation: Internal combustion engine ignition system, 4,711,226, Cl. 123-609.000.
- Neupert, Daniel: See—
Hofmann, Jurgen; Huschka, Hans; and Neupert, Daniel, 4,711,185, Cl. 110-215.000.
- New Holland Inc.: See—
Bernhardt, Richard P.; and Bowman, Robert L., 4,711,252, Cl. 130-27.00S.
- Strong, Russell W., 4,711,075, Cl. 130-27.00J.
- Newton, Feaster H.; and Wang, Kenneth Y., to Burlington Industries, Inc.: Roving blending for making sheath/core spun yarn, 4,711,079, Cl. 57-12.000.
- Ng, Kenny Y.: See—
Warwick, Alastair A.; Schenkel, David P.; and Ng, Kenny Y., 4,712,213, Cl. 371-15.000.
- NGK Insulators, Ltd.: See—
Matsuzawa, Soichiro, 4,711,018, Cl. 29-603.000.
- Nichol-Landry, Deborah J.: See—
McAneney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., 4,711,833, Cl. 430-131.000.
- Nick, Erich; Guse, Gunter; and Asmussen, Bodo: Medicinal self-adhesive plaster, 4,711,781, Cl. 424-446.000.
- Nicosia, Salvatore J.: See—
Johnson, Van B.; and Nicosia, Salvatore J., 4,712,228, Cl. 378-185.000.
- Nielsen, Lawrence E.: See—
Nielsen, Orlan S.; and Nielsen, Lawrence E., 4,711,446, Cl. 272-70.100.
- Nielsen, Orlan S.; and Nielsen, Lawrence E. Stilt, 4,711,446, Cl. 272-70.100.
- Niinomi, Masahiro: See—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,711,809, Cl. 428-336.000.
- Nilssen, Ole K.: Programmable electronic plug-in timer, 4,712,019, Cl. 307-141.000.
- Nilsson, Ben A.; and Shepherd, Roger D., to International Business Machines Corporation: Synchronizing electrostatic copy formation, 4,711,552, Cl. 355-3.00R.
- Nilsson, Einar W.: Straightening machines and methods, 4,711,112, Cl. 72-98.000.
- Nimbus Water Systems, Inc.: See—
Bray, Donald T., 4,711,723, Cl. 210-652.000.
- Ninomiya, Masao; Takashima, Susumu; Fukushima, Kazumasa; Yuyama, Masami; and Kurosawa, Kazuyuki, to Casio Computer Co., Ltd.: Speech recognition apparatus, 4,712,243, Cl. 381-43.000.
- Nipp, Hansjorg: See—
Blaas, Karl; and Nipp, Hansjorg, 4,711,308, Cl. 173-162.00R.
- Nippon Gakki Seizo Kabushiki Kaisha: See—
Takeda, Fumiteru; Hirano, Katsuhiko; and Inagaki, Yoshihiro, 4,711,148, Cl. 84-1.010.
- Nippon Jiryoku Senko Co., Ltd.: See—
Harada, Akihisa, 4,711,662, Cl. 75-1.00R.
- Nippon Kogaku K.K.: See—
Tanimoto, Aikazu, 4,711,567, Cl. 355-53.000.
- Nippon Kokan Kabushiki Kaisha: See—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.
- Nippon Sheet Glass Co., Ltd.: See—
Iida, Naohiro, 4,711,654, Cl. 65-172.000.
- Nippon Shinyaku Co., Ltd.: See—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.
- Nippon Soken, Inc.: See—
Ito, Novuei; Nishida, Minoru; Mizuno, Naohito; and Hattori, Tadashi, 4,712,082, Cl. 338-4.000.
- Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.
- Nippon Steel Corporation: See—
Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, 4,711,916, Cl. 523-223.000.
- Nippondenso Co., Ltd.: See—
Haraguchi, Hiroshi; and Sakakibara, Koji, 4,711,212, Cl. 123-425.000.
- Hoshizaki, Hiroki; Kawahara, Nobuaki; Suzuki, Hirofumi; and Oyobe, Kazuo, 4,711,990, Cl. 219-552.000.
- Sakakibara, Koji; and Haraguchi, Hiroshi, 4,711,213, Cl. 123-425.000.
- Sakakibara, Koji; Haraguchi, Hiroshi; and Yukumoto, Hideki, 4,711,214, Cl. 123-425.000.
- Takeuchi, Yukihisa; and Takagi, Makoto, 4,711,795, Cl. 427-130.000.
- Tsukahara, Kenji; and Abe, Taizou, 4,711,616, Cl. 417-216.000.
- Wakabayashi, Hiroyuki; and Matsubara, Tamotsu, 4,711,806, Cl. 428-334.000.

- Nishida, Masamitsu: See—
Yokotani, Yoichiro; Kato, Junichi; Nishida, Masamitsu; Kawashima, Syunichiro; and Ouchi, Hiromu, 4,711,862, Cl. 501-136.000.
- Nishida, Minoru: See—
Ito, Novuei; Nishida, Minoru; Mizuno, Naohito; and Hattori, Tadashi, 4,712,082, Cl. 338-4.000.
- Nishigaki, Shinichi: See—
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.
- Nishihara, Toshikazu: See—
Ando, Toshio; Nishihara, Toshikazu; and Kimura, Akihiro, 4,711,810, Cl. 428-336.000.
- Nishii, Kazuhiko: See—
Sato, Toshiaki; Mori, Hisako; Horio, Yasuhiko; Tabuchi, Kastumi; Matsumoto, Nobuo; and Nishii, Kazuhiko, 4,712,160, Cl. 361-388.000.
- Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, to Fuji Photo Film Co., Ltd.: Magnetic recording medium, 4,711,809, Cl. 428-336.000.
- Nishimori, Kadotaro, to Minolta Camera Kabushiki Kaisha: Scanning type copying machine, 4,711,554, Cl. 355-8.000.
- Nishimori, Kadotaro; Yoshida, Keiji; and Ohira, Tadashi, to Minolta Camera Kabushiki Kaisha: Original illumination device with an automatic illumination control, 4,711,569, Cl. 355-69.000.
- Nishimura, Eiji; Takigawa, Tadahiro; and Kato, Yoshihide, to Kabushiki Kaisha Toshiba: Method of forming a fine pattern with a charged particle beam, 4,712,013, Cl. 250-492.200.
- Nishimura, Shinichi: See—
Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,540, Cl. 351-214.000.
- Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,541, Cl. 351-214.000.
- Nishimura, Takashi: See—
Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, 4,712,038, Cl. 313-2.100.
- Nishiyama, Masaki, to Canon Kabushiki Kaisha: Pattern output apparatus, 4,712,188, Cl. 364-900.000.
- Nishiyama, Yoshihisa: See—
Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, 4,711,314, Cl. 177-164.000.
- Nishizawa, Junichi; and Motoya, Kaoru, to Research Development Corp.; Nishizawa, Junichi; and Motoya, Kaoru: Heterojunction gate ballistic JFET with channel thinner than Debye length, 4,712,122, Cl. 357-22.000.
- Niskanen, Heikki, to Oy Wartsila AB: Method and apparatus for fixing an end of a web on a core tube in a web reeling machine, 4,711,405, Cl. 242-66.000.
- Niske, Jorgen, to Tetra Pak International AB: Material for packing containers, 4,711,797, Cl. 428-35.000.
- Nissan Motor Co., Ltd.: See—
Kato, Takatsugu; and Takahashi, Takao, 4,711,273, Cl. 139-116.000.
- Kita, Toru, 4,711,134, Cl. 73-862.360.
- Suzuki, Tadashi; Okada, Kazuyoshi; and Abe, Noriyuki, 4,712,211, Cl. 370-100.000.
- Nissin Seiki Kabushiki Kaisha: See—
Kobayashi, Minoru, 4,711,257, Cl. 134-56.00R.
- Nitro Nobel AB: See—
Ehrnstrom, Hans, 4,711,678, Cl. 149-2.000.
- Niwa, Kiyomi; and Kozawa, Yutaka, to Kabushiki Kaisha Toshiba: Ventilator of the heat exchange type, 4,711,293, Cl. 165-4.000.
- NL Industries, Inc.: See—
Barr, John D.; and Lamb, Haydn R., 4,711,144, Cl. 76-108.00A.
- Loukanis, Jesse J.; Mathews, Will W.; and Tune, Raymond L., 4,711,143, Cl. 76-108.00A.
- Noell, Godwin L.: See—
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- Nohira, Hidetaka: See—
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.
- Nold, Robert D., to Sundstrand Corporation: Generator high temperature electrical lead assembly, 4,712,029, Cl. 310-71.000.
- Nomura, Masahiro: See—
Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhamu, Tetsuro, 4,711,501, Cl. 299-21.000.
- Nomura, Tadatoshi: See—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.
- Noorily, Peter, to Thomas & Betts Corporation: Electrical connector and latching apparatus therefor, 4,711,507, Cl. 439-292.000.
- Noorily, Peter, to Thomas & Betts Corporation: Latching apparatus for an electrical connector, 4,711,511, Cl. 439-347.000.
- Norcross, Kenneth L., III: See—
Calltharp, Glen R.; Norcross, Kenneth L., III; and Nelson, Dennis L., 4,711,716, Cl. 210-136.000.
- Norden Laboratories, Inc.: See—
Bass, Edmund P.; and Sharpee, Richard L., 4,711,778, Cl. 424-89.000.
- Nordson Corporation: See—
Price, Richard P., 4,711,379, Cl. 222-504.000.
- North American Philips Corporation: See—
Carleton, Samuel A.; and King, Norman R., 4,712,040, Cl. 313-331.000.
- Madsen, Elmer W., 4,712,154, Cl. 361-178.000.
- Stupp, Edward H., 4,712,124, Cl. 357-23.400.
- North, Bernard: See—
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- Northern Telecom Limited: See—
Warwick, Alastair A.; Schenkel, David P.; and Ng, Kenny Y., 4,712,213, Cl. 371-15.000.
- Northrop Corporation: See—
Binden, John A., 4,711,415, Cl. 244-17.190.
- Norton Company: See—
Scott, John J., 4,711,750, Cl. 264-144.000.
- NovaGene, Inc.: See—
Kit, Malon; and Kit, Saul, 4,711,850, Cl. 435-235.000.
- Nowaczyk, David J.: See—
Bulka, Raymond I.; and Nowaczyk, David J., 4,711,440, Cl. 270-53.000.
- Nowinski, Robert C.; and Hoffman, Allan S., to Genetic Systems Corporation: Polymerization-induced separation immunoassays, 4,711,840, Cl. 435-7.000.
- Noyori, Ryoji: See—
Hazato, Atsuo; Sugiura, Satoshi; Kurozumi, Seizi; and Noyori, Ryoji, 4,711,895, Cl. 514-530.000.
- Nozaki, Mineo; and Asakura, Osamu, to Canon Kabushiki Kaisha: Printer for printing by ink transfer, 4,711,591, Cl. 400-225.000.
- Nugier, John G., to Rockwell International Corporation: Apparatus for extracting an element from an assembly, 4,711,011, Cl. 29-239.000.
- Nukem GmbH: See—
Hofmann, Jurgen; Huschka, Hans; and Neupert, Daniel, 4,711,185, Cl. 110-215.000.
- Numata, Hidetaka, to Alps Electric Co., Ltd.: Servo control for motor having cutoff device for preventing motor from being locked, 4,712,053, Cl. 318-663.000.
- Nunlist, Erwin J., to Kennecott Corporation: Apparatus for avoiding thermal stresses in glass lined vessels, 4,711,296, Cl. 165-47.000.
- Nyman, Lars-Erik, to Flygt AB: Device for breeding fish and shellfish, 4,711,199, Cl. 119-3.000.
- Nytol Enterprises Limited: See—
Knight, Robert G.; Klat, Samir R.; and Unwin, Kenneth, 4,711,309, Cl. 175-93.000.
- O/Y Kyro A/B Tamglass: See—
Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., 4,712,086, Cl. 338-315.000.
- Obara, Kazuaki: See—
Takemura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, 4,712,204, Cl. 369-32.000.
- Obara, Sanhiro: See—
Omae, Tsutomu; Obara, Sanhiro; Kubo, Kenji; and Watanabe, Masahiko, 4,712,052, Cl. 318-625.000.
- Oberly, Charles E.; Gegel, Harold L.; and Ho, James C., to United States of America, Air Force: Composite aluminum conductor for pulsed power applications at cryogenic temperatures, 4,711,825, Cl. 428-614.000.
- Obitz, Daniel: See—
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- Oce-Nederland B.V.: See—
Geurts, Petrus A. M., 4,711,444, Cl. 271-290.000.
- Postath, Lambertus A.; Grootentraast, Johannes P.; and Verdonshot, Joannes F. J., 4,711,562, Cl. 355-16.000.
- Reinten, Hans, 4,712,116, Cl. 346-107.00R.
- Roodbeen, Leonardus F. H., 4,711,549, Cl. 355-3.0FU.
- Ochab, Douglas C.: Weight lifting safety device, 4,711,449, Cl. 272-123.000.
- Ochs, Heinrich: See—
Emrich, Helmut; Mathes, Josef; Ochs, Heinrich; and Despot, Janko, 4,711,173, Cl. 101-349.000.
- Oda, Tatsuharu: See—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.
- Oda, Yukio: See—
Tsujuchi, Toshio; Shinmura, Yoshinori; and Oda, Yukio, 4,711,054, Cl. 51-165.770.
- Odaira, Keikichi, to Yojigen Agricultural Corporation: Livestock feed and manufacturing method thereof, 4,711,787, Cl. 426-31.000.
- Odgaard, A. Jacob; and Kennedy, John F., to University of Iowa Research Foundation: Vanes for bank protection and sediment control in rivers, 4,711,597, Cl. 405-25.000.
- Oechlin, Ludwig; Giger, Urs; and Sporing, Jorg, to Ulysse Nardin S.A.: Astronomical wrist-watch, 4,711,583, Cl. 368-16.000.
- Oeschle, Manfred; Szieslo, Uwe; Streib, Karl-Peter; and Simm, Wolfgang, to Castolin S.A.: Device for the thermal spray application of fusible materials, 4,711,627, Cl. 431-30.000.
- Oetiker, Hans: Fastening arrangement for open hose clamp, 4,711,001, Cl. 24-20.0TT.
- Offe, Darrell L.; and Martin, R. Gregory, to United States of America, Navy: Trident II first and second stage internal insulation, 4,711,086, Cl. 60-253.000.
- Ogawa, Izumi: See—
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihoro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.

- Ogawa, Masaki; and Kudo, Takabumi, to Bridgestone Corporation. High-performance pneumatic tire having bead fillers of anisotropic elasticity. 4,711,285, Cl. 152-458.000.
- Ogawa, Yasuaki: See—
Okada, Hiroaki; Ogawa, Yasuaki; and Yashiki, Takatsuka, 4,711,782, Cl. 424-455.000.
- Ogden, Jeffrey D.: See—
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., 4,711,156, Cl. 92-31.000.
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., 4,711,157, Cl. 92-31.000.
- Ogiro, Kenji: See—
Goto, Shinichi; and Ogiro, Kenji, 4,712,149, Cl. 360-132.000.
- Ohanessian, Stephen. Garment hanger. 4,711,488, Cl. 297-190.000.
- Ohata, Hideo: See—
Wakamori, Fumio; Ohata, Hideo; Miyakawa, Shinichi; and Funabashi, Motohisa, 4,712,182, Cl. 364-507.000.
- Ohgoda, Makoto; and Tamura, Kaoru, to Fuji Photo Film Co., Ltd. Apparatus for scanning sheet-shaped recording medium. 4,712,009, Cl. 250-327.200.
- Ohira, Tadashi: See—
Nishimori, Kadotaro; Yoshida, Keiji; and Ohira, Tadashi, 4,711,569, Cl. 355-69.000.
- Ohloff, Gunther: See—
Schulte-Elte, Karl-Heinrich; Ohloff, Gunther; Muller, Bernard L.; and Giersch, Wolfgang K., 4,711,875, Cl. 512-1.000.
- Ohnuki, Nobutaka; Ojima, Masahiro; Arimoto, Akira; and Chinone, Naoki, to Hitachi, Ltd. Method of and apparatus for driving semiconductor laser. 4,712,218, Cl. 372-38.000.
- Ohs, Gary L.; and Byers, Timothy W., to Creative Sales & Mfg. Co., Inc. Adjustable support device for vehicle side view mirror. 4,711,538, Cl. 350-604.000.
- Ohta, Kazuhisa: See—
Kano, Kunihiko; Matsuki, Kanji; Ohta, Kazuhisa; and Sunohara, Tadaomi, 4,711,289, Cl. 164-34.000.
- Ohta, Masao: See—
Kato, Yasuyoshi; Teshima, Nobue; Ohta, Masao; and Konishi, Kunihiko, 4,711,872, Cl. 502-328.000.
- Ohta, Tomozo; Higashi, Kazutada; and Yamamoto, Hirohiko, to Sharp Kabushiki Kaisha. Antenna system. 4,712,111, Cl. 343-779.000.
- Ohu, Russell: See—
Gwilliam, Tony S.; and Ohu, Russell, 4,711,062, Cl. 52-646.000.
- Ohta, Takeji: See—
Maeda, Tatsuo; and Ohta, Takeji, 4,711,052, Cl. 49-502.000.
- Oida, Susumu; Munemoto, Yoshikazu; Ueda, Masami; and Ito, Michiaki, to Kabushiki Kaisha Toshiba. Washing machine having rotary basket in washing tub. 4,711,105, Cl. 68-23.200.
- Ojima, Masahiro: See—
Ohnuki, Nobutaka; Ojima, Masahiro; Arimoto, Akira; and Chinone, Naoki, 4,712,218, Cl. 372-38.000.
Saito, Atsushi; Ojima, Masahiro; Maeda, Takeshi; and Kato Tsuyoshi, 4,712,203, Cl. 369-13.000.
- Okada, Hiroaki; Ogawa, Yasuaki; and Yashiki, Takatsuka, to Takeda Chemical Industries, Ltd. Prolonged release microcapsules and their production. 4,711,782, Cl. 424-455.000.
- Okada, Kazuyoshi: See—
Suzuki, Tadashi; Okada, Kazuyoshi; and Abe, Noriyuki, 4,712,211, Cl. 370-100.000.
- Okamoto, Kenji: See—
Oshizawa, Hidekazu; and Okamoto, Kenji, 4,711,211, Cl. 123-357.000.
- Okamura, Minoru, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a transfer clutch of a four-wheel drive vehicle. 4,711,333, Cl. 192-0.076.
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Winter, Joseph; and Pryor, Michael J., 4,711,388, Cl. 228-148.000.
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- Walker, Frederick J.; and LaMattina, John L., 4,711,888, Cl. 514-269.000.
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- Pi-Yu, Ou. Outlet valve for toilet tank. 4,710,986, Cl. 4-382.000.
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- Pigott, John M., to Motorola, Inc. Delay circuit. 4,712,026, Cl. 307-600.000.
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- Plush, Richard Lee, Jr.: See—
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- McCullum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,711,917, Cl. 523-400.000.
- Schultz, Stephen J., 4,711,655, Cl. 65-351.000.
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- Price, Richard P., to Nordson Corporation. Proportional flow control dispensing gun. 4,711,379, Cl. 222-504.000.
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- Prokscha, Georg: See—
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- Pronk, Cornelis: See—
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- Prusak, Allan E., to Hayes Industrial Brake, Inc. Light switch and brake line connector assembly. 4,711,092, Cl. 60-534.000.
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Syvarth, Anne S.; Gordin, Harvey H.; Early, Paul D., Jr.; Needs, Kathy A.; and Perfetti, Thomas A., 4,711,255, Cl. 131-330.000.
- R. T. Vanderbilt Company, Inc.: See—
Doe, Lester A., Jr., 4,711,915, Cl. 523-122.000.
- Raasch, Hans, to W. Schlafhorst & Co. Method and apparatus for starting up a friction spinning assembly. 4,711,082, Cl. 57-263.000.
- Rachi, Masahiro: See—
Yoshikawa, Junichi; and Rachi, Masahiro, 4,712,000, Cl. 250-205.000.
- Radaelli, Dario; and Giraudi, Walter, to Alfa Romeo Auto S.p.A. Electromagnetic injector for an I.C. engine. 4,711,400, Cl. 239-585.000.
- Radisch, Helmer; and Esser, Gunther, to Saint-Gobain Vitrage. Process for treating the surface of a transparent sheet or film having antilaceration and self-healing properties and the product made thereby. 4,711,805, Cl. 428-323.000.
- Raidel, John E. Suspension system with sway guide. 4,711,465, Cl. 280-712.000.
- Rajasekaran, Periyagaram K.; Doddington, George R.; and Schalk, Thomas B., to Texas Instruments Incorporated. Speaker-independent word recognizer. 4,712,242, Cl. 381-42.000.
- Ramo, Simon: See—
Eastlund, Bernard J.; and Ramo, Simon, 4,712,155, Cl. 361-231.000.
- Randa, Stuart K., to Du Pont de Nemours, E. I., and Company. Thin wall cover on foamed insulation on wire. 4,711,811, Cl. 428-383.000.
- Rank Xerox Limited: See—
Tsuruoka, Ryoichi, 4,711,561, Cl. 355-3.00R.
- Ransomes Sims & Jefferies PLC: See—
Aldred, Edward J., 4,711,072, Cl. 56-6.000.
- Rapp, Gilsea, heir: See—
Letsche, Ulrich; Rapp, Wolfgang, deceased; Haefner, Guenther; and Tonhauser, Wilhelm, 4,711,220, Cl. 123-502.000.
- Rapp, Wolfgang, deceased: See—
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- Rauchle, Kurt: See—
von Stetten, Otto; Seth, Pyare L.; Schmid, Franz; and Rauchle, Kurt, 4,711,906, Cl. 514-561.000.
- Rawlings, Douglas E.; and Woods, David R., to General Mining Union Corporation, Limited. Construction of selectable shuttle cloning vectors for *Thiobacillus ferrooxidans*. 4,711,849, Cl. 435-91.000.
- Rawlings, Kelly R., to Anti-P, Inc. Internal combustion engine pollutant control system. 4,711,222, Cl. 123-555.000.
- Raytheon Company: See—
Argentini, Dino E., 4,711,859, Cl. 437-209.000.
- Faria, Lawrence E.; and Christopher, Earl H., 4,711,650, Cl. 62-6.000.
- Razzell, Charles J. H.: See—
Van Rump, Herman W.; and Razzell, Charles J. H., 4,712,073, Cl. 328-160.000.
- RCA Corporation: See—
Basile, Philip C., 4,712,020, Cl. 307-256.000.
- Casey, Robert F., 4,712,130, Cl. 358-22.000.
- Reno, Charles W., 4,712,207, Cl. 369-121.000.
- Slattery, Francis R., 4,712,126, Cl. 357-71.000.
- Rebound Systems, Inc.: See—
Dubner, Robert; Dubner, Russel S.; and Dubner, Todd A., 4,710,985, Cl. 2-425.000.

- Rebsamen, Roland, to Reishauer AG. Process and apparatus for controlling the spindle speed of a gear cutting machine. 4,712,048, Cl. 318-85.000.
- Regipa, Robert, to Centre National d'Etudes Spatiales (C.N.E.S.). Steerable lighter than air balloon. 4,711,416, Cl. 244-31.000.
- Rei, Nuno M.; and Wilson, Ronald C., to Morton Thiokol, Inc. Microbiocidal compositions comprising an aryl alkanol and a microbiocidal compound dissolved therein. 4,711,914, Cl. 523-122.000.
- REI Technologies, Inc.: See—
Zarrineghbal, Hossein; and Quinlan, Charles W., 4,711,713, Cl. 208-222.000.
- Reich Spezialmaschinen GmbH: See—
Dettelbach, Alfred; and Binder, Werner, 4,711,147, Cl. 83-863.000.
- Reichel, Kenneth R.; and Hebrock, Steve, to Audio Technica U.S., Inc. Audible audio level indicator. 4,712,093, Cl. 340-540.000.
- Reichenbach, Dean H., to Cummins Engine Company, Inc. Compression braking system for an internal combustion engine. 4,711,210, Cl. 123-321.000.
- Reichert-Jung Optische Werke AG: See—
Schindl, Klaus P.; Meitz, Franz; and Salzmann, Kurt, 4,711,537, Cl. 350-531.000.
- Reifenhauser GmbH & Co.: See—
Halter, Hartmut, 4,711,747, Cl. 264-40.200.
- Reinhold, Klaus. A method for making a roll for processing a web or strip of material. 4,711,291, Cl. 164-98.000.
- Reinten, Hans, to Océ-Nederland B.V. Means and method of symmetrical energization of individual array LED's for image exposure. 4,712,116, Cl. 346-107.00R.
- Reishauer AG: See—
Rebsamen, Roland, 4,712,048, Cl. 318-85.000.
- Remacle, Roger E. M.; and Verbeeck, Alain A. J., to Labofina, S.A. Treating spent filter media. 4,711,728, Cl. 210-772.000.
- Renault, Christian L. A.: See—
Dubroeuq, Marie-Christine; Le Fur, Gerard R.; and Renault, Christian L. A., 4,711,890, Cl. 514-311.000.
- Rennison, Stuart C.: See—
Butters, Alan; Barker, Roger N.; and Rennison, Stuart C., 4,711,834, Cl. 430-201.000.
- Reno, Charles W., to RCA Corporation. Apparatus for erasing information on a reversible optical recording medium. 4,712,207, Cl. 369-121.000.
- Research Development Corp.: See—
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- Retallick, William B.: See—
Cornelison, Richard C.; and Retallick, William B., 4,711,009, Cl. 29-157.00R.
- Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., to O/Y Kyro A/B Tamglass. Support frame for resistor elements in a heating furnace for glass sheets. 4,712,086, Cl. 338-315.000.
- Reuss, John R.: See—
Franchina, Thomas F.; Gudmundson, Gunnar G.; and Reuss, John R., 4,711,565, Cl. 355-39.000.
- Reuter, Alfred, to Gebrüder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck". Device for shaving the sides of tree trunks. 4,711,279, Cl. 144-39.000.
- Rexnord Inc.: See—
Hodlewsky, Wasly G., 4,711,605, Cl. 403-355.000.
- Rhone-Poulenc Sante: See—
Dubroeuq, Marie-Christine; Le Fur, Gerard R.; and Renault, Christian L. A., 4,711,890, Cl. 514-311.000.
- Rialan, Joseph; and Bary, Renate, to Institut Francais du Pétrole. Process for controlling the storage of data received by a seismic recording system and a device for implementing same. 4,712,199, Cl. 367-76.000.
- Rice, James M.: See—
Rice, John E.; Rice, James M.; and Rice, Robert W., 4,712,230, Cl. 379-112.000.
- Rice, John E.; Rice, James M.; and Rice, Robert W. Monitoring and recording apparatus for connection to a telephone line. 4,712,230, Cl. 379-112.000.
- Rice, Robert W.: See—
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- Richter, Donald L., to Temcor. Large span dome. 4,711,063, Cl. 52-741.000.
- Rickmers, Clifford P.; Donovan, Robert D.; and Brickner, Louis C., Jr., to Delta International Machinery Corp. Portable saw mill. 4,711,032, Cl. 30-372.000.
- Ricoh Company, Ltd.: See—
Kouchiwa, Taira, 4,711,536, Cl. 350-476.000.
- Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, 4,711,668, Cl. 106-22.000.
- Ueda, Yutaka; and Yamamuro, Tetsu, 4,711,798, Cl. 428-65.000.
- Yuyama, Yukihiko; Motosugi, Takanori; Honda, Yasuhiro; and Ichikawa, Akira, 4,711,874, Cl. 503-206.000.
- Ridoux, Frank E.: See—
Neuhafen, Michael A.; Ridoux, Frank E.; and Edenborough, John S., 4,711,226, Cl. 123-609.000.
- Riehl, Roger W., to Machine Technology, Inc. Balancing chuck. 4,711,610, Cl. 409-141.000.
- Riethmann, Max: See—
Rietzsch, Rolf; Dersch, Stefan; and Riethmann, Max, 4,711,290, Cl. 164-66.100.
- Rietzsch, Rolf; Dersch, Stefan; and Riethmann, Max, to George Fischer Ltd. Method and apparatus for casting iron treated with magnesium. 4,711,290, Cl. 164-66.100.
- Riggio, Stephen C.: See—
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- Rigouard, Alain: See—
Jamonet, Bernard; Rigouard, Alain; Bouchez, Jean-Pierre; and Duc, Jean, 4,711,721, Cl. 210-607.000.
- Rimmell, Herbert D.; and Perkins, John W., to General Motors Corporation. Simulated vehicle lamp. 4,711,527, Cl. 350-243.000.
- Ringel, Konrad; and Rudolf, Karl, to Diehl GmbH & Co. Warhead with rotationally-symmetrical hollow charge. 4,711,181, Cl. 102-476.000.
- Ringgenberg, Paul D., to Halliburton Company. Multi-mode testing tool and method of testing. 4,711,305, Cl. 166-336.000.
- Ringhoff, Hubert: See—
Menell, Hans; Ringhoff, Hubert; and Rump, Jurgen, 4,711,691, Cl. 156-415.000.
- Rippe, Dondeville M., Jr.; and Scaturro, David T., to Magnum Piering, Inc. Slab jacking process and apparatus. 4,711,603, Cl. 405-230.000.
- Risberg, Stig: See—
Sundberg, Sten; Risberg, Stig; and Eriksson, Ulf, 4,711,179, Cl. 102-426.000.
- Riseman, Jacob: See—
Bhatia, Harsaran S.; Bhatia, Satyapal S.; Riseman, Jacob; and Valsamakis, Emmanuel A., 4,712,125, Cl. 357-59.000.
- Ritter, G. Thomas; and Budniak, Mitchell, to Abbott Laboratories. Heat source circuitry for biological material analysis. 4,711,987, Cl. 219-358.000.
- Ritzer, Josef: See—
Brunner, Josef; and Ritzer, Josef, 4,710,999, Cl. 17-65.000.
- Roba, Giacomo; and Modone, Eros, to Csele-Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of producing halide glass, especially for optical communications. 4,711,652, Cl. 65-18.200.
- Robert Bosch GmbH: See—
Eckardt, Dieter; and Hettich, Gerhard, 4,712,064, Cl. 324-208.000.
- Fromme, Georg, 4,712,186, Cl. 364-565.000.
- Glas, Hans J.; Hecht, Hans; Muller, Klaus; Spitzenberger, Kurt; and Stecher, Gunther, 4,711,130, Cl. 73-708.000.
- Laufer, Helmut, 4,711,221, Cl. 123-503.000.
- Leiber, Heinz, 4,711,266, Cl. 137-554.000.
- Roberts, George A.: See—
Slobodnik, Andrew J., Jr.; Stiglitz, Martin R.; Roberts, George A.; and Webster, Richard T., 4,712,078, Cl. 331-99.000.
- Roberts, Luther C.: See—
Graenbaum, William T.; Harmon, Julie P.; and Roberts, Luther C., 4,711,832, Cl. 430-106.000.
- Robertshaw Controls Company: See—
Geary, Frederick J., 4,711,628, Cl. 431-31.000.
- Robertson, R. W.: See—
Rossborough, Richard F.; and Whitty, Graeme, 4,711,258, Cl. 134-138.000.
- Robertson, Warren D.: See—
Gorter, Helen R.; Moran, Lyle E.; Robertson, Warren D.; and Savard, Shaunalea, 4,711,672, Cl. 106-281.00R.
- Robinson, Robert S.: See—
Pierce, Claudia C.; Robinson, Robert S.; and Kneller, James F., 4,711,726, Cl. 210-701.000.
- Robinson, Ronald D.: See—
Wilmore, Scott H.; and Robinson, Ronald D., 4,710,991, Cl. 5-435.000.
- Rockwell International Corporation: See—
Christe, Karl O., 4,711,680, Cl. 149-109.400.
- Nelson, Blaine J., 4,712,223, Cl. 377-43.000.
- Nelson, Blaine J., 4,712,224, Cl. 377-43.000.
- Nelson, Blaine J., 4,712,225, Cl. 377-43.000.
- Nugier, John G., 4,711,011, Cl. 29-239.000.
- Rodgers, E. Walter, to Armor Metals, Inc. Multiple telephone jack slide assembly. 4,712,232, Cl. 379-329.000.
- Roe, James: See—
Spiel, Albert; Roe, James; and Spanier, Henry C., 4,711,425, Cl. 249-117.000.
- Roge, Paul; and Roge, Ralph R. Mailbox signal device. 4,711,391, Cl. 232-35.000.
- Roge, Ralph R.: See—
Roge, Paul; and Roge, Ralph R., 4,711,391, Cl. 232-35.000.
- Roger, Loic; Maubois, Jean-Louis; Brule, Gerard; and Piot, Michel, to Institut De La Recherche Agronomique. Process for obtaining an alpha-lactalbumin enriched product from whey and uses thereof. 4,711,953, Cl. 530-366.000.
- Rogier, Serge; and Guignois, Jacques, to Societe Europeenne des Produits Refractaires. Heat exchangers molded from refractory material. 4,711,298, Cl. 165-165.000.
- Rohde, Wolfgang; and Klockner, Jurgen, to SMS Schloemann-Siemag, A.G. Controlling thickness and planarity of hot rolled strips. 4,711,109, Cl. 72-8.000.
- Rohde, Wolfgang; and Kolakowski, Manfred, to SMS Schloemann-Siemag AG. Method of and apparatus for the production of wide strip. 4,711,114, Cl. 72-234.000.
- Rohm and Haas Co.: See—
Amick, David R.; Hann, William M.; and Natoli, John, 4,711,725, Cl. 210-701.000.

Rolls-Royce plc: See—
Lyons, Michael R., 4,711,085, Cl. 60-39.141.
Rommel, Reiner; and Landau, Werner; to Adolf Hottinger Giesserei und Maschinenbau GmbH. Core and shell shooter. 4,711,292, Cl. 164-200.000.
Roodbeen, Leonardus F. H., to Oce-Nederland B.V. Contact fixing device with an improved cleaning mechanism. 4,711,549, Cl. 355-3.0FU.
Roos, Roland: See—
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,712,148, Cl. 360-132.000.
Roquette Freres Societe Anonyme: See—
Gosset, Serge; and Lumaret, Jean-Claude, 4,711,794, Cl. 427-389.900.
Roschmann, Peter; and Simon, Howard E., to U.S. Philips Corporation. R.F. coil system for generating and/or receiving alternating magnetic fields. 4,712,067, Cl. 324-318.000.
Rose, Gerard: See—
Margot, Christian; and Rose, Gerard, 4,712,153, Cl. 361-91.000.
Rosen, Harold. Compact self-contained fire extinguisher. 4,711,307, Cl. 169-57.000.
Rosenberg, Carol S. Cushioning crutch support covering. 4,711,261, Cl. 135-72.000.
Rosenberg, Peretz. Liquid spraying devices. 4,711,399, Cl. 239-498.000.
Rosman, Matthew: See—
Berke, Michael; and Rosman, Matthew, 4,711,230, Cl. 128-69.000.
Ross, John J.: See—
Bilge, Umit; Scarpelli, August F.; Schwartz, Ronald E.; and Ross, John J., 4,711,984, Cl. 219-110.000.
Rossborough, Richard F.; and Whitty, Graeme, to Chapman, M. J.; Sherlock, G. K.; Kilby, J. F.; and Robertson, R. W. Apparatus for cleaning paint roller. 4,711,258, Cl. 134-138.000.
Rostron, Anthony: See—
Cowley, David J. W.; and Lewis, Peter R., 4,711,420, Cl. 248-243.000.
Roth, Bernard M.: See—
Viannay, Stephane G. J.; Roth, Bernard M.; Mirigay, Solange M. V.; and Chastang, Georges J. B., 4,711,431, Cl. 266-114.000.
Rothfuss, Hans: See—
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.
Rousseau, Jean: See—
Gaudilliere, Bernard; and Rousseau, Jean, 4,711,899, Cl. 514-330.000.
Rovensky, Jozef: See—
Kasafirek, Evzen; Cerny, Martin; Kocis, Petr; Krepelka, Jiri; and Rovensky, Jozef, 4,711,952, Cl. 530-327.000.
Rowenta-Werke GmbH: See—
Walter, Robert, 4,711,010, Cl. 29-157.00R.
Rozmestor, Raymond L. Socket organizer. 4,711,353, Cl. 206-378.000.
Rudolf, Karl: See—
Ringel, Konrad; and Rudolf, Karl, 4,711,181, Cl. 102-476.000.
Rudroff, Wolf-Dietrich. Process for the recovery of valuable substances from lacquer sludge. 4,711,729, Cl. 210-781.000.
Rueter, Joern: See—
Mumcu, Salih; Panoch, Hans J.; and Rueter, Joern, 4,711,925, Cl. 524-417.000.
Ruhrechemie Aktiengesellschaft: See—
Konkol, Werner; Bahrmann, Helmut; Dambkes, Georg; Gick, Wilhelm; Wiebus, Ernst; and Bach, Hans-Wilhelm, 4,711,648, Cl. 55-73.000.
Rump, Jurgen: See—
Menell, Hans; Ringhoff, Hubert; and Rump, Jurgen, 4,711,691, Cl. 156-415.000.
Runzi, Kurt. Sheet supply apparatus for typewriters, having slewing rollers engaging a platen roll, and method. 4,711,442, Cl. 271-22.000.
Rusconi, David M. Apparatus and method for cold weather protection of large diesel engines. 4,711,204, Cl. 123-142.50R.
Russell, Robert J., to Honeywell Information Systems Inc. Method for making testable electronic assemblies. 4,711,024, Cl. 29-832.000.
Ruston, Robert B., Sr. Variable speed fillet knife. 4,711,030, Cl. 30-272.00A.
Rusu, Radu, to Teatron/Auca Corp. Turboprop overspeed protection system. 4,711,615, Cl. 416-46.000.
S. C. Johnson & Son, Inc.: See—
Anderson, John J., 4,711,378, Cl. 222-499.000.
Kandathil, Thomas V., 4,711,739, Cl. 252-139.000.
S.I.E., Inc.: See—
Ondrik, Michael A., 4,712,007, Cl. 250-270.000.
Saadat, Mohammad M. Device for measuring dimensions of objects. 4,711,037, Cl. 33-520.000.
Sacki, Masaru: See—
Toyoshi, Seiji; Yoshizumi, Tomoya; Sacki, Masaru; and Kawakita, Tetsuya, 4,711,722, Cl. 210-638.000.
Saenko, Vladimir Y.: See—
Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasilii I.; Krendeleva, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A., 4,711,387, Cl. 228-143.000.
Sahr, Gladys M.: See—
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Saint-Gobain Vitrage: See—
Radisch, Helmer; and Esser, Gunther, 4,711,805, Cl. 428-323.000.
Saint Ives, Michael H., to Kal, Stephen. Dice pyramid tally board and game. 4,711,453, Cl. 273-268.000.

Saint-Jean, Guy: See—
Jeanjean, Robert; Demissy, Daniel; Saint-Jean, Guy; and Landry, Michel, 4,711,978, Cl. 200-148.00A.
Saito, Atsushi; Ojima, Masahiro; Maeda, Takeshi; and Kato Tsuyoshi, to Hitachi, Ltd. Method and apparatus for thermo magnetic recording/erasing information with preselected magnetic field switching. 4,712,203, Cl. 369-13.000.
Saito, Gunji: See—
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.
Saito, Takashi: See—
Hosaka, Masao; and Saito, Takashi, 4,711,560, Cl. 355-14.00C.
Saito, Yoshiharu, to Olympus Optical Co., Ltd. Standard zoom lens system having a large aperture ratio. 4,711,533, Cl. 350-426.000.
Sakaguchi, Hiroaki: See—
Aramaki, Minoru; and Sakaguchi, Hiroaki, 4,711,949, Cl. 525-356.000.
Sakai, Mituya: See—
Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhamu, Tetsuro, 4,711,501, Cl. 299-21.000.
Sakai, Terumasa: See—
Torioe, Makoto; Suzuki, Akiyoshi; and Sakai, Terumasa, 4,711,568, Cl. 355-68.000.
Sakakibara, Koji; and Haraguchi, Hiroshi, to Nippondenso Co., Ltd. Knock control system for internal combustion engines. 4,711,213, Cl. 123-425.000.
Sakakibara, Koji; Haraguchi, Hiroshi; and Yukumoto, Hideki, to Nippondenso Co., Ltd. Anti-knock control in internal combustion engine. 4,711,214, Cl. 123-425.000.
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Haraguchi, Hiroshi; and Sakakibara, Koji, 4,711,212, Cl. 123-425.000.
Sakakibara, Yasuyuki: See—
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.
Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a transfer clutch of a four-wheel drive vehicle. 4,711,317, Cl. 180-197.000.
Sakamoto, Akemi: See—
Suzukamo, Gohfu; Fukao, Masami; Minobe, Masao; and Sakamoto, Akemi, 4,711,873, Cl. 502-344.000.
Sakurai, Yoshihiko, to Diesel Kiki Co., Ltd. Air conditioner system for automobiles. 4,711,295, Cl. 165-22.000.
Salensky, George A., to Union Carbide Corporation. Carboxylic acid-grafted phenoxy resins. 4,711,817, Cl. 428-418.000.
Salensky, George A., to Union Carbide Corporation. Carboxylic acid-grafted phenoxy resins. 4,711,924, Cl. 524-402.000.
Salmons, Victor: See—
Pajak, Phillip; Salmons, Victor; and Chan, Tony, 4,711,451, Cl. 273-143.00R.
Salomon S.A.: See—
Morell, Joseph; and Demarchi, Jean-Louis, 4,711,042, Cl. 36-50.000.
Salyer, Ival O., to University of Dayton. Polyethylene composites containing a phase change material having a C14 straight chain hydrocarbon. 4,711,813, Cl. 428-402.000.
Salzmann, Kurt: See—
Schindl, Klaus P.; Meitz, Franz; and Salzmann, Kurt, 4,711,537, Cl. 350-531.000.
Sambayashi, Takeshi, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,711,559, Cl. 355-14.00D.
Samuel, Glenn W. Multiple-unit HVAC energy management system. 4,711,394, Cl. 236-49.000.
Sanchem, Inc.: See—
Bibber, John W., 4,711,667, Cl. 106-14.210.
Sanchez, David J. Interactive message garment. 4,710,981, Cl. 2-115.000.
Sander, Wilfried; and Mielke, Siegfried, to Kolbenachmidt AG. Piston for internal combustion engines. 4,711,208, Cl. 123-271.000.
Sando Iron Works Co., Ltd.: See—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,711,102, Cl. 68-5.00E.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Wet heat treating apparatus of a cloth for performing dyeing and washing in combination. 4,711,102, Cl. 68-5.00E.
Sanitation Equipment Limited: See—
Stewart, John M., 4,710,988, Cl. 4-438.000.
Sanitech, Inc.: See—
Nelson, Sidney G., Jr., 4,711,718, Cl. 210-282.000.
Sanner, Axel: See—
Sterzel, Hans-Josef; and Sanner, Axel, 4,711,907, Cl. 521-27.000.
Sano, Fumiaki: See—
Asami, Kazutomo; Sano, Fumiaki; Wada, Fumio; and Ishijima, Koji, 4,711,617, Cl. 417-295.000.
Sano, Takashi, to Pigeon Corp. Fruit juice squeezer. 4,711,167, Cl. 99-510.000.
Sansotta, Carmelo; and Spector, George. Saw horse. 4,711,319, Cl. 182-155.000.
Santa Barbara Research Center: See—
Malek, Fritz J., 4,711,998, Cl. 250-203.00R.
Santel, Hans-Joachim: See—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, 4,711,658, Cl. 71-92.000.

Santella, Michael L.: See—
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Sanyo Electric Co., Ltd.: See—
Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, 4,711,551, Cl. 355-3.0DD.
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamura, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.
Sasaki, Kazuyuki: See—
Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,540, Cl. 351-214.000.
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Sato, Mitsuo: See—
Imanishi, Shozo; and Sato, Mitsuo, 4,711,169, Cl. 100-257.000.
Sato, Toshiaki; Mori, Hisako; Horio, Yashuhiko; Tabuchi, Kastumi; Matsumoto, Nobuo; and Nishii, Kazuhiko, to Matsushita Electric Industrial Co., Ltd. Power supply module. 4,712,160, Cl. 361-388.000.
Sato, Yuichi: See—
Tsunekawa, Tokuchi; and Sato, Yuichi, 4,712,136, Cl. 358-213.150.
Sato, Seiki Co., Ltd.: See—
Yoneda, Katsuki, 4,711,188, Cl. 112-104.000.
Satzinger, Gerhard; Hartenstein, Johannes; Mannhardt, Karl; Kleinschroth, Jurgen; Oswald, Hartmut; Weinheimer, Gunter; and Fritsch, Edgar. 1-6-naphthyridine derivatives useful in the treatment of blood vessel diseases. 4,711,901, Cl. 514-300.000.
Saunders, Jeffrey H.: See—
Ansell, Henry G.; and Saunders, Jeffrey H., 4,712,077, Cl. 331-25.000.
Saunders, William J.: See—
Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., 4,711,374, Cl. 222-129.100.
Savard, Shaunalea: See—
Gorter, Helen R.; Moran, Lyle E.; Robertson, Warren D.; and Savard, Shaunalea, 4,711,672, Cl. 106-281.00R.
Savelainen, Matti, to Instrumentarium Corp. RF coil arrangement for NMR examination apparatus. 4,712,068, Cl. 324-318.000.
Savla, Lalit J., to Kolmogor Technologies Corporation. Floating mask encoder with assembly spacer. 4,712,005, Cl. 250-231.0SE.
Savoly, Arpad: See—
Garvey, Christopher M.; Savoly, Arpad; and Weatherford, Thomas M., 4,711,731, Cl. 252-8.514.
Sawamura, Kentaro; Kosaka, Yoshio; and Yamaguchi, Masayasu, to TDK Corporation. Sintered aluminum nitride body and method for making. 4,711,861, Cl. 501-98.000.
Sawamura, Mitsuharu: See—
Kikuchi, Kazuhiko; Hongu, Kazuoki; and Sawamura, Mitsuharu, 4,711,821, Cl. 428-457.000.
Scallill, Steven. Utility connection bar. 4,711,470, Cl. 285-30.000.
Scala, Luciano C.: See—
Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., 4,711,822, Cl. 428-458.000.
Scarpelli, August F.: See—
Bilge, Umit; Scarpelli, August F.; Schwartz, Ronald E.; and Ross, John J., 4,711,984, Cl. 219-110.000.
Scaturro, David T.: See—
Rippe, Dondeville M., Jr.; and Scaturro, David T., 4,711,603, Cl. 405-230.000.
Schaaf, Cecil; and Schaaf, Craig. Beach erosion control device. 4,711,598, Cl. 405-30.000.
Schaaf, Craig: See—
Schaaf, Cecil; and Schaaf, Craig, 4,711,598, Cl. 405-30.000.
Schachet, Eli: See—
Leigh, Harold G.; and Schachet, Eli, 4,711,637, Cl. 604-220.000.
Schaefer, Daniel W.: See—
Freier, Edward, Jr.; and Schaefer, Daniel W., 4,711,073, Cl. 56-13.300.
Schaffer, Curtiss R., to Cortronix, Inc. Cortical hearing aid. 4,711,243, Cl. 128-420.500.
Schaffner, Hanspeter, to Gebruder Buhler AG. Pellet mill. 4,711,622, Cl. 425-331.000.
Schaible, Siegfried; Hohlwegler, Heinz; and Kohl, Bernhard, to Klockner-Humboldt-Deutz AG. Baler and process for making bales or for operating the baler. 4,711,078, Cl. 56-341.000.
Schalk, Thomas B.: See—
Rajasekaran, Periaragam K.; Doddington, George R.; and Schalk, Thomas B., 4,712,242, Cl. 381-42.000.
Schallner, Otto: See—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, 4,711,658, Cl. 71-92.000.
Schatz, Klaus W., to Mobil Oil Corporation. Closed cyclone FCC system with provisions for surge capacity. 4,711,712, Cl. 208-153.000.
Schenkel, David P.: See—
Warwick, Alastair A.; Schenkel, David P.; and Ng, Kenny Y., 4,712,213, Cl. 371-15.000.
Schering Aktiengesellschaft: See—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.
Scherrer, Fernand. False ceiling or false wall constituted by a stretched sheet fastened. 4,711,060, Cl. 52-222.000.
Scherrer, Fernand. Spotlight bracket for a false ceiling or a false wall. 4,712,168, Cl. 362-427.000.

Schetina, Otto: See—
Barnthaler, Franz; Bedenk, Ferdinand; Schetina, Otto; and Zitz, Alfred, 4,711,502, Cl. 299-33.000.
Schiller, Helmut, to Linde Aktiengesellschaft. Process and apparatus for cooling a gaseous stream before and/or during its compression. 4,711,771, Cl. 423-359.000.
Schindl, Klaus P.; Meitz, Franz; and Salzmann, Kurt, to Reichert-Jung Optische Werke AG. Stage for a microscope. 4,711,537, Cl. 350-531.000.
Schluger, Allen. Container for product samples. 4,711,348, Cl. 206-45.290.
Schlumberger Electronics, Inc.: See—
Cossier, Harry F., 4,711,117, Cl. 73-1.00H.
Schlumberger Technology Corporation: See—
Clark, Brian; and Chew, Weng C., 4,712,070, Cl. 324-338.000.
Schmid, Franz: See—
von Stetten, Otto; Seth, Pyare L.; Schmid, Franz; and Rauchle, Kurt, 4,711,906, Cl. 514-561.000.
Schmidt, Edward D., to E.D.S. Company. High fiber bread and extruded products. 4,711,786, Cl. 426-19.000.
Schmidt, Oskar, to Lim Kunststoff Technologie Gesellschaft m.b.H. Pneumatic tire. 4,711,284, Cl. 152-452.000.
Schmidt, Phillip A., to Weyerhaeuser Company. Vertical flail delimber. 4,711,280, Cl. 144-208.00J.
Schmidt, Robert R.: See—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, 4,711,658, Cl. 71-92.000.
Schmittbetz, Klaus, to Klockner-Humboldt-Deutz AG. Mounted implement hitch for farm tractors. 4,711,460, Cl. 280-460.00A.
Schmitz, Beat: See—
Stahl, Peter H.; and Schmitz, Beat, 4,711,880, Cl. 514-108.000.
Schmitz, Steven R.: See—
Davis, Loren G.; Schmitz, Steven R.; and Tauer, Dennis L., 4,712,210, Cl. 370-77.000.
Schneider, Eugene: See—
Kessel, Michael; Kessel, Erwin; and Schneider, Eugene, 4,711,281, Cl. 144-256.100.
Schnell, Kenneth R., to Hubbell Incorporated. Connector for non-metallic conduit. 4,711,472, Cl. 285-162.000.
Schnerk, Thomas G., to TRW Inc. Transmission and reception of television broadcast in high-fidelity stereo audio. 4,712,240, Cl. 387-3.000.
Schobert, Frank: See—
Mesun, Randy O.; and Schobert, Frank, 4,710,987, Cl. 4-420.000.
Schoenberg, Andrew J.: See—
Swiggert, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.
Schomann, Klaus D.: See—
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,712,148, Cl. 360-132.000.
Schomblond, Jacques, to Cartier Industrie. Injection molds intended for the production of composite bodies such as multicolored light covers or components made of several different materials. 4,711,621, Cl. 425-120.000.
Schonenberger, Guido: See—
Mader, Karl; Schonenberger, Guido; and Buzzi, Carlo A., 4,711,375, Cl. 222-135.000.
Schoofs, Franciscus A. C. M.; Bierhoff, Martinus P. M.; Van Mil, Job F. P.; and Slomp, Albert H., to U.S. Philips Corporation. Digital/analog converter having a switchable reference current. 4,712,091, Cl. 340-347.0DA.
Schott, Heinrich, to Siemens Aktiengesellschaft. Signalling circuit. 4,712,056, Cl. 323-315.000.
Schrenk, Hartmut, to Siemens Aktiengesellschaft. Circuit for a cord carrier having a memory and an access control unit for secure data access. 4,712,177, Cl. 364-200.000.
Schroder, Joris, to Inventio AG. Service indicating device for elevators. 4,711,324, Cl. 187-135.000.
Schroeder, Gertrud: See—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.
Schrom, Ralf-H.; and Baltes, Horst, to General Motors Corporation. Mounting or locking assembly, especially for use with pivotable motor vehicle seats. 4,711,493, Cl. 297-379.000.
Schulte-Elte, Karl-Heinrich; Ohloff, Gunther; Muller, Bernard L.; and Giersch, Wolfgang K., to Firmenich SA. Composition essentially consisting of trans-1-(2,6,6-trimethylcyclohexyl)-hexan-3-ol. 4,711,875, Cl. 512-1.000.
Schulte, Susan M.: See—
Kwon, Young J.; and Schulte, Susan M., 4,711,664, Cl. 75-84.500.
Schultz, Daryl. Fertilizer applicator knife and its use. 4,711,187, Cl. 111-7.000.
Schultz, Stephen J., to PPG Industries, Inc. Adjustable quench for tempering a glass sheet. 4,711,655, Cl. 65-351.000.
Schultz, Stephen J.: See—
Frank, Robert G.; Claassen, George R.; Waterloo, Thomas L.; Schultz, Stephen J.; and Fecik, Michael T., 4,711,653, Cl. 65-106.000.
Schulze, Martin: See—
Spanton, David J.; and Schulze, Martin, 4,711,500, Cl. 298-17.00S.
Schuman, Mark. Radiant emission and absorption multigas analyzer. 4,711,571, Cl. 356-311.000.

Schuster, Joachim: See—
Genschow, Henning; Heisel, Uwe; and Schuster, Joachim, 4,711,016, Cl. 29-568.000.

Schuster, Max, to Zahnradfabrik Friedrichshafen AG: Drive connection with a free-wheel mechanism. 4,711,332, Cl. 192-48.920.

Schwab, Carl, to ISC Cardion Electronics, Inc.: Method and apparatus for detecting microbursts. 4,712,108, Cl. 342-26.000.

Schwabe GmbH: See—
Albeck, Bernhard; and Goedicke, Siegfried, 4,711,019, Cl. 29-609.000.

Schwartz, Nathan G., to Techniservice: Monofilament-wrap texturizing method and product. 4,711,191, Cl. 112-410.000.

Schwartz, Ronald E.: See—
Bilge, Umit; Scarpelli, August F.; Schwartz, Ronald E.; and Ross, John J., 4,711,984, Cl. 219-110.000.

Schweim, Hans, to Hydrolux S.A.: Hydraulic control block. 4,711,267, Cl. 137-596.150.

Schwender, Charles F.: See—
Bandurco, Victor T.; Schwender, Charles F.; Falotico, Robert; and Tobia, Alfonso J., 4,711,883, Cl. 514-253.000.

Scavo S.p.A.: See—
Porro, Massimo; and Costantino, Paolo, 4,711,779, Cl. 424-92.000.

Scotese, Michael J.: See—
Erker, James W.; Scotese, Michael J.; and Stotts, Jay B., 4,711,614, Cl. 414-641.000.

Scott, John J., to Norton Company: Abrasive casting process. 4,711,750, Cl. 264-144.000.

Scott, William A.; and Dull, Carl, to Tillotson, Ltd.: Starting aid for small internal combustion engines. 4,711,744, Cl. 261-64.400.

Scowen, Reginald V.: See—
Carter, Malcolm N. A.; and Scowen, Reginald V., 4,711,740, Cl. 252-174.240.

Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, to Westinghouse Electric Corp.: Handling tool for, and method of use of, ice basket removable cruciform. 4,711,755, Cl. 376-260.000.

Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, to Westinghouse Electric Corp.: Removable cruciform for ice condenser ice basket. 4,711,759, Cl. 376-284.000.

Scriven, Roger L.: See—
McCullum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Maurer, George W.; and Zwack, Robert R., 4,711,917, Cl. 523-400.000.

Seefluth, U. Christian, to Sita Baulelemente GmbH: Drill tool. 4,711,609, Cl. 408-68.000.

Seibu Polymer Kasei Kabushiki Kaisha: See—
Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhami, Tetsuro, 4,711,501, Cl. 299-21.000.

Seidl, Jiri, to Bayerische Motoren Werke AG: Timing case for a cylinder head of internal combustion engines having gas changing valves arranged essentially in parallel to one another. 4,711,203, Cl. 123-90.340.

Seikosha Co., Ltd.: See—
Kizawa, Hiroyuki, 4,711,586, Cl. 368-232.000.

Sekine, Kazumi, to Canon Kabushiki Kaisha: Electronic instrument. 4,711,992, Cl. 235-145.000.

Selenia Industrie Elettroniche Associate S.p.A.: See—
Galati, Gaspare; and Orsini, Mario, 4,712,109, Cl. 342-159.000.

Semenets, Valery I.: See—
Baldenko, Dmitry F.; Bolepkin, Nikolai P.; Vadetsky, Jury V.; Gusman, Moisei T.; Potapov, Jury F.; and Semenets, Valery I., 4,711,006, Cl. 29-156.40R.

Serafin, Frank G., to W. R. Grace & Co.: Method of grinding a hydraulic cement. 4,711,401, Cl. 241-16.000.

Serno, Peter, to Bayer Aktiengesellschaft: Medicament formulation. 4,711,902, Cl. 514-356.000.

Seshadri, Jayaram: See—
Howland, Leland L.; and Seshadri, Jayaram, 4,711,095, Cl. 62-117.000.

Seth, Pyare L.: See—
von Stetten, Otto; Seth, Pyare L.; Schmid, Franz; and Rauchle, Kurt, 4,711,906, Cl. 514-561.000.

Seto, Kaoru; Ushio, Yukihide; Hori, Kenjiro; Hashimoto, Hiroshi; Yoshimoto, Toshio; and Kanaiwa, Kiyoshi, to Canon Kabushiki Kaisha: Laser beam printer. 4,712,118, Cl. 346-108.000.

Seyfried, Christoph: See—
Hausberg, Hans-Heinrich; Bottcher, Henning; Seyfried, Christoph; and Bergmann, Rolf, 4,711,893, Cl. 514-339.000.

SF-Vollverbundstein-Kooperation GmbH: See—
Leling, Menno; and Hagenah, Gerhard, 4,711,606, Cl. 405-286.000.

S+G Implants GmbH: See—
Grundel, Hans, 4,711,639, Cl. 623-20.000.

SGS-Antes Componenti Elettronici S.p.A.: See—
Marchisi, Giuseppe; and Cognetti De Martis, Carlo, 4,711,023, Cl. 29-827.000.

SGS-ATES Componenti Elettronici SpA: See—
Colombo, Piero; Cellai, Marino; and Cognetti de Martis, Carlo, 4,712,127, Cl. 357-72.000.

Shadbolt, Peter J.: See—
Chen, Te H.; Cicchino, Dominic; and Shadbolt, Peter J., 4,711,186, Cl. 110-336.000.

Shafer, David R., to Perkin-Elmer Corporation: The Ring field projection system. 4,711,535, Cl. 350-442.000.

Shah, Manoj R.; and Lenz, Henry G., to General Electric Company: Acyclic generator with liquid metal current collectors having circulating current barriers. 4,712,033, Cl. 310-178.000.

Shank, Jeffrey B.; Swanson, Steven E.; and Opdahl, Barry J., to GTE Products Corporation: Fiber optic connector. 4,711,518, Cl. 350-96.200.

Shapiro, Eugene; and Santella, Michael L., to Olin Corporation: Iron-nickel alloys having improved glass sealing properties. 4,711,826, Cl. 428-630.000.

Sharma, Shanmuk; Hill, Donnie K.; and Durr, Charles A., to M. W. Kellogg Company: The Process for separation of hydrocarbon gases. 4,711,651, Cl. 62-34.000.

Sharp Kabushiki Kaisha: See—
Iida, Hiroyuki; Murakami, Haruhiko; Matsumoto, Tsuyoshi; and Kashiwara, Junzo, 4,711,313, Cl. 177-127.000.

Ohta, Tomozo; Higashi, Kazutada; and Yamamoto, Hirohiko, 4,712,111, Cl. 343-779.000.

Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,712,219, Cl. 372-45.000.

Sharpe, Richard L.: See—
Bass, Edmund P.; and Sharpe, Richard L., 4,711,778, Cl. 424-89.000.

Shell Oil Company: See—
Koeling, Thijs; Lehr, Bernd C.; and Broekhuizen, Willem, 4,711,303, Cl. 166-250.000.

Korez, William H.; and Singhal, Surendra N., 4,711,362, Cl. 220-67.000.

Zemel, Bernard; and Closmann, Philip J., 4,712,006, Cl. 250-269.000.

Shepherd, Roger D.: See—
Nilsson, Ben A.; and Shepherd, Roger D., 4,711,552, Cl. 355-3.00R.

Sherlock, G. K.: See—
Rossborough, Richard F.; and Whitty, Graeme, 4,711,258, Cl. 134-138.000.

Sherwin, Maynard A.; and Koleske, Joseph V., to Union Carbide Corporation: Humidity resistant coating employing branched polymers of t-butyl acrylate. 4,711,944, Cl. 526-318.420.

Shibanai, Ichiro; and Nakamura, Kenji, to Japan Liquid Crystal Co., Ltd.: Curing agent for epoxy resin and method for curing epoxy resin. 4,711,936, Cl. 525-485.000.

Shibazaki, Toshimi; and Nakayama, Teruo, to Murata Kikai Kabushiki Kaisha: Spun yarn and method and apparatus for forming spun yarn. 4,711,080, Cl. 57-207.000.

Shiga, Tatsuhide: See—
Fujiwara, Masatoshi; Kuroda, Masato; and Shiga, Tatsuhide, 4,712,173, Cl. 364-138.000.

Shigeta, Yuko: See—
Ando, Hirohito; Takada, Zenji; and Shigeta, Yuko, 4,711,674, Cl. 106-289.000.

Shiina, Haruo, to Honda Giken Kogyo Kabushiki Kaisha: High strength structural member made of Al-alloy. 4,711,823, Cl. 428-547.000.

Shikata, Nobuo: See—
Kikuchi, Kaoru; and Shikata, Nobuo, 4,711,707, Cl. 204-145.00R.

Shim, Hyun J.: Roller skate. 4,711,458, Cl. 280-11.220.

Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, to Ricoh Company, Ltd.: Aqueous ink composition. 4,711,668, Cl. 106-22.000.

Shimada, Susumu: See—
Katou, Yukio; Suzuki, Takehiro; and Shimada, Susumu, 4,711,316, Cl. 180-168.000.

Shimano, Akio: See—
Otsuki, Tatsu; Shimano, Akio; Aoki, Hiromitsu; and Aoki, Ikuko, 4,712,023, Cl. 307-450.000.

Shimazu, Toshikazu: See—
Kawaguchi, Fumiaki; Shimazu, Toshikazu; and Takahashi, Kazuhisa, 4,712,117, Cl. 346-108.000.

Shimura, Yoshiharu: See—
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamura, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.

Shinchi, Takashi: See—
Kano, Hidekazu; Shinchi, Takashi; and Hosoi, Shuichi, 4,711,217, Cl. 123-491.000.

Shinkai, Yasuo: See—
Kazaoka, Kenichi; Wakamatsu, Fumio; and Shinkai, Yasuo, 4,711,497, Cl. 297-458.000.

Shinmura, Yoshinori: See—
Tsuijuchi, Toshio; Shinmura, Yoshinori; and Oda, Yukio, 4,711,054, Cl. 51-165.770.

Shintani, Takeshi: See—
Iri, Eiji; Kaneko, Takashi; Shintani, Takeshi; Mio, Kotaro; and Ijiri, Yasuo, 4,711,523, Cl. 350-96.230.

Shiring, Francis J., III: See—
Cullo, Leonard A.; and Shiring, Francis J., III, 4,711,869, Cl. 502-239.000.

Shiroshita, Osamu; Ishiguro, Yasuo; and Ito, Yoshizumi, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyota Jidosha Kabushiki Kaisha: Tracking robot apparatus. 4,712,183, Cl. 364-513.000.

Shishido, Tadao: See—
Inagaki, Yoshio; and Shishido, Tadao, 4,711,963, Cl. 548-365.000.

Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, to Olympus Optical Co., Ltd.: Apparatus for photometrically detecting an optically focused condition of an optical system. 4,711,999, Cl. 250-204.000.

Shoji, Masaru: See—
Tanazawa, Masayoshi; Shoji, Masaru; and Yamada, Wataru, 4,711,584, Cl. 368-88.000.

Shupert, Kristine A.: See—
Bull, Rebecca L.; and Shupert, Kristine A., 4,710,979, Cl. 2-48.000.

Shure Brothers, Inc.: See—
Julstrom, Stephen D., 4,712,231, Cl. 379-202.000.

Shutt, Sidney G.: Hydrofoil apparatus. 4,711,195, Cl. 114-274.000.

Shyr, Yen-Shin; and Johnson, Marvin M., to Phillips Petroleum Company: Process for preparing silica-alumina. 4,711,868, Cl. 502-235.000.

Siemens Aktiengesellschaft: See—
Horbaschek, Heinz, 4,712,226, Cl. 378-134.000.

Luft, Johann, 4,712,220, Cl. 372-50.000.

Mugrauer, Hubert; Puritscher, Ernst; and Wittmann, Franz, 4,711,564, Cl. 355-30.000.

Narjes, Ferdinand, 4,711,976, Cl. 178-2.00C.

Schott, Heinrich, 4,712,056, Cl. 323-315.000.

Schrenk, Hartmut, 4,712,177, Cl. 364-200.000.

Warden, Hans-Erik, 4,712,227, Cl. 378-173.000.

Zwicker, Eberhard; Beckenbauer, Thomas; and Beer, Guenther, 4,712,244, Cl. 381-68.100.

Siemon Company, The: See—
Below, Randy; Burke, Howard; and Thomas, Stephen M., 4,712,234, Cl. 379-399.000.

Sigma Instruments, Inc.: See—
Horber, Ralph W., 4,712,028, Cl. 310-49.00R.

Sigma Tool & Machine Limited: See—
Leistner, Walter H., 4,711,980, Cl. 219-56.000.

Silbermangel, Peter, to B. Hagemann & Co.: Stretch foil wrapping arrangement. 4,711,069, Cl. 53-556.000.

Sillony Company Limited: See—
Fujiyama, Seiki; and Lee, Myonghi, 4,712,180, Cl. 364-419.000.

Siltronics Ltd.: See—
Carr, Francis, 4,712,112, Cl. 343-788.000.

Simkovich, George, to Pennsylvania Research Corporation: Oxidation resistant alloy. 4,711,665, Cl. 75-244.000.

Simm, Wolfgang: See—
Oeschle, Manfred; Szeslo, Uwe; Streb, Karl-Peter; and Simm, Wolfgang, 4,711,627, Cl. 431-30.000.

Simmonds Precision Products, Inc.: See—
Spillman, William B., Jr., 4,712,004, Cl. 250-227.000.

Simon, Howard E.: See—
Roschmann, Peter; and Simon, Howard E., 4,712,067, Cl. 324-318.000.

Simonazzi, Adriano: Filling device with interchangeable valve member for cans of different diameters. 4,711,276, Cl. 141-286.000.

Simons, Leon: Tamper proof package with electrical circuit. 4,711,368, Cl. 220-450.000.

Simons, Robert: See—
Frezza, William; Simons, Robert; and Westerfer, Richard, 4,712,239, Cl. 380-20.000.

Simonson, Dale E.; and Stoll, Donald H., to General Electric Company: Stud mounted non-metallic electric enclosure. 4,712,157, Cl. 361-357.000.

Simplicity Manufacturing, Inc.: See—
Freier, Edward, Jr.; and Schaefer, Daniel W., 4,711,073, Cl. 56-13.300.

Singer Company, The: See—
Houser, John, Jr., 4,712,055, Cl. 320-35.000.

Singh, Gurvinder P.: See—
Kwun, Hegeon; Biring, Anmol S.; Singh, Gurvinder P.; Hendrix, Gary J.; and Alcazar, David G., 4,711,120, Cl. 73-119.00R.

Singhal, Anil K., to IMRE Corporation: Immune complex assay. 4,711,839, Cl. 435-4.000.

Singhal, Surendra N.: See—
Korcz, William H.; and Singhal, Surendra N., 4,711,362, Cl. 220-67.000.

Sirenberg, Wilhelm; Klauke, Erich; Hamann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft: 2,4-dihalogenobenzoyl-(thio)urea insecticides. 4,711,905, Cl. 514-522.000.

Sita Baulelemente GmbH: See—
Seefluth, U. Christian, 4,711,609, Cl. 408-68.000.

Skeels, Gary W.; and Breck, Donald W., deceased (by Breck, Stephen R., George D. Breck, heirs), to Union Carbide Corporation: Silicon substituted Y zeolite composition LZ-210. 4,711,770, Cl. 423-328.000.

Slattery, Francis R., to RCA Corporation: Low resistance tunnel. 4,712,126, Cl. 357-71.000.

Slobodnik, Andrew J., Jr.; Stiglitz, Martin R.; Roberts, George A.; and Webster, Richard T., to United States of America, Air Force: Dielectric resonator oscillators with digital temperature compensation. 4,712,078, Cl. 331-99.000.

Slomp, Albert H.: See—
Schoofs, Franciscus A. C. M.; Bierhoff, Martinus P. M.; Van Mil, Job F. P.; and Slomp, Albert H., 4,712,091, Cl. 340-347.0DA.

Small, Maynard E.: Bingo game involving promotional coupons. 4,711,454, Cl. 273-269.000.

Smid, Albert; Greve, Peter F.; and 't Lam, Hendrik, to U.S. Philips Corporation: Opto-electronic focussing-error detection system with a compound wedge beam splitter. 4,712,205, Cl. 369-45.000.

Smith, David E.: See—
Matthews, Kenneth B.; Beckett, Christine A.; Smith, David E.; and Davidson, Richard R., 4,711,727, Cl. 210-727.000.

Smith International, Inc.: See—
Underwood, Lance D.; and Oliver, Michael S., 4,711,311, Cl. 175-340.000.

Smith, Jack E., to General Motors Corporation: Decoratively stitched trim part and method. 4,711,190, Cl. 112-266.200.

Smith, Robert K.: See—
Butler, Scott J.; Smith, Robert K.; and Abdollahian, Mehdy, 4,712,046, Cl. 315-248.000.

Smith, Vinson C.: See—
Lockett, Michael J.; Summers, Daniel R.; Smith, Vinson C.; and Upchurch, James C., 4,711,745, Cl. 261-114.200.

SmithKline Beckman Corporation: See—
Lindsey, Thomas O.; and Zavy, Michael T., 4,711,897, Cl. 514-665.000.

Moore, Michael L., 4,711,877, Cl. 514-11.000.

Smithwick, John H.: See—
Glasser, George M.; DeRobertis, Robert P.; Smithwick, John H.; and Kelly, William J., 4,711,979, Cl. 219-10.55D.

Smolnik, John: Mortar training device with functional simulated propelling charges. 4,711,180, Cl. 102-445.000.

SMS Schloemann-Siemag AG: See—
Bald, Wilfried, 4,711,116, Cl. 72-366.000.

Rohde, Wolfgang; and Kolakowski, Manfred, 4,711,114, Cl. 72-234.000.

SMS Schloemann-Siemag, A.G.: See—
Rohde, Wolfgang; and Klockner, Jurgen, 4,711,109, Cl. 72-8.000.

Smulders, Henricus W. W., to U.S. Philips Corporation: Assembly including an optical fiber secured in a wall. 4,711,519, Cl. 350-96.200.

Snider, Scott C.; and DeLeon, Alberto, to Celotex Corporation: The Polysocyanurate foams from digestion products of polyalkylene terephthalate polymers and polyols. 4,711,912, Cl. 521-125.000.

Snitzer, Elias, to Polaroid Corporation: Optical amplifier. 4,712,075, Cl. 330-4.300.

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Morey, William W.; and Snitzer, Elias, 4,711,524, Cl. 350-96.250.

Snyder, Donald Q., to American Telephone and Telegraph Company, AT&T Bell Laboratories: Apparatus for end finishing a lightguide fiber termination. 4,711,053, Cl. 51-3.000.

Soca, Serge, to Thomson Video Equipment: Device and method for reducing the amplitude range of signals representing an image. 4,712,132, Cl. 358-37.000.

Societe Europeenne de Propulsion: See—
Vives, Michel; and Buttazzoni, Bernard, 4,711,234, Cl. 128-92.0YF.

Societe Europeenne des Produits Refractaires: See—
Rogier, Serge; and Guignois, Jacques, 4,711,298, Cl. 165-165.000.

Societe Francaise d'Equipements pour la Aerienne (S.F.E.N.A.): See—
Bour, Andre, 4,711,128, Cl. 73-517.00B.

Sola U.S.A. Inc.: See—
Harvey, Thomas B., III, 4,711,943, Cl. 526-279.000.

Somerser, John B., to McPherson's Limited: Cookery implement. 4,711,029, Cl. 30-148.000.

Sonnenburg, Dennis T.: See—
Brooks, Ralf M.; Connell, Brian P.; Sonnenburg, Dennis T.; and Pagowski, Stefan J., 4,712,113, Cl. 346-1.100.

Sony Corporation: See—
Kawakami, Hiroshi; and Ishizaka, Kazuo, 4,712,143, Cl. 358-311.000.

Maeda, Satoru, 4,712,099, Cl. 340-703.000.

Tamura, Eiji, 4,712,187, Cl. 364-571.000.

Sood, Lal C., to Motorola, Inc.: High speed equalization in a memory. 4,712,197, Cl. 365-230.000.

Sorenson, Blaine: See—
Frazier, Stanley J.; and Sorenson, Blaine, 4,711,282, Cl. 182-106.000.

Sorochenko, Oleg A.; and Kondratiev, Igor F.: Electrosurgical instrument. 4,711,239, Cl. 128-303.140.

Sound Sender, Inc.: See—
Michels, Dennis; Howe, Geoff; and Joseph, Douglas, 4,712,250, Cl. 455-20.000.

Spangler, Glenn E.: See—
Vora, Kishore N.; Carrico, John P., Sr.; Spangler, Glenn E.; Campbell, Donald N.; and Martin, Charles E., 4,712,008, Cl. 250-287.000.

Spanier, Henry C.: See—
Spiel, Albert; Roe, James; and Spanier, Henry C., 4,711,425, Cl. 249-117.000.

Spanton, David J.; and Schulze, Martin: Stabilizing apparatus for a dump vehicle. 4,711,500, Cl. 298-17.00S.

Specia, Anthony N., to Exxon Chemical Patents Inc.: Olefin polymerization catalysts, production and use. 4,711,865, Cl. 502-116.000.

Specht, Dieter, to Interroll Fordertechnik GmbH & Co. KG: Apparatus for documentless order picking of goods. 4,711,045, Cl. 40-564.000.

Spector, George: See—
Fleisher, Nathaniel; and Spector, George, 4,711,254, Cl. 131-189.000.

Sansotta, Carmelo; and Spector, George, 4,711,319, Cl. 182-155.000.

Spelsberg, Thomas C., to Mayo Medical Resources: Nuclear binding assay for steroid receptor functionality in cancerous cells. 4,711,856, Cl. 436-504.000.

Speranza, Donald, to Eaton Corporation: Method for controlling AMT system including after transmission gear change clutch and fuel control. 4,711,141, Cl. 74-866.000.

Sperry Corporation: See—
Labrum, Joseph H., 4,712,059, Cl. 324-77.00K.

McGuire, Charles F.; Weber, David J.; and Steyaert, Gordon C., 4,712,024, Cl. 307-529.000.

Weindorf, Paul F. L., 4,712,047, Cl. 315-397.000.

- Spiel, Albert; Roe, James; and Spanier, Henry C., to Nabisco Brands, Inc. Rotary molding system. 4,711,425, Cl. 249-117.000.
- Spillman, William B., Jr., to Simmonds Precision Products, Inc. Method and apparatus for compensating fiber optic lead and connector losses in a fiber optic sensor by using a broadband optical source and multiple wave retardation. 4,712,004, Cl. 250-227.000.
- Spingler, John O.: See—
Orr, Avigdor; and Spingler, John O., 4,711,789, Cl. 426-326.000.
- Spiro America Inc.: See—
Castricum, Wilhelmus P. H., 4,711,110, Cl. 72-49.000.
- Spitzenberger, Kurt: See—
Glas, Hans J.; Hecht, Hans; Muller, Klaus; Spitzenberger, Kurt; and Stecher, Gunther, 4,711,130, Cl. 73-708.000.
- SPOFA, spolne podniky pro zdravotnickou výrobu: See—
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- Sporing, Jorg: See—
Oechslein, Ludwig; Giger, Urs; and Sporing, Jorg, 4,711,583, Cl. 368-16.000.
- Spring, Robert J.: See—
Caldwell, Donald B.; and Spring, Robert J., 4,711,299, Cl. 166-105.100.
- Square D Company: See—
Dvorak, Robert F., 4,712,151, Cl. 361-47.000.
- Staezel, Richard E., to Brunswick Corporation. Throttle-position signal generator for an electronic fuel-injection system. 4,711,219, Cl. 123-494.000.
- Stahl, Peter H.; and Schmitz, Beat, to Ciba-Geigy Corporation; and Henkel Kommanditgesellschaft auf Aktien. Crystalline disodium 3-amino-1-hydroxypropane-1,1-diphosphate pentahydrate. 4,711,880, Cl. 514-108.000.
- Stamegna, Andrew P.; and Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Acrylourethane reaction product. 4,711,929, Cl. 525-131.000.
- Standard Oil Company (Indiana): See—
Cartmell, Robert R.; and Horecky, Carl J., 4,711,766, Cl. 422-140.000.
- Starr, Harvey W. Electric guitar pickup switching system. 4,711,149, Cl. 84-1.160.
- State of Israel, Ministry of Defence, Israel Military Industries, The: See—
Meiler, Yehuda, 4,711,047, Cl. 42-1.150.
- State University of New York: See—
McNamara, Thomas F.; and Confessore, Fred, 4,711,851, Cl. 435-287.000.
- Statton, Gary L.; and Gaul, James M., to Atlantic Richfield Company. Preparation of fire retardant flexible polyester based polyurethane foams having reduced discoloration and scorch. 4,711,910, Cl. 521-107.000.
- Stauffer Chemical Company: See—
Leone-Bay, Andrea, 4,711,962, Cl. 548-337.000.
- STC plc: See—
Pitt, Gillies D.; Exance, Philip; and Jones, Roger E., 4,712,065, Cl. 324-244.000.
- Stecher, Gunther: See—
Glas, Hans J.; Hecht, Hans; Muller, Klaus; Spitzenberger, Kurt; and Stecher, Gunther, 4,711,130, Cl. 73-708.000.
- Steelton Can Corporation: See—
Kadunce, Leo, 4,711,801, Cl. 428-192.000.
- Steffy, David A., to Hughes Aircraft Company. Apparatus for ejection of a spacecraft. 4,711,417, Cl. 244-158.00R.
- Stegmeier, Karlheinz: See—
Bar-Tana, Jacob; Witte, Ernst-Christian; Hagenbruch, Bernd; Pill, Johannes; and Stegmeier, Karlheinz, 4,711,896, Cl. 514-570.000.
- Stendel, Wilhelm: See—
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,711,905, Cl. 514-522.000.
- Stenmans, Heinz: See—
Frentzel-Beyme, Johannes; and Stenmans, Heinz, 4,711,081, Cl. 57-279.000.
- Stephens, Barry D.: See—
Krage, William G.; Stephens, Barry D.; and Denman, Owen S., 4,711,481, Cl. 293-133.000.
- Sterzel, Hans-Josef; and Sanner, Axel, to BASF Aktiengesellschaft. Membranes of substantially non-crosslinked organic polymers which contain bonded ionogenic groups. 4,711,907, Cl. 521-27.000.
- Stessen, Lothar, to DIEHL GmbH & Co. Target tracking arrangement. 4,711,413, Cl. 244-3.160.
- Stetter, Jorg: See—
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- Steuer, Joachim: See—
Hummel, Peter; and Steuer, Joachim, 4,711,175, Cl. 101-365.000.
- Steuer, Robert R.; and Harris, David H., to Biokinetics, Inc. Physiological pressure monitor. 4,711,248, Cl. 128-748.000.
- Stewart, Alva N., to Brown Jordan Company. Light fixture mounting. 4,712,166, Cl. 362-147.000.
- Stewart, John M., to Sanitation Equipment Limited. Flush toilet. 4,710,988, Cl. 4-438.000.
- Steyaert, Gordon C.: See—
McGuire, Charles F.; Weber, David J.; and Steyaert, Gordon C., 4,712,024, Cl. 307-529.000.
- Stiglitz, Martin R.: See—
Slobodnik, Andrew J., Jr.; Stiglitz, Martin R.; Roberts, George A.; and Webster, Richard T., 4,712,078, Cl. 331-99.000.
- Stock, Gunter: See—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.
- Stoffel, James C.; and Tandon, Jagdish C., to Xerox Corporation. Method and apparatus for fabricating full width scanning arrays. 4,712,018, Cl. 250-578.000.
- Stokes, Kenneth B., to Medtronic, Inc. Body implantable lead. 4,711,251, Cl. 128-784.000.
- Stoll, Donald H.: See—
Simonsen, Dale E.; and Stoll, Donald H., 4,712,157, Cl. 361-357.000.
- Stone Container Corporation: See—
Hood, Paul F., 4,711,702, Cl. 162-123.000.
- Stone, Thomas R.: See—
Moon, William G.; Westwood, Donald C.; and Stone, Thomas R., 4,712,146, Cl. 360-97.000.
- Stormont, Richard W.; and Eriss, Lawrence, to Mobil Solar Energy Corporation. Apparatus for and method of making crystalline bodies. 4,711,695, Cl. 156-608.000.
- Stotts, Jay B.: See—
Erker, James W.; Scotese, Michael J.; and Stotts, Jay B., 4,711,614, Cl. 414-641.000.
- Stranahan, Michael: See—
Lew, Hyok S.; and Stranahan, Michael, 4,711,057, Cl. 52-81.000.
- Strapex AG: See—
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- Street, Michael; and Belfer-Canterman, Sofia, to National Research Development Corporation. Immobilized extractants. 4,711,863, Cl. 502-5.000.
- Streb, Karl-Peter: See—
Oeschle, Manfred; Szieslo, Uwe; Streb, Karl-Peter; and Simm, Wolfgang, 4,711,627, Cl. 431-30.000.
- Street, Norman E.: See—
Ares, Roland A.; Jones, Robert A.; and Street, Norman E., 4,711,094, Cl. 62-90.000.
- Stringfellow, William D., to Weatherford U.S., Inc. Valve assembly for inflatable packer. 4,711,301, Cl. 166-187.000.
- Strolle, Clifford H.: See—
Stamegna, Andrew P.; and Strolle, Clifford H., 4,711,929, Cl. 525-131.000.
- Strong, Russell W., to New Holland Inc. Integrally mounted positionable concave extension. 4,711,075, Cl. 130-27.000.
- Stuart, Richard J.: See—
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- Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., 4,711,157, Cl. 92-31.000.
- Stubenberg, Johann; Denk, Heimo; and Zeiringer, Rudolf, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr.Dr.h.c. Hans List. Pressure sensor. 4,711,129, Cl. 73-708.000.
- Stupp, Edward H., to North American Philips Corporation. Complementary lateral insulated gate rectifiers with matched "on" resistances. 4,712,124, Cl. 357-23.400.
- Suchy, Irmgard: See—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.
- Sueyoshi, Tadahiho, to Yazaki Corporation. Terminal retaining structure for connector. 4,711,508, Cl. 439-595.000.
- Sugano, Hiroshi; Ishida, Ryuichi; and Yamamura, Michio, to Tanabe Seiyaku Co., Ltd. Novel peptides and processes for preparing the same. 4,711,878, Cl. 514-18.000.
- Sugita, Masaya: See—
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- Sugiura, Satoshi: See—
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- Suka, Motoshi; and Omi, Shinzo, to Suka, Motoshi. Process for producing polymethyl methacrylate. 4,711,938, Cl. 526-88.000.
- Sukonnik, Israel M.; Judge, John S.; and Kilgore, Colin H., to Aluminum Company of America. Method for forming memory discs by forging. 4,711,115, Cl. 72-329.000.
- Sule, Akos. Solenoid valve. 4,711,269, Cl. 137-625.500.
- Sullivan, B. Patrick: See—
Meyer, Thomas J.; O'Toole, Terrence R.; Margerum, Lawrence D.; Westmoreland, T. David; Vining, William J.; Murray, Royce W.; and Sullivan, B. Patrick, 4,711,708, Cl. 204-280.000.
- Sullivan, Steven K.: See—
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- Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, to Mita Industrial Co., Ltd. Electrostatic copying apparatus. 4,711,550, Cl. 355-3.0SH.
- Sumitomo Chemical Company, Limited: See—
Nakamatsu, Toshio; Miyamoto, Tetsuya; and Imada, Kunihiko, 4,711,641, Cl. 8-524.000.
- Suzukamo, Gohfu; Fukao, Masami; Minobe, Masao; and Sakamoto, Akemi, 4,711,873, Cl. 502-344.000.
- Summers, Daniel R.: See—
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- Sunbeam Plastics Corporation: See—
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- Sundberg, Jack G.; and Noell, Godwin L., to Colt Industries Inc. Vane fuel pump having reduced displacement at high speeds. 4,711,619, Cl. 418-27.000.
- Sundberg, Sten; Risberg, Stig; and Eriksson, Ulf, to Affarsverket FFV. Arrangement in a mine which is capable of being neutralized. 4,711,179, Cl. 102-426.000.
- Sundstrand Corporation: See—
Nold, Robert D., 4,712,029, Cl. 310-71.000.
- Sunohara, Tadaomi: See—
Kano, Kunihiko; Matsuki, Kanji; Ohta, Kazuhisa; and Sunohara, Tadaomi, 4,711,289, Cl. 164-34.000.
- Sunstar Kabushiki Kaisha: See—
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- Surgimach Corporation, The: See—
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- Surrency, H. Skeet: See—
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Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, 4,711,551, Cl. 355-3.0DD.
- Suzukamo, Gohfu; Fukao, Masami; Minobe, Masao; and Sakamoto, Akemi, to Sumitomo Chemical Company, Limited. Process for preparing solid base catalyst. 4,711,873, Cl. 502-344.000.
- Suzuki, Akiyoshi: See—
Torigoe, Makoto; Suzuki, Akiyoshi; and Sakai, Terumasa, 4,711,568, Cl. 355-68.000.
- Suzuki, Hirofumi: See—
Hoshizaki, Hiroki; Kawahara, Nobuaki; Suzuki, Hirofumi; and Oyobe, Kazuo, 4,711,990, Cl. 219-552.000.
- Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, to Tokyo Electric Co., Ltd. Multi-range load cell weighing scale. 4,711,314, Cl. 177-164.000.
- Suzuki, Tadashi; Okada, Kazuyoshi; and Abe, Noriyuki, to Nissan Motor Company, Limited. Network system utilizing an intermediate synchronizations signal and predetermined code string patterns. 4,712,211, Cl. 370-100.000.
- Suzuki, Takehiro: See—
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- Suzuki, Toshio; and Yahagi, Kazuyuki, to Kao Corporation. Hair cosmetic composition. 4,711,776, Cl. 424-70.000.
- Svensson, A. Pedar: See—
Wallin, P. O. Thomas; Warell, Bengt H.; Svensson, A. Pedar; Lundstrom, Kurt A.; and Johansson, Lars A., 4,711,184, Cl. 108-144.000.
- Swanson, Steven E.: See—
Shank, Jeffrey B.; Swanson, Steven E.; and Opdahl, Barry J., 4,711,518, Cl. 350-96.200.
- Swarte, Petrus A., to U.S. Philips Corporation. Electro-acoustic system having a variable reflection/absorption characteristic. 4,712,247, Cl. 381-96.000.
- Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J., and Friedrich, Marju L., to Kollmorgen Technologies Corporation. Method of making wires scribed circuit boards. 4,711,026, Cl. 29-850.000.
- Swin, Richard E., Sr.; and Atalla, Anwar A., to Tec-Air, Inc. Ductless air treating device with illuminator. 4,711,161, Cl. 98-31.500.
- Synthelabo: See—
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- Manoury, Philippe; Obitz, Daniel; and Peynot, Michel, 4,711,892, Cl. 514-336.000.
- Sypula, Donald S.: See—
McAnaney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., 4,711,833, Cl. 430-131.000.
- Syvarth, Anne S.; Gordin, Harvey H.; Early, Paul D., Jr.; Needs, Kathy A.; and Perfetti, Thomas A., to R. J. Reynolds Tobacco Company. Method and system for effecting sensory evaluation of a smoking product. 4,711,255, Cl. 131-330.000.
- Szaz, Richard A.: See—
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- Szieslo, Uwe: See—
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- Szonntag, Eugene L.: See—
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- 't Lam, Hendrik: See—
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- Tabuchi, Kastumi: See—
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- Tago, Mamoru: See—
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- Tahara, Yasuteru; and Koike, Kazuyoshi, to Mitsubishi Rayon Co., Ltd. Method and equipment for detecting pinholes of hollow filament. 4,711,121, Cl. 73-37.700.
- Taisho Pharmaceutical Co., Ltd.: See—
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- Takada, Zenji: See—
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- Takagi, Makoto: See—
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- Takahashi, Kazuhisa: See—
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- Takahashi, Sadatoshi: See—
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- Takahashi, Shuji: See—
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- Takahashi, Susumu: See—
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.
- Takahashi, Takao: See—
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- Takahashi, Yukio; Hayase, Isao; Amano, Keiji; Mizukami, Masao; and Ishiguri, Masaaki, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Moving vane type compressor. 4,711,620, Cl. 418-96.000.
- Takai, Haruki; Ujii, Mikio; and Nakamura, Hideki, to NEC Corporation. Terminal control device for reference station in TDMA satellite communication system. 4,712,212, Cl. 370-104.000.
- Takamine, Henry K., to Hughes Aircraft Company. Ground shield apparatus for giga-hertz test jig. 4,712,062, Cl. 324-158.00F.
- Takara Company: See—
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- Takashima, Susumu: See—
Ninomiya, Masao; Takashima, Susumu; Fukushima, Kazumasa; Yuyama, Masami; and Kurosawa, Kazuyuki, 4,712,243, Cl. 381-43.000.
- Takeda Chemical Industries, Ltd.: See—
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- Takeda, Fumiteru; Hirano, Katsuhiko; and Inagaki, Yoshihiro, to Nippon Gakki Seizo Kabushiki Kaisha. Fractional range selectable musical tone generating apparatus. 4,711,148, Cl. 84-1.010.
- Takemura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, to Matsushita Electric Industrial Co., Ltd. Optical disk and method for reproducing reference signal therefrom. 4,712,204, Cl. 369-32.000.
- Takenaka, Hirofumi: See—
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- Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, to Kabushiki Kaisha Toshiba. Color cathode ray tube with plural electron gun assemblies. 4,712,038, Cl. 313-2.100.
- Takenaka, Shigeo; and Kamohara, Eiji, to Kabushiki Kaisha Toshiba. Electron gun with large aperture auxiliary electrode. 4,712,043, Cl. 315-15.000.
- Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Fuel supply device for an internal combustion engine. 4,711,216, Cl. 123-447.000.
- Takeuchi, Yukihisa; and Takagi, Makoto, to Nippondenso Co., Ltd. Method of manufacturing an amorphous-metal-coated structure. 4,711,795, Cl. 427-130.000.
- Takigawa, Tadahiho: See—
Nishimura, Eiji; Takigawa, Tadahiho; and Kato, Yoshihide, 4,712,013, Cl. 250-492.200.
- Takiguchi, Haruhisa: See—
Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,712,219, Cl. 372-45.000.
- Talwar, Anil K.: See—
Denick, John, Jr.; Peters, David; Talwar, Anil K.; and Liao, Wei C., 4,711,774, Cl. 424-48.000.
- Tamehiro, Taizo: See—
Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, 4,711,916, Cl. 523-223.000.
- Tamehiro, Tanezoh: See—
Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, 4,711,916, Cl. 523-223.000.
- Tamoto, Koji: See—
Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, 4,711,837, Cl. 430-548.000.
- Tamura, Eiji, to Sony Corporation. Automatic centering method for a video camera. 4,712,187, Cl. 364-571.000.
- Tamura, Kaoru: See—
Ohgoda, Makoto; and Tamura, Kaoru, 4,712,009, Cl. 250-327.200.
- Tan, Hong S.; and Wegman, Bernardus B. M., to Gist-Brocades N.V. Pharmaceutical tablets. 4,711,777, Cl. 424-79.000.
- Tan, Loon-Seng; and Arnold, Fred E., to University of Dayton. Bisdine from bis-benzocyclobutene compound. 4,711,964, Cl. 548-461.000.
- Tanabe Seiyaku Co., Ltd.: See—
Sugano, Hiroshi; Ishida, Ryuichi; and Yamamura, Michio, 4,711,878, Cl. 514-18.000.

- Tanabe, Toshiyuki, to Kabushiki Kaisha Toshiba. Sync apparatus for image multiplex transmission system. 4,712,131, Cl. 358-142.000.
- Tanaka, Masanori, to Hosiden Electronics Co., Ltd. Socket of electrostatic protection type. 4,711,506, Cl. 439-108.000.
- Tanaka, Nobuyoshi: See—
Hashimoto, Seiji; Kinoshita, Takao; and Tanaka, Nobuyoshi, 4,712,135, Cl. 358-213.220.
- Tanaka, Tsunefumi: See—
Matsushita, Takashi; Takahashi, Sadatoshi; Ikemori, Keiji; Kitagishi, Nozomu; Tanaka, Tsunefumi; and Momiyama, Kikuo, 4,711,534, Cl. 350-426.000.
- Tanaka, Yasuo: See—
Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, 4,711,136, Cl. 74-665.0GA.
- Tanaka, Yoichi: See—
Miki, Nobuyuki; Yamaoka, Hiroshi; and Tanaka, Yoichi, 4,712,085, Cl. 338-22.0SD.
- Tanazawa, Masayoshi; Shoji, Masaru; and Yamada, Wataru, to Casio Computer Co., Ltd. Movement of electronic watch of analog display type. 4,711,584, Cl. 368-88.000.
- Tandon, Jagdish C.: See—
Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Tandon, Jagdish C., 4,712,137, Cl. 358-213.290.
- Stoffel, James C.; and Tandon, Jagdish C., 4,712,018, Cl. 250-578.000.
- Tangonan, Gregory L.; Yen, Huan-Wun; and Persechini, David L., to Hughes Aircraft Company. Product of and process for forming tapered waveguides. 4,711,514, Cl. 350-96.120.
- Taniguchi, Toshikatsu: See—
Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, 4,711,136, Cl. 74-665.0GA.
- Tanimoto, Akikazu, to Nippon Kogaku K.K. Exposure apparatus. 4,711,567, Cl. 355-53.000.
- Tanimura, Nobuyoshi; and Yasui, Tokumasa, to Hitachi, Ltd. Semiconductor memory device and fabrication process thereof. 4,712,192, Cl. 365-51.000.
- Tanioka, Hiroshi; and Honma, Toshio, to Canon Kabushiki Kaisha. Copying apparatus with variable image magnification. 4,711,558, Cl. 355-14.00R.
- Taniyama, Tadayoshi; and Yoshida, Koichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for production of biologically active substances. 4,711,842, Cl. 435-68.000.
- Tannenbaum, Harvey P., to Du Pont de Nemours, E. I., and Company. Aqueous ink for use on fluorocarbon surfaces. 4,711,802, Cl. 428-207.000.
- Tapeimp Limited: See—
Laing, John, 4,712,098, Cl. 340-669.000.
- Tarron, Emanuel B.; and Maric, Dane, to John O. Butler Company. Interdenial brush handle. 4,710,996, Cl. 15-105.000.
- Tateosian, Louis H.; and Wilson, W. Donald, to Dentsply International Inc. Interpenetrating polymer network compositions employing rubber-modified polymers. 4,711,913, Cl. 522-14.000.
- Tatsuhama, Tetsuro: See—
Maeda, Akira; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhama, Tetsuro, 4,711,501, Cl. 299-21.000.
- Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshio; and Mogi, Toshiaki, to Kabushiki Kaisha Toshiba. Thermal-transfer printer. 4,712,115, Cl. 346-76.0PH.
- Tauer, Dennis L.: See—
Davis, Loren G.; Schmitz, Steven R.; and Tauer, Dennis L., 4,712,210, Cl. 370-77.000.
- Tawada, Yoshihisa: See—
Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, 4,711,807, Cl. 428-334.000.
- Taylor, Jerry A., Sr., to Thermco Systems, Inc. Gas scavenger. 4,711,197, Cl. 118-715.000.
- Taylor, Lawrence D., to Brandt, Inc. Electronic controller for dispensers and the like. 4,711,441, Cl. 271-6.000.
- Taylor, Maurice E.: See—
Finegold, Aaron N.; and Taylor, Maurice E., 4,711,231, Cl. 128-79.000.
- TDK Corporation: See—
Miki, Nobuyuki; Yamaoka, Hiroshi; and Tanaka, Yoichi, 4,712,085, Cl. 338-22.0SD.
- Sawamura, Kentaro; Kosaka, Yoshio; and Yamaguchi, Masayasu, 4,711,861, Cl. 501-98.000.
- TE-Co.: See—
Longenecker, Francis S.; Moeder, Kevin J.; and Wolff, Jeffrey L., 4,711,437, Cl. 269-91.000.
- Tec-Air, Inc.: See—
Swin, Richard E., Sr.; and Atalla, Anwar A., 4,711,161, Cl. 98-31.500.
- Techniservice: See—
Schwartz, Nathan G., 4,711,191, Cl. 112-410.000.
- Tega, Ezio; Piccini, Fabrizio; Mazzini, Marco; and Magi, Raffaello, to Metallmeccanica Gori & Zucchi M.G.Z. S.p.A. Apparatus for handling and assembling axial electronic components on printed circuit cards. 4,711,015, Cl. 29-566.200.
- Teichmann, Robert J. Nickel particle plating system. 4,711,814, Cl. 428-403.000.
- Teijin Limited: See—
Hazato, Atsuo; Sugiura, Satoshi; Kurozumi, Seizi; and Noyori, Ryoji, 4,711,895, Cl. 514-530.000.
- Tekma Oy: See—
Uimonen, Matti, 4,711,038, Cl. 34-25.000.
- Tektronix, Inc.: See—
Branson, Christopher W.; and Sullivan, Steven K., 4,712,058, Cl. 324-23.00R.
- Traa, Einar O., 4,712,087, Cl. 340-347.0CC.
- Temcor: See—
Richter, Donald L., 4,711,063, Cl. 52-741.000.
- Terai, Masao: See—
Yoshihiki, Hisashi; Iwasawa, Minoru; Oohigashi, Masakazu; and Terai, Masao, 4,710,995, Cl. 15-22.00R.
- Terasawa, Koji: See—
Kiyohara, Takehiko; Terasawa, Koji; and Miyakawa, Akira, 4,712,172, Cl. 346-1.100.
- Terashima, Jun: See—
Arakawa, Kazuhiko; Terashima, Jun; and Tokura, Go, 4,711,548, Cl. 354-485.000.
- Terashima, Kiichi: See—
Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, 4,711,345, Cl. 198-572.000.
- Teshima, Nobue: See—
Kato, Yasuyoshi; Teshima, Nobue; Ohta, Masao; and Konishi, Kunihiko, 4,711,872, Cl. 502-328.000.
- Tetra Pak International AB: See—
Niske, Jorgen, 4,711,797, Cl. 428-35.000.
- Texas Instruments Incorporated: See—
Douglas, Monte A., 4,711,698, Cl. 156-643.000.
- McLevige, William V., 4,711,701, Cl. 437-41.000.
- Orcutt, John W., 4,712,129, Cl. 357-84.000.
- Rajasekaran, Periyagaram K.; Doddington, George R.; and Schalk, Thomas B., 4,712,242, Cl. 381-42.000.
- Textron/Auca Corp.: See—
Rusu, Radu, 4,711,615, Cl. 416-46.000.
- Thaler, Arnold; and Yip, P. C., to Windmere Corporation. Electric hair dryer with multi-mode switch for air temperature and flowrate control. 4,711,988, Cl. 219-364.000.
- Theil, Arne: See—
Verbeek, Pieter W.; Klaase, Theodorus A.; and Theil, Arne, 4,712,037, Cl. 310-323.000.
- Theilacker, Klaus, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. System for lateral transport of liquid along a printing machine roller. 4,711,171, Cl. 101-148.000.
- Theisen, William M.: See—
Wiseman, Charles D.; and Theisen, William M., 4,711,791, Cl. 427-96.000.
- Thermalloy Incorporated: See—
Clemens, Donald L., 4,712,159, Cl. 361-386.000.
- Thermco Systems, Inc.: See—
Taylor, Jerry A., Sr., 4,711,197, Cl. 118-715.000.
- Yu, Chong-Tao, 4,711,989, Cl. 219-390.000.
- Thermo King Corporation: See—
Howland, Leland L.; and Seshadri, Jayaram, 4,711,095, Cl. 62-117.000.
- Thermo Plastic Research Co., Ltd.: See—
Tipton, Lance W., 4,711,751, Cl. 264-159.000.
- Thillays, Jacques C., to U.S. Philips Corporation. Method of manufacturing a terminal device for an optical fiber, and device thus obtained. 4,711,521, Cl. 350-96.200.
- Thomas & Betts Corporation: See—
Noorily, Peter, 4,711,507, Cl. 439-292.000.
- Noorily, Peter, 4,711,511, Cl. 439-347.000.
- Thomas, Stephen M.: See—
Below, Randy; Burke, Howard; and Thomas, Stephen M., 4,712,234, Cl. 379-399.000.
- Thomsen, Peter K. Arrangement for joining denture components by adhesion (device for binding parts of dental prosthesis by adhesion). 4,711,631, Cl. 433-181.000.
- Thomson CSF: See—
d'Humieres, Etienne; Bernet, Jean M.; and Imhoff, Claude, 4,712,001, Cl. 250-213.0VT.
- Dufour, Michel, 4,711,835, Cl. 430-314.000.
- Lagier, Michel, 4,712,201, Cl. 367-92.000.
- Thomson Video Equipment: See—
Soca, Serge, 4,712,132, Cl. 358-37.000.
- Thornber, Craig W.: See—
Briggs, Malcolm T.; Dowell, Robert I.; and Thornber, Craig W., 4,711,887, Cl. 514-247.000.
- Tibbals, E. C., Jr. Circular weft knitting machine. 4,711,100, Cl. 66-55.000.
- Tillotson, Ltd.: See—
Scott, William A.; and Dull, Carl, 4,711,744, Cl. 261-64.400.
- Tipton, Lance W., to Thermo Plastic Research Co., Ltd. Process and apparatus for stretching tubular extruded plastic material. 4,711,751, Cl. 264-159.000.
- Toa Nenryo Kogyo Kabushiki Kaisha: See—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,939, Cl. 526-124.000.
- Yamamoto, Tadashi; Imai, Masafumi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,940, Cl. 526-124.000.
- Tobia, Alfonso J.: See—
Bandurco, Victor T.; Schwender, Charles F.; Falotico, Robert; and Tobia, Alfonso J., 4,711,883, Cl. 514-253.000.
- Tokura, Go: See—
Arakawa, Kazuhiko; Terashima, Jun; and Tokura, Go, 4,711,548, Cl. 354-485.000.

- Tokyo Electric Co., Ltd.: See—
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.
- Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, 4,711,314, Cl. 177-164.000.
- Tokyo Kogaku Kikai Kabushiki Kaisha: See—
Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,540, Cl. 351-214.000.
- Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,541, Cl. 351-214.000.
- Tomita, Satoru; and Adachi, Mitsunori, to Mitsubishi Denki Kabushiki Kaisha. Image pickup apparatus with range specification of displayed image. 4,712,142, Cl. 358-285.000.
- Tomofuji, Yoshiaki: See—
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, 4,711,977, Cl. 178-18.000.
- Tomohisa, Kunio; Cho, Masamichi; and Kurusu, Yasuo, to Dainippon Screen Mfg. Co., Ltd. Method and apparatus for interpolating image signals. 4,712,141, Cl. 358-280.000.
- Tong Lung Metal Industry Co., Ltd.: See—
Fann, Yaw-Shin; and Wu, Rong-Faa, 4,711,477, Cl. 292-169.140.
- Tonhauser, Wilhelm: See—
Letsche, Ulrich; Rapp, Wolfgang, deceased; Haefner, Guenther; and Tonhauser, Wilhelm, 4,711,220, Cl. 123-502.000.
- Torigoe, Makoto; Suzuki, Akiyoshi; and Sakai, Terumasa, to Canon Kabushiki Kaisha. Exposure apparatus. 4,711,568, Cl. 355-68.000.
- Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, to Hitachi, Ltd. Data processing apparatus. 4,712,175, Cl. 364-200.000.
- Toshimitsu, Kenshi; and Kohayakawa, Hiromasa, to Kabushiki Kaisha Toshiba. Image forming apparatus having means for preventing damage to a photosensitive member. 4,711,555, Cl. 355-14.00R.
- Toyoda Koki Kabushiki Kaisha: See—
Tsuijuchi, Toshio; Shinmura, Yoshinori; and Oda, Yukio, 4,711,054, Cl. 51-165.770.
- Toyoshi, Seiji; Yoshizumi, Tomoya; Saeki, Masaru; and Kawakita, Tetsuya, to Ajinomoto Co., Inc. Method for preventing fouling of electrodialysis membrane. 4,711,722, Cl. 210-638.000.
- Toyota Jidosha Kabushiki Kaisha: See—
Horiuchi, Yusuke; and Inui, Masaki, 4,711,135, Cl. 74-473.00R.
- Kinoshita, Yoshiaki, 4,711,200, Cl. 123-492.000.
- Shiroshita, Osamu; Ishiguro, Yasuo; and Itou, Yoshizumi, 4,712,183, Cl. 364-513.000.
- Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.
- Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, 4,711,136, Cl. 74-665.0GA.
- Yoshitsugu, Noritada, 4,711,468, Cl. 280-804.000.
- TPO "Pharmachim": See—
Atanassova, Ivanka A.; Haimova, Marieta A.; Chavdarova, Veselina B.; Nakov, Anton I.; Petkov, Nedelcho G.; and Avramova, Ruska S., 4,711,956, Cl. 540-327.000.
- Traa, Einar O., to Tektronix, Inc. Analog-to-digital converter error correction circuit. 4,712,087, Cl. 340-347.0CC.
- Trinity Foundation: See—
Christine, William C., 4,711,373, Cl. 222-82.000.
- Triquint Semiconductor, Inc.: See—
Weiss, Frederick G., 4,712,025, Cl. 307-571.000.
- Troupes, Demetrios; and Alexander, Randall W., to International Business Machines Corporation. Method and apparatus for displaying enlarged or enhanced dot matrix characters. 4,712,102, Cl. 340-790.000.
- TRW Inc.: See—
Lammert, Michael D., 4,711,017, Cl. 437-20.000.
- Schnecker, Thomas G., 4,712,240, Cl. 387-3.000.
- Tsimbler, Jury A.: See—
Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I., 4,711,182, Cl. 104-283.000.
- Tsubakimoto Chain Company: See—
Kitaori, Tadashi; Haginoya, Tsutomu; and Kozakura, Nobuto, 4,711,676, Cl. 148-319.000.
- Tsuboi, Kunio: See—
Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, 4,711,551, Cl. 355-3.0DD.
- Tsuchida, Youichi: See—
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, 4,711,977, Cl. 178-18.000.
- Tsuchino, Kazunori: See—
Kawajiri, Kazuhiko; Fujiwara, Michio; Tsuchino, Kazunori; and Hisamori, Youichi, 4,711,091, Cl. 60-517.000.
- Tsuda, Masaaki, to Kabushiki Kaisha Takara. Binding apparatus for sealing bags or the like. 4,711,064, Cl. 53-137.000.
- Tsuijuchi, Toshio; Shinmura, Yoshinori; and Oda, Yukio, to Toyoda Koki Kabushiki Kaisha. Grinding machine with a steady rest. 4,711,054, Cl. 51-165.770.
- Tsukahara, Hirokazu: See—
Kosaka, Takao; Okumura, Fumio; and Tsukahara, Hirokazu, 4,711,749, Cl. 264-4.700.
- Tsukahara, Kenji; and Abe, Taizou, to Nippondenso Co., Ltd. Control apparatus for a variable displacement pump. 4,711,616, Cl. 417-216.000.
- Tsunekawa, Tokuchi; and Sato, Yuichi, to Canon Kabushiki Kaisha. Signal processing circuit of solid state image pickup device. 4,712,136, Cl. 358-213.150.
- Tsunekuni, Masao; and Ishizawa, Yasuhisa, to Canon Kabushiki Kaisha. Coordinate inputting apparatus using multiple sensors. 4,712,100, Cl. 340-710.000.
- Tsuruoka, Ryoichi, to Rank Xerox Limited. Toner recovery device. 4,711,561, Cl. 355-3.00R.
- Tuerk, James R. Tarp cover system for flat bed vehicles. 4,711,484, Cl. 296-105.000.
- Tune, Raymond L.: See—
Loukanis, Jesse J.; Mathews, Will W.; and Tune, Raymond L., 4,711,143, Cl. 76-108.00A.
- Turner, James E.: See—
Jacobson, Walter; Riggio, Stephen C.; and Turner, James E., 4,711,852, Cl. 436-15.000.
- Tuy, Heang K.; and Koka, Narasimharao, to Picker International Inc. Malfunctioning computed tomography detector correction method. 4,712,178, Cl. 364-414.000.
- Tyrell, John A.: See—
McCready, Russell J.; and Tyrell, John A., 4,711,933, Cl. 525-415.000.
- McCready, Russell J.; and Tyrell, John A., 4,711,947, Cl. 528-288.000.
- McCready, Russell J.; and Tyrell, John A., 4,711,948, Cl. 528-288.000.
- Udagawa, Tsunekazu, to Ishikawa Gasket Co., Ltd. Gasket for an internal combustion engine. 4,711,456, Cl. 277-235.00B.
- Ueda, Kenji: See—
Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, 4,711,345, Cl. 198-572.000.
- Ueda, Masami: See—
Oida, Susumu; Munemoto, Yoshikazu; Ueda, Masami; and Ito, Michiaki, 4,711,105, Cl. 68-23.200.
- Ueda, Yutaka; and Yamamuro, Tetsu, to Ricoh Company, Ltd. Optical information recording medium. 4,711,798, Cl. 428-65.000.
- Uehara, Kuniaki: See—
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.
- Uemura, Hiroyuki: See—
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, 4,711,668, Cl. 106-22.000.
- Ueno, Hiroshi: See—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,939, Cl. 526-124.000.
- Yamamoto, Tadashi; Imai, Masafumi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,940, Cl. 526-124.000.
- Uesugi, Yoshinori, to Casio Computer Co., Ltd. Data processing apparatus. 4,712,196, Cl. 365-229.000.
- Uhlmann, Eugen: See—
Konig, Wolfgang; Engels, Joachim; Uhlmann, Eugen; and Wetekam, Waldemar, 4,711,847, Cl. 435-70.000.
- Uimonen, Matti, to Tekma Oy. Run-through brick drying plant and method for the control of its operation. 4,711,038, Cl. 34-25.000.
- Ujii, Mikio: See—
Takai, Haruki; Ujii, Mikio; and Nakamura, Hideki, 4,712,212, Cl. 370-104.000.
- Uliana, Anthony R.: See—
Bazilio, Rayman E.; Hartz, James F.; and Uliana, Anthony R., 4,711,328, Cl. 188-296.000.
- Ullman, Myron, to Boardman Molded Products, Inc. Splash-proof closure. 4,711,360, Cl. 215-235.000.
- Ullum, Henrik, to A/S Atlas. Rotary drier with lifting element. 4,711,041, Cl. 34-179.000.
- Ulm, John G., to Liqui-Box Corporation. Tamper-evident seal for a toggle-type dispensing valve. 4,711,380, Cl. 222-541.000.
- Ultima Electronics Ltd.: See—
Fathi, Saul S., 4,712,051, Cl. 318-564.000.
- Ulyse Nardin S.A.: See—
Oechslin, Ludwig; Giger, Urs; and Sporing, Jorg, 4,711,583, Cl. 368-16.000.
- Umeyama, Hideaki: See—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiko; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,711,958, Cl. 544-139.000.
- Underwood, Lance D.; and Oliver, Michael S., to Smith International, Inc. Vibration and erosion resistant nozzle. 4,711,311, Cl. 175-340.000.
- Union Camp Corporation: See—
Pavlin, Mark S.; and West, James C., 4,711,927, Cl. 524-531.000.
- Union Carbide Corporation: See—
Acharya, Arun; and Bevier, William E., 4,711,646, Cl. 55-33.000.
- Feinstein, Jonathan J., 4,711,430, Cl. 266-407.000.
- Kokta, Milan R., 4,711,696, Cl. 156-617.0SP.
- Lockett, Michael J.; Summers, Daniel R.; Smith, Vinson C.; and Upchurch, James C., 4,711,745, Cl. 261-114.200.
- Pellet, Regis J.; and Hinchey, Richard J., 4,711,864, Cl. 502-65.000.
- Salensky, George A., 4,711,817, Cl. 428-418.000.
- Salensky, George A., 4,711,924, Cl. 524-402.000.
- Sherwin, Maynard A.; and Koleske, Joseph V., 4,711,944, Cl. 526-318.420.
- Skels, Gary W.; and Breck, Donald W., deceased, 4,711,770, Cl. 423-328.000.

- Uniqey (Hong Kong) Limited: See—
Yamashita, Toshihiko, 4,712,171, Cl. 363-142.000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Majesty's Government of the: See—
Copp, Warren K., 4,711,411, Cl. 244-1.00R.
- United States of America
- Agriculture: See—
Harper, Robert J., Jr., 4,711,640, Cl. 8-481.000.
Kaneshiro, Tsuneo, 4,711,656, Cl. 71-7.000.
- Air Force: See—
Foster, Joseph C., Jr.; and Bilek, Andrew G., 4,711,177, Cl. 102-204.000.
Oberly, Charles E.; Gegel, Harold L.; and Ho, James C., 4,711,825, Cl. 428-614.000.
Slobodnik, Andrew J., Jr.; Stiglitz, Martin R.; Roberts, George A.; and Webster, Richard T., 4,712,078, Cl. 331-99.000.
- Army: See—
Gilbert, Everett E., 4,711,679, Cl. 149-96.000.
- Energy: See—
Harvey, Alexander, 4,712,074, Cl. 328-233.000.
Osterwald, Carl R.; and Emery, Keith A., 4,712,063, Cl. 324-158.000.
- National Aeronautics and Space Administration: See—
Bell, Vernon L., 4,711,932, Cl. 525-397.000.
Cheng, Li-Jen, 4,711,857, Cl. 437-3.000.
Kaukler, William F., 4,711,697, Cl. 156-621.000.
- Navy: See—
Morey, William W.; and Snitzer, Elias, 4,711,524, Cl. 350-96.250.
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- Van Harding, Michael: See—
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- Venable, William H., to Hunter Associates Laboratory, Inc. Modeling properties of flake finishes using directional resolution and statistical flake orientation distribution function, 4,711,580, Cl. 356-406.000.
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- Vetco Gray Inc.: See—
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- Vicem Corporation: See—
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- Victor Company of Japan, Ltd.: See—
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- Vonderau, Werner: See—
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- von Stetten, Otto; Seth, Pyare L.; Schmid, Franz; and Rauchle, Kurt, to Merckle GmbH. Liquid diclofenac preparations, 4,711,906, Cl. 514-561.000.
- Voorhis, Ray: See—
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- W. Schlafhorst & Co.: See—
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- Wachtel, Helmut: See—
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- Wafer, Don B.; and Barrington, Claud C., to FMC Corporation. Uni-directional/bi-directional gate valve, 4,711,262, Cl. 137-14.000.
- Wakabayashi, Hiroyuki; and Matsubara, Tamotsu, to Nippondenso Co., Ltd. Plastic part resistant to deicing salt, 4,711,806, Cl. 428-334.000.
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- Walker, David L., to Zenith Electronics Corporation. Method and apparatus for unscrambling sync-suppressed television signals, 4,712,237, Cl. 380-15.000.
- Walker, Frederick J.; and LaMattina, John L., to Pfizer Inc. Hydroxy and alkoxy pyrimidines, 4,711,888, Cl. 514-269.000.
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- Weatherford U.S., Inc.: See—
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- Weber, Eugen: See—
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Miller, Reno W.; and Grobmyer, Louis R., 4,711,753, Cl. 376-216.000.
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Wierzbicki, Michel; Hugon, Pierre; and Poignant, Jean-Claude, to Adir et Compagnie. N-(N'-phenylpiperazine)-alkyl triazole compounds having anxiolytic and analgesic properties, 4,711,885, Cl. 514-253.000.

Wijnjes, Geert; and Hercher, Michael, to Beckman Instruments, Inc. Dynamic mirror alignment control, 4,711,573, Cl. 356-346.000.

Wilhelmi, Juergen, to Heinrich Wilhelmi GmbH & Co. Metal fitting, 4,711,593, Cl. 403-187.000.

Wilkinson, James R., to Cincinnati Milacron Inc. Interference detector for laser cutting machine, 4,711,985, Cl. 219-121.0LB.

Wilkins, John J.: See—
Yu, Thomas C.; Vogt, Robert K.; and Wilkins, John J., 4,711,341, Cl. 198-372.000.

Wilkinson, Blair E., to Johnston, H. Fred; and Grosso, Carl. System for automatically inspecting a flat workpiece for holes, 4,711,579, Cl. 356-375.000.

Wilkinson, John; and Holbrook, Nicholas, to Ashfield, Jacqueline M.; and Ashfield, Michele. Roof and a method of providing a building with a roof, 4,711,061, Cl. 52-410.000.

Wilks, Thomas M., to Lagan Marine Developments Limited. Marine survival system, 4,711,196, Cl. 114-365.000.

Williams, Rodger W.; and Atwood, Charles W., to Vxtra Corp. Delicate instrument holder and protector, 4,711,352, Cl. 206-365.000.

Willis, Robert E. Intravaginal device, 4,711,235, Cl. 128-130.000.

Willock, Charles B.: See—
Gilbaugh, James H., Jr.; and Willock, Charles B., 4,711,250, Cl. 128-765.000.

Wilmore, Scott H.; and Robinson, Ronald D. Headrest pillow, 4,710,991, Cl. 5-435.000.

Wilson, Lonny L.: See—
Porcello, Sam J.; Manns, James M.; Player, Kenneth W.; and Wilson, Lonny L., 4,711,788, Cl. 426-94.000.

Wilson, Ronald C.: See—
Rei, Nuno M.; and Wilson, Ronald C., 4,711,914, Cl. 523-122.000.

Wilson, W. Donald: See—
Tateosian, Louis H.; and Wilson, W. Donald, 4,711,913, Cl. 522-14.000.

Windmere Corporation: See—
Thaler, Arnold; and Yip, P. C., 4,711,988, Cl. 219-364.000.

Winkelmann, Manfred: See—
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.

Winkler, Hans-Joachim: See—
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.

Winter, Joseph; and Pryor, Michael J., to Olin Corporation. Process and apparatus for fabricating optical fiber cables, 4,711,388, Cl. 228-148.000.

Wiseman, Charles D.; and Theisen, William M., to BOC Group, Inc., The. Method of making a flexible microcircuit, 4,711,791, Cl. 427-96.000.

Wiseman, Michael D., to Hydro-Pulse, Inc. Surge irrigation valve, 4,711,272, Cl. 137-887.000.

Witco Corporation: See—
Pastorino, Ronald L.; and Bock, Lawrence A., 4,711,909, Cl. 521-69.000.

Witte, Ernst-Christian: See—
Bar-Tana, Jacob; Witte, Ernst-Christian; Hagenbruch, Bernd; Pill, Johannes; and Stegmeier, Karlheinz, 4,711,896, Cl. 514-570.000.

Witten, Alvin E.; and Witten, Erik H., to Witten Automatic Vent Company, Inc. Two-piece foundation ventilator, 4,711,160, Cl. 98-29.000.

Witten Automatic Vent Company, Inc.: See—
Witten, Alvin E.; and Witten, Erik H., 4,711,160, Cl. 98-29.000.

Witten, Erik H.: See—
Witten, Alvin E.; and Witten, Erik H., 4,711,160, Cl. 98-29.000.

Wittkopp, Helmut: See—
Lung, Dieter; Kluft, Werner; Fabry, Jochen; Wittkopp, Helmut; Dombrowski, Theodor; and Klosterhalfen, Hartwig, 4,711,146, Cl. 82-1.00C.

Wittmann, Franz: See—
Mugrauer, Hubert; Puritscher, Ernst; and Wittmann, Franz, 4,711,564, Cl. 355-30.000.

Wittnebel, Bruce W., to Minnesota Mining and Manufacturing Company. Transparent sheet material for electrostatic copiers, 4,711,816, Cl. 428-412.000.

Wolf, Hans P.: See—
Harder, Christoph S.; Jaekel, Heinz; and Wolf, Hans P., 4,711,858, Cl. 437-99.000.

Wolf, Joachim. Filter cartridge for fluids, 4,711,717, Cl. 210-137.000.

Wolf, Jurgen: See—
Holderle, Hans; Wolf, Jurgen; Eckhart, Horst; and Vonderau, Werner, 4,711,225, Cl. 123-590.000.

Wolf, Karlheinz: See—
Wolff, Joachim; and Wolf, Karlheinz, 4,711,642, Cl. 8-527.000.

Wolff, Jeffrey L.: See—
Longenecker, Francis S.; Moeder, Kevin J.; and Wolff, Jeffrey L., 4,711,437, Cl. 269-91.000.

Wolff, Joachim; and Wolf, Karlheinz, to Bayer Aktiengesellschaft. Liquid, water containing mono-fluoro-triazinyl reactive dyestuff preparation with pH 8-12, 4,711,642, Cl. 8-527.000.

Wolfrum, Gerhard: See—
Heidenreich, Holger; and Wolfrum, Gerhard, 4,711,954, Cl. 534-780.000.

Wolters, Donald R., to J & L Associates, Inc. Apparatus and method for installing gutter drops on rain gutters, 4,711,012, Cl. 29-243.520.

Wood, Kenneth O.: See—
Logan, David J.; Wood, Kenneth O.; Hernandez, William; and Edwards, Richard L., 4,711,035, Cl. 33-200.000.

Wood, Susan: See—
Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., 4,711,822, Cl. 428-458.000.

Woods, David R.: See—
Rawlings, Douglas E.; and Woods, David R., 4,711,849, Cl. 435-91.000.

Wooley, Orval H.: See—
Falwell, Bobby R.; and Wooley, Orval H., 4,710,992, Cl. 5-508.000.

Wright, Harry D.; Hale, John M.; and Weber, Eugen, to Orbisphere Corporation. Succursale de Collonge-Bellerive. Thermal protection method for electroanalytical cell, 4,711,703, Cl. 204-1.00T.

Wright, Roy F.: See—
Yu, Michael C.; and Wright, Roy F., 4,711,796, Cl. 427-185.000.

Wright State University: See—
Petrofsky, Jerrold S., 4,711,242, Cl. 128-419.00R.

Wu, Rong-Faa: See—
Fann, Yaw-Shin; and Wu, Rong-Faa, 4,711,477, Cl. 292-169.140.

Wursthorn, Karl R.: See—
Kugele, Thomas G.; Mesch, Keith A.; Wursthorn, Karl R.; and Conroy, Gary M., 4,711,920, Cl. 524-178.000.

Wynosky, Charles E.; and Mraz, Joseph, to Coalair Systems. High speed auger venturi system and method for conveying bulk materials, 4,711,607, Cl. 406-30.000.

Xerox Corporation: See—
Henry, Arnold W., 4,711,818, Cl. 428-421.000.
Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Tandon, Jagdish C., 4,712,137, Cl. 358-213.290.
McAnaney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., 4,711,833, Cl. 430-131.000.
Stoffel, James C.; and Tandon, Jagdish C., 4,712,018, Cl. 250-578.000.

Yagi, Tetsuya: See—
Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, 4,711,732, Cl. 252-28.000.

Yahagi, Kazuyuki: See—
Suzuki, Toshio; and Yahagi, Kazuyuki, 4,711,776, Cl. 424-70.000.

Yale University: See—
Ward, David C.; Langer, Pennina R.; and Waldrop, Alexander A., III, 4,711,955, Cl. 536-29.000.

Yamada, Chikara; Watabe, Yoji; Irako, Koichi, deceased (by Irako, Sanae, legal heir); and Murakami, Yuichi, to Bridgestone Corporation. Exhaust gas purifying catalyst, 4,711,870, Cl. 502-303.000.

Yamada, Koichi, to NEC Corporation. Data control circuits, 4,712,090, Cl. 340-347.00D.

Yamada, Mutsuo: See—
Ishida, Tetsuyoshi; Okiura, Kunio; Hanayama, Fumihiko; Yamada, Mutsuo; and Arikawa, Yoshijiro, 4,711,828, Cl. 429-12.000.

Yamada, Wataru: See—
Tanazawa, Masayoshi; Shoji, Masaru; and Yamada, Wataru, 4,711,584, Cl. 368-88.000.

Yamada, Yasuo: See—
Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhama, Tetsuro, 4,711,501, Cl. 299-21.000.

Yamada, Yasuyuki: See—
Hanai, Kazuko; and Yamada, Yasuyuki, 4,711,819, Cl. 428-425.900.

Yamaguchi, Masayasu: See—
Sawamura, Kentaro; Kosaka, Yoshio; and Yamaguchi, Masayasu, 4,711,861, Cl. 501-98.000.

Yamaguchi, Morio, to Max Co., Ltd. Printing wire driving device in wire dot printer, 4,711,170, Cl. 101-93.050.

Yamaguchi, Seiji; Ichinohe, Eisuke; and Katsura, Johji, to Matsushita Electric Industrial Co., Ltd. Static random access memory, 4,712,194, Cl. 365-203.000.

Yamakawa, Yoshihiro: See—
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamura, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.

Yamamori, Kenji: See—
Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshio; and Mogi, Toshiaki, 4,712,115, Cl. 346-76.0PH.

Yamamoto, Hirohiko: See—
Ohta, Tomozo; Higashi, Kazutada; and Yamamoto, Hirohiko, 4,712,111, Cl. 343-779.000.

Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Insulating material of non-single crystalline silicon compound, 4,711,807, Cl. 428-334.000.

Yamamoto, Saburo: See—
Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,712,219, Cl. 372-45.000.

Yamamoto, Tadashi; Imai, Masafumi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, to TOA Nenryo Kogyo Kabushiki Kaisha. Process for preparing catalyst component for polymerization of olefins, 4,711,940, Cl. 526-124.000.

Yamamoto, Tadashi: See—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,939, Cl. 526-124.000.

Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, to Aichi Steel Works, Ltd.; and Chuo Hatsujo Kabushiki Kaisha. Process for improving the sag-resistance and hardenability of a spring steel, 4,711,675, Cl. 148-144.000.

Yamamura, Michio: See—
Sugano, Hiroshi; Ishida, Ryuichi; and Yamamura, Michio, 4,711,878, Cl. 514-18.000.

Yamamuro, Tetsu: See—
Ueda, Yutaka; and Yamamuro, Tetsu, 4,711,798, Cl. 428-65.000.

Yamaoka, Hiroshi: See—
Miki, Nobuyuki; Yamaoka, Hiroshi; and Tanaka, Yoichi, 4,712,085, Cl. 338-22.0SD.

Yamashita, Toshihiko, to Uniqey (Hong Kong) Limited. Electrical power source, 4,712,171, Cl. 363-142.000.

Yamatake Honeywell: See—
Fujiwara, Masatoshi; Kuroda, Masato; and Shiga, Tatsuhide, 4,712,173, Cl. 364-138.000.

Yanagihara, Kenji: See—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,711,809, Cl. 428-336.000.

Yang, Darchun B.: See—
Wachs, Israel E.; and Yang, Darchun B., 4,711,871, Cl. 502-325.000.

Yang, Frank C.: See—
Heard, Charles M.; and Yang, Frank C., 4,712,222, Cl. 375-77.000.

Yang, Robert K., to Warner-Lambert Company. Encapsulation composition for use with chewing gum and edible products, 4,711,784, Cl. 426-5.000.

Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneiwa, Shinji, to Sharp Kabushiki Kaisha. Visible double heterostructure-semiconductor laser, 4,712,219, Cl. 372-45.000.

Yashiki, Takatsuka: See—
Okada, Hiroaki; Ogawa, Yasuaki; and Yashiki, Takatsuka, 4,711,782, Cl. 424-455.000.

Yasui, Tokumasa: See—
Tanimura, Nobuyoshi; and Yasui, Tokumasa, 4,712,192, Cl. 365-51.000.

Yates, Larry A. Heating device for use with asphalt pavement resurfacing equipment, 4,711,600, Cl. 404-95.000.

Yazaki Corporation: See—
Iino, Tadashi; Nagashima, Yoshikazu; and Sugita, Masaya, 4,711,544, Cl. 353-14.000.
Sueyoshi, Tadashi, 4,711,508, Cl. 439-595.000.

Yeckley, Russel L.; and North, Bernard, to Kennametal Inc. Ceramic material and method of manufacture, 4,711,644, Cl. 51-307.000.

Yen, Huan-Wun: See—
Tangonan, Gregory L.; Yen, Huan-Wun; and Persechini, David L., 4,711,514, Cl. 350-96.120.

Yen, Wei Hsiung. Inspectable antistatic container for packing electrical or electronic devices, 4,711,350, Cl. 206-328.000.

Yip, P. C.: See—
Thaler, Arnold; and Yip, P. C., 4,711,988, Cl. 219-364.000.

Yli-Vakkuri, Erkki P. J.: See—
Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., 4,712,086, Cl. 338-315.000.

Yojigen Agricultural Corporation: See—
Odaira, Keikichi, 4,711,787, Cl. 426-31.000.

Yokohama Rubber Co., Ltd., The: See—
Kabe, Kazuyuki; Morikawa, Tuneso; and Takahashi, Shuji, 4,711,286, Cl. 152-527.000.

Yokotani, Yoichiro; Kato, Junichi; Nishida, Masamitsu; Kawashima, Symichiro; and Ouchi, Hiromu, to Matsushita Electric Industrial Co., Ltd. Dielectric ceramic compositions, 4,711,862, Cl. 501-136.000.

Yokoyama, Kenzou: See—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.

Yokoyama, Naoki, to Fujitsu Limited. High-speed semiconductor device, 4,712,121, Cl. 357-4.000.

Yokoze, Kenzo; and Kubota, Koji, to Ajinomoto Company, Incorporated. Process for the production of L-aspartyl-L-phenylalanine methyl ester or L-aspartyl-L-phenylalanine, 4,711,846, Cl. 435-70.000.

Yoneda, Katsuki, to Satoh Seiki Co., Ltd. Preparatory devices for a pocket sewing machine, 4,711,188, Cl. 112-104.000.

Yonekubo, Hiroaki: See—
Kidouchi, Yasuo; and Yonekubo, Hiroaki, 4,711,392, Cl. 236-12.120.

Yoshida, Keiji: See—
Nishimori, Kadotaro; Yoshida, Keiji; and Ohira, Tadashi, 4,711,569, Cl. 355-69.000.

Yoshida, Kenzo: See—
Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, 4,711,732, Cl. 252-28.000.

Yoshida Kogyo K.K.: See—
Watanabe, Kozo; Kando, Akiyoshi; and Horita, Yoshiyuki, 4,711,020, Cl. 29-767.000.

Yoshida, Koichi: See—
Taniyama, Tadayoshi; and Yoshida, Koichi, 4,711,842, Cl. 435-68.000.

Yoshidg Kogyo K. K.: See—
Hatta, Keizo, 4,711,040, Cl. 34-73.000.

Yoshihara, Tsutomu: See—
Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, 4,712,123, Cl. 357-23.600.

Yoshiike, Nobuyuki; and Kondo, Shigeo, to Matsushita Electric Industrial Co., Ltd. Recording medium, 4,711,815, Cl. 428-411.100.

Yoshikawa, Junichi; and Rachi, Masahiro, to Canon Kabushiki Kaisha. Rotary encoder with source-adjacent light sampling and control, 4,712,000, Cl. 250-205.000.

- Yoshimoto, Toshio: See—
Seto, Kaoru; Ushio, Yukihide; Hori, Kenjiro; Hashimoto, Hiroshi; Yoshimoto, Toshio; and Kanaiwa, Kiyoshi, 4,712,118, Cl. 346-108.000.
- Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Power transfer device for four-wheel drive. 4,711,136, Cl. 74-665.0GA.
- Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, to Tokyo Kogaku Kikai Kabushiki Kaisha. Eye disease inspecting instrument. 4,711,540, Cl. 351-214.000.
- Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, to Tokyo Kogaku Kikai Kabushiki Kaisha. Slit lamp and accessory device thereof. 4,711,541, Cl. 351-214.000.
- Yoshitsugu, Noritada, to Toyota Jidosha Kabushiki Kaisha. Guide rail for seat belt device. 4,711,468, Cl. 280-804.000.
- Yoshizumi, Tomoya: See—
Toyoshi, Seiji; Yoshizumi, Tomoya; Saeki, Masaru; and Kawakita, Tetsuya, 4,711,722, Cl. 210-638.000.
- Younes, Usama E., to Atlantic Richfield Co. Flame-retardant molded composition which incorporates a poly(styrene-co-maleic anhydride-co-dibromostyrene) copolymer. 4,711,941, Cl. 526-272.000.
- Young, Grant A., to Amoco Corporation. Tangentially staged hydrocyclones. 4,711,720, Cl. 210-512.200.
- Young, Joe A.: See—
Wardlaw, Louis J., III; and Young, Joe A., 4,711,300, Cl. 166-153.000.
- Younger, Gilbert W. Throttle valve system for automatic transmissions. 4,711,140, Cl. 74-865.000.
- Yu, Chong-Tao, to Thermco Systems, Inc. Diffusion furnace multi-zone temperature control. 4,711,989, Cl. 219-390.000.
- Yu, Michael C.; and Wright, Roy F., to Phillips Petroleum Company. Poly(arylene sulfide) coating compositions. 4,711,796, Cl. 427-185.000.
- Yu, Thomas C.; Vogt, Robert K.; and Wilkins, John J., to E. W. Buschman Company, The. Package sortation conveyor. 4,711,341, Cl. 198-372.000.
- Yuasa, Satoshi: See—
Haruta, Masahiro; Kuwae, Yoko; Yuasa, Satoshi; and Miyazaki, Toshihiko, 4,711,830, Cl. 430-52.000.
- Yukamoto, Hideki: See—
Sakakibara, Koji; Haraguchi, Hiroshi; and Yukamoto, Hideki, 4,711,214, Cl. 123-425.000.
- Yushiro Chemical Industry Co., Ltd.: See—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.
- Yuyama, Masami: See—
Ninomiya, Masao; Takashima, Susumu; Fukushima, Kazumasa; Yuyama, Masami; and Kurosawa, Kazuyuki, 4,712,243, Cl. 381-43.000.
- Yuyama, Yukihiko; Motosugi, Takanori; Honda, Yasuhiro; and Ichikawa, Akira, to Ricoh Company, Ltd. Thermosensitive recording adhesive sheet. 4,711,874, Cl. 503-206.000.
- Zahnradfabrik Friedrichshafen AG: See—
Schuster, Max, 4,711,332, Cl. 192-48.920.
- Zanussi Elettrodomestici S.p.A.: See—
Mori, Maurizio; Babuin, Piero; and Cargnel, Giuseppe, 4,711,103, Cl. 68-12.00R.
- Zarrineghbal, Hossein; and Quinlan, Charles W., to REI Technologies, Inc. Process for enhancing the cetane number and color of diesel fuel. 4,711,713, Cl. 208-222.000.
- Zavy, Michael T.: See—
Lindsey, Thomas O.; and Zavy, Michael T., 4,711,897, Cl. 514-665.000.
- Zboril, Vaclav G., to Du Pont Canada Inc. Color of polymers. 4,711,923, Cl. 524-323.000.
- Zeiringer, Rudolf: See—
Stubenberg, Johann; Denk, Heimo; and Zeiringer, Rudolf, 4,711,129, Cl. 73-708.000.
- Zemel, Bernard; and Closmann, Philip J., to Shell Oil Company. Steam quality measurement apparatus and method. 4,712,006, Cl. 250-269.000.
- Zenith Electronics Corporation: See—
Greiner, Siegfried M.; and Palac, Kazimir, 4,712,041, Cl. 313-407.000.
- Walker, David L., 4,712,237, Cl. 380-15.000.
- Zeroni, Ludwig: See—
Pertzsch, Albert; Zeroni, Ludwig; and Brunner, Hubert, 4,712,150, Cl. 360-132.000.
- Zielinski, Paul E.: See—
Fox, Lester A.; and Zielinski, Paul E., 4,711,066, Cl. 53-436.000.
- Zimmerman, Morris: See—
Finke, Paul E.; Doherty, James B.; Zimmerman, Morris; Ashe, Bonnie M.; and Dorn, Conrad P., 4,711,886, Cl. 514-195.000.
- Zinssmeister, Axel: See—
Muller, Richard; Leis, Roland; and Zinssmeister, Axel, 4,711,189, Cl. 112-121.120.
- Zitz, Alfred: See—
Barnthaler, Franz; Bedenk, Ferdinand; Schetina, Otto; and Zitz, Alfred, 4,711,502, Cl. 299-33.000.
- Zucker, Richard S.; and Adinolfi, Philip J., to Westinghouse Electric Corp. Apparatus for storing electronic components. 4,711,351, Cl. 206-331.000.
- Zussman, Melvin P.: See—
Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., 4,711,822, Cl. 428-458.000.
- Zwack, Robert R.: See—
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,711,917, Cl. 523-400.000.
- Zwicker, Eberhard; Beckenbauer, Thomas; and Beer, Guenther, to Siemens Aktiengesellschaft. Directional microphone arrangement. 4,712,244, Cl. 381-68.100.
- ZymoGenetics, Inc.: See—
Insley, Margaret Y.; and Kawasaki, Glenn, 4,711,848, Cl. 435-91.000.
- ZYP Coatings, Inc.: See—
Chapman, Lloyd R.; and Holcombe, Cressie E., Jr., 4,711,666, Cl. 106-14.120.
- 2610 PGA Partnership: See—
Franchina, Thomas F.; Gudmundson, Gunnar G.; and Reuss, John R., 4,711,565, Cl. 355-39.000.
- 501 China Technical Consultants, Inc.: See—
Wey, Feng-Feng, 4,711,743, Cl. 260-370.000.
- 501 Hoechst Aktiengesellschaft: See—
Konig, Wolfgang; Engels, Joachim; Uhlmann, Eugen; and Wetekam, Waldemar, 4,711,847, Cl. 435-70.000.
- 501 Nederlandse Centrale Organisatie Voor Toegepast-Enschappelijk Onderzoek: See—
Haupt, Pieter M.; and Wielandt, Ralph T., 4,711,126, Cl. 73-293.000.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF DECEMBER, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Bennett, Clifford D.; and Odenthal, Charles. Exhalation valve assembly. Re. 32,553, Cl. 137-271.000.
- Chatterton, Robert T., to Northwestern University. Method of determining pregnadiol in female urine and test device for use therein. Re. 32,557, Cl. 435-7.000.
- Circuit Chemistry Corporation: See—
Czaja, James J., Re. 32,555, Cl. 252-79.300.
- Czaja, James J., to Circuit Chemistry Corporation. Solder stripping solution. Re. 32,555, Cl. 252-79.300.
- McDonnell Douglas Corporation: See—
Murphy, Dennis E., Re. 32,554, Cl. 244-118.500.
- Mein, Peter G. Process for recovering cesium from cesium alum. Re. 32,556, Cl. 423-599.000.
- Murphy, Dennis E., to McDonnell Douglas Corporation. Vent structure. Re. 32,554, Cl. 244-118.500.
- Northwestern University: See—
Chatterton, Robert T., Re. 32,557, Cl. 435-7.000.
- Odenhal, Charles: See—
Bennett, Clifford D.; and Odenthal, Charles, Re. 32,553, Cl. 137-271.000.

LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Blissett, Kitson; and Dunbar, Robert A., to Rothenhaus, Robert, a part interest. Control device responsive to infrared radiation. B1 4,346,427, 12-8-87, Cl. 361-173.000.
- Chen, Ching H.: See—
Chen, Jiann; and Chen, Ching H., B1 4,513,453, Cl. 2-150.000.
- Chen, Jiann; and Chen, Ching H. Pre-tied necktie. B1 4,513,453, 12-8-87, Cl. 2-150.000.
- Coutinho de Assis, Ruy: See—
Valladares Barrocas, Helcio V.; de Castro M. da Silva, Joao B.; and Coutinho de Assis, Ruy, B1 4,232,179, Cl. 585-640.000.
- Day, Joseph G., to Johnson Matthey & Co., Limited. Process for the recovery of platinum group metals from refractory ceramic substrates. B1 4,428,768, 12-8-87, Cl. 75-10.190.
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Thompson, Alan E., B1 4,507,019, Cl. 405-154.000.
- Intalite International: See—
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- Johnson Matthey & Co., Limited: See—
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- Lorenz, Walter F.; Kelly, John G.; and Mandel, Fredrick S., to Nalco Chemical Company. Carboxylate polymers for internal scale control agents in boiler systems. B1 4,457,847, 12-8-87, Cl. 210-698.000.
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- Andersson, Karl A.: See—
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- Ferm, Morgan; and Andersson, Karl A., 293,064, Cl. D7-102.000.
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- Ashie, George; and Miller, Donald L., to IVAC Corporation. Support flange for IV drip chamber. 293,130, 12-8-87, Cl. D24-53.000.
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Tosto, Roger J.: See—
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Yokoyama, Akira, to Citizen Watch Co., Ltd. Case for clinical thermometer. 293,085, 12-8-87, Cl. D10-60.000.

Zamboni, William C. Hat retaining leash. 293,043, 12-8-87, Cl. D2-624.000.

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Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de la Londe. Carnation named Lompachel. 6,057, 12-8-87, Cl. 71.000.

Busch, Daniel T., to Busch Greenhouses, Inc. Variety of geranium named Danielle. 6,055, 12-8-87, Cl. 68.000.

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Busch, Daniel T., 6,055, Cl. 68.000.

Ducloux, Yves: See—
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Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Solo. 6,058, 12-8-87, Cl. 74.000.

Duffett, William E.; VandenBerg, Cornelis P.; and Mack, Grace H., to Mack, Grace H. Chrysanthemum plant named Adorn. 6,059, 12-8-87, Cl. 74.000.

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Laver, Keith, to Nor'East Miniature Roses, Inc. Rose plant named Lavale. 6,054, 12-8-87, Cl. 10.000.

Mack, Grace H.: See—
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VandenBerg, Cornelis P.: See—
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CLASSIFICATION OF PATENTS

ISSUED DECEMBER 8, 1987

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2	139	4,711,043	CLASS 65	18.2	4,711,652	CLASS 89	90.34	4,711,203	CLASS 139	
2.1 R	4,710,978		CLASS 40	543	4,711,044	1.805	4,711,151	4,711,204	116	4,711,273
48	4,710,979			564	4,711,045	6.5	4,711,152	4,711,205		
50	4,710,980			605	4,711,046	7	4,711,153	4,711,206		
115	4,710,981		CLASS 42				4,711,154	4,711,207	5	4,711,274
150	4,710,982							4,711,208	271	4,711,275
	B1 4,713,453							4,711,209	286	4,711,276
301	4,710,983		1.15	4,711,047	55	4,711,100	446	4,711,155	321	4,711,210
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			CLASS 43					4,711,158		
382	4,710,986		81	4,711,049	5 E	4,711,102	31	4,711,159	491	4,711,213
420	4,710,987		102	4,711,050	12 R	4,711,103	94	4,711,160	492	4,711,214
438	4,710,988				23 R	4,711,104		4,711,161	494	4,711,215
449	4,710,989		51	4,711,643	23.2	4,711,105	2.11	4,711,162	499	4,711,216
542	4,710,990							4,711,163	491	4,711,217
			CLASS 44					4,711,164	492	4,711,218
435	4,710,991		17	4,711,051	34	4,711,106	29	4,711,165	494	4,711,219
508	4,710,992				233	4,711,107	31.5	4,711,166	502	4,711,220
			CLASS 49		312	4,711,108	38.3	4,711,167	503	4,711,221
								4,711,168	503	4,711,222
158	4,710,993		502	4,711,052				4,711,169	555	4,711,223
481	4,711,640				7	4,711,656	323.12	4,711,170	557	4,711,224
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527	4,711,642		3	4,711,053			353	4,711,172	590	4,711,226
			165.77	4,711,054			510	4,711,173	609	4,711,227
			268	4,711,055				4,711,174	643	4,711,228
			307	4,711,056				4,711,175		
			410	4,711,057				4,711,176		
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			CLASS 15		49	4,711,110	257	4,711,169		
22 R	4,710,995		81	4,711,057	63	4,711,111				
105	4,710,996		101	4,711,058	98	4,711,112	93.05	4,711,170	49	4,711,229
268	4,710,997		173 DS	4,711,059	197	4,711,113	148	4,711,171	69	4,711,230
			222	4,711,060	234	4,711,114	152	4,711,172	79	4,711,231
			410	4,711,061	329	4,711,115	349	4,711,173	92 VP	4,711,233
21	4,710,998		646	4,711,062	366	4,711,116	352	4,711,174	92 YF	4,711,232
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631	4,711,003		170	4,711,065	115	4,711,119	384	4,711,178	136	4,711,237
			436	4,711,066	119 R	4,711,120	426	4,711,179	303.14	4,711,238
			439	4,711,067	151	4,711,121	445	4,711,180		
15 R	4,711,004		551	4,711,068	162	4,711,122	476	4,711,181	319	4,711,239
			556	4,711,069	178 R	4,711,123			335.5	4,711,240
			573	4,711,070	293	4,711,124			419 R	4,711,241
			589	4,711,071	302	4,711,125			420.5	4,711,242
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	4,711,009		52	4,711,647					748	4,711,247
239	4,711,010		73	4,711,648					765	4,711,248
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603	4,711,017		295	4,711,075						
609	4,711,018		320.2	4,711,076						
767	4,711,019		341	4,711,077						
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832	4,711,023		207	4,711,080						
850	4,711,024		263	4,711,081						
854	4,711,025		279	4,711,082						
869	4,711,026		301	4,711,083						
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272 A	4,711,030		39.141	4,711,085						
294	4,711,031		253	4,711,086						
372	4,711,032		286	4,711,087						
			321	4,711,088						
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172 E	4,711,034		422	4,711,090						
200	4,711,035		517	4,711,091						
265	4,711,036		534	4,711,092						
520	4,711,037									
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25	4,711,038		6	4,711,650						
57 A	4,711,039		34	4,711,651						
73	4,711,040		87	4,711,093						
179	4,711,041		90	4,711,094						
			117	4,711,095						
			129	4,711,096						
			271	4,711,097						
			441	4,711,098						
			457	4,711,099						
50	4,711,042									

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393	4,711,312	781	4,711,729	CLASS 244	1 R	4,711,411	53	4,711,440	71	4,712,029	26	4,712,108
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164	4,711,314	CLASS 215	4,711,359	CLASS 219	3.16	4,711,413	22	4,711,442	90	4,712,031	779	4,712,110
2 C	4,711,315	11.1	4,711,360	CLASS 219	3.22	4,711,414	126	4,711,443	178	4,712,032	788	4,712,111
18	4,711,316	235	4,711,361	CLASS 219	17.19	4,711,415	290	4,711,444	217	4,712,033	CLASS 342	4,712,112
CLASS 180	4,711,317	118.5	4,711,362	CLASS 219	31	4,711,416	67	4,711,445	269	4,712,034	CLASS 343	4,712,113
132	4,711,318	158 R	4,711,363	CLASS 219	Re.32,554	4,711,417	70.1	4,711,446	323	4,712,035	CLASS 344	4,712,114
168	4,711,319	56	4,711,364	CLASS 219	5	4,711,418	73	4,711,447	333	4,712,036	CLASS 345	4,712,115
197	4,711,320	69 W	4,711,365	CLASS 219	225.2	4,711,419	118	4,711,448	220	4,711,505	CLASS 346	4,712,116
247	4,711,321	110	4,711,366	CLASS 219	243	4,711,420	123	4,711,449	CLASS 312	4,712,117	CLASS 347	4,712,117
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106	4,711,323	130.01	4,711,368	CLASS 219	515	4,711,422	143 R	4,711,451	CLASS 314	4,712,119	CLASS 349	4,712,119
155	4,711,324	358	4,711,369	CLASS 219	635	4,711,423	268	4,711,452	CLASS 315	4,712,120	CLASS 350	4,712,120
CLASS 184	4,711,325	364	4,711,370	CLASS 219	636	4,711,424	269	4,711,453	CLASS 316	4,712,121	CLASS 351	4,712,121
3.2	4,711,326	390	4,711,371	CLASS 219	117	4,711,425	CLASS 277	9.5	4,712,042	CLASS 352	4,712,122	
7.4	4,711,327	552	4,711,372	CLASS 219	235 B	4,711,456	CLASS 278	235 B	4,712,043	CLASS 353	4,712,123	
CLASS 187	4,711,328	4 F	4,711,373	CLASS 219	65	4,711,457	CLASS 279	65	4,712,044	CLASS 354	4,712,124	
1 R	4,711,329	67	4,711,374	CLASS 219	203 R	4,711,998	CLASS 280	11.22	4,712,045	CLASS 355	4,712,125	
52 R	4,711,330	266	4,711,375	CLASS 219	204	4,711,999	CLASS 281	279	4,712,046	CLASS 356	4,712,126	
135	4,711,331	276	4,711,376	CLASS 219	205	4,712,000	CLASS 282	460 A	4,712,047	CLASS 357	4,712,127	
CLASS 188	4,711,332	288	4,711,377	CLASS 219	206	4,712,001	CLASS 283	279	4,712,048	CLASS 358	4,712,128	
32	4,711,333	316	4,711,378	CLASS 219	207	4,712,002	CLASS 284	279	4,712,049	CLASS 359	4,712,129	
67	4,711,334	404	4,711,379	CLASS 219	208	4,712,003	CLASS 285	279	4,712,050	CLASS 360	4,712,130	
71.4	4,711,335	450	4,711,380	CLASS 219	209	4,712,004	CLASS 286	279	4,712,051	CLASS 361	4,712,131	
296	4,711,336	CLASS 221	4,711,381	CLASS 219	210	4,712,005	CLASS 287	279	4,712,052	CLASS 362	4,712,132	
CLASS 192	4,711,337	213	4,711,382	CLASS 219	211	4,712,006	CLASS 288	279	4,712,053	CLASS 363	4,712,133	
0.076	4,711,338	227	4,711,383	CLASS 219	212	4,712,007	CLASS 289	279	4,712,054	CLASS 364	4,712,134	
3.57	4,711,339	237	4,711,384	CLASS 219	213	4,712,008	CLASS 290	279	4,712,055	CLASS 365	4,712,135	
45	4,711,340	269	4,711,385	CLASS 219	214	4,712,009	CLASS 291	279	4,712,056	CLASS 366	4,712,136	
46	4,711,341	270	4,711,386	CLASS 219	215	4,712,010	CLASS 292	279	4,712,057	CLASS 367	4,712,137	
48.92	4,711,342	287	4,711,387	CLASS 219	216	4,712,011	CLASS 293	279	4,712,058	CLASS 368	4,712,138	
CLASS 193	4,711,343	129.1	4,711,388	CLASS 219	217	4,712,012	CLASS 294	279	4,712,059	CLASS 369	4,712,139	
6	4,711,344	135	4,711,389	CLASS 219	218	4,712,013	CLASS 295	279	4,712,060	CLASS 370	4,712,140	
CLASS 198	4,711,345	146.1	4,711,390	CLASS 219	219	4,712,014	CLASS 296	279	4,712,061	CLASS 371	4,712,141	
324	4,711,346	400.7	4,711,391	CLASS 219	220	4,712,015	CLASS 297	279	4,712,062	CLASS 372	4,712,142	
347	4,711,347	499	4,711,392	CLASS 219	221	4,712,016	CLASS 298	279	4,712,063	CLASS 373	4,712,143	
372	4,711,348	504	4,711,393	CLASS 219	222	4,712,017	CLASS 299	279	4,712,064	CLASS 374	4,712,144	
391	4,711,349	541	4,711,394	CLASS 219	223	4,712,018	CLASS 300	279	4,712,065	CLASS 375	4,712,145	
396	4,711,350	578	4,711,395	CLASS 219	224	4,712,019	CLASS 301	279	4,712,066	CLASS 376	4,712,146	
419	4,711,351	588	4,711,396	CLASS 219	225	4,712,020	CLASS 302	279	4,712,067	CLASS 377	4,712,147	
451	4,711,352	591	4,711,397	CLASS 219	226	4,712,021	CLASS 303	279	4,712,068	CLASS 378	4,712,148	
463.3	4,711,353	594	4,711,398	CLASS 219	227	4,712,022	CLASS 304	279	4,712,069	CLASS 379	4,712,149	
465.2	4,711,354	597	4,711,399	CLASS 219	228	4,712,023	CLASS 305	279	4,712,070	CLASS 380	4,712,150	
504	4,711,355	598	4,711,400	CLASS 219	229	4,712,024	CLASS 306	279	4,712,071	CLASS 381	4,712,151	
572	4,711,356	599	4,711,401	CLASS 219	230	4,712,025	CLASS 307	279	4,712,072	CLASS 382	4,712,152	
844	4,711,357	600	4,711,402	CLASS 219	231	4,712,026	CLASS 308	279	4,712,073	CLASS 383	4,712,153	
CLASS 200	4,711,358	188	4,711,403	CLASS 219	232	4,712,027	CLASS 309	279	4,712,074	CLASS 384	4,712,154	
148 A	4,711,359	BI 4,189,079	4,711,404	CLASS 219	233	4,712,028	CLASS 310	279	4,712,075	CLASS 385	4,712,155	
CLASS 204	4,711,360	10	4,711,385	CLASS 219	234	4,712,029	CLASS 311	279	4,712,076	CLASS 386	4,712,156	
1 T	4,711,361	121	4,711,386	CLASS 219	235	4,712,030	CLASS 312	279	4,712,077	CLASS 387	4,712,157	
28	4,711,362	143	4,711,387	CLASS 219	236	4,712,031	CLASS 313	279	4,712,078	CLASS 388	4,712,158	
34	4,711,363	148	4,711,388	CLASS 219	237	4,712,032	CLASS 314	279	4,712,079	CLASS 389	4,712,159	
129.65	4,711,364	151	4,711,389	CLASS 219	238	4,712,033	CLASS 315	279	4,712,080	CLASS 390	4,712,160	
145 R	4,711,365	154	4,711,390	CLASS 219	239	4,712,034	CLASS 316	279	4,712,081	CLASS 391	4,712,161	
280	4,711,366	157	4,711,391	CLASS 219	240	4,712,035	CLASS 317	279	4,712,082	CLASS 392	4,712,162	
282	4,711,367	158	4,711,392	CLASS 219	241	4,712,036	CLASS 318	279	4,712,083	CLASS 393	4,712,163	
CLASS 206	4,711,368	159	4,711,393	CLASS 219	242	4,712,037	CLASS 319	279	4,712,084	CLASS 394	4,712,164	
38	4,711,369	160	4,711,394	CLASS 219	243	4,712,038	CLASS 320	279	4,712,085	CLASS 395	4,712,165	
45.29	4,711,370	161	4,711,395	CLASS 219	244	4,712,039	CLASS 321	279	4,712,086	CLASS 396	4,712,166	
260	4,711,371	162	4,711,396	CLASS 219	245	4,712,040	CLASS 322	279	4,712,087	CLASS 397	4,712,167	
328	4,711,372	163	4,711,397	CLASS 219	246	4,712,041	CLASS 323	279	4,712,088	CLASS 398	4,712,168	
331	4,711,373	164	4,711,398	CLASS 219	247	4,712,042	CLASS 324	279	4,712,089	CLASS 399	4,712,169	
365	4,711,374	165	4,711,399	CLASS 219	248	4,712,043	CLASS 325	279	4,712,090	CLASS 400	4,712,170	
378	4,711,375	166	4,711,400	CLASS 219	249	4,712,044	CLASS 326	279	4,712,091	CLASS 401	4,712,171	
385	4,711,376	167	4,711,401	CLASS 219	250	4,712,045	CLASS 327	279	4,712,092	CLASS 402	4,712,172	
503	4,711,377	168	4,711,402	CLASS 219	251	4,712,046	CLASS 328	279	4,712,093	CLASS 403	4,712,173	
CLASS 208	4,711,378	169	4,711,403	CLASS 219	252	4,712,047	CLASS 329	279	4,712,094	CLASS 404	4,712,174	
111	4,711,379	170	4,711,404	CLASS 219	253	4,712,048	CLASS 330	279	4,712,095	CLASS 405	4,712,175	
153	4,711,380	171	4,711,405	CLASS 219	254	4,712,049	CLASS 331	279	4,712,096	CLASS 406	4,712,176	
222	4,711,381	172	4,711,406	CLASS 219	255	4,712,050	CLASS 332	279	4,712,097	CLASS 407	4,712,177	
348	4,711,382	173	4,711,407	CLASS 219	256	4,712,051	CLASS 333	279	4,712,098	CLASS 408	4,712,178	
CLASS 209	4,711,383	174	4,711,408	CLASS 219	257	4,712,052	CLASS 334	279	4,712,099	CLASS 409	4,712,179	
365	4,711,384	175	4,711,409	CLASS 219	258	4,712,053	CLASS 335	279	4,712,100	CLASS 410	4,712,180	
500.26	4,711,385	176	4,711,410	CLASS 219	259	4,712,054	CLASS 336	279	4,712,101	CLASS 411	4,712,181	
512.2	4,711,386	177	4,711,411	CLASS 219	260	4,712,055	CLASS 337	279	4,712,102	CLASS 412	4,712,182	
607	4,711,387	178	4,711,412	CLASS 219	261	4,712,056	CLASS 338	279	4,712,103	CLASS 413	4,712,183	
638	4,711,388	179	4,711,413	CLASS 219	262	4,712,057	CLASS 339	279	4,712,104	CLASS 414	4,712,184	
652	4,711,389	180	4,711,414	CLASS 219	263	4,712,058	CLASS 340	279	4,712,105	CLASS 415	4,712,185	
698	4,711,390	181	4,711,415	CLASS 219	264	4,712,059	CLASS 341	279	4,712,106	CLASS 416	4,712,186	
699	4,711,391	182	4,711,416	CLASS 219	265	4,712,060	CLASS 342	279	4,712,107	CLASS 417	4,712,187	
701	4,711,392	183	4,711,417	CLASS 219	266	4,712,061	CLASS 343	279	4,712,108	CLASS 418	4,712,188	
BI 4,457,847	4,711,393	184	4,711,418	CLASS 219	267	4,712,062	CLASS 344	279	4,712,109	CLASS 419	4,712,189	
72 R	4,711,394	185	4,711,419	CLASS 219	268	4,712,063	CLASS 345	279	4,712,110	CLASS 420	4,712,190	
86.52	4,711,395	186	4,711,420	CLASS 219	269	4,712,064	CLASS 346	279	4,712,111	CLASS 421	4,712,191	
107	4,711,396	187	4,711,421	CLASS 219	270	4,712,065	CLASS 347	279	4,712,112	CLASS 422	4,712,192	

CLASSIFICATION OF DESIGNS

D1— 125 293,040	D7— 608 293,060	D9— 318 293,079	13 293,098	D17— 15 293,117	87 293,136
199 293,041	70 293,061	376 293,080	293,099	19 293,118	50 293,138
314 293,042	75 293,062	293,081	293,100	20 293,119	61 293,137
624 293,043	99 293,072	424 293,082	52 293,101	D21— 13 293,120	D30— 152 293,139
D3— 30.1 293,044	102 293,063	446 293,083	53 293,102	25 293,121	D32— 18 293,140
101 293,045	293,064	D10— 34 293,084	293,103	66 293,122	25 293,141
335 293,047	104 293,065	60 293,085	293,104	187 293,123	38 293,142
347 293,046	293,066	71 293,086	293,105	198 293,124	46 293,143
366 293,049	334 293,067	101 293,087	293,106	201 293,125	53.1 293,144
373 293,050	346 293,068	106 293,088	293,107	219 293,126	58 293,145
431 293,052	293,069	106 293,089	293,108	D23— 207 293,128	70 293,146
484 293,051	293,070	114 293,090	293,109	226 293,127	D34— 21 293,148
491 293,053	384 293,071	116 293,091	293,110	D24— 53 293,129	26 293,149
499 293,054	20 293,074	D12— 110 293,092	293,111	293,130	D99— 28 293,150
505 293,048	61 293,073	147 293,093	293,112	D25— 128 293,132	293,151
510 293,055	330 293,075	156 293,094	293,113	129 293,131	293,152
522 293,056	331 293,076	163 293,095	293,114	D26— 28 293,133	293,153
523 293,057	343 293,077	304 293,096	293,115	35 293,134	293,154
575 293,059	344 293,078	D13— 8 293,097	293,116	61 293,135	

CLASSIFICATION OF PLANTS

P.— 7 6,053	68 6,055	70 6,056	71 6,057	74 6,058	6,059
10 6,054					

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,711,012	4,711,514	4,711,700	13 : 4,710,993	4,711,158	4,712,028
4,711,036	4,711,517	4,711,063	4,711,053	4,711,187	4,712,046
4,711,277	4,711,522	4,711,035	4,711,066	4,711,210	4,712,075
4,711,697	4,711,525	4,711,084	4,711,230	4,711,226	4,712,190
04 : 4,711,246	4,711,526	4,711,150	4,711,374	4,711,265	4,346,427
4,711,943	4,711,543	4,711,241	4,711,419	4,711,274	4,711,002
4,712,026	4,711,574	4,711,243	4,712,071	4,711,328	4,711,046
4,712,039	4,711,575	4,711,337	4,712,094	4,711,372	4,711,106
4,712,174	4,711,579	4,711,354	4,711,223	4,711,472	4,711,139
4,712,193	4,711,585	4,711,388	4,711,446	4,711,484	4,711,141
4,712,232	4,711,608	4,711,393	Re.32,556	4,711,763	4,711,192
05 : 4,711,233	4,711,636	4,711,520	Re.32,557	4,711,766	4,711,207
4,711,594	4,711,677	4,711,524	4,710,996	4,711,803	4,711,215
4,712,166	4,711,680	4,711,535	4,711,096	4,711,933	4,711,224
06 : Re.32,553	4,711,723	4,711,582	4,711,110	4,711,947	4,711,235
Re.32,554	4,711,752	4,711,615	4,711,161	4,711,948	4,711,288
4,710,978	4,711,764	4,711,619	4,711,183	4,712,035	4,711,364
4,710,981	4,711,767	4,711,687	4,711,227	4,712,164	4,711,397
4,710,983	4,711,843	4,711,702	4,711,237	4,712,236	4,711,463
4,710,990	4,711,844	4,711,793	4,711,325	4,711,049	4,711,467
4,711,014	4,711,845	4,711,826	4,711,343	4,711,407	4,711,476
4,711,017	4,711,857	4,711,829	4,711,359	4,711,597	4,711,483
4,711,058	4,711,909	4,711,888	4,711,361	4,712,151	4,711,496
4,711,062	4,711,911	4,711,915	4,711,391	4,712,167	4,711,512
4,711,063	4,711,983	4,711,955	4,711,394	4,711,338	4,711,516
4,711,122	4,711,989	4,711,962	4,711,434	4,711,632	4,711,527
4,711,125	4,711,995	4,712,070	4,711,440	4,711,635	4,711,588
4,711,132	4,711,996	4,712,154	4,711,449	4,711,716	4,711,589
4,711,140	4,711,998	4,712,161	4,711,451	4,710,992	4,711,598
4,711,149	4,712,010	4,712,202	4,711,475	4,711,643	4,711,628
4,711,152	4,712,042	4,712,234	4,711,656	4,711,030	4,711,928
4,711,195	4,712,044	4,711,811	4,711,667	4,711,640	4,711,960
4,711,197	4,712,062	4,711,812	4,711,724	4,711,965	4,711,984
4,711,204	4,712,101	4,711,929	4,711,726	4,711,966	4,712,034
4,711,222	4,712,107	4,711,942	4,711,744	4,711,351	Re.32,553
4,711,238	4,712,110	4,711,247	4,711,903	4,711,024	4,710,991
4,711,249	4,712,137	4,711,571	4,711,987	4,711,050	4,711,095
4,711,304	4,712,144	4,711,000	4,712,019	4,711,194	4,711,137
4,711,311	4,712,146	4,711,027	4,712,029	4,711,256	4,711,154
4,711,347	4,712,170	4,711,043	4,712,031	4,711,401	4,711,240
4,711,377	4,712,208	4,711,076	4,712,041	4,711,438	4,711,251
4,711,386	4,712,215	4,711,159	4,712,054	4,711,505	4,711,367
4,711,390	4,712,217	4,711,177	4,712,061	4,711,510	4,711,381
4,711,409	4,712,222	4,711,236	4,712,079	4,711,539	4,711,489
4,711,415	4,712,230	4,711,254	4,712,231	4,711,573	4,711,566
4,711,417	4,712,233	4,711,334	4,712,237	4,711,644	4,711,638
4,711,448	4,712,238	4,711,447	4,712,241	4,711,650	4,711,685
4,711,461	4,712,240	4,711,758	4,457,847	4,711,713	4,711,738
4,711,470	4,711,051	4,711,765	4,710,979	4,711,800	4,711,786
4,711,481	4,711,057	4,711,912	4,711,119	4,711,836	4,711,799
4,711,487	4,711,453	4,711,988	4,711,124	4,711,855	4,711,816
4,711,488	4,711,552	4,712,120	4,711,156	4,711,859	4,711,856
4,711,490	4,711,603	4,712,179	4,711,157	4,711,914	4,711,894

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

28 :	4,711,946	4,711,871	4,712,027	4,711,921	4,711,757	4,711,651
29 :	4,711,982	4,711,883	4,712,032	4,711,957	4,711,759	4,711,698
	4,712,022	4,711,884	4,712,033	4,711,964	4,711,760	4,711,701
	4,712,157	4,711,886	4,712,040	4,711,974	4,711,762	4,711,850
	4,712,210	4,711,900	4,712,051	4,711,985	4,711,768	4,711,865
	4,711,032	4,711,924	4,712,108	4,712,089	4,711,801	4,711,969
	4,711,094	4,711,927	4,712,124	4,712,093	4,711,802	4,711,972
	4,711,307	4,711,931	4,712,125	4,712,165	4,711,820	4,712,006
	4,711,406	4,711,968	4,712,140	4,712,178	4,711,822	4,712,060
	4,711,454	4,711,970	4,712,156	4,711,123	4,711,827	4,712,129
	4,711,465	4,711,994	4,712,176	4,711,299	4,711,869	4,712,155
	4,711,590	4,711,997	4,712,195	4,711,305	4,711,877	4,712,159
	4,711,637	4,712,020	4,712,214	4,711,439	4,711,897	4,712,197
	4,711,780	4,712,092	4,712,230	4,711,720	4,711,910	4,712,221
	4,711,993	4,712,096	4,712,250	4,711,796	4,711,913	4,712,223
	4,712,030	4,712,130	4,711,100	4,711,868	4,711,917	4,712,224
	4,712,049	4,712,207	4,711,160	4,712,076	4,711,941	4,712,225
30 :	4,711,538	4,711,428	4,711,198	4,711,250	4,711,973	4,712,242
31 :	4,711,778	4,712,007	4,711,255	4,711,356	4,712,077	4,329,090
32 :	4,711,452	4,712,047	4,711,403	4,711,383	4,712,095	4,507,019
	4,712,246	4,712,074	4,711,633	4,711,634	4,712,106	4,711,248
33 :	4,712,078	4,710,985	4,711,649	4,712,025	4,712,126	4,711,664
34 :	4,711,025	4,711,003	4,711,708	4,712,058	4,712,228	4,712,024
	4,711,031	4,711,013	4,711,922	4,712,087	4,712,239	4,712,059
	4,711,033	4,711,026	4,712,102	4,711,007	4,711,695	4,711,153
	4,711,093	4,711,165	4,712,235	4,711,099	4,711,904	4,712,004
	4,711,180	4,711,218	4,711,253	4,711,112	4,711,600	4,711,384
	4,711,186	4,711,244	4,711,009	4,711,113	4,711,792	4,711,422
	4,711,261	4,711,296	4,711,044	4,711,118	4,711,854	4,711,478
	4,711,269	4,711,348	4,711,056	4,711,142	4,712,055	4,711,580
	4,711,281	4,711,368	4,711,059	4,711,191	4,711,011	4,711,592
	4,711,319	4,711,369	4,711,115	4,711,231	4,711,264	4,711,659
	4,711,353	4,711,389	4,711,190	4,711,252	4,711,352	4,711,932
	4,711,371	4,711,418	4,711,202	4,711,312	4,711,602	4,712,008
	4,711,466	4,711,425	4,711,228	4,711,322	4,711,666	4,712,162
	4,711,507	4,711,430	4,711,242	4,711,344	4,711,761	4,711,089
	4,711,511	4,711,486	4,711,271	4,711,363	4,710,998	4,711,259
	4,711,515	4,711,491	4,711,283	4,711,373	4,711,022	4,711,280
	4,711,532	4,711,500	4,711,330	4,711,424	4,711,048	4,711,282
	4,711,563	4,711,529	4,711,341	4,711,426	4,711,068	4,711,414
	4,711,610	4,711,565	4,711,342	4,711,436	4,711,120	4,711,696
	4,711,669	4,711,577	4,711,360	4,711,441	4,711,131	4,711,839
	4,711,671	4,711,623	4,711,379	4,711,445	4,711,143	4,711,840
	4,711,679	4,711,646	4,711,380	4,711,455	4,711,262	4,711,848
	4,711,705	4,711,693	4,711,429	4,711,480	4,711,272	4,712,184
	4,711,710	4,711,745	4,711,437	4,711,482	4,711,300	4,711,944
	4,711,712	4,711,770	4,711,464	4,711,518	4,711,301	4,710,987
	4,711,731	4,711,804	4,711,479	4,711,607	4,711,302	4,711,073
	4,711,736	4,711,808	4,711,509	4,711,645	4,711,306	4,711,088
	4,711,742	4,711,818	4,711,611	4,711,653	4,711,326	4,711,092
	4,711,748	4,711,831	4,711,614	4,711,655	4,711,357	4,711,219
	4,711,772	4,711,832	4,711,718	4,711,660	4,711,362	4,711,320
	4,711,774	4,711,851	4,711,730	4,711,661	4,711,365	4,711,370
	4,711,784	4,711,860	4,711,735	4,711,665	4,711,382	4,711,378
	4,711,788	4,711,864	4,711,751	4,711,673	4,711,427	4,711,605
	4,711,789	4,711,876	4,711,813	4,711,725	4,711,469	4,711,683
	4,711,814	4,711,979	4,711,825	4,711,737	4,711,471	4,711,739
	4,711,817	4,711,986	4,711,853	4,711,753	4,711,474	4,711,791
	4,711,852	4,712,005	4,711,908	4,711,754	4,711,581	4,711,086
	4,711,866	4,712,018	4,711,920	4,711,755		

DESIGN PATENTS

01 :	293,114	293,150	293,067	293,077	293,051	42 :	293,040
04 :	293,124	293,151	293,084	293,101	293,080		293,041
06 :	293,124	293,152	293,102	293,096	293,082	45 :	293,081
	293,048	293,045	293,105	293,126	293,089	48 :	293,123
	293,054	293,088	293,068	293,087	293,097		293,153
	293,062	293,100	293,069	293,106	293,109		293,154
	293,071	293,104	293,070	293,119	293,110	49 :	293,061
	293,076	293,113	293,125	293,141	293,112	51 :	293,053
	293,078	293,135	293,091	293,143	293,121	53 :	293,056
	293,099	293,137	293,060	293,083	293,047		293,057
	293,129	293,072	293,128	293,042	293,116		293,117
	293,130	293,131	293,128	293,046	293,127		293,118
	293,133	293,132	293,055	293,046	293,145	55 :	293,044
	293,139	293,052	293,059	293,050			

PLANT PATENTS

06 :	6,058	6,059	08 :	6,055	25 :	6,053
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December 15, 1987

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COPIES OF PATENTS are furnished by the Patent and Trademark Office at \$1.50 each; PLANT PATENTS in color, \$6.00 each; copies of TRADEMARKS at \$1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and
Commissioner of Patents
and Trademarks.
June 2, 1987.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on December 11, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,486,901 through 4,488,312
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . \$ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) \$ 225.00
By other than a small entity \$ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 \$ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) \$ 55.00
By other than a small entity \$ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable \$ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 27, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,406,024	06/365,833	9/27/83
4,406,026	06/415,149	9/27/83
4,406,031	06/271,824	9/27/83
4,406,042	06/253,343	9/27/83
4,406,043	06/433,708	9/27/83
4,406,047	06/224,949	9/27/83
4,406,057	06/245,795	9/27/83

4,406,058	06/219,632	9/27/83
4,406,064	06/273,756	9/27/83
4,406,067	06/427,160	9/27/83
4,406,069	06/232,679	9/27/83
4,406,072	06/234,017	9/27/83
4,406,076	06/233,408	9/27/83
4,406,080	06/284,734	9/27/83
4,406,083	06/316,669	9/27/83
4,406,084	06/369,892	9/27/83
4,406,087	06/409,536	9/27/83
4,406,091	06/303,610	9/27/83
4,406,093	06/248,948	9/27/83
4,406,104	06/246,069	9/27/83
4,406,106	06/253,534	9/27/83
4,406,127	06/338,438	9/27/83
4,406,130	06/238,673	9/27/83
4,406,131	06/305,952	9/27/83
4,406,142	06/297,907	9/27/83
4,406,143	06/333,836	9/27/83
4,406,144	06/298,880	9/27/83
4,406,146	06/309,702	9/27/83
4,406,154	06/350,939	9/27/83
4,406,159	06/300,483	9/27/83
4,406,165	06/338,874	9/27/83
4,406,174	06/235,350	9/27/83
4,406,187	06/224,002	9/27/83
4,406,189	06/262,034	9/27/83
4,406,191	06/264,804	9/27/83
4,406,193	06/292,302	9/27/83
4,406,198	06/266,100	9/27/83
4,406,200	06/283,750	9/27/83
4,406,202	06/263,175	9/27/83
4,406,205	06/336,748	9/27/83
4,406,207	06/327,404	9/27/83
4,406,208	06/342,173	9/27/83
4,406,215	06/247,858	9/27/83
4,406,223	06/311,226	9/27/83
4,406,226	06/268,404	9/27/83
4,406,227	06/252,632	9/27/83
4,406,229	06/244,380	9/27/83
4,406,231	06/265,702	9/27/83
4,406,233	06/450,939	9/27/83
4,406,236	06/450,591	9/27/83
4,406,241	06/355,541	9/27/83
4,406,244	06/269,362	9/27/83
4,406,253	06/322,073	9/27/83
4,406,255	06/283,455	9/27/83
4,406,257	06/274,980	9/27/83
4,406,271	06/321,476	9/27/83
4,406,273	06/266,043	9/27/83
4,406,275	06/394,469	9/27/83
4,406,277	06/302,501	9/27/83
4,406,279	06/278,714	9/27/83
4,406,282	06/236,532	9/27/83
4,406,288	06/251,324	9/27/83
4,406,300	06/226,440	9/27/83
4,406,302	06/267,348	9/27/83
4,406,303	06/289,932	9/27/83
4,406,306	06/359,731	9/27/83
4,406,307	06/249,348	9/27/83
4,406,314	06/239,857	9/27/83
4,406,316	06/333,359	9/27/83
4,406,318	06/396,291	9/27/83
4,406,325	06/307,909	9/27/83
4,406,328	06/291,002	9/27/83
4,406,331	06/340,968	9/27/83
4,406,333	06/310,386	9/27/83
4,406,336	06/232,958	9/27/83
4,406,341	06/353,899	9/27/83
4,406,344	06/237,621	9/27/83
4,406,346	06/367,383	9/27/83
4,406,349	06/265,203	9/27/83
4,406,351	06/234,826	9/27/83
4,406,353	06/464,384	9/27/83
4,406,354	06/285,691	9/27/83
4,406,356	06/222,036	9/27/83
4,406,358	06/315,636	9/27/83
4,406,366	06/291,992	9/27/83
4,406,368	06/328,425	9/27/83

Patent Number	Serial Number	Issue Date	4,406,894	06/306,671	9/27/83
4,406,372	06/375,193	9/27/83	4,406,900	06/304,357	9/27/83
4,406,374	06/265,776	9/27/83	4,406,904	06/283,084	9/27/83
4,406,377	06/384,863	9/27/83	4,406,909	06/265,050	9/27/83
4,406,381	06/279,187	9/27/83	4,406,928	06/250,461	9/27/83
4,406,383	06/286,595	9/27/83	4,406,941	06/361,746	9/27/83
4,406,384	06/279,424	9/27/83	4,406,947	06/255,122	9/27/83
4,406,385	06/290,947	9/27/83	4,406,951	06/290,716	9/27/83
4,406,390	06/310,601	9/27/83	4,406,973	06/466,911	9/27/83
4,406,403	06/273,733	9/27/83	4,406,982	06/320,514	9/27/83
4,406,407	06/322,169	9/27/83	4,406,995	06/262,896	9/27/83
4,406,434	06/306,328	9/27/83	4,406,998	06/246,009	9/27/83
4,406,436	06/227,406	9/27/83	4,407,001	06/308,009	9/27/83
4,406,437	06/343,746	9/27/83	4,407,009	06/315,373	9/27/83
4,406,439	06/260,587	9/27/83			
4,406,446	06/260,371	9/27/83			
4,406,448	06/286,486	9/27/83			
4,406,449	06/265,915	9/27/83			
4,406,451	06/273,733	9/27/83			
4,406,454	06/332,407	9/27/83			
4,406,458	06/318,770	9/27/83			
4,406,464	06/418,333	9/27/83			
4,406,471	06/298,490	9/27/83			
4,406,476	06/281,020	9/27/83			
4,406,477	06/322,936	9/27/83			
4,406,479	06/306,832	9/27/83			
4,406,482	06/226,555	9/27/83			
4,406,484	06/240,724	9/27/83			
4,406,486	06/267,173	9/27/83			
4,406,495	06/244,425	9/27/83			
4,406,513	06/242,549	9/27/83			
4,406,522	06/249,986	9/27/83			
4,406,539	06/248,801	9/27/83			
4,406,540	06/239,934	9/27/83			
4,406,544	06/234,781	9/27/83			
4,406,555	06/260,923	9/27/83			
4,406,559	06/300,816	9/27/83			
4,406,564	06/289,136	9/27/83			
4,406,565	06/258,703	9/27/83			
4,406,569	06/220,986	9/27/83			
4,406,579	06/262,041	9/27/83			
4,406,595	06/283,747	9/27/83			
4,406,606	06/268,809	9/27/83			
4,406,607	06/363,051	9/27/83			
4,406,619	06/248,681	9/27/83			
4,406,630	06/254,512	9/27/83			
4,406,646	06/241,128	9/27/83			
4,406,647	06/288,193	9/27/83			
4,406,652	06/385,088	9/27/83			
4,406,661	06/386,916	9/27/83			
4,406,671	06/322,025	9/27/83			
4,406,689	06/350,911	9/27/83			
4,406,690	06/348,555	9/27/83			
4,406,696	06/254,125	9/27/83			
4,406,697	06/227,009	9/27/83			
4,406,718	06/283,708	9/27/83			
4,406,730	06/326,408	9/27/83			
4,406,742	06/366,257	9/27/83			
4,406,747	06/274,701	9/27/83			
4,406,751	06/333,573	9/27/83			
4,406,753	06/456,872	9/27/83			
4,406,754	06/246,944	9/27/83			
4,406,756	06/282,522	9/27/83			
4,406,767	06/376,413	9/27/83			
4,406,782	06/276,868	9/27/83			
4,406,783	06/323,140	9/27/83			
4,406,784	06/367,321	9/27/83			
4,406,786	06/347,223	9/27/83			
4,406,789	06/254,532	9/27/83			
4,406,790	06/396,940	9/27/83			
4,406,794	06/297,258	9/27/83			
4,406,797	06/317,977	9/27/83			
4,406,799	06/372,598	9/27/83			
4,406,810	06/391,598	9/27/83			
4,406,825	06/227,823	9/27/83			
4,406,848	06/273,056	9/27/83			
4,406,852	06/332,804	9/27/83			
4,406,863	06/347,381	9/27/83			
4,406,872	06/267,782	9/27/83			

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,471,038, Re. S.N. 042,923, Filed Apr. 27, 1987, Cl. 429/198, NICKEL-CADMIUM BATTERY, Brijesh Vyas, Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.*, Attorney or Agent: J. P. McDonnell, et al., Ex. Gp.: 114

4,520,082, Re. S.N. 115,082, Filed Oct. 29, 1987, Cl. 514/560, USE OF UNDECYLENIC ACID TO TREAT HERPES LABIALIS, C. Richard Kinsolving, Owner of Record: *Pennwalt Corp., Phila., Pa.*, Attorney or Agent: Arthur H. Seidel, Ex. Gp.: 125

4,520,728, Re. S.N. 056,645, Filed June 1, 1987, Cl. 101/248, METHOD OF OPERATING A PRINTING PRESS AND METHOD, Harold Ecker, et al., Owner of Record: *Paper Converting Machine Co., Green Bay, Wis.*, Attorney or Agent: Timothy L. Tilton, et al., Ex. Gp.: 337

4,524,410, Re. S.N. 063,613, Filed Aug. 7, 1987, Cl. 362/255, INCANDESCENT LAMP WITH FILM OF ALTERNATELY STACKED LAYERS, Akira Kawakatsu, et al., Owner of Record: *Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki-Shi, Japan*, Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 342

4,527,105, Re. S.N. 069,141, Filed July 2, 1987, Cl. 318/444, AUTOMATIC WINDSHIELD WIPER SPEED CONTROL WITH PIEZOELECTRIC SENSOR, Yasuhiro Shiraishi, Owner of Record: *Nissan Motor Co., Ltd., Yokohama, Japan*, Attorney or Agent: Arthur Schwartz, et al., Ex. Gp.: 217

4,538,872, Re. S.N. 053,657, Filed May 26, 1987, Cl. 339/97P, ELECTRICAL CONTACT FOR TERMINATING INSULATED CONDUCTORS, Weldon L. Brubaker, et al., Owner of Record: *Molex, Inc., Lisle, Ill.*, Attorney or Agent: Louis A. Hecht, Ex. Gp.: 322

4,545,342, Re. S.N. 107,394, Filed Oct. 8, 1987, Cl. 123/198F, METHOD AND APPARATUS FOR THE CONTROL OF VALVE OPERATIONS IN INTERNAL COMBUSTION ENGINE, Yoshikatsu Nakano, et al., Owner of Record: *Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Robert Douglas Lyon, et al., Ex. Gp.: 342

4,548,449, Re. S.N. 110,375, Filed Oct. 20, 1987, Cl. 439/641, LAMP SOCKET ATTACHMENT, John A. Corsetti, Owner of Record: *Dennis L. Johnson, Jensen Beach, Fla.*, Attorney or Agent: John A. Clifford, et al., Ex. Gp.: 322

4,577,956, Re. S.N. 043,400, Filed Apr. 28, 1987, Cl. 355/40, PROCESS FOR THE CHAOTIC FILMING OF DOCUMENTS AND DEVICE FOR THE COMPLETION THEREOF, Rolf Klosterhuber, et al., Own-

er of Record: *Inventor*, Attorney or Agent: John H. Mion, et al., Ex. Gp.: 211

4,583,978, Re. S.N. 108,768, Filed Oct. 15, 1987, Cl. 604/208, SYRINGE, Michael Porat, et al., Owner of Record: *Inventor*, Attorney or Agent: Donald L. Dennison, Ex. Gp.: 336

4,608,344, Re. S.N. 107,763, Filed Oct. 9, 1987, Cl. 436/34, METHOD FOR THE DETERMINATION OF SPECIES IN SOLUTION WITH AN OPTICAL WAVE-GUIDE, Timothy J. N. Carter, et al., Owner of Record: *Battelle Memorial Institute, Carouge, Switzerland*, Attorney or Agent: Herbert Dubno, et al., Ex. Gp.: 134

4,617,419, Re. S.N. 108,436, Filed Oct. 14, 1987, Cl. 568/464, PROCESS FOR PREPARING NATURAL BENZALDEHYDE AND ACETALDEHYDE NATURAL BENZALDEHYDE AND ACETALDEHYDE COMPOSITIONS, PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC UTILITIES THEREFOR, Charles Wiener, et al., Owner of Record: *International Flavor and Fragrances, Inc., New York, N.Y.*, Attorney or Agent: Harold Haidt, Ex. Gp.: 126

4,652,595, Re. S.N. 115,074, Filed Oct. 30, 1987, Cl. 523/315, PROCESS AND APPARATUS FOR THE PREPARATION OF MIXTURES ISOCYANATE AND WATER WHICH ARE STABLE FOR A SHORT TIME FOR GLUEING PARTICULATE MATERIAL IN PARTICULAR CHIPS, FIBERS OR THE LIKE, Robert Peters, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany*, Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 155

4,663,471, Re. S.N. 109,775, Filed Oct. 19, 1987, Cl. 556/411, METHOD FOR THE PREPARATION OF N-METHYL-N-TRIMETHYLSILYL TRIFLUOROACETAMIDE, Toshio Shinohara, et al., Owner of Record: *Shin-Etsu Chemical Co., Ltd., Tokyo, Japan*, Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 124

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,353,192, Reexam. No. 90/001,370, Requested: Nov. 9, 1987, Cl. 52/281, FIRE-RESISTANT METAL STUD, Robert J. Pearson, Owner of Record: *National Gypsum Co., Buffalo, N.Y.*, Attorney or Agent: Allan H. Gernstein, Ex. Gp.: 350, Requester: Owner

COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,634,971, Reexam. No. 90/001,371, Ordered: Nov. 16, 1987, Cl. 324/133, PORTABLE HAND-HELD VOLTAGE SENSOR WITH MANUALLY ADJUSTABLE REFERENCE VOLTAGE FOR COMPARISON WITH SENSED VOLTAGE, Robert C.

Johnson, Owner of Record: *Ford Motor Co., Dearborn, Mich.*, Attorney or Agent: Paul K. Godwin, Ex. Gp.: 260, Requester: Commissioner of Patents, Washington, D.C.

Erratum

"All reference to Patent No. 4,656,490, to Koji Terasawa of Tokyo, Japan, for 'SUCTION RECOVERY APPARATUS OF INK-JET PRINTER', appearing in the Official Gazette of Apr. 7, 1987, should be deleted since no patent was granted."

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 4,031,395, Christopher Archibald Gordon Le May, RADIOGRAPHY, Interference No. 100,721, decided Apr. 28, 1987, claims 1, 2, 3, 5, 6 and 7.

Patent No. 4,225,696, Ralph W. Colpitts and Jens H. Wendt, PROSTHETIC DENTURE PREPARED FROM POLYURETHANE ELASTOMER, Interference No. 101,283, decided May 20, 1987, claims 1-7.

Patent No. 4,238,153, Toshinori Imura, AUTOMATIC FOCUS ADJUSTING DEVICE FOR CAMERAS, Interference No. 101,295, decided Aug. 22, 1987, claim 1.

Patent No. 4,278,635, Herman Kerst, METHOD FOR DEOXYGENATION OF WATER, Interference No. 101,126, decided Apr. 15, 1987, claims 1, 3, 4, and 5.

Patent No. 4,427,767, Kozo Aoki, Yoshio Seoka, COLOR PHOTOGRAPHIC SENSITIVE MATERIALS, Interference No. 101,337, decided Aug. 27, 1987, claims 1 and 3-6.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals
and Interferences.

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,323,414, Larry A. Severson, SELF-SEALING CURING RIM FOR TUBELESS EARTHMOVER TIRE, Interference No. 101,671, decided Sept. 2, 1987, claims 1-14.

Patent No. 4,394,430, Thomas A. Jadwin, Robert C. Storey, ELECTROPHOTOGRAPHIC DRY TONER AND DEVELOPER COMPOSITIONS, Interference No. 101,792, decided Sept. 21, 1987, claims 1-7.

Patent No. 4,477,968, Alan G. Kracke, Tuan P. Tran, Beat G. Keel, METHOD FOR USING A MACHINING SENSOR, Interference No. 101,663, decided Oct. 26, 1987, claim 1.

Patent No. 4,501,924, Dennis K. Krass, HERBICIDALLY ACTIVE SUBSTITUTED DIPHENYL ETHER ACETALS OR KETALS, Interference No. 101,673, decided Oct. 5, 1987, claims 1-4.

Patent No. 4,519,796, Ronald D. Russo, THORACIC DRAINAGE DEVICE, Interference No. 101,600, decided Sept. 11, 1987, claims 1 and 3-6.

Patent No. 4,521,722, Richard C. Barthel and Richard D. Roy, APPLIANCE CONTROLLER, Interference No. 101,612, decided Aug. 27, 1987, claims 1-4.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals
and Interferences.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 15, 1987

D. 290,649	4,652,027	4,670,009	4,679,592
D. 290,875	4,652,880	4,670,033	4,679,634
4,414,071	4,654,111	4,670,147	4,680,268
4,432,067	4,654,226	4,670,705	4,680,537
4,493,902	4,654,240	4,670,728	4,680,709
4,506,362	4,654,545	4,670,998	4,680,759
4,530,252	4,655,686	4,671,344	4,680,889
4,535,601	4,655,939	4,671,604	4,680,936
4,535,772	4,655,957	4,671,916	4,681,117
4,544,696	4,657,610	4,672,113	4,681,155
4,559,211	4,658,965	4,672,149	4,681,317
4,577,420	4,659,737	4,672,151	4,681,986
4,578,936	4,659,917	4,672,170	4,682,858
4,585,934	4,659,972	4,672,408	4,682,885
4,593,306	4,660,333	4,672,658	4,682,985
4,596,823	4,660,571	4,673,297	4,682,997
4,600,765	4,661,077	4,673,508	4,683,002
4,617,148	4,661,085	4,673,687	4,683,350
4,619,755	4,661,634	4,673,871	4,683,520
4,623,408	4,662,574	4,674,263	4,683,553
4,627,708	4,662,716	4,674,302	4,683,780
4,628,122	4,663,388	4,674,434	4,683,802
4,628,798	4,663,705	4,674,436	4,684,538
4,631,627	4,664,157	4,674,865	4,684,842
4,634,250	4,664,905	4,675,897	4,684,870
4,635,229	4,665,250	4,675,986	4,684,983
4,635,701	4,665,726	4,676,322	4,685,387
4,636,093	4,665,967	4,676,961	4,685,495
4,639,895	4,666,755	4,676,991	4,685,852
4,640,424	4,666,807	4,677,717	4,686,156
4,643,013	4,666,933	4,677,896	4,686,788
4,643,650	4,667,194	4,677,968	4,687,674
4,643,873	4,667,676	4,677,989	4,687,694
4,643,885	4,668,301	4,678,015	4,688,322
4,645,954	4,668,568	4,678,086	4,688,936
4,646,375	4,668,801	4,678,636	4,689,153
4,648,540	4,668,874	4,678,937	4,689,801
4,649,195	4,669,557	4,679,045	4,693,903
4,651,612	4,669,744	4,679,110	

1085 OG 28

DECEMBER 15, 1987

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1085 OG 29

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	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
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	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 24, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	9-11-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-05-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-24-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	9-06-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-02-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-06-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during October 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

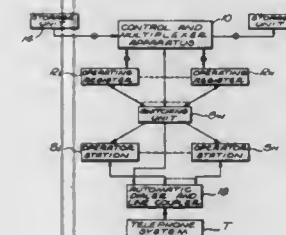
Patents Numbers 3,531,806 to 3,537,106, inclusive
Plant Patents Numbers 2,991 to 2,995 inclusive

REEXAMINATIONS

DECEMBER 15, 1987

Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,989,899 (796th)
TELEPHONE SCHEDULING SYSTEM
 Daniel Norwich, Beverly Hills, Calif., assignor to Telecredit Inc., Los Angeles, Calif.
 Reexamination Request No. 90/001,163, Feb. 4, 1987.
 Reexamination Certificate for Patent No. 3,989,899, issued Nov. 2, 1976, Ser. No. 566,643, Apr. 8, 1975.
 Int. Cl.⁴ H04M 11/00, 1/26
 U.S. Cl. 379—134



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-8 is confirmed.

1. A telephone scheduling system for use in cooperation with a telephone network, comprising:
 storage means for storing a plurality of data cells including data on individual telephone numbers identifying stations to be contacted along with representations of message information;
 at least one operating station including a telephone instrument, cue manifesting means, register means for receiving signals from said storage means representative of said data cells, and means for supplying data cell signals representative of message information from said register means to said cue manifesting means;
 an automatic dialing means coupled to said telephone network and connected to receive data cell signals representative of telephone numbers from said operating station register means, for dialing said stations to be contacted;
 sensing means coupled to said telephone network for providing an answer signal to indicate contact with one of said stations to be contacted and an interrupt signal to indicate termination of telephonic contact; and
 sequence control means for sequentially providing signals representative of said data cells from said storage means to said operating station register means, returning said data cells to said storage means, and actuating said automatic dialing means, said telephonic instrument, and said cue manifesting means, under control of said sensing means.

B1 4,445,944 (797th)
HEAT TREATMENTS OF LOW EXPANSION ALLOYS
 Darrell F. Smith, Jr., and Edward F. Clatworthy, both of Huntington, W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.
 Reexamination Request No. 90/001,202, Mar. 23, 1987.
 Reexamination Certificate for Patent No. 4,445,944, issued May 1, 1984, Ser. No. 302,975, Sep. 17, 1981.
 Int. Cl.⁴ C21D 7/14; C22F 1/10
 U.S. Cl. 148—12.3

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 and 5-18 is confirmed.

Claims 2 and 3 are determined to be patentable as amended.

Claim 4, dependent on an amended claim, is determined to be patentable.

New claims 19-26 are added and determined to be patentable.

1. The method for providing elevated temperature notch strength in wrought products made of an alloy consisting essentially of about 34% to about 55% nickel, about 5% to about 25% cobalt, about 1.5% to about 5.5% columbium, about 1% to about 2% titanium, no more than 0.2% aluminum, up to about 0.1% carbon and the balance essentially iron, said columbium being replaceable by tantalum on the basis of two parts of tantalum for each part of columbium by weight, which comprises annealing said product at a temperature of about 1650° F. to about 1925° F. and then heating said annealed product in an intermediate temperature range of about 1375° F. to about 1550° F. for a time sufficient to overage said product, with the proviso that said intermediate temperature and time are upwardly graduated as the annealing temperature is increased, said temperature and time relationship being equivalent to at least 8 hours at the intermediate temperature of 1425° F. when the annealing temperature is 1900° F., and then heat treating said product in a lower temperature range of about 1100° F. to 1400° F. for at least 8 hours to provide in said product a notch strength of at least about 100 hours at 1000° F. and 100 ksi.

B1 4,486,944 (798th)
METHOD OF MAKING SINGLE POLY MEMORY CELL
 Kim C. Hardee, Manitou Springs, Colo., assignor to Immos Corporation, Colorado Springs
 Reexamination Request No. 90/001,107, Oct. 3, 1986.
 Reexamination Certificate for Patent No. 4,486,944, issued Dec. 11, 1984, Ser. No. 485,732, Apr. 18, 1983.
 Division of Ser. No. 164,285, Jun. 20, 1980.
 Int. Cl.⁴ H01L 21/80
 U.S. Cl. 437—52

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 3 is cancelled.

Claims 1, 2, 4 and 5 are determined to be patentable as amended.

Claims 6-8, dependent on an amended claim, are determined to be patentable.

New claims 9-13 are added and determined to be patentable.

1. A method for fabricating a static RAM bistable flip-flop memory cell having a pair of transfer transistors and a pair of driver transistors on a wafer of semiconductor material, including the steps of:

doping to form a buried ground line beneath the surface of a substrate portion of the wafer;
establishing a layer of insulation over said wafer; and after said doping and establishing steps, then



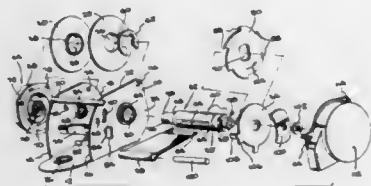
depositing only a single layer of polycrystalline silicon ("poly") on the wafer crossing over said conductive regions in the substrate; thereafter
doping and etching said poly layer to delineate a power supply line over said ground line, a word line, and a pair of load resistors in said single poly layer; thereafter
establishing insulation between the [polysilicon] poly layer and a metal layer to be established subsequently; and thereafter
establishing metal data lines for the memory cell said data lines being formed over said ground line and said power supply line.

B1 4,562,977 (799th)

EASILY ASSEMBLED SEAT BELT RETRACTOR AND METHOD

William Hollowell, Pacific Palisades, Calif., assignor to American Safety Equipment Corp., Troy, Mich.

Reexamination Request No. 90/001,159, Jan. 27, 1987.
Reexamination Certificate for Patent No. 4,562,977, issued Jan. 7, 1986, Ser. No. 536,292, Sep. 27, 1983.
Int. Cl.⁴ B60R 22/34; B65H 75/48
U.S. Cl. 242-107.4 D



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 3 is cancelled.

Claim 1 is determined to be patentable as amended.

Claims 2 and 4-12, dependent on an amended claim, are determined to be patentable.

New claim 13 is added and determined to be patentable.

1. A safety belt retractor comprising:

a retractor frame having [a] an integrally formed bottom and left and right side walls and open top; said side walls having inside faces facing each other and outside faces, said side walls each also having a belt storage spool shaft receiving opening for rotatable mounting of a belt storage spool shaft and wherein said left spool shaft receiving opening has a smaller diameter than said right spool shaft receiving opening;

a belt storage spool shaft having a left end, a middle portion, and right end, said belt storage spool shaft being sufficiently long so that said left and right spool shaft ends extend outward through their respective left and right side wall belt storage spool shaft receiving openings to position at least a portion of said belt storage spool shaft ends on the outside of said retractor frame when said belt storage spool shaft is rotatably mounted to said retractor frame, and wherein said spool shaft left end has a smaller diameter than said spool shaft right end, said belt storage spool shaft including a left shoulder portion between said left end and said middle portion to abut against said left wall inside face in said retractor frame when said spool shaft is mounted therein, said left shoulder portion having a diameter equal to or less than the diameter of said spool shaft right end, and said spool shaft middle portion having a diameter equal to or less than the diameter of said spool shaft right end;

means for rotatably mounting said belt storage spool shaft within said belt storage spool shaft receiving openings in said retractor frame side walls, said means for rotatably mounting said spool shaft including retainer spring means mountable on said belt storage spool shaft adjacent said right wall inside face when said storage spool shaft is mounted to said retractor frame for maintaining the position of said storage spool shaft left shoulder adjacent said left wall inside face during rotation of said belt storage spool shaft;

a left belt rub protector disc having a centrally located storage spool shaft receiving opening;

a circular collar integral with said disc surrounding the belt storage spool shaft receiving opening in said disc, said collar being press fit onto said belt storage spool shaft to provide [means] for mounting of said left belt rub protector disc on said belt storage spool shaft adjacent said left side wall inside face;

a right belt rub protector disc having a centrally located belt storage spool shaft receiving opening;

a circular collar integral with said disc surrounding the belt storage spool shaft receiving opening in said disc, said collar being press fit onto said belt storage spool shaft to provide [means for] mounting of said right belt rub protector disc on said belt storage spool shaft adjacent said [left] right side wall;

a safety belt;

means for mounting said safety belt to said belt storage spool shaft, said safety belt being extendable between a retracted position where said belt is wound around said belt storage spool shaft and an extended position where said belt is unwound from said belt storage spool shaft;

means associated with said belt storage spool shaft left end and mounted to said left side wall outside face for biasing said belt storage spool shaft in a belt retraction direction; and

ratchet means for preventing extension of said belt upon actuation at selected positions between said belt retracted and extended positions;

actuation means for actuating said ratchet means at said selected belt extension positions.

13. A safety belt retractor according to claim 1 which further includes brace bar means extending between the left and right side walls for providing support therebetween.

REISSUES

DECEMBER 15, 1987

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

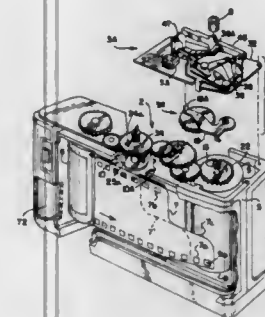
Re. 32,558

AUTOREWINDING SELF-THREADING CAMERA
Kwok Y. Chan, North Point, Hong Kong, assignor to Eastman Kodak Company, Rochester, N.Y.
Original No. 4,416,525, dated Nov. 22, 1983, Ser. No. 282,722, Jul. 13, 1981. Application for reissue Nov. 22, 1985, Ser. No. 801,133

Int. Cl.⁴ G03B 1/18;17/42

U.S. Cl. 354-173.1

53 Claims



32. In an electrically powered still camera for receiving a cassette film dispenser for a filmstrip having edge perforations, said camera including a film compartment for said cassette; a filmstrip take-up spool in said compartment; filmstrip capturing means on said take-up spool for capturing a film perforation with said filmstrip laid against said take-up spool and to wind the same forwardly when said take-up spool is driven in an advancing forward direction; manually operable shutter release means; film metering sprocket means for engaging a film perforation intermediate said dispenser and said take-up spool, and electric motor means energized in response to operation of said manually operable shutter release means for driving said take-up spool in a forward film winding direction to advance a captured filmstrip one frame, the improvement comprising: coupling means coupling said motor means to said film metering sprocket means so that the motor means drives the sprocket means forwardly at a lower speed than said take-up spool is driven forwardly unless decoupled from the motor means when the film metering sprocket is driven by the film movement, said coupling means including one-way clutch means operable between a freely decoupled condition and an engaged non-slipping condition for automatically decoupling said movable film metering sprocket from said motor means during rewind and when said take-up spool drives the filmstrip at a higher speed than said motor means drives said sprocket means during film advance; film metering switch means responsive to the movement of said film metering sprocket for de-energizing said motor means after a one-frame advance of said filmstrip; and shutter cocking means coupled to said film metering sprocket for re-cocking the shutter of said camera attendant to a one-frame advance of said film-engaging means when the sprocket means is driven in a forward direction.

Re. 32,559

CARD EDGE CONNECTOR LOCKING DEVICE
James L. Fedder, Harrisburg, and Attalee S. Taylor, Palmyra, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Original No. 4,487,468, dated Dec. 11, 1984, Ser. No. 453,653, Dec. 27, 1982. Application for reissue Nov. 20, 1986, Ser. No. 933,009

Int. Cl.⁴ H01R 13/639

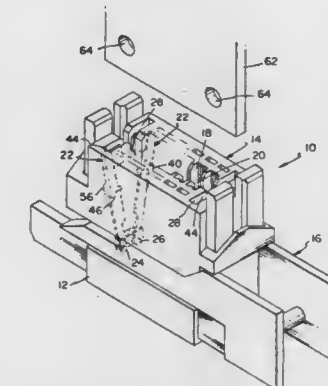
U.S. Cl. 439-325

6 Claims

6. A locking device for use with card edge connectors of the type having a lower housing, a vertically moving upper housing, a card

receiving slot and cavities normal to and opening into the slot, said locking device comprising:

a. a pair of identical, elongated arms pivotally disposed in the lower housing with the pivotal motion being normal to the card receiving slot, said arms extending upwardly into the upper housing and having on their upper ends a nose which faces towards the slot; and



b. a first follower on one side of each arm and cooperative cam means on the cavity wall adjacent thereto to pivot the arms in towards the slot as the upper housing moves upwardly whereupon the noses enter holes in a card which may be in the slot to lock the card therein, and a second follower on the other side of each arm and cooperative cam means on the cavity wall adjacent thereto to pivot the arms out from the slot as the upper housing moves downwardly whereupon the noses are withdrawn from the holes to unlock the card.

Re. 32,560

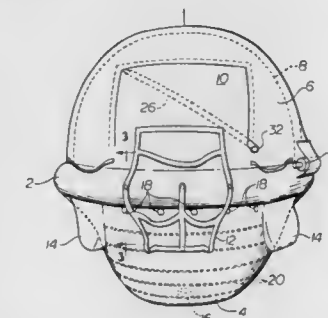
STABILIZED SURVIVAL RAFT

James A. Givens, 19 Willow St., Newport, R.I. 02840
Original No. 4,001,905, dated Jan. 11, 1977, Ser. No. 573,914, May 2, 1975. Continuation of Ser. No. 863,873, Dec. 23, 1977, abandoned, and a continuation-in-part of Ser. No. 314,389, Dec. 12, 1972, Pat. No. 3,883,913, which is a continuation-in-part of Ser. No. 216,990, Jan. 11, 1972, abandoned. Application for reissue Jul. 17, 1981, Ser. No. 284,200

Int. Cl.⁴ B63C 9/04

U.S. Cl. 441-37

12 Claims



1. A greatly improved device for assisting in the saving of lives at sea including a platform capable of supporting humans, said platform maintained in a stable upright floating condition by a buoyant peripheral flotation structure and [an attached main stabilizing chamber extending around the periphery of

the flotation structure,] a substantially closed, pendulous main stabilizing chamber secured to the flotation structure said chamber designed to be filled with the supporting fluid when the device is in use, the improvement comprising:

- a. [a circumferential] sheet means secured to the buoyant peripheral flotation structure at a point spaced from the attachment of the main stabilizing chamber and extending downwardly therefrom, said sheet means being secured to the main stabilizing chamber distally from the flotation structure thus forming a peripheral chamber, and
- b. openings in the wall of the [circumferential] sheet means whereby the peripheral chamber quickly fills with the supporting fluid and serves as a stabilizer until the main chamber fills with fluid.

Re. 32,561

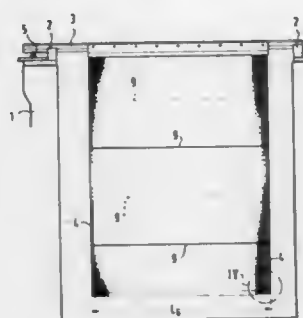
COATED METAL ANODE FOR THE ELECTROLYTIC RECOVERY OF METALS

Konrad Koziol, Rothenbach a.d. Pegnitz, and Erich Wenk, Nuremberg, both of Fed. Rep. of Germany, assignors to Conradt GmbH & Co. Metallektroden KG, Fed. Rep. of Germany
Original No. 4,391,695, dated Jul. 5, 1983, Ser. No. 231,165, Feb. 3, 1981. Application for reissue Jun. 11, 1984, Ser. No. 619,778

Int. Cl.⁴ C25B 11/02

U.S. Cl. 204—288

15 Claims



1. A coated metal anode for the electrolytic recovery of metals, the working surface of which is represented by rods which are arranged in a plane in spaced, parallel relationship to each other, and which are electrically connected to a current supply rail, wherein:

- said rods lie in a plane with the current supply rail, so as to create a substantially planar rectangular, surface of the anode;
- said rods being arranged in such a manner that a larger portion of the area of said rods extends perpendicular to the arrangement plane assumed by said rods than is congruent with said plane; and
- said rods are connected to said current supply rail at one end face; and
- both the electrical and mechanical connection of each rod with said current supply rail takes place by means of at least one connecting strip extending parallel to said rod; and wherein

one marginal region of said connecting strip is connected with said current supply rail and another marginal region is connected with said rods.

Re. 32,562

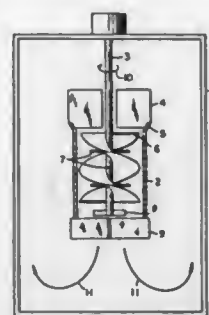
PROCESS AND APPARATUS FOR MIXING A GAS AND A LIQUID

Lawrence M. Litz, Pleasantville, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.
Original No. 4,454,077, dated Jun. 12, 1984, Ser. No. 396,281, Jul. 8, 1982. Application for reissue Jun. 10, 1986, Ser. No. 873,197

Int. Cl.⁴ B01F 3/04

U.S. Cl. 261—91

4 Claims



1. In a process for mixing a gas and a liquid in an apparatus comprising, in combination:

- (a) a vessel;
- (b) a cylindrical hollow draft member open at both ends and having a theoretical axis running from end to end, said axis being in a vertical position; [and the upper end of the draft member being conically flared;]
- (c) an axial flow down-pumping first impeller fixedly connected to a rotatable shaft, (i) the first impeller being positioned within the draft tube; (ii) the shaft corresponding in position to the axis; and (iii) the diameter of the first impeller being less than, but proximate to, the diameter of the draft tube;
- (d) first vertical baffling means disposed above the impeller;
- (e) means for rotating the shaft; and
- (f) means for introducing the gas and the liquid into the vessel and for removing gas and liquid from the vessel, the process comprising:

- (A) energizing the shaft to provide the first impeller with a rotational speed sufficient to cause (i) vortex formation downward from the surface of the liquid in the vicinity of the first vertical baffling means and [the flare] of the upper end of said draft member such that the gas is drawn into and down the draft tube and (ii) turbulence in the draft tube;
- (B) introducing a sufficient amount of liquid into the vessel to provide, during operation, a liquid level above the upper end of the draft tube; and
- (C) recovering liquid from the vessel, the improvement comprising

- (1) providing a rotational speed to the first impeller sufficient to impart a liquid velocity down the interior of the draft tube of at least one foot per second;
- (2) increasing the turbulence of the liquid at the shaft proximate to the first impeller;
- (3) in the area in the draft tube below the first impeller or in the area below, and immediately exterior to, the lower end of the draft tube, providing second vertical baffling means; and
- (4) in the area in the draft tube between the first impeller and the second vertical baffling means providing a radial flow impeller fixedly connected to the shaft whereby a high shear zone is created in the area heretofore mentioned in this paragraph (4).

2. In an apparatus for mixing a gas and a liquid comprising, in combination:

- (a) a vessel,
- (b) a cylindrical hollow draft member open at both ends and

having a theoretical axis running from end to end, said axis being in a vertical position; [and the upper end of the draft member being conically flared.]

- (c) an axial flow down-pumping first impeller fixedly connected to a rotatable shaft, (i) the first impeller being positioned within the draft tube; (ii) the shaft corresponding in position to the axis; and (iii) the diameter of the first impeller being less than, but proximate to, the diameter of the draft tube;
 - (d) first vertical baffling means disposed above the impeller;
 - (e) means for rotating the shaft; and
 - (f) means for introducing the gas and the liquid into the vessel and for removing liquid from the vessel, the improvement comprising:
- (1) protuberances or indentations located on the shaft or first impeller of sufficient size, and positioned, to increase the turbulence at the shaft proximate to the first impeller;
 - (2) second vertical baffling means located in the area in the draft tube below the first impeller or in the area below, and immediately exterior to, the lower end of the draft tube; and
 - (3) a radial flow impeller fixedly connected to the shaft located in the area in the draft tube between the first impeller and the second vertical baffling means whereby a high shear zone is created in said area.

Re. 32,563

CONTINUOUS WAVE MEDIUM FREQUENCY SIGNAL TRANSMISSION SURVEY PROCEDURE FOR IMAGING STRUCTURE IN COAL SEAMS

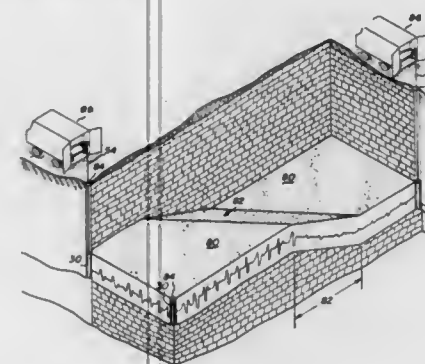
Larry G. Stolarczyk, Raton, N. Mex., assignor to Stolar, Inc., Raton, N. Mex.

Original No. 4,577,153, dated Mar. 18, 1986, Ser. No. 731,741, May 6, 1985. Continuation-in-part of Ser. No. 483,264, Apr. 8, 1983, abandoned. Application for reissue Jul. 28, 1986, Ser. No. 889,896

Int. Cl.⁴ G01V 3/12, 3/30

U.S. Cl. 324—334

20 Claims



1. A method for detecting geological anomalies in underground coal seam formations comprising
- placing an FM transmitter having continuous wave transmit capabilities in a medium frequency range of between approximately 300 KHz to approximately 800 KHz about a coal seam to be analyzed, the transmitter including a tuned-loop antenna for propagation through said seam;
 - placing a medium frequency FM receiver having continuous wave receive capability and including a tuned-loop antenna about said seam remote from the position of the transmitter with said seam intermediate to the transmitter and receiver, said tuned-loop antennas of the receiver and transmitter being positioned to be vertical to said seam, said receiver further including measuring and recording means for measuring and recording a plurality of characteristics of said received waves propagated through said seam;
 - exposing said seam to a plurality of transmissions of continuous wave medium frequency waves with an azimuthal

magnetic field component propagated horizontally through said seam from the transmitter towards the receiver;

measuring a plurality of signal transmission characteristics through said seam;

generating a number of data points by locating both the transmitter and receiver at several points about said seam such that for each transmitter location the receiver is placed at a plurality of preselected points about said seam; calculating a plurality of expected signal transmission characteristics through said seam; and

comparing said calculated signal transmission characteristics with said measured signal transmission characteristics and generating a graphical representation of said formation therefrom.

Re. 32,564

APPARATUS FOR DETERMINING THE RESISTIVITY OF A SUBSURFACE EARTH FORMATION AT DIFFERENT LATERAL DISTANCES FROM A BORE HOLE WALL

Andre Scholberg, Corseaux, Switzerland, assignor to Schlumberger Technology Corporation, New York, N.Y.

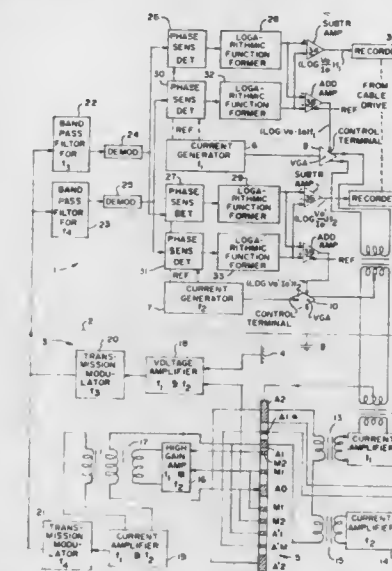
Original No. 3,772,589, dated Nov. 13, 1973, Ser. No. 233,668, Mar. 10, 1972. Application for reissue Aug. 13, 1980, Ser. No. 177,560

Claims priority, application France, Mar. 11, 1971, 71.08426

Int. Cl.⁴ G01V 3/24

U.S. Cl. 324—373

22 Claims



1. An apparatus for the electrical investigation of earth formations traversed by a borehole, comprising:
- a. an electrode system comprising a central electrode for emitting current having frequencies f_1 and f_2 into said formation and four pairs of electrodes respectively short-circuited and aligned symmetrically about said central electrode at increasing distances therefrom, the central electrode and the electrodes of the third and fourth pairs being called current electrodes, the electrodes of the first and second pairs being called voltage electrodes;
 - b. means for producing an alternating current at a first frequency, f_1 , coupled between the [electrodes of the fourth pair and at least one of the other current electrodes] third electrode pair and the fourth electrode pair to focus f_1 current emitting from said central electrode;
 - c. means for producing an alternating current at a second frequency, f_2 , coupled between [one of the current electrodes and] an electrode at electrical infinity with respect to the electrode system, and one of the third and fourth electrode pairs, said one of the third and fourth electrode

pairs being further coupled through a low impedance at frequency f_2 with the other of said third and fourth electrode pairs to focus f_2 current emitting from said central electrode;

d. means for maintaining the potential difference between the first and second pairs of electrodes at substantially zero, said means adapted to monitor the potential difference between the first and second pairs of electrodes and to emit current from the central current emitting electrode

in response to the measured potential difference to reduce the potential difference to zero; and

e. means for measuring the electrical potential proximate to one of the first and second pairs of electrodes and the current emitted from the central electrode to produce therefrom signals representative of the electrical resistivity of the formation [located] at different lateral distances from the borehole.

PLANT PATENTS

GRANTED DECEMBER 15, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,060

CHRYSANTHEMUM NAMED 'RED REFLA'

Martinus van der Jagt, Ter Aar, Netherlands, assignor to Chrysanthemum Breeders Association, N.V., Netherlands Antilles
Filed Sep. 30, 1985, Ser. No. 781,991

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinctive variety of Chrysanthemum as described and illustrated in the foregoing specification and accompanying drawings.

ularly characterized as to distinctiveness by the combined characteristics of commercial double flower type, flat, slightly reflexed form, miniature size of 45 to 65 mm. diameter, light orange with scarlet red variegated color, medium response, 6 to 8 flowers and buds showing color per stem, medium 10 to 12 cm. peduncle length, strong peduncle strength, and tall plant height.

6,061

CARNATION PLANT NAMED ACE HIGH

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 30, 1985, Ser. No. 792,989

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—70

1 Claim

1. A new and distinct cultivar of *Dianthus caryophyllus*, Linn., named Ace High as described and illustrated, and partic-

ularly characterized as to distinctiveness by the combined characteristics of commercial double flower type, flat, slightly reflexed form, miniature size of 45 to 65 mm. diameter, light orange with scarlet red variegated color, medium response, 6 to 8 flowers and buds showing color per stem, medium 10 to 12 cm. peduncle length, strong peduncle strength, and tall plant height.

6,062

CHRYSANTHEMUM NAMED 'RENEW'

Martinus van der Jagt, Ter Aar, Netherlands, assignor to Chrysanthemum Breeders Association NV, Netherlands Antilles
Filed Sep. 30, 1985, Ser. No. 781,884

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinctive variety of Chrysanthemum as described and illustrated in the foregoing specification and accompanying drawings.

1027

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PATENTS
GRANTED DEC. 15, 1987

ERRATA

For CLASS	See PATENT NO.
437-027	4,712,291
040-417	4,712,403
209-455	4,712,682
206-631	4,712,727
439-033	4,712,846
439-155	4,712,847
439-327	4,712,848
439-607	4,712,849
439-861	4,712,850
428-472	4,712,121
437-029	4,712,329
585-424	4,713,424

PATENTS

GRANTED DECEMBER 15, 1987

GENERAL AND MECHANICAL

4,712,251

NURSING BLANKET

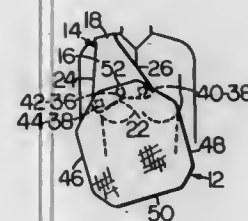
Danna J. Cobble, P.O. Box 7294, Oklahoma City, Okla. 73153

Filed Nov. 10, 1986, Ser. No. 928,919

Int. Cl.⁴ A41D 13/10, 1/20

U.S. Cl. 2—49 R

1 Claim



1. A nursing garment for concealing the mother's breast and child's head and upper torso, comprising:

an elongated fabric bib means characterized by longitudinally extending front and back end portions of substantially equal mass respectively overlying the right or left upper chest and back area of the user and being integrally interconnected in longitudinally aligned relation by a shoulder overlying portion having a transverse width substantially less than the transverse width of the front and back portions for normally maintaining the bib means balanced on a user's shoulder,

said front portion having a depending end surface substantially defining an arcuate concave curve between its lateral limits at least partially complementary with the curve of the upper limit of a user's breast;

fabric sheet blanket means depending from said bib means and characterized by opposing marginal side edges converging upwardly toward an upwardly disposed end edge of substantially equal dimension with respect to and overlying the lowermost end portion of the bib front portion; and,

a plurality of spaced-apart pairs of fasteners separably joining, in overlying relation, the respective ends and medial portion of the upper end edge portion of said blanket means to the depending end portion of said bib front portion for normally concealing the user's breast and a nursing child,

whereby the medial portion of the blanket upper end edge may be separated from the bib front portion for air circulation and user viewing the nursing child.

4,712,252

ANTI-WIND RAINCOATS

Hsui C. Chou, 181, Guang Hwa 1 Rd., Kaohsiung, Taiwan (800);

Jeef Wu, 2F, No. 9-1, Lane 80, Guang Fu 1 St., and John

Chang, 19, Alley 24, Lane 29, Chung Hwa 1 Rd., both of

Kaohsiung, Taiwan

Filed Apr. 22, 1987, Ser. No. 41,116

Int. Cl.⁴ A47B 3/04

U.S. Cl. 2—87

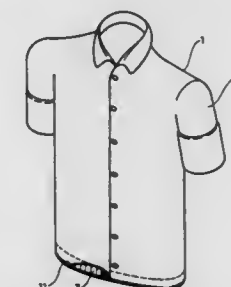
1 Claim

1. A kind of anti-wind raincoat comprising, a coat made of cloth that can prevent wind or rain from blowing through or wetting, and having two sleeves at the shoulders, and a horizontal zipper at the lowest part for hiding a skirt able to be rolled up inside or rolled down when the zipper has been pulled open,

sleeves having separately a ring of sticker fastening around its upper part and around inside near elbows which can stick together when the sleeves are folded up short,

a skirt made up as a kind of pleated skirt extending down from the lowest part of the coat, having a vertical opening at its front; one side and the other side of the opening are

vertically set with a sticker fastening separately inside and outside which can be stick together, and having the characteristics that in fine weather the skirt can be rolled up and hidden in the lowest part of the coat by means of the horizontal zipper set around the coat, and the sleeves



can be folded up short kept steady by sticking together the sticker fastenings, and that in wet weather the skirt can be rolled down by pulling open the zipper and stuck together by the sticker fastenings and the sleeves can also be folded down long by releasing the sticker fastenings.

4,712,253

HUNTING GLOVE WITH TELESCOPIC FOREFINGER SHEATH

Yi-Yi Chen, P.O. Box 10160, Taipei, Taiwan

Filed Dec. 22, 1986, Ser. No. 945,008

Int. Cl.⁴ A41D 19/00

U.S. Cl. 2—159

3 Claims



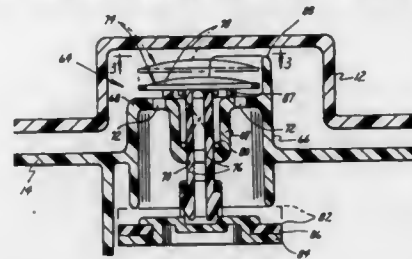
1. A hunting glove with telescopic forefinger sheath comprising:

an elastic thick covering formed on a palm piece of a mitten and having cut with an U-shaped opening within said covering to form an U-shaped lid as positioned approximately between a finger cushion and a phalanx of a wearer's forefinger when wearing such a mitten, said thick covering having sound elasticity such that said lid is adapted to be automatically recovered to close said U-shaped opening; and

a soft forefinger sheath having a thickness thinner than that of said covering and having a sound toughness and hand feeling and having a lower edge of the forefinger sheath fixed on an oval-shaped opening of a lining jacketed inside the palm piece and a back piece of the mitten, said oval-shaped opening said forefinger sheath being corresponding with said U-shaped opening of said elastic thick covering, and said forefinger sheath adapted to telescopically protrude through said U-shaped opening and said lid of

said covering and to retract therethrough to be concealed inside the mitten.

handle in a position maintaining said valve in its closed position in response to removal of said seat section from said holding



4,712,254

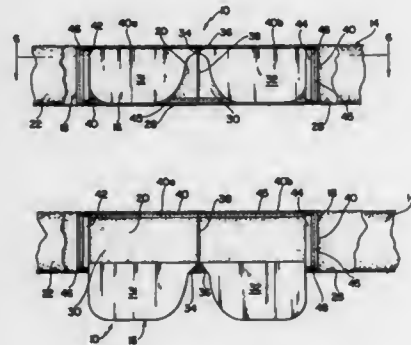
HEADBAND AND EYEPiece COMBINATION

Ronald H. Daigle, 20 Nickerson St., Cranston, R.I. 02910
Filed Aug. 29, 1986, Ser. No. 902,180

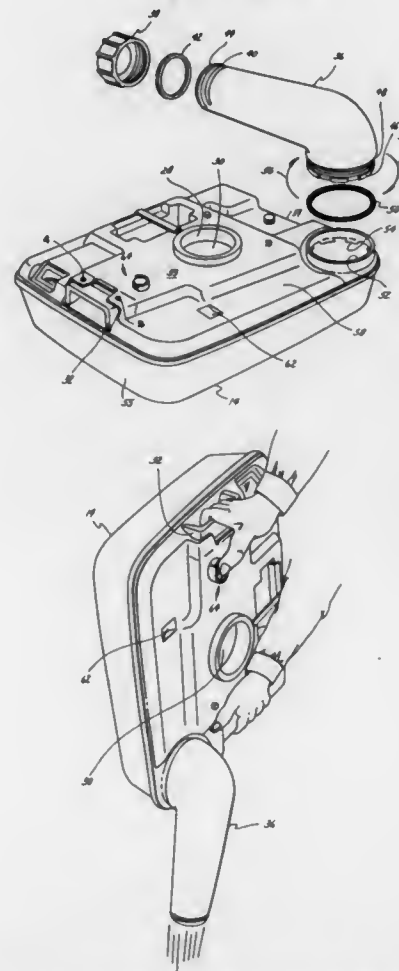
Int. Cl.⁴ A61F 9/02

U.S. Cl. 2-452

8 Claims



1. A headband and eyeglasses combination consisting essentially of a headband element having an open pocket therein which opens outwardly along an edge thereof, said headband element being receivable in encircling relation on the head of a wearer so that it extends across the forehead of said wearer in snug engagement therewith and so that said pocket opens downwardly adjacent said forehead, a flexible eyepiece receivable in said pocket, and means securing said eyepiece to said headband element so that it is alternatively positionable in a retracted first position wherein it is received in the pocket and a second position wherein it extends downwardly from the headband element and is disposed in front of the eyes of said wearer.



tank section to insure that said valve is closed during emptying and carrying of said holding tank.

4,712,255

PORTABLE TOILET WITH VALVE ACTUATING HANDLE THAT AUTOMATICALLY LOCKS THE VALVE IN CLOSED POSITION DURING EMPTYING OF THE HOLDING TANK

John M. Antos, Ann Arbor, and John R. Selina, Ypsilanti, both of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Aug. 20, 1986, Ser. No. 898,466

Int. Cl.⁴ E03D 1/00; A47K 11/02, 11/03

U.S. Cl. 4-323

5 Claims

1. In a portable toilet having a holding tank section and a seat section separably mounted on the holding tank section, said seat section including a bowl and said holding tank section including a valve which is operable to allow contents of the bowl to be deposited into the holding tank, a discharge spout via which the contents of the holding tank may be emptied after the seat section has been removed from the holding tank, a handle for operating said valve, means releasably locking said

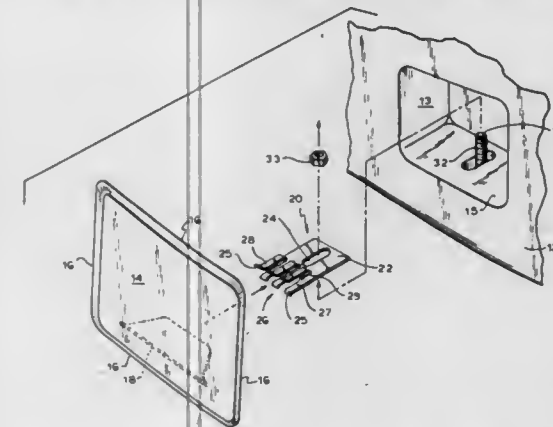
4,712,256
COVER PLATE AND MOUNTING CLIP ASSEMBLY
Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 3, 1986, Ser. No. 835,820
Int. Cl.⁴ E03D 11/00

U.S. Cl. 4-661

5 Claims

1. An assembly to conceal an opening which houses a mounting bolt of a sanitary fixture, said assembly comprising: a cover plate and metal retainer clip; said clip having a generally rectangular, flat body segment, one section of which is formed having an elongated longitudinal slot for receiving a shank of a threaded anchor bolt and another section formed having at least three parallel, horizontally extending gripping fingers, two of which are coplanar and are in spaced apart relation, said other finger being offset therefrom and positioned between said two spaced apart fingers; said cover plate, formed of a flexible, deformable plastic

material having its outer surface contoured to generally coincide with the outer surface of the sanitary fixture when mounted thereto; said plate having a flange which extends horizontally away from the inner surface of said plate, said flange being aligned with said space formed between said gripping fingers of said clip, said gripping fingers having means releasably latching said horizontal flange to hold said plate in fixed position; and said latch means formed on said at least two gripping fingers, being in the form of a projection extending obliquely



upwardly and away from the end of each finger so that when said horizontal flange of said cover plate is inserted between said gripping fingers, said projections are imbedded therein to latch said plate in fixed position.

4,712,257

INVALID HOISTS

David R. James, Tirley, England, assignor to Impro Limited, Gloucestershire, England

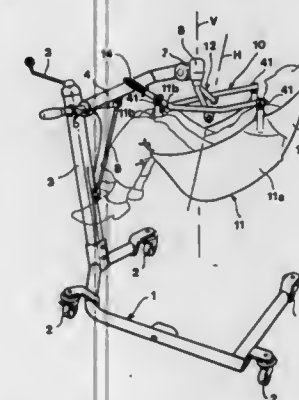
Filed Nov. 25, 1986, Ser. No. 934,786

Claims priority, application United Kingdom, Dec. 21, 1985, 8531561; Aug. 15, 1986, 8619894

Int. Cl.⁴ A61G 7/10

U.S. Cl. 5-83

14 Claims



1. An invalid hoist comprising a lifting arm, a sling hanger support mounted at the outer end of said arm so as to turn about a rigid vertical bearing axis, a sling hanger which is a unitary construction supported by said sling hanger support so as to be pivotable about a horizontal axis relative to the sling hanger support, said sling hanger presenting spaced sling attachment points on both sides of said horizontal axis for connection of one pair of sling attachments to one side of the horizontal axis and for connection of a second pair of sling attachments to the opposite side of the horizontal axis, and means for locating said sling hanger in angular position about said horizontal axis and which allow the latter to be infinitely adjustable in position throughout an operative range of pivotal movement about said horizontal axis.

4,712,258

BABY CHANGING MAT

Harold J. Eves, 78 Fort Picklecombe, Maker, Near Torpoint, Cornwall, United Kingdom

PCT No. PCT/GB84/00283, § 371 Date May 15, 1985, § 102(e)

Date May 15, 1985, PCT Pub. No. WO85/01197, PCT Pub.

Date Mar. 28, 1985

Continuation of Ser. No. 740,042, May 15, 1985, abandoned.

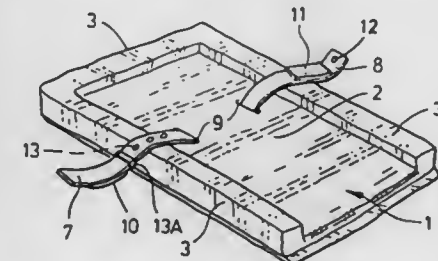
This PCT application Aug. 16, 1984, Ser. No. 942,956

Claims priority, application United Kingdom, Sep. 17, 1983, 832490

Int. Cl.⁴ A47C 27/08

U.S. Cl. 5-424

14 Claims



1. A portable baby changing mat comprising a flexible padded body intended to be used on any flat substantially rigid horizontal surface and provided with means for resisting lateral movement of a baby lying on the upper, working surface of the mat, the mat further comprising a substantially rigid transverse stabilising member located below the said working surface of the mat and extending across the full width of the mat but with a limited extent along the length of the mat and fixed relative to the mat, the mat retaining longitudinal flexibility at all portions not coextensive with said stabilising member, the means for resisting lateral movement of a baby comprising straps attached to the mat to cooperate with the said stabilising member and arranged to be secured around the chest of the baby lying on its back on the mat to hold the baby on the mat, so that the baby is prevented from rolling the mat or itself over sideways by the combined action of the transverse stabilising member and the straps.

4,712,259

INFLATABLE TRAVEL PILLOW WITH CASE

Moise Chiasson, 5326A Pierre Tetreault, Montreal, Quebec, Canada H1K 2Y9

Filed Apr. 8, 1987, Ser. No. 35,923

Claims priority, application Canada, Apr. 15, 1986, 506745

Int. Cl.⁴ A47G 9/00

U.S. Cl. 5-441

3 Claims



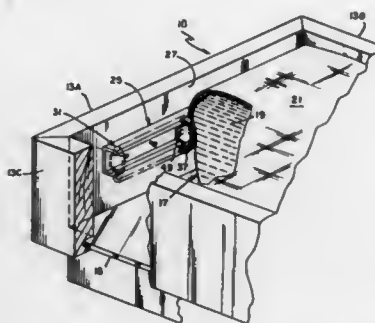
1. A portable travel pillow comprising the combination of an inflatable pneumatic enclosure, a slipcover adapted to receive and contain the pneumatic enclosure when inflated, a wall of the slipcover comprising an opening formed with a closure and an envelope surrounding the opening, said envelope having dimensions suitable to receive the remainder of the slipcover

when the envelope is inverted through the opening and the slipcover stuffed into the opening and the deflated pneumatic enclosure stowed therewithin.

4,712,260

WATERBED AND HOLDER ASSEMBLY FOR USE THEREWITH

Steve F. Bissel, 8 Robb Rd., Beverly, Mass. 01915
Division of Ser. No. 867,534, May 28, 1986, Pat. No. 4,683,602.
This application May 14, 1987, Ser. No. 49,554
Int. Cl.⁴ A47C 27/08; A47G 9/00
U.S. Cl. 5—451



14 Claims

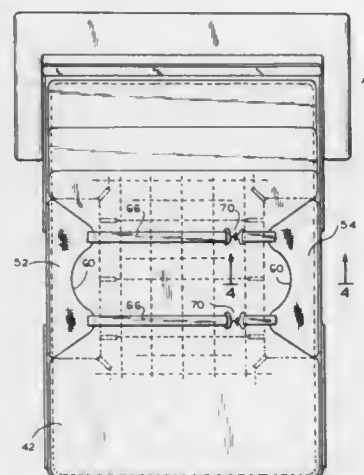
1. A holder assembly for releasably securing an article of bedclothing to a waterbed frame, said holder assembly comprising:

- a base member for being secured to said frame;
- an expandable, resilient member having a first portion for being secured to said article of bedclothing and a second portion for being releasably secured to said base member;
- first retention means for releasably securing said second portion of said expandable, resilient member to said base member;
- said first retention means including first and second cooperating adhesive materials for being releasably secured along a common surface thereof; and
- second retention means for engaging said expandable, resilient member against said base member.

4,712,261

MATTRESS GUARD

Bernard Castro, Ocala, Fla., assignor to Castro Convertible Corporation
Continuation of Ser. No. 714,164, Mar. 20, 1985, abandoned.
This application Apr. 27, 1987, Ser. No. 45,250
Int. Cl.⁴ A47C 31/00
U.S. Cl. 5—499



1. A mattress guard for use in a convertible sofa bed mattress

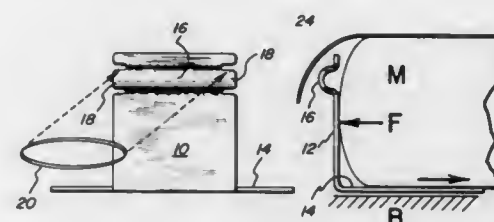
having a flat and a folded condition which is supported on a foldable frame to which a mattress support is secured and which is adapted to have bedding thereon, said mattress having an upper side and a lower side, said mattress guard comprising a pair of flexible mattress edge guard sheet members which adapted to be connected together when said bed is unfolded and to hold said bedding for the mattress securely against the mattress and prevent it from becoming entrapped in said folding mechanism when said bed is folded, each of said guard sheet members having first and second opposed edges, elastic means for resiliently interconnecting said first edges of said guard sheets on said upper side of the mattress in both said flat and folded conditions, said elastic means comprising two spaced apart pairs of opposed stretchable elastic straps with the first strap of each pair connected to the first edge of one guard sheet and the second strap of each pair connected to the first edge of the other guard sheet and releasable means respectively associated with each pair of straps for releasably connecting said first strap to said second strap of each of said pairs across the upper side of said mattress, said first opposed edges of said guard sheet members having a centrally disposed concave region between said elastic straps and means on said second edges for securing said second edges to said mattress support below the mattress.

4,712,262

BEDDING RETAINER

Frank Viggiano, East Greenbush, N.Y., assignor to FMR Corporation, Albany, N.Y.
Filed Jan. 20, 1987, Ser. No. 4,640
Int. Cl.⁴ A47C 21/02
U.S. Cl. 5—508

2 Claims



1. A planar fabric retention apparatus for securing said fabric to the top surface of a liquid filled bladder comprising: an "L" shaped semi-rigid bracket which has a detent projecting from the upper margin of the vertical leg in a direction essentially opposite the lower base leg; and an elastic band to resiliently fit about said detent whereby a planar fabric passed over said detent may be captured thereon by affixing said band thereabout.

4,712,263

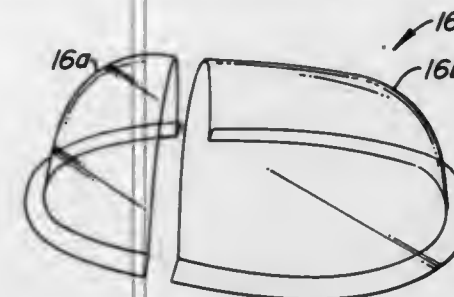
NEONATAL BLANKET

Catherine Pronzinski, 1390 Cadence Way, Santa Rosa, Calif. 95401
Filed Dec. 24, 1986, Ser. No. 946,305
Int. Cl.⁴ A61G 11/00; A47C 21/00; A47D 15/00
U.S. Cl. 5—508

7 Claims

1. A blanket for a neonatal infant comprising: a flexible, collapsible cover having a central cavity portion of a size to generally accommodate a neonatal infant, said central cavity having an inside surface; and an edge portion for placement on a bedding surface, so that when said cover is placed over said infant, said edge rests upon said bedding surface, said central cavity inside surface does not contact said infant, and said cover forms a

barrier to convective air currents said blanket being segmented into at least two portions, so that one portion can extending circumferentially spaced ribs, the ribs of one pad being out of alignment with the ribs of the other pad, and



be removed from said bedding surface without the removal of the other.

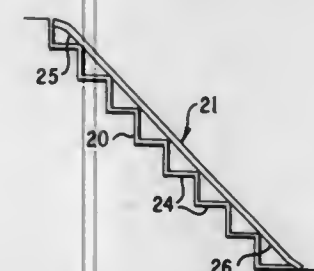
4,712,264

MODULAR STEP RAMP

Thomas P. Volth, 666 Wall St., West Hempstead, N.Y. 11552
Filed Sep. 29, 1986, Ser. No. 912,821
Int. Cl.⁴ E01D 1/00

U.S. Cl. 14—69.5

16 Claims



1. A stairway ramp comprised of a plurality of modules constructed to fit into right angular recesses as defined by the treads and risers of a set of stairway steps, each said module being used in pairs comprising tread and riser walls connected at their inner ends at a substantially right angle so as to abut the tread and riser of a respective step, means adapted to be traversed by a wheeled load and being connected with said tread and riser walls of the module at the upper ends thereof, and coupling means at least on one end of each module adjacent to one end of the said means adapted to be traversed for releasably connecting the module with another adjacent module of a stairway ramp.

4,712,265

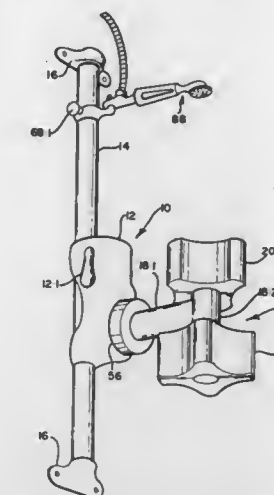
DEVICE FOR CLEANING THE HUMAN BODY

Kenneth A. Williams, 217 Milner Rd., South Claremont, Cape Town, Cape Province, South Africa
Filed Jan. 21, 1986, Ser. No. 820,950
Claims priority, application South Africa, Jan. 24, 1985, 85/0584; Jun. 4, 1985, 85/4226
Int. Cl.⁴ A47K 7/04

U.S. Cl. 15—97 R

10 Claims

1. A device for cleaning the human body, the device comprising a casing structure, drive means within the casing structure, first and second generally cylindrical cleaning pads for engagement with the body of a person using the device, said pads being spaced apart along a common longitudinal axis, each pad being of sponge and each having a series of axially



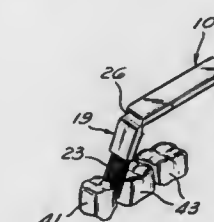
transmission means connecting the drive means to the cleaning means so that said pads are rotated about said common axis.

4,712,266

WHISK PICK

Chikara Yamaki, Sendai, Japan, assignor to Fan Out Co., Ltd., Orange, Calif.
Continuation of Ser. No. 764,420, Aug. 9, 1985, abandoned. This application Dec. 23, 1986, Ser. No. 946,653
Int. Cl.⁴ A46B 9/04
U.S. Cl. 15—167.1

9 Claims



7. An improved dental cleaning appliance in the nature of a toothpick having a single extruded plastic material linear member with a dental treatment device fabricated at each end of said member, wherein the improvement comprises: a brush end formed at one end of the single extruded linear member; and a neck formed in said linear extruded member adjacent to the brush end with the plastic material selected to permit the elastic bending of the single extruded member adjacent said brush end to a selective, fixed angular position, whereby the toothpick-type appliance is provided with a bendable, brush device to assist in the cleaning ability of the dental appliance.

4,712,267

CONVERTIBLE TOOTHBRUSH

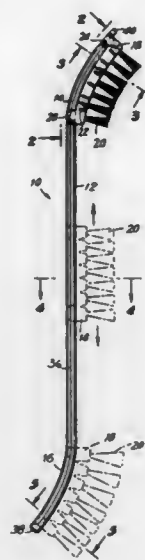
Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8
Filed Dec. 4, 1986, Ser. No. 937,873
Int. Cl.⁴ A46B 9/04

U.S. Cl. 15—172

17 Claims

1. A convertible toothbrush, comprising: an elongated handle of shape-retaining material and having a curved portion; a flexible brush block for supporting bristles; and means mounting the flexible brush block on the handle for

longitudinal movement along the elongation of the handle, said curved portion bending the flexible block and the



bristles supported thereon into a correspondingly curved configuration when the flexible block is moved onto the curved portion.

4,712,268

DEVICE FOR CLEANING UP FLOORS

Aaro Heinonen, SF-25460, Toija, Finland

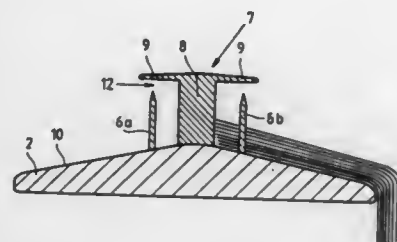
Filed Apr. 22, 1986, Ser. No. 854,999

Claims priority, application Finland, May 15, 1985, 851946

Int. Cl.⁴ A47L 13/20

U.S. Cl. 15—231

4 Claims



1. An apparatus for sweeping floors comprising: a frame-part connectable to a stick; at least two spikes mounted on the frame-part for detachably receiving a cleaning cloth by punching the cloth to the spikes; and a protector for each spike for protecting the user from the spike and the spike from outside knocks, the protector comprising a shank attached to the frame-part and a spike protector connected to the shank near the point of the spike.

4,712,269

VEHICLE ICE SCRAPER HAVING DEFORMABLE BLADE

Billie C. Worthen, 362 Oak Tree Ct., Hoffman Estates, Ill. 60194

Filed Jun. 9, 1986, Ser. No. 871,681

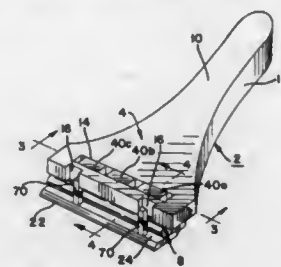
Int. Cl.⁴ B60S 3/04

U.S. Cl. 15—236 R

6 Claims

1. An ice scraper for the removing of ice from vehicle glass, comprising: body means having a handle for gripping by a user, blade means carried by said body means and having a blade

member forming a continuous scraper edge along one edge of said blade member, said blade member having a second edge spaced from said one edge, said blade member having at least one cut out section positioned inward from said second edge and opening from said second edge, and



said at least one cut-out-section acting to permit said scraper edge to deform in conforming relationship to the curvature of the glass being contacted by said edge upon the application of pressure on said handle.

4,712,270

BRAKE DRUM ENCAPSULATOR

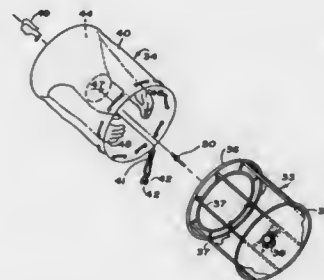
Gary E. Palmer, Roselle, Ill., assignor to Hako Minuteman, Inc., Addison, Ill.

Filed Feb. 2, 1987, Ser. No. 9,837

Int. Cl.⁴ A47L 5/14

U.S. Cl. 15—345

7 Claims



1. Apparatus for encapsulating brake drums comprising: a support stand; a frame having a generally open side wall and substantially open first and second ends; means for mounting said frame to said stand; a flexible cover having at least a continuous side wall of transparent, flexible, gas impermeable material, an open end for receiving said frame, and a continuous closed end wall of flexible material; means for drawing the open end of said cover about a brake assembly received in said cover and frame for substantially sealing said open end, said frame and cover being adapted to be coupled to means for evacuating the interior of said cover; the closed end wall of said cover having material of an area greater than the planar area thereof to permit back and forth as well as lateral motion within said apparatus; and means defining at least one glove integral with the closed end wall of said cover and adapted to receive at least one hand of an operator inside said cage for manipulating said drum assembly while permitting full vision of said drum assembly through said side wall.

4,712,271

MOUNTING PLATE FOR A FURNITURE HINGE WHICH IS ADJUSTABLE IN HEIGHT

Günter Sundermeier, Bünde, Fed. Rep. of Germany, assignor to Paul Hettich GmbH & Co., Kirchenger, Fed. Rep. of Germany

PCT No. PCT/DE85/00178, § 371 Date Jan. 3, 1986, § 102(e) Date Jan. 3, 1986, PCT Pub. No. WO86/00367, PCT Pub. Date Jan. 16, 1986

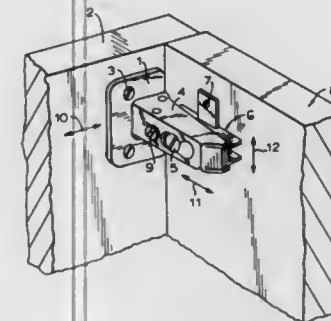
PCT Filed May 24, 1985, Ser. No. 844,354

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 8418939

Int. Cl.⁴ E05D 7/04

U.S. Cl. 16—238

6 Claims



1. Mounting plate for a furniture hinge which is adjustable in height and has a hinge arm mountable on the mounting plate, the plate comprising an upper part (13) and a base plate (14) which is mountable on a furniture body, the base plate (14) engaging in a center area thereof in recesses (25) of the upper part and extending transversely to a longitudinal axis (20) thereof and being displaceably and lockably mounted therein, said base plate being formed with an abutment plate (21) which has front faces (23), said upper plate having an inner chamber, said abutment plate being received in said inner chamber, said front faces limiting an adjustment path of the upper part with respect to the base plate.

4,712,272

PORTIONING, SHAPING AND DISPENSING APPARATUS

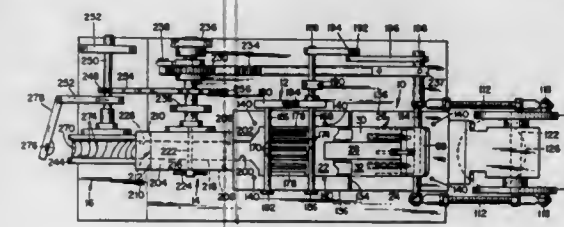
Arnold Soodalter, University Park Apts.-Apt. M-1, Easthampton Rd., Holyoke, Mass. 01040

Filed Dec. 16, 1986, Ser. No. 942,440

Int. Cl.⁴ A22C 7/00

U.S. Cl. 17—32

2 Claims



1. Apparatus for portioning, shaping and dispensing a plurality of molded, spherically shaped meatballs comprising: a food product entry area including a food product supply hopper and an interconnecting compression chamber for the containment and pressurizing of the food product, sets of spaced interdigitating food product engaging fingers swingably mounted in the supply hopper for moving the food product into the compression chamber, a pair of spaced wiper blades swingably mounted in the supply hopper for wiping food product from the hopper walls, compression means within the compression cham-

ber comprising a trio of side-by-side compactors and a compactor carrier, the compactors including a central compactor flanked by outside compactors all linked to the compactor carrier, the central compactor being rigidly linked to the compactor carrier and the outside compactors being spring-loaded and mounted for reciprocatory movement relative to the compactor carrier, the compression means pressurizing the food product within the compression chamber preparatory to and during the movement of the food product into a positioning area, the portioning area including a drum rotatable confined within a housing and having a diametrically-disposed opening therethrough defining a pair of aligned radially-arranged pockets of alternately increasing and decreasing size according to the movement of a plug limitedly-reciprocable within the opening in the area intermediate the two pockets, the pockets of the drum each communicating through the housing in seriatim first as a receiving pocket with the compression chamber for shaping, and measuring a charge of the food product loaded thereinto from the compression chamber responsively to the motivation of the compactors and second as a dispensing pocket with atmosphere for dispensing the shaped and portioned charge from the area into the shaping and dispensing area, with the compressing stroke of the compactor maintaining a tension on the food product during loading into the receiving pocket and therefollowing during a momentary dwell period as rotation of the drum out of register with the compression chamber is initiated following which the compactors are retracted in relieving stroke as the food product charged pocket is completely encapsulated by the cooperant drum and plug and housing is rotated into dispensing position as effected by the loading of the second-to-be-filled pocket and the resultant limited sliding movement of the plug within the drum opening, the portioned food product exiting from the portioning area to the shaping and dispensing area, the shaping and dispensing area comprising a grooved shaping wheel mounted for rotation relative to a grooved fixed shoe, the food product being deposited in the groove between the shaping wheel and fixed shoe for imparting a spherical shape thereto, with the resultant shaped article being dispensed into a suitable receiving means.

4,712,273

DEVICE FOR DELIVERING A PASTY STUFFING MATERIAL IN PORTIONS

Wolfgang Wagner, Sonnentalweg 21, 2067 Reinfeld, Fed. Rep. of Germany

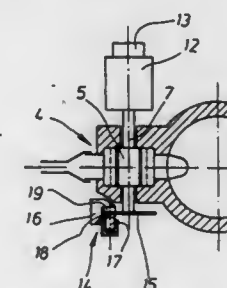
Filed May 16, 1986, Ser. No. 863,952

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518529

Int. Cl.⁴ A22C 11/04

U.S. Cl. 17—37

10 Claims



1. A device for delivering a pasty stuffing material in portions, comprising: pressure generating means for charging said material with a static pressure;

an outlet channel for permitting said material to move under the influence of said static pressure; shut-off and controlling means in said outlet channel; said shut-off and controlling means including a vane rotor; a motor connected to said vane rotor; said motor being effective for urging said material through said vane rotor, whereby a controlling function is performed; means for stopping said vane rotor; and said vane rotor being effective for blocking a flow of said material through said outlet channel when said vane rotor is stopped, whereby a shut-off function is performed.

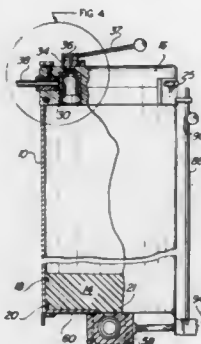
4,712,274

SAUSAGE STUFFER

David C. Curtis, 411 E. Waverly, Arlington Heights, Ill. 60004
Filed Jul. 16, 1986, Ser. No. 886,107

Int. Cl.⁴ A22C 11/06

U.S. Cl. 17-39



1. A vertically disposed, portable sausage stuffer apparatus, a housing comprising a cylinder open at one end, a piston in said cylinder movable by water pressure, means to control the action of the piston in said cylinder, a removable header for closing said open cylinder end, means to move the header, and a sausage stuffer tube positioned in said header and extending outwardly thereof, said cylinder having an open end and a closed bottom wall, spaced plates upwardly extending and secured to an upper end of said housing and extending beyond said open end for positioning said header, a plurality of depending, spaced legs secured to the lower end of said housing and having spaced apertures therein, wheels on a pair of said legs for portability, the other pair of legs being longer than the pair to which said wheels are attached to support the apparatus in vertical position.

4,712,275

METHOD FOR DRIVING A BALE OPENER

Fritz Hösel, Mönchengladbach; Hans-Jürgen Marx, and Josef Temburg, both of Jüchen, all of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Sep. 19, 1984, Ser. No. 652,095

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334789

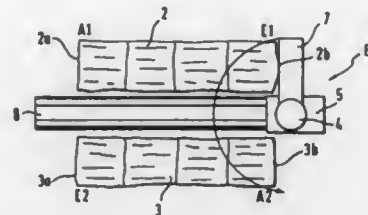
Int. Cl.⁴ D01G 7/04

U.S. Cl. 19-80 R

5 Claims

1. In a method of operating a bale opener, including the steps of propelling a carriage of the bale opener in a path of travel to execute consecutive back and forth passes in a generally horizontal direction along and between two parallel fiber bale rows having opposite end faces defining a length boundary for each bale row; removing, during each pass, fiber tufts from the top of the fiber bales of one of the rows by an opening device supported laterally by a tower mounted on the carriage; the improvement comprising the step of turning, upon reaching the end of each pass, the tower through 180° about a generally vertical axis for swinging the opening device through 180°

from above an end zone of one bale row to above an adjacent end zone of the other bale row such that the opening device,



during its swinging motion, remains substantially in its entirety within the end boundary of at least one of the bale rows.

4,712,276

CARDING ROLLER FOR PROCESSING STAPLE FIBERS

Peter Krusche, Aachen, Fed. Rep. of Germany, assignor to Hergeth Hollingsworth GmbH, Duermen, Fed. Rep. of Germany

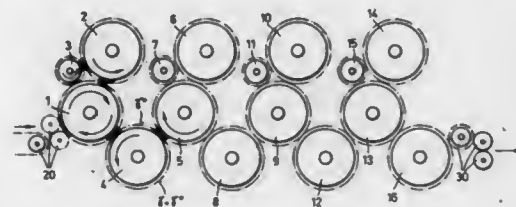
Filed Aug. 13, 1986, Ser. No. 900,040

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531151

Int. Cl.⁴ D01G 15/02

U.S. Cl. 19-99

10 Claims



1. Carding roller apparatus of the type which includes a number of operative carding units each of which includes a plurality of rollers for processing staple fibers; wherein said operative carding units are arranged in tandem to provide a desired effect of the carding and levelling capacity; and each operational unit consisting of four rollers which cooperate with each other in the carding process which include a high speed roller, a working roller contacting said high speed roller at a carding point with fiber circulation, a stripper roller disposed in advance of the working roller in the travel direction of said rollers, a carding and transfer roller contacting the high speed roller at a carding point with fiber circulation and for assisting in the transfer of fibers from one said operative carding unit to an adjoining operative carding unit, said carding and transfer roller including a second carding point at the next adjoining operative carding unit with fiber circulation and an additional fiber storage volume between said first and second carding points to provide increased blending and levelling of fibers, and said working roller and high speed roller having generally equal diameters.

4,712,277

METHOD AND APPARATUS FOR PRODUCING A CONTINUOUS WEB

Lennart Gustavsson, Växjö, Sweden, assignor to Fläkt AB, Nacka, Sweden

Filed Dec. 3, 1986, Ser. No. 937,562

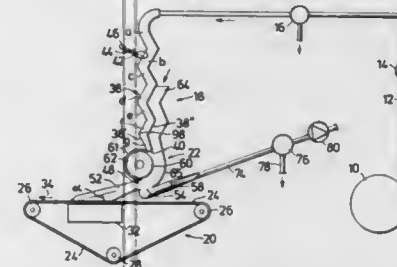
Int. Cl.⁴ D01H 5/00

U.S. Cl. 19-296

22 Claims

11. Apparatus for producing a continuous web of material including a preparatory station for fibers; a transport conduit for transporting a suspension of acceptable fibers and reject material in a carrier gas away from said preparatory station; a

distribution and delivery apparatus connected to said conduit to receive the flow of said suspension and incorporating in series, a transition part, a separator means, and a pair of alternative outlets comprising a reject outlet for receiving coarse particles and an accept outlet for accepting fine fibers; a distribution chamber connected to said accept outlet; a gas-permeable moving belt operable to pass through said chamber to receive said fine fibers in a continuous web thereon; and suction means in said distribution chamber underlying moving belt to carry away the carrier gas of said suspension;



said separator means including a convex surface having a curvature confronting the flow of said suspension, said transition part directing the suspension to flow tangentially along said convex surface and to follow the curvature thereof due to the Coanda Effect, said accept outlet being positioned downstream of said convex surface adjacent to said surface and said reject outlet being positioned radially outward from said surface, whereby the curved flow path of said suspension along said convex surface causes finer fibers to flow through said accept outlet and causes coarser reject particles to flow through the reject outlet.

4,712,278

EARLESS CLAMP STRUCTURE

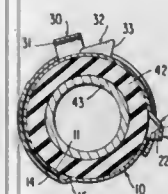
Hans Oetiker, Oberdorfstrasse 21, CH-8810 Horgen 2, Switzerland

Filed Oct. 22, 1986, Ser. No. 921,411

Int. Cl.⁴ B65D 63/02

U.S. Cl. 24-20 TT

21 Claims



1. An earless clamp structure whose open ends are adapted to be mechanically interconnected, comprising clamping band means provided near its free ends with mechanical interconnecting means for mechanically interconnecting the free ends when the clamp structure is at least approximately in the installed condition, said mechanical interconnecting means including at least one cold-deformed support hook means pressed-out of the clamping band means near one end thereof and aperture means near the other end of the band means, said support hook means having abutment surface means operable to engage with the side of said aperture means extending transversely to the longitudinal direction of said band means and nearer the other end of said band means, and two further means in said band means each including tool-engaging surface means extending substantially transversely to said longitudinal direction for engagement with a clamp-tightening tool, one of said further means being located intermediate said support hook

means and said one end and being in the form of substantially longitudinally extending tab-like means pressed-out of the band material of the band means and provided with said tool-engaging surface means on the side of said tab-like means opposite said one end, the other further means being located in the area of the side of said aperture means opposite said first-mentioned side, and said tab-like means being of such shape and so located in said band means as to be able to extend through said aperture means with movability in the circumferential direction to enable tightening of the clamp structure by applying mutually oppositely directed tightening forces at said tool-engaging surface means until said support hook means is able to engage with its abutment surface means at said side of the aperture means.

4,712,279

CLASP FOR PERSONAL ORNAMENTS

Mamoru Hiraishi, Hino, Japan, assignor to Heiwado Boueki Kabushiki Kaisha, Tokyo, Japan

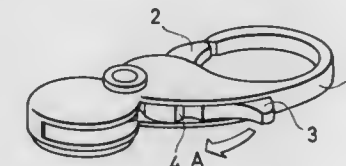
Filed Sep. 16, 1986, Ser. No. 907,913

Claims priority, application Japan, Jul. 18, 1986, 61-167829

Int. Cl.⁴ A44B 13/00

U.S. Cl. 24-241 R

4 Claims



1. A clasp for personal ornaments comprising: a hook shaped main body, a closing piece pivotally mounted in the main body biased by a spring so as to close an opening thereof, said closing piece having a closing portion at one end thereof, an operating portion at the other end thereof, and an engaging portion intermediate of said closing portion and said operating portion, and a locking member engaging said engaging portion at a position of said closing piece where said closing portion opens said opening of said main body and holding said closing piece at said position.

4,712,280

STRAP FASTENER

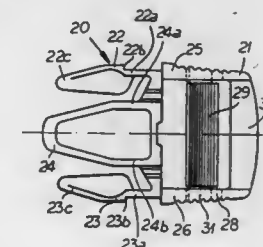
Gerhard Fildan, Dieselstrasse 20, D-7250 Leonberg, Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 855,099

Int. Cl.⁴ A41F 1/00

U.S. Cl. 24-625

2 Claims



1. A separable connector for two strap ends, comprising: a socket member constituted as a flat body formed with an insertion opening at one side thereof subdivided into a central opening and a pair of lateral openings flanking said central opening, a central passage extending linearly into

said body from said central opening, and respective lateral passages each extending into said body from a respective one of said lateral openings and terminating in respective locking slits provided at opposite edges of said body; and a plug member constituted with a flat body formed with a central guide tongue insertable through said central opening and guided into said central passage, and a pair of outer tongues flanking said central tongue and elastically deflectable inwardly toward said central tongue and insertable in said lateral openings and slidable in said lateral passages, said outer tongues having end formations engageable in said slits for impeding withdrawal of said plug member from said socket member, and wherein: said central guide tongue has a generally V shape in a projection in a plane parallel to said members truncated at a free end of said central guide tongue and is formed with a shank having parallel edges at an opposite end of said central guide tongue connected to said body of said plug member, said parallel edges defining therebetween a maximum width of said tongue, said lateral tongues each have shanks which extend generally parallel to said shank of said central guide tongue and terminate in end portions engageable with said parallel edges, said central tongue tapering in thickness from a region of said end portions to said free end, said central passage is separated from each of said lateral passages by respective pairs of guide ribs formed on said body of said socket member and engageable with said plug member the guide ribs of each pair projecting toward one another from opposite ends of the socket member, said pairs of guide ribs are spaced apart by a distance substantially corresponding to the spacing of said parallel edges from one another and at least equal to half of a width of the insertion opening of said socket member, said body of said socket member is formed with a bar at a side thereof remote from the other body when the bodies are engaged with one another and defining therein a slot accommodating a respective strap end, and said body of said plug member is provided with a window bordered by a movable bar and a fixed bar and forming a clamp element for another strap end received between the bars of said window.

4,712,281

NAPPED WARP-KNITTED FABRIC AND METHOD OF PRODUCING SAME

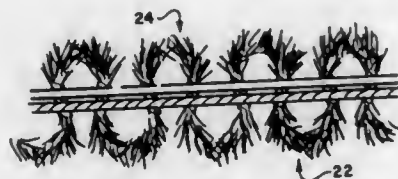
Holger Scheller, Greensboro, N.C., assignor to Guilford Mills, Inc., Greensboro, N.C.

Filed Oct. 30, 1986, Ser. No. 925,716

Int. Cl.⁴ D06C 13/08

U.S. Cl. 28—162

10 Claims



1. A method of producing a warp knitted fabric of at least two bar construction having a nappable surface on both the technical face and the technical back of said fabric, said method comprising:

providing a warp knitting machine having at least top, middle and bottom yarn guide bars with pile loop forming means mounted on said bottom bar; warp knitting a set of ground yarns on said middle bar of said machine to form a fabric substrate; simultaneously warp knitting a set of pile yarns on said top bar of said machine and over said pile loop forming means

on said bottom bar to knit said pile yarns into said substrate in needle loops at the technical face of said fabric forming a first nappable surface and in elongated pile underlap loops at the technical back of said fabric forming a second nappable surface; said underlap loops being nappable to produce a plush surface on the technical back of said fabric and being further adapted to be partially drawn sufficiently from the technical back of said fabric through said substrate to the technical face of said fabric into said needle loops upon napping of said needle loops to render said needle loops nappable to produce a plush surface at the technical face of said fabric of a comparable thickness to the technical back of said fabric; and then napping at least one of said nappable surfaces.

4,712,282

MACHINE TOOL

Ramon Romeu, La Ségurie, Saint-Jean-Lespinasse, 46 400 Saint-Cere, France

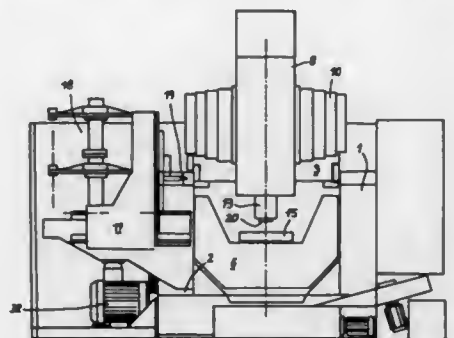
Filed Jul. 28, 1986, Ser. No. 889,955

Claims priority, application France, Jul. 26, 1985, 85 11457

Int. Cl.⁴ B23B 7/00; B23C 1/14

U.S. Cl. 29—27 C

9 Claims



1. A machine tool comprising a frame having two strong uprights, guideways carried on the uprights, a general slide guidedly engaged in the guideways, a cradle, journals for mounting the cradle on the uprights to pivot about a horizontal first pivot axis, a plate for receiving and holding a workpiece to be machined, a driving shaft carrying the workpiece-holding plate and mounted on the cradle to rotate about a second axis which is fixed in translation relative to the cradle, machining means comprising turning tool means, support means, at least some of which support means are movable in three different directions in space, for supporting the machining means so that the machining means may be moved toward the plate in a wide range of inclinations of the cradle about the pivot axis, indexed driving means drivingly connected to one of the journals of the cradle so as to pivot the cradle about the horizontal pivot axis, a transmission extending through one of the journals of the cradle and drivingly connected to the shaft of the plate, and an exterior fixed power motor fixed relative to said frame and drivingly connected to said transmission for ensuring the power rotation of the driving shaft of the workpiece-holding plate.

4,712,283

SYSTEMS INCLUDING AT LEAST ONE VERTICAL TURNING MACHINE OR THE LIKE AND AT LEAST TWO AUXILIARY STATIONS

Mario Bertorello, Turin, Italy, assignor to Rotomors S.p.A., Orbassano, Italy

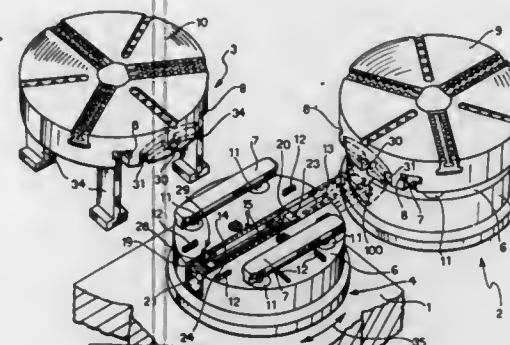
Filed Feb. 19, 1985, Ser. No. 702,458

Claims priority, application Italy, Dec. 7, 1984, 68220 A/84

Int. Cl.⁴ B23Q 41/02

U.S. Cl. 29—33 P

12 Claims



1. In a system including at least one vertical turning machine or like machine tool and at least two auxiliary stations, respective pallets on which pieces being worked are mounted, each pallet having pairs of through grooves in its lower face on opposite sides of the corresponding diametral plane of symmetry and parallel to this plane, and pallet supports at the turning machine and the auxiliary stations, each pallet support having straight guides engageable by said through grooves of said pallets, at least one said pallet support having means for moving said guides, a device for moving the pallets between the guides of adjacent pallet supports, wherein said device includes:

a cursor mounted close to the upper face of at least one of the pallet supports and movable parallel to the respective guides along a path equidistant from said guides; a T-shaped hook member projecting from said cursor; means defining at least one radial slot in the lower face of a said pallet, starting from the periphery thereof, and arranged to receive the T-shaped member, said slot having an inner end portion the width of which corresponds at least to that of the transverse head of the T-shaped member and the length of which is slightly greater than the thickness of said member, and a drive mechanism for imparting movements to the cursor such as to move the T-shaped element between a starting position in which it is engageable with said slot of the pallet when the latter is located on the pallet support and a final position in which the pallet is located on and centered relative to one of the adjacent pallet supports, said drive mechanism including a double-acting hydraulic cylinder fixed to the bottom of a diametral through seat formed in the upper face of the pallet support, a piston shaft projecting from said cylinder, a pair of identical chains carrying said cursor pairs of coaxial sprockets over which said chains pass, one of said sprocket pairs being located close to one end of said seat; the sprockets forming part of a carriage, a part of said carriage opposite the said end of the seat being fixed to the end of the piston shaft of said hydraulic cylinder, and the lower passes of said chains being fixed to the body of the hydraulic cylinder close to the end of the cylinder from which the piston shaft projects.

4,712,284

POWER TONGS WITH HYDRAULIC FRICTION GRIP FOR SPECIALITY TUBING

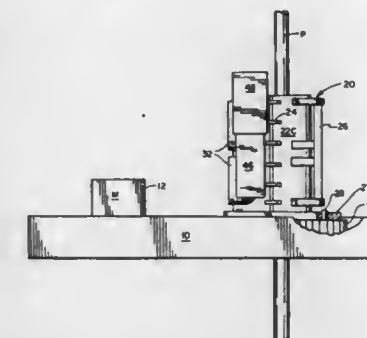
William E. Coyle, Sr., Houma, and Dennis J. Penisson, Raceland, both of La., assignors to Bilco Tools Inc., Houma, La.

Filed Jul. 9, 1986, Ser. No. 886,195

Int. Cl.⁴ B25B 13/50

U.S. Cl. 29—240

9 Claims



1. In a power tongs for well pipe, having a rotary head with plural jaws mounted thereon for movement radially with respect to the pipe, the improvement comprising an air-driven pump for hydraulic fluid mounted on the rotary head, an expansible chamber motor mounted on the rotary head for driving at least one of the jaws radially inward against the pipe when hydraulic fluid under pressure from said pump is applied thereto, pressure controlling means operatively connected between said pump and said expansible chamber motor, whereby jaw force can be controlled independent of tongs torque, and a quick-connect fitting for temporarily connecting said air-driven pump to an external compressed air line in order to pressurize the expansible chamber motor and thus clamp the pipe between the jaws, and check valve means between said pump and said expansible motor permitting fluid to flow only in the direction of the latter, so that the line can thereafter be disengaged from the pump, thereby permitting unlimited rotation of the tongs head.

4,712,285

METHOD FOR ACHIEVING FLUID-TIGHTNESS OF A PLASTIC SLEEVE FOR PROTECTING SPLICES OF ELECTRIC CABLES OR TELEPHONE CABLES

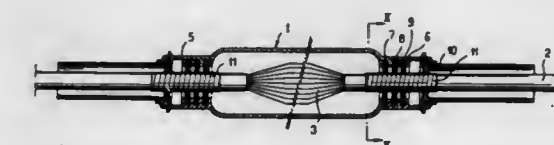
Jacques Morel, Le Moulin du Roi, and Didier Morel, Favières, both of France, assignors to Etablissements Morel - Ateliers Electromecaniques de Favières, Chateaufort en Thymerais, France

Filed Mar. 11, 1986, Ser. No. 838,598

Int. Cl.⁴ B21D 39/02

U.S. Cl. 29—458

2 Claims



1. A method for forming a tight seal between two half-shells (1a, 1b) to be assembled together along their adjacent edges (2a, 2b) according to a plane of assembly (M), comprising providing two half-shells (1a, 1b), the edge (2a) of one half-shell (1a) being provided with a longitudinal rib (12) to be engaged within a groove (13) formed in the edge (2b) of the

other half-shell (1b), said groove (13) having an inner side wall (14) of sufficiently small thickness to be flexible, the height (H) of the rib (12) to be engaged in said groove being slightly smaller than the depth (P) of the groove, the rib (12) having a face (12a) adjacent to the interior of said one half-shell (1a), the inner face (14a) of said flexible wall (14) forming with said inner face, when said rib is engaged into said groove, an angle (a) of a few degrees having a vertex (15) located at the extremity of said wall, the faces (17, 18) of the rib (12) and of the groove (13) which are opposite to the flexible wall (14) being applied against each other substantially perpendicular to the plane of assembly (M) of the two half-shells (1a, 1b), said method comprising the steps consisting in:

applying a flat strip of putty (16) against the inner face (14a) of the flexible wall (14) of said other half-shell (1b), the thickness of the strip of putty (16) being at least equal to the distance (d) between the summit (12b) and the rib (12) and the inner face (14a) of the flexible wall (14) when said rib is fully engaged in the groove, engaging the rib (12) into the groove (13), applying the two half-shells (1a, 1b) tightly against each other along the plane of assembly (M) and, putting under pressure the interior of the sleeve formed by said assembled two half-shells.

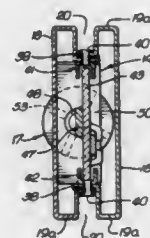
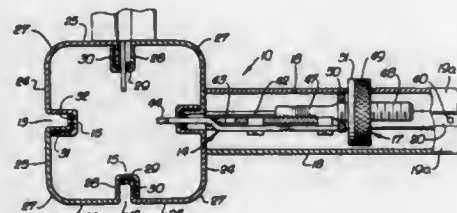
4,712,286

METHOD FOR MAKING MERCHANDISING DISPLAY MEMBERS

Morris A. Wolf, 7048 Macapa Dr., Los Angeles, Calif. 90068
Continuation-in-part of Ser. No. 496,260, May 19, 1983, Pat. No. 4,607,754. This application Jul. 25, 1986, Ser. No. 889,500
Int. Cl.⁴ B21D 39/02

U.S. Cl. 29—463

10 Claims



1. The method of forming an elongated hollow structural member having a preselected cross-sectional shape and a decorative outer side having longitudinal grooves therein formed with slotted inner walls, comprising the steps of:

providing a supply of elongated, generally flat strip material having a prefinished decorative surface on one side; forming a plurality of sections of said strip material each having longitudinal bends to form a side portion of said structural member and having connecting portions along its longitudinal edges, including the bending of a central portion of said strip material longitudinally to form an outside corner, and the bending of the edge portions of the strip material longitudinally to form a generally U-shaped channel along one edge portion having a bottom wall, and an offset foot along the other edge portion, shaped to

extend into the channel of an adjacent section and abut against the bottom wall of the channel thereof; fitting said sections together to form the hollow tubular structure with the connection portions thereof overlapping and with said feet in said channels thereby to define the longitudinal grooves; forming slots through said feet and said bottom walls spaced apart along the inner walls of said grooves; and securing the connecting portions together to form said member with said preselected cross-sectional shape.

4,712,287

METHOD OF ASSEMBLING A VEHICLE FROM MODULAR COMPONENTS

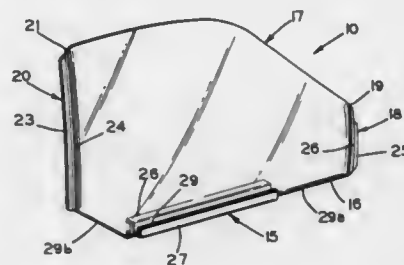
Norman W. Johnston, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed May 23, 1986, Ser. No. 866,446

Int. Cl.⁴ B23P 25/00

U.S. Cl. 29—469

31 Claims



1. A method of assembling a vehicle from a vehicle body and a plurality of modular window assemblies comprising the steps of:

- positioning a sheet of transparent material within the interior of a mold chamber formed by at least two cooperating mold sections; said mold sections provided with a gasket shaping portion which cooperates with a first peripheral portion of the sheet to define a first gasket forming cavity corresponding to a first gasket member to be formed and cooperates with a second peripheral portion of the sheet to define a second gasket forming cavity corresponding to a second gasket member to be formed;
- inserting a plug between said first and second cavities;
- injecting into the first and second gasket forming cavities a composition which is capable of polymerization when cured and, when cured in contact with the sheet, it adheres thereto to produce the first and second gasket members by injecting said composition into one of said first and second gasket forming cavities, removing said plug and then injecting said composition into the other one of said first and second gasket forming cavities;
- removing the sheet and the first and second gasket member as a modular window assembly from the mold chamber;
- repeating at least steps (a), (c) and (d) to produce a plurality of modular window assemblies; and
- attaching said plurality of modular window assemblies to a vehicle body to assemble a vehicle.

4,712,288

SPARK ERODER WITH FIXED MACHINE TABLE AND LOWERABLE WORKING CONTAINER FOR THE DIELECTRIC

Attilio Lodetti, and Hansueli Blaser, both of Losone, Switzerland, assignors to AG fur Industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

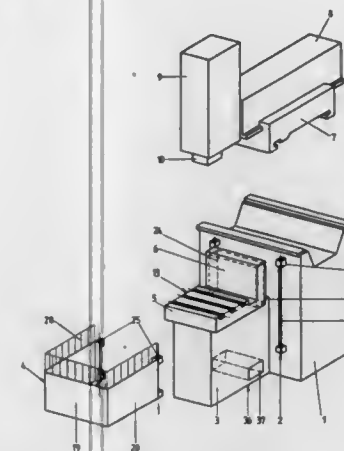
Filed Dec. 4, 1985, Ser. No. 805,152

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444390

Int. Cl.⁴ B23P 13/00

U.S. Cl. 29—557

17 Claims



1. A spark erosion machine comprising a machine upright; a fixed machine table disposed on a front side of the machine upright; a machine table plate attached to the machine table; a working container for containing dielectric fluid having a plurality of walls and a bottom and comprising a fixed component and at least one movable component, wherein the fixed component includes the machine table plate to form at least a portion of the bottom of the working container and a substantially vertical wall element attached to the machine table plate at a rear portion thereof to form at least a portion of that one of said walls of the working container which is disposed nearest to the machine upright.

4,712,289

INSTALLATION FOR THE AUTOMATIC GRINDING OF CURVED SURFACES

Wolfgang Stamm, Puchheim, and Dieter König, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

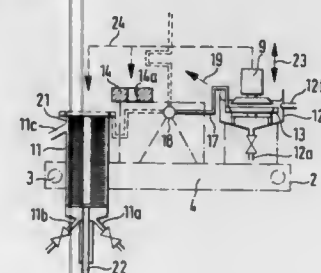
Filed Aug. 5, 1985, Ser. No. 762,676

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430856

Int. Cl.⁴ B23Q 3/157

U.S. Cl. 29—568

32 Claims



1. An installation for the automatic grinding of surfaces, especially of body surfaces to be painted, comprising a grinding aggregate including a rotating grinding wheel operatively connected with a grinding spindle means by way of a universal

joint and a grinding disk interchangeably secured at the rotating grinding wheel, the grinding aggregate being machine-guided during its operation, a grinding disk magazine means, means for automatically exchanging at the grinding wheel a used-up grinding disk for a new grinding disk, and clamping means for securing the rotating grinding disk at the grinding wheel, said clamping means being relatively rotatable with respect to the grinding wheel and enabling an automatic exchange of the grinding disk.

4,712,290

TEXTILE AND METHOD OF MANUFACTURE

James N. Lindsey, Sylacauga, Ala., assignor to Avondale Mills, Sylacauga, Ala.

Filed Jul. 28, 1986, Ser. No. 890,939

Int. Cl.⁴ D06L 1/14; D06M 16/00

U.S. Cl. 28—178

15 Claims

1. A method for treating a stiffened fabric to permit ready softening of garments manufactured therefrom, the fabric having been stiffened by the addition of at least 4% by weight corn starch and at least 0.4% by weight of a wax having a melting temperature below 150° F., said method comprising the steps:

of introducing into said fabric at least 0.25% by weight of a non-ionic wetter/re-wetter; and introducing into said fabric at least 0.5% by weight of at least one enzyme capable of decomposing corn starch while leaving said fabric essentially unaffected.

4,712,291

PROCESS OF FABRICATING TIW/SI SELF-ALIGNED GATE FOR GAAS MESFETS

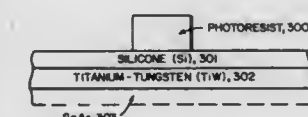
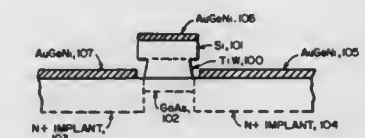
William V. McLevige, Plano, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 6, 1985, Ser. No. 741,643

Int. Cl.⁴ H01L 21/283

U.S. Cl. 437—27

11 Claims



1. A process of fabricating a metal silicon field effect transistor with a self-aligned mushroom gate from a gallium arsenide wafer, said self-aligned mushroom gate having a lower layer and a top layer, said lower layer being formed from titanium-tungsten and said top layer being formed from silicon, said process comprising the steps of:

forming an enhancement implant on the top surface of said gallium arsenide wafer; depositing a coating of titanium-tungsten on the top surface of said gallium arsenide wafer; forming a doped coating of silicon on the top surface of said coating of titanium-tungsten; forming said top layer of said self-aligned mushroom gate over the center of said top surface of said gallium arsenide wafer from said doped coating of silicon; forming said lower layer of said self-aligned mushroom gate from said coating of titanium-tungsten; doping with selected donor implants all areas of the top surface of said gallium arsenide wafer which are not cov-

ered by said self-aligned mushroom gate, said selected donor implants being selected from materials, including sulfur, which will diffuse laterally upon annealing; activating said selected donor implants by annealing them so that they diffuse laterally and reduce any spacing between the donor implants and the lower layer of the self-aligned mushroom gate; and applying source/drain ohmic contacts to the top surface of said self-aligned ohmic gate and said donor implants on said gallium arsenide wafer.

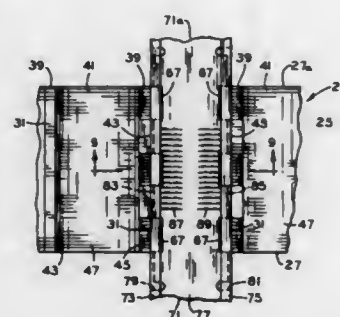
4,712,292

METHOD OF ASSEMBLING A STATIONARY ASSEMBLY FOR A DYNAMOELECTRIC MACHINE
James L. King, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 12, 1984, Ser. No. 660,101
Int. Cl.⁴ H02K 15/00

U.S. Cl. 29—596

29 Claims



1. A method of assembling a stationary assembly for a dynamoelectric machine, the stationary assembly having a core helically wound from a lanced strip of generally thin ferromagnetic material having a pair of opposite edges, a pair of opposite end faces on the core defining the axial length of the core, a plurality of spaced apart grooves in the lanced strip each having a pair of opposed sidewalls intersecting one of the opposite edges of the lanced strip and a base wall between the opposed sidewalls spaced from the one opposite edge of the lanced strip and with the grooves extending generally in axial row formation between the opposite end faces of the core, and a plurality of lands on the one opposite edge of the lanced strip intersecting with adjacent opposite sidewalls of the grooves in the lanced strip and extending generally in row formation between the opposite end faces of the core, respectively, and a set of beams with each beam including an intermediate portion interposed between a pair of opposite end portions and with the intermediate and opposite end portions being defined at least in part by a pair of opposite sidewalls integrally intersecting with a cross wall, a set of openings extending through the opposite sidewalls at least adjacent the intersections of the opposite sidewalls with the cross wall and at least in part within the intermediate portion, and a set of opposite marginal edges on the cross wall adjacent the openings and at least in part within the intermediate portion, respectively, the method comprising the steps of:

placing the intermediate sections of the beams at least in part within preselected ones of the grooves and extending the opposite end portions of the beams generally axially beyond the opposite end faces of the core, respectively; disposing a part of the opposite sidewalls of the beams within the intermediate sections thereof at least adjacent the opposite sidewalls of the preselected ones of the grooves and seating the cross walls of the beams within the intermediate sections thereof at least in part in engagement with the base walls of the preselected ones of the grooves during the placing and extending step, respectively; positioning the openings in the opposite sidewalls of the beam and the opposite marginal edges on the cross wall of the beams at least adjacent the opposed sidewalls of the

preselected ones of the grooves during the disposing and seating step; and displacing from the core a set of opposed sections including at least a part of the opposed sidewalls of the preselected ones of the grooves into overlaying engagement with confronting parts on the cross walls of the beams at least adjacent the openings and into abutting engagement with the opposite marginal edges on the cross walls of the beams and retaining thereby the beams against displacement from the preselected ones of the grooves.

4,712,293

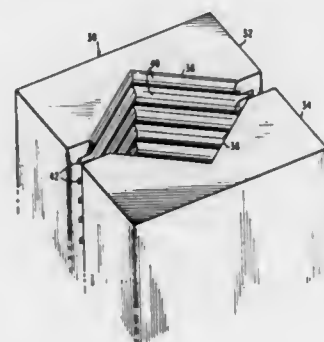
METHOD FOR SECURING A SLOW-WAVE STRUCTURE IN ENVELOPING STRUCTURE WITH CRIMPED SPACERS

Arthur E. Manoly, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 28, 1986, Ser. No. 935,871
Int. Cl.⁴ H01P 11/00; H01Q 13/00

U.S. Cl. 29—600

15 Claims



1. A method for securing a slow-wave structure for a traveling-wave tube within an enveloping structure comprising the steps of:

attaching a plurality of longitudinally disposed dielectric rods to the outer surface of said slow-wave structure to form a subassembly, mounting said subassembly within an enveloping structure comprising a plurality of annular non-magnetic spacer elements respectively interposed between and abutting a plurality of annular ferromagnetic disks, said spacer elements and said disks being coaxially disposed with the inner surfaces of said spacer elements and said disks defining a cylindrical surface of a diameter sufficient to receive said subassembly, and

applying plastically deforming force to the outer surface of said spacer elements to crimp said spacer elements onto said dielectric rods and thereby firmly hold said subassembly within said enveloping structure.

4,712,294

METHOD OF FORMING A HELICAL WAVE GUIDE ASSEMBLY BY PRECISION COINING

George M. Lee, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 789,882, Oct. 21, 1985, abandoned.
This application Feb. 24, 1987, Ser. No. 18,852

Int. Cl.⁴ H01P 11/00; B23P 11/00

U.S. Cl. 29—600

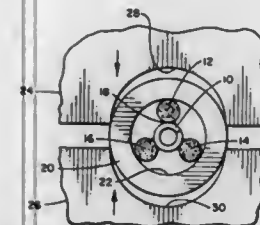
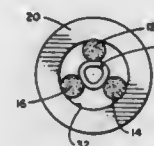
5 Claims

1. The method of securing a slow-wave structure in the barrel of a traveling-wave tube comprising the steps of:

mounting a helical slow-wave structure between at least three support rods having a circumscribing circular dimension;

placing the helical slow-wave structure with its support rods into a tubular barrel having an interior diameter greater

than the diameter of said circumscribing circular dimension; inserting the tubular barrel within a die having opposing faces which when the die is closed define a right circular cylinder of a diameter slightly less than the initial outer diameter of the barrel; and closing the die to directly coin the barrel around the support



rods such that the interior size of the barrel is reduced to a diameter less than that of said circumscribing circular dimension to engage the support rods which in turn resiliently compress and deform without axially elongating or changing the pitch of the helical slow-wave structure such that the compressed helical slow-wave structure maintains a return force on the rods to firmly hold the helical slow-wave structure and the support rods within the barrel.

4,712,295

CLAMP APPARATUS

Camille Peele, Pikeville, N.C.; Jon W. Harwood, Toledo, Ohio, and Peter L. Resuggan, Goldsboro, N.C., assignors to AP Industries, Inc., Toledo, Ohio

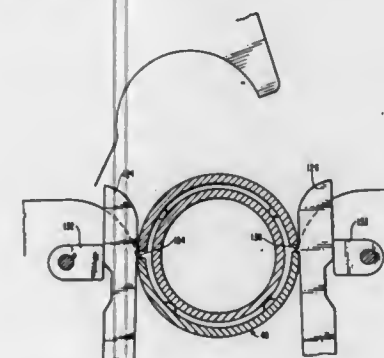
Division of Ser. No. 790,737, Oct. 24, 1985, Pat. No. 4,656,713.

This application Sep. 8, 1986, Ser. No. 904,943

Int. Cl.⁴ B23P 19/00; B25B 27/14; B21D 39/00

U.S. Cl. 29—700

9 Claims



1. A clamp assembly for positioning two longitudinal halves of a pipe in proximity to one another, said clamp assembly comprising a plurality of clamp apparatus at spaced apart locations and disposed relative to one another for receiving the longitudinal halves of the pipe, each said clamp apparatus comprising:

a first support having a recess therein for receiving the first half of the pipe;

gripping means for securely urging the first half of the pipe into the recess of the first support; and

a second support for urging the second longitudinal half of

the pipe into alignment with the first longitudinal half thereof.

4,712,296

METHOD OF CONSTRUCTING A COAXIAL CONNECTOR

Edgar W. Forney, Jr., Harrisburg, and Richard S. Hogendobler, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

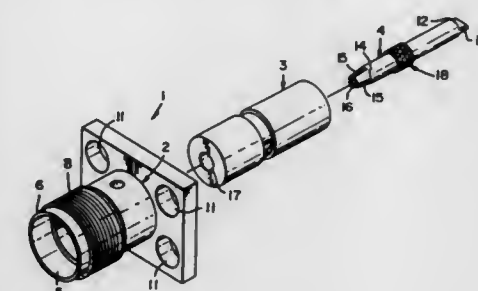
Division of Ser. No. 765,617, Aug. 14, 1985, Pat. No. 4,662,703.

This application Jan. 6, 1987, Ser. No. 704

Int. Cl.⁴ H01B 13/20

U.S. Cl. 29—828

7 Claims



1. A method of constructing an electrical connector, wherein the connector has a conductive outer shell for releasable connection with an electrical cable, a dielectric body coaxially surrounded by the outer shell, and a conductive electrical contact coaxially surrounded by the dielectric body and having an electrical contact portion for releasable connection with the cable, comprising the steps of:

assembling the contact concentrically within the dielectric body,

coaxially surrounding a roughened outer surface portion of the contact with an interior surface portion of the dielectric body,

heating a portion of the contact, heating the continuous interior surface portion of the dielectric body to a fluid state and into flowed interlocked engagement with the roughened surface portion, and assembling the outer shell concentrically over the dielectric body.

4,712,297

METHOD OF MANUFACTURING SUPPORTS FOR ELECTRICAL CIRCUITS

Claude J. Wolfram, 11, rue Victor Nessler, Strasbourg, France 67000

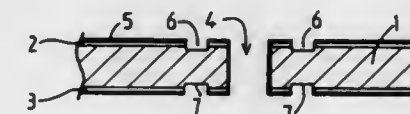
Filed Sep. 18, 1986, Ser. No. 908,676

Claims priority, application France, Sep. 18, 1986, 85 13803

Int. Cl.⁴ H01K 3/10

U.S. Cl. 29—852

2 Claims



1. Method of manufacturing supports for electrical circuits, comprising the steps of applying a conductive coating to both sides of a board, drilling holes in the coated board, causing a discontinuity in the electrical conductivity around at least some of said holes on at least one side of said board to prevent

electrolytic deposition on the walls of said at least some holes and depositing a conductive material at predetermined positions by electrolytic means.

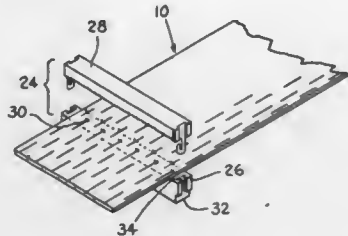
4,712,298

FLAT WOVEN CABLE FOR INSULATION DISPLACEABLE CONNECTOR TERMINATION AND METHOD

Edward J. Mondor, III, Greenville, S.C., assignor to Woven Electronics Corporation, Mauldin, S.C.
Continuation-in-part of Ser. No. 830,725, Feb. 19, 1986. This application May 16, 1986, Ser. No. 863,967
Int. Cl.⁴ H01R 4/66

U.S. Cl. 29—861

14 Claims



1. A method of producing a flat woven electrical transmission cable which transmits electrical signals of the type which includes a plurality of insulated signal conductors having a conductor wire surrounded by insulation extending longitudinally in a warp direction in said cable, and weft elements interwoven with said signal conductors in said woven cables, wherein the method comprises:

- weaving polymeric warp strand means in said woven cable between said signal conductors laterally spacing said signal conductors across the cable,
- inserting an insulation displaceable connector having a plurality of connector prongs into said woven cable to pierce and displace the insulation of said signal conductors and make electrical contact with the conductor wire of said signal conductors; and
- providing said polymeric warp strand means in a form having an outer covering of pliable polymeric material which readily yields to accept penetration of said connector prongs into said woven cable without bending of said prongs for reliable insulation displacement and electrical contact with said signal conductors.

4,712,299

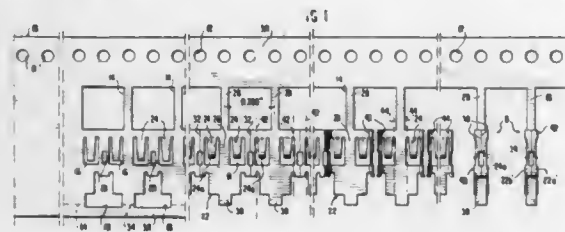
PROCESS FOR PRODUCING ELECTRICAL CONTACTS FOR FACILITATING MASS MOUNTING TO A CONTACT HOLDER

Heinz Loewen, Gardena, and Wold Wenko, Pasadena, both of Calif., assignors to Electronic Plating Service, Inc., Gardena, Calif.

Filed Feb. 21, 1986, Ser. No. 831,691
Int. Cl.⁴ H01R 43/04

U.S. Cl. 29—882

4 Claims



1. In a process of making a series of standard size contacts

from flat strip metal stock while commonly joined thereto, comprising steps of:

- advancing said flat strip metal stock;
 - removing material from said strip metal stock to form a carrier strip and integrally, a plurality of laterally separated blanks, and
 - bending sequentially portions of said blank to cause said blank to form a female contact portion of generally tubular form;
- the improvement comprising:
- stamping said blanks on centers such that the lateral width of each blank forming said tubular contact portion is less than the width of the strip metal stock material necessary to complete a standard size tubular contact portion; and
 - thinning at least a portion of each blank, subsequent to forming said blanks to increase the effective overall width of the blank tubular contact material to permit completion of a tubular contact portion of standard size whereby the tubular contact portions can be commonly mounted simultaneously to a support having respective uniformly spaced contact receiving and mounting means on centers equal to, a multiple of, or a fraction of said centers for said blanks thereby permitting initial severing of said strip to form each blank narrower than that the required width to achieve a tubular contact portion of standard size, while minimizing waste of strip metal stock material during contact fabrication.

4,712,300

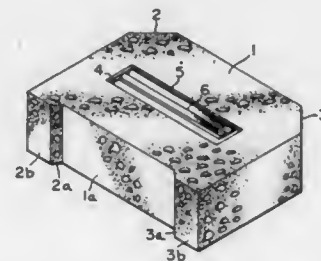
SPONGE-BLOCK SAFETY RAZOR HOLDER

George T. Hemmeter, 4125 Black Point Rd., Honolulu, Hi. 96816

Filed Oct. 20, 1986, Ser. No. 920,417
Int. Cl.⁴ B26B 19/44

U.S. Cl. 30—41

5 Claims



1. A safety razor blade holder constructed of a block of sponge material which is semi-stiff when dry and flacid when wet, said sponge-block supports a conventional razor-blade assembly having at least one cutting blade implanted within said sponge block with the cutting edge of said at least one blade located on or slightly below a plane established by the surface of the sponge-block oriented and to shave when said sponge-block with said at least one blade is pressed lightly on the skin until the cutting edge of the blade or blades are in contact with the skin and stroked in the direction of cutting or shaving.

4,712,301

SAFETY RAZOR

Tatsuya Saito, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Gifu, Japan

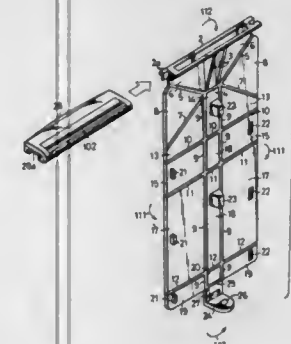
Filed Jul. 18, 1983, Ser. No. 514,588
Int. Cl.⁴ B26B 21/00

U.S. Cl. 30—47

8 Claims

1. A safety razor comprising a blank having a plurality of transverse and longitudinal bending lines defined thereon, said blank being foldable selectively around selected ones of said bending lines into a razor handle of a rectangular cross section and around other bending lines than said selected ones into a

box-shaped case, a blade holder mount integrally formed with an upper edge of said blank, and a blade holder separate from and adapted to be mounted on said blade holder mount, said blade holder being accommodatable in said case and having a blade mounted thereon, said bending lines include a central transverse bending line extending transversely in an upper portion of said blank, two pairs of upper and lower oblique bending lines extending from opposite ends of said central transverse bending line obliquely upwardly and downwardly, respectively, toward transverse edges of said blank, a pair of longitudinal bending lines extending from said opposite ends of said central transverse bending line toward a lower edge of said blank, and three transverse bending lines extending fully across said blank below said pair of lower oblique bending lines, said blank including a pair of upper triangular blade holder supports defined between said pair of upper oblique bending lines and said upper edge of said blank, a pair of lower triangular blade holder supports defined between said upper and lower oblique bending lines and said transverse edges of said blank, and a plurality of central and side walls defined between said central transverse bending line, said lower oblique bending lines, and said longitudinal and transverse bending lines, the arrangement being such that when said side walls are bent forward around said pair of longitudinal bending



lines, said upper blade holder supports are tilted forward along said central transverse bending line and said upper oblique bending lines, and said lower blade holder supports are spread obliquely forward along said lower oblique bending lines, thereby allowing said plurality of walls to constitute a razor handle, and when said blank is folded forward around said three transverse bending lines, said upper and lower blade holder supports and said plurality of walls jointly constitute a case in which said blade holder and said blade holder mount are accommodated, said blank has a pair of rectangular lids projecting forward from said transverse edges in transverse alignment with the walls defined by said longitudinal bending lines and intermediate and lower transverse bending lines of said three transverse bending lines, said lids serving as side walls of said case when said blank is folded along said three transverse bending lines, said lids can overlap each other to provide a front side wall of said razor handle when said blank is folded along said longitudinal bending lines, a plurality of engagement plates mounted on inner surfaces of said lids and detachably engageable with each other when said lids overlap each other, wherein one of said engagement blades has a pair of locking ledges respectively on opposite surfaces thereof, and the other engagement plates have a recess defined therebetween for engagement therein of said locking ledges.

4,712,302

TUBE CUTTER WITH RELEASABLE DRIVE

Charles E. Diller, Springfield, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 29, 1986, Ser. No. 902,439
Int. Cl.⁴ B26D 3/16

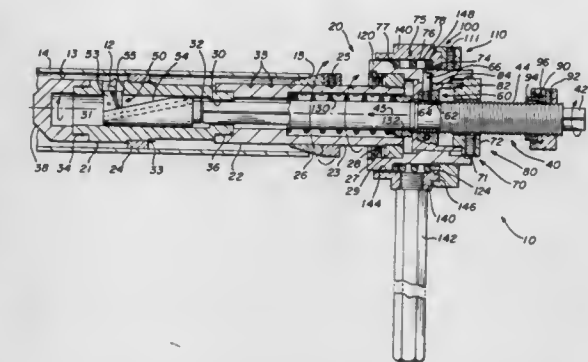
U.S. Cl. 30—107

14 Claims

1. A tube cutter of the type which forces a tool bit against an

interior tube wall as said bit is rotated to sever said tube from the inside, said tube cutter comprising:

- a. a housing for holding said tool bit at a distance from said tube end as said tool bit is rotated;
- b. a feed shaft means positioned by said housing for converting axial force along said feed shaft into radially directed pressure forcing said tool bit outwardly against said interior tube wall at said distance from said tube end as said tool bit is rotated;
- c. a drive means positioned by said housing for releasable



driving engagement with said feed shaft means, said drive means having a released non-feed position and an engaged feed position in which axial force is applied to said feed shaft means;

- d. means positioned by said housing for actuating said drive means between said released position and said engaged position; and
- e. means positioned by said housing for limiting the maximum axial force applied by said drive means to said feed shaft means so that the maximum radial force on said tool bit is limited.

4,712,303

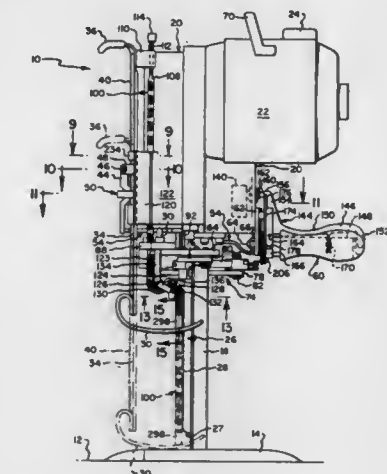
STRAIGHT KNIFE MACHINE WITH SAFETY FEATURES

Robert C. Barrett, Angola, N.Y., assignor to Eastman Machine Company, Buffalo, N.Y.

Filed Feb. 11, 1985, Ser. No. 700,721
Int. Cl.⁴ B26B 7/00

U.S. Cl. 30—275

25 Claims



25. In a cutting machine comprising a housing having a base spaced therefrom, a motor carried by said housing, a knife blade having a cutting edge and carried by said housing for reciprocal movement along a plane generally normal to said

base in response to operation of said motor, and presser foot means movably carried by said housing located in spaced relation to said blade cutting edge and movable toward and away from said base, the improvement comprising:

a single elongated guard operatively connected to said presser foot means and located closely adjacent said blade cutting edge and guidedly supported in said housing for movement along said blade edge into and out of guarding relation to said blade edge in response to movement of said presser foot means toward and away from said base, said guard being flexible and travelling along a path having a first portion closely adjacent said blade cutting edge, a second portion offset from said first portion generally parallel thereto and located in said housing and a third portion joining said first and second portions, said first, second and third portions of said path being located substantially in a plane parallel to said plane of said blade.

4,712,304

KNIFE HAVING A HANDLE COATED WITH AN ELASTOMER, PARTICULARLY FOR PROFESSIONAL USES

Danilo Sanelli, Via Roma, 1, Premana, Como, Italy
Filed Jul. 31, 1985, Ser. No. 761,229

Claims priority, application Italy, Sep. 26, 1984, 23329/84[U]
Int. Cl.⁴ B25G 3/00

U.S. Cl. 30-343

9 Claims



1. A knife for professional application comprising a cutting blade (1) having a shank (2), a handle in the form of a body (3) of synthetic plastic material in which said shank is buried, and a layer of an elastomer (4) covering said body, said elastomeric layer being partially discontinuous over at least one front zone (5) and at least one intermediate zone (6) comprised by the body (3) of plastic material to which the shank (2) of the cutting blade (1) is attached such that the body (3) is left exposed at the discontinuous zones (5) and (6), said zones being spaced apart from each other, the level of the body at said discontinuous zone and the level of the body covered by said elastomer layer being equal such that said exposed zones are flush with said elastomer layer.

4,712,305

FREEBOARD MEASURING DEVICE

Phillip A. Latham, P.O. Box 73600, Metairie, La. 70033
Filed Apr. 10, 1986, Ser. No. 850,025

Int. Cl.⁴ G01B 3/02

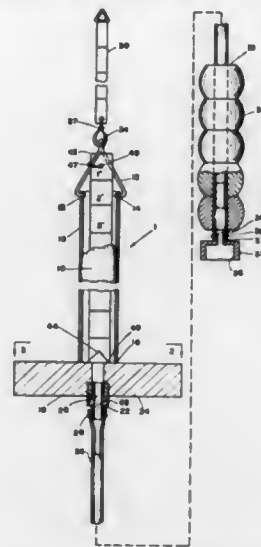
U.S. Cl. 33-126.5

19 Claims

1. A device for measuring the freeboard of a barge or structure on a body of water, comprising:

- a vertical pipe;
- a horizontal bar with an aperture therethrough, said bar connected to said pipe in substantially perpendicular relationship;
- a means for water ingress securedly, removably attached to said horizontal bar opposite said vertical pipe;
- a means for reading freeboard measurement mounted, at least in part, within said vertical pipe;
- a means for lowering said device into said water attached to said vertical pipe opposite said horizontal bar;

a means for stabilizing said device in said water, mounted on the means for water ingress; and



a means for preventing surging of water inside the apparatus associated with said means for water ingress.

4,712,306

FIBER OPTIC EARTH ROTATION GYRO COMPASS

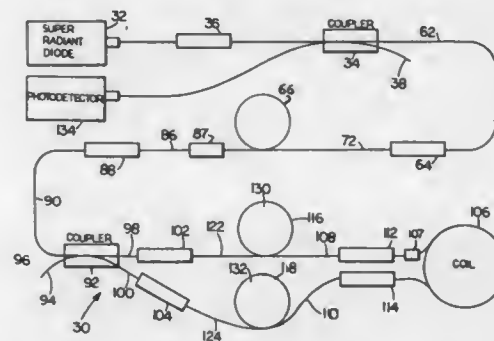
Richard F. Cahill, El Toro; Jeffrey A. Eck, Yorba Linda; Gerald L. Schwantz, Stanton; John P. Theriault, Fountain Valley; Philip A. Turek, Huntington Beach; Eric Udd, Huntington Beach; Raymond E. Wagoner, Huntington Beach, and Keith H. Wanser, Huntington Beach, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 27, 1985, Ser. No. 813,721

Int. Cl.⁴ G01C 19/64

U.S. Cl. 33-304

24 Claims



1. A fiber optic gyro, comprising:

- (a) a light source means for producing a first beam of light;
- (b) a first beam splitting means for receiving the first beam of light having a photodetector means connected to one output for monitoring the light source output and a polarizing means connected to the other output for polarizing the first light beam;
- (c) a second beam splitting means connected to the polarizing means for splitting the first beam of light into second and third beams of light and recombining the second and third beams into a fourth beam of light;
- (d) a first phase modulator connected to the second beam splitting means for supplying a harmonic modulation to the second beam of light;
- (e) a second phase modulator symmetrically connected to the second beam splitting means with respect to the first phase modulator for supplying a harmonic modulation to

the third beam of light 180 degrees out of phase with the harmonic modulation of the first phase modulator to offset environmental effects;

- (f) an optical fiber loop connected to the first and second phase modulators for directing the second and third beams of light in opposite directions along a path about a predetermined axis about which rotation is to be measured in a counterpropagating light path for the second and third light beams;
- (g) a sensing optical fiber wound in a coil about a predetermined axis for establishing the counterpropagating light path about which rotation is to be measured, the optical fiber having first and second ends, and coupling means for applying the second and third beams of light to the first and second fiber ends respectively; and
- (h) a detection means including electrical circuitry means connected to the first beam splitting means for detecting rotation of the fourth light beam recombined at the output of the optical fiber loop.

4,712,307

RAFTER ANGLE MEASURING DEVICE

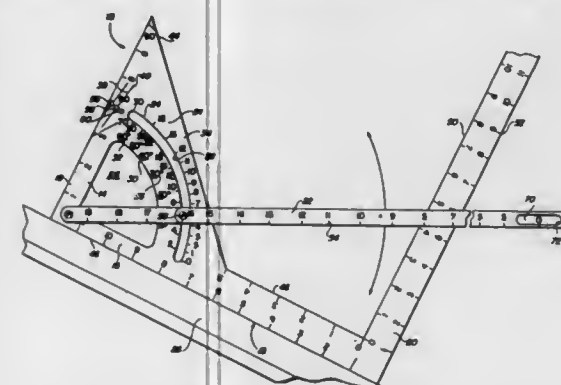
Karl E. Kish, 17611 Hamlin St., Van Nuys, Calif. 91406

Filed Mar. 27, 1987, Ser. No. 30,558

Int. Cl.⁴ B43L 7/06, 13/00

U.S. Cl. 33-421

9 Claims



1. An improved rafter angle measuring device, said device comprising, in combination:

- (a) a body comprising a generally U-shaped plate having a horizontal base, to opposite ends of which are connected vertical extending spaced, parallel first and second arms, said first arm including a generally sloping support portion extending from the upper portion of said first arm to about the middle portion of the length of said base; and
- (b) a third arm pivotally connected at one end thereof to said plate at about the intersection of said first arm and said base, the opposite end of which extends beyond said second arm, said third arm bearing a level and means releasably securing said third arm at a desired angle to said plate, said third arm being pivotable between a vertical position abutting said first arm and an about horizontal position adjacent said base.

4,712,308

MEASUREMENT METHOD AND APPARATUS

Carleton R. Richmond, Jr., P.O. Box 420, North Scituate, Mass. 02060

Filed Aug. 29, 1986, Ser. No. 901,557

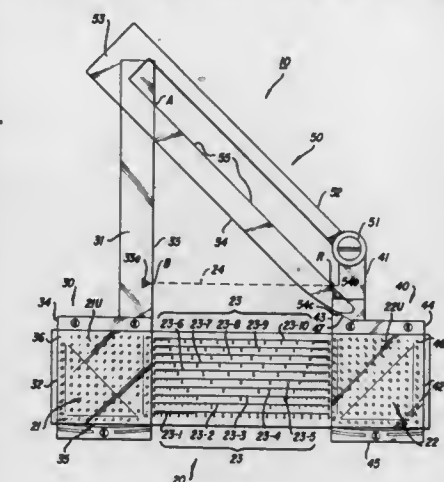
Int. Cl.⁴ B43L 7/06

U.S. Cl. 33-472

5 Claims

- 1. A contour plotter, comprising
- a scale bar having at least one scale thereon;
- a first slide movable in relation to said scale bar; and

a second slide movable in relation to said scale bar; said first slide having an arm with a reference edge; and



said second slide having a pivoted coordinator arm with a movable edge; wherein said coordinator arm doubles back as a return leg.

4,712,309

ADJUSTABLE TEMPLATE FOR POSITIONING TILE OF VARIOUS SIZES

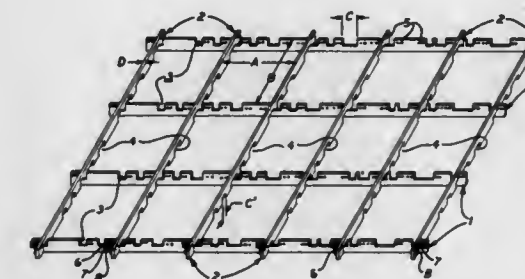
Arthur G. Kingston, 3226 Orchard Dr., Palm Harbor, Fla. 33563, and Carl R. DeLong, 1605 44th Ave. South, New Port Richey, Fla. 33552

Filed Apr. 16, 1987, Ser. No. 38,929

Int. Cl.⁴ G01B 5/16

U.S. Cl. 33-527

20 Claims



1. An adjustable template designed for the positioning of tile comprising (a) a first series of parallel bars spaced from each other, each bar having similar dimensions respectively in length, width and depth and having a plurality of grooves cut therein facing downward or upward and having a width for each groove determined by the amount of adjustment required; (b) a second series of parallel bars spaced from each other and perpendicularly to the bars in said first series, each bar in said second series having similar dimensions respectively in length, width and depth and having a plurality of grooves cut therein facing upward or downward and complementary to the grooves in said first series of bars, the combined depth of a groove in the first series with a complementary groove in the second series being equal to the depth of the bars having the greater depth; and (c) a fastening means for securing approximately the end of each bar of each series to a bar in the other series; the grooves in the respective bars being of appropriate depth to have the respective bottoms of the bars in both series all in the same plane.

4,712,310 CO-SPRAY TECHNIQUE

Suva B. Roy, Bear, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 15, 1986, Ser. No. 907,218

Int. Cl.⁴ F26B 5/06

U.S. Cl. 34—5

4 Claims

1. A process for preparing a free flowing dry powder blend suitable for preparing tablets containing ingredients which are incompatible in a single aqueous solution comprising the steps of:

- preparing at least two solutions suitable for use in S-1 spray-freeze processes, wherein each solution comprises ingredients compatible with one another, and wherein at least one ingredient is incompatible with at least one ingredient of another solution;
- spraying said solutions through separate spray nozzles onto the surface of a moving bath of boiling fluorocarbon refrigerant having a temperature below about -20° C. in such a way as to form hybrid droplets and immediately freezing said hybrid droplets;
- collecting the hybrid droplets; and
- lyophilizing said droplets.

4,712,311 GRAIN DRYING APPARATUS FOR STORAGE BIN

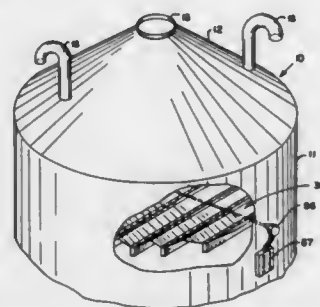
Ralph D. Peifer, R.R. 2, Box 155-A, Nokomis, Ill. 62075

Filed Nov. 13, 1986, Ser. No. 930,107

Int. Cl.⁴ F26B 25/10

U.S. Cl. 34—56

9 Claims



1. An apparatus for drying grain in a grain storage bin of the type wherein grain is poured in the top of the bin, said apparatus comprising:

- an elevated floor substantially horizontally disposed across said bin above and in spatial relation to a bottom of said bin, said floor including means for maintaining grain thereabove while allowing heat from below said floor to pass vertically therethrough for drying grain positioned thereabove;
- at least a portion of said elevated floor being slanted between a high position thereon and a low position thereon, for moving grain above said floor to said low position, a first opening through said floor at said low position for passage of grain therethrough;
- grain container means having a capacity to receive a predetermined amount of grain therein, said container means being disposed subjacent said first opening;
- a second opening in communication with a bottom of said grain container means for passage of grain therethrough; and
- said first opening and said second opening being disposed relative said grain container means to prevent both openings from being in communication with said grain container means simultaneously.

4,712,312 REACTION CHAMBER CONVEYOR

Spiros Christodoulou, New Barnet, United Kingdom, assignor to Din Engineering Limited, Luton, United Kingdom

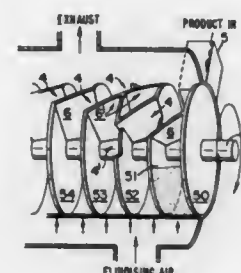
Filed Jul. 15, 1986, Ser. No. 885,635

Claims priority, application United Kingdom, Jnl. 15, 1985, 8517798

U.S. Cl. 34—57 D

Int. Cl.⁴ F26B 17/10

6 Claims



1. A fluidized bed reaction chamber having a perforated, part-cylindrical lower wall and a conveyor for conveying fluidized material through the reaction chamber, the conveyor comprising a shaft, a plurality of discs spaced axially along the shaft and mounted for rotation with the shaft to provide a plurality of substantially separate zones between the discs, a first opening having a leading edge and a trailing edge and defined in an upstream disc of each zone to allow for the passage of doses of fluidized material from zone to zone, and a transfer blade means associated with each opening and extending across the respective zone for urging fluidized material through the opening as the conveyor is rotated; wherein one or more of the discs is provided with a second opening disposed substantially axially opposite the opening in a preceding disc for spreading a dose of material through two or more adjacent zones for treatment during one rotation of the conveyor before being moved to the next succeeding zone.

4,712,313 HANDS FREE PORTABLE HAIR DRYER HOLDER

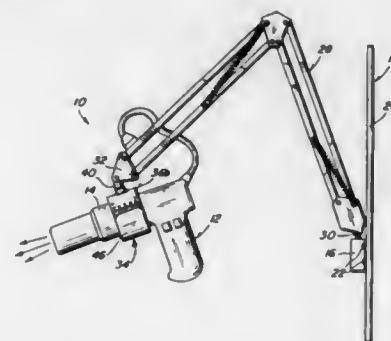
Carl Gettleman, 68-85 218th St., Bayside, N.Y. 11364

Filed Apr. 3, 1986, Ser. No. 847,664

Int. Cl.⁴ A45B 20/14

U.S. Cl. 34—97

5 Claims



1. A holder for a standard, separable portable hair dryer having a barrel comprising:

- a base member affixed to a stationary structure;
- a spring-tensioned extendable arm pivotally mounted at one end of said base member, said extendable arm having a terminal segment at other end; and
- a clamp assembly adjustably attached to terminal segment of said extendable arm, said clamp assembly adapted to removably grasp said barrel of said portable hair dryer

and to be manually turned on its axis 360 degrees allowing said hair dryer to be placed in a variety of positions in which a person using said holder is free to use their two hands for other things wherein said clamp assembly comprises:

- two C-shaped jaws hinged together, one of said jaws being adjustably attached to said terminal segment of said adjustable arm;
- two C-shaped foam liners, each of which is affixed to an inner wall of one of said jaws for cushioning said barrel of said portable hair dryer; and
- a hook and loop pile fastener strap extending between free ends of said jaws for securing said jaws in a closed position around said barrel of said portable hair dryer.

only one end (10) on one of said shell base (1) and cuff (3) and whose other end cooperates in freely sliding contact with a



4,712,314 FOOTWEAR SOLE CONSTRUCTION

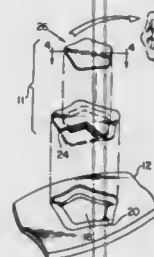
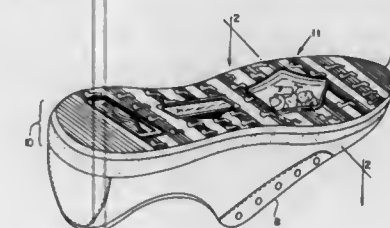
Jerome A. Sigoloff, Chesterfield, Mo., assignor to Sidney Rich Associates, Inc., St. Louis, Mo.

Filed Jul. 8, 1986, Ser. No. 883,049

Int. Cl.⁴ A43B 3/30

U.S. Cl. 36—112

7 Claims



3. A footwear sole, comprising:

- at least one inner ply and an outer ply, superimposed one upon the other;
- said outer ply having at least one aperture formed therein and having a peripheral recess about said aperture in a surface thereof adjacent said inner ply;
- and a lenticular assembly having a figure formed therein and having a peripheral flange for seating said lenticular assembly within said peripheral recess, such that an upper surface of said lenticular assembly is substantially coplanar with said surface of said outer ply adjacent said inner ply and a lower surface of said lenticular assembly is recessed relative to an outer sole surface of said outer ply.

cam ramp or track (11) carried by the cuff (3) or the shell base (1), respectively.

4,712,316 SKI BOOT WITH A DEVICE FOR SECURING THE FOOT OF THE SKIER

Giorgio Baggio, San Martino di Lupari, Italy, assignor to Nordica S.p.A., Montebelluna Tv, Italy

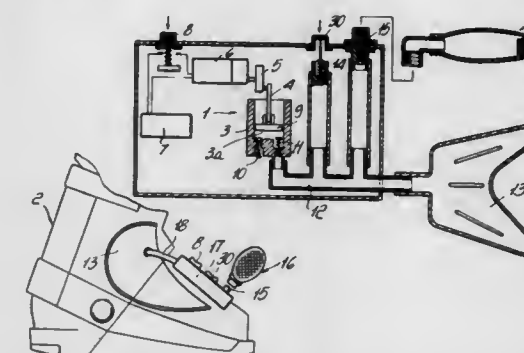
Filed Aug. 21, 1986, Ser. No. 898,564

Claims priority, application Italy, Sep. 9, 1985, 22087 A/85

Int. Cl.⁴ A43B 5/04, 7/14

U.S. Cl. 36—119

20 Claims



1. In a ski boot having a boot structure with internal surface defining internally a wearer's foot location and including a shell structure with a heel portion, an instep portion and a sole portion and an upper structure with a front portion and a rear portion, in combination,

- an electropneumatic device for securing the foot of the skier within the ski boot, comprising
- inflatable means in the reach of said wearer's foot location within said ski boot and
- electrically actuated fluid pressure supplying means including,
- a compressor unit comprised of an electric motor, pumping means and mechanical transmission means for actuating said pumping means by said electric motor through said transmission means,
- electrical energy storage means located in said boot structure and spaced from said compressor unit, circuit means with conductor means for connecting said electric motor with said electric energy storage means and duct means connecting said inflatable means with said pumping means and wherein said boot structure further defines a chamber for containing therein at least said said compressor unit and having therein a sealing bag means enclosing at least said compressor unit and having stopper means with openings for the passage therethrough of said duct means and said conductor means.

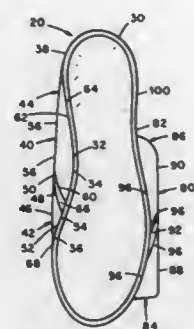
4,712,317

ATHLETIC SHOE

Gene H. Sowell, 528 Devon St., Seymour, Tenn. 37865
 Filed Sep. 22, 1986, Ser. No. 910,075
 Int. Cl.⁴ A43B 5/02, 5/00

U.S. Cl. 36—133

7 Claims



1. In an athletic shoe for use in kicking a ball and having an upper attached to a sole, generally curvilinear heel and toe end portions at opposite longitudinal ends of the shoe, a recessed medial portion on one side of the shoe and a lateral portion on the other side of the shoe, both the medial portion and the lateral portion being defined by curved surfaces and located generally intermediate the heel and toe end portions, the improvement comprising means defining a planar ball-impacting surface on the shoe generally vertically disposed on the surfaces of at least one of said medial and lateral portions and configured to maintain said ball-impacting surface in a substantially planar configuration during flexing of the shoe.

4,712,318

GRIPPING ELEMENT FOR A SPORTS SHOE

Peter Greiner, Wangen; Hubert Pflüger, Wetzlar, and Horst Widmann, Schwaig, all of Fed. Rep. of Germany, assignors to Adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG, Fed. Rep. of Germany

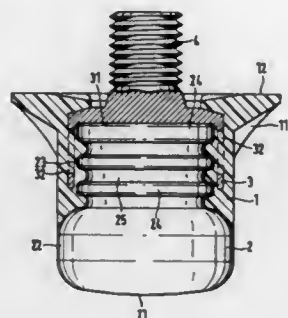
Filed Jan. 27, 1987, Ser. No. 7,177

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1986, 3603127

Int. Cl.⁴ A43C 13/04, 15/00

U.S. Cl. 36—134

14 Claims



1. A gripping element for a sports shoe comprising a body portion of plastic material, a ceramic insert embedded into the body portion to form the ground-engaging surface of the gripping element, and a metal sleeve means extending around said insert within said body portion over a part of the length of said insert, said insert being provided at least on its outside surface around which said metal sleeve extends with engagement means adapted to provide for positive engagement between said insert and the plastic material of said body portion.

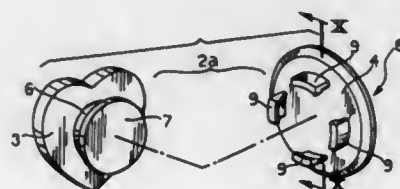
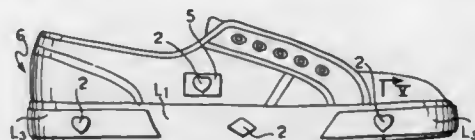
4,712,319

FOOTWEAR WITH DETACHABLE VISIBILITY AIDS

Luigi Gorla, Via Montosolo 8, 10025 Pino Torinese (Torino), Italy
 Filed Jul. 3, 1986, Ser. No. 881,982
 Claims priority, application Italy, Jul. 5, 1985, 53571/85[U]
 Int. Cl.⁴ A43B 23/00; G02B 5/12

U.S. Cl. 36—137

1 Claim



1. In footwear of the type having an elastomeric sole portion and an upper portion secured together and means for increasing the visibility of the footwear secured thereto, the improvement comprising a first member adapted to be secured to said footwear, a second member including said means for increasing the visibility of the footwear, fastener means detachably connecting said first and second members and securing means for securing said first member to said footwear, wherein said fastener means is comprised of a plurality of appendages integral with one of said members and extending outwardly therefrom in a circle with each appendage having a toothed edge facing radially inwardly of said circle and a circular disk secured in spaced relation to the other of said members and adapted to be snapped into and out of engagement with said toothed edges.

4,712,320

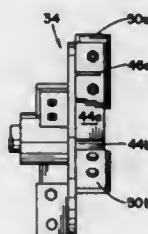
FOUR-WAY REVERSIBLE DITCHER BLADES

Jack O. Cartner, 1005 N. 8th St., Cambridge, Ohio 43725
 Division of Ser. No. 600,507, Apr. 16, 1984, Pat. No. 4,612,715, which is a continuation of Ser. No. 416,642, Sep. 10, 1982, abandoned. This application Apr. 21, 1986, Ser. No. 854,195
 The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.

Int. Cl.⁴ E02F 5/08

U.S. Cl. 37—92

5 Claims



5. A four-way reversible ditching blade for a ditching apparatus which includes a prime mover, an arm assembly operatively connected at a first end with the prime mover, a ditcher head operatively connected with a second end of the arm assembly, the ditcher head including a support member mounted for rotation about a central axis, a motor means for

rotating the support member, and a plurality of blade mounting brackets which have blade mounting faces disposed perpendicular to the rotary support member and extending radially from the central axis, the blade mounting brackets include a plurality of mounting apertures extending therethrough, the ditching blade being a generally planar rectangle which is symmetric about each of three axes to be four-way reversible for fastening to one of the blade mounting brackets in any one of four orientations to quadruple blade life, the ditching blade comprising:

- (1) first and second generally planar faces disposed symmetrically relative to a face plane extending centrally therebetween;
- (2) the first and second faces terminating at oppositely disposed first and second ends, the first and second ends being symmetric about an end axis which extends centrally therebetween;
- (3) the first and second faces further terminating at oppositely disposed first and second edges, the first and second edges being symmetric about an edge axis extending centrally therebetween and perpendicular to the end axis;
- (4) the first and second edges, faces, and ends defining four cutting areas:
 - (a) a first cutting area disposed along contiguous portions of the first edge, the first face, and the first end;
 - (b) a second cutting area disposed along contiguous portions of the first edge, the second face, and second end;
 - (c) a third cutting area disposed along contiguous portions of the second edge, the first face, and second end; and,
 - (d) a fourth cutting area disposed along contiguous portions of the second edge, the second face, and first end;
- (5) a plurality of mounting apertures extending between the first and second faces and disposed symmetric with respect to both the end and edge axes, the blade mounting apertures being disposed such that the blade is mountable through the mounting bracket apertures:
 - (a) with the second edge along the rotatably mounted support member and the first end extending generally radially beyond the rotary support member such that the first cutting area is disposed radially and axially outermost;
 - (b) with the second edge disposed along the rotatably mounted support member and the second end extending generally radially beyond the radial support member such that the second cutting area is disposed radially and axially outermost;
 - (c) with the first edge along the rotatably mounted support member and the second end extending generally radially beyond the radial support member such that the third cutting area is disposed radially and axially outermost; and,
 - (d) with the first edge disposed along the rotatably mounted support member and the first end extending generally radially beyond the radial support member such that the fourth cutting area is disposed radially and axially outermost;

whereby the blade is selectively mountable in four positions to quadruple blade life.

4,712,321

EXCAVATOR TOOTH FOR EARTH MOVING EQUIPMENT

Rütger Berchem, Gelsenkirchen, and Georg Prokscha, Recklinghausen, both of Fed. Rep. of Germany, assignors to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,617

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 3538355

Int. Cl.⁴ E02F 9/28

U.S. Cl. 37—142 R

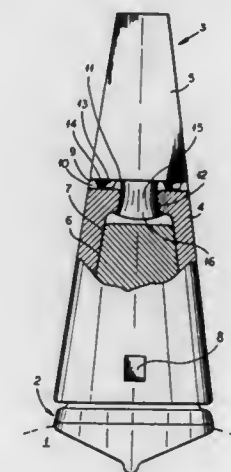
1 Claim

1. A tool for loosening and loading for a dredger, a suction strainer dredger, a wheel loader, a shovel loader or the like comprising:

an adapter attached at an end thereof to a tool support;
 a tooth attachable to said adapter, said tooth comprising a

bottom portion and a tooth peak formed as independent components of said tool, said tooth peak having a supporting face which engages on a complementary supporting surface of said bottom portion, said bottom portion having a hole therein leading to an interior area;

a mounting pin which is guided through said hole, said hole being surrounded by said supporting surface of said bot-



tom portion, said pin being deformed into a rivet attaching said tooth peak and said bottom portion, said hole having a conical widening directed interiorly and said rivet forming a conical widening; and

a plurality of complementary rotation-preventing locking elements provided on said supporting surface and said supporting face.

4,712,322

MULTIPLE MODULAR FRAME APPARATUS FOR DISPLAYING ITEMS

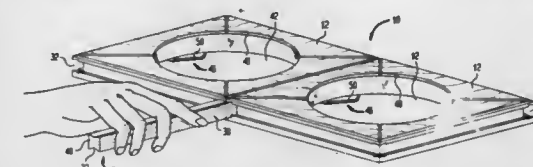
Gene L. Rubin, Mercer County, N.J., assignor to Liberty Gifts, Inc., Trenton, N.J.

Filed Jul. 21, 1986, Ser. No. 887,814

Int. Cl.⁴ G09F 1/12

U.S. Cl. 40—156

6 Claims



1. A multiple modular frame apparatus comprising:
 - a. a plurality of multi-sided rhombus shaped frames for displaying items, wherein one interior angle of each of said frames is less than 90 degrees, said angle being the same as the corresponding interior angle of every one of said frames, and each peripheral side of each of said frames has the same lengthwise dimension;
 - b. groove means extending lengthwise fully across the peripheral sides of said frames, wherein said groove means is a dove-tail groove;
 - c. engagement means for engaging the groove means of said frames, wherein said engagement means includes a first and second projection means for engaging at least two of said frames by said groove means, said first and second projection are disposed 180 degrees apart as viewed endwise towards said engagement means, said projection means extending axially along the entire edge of said engagement means, the axial length of said engagement means is not greater than the lengthwise dimension of said

peripheral sides minus the width, as viewed endwise, of the engagement means, whereby the engagement means is complimentary to any two of said frames for slidably engaging said grove means of said frames so that said engagement means can be inserted into any of said grove means so that said frames can completely surround the middle frame;

- d. a circular aperture in at least one of said frames for viewing a displayed item, wherein at least one of said frames does not include said circular aperture; and,
- e. a retaining means for retaining said items in said aperture of said frames, wherein said retaining means includes,
 - (i) a projection on the interior of said circular aperture; and,
 - (ii) a resilient clip attached to the back of said frame for holding said display item against the projection securely in said frame.

4,712,323

MULTIPLE BARREL RIFLE AND TRIGGER MECHANISM

Vittorino Masina, Via Novelli 732, S. Pietro in Casale (Bologna), Italy

Filed Aug. 14, 1986, Ser. No. 896,949

Claims priority, application Italy, Aug. 27, 1985, 3523 A/85

Int. Cl.⁴ F41C 7/00, 11/10, 19/00

U.S. Cl. 42—42.01

4 Claims



1. A hunting rifle, comprising:

- a barrel assembly comprising three mutually adjoining barrels having axes located at respective vertices of an equilateral triangle having a downwardly pointing vertex and including a lower centrally positioned barrel and a pair of laterally adjacent upper barrels, all of said barrels having the same bores but being formed with chokes set for different firing spreads;
- a breech assembly swingably connected to said barrel assembly and comprising:
 - a breech closure forming a housing,
 - a pair of outer hammers respectively juxtaposed with firing pins aligned with said upper barrels and swingably mounted in said housing,
 - a central hammer disposed between said outer hammer, juxtaposed with a firing pin aligned with said lower barrel, and swingably mounted in said housing,
 - respective coil hammer springs bearing upon said hammers and biasing same in the direction of the respective hammers,
 - respective retaining levers pivotally mounted on said housing and engageable with said hammers for retaining the respective hammers in cocked positions,

a trigger mounted in said housing,

- a rocker arm pivotally connected to said trigger in said housing and provided with a raising tooth positioned for successive engagement with said levers in a predetermined firing sequence for said hammers and said barrels whereby as said raising tooth successively engages said levers, said levers release the respective hammers,
- respective lever springs bearing upon said levers and swinging same out of the path of said tooth upon the release of the respective hammer by the respective lever whereby a subsequent pull on the trigger will permit said tooth to engage only the next lever to be released from the respective hammer in said sequence,
- a cock rod displaceable in said housing by the swinging of said breech assembly relative to said barrel assembly to close the breech of the rifle, and
- a cock lever in said housing displaceable by said cock rod and acting upon all of said hammers to compress said hammer springs and cock said hammers simultaneously; and
- a stock connected to said breech assembly.

4,712,324

FISHHOOK AND LURE RETRIEVING DEVICE

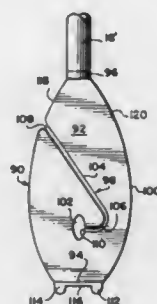
Bobby R. Padgett, Rte. 5 - Box 684, Chipley, Fla. 32428

Filed Aug. 4, 1986, Ser. No. 892,852

Int. Cl.⁴ A01K 97/00

U.S. Cl. 43—17.2

16 Claims



1. A device for engaging and manipulating a snagged fish line comprising:

- a pole having first and second ends; and
- a tip attached to said first end, said tip comprising a substantially continuous outer surface of a solid member, an interior line engaging area inward of said outer surface, said line engaging area extending through said tip, a barrier separating said outer surface and said line engaging area, and a passageway from said outer surface to said line engaging area, said interior line engaging area comprising an eye in said

tip, the axis of said eye being perpendicular to the longitudinal axis of said pole, said passageway is hook shaped, having a straight portion and a curved portion, each of said straight and curved portions having first and second ends, said first end of said straight portion opening to the exterior of said tip and said second end of said straight portion interfacing with said first end of said curved portion, said second end of said curved portion opening into said line engaging area.

13. A device for engaging and manipulating a snagged fish line comprising:

- a pole having first and second ends; and
- a tip attached to said first end, said tip comprising a curved wire lying in a plane substantially parallel to the longitudinal axis of said pole, having an outer surface and including, in sequence
 - a first portion perpendicular to the longitudinal axis of said pole, a second portion parallel to the longitudinal axis of said pole and extending away from said pole, a third portion perpendicular to the longitudinal axis of the pole and extending past the longitudinal axis of said pole, a fourth portion parallel to the longitudinal axis of said pole and extending back towards said pole, a fifth portion perpendicular to the longitudinal axis of said pole and extending towards said pole, a sixth portion parallel to said longitudinal axis of said pole in parallel overlapping relationship with said fourth portion, a seventh portion extending perpendicular to said longitudinal axis of said pole, and an eighth portion extending parallel to said longitudinal axis of said pole in overlapping relationship with said second portion.

4,712,325

FISHING LURE

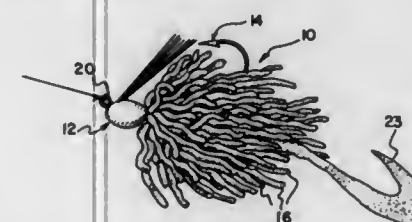
Charles E. Smith, 2321 Grange Hall Rd., Dayton, Ohio 45431

Filed Mar. 21, 1986, Ser. No. 842,327

Int. Cl.⁴ A01K 85/00

U.S. Cl. 43—42.24

6 Claims



1. A fishing lure comprising:

- a body having a weighted head portion with means for attaching fishing line thereto and a hook portion having a shank extending rearwardly therefrom; and
- a plurality of relatively thin, elongate strips of chamois attached to said shank rearwardly of said head portion, said strips being of varying lengths, thereby imparting a shaggy appearance to said lure, and being attached to said shank completely about a periphery thereof such that said strips radiate radially outwardly from said shank about an entire periphery thereof when said lure is immersed in water, said strips each having a free end trailing behind said head portion.

4,712,326

NOISEMAKING FISHING LURE

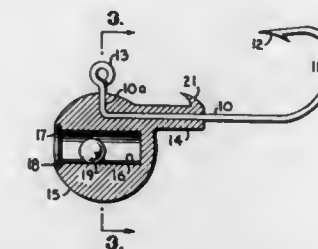
Gary W. Hoover, Rte. 1, Box 47, Pleasant Hill, Mo. 64080; Geuane Empson, 9216 Stubbs Rd., Kansas City, Mo. 64138, and Bruce W. Ashley, 5007 Manchester, Kansas City, Mo. 64129

Filed Jul. 14, 1986, Ser. No. 885,464

Int. Cl.⁴ A01K 85/00

U.S. Cl. 43—42.31

3 Claims



1. A weighted, noisemaking hook and body assembly for use as a jig type fishing lure comprising, in combination:

- a hook having an elongate, largely substantially straight shank, an eye at end of the shank and a bend portion and a terminal barbed point both positioned at the other end of the shank,
- a lead weight cast in the greater length portion thereof on the substantially straight shank portion and also along at least a portion of the eye end of the shank portion adjacent to the eye,
- said weight having essentially two portions thereof:
 - a first weight portion being positioned relatively far from said eye end of the hook shank and comprising a substantially cylindrical sleeve embracing part of said hook shank portion away from said eye,
 - and a second weight body portion positioned relatively adjacent to said eye and farthest from the bend and barbed point of the hook, such second weight body portion being an enlarged, thickened body portion of considerably greater thickness than said hook shank and sleeve, the said thickened body portion being positioned on the outside surface of the hook shank away from the side thereof leading into the closed end of the hook bend and also leading into the interior side of the barbed hook point,
 - a cavity formed in one end of said second weight body portion, said cavity having a first, straightly extending, cylindrical, deeper inward portion of relatively lesser uniform internal diameter and a shallower outermost second portion of greater internal diameter symmetrically encircling the outer end of said first inward cavity portion, whereby to form a circumferential shelf therebetween,
 - the elongate extension of said first portion of said cavity being positioned substantially parallel to the hook shank portion next thereto and extending a substantial portion of the length of said second weight body portion,
 - one spherical pellet positioned in said first cavity portion, said pellet being of lesser outer diameter than the internal diameter of said first cavity portion and operative to move and roll to and fro wherewithin as the orientation of the first cavity portion varies as the fisherman works the jig type fishing lure, thereby successively to impact on the inside surfaces of the inner and outer end closures of the said cavity,
 - said cavity open and closed by a metallic cap placed on said cavity shelf with the material of the second portion of said cavity positioned around and outside of said shelf circumferentially formed downwardly on the peripheral outer edge of said cap, whereby to retain the cap on the said shelf in first cavity portion sealing fashion.

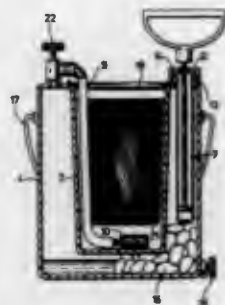
4,712,327

AERATED LIVE WELL

Ron S. Ross, Sr., P.O. Box 304, (Rte. 5), and Claude W. Goff, Sr., P.O. Box 292, (Rte. 5), both of Manning, S.C. 29102
Filed Feb. 5, 1987, Ser. No. 11,324
Int. Cl.⁴ A01K 97/04

U.S. Cl. 43—57

6 Claims



1. An aerated live well comprised of a moulded, thermoplastic, double walled container;
which is formed by joining and sealing a flanged lip of an inner wall container with a flanged lip of an outer wall container
said inner wall container being substantially bucketshaped having a curved or parabolic bottom, straight vertical or slanted sides and a flanged upper lip which flares outward, a portion of the lip arching upward forming a semi-circular threaded stem, said outer wall container being substantially cylindrical in shape having a flat enclosed bottom, vertical sides and an inward flanged upper lip, a portion of the lip arching upward forming the balance of the semicircular threaded stem,
a hand pump which screws onto the said threaded stem, the bulk of the pump projecting downward through the orifice of the stem into the inner wall chamber, said hand pump forcing pressurized air into the inner wall chamber and can on occasion be removed temporarily to add ice through the stem orifice to the inner wall chamber;
a pin point hole nipple which penetrates into the inner wall chamber and is affixed to the upper third of the double walled container, through which air flows;
and a section of tubing that is connected to the said nipple on one end and an air diffusion stone on the other, said stone resting on or near the bottom of the well;
which when filled with water and pumped up with air will provide a hospitable environment for bait for a number of hours.

4,712,328

TREE STAND HAVING A CASTING WITH CLAMPING DEVICES FOR HOLDING A TREE TRUNK

Jakob Gies, Solmsstrasse 14, D-6434 Niederaula I, Fed. Rep. of Germany

Filed Mar. 2, 1987, Ser. No. 20,519
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1986, 3606778

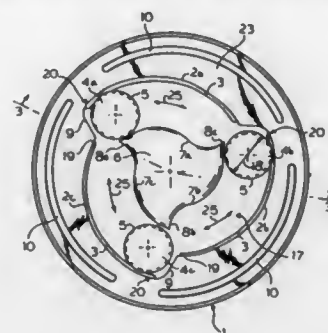
Int. Cl.⁴ A01G 17/06

U.S. Cl. 47—40.5

12 Claims

1. A tree stand for holding and supporting a tree having a trunk comprising:
a casing having an inner wall with spirally curved surfaces;
a guide piece disposed in the center of said casing, said guide piece having guide curves each with a curvature corresponding with the curvature of said spirally-curved surfaces of the inner wall of said casing;
clamping cylinders disposed inside said casing between said guide piece and said spirally-curved surfaces of said casing inner wall; and

means for moving said clamping cylinders within the spirally-curved surfaces of said guide piece and said inner wall



of said casing so that said cylinders spirally close upon the trunk of the tree.

4,712,329

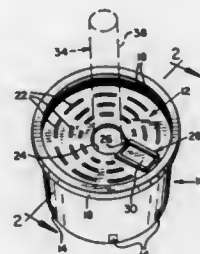
LIDDED NURSERY PLANT CONTAINER

George C. Anderson, 2425 SE. Moores St., Portland, Oreg. 97222, and Richard J. Paul, 8655 SE. Revenue Rd., Boring, Oreg. 97009

Filed Jan. 22, 1986, Ser. No. 821,465
Int. Cl.⁴ A01G 9/02

U.S. Cl. 47—84

2 Claims



1. A lidded nursery plant container of the class in which large plants may be grown, stored, transported and merchandised without removal from the container, comprising in combination:

- (a) a container for the root structure and growing medium of a plant, the container having an open top,
- (b) a plurality of substantially continuous, vertically-spaced, circumferentially-extending, friction ribs on the inner surface of the container, adjacent the open top thereof,
- (c) a lid comprising a substantially continuous sheet of substantially planar, substantially liquid-impervious, flexible plastic material capable of being pushed downwardly across the ribs to a position below one of the ribs, for closing the open top of the container and packing the growing medium of the plant into the container,
- (d) the lid having a plurality of radially spaced, concentrically arranged stiffening ribs,
- (e) the lid also having a central opening for receiving the stem of a plant, and a fixed radial slot extending from the central opening to the outer margin of the lid for passing the plant stem therethrough,
- (f) a slide block closure having grooves slidably to engage the margins of the radial slot for closing the slot, and
- (g) the container further characterized by the presence of an open top defined by a reversely bent, integral, stiffening flange spaced from the container side wall, which facilitates manual handling of the heavy, filled container.

4,712,330

WEATHERSTRIPPING FOR SIDE-HINGED WINDOWS AND DOORS

James R. Beirnes, P.O. Box 2099, Joliet, Ill. 60434
Filed Jul. 30, 1986, Ser. No. 890,506
Int. Cl.⁴ E06B 7/16

U.S. Cl. 49—484

1 Claim



1. The combination comprising, a planar window or door, a planar frame for said window or door, said window or door being hinged at one side to said frame so that the window or door swings outwardly and inwardly in relation to the frame, the top of said window or door being spaced slightly beneath the adjacent portion of said frame to permit relative swinging movement between window and frame, a continuous row of resilient fibers mounted on said frame adjacent the top of said window or door and the adjacent portion of the frame of the window or door and the adjacent portion of the frame when the window is closed, said resilient row of fibers extending downwardly for said frame a distance greater than said space between the top of the window and the frame, said resilient row of fibers being horizontally spaced outwardly from said window when closed a distance about equal to or greater than the distance that said row of fibers extend downwardly from said frame, and said row of resilient fibers extending across the width of said window or door whereby as the window or door swings to open or closed positions the row of fibers deforms incrementally along the moving juncture between the top of the window or door and the frame to thereby provide a continuous seal against rainwater and wind leakage between the window or door top and the frame.

4,712,331
DOOR

Kenichi Fujiwara, Itami, Japan, assignor to Hardglass Industry Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 812,978, Dec. 24, 1985, abandoned.
This application May 27, 1987, Ser. No. 56,349

Claims priority, application Japan, Dec. 26, 1984, 59-197161[U]

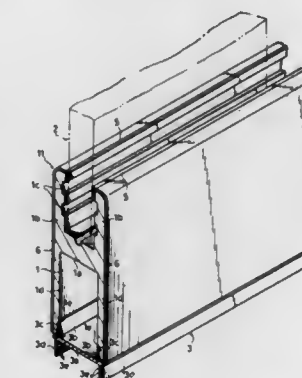
Int. Cl.⁴ E05B 7/16

U.S. Cl. 49—488

3 Claims

1. A door comprising:
a door main body (11) including a pair of longitudinally extending side plates (1d) which outwardly protrude in parallel spaced relation with respect to each other from at least one side edge of said door, each of said side plates having an engaging groove (1e) on its inner side surface, the engaging grooves extending in the longitudinal direction along the length of said side plates; and
an air shielding member (3) attached to said side plates of said door main body, said air shielding member comprising a resiliently deformable flat plate portion (3a) made of a rigid synthetic resin and extending in the longitudinal direction along each of the protruding surfaces of said side plates, a pair of attaching plates (3b) disposed between said side plates and protruding inwardly in parallel spaced

relation with respect to each other from respective longitudinally extending side edges of said flat plate portion with the outside surfaces of said attaching plates maintained in close contact with respective inside surfaces of said side plates, each of said attaching plates having a holding protrusion (3c) extending in the longitudinal direction along the length of said attaching plates for locking engagement with a respective one of said engaging grooves of said side plates, and a pair of shielding plates (3d) made of a soft synthetic resin and protruding outwardly in parallel spaced relation with respect to each



other from respective longitudinally extending side edges of said flat plate portion,
said air shielding member adapted to be directly fitted into shielding engagement with said door main body by positioning said longitudinally extending holding protrusions (3c) against the longitudinally extending side plates (1d) and pushing the shielding member inwardly while resiliently deforming said flat plate portion (3a) and said attaching plates (3b) until both the protrusions (3c) are lockingly engaged with respective ones of said engaging grooves (1e).

4,712,332

CENTERLESS AND CENTER-TYPE GRINDING SYSTEM

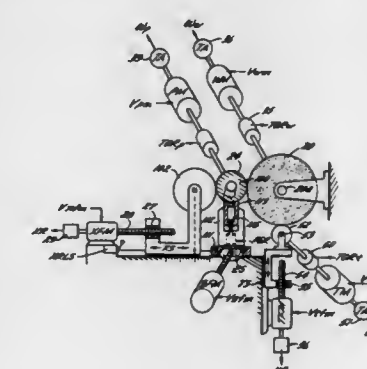
Roderick L. Smith, Rockford, Ill., assignor to Energy Adaptive Grinding, Inc., Rockford, Ill.

Continuation of Ser. No. 688,904, Jan. 4, 1985, abandoned, which is a division of Ser. No. 445,689, Nov. 30, 1982, Pat. No. 4,507,896. This application Jul. 1, 1986, Ser. No. 881,478

Int. Cl.⁴ B24B 5/00

U.S. Cl. 51—103 WH

16 Claims



1. A center-type grinding system comprising the combination of
a grinding wheel mounted for rotation about a fixed axis, and means for rotationally driving the grinding wheel at a controllable speed;
a non-deformable backup wheel mounted for free-wheeling

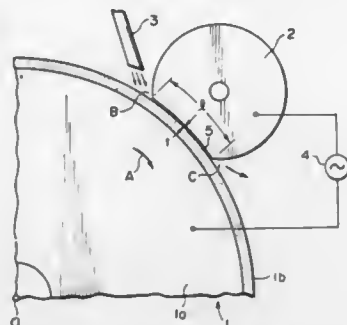
rotation about its axis and being neither rotationally driven nor rotationally braked, said backup wheel having an axial length at least as great as that of said grinding wheel;

workpiece support means for supporting a workpiece on a predetermined axis of rotation located between said grinding wheel and said backup wheel, said support means being bodily movable freely toward the grinding wheel to permit a workpiece supported thereby to be advanced into rubbing contact with the grinding wheel but said support means being free from any translation drive to produce bodily movement of the support means itself;

means for rotationally driving said workpiece around said predetermined axis at a controllable speed; and

means for bodily moving said backup wheel into idling rolling contact with said workpiece and toward the grinding wheel at a controllable rate so that the feeding movement of the workpiece toward the fixed-axis grinding wheel is effected solely by the controlled bodily movement of the backup wheel, whereby free-wheeling the backup wheel in rolling contact with the workpiece provides firm support for the workpiece against the grinding forces reactively applied from the wheel thereto.

surface of the grinding wheel over a predetermined length with a fine space therebetween, and an eliminating liquid feeding means which feeds cutting eliminating liquid into the fine



space between the opposed member and the grinding surface from the outside of the opposed member at the end thereof facing in the direction opposite to the direction of rotation of the grinding wheel.

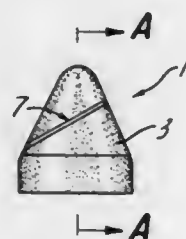
4,712,333 TUMBLING MEDIA

Hugh P. Lofton, Long Beach, Calif., assignor to Huck Manufacturing Company, Southfield, Mich.

Filed Jan. 23, 1986, Ser. No. 821,724
Int. Cl.⁴ B24B 31/14

U.S. Cl. 51—164.5

11 Claims



1. A tumbling media element for polishing or abrading workpieces, comprising:

- a non-magnetic, abrasive body member molded of a first material having a predetermined density;
- an insert member molded within a matrix of said body member and formed of a second material having a density greater than said predetermined density of said body member for increasing the mass of said element; and
- a positioning and aligning member formed of a plastic material, said positioning and aligning member being permanently molded within said body member and molded around said insert member, said positioning and aligning member having a mold engaging portion for aligning said insert member within said body member during molding of said body member.

4,712,334

ANTI-CLOGGING DEVICE FOR GRINDING WHEEL
Yasuo Ikezaki, Kanagawa; Tadashi Matsuoka, Tokyo, and Kazuyuki Mitani, Tokyo, all of Japan, assignors to Toshiba Tungstoloy Co., Ltd.; Science & Creative Co., Ltd. and Toyomitsu Kogyo Co., Ltd., all of Japan

Filed Aug. 28, 1986, Ser. No. 901,198

Claims priority, application Japan, Sep. 5, 1985, 60-196773
Int. Cl.⁴ B24B 55/02

U.S. Cl. 51—262 A

10 Claims

1. An anti-clogging device for preventing a grinding surface of a grinding wheel from being clogged with cuttings, comprising: an opposed member which is opposed to the grinding

4,712,335 METHOD OF SPAN CONSTRUCTION

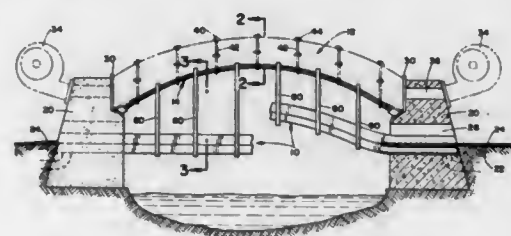
Howard L. Barkdull, Jr., 21 West Dr., Olmsted Township, Cuyahoga County, Ohio 44138

Filed Dec. 17, 1986, Ser. No. 942,777

Int. Cl.⁴ E04B 1/345; E04G 11/04

U.S. Cl. 52—2

7 Claims



1. A method of erecting a span between two points, comprising the steps of:

- securing an elongated, flexible tubular sheath to said two points, said tubular sheath having an upper side and a lower side which has apertures of predetermined dimension and spacing disposed therealong;
- inflating said sheath with a gaseous fluid to form an arched tubular span connecting said points, inflation of said sheath creating a pressure differential between the upper and lower sides thereof caused by said gaseous fluid exiting said apertures;
- maintaining inflation of said tubular span to effect a constant pressure differential across said tubular sheath, said pressure differential creating an upward force gradient on said tubular span;
- erecting a generally rigid frame structure supported by said tubular span said upward force gradient supporting erection of said structure;
- anchoring said frame structure at said two points;
- utilizing said frame structure as support to erect a permanent load-bearing span between said two points;
- permanently anchoring said span at said two points; and
- deflating and removing said sheath.

4,712,336 INTERCONNECTING "FULL BLEED" MODULAR PANEL AND CONNECTIVE HARDWARE SYSTEM TO FORM A VARIETY OF EXHIBIT AND OFFICE INTERIOR ENCLOSURES

Bruce E. Backer, 4430 Del Monte Ave., San Diego, Calif. 92107

Continuation-in-part of Ser. No. 485,864, Apr. 18, 1983,

abandoned. This application Aug. 25, 1986, Ser. No. 900,161

Int. Cl.⁴ E04B 1/344

U.S. Cl. 52—71

44 Claims U.S. Cl. 52—90



1. A modular full bleed panel and connective hardware system for which a variety of structures with shapes characteristic of wall segments, booths and the like may be rapidly assembled, said system comprising:

- (a) a plurality of full bleed panels of modular dimensions which may be connected vertically and horizontally, each panel comprising:
 - (i) a substantially rigid internal frame fully covered on its visible surfaces, said frame having two opposite vertical edges extending from top to bottom of the panel;
 - (ii) channel means fully recessed in each of said two opposite vertical edges of said frame for use in interconnecting the panels, each channel means being formed with openings at either end thereof, said openings being at the top and bottom of said panel respectively, and positioned to enable longitudinal alignment of corresponding channel means of two panels aligned vertically and substantially parallel alignment of corresponding channel means of two panels aligned horizontally; and
 - (iii) stop means as part of each channel means, said stop means being spaced a predetermined distance from said openings at either end of said channel means; and
- (b) a plurality of modular connector means each of which is adapted for insertion into adjacent ends of said channel means of at least two adjacent panels aligned vertically or horizontally; each connector means comprising at least two elongated, substantially rigid vertical post members and a horizontal plate member cooperating therewith, each said post member having an end adapted to extend into an open end of one of said adjacent channel means, the distance each post can extend into said end of said channel means being defined by said stop means; the other end of each said post member cooperating with said plate member, said post members extending respectively into said adjacent channels of said adjacent panels to provide positive, substantially rigid or hinged vertical or horizontal alignment of said two adjacent panels by connection only through the ends of the channels.

4,712,337 LOAD-CARRYING STRUCTURE FOR MAKING VOLUME-ENCLOSING CONSTRUCTIONS, IN PARTICULAR FOR PLACING AGAINST BUILDINGS

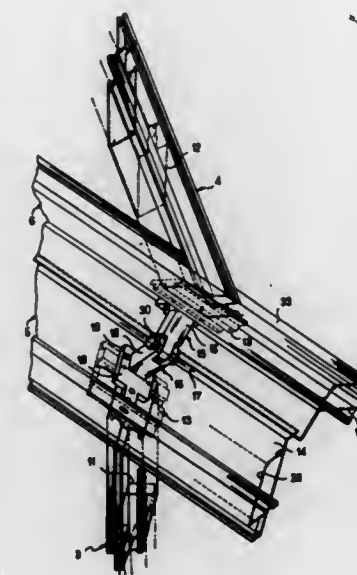
Alain Marcusse, and Max Pinel, both of Toulouse, France, assignors to Technal International S.A., France

Filed Jul. 31, 1986, Ser. No. 892,353

Claims priority, application France, Aug. 8, 1985, 85 12163

Int. Cl.⁴ E04B 7/02

13 Claims



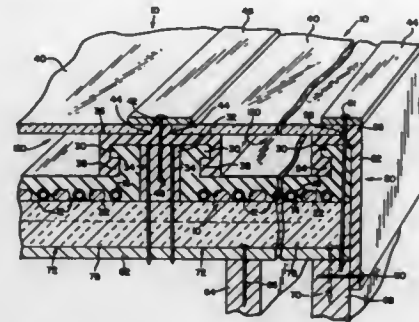
1. A load-carrying structure for making a volume-enclosing construction suitable, in particular, for being applied against a building, said volume-enclosing construction having an outside surface including two planes which intersect along a line of intersection and constitute the geometrical figure of a dihedral, at least one of said planes being defined by at least two load-carrying bars having longitudinal axes and longitudinally-extending cavities, two intersection bars each having a central web, and each of said planes having an edge along said line of intersection which edge is constituted by an associated one of said intersection bars, said load-carrying structure including the improvement of first link means for fixing each of said intersection bars to the associated one of said planes, said first link means including, at least when said associated one of said planes is defined by load-carrying bars, bar stubs which are fixed to said intersection bar by means of an intermediate bearing plate and which are inserted end wise into corresponding ones of said cavities of said load-carrying bars, and of second link means which are provided between said intersection bars, said second link means including two joining parts each fixed to said central web of a respective one of said two intersection bars, means releasably connecting said two joining parts to one another as a hinge for pivotal movement relative to one another about an axis which runs substantially parallel to said line of intersection between said two planes, but which runs at any desired angle relative to said longitudinal axes of said load-carrying bars defining said intersecting planes, and means releasably fixing said intermediate bearing plates and said two joining parts to the associated ones of said central webs of said two intersection bars so that said first and second link means are capable of being disassembled from said intersection bars and from said load-carrying bars.

4,712,338

SOLAR-ENERGY-COLLECTING STRUCTURAL UNIT AND SOLAR ROOF

Lora L. Trickle, 8806 NE Thompson St., Portland, Oreg. 97220
 Filed Jun. 30, 1986, Ser. No. 879,954
 Int. Cl.⁴ E04D 1/36; F24J 2/04
 U.S. Cl. 52—90

4 Claims

**1. A solar roof comprising:**

- a support surface,
- a plurality of solar-energy-collecting units positioned on the supporting surface in spaced relation to each other, each collecting unit comprising a panel of solar-energy-absorbing material adapted to lie on the underlying supporting surface, the panel having on its undersurface a plurality of downwardly extending projections serving as feet which support the panel on the underlying supporting surface, the projections being spaced from each other by an amount predetermined to provide channels therebetween dimensioned to receive and support conduit means for transporting fluid heat exchange medium in heat exchange relation to the panel, and an elongated flexible conduit supported removably in said channels under the panel in a selected pattern and having fluid heat exchange medium inlet and outlet ends,
- securing means for securing the units to the supporting surface,
- a cap piece overlying the space between each adjacent pair of collecting units, and
- fastening means for releasably coupling the cap piece to the adjacent pair of collecting units, the fastening means comprising interlocking flange means on the cap piece and the panels of the collecting units.

4,712,339

STRUCTURES FOR ENCLOSED TRANSFER OF PERSONS

Bruce T. Wenham; Raymond Cook, and Clifford R. Hunter, all of Victoria, Australia, assignors to Astarni Pty. Ltd., Australia

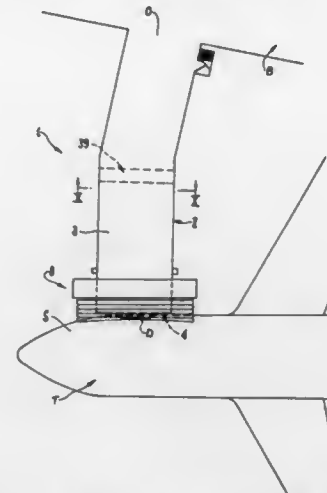
Filed Jun. 2, 1986, Ser. No. 869,332
 Claims priority, application Australia, Jun. 5, 1985, PH911
 Int. Cl.⁴ E04H 14/00

22 Claims

U.S. Cl. 52—173 PS

1. Apparatus for providing a vector connection between an opening in a generally enclosed walkway and an opening in a structure located adjacent the walkway, the apparatus being mountable at the walkway opening so as to vector seal between the walkway and the apparatus, the apparatus including a tubular sealing part providing a passageway with one open end for surrounding the walkway opening and an opposite open end for surrounding the structure opening, the sealing part being composed of flexible material and having a plurality of expandable chambers arranged in side-by-side relationship, each chamber being of a generally endless encompassing configuration and extending peripherally entirely about the passageway, expansion of the chambers flexing the sealing part causing it to project at least substantially axially from the walkway and abut with a surface of the adjacent structure so that the other open end of the passageway surrounds the struc-

ture opening, contraction of the chambers allowing the sealing part to be retracted from the structure back to adjacent the walkway opening, at least one of the chambers being adjacent the opposite open end of the passageway and deforming as necessary upon abutment of the sealing part with the structure so that the sealing part conforms to the structure surface and



vector seals completely about the structure opening, a plurality of elongated stiffening ribs connected to the sealing part so as to extend peripherally thereof, and the stiffening ribs being independent of each other and supporting the sealing part against radial collapse but not inhibiting axial projection or retraction of the sealing part.

4,712,340

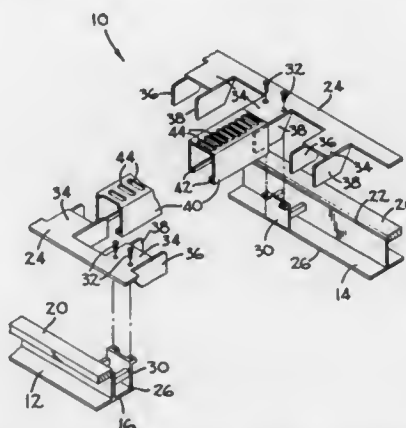
DECKING SUPPORT MEANS

John Sogge, Orlando, Fla., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 22, 1986, Ser. No. 909,796
 Int. Cl.⁴ B44D 5/08; E04C 2/42

U.S. Cl. 52—177

11 Claims



1. A floor system having a first floor means including a pair of projection means extending outwardly and downwardly from the bottom surface of said first floor means and beyond the top surface of said first floor means;
- a second floor means carried on said projection means of said first floor means in a free floating engagement, said second floor means having sidewall portions extending downwardly from a top surface of said second floor means whereby said sidewalls are positioned outboard of said projection means and the bottom surface of said second floor means is in contact with said projection means.

4,712,341

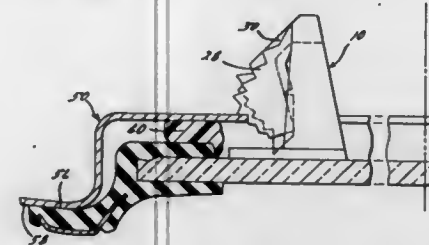
MODULAR WINDOW ASSEMBLY CLIP

Charles F. Harris, Jr., Ypsilanti, and James C. Coleman, Milford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 14, 1986, Ser. No. 896,492
 Int. Cl.⁴ E06B 3/00

U.S. Cl. 52—208

16 Claims



1. An automotive window assembly of the type having a modular window assembly consisting of a pane of glass surrounded by an elastomeric molding insertable into a rabbet flanged aperture in an automobile body to be adhesively secured thereto, the modular window assembly being positioned with respect to the aperture by a plurality of clip members operatively disposed between the modular window assembly and the aperture, each clip member comprising an integrally formed resilient unitary member including:

- a base portion abuttingly engaging and fixedly secured to the glass pane proximate its periphery;
- a positioning leg portion extending perpendicularly from the base portion away from the glass pane; and
- a locking leg portion comprising a locking leg extending at an acute angle in cantilever fashion from the positioning leg portion and having a curvilinearly extending locking surface formed at its free end for engagement with an inner peripheral surface of the body aperture upon insertion of the modular window assembly toward the aperture, the locking leg being inwardly deflectable toward the positioning leg portion during the insertion and being resiliently urged toward locking engagement with the peripheral surface.

4,712,342

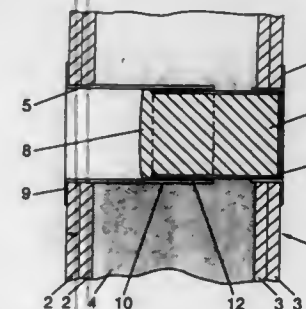
FIRE-SEALED LEAD-THROUGH FOR FRAMED BUILDING COMPONENTS

Bengt E. Legerius, and Inge Sundström, both of Nyköping, Sweden, assignors to Thorsman & Co. Aktiebolag, Nyköping, Sweden

PCT No. PCT/SE85/00373, § 371 Date May 19, 1986, § 102(e) Date May 19, 1986, PCT Pub. No. WO86/02119, PCT Pub. Date Apr. 10, 1986

PCT Filed Sep. 27, 1985, Ser. No. 871,407
 Claims priority, application Sweden, Sep. 28, 1984, 8404880
 Int. Cl.⁴ E04F 17/08; E04B 5/48; F16L 5/02; H02G 3/22
 U.S. Cl. 52—221

8 Claims



1. A method of fire-sealing a lead-through for at least one

cable or wire in the framework of a building comprised of two spaced walls, said method comprising forming a hole through the framework inclusive of aligned holes in the spaced walls, inserting through the hole in the framework a lead-through formed of an inner pipe containing an elastic, fire-resistant foam material precompressed transversely in the pipe and an outer pipe surrounding the inner pipe over a portion of the length of the inner pipe with a gap providing capability of relative axial displacement between the pipes, sealably connecting outer ends of the inner and outer pipes to respective walls of said framework such that the gap between the pipes permits relative movement of the walls, and sealing said gap during said movement by said foam material, a portion of which, extends out of the inner pipe and presses against the inner surface of the outer pipe while the remainder of the foam material remains in the inner pipe, under pressure, in sealed relation with the inner surface of the inner pipe.

4,712,343

INTERIOR AIR VENT SHIELD

J. C. Dearing, 736 Flesslers La., Nashville, Tenn. 37210, and Donald R. Rich, 2817 Desplane Dr., Nashville, Tenn. 37217
 Filed May 27, 1986, Ser. No. 867,146

Int. Cl.⁴ E04F 15/024

U.S. Cl. 52—221

1 Claim



1. A shield for covering interior air vent openings during construction of residential or commercial buildings comprising:

- a. a rectangular floor plate sized to cover the largest of standard floor vent openings, the width of said plate being slightly greater than twice the width of a standard base-board vent opening;
- b. a rectangular block attached to or formed with said plate along their respective largest planar surfaces, generally centrally located on and parallel aligned with said plate but having smaller outside dimensions which are slightly smaller than the smallest standard floor vent opening; and
- c. a groove for facilitating cutting or breaking of said shield, said groove linearly and centrally located along the lower planar surfaces of said plate and block, said groove extending partially into said plate and block, and aligned and parallel with the longest outside edges of said plate and block.

4,712,344

DOMESLAB BUILDING STRUCTURE AND METHOD

Karoly Erdel, 1607-C Amberwood Dr., South Pasadena, Calif. 91030

Continuation of Ser. No. 722,612, Apr. 12, 1985, abandoned.

This application Apr. 15, 1987, Ser. No. 40,764

Int. Cl.⁴ E04C 3/10

U.S. Cl. 52—223 R

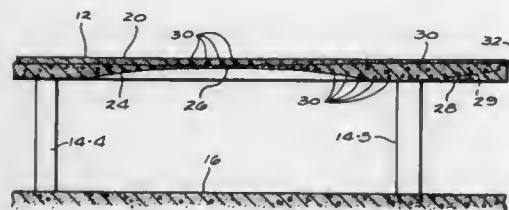
25 Claims

1. A building structure comprising: a series of support columns projecting upwardly at different locations about a region and spaced apart along the periphery of said region; and a floor supported locally at said locations by said spaced columns and extending from said columns across said region; said floor including a monolithic integrally cast body of

concrete having a top surface for supporting a load and having a bottom surface which, as it extends inwardly across said region from the periphery thereof, is shaped to form a shallow concave dome recess in the underside of said body;

the thickness of said body of concrete between said top and bottom surfaces increasing progressively and gradually in all directions outwardly from a crown portion of the dome recess to the periphery thereof;

the ratio of the diameter of a circle having an area equal to the area of the floor over the dome recess to the height of the dome recess at said crown portion being at least about 20 to 1;



said floor including a plurality of tendons extending within said body of concrete across said region and through the concrete body above said dome recess;

the individual tendons, in extending across said region within said concrete body, being bowed to advance first gradually away from said top surface from one side of said region toward an intermediate location above the dome recess and then gradually closer to said top surface toward the opposite side of said region, and being tensioned to apply an upward biasing force and a lateral compressive force on the body of concrete across said region and above said dome recess.

4,712,345

APPARATUS FOR CONNECTING CURTAIN WALL UNITS

Hiromitsu Kaminaga, Kurobe, Japan, assignor to Yoshida Kogyo, K. K., Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,390

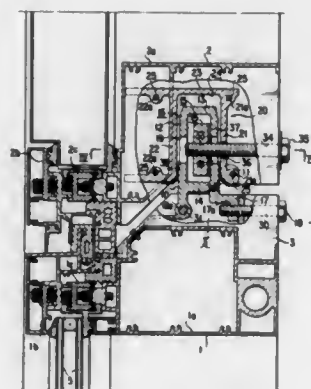
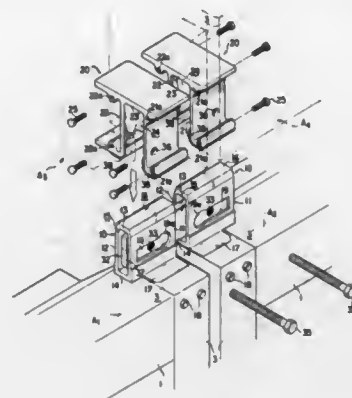
Claims priority, application Japan, May 8, 1985, 60-66861[U]
Int. Cl.⁴ E04B 1/40

U.S. Cl. 52-235

9 Claims

1. An apparatus for connecting curtain wall units, which are juxtaposed vertically and horizontally in a vertical plane, at a portion where four corners of said curtain wall units gather with one another in such a manner as to permit individual in-plane correlative displacement of each of said curtain wall units and restrict out-of-plane correlative displacement thereof, said apparatus comprising a pair of first coupling members fixed to upper edge portions of a pair of horizontally adjacent lower positioned curtain wall units, respectively, said first coupling members each having either one of a projecting portion and a recessed portion adapted to be engaged with each other in such a manner that in-plane correlative displacement of the curtain wall units in the vertical and horizontal directions in said vertical plane is permitted, while out-of-plane correlative displacement thereof is restricted; a pair of second coupling members fixed to lower edge positioned curtain wall units, respectively, in such a manner as to be arranged in opposed relation with said first coupling members, said second coupling members each having the other of said projecting portion or recessed portion; a connecting plate provided across each of the pairs of said first and second coupling members; through-holes formed through one of said pairs of said first or second coupling members, respectively; and bolts inserted through said through-holes for fixedly connecting said connecting plate and the other of said pairs of said first and second

coupling members with the one pair of coupling members sandwiched between said connecting plate and said other pair



of coupling members, said through-holes having a size permitting vertical and horizontal movement of said bolts.

4,712,346

METHOD FOR LAYING BRICKS IN A HERRINGBONE PATTERN, AND AN ACCORDINGLY MANUFACTURED BRICK STRUCTURE

Arend Luitjen, Mercuriusstraat 2, 3204 BM Spijkenisse, Netherlands, assignor to Arend Luitjen, Spijkenisse and Robert de Vries, The Hague, both of, Netherlands, a part interest to each

Filed May 14, 1986, Ser. No. 863,138

Claims priority, application Netherlands, May 15, 1985, 8501399

Int. Cl.⁴ E04C 1/00; E01C 5/06

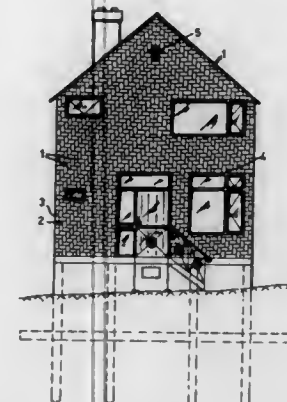
U.S. Cl. 52-311

1 Claim

1. An elevated brick structure, wherein the bricks are ar-

ranged in a herringbone pattern of alternate herringbone layers in which rectangular bricks are either in a horizontally

battans and said base, said outer portions being on opposite sides of said battans and being moveable toward and away from said base, and a flexible impermeate cover membrane



stretched position or in an upstanding position forming twilled rows of bricks at an incline of 45°.

4,712,347

METHOD AND APPARATUS FOR CONTAINING INSULATION USING NETTING

Henry V. Sperber, 8 Red Fox La., Englewood, Colo. 80111

Filed Oct. 31, 1986, Ser. No. 925,309

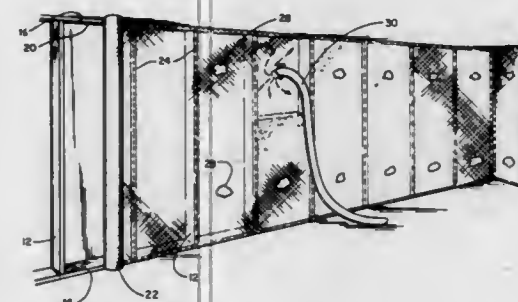
Int. Cl.⁴ E04B 1/74

U.S. Cl. 52-404

15 Claims

U.S. Cl. 52-408

7 Claims



1. A method for placing loose fill insulation in a support frame of a building, comprising:
forming a support frame;
providing a netting from material having a predetermined degree of flexibility and netting holes;
attaching said netting to said support frame;
forming at least a first access hole in said netting;
feeding loose fill insulation between said netting and a portion of said support frame using said first access hole wherein said netting bulges out when sufficient loose fill insulation has been received;
observing said bulging out of said flexible netting as a signal that a sufficient amount of insulation has been fed between said netting and said portion of said support frame; and discontinuing said feeding of said insulation.

4,712,348

NON-PENETRATING ROOF SYSTEM

Charles S. Triplett, 1520 Fairway Ct., Fort Wayne, Ind. 46825, and John D. Gray, R.R. #2, Avilla, Ind. 46710

Filed Jan. 13, 1986, Ser. No. 873,958

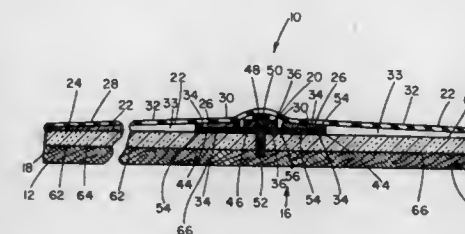
Int. Cl.⁴ E04B 7/00, 5/00

U.S. Cl. 52-408

23 Claims

1. A roof structure comprising roof base, a plurality of flexible retention sheets, said retention sheets having inner and outer portions, a plurality of battans, said battans being positioned on said inner portions of said retention sheets and being secured to said base, said inner portions being between said

1. A roofing system comprising a roof deck, a waterproof membrane above said roof deck, a plurality of panels of foam plastic insulation overlying said waterproof membrane, each of said foam plastic insulation panels having bounding perimetric edges and edge surfaces and having a planar lower surface and a plurality of flat-topped, parallel, raised, elongated ribs on an upper face thereof, and spaced apart by grooves, said ribs being integral with said panels and defining zonal sectors which are stiffer, stronger, and more resistant to deformation than a remainder of each panel, said grooves in said panels comprising channels including bounding sidewalls and base walls derived upon excision of laterally-spaced elongated, lineal sections from said panels transversely thereof, said bounding sidewalls and said base walls being formed with crater-like recesses in exposed surfaces thereof and opening outwardly of said walls, said ribs having tops forming a discontinuous planar surface substantially parallel to said lower surface, a waterproof plastic film having peripheral edges coincident with said bounding perimetric edges of a respective panel and being coextensive with and bonded to only the lower surface thereof, and resting on said waterproof membrane in an unsecured, face-to-face contacting relation, each of said panels being otherwise free of plastic film and exposed to ambient air for evaporation of moisture,



said plurality of panels being in substantially abutting relation at edges thereof, and
a plurality of concrete panels carried on said foam plastic insulation panels and resting on said rib top discontinuous planar surface.

4,712,350

CENTERING ARRANGEMENT FOR T MEMBERS OF A SUSPENDED CEILING

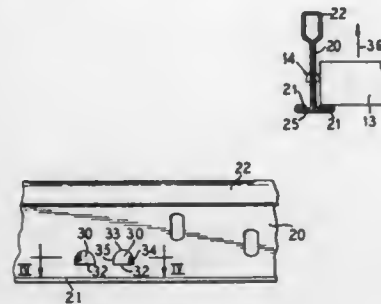
Ronald W. Vukmanic, Naperville, Ill., assignor to Chicago Metallic Corporation, Chicago, Ill.

Filed May 16, 1986, Ser. No. 864,160

Int. Cl.⁴ E04B 5/52

U.S. Cl. 52—484

7 Claims



1. A runner member having an inverted T configuration with a vertical web and two outwardly extending flanges adjacent a bottom edge of the web, said runner member being used with other runner member to form a ceiling system having rectangular openings receiving panels, each of said runner members having means for centering the panel in the rectangular opening, the improvement comprising said means for centering comprising a pair of oppositely extending bumps, each bump being adjacent a cut through the web extending parallel to the flange of the member, said bump having a substantially semi-circular configuration and providing curved camming surfaces for moving a member away from the web as the member moves towards the flange and also laterally along the flange and each bump and cut forming a smooth continuous edge with curved portions which will not interfere with lateral and downward movement of the panel relative to the runner.

4,712,351

VINYL SIDING

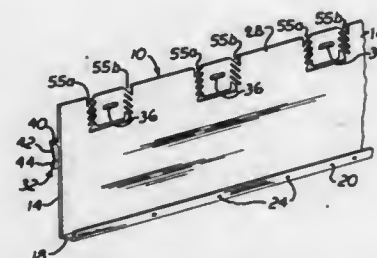
David P. Kasprzak, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed Nov. 10, 1986, Ser. No. 929,117

Int. Cl.⁴ E04C 1/06

U.S. Cl. 52—573

4 Claims



1. In a building siding unit comprising a sheet having an upper portion having a plurality of spaced, horizontally elongated, aligned fastener receiving slots disposed therein, an interlock receiver channel disposed on said upper portion and spaced from said plurality of fastener receiving slots, the improvement comprising isolation means disposed in a U-shaped

configuration partially around at least some of said aligned fastener receiving slots and in an area above said interlock receiver channel, said isolation means comprising vertical stress relief means at each side of at least some of said fastener receiving slots, said vertical stress relief means comprising a series of thin strips of said sheet and an elongated slot lying below corresponding ones of said fastener receiving slots and spanning the distance between said stress relief means, whereby said isolation means serves as a means to ameliorate the effects of expansion and contraction of said building siding unit caused by changing weather conditions.

4,712,352

MODULAR CONSTRUCTION SYSTEM

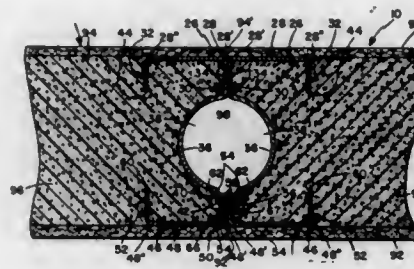
R. Glenn Low, 1911 Meadowview Rd., Bloomington, Minn. 55420

Filed Dec. 4, 1985, Ser. No. 804,429

Int. Cl.⁴ E04C 2/34; E04F 17/00

U.S. Cl. 52—809

7 Claims



1. A panel for a modular wall assembly comprising:
a frame (14) having a first vertical structural unit (16) and a second vertical structural unit (18) and connecting means (20, 22) for rigidly connecting said first structural unit (16) to said second structural unit (18);
each of said structural units having a pair of generally parallel spaced apart first and second side plate members (28, 48) and a pair of vertical edge plate members (34, 54) perpendicular to said side plate members with a first (34) of said edge plate members extending inwardly from an outer edge (28) of said first side plate member (28) and with a second (54) of said edge plate members extending inwardly from an outer edge (48) of said second side plate member (48); at least one (34) of said edge plate members having an inwardly protruding conduit defining portion (36) disposed spaced from said side plates (28, 48); thermal barrier means (62) for rigidly connecting free ends (42, 58) of said edge plate (34, 54) members in thermally insulated connection;
facing sheets (92, 94) secured to outer surfaces of said side plate members (28, 48) of said first structural unit and extending to and secured to outer surfaces of side plate members of said second unit;
fastening means (72, 78) disposed completely between said facing sheets (92, 94) for rigidly connecting said first structural unit of said panel to a second structural unit of a contiguous panel with vertical edge plate members (34, 54) of said panel and said contiguous panel abutting and with opposing conduit defining portions (36) having opposing surfaces defining a completed conduit (98) disposed between said facing sheets (92) and in spaced relation thereto;
said thermal barrier means including a first thermal barrier element connecting edge plate members of said first structural unit (16) and a separate second thermal barrier element connecting edge plate members of said second structural unit (18), said first and second thermal barrier elements disposed to define a first thermal barrier of said panel and a second thermal barrier of said contiguous panel so as to abut when said panel and said contiguous

panel are joined edge to edge to form a composite panel with abutting thermal barrier elements defining a composite thermal barrier; and
rigid foam insulation disposed within said panel and filling a volume defined by opposing surfaces of said facing sheets (92), side plate members (28, 48) and edge plate members (34, 54).

4,712,353

GAS PRESSURIZED SHOCK ABSORBER ASSEMBLY

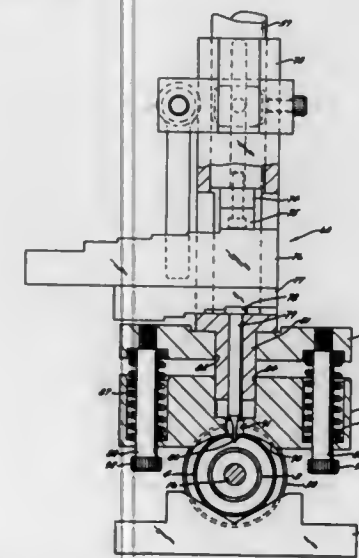
Michael R. Bethell, Monroe; Michael G. Gaines; James F. Mowat, Jr., both of Temperance, all of Mich.; Roger D. Wheeler, Sylvania, and Richard P. Woldke, Toledo, both of Ohio, assignors to Monroe Auto Equipment Company, Monroe, Mich.

Division of Ser. No. 383,949, Jun. 1, 1982, abandoned. This application May 14, 1984, Ser. No. 610,262

Int. Cl.⁴ B65B 31/04

U.S. Cl. 53—80

1 Claim



1. Apparatus for gas pressurizing a sealed shock absorber assembly, said assembly having a weldable metal outer shell, said apparatus comprising, in combination:
a first work station having means for piercing an opening in said weldable metal outer shell of said shock absorber assembly;
a second work station having chamber means for sealingly engaging a continuous annular portion of said outer shell surrounding said opening, gas charging means for passing gas through said chamber means and said pierced opening into an interior portion of said outer shell, plug handling means for moving a weldable plug into said chamber and placing said plug on said portion of said outer shell surrounding said opening and welding means for welding said plug to said outer shell to seal said pierced opening; and
shock absorber assembly moving means for moving a shock absorber assembly to said first work station and then to said second work station, said moving means having a plurality of shock absorber assembly holding fixtures for maintaining each shock absorber assembly in a fixed position with respect to its holding fixture;
whereby a sealed, unpressurized shock absorber assembly is positioned in a fixture, moved by said moving means to said first work station where an opening is pierced in the outer shell of the assembly, the moving means moves said assembly to said second work station, said shock absorber assembly is gas pressurized, a plug is placed over the pierced opening, the plug is welded to the outer shell surrounding said opening and the now gas pressurized and resealed shock absorber assembly is moved by said mov-

ing means to a position for removal from said holding fixture.

4,712,354

DUAL ROTATING STRETCH WRAPPING APPARATUS AND PROCESS

Patrick R. Lancaster, and William G. Lancaster, both of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.

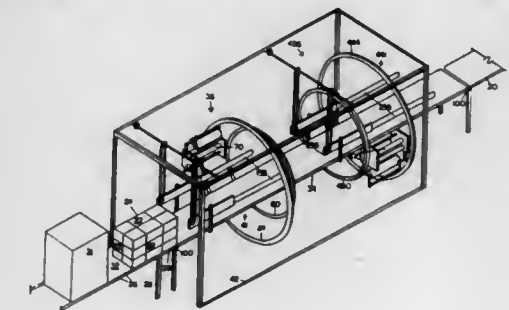
Continuation of Ser. No. 582,779, Feb. 23, 1984, abandoned.

This application Sep. 4, 1986, Ser. No. 903,896

Int. Cl.⁴ B65B 13/12

U.S. Cl. 53—399

33 Claims



1. An apparatus for wrapping a load to contain the load comprising:
wrapping conveyor means for conveying the load and a wrapped web in a longitudinal direction relative to first and second film dispensing means;
said first film dispensing means having means for stretching and wrapping a first web around the load and onto at least part of the wrapping conveyor means, means for rotating said first dispensing means in a first circumferential direction around the load while the load is conveyed in the longitudinal direction relative to the first film dispensing means to form a first helical layer which is formed and biased in a first helical direction;
said second film dispensing means having means for stretching and wrapping a second web around the load and onto the first helical layer of web, means for rotating said second dispensing means in a second circumferential direction around the load opposite the first circumferential direction while the load is conveyed in the longitudinal direction relative to the second film dispensing means to form a second helical layer which is formed and biased in a second helical direction opposite the first helical direction, and for producing in combination with the first helical layer a containment force on the wrapped conveyor means having longitudinal and circumferential components without a substantial helical component, at least one of the longitudinal and circumferential components being substantial; and
means for transferring the first and second helical layers as a unit from the wrapping conveyor means onto the load to apply a containment force on the load having longitudinal and circumferential components without a substantial helical component, at least one of the longitudinal and circumferential components being substantial.

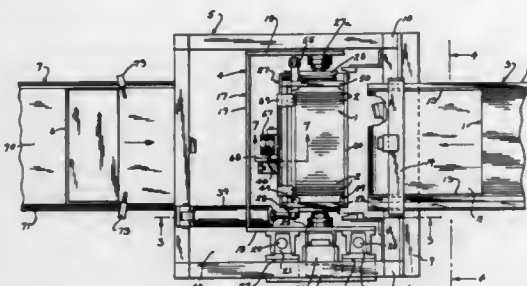
4,712,355 METHOD AND APPARATUS FOR LOADING ARTICLES INTO A CONTAINER

Wolfgang C. Dörner, Oconomowoc; Michael A. Hosch, Hartland, and Mark C. Wedell, Delafield, all of Wis., assignors to Dörner Mfg. Corp., Hartland, Wis.

Filed Mar. 2, 1987, Ser. No. 20,395
Int. Cl.⁴ B65B 5/04, 5/06

U.S. Cl. 53—443

20 Claims



1. An apparatus for feeding an article into a container, comprising article receiving means having an open end to receive an article and having a second end, movable closure means for closing said second end and movable between a first closed position where said closure means is disposed to be engaged by an article being received within said open end to a second open position, operating means for moving said closure means between the closed and open positions, mounting means for mounting said article receiving means for rotation about a horizontal axis from an article receiving position to a discharge position where said second end faces downwardly, means for moving said article receiving means between the receiving position and the discharge position, clamping means for clamping the article within the article receiving means, and release means for releasing the clamping means after said closure means has been moved to said open position to thereby permit said article to be discharged from said article receiving means through said second end.

4,712,356 TRAY LOADER

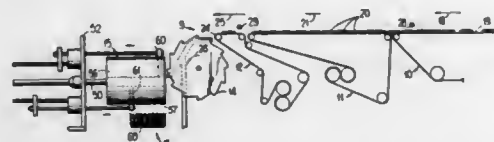
Timothy W. Hardage, Athens; Charles T. Haley, Watkinsville, and William D. Walker, Athens, all of Ga., assignors to Food Machinery Sales, Inc., Athens, Ga.

Continuation-in-part of Ser. No. 677,745, Dec. 3, 1984, Pat. No. 4,590,743. This application May 23, 1986, Ser. No. 866,868. The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.

Int. Cl.⁴ B65B 35/44, 35/50

U.S. Cl. 53—446

17 Claims



1. A method of loading cookies and the like each having substantially flat bottom surface and an opposed irregularly shaped upper surface in a receptacle comprising the steps of moving a plurality of cookies each resting on its bottom surface in an aligned series with a first surface conveyor means at a first velocity toward a second surface conveyor means, transferring the cookies from the first surface conveyor means to the second surface conveyor means with the cookies each resting on its bottom surface on the second surface conveyor means, moving the cookies with the second surface conveyor means

at a second velocity which varies with respect to the first velocity to a reorienting means in timed relationship with said reorienting means, retrieving the cookies with the reorienting means from the second surface conveyor means and reorienting the cookies to an edge standing attitude and aligning the cookies with a cell of a transfer member, engaging with the reorienting means the flat bottom surface of each cookie to urge the cookies into the cell of the transfer member, and after a predetermined number of cookies have been urged into the cell of the transfer member transferring the stack of cookies from the transfer member to a cell of a receptacle.

4,712,357

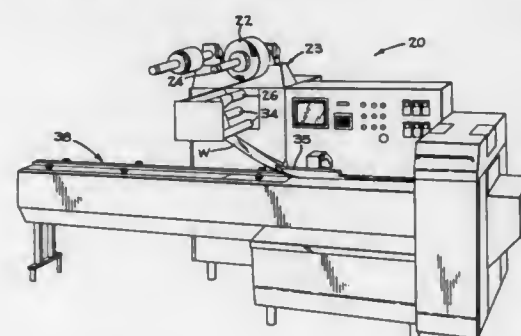
COMPUTER CONTROLLED HORIZONTAL WRAPPER
Donald C. Crawford, Green Bay; Jeffrey L. Ross, Pulaski; Gary P. Strike, Appleton, and Steven W. Mory, Green Bay, all of Wis., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 28, 1985, Ser. No. 792,084

Int. Cl.⁴ B65B 9/06, 57/04

U.S. Cl. 53—450

2 Claims



1. A method of operating a horizontal wrapping machine comprising a supply drive motor for supplying a succession of regularly spaced articles into a tubular web, means for feeding and sealing the margins of the formed web, and means for transversely sealing and cutting the web tube to produce packages having at least one article contained therein, the method comprising the steps of: generating a signal representative of the velocity and position of the article supply drive motor; digitizing the velocity and position signal; and using the digitized representative velocity and position signal to control the velocity of the feeding and sealing and cutting motors.

4,712,358

PRODUCTION OF TEA AND THE LIKE BAGS
James R. Rimmer, Wirral, and Ronald M. Sweeney, West Kirby, both of England, assignors to Premier Brands U.K. Limited, Birmingham, England

Filed Apr. 8, 1986, Ser. No. 849,480

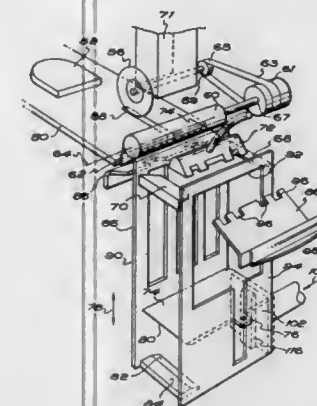
Int. Cl.⁴ B65B 9/02, 29/02

U.S. Cl. 53—450

19 Claims

1. A machine for producing tea bags, comprising: means for moving first and second webs of material through the machine, means for placing individual portions of tea on the first web as it moves through the machine so that said tea portions are spaced transversely of the web length, means for applying the second web over the first web and over said portions of tea, means for sealing said first and second webs together around

said tea portions to form two parallel rows of connected tea bags, means for severing the webs transversely so as to provide side by side but separated pairs of tea bags, a magazine for receiving said pairs of tea bags on top of each



other to define therein two separated side by side tea bag stacks, and means for displacing the tea in the bags to the sides of the bags remote from a longitudinal center line of the webs during travel of the webs through the machine and prior to insertion of the bags in the magazine.

4,712,359

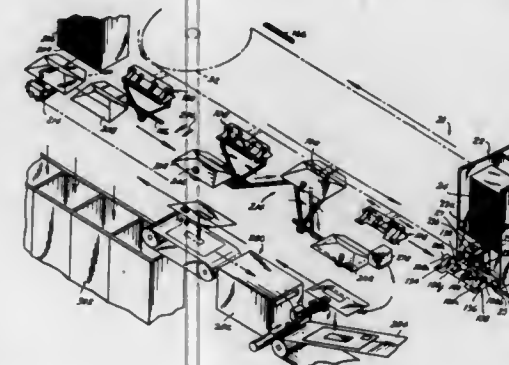
MAIL INSERTING AND COLLATING APPARATUS
John A. DePasquale, New York; Ivar R. Segalowitz, Great Neck, and Cesar P. Andolfi, Bellerose, all of N.Y., assignors to J.A.D. Enterprises, Inc., New York, N.Y.

Filed Oct. 14, 1986, Ser. No. 918,578

Int. Cl.⁴ B65B 5/04, 25/14

U.S. Cl. 53—460

24 Claims



20. A method of inserting mailing inserts into envelopes, comprising the steps of: supplying said envelopes to at least one envelope carrier means for holding said envelopes; clamping each supplied envelope in a respective carrier means with first clamping finger means secured to the respective envelope carrier means; moving said envelopes clamped to said envelope carrier means along a first path; supplying said inserts to at least one pocket means for holding said inserts; moving said inserts in said pocket means along a second path in which at least a portion of said second path runs substantially parallel and adjacent to said first path; moving each envelope carrier means toward a respective pocket means at an insert and envelope merge station to move said pocket means into said envelope; and clamping said envelope and inserts received in said envelope at said insert and envelope merge station with second

clamping finger means secured to the respective envelope carrier means.

4,712,360

MACHINE FOR FILLING BAGS WITH A LIQUID AND SEALING THEM

Guido Bertoglio, Viganello, Switzerland, assignor to Water Line S.A., Mezzovico, Switzerland

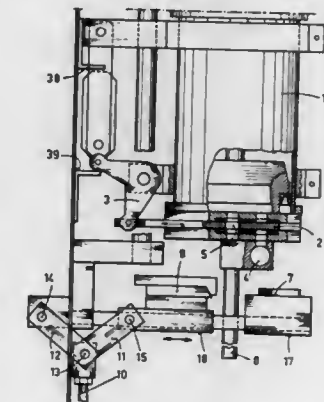
Continuation of Ser. No. 772,644, Sep. 4, 1985, abandoned. This application Sep. 3, 1986, Ser. No. 903,850

Claims priority, application Switzerland, Sep. 24, 1984, 4552/84

Int. Cl.⁴ B65B 9/10, 43/30

U.S. Cl. 53—567

2 Claims



1. Machine for filling bags with a liquid and sealing them, comprising:

liquid proportioning means; a pair of jaws adapted to open substantially along a given direction, said pair of jaws having suction means for holding the upper lips of a bag by partial vacuum, said pair of jaws being mounted beneath said liquid proportioning means; a toggle joint comprising two pivotally interconnected links and an actuating member connected to said joint at said pivotal interconnection, each said link having an end remote from said pivotal interconnection and said actuating member being displaceable in a direction substantially perpendicular to said given direction; at least one of said remote ends being pivotally connected to one of said pair of jaws; said pair of jaws being closed when said links are extended relative to one another, and open when said links are more nearly collapsed relative to one another; whereby displacement of said actuating member in said perpendicular direction at a constant rate will open said closed jaws at a progressively increasing rate; and a manually operable pedal for pulling said actuating member in a direction to open said jaws.

4,712,361

COLLATION ASSEMBLIES

Bhushan K. Oberoi, Horley, United Kingdom, assignor to Redland Roof Tiles Limited, Surrey, England

Filed Jul. 5, 1985, Ser. No. 751,911

Claims priority, application United Kingdom, Jul. 6, 1984, 8417249

Int. Cl.⁴ B65G 57/14, 49/05

U.S. Cl. 53—540

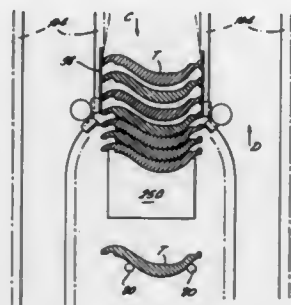
18 Claims

1. Apparatus for collating and stacking manufactured building components, comprising:

a plurality of pairs of opposed shelf means, each shelf means being movable up and down and each shelf means of the opposed pairs of shelf means movable towards and away from each other;

conveyor means for feeding components to the shelf means; means for moving the shelf means up or down in timed relation to the movement of the conveyor thereby to locate the components on the shelf means, opposed edges of each component being supported by a pair of shelf means;

a support for a stack of components, the support being vertically movable relatively to the shelf means; shelf positioning means for moving opposed pairs of shelf means apart, said shelf-positioning means being movable



up and down with respect to said shelf means, for moving pairs of shelf means apart in timed relation to relative downward or upward movement between the shelf means and the shelf-positioning means thereby to release the components and stack them on the support; and means for effecting relative movement between the shelf-positioning means and the shelf means, said shelf means, shelf-positioning means and support being relatively movable vertically in a timed relationship which effects the stacking of the components without undue shocks to the components.

4,712,362

HARVESTER FOR EXPERIMENTAL PLOTS OF GROUND

Michel Cornet, Avon, and Pierre Michel, Ormesson, both of France, assignors to Institut Technique des Cereales et des Fourrages, Paris; Association Generale des Producteurs de Maïs, Pau and Ateliers Rolland S.A., Chateau du Loir, all of, France

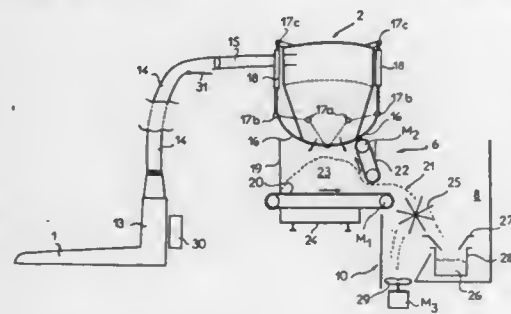
Filed Mar. 4, 1986, Ser. No. 836,137

Claims priority, application France, Mar. 6, 1985, 85 03312

Int. Cl.⁴ A01D 41/02

U.S. Cl. 56—16.5

8 Claims



1. A harvester for collecting a product from experimental plots of ground comprising first and second modules mounted on a self driven vehicle; said first module including a collecting-chopping means including a gathering nose, an injection duct connected to said collecting-chopping means, and an opening stand-by hopper connected to an opposite

end of said injection duct from said collecting-chopping means;

said second module including means for weighing and means for sampling the collected product,

a conveyor associated with said weighing means disposed in line with an opening in said stand-by hopper, means for equalizing the load of the collected product transported by said conveyor associated with said weighing means,

said equalizing means and said conveyor associated with said weighing means forming an outlet to said sampling means,

said sampling means including a sample conditioning station and said sampling means also having an outlet in said sampling means and a means for discharging the collected product collected from each plot in said outlet of said sampling means;

a first control station connected to a means to advance said vehicle and to a means to open said opening in said stand-by hopper;

a second control station connected to said conveyor associated with said weighing means, to said equalizing means, and to said sampling means;

said weighing means connected to one of said control stations.

4,712,363

APPARATUS FOR CONVERTING A FLEXIBLE LINE TRIMMER FOR USE AS A LAWN EDGER

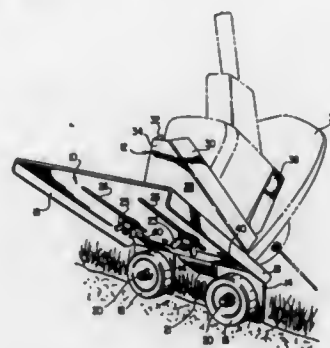
Morris W. Claborn, Dallas, Tex., assignor to Wedger, Inc., Dallas, Tex.

Filed Sep. 12, 1986, Ser. No. 906,516

Int. Cl.⁴ A01D 34/84

U.S. Cl. 56—16.7

11 Claims



1. An apparatus for converting a flexible line trimmer for use as a lawn edger comprising:

(a) a wheel-plate including:

a planar sheet member; first and second struts extending from an edge of said sheet member and being disposed at an obtuse angle with respect to said sheet member;

a wheel attached to each of said struts; an arm extending from said edge of said sheet member; and

a lip extending from an end of said arm;

(b) first and second flange members each having a flange surface;

(c) fasteners to adjustably and fixably connect said wheel-plate and said first and second flange members;

(d) a strap connected to said wheel-plate and having means for fastening the strap around the flexible line trimmer; and

(e) said lip, flange surfaces and strap being located to connect the apparatus to a flexible line trimmer.

4,712,364

QUICK ATTACHABLE AND DETACHABLE MOWER BLADE ASSEMBLY

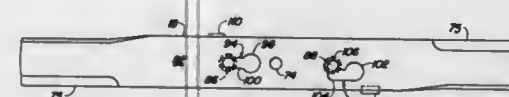
Lonnie R. Oxley, West Bend, Wis., assignor to Deere & Company, Moline, Ill.

Filed Jun. 30, 1986, Ser. No. 880,462

Int. Cl.⁴ A01P 34/73

U.S. Cl. 56—295

8 Claims



1. A quick attach blade assembly for use on a grass cutting mower having a vertical rotatably driven main shaft with a lower end portion, said assembly comprising: a vertical locking pin supported in the lower end portion of said shaft by biasing structure that yieldably holds said pin in a lowermost position in which the lower end of the pin projects downwardly of the lower end portion of the shaft; a blade holder fixed to the lower end portion of said shaft, and projecting radially to opposite sides thereof, said holder having a lower blade-contacting surface and a central opening through which said pin projects; a pair of headed studs fixed to the holder and offset radially from and on opposite sides of the central opening, said studs having the heads spaced downwardly from said lower surface; a mower blade having opposite ends and a central pin-receiving opening, and said blade a pair of stud openings with each of the stud openings having an enlarged portion for passing the head of a respective stud and a narrow portion extending from the enlarged portion to an end conforming to the shape and dimension of the shanks of its respective stud, one of said narrow portions being located and directed so as to prevent radial movement in either direction between the holder and blade, and the other of said narrow portions being located and directed so as to prevent angular movement between the holder and blade.

4,712,365

PROCESS FOR THE MANUFACTURE OF REINFORCED FALSE TWIST YARNS

Fernando F. Ferrer, Anselmo Clavé, 6 Calella (Barcelona), Spain

Continuation of Ser. No. 759,149, Jul. 26, 1985, abandoned. This application Oct. 2, 1986, Ser. No. 914,518

Claims priority, application Spain, Jul. 27, 1984, 534,967

Int. Cl.⁴ D01H 5/28; D02G 3/26, 3/36

U.S. Cl. 57—12

3 Claims



1. A process for manufacturing reinforced false twist yarns, comprising:

supplying a first and a second fiber roving; supplying a continuous fiber yarn; providing a pair of braking rolls to cause drag on said first and said second roving;

passing said first and said second roving between said pair of braking rolls;

providing a pair of drawing bands; passing said first and said second roving between said pair of drawing bands, and introducing said continuous fiber yarn between said pair of drawing bands;

providing a pair of pulling rollers to pull said first and said

second roving and said continuous fiber yarn; passing said first and said second roving and said continuous fiber yarn between said pair of pulling rollers to cause drawing of said first and said second roving;

providing a pair of twisting rollers to cause twisting of said first and second rovings;

whereby said continuous fiber yarn undergoes substantially less drawing than said first and said second roving due to the effect of said pair of braking rolls on said first and said second roving.

4,712,366

DENIER-MIXED COMPOSITE YARN, DENIER-MIXED SPECIAL THICK AND THIN YARN, FALSE TWIST YARN AND DENIER-MIXED SHRINKAGE-MIXED COMPOSITE YARN

Keizo Tsujimoto; Takashi Katagiri; Eiji Ichihashi, and Hitoshi Otsubo, all of Okazaki, Japan, assignors to Nippon Ester Co., Ltd., Aichi, Japan

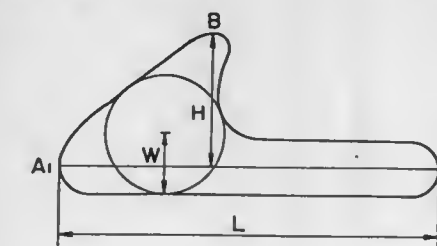
Filed Dec. 22, 1986, Ser. No. 945,382

Claims priority, application Japan, Dec. 28, 1985, 60-298563; May 19, 1986, 61-114083

Int. Cl.⁴ D02G 3/22, 3/24, 3/38, 1/02

U.S. Cl. 57—245

16 Claims



1. A denier-mixed composite yarn containing 20 weight percent or more coarse filaments whose single filament fineness is 3 deniers or more and 5 weight percent or more fine filaments whose single filament fineness is 1.5 denier or less, characterized in that part or all of said coarse filaments are of non-circular cross-section, the stress of said composite yarn at 10% elongation is 2.5 g/d or less, and the following relations (I) and (II) are satisfied:

$$E_{max} - E_{min} \geq 20(\%) \quad (I)$$

$$E_{i+1} - E_i \leq 20(\%) \quad (II)$$

Where E_{max} is the elongation (%) of the maximum elongation single filament constituting the composite yarn, E_{min} the elongation (%) of the single filament exhibiting minimum elongation, E_i the elongation (%) of any single filament (excluding the maximum elongation single filament) constituting the composite yarn, and E_{i+1} the elongation (%) of the single filament which exhibits elongation greater than and closest to E_i .

4,712,367

METHOD AND DEVICE FOR FORMING A THREAD JOINT

Manfred Lassmann, Nettetal, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 4, 1985, Ser. No. 794,757

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440009

Int. Cl.⁴ D01H 15/02

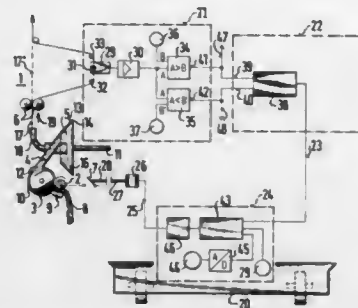
U.S. Cl. 57—263

20 Claims

1. Method of forming a thread joint in an open-end spinning machine having a sliver drawing-in device for drawing in a sliver and feeding it to a fiber loosening device from which it

is guided by a fiber guiding device to a fiber accumulator at which the fibers are accumulated, disentangled, imparted with a rotary motion, and thereafter engaged with an open end of a thread, and a take-up device for drawing the thread out of the fiber accumulator, which comprises, for the purpose of forming a joint, bringing a thread end which is fed back into the fiber accumulator into contact with a quantity of fibers to be joined which have been previously fed into the fiber accumulator, continuously withdrawing the thread out of the fiber accumulator and continuously feeding fibers into the accumulator, continuously measuring thickness of the joints and automatically controlling the quantity of fibers being joined which is necessary for producing a joint having a given acceptable thickness.

10. Joining device capable of traveling and forming a joint in an open-end spinning machine having a sliver drawing-in-



device for drawing in a sliver and feeding it to a fiber loosening device, a fiber guiding device for guiding the sliver then to a fiber accumulator for accumulating, disentangling, imparting a rotary motion to, and thereafter engaging the sliver with an open end of a thread, a take-up device for drawing the thread out of the fiber accumulator, means for feeding a thread end, for the purpose of forming a joint, back into the fiber accumulator into contact with a quantity of fibers to be joined which had been previously fed into the fiber accumulator, means for continuously withdrawing the thread from the fiber accumulator and means for continuously feeding fibers into the fiber accumulator the joining device comprising an automatic joint thickness measuring device connected to a joint thickness monitor, and a metering device for quantities of fibers to be joined which is controllable in accordance with a mean thickness of the joints, said metering device being operatively connected to said thickness monitor.

4,712,368

MANUFACTURE OF TELECOMMUNICATIONS CABLE CORE UNITS

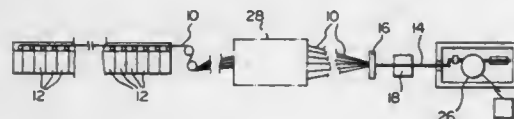
John N. Garner, Kingston, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 30, 1987, Ser. No. 31,295

Int. Cl.⁴ H01B 13/04

U.S. Cl. 57—314

12 Claims



1. Apparatus for forming a core unit from telecommunications conductor units in which each conductor unit is formed of twisted together insulated conductors, the apparatus comprising:

a plurality of arcuate position changing means for conductor units, each position changing means for moving an individual conductor unit laterally as it is moved along an individual passline, the position changing means located in

spaced side-by-side relationship in series in the general direction of passlines for conductors to extend around a volumetric space;

each position changing means comprising a movable conductor unit guide, a guide mounting means providing an arcuate path for movement of the movable guide into four quadrants around the volumetric space, and driving means drivably connected to the movable guide to move the guide alternately in one direction and then in the other around the arcuate path and into all four quadrants around the volumetric space;

fixed guide means disposed upstream of the plurality of position changing means, the fixed guide means defining an individual fixed guide surface for each conductor unit and cooperating with an associated movable guide to control movement of the conductor unit along its feedpath through the volumetric space and through a gap between position changing means for any position of the movable guide on its arcuate path, the fixed guide surfaces relatively disposed to avoid twisting together of conductor units in the volumetric space during movement of the movable guides along the arcuate paths;

an array forming means having a smooth convex conductor engaging surface extending transversely of the general direction of the passlines and in line with and downstream of the series of position changing means for holding the conductor units in an arcuate array while enabling relative positional change of the units around the array as the movable guides move individually on their arcuate paths; and

a core unit forming and take-up means to draw the conductor units together to form the core unit.

4,712,369

YARN TREATING DEVICE FOR OPEN-END SPINNING FRAMES

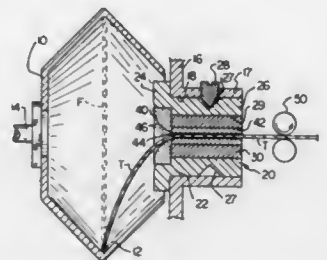
Thomas Vernon, Greensboro, N.C., assignor to Burckhardt America, Inc., Greensboro, N.C.

Filed May 11, 1987, Ser. No. 48,212

Int. Cl.⁴ D01H 7/882, 1/135

U.S. Cl. 57—417

5 Claims



1. A navel member adapted for attachment in the cover of an open-end spinning rotor for guiding thread formed in the fiber collecting groove of said spinning rotor of an open-end spinning machine therethrough to a take-up mechanism, said navel member including:

(a) a support housing having a head at the upstream end and a barrel protruding in a downstream direction from the rear side of said head, said barrel including a passageway therethrough, the axis of said passageway extending substantially along the thread path as it exits said spinning rotor, means associated with said barrel for mounting said housing in position adjacent the spinning rotor;

(b) a ceramic throat piece embedded in the front surface of said head and including a central guide orifice therein for guiding thread into said passageway;

(c) a generally cylindrical insert fixed in said barrel passageway and including a longitudinal channel therethrough having a diameter equal to or less than the diameter of said central guide orifice;

- (d) a plurality of spaced, substantially inside wall of said longitudinal channel, said plurality of grooves surrounding the yarn path therethrough;
- (e) an elongated ceramic rod partially embedded in each of said grooves and forming a plurality of peripherally spaced obstructions around the wall forming said longitudinal channel;
- (f) whereby the yarn exiting said spinning rotor through said navel member intermittently engages said ceramic rods causing an improved roughening and bulking effect.

4,712,370

SLIDING DUCT SEAL

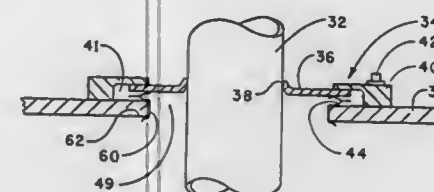
Andrew MacGee, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 24, 1986, Ser. No. 855,243

Int. Cl.⁴ F02C 6/18; F02G 3/00

U.S. Cl. 60—39.07

3 Claims



1. An air seal for reducing air leakage associated with an accessory conduit penetrating an air duct wall of an aircraft engine, the air seal comprising:

- (a) a sliding seal plate for encircling the accessory conduit;
- (b) a retaining plate connected to the air duct for retaining said seal plate adjacent to the air duct wall; and
- (c) an oppositely sprung seal member for forming an air seal between the air duct wall and said sliding seal plate, wherein said seal member is further characterized by two oppositely sprung seal legs, one of said seal legs being adjacent to said sliding seal plate and the other of said seal legs being adjacent to the air duct wall.

4,712,371

PROCESS AND DEVICE FOR STARTING A GAS TURBINE

Thomas Weber, Oberursel, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

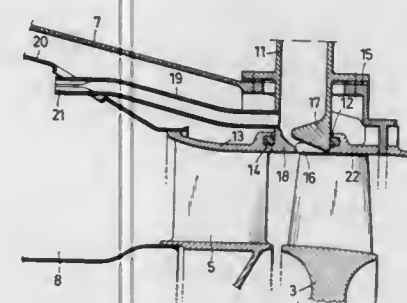
Filed Nov. 14, 1985, Ser. No. 797,903

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 3441509

Int. Cl.⁴ F02C 7/27

U.S. Cl. 60—39.142

8 Claims



1. In a gas turbine which includes a compressor; a turbine that defines a central rotary axis; a plurality of combustion chambers which are annularly disposed around said turbine; an

outer housing which encloses said compressor, said turbine and said combustion chambers; and an ignition means for starting said gas turbine; the improvement wherein said ignition means comprises a main hot exhaust gas supply channel which extends through said outer housing perpendicularly to said imaginary central axis, said main hot exhaust gas supply channel terminating within said outer housing at a discharge mouth which is directed towards said turbine so as to direct hot exhaust gases against said turbine and cause said turbine to rotate, and a plurality of branch hot exhaust gas supply channels within said outer housing which extend from said main fuel gas supply channel generally in parallel with said central rotary axis and respectively directly into said plurality of combustion chambers, each of said branch hot exhaust gas supply channels having a fan-shaped nozzle at its end within a respective combustion chamber for emitting a fan-shaped flow of exhaust gases into the respective combustion chamber to initiate combustion of fuel therein.

4,712,372

OVERSPEED SYSTEM REDUNDANCY MONITOR

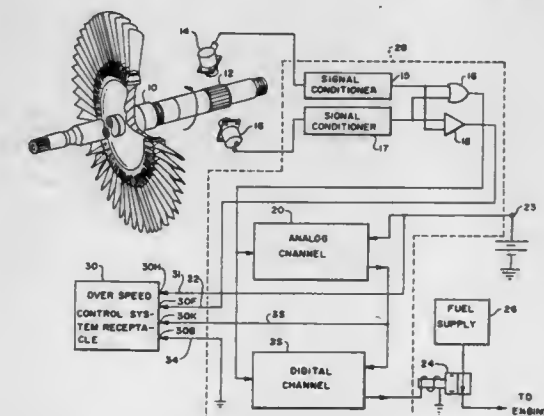
Thomas A. Dickey, Westport, and George R. Bodetka, Stamford, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Sep. 18, 1985, Ser. No. 777,118

Int. Cl.⁴ F02C 9/00

U.S. Cl. 60—39.281

4 Claims



1. In an overspeed control system for a gas turbine engine including:

a power source; a speed sensing circuit consisting of at least two sensors operatively connected to the gas turbine engine to redundantly generate first signals proportional to the operational speed of said gas turbine engine; gating means connected to receive the first speed signals and transmit a second speed proportional thereto only if all of said redundant signals are present; means to generate a signal indicative of a predetermined overspeed condition; dual comparison circuits, each connected to receive the first speed signals and the predetermined overspeed condition signal, said dual comparison means connected in series to generate an overspeed signal when comparisons, by each of said circuits, of said predetermined signal to at least one of said first speed signals is each indicative of an engine overspeed condition, said dual comparison circuits generating internal signals indicative of proper operation of each of said circuits; and actuating means responsive to the overspeed signal to shut off the fuel supply to the gas turbine engine; a monitor for checking the proper functioning of the overspeed control system during normal operation of the gas turbine engine comprising:

first means connected to the overspeed control system to receive the second speed signal and generate a first monitor signal in response thereto;

speed sensing circuit indicating means connected to receive the first monitor signal and to provide a visual indication of the proper functioning of the speed sensing circuits;

second means connected to the overspeed control system to receive the internal signals of the dual comparison circuits to generate a second monitor signal in response thereto;

comparison circuit indicating means connected to receive the second monitor signal and to provide a visual indication of the proper functioning of the dual comparison circuits; and

self test circuitry connected to actuate the first and second monitor signal generating means independent of the overspeed control system to check the proper functioning of the monitor.

4,712,373

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED RESPONSE CHARACTERISTICS

Toshinari Nagai, Susono; Takatoshi Masui; Yasushi Satou, both of Mishima, and Toshiyasu Katsuno, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

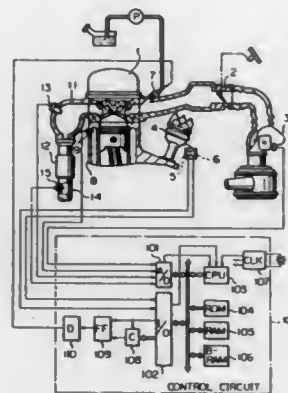
Filed Apr. 9, 1986, Ser. No. 849,839

Claims priority, application Japan, Apr. 12, 1985, 60-076615

Int. Cl.⁴ F02D 41/14

U.S. Cl. 60-274

16 Claims



1. A method for controlling the air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter for detecting a concentration of a specific component in an exhaust gas, comprising the steps of:

determining whether or not said engine satisfies first predetermined air-fuel ratio feedback control conditions;

comparing the output of said upstream-side air-fuel ratio sensor with a first predetermined reference voltage when said engine satisfies said first predetermined air-fuel ratio feedback control conditions;

changing a first air-fuel ratio correction amount in accordance with a result of the comparison of the output of said upstream-side air-fuel ratio sensor with said first predetermined reference voltage;

determining whether or not said engine satisfies second predetermined air-fuel ratio feedback control conditions;

comparing the output of said downstream-side air-fuel ratio sensor with a second predetermined reference voltage when said engine satisfies said second predetermined air-fuel ratio feedback control conditions;

changing a second air-fuel ratio correction amount in accordance with a result of the output of said downstream-side air-fuel ratio sensor with said second predetermined reference voltage, the changing speed of said second air-fuel ratio correction amount being larger for a predetermined

time period after said engine satisfies said second predetermined air-fuel ratio feedback control conditions than after said predetermined time period has passed; and

adjusting the actual air-fuel ratio in accordance with said first and second air-fuel ratio correction amounts.

4,712,374

HYDRAULIC PUMP JACK

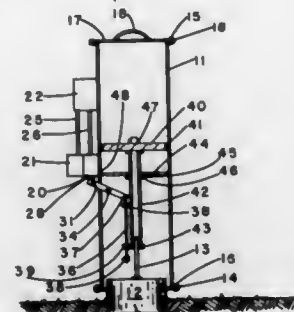
Wayne A. Stewart, 608 W. 10th, McCook, Nebr. 69001

Filed Aug. 10, 1981, Ser. No. 291,518

Int. Cl.⁴ F16D 31/02; F01L 31/00

U.S. Cl. 60-369

1 Claim



1. In combination,

a manhole type vault having upper and lower ends, said vault being situated in the ground with said upper end disposed approximately at ground level,

a cover removably covering the upper end of said vault,

an oil well casing disposed within the ground below said vault, said casing having an upper end portion protruding into said vault through the lower end thereof, and

a hydraulic pump jack, comprising

(a) hydraulic cylinder means mounted on the upper end of said oil well casing,

(b) piston means slidably mounted within said hydraulic cylinder means;

(c) piston rod means having a first end and a second end wherein said first end is operably attached to said piston and said second end is operably attached to the oil well sucker rod;

(d) fluid forcing means for providing hydraulic fluid under pressure to said cylinder means;

(e) control valve means for controlling the flow of hydraulic fluid to said hydraulic cylinder;

said piston rod means comprising a tubular shaft for telescopically accepting said oil well sucker rod,

said hydraulic cylinder means comprising a rod end cap fixedly mounted within said hydraulic cylinder means whereby said hydraulic cylinder means is divided into an upper chamber and a lower chamber;

said piston rod means being slidably mounted in said rod end cap and wherein said piston means is positioned in said upper chamber of said hydraulic cylinder means;

a hydraulic fluid return reservoir in fluid communication with said fluid forcing means and said control valve means; and

said hydraulic cylinder means comprising a removable blind end cap positioned at the top end of the cylinder.

4,712,375

SAFETY DEVICE FOR PRIORITY HYDRAULIC CONSUMER

Wolfgang Kaus, Lothar Wombach, and Norbert Muehler, Rechtenbach, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

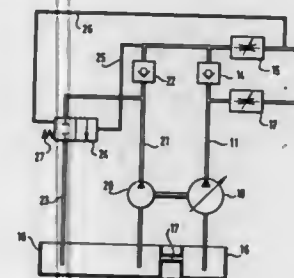
Filed Apr. 8, 1986, Ser. No. 849,471

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 3513967

Int. Cl.⁴ F16D 31/02

U.S. Cl. 60-405

6 Claims



1. A safety device in a system having a priority consumer and a lower ranking consumer comprising a pump having a pressure line and a suction communicating with a source and an auxiliary pump having a pressure line and a suction line communicating with a source, the improvement comprising means communicating said pump pressure line to said lower ranking consumer and to said priority consumer through a first check valve, means communicating said auxiliary pump pressure line with said priority consumer through a second check valve, and valve means responsive to the pressure applied to said priority consumer for communicating said auxiliary pump pressure line to its source when the pressure applied to said priority consumer is above a predetermined value and for closing the communication of said auxiliary pump pressure line to its source when the pressure applied to said priority consumer is less than said predetermined value.

4,712,376

PROPORTIONAL VALVE CONTROL APPARATUS FOR FLUID SYSTEMS

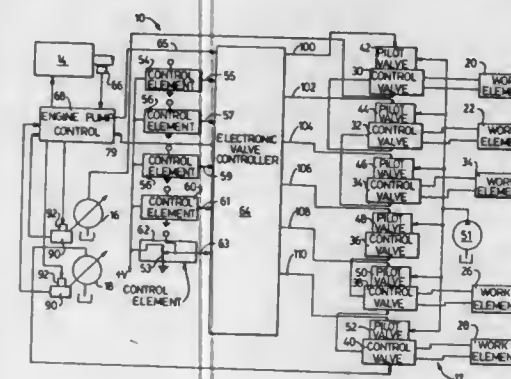
John M. Hadank, Dunlap, and Todd D. Creger, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Oct. 22, 1986, Ser. No. 921,506

Int. Cl.⁴ F16D 31/02

U.S. Cl. 60-427

20 Claims



1. An apparatus for controlling a fluid system of a work vehicle having a source of motive power, at least one fluid circuit having a variable displacement pump driven by the source of motive power, a plurality of control valves for controllably passing fluid from the variable displacement pump to

a plurality of respective work elements, and a plurality of operator control elements, the apparatus comprising:

means for sensing the speed of said source of motive power and delivering a signal representative of the actual speed in response to said sensed speed;

means for providing demand signals in response to selected settings of each respective operator control element; and

an electronic valve controller for receiving the actual speed signal and the demand signals, determining available flow and requested flow capacities of said variable displacement pump in response to the respective actual speed and demand signals, comparing the requested flow to the available flow capacity, delivering output signals to the respective control valves in response to said comparison, selectively positioning the valves, and limiting the total requested fluid flow to said respective work elements within the available flow capacity of the variable displacement pump.

4,712,377

CONTROL APPARATUS FOR HYDRAULIC MOTOR

Toshiyuki Yoshida, Kawasaki, and Mitsuru Arai, Kamakura, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

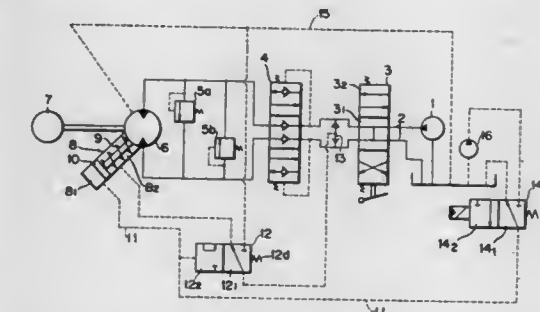
Filed Sep. 13, 1985, Ser. No. 776,016

Claims priority, application Japan, Sep. 17, 1984, 59-139397[U]

Int. Cl.⁴ F16D 31/02

U.S. Cl. 60-444

3 Claims



1. A control apparatus for a hydraulic motor for use in a construction vehicle driven by hydraulic power, comprising:

(a) a hydraulic motor connected to the running gear of the vehicle;

(b) a hydraulic pump serving as a pressurized fluid supply source to supply hydraulic fluid into said hydraulic motor;

(c) a manually operable directional control valve connected across supply and discharge conduits which extend between said hydraulic motor and said pressurized fluid supply source;

(d) a brake valve means connected across said conduits which extend between said directional control valve and said hydraulic motor, said brake valve means including a counterbalancing valve and two relief valves, said counterbalancing valve and said relief valves all being connected across said supply and discharge conduits which extend between said manually operable directional control valve and said hydraulic motor; and

(e) a selector valve adapted to control the supply of control pressurized fluid, which is introduced through a shuttle valve connected across said conduits, into a displacement control cylinder contained in said hydraulic motor, said selector valve being a pilot operated type selector valve which can be remotely controlled by pilot pressurized fluid supplied from an external pressurized fluid supply source through a pilot fluid conduit in which a remote controlled solenoid operated control valve is provided for selectively connecting said selector valve and a bottom side pressure chamber of said displacement control cylinder.

der with said external pressurized fluid supply source and with a drain conduit.

4,712,378

DRIVING APPARATUS FOR STIRLING CYCLE ENGINE

Kouichi Nakayama, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

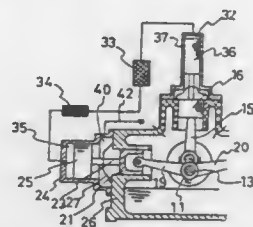
Filed Mar. 27, 1986, Ser. No. 844,936

Claims priority, application Japan, Mar. 29, 1985, 60-67637

Int. Cl.⁴ F02G 1/04

U.S. Cl. 60—525

7 Claims



1. In a Stirling engine, a driving apparatus comprising: at least two compression pistons; a driving mechanism for each compression piston; a rod interconnecting each compression piston with its respective driving mechanism; a diaphragm on each rod closing off a space of the compression piston back pressure side and permitting a change in the volumetric capacity of the space, means for releasing pressure from the spaces of the compression piston back pressure sides; and a crank axle having at least one crank pin, the at least two compression pistons being connected to a common one of said crank pins of said crank axle and located on opposite sides of said crank axle, said diaphragm of the two compression pistons changing the volumetric capacity of the piston back pressure sides 180° out of phase relative to one another.

4,712,379

MANUAL RECYCLER FOR DETONATING IMPACT TOOL

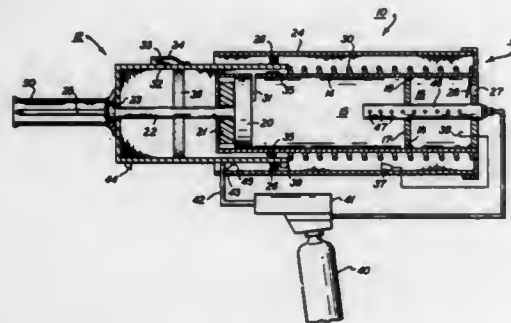
Joseph S. Adams, Whistler, and Paul G. Branstor, Vancouver, both of Canada, assignors to Pow-R Tools Corporation, Vancouver, Canada

Filed Jan. 8, 1987, Ser. No. 1,622

Int. Cl.⁴ F01B 29/08; F02N 13/00

U.S. Cl. 60—632

28 Claims



1. A detonating impact tool comprising:
 - a. a main housing having spaced inner and outer walls, with an inner wall enclosing a detonation chamber and an outer wall surrounding a space around said inner wall;
 - b. a front housing fitting between said inner and outer walls where a compression spring biases said front housing forward;
 - c. a piston axially movable within said detonation chamber

- and having an impact rod extending forward of said detonation chamber and said front housing;
- d. an exhaust passageway for exhausting gases from said detonation chamber out through said front housing;
- e. means for admitting air and fuel to said detonation chamber; and
- f. said front housing, piston, and main housing being arranged so that pressing a fastener against a work piece with said tool to retract said piston and said front housing against said spring charges and then detonates a charge in said detonation chamber, driving said piston and said impact rod forward to drive said fastener into said work piece, and opening said exhaust passageway to initiate an exhaust.

4,712,380

UTILIZATION OF THERMAL ENERGY

Ian K. Smith, London, England, assignor to Solmecs Corporation N.V., Curacao, Netherlands Antilles

PCT No. PCT/EP85/00067, § 371 Date Sep. 24, 1985, § 102(e) Date Sep. 24, 1985, PCT Pub. No. WO85/03328, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 23, 1985, Ser. No. 783,224

Claims priority, application United Kingdom, Jan. 25, 1984, 8401908

Int. Cl.⁴ F01K 7/00

U.S. Cl. 60—641.2

9 Claims

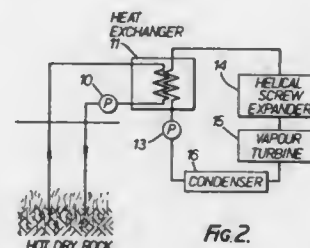


Fig. 2

1. A method of utilizing thermal energy comprising the steps of heating a first fluid by pumping through a hot dry rock heat source, transferring the heat from the said first fluid to a more volatile, second fluid which passes through a trilateral cycle and recycling the first fluid to the heat source, the said trilateral cycle comprising substantially adiabatically pressurizing the said second fluid, receiving the transferred heat from the first working fluid, substantially adiabatically expanding the hot pressurized second fluid by flashing in a helical screw expander capable of operating effectively with wet working fluid and progressively drying said fluid during expansion, passing substantially the whole of the exhaust dry second fluid through a turbine operating on dry vapor as in the conventional Rankine cycle, condensing the second fluid exhausted from the turbine, and recycling the second fluid to the adiabatic pressurization stage.

4,712,381

FLUID HANDLING ELEMENTS AND COMBUSTION ENGINES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

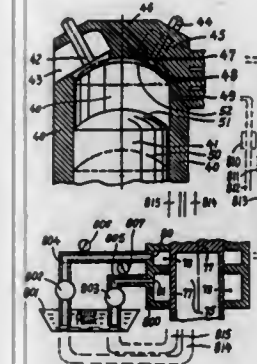
Continuation-in-part of Ser. No. 282,990, Jul. 14, 1981, Pat. No. 4,557,347, and a continuation-in-part of Ser. No. 338,741, Jan. 12, 1982, Pat. No. 4,480,532, and a continuation-in-part of Ser. No. 468,106, Feb. 22, 1983, abandoned, and a

continuation-in-part of Ser. No. 529,254, Sep. 6, 1983. This application Oct. 29, 1984, Ser. No. 665,482

Int. Cl.⁴ F01B 29/04

U.S. Cl. 60—712

2 Claims



1. A cylinder in a fluid handling device with high pressures and temperatures in said cylinder which vary in continuing cycles periodically, wherein at least one outer chamber is mounted around the wall of said cylinder and provided with at least one entrance port in the housing of said outer chamber, wherein a fluid under pressure is from a fluid pressure supply means (pump) led into that outer chamber parallel to said cycles in order to provide substantially reduced pressure differences between the inside and outside of said wall of said cylinder and in the ideal application to provide substantial equal pressures at said cycles inside and outside of said wall of said cylinder in order to prevent breaking of said cylinder under high internal pressures in said cylinder, and, wherein an outgoing passage is provided on said outer chamber to transfer said fluid from said outer chamber into said cylinder.

4,712,382

DEHUMIDIFIER HAVING LOW PROFILE RECEPTACLE

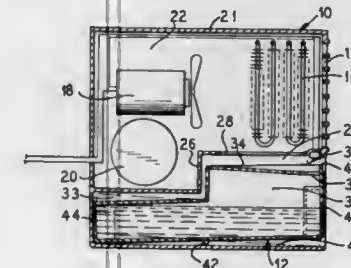
Douglas D. LeClear, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 20, 1986, Ser. No. 920,739

Int. Cl.⁴ F25D 21/14

U.S. Cl. 62—150

19 Claims



1. A condensate receptacle for cooperation with an appara-

tus having operative components that discharge a liquid during operation and shutoff switch means for selectively energizing said operative components, the receptacle comprising:

- a top portion including means for admitting condensate into a chamber defined by the receptacle;
- pivoting means located on a bottom of the receptacle for allowing the receptacle to pivot from a first position to a second position when a predetermined amount of liquid is admitted into the chamber, in the first position a back end of the receptacle rests on a surface of the apparatus and a front end of the receptacle is elevated, in the second position the front end of the receptacle rests on the surface and the back end is elevated; and
- the shut-off switch means is a biased-open shutoff switch having an actuator located superjacent a portion of a perimeter of the top portion of the receptacle, the shut-off switch is closed energizing the operative components by the perimeter of the top portion of the receptacle when the receptacle is in the first position and is opened deenergizing the operative components when the receptacle is in the second position or absent.

4,712,383

COMPARTMENTALIZED TRANSPORT REFRIGERATION SYSTEM

Leland L. Howland, Belle Plaine, and Jayaram Seshadri, Minneapolis, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

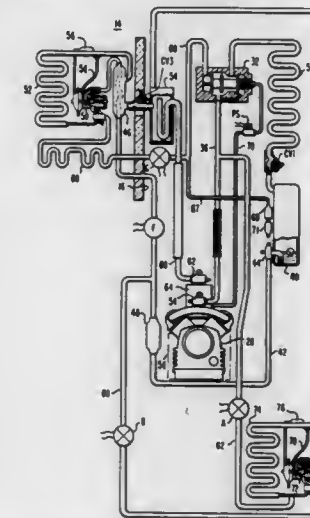
Division of Ser. No. 915,601, Oct. 6, 1986, Pat. No. 4,685,306.

This application Apr. 9, 1987, Ser. No. 36,537

Int. Cl.⁴ F25B 5/00

U.S. Cl. 62—200

4 Claims



1. A compartmentalized transport refrigeration system, comprising:
 - a trailer having a first compartment,
 - a host refrigeration unit for controlling the air temperature of said first compartment via heating, cooling, and null modes,
 - said host unit comprising a closed fluid circuit which includes a compressor, condenser, receiver, expansion valve, evaporator, and liquid, hot gas and suction lines,
 - first valve means connected in said closed fluid circuit to direct fluid flow from the high pressure side of said compressor to: (a) said condenser when said host unit is in a cooling mode, and (b) to said evaporator via a hot gas line which by-passes the expansion valve when said host unit is in a heating mode,
 - second valve means for selectively enabling and blocking fluid flow through said host hot gas line,

third valve means for selectively enabling and blocking fluid flow through said host liquid line, a second compartment in said trailer, a remote unit for controlling the air temperature of said second compartment via heating, cooling, and null modes, said remote unit including an evaporator, and liquid, hot gas and suction lines connected to the liquid, hot gas, and suction lines of said host unit, respectively, fourth and fifth valve means for respectively and selectively enabling and blocking fluid flow between said remote liquid and hot gas lines and said host unit, and control means for selecting the heating mode of said first valve means, and the fluid blocking positions of said second and fourth valve means, when the fifth valve means connects the hot gas line of the host unit to the remote evaporator, to enhance the heating capability of the remote evaporator by directing the entire output of the compressor to the remote evaporator when the remote unit requires heat.

4,712,384

INTEGRATED EVAPORATOR AND THERMAL EXPANSION VALVE ASSEMBLY

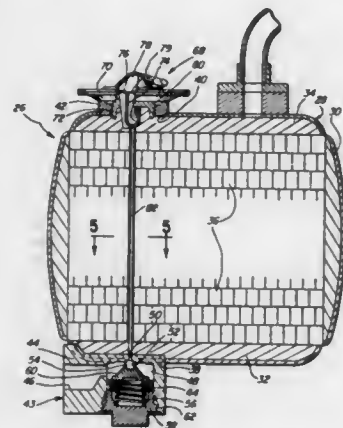
Lawrence E. Crowe, Lindenwood, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 22, 1986, Ser. No. 909,856

Int. Cl.⁴ F25B 41/04

U.S. Cl. 62—225

24 Claims



1. In a refrigeration system, an integrated evaporator and thermal expansion valve assembly, comprising: evaporator means including a housing surrounding a heat exchanger core means and defining inlet header means within the housing at one side thereof and outlet header means within the housing at another side thereof; valve means mounted on the housing in communication with the inlet header means for controlling the flow of refrigerant to the evaporator of the refrigeration system; pressure and temperature responsive means mounted on the housing with a sensing member directly in the outlet header means for responding to the superheat temperature in the outlet header means of the evaporator for opening the valve means when the superheat temperature increases and for responding to the pressure in the refrigeration system for closing the valve means when the pressure increases to offset a portion of the effect of the temperature responsive means on the valve means; and coupling means extending through the heat exchanger core means between the inlet header means at said one side of the evaporator housing and the outlet header means at said other side of the housing for operatively interconnecting the pressure and temperature responsive means to the valve means to move the valve means as a function of said responses of the pressure and temperature responsive means.

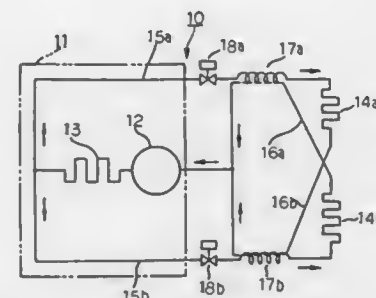
4,712,385
REFRIGERATING UNIT FOR VENDING MACHINE
Kazumi Aoki, Gunma, and Minoru Fujii, Omama, both of Japan, assignors to Sanden Corporation, Gunma, Japan
Filed May 29, 1986, Ser. No. 868,141

Claims priority, application Japan, May 31, 1985, 60-80809[U]

Int. Cl.⁴ F25D 17/00

U.S. Cl. 62—333

3 Claims



1. A refrigerating unit for use in a vending machine comprising a condensing unit including a single compressor and a condenser, two parallel connected evaporators, each evaporator being disposed in an isolated chamber of the vending machine and each evaporator being connected with said condensing unit through a discharge line and a suction line to form two refrigerant circuits, and a decompression device inserted in the suction side portion of each evaporator, the improvement comprising said suction lines being connected between said compressor and said evaporators, and said evaporator of one refrigerant circuit having a portion of its discharge line passing closely adjacent in heat exchange relation with said decompression device on the other refrigerant circuit to maintain balance of the circulating amount of refrigerant in each of said refrigerant circuits.

4,712,386

DISCOLD COLD CARTRIDGE INSERTABLE INTO AN ICE-CREAM MAKER

Romuald L. Bukoschek; Merowech Eckel, both of Klagenfurt, Austria, and Johann Schröder, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

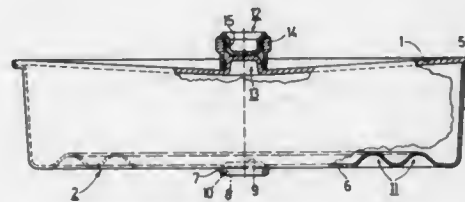
Filed Jun. 23, 1986, Ser. No. 877,560

Claims priority, application Austria, Jun. 26, 1985, 1904/85

Int. Cl.⁴ A23G 9/12

U.S. Cl. 62—342

9 Claims



1. A discoid cold cartridge insertable into an ice-cream maker and filled with a latent heat storage medium, comprising: a first part including a discoid main wall facing a scraper and stirrer tool of said ice-cream maker, said wall being adapted to coact with said scraper and stirrer tool, said wall having an inherently stable, outwardly curved shape, whereby the formation of the air bubbles on the portion of said first part most effectively cooperating with said scraper and stirrer tool is substantially eliminated, and

a second part connected to said first part to form said cartridge, said second part including a trough-shaped base, said base having at least one flexible wall reversibly adaptable to the change in volume of the latent heat storage medium phase transition.

4,712,387 COLD PLATE REFRIGERATION METHOD AND APPARATUS

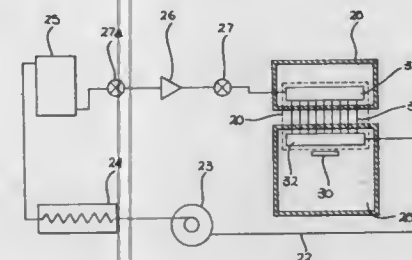
Timothy W. James, 325 Ladera #7, Santa Barbara, Calif. 93101, and David Wyman, 4727 Calle Reina, Santa Barbara, Calif. 93110

Filed Apr. 3, 1987, Ser. No. 34,397

Int. Cl.⁴ F25D 3/00

U.S. Cl. 62—434

17 Claims



1. A refrigeration system for cooling substances to below ambient temperatures, said refrigeration system comprising: a first insulated, enclosure means containing cold storage means capable of absorbing and emitting heat while remaining at a substantially constant temperature; a tube assembly means comprising an upper heat exchanger means, a lower heat exchanger means, and a plurality of substantially vertical conduit means connecting said upper heat exchanger means with said lower heat exchanger means, said upper heat exchanger means being in thermal communication with said cold storage means and said lower heat exchanger means being in thermal communication with said substances to be cooled below ambient temperatures; a refrigerant processing means, said refrigerant processing means comprising a compressor means, a condenser means, a refrigerant reservoir means and expansion valve means, each having an inlet and an outlet; said refrigerant processing means further comprising conduit means for connecting said outlet of said tube assembly means to said inlet of said compressor means, said outlet of said compressor means to said inlet of said condenser means, said outlet of said condenser means to said inlet of said reservoir means, said outlet of said reservoir means to said inlet of said expansion valve means and said outlet of said expansion valve means to said inlet of said tube assembly means, thereby forming a closed refrigerant loop; a volume of a refrigerant contained within said refrigerant loop; and an inlet valve means located in said conduit means between said inlet of said tube assembly and said outlet of said reservoir; whereby through selective operation of said compressor means and said inlet valve means said refrigeration system is capable of powered and non-powered cooling of said substances below ambient temperatures.

4,712,388

CRYOSTAT COOLING SYSTEM

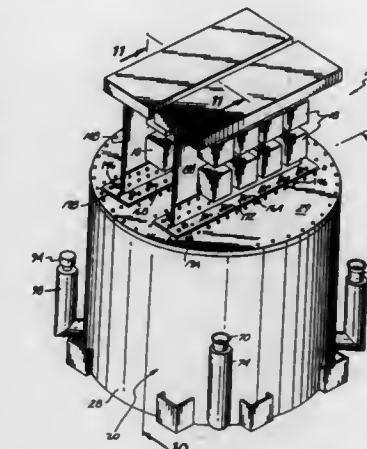
Daniel C. Sullivan, Columbia Heights, and Earl A. Mazorol, Jr., Bloomington, both of Minn., assignors to ETA Systems, Inc., St. Paul, Minn.

Filed Jan. 7, 1987, Ser. No. 1,236

Int. Cl.⁴ F25B 19/00

U.S. Cl. 62—514 R

27 Claims



1. A cryostat comprising: an outer shell having a side wall and a closed bottom; an inner shell positioned within the outer shell, the inner shell having a side wall, a closed bottom and an open top; means for connecting the inner and outer shells to define a vacuum chamber therebetween; an inner shell top plate covering the open top end of the inner shell, the inner shell top plate having a first opening therein; a first containment vessel mounted below the inner shell top plate and within an interior of the inner shell for receiving a first device to be cooled; supply means connected to the first containment vessel for supplying liquid cryogenic coolant to the first containment vessel; and means for suspending the device in the first containment vessel while covering the first opening and while providing transmission of signals to and from the first device.

4,712,389

FLOWER HOLDER JEWELRY ARTICLE

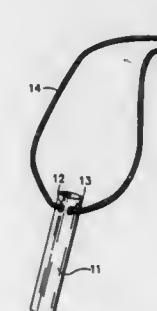
Pamela B. Innis, 2733 St. Laurent Pl., La Jolla, Calif. 92037

Filed Oct. 20, 1986, Ser. No. 920,447

Int. Cl.⁴ A44C 1/00, 15/00

U.S. Cl. 63—1 R

7 Claims



1. An item of jewelry adapted to hold a fresh cut flower in water, said jewelry item comprising: a substantially rigid cylindrical member made of jewelry material;

means for securing said cylindrical member to a person to show it off as jewelry;
an elongated vial having a closed bottom end and an open top end; and
resilient stopper means closing said top end of said vial, said stopper means having an opening therethrough which is substantially smaller than the opening of the top of said vial;
said vial being removably retained within said cylindrical member by means of said stopper means frictionally engaging the interior surface of said cylindrical member;
said vial being adapted to hold water and a portion of the stem of a cut flower extending through said opening in said stopper means so that the flower bud or blossom extends from said cylindrical member.

4,712,390

CIRCULAR KNITTING MACHINE INCORPORATING A STITCH DENSITY ADJUSTER DEVICE

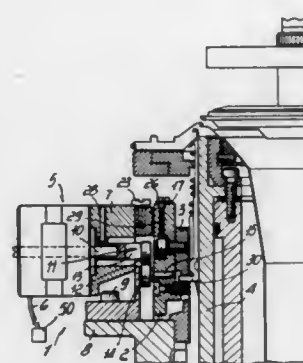
Francesco Lonati, Brescia, Italy, assignor to Lonati SpA, Brescia, Italy

Filed Dec. 5, 1985, Ser. No. 805,009

Claims priority, application Italy, Dec. 10, 1984, 23969 A/84
Int. Cl.⁴ D04B 15/32

U.S. Cl. 66—54

5 Claims



1. In a circular knitting machine including a supporting structure, a needle cylinder having an axis of rotation, cam assemblies near said needle cylinder, said needle cylinder rotating about said axis of rotation thereof and relative to said cam assemblies, said cam assemblies including stitch cam means adjustably movable in a direction substantially parallel to the axis of rotation of said needle cylinder,

a stitch density adjusting device comprising a framework arranged in front of said stitch cam means at a radial distance therefrom with respect to said needle cylinder to leave an interspace therebetween, said framework being supported by said supporting structure, supported on said framework a step motor having a shaft, within said interspace transmission means transmitting adjusting motion from said step motor shaft to said stitch cam means to impart to said stitch cam means a preset displacement relative to said cam assemblies and an electronic machine control connected with said step motor for controlling the operation thereof,

said transmission means comprising drive cam means connected to said step motor shaft, cam follower means in transmissive engagement with said drive cam means, a slide arranged near said stitch cam means, connection means for connecting said slide with said stitch cam means, guide means for guiding said slide in a direction parallel to the axis of rotation of said needle cylinder, said cam follower means being secured to said slide to transmit to said slide the motion received from said drive cam means, wherein said drive cam means comprise a cam shaft extending perpendicular to said needle cylinder axis of rotation and having a detent dog fixed thereon, said detent dog defining a circular path thereof following rotation

of said cam shaft, and wherein said framework comprises a pin formation secured thereon and extending into said circular path of said detent dog to determine a limit stop for resetting the rotation of said drive cam at the start of each knitting cycle.

4,712,391

FLAT KNITTING MACHINE

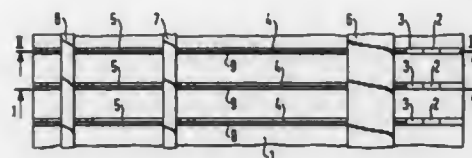
Reinhold Schimko, Aalen-Wasserralfingen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Fed. Rep. of Germany
Filed Apr. 16, 1987, Ser. No. 39,133

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1986, 3612836

Int. Cl.⁴ D04B 15/00

U.S. Cl. 66—115

9 Claims



1. Flat knitting machine having a needle bed and comprising: a needle selection arrangement movable along said needle bed, knitting needles arranged in channels of the needle bed, and selector drivers or a tandem arrangement of working drivers and selector drivers positioned adjacent the knitting needles in the needle channels to cooperate with the needle selection arrangement, wherein the width of the working driver and/or selector driver is smaller than the width of the needle channels, and distance plates are inserted in the needle channels and fixed on at least one side of the drivers and extend substantially along the length of the working drivers and/or selector drivers and have a width equal to the difference between the width of the needle channels and the width of the working drivers and/or selector drivers.

4,712,392

DRY CLEANING APPARATUS

Haruo Hagiwara, Hideo Tsukamoto, and Yasuhiro Tsubaki, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

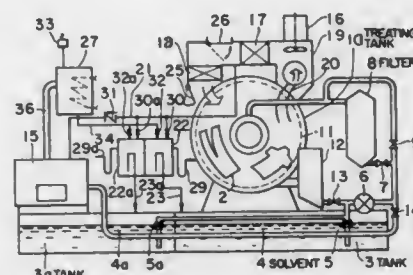
Filed Dec. 27, 1985, Ser. No. 813,698

Claims priority, application Japan, Dec. 28, 1984, 59-277497;
Dec. 28, 1984, 59-277498

Int. Cl.⁴ D06F 43/08

U.S. Cl. 68—18 C

1 Claim



1. A dry cleaning apparatus in which a main portion of a dry cleaner comprises tanks for exclusively receiving at least two kinds of solvents which are soluble in each other, one treating tank connected to the tanks, a fractionating device, connected to the tanks and the treating tank, for recovering the two or more kinds of solvents by batch distillation, exclusive filters for the respective solvents comprising a common filter or a multi-filter device composed of both the filters which is disposed

between the tanks and the treating tank, and the two or more kinds of solvents are used independently so that washing is carried out.

4,712,393

METHOD AND DEVICE FOR PERMANENTLY LOCKING A MOVABLE MEMBER IN A FRAMEWORK

Daniel Deschamps, Montigny Le Breton-Neux, and René Puntous, Toulouse, both of France, assignors to Fichet Bauche and Davey Bickford Smith & Cie.

PCT No. PCT/FR85/00129, § 371 Date Jan. 16, 1986, § 102(e)

Date Jan. 16, 1986, PCT Pub. No. WO85/05651, PCT Pub. Date Dec. 19, 1985

FCT Filed May 24, 1985, Ser. No. 829,137

Claims priority, application France, May 25, 1984, 8408272;
Jul. 12, 1984, 8411115

Int. Cl.⁴ E05G 1/04; E05B 63/00

U.S. Cl. 70—1.5

17 Claims



1. A safe, comprising a door having front and back panels and a side edge surface extending between said front and back panels in a thickness direction of said door, and a framework upon which said door is movably mounted, with said side edge surface being contiguous with said framework when said door is closed, and explosive means situated within said door between said front and back panels thereof and adjacent said side edge surface, for exploding under the effect of an attack and for deforming said side edge surface adjacent thereto, to create therein at least one artificial bolt extending towards and into said framework.

4,712,394

SURF LOCK

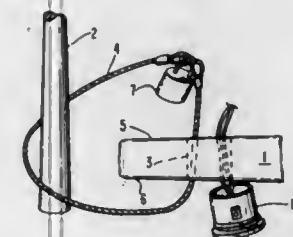
David R. Bull, 226 4th St., Hermosa Beach, Calif. 90254

Filed Oct. 28, 1986, Ser. No. 924,017

Int. Cl.⁴ E05B 73/00

U.S. Cl. 70—18

23 Claims



1. Arrangement for securing a long, broad object having an upper surface spaced apart from a lower surface, to a fixed object comprising:
lockably connecting means;
a sleeve having outside walls, defining a preselected cross section, a first end and a second end, said sleeve axially mountable perpendicular to said long, broad surfaces under the condition of said first end being adjacent to said lower surface and said second end being adjacent said upper surface of said long, broad object, said sleeve including a first wall defining an orifice internal to said sleeve and extending from said first end to said second end

having a preselected cross-section to provide an axial passage way for said lockably connecting means through said long, broad object to connect said long, broad object to said fixed object; and

a plug of a preselected length and including a bottom portion having a cross-sectional shape which complements but is slightly smaller than said orifice and axially insertably, removable through said orifice into said sleeve at least to a position in which said bottom portion is substantially adjacent to said first end under the condition that the end of said plug opposite said bottom portion is substantially adjacent to said second end.

4,712,395

BARREL LOCK WITH DETERRENT RING AND KEY THEREFOR

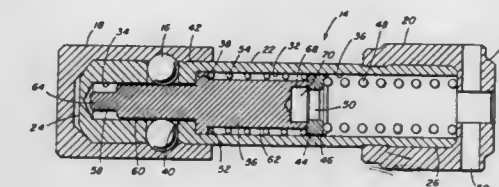
Anthony J. Agbay, Auburn, Mass., assignor to OMCO, Inc., Holden, Mass.

Continuation of Ser. No. 842,074, Mar. 19, 1986, abandoned, which is a continuation of Ser. No. 595,434, Mar. 30, 1984, abandoned. This application Dec. 23, 1986, Ser. No. 945,232

Int. Cl.⁴ E05B 67/36

U.S. Cl. 70—34

8 Claims



1. A barrel lock and key therefor comprising:

(a) a barrel lock having a hollow cylindrical lock barrel having a closed front end and an apertured rear end, said lock barrel having a stepped axially extending bore, a front bore of said stepped bore having a relatively small diameter and a rear bore of said stepped bore having a relatively large diameter;

(b) said stepped barrel bore having an annular shoulder forming the junction between said front bore and said rear bore;

(c) at least two radially extending passageways running from an outer aperture in the exterior surface of said lock barrel to an inner aperture in said front bore of said lock barrel, and a locking member mounted in each said passageway for limited movement therein, said locking member restrained from completely escaping through said outer aperture;

(d) a cylindrical plunger having a stepped axially extending exterior surface sized and shaped to slidably fit and reciprocate within said stepped bore of said lock barrel, the forward movement of said plunger being limited by said lock barrel annular shoulder, said plunger having a front exterior portion which is sized and shaped to permit said locking members to move radially inward, said plunger having a middle exterior portion which is sized and shaped to prevent said locking members from moving radially inward, said plunger in its rearward position opening the inner aperture of each said passageway and permitting each said locking member to move radially inward to its unlocking position, said plunger in its forward position closing the inner aperture of each said passageway forcing each said locking member outwardly to its locking position;

(e) said cylindrical plunger having an open rear end and an axially extending circular blind bore, the interior surface of said blind bore defining a cylindrical gripping surface;

(f) deterrent means for preventing picking of said barrel lock, said deterrent means having a washer-shape which has uniform circular walls forming a central completely circular opening, said deterrent means being positioned

within said rear bore of said lock barrel against said rear end of said plunger, the diameter of said completely circular central opening being uniform and being always smaller than the diameter of the cylindrical gripping surface of said circular plunger blind bore;

- (g) a top compression spring positioned in said rear bore of said lock barrel, one end of said top compression spring bearing against the rear end of said deterrent means and urging said deterrent means against said plunger;
- (h) a bottom compression spring positioned in said rear bore, said bottom compression spring bearing against the forward end of said deterrent means and against said plunger, said bottom compression spring urging said plunger forwardly;
- (i) a key adapted to be inserted into said barrel lock and passed through said central circular opening in said deterrent means, said key having a hollow cylindrical key barrel having an apertured front end and an apertured rear end;
- (j) a plurality of elongated relatively small diameter outer expanding fingers extending longitudinally forward through said key barrel apertured front end, said outer expanding fingers being fixed at their rear portions to a bushing which is axially movable within said key barrel and which is urged towards said front end of said key barrel, said outer expanding fingers having radially spreadable relatively large diameter gripping surface engaging finger tips;
- (k) a key plunger extending longitudinally and rearwardly through said key barrel apertured rear end, said key plunger being axially movable within said key barrel, said key plunger positioned to the rear of said expanding fingers bushing;
- (l) a cylindrical expander rod having an enlarged forward head, said expander rod telescopically slidable within said expanding fingers, the length of said expander rod being greater than the length of said expanding fingers, the rear end of said expander rod being fixed to said key plunger; and
- (m) a key handle pivoted to the rear end of said key plunger, said key handle being manually pivotable to axially reciprocate said key plunger between a forward locked position in which said expander rod head is positioned forward of said expanding finger tips and said expanding finger tips are unspread and have a maximum diameter which is smaller than the uniform diameter of said deterrent means central circular opening, and a rearward unlocked position in which said expander rod is retracted to initially spread said relatively large diameter expanding finger tips to have a maximum diameter which is larger than the uniform diameter of said deterrent means central circular opening, and into firm engagement with said plunger blind bore gripping surface, while maintaining said relatively small diameter outer expanding fingers out of engagement with said deterrent means circular opening walls, and to subsequently pull said fully spread expanding finger tips and said plunger rearwardly permitting said locking members to move to their unlocking positions.

4,712,396

EASY TO LOCK DEADBOLT STRUCTURE

Arthur P. Cary, 2519 Farrington St., Dallas, Tex. 75207, and Leslie W. Lyons, 4215 W. Jefferson St., Dallas, Tex. 75211
Filed Oct. 6, 1986, Ser. No. 915,658

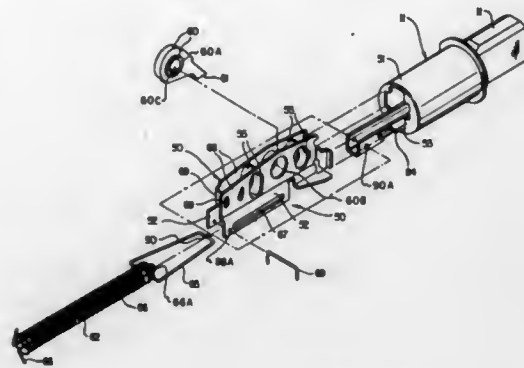
Int. Cl.⁴ E05B 17/00

U.S. Cl. 70—129

12 Claims

1. In a lock system including a deadbolt and key and lever means to unlock said system, the improvements comprising:

- a. means operable in response to movement of said lever means to hold said deadbolt in an unlocked position, and



- b. release means operable apart from said key and lever means to cause said deadbolt to move to a locked position.

4,712,397

PARKLOCK CONTROL

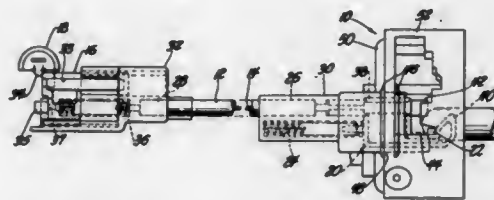
Don L. Niskanen, Livonia, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Mar. 6, 1987, Ser. No. 22,649

Int. Cl.⁴ E05B 65/12

U.S. Cl. 70—248

11 Claims



1. A park lock assembly (10) for retaining an automobile gear selector lever (22) in the park position while the automobile key lock means (18) is in the off position and for allowing the gear selector lever (22) to move out of the park position while the key lock means (18) is in the on position, said assembly (10) comprising: a conduit (12), a flexible motion transmitting core element (14) having first and second ends supported for longitudinal movement in said conduit (12), holding means (16) slideably disposed on said first end (35) of said core element (14) for engaging the key lock means (18) for being retained in an off position when the very lock means (18) is in said off position and movable past the key lock means (18) when the latter is in the on position, first biasing means (36) urging said holding means (16) into engagement with the key lock means (18) in the off position and into engagement with said first end (35) of said core element (14) in the on position, terminal means (20) attached to said second end (42) of said core element (14) for preventing movement of the selector lever (22) when the key lock means (18) is in the off position, said assembly characterized by including second biasing means (24) urging said core element (14) and said terminal means (20) out of and away from said second end of said conduit (12), said first biasing means (36) providing a greater force than said second biasing means (24), said terminal means (20) is urged to the extreme extended position by said second biasing means (24) and whereupon said first biasing means (36) moves said holding means (16) to the on position while retracting said terminal means (20) and overpowering said second biasing means (24).

4,712,398

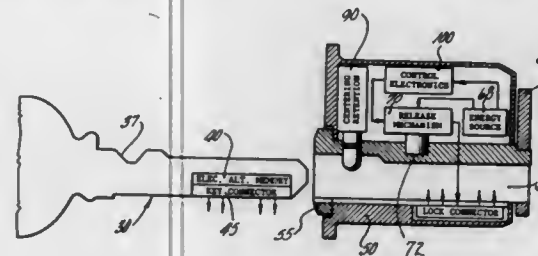
ELECTRONIC LOCKING SYSTEM AND KEY THEREFOR
Bruce A. Clarkson, Beverly; Ronald J. Frere, Southampton, both of Mass.; Thomas G. Loughlin, Rocky Hill, Conn.; William W. Taylor, Jr., Golden, Colo., and Peter Mongeau, Needham, Mass., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 21, 1986, Ser. No. 842,684

Int. Cl.⁴ E05B 47/06

U.S. Cl. 70—276

16 Claims



1. A locking apparatus comprising:

- a housing,
- a mechanical member supported adjacent to said housing and movable relative thereto during operation of said locking apparatus,
- a locking member movable into engagement with said mechanical member to prevent the movement of said mechanical member and the operation of said locking apparatus and moveable out of engagement with said mechanical member to allow the movement of said mechanical member and the operation of said locking apparatus,
- a magnet supported within said housing,
- an electrical coil supported for movement within the field of said magnet,
- a first spring mechanically coupled to said coil for movement therewith between two stable positions of said first spring, and
- a second spring coupled to said first spring for movement therewith and coupled to said locking member to move said locking member into and out of engagement with said mechanical member as said first spring moves between its two stable positions.

4,712,399

CYLINDER LOCK WITH INTERCHANGEABLE KEY
Maria Mattosovich, Antrodoto, Italy, assignor to Rielda Serrature S.R.L., Roma Fiumicino, Italy

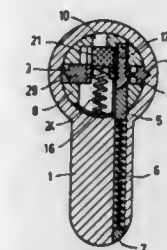
Filed Nov. 21, 1986, Ser. No. 933,540

Claims priority, application Italy, Dec. 19, 1985, 68073 A/85

Int. Cl.⁴ E05B 27/04

U.S. Cl. 70—364 A

8 Claims



1. A cylinder lock with interchangeable key, comprising: a stator, in said stator a cavity, at least a longitudinal groove, and a series of seatings extending at least at one side of said cavity; a rotary cylinder mounted in said cavity of the stator, in said cylinder a slit suitable for receiving a key, a series of first seatings which intersect said key receiving slit, a series of second seatings extending parallel to said first seatings, and a first and a second slit extending orthogonally to said seatings of

the cylinder and parallel to the axis of the cylinder; a series of sliders inserted with longitudinal and transversal mobility into said first seatings of the cylinder in order to cooperate with the notches of a key inserted into said key receiving slit, each slider having on one side a number of projections and, on the opposite side, a member for sliding engagement, and having an associated spring; a series of tumblers conforming at least at one of their ends to the outline of the cylinder, slidably inserted into said second seatings of the cylinder, corresponding to said seatings of the stator and having a series of first recesses turned towards said projections of the sliders and at least one second recess turned towards the side opposite said sliders; a stop bar, inserted into said first orthogonal slit of the cylinder, having a number of projections turned towards said second recess of the tumblers and a continuous projection turned towards the opposite side and suitable for cooperating with said groove of the stator; and a translation bar, inserted into said second orthogonal slit of the cylinder, having a number of members for sliding engagement suitable for engaging said members for sliding engagement of the sliders, and a continuous projection turned towards the opposite side and suitable for cooperating with said groove of the stator; said components being coordinated in such a manner that said projections of the stop bar engage said second recesses of the tumblers when the continuous projection of the stop bar does not register with said groove of the stator, and disengage therefrom when said groove allows the stop bar to move towards the outside, whilst said sliders engage corresponding recesses of the tumblers when the continuous projection of the translation bar does not register with said groove of the stator, and disengage therefrom when said groove allows the translation bar to move towards the outside, thereby displacing all the sliders under the action of the respective sliding engagements without the possibility of the sliders tilting; whereby said translation bar, when it attains a position in which it registers with said groove of the stator, moves towards the outside by displacing the sliders, thus disengaging these latter from the tumblers and allowing, in such position, the substitution of the key with the consequent different codification of the lock.

4,712,400

REMOVABLE CYLINDER LOCK

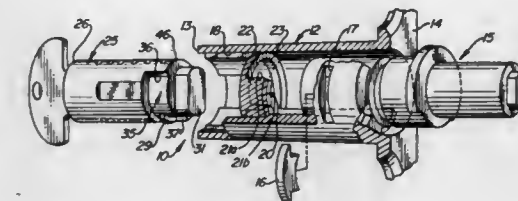
Robert Steinbach, Glendale Heights, Ill., assignor to Chicago Lock Company, Chicago, Ill.

Continuation-in-part of Ser. No. 491,374, May 4, 1983. This application Apr. 13, 1987, Ser. No. 37,736

Int. Cl.⁴ E05B 29/04

U.S. Cl. 70—369

6 Claims



1. In a rotatable cylinder lock of the type formed by an elongated cylindrical housing including an outer end and an inner end, a removable lock core adapted for removable engagement within said cylindrical housing and carrying a plurality of lock tumblers and a release tumbler along the length thereof, the lock tumblers being actuated by a bitted key for effecting the rotation of the lock core between the locked and unlocked positions thereof respectively, and the release tumbler being actuated by a release key for effecting the release and removal of the lock core from the cylindrical housing when the lock core is in the unlocked position, the improvement comprising in combination:

the cylindrical housing provided with a tumbler block mounted therein and extending inwardly for a distance. a tumbler ledge formed in said cylindrical housing and extending inwardly for a distance, and extending circumferentially around a portion of the interior periphery of said cylindrical housing.

said tumbler ledge forming a shoulder for providing a riding surface for the release tumbler to ride on as the core is rotated

said lock core provided with a block restrictor relief section formed therein along the inner end thereof,

said block restrictor relief section constructed and positioned to accommodate the positioning of said tumbler block therein when said lock core is fully positioned within said cylindrical housing,

and the release tumbler positioned to be retractable into said block restrictor relief section when actuated into a release position by the release key, and into overriding relation with said shoulder formed by said tumbler ledge and in blocking relation with respect to said tumbler block to prevent removal of said lock core

4,712,401

RANDOMLY AND INTEGRALLY RE-KEYABLE LOCK APPARATUS AND METHOD

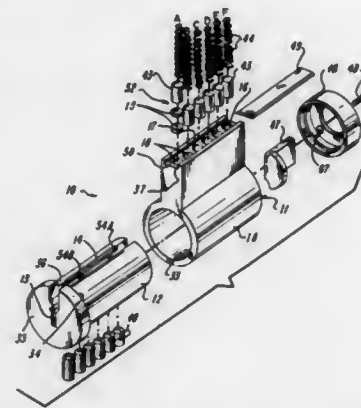
Brian J. Monahan, 28895 Cragmont Dr., Evergreen, Colo. 80439

Filed Jul. 20, 1986, Ser. No. 881,227

Int. Cl.⁴ E05B 25/00

U.S. Cl. 70—382

27 Claims



1. In a lock including a housing; a bore extending through said housing parallel to an axis; a plug having a cylindrical surface and being received in said bore; said bore of said housing and said cylindrical surface of said plug defining a shear interface, said housing and said plug having aligned holes therein forming portions of and combining to form a plurality of pinways that are spaced in the direction of said axis and that are divided by said shear interface; said plug being rotatably received in said bore; a first tumbler stack including a first tumbler pin, a first driver pin and at least one master pin being received in said first pinway; said master pin separating said first driver pin from said first tumbler pin; a second tumbler stack in said second pinway and including a second driver pin and a second tumbler pin; and a keyway formed in said plug and extending from said holes in said plug to said cylindrical surface of said plug; the improvement comprising:

means formed in said surface of said plug adjacent said keyway for guiding a master pin from one of said pinways to another of said pinways, said guiding means having spaced shoulder means for preventing removal of said master pin from said lock.

4,712,402 INTEGRALLY AND SEQUENTIALLY RE-KEYABLE LOCK APPARATUS AND METHOD

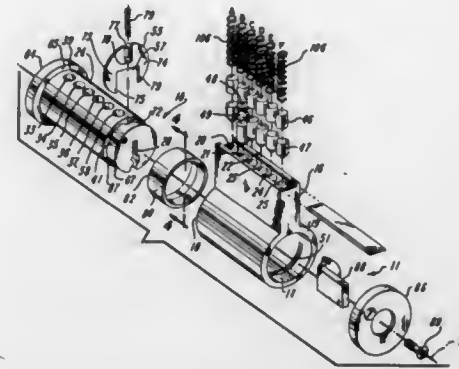
Brian J. Monahan, 28895 Cragmont Dr., Evergreen, Colo. 80439

Filed Jun. 16, 1986, Ser. No. 874,993

Int. Cl.⁴ E05B 25/00

U.S. Cl. 70—383

27 Claims



1. In a lock for sequential exclusive use with first and second change keys and use with reset key means for re-keying said lock to render it usable with only one of said change keys, said lock including a housing having an inner end; a bore extending through said housing along a longitudinal axis to define a shear interface; a plug rotatably received in said bore and having a keyway extending therein along said axis; said housing and said plug having holes therein, said housing and said plug being normally positioned so that said holes form portions of and combine to form at least first and second pinways that are spaced in the axial direction; a first tumbler stack including a first tumbler pin, a first driver pin and at least one master pin being received in said first pinway; said master pin separating said first driver pin from said first tumbler pin; and a second tumbler stack in said second pinway and including a second driver pin and a second tumbler pin; the improvement comprising:

said plug being slidably received in said bore for movement from said normal axial position in which said holes form said first and second pinways to a temporary re-keying axial position in which a hole in said plug that normally forms said second pinway is axially displaced for alignment with a hole in said housing that normally forms said first pinway so that said master pin is transferrable into a different one of said pinways;

means rotatable in said bore with said plug and slidably mounted on said plug for releasably retaining said plug in said normal axial position, said retaining means having a central section intersecting said keyway, said retaining means having a retainer section extending from said central section transversely across said inner end of said housing for retaining said plug in said normal axial position, said central section being adapted to respond to said reset key means in said keyway to move said retainer section into said bore and release said plug for movement to said temporary re-keying axial position; and

said bore having an arcuate slot formed therein transversely to said axial direction for receiving said retainer section of said retaining means to releasably retain said plug in said temporary re-keying axial position, said slot being formed eccentrically with respect to said arcuate section so that upon rotation of said plug said retainer section rides out of said slot to release said plug for return axial movement in said bore to said normal axial position and to allow said retainer section to extend transversely across said inner end of said housing for retaining said plug in said normal axial position, said return axial movement of said plug to said normal position being effective to recombine said holes and render said lock usable with only one of said

first and second change keys according to the different pinway in which said master pin is received.

4,712,403

METHOD OF PROTECTING LOCK CYLINDERS FROM BEING WRENCHED OR PULLED

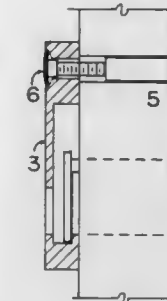
Frank Markisello, 91-10 Liberty Ave., Ozone Park, N.Y. 11417

Filed May 6, 1987, Ser. No. 46,572

Int. Cl.⁴ E05B 15/02

U.S. Cl. 70—417

4 Claims



1. An interlocking plate for securing lock cylinders against forceable removal or forceable entry, said plate having a front side and a back side and a cylinder engaging end and a securing end, comprising:

an elongated opening in said back of said plate at said cylinder engaging end, said elongated opening have a lock insertion portion with a dimension sufficient to accommodate insertion of the face of a lock cylinder, said elongated opening further including an interlocking portion having a cylinder face engaging lip for sliding receipt of the face of said cylinder therebehind whereby said cylinder engaging end is secured to said lock cylinder;

means for securing said plate at said securing end; and cylinder face aperture in said front side located opposite elongated opening for access to said cylinder face when said device is mounted on said lock cylinder.

4,712,404

METHOD OF SELF-REGULATING CONSISTENCY OF APPLIED ENERGY IN A FORGING HAMMER EMPLOYING INPUT DIFFERENTIAL

Charles J. Crout; Charles W. Frame, both of Chambersburg, and Ronald N. Harris, Ft. Loudon, all of Pa., assignors to Chambersburg Engineering Company, Chambersburg, Pa.

Division of Ser. No. 695,697, Jan. 28, 1985, Pat. No. 4,653,300.

This application Jan. 5, 1987, Ser. No. 577

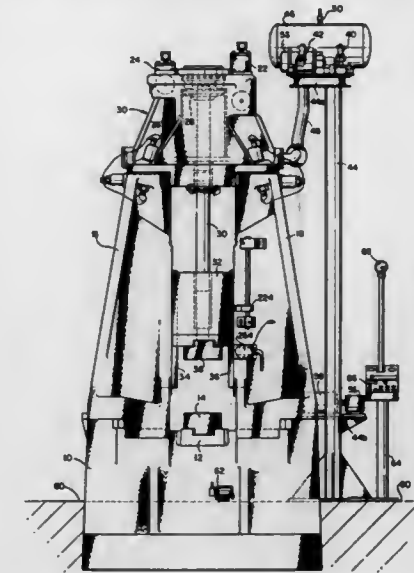
Int. Cl.⁴ B21J 9/16

U.S. Cl. 72—8

2 Claims

1. The method of using multiple data relating to energy to maintain kinetic output at a preselected level to obtain a preselected kinetic energy at the time of impact of a ram of a forging hammer in a system employing an impact device having a frame supporting at least one cylinder, a piston within said cylinder, means connecting the piston to a ram assembly such that the ram is repeatedly movable relative to the frame from a retracted position into impact position, a driving compressible fluid system including a fluid supply, valve means connecting said fluid supply into said at least one cylinder at a position in the cylinder to drive the ram into impact position and permitting release of fluid from the cylinder, and a trapped volume of compressible lifting fluid causing the ram to be retracted from impact position when fluid driving the ram into impact is released from the cylinder, wherein there is provided pressure sensing means to sense the pressure of the lifting fluid, calculating means for calculating kinetic energy, comparator means for comparing kinetic energy with a standard and a counter for accumulating error, comprising: sensing the pressure of the lifting fluid to determine the rate of change of lifting

fluid pressure and corresponding velocity of the ram assembly, calculating from the velocity and the mass of the ram assembly the kinetic energy, comparing the calculated kinetic energy



with a preselected kinetic energy requirement input, and, if there is significant error, correcting the timing of the valve means in the direction to correct or minimize the error.

4,712,405

METHOD OF SELF-REGULATION OF OUTPUT ENERGY OF FORGING HAMMERS USING INPUT SENSED PEAK OF LIFTING FLUID PRESSURE FOR CORRECTION

Charles J. Crout; Charles W. Frame, both of Chambersburg, and Ronald N. Harris, Ft. Loudon, all of Pa., assignors to Chambersburg Engineering Company, Chambersburg, Pa.

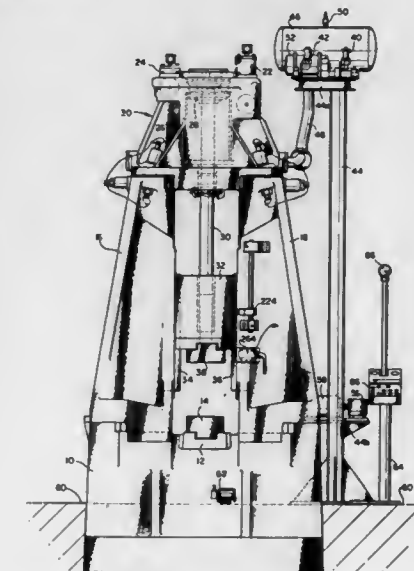
Division of Ser. No. 695,697, Jan. 28, 1985, Pat. No. 4,653,300.

This application Jan. 5, 1987, Ser. No. 573

Int. Cl.⁴ B21T 9/16

U.S. Cl. 72—19

1 Claim



1. The method of correcting effective kinetic energy to obtain the output kinetic energy at a preselected level in a system employing an impact device having a frame supporting at least one cylinder, a piston within said cylinder, means connecting the piston to a ram such that the ram is repeatedly

movable relative to the frame from a retracted position into impact position, a driving fluid system including a compressible fluid supply, valve means connecting said compressible fluid supply into said at least one cylinder at a position in the cylinder to drive the ram into impact position and permitting release of fluid from the cylinder, a trapped volume of compressible lifting fluid beneath the piston causing the ram to be retracted from impact position when fluid driving the ram into impact is released from the cylinder, and a pressure sensing means to sense the pressure of the lifting fluid comprising: sensing peak lifting air pressure, comparing said peak value with a reference pressure, representative of desired impact energy and, if it is in error, providing an incrementing or decrementing signal to correct the valve means to adjust the effect of the next blow.

4,712,406

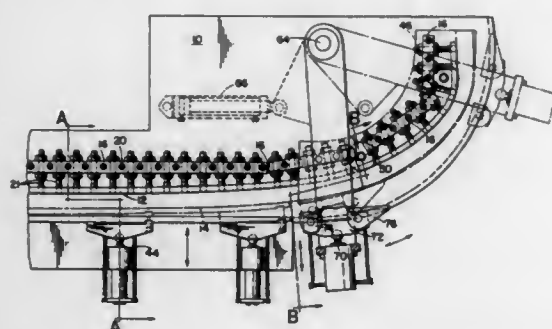
APPARATUS FOR BENDING TUBULAR WORKPIECES
Theodor Molz, Chur, Switzerland, assignor to W. Eckold AG, Switzerland

Continuation-in-part of Ser. No. 836,205, Feb. 27, 1986, abandoned, which is a continuation of Ser. No. 585,132, Mar. 1, 1984, abandoned. This application May 21, 1986, Ser. No. 865,899

Claims priority, application Fed. Rep. of Germany, 330728
Int. Cl.⁴ B21D 7/024

U.S. Cl. 72—23

8 Claims



1. An apparatus for bending a tubular workpiece to assume a shape including two substantially parallel end portions joined by a central portion of predetermined curvature, said apparatus comprising:

base plate means having a substantially horizontal upper surface,
template means including contour adjustment means mounted on said base plate surface and having a contour commensurate with said shape, said template means comprising a tape-like elastically deformable shaped member and adjustment elements rigidly supported by said base plate by means of socket members, and said template contour being adjustable within limits determined by quality variations of said workpiece,
generally horizontally displaceable shoe means adapted to deflect a straight tube length placed in front of said template means into engagement with the latter, adjacent shoe means being connected by an elastic tape extended substantially parallel to said tube length,
hydraulic cylinder means respectively drivingly connected to said shoe means,
control means selectively connecting said hydraulic cylinder means to a source of hydraulic pressurized fluid,
said displaceable shoe means comprising a first set of shoes driven by hydraulic cylinders stationarily mounted on said base plate means and adapted to bend said tube length to assume said central portion shape, and at least one second set of movable shoes, consisting of two shoes adapted to provide bending of said tube end portions,
each shoe of said second set being mounted, together with its hydraulic cylinder means, on a lever means pivotable in a

plane parallel to said upper horizontal surface for shoe and cylinder movement along an adjacent tube end portion, said control means being enabled and disabled in sequence such that

first, said first set of shoes are operated by associated hydraulic cylinders to clamp said tube to said template means at its said central portion of the tube length,
thereafter, while maintaining engagement of said shoes of said first set with said tube so that the latter is firmly clamped to said template means, said lever means is pivoted incrementally about predetermined angles and in each position so achieved, the hydraulic cylinder means of the shoes of said second set are actuated so as to incrementally bend said end portions of said tube length progressively from inner to outer ends of said end portions.

4,712,407

APPARATUS FOR WORKING SURFACE OF METAL PIPE

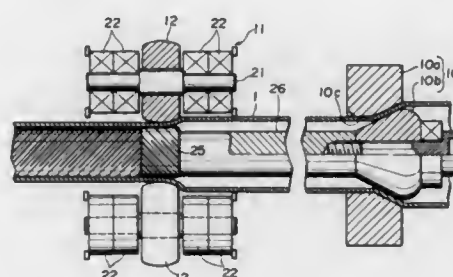
Naokazu Yoshiki, Yutaka Saito, and Tsuneo Haba, all of Kitamoto, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 725,275

Claims priority, application Japan, Mar. 30, 1985, 60-46948
Int. Cl.⁴ B21B 23/00

U.S. Cl. 72—68

7 Claims



1. An apparatus for working inner and outer surfaces of a metal pipe comprising:

means for drawing the metal pipe to reduce a diameter thereof;
means for working the inner and outer surfaces of the metal pipe to form at least one of the inner and outer surfaces thereof into a predetermined configuration; and
said working means including a rolling unit and a driving mechanism therefor, said rolling unit including a housing having end members each provides with a central bore, a plurality of rolling rolls rotatably disposed within said housing and outside the metal pipe so that said rolling rolls have their respective axes extending at an inclination angle with respect to an axis of the metal pipe and are in pressure contact with the metal pipe, and support shafts each having axial opposite ends thereof rotatably supported by said housing through thrust bearing means, said rolling rolls being respectively mounted on said end members on said driving mechanism and driven by said driving mechanism to revolve said rolling rolls around the metal pipe, said working means further including a plug floatingly disposed within the metal pipe at a position corresponding to said rolling rolls, said driving mechanism comprising an output shaft having a free end and having therein an axial bore for allowing the metal pipe to pass therethrough, a connecting flange mounted on said free end of said output shaft for rotating therewith, said connecting flange having formed therein a recess, and a cap member threadedly engaging with said connecting flange for securing said rolling unit within said recess so that said axial bore in said output shaft is in coaxial communication with the respective central bores in said end members of said housing; said recess in said connecting flange having

a peripheral wall surface tapering so as to diverge away from the free end of said output shaft, said cap member having a tapered surface tapering so as to diverge toward the free end of said output shaft, said driving mechanism further comprising a split sleeve having an inner peripheral surface thereof and an outer peripheral surface comprising a first tapered surface and a second tapered surface, said first tapered surface tapering so as to diverge toward the free end of said output shaft, said second tapered surface tapering so as to diverge away from the free end of said output shaft, said split sleeve being disposed in position with said first tapered portion being engaged with the peripheral wall surface of said recess in said connecting flange while said second tapered portion is engaged with the tapered surface of said cap member, so that the split sleeve is deformed into a shape of a reduced diameter to be brought into firm engagement with the outer peripheral surface of the rolling unit, thereby securing the rolling unit in position.

4,712,409

THREADING AND PROJECTION FORMING ON DIFFERENT SIZE DIAMETERS

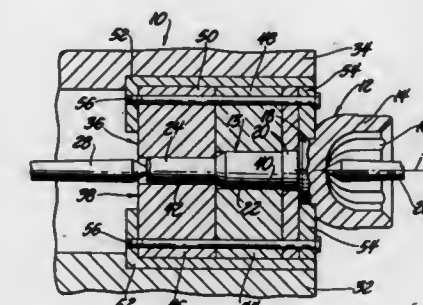
James T. Killop, Warren, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Continuation of Ser. No. 564,478, Dec. 21, 1983, abandoned.
This application Sep. 5, 1985, Ser. No. 772,792

Int. Cl.⁴ B21H 3/06, 5/02

U.S. Cl. 72—88

4 Claims



4,712,408

COARSE PITCH SPLINE ROLLING

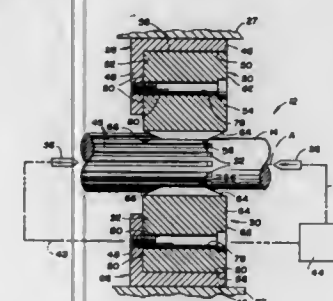
James T. Killop, Warren, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Continuation of Ser. No. 779,260, Sep. 23, 1985, abandoned, which is a continuation of Ser. No. 358,178, Mar. 15, 1982, abandoned. This application Nov. 10, 1986, Ser. No. 928,701

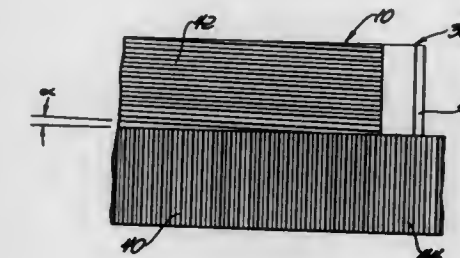
Int. Cl.⁴ B21H 5/00

U.S. Cl. 72—88

8 Claims



1. Apparatus for rolling splines of a coarse pitch comprising: a pair of rack boxes; a pair of racks fixedly mounted on said rack boxes moveable reciprocatingly on a path, each of said racks including a toothed forming face and flat side surfaces, said forming faces each including teeth spaced along the length thereof and having a linear pitch of less than 16 teeth per inch, said teeth of the rack bodies each including an origin and elongated sides upwardly tapering from said origin and extending perpendicular relative to the path and having a substantially flat top surface and a tapered end extending from the tooth origin at the side surface of the rack to the top surface; drive means for respectively driving said pair of racks thereon in a reciprocating manner; and workpiece mount means for rotatably supporting a workpiece between said racks and moving the workpiece along the axis of rotation thereof as said drive means drives said pair of racks in a reciprocating manner in a direction of said teeth having said tapered end such that the racks roll form splines progressively along the length of the workpiece.



1. A die of the type to be mounted in opposed relationship to an identical die on a support assembly defining a support axis for rotatably supporting a workpiece and defining a rotary axis for the workpiece, the dies being spaced apart from each other at the rotary axis on opposite side of the workpiece shaft portions, the workpiece including a first shaft portion having a diameter D_1 , and a second shaft portion having a diameter less than D_1 , said die comprising: a work surface having a spline forming portion (40) for engaging and cold forming splines in the first shaft portion (22) of the workpiece and a thread forming portion (42) for forming threads on the second shaft portion (24), said spline and thread forming portions (42,44) being disposed in side by side immovable relationship with respect to each other, said spline forming portion (44) being recessed with respect to said thread forming portion (42) for accommodating the greater diameter D_1 of the first shaft portion (22) to simultaneously engage the respective shaft portions (22,24) with the respective spline and thread forming portions (44,42), said thread forming portion including thread forming projections having a constant pitch and a lead angle α wherein

$$\tan \alpha = \frac{P}{\pi D}$$

where P equals said constant pitch and D equals the diameter of the first portion of the workpiece shaft.

4,712,410

METHOD AND APPARATUS FOR COLD SIZING A ROUND WORKPIECE HAVING MULTIPLE DIAMETERS

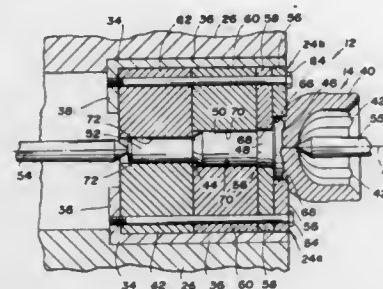
James T. Killop, Warren, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Continuation of Ser. No. 458,325, Jan. 17, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 787,273

Int. Cl.⁴ B21B 1/08, 27/00

U.S. Cl. 72—108

6 Claims



1. A method for cold sizing a preformed metal workpiece shaft having a plurality of cylindrical coaxial portions with round surfaces of different diameters, said method comprising: supporting the workpiece for free rotation about the shaft axis between a pair of die assemblies having a plurality of opposed pairs of sizing surfaces corresponding in number to the shaft portions so that each shaft portion can be disposed between a respective one of the opposed pairs of sizing surfaces, each sizing surface extending parallel to the shaft axis for a distance corresponding to the axial length of the respective shaft portion; and moving the die assemblies relative to each other such that their respective sizing surfaces move in opposite directions to simultaneously engage each of the opposed pairs of sizing surfaces with the round surfaces of the respective shaft portions as the workpiece rotates about the shaft axis so that the sizing surfaces simultaneously apply pressure to the respective shaft portions to reduce the diameters by an amount within 20 thousandths of an inch of the preformed diameters.

4,712,411

APPARATUS FOR MAKING A FORGED METAL ARTICLE

Roy S. Goodwin, St. Thomas, Canada, assignor to Clevite Industries Inc., Glenview, Ill.

Filed May 15, 1986, Ser. No. 863,290

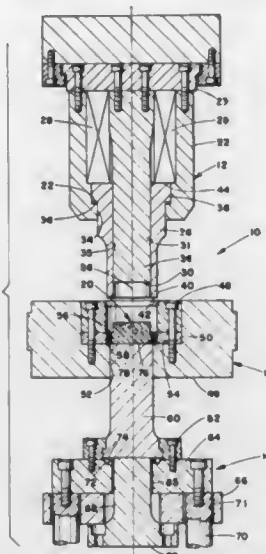
Int. Cl.⁴ B21D 45/02; B21K 1/30

U.S. Cl. 72—344

3 Claims

1. An apparatus for producing in a single stroke a forged metal article with a helical contoured surface comprising: a die assembly having a die passage there-through and a die having a helical profiled surface in said assembly, upper and lower punch assemblies, said die assembly being disposed between said punch assemblies, said upper punch assembly comprising an upper punch housing, a first forging punch mounted in said housing and a punch sleeve surrounding said first punch, means for axially reciprocating said upper housing relative to said die assembly to reciprocate said first punch and sleeve with respect to said die assembly, said sleeve being slidably mounted in said upper housing for axial telescopic retraction into said upper housing relative to said first punch, said lower punch assembly including a second forging punch extending into said die passage in opposed relationship with said first punch, said second punch being adapted to support an article to be forged in said die assembly and having mounting means allowing for free rotation with respect to the axis of the die assembly,

said upper and lower punches having a generally smooth surface with no helical form incorporated therein, and



means for axially raising said second punch in said die passage to eject a forged article from said die assembly.

4,712,412

DRAWING APPARATUS IN PRESSES

Gerhard Roos, Ebersbach; Hartmut Dextling, Gingen, and Wolfgang Michael, Goepfingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goepfingen, Fed. Rep. of Germany

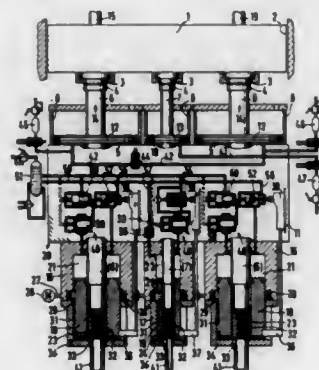
Filed Feb. 11, 1986, Ser. No. 828,173

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505984

Int. Cl.⁴ B21D 24/02

U.S. Cl. 72—345

20 Claims



1. Drawing apparatus for presses having a system for resisting the amount of press force and ejecting a work piece comprising:

first pressure piston-cylinder means for resisting the amount of press force; second pressure piston-cylinder means for ejecting the work piece; pressure cheek means displaceably guided in a press table in response to the press force to an end position and supported by said first and second pressure piston-cylinder means; said first and second pressure cylinder means having one of a cylinder or piston portions thereof, fixedly mounted at said pressure table; where, upon release of said press force a first follower means causes a non-fixed portion of the second pressure piston-cylinder means to displace the cheek means in a direction opposite to said displacement

caused by said press force and with a non-fixed portion of said first pressure piston-cylinder means being disconnected from and no longer supporting the cheek means.

4,712,413

BILLET HEATING PROCESS

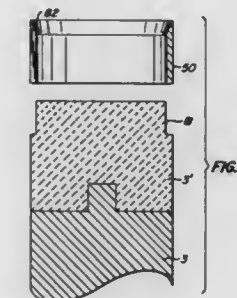
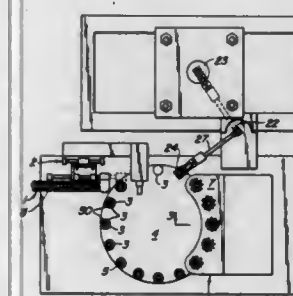
Alan A. Koch, Maryland Heights, Mo., assignor to Alumax, Inc., San Mateo, Calif.

Filed Sep. 22, 1986, Ser. No. 909,554

Int. Cl.⁴ B21D 37/16, 43/10

U.S. Cl. 72—361

19 Claims



12. In a process for continuously producing shaped metal parts comprising the steps of:

supporting and positioning a plurality of freestanding metal preforms, indexing said preforms sequentially through a plurality of separate induction heating stations for sequentially raising the heat content of said preforms to a level at which the preforms are partially liquid and partially solid, while the preforms remain freestanding and said preforms pass through each of said heating stations, transferring said freestanding preforms with a mechanical gripper from said supporting means to a shaping means while the preforms remain substantially in their initial shape and partially liquid-partially solid state, shaping said preforms while in said partially liquid-partially solid state into shaped metal parts and recovering said preforms after being shaped into solidified metal parts, the improvement comprising providing a ring of material around said means for supporting said preforms, a portion of said ring extending above said means for supporting said preform which acts as a heat sink to absorb heat from the liquid portion of said preforms to substantially solidify said liquid portion and substantially prevent said preforms from losing said liquid to runoff.

4,712,414

ROLLING METHOD OF PLATE-LIKE STOCK MATERIAL BY EDGER, AND CONTINUOUS HOT ROLLING MILL

Ichiro Kokubo, Hyogo; Atsuo Mizuta, Kobe; Yoshitaka Yamamoto, Hyogo, and Jitsuo Kitazawa, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

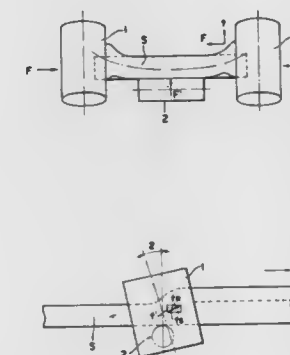
Continuation of Ser. No. 630,725, Jul. 13, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,509

Claims priority, application Japan, Jul. 13, 1983, 58-128590; Jul. 13, 1983, 58-128592; Sep. 16, 1983, 58-171615; Oct. 3, 1983, 58-185783; Dec. 21, 1983, 58-242776; Jan. 10, 1984, 59-003079; Feb. 4, 1984, 59-019244

Int. Cl.⁴ B21B 1/30, 39/02

U.S. Cl. 72—366

3 Claims



1. A process for width reduction of plate-like stock material, which method comprises:

positioning said first and second single driven vertical rolls in spaced relationship on opposite end portions of a table roller; feeding said plate-like stock material between said first and second driven single vertical rolls such that opposite side edges of said stock material respectively are engaged by said first and second driven single vertical rolls; tilting the central axis of said first and second driven single vertical rolls so as to be tilted in a direction opposite the advancing direction of the stock material in respective vertical planes which are parallel to the advancing direction of the stock material; contacting said plate-like material with said table roller such that said table roller supports said plate-like stock material via a counter force; maintaining the first and second single vertical rolls tilted toward the direction opposite the advancing direction of the plate-like stock material and simultaneously bringing the plate-like stock material into engagement with the first and second single vertical rolls so as to be edged by the first and second single vertical rolls and rotating said rolls so as to apply an upward force on edges of said plate-like stock material and develop a downward bending deformation in the plate-like stock material has a downward convex shape; and receiving the downward bending deformation of the plate-like stock material as a reaction force by said table roller, to thereby perform edging of the stock material while balancing bending moments, which are developed in the plate-like stock material during edging of the plate-like stock material, by means of said table roller.

4,712,415

METHOD OF DETERMINING STROKE LENGTH OF A PNEUMATIC FORGING HAMMER USING SENSED PEAK PRESSURE

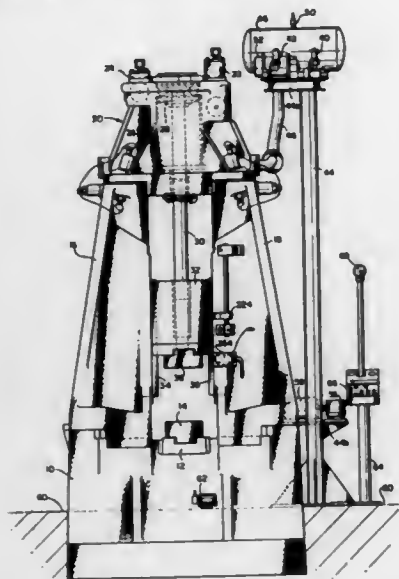
Charles J. Crout; Charles W. Frame, both of Chambersburg, and Ronald N. Harris, Ft. Loudon, all of Pa., assignors to Chambersburg Engineering Company, Chambersburg, Pa.
Division of Ser. No. 695,697, Jan. 28, 1985, Pat. No. 4,653,300.

This application Jan. 5, 1987, Ser. No. 575

Int. Cl.⁴ B21J 9/16

U.S. Cl. 72—8

2 Claims



1. The method of determining required energy input based on forging size measurements employing an impact device having a frame supporting at least one cylinder, a piston within said cylinder, means connecting the piston to a ram such that the ram is repeatedly movable relative to the frame from a retracted position into impact position, a driving fluid system including a fluid supply, valve means connecting said fluid supply into said at least one cylinder at a position in the cylinder to drive the ram into impact position and permitting release of fluid from the cylinder, and a trapped volume of compressible lifting fluid causing the ram to be retracted from impact position when fluid driving the ram into impact is released from the cylinder, comprising: sensing lifting air pressure, determining the peak of the lifting air pressure, examining a compilation of pressure versus stroke data for various residual lifting air pressures to determine the stroke, calculating the relative forging size by subtracting the actual stroke from the maximum stroke, calculating the rate of deformation from the forging size of the previous blow and the forging size of the current blow and, if the forging size is less than a predetermined minimum amount, adjusting valve means to provide only sufficient impact energy needed to finish the forging.

4,712,416

SIX-HIGH ROLL STAND WITH OFFSET INNER BACKUP ROLLS

Hans Römme, Dormagen, and Erich Stoy, Ratingen, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 710,837, Mar. 12, 1985, abandoned.

This application Sep. 25, 1986, Ser. No. 912,200

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409162; Feb. 5, 1985, 3503756

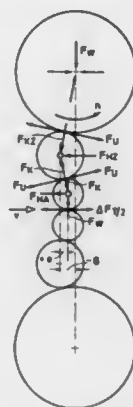
Int. Cl.⁴ B21B 31/20, 35/06

U.S. Cl. 72—241

8 Claims

1. In a six-high rolling stand comprising:
a pair of upper and lower working rolls defining a nip and

having respective axes lying in a vertical working-roll plane;
a pair of upper and lower inner backup rolls vertically flanking and bearing on the working rolls, said inner backup rolls having respective axes lying in a vertical inner-backup-roll plane;
a pair of upper and lower outer backup rolls vertically flanking and bearing on the inner backup rolls, said outer backup rolls having respective axes lying in a vertical outer-backup-roll plane;
a frame;
respective journal blocks carrying the rolls in the frame and supporting the rolls therein for rotation about the respective axes so that all of said axes are substantially parallel;
drive means connected directly to the outer backup rolls for



oppositely rotating same, the upper and lower rolls vertically engaging one another, whereby the rotation of the outer backup rolls is transmitted through the inner backup rolls to the working rolls; and
actuator means braced between some of the journal blocks and the frame for displacing at least some of the rolls horizontally perpendicular to the planes, the improvement wherein the actuator means are braced between the journal blocks of the inner backup rolls and the frame and are provided with means enabling them to be continuously adjusted for displacing the inner backup rolls and the respective axes horizontally perpendicular to said planes to a position in which said inner-backup-roll plane is offset horizontally from said outer-backup-roll plane and said working-roll plane is offset from both said backup-roll planes and is located between said backup-roll planes.

4,712,417

SWIVEL PULL TOWER

Davis R. Jarman, Hortense, and Virgil H. Hinson, Brunswick, both of Ga., assignors to Grabber Manufacturing Company, Brunswick, Ga.

Filed Feb. 28, 1986, Ser. No. 834,564

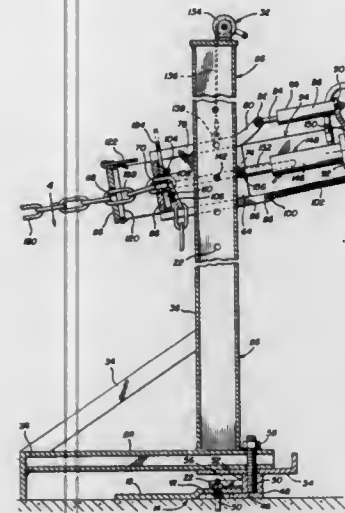
Int. Cl.⁴ B21D 1/12

U.S. Cl. 72—447

9 Claims

1. In combination with a floor anchored elongated track including inner and outer longitudinal marginal portions and wherein said outer marginal portion is spaced above an associated floor, a pull tower assembly including a horizontally elongated base having inner and outer ends and an upright anchored relative to and projecting upwardly from said outer end, a foot assembly mounted beneath said outer end for angular displacement relative thereto about an upstanding axis and embracingly engaging said outer longitudinal marginal portion for adjusted shifting therealong, said inner end of said base projecting inwardly of said inner longitudinal marginal portion and including downwardly facing abutment means for abutting said floor inwardly of said track, a horizontally elongated guide having inner and outer ends and opposite side plates

between which said upright is slidably received, a horizontally elongated pull arm including opposite side plates between which said guide is slidably received and also having inner and outer ends, corresponding to the first and second mentioned inner and outer ends, pivot means pivotally mounting an intermediate length portion of said guide from said upright for oscillation relative thereto about a horizontal axis extending transversely of said upright, base and pull arm and slidably guidingly supporting said pull arm from said guide for longitudinal shifting relative thereto, force means operatively con-



nected between said pull arm and upright for longitudinally shifting said pull arm relative to said pivot means and guide in a direction to shift said inner end of said pull arm toward said upright, first link chain section link anchoring means carried by said inner end of said pull arm for releasably anchoring a link chain section link relative to said pull arm and second link chain section link anchoring means anchored relative to said guide outwardly of said inner end of said pull arm and inwardly of said upright and to which a link chain section link may be anchored.

4,712,418

APPARATUS FOR THE MEASUREMENT OF SURFACE FRICTION

Harald Augustin, Arsenal Objekt 7/4/16, A-1030 Wien, Austria

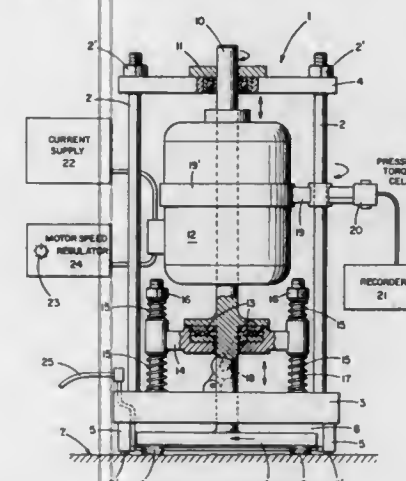
Filed Feb. 26, 1986, Ser. No. 833,207

Claims priority, application Austria, Feb. 26, 1985, 569/85

Int. Cl.⁴ G01N 19/02; G01L 5/00

U.S. Cl. 73—9

4 Claims



1. Apparatus for the measurement of the friction of surfaces

designed for traffic, such as road surfaces, floor coverings, and similar surfaces, said apparatus comprising:

a supporting assembly that can be positioned on the surface to be measured,
drive means carried on said supporting assembly and including an output shaft,
a rotor secured to said output shaft and having an axis of rotation that is perpendicular to the surface and having at least one contact member for contacting the surface,
adjustable pressure means carried by said support assembly for adjusting the contact force between the contact members and the surface, and
measuring means for measuring the torsional resistance to rotation of the drive means as a result of frictional contact between the contact member and the surface to be measured,
wherein said drive means is positioned coaxially with said rotor and included a motor casing, restraining means extending from said motor casing in a plane substantially perpendicular to the rotor axis and against the supporting assembly to prevent angular motion of the motor casing, said measuring means operative for measuring the torsional resistance exerted by the motor casing on the supporting assembly and mounted to measure the torque between the restraining means and the supporting assembly.

4,712,419

AIR/FUEL RATIO DETECTOR

Tadayoshi Ikai, and Takashi Kamo, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

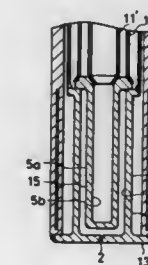
Filed May 13, 1986, Ser. No. 862,718

Claims priority, application Japan, May 13, 1985, 60-70489[U]; Jun. 17, 1985, 60-91090[U]

Int. Cl.⁴ G01M 15/00

U.S. Cl. 73—116

19 Claims

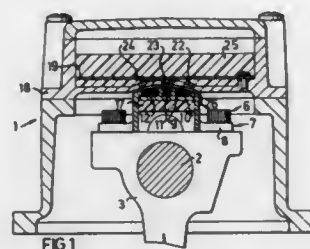


1. An air/fuel ratio detector comprising:
a first element of tubular shape made of an oxygen ion permeable solid electrolyte and having one end closed and inner and outer sides formed with electrodes which are connected with a d.c. power source to form an oxygen pump;
a second element of tubular shape made of an oxygen ion permeable solid electrolyte and having one end formed with gas diffusion means, inner and outer sides of said second element being formed with electrodes which are connected with a voltage source to form a limit current type oxygen sensor; and
a tubular heater having a heating element therein, wherein said first element is inserted into said second element such that a first space is formed between an outer side of said first element and an inner side of said second element, wherein said second element is inserted into said tubular heater such that a second space is formed between the outer side of said second element and the inner side of said tubular heater and wherein said one end of said second element and an end of said tubular heater include means to seal said second space.

4,712,420

ARRANGEMENT IN A MAGNETIC POSITION INDICATOR

Haas Johansson, and Anders Göras, both of Amal, Sweden, assignors to Saab-Scania AB, Sodertälje, Sweden
 Filed Feb. 28, 1986, Ser. No. 834,567
 Claims priority, application Sweden, Feb. 28, 1985, 8500977
 Int. Cl.⁴ G01M 19/00; G01D 5/12
 U.S. Cl. 73—118.1 9 Claims

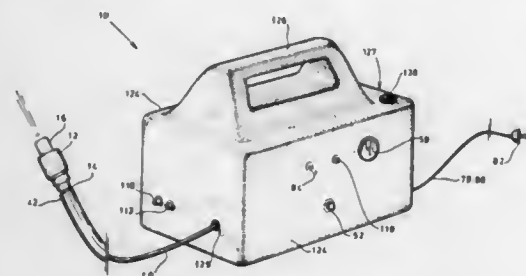


1. Apparatus for sensing in a gearbox the position of a gear selector rod that is axially displaceably and pivotably mounted in a gearbox housing, said apparatus comprising: a first and a second bar-shaped magnet disposed at mutually right angles and rigidly connected to said selector rod, each of said magnets having a long side and a free pole; a plurality of transducers rigidly connected to the gearbox housing and facing the free poles of said magnets for sensing the magnetic field of said magnets; at each long side of each of said first and second magnets and adjacent magnet disposed in parallel with the respective first or second magnet, each of said adjacent magnets having a free pole disposed in the vicinity of the free pole of the respective first or second magnet, the free poles of the first and the second magnets having a polarity reverse to that of the free poles of the adjacent magnets, each magnet having opposite to its free pole a second pole directed away from the transducers, at least the second poles of the mutually parallel magnets being magnetically connected, whereby the strength of the magnetic field facing the transducers is increased by the reduction in magnetic resistance attributable to said adjacent magnets.

4,712,421

FUEL INJECTOR TESTING DEVICE

Jeffrey H. Young, 606 Ardmore Cir., Maryville, Tenn. 37801
 Filed Sep. 8, 1986, Ser. No. 904,396
 Int. Cl.⁴ G01M 15/00
 U.S. Cl. 73—119 A 14 Claims



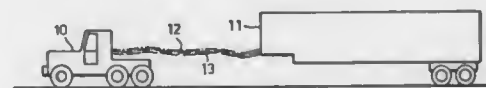
1. A portable fuel injector testing device for supplying a test fluid, under a preselected pressure, to a fuel injector of the type utilized for injecting fuel in an internal combustion engine to test and visually view the fuel spray pattern of said fuel injector when said injector is removed from said engine, said fuel injector having an inlet port for receiving said fuel, said fuel injector for generating said fuel spray pattern, and internal electrical control means, said fuel injector testing device being electrically powered by a suitable electrical power supply, said fuel injector testing device comprising:
 a reservoir for holding said test fluid;
 pumping means for pumping said test fluid, said pumping

means having a pump provided with an inlet port and an outlet port, and a fluid supply conduit for establishing fluid communication between said inlet port of said pump and said reservoir, whereby said pump selectively pumps said test fluid from said reservoir into said inlet port and out of said outlet port of said pump under pressure;
 injector supply means for selectively engaging, and communicating said test fluid to, said fuel injector, said injector supply means having an injector supply conduit for establishing fluid communication between said outlet port of said pump and said inlet port of said fuel injector, said injector supply conduit being provided with a first electrically controlled valve for selectively initiating and interrupting the flow of said test fluid to said fuel injector to generate and cease said spray pattern, respectively;
 pressure regulating means for maintaining said test fluid supplied to said fuel injector at said preselected pressure, said pressure regulating means having a pressure regulator defining an inlet port in fluid communication with said injector supply conduit and an outlet port, and a fluid return conduit for establishing fluid communication between said outlet port of said pressure regulator and said reservoir whereby said test fluid communicated through said pressure regulator is returned to said reservoir;
 a first electrical control circuit connected between said pump and said electrical power supply for selective operation of said pump;
 a second electrical control circuit connected to said first electrically controlled valve for selectively controlling flow of said test fluid to said fuel injector; and
 a third electrical control circuit connected to said electrical control means of said injector to selectively energize said control means to produce said spray pattern when said test fluid is provided to said fuel injector by said first electrically controlled valve.

4,712,422

TRACTOR-TRAILER FLUID PRESSURE BRAKE MONITORING SYSTEM

Dougald G. Munro, 4363 Garnetwood Chase, Mississauga, Ontario, Canada L4W 2H1
 Filed Aug. 19, 1986, Ser. No. 898,016
 Int. Cl.⁴ G01L 5/28
 U.S. Cl. 73—129 7 Claims



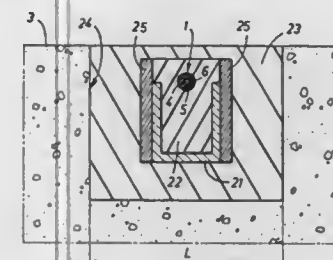
1. In a tractor-trailer fluid pressure brake system in which a driver-operated first brake valve is operable to release fluid for applying the tractor and trailer brakes simultaneously, and a driver-operated second brake valve is operable independently of the first brake valve to release fluid for applying the trailer brakes selectively, an improved tractor-trailer brake monitoring system comprising
 circuit means including a monitoring switch responsive to operation of the second brake valve for producing a signal in accordance with operation thereof, and
 a timer circuit interconnected with said circuit means and responsive to said signal for registering the duration of selective trailer brake usage.

4,712,423

PROCESS AND APPARATUS FOR MEASURING THE DYNAMIC LOADS APPLIED TO A HIGHWAY BY THE ROAD TRAFFIC

Marcel Siffert, Bazainville; Gervais Briant, Le Perray En Yvelines; Pierre Feunteun, Elancourt; Honoré Goacolou, Les Clayes/Bois; Jean-Claude Petitgrand, Prunay Sous Abris, and Francois Peyret, Angers, all of France, assignors to Laboratoire Central Des Ponts Et Chaussées, Paris, France
 Filed Feb. 7, 1986, Ser. No. 827,770
 Int. Cl.⁴ G01G 19/52 11 Claims

U.S. Cl. 73—146



1. A process for measuring the dynamic loads applied to a highway by the road traffic, in which a rectilinear piezo-electric cable is placed across the highway so that the wheels of the axles of the vehicles circulating on the highway subject it, upon passage thereof, to a pressure to which it responds by the emission of an electrical pulse and the corresponding dynamic load is calculated from the parameters of said pulse, whilst the speed of the vehicle is measured with the aid of the pulse delivered by a second rectilinear piezo-electric cable disposed on the highway at a certain distance from the first-mentioned cable, by determination of the duration of the time gap separating the appearance of the pulses respectively furnished by the two cables for the same wheel,

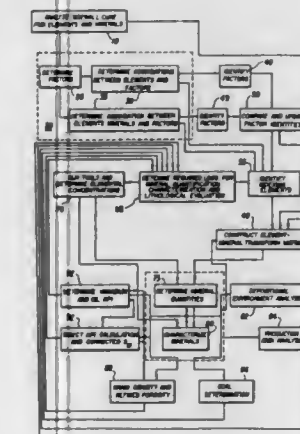
the dynamic load being deduced from the area of the contour, with respect to time, of the pulse delivered by the first-mentioned cable and from the speed of the vehicle, by making the product of said area by said speed.

4,712,424

QUANTITATIVE DETERMINATION BY ELEMENTAL LOGGING OF SUBSURFACE FORMATION PROPERTIES

Michael M. Herron, Danbury, Conn., assignor to Schlumberger Technology Corp., New York, N.Y.
 Continuation-in-part of Ser. No. 574,481, Jan. 26, 1984. This application Sep. 28, 1984, Ser. No. 656,104
 Int. Cl.⁴ E21B 49/00 48 Claims

U.S. Cl. 73—152



1. A method for investigating, through borehole measurements, an earth formation traversed by a borehole comprising:
 (a) making measurements in said borehole at least by spe-

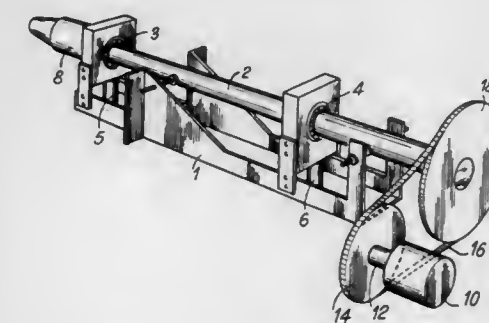
croscopy of nuclear radiation artificially induced in said formation;
 (b) determining, from said measurements, concentrations of a plurality of elements in said formation;
 (c) quantifying a plurality of attributes of said formation, including at least one clay mineral, by operating with a single-pass element-attribute transform on said elemental concentrations; and
 (d) producing a tangible record of the quantities of said attributes.

4,712,425

WHEEL BALANCING MACHINE, PARTICULARLY FOR AUTOMOBILE WHEELS

Claude Augendre, Dreux; Jean-Loup Rapidel, Paris, and Jacques Hennes, Ezy-sur-Eure, all of France, assignors to Facom, Morangis, France
 Filed Sep. 11, 1986, Ser. No. 906,076
 Claims priority, application France, Sep. 12, 1985, 85 13555
 Int. Cl.⁴ G01M 1/02 2 Claims

U.S. Cl. 73—460



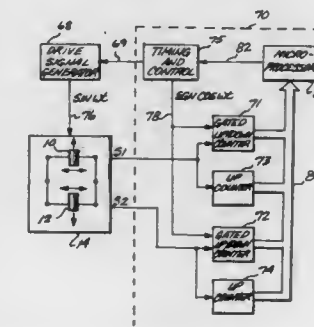
1. A wheel balancing machine, particularly for automobile vehicle wheels, comprising a shaft which is mounted in two bearings, each provided with a force sensor, and is driven rotationally by means of a transmission and a motor, wherein the transmission is a chain transmission comprising a chain whose pulling side is taut and is at right angles to the plane passing through the axes of sensitivity of the force sensors, while its driven side is slack.

4,712,426

SYNCHRONOUS FM DIGITAL DETECTOR

Rex B. Peters, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.
 Filed Oct. 21, 1985, Ser. No. 789,657
 Int. Cl.⁴ G01P 9/04, 15/10 9 Claims

U.S. Cl. 73—505



1. A system for determining the angular rate of rotation of a body about a rate axis, the system comprising:
 first and second accelerometers having their sensitive axes parallel to a sensing axis perpendicular to the rate axis, the

first and second accelerometers being adapted to produce respective first and second output signals, each output signal having a frequency corresponding to the acceleration experienced by the respective accelerometer along its sensitive axis;

movement means including means for producing a periodic movement signal and means responsive to the movement signal for periodically moving the accelerometers along a movement axis perpendicular to the rate and sensing axes, whereby each output signal includes a periodic Coriolis component; and

processing means comprising means for producing a reference signal that is operative to define one or more first time periods during which the Coriolis components have one polarity and one or more second time periods during which the Coriolis components have the opposite polarity, the first and second time periods together comprising one or more complete periods of the movement signal, means for determining, for each output signal, a phase value representing the difference between the phase change of the output signal during the first time periods and the phase change of the output signal during the second time periods, means for adding the phase values to one another to determine a phase sum value and for subtracting the phase values from one another to determine a phase difference value, and means for linearly combining the phase sum and phase difference values to determine a value representing the angular rate of rotation of the body about the rate axis.

4,712,427

VIBRATING BEAM ACCELEROMETER WITH VELOCITY CHANGE OUTPUT

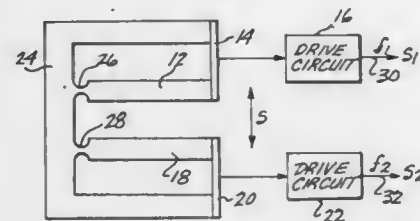
Rex B. Peters, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 789,752, Oct. 21, 1985, abandoned. This application Sep. 17, 1986, Ser. No. 908,356

Int. Cl. G01P 15/10

U.S. Cl. 73-517 AV

14 Claims



1. An accelerometer for measuring velocity change along a sensitive axis, comprising:

a pair of acceleration sensors, each sensor being operative to produce an output signal having a frequency related to the acceleration along the sensitive axis, the sensors being arranged such that a given acceleration along the sensitive axis causes the frequency of one output signal to increase and the frequency of the other output signal to decrease; and

means for determining the velocity change ΔV along the sensitive axis during a selected time interval in accordance with the relation:

$$\Delta V = A[\Delta\phi + FT + B\Sigma\phi]$$

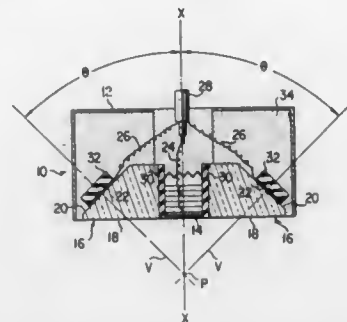
where A, F and B are nonzero constants, T is the length of said time interval, $\Delta\phi$ is the difference between the phase changes of the output signals over said time interval and $\Sigma\phi$ is the sum of the phase changes of the output signals over said time interval.

4,712,428
ULTRASONIC FLAW DETECTOR PROBE
Yugoro Ishii, Hino; Motohisa Onozawa, Sugakawa, and Akihiko Katamine, Yokohama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 21, 1986, Ser. No. 887,247
Int. Cl. G01N 29/04

U.S. Cl. 73-644

12 Claims



1. A probe for ultrasonic flaw detection comprising:

(a) a housing having an open bottom and an axis passing therethrough;

(b) a first ultrasonic transducer disposed at the open bottom of the housing and centered about the axis thereof;

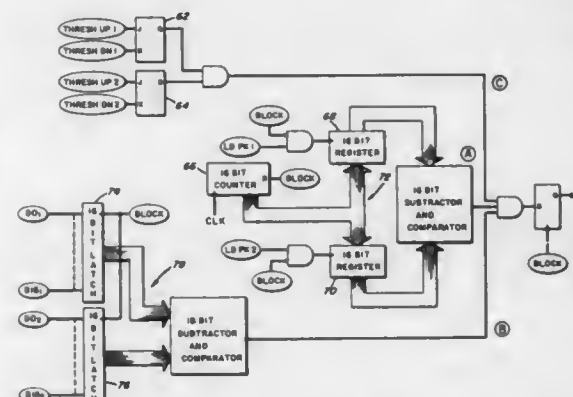
(c) lens means disposed within the housing and exposed through the open bottom thereof, the lens means having at least one sloping surface at an angle to the axis of the housing;

(d) at least one pair of second ultrasonic transducers mounted on the sloping surface of the lens so as to provide paths of ultrasonic vibrations extending through the lens means, the paths of ultrasonic vibrations crossing each other at that point on the axis of the housing which is located outside the open bottom thereof.

4,712,429
WINDSCREEN AND TWO MICROPHONE CONFIGURATION FOR BLAST NOISE DETECTION
Richard Raspel, Urbana, Ill., and Mark D. Wagner, Morristown, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 15, 1987, Ser. No. 755,388
Int. Cl. G01N 29/00

U.S. Cl. 73-646

15 Claims



14. The apparatus of claim 11 wherein the processing means further comprise means for timing the duration of the pulse output from the multivibrators and for producing a pulse in response to coherency of the microphone signals as determined by the fixed time duration of the multivibrator pulses.

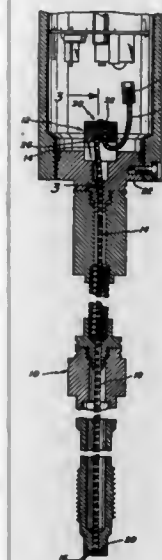
4,712,430
PRESSURE TRANSDUCER
William Wareham, Marion, Mass., assignor to Dynisco, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 848,300, Aug. 4, 1986. This application Oct. 14, 1986, Ser. No. 918,087

Int. Cl. G01L 7/08, 9/04

U.S. Cl. 73-706

28 Claims



1. A pressure transducer particularly for low pressure measurement comprising,

an elongated frame having means defining a passage, a flat surface at one end thereof, and mating means adjacent to the flat surface,

a capillary tube extending through the frame and terminating at one end adjacent another end of the frame,

a coupler closing the other end of the frame and defining with the frame a chamber in communication with the capillary tube,

a liquid filled deformable sensor including a cap member having an internal recess therein and mating means adjacent thereto for connecting with the mating means of the frame, said recess and flat surface defining a thin disc-shaped compartment in communication with another end of the capillary tube,

and a liquid filling the capillary tube, chamber and compartment for applying the pressure exerted against the coupler to the sensor,

said cap member having an outer substantially flat top wall having a diametrically disposed raised beam extending across its top surface and defining a gage receiving surface,

said cap member top wall having indentations therein on either side of an extending longitudinally of said raised beam.

4,712,431
MULTI-AXIS LOAD SENSOR
Yotaro Hatamura, 12-11, Kohinata 2-chome, Bunkyo-ku, Tokyo 112, Japan
Continuation of Ser. No. 605,212, Apr. 30, 1984, Pat. No. 4,628,745. This application May 27, 1986, Ser. No. 867,221
Claims priority, application Japan, Sep. 14, 1983, 58-168385
Int. Cl. G01L 5/16

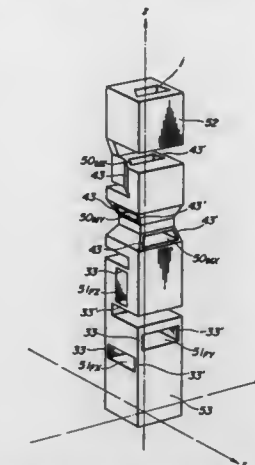
U.S. Cl. 73-862.04

33 Claims

23. A multi-axis load sensor adapted to be connected between a first rigid member (52) (72) and a second rigid member (53) (73) so as to detect the magnitude, direction and point of action of a force to be transmitted between the first and second

rigid members (52, 53) (72, 73) wherein said multi-axis load sensor comprises in combination:

a first radial plate structure having a standard axis, which extends in a prescribed direction and is adapted to detect a moment component to be produced about the standard axis by the force, wherein said first radial plate structure comprises at least one pair of plates (43, 43') (81, 81') having a thicknesswise dimension smaller than a widthwise dimension thereof and arranged radially with respect to a prescribed point; and



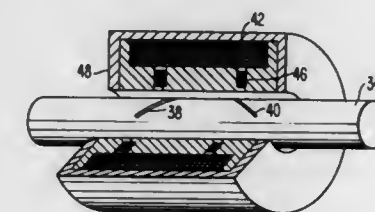
at least one plate structure wherein said at least one plate structure comprises at least one pair of plates (33, 33') (77, 77') (43, 43') (81, 81') having a thicknesswise dimension smaller than a widthwise dimension thereof, said at least one plate structure having a standard axis which extends in a prescribed direction wherein the standard axis of said at least one plate structure is neither coincident with nor parallel to the standard axis of said first radial plate structure.

4,712,432
TORQUE SENSOR
Peter A. Hochstein, Troy, and Nobuyuki Imai, Farmington Hills, both of Mich., assignors to AI Sin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation-in-part of Ser. No. 676,859, Nov. 30, 1984, abandoned. This application Oct. 18, 1985, Ser. No. 789,108
Int. Cl. G01L 3/10

U.S. Cl. 73-862.36

13 Claims



7. A torque sensor comprising:

a ferromagnetic member having at least two discontinuities, said discontinuities positioned at an angle of 60°-75° with respect to the central horizontal axis of said ferromagnetic member;

a primary coil for establishing an induced excitation current in said ferromagnetic member thereby generating a magnetic leakage flux at said discontinuities;

two differentially connected secondary coils, a different one of said secondary coils for measuring the change in leakage flux at each of said discontinuities when a torsional stress is applied to said ferromagnetic member; and

amplitude and phase means for deriving the amplitude and phase of the induced current output of said secondary coils.

4,712,433

TORQUE SENSOR FOR AUTOMOTIVE POWER STEERING SYSTEMS

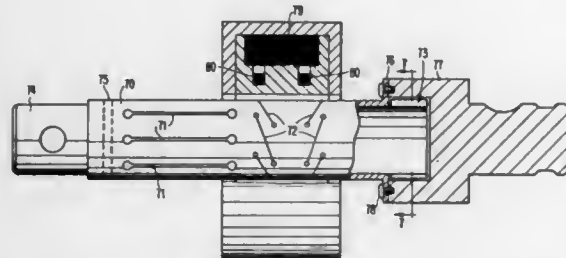
Peter Hochstein, Troy, and Nobuyuki Imai, Farmington Hills, both of Mich., assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Oct. 18, 1985, Ser. No. 789,109

Int. Cl.⁴ G01L 3/10

U.S. Cl. 73-862.36

13 Claims



1. A noncontacting, leakage flux torque sensor for an automotive, electrically powered steering assist system comprising:
 - a input shaft;
 - a output shaft;
 - a ferromagnetic member fixed to both said input shaft and said output shaft so as to transfer torque to said output shaft from said input shaft, said ferromagnetic member having at least one discontinuity;
 - a lost motion connection means for directly coupling said input shaft to said output shaft so that said input shaft may rotate a predetermined distance with respect to said output shaft before said lost motion connection means engages said output shaft, said lost motion connection means, when engaged, coupling said input and output shafts and thereby shunting additional torque directly from said input shaft to said output shaft;
 - a primary coil for establishing an induced excitation current in said ferromagnetic member thereby generating a magnetic leakage flux at said discontinuity;
 - two differentially connected secondary coils for measuring the change in leakage flux at said discontinuity when a torsional stress is applied to said ferromagnetic member to rotate said member less than said predetermined distance; and
 - amplitude and phase means for deriving the amplitude and phase of the induced current output of said secondary coils.

4,712,434

DEVICE FOR EMISSION-FREE SAMPLING OF VOLATILE LIQUIDS

Jens Herwig, Cologne; Hagen Nörenberg, Dormagen; Friedhelm Bergmann, Cologne; Manfred Stiller, Dormagen; Horst Schlemmermeyer; Wilfried Schmidt, both of Cologne; Hilmar Straube, Pulheim, and Helmut Wolter, Cologne, all of Fed. Rep. of Germany, assignors to EC Erdölchemie GmbH, Köln-Worringen, Fed. Rep. of Germany

Filed Oct. 1, 1986, Ser. No. 914,104

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1985, 3537940

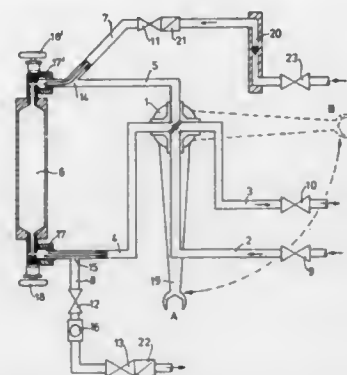
Int. Cl.⁴ G01N 1/10

U.S. Cl. 73-864.63

10 Claims

1. A device for the emission-free sampling of volatile liquids, comprising: a 4-way tap having four lines and actuatable into two alternative states including a first state wherein a first and a second line are fluidly coupled and a third and a fourth line are fluidly coupled and a second state wherein the first and

third lines are fluidly coupled and the second and fourth lines are fluidly coupled, wherein the first and second lines are fluidly connectable to a container holding the liquid to be tested, and the third and fourth lines are fluidly connectable to a sample bottle, a supply line for receiving an inert flushing medium and which is fluidly joined to the fourth line in a region of the connection to the sample bottle, and a discharge line for the inert flushing medium and which is branched from



the third line in a region of the connection to the sample bottle and fluidly connectable to a disposal system and wherein the sample bottle has a longitudinal axis and is connected in a position in which the longitudinal axis deviates from the horizontal and the fourth line which terminates at the sample bottle and the supply line for the inert flushing medium lie at a higher level with respect to gravity than the third line coming from the sample bottle and higher than the discharge line for the inert flushing medium.

4,712,435

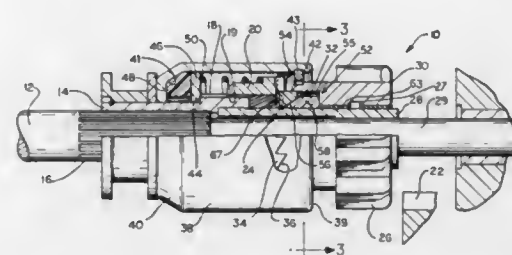
ENGINE STARTER GEARING

Walter N. Losey, Big Flats, and Paul F. Giometti, Horseheads, both of N.Y., assignors to Facet Enterprises, Inc., Tulsa, Okla. Continuation-in-part of Ser. No. 575,199, Jan. 30, 1987, Pat. No. 4,611,499. This application Sep. 15, 1986, Ser. No. 907,744

Int. Cl.⁴ F02N 11/00

U.S. Cl. 74-6

9 Claims



1. An engine starter gearing for selectively starting an engine having a starting gear, said engine starter gearing comprising:
 - a power shaft;
 - a sleeve slidably, but non-rotatably, secured to said power shaft, said sleeve having external helical splines formed on one extremity thereof;
 - a pinion gear slidably journaled to said power shaft for axial movement relative thereto, said pinion gear being adapted for movement into and out of engagement with said starting gear of said engine to be started;
 - a driven clutch member secured to said pinion gear for movement therewith;
 - a generally circular recess formed in said driven clutch member;
 - a molded plastic sleeve positioned within said generally circular recess formed in said driven clutch member, said

- molded plastic sleeve having an exterior surface and an interior surface;
- a driving clutch member slidably mounted on said helical splines of said sleeve, said driving and driven clutch members having complementary mutually engageable inclined teeth for transmitting torque therebetween in one direction of rotation;
- a barrel housing having an open end, said barrel housing being slidably supported on said sleeve and spatially encompassing said driving and driven clutch members;
- abutment means disposed within said barrel housing adjacent said open end thereof, said abutment means being adapted for engagement with said driven clutch member for confining said driving and driven clutch members within said barrel housing;
- resilient means disposed within said barrel housing, said resilient means abutting said driving clutch member, said resilient means further biasing said driving and driven clutch members into mutual engagement;
- a radially inwardly extending shoulder formed on said driving clutch member adjacent said circular recess of said driven clutch member;
- an annular thrust washer loosely disposed in said generally circular recess of said driven clutch member, said annular thrust ring having an inner conical surface, said annular thrust ring being adapted to abut said radially inwardly extending shoulder of said driving clutch member when said annular thrust ring is displaced in a first axial direction;
- a plurality of centrifugal flyweight members annularly arranged within said molded plastic sleeve, said plurality of centrifugal flyweight members each having an inclined surface abutting said conical surface of said annular thrust ring, said plurality of centrifugal flyweight members being operative to displace said annular thrust ring in said first axial direction in response to centrifugal force; and
- a plurality of radially outwardly extending cavities formed in said interior surface of said molded plastic sleeve, each of said cavities of said plurality of cavities slidably receiving at least a portion of an associated centrifugal flyweight member of said plurality of centrifugal flyweight members to prevent circumferential movement of said plurality of centrifugal flyweight members while permitting radial movement thereof.

4,712,436

BALANCERS FOR VARIOUS RECIPROCATING MACHINES USING ROTATING BALANCE WEIGHTS

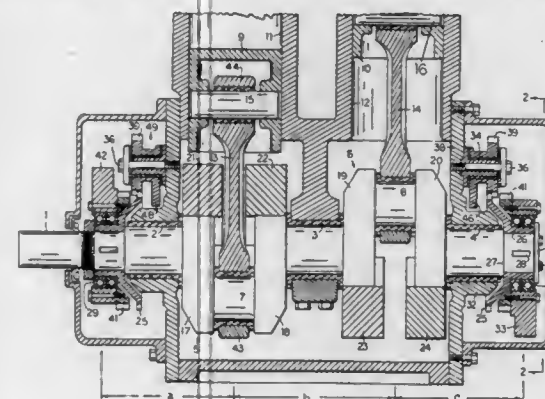
Arthur E. Brown, R.D. #1, Box 1107, Lake George, N.Y. 12845

Filed Oct. 2, 1985, Ser. No. 782,893

Int. Cl.⁴ F16F 15/26

U.S. Cl. 74-44

8 Claims



1. In a reciprocating machine, the combination of a frame structure, a crankshaft mounted, for rotation in said frame structure, said crankshaft having at least one crank, at least one reciprocable member guided for reciprocation, a connecting

rod interconnecting said crank and said reciprocable member for respective rotary and reciprocable motion, at least one main counterweight attached to said crankshaft and rotatable therewith, two contra-weights mounted for rotation around the axis of said crankshaft, said contra-weights being adapted to rotate in the opposite direction to that of said crankshaft and at the same RPM as the crankshaft, said contra-weights in cooperation with said main counterweight serving to counterbalance the primary reciprocating inertia forces of said reciprocable member,

and wherein the improvement comprises, two stub shafts, attached to one end of said frame structure, two more stub shafts attached to the other end of said frame structure making at least four stub shafts total, a secondary balance weight mounted for rotation on each of said stub shafts making at least four secondary balance weights total, pinion gears mounted for rotation on said four stub shafts making at least four such pinion gears total, two larger gears attached to said crankshaft and rotatable therewith, two more larger gears attached one to each of said contra-weights making at least four larger gears total, said pinion gears and said larger gears (at one end of the frame structure) meshing so as to drive two of said secondary balance weights at twice crankshaft speed and so as to drive one of said contra-weights, the remaining said pinion gears and the remaining said larger gears (at the other end of the frame structure) meshing so as to drive the remaining two secondary balance weights at twice crankshaft speed and so as to drive the other said contra-weights, and said four secondary balance weights serving to counterbalance the secondary reciprocating inertia force of said reciprocable member.

4,712,437

GEAR FOR TRANSFORMING ROTARY MOTION TO RECIPROCATORY MOTION

Karl J. Gaigl, Stockach, Fed. Rep. of Germany, assignor to Fahr-Bucher GmbH, Gottmadingen, Fed. Rep. of Germany

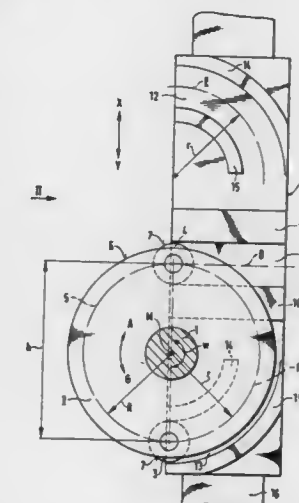
Filed Oct. 18, 1985, Ser. No. 789,081

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438363; Dec. 12, 1984, 3444168

Int. Cl.⁴ F16H 21/18, 21/54

U.S. Cl. 74-50

8 Claims



1. A gear for transforming or transmitting alternating rotary movement of a drive into linear movement which comprises: a first driver which rotates in a first radius about a center; a cam plate having a guidance channel for receiving the first driver and at least one reception groove; a second driver which rotates in a second radius about said center; said second driver engaging said at least one reception groove when the first driver is disengaged from said guidance channel and each said

reception groove has an axis with a radius about a center point which corresponds to said second radius, whereby said cam plate moves linearly along a first axis as said first driver is rotated about said center and moves along said guidance channel.

4,712,438

VARIABLE SPEED CONTROL

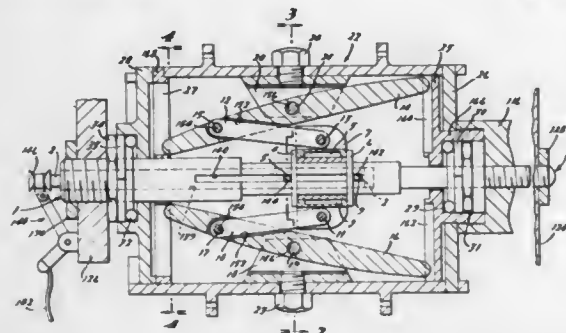
Julius W. Nawojski, 38148 Medville, Sterling Heights, Mich. 48077, and Walter Nawojski, VA 35 FPO, New York, N.Y. 09501-6206

Filed May 1, 1985, Ser. No. 729,487

Int. Cl.⁴ G05G 7/04

U.S. Cl. 74—63

6 Claims



1. In a bicycle hub for a bicycle wheel, including axle means and a sprocket secured to said axle means, a variable force mechanism comprising means disposed within the hub for connecting said axle means to said hub, including transmission means comprising at least one rocker arm pivotally secured to said axle means, slideably secured to said hub, and movable from a first position to a second position wherein disposition of said transmission means in said second position provides a greater resistance to rotation of said sprocket than disposition of said transmission means in said first position; and means for controlling the movement of said transmission means from said first position to said second position.

4,712,439

APPARATUS FOR PRODUCING A FORCE

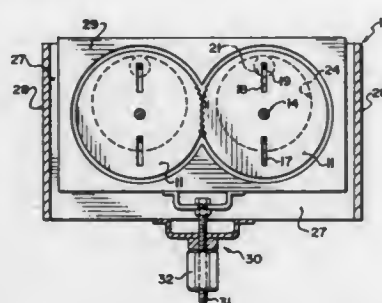
Henry North, R.R. #16, Thunder Bay, Ontario, Canada P7B 5E5

Filed Feb. 24, 1986, Ser. No. 832,235

Int. Cl.⁴ F16H 33/02

U.S. Cl. 74—84 R

15 Claims



1. Apparatus for producing a force comprising a housing, a first and a second balanced flywheel, bearing means mounting each of said flywheels for rotation in the housing about one of a pair of spaced parallel axes, drive means for drivingly rotating each of said flywheels in opposed directions about its respective axis, a first and second mass, each flywheel including means for applying force to a respective one of the masses in a direction angularly of the respective axis such that the mass rotates therewith about the respective axis, each mass

being free to move relative to the respective flywheel in a direction radially of the flywheel to define a rotating path of the mass around the axis of the respective flywheel, a first and second guide track means, means mounting said guide track means on said housing so as to be stationary relative thereto and so as to transmit forces from the guide track means to the housing, each guide track means providing an inwardly facing surface fully surrounding the rotating path of a respective one of the masses, each of said masses consisting of a shaft member having an axis parallel to the axis of the respective flywheel and spaced radially thereof, a body surrounding the shaft and symmetrically balanced around the axis of the shaft and bearing means mounting the body on the shaft to concentric balanced rotation therearound, said body having an outwardly facing peripheral surface for rolling on a respective one of said guide track means such that said rolling thereon causes rotation of the body about the shaft axis each said rotating body constituting a gyroscope, one of the guide track means being a mirror image of the other and each having a portion on one side of the axis of the respective flywheel which is spaced from the axis by a distance greater than a portion diametrically opposite thereto.

4,712,440

LINEAR ACTUATOR

André Rousselot, Cluses, France, assignor to Somfy, France

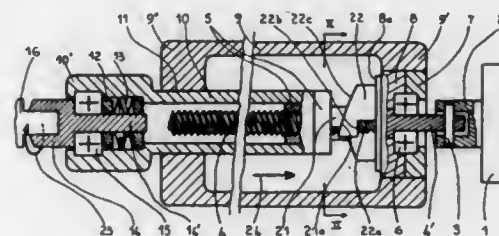
Filed Jul. 10, 1985, Ser. No. 753,377

Claims priority, application France, Jul. 18, 1984, 84 11375

Int. Cl.⁴ F16H 25/20

U.S. Cl. 74—89.15

7 Claims



1. A linear actuator comprising a motor having an output shaft which is connected kinematically to a first member, a reversible screw-and-nut system capable of movement in a first and second direction, said system comprising said first member and a second member, said screw-and-nut system having a pitch in a first direction, said second member of this screw-and-nut system being integral with an operating arm which moves parallel with said reversible screw, said second member capable of movement between a first axial position and a second axial end position, said second member of the screw-and-nut system includes at least one first profiled portion positioned on the outside of said second member, a friction torque-limiter connected to said second member and to an intermediate member rotationally fixed and intended for being connected to a device which is to be actuated, a fixed member having a second profiled portion which cooperates with said first profiled portion when said second member occupies said second axial end position, said fixed member surrounds at least locally the screw-and-nut system, at least one of the two profiled portions having the shape of a bayonet joint oriented so as to prevent the second member, when it reaches the said second axial end position, from turning in a direction corresponding to that of the driving shaft and said first member and from moving away axially from this second end position when said intermediate member is pulled out and said motor does not rotate, said bayonet joint having an outer side and an inner side, said

outer side capable of serving as a stop and as a guide to said first profiled portion, until the latter penetrates an entrance into the bayonet joint, the said other profiled portion being arranged for sliding over the outer side of the bayonet joint.

4,712,441

POSITION CONTROLLED LINEAR ACTUATOR

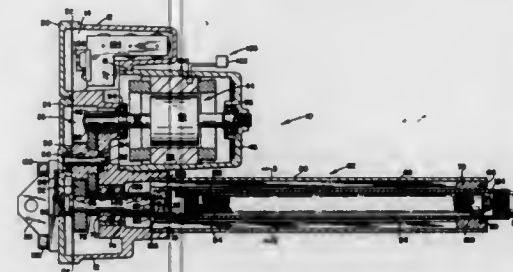
William F. Abraham, Lancaster, N.Y., assignor to Brunswick Valve & Control, Inc., Houston, Tex.

Filed May 13, 1985, Ser. No. 733,633

Int. Cl.⁴ F16H 25/20

U.S. Cl. 74—89.15

26 Claims



12. A linear actuator comprising:

a housing;
a drive screw rotatably supported within said housing;
a drive nut in threaded engagement with said drive screw;
a body tube assembly connected to said drive nut, said body tube assembly containing reaction surfaces for preventing rotation of said drive nut;
an extendable member having a load connecting member on its free end and having the opposite end connected to said drive nut, said extendable member adapted for axial movement so as to extend out of said body tube;
drive means including an electric drive motor containing windings for rotating said drive screw; and
an overload controller means having a thermal sensing element located in the windings of said electric motor, said controller means operable for interrupting power to said electric motor upon heat up of said motor windings beyond a predetermined temperature, and wherein a back stop means is attached to the inner end of said drive screw and a mating back stop reaction means is provided on the innermost portion of said drive nut, and wherein a front stop means is attached to said drive screw at its outer end and a mating front stop reaction means is provided on the outer portion of said drive nut, said front and back stop means preventing further axial motion of said drive nut to heat up said motor windings and interrupt power to said drive motor through operation of said overload controller means; said back stop means and mating back stop reaction means each being structured to have a safety gap formed axially therebetween to prevent jamming between the drive nut and the front or back stop means, the interior surfaces of said body tube assembly and the exterior surfaces of said drive nut configured to provide said reaction surfaces within said body tube assembly at least at corner portions of said drive nut and to provide open spaces between the outer surfaces of said drive nut and the interior surfaces of said body tube assembly other than at said reaction surfaces, substantially each corner portion having plural surfaces engaging corresponding reaction surfaces of the body tube assembly.

4,712,442

LUBRICATING MECHANISM FOR A ROTARY MACHINE

Toyokazu Baika, and Hidemi Oonaka, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

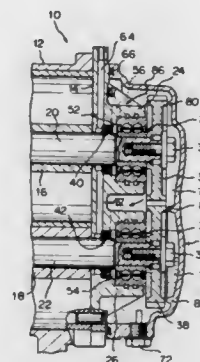
Filed May 29, 1986, Ser. No. 868,089

Claims priority, application Japan, Jul. 31, 1985, 60-116417[U]

Int. Cl.⁴ F16H 57/04; F16N 1/00, 7/14

U.S. Cl. 74—467

6 Claims



1. A rotary machine having a housing, comprising:
an upper and a lower shaft journaled in the housing at respective bearings, said shafts being parallel with each other and vertically spaced from each other, each of the shafts having an end extending outward beyond the housing;
an upper and a lower gear respectively secured to said shaft ends for rotation therewith, said gears being in mesh with each other to cause the shafts to rotate in a synchronized relationship;
a cover secured to the housing to define a sealed chamber for surrounding the gears and storing a quantity of lubricant sufficient to immerse a part of the lower gear, the teeth of said lower gear entraining said lubricant upon immersion therein;
a pair of oil seal members respectively disposed around the shafts, sealing the shafts to prevent the lubricant from entering inside the housing, said oil seal members being located adjacent to the bearings between said bearings and said housing;
a lubricating mechanism for supplying the lubricant transferred upward by the gears to the oil seal member and the bearing associated with the upper shaft;
a lubricant passage in said lubricating mechanism formed through a boss in the housing having an outlet opening between the bearing and the oil seal member associated with the upper shaft, and an inlet located at a level higher than that of the outlet and opening into the upper part of the sealed chamber; and
guiding means arranged with said upper and lower gears for positively guiding the lubricant entrained by the teeth of said upper and lower gears while said lubricant is transferred from the bottom of said lower gear to the top of said upper gear, said guiding means being arranged to substantially prevent the lubricant entrained by said teeth from spilling off said teeth in directions radially inwardly and outwardly of the respective gears during said lubrication transfer.

4,712,443

MECHANICAL OVER-RIDE LINKAGES

Norman P. Deane, Rugby, England, assignor to AE PLC, Warwickshire, England

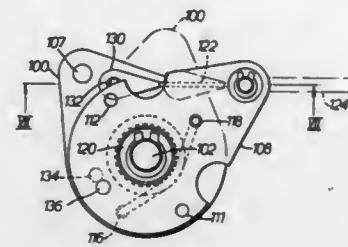
Filed Dec. 10, 1985, Ser. No. 806,803

Claims priority, application United Kingdom, Dec. 13, 1984, 8431455

Int. Cl.⁴ G05G 1/14, 11/00

U.S. Cl. 74-470

10 Claims



1. A mechanism for fitting between a fuel supply control of an engine and an operator's control which is movable by an operator to control the fuel supply to the engine by means of said fuel supply control, the mechanism comprising first and second members pivotally secured together for relative pivotal movement,

the first member having means for connecting it to the said operator's control and the second member having means for connecting it to the fuel supply control,

spring means biasing the members together such that they tend to move as one in response to movement of the operator's control which varies the engine's fuel supply via the said fuel supply control, and

over-ride means connected between said first and second, said over-ride means comprising a cable movable within a casing, said cable being connected to one of said members and said casing being connected to the other of said members, said over-ride means being capable of applying a force between the members in response to an engine speed controlling signal, the force acting in opposition to said spring means and moving said second member relative to the first member to cause said fuel supply control to reduce the engine's fuel supply independently of the operator's control, the force being applied such that it acts simultaneously but in opposite directions on said first and second members whereby the force is not transmitted to the operator's control in the direction opposing a force exerted thereby which increases the engine's fuel supply.

4,712,444

LEVERED OPTICAL MOUNT

Lindon L. Lewis, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Sep. 16, 1986, Ser. No. 907,780

Int. Cl.⁴ G05G 11/00; G02B 5/08; F16M 11/12

U.S. Cl. 74-479

21 Claims

1. A mounting device (10) for precisely adjusting the inclination of one (20) of the parts thereof with respect to two axes (X and Y), which device comprises:

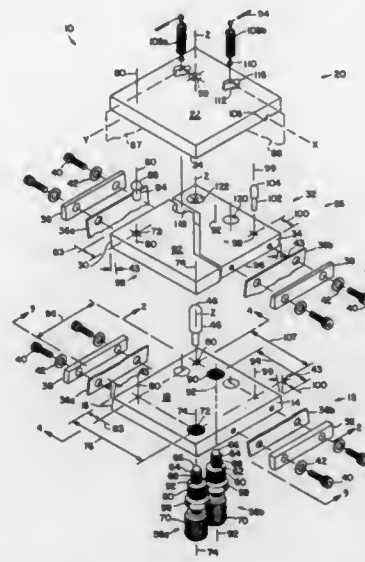
a first part (20);

a second part (12);

means (46, 48, and 52) for spacing said first part from said second part, for pivotally attaching said first part to said second part, for permitting said first part to pivot around intersecting X and Y axes, and for locating said intersection of said X and Y axes along a Z axis with respect to said second part;

first inclination adjusting means, comprising a first lever (28) that is flexibly attached to one (12) of said parts by a flexible metal hinge (36a), for receiving a first angular adjustment, and for rotating said first part around said X

axis by a first inclination angle that is smaller than said first angular adjustment; and



second inclination adjusting means, for receiving a second angular adjustment, and for rotating said first part around said Y axis by a second inclination angle that is smaller than said second angular adjustment.

4,712,445

ADJUSTING MECHANISM FOR TRACTOR LINKAGE

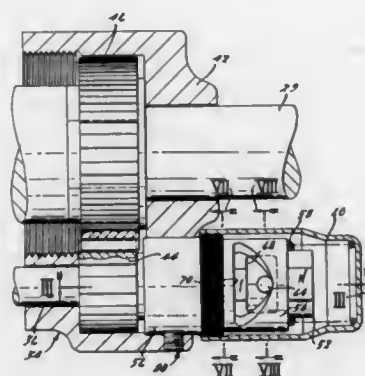
Charles A. Hansen, Troy, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 23, 1986, Ser. No. 866,623

Int. Cl.⁴ G05G 1/00; F16D 57/10

U.S. Cl. 74-491

4 Claims



1. In an agricultural tractor of the type having a frame, a tractor cab mounted on the frame, a trailing arm hitch link pivotally mounted on a portion of the frame and a telescoping link assembly mounted on portions of the frame and the trailing link and having a drive gear carried in a housing for effecting telescoping movement to pivotally adjust the trailing link an improved adjusting mechanism comprising:

crank means mounted in the tractor cab;

shaft means rotatively driven by the crank means; and

locking and unlocking adjusting means carried in the drive gear housing in driving relationship with the drive gear and engaged with the shaft means to be rotatable with the shaft means in response to rotation of the crank means, portions of the adjusting means being arranged in a locked position to prevent more than certain limited movement of the drive gear in response to movement of the trailing link, and including lost motion means for permitting driving

movement of the drive gear upon certain rotation of the shaft means by moving the adjusting means portions to an unlocked position permitting such movement.

4,712,446

ANTI-VIBRATION STRUCTURE OF A STEERING ARRANGEMENT

Mitsuo Kamata, Chigasaki, and Yutaka Yamashita, Hiratsuka, both of Japan, assignors to Nissan Shatai Company, Limited, Kanagawa, Japan

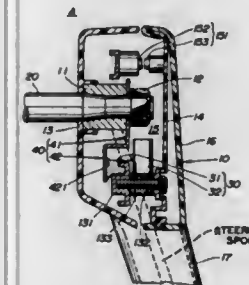
Filed Jan. 21, 1986, Ser. No. 820,001

Claims priority, application Japan, Aug. 9, 1985, 60-175242

Int. Cl.⁴ B62D 1/04

U.S. Cl. 74-492

8 Claims



1. An anti-vibration structure of a steering arrangement for a vehicle, comprising:

(a) a shaft housing having an inner space defined by a lower cover attached to an upper end of a steering shaft and an upper cover resiliently supported on the lower cover and formed on a center part of a steering wheel attached to an upper end of the steering shaft via the lower cover of the steering wheel;

(b) a mounting bracket housed within said shaft housing and having at least two parts, one part being formed with a fixing surface which is fixed to the upper part of the steering shaft, the other part being formed with a mounting surface substantially in parallel to the fixing surface of the one part, the mounting surface being positioned eccentrically with respect to an axis center of the steering shaft and nearer to the lower cover than the fixing surface, and both fixing surface and mounting surface forming a plane orthogonal to an axial direction of the steering shaft; and

(c) a dynamic damper including at least one elastic member and at least one mass member, housed within said shaft housing with one end of said elastic member fixed to said mounting surface so as to be in parallel to the axial direction of said steering shaft and the other end of said elastic member fixed to said mass member, for damping a vibration occurring on the steering wheel transmitted from said steering shaft regardless of a rotational angle and direction of the steering wheel.

4,712,447

OSCILLATOR FOR A CONTINUOUS CASTING MOLD

Carl Langner, Monsey, N.Y., assignor to SMS Concast Inc., Montvale, N.J.

Filed Apr. 24, 1986, Ser. No. 855,883

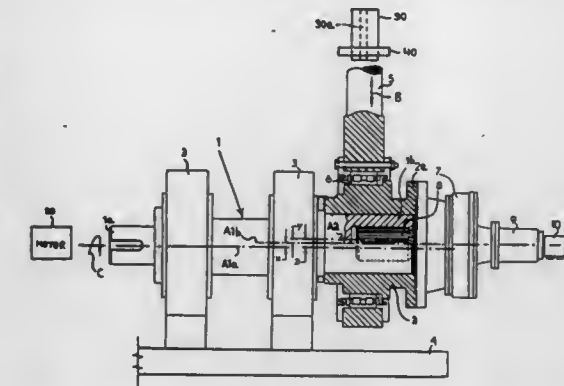
Int. Cl.⁴ G05G 3/00; B22D 11/04

U.S. Cl. 74-571 R

29 Claims

1. An oscillator for a continuous casting mold, comprising a rotary drive shaft having a first portion, and a second portion which is eccentric with respect to said first portion; a first motor for driving said drive shaft; a sleeve surrounding and rotatable relative to said second portion, said sleeve being eccentric with respect to both of said portions and being designed to transmit oscillatory motion to a continuous casting mold as said drive shaft rotates; and a varying mechanism for changing the oscillation stroke while said drive shaft rotates and while said drive shaft is at a standstill, said varying mechanism

including a second motor having an output element, and a supporting element for said output element, and said elements being rotatable relative to one another, one of said elements being coupled to said sleeve for rotation therewith, and said



sleeve being rotatable relative to the other of said elements so as to permit said second motor to rotate said sleeve relative to said second portion, said elements being at least approximately coaxial with said first portion.

4,712,448

DRIVE MECHANISM FOR MOTOR VEHICLES HAVING TWO DRIVE AXLES

Heribert Lanzer, Güssendorf, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

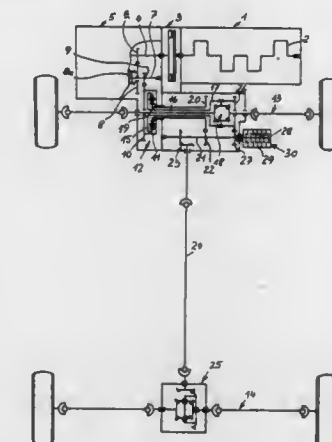
Filed Aug. 30, 1985, Ser. No. 772,128

Claims priority, application Austria, Aug. 30, 1984, 2781/84

Int. Cl.⁴ F16H 37/08

U.S. Cl. 74-665 GC

5 Claims



1. A drive mechanism for a motor vehicle having first and second drive axles, comprising

a transmission drive,

a differential gear unit following said transmission drive, said differential gear unit including first and second driven members, said first driven member drivingly connected to said first drive axle and said second driven member drivingly connected to said second drive axle,

a self-contained fluid friction clutch unit positioned outside of said differential gear unit and drivingly arranged between said first and second drive members, said fluid friction clutch unit including first and second torque transferring elements coupled to each other by fluid friction coupling with a torque which depends on the differential speed of rotation of said elements, and

a gear system connecting said first driven member to said

first torque transferring element and said second driven member to said second torque transferring element, said gear system being arranged so that said first and second torque transferring elements are rotated at a greater speed than said first and second driven members to enhance the coupling operation of said fluid friction clutch unit, and said fluid friction clutch unit being removable.

4,712,449

APPARATUS FOR LIMITING DIFFERENTIAL ROTATION

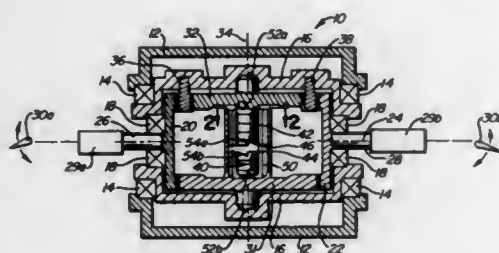
Eli Avny, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 18, 1986, Ser. No. 908,590

Int. Cl.⁴ F16H 1/44

U.S. Cl. 74-710.5

10 Claims



1. An apparatus for limiting the relative rotation between two drive members, comprising:
 - first and second coaxial input gears driven by respective drive members;
 - a carrier adapted to rotate about the axis of the input gears;
 - a first stop gear carried by said carrier for rotation about an axis substantially perpendicular to the input gear axis, said first stop gear drivably engaging said first and second input gears;
 - a second stop gear coaxial with the first stop gear and rotatably carried by the carrier;
 - first and second idler gears disposed between the second stop gear and the first and second input gears respectively;
 - means for axially moving a traveling nut supported for axial movement between the first and second stop gears in response to differential rotation between the first and second stop gears; and
 - means for limiting axial motion of the nut when the drive members are at a selected limit of relative rotation.

4,712,450

STEPLESS SPEED CHANGE DEVICE

Kikuzo Takamiya, Kitamoto; Hideyuki Ishibashi, and Kunitoshi Kozakae, both of Ageo, all of Japan, assignors to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,734

Claims priority, application Japan, Feb. 9, 1985, 60-22748; Feb. 14, 1985, 60-25280; Apr. 16, 1985, 60-79348

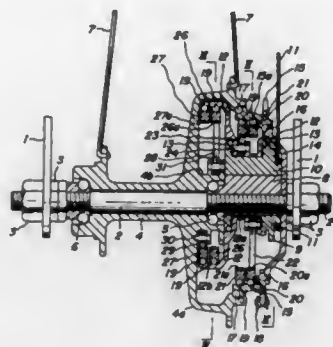
Int. Cl.⁴ F16H 3/44

U.S. Cl. 74-750 B

11 Claims

1. A stepless speed change device comprising: first internally toothed ratchet rings arranged in plural rows side by side in an axial direction on an inner circumferential surface of a rotary member on an input side through one-way clutches interposed therebetween; an eccentric cam assembly whose eccentricity is adjustable; first pawls in plural rows to engage first ratchets provided in said first ratchet rings and having bottoms pivotally connected to a carrier rotatably in contact with said eccentric cam assembly, said bottoms of the first pawls in one row being between said bottoms of the first pawls in another of said plural rows; second internally toothed ratchet rings arranged in plural rows side by side in the axial direction on an inner circumferential surface of an annular portion formed integrally with said carrier through one-way clutches interposed therebetween; second pawls in plural rows to engage ratchets provided in said second ratchet rings and having bottoms pivotally

tween; second pawls in plural rows to engage ratchets provided in said second ratchet rings and having bottoms pivotally



connected to a rotary member on an output side, said bottoms of the second pawls in one row being between said bottoms of the second pawls in another of said plural rows.

4,712,451

STARTER WITH A GEAR REDUCTION MECHANISM

Akira Morishita; Kyolchi Okamoto; Tatchi Nakagawa; Hiroyuki Morikane; Akinori Hasegawa; Takemi Arima, and Tadami Kounou, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

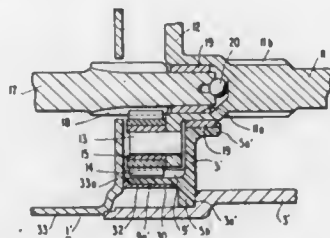
Filed Jan. 14, 1986, Ser. No. 818,633

Claims priority, application Japan, Jan. 18, 1985, 60-5799[U]

Int. Cl.⁴ F02N 15/06; F16H 1/32

U.S. Cl. 74-801

10 Claims



1. A gear reduction mechanism comprising:

- a rotary shaft having a spur gear formed on an outer peripheral surface thereof;
- a plurality of planet gears engaging said spur gear;
- an output rotary shaft supporting said plurality of planet gears so as to cause rotation of said rotary shaft;
- an internal ring gear formed of molded synthetic resin and having an intermediate bracket having a flange portion extending outwardly in the radial direction from said output rotary shaft, a cylindrical portion extending in the longitudinal direction with respect to said output rotary shaft, said flange portion acting as a cantilever for said cylindrical portion, and a toothed portion formed on an inner peripheral surface of said cylindrical portion, said plurality of planet gears engaging said toothed portion of said internal ring gear;
- a front bracket into which said flange portion of said intermediate bracket is fitted so as to support said internal ring gear; and
- a reinforcing member comprising a material having a higher mechanical strength than said synthetic resin, said member being secured to the outer surface of said cylindrical portion.

4,712,452

METHOD FOR DIRECTING AN UP-SHIFT OPERATION FOR A VEHICLE WITH A MANUAL TRANSMISSION

Yoshitaka Hibino, Utsunomiya, and Hiroshi Kogure, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

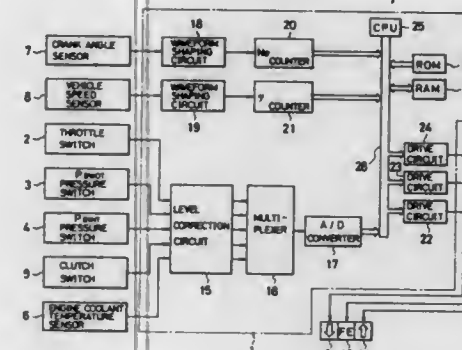
Filed Sep. 20, 1985, Ser. No. 778,054

Claims priority, application Japan, Sep. 28, 1984, 59-203279

Int. Cl.⁴ B60K 41/06

U.S. Cl. 74-866

3 Claims



1. In a method for directing an up-shift operation for a vehicle having an internal combustion engine and a manual transmission of at least three forward gear positions, including steps of detecting an opening angle of a throttle valve of said internal combustion engine, detecting a gear position of said manual transmission, detecting a vehicle speed, and generating a direction of an up-shift operation when said throttle valve is open, a medium speed gear of said manual transmission is engaged, and said vehicle speed is above a predetermined value, wherein the improvement comprises a step for detecting a high load range, a medium load range and a low load range of said internal combustion engine, said low load range being between said medium load range and a range in which the throttle valve is fully closed, said high load range being between said medium load range and a range in which the throttle valve is fully open, a step for stopping the generation of said direction of up-shift operation when the load of the internal combustion engine is in the medium load range, and a step for immediately directing an up-shift operation when the load of the internal combustion engine is in the low load range or is changed from the high load range to the low load range, in which said stop of the generation of the direction of up-shifting operation is cancelled when a predetermined time period has passed since the load of the internal combustion engine entered into the medium load range.

4,712,453

HYDRAULIC CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE TRANSMISSION

William J. Haley, Sterling Heights, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 728,533, Apr. 29, 1985, abandoned, which is a continuation of Ser. No. 421,198, Sep. 22, 1982, abandoned. This application Feb. 24, 1986, Ser. No. 832,208

Int. Cl.⁴ B60K 41/18

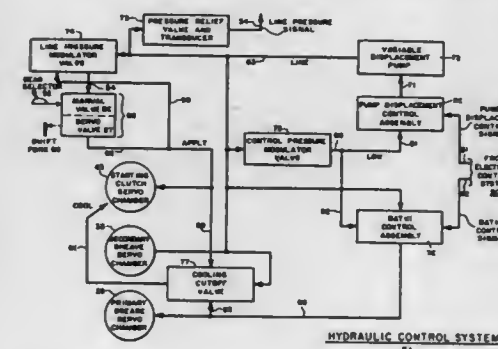
U.S. Cl. 74-866

19 Claims

14. A control arrangement for a continuously variable transmission in which torque is transferred from an engine to a primary pulley, having an axially fixed sheave and an axially movable sheave with a chamber for admitting and discharging fluid to regulate the effective primary pulley diameter, a secondary pulley having an axially fixed sheave and an axially movable sheave with a chamber for admitting and discharging fluid, a belt intercoupling the first and second pulleys, the tension in the belt being maintained by the fluid pressure in the secondary pulley chamber, a starting clutch including a chamber for admitting and discharging fluid to regulate the transfer

of drive torque from the secondary pulley through an associated vehicle drivetrain, an electronic control system connected to receive a plurality of information signals and to provide at least two output signals, and a hydraulic control system, connected to receive the output signals from the electronic control system and to regulate fluid under pressure individually applied to the primary pulley chamber, the secondary pulley chamber, and the starting clutch chamber, in which the hydraulic control system is characterized by

- a main line connected to supply fluid under pressure to the secondary pulley movable sheave chamber,
- a variable displacement pump connected to supply fluid under pressure to said main line,
- a control line,
- means, including a modulator valve coupled to said main line, for establishing a fluid pressure in said control line which is substantially constant and approximately equal to the lowest pressure in said main line,
- means, including a pump displacement control assembly coupled between said control line and said variable displacement pump,



- placement pump, for regulating the pressure in said main line,
- a transducer, coupled to said main line, for providing an electrical signal which varies as a function of the pressure in said main line, said pump displacement control assembly comprising a fluid control valve for providing a regulating signal to said variable displacement pump,
- means, including a solenoid valve coupled between said fluid control valve and said transducer, for regulating operation of the variable displacement pump as a function of the signal provided by the transducer, and
- a ratio control assembly, coupled between said main line and the primary pulley movable sheave chamber, for controlling the flow of fluid into and out of the primary pulley movable sheave chamber to regulate the ratio of the continuously variable transmission, and further comprising a cooling cutoff valve, coupled between said main line and said starting clutch, for providing a flow of cooling oil to the starting clutch when the cooling cutoff valve is in the appropriate position.

4,712,454

LIFT-TAB CONTAINER OPENER

Alan Hull, Apt. 601 600 9th Ave., Seattle, Wash. 98104, and Michael J. Yates, 2617 NE. 22nd St., Renton, Wash. 98056

Filed Aug. 18, 1986, Ser. No. 897,658

Int. Cl.⁴ B67B 7/40

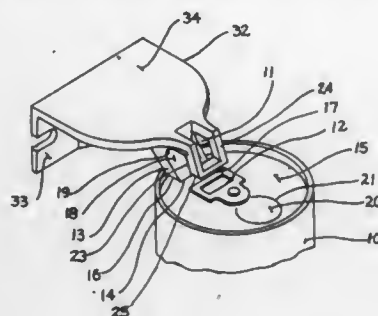
U.S. Cl. 81-3.27

13 Claims

1. Apparatus attachable to a support surface and enabling opening a lift-tab container with only one hand, said container having a top surface and a lift tab attached to said top, said container being openable by lifting of said tab, said apparatus comprising:

- a base,
- first means for lifting said lift tab,
- second means for depressing said lift tab,

structural means supporting said first and second means from said base,
said first means being oriented such that with said top surface placed in contact with said first means and said container moved toward said base, said lift tab is lifted,



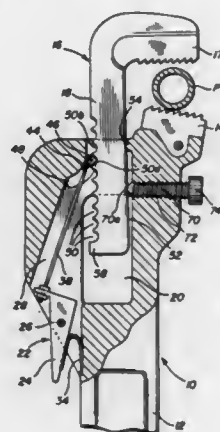
said second means being oriented such that when said container is moved away from said base, said lift tab is depressed,

4,712,455

SLIDING JAW WRENCH

Terrence D. Cox, P.O. Box 222, Olney, Ill. 62450
Continuation-in-part of Ser. No. 622,622, Jun. 20, 1984, Pat. No. 4,580,468. This application Mar. 3, 1986, Ser. No. 835,260
Int. Cl.⁴ B25B 13/14, 13/18
U.S. Cl. 81-141

9 Claims

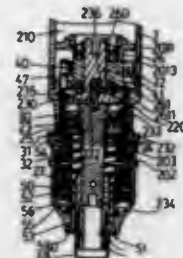


1. A sliding jaw wrench comprising a wrench handle, a stationary jaw on the handle, a movable jaw having an elongate shank extending therefrom, the shank being mounted for movement in a pocket formed in the handle to adjust the degree of opening of the jaws, means for providing incremental movement of the shank relative to the handle for incrementally adjusting the spacing between the jaws, means for releasably retaining the shank in selected incrementally adjusted positions relative to the handle, means permitting a degree of rocking movement of the shank in said pocket in said incrementally adjusted positions, and fine adjustment associated with the handle for selectively taking up slack in the movable jaw by moving the movable jaw toward the stationary jaw and reducing the amount of rocking movement available to the shank in said adjusted positions.

4,712,456
ELECTRIC TORSION-CONTROLLED SCREWDRIVER
WITH AN IMPROVED AUTOMATIC TURN-OFF DEVICE
Lo J. Yuan, Yung Ho City, Taiwan, assignor to Top Driver Enterprise Co., Ltd., Taipei Hsien, Taiwan
Filed Jul. 2, 1986, Ser. No. 881,364
Int. Cl.⁴ B25B 23/157

U.S. Cl. 81-473

14 Claims



1. An electric screw driver having a hollow cylindrical housing, a driving means, an electric circuit with power source for controlling said driving means and a reducing gear mechanism which are provided in said cylindrical housing, a handle switch for turning on said driving means provided at an upper portion of said hollow cylindrical housing, and an improved automatic turn-off device comprising:

- a clutch mechanism driven by said driving means including a clutch housing with a head portion, an inner annular flange portion provided at a bottom opening thereof and an outer threaded surface, an upper clutch member with a base flange portion and a bottom hollow portion, firmly received in said clutch housing and a lower clutch member with an upper extending portion which is received in said bottom hollow portion of said upper clutch member; wherein: said head portion of said clutch housing further includes an upper flange portion with a screw hole for fixing said clutch housing to said hollow cylindrical housing through a screw, and said upper clutch member further has a substantially triangular-shaped cam protrusion extending from the bottom surface of said base flange portion which has two arcs with different curvatures, and said lower clutch member has an annular flange portion provided between said lower clutch member and its upper extending portion, a hole and a ball member are provided on said annular flange portion of said lower clutch member and said ball can be received in said hole once it is moved into said hole by said cam protrusion, a sleeve member movably sleeves on said lower clutch and a bearing ring is movably sleeved and retained on said sleeve member;
- a switch device for short circuiting said driving means to turn off automatically said driving means, adapted to connect with said electric circuit, which is provided on said head portion of said clutch housing;
- means for supporting said switch device received in said clutch housing and provided around said upper and lower clutch member for controlling said switch device to short circuit said driving means;
- a cylindrical cover member with a bottom opening and an inner threaded surface threaded on said outer threaded surface of said clutch housing for covering said lower clutch member, wherein an inner flange portion is provided at said bottom opening of said cylindrical cover;
- a torsion spring member retained between said clutch housing and said cylindrical cover member and sleeved on said lower clutch member, and disposed on said inner flange portion of said cylindrical cover member for supporting and biasing said bearing ring and said sleeve member of said lower clutch member; and
- a socket member adapted to receive different kinds of screwdrivers or box spanners, and inserted into said cylindrical cover member through said bottom opening of said cylindrical cover member and fixed to said lower clutch member;

drical cover member and fixed to said lower clutch member;
whereby, said electric screwdriver can tighten or unfasten a screw or a nut on a workpiece if said electric screwdriver is switched on through said handle switch as said driving means drives said clutch mechanism, and said substantially triangular protrusion of said upper clutch member may move said ball into said hole of said lower clutch member when said clutch member is stopped rotating if said screw or nut is tightened tightly, and said ball can press down said sleeve member through said hole so that said switch device supporting means is pressed down by said bearing ring and disengaged from said switch device, whereby said driving means is short circuited and stopped from working even though said handle switch is turned on.

4,712,457

APPARATUS AND METHOD FOR CUTTING WINDOW SHADES

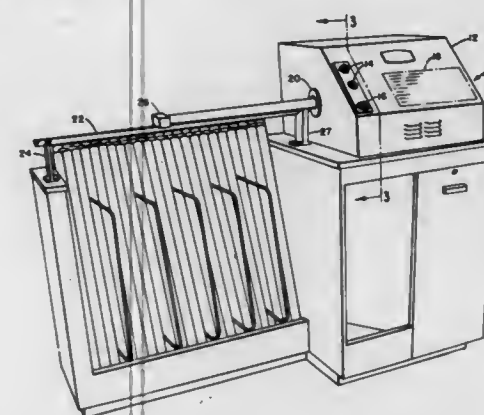
Glean S. Percivalle, Warwick, and Ronald L. Blanchette, Johnston, both of R.I., assignors to Keaney Manufacturing Company, Warwick, R.I.

Filed Jan. 20, 1986, Ser. No. 876,928

Int. Cl.⁴ B23B 3/26, 5/14

U.S. Cl. 82-47

5 Claims



1. A device for automatically cutting window shades mounted on a roller, comprising:
base means supporting the operative components of said device at a convenient working level;
means, supported from said base means, for cutting the shade, which means comprises:
a wheel having two lateral faces and walls centrally defining an opening on the rotational axis thereof, and mounting blocks disposed on opposite sides of said opening;
parallel shafts extending slidably through said mounting blocks;
cutting blade means mounted on said parallel shafts on one side of the rotational axis of the wheel for radial movement relative thereto;
means for drawing the cutting blade means toward the rotational axis of the wheel, said drawing means comprising a weight mounted on said shafts adjacent the ends thereof disposed on the opposite side of the axis of rotation of said wheel from said cutting blade means; whereby when said wheel rotates, centrifugal force acting on the weight draws the cutting blade toward the rotational axis of the wheel;
means for restraining radial movement of the cutting blade toward the rotational axis of the wheel, comprising spring means acting against the centrifugal force and the weight so as to urge the cutting blade away from the rotational axis of the wheel when the wheel is rotating at less than a predetermined speed;

means, supported from said base means, and operatively connected to said wheel, for driving said wheel;
means, mounted on said base means, for mounting the roller and shade concentrically to said wheel within said opening along the axis of rotation thereof and for stabilizing said roller and shade during the cutting operation at a predetermined point along said shade and roller;
first means for interrupting the operation of the cutting means responsive to contact by the cutting blade means with a metal shade roller, comprising means for disengaging said drive means, and time delay means adapted to defer the operation of said disengaging means until the cutting means shall have completed one additional revolution around the roller;
second means for interrupting the operation of the cutting means responsive to a predetermined radial movement of said cutting blade means, said second means comprising proximity sensing means mounted on said weight and on the support of said cutting device adapted to detect when said weight has travelled a predetermined distance, and to activate said means for disengaging said drive means in response to such a detection.

4,712,458

FOOD LOAF SLICING MACHINE WITH IMPROVED STACKING CHARACTERISTICS

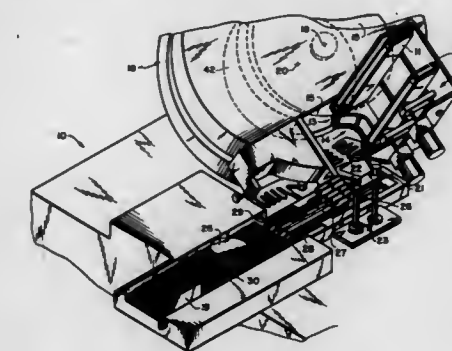
Timothy G. Mally, Oregon, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Dec. 11, 1986, Ser. No. 940,697

Int. Cl.⁴ B26D 7/06, 5/20

U.S. Cl. 83-86

11 Claims



1. In a high volume food loaf slicing machine of the kind comprising: a loaf support, supporting a food loaf for movement along a downwardly inclined path;
loaf feed conveyor means, positioned at the lower end of the food loaf path, for continuously advancing a food loaf along that path and into a slicing station;
a rotary knife, supported for orbital movement into and out of the slicing station in a direction transverse to the food loaf path, for cyclically cutting individual slices from the loaf as the loaf enters the slicing station, and contained within a blade housing wherein said blade housing comprises upper and lower blade housings;
variable speed main drive motor means;
knife orbit drive connection means, connecting the main drive motor means to the knife to drive the knife through its orbital movement at a slicing rate determined by the speed of the main drive motor means;
conveyor drive connection means, connecting the main drive motor means to the loaf feed conveyor means to drive the conveyor means at a loaf feed rate determined in part by the speed of the main drive motor means;
variable speed knife rotation motor means, connected to the knife to drive the knife through its rotary motion at a cutting rate determined by the speed of the knife rotation motor means and independent of the speed of the main drive motor means;

and a sliced food stacker comprising two pair of stacker grids mounted on vertically movable rotatable support shafts, said stacker located immediately below the slicing station.

the improvement comprising:

a large air baffle forming a substantially continuous wall adjacent to the open area of the lower blade housing, said lower housing bounding said large baffle on its ends and bottom, said large baffle bounded on its top by the rotating knife blade as it rotates over it;

a small air baffle mounted on the lower blade housing perpendicular to the plane of the knife blade and radially from the rotary knife orbiter, said small baffle bounded on its bottom and one end by the lower blade housing and on its other end by the rotating blade orbiter and on top by the rotating blade;

and a vent port formed in the lower blade housing wherein said port is sufficiently sized and shaped to allow turbulent air generated by the rotating knife blade to flow down and out of the blade housing rather than over the product to be sliced.

4,712,459

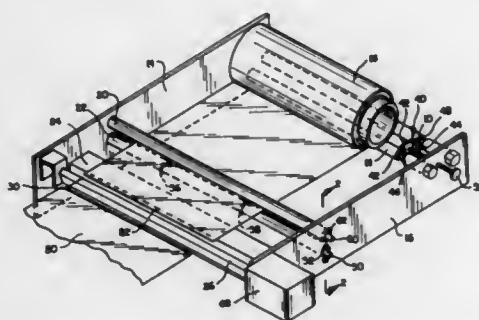
APPARATUS FOR SEVERING WRAPPING FILM
Zigmunt J. Walkiewicz, Jr., Chagrin Falls, and William C. Lynch, Brecksville, both of Ohio, assignors to Clamco Corporation, Cleveland, Ohio

Filed May 1, 1986, Ser. No. 858,447

Int. Cl.⁴ B65H 59/02; B26D 7/10

U.S. Cl. 83—171

9 Claims



1. Apparatus for severing sheets of film from a roll of plastic film, comprising:

means for supporting a said roll as it rotates about its axis of rotation while film is being withdrawn from said roll; means for applying braking force to said roll so that said film is under tension as it is being withdrawn from said roll; electrically heated cutoff means located forwardly of said roll for severing a sheet of film from said roll as a length of film is withdrawn under tension from said roll and then brought into contact with said cutoff means; and,

a pair of pinch rollers extending transversely of the path of said film and located intermediate said roll support means and said cutoff means for guiding movement of said film between said rollers from said roll to said cutoff means, one-way clutch means associated with at least one of said rollers for permitting forward movement of said film therebetween toward said cutoff means while restricting backward movement toward said roll, resulting from the severing of a said sheet, by a controlled amount sufficient to ensure that the leading edge of the remaining film moves off and away from said heated cut off means sufficient to prevent melting of said film while at the same time preventing said film from backing up by an amount to cause said film to bunch up on or gather on said roll.

4,712,460

INTEGRATED DRUG DOSAGE FORM AND METERING SYSTEM

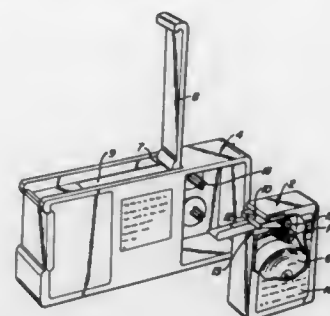
Jimmy D. Allen, Los Altos; Michael E. Cobb, San Jose; Robert S. Hillman, Cupertino; Dennis R. Mungall, Redwood City; Vladimir E. Ostoich, San Jose, and Gary H. Stroy, Los Altos, all of Calif., assignors to Blotrack, Inc., Mt. View, Calif.

Filed Nov. 18, 1985, Ser. No. 798,780

Int. Cl.⁴ B65D 83/00

U.S. Cl. 83—208

25 Claims



1. A drug tape dispenser for adjustably dispensing preselected single dosage lengths of drug tape from a drug tape supply, comprising:

a portable housing having a dispenser site and a cassette receptacle site;
a cassette adapted for removably engaging the housing at the cassette receptacle site;
drive means in the housing at the cassette receptacle site;
feed means disposed in said cassette to receive and engage the drug tape from the drug tape supply when the feed means is operably engaged by said drive means when said cassette engages the housing at the cassette receptacle site;
a first discharge site in said housing located to introduce said tape into said dispenser site;
a second discharge site located in said cassette so as to mate with the first discharge site when said cassette engages the housing at the cassette receptacle site;
a controller coordinately actuating the drive means for automatically measuring a single dosage length of drug tape; and
a cutter disposed proximate to the first discharge site to sever the single dosage length from the supply of drug tape.

4,712,461

ROLLED MATERIAL DISPENSER WITH FEED ROLLER CONTAINING A SLIDING CUTTER

Holger Rasmussen, Kilchberg, Switzerland, assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Oct. 18, 1985, Ser. No. 788,837

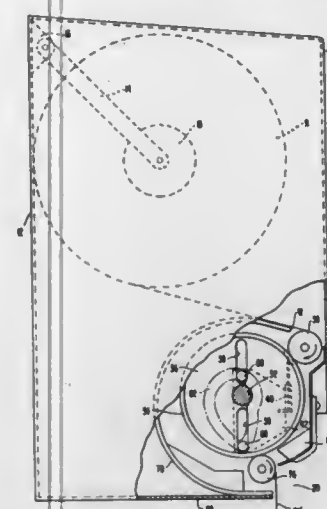
Int. Cl.⁴ A47K 10/36; B26D 1/56; B26F 3/02

U.S. Cl. 83—334

5 Claims

1. A dispenser for rolls of flexible sheet material comprising: a chassis adapted to be attached to a wall; means carried by said chassis for rotatably supporting a roll of flexible sheet material;
a feed roller rotatably mounted on said chassis for guiding a web of sheet material from the roll to a position to be grasped by a user so that the user may pull the web out of the dispenser, said feed roller having aperture means formed longitudinally in the periphery thereof;
carrier means within said feed roller having a cutting blade mounted thereon and cam followers extending beyond the opposite ends of said feed roller, said blade having a cutting edge;
means mounting said carrier means in said feed roller for movement of said cutting blade in a flat plane along a

linear path parallel to and laterally offset from a radius of said feed roller; and
means including stationary cams mounted on said chassis adjacent the ends of said feed roller, respectively, said cam



followers being engaged with said stationary cams to move said blade in said path projecting said cutting edge beyond said feed roller periphery through said aperture means to cut the web and retracting said edge as said feed roller rotates.

4,712,462

MODELMAKER'S MITER JIG

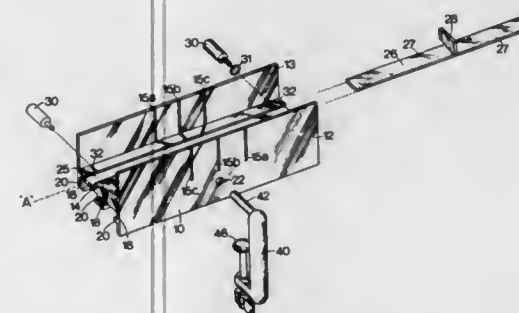
Sava Cvek, 9 Charlesbank Rd., Newton, Mass. 02158

Filed Dec. 19, 1985, Ser. No. 811,021

Int. Cl.⁴ B27B 21/00

U.S. Cl. 83—762

9 Claims



1. A modelmaker's miter jig having a body comprising a work support surface having a longitudinal axis, a guide wall rising from the work support surface along the axis, and including
(i) means for guiding a saw at a selected angle across the axis over the work surface,
(ii) an alignment face for aligning the axis with the edge of a table top by abutting against such edge, and
(iii) a clamp engaging face for engaging and securing a c-clamp in a plane in a plane perpendicular to the axis whereby the miter jig may be fixedly secured to a table top by a said c-clamp, wherein the clamp engaging face is the inner surface of an opening formed in the guide wall, parallel to the work support surface, for engaging an arm of a c-clamp directed parallel to said work support surface.

4,712,463

BRIDGE AND TUNING MECHANISM FOR STRINGED INSTRUMENTS

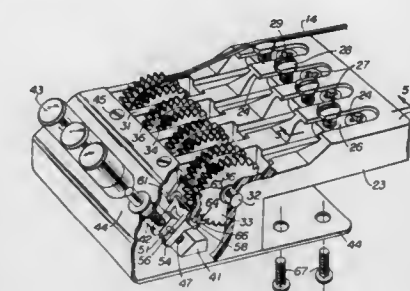
Philip Kubicki, and Geoffrey Richardson, both of P.O. Box 40110, Santa Barbara, Calif. 93103

Filed Feb. 24, 1986, Ser. No. 831,868

Int. Cl.⁴ G10D 3/14

U.S. Cl. 84—304

9 Claims



1. In an instrument having at least one string, a bridge comprising a frame an axle in said frame transverse to said string, a wheel rotatable on said axle and held against axial movement along said axle, first means securing said string to said wheel, said wheel having toothed second means whereby the user may rotate said wheel in one direction to tighten said string, third means engaging said second means to secure said wheel against return rotation, fourth means to render said third means inoperative, a knob, fifth means to convert turning of said knob to movement of said third means for very short angular movement of said wheel, a slider adjustably movable in said frame parallel to said string, a stop carried by said slider and sixth means to secure said slider in a position of adjustment, said string being contacted by said stop to limit effective vibrating length of said string.

4,712,464

STRINGED INSTRUMENT FINGER POSITIONING GUIDE

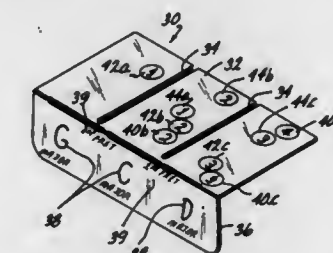
J. Gregg Nance, 1224 Ninth St., Santa Monica, Calif. 90401

Filed Oct. 31, 1985, Ser. No. 793,178

Int. Cl.⁴ G10G 1/02

U.S. Cl. 84—485 R

5 Claims



1. For use with a conventional fretted stringed musical instrument having a plurality of strings extending along and spaced above a longitudinally extended fretted fingerboard section of the instrument, a finger position guide selectively manually attachable to and removable from the neck of the instrument without mechanical modification or alteration of the conventional instrument for indicating finger impingement positions for performing at least one predetermined musical chord, said guide comprising:

(a) a plate having a shape adapted to be removably inserted to a predetermined position beneath the strings and on top of the longitudinally extended fretted fingerboard section of the neck of the musical instrument, said plate being slotted with at least one slot to receive at least one fret

- subtended thereby, so that said plate fits snugly on the fingerboard when inserted thereon and is laterally aligned and longitudinally positioned by the subtended frets;
- (b) said plate having established on its surface a first plurality of colored spots of a first color, said first plurality of colored spots when said plate is inserted being positioned beneath the strings for indicating respectively corresponding finger impingement positions for playing a first musical chord; and,
- (c) positioning means for laterally positioning said plate on said fingerboard comprising an appendage depending from only one side of said plate and making a corner therewith, said appendage being adapted to abut the side of the fingerboard when said plate is inserted thereon to serve as a lateral positioning stop therefor wherein all slots of said slotted plate are closed at one side of said plate adjacent said depending appendage and are open to the side of said plate opposite said depending appendage.

4,712,465

DUAL PURPOSE GUN BARREL FOR SPIN STABILIZED OR FIN STABILIZED PROJECTILES AND GUN LAUNCHED ROCKETS

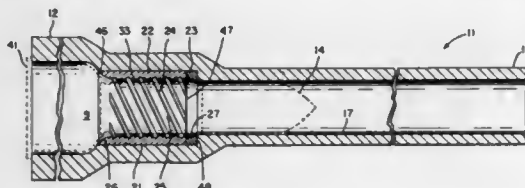
Kenneth A. B. Macdonald, Maple Valley, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 28, 1986, Ser. No. 901,486

Int. Cl.⁴ F41F 17/06; F42B 13/28

U.S. Cl. 89—16

20 Claims



1. A gun barrel and projectile round combination, comprising:
- an elongated tube having a smooth central bore and defining a muzzle end and a breech end;
 - a hollow cylindrical insert retained within said breech end coaxial with said smooth central bore and having a plurality of helical grooves defining lands therebetween on the inner surface of said insert;
 - a projectile loaded in said breech end, extending from the breech facing end of said insert forward into said smooth central bore, said projectile having a thin sidewall surrounding a central cavity and being dimensioned in diameter to provide a close sliding fit within said smooth central bore, said projectile further defining a hollow base circumscribed by a skirt which includes a plurality of pressure equalizing ports for transmitting breech pressure from the base of said projectile to the region between said thin sidewall and said smooth central bore; and
 - a frangible film surrounding said projectile skirt closing said pressure equalizing ports.

4,712,466

SEMI-AUTOMATIC OPERATION REVOLVING CYLINDER PISTOL

Emilio Ghisoni, Via Villa Serafina, 4, 27100 Pavia, Italy

Filed Feb. 13, 1986, Ser. No. 828,916

Claims priority, application Italy, Feb. 13, 1985, 19488 A/85

Int. Cl.⁴ F41D 7/04

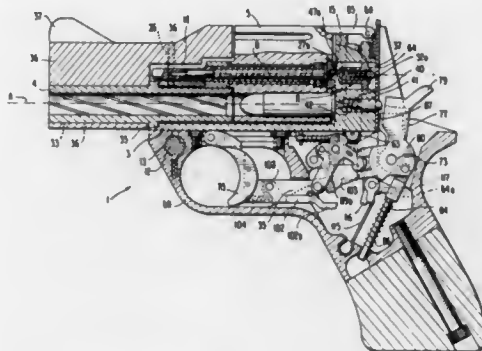
U.S. Cl. 89—157

9 Claims

1. A semiautomatic operation revolving cylinder pistol, comprising a frame containing a firing mechanism and a slide supporting the revolver barrel and cylinder, said slide being guided moveably on said frame between two mechanical stops

and against the bias of spring means, characterized in that it comprises:

- a housing formed on said slide and defining, rearwardly therein, a cylinder accommodating area;
- a cylinder rotatably mounted in said area having a plurality of teeth disposed in an annular configuration on an end face of said cylinder;
- pawl and ratchet means moveably mounted in said housing and being arranged to act on said teeth to rotate said cylinder;



- a spring motor in said housing for actuating said pawl and ratchet means;
- means for energizing said spring motor automatically by the recoil stroke of said slide on the frame each time a round is fired; and
- pusher means moveable guided in said frame and being linked mechanically to said firing mechanism for acting on said spring motor to energize it.

4,712,467

COMBINED LINEAR HYDRAULIC MOTOR AND TRANSFER VALVE

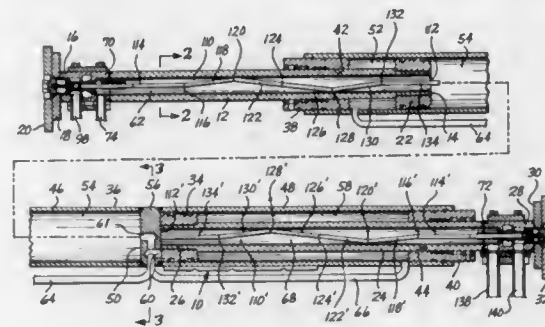
Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Filed Sep. 8, 1986, Ser. No. 905,098

Int. Cl.⁴ F01B 15/00; F15B 15/22

U.S. Cl. 91—176

5 Claims



1. A combined linear hydraulic motor and transfer valve, comprising:
- a fixed first piston rod having inner and outer ends;
 - a fixed second piston rod having inner and outer ends;
 - a first piston head at the inner end of said first piston rod;
 - a second piston head at the inner end of said second piston rod;
 - said first and second piston heads being spaced apart when in use;
 - a cylinder housing mounted to travel on said first and second piston heads;
 - said cylinder housing having first and second end members;
 - said first end member including a central opening through which the first piston rod extends;

- said second end member including a central opening through which the second piston rod extends;
- said cylinder housing including a divider wall between its ends;
- wherein a first fluid chamber is formed within said cylinder housing between said first end member and said first piston head;
- wherein a second fluid chamber is formed within said cylinder housing between said first piston head and the divider wall;
- wherein a third fluid chamber is formed within said cylinder housing between said divider wall and said second piston head;
- wherein a fourth fluid chamber is formed within said cylinder housing between said second piston head and said second end member;
- said divider wall including a first passageway having an inner end communicating with said third fluid chamber, and an outer end;
- said divider wall also including a second passageway having an inner end communicating with said second fluid chamber, and an outer end;
- first conduit means extending through said first piston rod and having an inner end in communication with said second fluid chamber, and an outer end;
- second conduit means interconnected between said first fluid chamber and the outer end of the first passageway in said divider wall;
- third conduit means interconnected between the outer end of the second passageway in said divider wall, and the fourth fluid chamber;
- fourth conduit means extending through said second piston rod and having an inner end in communication with said third fluid chamber, and an outer end, a pair of spaced apart ports in sidewall portions of the second piston rod, adjacent its outer end, a transverse wall inside of said fourth conduit means positioned axially between the two ports, said transverse wall including a transfer port;
- a valve plug member within said fourth conduit means axially outwardly of said transfer port, said valve plug member having a plug end portion directed towards said transfer port;
- spring means endwise outwardly of said valve plug member, biasing said plug end portion into seated engagement with the transfer port; and
- elongated operator rod means extending through said fourth conduit means, from said valve plug member to the inner end of said fourth conduit means, said actuator rod means having an inner end portion which projects into said third fluid chamber, into a position to be contacted by the divider wall when fluid is being removed from said third fluid chamber and said divider wall is moving toward said second piston head, with contact of the divider wall with the inner end of said rod pushing said rod endwise outwardly, and means responsive to such outward movement of the actuator rod for unseating said valve plug to open the transfer port and communicate each of the sidewall ports with the other, via the transfer port.

4,712,468

DISTRIBUTION VALVE ASSEMBLY FOR A PNEUMATIC BRAKE BOOSTER

Jean-Claude Blot, Louvres, France, assignor to Bendix France, Paris, France

Filed Sep. 12, 1986, Ser. No. 907,551

Claims priority, application France, Sep. 30, 1985, 85 14453

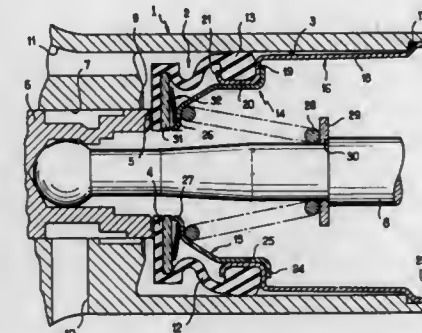
Int. Cl.⁴ F15B 9/10

U.S. Cl. 91—376 R

10 Claims

1. A distribution valve assembly for a pneumatic brake booster, comprising, inside a tubular hub of a booster piston, a resilient valve member associated with a valve-member support and comprising an annular active part cooperating selectively with two concentric valve seats formed in the hub, an external mounting part sealingly arranged between an internal

wall of a tubular hub and said valve-member support mounted in the tubular hub, a rod-return spring between said valve-member support and a bearing surface on an input rod, and a valve spring between said valve-member support and said active part of said valve-member so as to bias said active part in a direction toward said valve seat, and a valve plunger sliding inside the hub and coupled to the input rod of the



booster, characterized in that said valve-member support has an internal end zone extending radially inwardly adjacent said active part of said valve-member and forming a bearing surface for the valve spring which consists of a resilient washer formed by an annular revolution that minimizes the axial dimension thereof, and the rod return spring bearing against the internal end zone of said valve-member support to bias the internal end zone into engagement with the washer.

4,712,469

CHAIN TENSIONING DEVICE

Hans Hesse, Munich, Fed. Rep. of Germany, assignor to Krauss-Maffel A.G., Fed. Rep. of Germany

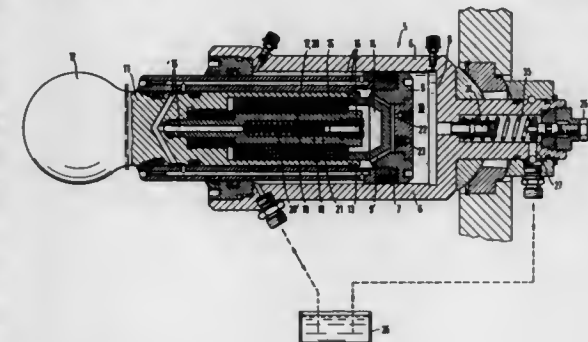
Filed Oct. 19, 1984, Ser. No. 662,637

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338313

Int. Cl.⁴ B62D 55/30

U.S. Cl. 91—422

20 Claims



1. A hydraulic tensioning device comprising:
- cylinder means for housing;
 - means, associated with said cylinder means, for fixing said cylinder means;
 - tappet means for coupling said tensioning device to an apparatus to be tensioned;
 - means for translating vibrational forces transmitted to said tappet means into a tensioning force tending to extend said tappet means, located within said means for housing; including
 - a piston assembly arranged within said cylinder exhibiting a piston base defining a primary cylinder chamber;
 - a tappet piston arranged within said piston assembly and defining an auxiliary cylinder chamber; means for drawing hydraulic fluid into said auxiliary cylinder chamber and pumping said hydraulic fluid into said primary cylinder chamber upon reciprocation of said tappet

piston, located within said piston assembly; and means for limiting said tensioning force by idling said means for drawing, upon attainment of a predetermined pressure in said auxiliary cylinder chamber.

4,712,470

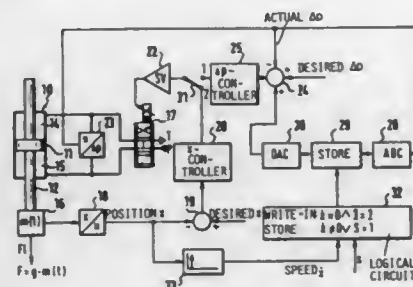
METHOD AND APPARATUS FOR COMPENSATING THE VARIABLE WEIGHT OF A MASS ACTING ON A HYDRAULIC DRIVE, IN PARTICULAR FOR THE UPRIGHT DRIVE CYLINDER OF A LAPPING MACHINE
Jürgen Schmitz, Marktheidenfeld, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany
Filed Jan. 7, 1987, Ser. No. 1,017

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1986, 3600364

Int. Cl.⁴ F15B 11/10

U.S. Cl. 91—433

10 Claims



1. Method for compensating the variable weight of a mass acting on a hydraulic drive, in particular for the upright drive cylinder of a lapping machine, comprising a pressure pickup and a pressure regulator for driving a directional valve setting the pressure exerted by the drive, characterized in that when the mass is held in suspension without support the pressure set at the drive is measured and in the subsequent pressure regulation the pressure value is supplied to the pressure regulator as compensation parameter.

4,712,471

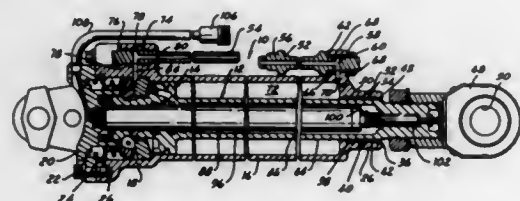
ACTUATOR LOCKING MECHANISM
D. Dale Johnson, Mt. Clemens, Mich., assignor to Ex-Cell-O Corporation, Walled Lake, Mich.

Filed Aug. 29, 1986, Ser. No. 901,720

Int. Cl.⁴ F15B 15/22

U.S. Cl. 92—24

5 Claims



1. In a hydraulic actuator having an actuator cylinder with an actuator head and locking mechanism for locking a main ram in a retracted position, the improvement comprising: first and second slideable sleeve means, extension means on the actuator head extending axially inwardly of the actuator cylinder in telescoping relationship with said first and second sleeve means for slidably supporting said first and second sleeve means in a sliding referenced relationship on the actuator head at one end of the actuator cylinder;
said first sleeve means having a release position and an axially spaced locking position;
a plurality of moveable locking jaws located at the end of said extension at circumferentially spaced locations therearound, spring means connecting each of said locking

jaws one to the other to spring bias said locking jaws radially outwardly into a release position;
each of said locking jaws having a first surface thereon including a load contact surface thereon;
said first sleeve means having a surface thereon selectively engageable with the load contact surface along a line of contact on each of said locking jaws to move the locking jaws into a locked position wherein the spring means are compressed;
each of said locking jaws having a second surface thereon that engages the main ram to hold it in a locked retracted position.
said main ram including an inboard end;
said inboard end engageable with said second sleeve means and operative to jam it into contact with the actuator head to eliminate all backlash between the main ram and the cylinder.

4,712,472

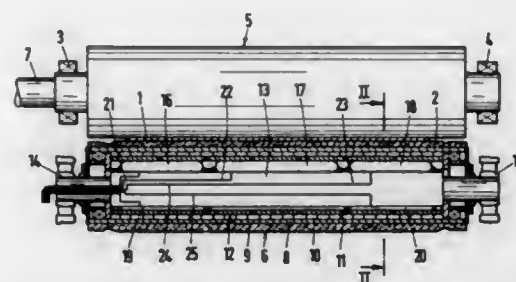
METHOD OF AND APPARATUS FOR ALTERING THE MOISTURE CONTENT OF RUNNING WEBS
Klaus Meisen, Tönisvorst, and Peter Towes, Anrath, both of Fed. Rep. of Germany, assignors to Kleinewefers Textilmaschinen GmbH, Krefeld, Fed. Rep. of Germany
Filed Sep. 30, 1986, Ser. No. 913,533

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535458

Int. Cl.⁴ B30B 3/04, 15/16

U.S. Cl. 100—37

20 Claims



1. A method of altering the moisture content of a running web of textile or like material in the elongated nip of two squeezing rollers at least one of which is deformable so as to allow for changes in the width of the nip, comprising the steps of monitoring the moisture content of a plurality of web portions which are spaced apart from each other in the longitudinal direction of the nip and each of which is in line with a different portion of the one roller; individually biasing said portions of the one roller toward the other of the rollers so as to exert pressure upon the corresponding portions of the web; comparing the monitored moisture content with predetermined reference values and generating signals denoting deviations of monitored moisture content from the respective reference values; reducing the bias upon a selected portion of the one roller, with attendant increase in the moisture content of the corresponding portion of the web, when the respective signal denotes insufficient moisture content; and biasing the selected portion of the one roller away from the other roller by increasing the pressure upon a further selected portion of said roller substantially on the opposite side of said selected portion when the bias upon the selected portion is reduced to zero but the moisture content of the corresponding portion of the web is still below that which is denoted by the respective reference signal.

4,712,473

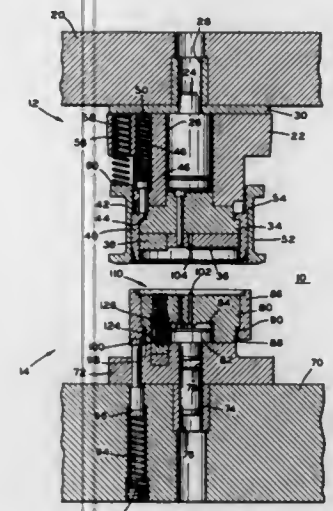
METHOD AND APPARATUS FOR MARKING AND FORMING WORKPIECES
Charles W. Amos, Bowling Green, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Feb. 24, 1986, Ser. No. 831,956

Int. Cl.⁴ B44B 5/00

U.S. Cl. 101—4

16 Claims



1. Apparatus for forming and placing indicia on a work piece, comprising:

- (a) cooperating work piece forming members for forming a work piece by contact therewith, each member having work piece contact surfaces positioned to receive a work piece therebetween, one of said work piece contacting surfaces having an aperture formed therein for receiving incising means,
- (b) incising means including a plurality of elements retained in an array in said aperture in said contact surface, each of said elements having an incising end and a support end, and
- (c) means removably secured to said forming member receiving said incising means for selectively supporting each of said incising elements in one of two positions, a first position locating an incising end above said contact surface and a second position locating an incising end at or below said contact surface, thereby enabling a selected indicia to be incising on a work piece at the same time as the work piece is being formed by said contact surfaces.

4,712,474

AUTOMATIC ARTICLE HANDLING AND SCREEN PRINTING APPARATUS
Phil Motev, Lincolnwood, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Filed Nov. 4, 1985, Ser. No. 794,508

Int. Cl.⁴ B41F 17/22

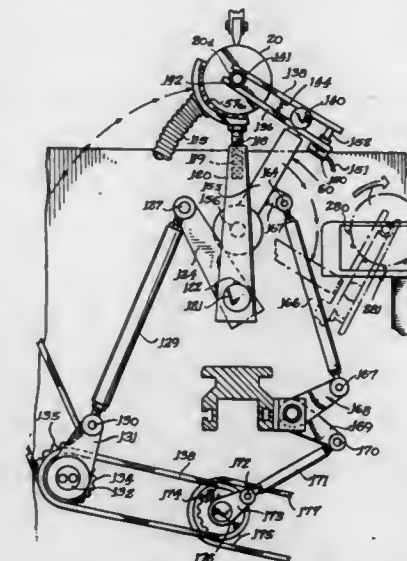
U.S. Cl. 101—38 A

20 Claims

1. In a screen printing apparatus for automatically handling and printing on objects, the combination comprising:

- a frame,
- a screen printing station on said frame having a squeegee and screen assembly for screen printing on objects,
- means for supplying a plurality of objects to a supply station for printing,
- a first oscillatory transfer means for picking up a container at said supply station and for swinging the object through an arcuate path to a preregistering station,
- preregistering means at a preregistering station for rotating the object to a predetermined orientation,
- a second oscillatory transfer means for transferring a second

object from the preregistering station by swinging the second object along an arcuate path to a transfer position, a third oscillatory means for receiving the second object at the transfer position and for swinging the second object through an arcuate path to the printing station, and



discharge means for removing a third and printed object from the printing station and for depositing the printed object at a discharge station.

4,712,475

INKING ROLLER FOR PRINTING MACHINES
Klemens Kemmerer, Seligenstadt, and Peter Hummel, Offenbach am Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

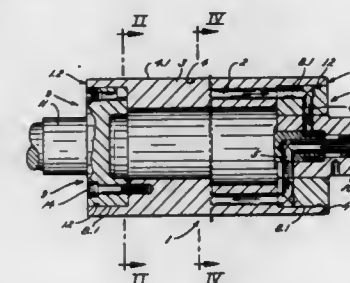
Filed Jun. 13, 1986, Ser. No. 873,815

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521424

Int. Cl.⁴ B41F 31/26

U.S. Cl. 101—348

5 Claims



1. An inking roller for an offset printing machine, which is adapted at one end to supply and discharge a temperature-control medium which flows in a counter-current flow and return fashion through free cross sections in the interior of the roller, characterized in that the inking roller is shaped in the form of a barrel and formed of aluminum having radially flanged journals mounted at both ends, the cross-section of the barrel including a plurality of substantially equal sized kidney-shaped ducts disposed near a wall of said barrel, said ducts being connected to the temperature-control medium supply and discharge by alternating star-shaped bores extending radially outwardly from adjacent the center-line inside one of said radially flanged journals mounted at one end of said barrel, said ducts being interconnected in pairs via substantially chord-like

recesses formed in said radially flanged journal mounted on the opposite end of said barrel to the end where the temperature-control medium is supplied and discharged, and the connection being such that the flow and return are disposed alternately side by side.

4,712,476

DEVICE FOR SECURING FLEXIBLE PRINTING PLATES UNDER TENSION ON A PLATE CYLINDER OF A ROTARY PRINTING MACHINE

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

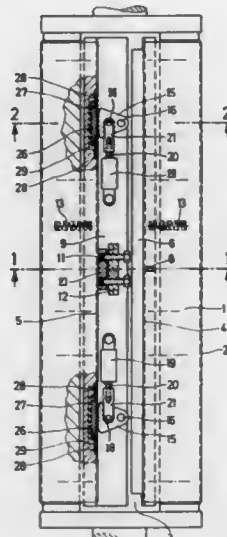
Filed Feb. 27, 1987, Ser. No. 19,875

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606351

Int. Cl.⁴ B41F 27/12

U.S. Cl. 101—415.1

9 Claims



1. In combination with a plate cylinder having a transverse channel, with sidewalls, formed therein, a device for securing a flexible printing plate under tension on the plate cylinder, a tensioning rail operatively associated with each end of the plate and being braceable against the side walls of the transverse channel formed in the plate cylinder for tensioning the printing plate, comprising means for selectively stretching and/or compressing at least one of the ends of a printing plate in the axial direction of the plate cylinder, the tensioning rail operatively associated with the one plate end being of one-piece construction and having a clamping member disposed at a middle region thereof and respective tensioning segments disposed at end regions thereof and means to selectively actuate the tensioning segments, for stretching and/or compressing the one plate end.

4,712,477

ELECTRONIC DELAY DETONATOR

Kenichi Aikou, Yoichi Kurihara, and Tsugio Goto, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 6, 1986, Ser. No. 871,487

Claims priority, application Japan, Jun. 10, 1985, 60-124181

Int. Cl.⁴ F42C 11/00

U.S. Cl. 102—206

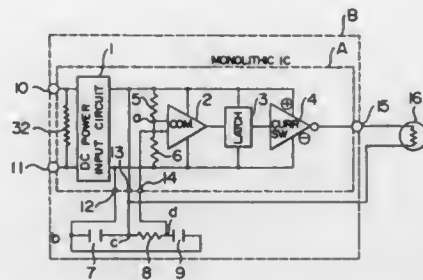
12 Claims

1. An electronic delay detonator, in a hybrid IC configuration, for igniting an ignition device through an ignition resistor a predetermined delay time after supply of electrical energy, comprising:

input terminal means for supplying the electrical energy to said electronic delay detonator;

a first capacitor for storing the electrical energy; release prevention means, connected between said input terminal means and said first capacitor, for preventing the electrical energy supplied through said input terminal means and stored in said first capacitor from being released;

time constant circuit means, connected in parallel with said first capacitor and including a second capacitor and a first resistor, for charging the electrical energy supplied from said input terminal means at a rate whose time constant, which corresponds to said predetermined delay time, is determined by the product of a capacitance of said second capacitor and a resistance of said first resistor;



reference voltage generation circuit means, including a voltage divider connected across said first capacitor, for generating a compare reference voltage; voltage comparator means for comparing the charged energy of said time constant circuit means with the compare reference voltage of said reference voltage generating circuit means to produce an output signal when the charged energy exceeds the compare reference voltage; and

transistor current switching circuit means, responsive to the output signal of said voltage comparator means, for establishing an electrical path to supply the electrical energy stored in said first capacitor to said ignition resistor of said ignition device.

4,712,478

ALIGN AT FIRE, SAFE AND ARM, AND POWER SUPPLY MODULE FOR A LAND MINE

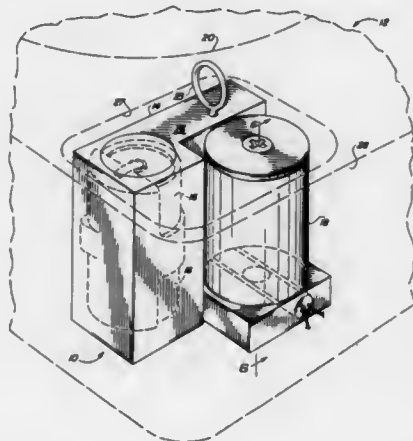
Steve A. Haglund, Minnetonka; Arthur M. Lohmann, Hopkins, and Sharon A. Pickering-Johnson, St. Louis Park, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 20, 1987, Ser. No. 4,937

Int. Cl.⁴ F42B 23/24

U.S. Cl. 102—424

19 Claims



1. A recoverable and refurbishable land mine 12 comprising: a mine housing 20;

a warhead 65 located in said mine housing; electronic fuzing means 87 located in the mine housing 20 for producing under one set of predetermined conditions an align signal and shortly thereafter a fire signal and under another set of predetermined conditions a fire signal;

an align at fire, safe and arm, and power supply module 10, said module including detonator means 44, said detonator means 44 being initiated responsive to a fire signal produced by the fuzing means 87 being applied thereto; means forming a firing train 57, said means forming a firing train 57 having an interrupted state and an aligned state, said means forming a firing train 57 initially being in its interrupted state; actuator means 32 responsive to an align signal produced by the fuzing means 87 for causing the means forming a firing train 57 to change from its interrupted state to its aligned state; said means forming a firing train 57 in its aligned state establishing a continuous lead from the detonator means 44 to the mine warhead 65 when the module 10 is mounted into the mine 12 for eventing the warhead 65 in response to the fuzing means 87 producing a fire signal; the application of a fire signal to detonator means 44 while the means forming a firing train 57 is in its interrupted state neutralizing the warhead 44; and battery means 16 for producing electrical power; means for removably mounting 22, 24 the module 10 into the mine 12; and

means for providing electrical connections 100 between the battery means 16 and the fuzing means 87 and between the fuzing means 87 and the detonator means 44 and actuator means 32.

4,712,479

MINE WITH ALARM AND TRIGGERING SENSORS

Wolfgang Babel, Rothenbach, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

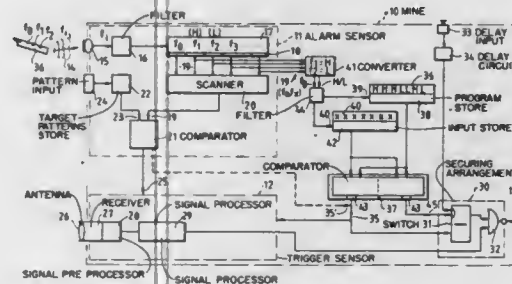
Filed Oct. 21, 1986, Ser. No. 921,951

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3538785

Int. Cl.⁴ F42C 11/00, 15/14

U.S. Cl. 102—427

8 Claims



1. A mine comprising a vibration-responsive waking or alarm sensor; a triggering sensor for emitting a detonating signal responsive to said alarm sensor; a reversible electrically-actuable securing arrangement for the emission of said detonating signal, said securing arrangement being resettable by said alarm sensor from an armed position into a secured condition.

4,712,480

RE-SECURABLE MINE

Klaus Lindstadt, Schwaig; Andreas Halsig, Denkingen; Dietmar Maier, Rodenbach, and Stefan Scholz, Alzenau, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

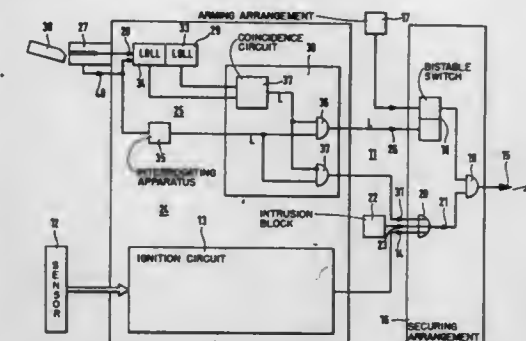
Filed Oct. 20, 1986, Ser. No. 922,070

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538786

Int. Cl.⁴ F42C 11/00, 15/14

U.S. Cl. 102—427

12 Claims



1. Re-securable mine including a triggering circuit, comprising a trigger securing arrangement for actuating said trigger circuit; a mine re-securing block including a comparator for a predeterminable information and for introduceable information for resetting the securing arrangement into a secured position at a predetermined relationship between said two informations.

4,712,481

ADDITIVE SEALING SLEEVE FOR A PROPELLANT CHARGE FOR LARGE-CALIBERED AMMUNITION FIRED FROM BARRELED WEAPONS

Hansjorg Heinrich, Leinburg, and Josef Kraft, Schnaittach, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

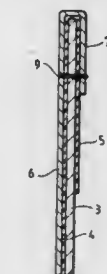
Filed Dec. 17, 1986, Ser. No. 942,874

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3544927

Int. Cl.⁴ F42B 5/02

U.S. Cl. 102—435

3 Claims



1. Additive sealing sleeve for a propellant charge for large-calibered ammunition which is fired from barreled weapons, said sealing sleeve being adhesively fastened within a cartridge casing, said sealing sleeve being constituted of a fabric material forming a support for a mixture of wax and titanium dioxide, wherein said mixture is covered by a polyethylene sheeting; the improvement comprising in that a textile material covers the surface of said polyethylene sheeting facing towards the propellant charge; and at least one seam connecting said textile material with said additive sealing sleeve.

4,712,482

PROJECTILE WITH ACTIVE COMPONENTS

Erich Bock, and Gerald Rieger, both of Nuremberg, Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

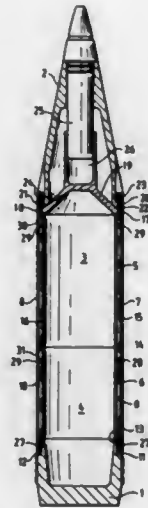
Filed Nov. 4, 1986, Ser. No. 927,247

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1985, 3542051

Int. Cl.⁴ F42B 11/00

U.S. Cl. 102—501

6 Claims



1. A projectile with active components which possess a cylindrical sheathing wall structure and are retained axially stacked in abutting contact between a projectile base and a projectile head; an ejecting arrangement for the ejection of the active components in said projectile, the sheathing wall structure of each said active component including at least two aligned axially-parallel through-extending bores; tie bolts extending through the aligned bores of the sheathing wall structures of said active components, each of said tie bolts having one end fastened to the projectile base and an opposite end fastened to the projectile head; breaking locations being provided on said tie bolts proximate the projectile base, proximate the abutting contact locations between said active components and proximate the projectile head; and means for clampingly engaging said tie bolts in said bores of the sheathing wall structure whereby, upon rupturing of the tie bolts at the breaking locations responsive to ejection of the active components, the separated parts of the tie bolts remain within the respective bores.

4,712,483

APPARATUS FOR SUPPORTING A VEHICLE FOR SIDEWAYS MOVEMENT

Edward W. Woodhall, 909 Covington Rd., Los Altos, Calif. 94022

Filed Mar. 4, 1985, Ser. No. 707,624

Int. Cl.⁴ B61J 1/12

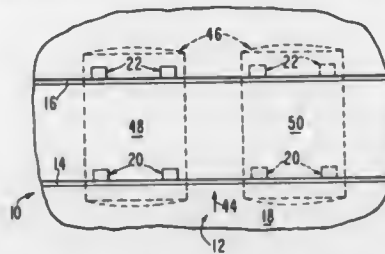
U.S. Cl. 104—48

26 Claims

1. Apparatus for supporting and moving a vehicle comprising:

- a floor part having an upper surface and a pair of spaced grooves extending into the upper surface thereof;
- a pair of roller members for each groove, respectively, each pair of roller members being adjacent to the respective groove and movable in rolling relationship over the upper surface of the floor part, the pair of roller members corresponding to one groove being movable independently of the pair of roller members corresponding to the other groove; and
- means on each pair of roller members, respectively, and

extending into the respective groove for coupling the pair of roller members to the respective groove for movement



longitudinally of the groove, each pair of roller members having an upper, wheel-supporting surface.

4,712,484

CONVEYOR ARRANGEMENT

Walter Sticht, Attnang-Puchheim, Austria, assignor to STIWA-Fertigungstechnik Sticht GesmbH, Attnang-Puchheim, Austria

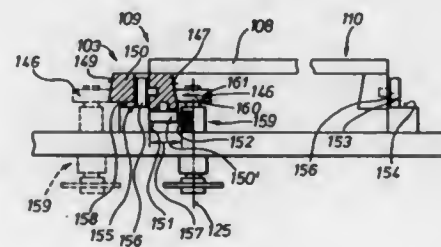
Division of Ser. No. 591,560, Mar. 20, 1984, Pat. No. 4,619,205. This application Jun. 25, 1986, Ser. No. 878,342

Claims priority, application Austria, Mar. 29, 1983, 1117/83; Feb. 6, 1984, 360/84

Int. Cl.⁴ B61B 13/00

U.S. Cl. 104—165

9 Claims



1. A conveyor arrangement for conveying a workpiece carrier in a conveying direction, the carrier having two opposite sides, a respective one of the carrier sides being constituted by a support ledge extending in the conveying direction and having a first side face and a second side face spaced from the first side face in a direction transverse to the conveying direction, and a guide means associated with the support ledge for vertically and laterally guiding the carrier in said direction, the guide means comprising

- (a) a means for advancing the carrier in the conveying direction, the advancing means including
 - (1) a succession of entrainment elements engaging the first support ledge side face and spaced in the conveying direction,
- (b) a guide ledge having an upper guide face for vertically guiding the carrier and a side guide face for laterally guiding the carrier, the upper and side guide faces extending along the second side face of the support ledge, and
- (c) a succession of guide elements mounted on the support ledge and spaced in the conveying direction, a first group of said guide elements engaging the side guide face of the guide ledge without play for laterally guiding the carrier and a second group of said guide elements engaging the upper guide face and mounted on the second side face of the support ledge for vertically guiding the carrier, the entrainment elements exerting a pressure having a vertical force component directed against the upper guide face on the guide elements of the second group, the guide elements of the second group being staggered in the conveying direction from the guide elements of the first group.

4,712,485

RESTRICTING BRACKET FOR AUTOMATIC TRANSPORT SYSTEM

Roald P. Nymark, Simsbury, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

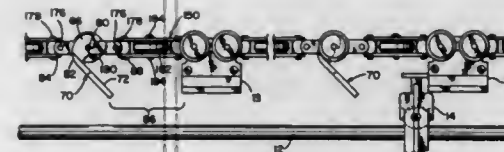
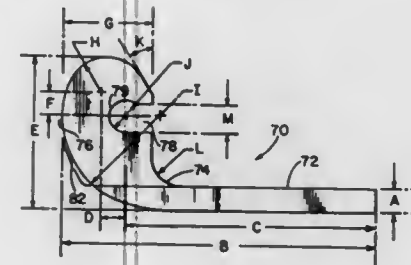
Continuation of Ser. No. 738,089, May 24, 1985, abandoned.

This application Dec. 22, 1986, Ser. No. 946,174

Int. Cl.⁴ B61B 3/00

U.S. Cl. 104—172.4

2 Claims



1. In an automated transport system, the combination comprising:

- a rail, a plurality of free traveling workpiece carriers which ride on said rail, a chain for propelling said workpiece carriers along said rail, said chain including a plurality of pushers for engaging said workpiece carriers and a horizontal pin extending transversely of said chain spaced ahead of each of said pushers, a restricting bracket pivotally suspended from each of said pins for permitting the associated one of said pushers to move into engagement with a workpiece carrier initially located downstream of said restricting bracket and for thereafter preventing said workpiece carrier from moving forwardly of said associated pusher beyond said restricting bracket, said restricting bracket having a curved head portion and an elongated stem portion extending downwardly from said head portion into the path of said workpiece carrier, said head portion including an inwardly extending recess for receiving said pin and terminating in a throat having a generally downwardly facing bearing surface pivotally engaged with said pin, said head portion being manually moveable along said recess in upward relation to said pin to remove said restricting bracket from said pin and chain, and means for limiting the pivotal movement of said restricting bracket relative to said chain in the direction corresponding to forward pivotal movement of said stem portion, said means for limiting the pivotal movement of said restricting bracket relative to said chain being a spacer on said chain forward of said pin for engaging said stem at a point located along the length of said stem between said pin and the point at which said carrier engages said stem so that the force exerted by said carrier on said stem tends to pivot said stem about said spacer to urge said bearing surface of said throat into engagement with said pin and to thereby oppose movement of said bracket from said pin.

4,712,486

AERIAL ROPEWAY TRANSPORT INSTALLATION WITH THE ROPE STOPPING TO DETACH THE CARS IN THE TERMINAL

Serge Tarassoff, Seyssinet, France, assignor to Pomagalski S.A., Fontaine, France

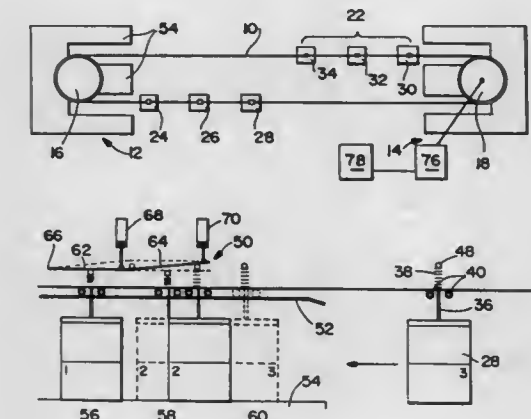
Filed Jun. 4, 1986, Ser. No. 870,414

Claims priority, application France, Jun. 14, 1985, 85 09588

Int. Cl.⁴ B61B 1/00, 11/00

U.S. Cl. 104—173.1

6 Claims



1. An aerial ropeway transport installation having a rope extending between two terminals comprising a motor for driving said rope and a device for controlling the speed of said motor, at least a first and second vehicle each having a detachable grip for coupling the vehicles to the rope at a first set distance apart and uncoupling them in the terminals for loading and unloading with the vehicles at a standstill, a detachment area of said grips extending along the rope in the terminal, a platform constituted by said detachment area, at least first and second control means for controlling said grips located at a second set distance apart in said detachment area; said second distance being less than said first distance, said first grip control means being arranged to detach the first vehicle from the rope and the second grip control means being arranged to detach the second vehicle from the rope so that a distance between the two detached vehicles in the terminal is the same as said second set distance, said speed control device being arranged so as to almost stop the rope each time said grip control means detach a vehicle from the rope and to reaccelerate the rope after detachment has taken place.

4,712,487

SIDE BEARING UNIT FOR RAILROAD CAR, INCLUDING METHOD OF MAKING

Robert L. Carlson, Skokie, Ill., assignor to Miner Enterprises, Inc., Geneva, Ill.

Continuation of Ser. No. 738,506, May 28, 1985, abandoned, which is a continuation of Ser. No. 494,239, May 13, 1984, abandoned. This application Jul. 17, 1986, Ser. No. 886,931

Int. Cl.⁴ B61F 5/14; F16C 27/02

U.S. Cl. 105—199.3

10 Claims

4. A method of making a railroad side bearing unit, comprising the steps of:

- providing a generally rectangular cap with a top surface for engaging a wear plate of a railroad car;
- forming a keyway in the underside of said cap;
- providing a block of thermoplastic elastomer material having a selected transverse configuration including sides and ends and a selected initial free height, and forming the block with an integral key at the top thereof for fitting in the keyway of said cap;

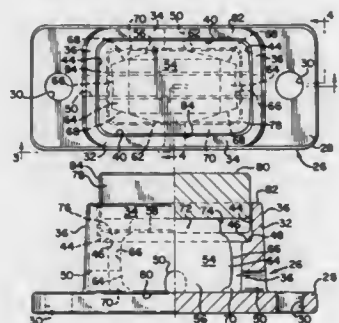
assembling the block with the cap by locating the key of the block in the keyway of the cap to thereby form an assembly;

applying to said assembly a force sufficient to compress the block at least 30% of its initial free height to permanently reduce the height and permanently change the transverse shape of the block such that said ends each are formed with an end wall vertically convex and horizontally concave and tapering to proximately align with and join said sides and to permanently expand and lock said key of the block into the keyway of the cap;

removing said force from the assembly; and

providing a housing adapted for attachment to a bolster of a truck of said car, the housing being provided with a generally rectangular cavity complementary to the generally rectangular shape of said cap and fitting closely with the cap to present substantial movement of the cap relative to the housing in a twisting direction and a direction transverse to the direction of applying said force, the sides of said permanently compressed block being separated from the housing to form a continuous clearance space therebetween.

7. A side bearing unit for use with a railroad car, comprising: a generally rectangular cap with a top surface for engaging a wear plate of a railroad car, with a keyway in the underside of the cap;



a body of thermoplastic elastomeric material having a selected transverse configuration including sides and ends and axial free height with an integral key at the top thereof for fitting in the keyway of said cap, defined by axially compressing said body by an extent equal to at least 30% of the initial free height to permanently reduce the height and permanently change the transverse shape of the body such that said ends each are formed with an end wall vertically convex and horizontally concave and tapering to proximately align with and join said sides and to permanently expand and lock said key of the block into the keyway of the cap;

a housing adapted for attachment to a bolster of a truck of said car, including a generally rectangular housing cavity defined by surrounding side wall means, the sides of said permanently compressed body being separated from said side wall means to form a continuous clearance space therebetween, and the side wall means of said generally rectangular cavity fitting closely to the generally rectangular cap to prevent relative substantial movement of the cap relative to the housing in a twisting direction and a direction transverse to the direction of compressing said body, and to thereby limit movement of the cap and attached body in a direction substantially parallel to the direction of compressing said body.

4,712,488 ELASTOMERIC MEMBER HAVING FLEXIBLE WOVEN MATERIAL BONDED THERETO IN A RAILWAY TRUCK PRIMARY SUSPENSION SYSTEM

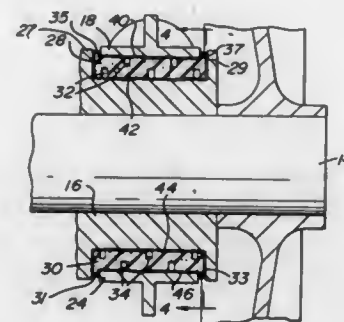
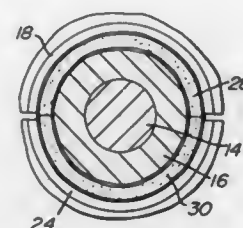
James M. Herring, Jr., Merion Station, Pa., assignor to The Budd Company, Troy, Mich.

Substitution of Ser. No. 612,822, May 22, 1984, abandoned. This application Oct. 24, 1986, Ser. No. 905,602

Int. Cl.⁴ B61F 5/26

U.S. Cl. 105—224.1

1 Claim



1. In a railway truck including a side frame with a clamp to receive a journal bearing assembly for an axle, a primary suspension system disposed between said journal bearing assembly and said side frame and clamp comprising:

- (a) a pair of elastomeric half-ring members disposed between said journal box assembly and said side frame and clamp;
- (b) the opposite surfaces of each of said elastomeric members including high wear flexible woven material bonded thereto;
- (c) each of said elastomeric half-ring members including lip portions extending outwardly to receive portions of said side frame and said clamp therebetween with said lip portions including woven material bonded thereto;
- (d) said elastomeric members further including voids therein;
- (e) said woven material preventing bulging in the areas of said voids of the elastomeric material when subjected to heavy car loads, and
- (f) said elastomeric members conforming to irregular surfaces in said journal box assembly said side frame and said clamp.

4,712,489 PROCESS FOR MARKING AND/OR DESTROYING VALUABLE DOCUMENTS IN PARTICULAR AND DEVICE FOR MAKING USE OF IT

Jean R. Levavasseur, Triel, France, assignor to Axytel, Dijon, France

Filed Dec. 13, 1985, Ser. No. 808,574
Claims priority, application France, Dec. 14, 1984, 84 19174

Int. Cl.⁴ E05G 3/00, 1/12

U.S. Cl. 109—25

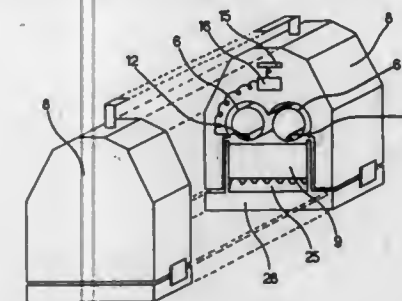
6 Claims

1. Apparatus for marking and/or destroying valuable documents contained in an enclosure, comprising:

- (a) a vessel containing a deleterious substance means for

damaging the documents to render them unusable or legally identifiable;

- (b) a pyrotechnic charge means located and detonated at a position which lies between the documents and the vessel so that energy from the pyrotechnic charge is released in one direction toward the vessel and in an opposite direction toward the documents, to cut the documents and



increase their receptivity to said deleterious substance means;

- (c) said vessel having an outlet opening means for releasing the substance into the documents to render the documents unusable or legally identifiable, said outlet opening means being openable by cutting in response to energy from the detonation of said pyrotechnic charge.

4,712,490 SAFE

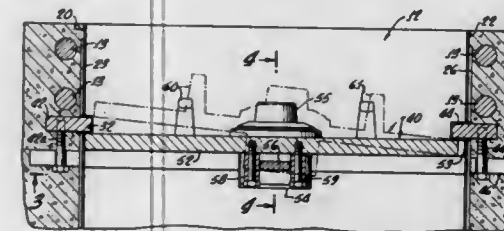
Robert J. Lichter, 15571 Placid Cir., Huntington Beach, Calif. 92647

Filed Feb. 27, 1986, Ser. No. 833,889

Int. Cl.⁴ E05G 1/00

U.S. Cl. 109—69

24 Claims



1. In a safe apparatus, the combination comprising: wall means defining a generally rectangular chamber for receiving valuables therein through an access opening thereof;
- ledge means on said wall means extending partially into said chamber;
- lockbolt receiving means on one of said wall means generally centrally relative thereto;
- first and second groove means on oppositely disposed ones of said wall means in transverse relation to said one wall means with said lockbolt receiving means, said first groove means having a depth at least twice the depth of said second groove means;
- separate door means for closing said opening, said door means including at least a first and second opposing edge portions having a thickness sufficient for being received within said groove and having a first dimension in the direction between said groove means generally equal to the distance between the innermost ends of said groove means plus a distance generally equal to the depth of said first groove means, and a second dimension orthogonal to said first dimension generally equal to the spacing between the wall means in that direction, said door means being inserted by positioning at an angle with said first edge thereof on said ledge means and then sliding said

edge into said first groove means while pivoting said second edge thereof toward said ledge means; and

lock means on said door mean including a lockbolt actuatable from a first unlocked position into a second locked position in engagement with said lockbolt receiving means only with said door means in abutting relation with the bottom of said second groove means.

4,712,491 PROCESS AND APPARATUS FOR THE CONTROLLED BURNING OF A VERTICAL STACK OF SOLID FUEL

Lothar Schmidt, Munich, Fed. Rep. of Germany, assignor to Wamsler-Herd-Und Ofen GmbH, Munich, Fed. Rep. of Germany

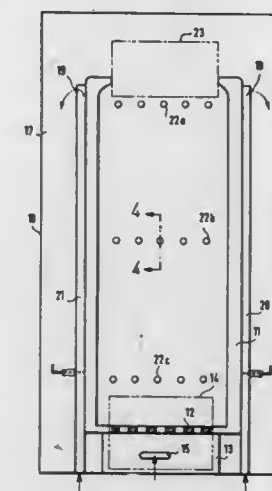
Filed Mar. 5, 1986, Ser. No. 836,494

Claims priority, application European Pat. Off., Mar. 5, 1985, 85102479.4

Int. Cl.⁴ F23G 5/24

U.S. Cl. 110—346

17 Claims



1. A process for the controlled combustion of a vertical stack of solid fuel which comprises the steps of igniting the top of said vertical stack of solid fuel such that combustion will commence at the top of said vertical stack and move downwardly towards its bottom as a moving zone of combustion, supplying a minor portion of the air necessary for combustion of said solid fuel in said vertical stack to the bottom of said vertical stack, supplying a major portion of the combustion air necessary for combustion of said solid fuel in said vertical stack to the side of said vertical stack, all of said major portion of the combustion air being gradually supplied to said vertical stack at sequentially lower, generally horizontal levels thereof as said zone of combustion moves downwardly along said vertical stack, and removing waste combustion gases from the top of said vertical stack.
3. A furnace for burning solid fuel in a controlled manner, said furnace comprising a housing having a fill door, a vertical furnace shaft mounted in said housing for receiving solid fuel supplied to said housing through said fill door, said vertical shaft having an open upper end and a bottom end and combustion air supply openings in its side at different vertical levels along its length for supplying a major portion of the required combustion air to the solid fuel therein, a grate located at the bottom of said vertical shaft through which a minor portion of the combustion air needed to burn the solid fuel therein can enter said vertical shaft, means forming downwardly-extending waste gas channels

within said housing and outside of said vertical shaft, said waste channels conveying waste combustion gases passing through the open upper end of said vertical furnace shaft downwardly and out of said housing, means forming secondary air vents communicating with said downwardly-extending waste gas channels near their upper ends in communication with the open upper end of said vertical shaft so as to secondarily burn combustion gases coming from said vertical shaft, and means for supplying adjustable amounts of combustion air to said respective combustion air inlet openings in the side of said vertical furnace shaft.

4,712,492

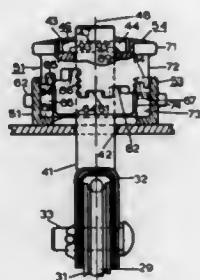
IMPLEMENT POSITION ADJUSTING DEVICE
David L. Murray, Lee's Summit, Mo., assignor to Deutz-Allis Corporation, Milwaukee, Wis.

Filed Sep. 29, 1986, Ser. No. 912,961

Int. Cl.⁴ A01C 5/06

U.S. Cl. 111—88

8 Claims



1. An adjustable spacer for adjusting the axial position of a rod relative to a support transverse thereto, comprising: an opening in said support through which said rod extends, diametrically opposite radially extending projections spaced from said support, a collar surrounding said rod and engaging said support, said collar having a pair of diametrically opposite abutments facing in the axial direction toward said projections and an annular knob having a central opening generally concentric with the axis of said knob through which said rod extends, at least two series of circumferentially spaced steps on the exterior of said knob, each series of steps including a plurality of axially spaced horizontal abutment surfaces facing toward said support, corresponding abutment surfaces of said series of steps being selectively engageable with said abutments, and a plurality of pairs of diametrically opposite shoulders extending radially outward in relation to the axis of said central opening, each pair of shoulders presenting radially extending abutment faces at the same axial position relative to said central opening and in selectively engageable relation to said projections.

4,712,493

BUTTON SEWING MACHINE

Hideo Aso, Chofu; Hirohisa Fujino, Yamatotakada, and Seiichi Saibe, Kashiwara, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed May 29, 1987, Ser. No. 55,784

Claims priority, application Japan, May 30, 1986, 61-126673

Int. Cl.⁴ D05B 3/14

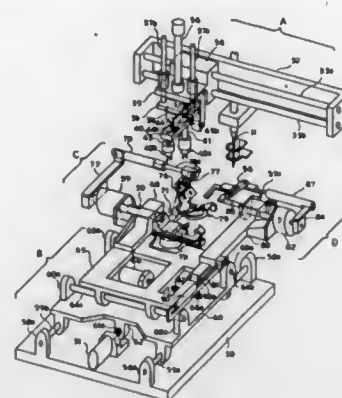
U.S. Cl. 112—112

2 Claims

1. In a button sewing machine having a needle which is provided with the predetermined length of thread for button sewing and travels between an upper needle bar spindle and a lower needle bar spindle being received by each spindle alternately per each needle stroke such that a button is sewn in a

manner simulating hand sewing, a button sewing machine comprising:

- a movable table which moves in X and Y directions by operation of two motors,
- a stay button chucking device placed on said movable table,
- a surface button chucking device placed on said movable table,
- a button holding device which transfers both a stay button



and a surface button to said stay button chucking device and to said surface button chucking device, respectively, said button sewing machine adapted to clamp said stay button and said surface button by said stay button chucking device and said surface button chucking device, respectively, and being adapted to place a workpiece and keep button holes in axial alignment, and to sew the stay button and the surface button simultaneously while moving said movable table in X and Y direction.

4,712,494

AUTOMATIC EXCHANGE OF THE SIZE IN AN AUTOMATIC SEWING UNIT

Flavio Bisson, Cava Manara P.v., Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

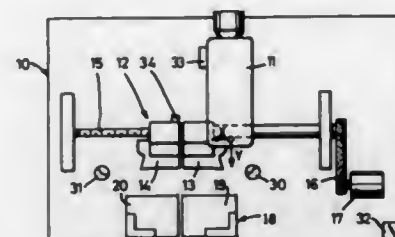
Continuation of Ser. No. 913,315, Sep. 30, 1986, abandoned. This application Mar. 27, 1987, Ser. No. 31,195

Claims priority, application Italy, Sep. 30, 1985, 42912-A/85

Int. Cl.⁴ D05B 21/00, 3/04

U.S. Cl. 112—121.12

4 Claims



1. An automatic exchange of the size in an automatic sewing unit comprising a sewing machine displaceable along two axes and a workpiece clamp group formed by at least two half-clamps of which one is fixed and the other mobile in order to obtain different sizes, comprising a machine positioned on a basic size ϕ , corresponding to the ϕ position of said axes, automatically movable in a positive way along one of said axes, for reading the displacement effected by said mobile half-clamp, and means for pointing out and memorizing the absolute coordinate of said axes.

4,712,495

CHAIN-STITCHING AND BLIND-STITCHING MACHINE FOR POINT-SEWING ARTICLES

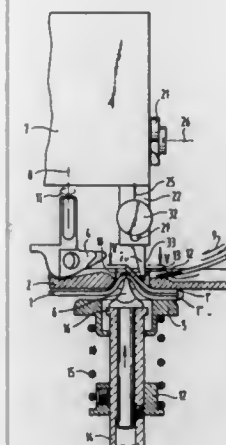
Johannes Jagielski, Gladbeck, Fed. Rep. of Germany, assignor to J. Strobel & Sohne GmbH & Co., Fed. Rep. of Germany
Filed Apr. 24, 1986, Ser. No. 855,388

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515189

Int. Cl.⁴ D05B 1/24, 57/04

U.S. Cl. 112—176

6 Claims



1. A chain-stitch blind stitch sewing machine having a machine head for sewing material at separate points with a predetermined number of stitches at each point and comprising:

- (a) a contacting plate having an aperture;
- (b) a presser disposed on a first side of said contacting plate for pressing the material being sewn against the contacting plate;
- (c) a bulge former disposed on said first side of said contacting plate for bulging the material being sewn into said contacting plate aperture;
- (d) an arcuate needle disposed on a second side of said contacting plate so as to oscillate about a first axis extending generally parallel to the contacting plate and to be laterally displaceable for alternately piercing the bulged material being sewn at two sites mutually spaced along a line extending generally parallel to said first axis;
- (e) a rotating looper disposed on said second side of said contacting plate for cooperation with said swinging arcuate needle to form chain-stitches;
- (f) a slide disposed on said second side of said contacting plate and adjustably attached to the machine head;
- (g) a stitch loosening finger disposed on the second side of the contacting plate and projecting toward the material being sewn between said two sites on the side thereof from which said arcuate needle pierces the material being sewn for picking up sewing thread portions extending between the two sites;
- (h) means to rotatably attach said stitch loosening finger to said slide such that it may pivot about a second axis extending generally parallel to the first axis;
- (i) clamping means interposed between said slide and said stitch loosening finger to clamp the stitch loosening finger in a desired position on the slide to provide a corresponding length of sewing thread portions; and,
- (j) actuation means to displace said slide between two positions on the machine head so as to set said stitch loosening finger into a first, thread pick-up position and a second, non-operative position.

4,712,496

MACHINE STITCHED BUTTONHOLE AND METHOD OF PRODUCING SAME

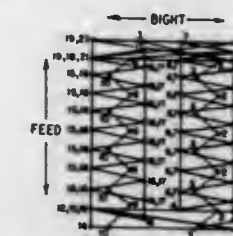
John Brown, Wilton, Conn.; Stephen A. Garron, Elizabeth, and John W. Wurst, Chester Township, Morris County, both of N.J., assignors to SSMC Inc., Stamford, Conn.

Filed Nov. 28, 1986, Ser. No. 936,006

Int. Cl.⁴ D05B 3/06

U.S. Cl. 112—264.1

2 Claims



1. A method of producing a buttonhole on a sewing machine having a needle, mechanism for jogging said needle laterally, a four motion work feed mechanism, and pattern means for controlling said needle jogging and work feeding mechanisms, comprising the steps of:

sequentially stitching a leg along each side of said buttonhole and a bar spanning both said legs at each end of said buttonhole, utilizing said pattern means at least during stitching of each leg of said buttonhole to implement a stitch pattern in which stitches extend alternately parallel to the length of said buttonhole and substantially transversely of the length of said buttonhole, said stitches extending parallel to the length of said buttonhole being formed at twice the stitch length and in the opposite direction of work feed from said transversely extending stitches.

4,712,497

SEWING MACHINE

Etuzo Nomura; Yasuo Sakakibara; Tetsuo Kozawa; Yukio Nishida, and Ikuzo Kondo, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

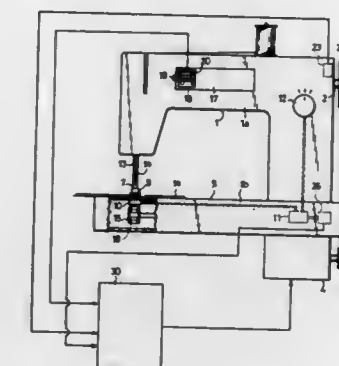
Filed Apr. 18, 1986, Ser. No. 853,486

Claims priority, application Japan, Apr. 25, 1985, 60-89280

Int. Cl.⁴ D05B 27/22, 69/22

U.S. Cl. 112—315

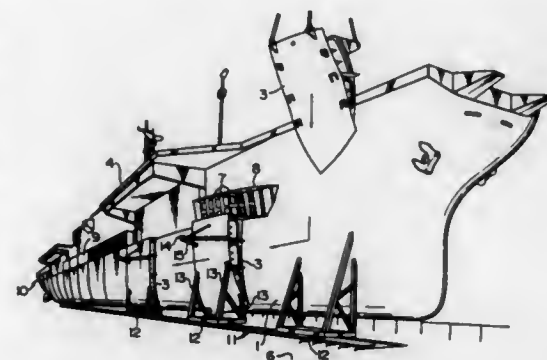
4 Claims



1. In a sewing machine comprising: a stitch forming device for forming a straight seam of a series of stitches on a work fabric, said stitch forming device including a sewing needle reciprocally movable in synchronism with the rotation of a main shaft of the sewing machine; a work feeding device including a presser foot and a feed dog for intermittently feeding the work fabric in synchronism with the rotation of the main shaft;

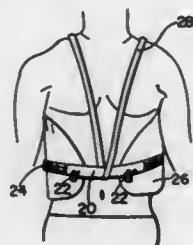
a feed adjusting device for adjusting the feed pitch by said feed dog; and
 a manual adjusting knob operatively coupled to said feed adjusting device for changing said feed pitch;
 the improvement comprising:
 means for generating feed pitch data corresponding to the adjusted amount of said feed adjusting device;
 a keyboard arrangement having selection keys enabling the selection of a numerical value corresponding to a seam length for setting a preset seam length;
 means for detecting a predetermined needle position on a reciprocal path of said sewing needle;
 means for sequentially computing the total seam length based upon said feed pitch data generated by said feed pitch data generating means in response to the detection of said detection means;
 means for distinguishing the coincidence between said computed total seam length and said present seam length; and
 means for stopping the operation of the sewing machine upon said coincidence distinguished by said distinguishing means.

4,712,499
METHOD OF MOUNTING BLISTER ON SHIP'S HULL IN DRY DOCK
 Kenji Haruguchi, Takuma Kobguchi, and Osamu Sekiya, all of Yokohama, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan
 Filed Jul. 18, 1986, Ser. No. 886,706
 Claims priority, application Japan, Jul. 19, 1985, 60-159471
 Int. Cl.⁴ B63B 9/06
 U.S. Cl. 114—77 R 3 Claims



1. A method for attaching a blister along the side of the shell of a ship or similar structure in a dry dock having a bottom wall and side walls, said blister to be attached at said side of said ship shell adjacent the side wall of said dry dock, comprising: providing rails on the bottom of said dry dock along the sides of said shell of the ship on which said shell is to be attached such that each rail extends in the longitudinal direction of said dry dock along said dry dock bottom at a spaced distance from said dry dock side wall; movably mounting at least one truck on at least one of said rails; placing a blister block having a guide member for engaging said dry dock side wall on said truck; moving said truck carrying said blister block to a position where said blister block is to be attached to said shell; and, with said guide member engaging said dry dock side wall, raising said blister block off of said truck and fixing said blister block to said shell.

4,712,498
MULTIPLE SUPPORT BAR FOR MANIPULATION OF A HAND-HELD SAIL ASSEMBLY
 Richard B. Oser, Houston, Tex., assignor to New Ocean Wind Products, Inc., Houston, Tex.
 Continuation-in-part of Ser. No. 864,824, May 19, 1986. This application Oct. 20, 1986, Ser. No. 920,462
 Int. Cl.⁴ B63H 9/04
 U.S. Cl. 114—39.2 17 Claims

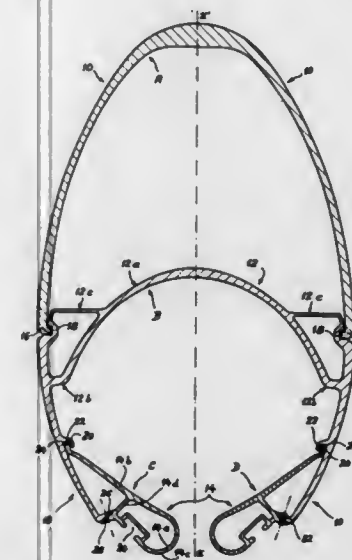


1. An apparatus for securing a sailor to a sailboarding assembly comprising a sailboard, mast, boom and sail, and having a harness line connected at each end to said boom, said apparatus comprising:
 a rigid bar member adapted to be secured circumferentially around the front portion of a sailor's torso;
 a plurality of open hook members spaced along said bar member, extending generally perpendicularly from and rigidly fixed to said bar member for connecting said bar member to the sailing assembly;
 means for securing said bar member on the sailor's torso; and
 said open hook members being adapted to be connected to said harness line at spaced points thereon to provide connections from multiple points on the sailor's torso to the sailing assembly whereby movements of the multiple hook members transmit movement from two points on the bar member to two points on the harness line for manipulation of said sailing assembly by body movements.

4,712,500
MAST FOR SAILBOAT
 Daniel Montandon, Yverdon-Les-Bains, Switzerland, assignor to Nirvana Espar Systems S.A., Yverdon-Les-Bains, Switzerland
 Filed Feb. 21, 1986, Ser. No. 831,766
 Claims priority, application France, Feb. 21, 1985, 85 02647
 Int. Cl.⁴ B63B 15/00
 U.S. Cl. 114—90 16 Claims

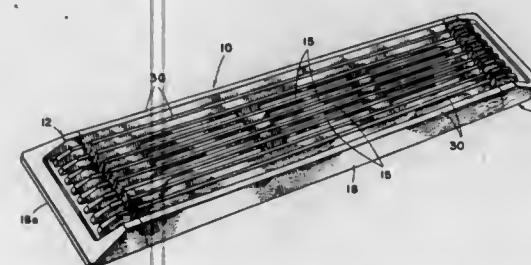
1. A mast for sail boats having a cross-section which exhibits:
 an external portion having roughly the form of a horseshoe with rearwardly extending arms defining a horseshoe opening;
 an internal portion arranged within the external portion for reinforcement thereof and having the form of an arc of a circle with the same axis of symmetry and open on the same side as the external portion, the ends of said arc being respectively coupled to the arms of the horseshoe; and
 two rigid closing members fixed to the respective arms for reinforcement thereof and forming two lips which partially close the horseshoe opening but leave therebetween sufficient space to allow passage of a sail retained within the mast;
 each of said rigid closing members providing a closed hollow wall portion of substantially triangular cross-section comprising a wall facing toward the interior of the mast, a wall facing toward the exterior of the mast, and a rounded wall forming the base of said triangular cross-section.

tion and providing a softened profile at an extremity of a corresponding one of said lips for reducing the risk of damage to a sail when it contacts said corresponding lip; and,



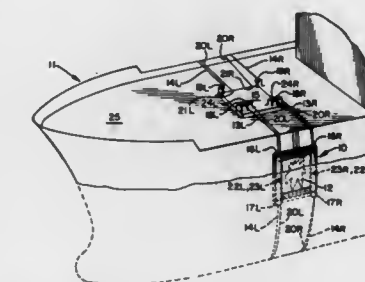
said mast comprising a first extrusion forming one of said closing members, a second extrusion forming the other of said closing members, and a third extrusion forming at least one of said external and internal portions.

4,712,501
BOAT VENT
 Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.
 Filed Feb. 12, 1987, Ser. No. 14,224
 Int. Cl.⁴ B63J 2/00
 U.S. Cl. 114—211 14 Claims



1. A grill for covering a vent opening in a panel of a boat, said grill having a primary section and a pair of end sections, said primary section having a ventilation zone, said zone having a plurality of air flow openings extending therethrough, said zone being spaced from both sides and the ends of said primary section; each of said end sections and ends of said primary section having a back face with a recess therein, said primary and end sections having abutting edges and interengaging fingers in their respective recesses and projecting from their respective edges with the fingers on said primary section extending into the recess and behind the back face of the corresponding one of said end sections whereby said end sections hold said primary section against the surface of said panel.

4,712,502
SEAL PAC DIAPER
 George L. McDuff, and Bobby G. McCoy, both of 308 E. Verdine St., Sulphur, La. 70663
 Filed Sep. 8, 1986, Ser. No. 904,712
 Int. Cl.⁴ B63B 43/16
 U.S. Cl. 114—229 17 Claims

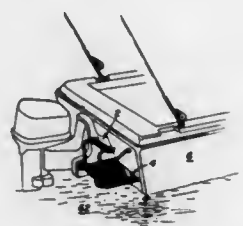


1. A seal pack diaphragm for vessels including ships such as an oil tanker mountable about a ruptured opening in a wall of a vessel comprising: a lipped mouth seal structure with a plurality of inflated side by side lips that as a lip structure enclose a generally rectangular area and a flexible resiliently compressible material seal member mounted on the front face of said side by side lips for engaging the wall of a vessel around an area of rupture opening; a leak proof flexible membrane spanning the area enclosed by said side by side lips and overlying and bonded to the back side of said side by side lips; transverse cross brace bar means overlying the back of the top and bottom portions of said side by side lips and fastened to said leak proof flexible membrane; vertically oriented flexible strap means overlying the backs of the opposite side sections of said side by side lips; strap end to cable connector means connected to each end of said flexible strap means; and a cable system including cables connected to each of said strap end to cable connector means for positioning said seal pack diaphragm on a vessel wall over a ruptured opening in the vessel wall and to hold the diaphragm firmly in place over the ruptured opening in the wall; wherein said transverse cross brace bar means overlying the back of the top and bottom positions of said side by side lips includes at least one transverse cross brace bar at the top, and at least one transverse cross brace bar at the bottom of said seal structure; and said transverse cross brace bars are individually retained in rearwardly extended sleeves fastened to the seal structure; and wherein said vertically oriented flexible strap means overlying the backs of the opposite side sections of said side by side lips includes at least one vertically oriented flexible strap at each side of said seal pack diaphragm; and with said vertically oriented flexible straps each individually running through a vertically extended sleeve in the back of said seal structure.

4,712,503
BOAT TRANSOM PLATFORM STEP DEVICE
 Robert G. Ritten, Ft. Pierce, Fla., assignor to Step On Inc., Ft. Pierce, Fla.
 Filed Apr. 20, 1987, Ser. No. 40,889
 Int. Cl.⁴ E06C 5/26
 U.S. Cl. 114—343 5 Claims

1. A step device for mounting on the transom platform of a boat that may be moved between a use position wherein a step thereof is immersed in the water in which the boat floats and a storage position wherein said step is located above said platform out of said water, which step in said use position permits a person to climb out of said water and onto said platform without said step making any appreciable movement relative to said platform during such climb, comprising:
 a step means, a bracket means and a pair of pin members.
 said step means including:
 a first tubular support member having:
 an L-shaped portion defined by a leg section with a top

end and a step section joined normally to said leg section via an arcuate section,
 a lateral portion that extends integrally and normally from said top end of said L-shaped portion,
 an abutment portion that extends integrally from said lateral portion in the direction of said step section spaced apart from and parallel to said leg section, said L-shaped, said lateral and said abutment portions all lying in a the same longitudinal plane, and
 a bore through said lateral portion normal to said plane between said L-shaped portion and the center-line of said abutment portion,
 a second tubular support member substantially identical to and spaced apart from said first tubular support member,
 a flat, rectangular step defined by two longitudinal sides and two ends, said step being fixed adjacent one of said ends to said step section of said first support member and adjacent the other of said ends to said step section of said second support member, and
 said bracket means including:



a first mount member having:
 a rectangular base section with a fore end, and aft end and fastener admission holes,
 a pair of integral side sections that project laterally from said base section,
 said side sections being spaced apart from each other a distance slightly greater than the width of the tubing of which said first and second support members are formed,
 said side sections extending beyond said aft end of said base section, and
 a hole in each of said side sections in the area thereof that is beyond said aft end, and
 a second mount member substantially identical to said first mount member,
 one of said pin members extending through said holes in said first mount member and said bore in said first support member connecting them together, and
 the second of said pin members extending through said holes in said second mount member and said bore in said second support member connecting them together.

4,712,504

TENNIS SCORING MEANS

Marilyn J. Zarley, and Donald H. Zarley, both of 3709 Southern Hills Dr., Des Moines, Iowa 50321

Filed Apr. 7, 1986, Ser. No. 848,760

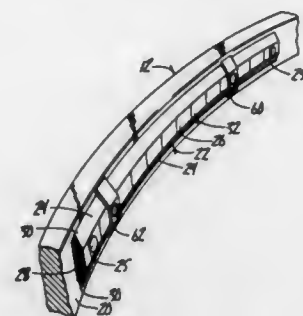
Int. Cl.⁴ A63B 49/00; G09F 9/40

U.S. Cl. 116—222

10 Claims

1. The combination of a tennis racquet having a frame comprising an elongated handle terminating in an open oval-shaped frame segment, and a tennis scoring device comprising,
 an elongated body member having a longitudinal axis, and a top, a bottom and opposite side edges, said bottom being secured to said frame and said side edges being free from contact with said frame along their entire length,
 visible tennis scoring indicia means secured to said body member and extending in a direction parallel to said axis, said indicia means divided into a plurality of indicia segments,
 and at least one slide member movably slidably mounted on

said body member and adapted for movement in a direction parallel to said axis, and being adapted to be positioned adjacent different of said indicia segments, whereby the scorer can move the slide member to a position adjacent the indicia segment that properly reflects the tennis score being kept, said slide member comprising a resilient U-shaped member having a top that extends over the top of said body member, and depending tabs that slidably engage said side edges of said body member, said body member having a width greater than



the normal width of said slide member so that said tabs are resiliently forced apart by the side edges of said body member whereby said tabs are laterally extended to exert spring tension against said side edges of said body member to create sufficient friction therebetween to releasably hold said slide member in a fixed position on said body member when a tennis ball hits the racquet as the tennis game is being played, while also permitting the slide member to be easily and quickly slidably moved on said body member to change the tennis score being kept.

4,712,505

COMBINATION HAZARDOUS LIQUID AND WATER SENSOR

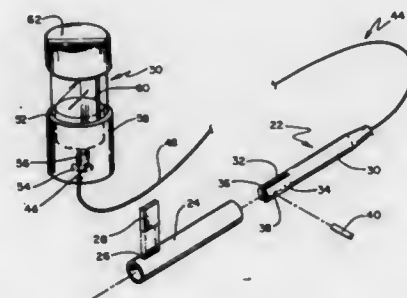
H. Kent Wainwright, Laramie, Wyo., assignor to In-Situ, Inc., Laramie, Wyo.

Filed Oct. 18, 1985, Ser. No. 789,153

Int. Cl.⁴ G01F 23/00

U.S. Cl. 116—227

3 Claims



1. An apparatus for use in sensing the presence of a first substance and for sensing the presence of a different second substance within an annular space defined by an inner wall and outer wall of a double wall storage tank, the apparatus comprising:

first sensing means for sensing the presence of said first substance, wherein said first sensing means weakens upon contact with said first substance;
 second sensing means for sensing the presence of said second substance, wherein said second sensing means weakens upon contact with said second substance;
 holder means for holding said first and second sensing means, wherein during use at least a portion of said holder means moves from a first position to another position

when said first sensing means weakens upon contact with said first substance and/or when said second sensing means weakens upon contact with said second substance;
 connecting means having first and second ends, said first end for connecting with said holder means, wherein said connecting means is elongated and flexible, and wherein said holder means and first and second sensing means are positioned during use in a bottom portion of said annular space free from restrictive engagement with said inner wall and outer wall of said double wall storage tank; and
 indicator means for indicating the presence of said first substance and/or said second substance, said indicator means being connected to said second end of said connecting means to be mechanically responsive during use to movement of said holder means away from said first position thereof.

4,712,506

DEVICE FOR TWO-SIDED COATING OF A PAPER WEB

Rauno Rantanen, Imatra, and Sivert Westergaard, Järvenpää, both of Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

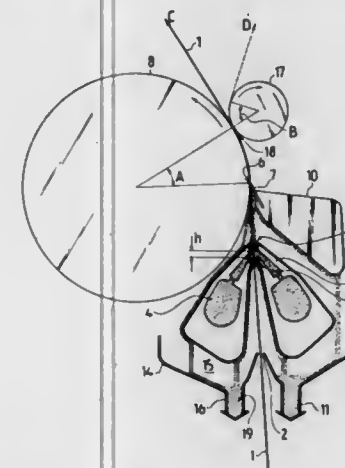
Filed Feb. 28, 1986, Ser. No. 834,559

Claims priority, application Finland, Mar. 7, 1985, 850917

Int. Cl.⁴ B05C 11/04, 5/02

U.S. Cl. 118—103

11 Claims



1. A system for coating liquid on both sides of an advancing indefinite length web, said device comprising:
 applicator means for applying liquid to both sides of the indefinite length web;
 a counter roller positioned downstream relative to said applicator means with respect to a direction of advancing of the indefinite length web whereby said counter roller receives the advancing indefinite length web;
 a leveling means positioned adjacent said counter roller for providing a first nip between said leveling means and said counter roller through which the advancing indefinite length web passes; and
 an auxiliary roller positioned adjacent said counter roller and downstream relative to said leveling means for providing a second nip between said auxiliary roller and said counter roller through which the advancing indefinite length web passes,
 wherein said auxiliary roller has a diameter less than the diameter of said counter roller, and
 wherein said auxiliary roller has a harder surface compared to said counter roller.

4,712,507

APPARATUS FOR THE APPLICATION OF A PRIMER TO A PLASTIC PROFILE OR THE LIKE

Wilhelm Helling, Schlachtweg 6, 4517 Hiltter 1, Fed. Rep. of Germany

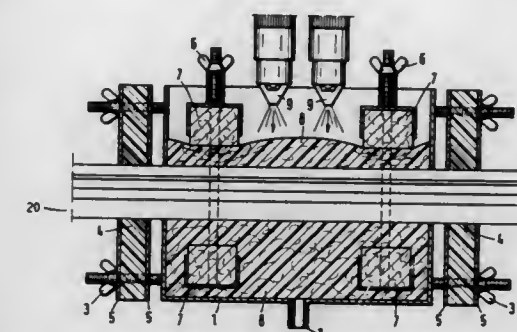
Filed Feb. 27, 1986, Ser. No. 833,980

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1985, 3507104

Int. Cl.⁴ B05C 1/06

U.S. Cl. 118—208

8 Claims



1. An apparatus for the application of a primer to a plastic profile or the like, characterized by a vat comprising: sealing elements provided with clearances for the passage of the plastic profile, a fibrous web material (8) in said vat and saturated with the primer to be applied, means (6, 7) for saturating the fibrous web material (8) with the primer, means for pressing the fibrous web material against the plastic profile and means defining an outlet opening (2), said vat having end faces and removable walls at said end faces lying perpendicular to the running direction of the plastic profile, each of said removable walls being formed of two spaced panels (5) having sealing cellular material (4) which is resistant to the primer solution lying therebetween, wherein the panels (5) with which the cellular material (4) lying therebetween are secured by threaded fastener means (3) and secured with said fastener means to the vat.

4,712,508

LITTER MATERIAL FOR SMALL ANIMALS

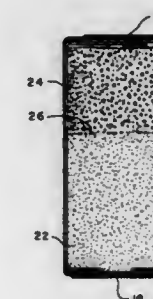
Henry E. Lowe, 201 N. Edwards St., Cassopolis, Mich. 49031

Continuation-in-part of Ser. No. 132,285, Mar. 20, 1980, Pat. No. 4,448,151. This application Nov. 4, 1982, Ser. No. 439,034

Int. Cl.⁴ A01K 1/015

U.S. Cl. 119—1

12 Claims



1. A package of litter material for small animals, comprising a container having elongated side walls and opposite end walls, a layer of relatively coarse particulate, liquid absorbent material disposed in one end of said elongated container and having an odor suppressant therein, a layer of relatively fine particulate, liquid absorbent material disposed in the other end of said elongated container, the end wall adjacent said relatively fine

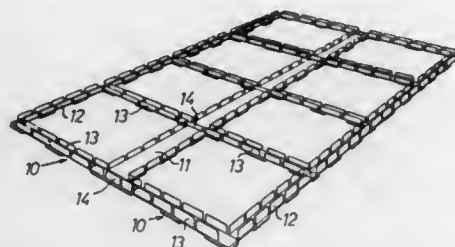
material being openable for discharging sequentially first said relatively fine particulate layer and then said relatively coarse particulate layer to form a multiple layer bed of litter with said relatively coarse particulate material forming the top layer of said bed.

4,712,509

ENCLOSURE CONSTRUCTIONS FOR FISH BREEDING
Knut Vangen, Bekkjærveien 19, N-5084 Tertnes, Norway
Filed Jan. 31, 1985, Ser. No. 696,767
Claims priority, application Norway, Feb. 1, 1984, 840376
Int. Cl.⁴ A01K 61/00

U.S. Cl. 119—3

7 Claims



1. An enclosure construction for fish breeding comprising a plurality of longitudinal frame members;
- a plurality of transverse frame members hingedly coupled with said longitudinal frame members to define at least two rows of rectangular frames;
- a plurality of junction-forming frame members, each said junction forming frame member being pivotally connected between and to a pair of aligned transverse frame members and pivotally connected between and to a pair of aligned longitudinal frame members;
- a plurality of frameworks, each said framework being secured to and extending from a respective junction-forming frame member to a point under an adjacent longitudinal frame member; and
- means securing each framework to said adjacent longitudinal frame member to laterally stabilize said adjacent longitudinal frame member.

4,712,510

EXPANDABLE WAND PET TOY

Suh Tae-Ho, Osaka, Japan, assignor to Fritz Chemical Company, Dallas, Tex.
Filed Jul. 28, 1986, Ser. No. 890,039
Int. Cl.⁴ A01K 15/02

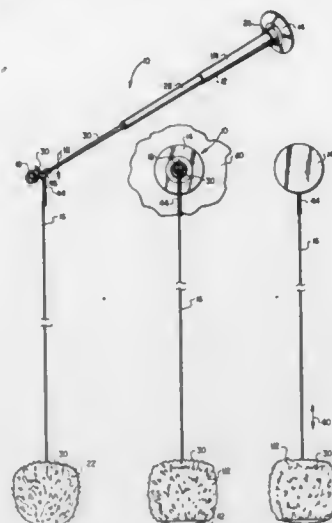
U.S. Cl. 119—29

5 Claims

1. A pet toy comprising:
 - a telescoping wand including first, second and third telescoping sections adapted for retraction one into the other for storage and expansion one from the other;
 - said first section of said wand having a diameter greater than the diameter of the other two sections and being substantially rigid in a longitudinal direction for providing structural rigidity to said wand structure and adapted for receiving said other two sections in concentric alignment therewith;
 - said second section of said wand having a substantially thick wall construction, formed of material substantially similar to that of said first section, and having longitudinal rigidity for supporting said third section outwardly thereof;
 - said third section of said wand being relatively narrow in cross-section, of resilient flexibility for facilitating the suspension of said pet interaction object therebeneath and formed of material substantially similar to that of said first section;
 - said third section of said wand being of solid construction manifesting resilient flexibility and formed with an aper-

ture on the outer end thereof adapted for receipt of said elastic tether therethrough for securement to said wand; means for mounting said first section of said wand to a vertical surface;

a pet interaction object suspended from a distal end of said wand; and



an elastic tether secured to said distal end of said wand and to said object for providing movement of said pet interaction by the elasticity of said tether and said flexibility of said wand.

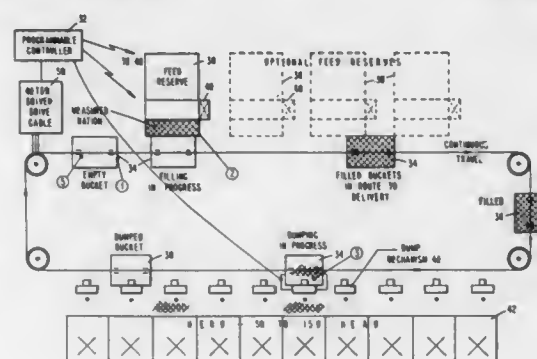
4,712,511

PROGRAMMED MIX AND DELIVERY SYSTEM

Donald D. Zamzow, P.O. Box 358, and George L. Gorski, P.O. Box 358, both of Wausau, Wis. 54401
Filed Aug. 15, 1985, Ser. No. 765,945
Int. Cl.⁴ A01K 5/02

U.S. Cl. 119—51 R

20 Claims



6. Apparatus for providing a specified ration to a specific stall comprising:
 - delivering means;
 - programmable control means programmed for outputting signals for controlling said delivering means to deliver said specified ration to the specific stall;
 - said delivering means including:
 - container means for receiving said specified ration and movable among a plurality of stalls for delivering said specified ration only to said specific stall;
 - motive means connected for receiving said signals from said programmable control means and for moving said container means to a first location to receive said specified ration and to a second location including the stalls; and
 - discharge control means responsive to said signals from

said programmable control means for discharging said container means of said specified ration only at said specific stall.

4,712,512

BIRD FEEDER MADE FROM A PLASTIC BOTTLE, INCLUDING APPARATUS THEREFOR AND A METHOD OF MAKING

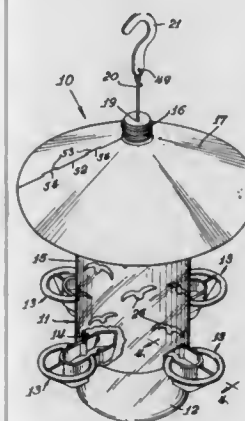
Bernhard Schreib, 2465 S. 170th St., New Berlin, Wis. 53151, and John K. Schreib, W299S4807 Hwy. 83, Mukwonago, Wis. 53149

Filed Aug. 1, 1986, Ser. No. 891,657

Int. Cl.⁴ A01K 39/01

U.S. Cl. 119—52 R

26 Claims



1. A combination of apparatus components cooperative for converting a plastic bottle into a bird feeder for a bottle being of the type having a closed sidewall and open neck portion being thread-engagable by a closure cap, said combination comprising:

sleeve means adapted to fit around and cover a portion of the sidewall of a plastic bottle;

tool means capable of piercing and slitting the sidewall of a bottle to create at least one generally H-shaped cut-out slot through the sidewall;

a feeder tray means having an open trough-like portion and capable of being inserted into the at least one H-shaped cut-out slot to be held by the sidewall of a bottle thereat;

cover means formed to have a central opening and a conic-like umbrella shape whereby the central opening may receive therethrough the neck portion of the plastic bottle;

cap washer means capable of being inserted interiorly of a closure cap when a closure cap is thread engaged to the neck portion of a plastic bottle;

support hook means capable of supporting a plastic bottle filled with bird seed and,

line means for supportively communicating at one end with said cap washer means through said closure cap and for connection at an other end to the support hook means whereby the support hook means may supportively communicate with the cap washer means and thereby be capable of supporting a bird feeder made by the combination of apparatus components for converting a plastic bottle.

4,712,513

SUSPENSION HARNESS

Frank Huppertsberg, Wuppertal, Fed. Rep. of Germany, assignor to Gebr. Wahlefeld GmbH & Co. KG, Krefeld-Linn, Fed. Rep. of Germany

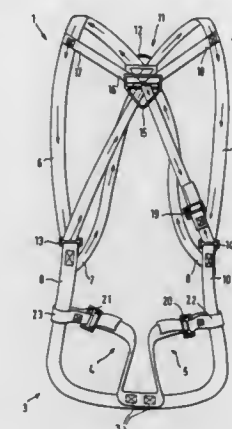
Filed Apr. 21, 1986, Ser. No. 854,396

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1985, 8511916[U]

Int. Cl.⁴ A62B 35/00; A63B 79/00

U.S. Cl. 119—96

15 Claims



1. In a suspension harness with adjustable shoulder straps which pass through a plate at a rear part of the harness having a suspension eye and are connected to a seat strap with adjustable leg straps at a front part of the harness, the improvement wherein:

said shoulder straps are formed by a single continuous belt passing in two directions through said plate at said rear part of the harness and passing additionally through a plate at the front part of the harness located generally opposite the plate at the rear part;

said belt is provided with means for adjusting the effective length thereof; and

said seat strap has loops at opposite ends thereof through which respective passes of said belt are looped at opposite sides of the harness.

4,712,514

FLUIDIZED BED BOILER AND HIGH TEMPERATURE SEPARATORS USED THEREIN

Zhang Xu-Yi; Yue Guangxi, and Zheng Qiayu, all of Beijing, China, assignors to Qinghua University, Beijing, China

Filed Sep. 5, 1986, Ser. No. 903,935

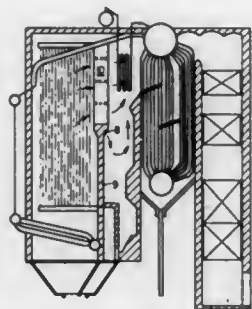
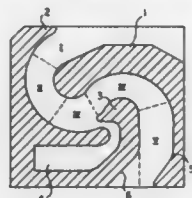
Int. Cl.⁴ F22B 1/00

U.S. Cl. 122—4 D

6 Claims

1. A fluidized bed boiler comprising a furnace section, a plurality of separators disposed adjacent said furnace section for receiving flue gases from said furnace section and separating fine particulate material from said gases, each separator comprising a casted block having an curved inlet passage formed therein, a portion of said solid particles being forced against a curved wall portion of said inlet passage by centrifugal forces to separate said solid particles from said gases, said block including partition means for dividing the other end portion of said passage into two branch passages, a wall portion of one of said branch passages being coextensive with said curved wall portion to receive said separated solid particles, the other branch passage adapted to receive the separated gases and discharge said gases from an end thereof extending flush with a second surface of said block, the discharge end of the other branch passage of a portion of said separators extending perpendicular to said second surface and the discharge end of the other branch passage of the remaining portion of said separators extending at an angle to said second surface and said

separators are stacked in a vertical direction adjacent said furnace section, with the perpendicularly extending and the



angularly extending discharge ends of their respective other branch passages extending in an alternating relationship.

4,712,515

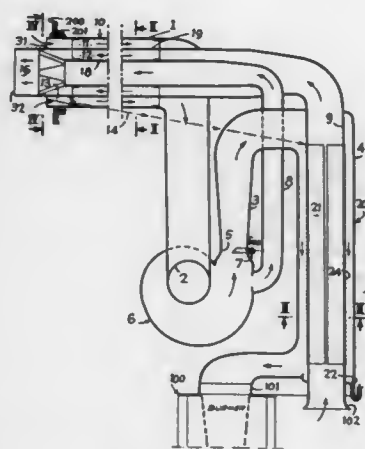
DEVICE FOR EVACUATING INTO THE AMBIENT AIR COMBUSTION PRODUCTS FROM A CONDENSATION BOILER

Francois Couprie, 30, rue des Haies, 75020 Paris, France
Continuation of Ser. No. 655,575, Sep. 28, 1984, Pat. No. 4,640,232. This application Jul. 11, 1986, Ser. No. 884,560
Claims priority, application France, Sep. 30, 1983, 83 15657
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ F22B 1/18; F24B 7/04

U.S. Cl. 122-7 R

6 Claims



1. In a device for evacuating into the ambient air combustion products from a condensation boiler, in which at least one downstream section of a conduit for evacuating the combustion products is coaxial to a conduit for admission of the combustion air necessary for a burner of said boiler, and a fraction of the air collected in said admission conduit is returned towards the outside, the improvement which includes:

an opening for suction of the combustion air and for rejection of the combustion products into the ambient air;
means for returning a fraction of the collected air to the outside comprising a central tube coaxial to said downstream section of the conduit for evacuating the combustion products;
said conduit for admission of the combustion air surrounding

said downstream section of the conduit for evacuating the combustion products;
said downstream section of the conduit for evacuating the combustion products, said coaxial section of the admission conduit and said means for returning to the outside a fraction of the collected air defining a first heat exchanger;
means for diluting the combustion products with said fraction of collected air located in the vicinity of said opening;
a second heat exchanger between said first heat exchanger and said boiler whereby the combustion products issuing from said boiler further heat the combustion air heated in said first heat exchanger, said second heat exchanger having a trickling water surface over which water trickles to increase the humidity of the combustion air already reheated; and
collecting means inside said first heat exchanger, adjacent the outlet of the conduit for evacuating the combustion products, to collect the condensates formed in said conduit and duct means external to said first heat exchanger connected at one end to said collecting means and connected at its opposite end to said trickling water surface to return the collected condensates from said collecting means into said second heat exchanger to constitute the trickling water intended to increase the humidity of the preheated combustion air.

4,712,516

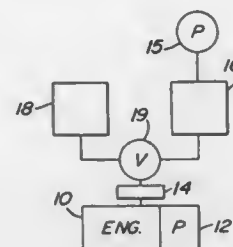
FUEL SUPPLY FOR A ROTARY PISTON ENGINE

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.
Division of Ser. No. 358,547, Mar. 15, 1982, Pat. No. 4,570,605.
This application Sep. 25, 1985, Ser. No. 768,688

Int. Cl.⁴ F02B 75/12

U.S. Cl. 123-1 A

4 Claims



1. A fuel supply for an internal combustion engine having a fuel inlet means for delivering a fuel-air mixture to the engine combustion chamber comprising:
means providing a contained supply of a running fuel and for delivering said fuel to the fuel inlet means for the use in the normal operation of the engine, said running fuel having a relatively low volatility,
and pump means including a small air pump for pressurizing said contained running fuel supply to provide a simple fuel injection system for said engine.

4,712,517

CYLINDER BLOCK STRUCTURE FOR MULTICYLINDER INTERNAL COMBUSTION ENGINES

Nobuo Anno, and Takeo Arai, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 12, 1985, Ser. No. 807,995

Claims priority, application Japan, Dec. 13, 1984, 59-263665; Dec. 13, 1984, 59-189439[U]

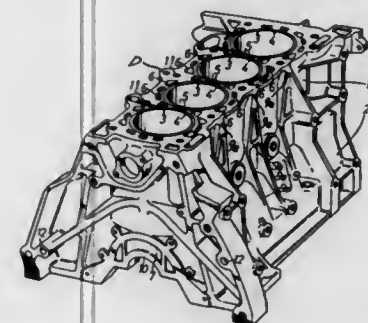
Int. Cl.⁴ F02B 75/18

U.S. Cl. 123-41.74

3 Claims

1. A cylinder block structure of a light alloy for use in a multi-cylinder internal combustion engine, comprising:
a cylinder-defining portion having a plurality of cylinder

bores, a water jacket defined in surrounding relation to said cylinder bores and a deck for attachment to a cylinder head;
a crankcase-defining portion integrally formed with said cylinder-defining portion and having a plurality of integral journal walls spaced in the direction in which said cylinder bores are arranged;
means defining concavities in opposite sides of said cylinder- and crankcase-defining portions between the adjacent cylinder bores, said concavities lying between said water jacket and said journal walls; and



a plurality of reinforcing rib systems projecting from said opposite sides with each rib system surrounding one of said concavities, each of said reinforcing rib systems extending substantially parallel to the central axes of said cylinder bores and having an upper end terminating short of said deck and each said reinforcing rib system having a substantially A-shaped configuration including a pair of laterally spaced substantially vertical ribs positioned one on each side of said concavities and a substantially horizontal rib interconnecting said vertical ribs.

4,712,518

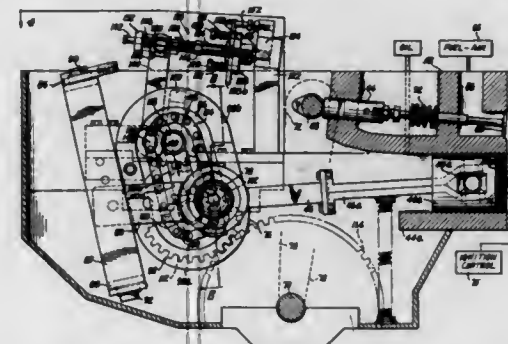
POWER OUTPUT MECHANISM FOR AN INTERNAL COMBUSTION ENGINE

Fred L. Johnson, New Bern, N.C., assignor to R. L. Thomas and W. J. Rouse, both of New Bern, N.C., a part interest
Filed Oct. 18, 1985, Ser. No. 789,018

Int. Cl.⁴ F02B 75/32

U.S. Cl. 123-48 B

25 Claims



1. Apparatus for converting between reciprocating movement and rotational movement comprising:

- (a) a member constrained so as to undergo reciprocating movement along a first axis between a top dead center position and a bottom dead center position;
- (b) an output shaft mounted so as to undergo rotational movement about its longitudinal axis; p1 (c) a connecting rod having a first end attached to the member and a second end;
- (d) guide means attached to the second end of the connecting rod to constrain the second end to move in a closed loop path, the guide means comprising:
 - (i) means defining a cam track forming the closed loop

path, the cam track including the pair of generally parallel, substantially straight portions disposed at an angle of greater than 90°, but less than 180° to the first axis, and, a first portion movable with respect to a second portion so as to vary the length of the closed loop path; and,

- (ii) a cam follower attached to the second end of the connecting rod and extending into the cam track so as to constrain the second end to follow the closed loop path defined by the cam track;
- (e) driving means interconnecting the second end of the connecting rod and the output shaft so as to cause the output shaft to rotate as the second end travels along the closed loop path, the drive means including a closed loop drive member; and,
- (f) means to move the first portion of the cam track with respect to the second portion so as to vary the length of the closed loop path and to maintain a predetermined tension on the closed loop drive member.

4,712,519

INTAKE MANIFOLD FOR A THREE-CYLINDER AIR-FUEL MIXTURE SUCTION TYPE ENGINE

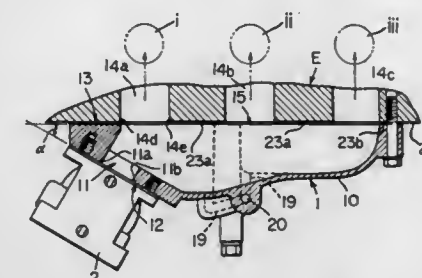
Kooichi Sugahara, Yoshio Shinno, and Kiyoharu Kimoto, all of Sakaishi, Japan, assignors to Kubota Ltd., Osaka, Japan
Filed Feb. 28, 1986, Ser. No. 834,789

Claims priority, application Japan, Mar. 11, 1985, 60-35270[U]

Int. Cl.⁴ F02B 75/18

U.S. Cl. 123-52 M

5 Claims



1. An intake manifold for a three-cylinder air-fuel mixture suction type engine having three engine intake ports, said intake manifold comprising a body defining an elongate manifold chamber, said body having a chamber inlet opening formed in a first end wall portion thereof, said first end wall portion adapted to receive a carburetor in fluid communication with said inlet opening, said body being open longitudinally along a back face portion so as to define an outlet opening sufficient to extend over all three intake ports of a three-cylinder engine, said inlet opening being directed longitudinally toward an opposite end wall portion of said body and obliquely toward said back face portion, said first end wall portion adapted to receive the carburetor so that the carburetor is aligned obliquely at an acute angle with respect to a plane defined by said back face portion of said body;

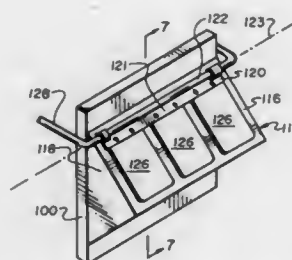
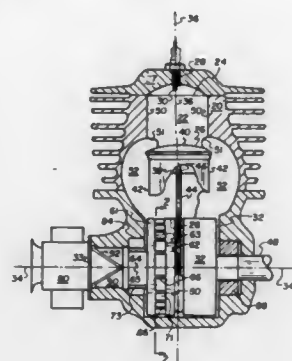
said body configured to be received by a planar cylinder head face so that said chamber inlet opening is located adjacent the rearward one of the three intake ports and said opposite end wall portion is adjacent the forward one of the three intake ports, a rearward body edge portion along said chamber inlet opening being located rearward of a rearward engine edge portion along the rearward intake port, a forward body edge portion along said chamber inlet opening being located longitudinally between the rearward and a forward engine edge portion along the rearward intake port.

4,712,520 CRANK CASE COMPRESSOR UNIT FOR A TWO CYCLE ENGINE

John Pasquin, 3254 S. Barney, West Valley City, Utah 84119
Filed Jul. 25, 1986, Ser. No. 889,347
Int. Cl.⁴ F02B 33/04

U.S. Cl. 123—73 S

7 Claims



1. In a two-cycle gasoline engine comprising an engine body, a cylinder in the body having a closed end and an open end, an enclosed crankcase in the body communicating with said open end, a crankshaft extending through the crankcase and rotatably mounted therein, a piston reciprocally mounted in the cylinder, a connecting rod connecting the piston and the crankshaft, a carburetor positioned exterior of said engine body, an intake duct in said engine body communicating with the cylinder through which a combustible mixture enters said cylinder when said piston is adjacent said open end, an inlet port in said body communicating said carburetor with said crankcase, the improvement comprising:

a compressor means mounted within said crankcase adapted for continuously pressurizing a combustible mixture within said crankcase as said mixture is received from said carburetor, while said engine is in operation, said compressor means including:

a fly wheel, having a periphery and an axis of rotation, said flywheel being mounted on said crankshaft and made rotatable therewith, said flywheel having a plurality of vanes mounted thereon, said vanes extending from a central region of said flywheel outwardly to said periphery of said flywheel;

wherein said inlet port is positioned proximate said axis of rotation of said flywheel, said combustible mixture being directed initially to a central region of said flywheel and thereafter directed by said vanes outwardly to said periphery of said flywheel;

a reed-type valve mounted in said inlet port for allowing a one-way directional flow of combustible mixture, said reed type valve including:

a support frame adapted for sealing said inlet port, said support frame defining at least one aperture therein: at least one cover plate fabricated of a resilient material pivotally mounted on said support frame over said

aperture, said cover plate being dimensioned to cover and seal said aperture; each said cover plate being mounted on a hinge; said hinge being pivotally mounted on said support frame; an angular displacement of said hinge about its axis of rotation facilitating a coordinated sealing and unsealing of said support frame aperture by a selected displacement of said cover plate;

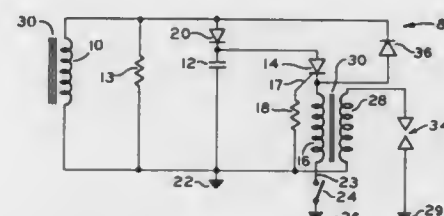
wherein said combustible mixture being directed through said inlet port into said vaned flywheel, is constantly compressed within said crankcase due to the rotation of said flywheel within said crankcase.

4,712,521 IGNITION SYSTEM

Kenneth W. Campen, Kiel, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed Jan. 15, 1987, Ser. No. 3,851
Int. Cl.⁴ F02P 1/00; F02B 77/00

U.S. Cl. 123—149 C

14 Claims



1. An electronic ignition system for an internal combustion engine comprising:

a ferromagnetic core;

a plurality of coils mounted on said core and including a primary coil and a secondary coil which are inductively coupled by said core;

permanent magnet means rotatably mounted for movement past said core to induce varying flux densities therein;

an electronic switching circuit connected to said primary coil to control the current flow therethrough, said electronic switching circuit including an electronic switching device and a capacitor which is charged by the voltage developed by said moving permanent magnet in one of said plurality of coils and which is discharged through said electronic switching device;

a first ground connection for said electronic switching circuit;

a second ground connection for said primary coil; and

a cut off switch connected between one end of said primary coil and said second ground connection, whereby, when said cut off switch is opened, current flow through said primary coil is prevented and triggering of said electronic switching device continues as the engine coasts to a stop.

4,712,522 METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Katsushi Anzai, Osamu Harada, Toshio Suematsu, and Yuji Takeda, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 23, 1985, Ser. No. 768,830
Claims priority, application Japan, Aug. 27, 1984, 59-176695; Aug. 27, 1984, 59-176696; Aug. 27, 1984, 59-176691

Int. Cl.⁴ F02D 41/06

U.S. Cl. 123—179 L

16 Claims

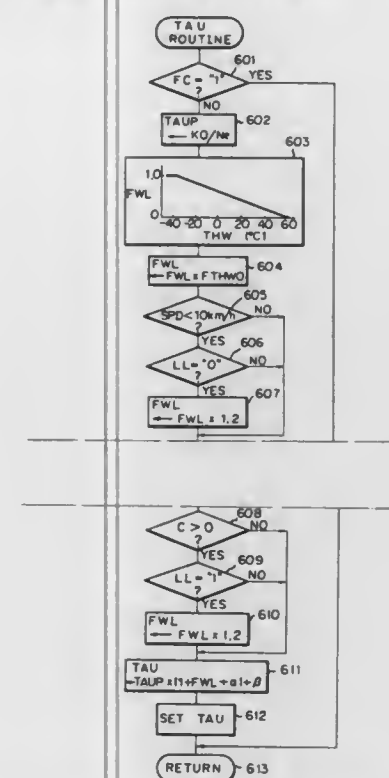
3. A method for controlling an air-fuel ratio in an internal combustion engine, comprising the steps of:

detecting a temperature of an engine coolant;

determining whether said engine is in a cranking state;

calculating a fuel enrichment amount in accordance with the detected temperature of the engine coolant when said engine is in said cranking state and said temperature of said engine coolant when said engine is not in said cranking state; and supplying fuel to said engine in accordance with said enrichment amount.

5. A method for controlling the air-fuel ratio in an internal combustion engine, comprising the steps of:



detecting a temperature of an engine coolant; detecting when a starter of the engine is turned on; calculating a fuel enrichment amount in accordance with a currently detected temperature of the engine coolant and a temperature detected during a time when said starter is on; and incrementing fuel to be supplied to the engine by the fuel enrichment amount.

4,712,523 AIR-FUEL MIXTURE INTAKE PIPE FOR INTERNAL COMBUSTION ENGINE

Tatsuhiko Matsubayashi, Hachioji, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed May 19, 1986, Ser. No. 864,093

Claims priority, application Japan, Jun. 4, 1985, 60-83451[U]
Int. Cl.⁴ F02M 29/04, 33/02

U.S. Cl. 123—188 M

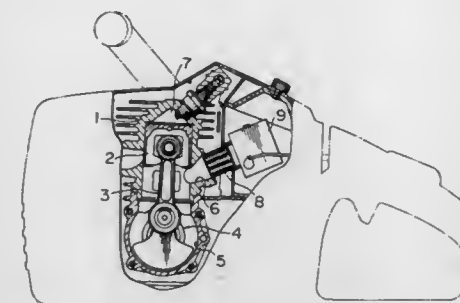
3 Claims

1. An air-fuel mixture intake pipe for an internal combustion engine, adapted to communicate a carburetor of the internal combustion engine and an intake port of a cylinder thereof, said intake pipe comprising

means for containing stagnate excess fuel during sudden deceleration and evaporation said excess fuel during re-acceleration so as to be gradually supplied to said engine, said means including

a wall on an interior of the intake pipe which a plurality of projection rows are molded integrally therewith to provide a hollow, elongated passage for said air-fuel mixture between said carburetor and intake port, each said projection being composed of a plurality of projections spaced from each other extending along and slightly into said interior of said wall of the intake pipe and, said projections

being arranged in a circumferential direction and spaced from each other with said rows extending in a longitudinal direction of the intake pipe, and a space defined between each adjacent pair of said rows of projections by a longitudinal groove formed in said inner wall of the intake pipe;



wherein when said engine is suddenly decelerated, said excess fuel in said air-fuel mixture stagnates between said projections, and when said engine is re-accelerated, the stagnant fuel evaporates from said projections and flows along said longitudinal grooves to be gradually supplied for combustion.

4,712,524 FUEL INJECTION SYSTEM

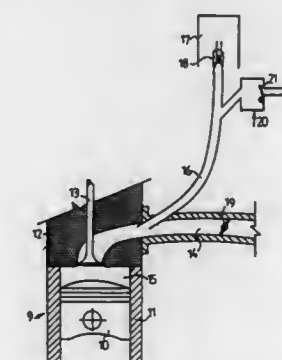
Darren A. Smith, Scarsborough, and Ian R. Thompson, Dun-craig, both of Australia, assignors to Orbital Engine Company Proprietary Limited, Balcatta, Australia

Filed May 23, 1986, Ser. No. 866,294

Claims priority, application Australia, May 24, 1985, PH00730
Int. Cl.⁴ F02M 67/00

U.S. Cl. 123—198 A

38 Claims



1. A method of periodically delivering units of liquid fuel to an internal combustion engine having a fuel metering device for providing individual metered quantities of fuel for supply to the engine, and a conduit communicating the fuel metering device to the engine, said method comprising applying an individual gas pulse to each respective metered quantity of fuel to convey the fuel from the fuel metering device through the conduit to the engine, and establishing a secondary gas flow through at least part of the conduit to the engine at least part of the time between successive gas pulse applications to reduce cycle to cycle variations in fuel deliveries.

4,712,525

COMBUSTION CHAMBER OF INTERNAL COMBUSTION ENGINE

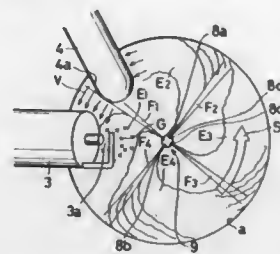
Shiro Ishida, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Nov. 26, 1986, Ser. No. 935,357

Claims priority, application Japan, Nov. 30, 1985, 60-270288
Int. Cl.⁴ F22B 15/00, 21/30

U.S. Cl. 123—263

6 Claims



1. A combustion chamber of an internal combustion engine, comprising:

- a combustion chamber with a swirl formed therein;
- a fuel injecting nozzle means for feeding fuel in an atomized condition toward an inner wall of said combustion chamber with a swirl formed therein;
- a glow plug means for vaporizing the fuel fed in an atomized condition, said glow plug means being disposed on an upstream side of the swirl near the line of injection of the fuel; and
- a spark plug means for igniting the vaporized fuel, said spark plug means being disposed downstream of the swirl in proximity to said glow plug means.

4,712,526

PISTON WITH TURBINE FAN FOR USE IN INTERNAL COMBUSTION ENGINES

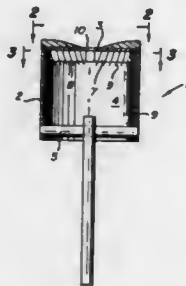
David Caughran, 3743 Mt. Blanc Cir., Anchorage, Ak. 99508

Filed Jan. 23, 1986, Ser. No. 821,893

Int. Cl.⁴ F02F 3/24; F02M 29/00

U.S. Cl. 123—307

13 Claims



1. A piston, mounted in a cylinder having spark means, for use in an internal combustion engine comprising:

- A. a cylindrical casing, having a hollow cavity therein with closed side and bottom walls;
- B. a top portion, having a perimeter fixedly attached to said hollow cavity of said cylindrical casing, thereby forming an integral unit;
- C. turbine blade means fixedly mounted so as to be positioned inside the hollow cavity of said cylindrical casing;
- D. air inlet means, installed in said top portion to allow entry of air and fuel, in a mixture, into said hollow cavity of said cylindrical casing;
- E. air outlet means also installed in said top portion to allow exit of the air fuel mixture out of said hollow cavity after said air fuel mixture has been swirled by said turbine blade means.

4,712,527

ENGINE IDLE STABILIZATION TIMING CIRCUIT

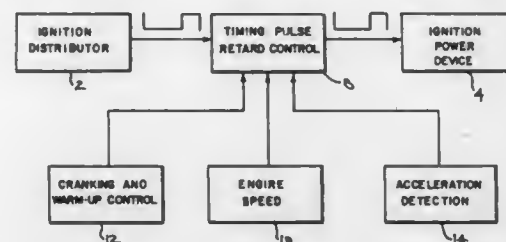
Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 22, 1986, Ser. No. 866,163

Int. Cl.⁴ F02P 5/145

U.S. Cl. 123—418

6 Claims



1. In an internal combustion engine having ignition timing means supplying ignition timing pulses according to a baseline timing curve as a function of engine speed, a timing circuit for stabilizing idling of said engine comprising:

- delay means for variably delaying said ignition timing pulses relative to a top dead center position of said engine to retard engine timing from said baseline curve;
- engine speed responsive means coupled to said delay means for varying the relative timing delay of said pulses according to engine speed;
- acceleration detection means comprising throttle position responsive means coupled to said delay means for decreasing said relative timing delay to advance engine timing for quick acceleration;
- engine temperature responsive means coupled to said delay means for decreasing said relative timing delay when engine temperature is below a given value; and
- disabling means coupled to said acceleration detection means and responsive to a second predetermined engine speed higher than said first mentioned predetermined speed and disabling said acceleration detection means at engine speeds above said second predetermined speed.

4,712,528

FUEL INJECTION SYSTEM

Wolfgang Schaffitz, Munich, Fed. Rep. of Germany, assignor to Institut für Motorenbau Professor Huber e.V., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 122,951, Feb. 20, 1980, abandoned.

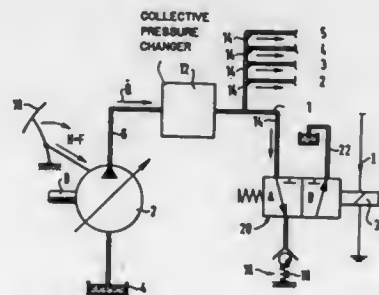
This application Feb. 26, 1982, Ser. No. 352,918

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 2907279; Mar. 9, 1979, 2909307; Apr. 12, 1979, 2914966; May 12, 1979, 2919229

Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—446

27 Claims



1. A fuel injection system for dosing and atomizing fuel into each cylinder of an internal-combustion engine, comprising:

- (a) an injection nozzle for each cylinder of the engine for atomizing the fuel into the respective cylinder;
- (b) a continuously-operating, controllable-flow-rate fuel

pump for continuously pressurizing and dosing the fuel per unit of time from said fuel pump up to and through every injection nozzle for atomizing the fuel into the respective cylinder thereby delivering a quantity of the fuel required by the fuel injection system per said unit of time;

- (c) fuel path means for forming a fuel path and collective pressure chamber for the entire fuel flow from the fuel pump to every injection nozzle;
- (d) at least one timing means associated with each injection nozzle for opening, and controlling the timing of at least the opening of to each injection nozzle; and
- (e) means for setting the controllable flow rate of the fuel pump to the sum of the fuel quantities to be injected into every cylinder of the engine per unit of time such that a return flow of the fuel quantities into the fuel injection system is eliminated.

4,712,529

AIR-FUEL RATIO CONTROL FOR TRANSIENT MODES OF INTERNAL COMBUSTION ENGINE OPERATION

Katsunori Terasaka, Yokosuka; Hiroshi Sunbuichi, and Toyooki Nakagawa, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

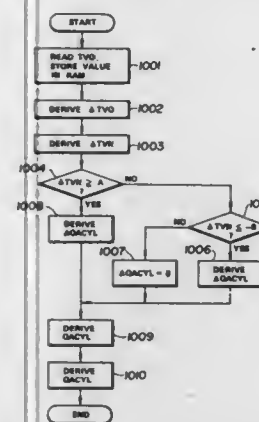
Filed Jan. 8, 1987, Ser. No. 1,441

Claims priority, application Japan, Jan. 13, 1986, 61-5838

Int. Cl.⁴ F02D 41/10

U.S. Cl. 123—492

6 Claims



1. A method of operating an internal combustion engine comprising the steps of:

- sensing a parameter which varies with the amount of air being inducted into a cylinder of the engine and producing a first signal indicative thereof;
- detecting a parameter which varies with the throttling of the induction system and producing a second signal indicative thereof;
- monitoring said second signal to sense the initiation of transitory engine operation;
- determining a first correction value by:
 - (i) modifying the change in said second signal with respect to engine speed, and
 - (ii) modifying a value indicative of the amount of air being inducted into the cylinder at the instant that the initiation of said transitory operation is detected with the value derived by modifying the change in said second signal with respect to engine speed;
- determining a second correction value by adding a value derived by multiplying (a) the change in said first signal by a factor which varies with engine speed by (b) the instant value of said first signal; and
- summing the first and second correction values to derive an accurate approximation of the air being inducted into the cylinder.

4,712,530

HYDRAULIC ADJUSTING ARRANGEMENT FOR AN INJECTION PUMP

Wolfgang Rapp, deceased, late of Esslingen, Fed. Rep. of Germany (by Gisela Rapp, administratrix); Günther Häfner, Berglen, and Ulrich Letsche, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

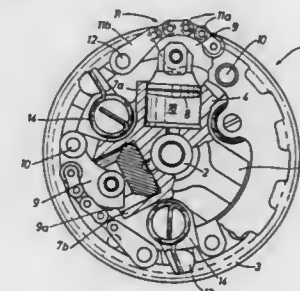
Filed Nov. 4, 1985, Ser. No. 794,286

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440055

Int. Cl.⁴ F02M 59/20

U.S. Cl. 123—502

12 Claims



1. A hydraulic timing adjustment arrangement linking a primary and a secondary part of a transmission for driving a fuel injector system for a motor vehicle internal combustion engine, said arrangement comprising:

- a flexible connector means having one section fixed to move with the primary part and another section fixed to move with the secondary part movable means on the secondary part adjacent to said connector means for deforming said flexible connector means radially to effect a circumferential rotation of the secondary part with respect to the primary part.

4,712,531

APPARATUS FOR ADJUSTING SPECIFIC VOLUME OF INTAKE AIR FOR ENGINE

Isamu Ishizawa, and Sigeo Tamaki, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

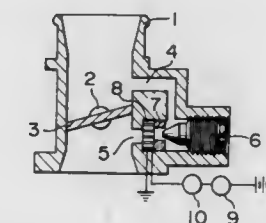
Filed May 8, 1985, Ser. No. 731,734

Claims priority, application Japan, May 18, 1984, 79-100767

Int. Cl.⁴ F02M 15/00, 23/14

U.S. Cl. 123—556

11 Claims



1. In an apparatus for adjusting a specific volume of intake air for an engine of the type having a by-pass passage which by-passes a throttle valve for adjusting the specific volume of intake air flowing through an intake passage, and an orifice defined by an adjusting valve body and a valve seat and adapted to adjust the specific volume of intake air passing through said by-pass passage, the improvement comprising a heating element provided on a downstream side of said orifice in said by-pass passage, said heating element allowing said intake air to pass therethrough, said heating element is formed so as to have a lattice shape, and wherein said valve seat is formed so as to have a sharp-edged shape, said latticeshaped heating element being integrated with said valve seat.

4,712,532

CRANKCASE EMISSION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Syouzabu Ura, Fujisawa; Makoto Yasuda, and Yoshitaka Ooki, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

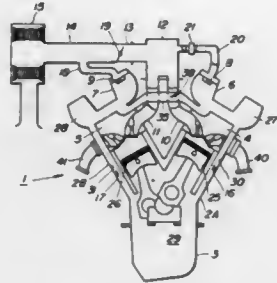
Filed Oct. 20, 1986, Ser. No. 920,439

Claims priority, application Japan, Oct. 21, 1985, 60-160963[U]

Int. Cl.⁴ F02B 25/02

U.S. Cl. 123—572

6 Claims



1. A crankcase emission control system for a V-type internal combustion engine having first and second cylinder blocks, combustion chambers defined by the first and second cylinder blocks, an air intake passage leading to the combustion chambers, a throttle valve disposed in the air intake passage, first and second cylinder heads mounted on the first and second cylinder blocks respectively, first and second cam covers mounted on the first and second cylinder heads respectively, a first cam chamber defined by the first cylinder head and the first cam cover, a second cam chamber defined by the second cylinder head and the second cam cover, and a crank chamber, the system comprising:

- (a) a first gas passage connecting the crank chamber to a point of the air intake passage downstream of the throttle valve via the first cam chamber;
- (b) a second gas passage connecting the crank chamber to a point of the air intake passage upstream of the throttle valve via the second cam chamber;
- (c) a control valve disposed in a segment of the first gas passage between the first cam chamber and the air intake passage, the control valve being responsive to a vacuum developed in the air intake passage downstream of the throttle valve; and
- (d) a communication passage connecting the first and second cam chambers.

4,712,533

HIGH-SPEED BOW LIMBS

Billy J. Cruise, 28494 Sesta La., Eugene, Oreg. 97402

Filed May 22, 1986, Ser. No. 866,391

Int. Cl.⁴ F41B 5/00

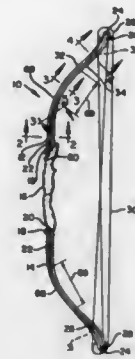
U.S. Cl. 124—23 R

16 Claims

1. An archery bow having a pair of elongate limbs of laminated pre-stressed construction, each limb comprising:

- (a) a back layer having a plurality of back layer laminae, each of said back layer laminae including a plurality of pre-stressed reinforcing fibers extending parallel with one another and longitudinally of said limb and being embedded in a resin matrix;
- (b) a belly layer having a plurality of belly layer laminae, each of said belly layer laminae including a plurality of pre-stressed reinforcing fibers extending parallel with one another and longitudinally of said limb and being embedded in a resin matrix;
- (c) a pair of opposite end portions and an intermediate portion located therebetween, between, said intermediate portion being free of any core material located between said belly layer laminae and said back layer laminae and

substantially all reinforcing fibers present in said intermediate portion being pre-stressed; and
(d) all of said laminae being fixedly interconnected with one another in a pre-stressed arcuately curved configuration



with respective confronting faces of said laminae adhesively interconnected with one another over their entire confronting surfaces within each of said belly and back layers.

4,712,534

BALL THROWING MACHINE

Fujio Nozato, 33-20, Izuo 1-chome, Taisho-ku, Osaka 551, Japan

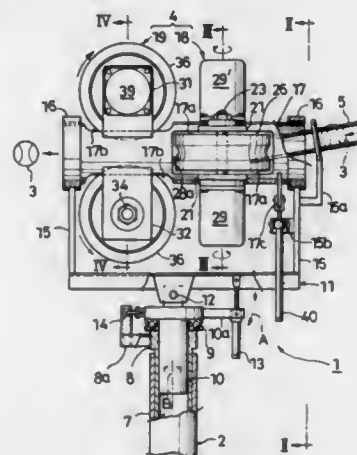
Filed Apr. 25, 1986, Ser. No. 855,574

Claims priority, application Japan, May 17, 1985, 60-106698

Int. Cl.⁴ F41B 15/00

U.S. Cl. 124—78

2 Claims



1. A ball throwing machine including a pair of first counter-rotating rotary wheels having axes parallel to each other, at least one first motor driving said pair of first rotary wheels, means for feeding balls to said pair of first rotary wheels, each of said first rotary wheels having an arcuately grooved outer peripheral surface for nipping a ball fed therebetween and accelerating and propelling said ball forward of said pair of first rotary wheels along a free path substantially tangent to said wheels of said pair of first rotary wheels, a second pair of counter-rotating rotary wheels located in said ball propelling path and forwardly of said first rotary wheels with the tangents of the wheels of said second pair of wheels in substantial alignment with said free path, said second pair of rotary wheels having axes parallel to each other and substantially at right angle to said axes of said pair of first rotary wheel as view from said propelling path, each of said second rotary wheels having a linear peripheral outer surface, the outer linear peripheral outer surfaces of said second rotary wheels being substantially parallel to each other and to the axes of said second rotary wheels, at least one second motor driving said pair of second

rotary wheels, the arrangement being such that the ball accelerated and propelled by said first rotary wheels along said free path tangent to said pair of first wheels is caught by and nipped between the outer peripheral surfaces of said second rotary wheels, is further accelerated and is thrown forward and out of said ball throwing machine by said pair of second rotary wheels.

4,712,535

METHOD AND APPARATUS FOR SEVERING WAFERS
Masayasu Fujisawa, Ninomiya, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

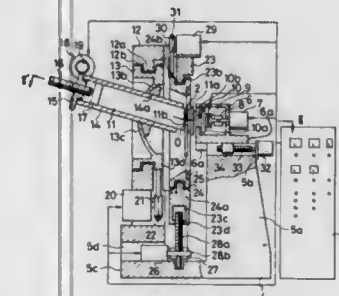
Filed Jun. 4, 1986, Ser. No. 910,142

Claims priority, application Japan, Jul. 12, 1985, 60-152524

Int. Cl.⁴ B28D 1/04

U.S. Cl. 125—13 R

7 Claims



1. A method of severing an end portion of an ingot into wafers and the like by means of a cutting tool, comprising the steps of

holding a front end portion of the ingot, cutting the end portion of the ingot until a portion remains between a cut end surface from which a wafer is formed and the remainder of the ingot, controlling the stress applied to a remaining portion between the cut end surface of the ingot from which a wafer is formed and the remainder of the ingot just before severing the cut end surface so as to pull the wafer at a right angle relative to the plane of the cut end surface, severing the remaining portion between the ingot and the cut end surface to form the wafer, moving the cut surface of the separated wafer toward the remainder of the ingot while rotating the wafer, and pressing the wafer against the cutting tool to remove any undesired remaining material caused by the severing operation.

4,712,536

RECTAL SPECULUM WITH OBTURATOR

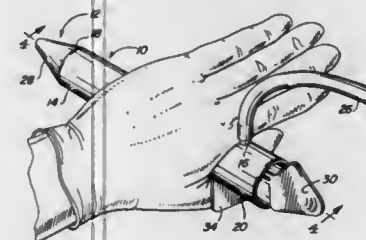
Robert A. Hawks, 3602 W. Danbury Dr., Glendale, Ariz. 85308

Filed Jan. 20, 1987, Ser. No. 4,600

Int. Cl.⁴ A61B 1/12

U.S. Cl. 128—3

20 Claims



1. A rectal speculum for use with a colonic lavage machine, said speculum comprising:
an unobstructed main tube, said main tube including a distal

end for insertion into a patient's rectum and a proximal end for connection to a waste discharge hose; and
an inlet tube for directing fluids into said main tube, said inlet tube having a diameter less than the diameter of said main tube, and intersecting said main tube at an obtuse angle with respect to the proximal end of said main tube so as to direct fluids away from said distal end of said main tube.

4,712,537

APPARATUS FOR TREATING RECURRENT EAR INFECTIONS

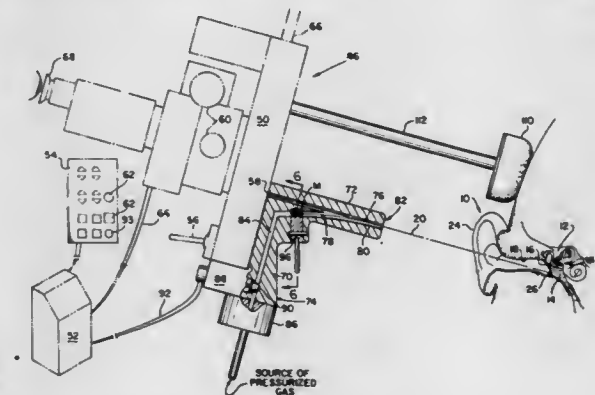
Daniel J. Pender, 325 E. Park Ave. - Suite 1, Long Beach, N.Y. 11561

Filed Aug. 13, 1986, Ser. No. 895,917

Int. Cl.⁴ A61B 1/22

U.S. Cl. 128—9

7 Claims



1. An apparatus for treating ear infections comprising a body mounted on a turret and having a main bore extending linearly from a fixed opening through which a sighting and delivery of laser energy passes axially enabling the location and formation of a hole by vaporization of a selected target site on an eardrum, an auxiliary bore connected at one end to a source of air under pressure and at its other end to said main bore, a breech block having a cylinder for receiving a missile to be positioned in said eardrum, said breech block being mounted in said body between an open position permitting loading of the missile therein and a closed position aligning the receiving cylinder in the breech block with the said auxiliary bore, and means for selectively controlling the passage of air through said auxiliary bore for propelling the missile into and through said main bore.

4,712,538

VIBRATORY SAUNA

Laurie S. Hardie, 8 View Avenue, Surfers Paradise, Queensland, and Leonard J. Coleman, 5 Seafarer Court, Paradise Waters, Queensland, both of Australia (4217)

Continuation-in-part of Ser. No. 551,958, Nov. 15, 1983, Pat. No. 4,565,188. This application Sep. 4, 1985, Ser. No. 772,726 The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

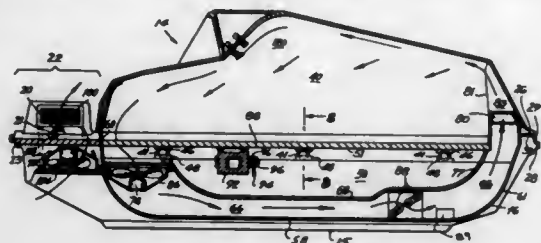
Int. Cl.⁴ A61H 29/00

U.S. Cl. 128—24.1

47 Claims

1. A vibratory sauna comprising:
a housing including a lower housing member and an upper closure member forming a cover rotatably connected to said lower housing member, said lower housing member including a base,
a support member mounted on said lower housing member oriented in a substantially horizontal plane adapted for supporting the torso of a person in a supine position, head support means located adjacent to said lower housing member and outwardly of said closure member to form a longitudinal extension of said support member,

resilient mounting means positioned in said lower housing member for supporting said support member, vibration means operatively connected to said support member for vibrating said support member, said cover member forming an upper compartment, said lower housing member forming a chamber below said support member, heating means for heating unheated air, airflow generation means for forcing heated and unheated air, and chamber means positioned within and mounted in said chamber,



ber, said heating means being positioned in said chamber means, and said airflow generation means being associated with at least one inlet and at least one outlet of said chamber means, said chamber means being for receiving unheated air from said compartment at said at least one inlet and passing said unheated air to said at least one outlet back to said compartment in a flow of air creating a continuous closed circulation of air in said housing, said continuous closed circulation of air including a flow of heated air above said support member so as to contact the person lying thereon while said support member is adapted to be simultaneously vibrated.

4,712,539

PRESSURE APPLYING APPARATUS

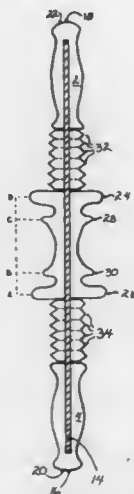
Jung J. Kim, 1916 Stanley Ave., Rockville, Md. 20851

Filed Jun. 26, 1985, Ser. No. 748,827

Int. Cl.⁴ A61H 15/00

U.S. Cl. 128—57

7 Claims



1. In an apparatus for use in the related sciences of accupressure, chiropractic and massotherapy, having rolling elements supported on a central shaft disposed between two handles fixedly connected to opposite ends of the central shaft, the improvement comprising:

a first accupressure means for back-massaging comprising a rolling mid-portion, rotatably supported on the shaft, and having two widely spaced, relatively large diameter outer discs defining a first rolling element for applying pressure to the back area of a user, and second accupressure means for neck-massaging comprising a long concave portion

axially outwardly terminated by two inner discs having a diameter smaller than the outer discs, and being spaced slightly inwardly from the outer discs, defining a second rolling element for applying pressure to the neck area of a user, the inner discs being separated by the long concave surface which is concave in cross-section, the first means for back massaging and the second means for neck massaging comprising a unitary rolling element,

two accupressure means for foot-massaging comprising two opposite independently rolling side portions, each being independently rotatably supported on the shaft between flat proximal ends of the handles and flat distal ends of the mid-portion and having a plurality of radially extending thin outer edge rolling surfaces sloping inwardly to solid inner cores and defining third and fourth independently rolling elements for applying pressure to the foot area of a user,

the handles being solid and distal ends of the handles being rounded to provide blunt, pressure applying means for applying pressure to various points and areas of the body by applying light thrusts to the body.

4,712,540

CERVICAL COLLAR

Kevin M. Tacker, and Donald Peeler, both of Toledo, Ohio,

assignors to Jobst Institute, Toledo, Ohio

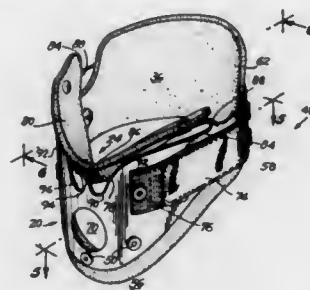
Continuation of Ser. No. 734,981, May 16, 1985, abandoned.

This application Mar. 2, 1987, Ser. No. 21,629

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—76 R

22 Claims



1. A cervical collar comprising:

a flexible panel having an inner surface, an outer surface and a top surface interconnecting said inner and outer surfaces, said panel being formable from a flat configuration to a neck encircling band configuration;

a chin support member connected to said panel and pivotable relative thereto from a first non-chin support position to a second chin support position, said member in said first position located adjacent to said outer surface of said panel, and responsive solely to formation of said panel into said neck encircling band configuration said chin support member pivoting over said top surface into said second position extending across said neck encircling band for providing support to a wearer's chin; and means for retaining said panel in said neck encircling band configuration.

4,712,541

BONE NAIL AND INSTRUMENTS FOR THE TREATMENT OF FRACTURES

Hans E. Harder, Probstelerhagen, and Hermann Kramer, Neumunster, both of Fed. Rep. of Germany, assignors to Howmedica International, Inc., Kiel, Fed. Rep. of Germany

Continuation of Ser. No. 493,887, May 12, 1983, abandoned.

This application Dec. 19, 1986, Ser. No. 943,970

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 8214493[U]; European Pat. Off., Mar. 18, 1983, 83102694.3

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 YY

4 Claims



1. A thin, elongated flexible and resilient bone nail, having a longitudinal axis and having a substantially uniform cross-section along the length thereof, for the treatment of fractures in the proximal femur zone, comprising a distal end portion adapted to be disposed at the outer surface of the femoral condyle and having a free end terminating in a distal tip of the nail, a proximal end portion adapted to be seated in the natural femoral head and having a free end, and a curved intermediate portion between said end portions, with said proximal end portion being provided at the free end thereof with a rounded-off thickened portion and with the cross-sectional configuration of said distal end portion of the nail being polygonal with edges rounded off and identical to the cross-sectional configuration of the remainder of the nail, except for said rounded-off thickened portion and a recess in said distal end portion formed by a solid polygonal cutout having a bottom surface substantially parallel to said longitudinal axis and a plurality of additional surfaces coincident with a partial perimeter of said polygonal cross-section, said recess forming a reduced gripping portion which is polygonal in cross section for engagement with a driving tool and said recess being spaced from the distal tip of the nail by a length.

4,712,542

SYSTEM FOR ESTABLISHING LIGAMENT GRAFT ORIENTATION AND ISOMETRY

Dale M. Daniel, Lamesa, and Kay R. Watkins, San Diego, both of Calif., assignors to Medmetric Corporation, San Diego, Calif.

Filed Jan. 30, 1986, Ser. No. 880,055

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 V

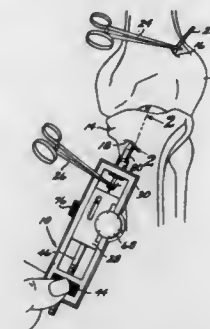
15 Claims

1. A method for establishing skeletal referenced isometric positioning and tensioning of a ligament graft between fixation sites on a pair of articulated bones, said method comprising the steps of:

establishing the locations of said fixation sites; drilling openings in said bones between said fixation sites; skeletally fixing a first portion of an instrument adjacent one of said fixation sites; disposing a tension element through said openings, temporarily fixing one end of said element at the other of said

fixation sites, and temporarily fixing the other end of said element to a second portion of said instrument which is movable relative to said first portion for displacement of said element.

determining the amount of the movement of said second portion relative to said first portion, and the amount of said bias to establish the amount of said displacement and tension during flexion of said bones and, if necessary,



reestablishing said fixation sites and openings until said amount of said displacement and said tension satisfy predetermined criteria; drilling larger graft openings in said bones between the established fixation sites; repeating the foregoing skeletally fixing, disposing and determining steps relative to said graft; and fixing said graft to the established fixation sites.

4,712,543

PROCESS FOR RECURVING THE CORNEA OF AN EYE

Neville A. Baron, Medical Plz. #66, Rte. 46, Dover, N.J. 07801

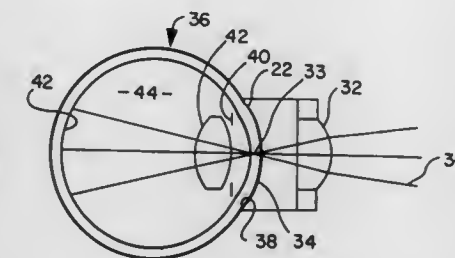
Continuation-in-part of Ser. No. 340,978, Jan. 20, 1982, Pat. No.

4,461,294. This application Jul. 23, 1984, Ser. No. 633,197

Int. Cl.⁴ A61B 17/36

U.S. Cl. 128—303.1

5 Claims



1. A process for predictably recurving the cornea of an eye which comprises disposing light-absorbing color bodies in said cornea and thereafter vaporizing at least some of said color bodies by applying thereto light energy focused thereon and defocused within said eye behind said cornea, said vaporization being effected according to a preselected patterned design and generating thereby corneal recurving scar tissue in said cornea according to said preselected patterned design.

4,712,544

ELECTROSURGICAL GENERATOR

Frieder H. Enaslin, Rochester, N.Y., assignor to Castle Company, Rochester, N.Y.

Filed Feb. 12, 1986, Ser. No. 828,472

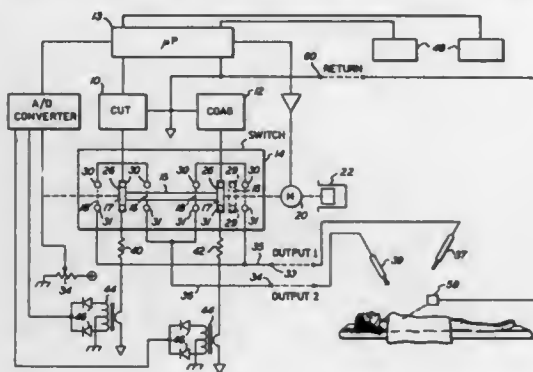
Int. Cl.⁴ A61B 17/39

U.S. Cl. 128—303.14

7 Claims

1. An electrosurgical generator for use with a living being comprising: at least one electrical power generating means;

a first output port;
 a first output circuit connected to said first output port for connecting the output of said at least one electrical power generating means to said first output port;
 a measuring circuit having a known constant load, said measuring circuit being isolated from said first output circuit;
 switch means for selectively connecting the output of said at least one power generating means to said measuring circuit or said first output circuit;
 means for determining real power output of said at least one power generating means when said at least one power generating means is connected to said measuring circuit, said measuring circuit comprising a transformer placed in series with said known constant load for measuring the output current of said at least one power generating means, a full wave rectifier connected to the output of the secondary side of said transformer, an A/D converter connected to said rectifier, a microprocessor connected to said A/D converter for receiving a signal from said A/D converter and for displaying true power output, said at



least one electrical power generating means comprises two electrical power generating means, said electrosurgical generator comprising a second output port, a second output circuit connected to said second output port for connecting said first or second electrical power generating means to said second output port, said switch means being capable of allowing said first or second power generating means to be alternately selectively electrically connected to said first or second output circuit, said switch means having a first set and second set of corresponding input and output contacts associated with each of said power generating means so as to provide a first and second axially spaced switch positions associated with each of said first and second electrical power generating means, a movable switch member for moving between said first and second switch positions associated with each of said electrical power generating means at the same time, said movable member having means for providing electrical continuity between said one set of input and output contacts associated with each power generating means with said first or second output circuit.

4,712,545

SURGICAL INSTRUMENT

George P. Honkanen, Scituate, Mass., assignor to Acufex Microsurgical, Inc., Norwood, Mass.

Continuation of Ser. No. 596,923, Apr. 5, 1984, abandoned. This application Sep. 5, 1986, Ser. No. 904,949

Int. Cl.⁴ A61B 17/28, 17/32

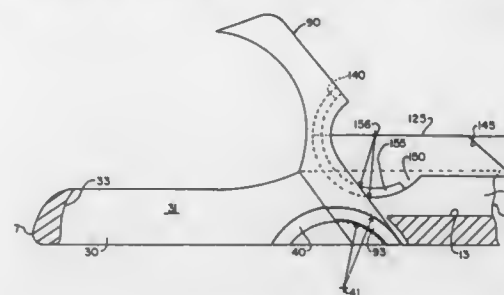
U.S. Cl. 128—305

43 Claims

1. A surgical punch comprising a first stationary jaw member, a second movable jaw member, and a coupling member that is movable relative to said first stationary jaw member, one of said jaw members comprising at least one first arcuate flange and the other of said jaw members comprising at

least one first arcuate groove, said at least one first arcuate flange being slidably disposed in said at least one first arcuate groove so as to pivotally couple said second movable jaw member to said first stationary jaw member, whereby said second movable jaw member is capable of pivotal movement towards and away from said first stationary jaw member, with said at least one first arcuate flange and said at least one first arcuate groove having a first center of curvature that is fixed in position relative to said first stationary jaw member when said at least one first arcuate flange is disposed in said at least one first arcuate groove, and

one of said second movable jaw member and said coupling member comprising at least one second arcuate flange and the other of said second movable jaw member and said coupling member comprising at least one second arcuate groove, said at least one second arcuate flange being slidably disposed in said at least one second arcuate groove so as to pivotally couple said coupling member to said second movable jaw member, with said at least one



second arcuate flange and said at least one second arcuate groove having a second center of curvature that is fixed in position relative to said coupling member and is not fixed in position relative to said first stationary jaw member when said at least one second arcuate flange is disposed in said at least one second arcuate groove, and one of said centers of curvature is displaced laterally from said stationary jaw member and said coupling member,

whereby (a) when said coupling member is moved in a first direction relative to said first stationary jaw member, said second movable jaw member will open away from said first stationary jaw member, and (b) when said coupling member is moved in a second opposite direction relative to said first stationary jaw member, said second movable jaw member will close towards said first stationary jaw member, said first and second jaw members being arranged so that body tissue located between said first and second jaw members may be severed in a punching motion as said jaw members are opened and closed relative to one another by movement of said coupling member relative to said first stationary jaw member.

4,712,546

CUTTING INSTRUMENT FOR NASAL SURGERY WHICH CUTS PARALLEL TO ITS LENGTH

Joel M. Noe, 59 Baxter Rd., Brookline, Mass. 02146

Filed Mar. 11, 1982, Ser. No. 357,265

Int. Cl.⁴ A61F 17/32

U.S. Cl. 128—305

5 Claims

1. A cutting instrument for human nasal surgery consisting of:

an elongated portion extending along a first direction and having a first end means which is to be placed into a nostril during nasal surgery;

a single cutting extension extending from one side of said elongated portion in a second direction from said elongated portion at approximately ninety degrees from said first direction which has first and second cutting edges which point in opposite directions parallel to said first

direction and which extend in said second direction and which extension has a blunted non cutting end which



extends beyond said cutting edges away from said elongated portion in said second direction.

4,712,547

INSTRUMENT FOR SLITTING STENOSSES IN BODILY PASSAGES

Ludwig Bonnet, Jahnstrasse 28, 7134 Knittlingen, Fed. Rep. of Germany

Continuation of Ser. No. 862,690, May 13, 1986, abandoned.

This application Jun. 25, 1987, Ser. No. 67,431

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520524

Int. Cl.⁴ A61B 17/32

U.S. Cl. 128—311

17 Claims



9. A ureterotome for slitting stenoses in a ureter, comprising: an elongated flexible shaft having first and second opposite ends and a passage extending along the longitudinal extent of said shaft, said first end having a slot laterally of said passage and defining an endmost portion of said ureterotome;

a blade pivotally mounted at said first end of said shaft in said slot for movement between a first position extending axially beyond said endmost portion of said ureterotome and a second position angularly related to said first position and extending laterally to one side of said shaft,

a first cutting edge of said blade being directed out said first end of said ureterotome when said blade is in said first position to slit a stenoses open wide enough to admit said ureterotome when said shaft is moved axially against the stenoses,

a second cutting edge of said blade being sheathed in said slot when said blade is in said first position and extending from said slot laterally of said shaft when said blade is in said second position; and

means at said second end of said shaft for selectively moving said blade between said first position and said second position.

4,712,548

BLOOD LANCING DEVICE

Hans Enstrom, Graners Grand 1, S-151 57 Sodertalje, Sweden

Continuation-in-part of Ser. No. 541,989, Oct. 14, 1983, Pat. No. 4,676,244, which is a continuation-in-part of Ser. No. 245,080, Mar. 18, 1981, abandoned. This application Dec. 19, 1985, Ser. No. 810,924

Claims priority, application Sweden, Apr. 23, 1980, 80 03057

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

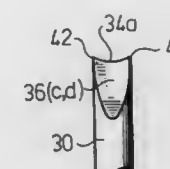
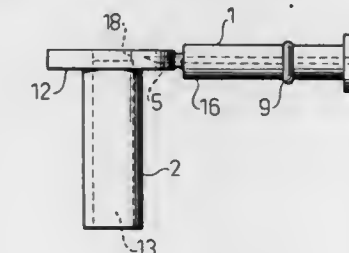
Int. Cl.⁴ A61B 17/32

U.S. Cl. 128—314

19 Claims

1. A disposable miniature lancing device for obtaining a drop of blood by cutting the skin without passing through the body

of the patient comprising a cylinder and a plunger, at least said cylinder being formed of a material distendable under force applied thereto, said plunger being insertable at its front end into said cylinder, said plunger and said cylinder having a slight clearance enabling said plunger to be freely slidable within said cylinder, said plunger having a radially extending flange at its rear end engageable with the rear end of said cylinder for limiting passage of said plunger through said cylinder and defining the full insertion of said plunger in said cylinder, a lancet integrally formed with said plunger and



having a cutting edge projecting axially from said front end of said plunger, said plunger, cylinder and lancet being so formed that said lancet protrudes from the front end of said cylinder a predetermined distance when said plunger is fully inserted within said cylinder, said cutting edge extending transversely to said plunger in a longitudinal plane passing through the central axis of said lancet and having a pair of identical inclined surfaces extending on either side of said longitudinal plane from said cutting edge and forming uniform angles with the central plane.

4,712,549

AUTOMATIC HEMOSTATIC CLIP APPLIER

Rudolph Peters; Ronald Peters, and William Taylor, all of Oakland, Calif., assignors to Edward Weck & Co., Research Triangle Park, N.C.

Filed Jul. 1, 1985, Ser. No. 750,158

Int. Cl.⁴ A61B 17/12

U.S. Cl. 128—325

24 Claims

1. A tool for storing, dispensing, and applying a plurality of hemostatic clips in serial fashion, comprising;

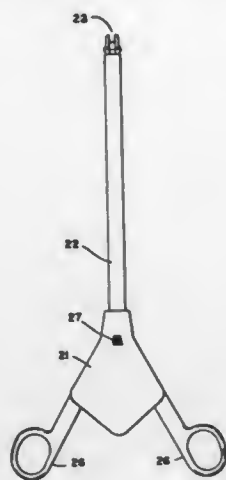
magazine means for storing a plurality of hemostatic clips in column fashion;

dispensing means for selectively removing and dispensing a hemostatic clip from one end of said column in serial, sequential fashion;

jaw means for retaining and crimping a hemostatic clip; feed means for transferring a dispensed clip from said column to said jaw means,

actuating means for operating said feed means, jaw means, and dispensing means in sequential interaction, including a flexible band coupled to said feed means, a pulley member about which said flexible band is passed, lever means for pulling said flexible band around said pulley member in such a direction to withdraw said feed means from said jaw means, a jaw housing extending from said actuating means and adapted for reciprocal translation to close and open said jaw means, means for joining said pulley member to one end of said jaw housing in force translating

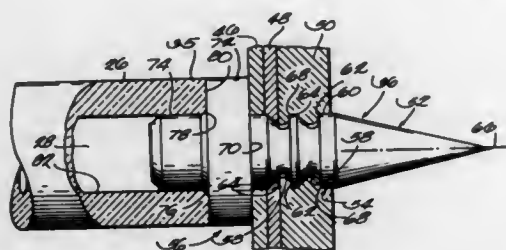
fashion, so that tension on said flexible band urges said jaw housing to extend from said tool, wherein said feed means includes a feeder slide assembly extending longitudinally from said tool in translatable fashion, and further includ-



ing first spring means extending between said proximal end of said feeder slide assembly and said proximal end of said jaw housing and adapted to be compressed elastically therebetween.

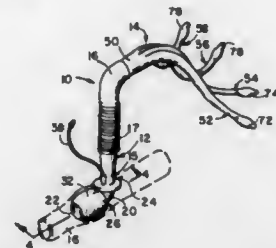
4,712,550 RETINAL TACK

Kevin B. Sinnott, W273S8555 Hillview Dr., Mukwonago, Wis. 53186
Continuation of Ser. No. 720,988, Apr. 8, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 4,798
Int. Cl.⁴ A61B 17/04; F16B 15/08
U.S. Cl. 128—334 R 15 Claims



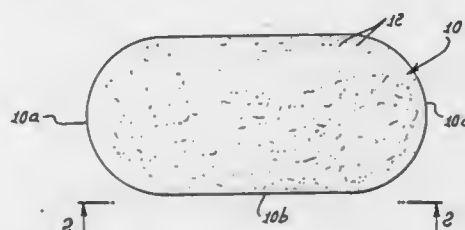
1. A retinal tack for securing a human patient's detached retina to the choroid comprising
a pointed forward end portion for piercing through the patient's retina, choroid, and sclera;
an elongated retaining portion extending rearwardly from said forward end portion and having a longitudinal dimension approximating the thickness of the patient's retina, choroid, and sclera, said retaining portion including one or more circumferentially-extending grooves for receiving sclera tissue displaced by said forward end portion during insertion therethrough; and
an enlarged head extending rearwardly from said retaining portion and having a radially outwardly extending flange portion for engaging the retina in the area surrounding the opening formed by said forward end portion.

4,712,551
VASCULAR SHUNT
Simon B. Rayhanabad, P.O. Box 2200, Long Beach, Calif. 90801-2200
Filed Oct. 14, 1986, Ser. No. 918,148
Int. Cl.⁴ A61B 17/04; A61M 5/00, 21/00
U.S. Cl. 128—334 R 18 Claims



1. A vascular shunt comprised of a single, flexible tubular inlet end, an inlet tip projecting therefrom and turned to form a mouth and adapted for insertion into an incision surgically formed into the wall of an aorta so that said mouth is directed upstream in said aorta, releasable inlet sealing means connected to said inlet tip to block blood flow in said aorta beyond said inlet tip, a plurality of tubular branches in flow communication with said tubular inlet end each terminating in a discharge tip of internal cross section reduced from the internal cross section of said inlet tip, and separate releasable discharge sealing means connected to each of said discharge tips, whereby said discharge tips are each insertable into selected arteries and said discharge sealing means limits internal bleeding at the interfaces between said discharge tips and said arteries.

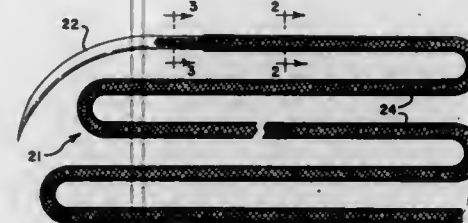
4,712,552
CUSHIONED ABRASIVE COMPOSITE
William E. Pangburn, Ventura, Calif., assignor to William W. Haefliger, Pasadena, Calif., a part interest
Continuation of Ser. No. 580,190, Feb. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 356,830, Mar. 10, 1982, Pat. No. 4,459,987. This application Jun. 23, 1986, Ser. No. 831,808
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.⁴ A61B 17/00; B24B 3/46
U.S. Cl. 128—355 10 Claims



1. A composite cosmetic device, comprising
(a) a tough, flexible first sheet of silicone polymer, and having first and second sides,
(b) abrasive particulate consisting of pumice carried by and protruding from the first side of the sheet and exposed for rubbing contact with human skin or other work, said sheet being stretchable, and being formed from a layer of initially incompletely cured silicone polymer with which said particulate has been combined to adhere to the sheet, the sheet then allowed to cure, and
(c) other sheet means attached to said silicone polymer sheet and projecting from said second side thereof,
(d) said particulate penetrating, and anchored by, the silicone polymer of the first sheet at said first side of the sheet,
(e) said other sheet means including a release liner bonded to

said first sheet, and auxiliary sheet structure carrying said release liner.

4,712,553
SUTURES HAVING A POROUS SURFACE
David C. MacGregor, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed May 30, 1985, Ser. No. 739,545
Int. Cl.⁴ A61F 2/00; A61L 17/00
U.S. Cl. 128—335.5 13 Claims

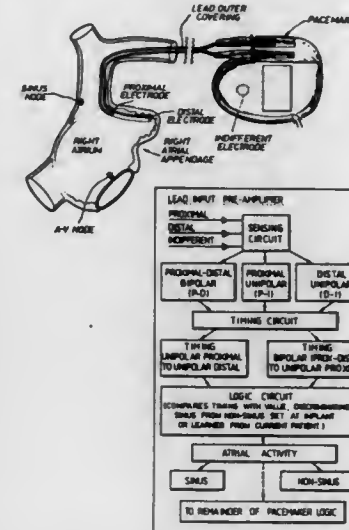


1. A non-braided surgical suture, comprising:
a suture material including:
a flexible, non-metallic elongated central core member having an outside diameter that is less than that of the non-braided surgical suture;
a generally cylindrical porous elongated flexible, non-metallic portion that has an inside diameter which is substantially the same as said central core member outside diameter and that has an outside diameter that is no larger than that of a surgical suture, said generally cylindrical porous elongated flexible portion closely overlying said elongated central core member, and said generally cylindrical porous elongated flexible portion having a porous surface that promotes tissue ingrowth into said porous elongated flexible portion; and
said generally cylindrical elongated flexible portion includes a spun filament that is wound onto the elongated central core member into multiple layers that cross each other in order to form said porous surface.

4,712,554
ELECTRONIC SYSTEM TO DISTINGUISH BETWEEN SINUS AND NONSINUS ATRIAL DEPOLARIZATIONS WHICH DO NOT STIMULATE VENTRICULAR DEPOLARIZATIONS IN RESPONSE TO NONSINUS ATRIAL DEPOLARIZATIONS
Arthur Garson, Jr., Houston, Tex., assignor to Baylor College of Medicine, Houston, Tex.
Filed Apr. 8, 1985, Ser. No. 721,247
Int. Cl.⁴ A61N 1/36
U.S. Cl. 128—419 PG 17 Claims

1. An electronic system for pacing a heart that distinguishes between sinus and nonsinus atrial depolarizations and that does not stimulate ventricular depolarizations in response to nonsinus atrial depolarizations, comprising:
an electric lead having first and second ends;
at least two electrodes;
means attaching one electrode to a first end of the lead and means attaching the other electrode to the lead for location in the right atrium when the first end is implanted in the right atrial appendage;
a sensing circuit including an indifferent electrode connected to the second end of the electric lead, said sensing circuit for detecting voltage difference between one of the electrodes and the indifferent electrode and for detecting voltage difference between the two electrodes;
a timing circuit connected to the sensing circuit said timing circuit for determining the time interval between the time a voltage difference is detected between one electrode and

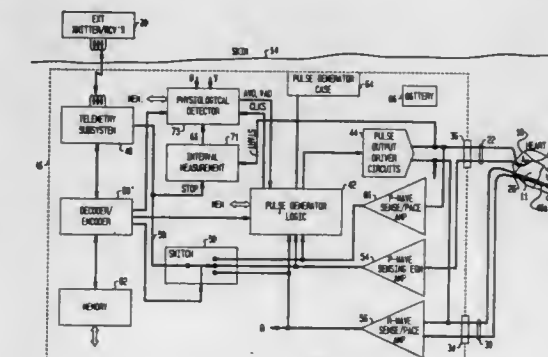
an indifferent electrode and the time a voltage difference is detected between the two electrodes;
a logic circuit connected to the timing circuit said logic circuit for comparing the time intervals determined by the timing circuit to time intervals indicative of sinus atrial depolarizations; and
a ventricular stimulating circuit connected to the logic cir-



cuit said ventricular stimulating circuit that does not stimulate ventricular depolarization when the comparison made by the logic circuit indicates that the immediately preceding atrial depolarization was nonsinus said ventricular stimulating circuit effective to stimulate ventricular depolarization only when an immediately preceding atrial contracting is a spontaneous or pacemaker stimulated sinus atrial depolarization.

4,712,555
PHYSIOLOGICALLY RESPONSIVE PACEMAKER AND METHOD OF ADJUSTING THE PACING INTERVAL THEREOF

Hans T. Thornander, Paris, France; John W. Poore, Chatsworth, Calif.; Jason A. Sholder, Canoga Park, Calif.; James R. Thacker, Sangus, Calif., and David C. Amundson, Pacific Palisades, Calif., assignors to Siemens-Elema AB, Solna, Sweden
Continuation-in-part of Ser. No. 662,723, Oct. 19, 1984. This application Mar. 27, 1985, Ser. No. 716,831
Int. Cl.⁴ A61N 1/36
U.S. Cl. 128—419 PG 47 Claims



1. A cardiac pacemaker for controlling the rate at which a heart beats as a function of physiological need, said heart beat rate defining a cardiac cycle during which atrial and ventricular events occur, said pacemaker comprising:

means for generating an atrial stimulation pulse (A);
 means for delivering said atrial stimulation pulse to an atrium of the heart in order to trigger atrial depolarization (P);
 means for sensing the occurrence of said triggered atrial depolarization;
 means for measuring the time interval between the generation of said atrial stimulation pulse and said triggered atrial depolarization, said atrial depolarization time interval being referred to as an A-P interval, said A-P interval varying as a function of physiological need; and
 means for adjusting the pacemaker-controlled rate as a function of the measured A-P interval;
 whereby the pacemaker-controlled rate is adjusted as a function of physiological need as sensed by measuring said depolarization time interval.

4,712,556

PACEMAKER AND METHOD FOR VENTRICULAR RATE LIMIT OPERATION AND TERMINATION OF PACEMAKER MEDIATED TACHYCARDIA

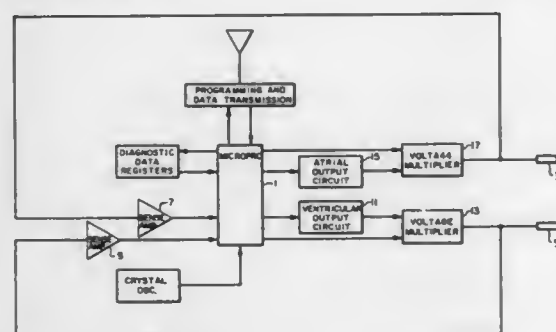
Ross G. Baker, Jr., Houston, Tex., assignor to Intermedics, Inc., Angleton, Tex.

Continuation of Ser. No. 443,559, Nov. 22, 1982, abandoned.
 This application Sep. 25, 1985, Ser. No. 780,702

Int. Cl.⁴ A61N 1/36

U.S. Cl. 128—419 PG

38 Claims



1. A heart pacemaker, comprising:
 means for sensing electrical events that occur in the atrium of a heart;
 means for sensing electrical events that occur in the ventricle of the heart;
 means for selecting an atrial refractory period;
 means for timing said atrial refractory period from detected electrical events of the ventricle;
 means for pacing the ventricle of the heart in synchronism with atrial events detected outside said atrial refractory period;
 means for selecting a value of a ventricular rate limit that defines the maximum rate at which the ventricle can be paced;
 said means for pacing the ventricle including means for pacing the ventricle at a rate that does not exceed said value of the ventricular rate limit;
 means for counting a preselected number of successive atrial synchronous paces of the ventricle at the ventricular rate limit; and
 means for preventing a pace of the ventricle in response to an atrial event sensed outside said atrial refractory period and after said preselected number of successive atrial synchronous paces of the ventricle is counted.

4,712,557 A PACER INCLUDING A MULTIPLE CONNECTOR ASSEMBLY WITH REMOVABLE WEDGE AND METHOD OF USE

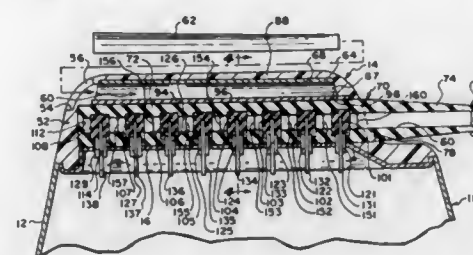
Donald L. Harris, Miami, Fla., assignor to Cordis Leads, Inc., Miami, Fla.

Filed Apr. 28, 1986, Ser. No. 856,484

Int. Cl.⁴ A61N 1/36

U.S. Cl. 128—419 P

24 Claims



- (b) waiting a period of time sufficient for the ligand to bind to the neuroreceptors;
- (c) measuring emissions from the tracer substance which are indicative of the number of the patient's neuroreceptors and the degree of occupancy or blocking of the patient's neuroreceptors;
- (d) calculating the number of neuroreceptors and the degree of occupancy or blocking of the neuroreceptors by another, treatment, drug or substance utilizing a mathematical model computation;
- (e) comparing the calculations obtained in step (d) with an intra-person control, if one is available for the patient, or if an intra-person control for the patient is not available, comparing the calculations with an inter-person control, to determine the degree of drug response; and
- (f) gauging further treatment of the patient with the treatment drug or substance based upon the comparison made in step (e).

4,712,562

OUTPATIENT MONITORING SYSTEMS

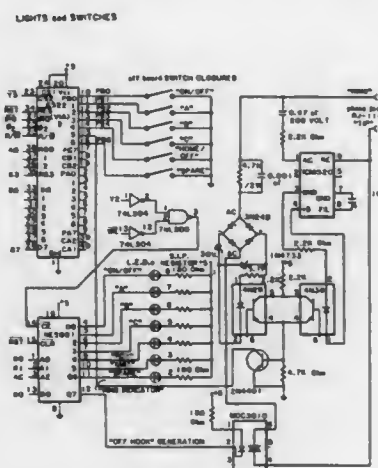
Jacques J. Ohayon, 316 Oakville Dr., Pittsburgh, Pa. 15220, and Glen P. Williams, Pittsburgh, Pa., assignors to Jacques J. Ohayon, Pittsburgh, Pa.

Continuation of Ser. No. 689,655, Jan. 8, 1985, abandoned. This application Oct. 1, 1986, Ser. No. 914,088

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128—672

3 Claims



1. A system for providing information pertaining to a blood pressure of a patient utilizing telephone lines, including a ring line and a tip line, said system comprising:

means for generating signals representing the level of blood pressure of a patient and signals representing the identity of to which patient, of at least two patients, the blood pressure signals pertain, said signals being suitable for transmission over said telephone lines;

a remote central digital processor; and

means for transmitting said blood pressure signals and said patient identifying signals over said telephone lines to said remote central digital processor, and including an off hook detecting circuit having voltage measuring means for measuring voltage across said ring and tip lines, and switching means responsive to the measured voltage and operative to connect said transmitting means to the telephone lines only when said voltage is above a predetermined voltage indicating that the telephone lines are not in use,

said central processor including storage means which stores said blood pressure signals in a form suitable for latter access, and analyzing means which analyzes said blood pressure signals according to predetermined criteria.

4,712,563 METHOD OF AND APPARATUS FOR DETERMINING THE DIASTOLIC AND SYSTOLIC BLOOD PRESSURE OF A PATIENT

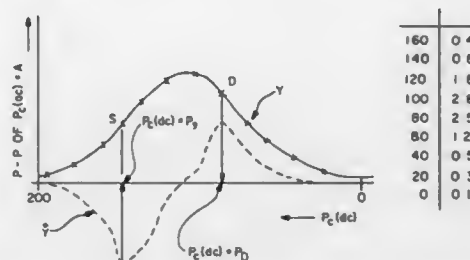
William T. Link, Berkeley, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 28, 1986, Ser. No. 868,400

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128—681

4 Claims



1. A method of determining the diastolic and systolic blood pressures of a particular patient, comprising the steps of:

(a) placing blood pressure cuff means adjacent a particular artery of said patient;

(b) using means cooperating with said cuff means, pressurizing said cuff means to a number of different cuff pressure levels from a level below the anticipated diastolic pressure of the patient to a pressure above the patient's anticipated systolic pressure and generating cuff pulses having peak to peak amplitude values corresponding to and dependent on said different cuff pressure levels; and

(c) electronically obtaining the diastolic and systolic pressures of said patient mathematically using said cuff pulses, said step of obtaining said diastolic and systolic pressures mathematically including the steps of:

(i) generating a curve corresponding to the peak to peak amplitude values of said cuff pulses as a function of said different cuff pressure levels,

(ii) differentiating said curve with respect to said different cuff pressure levels, said differentiated curve including a first peak point at a cuff pressure level equal to the diastolic pressure of said patient and a second peak point at a cuff pressure equal to the systolic pressure of said patient, and

(iii) from said differentiated curve, obtaining the patient's diastolic and systolic pressures by identifying said first and second peak points and determining the cuff pressures at those points.

4,712,564

BLOOD PRESSURE MEASURING APPARATUS

Keiji Yamaguchi, Shimizu, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Feb. 11, 1986, Ser. No. 828,189

Claims priority, application Japan, Feb. 13, 1985, 60-24460

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128—682

16 Claims

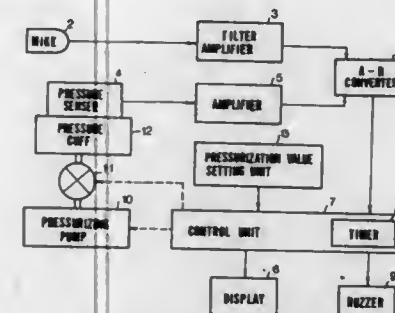
1. A blood pressure measuring apparatus in which a pressure cuff is adapted to be affixed to a patient, comprising:

pressurizing means for feeding a fluid into the pressure cuff to effect pressurization thereof;

sensing means for sensing blood flow sounds produced by a blood vessel of the patient when the pressure cuff, pressurized by said pressurizing means, is depressurized and for producing an output signal indicative of the blood flow sounds;

first measuring means for measuring elapsed time from when depressurization starts until said sensing means first generates the output signal indicative of the blood flow sound; second measuring means for measuring a pulse interval

between blood flow sounds in dependence upon the output signal from said sensing means; and



decision means for deciding whether pressurization is inadequate on the basis of a relationship between the elapsed time measured by said first measuring means and the pulse interval measured by said second measuring means.

4,712,565

METHOD AND APPARATUS FOR EVALUATING OF ARTIFICIAL HEART VALVES

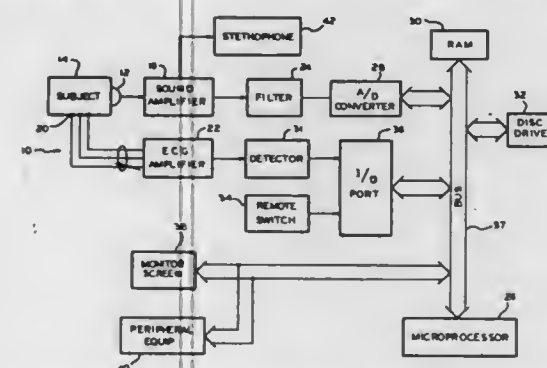
Hart V. Katz, Willowdale, Canada, and Gerald A. Kien, Tower Lakes, Ill., assignors to International Acoustics Incorporated, Palatine, Ill.

Filed Oct. 27, 1986, Ser. No. 923,576

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128—715

16 Claims



1. An apparatus for non-invasive evaluation of implanted artificial heart valves, comprising:

transducer means for converting heart sounds into electrical signals corresponding to a phonocardiogram;

amplifying means for amplifying the electrical signals and for generating amplified electrical signals;

means for filtering said amplified electrical signals and for generating filtered electrical signals;

means for converting said filtered electrical signals into a series of digital signals;

microprocessor means responsive to said series of digital signals for processing a portion of said series of digital signals corresponding to valve sounds in the phonocardiogram;

a deconvolution algorithm for transforming said portion of said series of digital signals into an impact history signal to characterize the occluding elements of the valve;

means for converting said impact history signal into a digital output signal; and

means for recording graphically said digital output signal.

4,712,566

DEVICE FOR RECORDING PHYSIOLOGICAL PRESSURES

Bertil Hök, Västerås, Sweden, assignor to Radisensor AB, Västerås, Sweden

PCT No. PCT/SE86/00005, § 371 Date Sep. 5, 1986, § 102(e)

Date Sep. 5, 1986, PCT Pub. No. WO86/03956, PCT Pub. Date Jul. 17, 1986

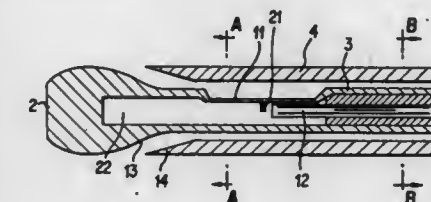
PCT Filed Jan. 9, 1986, Ser. No. 915,066

Claims priority, application Sweden, Jan. 10, 1985, 8500104

Int. Cl.⁴ A61B 5/00

U.S. Cl. 128—748

20 Claims



1. A device for recording physiological pressures, comprising an essentially threadlike guide (3) inserted into a catheter (4), and at least one sensor element (1) provided near the tip of the guide (3), said at least one sensor element (1) producing an electrical or optical signal representing the hydrostatic pressure prevailing at the sensor element,

characterized in that the guide (3) and the catheter (4) have at least one sealing surface (5, 6; 15, 16) each which are brought into contact with each other and which open and shut-off the hydraulic communication between the sensor element (1) and its surrounding medium by means of axial or rotary motion of the guide (3) in relation to the catheter (4), whereby the sensor element (1), via the interior of the catheter (4), can be brought into pressure communication with a pressure generator (7) connected to a proximal end of the catheter (4), said pressure generator being arranged to generate and transmit known calibration pressures to the sensor element (1).

4,712,567

LIQUID METER ASSEMBLY

Henrick K. Gille, Van Nuys; Richard S. Willing, Granada Hills; William G. Bloom, Northridge; Bernard Siegel, Los Angeles; Tsang Cheung, La Canada; Richard Lobodzinski, Sunland, and Keith Gilroy, Valencia, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 14, 1985, Ser. No. 712,953

Int. Cl.⁴ A61M 1/00

U.S. Cl. 128—771

32 Claims

1. A liquid meter assembly comprising:

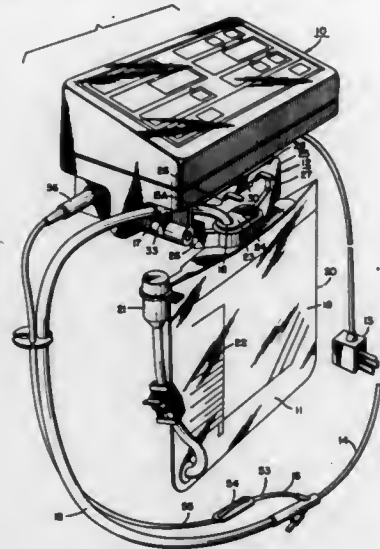
a container for collecting the liquid;

an electrical strain gauge suspension means for supporting the container and for determining the weight of liquid collected in the container;

a handle means on the container for interconnecting with the strain gauge suspension means;

a length of tubing attached to the container and adapted for interconnecting with the source of the liquid;

means to substantially inhibit influence on weight determination due to any movement of said tubing; and



a power supply means for providing power to the strain gauge suspension means.

4,712,568

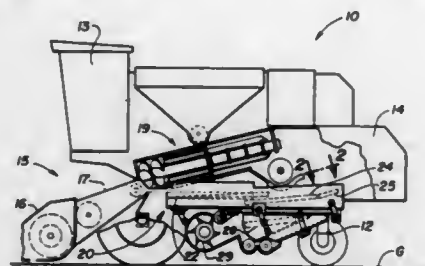
COMBINE SIEVE ADJUSTMENT MECHANISM

Russell W. Strong, Brugge, Belgium, and Kenneth S. Rutt, Lancaster, Pa., assignors to New Holland Inc., New Holland, Pa.
Filed Mar. 10, 1986, Ser. No. 837,913

Int. Cl.⁴ A01F 12/44

U.S. Cl. 130—272

10 Claims



1. In a combine having a mobile frame adapted for movement over a field to harvest crop material therefrom; crop gathering means supported from said frame to gather crop material, including both grain crop and trash material, from the field; threshing and separating means mounted on said frame to receive crop material from said crop gathering means and process said crop material to remove said grain crop from the trash material; and cleaning means supported on said frame proximate to said threshing and separating means to receive grain crop therefrom and further separate said grain crop from any residual trash material associated therewith, said cleaning means including an adjustable sieve having a plurality of transversely extending slats pivotally mounted in a sieve frame and an adjustment mechanism operatively connected to said slats to pivotally move said slats within said sieve frame, said slats defining openings through said sieve to permit the passage of said grain, the size of said openings being variable with the pivoted movement of said slats, an improved adjustment mechanism comprising:

a fore-and-aft extending slat connection member interconnecting said slats to effect a simultaneous pivotal movement thereof upon a fore-and-aft movement of said slat connection member;

an upwardly extending pivot member pivotally mounted on said sieve frame and connected to said slat connection member so that a pivotal movement of said pivot member

causes a corresponding fore-and-aft movement of said slat connection member; and

a retractable handle connected to said pivot member and being movable into an actuation position in which said handle extends upwardly above said sieve and can be operable to effect pivotal movement of said pivot member, said handle also being movable to a retracted position to minimize the obstruction therefrom to the flow of crop material across said sieve.

4,712,569

PIPE STEM REPLACEMENT KIT

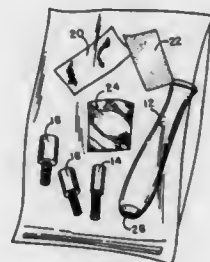
Alfred S. Baier, 91 Pleasant St., Apt. D-1; P.O. Box 113, Medfield, Mass. 02052

Filed Feb. 6, 1986, Ser. No. 826,678

Int. Cl.⁴ A24F 9/00

U.S. Cl. 131—328

3 Claims



1. A pipe stem replacement kit for user repair of a pipe of the type having an air-flow channel therein leading to a pipe, comprising:

a replacement pipe stem having at one end a mouth piece and having at the other end a threaded aperture defined therein, said threaded aperture being continuous with the air flow of said pipe stem, said pipe stem being curved inwardly at the end having said threaded aperture;

a plurality of tenons having different diameters, each tenon having at one end a cylindrical portion and having at the other end a threaded portion with an aperture there-through for the passing of said air flow, said threaded portion adapted to be inserted and screwed into said threaded aperture in the end of said stem opposite said mouthpiece;

sandpaper for sanding the cylindrical portions of said tenon for insertion into said pipe;

wax to act as a lubricant when applied to said tenon before insertion of said sanded tenon into said pipe;

whereby said kit is to be utilized by determining the diameter of the shank aperture in the pipe in which said replacement pipe stem is to be placed, selecting an appropriate tenon; sanding and testing the fit of the selected tenon by screwing said tenon into said pipe stem, and waxing said tenon for easy insertion of said tenon into said pipe stem aperture until said pipe stem is in place in said pipe.

4,712,570

COMBINATION BRUSH/ROLLER HAIR-GROOMING TOOL

Sebastian Caccioppo, 201 E. 28th St., New York, N.Y. 10016
Filed Mar. 11, 1986, Ser. No. 838,556

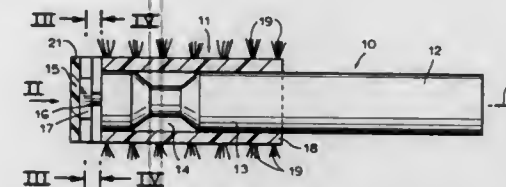
Int. Cl.⁴ A45D 2/00

U.S. Cl. 132—40

4 Claims

1. A hair-grooming tool, comprising a wand extending along a wand axis and having a rear handle portion adapted to be held in the hand and an opposite front portion having a front wand end, said front wand end being provided with a projection extending transversely said wand axis; and a tubular roller sleeve extending along a sleeve axis and having an axially open first roller end and an opposite closed second roller end, said

roller sleeve being provided with radially outwardly projecting bristle tufts, said roller sleeve having at said second roller end two walls extending transversely to said sleeve axis and spaced from one another in an axial direction so as to define a space therebetween, one of said walls being solid while the other of said walls being provided with a transverse slot, and said roller sleeve being provided in said space between said walls with two webs spaced from one another in a circumferential direction, so that said wand can be removably attached to said roller sleeve by passing said projection of said wand in



an insertion direction through said slot of said other wall of said roller sleeve, and then turning said wand and thereby said projection of said wand to a position circumferentially offset from said slot so that said other wall of said roller sleeve than prevents unintentional axial withdrawal of said wand from said roller sleeve in a direction opposite to said insertion direction during operation, by abutting said projection of said wand against said other wall of said roller sleeve, while said webs of said wand prevent unintentional rotation of said wand relative to said roller sleeve during operation.

4,712,571

NAIL POLISH COMPOSITIONS AND MEANS FOR APPLYING SAME

Harvey M. Remz, Huntington; Phillip J. Gordon, Southbury; John D. Cunningham, Madison, and Joseph D. Melnik, Stratford, all of Conn., assignors to Chesebrough-Pond's, Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 626,307, Jun. 29, 1984, abandoned. This application Jan. 8, 1985, Ser. No. 689,663

Int. Cl.⁴ A45D 40/26; A61K 7/04

U.S. Cl. 132—88.7

27 Claims



1. A low viscosity nail polish composition comprising from about 2.0% to about 40% primary film former selected from the group consisting of nitrocellulose, cellulose propionate, cellulose acetate butyrate, ethyl cellulose, sucrose acetate isobutyrate, polyvinyl acetate, polyvinyl alcohol, acrylic resins, urethane polymers, nylon, polyesters and alkyds; from about 3% to about 24% shade paste comprising 20%–80% pigment in mill base; and an amount of thinner sufficient to render the Brookfield viscosity of the final composition not greater than 200 cps.

25. An applicator means for dispensing the nail polish composition according to claim 1 containing said composition and comprising a pen having a substantially non-bristle nib.

4,712,572

DENTAL FLOSS PACKET AND METHOD FOR ITS MANUFACTURE

William G. Hovel, III, P.O. Box 26766, El Paso, Tex. 79926
Filed Sep. 16, 1986, Ser. No. 907,991

Int. Cl.⁴ A61C 7/00

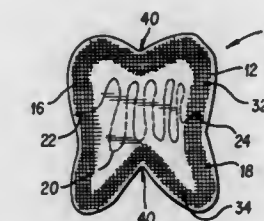
U.S. Cl. 132—89

6 Claims

1. A dental floss packet comprising; first and second overlying sheets of water resistant material

defining a bi-lobal configuration representative of a molar, said overlying sheets having a left and right periphery, said packet including a top periphery having elevated left and right peaks and an intermediate depression forming a top apex, a bottom periphery having depending left and right roots and an intermediate indentation forming a bottom apex,

a length of dental floss between said sheets having one end thereof secured to a portion of said left periphery and having another end thereof secured to a portion of said right periphery,



a die stamped seal extending entirely along said peripheries to secure said sheets together with said dental floss therebetween, and

an axis between said two apices substantially bisects said packet and defines a dimension representing the minimum distance between said top and bottom peripheries whereby,

a path of least resistance is presented by said apices as said left and right peripheries are grasped to tear apart said overlying sheets along the line between said apices.

4,712,573

APPARATUS FOR MOVABLY WASHING, RINSING AND DRYING A STATIONARY ARTICLE

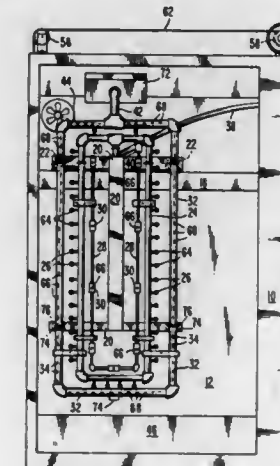
Henry Y. Kuhl, P.O. Box 26, Kuhl Rd., Flemington, N.J. 08822-0026

Filed May 16, 1986, Ser. No. 863,906

Int. Cl.⁴ B08B 3/02

U.S. Cl. 134—95

20 Claims



1. An apparatus for movably washing, rinsing and drying a stationary article comprising:

(a) a housing means defining a washing chamber therein, said housing means including an open area to allow entry and exit of the article to be cleaned within said washing chamber;

(b) a support strut means fixedly secured with respect to said housing means and extending laterally and horizontally through said washing chamber;

(c) a carriage means movably mounted on said support strut

- means to allow lateral movement thereof along said support strut means;
- (d) a support wheel means rotatably mounted with respect to said carriage means and engageable with respect to said support strut means to movably mount said carriage means with respect thereto;
- (e) a washing conduit fixedly secured with respect to said carriage means to be movable therewith, said washing conduit defining wash outlet means therein to selectively release cleaning solution therefrom;
- (f) a rinsing conduit fixedly secured with respect to said carriage means to be movable therewith, said rinsing conduit defining rinse outlet means therein to selectively release rinsing solution therefrom;
- (g) a drive means secured with respect to said carriage means for reciprocal movement thereof;
- (h) a washing supply line in fluid flow communication with respect to said washing conduit to supply cleaning solution thereto;
- (i) a rinsing supply line in fluid flow communication with respect to said rinsing conduit to supply rinsing solution thereto; and
- (j) a bumper means fixedly secured with respect to said carriage means and extending rearwardly therefrom to selectively contact the rear area of said housing means and prevent excessive movement of said carriage means with respect to said support strut means as a result of reaction forces exerted by release of cleaning and rinsing solutions from the conduits secured to said carriage means.

4,712,574

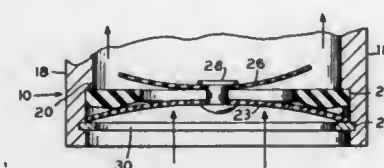
VACUUM-BREAKING VALVE FOR PRESSURIZED FLUID LINES

Charles H. Perrott, Portland, Oreg., assignor to C. H. Perrott, Inc., Portland, Oreg.

Filed Apr. 23, 1987, Ser. No. 41,401
Int. Cl.⁴ F16K 24/04

U.S. Cl. 137-217

5 Claims



1. For use in a pressurized line delivering liquid to an outlet, a vacuum breaking valve for preventing backflow and siphoning comprising:

- (a) a conduit adapted for tapping into the line upstream of the outlet,
- (b) a housing having an open end connected to the conduit,
- (c) the interior of the housing having an annular, outwardly facing shoulder,
- (d) check valve means dimensioned for reception in the housing, seated against the shoulder, and
- (e) retaining means position in the housing for releasably retaining the check valve means therein,
- (f) the check valve means comprising,
- (1) a perforated backup plate adapted for bearing engagement with the retaining means,
- (2) a floating, centrally ported valve seat plate seated against the shoulder and bearing against the backup plate,
- (3) a flexible, valve disc overlying the port in the valve seat plate in valving relation thereto, and
- (4) centrally located interconnecting means interconnecting the backup plate and the valve disc, confining the valve seat plate in operative positions between them.

4,712,575

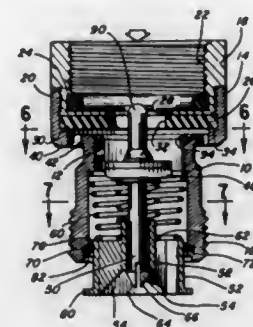
SELF-DRAINING HOSE CONNECTION VACUUM BREAKER AND BACKFLOW PREVENTER

John E. Lair; Lawrence F. Lackenbill, and Richard J. Holliday, all of Decatur, Ill., assignors to A. W. Cash Valve Manufacturing Corporation, Decatur, Ill.

Filed Mar. 2, 1987, Ser. No. 20,566
Int. Cl.⁴ F16K 24/00

U.S. Cl. 137-218

22 Claims



10. A self-draining hose connection vacuum breaker and backflow preventer comprising, a body with an internal passage having inlet and outlet ends, backflow prevention means in said passage including a diaphragm and a movable member with said movable member having an active position engaging the diaphragm and an inactive position spaced from said diaphragm, and means responsive to the attachment of a hose to said body for yieldably urging said movable member from the inactive position to the active position.

4,712,576

PNEUMATICALLY OPERATED VALVE

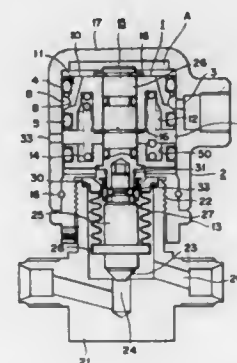
Ryozo Arizumi, Ohmiya, and Takashi Ejiri, Tokyo, both of Japan, assignors to Fujikura Rubber Limited, Tokyo, Japan
Filed Jan. 31, 1986, Ser. No. 824,905

Claims priority, application Japan, Mar. 29, 1985, 60-63224; Mar. 29, 1985, 60-63225; Jul. 3, 1985, 60-100479[U]

Int. Cl.⁴ F16K 31/122, 1/48

U.S. Cl. 437-270

18 Claims



1. In a pneumatically operated valve which includes a passage through which a fluid can flow, a casing having a piston chamber therein, a piston slidably supported in the piston chamber for reciprocal movement and having a piston rod thereon, the piston rod having a valve portion thereon and the piston being movable between first and second positions in which the valve portion of the piston rod respectively permits and obstructs fluid flow through the passage, means for exerting a force on the piston which yieldably urges it in a predetermined direction toward one of its first and second positions, and means responsive to a predetermined fluctuation of fluid pressure in the passage for effecting movement of the piston by

introducing pressurized air into the piston chamber in a manner causing it to act on the piston in a direction opposite the predetermined direction against said force exerted on the piston, the improvement comprising wherein the means for effecting movement of the piston includes an inlet port through which the pressurized air is introduced into the piston chamber in the casing being provided in a side wall of the casing in which the piston is accommodated slidably, wherein two sealing portions in airtight contact with an inner wall of the casing are provided on an outer surface of the piston in a spaced relationship so that an annular space is formed between them, and wherein the means for effecting movement of the piston includes a controlling passage provided through the piston, one end of said controlling passage opening into said annular space and the other end thereof opening through a surface of the piston which faces generally in said predetermined direction.

4,712,577

PNEUMATIC VALVE FOR BRAKING SYSTEMS

Domenico Angelillo, Sesto San Giovanni, Italy, assignor to Industrie Magneti Marelli S.r.l., Milan, Italy

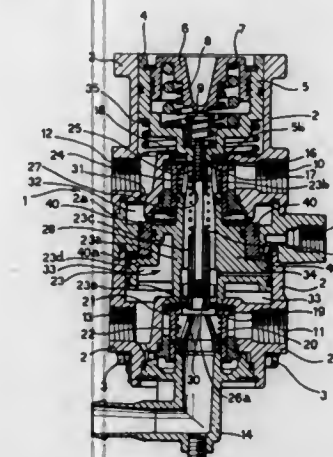
Filed Apr. 2, 1987, Ser. No. 33,383

Claims priority, application Italy, Apr. 2, 1986, 53220/86[U]

Int. Cl.⁴ F16K 11/22, 31/143; B60T 15/06

U.S. Cl. 137-270

2 Claims



1. Pneumatic valve, particularly for braking systems, comprising a body with an inlet connector and an outlet connector for connection to a pressure source and a pneumatic circuit respectively, and with an obturator valve which controls communication between the connectors and a control device for the valve, including a piston sealingly slidable in a guide portion of the body between a first chamber which can be put into communication with a pressure source and a second chamber housing the valve, so that the piston can move and open the valve under the effect of the pressure in the first chamber characterised in that the guided portion of the piston is generally cylindrical and has a smaller cross-section than the passage cross-section of the guide portion of the body, and in that an intermediate member is sealingly interposed between the guided portion of the piston and the guide portion of the body, the intermediate member having stop means and being locatable between the wall of the body and the guided portion of the piston in first or second orientations, in which the stop means respectively allow and prevent its movement with the piston under the effect of the pressure in the chamber; the intermediate member being able to transfer to the piston the force exerted thereon by the pressure in the first chamber, in its first orientation.

4,712,578

FLUID MANIFOLD SYSTEM

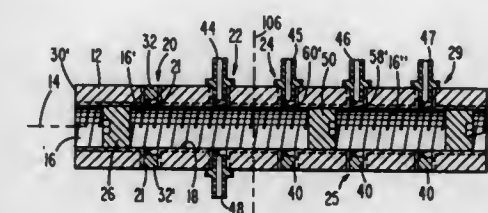
Allan E. White, Hightstown, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1986, Ser. No. 853,430

Int. Cl.⁴ F17D 1/08

U.S. Cl. 137-271

13 Claims



1. A fluid manifold comprising:

- a body;
- a threaded first conduit having threads of a first given thread size, said conduit and threads extending into the body a given length in communication with at least one exterior body surface;
- a plurality of threaded second conduits of a second given thread size, each in an exterior body surface in communication with the first conduit and spaced along the threaded length of the first conduit;
- a plurality of threaded first elements adapted to mate with the first conduit threads to block the flow of fluid through the first conduit; and
- at least one threaded second fluid coupling element adapted to mate with a selected one of said first and second conduits to fluid couple the first conduit in communication therewith to a region external to the body;
- said first elements being positioned and spaced in said first conduit to divide said first conduit into at least two separate chambers.

4,712,579

WELL FLOW LINE CHOKE

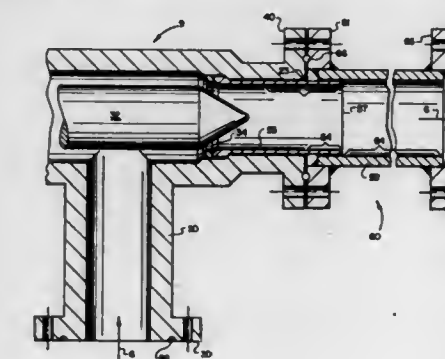
Herbert A. Wolcott, and James H. McHaney, both of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 22, 1983, Ser. No. 516,067

Int. Cl.⁴ F16K 25/04

U.S. Cl. 137-375

1 Claim



1. In a well flow line choke having a body with a first aperture which extends longitudinally through said body from a first end of said body to a second fluid outlet end of said body, said body having a second aperture therein which has a fluid inlet at one side of said body and which extends through said body to intersect and communicate with said aperture intermediate the first and second ends of said first aperture, and hollow insert means carried concentrically and interiorly of said first

aperture between the point where said first and second apertures intersect and said fluid outlet end of said first aperture, the improvement comprising said insert means extending in a continuous unrestricted manner to said fluid outlet end of said first aperture and a substantial distance beyond said fluid outlet end and outside said body whereby any blast effect that may occur due to a pressure change inside said insert means in said body is transferred without flow restriction outside said body by said insert means before being released by said insert means, and a blast receiving means carried by said body adjacent said fluid outlet end and surrounding the portion of said insert means which extends outside said body whereby any blast effect released by said insert means is received by said blast receiving means, said blast receiving means further comprising a preferentially consumable, hollow, elongated member which is specifically designed to receive and absorb a blast effect and which fits concentrically about the portion of said insert means which extends outside said body, said member extending a finite distance away from the fluid outlet end of said first aperture, said member being removably carried by said body and said flow line for ease of inspection and replacement should excessive wear be experienced by said member due to any blast effect from fluid passing therethrough.

4,712,580

EXHALATION VALVE ASSEMBLY

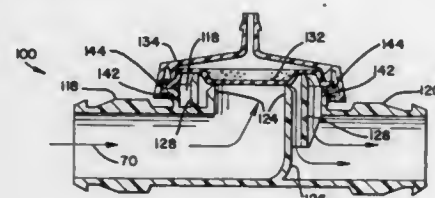
Keith Gilman, W. Cajon Valley, and Bruce W. Lutz, Hesperia, both of Calif., assignors to Intertech Resources Inc., Bannockburn, Ill.

Filed Mar. 21, 1986, Ser. No. 842,670

Int. Cl.⁴ F16K 15/14

U.S. Cl. 137—512.15

6 Claims



1. A valve assembly for use in a volume ventilator, said valve assembly comprising a valve body having an exterior wall in part defining a pressure chamber, a gas inlet conduit in flow communication with the pressure chamber, said gas inlet conduit forming a discharge port in said pressure chamber, a gas outlet conduit in flow communication with said pressure chamber for directing gas out of said pressure chamber, said outlet conduit being located concentrically around said discharge port, diaphragm means removably disposed in and extending across said valve body, said discharge port, said outlet conduit and said pressure chamber being on one side of said diaphragm means, said diaphragm means including a central portion engageable with said discharge port for selectively closing off said discharge port, said diaphragm means defining the remainder of said pressure chamber and further including an annular arched portion which is spaced radially from said central portion, and a cover having a gas inlet joined to the valve body and extending across the diaphragm means on the opposite side thereof from the pressure chamber, said cover engaging and clamping the outer periphery of said arched portion, said arched portion being spaced in the direction of said opposite side from said central portion and said outer periphery, a generally tubular ring structure joined to said valve body and located concentrically between said discharge port and said exterior wall and within the pressure chamber, said ring structure being separate from said exterior wall by a predetermined distance and extending into said pressure chamber such that the ring structure engages and supports said arched portion of the diaphragm means between the exterior wall and the discharge port and

thereby decreases the effective area of the diaphragm means, said ring structure being spaced in the direction of said opposite side from said discharge port and said outer periphery and normally engaging said arched portion when said diaphragm means is in its relaxed position, flow passages being formed between said ring structure and said outer wall and between said ring structure and said discharge port.

4,712,581

DISTRIBUTION DEVICE FOR A TWO-PHASE FLOW

Klaus-Dieter Emmenhal, Wolfsburg, and Joachim Neumann, Braunschweig, both of Fed. Rep. of Germany, assignors to Volkswagen Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

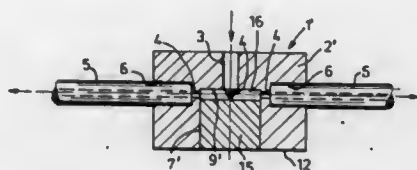
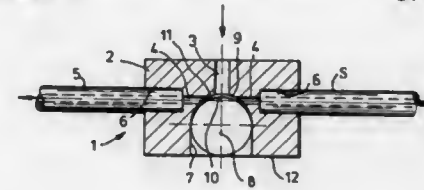
Filed Apr. 8, 1986, Ser. No. 849,573

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513777

Int. Cl.⁴ F02M 35/10; F02D 9/02

U.S. Cl. 137—561 A

14 Claims



1. A device for uniform distribution of a two-phase flow containing a liquid and a gaseous component, in particular a fuel-air mixture in a mixture delivery arrangement of an automobile, with a flow-in line bore arranged centrally in a housing and with a plurality of flow-out line bores arranged within a plane extending essentially perpendicularly to the flow-in line and connected with the flow-in line bore, whereby the flow-in line bore is bounded by the end face of an obturating body pressed into a retaining bore arranged in the housing coaxially with the flow-in line bore but beyond the plane of the flow-out line bores, characterized in that the retaining bore is provided, in the region of the connection between the flow-in line bore and the flow-out line bore, with a substantially larger diameter than the flow-in line bore, and in that between the end face of the obturating body and the bottom of the retaining bore is formed a distribution space in the form of a narrow gap into which open the flow-out line bores.

4,712,582

REVERSING VALVE ASSEMBLY WITH IMPROVED PILOT VALVE MOUNTING STRUCTURE

Robert T. Marks, Columbus, Ohio, assignor to Ranco Incorporated, Dublin, Ohio

Continuation of Ser. No. 652,833, Sep. 20, 1984, abandoned. This application Feb. 9, 1987, Ser. No. 15,507

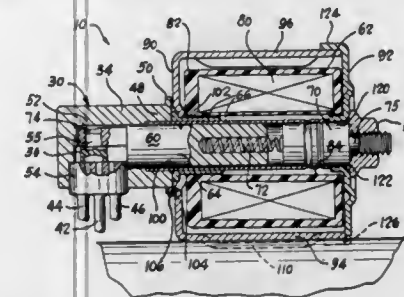
Int. Cl.⁴ F16K 31/42, 11/00

U.S. Cl. 137—625.29

11 Claims

1. A refrigerant reversing valve assembly comprising: (a) a fluid pressure actuatable reversing valve for reversing the direction of refrigerant flow in a refrigeration system; (b) a pilot valve unit for controlling actuation of said reversing valve comprising a pilot valve housing in fluid communication with said reversing valve, a pilot valving member in said housing, and pilot valve actuating means comprising a pilot valving member actuating plunger coupled to the pilot valving member, a guide tube surrounding said plunger connected to said pilot valve body and projecting therefrom, and a solenoid surrounding said guide tube for actuating said plunger; and (c) supporting means for interconnecting said reversing valve and said pilot valve unit, said supporting means comprising: (i) anchoring panel means fixed with respect to said reversing valve and attached to said pilot valve unit for securing said reversing valve and said pilot valve unit together with said plunger guide tube projecting away

munication with said reversing valve, a pilot valving member in said housing, and pilot valve actuating means comprising a pilot valving member actuating plunger coupled to the pilot valving member, a guide tube surrounding said plunger connected to said pilot valve body and projecting therefrom, and a solenoid surrounding said guide tube for actuating said plunger; and (c) supporting means for interconnecting said reversing valve and said pilot valve unit, said supporting means comprising: (i) anchoring panel means fixed with respect to said reversing valve and attached to said pilot valve unit for securing said reversing valve and said pilot valve unit together with said plunger guide tube projecting away



from said anchoring panel means, said anchoring panel means engageable with said solenoid and including a projecting hub extending into said solenoid for supporting said solenoid in position about said guide tube; and (ii) retainer panel means detachably connected to the guide tube projecting end region remote from said anchoring panel means, said retainer panel means detachable to enable placement of said solenoid about said guide tube and connected to said guide tube for maintaining said solenoid in position with respect to said guide tube and engaged between said anchoring and retaining panel means, said retainer panel means including a projecting hub extending into said solenoid for supporting said solenoid in position about said guide tube.

4,712,583

PRECISION PASSIVE FLAT-TOP VALVE FOR MEDICATION INFUSION SYSTEM

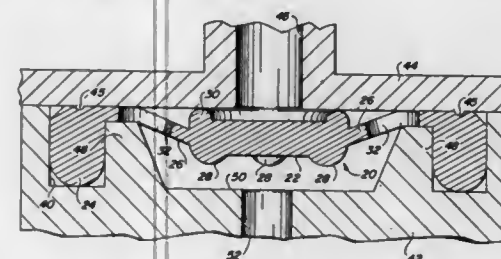
John P. Pelmulder, Chatsworth; Lanny A. Gorton, Sunland; Armea J. Guleserian, Simi Valley, and John H. Livingston, Santa Monica, all of Calif., assignors to Pacesetter Infusion, Ltd., Sylmar, Calif.

Filed May 27, 1986, Ser. No. 867,824

Int. Cl.⁴ F16K 15/14

U.S. Cl. 137—852

17 Claims



1. A one-way precision valve for medical applications, said valve for mounting between an upper housing portion having an essentially flat surface with an inlet aperture therein and a lower housing portion having an outlet portion therein, said valve being of one-piece manufacture and comprising: a rigid circular valve disk, wherein said valve disk is so arranged and configured as to be of a thickness sufficiently

substantial to prevent said valve disk from exhibiting a significant amount of flexure even under high reverse pressure;

a cylindrical dynamic sealing ridge protruding from the top side of said rigid circular valve disk, said dynamic sealing ridge for providing a sealing contact with said flat surface of said upper housing portion around said inlet aperture when said valve disk is urged toward said upper housing portion; a static seal ring for installation between said upper and lower housing portions in sealing fashion, said static seal ring being located circumferentially around and spaced away from said valve disk; and a relatively thin support web extending between said static seal ring and said valve disk for supporting said valve disk from said static seal ring, said support web being flat when in an unbiased position, said support web supporting said dynamic sealing ridge on said valve disk in position around said inlet aperture, said dynamic sealing ridge being located above the surface of said support web, said support web being elastomeric and functioning to bias said valve disk toward said upper housing portion to maintain said dynamic sealing ridge against said upper housing portion around said inlet aperture in sealing fashion until and unless a predetermined forward pressure drop exists across said valve, said support web having disposed therein a plurality of apertures to allow the passage of fluid therethrough.

4,712,584

SURGE SUPPRESSOR

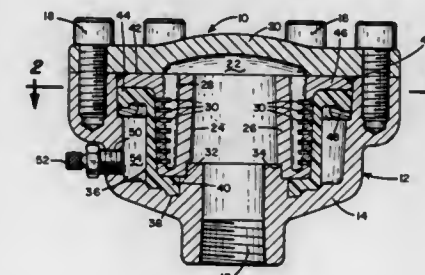
Ramon Pareja, Edina, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 8, 1986, Ser. No. 939,010

Int. Cl.⁴ F16L 55/04

U.S. Cl. 138—30

12 Claims



1. A surge suppressor for suppressing undesired pressure surges in a fluid handling system comprising:

(a) a housing having a fluid inlet port leading to a hollow chamber; (b) a rigid baffle member disposed in said hollow chamber and having a generally cylindrical tubular wall coaxially aligned with said fluid inlet port in said housing, said baffle member including a plurality of radially spaced bores extending longitudinally inwardly into said cylindrical wall, the length of said bores being less than the length of said tubular wall, said bores being exposed to a working fluid through said fluid inlet port in said housing, said cylindrical tubular wall having a plurality of longitudinally spaced, radially extending slits formed through the exterior surface thereof and intersecting with said bores; (c) a generally tubular diaphragm formed from an elastomeric material and surrounding said generally cylindrical tubular wall of said rigid baffle member and clamped with respect to said baffle member and said housing so as to be sealed against fluid flow at the opposed end portions of said elastomeric tubular diaphragm; and (d) means for introducing a compressible fluid at a predeter-

mined pressure between said housing and the exterior wall of said generally tubular elastomeric diaphragm.

4,712,585

ORIFICE PLATE HOLDER

Richard B. Evans, Tulsa, Okla., assignor to Red Man Pipe and Supply Company, Tulsa, Okla.

Filed Oct. 10, 1986, Ser. No. 917,665

Int. Cl.⁴ F16L 55/10

U.S. Cl. 138—44

6 Claims



1. An orifice forming assembly for insertion between juxtaposed flanges, comprising:

a plate body portion of rigid material having first and second opposed planar surfaces and having an opening there-through;

a first elastomeric washer member having an outer diameter greater than said plate body portion opening and an inner diameter less than said plate body portion opening, the first elastomeric washer member being secured to said first body portion planar surface coaxially with said body portion opening;

a second elastomeric washer member contacting said second body portion planar surface, said second elastomeric washer having an outer diameter greater than said plate body portion opening and an inner diameter less than said plate body portion opening, approximately one-half of the second elastomeric washer member contacting surface being secured to said second body portion planar surface coaxially with said body portion opening, the unsecured portion being resiliently deflectable away from said body portion second planar surface; and

an orifice plate insert of rigid material having first and second opposed planar surfaces and of an outer diameter less than said opening through said plate body portion and larger than said elastomeric washer members inner diameters and having a central orifice hole therethrough, the orifice plate insert being removeably inserted into said opening in said plate body portion and between said elastomeric washer members, said plate body portion, said elastomeric washer members and said orifice plate being insertable and removeable as a unit between juxtaposed flanges.

4,712,586

PIPE PLUG AND CENTERING CONSTRUCTION FOR CENTERING RIDGED KEY IN MATING GROOVE IN PIPE PLUG

Durham S. McCauley, and Jeffrey R. Sullivan, both of Boston, N.Y., assignors to McGard, Inc., Buffalo, N.Y.

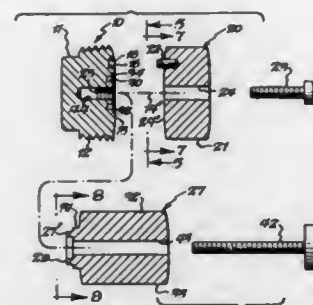
Continuation of Ser. No. 732,675, May 10, 1985, abandoned.

This application Aug. 27, 1986, Ser. No. 900,975

Int. Cl.⁴ F16L 55/10

U.S. Cl. 138—89

13 Claims



1. A pipe plug which is installable in a pipe by the use of a first key which cannot be used to remove the pipe plug from the pipe and which is removable from the pipe only by the use of a second key comprising a body having an axis, threads on said body, a face on said body, a plurality of arcuate ramps on said face, said arcuate ramps being oriented about said axis, each of said ramps having a first end and a second end and a surface which leads away from said face and which extends a greater distance into said body as it progresses toward said second end from said first end and terminates at shoulder means at said second end for receiving said first key in abutting relationship for tightening said plug to install it when said first key is turned in a first direction but said first key camming out of said ramps without loosening said pipe plug to remove it when said first key is moved in an opposite second direction away from said shoulder means, said threads on said body having a tightening direction which is the same as the direction of said ramps leading toward said shoulder means, and curvilinear key-receiving groove means in said face for receiving said second key for removing said plug, said curvilinear groove means being oriented about said axis.

4,712,587

CLEANING AND YARN CONDITIONING SYSTEM FOR WEAVING MACHINES

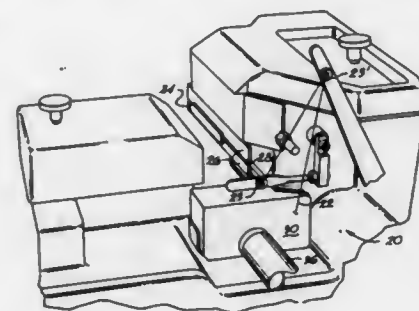
Walker O. Graham, 105 Sycamore Dr., Mauldin, S.C. 29662

Filed Aug. 4, 1986, Ser. No. 892,906

Int. Cl.⁴ D03J 1/04

U.S. Cl. 139—1 C

20 Claims



1. A cleaning and weft conditioning system for a weaving machine which has a warp supply, harnesses having a plurality of heddles, a reed supported on a sley, means for selectively raising and lowering the heddles and the warp yarns passing

from said warp supply through said heddles and through said reed to form warp sheds, a weft insertion system, and a loading station whereat weft yarns are loaded into said weft insertion system and are picked through said warp sheds for forming a fabric, said cleaning and weft conditioning system comprising:

(a) a first vacuum chamber disposed adjacent to the weft loading station;

(b) at least one hollow, elongated vacuum chamber extending from one side of said first vacuum chamber and in pneumatic communication therewith, with a free end of said elongated chamber being closed, said elongated chamber further having a narrow slot extending longitudinally along said hollow, elongated vacuum chamber, and along at least a part of the path on which weft yarns are loaded into the weft insertion system, so as to draw air from the ambient atmosphere across the weft yarn and across adjacent surfaces of the loading station and the weaving machine, whenever a partial vacuum is created in said vacuum chambers; and

(c) means for creating a partial vacuum within said vacuum chambers thereby causing a portion of the ambient atmosphere of the weave room to be drawn across the weft yarn at the loading station to condition it and across adjacent surfaces of said weaving machine to remove lint, fly, size or the like from said surfaces.

4,712,588

PICK SPACING CONTROLLING DEVICE AND METHOD

Tsutomu Sainen, Kanazawa, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

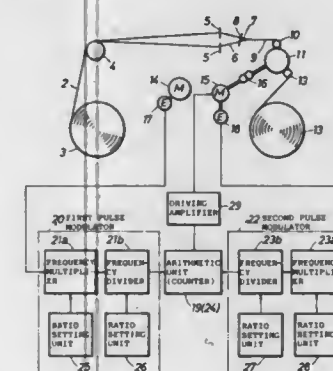
Filed Sep. 11, 1986, Ser. No. 906,261

Claims priority, application Japan, Sep. 11, 1985, 60-199539

Int. Cl.⁴ D03D 49/20

U.S. Cl. 139—309

4 Claims



1. A pick spacing controlling device for controlling the pick spacing of a fabric being woven on a loom having a main motor for driving a principal weaving mechanism of the loom and having a take-up motor for driving a take-up roller for the fabric by controlling the take-up motor so that the amount of rotation of the take-up motor during a given time interval is directly proportional to that of the main motor, comprising:

a first rotation amount detector which provides a first number of digital pulses proportional to the amount of rotation of the main motor during said given time interval;

a second rotation amount detector which provides a second number of digital pulses proportional to the amount of rotation of the take-up roller during said given time interval;

a first pulse number modulator which digitally modulates the first number of pulses from the first rotation amount detector by a predetermined ratio;

a second pulse number modulator which digitally modulates the second number of pulses from the second rotation amount detector by a predetermined ratio;

an arithmetic unit which digitally calculates the difference between the number of pulses output by the first pulse

number modulator and the number of pulses output by the second pulse number modulator during said given time interval; and

a driving amplifier which is responsive to the arithmetic unit and controls the amount of rotation of the take-up motor so as to reduce said difference toward zero.

4,712,589

EQUIPMENT FOR THE HANDLING OF SUBSTANCES MADE FLUID BY HEATING, IN PARTICULAR WAX FOR MODELS

Giovanni De Gaspari, Via Lago, 2, 20090 Rodano (Milan), Italy

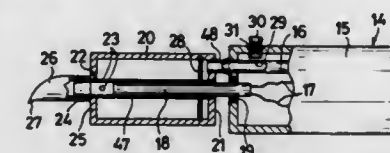
Filed Feb. 18, 1986, Ser. No. 830,011

Claims priority, application Italy, Feb. 20, 1985, 19581 A/85

Int. Cl.⁴ A61C 13/20

U.S. Cl. 141—25

11 Claims



1. Apparatus for handling a liquid through the selective utilization of negative and positive air pressure comprising a body defining a chamber, filter means for separating said chamber into a liquid chamber and an air chamber, said filter means further precluding the passing of liquid therethrough, means for introducing air into and withdrawing air from said air chamber, means for drawing liquid into and ejecting liquid from said liquid chamber in response to the respective withdrawal and introducing of air into said air chamber, means for heating the liquid while in the liquid chamber, a tube within at least said liquid chamber in fluid communication with said liquid drawing and ejecting means, and at least one bore in said tube placing said tube in fluid communication with said liquid chamber.

4,712,590

ELECTRICAL CONNECTION MEANS FOR MULTIPLE BULK COMPOUNDING SYSTEMS

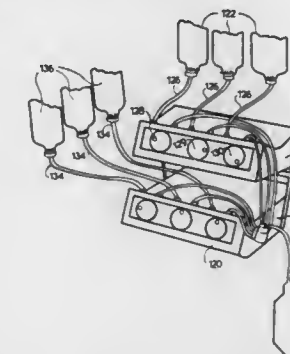
Aleandro Di Gianfilippo, Crystal Lake, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 30, 1986, Ser. No. 868,974

Int. Cl.⁴ B65B 3/30

U.S. Cl. 141—83

9 Claims



1. A device for connecting multiple bulk compounding systems together in which each bulk compounding system precisely controls fluid transfer of at multiple solutions to a single receiving container, each solution being contained in a separate source container, each bulk compounding system including:

a manifold having an outlet fluid line in fluid communication with said receiving container;

a plurality of fluid lines, each source container being in fluid communication with one of said fluid lines each of said fluid lines being in fluid communication with said manifold;

pumping means for pumping solution in said plurality of fluid lines from each of said source containers to said receiving container;

control means, including first means for sensing the weight of fluid in said receiving container, and second means including a peripheral interface means, said peripheral interface means having a first set of input signals for selecting an amount of fluid to be transferred from each source container to said receiving container, said peripheral interface means also having a first set of output signals for displaying the amount of solution to be transferred, and a second set of output signals for controlling said pump means to deliver a predetermined amount of solution from said source to said receiving container in response to the amount of fluid sensed in said container, wherein the improvement comprises:

first electronic connector means for electronically connecting together said second set of output signals from more than one bulk compounding system to cause said plurality of bulk compounding systems to transfer said selected amount of fluids from said source containers to said single receiving container, said connector means having a multiplexer means for receiving said second set of output signals from each of said bulk compounding systems, and for generating a plurality of output signals to activate said pumping means for each of said bulk compounding systems.

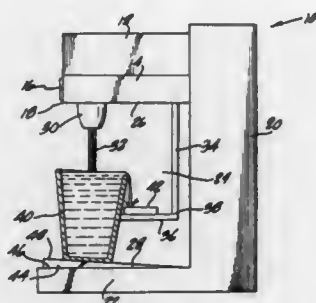
4,712,591

LIQUID DISPENSER WITH AUTOMATIC SHUT-OFF
Gerald P. McCann, Los Angeles; Andrew J. Holonbek, Valencia, and Donald Verley, Sangus, all of Calif., assignors to McCann's Engineering and Manufacturing Co., Los Angeles, Calif.

Filed Mar. 18, 1986, Ser. No. 840,895
Int. Cl.⁴ B65B 3/04

U.S. Cl. 141—88

27 Claims



18. A drink dispenser assembly used for filling a receptacle when placed into a position to receive liquid dispensed from a nozzle attached to a faucet assembly comprising:

a support tower operative to suspend the nozzle,
a base attached to said support tower,
a feedline operative to convey liquid to the nozzle,
a valve disposed in said feedline,
a solenoid operative with said valve,
an electric circuit operative with said solenoid to open or close said valve,
switch means for actuating said electric circuit and said solenoid to open said valve and initiate a filling cycle,
a ramp attached to said base, wherein said ramp is operative to position the receptacle below the nozzle in an inclined condition,

retaining means attached to said support tower for locating the receptacle below the nozzle,
means for sensing the filled condition of the receptacle, said

sensing means including means for deactuating said electric circuit and said solenoid to close said valve and terminate the filling cycle, said sensing means positioned to receive overflow from the receptacle at a defined location below the rim of the receptacle.

4,712,592

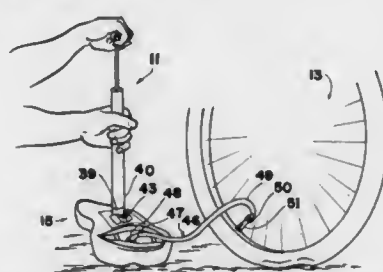
BICYCLE PUMP APPARATUS

Alexander N. Brown, 363 Kootenai Creek Rd., Stevensville, Mont. 59870

Filed Nov. 10, 1986, Ser. No. 928,373
Int. Cl.⁴ B65B 3/04

U.S. Cl. 141—98

12 Claims



1. Bicycle pump/seat post apparatus including a cylinder portion, a piston portion, a handle portion, a seat mounting portion and an air discharge portion; said cylinder portion including an elongated tubular seat post section, said tubular section having an external diameter slidably engageable snugly with a seat post receiving section of a bicycle frame; said piston portion including an elongated rod member disposed within said tubular section along a centerline thereof, said rod member having a length slightly longer than said tubular section, a transverse plunger member affixed adjacent one end of said rod member, said plunger member having a diameter substantially equal to the internal diameter of said tubular section to provide a snug fit therebetween, a transverse guide section disposed adjacent an opposite end of said tubular section aligning and maintaining said rod member along the centerline thereof; said handle portion including a grip member connected to an end of said rod member that extends outwardly beyond said guide section, said grip member having an exterior diameter not more than that of the external diameter of said tubular section; said seat mounting portion including a central section engageable with an end of said tubular section remote from said handle portion, a passage through said central section, flange sections extending from said central section connectable with an underside of a bicycle seat; said air discharge portion including a length of flexible tubing, one end of said tubing being attached to an end of said mounting portion passage remote from said cylinder portion, an opposite end of said tubing including a fitting connectable to a tire valve; whereby said pump/seat post apparatus can be secured within said seat post receiving section of a bicycle frame and a seat affixed to said seat mounting portion with said tubing within said seat, and said pump apparatus can be used to inflate a tire by withdrawing same from said frame section and inverting it, positioning said apparatus adjacent said tire resting on said seat as a base, attaching said fitting to a tire valve and reciprocating said piston portion to force air along said tubing into said tire.

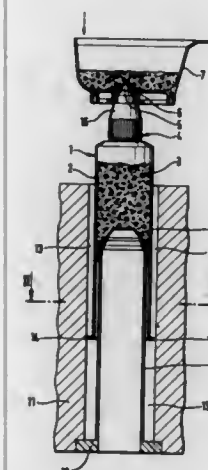
4,712,593

APPARATUS FOR THE METERED REMOVAL OF PASTY OR FLUID SUBSTANCES

Karlheinz Zulauf, Höchst-Hassearoth, and Lothar Breuer, Klein-Bleberau, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany
Continuation of Ser. No. 577,122, Feb. 6, 1984, abandoned. This application Nov. 6, 1985, Ser. No. 796,486

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309692

U.S. Cl. 141—113

Int. Cl.⁴ B65B 3/04

1. Apparatus for the metered removal of a pasty or fluid substance, comprising:

- a storage container for the pasty or fluid substance having a cylindrical body with an opened lower end and an upper end, and an outlet nozzle for discharge of the substance disposed at said upper end;
- a plunger disposed in said body of said storage container and being upwardly displaceable relative to said storage container to exert a feed pressure on said body of said storage container;
- a piston rod for actuating said plunger and having a support foot integral with the piston rod projecting from below into said storage container and bearing removably on said plunger;
- a base plate containing a substantially cylindrical chamber which receives said piston rod, the support foot of which is anchored in said base plate, said cylindrical chamber receiving said piston rod, said plunger and said storage container so that they are coaxial and concentric with each other and said base plate;
- a mixture container positioned exteriorly of said base plate and having a one piece self-closing bottom valve into which said outlet nozzle of said storage container is insertable, said bottom valve being openable upon insertion of said outlet nozzle to discharge the substance into said mixing container and closeable upon removal therefrom to prevent leakage of the substance from said mixing container by an annular sealing seat for said outlet nozzle;
- a closure valve disposed within said outlet nozzle of said storage container and having a valve actuation cap arranged to actuate said closure valve by rotational movement relative to said storage container, said closure valve being closable by rotation of said valve actuation cap so that after removal of said outlet nozzle from said self-closing bottom valve the substance in said storage container is sealed from contamination, said valve actuation cap having an exterior conical sealing seat which communicates with said self closing bottom valve of said mixing container to form a continuous closed seal during discharge of the substance into said mixing container; and

straight guide means for guiding said storage container in said chamber.

4,712,594

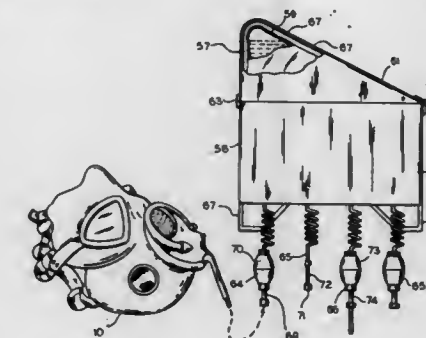
LIQUID STORAGE AND DELIVERY SYSTEM FOR PROTECTIVE MASK

Wesley Schneider, 1030 N. State Pkwy., Apt. 50-F, Chicago, Ill. 60610

Continuation-in-part of Ser. No. 654,121, Sep. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 462,614, Jan. 31, 1983, Pat. No. 4,503,310. This application Jan. 23, 1986, Ser. No. 821,792

Int. Cl.⁴ B65B 3/04
U.S. Cl. 141—114

24 Claims



16. Apparatus for introducing a liquid into a system, said system of the type including a protective mask having a drinking mouth piece assembly on the interior thereof, positionable at the mouth of a user for ingestion of said liquid, a portable canteen for the storage of an initial quantity of said liquid, a connecting tube extending from said canteen to said drinking mouth piece assembly, a mask connector joining said connecting tube to said drinking mount piece assembly, and a canteen connector joining said connecting tube to said canteen, said apparatus comprising:

- a flexible, impermeable storage bag within which said liquid is disposed without exposing said liquid to the atmosphere; at least one first coupling formed liquid-tightly on said storage bag,
- each of said first coupling adapted to selectively and liquid-tightly receive one said mask connector;
- means for selectively refilling said canteen from said bag, said refilling means including at least one second coupling formed liquid-tightly on said bag,
- each said second coupling adapted to selectively and liquid-tightly receive one said canteen connector,
- said bag, one said first connector, and said mask connector creating a closed delivery path for said liquid from said bag to said drinking mouth piece assembly; and
- said bag, one said second connector, and said canteen, creating a closed delivery path for said liquid from said bag to said canteen.

4,712,595

MAGNETIC SAFETY FUNNEL

Harold L. Wilson, P.O. Box 394, Pevely, Mo. 63070
Filed Aug. 15, 1986, Ser. No. 897,131

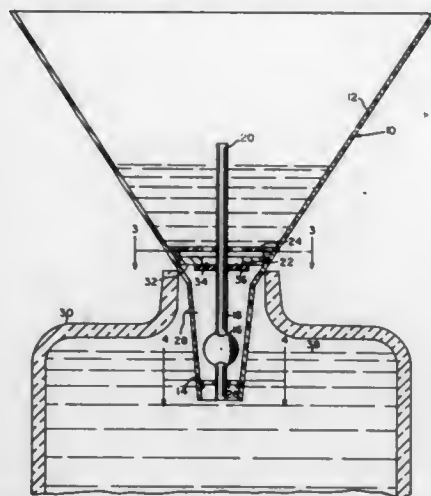
Int. Cl.⁴ B65B 3/06

U.S. Cl. 141—201

5 Claims

1. A safety funnel to prevent fluid overflow of a container, said funnel comprising a reservoir body and a depending elongated spout, a float member supported by an elongated member connected to the funnel and extending in said funnel spout, valve means operable by said float member to open and close the flow of fluid through the spout said float member being responsive to immersion in the fluid level in the container to be filled to operate said valve means to a closed position, a mag-

netic member to maintain said valve means in a closed position, said magnetic member comprising a magnet fixed to the funnel and a metallic member fixed to the elongated member, said metallic member being movable with the float member upon immersion of the float member at fluid level toward said magnet to close said valve means and maintain it closed upon removal of the funnel, said float member being connected to



said elongated member inside said spout and receivable in said spout in protected relation in opened and closed valve means position and a top strainer member and a bottom strainer member fixed adjacent an upper and lower portion of the spout and having a central openings slidably receiving in guided relation said elongated member, said float member being receivable in said spout between said top and bottom strainer members to provide said protected relation.

4,712,596

LUMBER SURFACING MACHINE

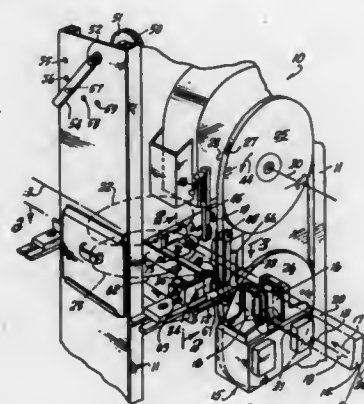
Tom McClaran, 1042 Turndell Rd., La Habra, Calif. 90631

Filed Feb. 5, 1987, Ser. No. 11,311

Int. Cl.⁴ B27C 9/00

U.S. Cl. 144-3 R

18 Claims



18. A lumber surfacing machine for roughening the surface of at least one face of a length of lumber, said machine comprising:

a frame including a generally horizontal lumber-supporting bed, said lumber-supporting bed having a longitudinal axis which is parallel to the direction in which lumber is moved along said bed and said frame being positionable adjacent lumber feeding means for feeding lumber to the machine;

an upper saw wheel supported by said frame above the lumber-supporting bed;

a lower saw wheel supported by said frame below the lum-

ber-supporting bed, at least one of said saw wheels being a driven wheel and both of said saw wheels having an axis of rotation which is parallel to the longitudinal axis of the lumber-supporting bed;

a band saw blade having teeth along its cutting side and having a smooth side, said blade being held over the top half of the upper saw wheel and held around the lower half of the lower saw wheel;

upper and lower blade guides held by said frame, the upper blade guide being above the lumber-supporting bed and the lower blade guide being below the lumber-supporting bed and each of the blade guides having a flat outer surface including a blade-supporting ridge extending above the flat outer surface so that the blade guides have a ridge edge and a flat edge and the band saw blade being held against the flat outer surface so that its smooth said abuts each ridge and each of said blade guides being parallel to one another and being supported so that an acute angle is formed between the flat surface and the longitudinal axis of the lumber-supporting bed, said acute angle having its apex at the smooth edge of the flat surface and said guides being positioned so that said band saw blade has a cutting length between the guides which is adjacent the lumber-supporting bed and perpendicular to the longitudinal axis of the bed; and

opposing guide means held by said frame and said opposing guide means having a guide surface parallel to the cutting length so that lumber fed into the machine will have one surface held against the guide means and the opposite surface held against the teeth of the band saw and roughened by the teeth thereof.

4,712,597

KNIFE HOLDER FOR WOOD CHIPPERS

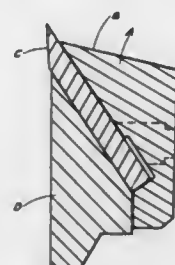
George E. Stringer, Box 450, Tylertown, Miss. 39667

Filed Mar. 27, 1986, Ser. No. 844,697

Int. Cl.⁴ B27C 1/14

U.S. Cl. 144-176

4 Claims



1. An improved knife holder for wood chippers of the type having a series of substantially radially positioned knives mounted on a rapidly rotatable disc wherein the improvement comprises combining the knife holder and counter knife presently used into one unit, said knife holder comprising one solid piece of steel with a flat surface secured to the base of the chipper disc by one or more bolts mounted within a recess in the flat surface of the chipper disc and having an adjacent surface which extends outward from the chipper disc at an angle of between 90 degrees and 150 degrees from the flat surface which abuts the chipper disc, which surface is the wear surface of the holder in that chips are impelled against this surface during the operation of the chipper, causing the surface to wear, to a desired distance from the chipper disc at which point another flat surface extends at a desired angle of between 30 degrees and 90 degrees therefrom, which surface includes a shallow recess located at one end of the length of the surface, to a point where it meets another surface which extends at an angle of 90 degrees therefrom to a point which is immediately adjacent to a knife clamp utilized to clamp the knife in position between the knife holder and clamp, said surfaces forming a recess into which the chipper knife is mounted and secured

through clamping action between the knife clamp and knife holder.

4,712,598

SCREEN DOOR ASSEMBLY

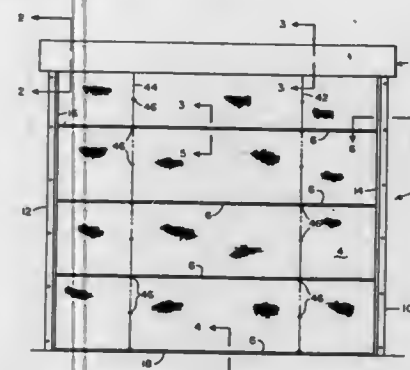
Stephen T. Bonacci, 202 Mitchell Ave.; Richard L. Douville, 3322 W. Third Ave., and Rodger C. Winter, Rte. #1-Box 119E, all of Hibbing, Minn. 55746

Filed Oct. 17, 1986, Ser. No. 920,068

Int. Cl.⁴ E06B 3/94

U.S. Cl. 160-84 R

9 Claims



1. A ventilated cover for a garage door opening comprising:
 - (a) a screen curtain sized to extend beyond the sides and top of said opening and having a plurality of horizontally disposed cord members sewn thereto, wherein a topmost edge is mounted in sealed external relation above the top of said opening and a bottommost edge is hemmed to support a horizontally disposed weighted rod and beneath which a compressible seal member is mounted, wherein each of a plurality of rings are attached to the face of said curtain in vertical columns and wherein the curtain sides are hemmed and grommets are set therein at the outer hem edges in alignment with each cord and the ends of which cords are threaded through each of said grommets;
 - (b) a pair of vertical track members mounted in sealed external relation to the sides of said opening, each track member including a vertical flanged slideway and a flexible vertical seal member positioned to angulate from an outer track edge;
 - (c) a plurality of slide clip members, each secured to an end of one of said cord members and slidably constrained in one of said vertical tracks; and
 - (d) draw pulley means including a plurality of vertically disposed draw cords threaded through said rings for raising and lowering said curtain and such that said bottom compressible seal conformally engages the ground and said track mounted seals contact said curtain when fully lowered.

4,712,599

SHUTTER

Toshiro Komaki, Tokyo, Japan, assignor to Tachikawa Corporation, Tokyo, Japan

Filed Jun. 19, 1985, Ser. No. 746,830

Claims priority, application Japan, Mar. 7, 1984, 59-44277[U]; Jul. 2, 1984, 59-99729[U]

Int. Cl.⁴ A47G 5/02; E06B 9/202

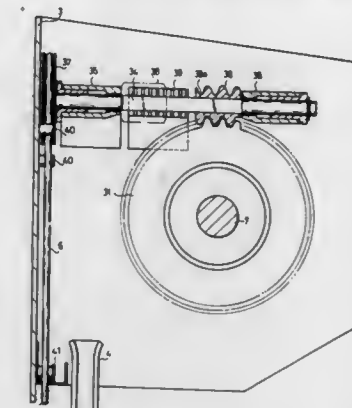
U.S. Cl. 160-133

10 Claims

1. A shutter comprising:
 - a plurality of slats extending laterally and vertically expandably coupled together, each slat including a main portion and an expandable portion having slits therein;
 - a take-up shaft device including an immovable core shaft, a rotary member rotatably mounted on said core shaft, one of said slats being attached to said rotary member for winding the slats onto and unwinding the slats from the

rotary member, and a spring connected between the core shaft and the rotary member for turning the rotary member to wind the slats thereonto; and

slit open-close means for expanding and contracting said slats to open and close the slits, said slit open-close means including a worm-wheel mounted on said core shaft to



rotate together with said rotary member, a worm-gear situated adjacent to the worm-wheel so that the worm-gear can engage with and disengage from the worm-wheel, and shifting means connected to the worm-gear for shifting the worm-gear to engage with and disengage from the worm-wheel and moving the slats to completely close the slits by rotating the rotary member.

4,712,600

PRODUCTION OF PISTONS HAVING A CAVITY

Kaneo Hamajima, Nagoya; Tadashi Dohnomoto, Toyota; Atsuo Tanaka, Toyota, and Masahiro Kuno, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

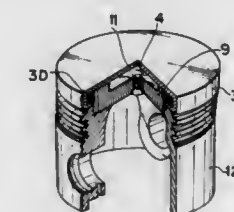
Filed Jul. 9, 1986, Ser. No. 883,825

Claims priority, application Japan, Jul. 12, 1985, 60-153640; Jul. 22, 1985, 60-161377; Jul. 25, 1985, 60-164822

Int. Cl.⁴ B22D 18/02, 19/00, 19/14, 29/00

U.S. Cl. 164-97

24 Claims



1. A method for producing a piston of a light alloy matrix metal having a cavity within its head by pressure casting, comprising the steps of:

- preforming a precursory member having the shape of said cavity from an extractable material which remains in solid state at room temperature and is convertible into a fluid at a heating temperature below the melting point of the matrix metal,
- disposing said precursory member in place in a pressure casting mold having a cavity corresponding to the shape of the piston, while covering said precursory member with a porous member stable to molten matrix metal,
- pouring molten matrix metal into the mold cavity and applying a pressure thereto to form a piston-shaped casting having said precursory member and said porous member embedded therein, and
- heating said casting at a temperature below the melting point

of said matrix metal and above the fluidizing temperature of the material of said precursory member to convert the precursory member material into a fluid, and extracting said fluid from said casting, leaving a cavity at the location of said precursory member.

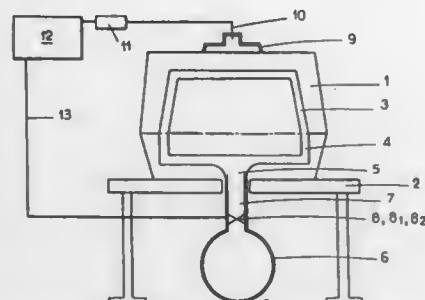
4,712,601

PROCESS AND APPARATUS FOR AUTOMATING A BAKING CYCLE UNDER HOT AIR OF SAND MOLDS
Pierre L. Merrien, Billere, and Pierre A. Merrien, Sceaux, both of France, assignors to Etude et Developpement en Metallurgie, Billere, France

Division of Ser. No. 631,521, Jul. 18, 1984, Pat. No. 4,573,522, which is a continuation of Ser. No. 210,623, Nov. 26, 1980, abandoned. This application Jul. 16, 1985, Ser. No. 755,687
Claims priority, application France, Nov. 28, 1979, 79 29227
Int. Cl.⁴ B22C 9/14

U.S. Cl. 164—150

16 Claims



1. An apparatus for ensuring the proper removal of volatile organic materials from a sand mold, wherein said apparatus comprises:

- (a) means for determining the optimal concentration of volatile organic materials evaporating from said sand mold as a function of time during the drying of said sand mold;
- (b) means for heating said sand mold before casting in such a manner that the concentration of volatile organic materials as a function of time evaporating from said mold during drying before casting is substantially the same as said optimal volatile organic material concentration as a function of time.

4,712,602

POOL-LEVEL SENSING PROBE AND AUTOMATIC LEVEL CONTROL FOR TWIN-BELT CONTINUOUS METAL CASTING MACHINES

Timothy D. Kaiser, Colchester, and Gary P. Ackel, Burlington, both of Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Filed Sep. 11, 1986, Ser. No. 906,256
Int. Cl.⁴ B22D 11/18

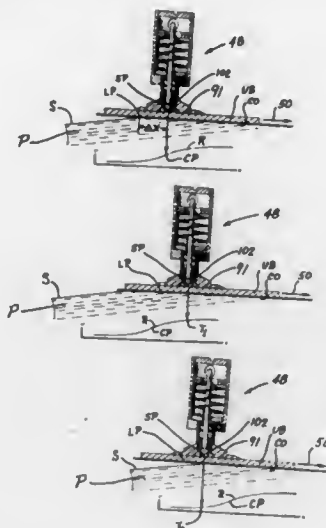
U.S. Cl. 164—453

18 Claims

1. In a continuous metal-casting machine having an input region for introducing molten metal into a pool P of molten metal having an upper surface S and wherein flow-control means control the rate of introducing molten metal into said pool, said casting machine employing at least one moving flexible casting belt having a front face for contact with the molten metal in said pool and a reverse face which is cooled by aqueous coolant having an incoming temperature and wherein said casting belt travels downstream in the machine at a controllable travel rate for carrying metal downstream from said pool to become solidified and wherein the temperature of each point on the reverse face of the traveling belt rises from an initial temperature prior to contact with the molten metal to a steady state temperature after remaining in contact with the molten metal, said rise in temperature of each such point occurring along a ramp R of ascending temperature as each

opposite point on the front face travels downstream from initial contact with the molten pool surface S, and wherein the physical position of said ramp R of ascending temperature moves upstream and downstream as said pool surface moves upstream and downstream, the method for controlling the elevation level of said pool surface S as the casting machine is operating comprising the steps of:

- selecting a desired elevation-level control-point LP for said molten pool surface S during operation of the casting machine,
- selecting a sensing point SP for sensing the temperature of the reverse face of the traveling belt to be a small distance Δx in the downstream direction from said desired level-control point LP,



said small distance being predetermined to be at a control-point temperature CP within a predetermined range of temperature ΔT on said ramp R of ascending temperature, positioning the sensitive area of a signal-producing thermal probe against the reverse face of the traveling belt at said selected sensing point SP for causing the thermal probe to provide a signal increasing in value as said ramp R of ascending temperature moves upstream and decreasing in value as said ramp R of ascending temperature moves downstream,

and using the value of the signal from said thermal probe for controlling said flow control means for controlling the rate of flow of molten metal into said pool for controlling the elevation level of said pool surface S to be near said selected elevation level control point LP.

4,712,603

METHOD OF MAKING A NICKLE HIGH-CHROMIUM BASE BRAZING FILLER METAL

Debasis Bose, Randolph, and Alfred Freilich, Livingston, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 710,343, Mar. 11, 1985, Pat. No. 4,658,531, which is a division of Ser. No. 441,465, Nov. 15, 1982. This application Nov. 17, 1986, Ser. No. 931,320

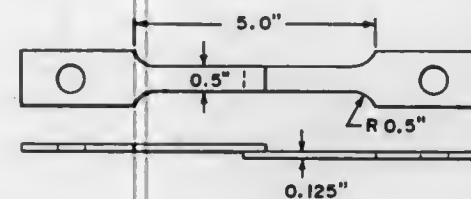
Int. Cl.⁴ B22D 11/06

U.S. Cl. 164—463

3 Claims

1. A process for fabricating homogeneous ductile foil having a composition consisting essentially of 17 to 20 atom percent chromium, 4 to 10 atom percent boron and 10 to 16 atom percent silicon, the balance being nickel and incidental impuri-

ties and the total of nickel and chromium ranging from about 74 to 84 atom percent, which process comprises forming a melt



of the composition and quenching the melt on a moving chill surface at a rate of at least about 10^5 °C./sec.

4,712,604

APPARATUS FOR CASTING DIRECTIONALLY SOLIDIFIED ARTICLES

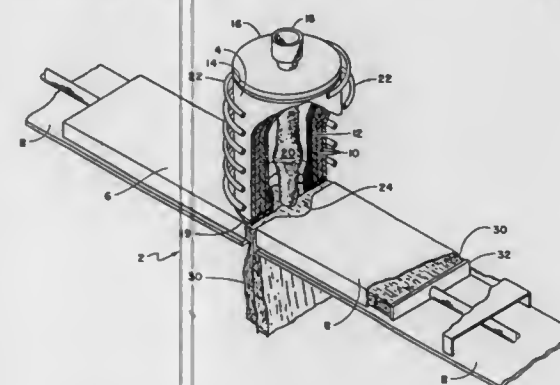
Thomas F. Sawyer, Charlton, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 14, 1986, Ser. No. 917,934

Int. Cl.⁴ B22D 27/04

U.S. Cl. 164—513

8 Claims



1. Apparatus for casting an article comprising: heating chamber means for enveloping a mold and for establishing a heating zone thereabout; mold support means for supporting said mold within said heating chamber means and for withdrawing said mold from said heating chamber means; insulative material having its fibers arranged in a flexible blanket form; and tunnel means positioned below said heating chamber means, said tunnel means containing said insulative material and urging said material against said mold to cover said mold as it is extracted from said heating chamber means.

4,712,605

PROCESS FOR PRODUCING HOLLOW CAST ARTICLE

Nobuyoshi Sasaki, Susumu Baba, and Hisahiro Arai, all of Yokohama, Japan, assignors to M.C.L. Co., Ltd., Japan

Filed Jan. 12, 1987, Ser. No. 2,006

Claims priority, application Japan, Jan. 27, 1986, 61-13871
Int. Cl.⁴ B22C 9/04; B22D 19/16

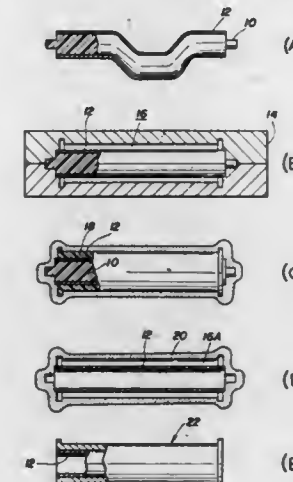
U.S. Cl. 164—516

19 Claims

1. A process for producing a hollow metal cast product comprising the steps of preparing a first lost model having an outer contour substantially corresponding to a desired interior contour of the finished product, depositing a molten metal or alloy over the surface of said first lost model by spraying to form a metal layer defining a hollow core block, placing said hollow core block in a first mold, pouring or injecting a material for forming a second lost model into said first mold to form a second lost model layer, coating a refractory material over

said second lost model layer to form a second mold for casting, removing said second lost model to form a cavity, casting a molten metal or alloy into said cavity, and staving said second mold to take out a finished product.

7. A process for producing a hollow metal cast product comprising the steps of preparing a first lost model having an outer contour substantially corresponding to a desired interior contour of the finished product, depositing a molten ceramic material over the surface of said first lost model by spraying to form a ceramic layer defining a hollow core block, placing said hollow core block in a first mold, pouring or injecting a material for forming a second lost model into said first mold to form a second lost model, coating a refractory material over said second lost model to form a second mold for casting, removing said second lost model to form a cavity, casting a molten metal



or alloy into said cavity, and staving said second mold to take out a finished product.

13. A process for producing a hollow metal cast product comprising the steps of preparing a first lost model having an outer contour substantially corresponding to a desired interior contour of the finished product, depositing a metal and a ceramic material over the surface of said first lost model by spraying to form a composite layer defining a hollow core block, placing said hollow core block in a first mold, pouring or injecting a material for forming a second lost model into said first mold to form a second lost model, coating a refractory material over said second lost model to form a second mold for casting, removing said second lost model to form a cavity, casting a molten metal or alloy into said cavity, and staving said second mold to take out a finished product.

4,712,606

SOLAR ENERGY STORAGE CELL

Richard A. Menelly, 87 Belden Rd., Burlington, Conn. 06013
Division of Ser. No. 652,271, Sep. 20, 1984, Pat. No. 4,597,434.

This application Apr. 2, 1986, Ser. No. 847,198

Int. Cl.⁴ F28D 21/00

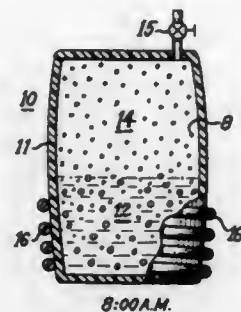
U.S. Cl. 165—1

8 Claims

1. A method of storing thermal energy comprising the steps of:

- providing a first material having a first heat of adsorption within a container, said first material being saturated with a liquid at a first temperature;
- exposing said container and said first material to a source of heat to increase the temperature of said first material to a second temperature in excess of said first temperature but less than the boiling point of said liquid to release some of said liquid from said first material to within said container; and
- adsorbing said released liquid from within said container

when the temperature of said first material decreases to a third temperature lower than said second temperature to



cause said first material to release heat as heat of adsorption.

4,712,607

CRYOSYSTEM FOR BIOLOGICAL MATERIAL

Willem Lindemans, and Lauri J. Aaltonen, both of Victoria, Australia, assignors to Freeze Control Pty. Ltd., Victoria, Australia

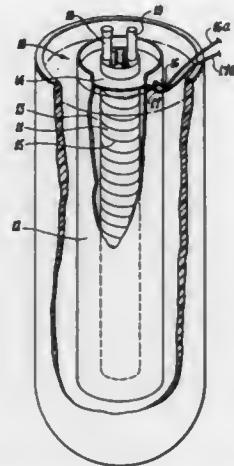
Filed Nov. 8, 1985, Ser. No. 796,328

Claims priority, application Australia, Nov. 9, 1984, PG8048

Int. Cl.⁴ F25B 29/00, 19/00

U.S. Cl. 165—30

15 Claims



1. A cyro-cell assembly for freezing/thawing biological material, said assembly including a core member having a substantially circular cross-section, a plurality of spaces formed in said core member for receiving said biological material, said core member being adapted for conducting heat from said spaces to a cryogenic heat sink, said assembly including heat generating means in heat conducting relationship with said spaces and said spaces being arranged such that they intercept common isotherms which lie substantially along concentric cylindrical surfaces.

4,712,608 HEAT EXCHANGER FOR THE INDEPENDENT HEATING OF THE DRIVER AND FRONT-SEAT PASSENGER SIDE OF A MOTOR VEHICLE

Klaus Aroid, Sindelfingen, Fed. Rep. of Germany; Hermann Grimm, deceased, late of Ostelsheim, Fed. Rep. of Germany (by Christel Grimm, executrix), and Heinz Koukal, Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

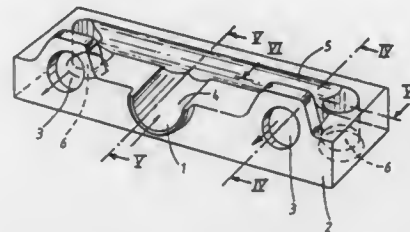
Filed Feb. 7, 1986, Ser. No. 827,287

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504129

Int. Cl.⁴ F28F 1/10; F28D 7/00

U.S. Cl. 165—41

26 Claims



1. An upper heat exchanger header for a heat exchanger for independent heating of the driver and front passenger side of a passenger space of a motor vehicle, said heat exchanger being of the type having a pair of ribbed block units, each including inlet flow pipes and return flow pipes extending therethrough between an upper heat exchanger header and a lower heat exchanger header, said upper heat exchanger header comprising:

centrally disposed inlet flow connection means for accommodating inflow of heating medium means,

transverse channel means extending across a substantial portion of the lateral width of the upper heat exchanger header and being configured to connect the inlet flow connection means with respective inlet flow pipe openings opening into the respective lateral outward portions of the upper heat exchanger header, and

return flow collection chamber means extending substantially across the width of the upper heat exchanger header and between the respective inlet flow openings for accommodating return flow from return flow pipes of the respective ribbed block units communicating therewith, whereby the inlet flow of the heating medium is passed from the upper heat exchanger header downwardly through the ribbed block units at positions laterally outwardly of the location of return flow pipes in the ribbed block unit thereby optimizing heat stratification in the heat exchanger.

14. A heat exchanger for independent heating of the driver and front passenger side of a passenger space of a motor vehicle, comprising:

an upper heat exchanger header,

a lower heat exchanger header, and

a pair of ribbed block units which each include inlet flow pipes and return flow pipes extending between the upper and lower headers,

wherein said upper heat exchanger header comprises:

centrally disposed inlet flow connection means for accommodating inflow of heating medium means,

transverse channel means extending across a substantial portion of the lateral width of the upper heat exchanger header and being configured to connect the inlet flow connection means with respective inlet flow pipe openings opening into the respective lateral outward portions of the upper heat exchanger header, and

return flow collection chamber means extending substantially across the width of the upper heat exchanger header and between the respective inlet flow openings for accommodating return flow from return flow pipes

of the respective ribbed block units communicating therewith, whereby the inlet flow of the heating medium is passed from the upper heat exchanger header downwardly through the ribbed block units at positions laterally outwardly of the location of return flow pipes in the ribbed block unit thereby optimizing heat stratification in the heat exchanger.

4,712,609

HEAT SINK STRUCTURE

Arthur H. Iversen, 15315 Sobey Rd., Saratoga, Calif. 95070

Continuation-in-part of Ser. No. 673,839, Nov. 21, 1984,

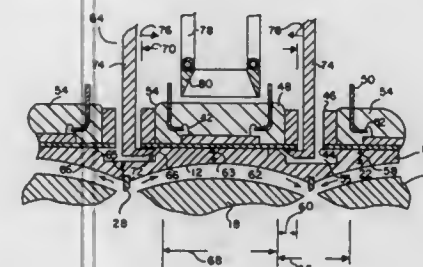
abandoned. This application Feb. 7, 1985, Ser. No. 699,429

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.⁴ F28F 3/06; H01L 23/36

U.S. Cl. 165—80.4

31 Claims



6. A semi-conductor heat sink structure including a planar surface suitable for bonding one or more semi-conductor devices in intimate thermal relationship thereto, and including a heat exchange surface on the interior surface thereof, said structure providing means for enclosing said heat exchange surface in a liquid tight manner and including means for providing a flow of coolant liquid to remove heat from said heat exchange surface by formation of nucleate vapor bubbles on said heat exchange surface, said heat exchange surface further includes one or more adjacent periodic curves across substantially the width of said structure and extending substantially the length of said structure and wherein a liquid coolant diverter is structured in the heat exchange region to provide predetermined liquid flow conditions in the proximity of said heat exchange surface, the improvement wherein said surface for bonding semi-conductor devices includes:

channels of predetermined depth and width adjacent to at least two sides of said semi-conductor device and underlying, to a pre-determined distance, said semi-conductor device wherein a semi-conductor device removal tool may be inserted to provide a force for the removal of said semi-conductor device.

4,712,610

CHEMICAL HEAT PIPE EMPLOYING SELF-DRIVEN CHEMICAL PUMP BASED ON A MOLAR INCREASE

Arthur S. Kesten, West Hartford; Alan F. Hought, Glastonbury, and Harold T. Couch, Simbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 28, 1986, Ser. No. 936,048

Int. Cl.⁴ F28D 21/00

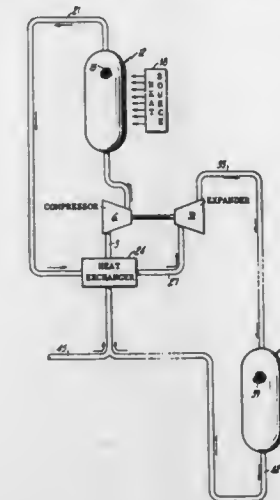
U.S. Cl. 165—104.12

4 Claims

1. In a chemical heat pipe employing reversible endothermic/exothermic chemical reactions to transfer thermal energy between a heat source and a heat sink the method of self-driving at least one reactant substantially unidirectionally through said heat pipe comprising:

(a) compressing said reactant(s) with a compressor and heating said reactant(s) to a predetermined pressure and temperature sufficient to endothermically react said reactant(s) to form reaction product having at least a 150%

molar increase thereby establishing said self-driving unidirectional flow;
(b) transferring heat from said reaction product to said reactants; and



(c) expanding said reaction product with an expander linked mechanically to said compressor whereby said expansion energy is sufficient to compress said reactants to said predetermined pressure while maintaining said self-driving unidirectional flow.

4,712,611

HEATING OR AIR-CONDITIONING VENTILATION UNIT FOR MOTOR VEHICLES

Karlheinz Witzel, Stuttgart, Fed. Rep. of Germany, assignor to Sneddeutsche Kneblerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

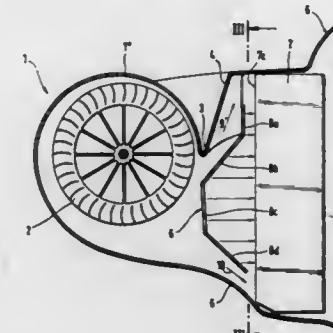
Filed May 28, 1986, Ser. No. 867,511

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520548

Int. Cl.⁴ F28F 13/12

U.S. Cl. 165—122

21 Claims



1. A heating or air-conditioning ventilation unit for a motor vehicle, comprising:

a radial blower disposed in a first housing and having a generally rectangular outlet opening of a first size;
a second housing closely adjacent to said first housing and having a cross-sectional size substantially larger than the size of said outlet opening;
a diffuser defined by upper and lower wall parts connecting said first housing and said second housing, wherein said upper and lower wall parts open from the size of said outlet opening to the cross-sectional size of said second housing with a wide opening angle;
a heat exchanger positioned in said second housing in close proximity to said diffuser.

proximity to said diffuser and having a rear surface which faces said diffuser and which substantially fills the cross-section of said second housing; and means for providing a uniform admission of air to said heat exchanger, said means comprising a grid comprised of portions of substantially equal thickness wherein the thickness is small in comparison to the area of the grid, said grid being positioned between said diffuser and said heat exchanger and having a generally convex profile, with a portion of said profile of said grid extending into said diffuser, wherein said grid extends over about 60% to 80% of the end face of said heat exchanger and wherein the ratio of the open area to the total area of said grid is from about 0.6:1 to about 0.8:1.

4,712,612

HORIZONTAL STACK TYPE EVAPORATOR

Masayoshi Okamoto, Oyamashi; Katsuhisa Suzuki, Utsumomiyashi; Ryolchi Hoshino, Oyamashi, and Hironaka Sasaki, Shimodateshi, all of Japan, assignors to Showa Aluminium Kabushiki Kaisha, Osaka, Japan

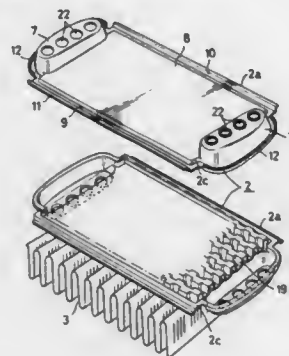
Filed Oct. 7, 1985, Ser. No. 785,279

Claims priority, application Japan, Oct. 12, 1984, 59-214981; Jun. 21, 1985, 60-136573

Int. Cl.⁴ F28F 13/00; F28D 1/02

U.S. Cl. 165-146

1 Claim



1. A horizontal stack type evaporator comprising:
 - a core portion having an inlet disposed at a lower part thereof and an outlet disposed at an upper part thereof;
 - a fluid path for allowing a cooling fluid to pass through the core from the lower part to the upper part thereof, the path being a zigzag form so that the fluid passes through the core portion at least three times and comprises a stack which includes a plurality of planar tubular elements and corrugated fins alternately overlaid into a stack form, the tubular elements each having bulged sections at their opposite ends;
 - flat tubings forming said tubular elements and communicating with the bulged sections, each flat tubing being formed by two molded plates joined along their periphery, each plate including a trough along the periphery formed by bending the periphery of the molded plate;
 - multi-entry type inner fins arranged in said flat tubings and having a fin pitch ranging from 3.0 to 6.0 mm;
 - each flow direction of the fluid passing through the core is comprised of a plurality of flat tubings so that a plurality of unit paths result; and
 - the fluid path through the core has an increasingly large cross-sectional area from inlet to outlet.

4,712,613

DOWN-HOLE BLOW-OUT PREVENTERS

Ronald L. Nienwstad, Stavanger, Norway, assignor to Peder Smedvig Aksjeselskap, Stavanger, Norway

Filed Jun. 10, 1986, Ser. No. 872,276

Claims priority, application United Kingdom, Jun. 12, 1985, 8514887

Int. Cl.⁴ E21B 34/06

U.S. Cl. 166-53

17 Claims



1. A down-hole blow-out preventer of the kind having means for connection into a drill string for use therewith in a bore hole, said blow-out preventer comprising:
 - a housing formed with a bore extending through said housing for the passage therethrough of drilling fluid;
 - means for connecting said housing into a drill string so that the bore of the housing communicates with the bore of the drill string;
 - packer means inflatable into engagement with the bore hole to form an annular seal between said bore hole and the housing;
 - and bore closure means for closing off the bore of the housing, said bore closure means including a bore closure member movably mounted in the bore of the housing, a piston mounted for movement in a cylinder in the housing, said piston being operatively connected to said bore closure means and being movable between a first position in which the bore of the housing is open and a second position in which the bore closure means closes off the bore of the housing, means for communicating said cylinder on one side of the piston with the bore of the housing, said cylinder on the other side of the piston defining a chamber which contains a compressible fluid, and first valve means normally isolating said communicating means and operable by a signal to open said communicating means to expose said piston to said fluid pressure in the bore of the housing to cause the piston to move to its second position to close off the bore of the housing.

4,712,614

LINER HANGER ASSEMBLY WITH COMBINATION SETTING TOOL

Roger P. Allwin, College Station, and Mark P. Budke, Bryan, both of Tex., assignors to Lindsey Completion Systems, Midland, Tex.

Filed Aug. 29, 1986, Ser. No. 901,835

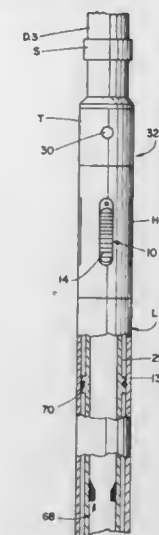
Int. Cl.⁴ E21B 23/00

U.S. Cl. 166-208

28 Claims

1. A setting tool and liner hanger for setting a liner in a well bore traversing earth formation which include:
 - a tubular outer member adapted for coupling to a liner, said outer member having slip means circumferentially disposed about said outer member and arranged for movement between a contracted unset position within the circumference of the outer surface of the outer member and an extended setting position where the slip means engage the wall of a well bore;
 - a setting tool having a tubular inner member arranged for coupling to a drill or work string,

interconnecting means for releasably interconnecting said inner member and said outer member, hydraulic-mechanical actuator means carried by said inner member and having a hydraulic cylinder movable between contracted and expanded positions, spring means cooperating with said cylinder for providing a mechanical force, said cylinder having access to the bore of said inner member for the application of hydraulic pressure;



slip actuator means for moving said slip means in response to operation of said hydraulic-mechanical actuator means, release means for releasably retaining said actuator means in a contracted position on said inner member, said release means being operable in response to hydraulic pressure to said cylinder or operable in response to relative rotation between said tubular inner member and said slip actuator means to release said mechanical force.

4,712,615

LINER HANGER ASSEMBLY WITH SETTING TOOL

Roy R. Dockins, Jr., Orange, Calif., and Hiram E. Lindsey, Jr., Midland, Tex., assignors to Lindsey Completion Systems, Midland, Tex.

Filed Jul. 1, 1986, Ser. No. 881,053

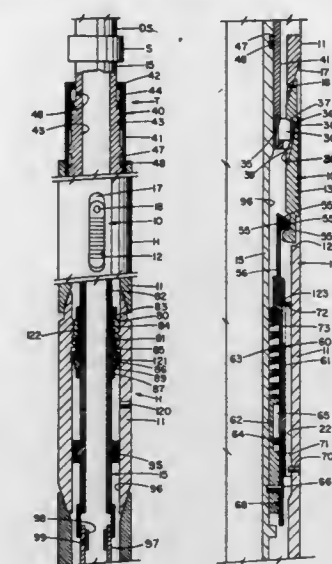
Int. Cl.⁴ E21B 23/00, 43/10

U.S. Cl. 166-208

17 Claims

1. A setting tool and liner hanger for setting a liner in a well bore traversing earth formations including:
 - a tubular outer hanger member adapted for coupling to a depending liner,
 - said outer hanger member having circumferentially disposed elongated slip openings,
 - elongated slip members disposed in said slip openings for movement of said slip members from a first retracted position within the outer hanger member to an extended position in engagement with the wall of a well casing,
 - a setting tool having a tubular inner member adapted for coupling to a drill string; hydraulic slip setting means for response to hydraulic pressure for producing a slip setting force and mechanical slip setting means for producing a slip setting force, said hydraulic slip setting means and said mechanical slip setting means being carried by said tubular inner member;
 - coupling means for releasably coupling said tubular inner member to said outer hanger member;
 - said slip setting means including an upper dog member and a lower dog member which are respectively connected to said hydraulic slip setting means and to said mechanical slip setting means wherein said dog members are movable longitudinally relative to said tubular inner member in response to a slip setting force for moving said slip mem-

bers from said first retracted position to said extended position, said hydraulic slip setting means and said mechanical slip setting means for moving said upper and lower dog mem-



bers respectively including selectively operable actuator means for selectively moving one of said dog members longitudinally relative to said tubular inner member and said outer hanger member.

4,712,616

METHOD FOR SCALE REDUCTION IN OFF-SHORE PLATFORMS

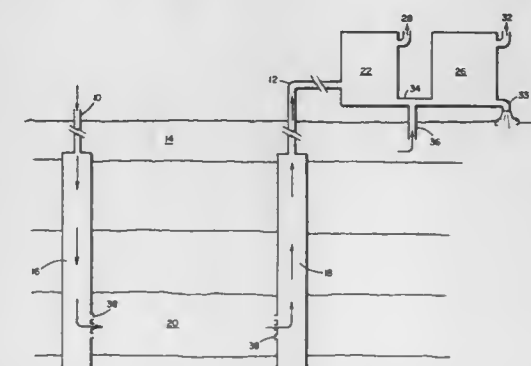
D. M. Ehlers, Addison, and Daniel N. Hopkins, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 11, 1986, Ser. No. 906,112

Int. Cl.⁴ E21B 41/02, 43/34

U.S. Cl. 166-266

8 Claims



1. A process for reducing scale formation wherein sea water, incompatible with connate water, is used as the flooding medium forming thereby a mixture with liquid hydrocarbonaceous fluids where said fluids are produced in off-shore platforms comprising:

- (a) producing said mixture of water and liquid hydrocarbonaceous fluids to the surface from said formation;
- (b) directing said mixture into a water/oil separator where said liquid hydrocarbonaceous fluids are substantially separated from said mixture and the remaining hydrocarbonaceous fluid is entrained in the form of oil droplets within the separated aqueous mixture;
- (c) removing said aqueous mixture with oil droplets therein from said water/oil separator and thereafter mixing the

combination with additional sea water, or other aqueous solution having a similar concentration of sulfate ions, in a vessel containing a coalescing means which sea water upon contact with said connate water causes a precipitate to form thereby reducing the scale forming tendency of the water; and

(d) collecting liquid hydrocarbons from step (b) and from said coalescing means, and disposing of the resultant water.

4,712,617

METHOD FOR CONTROLLING THE FLOW OF LIQUIDS THROUGH A SUBTERRANEAN FORMATION
Deborah L. Kocsis, Newark, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 3, 1986, Ser. No. 914,959
Int. Cl.⁴ E21B 33/138, 43/20

U.S. Cl. 166—270

18 Claims

9. An improved method for the enhanced oil recovery of a hydrocarbon from a subterranean formation, the enhanced oil recovery method comprising injecting an aqueous drive fluid through an injection wellbore into a hydrocarbon-bearing formation to drive the hydrocarbon from the formation to a producing wellbore wherein the improvement in the method comprises introducing, through the injection wellbore, into the formation, a water-soluble carboxamide polymer and a hypoalite salt cross-linking agent in amounts and at conditions such that the polymer is or has been cross-linked to form a gel, thereby restricting the passage of the drive fluid through the more permeable zones of the formation.

4,712,618

MULTIPLE RESERVOIR TRANSPORTATION ASSEMBLY FOR RADIOACTIVE SUBSTANCES, AND RELATED METHOD

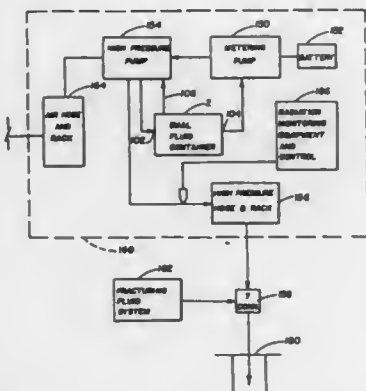
Wayne A. Handke, and Mark A. Priest, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 823,885, Jan. 29, 1986, Pat. No. 4,698,510.
This application Jan. 16, 1987, Ser. No. 4,001

Int. Cl.⁴ E21B 43/26, 49/00

U.S. Cl. 166—308

4 Claims



1. A method of injecting a radioactive substance into a well, comprising the steps of:
transferring the radioactive substance into a first cavity of a single radioactivity shielding container;
transferring a diluting substance into a second cavity of the container;
moving the container to the well;
flowing the radioactive substance from the first cavity;
flowing the diluting substance from the second cavity into the flowing radioactive substance for mixing therewith;
flowing at least a portion of the mixed radioactive substance and diluting substance into the well; and
flowing any remaining portion of the mixed radioactive

substance and diluting substance into the second cavity of the container.

4,712,619

POPPET VALVE

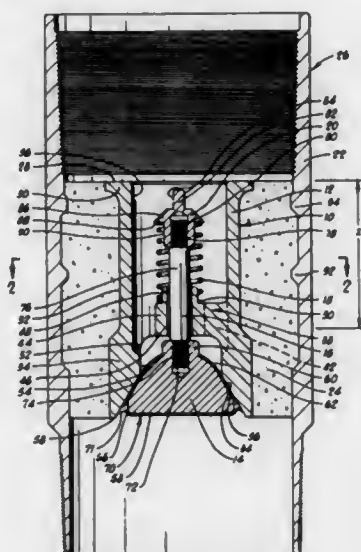
Lee W. Stepp, Comanche, and Richard L. Giroux, Duncan, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 30, 1986, Ser. No. 892,004

Int. Cl.⁴ F21B 34/08; F16K 15/00

U.S. Cl. 166—327

3 Claims



1. A float device for use in a well bore cementing operation, said float device comprising:
a casing equipment housing including a tubular section having an axial bore therethrough;
a valve assembly axially disposed in said tubular section axial bore of said casing equipment housing, said valve assembly including:
a unitary tubular valve body having a radially extending flange at the top exterior thereof defining a plug seat, a valve seat base therebelow and a cylindrical surface of lesser diameter than said flange and said valve seat base and extending therebetween and an axial bore extending therethrough with a downwardly-facing valve seat therein adjacent said valve seat base, said valve seat having a generally frustoconical configuration;
a guide spider above said valve seat comprising a plurality of radially oriented legs extending inwardly from the wall of said axial bore of said unitary tubular valve body to a central cylindrical collar having an axial stem bolt bore therethrough and a shoulder having, in turn, an upset extending upwardly therefrom;
a valve poppet having an upwardly-facing valve surface of frustoconical configuration thereon disposed adjacent said valve seat sealingly engaging the generally frustoconical configuration thereof and having an elastomeric sheath over the frustoconical configuration of said upwardly-facing valve surface, said elastomeric sheath including a circumferentially-extending lip at the lower periphery thereof;
a stem bolt secured to said valve poppet and extending upwardly through said stem bolt bore in said collar;
a spring retention cap at the top of said stem bolt, said spring retention cap including an outwardly extending flange thereon and a lower cylindrical section of lesser diameter than said flange; and
a coil spring disposed about said stem bolt above said collar, said coil spring being supported on said annular spring shoulder on said guide spider being centered thereon by said upset extending upwardly from said

shoulder into said spring and extending over said cylindrical section on said spring retention cap abutting the outwardly extending flange thereon; and
a cement sheath surrounding said valve assembly and substantially filling the annular void between said valve assembly and the wall of said tubular section bore of said casing equipment housing, said cement sheath having a top surface substantially flush with said plug seat on said valve body.

4,712,620

UPPER MARINE RISER PACKAGE

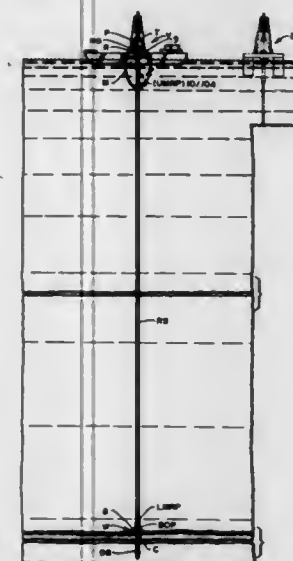
Jack S. Lim, Ventura, and Darrell L. Jones, Ojai, both of Calif., assignors to Vetco Gray Inc., Houston, Tex.

Filed Jan. 31, 1985, Ser. No. 696,823

Int. Cl.⁴ E21B 17/01, 33/035

U.S. Cl. 166—355

51 Claims



1. An upper marine riser package, operable from a relatively moveable structure, such as on a floating vessel which is subject to movement by wave action and the like, and adapted to be connected and lowered through a confined opening such as a rotary table in the vessel and supportable on a diverter housing on the vessel, said package comprising:

a diverter for diverting drilling fluid and gas from a subsea well;
a tilting means connected to said diverter to allow tilting movement between said diverter, diverter housing, vessel and the remainder of said package;
a slip joint with riser tensioning means forming part thereof connected to said tilting means to compensate for vertical movement between said well and said vessel;
said slip joint comprising an inner barrel and an outer barrel, the inner barrel being sized to telescope within said outer barrel and further including means supporting said inner barrel with respect to said diverter housing, and a plurality of cylinder assemblies connected to said support means and to said outer barrel and subject to said fluid pressure within said cylinder assemblies to compensate for vertical motion of said vessel, and
a rotation bearing connected to part of said slip joint to allow rotational movement between said well and said part, said package being connectable to a string of risers and lowered through said confined opening and said diverter housing and to a source of air and fluid under pressure for operating said package.

32. A self-tensioning slip joint for supporting a load beneath a floating vessel and capable of being lowered through a rotating table on said vessel comprising:
an inner barrel,

an outer barrel of a size to telescope over said inner barrel, means preventing relative rotation between said barrels, a plurality of cylinder assemblies surrounding said barrels and actuatable in parallel with the major axes of said barrels, said cylinder assemblies each comprising an outer cylinder and a piston rod reciprocal in said cylinder with a piston attached thereto and with said outer cylinder defining a pressure chamber in said cylinder assembly, means for communicating fluid pressure from a high pressure source to said chamber as operating fluid for urging said outer barrel toward a position fully telescoped with said inner barrel,

said piston rod being attached to a supporting means which moves to said floating vessel and said cylinder being attached to said outer barrel to compensate for the load.

50. In a self-tensioning slip joint comprising a pair of telescoping tubular members, one of which is connected for vertical movement to a subsea well and the other which is connected to a floating vessel and having seal means therebetween for slideable fluid tight interaction, the method of removing said sealing means from between said tubular members comprising the steps of;

causing said tubular members to be latched against movement therebetween, and
removing said sealing means axially of said cylindrical members.

4,712,621

CASING HANGER RUNNING TOOL

William D. Wightman, Houston, and Wilson L. Strahan, Magnolia, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Dec. 17, 1986, Ser. No. 943,278

Int. Cl.⁴ F21B 23/08

U.S. Cl. 166—382

9 Claims

1. A running tool adapted to be secured to the lower end of the string of drill pipe for running a string of casing into a well, landing a casing hanger on a shoulder in a wellhead, and setting a seal between the wellhead and the casing hanger, the running tool comprising in combination:

holder means carried by the running tool for holding the casing hanger as the casing hanger is lowered into the wellhead;

piston means, including a piston carried by the running tool above the seal, for setting the seal when supplied with hydraulic fluid pressure;

an axial passage extending through the running tool and joining a passage extending through the drill pipe;

actuating passage means in the running tool extending to the top of the piston for supplying liquid pumped down the drill pipe passage to the piston to move the piston downward to set the seal;

release passage means in the running tool extending to the holder means for supplying liquid pumped down the drill pipe passage to the holder means to release the running tool from the casing hanger after the seal has set;

means for blocking access from the running tool axial passage to the actuating passage means and release passage means while cement is pumped down the drill pipe and through the running tool to cement the casing;

means actuated from the surface for providing access from the running tool axial passage to the actuating passage means and blocking access to the release passage means to pump fluid from the drill pipe against the piston to set the seal after cementing; and

means actuated from the surface for providing access from the running tool axial passage to the release passage means and blocking access to the actuating passage means, to pump fluid from the drill pipe to the holder means to release the running tool from the holder means.

8. In a method of setting a string of casing in a well, including the steps of securing a running tool to a string of drill pipe,

4,712,633

MOTOR VEHICLE WITH HANDLEBAR

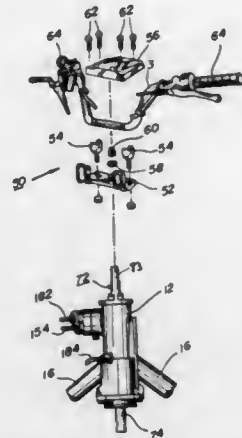
Takahisa Suzuki, Saitama; Shinichi Kuwahara, Tokyo, and Yoshinori Kawashima, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1986, Ser. No. 899,984

Claims priority, application Japan, Aug. 23, 1985, 60-185110
Int. Cl.⁴ B62D 5/08

U.S. Cl. 180-149

9 Claims



1. A motor vehicle with a handlebar, comprising: a vehicle frame assembly; at least one front wheel rotatably supported on said vehicle frame assembly; at least one rear wheel rotatably supported on said vehicle frame assembly; an engine mounted on said vehicle frame assembly between said front and rear wheels; a hydraulically operated power steering system operatively coupled to said handlebar, and said hydraulically operated power steering system comprising: a substantially cylindrical housing; an input shaft rotatably supported in said housing and coupled to said handlebar; an output shaft rotatably supported in said housing coaxially with said input shaft and operatively coupled to said front wheel; means for limiting the relative angular difference between said input and said output shafts; a hydraulically actuated vane motor coupled to said output shaft for applying a torque to said output shaft; and a control valve mechanism combined with said input and output shafts for controlling said vane motor based on a relative angular difference between said input and output shafts.

4,712,634

CONTROL SYSTEM FOR A MOTOR VEHICLE ENGINE TO PREVENT SLIPPING OF THE VEHICLE DRIVE WHEELS DURING ACCELERATION

Klaus Lindemann, Hanover, Fed. Rep. of Germany, assignor to Wabco Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 5, 1986, Ser. No. 938,695

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544294

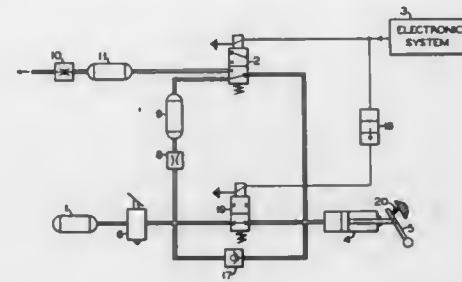
Int. Cl.⁴ B60T 8/04

U.S. Cl. 180-197

6 Claims

1. A wheel slip control system for regulating the power of a motor vehicle engine when a wheel slip condition of said vehicle arises upon acceleration thereof, comprising: (a) an operator-controlled accelerator pedal; (b) a fuel control lever; (c) a mechanical linkage between said accelerator pedal and said fuel control lever via which said fuel control lever is operated in accordance with the selected position of said

- accelerator pedal to control the power produced by said motor vehicle engine;
- (d) at least one wheel driven by said motor vehicle engine;
 - (e) means for sensing the driven rotational speed of said at least one wheel;
 - (f) evaluation means for detecting said wheel slip condition of said vehicle in response to the sensed rotational speed of said at least one wheel exceeding a predetermined threshold value;
 - (g) a fluid pressure actuator cylinder having a piston operatively connected in said mechanical linkage;
 - (h) first and second reservoirs normally charged with fluid under pressure;
 - (i) a first fluid flow restrictor via which fluid pressure com-



munication is established between said first and second reservoirs; and

- (j) a control valve having a supply port connected to one of said first and second reservoirs and an outlet connected to said actuator cylinder, said control valve being operated from a first position in which said supply port is cut off from said outlet to a second position in which said supply port is communicated with said outlet when said wheel slip condition is detected by said evaluation means, whereby said actuator cylinder is pressurized initially at a relatively fast rate and thence at a relatively slow rate to urge said piston in a direction to override said accelerator pedal control of said fuel control lever to accordingly effect a decrease of the power produced by said motor vehicle engine.

4,712,635

CONTROL APPARATUS FOR FOUR-WHEEL DRIVE VEHICLE

Koji Sumiya, Tokyo, and Shuzo Moroto, Handa, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo and Kabushiki Kaisha Shinsangyokaihatu, Tokyo, both of Japan

Filed Dec. 29, 1986, Ser. No. 947,225

Claims priority, application Japan, Jan. 13, 1986, 61-4820

Int. Cl.⁴ B60T 8/10

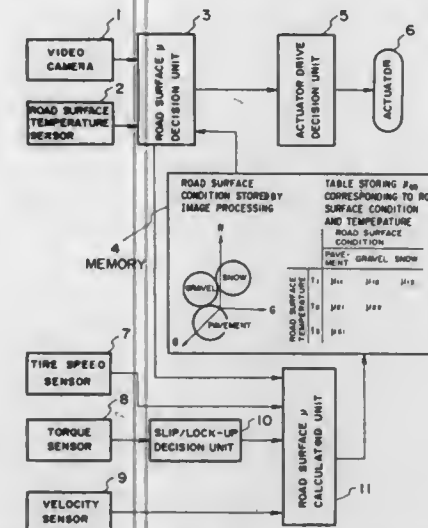
U.S. Cl. 180-197

3 Claims

1. A control apparatus for a four-wheel drive vehicle having an actuator for controlling changeover between two- and four-wheel drive or locking of a center differential mechanism, comprising:

- pick-up means mounted on the vehicle for picking up an image of a road surface lying ahead of the vehicle; memory means for storing a coefficient of friction of the road surface corresponding to an output signal from said pick-up means; decision means for judging the coefficient of friction of the road surface by comparing data stored in said memory means and the output signal from said pick-up means; driving decision means for driving the actuator in response to an output signal from said decision means; and torque sensing means arranged on front and/or rear wheels of the vehicle for sensing the torque of the front and/or rear wheels; wherein if it is judged by said torque sensing means that tire skidding or lock-up has occurred, the coefficient of fric-

tion of the road surface is calculated in response to an output signal from the torque sensing means and the coef-



ficient of the road surface stored in said memory means is revised.

4,712,636

CARRIAGE FOR WATERCRAFT

Tsutomu Ishimatsu, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

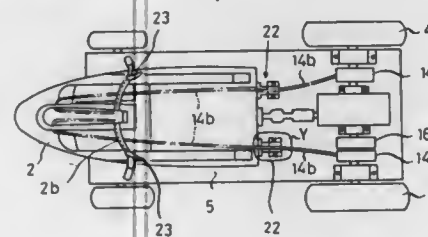
Filed May 29, 1986, Ser. No. 868,069

Claims priority, application Japan, May 29, 1985, 60-117535

Int. Cl.⁴ B60P 3/10; B60K 25/06

U.S. Cl. 180-198

2 Claims



1. A carriage for transporting a watercraft on land, comprising: a dolly carrying a watercraft having an inboard prime mover and a power take-off means from that inboard prime mover; said dolly having plural wheels including driving wheels, rotatably supported by shafts on said dolly;

- an input shaft connected to said power take-off means to transmit the prime mover's power in the form of torque; power transmission means fixed on said dolly to transmit torque from said input shaft to said driving wheels, said torque propelling the carriage by being transmitted via said power transmission means from said power take-off means of the watercraft loaded on said dolly to said driving wheels; and means for steering said carriage when said carriage is being propelled, said steering means including: manual lever means movably mounted on the watercraft; a steering means mounted on the carriage; and an interlocking means between said manual lever means and said steering means on the carriage for transmitting movement of said watercraft mounted lever means to said steering means to guide the carriage, said manual lever means includes a steering handle bar on the watercraft and levers located on both sides of said steering handle bar on the watercraft and wherein said steering means on the carriage includes clutches on said carriage for controlling the driving wheels, and said interlocking

means includes means for transmitting the movement of said manual lever means to said clutches respectively for engaging/disengaging said clutches.

4,712,637

STRADDLE TYPE VEHICLE SEAT ASSEMBLY

Tomonori Mogi, and Yoshiaki Kashio, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

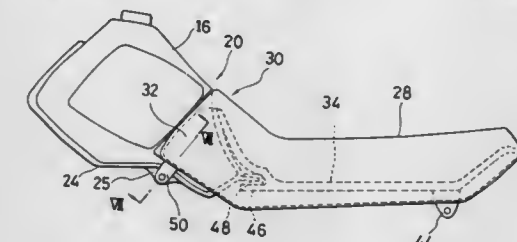
Filed Jun. 20, 1986, Ser. No. 876,973

Claims priority, application Japan, Jun. 20, 1985, 60-092228; Jun. 20, 1985, 60-092229

Int. Cl.⁴ B62K 11/04, 19/30

U.S. Cl. 180-219

6 Claims



1. A saddle type seat assembly for a vehicle having a fuel tank, comprising: downwardly projecting attachment members including fastening holes affixed to either side of the rear portion of the fuel tank; a seat frame having the U-shaped cross section; a forward portion of said seat frame extending over a rearward portion of the fuel tank to said attachment members; engagement means affixed to said frame for engaging said attachment members; and bolts extending through said fastening holes to engage said engagement means.

4,712,638

SUSPENSION SYSTEM FOR MOTORCYCLES

Takeshi Kawaguchi, and Akio Kawano, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

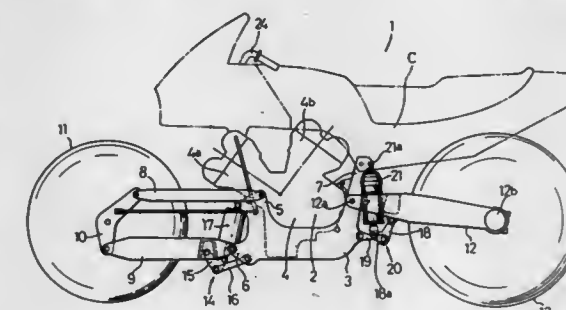
Filed Jun. 25, 1986, Ser. No. 878,414

Claims priority, application Japan, Jun. 25, 1985, 60-138186; Jun. 25, 1985, 60-138184

Int. Cl.⁴ B62K 25/16

U.S. Cl. 180-219

4 Claims



1. A suspension system for a motorcycle having front and rear wheels and a frame structure including a power unit as a structural part thereof, comprising: generally horizontally disposed forwardly extending vertically spaced upper and lower front swing arms pivotally mounted at their proximal ends to said frame structure,

a steering plate extending between and pivotally connecting the distal ends of said upper and lower front swing arms, means in said steering plate intermediate the ends thereof for rotatably mounting said front wheel, a cushion member pivotally mounted at one end to said frame structure, and means for connecting the other end of said cushion member to said lower front swing arm, including:

- a generally L-shaped cushion arm pivotally connected at one end to said cushion member and at the other end to said lower front swing arm, and
- a connecting rod extending substantially parallel to said lower swing arm and having one end pivotally connected to said frame structure and its other end pivotally connected to said cushion arm intermediate the ends thereof.

4,712,639

AUTOMOBILE ANTI-THEFT DEVICE

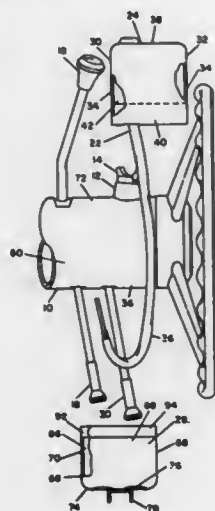
Joseph E. Solow, Plainview, N.Y., assignor to Wolo Manufacturing Corp., Deer Park, N.Y.

Filed Feb. 11, 1987, Ser. No. 13,392

Int. Cl.⁴ E05B 17/14

U.S. Cl. 180—287

4 Claims



1. An automobile anti-theft device for protecting a steering column ignition lock, comprising:

- a first cover having a hollow interior space and being open on one side, the open side having arcuate surfaces spacing opposite ends of said first cover, thereby being adapted to fit over a portion of a steering column containing an ignition lock;

- a tension bearing element;

- means for attaching one end of said element to one end of said first cover to permit the remaining portion to wrap around the steering column and a second cover;
- means for releasably attaching said element to the other end of said first cover;

- a second cover having opposed end walls with arcuate edges adapted to wrap around a portion of the steering column, a top wall arranged perpendicular to said opposed edges at the edges away from said arcuate edges, with at least one opening permitting a turn signal lever to be received by said second cover, opposed side walls, adapted to fit along a portion of the steering column, and an open bottom, wherein said second cover has a hollow interior adapted to fit over a turn signal housing; and

- constraining means on the second cover top wall for receiving said tension bearing for constraining said tension bearing element against lateral movement, whereby said first cover may be placed over a steering column ignition lock, said second cover may be fitted over the turn signal housing, and said tension bearing element can be wrapped

around the steering column, engaging said constraining means, and attached to the other end of the cover for retaining said first and second covers against the steering column.

4,712,640

HYDRAULIC REMOTE CONTROL FOR MOTOR VEHICLE MANUAL SHIFT TRANSMISSION

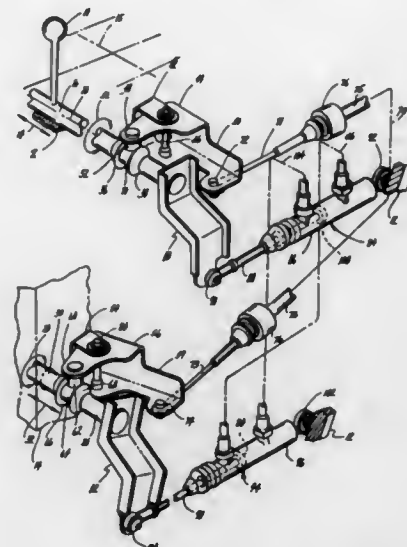
Keith V. Leigh-Monstevens, Troy, and David K. Mienko, Clawson, both of Mich., assignors to Automotive Products plc, Warwickshire, England

Filed Dec. 20, 1985, Ser. No. 811,344

Int. Cl.⁴ B60K 20/14

U.S. Cl. 180—336

15 Claims



1. A gear select and shift mechanism for a motor vehicle having a transmission having a housing and including a select and shift rail having an operating portion positioned within said housing and an access portion positioned outside of said housing, said rail being axially movable for selection of a couple of gear ratios and being rotatably movable in opposite directions for shifting into a gear ratio, said mechanism comprising a manually operable shift lever located remotely from said transmission and motion transmitting means between said shift lever and said shift rail for axially displacing said shift rail and for rotating said shift rail in response to pivoting motion of said shift lever, said motion transmitting means for rotating said shift rail comprising a hydraulic master cylinder having a linearly displaceable input member connected to said shift lever for operating said input member by pivoting motion of said shift lever, a slave cylinder having a linearly displaceable output member connected to said access portion of said shift rail for rotating said shift rail in one of two opposite directions in response to linear displacement of said output member, and hydraulic link means interconnecting said master cylinder and said slave cylinder and operative to direct the hydraulic fluid discharged from said master cylinder in response to linear displacement of said input member to said slave cylinder and operative to direct the hydraulic fluid discharged from said slave cylinder in response to linear displacement of said output member to said master cylinder so that linear movement of said input member of said master cylinder produces corresponding linear movement of said output member of said slave cylinder so that pivoting movement of said shift lever produces rotation of said shift rail, said motion transmitting means for axially displacing said shift rail comprising a bracket adapted to be secured to said transmission housing proximate said shift rail, a first lever pivotally mounted on said bracket and engaging said shift rail access portion, and means operative in response to

axial displacement of said shift lever to pivot said first lever on said bracket and axially displace said shift rail.

4,712,641

METHOD AND SYSTEM FOR GENERATING SHEAR WAVES AND COMPRESSION WAVES IN THE EARTH FOR SEISMIC SURVEYING

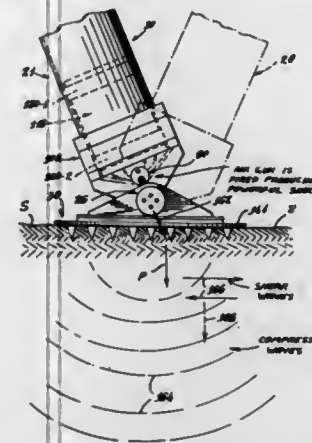
Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Technology Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 590,723, Mar. 19, 1984, abandoned. This application Sep. 21, 1984, Ser. No. 653,438

Int. Cl.⁴ G01V 1/04, 1/02, 1/00; H04R 1/02

U.S. Cl. 181—113

58 Claims



1. Apparatus for generating horizontally polarized shear waves and compression waves in the earth for seismic surveying which comprises:

- transport means movable across the earth's surface;

- substantially vertical hollow cylinder means carried by said transport means, having a wall and closed upper and lower ends;

- an earth-contacting plate pivotally mounted to the lower end of said cylinder means for pivoting in an arc direction about an axis substantially perpendicular to the axis of said cylinder means and parallel with the earth's surface and said pivot axis being at the lower end of said cylinder means near said earth-contacting plate, said plate having an earth-contacting surface including a plurality of blade members engageable with the earth's surface;

- a piston-like reaction mass slidably contained within said cylinder means;

- a liquid contained within said cylinder means forming a liquid-filled volume substantially filling the cylinder means between the lower end of the cylinder means and the reaction mass; and

- an air gun means contained within said cylinder means between the lower end of said cylinder means and the reaction mass and extending transverse to the axis of said cylinder means, with the axis of the air gun being oriented parallel with said pivot axis, for suddenly discharging an explosive-like burst of expanding compressed gas within said liquid-filled volume, the lower end of said cylinder means serving to focus and direct the burst upwardly toward the reaction mass and forcibly drive the earth-contacting plate down onto the earth's surface.

4,712,642

SELF-DAMPING CONVOLUTED CONDUIT

James M. Lalikos, Springfield, and Harold K. Waite, East Longmeadow, both of Mass., assignors to Titeflex Corporation, Springfield, Mass.

Filed Feb. 11, 1986, Ser. No. 828,767

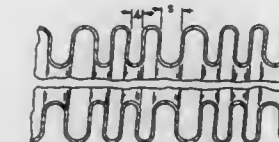
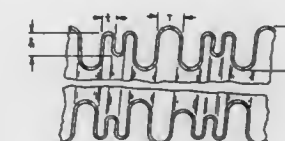
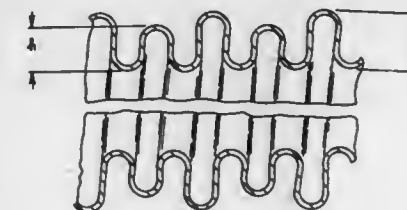
Int. Cl.⁴ F16F 7/00

U.S. Cl. 181—207

10 Claims

1. An automotive exhaust system comprising a self-damping

conduit made of metal which is capable of resonant vibrations, said conduit being formed of a convoluted tube having successive convolutions with varying physical dimensions which produce different resonant frequencies of vibration in individual incremental lengths of said conduit, and each incremental



length of said tube having a reaction to physical vibration which counteracts the reaction of its neighboring incremental length to those same physical vibrations, whereby said conduit is self-damping because it does not have a single high amplitude resonant frequency of vibration throughout its entire length.

4,712,643

PARTICULATE TRAP EXHAUST MUFFLER

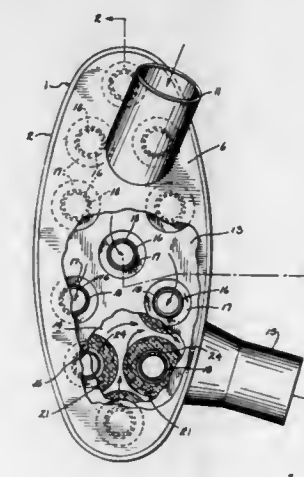
Lawrence F. Iles, Madison, and Gary D. Goplen, Stoughton, both of Wis., assignors to Nelson Industries, Inc., Stoughton, Wis.

Filed Feb. 17, 1987, Ser. No. 15,743

Int. Cl.⁴ F01N 3/02

U.S. Cl. 181—231

14 Claims



1. A particulate trap exhaust muffler, comprising a casing having an inlet and an outlet, an internal wall disposed within the casing, said wall having a plurality of openings, a plurality of tubes, one end of each tube communicating with one of said

openings and the other end of each tube being closed, each tube having a plurality of holes extending therethrough, and a cylindrical member spaced concentrically outward of each tube, each cylindrical member being permeable to the flow of exhaust gas and being constructed and arranged to trap particulate material in the gas as said gas flows therethrough, exhaust gas entering the inlet flowing through said tubes and then outwardly through said holes and through said cylindrical members chamber for discharge from said outlet.

4,712,644

EXHAUST SILENCER FOR INTERNAL COMBUSTION ENGINES

Yichang Sun, 25 Zhang Zizhong Rod., Tianjin, China

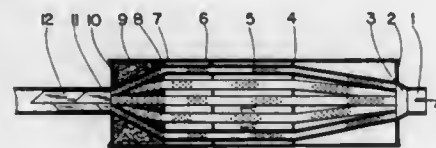
Filed Mar. 13, 1986, Ser. No. 839,062

Claims priority, application China, Apr. 1, 1985, 85102410

Int. Cl.⁴ F01N 1/10

U.S. Cl. 181—251

12 Claims



1. An exhaust silencer for an internal combustion engine having an exhaust pipe, comprising:

a cylindrical shell, said shell having first and second ends, an inner space therebetween and a longitudinal axis; first and second lids disposed at said first and second ends, respectively, closing said cylindrical shell;

at least one substantially circular spacer dividing said inner space into a plurality of chambers, said chambers having different volumes, said spacer having a plurality of substantially circular openings therein uniformly and circumferentially disposed within said spacer;

front and tail pipes, said tail pipe having a front end including a geometric center and further having an outlet edge having an approximately sinewave profile;

a trumpet pipe having large and small ends, said large end having a geometric center, said front pipe being coupled to said trumpet pipe small end, and said trumpet pipe large end being coupled to said first lid;

said first and second lids each having an aperture for fitting therein said trumpet pipe large end and tail pipe, respectively, said apertures further having geometric centers, said geometric centers being aligned with said longitudinal axis;

a plurality of core tubes extending through said substantially circular openings in said spacer, said core tubes including first and second ends, said ends having cross sections substantially defining a sector of a circle, said core tubes having walls with holes therein coupling the interior volume of said core tubes to said chambers, said core tube holes having flanges;

said core tubes each including a portion parallel to said longitudinal axis and first and second portions deflecting at first and second angles toward the centers of the large end of said trumpet pipe and the front end of said tail pipe, respectively, said first ends of said core tubes being assembled together and inserted into said trumpet pipe large end to form an integral connection therewith; and flow dividing plates disposed in said tail pipe.

4,712,645

FIRE ESCAPE DEVICE

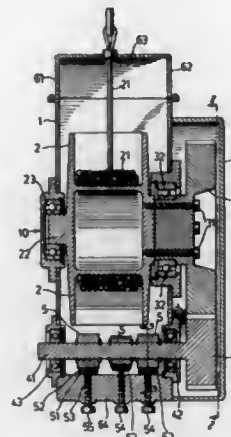
Tzyy Z. Shih, No. 9, Lane 2, Hsinchung Street, Taipei, Taiwan

Filed Dec. 29, 1986, Ser. No. 947,363

Int. Cl.⁴ A62B 1/08

U.S. Cl. 182—5

8 Claims



1. A fire escape device, comprising:

a supporting cable adapted to be connected, at one end thereof, to a fixed point,

a housing, including a pair of side walls and top and bottom walls,

a drum comprising a shaft thereof extending across an interior of said housing and rotatably mounted in said side walls, with said supporting cable being wound upon said drum at an opposite end thereof and being unwindable therefrom such that said housing can be lowered with respect to said fixed point,

a first gear mounted upon said drum to be rotatable therewith,

a second gear engagable with said first gear and rotatably journaled on an exterior of one of said housing side walls, said second gear comprising a shaft extending across the housing interior,

three fastening rings securely mounted upon said shaft of said second gear,

three corresponding compression rollers, each being mounted directly below a respective one of said fastening rings and being mounted upon said bottom housing wall, and being in continuous contact with said respective rings, and

each of said rings comprising a wavelike outer circumferential surface having at least one convex protrusion and at least one concave depression, with at least one of said compression rollers contacting a respective ring at said convex protrusion thereof, and at least one other compression roller contacting a respective ring in said concave depression thereof.

4,712,646

LINEMAN'S SAFETY STRAP ASSEMBLY

Lawrence J. Page, R.R. #4, Division Street North, Cobourg, Ontario, Canada K9A 4J7

Filed Mar. 13, 1987, Ser. No. 25,592

Claims priority, application Canada, Jan. 12, 1987, 527131

Int. Cl.⁴ A62B 35/00

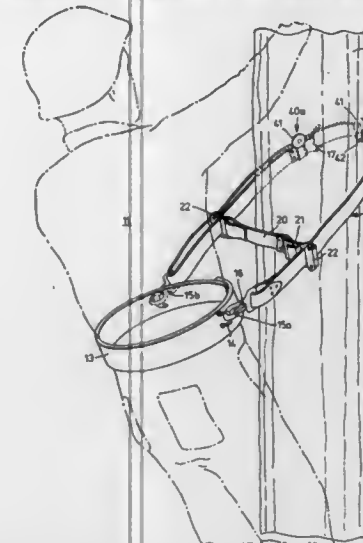
U.S. Cl. 182—9

14 Claims

1. A lineman's safety strap assembly for attachment to a body belt, comprising:

an elongated safety strap terminating in a buckle at one end for varying the length of the safety strap, and in first means for coupling the safety strap to the body belt at the other end of the safety strap, second means for coupling the safety strap to the body belt being slidably mounted on said safety strap;

an inclined sharp edged roller slidably mounted on the safety strap for movement toward the midpoint thereof; and a cross-belt terminating in means at both ends for slidably coupling the cross-belt to the safety strap at two locations,



thereby forming a closed loop for encircling a pole with the roller facing inwardly, whereby in the event of a fall, the cross-belt bears against the inner face of the pole while the lower edge of the roller is pulled into biting engagement with the outer face of the pole.

4,712,647

PORTABLE AND COLLAPSIBLE PLATFORM

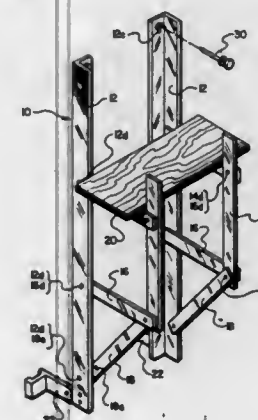
Richard A. Romine, 13251 Cherry St., Westminster, Calif. 92683

Filed Sep. 5, 1986, Ser. No. 905,118

Int. Cl.⁴ E06C 1/383; E04G 3/10

U.S. Cl. 182—96

21 Claims



1. A portable and collapsible platform comprising:

(a) a pair of inward vertical members having on their upward end a means for fastening said vertical members to a stationary structure and having along their outward side a plurality of attachment bores,

(b) a pair of outward vertical members having along their side a plurality of attachment bores in horizontal alignment with the respective attachment bores on said pair of inward vertical members,

(c) a plurality of horizontal member pairs each having an attachment bore on each end where inward attachment bores concentrically interface with the attachment bores on said inward vertical members and where outward attachment bores concentrically interface with the respec-

tive horizontal attachment bores on said outward vertical members,

(d) a pair of angular support members each having on their lower inward side an attachment bore that concentrically interfaces respectively with an attachment bore located on lower section of said inward vertical member and having on their upper outward side an attachment bore that concentrically interfaces respectively with the lowest outward attachment bores on said outward vertical members and with the outward attachment bores on the lowest of said horizontal members,

(e) means to rotatably attach each of the concentric bore sets, and

(f) a utility platform sized to rest on the top surface of a selected pair of said horizontal members where said platform allows a person to stand or sit while working at a height above the floor or ground.

4,712,648

DUAL MAGNETIC COIL DRIVER AND MONITOR SENSOR CIRCUIT

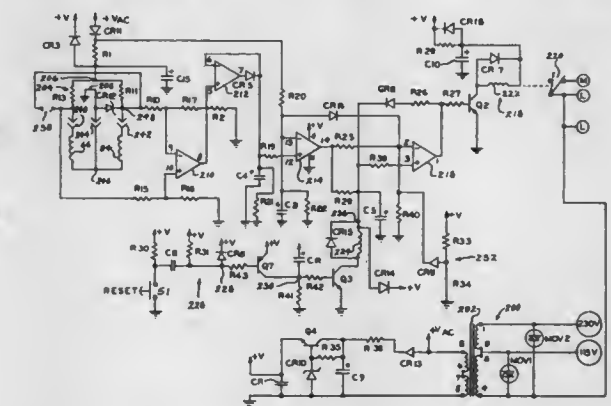
Michael F. Mattes, and Mark A. Dorland, both of Durham, N.C., assignors to SSI Technologies, Inc., Janesville, Wis.

Filed Aug. 18, 1986, Ser. No. 897,737

Int. Cl.⁴ H01F 21/06; G01L 7/16; F01M 1/22

U.S. Cl. 184—6.4

37 Claims



1. In a transducer having a delta coil for generating a magnetic flux path through a path of movement of a magnetically permeable member, such that movement of said member changes the return coupled flux linkage, which flux change indicates movement of said member, and having a reference coil spaced sufficiently from said path of movement of said member such that movement of the latter has less effect on return coupled flux linkage of said reference coil than said delta coil, a sensor circuit comprising:

means connecting said coils in respective parallel voltage dividers;

means applying electrical potential across said parallel voltage dividers such that there is no relative phase shift between said coils;

differential amplifier means having a reference input from said reference coil and a comparing input from said delta coil, and having an output, such that when said magnetically permeable member moves in a given direction the voltage at said comparing input of said differential amplifier means increases in a given polarity direction above a given threshold relative to the voltage at said reference input of said differential amplifier means such that said output of said differential amplifier means increases and provides an output error signal.

4,712,649

PROGRESSIVE DISTRIBUTOR FOR LUBRICANTS
Werner Saam, Oberhausen-Rheinhausen, Fed. Rep. of Germany, assignor to Joseph Voegel AG, Mannheim, Fed. Rep. of Germany

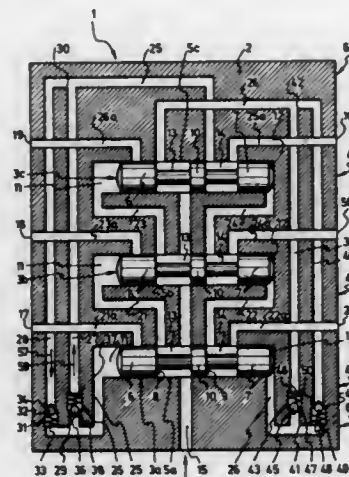
Filed Oct. 21, 1986, Ser. No. 921,070

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542934

Int. Cl.⁴ F16N 25/02

U.S. Cl. 184—7.4

7 Claims



1. A progressive distributor for lubricants supplied under pressure and discharged in metered amounts through at least one outlet in successive pulses, comprising at least two distributor sections each including a double piston housed in a cylinder chamber for reciprocating between two end positions, a supply passage leading to said cylinder chambers disposed in a common plane of said distributor, and passages interconnecting adjacent cylinder chambers as well as the first cylinder chamber and the last cylinder chamber in said plane and leading to discharge outlets, each of the two end portions of each cylinder chamber acting alternately as a control chamber for the pressurization of the double piston and as a metering chamber for the lubricant expelled therefrom by the displacement of said piston, characterized in that at least each passage (25, 26) connecting said first cylinder chamber (5a) to said last cylinder chamber (5c) in said plane is formed over at least part of its length of two juxtaposed branch passages (27, 28; 39, 40), that both said branch passages (27, 28; 39, 40) are provided therein with closure elements (31, 35, 43, 44) closing in mutually opposite flow directions, and that said closure elements (31, 35, 43, 44) are disposed closely adjacent to a metering chamber formed by the end portion (11, 12) of said cylinder chamber (5a).

4,712,650

HOOD CONVEYING APPARATUS HAVING AN OUTWARDLY REACHING BASKET

David L. Campbell, Houston, Tex., assignor to Pronto Service Facilities, Inc., Austin, Tex.

Filed Mar. 28, 1986, Ser. No. 845,566

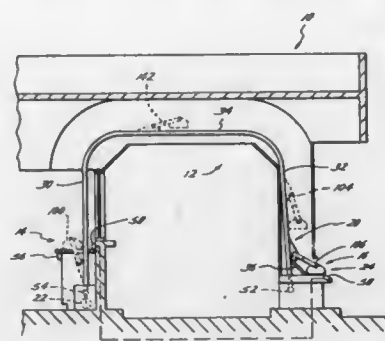
Int. Cl.⁴ B65G 17/16; E04H 3/04

U.S. Cl. 186—41

18 Claims

18. In a conveyance system having a track with receiving and sending vertical track sections adjacent respective receiving and sending stations, a trolley coupled to the track, and a belt coupled to the trolley for shifting the trolley along the track to the receiving station, the improvement comprising: elongated arm structure having one end pivotally coupled to the trolley and the other end coupled to a basket, means for locking the arm structure relative to the trolley as the trolley transits the sending vertical track section and

for allowing the arm structure to pivot as the trolley transits the receiving vertical track section, and shoulder means disposed at the receiving station adjacent said receiving vertical track section for contacting the



basket as the trolley moves towards the receiving station to pivot the arm structure relative the trolley and outwardly shift the basket away from the receiving vertical track section.

4,712,651

ELEVATOR CAB

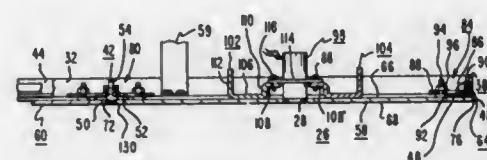
Edward F. Sherwood, Gettysburg, and Karl B. Orndorff, Bonneauville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1986, Ser. No. 863,486

Int. Cl.⁴ B66B 11/02; F21S 1/02

U.S. Cl. 187—1 R

1 Claim



1. An elevator cab, comprising: a canopy, sidewalls supporting said canopy, a frame suspended from said canopy, a plurality of drop ceiling pan assemblies supported by said frame, with each pan assembly including a metallic sheet member having upper and lower surfaces, and outer edges, at least two spaced openings in one of said pan assemblies which extend between the upper and lower surfaces of the metallic sheet member, first and second elongated bracket members fixed in spaced relation to the upper surface of said metallic sheet member, on opposite sides of said at least two spaced openings, to stiffen said metallic sheet member and to provide an elongated space between the spaced bracket members for receiving down lamp fixtures, and a down lamp fixture centered over each of said at least two spaced openings, each of said down lamp fixtures being disposed between and supported by said first and second elongated bracket members, each of said first and second bracket members having a cross-sectional configuration which includes first and second horizontally oriented leg portions interconnected by an intermediate leg portion, with the first leg portion being fixed to the second surface of the sheet metal member, and with the down lamp fixtures being fixed to the second leg portions.

4,712,652

ELEVATOR FOR TRANSPORTING PEOPLE AND GOODS WITH AN ANNULAR TRAVELLING CABIN
Otakar Smidek, Burgdorf, Switzerland, assignor to Von Roll AG., Gerlafingen, Switzerland

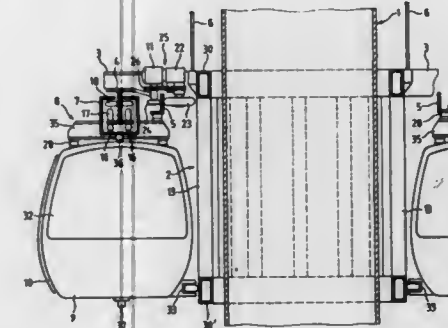
Filed Mar. 17, 1986, Ser. No. 839,953

Claims priority, application Switzerland, Mar. 22, 1985, 1287/85; Nov. 21, 1985, 4969/85

Int. Cl.⁴ B66B 9/00; A63G 1/00

U.S. Cl. 187—1 R

19 Claims



1. An elevator system for a building comprising: a cage arranged around the outer circumference of said building, said cage having an upper cage ring and a lower cage ring interconnected by struts, and a supporting track; first drive means associated with said cage for selectively raising and lowering same; a plurality of closed, independent travelling cabins vertically supported on said supporting track in a juxtaposed manner by rollers having a substantially horizontal axis and horizontally supported on said cage by rollers having a substantially vertical axis; and second drive means associated with said at least one travelling cabin for moving same on said cage around said building.

4,712,653

ENERGY-RECYCLING SCISSORS LIFT

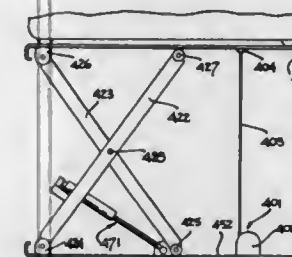
Duane R. Franklin, Northridge; Archibald D. Evans, Thousand Oaks, and Walter J. Hansen, Woodland Hills, all of Calif., assignors to Lift-R Technologies, Inc., Los Angeles, Calif.

Filed Aug. 14, 1985, Ser. No. 765,911

Int. Cl.⁴ B66B 11/04

U.S. Cl. 187—18

35 Claims



1. An energy-recycling scissors lift for raising and lowering an article comprising: a lower support member and upper support member, said upper support member being adapted for vertical motion between a relatively retracted position and a relatively extended position above said lower support member, said upper support member being adapted to hold the article; a scissors linkage including a first and second scissors leg, said first scissors leg having one end that is pivotally connected to said upper support member and another end that translates along said lower support member while in operation, said second scissors leg having one end that is

pivotally connected to said lower support member and another end that translates along said upper member while in operation; attachment-structure means secured to said second scissors leg; a sealed gas cylinder having a first end that is pivotally fixed to said attachment-structure means and a second end that is pivotally attached to said lower support member, said sealed gas cylinder being adapted for storing energy when the article and said upper support member is lowered to a retracted position and for moving said upper support member and the article upwardly from said retracted position toward said extended position; and means for compensating for the force exerted on said upper support member by said sealed gas cylinder.

4,712,654

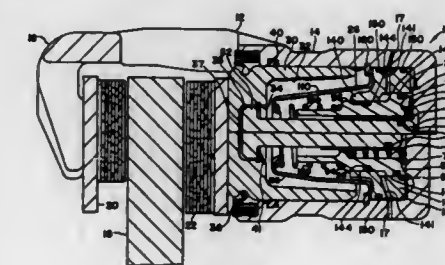
BRAKE ASSEMBLY WITH MULTIPLE ADJUSTABILITY
Robert B. Temple, and James J. Colpaert, both of Granger, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 9, 1986, Ser. No. 939,588

Int. Cl.⁴ F16D 65/54

U.S. Cl. 188—71.8

23 Claims



1. A disc brake assembly comprising a caliper connected with a caliper housing having therein a bore, a first piston disposed within the bore for slidable movement therein, a first seal disposed between the piston and caliper housing, a rod extending within said bore and having a head connected with the first piston, resilient means disposed between the first piston and head, the rod having a tube disposed thereabout and the tube having a radially extending flange, a second seal disposed between said rod and tube, a second piston disposed within said bore and about said tube and rod, a first spring disposed between said flange and second piston, a retainer connected with the caliper housing and disposed within said bore, and a second spring located between and biasing apart said retainer and second piston, so that said second seal has a resistance to movement of the rod relative to the tube which resistance is greater than a resistance to movement effected by the first seal for movement of the first piston relative to the caliper housing.

4,712,655

BRAKE ACTUATOR WITH AUTOMATIC ADJUSTMENT
Jean-Paul Sauvée, Aubervilliers, France, assignor to Bendix France, Paris, France

Continuation of Ser. No. 818,460, Jan. 13, 1986, abandoned. This application May 6, 1987, Ser. No. 45,717

Claims priority, application France, Jan. 25, 1985, 85 01027

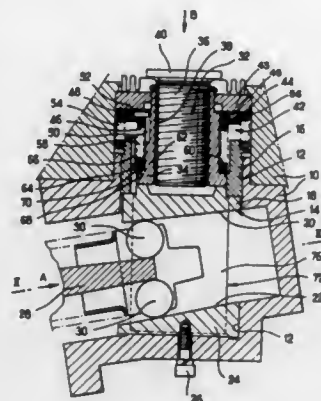
Int. Cl.⁴ F16D 65/56

U.S. Cl. 188—196 D

5 Claims

1. A brake actuator with automatic adjustment of the type comprising a screw-and-nut actuating mechanism the lengthening of which is controlled by a combined system having a screw-and-nut of reversible pitch mounted within a fixed and a unidirectional clutch, operatively connected between said nut and axial body, which is sensitive to relative axial movement between a control piston and said fixed body which houses the control piston, characterized in that the brake actuator com-

prises a device for preventing rotation of the nut of the actuating mechanism and for allowing forced rotation of the nut beyond a predetermined value of torque, the control device comprising two surfaces facing one another and pushed into friction engagement against one another, one surface fixed firmly to the nut and the other surface immobilized rotationally



relative to the fixed body, the other surface formed on an annular component comprising at least one projection entering into an axial groove formed in the control piston, and the control piston immobilized rotationally relative to the body by means of a fork connected to a sleeve of the control piston and fork guided by a reaction component which is fixed firmly to the body.

4,712,656

ARMATURE ROTORS FOR ELECTROMAGNETIC BRAKES

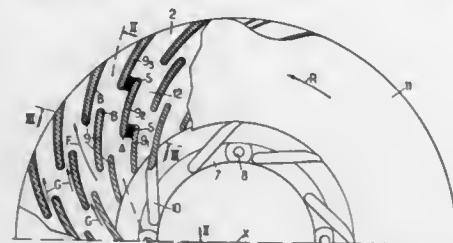
Jean-Claude Courtois, Vigny, France, assignor to Labavia S.G.E., France

Filed Jun. 30, 1986, Ser. No. 880,182

Claims priority, application France, Jul. 11, 1985, 85 10654
Int. Cl.⁴ H02K 49/04, 1/32

U.S. Cl. 188—218 XL

8 Claims



1. Armature rotor of an electromagnetic brake, comprising at least one disc (2) joined to a fastening ring (7) by a crown of arms (10), a plurality of ventilation fins, the portions of largest diameter (9) of these fins projecting axially on the disc and being inclined to the corresponding radii and their crests being joined to one another by an annular flange (11), characterised in that the fins (9) forming cross pieces between the flange and the disc are constituted by a plurality of sections (9₁, 9₂, 9₃) each extending over one portion only of the radial width of these two annular elements (2 and 11), each cross-piece section exhibiting the shape of a curved tile orienting its concavity rearwards with respect to the direction of rotation (R) of the rotor, said tiles forming a plurality of concentric rings which are radially overlapping with respect to each other, the tiles composing each ring being identical with one another and equidistant from each other, the numbers of tiles composing the different rings being identical with one another, and each tile of any ring being slightly offset angularly with respect to

the outer extension of the closest tile of the ring which is placed immediately radially inside said ring.

4,712,657

METHOD AND MEANS FOR SEALING A CARRYING CASE

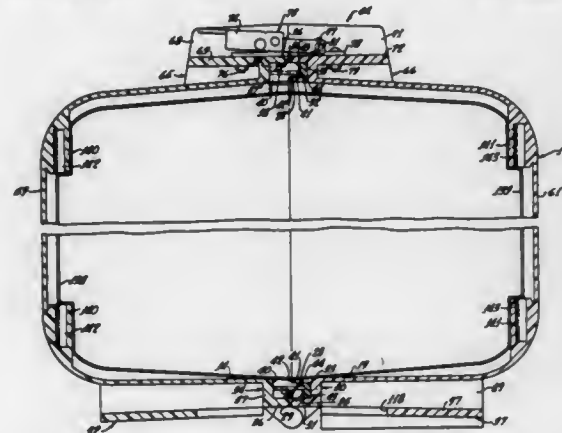
Jay E. Myers, Laguna Beach, Calif.; M. Todd Myers, New York, N.Y., and Siamak Iravanchi, Lawndale, Calif., assignors to Andiamo Inc., Fountain Valley, Calif.

Division of Ser. No. 828,769, Feb. 12, 1986. This application Feb. 4, 1987, Ser. No. 10,693

Int. Cl.⁴ B65D 53/00; A45G 13/36

U.S. Cl. 190—28

6 Claims



1. A carrying case comprising two sections, each having an outer edge portion hinge means pivotally interconnecting said sections so that said sections can meet at said outer edge portions thereof, said sections having walls such that said sections define a closed container when said sections so meet at said outer edge portions, one of said sections defining a recess around said outer edge portion thereof, said recess having sidewall means, a gasket means within said recess, the other of said sections including a continuous flange at said outer edge portion thereof, and a plurality of spaced ribs projecting laterally from said flange, said flange being narrower than said recess, said flange when said sections so meet at said outer edges being within said recess and engaging said gasket means for forming a seal therewith, said ribs when said sections so meet extending to a position of juxtaposition with said sidewall means for reinforcing the joint between said sections.

4,712,658

METHOD OF AUTOMATICALLY OPERATING A CLUTCH RELEASE BEARING ACCORDING TO THE SPEEDS OF THE SHAFTS COUPLED BY AN ASSOCIATED CLUTCH

Pierre Grunberg, Paris, France, assignor to Valeo, Paris, France

Filed Apr. 23, 1986, Ser. No. 854,833

Claims priority, application France, Apr. 24, 1985, 85 06221
Int. Cl.⁴ F16D 43/04

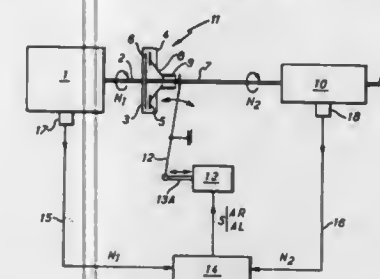
U.S. Cl. 192—0,033

11 Claims

1. Method of automatically operating a clutch release bearing in order to re-engage a friction clutch adapted to transmit between first and second rotating shafts a torque depending on the action of said release bearing on a clutch release device associated with the clutch, said clutch release bearing having a predetermined total travel between a clutch released position in which no torque is transmitted between said shafts and a clutch engaged position in which said shafts are coupled together in rotation, in which method the clutch release bearing is moved according to speed modes selected from a plurality of predetermined modes related to the rotation speeds of the first

and second shafts, the clutch release bearing being moved during a first phase in accordance with a first or fast speed mode over at least a predetermined approach travel beyond

threads, said adjusting ring comprising means for rotating said adjusting ring, whereby said clutch brake ring may be axially adjusted by said rotation of said adjusting ring.



which the changing difference between the rotation speeds of the two shafts is monitored and, when a decrease in this difference is detected, a second or slow speed mode is substituted for said first speed mode.

4,712,659

ADJUSTABLE CLUTCH BRAKE APPARATUS

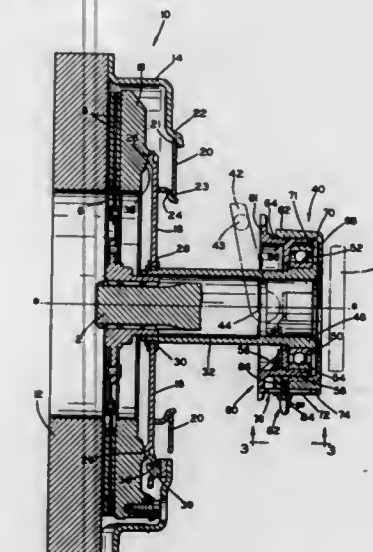
Richard A. Flotow, Butler, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 11, 1986, Ser. No. 940,324

Int. Cl.⁴ F16D 67/02, 13/75

U.S. Cl. 192—13 R

12 Claims



1. In a friction disc clutch assembly including friction linings, said clutch assembly having actuating means disposed for selectively coupling an input shaft and an engine fly wheel, said assembly including a clutch release bearing comprising means for disengagement of said clutch assembly, said release bearing comprising inner and outer races mounted upon and secured to an axially moveable sleeve engagable with said actuating means, said release bearing further comprising a clutch brake ring disposed for engagement with a clutch brake wear pad spaced axially thereof for arresting rotational movement of said input shaft upon disengagement of said clutch assembly; an improvement comprising a manual adjusting ring adapted for moving said clutch brake ring toward said wear pad as said friction linings become worn, said adjusting ring being secured directly to the outer race of said release bearing, and having an exterior circumferentially threaded portion thereon, said clutch brake ring having an interior circumferentially threaded portion disposed for mating with said exterior threaded portion of said adjusting ring, said clutch brake ring being secured directly to said adjusting ring via said mating

4,712,660

ELECTROMOTIVE VARIABLE-SPEED AND CONTROL DRIVE PARTICULARLY FOR USE IN INDUSTRIAL SEWING MACHINES

Hans Erndt, Wiesloch; Erich Link, Brühl; Adolf Martin, Rhein-stetten; Herbert Palloch, Schwetzingen, Baden, and Hilmar Wittler, Karlsruhe, all of Fed. Rep. of Germany, assignors to Frankl & Kirchner GmbH & Co KG, Schwetzingen, Baden, Fed. Rep. of Germany

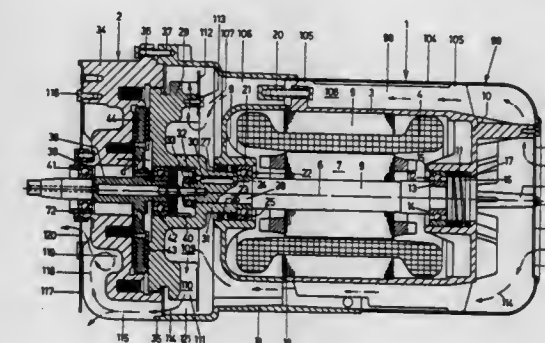
Filed Mar. 5, 1986, Ser. No. 836,328

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508310

Int. Cl.⁴ F16D 67/06, 13/72

U.S. Cl. 192—18 B

7 Claims



1. An electromotive variable-speed and control device particularly for use in industrial sewing machines comprising: a motor capable of continuous drive and having a motor shaft, a flywheel having a clutch surface and connected to said motor shaft, and a clutch-brake unit for selectively connecting said motor shaft to a drive shaft, said clutch-brake unit comprising a clutch-brake disk which is connected to said drive shaft non-rotatably with respect thereto, said clutch-brake unit also comprising non-rotatable brake bearing bracket having a brake surface, said clutch-brake disk being brought into friction engagement optionally with said brake surface of said brake bearing bracket or optionally with said clutch surface of said flywheel, said motor having a stator frame and an outer shell confining a cooling region surrounding said stator frame, said flywheel, when rotating, forming a fan sucking cooling air, cooling channels confined by cooling ribs being provided at said stator frame and said fan being in the form of an axial-radial blower having a suction region extending close to said clutch surface, said suction region comprising an annular recess in said flywheel and including radial channels leading out from said recess, ribs on said flywheel and an air conductor ring attached to said ribs, said radial channels being confined by said ribs on said flywheel and by said air conductor ring, and said air conductor ring being rotatable with said flywheel.

4,712,661

OVERRUNNING CLUTCH CAGE

Frederick E. Lederman, Sandusky, and Donald J. King, Huron, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 16, 1986, Ser. No. 863,871

Int. Cl.⁴ F16D 13/75, 41/07

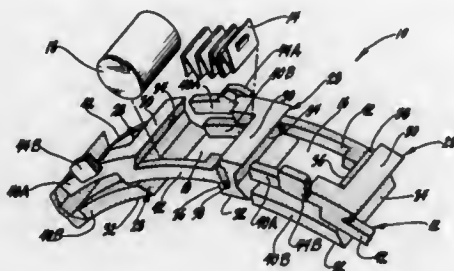
U.S. Cl. 192—45

1 Claim

1. In an overrunning clutch of the type that has metal wedging elements and a cage that has plastic support portions adapted to fit closely within an annular space between confronting surfaces of a pair of metal rotatable members so as to maintain said rotatable members in coaxial relation to one

another when said clutch overruns, said plastic having a thermal coefficient of expansion and contraction different from said metal rotatable members and a wear resistance less than said wedging elements, an improvement allowing the cage to be easily molded as a unitary structure from the same plastic material as said support portions, while conforming to said annular space with changing temperature without binding, in spite of said different coefficient, and also providing metal armored pockets for retaining said wedging elements, said improvement comprising,

- a plurality of cage sections formed of said plastic material and including said support portions, said cage sections being circumferentially spaced relative to one another,
- a plurality of alternating spaced connector members extending circumferentially between said cage sections to interconnect said cage sections and also formed of said plastic material, said connector members further being both suffi-



ciently flexible and sufficiently axially spaced from one another so that, as said cage expands or contracts with changing temperature, said cage sections may in turn move circumferentially away from or toward one another with sufficient freedom that said cage will conform to said annular space without forcing said cage sections strongly into either of said confronting surfaces, thereby avoiding binding on either rotatable member, and,

- a pair of metal end rings adapted to be joined to said cage in axially spaced relation, thereby forming a plurality of circumferentially spaced armored wedging element retention pockets in cooperation with said cage sections, with said end rings further being joined to said cage sections so as to slip relative thereto when said cage sections move circumferentially toward or away from one another so as to not interfere with the conformation of said cage to said annular space.

4,712,662

GEARBOX SYNCHRONIZER

Peter Elverdam, Mölndal, Sweden, assignor to AB Volvo, Gothenburg, Sweden

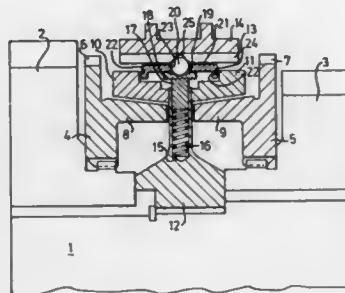
Filed Oct. 11, 1985, Ser. No. 786,856

Claims priority, application Sweden, Oct. 11, 1984, 8405095

Int. Cl.⁴ F16D 23/06

U.S. Cl. 192—53 F

9 Claims



1. In a synchronizing device for a gearbox, comprising a

synchronizer ring having a conical frictional surface, said synchronizer ring surrounding a synchronizer cone having a cooperating frictional surface, said synchronizer cone being securely joined to a gear rotatably journaled on a shaft, and comprising as well an engaging sleeve non-rotatably but axially displaceably mounted on a locating sleeve, by means of which engaging sleeve the synchronizer ring can be displaced axially from a neutral position to bring the frictional surfaces into engagement with each other, said locating sleeve supporting radially acting spring means which load antifriction bodies into contact with the engaging sleeve, which is provided with cavities in which said bodies engage in the neutral position; the improvement in which the locating sleeve is fixed on the shaft and the spring means load said bodies into direct contact with said engaging sleeve via radially movable cam elements, relative to which the bodies are axially displaceable, said cam elements having cam surfaces thereon that are oppositely inclined radially in opposite axial directions from the position on the cam elements occupied by the bodies in said neutral position, said bodies being in direct rolling contact with said cam surfaces, each body passing freely through a hole in a pusher which is axially displaceable together with the body and which, as the engaging sleeve moves in the engagement direction, pushes the synchronizer ring to move the frictional surfaces into engagement with each other.

4,712,663

VISCOUS COUPLING FOR A DRIVE SHAFT

Masao Teraoka, Sano, Japan, assignor to Tochigifujisangyo Kabushikigaisha, Tochigi, Japan

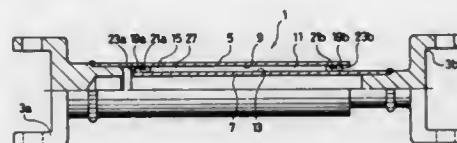
Filed Jul. 14, 1986, Ser. No. 885,219

Claims priority, application Japan, Jul. 17, 1985, 60-109277[U]

Int. Cl.⁴ F16D 33/00

U.S. Cl. 192—58 A

2 Claims



1. A viscous coupling for a drive shaft, comprising: an elongated tubular first shaft; an elongated cylindrical second shaft extending into and cooperating with said first shaft to define a cylindrical clearance therebetween; bearing means for accommodating both relative rotation and axial displacement of said first and second shafts, said bearing means being interposed between said shafts at the opposite ends of said clearance; sealing means associated with said bearing means for hermetically sealing the opposite ends of said clearance; and, a viscous fluid contained in said clearance, the viscous resistance of said fluid to rotation of one of said shafts relative to the other of said shafts providing a means of transmitting torque therebetween.

4,712,664

LOAD-OUT CONSTRUCTION DEVICE

James E. Angus, 906 S. 45th St., Temple, Tex. 76501

Filed May 20, 1986, Ser. No. 865,207

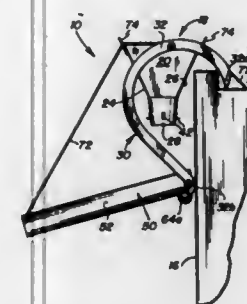
Int. Cl.⁴ B65G 11/18

U.S. Cl. 193—17

4 Claims

1. A load-out device for conveying debris from a building having a roof, floors and an exterior wall comprising: a hopper having a pair of side walls and a pair of end walls; suspension means for mounting said hopper to the roof or a floor of the building, said suspension means including a pair of hooks mounted on said end walls of said hopper wherein each of said hooks has a first and second end, such that said first end contacts the roof or floor of the

building and said second end contacts an exterior wall of the building;
a rod pivotally mounted between said second ends of said hooks;



a chute mounted on said rod for receiving debris from said hopper; and
means attached to said chute for adjusting the position of said chute with respect to the building.

4,712,665

CONTAINER LIFT MECHANISM

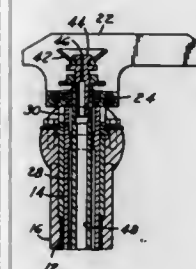
Kenneth P. McDonald, Livonia; Badruddin K. Rangwala, Farmington Hills; Barry C. Owen, Southfield, and Frank A. Rodocker, Milford, all of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Aug. 7, 1986, Ser. No. 894,177

Int. Cl.⁴ B65B 3/00

U.S. Cl. 198—346.2

8 Claims



1. A container lift mechanism comprising a set of spaced lifting rails mounted at the top of a vertically oriented tubular actuator, first lifting means operatively connected to said actuator for vertically lifting same, a vacuum cup independently mounted between said spaced rails, and second lifting means operatively connected to said tubular actuator for vertically lifting said vacuum cup relative to the movement of said tubular actuator for at times engaging the bottom of a container riding on said rails.

4,712,666

DEVICE TO COUNT BARS

Giancarlo Roseano, Buttrio, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Continuation of Ser. No. 610,581, May 15, 1984, abandoned.

This application May 30, 1986, Ser. No. 869,817

Claims priority, application Italy, Jul. 27, 1983, 83429 A/83

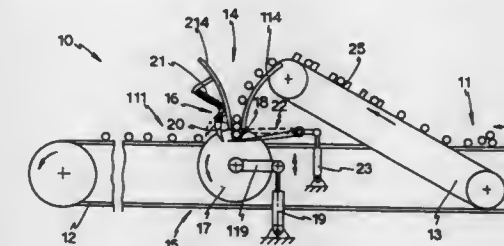
Int. Cl.⁴ B65G 47/12; G06M 7/00

U.S. Cl. 198—503

17 Claims

1. A device for facilitating the counting of bars, comprising: first conveyor means located at a first, lower level, said bars being randomly disposed thereon;
inclined conveyor means to move only one portion of said

bars upward to a second, higher level, the remainder of the bars remaining at the first level;
guide funnel means for receiving said one portion of said bars from said inclined conveyor means at said second level, and capable of arranging said one portion of said bars in an ordered manner wherein the one portion of said bars are placed next to each other in single fashion;



counting means for counting the bars; and
withdrawal means for withdrawing said one portion of said bars one by one from said guide funnel means, for causing said one portion of said bars to activate said counting means, and for depositing said bars on a second conveyor means located at said first, lower level.

4,712,667

DEVICE FOR RECOVERING FLUID FROM A WELL

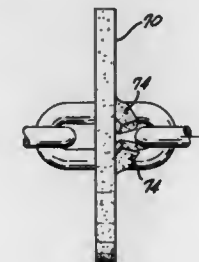
Owen E. Jackson, 7501 E. McCormick Pkwy., Ste. 207, Scottsdale, Ariz. 85258, and Thomas W. Donaldson, 2460 Lemon Ave., Signal Hill, Calif. 90806

Continuation-in-part of Ser. No. 573,022, Jan. 23, 1984, abandoned. This application Mar. 26, 1985, Ser. No. 716,343

Int. Cl.⁴ B65G 15/00

U.S. Cl. 198—643

2 Claims



1. A device for recovering fluid from a well comprising: an endless chain of rigid link members adapted to be suspended down a well,
drive means for moving said chain through said well,
a wiper through which said chain passes, said wiper comprising a flexible plate, said plate having pairs of holes, the holes of each said pair being spaced a distance from each other an amount substantially equal to the largest transverse dimension of said link members and said holes having a diameter corresponding to the smallest transverse dimension of said link members, whereby said holes wipe the sides of said link members, said wiper further having movable flaps defined by intersecting cross cuts each extending between a respective pair of said holes, whereby said flaps wipe the ends of said link members.

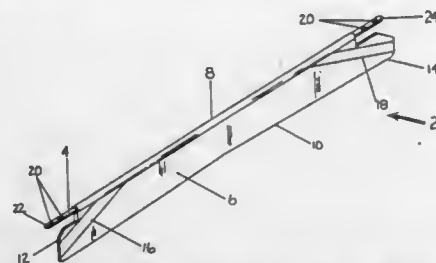
4,712,668

FLIGHT FOR USE ON A CONVEYOR BELT
Ralph Gray, 31-249 Cedarbrae Avenue, Waterloo, Ontario,
Canada N2L 4S8

Filed Feb. 24, 1986, Ser. No. 832,355
Int. Cl.⁴ B65G 15/42

U.S. Cl. 198—698

6 Claims



1. A flight for use as part of a conveyor belt for agricultural equipment, said flight comprising an elongated support rod and wing, said wing having one edge that is affixed to said rod throughout most of its length with an opposite edge of said wing being a free edge, said wing being of bendable but reasonably stiff material, said wing being symmetrical about a plane normal to a mid-point of said rod, said wing having two free ends that are not affixed to said rod and are slightly narrower than a remainder of said wing, said free ends being able to move back and forth relative to said rod, each of said free ends being stiffened by a metal cable embedded in reinforcing ribs affixed to said wing and extending at an angle from each free end to said rod, each metal cable having one end that is affixed to said rod, said rod having means whereby said rod can be affixed to the conveyor belt so that the wing can extend substantially normal and outward relative to said conveyor belt when the flight is in use.

4,712,669

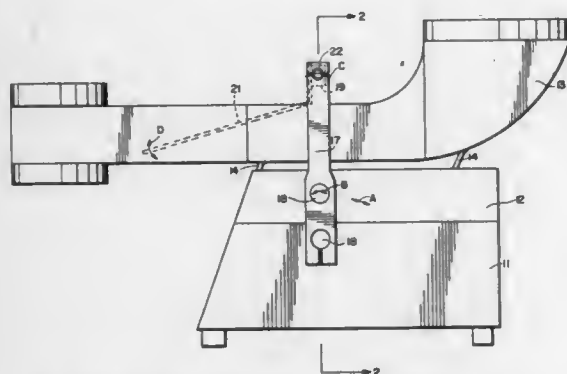
VIBRATORY MATERIAL FEEDER WITH VIBRATING GATE

Marcel Rohr, Unterfeldweg, Switzerland, assignor to K-Tron International, Inc., Pitman, N.J.

Filed Dec. 30, 1986, Ser. No. 947,856
Int. Cl.⁴ B65G 27/00

U.S. Cl. 198—771

7 Claims



1. A vibratory material feeder comprising:
a base portion and a vibrating portion, including a material feed tray, moveable relative to said base portion;
vibrating gate support means having first and second ends, said first end being rotatably connected to said base portion, and said vibrating portion being rotatably connected to said support means at a point intermediate said first and second ends; and
vibrating gate means fixed to said second end of said support means and extending into said material feed tray.

4,712,670

MECHANISM FOR THE TRANSPORTATION OF OBJECTS

Volker Burkhardt, Lerchenstr. 29, D-7085 Bopfinger, Fed. Rep. of Germany

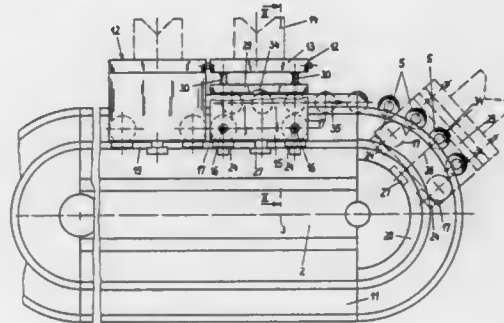
Filed Nov. 18, 1985, Ser. No. 799,844

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445249

Int. Cl.⁴ B65G 17/24

U.S. Cl. 198—803.01

13 Claims



1. A mechanism for transportation of objects on an endless rotating roller chain which runs on a support structure, wherein said support structure (1,37) comprising straight and curved conveyor sections connected together end-to-end to form a substantially oval endless path, each conveyor section has an outwardly facing U-section (20) secured to its sides and a rail formed on the top portion of the conveyor section; the roller chain comprising a plurality of links each having at least three rollers (5, 6, 36) on the same axis and each link connected to the next by a fishplate means (7) to form a continuous roller chain, at least one roller of said links engages with said rail; and wherein a plurality of carriages (12), having work piece-receiving elements (14) for accommodating the objects to be transported, are carried by the roller chain, each comprise a base plate (13) having a laterally downwardly projecting cover (15) on each side thereof supporting tread rollers (17) and guide rollers (24) on their lower ends which engage with said U-sections (20) and guide said carriages (12), wherein said carriages (12) being frictionally supported by said roller chain (4), in straight conveyor sections, by means of friction-carrier element (29) and being connected, in curved sections, by a roller engaging recess (34) on said friction-carrier element (29).

4,712,671

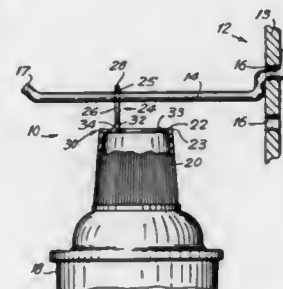
UNIVERSAL HANGING PACKAGING SYSTEM
Frank S. Salacuse, 710 Park Ave., New York, N.Y. 10021

Filed May 27, 1986, Ser. No. 867,829

Int. Cl.⁴ B65D 5/50

U.S. Cl. 206—44 R

10 Claims



1. A system adapted to hang a packaged product at a display rack having at least one horizontal mounting rod extend from the rack, said rod having a free end spaced from said rack, comprising, in combination:

a container,
a plastic cap removably mounted on said container, said plastic cap having a flat top surface, said cap comprising, at least one flat tab of single layer plastic, said tab and cap being of unitary integral-mold type construction,
said tab including a loop portion forming a hole capable of being received by said rod free end, and further including, a flexible plastic hinge integrally joining the tab with the cap,
said tab being rotatably movable about said hinge between an operative position for being received by said rod, and a nonoperative position, wherein in said nonoperative position said tab is parallel with said cap top surface, and in said operative position said tab is positioned approximately perpendicular to said flat top surface,
said cap flat top including a recess for receiving said flat tab when said tab is in the nonoperative position, there being no cap material above said hole in the nonoperative position, adding to stacking height,
said loop portion including a continuous wall having an inner side surface defining said hole and having an outer side surface, and said recess having an inner side surface adapted to fit closely with said outer surface when said at least one tab is in said nonoperative position,
said loop portion having a flat bottom side and said recess being further defined by a flat bottom surface,
said flat bottom surface being continuous with said cap top, there being no opening by way of said recess through said cap top,
said flat bottom side being positioned against said flat bottom surface when said tab is in said nonoperative position.

4,712,672

HAY BALE COVER

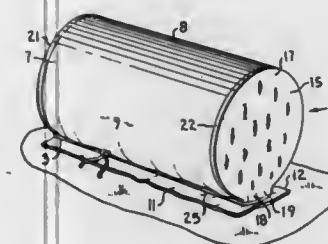
George N. Roy, 401 W. North, Apt. B, Warrensburg, Mo. 64093, and James Roy, Rte. 1, Spickard, Mo. 64679

Filed Jun. 6, 1986, Ser. No. 871,554

Int. Cl.⁴ B65D 71/00

U.S. Cl. 206—83.5

10 Claims



1. A cover for a cylindrical hay bale sized to cover a large hay bale comprising:

(a) a sleeve member having a first configuration and a second configuration; said sleeve member having an elongate semi-circular top portion and opposed side portions; said top portion having semicircular edges at opposite ends thereof, each of said semi-circular edges having a common radius associated therewith; each of said side portions being attached at the top thereof to respective horizontal lower edges of said top portion; said side portions in said first configuration extending vertically down from respective lower edges of said top portion and each of said side portions having a height substantially greater than said common radius; said side portions being sized such that when said sleeve member is placed in said first configuration wherein said cover is adapted to cover a hay bale having a radius substantially equal to said common radius, said top portion is adapted to cover the entire top of the bale and said side portions extend down so as to be engageable with a ground surface supporting the bale; said side portions in said second configuration being flexible and adapted to be tucked inwardly toward a bale being

covered by said cover such that the side portions engage both the ground surface and the bale; and

(b) opposite end members each having an inverted U-shape periphery with an upper semi-circular edge thereof being directly connected with a respective semi-circular edge of said top portion and having lower side edges of equivalent length to respective edges of respective side portions and being connected therewith and further having a generally horizontal lower edge in said first configuration; each of said end members being positioned to extend between respective semicircular side and lower edges; said end members, said top portion and said side portions forming an integral enclosure with only an open bottom in said first configuration; said cover being made of a flexible and foldable, waterproof sheet material shaped to substantially enclose the cylindrical hay bale with a bottom thereof reposed on a supporting surface in said second configuration, whereby said cover is adapted to fit over said bale with said side portions and said end member lower portions tucked inwardly between the reposed bale bottom and the supporting surface in covering relation to said bale.

9. In combination with a generally cylindrical large bale reposed on a side in an open area on a supporting surface, a covering for the bale comprising:

(a) a bale cover having a semi-cylindrical portion with side portions depending therefrom, and end portions with side and top margins secured to the adjacent edges of the semi-cylindrical portion and sides thereof; said depending sides being of a length to have lower portions folded against the supporting surface when the semi-cylindrical portion is resting on said cylindrical bale;

(b) said folded lower portions being movable to extend between said cylindrical bale and the supporting surface and engaged therebetween to substantially secure said cover to said cylindrical bale; and

(c) including said cover covering said bale and a tie being received in said folded lower portions and extending around said cover such that said cover is between said bale and the said tie and said tie is drawn snugly so as to hold said cover securely over said bale.

4,712,673

COMBINATION FOOD CARRIER AND AMUSEMENT DEVICE

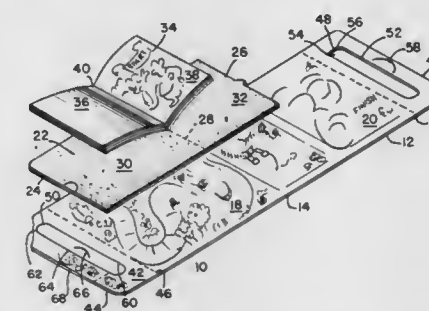
Richard A. Moore, Marietta, Ga., assignor to Western Publishing Company, Inc., Racine, Wis.

Filed Mar. 31, 1986, Ser. No. 846,075

Int. Cl.⁴ B65D 25/30, 77/02, 77/04

U.S. Cl. 206—232

17 Claims



1. A combination food carrier and amusement device comprising first and second panels connected together by means of a fold line, a removable bag member disposed between the inner surfaces of said first and second panels, said bag member being secured between said inner surfaces of said first and second panels by retaining means, a book disposed between the inner surfaces of said first and second panels, said book being secured between said inner surfaces of said first and second

panels by fastening means, a handle portion provided on said first and second panels, and a handle mechanism provided on each of said handle portions, said handle mechanism including an aperture provided in said second panel and a corresponding partially cut out portion provided on said first panel.

4,712,674

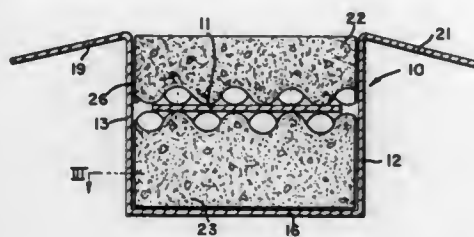
CONTAINER FOR STATIC-SENSITIVE ARTICLES
William I. Young, North Sitate, Mass., assignor to Hy-Con Products, Inc., Framingham, Mass.

Continuation of Ser. No. 715,203, Mar. 25, 1985, Pat. No. 4,610,353. This application May 7, 1986, Ser. No. 860,499. The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.

Int. Cl.⁴ B65D 73/02

U.S. Cl. 206—328

5 Claims



1. Container for use with an article which can be damaged by static electricity, comprising:

a plurality of walls forming a cell in which the article resides, each wall consisting of a sheet of corrugated board made up of an outer web, an inner web, and a corrugated flute web that is sandwiched between the inner and outer webs, at least one web being formed with a substantially uniform, electrically-conductive dispersion of conductive particles, wherein the walls have a surface conductivity and bulk conductivity in the range from 10^3 to 10^9 ohms/squares, wherein the container contains electrically-conductive foam plastic packing, consisting of a block of electrically-conductive foamed plastic packing enclosed in the container and having a conductivity in the order of 10^7 ohms/square, wherein the foam plastic is of the open-cell type and is impregnated with carbon particles during its manufacture.

4,712,675

TAPE PACKING FOR ELECTRICAL OR ELECTRONIC COMPONENTS

Gerard J. Scholten; Louis F. A. Dieleman, and Johannes M. M. Blankers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

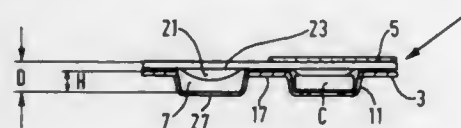
Filed Oct. 27, 1986, Ser. No. 923,260

Claims priority, application Netherlands, Nov. 8, 1985, 8503063

Int. Cl.⁴ B65D 85/30

U.S. Cl. 206—332

3 Claims



1. A tape packing for electrical or electronic components comprising a strip-shaped carrier with lateral and longitudinal dimensions and formed at least in part of metal, said carrier having cavities for receiving the components, said cavities being formed along the longitudinal dimension at regular distances by means of a cold drawing process and having side

walls which extend along the longitudinal dimension of the carrier and at right angles thereto, said carrier including edge zones extending on either side of the cavities along the longitudinal dimension, barriers at right angles to the longitudinal dimension between successive cavities, at least one series of transport holes, and a covering tape closing the cavities, said covering tape adhering to the edge zones, and wherein the side walls of the cavities, which extend along the longitudinal dimension of the strip-shaped carrier, are provided with openings, which are bounded by an associated edge zone.

4,712,676

SHIPPING PACKAGE CONTAINING COILED FASTENER PACKAGES

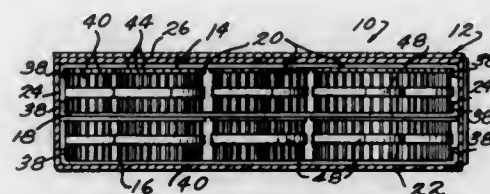
Warwick Randall, Warwick, R.I., assignor to Stanley-Bostitch, Inc., East Greenwich, R.I.

Continuation of Ser. No. 661,475, Oct. 16, 1984, abandoned. This application Mar. 3, 1986, Ser. No. 837,320

Int. Cl.⁴ D65D 85/24

U.S. Cl. 206—338

11 Claims



1. A shipping package comprising: an exterior carton having a rectangular bottom, four interconnected sides extending up from the periphery of said bottom and a top closure, said bottom, sides and top closure defining an interior space, a bottom panel extending within said interior space adjacent said bottom, a top panel within said interior space adjacent said top closure, at least one divider panel extending within said interior space in generally parallel relation with said bottom and top closure, said bottom panel including an upwardly facing corrugated sheet having flat sheet means fixed to its opposite face, said top panel including a downwardly facing corrugated sheet having flat sheet means fixed to its opposite face, each divider panel including a downwardly facing corrugated sheet, an upwardly facing corrugated sheet and flat sheet means fixedly connected between and with the opposite faces of said upwardly facing corrugated sheet and said downwardly facing corrugated sheet, each corrugated sheet including a multiplicity of elongated continuous side-by-side alternating ridges and troughs defining corrugations, each end of each divider panel being folded transversely along a marginal line perpendicular to the longitudinal extent of the corrugations in closely spaced parallel relation to the associated end edge thereof and being mounted in said interior space in said folded relation, said panels dividing said interior space into a plurality of tiered spaces, each tiered space being defined along its lower surface by an upwardly facing corrugated sheet and along its upper surface by a downwardly facing corrugated sheet, and a plurality of coiled fastener packages within each tiered space, each coiled fastener package presenting a multiplicity of fastener heads defining one end thereof and a multiplicity of fastener points defining the other end thereof, said panels and coiled fastener packages being vertically compressed within said exterior carton, each coiled fastener package being vertically compressed within its associated tiered space against movement by virtue of the fastener head defining end thereof engaging

one of the corrugated sheets defining the same so as to collapse the engaged corrugations thereof and the fastener point defining end thereof engaging the other of the corrugated sheets defining the same so as to penetrate the engaged corrugations thereof.

4,712,677

METHOD AND APPARATUS FOR DISPENSING FASTENERS

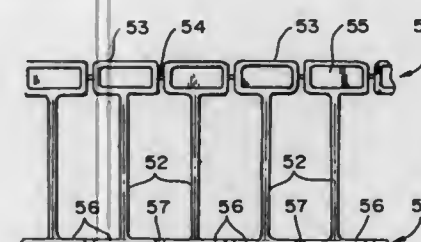
David B. Russell, Southborough, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 147,000, May 6, 1980, abandoned, which is a continuation of Ser. No. 827,276, Aug. 24, 1977, abandoned. This application Jul. 20, 1981, Ser. No. 284,439. The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.⁴ B65D 85/24

U.S. Cl. 206—345

5 Claims



1. In fastener stock of the type comprising two continuous and elongated plastic side members that are cross-coupled by a plurality of filaments, the stock being proportioned to be fed as a unit to a position where individual fasteners are separated therefrom within a machine, one of said side members being proportioned so that each separated fastener includes an end-bar formed from a portion of the said side member and is configured for feeding through the bore of a hollow needle having a longitudinal slot for passage of the associated filament, and in which each filament is foldable towards the associated end-bar that is feedable through said hollow needle; the improvement adapted for continuous molding in long lengths and for feeding and dispensing individual fasteners therefrom with dispensing apparatus which advances the end fastener adjacent the rear portion of the needle bore and moves its end-bar into alignment with said bore and contacts said end-bar with a plunger to separate the end-bar from the stock and force it through said bore; said improvement comprising fastener stock wherein each of said filaments is molded with a cross-section having its maximum width at a substantially flat plane at one side thereof, said end-bars being wider in cross-section at said plane than in other planes parallel thereto, and wherein adjacent end-bars are connected end-to-end at a portion of their peripheries adjacent to said plane by severable connectors located substantially at said plane.

4,712,678

CONTAINER HAVING AUTOMATIC DOORS AND FOR ACCOMMODATING DATA STORAGE MEDIA

Peter Ackeret, Küssnacht, Switzerland, assignor to IDN Inventions and Development of Novelities AG, Chur, Switzerland. Continuation of Ser. No. 570,912, Jan. 16, 1984, Pat. No. 4,640,415. This application Nov. 13, 1986, Ser. No. 929,833

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301203; European Pat. Off., Aug. 29, 1983, 83108481.9. The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ B65D 85/57, 85/672

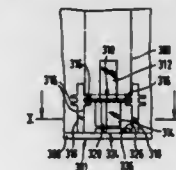
U.S. Cl. 206—387

31 Claims

1. A container for accommodating data storage media, said

media including magnetic tape cassettes and disks, said container comprising:

a housing having at least one small side and having an opening in said small side thereof;
a media transport slider, said slider being accommodated in said opening;
spring means acting between said housing and said slider for causing ejection of said slider from said housing, said slider on ejection from said housing transporting a data storage medium accommodated thereon through said opening into a position wherein said medium is accessible for removal;
door means pivotally connected to said housing for closing said opening and forming a data storage medium accommodation space, said door means being pivotable between open and closed positions;
locking means for locking said slider and a medium inserted thereon against the bias of said spring means; and
release means for manually unlocking said locking means; wherein:
said door means is coextensive with all but a portion of said opening;
said slider further has an element projecting into said portion of said opening when said slider is moved into said data storage medium accommodation space, said element remaining uncovered by said door means;
said release means is located on said projecting element; and



said door means is positively moved between its opened and closed positions responsive to movement of said slider.

11. A container for accommodating at least one data storage medium, said container comprising:

(a) a housing having a base wall, a top wall, two side walls, a rear wall, and an open front face opposite the rear wall, and having at least one compartment therein;
(b) at least one slider member each for holding at least one data storage medium; the number of slider members at least corresponding to the number of compartments, said slider member being received in said compartment and being slidably movable into and out of the housing, the data storage medium being accessible for insertion or removal when the slider member is out of the housing;
(c) locking means for retaining the slider member in the housing;
(d) biasing means for ejecting the slider member from the housing when the locking means is released;
(e) door means separate and distinct from the slider member, said door means being movable between an open position and a closed position for opening and closing the open front face of the housing; and
(f) spring means biasing said door means into said closed position when said slider member is locked in said housing, said door means being operatively connected to said

spring means, said slider member having actuating means to overcome said spring bias upon said locking means being unlocked and said slider member being ejected, for moving said door means into said open position.

23. A container for accommodating at least one data storage medium, said container comprising:

- a housing having a base wall, a top wall, two side walls, a rear wall, and an open front face opposite the rear wall, and having at least one compartment therein;
- at least one slider member each for holding at least one data storage medium, the number of slider members at least corresponding to the number of compartments, said slider member being received in said compartment and being slidably movable into and out of the housing, the data storage medium being accessible for insertion or removal when the slider member is out of the housing;
- locking means for retaining the slider member in the housing;
- biasing means for ejecting the slider member from the housing when the locking means is released;
- door means separate and distinct from the slider member, said door means being movable between an open position and a closed position for opening and closing the open front face of the housing; and
- coupling means operatively connecting said slider member and said door means for transmitting an opening drive force to said door means upon ejection of said slider member, and for transmitting a closing drive force to said door means upon said slider member being moved into said housing.

4,712,679

ORGANIZER FOR COMPACT DISC ALBUMS AND THE LIKE

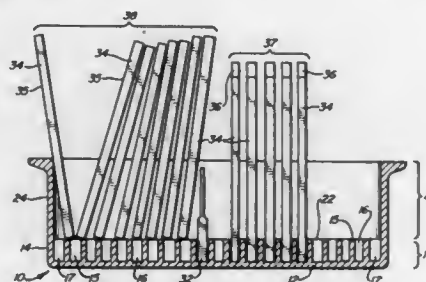
Gary C. Lowe, 9321 Mansfield, Morton Grove, Ill. 60053

Filed Oct. 22, 1986, Ser. No. 921,548

Int. Cl.⁴ B65D 85/672

U.S. Cl. 206—387

9 Claims



1. A container for thin rigid envelopes, each envelope having uniform size and characterized by length greater than width and thickness not more than 25% of width, wherein the envelopes may be organized in each of two modes and which comprises

- a bottom;
- a lower perimetral member extending upwardly from the bottom;
- interior wall portions connected with the bottom and having a height not exceeding the height of the lower perimetral member which define a plurality of cavities whereof each has an upper open end of which one dimension exceeds the width of the envelope but is less than the length of the envelope and another dimension exceeds the thickness of the envelope;
- a first ledge extending from the perimetral member along one portion of the container,
- a second ledge, opposed to the first ledge and extending from the perimetral member along another portion of the container, and
- an upper retaining member connected with each ledge; so for one organizational mode an envelope may be inserted,

width-edge downward, into a cavity and carried on the bottom, and, for another organizational mode, at least one such envelope may be placed length-wise onto the opposed first and second ledges, supported at each of its lower corners by one of the ledges, and kept from lateral displacement by the upper retaining member.

4,712,680

REINFORCED SELF-CENTERING PLASTIC CARRIER FOR BOTTLES

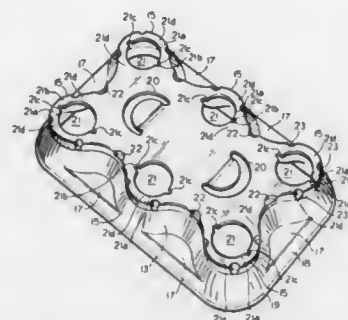
Aldo Panazzolo, Perrysburg, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 834,133, Feb. 24, 1986, which is a continuation of Ser. No. 663,651, Oct. 22, 1984. This application Mar. 27, 1986, Ser. No. 845,211

Int. Cl.⁴ B65D 65/00

U.S. Cl. 206—427

24 Claims



1. A single piece carrier for carrying a plurality of filled and capped bottles from the upper portions thereof, said carrier comprising:

- a top panel having an outer periphery;
- a peripheral wall extending downwardly from said outer periphery of said top panel, said peripheral wall having plural outwardly convex arcuate first wall portions and plural outwardly concave arcuate second wall portions disposed intermediate said first wall portions, said second wall portions blending with said first wall portions to define plural compartments for said bottles, said peripheral wall merging with said top panel at a juncture between said peripheral wall and said outer periphery of said top panel;
- a plurality of spaced apart apertures in said top panel, each of said plurality of apertures being adapted to have the upper portion of one of said plurality of bottles inserted thereto, each of said plurality of apertures having a plurality of tabs extending radially inwardly from the periphery of said each of said plurality of apertures, each of said plurality of apertures further having a plurality of spaces, a space being provided between adjacent tabs, each of said spaces having a radial depth and a bottom to said radial depth, the bottoms of said plurality of spaces defining a circle having a diameter, said plurality of tabs in said each of said plurality of apertures being adapted to releasably engage and support said one of said plurality of bottles, at least an arcuate portion of said each of said plurality of apertures being disposed adjacent to and generally concentric with at least an arcuate portion of one of said plural outwardly convex first wall portions of said peripheral wall and forming an arcuate strip with said at least an arcuate portion of one of said plural outwardly convex first wall portions of said peripheral wall; and
- at least two spaced apart centering and reinforcing lug projections adjacent each of said plurality of spaced apart apertures in said top panel, each of said centering and reinforcing lug projections extending radially inwardly and downwardly from said juncture between said peripheral wall and said top panel in said arcuate strip between

said at least an arcuate portion of said one of said plural outwardly convex first wall portions of said peripheral wall and said at least an arcuate portion of said each of said plurality of apertures, each of centering and reinforcing lug projections extending radially inwardly substantially to said circle and serving to help to center said upper portion of said one of said plurality of bottles as said upper portion is inserted into said each of said plurality of apertures; said at least two spaced apart centering and reinforcing lug projections serving to reinforce at least one of said tabs in said each of said plurality of apertures.

4,712,681

METHOD OF PACKAGING ARTIFICIAL IMPLANTS IN STERILE AND CONTAMINATION-FREE MANNER AND A PACKAGE THEREFOR

Per-Ingvar Branemark, Åndergatan 3, S-431 39 Mölndal; Bengt Kasemo, Tjärkil 1400, S-464 00 Mellerud, and Jukka Lausmaa, Pontus Wilknersgatan 3, S-411 32 Göteborg, all of Sweden

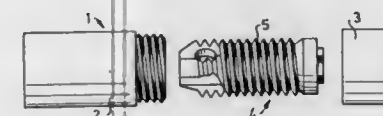
Filed Dec. 26, 1985, Ser. No. 813,355

Claims priority, application Sweden, Dec. 27, 1984, 8406592

Int. Cl.⁴ A61B 17/06; B65D 81/08

U.S. Cl. 206—438

11 Claims



1. A method of packaging artificial implants for sterile and contamination-free storage, comprising positioning the implant inside a closable capsule made of the same material as the implant, thereafter enclosing the capsule in a hermetically sealable outer casing which is then hermetically sealed, and sterilizing the package thus produced, wherein said implant is removed from the casing and capsule prior to implantation.

4,712,682

ELECTRONIC VALVE CONTROL FOR SLOUGHING MACHINES

Ulrich Reillard, Gelsenkirchen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

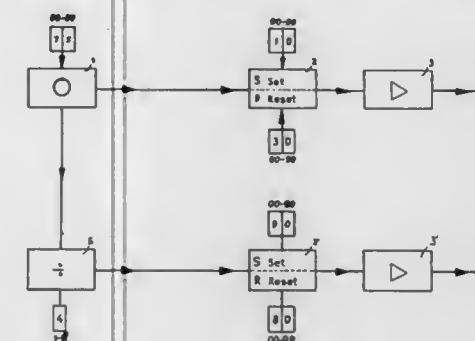
Filed Oct. 4, 1985, Ser. No. 784,514

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1984, 3437009; Aug. 31, 1985, 3531240

Int. Cl.⁴ B03B 5/20, 5/24

U.S. Cl. 209—455

15 Claims



1. A method of electronically controlling the sloughing strokes of a wet sloughing machine having inlet and outlet valves that are opened and closed by respective command pulses, comprising generating recurrent signal codes that are adjustable to represent an adjustable stroke frequency, operating an inlet sloughing stroke generator as a function of the

signal codes to generate command pulses for the inlet valve, dividing the signal codes according to a selected clock sequence to form divided signal codes, operating an outlet sloughing stroke generator as a function of the signal codes to generate command pulses for the outlet valve, and influencing the formation of the command pulses for the outlet valve according to the divided signal codes.

4,712,683

DISPLAY CARD OF PLASTIC MATERIAL WITH TWO ANTI-THEFT SYSTEMS

Pierre Cazin, St. Pierre les Nemours, France, assignor to Nestec, S.A., Vevey, Switzerland

Filed Dec. 13, 1982, Ser. No. 449,337

Int. Cl.⁴ B65D 73/00

U.S. Cl. 206—478

6 Claims



1. A display card of plastic material, usable in particular for elongated articles such as collars and leashes for cats or dogs, distinguished in that it includes:

- a device, preferably lateral, for hanging the card on a bar of a display unit;
- a first longitudinal anti-theft device comprising an elongated strap of plastic material with one of the ends of the strap being hingedly secured to the card, and the free end of the strap having a plurality of ratchet teeth which are adapted to be inserted through and secured in a slot in the card adjacent the free end of the strap;
- a second anti-theft device similar to the first, disposed in a direction perpendicular to that of the first device;
- and a notch in the bottom edge of the card, with the card having an opening adjacent said notch, said opening and said notch being sized to permit the article to pass from the front surface of the card, through said opening to the back of the card and around said notch to the front surface of the card.

4,712,684

BAG DISPENSING ARRANGEMENT

Hugo Boeckmann, Arlington Heights, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,762

Int. Cl.⁴ B65D 85/67

U.S. Cl. 206—554

7 Claims

1. A chain bag dispensing arrangement, comprising a packet having:

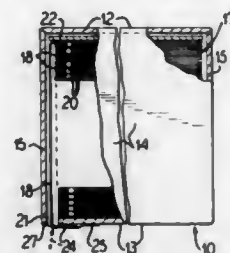
- a container defining a housing having a bottom wall;
- a pack of unfilled chain bags within said container, said bags being connected by frangible link means;
- said bottom wall having a slot along one edge of the pack;
- said bags being guided from the top the stack and down between said edge of the pack and a vertical wall of the container to said slot; and

said slot having surface means so that each succeeding bag can be braked and stopped when partially withdrawn from the pack by pull applied through a lead bag and the frangible link means connecting the lead bag to the succeeding bag then broken to separate the lead bag from the next succeeding bag.

6. A chain bag dispensing arrangement, comprising a packet having:

a container defining a housing having spaced horizontal walls and a vertical front wall;
a pack of unfilled chain bags within the container housing;
frangible link means connecting said bags end-to-end into a chain;

one of said horizontal walls having a dispensing slot contiguous to said front wall so that a vertically facing free edge of said front wall provides an unobstructed front edge along said slot over which said bags can be pulled seriatim from said pack;



said edge being a stop shoulder against which each succeeding bag can be braked and stopped by thrusting the succeeding bag against the edge stop shoulder, when partially withdrawing from the pack by a pull applied through a lead bag, and the frangible link means connecting the lead bag to the succeeding bag broken to effect separation of the lead bag from the succeeding bag as a result of continued pulling on said lead bag while said succeeding bag is stopped against said edge stop shoulder;

said one wall being the bottom wall of the container and said pack of chain bags being supported on said bottom wall; said slot being in said bottom wall along one edge of the pack; and

said bags being guided from the top of the stack down between said edge of the pack and said vertical front wall of the container to said slot.

4,712,685

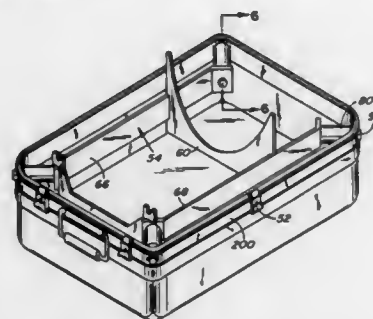
CONTAINERIZED SHOCK MOUNT

James J. Kirchhan, 23912 Flores Ave., Laguna Niguel, Calif. 92677

Filed Sep. 5, 1986, Ser. No. 904,343
Int. Cl.⁴ B65D 81/10

U.S. Cl. 206—591

20 Claims



1. A container for receipt of equipment to be maintained therein wherein said container is formed from two portions

that have edge regions thereto to provide a closure wherein the improvement comprises:

a substantially rigid frame member held at the outer portion of said container;

a plurality of individually mounted shock mounts extending from said frame member interiorly thereof in spaced relationship;

means attached to said shock mounts for supporting equipment; and wherein,

said shock mounts extend interiorly to place at least a portion thereof under a bending moment.

4,712,686

POWER ASSISTED ROLLER-STRETCH APPARATUS AND PROCESS

Patrick R. Lancaster, Anchorage, and William G. Lancaster, Louisville, both of Ky., assignors to Lantech, Inc., Louisville, Ky.

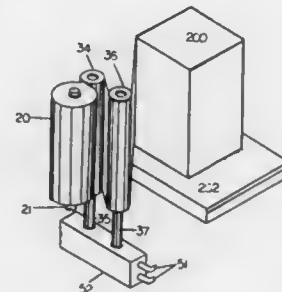
Division of Ser. No. 184,787, Sep. 8, 1980, Pat. No. 4,387,548, which is a continuation-in-part of Ser. No. 96,384, Nov. 21, 1979, Pat. No. 4,302,920. This application Dec. 11, 1980, Ser. No. 215,250

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.⁴ B65D 19/38

U.S. Cl. 206—597

9 Claims



1. A pallet load comprising a plurality of articles in a predetermined stacked array wrapped with at least two substantially superimposed wraps of a plastic film web stretched above 100 percent and beyond its yield point, said web being wrapped on the pallet load with a first containment force, said containment force substantially increasing through the passage of time after the pallet has been wrapped until the containment force on the load is at least ten percent greater than the original containment force.

4,712,687

COLLAPSIBLE PALLET CONTAINER AND MULTI-WALL FIBREBOARD CONTAINER THEREFOR

Terry L. Silcott, Hicksville, Ohio, and Dale T. French, South Lyon, Mich., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jul. 8, 1986, Ser. No. 883,340

Int. Cl.⁴ B65D 19/00

U.S. Cl. 206—600

16 Claims

1. A container for mounting on the top of a pallet, comprising:

a first side panel having top and bottom edges and first and second side edges;

a first end panel having top and bottom edges, a first side edge connected along a score line to said second side edge of said first side panel, and a second side edge;

a second side panel having top and bottom edges, a first side edge connected along a score line to said second side edge of said first end panel, and a second side edge;

a second end panel having top and bottom edges, a first side edge connected along a score line to said second side edge of said second side panel, and a second side edge con-

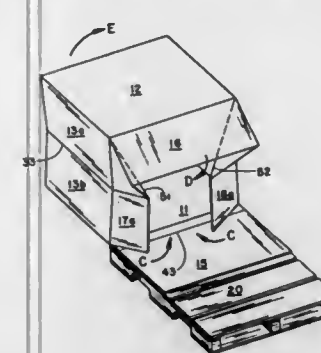
nected along a score line to said first side edge of said first side panel;

a first bottom length flap connected along a score line to said bottom edge of said first side panel and being adapted to be connected to the top of a pallet, said first bottom length flap having first and second side edges;

a first bottom width flap connected along a score line to said bottom edge of said first end panel, said first bottom width flap having a first side edge which is free from but adjacent to said second side edge of said first bottom length flap to define a slot therebetween, and a second side edge;

a second bottom length flap connected along a score line to said bottom edge of said second side panel, said second bottom length flap having a first side edge connected along a score line to said second side edge of said first bottom width panel, and a second side edge; and

a second bottom width flap connected along a score line to said bottom edge of said second end panel, said second bottom width flap having a first side edge connected along



a score line to said second side edge of said second bottom length flap and a second side edge free from but adjacent to said first side edge of said first bottom length flap;

means for connecting said first and second side panels and said first and second end panels defining a container space therebetween;

each of the first and second end panels with their connected respective first and second bottom width flaps, having a central score line extending from the top edges of said first and second end panels through said first and second bottom width flaps, whereby said end panels and bottom width flaps are foldable inwardly of the container space along each central score line;

one-half of each bottom width flap between said central score line and said second bottom length flap having a diagonal score line extending from said second bottom length flap to an end of said central score line on said bottom width flap, whereby said half is foldable inwardly of the container space along the diagonal foldline.

4,712,688

DOUBLE BREAKAPART CARTON WITH SEALABLE ENDS AND BLANK FOR FORMING THE SAME

Herbert L. Lambert, West Chicago, Ill., assignor to Waldorf Corporation, St. Paul, Minn.

Filed Mar. 13, 1985, Ser. No. 711,285

Int. Cl.⁴ B65D 5/54

U.S. Cl. 206—602

16 Claims

1. A carton formed from a foldable blank, comprising: a plurality of sides defining a tube, said tube and sides having first and second ends;

end flaps coupled to said sides and closing said tube ends; first and second intermediate closure flaps formed in and hingedly coupled to one of said side along separate intermediate closure fold lines that span said side between the ends of said side, said intermediate closure flaps extending from and being foldable at their respective intermediate

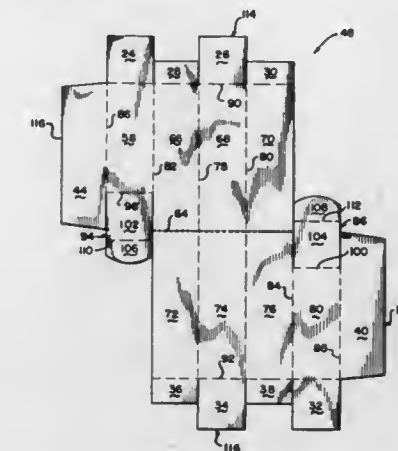
closure fold lines to lie substantially perpendicular to said one side; and

a common perforated line in the remaining sides intermediate the ends of said remaining sides and adjacent said intermediate closure flaps, the plane of said common perforated line being distinct from either intermediate closure fold line associated with an intermediate closure flap;

whereby, the remaining sides can be separated along said common perforated line, forming two additional open tube ends each of which is fully closeable by one of said intermediate closure flaps when said flaps are folded to lie substantially perpendicular to said one side and each of which is open when said intermediate closure flaps are positioned to lie in the plane of said one side.

9. A unitary blank formed of paperboard and adapted to be folded into a carton, comprising:

a first full length panel;



second and third full length panels hingedly coupled to opposite sides of said first full length panel along fold lines;

a lateral weakened line in said full length panels dividing each of said full length panels into top and bottom half panels;

a first and a second partial panel hingedly coupled to said second and third full length panels, respectively, at longitudinal fold lines opposite said first full length panel, said first partial panel being laterally adjacent said top half panel of said second full length panel and said second partial panel being laterally adjacent said bottom half panel of said third full length panel; and

first and second intermediate closure flaps hingedly coupled to said first and second partial panels, respectively, at intermediate closure fold lines perpendicular to said longitudinal fold lines and parallel to each other along an edge of said partial panels.

4,712,689

ICE-CREAM CARTON, CARTON BLANK, AND METHOD OF ERECTING SAME

Thomas W. Froom, 10 Burncoat Way, Pittsford, N.Y. 14534

Continuation-in-part of Ser. No. 866,890, May 23, 1986, Pat. No. 4,712,730. This application Apr. 14, 1987, Ser. No. 38,368

The portion of the term of this patent subsequent to Dec. 15,

2004, has been disclaimed.

Int. Cl.⁴ B65D 5/54

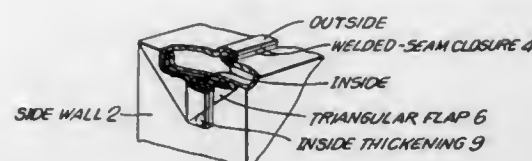
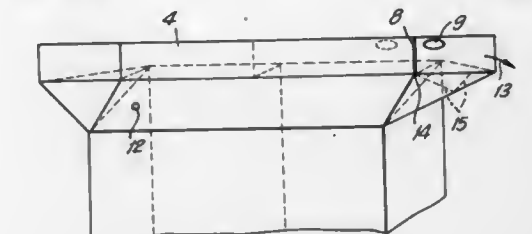
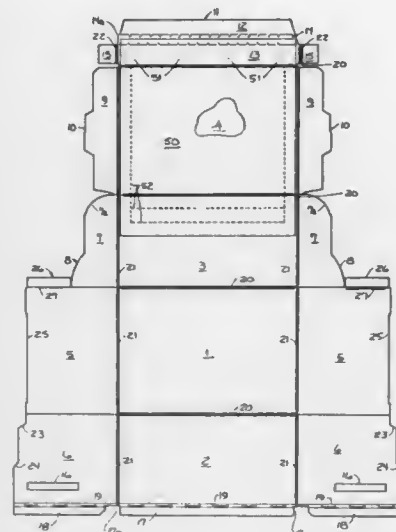
U.S. Cl. 206—626

31 Claims

1. In an integral carton blank, adapted to be erected into a carton, said carton blank having a bottom panel, a front panel hingedly connected to said bottom panel, a rear panel hingedly connected to said bottom panel, a cover panel hingedly connected to said rear panel, and a cover panel front flap comprising tear-away means connected to said cover panel

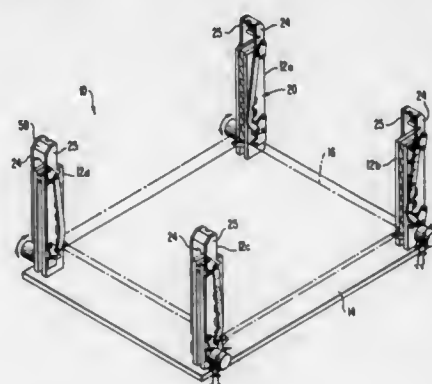
and adapted to overlap said front panel and to be releasably secured thereto in the erected carton, said bottom panel having end flaps hingedly connected thereto, said rear panel having end flaps hingedly connected thereto, said front panel having end flaps hingedly connected thereto, said cover panel having end flaps hingedly connected thereto, and said cover panel front flap having end posts hingedly connected thereto, said bottom panel, front panel, and rear panel end flaps being adapted to be folded in to form end walls in the erected carton, and said cover panel front flap end posts being adapted to overlie said cover panel end flaps and to be secured thereto in the erected carton to form a skirted cover, the improvement which comprises:

said bottom panel end flaps are adapted to be infolded so as to constitute the inner end walls of the erected carton, said front panel end flaps are adapted to overlie said said bottom panel end flaps in the erected carton, and said rear panel end flaps are adapted to overlie said bottom panel end flaps and to overlap said front panel end flaps in the erected carton,



1. In a parallelepipedal package having an upper surface and side walls and made by folding and sealing a scored blank of a sheet material, the package having a welded-seam closure at the upper surface and triangular flaps foldable down against the side walls, the improvement wherein at least one side of the welded-seam closure has a thickening comprising a hot melt coating and having a convex and tacky surface that facilitates ripping into the closure or ripping the closure out.

4,712,691
RACKING DEVICE
Hans Grill, Filswiesenstrasse 31, 7333 Ebersbach 1, and Gerhard Tappen, Johann-Sebastian-Bach Str. 12, D732 Wangen, both of Fed. Rep. of Germany
Filed Oct. 14, 1986, Ser. No. 918,121
Int. Cl.⁴ A47F 5/00
U.S. Cl. 211-49.1 19 Claims



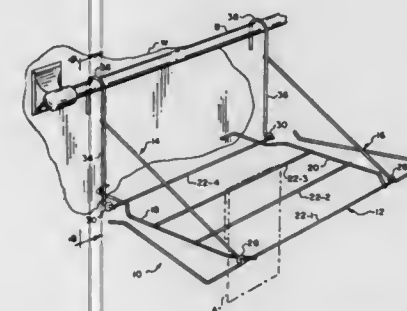
1. A device for stacking finished parts comprising:
a frame formed from a plurality of latch columns secured to a base member to define a space intermediate the latch

4,712,690
PACKAGE HAVING WELDED SEAM CLOSURE WITH HOT MELT THICKENING
Benno Stöhr, Hückelhoven, Fed. Rep. of Germany, assignor to PKL Papier-und Kunststoff-Werke Linnich GmbH, Dusseldorf, Fed. Rep. of Germany
Continuation of Ser. No. 704,128, Feb. 22, 1985, abandoned.
This application Jun. 5, 1986, Ser. No. 873,136
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406962

Int. Cl.⁴ B65D 5/70 15 Claims
U.S. Cl. 206-628

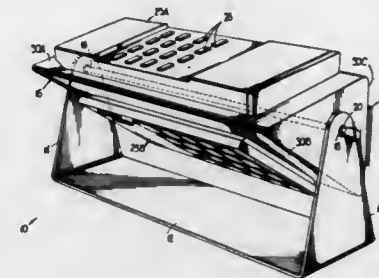
columns for receiving finished articles in a spaced, stacked array;
a plurality of lever arms pivotably secured to said latch column and spaced vertically therealong, each of said lever arms having a receiving portion and an oppositely-extending weighted arm angularly disposed relative to said receiving portion, said lever arms being pivotably connected to said latch column so that each of said lever arms is capable of assuming (a) a rest position, wherein each of said receiving portion and said weighted arm are free from said space; (b) a receiving position, wherein said receiving portion is located within said space in a position ready to receive an article thereon within said space; and (c) a loaded position, an adjacent pair of said latch arms cooperating so that a loading of an article on said receiving portion of a lower latch arm causes said lower latch arm to pivot from its receiving position to its loaded position and thus to cause a pivoting of the next uppermost latch arm from its rest position to its receiving position, the weighted arms of the respective latch arms being in sliding contact;
each of said latch arms including a retaining arm located intermediate said receiving portion and said weighted arm to define with said receiving portion a recess for securing an end of said stacked article in said recess when said latch arm rotates from its receiving to its loaded position.

4,712,692
STOWABLE SHELF/RACK ASSEMBLY
Alice A. Peinsipp, Westchester, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Mar. 6, 1987, Ser. No. 22,672
Int. Cl.⁴ A47F 5/08
U.S. Cl. 211-119 11 Claims



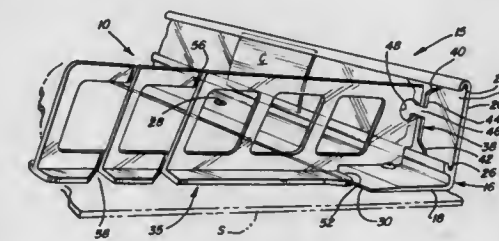
1. A stowable shelf/rack assembly comprising:
a rack member for supporting articles placed thereon or hung therefrom; and
hanger means connected to either side of said rack member, and pivotable between a first position in which said hanger means are oriented generally transverse to said rack member, and a second position in which a major portion of said hanger means lies generally in the same plane as and rests on said rack member, said hanger means including a first hook portion extending rearwardly of the assembly and adapted when said hanger means is in said first position to hang on and be supported by a bar or other member affixed to and spaced from a substantially vertical planar surface, and a second hook portion integral with said first hook portion and extending rearwardly from a point adjacent the front of the assembly and engageable when said hanger means is in said second position with a substantially horizontal planar support member for supporting the collapsed assembly in close contact with one substantially horizontal surface thereof for stowage.

4,712,693
REMOTE CONTROL UNIT CONSOLE
James W. Striplin, 10095 Kinross Rd., Roswell, Ga. 30076
Filed Jul. 14, 1986, Ser. No. 885,198
Int. Cl.⁴ A47F 5/02
U.S. Cl. 211-164 15 Claims



1. A device for supporting remote control units which emit activating beams, comprising:
a base;
a remote control unit mount rotatably mounted about a first axis relative to said base, including means for supporting a plurality of remote control units; and
connecting means operably associated with said base and said remote control unit mount so that said remote control unit mount may be rotated about said axis relative to said base so that said remote control units may be selectively activated to emit triggering beams along axes substantially parallel to said first axis without movement of said base.

4,712,694
DISPLAY SHELF ORGANIZER
David Breslow, Chicago, Ill., assignor to RTC Industries, Inc., Chicago, Ill.
Filed Nov. 10, 1986, Ser. No. 929,053
Int. Cl.⁴ A47F 5/00
U.S. Cl. 211-184 7 Claims



1. A shelf organizer comprising:
an elongated rail member having a bottom mounting portion and an upper portion extending upwardly from the mounting portion, said mounting and upper rail portions together defining a generally L-shaped cross-section for said rail member, said mounting portion being attachable to an upper surface of a shelf;
channel means comprising a top rail and an opposed bottom rail integrally formed on an inner surface of said upper rail portion wherein said top rail is generally coextensive with the upper edge of said upper rail portion, and wherein said bottom rail is generally coextensive with the lower extend of said upper rail portion; and
an elongated divider member comprising an elongated panel and having resilient connector means integral with a front edge thereof, said connector means including vertically spaced upper and lower flange means respectively positionable in said top and bottom rails, said panel being configured to permit said upper and lower flange means to be resiliently compressed toward each other so that said flange means are snap fittable in said channel means to

operationally mount said divider member in a substantially vertical orientation and perpendicular to said rail portion, whereby said divider member substantially spans the vertical extent of the upper rail portion.

4,712,695

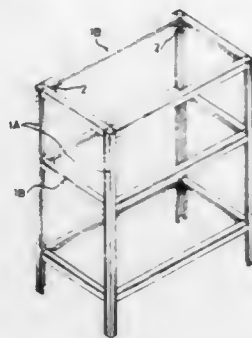
STRUCTURAL FRAME CONNECTOR

Huey-Der Cheng, 343 Fu Hsing South Rd., Sec. 2, Taipei, Taiwan

Filed Jul. 25, 1986, Ser. No. 889,396
Int. Cl.⁴ A47B 47/00

U.S. Cl. 211—191

7 Claims



1. The assembly rack comprising:

a plurality of upright posts each comprising angularly related sides having longitudinal guide edges, said sides defining an inner surface of said post;

a plurality of lateral joining rods each comprising angularly related sides having longitudinal guide edges, said sides of said joining rod defining an inner surface of said joining rod; and

a plurality of structural connectors each joining at least one joining rod to an upright post, said structural connectors each comprising:

a body having at least two branch arms disposed at an angle relative to one another, one said branch arm including a pair of first guide slots for receiving said guide edges of a respective upright post such that said one branch arm can be assembled into said upright post, the other of said branch arms including a pair of second guide slots for receiving said guide edges of a respective joining rod such that said joining rod can be assembled onto said other branch arm,

a friction block mounted on each of said branch arms and arranged to face said inner surface of a respective post and joining rod when said branch arms are assembled to said post and joining rod, and

threaded bolts operably connected to said branch arms and their respective friction blocks for moving said friction blocks independently of one another and away from said branch arms into frictional contact with said inner surfaces of said post and joining rod to frictionally lock said branch arms between said inner surfaces and said guide edges of their respective post and joining rod.

4,712,696

KNOCKDOWN STORAGE RACK WITH WEDGE CONNECTORS

Herbert H. Klein, Arlington Heights, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Jan. 15, 1987, Ser. No. 4,336
Int. Cl.⁴ A47B 47/00

U.S. Cl. 211—192

18 Claims

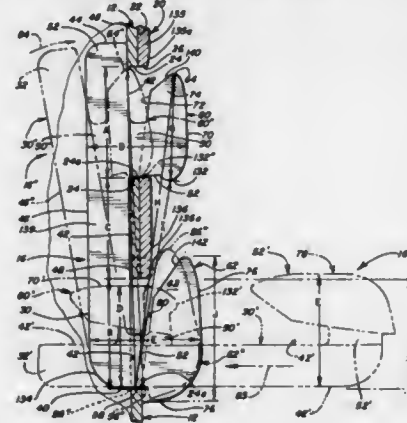
1. A wedge connector in combination with a knockdown storage rack that includes a hollow, upright, post having an inside, an outside and at least one pair of vertically aligned, vertically oriented, spaced, elongated slots in the wall of said post, the upper slot of said pair having a first predetermined

length, the lower one having a second predetermined length, the two slots of said pair being spaced apart vertically a third predetermined distance, said rack further including a horizontal cross beam that terminates in a support plate matingly related to the exterior surface of said post, said support plate defining a vertically oriented elongated slot of substantially the same shape and dimensions as said upper elongated slot in said post wall, the bottom edge of said vertical elongated slot in said cross beam support plate being spaced above the bottom edge of the support plate a distance equal to said third predetermined distance, which wedge connector comprises:

(a) a flat, elongated shank spanning said lower post slot, the portion of the post wall lying between said two post slots, and at least a portion of the upper one of said two post slots, the median plane of said shank being perpendicular to the respective planes tangent to the surfaces of the wall of said hollow post and of said mating support plate in the area adjacent said elongated slots in said post and said support plate,

said elongated shank having a width, a bottom edge, an inner edge, an upper edge and an outer edge, the inner edge of said shank abutting the inner surface of said post wall, and the outer edge of said shank being remote from said post wall;

(b) two ear-supporting members extending laterally from said inner edge of said elongated shank, one for each slot of said pair of post slots, said ear-supporting members being disposed one above the other; and



(c) a wedging ear supported by each of said laterally extending members, said two ears being disposed one above the other, with a free end of each of said ears being directed upward, each of said ears having a bottom edge, an outer side edge, an upper edge located at the free end of the ear, and an inner edge adjacent the upper portion of said ear, the lateral dimension of said connector adjacent the upper end thereof, comprising the widths of said shank, said upper ear-supporting member and said upper ear, being slightly less than said second predetermined length of said lower post slot such that said upper end of said wedge connector, with said wedging ears pointed upward and the longitudinal axis of said elongated shank generally perpendicular to the lower one of said two elongated post slots, is inserted from outside the post into said lower post slot, the lateral dimension of said connector adjacent the lower end thereof, comprising the widths of said shank, said lower ear-supporting member and said lower ear, being slightly more than said second predetermined length of said lower post slot such that said lower end of said wedge connector can not pass through said lower elongated post slot during said upper end portion of said wedge connector into said lower post slot

the shape and dimensions of the lower portion of said elongated shank and the shape, dimensions, and location on said shank of said two wedging ears being such that, after said

upper wedging ear has been inserted in said lower elongated post slot while said cross beam support plate is matingly engaged with said post wall and said upper post slot and said support plate slot are aligned with each other, the upper end portion of said elongated shank is pivoted within said lower elongated post slot upward about the lower end portion of said shank and the highest point on said upper edge of said upper wedging ear is moved to a position just within said upper elongated slot in said post wall,

the shape, dimensions, and location on said elongated shank of said upper wedging ear being such that the highest point on said upper edge of said wedging ear continues to fall below the top edge of said upper elongated post slot as said upper end portion of the wedge connector is pivoted farther beyond the position in which said upper ear lies just within said upper post slot, the shape and dimensions of said upper wedging ear being such that said ear passes, after the wedge connector has been pivoted as just described, entirely through said aligned slots in said post wall and said cross beam support plate,

said inner edge of each of said upper and lower wedging ears having a first inclined surface that is inclined away from said shank in the upward direction towards the free end of the ear, with the bottom portion of said inner edge of the ear being spaced from said inner edge of said shank a distance less than the combined thickness of said cross beam support plate and the wall of said post, to provide a wedging surface to confine (i) the portion of said support plate that lies immediately above said elongated slot in said plate, and (ii) the portion of said support plate that lies immediately above said bottom edge of the plate, respectively, when said support plate slot is aligned with said upper post slot, said upper wedging ear is inserted in the lower elongated post slots and pivoted as aforesaid to pass the upper wedging ear through said aligned slots, and the support plate is moved downward,

whereby portions of said support plate above the confined portions just mentioned are urged against the outer surface of the wall of said upright post, and said inner edge of said shank is urged against the inner surface of the wall of said upright post, thereby connecting said support plate and its associated cross beam securely to the post.

4,712,697

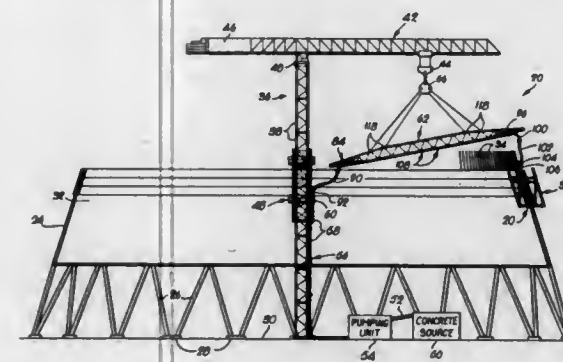
LIGHTWEIGHT TOWER CRANE BOOM FOR CONVEYING PUMPED CONCRETE

Joseph L. McGowan, Harpenden, England, assignor to The Marley Cooling Tower Company, Mississauga, Ont., Canada

Filed Jul. 22, 1986, Ser. No. 888,118
Int. Cl.⁴ E04B 11/16

U.S. Cl. 212—189

5 Claims



1. In an apparatus for lifting flowable concrete mix to an elevated height for introduction into a form system, wherein said apparatus includes a concrete pumping means having discharge piping, and crane means with an upright tower and an elongated jib carried by the tower and swingable about the upright axis of said tower, a lightweight boom at least partially supported by said jib for conveying concrete mix from said

discharge piping of said concrete pumping means to said form system, said boom comprising:

a first elongated upper member,

a second elongated upper member disposed in horizontally spaced, side-by-side, generally parallel relationship to said first member;

a number of elongated brace members each fixedly interconnecting said first upper member and said second upper member at spaced locations along the lengths of said first and second upper members;

a first plurality of elongated spacer bars each having an upper end portion secured to said first upper member at spaced locations along the length of the latter; a second plurality of elongated spacer bars each having an upper end portion fixed to said second upper member at spaced locations along the length of the latter;

an elongated bottom member disposed below said first upper member and said second upper member in spaced, generally parallel relationship to said first upper member and said second upper member,

each of said first plurality of bars and each of said second plurality of bars extending downwardly toward said bottom member and having a lower end portion fixedly connected to said bottom member,

said boom presenting a substantially triangular configuration in a cross-section transverse to the longitudinal axis of said bottom member,

said bottom member having walls defining a longitudinally extending, concrete conveying conduit; and

means for joining the conduit to said discharge piping of said pumping means to permit concrete mix from said pumping means to be directed along the length of said boom for introduction into said form system,

said boom and thereby the conduit therein being of extensible length to enable concrete mix to be directed to said form system at selectively variable distances from the center of said tower.

4,712,698

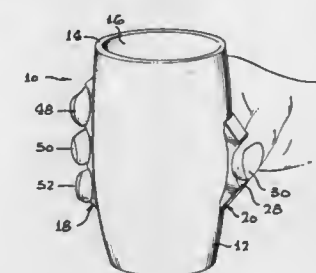
DRINKING VESSEL

Herbert S. Greenberg, 21 Via Marina #2, Marina del Rey, Calif. 90290

Filed Feb. 28, 1986, Ser. No. 834,569
Int. Cl.⁴ B65D 23/10

U.S. Cl. 215—100 A

18 Claims



1. A drinking vessel comprising:

walls defining a closed side, closed bottom and open top vessel;

first and second opposed handle portions positioned on substantially opposite sides of said vessel, each of said handle portions having an external digit engagement surface and being secured to said vessel for manual engagement of said vessel by grasp of both of said handle portions within the digits of the same hand, said handle portions each having at least one digit-receiving depression on the outer surface thereof so that manual grasp of said drinking vessel and digit engagement of said handle portions comprises digit engagement in said depression; and

insulation of a different material than said vessel between said engagement surface and said vessel.

4,712,699

PACKAGE EMPLOYING UNIQUE SEAL

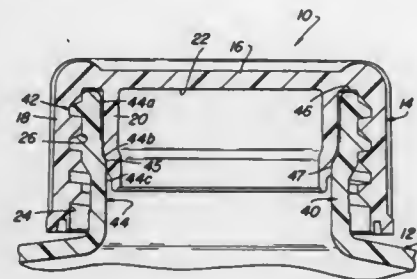
Michael Lutz, Watchung, N.J., assignor to Captive Plastics, Inc., Piscataway, N.J.

Filed Oct. 2, 1986, Ser. No. 914,384

Int. Cl.⁴ B65D 53/00

U.S. Cl. 215—329

6 Claims



1. A package including a container and a closure, said container being a unitary, molded plastic member including an upper elongate finish having outer and inner surfaces, threads on the outer surface adjacent the upper margin of said finish, said inner surface having a lower sealing section located solely in a section of the finish spaced downwardly from said upper margin; said closure including an upper surface, an outer skirt extending downwardly from the upper surface and having threads on the inner surface thereof for threadedly engaging the threads on the finish, and an inner valve spaced concentrically within the outer skirt and extending axially downward from the upper surface of said closure, said inner valve having an outer surface for frictionally engaging only the lower sealing section of the inner finish surface in a region for creating a leak-proof seal between said container and closure; the outer surface of the finish opposite the region of frictional engagement between the inner valve member of the closure and the container being free of threads.

4,712,700

TAMPER RESISTANT BOTTLE

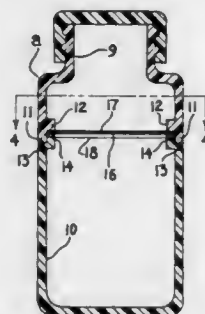
Harry H. Fischman, 9436 Kostner Ave., Skokie, Ill. 60076

Filed Dec. 2, 1986, Ser. No. 937,078

Int. Cl.⁴ B65D 55/02, 53/04

U.S. Cl. 215—366

7 Claims



1. A tamper resistant bottle, comprising a bottle or container of plastic or other suitable material, a first means adapted to form said bottle in, but not limited to, two sections, a second means to connect said sections, one to the other, a third means to permanently bond said connected sections, each to the other, said unit further including means adapted to form configurations and projections on the inside periphery of said tamper resistant bottle, to receive and to position one or more

safety seals, bonding means to permanently bond said safety seals to said configurations and projections, in said tamper resistant bottle.

4,712,701

SUPER-ELLIPTICAL ADAPTOR RING FOR REFUSE CONTAINERS AND THE LIKE

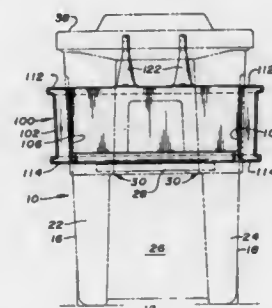
Martin J. Durkan, Jr., 3000 Lind Ave. SW., Renton, Wash. 98055

Filed Sep. 15, 1986, Ser. No. 906,968

Int. Cl.⁴ B65D 6/34

U.S. Cl. 220—71

15 Claims



1. For use with a substantially rectangular container having planar exterior walls tapering inwardly toward a lower portion of said container and defining a substantially rectangular horizontal cross-section therethrough, a ring-like adaptor for adapting the container to be handled by a robotic manipulator of substantially cylindrical objects, said adaptor comprising:

- (a) a smoothly curving outer surface having a horizontal cross-section substantially in the form of a super-ellipse;
- (b) substantially planar inner mating surfaces for frictionally engaging and mating with the exterior walls of an upper portion of the container, said inner mating surfaces defining a substantially rectangular horizontal cross-section therethrough, such that the adaptor is removably mountable on the container by sliding said adaptor upwardly from the lower portion of the container until the inner mating surfaces of the adaptor are frictionally arrested by the exterior walls of the container to prevent further upward movement of the adaptor; and
- (c) locking means for positively securing the adaptor in position around the upper portion of the container to prevent downward movement of the adaptor toward the lower portion of the container both when the container is upright and when the container is inverted.

4,712,702

CONTAINERS FOR BEVERAGES

Youzon Ayabe, Imperial Roppongi 406, 16-5, Roppongi 5-chome, Minato-ku, Tokyo, and Shigeru Sugiyama, 8-7, Kugenmakai-gan 3-chome, Fujisawa-shi, Kanagawa-ken, both of Japan

Filed Oct. 23, 1986, Ser. No. 922,222

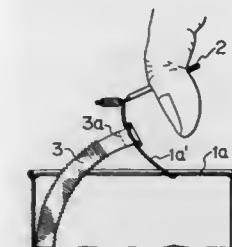
Int. Cl.⁴ A47G 21/18, 19/22; B65D 47/04

U.S. Cl. 220—90.2

1 Claim

- 1. A container for beverages comprising
 - a housing;
 - a straw in said housing;
 - a removable opening portion on the top of said housing forming an opening in said housing upon removal of said opening portion from the top of said housing;
 - said straw including
 - an upper end mounted in a caulked attachment to said removable opening portion and extending from the rear side of said removable opening portion;
 - a cut-off portion in the vicinity of said upper end of said straw;

a body portion formed into a bellows adapted to be extensible;
a stopper formed as a float and attached at a lower portion of said straw;
said stopper being larger in size than said opening in said housing formed by removal of said removable opening



portion to prevent passage of said stopper through said opening
whereby said straw may be pulled to extend it in its bellows body portion while its bottom end is held within said opening in said housing to provide the opposite force to the force applied for extending the length of said straw.

4,712,703

PERFECTED CAP, PARTICULARLY FOR MOTOR VEHICLES

Manrico Oddenino, Via Reano, Italy, assignor to Illinois Tool Works Inc., Chicago, Ill.

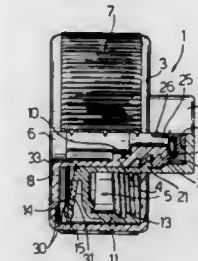
Filed May 12, 1986, Ser. No. 861,719

Claims priority, application Italy, May 21, 1985, 53410/85[U]

Int. Cl.⁴ B65D 55/14

U.S. Cl. 220—210

2 Claims



- 1. A locking safety cap for a threaded filler neck comprising: an outer shell member having a cup-shaped portion and an integral hollow shank portion, said cup-shaped portion having a circular base section and an integral annular flange section, said hollow shank portion having exterior threads on its outer end,
an inner closure member rotatably slidably retained within said outer cap member and having threads to engage and close said filler neck, said closure member having a hollow cylindrical sleeve portion slidably disposed over the outer end of said hollow shank portion of said outer shell member,
a cylindrical shaped control member rotatably slidably retained within said hollow cylindrical sleeve portion of said inner closure member and having internal threads in threaded engagement with said exterior threads on the outer end of said hollow shank portion of said outer sleeve member, where said control member allows said outer shell member to be moved axially relative to said inner closure member between a locked and an unlocked positions,
lock means mounted inside said hollow shank portion of said outer shell member for selectively interlocking said control member in a manner that turning said lock means causes said outer shell member to move from said locked position to said unlocked position,
a first saw-tooth ring gear half being formed on the inside

surface of said circular base section of said cup-shaped portion of said outer shell member and a second saw-tooth ring gear half flexibly supported by said cylindrical sleeve portion of said inner closure member in a manner to be in a mating relationship with said first sawtooth gear half whenever said outer shell member is in said locked position and disengaged whenever said outer shell member is in said unlocked position.

4,712,704

SELF-SEALING CLOSURE

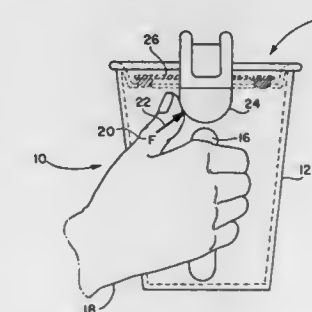
Douglas P. Ramsey, 154 Fiesta Rd., Rochester, N.Y. 14626, and Michael J. O'Brien, 106 Meadow Farm N., North Chili, N.Y. 14514

Filed Feb. 19, 1987, Ser. No. 16,345

Int. Cl.⁴ B65D 51/18; A47G 19/22

U.S. Cl. 220—254

16 Claims



- 1. A self-sealing closure for a drinking vessel with a receptacle, said closure comprising (a) a lid having a depressed area and at least one orifice within the depressed area; (b) a shutter matching said orifice; (c) means for resiliently holding the shutter against said orifice; and (d) means rotating within a plane perpendicular to the central axis of said receptacle and lid for pushing the shutter away from said orifice in a direction substantially orthogonal to the plane of said orifice, wherein:
 - (e) said shutter is normally in a closed position in which the passage of fluid through it is prevented;
 - (f) said shutter can be moved from its closed position to an open position by the application of an external force, which need not exceed about 2.8 ounces, applied along the perimeter of the shutter within a plane perpendicular to the central axis of the shutter; and
 - (g) when said external force ceases to be applied to the shutter, the shutter spontaneously returns to its closed position.

4,712,705

TAMPER INDICATING CAP SEAL FOR CONTAINER VALVES

Charles Fuehrer, Scarsdale, N.Y., assignor to Stoffel Seals Corporation, Tuckahoe, N.Y.

Filed Jan. 30, 1987, Ser. No. 8,944

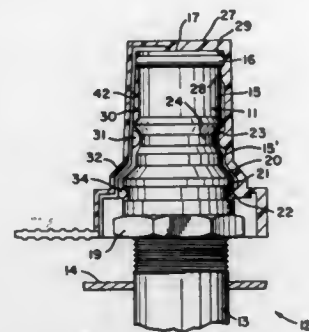
Int. Cl.⁴ B65D 51/16

U.S. Cl. 220—270

8 Claims

- 1. A cap seal for use in covering and preventing undetected removal of a valve plug having a generally cylindrical wall on a container, the valve plug having an end face, an O-ring just below the end face extending radially beyond the contiguous surface of the plug, and a base portion with wrench engageable surfaces extending radially beyond the contiguous surface of the plug, comprising a body having a generally cylindrical side wall, a closed end wall and an open end, said body being of a size approximately to engage the O-ring, said body having protrusion means adjacent to its end wall and, when the seal is mounted on the plug, extending inwardly beneath the O-ring and proximate to said plug wall, a skirt portion depending from

said body and being joined thereto by frangible connecting means and having a wall portion with an integrally formed tear strip which is separable from said skirt portion along spaced frangible lines, said wall portion being substantially parallel to said side wall and overlying a least a portion of said wrench engageable surfaces, said tear strip extending along the height of the side wall and the skirt portion and being separable from said side wall along spaced frangible lines which extend along



said side wall and formed by internal grooves therein, said grooves permitting air to escape from inside the cap and past the O-ring when it is applied to a plug, and pull tab means extending from said tear strip, whereby said tear strip may be severed along said frangible lines in order to remove said cap from the valve plug, and whereby undetected removal and replacement of said cap seal or manipulation of said wrench engageable surfaces is prevented.

4,712,706

EASY OPEN TYPE CAN

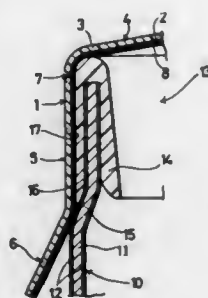
Akira Nakata, Ageo; Shiroh Matsumoto; Hitoshi Tozima, both of Kasukabe, and Masahiko Minato, Iwatsuki, all of Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 4,645

Int. Cl.⁴ B65D 41/32

U.S. Cl. 220—276

4 Claims



1. An easy open type can comprising:

- a can closure including a top panel having a peripheral wall portion extending downwards from a circumferential edge of the top panel portion thereof;
- a tab for opening the closure;
- a score line constructed in the peripheral wall portion so as to be connected to an end of one side edge of the tab and extending over the whole circumference of the peripheral wall portion;
- said peripheral wall portion is mounted on and fixed to an open end portion of a can barrel;
- said can closure is formed of a metallic foil and a thermoplastic resin layer covering an outer surface of the metallic foil and the score line is constructed by removing only the resin layer of the peripheral wall portion of the can closure, and the score line is provided in such a region of the

peripheral wall portion that is adhered to the open end portion of the can barrel.

4,712,707

CLOSURE FOR A CONTAINER

Andrew P. Pavely, Blunsdon, United Kingdom, assignor to Metal Box p.l.c., Reading, England

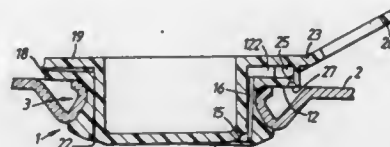
Filed Sep. 9, 1986, Ser. No. 905,185

Claims priority, application United Kingdom, Sep. 9, 1985, 8522284

Int. Cl.⁴ B65D 39/00

U.S. Cl. 220—307

15 Claims



1. A closure for a container having an opening therein which includes a frusto-conical closure-engaging surface which flares outwardly into the container, the closure comprising:

- a relatively elastic annular collar which is an easy fit in the opening in the relaxed state and consists of a substantially cylindrical neck located in the opening, a radial flange connected to the neck of the collar at its end outside the container, and a thickened portion connected to the neck of the collar at its end within the container and which in the relaxed state flares both inwardly and outwardly from the neck of the collar;
- and a relatively stiff plug hingedly connected to the collar which is inserted into the collar to close the opening and engages the thickened portion of the collar and causes it to be elastically deformed into tight sealing engagement with the frusto-conical closure engaging surface of the opening and with the plug.

4,712,708

CAP MOUNTING STRUCTURE OF THE GOVERNOR VALVE FOR AUTOMATIC TRANSMISSION

Hiromi Taguchi, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

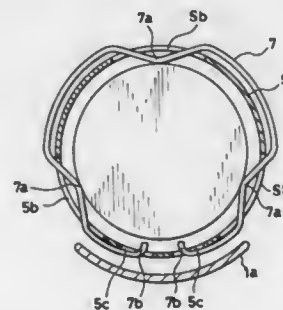
Filed Apr. 9, 1986, Ser. No. 849,714

Claims priority, application Japan, Apr. 17, 1985, 60-57355[U]

Int. Cl.⁴ B65D 45/32

U.S. Cl. 220—319

5 Claims



1. A cap mounting structure for a transmission comprising:

- a casing provided in the transmission and having an outer flange formed in the periphery of the casing;
- cap means disposed on the casing and having a skirt section which downwardly extends beyond the outer flange and has a plurality of holes and a pair of openings located below the outer flange; and

a snap ring means having a plurality of inwardly protruding portions each inwardly protruding into one of the holes, each end of the snap ring means being inwardly bent and inserted into one of said pair of openings of the skirt section of the cap means, said inwardly protruding portions of said snap ring and said ends of the snap ring means engaging with the skirt section of the cap means, and said ends of the snap ring means engaging with said outer flange of the casing to prevent the snap ring means from circumferentially rotating beyond a predetermined range.

4,712,709

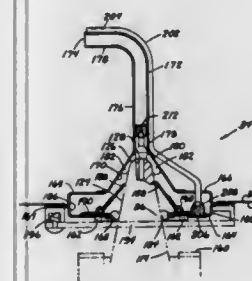
FUEL-INTAKE DEVICE FOR VEHICLE TANK
Ronald F. Horvath, and Barbara L. Horvath, both of 4325 Kennedy Dr., #204, Racine, Wis. 53404

Filed Apr. 28, 1986, Ser. No. 856,172

Int. Cl.⁴ B67D 5/04

U.S. Cl. 220—334

20 Claims



1. In a vehicle fuel tank of the type having a substantially flat bottom wall, an opposed top wall, and fuel intake means, the improvement in the fuel intake means comprising:

- spaced upper and lower barrier walls having edge portions joined together and to the flat bottom wall;
- lower and upper openings in the lower and upper barrier walls, respectively; and
- a standpipe having a proximal end beginning at and secured to the upper barrier wall about the upper opening and extending upwardly to a distal end adjacent to the top wall of the tank, the distal end having fuel outlet means therein.

4,712,710

ONE-PIECE SEAMLESS ENCLOSURE AND METHODS OF MAKING IT

Richard B. Freeman, Wilmington, Del.; Charles W. Goetz, Willingboro, N.J., and Walter S. Eggert, Jr., Huntington Valley, Pa., assignors to The Budd Company, Troy, Mich.

Continuation of Ser. No. 663,626, Oct. 22, 1984, abandoned.

This application Feb. 27, 1987, Ser. No. 19,849

Int. Cl.⁴ B65D 25/18

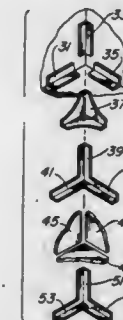
U.S. Cl. 220—414

1 Claim

1. A one-piece seamless enclosure comprising:

- (a) six panels each including a foam core completely surrounded by fiber reinforced material with one of said panels having an opening therein;
- (b) said foam core comprising high density foam foam frames and low density foam material;
- (c) each of said panels having mitered edges and being joined together at its edges on adjacent panels to provide a hollow enclosure between said panels;

(d) a "Y" shaped member disposed in corners of said panels to provide rigidity of the panels around said corners, and



(e) said fiber reinforced material completely surrounding the joined panels being impregnated with cured resin to form said one-piece enclosure.

4,712,711

CONTAINER FOR TRANSPORTING HAZARDOUS CHEMICALS

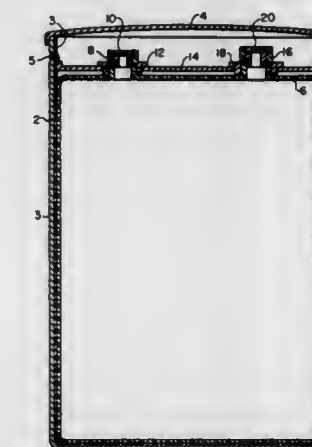
Emil J. Geering, Grand Island, and Frank J. Grano, Lewiston, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Mar. 5, 1982, Ser. No. 355,280

Int. Cl.⁴ B65D 25/14, 51/18

U.S. Cl. 220—457

7 Claims



1. In a cylindrical metal drum having a protective lining and a removable crown outer lid which is adapted to be secured to the exterior only of said drum, the improvement which comprises:

- (a) a rigid high density polyethylene bottle fitted inside said drum, said bottle having two upwardly projecting outlets, one of said outlets serving as a vent for stored chemicals,
 - (b) an inner lid adapted to be fitted entirely inside said drum on top of said bottle, said inner lid having openings corresponding to said bottle outlets permitting said outlets to extend through said openings,
 - (c) means for securing said bottle to the inner lid, and
 - (d) means for securing said inner lid to the interior only of said drum.
7. A method of improving the suitability of a conventional metallic drum for storing and transporting hazardous chemicals, said method comprising the steps of
- (a) inserting a rigid high density polyethylene bottle inside said drum, said bottle having two upwardly projecting outlets, one of said outlets serving as a vent for stored chemicals,
 - (b) fitting an inner lid entirely inside said drum on top of said bottle, said inner lid having openings corresponding to

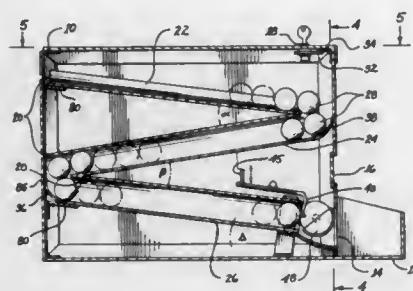
said bottle outlets permitting said outlets to extend through said openings,
(c) securing said bottle to the inner lid, and
(d) securing said inner lid to the interior only of said drum.

4,712,712

BALL DISPENSING APPARATUS AND METHOD
Robert L. Garden, 1525 W. Cornstock, Chandler, Ariz. 85224
Filed Jul. 18, 1986, Ser. No. 888,030
Int. Cl.⁴ G01F 9/00

U.S. Cl. 221-68

6 Claims



1. A manually operated golf ball dispenser apparatus for simultaneously dispensing a plurality of golf balls, comprising:
a housing member means for housing a plurality of golf balls therein;
a plurality of angularly aligned guide means each arranged in a continuous zig-zag manner for guiding one of said plurality of golf balls out of said housing member means, each of said plurality of guide means having a plurality of golf ball guide members;
a safety flap member means located therebelow said guide member means for blocking off said golf balls when said ball dispenser apparatus is not in use;
a removable cover member means thereabove said housing member means operably attached to said safety flap member means to cause said flap member means to unblock the golf balls on said guide members in response to the action of the cover member means being placed in its closed position;
a holding member means located proximately adjacent the lower end of said guide member means rotatably coupled to an inner frame of said housing member means for holding a number of said plurality of golf balls; and
a manually operated, coin activated dispenser means for operably coupling to said holding member means for simultaneously dispensing said plurality of golf balls that are accumulated from each one of said plurality of guide means.

4,712,713

GAS CYLINDER COUPLING AND WEIGHTING MECHANISM FOR A CARBONATED DRINK DISPENSER

Robert G. Karlis, Fairfield, Conn.; Charles M. Dole, Purdys, N.Y.; Gary L. Webster, Fairfield, Conn., and George J. Andersen, Garrison, N.Y., assignors to Cadbury Schweppes, PLC, London, England

Filed Nov. 20, 1985, Ser. No. 799,919
Int. Cl.⁴ B67B 7/24; G01G 3/00

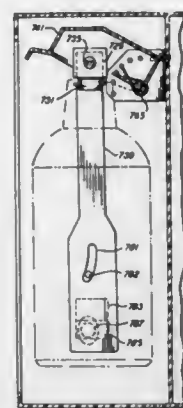
U.S. Cl. 222-3

27 Claims

19. A mounting and weighing mechanism for a gas cylinder comprising:

(a) a first fitting, said first fitting comprising a cylindrical member containing a passage for conducting gas and having on the outside surface thereof diametrically opposed means for engaging a second mating fitting of a gas cylinder such that the gas cylinder is suspended from said first fitting; and
(b) a weighing mechanism to which said first fitting is at-

tached including: means forming a rotatable lever at the end of which said first fitting is mounted; means for bias-



ing said lever upwardly against the downwardly acting weight of said gas cylinder; and indicator means for indicating the relative position of said second fitting.

4,712,714

SEALING SPOUT FOR PAPER CARTONS

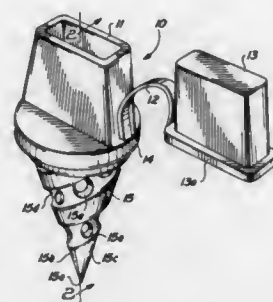
Domenick Mucciarone, 3645 Boca Ciega Dr., Apt. 206, Naples, Fla. 33942

Continuation of Ser. No. 865,460, May 21, 1986, abandoned.
This application Jun. 11, 1987, Ser. No. 59,186

Int. Cl.⁴ B67B 7/26

U.S. Cl. 222-91

4 Claims



1. A device for removing liquid from a sealed paper carton comprising

a pouring spout which is rectilinear in cross section, a sealing ring surrounding the base of said spout, and a sharply tipped hollow cone depending axially from said sealing ring having a flat smooth geometrically conical outer surface and a single groove therein which groove spirally extends from the tip of the cone to the underside of the sealing ring and which is concavely arcuate in cross-section.

the flat underside of said sealing ring containing a single annular ring-shaped recess, one side of which is formed by the base of said cone and the other side is formed by the lower edge of the sealing ring, and
the spiral groove in said cone contains a plurality of holes providing passageways from the outside of said cone into the interior of said spout.

4,712,715

DEVICE FOR INJECTING A FIXING AGENT INTO A DRILLED HOLE FOR ANCHORING A FASTENING ELEMENT INSERTED IN A DRILLED HOLE
Artur Fischer, Weinhalde 34, D-7244 Tumlengen/Waldachtal 3, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,636

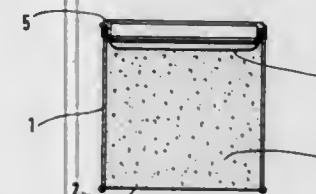
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524289

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.⁴ B65D 25/40; B67C 3/02

U.S. Cl. 222-145

3 Claims



1. In a device for injecting a fixing agent into a drilled hole for anchoring a fastening element inserted in said hole, a combination comprising a vessel filled with one component of the fixing agent and sealably closable with sealing means; a plunger; and an injection nozzle mounted on said plunger, said plunger and said injection nozzle having an overall length which matches a height of an interior of said vessel, the improvement comprising said plunger including an elongated cylindrical sleeve surrounding said nozzle and radially spaced therefrom, said sleeve starting from a base of said plunger and extending along an axis of said nozzle over a substantial portion of a length of said nozzle so as to form between a wall of said sleeve and a wall of said nozzle an annular space filled with another component of said fixing agent, said sleeve having an end face, said end face being sealed with a cover closing said space and having a frangible opening, said plunger with said sleeve and said nozzle being movable into said vessel whereby upon piercing of said frangible opening, said another component from said sleeve is admitted into said vessel filled with said one component and is mixed with said one component to form in said vessel a mixture of said one and another component prior to mounting said plunger-sleeve-nozzle combination on said vessel so that the mixture is discharged from said vessel through said nozzle toward said drilled hole as pressure is applied to said vessel against said plunger and injection nozzle.

4,712,716

APPARATUS FOR METERING DUSTING POWDER
Gerhard Schloz, Leinfelden-Echterdingen, and Heinz Weitmann, Rosenfeld, both of Fed. Rep. of Germany, assignors to Weitmann & Konrad GmbH & Co. KG, Leinfelden-Echterdingen, Fed. Rep. of Germany

Filed Sep. 8, 1986, Ser. No. 905,324

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1985, 3534090

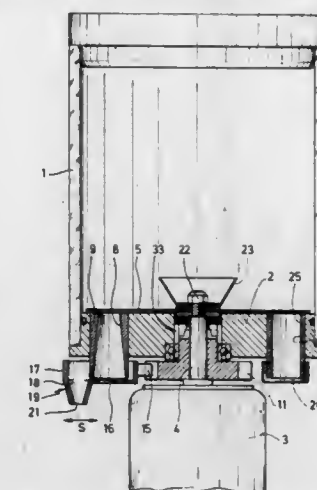
Int. Cl.⁴ B67D 5/58; G01F 11/00

U.S. Cl. 222-189

16 Claims

1. Apparatus for metering dusting powder comprising a powder supply container, a powder outlet opening at the bottom of the supply container, a stirring mechanism comprising a stirring blade (5) rotating immediately above the bottom (2) and the outlet opening (8) of the supply container (1), an oscillating plate for metered delivery of the powder provided at the outlet opening, and a shaking device for imparting oscillatory motion to said plate, said shaking device comprising a

lever (13) attached to said oscillating plate, a spring (14) for prestressing said lever, and a cam disk (11) for imparting to said



4,712,717

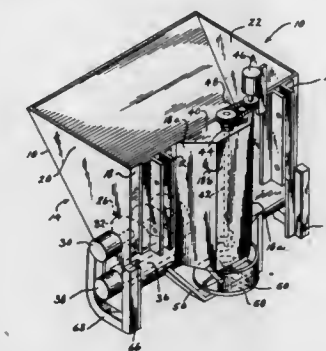
COMBINED DROP AND BROADCAST SPREADER FOR GRANULAR MATERIAL

Raymond H. Egerdahl, 1208 S. 75th St., West Allis, Wis. 53214
Continuation-in-part of Ser. No. 578,376, Feb. 2, 1984, Pat. No. 4,588,113. This application Mar. 26, 1986, Ser. No. 844,086

Int. Cl.⁴ E01C 19/20

U.S. Cl. 222-252

17 Claims



1. A combined drop and broadcast spreader for granular material comprising:

a hopper for receiving the granular material, said hopper having a bottom containing a plurality of discharge openings for dropping said material, said hopper having a side wall;
wall means mounted on said hopper side wall and forming a chamber on said side wall opening into said hopper;
a rotatable impeller in the bottom of said hopper above said discharge openings for forcing granular material from said openings;
a rotatable broadcast means coupled to said hopper for broadcasting granular material supplied thereto in an arc-like pattern; and
means for selectively supplying granular material from said hopper to said broadcast means, said means comprising a hole in said chamber and rotatable supply means operatively associated with said hole for supplying granular material through said hole to said broadcast means.

4,712,718

APPARATUS FOR ASSEMBLING PAIRS OF FASTENER ELEMENTS

Keiichi Yoshieda, Kurobe, Japan, assignor to Yoshida Kogyo, K. K., Tokyo, Japan

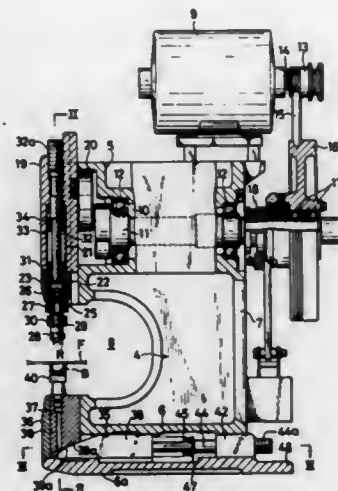
Filed Aug. 13, 1986, Ser. No. 896,063

Claims priority, application Japan, Aug. 16, 1985, 60-179290

Int. Cl.⁴ B21J 15/10

U.S. Cl. 227-62

7 Claims



1. An apparatus for assembling a pair of fastener elements, comprising:

- (a) a frame;
- (b) a die holder vertically movably mounted on a lower portion of said frame and supporting thereon a die on which one of the fastener elements is supported, said die and said die holder being movable in unison with each other;
- (c) a reciprocable ram mounted on an upper portion of said frame in confronting relation to said die and supporting thereon a punch on which the other fastener element is supported, said ram being vertically movable toward and away from said die to clinch the fastener elements together by and between said punch and said die; and
- (d) means for adjustably setting a clinching force to be applied to the fastener elements as they are clinched by said punch and said die, said clinching-force setting means including:
 - (1) a downwardly sloping lower surface of said die holder,
 - (2) a slider block disposed in said lower portion of said frame and slidably movable in a horizontal direction, said slider block having a downwardly sloping upper surface engageable with said sloping lower surface of said die holder,
 - (3) first spring means for urging said slider block toward said die holder to hold said sloping upper surface and said lower surface in abutting engagement with each other,
 - (4) first means for adjusting the force of said first spring means,
 - (5) a punch holder mounted on said ram for holding said punch and vertically movable in unison with said punch and relative to said ram by a limited distance,
 - (6) second spring means disposed in said ram for urging said punch holder to a lower end of said limited distance, and
 - (7) second means for adjusting the force of said second spring means.

4,712,719

VAPOR PHASE PROCESSING MACHINE

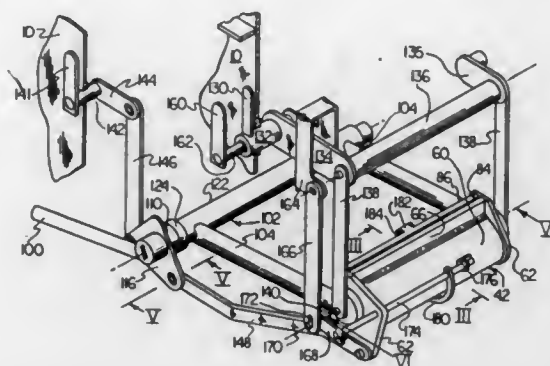
Gerard G. Derrico, Maynard, Mass., assignor to Dynapert-HTC Corporation, Concord, Mass.

Filed Jul. 30, 1986, Ser. No. 891,928

Int. Cl.⁴ B23K 1/08

U.S. Cl. 228-37

6 Claims



1. A soldering system for applying molten solder to a work product comprising

- solder applicator means including
- cylindrical barrel means having an elongated orifice wall extending parallel to the axis of said barrel means, and
 - nozzle means secured to said barrel means and including a nozzle having an elongated orifice surface,
 - means for supporting said nozzle for movement from a first position whereat said orifice surface and said orifice wall define an elongated orifice having a selected opening to a second position whereat the opening is substantially enlarged, and
 - compressed spring means located between said nozzle and said cylindrical barrel means for forcefully biasing said nozzle towards said first position said spring means being further compressed when said nozzle is at said second position,
 - means for displacing said nozzle from said first position to said second position,
 - means for supplying molten solder to said solder applicator means, and
 - means for conveying work product past said solder applicator.

4,712,720

DEVICE FOR MUTUALLY CENTERING AND CLAMPING TWO PIPE BODIES TO BE WELDED TO ONE ANOTHER

Klaus Tesch, Dorotheenstrasse 93, 2000 Hamburg 60, Fed. Rep. of Germany

PCT No. PCT/EP86/00131, § 371 Date Nov. 14, 1986, § 102(e) Date Nov. 14, 1986, PCT Pub. No. WO86/05430, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 11, 1986, Ser. No. 937,064

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 8507555; Sep. 11, 1985, 8525952

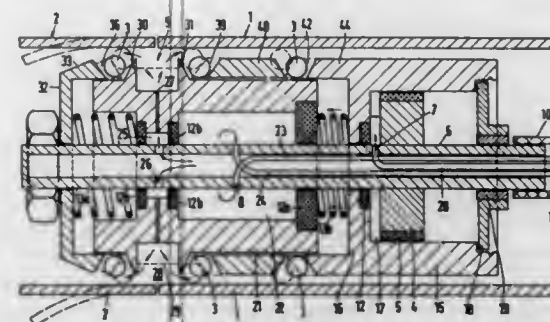
Int. Cl.⁴ B23K 31/06

U.S. Cl. 228-49.3

16 Claims

1. A device for mutually centering and clamping two workpieces (1,2; 50,51) which are to be welded to one another and contain a round bore, which device, for each of the workpieces, has a clamping unit on both sides of a welding area (9) provided with an inert gas supply, which clamping unit comprises at least one peripheral row of clamping members (3) which are contained in a clamping groove (36, 39, 42), can be stretched outwards or relaxed inwards by mutual axial approach or distancing of the flanks (52, 53) of the clamping groove and have an outwardly pointing clamping surface (54)

for the contact with the bore surface of the workpiece and are also at a distance (57) from one another in the peripheral direction, wherein the axial extent (58) of the clamping members



(56), lined up in large number at a slight distance (57) from one another, is greater than the width of their clamping surfaces (54) in the peripheral direction.

4,712,721

SOLDER DELIVERY SYSTEMS

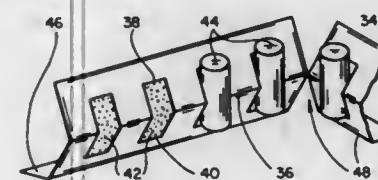
Raymond Noel, Menlo Park; William M. Robinson, Palo Alto; Gabe Cherian, Fremont; Thomas H. Clifford, Half Moon Bay; William D. Carlomagno; William M. Deasy, both of Redwood City, all of Calif.; Willie K. Grassaner, Mapleton, Oreg.; David K. Haygood, Sunnyvale, Calif.; H. Paul Sherlock, San Francisco, Calif., and Harry E. White, Newark, Calif., assignors to Raychem Corp., Menlo Park, Calif.

Filed Mar. 17, 1986, Ser. No. 840,624

Int. Cl.⁴ H01L 21/58; B23K 1/12

U.S. Cl. 228-56.3

24 Claims



1. A solder post delivery system comprising:
- a positioning means for positioning solder posts, said positioning means being elongated along a longitudinal axis, said positioning means having a plurality of longitudinally spaced openings therethrough, each of said openings having a top and a bottom generally parallel to said longitudinal axis wherein said positioning means is folded along a line generally parallel to the tops and bottoms of said openings providing unobstructed access to said solder posts;
 - an elongated and flexible backing means having at least one adhesive surface, said backing means connected to said positioning means by said surface and to solder posts to be positioned through said openings; and
 - a plurality of solder posts positioned by said openings and held therein by said backing means, said positioning means capable of being bent with respect to said longitudinal axis to align the ends of said solder posts with respect to electrical components to be interconnected.

4,712,722

CONCURRENT ULTRASONIC WELD EVALUATION SYSTEM

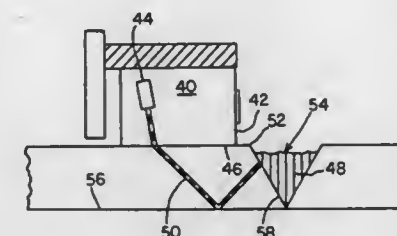
Donald W. Hood; John A. Johnson, and Herschel B. Smartt, all of Idaho Falls, Id., assignors to EG&G, Inc., Wellesley, Mass.

Filed Sep. 4, 1985, Ser. No. 772,527

Int. Cl.⁴ B23K 5/22, 9/32, 37/00

U.S. Cl. 228-104

19 Claims



1. Apparatus for concurrent non-destructive evaluation of partially completed welds for use in conjunction with an automated welder, comprising:

- (a) generating means, mounted to maintain in predetermined fixed proximate spatial relationship to the automated welder, for generating ultrasonic signals and for coupling the ultrasonic signals in real-time to the region of the partially completed weld;
- (b) detection means for detecting ultrasonic signals reflected within a reflection period of predetermined resolution from the region of the partially completed weld; and,
- (c) analysis means for processing in real-time the ultrasonic signals within the reflection period detected by the detection means to identify welding flaws in response thereto.

4,712,723

METHOD FOR BONDING AN INSULATED WIRE ELEMENT ON A CONTACT

Helmut Moll, Erlangen; Gerd Wiegand, Langenzenn; Josef Schindler, Regensburg; Wilfried Scherer, Rieden, and Kurt Marth, Regensburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

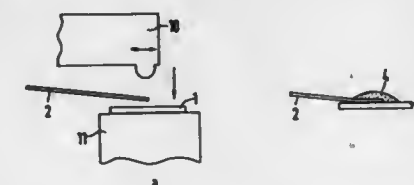
Filed Apr. 14, 1986, Ser. No. 851,839

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1985, 3513436

Int. Cl.⁴ B23K 21/00

U.S. Cl. 228-111

12 Claims



1. A method for bonding a metallic wire coated with an insulated lacquer layer to a metallic contact element, which comprises the steps of:

- (a) applying ultrasonic energy to the wire so that the lacquer layer is broken up and the wire is deformed in a certain area and welded to the contact element; and
- (b) enclosing the entire area of deformation with an thixotropic adhesive.

4,712,724

METHOD OF FRICTION WELDING

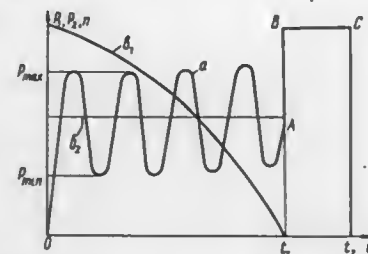
Vladimir K. Lebedev, ulitsa Engelsa, 25, kv. 12; Ivan A. Chernenko, ulitsa Lomonosova, 24, kv. 125; Alexandr T. Dyshlenko, ulitsa Vasilkovskaya, 49, korpus 3, kv. 14; Leonid V. Litvin, ulitsa Vernadskogo, 87, kv. 46, and Vladimir I. Tishura, ulitsa Chigorina, 55, kv. 27, all of, Kiev, U.S.S.R.

Filed Nov. 12, 1986, Ser. No. 930,663

Int. Cl.⁴ B23K 27/00

U.S. Cl. 228—112

2 Claims



1. A method of friction welding comprising the steps of: jiggling coaxially the parts to be welded end face-to-end face having diameters which are the same or different and the materials of which have inherent Young's moduli; setting said parts to be welded to rotate with respect to each other; applying to said parts to be welded, while heating up said parts so as to accomplish friction welding, an axial pressure recurrently varying with a frequency which is in inverse proportion to the smaller value of said Young's moduli of said materials of said parts welded and to said diameter or the smaller of said different diameters, whereby the value of said frequency varies over a range between + and -15%; and upset-forging said parts welded together.

4,712,725

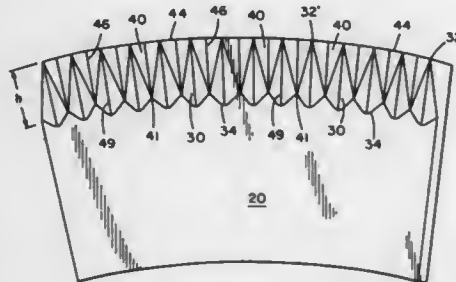
CONTAINER WITH INTEGRAL FOLD-IN CLOSURE LID

Timothy J. Moore, 301 Diamond, Redondo Beach, Calif. 90277
Filed Sep. 17, 1986, Ser. No. 908,245

Int. Cl.⁴ B65D 1/00

U.S. Cl. 229—8

3 Claims



1. A container for holding and dispensing liquids and solids, comprising: a main container portion defining a hollow cavity in which material to be dispensed is stored, said main container portion having a bottom portion and an upper rim portion defining the mouth of a container; an inwardly-foldable closure-lid portion, said closure-lid portion having a peripheral base portion connected to said upper rim portion, said base portion being pivotal relative to said rim portion so that said closure-lid portion may be folded inwardly to close off the mouth of said container portion; said closure-lid portion comprising a first series of substantially triangular-shaped sections, each said section of said first series comprising a pair of sides and a base, the bases

of said sections of said first series defining said peripheral base portion of said closure-lid portion connected to said upper rim portion, each said section of said first series defining a first apex thereof facing away from said upper rim portion;

a second series of substantially triangular-shaped sections, each said section of said second series comprising a pair of sides and a base, the bases of said sections of said second series defining an outer edge portion of said closure-lid portion when said closure-lid portion is in its open-position to allow dispensing and filling of the container, each said section of said second series defining a second apex; said sections of said first series alternating with said sections of said second series about said closure-lid portion such that a section from said first series is positioned between a pair of sections of said second series, and a section from said second series is positioned between a pair of sections of said first series;

each said section of said second series having a first fold line to allow for the folding thereof when said closure-lid portion is folded inwardly to close off the mouth of the container;

each said section of said first series having a height thereof slightly greater than the radius of said mouth of said container portion, so that said apex of each section of said first series, when said first series is positioned in the mouth of said container portion, lies in a plane spaced from a plane containing therein said upper rim portion of said container portion, said plane of said apex lying closer to said bottom portion of said container portion than said upper rim portion;

each said section of said first series having a second fold line extending substantially along the height thereof parallel to said first fold line when said sections are in their open state; each said first fold line of said sections of said second series bisecting the respective triangle thereof along the entire height thereof from the respective said second apex to the respective said base thereof, said pair of sides of each said section of said second series defining third and fourth fold lines with directly adjacent sections of said first series, each said third and fourth fold lines extending from the respective said apex of the respective said section of said second series to the respective said base of the respective said section of said second series, whereby added strength and holding force is provided to said closure-lid portion;

each said base of each said section of said first series having a fifth fold line thereof, each said fifth fold line being arcuate in shape to aid in the folding-in of said sections of said first series to close off said mouth of said container portion.

4,712,726

SIMULATED GIFT WRAP BOX

Kenneth Fonas, 814 Pittsburgh St., North Versailles, Pa. 15137

Continuation-in-part of Ser. No. 732,729, May 10, 1985,

abandoned. This application Sep. 24, 1986, Ser. No. 911,253

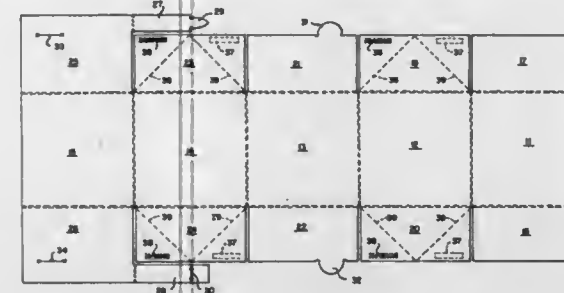
Int. Cl.⁴ B65D 1/00

U.S. Cl. 229—8

17 Claims

1. A simulated gift wrap box having an open top body and cover of paperboard and the like, the body having a unitary bottom and two unitary oppositely disposed side panels only with extensions at each end of said bottom and said side panels respectively hinged thereto and folded against each other, the cover having a unitary top and at least one unitary side panel with extensions at each end of said top and said side panel respectively hinged thereto and folded against each other, the top panel and bottom panel extensions having their outer cor-

ners folded inwardly against them respectively on diagonal lines to form isosceles figures, the extensions of said at least one



cover side panel overlapping said body side panel extensions and underlapping said body isosceles figures.

4,712,727

GABLE-TOP CONTAINER CLOSURE SYSTEM

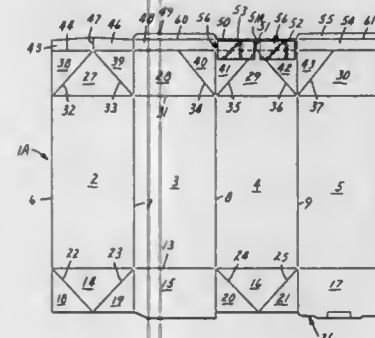
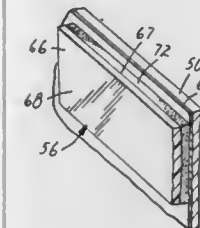
Gregory R. Wyberg, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 10, 1987, Ser. No. 36,969

Int. Cl.⁴ B65D 5/06

U.S. Cl. 206—631.3

22 Claims



1. A sheet material blank for constructing a sealed gable-top container with a thermoplastic inner surface coating responsive to a container sealing process, said blank comprising:

- (a) four body panels including front and back panels and first and second side panels;
- (b) bottom closure panel means for closing a bottom of a said container;
- (c) first and second oppositely disposed roof panels connected to upper edges of said first and second side panels, respectively;
- (d) first and second opposed substantially triangular end panels connected to upper edges of said front and back body panels,
- (e) first and second foldback panels, said first foldback panel connected to said first roof panel and to one lateral edge of said first triangular end panel, and said second foldback

panel connected to said second roof panel and to the other lateral edge of said first triangular end panel;

- (f) third and fourth foldback panels, said third foldback panel connected to said first roof panel and to one lateral edge of said second triangular end panel, and said fourth foldback panel connected to the other lateral edge of said second triangular end panel and adapted to be connected to said second roof panel;
- (g) first and second gable rib panels connected to upper edges of said first and second foldback panels and having upper edges and lateral edges, and connected to each other at a common line;
- (h) third and fourth gable rib panels connected to upper edges of said third and fourth foldback panels, respectively, and to each other;
- (i) first and second roof rib panels connected to upper edges of said first and second roof panels, respectively, each said roof rib panel connected at one side thereof to one of said first and second gable rib panels;
- (j) first and second upper rib panels connected to upper edges of said first and second roof rib panels, respectively;
- (k) first roof wing panel comprising a triangular portion of said first roof panel adjoining said first foldback panel and said first roof rib panel and connected thereto;
- (l) second roof wing panel comprising a triangular portion of said second roof panel adjoining said second foldback panel and said second roof rib panel and connected thereto; and
- (m) at least one stiffening fillet overlying a portion of, and bonded to the inner surface of at least one of said (x) first gable rib panel, (xx) second gable rib panel, (xxx) first roof rib panel, and (xxxx) second roof rib panel, for simultaneously stiffening said overlain panel to transfer applied opening forces therealong and for limiting the force required to open said container from the sealed condition, said fillet comprising a strip of material resistant to the temperature and pressure of said container sealing process and a layer of adhesive attached to one side of said strip and to said inner surface of said at least one said panel for bonding said strip thereto.

4,712,728

CARTON WITH IMPROVED HANDLE

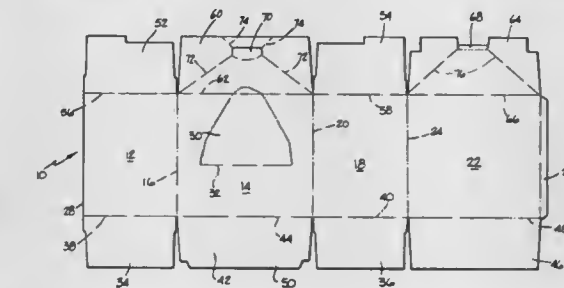
Richard L. Schubert, Monroe, La., assignor to Manville Corporation, Denver, Colo.

Filed Apr. 2, 1987, Ser. No. 33,280

Int. Cl.⁴ B65D 5/46

U.S. Cl. 229—52 B

20 Claims



1. In a paperboard carton, an upper panel structure comprising: an inner top panel; an outer top panel overlapping a portion of the inner top panel; the inner top panel containing a flap having an outer surface and an interior surface, and also having a free edge and an opposite edge foldably connected to the inner top panel in the overlapped portion thereof to form a foldable connection; the outer top panel containing a flap covering a handle

opening, the outer top panel flap having a free edge and an opposite edge foldably connected to the outer top panel to form a foldable connection, the foldable connections of the inner and outer top panel flaps being farther apart than the free edges of the flaps;

the free edge of the outer top panel flap overlying the outer surface of the inner top panel flap so that when fingers of a user press down on the outer top panel flap, the free edge of the outer top panel flap pivots downwardly about the foldable connection of the outer top panel flap and the inner top panel flap pivots downwardly about the foldable connection of the inner top panel flap, the inner top panel flap adapted to be folded under by the fingers and the outer top panel flap adapted to be pivoted downwardly by the backs of the fingers; and

means causing the outer top panel flap to pivot upwardly upon removal of the fingers of a user.

4,712,729

TAMPER EVIDENT ENVELOPE

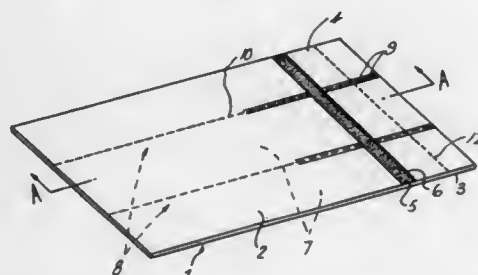
John P. Craig, Redmond, Wash., assignor to Trigon Packaging Systems Limited, Hamilton, New Zealand

Filed Jul. 1, 1986, Ser. No. 880,882

Int. Cl.⁴ B65D 27/08, 27/16

U.S. Cl. 229—72

10 Claims



1. An envelope comprising:

- a body formed from a front and a rear panel having an opening at at least one edge of said panels;
 - a closure flap formed as an extension of said rear panel and extending beyond said opening;
 - a crosswise pressure adhesive closure strip applied across the full width of the body adjacent said opening so that when said flap is folded to overlap said front panel and close said opening said closure strip retains said flap in the closed position;
 - separator means extending lengthwise between said panels to form at least two separate compartments in the envelope;
 - lengthwise extending pressure sensitive adhesive tracks on said closure flap and on at least the portion of said front panel which said closure flap overlaps on at least one of said separator means; and
 - tear lines extending between said adhesive tracks for a distance at least of the depth of the flap;
- the arrangement and construction being such that on closing of said flap and application of pressure to said adhesive strip and tracks the envelope is divisible into separable sections each having a compartment therein and access to said compartments can be gained without disturbing the adjacent closed section.

4,712,730

ICE-CREAM CARTON, CARTON BLANK, AND METHOD OF ERECTING SAME

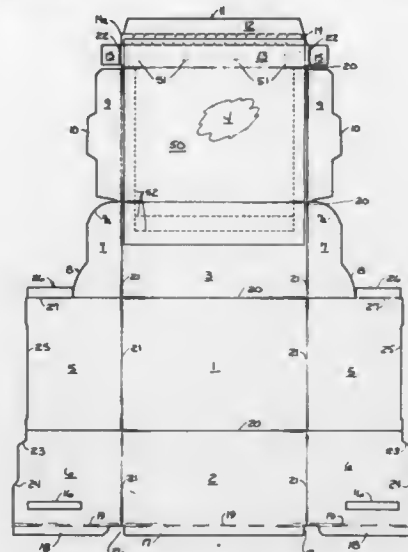
Thomas W. Froom, 10 Burncoat Way, Pittsford, N.Y. 14534

Filed May 23, 1986, Ser. No. 866,890

Int. Cl.⁴ B65D 5/28

U.S. Cl. 229—169

26 Claims



1. In an integral carton blank, adapted to be erected into a carton, said carton blank having a bottom panel, a front panel hingedly connected to said bottom panel, a rear panel hingedly connected to said bottom panel, a cover panel hingedly connected to said rear panel, and a cover panel front flap comprising tear-away means connected to said cover panel and adapted to overlap said front panel and to be releasably secured thereto in the erected carton, said bottom panel having end flaps hingedly connected thereto, said rear panel having end flaps hingedly connected thereto, said front panel having end flaps hingedly connected thereto, said cover panel having end flaps hingedly connected thereto, and said cover panel front flap having end posts hingedly connected thereto, said bottom panel, front panel, and rear panel end flaps being adapted to be folded in to form end walls in the erected carton, and said cover panel front flap end posts being adapted to overlie said cover panel end flaps and to be secured thereto in the erected carton to form a skirted cover, the improvement which comprises:

- said bottom panel end flaps are adapted to be infolded so as to constitute the inner end walls of the erected carton, said front panel end flaps are adapted to overlie said said bottom panel end flaps in the erected carton, and said rear panel end flaps are adapted to overlie said bottom panel end flaps and to overlap said front panel end flaps in the erected carton,
- said bottom panel end flaps are full end flaps having an area adapted essentially to close an open end of a carton erected from said blank,
- said bottom panel end flaps have a recess along a major portion of an outer marginal edge thereof adapted to underlie the cover panel in the erected carton and of a depth corresponding generally to the thickness of the material of construction of said carton blank,
- said front panel end flaps are adapted to overlie a major area of the bottom panel end flaps in the erected carton and have, along an edge thereof adapted to be an upper edge thereof in the erected carton, a lip extending along a major portion of the reach thereof and adapted to coincide with said recess in said outer marginal edge of said bottom panel full end flaps in a closed carton erected from said blank, and
- said rear panel end flaps being adapted to overlie a minor

area of said bottom panel full end flaps and to overlap said front panel end flaps and to be secured thereto by single lines of adhesive extending from the bottom of the rearwardmost edges of said front panel end flaps along the edges thereof and ending below the cover panel end flap lower edges as they will be located in the erected carton.

4,712,731

MAIL BOX STRUCTURE

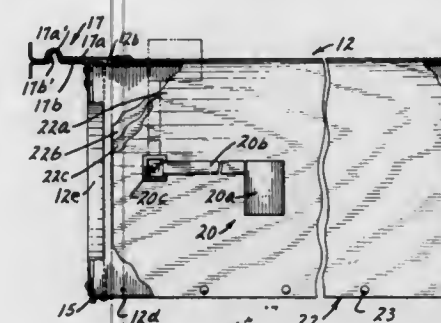
George W. Gramelspacher, 3955 Frankfurt St., Jasper, Ind. 47546

Filed Jul. 22, 1986, Ser. No. 888,120

Int. Cl.⁴ B65D 91/00

U.S. Cl. 232—17

5 Claims



1. A mail box structure comprising a housing defined by an arcuate upper portion blending into side walls, a bottom wall, a back wall, an entry door, a latching mechanism cooperable between said housing and said entry door, a unitary sheet of thin flexible plywood presenting dimensionally stable and strong physical properties overlying said housing in a conforming and engaging relationship, and means securing said unitary sheet of thin flexible plywood to said housing.

4,712,732

REVERSIBLE MAILBOX SIGNALING DEVICE

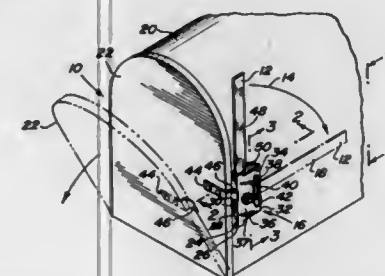
Aldo Esopi, 929 Belford Rd., Allentown, Pa. 18103

Filed Jan. 23, 1987, Ser. No. 6,220

Int. Cl.⁴ A47G 29/12

U.S. Cl. 232—35

6 Claims



- (a) a housing generally symmetrical along its horizontal axis, attachable to either side of a mailbox proximate the mailbox door, said housing including a front face, a proximal end serving as a first stop and including a centered elongated aperture to receive a flagstaff flange, and an open distal end, an open top edge and an open bottom edge;
- (b) a longitudinally symmetrical, generally planar flagstaff, said flagstaff having a first and second end and two sides and two parallel edges, said flagstaff mounted at its first end within said housing for pivotal movement about its horizontal axis, said flagstaff first end also including an

opposing pair of flanges, said opposing flanges being planar extensions of said flagstaff edges and perpendicular to the longitudinal axis of said flagstaff, and a third flange projecting in the same longitudinal axis as said flagstaff at said flagstaff's first end, each said flange sized to fit through said housing's proximal edge's aperture;

- (c) a generally longitudinally symmetrical flag attached to said flagstaff's other end; and
 - (d) reversible means attachable to a mailbox door, said means including a detent to retain, depending on which side of said mailbox said housing is mounted, one of said corresponding opposing flanges of said flagstaff when said flag extends from said open top edge,
- whereby, when said means to retain one of said opposing flanges in place is removed by opening said mailbox door, said flag falls approximately 180 degrees by gravity, through said housing's top edge, distal end and bottom edge, until engaging said housing's proximal end as a said first stop.

4,712,733

INTERNALLY MOUNTED DUTY CYCLING CONTROL

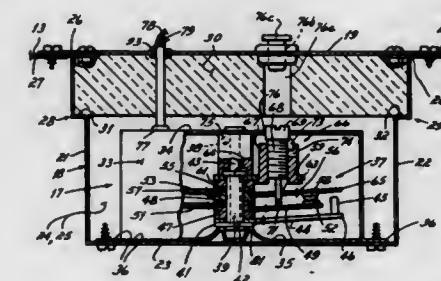
Raymond K. Davis, 40 Edgewood Dr., Lawrenceburg, Ind. 47025

Filed Mar. 24, 1986, Ser. No. 842,829

Int. Cl.⁴ F23N 5/20

U.S. Cl. 236—10

13 Claims



1. A heating system comprising means to heat air, a duct adapted to transfer air from said means to heat air in an air flow direction;

- a duty cycling control adapted to deactivate said means to heat air,
- said duty cycling control comprising: an adjustable temperature sensitive switch including a temperature sensitive element operable to open and close said switch;
- a case completely enclosing said temperature sensitive switch said case including a metal base;
- heat conductive means to transfer heat from said metal base to said temperature sensitive element;
- means mounting said entire duty cycling control within said duct;
- means to adjust said duty cycling switch when mounted within said duct;
- wherein said means mounting said duty cycling control within said duct comprises a bracket fixed to said duct;
- wherein said bracket includes a metal base panel wherein said metal base of said case is fixed to said panel; and
- wherein said duct defines an opening adapted to receive said bracket and said bracket includes a top wall adapted to completely cover said opening and at least one said wall extending from said top wall to said metal base panel.

4,712,734

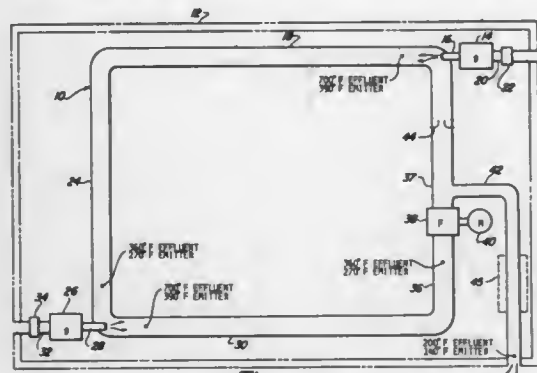
LOW-INTENSITY INFRARED HEATING SYSTEM WITH EFFLUENT RECIRCULATION

Arthur C. W. Johnson, 2611 Lake Charnwood, Troy, Mich. 48084

Filed May 8, 1986, Ser. No. 860,859

Int. Cl.⁴ F24H 3/00; F24C 3/00

U.S. Cl. 237-70



1. A low-intensity infrared heating system comprising: emitter means defining a continuous loop to circulate effluent introduced therein;
- a burner having a combustion chamber with a combustion air input, both said chamber and said input being external to the loop of said emitter means for producing a hot gaseous effluent;
- means connecting said burner to said emitter means to introduce said effluent into said emitter means;
- an exhaust means connected to said emitter means to exhaust a portion of the circulating effluent;
- the mass flow capacity of said emitter tube being substantially greater than the flow capacity of said exhaust means whereby at least a substantial portion of the effluent passes said exhaust means and recirculates through said loop.

4,712,735

PRESTRESSED CONCRETE CROSS TIE HAVING INCREASED FATIGUE LIFE

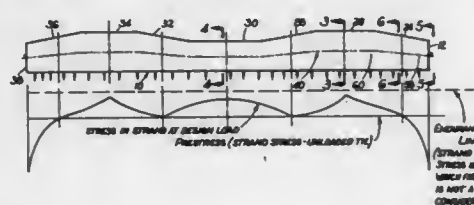
Steven L. Jantzen, 404 E. Pearl Apt. #6, Jerseyville, Ill. 62052, assignor to Steve L. Jantzen, Jerseyville, Ill.

Continuation of Ser. No. 521,274, Aug. 8, 1983, abandoned. This application Feb. 6, 1986, Ser. No. 767,857

Int. Cl.⁴ E04C 3/10

U.S. Cl. 238-94

5 Claims



1. A prestressed concrete tie assembly comprising: a concrete tie body wherein the cross section of the body varies transversely across the tie and includes a pair of track support portions of large cross sections, end portions of reduced cross sections, and a center portion of reduced cross section;
- a plurality of prestressed metallic rods spaced across the transverse extent of the concrete body and extending throughout the longitudinal extent of the body;
- said concrete body having a neutral axis which varies according to the cross section of the body portion;
- said rods being located at a single level within the concrete body, and at the same time being located sufficiently near the varying neutral axis of the concrete body whereby stress fluctuations in the rods do not exceed the endurance

limit of the rod material, and wherein in the track support portions of the body, the strands are located below the neutral axis of the section, and wherein at the center and end portions of the body the strands are located above the neutral axis of the section.

4,712,736

METHOD AND SYSTEM FOR MAINTAINING A SPRAY PATTERN

David J. Bray, Bromsgrove, and Francis R. Piper, Evesham, both of United Kingdom, assignors to Gaydon Technology Limited, Uxbridge, United Kingdom

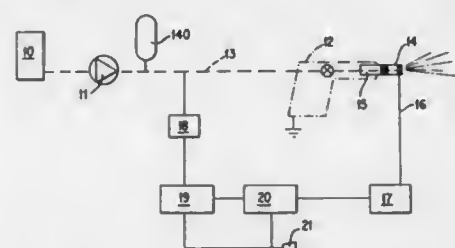
Continuation of Ser. No. 820,897, Jan. 17, 1986, abandoned, which is a continuation of Ser. No. 684,853, Dec. 21, 1984, abandoned, which is a continuation of Ser. No. 360,643, Mar. 22, 1982, abandoned. This application Jul. 18, 1986, Ser. No. 885,819

Claims priority, application United Kingdom, Mar. 27, 1981, 8109652

Int. Cl.⁴ B05B 17/04

U.S. Cl. 239-11

14 Claims



1. A method of maintaining an optimum spray pattern during spraying of a pressurized medium from a spray unit, the spray unit having an adjustable nozzle formed of electrically conducting material but which is electrically isolated from the remainder of the spray unit, so that during spraying a voltage is generated on the nozzle by the atomization of the pressurized medium flowing therethrough, the method comprising the steps of:

- (1) monitoring the voltage generated on the nozzle as a medium is sprayed from the nozzle in a spray pattern;
- (2) comparing the monitored voltage with at least one reference voltage indicative of the optimum spray pattern;
- (3) sensing any deviation of the monitored voltage beyond predetermined limits;
- (4) taking corrective action, in response to any sensed deviation of the monitored voltage beyond predetermined limits, such corrective action selected from the steps of (1) adjusting the nozzle size (2) adjusting the pressure of the pressurized medium, (3) clearing the nozzle, so as to restore the monitored voltage back within the predetermined limits, thereby insuring that an optimized spray pattern is maintained.

4,712,737

AIR FRESHENER CONTAINER HAVING RESEALABLE OPENINGS

Robert J. Hecking, Passaic, N.J., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 9, 1985, Ser. No. 764,017

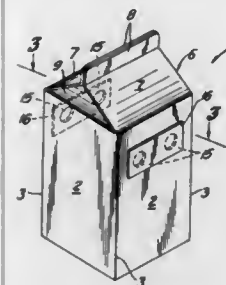
Int. Cl.⁴ A61L 9/04

U.S. Cl. 239-58

7 Claims

1. An air freshener package comprising a unitary folded container formed of a single ply of foil laminated lined paperboard having two opposed pairs of upstanding side walls, a bottom wall and a gable top comprising a pair of inclined top walls and a pair of top flaps articulated to the respective top walls and adhered in face-to-face relationship to securely seal the container top; and an air freshener contained therein, a plurality of openings formed in said single ply of foil laminated lined paperboard in said gable top of said container, said open-

ings being covered by a release tape which can be removed permitting exposure of less than all of the openings depending



on the amount of air freshener desired to be exposed to the atmosphere.

4,712,738

SPRAYING EQUIPMENT

David C. Gill, Bristol, United Kingdom, assignor to Nomix Manufacturing Co. Limited, Bristol, Great Britain

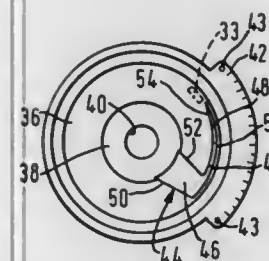
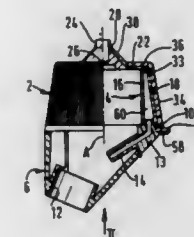
Filed Mar. 6, 1986, Ser. No. 836,835

Claims priority, application European Pat. Off., Mar. 18, 1985, 85301865.3; United Kingdom, Sep. 25, 1985, 8523647

Int. Cl.⁴ B05B 3/02

U.S. Cl. 239-74

10 Claims



1. A spraying head body for supporting a rotary distribution element, the body comprising:

- a first fixed body component having a central aperture in one face thereof and for receiving a drive shaft to extend through said aperture for driving a distribution element, a second aperture in said face radially distant from said central aperture, a supply duct adapted to supply fluid to said second aperture, a conical projection having an aperture and a tubular element extending from said projection, said second apertures on said projection and tubular element being coaxially aligned with said central aperture, a plurality of splines extending radially from said tubular element and spaced therearound; and
- a second rotatable body component having an inner face formed to mate with said one face on said fixed body component, said rotatable component having a conical recess in said face sized to receive said conical projection and having a central aperture to be coaxially aligned with said central aperture of said first component and sized to receive said splines, passage means in said inner face for

directing and controlling the flow of fluid from said second aperture to said conical recess by rotation of said second component so that fluid may flow to a rotary distribution element.

4,712,739

SPRAY GUN NOZZLE ASSEMBLY RETAINER CLIP AND SPRAY GUN NOZZLE ASSEMBLY

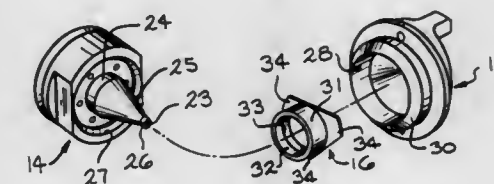
Raymond J. Bihn, Oregon, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Oct. 3, 1986, Ser. No. 915,307

Int. Cl.⁴ B05B 15/06

U.S. Cl. 239-290

10 Claims



1. A spray gun assembly including a spray gun barrel defining at least one fluid passage and having an end, a cap positioned over said barrel end, said cap having an interior surface spaced from an exterior surface on said barrel end to form a chamber, removable means engaging said barrel for retaining said cap on said barrel end, and a clip frictionally holding said cap on said barrel end, said clip comprising a tubular body, means for attaching said clip body to said barrel end, said spray gun having at least one fluid passage extending through said barrel, said clip and said cap, and holding means projecting from said body for frictionally engaging said interior cap surface while permitting easy removal of said cap from said barrel when said retaining means is removed from said barrel.

4,712,740

VENTURI SPRAY NOZZLE FOR A CLEANING DEVICE

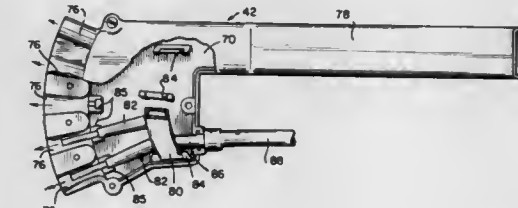
L. Scot Duncan, Independence; Hugh F. Groth, Richfield, and John M. Collins, Sagamore Hills, all of Ohio, assignors to The Regina Co., Inc., Rahway, N.J.

Continuation of Ser. No. 585,872, Mar. 2, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 841,054

Int. Cl.⁴ B05B 7/30

U.S. Cl. 239-340

10 Claims



1. A cleaning device comprising: a source of cleaning fluid; a source of pressurized air; spray means connected to said fluid and air sources for educing fluid from said fluid source using said pressurized air and forcibly spraying said fluid onto a surface to be cleaned; said spray means including an air manifold provided by and internally of a housing which is open at one end and which is connected to said air source to pressurize said housing, said housing having separate, interconnected top and bottom walls and having a plurality of nozzle channels extending from said air manifold and formed by constrictions in at least one of said walls of said housing, said constrictions extending inwardly into said manifold from said open one end of said housing; and a fluid manifold connected to said fluid

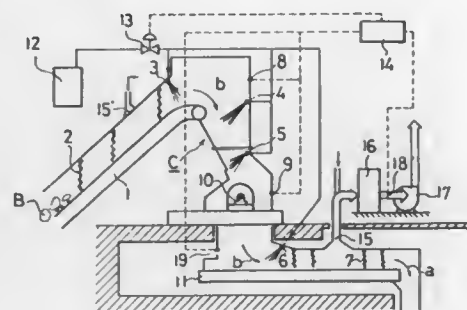
source and having a plurality of fingers extending therefrom, each finger being positioned in a respective nozzle channel so that pressurized air flowing through said channels educes fluid from said fingers.

4,712,741

EXPLOSION PREVENTIVE ROTATION CRUSHER
Kunihiko Uno, Hirakata; Yoshinori Tamade, Kobe; Selya Horino, Miki, and Tamotsu Kadera, Otsu, all of Japan, assignors to Kabushiki Kaisha Takuma, Japan
Continuation of Ser. No. 589,447, Mar. 14, 1984, abandoned.
This application Aug. 28, 1985, Ser. No. 770,363
Int. Cl.⁴ B02C 25/00

U.S. Cl. 241—16

6 Claims



1. In a crushing process at a temperature, absent the injection of steam, below 100° C., for crushing materials including combustible substances in which steam is injected to limit the amount of oxygen in said crushing process to thereby eliminate the possibility of explosions, the additional improvement steps comprising:

- determining the amount of steam necessary to prevent an explosion in accordance with the graphs illustrated in FIGS. 1 through 3;
- deriving from the determination made in step (a) a corresponding minimum amount of oxygen below which none of the combustible substances could tend, together with any oxygen in said crushing process, to cause an explosion;
- measuring the temperature of said crushing process at a plurality of locations to establish by the measured temperature the amount of steam present in said crushing process and thereby also establishing the amount of oxygen present in said crushing process;
- injecting, in response to the temperature as measured, no more steam than is required to keep the temperature of the crushing process at a level that assures that the oxygen content, illustrated as a function of temperature in FIG. 4, does not exceed the value necessary to sustain an explosion.

4,712,742

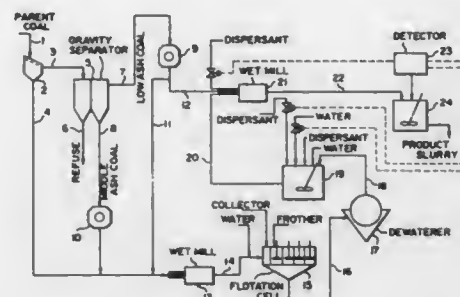
PREPARATION OF DEASHED HIGH SOLID CONCENTRATION COAL-WATER SLURRY
Takayuki Ogawa, Yokohama; Hideaki Ito, Chigasaki; Naokazu Kimura, Tokyo; Hayami Ito, Himeji; Shuhei Tatsumi; Shoichi Takao, both of Akashi; Nitao Suzuki; Takashi Watanabe, both of Funabashi; Kunizo Shinano, Matsudo; Takashi Kuwabara, Kawasaki, and Kaoru Aoki, Hiratsuka, all of Japan, assignors to Electric Power Development Co., Ltd., Tokyo; Kawasaki Jukogyo Kabushiki Kaisha, Kobe-shi and Sumitomo Heavy Industries, Ltd., Tokyo, all of Japan
Filed Nov. 15, 1985, Ser. No. 798,524
Claims priority, application Japan, Nov. 20, 1984, 59-246485
Int. Cl.⁴ B02C 19/12

U.S. Cl. 241—20

6 Claims

1. A process for preparing a deashed high solid concentration coal-water slurry comprising the steps of:

- subjecting a parent coal to screening to classify it into a coarse-grained coal and a fine-grained coal;
- subjecting said coarse-grained coal to gravity classification to classify it into a low ash coal, a middle ash coal and a high ash coal, said middle ash coal having a specific gravity higher than that of said low ash coal and lower than that of said high ash coal;
- mixing said fine-grained coal with said coarse middle ash coal and further mixing a first fraction of the coarse low ash coal therein, and wet grinding this mixture to prepare a slurry suitable for flotation, said first fraction being about 15% by weight, based on the weight of said parent coal;



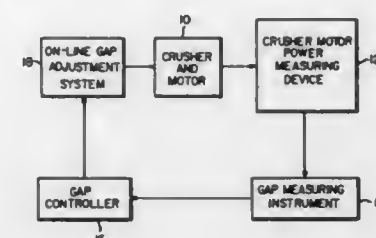
- subjecting said slurry to flotation to thereby obtain a froth having a reduced ash content;
- dewatering said froth and thereafter adding water thereto to thereby prepare another slurry containing 40-60 wt. % of coal solids;
- mixing the balance of the coarse low ash coal obtained in the step (b) with said another slurry according to the solid concentration of said another slurry so that the solid concentration of the final product coal-water slurry may take a target value; and
- wet grinding the mixture from the step (f) to obtain the final product coal-water slurry.

4,712,743

CRUSHER GAP SETTING
Lee Nordin, 2403 Highpoint, Kotze Street, Hillbrow, Johannesburg, Transvaal, South Africa
Filed May 20, 1985, Ser. No. 735,951
Claims priority, application South Africa, May 22, 1984, 84/3853
Int. Cl.⁴ B07C 19/00

U.S. Cl. 241—30

6 Claims



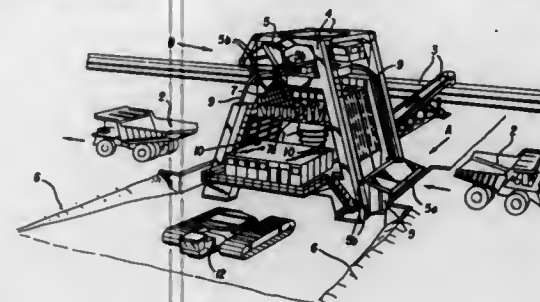
1. A method of maintaining a predetermined size of crushing gap in an ore crusher of the type comprising crusher means defining an adjustable crushing gap, and a driving motor for driving said crusher means, said method comprising the steps of:
- establishing a predetermined gap size,
 - measuring noise in the power drawn by said motor during a crushing operation, which measured noise is indicative of the size of said crushing gap,
 - setting said crushing gap at said predetermined gap size in accordance with said measured noise, and
 - maintaining the crushing gap at said predetermined gap size.

4,712,744

APPARATUS FOR CHARGING AT LEAST ONE TOP-LOADING CRUSHER
Bernd Kirchhoff, and Hermann Mecklenfeld, both of Ennigerloh, Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Dortmund, Fed. Rep. of Germany
Filed May 28, 1986, Ser. No. 867,647
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3520062
Int. Cl.⁴ B02C 21/02

U.S. Cl. 241—80

8 Claims

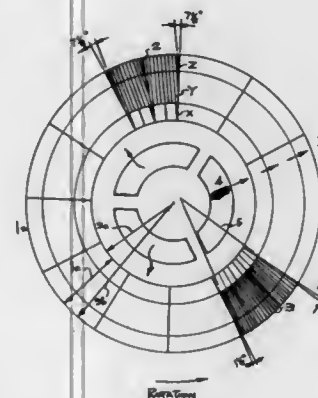


1. A crusher system comprising:
- a top-loading crusher for converting bulk charge material to comminuted material;
 - a transportable supporting framework, said crusher being carried by said framework at a lower portion thereof;
 - a plurality of buckets arranged along sides of said framework;
 - means for elevating said buckets from a loading position near a bottom of said framework to a discharge position at a top of said framework, said elevating means orienting said buckets at said loading position to direct openings of said buckets for receiving charge material from external transport vehicles, said elevating means reorienting said buckets at said discharge position to direct said bucket openings for discharging said charge material; and
 - a hopper disposed between said crusher and said discharge position for directing charge material from said buckets to said crusher, said hopper receiving charge material intermittently from said buckets and continuously feeding said charge material to said crusher.

4,712,745

ROTATING DISC WOOD CHIP REFINER
William C. Leith, Box 157, Trail, British Columbia, Canada V1R 4L4
Filed Aug. 19, 1985, Ser. No. 767,121
Claims priority, application Canada, Jun. 6, 1985, 483274
Int. Cl.⁴ B02C 7/08, 7/12
U.S. Cl. 241—261.3

9 Claims



1. A refiner plate for a rotating disc wood chip refiner apparatus,

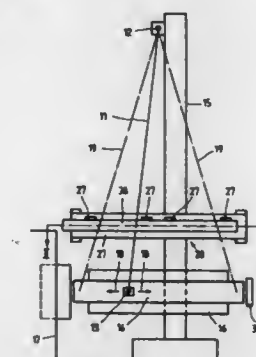
said apparatus including a frame; two parallel circular discs having facing surfaces and mounted concentrically on said frame; means for rotating at least one of said discs, having a direction of rotation, for relative counter-movement of said discs to each other; each disc having a rim portion; each said disc having a multiplicity of refiner plates forming adjacent segments of and mounted on said rim portion of said facing surfaces; each refiner plate having an inner radius and an outer radius, a grid of radial bars and slots defined between said bars; each said radial bar having a leading edge in the direction of said relative counter-movement. a substantially horizontal top surface and two substantially vertical side surfaces; each said slot having a substantially horizontal bottom surface between vertical side surfaces of adjacent bars; a multiplicity of dams located and spaced in each said slot but staggered in parallel slots; and said grid of bars and slots with dams providing multiple bar-crossings caused by said relative counter-movement of said discs to each other, characterized in that said dams are spaced in radial (outwards) outwardly decreasing increments, said increments forming a continuous series of resonant cavities; and said radial bars and slots therebetween are radially and uniformly skewed backwards at a radial angle of about 1.5 degrees to disc rotation in the direction of said relative counter-movement, the backwardly skewed bars and slots on the one disc being skewed in a direction opposite to the backwardly skewed bars and slots on the other disc.

4,712,746

METHOD AND APPARATUS FOR FORMING CROSS-WOUND PACKAGES
Felix Graf, Winterthur; Ruedi Schneeberger, Seuzach, and Georg Symon, Winterthur, all of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland
Filed Aug. 25, 1986, Ser. No. 900,095
Claims priority, application Switzerland, Aug. 30, 1985, 03759/85
Int. Cl.⁴ B65H 54/28

U.S. Cl. 242—43 R

12 Claims



1. A method for winding a thread arriving from a stationary thread guide to form a cross-wound package, comprising the steps of:
- guiding the thread arriving from the stationary thread guide by means of a main traverse mechanism with a movable traverse means through a complete path of traverse movement;
 - laying the thread onto the cross-wound package;
 - running the thread to be wound up through a gap formed by elongate guide members in a preliminary traverse mechanism located between the stationary thread guide and said main traverse mechanism;
 - said elongate guide members extending substantially mutually parallel along substantially said complete path of traverse movement and substantially transverse to the thread;
 - generating air streams substantially in synchronization with the movement of said movable traverse means of said main

traverse mechanism such that said air streams are time-controlled and flow between said elongate guide members in the longitudinal direction thereof; and said step of generating said air streams entailing generating said air streams such that said air streams alternately flow in opposite directions between said elongate guide members and thus entrain the thread along substantially said complete path of traverse movement of the thread.

4,712,747

HOMING DEVICE FOR GUIDED MISSILES USING SIDE NOZZLES

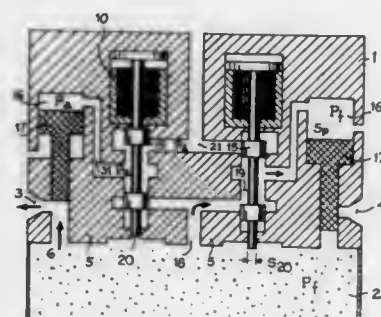
Pierre Metz, Palaiseau, and Marc Antonicelli, Meung 1 Loire, both of France, assignors to Thomson Brandt Armements, Bologne Billancourt, France

Filed Oct. 8, 1986, Ser. No. 917,102

Claims priority, application France, Oct. 8, 1985, 85 14882
Int. Cl.⁴ F42B 15/033

U.S. Cl. 244—3.22

11 Claims



1. Homing device using a propulsion unit with side nozzles for guided missiles, comprising:
a number N of side nozzles;
a gas generator designed to feed the said nozzles;
means to control the blocking and opening of the nozzles so as to affect the trajectory of the missile, comprising, for each nozzle, an electromagnetic device, controlled independently of the electromagnetic devices of the other nozzles so as to block or open the nozzles independently of one another.

4,712,748
MISSILE

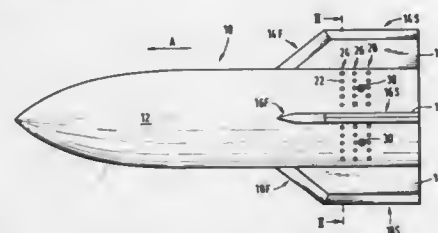
Berthold Schäfer, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany
Filed Dec. 10, 1986, Ser. No. 940,520

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1985, 3546269

Int. Cl.⁴ F42B 15/033

U.S. Cl. 244—3.22

18 Claims



1. Missile, in particular a supersonic missile, which comprises a body provided with, at its rear end, in the direction of flight, a plurality of tail fins, and at least one outflow aperture, for discharging fuel capable of being ignited to change the flight direction of said missile, said outflow aperture being located between adjacent tail fins of the body in an area where,

due to shock waves originating from the front edges of the tail fins, recirculations are formed.

4,712,749

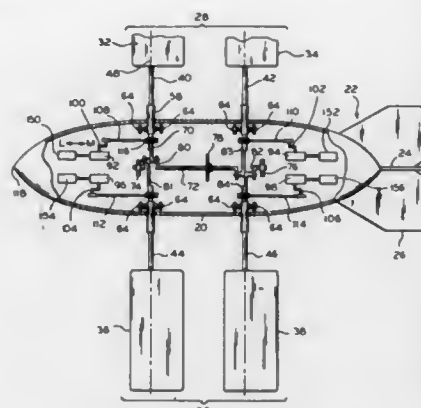
MEANS FOR AND METHODS OF CONTROLLING ORNITHOPTERS

Duke Fox, 5305 Towson Ave., Ft. Smith, Ark. 72901
Filed Oct. 11, 1985, Ser. No. 786,624

Int. Cl.⁴ B64C 33/02

U.S. Cl. 244—22

18 Claims



1. An ornithopter aircraft having a fuselage and four rigid tandem mounted wings disposed in forward and rear pairs on opposite sides of the fuselage, whereby said wings have a dragonfly configuration, means for beating said four wings in synchronism with a front wing on one side moving in synchronism with a rear wing on the opposite side, the front and back wings on each one side moving in opposition, the two front wings in opposition, and the two back wings moving in opposition, whereby a first of the forward wings in one tandem pair on one side of the fuselage beats upwardly simultaneously with a rear wing in the opposing tandem pair on the opposite side of the fuselage, while the remaining two wings are beating downwardly, and means for cyclically varying the pitch of the wings throughout each beat to produce lift on the downstroke and minimum air resistance on the upstroke, the angular pitch of the wings during each of their downstrokes being set to equal the angular pitch corresponding to the angular pitch of a glider wing at the sink rate for the same flying speed.

4,712,750

TEMPERATURE CONTROL DEVICE FOR JET ENGINE NACELLE ASSOCIATED STRUCTURE

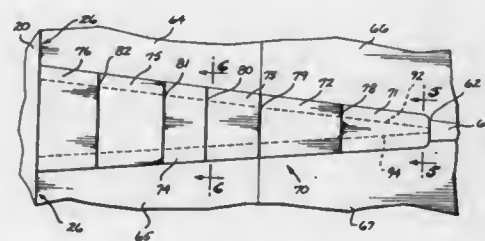
Robert H. Ridgwell, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 2, 1986, Ser. No. 859,015

Int. Cl.⁴ B64D 33/04

U.S. Cl. 244—117 A

7 Claims



1. A temperature control device for use in a jet aircraft engine installation, the engine installation comprising a jet engine having a primary exhaust nozzle from which the jet

engine produces a rearwardly extending primary exhaust plume of hot gases, the primary exhaust plume having a centerline and a generally cylindrical shape about said centerline, the engine installation further comprising a nacelle for supporting and enclosing the jet engine, and a nacelle-associated structure that includes the temperature control device and that extends in a generally fore and aft direction above the centerline of the primary exhaust plume from a forward aerodynamically shaped leading edge to an aft trailing edge, the temperature control device comprising:

a deflector formed at the lowermost surface of the nacelle-associated structure, the deflector having a sheet-like lower surface having a lateral extent greater than the lateral extent of the nacelle-associated structure immediately above the deflector and aligned generally in parallel conformance therewith, the deflector extending longitudinally aft from the primary exhaust nozzle substantially to the trailing edge of the nacelle-associated structure and being positioned such that said lower surface is generally parallel to the primary exhaust plume.

4,712,751

TAIL END STRUCTURE FOR AN AIRCRAFT FUSELAGE

Ernst H. Hirschel, Zorneding, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

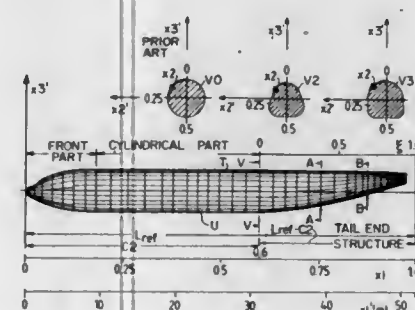
Filed Jul. 16, 1986, Ser. No. 886,792

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526472

Int. Cl.⁴ B64C 1/00

U.S. Cl. 244—119

18 Claims



1. A tail end structure for an aircraft fuselage having a longitudinal central axis extending centrally through said fuselage, comprising a circular sectional reference plane as defined by a circular fuselage and extending through an interface between said circular fuselage and said tail end structure perpendicularly to said longitudinal central axis, said circular reference plane having a first centroid, said tail end structure further comprising a tail cross-section with an upper cross-sectional portion within said circular sectional plane above said first centroid and a lower cross-sectional portion below said first centroid, said lower cross-sectional portion having two first lobes extending laterally and downwardly outside said circular sectional reference plane, said lower cross-sectional portion having a second centroid in said tail cross-section located under said first centroid so that a vertical line passes through both centroids, said tail cross-section having upper, lower and lateral contour or silhouette boundary lines appearing within a silhouette formed by said circular sectional reference plane, so that the projection or silhouette of the tail end structure as viewed from the side and from above or below remains the same as that of a tail end structure having a cross-section corresponding to that of said circular sectional reference plane, whereby said cross-sectional portions of said tail end structure blend smoothly into said circular fuselage.

4,712,752

WING TRAILING EDGE AIR DAM

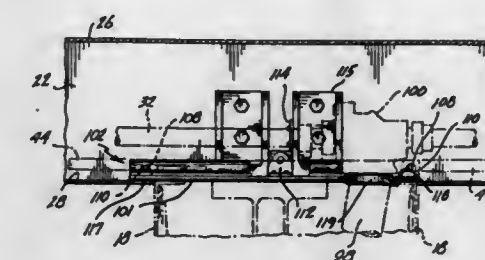
Paul F. Victor, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 474,654, Dec. 6, 1982, Pat. No. 4,618,109.
This application Sep. 19, 1985, Ser. No. 777,827

Int. Cl.⁴ B64C 3/26

U.S. Cl. 244—129.1

10 Claims



4. In an aircraft wing having a fixed wing structure, a rear flap extending rearwardly from the fixed wing structure to define a spanwise wing rear cavity, a flap track fairing depending downwardly from the fixed wing structure including from the spanwise rear cavity portion thereof, with the flap track fairing being open at intersection with the wing rear cavity, actuating means disposed in the flap fairing for actuating the rear flap, air dam means comprising:

a removable air dam which is structurally independent from the wing and positionable over the opening at intersection of the wing rear cavity and the flap track fairing to prevent passage of air therebetween;
mounting means for detachably securing said air dam to the wing; and,
wherein said air dam includes marginal portions extending around the periphery of the air dam for overlapping the margins of the opening between the rear wing cavity and the flap track fairing.

4,712,753

SATELLITE RETRIEVAL APPARATUS

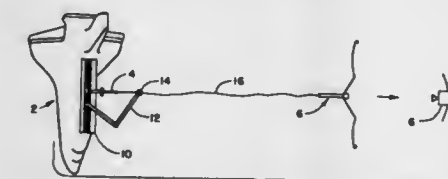
Thomas R. Howard, PSC #2, Box 15195, APO San Francisco, Calif. 96367

Filed Feb. 11, 1987, Ser. No. 13,820

Int. Cl.⁴ B64G 1/64

U.S. Cl. 244—161

6 Claims



1. Apparatus for capturing and retrieving objects from space comprising:

launching means and grappling means;
said launching means comprising a launch tube, a catch collar having a braking surface and being slideably positioned over said launch tube, reel means attached to said launch tube for storing a retrieval line threaded through said launch tube and attached to said grappling means, rotational drive means for rotating said grappling means when disposed on said launch tube, and pressurizing means for pressurizing said launch tube to propel said grappling means from said launching means;
said grappling means comprising a hollow shaft having a first and a second end and being slideably positionable over said launch tube, shaft rotation means affixed to said shaft adapted for engagement with said rotational drive

means, braking ring means formed on said shaft rotation means and aligned for engagement with said braking surface of said catch collar, a plurality of foldable deployment arms pivotally attached to said second end of said shaft, each of said plurality of arms having a catching line affixed to the free end thereof, each said catching line having bonding material at the extremity thereof distant from said arm, and a bumper pad adjacent said second end of said shaft.

4,712,754

ROCK CLIMBING ANCHOR

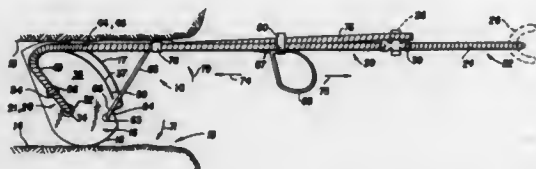
Malcolm J. Brodie, 7975 French Street, Vancouver, British Columbia, Canada V6P 4V8

Filed Jul. 7, 1986, Ser. No. 882,422

Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—1

20 Claims



1. An anchoring device for releasably anchoring within a crack in a rock face, the crack having a pair of oppositely facing crack walls, the device including:

- (a) a cam member having first and second convexly curved cam surfaces adapted to contact respective walls of the crack, the cam member having shoulder means and cable securing means,
- (b) a load cable having an inner end portion cooperating with the cable securing means, an outer end portion adapted to cooperate with a separate link, and an intermediate portion disposed between the inner and outer end portions and cooperating with the shoulder means in such a manner as to rotate the cam member in a first direction when the cable is pulled so as to increase force acting on the crack walls, the inner end portion of the cable being located relative to the shoulder means so that the cable is deformed resiliently as the intermediate portion thereof engages at least a portion of the shoulder means, force from deforming the cable tending to rotate the cam means in the first direction so that forces generated by pulling the cable and deforming the cable over the shoulder means act in unison to rotate the cam so as to augment retention of the device within the crack,
- (c) retraction means cooperating with the cam member and the load cable for rotating the cam member in a second direction which is opposite to the first direction, so as to decrease forces on the crack walls thus facilitating removal of the device from the crack.

4,712,755

HOSE SUPPORT

Daniel T. Robbins, and Melvin T. Stewart, both of 6728 Ben Ave., North Hollywood, Calif. 91606

Filed Oct. 20, 1986, Ser. No. 920,458

Int. Cl.⁴ F16L 3/00

U.S. Cl. 248—49

1 Claim

1. In combination with a storage tank outlet and a disposal tank inlet with a flexible hose interconnecting said outlet with said inlet, the improvement which comprises:

- a pair of elongated rails having a flat bottom and opposite flat sidewalls arranged in sliding end-to-end relationship supporting said flexible hose;
- mounting means coupling one end of said pair of rails to said outlet at said hose interconnection;

retainer means slidably connecting said pair of rails together so that said rails are co-extensive;

said mounting means includes a bracket having a sloped central section with outwardly extending flanges at each of its opposite ends;

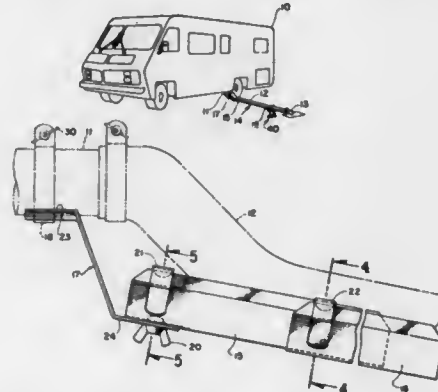
said end flanges angularly disposed with respect to said central section;

a clamp for detachably connecting a selected one of said bracket flanges to said hose coupled outlet;

an adjustable fastener coupling the other of said bracket flanges to the terminating end of said rail;

said retainer means includes hook means carried on the end of one rail slidably coupled to the other rail of said pair;

each of said rails of said pair are identically configured with opposite sloping sidewalls connected by a flat bottom section wherein the distance between the opposing surfaces of said sidewalls at their top edge is greater than the



distance between opposite sidewalls at the bottom section so that said hose is disposed between said sidewalls on said bottom section;

said other bracket flange mating the flat bottom section so that said bracket flange is pivotal about said adjustable fastener;

said retainer means are disposed on said sidewalls wherein each hook comprises an integral cut-out portion of said sidewall folded over upon itself to define a hook for slidably receiving said sidewall of the other sidewall of said pair;

a self-adjusting free-standing stanchion means disposed under said rails to support said rails and hose on the ground;

said stanchion means includes a V-base supporting a bracket on a pair of spaced apart rods, said bracket adapted to slide on said rods when free of weight thereon and being retained on said rods under weight of said rails and hose.

4,712,756

SHOCK CORDED TRIPOD STAND

Engene A. Kester, Los Gatos; Scott P. Reeves, Campbell, and Danny Zemanek, Sunnyvale, all of Calif., assignors to Photo-flex Products, Campbell, Calif.

Filed Apr. 23, 1986, Ser. No. 855,755

Int. Cl.⁴ F16M 11/32

U.S. Cl. 248—165

11 Claims

1. A shock corded tripod stand, for use in providing a means to hold aloft various lightweight objects, comprising:

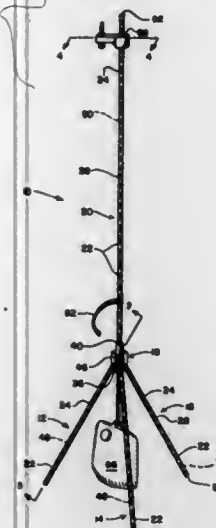
three or more hollow segmented legs acting as support for the device, and to which the objects can be attached when desired;

a hollow segmented vertical member to which the objects are generally attached;

a spider assembly having a plurality of interconnected passages therethrough and including positions for receiving

said legs and vertical member, acting as the interface between the legs and the vertical member;

one or more elasticized shock cords extending within said legs, said vertical member, and said passages to connect



the device together, to provide tension during assembly of the device and to further maintain the device in its assembled position; and

affixing means to hold the objects, said means being attachable to either the legs or to the vertical member.

4,712,757

PORTABLE VOTING BOOTH ADAPTER

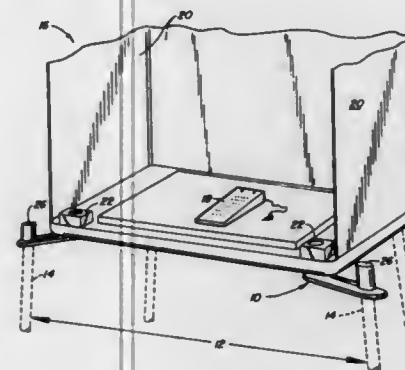
John E. Ahmann, 1400 Duhig Rd., Napa, Calif. 94558

Filed Sep. 15, 1986, Ser. No. 906,941

Int. Cl.⁴ F16M 11/16

U.S. Cl. 248—188

8 Claims



1. For use on a portable voting booth having a planar table with spaced apart front and rear legs and socket means near its front corners adapted to receive the upper ends of the front legs, an adapter device for widening the distance between the front legs to facilitate use of the voting booth by a person in a wheelchair, said adapter device comprising:

- a generally cylindrical male connector member adapted to fit within a socket means of said table;
- a support leg socket member oriented downwardly at a spaced apart distance from, and parallel to, said connector member, its lower end portion being coplanar with the lower end portion of said connector member;
- said connector member and said support leg socket member being connected together by a horizontal flange portion, coplanar with the lower end portions of both said cylindrical member and said support leg socket member, whereby when a front leg is placed in said support leg socket mem-

ber of an adapter device and its said connector member is placed in a said table socket means, the distance between the table front legs of the voting booth is widened.

4,712,758

NESTED HUB KNOCK-DOWN PEDESTAL

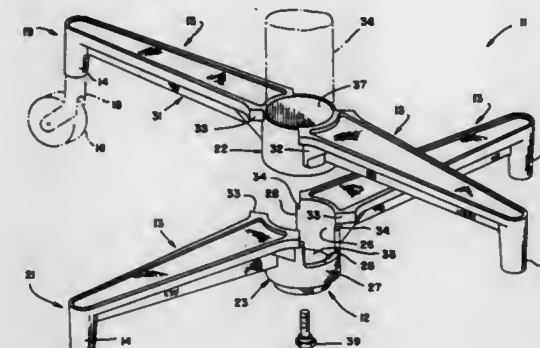
Casper Cuschera, 967 Industrial Parkway West, Hayward, Calif. 94544

Filed Jan. 27, 1986, Ser. No. 822,323

Int. Cl.⁴ A47B 91/00

U.S. Cl. 248—188.7

6 Claims



1. In a support pedestal having a central hub and a plurality of arms extending outwardly from said hub at angular intervals therearound, said hub having means for receiving a vertically extending member which connects with a load that is to be supported by the pedestal and said arms having means for contacting a floor or other underlying surface, wherein the improvement comprises:

said hub being formed at least in part by first and second hub elements each having a pair of said arms extending outwardly from the hub element at opposite locations thereon, the first hub element being of greater diameter than the second hub element and having a first chamber with an opening at the top into which the second hub element is fittable in seated nesting relationship with the first hub element, the first hub element having a chamber wall with a pair of oppositely situated slots therein which extend downward from said opening and which are located between the arms of said first hub element and in which said pair of arms of said second hub element are received when said hub elements are in said nesting relationship, said second hub element having means for receiving said vertically extending member and for bearing the weight thereof, wherein said arms of said second hub element have horizontally extending side portions located to seat against the upper end of said first hub element in the regions thereof which are adjacent the upper ends of said slots when said hub elements are in said nesting relationship.

4,712,759

LOCK STRUCTURE FOR SEAT SLIDE DEVICE

Takayuki Sugama; Hiroshi Tabata, and Tadanori Honda, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1986, Ser. No. 858,400

Claims priority, application Japan, May 11, 1985, 60-100068; May 11, 1985, 60-100069

Int. Cl.⁴ F10M 13/00

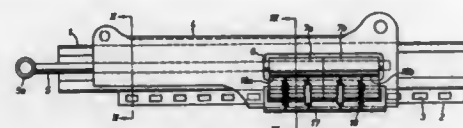
U.S. Cl. 248—429

7 Claims

1. A lock structure for a seat slide device having a first and a second rail which are parallel to each other and mutually slidable, comprising:

- a plurality of lock holes provided in the first rail along its longitudinal direction at an equal pitch of P;

at least three lock members, each having a lock tooth at a same phase position with respect to a lock tooth on each of the other lock members, which lock members are hinged to the second rail at an equal pitch z so as to have



the lock teeth independently engageable with the lock holes and jointly releasable from the lock holes; and wherein $P=nz/(n-1)$ and $P/n+x < a$, where n is the number of the lock members, x is the width of each lock tooth and a is the width of each lock hole.

4,712,760

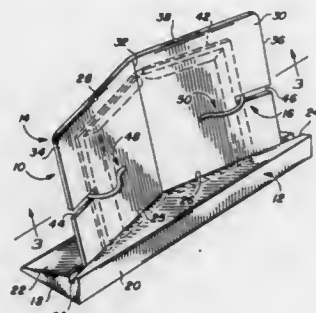
BOOK REST WITH PAGE RETAINER

Howard J. Winter, 4131 E. Indian School Rd. #209, Phoenix, Ariz. 85018

Filed Oct. 14, 1986, Ser. No. 918,707
Int. Cl.⁴ A47B 97/04

U.S. Cl. 248—451

13 Claims



1. A book rest for supporting books and magazines comprising:

- (a) a base for resting placement on a substantially horizontal surface, said base having a front and having an upper surface;
- (b) a prop structure extending from the upper surface of said base in a leaning attitude away from the front of said base, said prop structure including a pair of juxtaposed planar walls which extend oppositely from a central linear vertex and defines an included obtuse angle which opens toward the front of said base, said prop structure defining a front side which faces the front of said base and having an opposite back side;
- (c) said prop structure defining a pair of slots each formed so as to extend inwardly from the distal edge of a different one of said pair of juxtaposed planar walls toward the central vertex thereof; and
- (d) page retainer means mounted in the slots defined by said prop structure for releasably holding the pages of a book in an open position against the front side of said prop structure, said page retainer means comprising,

- I. a pair of hooks each positioned in a different one of said pair of slots defined by said prop structure, each of said pair of hooks including,
 - i. a curved bight portion looped through its respective one of said pair of slots of said prop structure,
 - ii. a page engaging end extending integrally from one end of said bight portion toward the central vertex along the front side of said prop structure,
 - iii. a connection end extending integrally from the other end of said bight portion toward the central vertex along the back side of said prop structure said con-

nection end being provided with at least one curved notch,

- II. biasing means interconnecting said connection ends of said pair of hooks said biasing means is in the form of an elastic band connected between the curved notches of said pair of hooks.

4,712,761

PICTURE WALL HANGING ASSEMBLY

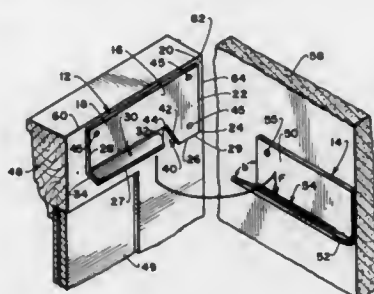
Edward T. Wassell, 3540 Ketch Ave., Oxnard, Calif. 93033

Filed Jan. 29, 1987, Ser. No. 8,565

Int. Cl.⁴ A47G 1/16

U.S. Cl. 248—475.1

16 Claims



- 1. A wall hanging assembly for a picture frame comprising: a self locating picture frame corner bracket comprising a planar body portion defined in part by a lower edge and straight upper edge, said upper edge forming a corner with a straight outer edge, said outer edge forming an intersection with a lower edge, a part of which flares outwardly and downwardly to form a flange, said flange having a first lateral edge angularly spaced from said body portion to form a notch opening, said bracket including picture frame attachment means said upper edge providing alignment means for other adjacent picture frames; and,

- a wall track comprising an elongated web having an up-turned lower end adapted to engage said bracket flange, said track including wall attachment means.

4,712,762

ADJUSTABLE REUSABLE ADAPTER SYSTEM FOR TEMPORARY ELECTRICAL SERVICE

William O. Liedle, 2809 E. 27th St., Vancouver, Wash. 98661

Filed Aug. 14, 1986, Ser. No. 896,838

Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—533

12 Claims

- 1. An adjustable, reusable adapter system for maintaining a temporary electrical service in position above ground level at a building site prior to the installation of permanent electrical service, which comprises:

- a. a vertical support member;
- b. a base support means connected to a lower end of the vertical support member and including a stake means for securing said vertical support member into the underlying terrain;
- c. bracket support means including a bracket angle assembly comprising a pair of front bracket angle means and a rear bracket angle means enclosing said vertical support means for clamping onto said vertical support member and adjustably movable in an upward and downward substantially vertical direction to a plurality of fixed positions and to a desired vertical position, along said vertical support member, for maintaining said vertical support member in a stable substantially vertical position regardless of the contour of the underlying terrain, and further including a plurality of sleeve means, having a substantially rectangular cross-sectional configuration, and spaced angularly apart about the vertical support member and pivotally

- attached to said bracket angle assembly for pivotable movement in an angular arcuate path toward or away from said vertical member to a desired angular position with respect to said vertical support member; and
- d. a plurality of bracing support members, having a substan-

is in said engaged position thereof, and locking means for releasably retaining said plate in the engaged position thereof.

4,712,764

FLEXIBLE FORMS

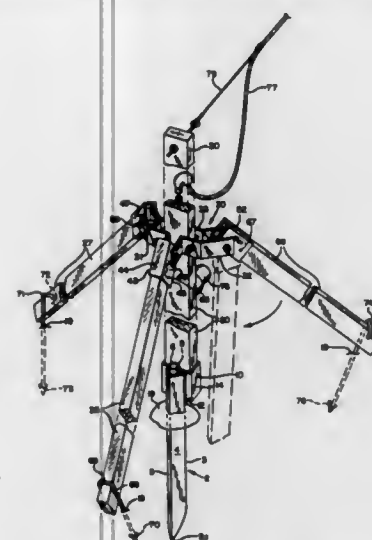
Lee Roy White, 1137 W. Emerald, Mesa, Ariz. 85202

Filed May 23, 1986, Ser. No. 867,233

Int. Cl.⁴ E01C 19/50

U.S. Cl. 249—6

4 Claims



tially rectangular cross-sectional configuration, and having an upper end mounted within said sleeve means for adjustable movement to a desired angular position with respect to said vertical support member, for further maintaining said vertical members in a stable vertical position in spite of the contour of the underlying terrain.

4,712,763

SECURITY DEVICE FOR OFFICE MACHINES

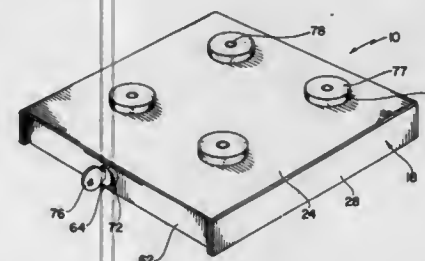
Peter G. Leite, Seekonk, Mass., assignor to P.G.L. Industries, Inc., Seekonk, Mass.

Filed Dec. 29, 1986, Ser. No. 946,707

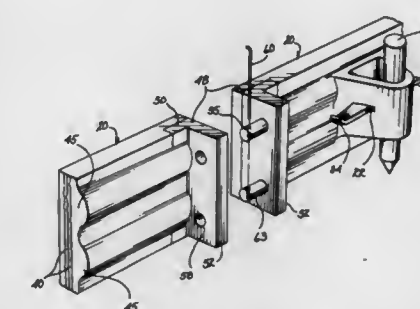
Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—553

8 Claims



- 1. A security device for an office machine comprising a substantially closed housing having spaced top and bottom walls, said bottom wall being adapted to be secured on a mounting surface, said top wall having an aperture therein, a fastening element securable to the underside of said office machine and having a locking end portion which is receivable in said aperture when said fastening element is secured to said office machine, a plate slidably mounted in said housing between said top and bottom walls thereof and operable from the exterior of said housing when said fastening element is secured to said office machine and said locking end portion is secured in said aperture for sliding said plate between an engaged position wherein it engages said locking end portion to secure same in said aperture and a disengaged position wherein it is disengaged from said locking end portion and said fastening element is releasable from said housing, said housing and said plate being constructed so that said locking end portion is inaccessible from the exterior of said housing when said plate



- 1. A flexible form for use in concrete work, comprising: an elongated flexible member means suitable for being bent and shaped during use as a concrete form for fitting onto the variable contour of a concrete structure, said flexible member means is adapted to rest on one of its longitudinal edges which extends lengthwise in a horizontal direction and having a substantially vertical side;

- connecting member means having a first member and a second member each extending outwardly from a side opposite said vertical side and on opposite ends of the flexible member means, said first member having at least one protruding member protruding orthogonally therefrom, each protruding member having at least one aperture through which a pin member extends, said second member having at least one opening therein corresponding to the protruding member, whereby two or more flexible member means are connectable together by inserting the protruding member of a first member of one flexible member means into an opening of a second member of another flexible member means, and then inserting a pin member into an aperture in the protruding member;

- a plurality of reinforcement means integral and therealong said elongated flexible member means;
- a plurality of horizontal arcuate shaped rib means integral to said elongated flexible member means for providing strength thereto; and

- a positioning bracket means integrally connected to said elongated flexible member means for holding said flexible form in place, said positioning bracket means comprises (a) a hollow body portion having slots passing there-through and flanges extending therefrom; (b) a stake member means for removably inserting inside said hollow body portion; and (c) a wedge means for slidably engaging said slots and operably securing said stake member means inside said hollow body portion, said wedge means has an extension for preventing said wedge means from sliding out of the slots.

4,712,765

APPARATUS FOR PRODUCING COATED PANELS

Iraj Sabet, Bassecourt, Switzerland, assignor to Stella Werke AG, Bassecourt, Switzerland

Filed Dec. 3, 1985, Ser. No. 804,187

Claims priority, application Switzerland, Dec. 4, 1984, 5761/84

Int. Cl.⁴ B29C 33/10, 33/14, 39/10, 45/14

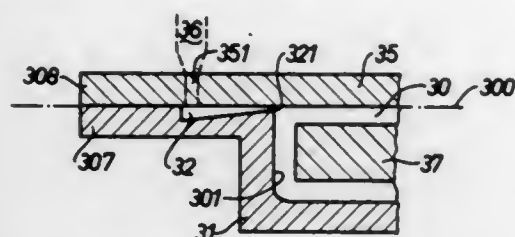
U.S. Cl. 249—91

3 Claims

- 1. In a casting mold for use in producing panels each having

an integral coat of a cross-linked polymer matrix, said mold consisting essentially of:

- (A) a lower or tray portion having an inner bottom face, at least four times side faces, and an essentially continuous rim face adjoining said inner side faces;
 - (B) an upper or lid portion having a face that is essentially co-extensive with said tray portion to form, with said inner sides of said tray portion, a mold cavity that is closed by juncture of said rim face of said tray portion and of a coextensive part of said lid portion, said lid portion having means for supporting a panel core at a distance from said lid face;
 - (C) an inlet opening for introducing a liquid resin composition into said mold and an outlet opening for permitting air to escape from said mold when said liquid resin composition is introduced through said inlet opening;
- the improvement consisting essentially of:



- (D) an elongated recess substantially aligned with one of said inner side faces of said tray portion and arranged adjoining thereto within an area of said juncture of said rim face of said tray portion and said co-extensive part of said lid portion, said recess being shaped to form an elongated and essentially prismatic space when said rim face is in said juncture with said co-extensive face portion of said lid; said prismatic space having an edge portion extending over at least about 50% of said one inner side face and forming an elongate slit shaped nozzle means communicating with said mold cavity when said casting mold is closed, and
- (E) said inlet opening ending in said prismatic space for feeding said liquid resin composition into said prismatic space so as to form at said slit-shaped nozzle means a smooth and laminar film for filling said mold cavity with said liquid resin composition substantially without turbulence of flow.

4,712,766

EASY SQUEEZE NOZZLE HOLDER

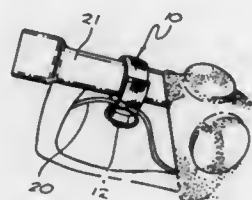
Caradoc Ehrenhalt, Los Angeles, Calif., assignor to Easy Use Products, Inc., Los Angeles, Calif.

Filed Mar. 23, 1987, Ser. No. 28,735

Int. Cl.⁴ G05G 5/06; F16K 31/00

U.S. Cl. 251—90

6 Claims



1. A device for holding a mechanical structure such as the operating handle of a fuel delivery nozzle, comprising: an elongated flexible body of material; a flexible cross member secured thereto; mating adjustable securing means on opposite portions of both said body and said cross member whereby the cross

member may be formed into one loop and said body formed into a second loop, each of said loops of adjustable size; the cross member dimensioned to form a finger sized loop wherein an index finger is positioned, overlying the flexible body of material and a loop being formed and secured about the index finger; and wherein the flexibility of the body of material allows the body to be naturally formed into a loop around the handle of a fuel delivery nozzle by grasping the handle, thereby bringing the adjustable securing means on said body into mating engagement for holding the handle in an operated position.

4,712,767

SOLENOID CONTROL VALVE

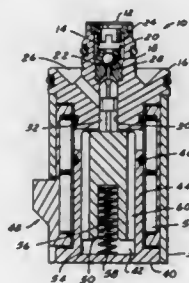
Gerald L. Losser, Gloucester, and Richard D. Weaver, Williamsburg, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 29, 1986, Ser. No. 925,006

Int. Cl.⁴ F16K 31/06

U.S. Cl. 251—129.14

3 Claims



1. In an adaptive braking system having a solenoid operated control valve for receiving fluid at one end thereof, a valve means adjacent the one end and biased closed, a plunger means reciprocally actuated to open the valve means, a solenoid means having an armature normally biased into contact with the plunger means, the improvement comprising: the armature having at least one aperture axially extending for allowing passage of fluid therethrough from one end thereof to the other end when the armature is moved by the energizing of the solenoid means for effecting the opening of the valve means and; circular groove means at one end thereof in contact with the plunger means and intersecting said aperture for reducing the adhesion between the armature and the plunger.

4,712,768

QUARTER TURN VALVE

Leroy E. Herr, Allan K. Shea, both of Erie, and Timothy E. Kunkle, McKean, all of Pa., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 747,980, Jun. 24, 1985, abandoned.

This application Oct. 23, 1986, Ser. No. 922,782

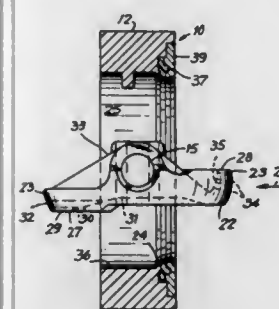
Int. Cl.⁴ F16K 1/22

U.S. Cl. 251—305

7 Claims

7. A high performance butterfly control valve which comprises:
 - (a) a valve housing,
 - (b) a generally disc-shaped vane, including an outer periphery,
 - (c) said disc-shaped vane being mounted for selective controlled rotation in said valve housing, whereby a first portion of said outer periphery is rotated in the downstream direction, and a second portion of said outer periphery is rotated in the upstream direction,
 - (d) said disc-shaped vane being rotated through a quarter turn of rotation, whereby the outer periphery is in a sealed

- relation with the valve housing at 0° of rotation, and the vane extends generally parallel to the direction of fluid flow through the valve housing at 90° of rotation, (and)
- (e) a first projection extending from said vane about the first portion of the outer periphery,
- (f) said first portion and said first projection each being in close proximity to the valve housing at least during a predetermined number of degrees of vane rotation whereby said close proximity inherently controls fluid flow about said first projection and said first portion during said predetermined number of degrees of vane rotation, and



- (g) a second projection extending from said vane about the second portion of the outer periphery,
- (h) said first projection being formed to a generally streamlined, smoothly contoured configuration and to a length of extension which is minimized to the extent permitted by the inherent control of said close proximity,
- (i) said first projection having a length of extension which is less than the length of extension of said second projection, thereby providing a minimal, turbulence free obstruction to fluid flow when said vane is at 90° of rotation.

4,712,769

HIGH TEMPERATURE BALANCED VALVE TRIM

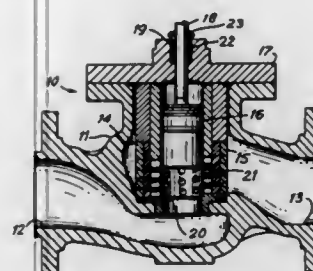
Roger E. Johnson, Girard, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Aug. 29, 1986, Ser. No. 902,310

Int. Cl.⁴ F16K 15/00

U.S. Cl. 251—324

11 Claims



1. A valve plug for use in a fluid control valve, which comprises:
 - (a) a main valve plug member,
 - (b) a seal forming member mounted in an axially stacked relation to said main valve plug member whereby said seal forming member and said main valve plug member together form a generally smooth, continuous outer surface,
 - (c) said seal forming member comprising
 - (i) an outer element made from a durable material having predetermined resilient characteristics and including an outer wall member forming said generally smooth continuous outer surface with said main valve plug and two, spaced wall sections, each being connected at a

- first end to said outer wall member and having a second free end,
- (ii) the connected ends of said two wall sections and said outer wall member being arranged and configured with respect to one another whereby there is a section of minimum wall thickness arranged within said outer wall member at a position between said spaced, two wall sections,
- (iii) said outer wall member and said two, spaced wall sections defining an interior space within said outer element,
- (iv) a packing material tightly received and compressed within said interior space of the outer element, and
- (d) means for compressing said seal forming member upon shut off of the control valve whereby the free ends of the two wall sections are resiliently crimped toward one another to compress and urge the packing material toward the section of minimum thickness of the outer wall to resiliently deform said outer wall into an outwardly extending bulge formation, which bulge formation is arranged to contact said control valve to thereby form a leak tight seal around the valve plug.

4,712,770

ELECTRICAL TENSIONING DEVICE FOR ORTHOPEDIC ADJUSTMENT MEANS

Hans Wiederkehr, Ifangstrasse 107, Rümlang, Switzerland

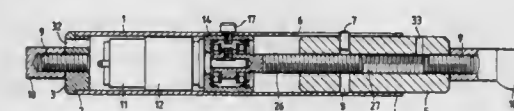
Filed Apr. 29, 1985, Ser. No. 728,207

Claims priority, application Switzerland, Apr. 30, 1984, 2106/84

Int. Cl.⁴ B66F 3/08

U.S. Cl. 254—98

7 Claims



1. An orthopedic tensioning device comprising a hollow elongated housing having a slot therein; a lift member guidably mounted in said housing at one end thereof for reciprocal movement therein, said lift member having guide means receivable in said slot in said housing so as to prohibit said lift member from rotating while guiding said lift member for reciprocal movement; motor means mounted in said housing at the other end thereof for driving said lift member, said motor means comprising an electric motor, a gear reduction means connected to said electric motor and an output shaft from said gear reduction means; transmission means between said output shaft and said lift member, said transmission means including a worm gear comprising a threaded spindle having one end threadably received in a bore provided in said lift member and the other end connected to said output shaft of said gear reduction means; and bearing means provided in said housing between said electric motor and said worm gear about said output shaft for absorbing oppositely acting axial forces, said bearing means being situated in a bushing fitted on the inner wall of said housing including means external of said housing engaging with said bushing for releasably securing said bearing means in said housing.

4,712,771

WALLBOARD JACK

Kevin S. Donnelly, 5842 Comanche Dr., San Jose, Calif. 95123, and Ralph H. Donnelly, 425 Hershner Dr., Los Gatos, Calif. 95030

Filed Apr. 21, 1986, Ser. No. 854,020

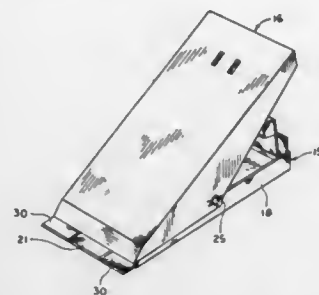
Int. Cl.⁴ B66F 3/00

U.S. Cl. 254—131

1 Claim

1. A jack for positioning and holding wallboard and the like comprising:

a base;
a lever assembly having first and second ends;
means for pivotally mounting the lever assembly on said base so that downward pressure on the first end of said lever assembly will raise the second end thereof;
ratchet means for holding said lever assembly with the second end elevated after pressure is applied to said first end;



releasable locking means actuable for releasing said ratchet means and allowing said second end to pivot downward;
and
means to disable said locking means to prevent the ratchet from holding said lever assembly with the second end elevated.

4,712,772

POWER HYDRAULIC GEAR

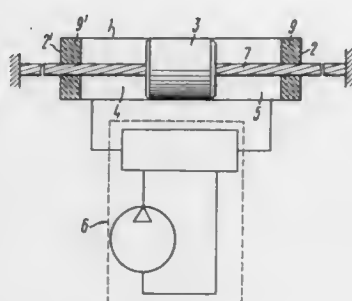
Sergei B. Negrutsky, 43, kv. 121, Karaganda, bulvar Mira;
Sergei B. Klimov, Sovetsky, 60/2, kv. 14, Karaganda, prospekt; Boris F. Negrutsky, 51, kv. 12, Karaganda, ulitsa Lenina, and Vladimir G. Churkin, 14, kv. 12, Karaganda, ulitsa Kostenko, all of U.S.S.R.

PCT No. PCT/SU84/00056, § 371 Date Dec. 19, 1985, § 102(e) Date Dec. 19, 1985, PCT Pub. No. WO85/04933, PCT Pub. Date Nov. 7, 1985

PCT Filed Nov. 2, 1984, Ser. No. 824,010

Claims priority, application U.S.S.R., Apr. 24, 1984, 3732434
Int. Cl.⁴ B66D 3/18; B25B 25/00; F16H 27/02
U.S. Cl. 254-264

4 Claims



1. A power hydraulic gear comprising a hollow cylindrical housing (1) with end faces (2, 2'), said housing accommodating therein a piston (3) dividing the housing space into a direct stroke chamber (4) and a return stroke chamber (5) communicated alternately with a source (6) of pressurized fluid medium for effecting efficient translation movement of the piston along a traction guide member (7) passed therethrough, and means (8) for engaging the piston (3) with the traction guide member (7), characterized in that the traction guide member (7) is a rope passed through seals (9, 9') fitted at the end faces (2, 2') of the housing (1) and through the piston (3) which accommodates the means (8) for engaging with the rope, said means adapted to engage said rope upon delivery of pressurized fluid medium to one of the chambers of the housing and disengage from the rope upon delivery of pressurized fluid medium to the other one of the housing chambers, characterized in that the

seals (9, 9', 9'') of the housing end faces and of the piston (3) are fashioned as chambers formed in each end face (2, 2') and in the piston (3) and filled with a viscoelastoplastic material, said chambers being provided with means for developing in them a pressure, said means being fashioned as step-like pistons (21, 21', 12) fitted in the chambers formed in the end faces (2, 2') and piston (3) and communicating with said direct and return stroke chambers.

4,712,773

MULTIPLE PANEL PLAY AREA

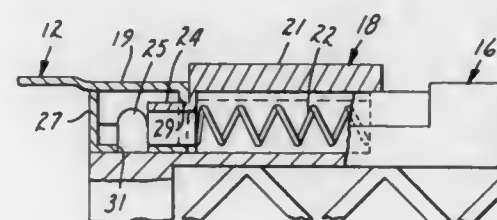
Donald A. Larson, Circle Pines, Minn., assignor to North States Industries, Inc., Minneapolis, Minn.

Filed Apr. 24, 1987, Ser. No. 42,028

Int. Cl.⁴ E04H 17/16

U.S. Cl. 256-25

7 Claims



1. In a multiple panel unit for creating a play area for young children in which each panel has a rigid rectangular frame and is connected to an adjacent panel by a hinge structure at the top and bottom of the panels, permitting the panels to be pivoted with respect to each other at the hinge, the improvement comprising:

the top of a first of two adjacent panels having a releasable retaining means for releasably retaining one end of the hinge structure connecting said two panels and said one end of the hinge structure being complementarily formed for being retained by said releasable retaining means, said releasable retaining means including a spring loaded slide mechanism for retaining the hinge end when the slide mechanism is first held in an open position against the force of the spring and the hinge end is positioned in its retention position and the slide mechanism is then released and urged to its retention position by said spring,
the bottom of the second of said two adjacent panels and the corresponding end of the bottom hinge structure being formed with a pin and a mating recess that are mateable in a direction parallel to the hinge pivot axis.

4,712,774

DEVICE FOR THE MELTING OF LIGHT METALS

Raymond Louis, Montmagny, France, assignor to Gaz de France, Paris, France

Filed Dec. 20, 1985, Ser. No. 811,787

Claims priority, application France, Dec. 20, 1984, 84 19543
Int. Cl.⁴ F27B 14/02

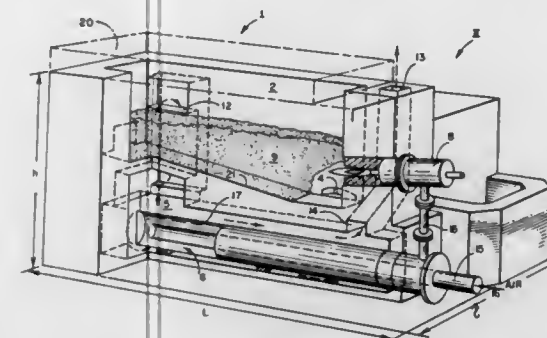
U.S. Cl. 266-155

5 Claims

1. Apparatus for melting and holding light metal alloy loads in the molten state, the apparatus including a furnace comprising:

a first chamber positioned at a first level for loading the metal alloy, the first chamber having a first burner for melting the alloy into a molten bath;
a second chamber, having a second burner, positioned at a level lower than the first chamber for holding the molten bath, the second burner maintaining the molten bath in the molten state for tapping;
a channel connecting the first chamber to the second chamber for allowing the molten bath to flow from the first chamber to the second chamber;

an exhaust means connected to the first and second chambers for evacuating combustion fumes produced in each of the chambers; and
a heat exchanger having air for combustion of the burners



inputted thereto, the heat exchanger being positioned substantially under the first chamber and adjacent to an internal lateral wall of the second chamber for heating the combustion air with combustion products produced in the chambers.

4,712,775

CONSTRUCTION OF CONTROL VALVE FOR AIR SUSPENSION

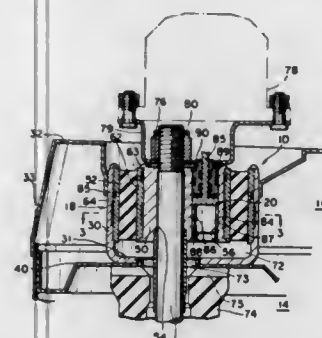
Shuichi Buma, Toyota, and Osamu Horiyama, Kani, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 26, 1986, Ser. No. 833,068

Claims priority, application Japan, Feb. 26, 1985, 60-25514[U]
Int. Cl.⁴ F16F 3/08

U.S. Cl. 267-220

6 Claims



1. A control valve in combination with an air suspension assembly having main and auxiliary air chambers comprising: boundary means disposed between said main air chamber and said auxiliary air chamber and provided with passage means for communicating between both air chambers, the path including a first passage, a second passage having a bore smaller than that of the first passage and a third passage;

a sound muffling perforated member having a plurality of perforations provided solely in relation with said second passage of said passage means for muffling noise generated by air flow therethrough; and
a valve body selectively interconnecting said first and second and said first and third passages for affording and interrupting communication between said main air chamber and said auxiliary air chamber wherein each of said air chambers are communicated through one of said first and second passages when said valve body is in a predetermined position and the other of said first and second passages is closed by said valve body.

4,712,776

AIR SPRING SUSPENSION SYSTEM

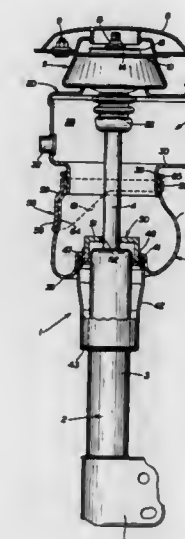
Wayne H. Geno, Cicero, Ind., and David A. Weitzenhof, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 14, 1986, Ser. No. 885,124

Int. Cl.⁴ F16F 9/04

U.S. Cl. 267-64.21

20 Claims



1. An improved air spring suspension system for vehicle including:

(a) a fluid shock absorber strut having an outer cylinder and a reciprocal piston rod;
(b) first attachment means for securing the cylinder to a first vehicle support system;
(c) second attachment means for securing the piston rod to a second vehicle support structure spaced from the first vehicle support structure;
(d) a fluid pressure chamber comprising an annular canister mounted against movement relative to the piston rod, and a flexible sleeve sealingly connected to and extending between said canister and cylinder, said pressure chamber adapted to contain a supply of pressurized fluid with said piston rod extending through said pressure chamber; and
(e) a rigid retention member having a sidewall surrounding a predetermined portion of the flexible sleeve to restrain outward expansion of a first sleeve portion while permitting free expansion of a second sleeve portion to place a lateral force on the shock absorber strut.

4,712,777

FLUID FILLED VIBRATION ISOLATOR HAVING PRECISELY ADJUSTABLE DYNAMIC OPERATING CHARACTERISTICS

H. Timothy Miller, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Aug. 25, 1986, Ser. No. 900,167

Int. Cl.⁴ F16F 13/00, 9/34

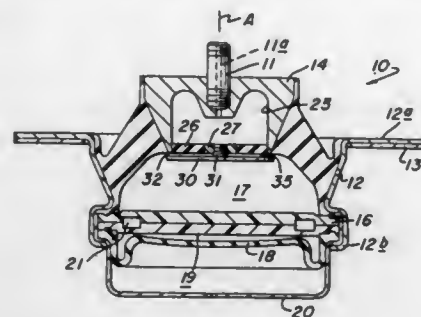
U.S. Cl. 267-140.1

8 Claims

1. In a fluid filled vibration isolator having compliant means providing a variable volume working fluid chamber displaceable in response to vibrations of the working fluid and an inertia track passageway cooperable therewith to provide certain dynamic operating characteristics, a control fluid chamber adjacent to said working fluid chamber for containing a control fluid, and flexible means separating said control fluid chamber from said working fluid chamber while normally providing a portion of the overall compliance of said working fluid chamber, the improvement comprising: means movable in response to a control for selectively either permitting said flexible means to flex or preventing said flexible means from

flexing relative to said control fluid chamber in response to dynamic pressure variations in said working fluid chamber for thereby affecting the contribution of the flexible means to the overall compliance of said compliant means, whereby certain dynamic operating characteristics of the vibration isolator can be precisely modified wherein

- (a) said movable means includes a shutter panel disposed alongside said flexible means and movable in relation thereto;
- (b) said shutter panel is disposed intermediate said control fluid chamber and said working fluid chamber and is



movable between extended and retracted positions in said working fluid chamber; and

- (c) said shutter panel is stiff relative to said flexible means and is at least coextensive in area therewith, and including abutment means carried by said compliant means around said flexible means, said abutment means being engageable by said shutter panel in response to retraction thereof toward said control fluid chamber from its extended position in said working fluid chamber for completely isolating said flexible means from dynamic pressure variations occurring in said working fluid chamber.

4,712,778

HELICAL SPRING HOLDER ASSEMBLY

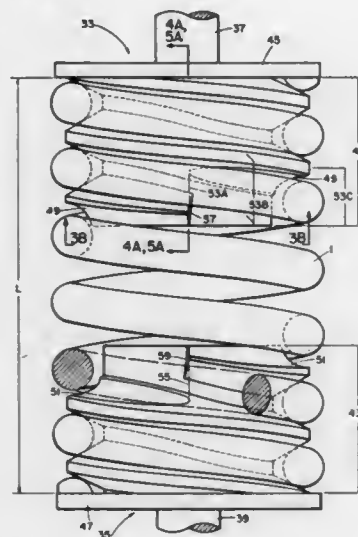
Wyatt S. Newman, New York, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,993

Int. Cl.⁴ F16F 1/06, 1/12

U.S. Cl. 267-170

8 Claims



1. A spring assembly comprising at least one helically-threaded spring holder and a helically-wound spring mounted thereon, the thread on the spring holder having a tension bearing side against which the spring bears when it is in tension and a compression bearing side against which the spring bears

when it is in compression, characterized in that the spring holder has a groove formed in a portion of at least one of said sides of its thread over a predetermined circumferential length starting at the end of the thread where the spring engages the spring holder, said groove relieving the spring from restriction against axial movement by said portion of the side, said length being chosen to establish a predetermined ratio of the number of active spring coils in tension to the number of active spring coils in compression.

4,712,779

WELDING FIXTURE

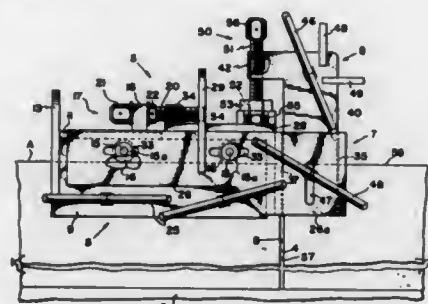
Timothy C. Dearman, P.O. Box 937, Pearland, Tex. 77581

Filed Dec. 2, 1981, Ser. No. 326,485

Int. Cl.⁴ B25B 1/20

U.S. Cl. 269-43

12 Claims



1. Apparatus for use in relatively positioning a pair of plate-like members for welding, said apparatus comprising a first clamp unit for attachment to one of said members; first anchor means carried by said first clamp unit for securing the latter to said one of said members; a second clamp unit for attachment to the other of said members; second anchor means carried by said second clamp unit for securing the latter to the other of said members; means mounting one of said clamp units on the other of said clamp units for relative movement therebetween in each of two mutually normal planes; and adjusting means interconnecting said first and second clamp units and operable to effect relative movement therebetween in either of said planes while such units are secured to their respective members.

4,712,780

HYDROPNEUMATIC SPRING SUSPENSION DEVICE

Reinhold Ficht, Kirchseon, and Walter Vilsmeier, Grossfend, both of Fed. Rep. of Germany, assignors to Ficht GmbH, Fed. Rep. of Germany

PCT No. PCT/DE85/00190, § 371 Date Mar. 14, 1986, § 102(e) Date Mar. 14, 1986, PCT Pub. No. WO85/05605, PCT Pub. Date Dec. 19, 1985

PCT Filed May 31, 1985, Ser. No. 825,284

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420557

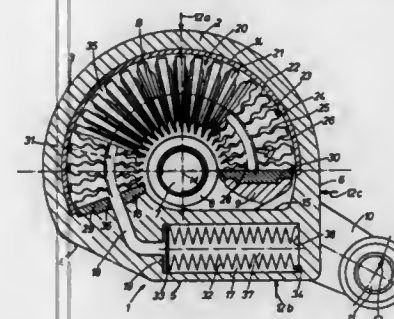
Int. Cl.⁴ B60G 11/26

U.S. Cl. 267-256

14 Claims

1. Hydropneumatic spring suspension device for a vehicle for insertion between suspension components movable in relation to each other, comprising a housing having a spring bellows therein filled with a hydraulic medium and hydraulically connected by a channel to a chamber filled with said hydraulic medium and containing a pneumatic spring deformable under hydraulic pressure, one end of said bellows being supported in said housing and connected at its other end through an abutment connected to one of said suspension components, said bellows comprising a plurality of individual segments fixed together along the arc of a circle and having an eccentric passage passing therethrough, each of said segments having walls with beads thereon, said walls on adjacent segments

being joined to each other around said eccentric passage and forming a liquid tight joint between said segments, said beads on the adjacent walls of said segments nesting into each other



when said bellows is compressed and interlocking said walls, said bellows being bent substantially in the shape of an arc of a circle, said abutment connected at said other end of said bellows being movable along a circular arc.

4,712,781

OPERATING TABLE FOR MICROSCOPIC LUMBAR LAMINECTOMY SURGERY

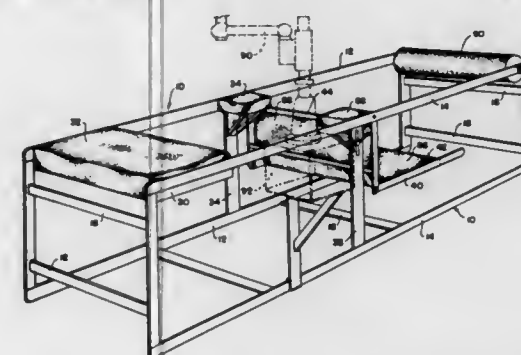
Robert S. Watanabe, Los Angeles, Calif., assignor to Watanabe Orthopedic Systems, Inc., Los Angeles, Calif.

Filed May 12, 1986, Ser. No. 861,829

Int. Cl.⁴ A61G 13/00

U.S. Cl. 269-322

4 Claims



1. An operating table for microscopic lumbar laminectomy, and the like, comprising: a frame-like structure including first and second elongated spaced and parallel side members defining a rectangular-shaped open top; a shelf-like member mounted on said side members at one end of said open top for supporting the chin and chest of a patient lying face down on the table; a pair of brackets mounted on the frame-like structure adjacent to said open top, said brackets being spaced laterally from one another and spaced longitudinally from said shelf-like member for supporting the iliac crests, means for vertically adjusting said brackets on said first and second side members, respectively of the patient so that the weight of the patient is supported by the iliac crests and by the lower part of the chest; and support means pivotally coupled to said side members at the open top of said frame structure on the remote side of said brackets from said shelf-like member and movable to a first position to provide a flat surface at said open top of said frame-like structure for receiving a patient on the table, and to a second position to provide a support for the patient in a kneeling position, said support means including first and second panels which extend across the open top of said frame-like structure in co-planar relationship with one another when the support means is in said first position, and in which said first panel assumes a vertical position and said second panel assumes a horizontal position displaced down from the open

top of said frame-like structure when said support means is in said second position.

4,712,782

METHOD AND APPARATUS OF SEPARATING AND TRANSPORTING FABRIC PIECES

Anthony D. Mathias, Toorak, Australia, assignor to Dunlop Olympic Limited, Victoria, Australia

PCT No. PCT/AU84/00169, § 371 Date May 7, 1985, § 102(e)

Date May 7, 1985, PCT Pub. No. WO85/01037, PCT Pub. Date Mar. 14, 1985

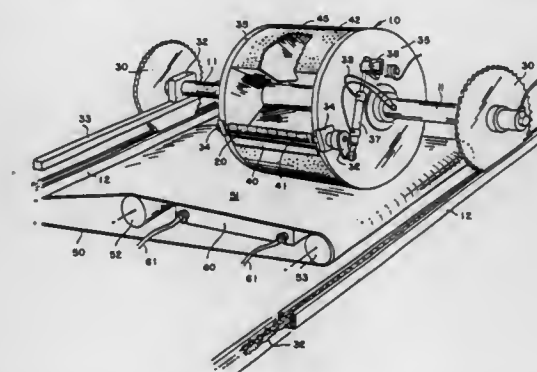
PCT Filed Sep. 7, 1984, Ser. No. 750,608

Claims priority, application Australia, Sep. 7, 1983, PG1303

Int. Cl.⁴ B65H 3/06, 3/44, 5/00

U.S. Cl. 271-21

5 Claims



1. An apparatus for separating a piece of limp fabric from a stack of fabric pieces and transporting said piece to a distant receptor location comprising in combination

(A) a carrier member having a generally cylindrical outer surface,

(B) means for moving said carrier member by rotation from a position adjacent said stack of fabric pieces to a position adjacent said receptor location,

(C) means to establish pressure contact between said stack of fabric pieces and the periphery of said carrier member,

(D) means to rotate the carrier member relative to said stack of fabric pieces to thereby separate one piece of limp fabric from the top of said stack,

the improvement which comprises

(1) said generally cylindrical carrier member having an elongated opening in its external surface which is parallel to the axis of the carrier member,

(2) said generally cylindrical carrier member being provided with an elongated friction roller that is positioned in said elongated opening so that a portion of the outer periphery of said friction roller extends outwardly beyond the outer circumference of said generally cylindrical carrier member and so that an elongated gap is left between said elongated opening in said carrier member and said elongated friction roller, the axis of said carrier member and the axis of said friction roller being in fixed positions relative to each other,

(3) means to rotate said elongated friction roller in a direction opposite to the direction of rotation of said carrier member so that rotational movement of the elongated friction roller over the top of said stack will withdraw the front marginal portion of the top piece of fabric in the stack and both cause it to form a fold and then force this fold into said elongated gap,

(4) the width of said elongated gap that is adjacent said elongated friction roller being selected relative to the fabric being handled so that when the fold formed by rotating said elongated friction roller is forced into said elongated gap the elongated gap will exert a sufficient

gripping force on the fold to retain the fold in that position in the elongated gap, and
 (5) suction means associated with a portion of the external surface of said carrier means which insures that the remainder of the fabric piece that is not held in said elongated gap will be retained against the exterior surface of the generally cylindrical carrier means.

4,712,783

SUCTION SHEET SEPARATOR WITH ADJUSTABLE FEED RESTRAINT AND STACK CONFINEMENT

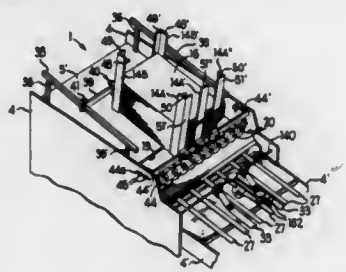
Martin Selak, 578 S. Warrington Rd., Des Plaines, Ill. 60016
 Division of Ser. No. 273,573, Jun. 15, 1981, Pat. No. 4,437,657.

This application Feb. 29, 1984, Ser. No. 584,792

Int. Cl.⁴ B65H 9/08, 3/08

U.S. Cl. 271—100

7 Claims



1. In feeding apparatus for feeding sheet material one at a time from the bottom of the stack of the same, said apparatus including a horizontal support for a stack of sheets, stacking means for retaining on said horizontal support a vertical stack of sheet material, said horizontal support terminating short of the front end of the stack to provide a feed opening exposing the front end portion of the bottom sheet in the stack, and means for withdrawing the bottommost sheet from the bottom of the stack through said feed opening and including suction cup means for engaging the bottom surface of the exposed end portion of the bottommost sheet in the stack and by force of suction therefrom pulling the sheet downwardly from the stack through the feed opening, the improvement wherein said stacking means includes upstanding front wall means for engaging the front end of said stack of sheets, and means for supporting said front wall means for longitudinal front to rear movement to varying degrees relative to the horizontal support to vary the relative position between the front margin of said stack of sheets abutting said front wall means and the suction cup means.

4,712,784

ADJUSTABLE VACUUM PAD

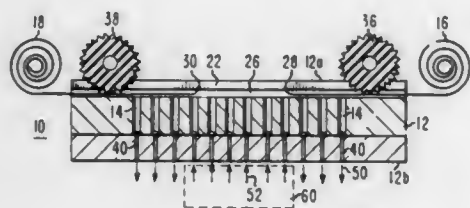
Ross M. Carrell, Cinnaminson, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1985, Ser. No. 739,918

Int. Cl.⁴ B65H 3/08

U.S. Cl. 271—108

7 Claims



1. A vacuum pad comprising in combination a block of material having a plurality of spaced apart orifices along one surface thereof each of said orifices being connected to a com-

mon plenum and having a connecting passageway to an orifice to the atmosphere;

means connected to said plenum for normally creating a reduced pressure relative to atmospheric pressure at said orifice; and

means for covering said orifice to the atmosphere for creating elevated pressure at selected ones of said orifices.

4,712,785

SHEET STACKING APPARATUS

Denis J. Stemmler, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

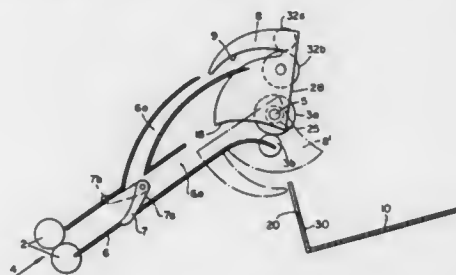
Filed Apr. 11, 1986, Ser. No. 850,452

Claims priority, application United Kingdom, Apr. 12, 1985, 8509462; Apr. 23, 1985, 8510275

Int. Cl.⁴ B65H 29/00

U.S. Cl. 271—187

11 Claims



1. Apparatus for stacking sheets fed seriatim from an inlet into a collection tray comprising first and second sets of co-acting driven output roller pairs associated respectively with alternative inverting and non-inverting copy sheet paths, coaxial discs each having an arcuate slot communicating at one end with the disc periphery, and diverter means selectively movable between first and second positions, wherein in the first position the diverter means is arranged to direct each sheet issuing from the inlet so that its lead edge enters the slots in the discs, which slots guide the sheet to the first set of output rollers, the discs being adapted to rotate as the sheet is advanced by the first set of output rollers so that the sheet is guided by said slots along a substantially semi-circular path and the sheet is thereby inverted before it exits the slots to be received inverted in the collection tray, which is disposed on the side of the disc opposite said inlet, and in the second position the diverter means directs the lead edge of each sheet issuing from the inlet to the second set of output rollers which feed the sheet without inversion directly into the collection tray.

4,712,786

COPY SHEET OFFSETTING DEVICE

John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1985, Ser. No. 810,453

Int. Cl.⁴ B65H 31/00

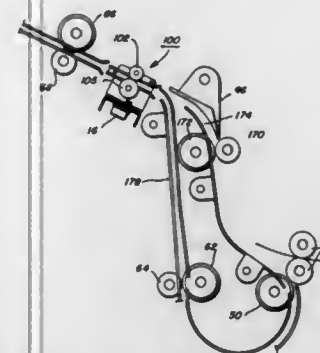
U.S. Cl. 271—207

15 Claims

1. In a printing apparatus having a page image transfer area and an output area and adapted for printing page image information onto copy sheets and feeding the copy sheets out of the output area into a sorter with the copy sheets being offset in the sorter in sets, the improvement, comprising:

offsetter means positioned within the printer between said page image transfer area and said output area and adapted

to translate copy sheets in route to the sorter alternately front and rearward during the time each copy sheet is



within said offsetter means such that offset sets of copy sheets are attained in the sorter.

4,712,787

STACKING APPARATUS

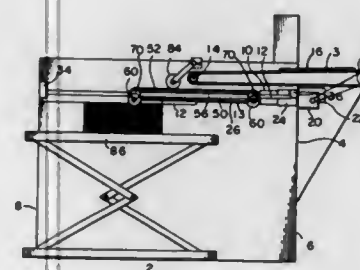
Raymond A. Princiotta, Sr., 208 N. Concord Ave., Havertown, Pa. 19083, and Antonio Salvucci, 131 Windswept Dr., Feasterville, Pa. 19047

Filed Apr. 14, 1986, Ser. No. 851,107

Int. Cl.⁴ B65H 29/54

U.S. Cl. 271—311

7 Claims



1. An apparatus for stacking pieces of cloth which comprises: a frame;

a conveyor means, connected to said frame, adapted to receive a plurality of pieces of cloth in sequence; a reciprocating carriage connected to said frame, positioned below said conveyor means and adapted to move parallel with respect to the longitudinal axis of said conveyor means, so that cloth pieces are sequentially deposited on said reciprocating carriage and then are deposited on a receiving table that is situated below the reciprocating carriage; and

a stationary cross member having one or more arms extending therefrom and supporting one way rotatable wheels, positioned above said reciprocating carriage and located so that the wheels touch and guide pieces of cloth as the pieces of cloth are sequentially deposited on said reciprocating carriage, and located so that the wheels stop and grip the pieces of cloth when the reciprocating carriage changes direction, so as to remove the pieces of cloth from the reciprocating carriage surface and so as to stack the cloth on the receiving table.

7. A method of stacking pieces of cloth which comprises: conveying pieces of cloth, by means of conveyor means, to a reciprocating carriage at a predetermined rate; causing the reciprocating carriage to move horizontally at the same rate and in the same direction as the conveyor means;

guiding the pieces of cloth off the reciprocating carriage so that they form an orderly stack on a receiving table, by means of clutch wheels that move only in a clockwise

direction as they are guiding the cloth on the reciprocating carriage and that stop moving, and, in doing so, grip the cloth when the reciprocating carriage changes direction so as to move rearward;

moving said reciprocating carriage rearward after it receives a piece of cloth from the conveyor means and after the cloth is guided off the reciprocating carriage so that the reciprocating carriage is in a position to move forward again to receive the next piece of cloth; and moving said receiving table downward so that the top of the stack of cloth formed on the receiving table is kept at a predetermined distance from the horizontally moving reciprocating carriage's surface.

4,712,788

AQUATIC EXERCISE APPARATUS

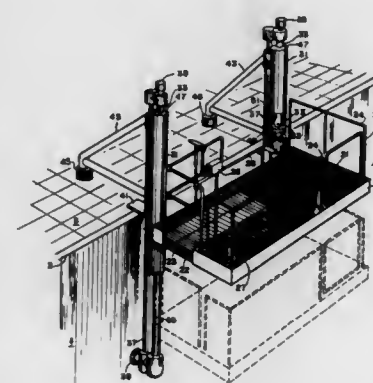
Charles H. Gaudreau, Jr., 2736 Octavia St., New Orleans, La. 70115

Filed Oct. 8, 1986, Ser. No. 916,888

Int. Cl.⁴ A63B 23/06

U.S. Cl. 272—69

18 Claims



1. An aquatic exercise apparatus comprising:

a platform means; vertical-movement means for vertically moving said platform means between a first position above a body of water, and a second position in which at least a portion of said platform means is disposed in a body of water; means for mounting said aquatic exercise apparatus adjacent a body of water; and a stationary exercise device positioned on said platform means.

4,712,789

CYCLE EXERCISERS

Frank P. Brilando, Niles, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Apr. 10, 1987, Ser. No. 36,882

Int. Cl.⁴ A63B 21/00; F16H 37/06, 7/00

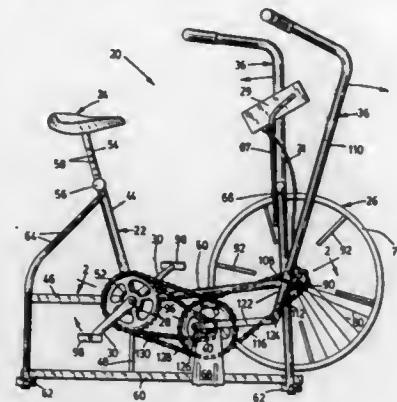
U.S. Cl. 272—73

14 Claims

1. A cycle exerciser including:

a frame; a seat mounted on said frame; energy absorbing means rotatably mounted on said frame; a substantially horizontal main drive shaft rotatably carried by said frame; foot pedal crank arms at opposite ends of said main drive shaft; a pair of coaxial countershafts rotatably carried by said frame; two handlebar levers mounted on said frame for oscillating movement; first drive means comprising means connecting said main drive shaft to said energy absorbing means through one of

said countershafts to cause rotation of the energy absorbing means in response to rotation of said main drive shaft; a pair of drive crank arms secured to opposite end portions of the other of said countershafts and extending laterally therefrom in opposite directions; and



second drive means including means connecting each of said handlebar levers to a respective one of said drive crank arms and means connecting said other countershaft to said main drive shaft to cause rotation of said main drive shaft in response to oscillating movement of said handlebar levers.

4,712,790

CYCLE EXERCISER

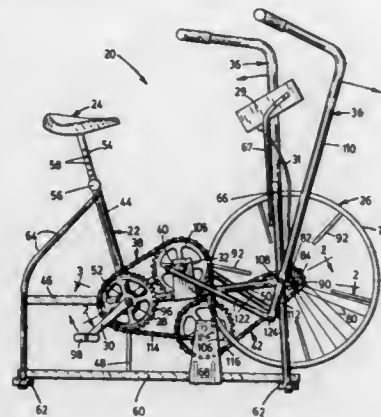
Eugene J. Szymiski, Skokie, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Apr. 20, 1987, Ser. No. 40,341

Int. Cl.⁴ A63B 21/00; F16H 37/06, 7/00

U.S. Cl. 272-73

6 Claims



1. In a cycle exerciser having a frame, a pedal-actuable main drive shaft, a pair of counter shafts, and energy-absorbing means all rotatably mounted thereon, and a pair of handle bar levers oscillatably mounted thereon, the improvement wherein said shafts are mounted about separate, spaced, parallel, substantially horizontal axes; a first sprocket is mounted on said main drive shaft; a second sprocket the same size as said first sprocket is mounted on one of said counter shafts; a pair of drive crank means are secured to opposite ends of said one counter shaft and extended in opposite lateral directions; third and fourth sprockets are mounted on the other counter shaft; a fifth sprocket is in driving relation with said energy absorbing means; a primary orbitally moveable endless chain is in wraparound connecting engagement with said first, second, and third

sprockets; a secondary orbitally moveable endless chain is in wraparound connecting engagement with said fourth and fifth sprockets; and said handle bar levers are connected to said drive crank arms; whereby said energy-absorbing means may be rotatably driven by said pedals and said handle bar levers jointly or separately.

4,712,791

EXERCISE MACHINE

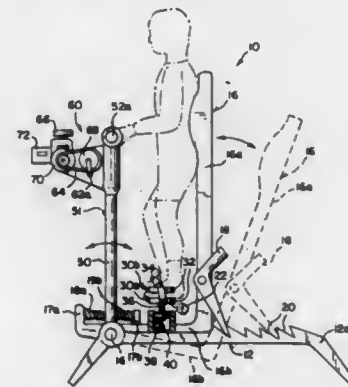
Pansy S. Edwards, 16 Caraway Rd., Reisterstown, Md. 21136

Filed Oct. 2, 1986, Ser. No. 914,365

Int. Cl.⁴ A63B 21/00

U.S. Cl. 272-73

8 Claims



1. An exercise machine, comprising in combination a base, exercise means mounted on said base for exercising at least the limbs of a user, positionally adjustable user support means pivotally connected to said base for permitting the user to actuate said exercise means in a selected posture between upright and inclined positions, and adjustment means for adjusting said user support means in discrete steps to a selected position within the range of said upright and inclined positions, wherein said base is a stand, and wherein said user support means includes an L-shaped bracket having two arms, one relatively short arm and one relatively long arm, a shorter arm thereof being pivotally connected to said stand, wherein an upwardly pointing surface of said stand is formed with a plurality of ratchet-like teeth normally pointing upwardly, and wherein said adjustment means includes a pawl pivotally connected to a longer arm of said L-shaped bracket, and engageable with a free end thereof with one of said ratchet-like teeth on said stand.

4,712,792

GYMNASTIC AND PLAYING DEVICE

Wolfgang Rogall, Kirchstrasse 1, 3012 Langenhagen 4, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 860,733

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526368

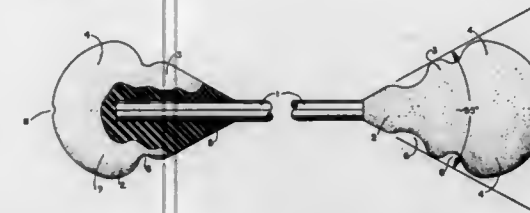
Int. Cl.⁴ A63B 15/00

U.S. Cl. 272-93

10 Claims

1. An exercise stick comprising: two pear-like members having the same size and shape, each of the members having a tapering portion terminating in a thickened outer portion at one end and a narrow portion having a central bore therein at the other end, the outer portion of each member being ball-like and comprising elastic, deformable material in the axial direction and having a largest radial section providing a smooth surface

for adapting the exercise stick to roll on a flat surface, the tapering portion of each member having at least one circumferential groove configured to receive fingers of a hand; and



a cylindrical, flexural rod having two opposing end portions received within the narrow portion of each pear-like member to connect the members in spaced-apart relationship, the rod having an axial length substantially several times longer than the axial length of the tapered portion.

4,712,793

WEIGHT MAXIMIZER

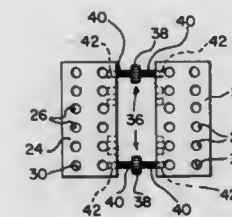
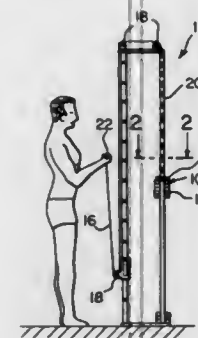
Milton C. Harwick, 3205 S. 3rd St., Whitehall, Pa. 18052, and George Spector, 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Mar. 14, 1986, Ser. No. 839,639

Int. Cl.⁴ A63B 21/06

U.S. Cl. 272-118

6 Claims



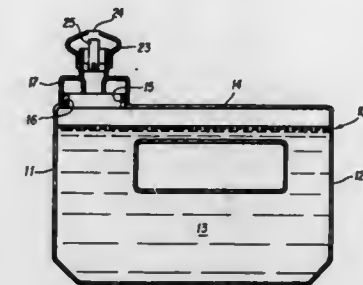
1. A weight adjustable base unit for a weight lifting device of the type having adjustable weights connected to one end of a cable, the cable trained over various pulleys on a frame and a handgrip connected to other end of the cable, said base unit comprising:

- (a) a pair of base plates, each said plate having two sides and a plurality of holes therein;
- (b) a clamp holding device being at least one turn bolt having two reverse threaded shafts to threadably engage within edges of said pair of base plates having holes to secure said base plates together;
- (c) two-sided adhesive tape secured on one tape side to one side of each of said base plates and on said other tape side to the top of the uppermost of said adjustable weights; and
- (d) a plurality of cylinder shaped weights, each being detachably inserted in said holes of said base plates so as to more precisely adjust said weight lifting device.

4,712,794
JOGGERS FLUID WEIGHTED EXERCISER JUG
Gary W. Hall, 7316 Carver Rd., Modesto, Calif. 95356
Filed Oct. 6, 1986, Ser. No. 916,014
Int. Cl.⁴ A63B 11/00

U.S. Cl. 272-122

1 Claim



1. A joggers fluid weighted exerciser jug comprising a base liquid reservoir, front and rear liquid risers upstanding from and in fluid connection with said reservoir, a hollow handle connecting said front and rear liquid risers at their tops, primary cap means carried by one of said liquid risers upstanding from said hollow handle substantially normal thereto and having an upper and lower annular groove, a fluid dispensing cap having a dispensing opening and being carried by said primary cap means, spider means comprising a solid dowel upstanding therefrom carried by said primary cap means and positioned for said solid dowel to seal the dispensing opening in said fluid dispensing cap when said dispensing cap is in the down sealed position, and cap retaining means between said primary cap and said dispensing cap for locking said caps relative to one another between a sealed and dispensing condition along the axis of said dowel, said retaining means comprising an annular lip about the periphery of said dispensing cap resiliently movable between upper and lower annular grooves on said primary cap to open and close said fluid dispensing cap, said dispensing cap being shaped to fit within the mouth and behind the teeth of a user whereby said dispensing cap may be axially displaced to open and close said jug for removal of contents while jogging.

4,712,795

GAME RACKET

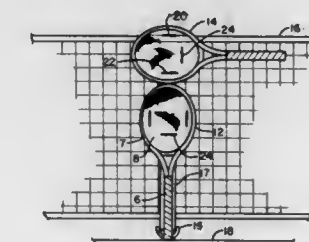
An Wang, Bedford Rd., Lincoln, Mass. 01730

Filed May 29, 1986, Ser. No. 868,836

Int. Cl.⁴ A63B 49/00

U.S. Cl. 273-73 R

13 Claims



8. A tennis racket for playing tennis, the racket comprising a head supporting strings and a handle extending from the head along a handle axis, the head having a free end located away from the handle and the handle having a free end located away from the head, the handle and head defining a racket length, the racket having at least one prominent, linear mark thereon which is parallel to or perpendicular to the handle axis and which is isolated from like marks so as not to be confused with other like marks, the mark defining, relative to an end or side edge of the racket, a measurement length which runs perpen-

dicular to the linear mark, the measurement length being equal to the difference between 36" and the racket length.

4,712,796

DEVICE FOR OBTAINING SUBSETS FROM A FIELD OF CHARACTERS

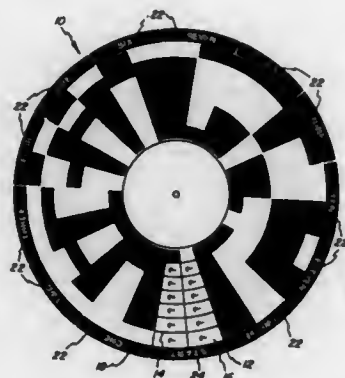
Alan Reiss, Rexford, N.Y., assignor to World Gaming Consultants, Hingham, Mass.

Filed Feb. 18, 1986, Ser. No. 830,455

Int. Cl.⁴ A63B 71/06

U.S. Cl. 273—148 R

1 Claim



1. A device for generating a plurality of subsets from a prechosen field of characters comprising:

- a first circular, substantially transparent surface having a designated area for recording a field of characters, said designated area having a plurality of spaces aligned in at least two adjacent rows extending outwardly toward the perimeter of the device, said spaces closer to the periphery being larger than those spaces further from the periphery;
- a second circular surface lying beneath and in registry with respect to said first surface, said surfaces being rotatable with regard to each other, said second surface having a plurality of marked segments each of which is adapted to correspond to the designated area of the first surface as the surfaces are moved, one of said segments rendering visible all the characters in the designated area, the other segments having portions which correspond to respectively different arrays of spaces of the designated area and obscure some of the characters while allowing the characters in the spaces which do not correspond to the obscuring portions to remain visible, said designated area and segments corresponding to each other such that aligning the designated area over each segment provides a visible array of distinct subsets of equal size.

4,712,797

GOLF PUTTER WITH SIGHTING DEVICE

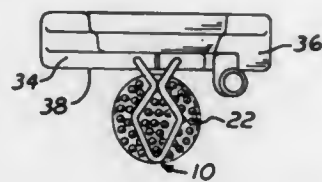
John G. Kovalchek, Clearwater, Fla., assignor to Fore-Sight Golf, Inc., Clearwater, Fla.

Filed Dec. 15, 1986, Ser. No. 941,665

Int. Cl.⁴ A63B 53/04, 69/36

U.S. Cl. 273—163 R

8 Claims



1. A sighting device and golf putter in combination comprising

- (a) a golf putter having a flat front face and a top surface mounting ridge,
- (b) a continuous length wire made of rust resistant metal or stiff plastic formed to enclose a space above a golf ball juxtaposed to the front face of the putter, and
- (c) the wire further formed to present a pair of legs at right angles to the plane of the enclosed space and the legs being integral with the putter through their location in a corresponding pair of downward descending holes in the mounting ridge.

4,712,798

GOLF PUTTER

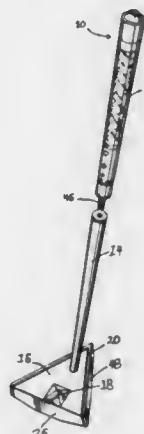
Mario Preato, 7514 E. Granada Rd., Scottsdale, Ariz. 85257

Filed Mar. 4, 1986, Ser. No. 835,983

Int. Cl.⁴ A63B 53/16, 53/06

U.S. Cl. 273—164

10 Claims



1. A golf club for use in putting, comprising:

- a polycarbonate club head member having a generally triangular shape in plane and having a top surface, a bottom surface and a plurality of side surfaces, at least one of said side surfaces further comprising a striking surface for contacting a golf ball, said bottom surface further having a pair of angled surfaces, each of said angled surfaces having a downward slope from a bottom portion of one of said side surfaces toward a central portion of said bottom surface;
- adjustable weighting means for varying the weight of said golf club, firmly affixed to said club head member;
- aiming means for permitting a golfer to aim said golf club at a golf ball;
- a shaft firmly engaged with said club head member for allowing a golfer to swing said club member; and
- means for permitting a golfer to grasp said shaft.

4,712,799

MULTI-SCREEN VIDEO GAMING DEVICE AND METHOD

Walter C. Fraley, Carlsbad, Calif., assignor to Edwards Manufacturing, Inc., Ontario, Calif.

Continuation of Ser. No. 655,350, Sep. 27, 1984, abandoned. This application Apr. 10, 1986, Ser. No. 851,278

Int. Cl.⁴ A63F 9/22

U.S. Cl. 273—138 A

16 Claims

1. In a video slot machine displaying plural movable symbol sequences stopped by the machine to indicate the result of a gaming attempt, the improvement comprising:

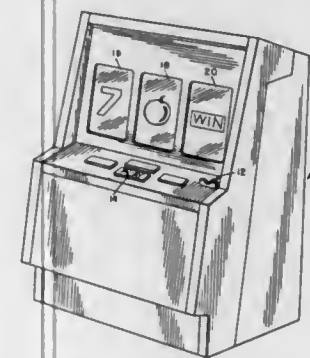
- a plurality of adjacently-disposed video monitors, each responsive to a respective sequence of video symbol signals for providing a corresponding movable symbol sequence in a raster-scanned format in which multi-line video frames are consecutively displayed;
- microprocessor means responsive to a gaming attempt on said video slot machine for randomly determining a plu-

ality of stopping symbols at which to stop the movements of a plurality of movable symbol sequences and, for each of said randomly determined symbols, generating a sequence of starting addresses in which the value of a starting address is incremented by a predetermined amount once each video frame to produce the next starting address of the sequence;

a plurality of reel address storage circuits, each including a counting circuit which responds to a respective sequence of starting addresses by incrementally counting from a starting address value in the sequence at a predetermined rate for the duration of at least one of the lines of a respective video frame, and a storage device containing a set of first address portions stored in a predetermined order which provides a respective first address signal sequence including a string of first address portions in response to said incremented counting;

an addressable symbol memory in which signals corresponding to a plurality of symbols are stored and which responds to said first address signal sequence and to a second address signal sequence by providing respective sequences of video symbol signals, each of said video symbol signal sequences including video symbol signals stored at symbol memory locations addressed by the combination of a respective first address sequence and said second address signal sequence; and

synchronizing and address means connected to said video monitors, said microprocessor means, and said reel ad-



dress storage circuits for time-synchronizing said starting address sequences and said first address signal sequences to the raster-scanned format of said video monitors and for providing said second address signal sequence in time-synchronism with the raster-scanned format of said video display means.

10. A method for displaying a plurality of apparently-rotating symbol sequences on a set of adjacent, raster-operating video display devices included in a video slot machine having an addressable symbol memory, in which each symbol sequence is displayed in a raster-scanned format consisting of consecutively-displayed multi-line video frames on a respective one of said video display devices in response to a sequence of video symbol signals, comprising the steps of:

- storing plural sets of video symbol signals in addressable storage space in said symbol memory, each of said sets corresponding to a respective video symbol;
- generating a plurality of respective first address portion sequences at a first rate synchronized with the raster-scan operations of said video display devices, each of said first address portion sequences corresponding to a specific sequence of symbols;
- generating a second address portion sequence at a second data rate synchronized with the raster-scan operations of said video display devices, said second address portion sequence including a succession of second address portions which, when combined with a respective first address portion sequence, produces a symbol memory address sequence that defines a predetermined succession of

video symbol signals stored at correspondingly-addressed locations in said symbol memory;

combining each of said first address portion sequences with said second address portion sequence to produce a plurality of symbol memory address sequences; and

providing said plurality of symbol memory address sequences to said symbol memory to produce a plurality of corresponding video symbol signal sequences synchronized with the raster-scan operations of said video display devices.

4,712,800

SPLIT ELASTOMER RING FOR REPAIRING POTHEADS AND PROCESS OF REPAIRING A POTHEAD THEREWITH

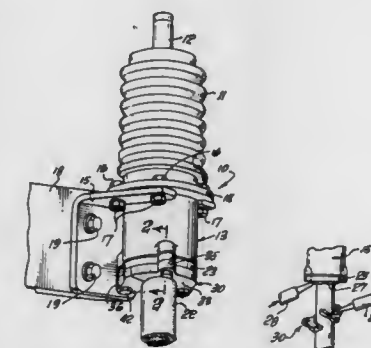
Roy E. Johnson, 12308 Aegean St., Norwalk, Calif. 90650

Filed Dec. 15, 1986, Ser. No. 941,322

Int. Cl.⁴ H02G 1/00, 15/23; F16J 15/00

U.S. Cl. 277—1

9 Claims



1. A process for sealing the base of a pothead without the necessity of disconnecting the electrical cable therein, said pothead being of the type having a sealing plate on the bottom thereof surrounding the cable extending from the base of the pothead and wherein said sealing plate is held to the body of the pothead by a plurality of bolts, said method comprising the steps of:

- applying a silicone sealant in and around the area where the cable enters the sealing plate;
- removing all bolts which hold the sealing plate to the base of the pothead body;
- twisting open an elastomeric split ring and placing said ring around the cable below the area to which the elastomeric sealant has been applied; and
- moving the split ring upwardly and securing the split ring to the base of the body of the pothead.

4,712,801

SEALING GASKET ASSEMBLY

Sigurd Kaller, Blästadgatan 111, S-582 62 Linköping, Sweden
PCT No. PCT/SE86/00050, § 371 Date Sep. 15, 1986, § 102(e)
Date Sep. 15, 1986, PCT Pub. No. WO86/04656, PCT Pub.
Date Aug. 14, 1986

PCT Filed Feb. 5, 1986, Ser. No. 916,512

Claims priority, application Sweden, Feb. 5, 1985, 8500515

Int. Cl.⁴ F16J 15/46, 15/56

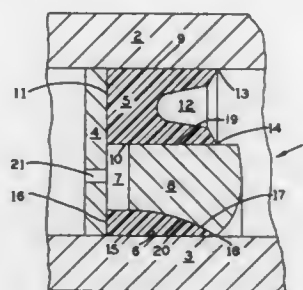
U.S. Cl. 277—71

7 Claims

1. A sealing assembly operable between a first cylindrical component and a second cylindrical component, which first and second components are telescopically displaceable relative to each other, said gasket comprising:

- an annular flange being stationary relative to one of said first and second cylindrical components, which annular flange includes a vent passage therethrough;
- a first sealing ring;
- a second sealing ring separated from said first sealing ring at

a fixed distance, which first and second sealing rings cooperate to define a space therebetween;
 an annular piston mounted and operable in said space, which space is vented between said annular flange and said annular piston by said annular passage vent;
 one of said first and second sealing rings positioned in proximity to said first cylindrical component, said one sealing ring having a generally rectangular configuration in cross-section and defining an annular surface contacting said annular flange and an opposite surface away from said annular flange, a first and a second radially-viewed cylindrical boundary surface, and, a groove which extends toward said annular flange from said opposite surface, first and second sealing lips being formed, respectively, between said groove and said first and second cylindrical boundary surface;
 the other of said first and second sealing rings having a radially-viewed cylindrical boundary surface, said other ring cylindrical boundary surface sealingly contacting



said second cylindrical component, which second cylindrical component moves relative to said sealing assembly, said other sealing ring further including an annular surface contacting said annular flange and a sloped surface extending between said annular surface contacting said annular flange and said cylindrical boundary surface and terminating in cross-section at a sharp point at said cylindrical boundary surface distal from said annular flange;
 said annular piston having a generally wedge-shaped cross-section with a cylindrical boundary surface to contact at least a portion of the cylindrical boundary surface of the sealing ring in proximity to said first component adjacent a sealing lip and having a curved form boundary surface conforming to said sloped form of the sealing ring in proximity to said second component, said annular piston of a material relatively harder than said sealing rings and movable in said space toward said annular flange to maintain said first and second sealing rings in sealing contact with said first and second components.

4,712,802

SEALING WASHERS FOR HEADED FASTENERS

George D. Hewison, Aldershot, and Terence E. Harris, Reading, both of Great Britain, assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 27, 1986, Ser. No. 844,790

Claims priority, application United Kingdom, Apr. 1, 1985, 8508477

Int. Cl.⁴ F16J 15/12; F16B 43/00

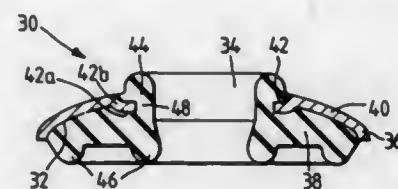
U.S. Cl. 277-212 C

9 Claims

1. A sealing washer comprising an apertured metal backing member, a sealing member of resilient material abutting one face of the backing member forming a laminate therewith, and a shoulder of resilient material abutting the opposite face of the backing member and integral with the sealing member by a connecting portion extending axially through the aperture whereby, in use, a headed fastener may be assembled to the sealing washer with a shank of the fastener extending through the aperture,

characterized in that, when considered in any plane including the axis of the aperture, the backing member includes

an outer rimmed portion, an intermediate domed portion whose concave surface contacts the sealing member, and an inner depressed portion having first and second parts, the first part of the depressed portion extending more perpendicularly than the second part to the axis of the aperture for assisting in resisting transverse spread of the



shoulder during use of the sealing washer and indicator means in the form of an outer rib is provided on that face of the sealing member for pressing against a workpiece whereby, during use of the sealing washer, the outer rib is urged outwardly to become at least equal in diameter to the rimmed portion when a correct load setting is achieved.

4,712,803

COLLAPSIBLE SAILBOARD DOLLY

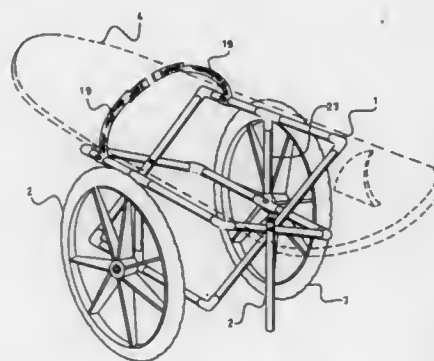
Joseph T. Garcia, 20336 Anza Ave., #35, Torrance, Calif. 90503

Filed Aug. 8, 1986, Ser. No. 894,620

Int. Cl.⁴ B62B 1/12

U.S. Cl. 280-47.13 B

2 Claims



1. A sailboard dolly comprising a frame, a stand and two wheel assemblies: said frame being collapsible in a scissors-like fashion forming a relatively flat package; said wheel assemblies being independently mounted on either side of said frame; said frame being made of light weight tubing; said frame shape, size and construction being such that a sailboard may be transported supported near its edges in a manner to minimize possible damage to the board surface, while the dolly wheelbase and length of the horizontal members provide stability and avoid tipping; said stand being for preventing the sailboard dolly from tipping on end when the dolly is stationary said frame comprising an inner frame assembly, an outer frame assembly, two telescoping support assemblies, and two pivot bolt assemblies; said telescoping support assemblies being pivotally fastened at one end to said inner frame assembly, and pivotally fastened at the other end to said outer frame assembly, so that when said frame is opened fully, said telescoping assemblies hold said inner and outer frame assemblies in a rigid frame structure capable of supporting a sailboard; said inner frame assembly and said outer frame assembly being identically shaped and sized parallelogram assemblies, except that said inner frame assembly is shorter in width so that it can rotate freely at a fixed point inside said outer frame assembly; said rotation point being determined by said two pivot bolt assemblies said bolt assemblies fastening said inner frame assembly to

said outer frame assembly; said inner and outer frame each comprising two end braces; two horizontal members each comprising two cross braces and a first and second tee section, four corner elbows and two pivot rods, said inner and outer frame assembly components being joined by gluing and a press fit; said end braces each having a hole drilled through at the center point of its length to accommodate said pivot bolt assemblies; said pivot rods having a smaller diameter than the inside diameter of said cross braces, and having two holes drilled in them to accommodate a rivet; said cross braces each having a hole drilled through them to match the position of the rivet holes in said pivot rods, which are located inside said cross braces; said stand being fastened to said frame by one of said pivot bolt assemblies, allowing said stand to be rotated when necessary; said inner and outer frame assemblies being pivotally fastened to each other by said pivot bolt assemblies and also by said telescoping support assemblies, so that said frame can open fully in an 'X' shape, or close flat in scissors-like fashion.

4,712,804

ARTICLE CARRIER

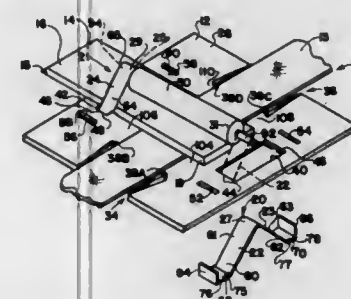
Eddie Harrison, Jr., 2177 N. Stocker St., Pomona, Calif. 91767

Filed Feb. 7, 1986, Ser. No. 827,090

Int. Cl.⁴ B62B 3/02

U.S. Cl. 280-47.13 R

11 Claims



1. An article carrier for cooperation with a strap secured to an article to be moved comprising:
 a base member having a first side and a second side;
 a plate having a first end and a second end;
 a first inverted V-shaped member and a second inverted V-shaped member each defining a proximal leg and distal leg extending from an apex;
 said first inverted V-shaped member and said second inverted V-shaped member being spaced apart on said base member to enable said first end and said second end of said plate to engage and be slidably received between each of said proximal leg and said distal leg of said first and of said second inverted V-shaped members;
 a handle with a first end and a second end;
 said first end of said handle and said second end of said handle releasably secured to said apex of said first inverted V-shaped member and said apex of said second inverted V-shaped member, respectively, thereby extending between each said V-shaped member;
 said plate having a first side and a second side;
 said proximal leg and said distal leg of each said first and said second inverted V-shaped members being attached to said base member to enable said first end of said plate and said second end of said plate to engage and be slidably received between said proximal leg and said distal leg of each said inverted V-shaped member; and
 said proximal leg and said distal leg of each said inverted V-shaped member being flexible to enable said strap to pass between said first side of said base member and said second side of said plate and to enable said plate to exert pressure upon said strap and said first side of said base member upon tensioning said handle in use.

4,712,805

FLEXIBLE MOUNTING FOR SPLASH/SPRAY CONTROL GUARDS AND THE LIKE

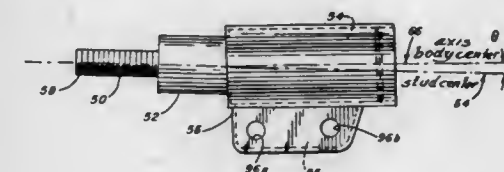
Russell G. McMillen, c/o Suntron Corporation, P.O. Box 11426, Fort Wayne, Ind. 46858

Filed Mar. 13, 1986, Ser. No. 839,439

Int. Cl.⁴ B62D 25/16

U.S. Cl. 280-154.5 R

21 Claims



1. A flexible mount for resiliently securing a first member to a second member wherein the first member can be deflected from an equilibrium position relative to the second in response for an applied force and wherein the first member returns substantially to the equilibrium position once the applied force is removed, comprising:

an elongate stud having a center axis and means disposed at one end of the stud for securing the stud to the second member; and

a body of elastomeric material encapsulating and joined to the other end of the elongate stud, the body including a body center axis disposed at an angle other than 0° with respect to the stud center axis and second means for securing the first member to the body wherein the body of elastomeric material includes a cylindrical main body portion and wherein the second securing means includes a tab extending outwardly from the cylindrical main body portion.

4,712,806

GIROCYCLE

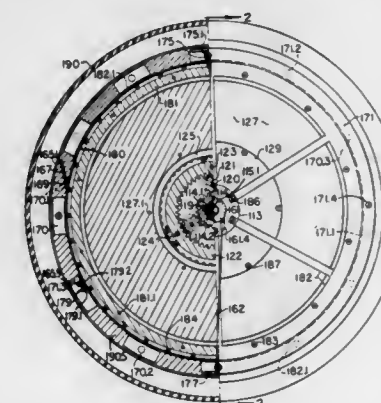
Raymond A. Patrin, P.O. Box 306, Queens, N.Y. 11372

Filed May 28, 1986, Ser. No. 867,641

Int. Cl.⁴ B62M 1/00

U.S. Cl. 280-217

20 Claims



1. A wheel assembly for a vehicle having an axle fixedly mounted thereon, comprising
 an inner wheel rotatably mountable on the axle, said inner wheel having a surface, said inner wheel adapted to be imparted a rotational forward motion,
 an outer wheel mounted centrally and concentric, peripherally around said inner wheel and rotatably relative thereto,
 said outer wheel having an outermost surface adapted for riding contact with the ground and having an inner surface operatively engaging said surface of said inner wheel,

said inner surface and said surface of said inner wheel constituting operatively engaging surfaces, the distance of said operatively engaging surfaces from said outermost surface is substantially smaller than the radius of said operatively engaging surfaces, whereby said inner wheel makes substantially relatively close contact with the ground through said outer wheel, a flywheel-gyro mounted centrally and concentric to and rotatable by said inner wheel and rapidly rotatably relative thereto, engaging means for selectively releasably engaging said outer wheel and said inner wheel and said flywheel-gyro for joint rotation.

4,712,807

VEHICLE ACTIVE SUSPENSION SYSTEM INCORPORATING ACCELERATION DETECTING MEANS

Ryuichi Kurosawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

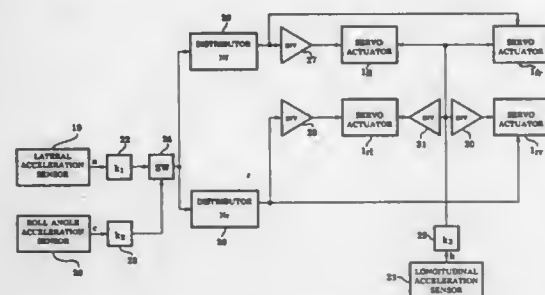
Filed Feb. 5, 1986, Ser. No. 826,320

Claims priority, application Japan, Feb. 6, 1985, 60-021522; Dec. 26, 1985, 60-295943

Int. Cl.⁴ B60G 17/00

U.S. Cl. 280—707

12 Claims



1. A suspension system for a vehicle comprising a body and a plurality of wheels, comprising:
 - a plurality of actuators, each of which supports said body from one of said wheels and is controllable to provide a variable force between said body and said wheels;
 - a sensor means for detecting acceleration of said body in lateral directions thereof and for producing a signal representative thereof;
 - a sensor means for detecting roll angle acceleration of said body and for producing a signal representative thereof; and
 - a control means for inputting said signals representative of said lateral acceleration and said roll angle acceleration of said body from said sensor means, for calculating based thereupon fluctuations in load acting between said wheels and said body caused by said accelerations, and for controlling said actuators to increase or decrease forces provided thereby between said body and said wheels, wherein said control means comprises a means for:
 - (a) detecting whether or not the direction of lateral acceleration of said body as determined by said lateral acceleration detecting means is the same as or is the opposite to the direction of roll acceleration of said body as considered for a point above the center of gravity of said vehicles; and for:
 - (b) if said directions are the same, calculating, based upon said signal representative of said roll angle acceleration of said body from said sensor means therefor, fluctuations in load acting between said wheels and said body caused by said acceleration, and based thereupon controlling said actuators to increase or decrease forces provided thereby between said body and said wheels; and for:
 - (c) if said directions are opposite, calculating, based upon said signal representative of said lateral acceleration of

said body from said sensor means therefor, fluctuations in load acting between said wheels and said body caused by said acceleration, and based thereupon controlling said actuators to increase or decrease forces provided thereby between said body and said wheels.

4,712,808

HOT MELT ADHESIVE COMPOSITION FOR BOOK HINGE JOINT

Eric Beh-Forrest, Doylestown, Pa., and Thomas P. Flanagan, Green Brook, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 19, 1986, Ser. No. 831,245

Int. Cl.⁴ B42D 1/00

U.S. Cl. 281—15 R

12 Claims

1. A process for the formation of hinge joints on bound book blocks comprising the steps of applying a molten film of a hot melt adhesive to the outer sheet of each side of the book block on an area immediately adjacent the bound edges and for a length substantially coterminous with the bound edges; applying a cover thereto and exerting pressure on the book cover in the area of the hot melt film wherein the hot melt adhesive is a pressure sensitive adhesive composition comprising:

- (a) 20 to 35% by weight of an A-B-A-B-A-B block or multi-block copolymer where the A component is styrene and the B component is butadiene or hydrogenated butadiene; and wherein the styrene is present in an amount of at least 28 parts per 100 parts copolymer;
 - (b) 45 to 70% by weight of a compatible tackifying resin;
 - (c) 5 to 30% by weight of a plasticizing oil;
 - (d) 0 to 5% by weight of a petroleum derived wax; and
 - (e) 0.1 to 2% by weight of a stabilizer.
4. A book produced by the process of claim 1.

4,712,809

METHOD AND DEVICE FOR ASSEMBLING SEVERAL COMPONENTS, PARTICULARLY CONNECTION FITTINGS FOR FLUID COUPLINGS

André Legris, Rennes, France, assignor to Société Anonyme Stylé Legris, Rennes, France

PCT No. PCT/FR84/00108, § 371 Date Dec. 18, 1984, § 102(e) Date Dec. 18, 1984, PCT Pub. No. WO84/04069, PCT Pub. Date Oct. 25, 1984

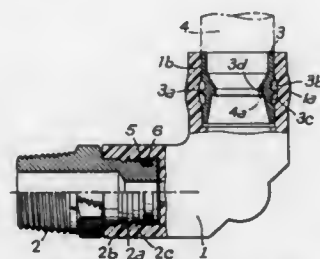
PCT Filed Apr. 18, 1984, Ser. No. 694,459

Claims priority, application France, Apr. 18, 1983, 83 06306

Int. Cl.⁴ F16L 13/14

U.S. Cl. 285—21

11 Claims



1. A method of forming a stress-free, fluid tight, swivelable joint between members of different hardness for fluid coupling said members, said method comprising the steps of:
 - (a) force fitting the harder of said members having a projecting ridge and adjacent groove into an opening in the other of said members, thereby locally deforming and stressing a portion of said opening opposing said ridge;
 - (b) rotating the harder of said members at a speed sufficient to cause melting of at least some material of the locally deformed and stressed portion of said opening, whereby the melted material flows into said adjacent groove forming a fluid tight joint assembly without bonding said mem-

bers, whereby said members are operable to swivel relative to each other.

11. A stress-free assembly comprising:

- a body formed from a first malleable material of a first hardness, said body having a generally cylindrical opening therein;
- a generally cylindrical connecting member formed from a second material of a second hardness greater than said first hardness, said connecting member being sized to force fit into said opening;
- said connecting member having an annular ridge, a first annular groove adjacent said annular ridge and a second annular groove spaced from said annular ridge, said annular ridge having a slightly larger diameter than said opening to locally deform a portion of said opening when force fit therein;
- a sealing member disposed in said second annular groove; said connecting member being shaped to receive means for rotating said connecting member relative to said body to thereby melt said locally deformed portion of said opening whereby the melted first material flows into said first annular groove, said body connecting member forming a stress-free, swivelable assembly essentially without bonding or welding said first and second materials.

4,712,810

QUICK ACTION SELF-LOCKING PIPE FITTINGS

Gian C. Pozzi, Via Concordia, 4, 21040 Menzago di Sumirago (VA), Italy

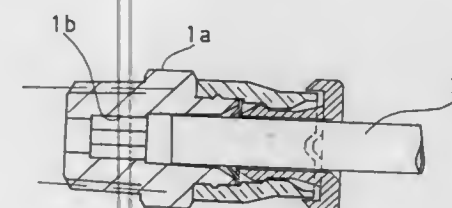
Filed Nov. 24, 1986, Ser. No. 933,818

Claims priority, application Italy, Nov. 25, 1985, 83626 A/85

Int. Cl.⁴ F16L 35/00

U.S. Cl. 285—93

9 Claims



1. A quick action, lockable and releasable fitting for connecting a pipe or tube to a coupling body, said fitting comprising a hollow body having at least a nipple, said nipple having an internal truncated cone surface with the major base facing towards the external opening of said nipple making a leakproof seal with an end of a pipe when the latter is pushed inside said nipple, and an external cylindrical surface provided with at least a collar and terminating in a rim;

an elastic anchoring washer placed on said rim of said nipple and provided with a plurality of claws projecting radially inward from its inner circumference and long enough to be elastically flexed towards the interior of the coupling by said pipe and to abut against the external surface of said pipe preventing it from being pulled out;

a sleeve having a seat in the internal surface thereof and adapted to be forceably snapped-on said nipple until said collar on said nipple is received in said seat, the internal surface of said sleeve being further provided with a first step blocking said elastic washer against said rim of said nipple, and with a second step;

a plug having a crown and a tubular appendix terminating in a collar and having a central cylindrical hole of diameter sufficient to permit passage of said pipe through the plug, said plug by means of said appendix being forceably snapped into said sleeve by forcing said collar of said tubular appendix beyond said second step of the internal surface of said sleeve a distance such that the crown of the plug remains outside the sleeve;

cooperating means in said plug and in said sleeve for allowing or preventing an axial displacement of said plug with

respect to said sleeve by rotating the plug, by means of said external crown, between at least two distinct angular positions in such a way that, when in a first angular position, said plug may advance towards the interior of said sleeve until the rim of said tubular appendix flexes elastically the claws of said washer further towards the interior of the fitting parting said radially projecting claws and freeing said pipe so that it may be pulled out, and, when in a second angular position, said plug is backed out and prevented from being pushed further inside said sleeve and said claws abut against the external surface of said pipe at an angle such as to prevent withdrawal of said pipe.

4,712,811

CONNECTOR AND A METHOD OF CONNECTING PIPES

Jan H. Wier, Bursfield, Bulls, New Zealand

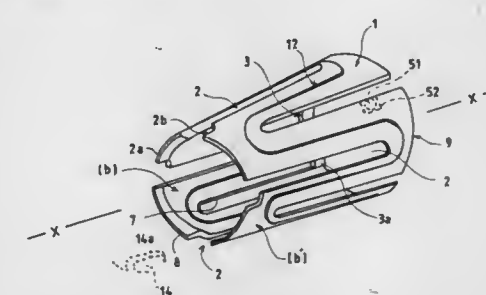
Filed Sep. 30, 1985, Ser. No. 781,784

Claims priority, application New Zealand, Sep. 28, 1984, 209718

Int. Cl.⁴ F16L 17/02

U.S. Cl. 285—113

14 Claims



1. A releasable connector comprising:
 - a connector body having an opening at one end;
 - a tapered bore extending inwardly in said connector body from said opening and increasing in diameter from said opening inwardly;
 - a substantially coaxial inner sleeve of plastics material positioned in said tapered bore having a substantially frusto-conical shape with inner and outer ends, said outer end being nearer said opening;
 - an outer surface on said inner sleeve substantially complementary to said tapered bore;
 - a bore through said inner sleeve extending in the direction of the central axis thereof defining an inner surface having a rounded cross-sectional configuration substantially complementary to that of a connected member to be connected when inserted into said inner sleeve;
 - at least one substantially elongated slot through the wall of said inner sleeve extending from one of said ends of said inner sleeve and terminating short of the other of said ends so that said inner sleeve is pliable; and
 - circumferentially continuous sealing means on said inner and outer surfaces of said inner sleeve, said tapered bore and outer surface on said inner sleeve having relative sizes and said inner surface on said inner sleeve having a size relative to the connected member and being adapted so that when the connected member is inserted into said bore in said inner sleeve the connected member frictionally engages said inner surface and reverse movement of the connected member in the direction opposite to said direction of insertion displaces said inner sleeve into wedging and circumferentially continuous sealing and connecting engagement with said tapered bore and into circumferentially continuous sealing and connecting engagement with the connected member for sealingly connecting the connected member in said connector body.

4,712,812

UNIVERSAL FITTINGS

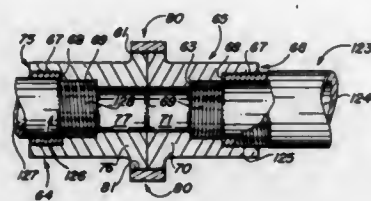
Joseph W. Weir, III, 311 E. Forsythia St., Ore City, Tex. 75683

Filed Sep. 2, 1986, Ser. No. 902,790

Int. Cl.⁴ F16L 25/00

U.S. Cl. 285—177

2 Claims



1. A universal union fitting for attachment to threaded and unthreaded pipes having different diameters, said universal fitting comprising a first body portion and a first central bore provided in said first body portion; at least two axial first sleeves having successively decreasing diameters provided in stepped relationship in one end of said first body portion, said first sleeves communicating with said first central bore; a first flange provided on the opposite end of said first body portion from said first sleeves and first threads provided on said first flange; a second body portion and a second central bore provided in said second body portion; at least two axial second sleeves having different diameters provided in stepped relationship in one end of said second body portion, said second sleeves communicating with said second central bore; a second flange provided on the opposite end of said second body portion from said second sleeves and second threads provided on said second flange; and a threaded nut disposed between said first body portion and said second body portion for engaging said first threads and said second threads and removably joining said first body portion to said second body portion.

4,712,813

COUPLING APPARATUS

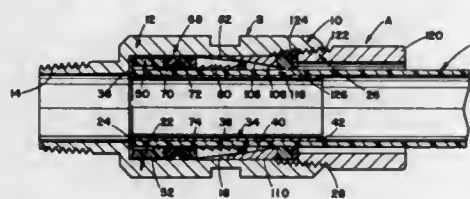
David P. Passerelli, Geneva, and Danny G. Rogge, Dorset, both of Ohio, assignors to Perfection Corporation, Madison, Ohio

Filed Oct. 28, 1986, Ser. No. 924,050

Int. Cl.⁴ F16L 33/18

U.S. Cl. 285—250

15 Claims



1. A stab-type coupling apparatus comprising:
a body having a recess defined therein, said recess having axially spaced inner and outer ends;
an elongated hollow stiffener received in said recess having an outer peripheral dimension for defining a generally annular cavity with said body, said cavity adapted to receive an associated non-metallic pipe end;
an elastomeric first seal member received in said recess adjacent said inner end and adapted for sealing engagement between said body and an associated non-metallic pipe end;
a collet retainer disposed in said recess between said first seal member and recess outer end, said collet retainer having a generally tapered outer surface and a toothed inner surface;
a ring disposed in said recess having a generally tapered inner surface in facing, conforming relation with said collet retainer outer surface adapted to cam said collet

retainer inner surface toward engagement with an associated non-metallic pipe end; and
a gasket disposed in said recess between said collet retainer and said recess outer end, said gasket adapted to be compressed toward sealing engagement with an associated non-metallic pipe end.

4,712,814

COUPLING ARRANGEMENT

Tom Petterson, Box 19, S-452 05 Sydskoster, Sweden

PCT No. PCT/SE85/00210, § 371 Date Jan. 17, 1986, § 102(e)

Date Jan. 17, 1986, PCT Pub. No. WO85/05418, PCT Pub.

Date Dec. 5, 1985

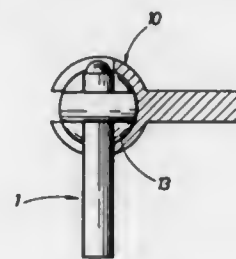
PCT Filed May 21, 1985, Ser. No. 833,386

Claims priority, application Sweden, May 21, 1984, 8402711

Int. Cl.⁴ F16L 37/26

U.S. Cl. 285—325

3 Claims



1. Coupling means comprising a first element having a main portion in the form of at least one disc having an outer spherical surface forming a surface of rotation and sides connected by means of said spherical surface, a shaft extending from one of said sides, and a second element having a cavity with an inner surface forming more than one-half of a spherical surface of rotation, said cavity having a diameter slightly larger than said surface of rotation of said first element, said cavity having an opening to allow the main portion of the first element to be inserted therethrough into the cavity, said opening being in the form of a first slot, said first slot being sized to correspond to the width of the main portion of the first element measured parallel to the axis of the shaft, and a second slot being sized to correspond to the width of the shaft so that the main portion of the first element can be introduced into the cavity by inserting it through the first slot with the shaft introduced into said second slot until the center of the spherical surface of the first element coincides with the center of the spherical surface in the cavity of the second element, whereby the first and second elements can be locked to each other by turning the main portion of the first element in the cavity as the shaft moves in the second slot so that the outer spherical surface is substantially out of alignment with said first and second slots.

4,712,815

METAL-TO-METAL WEDGE THREAD COUPLING CONNECTOR

Doyle E. Reeves, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Filed Oct. 2, 1984, Ser. No. 657,078

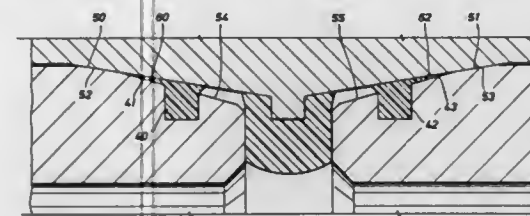
Int. Cl.⁴ F16L 15/04

U.S. Cl. 285—334

3 Claims

1. In a threaded connection comprising a short tubular coupling having two sets of internal threads that taper inwardly from opposite ends of the coupling toward the center to mate with external threads on pin ends of two axially aligned pipes, said threads of the coupling and the pin ends being dovetailed shaped in cross-section with the axial width of the internal threads of the coupling increasing in one direction and the axial width of the external threads on the pin ends increasing in the opposite direction so that thread flanks of both external and internal threads will engage as elongated wedges to form

metal-to-metal seals when the connection is made up fully, said threads further having roots and crests that are parallel to a longitudinal axis of the coupling that engage before the flanks engage when the connection is made up hand tight and that also form metal-to-metal seals when the connection is fully made up, the improvement comprising an internal projection



integral with the coupling and located between the two sets of threads and a resilient corrosion barrier ring having an external groove to receive the projection and hold the ring on the projection and which is compressed between tip ends of the pin ends of the pipes when the connection is made up fully to protect the metal-to-metal seals from corrosive fluids in the pipes.

4,712,816

AUXILIARY DOOR LATCH FOR CHILDREN'S SAFETY

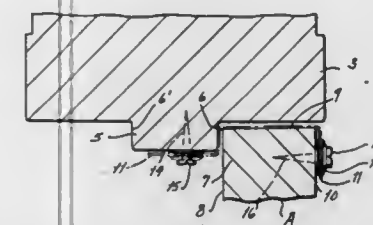
Theodore V. Mueller, 760 Preakness La., Florissant, Mo. 63033

Filed May 12, 1986, Ser. No. 861,980

Int. Cl.⁴ E05C 19/18, 3/04

U.S. Cl. 292—253

1 Claim



1. In combination with a door and a frame therefor, said frame having first and second opposed jambs and a header defining a door opening, said opposed jambs and header having outer and inner sides, said door having an outer face, an inner face, and first and second opposed side edges, means swingably mounting said second side edge of said door to said second jamb for optional opening and closing action of said door with respect to said door opening, said door being free on the first side edge thereof and with said first side edge being presented confrontingly toward said first jamb when said door is in a closed condition, said frame further having a jamb stop provided on said first jamb, said jamb stop having a central portion projecting into said door opening and an outer and an inner shoulder, said outer shoulder being presented a distance from the outer side of said first jamb for receiving the door therebetween when closed whereby the inner face of said door approximate the free edge thereof will be in confronting relationship with the door stop outer shoulder, an auxiliary door latch for maintaining said door in closed condition for assuring security comprising a first mounting member secured upon said jamb stop between said outer and inner shoulders and having a head projecting spacedly from said jamb stop into said door opening, a second mounting member secured upon and projecting outwardly of said outer face of said door proximate the free side edge thereof, and an independent latching element detachably interengaging said first and second mounting members for securing said door against accidental opening comprising an elongated, narrow, thin, flat, tape-like, latching element being free at opposite ends thereof and fabricated of flexible, durable material said latching element conforming to the contouring developed by the outer face of said door, the

free side edge of said door, the outer shoulder of the jamb stop, and the central portion of said jamb stop when the door is in closed condition, said latching element being in a non-interfering disposition between the jamb and the door free edge and the jamb stop outer shoulder and door inner face, said latching element having an opening provided adjacent, but spacedly from, each end thereof, said latching element openings being of predetermined cross section with the heads of said first and second mounting members projecting therethrough placing said latching element in an operative condition.

4,712,817

DOOR LATCH ASSEMBLY, IN PARTICULAR FOR AN AUTOMOBILE VEHICLE

Richard Grandjean, Saint Die, France, assignor to Compagnie Industrielle de Mecanismes en abregé C.I.M., France

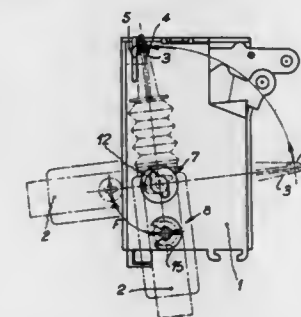
Filed Jul. 14, 1986, Ser. No. 885,123

Claims priority, application France, Jul. 19, 1985, 85 11115

Int. Cl.⁴ E05C 13/10

U.S. Cl. 292—336.3

4 Claims



1. A door latch assembly for an automobile vehicle comprising:
a latch cover having a rectangular box configuration and an upper wall having a cavity in said latch cover and said latch cover being constructed to provide a plurality of hollow boss means projecting above said upper wall and fixed to said upper wall;
a locking actuator mounted on said latch cover;
anchoring means securing said locking actuator to a corner of the upper face of said latch cover;
said locking actuator including a carriage having an elastic portion;
a crank lever including a tab located in the cavity of said latch cover adapted for pivotal movement in the corner below the upper wall of said latch cover;
a first stud integral with said locking actuator having a circular center portion and wings on each side of said center portion, said wings and circular center portion being adapted to be introduced into the opening at the top wall of said first boss;
a second stud integral with said actuator having a center portion and wings adapted to be fitted through the top wall of said second boss;
a plurality of cylindrically shaped boss means comprising a first hollow boss means secured to the upper wall of said latch cover, said first boss means having a top wall with an opening to receive said first stud and wings of said anchoring means and a second hollow boss means secured to the upper wall of said latch casing which is located below said first hollow boss means on said upper wall of said latch casing to receive a locking means;
said actuator being adapted to introduce said first stud into said first boss permitting the anchoring means to be placed in locked position and to introduce said second stud into said second boss by an angular movement of said actuator to the locking member, so that in one position the actuator can be withdrawn from said latch cover and in another

position the actuator may be retained on said latch cover whereby in the locked position the actuator is retained on said cover.

4,712,818

VACUUM MANIFOLD WITH QUICK CONNECT-DISCONNECT LATCH ASSEMBLY

Bradley N. Borgman, Riverside; Jerry W. Cramer, Upland, and Don E. Dossey, Montclair, all of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

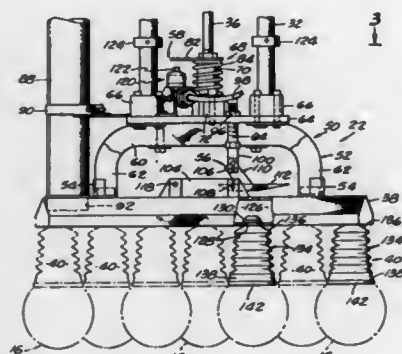
Division of Ser. No. 570,265, Jan. 12, 1984, Pat. No. 4,583,910.

This application Jan. 30, 1986, Ser. No. 824,245

Int. Cl.⁴ B65B 35/38

U.S. Cl. 294—64.1

2 Claims



1. In apparatus for picking up and transferring layers of round food articles, the apparatus including a movable carriage for positioning and shifting at least one movable pickup head, said at least one pickup head including a manifold adapted for connection with a vacuum source and an array of vacuum cups mounted on the manifold for engagement with the round food articles, the improvement comprising:

a mounting bridge connected to the carriage for said at least one pickup head,

multiple spaced apart brackets mounted on the at least one pickup head for engagement with said mounting bridge, a vacuum conduit in communication with the vacuum source and adapted for sealed communication with an opening in the manifold, and

latch means adapted for rapid connection and disconnection between the at least one pickup head and said mounting bridge whereby said at least one pickup head is rapidly replaceable upon the carriage with the at least one pickup head being secured by said latch means in a relative position precisely determined by said brackets, said latch means including a lever pivotally connected to one of said mounting bridge and the manifold, a ramp element being angularly affixed to said lever and including a notch along its ramp surface for engagement with a pin in the other of said mounting bridge and manifold, connector means being secured to said other of the mounting bridge and manifold, said connector means comprising means arranged in spaced apart relation for alternate engagement of said pin with said ramp element whereby said latch means is adapted for securing the at least one pickup head in one of a plurality of predetermined positions relative to said mounting bridge.

4,712,819

TOOL FOR LIFTING DOORS AND PANELS

Urban Pope, 168 E. Vista Ave., Daly City, Calif. 94014

Filed Jun. 7, 1982, Ser. No. 385,479

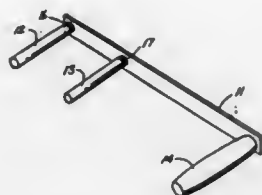
Int. Cl.⁴ B66F 15/00; B65G 7/12

U.S. Cl. 294—92

5 Claims

1. A tool for setting a door in a jamb, comprising an elongated arm comprising a flat bar of generally rectangular cross-section positioned between one side edge of the door and the

jamb and having a handle portion which projects outwardly on one side of the door, said elongated arm being of sufficiently narrow width to move freely between the door and the jamb when the door is installed in the jamb, and a pair of generally parallel fingers extending from the arm on opposite sides of the



door for gripping engagement with the door when the handle is lifted in a vertical direction, one of said fingers being threadedly attached to the bar and removable from the arm to permit withdrawal of the arm from between the door and the jamb when the door is installed.

4,712,820

DOCUMENT CARRIER

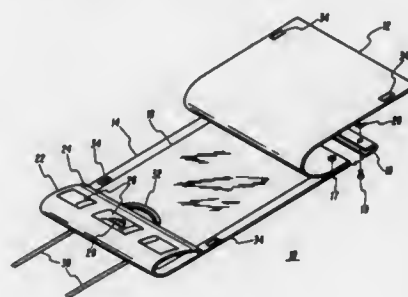
Robert Cartledge, McKinney, Tex., assignor to Shepard & Associates, Dallas, Tex.

Filed Nov. 14, 1986, Ser. No. 930,467

Int. Cl.⁴ G09F 3/18

U.S. Cl. 294—138

12 Claims



1. A document carrier for storing and transporting documents such as blueprints, comprising:

a pair of flaps of durable pliable material affixed at one end between which the documents are placed, one of said flaps being longer than the other so as to enable the free end to be placed over the documents when in an unrolled viewing state.,

at least one strap affixed to one of said flaps for binding said pair of flaps when in a rolled state, and

a strap handle affixed to one of said flaps for holding said pair of flaps when in a rolled state.

4,712,821

GRAIN BOX CLEANOUT DEVICE

James E. Scharf, Box 305, Perdue, Saskatchewan, Canada S0K 3C0

Filed Dec. 29, 1986, Ser. No. 947,376

Int. Cl.⁴ E01H 5/02; A62C 1/06; B05B 7/02

U.S. Cl. 294—19.1

14 Claims

1. A hoe or scraper for use in cleaning out grain from the lower rear corners of a dump truck box when in the dump position, said truck box including a substantially centrally located tailgate opening in the base of said tailgate assembly; said hoe or scraper comprising an elongated handle and a scraper blade secured by one end thereof and extending transversely upon either side of said handle, said handle being secured to said blade offset from the vertical axis of said blade,

thereby defining a minor portion of said blade extending upon one side of said handle and a major portion of said blade extending upon the other side of said handle, said major portion of said blade being arcuately curved for at least part of the



length thereof whereby the distal end of of such blade is situated closer to the other end of said handle than the point of attachment of said one end of said handle to said blade, said scraper being engageable through the associated tailgate opening and into either of the rear corners of said truck box.

4,712,822

SIGHT-TESTING AMBULANCE BUS

Antal János, Budapest, and Pojbics Jenő, Esztergom Rozetti, both of Hungary, assignors to Latszereszeti Eszkozok Gyara, Hungary

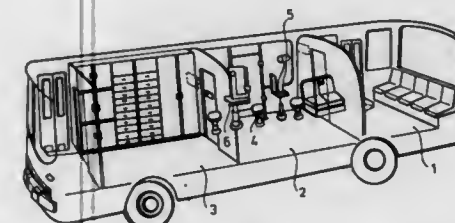
Filed Apr. 30, 1986, Ser. No. 857,856

Claims priority, application Hungary, May 3, 1985, 1695/85

Int. Cl.⁴ B60P 3/14

U.S. Cl. 296—24 R

4 Claims



1. Sight-testing ambulance bus, comprising an inner space including at least a sight-testing room and an optical workshop, said sight-testing room being equipped with vibration sensitive instruments required for performing ophthalmological procedures, said optical workshop being equipped with tools and control instruments required for manufacturing spectacles, at least one of said instruments which is sensitive against vibrations is mounted on a respective support plate (11) supported by support rods (12) having telescopically adjustable lengths and standing on a floor (9) of said bus, said floor (9) defining respective openings (22) under said rods (12) being releasably covered and uncovered, and in a parking position of said bus said rods (12) extending through said openings (22) and abutting the ground under said bus, and a spacing (20,21,22) is formed between said rods (12) and the openings of said spacing being larger than the amplitude of vibration of a part of the bus that takes place during use, whereby said part can not touch said rod through said spacing.

4,712,823

CUP HOLDER APPARATUS

Ronald E. Mills, Birmingham, and Peter J. Perry, South Lyon, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 5, 1986, Ser. No. 859,966

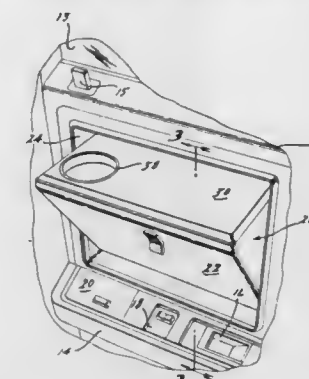
Int. Cl.⁴ B60R 7/04

U.S. Cl. 296—37.8

1 Claim

1. In combination with a vehicle body panel having an access opening, a cup holder apparatus mounted in said access

opening and movable between a stowed position generally parallel with said panel and an extended position projecting outside said compartment access opening, said cup holder apparatus comprising a housing having a frame surrounding said access opening and opposite generally vertically extending side walls positioned to extend to one side of said vehicle body panel, a cover member pivotally supported on a horizontal axis adjacent a lower edge of said housing, said cover member substantially closing said access opening when the cup



holder is in stowed position, a shelf member having a first edge hingedly mounted adjacent an upper edge of said cover member, said shelf being movably supported within slots provided in said vertical walls of said cup holder housing such that said shelf is within said housing and generally parallel with said vehicle body panel when the cup holder apparatus is in the stowed position, and generally in a horizontal position projecting outwardly from said vehicle body panel in the extended position of said cup holder apparatus.

4,712,824

VEHICLE BACK-SEAT

Michel S. Naert, Vastra Frolunda, Sweden, assignor to AB Volvo, Goteborg, Sweden

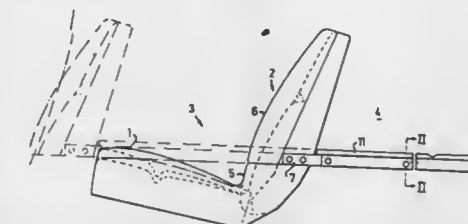
Filed Mar. 12, 1986, Ser. No. 839,023

Claims priority, application Sweden, Mar. 12, 1985, 8501225

Int. Cl.⁴ B60N 1/10

U.S. Cl. 296—65 R

4 Claims



1. Back-seat in a vehicle, especially in a so-called station wagon with a cargo space behind the back-seat, comprising a seat-bottom and a seat-back, characterized in that at least an upper portion of the seat-back is mounted for horizontal displacement in an upright position relative to the seat-bottom between a rear normal upright position and a forward upright position in which the displaceable seat-back portion is situated at or in the vicinity of the forward edge of the seat-bottom.

4,712,825

SUPPORT ARM FOR THE TRUNK LID AND/OR THE HOOD OF A MOTOR CAR

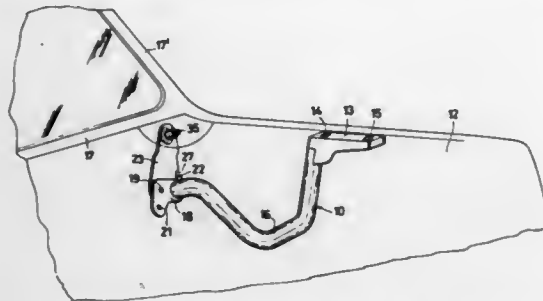
Renzo Braga, Milan; Renato Pasquali, Garbagnate Milanese, and Franco Mendicino, Arese, all of Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Nov. 7, 1986, Ser. No. 928,091

Claims priority, application Italy, Nov. 21, 1985, 23912/85[U] Int. Cl.⁴ B62D 25/10

U.S. Cl. 296—76

3 Claims



1. A supporting arm for the trunk lid or the hood of a motor car, said arm having a first part fastened to the trunk lid or the hood of the motor car, said arm having a second part which hinges said arm onto the bodywork of the same motor car, said second part of said arm comprising hinge linking means for hingeably attaching said arm and secured trunk lid or hood to the motor car whereby the trunk lid or the hood may open and close relative to the motor car, and said hinge linking means having manually disengagable lock means for releasing said hinge linking means to permit the trunk lid or the hood to be spaced away and apart from the rear windshield or the windshield respectively whereby the glass may be mounted in the motor car.

4,712,826

AUTOMOTIVE WINDOW AND MOLDING ASSEMBLY HAVING A DEVICE FOR MOUNTING A CORNER JOINT

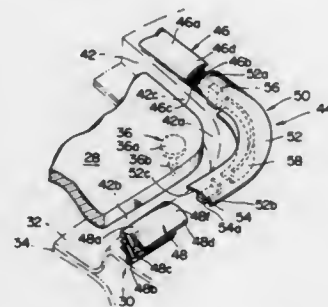
Kiyoshi Omori, Utsunomiya, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Dec. 24, 1986, Ser. No. 945,966

Claims priority, application Japan, Dec. 28, 1985, 60-299193 Int. Cl.⁴ B60J 1/02

U.S. Cl. 296—93

8 Claims



1. A window and molding assembly for mounting an automotive vehicle window, comprising:
a window glass having a corner portion;
a vehicle body having a flanged opening portion for receiving said window glass in such a manner as to provide a space between said window glass and said vehicle body; sealant-adhesive filling said space, said space having a corner portion located correspondingly to said corner portion of said window glass and a pair of elongated portions diverging from said corner portion of said space;
a window molding having a corner joint molding element

having a head portion extending between said window glass and said vehicle body to cover said corner portion of said space and an anchor portion inserted into said space, said anchor portion being L-shaped in cross section so as to cooperate with said head portion to clamp therebetween said window glass;
said window molding having a pair of elongated molding elements covering said elongated portions of said space and abutting said corner joint molding element;
said flanged opening portion of said vehicle body having a corner located correspondingly to said corner portion of said window glass and being formed with a hole at said corner thereof;
a support pin having at an upper end thereof a head portion supporting said corner portion of said window glass and a leg portion fitted in said hole of said flanged opening portion; and
adhesive means for adhesively attaching said corner portion of said window glass to said head portion of said support pin.

4,712,827

CONVERTIBLE CAR

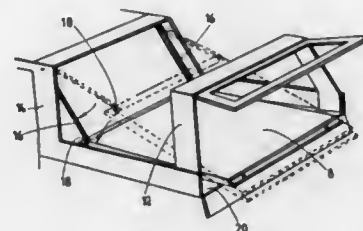
Jakob Jensen, Viborg, Denmark, assignor to Logicar A/S, Viborg, Denmark

Continuation of Ser. No. 860,046, May 6, 1986, abandoned, Continuation of Ser. No. 711,515, Mar. 6, 1985, abandoned. This application Feb. 17, 1987, Ser. No. 15,028

Claims priority, application Denmark, Jul. 6, 1986, 3119/83 Int. Cl.⁴ B60J 7/08; B62D 33/04

U.S. Cl. 296—99 R

4 Claims



1. A convertible car having a cabin, the rear part of which is convertible into an open platform section, the rear cabin portion being provided with a roof section convertible into a carrier platform, said roof section being releasable from a supporting engagement with a foremost and a rearmost cabin frame portion for being guidable downwardly in a carrier platform position, the rearmost of said cabin frame portions thereafter being forwardly displaceable into engagement with the foremost cabin frame portion, the roof section is connected with the foremost cabin frame portion by a pair of rod means telescopically held within the roof section and pivotally secured to said foremost frame portion, each of said rod means having a pivotal joint, which is withdrawn from within the roof section by rearward retraction of the roof section upon the rear end of the roof section having been released and swung down from the rear cabin frame portion, said pivotal joints being located so as to enable, upon their being withdrawn, said rod means to be downwardly pivotable for lowering of a front end of the roof section to the carrier position during concurrent forward displacement of the roof section, while the rear of the roof section is freely lowerable into engagement with support means at the desired carrier platform height.

4,712,828

CONVERTIBLE TOP APPARATUS FOR MIDENGINE AUTOMOBILES

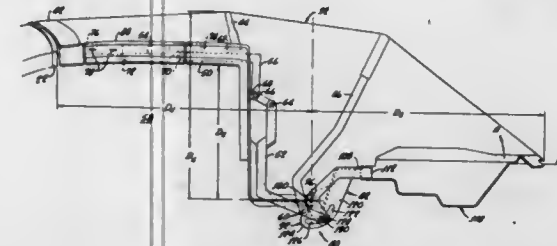
Leonard N. Albrecht, Irvine, Calif., assignor to California Auto Trends, Irvine, Calif.

Filed Nov. 7, 1985, Ser. No. 796,074

Int. Cl.⁴ B60J 7/12

U.S. Cl. 296—121

20 Claims



1. Convertible top apparatus for midengine automobiles having a forwardly extending engine compartment access opening and a forwardly extending rear deck lid for covering said opening, the convertible top apparatus comprising:

- a convertible top frame assembly configured for being foldable from an extended condition to a collapsed condition and unfoldable from the collapsed condition to the extended condition;
- a fabric convertible top covering configured for fitting over the top frame assembly when said assembly is in the extended condition;
- means for pivotally mounting forward regions of the rear deck lid to the automobile for pivotal movement of the deck lid between a closed condition in which the engine compartment access opening is closed and an open position in which said opening is uncovered; and
- lost motion connection means for mounting the top frame assembly to said means for pivotally mounting enabling concurrent pivotal motion of the deck lid and retention of the respective condition of the frame assembly.

4,712,829

SIDE MEMBER SUPPORT

Oskar Hurten, Cologne, and Hans Vogt, Overath, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

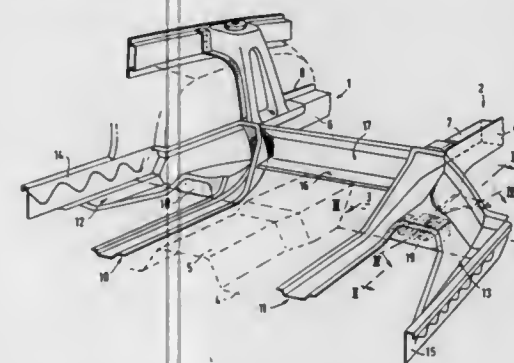
Filed Apr. 4, 1986, Ser. No. 848,059

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512213

Int. Cl.⁴ B62D 25/20

U.S. Cl. 296—203

2 Claims



1. Improved front side members for the front part of a self-supporting motor vehicle bodywork of the type in which the bodywork includes a floor panel having a tunnel and front side members positioned on opposite lateral sides of the tunnel and extending longitudinally of the vehicle inboard of sill members

of the vehicle, each improved front side member comprising laterally inner and outer side member panels arranged together to form:

- a front region in which:
the inner side member panel is formed to define a laterally outwardly opening U-shaped cross-section having vertically extending weld flanges; and
the outer side member panel is formed to define a flat cross-section abutting the adjacent inner side member panel weld flanges;
- a fork region in which:
the inner side member panel is formed to reorient the weld flanges away from the vertical position abutting the outer side member panel; and
the outer side member panel is formed to extend laterally outwardly in V-shaped cross-section; and
- a rear region in which:
the inner side member panel is formed to define an upwardly opening U-shaped section having horizontally extending weld flanges secured to the floor panel; and
the outer side member panel is formed to define vertically opening U-shaped cross-sections and having weld flange portions for attachment to the floor panel and the vehicle sill members; and
a reinforcing panel is secured to the outer side member panel proximate its point of attachment to the floor panel.

4,712,830

FOLDING CHAIR COMPRISING QUICK UNLOCKING MEANS

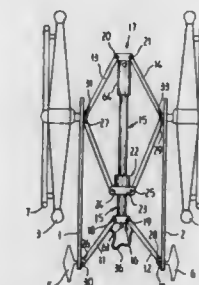
Jean-Jacques Charbrol, Gironde, and Jean-Pierre Lambert, Indre-et-Loire, both of France, assignors to Composites Aquitaine S.A. and Etablissements Poirier S.A., both of Paris, France

Filed May 5, 1986, Ser. No. 859,580

Claims priority, application France, May 6, 1985, 85 06842 Int. Cl.⁴ A61G 5/00

U.S. Cl. 297—42

4 Claims



1. In a folding chair comprising means for holding the chair in the opened out position, which are foldable, means for locking said holding means in the opened out position, which comprise a hollow bar, a slide mounted for sliding on said bar and coupled to said holding means so as to prevent said holding means from folding up against when said holding means occupies an end position along the bar, and for allowing folding when said holding means leaves said end position and slides along said bar, means for locking said slide in said end position and means for unlocking said slide, said unlocking means comprise a rod, mounted in said hollow bar and longitudinally slidable therein for movement on the chair so as to be able to be brought into a position in which said unlocking means cooperates with said locking means for unlocking said slide, said means for locking said slide comprise a retractable stud carried by said slide and being projectable inside said bar through an opening disposed in line with said end position of said slide, said rod having an end arranged for pushing said stud out of said bar when said rod is moved along the bar.

4,712,831

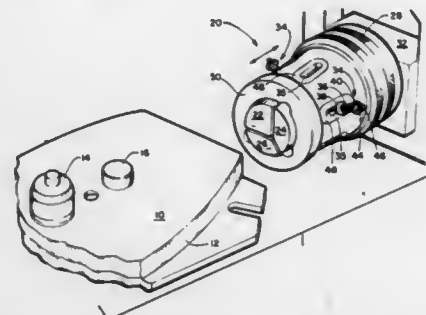
JAW ALIGNMENT PIN FOR A STRETCH JAW CHUCK
Everett L. Stoneman, San Diego, Calif., assignor to Robr Industries, Inc., Chula Vista, Calif.

Filed Jan. 12, 1987, Ser. No. 2,246

Int. Cl.⁴ B23B 31/10

U.S. Cl. 279—123

9 Claims



1. A pin assembly for maintaining a jaw portion in a predetermined position within a translatable jaw housing of a stretch jaw chuck, said jaw housing having a bore therein and said chuck housing having a plurality of spaced apart elongated openings, the elongation of the openings extending in the direction of movements of said jaw portion with the chuck housing and comprising:

- a bushing with a central aperture therethrough with an inner bottom exterior surface thereon carried by each jaw portion;
- a pin having a first end insertable through one of said slotted openings in said chuck housing and through said central aperture in said bushing for removable locking engagement with said bottom exterior surface of said bushing and a second end extending outwardly from said slotted opening; and
- a bias means carried by said pin and located intermediate said slotted opening and said second end for maintaining pin locking engagement with the bottom exterior surface of said bushing.

4,712,832

COVER, PARTICULARLY FOR VEHICLE SEATS
Adriano Antolini, Via Santucci, 58; Rodolfo Morigi, Via Fiume Abbandonato, 136, and Giancarlo Saviotti, Via Savini, 31, all of 48100 Ravenna, Italy

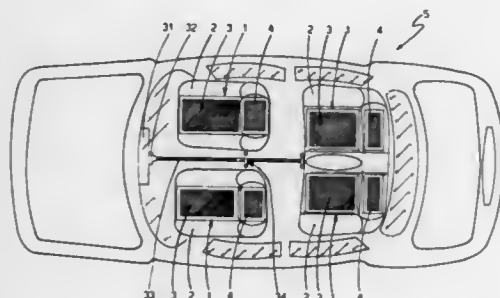
Filed Jun. 24, 1986, Ser. No. 877,921

Claims priority, application Italy, Jun. 24, 1985, 3470 A/85; Jul. 8, 1985, 4950/85[U]

Int. Cl.⁴ A47C 7/72

U.S. Cl. 297—180

12 Claims



1. A cover for seats used in vehicles or the like for channeling air at a desired temperature to an occupant's body, comprising:

- (a) a first outer layer for being positioned adjacent the body of an occupant of the vehicle;

- (b) a first inner layer extending substantially parallel to said outer layer;
- (c) a first intermediate layer positioned between said first outer layer and said first inner layer;
- (d) said intermediate layer including a plurality of interwoven members welded together and forming a substantially honeycomb-shaped structure permitting free circulation of air therethrough and sturdy support for the occupant's body;
- (e) said intermediate layer including upper and lower substantially planar surfaces;
- (f) means for securing said substantially planar upper surface to said outer layer; and
- (g) means for securing said substantially planar lower surface to said inner layer.

4,712,833

SEAT CUSHION FOR PREVENTING SLOUCHING OF AN INFANT OR WEAKENED ADULT

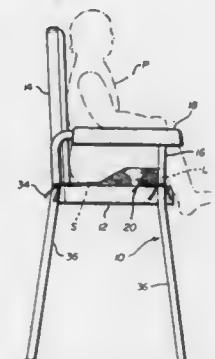
Elrod H. Swanson, Des Plaines, Ill., assignor to Swanson Brothers, Inc., Elk Grove, Ill.

Filed Oct. 16, 1986, Ser. No. 919,369

Int. Cl.⁴ A47C 31/00

U.S. Cl. 297—219

14 Claims



1. For use with a chair having a seat with spaced forward and rearward edges, an improved cushion adapted to be removably secured to the chair so as to cover most of the seat, said cushion comprising the combination of

- a padded member having a bottom and a top, and having front, rear and opposed side edges extended therebetween; the bottom of said padded member being generally flat; and the top of said padded member having generally flat forward and rearward portions meeting between the front and rear edges, and being angled relative to one another; the angled rearward top portion of the padded member further being angled relative to the bottom of the padded member, to define a wedge configuration pointing rearwardly toward, and having an apex at, the rear edge thereof;
- said padded member between the said front and rear edges being only slightly smaller than the chair seat between the said forward and rearward edges, and being sufficiently wide between the two side edges to extend beyond and underlie the legs and/or seat area of the person who will sit on the chair seat;
- means to removably hold the padded member on and secured relative to a chair seat: with the wedge configuration pointing rearwardly toward, but being only slightly spaced forwardly of, the rearward edge of the chair seat; and with the front edge located even with or only slightly rearwardly of the forward edge of the chair seat;
- so that a person may sit on the chair seat: with his/her seat area disposed closely adjacent the rearward edge of the chair seat, to be seated erect, and with his/her seat area disposed just rearwardly of and/or on the wedge configuration.

ration of the padded member; and with the forward portion of his/her seat area and part of his/her legs between the knees and seat area crossing over the rearward and forward top portions of the cushion; and the padded member having a firmness to withstand the weight of the person who will normally sit on the cushion and yet deform, but not to a dimension less than between approximately 10% and 40% that of the original dimension.

4,712,834

ADJUSTABLE SEAT CUSHION WITH TENSION LIMITING MEANS

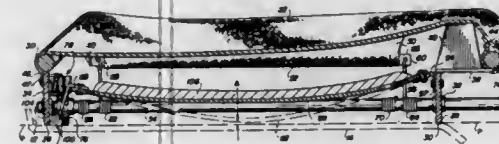
James C. Warrick, Tempe, Ariz., assignor to Simula, Inc., Phoenix, Ariz.

Filed Dec. 18, 1986, Ser. No. 943,169

Int. Cl.⁴ A47C 7/14; B64D 11/06, 25/04

U.S. Cl. 297—284

20 Claims



1. A bottom cushion for use in a seat of the type used when rapid vertical acceleration or deceleration could occur, said seat having a rigid seat pan, said seat cushion comprising:

- (a) a frame defining an opening;
- (b) subframe means below said frame and defining a plane below said frame which is coextensive with the seat pan of the seat when said bottom cushion is used therein;
- (c) a flexible membrane mounted in said frame to span the opening thereof and having a preloaded tension so that it will be deflected downwardly toward the plane of said subframe when an occupant sits on said bottom cushion;
- (d) adjustable tensioning means mounted in said subframe and connected to said membrane, said tensioning means having a latched state wherein it is operable for adjustably increasing the tension on said membrane to vertically and upwardly displace said membrane relative to the plane of said subframe and having a released state wherein any tension applied to said membrane by said tensioning means is removed; and
- (e) vertical displacement limiting means mounted in said subframe and interacting with said membrane and said tensioning means for placing said tensioning means in its latched state when said membrane is below a predetermined distance above the plane of said subframe and for placing said tensioning means in its release state when said membrane is above said predetermined distance.

4,712,835

CHAIR WITH SEAL SPRING MECHANISM

Rolf Völkle, Siemensstrasse 2, D-7298 Lössburg, Fed. Rep. of Germany

PCT No. PCT DE/00325, § 371 Date Sep. 12, 1986, § 102(e) Date Sep. 12, 1986, PCT Pub. No. WO86/03954 PCT Pub. Date Jul. 17, 1986

PCT filed Sep. 12, 1986, Ser. No. 919,263

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500932

Int. Cl.⁴ A47C 3/00

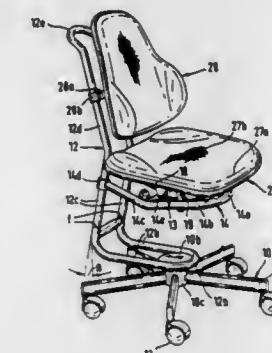
U.S. Cl. 297—304

18 Claims

- 1. A chair, especially for children and teenagers, comprising a seat having a knee-support area;
- a plurality of substantially horizontal legs extending radially from a vertical axis, said horizontal legs being provided with casters for resting said chair on a floor;
- a supporting frame secured to said horizontal legs, said supporting frame comprising
- a horizontally extending portion disposed close to said floor at a distance therefrom determined by the heights of said horizontal legs and said casters; and

a vertically extending portion having an adjustment section, the angle between the horizontally and vertically extending portions of said supporting frame being not greater than about 90°;

- a back-rest attached to the vertically extending portion of said supporting frame;
- a substantially horizontal support arm adjustably mounted on said supporting frame at the adjustment section thereof and extending toward the knee-support area of said seat, the height of said support arm above said horizontal legs being adjustable;
- a horizontal shaft pivotably mounted on said support arm and extending in the direction transverse to the direction in which said support arm extends, said horizontal shaft being located near the knee-support area of said seat and having a radial arm;
- a tiltable seat support member attached to said seat and to said horizontal shaft, said seat support member being



rotatable about said shaft through a predetermined swivel angle;

- a spring mechanism including a single helical tension spring, disposed substantially horizontally along a tension axis, having one end attached to the radial arm of said horizontal shaft and the other end to said support arm, said spring mechanism suppressing the tilting of said seat support member when said swivel angle is decreased and stimulating the tilting of said seat support member when said swivel angle is increased;
- detent means for limiting the magnitude of said swivel angle; and
- means for prestressing said helical tension spring, said means being adjustable as a function of the weight on said seat, whereby said swivel angle is limited to a predetermined middle range within the range determined by said detent means.

4,712,836

LEG REST FOR BELOW KNEE AMPUTEE

James R. Gerber, 1171 Ringling Ave., Johnstown, Pa. 15902

Filed Oct. 21, 1985, Ser. No. 789,662

Int. Cl.⁴ A47C 7/52

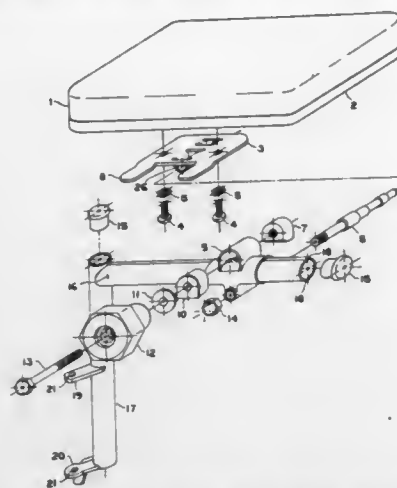
U.S. Cl. 297—429

4 Claims

1. An adjustable stump rest for attachment to a wheel chair suitable, when attached to said wheel chair, for use by below-the-knee amputees, said stump rest comprising, in combination:

- a stump rest panel;
- a vertical tube having situated thereon means for securing said tube to said wheel chair;
- a horizontal tube permanently attached to said vertical tube at or near the top thereof, said horizontal tube having at least one longitudinal ridge extending substantially the length thereof and one longitudinal ridge extending substantially the upper length thereof;
- a cylindrical sleeve slideably mounted on said horizontal tube, said sleeve having a transverse channel at the top thereof, said channel communicating with said horizontal tube, said channel adapted to receive and retain locking

means, said locking means when engaged with said tube and said upper ridge securing said sleeve to said horizontal tube;
said locking means comprising a knobbed clasp bolt, flanged clasp and opposing threaded flanged clamp, said clamps



mounted on said bolt and said clamps situated on a horizontal plane on opposing sides of said horizontal tube and said upper ridge; and
said sleeve further having attachment means situated thereon for securing said sleeve to said stump rest panel.

4,712,837

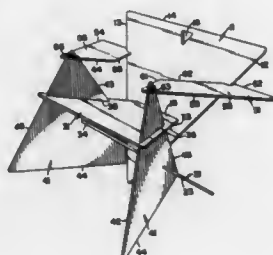
CHAIR WITH INTERLOCKING MULTIPLE COMPONENTS

Dennis N. Swilley, #12 W. Oak Bluff, Aubrey, Tex. 76227
Filed Oct. 9, 1986, Ser. No. 916,870

Int. Cl.⁴ A47C 4/00

U.S. Cl. 297-442

26 Claims



1. A chair capable of being assembled for use and disassembled for portability and storage, comprising:
first and second leg members;
a seat member interlockably connected to and between the leg members;
a back member removably and interlockably connected to the seat member;
an arm member comprising right and left-hand arm portions joined by an interconnecting section, the interconnecting section being removable and interlockably connected to the back member, and the right and left-hand arm portions being removably and interlockably connected to the first and second leg members, respectively;
and a seat support member disposed beneath the seat member, the seat support member being removably and interlockably connected to and between the leg members, and removably and interlockably connected to the back member, and the seat support member having a portion that engageably supports the underside of the seat member.

4,712,838

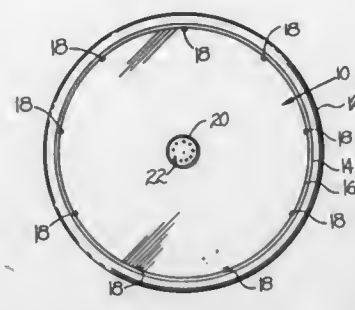
DEMOUNTABLE DISC COVERS FOR SPOKED WHEELS

Roger M. Berg, Beaverton, and Francis H. Scott, Washington County, both of Oreg., assignors to UNI-BMX, Inc., Aloha, Oreg.
Continuation of Ser. No. 811,503, Dec. 19, 1985, abandoned.
This application Feb. 19, 1987, Ser. No. 18,796

Int. Cl.⁴ B60B 7/04, 7/06

U.S. Cl. 301-37 SA

4 Claims



1. A demountable disc cover for a bicycle wheel having a rim, an axle, and a multiplicity of spokes interconnected therebetween, consisting essentially of:

- hoop means of substantially the circumference of said rim but fitting inside thereof, said hoop means being of relatively stiff springy material and having circumferential adjustment means therein;
- cover means of flexible material removably fitting over said hoop means and having:
 - an axial opening therein to receive said axle; and
 - a circumferential casing thereon;
- a loop of stretch cord of less length than said circumference threaded in said casing;
- a multiplicity of fastening means:
 - removably affixed to said spokes; and
 - removably holding said hoop means adjacent said rim.

4,712,839

VEHICLE BRAKING SYSTEM

Malcolm Brearley, Solihull, and Richard B. Moseley, Birmingham, both of England, assignors to Lucas Industries public limited company, Birmingham, England

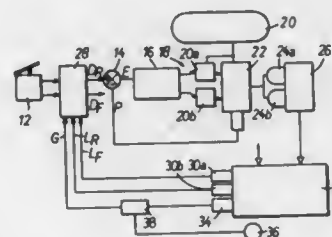
Filed May 30, 1986, Ser. No. 868,559

Claims priority, application United Kingdom, May 30, 1985, 8513686

Int. Cl.⁴ B60T 13/66, 13/74

U.S. Cl. 303-3

11 Claims



1. An electronically controlled braking system for a vehicle comprising:
(a) means for generating driver's braking demand signals for the vehicle brakes;
(b) means for generating electrical signals dependent upon dynamic vehicle load;
(c) means enabling the braking demand signals to be modified, individually for each axle of the vehicle, in dependence upon vehicle load measurements;
(d) means for sensing predetermined conditions of vehicle speed, braking level and vehicle operating gradient;

- means for generating a signal proportional to vehicle deceleration;
- means for generating a deceleration error signal by comparison of the driver's braking demand signal and measured actual deceleration; and
- means for generating an adaptive factor from said deceleration error signal and using same, under said predetermined conditions of vehicle speed, braking level and operating gradient, and over a number of vehicle stops, to correct the braking demand signals in order to compensate for long term deterioration of the brakes and to restore expected braking performance.

4,712,840

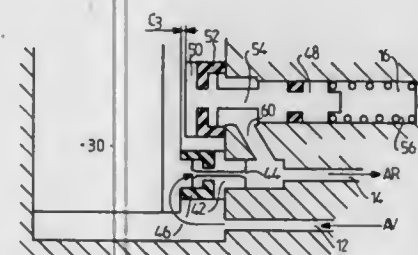
DECELERATION-RESPONSIVE BRAKING CORRECTOR

Jean-Jacques Carre, Le Raincy, France, assignor to Bendix France, Paris, France
Filed Jun. 9, 1986, Ser. No. 871,749
Claims priority, application France, Jun. 20, 1985, 85 09368

Int. Cl.⁴ B60T 8/28

U.S. Cl. 303-24 R

9 Claims



1. A deceleration-responsive braking corrector for a brake system of a vehicle, comprising a body having a chamber, an inlet connected to the chamber and intended to be connected to a pressurized fluid source, an outlet connected to the chamber and intended to be connected to brakes of the vehicle, characterized in that the corrector comprises a mass which is mounted slidably inside the chamber and movable in response to deceleration of the vehicle, a pressure responsive piston engaging and pushing the mass toward a rest position and forming a closure element for a shut-off valve of a nonrestricted first passage connecting the chamber with the outlet, and a by-pass second passage connecting the chamber with the outlet and having a restriction which bypasses the shut-off valve and which can be sealed off and closed by the mass when the mass moves in response to deceleration, so that closure of the shut-off valve and nonrestricted first passage is effected initially by means of the pressure responsive piston being displaced by pressure and sealing off closure of the restriction occurring sequentially thereafter and effected by the mass.

4,712,841

FAIL SAFE CIRCUIT FOR AN ANTI-LOCK BRAKING SYSTEM MODULATOR DRIVE

Jerry L. Cage, Granger, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 19, 1986, Ser. No. 932,120

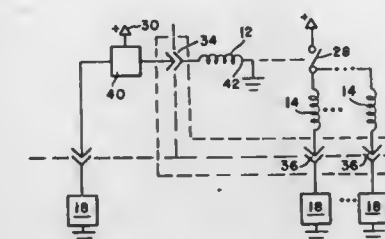
Int. Cl.⁴ B60T 8/88

U.S. Cl. 303-92

7 Claims

1. In an anti-lock braking system which includes sensor means coupled to the wheels of a vehicle to generate signals corresponding to the rotational behavior of said wheels, an electronic control unit connected to said sensor means to receive said signals and generate a plurality of control signals of first predetermined polarity in response to an incipient wheel lock condition, an electrical connecting means, at least one solenoid operated modulating valve connected to said electronic control unit through said connecting means for operation in response to predetermined ones of said control signals, a relay connected to said electronic control unit through said

connecting means and operative in response to a predetermined one of said control signals to connect said modulating valve to a source of operating potential, the improvement comprising a relay driver circuit connected between said electronic control unit and said connector means, said relay driver circuit generating a relay control signal in response to said



predetermined one of said control signals and of a polarity opposite said first predetermined polarity, one of said relay and said solenoids being electrically disabled in response to a short circuit between said connecting means and a source of said first polarity, the other of said relay and said solenoids being electrically disabled by a short circuit between the said connecting means and a source of said opposite polarity.

4,712,842

MOVABLE COMPUTER WORK PROCESSING SYSTEM

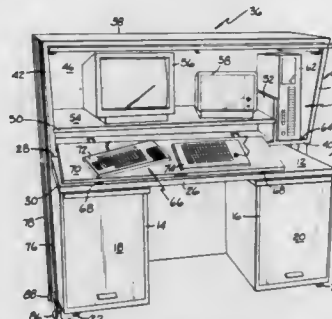
Macy J. Price, Golden; Mack E. Johnson, Littleton, and Norman J. Acker, Denver, all of Colo., assignors to Engineered Data Products, Inc., Broomfield, Colo.

Filed Nov. 7, 1986, Ser. No. 928,751

Int. Cl.⁴ A47B 21/03

U.S. Cl. 312-196

14 Claims



1. A computer work processing system comprising:
a generally flat top panel means for providing support means for work product material, said panel means having a front edge portion, a back edge portion and left and right side edge portions;
a pair of laterally spaced pedestal means for supporting said top panel means a distance above a fixed generally horizontal supporting surface area;
a movable computer work station unit having a plurality of support surfaces for supporting various components of a computer work processing system;
said support surfaces located in a housing having a bottom wall portion, a top wall portion, a back wall portion, two side wall portions and a front wall portion;
support means for supporting said bottom wall portion of said movable computer work station unit at a distance above said top panel means when said movable computer work station unit is moved to a position over a portion of said top panel means including said back edge portion;
said support means comprising a pair of spaced apart support members having upwardly extending support sections secured thereto;

each of said support sections having an upper portion secured to one of said side wall portions of said housing and a middle portion having at least a portion thereof opposite to either said left or right side edge portions; said at least portions being spaced apart a distance greater than the distance between said left and right side edge portions;

roller means on each of said support members for permitting movement of said movable computer work station unit over said top panel means to said position over a portion of said top panel means including said back edge portion;

a slidable shelf means mounted in said housing for permitting movement of said slidable shelf means between a closed storage position in said housing and an open position with a portion thereof supported on said top panel;

pivot means connecting said slidable shelf means to said housing for permitting pivotal movement of said slidable shelf means toward said top panel means and into contact therewith when said slidable shelf means has been pulled out of said housing to said open work position;

said pivot means cooperating with a portion of said top panel means to hold said slidable shelf means at a fixed location when in said open work position and at a slight angular relationship to said top panel means so as to maintain components of said computer work processing system placed thereon at a relatively fixed position; and

a surface portion on said slidable shelf means for supporting various components of said computer work processing system.

4,712,843

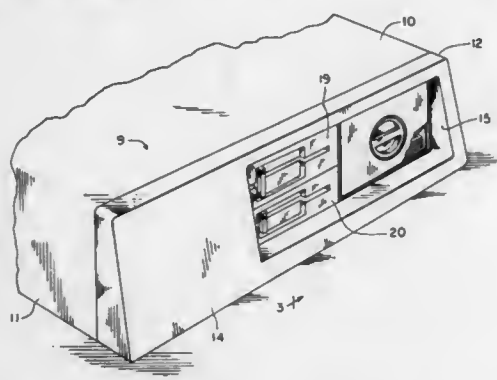
STORAGE BOX FOR PERSONAL COMPUTER INTERIOR

Joseph Q. Castelli, 1563 Glencrest Dr., San Jose, Calif. 95118, and Don L. Johnson, 19467 Dorchester Dr., Saratoga, Calif. 95070

Filed Jul. 14, 1986, Ser. No. 885,604
Int. Cl.⁴ A47B 63/00; B65D 85/57

U.S. Cl. 312-242

2 Claims



1. The combination of:

A computer having a cabinet including a compartment opening to the outside and enclosing a side panel for attachment of a disk recording device; and

a box sized to fit within said compartment and having a bottom and top wall, two side walls and one end wall thereby leaving one end open for access to said box interior;

means to fix said box to said cabinet side panel in a position with said open end facing outward from said cabinet and all the other walls fitting within the cabinet in place of said disk recording device; and

a cover for fitting over said box open end with means for attachment to said box thereby to form a closed storage compartment in said computer cabinet in place of a disk recording device.

2. The method of providing storage in a computer cabinet having an empty compartment normally housing a disk drive

held in by screws passing through a panel internal to the cabinet, said method comprising:

providing a box structure formed of four side walls and one end wall and having the approximate outside dimensions of the disk drive with one end open for access to the box structure interior;

inserting the box structure into said empty compartment with the open end facing outward of said cabinet;

fastening said box structure in said cabinet by passing screws through said panel and into said box structure; and

closing the open end of said box structure with a planar closure having means for attachment to said box structure wherein said means for attachment includes forming openings in two or more of said box structure walls and attaching movable planar tongues to said planar closure in position to enter said openings and hold the closure in the open end of the box structure.

4,712,844

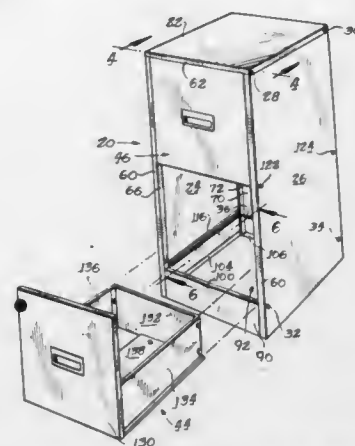
HOME FILING CABINET

John A. Fry, Lindenhurst, Ill., assignor to Quaker Industries, Inc., Antioch, Ill.

Filed Jun. 25, 1986, Ser. No. 878,295
Int. Cl.⁴ A47B 43/00

U.S. Cl. 312-265

20 Claims



1. An easily-assembled knock-down home filing cabinet comprising: a generally rectangular top panel; a pair of generally rectangular opposite side panels engaged at respective upper margins of said top panel in a parallel and spaced apart condition; and a plurality of elongate tie rod means spanning and joining said side panels intermediate areas thereof located generally adjacent respective corners thereof for maintaining the side panels in said parallel and spaced apart condition so as to define, with said top panel, a generally rectilinear cabinet for receiving at least one file drawer; each of said tie rod means comprising an elongate rod-like member having at least one threaded end; and a complementary mating threaded fastener for threaded engagement with each said rod threaded end and for engagement with an adjacent side panel; wherein each of said elongate rod-like members is threaded at both ends thereof and further including fastener-receiving means at each of the areas adjacent said four corners of said cabinet for receiving and engaging the respective mating fasteners; wherein said rod-like member opposite ends are both externally threaded, and wherein each of said mating fasteners comprises an elongate, tubular internally threaded portion for complementary engagement with one of said threaded rod ends and an enlarged head portion; said fastener-receiving means comprising aligned through apertures in said side panels for respectively receiving said tubular fastener portions therethrough with said fastener head portions engaging exterior surfaces of said cabinet about said through apertures.

4,712,845

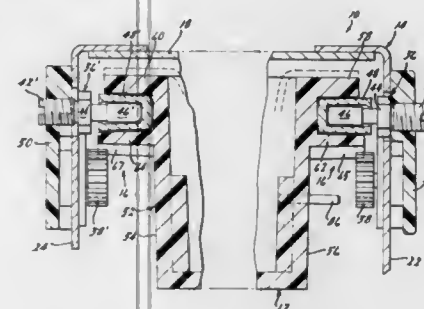
SELF-OPENING RECEPTACLE ASSEMBLY WITH ADJUSTABLE ROLLERS

Steven M. Nicol, Canton, Mich., assignor to NI Industries, Inc., Novi, Mich.

Filed Jan. 27, 1986, Ser. No. 823,033
Int. Cl.⁴ A47B 88/16

U.S. Cl. 312-319

4 Claims



1. A self-opening receptacle assembly comprising:

a housing adapted to be supportingly secured in a motor vehicle and having an opening at one end thereof;

a container assembly movably supported for movement inwardly and outwardly with respect to said housing through said opening, said container assembly including a closure member positionable in overlying relationship to said opening when said container assembly is in a closed position;

means defining a pair of elongated arcuately shaped guide channels provided on opposite lateral sides of one of said housing and said container assembly and projecting into the space between said container assembly and said housing, said channels including first and second spaced substantially parallel surfaces and an inner end wall extending between said first and second surfaces;

a plurality of axially adjustable elongated rollers positioned in an arcuate spaced relationship on each of the opposite lateral sides of the other of said housing and said container assembly;

said rollers being received within said arcuate guide channels and cooperating therewith to provide the sole support for and to guide inward and outward arcuate movement of said container assembly with respect to said housing, each of said rollers being axially adjustable to enable accurate alignment of said closure member with respect to said housing and to assure free and easy movement of said container assembly inwardly and outwardly of said housing and including a generally cylindrical surface engageable with one of said first and second surfaces and an end surface engageable with said end wall at a substantially point contact;

biasing means operative to urge arcuate movement of said container assembly outwardly with respect to said housing; and

releasable latch means for retaining said container assembly in said closed position.

4,712,846

CONNECTOR APPARATUS

Frank B. Bardsley, Andover, and Alec B. Sycha, Wokingham, both of United Kingdom, assignors to Gearhart Tesel Limited, Basin Gstone, England

Filed Sep. 12, 1985, Ser. No. 775,740
Claims priority, application United Kingdom, Sep. 14, 1984, 8423300

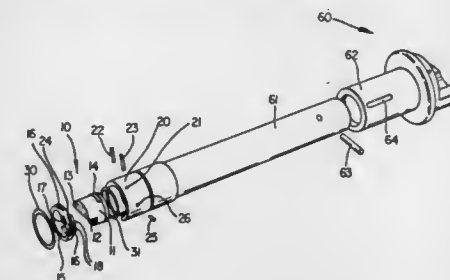
Int. Cl.⁴ H01R 13/518

U.S. Cl. 439-33

14 Claims

1. A connector for making electrical connection between electrical conductors in a first connector casing and electrical conductors in a second connector casing, the first and second

connector casings being mutually engageable in one orientation only by relative axial movement, which connector comprises a first connector assembly located in the first connector casing and a second connector assembly located in the second connector casing, the first and second connector assemblies comprising respectively first and second connector bodies matable one with another by relative axial movement in a single rotational orientation only, first and second rigid support means engaging the first and second connector assemblies respectively, each of said rigid support means including a ring



surrounding the respective connector assembly wherein each of said connector assemblies includes at least one outwardly extending engagement portion and each ring includes part cylindrical flange means for engaging said at least one engagement portion of the respective body to prevent relative rotation between the associated connector assembly and the rigid support means, and means locating the first and second rigid support means in the first and second connector casings respectively to prevent relative axial and rotational movement therebetween, the arrangement being such that the locating means make no direct engagement with the connector assemblies.

4,712,847

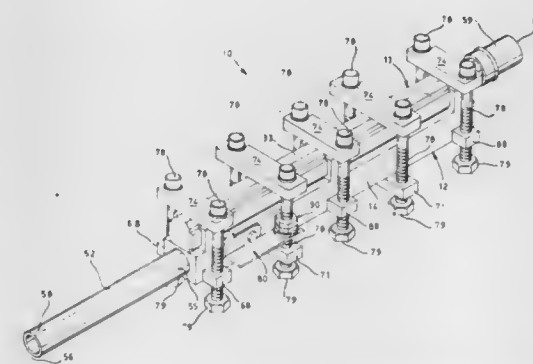
ELECTRICAL CONNECTOR

Brook L. Hunter, Knoxville; Joseph W. Rizzio, Knox County, both of Tenn., and Marvin L. Ward, Warminster, Pa., assignors to Technology for Energy Corporation, Knoxville, Tenn.

Filed May 7, 1986, Ser. No. 860,455
Int. Cl.⁴ H01R 13/621, 13/635

U.S. Cl. 439-155

16 Claims



1. An improved electrical connector for releasably connecting a first plurality of electrical wires with a second plurality of electrical wires, which comprises:

a first connector half having

a. a first elongated housing having two end walls, two oppositely disposed side walls, and a bottom wall to define a first elongated wire cavity for receiving said first plurality of electrical wires, said first cavity defining a first elongated opening, said first housing having an aperture in one

- of said end walls for routing said first plurality of electrical wires into said first cavity,
- b. a first plurality of lug members extending outwardly from one of said side walls of said first housing, and a second plurality of lug members extending outwardly from the other of said side walls oppositely disposed from said first plurality of lug members, each of said lug members provided with a threaded receptor,
 - c. a pin insulator, defining inner and outer surfaces, mounted in said first opening whereby at least a selected portion of said inner surface of said pin insulator is accessible from said first cavity, and
 - d. a plurality of connector pins mounted through said pin insulator in a selected pattern whereby ends of said first plurality of electrical wires can be secured to ends of said pins within said first cavity;
- a second connector half having
- a. a second elongated housing having two end walls, two oppositely disposed side walls, and a bottom wall to define a second elongated wire cavity for receiving said second plurality of electrical wires, said second cavity defining a second elongated opening, said second housing having an aperture in one of said end walls, oppositely disposed from said aperture in said first housing, for routing said second plurality of electrical wires into said second cavity,
 - b. a socket insulator, defining inner and outer surfaces, mounted in said second opening whereby at least a selected portion of said inner surface of said socket insulator is accessible from said second cavity, and
 - c. a plurality of connector sockets mounted through said socket insulator in a pattern complementary of said selected pattern of said connector pins whereby ends of said second plurality of electrical wires can be secured to ends of said connector sockets within said second cavity;
- a gasket member for being secured between said first connector housing and said second connector housing; and locking means for releasably locking together said first and second connector halves with said connector pins being received in said connector sockets, said locking means having
- a. a plurality of swing away clamp members equal in number to lug members of said first plurality of lug members, each of said clamp members provided with a hole therethrough proximate one end thereof and with an edge slot proximate a second end, said clamp members for engagement with said bottom wall of said second elongated housing,
 - b. a first plurality of bolt members each received through one of said holes in said clamp members and threadably received in said threaded receptors of said first plurality of lug members, and a second plurality of bolt members threadably received in said threaded receptors of said second plurality of lug members, each of said second plurality of bolt members releasably receiving in one of said slots of said clamp members whereby threading said first and second plurality of bolts into said threaded receptors of said connector pins with said connector sockets and compression of said gasket between said connector halves.

4,712,848

EDGE BOARD CONNECTOR WITH POSITIVE BOARD LOCK

Richard Edgley, Elmhurst, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Apr. 17, 1986, Ser. No. 853,314
Int. Cl.⁴ H01R 9/09

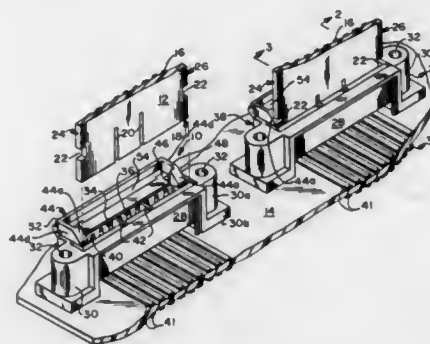
U.S. Cl. 439—327

3 Claims

1. A connector for electrically connecting circuits on mother and daughter printed circuit boards, said connector including an elongate dielectric housing with a cavity formed along its length with an opening for receiving said daughter board mating edge and defining opposed front and rear walls in said housing, a plurality of terminals mounted in the housing,

each terminal having one end adapted to engage a daughter board circuit and another end adapted to contact a mother board circuit, means on the housing for mounting the connector to said mother board, and latch means formed on the housing for releasably securing said daughter board to said connector,

the improvement comprising:
said daughter board including a plurality of latch-receiving cut-outs disposed near said mating edge;
said integral latch means being a latch assembly including a corresponding plurality of resilient vertical arm members spacedly disposed within the cavity, each vertical arm member hingeably connected to said rear wall having a



forwardly extending latch tab adapted to be received within a cut-out of the daughter board and a manipulable actuator opposite the tab, said actuators being mechanically interconnected by an integrally formed bail bar, said bail bar being disposed outside of the housing in parallel spaced relation to said rear wall to define a tool receiving gap therebetween, said latch assembly being moveable between a normal closed vertical position wherein said tabs are received within said cut outs and a release position wherein said tabs are retracted from said cut-outs, whereby said latch assembly is actuatable by rearward movement of said bail bar from a closed position to a release position to permit insertion or withdrawal of said mating edge into the cavity through said opening.

4,712,849

DEVICE CONNECTING THE SHIELDING OF PLUGS TO A SUBRACK GROUND

Peter Seidel, Groebenzell; Leo Pelzl, Holzkirchen, and Karl Zell, Niederpoecking, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,862

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1985, 3524670

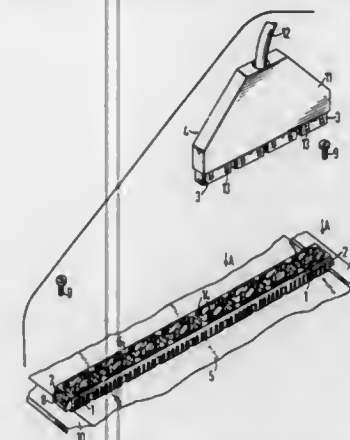
Int. Cl.⁴ H01R 13/648

U.S. Cl. 439—607

10 Claims

1. A mechanism for connecting the shielding of a plug of a multi-pole plug connector to the grounded potential layer of a subrack, whereby the plug partially immerses into a plurality of individual passages of a centering strip during the plugging operation, comprising: a metallic, electrically conductive layer being applied to the lateral faces of said passages; said shielding of the multi-pole plug being provided with a plurality of spring elements which resiliently press against said metallic layer of the lateral faces in the plugged condition of the plug said spring

elements being received in recesses in the lateral faces of said passages; and means electrically connecting the metallic layer



of the individual passages to one another and to the grounded potential layer of the subrack.

4,712,850

TERMINAL STRIP WITH ATTACHED SUPPORT AND METHOD OF MANUFACTURE

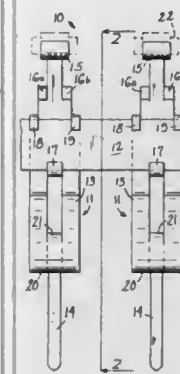
Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corp., Flushing, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,924

Int. Cl.⁴ H01R 11/22

U.S. Cl. 439—861

4 Claims



1. A terminal strip comprising:
a plurality of edge clips having upper and lower ends adapted respectively for attachment to contact pads on a circuit-bearing board, and to another circuit component each of said clips having been formed in a stamping process and having a body portion;
upper and lower bendable tabs stamped from said body portion and projecting laterally therefrom; and
an elongate support bar of non-conductive material and of a uniform cross-section along its length, the support bar being crimped to said clips by said tabs during the stamping process, and serving to support the clips in predetermined position for subsequent attachment to circuit components.

4,712,851

POSITIONING ALIGNMENT APPARATUS AND METHOD USING HOLOGRAPHIC OPTICAL ELEMENTS

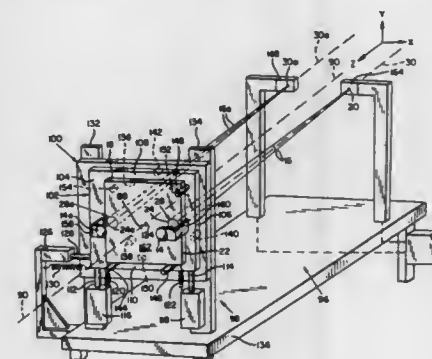
Richard L. Fusek, Pleasanton, and Lawrence H. Lin, Alamo, both of Calif., assignors to Insystems, Inc., San Jose, Calif.

Filed Mar. 3, 1986, Ser. No. 835,779

Int. Cl.⁴ G03H 1/04

U.S. Cl. 350—3.6

18 Claims



1. A method of aligning a subject in a space coordinate system, comprising:
supporting the subject in a first position in the system, the first position being specified by translation and rotation coordinates;
providing on the subject at least one holographic optical element to develop first and second beams of light with respective first and second predetermined focal configurations;
using first and second position detecting means to determine the positions in the system of the first and second focal configurations;
recording first and second alignment information that correspond to the positions of the respective first and second focal configurations;
changing the position of the subject from the first position; reconstructing the first and second beams of light by illuminating the number of holographic optical elements provided on the subject;
repositioning the subject so that the information indicated by the first and second position detecting means correspond to the respective first and second alignment information recorded for the subject in the first position, thereby to align the subject to the first position or a predetermined position corresponding to the first position.

4,712,852

HOLOGRAM DISK FOR DEFLECTING A LIGHT BEAM

Hiroyoshi Funato, and Nobuo Banba, both of Kanagawa, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

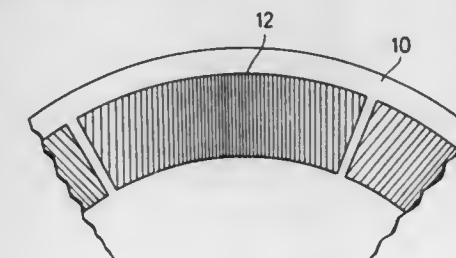
Filed Jun. 3, 1986, Ser. No. 870,079

Claims priority, application Japan, Jun. 7, 1985, 60-123937

Int. Cl.⁴ G02B 26/10; G03H 1/04

U.S. Cl. 350—371

1 Claim



1. A hologram disk for deflecting a light beam in a hologram

scanner, comprising a plurality of straight-line gratings formed by holograms in an annular pattern for deflecting the light beam, the line-to-line distance $d\theta$ between adjacent lines of each of said straight-line gratings being determined to meet, at least approximately, the following equation when said each straight-line grating is rotated through an angle θR :

$$d\theta = \frac{\lambda \sin \theta R}{\sin(\alpha + \theta R)}$$

where λ is the wavelength of the light beam and α is a proportionality constant, so that the angle θ s through which the light beam is deflected can be expressed by $\theta s = \alpha \theta R$.

4,712,853

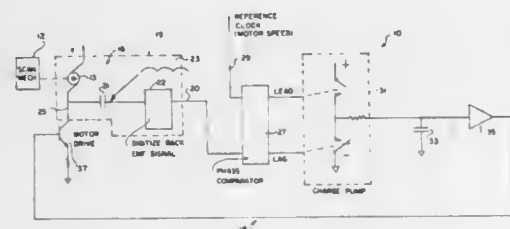
RAPIDLY STARTING LOW POWER SCAN MECHANISM
P. Guy Howard, Junction City, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Feb. 27, 1986, Ser. No. 834,190

Int. Cl.⁴ G02B 26/10

U.S. Cl. 350—6.5

5 Claims



1. An optical beam scanning device capable of quickly obtaining operating speed and drawing relatively low power, comprising,

optical scanning apparatus including at least one mirror for scanning a beam in a desired scanning pattern, the beam originating from a beam source associated with the scanning device,
an electric DC brush type motor driving the optical scanning apparatus,
means for picking up a back EMF signal from the motor, processor means for comparing the back EMF signal with a reference frequency timing signal to determine whether the motor's speed is equal to the desired operating speed as defined by the reference frequency timing signal and, when the motor is not at desired speed, for generating an error signal representative of the difference between the motor's actual speed and the desired speed, and
motor speed drive means for varying power to the motor when it is not at desired speed, in accordance with the direction and size of the error signal.

4,712,854

OPTICAL WAVEGUIDE AND METHOD OF MAKING THE SAME

Kazuo Mikami, Kyoto; Tsukasa Yamashita, Nara, and Mitsutaka Katoh, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 10, 1984, Ser. No. 629,442

Claims priority, application Japan, Jul. 11, 1983, 58-126547; Jul. 12, 1983, 58-127489

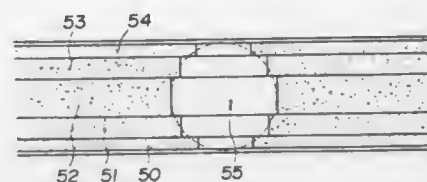
Int. Cl.⁴ G02B 6/10

U.S. Cl. 350—96.12

6 Claims

1. An optical waveguide, comprising a material having (i) a reflective index which may be varied over an extent of the material according to a degree of photopolymerization to which the material is subjected and (ii) a selective photopolym-

erization over said extent of the material to create a refractive index of said material which has a substantially parabolic profile



file in both widthwise and depthwise directions across a cross-section of said material.

4,712,855

PLANAR OPTICAL WAVEGUIDE AND METHOD OF MANUFACTURING SAME

Wolfgang F. M. Tolksdorf, Tornesch; Inse E. H. Bartels, Pinneberg; Hans O. B. Dammann, Tangstedt; Claus-Peter Klages, and Elke B. Pross, both of Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

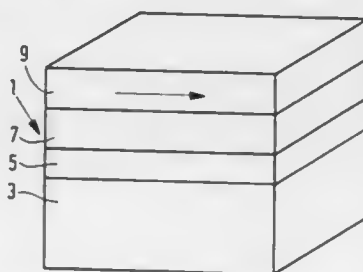
Filed Jan. 13, 1986, Ser. No. 818,152

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514413

Int. Cl.⁴ G02B 6/10

U.S. Cl. 350—96.12

20 Claims



1. A planar optical waveguide having a crystal body consisting of a nonmagnetic substrate having a first magneto-optical layer epitaxially provided on the substrate and a second magneto-optical layer epitaxially provided on the first magneto-optical layer, the two magneto-optical layers consisting of a material based on iron garnet, the second magneto-optical layer having a refractive index n_2 which is approximately 1×10^{-3} to 1×10^{-2} higher than the refractive index n_1 of the first magneto-optical layer; characterized in that a layer (5) of a material based on iron garnet and absorbing radiation in the wavelength of $1.0 \leq \lambda \leq 2.5 \mu\text{m}$ is provided between the substrate (3) and the first magneto-optical layer (7), said iron garnet-based layer having a refractive index n_4 which is higher than the refractive index of the first magneto-optical layer.

4,712,856

GEODESIC OPTICAL COMPONENT

Antonius J. A. Nicia, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 628,075, Jul. 5, 1984. This application Jan. 27, 1987, Ser. No. 9,084

Claims priority, application Netherlands, Jul. 11, 1983, 8302461

Int. Cl.⁴ G02B 6/10

U.S. Cl. 350—96.12

10 Claims

1. A geodesic optical waveguide comprising:
a substrate having a plane surface portion and a curved surface portion bounded by the plane surface portion; and
an optical waveguide layer on the surface of the substrate,

said waveguide layer having a substantially uniform thickness and following the shape of the substrate; characterized in that:

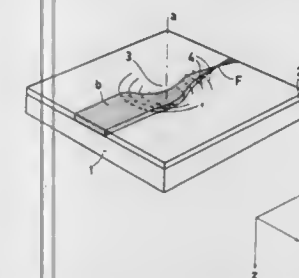
the curved surface portion is made up of a plurality of points, each point being located at a height relative to the plane surface portion of the substrate;

the curved surface portion has at least two points of local minimum height, not arranged on the boundary of the curved surface portion; and

the curved surface portion has at least one point of local maximum height arranged between the points of local minimum height.

6. A geodesic optical waveguide comprising:

a substrate having a plane surface portion and a curved surface portion bounded by the plane surface portion; and



an optical waveguide layer on the surface of the substrate, said waveguide layer having a substantially uniform thickness and following the shape of the substrate; characterized in that:

the curved surface portion is made up of a plurality of points, each point being located at a height relative to the plane surface portion of the substrate;

the curved surface portion has at least two points of local maximum height, not arranged on the boundary of the curved surface portion; and

the curved surface portion has at least one point of local minimum height arranged between the points of local maximum height.

4,712,857

NO₂ THIN FILM ELECTRO-OPTIC SWITCH

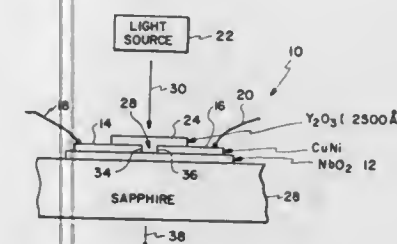
James C. Lee, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 28, 1985, Ser. No. 717,261

Int. Cl.⁴ G02B 6/10

U.S. Cl. 350—96.14

4 Claims



1. An electro-optic device, comprising:

a niobium dioxide (NbO₂) crystalline material; means for illuminating at least a portion of said crystalline material with electromagnetic energy, wherein said electromagnetic energy includes wavelengths which are at least partially transmitted through said crystalline material, and wherein said electromagnetic energy enters said crystalline material at a first location and exits said crystalline material at a second location;

means for applying an electric field to said crystalline mate-

rial, wherein the direction of said electric field is coextensive with at least a portion of the path of said electromagnetic energy between said first and second locations; and means for varying said electric field, so that the intensity of said electromagnetic energy at said second location will be a function of said electric field.

4,712,858

LIGHTGUIDE ACCESS PORT

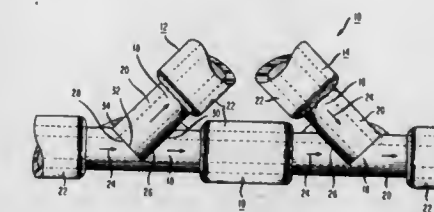
Herman M. Presby, Highland Park, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 13, 1985, Ser. No. 733,245

Int. Cl.⁴ G02B 6/26, 6/42

U.S. Cl. 350—96.15

9 Claims



1. An optical fiber access port structure, comprising:
a first optical fiber having a core region and a cladding region and having a first notch extending through its cladding region and partially into its core region, the notch defining two notch faces at an angle to each other;
a second optical fiber having a core region, a cladding region and at least one end face, the end face being positioned against one of the notch faces for optical coupling thereto, and longitudinal axes of said first and second optical fibers intersect at a substantially acute angle.

4,712,859

DISTRIBUTED STAR NETWORK

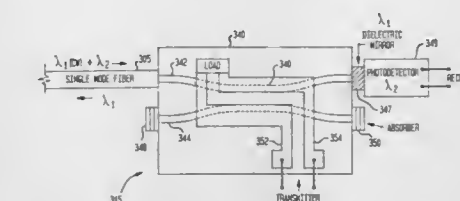
Andres Albanese, Morristown, and Steven S. Cheng, Bernards Township, Somerset County, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 19, 1985, Ser. No. 777,953

Int. Cl.⁴ G02B 6/28; H04B 9/00

U.S. Cl. 350—96.16

13 Claims



1. A telecommunications network for providing communications among a plurality of user stations comprising:
continuous wave laser means for transmitting unmodulated coherent optical radiation to each of said user stations, said means for transmitting comprising at least one single mode optical fiber link to each of said user stations, means at each of said user stations capable of modulating information onto said radiation, and
a hub element for receiving said radiation from all of said user stations and for optically broadcasting information received from any of said user stations by means of said radiation to all of said user stations, said hub element comprising a passive optical combiner for combining said radiation received from all of said user stations and a passive optical power divider for transmitting a fraction of

the combined radiation formed by said combiner to all of said user stations.

4,712,860

RETROFITTABLE OPTIC FIBER CONTACT ASSEMBLY

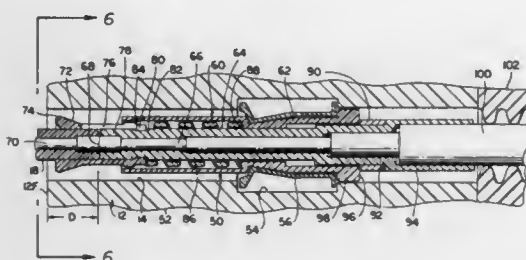
Patrick G. Corrales, Whittier, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jul. 15, 1985, Ser. No. 755,246

Int. Cl.⁴ G02B 6/36, 7/26

U.S. Cl. 350—96.20

5 Claims



1. An optic fiber contact assembly adapted to be installed in a connector housing that has contact holes each capable of instead holding an electrical contact, comprising:

an outer sleeve with forward and rearward ends, said sleeve having a contact retaining-clip engaging portion and a forward-facing spring abutting surface;

an optic fiber tube slidable within said outer sleeve, said tube having a forward end lying near the forward end of the outer sleeve, said tube having a rearwardly-facing shoulder, thereon and a forwardly facing shoulder spaced rearward of said rearwardly-facing shoulder;

a coil spring surrounding said tube, said spring having a rearward end which lies adjacent to said spring-abutting surface of said outer sleeve, and said spring having a forward end which lies adjacent to said rearwardly-facing shoulder on said tube; and

a spring pre-loading clip which lies about said tube and abuts said forwardly-facing shoulder of said tube and the rearward end of said outer sleeve, said pre-loading clip having a sufficient length to push said tube rearwardly relative to said outer sleeve far enough to compress said spring along its length.

4,712,861

TWO-CHANNEL HERMAPHRODITIC FIBER CONNECTOR

Helmut H. Lukas, Carleton Place, and Grant K. Pacey, Stittsville, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 7, 1985, Ser. No. 699,278

Int. Cl.⁴ G02B 6/38

U.S. Cl. 350—96.21

24 Claims

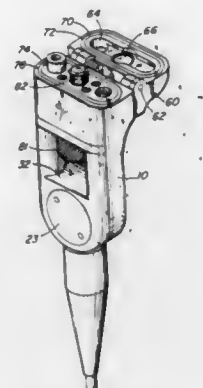
1. A hermaproditic connector, for optical fibers and the like, comprising:

a body having an end face adapted for mating hermaproditically with a corresponding end face of another such connector; and

an end cap having an end face formed for mating hermaproditically with said end face of said body;

said end cap being hingedly attached to said body adjacent its end face and pivotal between a closed position, in which the end face of the end cap mates with the end face of the body, and an open position in which the end face of said end cap is substantially coplanar with the end face of said body, the arrangement being such that when two

such connectors are connected end-to-end with their respective end caps in said coplanar position, the respec-



tive body end faces mate hermaproditically and the two end caps mate hermaproditically.

4,712,862

OPTICAL FIBER CONNECTOR AND METHOD OF ASSEMBLING SAME

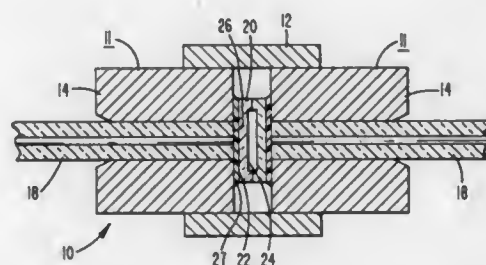
Alexander W. Lightstone, Quebec, Canada, assignor to RCA Corporation, Toronto, Canada

Filed Aug. 27, 1986, Ser. No. 901,036

Int. Cl.⁴ G02B 6/38

U.S. Cl. 350—96.21

11 Claims



1. A fiber optic connector for transmitting at least one wavelength comprising:

first means having a first opening for supporting a first fiber extending therethrough;

a first pellicle which is at least partially transparent at the transmitting wavelength and having first and second major surfaces wherein said first major surface extends over the first opening of said first supporting means and is attached to said first supporting means and said first fiber;

a low reflectivity coating on said second major surface of said first pellicle;

a second means having a second opening for supporting a second fiber extending therethrough;

a second pellicle which is at least partially transparent at the transmitting wavelength and having first and second major surfaces wherein its first major surface extends over the second opening of said second supporting means and is attached to said second supporting means and said second fiber;

a low reflectivity coating on said second major surface of said second pellicle; and

removable sleeve means connecting and aligning said first and second supporting means in spaced apart relation with a predetermined air gap between the second major surfaces of the first and second pellicles.

4,712,863

JUNCTION BLOCK FOR OPTICAL FIBERS

Jean-Paul Heng, Lyons; Marcel Jusseau, Villeurbanne, and Alain Humbert-Labeaumaz, Bron, all of France, assignors to Cgee Alstom, Levallois-Perret, France

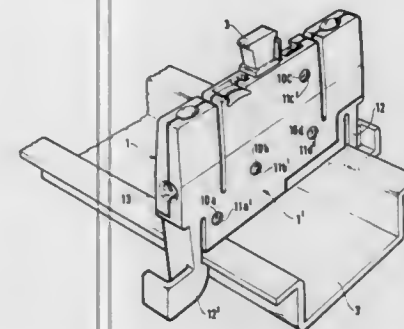
Filed Jan. 12, 1986, Ser. No. 873,551

Claims priority, application France, Jun. 12, 1985, 85 08902

Int. Cl.⁴ G02B 6/38

U.S. Cl. 350—96.21

8 Claims



1. A junction block for end-to-end interconnection of two optical fibers each having a core and a coating about said core, said block comprising two identical parts having identical faces assembled flush face-to-face, and forming a block having a fiber-receiving duct passing therethrough, said parts each including a half duct running along a corresponding one of said parts within said face thereof, said duct having a mid guide portion and two retaining members suitable for receiving two fibers inserted into respective ends thereof, and for positioning the cores of said two fibers in end-to-end alignment inside said mid guide portion thereof, and for holding said fibers in place by clamping their respective coatings inside two retaining members of the duct, said two retaining members being located adjacent to respective ends of said mid guide portion and each retaining member being constituted by two resiliently separable, half retaining members allowing momentary lateral separation after face-to-face assembly of said block parts at the plane of the face-to-face assembly of said parts to enable a fiber to be connected to pass therethrough in order to properly position the core of said fiber for interconnection with the core of the other fiber.

4,712,864

MULTI-CHANNEL FIBER OPTIC CONNECTOR

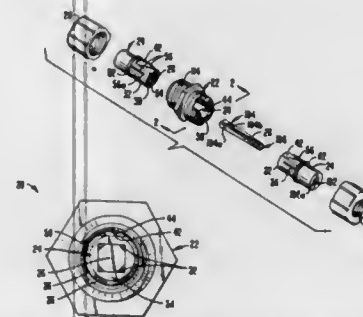
Roger H. Ellis, Atherton, and John W. Alyea, San Carlos, both of Calif., assignors to Luxtron Corporation, Menlo Park, Calif.

Filed May 2, 1985, Ser. No. 730,669

Int. Cl.⁴ G02B 6/40

U.S. Cl. 350—96.22

17 Claims



1. A connector for connecting a first and a second group of optical fibers in axial alignment, comprising: receptacle means having therein a bore, the surface of said

bore at one end of the bore defining a first surface, and the surface of said bore at the other end defining a third surface, each of said first and third surfaces comprising a curved portion and only one substantially flat reference surface portion;

first plug means having a mating portion shaped to fit into the end of the bore of the receptacle means having the first surface, the outside surface of the mating portion of the plug means defining a second surface, said second surface comprising a curved surface portion of a shape substantially similar to that of the curved portion of the first surface and only one substantially flat reference portion shaped to contact the reference portion of the first surface when the mating portion of the plug means is inserted into the bore, said first plug means adapted for connection with a first group of one or more optical fibers so that the ends of the fibers in the first group are substantially fixed in position relative to the reference portion of the second surface, one of the curved portions of the first and second surfaces having one or more bosses thereon for contacting the other curved portion, wherein one boss is located so that when the mating portion is inserted into the bore, the two reference portions will contact and be urged against each other to connect the first group of fibers to the receptacle means so that the fibers are in selected positions relative to the reference portion of the first surface; and

a second plug means having a mating portion shaped to fit into the other end of the bore, the outside surface of the mating portion of the second plug means defining a fourth surface which includes a flat portion shaped to contact the flat portion of the third surface, said second plug means adapted for connection with the second group of one or more optical fibers so that the ends of the fibers in the second group are substantially fixed in position relative to the flat portion of the fourth surface, one of the third and fourth surfaces having one or more bosses thereon for contacting the other of the third and fourth surfaces wherein one of the bosses on the third or fourth surface is located so that when the second plug means is inserted into the other end of the bore, the flat portions of the third and fourth surfaces will contact and be urged against each other to connect the second plug means to the receptacle means, the relative orientations of the flat portions of the first and third surfaces of the bore being such that each of the ends of one or more fibers in the first group is aligned with an end of a fiber in the second group; whereby the connector permits the two groups of fibers to be repeatedly disconnected and then re-connected while maintaining substantially the alignment of the fibers when re-connected.

4,712,865

DYE CONTAINING SILICON POLYMER COMPOSITION

Li-chien Hsu, Mission Viejo, and Hal Heitzmann, Irvine, both of Calif., assignors to Baxter Travenol Laboratories, Deerfield, Ill.

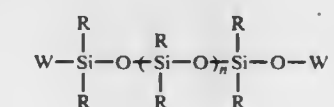
Filed Jan. 5, 1987, Ser. No. 529

Int. Cl.⁴ C07F 7/08, 7/10, 7/12

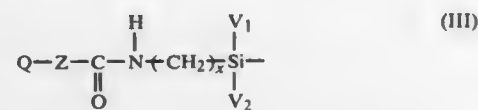
U.S. Cl. 350—96.29

5 Claims

1. A dye containing solid gas permeable silicone composition comprising a polysiloxane polymer structure and a polynuclear aromatic hydrocarbon/silane photoactive center substituent chemically attached to the polymer structure, wherein the dye containing polysiloxane polymer is a linear siloxane having the formula



wherein n is an integer of from 1 to 10,000; R is independently selected from hydrogen, hydroxyl and halogen or alkyl, aryl, alkenyl, acyloxy and alkoxy groups of up to 30 carbon atoms or the silane photactive center substituent, W having the following formula:



where Q is a polynuclear aromatic hydrocarbon based fluorescent dye; x is an integer of from 1 to 10; Z is a hydrocarbon of up to 50 carbon atoms and V₁ and V₂ are independently any hydrocarbon of up to 50 carbon atoms or hydrogen, halogen, aryl, hydroxyl, alkoxy, acyloxy or alkenyl substituent.

4,712,866

INDIUM-CLAD FIBER-OPTIC POLARIZER

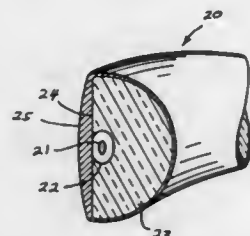
Richard B. Dyott, Orland Park, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Jul. 24, 1986, Ser. No. 888,930

Int. Cl.⁴ G02B 6/16

U.S. Cl. 350—96.30

5 Claims



1. A fiber-optic polarizer comprising the combination of an optical fiber having a polarization-holding core and cladding with different refractive indices and forming a single-mode guiding region, said guiding region being offset from the center of gravity of the fiber section and located sufficiently close to the surface of one side of the fiber, along a selected length of the fiber, to expose the evanescent field of the guiding region at the surface of said one side to allow coupling to a contiguous medium, the outer surface of the fiber having a non-circular cross-section with a predetermined geometric relationship to said guiding region and a pair of orthogonal polarization axes therein so that the location of said guiding region and the orientation of said axes can be ascertained from the geometry of said outer surface, and a coating of indium on at least said one side of the fiber where said evanescent field is exposed so that light waves having undesired polarizations are attenuated by said indium coating.

4,712,867

RETROREFLECTOR

Fritz J. Malek, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Continuation of Ser. No. 473,479, Mar. 9, 1983, abandoned. This application Jan. 7, 1986, Ser. No. 817,765

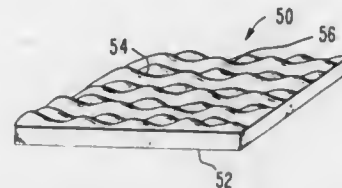
Int. Cl.⁴ G02B 5/128

U.S. Cl. 350—103

3 Claims

1. A retroreflector for reflecting radiation over a wide range of incident angles, said retroreflector comprising: a nonreflective base having a back surface and a forward surface, said forward surface comprising a series of adjacent wavy columns having alternately disposed hills and valleys running longitudinally on said base, each column

having rounded top faces extending in all directions as well as rounded lower portions, laterally adjacent columns being offset such that the valleys of a given column are bounded laterally by hills of adjacent columns; adjacent faces in different columns blending smoothly into each other and being arranged so that lines normal to said adjacent faces define angles of less than 90 degrees with respect to each other, with lines normal to all faces in the



forward surface defining an angle of less than 45 degrees with respect to a line normal to the back surface; and a substantially uniform coating of retroreflective elements in the form of glass spheres suspended in a polymeric material secured substantially throughout and covering the entirety of the forward surface of the base whereby incident radiation up to 90 degrees from said normal to the back surface can be retroreflected.

4,712,868

EXPANDED RETROREFLECTIVE SHEET MATERIAL

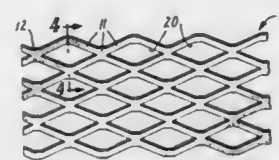
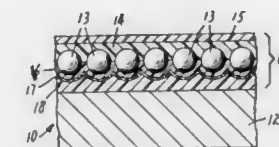
Chi F. Tung, Mahtomedi, and James C. Coderre, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 23, 1985, Ser. No. 778,806

Int. Cl.⁴ G02B 5/128, 5/124, 17/00

U.S. Cl. 350—105

5 Claims



1. Retroreflective sheet material comprising retroreflective sheeting laminated to a base sheet, the retroreflective sheeting being selected from (1) sheeting that comprises a monolayer of transparent microspheres and a layer of specularly reflective material underlying the microspheres and 2) sheeting that comprises cube-corner retroreflective elements; the laminated sheet assembly being slit in an array of spaced discontinuous slits; and the laminated sheet assembly being expanded so that openings occur at the slits, and portions of the laminated sheet assembly between the slits bend out of the plane they originally occupied.

4,712,869

THREE DIMENSIONAL STACKED REPRODUCTION SCREEN

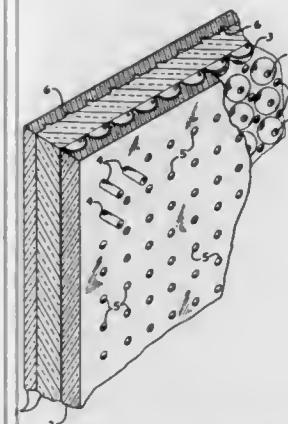
Claxton John C., 10844 High Ridge Rd., Jacksonville, Fla. 32225

Filed Oct. 24, 1986, Ser. No. 922,888

Int. Cl.⁴ G03B 21/60

U.S. Cl. 350—126

2 Claims



1. Stacked multiple transparent screen device as a means for displaying light from each separate optic fiber or other light source over a specific area of a specific screen and viewing said light through intervening subsequent screens when intervening areas of subsequent screens are unlit, said stacked multiple transparent screen device comprising:

- a. stacked multiple transparent screens as a means whereby lit areas become opaque to "through the screen" viewing while lit,
- b. mirrored layer sandwiched between screen layers as a means to reflect light from light source or fiber optic fiber back to viewer while unlit area of mirrored surface passes light freely from rear allowing through the screen viewing,
- c. reflecting devices imbedded in screens as a means to reflect light from fiber optic fiber or other light source back on mirrored surface,
- d. between the screens air gaps or vacuum gaps whereby with next transparent layer or screen that light enters it effects a masking screen to mask or hide the dot or unlit area of mirror by refraction of the converging light from outer edges of lighted area or mirrored surface.

4,712,870

FRESNEL LENS AND FILTER FOR USE WITH COMPUTERS AND THE LIKE

Donald L. Robinson, and William Ojala, both of 660 El Camino, Millbrae, Calif. 94030

Filed Apr. 3, 1986, Ser. No. 847,733

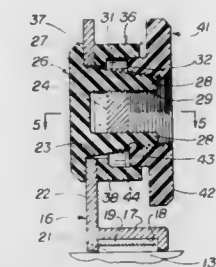
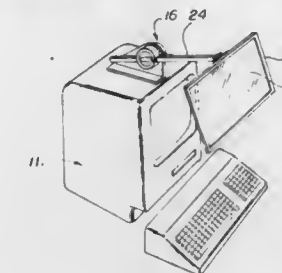
Int. Cl.⁴ H04N 5/72

U.S. Cl. 350—243

12 Claims

1. An auxiliary device for a viewing screen housed in a cabinet, comprising a bracket having a first base and an upward projecting member formed with an aperture, first attachment means adapted to attach said first base to the cabinet, an elongated bar, a Fresnell lens, second attachment means for attaching said lens to an end of said bar, a screw having a second base on one side of said member having a pair of prongs extending through said aperture and beyond the side of said first member opposite said one side, said prongs being separated by a gap slightly wider than the thickness of said bar, the sides of said prongs opposite said gap being formed with a first taper tapering outwardly and formed with first threads and an

annular nut having a head and a stem having an internal second taper formed with second threads mating with said first



threads, whereby tightening said nut forces said prongs toward each other to clamp said bar therebetween.

4,712,871

POSITIONING MECHANISM FOR POSITIONING AUXILIARY OPTICAL DEVICE RELATIVE TO MAIN OPTICAL DEVICE AND THE AUXILIARY OPTICAL DEVICE

Junichi Tanii, and Yukio Maekawa, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

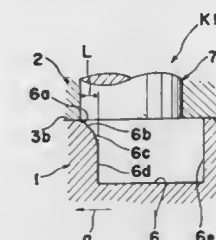
Filed Jul. 17, 1985, Ser. No. 755,898

Claims priority, application Japan, Jul. 23, 1984, 59-153500

Int. Cl.⁴ G02B 7/02; B23Q 16/00

U.S. Cl. 350—257

18 Claims



1. A positioning mechanism for positioning an auxiliary optical device relative to a main optical device when mounting of said auxiliary optical device on said main optical device completes through movement of said auxiliary optical device relative to said main optical device in a predetermined direction with mount members of said main and auxiliary optical devices being in contact with one another, said mechanism comprising:

- a positioning member provided on said main optical device and urged to project from said mount member of said main optical device;
- a positioning recess provided on the mount member of said auxiliary optical device and having a width allowing engagement of said positioning member with a predetermined clearance, said positioning member and said positioning recess respectively including a front side face portion being at the front side with respect to the direction of said relative movement of said auxiliary optical device

and a rear side face portion being opposite to and in alignment with said front side face portion in the direction of said relative movement of said auxiliary optical device such that said engagement starts due to the urging of said positioning member immediately after said front side face portions of said positioning member and said positioning recess come in alignment with one another as a result of said relative movement of said auxiliary optical device and such that said rear face portions of said positioning member and positioning recess come into contact with one another with said clearance interposed between said front face portions of said positioning member and positioning recess when said engagement completes, and said front face portions of said positioning member and said positioning recess having a configuration which allows said front face portions not to contact one another during the advancement of said engagement when said relative movement of said auxiliary optical device is effected at a speed faster than a predetermined speed;

said configuration including:

- a convex arcuate portion formed on said front side face portion of said positioning recess at an entrance part thereof;
- a first straight slope portion formed on said front side face portion of said positioning recess at an inner portion thereof which is consecutive with said convex arcuate portion, said first straight slope portion having an inclination of not less than 60° with respect to the direction of said relative movement of said auxiliary optical device; and
- a straight portion provided on at least said front side face portion of said positioning member and extending in the longitudinal direction of said positioning member perpendicular to said mount member of said main optical device, said straight portion forming a substantially right angle edge in a front elevational view at a distal end of said positioning member.

4,712,872

LIQUID CRYSTAL DEVICE

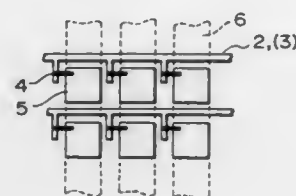
Junichiro Kanbe, and Kazuo Yoshinaga, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 21, 1985, Ser. No. 714,618

Claims priority, application Japan, Mar. 26, 1984, 59-58016; Mar. 28, 1984, 59-61336; Jul. 20, 1984, 59-150651

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—333

48 Claims



1. A liquid crystal device, comprising:
 - a group of scanning electrodes;
 - a group of signal electrodes intersecting the scanning electrodes;
 - a ferroelectric liquid crystal having memorizable electrically polarized states interposed between the scanning electrodes and the signal electrodes, each of the intersections of the scanning electrodes and the signal electrodes defining a picture element; and
 - a nonlinear element having a nonlinear voltage-current characteristic corresponding to each picture element.

4,712,873

LIQUID CRYSTAL OPTICAL DEVICE

Junichiro Kanbe, Yokohama, and Shinjiro Okada, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

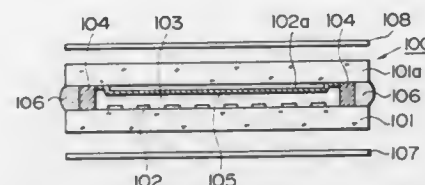
Filed Apr. 4, 1985, Ser. No. 720,084

Claims priority, application Japan, Apr. 16, 1984, 59-76819

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—337

30 Claims



1. In a liquid crystal optical device comprising at least one polarizer, and a cell structure including a pair of base plates having electrodes thereon and a ferroelectric liquid crystal disposed between the base plates, said cell structure having been subjected to a monoaxial orientation treatment; the improvement wherein:

said ferroelectric liquid crystal is disposed in a layer thin enough to release its own helical structure, and said polarizer is arranged such that the angle between the polarizing direction of the polarizer and the axial direction of the monoaxial orientation treatment is smaller than the angle between the axial direction of the monoaxial treatment and an average molecular axis direction of the ferroelectric liquid crystal under application of a polarity of voltage between the electrodes.

4,712,874

FERROELECTRIC LIQUID CRYSTAL DEVICE HAVING

COLOR FILTERS ON ROW OR COLUMN ELECTRODES
Nobuyuki Sekimura, Kawasaki; Masaru Kamio, Atsugi; Hideaki Takao; Taiko Motol, both of Sagami, and Tatsuo Murata, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

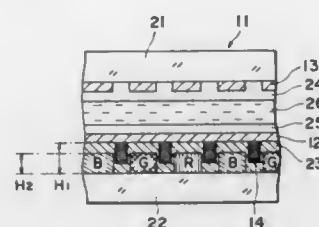
Filed Dec. 19, 1986, Ser. No. 943,502

Claims priority, application Japan, Dec. 25, 1985, 60-290423; Dec. 25, 1985, 60-290424

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—339 F

26 Claims



1. A ferroelectric liquid crystal device, comprising a pair of substrates each provided with a stripe electrode and a ferroelectric liquid crystal disposed between the substrates; at least one of the substrates having thereon a layer of discretely defined color filters disposed along the stripe electrode and electroconductive films disposed between the discretely defined color filters.

17. A ferroelectric liquid crystal device, comprising a pair of substrates each provided with a stripe electrode and a ferroelectric liquid crystal disposed between the substrates; at least one of the substrates having thereon a layer of discretely defined color filters disposed along the stripe electrode and insulating films disposed between the discretely defined color filters, and the difference between the height of said layer of

color filters and the height of the insulating films, respectively from the substrate face, being 1000 Å or less.

4,712,875

DIMENSIONS OF SPACER PARTICLES FOR A FERROELECTRIC LIQUID CRYSTAL DISPLAY

Akira Tsuboyama, Tokyo; Kazuharu Katagiri, Tama, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

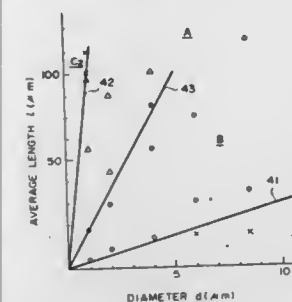
Filed May 14, 1986, Ser. No. 862,979

Claims priority, application Japan, May 15, 1985, 60-103074

Int. Cl.⁴ G02F 1/133

U.S. Cl. 350—344

11 Claims



1. In a liquid crystal device comprising a pair of base plates and a ferroelectric chiral smectic liquid crystal disposed between the base plates, said pair of base plates being secured to each other to leave a spacing which is small enough to release the spiral structure of the ferroelectric chiral smectic liquid crystal due to the wall effect of the base plates; the improvement wherein fibrous spacers having a diameter d (μm) and an average length l satisfying the relationship of $3 \leq l/d \leq 100$, are disposed together with the ferroelectric chiral smectic liquid crystal.

4,712,876

DRIVING FERROELECTRIC LIQUID CRYSTAL PRINTERS VIA SHORT CIRCUITING

Takao Umeda, Mito; Kazuya Oishi, Tsukuba; Tatsuo Igawa, Kitaibaraki, and Yasuro Hori, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

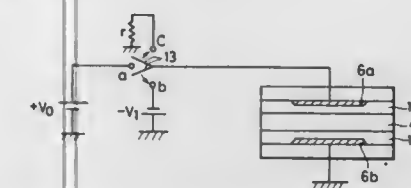
Filed Jul. 5, 1985, Ser. No. 751,847

Claims priority, application Japan, Jul. 4, 1984, 59-138786

Int. Cl.⁴ G02F 1/137

U.S. Cl. 350—350 S

2 Claims



1. A method for driving a plurality of optical switch elements of a liquid crystal device wherein each of the optical switch elements includes a transparent ferroelectric liquid crystal material between opposed electrodes, the method comprising the steps of applying a positive or negative voltage between the opposed electrodes of each of the plurality of optical switch elements selectively during a first period so as to control the quantity of transmission light between the opposed electrodes, and effecting a short circuit by simultaneously applying a substantially zero voltage between the opposed electrodes of all of the plurality of optical switch elements during a second period so as to reduce the quantity of non-uniform existence of ions in the high dielectric material between the opposed electrodes, wherein the second period is a period at least one of before and after the first period, and the

second period is a shorter time than the first period and wherein the plurality of switch elements form part of a printer for printing a desired pattern on print regions of a paper having non-print regions, and the second period wherein the substantially zero voltage is applied simultaneously between opposed electrodes of all of the plurality of optical switch elements corresponds to at least one of the non-print regions at the leading and trailing end portions of the paper among the non-print regions of the paper.

4,712,877

FERROELECTRIC DISPLAY PANEL OF VARYING THICKNESS AND DRIVING METHOD THEREFOR

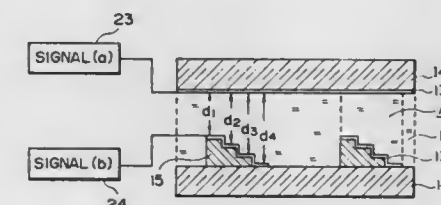
Shinjiro Okada, Kawasaki; Junichiro Kanbe, Yokohama; Akira Tsuboyama, Tokyo, and Yutaka Inaba, Kawaguchi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 15, 1986, Ser. No. 819,070

Claims priority, application Japan, Jan. 18, 1985, 60-5847; Dec. 20, 1985, 60-287108

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—350 S

41 Claims



1. A liquid crystal device, comprising: a pair of oppositely spaced electrodes and a ferroelectric liquid crystal layer disposed between the pair of oppositely spaced electrodes, said ferroelectric liquid crystal layer having a varying thickness.

24. A driving method for a liquid crystal device of the type comprising a picture element formed by a first electrode, a second electrode oppositely spaced from the first electrode so as to form a varying spacing therebetween, and a ferroelectric liquid crystal disposed at the opposite portion between the first and second electrodes and having a varying layer thickness; said driving method comprising:

- a first step of applying a voltage signal between the first and second electrodes for orienting a region extending over the whole area of the picture element to either one of a first and a second state and,
- a second step of applying a pulse with a waveform corresponding to gradation information between the first and second electrodes to switch the state of a region defining a prescribed area of the picture element from one state resultant in the first step to the other state.

4,712,878

COLOR IMAGE FORMING APPARATUS COMPRISING FERROELECTRIC SMECTIC LIQUID CRYSTAL HAVING AT LEAST TWO STABLE STATES

Osamu Taniguchi; Shinjiro Okada, both of Kawasaki, and Yujiro Ando, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1986, Ser. No. 819,400

Claims priority, application Japan, Jan. 18, 1985, 60-006716; Jan. 18, 1985, 60-006717

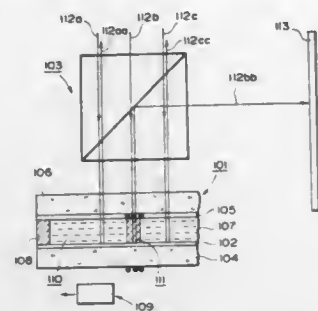
Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—350 S

17 Claims

1. An image-forming apparatus, comprising:
 - a liquid crystal device of a cell structure comprising an electroconductive member, an electric charge-accepting member, and a ferroelectric liquid crystal interposed between the electroconductive member and the electric charge-accepting member,

charging means for imparting an electric charge to the electric charge-accepting member sufficient to form an electric field exceeding the threshold voltage of the ferroelectric liquid crystal between the electric charge-accepting member and the electroconductive member, and



a multi-color optical filter disposed in the neighborhood of the electroconductive member and comprising a plurality of filter elements of which adjacent ones have mutually different spectral characteristics.

4,712,879

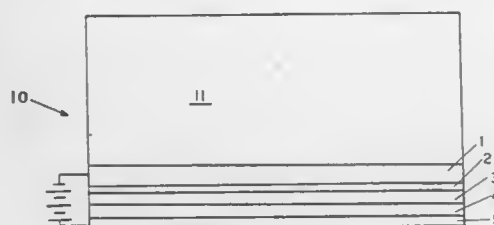
ELECTROCHROMIC MIRROR

Niall R. Lynam, and Kiok K. Seah, both of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Apr. 2, 1986, Ser. No. 847,192
Int. Cl.⁴ G02F 1/01, 1/23

U.S. Cl. 350—357

20 Claims



1. An electrochromic vehicle mirror which can be alternatively darkened or lightened to decrease or increase reflectivity comprising in the order indicated:

- a glass substrate;
- a conductive coating thereon; one of an anodic electrochromic layer of nickel hydroxide and a cathodic electrochromic layer of tungsten oxide;
- a solid electrolyte layer;
- the other of said cathodic electrochromic layer and said anodic electrochromic layer; and
- a layer of a reflective/conductive material;

where said anodic nickel hydroxide electrochromic layer has a thickness of from about 300 to about 600 angstroms, said solid electrolyte layer has a thickness of from about 1000 to about 1500 angstroms and said cathodic tungsten oxide electrochromic layer has a thickness of from about 600 to about 1200 angstroms.

4,712,880

POLARIZATION ROTATION COMPENSATOR AND OPTICAL ISOLATOR USING THE SAME

Masataka Shirasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 508,547, Jun. 28, 1983, abandoned.

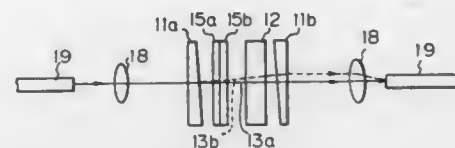
This application Aug. 25, 1986, Ser. No. 900,246

Claims priority, application Japan, Jun. 28, 1982, 57-109912; Jun. 28, 1982, 57-111013

Int. Cl.⁴ G02F 1/09; G02B 27/28

U.S. Cl. 350—377

11 Claims



1. A device comprising:

- a compensator which includes a half-wave plate and a quarter-wave plate arranged in a predetermined order with respect to a beam of plane-polarized incident light, the respective orientations of the principal axes of said plates with respect to the plane of polarization of said incident light being $\theta/2$ and θ , said incident light being incident first on said half-wave plate, and
- a rotator arranged in combination with said compensator, after said compensator with respect to said incident light, said rotator rotating the light passing therethrough by an amount that depends on wavelength, wherein θ is provided at an optimum angle to compensate the wavelength dependency of said rotator in the predetermined wavelength region, thus a plane-polarized output beam is provided from said compensator with a rotation of the plane of polarization from that of said incident light that depends on wavelength, and the rotation of the plane of polarization of said incident light, by the combination of said compensator and rotator, becomes independent of wavelength.

4,712,881

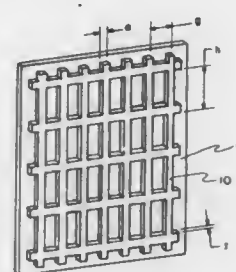
BIREFRINGENT ARTIFICIAL DIELECTRIC STRUCTURES

Richard R. Shurtz, II, Oakton, Va., and Edward J. Sharp, Fort Washington, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1985, Ser. No. 747,214
Int. Cl.⁴ G02B 5/30, 27/28

U.S. Cl. 350—406

3 Claims



1. An artificial dielectric device for electromagnetic radiation, composed of a regular planar pattern of highly-conductive metal film on an insulating and transparent substrate, wherein said pattern comprises cells with two-fold symmetry about an axis normal to the plane of said pattern, wherein said device is birefringent to said radiation.

4,712,882

VARIABLE FOCAL LENGTH LENS

Takeshi Baba, Yokohama; Hiroyuki Imataki, Kawasaki; Masayuki Usui; Takashi Serizawa, both of Yokohama, and Hiroyasu Nose, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

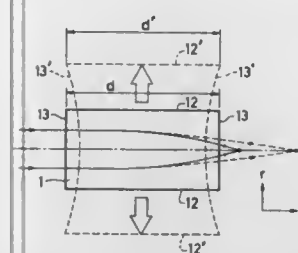
Filed Dec. 27, 1984, Ser. No. 686,756

Claims priority, application Japan, Jan. 5, 1984, 59-45

Int. Cl.⁴ G02B 15/00, 3/14

U.S. Cl. 350—413

8 Claims



1. A variable focal length lens comprising:

- a lens having a distribution of refractive index in which the refractive index varies in a direction perpendicular to the optic axis thereof, said lens comprising a deformable elastic member; and
- means for changing the shape of the distribution of refractive index by applying to said lens a force in the direction perpendicular to the optic axis to thereby deform said lens.

4,712,883

REAR FOCUS ZOOM LENS

Masatake Kato, Tokyo; Sadahiko Tsuji, and Toshiaki Asano, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

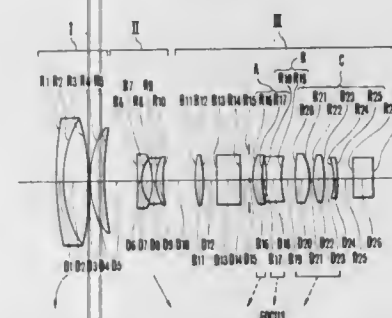
Filed Jan. 17, 1984, Ser. No. 571,481

Claims priority, application Japan, Jan. 18, 1983, 58-6058

Int. Cl.⁴ G02B 15/14, 13/18

U.S. Cl. 350—427

20 Claims



1. A zoom lens of the rear focusing type comprising:

- from front to rear, a magnification varying assembly having a plurality of movable lens components movable during zooming and stationary during focusing, and an image forming assembly stationary during zooming, said image forming assembly including a lens component B having negative refractive power and movable at a time of focusing, a lens component A on the object side of said lens component B and movable when focusing, and a lens component C on the image side of said lens group B and movable when focusing.

4,712,884

LENS SYSTEM FOR DEFLECTED LIGHT BEAM

Nobuo Sakuma, Tokyo, and Keiichi Takanashi, Kanagawa, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

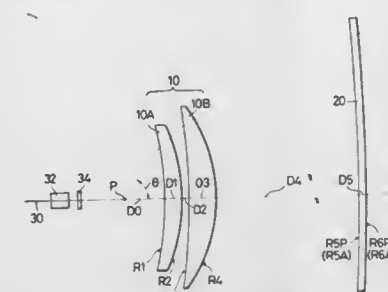
Filed Jan. 27, 1986, Ser. No. 823,002

Claims priority, application Japan, Jan. 30, 1985, 60-016002

Int. Cl.⁴ G02B 13/18, 9/12, 26/10

U.S. Cl. 350—434

10 Claims



1. A light beam scanner comprising:

- means for producing a scanning light beam; and
- a lens system including two positive-meniscus lenses and a toroidal lens, said two positive-meniscus lenses having their concave surfaces directed towards said means for producing a scanning light beam, said two positive-meniscus lenses having an effective deflection angle of at least 50°, said toroidal lens correcting for surface irregularity and curvature of field.

4,712,885

LASER DIODE OPTICAL SYSTEM

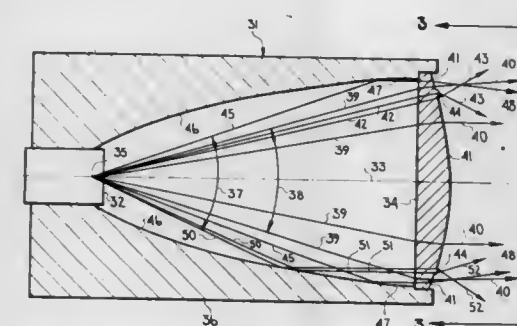
Christopher Dawson, Glendora; Fritz W. Healey, and Leo O. Taylor, both of Alta Loma, all of Calif., assignors to Loral Electro-Optical Systems, Inc., Pasadena, Calif.

Filed Oct. 31, 1985, Ser. No. 793,666

Int. Cl.⁴ G02B 17/00

U.S. Cl. 350—443

10 Claims



1. A laser diode optical system including:

- a laser diode having non-circular beam emitted from a diode emitter junction and having a peak energy centered on an optical axis,
- a collimating lens spaced from the laser diode with its focus at the diode emitter on the optical axis to intercept direct energy from the laser diode and produce a centralized collimated beam on the optical axis through the laser diode and lens,
- a generally paraboloidal reflector coaxially disposed about the laser diode emitted beam collimating the portion of the emitted beam outside the included angle subtended by the lens, the collimated energy from the reflector being refracted through the periphery of the collimating lens to direct the collimated energy from the reflector into a

hollow convergent-divergent conical off-axis beam coaxial about the centralized collimated beam, a plurality of spaced energy diffusing elements on a surface of the lens intercepting and diffusing direct laser diode energy impinging the lens, and also intercepting and diffusing laser diode energy from the reflector, and producing a spaced pattern of overlapping diffused beams forming a generally toroidal beam coaxially disposed about the centralized collimated beam and having a cross-sectional shape elongated in the direction of the collimated beam.

4,712,886

LENS DOUBLET COLOR-CORRECTED FOR VISIBLE AND NEAR-INFRARED WAVELENGTHS

Romeo I. Mercado, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

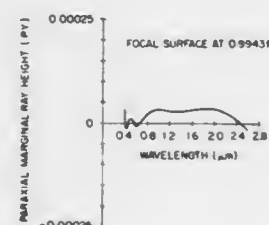
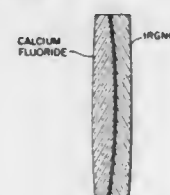
Continuation of Ser. No. 676,492, Nov. 29, 1984, abandoned.

This application Nov. 14, 1986, Ser. No. 931,003

Int. Cl.⁴ G02B 3/00

U.S. Cl. 350—482

10 Claims



1. A lens doublet comprising a first lens element and a second lens element, said first and second lens elements being made of different refractive materials, each of said refractive materials having a characteristic index of refraction, the indices of refraction of said refractive materials being related to each other so that color correction of said lens doublet at four discrete wavelengths is possible, said first and second lens elements being configured and disposed with respect to each other so that said lens doublet is simultaneously color-corrected for four visible wavelengths and one infrared wavelength at one focal surface, and for one visible wavelength and four infrared wavelengths at another focal surface.

4,712,887

OPTICAL SYSTEM FOR FAST ACCESS OPTICAL DATA STORAGE DEVICE

James W. Baer, Boulder, Colo., assignor to Dazar Corporation, Boulder, Colo.

Filed Dec. 20, 1985, Ser. No. 811,380

Int. Cl.⁴ G02B 26/08

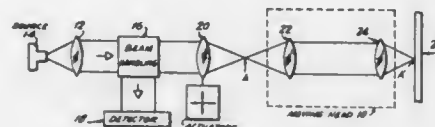
U.S. Cl. 350—484

14 Claims

1. An optical system for a fast access optical storage device, said system being used for passing an energy beam from a light source to a spot on the recording surface of a recording medium, said medium rotating about an axis, comprising:

- a non-moving portion of said optical system, said non-moving portion including first optics and actuators for focus control and fine tracking control of said system, said actuators operating to move portions of said first optics;
- a moving portion of said optical system said moving portion including second optics having a plurality of elements,

said moving portion being subject to movement as a monolithic component over said recording surface, physical relationships between said plurality of elements being fixed.



cal relationships between said plurality of elements being fixed.

4,712,888

SPATIAL LIGHT MODULATOR SYSTEMS

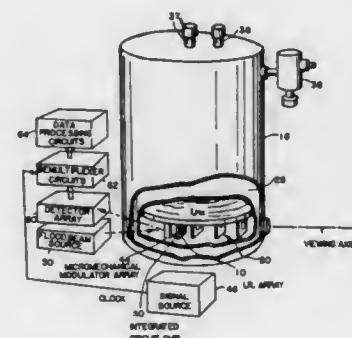
Robert E. Brooks, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 4, 1986, Ser. No. 892,665

Int. Cl.⁴ G02B 26/08, 26/00; H01L 25/00

U.S. Cl. 350—486

23 Claims



14. A system responsive to the amplitudes of individual picture elements in incoming radiant energy image patterns, comprising:

- a plurality of radiant energy detectors distributed in an array throughout an image area and each responsive to intensity variations corresponding to a different picture element in the image patterns;
- drive circuit means responsive to one or more detectors and generating a drive signal in response thereto;
- a plurality of spatial light modulators in an object plane, each deflectable to a limit position for a period of time in response to a different signal;
- flood beam means illuminating the light modulators to direct light reflected therefrom toward a remote focal plane; and
- a plurality of light detectors positioned at the focal plane to be individually responsive to light from different ones of the fully deflected modulators.

4,712,889

PHOTOMETER FOR USE WITH A MICROSCOPE

Klaus P. Schindl, Vienna, Austria, assignor to C. Reichert Optische Werke AG, Vienna, Austria

Filed Nov. 20, 1985, Ser. No. 799,888

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443728

Int. Cl.⁴ G02B 21/18, 21/06; G01J 1/42

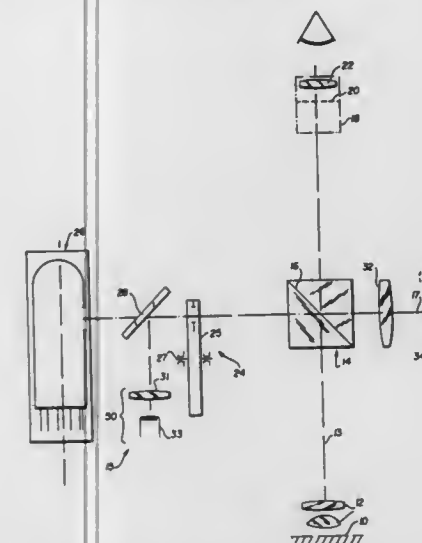
U.S. Cl. 350—511

8 Claims

1. A photometer for use with a microscope having an object

plane, an image plane and an optical axis between said planes, which photometer comprises:

- an optical dividing means adapted to be disposed in said optical axis between said microscope object and image planes;
- a reflective element having a reflecting surface;
- a pin hole occluder adapted to be arranged on the opposite side of the optical dividing means to the reflective element;
- an optical imaging device for providing an image of the pin hole occluder on the reflecting surface;



a light source;

a semi-reflective element for reflecting light from the light source to the optical dividing means;

a detector arranged in an optical axis including the semi-reflective element, pin hole occluder, optical dividing means, optical imaging device and reflective element;

the object and image planes of the microscope and the reflecting surface of the reflective element being conjugate planes.

4,712,890

APPARATUS FOR ADJUSTING PLAY IN A PRECISION OPTICAL INSTRUMENT

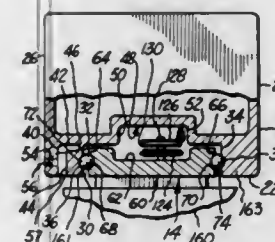
Michael H. Dobner, Webster, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sep. 14, 1984, Ser. No. 650,928

Int. Cl.⁴ G02B 21/26; F16C 29/00

U.S. Cl. 350—530

8 Claims



1. In an optical instrument, such as a microscope, apparatus for adjusting play between a support column and a member such as a stage or optical head assembly mounted for linear movement with respect to said support column, comprising:

- (a) bearing means mounted between the support column and the linearly movable member; and
- (b) adjustment means for enabling the engagement between the support column, said bearing means and the linearly

movable member to be altered, said adjustment means including:

- (i) a pivotable member coupled to the support column by a hinged section integrally formed therebetween, and
- (ii) means to pivot said pivotable member either toward or away from said linearly movable member to thereby adjust the play between said linearly movable member and said support column.

4,712,891

VEHICLE DOOR MIRROR WITH HOUSING AND BASE PART INCLUDING A SOFT FLEXIBLE MATERIAL

Masashi Midorikawa, Wako, and Isamu Inoh, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

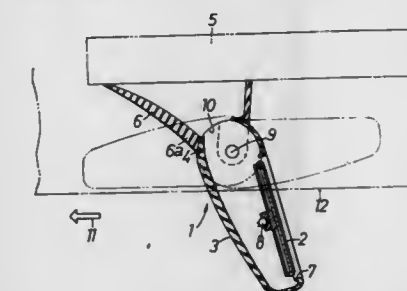
Filed Jun. 17, 1986, Ser. No. 875,136

Claims priority, application Japan, Jun. 18, 1985, 60-132196; Jun. 18, 1985, 60-132197

Int. Cl.⁴ G02B 7/18; B60R 1/06

U.S. Cl. 350—604

9 Claims



1. A door mirror of a vehicle comprising a base part mounted to a vehicle body and a housing which is supported on the base part rotatably around a substantially vertical axis and which is provided with a mirror, wherein portions of the base part and the housing that come into abutment against each other when the housing is rotated towards a front of the vehicle are both formed of a soft material having a flexibility and are, at the time of rotation towards the vehicle front, subject to resilient deformation.

4,712,892

REAR SEAT MIRROR

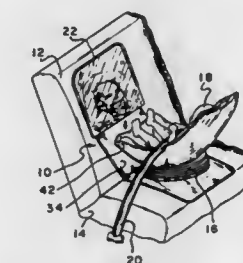
Ann M. Masucci, 905 Lichtenthal Ave., Delran, N.J. 08075

Filed Oct. 10, 1986, Ser. No. 917,525

Int. Cl.⁴ G02B 7/18; B60R 1/00

U.S. Cl. 350—631

6 Claims



1. A forward viewing arrangement for an automobile comprising:

- an automobile back seat including a generally horizontal seat cushion and a generally vertically extending seat back;
- a non-glass mirror, and
- means for mounting said mirror to said automobile such that said mirror lies substantially against said seat back adjacent the top thereof and wherein said mirror faces the front of said automobile.

4,712,893

TEMPLE END PIECE FOR A TEMPLE OF A SPECTACLE FRAME

Wilhelm Anger, Chesa Pas-Chura, 7500 St. Moritz-Suvretta, Switzerland

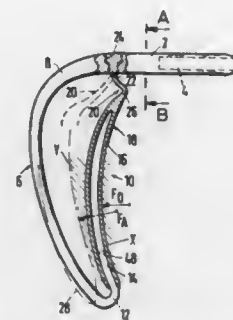
Filed Dec. 10, 1985, Ser. No. 807,527

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3525006

Int. Cl.⁴ G02C 5/14

U.S. Cl. 351—123

14 Claims



1. Temple end piece for a temple of a spectacle frame comprising an essentially straight first segment extending in the longitudinal direction of the temple, an elongated substantially arcuately shaped fitting segment which is intended for resting between the head and the ear and which extends downwardly with respect to the first segment, and a connecting segment extending from the first segment to the fitting segment and connecting these segments to one another, said connecting segment being connected to the fitting segment at or below the longitudinal middle of the latter and whereby at least the upper half of the fitting segment forms an end region protruding out from the transition region between the connecting segment and the fitting segment upward in the direction toward the first segment, which end region is deflectable at least essentially to the rear in the direction toward the connecting segment, and an elongated, flexible element attached at its one end to the upper end of the fitting segment, and attached at its other end to the first segment where by the flexible element permits movement of the upper end of the fitting segment rearwardly relative to the first segment.

4,712,894

OPHTHALMOSCOPIC INSTRUMENT HAVING WORKING POSITION DETECTING MEANS

Kazuo Nunokawa, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 304,575, Sep. 22, 1981, Pat. No. 4,511,227. This application Mar. 10, 1983, Ser. No. 473,454

Claims priority, application Japan, Mar. 15, 1982, 57-40405

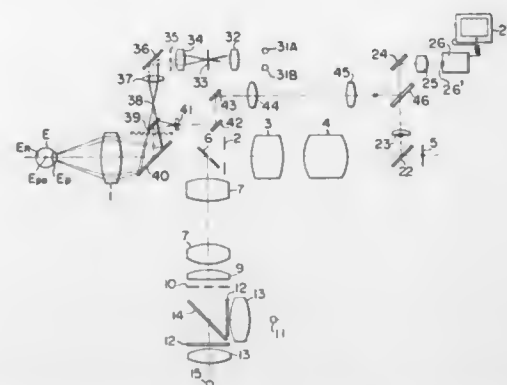
Int. Cl.⁴ A61B 3/14

U.S. Cl. 351—208

5 Claims

1. An ophthalmoscopic instrument comprising objective lens means having an optical axis and adapted to be positioned to confront a patient's eye at a working distance, said patient's eye having a cornea with a center of curvature, an observing optical system adapted to focus a light beam reflected from the eye and passing through the objective lens means on an image plane, means for detecting that the eye is properly positioned with respect to the objective lens means, said detecting means including a single target mark, a target mark image projection system adapted to project said target mark image by way of at least two light beams crossing each other on the optical axis of the objective lens means so that a target image is formed by each of the beams at the center of curvature of the cornea of the eye when the eye is properly positioned with respect to the objective lens means, a target mark image plane wherein target mark images are formed by mirror reflection, at the cornea, of the light beams projected through the target mark projection system when the patient's eye is properly positioned, a target

mark image observation system for observing the target mark images on the target mark image plane in superposition with a reference mark, whereby said target mark images on the target



mark image plane are formed in superposition with said reference mark at predetermined positions when the eye is properly positioned with respect to the objective lens means.

4,712,895

OCULAR POSITION MEASURING APPARATUS

Kiichi Kamiyama, and Yasuo Kato, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

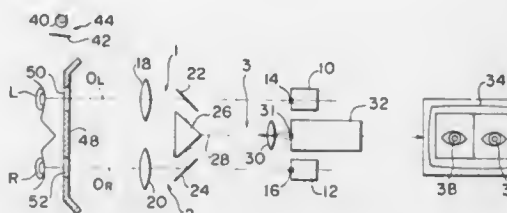
Filed Oct. 25, 1984, Ser. No. 664,507

Claims priority, application Japan, Oct. 26, 1983, 58-200519

Int. Cl.⁴ A61B 3/02, 3/10

U.S. Cl. 351—243

2 Claims



1. An ocular position measuring apparatus for determining the heterophoria or strabismus of a patient's eyes, having a pair of fixation mark means for projecting fixation marks of visible rays into patient's eyes, a pair of first half mirrors located between respective ones of the eyes and respective ones of the fixation mark means along right and left fixation axes, a pair of rotatable variable deflection prisms located between respective ones of the first half mirrors and the fixation mark means along the right and left fixation axes, a second pair of half mirrors located between the variable deflection prisms and the fixation mark means along the right and left fixation axes and capable of reflecting infrared rays and transmitting visible rays, a pair of infrared mark members located along reflecting axes of the second pair of half mirrors to project images of the infrared marks on the eyes, position detecting means for detecting position of the image of the infrared marks produced by light beams reflected by the eyes, a control circuit for controlling rotation of the variable deflection prisms when the image of the infrared mark moves in response to the flickering of one of the fixation marks, whereby quantity and direction or angle of heterophoria and strabismus are detected from the position of the infrared mark and direction or angle and quantity of deflection of the variable deflection prisms when the image of the infrared mark does not move in response to flickering of the fixation mark.

4,712,896

PHOTOSETTING APPARATUS

Bernd Holthusen, Hamburg, Fed. Rep. of Germany, assignor to Scangraphic Dr. Boger GmbH, Fed. Rep. of Germany

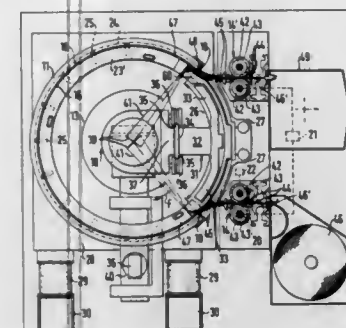
Filed Feb. 11, 1987, Ser. No. 13,308

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1986, 3604360

Int. Cl.⁴ B41B 13/00

U.S. Cl. 354—5

10 Claims



1. Photosetting apparatus comprising a segment of a regular cylinder on which a sheet-like photosensitive material can be fixed with the photosensitive layer at the inside, and a rotary mirror arranged on the axis of the segment of the regular cylinder, wherein the rotary mirror is illuminated by a laser beam modulated in accordance with the signs to be set and wherein the rotary mirror is arranged on a carriage which is controllably displaceable along the axis of the segment of the regular cylinder in such a way that the mirror generates a radial scanning beam with its origin on the rotary mirror and on the axis of the segment of the regular cylinder, with the scanning beam executing a rapid periodic scanning movement substantially in the circumferential direction of the segment of the regular cylinder, whereby an exposure region on the photosensitive material extending over the larger part of the circumference and the whole or part of the axial length of the segment of the regular cylinder is exposed with the marks to be set, wherein the photosensitive material can be laid against the cylindrical inner side of the segment of the regular cylinder, which preferably consists of light impermeable material, by the provision before and after the exposure region of the segment of the regular cylinder, as seen in the circumferential direction, of respective force transmitting devices which exert a restricted compressive force on the photosensitive material; wherein guide elements also engage the side edges of the photosensitive material radially from the interior; and wherein an end face abutment engages at least one side edge of the photosensitive material, characterized in that the guide elements (16) and two end face abutments (18) are formed on two guide rings (23, 23') which are inserted axially spaced apart into the segment (11) of the regular cylinder, with the external diameter of the guide rings corresponding to the internal diameter of the segment (11) of the regular cylinder, and with the rings being mounted on the segment (11) of the regular cylinder so that they are axially adjustable relative to one another.

4,712,897

DEVICE FOR ADJUSTMENT OF THE VIEWFINDER EYEPIECE OF A CAMERA

Rolf Crema, Greifenthal, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jul. 21, 1986, Ser. No. 887,226

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 3526938

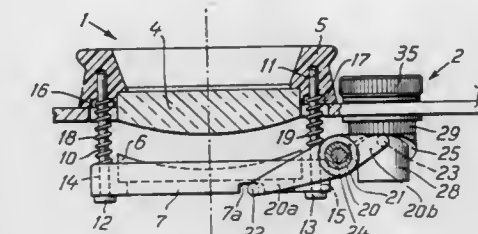
Int. Cl.⁴ G03B 13/06

U.S. Cl. 354—219

11 Claims

1. A device for adjusting a viewfinder eyepiece of a camera, comprising:

a viewfinder eyepiece mounted in an axially movable manner in the camera, and means for axially displacing the viewfinder eyepiece, wherein said axial displacing means comprises: an actuating knob which has a shaft;



a sleeve surrounding said shaft and which is normally rotatable with respect to said shaft, said sleeve including a radial cam; a lever operatively connected between the radial cam and the viewfinder eyepiece; and means for selectively coupling and decoupling said shaft to said sleeve.

4,712,898

CAMERA BATTERY COVER FOR A CAMERA HAVING A CHAMBER FOR A BUILT IN BATTERY

Shosuke Haraguchi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

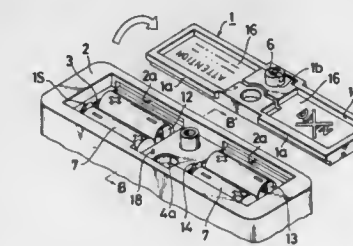
Filed Dec. 5, 1985, Ser. No. 805,985

Claims priority, application Japan, Dec. 5, 1984, 59-255662; Dec. 10, 1984, 59-260521

Int. Cl.⁴ G03B 17/02

U.S. Cl. 354—288

15 Claims



1. A camera comprising:

- (a) a camera body;
- (b) a battery chamber formed in said camera body;
- (c) a battery cover for covering said battery chamber, at least part of said battery cover being an electrically conductive part;
- (d) connecting means for electrically connecting said camera body with said electrically conductive part in a state where said battery cover is closed; and
- (e) detecting means for detecting closure of said battery cover, said detecting means detecting a connecting state of said connecting means with said electrically conductive part to detect the closure of said battery cover.

4,712,899

PHOTOSENSITIVE MATERIAL TREATING APPARATUS

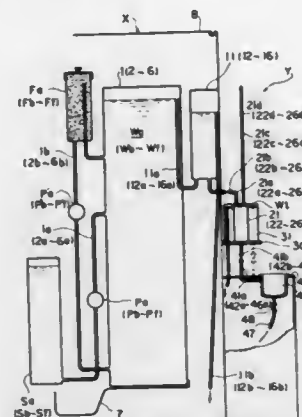
Kanichi Nishimoto, Wakayama, Japan, assignor to Noritsu Kenkyu Center Co., Ltd., Wakayama, Japan
Filed Feb. 3, 1987, Ser. No. 10,421

Claims priority, application Japan, Feb. 10, 1986, 61-16829[U]; Feb. 10, 1986, 61-16830[U]; Feb. 10, 1986, 61-16831[U]; Jun. 16, 1986, 61-90565[U]

Int. Cl.⁴ G03D 3/06

U.S. Cl. 354—316

14 Claims



1. A photosensitive material treating apparatus comprising: a treating unit including a series of treating liquid baths for carrying out a series of developing treatments such as developing, bleaching, fixing and others, for photosensitive material such as strip of photographic film, printing paper or the like, said treating unit being housed in a dark box and each of said treating liquid baths being equipped with a treating liquid supply device;
- a disc film treating unit including a plurality of tanks into which specific treating liquid separately introduced from the first-mentioned treating unit for treating several number of disc films is stored, a hot water bath for heating said tanks in order to maintain a temperature of each of treating liquids at temperature suitable for treating said disc films and a single disc film treating tank into which said treating liquids are successively supplied from said tanks in accordance with a predetermined order of treatments for the disc films, and
- said disc film treating unit being attached to the first-mentioned treating unit in the side-by-side relation.

4,712,900

APPARATUS FOR CONVERTING INTERCHANGEABLE CAMERA LENS FROM MANUAL INTO AUTOFOCUS

Hideo Hamano, C-524, Dai-2 Kōporasu, Kibōgaoka 144-1, Nakabougōnaka, Asahi-Ku, Kanagawa-Ken; Jun Sugita, 206, Fuji-sou, 4-3-14 Nishi-ikuta, Tama-Ku, Kawasaki-Shi Kanagawa-Ken, and Takashi Watanabe, Haimu, Ayabe 2F, 2-25-49 Honmachi, Fuchu-Shi, Tokyo, all of Japan

Filed Dec. 12, 1986, Ser. No. 940,546

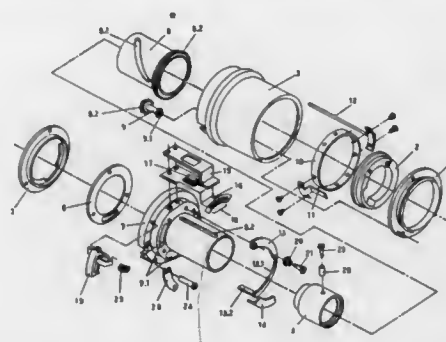
Claims priority, application Japan, Dec. 14, 1985, 60-280217
Int. Cl.⁴ G03B 3/00

U.S. Cl. 354—400

15 Claims

1. An apparatus for converting a manual focus interchangeable lens having an associated focal length into an autofocus type lens for use with a microprocessor based autofocus single lens reflex camera for providing autofocus photography with said manual focus interchangeable lens, said camera having a camera body, said camera body comprising focus detecting means and focus driving means for providing a focus driving signal under control of said focus detecting means, said focus detecting means comprising said microprocessor, said camera body having a lens mounting means for mounting an interchangeable autofocus lens to said camera body in driving

relation with said focus driving means and in electrical connection with said focus detecting means for providing lens driving power to said interchangeable autofocus lens in response to a signal from said focus detecting means; said converter apparatus comprising first mounting means disposed at one end thereof for mounting said converter apparatus to said camera body lens mounting means and second mounting means disposed at the opposite end thereof for mounting said manual focus interchangeable lens to said converter apparatus, said manual focus interchangeable lens having an associated camera mounting different from said camera lens mounting, said converter apparatus further comprising a lens system for converting said focal length of said manual focus interchangeable lens, a driving means couplable to said focus driving means in driving engagement therewith for driving said converter lens sys-



tem along the optical axis thereof in response to said focus driving signal from said camera body, lens data conversion and output means for converting lens data representing the characteristics of said manual focus interchangeable lens into digital representations thereof for electrically providing a bit pattern for transmission of said lens data to said camera body microprocessor through said camera lens mounting means, and aperture control and conversion means for providing aperture control of said interchangeable lens in response to aperture control data derived from said camera body, said lens data conversion and output means comprising means for detecting minimum aperture value of said manual focus interchangeable lens and for providing a full/minimum aperture value lens data characteristic therefrom based on said detected minimum aperture value for said manual focus interchangeable lens.

4,712,901

SHARP FOCUS DETECTING DEVICE

Keiji Ohtaka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

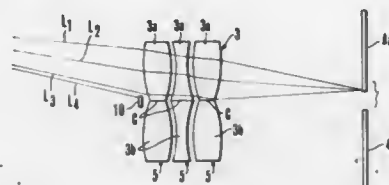
Continuation of Ser. No. 576,858, Feb. 3, 1984, abandoned. This application Dec. 4, 1985, Ser. No. 805,404

Claims priority, application Japan, Feb. 5, 1983, 58-15699[U]

Int. Cl.⁴ G03B 3/00

U.S. Cl. 354—407

6 Claims



1. A focus detecting device for detecting a focus condition of an objective lens, comprising:
 - (a) image forming means for forming a plurality of images on the basis of respective light beams passing through different areas of a pupil of said objective lens, said image forming means cutting off part of outer peripheries of lens

- components for combining the cut off components at their cut off portions into a united form;
 - (b) photo-electric transducing means receptive of all the images formed by said lens components for producing a signal for distinguishing between focus conditions of said objective lens; and
 - (c) light shielding means for preventing light beams incident upon one lens component of said image forming means from influencing the image formed by the other lens component;
- and wherein said light shielding means is positioned near the contacted portion of each of the lens components.

4,712,902

DEVICE FOR INDICATING AN OBJECT DISTANCE FOR FLASH PHOTOGRAPHY

Hiroshi Hosomizu, Nara; Kenji Tsuji, Amagasaki, and Makoto Kamiya, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

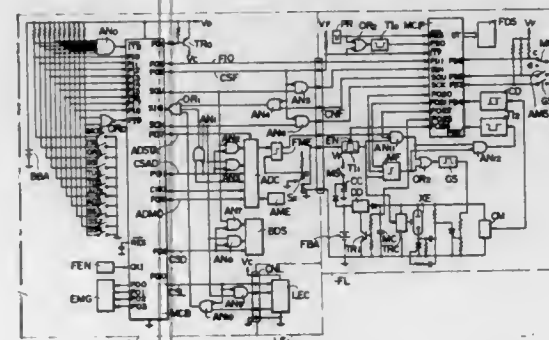
Filed Jan. 17, 1986, Ser. No. 819,695

Claims priority, application Japan, Jan. 18, 1985, 60-6016[U]

Int. Cl.⁴ G03B 15/05

U.S. Cl. 354—416

9 Claims



1. A flash photography system comprising a camera and an electronic flash device detachably coupled to said camera; said camera comprising:
 - means for generating a first data indicative of a set film speed, a second data indicative of a set amount of exposure to be compensated from a predetermined amount of exposure, and a third data indicative of a value of diaphragm aperture to be controlled;
 - a data transmission means for transmitting the first through third data to said flash device; and
 - means for generating a firing signal for flash firing and transmitting the signal to said flash device;
 said flash device comprising:
 - a light emitter for emitting a light for flash photography; means for receiving the firing signal and effecting the control for the flash light emission in response to the received firing signal;
 - a data receiving means for receiving the first through third data fed from said camera;
 - a data output means for generating a fourth data indicative of the flash light amount to be emitted from said light emitter;
 - a calculation means responsive to the first through fourth data for calculating a camera-to-object distance for flash photography; and
 - a display means for displaying the calculated distance.

4,712,903

METHOD AND CIRCUIT ARRANGEMENT FOR THE AUTOMATIC DETERMINATION OF AN EXPOSURE VALUE

Klaus-Dieter Schaefer, Braunsfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

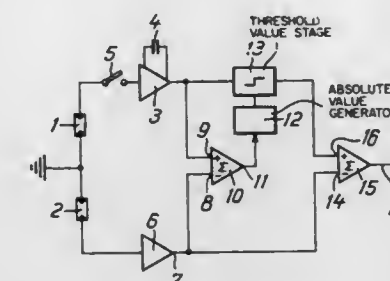
Filed Dec. 2, 1986, Ser. No. 936,763

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1985, 3542511

Int. Cl.⁴ G03B 7/08

U.S. Cl. 354—433

10 Claims



1. A method for the automatic determination of an exposure value for the exposure control in a photographic camera, comprising the steps of:
 - (a) generating electrical signals from an integrated brightness measurement of an object to be exposed;
 - (b) generating electrical signals from a selective brightness measurement of the object;
 - (c) comparing the integrated brightness electrical signal with the selective brightness electrical signal to generate a difference value;
 - (d) comparing the difference value with a threshold value to generate a correction value; and
 - (e) comparing the correction value with the integrated brightness electrical signal to generate an exposure value.

4,712,904

CAMERA SYSTEM

Nobuyuki Taniguchi, Tondabayashi; Masatake Niwa, Sakai; Akira Fujii, Osaka; Takeo Hoda, Sakai; Masaaki Nakai, Nara; Minoru Sekida, Sakai, and Masayoshi Sahara, Sennan, all of Japan, assignors to Minolta Camera KK, Japan

Division of Ser. No. 634,474, Jul. 25, 1984, Pat. No. 4,621,914.

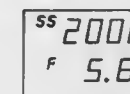
This application Jul. 23, 1986, Ser. No. 888,600

Claims priority, application Japan, Jul. 27, 1983, 58-138129; Jul. 29, 1983, 58-139600; Aug. 8, 1983, 58-144547; Aug. 8, 1983, 58-144549; Aug. 17, 1983, 58-150572; Jun. 22, 1984, 59-129572; Jun. 25, 1984, 59-131452; Jun. 25, 1984, 59-131453

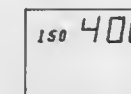
Int. Cl.⁴ G03B 17/18, 1/60

U.S. Cl. 354—475

5 Claims



(a)



(b)

1. A camera functioning with film speed data, comprising:
 - means for introducing film speed data, including first means responsive to a manual operation for setting desired film speed data;
 - second means responsive to a manual operation for setting exposure time data;
 - first means for alternatively indicating one of the film speed data or the exposure time data;

second means for indicating additional data relating to exposure; and means, responsive to said first setting means, for controlling said first and second indicating means, including means for selecting the film speed data to appear at said first indicating means when said first setting means is manually operated, means for selecting the exposure time data to appear at said first indicating means when said first setting means is not manually operated, and means for disabling said second indicating means so that film speed data appears without appearance of the additional data when said first setting means is manually operated, and for enabling said second indicating means so that the additional data appears with the exposure time data when said first setting means is not manually operated.

4,712,905

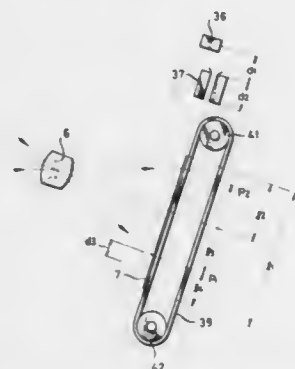
METHOD OF PREVENTING THE OCCURRENCE OF BLACKENED MARGINS ON PHOTOSENSITIVE SHEETS IN ELECTROPHOTOGRAPHY

Tatsunari Arito, and Yu Tojo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 15, 1985, Ser. No. 792,694

Claims priority, application Japan, Oct. 15, 1984, 59-214180
Int. Cl.⁴ G03G 15/048

U.S. Cl. 355—3 CH

5 Claims



1. A method of charging a photosensitive sheet with electricity by charging means disposed before an exposure position in an electrophotographic apparatus while the photosensitive sheet is transported toward the exposure position by transporting means so as to render the photosensitive sheet electrophotographic, said method comprising the steps of:

- determining on the basis of the extent of an image area of said photosensitive sheet a first transporting length by which said photosensitive sheet is to be moved until a forward end of the image area of said photosensitive sheet within which an image can be formed is charged with electricity by said charging means after the arrival of a leading end of said photosensitive sheet at a specified position and a second transporting length by which the photosensitive sheet is to be further transported until a rear end of said image area of said photosensitive sheet is charged with electricity by said charging means;
- actuating said charging means to turn ON upon said photosensitive sheet having been transported by said first transporting length by said transporting means; and
- deactuating said charging means to turn OFF upon said photosensitive sheet have been transported by said second transporting length by said transporting means, thereby preventing any area of said photosensitive sheet which is not part of the image area from being charged with electricity so as to prevent blackened margins on the photosensitive sheet.

4,712,906 ELECTROSTATOGRAPHIC APPARATUS HAVING A TRANSFER DRUM

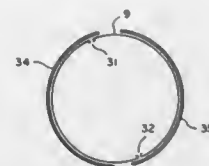
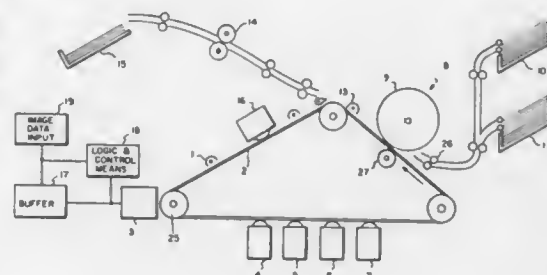
Rose M. Bothner, and James L. Butler, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1987, Ser. No. 7,036

Int. Cl.⁴ G03G 15/16, 15/01

U.S. Cl. 355—3 TR

17 Claims



1. In a transfer apparatus, for an electrostatographic copier, printer or the like, for transferring a plurality of toner images, electrostatically held to a moving image member, to copy sheets which copy sheets are moved to said transfer apparatus in timed relation with the arrival of the toner images to be transferred, said transfer apparatus including a transfer drum having means for securing a first copy sheet to the periphery of said drum and means for rotating the drum to bring the secured copy sheet into transfer relation with more than one of said images as said images are moved by the image member past the transfer apparatus, to transfer said more than one images in registration to the first copy sheet;

the improvement wherein said transfer drum includes means for securing a second copy sheet thereto to receive, in registration, its own set of toner images from the image member, during said rotation of the transfer drum.

4,712,907

SEQUENCING MEANS FOR PHOTOCOPYING PROCESSES

Joseph Weinberger, Brunswick, N.J.; Gary S. Bricault, Rochester, N.Y.; David Gruber, Rochester, N.Y., and Eleonora Rakover, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1985, Ser. No. 794,129

Int. Cl.⁴ G03G 15/00

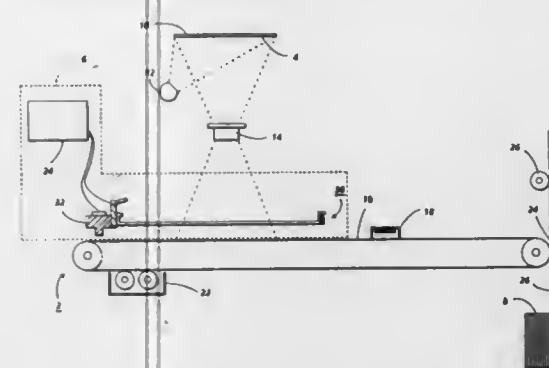
U.S. Cl. 355—7

5 Claims

1. An electrophotographic printing machine for reproducing an original document with a copy thereof having additional indicia thereon, including:

- a photoconductive member;
- means for charging at least a portion of said photoconductive member to a substantially uniform potential;
- means for illuminating selectively the charged portion of said photoconductive to discharge selectively the charged portion of said photoconductive member to record an electrostatic latent image on said photoconductive member corresponding substantially to the original document being reproduced;
- means for masking a region of the charged portion of said photoconductive member discharged normally by said

illuminating means to prevent the discharge thereof by said illuminating means; and



means for discharging selectively the masked region of the charged portion of said photoconductive member to record an electrostatic latent image thereon corresponding to the additional indicia.

4,712,908

IMAGE FORMING APPARATUS

Tomobumi Nakayama; Toshihiko Mori, both of Tokyo; Masayuki Hirose, Yokohama; Toru Ohbuchi, Yokohama; Masanori Miyata, Yokohama; Shinichi Nakamura, and Takeshi Honjo, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

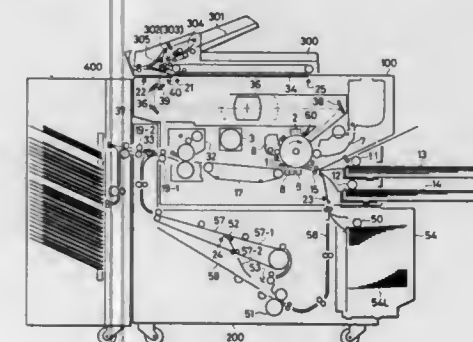
Filed Sep. 17, 1986, Ser. No. 908,254

Claims priority, application Japan, Sep. 19, 1985, 60-207022

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—14 SH

15 Claims



1. An image forming apparatus comprising:
means for forming images onto one sheet a plurality of times, in which said image forming means has means for temporarily enclosing the sheet on which the images are formed and further forms images onto the sheet enclosed in said enclosing means;
means for setting the number of sheets to be formed with images; and
means which, in the case where the number of sheets which is set by said setting means is larger than the number of sheets which can be enclosed into said enclosing means, controls said image forming means in order to divide the images into the images as many as the number of image forming times below said number of sheets which can be enclosed and to form the images.

4,712,909

CRT COMPOSITE IMAGE PRINTING METHOD AND APPARATUS

Yuji Oshikoshi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

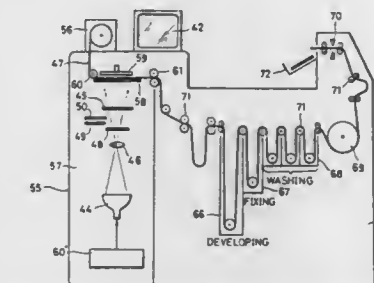
Filed Aug. 21, 1986, Ser. No. 898,584

Claims priority, application Japan, Aug. 21, 1985, 60-181686; Aug. 26, 1985, 60-185795; Sep. 17, 1985, 60-203536

Int. Cl.⁴ G03B 27/80

U.S. Cl. 355—20

16 Claims



1. An apparatus for making a print from an image on a CRT display device, which comprises:
video recording means for recording and reproducing a number of figure images in sequence, said figure images being produced by means of a TV camera;
memory means for storing personal data corresponding to each of said figure images which are entered therein with the aid of a computer;
means for retrieving said personal data as video signals from said memory means and said figure images as video signals from said video recording means as a composite of said retrieved video signals;
means for displaying said composite video signals as a visible composite image on a screen of said CRT display device; and
means for producing a latent image of said visible composite image displayed on said screen of said CRT display device on a printing paper and then processing said printing paper, thereby providing a print of said composite image.

4,712,910

EXPOSURE METHOD AND APPARATUS FOR SEMICONDUCTOR FABRICATION EQUIPMENT

Keiichiro Sakato, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 688,599, Jan. 3, 1985, abandoned. This application Oct. 29, 1986, Ser. No. 925,487

Claims priority, application Japan, Jan. 5, 1984, 59-487; Jan. 9, 1984, 59-763

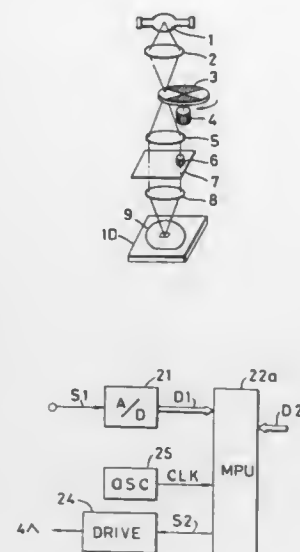
Int. Cl.⁴ G03B 27/72, 27/42

U.S. Cl. 355—53

21 Claims

1. An exposure apparatus used in fabrication of semiconductor devices to control a mercury-vapor lamp for projecting light onto a substrate to be exposed, said apparatus comprising:
(a) supply means for supplying power to said mercury-vapor lamp whereby said lamp projects light of an intensity corresponding to the power supplied thereto by said supply means;
(b) drive means for driving said supply means; and
(c) control means for controlling said drive means to cause said supply means to supply a first power and a second power lower than said first power to said lamp, said control means controlling said drive means in such a manner that an average power supplied to said lamp over a whole exposure cycle, including an exposure period in which said first power is supplied to said lamp and an interval between exposure periods in which said second power is supplied to said lamp, attains a predetermined value, said predetermined value being not less than a rated input

power and being less than a maximum allowable instantaneous input power and said second power being not less than a minimum instantaneous input power, wherein said



control means includes means for computing said second power in dependence on a ratio between said exposure period and said interval and said first power.

4,712,911

EXPOSURE MASK FOR MICRO CAMERA

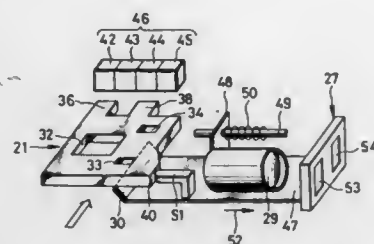
Hisatsugu Torii, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 3, 1986, Ser. No. 881,970

Claims priority, application Japan, Jul. 3, 1985, 60-146384
Int. Cl.⁴ G03B 27/58

U.S. Cl. 355-74

4 Claims



1. An exposure mask adapted to be interchangeably used with a micro camera whose microfilming format is changeable, said exposure mask having an exposure aperture for defining the size of frames of micro images to be recorded on a photographic film and at least one aperture outside the exposure aperture and which is adapted to allow data images to be projected there through to be recorded on said photographic film outside said frames, said mask having means containing mask-type information adapted to be detected by said micro camera in order to effect the changing of the microfilming format of said micro camera in accordance with the type of said exposure mask, said information-containing means comprising a plurality of opaque segments adapted to be detected by means of a photoelectric sensor in said micro camera, the arrangement of said opaque segments being unique to one type of exposure mask.

4,712,912 SPECTROPHOTOMETRIC IMAGE SCRAMBLER FOR FULL APERTURE MICROSPECTROSCOPY

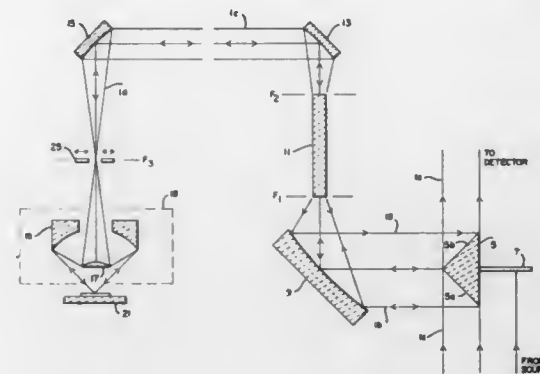
Robert G. Messerschmidt, Westport, Conn., assignor to Spectra-Tech, Inc., Stamford, Conn.

Filed Mar. 10, 1986, Ser. No. 837,672

Int. Cl.⁴ G01N 21/55, 21/59

U.S. Cl. 356-73

25 Claims



1. An optical system for a spectrophotometer that has a source of a beam of radiant energy and a detector for the radiant energy, said optical system directing radiant energy from the source to a sample along an optical path, comprising: means for scrambling the beam of radiant energy from the source said scrambling means being positioned to scramble a segment of the radiant energy from the source; means for forming a sample image with the scrambled radiant energy from the source; means for collecting radiant energy reflected from the sample, said radiant energy having image information about the sample; said means for scrambling being positioned to also scramble said reflected radiant energy to destroy said sample image; and means for directing said scrambled reflected radiant energy to the detector.

4,712,913

LINEAR-SCANNED-ARRAY WAVEFRONT SENSOR

Noah Bareket, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 522,678, Aug. 12, 1983, abandoned.

This application Nov. 28, 1986, Ser. No. 935,900

Int. Cl.⁴ G01B 11/26

U.S. Cl. 356-121

11 Claims



1. An apparatus for sensing aberrations in an optical beam wavefront, said apparatus comprising:
(a) means for producing a plurality of sample beams, each sample beam having a wavefront representing a corresponding portion of the optical beam wavefront in which said aberrations

tions are to be sensed, and for converging said sample beams to form corresponding focussed sample beam spots;

(b) beamsplitting means for dividing each of said sample beams into a first component and a second component, and for directing the first components of said sample beams along a first path to form corresponding first-component spots on a focal surface in said first path, and for directing the second components of said sample beams along a second path to form corresponding second-component spots on a focal surface in said second path, the first-component and second-component spots thereby formed from each sample beam having a predetermined width, each first-component and second-component spot having an irradiance that is characteristic of the corresponding portion of the optical beam wavefront that is represented by the sample beam from which said first-component and second-component spots are formed;

(c) means for performing a one-dimensional integration across substantially the entire width of each of said first-component and second-component spots, the irradiance integration for each first-component and second-component spot being performed independently along a first integration axis and a second integration axis;

(d) a first linear array of time-integrating photodetectors positioned in said first path generally orthogonally with respect to said first integration axis, and a second linear array of time-integrating photodetectors positioned in said second path generally orthogonally with respect to said second integration axis, the photodetectors of said first linear array generating signals responsive to the integrated irradiance of said first-component spots, and the photodetectors of said second linear array generating signals responsive to the integrated irradiance of said second-component spots; and

(e) means for processing said signals, and for calculating a measure of position for each sample beam from said signals.

4,712,914

DEVICE FOR CHARACTERIZING WIDE ANGLE BEAMS

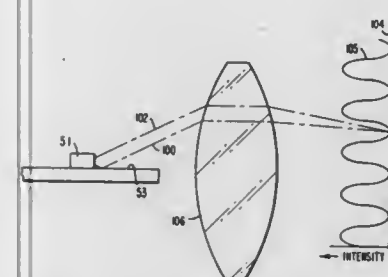
Michael A. Cross, Severna Park, and Edward W. Nichols, Reisterstown, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 10, 1986, Ser. No. 817,705

Int. Cl.⁴ G01J 1/00

U.S. Cl. 356-121

6 Claims



1. A system for determining the characteristics of an optical beam comprising, in combination:

(a) optical projection means for collecting optical energy comprising a divergent optical beam and for projecting energy comprising said optical beam into a planar projection plane such that a substantially linear relationship is maintained between the energy density of said optical beam when measured in equal solid angular increments at a constant distance from the centroid of said optical beam and the energy density in said projection plane;

(b) sensor means for determining the energy density of said optical beam at predetermined location in said projection

plane to generate a data matrix having a predetermined relationship to the characteristics of said optical beam;

(c) data processing means for processing said data matrix to determine selected characteristics of said optical beam; and

(d) a reflecting plane positioned between a source generating said optical beam and said optical projection means such that Lloyd's fringes are produced in said projection plane.

4,712,915

ARRANGEMENT FOR HOLDING AN INSTRUMENT IN ALIGNMENT WITH A MOVING REFLECTOR

Alex S. Kosakowski, and Mats A. Lundqvist, both of Täby, Sweden, assignors to Geotronics AB, Danderyd, Sweden

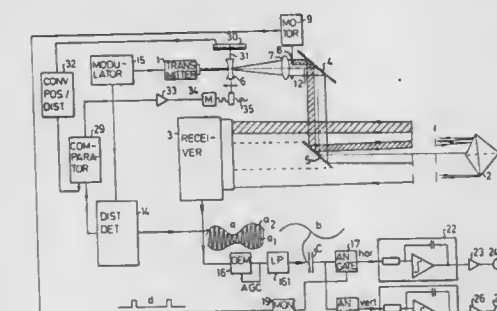
Filed May 7, 1985, Ser. No. 731,410

Claims priority, application Sweden, May 21, 1984, 8402723

Int. Cl.⁴ G01B 11/26; G01C 1/00, 3/08

U.S. Cl. 356-152

11 Claims



1. An instrument which is adapted to be maintained in alignment with a reflector, such as a cube corner prism, which moves in relation to the instrument, said instrument comprising:

(a) transmitter means for transmitting towards said reflector for reflection thereby an electromagnetic beam of radiation which is substantially collimated or slightly divergent;

(b) receiver means for receiving the beam of radiation reflected by said reflector and for producing a corresponding output;

(c) an optical modulating means, disposed in the path of the beam of radiation transmitted by said transmitter means, for varying, at a predetermined frequency, the light intensity in at least the peripheral portion of the beam in a cyclically varying manner around the optical axis of the transmitted radiation beam so as to provide modulation of at least the peripheral portion of said transmitted beam;

(d) an electrical circuit, connected to said receiver means to receive the output therefrom, for processing at least the part of the output produced by said receiver means corresponding to the modulated peripheral portion of the transmitted beam and for producing an output signal in accordance therewith, and

(e) a servo means, connected to said transmitter means and responsive to the output signal produced by said electrical circuit, for displacing the direction of said transmitted beam in a sense such as to reduce said output signal to a minimum.

4,712,916

APPARATUS FOR INSPECTION OF THE WALLS OF DEEP HOLES OF MINUTE DIAMETER

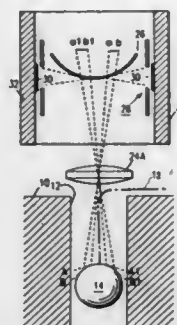
John B. Gunn, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,509

Int. Cl.⁴ G01N 21/88; G02B 23/24

U.S. Cl. 356—241

1 Claim



1. Apparatus for the inspection of the walls of a deep hole of minute diameter in a structure such as an integrated circuit board comprising a reflective optical sphere having a diameter at least slightly smaller than the hole diameter, a single coated optical fiber having a diameter substantially less than the diameter of said sphere and having one end attached to said sphere for manipulation of said sphere in the hole, an optical scattering means interposed between said sphere and said fiber to disperse illumination from the optic fiber to illuminate the walls of the hole, a source of illumination at the opposite end of said optic fiber, and an optical system positioned axially at the end of said hole to pick up the image of the illuminated walls reflected from said sphere, said optical system including at least one lens and a second spherical reflector arranged beyond said lens for reflecting images focused through said lens from said first-mentioned sphere radially outwardly, a cylindrical slip aperture positioned to transmit a selected axial length of the illuminated image of the cylindrical wall being inspected as reflected from said second spherical reflector, a photographic film arranged in a cylindrical configuration in axial alignment with the hole to be inspected, and means for synchronously moving said film along an extension of the axis of said hole in synchronism with movement of said image axially within said hole to thereby generate a photographic record of the appearance of the inside wall of the hole.

4,712,917

READOUT FOR A RING LASER GYRO

James W. Bergstrom, New Brighton, and Theodore J. Podgorski, Maplewood, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 26, 1984, Ser. No. 665,414

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.⁴ G01C 19/64

U.S. Cl. 356—350

4 Claims

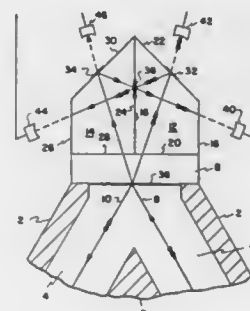
I. A readout optical apparatus for a ring laser angular rate sensor comprising:

- an optically transparent substrate member having first and second major surfaces, and said second major surface includes a first beam splitter means; and
- a first prism element having
 - a first surface perpendicular to a second surface thereof,
 - a third surface being at a predetermined acute angle with respect to said first surface,
 - a first beam reflecting means on said third surface for reflecting, back into said first prism element and toward said first surface thereof, beams entering through said second surface, passing uninterrupted through said first

prism element between said second and third surfaces, and impinging on said first beam reflecting means, and said first surface including a metallic coating thereon to provide a second beam splitter means;

a second prism element having

a first perpendicular to a second surface thereof, said first surface of said first prism element being positioned in contiguous juxtaposition with respect to said first surface of said second prism element, said second surface of said first prism element being coplanar with said second surface of said second prism element, said first and second prism elements being bonded together at said first surface solely by optical bonding, and said coplanar second surfaces of said first and second prism



elements being positioned in contiguous juxtaposition with said first major surface of said substrate member, and bonded thereto solely by optical bonding with said second beam splitter means being in the interface between said contiguous first surfaces of said first and second prism elements; and

a third surface being at said predetermined acute angle with respect to said first surface, said third surface including a second beam reflecting means for reflecting back into said second prism element toward said first surface thereof, beams entering through said second surface of said second prism element passing through said second prism element between said second and third surfaces thereof, and impinging on said second beam reflecting means.

4,712,918

METHOD FOR MEASURING INK DENSITY

Helmut Weigend, Leipzig; Bernd Morgenstern, Lützschena, and Peter Reinhardt, Leipzig, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lambertz" Leipzig, Leipzig, German Democratic Rep.

Filed Nov. 14, 1984, Ser. No. 671,629

Claims priority, application German Democratic Rep., Nov. 14, 1983, 256652

Int. Cl.⁴ G01N 21/86

U.S. Cl. 356—429

3 Claims

1. In a method for measuring ink density on printed sheets in an operating printing machine by means of a measuring head, a light source which illuminates measuring marks provided on a printed material, a sensor, which receives reflected light from said marks and measures a value of the reflected light and converts said value of said light into electric signals, and an electric circuit receiving signals from said sensor, the improvement comprising:

- releasing a start of a measuring process by controlling electrical impulse flanks of said signals, wherein measuring of said light reflected from a measuring mark is performed by sensors having short response time; and
- determining a medium reflection of an entire surface of a measuring mark being scanned, wherein said controlling of electrical impulse flanks of said signals is released via a leading edge of at least one printed measuring mark and the light source responds via a con-

4,712,920

APPARATUS FOR MANUFACTURING SOFT ICE CREAM AND THE LIKE

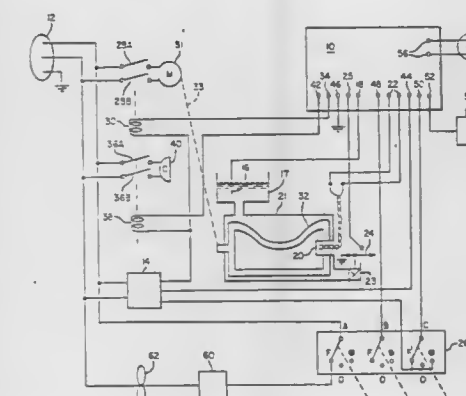
Theodore Ames, Portland, and Vernon E. Brown, Jr., Yamhill, both of Oreg., assignors to Glacier Products, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 637,382, Aug. 2, 1984, Pat. No. 4,551,025. This application Aug. 26, 1985, Ser. No. 769,664

Int. Cl.⁴ A23G 9/00

U.S. Cl. 366—144

21 Claims



1. In a controller means for operating an apparatus for manufacturing soft ice cream and the like, said soft ice cream being served with a desired characteristic, said controller means responsive to the actuation, for incremental serving periods, of a dispenser spigot, the improvement comprising:

- said controller means having preset therein a base period and having:
- 1. means for accumulating said incremental serving periods during said base period, and comparing said accumulated incremental serving periods to said base period; and
- 2. means for maintaining said desired characteristic as said accumulated incremental serving periods vary during successive base periods.

4,712,921

MIXER FOR CONTINUOUSLY MIXING FLUIDS

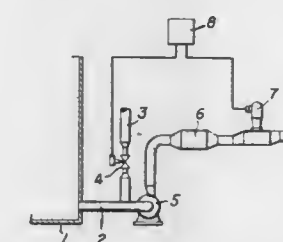
Hikokoku Sugiura, 1-1569-1 Minami, Kaijin-cho, Funabashi-shi, Chiba-ken, Japan

Filed Oct. 24, 1986, Ser. No. 924,343

Int. Cl.⁴ B01F 5/04

U.S. Cl. 366—151

3 Claims



1. A mixer for continuously mixing fluids adapted to be employed in conjunction with a paper-making line comprising a slurry tank, a material supply pipe extending from said slurry tank and including a pump, a dilution water injecting pipe connected to said supply pipe upstream of said pump, a concentration determination device connected to said supply pipe downstream of said pump and a control board operatively connected to said concentration determination device, characterized in that said mixer is mounted in said material supply pipe between said pump and said concentration determination

4,712,919

CONTINUOUS SOIL MIXING APPARATUS

Floyd E. Bouldin, McMinnville, Tenn., assignor to Bouldin & Lawson, Inc., McMinnville, Tenn.

Filed Jan. 6, 1987, Ser. No. 670

Int. Cl.⁴ B01F 15/00

U.S. Cl. 366—133

14 Claims



1. A continuous soil mixing apparatus comprising:

- (a) an elongated, endless conveyor belt having an elongated upper run for carrying soil deposited on said upper run,
- (b) conveyor drive means for driving said conveyor belt continuously in a longitudinal direction,
- (c) an elongated first hopper having upper and bottom portions and opposite end walls, and adapted to receive a first soil of predetermined composition,
- (d) an elongated second hopper having upper and bottom portions and opposite end walls, and adapted to receive a second soil of a composition different from said first soil,
- (e) support means mounting said first and second hoppers longitudinally spaced above the upper run of said conveyor belt, said second hopper being downstream from said first hopper,
- (f) said first hopper having an open bottom spaced directly above and proximate to said upper run, so that first soil received in said first hopper gravitates directly upon said upper run below said first hopper,
- (g) agitator means in said first hopper for breaking up said first soil in said first hopper,
- (h) an elongated, endless feed belt extending the length of the bottom portion of said second hopper for supporting the second soil received in said second hopper,
- (i) feed drive means for driving said feed belt to move second soil on said feed belt toward the downstream end of said second hopper,
- (j) a discharge opening in said second hopper at the downstream end of said feed belt through which said second soil is discharged from said second hopper by said feed belt upon the upper run of said conveyor belt and upon any of said first soil carried by said upper run,
- (k) a mixing chamber above said upper run downstream from said second hopper,
- (l) a rotary mixer device in said mixing chamber, and
- (m) mixer drive means for actuating said mixer device to continuously mix said layers of said first soil and said second soil carried on said upper run of said conveyor belt into said mixing chamber.

device and comprises a hollow cylindrical body including an enlarged diameter central portion, an inwardly tapering inlet port provided at one end of said body and connected to said supply pipe and an outlet port of uniform diameter provided at the other end of said body; and an impinging disc disposed vertically within said enlarged diameter central portion and having the diameter greater than the minimum diameter of said inlet port and smaller than the diameter of said enlarged diameter central portion of the body, said impinging disc having a projection at the periphery of the disc extending towards said inlet port so as to define an annular clearance between the inner surface of said enlarged diameter central portion and the periphery of said disc.

4,712,922

MATERIAL MIXING APPARATUS

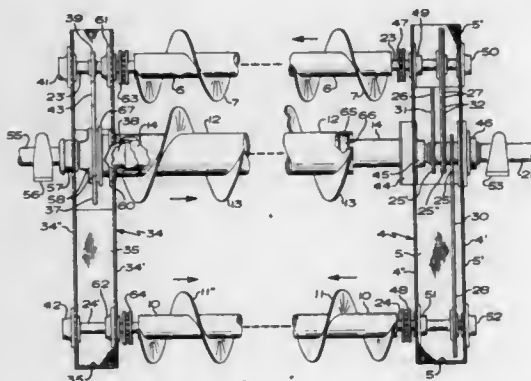
Leon G. Feterl, Salem, S. Dak., assignor to Core Industries Inc., Bloomfield, Mich.

Filed Jan. 3, 1986, Ser. No. 815,928

Int. Cl.⁴ B01F 7/08, 7/14, 15/02; B65G 33/26

U.S. Cl. 366-288

35 Claims



1. A material mixing apparatus for a mixer box, comprising: an elongated center shaft rotatively driven about a longitudinal axis within said mixer box;
- a first rotor end assembly fixedly mounted transversely to one end of said center shaft for rotation therewith, said first rotor end assembly being hollow and comprising a plurality of hollow arms extending radially therefrom;
- a second rotor end assembly fixedly mounted transversely to the opposite end of said center shaft for rotation therewith, said second rotor end assembly including a plurality of hollow arms extending radially therefrom corresponding in number to said plurality of hollow arms of said first rotor end assembly;
- a plurality of outer augers extending longitudinally within said mixer box, parallel to and radially spaced from said center shaft, each said outer auger comprising an elongated outer auger shaft having a helical flight means fixedly mounted on a portion thereof to move said material longitudinally, said outer auger shafts having one end rotatably mounted in the terminal portion of a hollow arm of said first rotor end assembly and the opposite end rotatably mounted in the terminal portion of the corresponding arm of said second rotor end assembly;
- a high speed drive shaft rotatably mounted within and projecting from said first rotor end assembly;
- outer auger drive means enclosed within said first rotor end assembly for transmitting rotational energy from said high speed drive shaft to said outer auger shafts to rotate said outer augers with respect to said mixer box;
- a low speed drive shaft fixedly mounted to said second rotor end assembly and coaxial with said center shaft for rotation of said first and second rotor end assemblies in unison, together with said plurality of outer augers mounted thereon, in an orbit about said center shaft; and
- bearing means attached to said mixer box for supporting said

high speed drive shaft and said low speed drive shaft within said mixer box.

4,712,923

ELECTRONIC CALENDAR AND METHOD FOR RANDOMLY SELECTING AND DISPLAYING MESSAGES

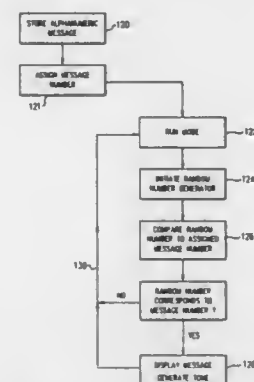
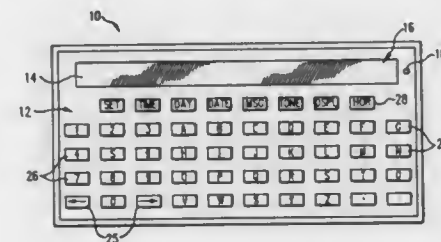
Victor G. Martin, 513 Willowcrest Dr., Garland, (Dallas), Tex. 75040

Filed Jun. 23, 1986, Ser. No. 877,471

Int. Cl.⁴ G04B 47/00, 19/24, 45/00

U.S. Cl. 368-10

17 Claims



1. An electronic calendar, comprising: a keyboard having function keys and alphanumeric keys for entering time, date, and message data; means connected to said keyboard for storing and processing said time, date, and message data; display means connected to said keyboard and said storing and processing means for displaying said time, date, and message data; and
- said storing and processing means including means for randomly selecting designated message data for display at recurring times.

4,712,924

WATCH FOR DISPLAYING A LINE ON THE DIAL

Fabrizio Agostini, Florence, Italy, assignor to Trast Enterprise S.r.l., Florence, Italy

Filed May 20, 1986, Ser. No. 864,992

Claims priority, application Italy, May 20, 1985, 67462 A/85; May 5, 1986, 53359/86[U]

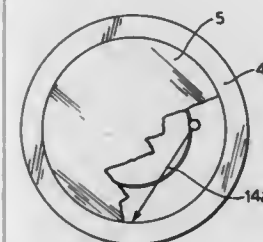
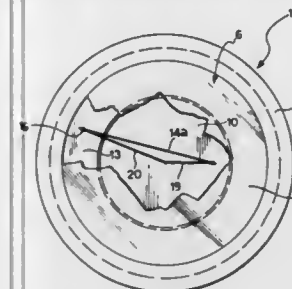
Int. Cl.⁴ G04B 19/04

U.S. Cl. 368-76

12 Claims

1. A clock comprising a clock casing, a dial, time indicator means associated with the dial, and means for controlling the

indicator means, wherein the indicator means is comprised of a single straight line on the dial, the ends of the line pointing



towards two separate zones of the periphery of the dial corresponding to the time to be indicated.

4,712,925

PENDULUM TYPE DECORATIVE AND TIME INDICATING DEVICE

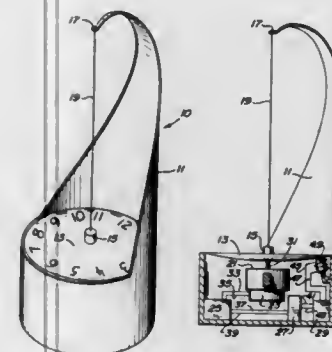
William B. Beebe, 2832 Main St., Bethlehem, Pa. 18017

Filed Jan. 27, 1987, Ser. No. 7,725

Int. Cl.⁴ G04B 17/02

U.S. Cl. 368-179

18 Claims



1. A time keeping device comprising:
 - (a) an at least partially upwardly facing surface structure,
 - (b) time indicia means associated with said partially upwardly facing surface,
 - (c) pendulum means arranged for oscillation over the portion of the time indicia means indicating actual time during such oscillation,
 - (d) electromagnetic means positioned adjacent to said time indicia in position to maintain oscillation of said pendulum across the time indicia means,
 - (e) intermittent energization means for energizing the electromagnetic means,
 - (f) timing means for controlling the intermittent energization of said intermittent energization means to the portion of the oscillation of the pendulum approaching the electromagnetic means.

4,712,926

ELECTRONIC TIMEPIECE

Tohru Tanabe, Showa, Japan, assignor to Rhythm Watch Company Limited, Tokyo, Japan

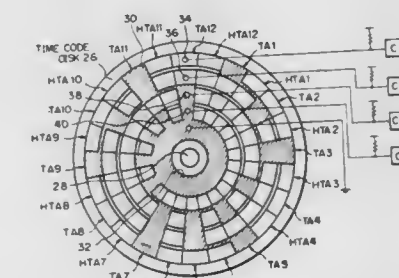
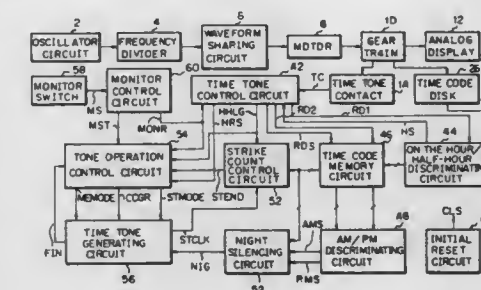
Filed Jun. 25, 1986, Ser. No. 878,411

Claims priority, application Japan, Jun. 29, 1985, 60-141587; Jun. 29, 1985, 60-98374[U]

Int. Cl.⁴ G04C 21/16

U.S. Cl. 368-251

9 Claims



1. An electronic timepiece including a time tone contact for providing a start signal, a time code disk including time code patterns composed of radially extending time areas formed by dividing a surface into at least twelve areas, said time areas having electrically conductive portions and non-conductive portions which are disposed in a diametrical direction therein to provide time codes of on-the-hour times corresponding to a time indication made by time indicating hands, time tone circuit means for starting a time tone generating operation in response to said start signal and a clock strike count control circuit which receives a code signal from said time code disk as a signal for limiting the number of time tone strikes, for terminating the time tone operation when the code value and the number of time tones strikes generated coincide, comprising:
 - a control circuit for generating read-in signals in response to said start signal; and
 - memory circuit means for storing said time code from said time code disk in response to said read-in signals; wherein said time code being stored in said memory circuit means is supplied to said clock strike count control as the signal for limiting the number of time tone strikes.

4,712,927

NESTED PLASTIC EXTENSION SLIDE

Robert Arrendiell, and Gwendolyn E. Ellis, both of 280 Sugarberry Cir., Houston, Tex. 77024

Filed Mar. 16, 1987, Ser. No. 26,150

Int. Cl.⁴ F16C 29/02

U.S. Cl. 384-23

11 Claims

1. A nested plastic extension slide for mounting a drawer into an accommodating opening in an apparatus, comprising an outer piece having a "C" shaped vertical cross section, the vertical base thereof being suited for installation on an inside wall of a drawer opening of the apparatus, the open

4,712,933

RIBBON GUIDE DEVICE INCLUDING A SEPARATE, LONGITUDINALLY SHIFTABLE, RIBBON GUIDE MEMBER

Yukihito Natsume, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 739,379, May 30, 1985, abandoned.

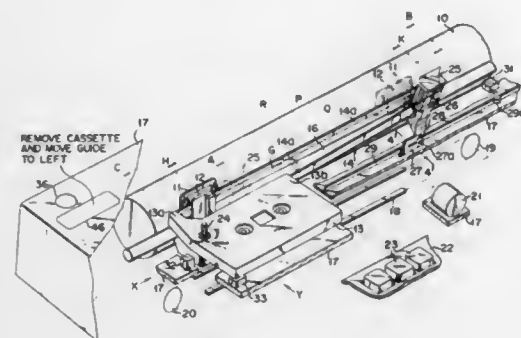
This application Dec. 10, 1986, Ser. No. 940,177

Claims priority, application Japan, Jun. 1, 1984, 59-82243[U]

Int. Cl.⁴ B41J 35/04

U.S. Cl. 400—248

11 Claims



1. A printer comprising:

- a platen;
- printing means movable relative to the platen along a print line on the platen;
- ribbon supply means containing a print ribbon and disposed in a predetermined fixed position, said print ribbon including a looped ribbon portion exposed from the ribbon supply means to the outside;
- a ribbon guide member movable along the print line between a first position and a second position, said ribbon guide member capable of being located within a region surrounded by the exposed looped ribbon portion when in the first position and to be releasably latched when in the second position;
- moving means capable of actuating the ribbon guide member for movement between the first and second positions; and
- a control device including
- first sensing means for detecting the location of the ribbon guide member in the first position,
- second sensing means for detecting the location of the ribbon guide member in the second position,
- a control means for actuating, in cooperation with the first sensing means, the moving means so that the moving means urges the ribbon guide member in the first position to move toward the second position, thereby causing the ribbon guide member to engage the looped ribbon portion so that the ribbon is drawn out from the ribbon supply means, and
- said control means stopping, in cooperation with the second sensing means, the operation of the moving means when the ribbon guide member reaches the second position, thereby causing the ribbon to be stretched along the print line between the ribbon supply means and the ribbon guide member.

4,712,934

TYPEWRITER CARRIAGE ESCAPEMENT MECHANISM HAVING TWO SETS OF TEETH

Peter Greaves, Nottingham, England, assignor to Dobson Park Industries plc, Nottingham, United Kingdom

Filed Nov. 26, 1985, Ser. No. 802,031

Claims priority, application United Kingdom, Nov. 28, 1984, 8430084

Int. Cl.⁴ B41J 19/48

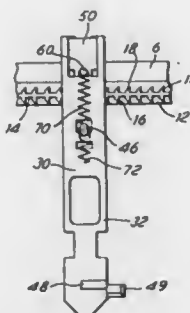
U.S. Cl. 400—332.5

5 Claims

1. A typewriter having a carriage and driving means biasing

the carriage to move in one direction, and a carriage escapement mechanism comprising:

- (a) A rack movable with the carriage, said rack having first and second sets of teeth projecting away from one another on opposite sides of the rack;
- (b) An escapement member constrained to slide in a straight line at right angles to the direction of movement of the rack, and movable between first and second positions;
- (c) Said escapement member having a tooth arranged to engage the first set of teeth on said rack when said member is in its second position, said tooth moving out of engagement with the rack as said member is moved to its first position;
- (d) A pawl slidably mounted in said escapement member for movement relative to said member in a straight line at right angles to the direction of movement of said rack, between first and second positions;
- (e) Resilient means biasing said pawl to its first position relative to said escapement member;
- (f) Said pawl having a tooth arranged, when said pawl is in its first position and said escapement member is in its first position, to engage the second set of teeth on said rack;



- (g) The tooth on said escapement member and the tooth on said pawl, when the pawl is its first position, being spaced apart from one another by a distance, measured in the direction of movement of said member, less than the distance, measured in the same direction, between the crests of the teeth of the first and second sets of teeth of said rack;
- (h) The tooth of said escapement member and the tooth of said pawl being so positioned relative to said rack, in the direction of movement of said rack, that movement of said escapement member from its first to its second position allows said rack to move through a first predetermined distance and movement of said escapement member from its second to its first position allows said rack to move through a second predetermined distance; and
- (i) Movement of said pawl to its second position relative to said escapement member when said escapement member is in its first position being arranged to withdraw the tooth on said pawl from said rack to allow said rack to move freely.

4,712,935

BLANK DOCUMENT GUARD IN A CHECK WRITING MACHINE

Philip G. LaDue, and James D. Peglow, both of Canandaigua, N.Y., assignors to The Standard Register Company, Dayton, Ohio

Filed Nov. 4, 1985, Ser. No. 794,985

Int. Cl.⁴ B41J 13/10

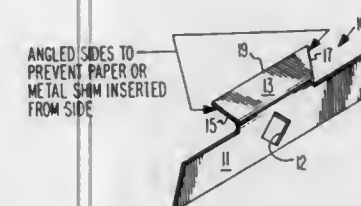
U.S. Cl. 400—645.1

9 Claims

- 1. A guard for use in a printer to inhibit the entry through a document aperture in said printer of extraneous print receiving media between an ink ribbon and a printer platen, said ink ribbon and said printer platen being positioned beneath said document aperture, comprising,

support means adapted to be disposed on an ink ribbon

containing cartridge and defining a ribbon aperture through which said ink ribbon may be driven, pressure means extending from said support means to said



platen above said ribbon and adapted to bear against said printer platen along a line directly above said ribbon aperture, thereby closing the space between said ink ribbon and said printer platen.

4,712,936

ONE-PIECE CAP AND BRUSH AND METHOD OF FORMING IT

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Continuation-in-part of Ser. No. 277,843, Jun. 26, 1981, abandoned. This application Mar. 23, 1983, Ser. No. 478,051

Int. Cl.⁴ A46B 11/00

U.S. Cl. 401—129

12 Claims



1. A method of forming a one-piece internally threaded cap and brush structure for closing a container and for spreading liquid content of the container, comprising the steps of:

- (a) providing a mold having at least three relatively movable mold parts which cooperate to define a cavity configured to form a one-piece cap, stem and brush structure which includes:
 - (i) a top wall;
 - (ii) a skirt depending from the top wall and formed integrally therewith, the skirt having threads formed on its inner surface;
 - (iii) an elongated stem depending from central portions of the top wall along a central axis of the mold cavity and formed integrally with the top wall;
 - (iv) a brush formed of discrete bristles depending from the stem and formed integrally therewith; and wherein said mold includes a cavity for forming said elongate stem with a plurality of discrete bristle projections integrally extending axially therefrom;
- (b) injecting molten plastics material into the mold cavity to form the cap and brush structure;
- (c) removing the cap and brush structure from the mold cavity by effecting relative movement of the three mold parts, with two of the mold parts separating to open the mold cavity to permit removal of the cap and brush structure from the mold cavity, and with a third of the mold

parts moving in a direction paralleling the central axis to engage the cap and brush structure and to pop the threaded skirt off such one of the other two mold parts as formed the threaded inner surface of the skirt; and

(d) elongating the plurality of discrete bristle projections to diminish their cross-sections, the elongation being effected after the cap and brush structure is removed from the mold cavity.

4,712,937

PLOTTER STYLUS WITH CAP COVERED VENT

Rolf Schmidt, St. Georgen, and Roland Schneider, Tennenbronn, both of Fed. Rep. of Germany, assignors to Schmidt Feintech-nik GmbH, Fed. Rep. of Germany

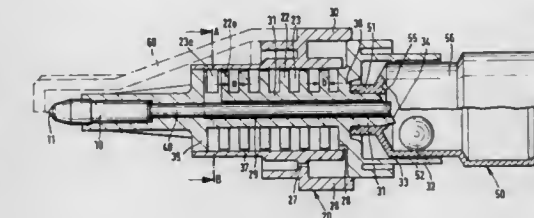
Filed Apr. 9, 1985, Ser. No. 721,466

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415859

Int. Cl.⁴ B43K 9/00, 7/00

U.S. Cl. 401—213

1 Claim



1. An elongated cylindrical plotter pen comprising a liquid ink distribution means at its distal end, a cap adapted and constructed to cover said distribution means, a liquid ink reservoir means at its proximal end, a cylindrical housing means having an inner cylindrical wall positioned between said ink distribution means and said ink reservoir means, an ink duct means positioned centrally and coaxially in said cylindrical housing means adapted and constructed to capillary convey ink from said ink reservoir means to said ink distribution means, a cylindrical hollow core means positioned internally and coaxially of said cylindrical housing means and about said ink duct means at a capillary producing distance, said core means having a plurality of radially outwardly extending fins defining annular spaces therebetween each having outwardly facing peripheral portions, said peripheral portions of said fins being spaced from the inner cylindrical wall of said cylindrical housing means for a capillary producing distance, said fins and said spaces each define an axial dimension of about the same distance, means for fluidly connecting said ink duct means and the annular space closest to said ink distribution means, relatively large means for fluidly connecting each of said annular spaces in said core means, said cylindrical housing means having a separate annular chamber annularly about said core means and remote therefrom, a first vent means for fluidly connecting the annular space closest to the ink reservoir means through said cylindrical housing means to said annular chamber, said annular chamber having a second vent means for fluidly connecting the annular chamber to the ambient atmosphere only when said cap is removed from said plotter pen.

4,712,938

EXPANSION SEAL ASSEMBLY

Venkatraman Sesbamani, Gillette, and Dudley P. Money, Parsippany, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 13, 1986, Ser. No. 818,468

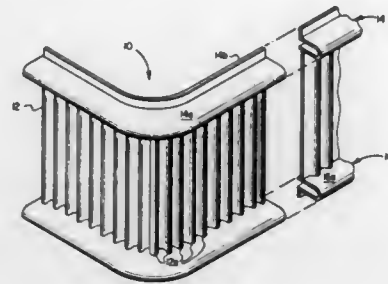
Int. Cl.⁴ E02D 29/12

U.S. Cl. 403—24

3 Claims

1. An expansion seal assembly for sealingly connecting two vertically spaced members subject to differential thermal expansion and contraction, said assembly comprising a corru-

gated plate extending between the two members with its corrugations extending vertically to accommodate differential thermal expansion and contraction between the two members in at least one lateral direction, a first U-shaped expansion joint rigidly secured at its respective ends to the upper edge of said plate and to one of said members, and a second U-shaped expansion joint rigidly secured at its respective ends to the



lower edge of said plate and to the other of said members, the ends of each of said expansion joints being movable relative to each other in a vertical direction to accommodate differential thermal expansion and contraction between said two members in an axial direction, and being movable relative to each other in a lateral direction to accommodate said thermal expansion and contraction between said members in said lateral direction.

4,712,939

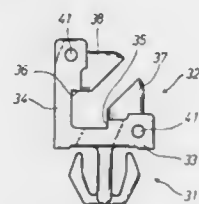
SUBSTRATE SUPPORT OF INTEGRAL CONSTRUCTION
Nobuaki Fujimoto, Okazaki, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Dec. 31, 1985, Ser. No. 815,024

Claims priority, application Japan, Jan. 11, 1985, 60-2610[U]
Int. Cl.⁴ F16B 5/06; H05K 7/12

U.S. Cl. 403—24

19 Claims



1. A substrate support of integral construction by which a substrate (20, 39) can be fixed angularly relative to a plate (22, 40), said substrate support comprising:

- (a) a first base (3, 3', 33);
 - (b) a fixing portion (1, 31) for coupling said first base (3, 3', 33) to a plate (22, 40);
 - (c) a first projection (7, 37) extending from said first base (3, 3', 33);
 - (d) a wall (9, 34) extending from said first base (3, 3', 33) at least generally parallel to said first projection (7, 37); and
 - (e) a second projection (8, 38) extending from said wall (9, 34) toward said first projection (7, 37) but leaving a space therebetween, said second projection (8, 38) being integral with said wall (9, 34) and said first projection (3, 37) and said second projection (8, 38) having the same form and having slopes facing each other,
- whereby, in use, a substrate (20, 39) is gripped by said first base (3, 3', 33), said first projection (7, 37), and said second projection (8, 38) so that an end of the substrate (20, 39) can be inserted into the space between said first projection (7, 37) and said second projection (8, 38) and the substrate (20, 39) can be fixed angularly relative to a plate (22, 40).

4,712,940

JOINT ASSEMBLY

Ruey E. Wood, Jr., St. Clair Shores, Mich., assignor to TRW Inc., Cleveland, Ohio

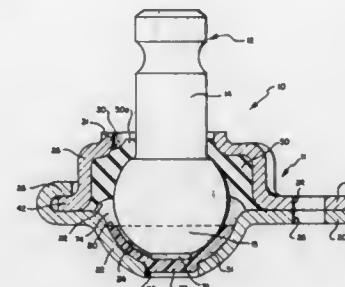
Continuation of Ser. No. 726,135, Apr. 23, 1985, abandoned.

This application Jan. 2, 1986, Ser. No. 815,675

Int. Cl.⁴ F16C 3/00

U.S. Cl. 403—133

9 Claims



1. A ball and socket joint for use between load bearing members which pivot relative to each other, said ball and socket joint including a ball stud for connection with one member and a socket for connection with the other member, said ball stud including a ball portion and a shank portion projecting from said ball portion, said socket having a chamber in which said ball portion is located and an opening through which said shank portion projects, a cup-shaped polymeric bearing liner interposed between a first part of said ball portion and said socket for transmitting forces and enabling sliding movement to occur therebetween, and an elastomeric layer bonded to a second part of said ball portion and resiliently interconnecting said ball stud and socket and urging said ball stud and socket to an initial relative position, said elastomeric layer having portions which project into volumes defined by said socket to mechanically interlock said elastomeric layer and socket and prevent slipping of said elastomeric layer relative to said socket.

4,712,941

TAPERED PISTON PIN

Eric D. Emmer, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

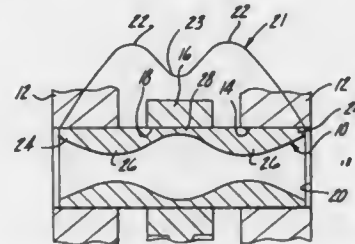
Division of Ser. No. 808,968, Dec. 16, 1985. This application

Dec. 3, 1986, Ser. No. 937,243

Int. Cl.⁴ F16C 11/06

U.S. Cl. 403—151

1 Claim



1. A tubular piston pin for an internal combustion engine with a double hourglass configured aperture extending axially therethrough produced by relatively thin-walled end portions and midportion and by relatively thicker-walled portions therebetween, comprising:

a piston pin having a cylindrical exterior surface on which bending load and shear load forces are imposed by portions of an associated piston and a connecting rod whereas

the bending and shear forces are greatest at two locations on either side of the midportion and inwardly from either end;

- a contoured aperture extending axially through the pin characterized by relatively thin walled end portions and midportion and by relatively thicker-walled portions therebetween whereby the thicker-walled portions are substantially aligned with the increased bending and shear force load on the pin in the areas on either side of the contact between the pin and the associated connecting rod;
- the tubular piston pin being composed of two joined half pin portions which are axially aligned and integrally weld joined together.

4,712,942

JOINT MAKER

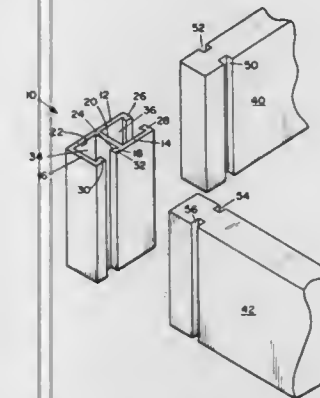
Robert K. Brown, 416 S. Church St., Lockhart, Tex. 78644

Filed Sep. 22, 1986, Ser. No. 909,580

Int. Cl.⁴ F16D 1/00; F16B 1/00

U.S. Cl. 403—174

7 Claims



1. Joint maker for joining at least two pieces of stock, each piece of stock with opposing configured like grooves comprising:

- a. at least two opposing angled inwardly extending cleat means, each of said cleat means including an expanding section which angles inwardly;
- b. arm means supporting each of said cleats; and,
- c. at least one interconnecting member means supporting and connecting said arm means for a captured area between said arm means and said interconnecting member means, each of said cleat means diverges inwardly toward said interconnecting member means providing for engagement within opposing grooves of said stock.

4,712,943

METHOD AND MACHINE FOR LEVELLING CONCRETE WHEN CASTING LARGE CONCRETE AREAS

Yngve Alvarsson, Skogshemsvägen 7B, S-141 41 Huddinge, Sweden

PCT No. PCT/SE85/00162, § 371 Date Nov. 29, 1985, § 102(e)
Date Nov. 29, 1985, PCT Pub. No. WO85/04686, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 4, 1985, Ser. No. 824,691

Claims priority, application Sweden, Apr. 9, 1984, 8401977

Int. Cl.⁴ E01C 19/29, 21/00

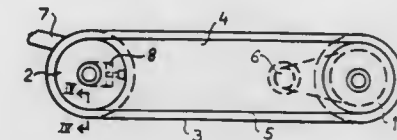
U.S. Cl. 404—75

9 Claims

1. A method for levelling and smoothing concrete when concreting large areas, characterized by providing a machine the bottom surface of which comprises a rotatable endless belt, providing sealing flanges along the longitudinally extending edges of said belt to prevent concrete from flowing over the surface of said belt opposite the surface thereof in contact with

the concrete to thereby enable flotation of said machine on said concrete, floating said machine even on a highly fluid concrete mass which thus normally exerts very low surface pressure onto the substratum such that the machine is supported solely by the concrete, moving the machine over, while it floats on, the surface of the concrete to level and smooth the concrete as a result of the rolling motion between the surface of the concrete and the belt arranged on the machine and in contact with said concrete surface.

6. A machine for levelling and smoothing concrete when concreting large areas, the machine being arranged to be



moved over and in direct contact with the surface of the concrete and being supported solely by said concrete, characterized in that the bottom surface of the machine intended for contact with the concrete comprises an endless belt (3) which extends over two rotatable drums (1, 2), said belt being adapted to level and smooth the concrete during movement of the machine over the surface thereof as a result of rolling motion between the belt and the concrete surface and in that the belt (3) is provided along its longitudinally extending edges with sealing flanges (13-15) which flanges sealingly co-act with side portions (4) of the machine, whereby the machine floats even on highly fluid concrete mass.

4,712,944

SEA WAVE DISSIPATOR APPARATUS AND METHOD FOR ITS MANUFACTURE

Leo J. Rose, 16 S. Pendleton Ct., Frederick, Md. 21701

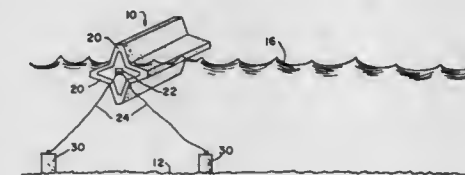
Continuation of Ser. No. 334,514, Dec. 30, 1981. This application

Oct. 29, 1986, Ser. No. 924,575

Int. Cl.⁴ E02B 3/06

U.S. Cl. 405—26

8 Claims



1. Improved sea wave dissipator systems comprising a plurality of floatable buoyant members constructed of a rigid material, each of the members having a generally star shaped geometric outer sectional configuration being symmetrically disposed about a vertical plane with a portion forming a substantially horizontal portion thereof disposed for engagingly receiving an oncoming sea wave form front, end elements constructed integrally with the members and having a central coupling unit mounted proximate a horizontal axis of the members, an integral component of the members having an integrally depending ballast portion defined as a generally hollow interior configuration and disposed below a surface of sea waves, each of the members having the generally star shaped geometric outer sectional configuration related to the generally hollow interior configuration as is the outer sectional configuration, the central coupling units being axially rotatable about the horizontal axis of the members, anchor means positioned on each side of the vertical plane

and deposited on the sea floor for retaining the buoyant members in a generally stationary relative position when the buoyant members are disposed in a floating relation, line members extending between the central coupling units and the anchor means,
a plurality of distally arranged air and water fluid check valves disposed and mounted in the end elements and adapted to be adjusted to selectively pass or retain fluid within the members,
the members, when it is desired to raise them from a bottom and lowered position in water, then being coupled by a series of air supply lines for augmenting the air supply within the plurality of members, and
lines and unidirectional flow check valve means being provided for remotely supplying of pressurized air fluid to the members.

4,712,945 SYSTEM FOR SEALING BARRIER CONSTRUCTIONS IN SUBTERRANEAN GALLERIES

Christian Schimpf, Hildesheim, Fed. Rep. of Germany, assignor to Leine & Konig, Fed. Rep. of Germany

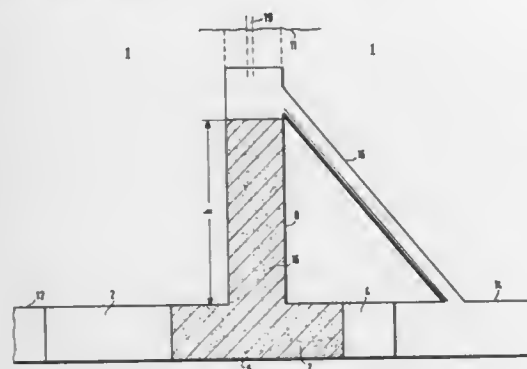
Filed Jul. 23, 1985, Ser. No. 758,214

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427978

Int. Cl.⁴ E21D 9/14; E21F 17/00

U.S. Cl. 405—132

31 Claims



3. A device for sealing a barrier construction in a subterranean gallery, said gallery including a stressing medium that applies pressure within the gallery and a hollow space, comprising, in combination:

- a fluid sealing medium substantially filling said hollow space and maintained at an overpressure relative to the pressure of the stressing medium, said fluid sealing medium positioned between a part of the gallery to be protected and another part of the gallery in which the stressing medium stands;
- a pressure shaft interconnected to said hollow space, said fluid sealing medium standing at a predetermined level within said pressure shaft and an upper portion of said pressure shaft located above the level of the fluid sealing medium; and
- an interconnection between said upper portion of said pressure shaft and said part of said gallery holding said stressing medium.

4,712,946 ASSEMBLY AND INSTALLATION OF PIPES

Cyril B. Greator, Stapleford; Ian W. H. Smith, Allestree, and Graham J. Hammersley, Awworth, all of England, assignors to Stanton plc, Ilkeston, England

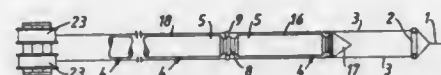
Filed Feb. 24, 1986, Ser. No. 831,823

Claims priority, application United Kingdom, Mar. 1, 1985, 8505315

Int. Cl.⁴ F16L 1/00

U.S. Cl. 405—170

15 Claims



1. A method of assembling and installing pipes comprising disposing at least one cable between a first station and a second station; attaching a first pipe to the cable at or adjacent one of said stations; moving the pipe away from said one station with the cable; jointing a second pipe to the first pipe and attaching the second pipe to the cable at or adjacent said one station; repeating the jointing and attaching operation to provide an elongate connected sequence of pipes attached to the cable; and drawing the cable away from said one station towards the second station to move the sequence of pipes into its desired position between the first and second stations, the attachment of the pipes to the cable being such as to hold the pipe jointings together when the cable is drawn from one station towards the second station.

4,712,947 MINE SUPPORT PROP

Michael J. Thom, Krugersdorp, South Africa, assignor to Hunt Leuchars and Hepburn Limited, South Africa

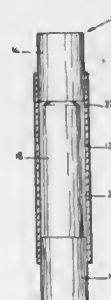
Filed Jul. 20, 1981, Ser. No. 284,727

Claims priority, application South Africa, Jul. 22, 1980, 80/4405

Int. Cl.⁴ E21D 15/02; E04G 25/02

U.S. Cl. 405—288

4 Claims



1. A mine support prop comprising a timber load support member which is elongated in the direction of its grain and yieldable in its lengthwise direction, and which includes a zone of reduced cross-sectional area that is no less than 40% of the cross-sectional area of the non-reduced portion of the timber member and a sleeve which surrounds and supports the timber member over and on either side of its zone of reduced cross-section, with the sleeve being out of contact with the timber member in its zone of reduced cross-sectional area to define a void between said sleeve and said zone, said sleeve being constructed of ductile mild steel adapted yieldably to restrain an increase in the cross-sectional dimension of the timber member as the prop is reduced in length under load.

4,712,948 BALL END MILL CUTTER

Morio Kidani, Kopo Tasaka 304, 8-14, Misasamachi 2-chome, Nishi-ku, Hiroshima-shi, Hiroshima-ken 730, Japan

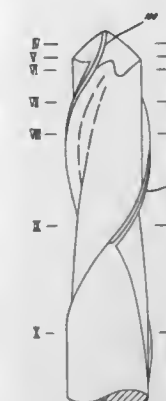
Continuation-in-part of Ser. No. 717,752, Mar. 29, 1985, abandoned. This application Jul. 15, 1986, Ser. No. 886,307

Claims priority, application Japan, Mar. 31, 1984, 59-64217

Int. Cl.⁴ B23C 5/02, 5/10

U.S. Cl. 407—42

3 Claims



1. A ball end mill cutter comprising a central axis and a mill body and a shank portion distributed along said central axis, said mill body comprising a generally cylindrical surface and a reference semi-spherical surface mounted on a tip end of said reference cylindrical surface and a plurality of helical cutting edges continuously provided between said cylindrical surface and the reference semi-spherical surface, a random point of said cutting edges on said reference semi-spherical surface being expressed as:

when a reference latitudinal plane is taken as a junction surface of the reference cylindrical surface with the reference semi-spherical surface;

a plane corresponding to a meridian plane with respect to the reference semi-spherical surface is taken as a reference longitudinal plane intersecting with the reference latitudinal plane;

an angle between the reference latitudinal plane and a radius line of the sphere drawn to the reference semi-spherical surface (which radius line extends from a central point at which the reference latitudinal plane intersects with the central axis of the ball end mill cutter) is taken as a latitudinal angle α ;

an angle of a line tangent to a said helical cutting edge with respect to the reference longitudinal plane (which tangential line passes through a point at the intersection of the cutting edge line of the cutting edge with the reference latitudinal plane) is taken as a helical angle γ ;

an angle of a longitudinal plane (namely the longitudinal plane connecting the central axis of the ball end mill cutter to a random point of the tip of helical cutting edge on the reference semi-spherical surface) with respect to the reference longitudinal plane is taken as a helical cutting edge longitudinal angle β ;

a random value of a latitudinal angle α in the range of 65° to 90° is taken as α_p ;

a function producing a desired smooth line with respect to the latitudinal angle is taken as $F(\alpha)$; and

a differential of the function $F(\alpha)$ is taken as $F'(\alpha)$; then in the range of $0 \leq \alpha \leq \alpha_p$

$$\beta = \tan \gamma \cdot F(\alpha)$$

$$F'(0) = 1$$

$$F'(\alpha_p) = 0 \text{ or a positive value approaching } 0,$$

$$\text{and in the range of } \alpha_p \leq \alpha < 90^\circ$$

$$F'(\alpha) = 0 \text{ or a positive value approaching } 0.$$

4,712,949 ON-EDGE END-MILLING INSERT

William B. Johnson, Rockford, Ill., assignor to Ingersoll Cutting Tool Company, Rockford, Ill.

Continuation-in-part of Ser. No. 842,460, Mar. 21, 1986, abandoned. This application Feb. 4, 1987, Ser. No. 10,761

Int. Cl.⁴ B26D 1/00

U.S. Cl. 407—42

11 Claims



1. An on-edge cutting insert for end mills or the like comprising an essentially flat block of cutting material having two opposed major surfaces at least one of which is a plane surface constituting a major locating surface upon which the insert is seated in a tool body while the other major surface provides a radially outward facing secondary clearance surface when the insert is so seated, a plane minor boundary edge face disposed at an obtuse angle to said major locating surface and constituting the rake face of the insert, an opposite, plane, minor boundary edge face perpendicular to the major locating surface and constituting a first locating edge surface, an adjoining minor boundary edge face disposed perpendicularly to said major locating surface and to said opposite minor boundary edge face and constituting a second locating edge surface, a fourth minor boundary edge face opposed to said second locating edge surface and disposed at an obtuse angle to said opposite minor boundary edge face and intersecting said rake face at an acute angle, and a primary clearance face extending along an edge of said secondary clearance face adjacent to said rake face and intersecting the rake face to define a cutting edge with an acute included angle larger than the included angle between said rake and secondary clearance faces extended, said block having a hole passing between said major surfaces to receive a fastener for securing the insert to a tool body, said hole being countersunk at said other major surface.

4,712,950 DRILLING FIXTURE AND WORK HOLDER

Robert L. Reynolds, 70 Stanley Ave., Landisville, Pa. 17538

Filed Dec. 10, 1985, Ser. No. 806,827

Int. Cl.⁴ B23B 49/02

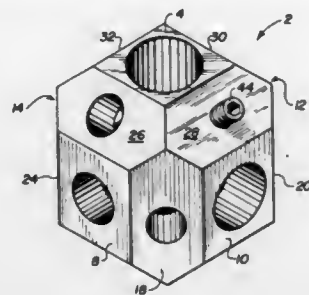
U.S. Cl. 408—72 R

3 Claims

1. A drilling fixture and work holder comprising:
(a) at least a first one piece, uniformly square cube having six flat surfaces and all of its corners chamfered at a 45 degree angle to form twelve additional flat surfaces whereby the original six sides of the cube and the twelve chamfered corners form an eighteen sided symmetrical polygon;
(b) the eighteen flat surfaces being arranged such that each surface is paired with a surface on the opposite side of the polygon to form nine paired surfaces with the two surfaces of each pair being parallel to each other;
(c) said polygon having a center point and each flat surface having a midpoint, said eighteen flat surfaces being arranged such that the midpoint of each flat surface is spaced the same distance from the center point of the polygon and said paired flat surfaces being arranged such

that the midpoint of each flat surface of the pair of parallel surfaces and the center point of the polygon are along a single straight line;

- (d) a plurality of nine or less, but more than two cylindrical bored holes of differing size diameters ranging from the largest size to the smallest size extending completely through the polygon, each bored hole extending from one surface to the parallel surface of each paired surface and



positioned concentric with the single straight line containing the midpoint of the paired parallel surfaces to provide only one bored hole per pair of parallel surfaces; and
(e) each larger size diameter bored hole normally being a means receiving and holding a rod to be drilled and each smaller size diameter bored hole perpendicular to said larger size diameter bored hole being a means receiving a drill to cross drill said rod.

4,712,951

TOOL FOR CUTTING ANNULAR GROOVE

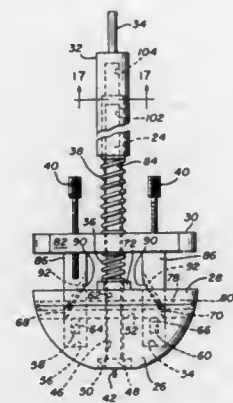
Byron L. Brown, 2315 Hendrick Blvd., Fort Smith, Ark. 72903

Filed Aug. 26, 1985, Ser. No. 769,135

Int. Cl.⁴ A61F 17/32; B23B 51/00

U.S. Cl. 408—158

10 Claims



1. A tool for cutting an annular groove on the interior of an annular surface comprising:

- a primary body having a pointed base for anchoring said cutting tool and a portion for being grasped and rotated by a power source, said portion of said primary body for being grasped and rotated by a power source comprises a handle having a first hollow portion forming means for positioning on and freely rotating about said primary body and a second hollow portion forming means for engaging said primary body wherein said body rotates with said handle, and a projection extending from the outer end of said handle for being grasped by said power source to rotate said primary body and cut said annular groove,
- a groove cutting assembly including a cutting bit carrier attached to and extending horizontally from said primary body towards said interior surface,
- at least one horizontal passageway in said bit carrier,

- a cutting bit slidably positioned in said horizontal passageway, said cutting bit including a cutting tip and a base,
- an orifice extending through said bit carrier perpendicular to and communicating with said cutting bit passageway,
- a wedge plate slidably attached to said primary body above said groove cutting assembly,
- a projection depending from said wedge plate and extending into said orifice in said bit carrier for movement upwardly and downwardly within said orifice,
- a sloping wedge shaped surface on said plate projection,
- a corresponding sloping wedge shaped surface on said base of said cutting bit for sliding attachment to said sloping wedge shaped surface on said plate projection so that said bit is moved outwardly when said projection is moved downwardly in said orifice and inwardly when said projection is moved upwardly in said orifice,
- a channel in said plate projection parallel to and communicating with said sloping wedge shaped surface of said plate projection,
- a mating projection on said wedge shaped sloping surface of said base of said cutting bit for insertion in said channel in said plate projection thereby slidably attaching said cutting bit to said plate projection,
- at least one arm mounted in and extending below said wedge plate toward and above said bit carrier and contacting said bit carrier as said wedge plate is forced downwardly to prevent further movement of said wedge plate,
- means for controlling the position of said one arm toward or away from said bit carrier thereby varying the downward travel of said wedge plate, and
- a spring positioned about said primary body and located between said wedge plate and said bit carrier to be compressed when said wedge plate is moved towards said bit carrier thereby causing said wedge plate to be moved away from said bit carrier and said bit withdrawn from said groove when force on said wedge plate is removed.

4,712,952

DRILL FOR GENERATING OF HOLES IN A WORKPIECE

Karl B. Isaksson, and Bror G. K. Svahn, both of Sandviken, Sweden, assignors to Santrade Limited, Luzern, Switzerland

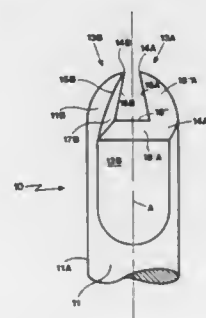
Filed Mar. 4, 1986, Ser. No. 835,944

Claims priority, application Sweden, Mar. 7, 1985, 8501106

Int. Cl.⁴ B23B 51/00

U.S. Cl. 408—211

7 Claims



1. A drill for generating a hole in a workpiece comprised of a composite material, said drill comprising a shank rotatable about a longitudinal axis and including a cylindrical envelope surface and a longitudinally forward cutting end defined by a pair of cutting portions arranged symmetrically about said longitudinal axis, each said cutting portion comprising:

- a front surface defining a chip surface and facing in a first direction having a component extending in the direction of rotation, said front surface being raked in a positive fashion such that said first direction has another component extending longitudinally rearwardly,

a curvilinear outer surface defining a longitudinally forward extension of said envelope surface, and
an end surface facing in a direction having a component extending longitudinally forwardly and another component extending away from the direction of rotation,
said front, outer, and end surfaces intersecting to form a cutting point which defines a longitudinally forwardmost point and a radially outermost point of the respective cutting portion,
said front and outer surfaces intersecting at an acute angle to form an outer circumferential cutting edge extending longitudinally rearwardly from said cutting end point, said outer circumferential cutting edge forming a first acute angle with said axis as viewed in a radial direction, said front and end surfaces intersecting to form an inner cutting edge extending longitudinally rearwardly from said cutting end point and forming a second acute angle relative to an imaginary line which intersects both of said cutting end points as viewed in a longitudinal direction, a longitudinally innermost end of said inner cutting edge being spaced radially outwardly of said axis and radially inwardly of said outer surface,
each of said inner cutting edges extending nonradially as viewed in said longitudinal direction, with a longitudinally rearward end of each of said inner cutting edges disposed circumferentially rearwardly of said imaginary line with reference to said direction of rotation as viewed in said longitudinal direction.

4,712,953

METHOD AND APPARATUS FOR ALIGNING CUTTING TOOLS

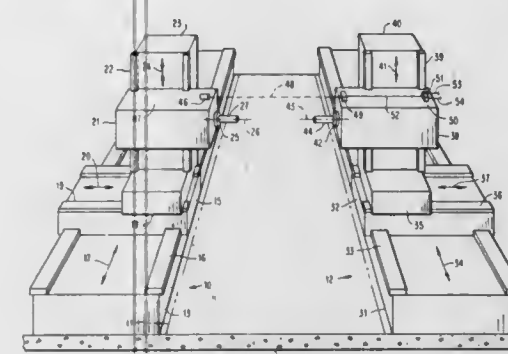
John R. Witzel, Goshen, and Paul J. Welsgerber, Cincinnati, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Feb. 19, 1987, Ser. No. 16,414

Int. Cl.⁴ B23B 39/06; B23Q 15/24

U.S. Cl. 409—131

20 Claims



1. A method of forming aligned bore holes in opposite side walls of a part by two separate cutting tools mounted in two separate spindle carriers adjacent the opposite side walls of the part including:

- positioning one of the two separate cutting tools on one of the two separate spindle carriers at a position at which it is to form a bore hole in one of the opposite side walls so that the longitudinal axis of the one cutting tool is aligned with the location of the center of the bore hole to be formed in the one side wall;
- positioning the other of the two separate spindle carriers having the other of the two separate cutting tools at a position adjacent a zero point at which light producing means on a first of the two separate spindle carriers is aligned with light target means on a second of the two separate spindle carriers along an axis parallel to the longitudinal axes of the one cutting tool and the other cutting tool;
- moving the other spindle carrier in one direction along a first

axis perpendicular to the longitudinal axes of the one cutting tool and the other cutting tool from the position adjacent the zero point;

activating detector means that detects when the one of the light producing means and the light target means on the other spindle carrier is at a predetermined position prior to the zero point when the other spindle carrier is moving in the opposite direction along the first axis with activation of the detector means occurring when the other spindle carrier is at a selected distance past the zero point during movement of the other spindle carrier in the one direction along the first axis;

moving the other spindle carrier in the opposite direction along the first axis after the other spindle carrier has moved at least the selected distance past the zero point in the one direction along the first axis with a feed rate that will provide momentum to the other spindle carrier to cause it to stop with the one of the light producing means and the light target means on the other spindle carrier at the zero point when feeding of the other spindle carrier is stopped at the predetermined position prior to the zero point;

and stopping feeding of the other spindle carrier in the opposite direction along the first axis in response to a signal from the detector means detecting that the one of the light producing means and the light target means on the other spindle carrier stops at the zero point whereby the other cutting tool has its longitudinal axis aligned with the longitudinal axis of the one cutting tool in a plane containing the first axis.

4,712,954

TUBE CUTTING DEVICE

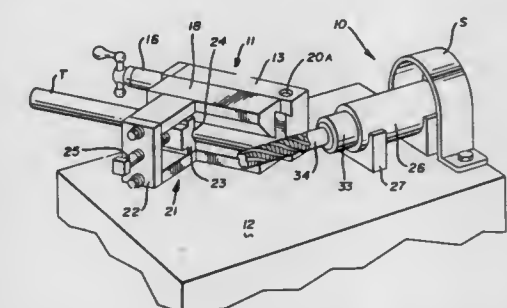
Dino Campolito, 6949 S. Racoon Rd., Canfield, Ohio 44406

Filed Sep. 5, 1986, Ser. No. 903,606

Int. Cl.⁴ B23C 1/02

U.S. Cl. 409—163

2 Claims



1. A tube cutting device comprises a tube holding assembly and a cutting head assembly, said tube holding assembly comprises a main body member and a movable V-block registerable thereon, having a threaded rod and follower rotatably positioned within said main body member for advancing said V-block relative said main body member, a tube clamp having movable tube engagement member comprising a U-shaped main frame member, a threaded bar threadably secured there-through engaging a V-shaped tube engagement member positioned within said main frame member, and means for selectively pivoting said tube holder assembly, said tube cutting assembly comprises a fixed milling support and an interchangeable milling bits, drive means associated with said milling assembly and a mounting support means on which said tube holding assembly and said cutting head assembly are positioned.

4,712,955

EXPANDABLE FASTENER ASSEMBLY

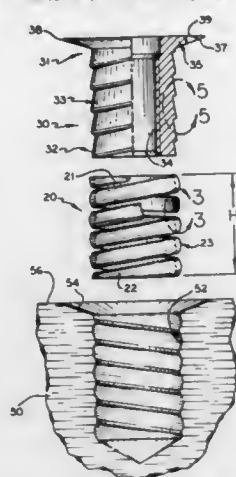
Marvin P. Reece, Dana Point, and Jose Rosan, Jr., Newport Beach, both of Calif., assignors to Rexnord Inc., Brookfield, Wis.

Filed May 14, 1985, Ser. No. 734,416

Int. Cl.⁴ F16B 13/04

U.S. Cl. 411-17

3 Claims



1. An expandable fastener assembly for use in a prepared opening in a parent material, said assembly comprising: an insert formed as a continuous, expandable, helical coil, with said coil forming an outer thread and an inner thread and having a uniform outer diameter; a fastener having a portion with an outer thread thereon, said fastener being constructed for threadable engagement with said insert inner thread; said insert outer thread constructed so as to secure said insert within an opening in a parent material when said insert is expanded thereto; and means for uniformly expanding said insert and securing said fastener relative to said insert inner thread, said means including said insert inner thread having a helical surface inclined at approximately ten degrees with respect to a vertical axis, with said fastener outer thread having a like thread form for mating with said insert inner thread creating a ramp effect therebetween when a tightening torque is applied to said fastener.

4,712,956

PLASTIC WALL ANCHOR

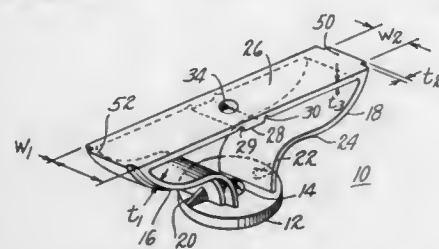
Michael E. Bond, Topton, and Fred R. Voreh, Wyomissing, both of Pa., assignors to USM Corporation, Farmington, Conn.

Filed Sep. 21, 1981, Ser. No. 304,075

Int. Cl.⁴ F16B 13/06

U.S. Cl. 411-55

12 Claims



1. A plastic wall anchor which is to receive and hold a threaded fastener in a flexed state, said plastic wall anchor comprising the following when in an unflexed state prior to receipt of the threaded fastener: a head portion having a hole therein for receiving the threaded fastener; a pair of reverse curved legs extending from said head portion to either side of the hole therein; and a collapsible member extending between said pair of reverse curved legs and having a hole therein which is substantially in alignment with the hole in said head portion, said

collapsible member having ends connected to the ends of said pair of reverse curved legs, said reverse curved legs each having a curved arc portion of definable radius below said collapsible member and immediate to one of said end connections so as to define a substantial open space between said collapsible member and the respective reverse curved leg thereby allowing said curved arc portion to flex.

4,712,957

ADHESIVELY SECURED FASTENER

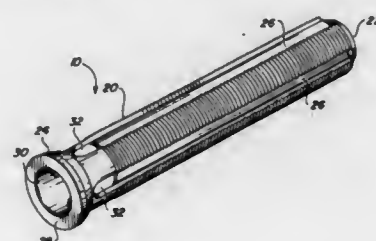
Wayne Edwards, 125 Country Club Dr.; Richard V. Nation, 5610 Lenwood Cir., both of Sanford, Fla. 32771, and Keith A. Tomkins, 621 Oakmont Ave., Sorrento, Fla. 32776

Filed Dec. 11, 1985, Ser. No. 807,520

Int. Cl.⁴ F16B 39/02

U.S. Cl. 411-82

3 Claims



1. A fastener in which a fluent adhesive is introduced for fastening material, said fastener comprising: (a) a solid shank having a leading end and a trailing end; (b) at least one peripherally longitudinal channel along said shank; (c) a head on said trailing end of said fastener; (d) an axial cavity through said head defining a mouth, an axially extending sidewall and an inner end; (e) apertures through said sidewalls, said apertures communicating with said at least one longitudinal channel for introducing adhesive through said head and into said channel; and (f) at least one longitudinal flat surface extended along said shank from said trailing end to said leading end, said channel being formed in said flat surface.

4,712,958

CONTROLLED EXPANSION FLUSH-HEAD RIVET DESIGN AND METHOD OF INSTALLING SAME

Kenneth P. Sparling, Burbank; Angelo Incardona, Reseda; Garth D. Kikendall, Glendale; David G. Richardson, Burbank; Ronald E. Wood, Sepulveda, and Leon Bakow, Sherman Oaks, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Oct. 3, 1984, Ser. No. 657,300

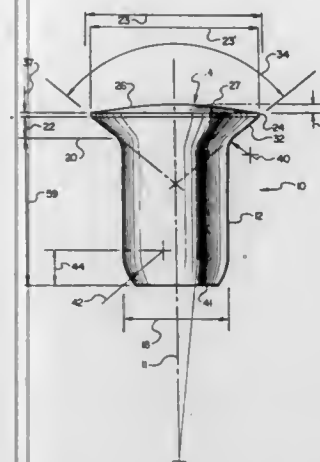
Int. Cl.⁴ F16B 19/06

U.S. Cl. 411-506

4 Claims

1. A flush-head rivet, having a shank portion with a minimum and maximum diameter and a nominal diameter therebetween, for joining two or more structural members together, the members having a countersunk rivet hole therethrough with a countersink included angle of between 99 and 101 degrees, the rivet providing controlled expansion of the rivet hole when the hole has a minimum diameter equal to the maximum shank diameter and a maximum diameter of 1.05 times the minimum shank diameter, the rivet comprising: a head portion comprising: a head diameter before forming a land on the edge thereof of between 1.642 times the minimum shank diameter and 1.646 times the maximum shank diameter; a minimum head diameter after forming the land on the edge thereof of 1.596 times the minimum shank diameter; a land width on said head of between 0.007 times the mini-

imum shank diameter and 0.015 times the maximum shank diameter; a head crown radius between 4.334 times the minimum shank diameter and 3.747 times the maximum shank diameter; and



a crown height of between 0.074 times the minimum shank diameter and 0.089 times the maximum shank diameter; and an underhead included angle of 104 to 105 degrees.

4,712,959

WASHER WITH RESILIENT HEAD CRIPPING MEANS

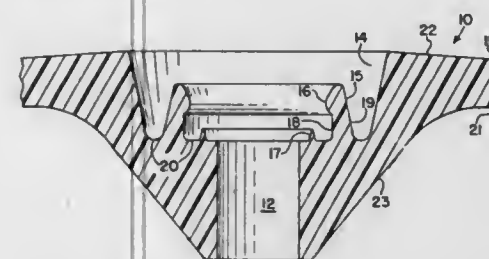
Riaz Hasan, Palatine, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 840,152, Mar. 17, 1986, Pat. No. 4,663,910. This application Mar. 30, 1987, Ser. No. 32,299

Int. Cl.⁴ F16J 15/10; E04D 3/36

U.S. Cl. 411-533

4 Claims



1. A washer for use in attaching insulation to a roof member with a fastener having a head and an elongated shank, said washer comprising a resilient non-metallic body having a central throughbore, a shoulder formed in said throughbore for engaging the head of a fastener, said shoulder defining and separating upper and lower portions of said throughbore, said upper portion having a maximum lateral dimension greater than that of said lower portion, restraining means formed in said upper portion of said throughbore for engaging a portion of said fastener head, resilient head pushing means formed on said shoulder for urging the fastener head into engagement with said restraining means.

4,712,960

OPENABLE CAN BODY

Paul Opprecht, Bergdietikon; Werner Urech, Kaiserstuhl, and Jürg Opprecht, Widen, all of Switzerland, assignors to Elpa-tronic AG, Switzerland

Division of Ser. No. 754,340, Jul. 11, 1985, Pat. No. 4,637,521.

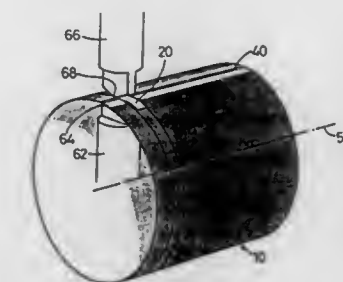
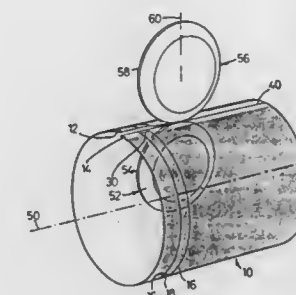
This application Jul. 14, 1986, Ser. No. 885,019

Claims priority, application Switzerland, Jul. 12, 1984, 3404/84

Int. Cl.⁴ B21D 51/28

U.S. Cl. 413-74

3 Claims



1. A method of producing a can body (10) wherein a sheet-metal blank (28) provided with circumferential scorings (16) is rolled to form a cylinder and its two overlapping longitudinal edges (12, 14) are welded to one another, characterized in that a tongue (20) is placed on and welded onto the outer longitudinal edge (12) between the circumferential scorings (16) after the longitudinal edges (12, 14) have been welded to form overlapping tongue and edge welds whereby the strength of the tongue is reinforced and the weld seam between the circumferential scorings is stiffened to encourage propagation of cracks into the circumferential scorings during can opening.

4,712,961

APPARATUS FOR STACKING SHAPED MATERIALS ON A PALLET

Masahiro Honda, and Hironari Maeda, both of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Filed Aug. 2, 1985, Ser. No. 761,703

Claims priority, application Japan, Aug. 3, 1984, 59-162842

Int. Cl.⁴ B65G 57/18

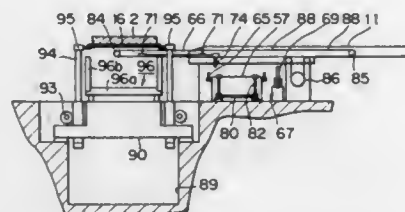
U.S. Cl. 414-42

4 Claims

1. An apparatus for stacking elongated shapes, such as metal blocks, or the like, on a pallet and for inserting spacers between the individual adjacent shapes, comprising: a plurality of elongated tables arranged in parallel to each other, each horizontally extending from a shape supplying station, said tables being adapted to support said shapes thereon which are supplied onto the tables one by one in a longitudinal direction of the tables which is perpendicular to a longitudinal direction of the shapes; a spacer conveyor arranged under the tables and extending perpendicularly thereto for feeding spacers one by one from a spacer supplying machine located outside a region

occupied by the tables, said spacer conveyor including means for simultaneously stopping the spacers at a predetermined number of first positions each located between the tables and means for simultaneously lifting the spacers to second positions adjacent the tables;

- a plurality of elongated transfer frames each arranged in parallel to each of the tables and supported for movement in the longitudinal direction thereof from a retracted position to a projected position wherein each transfer frame is projected to a stacking station, said transfer frames each including means for receiving each of the spacers in the second position so as to bring said spacers to the stacking station;



a plurality of conveyor belts each extending along and movably supported on each transfer frame in the longitudinal direction thereof for feeding the shapes one by one from said tables to the stacking station; and

loading means for loading a shape and a predetermined number of spacers onto the pallet at the stacking station, and repeating the same so as to make a stack comprised of several layers of the shapes, said loading means including spacer lifters having spacer holders for placing said shape and said spacers on the pallet or on the stack by slightly lifting said spacers from said receiving means of said transfer frames by means of said holders, retracting said transfer frames and then lowering said spacers on said holders.

4,712,962

ARTICULATED BOOM MECHANISM FOR UNLOADING BULK SOLID MATERIAL FROM A SHIP

William H. Johnston, Ville de Mont Royal, Canada, assignor to The CSL Group Inc., Montreal, Canada

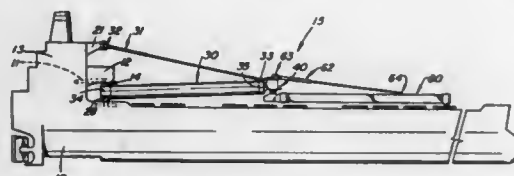
Filed May 9, 1986, Ser. No. 861,680

Claims priority, application Canada, Jun. 14, 1985, 484002

Int. Cl.⁴ B63B 27/22; B65G 37/00

U.S. Cl. 414-144

37 Claims



1. An articulated boom mechanism for use in conveying bulk solid material, the boom mechanism comprising:

- (a) a first boom construction, one end of the first boom construction being pivotally mounted to a support base by a universal-type connection, the first boom construction having a first conveyor means with one and another end extending through it for transporting material from one of its ends to another of its ends;
- (b) an articulation member, one portion of which is pivotally mounted to the other end of the first boom construction;
- (c) a second boom construction, one end of the second boom construction being pivotally mounted to another portion of the articulation member, the second boom construction having a second conveyor means with one and another

end extending through it for transporting bulk solid material from one of its ends to another of its ends;

- (d) first actuator means extending between the support base and the first boom construction for selectively varying the relative vertical angle between the first boom construction and the support base;
- (e) second actuator means extending between the articulation member and the second boom construction for selectively varying the relative vertical angle between the articulation member and the second boom construction;
- (f) further actuator means for maintaining the articulation member in a substantially fixed orientation relative to the support base for all angular positions assumed by the first boom construction relative to the support base;
- (g) first powered pivot means for rotating the first boom construction relative to the support base through desired horizontal angles; and,
- (h) second powered pivot means for rotating the other portion of the articulation member and the second boom construction mounted thereto relative to the one portion of the articulation member through desired horizontal angles whereby bulk solid material placed onto one of the conveyor means is subsequently discharged from the other conveyor means after moving through a path determined by the first and second actuator means and the first and second pivot means.

4,712,963

APPARATUS FOR SOLDERING PRINTED CIRCUIT BOARDS

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co. Ltd., Tokyo, Japan

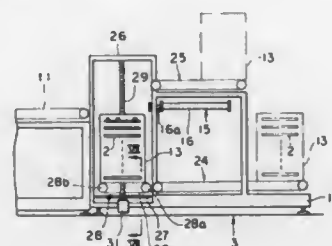
Filed Nov. 9, 1983, Ser. No. 550,092

Claims priority, application Japan, Jan. 18, 1983, 58-5281

Int. Cl.⁴ B65H 5/00

U.S. Cl. 414-222

5 Claims



comprising a rotatable belt having an uppermost run defining a conveyor plane for items to be sorted and belt-rotating means for rotating the belt with the uppermost run moving toward one of the sides of the carriage for discharging the items from the conveyor plane;

a motor unit for running along the central rail, the motor unit comprising a frame, a pair of freely-rotatable wheels having horizontal axes for running on a top and a bottom of the transverse webs of the central rail, a pair of freely-rotatable reference wheels spaced from the latter for respectively acting on the tops of the transverse webs, two pair of freely-rotatable wheels having spaced vertical axes for running on the edges of the transverse webs, a motor-transmission group comprising a motor and a transmission therefor, an elastic mount oscillatingly securing the motor-transmission group to the frame with the motor on one side of the elastic mount in the direction in which the vertical axes of the two pair of wheels of the motor unit are spaced, the transmission comprising drive wheels rotated by the motor respectively acting on the bottoms of the transverse webs on the opposite side of the elastic mount from the motor, whereby the torque exerted by the weight of the motor keeps the drive wheels constantly pressed up against the transverse portions of the central rail; and

a union bar having a hinge at each end respectively connected to one of the carriages and the motor unit, whereby the one carriage is a drive carriage and the other is a driven carriage.

4,712,966

MATERIAL HANDLING RACK WITH TRANSPORTATION MEANS

Peter L. Gross, Indianapolis, Ind., assignor to Thomas L. Gross, Indianapolis, Ind., a part interest

Filed Nov. 8, 1985, Ser. No. 796,106

Int. Cl.⁴ B60P 3/40

U.S. Cl. 414-458

2 Claims



1. A material handling rack with detachable wheels comprising:

a frame to hold material thereon and having a first end and a second end;
a first carriage having supporting wheels rotatably mounted thereon with a single horizontal axis of rotation, a first tongue movably mounted to said first carriage and insertable into said first end, a first vertical lifting means mounted to said first carriage being operable to apply an upwardly directed lifting force to lift said tongue with said first end;

a second carriage having supporting wheels rotatably mounted thereon with a sole horizontal axis of rotation, a second movable tongue movably mounted to said second carriage and insertable into said second end, a second vertical lifting means mounted to said second carriage being operable to apply an upwardly directed lifting force to lift said second tongue with said second end; and

limit means on said frame at said first end and said second end limiting pivotal motion of said first tongue and said second tongue when inserted therein as said first vertical lifting means and said second lifting means lift said frame; said first tongue and said second tongue are positioned and extend respectively laterally away from said single hori-

zontal axis and said sole horizontal axis with each extending in mutually facing directions into said frame;

said limit means at said first end of said frame includes a first inner support and a first outer support vertically and horizontally spaced apart forming a first mouth;

said first tongue is insertable into said first mouth and includes a first proximate portion and a first distal portion with said first distal portion bearing downwardly against said first inner support and said first proximate portion bearing upwardly against said first outer support as said first tongue is lifted upwardly limiting pivotal motion of said first tongue;

said limit means at said second end of said frame includes a second inner support and a second outer support vertically and horizontally spaced apart forming a second mouth;

said second tongue is insertable into said second mouth and includes a second proximate portion and a second distal portion with said second distal portion bearing downwardly against said second inner support and said second proximate portion bearing upwardly against said second outer support as said second tongue is lifted upwardly limiting pivotal motion of said second tongue;

power means on said first carriage being operable to move said frame with said first carriage and said second carriage connected across ground;

said frame includes horizontally extending spaced apart members connected together and upon which material may be supported, said first outer support and said second outer support are cross members affixed to and positioned atop said horizontally extending members with said cross members including downwardly facing surfaces contactable against said first tongue and said second tongue as said frame is lifted, said first inner support and said second inner support are cross members affixed to and positioned beneath said horizontally extending members inwardly of said first outer support and said second outer support and include upwardly facing surfaces contactable against said first tongue and said second tongue as said frame is lifted, said downwardly facing surfaces are spaced apart vertically and horizontally from said upwardly facing surfaces and cooperatively therewith limit pivotal motion of said first tongue and said second tongue as said frame is lifted, said horizontally extending members with said first outer support, said second outer support, said first inner support and said second inner support cooperatively form two horizontally extending mouths opening in opposite directions to receive said first tongue and second tongue, said first carriage and said second carriage applying lifting force via said first lifting means and said second lifting means to said frame only at said first outer support and at said second outer support and contacting said frame only at said first outer support, said second outer support, said first inner support, and said second inner support;

said frame includes a first upright member removably mountable to said horizontally extending members between said first inner support and said first outer support and further includes a second upright member removably mountable to said horizontally extending members between said second inner support and said second outer support and cooperatively with said first upright member limiting movement of material resting upon said frame, said first upright member and said second upright member are vertically slidable into said mouths respectively between said first outer support and said first inner support and between said second outer support and said second inner support and extend perpendicularly therefrom, said first inner support and said first outer support have mutually facing vertical surfaces contacting said first upright member limiting movement thereof, said second inner support and said second outer support have mutually facing vertical surfaces contacting said second upright member limiting movement thereof, said first upright

member and said second upright member each have a horizontally extending stop surface contacting said horizontally extending members limiting downward movement of said first upright member and said second upright member.

4,712,967

CAR CARRIER ASSEMBLY

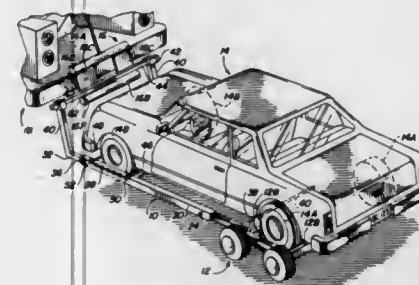
Denis Farthing, Tampa, Fla., assignor to Gulf Eastern Manufacturing Company, Tampa, Fla.

Filed Nov. 26, 1984, Ser. No. 675,079

Int. Cl.⁴ B60P 3/12

U.S. Cl. 414-563

18 Claims



1. A car carrier assembly for use in conjunction with a dolly having a means for allowing elevation of the rearward pair of wheels of a four-wheeled vehicle for towing by a lifting mechanism of a wrecker, the car carrier assembly comprising in combination:

a left and a right side member for positioning in a spaced apart manner on opposing sides of the vehicle, each said side member including a rear end and an upwardly angled front end;

a tow bar;

means for removably connecting said tow bar to said front ends of said side members for engagement by the lifting mechanism of the wrecker;

means for removably connecting said rear ends of said side members to the dolly to support said rear ends of said side members in an elevated position;

wheel engaging means for engaging the forward wheels of the vehicle; and

means for removably connecting said wheel engaging means between said side members to cause elevation of the forward portion of the vehicle upon elevation of said tow bar.

4,712,968

MECHANICAL DIGGER TOY

George C. Manning, P.O. Box 6001, Saskatoon, Saskatchewan, Canada S7K 4E4

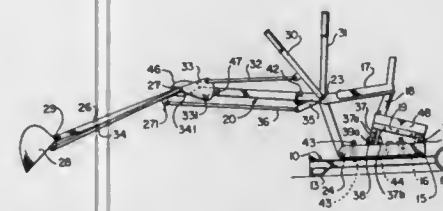
Filed Nov. 12, 1985, Ser. No. 797,215

Claims priority, application Canada, Nov. 13, 1984, 467,710

Int. Cl.⁴ E02F 3/358

U.S. Cl. 414-694

9 Claims



1. A toy mechanical digger for simulating the action of a full size hydraulic excavator comprising:

(a) a base frame member;

(b) a longitudinally-extending base beam pivotally mounted

on said base frame member for manually-actuated, 360° slewing action relative to said base frame member;

(c) a seat including means for longitudinally slidably mounting said seat with respect to said longitudinally-extending base beam;

(d) a primary boom having a pivoted end, an intermediate end, a remote end, said pivoted end being pivotally mounted to the forward end of said base beam for pivotal movement about a first horizontal axis, such that said remote end can be raised and lowered, said intermediate end being pivotally mounted to the forward end of said seat such that forward and rearward longitudinal sliding movement of said seat is linked to lowering and raising movements, respectively, of said primary boom;

(e) a secondary boom having a pivoted end and a remote end, said pivoted end being pivotally mounted on said remote end of said primary boom for pivotal movement relative thereto about a second horizontal axis;

(f) a bucket pivotally mounted on said remote end of said secondary boom for pivotal movement relative thereto, whereby said primary boom, said secondary boom and said bucket can be manually actuated to dig and dump; and

(g) two separate, manually-actuable mechanical operators mechanically connected by linkage members and pivot means, one operator connected to said secondary boom and the other operator connected to said bucket;

whereby a user, sitting on said seat can independently and by manual operation only of said slidably mounted seat and of said two mechanical operators cause said primary boom to pivot vertically with respect to said base frame member, cause said secondary boom to pivot vertically with respect to said primary boom in a knee-like action, and cause said bucket to pivot vertically with respect to said secondary boom in an ankle-like action.

4,712,969

EXPANDABLE AND CONTRACTABLE ARMS

Motohiko Kimura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

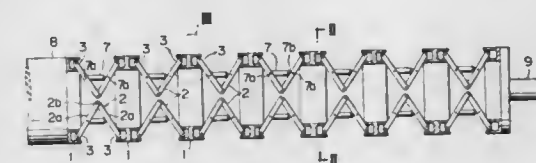
Filed Aug. 24, 1984, Ser. No. 643,793

Claims priority, application Japan, Aug. 29, 1983, 58-157475; Mar. 31, 1984, 59-64880

Int. Cl.⁴ B25J 9/06

U.S. Cl. 414-730

10 Claims



1. An expandable and contractable arm comprising: a plurality of independently expandable and contractable units; and

connecting means including universal joints for serially interconnecting said units into said arm;

each of said units comprising a pair of disc members disposed at opposite ends of said unit, at least three link mechanisms each comprising two links, the inner ends of said links being connected together by a pin and the outer ends of said links being connected to said pair of disc members through said universal joints and means for relatively rotating said two links about said pin independently from the other said link mechanisms within said unit thereby expanding and contracting each unit independently from another unit when said at least three link mechanisms are operated equally, and bending each unit independently from another unit when said at least three link mechanisms are operated unequally.

4,712,970

METHOD FOR HANDLING A WORK IN A ROBOT SYSTEM

Hiro Nakamura; Shuji Ohkawa; Yasuo Ohtsuka; Hajime Tachikawa, and Toshiya Shinozaki, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

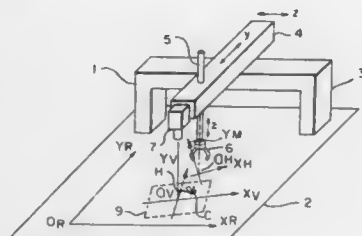
Filed Jun. 6, 1985, Ser. No. 741,949

Claims priority, application Japan, Jun. 8, 1984, 59-116392

Int. Cl.⁴ B25J 9/16, 19/04

U.S. Cl. 414—730

18 Claims



18. A method for handling a work in a robot system having a visual sensor capable of recognizing a centroid position of the work and an angle between a principal axis of the work and one coordinate axis of a visual field of the visual sensor, in which a robot has a hand for holding the work and a movable arm for moving the hand, comprising the steps of:

- positioning the work in the visual field of the visual sensor;
- recognizing the centroid position of the work and the angle of the principal axis of the work in the visual field;
- storing temporarily data representative of the centroid position of the work and the angle of the principal axis of the work in the robot system;
- calculating a relation between a holding position and the centroid position of the work and a relation between a holding angle of the hand holding the work and the principal axis of the work, relative to a plane including said one coordinate axis at said holding position by using said data representative of the centroid position of the work and the angle of the principal axis of the work and other data stored in the robot system; and
- holding the work at said holding position and said holding angle.

4,712,971

CONTROL ARM ASSEMBLY

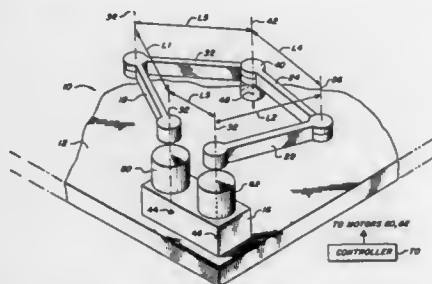
Donald C. Fyler, Cambridge, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Feb. 13, 1985, Ser. No. 701,151

Int. Cl.⁴ B25J 17/00

U.S. Cl. 414—744 R

13 Claims



1. A control arm apparatus for controlling the position of a control point fixedly positioned with respect to a controlled element within a reference plane with respect to a reference points in said plane, comprising:

- a control arm assembly including:
- A. a first link member, said first link member having a first

end pivotably coupled to a support element, said first end being pivotable about a first pivot axis perpendicular to said plane and passing through a first of said reference points,

- B. a second link member, said second link member having a first end pivotably coupled to a support element, said first end being pivotable about a second pivot axis perpendicular to said plane and passing through the second of said reference points,
- C. a third link member, said third link member having a first end pivotably coupled to the second end of said first link member about a third pivot axis perpendicular to said plane,
- D. a fourth elongated link member, said fourth link member having a first end pivotably coupled to the second end of said second link member about a fourth pivot axis perpendicular to said plane,
- E. means for pivotably coupling the second end of said third link member and the second end of said fourth link members about a fifth pivot axis perpendicular to said reference plane and passing through said control point, and
- F. means for coupling said controlled element to one of said third and fourth link members, and

further comprising a selectively operable control means for independently controlling the angular position of each of said first and second link members with respect to said reference axes passing through said first and second reference points.

4,712,972

CABLE SUPPORTING ARRANGEMENT IN INDUSTRIAL ROBOTS

Seiichi Nakashima; Kenichi Toyoda, both of Hino; Shigemi Inagaki, Kokubunji, and Kazuhisa Otsuka, Hino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP85/00193, § 371 Date Feb. 12, 1986, § 102(e) Date Feb. 12, 1986, PCT Pub. No. WO85/04615, PCT Pub. Date Oct. 24, 1985

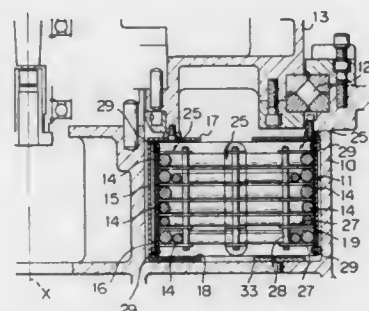
PCT Filed Apr. 12, 1985, Ser. No. 815,082

Claims priority, application Japan, Apr. 13, 1984, 59-73027

Int. Cl.⁴ B25J 11/00

U.S. Cl. 414—744 R

7 Claims



1. A cable supporting arrangement for use in a base body of an industrial robot with a cylindrical inner surface and a movable body mounted atop the base body pivotally about an axis of the latter, which supports inside the base body at least a cable led through the interior of the base body into the movable body, comprising:

- an inner cylinder fixed to said movable body and disposed concentrically within said base body so that an annular space is defined between said inner cylinder and said base body;
- a resilient strip member having one end thereof fixed to the cylindrical inner surface of said base body and the other end fixed to the cylindrical outer face of said inner cylinder, said strip member being formed of sheet material having a substantial lateral dimension extending in the direction of said axis and having one side thereof so curved at a selected portion thereof that portions of the

strip member before and after the curved portion are facing each other, said strip member being forced under its own resilience onto the inner surface of said base body and the outer face of said inner cylinder; and

a plurality of cable holders disposed on said one side of said strip member and spaced from each other along the length of said strip member to hold said cable.

4,712,973

TWO SERVO AXIS, AC POWERED ROBOT WRIST

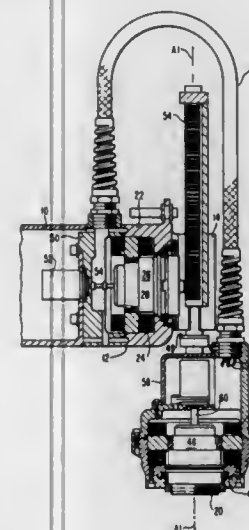
John Garin, Birmingham; Allan J. Riggs, Ann Arbor, both of Mich., and Robert S. Palmer, Penn Hills, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1986, Ser. No. 863,483

Int. Cl.⁴ B25J 17/02

U.S. Cl. 414—744 A

5 Claims



1. A two axis wrist mounted at the end of an at least partly open-ended manipulator arm, comprising:

- a substantially hollow first housing mounted to said arm end;
- a first frameless permanent magnet AC motor mounted in said housing and having a rotor with its axis parallel to the axis of said arm;
- an assembly mounted to the distal end of said first housing, said assembly including a bracket fixed to said housing and a carriage having opposite ends with guide means extending therebetween, said guide means being slidably received by said bracket for guiding said carriage in movement transverse to said arm axis;
- said carriage including a rack gear disposed in parallel relation to said guide means and attached to at least one opposite end of said carriage, and a pinion meshing with said rack and driven by said first motor rotor to provide translational motion to said carriage;
- a second substantially hollow housing having one end thereof attached to one end of said carriage and disposed with its axis transverse to said arm axis;
- a second frameless permanent magnet motor mounted in said second housing adjacent the second housing end opposite to said second housing one end, said second motor including a stator, and a rotor providing a rotary output at said second housing opposite end to provide rotary motion of a tool at said opposite end of said second housing.

4,712,974

PART POSITIONING APPARATUS AND METHOD

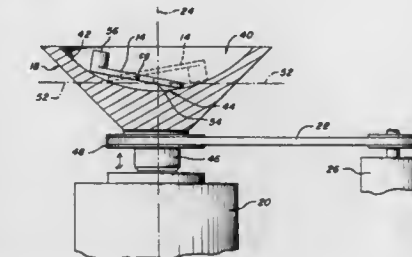
Peter E. Kane, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 24, 1985, Ser. No. 747,841

Int. Cl.⁴ B65G 47/24

U.S. Cl. 414—757

17 Claims



12. Apparatus for positioning a piece-part in a predetermined orientation, said apparatus comprising:

- a bowl-like receptacle defining an upwardly facing generally concave, curved surface disposed about a vertical axis and having a shape of a surface of revolution formed by rotating a generating curve segment about said vertical axis, and adapted to receive the piece-part thereon randomly disposed with respect to said vertical axis;
- means for vibrating said receptacle to impart a sliding motion to the piece-part along said generally concave, curved surface until the center of gravity of the piece-part is disposed at its lowest-most possible position within said receptacle thereby locating said piece-part with its center of gravity in a predetermined horizontal plane and predeterminedly radially disposed with respect to said vertical axis, said curved surface making said receptacle usable with a variety of differently shaped parts; and
- means for rotating said receptacle about said vertical axis to establish the desired predetermined angular orientation of the piece-part.

4,712,975

BAG PALLETIZING SYSTEM

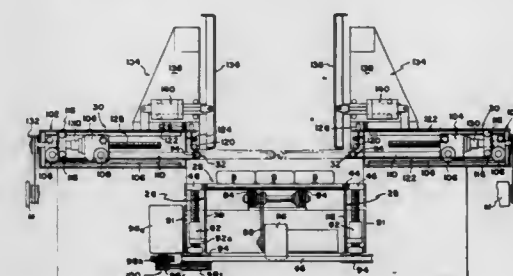
Thomas R. Salts, Alpena, Mich., assignor to Besser Company, Alpena, Mich.

Filed Sep. 13, 1985, Ser. No. 775,731

Int. Cl.⁴ B65G 57/30, 57/22

U.S. Cl. 414—786

2 Claims



1. A method of assembling a multi-tier stack of compressible articles such as bags of particulate material or the like having normally vertical convex perimetral side surfaces on a pallet or carrier with an elevator having an article support surface defined by a plurality of generally horizontal spaced parallel elements, movable vertically in an elevator shaft; tines, with article support surfaces thereon, projectable generally horizontally between said elements, from retracted positions out of the elevator shaft, for receiving and supporting tiers of articles transferred thereto by the elevator; and a vertically extending compression plate mechanism just above said tines movable parallel thereto from a retracted position to compress opposite sides of bags in the elevator shaft; including the steps of:

- a. receiving a tier on the elevator and raising the elevator to a level to position the tier above the projection path of the tines at a time when the tines are retracted;
- b. projecting the tines from a retracted position to a position below the tier and moving the compression plate mechanism from retracted position to physically compress the opposite sides of bags in the tier and displace material in the sides of the bags to flatten the convex vertical side surfaces and concave the upper surfaces of the bags without exerting a compressing force which prevents the bags from dropping under the influences of gravity;
- c. lowering the elevator through the tines to transfer the tier to the tines and the elevator to a position sufficiently below the tines to receive the next tier thereon;
- d. receiving the next tier on the elevator and raising the elevator to position said next tier just below the tines;
- e. retracting the tines out of the shaft, while maintaining the compression plate mechanism in place, to deposit the tier formerly supported on the tines by gravity vertically on the upper surface of said next tier, and then retracting the compression plate mechanism;
- f. raising the elevator to position the tiers thereon above the projection path of the tines;
- g. reprojecting the tines and compression plate mechanism into the elevator shaft; and
- h. lowering the elevator through the tines to transfer the tiers to the tines and the elevator to a position below the tines.

4,712,976

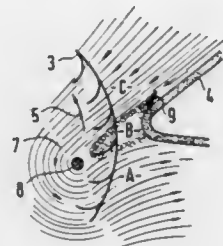
TANGENTIAL BLOWER

Reinhold Hopfensperger, Dietelskirchen, and Klaus Taschner, Landshut, both of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany
 Filed May 14, 1985, Ser. No. 734,345
 Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418160

Int. Cl.⁴ F04D 17/04, 29/66

U.S. Cl. 415—54

5 Claims



1. A tangential blower comprising:
 - a. an impeller having blade edges extending parallel in relation to the axis of rotation,
 - a. a deflector partially surrounding said impeller,
 - a. a vortex former and side members completely or partially surrounding the impeller ends,
 said vortex former in the proximity of its greatest approximation to the circumference of said impeller having on its suction side a sharp-edged interfering body non-rotatably fixed to said vortex former and extending at least over one half of the length of said vortex former, said interfering body acting to reduce noise by producing a zone of turbulence adjacent said vortex former between pressure and suction zones on either side of said vortex former through which said blade edges travel.

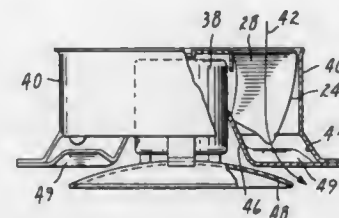
4,712,977

AXIAL FAN

Sten R. Gerfast, 1802 Valley Curve Rd., Mendota Heights, Minn. 55118
 Division of Ser. No. 627,087, Jul. 2, 1984, Pat. No. 4,610,601.
 This application May 27, 1986, Ser. No. 843,038
 Int. Cl.⁴ F04D 29/44

U.S. Cl. 415—209

12 Claims



1. Axial fan comprising
 - a. a substantially cylindrical shroud defining an axial air passage,
 - a. an impeller of n airfoil blades, n being an integer of at least 3, mounted coaxially within the shroud and rotatable to force air helically through the passage, the peripheries of the blades together generally defining a cylinder slightly smaller than the inside diameter of the shroud, the length of each blade at said cylinder being at least 20% of the distance between identical points on adjacent blades along said cylinder, and the blades having a depth-to-radius ratio exceeding 0.5, and
 - bell-shaped deflector means coaxially positioned to extend at least partially across the air passage at the exhaust to redirect the airflow toward radially outward directions, said deflector means comprising coaxial first and second circular deflector plates, the first plate being bell-shaped and integral with the motor housing and having a diameter which is small compared to that of the shroud at the exhaust, and the second plate being dish-shaped and downstream from the first plate, of larger diameter, and having a convex surface facing the impeller.

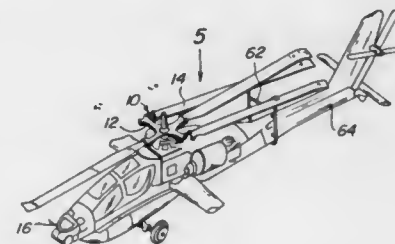
4,712,978

HELICOPTER BLADE AND THE LIKE STAND-OFF AND FOLDING DEVICE

James P. Tiemann, 100 Manor Rd., Huntington, N.Y. 11743
 Filed Dec. 1, 1986, Ser. No. 936,708
 Int. Cl.⁴ B64C 11/28, 27/50

U.S. Cl. 416—1

6 Claims



5. A method for folding a helicopter blade assembly, which comprises:
 - a. removing a first retaining pin from said helicopter blade assembly;
 - b. pivoting a rotor blade in a first direction about a second retaining pin;
 - c. inserting a stand-off and folding device between said rotor blade and a main rotor of said helicopter;
 - d. installing a third retaining pin through said stand-off and folding device, and said main rotor of said helicopter;

- e. installing a fourth retaining pin through said stand-off and folding device, and said rotor blade of said helicopter;
- f. removing said second retaining pin from said helicopter blade assembly; and
- g. pivoting said rotor blade in a second direction about said third and said fourth retaining pins in said helicopter blade assembly to a folded position.

4,712,979

SELF-RETAINED PLATFORM COOLING PLATE FOR TURBINE VANE

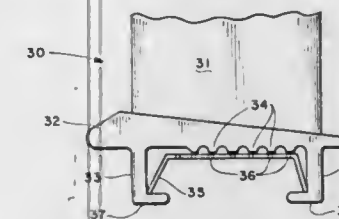
Stephen N. Finger, Jupiter, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 13, 1985, Ser. No. 797,581

Int. Cl.⁴ F01D 5/08

U.S. Cl. 416—96 R

4 Claims



1. A stator vane assembly, comprising:
 - (a) a platform having upper and lower surfaces and leading and trailing edges;
 - (b) a vane attached to the platform upper surface;
 - (c) pin fins defined on the platform lower surface;
 - (d) first and second wall means defined on the platform lower surface respectively near said leading and trailing edge and defining a channel between said first and second wall means;
 - (e) inwardly extending retaining flanges on each wall means, spaced a predetermined distance from the platform lower surface, and formed as permanently fixed in place integral extensions of said first and second wall means; and,
 - (f) a cooling impingement plate comprising a substantially flat sheet of resilient material having first and second downwardly slanted bent edges on opposite sides of said sheet, the sheet positioned inside said channel against said pin fins and the downwardly slanted bent edges resiliently biased against said wall means; and, whereby said impingement cooling plate can be inserted and removed only by deformation of the impingement cooling plate.

4,712,980

FAIRING FOR TURBO-JET ENGINE FAN LEADING EDGE

Jean-Marie L. Gely, Le Havre; Marius J. Goutines, Melun, and Georges Meauze, Paris, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed May 8, 1986, Ser. No. 860,864

Claims priority, application France, May 9, 1985, 85 06996

Int. Cl.⁴ F01D 5/16

U.S. Cl. 416—224

10 Claims

10. An aircraft engine fan blade having a leading edge and a radially-outer tip portion wherein a fairing is secured to said leading edge at said tip portion, said fairing comprising:
 - a. a skin portion forming an extension of the intrados of the blade,
 - a. a skin portion forming an extension of the extrados of the blade,
 - a. a rounded apex portion interconnecting the skin portion at a zone remote from the leading edge of the blade, said apex

portion having a radius of curvature less than that of the leading edge portion of the blades, and



reinforcement means located within said skin portions of the fairing.

4,712,981

PRESSURE-OPERATED VALVING FOR OIL AND GAS WELL SWABS

Gramling William D., 5144 Newport Ave., Chevy Chase, Md. 20816

Continuation-in-part of Ser. No. 832,445, Feb. 24, 1986, abandoned. This application Oct. 29, 1986, Ser. No. 924,417

Int. Cl.⁴ F04B 47/12

U.S. Cl. 417—56

12 Claims



1. In a swabbing device for pumping liquids from oil wells and other like wells, a connection member between the valve ball and the activating means for the valve ball, the connection member comprising:
 - a. a rod extending downwardly from said actuating means and coupling means disposed between the end of said rod and said valve ball which permits limited axial movement of said valve ball relative to said rod in response to fluid pressure acting upwardly on said valve ball.

4,712,982

VARIABLE DISPLACEMENT WOBBLE PLATE TYPE COMPRESSOR WITH GUIDE MEANS FOR WOBBLE PLATE

Mitukane Inagaki; Masaki Ohta; Akihiko Hyodo; Kenji Takenaka; Takashi Mitibata; Shinichi Suzuki, and Hiroaki Kayukawa, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

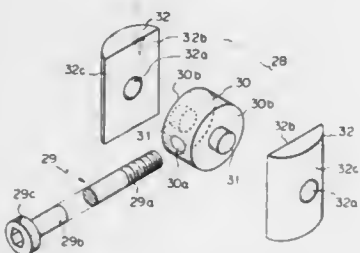
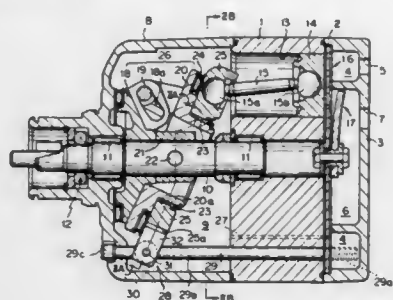
Filed Mar. 21, 1986, Ser. No. 842,482

Claims priority, application Japan, Mar. 25, 1985, 60-60495; Jun. 19, 1985, 60-133781

Int. Cl.⁴ F04B 1/26; F16H 23/00

U.S. Cl. 417-222

7 Claims



1. A variable displacement wobble plate type compressor including a compressor head having therein a suction chamber for a refrigerant to be compressed and a discharge chamber for a compressed refrigerant, a cylinder block having therein a plurality of cylinder bores in which associated reciprocating pistons are disposed so as to draw the refrigerant from the suction chamber and then to discharge the refrigerant after compression to the discharge chamber, a crankcase connected to the cylinder block and receiving therein an axial drive shaft and an assembly of non-rotary wobble and rotatable drive plates mounted on the drive shaft so as to cause compressing motion of the reciprocating pistons, a guide means for permitting inclination of the wobble plate from a plane perpendicular to the drive shaft while preventing any rotation of the wobble plate about the drive shaft, and a control means for changing an angle of inclination of the wobble plate so as to vary compressor displacement in association with a refrigerating load, wherein said guide means comprise:

- a guide rod having a cylindrical extended major portion arranged so as to be axially extended in parallel with said drive shaft in said crankcase;
- a slide axially slidable and rotatably mounted on said cylindrical extended major portion of the guide rod and having opposite lateral ends thereof, the slide having a pivot on each of the lateral outer ends thereof extending at a right angle to the guide rod;
- a pair of shoes pivotally and coaxially mounted on said lateral ends of said slide, respectively, so as to axially slide with said slide along said guide rod and to rotate relative to said slide, each of said pair of shoes having, on a laterally outer face thereof, a semi-cylindrical convex face extending in a direction across a sliding direction of said slide, each shoe having a through-hole rotatably fitting on each pivot of the slide; and
- a radial slot formed in a part of a periphery of said wobble

plate for slidably receiving said pair of shoes, said radial slot having a central opening permitting said guide rod to pass therethrough and a pair of semi-cylindrical convex faces of said shoes while opposing one another.

7. A variable displacement wobble plate type compressor including a compressor head having therein a suction chamber for a refrigerant to be compressed and a discharge chamber for a compressed refrigerant, a cylinder block having therein a plurality of cylinder bores in which associated reciprocating pistons are disposed so as to draw the refrigerant from the suction chamber and then to discharge the refrigerant after compression to the discharge chamber, a crankcase connected to the cylinder block and receiving therein an axial drive shaft and an assembly of non-rotary wobble and rotatable drive plates mounted on the drive shaft so as to cause compressing motion of the reciprocating pistons, a guide means for permitting inclination of the wobble plate from a plane perpendicular to the drive shaft while preventing any rotation of the wobble plate about the drive shaft, and a control means for changing an angle of inclination of the wobble plate so as to vary compressor displacement in association with a refrigerating load, wherein said guide means comprise:

- a guide rod having a cylindrical extended major portion arranged so as to be axially extended in parallel with said drive shaft in said crankcase;
- a slide having an axial bore, the slide axially slidably and rotatably mounted on said guide rod and having opposite lateral conical convergent ends exiting at a right angle to the guide rod;
- a pair of shoes pivotally and coaxially mounted on said lateral ends of said slide, respectively, so as to axially slide with said slide along said guide rod and to rotate relative to said slide, each of said pair of shoes having, on a laterally outer face thereof, a semi-cylindrical convex face extending in a direction across a sliding direction of said slide, each of the shoes having a conical convergent recess complimentary with and rotatably fitting with each of the conical convergent ends of the slide; and
- a radial slot formed in a part of a periphery of said wobble plate for slidably receiving said pair of shoes, said radial slot having a central opening permitting said guide rod to pass therethrough and a pair of semi-cylindrical concave and parallel faces on opposite lateral sides and complementary with said semi-cylindrical convex faces of said shoes while opposing one another.

4,712,983

AIR COMPRESSOR ACCESSORY DRIVEN BY PORTABLE ELECTRIC DRILL

Patrick B. Moynihan, 1517 Charlestown Dr., Edgewood, Md. 21040

Filed Nov. 8, 1985, Ser. No. 796,178

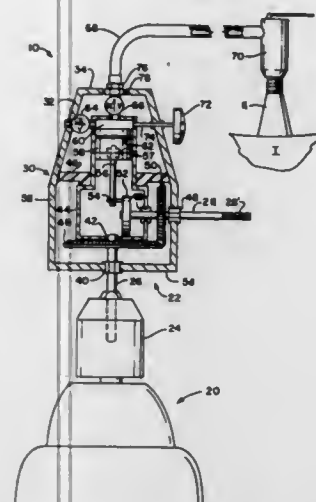
Int. Cl.⁴ F04B 35/00; F16H 37/08

U.S. Cl. 417-234

12 Claims

1. An air compressor attachment adapted to be driven by a portable power drill, comprising a housing including a side wall and further including a rearward end wall, a casing within the housing, a transverse web supporting the casing within the housing, the casing including a forward portion extending forwardly of the transverse web and the casing further including a rearward portion extending rearwardly of the transverse web, the forward portion of the casing being formed as a cylinder having an axis and further having a cylindrical wall, such that the casing and the housing have a substantially continuous annular space therebetween, a first shaft rotatably supported between the rearward portion of the casing and the end wall of the housing, the first shaft being substantially coaxial with the axis of the cylinder, means for driving the first shaft by the portable power drill, a second shaft arranged substantially transversely of the first shaft, the second shaft being rotatably supported between the rearward portion of the casing and the side wall of the housing, the second shaft having a portion extending into the rearward portion of the casing,

bevel gears carried by the first and second shafts, respectively, and providing an rpm step-up between the first and second shafts, the bevel gears being disposed between the casing and housing, respectively, crank means driven by the extending portion of the second shaft within the rearward portion of the casing, a piston guided for reciprocation within the cylinder, means for connecting the piston to the crank means, air inlet



and exhaust means associated with the cylinder, and compressed air discharge means on the housing and communicating with the air exhaust means of the cylinder, and wherein the portable power drill may be held in one hand of the user, while the housing may be held in the other hand of the user, without regard to the heat generated by the reciprocation of the piston in the cylinder formed in the casing.

4,712,984

PROCESS AND APPARATUS FOR CIRCULATING FLUIDS BY PUMPING

Claude Lepert, Annecy le Vieux, France, assignor to Etablissements Pompes Guinard, Courbevoie, France

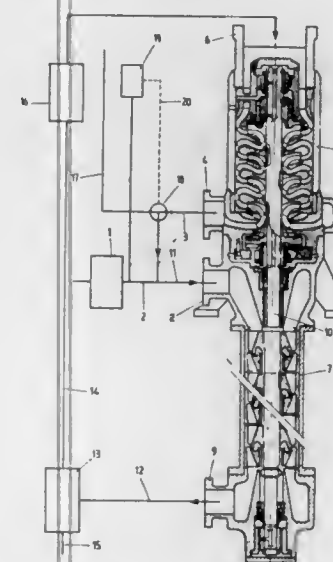
Filed Feb. 4, 1987, Ser. No. 10,686

Claims priority, application France, Feb. 10, 1986, 86 01763

Int. Cl.⁴ F04B 17/00

U.S. Cl. 417-391

13 Claims



6. Process for pumping fluid composed of a liquid phase and of a gaseous phase, comprising conveying liquid under pressure to the inlet of the turbine of a turbo-machine comprising

a pump having an inlet and an outlet and a turbine which has an inlet and an outlet separate from those of the pump and which is keyed on the same shaft as the pump, mixing the fluid with liquid coming from the turbine in order to obtain a mixture, and sucking the mixture through the inlet of the pump, wherein only some of the liquid, representing the proportion necessary for reducing the gas content of the mixture to a value below that from which the mixture can be pumped into the pump, is mixed with the fluid, and transferring or returning the rest of the harnessed liquid.

4,712,985

DIESEL ENGINE FUEL INJECTION PUMP CAPABLE OF INJECTION TIMING ADJUSTMENT

Satoshi Wakasa, and Toru Okazaki, both of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

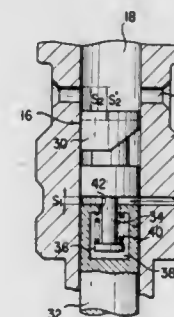
Filed Jun. 27, 1986, Ser. No. 879,734

Claims priority, application Japan, Jul. 24, 1985, 60-112448[U]

Int. Cl.⁴ F04B 7/04, 39/10; F02M 59/20

U.S. Cl. 417-486

3 Claims



1. A diesel engine fuel injection pump capable of injection timing adjustment, comprising:

- (a) housing means;
- (b) a plunger assembly reciprocally mounted within the housing means and defining a pumping chamber therein;
- (c) the housing means having defined therein a fuel inlet port to the pumping chamber in a predetermined position in the longitudinal direction of the pumping chamber;
- (d) drive means for reciprocally moving the plunger assembly within the pumping chamber between a first extreme position, where the fuel inlet port is uncovered by the plunger assembly for the admission of fuel into the pumping chamber, and a second extreme position, the plunger assembly starting the pressurization of the fuel upon completion of a prestroke extending from the first extreme position to an intermediate position where the plunger assembly covers the fuel inlet port;
- (e) the plunger assembly being formed of at least two transversely split segments movable toward and away from each other within limits and including resilient means biasing the segments of the plunger assembly toward each other; and
- (f) the housing means further including a timing fluid inlet port for introduction of a timing fluid under variable pressure between the segments of the plunger assembly to move the plunger assembly segments away from each other to an extent that timing fluid pressure is counterbalanced by force of said resilient means for controllably varying the distance therebetween and, in consequence, for varying the prestroke of the plunger assembly solely in response to variation of said timing fluid pressure to effect adjustment of injection timing.

4,712,986

OIL FEEDING APPARATUS FOR A ROTARY COMPRESSOR

Harry S. Nissen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

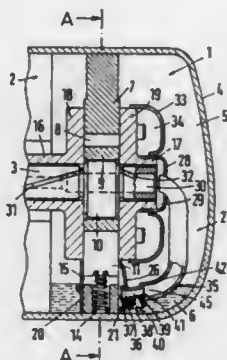
Filed Aug. 8, 1986, Ser. No. 894,580

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3528963

Int. Cl.⁴ F04C 29/02

U.S. Cl. 418—63

5 Claims



1. A rotary compressor assembly, comprising a capsule having a lower part forming an oil sump, and an electric motor and a rotary compressor mounted in the capsule, the rotary compressor including a horizontal shaft driven by said motor, a housing having a rotary piston bore, at least in part defining a pump chamber that has a closed axial side and an opposite open axial side, and mounting the shaft for rotation, a rolling piston eccentrically mounted on the shaft, a vane mounted in the pump chamber, resiliently retained in engagement with the rolling piston to separate the housing bore into suction and pressure chambers, and reciprocally movable in the pump chamber to operate as a pump piston, an oil feeding conduit having a first end joined to and opening to the housing adjacent to the shaft and a second end adjacent to the sump, a venturi passage assembly having a first end joined to the conduit second end, said venturi passage assembly having an opposite second end, a venturi passage extending between the venturi assembly ends and in part is defined by a tapered bore portion convergingly, the bore portion having a larger cross-sectional end more closely adjacent to the venturi assembly second end and a smaller cross-sectional end that is more closely adjacent to the venturi assembly first end than the venturi assembly second end and an orifice opening to the venturi passage more closely adjacent to the bore portion smaller cross-section end than the bore portion larger cross-sectional end for placing the venturi passage in liquid communication with the oil sump to draw oil from the sump when oil flows from the pump chamber toward the conduit, the conduit having a passage in the second end that opens to the venturi passage and adjacent to the venturi passage is of a substantially larger cross-section than the bore portion smaller cross-section, and a side plate for closing the pump chamber opposite side and joined to the venturi assembly second end for placing the venturi second end in liquid communication with the pump chamber.

4,712,987

VANE COMPRESSOR PROVIDED WITH ENDLESS CAMMING SURFACE MINIMIZING TORQUE FLUCTUATIONS

Kenichi Inomata, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 13, 1986, Ser. No. 862,758

Claims priority, application Japan, May 22, 1985, 60-108358

Int. Cl.⁴ F04C 18/344

U.S. Cl. 418—150

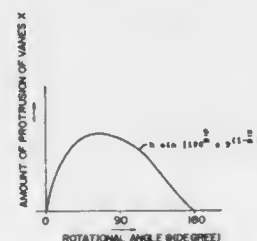
9 Claims

1. In a vane compressor comprising: a pump housing having

an endless camming inner peripheral surface; a cylindrical rotor rotatably received within said pump housing, said rotor having an outer peripheral surface, a plurality of axial slits being formed in said outer peripheral surface; a plurality of vanes radially movably fitted in said axial slits of said rotor; and a drive shaft coupled to said rotor for causing rotation of said rotor together therewith; whereby rotation of said rotor causes said vanes to slidably move along said endless camming inner peripheral surface of said pump housing in a predetermined circumferential direction to define at least one pumping chamber between inner surfaces of said pump housing, the outer peripheral surface of said rotor and said vanes, for performing suction, compression and discharge of fluid;

the improvement wherein:

said endless camming inner peripheral surface of said pump housing has at least one portion for performing one cycle of suction, compression and discharge of fluid in cooperation with said vanes and said rotor, said at least one portion having a cam profile including:



an increasing radius portion along which the amount of protrusion of each vane from the rotor gradually increases with movement of the vane; and a decreasing radius portion along which the amount of protrusion of each vane from the rotor gradually decreases with movement of the vane; said increasing radius portion and said decreasing radius portion being continuously arranged in the order mentioned and in the moving direction of said vanes; said increasing radius portion terminating in a first half of the whole circumferential length of said one cycle performing portion of said endless camming inner peripheral surface of said pump housing; said cam profile of said one cycle performing portion of said endless camming inner peripheral surface being defined by only a single equation throughout the whole circumferential length of said one cycle performing portion of said camming inner peripheral surface from a starting end to a terminating end thereof.

4,712,988

APPARATUS FOR QUENCHING MELT SPUN FILAMENTS

Clarke R. Broadus, and Bradley J. Gollhardt, both of Greenville, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 27, 1987, Ser. No. 20,019

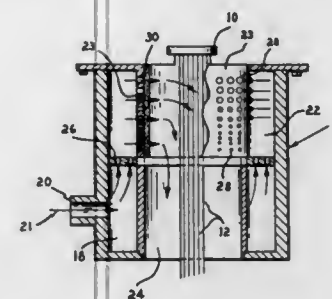
Int. Cl.⁴ B29C 35/06

U.S. Cl. 425—725

2 Claims

1. In an apparatus for melt spinning polymer that includes a spinneret, means for passing molten polymer through the spinneret, a hollow cylindrical foraminous member positioned immediately below the spinneret and a plenum chamber supplied with a current of gas surrounding the foraminous mem-

ber to form a quench chamber for the filaments to pass through to its exit, the improvement for changing the gas distribution pattern inwardly toward the filaments in the chamber to a profile defined by maximum gas flow immediately below the



spinneret decreasing to a minimum gas flow at the exit of the quenching chamber comprising: forming said hollow foraminous member of decreasing porosity from a location immediately below the spinneret toward the exit of the quench chamber.

4,712,989

EXTRUSION MEANS FOR PRODUCING RUBBER PROFILES

Walter A. Schlessler, Giebeleichstrasse 70, 8152 Glattbrugg, Switzerland

Continuation of Ser. No. 682,933, Dec. 18, 1984, abandoned.

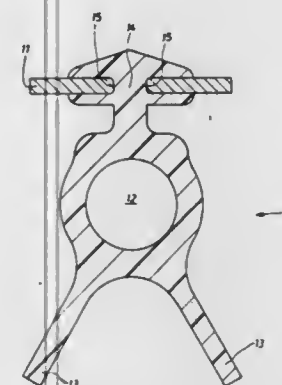
This application Dec. 8, 1986, Ser. No. 940,226

Claims priority, application Switzerland, Dec. 23, 1983, 6922/83

Int. Cl.⁴ B29C 47/02

U.S. Cl. 425—114

13 Claims



1. Extrusion means for producing rubber profiles from extruded rubber mass, said profiles having a heel section, said heel sections having a spring elastic supporting strip partly embedded therein to form rubber free edge sections projecting out of the edges of the profiles,

the extrusion means comprising:

an extrusion die having an outer, downstream side, which is downstream in relation to the movement of the extruded rubber mass through the die, the die having an inner, upstream side which is upstream in relation to the movement of the extruded rubber mass through the die; an extrusion opening through the die, which opens at the downstream side of the die in a cross-sectional shape corresponding to the cross-section of the profiles to be extruded; a recess defined in the upstream side of the die, and communicating into the extrusion opening and having a first cross section across the extrusion opening; an extrusion head disposed upstream of the die for supplying rubber mass through the extrusion die, the extrusion head comprising an extrusion pin projecting downstream toward the die and having a downstream end portion

which projects into the recess in the die, the downstream end portion of the extrusion having a cross sectional shape that corresponds to the first cross section of the recess in the die, and the extrusion pin being sealingly located in the recess in the die;

the extrusion pin further including and defining a first passage through the extrusion pin for supplying to the extrusion die rubber mass received from the extrusion head; the extrusion pin including a second passage therethrough which is of a shape for passing along the supporting strip of the profiles.

4,712,990

APPARATUS FOR INJECTION MOLDING AND INJECTION BLOW MOLDING MULTI-LAYER ARTICLES

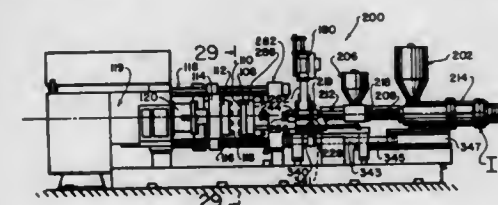
Frederick G. Kudert, Niles; Maurice G. Latreille, Batavia; Robert J. McHenry, St. Charles; George F. Nahill, Crystal Lake, all of Ill.; Henry Pfutzenreuter, III, Alta Loma, Calif.; William A. Tennant, Schaumburg, Ill.; Thomas T. Tung, Hoffman Estates, Ill., and John Vella, Jr., Aurora, Ill., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 13, 1983, Ser. No. 484,707

Int. Cl.⁴ B29C 45/16, 45/22, 49/22

U.S. Cl. 425—130

123 Claims



1. Apparatus for a multi-layer injection molding machine, which comprises

a co-injection nozzle having

a gate at one end,

a central channel in communication with the gate,

at least three polymeric melt material flow stream passageways in communication with the central channel, each passageway having an associated orifice whereat the passageway communicates with the central channel, wherein the first of said orifices is more proximate the gate than said other orifices, the third of said orifices is operative at a position more remote from the gate than said first orifice, and the second of said orifices is located between the first and third orifices, and

valve means moveable in the co-injection nozzle central channel, operative with respect to said orifices and adapted to block and unblock and prevent and allow the flow of polymeric melt material through the orifices into said central channel, said valve means being adapted to in one position block said second orifice while it does not block the first or third orifice or both the first and third orifices.

4,712,991

HYDRAULIC CONTROL SYSTEM FOR INJECTION UNIT OF INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lössburg 1, Fed. Rep. of Germany

Filed Dec. 30, 1985, Ser. No. 814,605

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1984, 3447605

Int. Cl.⁴ B29C 45/82

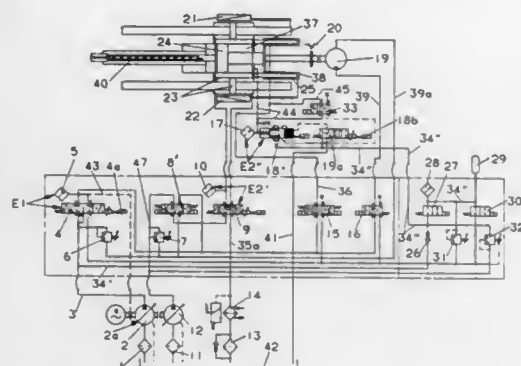
U.S. Cl. 425—145

17 Claims

1. A hydraulic control system for the operation of a plurality of hydraulic drive assemblies of the type which are used in the hydraulic drive system of an injection unit of a plastics injection

tion molding machine, the hydraulic control system comprising in combination:

- a main pump feeding drive fluid to a supply line, the main pump being in the form of a first variable delivery pump of comparatively large capacity which includes a pump adjustment unit for the continuous adjustment of the output of the main pump;
- a first branch line leading from the supply line to a first drive assembly of the hydraulic drive system, the first branch line including a first switching valve;
- a pressure maintenance pump in the form of a second variable delivery pump of comparatively small capacity, the pressure maintenance pump feeding drive fluid to the first switching valve, the first switching valve being operable to selectively connect the first drive assembly to either of said two pumps, whereby the output of the main pump is used to generate displacements of the first drive assembly and the output of the pressure maintenance pump is used to maintain the first drive assembly under pressure, after the first drive assembly has reached a displacement end point; and
- a first control unit arranged in the supply line, between the main pump and the first branch line, the first control unit including a first proportional P/Q valve, where P is pressure and Q is flow rate, a feedback line leading from the supply line on the downstream side of the first proportional P/Q valve to the pump adjustment unit of the main pump, displacement transducing means operable to provide feedback-control for the execution of a displacement-referenced control program on the pump adjustment unit of the main pump, at pressures in the first supply line which exceed a predetermined pressure level at which the first proportional P/Q valve converts from volume control to pressure control, the pump adjustment unit being set for the maintenance of a predetermined constant pressure gradient in the supply line between the upstream and downstream sides of the first proportional P/Q valve;



vide feedback-control for the execution of a displacement-referenced control program on the pump adjustment unit of the main pump, and a pressure transducer arranged in the supply line, on the downstream side of the first proportional P/Q valve, providing feedback control for the execution of a pressure-referenced control program on the pump adjustment unit of the main pump, at pressures in the supply line which exceed a predetermined pressure level at which the first proportional P/Q valve converts from volume control to pressure control, the pump adjustment unit being set for the maintenance of a predetermined constant pressure gradient in the supply line between the upstream and downstream sides of the first proportional P/Q valve.

8. A hydraulic control system for the operation of a plurality of hydraulic drive assemblies, such as the linear and rotary hydraulic drive assemblies which drive an injection unit of a plastics injection molding machine, which drive assemblies include a first cylinder assembly for the movement of the injection unit into engagement with and away from an injection molding die of the injection molding machine, a second cylinder assembly of axially advancing a plastification screw inside a plastification cylinder in an injection stroke and for exerting counter-pressure on the plastification screw during a plastification stroke, a third cylinder assembly for retracting the plastification screw away from the injection molding die, and a rotary drive assembly for the rotation of the plastification

screw during the plastification stroke, the hydraulic control system comprising in combination:

- a main pump in the form of a first variable delivery pump which includes a pump adjustment unit for the continuous adjustment of the output of the main pump;
- a first supply line and a second supply line connected to the output side of the main pump, the first supply line leading to the first cylinder assembly and the second supply line leading to the second cylinder assembly;
- a first switching valve arranged in the first supply line;
- a first control unit arranged in the first supply line, between the main pump and the first switching valve, the first control unit including a first proportional P/Q valve where P is pressure and Q is flow rate, a feedback line leading from the first supply line on the downstream side of the first proportional P/Q valve to the pump adjustment unit of the main pump, displacement transducing means operable to provide feedback-control for the execution of a displacement-referenced control program on the pump adjustment unit of the main pump, and a pressure transducer arranged in the first supply line, on the downstream side of the first proportional P/Q valve, providing feedback control for the execution of a pressure-referenced control program on the pump adjustment unit of the main pump, at pressures in the first supply line which exceed a predetermined pressure level at which the first proportional P/Q valve converts from volume control to pressure control, the pump adjustment unit being set for the maintenance of a predetermined constant pressure gradient in the first supply line between the upstream and downstream sides of the first proportional P/Q valve; and
- a second control unit arranged in the second supply line, the second control unit including a second proportional P/Q valve, displacement transducing means operable to provide feedback-control for the execution of a displacement-referenced control program on the pump adjustment unit of the main pump, and a pressure transducer arranged in the second supply line, on the downstream side of the second proportional P/Q valve, providing feedback control for the execution of a pressure-referenced control program on the pump adjustment unit of the main pump, at pressure in the second supply line which exceed a predetermined pressure level at which the second proportional P/Q valve converts from volume control to pressure control; and wherein

the first and second control units are arranged to cooperate in such a way that, for a movement of the injection unit against the injection molding die through the operation of the first cylinder assembly, the second proportional P/Q valve of the second control unit is closed and, for the execution of an injection stroke of the plastification screw through the operation of the second cylinder assembly, the first switching valve in the first supply line disconnects the first proportional P/Q valve from the first supply line, while the first proportional P/Q valve maintains a predetermined constant pressure gradient in the second supply line between the upstream and downstream sides of the second proportional P/Q valve.

4,712,992

EXTRUDER WITH SCREW HAVING CORE PORTION OF POLYGONAL CROSS-SECTION

Heung-Tai Kim, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 12, 1986, Ser. No. 873,646

Int. Cl. B29C 47/60

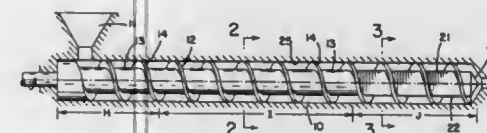
U.S. Cl. 425—207

17 Claims

6. A screw conveyor for converting plastic material from the solid phase to a viscous or liquid form comprising a longitudinally extending core, a helical flight on said core extending continuously from one end of said core to the other end of said core, said core with said helical flight having one end portion

terminating at said one end defining a metering section, said core with said helical flight having an intermediate portion extending downstream and terminating at said metering section defining a melt section, said core with said helical flight having the other end portion beginning at said other end of said core and terminating as said melt section defining a feed section, the core of each of said sections having a portion of its length cylindrical in cross-section and the remaining portion of its length polygonal in cross-section.

12. An extruder having a housing with a cylindrical bore extending longitudinally therethrough; said cylindrical bore having a smooth surface; a screw conveyor journaled in said cylindrical bore for converting plastic material from the solid phase to a viscous or liquid form; said screw having a core; a



circumferentially extending flight means encompassing said core for the full length thereof; one end portion of said core with the flight means encompassing such portion defines a feed section; the other end portion of said core with the flight means encompassing such portion defines a metering section; said core between said feed section and said metering section cooperative with the flight means encompassing such portion to define a melting section for plasticating such plastic material, changing said plastic material into a fluid phase; said core of said feed section and said melting section having a cylindrical cross-section; and said core in said metering section having a polygonal cross section presenting plasticating and force-producing components on such plastic material in any one turn of said flights in cooperative action with said flights of said metering section.

4,712,993

EXTRUSION DIE FOR EXTERNALLY RIBBED PLASTIC TUBING

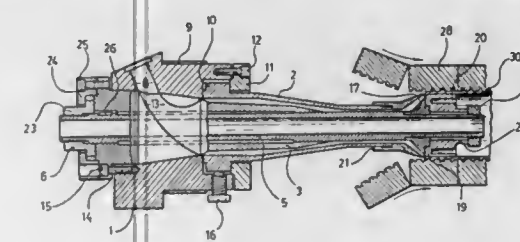
Manfred A. A. Lupke, 92 Elgin St., Thornhill, Ontario, Canada L3T 1W6

Filed Mar. 25, 1986, Ser. No. 843,516

Int. Cl. B29C 47/22

U.S. Cl. 425—466

4 Claims



1. An extrusion die for an apparatus producing seamless plastic tubing having a smooth inner surface and an annularly ribbed outer surface defined by alternating ribs and grooves, including:

- an extrusion head having a central bore with a lateral opening for receiving an extrudate of a thermoplastic material under pressure therefrom,
- an elongate nozzle attached to said head and providing a supply passage extending in the longitudinal direction thereof for the delivery of said extrudate to the delivery end thereof,
- a hollow mandrel placed in said bore in substantially coaxial relation with said nozzle and spaced from the latter to provide a plastic conducting passage extending in the longitudinal direction thereof for the delivery of said

extrudate to the delivery end thereof, the nozzle and mandrel defining respectively the annular extrusion orifice of diminishing interior dimensions, through which the extrudate can flow uninterruptedly and form a parison within the nozzle and around the mandrel, said delivery end of the mandrel having a coaxial external conical portion;

- a threaded adjusting member for adjusting longitudinally said mandrel, effective to vary the size of the extrusion orifice when the mandrel is axially adjusted;
- a coupling means interconnecting said mandrel and the head and allowing only the axial, without rotation, movement of the mandrel.

4,712,994

APPARATUS FOR COLD RUNNER TRANSFER MOLDING

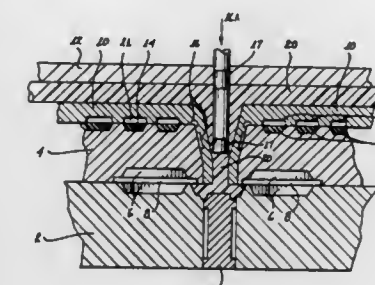
Richardus H. J. Fierkens, Herwen, and Ireneus J. T. M. Pas, Rozendaal, both of Netherlands, assignors to ASM Fico Tooling, b.v., Herwen, Netherlands

Continuation of Ser. No. 628,621, Jul. 6, 1984, abandoned. This application Oct. 15, 1986, Ser. No. 919,580

Int. Cl. B29C 45/72

U.S. Cl. 425—543

5 Claims



1. A mold apparatus for the transfer molding of a plurality of small objects, comprising:

- a cavity block;
- a plurality of cavities in said cavity block;
- gate means for admitting a plastic molding material to each of said cavities;
- a runner block;
- runner means in said runner block for permitting the flow of plastic molding material therethrough;
- plunger means having a plunger tip for forcing said plastic molding material into said plurality of mold cavities and for maintaining said plastic material under high pressure in said cavities;
- insulating means for providing thermal insulation between said runner block and said cavity block;
- cooling means in contact with said runner block for inhibiting curing of said plastic molding material in said runner block; said cooling means comprising a plurality of coolant passageways at a surface of said runner block, said passageways being partially bounded by said insulating means;
- local heating means within said cavity block for heating said plastic molding material prior to said plastic molding material entering said plurality of cavities, said heating means being proximately located in a common passageway within said gate means abutting object cavities wherein curing of said small objects are to take place; and said cavity block further having an upper portion and a lower portion, said runner block further having a tapered inner bore, said cooling means being located in said upper portion of said cavity block and surrounding said runner block adjacent to said tapered bore of said runner block, said heating means being a solid plug member and located

directly below said tapered bore of said runner block and in said lower portion.

4,712,995

REPLACEABLE ROCKER ARM ASSEMBLY FOR INJECTION MOLDING SYSTEM

David T. Bassett, Bramalea, Ontario, Canada, assignor to Die-Mold Tool Ltd. and Mold-Masters Limited, both of Georgetown, Canada

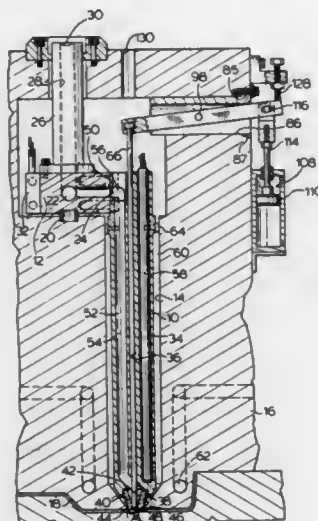
Filed Apr. 1, 1987, Ser. No. 32,549

Claims priority, application Canada, Mar. 19, 1987, 532,489

Int. Cl.⁴ B29C 45/23

U.S. Cl. 425-562

9 Claims



1. In a valve gated injection molding system having at least one heated nozzle seated in a mold core, the nozzle having a bore in alignment with a gate extending from a melt passage to a cavity, a rocker arm assembly with a pivoted rocker arm, said rocker arm having inner and outer elongated ends, an elongated valve pin having a driven end and a tip end, the valve pin extending through the bore of the nozzle with the driven end being operatively connected to the inner end of the rocker arm and the outer end of the rocker arm being operatively connected to a valve pin actuating mechanism, whereby the valve pin is reciprocated between a retracted open position and a closed position wherein the tip end of the valve pin is seated in the gate, the improvement wherein;

the rocker arm assembly comprises a rocker arm support member and the elongated rocker arm being pivotally mounted on the support member, the rocker arm assembly being mounted in a bore in the mold, said bore having an inner and an outer end, the rocker arm being disconnectable from the valve pin and the actuating mechanism, and the rocker arm assembly being removably received through the outer end of the bore, whereby the rocker arm assembly can be replaced without disassembly of the mold.

4,712,996

GAS BURNER CONTROL SYSTEM WITH MASS FLOW SENSOR

John T. Adams, St. Louis, and John B. Goodale, St. Charles County, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 21, 1986, Ser. No. 933,558

Int. Cl.⁴ F23N 3/00

U.S. Cl. 431-20

12 Claims

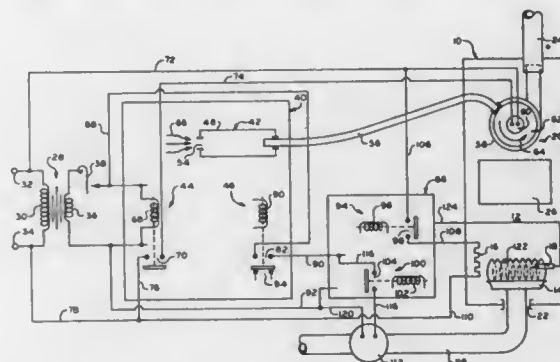
1. In a gas burner control system for controlling operation of a furnace wherein the furnace is provided with a blower fluidically connected to the combustion chamber of the furnace, a mass flow sensing device connected fluidically in an air

flow path between ambient air and a low pressure portion of a fluid flow path controlled by the blower whereby said ambient air is caused to be drawn in so as to establish an air flow through said sensing device when said blower is operating;

said sensing device including first and second temperature sensitive sensors and a heating means;

said heating means being positioned in heat conductive relationship with said second sensor, and wherein said air flow through said sensing device causes a transfer of heat from said second sensor to the moving air of said air flow; and

circuit means connected to said sensing device for initiating operation of said blower, for energizing said heating means so as to establish a predetermined temperature difference between said first and second sensors, and for effecting burner operation when the degree of energizing



of said heating means is the degree required to establish said predetermined temperature difference in the presence of the proper mass flow value of said air flow through said sensing devices,

wherein said circuit means includes first and second operational amplifiers, wherein said first sensor is connected to one of the inputs of said first amplifier, wherein the other of the inputs of said first amplifier is connected to input and feedback circuit means for establishing a gain greater than 1 for said first amplifier, wherein said second sensor is connected to one of the inputs of said second amplifier, wherein the other of the inputs of said second amplifier is connected to the output of said first amplifier, wherein the output of said second amplifier controls energizing of said heating means, and wherein said input and feedback circuit means includes resistors with selected values of resistance for controlling said output of said second amplifier.

4,712,997

BURNER, IN PARTICULAR BURNER FOR THE COMBUSTION OF LIQUID FUEL IN THE GASEOUS STATE

Jörg Fülleemann, obere Hauser, CH-7302 Mastrils, and Helrich Boner, Malans, both of Switzerland, assignors to Jörg Fülleemann, Mastrils, Switzerland

Filed Dec. 23, 1986, Ser. No. 946,190

Claims priority, application Switzerland, Dec. 30, 1985, 5568/85

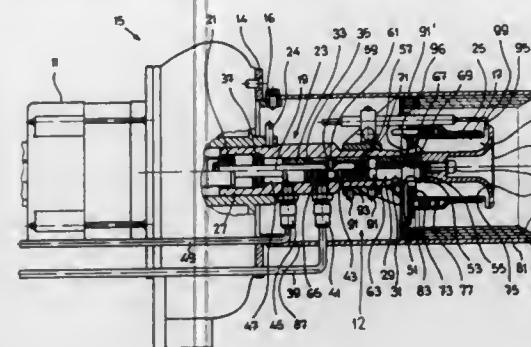
Int. Cl.⁴ F23J 5/02

U.S. Cl. 431-89

23 Claims

1. A burner comprising a motor (11) to drive a fan (15) and a fuel pump (13); a gasification chamber (25) formed by a housing (75), said gasification chamber (25) being provided with at least one heatable wall; rotatable means (17) located in the gasification chamber (25), said rotatable means (17) having a drive shaft (19) coupled to the motor (11); and a sleeve (23) enclosing the drive shaft (19) and serving as fuel supply means into the gasification chamber (25); characterized in that a first axial bearing surface (51) is provided by the end of the sleeve

(23) located proximate to the gasification chamber (25), that the rotatable means (17) provides a second axial bearing surface (53), and that actuating means (55, 57) are provided to



move the two axial bearing surfaces (51, 53) apart from each other or toward each other to supply fuel into the gasification chamber (25) according to the heating requirements, or to stop fuel supply.

4,712,998

MIXING ARRANGEMENT FOR A COMBUSTIBLE GAS MIXTURE

Hans-Jürgen Conrad, Rutesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00045, § 371 Date Oct. 9, 1986, § 102(e) Date Oct. 9, 1986, PCT Pub. No. WO86/05258, PCT Pub. Date Sep. 12, 1986

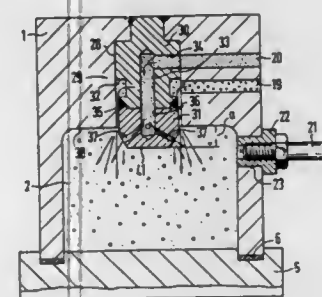
PCT Filed Feb. 8, 1986, Ser. No. 932,504

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507669

Int. Cl.⁴ F27B 3/00

U.S. Cl. 432-159

8 Claims



1. A mixing arrangement for a combustible gas mixture consisting of at least two gas components for treating materials by means of temperature and pressure shocks obtained by igniting the gas mixture, in particular for thermic deburring installations, comprising a mixing chamber; an ignition device; and feeding lines for feeding gas components into the mixing chamber and discharging into the mixing chamber, the feeding lines being each provided in a discharging area thereof with a jet arrangement (35, 37, 40) which forces gas flows discharged therefrom to take a sharp and direction which enhance the admixture of the gas components before they enter the mixing chamber (2); the jet arrangement (35, 37, 40) including an annular slot jet (35) for feeding one gas component and a multiple hole jet (37, 40) for a second gas component and directed towards a gas flow discharging from the annular slot jet, said annular slot jet (35) being formed by a bore (28) provided in a wall of the mixing chamber and a bolt (29) centrally inserted in said bore and made from a heat resistant material, said bolt having one portion (31) which has an end which faces the mixing chamber (2) and has an extension (a) projecting from a wall face (38) of the mixing chamber, and another

portion (30), said multiple hole jet (37, 40) being formed in said extension at said end of said one portion.

4,712,999

CONVERTIBLE, SELF-LIGATING, ARCHWIRE POSITIONING ORTHODONTIC BRACKET

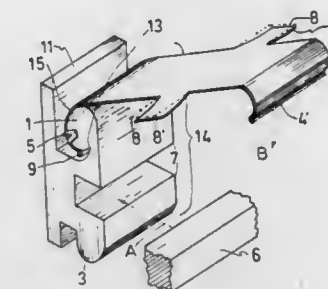
Farel Rosenberg, 10535 Wilshire Blvd., Los Angeles, Calif. 90024

Filed Sep. 10, 1986, Ser. No. 905,409

Int. Cl.⁴ A61C 7/00

U.S. Cl. 433-18

7 Claims



1. An orthodontic bracket assembly comprising:

a. a base structure having transverse and integral upper and lower semi-cylindrical extensions and also containing a transverse slot between said extensions to receive an archwire;

b. a cover plate formed at both ends into semi-cylindrical sections, the top cylindrical section being of greater circumference and incorporating a tab at each side and adapted to slide over the said top semicylindrical extension and thus act as a hinge, the lower semi-cylindrical section acting as a clip to fit over and lock with the lower semi-cylindrical extension, said cover plate being able to remain in any open position by friction in the hinge;

c. an archwire seating member incorporated in the cover plate so as to be aligned with the slot in the base structure when the cover plate is rotated to a closed position; whereby the cover plate can be rotated into the open position, an archwire introduced into the slot and the cover plate rotated closed until said clip engages with the lower semi-cylindrical extension, forcing the seating member against the archwire and achieving various degrees of play and seating against the bottom of the slot depending on the archwire size and configuration and the size of the seating member; conversely disengaging the clip permits the cover plate to be rotated into its open position thus unlocking the archwire, the process being easily repeatable for the number of cycles required during the course of the treatment without the bracket being subject to accidental opening and disassembly during normal activities by the patient, said tabs being bent at right angles to the rest of the plate thus confining the plate axially with respect to the semi-cylindrical extensions and restricting its movement to a radial direction.

4,713,000

MOLAR CONTROLLING AND POSITIONING ORTHODONTIC APPLIANCE ADJUSTABLE IN THREE PLANES

Farel Rosenberg, 10535 Wilshire Blvd., Los Angeles, Calif. 90024

Filed Feb. 12, 1987, Ser. No. 14,631

Int. Cl.⁴ A61C 7/00

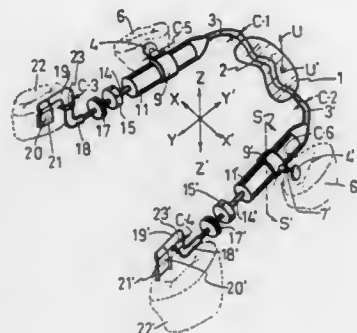
U.S. Cl. 433-18

1 Claim

1. A dental appliance for use as a tooth movement inhibitor, inducer and controller comprised in combination of:

a. a plate shaped to bear against tissue-covered basal bone

- areas, said plate being mounted about and partially enclosing a primary rod;
- cylindrical force exerting members on both sides of the appliance each of the members terminating at one end in tubing to slidably and crimpably fit over an end of the primary rod for horizontal adjustment and fitting of the appliance;
 - springs contained within said cylindrical force exerting members;
 - piston heads contained within said cylindrical force exerting members and pressing against the springs and terminating in threaded piston rods;
 - connecting fixtures which are internally threaded to receive the threaded piston rods on their forward ends, said fixtures terminating in vertical extensions;
 - u-shaped tubing sections which slide over and are crimpable to said vertical extension of the connecting fixtures on each side of the appliance and are flattened at their far



ends to fit into receptacles which have been previously cemented to rear molars;

- retaining plates which bear on the surfaces of the cylindrical force exerting members, said retaining plates having hollow neck sections which slide over and are crimpably mounted to wires extending from buttons attached to the lingual surface of forward teeth on each side of the mouth; whereby the appliance is assembled in the mouth, the crimpable fits between said primary rod and the force exerting members, between the tubing sections mounting in the molar receptacles and the connecting fixtures, and between the retaining plates, hollow necks and the wires extending from the buttons cemented to the lingual surfaces of the forward teeth are adjusted as the individual case need dictate and then crimped to hold the appliance rigidly in the mouth to permit subsequent rotation of the threaded pistons in carrying out backward tooth movement, movement inhibition or controlled forward slip-page.

4,713,001

ORTHODONTIC BRACKET-MOUNTED TRACTION HOOK

Paul E. Klein, 928 Lake Shore Road, and Douglas J. Klein, 901 Lake Shore Road, both of Lake Oswego, Ore. 97034

Filed Aug. 25, 1986, Ser. No. 900,330

Int. Cl.⁴ A61C 7/00

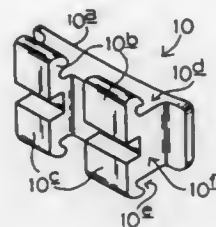
U.S. Cl. 433—18

9 Claims

1. An orthodontic traction-hook device adapted for selective, removable attachment to at least a pair of the outwardly projecting posts in an orthodontic bracket, where such posts include oppositely directed flanges which at least partially define inwardly facing, spaced channels, said device comprising

- a pair of spaced, interconnected legs constructed for releasable securement in such channels, with each leg disposed in a different channel, and
- a projection joined to said legs, adapted to accommodate the

connection thereto, by hooking, of an orthodontic, traction-applying instrumentality, said projection, with the



device mounted in place on a bracket, extending in spaced, freely exposed relation away from the latter.

4,713,002

DENTAL MIRROR

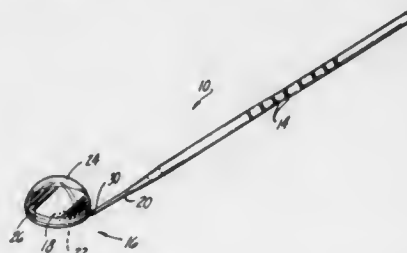
Dwight W. Presser, West Bloomfield Township, Oakland County, Mich., and Joseph J. Berke, 3333 E. Jefferson St., Detroit, Mich. 48207, assignors to Joseph J. Berke, Bloomfield Hills, Mich.

Filed Oct. 9, 1985, Ser. No. 785,922

Int. Cl.⁴ A61C 1/00, 3/00

U.S. Cl. 433—30

14 Claims



1. In an instrument of the type including an elongated handle and a disc-like mirror mounted at one end of the handle, said mirror having a mirror face, the improvement comprising: a protective shield over the disc-like mirror, the protective shield sealed relative to said mirror face to prevent fluids from entering therebetween; and the protective shield is formed as a portion of a sphere.

4,713,003

FIXTURE FOR ATTACHING PROSTHESIS TO BONE

John M. Symington, Etobicoke, and Robin D. Listrom, Willowdale, both of Canada, assignors to University of Toronto Innovations Foundation, Toronto, Canada

Filed May 19, 1986, Ser. No. 864,804

Claims priority, application Canada, May 17, 1985, 481851

Int. Cl.⁴ A61C 8/00

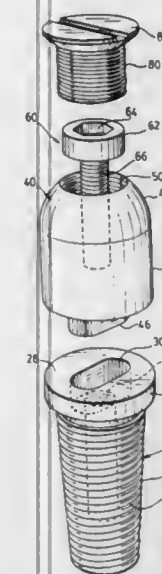
U.S. Cl. 433—173

12 Claims

1. A device for using and connecting a prosthesis to bone, which comprises:

- an implant for integration with bone, the implant having a head defining an upper surface and an externally threaded shaft depending therefrom, the shaft tapering downwardly from the head;
- an abutment to receive the prosthesis, the abutment having a lower surface complementary to the upper surface of the head of the implant, one of either of said lower surface of the abutment or said upper surface of said implant bearing a tongue and the other defining a complementary groove, said tongue and groove interfitting to prevent relative rotation therebetween, said abutment defining a first bore extending longitudinally through said abutment and along a central axis thereof and said implant defining a screw threaded second bore adapted to align with said first bore

of said abutment extending longitudinally from said upper surface of said implant along a central axis of said implant, said abutment defining a seat coaxial with said first bore and superior thereto; and



connecting means for connecting the abutment to the implant at the complementary surfaces, said connecting means comprising a bolt having a head and a screw threaded portion such that when the bolt is in its connecting position, the head of the bolt engages with said seat and the screw threaded portion engages said second bore.

4,713,004

SUBMERGIBLE SCREW-TYPE DENTAL IMPLANT AND METHOD OF UTILIZATION

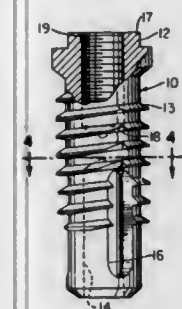
Leonard I. Linkow, New York, N.Y., and Anthony W. Rinaldi, Philadelphia, Pa., assignors to Vent Plant Corporation, Philadelphia, Pa.

Filed Sep. 4, 1986, Ser. No. 904,381

Int. Cl.⁴ A61C 13/00

U.S. Cl. 433—174

33 Claims



1. An implant portion of an oral implant designed for supporting an artificial tooth structure comprising:

- an implant body having threads over at least part of its exterior surface and being adapted to be threaded into an opening in a bone of a patient in the vicinity of the occlusal plane, which bone has been exposed by an incision in the covering fibromucosal tissue; and
- at least one channel formed such that it at least extends through the threads on the body for directing bone chips toward a base portion of the opening in the bone, one edge of the threads at one side of the channel being substantially at a right angle to the circumferential direction of the threads and the other edge of the threads at the other side of the channel being at an oblique angle to the circumfer-

ential direction of the threads, said one edge being adapted (i) to promote self-tapping of the threads in the bone, (ii) to shave off pieces of bone during threading of the implant portion into the bone, and (iii) to direct the pieces of bone into the channel such that the channel may direct pieces toward the base portion of the opening.

4,713,005

METHOD AND APPARATUS FOR MAKING A DENTAL PROSTHESIS AND PRODUCT THEREFROM

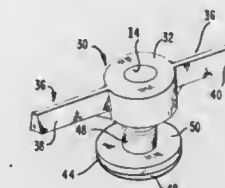
Howard B. Marshall, 301 W. 53rd St., Apt. 21K, New York, N.Y. 10019; Gordon E. Kaye, Garrison, N.Y., and Ira L. Lopata, Palm Beach, Fla., assignors to Howard B. Marshall, New York, N.Y.

Filed Sep. 2, 1986, Ser. No. 903,641

Int. Cl.⁴ A61C 13/22

U.S. Cl. 433—180

55 Claims



1. A method of forming at least one pontic in situ in an edentulous space defined adjacent at least one tooth and lightly touching the adjacent gum surface, comprising the steps of:

- drilling the occlusal surface of said at least one tooth to form at least one groove;
- positioning a bridge bar assembly including, at least one boss and a pontic base adjustably mounted on each said boss, in said edentulous space such that at least one side of said bridge bar assembly can be fixedly connected in said at least one groove;
- adjusting each said pontic base to a position lightly touching the gum surface in said edentulous space;
- placing mold means about said edentulous space;
- filling said mold means with a pontic forming material to form said at least one pontic surrounding said at least one boss on the bridge bar assembly;
- making said pontic forming material set;
- removing said mold means;
- polishing the sides and undersurface of each formed pontic; and
- cementing said bridge bar assembly in said at least one groove to secure said at least one pontic in assembled position.

4,713,006

ARTIFICIAL TOOTH ROOT

Yasuharu Hakamatsuka, Tokyo, and Nobuyuki Yokoyama, Chiba, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,210

Claims priority, application Japan, Apr. 4, 1985, 60-71375

Int. Cl.⁴ A61C 8/00; A61F 1/24

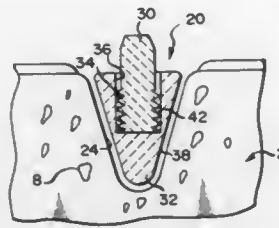
U.S. Cl. 433—201.1

10 Claims

1. An artificial tooth root implantable in a recess formed in an alveolar bone portion, comprising:

- an artificial tooth root body;
- a root holder, which is insertable into said alveolar bone recess, at least that portion of an outer surface of said root holder that is in contact with the alveolar bone portion being formed of biologically activated material, said root holder having walls defining a receiving recess in said root holder and into which said artificial tooth root body is fitted; and

an impact reducing means including a silicon rubber impact absorbing material and an adhesive provided between said artificial tooth root body and said walls of said root holder



defining said receiving recess, for elastically boding said tooth root body to said root holder and for reducing impact on said root holder.

4,713,007

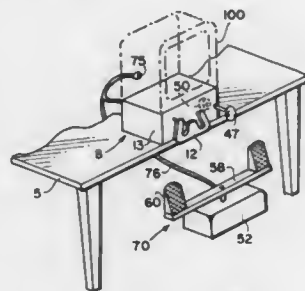
AIRCRAFT CONTROLS SIMULATOR

Eugene P. Alban, 312 Temko Terr., Daytona Beach, Fla. 32018
Filed Oct. 11, 1985, Ser. No. 786,871

Int. Cl.⁴ G09B 9/08

U.S. Cl. 434-45

10 Claims



1. A simulated aircraft control system for providing input signals to computer flight simulation programs to thereby produce graphic flight simulation displays on a personal computer screen comprising:

- a chassis having a first bracket disposed vertically and attached thereto;
- a first electrical potentiometer having a control shaft and attached to said chassis
- a simulated aircraft yoke control having a yoke shaft projecting therefrom, said shaft supported in a horizontal position by said first bracket, and rotatable and movable horizontally with respect to said first bracket by said yoke control;
- a second electrical potentiometer having a control shaft, said control shaft directly connected to said yoke shaft, said second potentiometer having a second bracket disposed horizontally and attached thereto, said second bracket and said second potentiometer movable horizontally by said yoke shaft, said second bracket including means for preventing said second bracket from rotating when said yoke control and yoke shaft are rotated thereby causing rotation of said yoke shaft to operate said second potentiometer; and

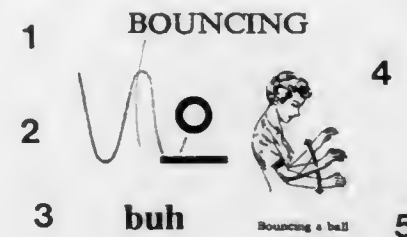
first coupling means for coupling said second bracket to said control shaft of said first potentiometer for rotating same when said second bracket is moved horizontally.

4,713,008
METHOD AND MEANS FOR TEACHING A SET OF SOUND SYMBOLS THROUGH THE UNIQUE DEVICE OF PHONETIC PHENOMENA
Elizabeth M. Stocker, 3947 Bandini, San Diego, Calif. 92103, and Eugene U. Knight, III, P.O. Box 268, Phelan, Calif. 92371

Filed Sep. 9, 1986, Ser. No. 905,786
Int. Cl.⁴ G09B 19/00

U.S. Cl. 434-167

14 Claims



1. A method of teaching, comprising:
presenting a discrete language sound to a student,
presenting a depiction of a soniferous event to said student, said soniferous event consisting of an event distinct from articulation of said language sound, and comprising an environmental sound comprising a character similar to that of said language sound,
presenting an indicium to said student, whereby said student can be taught to associate said indicium with said language sound without using a skill comprising a knowledge of phonemic segmentation.

4,713,009

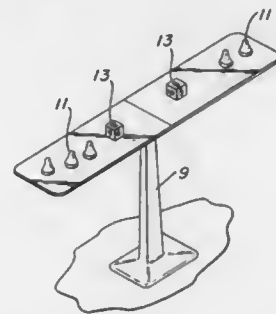
TEACHING APPARATUS AND METHOD FOR SOLVING ALGEBRAIC LINEAR EQUATIONS

Henry Borenson, 1469 Neshaminy Valley Dr., Bensalem, Pa. 19020

Filed Jun. 11, 1986, Ser. No. 872,845
Int. Cl.⁴ G09B 19/02, 23/02

U.S. Cl. 434-188

10 Claims



1. A device for solving a given linear algebraic equation, comprising:

- (a) a reference line which has an indicated center point for the purpose of giving the cognitive impression of balance,
- (b) a plurality of markers, each marker representing a unit amount of an unknown quantity,
- (c) a plurality of numbered cubes for representing numerical values whereby said markers and cubes are arranged in clusters on both sides of said center point to represent said equation and thereafter rearranged according to rules of movement in order to simplify said equation until the value of the unknown quantity is obvious, said markers, cubes, reference line, and center point, being the only articles used for representing elements of said equations

without any indicator means for representing mathematical operations.

4,713,010

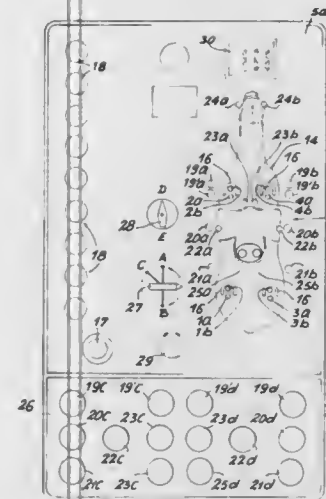
APPARATUS FOR SIMULATING THE DIFFERENT PACES OF A HORSE AND THE AIDS TO BE APPLIED FOR CONTROLLING THE HORSE

Paul Veillas, Domaine de Saint-Aubin, Saint-Aubin, F-91190 Gif-sur-Yvette, France

Filed Jul. 2, 1986, Ser. No. 881,299
Claims priority, application France, Jul. 4, 1985, 85 10198
Int. Cl.⁴ G09B 9/00

U.S. Cl. 434-247

10 Claims



1. An apparatus for simulating the different paces of a horse and the aids to be applied for the purpose of controlling the horse, wherein said apparatus includes a display panel provided with:

on the one hand four representative display lamps which are intended to light-up so as to represent the precise time-duration of the instant of ground contact of the different hooves of a horse and are supplied by four separate circuits in dependence on one or a number of control devices which are capable of ensuring different lighting-up recurrence rates and sequences so as to reproduce different types of paces of a horse (walk, trot, canter, gallop, etc.); on the other hand a signal lamp which is intended to light-up so as to represent predetermined aids for controlling a horse, said signal lamp being connected into a circuit which includes an operating key at the user's disposal and the arrangement of which is such that closing of said circuit has the effect both of turning-on the signal lamp and blocking the circuits of the representative display lamps in their state of operation at that instant.

4,713,011

SOLAR SYSTEM SIMULATOR

Fahad A. Alnafissa, 2407 Wilshire Blvd. #4, Santa Monica, Calif. 90403

Filed Dec. 12, 1986, Ser. No. 941,726
Int. Cl.⁴ G09B 27/02

U.S. Cl. 434-292

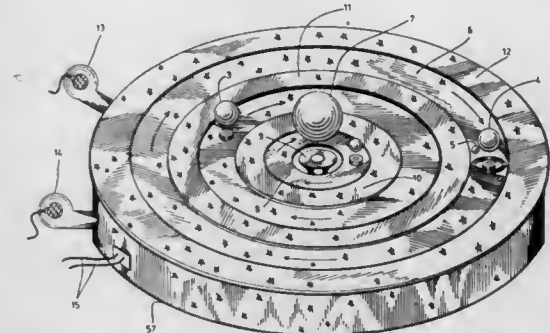
13 Claims

1. Apparatus for displaying a representation of the solar system, and particularly the inner planets and the Sun, the apparatus comprising:

- (a) a model Earth globe and a model Moon globe;
- (b) an Earth-ring assembly having an annular shape, said Earth-ring assembly comprising two structures: a rotating Earth-ring and a first ring-base assembly which is stationary; said rotating Earth-ring providing support for said model Earth and Moon globes, orbiting a model of the Sun; said first ring-base assembly providing support for

said Earth-ring, and the structure for delivering forced air through nozzles to said model Earth and Moon globes, supporting them in the air;

(c) a model Venus globe and a model Mercury globe;
(d) a Venus-ring assembly, identical in shape, structure and composition to said Earth-ring assembly, except that said Venus-ring assembly is proportionally smaller in diameter than said Earth-ring assembly, and does not include an Earth-Moon support system; said Venus-ring assembly providing the mechanism for supporting said Venus globe in air, orbiting a model Sun globe;



(e) a Mercury-ring assembly, identical in shape, structure and composition to said Venus-ring assembly, except that said Mercury-ring assembly is proportionally smaller in diameter than said Venus-ring assembly; said Mercury-ring assembly providing the mechanism for supporting a Mercury globe in air, orbiting a model Sun globe;

(f) a model Sun globe;
(g) a solar pedestal for supporting said Sun globe in air;
(h) means for driving said rotating Earth-ring, rotating Venus-ring and rotating Mercury-ring; and
(i) means for providing a sufficient volume of high velocity air to each said ring-base assembly and to said solar pedestal, for the purpose of supporting each said model globe.

4,713,012

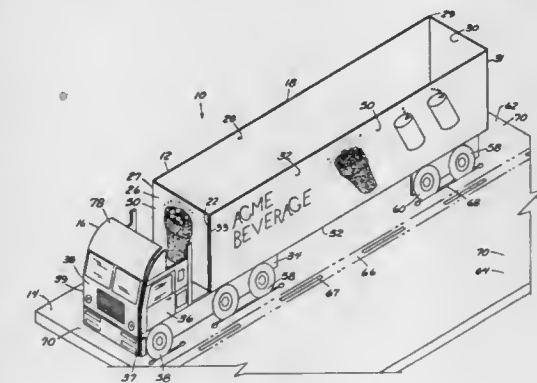
PORTABLE DEVICE FOR MODELING VEHICLE GRAPHICS

Judith A. Poplawski, and David J. Andersen, both of Racine, Wis., assignors to Color Arts, Inc., Racine, Wis.

Filed Apr. 17, 1986, Ser. No. 853,188
Int. Cl.⁴ G09B 25/00

U.S. Cl. 434-373

20 Claims



1. A portable device for modeling of vehicle graphics comprising:

first and second flat opposite side panels each forming a side profile of the vehicle;
at least two flat cross panels extending between the first and second side panels, including a front panel forming a front profile of the vehicle and a back panel forming a back profile of the vehicle.

means hinging the cross panels to the first and second side panels whereby the panels are erectable to a three-dimensional vehicle model and collapsible to a flat stack, each of said panels having a first edge; and
means along at least some of the first edges of the panels for removably securing graphics sheets against the panels.

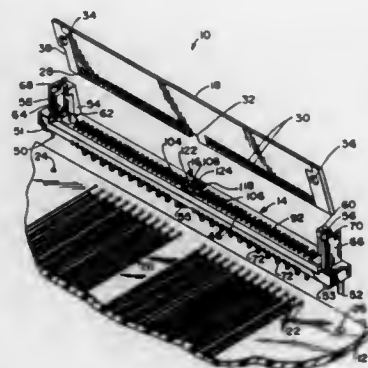
4,713,013

COMPLIANT HIGH DENSITY EDGE CARD CONNECTOR WITH CONTACT LOCATING FEATURES
Kent E. Regnier, Lombard; Thomas C. Hoover, Lisle, and Alan S. Walse, LaGrange, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jan. 30, 1987, Ser. No. 9,415
Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—62

10 Claims



1. In an arrangement for electrically connecting closely-spaced circuit elements disposed on two printed circuit boards, said arrangement including:

- a first printed circuit board; and
- a second printed circuit board having a mating edge and a surface with a linear array of aligned contact pads adjacent said edge;
- a connector including an elongated dielectric housing with a cavity formed along its length with an opening for receiving said second printed circuit board mating edge and a plurality of terminals mounted in the housing to form a closely spaced linear terminal array, each terminal adapted to engage a contact pad when the second printed circuit board is inserted into the cavity through said opening; and
- means for mounting the connector to said first printed circuit board;

the improvement comprising:

- a pitch-controlling contact locator means cooperating between said mating edge and said connector, said contact locator means including:
 - a resilient supported spring member disposed in said connector cavity generally at the midpoint of said terminal array, said spring member being resilient in a vertical direction and substantially rigid in a horizontal direction; and
 - a mating cutout disposed in said mating edge generally at the midpoint of the array of contact pads and adapted to engage said spring member with two points of contact when the second printed circuit board is inserted into said cavity;
- whereby a connector arrangement exhibiting corrective compliance for circuit to terminal mating misalignments introduced by dimensional tolerances and board warpage is provided.

4,713,014

QUICK-RELEASE MULTI-MODULE TERMINATING ASSEMBLY

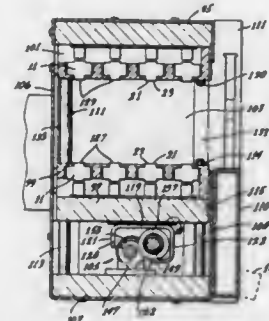
Theodore R. Conroy-Wass, Colton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 23, 1986, Ser. No. 946,551

Int. Cl.⁴ H01R 9/07, 13/631

U.S. Cl. 439—67

51 Claims



45. A panel receiver for receiving a cartridge assembly and coupling the cartridge assembly to a test device wherein the cartridge assembly has a plurality of contacts, said panel receiver comprising:

- a supporting structure;
- a table;
- means on the supporting structure for defining a compression member;
- means for mounting the table on the supporting structure for movement toward and away from the compression member between extended and retracted positions, said table being closer to said compression member in said extended position than in said retracted position;
- means defining an array of exposed contacts carried by at least one of the compression member and the table;
- said panel receiver having a cartridge assembly receiving space between the compression member and the table for receiving the cartridge assembly when the table is in the retracted position whereby the contacts on the cartridge assembly can be in confronting relationship with said array of contacts;
- means for moving the table from the retracted position to the extended position, whereby the contacts of the cartridge assembly can be brought into engagement with said array of contacts;
- first and second elevators; and
- means for mounting the first and second elevators on the supporting structure at opposite ends of the cartridge receiving space for movement in the same general direction as the table moves in moving between the extended and retracted positions, said elevators having means thereon for supporting the cartridge assembly thereon and being drivable with the table only after the table has moved a certain distance toward its extended position.

4,713,015

CONNECTING STRUCTURE FOR HIGH VOLTAGE RESISTANCE WIRES

Isao Takiguchi, Gotenba, Japan, assignor to Yazaki Corporation, Japan

Filed Jul. 11, 1986, Ser. No. 884,605

Claims priority, application Japan, Jul. 12, 1985, 60-105491

Int. Cl.⁴ H01R 13/516

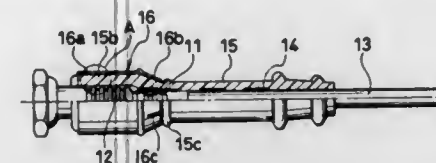
U.S. Cl. 439—125

15 Claims

1. A connecting structure for high voltage resistance wire, comprising:

- a high voltage resistance wire for suppressing noise which has on one end a connecting terminal fitted to a high voltage terminal that has a cylindrical insulator on its circumference;

an insulating soft elastic cap mounted on said high voltage resistance wire enclosing said connecting terminal which is fitted to said high voltage terminal, said cap further being fitted to the cylindrical insulator of the high voltage terminal; and
a rigid holder having means for increasing fitting strength of



said cap to the cylindrical insulator and sealing efficiency between said cap and insulator, said holder being inserted onto the outside of said elastic cap from the side of the resistance wire toward the side of the cylindrical insulator, which can be fitted closely to the outer periphery of the connecting portion of the elastic cap and the cylindrical insulator.

4,713,016

JACK FOR TELEPHONE SET

Yutaka Kato, Mie, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

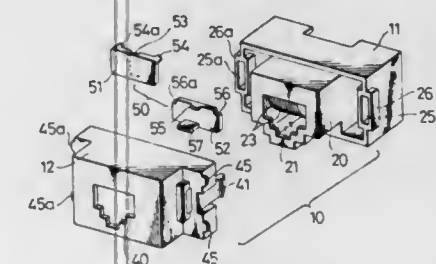
Filed Jan. 9, 1987, Ser. No. 1,863

Claims priority, application Japan, Jan. 27, 1986, 61-15006

Int. Cl.⁴ H01R 13/44

U.S. Cl. 439—137

5 Claims



1. A jack for a telephone set comprising a casing having an aperture for receiving a cord plug of said telephone set and a dust-proof closure unit provided to be shiftable along said plug receiving aperture within said casing for opening and closing the aperture, wherein said closure unit including a pair of cover plates slidable relative to each other, said first plate having a guide groove extended in slidable direction, said second plate having a projection engageable in said guide groove of the first plate, and one of the first and second plates being provided with an operating portion projected out of said plug receiving aperture of the casing.

4,713,017

ELECTRICAL POWER RECEPTACLE

Dominic Pesapane, West Haven, Conn., assignor to Casco Products Corporation, Bridgeport, Conn.

Filed Oct. 10, 1986, Ser. No. 917,701

Int. Cl.⁴ H01R 13/44

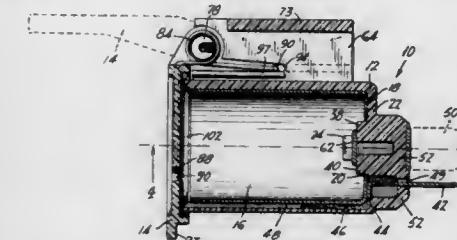
U.S. Cl. 439—142

23 Claims

1. An electrical power receptacle comprising, in combination:

- (a) a tubular plastic housing having at one end a transverse end wall, the other end of the housing being open to receive an electric plug,
- (b) a tubular metal well which is fitted in said plastic housing, said well having at its inner end a transverse end wall adjacent the end wall of the housing,

- (c) cooperable means on said end walls for securing the same together to thereby secure the well in said housing,
- (d) a pair of terminals mounted in the end wall of the housing and projecting from the exterior thereof, one of said terminals being electrically connected to said metal well,
- (e) an internal contact member on the interior of the housing end wall, connected to the other of said terminals,



- (f) said housing having a pair of integral spaced-apart stand-off legs extending laterally from its exterior and respectively provided with integral mounting feet,
- (g) a cover plate for closing the open end of the housing, and
- (h) means pivotally mounting said cover plate on said stand-off legs for pivotal movement between a closed position wherein it covers the open end of the housing and an open position wherein it uncovers the said open end.

4,713,018

SLIDING CURRENT INTERCHANGE

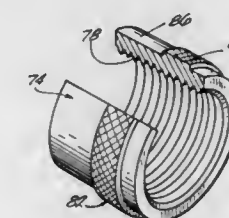
Quinten H. Sutton, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Apr. 24, 1987, Ser. No. 41,959

Int. Cl.⁴ H01R 13/53

U.S. Cl. 439—185

7 Claims



1. An electrical device comprising a housing having a passage including an electrically conductive surface fixedly secured within said housing, and a contact assembly disposed in said passage and movable relative to said housing conductive surface, and including a member having a conductive surface, and one of said housing conductive surface and said member conductive surface having a knurl in contact with said other of said housing conductive surface and said member conductive surface so that there is continuous electrical continuity between said contact assembly and said housing conductive surface.

4,713,019

SOCKETS FOR COMPACT FLUORESCENT LAMPS

Edwin Gaynor, 688 Hulls Farm Rd., Southport, Conn. 06490

Filed Sep. 17, 1986, Ser. No. 908,193

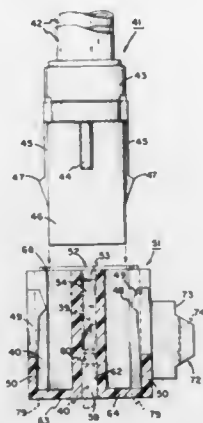
Int. Cl.⁴ H01R 4/24

U.S. Cl. 439—232

16 Claims

1. A socket for a compact fluorescent lamp which includes two or more parallel tubes that share a common base, said base including at least two terminal pins and at least one laterally extending retaining hook, said socket having an open front lamp-receiving recess and a back end, and further comprising:
a housing having a back wall, with first, second, third and

fourth joined side walls, each joined at one end to the back wall, said side walls defining a front opening at their other front end for receiving the lamp base, said first and third walls and said second and fourth walls being in opposition to one another, and defining with said back wall the lamp-receiving recess,



a portion of said first wall comprising an integral resilient flange having an inward facing hook, shaped and aligned for establishing reversible locking engagement with said base retaining hook when the lamp base is inserted into the housing recess, and channel means formed in said housing enclosing conductive terminal means for receiving each of said terminal pins in electrically conductive engagement.

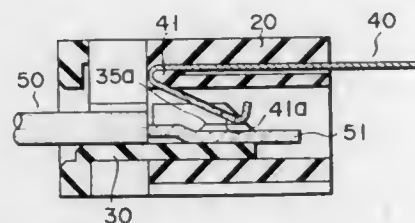
4,713,020 CONNECTOR UNIT

Yoshiyuki Awano, Kawasaki, and Hiroshi Narita, Tokyo, both of Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 29, 1987, Ser. No. 8,272
Int. Cl.⁴ H01R 9/07

U.S. Cl. 439-267

1 Claim



1. A connector unit comprising:

- a housing having an opening and connection terminal arranged in the opening, and
- a movable member made of an insulating material and adapted to be inserted into the opening of the housing, in which
- said connection terminal has an elastic contact portion to be brought into contact with a corresponding conductor in a direction perpendicular to that in which said conductor is inserted into the opening of the housing, and
- said movable member has cam projections extending in a direction from that end of the movable member at which the movable member is inserted into the housing, to the other end of said movable member, the dimensions and position of the cam projection being so selected that, when the movable member is partially inserted into the opening of the housing, the cam projection presses the elastic contact portion to provide such a clearance as to allow the conductor to be inserted there and, with the movable member in a fully inserted position, the pressing of the elastic contact portion by the cam projection is

released to allow the conductor to be electrically connected to the elastic contact portion.

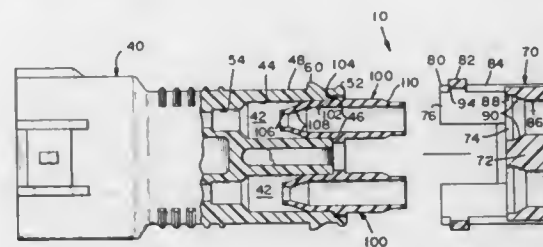
4,713,021 SEALED ELECTRICAL CONNECTOR AND METHOD OF USING SAME

Robert J. Kobler, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 17, 1985, Ser. No. 735,416
Int. Cl.⁴ H01R 13/52

U.S. Cl. 439-272

17 Claims



1. A sealed connector assembly for receiving insertably thereto and securing therewith electrical conductors having terminals terminated on ends thereof, comprising:

housing means, a rigid camming member secured to a rearward end of said housing means, and a plurality of individual wire seal members secured therebetween, defining a preassembled connector assembly prior to insertion of terminated conductors thereinto, wherein:

said housing means having a plurality of terminal-receiving cavities extending therethrough each to receive a respective terminated electrical conductor securely thereinto; said plurality of individual wire seal members each associated with a said terminal-receiving cavity and said respective conductor, each said wire seal member being elongated and sleeve-like of relatively incompressible, deformable elastomeric material and having a conductor-receiving aperture extending therethrough for a said respective terminated conductor, each said wire seal member adapted to receive insertably therethrough a said terminated conductor and then initially loosely surround an insulated conductor portion therewithin substantially therealong, each said wire seal member having a forward seal portion disposed and held within a rearward section of a said associated terminal-receiving cavity and at least a rearward seal portion extending rearwardly from said cavity, said wire seal members held by said housing means prior to securing said camming member thereto;

said rigid camming member securable to said housing means in a first fixed position after said wire seal members are disposed within respective said terminal-receiving cavities of said housing means, said camming member exposing said rearward seal portions of said wire seal members for receiving said terminated ends of respective said conductors thereinto, said camming member being movable relatively towards said housing means from said first position to a second position; and

each said wire seal member including a camming surface portion on a radially outward surface thereof at least proximate a rearward end thereof, and said camming member having respective rigid cooperating camming means associated with said camming surface portion of each said wire seal member, all such that when said camming member is in said first position, a said terminated end of each said conductor is insertable into and through an associated said wire seal member and the terminal terminated to said conductor is securable in said associated terminal-receiving cavity, and when said camming member is moved to said second position, said camming surface portion of each said wire seal member is engaged by a said associated rigid cooperating camming means of said cam-

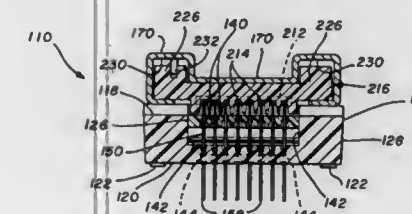
ming member and placed under force directed substantially radially inwardly, and the rearward section of each said wire seal member is radially deformed thereby into sealing engagement around an insulated portion of a said respective conductor, whereby said camming member cams the plurality of said wire seal members simultaneously into sealing engagement with respective said conductors.

4,713,022 SOCKET FOR FLAT PACK ELECTRONIC DEVICE PACKAGES

Wayne K. Pfaff, 309 Steeplechase, Irving, Tex. 75062
Filed Aug. 5, 1986, Ser. No. 893,170
Int. Cl.⁴ H01R 9/09

U.S. Cl. 439-331

5 Claims



1. A socket for a flat pack electronic device package having a housing and plurality of ribbon leads supported in a carrier comprising:

- (a) a base defining opposite upper and lower surfaces;
- (b) a plurality of electrically conductive contacts mounted in said base and extending through said base from said upper surface to said lower surface, each of said contacts including a resilient upper contact point projecting from said upper surface and at least one tab projecting from said lower surface for electrical connection exteriorly of the socket;
- (c) a lid pivotally connected to said base and shiftable between a loading position for receipt of a carrier supporting a flat pack electronic device package and a latched position with said lid adjacent and parallel with said upper surface with each ribbon lead of the flat pack package aligned and in contact with one of said contacts in said base, said lid defining a pair of laterally spaced channels for sliding receipt of the carrier containing the electronic device package to support the carrier from the underside thereof;
- (d) latch means for releasably securing said lid in said latched position; and
- (e) means depending from said lid and cooperating with said channels to engage said carrier and thereby align each of the ribbon leads of the flat pack package with one of said contact points when said lid is in the latched position.

4,713,023 ELECTRICAL CONNECTOR AND METHOD OF ASSEMBLY

Craig A. Bixler, Elmhurst, and Irvin R. Triner, Stickney, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jan. 30, 1987, Ser. No. 9,314
Int. Cl.⁴ H01R 4/04

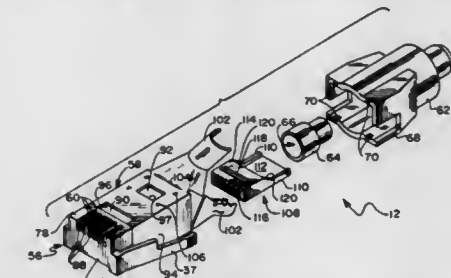
U.S. Cl. 439-393

19 Claims

1. A plug assembly for connecting multiconductor cable assembly to a receptacle, said multiconductor cable assembly including a plurality of insulated conductors surrounded by an outer insulation jacket, said plug assembly being of the type including

an insulated housing having a front mating end and a rear wire receiving end joining opposing top and bottom walls and an opposing pair of side walls and further including a generally planar trough extending from a wire receiving

opening in the rear end towards the front end of the housing, and a plurality of terminal receiving cavities extending from the top wall into said trough near the front end thereof and a strain relief section formed in the top wall between the terminal receiving cavities and the rear end and extending generally over the width of the trough and deformable downwardly into the trough upon receiving a downward force, insulative wire positioning means received through the wire receiving opening into the trough and holding said insulated conductors in an array so that the ends thereof are presented in alignment below said terminal receiving



cavities when the wire loaded positioning means is in the housing trough, and a plurality of insulation penetrating terminals mounted in the terminal receiving cavities and moveable toward the trough to engage the conductors aligned thereunder; the improvement comprising:

said positioning means includes cam means formed thereon adapted to engage said housing strain relief section when it is moved downwardly, whereby said positioning means is moved forwardly in the trough to fully seat the positioning means therein and position the free ends of the insulated conductors below said terminals.

4,713,024 CONNECTOR FOR TELEVISION DISTRIBUTION EQUIPMENT

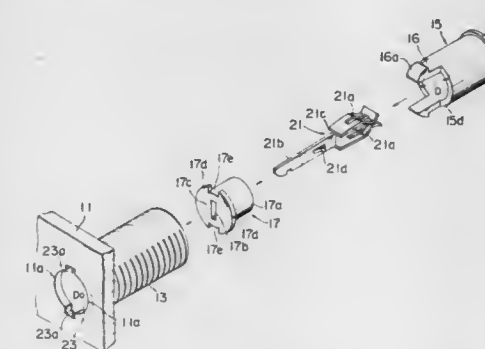
Takuya Hatakeyama, Chiba, and Shinji Ohga, Tokyo, both of Japan, assignors to Uro Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 891,878

Claims priority, application Japan, Jul. 30, 1985, 60-115897
Int. Cl.⁴ H01R 13/73

U.S. Cl. 439-555

7 Claims



1. A connector for distribution equipment, comprising:

- a cylindrical outer conductor fixed on a casing of the distribution equipment, an outer braid conductor of a coaxial cable being connectable to said outer conductor;
- a substantially cylindrical insulator inserted in said outer conductor;
- an inner resilient conductor member inserted and held in said insulator, an internal conductor of said coaxial cable being connectable to said inner resilient conductive member;

a plurality of projecting members extending radially inward in mutually opposed state around an opening through which a space in said casing and a space in said outer conductor communicate with each other; and
a plurality of flexible legs having respective claws formed radially outward on nose portions thereof, said legs being provided on said insulator and projecting further rearward of a rear end surface of the insulator.

4,713,025

ELECTRIC CONNECTOR FOR MULTI-CONDUCTOR FLAT CABLES

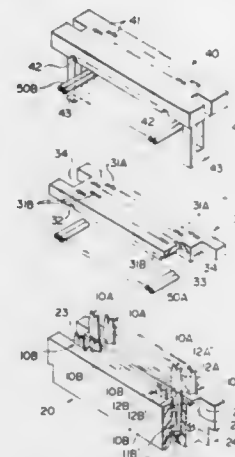
Keiji Soma, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 608,101, May 8, 1984, abandoned. This application Nov. 21, 1985, Ser. No. 799,563

Claims priority, application Japan, Feb. 10, 1984, 59-23413 Int. Cl.⁴ H01R 13/502

U.S. Cl. 439—752

1 Claim



1. An electric connector for at least first and second multi-conductor flat cables having conductors therein being spaced apart a predetermined distance, said electric connector comprising:

an insulating housing having a substantially flat end face; a plurality of first and a plurality of second contacts extending from said end face, said first contacts having a press-contact portion located at a level of height with respect to said end face different from the level of height of said second contacts, each contact having said press-contact portion and a contact part for securing said contacts in said housing;

first and second cable connecting members in the form of a substantially flat plate;

said first contacts and said second contacts extending from said end face in at least two respective rows so that all of the contacts in the same row are arranged in a uniformly staggered fashion across said end face with the contact parts of said contacts within said rows being aligned along a line and the press-contact portions of the contacts in the same row being aligned along two lines with said contact parts being located between said two lines,

a spacing between adjacent staggered press-contact portions of the contacts arranged in one row being equal to a spacing between adjacent staggered press-contact portions of the contacts arranged in another row and being equal to said predetermined distance spacing between the conductors in said multi-conductor flat cable to be connected;

said first cable connecting member having a cable receiving recess for receiving an end portion of the first multi-conductor flat cable to be connected, press-contact portion holes for receiving the press-contact portions of the first contacts, and press-contact portion passing holes for passing the press-contact portions of the second contacts, the

first cable connecting member being able to be coupled to said end face of said insulating housing;

said second cable connecting member having a cable receiving recess for receiving an end portion of the second multi-conductor flat cable to be connected, and press-contact portion holes for receiving the press-contact portions of the second contacts protruding from the substantially flat plate face of the first cable connecting member coupled to said insulating housing, the second cable connecting member being able to be coupled to the first cable connecting member for stacking on said substantially flat plate face of the first cable connecting member.

4,713,026

TAB RECEPTACLE TERMINAL HAVING IMPROVED ELECTRICAL AND MECHANICAL FEATURES

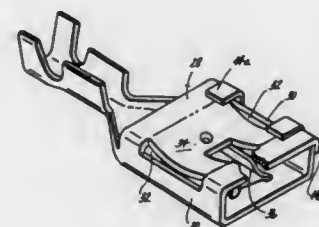
Dewey F. Mobley, Lake Orion; Janice M. Warren, New Hudson; August Barbrick, Plymouth, all of Mich., and Gregg A. Eisenmann, Parma, Ohio, assignors to Interlock Corporation, Westland, Mich.

Filed Oct. 8, 1986, Ser. No. 916,950

Int. Cl.⁴ H01R 13/11

U.S. Cl. 439—845

9 Claims



1. A tab receptacle terminal fabricated by bending a single sheet of material comprising:

a rectangular receptacle box having a closed continuous wall forming an end opening through which a male terminal is inserted so as to make contact with said receptacle box, said receptacle box including a bottom, a top, and sides,

single leaf spring means formed in said top so as to extend across substantially the entire width of said top between said sides, and extending toward said bottom for engagement with a male terminal inserted therebetween to achieve high retention forces,

closed slots extending lengthwise along the juncture of said top with said sides to enable deflection of said leaf spring means,

and fixed beams formed on said bottom and extending toward said leaf spring means for engagement with a male terminal with normal force applied by said leaf spring means toward said fixed beams.

4,713,027

RINGED IMPELLER FOR A WATER JET DRIVE

Ronald B. Fowler, 1991 Main St., Sarasota, Fla. 33577

Filed Apr. 15, 1987, Ser. No. 38,714

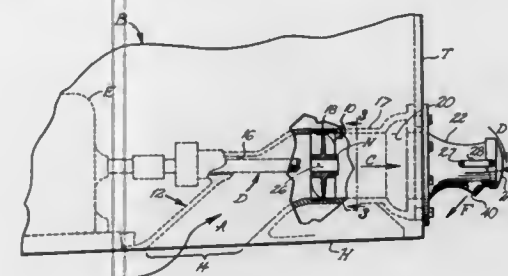
Int. Cl.⁴ B63H 11/103

U.S. Cl. 440—47

7 Claims

1. In a water jet drive for a boat having a bottom, a transom, and a motor for providing rotational output through an output shaft, the water jet driven having a housing with a water inlet and a water outlet, the inlet disposed through the boat bottom allowing water to flow into the housing, said outlet disposed through the boat transom allowing water to be pumped out of the housing to propel the boat, a rigid motor driven impeller having blades and mounted on the rotatable output shaft, the impeller positioned within the housing to forcibly urge and accelerate water entering the housing inlet out through the

housing outlet for propelling the boat, the improvement comprising:
an annular ring connected to and between the distal ends of the impeller blades;



said ring having a generally circular outer surface concentric with the output shaft and fitted in close proximity within a mating circular surface in the housing; and a plurality of apertures through said annular ring for flushing debris from between said annular ring and the mating surface in the housing.

4,713,028

SHALLOW WATER BOAT DESIGN

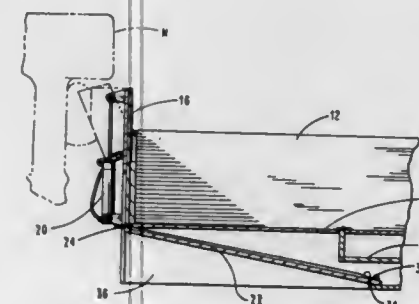
Don Duff, P.O. Box 246, Chavies, Ky. 41717

Filed Jun. 19, 1986, Ser. No. 875,921

Int. Cl.⁴ B63H 5/12

U.S. Cl. 440—61

14 Claims



1. A boat allowing full operation in shallow water utilizing an outboard motor with propeller and cooling water intake port, comprising:

a main hull;
a displaceable transom of said main hull supporting said motor to be lowered for normal operation and raised for shallow water operation;
a displaceable hull section; and
means for pivotally connecting said displaceable hull section to said displaceable transom so as to follow the movement thereof;

whereby raising said displaceable transom serves to raise said motor and prevent damage to said propeller as well as raise said displaceable hull section so as to provide a flow channel for directing water to the propeller and intake port of the motor for proper and efficient cooling.

4,713,029

INVERTED FLOW MARINE ENGINE EXHAUST MUFFLER

John R. Ford, Xenia, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Feb. 17, 1987, Ser. No. 15,415

Int. Cl.⁴ F01N 1/14; B63H 21/32

U.S. Cl. 440—89

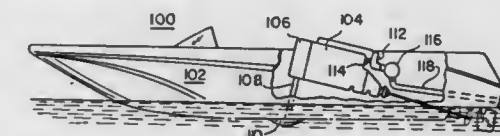
7 Claims

1. An exhaust muffler for a marine engine comprising:
a muffler main body chamber;
inlet means for carrying a combination of exhaust gases and

cooling fluid from the exhaust of a marine engine into said chamber;

first tubular means having a lower end sealingly extended through the bottom of said chamber and an upper end extending upwardly within said chamber in a generally vertical orientation for carrying a combination of exhaust gases and cooling fluid from said chamber downwardly through said first tubular means;

second tubular means surrounding and spaced from said first tubular means for forming a passage therebetween, said second tubular means having its upper end substantially adjacent the upper end of said first tubular means and its lower end extending to a point below said inlet means and spaced from the bottom of said chamber; and



cap means sealing the upper end of said second tubular means for inverting the flow of exhaust gases and cooling fluid from said passage defined between said first and second tubular means into said first tubular means whereby as the cooling fluid accumulates on the bottom of said chamber and rises toward the lower end of said second tubular means, and hence, said passage, a pressure differential is set up between said chamber and the exhaust path defined by said passage, said cap means and said first tubular means such that the combustion gases carry portions of the cooling fluid upwardly to the top of the passage whereat they are diverted downwardly into said first tubular means by said cap means and discharged from said chamber through said first tubular means.

4,713,030

MARINE CRAFT

John W. Ingle, 85 Cynthia Road, Toronto, Ontario, Canada M6N 2P8

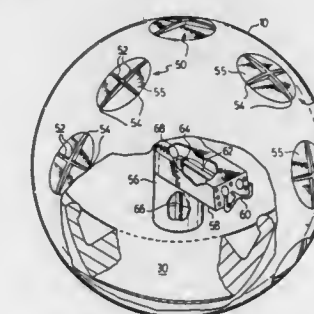
Continuation-in-part of Ser. No. 598,980, Apr. 11, 1984, which is a continuation of Ser. No. 744,527 Jun. 14, 1985 abandoned.

Filed Jan. 22, 1987, Ser. No. 8,146

Int. Cl.⁴ B63H 1/38

U.S. Cl. 440—99

5 Claims



1. A marine craft comprising:
an outer hull of completely spherical shape;
an inner load-carrying structure of hemispherical shape;
universal bearing means between said inner structure and said outer hull supporting said inner structure within said outer hull and permitting universal movement of said inner structure relative to said outer hull;
mass means in said inner structure, biasing the same into a predetermined reference position;
drive motor means on said inner structure, engageable with and disengageable from said outer hull, whereby said outer hull may be rotated relative to said inner hull about

a selected diametric axis of said inner structure, and means for operating said drive motor means;

a plurality of groups of fins on the exterior of said outer hull, each of said groups comprising four planar fins each said fin defining a root and a tip and tapering from said root to said tip, said four fins in each said group joining one another at their roots at a central junction in a generally cruciform configuration and extending radially away from said central junction, with adjacent said fins in said group being arranged at right angles to one another, said groups of fins being located at spaced apart positions over said outer hull, said fins being disposed in planes which include diametric axes of said outer hull whereby rotation of said outer hull about any selected diametric axis may cause some said fins to engage the water and procure propulsion of said craft along the surface of the water.

thetic resin and said surface layer is an intimately adhering deep drawn thermoplastic film with a thickness of 0.1 to 0.5



mm applied during the preparation of said sailboard or surfboard.

4,713,033

LINE THROW-BAG

Robert W. Cameron, 7724 115th Pl. NE., Kirkland, Wash. 98033
Filed Mar. 19, 1986, Ser. No. 841,957
Int. Cl.⁴ B63C 9/26

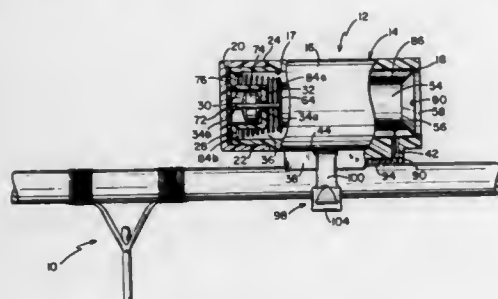
U.S. Cl. 441—84

49 Claims

4,713,031
SUBMERGED BOBBER RELEASE DEVICE FOR FISHING RODS AND THE LIKE
Kevin S. Fuller, 3418 Greenbrier, Vadnais Heights, Minn. 55110
Filed Jun. 20, 1986, Ser. No. 876,773
Int. Cl.⁴ B63B 22/10

U.S. Cl. 441—8

14 Claims



1. A device for enabling the retrieving of a submerged fishing rod or the like comprising a tubular housing having a cylindrical bore open at one end and closed at its other end, means within said other end for containing a water-soluble element therein, a bobber releasably confined within said housing having a tongue projecting from one end thereof, said bobber having an enlarged end at each end thereof substantially occupying said bore and having notches therein to facilitate the passage of water when said device becomes submerged, said element-containing means having a slot therein so that said tongue extends through said slot for retention by said water-soluble element until said element is dissolved.

4,713,032

SAILBOARDS AND SURFBOARDS AS WELL AS MANUFACTURING PROCESS THEREOF

Wolfgang Frank, Bruckmühl, Fed. Rep. of Germany, assignor to TAA Technique and Administration AG, Basel, Switzerland
PCT No. PCT/EP84/00240, § 371 Date Apr. 12, 1985, § 102(e) Date Apr. 12, 1985, PCT Pub. No. WO85/00755, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 9, 1984, Ser. No. 723,959

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329230

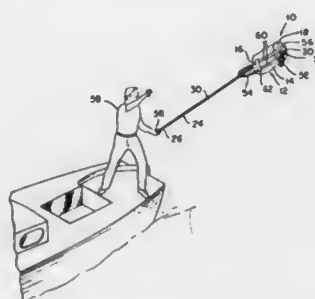
Int. Cl.⁴ A63C 15/05

U.S. Cl. 441—74

5 Claims

1. A sailboard or surfboard comprising a foam core and a shell of fiber-reinforced synthetic resin and a surface layer, characterized in that polyurethane resin is provided as syn-

1. A line throw-bag for water rescue, comprising:
a bag colored for high visibility manufactured of a water resistant material, said bag having a pliable and generally cylindrical sidewall with sufficient stiffness to maintain an at least partially uncollapsed shape when under its own weight, said bag further having an open end, a closed end formed by an end wall with a central aperture, and an interior compartment with sufficient size to loosely receive and store therein a length of line, said line having first and second end portions with a lengthy central portion therebetween, said first line end portion extending through said end wall aperture and having a loop positioned exterior of said bag and sized for grasping by the person to be rescued, said first line end portion further having a pair of knots, one of said knots being positioned to each side of said end wall aperture and said end wall aperture being sized to prevent passage of said knots therethrough, said central line portion being storable in a plurality of folds within said bag compartment, said second line end portion extending through said bag open end and having a loop positioned exterior of said bag and sized for grasping by the person throwing said bag, whereby said line gradually plays out of said bag through said bag open end as said bag travels forward when thrown with said second line end portion loop being held stationary;
an annular weighted member fixedly attached to said bag end wall with a central opening generally concentric with said end wall aperture, said weighted member having sufficient weight in combination with the weight of said bag to carry said bag forward when forwardly thrown for a distance substantially equal to the length of said line central portion and to gradually play said line out of said bag under the rearward drag created by holding said second line end portion loop stationary while said line plays out, said weighted member having sufficient weight



to cause said bag to land with said bag end wall downward when thrown;

an annular disc-shaped flotation member fixedly attached to said bag end wall and having a central opening generally concentric with said end wall aperture, said flotation member having sufficient buoyancy to keep said bag afloat in water in a generally upright position with said bag sidewall extending upward above the water level for visibility; and

a pair of handles fixedly attached to said bag and extendable beyond said bag open end, said handles being sized for releasable grasping by the person throwing said bag, each of said handles being attached to said bag sidewall at generally diametrically opposing positions.

4,713,034

MEANS AND METHOD FOR MANUFACTURE OF A HIGH-RESOLUTION COLOR CATHODE RAY TUBE

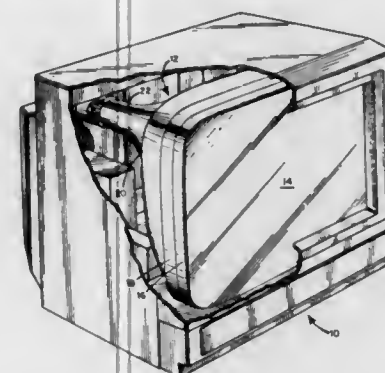
Sae D. Lee, Buffalo Grove, and Kazimir Palac, Carpentersville, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 23, 1985, Ser. No. 758,174

Int. Cl.⁴ H01J 9/227, 9/40

U.S. Cl. 445—45

10 Claims



1. In-process articles of manufacture for the manufacture of a high-resolution color cathode ray tube having a tensed foil shadow mask, a first in-process article comprising a faceplate with a target area for receiving at least one pattern of phosphor deposits, said faceplate having attached at preselected, widely spaced locations on the sides thereof a plurality of discrete, detachable first indexing elements, and a second in-process article comprising a shadow mask support assembly having a frame ultimately constituting a part of the tube envelope for supporting said shadow mask in precise adjacency to said target area, said frame having attached on the sides thereof a like plurality of discrete, detachable second indexing elements which are in facing adjacency to said first indexing elements on said faceplate when the faceplate and frame are mated, said indexing elements being detachably attached by a thermally degradable cement compounded to degrade at the final assembly frit-seal temperature, whereby said faceplate and said frame can be inter-registered in precise relationship by the temporary use of said first and second indexing elements in the process of screening said pattern of phosphor deposits on said target area and later in the final assembly of said tube.

4,713,035

TOY TELEPHONE

Paul Thom, Woburn, Mass., assignor to Kiddie Products, Inc., Avon, Mass.

Filed Aug. 20, 1986, Ser. No. 898,330

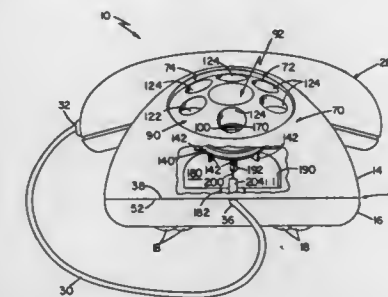
Int. Cl.⁴ A63H 33/30

U.S. Cl. 446—141

13 Claims

1. A toy telephone comprising a base, a dial connected to

said base and having a rotary surface and noise generating means within said base actuable by said dial, characterized in that said dial is connected to said base for both rotary and axial motion relative to said base and



said noise generating means within said base is actuable to generate one noise upon rotary actuation of said dial, and said noise generating means within said base is actuable to generate a different noise upon axial actuation of the rotary surface of said dial.

4,713,036

TOY SIMULATOR POWER DRIVEN RECIPROCATING SAW WORKSHOP

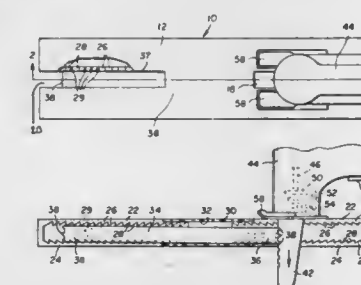
David E. Moomaw, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 27, 1986, Ser. No. 923,631

Int. Cl.⁴ A63H 33/30

U.S. Cl. 446—145

9 Claims



1. A toy simulated power driven reciprocating saw workshop for simulating the sawing action of a real power driven reciprocating saw cutting a groove through a board, comprising:

saw means;
means defining an elongated slot extending therethrough;
bar means;
means for supporting the bar means within the slot substantially parallel thereto; and
escapement means between the bar means and the slot defining means adapted when the bar means is reciprocated and pressed forwardly along the slot to intermittently move the bar means in steps along the slot by said saw means simulating the movement of a real power driven reciprocating saw cutting a groove through a board.

4,713,037

SWIMMING MARINE CREATURE TOYS

Duncan Tong, Hong Kong, Hong Kong, assignor to Duncan Products Ltd., Hong Kong, Hong Kong

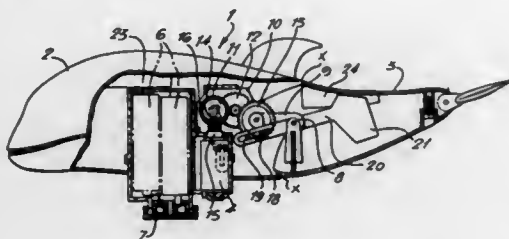
Filed Aug. 8, 1986, Ser. No. 894,991

Claims priority, application United Kingdom, Sep. 10, 1985, 8522372; Dec. 31, 1985, 8531942

Int. Cl.⁴ A63H 23/10

U.S. Cl. 446—158

6 Claims



1. A toy simulating a marine creature which comprises a body portion and a tail portion with a tail fin pivotally mounted thereto; a battery operated motor housed in said body portion and arranged to move said tail and said tail fin relative to said body portion to propel said toy through the water; a drive means to drive said tail portion comprising a pair of cranks mounted parallelly and directly opposite one another on a single spindle and driven through gearing by said motor; and a drive member extending down within the top portion of said tail, said drive member being provided with a pair of slots, each slot receiving a pin connected to one of said cranks.

4,713,038

MARBLE RACE GAME

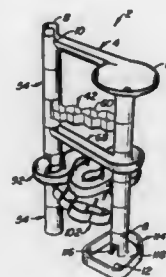
William J. Wichman, Glendora, Calif., and Edward M. Troup, deceased, late of Mount Baldy, Calif. (by Cathryn H. Troup, executor), assignors to Discovery Toys, Inc., Pleasant Hill, Calif.

Filed Jul. 5, 1985, Ser. No. 752,420

Int. Cl.⁴ A63H 29/08

U.S. Cl. 446—168

17 Claims



1. A modular marble race game made of a number of marble race toys comprising:

entrance columns each having upper and lower ends, a top entrance at the entrance column upper end and a side exit; exit columns each having upper and lower ends, a side entrance and a bottom exit at the exit column lower end, the side exit positioned at a higher elevation than the side entrance;

the upper ends of the entrance and exit columns of one of said toys sized for mating engagement with the respective lower ends of the exit and entrance column of another of said toys;

a zig-zag channel connecting the side exit of a first entrance column with the side entrance of a first exit column to constitute a zig-zag toy, the channel including a number of channel segments positioned at angles to adjacent channel segments to define a zig-zag marble path;

a J-channel connecting the side exit of a second entrance

column with the side entrance of a second exit column to constitute a J-channel toy, the J-channel including a first, elongate portion extending from the second entrance column side exit and a second, spiral portion circumscribing a substantial portion of the second exit column and opening into its side entrance;

a paddle wheel channel connecting the side exit of a third entrance column with the side entrance of a third exit column;

a rotatable paddle wheel mounted to the paddle wheel channel to constitute a paddle wheel toy, the paddle wheel having an outer surface positioned adjacent a portion of the paddle wheel channel to engage the marble as the marble rolls along the paddle wheel channel to rotate the paddle wheel, the outer paddle wheel surface having a scalloped shape;

a serpentine channel connecting the side exit of a fourth entrance column and the side entrance of a fourth exit column to constitute a serpentine channel toy, the serpentine channel including a plurality of alternating right and left helical segments defining arcs of substantially greater than 180° while maintaining a generally constant downward slope;

a wide, pin-deflect channel connecting the side exit of a fifth entrance column and the side entrance of a fifth exit column constituting a pin-deflect toy, the pin-deflect channel having a bottom, a sidewall and a plurality of upwardly extending pins mounted to the bottom, a first bottom portion at the fifth entrance column side exit and a second, laterally contracting bottom portion at the fifth exit column side entrance, at least a portion of the sidewall having an irregular inner sidewall surface to deflect the marble away from the sidewall as the marble rolls along the channel;

a funnel member having a sidewall defining an inwardly and downwardly tapering inner funnel surface extending between an upper rim and a lower funnel end, the lower funnel end being at a downwardly opening funnel exit, the sidewall having a funnel entrance towards the upper rim;

a funnel toy channel connecting the side exit of a sixth entrance column to the funnel entrance to constitute a funnel toy, the funnel toy channel defining a generally tangential funnel entrance path along which the marble rolls as it enters the funnel; and

the lower funnel end of the funnel member sized for mating engagement with upper ends of the entrance columns of at least one other of said toys.

4,713,039

GYROSCOPIC TOY

Raymond Wong, Union City, Calif., assignor to Wong & Bibaoco, Union City, Calif.

Filed Sep. 19, 1986, Ser. No. 909,170

Int. Cl.⁴ A63H 33/26

U.S. Cl. 446—233

6 Claims

1. An electrically rotated toy top comprising:

a tubular first housing;

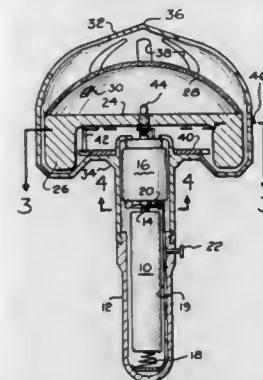
an electric motor within said first housing, said motor having an extending rotatable shaft coaxial with said tubular first housing;

a battery within said tubular first housing, said battery having a first terminal in contact with a first motor terminal and a second terminal in contact with a second motor terminal through a momentary contact electrical switch;

a rotatable flywheel coupled to said motor shaft, said flywheel including an overlying hollow dome with a small opening therein;

a second housing, said second housing including a second hollow dome closely overlying the hollow dome on said rotatable flywheel, said second hollow dome having a plurality of openings to form first sound generating means upon relative rotation between said hollow domes; and

second sound generating means including a multiple spoked non-rotatable disc centered around the shaft end of said



motor and a resilient member coupled to said rotatable flywheel and extending into the spokes of said disc.

4,713,040

TORQUE TRANSMISSION ASSEMBLY WITH ENHANCED TORQUE TRANSMITTING CHARACTERISTICS

Wolfgang Beigang, and Werner Hoffman, both of Siegburg, Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft

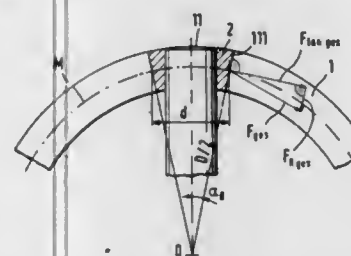
Filed Oct. 20, 1986, Ser. No. 922,039

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539447

Int. Cl.⁴ F16D 3/40

U.S. Cl. 464—132

8 Claims



1. In a shaft assembly for transmitting torque including a fiber-reinforced composite shaft member having a tubular configuration with a tube wall having radial bores through at least one end thereof and bushes inserted into said bores, with said bushes being provided with recesses which may receive therein joint journals having a longitudinal axis arranged radially in said shaft member for the purpose of introducing torque, with tangential and radial forces occurring at a transmitting face of said tube wall, the improvement comprising that said bushes are formed as truncated cones tapered towards an interior of said shaft member with a cone angle α selected such that a radial component of forces to be transmitted is minimized or eliminated.

4,713,041

NON-LUBRICATED DRIVE BELT SYSTEM FOR A CONTINUALLY VARIABLE TRANSMISSION

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 15, 1986, Ser. No. 907,273

Int. Cl.⁴ F16H 11/04

U.S. Cl. 474—28

8 Claims

1. A transmission for an automotive driveline connected to an engine for shifting continually among drive ratios comprising input pulley means driveably connected to the engine for

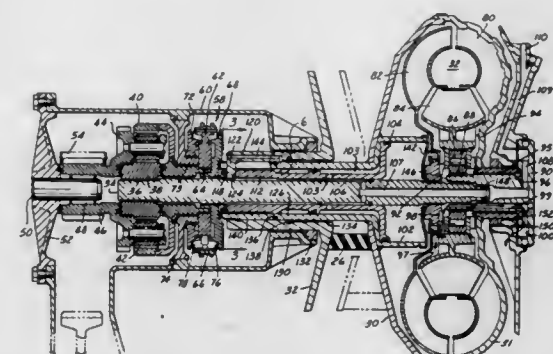
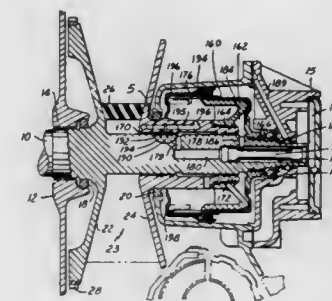
engagement driveably by a drive belt at a continually variable radial distance from the axis of the engine shaft including:

a first sheave fixed against displacement and supported for rotation with the engine shaft;

a second sheave longitudinally displaceable with respect to the first sheave and supported for rotation with the engine shaft;

a hydraulic cylinder fixed for rotation with the engine shaft;

a piston displaceable within the cylinder and connected to the second sheave, defining in the cylinder a first variable



volume connectable to a source of pressurized hydraulic fluid and a second variable volume connectable to a source of relatively low pressure fluid;

first dry bushing means for rotatably supporting the second sheave; and

hydraulic sealing means for sealing against the flow of hydraulic fluid toward the dry bushing including first and second hydraulic seals spaced from one another along the axis of the engine shaft and first passage means for carrying hydraulic fluid away from the space between the first and second seals.

4,713,042

AUTOMATIC TRANSMISSION FOR A BICYCLE

Daniel Imhoff, 334 Cross St., Battle Creek, Mich. 49017

Filed Mar. 24, 1986, Ser. No. 843,326

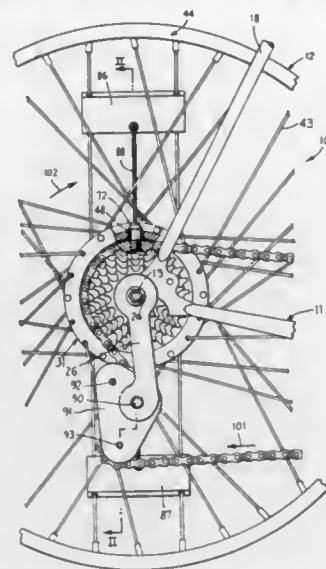
Int. Cl.⁴ F16H 9/26

U.S. Cl. 474—69

16 Claims

1. A drive apparatus for a manually propelled vehicle, comprising: a wheel supported on said vehicle for rotation about an axis; a driving member which is movably supported on said vehicle and is moved in response to manually applied forces; and transmission means for drivingly coupling said driving member to said wheel, said transmission means including variable drive ratio means for varying a drive ratio at which said driving member is drivingly coupled to said wheel within a range bounded, by an upper limit and a lower limit, means responsive to the rotational speed of said wheel and operatively coupled to said variable drive ratio means for urging said variable drive ratio means to respectively decrease and increase said drive ratio in response to increases and decreases in the speed of said wheel, and means responsive to a torque

applied by said driving member to said wheel through said transmission means for resisting a decrease in said drive ratio



by said variable drive ratio means in response to an increase in the speed of said wheel.

4,713,043 CHAIN TENSIONER

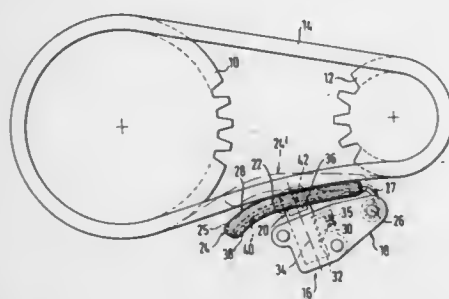
Adam Biedermann, Puchheim, Fed. Rep. of Germany, assignor to Joh. Winkhofer & Söhne, Munich, Fed. Rep. of Germany
Filed Feb. 25, 1986, Ser. No. 833,346

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1985, 3506770; Jul. 8, 1985, 3524378

Int. Cl.⁴ F16H 7/08

U.S. Cl. 474-111

18 Claims



1. Chain tensioner comprising a housing (32), an axially extending piston (34) displaceably guided in the axial direction of said piston in a recess in said housing (32), an elongated tensioner bar (38) having a first end and a second end spaced apart in the elongated direction with the first end articulated to the housing (32), said tensioner bar (38) has a first side (36) extending in the elongated direction and pressed against a piston head (42) of said piston (34) located externally of said housing (32), said tensioner bar (38) has a second side (72) extending in the elongated direction and disposed opposite said first side (36) and said second side (72) rests against a chain (14), and a device for lubricating the chain (14) having an oil entry aperture (48) in said first side (36) and at least one oil outlet aperture (68) in the second side (72) of said tensioner bar (38), wherein the improvement comprises an oil feed opening (44) opening into the recess of said housing (32), said piston (34) is a hollow piston in the axial direction forming an axially extending bore and an oil outlet opening (46) through said piston head (42) connected to said oil entry aperture (48), said tensioner bar (38) has a passage (50) extending parallel to

said second side (72'), and said passage (50') connects said oil entry aperture (48') with said at least one oil outlet aperture (68').

4,713,044 BELT TENSIONER UNIT FOR INTERNAL COMBUSTION ENGINE OR THE LIKE

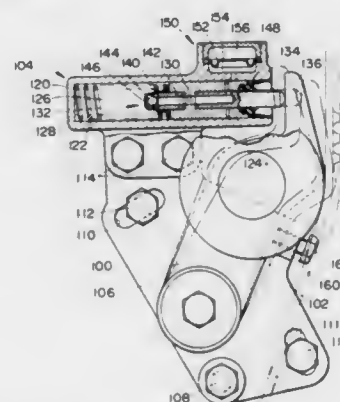
Makoto Nakamura, Yokohama; Mitsuru Takahashi, Yamato; Namieki Osawa, and Yuichi Murakami, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 8, 1986, Ser. No. 904,293

Claims priority, application Japan, Sep. 9, 1985, 60-137660[U]
Int. Cl.⁴ F16H 7/12

U.S. Cl. 474-135

8 Claims



1. In a device having a belt which drivably interconnects pulleys, a belt tensioning arrangement comprising:
a base plate pivotally mounted on said device and selectively securable in a selected position;
a support arm having first and second ends, said support arm being pivotally mounted on said base plate at a first end thereof so as to be pivotal about an axis;
an idler pulley mounted on said support arm at a location between said first and second ends, said idler pulley being engageable with said timing belt; and
a tensioner mechanism mounted on said base plate at a location distal from said axis, said tensioner mechanism including means for applying a bias to said second end of said support arm which biases said support arm in a first rotational direction which increases the force with which said pulley engages said timing belt and thus increases the tension therein.

4,713,045 AUTO-TENSIONER FOR BELT SYSTEMS AND A METHOD FOR ADJUSTING TENSION DEGREE

Hisashi Kodama, Nagoya, and Yoshio Okabe, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Sep. 30, 1986, Ser. No. 913,461

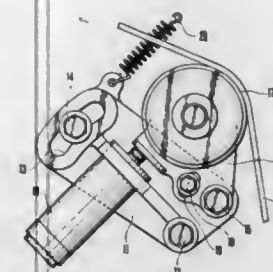
Claims priority, application Japan, Sep. 30, 1985, 60-217518
Int. Cl.⁴ F16H 7/12

U.S. Cl. 474-135

1 Claim

1. An auto-tensioner for belt systems, comprising:
an idler pulley for tensioning a belt and swingable around a pivotal point formed on a bracket,
an auto-tensioner body fixed firmly to said bracket and having a rod for pushing said idler pulley,
a first bolt fixed to a fast member and around which said bracket is swingable,
a second bolt inserted in a first slit-like opening formed on said bracket,
a third bolt inserted in a second slit-like opening formed on

said bracket for setting said swingable idler pulley at a desired position, and
a spring connected with said bracket for setting a starting tension degree of belt, and



said third bolt being removed or loosened after setting the starting tension degree of belt.

4,713,046 CIRCULAR MACHINE FOR AUTOMATIC MANUFACTURING OF DISPLAY BOXES

Francois Dupuy, Dignac, France, assignor to Dupuy Engineering, S.A., L'Isle D'Espagnac, France

Continuation of Ser. No. 476,346, Mar. 17, 1983, abandoned.

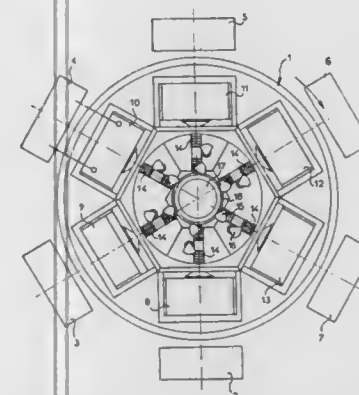
This application Feb. 13, 1987, Ser. No. 15,527

Claims priority, application France, Mar. 18, 1982, 82 04579;
Feb. 24, 1983, 83 02985

Int. Cl.⁴ B31B 1/60

U.S. Cl. 493-6

11 Claims



1. Apparatus for assembling paperboard and plastic blanks, particularly for making packages of the type having an opening which is closed by a stiff sheet of plastic, comprising in combination:

a horizontal table which is indexable around a vertical axis;
a plurality of suction boxes adapted to receive the blanks to be assembled, means mounting said suction boxes on said table in predetermined angular positions; means for connecting each suction box to a vacuum source;
a plurality of work stations arranged around said table in predetermined spaced apart angular positions, said work stations comprising a feeding station for feeding a paperboard blank onto a suction box, a feeding station for feeding a plastic blank onto a suction box, a sealing station for sealing a plastic blank on a suction box to a paperboard blank on the same suction box, and a discharge station for removing assembled blanks for the suction boxes; and
control means for intermittently indexing said table to move said suction boxes successively from one work station to the next and for operating each of said stations, after indexing movement of said table.

4,713,047

TUBULAR BAG CLOSING MACHINE

Wolfgang Klinkel, Bigorio, Switzerland, assignor to ILAPAK Research & Development S.A., Lugano, Switzerland

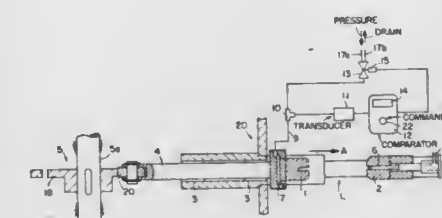
Filed Feb. 18, 1986, Ser. No. 830,641

Claims priority, application Switzerland, Feb. 18, 1985, 738/85

Int. Cl.⁴ B31B 1/00

U.S. Cl. 493-34

2 Claims



1. Tubular bag closing machine having a pair of closing jaws (1, 2) at least one jaw being relatively movable with respect to the other in a closing direction to close the jaws against each other and to seal walls of a tubular plastic element together to form a bag closure, comprising:

a mechanical drive means (5) for moving said at least one of said closing jaws over a fixed path towards the other jaw (2), said mechanical drive means including a rotary-to-linear drive system (5, 5a, 18, 20; 4), providing a fixed displacement path for said at least one closing jaw;
a pneumatic pressure element (7) pressing at least one of said closing jaws (1) against the other (2), said pneumatic pressure element (7) including a pneumatic pressure pillow or cushion (7) located between at least one of said closing jaws (1) and said rotary-to-linear drive system; and
control means for controlling the pneumatic pressure applied to the pneumatic pressure element including command means (22) for preselecting and modifying a command value of commanded pressure;
a pressure-electrical transducer (11) forming an actual pressure sensing means (11) coupled to and sensing actual pressure at the pneumatic pressure element (7) and providing an actual fluid pressure value;
comparator means (12) connected to receive the command value and the actual fluid pressure value for comparing said values and for providing a deviation signal if the values do not agree; and
a controlled valve means (13, 15) receiving the deviation value from said comparator means (12) connected to the pneumatic pressure element (7) for controlling pneumatic pressure therein to the level of said commanded value;
said valve means (13) including an inlet line (17a) for pressurized pneumatic fluid and a drain line (17b) and a servo positioning element (15) coupled to the comparator means and selectively opening or closing said inlet and said drain lines (17a, 17b) depending upon the deviation signal, whereby the opening and closing of said valve means need only compensate for a deviation between the command value and the actual pneumatic pressure value; said command means, said actual pressure sensing means (11), said comparator means, and said control valve means being connected into a closed control servo loop.

4,713,048

PROCESS FOR THE PRODUCTION OF A LIQUID PACKAGE AND APPARATUS FOR IMPLEMENTATION OF THE PROCESS

Wilhelm Reil, Bensheim, and Ulrich Deutschbein, Mühlthal, both of Fed. Rep. of Germany, assignors to Tetra Pak Finance & Trading S.A., Pully, Switzerland

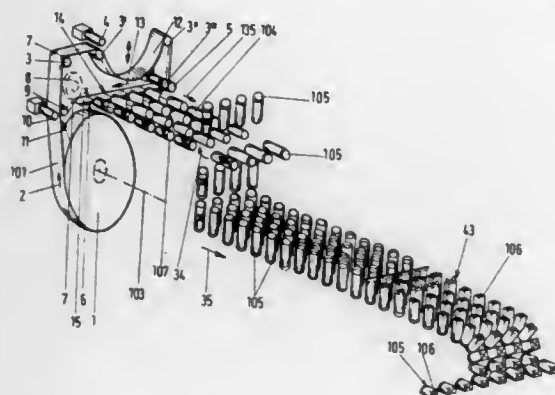
Filed Sep. 3, 1986, Ser. No. 903,370

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1985, 3531663

Int. Cl.⁴ B31B 1/16, 1/28

U.S. Cl. 493—74

6 Claims



1. A method for production of containers for packaging liquids, comprising the steps of:
providing a supply roll of a web of plastic-coated supporting material;
drawing said web of said material off said supply roll in a first direction along a web path;
at a first position, cutting said web into sheets, each of said sheets thereby having opposing side edges transverse to said first direction;
conveying said sheets along a transport path from said first position in a second direction transverse to said web path;
at a second position along said transport path, partially shaping each of said sheets into a tube by folding over a first of said side edges through 180° and sealing the resulting folded-over portion to an outer surface of said sheet, and simultaneously bending approximately half of said sheet semicircularly along a center line parallel to said second direction;
at a third position along said transport path, completing shaping each of said sheets into said tube by bending the remaining portion of said sheet semicircularly along said center line to cause said side edges to join, and sealing said folded-over portion onto the opposite of said side edges to define a longitudinal sealing seam for said tube;
molding a plastic lid defining an opening device onto a top end of each of said tubes; and
folding and sealing a bottom end of each of said tubes into a quadrilateral bottom.

2. Apparatus for the production of containers for packaging liquids, comprising:
a supply roll supporting a web of plastic-coated supporting material;
first means for conveying said web of said material from said supply roll in a first direction along a web path;
cutting means located at a first position along said web path for cutting said web into sheets such that each of said sheets is provided with opposing side edges transverse to said first direction;
second means for conveying said sheets from said first position along a transport path in a second direction transverse to said web path, said transport path including a second and a third position of each said sheet;
shaping means for shaping each of said sheets into a tube, said shaping means including
an elongated mandrel disposed along said transport path

and extending therealong from said second to said third position;
a first axle disposed parallel with said mandrel at said second position;
a plurality of first levers connected to said first axle configured for axially embracing a first half of said mandrel in semi-circular fashion;
a second axle disposed parallel with said mandrel at said third position;
a plurality of second levers connected to said second axle configured for axially embracing a second, opposite half of said mandrel in semi-circular fashion; and
means for pivotally driving said axles.

4,713,049

URETERAL STENT KIT

Garry L. Carter, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Aug. 5, 1986, Ser. No. 893,381

Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—8

4 Claims



1. A ureteral stent kit comprises an elongated flexible tubular stent of substantially uniform outside surface throughout its length having at least one end which is set in the form of a hook, said stent having a lumen; a flexible, reinforced guide member having a relatively more flexible, unreinforced tip portion and a lumen, said member being sized to fit within the lumen of the stent; and, a removable, relatively rigid, elongated core means for the guide member, said core means being sized to freely move within the lumen of said guide member.

4,713,050

APPLICATOR FOR NON-INVASIVE TRANSCUTANEOUS DELIVERY OF MEDICAMENT

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Continuation of Ser. No. 660,192, Oct. 12, 1984, Pat. No. 4,622,031, which is a continuation-in-part of Ser. No. 524,252, Aug. 18, 1983, Pat. No. 4,557,723; This application Oct. 24, 1986, Ser. No. 922,518

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

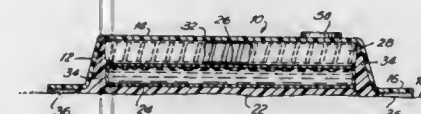
Int. Cl.⁴ A61N 1/30

U.S. Cl. 604—20

6 Claims

1. A self-contained electrically powered drug applicator for the migration of medicament through the skin into the blood stream of a patient comprising: reservoir means containing said medicament forming a first electrode, battery means for char-

ging/driving the medicament, means for covering comprising an electrically conductive material for partially enclosing at least said reservoir means leaving a side of said reservoir means exposed for contacting the skin, said cover means, being electrically connected to said battery means, and having a lip defining the periphery of said applicator and forming a second electrode for making contact with said skin when mounted on



said skin leaving at least said reservoir means fully enclosed, and an electrically conductive adhesive material coating disposed on at least the underside of said lip, whereby when said applicator is adhered to said skin a complete electrical circuit between said first and second electrodes and through said skin is formed so as to drive said medicament out of said reservoir means and through said skin into the blood stream of said patient.

4,713,051

CASSETTE FOR SURGICAL IRRIGATION AND ASPIRATION AND STERILE PACKAGE THEREFOR

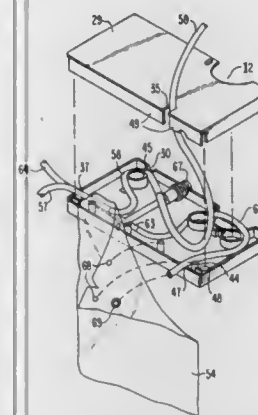
Dennis L. Steppe, Tustin; Larry L. Hood, Laguna Hills, and Gary D. Boggs, Santa Ana, all of Calif., assignors to Cooper-Vision, Inc., Palo Alto, Calif.

Filed May 21, 1985, Ser. No. 736,335

Int. Cl.⁴ A61M 1/00

U.S. Cl. 604—30

16 Claims



1. In combination:
a cassette having a housing defining an irrigation opening, an aspiration pump opening, and a VCS opening, the housing of said cassette defining an irrigation boss in register with said irrigation opening and having a leading edge surface;
a portion of an irrigation manifold located intermediate said leading edge surface of said irrigation boss and said irrigation opening;
an aspiration boss located in register with said aspiration pump opening;
a portion of an aspiration manifold connected intermediate said aspiration pump opening and said aspiration boss;
a cassette receiving mechanism which includes an irrigation solenoid having an occluder shaft, an aspiration pump and roller assembly, and a vacuum control system which includes a vacuum control system fitting;
said cassette mechanism and said cassette thus interfacing when connected so that said occluder shaft of the irrigation solenoid passes through the irrigation opening of the cassette to occlude said irrigation manifold against said leading edge surface of said irrigation boss, thereby to control flow of irrigation fluid through said irrigation

manifold; and so that the roller assembly of said aspiration pump occupies said aspiration pump opening of said cassette and occludes said aspiration manifold against said aspiration boss, thereby to control the aspiration of fluid through said aspiration manifold;
said VCS fitting connecting with said VCS opening in a sealing manner.

4,713,052

APPARATUS FOR ASPIRATING SECRETED FLUIDS FROM A WOUND

Walter Beck, Obere Häslbachstr. 87, CH-8700 Küsnacht; Siegfried Berger, Wernau, and Margrit Werner, Lion-Feuchtwanger Str. 69, 6500 Mainz-Hechtsheim, all of Fed. Rep. of Germany, assignors to Walter Beck and Margrit Werner, both of, Fed. Rep. of Germany

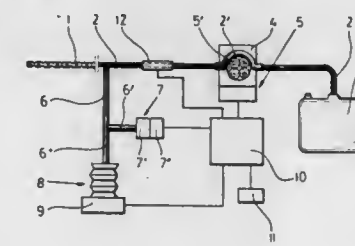
Filed Nov. 18, 1985, Ser. No. 798,844

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1984, 3441893

Int. Cl.⁴ A61M 31/00

U.S. Cl. 604—48

5 Claims



1. Apparatus for aspirating secreted fluids from a wound comprising a controllable negative pressure source to which a drain is connected by means of a tube, a container for collecting the aspirated secreted fluid, a negative pressure measuring device and a regulator which controls the negative pressure source with inputs for the actual value determined by the negative pressure measuring device and for the prescribed set point values of the negative pressure, further including a hollow element having a variable inside volume, the inner chamber of which communicates with that of the tube leading to the drain,
wherein the lateral boundary wall of the hollow element is formed by a folding bellows, drive means for adjusting the closure elements bounding the folding bellows at both sides relative to each other in the longitudinal direction of the bellows.

4,713,053

METHOD AND APPARATUS FOR PERFORMING SUCTION LIPECTOMY

Hans Lee, 526 Sheridan Cir., Charleston, W. Va. 25314
PCT No. PCT/US85/00814, § 371 Date Jan. 3, 1986, § 102(e)
Date Jan. 3, 1986, PCT Pub. No. WO85/05024, PCT Pub. Date Nov. 21, 1985

Continuation-in-part of Ser. No. 607,714, May 7, 1984, Pat. No. 4,596,553, and a continuation-in-part of Ser. No. 651,720, Sep. 18, 1984, Pat. No. 4,627,834. This PCT application May 6, 1985, Ser. No. 887,040

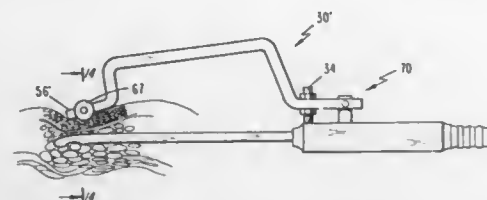
Int. Cl.⁴ A61M 31/00, 5/00

U.S. Cl. 604—49

16 Claims

1. A device for surgically aspirating subcutaneous fatty tissue and the like from an animate body, comprising:
(a) a cannula having a tip and a handle at opposite ends thereof, the tip being formed with a hole, and a longitudinal passage extending through the cannula in communication with the hole, said passage being connectable to a source of vacuum so that suction can be applied to surgically aspirate fatty tissue through the hole when the tip is inserted in the tissue;

(b) guide means attached to the cannula for maintaining the hole at a predetermined depth within the tissue as the tip is manually directed by a surgeon through the tissue in reciprocating strokes, said guide means including a guide



surface defined by guide wheel means in rolling contact with, during surgery, a portion of the skin overlying the fatty tissue to limit the depth at which the hole penetrates the tissue; and

(c) means for connecting the guide means to the cannula.

4,713,054

IMPLANTED MUSCLE POWERED DRUG DISPENSING SYSTEM

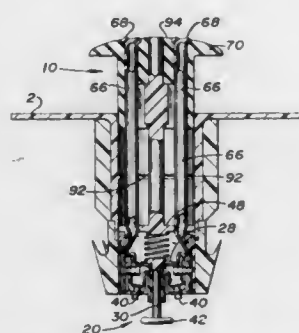
L. Thomas Kelly; Esther V. M. Hamel, both of Rte. 1, Box 68, St. Ignatius, Mont. 59865, and Robert P. Bielka, 2211 N. 59th St., Seattle, Wash. 98103

Continuation-in-part of Ser. No. 830,999, Feb. 19, 1986, abandoned. This application Mar. 4, 1986, Ser. No. 836,010

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—89

18 Claims



1. A muscle powered liquid drug delivery device implanted in the region behind an animal's ear bounded cranially by the posterior border of the conchal cartilage, caudally by the anterior border of the cleidocapitalis muscle, and medially by the splenius muscle, said device comprising:

- (a) balloon-like reservoir means including a plurality of balloon-like reservoirs, said reservoir means in expanded condition aiding in anchoring the device in the animal; and
- (b) pump means having inlet means in fluid communication with each of said reservoirs and outlet means in fluid communication with the adjacent tissue of the animal, said pump means including a pump body defining a pump chamber and including a flexible impermeable pump body, said pump chamber communicating through inlet valve means with the reservoir means, and through outlet valve means with the animal's tissue surrounding the device, a piston having a piston head fixedly attached to an upper portion of the pump body, a piston shaft fixedly attached to and depending from the piston head and extending downwardly to a lower end positioned adjacent the animal's splenius muscle, said lower end and in turn the piston being translated by movement of the animal's muscles and tissues to vary the volume of the pump chamber, and means biasing the piston in a direction which minimizes the volume of the pump chamber, said pump means further including compressive means actuating

flow of fluid therethrough responsive to flexure of the animal's muscles and tissues surrounding and underlying said region, whereby the liquids from the reservoirs are mixed in said pump means.

4,713,055

ARTIFICIALLY VASCULARIZED GRAFT

Donato A. Viggiano, 1090 Virginia Ave., Ft. Pierce, Fla. 33450

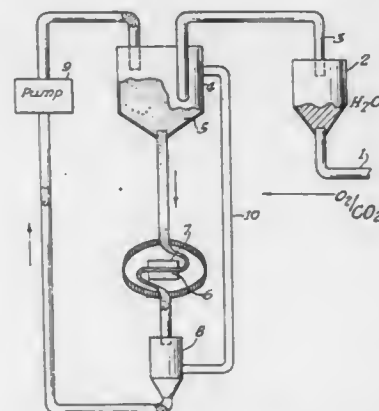
Division of Ser. No. 506,858, Jun. 22, 1983, abandoned. This

application Mar. 18, 1986, Ser. No. 842,351

Int. Cl.⁴ A61M 11/00; A61N 1/02

U.S. Cl. 604—93

23 Claims



1. A process for maintaining a graft or flap for animals viable for a period of time before surgical use comprising:

- (1) initially providing a fluid including a source of oxygen;
- (2) thereafter providing a graft or flap;
- (3) thereafter placing at least one artificial capillary tube into said graft or flap, said tube being formed of a material permitting said fluid to perfuse therethrough; and
- (4) then flowing said fluid first through said tube and then perfusing said fluid within said graft or flap;

the quantity of oxygen from said oxygen source, the number of capillary tubes, and the rate of flow of said fluid being so correlated for maintaining said graft or flap viable for a sufficient period of time thereby preventing necroses of said flap or graft prior to surgical use, said process including the additional step of surgically transplanting said graft or flap to a segment of a living body.

4,713,056

NON-REUSABLE HYPODERMIC SYRINGE

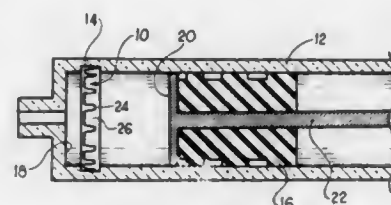
Ida M. Butterfield, Santa Maria, Calif., assignor to Butterfield Group, Santa Maria, Calif.

Filed Jun. 23, 1986, Ser. No. 877,288

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—110

5 Claims



1. A non-reusable hypodermic syringe characterized in that it is extremely robust, and comprising:

- a hollow cylindrical tubular member closed at a first end except for an axial passage, having a cylindrical inside wall, and including portions defining an internal circum-

ferential groove located adjacent but spaced axially from said first end;

- a drive rod extending axially in said tubular member;
- a piston head permanently attached to the end of said drive rod nearest the first end, slidable axially within said tubular member, and substantially rigid;
- a latch ring consisting of a generally ring-shaped unitary structure, residing in said groove, and including resilient fingers that all extend toward said first end and slightly radially inwardly into the cylindrical space defined within the cylindrical inside wall of said tubular member, the resiliency of said fingers permitting them to deflect into said groove when said piston head is pushed toward said first end past said fingers, and then to spring back into the cylindrical space to catch against said piston head when the latter is pulled away from said first end, thereby preventing refilling of the syringe by preventing movement of said piston head away from said first end.

4,713,057

MECHANICAL ASSIST DEVICE FOR INSERTING CATHETERS

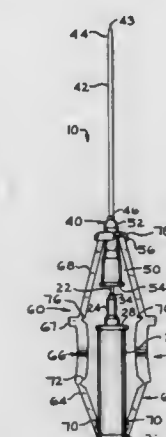
James Huttner, Toledo, and Marc M. Levine, Sylvania, both of Ohio, assignors to Medical College of Ohio, Toledo, Ohio

Filed Feb. 27, 1984, Ser. No. 583,663

Int. Cl.⁴ A61M 5/18

U.S. Cl. 604—164

11 Claims



- 11. Apparatus for the insertion of a catheter comprising: a needle member, said needle member including a needle having a first end and a second end, said first end of said needle being disposed for insertion into a vein of a patient; a catheter unit positioned around said needle member, said catheter unit including a hollow catheter member that is movably and axially positioned around said needle, said catheter member having a first end and a second end, said first end of said catheter member terminating adjacent said first end of said needle, said first end of said needle extending from said catheter member; and
- a handle member operatively connected to said needle member and said catheter unit, said handle member being positioned in adjacent spaced apart relationship with said needle member, said handle member and said needle member being designed to be held in one hand, said handle member includes at least two moveable strut members positioned in substantially opposed relationship and equidistant apart around said needle member, said strut members having a first end connected to said needle member and a second end positioned adjacent said catheter unit, said strut members being movable in a direction towards said needle member, said strut members include a first segment extending from said needle member at an acute angle, a second segment connected to said first segment and being positioned in substantially the same longitudinal plane as said first segment, said second segment extending from said first segment at an obtuse angle, said second

segment being substantially parallel to the longitudinal axis of said needle member, a third segment connected to said second segment and being positioned in substantially the same longitudinal plane as said first and second segments, said third segment extending from said second segment at an obtuse angle, said third segment extending in a direction towards said catheter unit, said end of said third segment that is spaced apart from said second segment being in engagement with said catheter unit, said handle member being deformable towards said needle member whereby said handle member acts upon said catheter member to advance said catheter member along said needle whereby said first end of said catheter member is advanced beyond said first end of said needle into said vein of said patient and said needle member and handle member can be removed from said catheter unit to leave said catheter unit operatively positioned in said vein, only one hand being required to position and insert said catheter unit in said vein.

4,713,058

GUIDING MANDRIN FOR DRAINAGE DUCTS

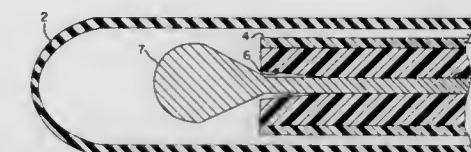
Hans-Ernst Sachse, Lerchenstrasse 55, 8500 Nuremberg 90, Fed. Rep. of Germany, assignor to Hans-Ernst Sachse, Nuremberg, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 844,675

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—165

5 Claims



1. A guiding mandrin for insertion into a drainage duct comprising:

- a long horizontal tube made of elastic material or from flexible resilient metal wherein the tip of said tube is split, and a wedge push-pull wire passes through the entire length of said tube and extend beyond both ends thereof, said wire having a wedge means firmly attached to said wire end extending beyond the tip end of said tube, the diameter of the wedge means being greater than the diameter of said tube, whereby the split end of said tube is forced outwardly to engage the inner wall of the drainage duct by manipulating said wire so as to move the wedge means into the split end of said tube and is disengaged from said wall by moving the wedge means out of the split end of said tube.

4,713,059

DISPENSER FOR AN ELONGATED FLEXIBLE MEMBER

Roger Bickelhaupt, Orange, and Michael D. Rold, Costa Mesa, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 11, 1984, Ser. No. 659,702

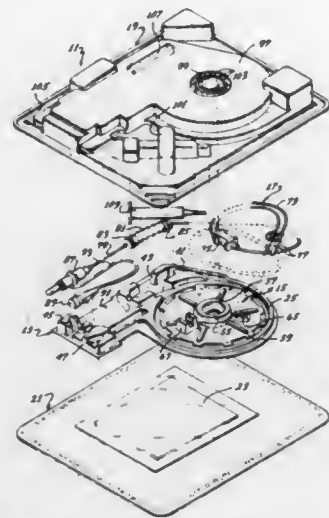
Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—171

18 Claims

- 11. A dispenser for an elongated flexible member comprising: a base;
- a reel having a side face;
- means for mounting the reel on the base for rotation relative to said base about a rotational axis;
- said reel having first and second sets of radially extending fingers at the periphery of the reel with said first set of fingers being inclined axially relative to the second set of fingers whereby said flexible member can be wound on

the reel adjacent said periphery between said first and second sets of fingers; and



means on said face of the reel for releasably retaining an inner end portion of the flexible member.

4,713,060

SYRINGE ASSEMBLY

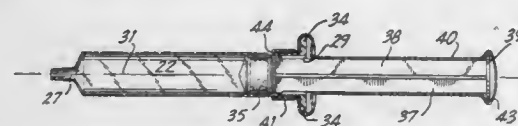
Arduino Rioli, Wayne, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 20, 1986, Ser. No. 876,501

Int. Cl.⁴ A61M 5/32

U.S. Cl. 604—199

21 Claims



1. An operable syringe assembly comprising:
 - a hollow barrel having a chamber for retaining fluid;
 - a proximal end of said barrel having an aperture therethrough;
 - a distal end of said barrel having a passageway therethrough communicating with said chamber;
 - a stopper slidably positioned in fluid-tight engagement inside said barrel, said stopper capable of moving fluid from said chamber through said passageway upon its movement toward said distal end, said stopper capable of facilitating the drawing of fluid into said chamber through said passageway upon its movement away from said distal end;
 - a plunger rod having an elongate body portion engaging said stopper to facilitate operation of said stopper, said body portion extending outwardly from said proximal end of said barrel, through said aperture; and
 - a flexible cover having a closed first end and an open second end, said open second end being attached to said barrel covering said aperture and containing that portion of said elongate body portion of said plunger rod protruding from said aperture, said cover being flexible enough and strong enough to allow movement of said plunger rod for operating said syringe without tearing, said cover acting as a barrier for helping to block the transfer of fluid and particulate matter between said chamber and the environment.

4,713,061

CARTRIDGE WITH UNIVERSAL PLASTIC HUB

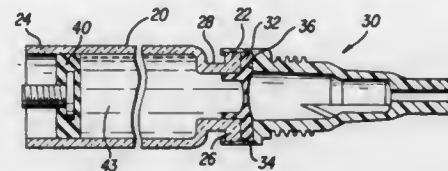
William R. Tarello, Bethesda; Linda A. Gordon, Germantown, both of Md., and T. Daniel Whalen, Trenton, N.J., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Jul. 14, 1986, Ser. No. 885,164

Int. Cl.⁴ A61M 5/24

U.S. Cl. 604—200

8 Claims



1. In a cartridge assembly comprising a cylindrical body, said body having a forward end and a rearward end, the forward end being necked down to form an annular flange, a hub fitted on the annular flange, a diaphragm seal positioned on the forward face of the annular flange and held in sealing position by the hub fitted on the annular flange, a piston slidably carried in the rearward portion of the body, a liquid medicament held in the body in the space between the diaphragm and the piston, said hub being made of transparent plastic material and comprising:

- (1) a first cylindrical portion having a rearward end and a forward end and an inner and an outer surface, the internal diameter of the first cylindrical portion being sized to fit over the annular flange of the necked down portion of the cartridge body;
- (2) a second cylindrical portion having a rearward end and a forward end and an inner and an outer surface, said rearward end extending forwardly from the forward end of the first cylindrical portion and coaxial with said first cylindrical portion, the second cylindrical portion having a diameter less than that of the first cylindrical portion, a shoulder portion generally perpendicular to the axis of the two cylindrical portions and connecting the rearward end of the second cylindrical portion to the forward end of the first cylindrical portion;
- (3) a third cylindrical portion having a rearward end and a forward end and an inner and an outer surface, said rearward end extending forwardly from the forward end of the second cylindrical portion and coaxial with the second cylindrical portion, the third cylindrical portion having a diameter less than that of the second cylindrical portion and having its rearward end connected to the forward end of the second cylindrical portion;
- (4) a fourth cylindrical portion having a rearward end and a forward end and an inner and an outer surface, said rearward end connected to the forward end of the third cylindrical portion and coaxial with the third cylindrical portion, the fourth cylindrical portion having a diameter less than that of the third cylindrical portion;
- (5) the internal diameter of the axial hole in the fourth cylindrical portion being sized to receive the non patient end portion of a needle;
- (6) the outer surface of the third cylindrical portion being tapered 6° inwardly and forwardly so as to accommodate mounting means embodying the standard Luer taper;
- (7) the diaphragm chamber defined by the inner surface of the second cylindrical portion being provided with a spike, said spike having a pointed portion directed toward the rearward end of the second cylindrical portion and offset from the axis of said second cylindrical portion, the point of said spike being spaced from the rearward end of the second cylindrical portion a sufficient amount so that the diaphragm will normally

balloon and then burst in the diaphragm chamber upon contacting the spike,

- (8) the outer surface of the second cylindrical portion being provided with peripheral threads extending from adjacent the shoulder portion connecting the first and second cylindrical portions to near the forward end of the second cylindrical portion, said threads being sized to cooperate with like means on a cartridge holder, and the threads acting as magnifying means to aid in viewing within the diaphragm chamber whereby it will be easy to look through the threads and in a magnified rendition see whether or not blood appears in said chamber to thereby indicate that a blood vessel has been pierced by the needle in the injection procedure.

4,713,062

READY TO USE SYRINGE

Giovanni Stevanato, Chiasso, Switzerland, assignor to Vecta Glass Company Ltd., London, England

Filed May 29, 1986, Ser. No. 868,076

Claims priority, application Luxembourg, May 29, 1985, 85916

Int. Cl.⁴ A61M 5/24

U.S. Cl. 604—203

10 Claims



1. A ready to use syringe, said syringe comprising in combination a cylindrical shaped container for an injectable solution, said cylindrical shaped container also serving as a piston and being closed by a piston plug, said piston plug may be perforated by a point extending downwards from a small suction tube, said small suction tube being fixed to the outer casing of said syringe in correspondence with a head for recording to a guide cone of an administration needle, said point for perforating said piston plug being provided with means for securing the piston itself, preventing mutual detachment at the time of use, and allowing the visual control, by means of a slight suction resulting from the correct introduction of the administration needle into the tissue of a patient.

4,713,063

INTRAVENOUS TUBE AND CONTROLLER THEREFOR

John F. Krumme, Woodside, Calif., assignor to Beta Phase, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 733,036, Apr. 29, 1985, Pat. No. 4,645,489, which is a continuation of Ser. No. 445,390, Nov. 30, 1982, abandoned. This application May 1, 1986, Ser. No. 857,974

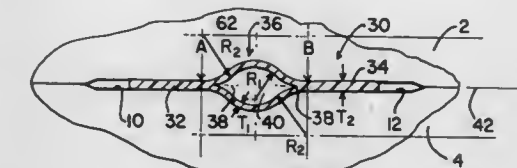
Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—250

4 Claims

1. An I.V. flow control tube adapted to be used in an I.V. control wherein the metering characteristics of the tube require the repeated controlled closing and time responsive opening of the tube in operation, the tube consisting essentially

of a hollow elongated tube of resilient material through which fluid may flow, said tube having a reformed section which has an internal cross-section defined by symmetrical catenary shaped wall portions joining approximately tangentially in opposed sharp internal corners, said section of said tube having a center region having an internal radius for each catenary shaped wall portion, said section of said tube having end regions each having an external reverse radius for each wall



portion such that the wall portions join approximately tangentially in opposed sharp internal corners and wherein the internal radii and said external reverse radii are approximately equal within the range of about 0.75 to 1.25, said wall portions capable of being moved toward each other to flatten said tube and control fluid that may flow therethrough, the shape of said cross-section in combination with resilient recovery forces inherent in said material producing a residual reopening force.

4,713,064

ENTERAL FEEDING DEVICES

Robert Bruno, Avon; Stuart R. Kipperman, Easton; Geoffrey R. Mayer, Trumbull, all of Conn., and Michael Thomas, Ann, Ohio, assignors to Sherwood Medical Company, St. Louis, Mo.

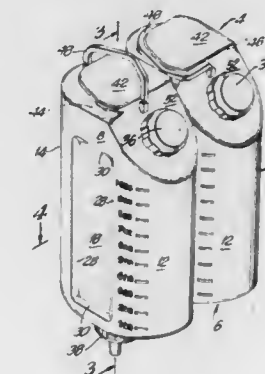
Continuation of Ser. No. 728,862, Apr. 30, 1985, abandoned.

This application Apr. 18, 1986, Ser. No. 853,400

Int. Cl.⁴ A61M 5/85

U.S. Cl. 604—257

10 Claims



1. An enteral feeding device comprising:
 - a rigid plastic substantially rectangular container adapted to contain a supply of liquid nourishment, said container including a substantially flat front wall and a substantially flat rear wall;
 - curved walls joining the front and rear walls;
 - a projection extending from one of said front and rear walls, said projection having a length substantially equal to the length of the container and a width substantially equal to the width of the flat portion of the wall;
 - a recess on the other of said front and rear walls, said recess having a length substantially equal to the length of the container and a width substantially equal to the width of the flat portion of the wall;
 - said projection and said recess being dimensioned so that the projection on said container can nest in the recess of another container in side-by-side relationship; and
 - an opening with a spout at one end of the container and

another opening with a spout at the other end of the container, said openings being adapted to permit the flow of liquid nourishment therethrough.

4,713,065

URINE-RECEIVING SYSTEM

Hubertus H. M. Koot, Cuyk, Netherlands, assignor to Mandhy Products B.V. Cuyk, Netherlands

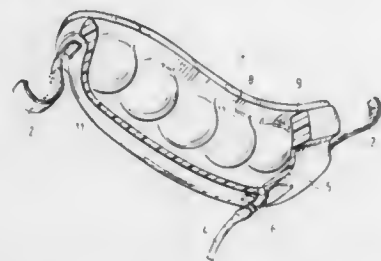
Filed Jun. 3, 1986, Ser. No. 869,877

Claims priority, application Netherlands, Mar. 13, 1986, 8600656

Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—329

13 Claims



9. A urine-receiving system intended particularly for women comprising oblong receiving means formed of elastic material of stable form, said receiving means defining a cavity therein and a receiving opening in one side thereof for receiving urine into said cavity, said receiving means having a drainage opening at another side thereof opposite to said one side of the receiving means and being in communication with said cavity, a flexible drainage conduit connected to said drainage opening, a collecting reservoir connected to said drainage conduit for receiving fluid from said drainage opening, an inset-body formed of moisture absorbing material for directly receiving urine, said inset-body being supported by said receiving means and overlying said receiving opening, said inset-body having pumping means extending into said cavity including a plurality of integral portions extending within said receiving element and having spaced outer surfaces which provide material-free space within the receiving element and in communication with said drainage opening, said receiving means having wall portions engageable with said integral portions of the inset-body for alternately pressing inwardly and releasing said integral portions upon movement of the legs of an associated patient to squeeze fluid from the inset-body and drain such fluid through said material-free space to the drainage opening.

4,713,066

EXTERNAL MALE URINARY CATHETER WITH GARMENT

Glenna Komis, P.O. Box 163, Hammonton, N.J. 08037

Filed Mar. 20, 1986, Ser. No. 841,590

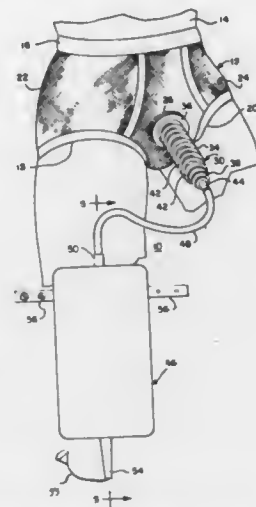
Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—353

11 Claims

1. An external male urinary catheter assembly comprising a moderately thin, flexible, resilient durable tubular sheath dimensioned to be positioned in enclosing relation to a substantial portion of the penis, said sheath including a distal tubular member having a central aperture providing an open end, the proximal end of said sheath opposite to said distal end portion forming an annular flange, said catheter sheath having a pleated portion between said distal and proximal ends, at the proximal end said pleats having an inner diameter to encircle the penis without constricting the same and at the distal end said pleats having an inner diameter smaller than the inner diameter at the proximate end, and a resilience to snugly engage the tip of the penis without constricting the flow of urine therethrough; drainage tubing telescopically engaging said tubular member to communicate at the distal end with said tubular sheath through said aperture and extending to a connection element, said connection element communicating with

a collection receptacle having means for attachment either to the ambulatory wearer at his calf or to the bedside of the bedridden wearer; and a supporting garment of the men's brief type, having elasticized leg openings and an elasticized waistband, said garment composed of an absorbent material and having an annular reinforcement on the front thereof comple-



mentary to said flange, and dimensioned to encircle the penis without constricting the same, said flanged end portion engaging said reinforcement and securely united thereto by fastening means continuously circumscribing said reinforcement and said flange respectively to provide a continuous connection therebetween without substantially constricting the penis.

4,713,067

URINARY COLLECTION SYSTEM FOR MALE INCONTINENT

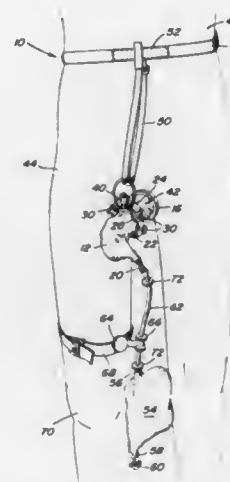
I. Herbert Rothenberg, and Thelma Rothenberg, both of 319 Hill House, Huntingdon Pike, Huntingdon Valley, Pa. 19006

Filed Jun. 19, 1986, Ser. No. 876,089

Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—353

21 Claims



21. A body worn urinary collection system for a male incontinent, said apparatus comprising:

(a) a reusable, generally moistureproof and pliable penile sheath shaped as a sack with a closed corn-shaped end and an open end at generally right angles to said closed end, said sack sized to loosely overfit the male organ and formed of two longitudinal seamed halves;

- (b) a first oversized, resilient, outer ferrule integral with and rimming said sack's open end to aid in mounting said sheath and a second resilient, cleated ferrule proximate said sheath's middle, said second cleated ferrule forming a tunnel to hold said mounted sheath spaced apart from the penis, said sheath also including a urine outlet proximate its closed end;
 - (c) means to releasably secure said sack to said male organ proximate its intersection with the body, said means including a strap, one end of which is attached to said sack between said first outer ferrule and said second cleated ferrule and the other end of said strap terminating in a ring;
 - (d) a generally pliable and waterproof urine storage bag including an intake urine orifice and an outlet urine orifice, said storage bag outlet orifice including plug means;
 - (e) a thigh strap;
 - (f) a flexible drain tube having means for mounting said tube on either of a user's thighs, said drain tube being of a user-determined length to span from said sheath urine outlet to said storage bag intake urine orifice;
 - (g) means to attach said tube ends, one each to, respectively, said sheath urine outlet orifice and said storage bag intake urine orifice;
 - (h) a spool slidably mounted on said drain tube;
 - (i) a strap mounted at one end on said spool; and,
 - (j) a double faced engaging pad mounted on said strap's other end and having means removably attaching said pad to said thigh strap to aid in the positioning and angulation of said drain tube between the user's legs,
- so that when said sheath is worn, said first ferrule permits ease of donning and said second ferrule's cleats and said strap's ring together provide adjustable closing means and wherein urine evacuated by the user may be collected and transferred from said sheath through said drain tube and collected into said urinary storage bag without leakage or backflow.

4,713,068

BREATHABLE CLOTHLIKE BARRIER HAVING CONTROLLED STRUCTURE DEFENSIVE COMPOSITE

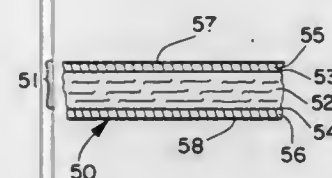
Kenneth Y. Wang, Roswell, and Richard S. Yeo, Dunwoody, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 31, 1986, Ser. No. 925,425

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—366

69 Claims



1. A breathable clothlike barrier which comprises a defensive composite comprising at least two layers:

- A. a first layer which is a clothlike porous substrate having a first side and a second side, in which: said first layer has a nominal basis weight of at least about 10 g/m²; the fibers comprising said first layer have an average fiber diameter in the range of from about 0.01 to about 10 microns; and each of substantially all of the pores at the surface of said first side of said first layer has a cross-sectional area of from about 6×10⁻¹⁶ m² to about 2×10⁻⁹ m²; and
- B. a second layer joined to said first side of said first layer, which second layer comprises a continuous film of a poly(vinyl alcohol), in which: said film is not microporous in that it is substantially free

of voids which connect the two surfaces of said film; and said film has an average thickness of (a) from about 3 to about 25 microns when the basis weight of said first layer is at least about 20 g/m² or (b) from about 8 to about 25 microns when the basis weight of said first layer is from about 10 to less than about 20 g/m²; wherein the first layer side of said second layer is intimately comingled with at least some of the fibers at the surface of said first side of said first layer, and said defensive composite has a water vapor transmission rate at 37 degrees C. and about 50 percent relative humidity of from about 100 to about 5,000 g/m²/24 hours and is impermeable to 0.9 percent by weight saline solution at about 21 degrees C. for a period of at least about one hour at a hydrostatic head of at least about 11.4 cm.

4,713,069

BAFFLE HAVING ZONED WATER VAPOR PERMEABILITY

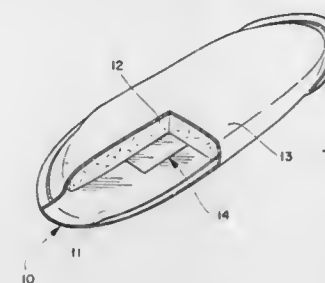
Kenneth Y. Wang, Roswell, and Richard S. Yeo, Dunwoody, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 31, 1986, Ser. No. 925,446

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—378

44 Claims



1. A baffle having a central zone extending along at least a portion of the length thereof,

- A. said zone being impermeable to menses under a static pressure of from about 1 to about 3 psi for a period of at least about one hour and having a water vapor transmission rate at 37 degrees C. and about 50 percent relative humidity of from about 50 to about 2,500 g/m²/24 hours,
 - B. with the non-central zone portions of the baffle being impermeable to menses under a static pressure of from about 0.1 to about 1 psi for a period of at least about one hour and having a water vapor transmission rate at 37 degrees C. and about 50 percent relative humidity of from about 1,500 to about 5,000 g/m²/24 hours;
- in which said baffle comprises a fibrous porous substrate and a water vapor-permeable material overlaying and joined to said fibrous porous substrate in the area of said central zone; with the proviso that the water vapor transmission rate of the central zone is less than that of the non-central zone portions of the baffle.

4,713,070

**POROUS STRUCTURE OF
POLYTETRAFLUOROETHYLENE AND PROCESS FOR
PRODUCTION THEREOF**

Hiroshi Mano, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 333,357, Dec. 22, 1981, abandoned, which is a continuation of Ser. No. 98,283, Nov. 28, 1979, Pat. No. 4,332,035. This application Jan. 24, 1986, Ser. No. 821,528. The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.⁴ A61F 2/06, 2/02

U.S. Cl. 623—1

11 Claims



1. A unitary porous structure of polytetrafluoroethylene having a microfibrillar structure composed of fibers and nodes connected to one another by these fibers, said microfibrillar structure having at one surface a strong orientation of fiber in one direction and at another surface a strong orientation of nodes sintered by means of heating above 327° C. resulting in melt-adhesion of the nodes connected to one another in a direction at right angles to the aforesaid direction, the orientation of said microfibrillar structure progressively changing from one surface to the other.

4,713,071

HEART VALVE PROSTHESIS

Naum A. Iofis, Lomonosovsky prospekt, 23, kv. 416; Rudolf N. Vetsel, ulitsa Vinokurova, 24, korpus 4, kv. 63; Alexandr S. Bukatov, ploshchad Pobedy, 1, korpus "A", kv. 122, and Semen G. Khurtsilava, ulitsa Kedrova, 5, kv. 118, all of, Moscow, U.S.S.R.

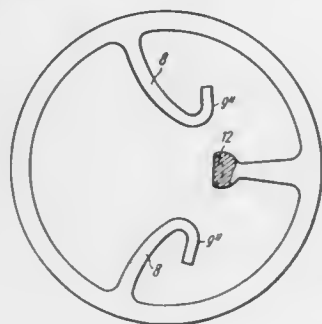
Continuation of Ser. No. 969,424, Jan. 30, 1985, abandoned. This application Sep. 10, 1986, Ser. No. 906,623

Claims priority, application U.S.S.R., Feb. 16, 1984, 3700753

Int. Cl.⁴ H61F 2/24

U.S. Cl. 623—2

7 Claims



1. A heart valve prosthesis comprising: a valve ring having an opening therein for the flow of blood, a valve poppet having a top side and a bottom side and a concentric depression in the top side thereof, said concentric depression including a surface portion, containing means for floatingly containing the poppet during opening and closing, said containing means being formed by a lower support structure for holding the bottom

side of the poppet during closing and by a single upper support and stop member for engaging the top side of the poppet within the depression thereof, said upper support and stop member being mounted on a radial holder extending from said valve ring, said upper support having an inclined surface portion with a surface area which corresponds in surface configuration with and is in surface area contact with said surface portion of said concentric depression when said valve poppet is in an open position to permit blood to pass through said ring opening and is inclined with respect to a horizontal diametrical plane of the valve ring at an angle corresponding to the angle of inclination of the valve poppet with respect to the same plane when the poppet is in the open position to thereby define a stop, and said lower support structure having profiled end portions extending transversely with respect to said radial holder, the profiles of said end portions defining pivot surfaces for the poppet and corresponding to the profile of adjacent portions of the bottom side of the poppet on the sides of said end portions facing toward the holder for engaging the bottom side of the poppet with surface area contact in the open position of the poppet, the end portions of said lower support structure being spaced apart from each other with a clearance space therebetween, and the inclined surface portion of said upper support facing the space between the profiled end portions of said lower support structure, the surface area contact of the poppet with said surface portion of the upper support and said pivot surfaces of the lower support structure in the open position distributing support forces over said surface areas to reduce wear and prolong service life of the prosthesis.

4,713,072

**IMPLANT LENS AND METHOD AND APPARATUS FOR
ITS PRODUCTION**

Staffan F. Bowald, Storvreta, Sweden, assignor to Swedish Graft Technique AB, Sweden

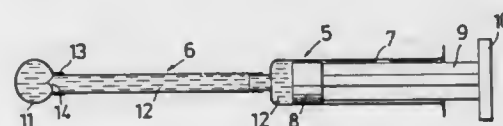
Filed Nov. 19, 1986, Ser. No. 932,298

Claims priority, application Sweden, Nov. 22, 1985, 8505518

Int. Cl.⁴ A61F 2/16; A61B 17/00

U.S. Cl. 623—6

13 Claims



1. An implant lens having at least the outer layer thereof consisting of substantially water-insoluble biodegradable and biocompatible material capable of providing a growth zone for the natural eye lens tissue.

13. An apparatus for producing an implant lens, comprising syringe member for holding a first, fluid lens material, an envelope member of a second lens material, communicatively connected to said syringe member, and means for permitting separation of said envelope member after it has been filled with said first material to form said implant lens wherein said first and second lens materials are biodegradable.

4,713,073

PLASTIC IMPLANT

Johannes Reinmüller, An der Schanze 5, D-6500 Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 724,208, Apr. 17, 1985, abandoned.

This application Dec. 22, 1986, Ser. No. 945,173

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329733

Int. Cl.⁴ A61F 2/12

U.S. Cl. 623—8

4 Claims

1. A method for preventing and/or treating capsule formation and/or shrinkage around a plastic implant in a blood dry

tissue cavity for construction or reconstruction of the female breast, comprising, before implanting the implant, covering



and bonding to the surface of said implant, a substance selected from the group consisting of heparin, heparinoids or glycosaminoglycans chemically related to heparin.

4,713,074

**IMPLANT DEVICE FOR THE SURGICAL TREATMENT
OF INFERTILITY DUE TO OBSTRUCTION OF UTERINE
TUBES**

Renato Piacentino, Viale del Castello 32, 10024 Moncalieri (Torino), Italy

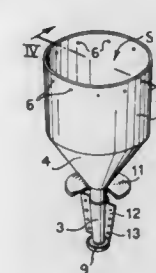
Filed Jun. 9, 1986, Ser. No. 871,785

Claims priority, application Italy, Jun. 12, 1985, 67549 A/85

Int. Cl.⁴ A61F 2/04

U.S. Cl. 623—12

12 Claims



1. An implant device for the surgical treatment of infertility due to obstruction of uterine tubes, intended to be implanted in a position approximately homologous to the obstructed natural tube to bring the respective ovary closer to the uterus, comprising a generally tubular envelope having a wider portion intended to receive the respective ovary and a narrower portion intended to extend through the wall of the uterus, said narrower portion having a length corresponding substantially to a thickness of the wall of the uterus, said wider portion and said narrower portion being immediately adjacent one another and connected together in a general funnel-shaped configuration converging towards said narrower portion.

4,713,075

METHOD FOR THE REPAIR OF CONNECTIVE TISSUE

Kenneth Z. Kurland, 2 W. McCabe Rd., El Centro, Calif. 92243 Division of Ser. No. 589,713, Mar. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 524,351, Aug. 18, 1983, Pat. No. 4,585,458, which is a continuation-in-part of Ser. No. 272,134, Jun. 10, 1981, Pat. No. 4,400,833. This application Oct. 20, 1986, Ser. No. 920,408

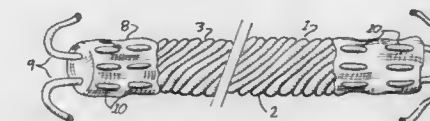
Int. Cl.⁴ A61F 2/08

U.S. Cl. 623—13

3 Claims

1. A method for repairing a connective tissue lesion such as a tendon, linear ligament or capsular ligament, and for promoting the regrowth of at least one damaged portion of the tissue toward its point of attachment, which comprises: attaching to said portion one of each end of a plurality of

lengths of composite thread comprising a core of filament coated with an absorbable composition; said core filaments being braided together; and said plurality of composite threads being braided together into a length of rope;



tautly securing the other ends of thread to said point of attachment; and allowing growth of the tissue around the lengths of thread.

4,713,076

**COATING COMPOSITION AND ANCHORAGE
COMPONENT FOR SURGICAL IMPLANTS**

Klaus Draenert, Gabriel-Max-Strasse 3, Munich, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 724,103

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414924

Int. Cl.⁴ A61F 2/28, 2/32

U.S. Cl. 623—16

15 Claims



1. A resorbable coating composition for anchorage components for surgical implants, consisting of a dried resorbable filling material and a resorbable binding agent, wherein the filling material consists of porous spherical particles containing solid tricalcium phosphate or apatite and having a diameter from about 15 to 50 μ m and a pore volume from about 25 to about 80%, the pores of the spherical particles being filled with the resorbable binding agent.

4,713,077

**METHOD OF APPLYING A CHIN IMPLANT, DRILL
GUIDE TOOL AND IMPLANT**

Irwin A. Small, 6861 Orinoco Cir., Birmingham, Mich. 48010 Continuation-in-part of Ser. No. 702,595, Feb. 19, 1985, Pat. No. 4,608,972. This application Dec. 23, 1985, Ser. No. 812,281

Int. Cl.⁴ A61F 2/30

U.S. Cl. 623—16

15 Claims

1. The method of applying a chin implant to a human comprising: surgically stripping tissue from frontal portions of the lower jaw mandible adjacent the chin down to the jaw bone; centrally locating and applying an apertured drill guide to the exposed jawbone and to the undersurface of the chin with the central axis of the guide in alignment with a median plane of the mandible; drilling through the guide a first bore into said jawbone at said median plane; projecting a removable locking pin through the guide and

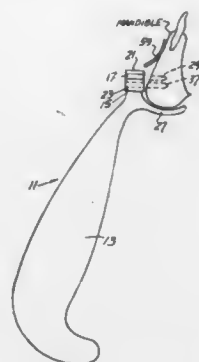
snugly into said first bore for supporting and retaining the drill guide as centered;

successively drilling through said guide a pair of laterally spaced bores into said jawbone equidistant from said median plane;

upon removal of said locking pin and guide, manually threading into each of said pair of bores, a headless self threading cortical bone screw having an axial bore, with the outer end of said screw in registry with the outer surface of said jawbone;

assembling a resilient preformed chin implant with a pair of projecting mount posts snugly against said jawbone while

slidably positioning said posts into said screws respectively;



and suturing the stripped tissue back into natural position enclosing and retaining engaging said implant.

CHEMICAL

4,713,078 METHOD FOR PRESERVING RAW HIDES, SKINS AND FURSKINS

Dezso David; Peter Rovo; Terez Sipos nee Richter; Gyorgy Molnar; Istvan Deme, and Tamas Karnitscher, all of Budapest, Hungary, assignors to Bor-es Cipoiari Kutato-Fejlesztó Vallalat and Budapesti Boripari Vallalat, both of Budapest, Hungary

Filed Apr. 9, 1986, Ser. No. 849,702

Claims priority, application Hungary, Apr. 10, 1985, 1313/85
Int. Cl.⁴ C14C 1/00

U.S. Cl. 8—94.15

4 Claims

1. A process for preserving untanned freshly flayed animal hides and skins which comprises: treating said hides or skins with an aqueous solution containing at least 0.1% by volume of cyanamide.

4,713,079 PARTICLES CONTAINING DIHALOHYDANTOIN BLEACH IN A DILUTED CORE

Kil Whan Chun, Wyckoff, N.J., and Clemens A. Kyllmann, Chicago, Ill., assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 31, 1985, Ser. No. 815,413

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

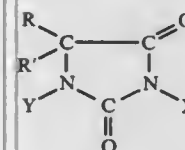
Int. Cl.⁴ D06L 3/00, 3/06; C11D 9/42; A62D 3/00

U.S. Cl. 8—101

20 Claims

1. Hard spherical bleaching particles whose composition is an intimately dispersed mixture having a core comprising:

(i) from about 1 to about 90% by weight of said core of dihalohydantoin having the molecular structure:



where

R and R' may be the same or different and selected from C₁–C₁₂ alkyl, benzyl, aryl or C₁–C₁₂ alkyl substituted benzyl or aryl groups; and

X and Y may be the same or different and chosen from chlorine or bromine;

(ii) from about 1 to 90% by weight of said core of a buffering salt; and

(iii) from about 0.5 to 60% by weight of said core of an organic binder;

wherein the pH of said core is less than 9.5 when dissolved in water.

4,713,080 METHOD AND COMPOSITION FOR THE DYEING OF HAIR WITH 2,6-DIAMINO-PYRIDINE DERIVATIVES

Eugen Konrad, Darmstadt, and Thomas Clausen, Alsbach, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,634

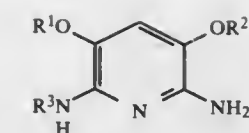
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530732

Int. Cl.⁴ A61K 7/13

U.S. Cl. 8—408

13 Claims

1. Composition for the oxidative coloration of hair, based upon 1.0 to 5.0 by weight of a developer substance-coupler substance combination, comprising an effective amount of a developer substance and as a coupler substance 0.01 to 3.0% by weight of at least one 2,6-diaminopyridine derivative according to Formula I:



(I)

wherein R¹ and R² are the same or different and are each CH₃ or C₂H₅ and R³ is hydrogen, C₁–C₄-alkyl or C₁–C₄-hydroxy-alkyl, or a physiologically compatible salt thereof.

4,713,081 STABLE AQUEOUS DYESTUFF PREPARATIONS OF FINELY DISPERSED WATER-INSOLUBLE OR SPARINGLY WATER-SOLUBLE DYES

Carl Becker, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 917,709, Jun. 21, 1978, abandoned. This application Apr. 23, 1979, Ser. No. 32,431
Claims priority, application Switzerland, Nov. 23, 1977, 14346

Int. Cl.⁴ B41M 5/26; D06P 1/22, 3/54; C09K 11/06

U.S. Cl. 8—527

46 Claims

1. An aqueous dyestuff preparation of a water-insoluble or sparingly water-soluble dye having a particle size of less than 10μ which contains at least 10% by weight of water, 10 to 60% by weight, of a finely dispersed water-insoluble or sparingly water-soluble dye, 0.1 to 5% by weight of a ligninsulphonate and 0.5 to 5% by weight of a non-ionic copolymer of ethylene oxide and propylene oxide, said copolymer having an ethylene oxide content of at least 65% by weight and a molecular weight of more than 12,000.

4,713,082 PROCESS FOR DYEING OR PRINTING TEXTILE FIBRE MATERIALS WITH REACTIVE DYE CONTAINING VINYL SULFONYL-TYPE GROUP AND CHLORO-TRIAZINYL AMINO GROUP

Peter Scheibli, Bottmingen, and Karl Seitz, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 771,127, Aug. 30, 1985, abandoned.

This application Aug. 20, 1986, Ser. No. 898,797

Claims priority, application Switzerland, Aug. 30, 1984, 4154/84

Int. Cl.⁴ C09B 62/04; D06P 1/38, 3/66

U.S. Cl. 8—549

9 Claims

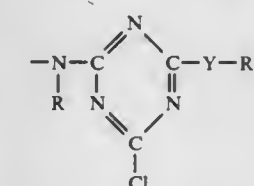
1. A process for dyeing or printing a textile fibre material selected from the group consisting of silk, leather, wool, polyamide, polyurethane and cellulose fibre materials with reactive dyes, which comprises dyeing or printing said fibre material with a reactive dye which contains at least one radical of the formula



or



and at least one radical of the formula



(2)

in which X is an inorganic or organic radical detachable under alkaline conditions, R is hydrogen or substituted or unsubsti-

tuted C₁₋₄-alkyl, Y is oxygen or sulfur and R₁ is alkyl of 1 to 7 carbon atoms which is unsubstituted or further substituted by halogen, hydroxyl, cyano, alkoxy, carboxyl, sulfo or a reactive radical, or is unsubstituted alkyl of 7 to 20 carbon atoms, methoxycarbonylmethyl, ethoxycarbonylmethyl, β -ethoxy- β -ethoxy-ethyl or cyclohexyl, and the dye is a metal-free mono-azo or secondary disazo dye, a primary disazo dye in which the diazo component to which a radical of the formula (2) is bonded is coupled in the ortho-position to an amino group, or an anthraquinone, phthalocyanine, formazan, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, pyrenquinone or perylenetetracarboximide dye, except 1-[2'-chloro-4'-methoxy-triazinyl-(6')]amino-7-[1''-sulfo-5''- β -sulphatoethylsulfonyl-naphthyl-(2'')]azo-8-hydroxy-naphthalene-3,6-disulfonic acid.

4,713,083

ALCOHOLIC SOLUTION OF SULPHONIC ACID-CONTAINING COPOLYMER DYED WITH BASIC DYE

Shuichi Okuzono, Shinnanyo; Tetsuo Tanaka, Hofu; Yasuhiro Oda, Tokuyama; Takashi Shintani, Tokuyama, and Noriaki Emura, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Jul. 3, 1985, Ser. No. 751,595

Claims priority, application Japan, Jul. 6, 1984, 59-138971
Int. Cl.⁴ C09B 67/34, 69/10; C09D 11/10; C08F 2/44

U.S. Cl. 8-557

8 Claims

1. A coloring material comprising a solution of an alcohol-soluble copolymer having a sulphonic acid group or a salt thereof, which is dyed with a basic dye, in a solvent comprising an alcohol as a main component;

said copolymer being derived from (i) 0.1% to 40% by weight of at least one ethylenically unsaturated sulphonic acid or salt thereof selected from the group consisting of styrene-sulphonic acid, vinylbenzyl-sulphonic acid, vinyl-sulphonic acid, allyl-sulphonic acid, methallyl-sulphonic acid, acryloyloxyethyl-sulphonic acid, acryloyloxyethyl-sulphonic acid, methacryloyloxypropyl-sulphonic acid and 2-acrylamido-2-methylpropane-sulphonic acid, and the lithium, sodium, potassium or ammonium salts of said unsaturated sulphonic acids, and (ii) 60 to 99.9% by weight of at least one copolymerizable monomer composed of, based on the weight of the copolymerizable monomer, 60% to 100% by weight of at least one monomer selected from the group consisting of hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate, hydroxyethyl methacrylate, polyethylene glycol monomethacrylate, ethyl acrylate, ethyl methacrylate, propyl acrylate, propyl methacrylate, butyl acrylate and butyl methacrylate, and 0% to 40% by weight of other copolymerizable monomer; and

the concentration of said alcohol-soluble copolymer in the solution being in the range of 1% to 50% by weight.

4,713,084

ALGINATE GEL PARTICLE INKS OR DYE LIQUORS FOR IMPARTING COLOR TO TEXTILES

Walter J. Bohrn, Lancaster; Robert D. Lewis, Landisville, both of Pa., and William A. Maggio, Ocean City, N.J., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 607,798, May 7, 1984,

abandoned. This application Oct. 24, 1985, Ser. No. 790,822

Int. Cl.⁴ C09B 67/00; D06P 5/00

U.S. Cl. 8-561

25 Claims

1. Gel particles for imparting color to textiles produced by mixing a first composition comprising alginic acid or an alginic acid derivative with a second composition comprising a gel agent for the first composition, at least one of said compositions also containing a dye, whereby the alginic acid or alginic acid derivative of said first composition and the gel agent of said second composition react forming a suspension of gel particles in water, said gel particles comprising said dye, having a particle size dimension of from about 1/32 to about 1/2 inch and being water insoluble and non-liquifiable within a tempera-

ture range of from about ambient temperature up to at least 300° F. and wherein said gel agent is comprised of a mixture of a monovalent chloride salt and a polyvalent metal salt other than magnesium.

4,713,085

Patent Not Issued For This Number

4,713,086

OIL-COMPATIBLE COAL/WATER MIXTURES

Francis J. Smit, Arvada; William E. Horst, and Anirudh K. Bhasin, both of Golden, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Mar. 2, 1984, Ser. No. 585,661

Int. Cl.⁴ C10L 1/32

U.S. Cl. 44-51

13 Claims

1. A method for inhibiting the increase in viscosity of a coal/water slurry when brought into transitional contact with petroleum oil during fuel changeover while operating, a power generation system in which the changeover occurs from petroleum oil to coal/water slurry or from coal/water slurry to petroleum oil which comprises,

causing transitional contact to occur between said coal/water slurry and said petroleum oil during fuel changeover in a power generation system while maintaining in said coal/water slurry during transitional contact with petroleum oil an effective amount of at least about 0.2% by weight of an agglomeration-inhibiting agent selected from the group consisting of nonionic and anionic dispersing agents, the amount being sufficient to thereby inhibit the formation of coal/oil agglomerates and provide a flowable mixture during transitional contact characterized by a Brookfield viscosity of less than about 50,000 cP, and continuing to operate said power generation system following fuel changeover.

4,713,087

CARRIER COMPOSITION FOR INTRODUCING ADDITIVES TO A MOTOR FUEL

Robert H. Jenkins, Jr., Walden; Edward Mitchell, Hopewell Junction; Frank J. Gaetani, Poughkeepsie; John J. Mahusky, Marlboro, and Marilyn Hall, Poughkeepsie, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 14, 1986, Ser. No. 918,205

Int. Cl.⁴ C10L 1/16, 1/18

U.S. Cl. 44-53

8 Claims

1. A diluent composition effective for solubilizing a motor fuel additive to form a motor fuel additive concentrate solution, said solution being characterized by having a relatively high flash point, a low viscosity and solution stability at temperatures below 0° F., said diluent composition comprising a mixture of hydrocarbons in the ajet boiling range and primary amyl alcohol in the proportion of from 3-6 parts by weight of said mixture of hydrocarbons per part by weight of said primary amyl alcohol.

4,713,088

MIDDLE DISTILLATE COMPOSITIONS WITH IMPROVED COLD FLOW PROPERTIES

Robert D. Tack, Abingdon, Sarah L. Pearce, Wantage, both of United Kingdom, and Albert Rossi, Warren, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 20, 1985, Ser. No. 703,339

Claims priority, application United Kingdom, Feb. 21, 1984, 8404518; Aug. 10, 1984, 8420435

Int. Cl.⁴ C10L 1/14

U.S. Cl. 44-62

15 Claims

1. A distillate petroleum fuel oil boiling in the range of 120° to 500° C. having a cold flow property improving amount of a copolymer present therein, said copolymer consisting essentially of polyvinylester containing at least 25 weight percent of repeating monomer units of monoethylenically unsaturated C₄ to C₈ mono- or dicarboxylic acids esterified with at least 2

different n-alkyl groups wherein (1) said n-alkyl groups have an average number of carbon atoms of from 12 to 14; (2) no more than 10 wt. % of said esterified monomer units contain n-alkyl groups having more than 14 carbon atoms; and (3) no more than 20 wt. % of said esterified monomer units contain n-alkyl groups having fewer than 12 carbon atoms.

4,713,089

SYSTEM AND METHOD FOR REMOVING VOLATILE COMPONENTS FROM AN AQUEOUS MEDIUM

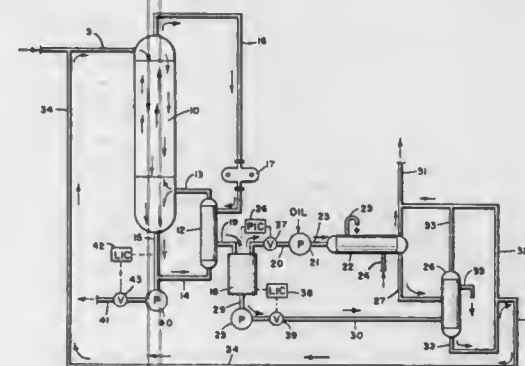
Lanny A. Robbins, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 18, 1986, Ser. No. 886,693

Int. Cl.⁴ B01D 19/00

U.S. Cl. 55-52

4 Claims



2. A method for removing volatile components from an aqueous medium, comprising the steps of:
passing into a column an aqueous medium containing volatile components, and steam as a vaporizing gas;
flowing the aqueous medium and the steam vapor through the column countercurrent to each other;
contacting the aqueous medium with the steam vapor to vaporize the volatile components, and causing a negative pressure condition in the column;
passing the steam vapor containing the volatile components into a vapor compressor, and compressing the steam vapor to raise its pressure to a point below atmospheric pressure;
passing the pressurized steam vapor into a first condenser, to condense part of the vapor phase, and thereby form a liquid phase and a vapor phase;
passing the liquid phase and vapor phase into a receiver vessel, to separate these phases, such that the liquid phase contains water and the condensed volatile components, and the vapor phase contains noncondensable components;
passing the vapor phase from the receiver vessel into a vacuum pump to raise the pressure of this phase to atmospheric pressure;
passing the liquid phase from the receiver vessel into a decanter vessel;
passing the vapor phase from the vacuum pump into a second condenser, to condense part of the vapor phase, and thereby form a liquid phase and a vapor phase;
discharging the vapor phase from the second condenser;
passing the liquid phase from the second condenser into the decanter vessel, to separate part of the condensed volatile components from the water phase;
discharging the condensed volatile components from the decanter vessel; and
discharging the water phase containing the remaining condensed volatile components from the decanter vessel.

4,713,090

ADSORBENT FOR SEPARATION-RECOVERY OF CO, PREPARING METHOD THEREOF AND PROCESS FOR SEPARATION-RECOVERY OF HIGH PURITY CO, USING THE ADSORBENT

Jintaro Yokoe, Masami Takeuchi, and Toshiaki Tsuji, all of Amagasaki, Japan, assignors to Kansai Netsukagaku Kabushiki Kaisha, Hyogo, Japan

Filed Sep. 16, 1986, Ser. No. 907,915

Claims priority, application Japan, Sep. 17, 1985, 60-205972
Int. Cl.⁴ B01D 53/04

U.S. Cl. 55-68

20 Claims

16. A process for separation-recovery of high purity CO from any mixed gas containing CO by the method of pressure swing adsorption and/or temperature swing adsorption, which comprises using as the adsorbent a composite carrier (X) composed of a carrier (a) formed of silica and/or alumina as its nucleus and an active carbonized material layer (b) formed on the surface thereof, on which a copper compound (Y) is carried.

4,713,091

ADSORPTION OF GASES BY AMINE AND PHOSPHINE COMPLEXED MN(II) AND COMPOUNDS

Rakesh Govind, Cincinnati, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Continuation-in-part of Ser. No. 792,972, Oct. 30, 1985, Pat. No. 4,668,255. This application Oct. 20, 1986, Ser. No. 918,701

Int. Cl.⁴ B01D 53/14

U.S. Cl. 55-73

12 Claims

1. A method of sorbing a gas comprising contacting a manganese (II) complex with said gas at an effective temperature and pressure whereby said gas is sorbed by said manganese (II) complex;

wherein said gas is selected from the group consisting of oxygen, nitrogen oxides, sulfur dioxide, carbon monoxide, carbon dioxide, and C₂-C₅ alkenes; said manganese (II) complex having the following general formula:

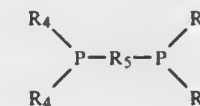


wherein L represents a diphosphine ligand sensitive to a compound selected from the group consisting of oxygen, nitrogen oxides, carbon monoxide, carbon dioxide, sulfur dioxide and C₂-C₅ alkenes and X represents an anion.

11. A compound having the following general formula:



L represents a diphosphine ligand having the following general formula:



wherein R₄ represents the same or different radicals selected from the group consisting of substituted and unsubstituted alkyl, cycloalkyl, aryl, alkyaryl, arylalkyl and hydrogen; and R₅ represents a radical selected from the group consisting essentially of alkylene and arylene.

4,713,092

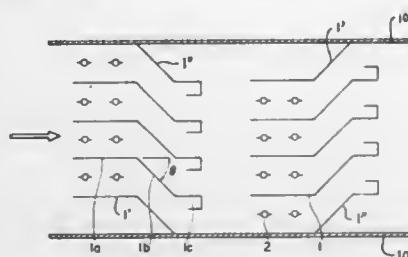
ELECTROSTATIC PRECIPITATOR

Yoshikazu Kikuchi, Tokyo, and Reiro Nakao, Kawaguchi, both of Japan, assignors to Corona Engineering Co., Ltd., Japan
Continuation of Ser. No. 765,036, Aug. 12, 1985, abandoned.
This application Feb. 19, 1987, Ser. No. 16,992

Claims priority, application Japan, Aug. 14, 1984, 59-168892
Int. Cl.⁴ B03C 3/12, 3/14, 3/45

U.S. Cl. 55—130

10 Claims



1. A device for collecting particles floating in a gas, comprising:

a flow channel for flowing said gas in a predetermined direction;

corona charging means for charging at least partly said particles floating in said gas flowing through said channel thereby causing said particles to be agglomerated at least partly, said charging means being located inside of said flow channel and including at least a pair of parallel electrode means spaced apart from each other over a predetermined distance and each arranged in parallel with said predetermined direction and at least one corona electrode means disposed between said pair of parallel electrode means;

deflecting means disposed downstream of said corona charging means for deflecting said gas such that said gas flows generally in a direction other than said predetermined direction thereby causing particles in said deflected gas to impinge on said deflecting means due at least partly to inertia; and

collecting means disposed downstream of and formed continuously with said deflecting means to define a local negative pressure region, said collecting means having in a horizontal plan view a generally inverted C-shaped cross section whose upstream end is connected to said deflecting means and which is all located at a downstream side with respect to an imaginary line defined as a trailing extension of said deflecting means, for collecting at least said particles moving along said deflecting means, said collecting means guiding said particles thus collected to be transported by force of gravity to a desired position without being reentrained in the flowing gas.

4,713,093

ELECTROSTATIC DUST PRECIPITATOR

Curt Hansson, Västra Frölunda, Sweden, assignor to Kraftelektronik AB, Surte, Sweden

Filed Jul. 8, 1986, Ser. No. 883,356

Claims priority, application European Pat. Off., Jul. 15, 1985, 85850238.8

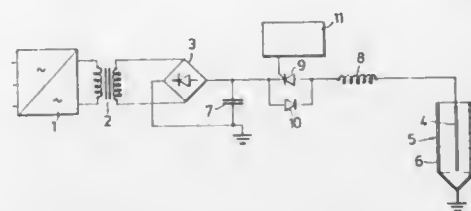
Int. Cl.⁴ B03C 3/02

U.S. Cl. 55—139

1 Claim

1. An electrostatic dust precipitator comprising a separation filter having emitter and collector electrodes means connected to said electrodes for maintaining a pre-determined substantially constant d.c. voltage therebetween during operation of the precipitator, and pulse-generating means connected to the electrodes for generating at a given frequency in the order of 30-500 Hz voltage pulses or voltage pulse trains which are superimposed on said d.c. voltage and which are of short duration in relation to said frequency, said pulse-generating means including capacitive and inductive elements connected in a manner to form, together with a capacitance provided by the

separation filter, an electrical oscillation circuit, and a switching device which is incorporated in said oscillation circuit and which is periodically actuable by a control means for activation of the oscillation circuit, wherein the pulse-generating means upstream said oscillation circuit further includes a volt-



age-controlled frequency converter arranged to generate an a.c. voltage having a frequency which is at least three times higher than the frequency of said voltage pulses or trains of pulses, and a single-phase transformer connected downstream of said converter and followed by a rectifier.

4,713,094

AIR DRIER APPARATUS

Ichiro Yanagawa, and Yuji Wachi, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Japan

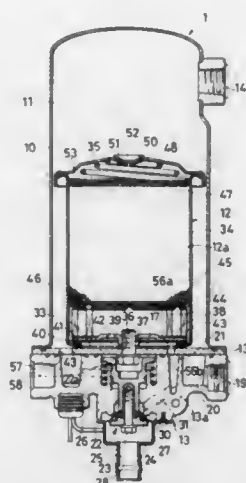
Filed Aug. 25, 1986, Ser. No. 900,316

Claims priority, application Japan, Aug. 28, 1985, 60-130968[U]; Aug. 30, 1985, 60-132681[U]; Aug. 30, 1985, 132682[U]

Int. Cl.⁴ B01D 53/04

U.S. Cl. 55—163

11 Claims



1. In an air drier apparatus including a housing having an open bottom end, a drying agent storage casing disposed within said housing, and a bottom end cover blocking the open bottom end of said housing, said air drier apparatus being adapted to dry compressed air supplied through an air inlet port formed on said bottom end cover with drying agent charged within said casing; the improvement whereby the bottom portion of said drying agent storage casing is mounted securely upon said bottom end cover, said improvement comprising, in combination, a securing plate means positioned within said bottom portion of said drying agent storage casing, said securing plate means having a lock nut incorporated thereon and a single bolt means engaging said lock nut and clamping said bottom portion of said drying agent storage casing to said bottom end cover.

4,713,095

LIQUID SEPARATOR FOR GAS ANALYZER

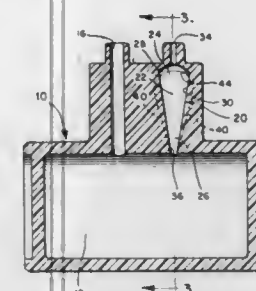
Robert H. Ricciardelli, Waukesha, Wis., assignor to Criticare Systems, Inc., Milwaukee, Wis.

Filed Oct. 16, 1986, Ser. No. 919,894

Int. Cl.⁴ B01D 19/00

U.S. Cl. 55—189

25 Claims



1. A liquid separator for a gas analyzer, said separator comprising:

means for defining a separation chamber comprising an upper zone and a lower zone;

inlet means for introducing a gas/liquid mixture into the separation chamber;

gas outlet means for removing gas from the upper zone; and liquid outlet means for removing liquid from the lower zone;

said upper zone bounded upwardly by an upper surface which surrounds the gas outlet means;

said lower zone bounded downwardly by a lower surface which surrounds the liquid outlet means;

said upper surface concavely shaped to drain liquid away from the gas outlet means into the lower zone;

said lower surface defining a plurality of facets which define a plurality of internal corners, wherein at least a portion of the internal corners converge toward the liquid outlet means to draw liquid by capillary action away from the upper zone toward the liquid outlet means;

said gas outlet means separated from the closest one of the internal corners by a distance greater than 0.05 inches, said separation chamber having a volume less than 1 milliliter.

4,713,096

APPARATUS FOR SEPARATING GRANULAR SOLIDS FROM CARRYING GAS

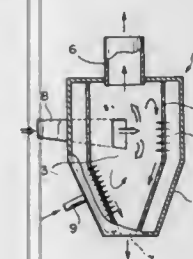
Isamu Kajihara, Yokosuka, Japan, assignor to Morinaga & Co., Ltd., Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,182

Int. Cl.⁴ B01D 53/24

U.S. Cl. 55—204

4 Claims



1. In a cyclone separator for separating granular solids from a carrying gas thereof, having a cylindrical main body provided with a downwardly gradually reducing-diameter lower portion; mixture gas inlet for introducing a mixture gas consisting of granular solids and a carrying gas thereof into said main body, said mixture gas inlet being tangentially directed to a side wall of said main body; a gas outlet for discharging said carrying gas having been separated from said granular solids,

said gas outlet being provided in an upper portion of said main body; and a granular solid outlet for discharging said granular solids having been separated from said carrying gas thereof, the improvement wherein a front end of said gas outlet is slightly projected into said main body; and said mixture gas inlet is provided in a side wall of said main body at a position spaced downward apart from a ceiling portion of said main body by a distance enabling said mixture gas to make at least one swirl above said mixture gas inlet when introduced into said main body.

4,713,097

INTEGRATED ENGINE AIR CLEANER AND VENTURI RESONATOR

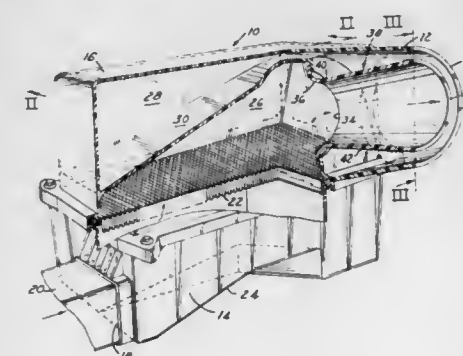
Franklin L. Grawi, Southfield, and Michael B. Magnan, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 27, 1987, Ser. No. 19,990

Int. Cl.⁴ B01D 46/00

U.S. Cl. 55—276

4 Claims



1. An air cleaner-engine induction noise silencer combination for a motor vehicle type internal combustion engine, comprising an air cleaner housing having first and second parts defined by an air filter element located between, an ambient air inlet into the first part, a clean air outlet in the second part, means including a venturi connecting the outlet to the filter, and a noise reducing resonator cooperating with the outlet to suppress engine induction noise feedback, the resonator including a closed chamber having an inlet thereto concentric with the air outlet and radially spaced therefrom for the dissipation of sound waves therebetween into the chamber, the venturi having a gradually tapering diffuser gradually increasing in area from the throat of the venturi towards the outlet to provide efficient operation through maximum air flow pressure recovery while concurrently further reducing the acoustic energy of the engine induction noise by reflecting the same off the tapering walls of the venturi back towards the engine.

4,713,098

TANDEM CURVED ARM STEAM-WATER SEPARATOR

Nick Idvorian, St. Catharines, and Robert H. Renshaw, Grimsby, both of Canada, assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 31, 1986, Ser. No. 825,556

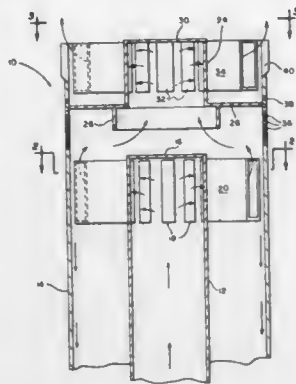
Int. Cl.⁴ B01D 45/00

U.S. Cl. 55—345

7 Claims

1. A steam-water separator comprising a first stage riser adapted to receive a steam-water mixture, baffle means disposed in a spaced relation to said riser, at least one discharge slot formed through said riser, an arcuate discharge member registering with each slot for receiving said mixture and discharging it against said baffle means to promote the separation of water from said mixture, said water collecting on said baffle means and said mixture rising by buoyant forces, a second stage riser disposed above said first stage riser, means for directing said rising mixture into said second stage riser, addi-

tional baffle means disposed in a spaced relation to said second stage riser, at least one discharge slot formed through said second stage riser, and an arcuate shaped discharge member registering with each latter slot for receiving said riser mixture



and discharging it against said baffle means to facilitate additional separation of water from said mixture, said water collecting on said additional baffle means and said mixture rising by buoyant forces for further treatment.

4,713,099

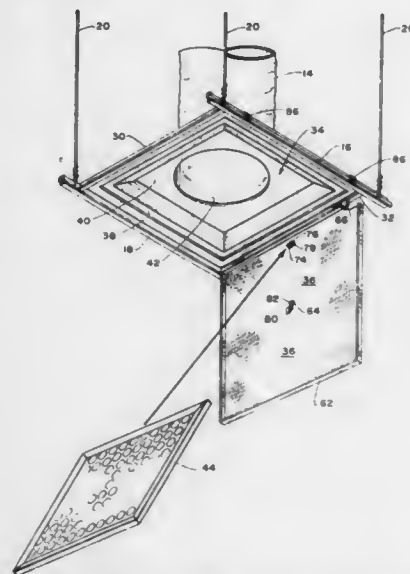
MOLDED FIBERGLASS AIR RETURN FILTER GRILLE
Clifford A. Schroeder, 904 Skelton Canyon Circle, Westlake, Calif. 94015

Filed Jun. 5, 1986, Ser. No. 871,092

Int. Cl.⁴ B01D 46/10

U.S. Cl. 55—385 R

13 Claims



1. An air return filter grille assembly comprising;
a molded fiberglass plenum having an open side surrounded by a skirt;
a filter receiving recess formed in said molded fiberglass plenum for receiving a filter;
filter means positioned in said recess;
a perforated faceplate fitting the open side of said plenum;
hinge means hingedly mounting said perforated faceplate on said fiberglass plenum so that said perforated faceplate can be easily swung open to remove and replace said filter means;
said perforated faceplate constructed and arranged to hold said filter in said recess when closed; and
latch means on said perforated faceplate for holding said faceplate in a closed position against said open side of said molded fiberglass plenum;
whereby filters may be easily removed and replaced by

unlatching said perforated faceplate, placing a filter on said perforated faceplate and closing and latching said faceplate.

4,713,100

ADSORPTION APPARATUS

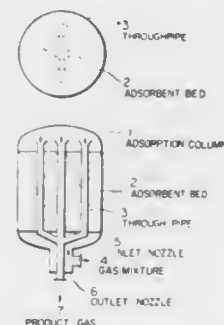
Kazuo Haruna, Kakogawa, and Iwamitsu Shiozawa, Hyogo, both of Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan

Filed Jun. 25, 1986, Ser. No. 879,753

Int. Cl.⁴ B01D 53/04

U.S. Cl. 55—387

3 Claims



1. An industrial scale adsorption apparatus for separating a gas mixture into its components by pressure swing adsorption, comprising:

a closed vessel, having an inlet nozzle at one end for admitting said gas mixture;
an adsorbent bed retained inside said vessel; and,
a plurality of unrestricted passages extending vertically in said vessel through entire height of said adsorbent bed, each of said passages being open at one end above said bed for admitting an unadsorbed gas, all said passages discharging inside said closed vessel, into one common outgoing passage being in communication with an outlet nozzle.

4,713,101

COOLING APPARATUS

David J. Spring, Slough, England, assignor to Grainer Limited, Essex, England

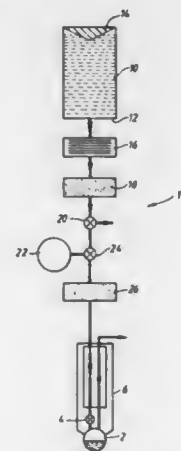
Filed Apr. 15, 1986, Ser. No. 852,204

Claims priority, application United Kingdom, Apr. 16, 1985, 8509738; Dec. 9, 1985, 8530306

Int. Cl.⁴ F25J 1/00

U.S. Cl. 62—8

13 Claims



1. A Joule-Thomson effect cooler including

a supply of high pressure gas having an outlet, said supply including a chemical, pyrotechnic composition operable to generate a pure gas, and a device operatively associated with said composition to initiate combustion thereof and thereby to initiate gas generation from said composition and supply of said gas from said outlet, the temperature of the gas being above its inversion temperature,
a throttle having an inlet and an outlet,
a cool chamber having an inlet connected to the outlet of said throttle, and an outlet,
a heat exchanger operatively connected to cool the gas passing to said inlet of said throttle, said heat exchanger being operatively connected to said outlet from said cool chamber, and
filter means operatively connecting said outlet of said gas supply to said inlet of said throttle, the filter means performing a cooling as well as a filtering action and cooling the gas to below its inversion temperature, whereby the gas arriving at the inlet of the throttle is free of impurities capable of significantly reducing flow through said throttle.

4,713,102

METHOD OF CONCENTRATING MULTICOMPONENT LIQUID PRODUCTS

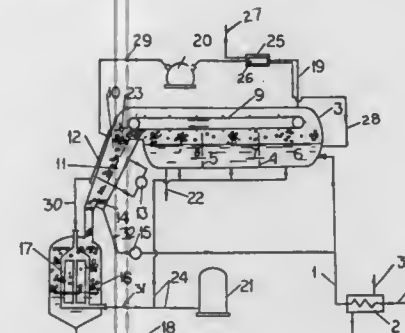
Boris M. Khudenko, and Jack Zbar, both of Atlanta, Ga., assignors to Insta, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 657,580, Oct. 4, 1984, abandoned. This application Aug. 18, 1986, Ser. No. 897,326

Int. Cl.⁴ B01D 9/04; C02F 1/22

U.S. Cl. 62—535

17 Claims



1. A method of concentrating multicomponent liquid product containing volatile and nonvolatile constituents comprising the steps of:

mixing said multicomponent liquid product and a liquid refrigerant gas in at least one freezing chamber;
forming crystals of ice containing entrained multicomponent liquid product by means of vaporization of said refrigerant gas;
applying heat to said crystals of ice containing entrained multicomponent liquid product so that said entrained multicomponent liquid product is separated from said crystals of ice;
collecting said separated entrained multicomponent liquid product;
recirculating said separated entrained multicomponent liquid product to said at least one freezing chamber;
removing volatilized constituents of said multicomponent liquid product and said vaporized liquid refrigerant gas to said freezing chamber, recirculating said volatilized constituents of said multicomponent liquid product and said vaporized liquid refrigerant gas to said freezing chamber so that said volatilized constituents and said vaporized liquid refrigerant gas is mixed with said multicomponent liquid product; and
removing said multicomponent liquid product from said freezing chamber.

4,713,103

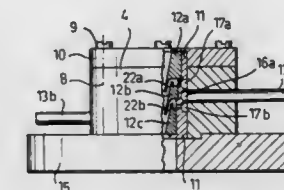
METHOD OF AND A DEVICE FOR APPLYING A PRIMARY COATING TO AN OPTICAL FILAMENT
Risto Pennanen, and Jyrki Peanala, both of Helsinki, Finland, assignors to Oy Nokia AB, Helsinki, Finland

Filed Dec. 5, 1986, Ser. No. 938,252

Claims priority, application Finland, Dec. 17, 1985, 855012
Int. Cl.⁴ C03B 37/023; B05D 5/06

U.S. Cl. 65—3.11

10 Claims



1. A method of applying a primary coating to an optical filament by passing a filament coming from a drawing furnace through a coating crucible into which a coating material is fed for applying it to the surface of the filament and by passing the coated filament, after the coating is hardened, over an idler wheel through a drawing apparatus on to a coil, wherein

the flow of the coating material to be introduced into the coating crucible is divided in the crucible into two flows opposite in direction and advancing in the peripheral direction of the crucible;

the two flows are caused to flow in the axial direction substantially on the opposite sides of the crucible;

the axial flows are caused to flow in the peripheral direction of the crucible, joined by means of an outer channel extending around the crucible in the peripheral direction, and passed radially through throttle openings into an inner peripheral channel; and

the material is passed from the inner peripheral channel through a peripheral throttle slot into a conical channel along which the material is guided into a central chamber of the crucible, through which chamber the filament is drawn.

4,713,104

QUARTZ GLASS CRUCIBLES

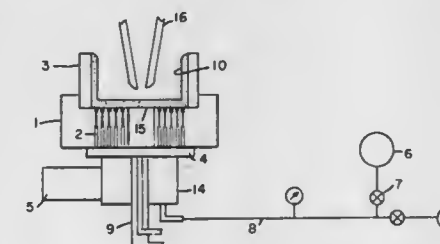
David R. Brown, Beverly, Mass.; Charles E. Frost, Jr., Exeter, and Kenneth A. White, Raymond, both of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 31, 1986, Ser. No. 846,190

Int. Cl.⁴ C03B 19/04

U.S. Cl. 65—18.1

2 Claims



1. A method of making a quartz glass crucible from granular quartz particles comprising the steps of:

providing a base having an upper flat surface thereon, the base having holes therethrough through which a vacuum can be drawn, the diameters of the holes at said upper surface being greater than can be bridged by the granular quartz particles, the holes at said upper surface being filled with a porous material through which a vacuum can be

drawn but through which the granular quartz particles will not pass;
 placing an open-ended cylindrical mold on the base;
 disposing a thick layer of granular quartz particles on the flat surface of the base and on the cylindrical mold;
 rotating the base and cylindrical mold while drawing a vacuum on the granular quartz particles through the holes in the base, the granular quartz particles on the flat surface of the base being held in place by means of the vacuum;
 heating the granular quartz particles, while maintaining the rotation and vacuum, to melt and fuse an inner portion of the thick layer of granular quartz particles to form a quartz glass crucible shape having a substantially flat bottom;
 removing the quartz glass crucible shape from the base and cylindrical mold; and
 machining the quartz glass crucible shape into a finished crucible.
 the method including the provision that holes are provided only in the base and not in the cylindrical mold and that enough vacuum is drawn through said holes to remove bubbles from the entire mass of the quartz particles.

4,713,105

METHOD FOR GLASS FIBER SPLICING BY FLAME FUSION

John T. Krause, New Providence; Charles R. Kurkjian, Basking Ridge, and Un-Chul Paek, Lawrenceville, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 573,141, Jan. 24, 1984, abandoned. This application Nov. 25, 1986, Ser. No. 935,162

Int. Cl.⁴ C03B 23/20, 37/10

U.S. Cl. 65—4.1

6 Claims

1. Method for making a glass fiber which here is designated as a spliced fiber,
 said method comprising a step of connecting at least a first glass fiber and a second glass fiber,
 said first and said second glass fibers comprising respective surface portions which consist of at least 95 weight percent silica,
 said step of connecting comprising heating an end portion of said first fiber and an end portion of said second fiber while said end portion of said first fiber is in contact and essentially aligned with said end portion of said second fiber,
 said heating being in a flame which results upon combustion in a flow of gases,
 said flow comprising an outer flow portion, an intermediate flow portion which is interior to said outer flow portion, and central flow portion which is interior to said intermediate flow portion,
 said outer flow portion comprising at least 50 percent by volume oxygen,
 said intermediate flow portion consisting essentially of chlorine,
 said central flow portion consisting essentially of hydrogen or deuterium,
 the velocity of the flow of said outer flow portion being greater than the velocity of the flow of said intermediate flow portion so as to render said flame more narrow and so as to cool the fiber away from said end portions, and central flow being kept low during placement of fiber such that fiber end temperature is less than or equal to 500 degrees C. up until fiber ends are within said intermediate flow,
 whereby said spliced fiber has a tensile strength which is at least 95 percent of pristine strength.

4,713,106
METHOD AND APPARATUS FOR CONVEYING
MOLTEN MATERIAL

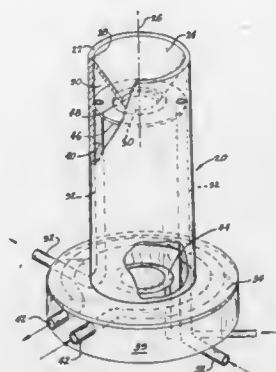
John A. McCague, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Apr. 18, 1986, Ser. No. 853,511

Int. Cl.⁴ C03B 5/26

U.S. Cl. 65—128

11 Claims



9. A method of conveying molten glass from a container comprising:

- conveying the molten glass into the top opening of a substantially vertical standpipe;
- guiding the molten glass through an orifice of a fitting mounted in said standpipe, said orifice being spaced apart from interior surface of said standpipe,
- conveying the molten material through said standpipe to the outside of said container without substantial contact between the molten glass and said interior surface after the molten glass passes through said orifice, and
- cooling said fitting to adjust the temperature of the molten glass through said orifice.

4,713,107

APPARATUS FOR PRODUCING POROUS PREFORMS FOR OPTICAL FIBERS

Masaaki Yoshida; Shigeki Endo; Shigeru Kisanuki, and Hideo Kakuzen, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

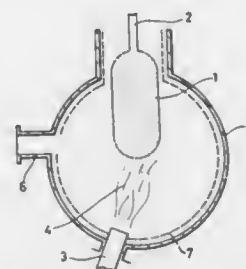
Continuation of Ser. No. 720,223, Apr. 5, 1985, abandoned. This application Dec. 10, 1986, Ser. No. 940,203

Claims priority, application Japan, Apr. 6, 1984, 59-69569

Int. Cl.⁴ C03B 37/018

U.S. Cl. 65—157

3 Claims



1. An apparatus for producing a porous preform for use in producing optical fiber, said apparatus comprising: a target member (2) upon which a porous preform (1) is to be grown; an enclosure wall (5) defining a deposition chamber, said wall having an elongate passage formed therein for receiving said target member, said target member being disposed in said passage and extending into the interior of said chamber, an aperture defined in said enclosure wall, and a discharge outlet

(6) defined in said enclosure wall; an oxyhydrogen burner (3) for producing a flame for generating fine solid electrically charged particles of SiO₂ having a first electrical polarity, means for providing reactants to said burner such that said fine solid particles of SiO₂ are generated, said burner being disposed in said aperture in communication with the interior of said chamber such that the flame extends into said chamber, whereby some of said charged particles contact an inner surface of said enclosure wall thereby causing an electrostatic field force which is opposite in electrical polarity to said first polarity to be formed on the inner surface of said enclosure wall; and an electrically conductive metal mesh shielding member (7), disposed inside said wall and substantially surrounding said target member and the flame, said shielding member being located for and being a means for substantially preventing the electrostatic field force from exerting an attractive force on any of said particles of SiO₂ located within said shielding member.

4,713,108

NPK COMPLEX FERTILIZER

Olav Kjøhl, Heistad; Torstein Obrestad, Ulefoss, and Hans Groland, Porsgrunn, all of Norway, assignors to Norsk Hydro, a.s., Oslo, Norway

Filed Sep. 11, 1985, Ser. No. 774,716

Claims priority, application Norway, Sep. 12, 1984, 843606

Int. Cl.⁴ C05D 1/02

U.S. Cl. 71—32

3 Claims

1. A complex NPK-fertilizer manufactured by using KCl and/or K₂SO₄ as a potassium source, characterized in that it contains magnesium in an amount of 0.2–3.0% calculated MgO and added to the product as lightly calcined MgO having an average particle size of 0.2–3.0 mm.

4,713,109

2-[4-(5-CHLORO-3-FLUOROPYRIDIN-2-YLOXY)-PHENOXY]-PROPIONIC ACID-PROPYNYL ESTER WITH HERBICIDAL ACTIVITY

Roif Schnurter, Binningen, and Hermann Rempfer, Ettingen, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 677,775, Dec. 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 450,815, Dec. 20, 1982, Pat. No. 4,505,743. This application May 2, 1986, Ser. No. 858,698

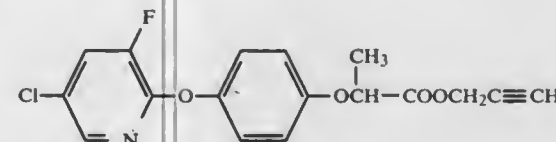
Claims priority, application Switzerland, Dec. 31, 1981, 8372/81

Int. Cl.⁴ C07D 213/64; A01N 43/40

U.S. Cl. 71—94

6 Claims

1. 2-[4-(5-Chloro-3-fluoropyridin-2-yloxy)-phenoxy]propionic acid propynyl ester of the formula



5. A method of selectively controlling weeds which comprises applying thereto or to the locus thereof a herbicidally effective amount of 2-[4-(5-chloro-3-fluoropyridin-2-yloxy)-phenoxy]-propionic acid propynyl ester according to claim 1.

4,713,110

PROCESS FOR PREPARING FINELY DIVIDED METAL POWDERS

Borislav Bogdanovic, and Helmut Bönnemann, both of Mulheim, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim, Fed. Rep. of Germany

Filed Nov. 21, 1986, Ser. No. 933,454

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541633

Int. Cl.⁴ C22B 1/00

U.S. Cl. 75—0.5 A

12 Claims

1. A process for preparing a finely divided metal powder, comprising reacting a salt of such metal with magnesium, in the presence of a solvent and a catalytic amount of a material selected from the group consisting of an anthracene, a magnesium anthracene, and a mixture of an anthracene and a magnesium anthracene.

4,713,111

PRODUCTION OF ALUMINUM-SiC COMPOSITE USING SODIUM TETRABORATE AS AN ADDITION AGENT

Thomas B. Cameron; Wilbur W. Swanson; John M. Tartaglia, and Thomas B. Cox, all of Ann Arbor, Mich., assignors to Amax Inc., Greenwich, Conn.

Filed Aug. 8, 1986, Ser. No. 894,548

Int. Cl.⁴ C22C 1/09

U.S. Cl. 75—68 R

7 Claims

1. The process for introducing particulate silicon carbide into molten aluminum or aluminum alloy which comprises mixing particulate silicon carbide from the group consisting of particles having an average size of about 5 to about 70 microns and fibers having an average diameter of about 0.1 to about 15 microns and a length of about 10 microns to about 5 centimeters with a dehydrated addition agent of sodium tetraborate in weight proportions of 1:1 to 2:1, introducing the resulting mixture into an aluminum or aluminum alloy bath at a temperature above the liquidus temperature of the bath in an amount of about 5% to about 40% of silicon carbide, by volume of said bath to disseminate said silicon carbide particles through said bath and solidifying said bath to produce a composite material reinforced with silicon carbide particles or whiskers distributed in a matrix of aluminum or aluminum alloy.

4,713,112

PIGMENTARY COMPOSITION FOR THE CATHODIC PROTECTION OF METALLIC SURFACES AGAINST CORROSION, AND PROCESS FOR PREPARING SAID COMPOSITION

Maurice Barre, 41 avenue de Chartres, 28570 Abondant, and Zdzislaw Kalewicz, 45 avenue Perronet, 92200 Neuilly-sur-Seine, both of France

Filed May 28, 1985, Ser. No. 737,868

Claims priority, application France, Jun. 5, 1984, 84 08781

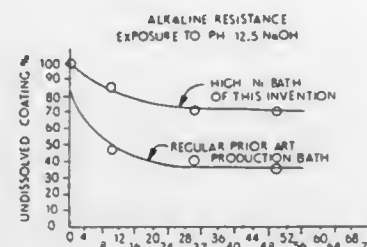
Int. Cl.⁴ C04B 9/02, 14/00

U.S. Cl. 106—14.05

9 Claims

1. A process for preparing a pulverulent pigmentary composition intended for the cathodic protection of a metallic surface against corrosion and capable of being applied to said surface, said pigmentary composition comprising (1) a metal more anodic than the metal to be protected; and (2) a substitute metal constituting an electrically conductive compound selected from the group consisting of carbides, phosphides, nitrides, borides and silicides of iron, cobalt, nickel, molybdenum, titanium, chromium, zirconium, vanadium, tungsten, thorium, tantalum and cadmium, said process comprising preparing said substitute metal, and the metal more anodic than the metal to be protected, in the form of particles of appropriate granulometry, and provoking by mechanical grinding the deposition of a layer of said anodic metal on the surface of the particles of said substitute metal, thus obtaining product particles comprising a core of said substitute metal coated by a coating layer

- (a) selecting cobalt cations as said first divalent metal cations;
 (b) selecting zinc cations as said second divalent metal cations;
 (c) maintaining a minimum zinc ion concentration in said solution of 0.2 grams per liter; and



- (d) controlling the concentrations of said first and said second divalent metal cations in said solution so that the concentration of said cobalt cations is maintained at the time of coating between about 65 and about 95 mole percent of the total first and second divalent metal cations in said solution.

4,713,122

PRODUCTION OF THIN FLAT ARTICLES WITH HARDENED SURFACES

Cyril Dawes, Sutton Coldfield, and Colin G. Smith, Solihull, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

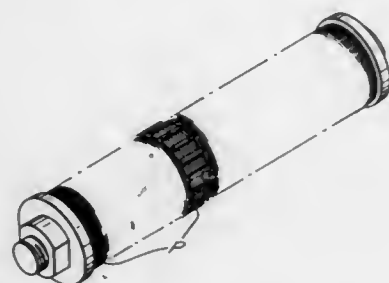
Filed Mar. 18, 1986, Ser. No. 840,778

Claims priority, application United Kingdom, Mar. 20, 1985, 8507230

Int. Cl.⁴ C21D 1/74

U.S. Cl. 148—16.6

15 Claims



1. A method of treating a plurality of thin metal articles so as to increase their hardness and wear resistance, the method comprising subjecting the articles to a nitriding treatment to provide the articles with a hardened surface but which nitriding treatment tends to distort the shape of the articles, and then subjecting them to a heat treatment to correct distortion caused by the nitriding treatment, wherein the nitriding treatment is arranged to provide the thin articles with an epsilon nitride layer and the heat treatment comprises subjecting the surface hardened articles to a heat treatment while they are held in a stack under compression, the heat treatment being carried out at a temperature of from about 150° C. to about 600° C. for a time sufficient to cause the distortion to be corrected without reducing the hardness of the epsilon nitride surface layer.

4,713,123

METHOD OF PRODUCING EXTRA-LOW IRON LOSS GRAIN ORIENTED SILICON STEEL SHEETS

Yukio Inokuti, Yoh Ito, and Toshihiko Funahashi, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan
 PCT No. PCT/JP86/00087, § 371 Date Sep. 9, 1986, § 102(e)
 Date Sep. 9, 1986, PCT Pub. No. WO86/04929, PCT Pub. Date Aug. 28, 1986

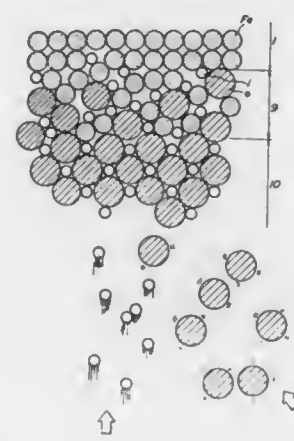
PCT Filed Feb. 21, 1986, Ser. No. 907,734

Claims priority, application Japan, Feb. 22, 1985, 60-32935; Mar. 5, 1985, 60-42984; Mar. 5, 1985, 60-42985; Apr. 8, 1985, 60-73842; Apr. 10, 1985, 60-74460; Apr. 10, 1985, 60-74461; Apr. 10, 1985, 60-74462; Apr. 22, 1985, 60-84523; Apr. 22, 1985, 60-84525; Jul. 23, 1985, 60-161221; Jul. 23, 1985, 60-161223; Jul. 23, 1985, 60-161227; Jul. 23, 1985, 60-161228; Jul. 23, 1985, 60-161232; Aug. 16, 1985, 60-180161; Aug. 16, 1985, 60-180162; Aug. 16, 1985, 60-180163; Aug. 16, 1985, 60-180164; Dec. 17, 1985, 60-282053; Feb. 6, 1986, 61-22848; Feb. 18, 1986, 61-31764

Int. Cl.⁴ H01F 1/04

U.S. Cl. 148—113

23 Claims



1. A method of producing an extra-low iron loss grain oriented silicon steel sheet, which comprises subjecting a silicon containing steel slab to a hot rolling, subjecting the resulting hot rolled steel sheet to one or two cold rollings with an intermediate annealing to form a cold rolled steel sheet having a given final gauge, subjecting the cold rolled steel sheet to decarburization and primary recrystallization annealing, applying an annealing separator onto the surface of the treated steel sheet, subjecting the coated steel sheet to a finish annealing and to secondary recrystallization annealing for developing secondary recrystallized grains in {110}<001> orientation and a purification annealing, removing the resulting oxide from the surface of the steel sheet, and forming on the sheet surface a thin coat of at least one layer composed mainly of at least one nitride and/or carbide of Ti, Zr, Hf, V, Nb, Ta, Mn, Cr, Mo, W, Co, Ni, Al, B and Si and strongly adhered to the surface of the silicon steel sheet through a mixed layer of the silicon steel sheet and the thin coat.

4,713,124

METHOD FOR COOLING A CHARGE AFTER THERMAL TREATMENT

Peter Schmetz, Menden, and Dieter Glerse, Werdohl, both of Fed. Rep. of Germany, assignors to Schmetz GmbH & Co. KG Unternehmensverwaltung, Menden, Fed. Rep. of Germany
 Division of Ser. No. 621,524, Jun. 18, 1984, Pat. No. 4,634,103.
 This application May 28, 1986, Ser. No. 868,299

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 3322386

Int. Cl.⁴ C21D 1/74

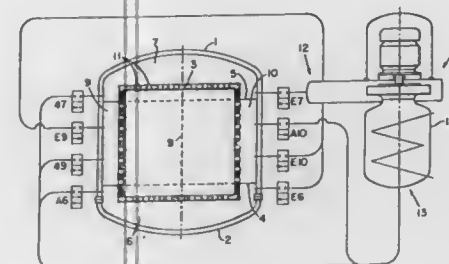
U.S. Cl. 148—128

1 Claim

1. A method of cooling a charge including a number of metal workpieces after thermal treatment of the metal workpieces

within a closed chamber for then continuously and uniformly cooling the metal workpieces by blowing in a cooling gas against the metal workpieces in variable direction and variable intensity of cooling gas flow; said method comprising the steps of:

measuring the temperature distribution in said charge of the metal workpieces with temperature sensors to obtain actual values of temperature distribution in the charge of the metal workpieces; and



changing at least one of the intensity and the direction of flow of said cooling gas against the metal workpieces in all directions as a function of deviations of actual values of said measured temperatures from prescribed and desired rated values for said temperatures continuously matched and adapted as to each other in order to achieve influencing of a desired cooling speed, and to achieve influencing of substantially uniform temperature distribution to avoid dimensional distortion in said metal workpieces.

4,713,125

METHOD OF COOLING STEEL STRIP IN CONTINUOUS HEAT TREATING LINE

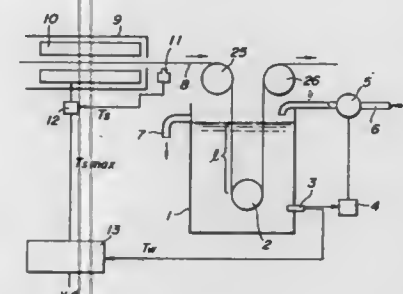
Sachihro Iida, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 20, 1986, Ser. No. 842,136

Claims priority, application Japan, Mar. 22, 1985, 56093/85
 Int. Cl.⁴ C21D 11/00

U.S. Cl. 148—128

4 Claims



1. A method of cooling a steel strip which has been cooled through a final cooling zone in a continuous heat treating line comprising step of finally cooling by immersing the steel strip in cooling water within a cooling tank and passing the steel strip around one or more sink-rolls immersed in the cooling water, wherein cooling of the steel strip immersed in the cooling water prior to reaching to the first sink-roll is controlled to be cooled to such a low temperature as to prevent evaporation of a water film interposed between the surface of the first sink-roll and the surface of the strip around the first sink-roll by controlled cooling in accordance with the following formula:

$$l \geq \frac{p \cdot Cp \cdot v \cdot d}{2\alpha} \ln \left(\frac{T_s - T_w}{120 - T_w} \right)$$

here,

l is the cooling length from the surface of the cooling water to the sink-roll (m)
 Ts is the temperature of the steel strip at the inlet of the cooling tank (°C.)
 Tw is the temperature of the cooling water (°C.)
 Cp is the specific heat of the steel strip (Kcal/kg°C.)
 v is the feed speed of the steel strip (m/hr)
 d is the thickness of the steel strip (m)
 α is the coefficient of heat transfer (Kcal/m hr°C.)
 ρ is the density of the steel strip (kg/m³).

4,713,126

PROCESS FOR MANUFACTURING NEGATIVE CADMIUM ELECTRODES FOR SEALED ALKALINE BATTERY CELLS

Jurgen Woit, and Wolfgang Fries, both of Hagen, Fed. Rep. of Germany, assignors to Varta Batterie A.G., Hanover, Fed. Rep. of Germany

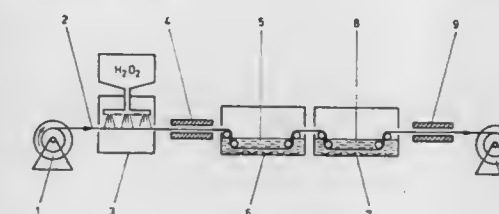
Filed May 8, 1986, Ser. No. 861,099

Claims priority, application Fed. Rep. of Germany, May 28, 1985, 3519051

Int. Cl.⁴ H01M 10/24, 10/34

U.S. Cl. 148—6.14 R

14 Claims



1. A process for manufacturing negative cadmium electrodes for sealed alkaline battery cells, in strip form, wherein said electrodes are subjected to partial oxidation to form a charge reserve by a chemical treatment with oxidizing agents outside said cells, and wherein said process comprises the step of: subjecting the electrode strip to treatment in an alkaline solution, after or during said partial oxidation and prior to incorporation into a cell, to decompose formed heavy metal peroxides and to hydrogenate CdO into Cd(OH)₂.

4,713,127

TRIPLEBASIC PROPELLANT POWDER AND PROCESS FOR THE PRODUCTION THEREOF

Dietmar Müller, Karlsruhe, and Jürgen Kremp, Vallendar, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1986, Ser. No. 907,037

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 3532525

Int. Cl.⁴ C06B 25/26

U.S. Cl. 149—98

6 Claims

1. A process for preparing a triplebasic propellant powder, from nitrocellulose (NC), an explosive oil (NGL) and crystalline nitroguanidine (NIGU), comprising the following steps; mixing with one another the NC, NGL and plasticising the NC by means of a solvent, kneading the mixture to give solid propellant bodies adding at least one organic titanate selected from the group of monoalkoxy, chelate, quaternary, neoalkoxy, cycloheteroatom or coordinated titanates and/or at least one organic zirconate from the group of neoalkoxy zirconates to provide a proportion of ≤2% by weight of such organic titanate and/or zirconate.

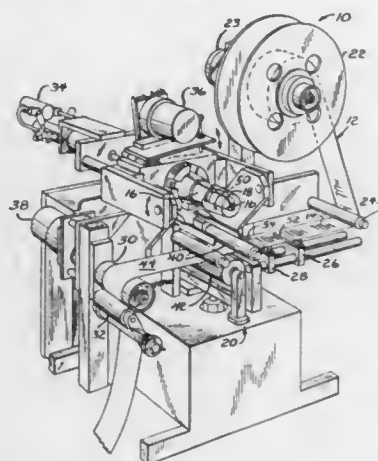
4,713,128

MACHINE AND METHOD FOR APPLYING MINIATURIZED INDICIA TO ARTICLES

Daniel Kerwin, 588 S. Stewart, Lombard, Ill. 60148
Division of Ser. No. 655,091, Sep. 27, 1984, Pat. No. 4,599,129.
This application Apr. 14, 1986, Ser. No. 851,224
Int. Cl.⁴ B65C 3/16

U.S. Cl. 156—64

9 Claims



1. A method for transferring indicia from a web to an article wherein the web includes a plurality of substantially regularly spaced indicia and the article is of any varietal shape having a length of surface substantially greater than the length of each of said indicia, comprising the steps of mounting said article on holding means for movement therewith, continuously moving the web at a constant speed so that at times a one of said indicia is disposed adjacent the article, pressing said web against the article, continuously moving said holding means at a constant preselected velocity different from said speed of the web, simultaneously moving said web at a rectilinear speed slower than said velocity for causing said one of said indicia to be frictionally heated to a plastic condition, simultaneously stretching and transferring said one of said indicia permanently to the article, stopping said holding means, moving said web away from the article for removal thereof, whereby the form of said one of said indicia transferred to said article is changed from a minimal to an optimal preselected size and shape.

4,713,129

PLASTIC PILE PROTECTOR AND METHOD OF COVERING A PILE WITH SAME

James A. Inhofe, Jr., Tecumseh, and Harold J. Evans, Perkins, both of Okla., assignors to Central Plastics Company, Shawnee, Okla.

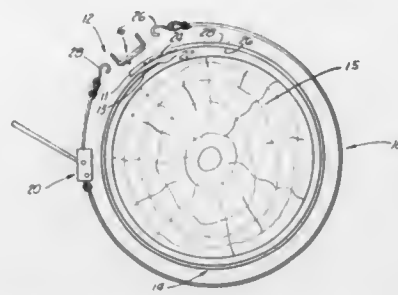
Filed Aug. 19, 1983, Ser. No. 524,559
Int. Cl.⁴ E04B 2/00

U.S. Cl. 156—71

2 Claims

1. A method of covering a pile with a plastic material comprising: extending a plastic sheet having first and second ends around a pile such that said first end overlaps said second end and a strip heatable by electrical resistance heating extends therebetween; sliding said first end over said second end until said plastic sheet is tightly cinched around said pile; and,

after said extending and sliding steps applying an electric current to said heatable strip so as to fuse and seal by



electrical resistance said first end to said second end forming a fused, tightly wrapped pile cover.

4,713,130

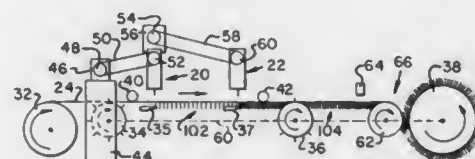
TUFTING PROCESS AND APPARATUS FOR MANUFACTURING WEATHERSTRIPPING

Robert D. Evans, Weston, Conn., and Robert C. Blezard, Harrisville, R.I., assignors to Amesbury Industries, Inc., Amesbury, Mass.

Filed Aug. 14, 1984, Ser. No. 640,667
Int. Cl.⁴ B32B 5/00

U.S. Cl. 156—72

8 Claims



1. A method of manufacturing weatherstripping, comprising the steps of: withdrawing primary backing from a supply of a length thereof and moving the withdrawn primary backing longitudinally and continuously to a location downstream of said supply; tufting a first row of tufts into said primary backing as it passes a first tufting station between said supply and said location; tufting second and third rows of tufts into said primary backing as it passes a second tufting station located between said first tufting station and said location; said second and third rows being tufted into said primary backing immediately adjacent said first row and on each side thereof; sensing any lateral displacement of said moving primary backing relative to a direction of movement of said primary backing while moving from said supply to the said location; and adjusting said primary backing laterally with respect to said direction in response to said sensing to locate said first row of tufts centrally between said second and third rows of tufts.

4,713,131

APPARATUS AND METHOD FOR ULTRASONICALLY JOINING SHEETS OF THERMOPLASTIC MATERIALS

Edward G. Obeda, Sunset Hill Rd., Brookfield Center, Conn. 06805

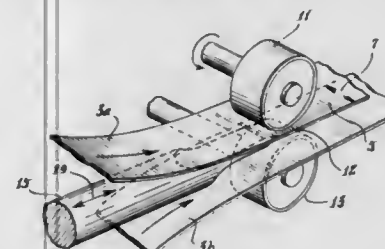
Filed Jun. 5, 1986, Ser. No. 870,920
Int. Cl.⁴ B29C 65/06, 65/08

U.S. Cl. 156—73.1

27 Claims

1. Apparatus for welding sheets of thermoplastic material

together along proximate edges of said sheets to form a welded seam, said apparatus including a supporting frame, a pair of joining rollers mounted on said frame, said rollers having parallel axes and forming a nip therebetween, said nip having an axis parallel to said axes, driving means to drive at least one of said rollers, a horn having a tip and means to reciprocate said horn and said tip in the longitudinal axis of said horn, said horn being carried by said frame with said tip in said nip and positioned such that said reciprocation is in a direction transverse to the axis of said nip, whereby proximate edges of said sheets may move through said nip with one said edge on each side of said tip, be



melted on their surfaces by frictional energy created by said reciprocal motion of said tip, and thereafter be pressed together in said nip.
24. The method of welding together proximate edges of sheets of thermoplastic material including the steps of continuously moving said proximate edges together so said sheets overlap and form a nip, melting the inner surfaces of said sheets as they are moved together, generating frictional heat energy proximate to said nip to cause said melting by rapidly reciprocating a horn tip against said inner surfaces, said reciprocation being in a direction transverse to the axis of said nip, and pressing said surface together in said nip as said melting sheets cool.

4,713,132

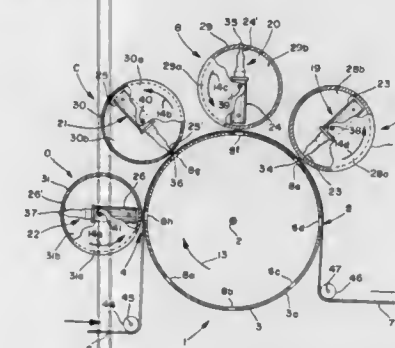
APPARATUS AND METHOD FOR ULTRASONIC BONDING OF A MOVING WEB

Kent W. Abel, Black Creek, and Gary N. Attoe, Kaukauna, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 8, 1986, Ser. No. 861,014
Int. Cl.⁴ B29C 65/08; B32B 31/20

U.S. Cl. 156—73.1

17 Claims



1. Apparatus for ultrasonically bonding a web of bondable material, comprising: web transport means for moving the web along a web travel path; the web transport means comprising a rotatable drum having an outer cylindrical surface, means for rotating the drum, and means for feeding the web onto the

outer cylindrical drum surface at a first position, and for removing the web from the outer cylindrical drum surface at a second position circumferentially spaced-apart from the first position, whereby the segment of the drum surface between the first and second position defines the web travel path; a plurality of ultrasonic bonding means having respective sonotrode bonding surfaces and disposed along the travel path; means for energizing the ultrasonic bonding means; and carrier means for selectively moving the ultrasonic bonding means into intermittent bonding contact with the web during movement of the web along the travel path, the carrier means comprising a plurality of horn rolls, each horn roll having an outer carrier surface at which a respective sonotrode bonding surface is disposed, each outer carrier surface being positionable relative to the surface of the drum so as to bring the sonotrode bonding surface into bonding contact with a web carried on the outer cylindrical drum surface between the first and second positions thereof, and means to rotate the horn rolls to bring the sonotrode bonding surface into the bonding contact position; such that the web is multiply ultrasonically bonded during travel along the travel path by at least one of: (i) successive bonding contacts with a bonding site on the web by different ones of the plurality of ultrasonic bonding means, and (ii) simultaneous bonding contacts with a plurality of different web bonding sites by different ones of the ultrasonic bonding means.

11. A method of ultrasonically bonding a web, comprising: feeding the web to a first position along a web travel path defined by an outer cylindrical surface of a rotatable drum; rotating the drum; providing a plurality of ultrasonic bonding means along the path; the plurality of ultrasonic bonding means comprising a plurality of horn rolls, each horn roll (i) having an outer cylindrical surface comprising a sonotrode bonding surface portion and (ii) being positionable relative to the drum so that the outer cylindrical surface of the horn roll is positioned to engage its associated sonotrode bonding surface portion into bonding contact with a web carried on the outer cylindrical surface of a drum, the horn rolls being concurrently rotated during rotation of the drum; energizing the ultrasonic bonding means at least when same are in bonding position; engaging the ultrasonic bonding means with the web in bonding position during movement of the web along the travel path, to multiply ultrasonically bond the web by at least one of the steps of: (i) successively engaging the same bonding site on the web by different ultrasonic bonding means, and (ii) simultaneously engaging different web bonding sites by different ultrasonic bonding means; and removing the web from the outer cylindrical surface at a second position circumferentially spaced-apart from the first position.

4,713,133

METHODS OF ADHERING A SELF-FUSING TAPE TO A SUBSTRATE

Eric G. Kent, Ontario, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 768,110, Aug. 21, 1985, abandoned, and Ser. No. 768,111, Aug. 21, 1985, abandoned, each is a continuation-in-part of Ser. No. 636,719, Aug. 1, 1984, abandoned, which is a continuation-in-part of Ser. No. 465,174, Feb. 9, 1983, abandoned. This application Aug. 6, 1986, Ser. No. 893,809

Claims priority, application Canada, Mar. 15, 1982, 398,303
Int. Cl.⁴ B32B 31/16, 27/06; C08L 9/00, 23/04

U.S. Cl. 156—162

17 Claims

1. The process of affixing to a substrate a flexible layer having insufficient tack to self-bond in the relaxed state, said

layer consisting of a raw polymer mixture selected from the group consisting of (all parts being parts by weight) (a) a mixture of from about 15 to about 30 parts of a polymer of ethylene having a density of from about 0.945 to about 0.965 gm/cm³ with from about 70 to about 85 parts of elastomeric polymer, (b) a mixture of from about 15 to about 30 parts of a linear low density polymer of ethylene having a density of from about 0.91 to about 0.94 gm/cm³ with from about 70 to about 85 parts of elastomeric polymer, and (c) a mixture of from about 15 to about 25 parts of isotactic polypropylene with from about 75 to about 85 parts of elastomeric polymer, said elastomeric polymer consisting of from about 50 to 100 parts by weight of an isobutylene-isoprene polymer and from 0 to about 50 parts by weight of one or more polymers selected from (i) natural rubber, and (ii) homopolymer of isobutylene having a molecular weight from about 50,000 to about 100,000, wherein said flexible layer is subjected to a stretching elongation of at least about 50% immediately prior to contact with the substrate, applying the elongated layer to the substrate in a wrapping operation and allowing overlapping layers of said flexible layer to bond to and fuse with each other.

4,713,134

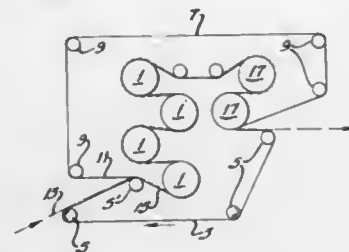
DOUBLE BELT BONDING OF FIBROUS WEB COMPRISING THERMOPLASTIC FIBERS ON STEAM CANS

Alfred T. Mays, East Windsor, and Nicholas Wereson, Spotswood, both of N.J., assignors to Chicopee, New Brunswick, N.J.

Continuation of Ser. No. 608,253, May 7, 1985, abandoned. This application Aug. 28, 1985, Ser. No. 771,138
Int. Cl.⁴ D04H 3/08

U.S. Cl. 156—181

3 Claims



1. A method of producing a high cross directional strength fused nonwoven fabric comprising thermoplastic fibers, said method comprising:

- superimposing a fibrous web comprising at least 5 percent thermoplastic fibers on a first endless carrier belt;
- superimposing a second endless carrier belt on said web so as to form a two belt laminate with said web sandwiched between the first and second endless carrier belts;
- directing said two belt laminate to travel in a path consecutively around substantial portions of first and second heated rolls, which are offset from each other and spaced apart a sufficient distance to avoid a compression nip between said first and second heated rolls, the peripheral surfaces of said first and second heated rolls cooperating to provide a portion of said path whereby said two belt laminate travels out of contact with said first and second heated rolls, so as to initially apply heat to a first side of said web as said two belt laminate is directed around said first heated roll and thereby fuse the thermoplastic fibers to fibers adjacent the first side thereof and to thereafter apply heat to a second side of said web as said two belt laminate is directed around said second heated roll and thereby fuse the thermoplastic fibers to fibers adjacent the second side thereof; and
- cooling the two belt laminate after it has traveled around the first and second heated rolls so as to cool the fibers in the web sandwiched between the first and second endless carrier belts.

2. Apparatus for forming a high cross directional strength

nonwoven fabric comprising thermoplastic fibers, said apparatus comprising:

- a frame;
- first and second heated rolls rotatably mounted to said frame in offset relationship to each other, said rolls being spaced apart a sufficient distance to avoid a compression nip between said first and second rolls;
- a first endless carrier belt means mounted to said frame for travel in a path consecutively around substantial portions of said first and second heated rolls;
- a second endless carrier belt means mounted to said frame for travel along said path around substantial portions of said first and second heated rolls adjacent to said first belt means;
- means for superimposing a fibrous web, comprising at least 5 percent thermoplastic fibers, onto said first belt means so that said first and second belts form a two belt laminate with said web sandwiched therebetween, said two belt laminate being caused to travel in said path consecutively around a substantial portion of said first heated roll to initially apply heat to a first side of said web and thereby fuse the thermoplastic fibers to fibers adjacent the first side thereof and then around a substantial portion of said second heated roll to apply heat to a second side of said web and thereby fuse the thermoplastic fibers to fibers adjacent the second side thereof;
- the peripheral surfaces of said first and second heated rolls cooperating to provide a portion of said path whereby said two belt laminate travels out of contact with said first and second heated rolls; and
- cooling means for cooling said two belt laminate after it has travelled around said first and second heated rolls to cool the fibers in the web sandwiched between said first and second endless carrier belts.

4,713,135

PROCESS FOR SEAMING COATED CELLULOSE WEBS

Douglas J. Bridgeford, Champaign, Ill., assignor to Teepak, Inc., Oak Brook, Ill.

Filed Sep. 9, 1985, Ser. No. 774,108
Int. Cl.⁴ B29C 53/00; C09J 5/02

U.S. Cl. 156—218

24 Claims

1. In a process for producing a cellulosic tubular structure suitable for stuffing to form a sausage wherein the longitudinal edges of a web of cellulose containing material are overlapped to form a tube and sealed by applying an aqueous zinc chloride solution between said overlapped edges, the improvement comprising applying at least about 0.002 g of zinc chloride per cm² of lapped seam between said overlapped edges, sealing said overlapped edges, at a temperature of from about 0° C. to about 125° C., by pressing together said overlapped edges having aqueous zinc chloride solution between and retaining at least 0.002 g/cm² of zinc chloride at said overlapped seam of said casing.

4,713,136

METHOD FOR MAKING A SPONGE COLLECTING DEVICE

Felipe S. Li, Lake Zurich, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 407,391, Aug. 12, 1982, abandoned, which is a division of Ser. No. 223,187, Jan. 7, 1981, abandoned. This application Aug. 27, 1985, Ser. No. 769,652

Int. Cl.⁴ B32B 31/08, 31/18

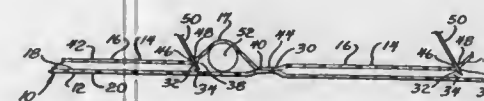
U.S. Cl. 156—229

2 Claims

1. A method of constructing a sponge collecting device, comprising the steps of:
providing a backing sheet of flexible material having a front surface, a rear surface, a pair of side edges, and a pair of end edges;
placing a frong sheet of flexible material over the front surface of the backing sheet;

bonding the front sheet to the backing sheet along a plurality of lateral lines extending substantially between the side edges of the backing sheet and spaced along the length of the sheets;

severing the front sheet along spaced upper and lower lateral lines on opposed sides of the lateral bonding lines while increasing the length of the front sheet at a location intermediate the bonding lines and the lower severance lines by moving the front sheet away from the backing



sheet prior to severing by inserting an elongated member between the front sheet and backing sheet such that the portions of the front sheet intermediate the bonding lines and the lower severance lines have a sufficient length to overlap the portions of the front sheet intermediate the bonding lines and the upper severance lines; and bonding side portions of the front sheet to the backing sheet along longitudinal lines extending from the lateral bonding lines to the upper severance lines adjacent the side edges of the backing sheet.

4,713,137

RESIN COMPOSITION AND A PROCESS FOR PREPARING LAMINATES THEREFROM

Diane Sexton, Lauf, Fed. Rep. of Germany, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 30, 1986, Ser. No. 892,022

Claims priority, application United Kingdom, Jul. 31, 1985, 8519290

U.S. Cl. 156—233

Int. Cl.⁴ B05D 5/12

8 Claims

1. A process for preparing electrical laminates which comprises the steps of (a) impregnating a reinforcing web with an epoxy resin composition containing an epoxy resin possessing more than one 1,2-epoxy group, a hardener for the epoxy resin and an organic solvent; (b) heating the thus prepared prepreg at a temperature sufficient to cure the epoxy resin and (c) subsequently fabricating the prepreg into an electrical laminate by laminating one or more layers of the prepreg with electrical conductive material and heating the thus prepared laminate at elevated temperature and pressure; wherein the hardener is a polyhydric phenolic hardener and the epoxy resin composition contains an acid having a pKa at 25° C. of less than 2.5 or an ester or anhydride of such acid.

4,713,138

METHOD OF PRODUCING ABRASION-RESISTANT DECORATIVE LAMINATE

Israel S. Ungar, Randallstown; Nelson L. O'Neill, Crofton; Herbert I. Scher, Randallstown, and Robin D. O'Dell, Pasadena, all of Md., assignors to Nevamar Corporation, Odenton, Md.

Filed Dec. 26, 1984, Ser. No. 686,350

Int. Cl.⁴ C09J 5/02

U.S. Cl. 156—307.4

19 Claims

1. A method of providing a paper facing sheet for use as the uppermost sheet in the manufacture of an abrasion-resistant decorative laminate, the method consisting essentially of preparing in mixture of a liquid thermosettable impregnating resin and an abrasion-resistant composition, said mixture during subsequent coating and impregnation having a viscosity no greater than about 200 centipoise, said abrasion-resistant composition comprising a mixture of (1) an abrasion-resistant hard mineral of fine particle size in quantity sufficient to provide an abrasion-resistant layer without interfering with visibility and (2) binder material for said mineral which binder material has the properties of withstanding the subsequent laminating conditions and being compatible with said thermosetting resin, said

binder being present in an amount sufficient to bind said abrasion-resistant mineral to the surface of an unsaturated paper sheet, and said binder material suspending said abrasion-resistant hard mineral particles in said liquid thermosettable impregnating resin;

effecting coating and impregnating in essentially one step by coating said mixture of said liquid thermosettable impregnating resin and said abrasion-resistant composition over the facing surface of said unsaturated paper sheet at a rate such that said paper sheet becomes substantially saturated with said liquid resin, and said abrasion-resistant composition becomes deposited on said facing surface in an ultrathin layer, said mixture having a viscosity no greater than about 200 centipoise during saturation of said paper sheet; and

drying said coated and impregnated paper sheet at an elevated temperature and thereby obtaining a paper facing sheet for use as the uppermost sheet in the manufacture of a decorative laminate.

4,713,139

APPARATUS FOR PRODUCING FLEXIBLE COMPOSITE MATERIAL

Roland A. Ganga, Joinville Le Pont, France, assignor to Atochem, France

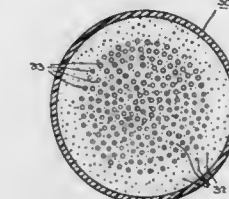
Division of Ser. No. 624,044, Jun. 25, 1984, Pat. No. 4,614,678. This application Dec. 19, 1986, Ser. No. 911,002

Claims priority, application France, Jan. 28, 1983, 83 10632; Apr. 10, 1984, 84 05627

Int. Cl.⁴ B29C 47/02

U.S. Cl. 156—500

5 Claims



1. Apparatus for preparing a composite article comprising a flexible sheath covering a roving of fibers impregnated with thermoplastic powder melting at or above the melting point of the flexible sheathing material, which apparatus comprises means for holding and supplying roving continuously; a holding tank capable of fluidizing the thermoplastic powder, and wherein the thermoplastic powder is introduced onto and into the peripheral surface of the roving to coat the individual fibers of the roving with the powder, the holding tank having a first lock capable of receiving roving from the holding and supply means and of keeping gas from escaping from the holding tank, and the holding tank having a second lock capable of receiving roving from the inside of the holding tank and permitting the roving to pass out of the holding tank and capable of preventing gas from escaping from the holding tank; a die positioned after the second lock, the die being capable of receiving roving from the lock; an extruder feeding plastic material to one die and the die covering the roving with the plastic material to form sheathing around the roving; and a take-up means capable of continuously receiving the sheathed roving.

4,713,140

LASER LUMINESCENCE MONITOR FOR MATERIAL THICKNESS

Zu-Jean Tien, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 2, 1987, Ser. No. 20,402

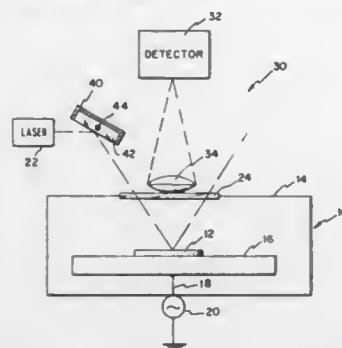
Int. Cl.⁴ H01L 21/306; B44C 1/22; B05D 3/06; B05C 11/00
U.S. Cl. 156—626

39 Claims

25. A method for monitoring a change in thickness of a first material layer with a first bandgap energy, said first material layer for disposal over a second material layer formed on a

wafer, with said second material layer having a different bandgap energy, wherein at least one of said material bandgaps is a direct bandgap, comprising the steps of:

- changing the thickness of said first material layer having said first bandgap energy at a particular location over said second material layer;
- generating a beam of energy of an intensity and wavelength sufficient to pump said at least one direct bandgap material layer to a higher energy state;



directing said beam of energy to impinge at an angle on to the surface and to penetrate said wafer at said location where said first material thickness is being changed; and detecting induced luminescence from said at least one direct bandgap material layer to determine when to alter said thickness changing step.

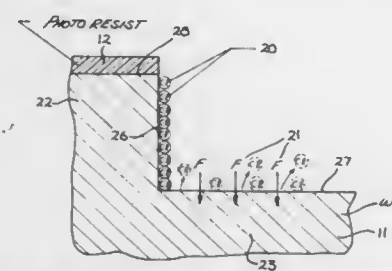
4,713,141

ANISOTROPIC PLASMA ETCHING OF TUNGSTEN
Chi-Hwa Tsang, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 22, 1986, Ser. No. 910,078

Int. Cl.⁴ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156-643

16 Claims



1. A process for anisotropic etching of tungsten, comprising the steps of:

- forming a plasma gas mixture having fluorinated and chlorinated gases;
- subjecting said tungsten to said plasma gas mixture;
- said chlorinated gases forming along side walls developed during said etching process and preventing etching of said side walls;
- whereby anisotropic etch of said tungsten is achieved.

4,713,142

METHOD FOR FABRICATING EPROM ARRAY

Allan T. Mitchell, Garland, and James L. Paterson, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 729,439, May 1, 1985, Pat. No. 4,597,060.
This application Apr. 4, 1986, Ser. No. 848,411

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00; C23F 1/02
U.S. Cl. 156-653

7 Claims

1. A process for forming a nonvolatile memory comprising the steps of:

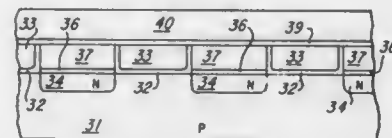
- providing a semiconductor substrate;

forming conductive strips on the surface of but insulated from said substrate;

forming source/drain regions in said substrate between said conductive strips;

depositing a conformal layer of insulating material on the surface of said substrate and said conductive strips;

planarizing said layer of insulating material to a point where the top surface of said layer of insulating material is substantially even with the top surface of said conductive strips;



forming a layer of conductive material on the surface of said conformal layer and on the surface of but insulated from said conductive strips; and

etching said layer of conductive material and said conductive strips to form word lines from said layer of conductive material running perpendicular to said conductive strips and to form floating gates from said conductive strips disposed beneath said word lines.

4,713,143

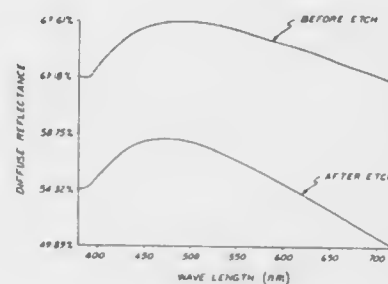
ETCHING OF VACUUM METALLIZED INDIUM

Richard C. Eisfeller, Greenland, N.H., assignor to Davidson Texttron Inc., Dover, N.H.

Filed Apr. 16, 1987, Ser. No. 39,064

Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06; C23F 1/02
U.S. Cl. 156-655

16 Claims



1. In a process of manufacturing a corrosion resistant vacuum metallized article in which a dielectric substrate surface has vacuum deposition thereon of a corrosive metal and wherein vacuum deposition of the metal continues only until there is formation of discrete islands of said metal which visually appear as a continuous film while having channels between discrete islands to maintain electrically non-conductive the film over the substrate, the improvement comprising: etching the vacuum deposited material with a solvent which dissolves residuals of metal from the channels to clear the channels so as to expose clean bonding surfaces on the substrate at the base of the channels and applying a clear resinous protective dielectric top coat to both the surfaces of the discrete islands and to the clean bonding surfaces and drying the top coat to form a protective film encapsulating said discrete islands and bonded to the substrate at the base of the channels by a bond force throughout the surface extent of the channel base greater than two orders of magnitude in strength as compared to the bond force between the top coat and the discrete islands.

4,713,144

COMPOSITION AND METHOD FOR STRIPPING FILMS FROM PRINTED CIRCUIT BOARDS

Harold Schiller, Long Beach, Calif., assignor to Ardrex Inc., La Mirada, Calif.

Filed Aug. 1, 1986, Ser. No. 893,027

Int. Cl.⁴ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156-656

11 Claims

5. In a method of rapidly stripping solder and the underlying tin-copper alloy from the copper substrate of a printed circuit board, the steps of:

- providing an aqueous solution consisting essentially of about 5 to 50 volume percent of 69% nitric acid aqueous solution, about 1 to 50 volume percent of 45% ferric nitrate aqueous solution, about 5 grams per liter to saturation of sulfamic acid, and the balance water; and
- applying the solution to the printed circuit board.

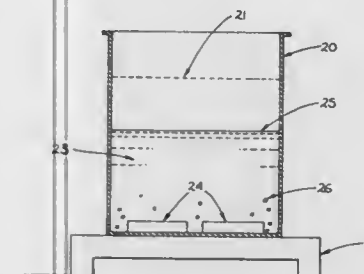
4,713,145

METHOD OF ETCHING ETCH-RESISTANT MATERIALS
Vikram N. Doshi, Costa Mesa, Calif., assignor to Gulton Industries, Inc., Costa Mesa, Calif.

Filed Dec. 19, 1986, Ser. No. 943,683

Int. Cl.⁴ B44C 1/22; C23F 1/00
U.S. Cl. 156-667

8 Claims



1. A method for etching the surface of an item, comprising the steps of:

- placing a quantity of phosphoric acid solution in a vessel;
- heating the vessel for a period of time until the liquid phosphoric acid solution jells and a white precipitate forms, resulting in a gel-like precipitated form of phosphoric acid;
- submerging the item in the gel-like precipitated form of phosphoric acid;
- maintaining the gel-like precipitated form of phosphoric acid at an elevated temperature; and
- removing the item from the gel-like precipitated form of the phosphoric acid after a period of time, the length of which period of time depends on the amount of etching that is desired.

4,713,146

DRIVE SHAFT ASSEMBLY

Matthew C. Ek, Chico, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 14, 1985, Ser. No. 691,087

U.S. Cl. 159-4.2
Int. Cl.⁴ B01D 1/18

22 Claims

1. In a machine including a drive means for imparting torque at a high rotational speed to a drive assembly for transmitting said torque to a work piece which is subjected to variable imbalance conditions during normal operation of the machine, the improvement in the drive shaft assembly to accommodate such imbalance conditions comprising:

- an elongated inner drive shaft having opposite ends, one of said ends being provided with engagement means engaged with said drive means for receiving the torque therefrom

and the opposite end being cooperatively engaged with said work piece for transmitting the torque thereto;

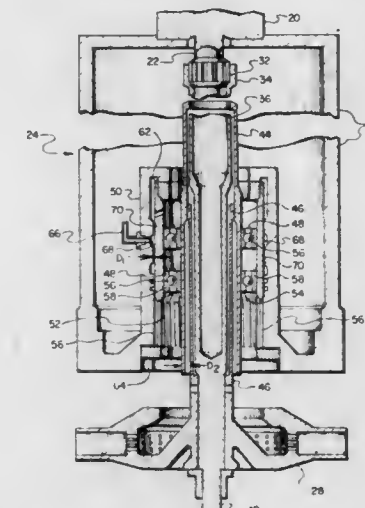
a substantially cylindrical, hollow, outer shaft circumferentially surrounding said drive shaft and coaxial therewith, said outer shaft having an inner surface spaced apart from an outer surface of said drive shaft and said outer shaft being connected to said drive shaft;

first spring means for resiliently inhibiting movement of said outer shaft out of its coaxial position with said drive shaft;

a bearing carrier member circumferentially surrounding and extending coaxially with said outer shaft;

bearing means located circumferentially about an outer surface of said outer shaft for permitting rotational movement of said outer shaft, said bearing means being retained in position by an inner surface of said bearing carrier member and the outer surface of said outer shaft;

lubrication means for providing a flow of lubricant to said bearing means;



second spring means for resiliently inhibiting movement of said bearing carrier member from its coaxial position with said outer shaft;

a support structure supporting said drive means, said support structure including a bore defined by an inner surface circumferentially surrounding said bearing carrier member and second spring means, the bore extending substantially coaxially with both of said shafts and said bearing carrier member, the outer surface of said bearing carrier member and inner surface of the bore cooperatively forming an annular fluid flow passageway, said annular fluid flow passageway being bounded on either side annular, axially extending barriers, each barrier forming a restricted fluid flow path; and

means for providing a pressurized flow of a viscous fluid to said annular fluid flow passageway during normal operation of the machine such that said fluid will flow axially across each barrier forming a squeeze film damper to resist lateral movement of said bearing carrier member.

4,713,147

EXTENDED NIP PRESS WITH DISPLACEABLE CENTER OF GRAVITY FOR THE SUPPORTING FORCE

Esko Saarinen, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

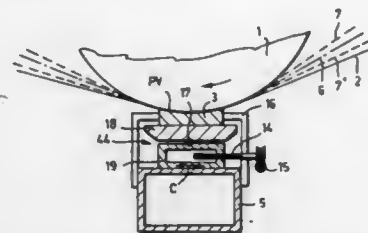
Filed Apr. 29, 1983, Ser. No. 489,830

Claims priority, application Finland, May 5, 1982, 821584
Int. Cl.⁴ D21F 3/06

14 Claims

1. An extended nip press for a paper machine for removing water from a wet paper, cardboard or similar fibrous or porous web, said press comprising a rotating press roll,

at least one stationary loading shoe parallel to the axis of said press roll and pivotable around an axis parallel to said axis, said loading shoe together with said press roll forming an extended press zone,
at least one dewatering felt passing between said press roll and a band for passing the web to be dewatered through said press zone, and



a support means located between said loading shoe and its supporting frame for applying a supporting force on said loading shoe, said supporting force pressing said loading shoe against said press roll, said support means being provided with transfer elements for displacing the centre of gravity of the supporting force acting on said loading shoe in the direction of movement of the web to be dewatered.

4,713,148

LIGHT CONSTRUCTION PLUG FOR COKE OVEN DOORS

Ludwig Offermann, Olfen, Fed. Rep. of Germany, assignor to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany
PCT No. PCT/EP85/00096, § 371 Date Nov. 12, 1985, § 102(e)
Date Nov. 12, 1985, PCT Pub. No. WO85/04180, PCT Pub. Date Sep. 26, 1985

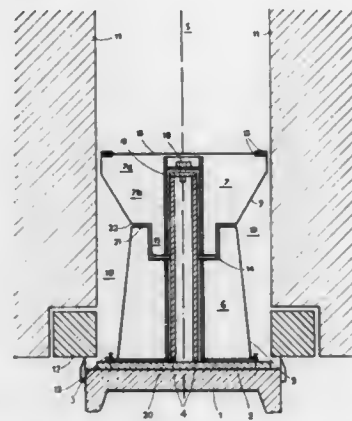
PCT Filed Mar. 12, 1985, Ser. No. 801,151

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 34092242

Int. Cl.⁴ C10B 25/06

U.S. Cl. 202-248

15 Claims



1. A coke oven door in combination with a coke oven having a coke oven chamber and spaced apart wall portions defining a chamber opening therebetween; said coke oven door comprising a door body for engaging over the chamber opening to close the opening; at least a first and a second box-like metallic hollow body connected to and supported by said door body and closely engaged with each other, said first hollow body being adjacent to said door body and said second hollow body being spaced away from said door body so that said at least first and second hollow body extend serially into the chamber between the wall portions to form a plug extending inwardly of the chamber with said door body engaged over the chamber opening with the hollow bodies and said door body are in a closed position; said first hollow body including a pair

of laterally spaced outside walls and said second hollow body including a pair of laterally spaced outside walls, said outside walls of said first hollow body cooperating with said outside walls of said second hollow body and said chamber spaced apart wall portions to define laterally spaced concave and vertically extending gas pressure equalizing channels; said at least first and second hollow body being detachable from each other and detachably connected to said door body to allow for replacement whereby a horizontal cross-sectional shape of said pressure equalizing channels can be changed.

4,713,149

METHOD AND APPARATUS FOR ELECTROPLATING OBJECTS

Shigeo Hoshino, 1244-7, Mukogaoka, Miyama-Ku, Kawasaki-shi, Kanagawa-ken 213, Japan

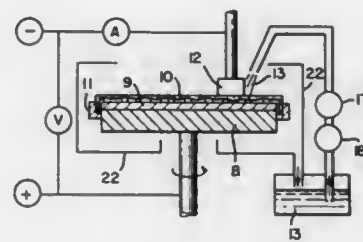
Filed Nov. 21, 1986, Ser. No. 933,167

Claims priority, application Japan, Nov. 26, 1985, 60-263888

Int. Cl.⁴ C25D 5/22, 17/00

U.S. Cl. 204-23

13 Claims



1. An apparatus for electroplating objects comprising an anode, an object to be plated serving as a cathode, said anode comprising a carbon fiber material and said anode placed adjacent said object, means for supplying a plating solution to the interface of said object and said anode through the carbon fiber material of said anode, means for supplying an electric current between said anode and said cathode; and means for providing relative motion between said anode and said object so that during the plating operation movement between the object to be plated and the carbon fiber material of the anode can be maintained.

4,713,150

PROCESS FOR PREPARING A PART FOR COLOR ANODIZATION

Lloyd Hornbostel, Beloit, and Dale Butrymowicz, Janesville, both of Wis., assignors to Parker Pen Ltd., East Sussex, England

Filed Nov. 8, 1985, Ser. No. 796,195

Int. Cl.⁴ C23C 28/00

U.S. Cl. 204-38.3

5 Claims

1. A method of forming an ornamental coating on an article of manufacture comprising the steps of:
providing a substrate having a metallic surface consisting of the metal brass;
plating said surface with a first layer of nickel to a thickness of between two to five microns;
sputter-depositing over said first layer a second layer of niobium to a thickness of between one to five microns;
cleaning said second layer; and
color anodizing said second layer in a solution of ammonium sulphate and water.

4,713,151

ELECTRODEPOSITION OF LITHIUM

David J. Smith, Kingston, Canada, assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 31, 1986, Ser. No. 925,327

Int. Cl.⁴ C25D 3/54; H01M 6/14, 6/16

U.S. Cl. 204-58.5

20 Claims

17. A process for electrodepositing lithium comprising electrolyzing a nonaqueous solution which comprises at least one lithium salt and a minor amount of at least one triglyceride dissolved in liquid sulfur dioxide, wherein at least one of the three fatty acid residues of said triglyceride is that of ricinoleic acid.

4,713,152

METHOD AND SYSTEM FOR THE REMOVAL OF OXIDES OF NITROGEN AND SULFUR FROM COMBUSTION PROCESSES

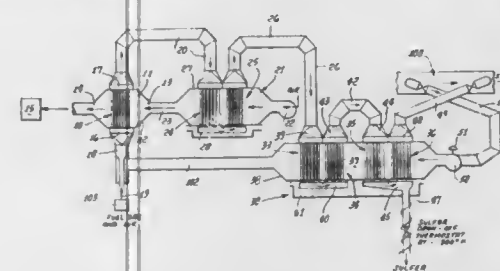
John V. Walsh, Glendora, Calif., assignor to VSM Associates, Inc., Covina, Calif.

Filed Mar. 9, 1987, Ser. No. 23,724

Int. Cl.⁴ C25F 5/00

U.S. Cl. 204-130

26 Claims



1. In a process for removing oxide contaminants from combustion gas, and employing solid electrolyte reactor means, the steps that include:

- flowing the combustion gas into a zone containing said solid electrolyte means and applying a voltage to said means and at elevated temperature to thereby separate oxygen via said solid electrolyte means,
- removing oxygen from said zone in a first stream and removing hot effluent gas from said zone in a second stream, the effluent gas containing contaminant,
- and pre-heating the combustion gas flowing to said zone by passing it in heat exchange relation with said hot effluent gas.

4,713,153

PROCESS AND APPARATUS FOR CLEANING BY ELECTROCHEMICAL PICKLING WITH ALTERNATING CURRENT OF SPECIFIED FREQUENCY

Ludo Adriaensen, Deerlijk, and Bernard Decontere, Beveren Lele, both of Belgium, assignors to N. V. Bekaert S. A., Zvevegem, Belgium

Filed Jun. 20, 1986, Ser. No. 876,498

Claims priority, application United Kingdom, Jul. 12, 1985, 8517606

Int. Cl.⁴ C25F 1/06

U.S. Cl. 204-144.5

13 Claims

1. A process for cleaning a carbon steel strand with more than 0.30% C by means of an electrochemical pickling method comprising:

- passing the strand to be cleaned through an electrolytic pickling bath comprising an aqueous solution of hydrochloric acid, and subjecting the strand therein to the action of an alternating current having a density of at least 25 A/dm² and a frequency of at least 200 Hertz, thereby producing a substantially bare strand.

4,713,154

CONTINUOUS ANNEALING AND PICKLING METHOD AND APPARATUS FOR STEEL STRIPS

Norio Ohta; Fumiya Yanagishima; Toshikazu Kaihara; Akira Kishida; Kuniaki Sato, and Masanobu Ochiai, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan
Filed Aug. 5, 1986, Ser. No. 893,476

Claims priority, application Japan, Aug. 8, 1985, 60-173134; Jun. 27, 1986, 61-149782

Int. Cl.⁴ C25F 1/06, 7/00

U.S. Cl. 204-145 R

8 Claims

1. A method of continuously annealing and pickling cold rolled stainless steel strips successively transferred through a continuous annealing apparatus including heating and cooling zones and a pickling apparatus, wherein annealing the strips is effected in reducing atmosphere consisting of hydrogen within a range of 3-15% and nitrogen of substantially the remainder and thereafter pickling is effected at least by nitric acid electrolyte treatment.

4,713,155

METHOD FOR PREPARATION OF PHOSPHATIDE CONCENTRATES FROM VEGETABLE OILS

Norair S. Arutjunian; Elena P. Kornena; Robert V. Kazarian; Natalya A. Ponomareva; Grigory V. Redko; Lidia T. Sakhno, and Irina S. Zhidkova, all of Krasnodar, U.S.S.R., assignors to Krasnodarsky Politekhichesky Institut, Krasnodar, U.S.S.R.
Filed Jul. 10, 1986, Ser. No. 884,038

Int. Cl.⁴ C25F 1/00

U.S. Cl. 204-155

9 Claims

1. A method for preparation of phosphatide concentrates from vegetable oils comprising treating crude vegetable oil with a hydrating agent selected from the group consisting of water and aqueous solutions of electrolytes, separating phospholipids from hydrated vegetable oil providing a phospholipid sediment, passing said sediment through an electromagnetic field with a strength of 40 000-24 000 Amperes/meter at 5°-65° C., and drying the treated phospholipid sediment.

4,713,156

PROCESS FOR REGULATING AN ELECTRO-DIALYZER AND IMPROVED ELECTRODIALYSIS APPARATUS

Jean-Yves Gal, 75 impasse du Dragon, Le Clos Saint Georges, 34000 Montpellier; Jean-Michel Chiapello, 4 rue Castel Moton, 34000 Montpellier; Martial Peyrot, 87 avenue de la Révolution, and Etienne Tourneux, 87 rue Pierre Brossollette, both of 87000 Limoges, all of France

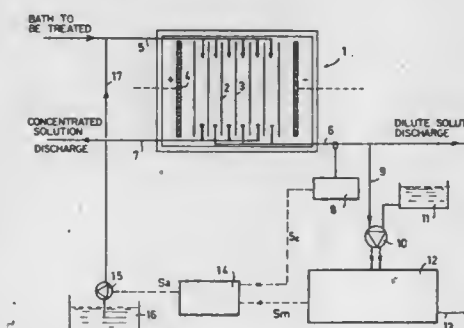
Filed Jan. 2, 1987, Ser. No. 283

Claims priority, application France, Jan. 2, 1986, 86 00072

Int. Cl.⁴ B01D 13/02; C02F 1/46

U.S. Cl. 204-182.4

12 Claims



1. A process for regulating the electro-dialysis of a cyanide metal bath having a stack of ion exchange membranes in an electric field, an intake for the cyanide bath to be treated, a discharge for the concentrated solution and a discharge for the dilute solution, the process comprising measuring the content of free cyanide in the dilute solution at said discharge and

adding to the cyanide bath at said intake a solution of cyanide containing free cyanide ions as an inverse function of the measured content.

4,713,157

COMBINED INTEGRATED CIRCUIT/FERROELECTRIC MEMORY DEVICE, AND ION BEAM METHODS OF CONSTRUCTING SAME

Larry McMillan; Carlos Paz de Araujo, both of Colorado Springs, Colo., and George A. Rohrer, Chassell, Mich., assignors to Ramtron Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 695,969, Jan. 29, 1985, which is a continuation-in-part of Ser. No. 133,338, Mar. 24, 1980, which is a continuation-in-part of Ser. No. 658,199, Feb. 17, 1976, Pat. No. 4,195,355, which is a continuation-in-part of Ser. No. 316,417, Dec. 18, 1972, Pat. No. 3,939,292, which is a continuation-in-part of Ser. No. 076,059, Sep. 28, 1970, Pat. No. 3,728,694. This application May 14, 1985, Ser. No. 733,939

Int. Cl.⁴ C23C 14/00

U.S. Cl. 204—192.11 13 Claims

1. A method of depositing a ferroelectric material by ion beam techniques, comprising:

- (a) mounting a target bed of a ferroelectric material in an ion beam machine;
- (b) mounting a substrate a predetermined distance from said target bed within said ion beam machine;
- (c) evacuating said ion beam machine to a predetermined vacuum level;
- (d) directing a beam of high energy particles at said target bed whereby molecular sized amounts of said ferroelectric material are ejected from said target bed and subsequently deposited on said substrate;
- (e) said ferroelectric material being selected from the group consisting of metal nitrates, metal nitrites, metal phosphates, and sulfates;
- (f) said target bed comprising a support member having an amount of ferroelectric materials substantially tightly adhered to one surface thereof; and
- (g) said supporting member being substantially planar and having a recess formed in one surface thereof for containing said ferroelectric material.

4,713,158

SYSTEM FOR APPLIED CURRENT CATHODIC PROTECTION OF A STRUCTURE

Maurice Lambert, Lardy, France, assignor to Service National: Gaz de France, Paris, France

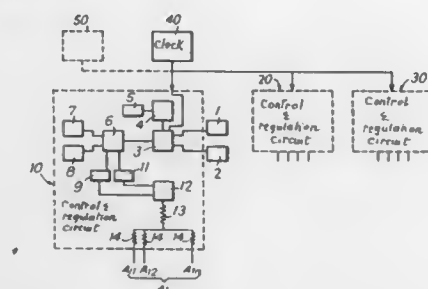
Filed Jul. 21, 1986, Ser. No. 887,214

Claims priority, application France, Jul. 23, 1985, 85 11259

Int. Cl.⁴ C23F 13/00

U.S. Cl. 204—196

8 Claims



1. An applied current cathodic protection system for a structure placed in an electrolyte, the system comprising:
 - a cathode constituted by the structure to be protected;
 - a group of anodes isolated from the structure and in contact with the electrolyte in which said structure is placed;
 - a DC generator connected between the cathode-forming

structure and said group of anodes in contact with the electrolyte;

a reference electrode

a control and regulation circuit, connected to said reference electrode and said generator, for adjusting the potential delivered by said generator and consequently for adjusting the current applied to said anodes;

means for bringing into service in a cyclic manner the circuit for controlling and regulating said generator;

means for reading the potential provided by the reference electrode and for calculating the potential difference between the protected structure and the electrode potential as read;

comparator means for comparing the calculated potential difference with a first reference potential constituting an upper threshold and with a second reference potential constituting a lower threshold; and

means for adjusting the absolute value of output voltage delivered by the generator in a single step during each cycle of the cyclic operation of said circuit for controlling and regulating the generator, said means increasing said absolute value by a fixed predetermined value different from zero if the calculated potential difference is less negative than the upper threshold, decreasing said absolute value by a fixed predetermined value different from zero if the calculated potential difference is more negative than the lower threshold and adding to said absolute value a predetermined value equal to zero if the calculated potential difference is between the lower and upper thresholds.

4,713,159

COMPACT AND CLEANABLE APPARATUS FOR PREVENTING SCALE FORMATION IN LIQUID SYSTEMS

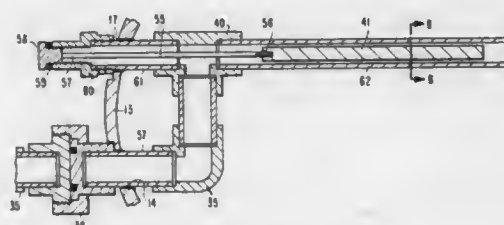
Robert B. Trullitt, West Lafayette, and V. Bruce Junius, Lafayette, both of Ind., assignors to Fluid Mechanics, Lafayette, Ind.

Filed May 7, 1986, Ser. No. 860,746

Int. Cl.⁴ C23F 13/00

U.S. Cl. 204—197

5 Claims



1. Apparatus for stabilizing water comprising:

a container for holding water and having an inlet for receiving untreated water and an outlet through which treated water may flow from said container;

inlet pipe means mounted to said inlet and extending into said container with said inlet pipe means having a bottom end;

outlet pipe means mounted to said outlet;

sleeve means mounted to and sealingly extending out of said container at a location separate from said inlet pipe means and said outlet pipe means, said sleeve means having a removable external cap; and,

treatment means suspendedly mounted in said container having a conduit connected to said bottom end of said inlet pipe means to receive said untreated water therefrom and further including a metal treatment member removable through said sleeve means once said cap is removed, said conduit circumferentially surrounding said metal treatment member with said member having surfaces exposed to said untreated water passing through said conduit, and wherein;

said conduit is suspendedly mounted within said container and is in liquid communication with said inlet pipe means to receive all of said untreated water therefrom, said metal member is located within said conduit and has a plurality of longitudinally extending edges in contact with said conduit forming a plurality of separate passages between said metal member and said conduit extending the length of said metal member and through which said untreated water passes contacting said metal member prior to exiting said conduit into said container, all of said untreated water being adapted to contact said metal member and flow in one direction along the entire length thereof prior to release into said container.

4,713,160

CURRENT LEAKAGE APPARATUS IN ELECTROLYTIC CELL

Peter J. Moreland, Frodsham, England, assignor to Imperial Chemical Industries PLC, London, England

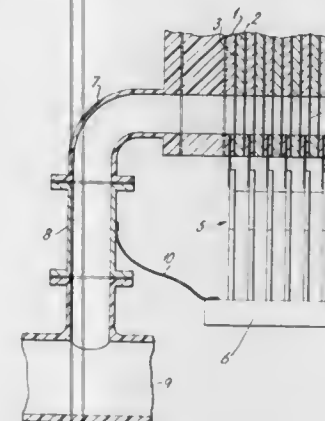
Filed Dec. 13, 1985, Ser. No. 808,561

Claims priority, application United Kingdom, Dec. 28, 1984, 8432704

Int. Cl.⁴ C25B 15/08, 9/04

U.S. Cl. 204—231

2 Claims



1. An electrolytic cell comprising at least one anode and at least one cathode and a separator positioned between each anode and adjacent cathode to form in the cell separate anode compartments and cathode compartments, and pipework for charging liquor to and/or for removing liquor from said anode compartments and pipework for charging liquor to and/or removing liquor from said cathode compartments, in which at least one of said pipeworks is made in part of an electrically non-conducting material and which also comprises an electrically conducting electrode material positioned in said pipework, and in which said electrode material is positioned in the pipework for charging liquor to and/or removing liquor from said anode compartments and is connected directly or indirectly to said anode by means of an electrical connection external of the electrolytic cell.

4,713,161

DEVICE FOR CONNECTION BETWEEN VERY HIGH INTENSITY ELECTROLYSIS CELLS FOR THE PRODUCTION OF ALUMINIUM COMPRISING A SUPPLY CIRCUIT AND AN INDEPENDENT CIRCUIT FOR CORRECTING THE MAGNETIC FIELD

Joseph Chaffy; Bernard Langon, and Michel Leroy, all of St. Jean de Maurienne, France, assignors to Aluminium Pechiney, Paris, France

Filed Jun. 5, 1986, Ser. No. 870,919

Claims priority, application France, Jun. 5, 1985, 85 08924

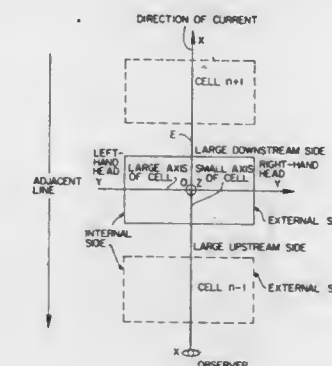
Int. Cl.⁴ C25C 3/16

U.S. Cl. 204—243 M

14 Claims

1. In a circuit for electrical connection between two succes-

sive cells of rank n and rank n+1 in a series of cells for the production of aluminum by electrolysis of alumina dissolved in molten cryolite by the Hall-Heroult process at a total electrolysis current J1 of an intensity of at least 150 kA, and possibly attaining 500 to 600 kA, each cell being constituted by an insulated parallelepiped metal container of which the large axis is perpendicular to the axis of the series and of which the two tank ends comprise respectively, a left-hand head and a right-hand head, the container supporting a cathode formed by the juxtaposition of carbonaceous blocks in which there are sealed metal rods of which the rod ends issue from the container, generally on its two large upstream and downstream sides, relative to the direction of the current in the series, each cell also comprising an anode system formed by at least one horizontal rigid beam supporting at least one horizontal conducting rod comprising an anode frame on which anode suspension shafts are attached, the connecting circuit comprising, a circuit



for the transmission of electrolysis current between two successive cells constituted by cathode collectors connected to the cathode outputs of the cell in rank n and to the connecting conductors which join, via risers, the anode frame on the cell of rank n+1 in the series, the improvement comprising, in addition to the circuit for the transmission of electrolysis current, a distinct circuit comprising means for the correction and balancing of the magnetic fields and which comprises a first conductor which is substantially parallel to the axis of the series and adjacent to said left-hand heads, and a second conductor which is substantially parallel to the axis of the series and adjacent to said right-hand heads, said first and second conductors being adapted to be traversed by a direct current J2 in the same direction as the electrolysis current and which creates in the cells a vertical correcting magnetic field which is directed downwards close to the left-hand heads and is directed upwards close to the right-hand heads.

4,713,162

BIPOLAR ELECTROLYTIC CELL

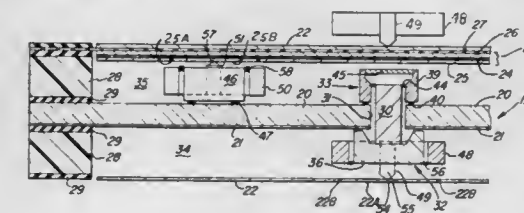
John R. Pimlott, Sweeny, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1986, Ser. No. 901,845

Int. Cl.⁴ C25C 3/08

U.S. Cl. 204—254

20 Claims



1. A bipolar electrolytic cell comprising a centerboard having opposite anode and cathode surfaces confronting and

spaced from an anode and a cathode respectively, an electrically conductive rod extending transversely through said centerboard, first and second protective cover means electrically connected with said rod and cooperable with said centerboard for completely shielding said rod and its electrical connections from fluid in said cell, said first cover means comprising an electrically conductive cup having its opening overlying one end of said rod and having an annular rim portion around the mouth of said opening welded to one of said surfaces of said centerboard entirely around said rod, said rod and the interior of said cup having coextensive shaped surface portions joined by a direct surface-to-surface weld therebetween throughout their coextensive surfaces.

4,713,163

POROUS DIAPHRAGM FOR ELECTROLYTIC CELL
John F. Cairns, and Gavin W. Cowell, both of Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 6, 1983, Ser. No. 501,764

Claims priority, application United Kingdom, Jun. 9, 1982, 8216747

Int. Cl.⁴ C25B 1/16

U.S. Cl. 204—296

17 Claims

1. A porous sheet diaphragm of an organic polymeric material said sheet containing throughout the thickness of the sheet at least one wetting agent which is a substance capable of increasing the time for which the sheet remains permeable to an aqueous solution of an electrolyte, characterized in that the concentration of the said substance in that part of the sheet near to one or to both outer surfaces of the sheet is greater than the concentration of the said substance in that part of the sheet remote from the outer surfaces of the sheet.

4,713,164

APPARATUS FOR ANALYZING MALODORS IN THE BREATH

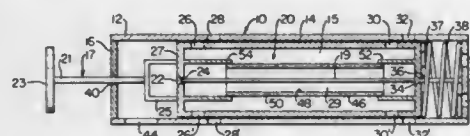
Rickie F. Krietemeier, Englewood, and Laurence W. Ross, Denver, both of Colo., assignors to Confidence Corporation, Englewood, Colo.

Filed Jul. 25, 1985, Ser. No. 758,826

Int. Cl.⁴ G01N 27/46

U.S. Cl. 204—400

13 Claims



1. A sensor for the detection of contaminants in streams of gases by electrochemical methods, the combination comprising:

- means defining a normally sealed, hand-held housing including inner and outer casings movable between an open position and a closed position;
- detection means operably disposed within said housing, said detection means comprising at least two electrodes and electrolyte means, said electrodes in communication with said electrolyte means, said electrolyte means operable to create an electric potential between said electrodes upon detection of contaminants in a sample gas stream;
- first valve means for selectively directing a sample gas stream to one of said electrodes with said housing in the open position;
- second valve means for selectively directing a reference gas stream to another electrode with said housing in the open position; and
- means for producing an electric signal upon detection of contaminants by said detection means.

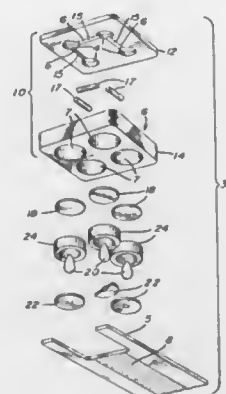
4,713,165
SENSOR HAVING ION-SELECTIVE ELECTRODES
Gilbert Conover, Providence, R.I.; Thaddeus Minlor, Lawrence, and John P. Willis, Harvard, both of Mass., assignors to Ilex Corporation, Boston, Mass.

Filed Jul. 2, 1986, Ser. No. 881,099

Int. Cl.⁴ G01N 27/30

U.S. Cl. 204—403

14 Claims



1. A sensor for the potentiometric determination of the activity of an ion or other concentration of a component in a sample, the ion being selected from the group consisting of hydrogen ions, potassium ions, sodium ions, chloride ions, ammonium ions, carbonate ions, bicarbonate ions, and calcium ions, the sensor comprising:

- a. a frame having an upper section and a lower section, each section having at least two openings therethrough and grooves in the mating surfaces thereof between the openings, the upper section and the lower section mating in such a relationship that the holes in the two sections are aligned and the grooves in the mating surfaces are aligned to form internal channels between the openings;
- b. ion selective electrodes in the openings, each electrode being comprised of:
 - 1. an ion selective membrane which is comprised of an ionophore selective for the ion whose activity is to be determined; a thermoplastic resin or a plastic; and a plasticizer;
 - 2. a reference electrode; and
 - 3. an internal reference material having a known concentration of the ion whose activity is to be determined;
- c. retainer means for securing the ion selective membranes in the openings; and
- d. porous material in the spaces between the openings in the sensor frame, the porous material, when conductive, providing ionic flow between the ion selective electrodes in the openings.

4,713,166

PUMP CELL ELEMENT FOR AIR-FUEL RATIO SENSOR
Takao Kojima, and Hiroyuki Ishiguro, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jun. 17, 1986, Ser. No. 875,077

Claims priority, application Japan, Jun. 18, 1985, 60-130703

Int. Cl.⁴ G01N 27/58

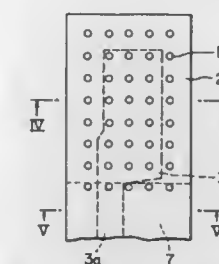
U.S. Cl. 204—425

15 Claims

1. A pump cell element for an air-fuel ratio sensor, the pump cell element comprising:

- an oxygen ion conductive zirconia solid electrolyte,
- a pair of layer electrodes coated on the both surface areas of a measuring portion, and
- ceramic coating layers each coated on each of said electrodes, at least one of said coating layers disposed on the

electrode of a minus side of the pump cell element being provided uniformly and dispersedly with through-pores



having a converted diameter of at least 20 but less than 500 μm.

4,713,167
MULTIPLE SINGLE-STAGE HYDROCRACKING PROCESS

Mark E. Reno, Villa Park; Robert K. Olson, Elgin, and Tom N. Kalnes, La Grange, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 20, 1986, Ser. No. 876,640

Int. Cl.⁴ C10G 65/10

U.S. Cl. 208—59

17 Claims

1. A hydrocracking process for converting a heavy hydrocarbonaceous charge stock having an end boiling point greater than about 700° F. into a lower boiling distillate product which comprises the steps of:

- (a) reacting said charge stock and hydrogen in a first catalytic hydrocracking reaction zone at hydrocracking conditions to obtain a first hydrocracked effluent stream comprising distillate hydrocarbons boiling in a distillate product range and unconverted charge stock boiling above about 700° F.;
- (b) passing said hydrocracked effluent stream and a second hydrocracked effluent stream from a second catalytic hydrocracking reaction zone into a separation zone;
- (c) withdrawing from said separation zone a vaporous phase comprising hydrogen and a liquid hydrocarbon phase comprising hydrocarbons boiling in a distillate product range and unconverted charge stock;
- (d) fractionating said liquid hydrocarbon phase into a light hydrocarbon stream comprising at least a portion of said hydrocarbons boiling in a distillate product range, a middle hydrocarbon stream comprising at least a portion of said hydrocarbons boiling in a distillate product range, said light hydrocarbon stream having a boiling range which is lower than the boiling range of the middle hydrocarbon stream, and a heavy hydrocarbon stream comprising unconverted charge stock boiling above about 700° F.;
- (e) reacting at least a portion of said middle hydrocarbon stream comprising at least a portion of said hydrocarbons boiling in a distillate product range and hydrogen in a second catalytic hydrocracking reaction zone at hydrocracking conditions to convert said middle hydrocarbon stream to lower boiling hydrocarbons boiling in a distillate product range;
- (f) recycling at least a portion of said heavy hydrocarbon stream comprising unconverted charge stock boiling above about 700° F. to said first catalytic hydrocracking reaction zone; and
- (g) withdrawing said light hydrocarbon stream.

4,713,168

PREMIUM COKING PROCESS

Bruce A. Newman, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Aug. 29, 1986, Ser. No. 901,851

Int. Cl.⁴ C10G 9/14

U.S. Cl. 208—131

2 Claims

1. In a delayed premium coking process in which an aromatic mineral oil feedstock is heated to an elevated temperature and introduced into a coking drum under delayed coking conditions, the improvement comprising:

- (a) determining the time required at said coking conditions to obtain a calcining yield of from 70 to 85 weight percent; and
- (b) adding a Lewis acid to said coking drum during only the latter portion of the introduction of feedstock to said coking drum, said latter portion being a period equal to the time determined in step (a), whereby the proportion of +30 mesh coke product resulting is increased without a substantial increase in the CTE of said coke.

4,713,169

FLUID FEED METHOD

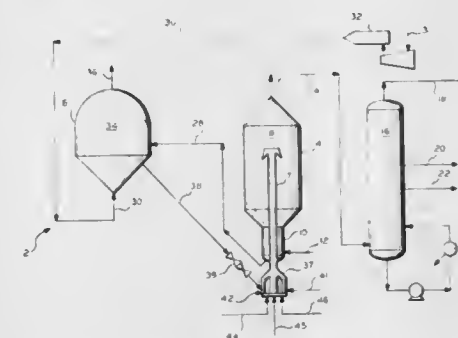
Richard H. Nielsen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 689,676, Jan. 8, 1985, abandoned. This application Mar. 19, 1986, Ser. No. 841,148

Int. Cl.⁴ C10G 11/18

U.S. Cl. 208—157

5 Claims



1. A fluid feeding method comprising: injecting an oil feedstock and an atomizing fluid for atomizing the oil feedstock from a plurality of nozzles which empty into a chamber defined by the interior surface of a hollow member which has an axis and an open end which defines an opening, wherein at least a portion of the interior surface progressively tapers toward the axis from the open end to an interior surface boundary axially opposite the open end, the oil feedstock and atomizing fluid being injected from the nozzles into the area of the chamber within said interior surface portion and toward the opening so as to exit the chamber through the opening, wherein topped crude oil is injected from a first position within said chamber and wherein slurry oil is injected from a second position within said chamber, said second position being radially spaced farther from the axis than said first position, where radial spacing is measured along lines perpendicular to the axis; introducing a fluidized cracking catalyst adjacent to the opening such that the oil feedstock exiting the chamber and the catalyst mix to yield a mixture; and passing the mixture through a riser reactor.

4,713,170

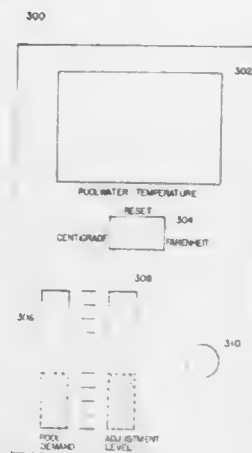
SWIMMING POOL WATER PURIFIER

Darryl S. Saibic, Plantation, Fla., assignor to Florida Development and Manufacturing, Inc., Deerfield Beach, Fla.
Filed Mar. 31, 1986, Ser. No. 846,308

Int. Cl.⁴ C25B 9/04, 15/00

U.S. Cl. 210—85

11 Claims



10. An apparatus for purifying swimming pool water comprising:

housing means including a water inlet means and a water outlet means suitable for coupling to a swimming pool filtration system, said inlet and said outlet being approximately diametrically opposed to allow water to flow in a path from said inlet to said outlet without change in water direction;

an anode composed substantially of copper, said anode disposed within said path of water flow;

a cathode disposed within said path of water flow;

means for measuring temperature of said water;

circuit means for converting said temperature to a first figure of merit and for graphically displaying said figure of merit; and

a manually adjustable current source for allowing adjustment of current passing between said anode and said cathode and for graphically displaying a measure of said current in the same manner as said figure of merit is displayed.

4,713,171

APPARATUS FOR REMOVING WATER FROM BLOOD
Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,492

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302804

Int. Cl.⁴ A61M 1/14, 1/34; B01D 13/00

U.S. Cl. 210—110

22 Claims

1. In an apparatus for removing water from blood including an extracorporeal circulation circuit, said extracorporeal circulation circuit having a blood inlet side and a blood outlet side, a supply line on the blood inlet side and having an upstream end and a downstream end, an offtake line on the blood outlet side and having an upstream end and a downstream end, and a filter having a filtrate side and a blood side, said filter being connected to said downstream end of said supply line and said upstream end of said offtake line, said upstream end of said supply line and said downstream end of said offtake line being connected to at least one blood connection, said supply line including therein a blood pump, a first clamp disposed upstream of said blood pump and a second clamp disposed downstream of said blood pump, said offtake line further including therein a third clamp, the improvement comprising:

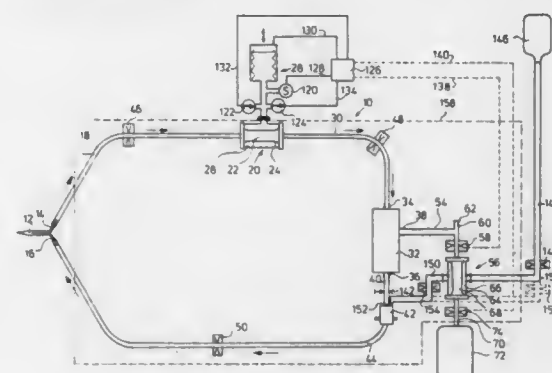
a filtrate connection (38) on said filtrate side connected to said filter (32);

an inlet tube (54) connected to said filtrate connection (38); means for limiting the volume of water removed from blood in the circuit in one machine cycle to a predetermined volume V_2 , said limiting means comprising an ultrafiltrate measuring chamber (56), said ultrafiltrate measuring chamber having an inlet connection coupled to said inlet tube (54) and an outlet connection, said ultrafiltrate measuring chamber (56) being coupled at its inlet connection through said inlet tube (54) to said filtrate connection and having a restricted maximum intake volume V_2 ;

an inlet tube (70) coupled to said outlet connection;

a fourth clamp (58) on said inlet tube (54) and a fifth clamp (74) on said outlet tube (70); and

control means (126) coupled to said first clamp, to said second clamp, to said third clamp, to said fourth clamp and to said fifth clamp, said control means (126) being operative to open and close said first clamp and said second clamp in opposition to one another, to open and close said third clamp in synchronism with said second clamp, to open and close said fourth clamp in synchronism with said second clamp, and to open and close said fifth clamp in synchronism with said third clamp, said control means being presettable to actuate said clamps (46, 48, 50, 58, 74) during a treatment to specify total amounts of fluid to be withdrawn from a patient through said ultrafiltrate measuring chamber;



and wherein said blood pump includes a pump chamber (20) in said extracorporeal circulation circuit, the maximum intake volume V_1 of the pump chamber (20) and the maximum intake volume V_2 of the ultrafiltrate measuring chamber (56) are in a ratio of between 5:1 and 2:1, thereby controlling the ratio of the amount of blood pumped in a machine cycle to the amount of water removed in a machine cycle.

20. In an apparatus for removing water from blood including an arteriovenous extracorporeal circulation circuit, said extracorporeal circulation circuit having a blood inlet side and a blood outlet side, a supply line on the blood inlet side and having an upstream end and a downstream end, and offtake line on the blood outlet side and having an upstream end and a downstream end, and a filter which is connected to said downstream end of said supply line and said upstream end of said offtake line, said upstream end of said supply line and said downstream end of said offtake line being connected to at least one blood connection, said supply line including a therein a blood pump, a first valve means disposed upstream of said blood pump and a second valve means disposed downstream of said blood pump, said offtake line further including therein a third valve means, said filter (32) having a filtrate side and a filtrate connection (38), the improvement comprising: means for limiting the volume of water removed from blood in the circuit in one machine cycle to a predetermined volume V_2 , said limiting means including an ultrafiltrate measuring chamber (56), said ultrafiltrate measuring chamber (56) having an

outlet conduit (70) and an inlet conduit (54) and being coupled through said inlet conduit (54) to said filtrate connection, said ultrafiltrate measuring chamber (56) having a restricted maximum intake volume V_2 ; a fourth valve means (58) in said inlet conduit (54) and a fifth valve means (74) in said outlet conduit (70); control means (126) coupled to said first valve means, to said second valve means, to said third valve means, to said fourth valve means and to said fifth valve means, said control means (126) being operative to open and close said first valve means and said second valve means in opposition to one another, to open and close said third valve means in synchronism with said second valve means, to open and close said fourth valve means in synchronism with said second valve means, and to open and close said fifth valve means in synchronism with said third valve means, said control means being presettable to actuate said valve means (46, 48, 50, 58, 74) during a treatment to specify total amounts of fluid to be withdrawn from a patient through said ultrafiltrate measuring chamber; an air separator chamber (42) in said offtake line (40); a throttling means (142) in said offtake line (40) between said filter 32 and said air separator (42); an infusion bag (146) in fluid communication with said air separator (42); wherein said control means (126) is coupled to said throttling means (52) to constrict said offtake line (40) in a controlled manner, and wherein said blood pump includes a pump chamber (20) in said supply line of said extracorporeal circulation circuit and the maximum intake volume V_1 of the pump chamber (20) and the maximum intake volume V_2 of the ultrafiltrate measuring chamber (56) are in a ratio of between 5:1 and 2:1, thereby controlling the ratio of the amount of blood pumped in a machine cycle to the amount of water removed in a machine cycle.

4,713,172

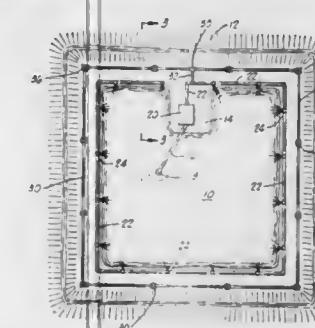
APPARATUS FOR IMPROVED AERATION OF LIQUIDS
Spencer C. Horn, and Virginia Horn, both of P.O. Box 418, Fort Cobb, Okla. 73038

Filed Jun. 16, 1986, Ser. No. 874,643

Int. Cl.⁴ B01D 1/16; C02F 1/74

U.S. Cl. 210—150

17 Claims



1. Apparatus for increasing the air/liquid interface of a body of liquid, comprising:

suction means for drawing liquid from said body;

distribution conduit means connected to said suction means to distribute liquid to selected points around the area wherein the liquid body is contained;

aeration panel means in the form of generally flat, cellular sheet supported vertically upright to expose a generally horizontal top portion and being disposed at a position proximate the liquid body area;

feeder pipe means disposed along said top portion of the panel means, said pipe means including a multiple of spaced liquid discharge openings along said top portion; and

means connecting said distribution conduit means and said feeder pipe means; whereby

liquid is distributed continuously along the panel means top portion for downward flow and distribution over said panel means thereby to increase the air/liquid interface to

accelerate evaporation and separation of liquid components.

4,713,173

THREE ELEMENT AQUARIUM FILTER CARTRIDGE
Jerome Goldman, New York; Marvin Goldman, Great Neck, and Terry Goldman, New York, all of N.Y., assignors to Penn Plax Plastics, Inc., Garden City, N.Y.

Filed Jan. 3, 1986, Ser. No. 816,084

Int. Cl.⁴ B01D 27/02, 35/16

U.S. Cl. 210—169

17 Claims



1. A filter cartridge for aquarium using comprising:

(a) a mechanical filtration element forming a front wall of the filter cartridge;

(b) a back member which is able to let water pass there-through, forming a back wall of the filter cartridge, the mechanical element and back member sealed to each other around the outer borders thereof;

(c) a chemical filtration element sandwiched between the front wall mechanical filter element end back member, and;

(d) a biological filtration element which is formed from a material selected from the following group consisting of natural sponge, synthetic sponge, and foam, also sandwiched between the front wall mechanical filtration element and the back member, the back member of the filter cartridge being a distinct component from the biological filtration element.

4,713,174

MOUNTING ARRANGEMENT FOR A TUBE-TYPE FILTER ELEMENT

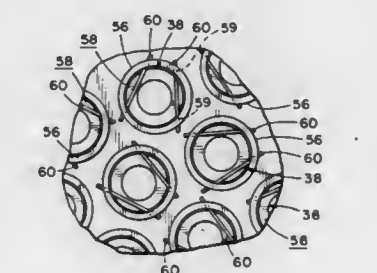
James F. Zievers, LaGrange, and Paul Eggerstedt, North Riverside, both of Ill., assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Jul. 22, 1986, Ser. No. 888,126

Int. Cl.⁴ B01D 27/08, 35/30

U.S. Cl. 210—233

8 Claims



1. Filter apparatus comprising

a tank having means defining an inlet port and means defining an outlet port;

a generally rigid tube sheet disposed within said tank and adapted to sealably partition said tank between said inlet and outlet ports;

a tubular filter element formed of a porous material for filtering fluid admitted to said tank, said filter element having a hollow, generally cylindrical body portion, said body portion having a proximal end and a distal end; said distal end being closed;

said proximal end having an integrally formed annular, external flange;
 said tube sheet having a circular aperture for receiving said cylindrical body portion of said filter element and further having an upstanding circular wall member coaxially disposed with respect to said aperture;
 said wall member having an inside diameter which is larger than the outside diameter of said flange to receive said flange therewithin;
 annular sealing means disposed between said flange and said tube sheet;
 said wall member having means defining a plurality of through holes; and
 pin means extending through said holes across the top of said filter elements,
 said pin means bearing against the proximal end of said filter element,
 whereby said flange is held by said pin means against said sealing means to form a fluid tight seal between said filter element and said tube sheet.

4,713,175

WATER PURIFIER COMPRISING STAGES MOUNTED SIDE-BY-SIDE TO UNITARY HEADER

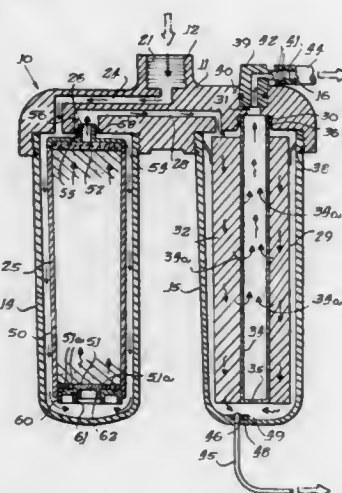
Donald T. Bray, Escondido, Calif., assignor to Nimbus Water Systems, Inc., Escondido, Calif.

Filed Aug. 5, 1986, Ser. No. 893,486

Int. Cl. B01D 13/00

U.S. Cl. 210-259

6 Claims



1. A water purification device having at least three stages for treating pressurized tap water, comprising:
 - a. an activated carbon prefilter;
 - a reverse-osmosis element;
 - a sediment filter upstream of said activated carbon prefilter to prevent clogging of said activated carbon prefilter with sediment;
 - a first unitary container containing said activated carbon prefilter and said sediment filter, means connecting said activated carbon prefilter and said sediment filter in serial relationship with said sediment filter upstream of said activated carbon prefilter, and said first unitary container having an open end for releasable attachment to a header;
 - a second unitary container containing said reverse-osmosis element and having an open end for releasable attachment to a header;
 - a unitary header including first and second container-attaching means directly releasably attached to the open ends of said first and said second containers, so that said first and said second containers are mounted in side-by-side relationship, means serially connecting said first and said second containers together in serial connection with an upstream unpurified water inlet defined by said unitary header and a downstream purified water outlet channel

defined by said unitary header such that said sediment filter and said activated carbon prefilter are connected upstream of said reverse-osmosis element, whereby said sediment filter and said activated carbon prefilter are separately and independently accessible with respect to said reverse-osmosis element to facilitate separate maintenance operations on the respective water purifying components contained within said containers.

4,713,176

PLASMAPHERESIS SYSTEM AND METHOD

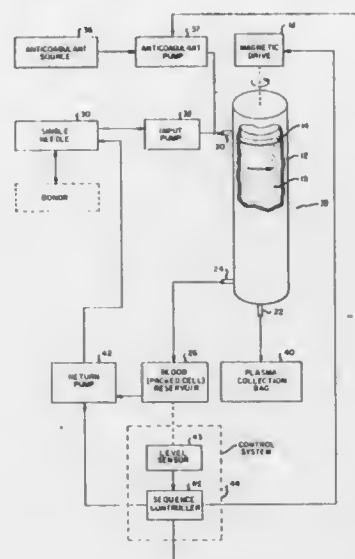
Donald W. Schoendorfer, and Lee E. Hansen, both of Santa Ana, Calif., assignors to Hemascience Laboratories, Inc., Santa Ana, Calif.

Filed Apr. 12, 1985, Ser. No. 722,800

Int. Cl. B01D 13/00, 21/26

U.S. Cl. 210-645

10 Claims



1. The method of membrane filtration of at least one selected constituent from a whole blood flow from a blood donor, the blood flow passing adjacent a filtration membrane having pore sizes selected to pass the selected constituent comprising the steps of:
 - a. deriving blood including platelets and including the at least one selected constituent from the donor in extraction intervals separated by reinfusion intervals in which unfiltered remainder is returned to the donor;
 - b. adding anticoagulant to the blood derived from the donor during the extraction intervals, the anticoagulant having an initial pH in the range of 4.5 to 5.5 and being delivered in a ratio of anticoagulant to whole blood in the range 1:6 to 1:25 to establish a pH for the selected constituent in the range of 6.8 to 7.2; and
 - c. passing the anticoagulant adjusted whole blood across the filtration membrane during the extraction intervals to filter the selected constituent through the pores in the membrane, with the adjusted whole blood stabilizing the platelets to minimize agglutination tendencies thereof arising because of variations in donor blood characteristics and changes in flow dynamics at the membrane between extraction and reinfusion intervals for minimizing clogging of said membrane.

4,713,177

PROCESS FOR MITIGATING SCALE FORMATION IN TUBE REACTION APPARATUS

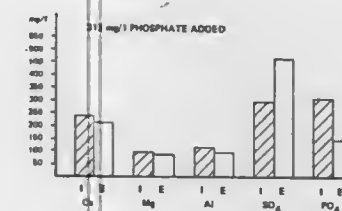
Mark T. Atwood, Arvada, Colo., and Ronald H. Hall, Oakville, Canada, assignors to VerTech Treatment Systems, Inc., Denver, Colo.

Filed Dec. 19, 1986, Ser. No. 943,409

Int. Cl. C02F 5/04

U.S. Cl. 210-697

19 Claims



1. A process for inhibiting scale formation in a continuous plug flow vertical tube waste reactor of the type in which liquid waste that contains scale-forming dissolved ions is injected into said reactor as an influent waste stream under heat and pressure to bring about a wet oxidation reaction within said liquid waste in a reaction zone in said reactor to break down said liquid waste into simpler components which are discharged from said reactor as an effluent waste stream, the process comprising adding a quantity of precipitating reagent to said liquid waste before said liquid waste enters said reaction zone and at a temperature significantly below the temperature of said reaction zone to form precipitates containing said ions which would otherwise accumulate as scale on the walls of said reactor.

4,713,178

DEWATERING AGENTS

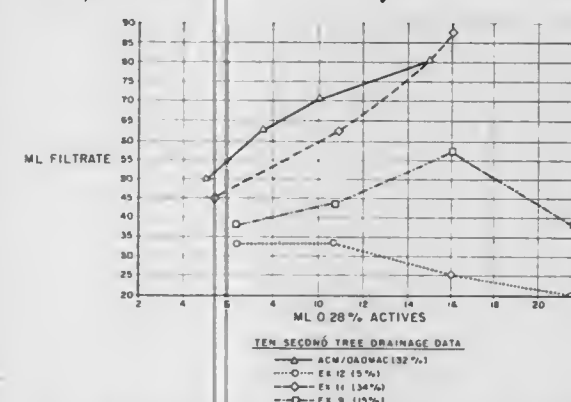
Dodd W. Fong, Naperville, and Ann M. Halverson, Wheaton, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 737,954, May 28, 1985, abandoned. This application Apr. 14, 1986, Ser. No. 851,172 The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl. C02F 11/14

U.S. Cl. 210-734

2 Claims



1. In a process of the type wherein organic suspensions comprising raw sewage sludge and sludges obtained by biological degradation are flocculated by adding to the suspension an aqueous solution of a cationic polymer and then dewatered the improvement which comprises treating the raw sewage sludge and sludges obtained by biological degradation with from 0.01-1% by weight based on the weight of the sludge solids with a cationic polymer having an intrinsic viscosity greater than 0.5 and which contains at least 5 mole percent of the

dimethyl sulfate or the methyl chloride quaternary ammonium salt of 1-acryloyl-4-methyl piperazine.

2. The process of claim 1 where the cationic polymer is a copolymer of acrylamide which contains between 5-50 mole percent of the dimethyl sulfate or the methyl chloride quaternary ammonium salt of 1-acryloyl-4-methyl piperazine.

4,713,179

REMOVABLE CULVERT GRATE

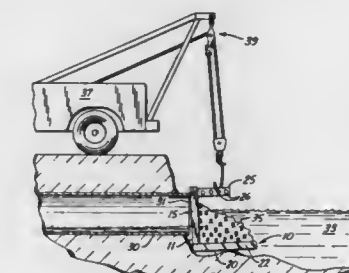
Stanley J. Goedderz, Sr., Star Rte., Box 355, Deerwood, Minn. 56444

Filed Mar. 14, 1986, Ser. No. 839,689

Int. Cl. B01D 35/28; E02B 5/08

U.S. Cl. 210-747

10 Claims



9. A method of clearing debris away from the inlet of a water passageway comprising the steps of:
 - a. providing a removable grate assembly having a vertical grate which permits the flow of water therethrough while substantially preventing the flow of debris therethrough, a horizontal platform joined to the vertical grate at the lower edge thereof, forming a generally right angle therewith, and linkage means comprising a bar extending from the upper edge of the vertical grate generally normal to the plane of the grate in the same direction as the horizontal platform;
 - b. placing the grate assembly adjacent the inlet of the passageway with the platform extending away therefrom;
 - c. allowing debris to collect adjacent the vertical grate and above the horizontal platform; and
 - d. lifting the grate assembly away from the opening by a power source attached to the bar, the horizontal platform carrying with it the debris.

4,713,180

CERAMIC FILTER AND METHOD FOR USING SAME

Franz Hofmann, Neuhausen; Hans G. Trapp, Schaffhausen, both of Switzerland; Rolf Rietzsch, Mettmann, Fed. Rep. of Germany; Jürgen Otto, Hattingen, Fed. Rep. of Germany; Wolfgang Kaettlitz, and Gerd Trinkl, both of Borken, Fed. Rep. of Germany, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Feb. 13, 1985, Ser. No. 701,135

Claims priority, application Switzerland, Feb. 15, 1985, 731/84

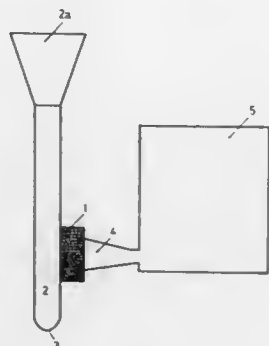
Int. Cl. B01D 29/32

U.S. Cl. 210-773

18 Claims

10. A method for filtering molten iron which comprises:
 - (a) providing a flowing mass of molten iron;
 - (b) providing a ceramic filter made from a high melting ceramic material and having an open-celled foam structure with at least one afflux surface for filtering molten cast iron, said ceramic filter comprising an interior region surrounded by an outer region wherein the bulk density of the outer region of said ceramic filter is higher than the bulk density of the interior region of said ceramic filter, said ceramic material comprising 20-70% by weight of silicon carbide, 10-40% by weight of aluminum oxide,

- 2-20% by weight of silicon oxide, and 10-30% by weight of a refractory inorganic binder,
- (c) positioning said ceramic filter in a casting system near the location where the molten iron has its highest kinetic energy; and
- (d) causing the mass of molten iron to flow tangentially by the afflux surface of said ceramic filter and creating turbulent flow in front of the afflux plane of said ceramic filter thereby causing the mass of molten iron to pass through said ceramic filter.



17. A ceramic filter made from a high-melting ceramic material and having an open-cell foam structure, with at least one afflux surface, said ceramic filter comprising an interior region surrounded by an outer region, wherein the bulk density of the outer region of said ceramic filter is higher than the bulk density of the interior region of said ceramic filter, said ceramic material comprising 20-70% by weight of silicon carbide, 10-40% by weight of aluminum oxide, 2-20% by weight of silicon oxide, and 10-30% by weight of a refractory inorganic binder.

4,713,181

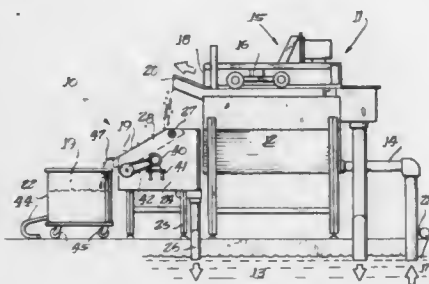
METHOD AND APPARATUS FOR HANDLING SLUDGE
Frederick E. Russell, Elgin, Ill., assignor to Protectaire Systems Co., Elgin, Ill.

Filed Mar. 18, 1986, Ser. No. 841,078

Int. Cl. B01D 33/00; C02F 1/40

U.S. Cl. 210-776

4 Claims



1. An apparatus for separating and dewatering floating wet sticky, agglomerated paint sludge from a body of water and for dewatering the wet sludge to a dried sludge, said apparatus comprising means for providing a paint sludge sufficiently dry for enabling open transport and placement thereof in unlined landfills, including, a skimmer device having inlet means for connection to a reservoir to receive water bearing the sticky paint sludge and having a skimmer for skimming floating sticky paint sludge from the water and for discharging the skimmed sticky paint wet sludge,

a porous conveyor means having a porous flexible screen receiving the wet paint sludge from said skimmer device and for conveying the wet sticky paint sludge,

a supply roll of said porous flexible screen being wound in a

roll and being unwound to provide a clean portion of screen to receive the wet sticky paint sludge, and means to impart a squeezing action on the wet sticky paint sludge to squeeze sufficient water therefrom to cause reclassification of the wet paint sludge to dry paint sludge.

4,713,182

FIRE-FIGHTING FOAM

Ralph H. Hiltz, Allison Park; John S. Greer, Ellwood City, and Joseph V. Friel, Butler, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Nov. 6, 1986, Ser. No. 927,386

Int. Cl. A62D 1/00; B01J 13/00; C09K 3/00; B01F 17/00

U.S. Cl. 252-3

8 Claims

1. A foam concentrate for forming a fire-fighting foam comprising an essentially aqueous solution containing between about

4% and 6% by weight citrus pectin,
3% and 9% by weight alkylbetaine surfactant,
9% and 20% by weight sodium alkyl sulfate surfactant having 8 to 13C atoms, and,
4% and 12% by weight alkoamphoglycinate or alkoamphopropionate surfactant, the total amount of surfactant being at least 30% by weight and the viscosity of the concentrate being less than about 1000 cp. at room temperature.

4,713,183

OIL BASED DRILLING FLUID REVERSION

Arvind D. Patel, Houston, and Carmelita Salandanan, Sugarland, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

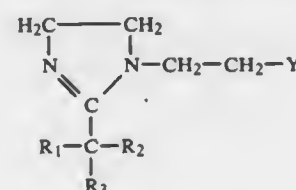
Filed Mar. 12, 1986, Ser. No. 838,975

Int. Cl. C09K 7/06

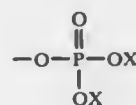
U.S. Cl. 252-8.515

15 Claims

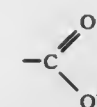
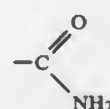
1. In a petroleum oil, mud drilling fluid that has undergone conversion of at least a portion of the solid particles therein from an oil wet stage to a water wet stage, the process for substantially converting the water wet particles to an oil wet state comprising adding to the water wet drilling mud a water soluble imidazoline having the general formula



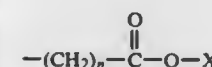
wherein Y is (1) a phosphate group



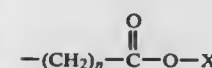
wherein X is —H, —NH₃, or an alkali metal cation, (2) —OH, (3) —NH₂, (4) an amide



wherein R is an alkyl radical containing 1 to 12 carbon atoms; R₁ is (1) —H, (2) an alkyl radical containing 1 to 6 carbon atoms, or (3)



wherein n is an integer from 1 to 4 and X is —H, —NH₃, or an alkali metal cation; R₂ is an alkyl carboxylate radical of the formula



wherein n is an integer from 1 to 4, X is —H, —NH₃, or an alkali metal cation; and R₃ is an alkyl radical containing 1 to 14 carbon atoms.

4,713,184

DISPERSED OIL SOLUBLE CORROSION INHIBITOR AND WATER SOLUBLE PHOSPHONATE SCALE INHIBITOR COMPOSITION

Najib H. Zaid, 213 E. Monroe, Sterling, Kans. 67579

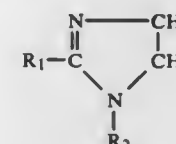
Filed Sep. 26, 1985, Ser. No. 780,449

Int. Cl. E21B 37/00; C23F 11/14

U.S. Cl. 252-8.552

30 Claims

1. A corrosion and scale inhibiting preblend composition comprising:
from about 2 to 25% by weight of an imidazoline wherein said imidazoline is selected from the group consisting of compounds having the following structural formula:



wherein R₁ is hydrogen or an alkyl group having up to 18 carbon atoms therein, and R₂ is hydrogen, or an alkyl or amine group having up to 18 carbon atoms therein;
from about 2 to 35% by weight of oligomers of C₁₂-C₂₂ fatty acids;
from about 2 to 25% by weight of a scale inhibitor selected from the group consisting of organophosphonic acids and salts thereof; and
from about 2 to 50% of a nonylphenol ethoxylate surfactant having about 6 ethylene oxide groups per molecule, said composition being in the form of a liquid homogeneous dispersion.

4,713,185

SACRIFICIAL AGENTS FOR ENHANCED OIL RECOVERY

John Howard, Vancouver, and Marie Stirling, Surrey, both of Canada, assignors to Canadian Patents and Development Ltd., Ottawa, Canada

Filed Mar. 25, 1985, Ser. No. 715,368

Int. Cl. E21B 43/22

U.S. Cl. 252-8.554

3 Claims

1. In a method of obtaining oil from a subterranean rock formation which comprises displacing the oil from the forma-

tion by a waterflood technique employing a surfactant to improve the miscibility of the oil and the water and a sacrificial agent to reduce the amount of the surfactant required, the improvement which comprises employing as said sacrificial agent an oxidized and/or chlorinated lignin derivative obtained from dilute caustic bleach plant effluent liquor by a concentration and purification step capable of separating said derivative from other components of said liquor and selected from the group consisting of adsorption of said derivative by a macroporous resin followed by elution, reverse osmosis and membrane dialysis; and wherein said derivative is complexed with iron ions prior to use in said waterflood technique.

4,713,186

LUBRICANT ADDITIVE IN POWDER TO PASTE FORM
Ulrich Kristen, Rheinfelden; Ulrich Häring, Riehen; Francis Fischer, Sins, and Alain Cron, Hildisrieden, all of Switzerland, assignors to Lonza Ltd., Gampel and Ciba-Geigy A.G., Basel, both of, Switzerland

Filed Aug. 20, 1986, Ser. No. 898,193

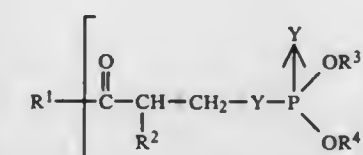
Claims priority, application Switzerland, Sep. 9, 1985, 03880/85

Int. Cl. C10M 125/02, 125/00, 137/10

U.S. Cl. 252-30

25 Claims

1. Composition which has been obtained by mixing and/or grinding at least one phosphate and at least one solid lubricant component, said composition containing from 10 to 50 percent by weight of the phosphate and 50 to 90 percent by weight of the solid lubricant component, the phosphate having formula III:



wherein X and Y are the same or different and are oxygen or sulfur, R¹ is an alkoxy radical which is derived from an aliphatic C₂-C₂₀ alcohol having 1 to 4 hydroxy groups, R² is hydrogen or C₁-C₃ alkyl, R³ and R⁴ are the same or different and are C₁-C₂₀ alkyl, C₅-C₈ cycloalkyl, or phenyl or naphthyl unsubstituted or substituted with one to three C₁-C₈ alkyl groups, and t is a whole number from 1 to 4 which corresponds to the functionality of the alcohol from which radical R¹ is derived, and the at least one solid lubricant component being graphite, a bisulfide or selenide of Mo, Nb, Ta, Ti or W, boron nitride, lead sulfide, an intercalation compound of graphite with NiCl₂, CoCl₂, FeCl₃, CuCl₂, CrCl₃, YCl₃, PtCl₄, RuCl₃, PdCl₂, RhCl₃ or AlCl₃, an intercalation compound of graphite with Co, Ni, Fe, Cu, Rh, Pt, Pd or Ru, and a graphite fluoride (CF_x)_n, wherein x is greater than one.

11. Process for the production of a lubricant additive in powder to paste form for lubricating oils and lubricating greases comprising mixing and comminuting 10 to 50 percent by weight of at least one phosphate as defined in claim 1 and 50 to 90 percent by weight of at least one solid lubricant component by bringing them into mutual contact in a mixing and/or comminuting device.

4,713,187

LUBRICATING OIL COMPOSITIONS CONTAINING MODIFIED SUCCINIMIDES (V)

Thomas F. Buckley, III, Hercules, and Robert H. Wollenberg, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 819,770, Jan. 26, 1986, Pat. No. 4,647,390, which is a continuation-in-part of Ser. No. 722,910, Apr. 12, 1985, abandoned. This application Mar. 2, 1987, Ser. No. 20,934

Int. Cl.⁴ C10M 133/16

U.S. Cl. 252—49.6

29 Claims

1. A product prepared by the process which comprises contacting at a temperature sufficient to cause reaction:

- (a) a compound selected from the group consisting of boric acid, boron oxides, boron halides and esters of boric acid; and
(b) a polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with



wherein R₄ is hydroarbyl of from 1 to 30 carbon atoms; R₅ is selected from the group consisting of hydrocarbyl of from 2 to 30 carbon atoms and —R₆—OR₆—p wherein R₆ is alkylene of from 2 to 5 carbon atoms and p is an integer from 1 to 100; and m is an integer of from 0 to 1; wherein from about 0.1 equivalents to about 10 equivalents of (a) are employed per equivalent of (b).

4,713,188

CARBONATE TREATED

HYDROCARBYL-SUBSTITUTED AMIDES

Robert H. Wollenberg, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 10, 1986, Ser. No. 818,575

Int. Cl.⁴ C10M 129/00

U.S. Cl. 252—51.5 A

10 Claims

1. A lubricating oil composition comprising an oil of lubricating viscosity and a dispersant effective amount of a product prepared by the process which comprises contacting at a temperature sufficient to cause reaction a hydrocarbyl-substituted amide of the formula



wherein

R₇ is hydrocarbyl of from 12 to 350 carbon atoms;

R₈ is alkylene of from 2 to 6 carbon atoms;

and a is an integer from 1 to 10;

with a cyclic carbonate wherein the molar charge of the cyclic carbonate to the basic nitrogen of the hydrocarbyl-substituted amide is from about 0.2:1 to about 10:1.

4,713,189

PRECOPLED MONO-SUCCINIMIDE LUBRICATING OIL DISPERSANTS AND VITON SEAL ADDITIVES

Theodore E. Nalesnik, Beacon, and Nicholas Benfaremo, Wappingers Falls, both of N.Y., assignors to Texaco, Inc., White Plains, N.Y.

Filed Aug. 20, 1986, Ser. No. 898,275

Int. Cl.⁴ C10M 133/16

U.S. Cl. 252—51.5 A

14 Claims

1. A lubricating oil composition comprising a major portion of a lubricating oil and a minor dispersant amount of a reaction product prepared by a process which comprises:

- (a) reacting a polyethyleneamine with a phenolic compound

in the presence of excess formaldehyde to form a Mannich phenol coupled polyethyleneamine;

(b) reacting said Mannich phenol coupled polyethyleneamine with an alkenyl succinic acid anhydride to form a Mannich phenol coupled mono-alkenyl succinimide;

(c) acylating said coupled mono-alkenyl succinimide with glycolic acid to form a glycolated Mannich phenol coupled mono-alkenyl succinimide; and

(d) recovering said glycolated Mannich phenol coupled mono-alkenyl succinimide.

4,713,190

MODIFIED CARBOXYLIC AMIDE DISPERSANTS

Timothy R. Erdman, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 23, 1985, Ser. No. 790,578

Int. Cl.⁴ C10M 131/12, 133/56

U.S. Cl. 252—51.5 A

14 Claims

1. A hydrocarbon-soluble product produced by the process which comprises reacting at a temperature sufficient to cause reaction:

(a) a carboxylic amide containing at least one basic nitrogen wherein said carboxylic amide is derived from an aliphatic carboxylic acid containing 12 to 350 aliphatic carbon atoms; and

(b) a fluorine-containing acid selected from the group consisting of fluorophosphoric acid, boron trifluoride, fluoboric acid and the ammonium salts or complexes thereof wherein the amount of said fluorine-containing acid is from about 0.1 to 1 equivalent per equivalent of basic nitrogen atom.

7. A lubricating oil composition comprising an oil of lubricating viscosity and a dispersant effective amount of the product of claim 1.

4,713,191

DIISOCYANATE ACID LUBRICATING OIL DISPERSANT AND VITON SEAL ADDITIVES

Theodore E. Nalesnik, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 29, 1986, Ser. No. 946,750

Int. Cl.⁴ C10M 133/16

U.S. Cl. 252—51.5 A

13 Claims

1. A lubricating oil composition comprising a major portion of a lubricating oil and a minor dispersant amount of a reaction product prepared by the process which comprises:

(a) reacting a polyethylene amine with an alkenyl succinic acid anhydride to form a bis-alkenyl succinimide;

(b) acylating said bis-alkenyl-succinimide with glycolic acid to form a partially glycolated bis-alkenyl succinimide;

(c) adding a diisocyanate to partially or fully glycolated bis-succinimide thereby forming a diurea or respective urethane coupled glycamide bis-alkenyl succinimide; and

(d) recovering said diurea or urethane coupled glycamide bis-alkenyl succinimide.

4,713,192

DOPING OF CATENATED PHOSPHORUS MATERIALS

Christian G. Michel, Ossining; Rozalie Schachter, New York, both of N.Y.; Mark A. Kuck, Upper Montclair, N.J.; John A. Baumann, Dobbs Ferry, N.Y., and Paul M. Raccach, Chicago, Ill., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 442,208, Nov. 16, 1982, Pat. No. 4,508,931, which is a continuation-in-part of Ser. No. 335,706, Dec. 30, 1981, abandoned, and a continuation-in-part of Ser. No. 419,537, Sep. 17, 1982, Pat. No. 4,620,968, which is a continuation-in-part of Ser. No. 335,706, Dec. 30, 1981, abandoned. This application Dec. 4, 1984, Ser. No. 677,911

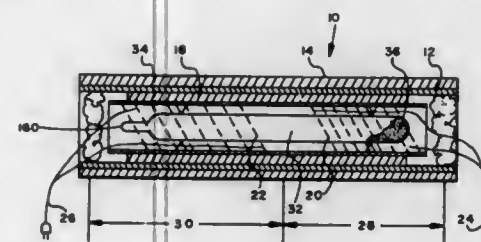
Int. Cl.⁴ H01L 21/34, 21/38

U.S. Cl. 252—62.3 R

8 Claims

1. A method of fabricating a semiconductor device including

the step of condensing a high phosphorus alkali metal polyphosphide from the vapor phase in the presence of an alkali metal.



2. A method of fabricating a semiconductor device including the step of doping a high phosphorus alkali metal polyphosphide with another pnictide to substitute said other pnictide for parts of said phosphorus of said alkali metal polyphosphide.

4,713,193

STABLE, FREE-FLOWING PARTICULATE ADJUNCTS FOR USE IN DETERGENT COMPOSITIONS

Ho Tan Tai, Lille, France, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 669,152, Nov. 7, 1984, abandoned. This application Jul. 15, 1986, Ser. No. 884,664

Claims priority, application United Kingdom, Nov. 9, 1983, 8329880

Int. Cl.⁴ C11D 3/12, 3/37, 11/02, 17/06

U.S. Cl. 252—91

5 Claims

1. Stable, free-flowing, particulate adjunct suitable for use in particulate detergent compositions consisting essentially of a spray-dried zeolite granular material having absorbed therein a liquid, viscous liquid, oily or waxy adjunct in an amount of from at least about 54% up to 100% of its weight, said granular zeolite material consisting essentially of 65 to 85% by weight of zeolite and 15 to 35% by weight of sodium sulphate and water, and having a particle size distribution of between 50 and 500 microns, and a bulk density of from 450 to 600 g/l.

5. Stable, free-flowing, particulate adjunct suitable for use in particulate detergent compositions consisting essentially of a spray-dried zeolite granular material having absorbed therein a liquid silicone oil in an amount of from 25% up to 100% of its weight, said granular zeolite material consisting essentially of 65 to 85% by weight of zeolite and 15 to 35% by weight of sodium sulphate and water, and having a particle size distribution of between 50 and 500 microns, and a bulk density of from 450 to 600 g/l.

4,713,194

BLOCK POLYESTER AND LIKE COMPOUNDS HAVING BRANCHED HYDROPHILIC CAPPING GROUPS USEFUL AS SOIL RELEASE AGENTS IN DETERGENT COMPOSITIONS

Eugene P. Gosselink, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 15, 1986, Ser. No. 852,258

Int. Cl.⁴ C11D 17/00

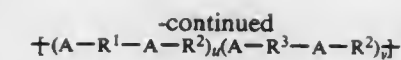
U.S. Cl. 252—174.23

35 Claims

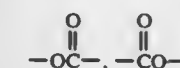
18. A detergent composition which comprises:

(a) from about 1 to about 75% by weight of a nonionic, anionic, ampholytic, zwitterionic, or cationic detergent surfactant, or mixture thereof; and

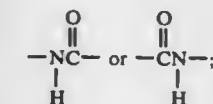
(b) a soil release component which comprises an effective amount of an ester compounds having branched hydrophilic capping groups and oligomer or polymer backbone, said compound having the formula:



wherein the A moieties are selected from the group consisting of



and combinations thereof with either or both of the moieties



the R¹ moieties are selected from 1,4-phenylene moieties and combinations thereof with other arylene moieties selected from 1,3-phenylene, 1,2-phenylene, 1,8-naphthylene, 1,4-naphthylene, 2,2'-biphenylene, 4,4'-biphenylene and mixtures thereof; the R² moieties are selected from ethylene, 1,2-propylene, 1,2-butylenes, 1,2-hexylene and 3-methoxy-1,2-propylene moieties and mixtures thereof; the R³ moieties are substituted C₂-C₁₈ hydrocarbylene moieties having at least one —SO₃M, —COOM, —O—(R⁵O)_m(CH(Y)CH₂O)_n—X or —A—(R²—A—R⁴—A)_u[(R⁵O)_m(CH(Y)CH₂O)_n]X substituent or at least one moiety —A—(R²—A—R⁴—A)_uR²—A— cross-linked to another R³ moiety; the R⁴ moieties are R¹ or R³ moieties, or a mixture thereof; each R⁵ is C₃-C₄ alkylene, or the moiety —R²—A—R⁶—, wherein R⁶ is a C₁-C₁₂ alkylene, alkenylene, arylene or alkarylene moiety; each M is H or a water-soluble cation; the Y substituents of each moiety —(R⁵O)_m(CH(Y)CH₂O)_n are the ether moiety —CH₂(OCH₂CH₂)_p—O—X or mixture of said ether moiety and H; each X is H, C₁-C₄ alkyl or



wherein R⁷ is C₁-C₄ alkyl; m and n are numbers such that the moiety —(CH(Y)CH₂O)—comprises at least about 50% by weight of the moiety —(R⁵O)_m(CH(Y)CH₂O)_n—, provided that when R⁵ is the moiety —R²—A—R⁶—, m is 1; each n is at least about 6; p is 0 or at least 1; u and v are numbers such that the sum of u+v is from about 3 to about 25 when w is 0; w is 0 or at least 1; and when w is at least 1, u, v and w are numbers such that the sum of u+v+w is from about 3 to about 25.

4,713,195

SCALE INHIBITOR

Burnett M. Schnelder, Burlington, Wis., assignor to Aqua-Chem Inc., Milwaukee, Wis.

Filed Jan. 30, 1986, Ser. No. 824,230

Int. Cl.⁴ C02F 5/14

U.S. Cl. 252—180

8 Claims

1. A threshold scale inhibitor comprising a mixture of about 10 to 25% by weight of a maleic acid or anhydride homopolymer, about 60 to 75% by weight of an organophosphonate, and about 5 to 25% by weight of a sulfonated styrene-maleic acid or anhydride copolymer.

4,713,196

POLYMER COMPOSITIONS EXHIBITING LIQUID-CRYSTALLINE PHASES

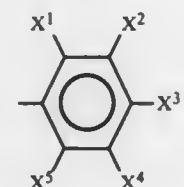
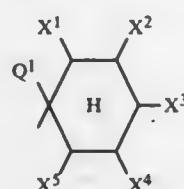
Klaus Praefcke; Bernd Kohne, both of Berlin; Eike Poetsch, Mühlthal, and Claus P. Herz, Heidelberg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany
Filed Aug. 16, 1985, Ser. No. 766,179

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430482

Int. Cl.⁴ C09K 19/52, 19/06, 19/38; G02F 1/13

U.S. Cl. 252—299.01 16 Claims

1. In a polymer exhibiting a liquid-crystalline phase and having mesogenic groups chemically bonded directly to the polymer backbone or bonded thereto by an acyclic chain spacer group, the improvement wherein the mesogenic groups are groups of the formula Ia, or both Ia and Ib:



wherein

Q¹ is H, alkyl or alkoxy each of 1-5 C atoms, F, Cl, Br or CN,

each of X¹ or X⁵ independently is H, alkyl of up to 15 C atoms or alkyl of 1-15 C-atoms in which one or two non-adjacent CH₂ groups are replaced by —Q—, —S—, —O—CO—O—, —O—CO—NH—, —CO—, —CO—O—, —CO—S—, —S—CO—, —SO— or —SO₂—,

with the proviso that at least two of X¹ to X⁵ are different from H.

14. In an anisotropic composition comprising an organic polymeric material useful in electromagnetic applications, the improvement wherein the polymer material is an anisotropic polymer material of claim 1.

4,713,197

NITROGEN-CONTAINING HETEROCYCLIC COMPOUNDS

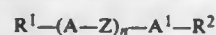
Rudolf Eidenschink, Münster; Joachim Krause, Dieburg; Reinhard Hittich, Modautal; Eike Poetsch, Mühlthal; Bernhard Scheuble, Alsbach; Georg Weber, Erzhausen, and Ludwig Pohl, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany
Filed Jan. 17, 1985, Ser. No. 692,097

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 3401321

Int. Cl.⁴ C09K 19/34; C07D 239/26, 239/34, 237/08, 237/14, 241/12, 241/18, 403/06, 403/12, 403/14, 405/06, 405/12, 405/14, 339/08, 319/06

U.S. Cl. 252—299.61 15 Claims

1. In a liquid crystal phase comprising at least two liquid crystalline components, the improvement wherein at least one component is a compound of the formula



wherein

each of R¹ and R² independently is alkyl of 1-15 C atoms; alkyl of 1-15 C atoms wherein one or two non-adjacent CH₂ groups are replaced by O atoms, —O—CO—, —CO—O—; and one of R¹ and R² can also be H, CN, F, Cl or Br,

each A independently is 1,4-phenylene (Phe) or 1,4-cyclohexylene (Cy),

each Z independently is —CO—O—, —O—CO—, —CH₂C—H₂—, or a single bond, at most two Z's not being a single bond,

A¹ is pyrimidine-2,5-diyl,

n is 3

with the proviso that at least one of the groups A is Cy or at least one group Z is not a single bond.

4,713,198

HIGH TEMPERATURE PLASTIC SCINTILLATORS

Ia John J. Simonetti, Cranbury, N.J., assignor to Sangamo Weston, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 604,699, Apr. 27, 1984, Pat. No. 4,578,213. This application Apr. 11, 1985, Ser. No. 722,204

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.⁴ C09K 11/06

U.S. Cl. 252—301.17 10 Claims

Ib 1. As an article of manufacture, a plastic scintillator which will function at high temperatures and retain as optical properties, said scintillator comprising a polymethylpentene host plastic containing a fluorescent agent, an energy transfer compound to cause energy from the fluorescent agent to be re-radiated at a lower wavelength, a wavelength shifter to absorb energy from the energy transfer agent and re-radiate it at a higher wavelength, a solubility enhancer for the polymethylpentene, and a decolorizing agent.

4,713,199

DEPOSITORY FOR RADIOACTIVE WASTE AND SPENT FUEL CELLS

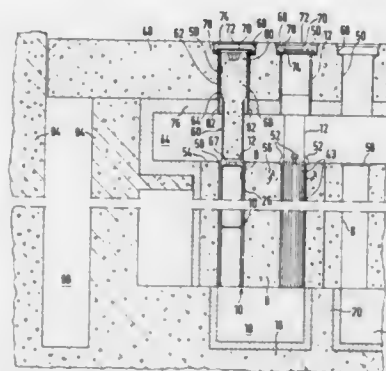
Harry Spilker, Talstrasse 3, D-3252 Bad Münster 2; Rainer Rox, Grethenweg 68, D-6000 Frankfurt/M. 70, and Heinz-Walter Peschl, Die Ritterwiesen 8, D-6237 Liederbach, all of Fed. Rep. of Germany

Continuation of Ser. No. 699,082, Feb. 7, 1985, abandoned. This application Jul. 28, 1986, Ser. No. 889,638

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404329

Int. Cl.⁴ G21F 9/12, 9/24, 5/00

U.S. Cl. 252—633 19 Claims



1. Modular-system depository for dry storage of radioactive waste containers and spent fuel cells comprising a concrete storage block on a concrete base, said concrete storage block containing vertical channels for storing and cooling said radioactive waste and fuel cells, and a cover, said storage block being composed of a plurality of individ-

ual concrete blocks each having a plurality of vertical storage and cooling channels extending therethrough, said concrete blocks being stacked beside and on top of one another with said vertical channels in alignment, at least one said container or fuel cell being disposed in each said channel,

said concrete blocks having said channels being arranged in essentially equal modular grids and having the same dimensions, a plurality of stacked concrete blocks forming a block segment and a plurality of block segments forming a storage block, said block segments being spaced from said concrete base, the spaces between the bottom of the block segments and the concrete base forming intake air conduits communicating with said vertical storage and cooling channels.

4,713,200

PESTICIDAL COMPOUNDS

Robert J. Blade, Berkhamsted, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Mar. 29, 1985, Ser. No. 717,449

Claims priority, application United Kingdom, Apr. 3, 1984, 8408566; Apr. 11, 1984, 8409361; Aug. 15, 1984, 8420753; Nov. 21, 1984, 8429372

Int. Cl.⁴ C11C 1/00, 3/00

U.S. Cl. 260—408 1 Claim

1. The compound 11-(3'-trifluoromethylbenzyloxy)-(2E,4E)-undecadienoic acid.

4,713,201

PROCESS FOR THE PREPARATION OF SALTS OF A DICARBOXYLIC ACID AND A DIAMINE

Georg Pilz, Neustadt; Gert Buerger, Mannheim; Manfred Barl, Otterstadt, and Gerhard Thiel, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,547

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522216

Int. Cl.⁴ C07C 83/00

U.S. Cl. 260—501.17 3 Claims

1. A process for the preparation of a salt of a dicarboxylic acid and a diamine of the formula



where R¹ and R² may be identical or different and are each alkylene of 2 to 4 carbon atoms and n is an integer from 1 to 3, which comprises: reacting a dicarboxylic acid and a diamine of the formula I which contains hydrazine in the form of hydrazine hydrate, in an aqueous solution at a temperature of from 50° to 95° C.

4,713,202

PROCESS FOR REDUCING THE DISTORTION OF MULTI-LAYERED LAMINATES

Llewellyn D. Booth, Lake Jackson, Tex., and Arie Cohen, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 6, 1985, Ser. No. 730,523

Int. Cl.⁴ B29C 35/16, 71/00, 67/20

U.S. Cl. 264—46.5 9 Claims

1. In a process for preparing a multilayer composite structure whereby the structure is produced at an elevated temperature, wherein the structure

(i) tends to distort upon changes in temperature, (ii) comprises at least two layers of different materials, at least one of which creeps at the elevated temperature at which the structure is prepared, and (iii) contains no layers which creep significantly at ambient temperature,

the improvement which comprises cooling said structure such that at least one of the layer(s) which creeps at said elevated

temperature is cooled to a temperature at which it does not significantly creep at a rate which is at least 50% less than the natural cooling rate thereof, and while the rate of cooling of at least one other layer in said composite, which layer has a greater coefficient of expansion and a higher elastic modulus than the layer(s) whose rate of cooling is retarded, is accelerated with respect to its natural cooling rate, thereby reducing or eliminating distortion in the cooled structure.

4,713,203

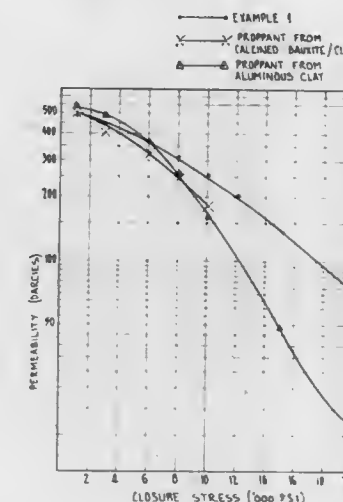
BAUXITE PROPPANT

William H. Andrews, Mt. Waverley, Australia, assignor to Comalco Aluminium Limited, Victoria, Australia
Filed Dec. 24, 1985, Ser. No. 812,984

Claims priority, application Australia, May 23, 1985, PH0703; Jul. 1, 1985, PH1268

Int. Cl.⁴ C04B 35/10

U.S. Cl. 264—117 10 Claims



1. A process for manufacture of a sintered bauxite suitable for use as a proppant comprising the following steps:

(a) separating a fine fraction from a naturally occurring bauxite containing same, said fine fraction being an uncalcined natural bauxite fraction composed largely of monomineralic particles of gibbsite, boehmite and kaolinite, the kaolinite responding no more than 25% of the total, said particles having a size range from 0.02 to 0.3 micrometers; (b) pelletizing the separated fine fraction in the presence of water; (c) treating the pellets produced in step (b) to remove water therefrom; (d) sintering the product of step (c) to produce sintered bauxite suitable for use as a proppant, said sintered bauxite having a density of less than 3.4.

4,713,204

PROCESS OF MANUFACTURING A ONE-PIECE MOLDING FROM A DRY CERAMIC MASS

Rolf Jung, Trier, Fed. Rep. of Germany, assignor to Laels-Werke AG, Trier, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 542,772, Oct. 17, 1983, abandoned. This application Nov. 14, 1985, Ser. No. 798,167
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 3238389

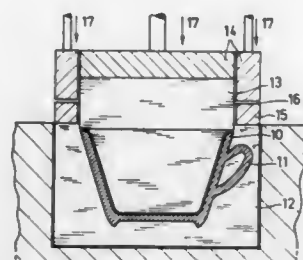
Int. Cl.⁴ B29C 43/04

U.S. Cl. 264—120 5 Claims

1. A process for fabricating one-piece moldings from a dry ceramic mass, having deep handles, comprising the steps of (a) filling a mold cavity which defines the shape of the

molding with a sprayed granular ceramic mass via feed channel means;

- (b) said mold cavity being formed by a divided punch and a divided mold matrix, said punch and mold matrix having molding surfaces which contact the ceramic mass during molding; at least said molding surfaces being made of synthetic material, an inner contour of said molding being matingly shaped with respect to said divided punch and an outer contour of said molding being matingly shaped with



- respect to said mold matrix, said mold matrix and punch defining a mold cavity for handle or grip there between, a dividing plane of said mold bisecting said handle or grip; (c) applying pressure to said sprayed granular ceramic mass in said mold cavity via said divided punch to mold said ceramic mass in said mold cavity; and (d) said mold matrix and punch coact in such a way during the molding process that over a predetermined period of molding time different pressures are applied via the punch to the molding.

4,713,205

METHOD FOR REDUCING MELT FRACTURE DURING EXTRUSION OF LINEAR POLYETHYLENE HOMOPOLYMERS AND COPOLYMERS BY VARYING THE GEOMETRY OF THE DIE EXIT FACE

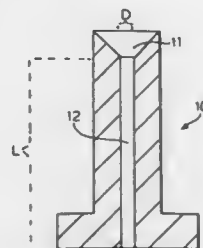
Tien-Kuei Su, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 25, 1985, Ser. No. 780,051

Int. Cl.⁴ B29C 47/12, 47/20

U.S. Cl. 264—176.1

4 Claims



1. In a method for extruding a linear homopolymer and/or copolymer of ethylene obtained from the polymerization of ethylene with up to 10 mol percent of a C₃₋₆ alpha olefin in which said linear homopolymer and/or copolymer is extruded through a first die having a first aspect ratio that exceeds 10 and under conditions of temperature and shear rate as to provide an extrudate exhibiting significant melt fracture, the improvement which comprises extruding said linear homopolymer and/or copolymer at said temperature and shear rate but substituting for said first die, a second die having a maximum aspect ratio of 10, said second die providing an extrudate of significantly reduced melt fracture.

4,713,206

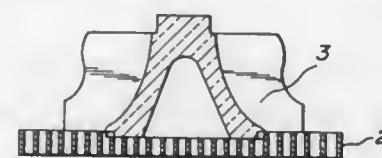
PROCESS FOR DEWAXING CERAMIC MOLDED BODIES

Tadaaki Matsuhisa, Kasugai, and Shingo Sasaki, Kuwana, both of Japan, assignors to NGK Insulators, Ltd., Japan
Filed Mar. 4, 1985, Ser. No. 707,680

Claims priority, application Japan, Mar. 16, 1984, 59-52030
Int. Cl.⁴ B29C 71/02; C04B 35/64

U.S. Cl. 264—328.2

12 Claims



1. A process for dewaxing a ceramic molded body comprising:
forming an injection molded ceramic body, said ceramic body containing a wax-series binder;
placing said molded body upon a honeycomb ceramic body;
and
heating said molded ceramic body to remove said wax-series binder therefrom.

4,713,207

MANUFACTURING METHOD FOR THERMOPLASTIC CONTAINER WITH INTEGRAL LIFTING RING

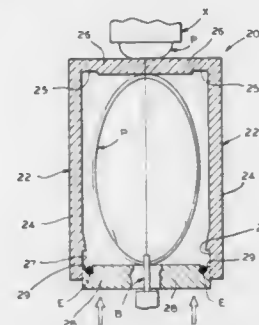
Theodore H. Udell, West Chester, Pa., and David R. Koller, Wilmington, Del., assignors to Container Corporation of America, Alton, Ill.

Filed Jul. 7, 1986, Ser. No. 883,752

Int. Cl.⁴ B29C 49/04, 47/02, 43/00

U.S. Cl. 264—515

3 Claims



1. A method of forming, in a mold having a pair of side sections movable toward and away from each other and a pair of generally co-planar end sections movable toward and away from each other and toward and away from said side sections, a plastic container having a generally cylindrical, hollow body with an integral, solid ring extending radially outward therefrom said method comprising the steps of:

- (a) while said mold is in an open position, inserting molten plastic extrudate between said mold end and side sections in grooves formed by adjacent recesses of respective mold sections;
(b) extruding a plastic parison between said mold sections;
(c) closing said mold by moving said side sections toward each other and said end sections toward said side sections to close off the opposite ends of said parison and to compress extrudate between said mold end and side sections to form said ring;
(d) introducing air under pressure into the interior of the parison in said mold to force the material of said parison against said mold sections to form said hollow container body and, at the same time, weld said ring to said body.

4,713,208

SPHEROMAK REACTOR WITH POLOIDAL FLUX-AMPLIFYING TRANSFORMER

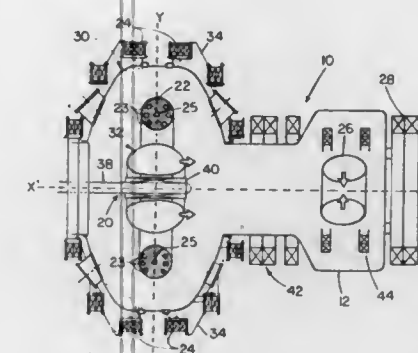
Harold P. Furth, Princeton; Alan C. Janos, East Windsor, both of N.J.; Tadao Uyama, Osaka, Japan, and Masaaki Yamada, Lawrenceville, N.J., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 21, 1986, Ser. No. 866,031

Int. Cl.⁴ G21B 1/00

U.S. Cl. 376—137

3 Claims



1. Apparatus for forming and sustaining a spheromak plasma comprising:

- a closed vacuum vessel having a longitudinal axis;
a generally circular conductive core disposed within said vacuum vessel symmetrically with respect to and along the longitudinal axis of said vacuum vessel, said conductive core having a plurality of electrical currents flowing therein for rapidly generating in an alternating manner first poloidal and toroidal magnetic fields, respectively, about said conductive core so as to form a spheromak plasma; and
an inductive transformer disposed radially inwardly of said conductive core and said spheromak plasma and spaced therefrom, said inductive transformer being coaxial with said longitudinal axis of said vacuum vessel, said inductive transformer having a current flowing therein for producing a second poloidal magnetic field about said conductive core, means for rapidly reversing said inductive transformer current and for converting said second poloidal magnetic field to a second toroidal magnetic field about said conductive core for facilitating the formation of and sustaining the spheromak plasma.

4,713,209

DRAIN RECOVERY SYSTEM FOR CONDENSATE FEEDWATER SYSTEM OF NUCLEAR POWER PLANT

Hitoshi Ishimaru, Hitachi, and Toshiki Kobayashi, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of Japan

Filed Apr. 15, 1986, Ser. No. 852,315

Claims priority, application Japan, Apr. 15, 1985, 60-78369

Int. Cl.⁴ G21C 7/32

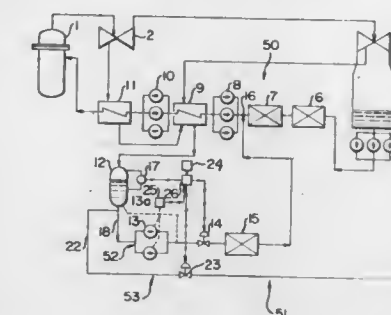
U.S. Cl. 376—211

10 Claims

1. A drain recovery system for the condensate feedwater system of a nuclear power plant, said condensate feedwater system including condensate pumps for boosting the condensate from a condenser, and feedwater heaters for heating the condensate from said condensate pumps, said drain recovery system comprising:

- drain pumping-up recovery means including a drain tank for storing a feedwater heater drain, and drain pump means connected to said drain tank for pumping up the drain therein to inject the drain into said condensate feedwater system at a predetermined portion thereof; and
drain level control means including conduit means con-

nected between a portion of said drain pumping-up recovery means upstream of said drain pump means and a portion of said condensate feedwater system upstream of said condensate pumps for causing the drain in said drain tank



to be returned to said portion upstream of said condensate pumps by a pressure differential therebetween so as to maintain a drain level in said drain tank at a predetermined position when the plant operates at a low load level or said drain pump means malfunctions.

4,713,210

CONTROL ROD DRIVE LINE AND GRAPPLE

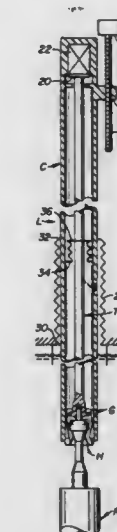
John H. Germer, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Nov. 18, 1985, Ser. No. 798,778

Int. Cl.⁴ G21C 7/12, 19/10

U.S. Cl. 376—233

3 Claims



1. A control rod driveline and grapple for engaging and releasing a control rod from a control rod drive, the combination comprising an enlarged control rod handle including an upwardly flaring frustum and a rod extending from said control rod handle;

- a relatively moving outer member;
a tension rod connected to said relatively moving outer member at the upper end and provided with a lower annular flange at the lower end, said tension rod including a female cavity for receiving the upwardly extending rod from said enlarged control rod handle;
a plurality of discrete and independent grapple segments for surrounding and grappling the control rod handle, each grapple segment including a first indentation for engaging and gripping the flange of said tension rod at an upper and interior annulus;
said grapple segments defining collectively an enlarged

interior female annulus for confining said control rod handle and collectively defining at the lower extremity a gathering surface to permit said grapple segments to gather said handle upon downward movement; said relatively moving outer member mounted about said tension rod, said second relatively outer member movable to a first position wherein said grapple segments can move to and from said open position and a second position wherein said grapple segments are restricted to a closed position; said grapple segments including a first bearing surface on said lower annular flange on said tension rod and a second bearing surface on said control rod handle causing said grapple segments to close about said control rod handle when said tension rod is lowered overlying said control rod; said grapple segments defining at the bottom peripheral surface adjacent said relatively moving outer member an exterior flange, said exterior flange when confronted to said outer member holding said segments in said closed position and when moving just beyond said relatively moving outer member permitting said segments to completely open whereby a small amount of relative movement between said relatively moving outer member and said tension rod causes release of said control rod; and means for effective relative movement of said tension rod and said relatively moving outer member to permit said grapple segments to engage said control rod handle and permit said control to be manipulated by said drive.

4,713,211

HIGH TEMPERATURE PEBBLE BED REACTOR AND PROCESS FOR SHUT-DOWN

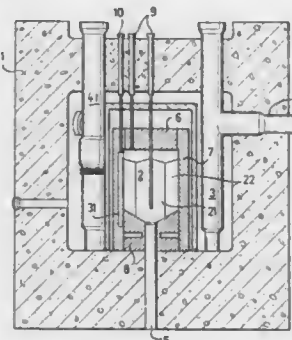
Winfried Wachholz, Gornheimer Tal, and Ulrich Weicht, Weinheim, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Fed. Rep. of Germany
Filed Sep. 28, 1984, Ser. No. 655,420

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335269

Int. Cl.⁴ G21C 7/08

U.S. Cl. 376—238

5 Claims



1. A process for the shutdown of a high temperature pebble-bed nuclear reactor having a core of spherical fuel elements, a reflector surrounding the core comprising a top reflector, a side reflector and a bottom reflector, means for the removal of decay heat, means for shutdown of the reactor over an extended period of time comprising at least one first absorber rod removably displaceable into the core of the reactor, and means for the rapid shutdown of the reactor comprising a plurality of second absorber rods removably displaceable into the side reflector of the reactor, the shutdown reactivity of said second absorber rods being such that the reactor may be reduced to a subcritical state under any condition by insertion of same into said side reflector, the process for shutdown of the reactor for all non-reactivity accidents comprising displacing only that portion of said second absorber rods into said side reflector which is sufficient to reduce the reactor to a subcritical state,

the shutdown reactivity of said second absorber rods being such that only a portion of the total plurality of said absorber rods is required to achieve a subcritical state, removing decay heat to reduce the temperature of the reactor to a predetermined lower level and subsequently causing said reactor to become critical at said predetermined lower level.

4,713,212

PROCESS FOR SURVEILLANCE AND CONTROL OF OPERATIONS OF LOADING AND UNLOADING OF THE FUEL OF A NUCLEAR REACTOR AND APPARATUS APPLYING THIS PROCESS

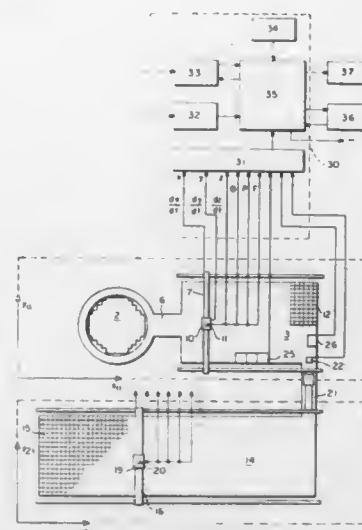
Michel Plumier, Ham-Sur-Heure, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi, Brussels, Belgium
Filed Sep. 5, 1984, Ser. No. 647,444

Claims priority, application European Pat. Off., Sep. 6, 1983, 83201278.5

Int. Cl.⁴ G21C 19/02

U.S. Cl. 376—258

8 Claims



1. A process for the fully automated supervision and control of loading and unloading operations of groups of combustible nuclear elements into a core of a reactor, a reactor pool and a spent fuel pit by means of a reactor pool loading machine having a telescopic mast, upon the end of which is provided a gripping head with pinchers, for supplying the reactor and the reactor pool having a buffer rack, a fixed deposit station a transfer basket and a plurality of mobile deposit stations, and a deactivation pool handling machine having a telescopic mast, upon the extremity of which is provided a gripping head with pinchers for supplying the spent fuel storage pit containing storage racks and a transfer apparatus assuring the connection between the reactor pool and the spent fuel pit, comprising the steps of:

- (a) recording a position of each group in the core of the reactor, the storage rack and the buffer rack,
- (b) recording a position of the reactor pool loading machine, the deactivation pool handling machine, the transfer apparatus and the mobile deposit stations,
- (c) verifying the identification of each group at the moment of gripping and/or at the moment of release of each group in the core of the reactor, in the buffer rack, in the transfer basket, in the storage rack, in the fixed deposit stations, and in the mobile deposit stations,
- (d) supplying command and control signals for the manipulation of the reactor pool loading machine, the deactivation pool handling machine, the transfer apparatus and the mobile deposit stations;
- (e) comparing the command signals and control signals of each manipulation ordered to the reactor pool loading machine, to the deactivation pool handling machine, to

the transfer apparatus, and to each mobile deposit station with recorded signals of a pre-established loading sequence and the position of each group, for producing a signal in one of:

- (1) a first state indicating coincidence in said comparing step whereby said ordered manipulation can be safely carried out, and
 - (2) a second state indicating noncoincidence in said comparing step whereby said ordered manipulation cannot be safely carried out,
- (f) carrying out one of (1) the manipulation of the reactor pool loading machine, the deactivation pool handling machine, the transfer apparatus and the mobile deposit station in response to said signal in said first state, and (2) a blocking of subsequent ordered manipulation by the reactor pool loading machine, by the deactivation pool handling machine, by the transfer apparatus or by any of the mobile deposit stations,
- (g) updating the position of the group moved by the ordered manipulation; and
- (h) establishing a table of final positions of each group in the core of the reactor, in the storage racks, and in the buffer rack for establishing a plan of disposition of the groups.

4,713,213

NUCLEAR REACTOR PLANT HOUSED IN A STEEL PRESSURE VESSEL WITH A GAS COOLED SMALL HIGH TEMPERATURE REACTOR

Josef Schoening, Hambruecken, and Claus Elter, Bad Dürkheim, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Fed. Rep. of Germany

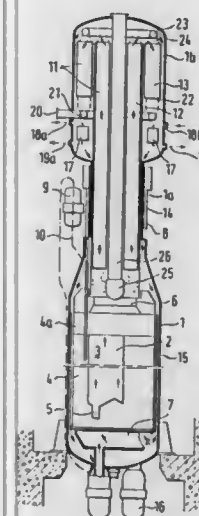
Filed Dec. 18, 1985, Ser. No. 811,111

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446101

Int. Cl.⁴ G21C 15/18

U.S. Cl. 376—299

19 Claims



1. A nuclear reactor plant comprising a gas cooled small high temperature reactor, housed in a steel pressure vessel, the reactor having a core containing a pile of spherical fuel elements and traversed from bottom to top by a flow of primary helium gas,

a heat utilization system arranged in the flow of cooling gas and installed above the small high temperature reactor in the reactor pressure vessel and which is followed in line preferably by two circulating blowers connected in parallel;

the heat utilization system comprising a He/He heat exchanger in which the primary helium transfers its heat to secondary helium circulating in an intermediate circulation loop;

the He/He heat exchanger comprises an inner annular coil bundle, extending to a hot gas collector chamber located

above the reactor core and exposed from below to hot primary helium cooling gas and an outer coil bundle arranged concentrically and connected successively where the inner coil bundle is of greater length than the outer coil bundle and only the inner coil bundle extends to the hot gas collector chamber;

at least one decay heat exchanger installed in the steel pressure vessel;

the decay heat exchanger is arranged immediately following the He/He heat exchanger in the direction of flow, and is constantly traversed by the entire flow of cooling gas.

4,713,214

DEVICE FOR PURIFYING LIQUID METAL COOLANT FOR A FAST NEUTRON NUCLEAR REACTOR

Jean-Jacques Dumay, Dampierre, and Claude Malaval, Antony, both of France, assignors to Novatome, Le Plessis Robinson, France

Filed Oct. 13, 1983, Ser. No. 541,749

Claims priority, application France, Oct. 29, 1982, 82 18195

Int. Cl.⁴ G21C 19/30

U.S. Cl. 376—312

13 Claims



1. In a fast neutron nuclear reactor cooled by a liquid metal and comprising a vessel containing said liquid metal coolant and a support structure, a device of purifying the liquid metal coolant comprising

- (a) an external cylindrical envelope fixed to the support structure;
 - (b) an assembly of annular and coaxial chambers separated by cylindrical casings disposed vertically inside said cylindrical envelope;
 - (c) a pump connected to said assembly of chambers and disposed with respect to said vessel for circulating the liquid metal through said chambers;
 - (d) a filter cartridge disposed at the central part of said assembly of chambers;
 - (e) a channel disposed at the central part of said filter cartridge for collecting the purified liquid metal;
 - (f) an economizer exchanger contained in a first chamber of said assembly of chambers connected to said pump to receive liquid metal to be purified and to said channel to receive purified liquid metal;
 - (g) cooling means connected to a second chamber for cooling the liquid metal before its purification by passage through the filter wherein said chambers are all disposed one inside the other, their casings being fixed at their lower parts, on one horizontal plate supported by said external envelope, such that they are freely expandable independent of each other, said assembly of chambers comprising from said external envelope inwards;
- a chamber for degassing the purified metal open in its upper part, bounding externally by its external wall a basin for

collecting the purified metal placed at the upper part of the device;
said first chamber enclosing the economizer exchanger communicating with the lower part of said degassing chamber through its part receiving the purified liquid metal and with a duct for discharging the purified liquid metal;
said second chamber connected to said cooling means and filled with purified liquid metal;
a chamber containing the filter in communication through its upper part with the part of the economizer exchanger where circulates the liquid metal to be purified; and
said channel for collecting the purified liquid metal;
an annular thermal insulation wall coaxial with the chambers being disposed between said first and said second chambers.

4,713,215

PROCESS FOR SINTERING POWDERED MATERIAL IN A CONTINUOUS FURNACE

Michel Madsac, Sceaux, France, assignor to L'Air Liquide, Paris, France

Filed May 15, 1987, Ser. No. 49,850

Claims priority, application France, May 16, 1986, 86 07067
Int. Cl.⁴ B22F 7/00

U.S. Cl. 419-8

5 Claims

1. A process for sintering in a continuous furnace a powdered material containing oxygen in the oxide and/or adsorbed state, comprising reducing the oxygen present in a first pre-sintering stage and then ensuring a cohesion of the material in second sintering stage, said pre-sintering stage being carried out under a reducing atmosphere based on hydrogen and neutral gas having a flow rate F_G which is at least equal to:

$$F_G \geq \frac{1.4 \times S_P \times D_P}{P(H_2) - P(H_2)'} \times \frac{X(O_2)i}{\alpha} \times v_S$$

S_P =section of a layer of said powdered material to be sintered in sq.m

D_P =voluminal mass of said powdered material in kg/cu.m

$X(O_2)i$ =percentage of oxygen mass in said powdered material before said pre-sintering stage in the oxide and/or adsorbed form,

$P(H_2)i$ =voluminal percentage of hydrogen in the gas introduced into the furnace,

$P(H_2)'$ =the smallest voluminal percentage of hydrogen in the atmosphere in the furnace at a point where the oxides have been completely reduced,

v_S =speed of feed of the material in the furnace expressed in m/hr,

α is a constant

F_G being expressed in cu.m/hr

4,713,216

ALUMINUM ALLOYS HAVING HIGH STRENGTH AND RESISTANCE TO STRESS AND CORROSION

Kenji Higashi, Tadakazu Ohnishi, and Ichizo Tsukada, all of Osaka, Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1986, Ser. No. 854,777

Claims priority, application Japan, Apr. 27, 1985, 60-91840;
Aug. 22, 1985, 60-185472; Mar. 7, 1986, 61-51078

Int. Cl.⁴ C22C 21/10

U.S. Cl. 420-532

14 Claims

1. An aluminum alloy having excellent properties including high resistance to stress and corrosion, the alloy consisting essentially of 4.0 to 12% of zinc, 0.3 to 5.0% of magnesium, and one or more elements selected from the rare earth elements, wherein the content of the selected element is in the range of 0.5 to 10.0%, and the balance being substantially aluminum and unavoidable impurities.

2. An aluminum alloy as defined in claim 1, further containing 0.05 to 2.0% of copper.

4,713,217

NICKEL BASE BRAZING ALLOY AND METHOD

Marvin J. Stern, Seattle, Wash., assignor to Alloy Metals, Inc., Troy, Mich.

Filed Jan. 4, 1984, Ser. No. 617,287

Int. Cl.⁴ C22C 19/05

U.S. Cl. 420-452

7 Claims

1. A nickel base brazing alloy suitable for diffusion brazing nickel base superalloys consisting essentially of the following composition in weight percent:
Chromium: 12 to 14%
Boron: 1 to 2.5%
Iron: 3 to 4.5%
Nickel: Balance
the brazing alloy having less than about 0.03% carbon and less than 0.04% incidental impurities and additions.

4,713,218

TUBE TRAP APPARATUS

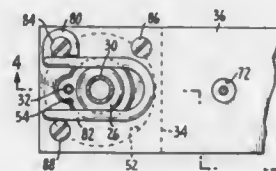
Henry L. Schwartz, Los Gatos, Calif., assignor to Sequoia-Turner Corporation, Mountain View, Calif.

Filed Jul. 22, 1985, Ser. No. 757,646

Int. Cl.⁴ G01N 37/00

U.S. Cl. 422-99

9 Claims



1. An apparatus for registering tubes with an elongate probe which comprises:

an elongate probe selectively movable along a shaft between retracted and extended positions;

spring means having at least one aperture therethrough for receiving said elongate probe;

restraint means affixed to said spring means, said restraint means having an aperture therethrough which is aligned with said spring means aperture, for receiving said elongate probe, said spring means selectively biasing said restraint means against a tube top to focus a tube mouth in line with said elongate probe prior to insertion of said elongate probe into the tube mouth; and

bail means, affixed to said spring means for receiving said elongate probe therethrough,

wherein said elongate probe passes through said spring means aperture and said restraint means aperture and wherein said elongate probe mechanically contacts said bail means to selectively retract and to extend said restraining means relative to the tube top in sequence with said elongate probe shaft extension and retraction.

4,713,219

PLASTIC REACTION VESSEL

Hero Gerken, and Heinz-Jürgen Gora, both of Hamburg, Fed. Rep. of Germany, assignors to Eppendorf Geratebau Netheler & Hinz GmbH, Hamburg, Fed. Rep. of Germany
Continuation of Ser. No. 686,198, Dec. 26, 1984, abandoned.

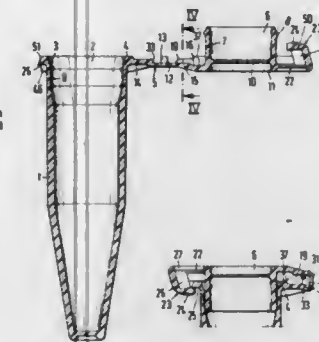
This application Oct. 20, 1986, Ser. No. 921,866

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1984, 3402276

Int. Cl.⁴ B01L 3/00

U.S. Cl. 422-102

12 Claims



1. In a plastic reaction vessel comprising a hollow vessel body having an inside peripheral surface and an edge portion which defines an opening (2) adjoining said surface,

a cover comprising a cylindrical skirt which extends through said opening into said vessel body and is removable therefrom and has an inner end provided with a sealing lip (8) in sealing contact with said inside peripheral surface, said cover having a radially outwardly protruding rim which is axially spaced from said sealing lip and contacts said edge portion along a substantial part of the peripheral extent of the edge portion, said cover also comprising a transverse wall, said wall axially spaced from said sealing lip and closing said skirt, and
a flexible connecting strip (5) having opposite ends that are respectively integral with said vessel body and said cover, said connecting strip permitting said skirt to be removed from said vessel through said opening,

the improvement comprising that said vessel body comprises a body flange (4) which surrounds said edge portion, said flange defining a downwardly facing abutment surface (25, 41) extending radially outwardly from said vessel body at a location which is diametrically opposite to said connecting strip, said cover comprises a hooklike extension (23) which is attached to said body flange and spaced radially outwardly from said skirt and releasably engages said abutment surface,

said connecting strip comprises a hinge portion (12) defining between said opposite ends at least one laterally extending hinge axis,

said cover comprises a depending flange extending downwardly from the outer edge of said rim and contacting the periphery of said body flange, wherein

said hinge portion of said connecting strip comprises two hinges (31, 32) spaced apart along said strip, so that in conjunction with said depending flange said hinge portion permits a lateral movement of said cover whereas a parallel guidance of said cover is effected by said depending flange in contact with said body flange,

said hinges spaced such a distance apart that said parallel guidance is provided in a height which corresponds to the length of said hooklike extension, and

an alignment of the cover is effected by the contact of said sealing lip with said inside surface, and wherein said hinge portion (12) is provided with an inwardly protruding projection (13) attached to said hinge portion (12)

of said connecting strip and located between said hinges, said projection (13) serving for holding said hinges (31, 32) spaced apart and for effecting a parallel guidance by means of said hinges, and wherein
said hinge portion (12) is thinner between said hinges than those portions (14, 15) of said connecting strip which extend from said hinge portion to said vessel body (1) and said cover (6), respectively, and
an upwardly protruding step (33) facing away from said vessel body is formed in said portion which extends from said hinge portion to said vessel body.

4,713,220

OZONATOR POWER SUPPLY

Anh N. Huynh, Edgewood, Ky., and Phoivos D. Ziogas, Brosard, Canada, assignors to National Distillers and Chemical Corporation, New York, N.Y.

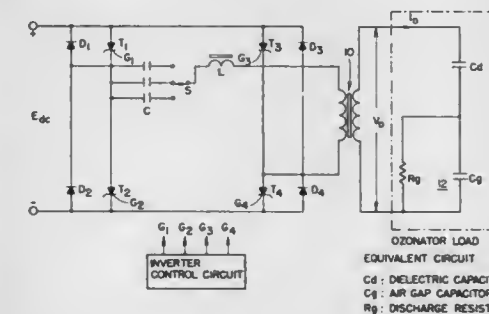
Continuation of Ser. No. 725,737, Apr. 22, 1985, Pat. No.

4,680,694. This application Feb. 13, 1987, Ser. No. 14,750

Int. Cl.⁴ B01J 19/08

U.S. Cl. 422-186.16

18 Claims



1. A power supply circuit for an ozonator comprising:

a. a DC/AC thyristor bridge inverter coupled at its input terminals to a direct current power source and at its output terminals to a resonant network, said thyristor bridge inverter comprising a first thyristor means for conducting through the resonant network in a first direction and a second thyristor means for conducting through the resonant network in a second direction;

b. said resonant network having a step up high voltage transformer with its primary winding coupled to said thyristor bridge inverter and its secondary winding coupled to the ozonator; and

c. an inverter control circuit for controlling the gating electrodes of said first and second thyristor means, said inverter control circuit comprising a square wave generator for generating first and second opposite square wave signals, a first edge detecting circuit coupled to the first square wave signal for producing a first gating pulse for each detected edge, which is coupled to gate said first thyristor means, and a second edge detecting circuit coupled to the second square wave signal for producing a second gating pulse for each detected edge, which is coupled to gate said second thyristor means.

4,713,221

CRUDE OIL REFINING APPARATUS

Dean P. Montgomery, James W. Gall, both of Bartlesville, Okla., and Ed D. Davis, Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 613,944, May 25, 1984, Pat. No. 4,565,620.

This application Sep. 16, 1985, Ser. No. 776,280

Int. Cl.⁴ B01J 8/04; C10G 69/14

U.S. Cl. 422-190

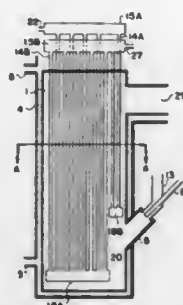
4 Claims

1. Apparatus comprising:

a crude tower;

means for providing a crude oil feed to said crude tower,

- (b) providing a heat exchange means in said combustion zone in proximity to the burning phosphorus;
 (c) passing a heat exchange fluid through said heat exchange means to maintain the outer surface thereof at a temperature no higher than about 1000° F. (538° C.), said surface



- having thereon a protective, adherent coating of metaphosphoric acid;
 (d) removing heat from the gas stream, without cooling the gas stream below its dew point; and
 (e) conveying the gas stream of P_2O_5 containing vapors to a conversion zone for recovery of phosphoric acid.

4,713,229

PROCESS FOR PURIFYING PHOSPHORIC ACID

Günther Schimmel, and Reinhard Gradl, both of Erfstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 774,084

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434611

Int. Cl.⁴ C01B 25/14, 25/16

U.S. Cl. 423—321 R

9 Claims

1. In a process for purifying phosphoric acid containing from 3 to 80 weight % P_2O_5 , especially for removing ions of cadmium, copper, mercury, lead and arsenic and optionally also organic compounds and sulfuric acid from wet process phosphoric acid, wherein the phosphoric acid is contacted either with a diorganyldithiophosphoric acid ester or with a mixture of an adsorbent and said ester or, prior to or after said treatment with the ester, is contacted with the adsorbent alone and the phase containing the purified phosphoric acid is separated from the phase containing the ester, the improvement which comprises: admixing the phosphoric acid with a reductant prior to treating it with the dithiophosphoric acid ester and, in the event of an adsorbent being used, using the adsorbent alone or in combination with an alkaline earth metal compound soluble in phosphoric acid, whereby cadmium, arsenic and copper contaminants are effectively removed.

4,713,230

PURIFICATION OF CHLOROSILANES

Richard S. Doornbos, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 427,082, Sep. 29, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,226

Int. Cl.⁴ C01B 33/08, 33/107

U.S. Cl. 423—341

20 Claims

1. A process for purification of a chlorosilane selected from the group consisting of monochlorosilane, dichlorosilane, trichlorosilane, and tetrachlorosilane where said chlorosilane is contaminated with boron-containing impurities, said process comprising the steps of

- (A) passing the chlorosilane, in the vapor phase, through a bed of silica, said bed of silica consisting of silica containing about 0 to 10% by weight free water and more than about 0.25% by weight total hydroxyl, said bed of silica being at a temperature greater than 3° C. above the boiling point of the chlorosilane at the operating pressure

of step (A) and a temperature of less than or equal to about 99° C., and

- (B) collecting the purified chlorosilane having a significantly reduced amount of the boron-containing impurities.

4,713,231

PROCESS FOR THE RECOVERY OF AMMONIA AND FLUORIDE VALUES FROM AMMONIUM FLUORIDE SOLUTIONS

Kent D. Campbell, Concord; Laura J. Dietsche, Berkeley; Lee B. Crampton, Concord; Keith D. Hovda, Antioch; George K. Tyson, Walnut Creek, and Charles A. Wilson, Pittsburg, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 21, 1986, Ser. No. 887,587

Int. Cl.⁴ C01B 7/19

U.S. Cl. 423—356

20 Claims

12. A process for preparing a slurry comprising potassium fluoride in a water soluble, dipolar, aprotic solvent which process comprises combining an aqueous solution comprising potassium fluoride with the solvent and distilling to remove water.

4,713,232

PROCESS FOR THE DESTRUCTION OF BY-PRODUCT TETRANITROMETHANE

Chang-Hwa Chio, Brossard; Anthony C. F. Edmonds, North York, and Colin M. Evans, Toronto, all of Canada, assignors to C-I-L Inc., North York, Canada

Filed Aug. 13, 1986, Ser. No. 896,094

Claims priority, application Canada, Apr. 9, 1986, 506238

Int. Cl.⁴ C01B 21/46, 21/38

U.S. Cl. 423—390

7 Claims

1. A process for the destruction of tetranitromethane which is present in admixture with nitric acid as a by-product of the nitric acid treatment of an organic substance, which destruction process comprises subjecting the tetranitromethane and nitric acid mixture to a temperature of at least 210° C. whereby the tetranitromethane fraction is decomposed and the nitric acid fraction is substantially preserved for recovery.

4,713,233

SPRAY-DRIED INORGANIC OXIDES FROM NON-AQUEOUS GELS OR SOLUTIONS

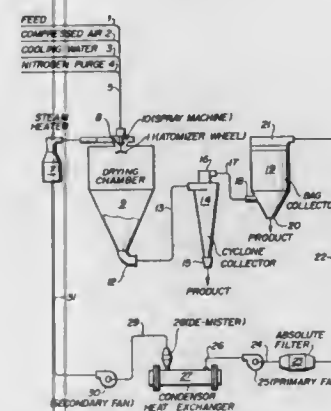
Gary B. Marsh, Pittstown; Anthony J. Fanelli, Rockaway; John N. Armor, Morris Plains, and Patrick M. Zambri, Montclair, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 717,931, Mar. 29, 1985, Pat. No. 4,649,037. This application Sep. 24, 1986, Ser. No. 910,929

Int. Cl.⁴ C01G 25/02

U.S. Cl. 423—608

1 Claim



1. A yttria-stabilized zirconia xerogel having a pore volume of at least 1.4 cc/g and a surface area of at least 219 m²/g.

4,713,234

PROCESS AND APPARATUS FOR CONVERSION OF WATER VAPOR WITH COAL OR HYDROCARBON INTO A PRODUCT GAS

Walter Weirich, Aachen; Heiko Barnert, Jülich; Michael Oertel, Aachen, and Rudolf Schulten, Aachen-Richterich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,909

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424208

Int. Cl.⁴ C01B 1/02

U.S. Cl. 423—648 R

17 Claims



1. In a process of generating a product gas containing hydrogen, by reacting under heat a mixture of steam and solid carbon in a reaction vessel, a method of improving the reaction in order to separate and isolate the hydrogen from the product gas comprising the steps of:

- forming a hydrogen collection chamber in said vessel by providing a hydrogen-permeable membrane;
 introducing solid carbon into said reaction vessel;
 introducing steam into said reaction vessel;
 reacting said solid carbon and said steam in said reaction vessel;
 providing external heat to support said reaction within the reaction vessel;
 reducing hydrogen adsorption by said solid carbon at its

surface by continuously removing and collecting the generated hydrogen into said collection chamber within said reaction vessel; and

maintaining a hydrogen pressure differential across said membrane to augment hydrogen flow into said hydrogen collection chamber and hydrogen removal from said vessel.

4. Apparatus for generating a product gas containing hydrogen, by reacting under external heat a mixture of steam and solid carbon in a reaction vessel and separating and isolating the hydrogen from the product gas, comprising:

a reaction vessel having inlets for receiving steam and solid carbon, such as coal or coke, and at least one outlet for product gas;

a reaction zone for reacting said solid carbon and said steam in said vessel;

a hydrogen collection chamber in said vessel, said collection chamber being formed from a wall which is selectively hydrogen permeable for separating the hydrogen from the product gas and which hydrogen collection chamber is located away from said reaction zone in said reaction vessel, and wherein said collection chamber is connected to hydrogen collecting means for continuously collecting and removing hydrogen;

means to maintain a hydrogen pressure differential across said wall to facilitate hydrogen permeation from said reaction vessel into said hydrogen collection chamber; and means for maintaining a reaction temperature inside said reaction vessel of between about 500° to 1000° C.; said hydrogen permeable wall providing means for reducing hydrogen adsorption by said solid carbon at its surface by continuously removing and collecting the generated hydrogen in said reaction chamber.

4,713,235

RADIOPAQUE CYANOACRYLATES

Robert E. Krall, Raleigh, N.C., assignor to CRX Medical, Inc., Raleigh, N.C.

Continuation-in-part of Ser. No. 267,400, May 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 198,466, Oct. 20, 1980, abandoned. This application Dec. 16, 1982, Ser. No. 450,249

Int. Cl.⁴ A61K 49/04

U.S. Cl. 424—5

15 Claims

1. A radiopaque polymerization cyanoacrylate composition comprising a mixture of an ester of 2-cyanoacrylic acid and a radiopaque additive stable to and not substantially decreasing the storage life of the cyanoacrylate ester, the additive including at least one member selected from the group consisting of triiodophenol, iodoform and tetraiodoethylene and the composition having between 0.5 and 11 mole percent iodine atoms.

4,713,236

POLYMERIC AMINE CONDITIONING ADDITIVES FOR HAIR CARE PRODUCTS

M. Fred Hoover, and Lawrence J. Guilbault, both of Topsfield, Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Dec. 7, 1981, Ser. No. 327,670

Int. Cl.⁴ A61K 7/06; C08F 124/00

U.S. Cl. 424—70

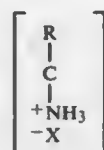
12 Claims

1. A hair conditioning product which is a member selected from the group consisting of shampoos, conditioners, creme rinses, and setting gels and containing an effective amount of a polymer for imparting good conditioning properties to hair made from ethylenically unsaturated addition polymerizable monomers and containing units of a member selected from the group consisting of a pendant primary amino group of the following structure:



where:

=an organic polymer chain;
R=H, alkyl, aryl, —COOH, —COOR" or —CONH₂, and
R"—methyl, ethyl or other lower alkyl; an ammonium salt of
said amine group of the following structure:



where:

=an organic polymer chain,
R=H, alkyl, aryl, —COOH, —COOR" or —CONH₂, and
R"—methyl, ethyl or other lower alkyl, and
-X=halide, hydroxide, methyl sulfate, or similar negatively
charged group;
or admixtures of the amino group and salt.

4,713,237

SUSTAINED RELEASE DOSAGE FORM
Mahendra Shah, Lake Hiawatha, N.J., assignor to Schering
Corporation, Kenilworth, N.J.

Filed Jun. 18, 1984, Ser. No. 621,580

Int. Cl.⁴ A61K 9/22, 9/52, 31/74, 31/78

U.S. Cl. 424—78

3 Claims

1. A sustained release dosage form comprising an effective amount of active ingredient and an effective amount of a water insoluble, water swellable, saponified starch acrylonitrile graft copolymer to provide sustained release of said active upon oral administration to a patient in need of such treatment.

4,713,238

WATER SOLUBLE COMPLEX OF A POLY (VINYL LACTAM) AND CHLOROTHIAZIDE AND PROCESS FOR PRODUCING SAME

Eugene S. Barabas, Watchung, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed May 2, 1986, Ser. No. 858,635

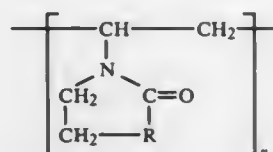
Int. Cl.⁴ A61K 31/38; C07D 285/28

U.S. Cl. 424—80

12 Claims

1. Water soluble chlorothiazide in a complexed state, derived from the reaction between a polymer of a N-vinyl lactam having 6 to 7 carbon atoms and chlorothiazide.

8. The process for producing the complexed compound of claim 1 which comprises: mixing alkali metal hydroxide solutions of chlorothiazide and a poly(N-vinyl lactam) having the formula:



wherein n is an integer having a value of from 5 to 3,500 and R is —CH₂— or —C₂H₄— in a mole ratio of polymer to chlorothiazide of between about 1:1 and about 10:1, agitating the mixture having a pH of between about 7.5 and about 10 under a pressure of from about atmospheric to about 50 psig at

a temperature of from about 4° C. to about 100° C. and below the boiling point of said hydroxide solution, for a period of from about 5 minutes to about 3 hours, to form the alkali metal salt of the complexed poly(N-vinyl lactam) and chlorothiazide in the liquid phase, separating said hydroxide solution from said complexed salt, diluting said complexed salt with water and adjusting the pH of the resulting solution to between about 3.5 and about 7 to produce the complexed poly(N-vinyl lactam)-chlorothiazide product of the reaction.

4,713,239

ANTIANGINAL FILM AND METHOD OF TREATING ISCHEMIC HEART DISEASE

Eduard A. Babaian; Galina A. Gerasimova; Anatoly B. Davydov; Rustam I. Utyamyshev; Gennady L. Khromov; Vladimir I. Metelitsa; Anatoly M. Vikhert; Konstantin L. Savvateev; Vladimir K. Piotrovsky, and Elizaveta B. Novikova, all of Moscow, U.S.S.R., assignors to Vsesojunznyi Kardiologicheskii Nauchny Tsentr Adkaemii Meditsinski Nauk SSSR and Vsesojuzny Nauchno-Issledovatel'skiy Institut Meditsinskoi Tekhniki, both of Moscow, U.S.S.R.

Continuation of Ser. No. 42,874, May 29, 1979, abandoned. This application Nov. 19, 1985, Ser. No. 799,210

Int. Cl.⁴ A61K 31/04, 9/22

U.S. Cl. 424—81

13 Claims

1. In the method of treating ischemic heart disease in patients subject to anginal pectoris by placing anti-anginal coronary vasodilating nitrates buccally for rapid arresting of anginal pectoris attacks, the improvement whereby said buccally placed coronary vasodilating nitrates are highly adhered and remain fixed and glued to a chosen site of the mouth mucosa to insure uniform delivery of said anti-anginal nitrate directly into the blood circulation system through the mouth mucosa, with the great advantage that it is possible to control and easily discontinue the nitrate uptake by removing the unresolved film in cases where it becomes necessary or, on the contrary, to renew the therapy, which comprises placing at a selected site of the mouth mucosa of said patient, an anti-anginal effective amount of said anti-anginal nitrate admixed and dissolved in film form with a selected mouth mucosa-soluble, swellable and resolvable polymeric film-forming carrier, in which solutions of the biologically resolvable soluble polymer carrier and the active substance were mixed, and a film cast and dried until the residual amount of the solvent does not exceed about 10 percent by weight;

said resolvable, polymeric film forming carrier having been evaluated to determine its ability to provide immediate, uniform and sustained release of a safe but adequate dose of said anti-anginal nitrate, for a particular patient, by:

- first applying a film of said soluble and resolvable carrier polymer containing no active anti-anginal ingredient, to a chosen site of the mouth mucosa of the patient in the region of the upper gum above the canine or premolars.
- determining the time of full resolution of the film, and
- preparing a film containing that dose of the active principle which should be given to the patient during the time required for full resolution of the film, thereby insuring continuous and optimal therapeutic effect during the entire period of dissolution of the film once the film containing the required amount of the anti-anginal preparation is applied to the chosen site of the mouth mucosa of the patient; said film-forming carrier having the ability to:
 - form labile complex bonds with said anti-anginal coronary vasodilating nitrate;
 - remain highly adhered to the mouth mucosa, but can be removed to interrupt or discontinue treatment; and
 - release the active principle of said coronary vasodilator nitrate immediately, and thereafter at such a sustained rate and for a period of time that the pharmacodynamic effects as expressed by the mean data of the repeated individual selected standard physical loads with treadmill in combination with ECG-monitoring

- are detectable practically instantaneously after affixing to the mouth mucosa,
- confirm the presence of a continuous therapeutic concentration of said active principle in the patient's blood during resolution of said carrier, and
- confirm a bioavailability of said active principle in an amount substantially greater than that obtained with a sublingual nitroglycerin tablet as the standard.

4,713,240

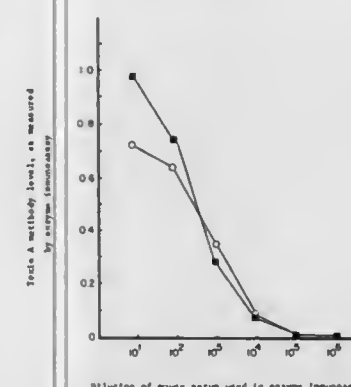
VACCINES BASED ON INSOLUBLE SUPPORTS
Tracy D. Wilkins, Blacksburg, and David M. Lyerly, Radford, both of Va., assignors to Research Corporation, New York, N.Y.

Filed Apr. 4, 1985, Ser. No. 719,775

Int. Cl.⁴ A61K 39/08

U.S. Cl. 424—92

10 Claims



1. A vaccine composition useful in initiating an immune response against an organism of the genus *Clostridium* which comprises an immunogenic-effective amount of at least one non-enzymatic toxin of said organism covalently bonded or cross-linked to a water-insoluble support, in combination with a pharmaceutically acceptable carrier.

4,713,241

BACTERIAL INSECTICIDE AND PRODUCTION THEREOF

Yoshiharu Wakisaka, Hyogo; Junko Uo, Kyoto; Kouichi Matsumoto, Osaka; Osamu Ohodaira, Osaka, and Kentaro Tanaka, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 349,256, Feb. 16, 1982, abandoned. This application Oct. 15, 1984, Ser. No. 661,178

Claims priority, application Japan, Feb. 27, 1981, 56-28781
Int. Cl.⁴ A01N 63/00; C12N 1/20; C12P 21/00; C12R 1/07

U.S. Cl. 424—93

6 Claims

1. A condensate or dried bacterial insecticidal substance produced by fermentation of *Bacillus thuringiensis* serovar *kurstaki* 290-1 (ATCC 31813), in an organic culture medium therefor containing carbon and nitrogen sources at about 25° to 30° C. for about 2 to 5 days under highly aerobic conditions, said insecticidal substance being selected from the group consisting of (a) living cells of said microorganism containing crystalline δ -toxin, (b) dead cells of said microorganism containing said crystalline, δ -toxin, and (c) mixtures thereof.

4,713,242

SKIN THERAPEUTIC MIXTURE CONTAINING EUPATORIUM EXTRACT

Theodore Trenzeluk, Manville, N.J., assignor to Tecma Laboratories, Inc., Manville, N.J.

Filed Nov. 7, 1985, Ser. No. 795,882

Int. Cl.⁴ A61K 33/30, 35/78

U.S. Cl. 424—145

1 Claim

1. A skin therapeutic mixture for alleviating the conditions

of acne, psoriasis, burns, pimples, blackheads, and open sores comprising: the extract from the dried leaves of the Eupatorium plant; sulfathiazole; zinc oxide; and petrolatum;

wherein said extract is about 7.4% by weight of said mixture; said sulfathiazole is about 3.7% by weight; said zinc oxide is about 14.2% by weight; and said petrolatum is about 74.7% by weight; and

wherein said extract is prepared from said Eupatorium plant as follows: the leaves of the plant are dried under moderate light, under warm temperatures, and with frequent tossing; the dried leaves are then ground to a very small particle size; and then the ground leaves are extracted with water.

4,713,243

BIOADHESIVE EXTRUDED FILM FOR INTRA-ORAL DRUG DELIVERY AND PROCESS

Michael T. Schiraldi, East Brunswick, N.J.; Martin M. Perl, Brooklyn, N.Y., and Howard Rubin, Rockaway, N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Jun. 16, 1986, Ser. No. 874,904

Int. Cl.⁴ A01N 59/10; A61K 33/16

U.S. Cl. 424—151

9 Claims

1. A pharmaceutically acceptable controlled-releasing medicament-containing extruded single or multi-layered thin film, capable of adhering to a wet mucous surface, comprising a water soluble or swellable polymer matrix bioadhesive layer which can adhere to a wet mucous surface and which bioadhesive layer consists essentially of 40-95% by weight of a hydroxypropyl cellulose having a molecular weight above 100,000, 5-60% of a homopolymer of ethylene oxide having a molecular weight from 3,000,000 to 5,000,000, 0-10% of a water-insoluble polymer selected from the group consisting of ethyl cellulose, propyl cellulose, polyethylene and polypropylene, and 2-10% of a plasticizer, said film having incorporated therein a pharmaceutically effective amount of said medicament.

4,713,244

SUSTAINED-RELEASE FORMULATION CONTAINING AN AMINO ACID POLYMER WITH A LOWER ALKYL (C₁-C₄) POLAR SOLVENT

Rajan Bawa, Fairport, and William G. Deichert, Macedon, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,734

Int. Cl.⁴ A61K 31/74; G03B 21/46; C08F 226/10; B29D 11/00
U.S. Cl. 424—429

24 Claims

1. A sustained-release polymeric hydrogel dosage form useful for topical, systemic or transdermal administration of a medicinal agent comprising a cross-linked, polymerized hydrophilic polymer including an amino acid moiety in the polymer, in conjunction with a lower alkyl (C₁-C₄) polar solvent and said medicinal agent in a therapeutically effective amount.

4,713,245

GRANULE CONTAINING PHYSIOLOGICALLY-ACTIVE SUBSTANCE, METHOD FOR PREPARING SAME AND USE THEREOF

Shinji Ando; Masami Ohtaguro, both of Nagoya; Takayoshi Masuda, Tohoku, and Yoshimoto Watanabe, Kasugai, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed May 24, 1985, Ser. No. 737,407

Claims priority, application Japan, Jun. 4, 1984, 59-113192; Jun. 4, 1984, 59-113193; Jul. 31, 1984, 59-159193

Int. Cl.⁴ A61K 9/42

U.S. Cl. 424—438

6 Claims

1. In a method for preparing a granule containing physiologically-active substance which contains at least:

- (A) a physiologically-active substance;
 (B) a substance which is stable under neutral conditions but disintegrates or dissolves at a pH of 3 or less, said substance being selected from the group consisting of cellulose derivatives, polyvinyl derivatives, nitrogen-containing polysaccharides, metal salts of a polysaccharide and water-insoluble salts of an acid which is less acidic than hydrochloric acid and is acceptable to a living body, the amount of said substance ranging from 5 to 90 percent by weight based on the total amount of the granule; and
 (C) at least one substance selected from the group consisting of straight-chain or branched, saturated or unsaturated monocarboxylic acids having 14 carbon atoms or more and salts thereof, animal fats having a melting point of 40° C. or higher, vegetable fats having a melting point of 40° C. or higher and waxes having a melting point of 40° C. or higher, the improvement which comprises subjecting said granule to a heat treatment to treat only the surface thereof at temperature higher than the melting point of said substance (C), thereby forming a protective film containing at least said substance (B) and (C) on the surface thereof.

4,713,246

ETOPOSIDE ORAL DOSAGE FORM

Selima Begum; Ismat Ullah, and Bernard C. Nuning, all of Liverpool, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 742,644, Jun. 10, 1985, abandoned, which is a continuation of Ser. No. 591,144, Mar. 19, 1984, abandoned. This application Apr. 2, 1986, Ser. No. 847,147

Int. Cl.⁴ C07H 15/20, 15/24; C07D 317/44; A61K 9/42
 U.S. Cl. 424—455 11 Claims

1. A pharmaceutical solution dosage composition adapted for the oral administration of etoposide comprising (a) about 1 part by weight of etoposide, and on the basis of parts by weight per part of etoposide, (b) 5 to 9 parts by weight of polyethylene glycol, (c) 2.0 to 10 parts by weight of taurocholic acid, (d) 5% to 20% by weight of total solution ethanol, and (e) 0.1 to 0.5 parts by weight of an additional water-soluble organic carboxylic acid in such proportion as to form a homogeneous solution which is stable and free of precipitate and is acidic after dilution with water for a period of time sufficient to permit oral administration of said pharmaceutical dosage composition and absorption of the contents by a mammalian organism.

4,713,247

LONG-ACTING FORMULATION OF CEFACLOX

Teruo Sakamoto; Sadao Kawai, both of Osaka; Kinzaburo Noda; Toyohiko Takeda, both of Hyogo, and Hiroshi Kato, Miyagi, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan
 Filed May 30, 1984, Ser. No. 615,242

Claims priority, application Japan, Jun. 15, 1983, 58-108289
 Int. Cl.⁴ A61K 9/62, 9/58, 31/78, 31/675

U.S. Cl. 424—461 5 Claims

1. A long-acting formulation of cefaclor which comprises a mixture of a non-enteric coated component of cefaclor as a rapid-release component with an enteric coated component of cefaclor as a slow release component at a ratio of about 4:6 based on the potency of cefaclor respectively, wherein:
 said rapid release component contains at least one additive selected from the group consisting of lactose, sucrose, D-mannitol, corn starch, wheat starch, and low-substituted hydroxypropylcellulose in an amount of up to 75 wt % based on the whole rapid-release component; and
 said slow-release component contains at least one additive selected from the group consisting of lactose, sucrose, D-mannitol, corn starch, wheat starch, and low-substituted hydroxypropylcellulose in an amount of up to 75 wt % based on the whole slow-release component and is coated with an enteric coating film soluble in the pH range of 5.0 to 7.0.

4,713,248

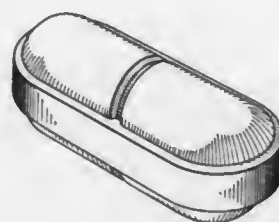
DIFFUSION COATED MULTIPLE-UNITS DOSAGE FORM

Kim Kjornæs, Valby, and Jorgen Linnemann, Dragør, both of Denmark, assignors to A/S Alfred Benzon, Copenhagen, Denmark

PCT No. PCT/DK85/00006, § 371 Date Oct. 4, 1985, § 102(e) Date Oct. 4, 1985, PCT Pub. No. WO85/03437, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 8, 1985, Ser. No. 786,967
 Claims priority, application Denmark, Feb. 10, 1984, 621/84
 Int. Cl.⁴ A61K 9/14, 9/22

U.S. Cl. 424—468 15 Claims



1. An oral pharmaceutical controlled release multiple-units formulation, comprising individual units constituted of an active substance coated with a substantially water-insoluble, but water-diffusible controlled release coating incorporating a homogeneous mixture of a water-dispersible film-forming agent and a polymeric substance which imparts compressibility to the coating.

4,713,249

CRYSTALLIZED CARBOHYDRATE MATRIX FOR BIOLOGICALLY ACTIVE SUBSTANCES, A PROCESS OF PREPARING SAID MATRIX, AND THE USE THEREOF
 Ulf Schröder, Fagottgränden 11 B, S-223 68 Lund, Sweden
 PCT No. PCT/SE83/OC268, § 371 Date Feb. 22, 1984, § 102(e) Date Feb. 22, 1984, PCT Pub. No. WO84/00293, PCT Pub. Date Feb. 2, 1984.

Continuation of Ser. No. 588,099, Feb. 22, 1984, abandoned.
 This application Oct. 22, 1985, Ser. No. 789,933

Claims priority, application Sweden, Nov. 12, 1981, 8106723;
 Jul. 9, 1982, 8204244

Int. Cl.⁴ A61K 9/26; B01J 13/02
 U.S. Cl. 424—488 12 Claims

1. A composition useful for the prolonged release of a biologically-active substance comprising a sphere or particle comprising a non-covalently cross-linked crystalline polymeric carbohydrate matrix, said matrix incorporating 0.001-50% by weight of an absorbed or covalently bonded biologically-active substance.

10. A process for producing a composition useful for the prolonged release of a biologically-active substance, comprising:

- forming a solution of a polymeric carbohydrate and a biologically-active substance in one or more hydrophilic solvents;
- emulsifying the mixture of the carbohydrate and the biologically active substance in a liquid hydrophobic medium to form spherical droplets; and
- introducing the emulsion into a crystallizing medium to form spheres having a non-covalently cross-linked crystalline polymeric carbohydrate matrix, said matrix incorporating 0.001-50% by weight of the biologically-active substance.

4,713,250

DOG FOOD PALATABILITY ENHANCER AND PROCESS
 Henry J. Tonyes, Bourbonnais, Ill.; William T. Keehn, Danforth, Ill.; Harold W. German, Clifton, Ill., and Brian S. Hill, Denton, Tex., assignors to Gaines Pet Foods Corp., Chicago, Ill.

Continuation-in-part of Ser. No. 595,080, Mar. 30, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 872,125
 Int. Cl.⁴ A23K 1/00

U.S. Cl. 426—2 14 Claims

1. A process for preparing a dog food palatability enhancer, comprising:

- preparing a first stage reaction product by dispersing a substrate comprising a proteinaceous or farinaceous material in water and reacting the substrate with an enzyme or enzyme mixture comprising amylase when the substrate comprises farinaceous material and protease when the substrate comprises proteinaceous material, in amounts, under conditions of pH and temperature, and for a time effective to partially hydrolyze the substrate;
- preparing an emulsion comprising fat and said first stage reaction product; and then
- reacting said emulsion with lipase and protease in amounts, under conditions of pH and temperature, and for a time, effective to cause an enzyme reaction resulting in the production of a palatability enhancer.

4,713,251

PROCESS FOR ENCAPSULATING LIQUID ACIDS AND PRODUCT

Jon T. Seighman, North Olmsted, Ohio, assignor to Durkee Industrial Foods Corp., Iselin, N.J.

Filed Dec. 18, 1985, Ser. No. 810,662
 Int. Cl.⁴ A23L 1/216

U.S. Cl. 426—96 7 Claims

1. A process for encapsulating liquid acids comprising the steps of

- preparing a water dispersion comprising water, at least one water dispersible matrix forming ingredient including a film forming amount of a film forming agent which on hardening forms a glassy structure, a liquid acid and an acid buffering agent present in an amount effective to establish a pH of said dispersion in the range of about 4.4 to about 8.8;
- forming said water dispersion into a hot aqueous cook and carrying out the heat of said cook until a water content of less than amount 10% is obtained;
- extruding the dispersion of step (b) into a cold alcohol bath at a temperature effective for solidifying the matrix composition;
- the amount of matrix forming ingredient being an effective amount to encapsulate said acid and acid buffering agent, the matrix being free of acid and acid buffering agent on the external surface thereof.

4,713,252

PROCESS FOR PRODUCING A SEMI-MOIST FRUIT PRODUCT AND THE PRODUCTS THEREFROM

Amr A. Ismail, Machias, Me., assignor to Maine Wild Blueberry Co., Machias, Me.

Continuation-in-part of Ser. No. 763,603, Aug. 8, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 923,107
 Claims priority, application Canada, Sep. 12, 1985, 490526; Japan, Dec. 4, 1985, 60-271715

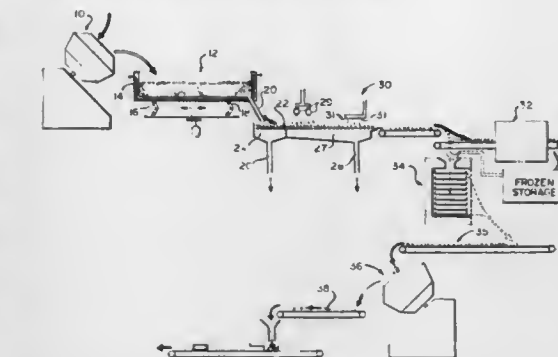
Int. Cl.⁴ A23B 7/14 24 Claims

1. A process for producing a sweetened, semi-moist fruit product having a moisture content in the range of 10% to 40% comprising:

- coating fresh or frozen fruit with an effective amount of sugar to initiate nondestructive osmotic fluid-sugar exchange;
- continuing the nondestructive osmotic fluid-sugar ex-

change within the fruit in which fruit juices migrate outward from the fruit and sugar migrates into the fruit by the osmotic exchange until the sugar concentration reaches an equilibrium across the fruit, without disturbing the natural skin of the fruit to produce a mixture of sugared fruit and sugared fruit syrup;

(c) separating the syrup from the fruit;



(d) rinsing the fruit to remove surface sugar and syrup from outside the fruit; and

(e) drying the sweetened fruit in a vacuum atmosphere of up to 400 microns Hg and suddenly releasing the vacuum atmosphere within 1 to 2 minutes to collapse the fruit to a relatively wrinkled solid, chewy and palatable condition.

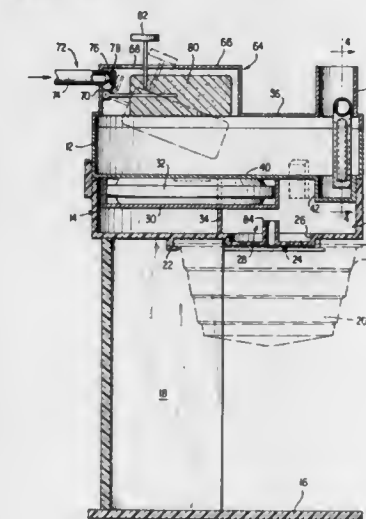
4,713,253

FLOAT ACTIVATED SIPHON FOR AUTOMATIC DRIP COFFEE MAKER

Wayne B. Stone, Jr., Bethesda, Md., assignor to Wood Manufacturing, Flippin, Ark.

Continuation-in-part of Ser. No. 734,210, May 15, 1985, Pat. No. 4,622,230. This application Aug. 25, 1986, Ser. No. 899,725
 Int. Cl.⁴ A47J 31/00; A23F 5/00

U.S. Cl. 426—433 8 Claims



8. A method of making coffee, comprising:
 heating a first body of water to coffee brewing temperature in a holding tank;
 floating a buoyant member in said first body of water;
 depressing said buoyant member in said first body of water and raising the level thereof;
 transferring substantially all said body of water to basket contained coffee grounds;
 introducing cold water to said holding tank to constitute a second body of water therein;

refloating said buoyant member in said second, body of water and valving off said cold water; and heating said second body of water preparatory to making additional coffee.

4,713,254

CASEIN-SOLUBLE PROTEIN COMPLEX

Ernest A. Childs, and Rajagopalan Narasimhan, both of Green Bay, Wis., assignors to Schreiber Foods, Inc., Green Bay, Wis.
Filed Oct. 30, 1980, Ser. No. 202,237
Int. Cl.⁴ A23C 19/08, 20/00; A23J 1/20

U.S. Cl. 426—582

109 Claims

1. A process for recovering a curd of casein and soluble proteins from an aqueous medium comprising:
 - (a) adjusting the pH of the aqueous medium to an alkaline pH of less than about 8.0; then
 - (b) heating the aqueous medium to a temperature in the range of about 65.6° C. to 85.0° C.; and
 - (c) holding the heated aqueous medium for a time period sufficient to permit the formation of casein-soluble protein complex; then
 - (d) adjusting the temperature of the aqueous medium to the range of about 32.2° C. and 76.7° C.; and
 - (e) adjusting the pH of the aqueous medium to the range of 4.2 to 5.5 to precipitate the casein-soluble protein complex in the aqueous medium; and then
 - (f) separating the complex precipitate from the aqueous medium to recover a curd of casein and soluble proteins, said curd being useful as both the curd ingredient in the making of natural cheeses and as the natural cheese ingredient in the making of processed and imitation cheeses.

4,713,255

EMULSIFICATION SYSTEM FOR CREAMY CHEESE FOOD PRODUCTS

William J. Horan, Dover, Del., and Jeffrey M. Schweid, Haverhill, Mass., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 718,395, Apr. 1, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 938,700
Int. Cl.⁴ A23L 1/24

U.S. Cl. 426—589

6 Claims

1. A process for preparing a dry mix salad dressing containing cheese solids which makes a creamy cheese salad dressing with mild hand shaking and will remain in emulsion and not separate at up to 15% reduction in the aqueous phase, comprising:

- (a) blending spices, salt, cheese flavoring containing no cheese solid, sugar, sodium citrate and monosodium glutamate to form a uniform first part;
- (b) contacting the blended first part with heated polysorbate 60 while mixing;
- (c) blending cheese flavoring containing up to 50% whey solids; cheese containing up to 70% cheese solids, gums and dextrin in an amount sufficient to disperse the cheese solids to form a uniform second part;
- (d) combining the blended first part with the blended second part and mixing to form a homogeneous mixture, wherein the weight ratio of the first part contacted with polysorbate 60 and the second part combined with dextrin is 60:55 to 39:45.

4,713,256

PROCESS FOR PREPARING A CHOCOLATE PASTE

Henri Chaveron, Paris; Jean Pontillon, Meulan; Michel Billon, Unieux; Hervé Adenier, Compiègne, all of France, and Ahmed Kamoun, Sfax, Tunisia, assignors to Clextal, Paris, France

PCT No. PCT/FR84/00192, § 371 Date Apr. 26, 1985, § 102(e) Date Apr. 26, 1985, PCT Pub. No. WO85/00957, PCT Pub. Date Mar. 14, 1985

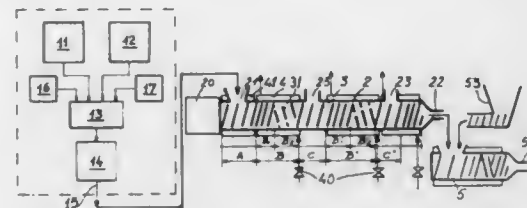
PCT Filed Aug. 24, 1984, Ser. No. 731,622

Claims priority, application France, Aug. 26, 1983, 83 13769

Int. Cl.⁴ A23G 1/16

U.S. Cl. 426—631

8 Claims



1. Process for the continuous preparation of a chocolate paste, comprising the steps of:

- (a) introducing, at an upstream end of a screw conveyor having a plurality of treatment zones (A, B, C, D) and comprising an elongated sleeve surrounding at least two screws (3) driven in rotation and provided with means (41, 42) for regulating the temperature of entrained material, a refined paste comprising cocoa, refined sugar and a small portion of fatty materials
- (b) effecting dry conching of said refined paste in a first section of said screw conveyor, said dry conching comprising the steps of
 - (i) simple kneading of said refined paste in a first step (A), accompanied by a rise in temperature;
 - (ii) at least one further kneading step (B) producing rolling and shearing effects of progressively increasing intensity, said intensity being coordinated with said temperature regulating means (41, 42); and
 - (iii) a degasifying step (C) following each said further kneading step (B);
- (c) introducing downstream of said first section of said screw conveyor remaining portions of ingredients comprising a portion of said fatty materials greater than said previously introduced small portion, and then
- (d) effecting liquid conching in a second portion of said screw conveyor, said liquid conching comprising a step (D) producing combined kneading, rolling and shearing effects.

4,713,257

SPRAYING METHOD AND DEVICE FOR APPLYING A FILM TO A WORKPIECE

Jürgen Luttermöller, Bielefeld, Fed. Rep. of Germany, assignor to Kopperschmidt-Müller GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed Feb. 19, 1986, Ser. No. 830,972

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505618

Int. Cl.⁴ B05D 1/04; B05B 5/04, 7/06

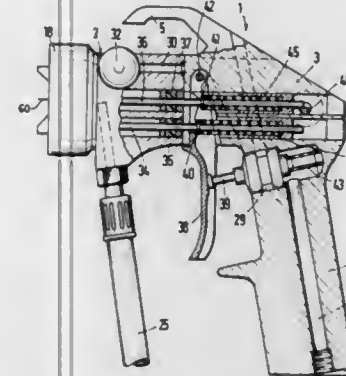
U.S. Cl. 427—27

30 Claims

1. A method of applying a film to a workpiece, comprising the steps of atomizing a material to generate a first spray within a predetermined space; atomizing a material to generate a second spray which surrounds said space, one of said sprays being generated pneumatically and the other of said sprays being generated hydrostatically; and directing said sprays against said workpiece.

17. A device for applying a film to a workpiece, comprising

a spray head; first nozzle means in said head for generating a first spray within a predetermined space; second nozzle means in said head for generating a second spray which surrounds said space, said second nozzle means comprising a substantially circumferentially complete material discharge nozzle and a substantially circumferentially complete air discharge nozzle, said air discharge nozzle surrounding said material discharge



nozzle and each of said nozzles surrounding said first nozzle means; material supply means for supplying material to be pneumatically atomized to said second nozzle means and for supplying material to be hydrostatically atomized to said first nozzle means; air supply means for supplying at least one current of atomizing air to said second nozzle means; and control means for said air and material supply means.

4,713,258

METHOD OF FORMING ULTRAFINE PATTERNS

Shizuo Umemura, Ibaraki, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan, a part interest

Filed Jul. 3, 1985, Ser. No. 752,208

Claims priority, application Japan, Aug. 6, 1984, 59-163881

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—35

12 Claims

1. A method of forming an ultrafine pattern on a substrate, which consists essentially of the steps of: holding a substrate in a highly evacuated system that employs an oil diffusion pump as a vacuum source, the atmosphere in said highly evacuated system comprising a vapor of the operating oil of the oil diffusion pump; then projecting a focused electron beam in a pattern against a surface of said substrate and thereby forming a pattern of adsorption sites comprised of adsorbates or deposits of said vapor of said operating oil on the irradiated area on said surface of said substrate; and then depositing a pattern-forming substance onto said substrate so that said substance adheres to said adsorption sites and forms a pattern having a width of 1000 Å or finer.

4,713,259

METHOD FOR THE GLOW-DISCHARGE-ACTIVATED REACTIVE DEPOSITION OF ELECTRICALLY CONDUCTIVE MATERIAL FROM A GASEOUS PHASE

Georg F. Gärtner, Aachen; Peter A. Janiel, Würselen, and Hans-Jürgen Lydtin, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,917

Claims priority, application Fed. Rep. of Germany, May 4, 1985, 3516078

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—39

18 Claims

1. A method for the reactive deposition of tubular bodies of an electrically conductive material from a flowing gas phase on a tubular substrate in which a glow discharge is produced between an inner electrode and an outer electrode, one of which is constructed to be tubular and serves as a substrate, characterized in that

- (a) a controlled reciprocating movement occurs of the inner electrode relative to the outer electrode,
- (b) a localized glow discharge zone is produced between the inner electrode and the outer electrode and is maintained during deposition,



- (c) measures are taken to prevent the formation of electrically conductive layers on electrically insulating structural parts in the reaction space, and
- (d) the temperature in the substrate area is kept constant at a low value at which the thermal deposition rate is small compared with the deposition rate with glow discharge.

4,713,260

METHOD OF ENSURING ADHESION OF CHEMICALLY VAPOR DEPOSITED OXIDE TO GOLD INTEGRATED CIRCUIT INTERCONNECT LINES

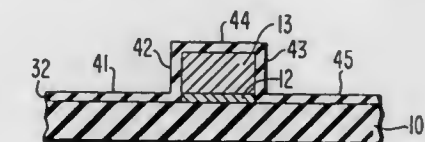
Bruce E. Roberts; Jimmy C. Black, both of Palm Bay, and Dyer A. Matlock, Melbourne, all of Fla., assignors to Harris Corporation

Division of Ser. No. 768,326, Aug. 22, 1985. This application May 4, 1987, Ser. No. 45,526

Int. Cl.⁴ B05D 5/12, 3/06

U.S. Cl. 437—238

13 Claims



1. A method of adhesively bonding a layer of silicon dioxide to a layer of gold comprising the steps of:

- (a) forming a thin film of titanium on the surface of said gold layer;
- (b) converting said titanium to an oxide of titanium; and
- (c) forming a layer of silicon dioxide on said film of said oxide of titanium.

4,713,261

METHOD FOR PREPARING FERROMAGNETIC IRON OXIDE PARTICLES

Kouichi Masaki, and Tatsuji Kitamoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1986, Ser. No. 928,352

Claims priority, application Japan, Nov. 8, 1985, 60-249019

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—129

6 Claims

1. A method for preparing ferromagnetic iron oxide particles which comprises depositing a cobalt compound onto a surface of lepidocrocite (γ -FeOOH) particles, and then calcining the particles at 150° C. to 350° C.

4,713,262

MANUFACTURING METHOD FOR A MAGNETIC RECORDING MEDIUM

Tadashi Yasunaga, and Ryuji Shirahata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 765,482, Aug. 14, 1985, abandoned.

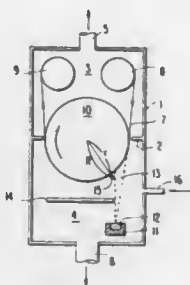
This application Oct. 2, 1986, Ser. No. 914,513

Claims priority, application Japan, Aug. 14, 1984, 59-169857; Aug. 14, 1984, 59-169859; Aug. 14, 1984, 59-169860

Int. Cl.⁴ H01F 10/02

U.S. Cl. 427—130

19 Claims



1. A method for manufacturing a magnetic recording medium, comprising evaporating a magnetic metal material from an evaporation source to form a vapor stream of the magnetic metal material in a vacuum vessel, vapor-depositing the magnetic metal material on a tape-shaped substrate moving along a cooling can such that the incident angle (θ) of the vapor stream which is incident upon the substrate changes continuously from a high incident angle (θ_{\max}) to a low incident angle (θ_{\min}), and at the same time introducing one or more gases selected from the group consisting of a rare gas, CO₂ gas, N₂ gas, and nitrogen oxide gas, or a mixed gas composed of oxygen gas and one or more gases selected from the group consisting of a rare gas, CO₂ gas, N₂ gas and nitrogen oxide gas from a gas inlet nozzle disposed at a position in the vicinity of the substrate and near the vapor stream at a low incident angle (θ_{\min}) upon the substrate, thereby providing a ferromagnetic metal film on the substrate, wherein the gas inlet nozzle is disposed so that the ratio (R/r) of a distance (R) from the center of said cooling can to said gas inlet nozzle to the radius (r) of said cooling can is within the range of 1.10 or less, wherein a mask is disposed between the evaporation source and the tape-shaped substrate, which mask is separate from the gas inlet nozzle and which mask controls the incident angle (θ) of the vapor stream so that only vapor stream of the desired incident angle (θ) contacts the tape-shaped substrate.

4,713,263

ETHYLENE VINYL ACETATE COMPOSITIONS FOR FLOCKING ADHESIVES

David Lunsford, Mauldin, S.C., and James L. Walker, Whitehouse Station, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 861,964, May 12, 1986. This application May 13, 1987, Ser. No. 49,237

Int. Cl.⁴ B05D 1/14, 1/16, 1/36

U.S. Cl. 427—206

9 Claims

1. A process for manufacturing a flocked article which comprises the steps of:

- (1) applying to the substrate to be flocked a foamed composition comprising, a thickener selected from the group consisting of hydroxyethylcellulose, carboxymethylcellulose, polyacrylate-hydrolyzed acrylonitrile and carboxylic acid/acrylate emulsions or solutions, pigments, a foaming agent activatable by heating air or another gas into the composition comprising a water soluble salt of an aliphatic carboxylic acid containing 16 to 20 carbon

atoms, and an aqueous emulsion, the latter prepared by the emulsion polymerization of:

- (a) a vinyl ester of an alkanolic acid having 1 to 13 carbon atoms interpolymerized with the following comonomers:
 - (b) 5 to 30% by weight of ethylene;
 - (c) 0.5 to 6% by weight of N-methylol acrylamide or N-methyl methacrylate;
 - (d) 1 to 5% by weight of an alkenoic acid having 3 to 6 carbon atoms or an alkenedioic acid having 4 to 6 carbon atoms;
 - (e) 0.2 to 3% by weight of a latex stabilizer; and
 - (f) 0 to 1% by weight of at least one polyunsaturated copolymerization monomer; the vinyl ester being added in an amount to total 100%, said adhesive being applied in an amount of 0.5 to 3.0 ounces per square yard;
- (II) applying the flocking fibers to the coated substrate; and
- (III) drying said flocked substrate.

4,713,264

PROCESS OF FORMING PREPASTED WALLCOVERINGS

John B. Clarke; John F. Firth, and John R. Walker, all of West Yorkshire, England, assignors to Allied Colloids Limited, England

Filed Oct. 4, 1985, Ser. No. 784,824

Claims priority, application United Kingdom, Oct. 4, 1984, 8425155

Int. Cl.⁴ B05D 5/10

U.S. Cl. 427—207.1

20 Claims

1. A process of forming a prepasted wallcovering comprising a porous surface that carries a dry coating comprising discrete polymer particles that become adhesive when the coating is wetted by water, the process comprising applying to the surface a dispersion of polymer particles having a dry size below 10 microns in a non-aqueous liquid and that is stabilised by a polymeric stabiliser which is an oil at 25° C. and then evaporating the non-aqueous liquid and in which a dried residue of the dispersion does not form a coherent film.

4,713,265

PROCESS FOR CURING A COATING COMPOSITION OF AN ACRYLIC POLYMER AND A POLYISOCYANATE WITH AN AMINE VAPOR CATALYST

Robert C. Nahas, Voorhees, N.J., and Clifford H. Strolle, Springfield, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 804,134, Dec. 3, 1985, Pat. No. 4,659,799.

This application Nov. 17, 1986, Ser. No. 931,078

Int. Cl.⁴ B05D 3/04

U.S. Cl. 427—341

13 Claims

1. A process comprising (1) applying a coating composition to a substrate and (2) exposing the composition to a vaporous amine catalyst to cure the composition; wherein the composition comprises about 20-80% by weight of film forming binder and correspondingly about 80-20% by weight of a liquid carrier; wherein the binder consists essentially of

- (a) an acrylic polymer containing hydroxyl groups and amine containing groups selected from the group consisting of secondary amine groups, tertiary amine groups, pyridine groups, amino ester groups, hydroxy aminoester groups and the polymer has a weight average molecular weight of about 2,000-50,000 determined by gel permeation chromatography using tolylmethyl methacrylate as the standard and wherein the acrylic polymer consists essentially of (1) polymerized monomers of an alkyl methacrylate or an alkyl acrylate and mixtures thereof wherein the alkyl groups have 1-12 carbon atoms, (2) polymerized monomers of hydroxyl alkyl methacrylate or hydroxy alkyl acrylate or mixtures thereof wherein the alkyl groups have 2-4 carbon atoms and (3) polymerized ethylenically unsaturated amine containing monomer; and

- (b) an aliphatic polyisocyanate.

4,713,266

METHOD FOR PRODUCTION OF POLYESTER STRUCTURES WITH IMPROVED GAS BARRIER PROPERTY

Kenji Hasegawa, Hirakata; Tetsuo Sato, Kyoto, and Teruo Iwanami, Ibaraki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP86/00199, § 371 Date Dec. 12, 1986, § 102(e) Date Dec. 12, 1986, PCT Pub. No. WO86/06392, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 18, 1986, Ser. No. 16,698

Claims priority, application Japan, Apr. 19, 1985, 60-84726

Int. Cl.⁴ B05D 3/02

U.S. Cl. 427—412.5

8 Claims

1. A method of producing a polyester structure with improved gas barrier property comprising coating a polyester substrate structure with a solution of a vinyl alcohol resin having a high gas barrier property, characterized in that the surface of the polyester substrate structure is precoated with a solvent solution of a polyester having the following formulation and an intrinsic viscosity of at least 0.4 and dried to provide an anchor coating layer on said surface:

Acid component:	
Terephthalic acid and/or isophthalic acid	90 to 40 mol %
An aliphatic dicarboxylic acid containing 2 to 12 carbon atoms	10 to 60 mol %
Diol component:	
A straight-chain or cyclic diol containing 2 to 8 carbon atoms	90 to 10 mol %
A branched diol containing 3 to 6 carbon atoms	10 to 90 mol %

4,713,267

DECORATIVE RIBBON AND SHEET MATERIAL

Bernard S. Truskolaski, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

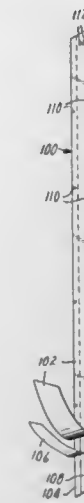
Continuation-in-part of Ser. No. 722,233, Apr. 15, 1985, abandoned. This application Apr. 22, 1986, Ser. No. 855,002

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.⁴ D04D 7/10

U.S. Cl. 428—4

24 Claims



1. Decorative sheet material comprising
 - (a) a thermally bonded nonwoven tissue-like base layer

having (i) a web of 20 to 90 weight percent thermally bondable polymeric staple fibers having a length of from about $\frac{1}{4}$ to 6 inches and 10 to 80 weight percent rayon staple fibers having a length of from about $\frac{1}{4}$ to 6 inches and (ii) 5 to 50 weight percent thermobonding resin based on the weight of the web, and

(b) at least a monolayer of a multiplicity of substantially parallel continuous multifilament acetate yarns substantially covering a first side of said base layer and thermally laminated to said base layer, the second side of said base layer being sufficiently sonically sealable to a base layer of a second sheet material to form durable ribbon assemblies.

4,713,268

CRYSTALLIZABLE POLYESTER RESIN HAVING HIGH IMPACT STRENGTH AND DIMENSIONAL STABILITY

William G. Carson, Moorestown, N.J., assignor to Rohm and Haas Co., Philadelphia, Pa.

Filed Dec. 5, 1986, Ser. No. 938,224

Int. Cl.⁴ B65D 5/00; B32B 27/08, 27/36

U.S. Cl. 428—35

38 Claims

1. A tough, ovenable tray comprising a thermoformed, crystalline sheet of modified polyester resin, the resin comprising

- (A) from about 70 to about 95% of a poly(ethylene terephthalate) resin having an intrinsic viscosity from about 0.7 to about 1.1 dl/g,
- (B) from about 4 to about 29% of core/shell polymer having
 - (1) from about 25 to about 95% of a first elastomeric phase polymerized from a monomer system comprising
 - (a) from about 75 to about 99.8% of a monomer or monomer mixture which yields a rubbery polymer on polymerization,
 - (b) from about 0.1 to about 5% crosslinking monomer, and
 - (c) from about 0 to about 5% graftlinking monomer, and
 - (2) from about 5 to about 75% of a rigid vinyl thermoplastic phase polymerized from a monomer system comprising from about 50 to 100% of an alkyl methacrylate wherein the alkyl group has from 1 to 4 carbon atoms,
- (C) from about 1 to about 5% of a poly(alkylene terephthalate) crystallization-rate accelerator, the alkylene group having from 4 to 6 carbon atoms, and
- (D) from 0 to about 14.5% of an aromatic polycarbonate of a di(monohydroxyphenol)-substituted aliphatic hydrocarbon wherein the hydrocarbon has 2 to 4 carbon atoms.

4,713,269

HEATSET MULTILAYER CONTAINER

Saleh A. Jabarin, Holland, and Prakash R. Ajmera, Toledo, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Mar. 20, 1986, Ser. No. 841,651

Int. Cl.⁴ B65D 1/40

U.S. Cl. 428—35

11 Claims

1. A transparent hollow delamination resistant, thermally stable multilayer article obtained by blowmolding and heatsetting a parison composed of at least one layer containing poly(ethylene terephthalate) directly adhered to at least one barrier layer containing a copolyester which consists essentially of: (A) reactant(s) selected from the group consisting of isophthalic acid, terephthalic acid, and their C₁ and C₄ alkyl esters, and any mixture thereof in any proportion; (B) reactant(s) 1,3 bis(2-hydroxyethoxy)benzene plus ethylene glycol, and optionally one or more other ester forming dihydroxy organic hydrocarbon reactant(s), and optionally, (C) reactant, bis(4-beta-hydroxyethoxyphenyl)sulfone, wherein:

- (1) the amount of said 1,3 bis(2-hydroxyethoxy)benzene is 5 to 90 mole percent of the amount of (A) reactant(s),

- (2) the combined amount of (B) and (C) reactant is about 110 to 300 mole percent of the amount of (A) reactants,
 (3) the amount of said ester forming dihydroxy organic hydrocarbon reactant(s) is zero to 20 mole percent of the amount of said (A) reactants, and
 (4) the combined amount of said (C) reactant plus said 1,3 bis(2-hydroxyethoxy)benzene and said other ester forming dihydroxy organic hydrocarbon reactant(s) is not over 90 mole percent of said (A) reactants,
 said copolyester being present in an amount from about 10 percent to about 30 percent, by weight, of said article.

4,713,270

HEATSET HIGH BARRIER CONTAINER

Saleh A. Jabarin, Holland, and Prakash R. Ajmera, Toledo, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Mar. 20, 1986, Ser. No. 841,649
 Int. Cl.⁴ B65D 1/00

U.S. Cl. 428—35

3 Claims

1. A transparent hollow high barrier, thermally stable article obtained by blow molding and heatsetting an intimate fusion blend of

a poly(ethylene terephthalate), and a high barrier copolyester formed of the polymeric reaction product of (A) reactant(s) selected from the group consisting of isophthalic acid, terephthalic acid, and their C₁ to C₄ alkyl esters, and any mixture thereof in any proportion, (B) reactants, 1,3-bis(2-hydroxyethoxy)benzene plus ethylene glycol, and optionally one or more other ester forming dihydroxy organic hydrocarbon reactant(s), and optionally, (C) reactant, bis(4-betahydroxyethoxyphenyl)sulfone, wherein:

- (1) the amount of said 1,3 bis(2-hydroxyethoxy)benzene is 5-90 mole percent of the amount of A reactants,
 (2) the combined amount of B and C reactant is about 110 to 300 mole percent of the amount of A reactants,
 (3) the amount of said other ester forming dihydroxy organic hydrocarbon reactant(s) is zero to 20 mole percent of the amount of said A reactants, and
 (4) the combined amount of said (C) reactant plus said 1,3 bis(2-hydroxyethoxy)benzene and said other ester forming dihydroxy organic hydrocarbon reactant(s) is not over 90 mole percent of said A reactants,
 said copolyester being present in an amount from about 20 percent to about 30 percent, by weight, of said article.

4,713,271

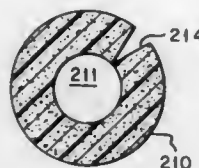
FOAMED POLYMER TUBING

Alonzo H. Searl, Fort Worth; Granville J. Hahn, and Raleigh N. Rutledge, both of Big Spring, all of Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 393,911, Jun. 30, 1982, abandoned. This application Jun. 24, 1983, Ser. No. 507,373
 Int. Cl.⁴ B32B 31/00

U.S. Cl. 428—36

12 Claims



1. A foamed insulation tubing for placement around pipes and tubes, said tubing comprising:

- a predetermined length of tubing having an open central bore and a predetermined wall thickness;
 said length of tubing having a longitudinal slit cut partially

through the wall thereof for substantially the entire length of said tubing; and,
 said ends of said tubing being cut parallel at generally 45 degree angles to the longitudinal axis of said tubing.

4,713,272

LONGITUDINALLY DIVIDED SLEEVE OF SHRINKABLE MATERIAL

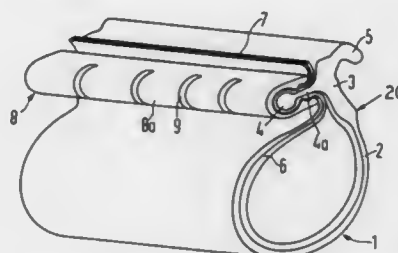
Ernst Bachel, Geltendorf, and Wolfgang Giebel, Planegg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,004
 Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518580

U.S. Cl. 428—36

Int. Cl.⁴ B32B 1/08

17 Claims



1. A longitudinally divided sleeve of heat shrinkable material comprising an elongated, separate clamping element and a sheet of flexible heat shrinkable material having a first and second longitudinally extending edge, said sheet having a single longitudinally extending closure element extending along the first longitudinal edge, said closure element having a longitudinally extending bead portion connected by a narrow neck portion to an enlarged base, said sleeve being closed by said bead and neck portion having the sheet of flexible material adjacent the second edge wrapped therearound with said clamping element holding the wrapped around portion of the sheet on said bead, said clamping element having a U-shaped with an inside profile matched to a profile of the bead and neck portion and being dimensioned to receive the bead with a portion of the sheet wrapped around the bead to form a closure region, an inside profile of the clamping element including at least one pair of latching projections to hold the clamping element on the bead so that articles of different diameters can be enveloped by adjusting the diameter of the sleeve, and then using optimum shrinking of the sleeve.

4,713,273

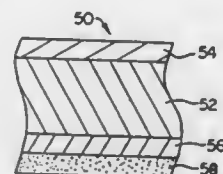
COMPOSITE FACESTOCKS AND LINERS

Melvin S. Freedman, Beachwood, Ohio, assignor to Avery International Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 699,204, Feb. 5, 1985, abandoned. This application Apr. 18, 1986, Ser. No. 853,772
 Int. Cl.⁴ C09J 7/02; B32B 27/08

U.S. Cl. 428—40

30 Claims



1. A liner comprising a multilayer web construction for use with label, tape or sign stock, said web construction comprising a coextrudate in the form of at least two firmly adhered

layers, at least one of said layers comprising a multiphase layer including a continuous phase of polymeric film material and a discontinuous phase of filler material, said liner having at least one face that is roughened at least in part by the mechanical effect of the filler material contained in said coextrudate, to a roughness of at least about 10 Sheffield units, a release face provided on one face of said liner.

4,713,274

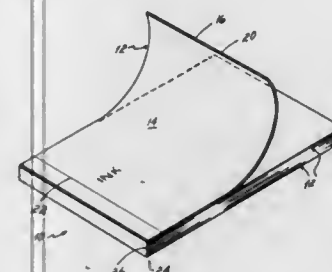
PAD OF SHEETS FOR REMOVING PARTICULATE MATTER

Cathy L. Minor, 7503 Constitution Dr., Cincinnati, Ohio 45215
 Filed Aug. 18, 1986, Ser. No. 897,622

Int. Cl.⁴ B32B 3/06, 7/06

U.S. Cl. 428—40

2 Claims



1. A pad of sheets for removing undesirable particulate matter from a surface to be cleaned, said pad comprising in combination:

- (a) a plurality of individual flexible sheets capable of accepting an adhesive coating, said individual flexible sheets each having four edges wherein a line is scored onto said individual flexible sheet along a length parallel to an edge and spaced inward therefrom;
 (b) an adhesive coating covering the entire surface of one side of each flexible sheet which preferentially binds to said flexible sheet and which removes undesirable particulate matter upon contacting a surface to be cleaned;
 (c) a cover sheet which covers and protects said adhesive coating on each flexible sheet from undesired contact prior to use, said cover sheet capable of being separated from said adhesive coating without disrupting said adhesive coating; and
 (d) adhesive means, along the aforementioned edge of the pad, for joining said flexible sheets and cover sheets together to form a pad and which adhesive means permit a single flexible sheet to be easily removed from the pad and cover sheet.

4,713,275

CERAMIC/CERAMIC SHELL TILE THERMAL PROTECTION SYSTEM AND METHOD THEREOF

Salvatore R. Riccitello; Marnell Smith, both of San Jose; Howard E. Goldstein, Saratoga, and Norman B. Zimmerman, Los Gatos, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 14, 1986, Ser. No. 862,925

Int. Cl.⁴ B32B 1/06

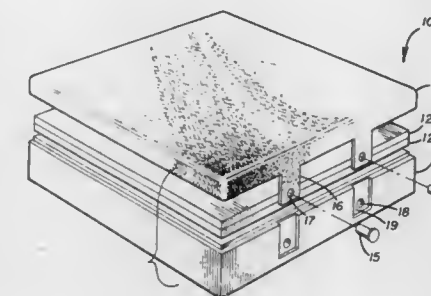
U.S. Cl. 428—76

22 Claims

1. A ceramic composite tile device specially adapted for use as a component of a reusable thermal protection system for use on the surface of an object in need of thermal protection, which device comprises:

- (a) a ceramic-coated ceramic-fabric upper shell itself comprising a woven ceramic fabric in the shape of an upper shell wherein the upper shell is coated with additional ceramic by chemical vapor deposition and chemical vapor infiltration;

(b) ceramic lower base tile, wherein the upper shell and lower base tile are stress/strain independent; and,



(c) one or more layers of flexible or rigid ceramic insulation interposed in the interior cavity formed by the attachment of component (a) to component (b).

4,713,276

PAPER-LIKE PRODUCT, METHOD AND APPARATUS FOR PRODUCTION THEREOF AND PREPREG FORMED OF SAID PAPER-LIKE PRODUCT

Hajime Gotoh; Mamoru Machida, and Osamu Sugiyama, all of Nagoya, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

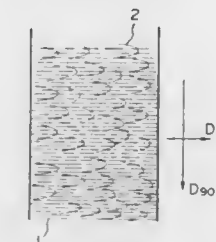
Filed Mar. 20, 1985, Ser. No. 713,987

Claims priority, application Japan, Mar. 21, 1984, 59-53788; Jun. 28, 1984, 59-133551; Oct. 19, 1984, 59-220070; Nov. 1, 1984, 59-230764; Dec. 12, 1984, 59-188385[U]

Int. Cl.⁴ B21F 1/02; D21E 11/00; D21F 11/04

U.S. Cl. 428—113

17 Claims



1. A paper-like product composed of (a) staple fibers oriented substantially in a direction orthogonal to the longitudinal direction of the paper-like product and (b) binder fibers which are staple fibers having portions parallel and perpendicular to the oriented staple fibers (a); said staple fibers (a) having an orientation degree, expressed by the following formula:

$$\text{orientation degree (\%)} = \frac{\text{number of staple fibers oriented within } \pm 5^\circ \text{ to direction orthogonal to longitudinal direction of paper-like product}}{\text{total number of staple fibers in paper-like product}} \times 100$$

of at least 50%, and the proportion of the binder fibers (b) being at least about 1.5% by weight based on the total fibers.

4,713,277

FOAMED METAL AND METHOD OF PRODUCING SAME

Shigeru Akiyama; Hidetoshi Ueno; Koji Imagawa; Akira Kitahara; Sumio Nagata, all of Tosu; Kazuo Morimoto, Amagasaki; Tooru Nishikawa, Amagasaki, and Masao Itoh, Amagasaki, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo and Shinko Kosen Kogyo Kabushiki Kaisha, Amagasaki, both of, Japan

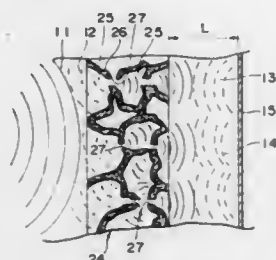
Filed Jul. 18, 1986, Ser. No. 886,678

Claims priority, application Japan, Jul. 19, 1985, 60-160804; Dec. 25, 1985, 60-297832; Jan. 27, 1986, 61-9972[U]

Int. Cl.⁴ E04B 1/82; B32B 3/10, 3/24, 15/00

U.S. Cl. 428—131

3 Claims



3. An electromagnetic shielding material consisting of a foamed metal plate having an apparent specific gravity of from 0.2 to 0.8 and comprising an aggregate of uniform size and uniformly dispersed of polygonal closed cells having an average diameter of from 2 to 10 mm, provided with through-holes, wherein the diameter of the through-holes communicating both sides of said plate to each other is not larger than 5 mm.

4,713,278

MAGNETIC RECORDING MEDIUM

Kuniichi Yoda; Eiji Kitaura; Tsutomu Tsunoda, all of Saku, and Yoshio Kawakami, Nagano, all of Japan, assignors to TDK Corporation, Tokyo, Japan

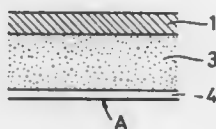
Filed Sep. 4, 1986, Ser. No. 904,123

Claims priority, application Japan, Sep. 9, 1985, 60-197802

Int. Cl.⁴ G11B 5/70

U.S. Cl. 428—141

4 Claims



1. A magnetic recording medium comprising a light-shield base in the form of a tape or sheet, and a magnetic layer composed of a magnetic powder of Co-coated $\gamma\text{Fe}_2\text{O}_3$ dispersed in a resin binder and applied to the upper surface of the base, said powder having a specific surface area as determined by the BET adsorption method of at least $35 \text{ m}^2/\text{g}$, said base having a surface roughness of $0.012 \mu\text{m}$ or less in terms of the centerline average surface roughness and said base having a light transmittance of 30% or less.

4,713,279

MAGNETIC RECORDING MEDIUM

Norio Fujiwara; Nobuyuki Takahashi, and Akihiro Otsuki, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

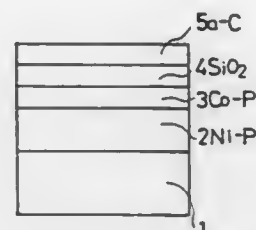
Filed Apr. 15, 1986, Ser. No. 852,151

Claims priority, application Japan, Apr. 19, 1985, 60-84001

Int. Cl.⁴ G11B 5/72

U.S. Cl. 428—142

13 Claims



1. A magnetic recording medium comprising a non-magnetic base plate, a magnetic layer formed on said plate, a protective layer comprising silicon dioxide formed on said magnetic layer, and a lubricant layer comprising amorphous carbon formed on said protective layer.

4,713,280

RECEPTOR SHEET FOR IMPACT PRINTERS

Donald J. Williams, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 29, 1986, Ser. No. 891,231

Int. Cl.⁴ B32B 5/16, 27/30, 27/34

U.S. Cl. 428—149

10 Claims

1. A transparent, non-tacky sheet comprising a backing bearing on at least one major surface thereof an ink-receptive layer, capable of having images formed thereon by means of oil-based inks, said layer formed from a polymeric composition having a Hansen dispersion parameter of from about 10 to about $20 \text{ J}^1/\text{cm}^{3/2}$, a Hansen hydrogen bonding parameter of from about 8 to about $20 \text{ J}^1/\text{cm}^{3/2}$, and a Hansen dipole parameter of less than about $6 \text{ J}^1/\text{cm}^{3/2}$, said layer further having a Sheffield smoothness of at least about 30 as measured in accordance with TAPPI Useful Method 518 and a haze value of 20% or less, as measured in accordance with ASTM D1003-61 (reapproved 1977).

4,713,281

MULTIPLE-USE PRESSURE-SENSITIVE TRANSFER RECORDING MEDIA

Masami Shini, Itami, Japan, assignor to Fuji Kagakushu Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 753,173, Jul. 9, 1985, Pat. No. 4,624,881. This application Sep. 10, 1986, Ser. No. 905,442

Claims priority, application Japan, Jul. 13, 1984, 59-146524; Sep. 18, 1984, 59-195374

The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.

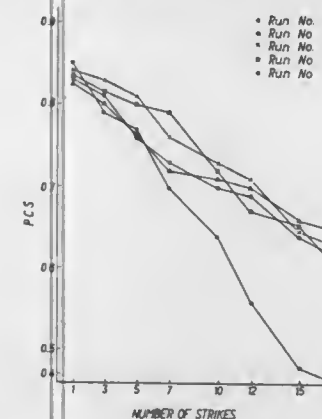
Int. Cl.⁴ B32B 3/26, 5/18; B41J 31/02

U.S. Cl. 428—207

5 Claims

1. A multiple-use pressure-sensitive transfer recording media which comprises a foundation and a finely porous resinous layer provided on the foundation, said porous layer comprising minute porous particles and a resinous binder material for bonding the porous particles to each other and containing a liquid ink paste substantially incompatible with the resinous

binder material, said liquid ink paste comprising a pigment, a liquid fatty acid and an oil-soluble dye dissolved in said liquid



fatty acid, and the weight ratio of said fatty acid to said dye being from 20:1 to 2:1.

4,713,282

FILMS FOR USE IN STRETCH-PACKAGING

Takao Yazaki; Masataka Noro, and Takashi Matsui, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00555, § 371 Date Jun. 6, 1986, § 102(e)

Date Jun. 6, 1986, PCT Pub. No. WO86/02043, PCT Pub.

Date Apr. 10, 1986

PCT Filed Oct. 7, 1985, Ser. No. 878,959

Claims priority, application Japan, Oct. 8, 1984, 59-211125

Int. Cl.⁴ B32B 27/28, 27/32; B65D 65/40

U.S. Cl. 428—216

14 Claims

1. A film for use in stretch-packaging, which comprises: an intermediate layer that has as its main component an α -olefin-series resin component containing a butene-1-series resin and at least two surface layers each containing as its main component an ethylene-vinyl acetate copolymer resin with a vinyl acetate content of 5 to 25 wt%, the surface layers being laminated over both surfaces of the intermediate layer.

4,713,283

REINFORCED COMPOSITE STRUCTURES

Frederic N. Cogswell, Guisborough, and Umakant Measuria, Great Ayton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jan. 15, 1985, Ser. No. 691,643

Claims priority, application United Kingdom, Jan. 27, 1984, 8402192; Mar. 6, 1984, 8405828

Int. Cl.⁴ B32B 5/16

U.S. Cl. 428—240

9 Claims

1. A reinforced composite structure comprising parallel, aligned continuous filaments extending along the maximum dimension of the structure, said filaments being present in a thermoplastic matrix polymer which intimately contacts substantially the whole of the surface of the filaments characterized in that the reinforcement of the structure comprises at least 30% by volume of filamentary reinforcing material and from 1% up to 30% by volume of particulate filler and that said intimate contact between matrix polymer and the surface of the filaments is achieved by the use of a molten mixture of thermoplastic polymer and plasticizer for the polymer.

4,713,284

CERAMIC COATED LAMINATE AND PROCESS FOR PRODUCING THE SAME

Hiroshi Hasegawa, Shimodate, and Mitsuhiro Inoue, Oyama, both of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 943,695

Claims priority, application Japan, Dec. 26, 1985, 60-295798; Feb. 12, 1986, 61-28698

Int. Cl.⁴ B32B 7/00

U.S. Cl. 428—246

15 Claims



4. A ceramic coated laminate according to claim 1, wherein a woven fabric in the woven fabric prepreg layer is a glass fiber.

4,713,285

HIGH TEMPERATURE FILTER MATERIAL

Max Klein, Schremsbury, N.J., assignor to Frederick G. Crane, Jr., Dalton, Mass. and Max Klein, Trustee, Shrewsbury, N.J.

Filed May 2, 1986, Ser. No. 858,941

Int. Cl.⁴ B32B 5/16; B65B 1/24, 63/02

U.S. Cl. 428—283

15 Claims

1. A high temperature filter material comprising a non-woven, glass fiber matrix, including mica particles, the majority of said particles being of a size below 40 microns, and polymer micro-bits produced from an expanded, thermoplastic polymer selected from the group of a styrene-polymer, a lower polyolefin, which is a polymer of an ethylenically unsaturated hydrocarbon monomer having from 2-6 carbon atoms, or copolymers or blends of said polymers, each said polymer being non-brittle in expanded form, or produced from a flexible foamed polyurethane, said polymer micro-bits being substantially completely free of intact cells of the expanded or foamed polymer from which they are produced, said matrix having uniformly distributed throughout a compatible binder system comprising an organic binding agent, which is insoluble in cold water and soluble in hot water and which retains its binding action upon cooling, for binding the points of contact of the fibrous and particulate components of said filter material and a film-forming siloxane polymer for aiding in the retention of the particulate components in said filter material.

4,713,286

PRINTED CIRCUIT BOARD DRILL AND METHOD OF MANUFACTURE

John A. Bunting; Louis M. Pope, both of Provo, Utah, and James L. Clark, Lubbock, Tex., assignors to Precorp, Inc., Niles, Ill.

Filed Oct. 31, 1985, Ser. No. 793,202

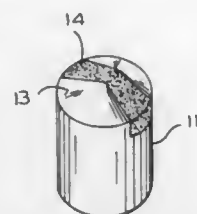
Int. Cl.⁴ B22F 3/14, 7/08

U.S. Cl. 428—323

12 Claims

1. A composite sintered abrasive drill blank for formation into a rotary cutting tool comprising:
a drill blank of a first material, having a cylindrically shaped region with a top and bottom side,
said drill blank including a conically shaped point region of said first material, at said top side of said cylindrically shaped region;
one or more veins of sintered abrasive particulate extending longitudinally from the top of said conically shaped point region into said cylindrically shaped region of said drill blank, from the circumferential edge of said drill blank inwardly along at least a portion of the diameter of said drill blank;

said one or more veins of sintered abrasive particulate being directly and molecularly bonded to said first material of said drill blank without the utilization of intermediary carrier and substrate materials, so as to expose said sintered abrasive particulate only at both the top conical surface of said conically shaped point region and at the circumferential edges of said cylindrically shaped region, of said drill blank,



said one or more veins of sintered abrasive particulate retaining their position within said drill blank upon formation of said drill blank into said rotary cutting tool at which time the longitudinal edges of said one or more veins of sintered abrasive particulate are exposed to form cutting surface elements for said rotary cutting tool.

4,713,287

MAGNETIC RECORDING MEDIUM

Yasuo Nishikawa; Tsutomu Okita; Yoshito Mukaida, all of Kanagawa; Masahiro Niinomi, Tokyo; Kenji Yanagihara, Tokyo, and Mituo Kimura, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Japan Synthetic Rubber Co., Ltd., Tokyo, both of Japan

Filed Sep. 25, 1984, Ser. No. 654,288

Claims priority, application Japan, Sep. 26, 1983, 58-176387 Int. Cl.⁴ G11B 5/72

U.S. Cl. 428—336

17 Claims

1. A magnetic recording medium comprising a support having provided thereon a thin magnetic metal film, and a thin layer from 0.5 nm to 100 nm thick consisting essentially of at least one fluorinated polymer selected from 1,1-difluoroethylene polymer, 1,1,2-trifluoroethylene polymer and a copolymer of 1,1-difluoroethylene and 1,1,2-trifluoroethylene being provided on at least one of the surface of the thin magnetic metal film and on the surface of the support opposite to the thin magnetic metal film, wherein said fluorinated polymer is pre-formed, is then dissolved in an organic solvent or emulsified, and thereafter is applied to at least one of the surface of said thin magnetic metal and the surface of the support opposite to the thin magnetic film by coating and drying.

4,713,288

MAGNETIC RECORDING MEDIUM

Yunichi Kokaku; Makoto Kitoh, and Yoshinori Honda, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 4, 1986, Ser. No. 910,141

Claims priority, application Japan, Jun. 17, 1985, 60-129820 Int. Cl.⁴ G11B 5/72

U.S. Cl. 428—336

22 Claims

1. A magnetic recording medium comprising a magnetic layer of a ferromagnetic material, a layer of an organic material and a layer of carbon on a substrate in this order, wherein said layer of an organic material has a thickness of 0.001 to 0.5 μm and a bond strength of at least 10 Kg/cm².

22. A magnetic recording medium comprising a magnetic layer of a ferromagnetic material, a layer of an organic material and a layer of carbon which are formed on a substrate in this order, wherein said layer of organic material has a thickness of 0.001 to 0.5 μm and a bond strength of at least 10 Kg/cm², and wherein said layer of carbon is formed by any one method of sputtering a target material comprised of carbon; decomposing a hydrocarbon-containing gas in a plasma for deposition; ionization deposition wherein carbon is evaporated in a vacuum

vessel, and the resultant vapor particles are ionized and accelerated in an electric field to impinge on the surface of the substrate to be treated; or evaporating carbon while irradiating the surface of the substrate to be treated with an energy beam such as an ion beam, laser, and electron rays.

4,713,289

WATER-DISPERSIBLE SYNTHETIC FIBER

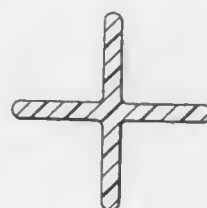
Donald A. Shiffler, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 721,346, Apr. 9, 1985, abandoned. This application Mar. 27, 1986, Ser. No. 842,788

Int. Cl.⁴ D02G 3/00

U.S. Cl. 428—361

9 Claims



1. Water-dispersible polyester fiber provided with a water-dispersing coating in sufficient amount to render the fiber water-dispersible, characterized in that the fibers are of cruciform cross-section.

4,713,290

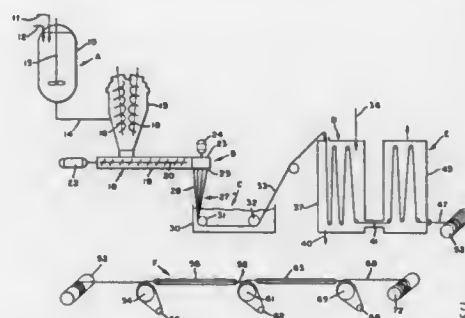
HIGH STRENGTH AND MODULUS POLYVINYL ALCOHOL FIBERS AND METHOD OF THEIR PREPARATION

Young D. Kwon, Morristown; Sheldon Kavesh, Whippany, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J. Division of Ser. No. 569,818, Jan. 11, 1984, Pat. No. 4,599,267, which is a division of Ser. No. 432,044, Sep. 30, 1982, Pat. No. 4,440,711. This application Jan. 22, 1986, Ser. No. 821,374

Int. Cl.⁴ D02G 3/00

U.S. Cl. 428—364

29 Claims



1. Polyvinyl alcohol fiber having a tenacity of at least 10 g/denier and a modulus of at least about 200 g/denier prepared by a process comprising the steps:

- forming a solution of a linear polyvinyl alcohol having a weight average molecular weight at least 500,000 in a first solvent at a first concentration between about 2 and about 15 weight percent polyvinyl alcohol,
- extruding said solution through an aperture, said solution being at a temperature no less than a first temperature upstream of the aperture and being substantially at the first concentration both upstream and downstream of said aperture,
- cooling the solution adjacent to and downstream of the

- aperture to a second temperature below the temperature at which a rubbery gel is formed, forming a gel fiber containing first solvent of substantially indefinite length,
- extracting the gel fiber containing first solvent with a second, volatile solvent for a sufficient contact time to form a fibrous fiber structure containing second solvent, which gel is substantially free of first solvent and is of substantially free of first solvent and is of substantially indefinite length;
- drying the fibrous structure containing second solvent to form a xerogel fiber of substantially indefinite length free of first and second solvent; and
- stretching at least one of:
 - the gel fiber containing the first solvent,
 - the fibrous fiber structure containing the second solvent and,
 - the xerogel fiber, at a total stretch ratio sufficient to achieve a tenacity of at least about 10 g/denier and a modulus of at least about 200 g/denier.

4,713,291

FRAGRANT FIBER

Makoto Sasaki; Jun Yoshida; Yoshishige Shimizu; Kiyoshi Akazawa; Eiji Kishita, and Kaoru Hirata, all of Toyohashi, Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

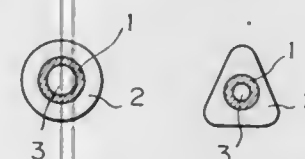
Filed Sep. 6, 1985, Ser. No. 773,038

Claims priority, application Japan, Sep. 6, 1984, 59-186842; Feb. 27, 1985, 60-38415; Feb. 27, 1985, 60-38416

Int. Cl.⁴ D02B 3/00

U.S. Cl. 428—373

7 Claims



1. A fragrant sheath-core composite fiber having a cross-section comprising a sheath and a core including a hollow portion along the entire cross-section thereof, wherein an aromatic perfume having a boiling point higher than 150° C. under normal pressure is incorporated and dispersed in an amount of 0.1 to 10.0% by weight in a thermoplastic polymer constituting the core, said polymer constituting the core being a polyethylene polymer in which at least 70 mole % of recurring units are ethylene recurring units, and the sheath being constituted by a polyethylene terephthalate polymer in which at least 95 mole % of recurring units are ethylene terephthalate recurring units, said aromatic perfume comprising an admixture of essential oils selected from the group consisting of (a) an admixture of lemon oil, bergamot oil, lavender oil, lemongrass oil, cedarwood oil and jasmine absolute, and (b) an admixture of α -pinene, cedarwood oil, abies oil, pine needle oil, orange oil and eucalyptus oil.

4,713,292

MULTILAYER COMPOSITE HOLLOW FIBERS AND METHOD OF MAKING SAME

Tohru Takemura; Hajime Itoh; Jun Kamo, all of Hiroshima, and Haruhiko Yoshida, Yamaguchi, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1986, Ser. No. 878,678

Claims priority, application Japan, Jun. 27, 1985, 60-141385

Int. Cl.⁴ D02G 3/00

U.S. Cl. 428—373

8 Claims

1. A multilayer composite hollow fiber comprising at least one nonporous separating membrane layer (A) performing a separating function and two or more porous layers (B) performing a reinforcing function, said layer (A) and said layers

(B) being alternately laminated so as to give a structure having inner and outer surfaces formed by said porous layers (B).

4,713,293

MAGNETIC RECORDING MEDIA

Masao Asano; Ryosuke Isobe; Yasuhisa Yamauchi, and Hiroaki Yamagishi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1985, Ser. No. 760,406

Claims priority, application Japan, Aug. 7, 1984, 59-166280

Int. Cl.⁴ G11B 5/712

U.S. Cl. 428—403

13 Claims

1. A magnetic recording medium comprising a magnetic recording layer and a support wherein said magnetic recording layer contains a magnetic metal powder, a fatty acid and an ester thereof, and wherein the surface of said magnetic powder is pre-treated with a surfactant, the total amount of said fatty acid and said ester being in the range of 1.5% to 7.5% by weight of said magnetic metal powder, and the weight ratio of said fatty acid to said ester being from 85/15 to 99/1.

4,713,294

FOUNDRY SHELL CORE AND MOLD COMPOSITION

David R. Armbruster, Forest Park, and Calvin K. Johnson, Lockport, both of Ill., assignors to Acme Resin Corporation, Westchester, Ill.

Filed May 23, 1986, Ser. No. 866,438

Int. Cl.⁴ B05D 7/00; B44D 1/20; B32B 5/16; C08G 8/04

U.S. Cl. 428—404

18 Claims

18. A free flowing foundry shell sand core and mold composition consisting essentially of particulate matter coated with a curable phenolicfuran resin, containing substantially no hexamethylene tetramine, said phenolicfuran resin having a mole ratio of phenol to furfuryl alcohol of from about 0.1:1 to about 10:1.

4,713,295

METHOD OF MODIFYING THE WETTABILITY OF GLASS BEADS, GLASS BEADS POLYMERIC MATERIAL INCORPORATING SUCH GLASS BEADS, AND METHOD OF APPLYING REFLECTIVE MARKINGS TO A SURFACE

Pierre Laroche, Nalines, Belgium, assignor to Glaverbel, Brussels, Belgium

Filed Mar. 26, 1986, Ser. No. 844,315

Claims priority, application United Kingdom, Mar. 28, 1985, 8508093

Int. Cl.⁴ B05C 1/16; B05D 7/00; B32B 5/16; C03C 17/00

U.S. Cl. 428—406

21 Claims

9. A glass bead coated with a mixture of substances comprising a first substance which if present alone would tend to make the bead hydrophobic while leaving it oleophilic and a second substance which if present alone would tend to make the bead both hydrophobic and oleophobic; said first and said second substance being present in a proportion effective to attain a desired degree of wettability or bonding to a medium with which said coated beads are to be admixed.

4,713,296

LAMINATE HAVING GOOD GAS BARRIER PROPERTIES WITH BARRIER LAYER OF MODIFIED ETHYLENE-VINYL ALCOHOL COPOLYMER

Akimasa Aoyama; Takeshi Moritani; Kiyoshi Yonezu; Taichi Negi, all of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jun. 12, 1986, Ser. No. 873,413

Claims priority, application Japan, Jun. 29, 1985, 60-140909

Int. Cl.⁴ B32B 27/32, 27/08; B29C 47/00; B65D 85/00

U.S. Cl. 428—412

5 Claims

1. A laminate having good gas barrier properties which comprises at least one barrier layer of modified ethylene-vinyl

alcohol copolymer and at least one layer of thermoplastic resin, said modified ethylene-vinyl alcohol copolymer being a saponified product of pyrrolidone ring containing ethylene-vinyl acetate copolymer, having a pyrrolidone ring-containing unit of 0.01 to 5 mol %, ethylene unit of 20 to 55 mol % and a degree of saponification of the vinyl acetate component of at least 98 mol %.

4,713,297

LAMELLAR MAGNETIC CORE UTILIZING LOW VISCOSITY EPOXY ADHESIVE

Johannes P. M. Verbunt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

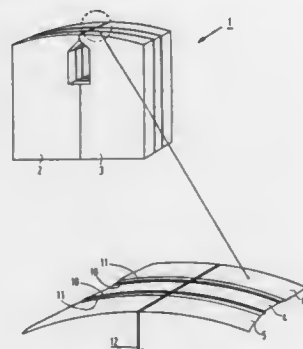
Filed Apr. 23, 1986, Ser. No. 854,970

Claims priority, application Netherlands, May 24, 1985, 8501491

Int. Cl.⁴ B32B 27/38, 9/00; G11B 5/147

U.S. Cl. 428—414

3 Claims



1. A magnetic core comprising a first lamellar core part of amorphous, ferromagnetic material bonded by means of epoxy adhesive to a second lamellar core part or to a substrate by means of an epoxy adhesive having a viscosity of less than 1 Pa.s at room temperature, the opposing surfaces of said lamellar core parts or said substrate being coated with a thin film of an inorganic material selected from the group consisting of TiO₂, SiO₂, Al₂O₃ and Si₃N₄.

4,713,298

PRINTED CIRCUIT BOARDS HAVING IMPROVED ADHESION BETWEEN SOLDER MASK AND METAL

Paul L. K. Hung, Edison; Richard J. Radigan, Toms River, and David S. Rosen, Avenel, all of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Division of Ser. No. 712,308, Mar. 15, 1985, Pat. No. 4,615,950.

This application Apr. 17, 1986, Ser. No. 853,078

Int. Cl.⁴ B32B 15/08; G03C 1/495, 1/68

U.S. Cl. 428—461

5 Claims

1. In a method of making a printed circuit board which includes a u.v. curable solder mask coating over a substrate having a metal, the step which enables the production of such boards having improved adhesion between mask and metal thereon, comprising:

applying a primer film to said substrate from an aqueous solution which includes 0.01 to 10% by weight of a carboxyl-containing polymer selected from the group consisting of a polyacrylic acid polymer, an ethylene-maleic acid copolymer or its half-acid ester, a butadiene-maleic acid copolymer or its half-acid ester, and a styrene-maleic acid copolymer or its half-acid ester.

4,713,299 MODIFIED MELAMINE RESIN FOR USE IN DECORATIVE LAMINATES

Arthur R. Taylor, Billingham, England, and Dudley Wulfekotter, Cincinnati, Ohio, assignors to Formica Corporation, Wayne, N.J.

Filed Mar. 3, 1986, Ser. No. 835,567

Claims priority, application United Kingdom, Mar. 5, 1985, 8505602

Int. Cl.⁴ B32B 23/08, 27/42

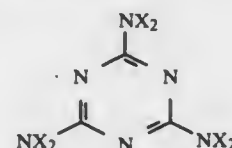
U.S. Cl. 428—526

10 Claims

1. A cellulosic paper sheet impregnated with from about 15% to about 80%, by weight, based on the weight of the paper sheet, of a composition comprising a blend of (1) from about 35% to about 98%, by weight, based on the total solids of the composition, of a melamine/formaldehyde resin having a ratio of formaldehyde to melamine of from about 1.1:1 to about 3:1, respectively, and (2) from about 2% to about 65%, by weight, based on the total solids of the composition, of a mixture of (A) a polyalkylene glycol having the formula



wherein x is an integer of 2-4, inclusive, and n is an integer such that the glycol has a weight average molecular weight of from about 200 to about 1200 and, (B) an alkylated methylol-melamine having the formula



wherein each X is, individually, hydrogen or CH₂OR, R is hydrogen or an alkyl group of 1-4 carbon atoms, inclusive, at least 2 X's are CH₂OR, and at least one R is an alkyl group, the ratio of A:B ranging from about 2.5:1 to about 0.3:1, respectively, (C) from about 0% to about 3%, by weight, based on the total solids of the composition, of an acid catalyst, (D) from about 0% to about 0.5%, by weight, same basis, of a surfactant, (E) from about 0% to about 2.0%, by weight, same basis, of an abrasive material and (F) from about 0% to about 4.0%, by weight, same basis, of a flow promotor.

4,713,300

GRADED REFRACTORY CERMET ARTICLE

Harold G. Sowman, Stillwater, and David R. Kaar, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 13, 1985, Ser. No. 809,067

Int. Cl.⁴ B05D 5/12, 7/00

U.S. Cl. 428—547

19 Claims



1. A shaped, non-fused, cermet article comprising at least one continuous ceramic phase and containing at least one metal phase of discrete particles separated from each other, the ratio of ceramic/metal being controlled and gradually and continu-

ously varied over the depth of the article so as to provide an article wherein the density of metal is greatest in all the exterior surface portions and decreases towards the innermost portions.

4,713,301

SN-BASED MULTILAYER COATED STEEL STRIP HAVING IMPROVED CORROSION RESISTANCE, WELDABILITY AND LACQUERABILITY

Seizun Higuchi; Tomonari Oga; Masao Ikeda, and Hirohumi Nakano, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

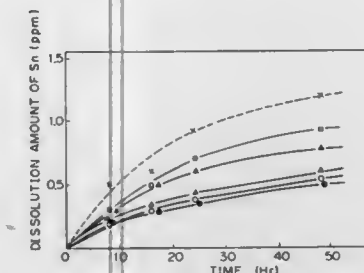
Filed Jun. 27, 1986, Ser. No. 879,273

Claims priority, application Japan, Jul. 1, 1985, 60-144174

Int. Cl.⁴ B32B 15/01

U.S. Cl. 428—628

13 Claims



1. A surface-treated steel strip for use as a container, having improved properties, characterized by having an Fe-Ni-P based, underlying coating layer, an Sn plated layer on the underlying coating layer, and a chromate coating layer on the Sn plated layer, wherein the Fe-Ni-P based underlying coating layer has a weight of from 10 to 300 mg/m² of a surface of the steel strip, and contains from 5 to 30% of Ni and from 0.1 to 10% of P.

4,713,302

SINTERED CERAMIC BODY

Michiyasu Komatsu, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 563,446, Dec. 20, 1983, abandoned.

This application Apr. 30, 1986, Ser. No. 869,820

Claims priority, application Japan, Dec. 22, 1982, 57-225417

Int. Cl.⁴ B32B 15/04

U.S. Cl. 428—698

10 Claims

1. A sintered body of silicon nitride-based ceramics which contains at most 10% by weight of yttrium oxide and at most 10% by weight of aluminum oxide and which has a surface layer consisting essentially of yttrium silicate, cristobalite and silicon nitride.

4,713,303

FUEL CELL APPARATUS WITH RAPID START-UP

Mohammad Farooque, Huntington, and Lawrence J. Novacco, Brookfield, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Feb. 24, 1987, Ser. No. 17,356

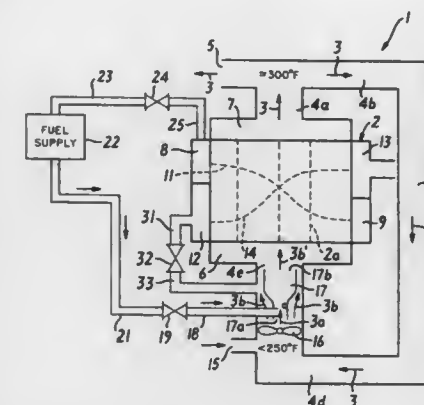
Int. Cl.⁴ H01M 8/04

U.S. Cl. 429—26

8 Claims

1. Apparatus comprising:
a fuel cell stack including passage means having entry and exit ends, said passage means carrying a gas through the stack from said entry to said exit end;
loop means for recirculating a portion of the gas leaving said exit end back to said entry end;
blower means within said loop for driving said recirculation;
burner means within said loop downstream of said blower means, said burner means being adapted to receive a portion of the gas in said loop and being further adapted to

receive fuel from a fuel supply during start-up of said fuel cell stack;



and an entry port in said loop means disposed upstream of said blower, for replenishing gas to said loop.

4,713,304

METHOD OF PREPARING LEAD-ACID BATTERY PLATES AND LEAD-ACID BATTERIES CONTAINING PLATES SO PREPARED

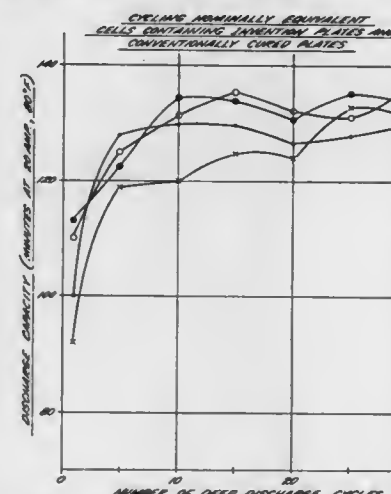
Purushothama Rao, Eagan, and Frederick L. Marsh, Fridley, both of Minn., assignors to GNB Incorporated, Mendota Heights, Minn.

Filed Jun. 18, 1986, Ser. No. 875,800

Int. Cl.⁴ H01M 4/23

U.S. Cl. 429—136

40 Claims



1. A method for preparing lead-acid battery positive and negative plates for use in lead-acid batteries, comprising: (a) providing battery grids, (b) applying wet leady oxide paste to the grids to form plates, and (c) initiating formation of the lead-acid battery plates while the plates contain more than about 5 wt. % free lead in the paste.

4,713,305

WATER-FREE ORGANIC ELECTROLYTE

Ulrich von Alpen, Glashutten, Fed. Rep. of Germany, assignor to Varta Batterie A.G., Hanover, Fed. Rep. of Germany
Filed Mar. 31, 1987, Ser. No. 33,115
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611123

Int. Cl.⁴ H01M 6/16

U.S. Cl. 429—194

10 Claims

1. In a water-free organic electrolyte for galvanic cells with a negative light-metal electrode, which electrolyte contains at least one organic solvent with a CH bond activated by an —O—, =CO or =N-neighbor group, the improvement wherein a stabilizer substance is added to the electrolyte to prevent formation of polymeric peroxides or to destroy peroxides that are present.

4,713,306

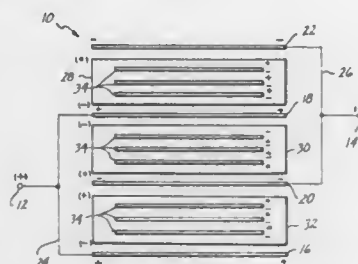
BATTERY ELEMENT AND BATTERY INCORPORATING DOPED TIN OXIDE COATED SUBSTRATE

Naum Pinsky, Thousand Oaks, and Saulius A. Alkaitis, Venice, both of Calif., assignors to Ensco, Inc., Chatsworth, Calif.
Filed Mar. 24, 1986, Ser. No. 843,047

Int. Cl.⁴ H01M 4/58, 6/48

U.S. Cl. 429—218

48 Claims



1. A battery element useful as at least a portion of the positive plates in a lead acid battery comprising an acid resistant substrate coated with electrically conductive doped tin oxide and a positive active electrode material provided that at least a portion of said coated substrate contacts said electrode material.

4,713,307

ORGANIC AZO PHOTOCONDUCTOR IMAGING MEMBERS

Kock-Yee Law, Fairport, and James M. Wescott, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

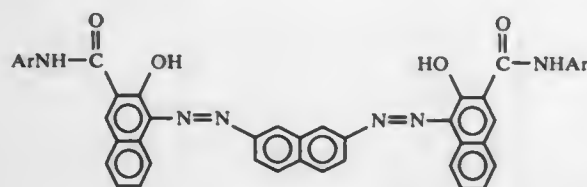
Filed Apr. 11, 1986, Ser. No. 851,066

Int. Cl.⁴ G03G 5/06, 5/14

U.S. Cl. 430—57

44 Claims

1. An imaging member comprised of a supporting substrate, a photogenerating pigment containing an azo compound of the following formula



wherein Ar is an aromatic or substituted aromatic substituent; and a hole transport layer.

4,713,308

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER USING MICROCRYSTALLINE SILICON

Shuji Yoshizawa, Tokyo; Wataru Mitani; Mariko Yamamoto, both of Yokohama; Akira Sanjoh, Aichi, and Tatsuya Ikezue, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 23, 1986, Ser. No. 877,383

Claims priority, application Japan, Jun. 25, 1985, 60-138212; Jun. 25, 1985, 60-138215; Jun. 25, 1985, 60-138216; Jun. 25, 1985, 60-138217

Int. Cl.⁴ G03G 5/14

U.S. Cl. 430—65

18 Claims

1. An electrophotographic photosensitive member comprising:
a conductive substrate;
a barrier layer provided on the conductive substrate; and
a photosensitive layer provided on the barrier layer, at least part of said photosensitive layer being comprised of microcrystalline silicon, the crystallinity of said microcrystalline silicon varying all the way through the thickness of the photosensitive layer.

4,713,309

ENHANCEMENT LAYER FOR POSITIVELY CHARGED ELECTROPHOTOGRAPHIC DEVICES AND METHOD FOR DECREASING CHARGE FATIGUE THROUGH THE USE OF SAID LAYER

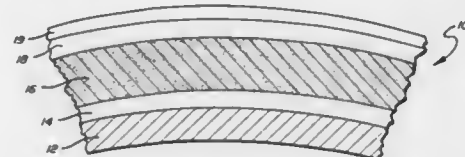
Annette Johncock, Royal Oak, and Stephen J. Hudgens, Southfield, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 769,106, Aug. 26, 1985, abandoned. This application Feb. 18, 1987, Ser. No. 16,157

Int. Cl.⁴ G03G 5/082, 5/14

U.S. Cl. 430—65

19 Claims



1. An electrophotographic medium comprising:
an electrically conductive substrate;
a bottom layer overlying the substrate, the bottom layer adapted to block the free flow of charge carriers from the substrate;
a photoconductive layer overlying the bottom layer, the photoconductive layer adapted to discharge an electrostatic charge;
an enhancement layer overlying the photoconductive layer, the enhancement layer adapted to substantially reduce the number of charge carriers caught in deep mid-gap traps for preventing charge fatigue; said enhancement layer formed of silicon alloy material from which is intentionally N-doped so as to move the Fermi level thereof to within about 0.8 to 0.5 eV of the conduction band to avoid said deep trapping and prevent image flow;
the semiconductor alloy material from which said enhancement layer is formed having the Fermi level thereof pinned; and
a top protective layer overlying the enhancement layer, said protective layer adapted to protect the photoconductive layer from ambient conditions.

4,713,310

COLORED RESIN COMPOSITION

Shinji Horie, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Jan. 9, 1986, Ser. No. 817,438

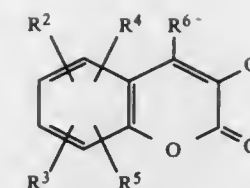
Claims priority, application Japan, Jan. 9, 1985, 60-1770

Int. Cl.⁴ C08L 67/02

U.S. Cl. 430—109

9 Claims

1. A colored resin composition comprising: a matrix phase comprised of a thermoplastic polyester and a thermoplastic modified polyester graft-copolymerized with styrene; a dispersed phase comprised of a thermoplastic styrene polymer, the dispersed phase being dispersed in the matrix phase and being separated in phase from the matrix phase; and a colorant having greater affinity for the thermoplastic styrene polymer of the dispersed phase than for at least one of the thermoplastic polyester and the thermoplastic modified polyester graft-copolymerized with styrene of the matrix phase so that substantially the entire amount of the colorant remains in the dispersed phase.



wherein Q is —Z—R¹, Z is carbonyl, R¹ is a hydroxyl group, an alkenyl group, an alkoxy group, an alkyl group, an aryl group, a carboxylic group or a heterocyclic group;

R², R³, R⁴ and R⁵ each independently represent hydrogen, an alkoxy group, a dialkylamino group, a halogen atom, an acyloxy group, a nitro group, a 5- or 6-membered heterocyclic group, or a group having the formula (II):



(II)

4,713,311

HOMOGENEOUS PHOTOCONDUCTIVE LAYER OF AMORPHOUS SILICON AND HYDROGEN

Wilhelm Senske, Eschborn; Roland Herkert; Norbert Marschall, both of Frankfurt, and Karl-Heinrich Greeb, Dreieich, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 7, 1983, Ser. No. 559,178

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3245500

Int. Cl.⁴ G03G 5/082

U.S. Cl. 430—127

7 Claims

1. A process for producing an electrophotographic recording material having an electrically conductive substrate and an homogeneous photoconductive layer of amorphous silicon and hydrogen applied thereon, said process comprising precipitating a photoconductive layer of silicon onto a substrate maintained at a temperature ranging from 100° to 300° C. by cathode sputtering in an atmosphere consisting of oxygen or an oxygen-releasing gas, hydrogen and argon, wherein the oxygen or oxygen-releasing gas is present in a proportion of about 1 ppm to 1 vol.% to said hydrogen and said argon gases.

4,713,312

IMAGING SYSTEM EMPLOYING PHOTOSENSITIVE MICROCAPSULES CONTAINING 3-SUBSTITUTED COUMARINS AND OTHER PHOTOBLEACHABLE SENSITIZERS

Paul C. Adair; Gary F. Hillenbrand, and Paul D. Davis, all of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

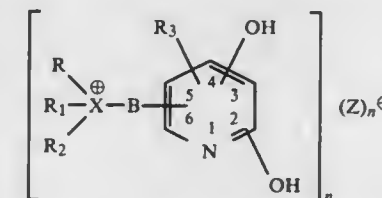
Continuation of Ser. No. 824,310, Jan. 30, 1986, abandoned, Continuation of Ser. No. 658,934, Oct. 9, 1984, abandoned. This application Dec. 10, 1986, Ser. No. 939,270

Int. Cl.⁴ G03C 1/40, 1/00

U.S. Cl. 430—138

8 Claims

1. An imaging sheet useful in forming full color images comprising a support having on a surface thereof a layer containing three sets of microcapsules having distinct sensitivities and containing respectively cyan, magenta, and yellow image-forming agents; one of said three sets of microcapsules being blue light-sensitive and including in the internal phase thereof a free radical addition polymerizable material and a photoinitiator system including a photobleachable sensitizer, said sensitizer being bleachable upon exposure to radiation in the wavelength range of 390 to 500 nm and being represented by formula (I):



wherein X is nitrogen or phosphorus; B is a divalent linking group; R and R₂ are independently selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, aryl, aralkyl and alkaryl; R₁ is selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, aryl, aralkyl, alkaryl and a divalent linking group; or at least two of R, R₁ and R₂, together with X, form a substituted or unsubstituted heterocyclic ring; R₃ is selected from the group consisting of hydrogen, alkyl, substituted alkyl, aryl, nitro and halogen; Z is a photographically acceptable anion; and n is 1 or 2; said compound being capable of reacting with silver halide to form a complex silver salt that is soluble in said alkaline solution;

(3) transferring said complex silver salt to a superposed image-receiving layer; and

maintaining the tabular grains in suspension with a gelatino-peptizer,



characterized in that the gelatino-peptizer contains less than 30 micromoles of methionine per gram.

4,713,321

PROCESS FOR PREPARING SILVER HALIDE EMULSION UTILIZING A PHOTOGRAPHICALLY USEFUL ADDITIVE CAPABLE OF BEING DEACTIVATED AND A DEACTIVATING AGENT THEREFOR AND SILVER HALIDE PHOTOGRAPHIC MATERIAL PREPARED BY THE PROCESS
Hiroyuki Mifune; Tadao Shishido, and Yoshiaki Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

PCT No. PCT/JP85/00335, § 371 Date Feb. 14, 1986, § 102(e) Date Feb. 14, 1986, PCT Pub. No. WO86/00150, PCT Pub. Date Jan. 3, 1986

PCT Filed Jun. 14, 1985, Ser. No. 834,278

Claims priority, application Japan, Jun. 15, 1984, 59-122982
Int. Cl.⁴ G03C 1/02, 1/06

U.S. Cl. 430—569

11 Claims

1. A process for preparing a silver halide photographic emulsion utilizing a dye of the kind which can be adsorbed by or react with silver halide grains within a period from the silver halide grain forming time to just before the emulsion coating step, which further comprises using an oxidizing agent which has the ability to act on said dye and which is selected from the group consisting of hydrogen peroxide, adducts of hydrogen peroxide, peroxy acid salts, organic peroxides, oxidizing gases, and halogen releasing oxidizing compounds, therethrough to lower or to extinguish its function of absorption or reaction at the time when the function of said dye becomes substantially needless.

4,713,322

SILVER HALIDE PHOTOSENSITIVE MATERIAL
Philip S. Bryan, and Arthur H. Herz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

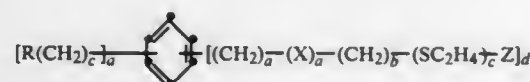
Filed Dec. 29, 1986, Ser. No. 947,454

Int. Cl.⁴ G03C 1/02, 1/06

U.S. Cl. 430—569

17 Claims

13. In a process for the preparation of a silver halide emulsion, the improvement which comprises adding, during preparation of said emulsion or prior to coating thereof on a support, from about 0.001 to about 10 g per mol of silver halide of a compound having the structural formula:



wherein

R is COOH;
X is sulfur or oxygen;
each a is independently 0 or 1;
b is 0, 1, 2 or 3;

each c is independently 0, 1 or 2;
d is from 2 to 6; and
Z is a group having the formula $-S(CH_2)_nCOOH$, $-S(CH_2)_nCH_2OH$, $-OCH_2CH_3$ or $-NHCOCH_2CH_2COOH$, where n is from 1 to 6,
with the proviso that said compound comprises more than 2 sulfur atoms.

4,713,323

CHLORIDE CONTAINING TABULAR GRAIN EMULSIONS AND PROCESSES FOR THEIR PREPARATION EMPLOYING A LOW METHIONINE GELATINO-PEPTIZER

Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

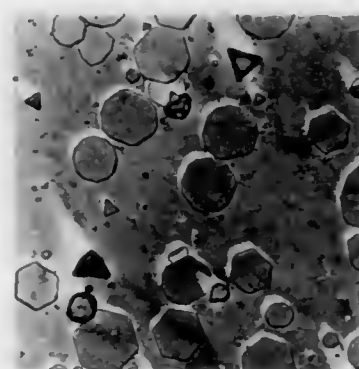
Continuation of Ser. No. 811,132, Dec. 19, 1985, abandoned.

This application Feb. 17, 1987, Ser. No. 15,405

Int. Cl.⁴ G03C 1/02, 1/76, 5/26

U.S. Cl. 430—569

30 Claims



1. A process of preparing a radiation sensitive high aspect ratio tabular grain emulsion, wherein tabular grains of less than 0.35 μm in thickness and an aspect ratio of greater than 8:1 account for greater than 50 percent of the total grain projected area, comprising

introducing silver ion into a dispersing medium containing at least a 0.5 molar concentration of chloride ion and a gelatino-peptizer formed of less than 30 micromoles of methionine per gram.

4,713,324

INVERTED LATENCY SPECIFIC BINDING ASSAY
John P. Fox, Ardsley; Eddie Hedaya, Hartsdale, both of N.Y., and Violet Lippman, Teaneck, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,496

Int. Cl.⁴ C12Q 1/00; G01N 33/53

U.S. Cl. 435—4

22 Claims

1. A composition for determining a ligand in a sample, which composition comprises:

- a binding partner for said ligand;
- a detection system which has at least two components;
- a selective permeable vesicle having a surface bound ligand or ligand analog and a first component of said detection system therein;
- a substance which modifies vesicle permeability in response to binding of surface-bound ligand or ligand analog and the binding partner; and
- at least an additional component of said detection system which is reactive with said first component to produce a detectable response which is reduced when the vesicle is in the presence of the binding partner and vesicle modifying substance.

4,713,325

HYBRIDOMAS PRODUCING MONOCLONAL ANTIBODIES SPECIFIC FOR FELV P27
Hans Lutz, Raedlinger, Switzerland, assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 503,643, Jun. 14, 1983, abandoned, which is a continuation of Ser. No. 219,603, Dec. 24, 1980, abandoned. This application Mar. 21, 1986, Ser. No. 842,749

Int. Cl.⁴ C12Q 1/70; G01N 33/53, 33/577

U.S. Cl. 435—5

7 Claims

1. Murine hybridoma cells producing and secreting monoclonal antibodies specific for a determinant site of the p27 protein of feline leukemia virus, and capable of distinguishing the A, B, C, AB, and ABC strains of FeLV from murine leukemia virus (AKR strain).

5. A method according to claim 4, wherein said enzyme immunoassay is an enzyme linked immunosorbent assay.

4,713,326

COUPLING OF NUCLEIC ACIDS TO SOLID SUPPORT BY PHOTOCHEMICAL METHODS
Nanibhushan Dattagupta, New Haven, and Donald M. Crothers, Northford, both of Conn., assignors to Molecular Diagnostics, Inc., West Haven, Conn.

Continuation-in-part of Ser. No. 511,064, Jul. 5, 1983, Pat. No. 4,542,102. This application May 18, 1984, Ser. No. 611,667

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.⁴ G01N 33/50

U.S. Cl. 435—6

12 Claims

7. An immobilized nucleic acid probe comprising (a) a nucleic acid, (b) a nucleic acid-binding ligand photochemically linked to the nucleic acid, and (c) a solid substrate chemically linked through a divalent radical to the nucleic acid-binding ligand (b).

4,713,327

DETERMINATION OF TOTAL CREATINE KINASE OR AN ISOENZYME WITH A MULTILAYER ANALYTICAL ELEMENT

John B. Findlay, Rochester; Annie L. Wu, Penfield, and Gary E. Norton, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1985, Ser. No. 729,331

Int. Cl.⁴ C12Q 1/50; C12M 1/38; G01N 33/50

U.S. Cl. 435—17

19 Claims

1. A multilayer analytical element for the determination of total creatine kinase or a creatine kinase isoenzyme, said element comprising three or more layers and containing in one or more of said layers, a substrate for creatine kinase, said element also comprising a support having thereon,

- a registration layer containing a binder material at a coverage of at least about 8 g/m² and an indicator composition which provides a detectable change in response to the reaction of said substrate with said creatine kinase or said isoenzyme,
- a reagent layer, and
- an isotropically porous spreading layer containing an activator for creatine kinase, said layers being in order from said support and in fluid contact.

4,713,328

MICROBIAL ENZYME ASSAYS
Robert H. Yolken, 9120 Gorman Rd., Laurel, Md. 20810
Continuation of Ser. No. 307,323, Sep. 30, 1981, abandoned. This application Jan. 3, 1984, Ser. No. 567,152

Int. Cl.⁴ C12Q 1/34, 1/04, 1/06, 1/02

U.S. Cl. 435—18

22 Claims

1. A method of detecting a microbial infection in a mammal by measuring for the presence of beta-lactamase enzymes (E.C. 3.5.2.6) generated by the infecting microbes comprising:

- combining an internal body fluid sample taken from the mammal suspected of having a microbial infection with a

penicillin substrate having a beta-lactam ring capable of being hydrolyzed by beta-lactamase enzymes under conditions suitable for beta-lactamase activity, wherein said substrate is ¹⁴C-benzylpenicillin;

(b) determining the presence of beta-lactamase enzyme in said sample by quantitating hydrolysis of said substrate by said enzyme using an ion exchange column to which the cleaved substrate binds; and

(c) comparing under similar conditions the results in step (b) with a normal predetermined standard for an uninfected mammal of the same species;

wherein appreciably greater amount of hydrolysis of said substrate in the sample as compared to the normal standard is indicative of a microbial infection.

4,713,329

WELL MASK FOR CMOS PROCESS

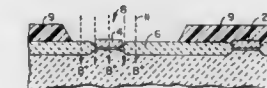
Robert Fang, Cupertino; Jerry Wang, Los Altos Hills; Victor Liang, Capistrano Beach; Joseph Farb, Riverside, and Chung Hsu, Cupertino, all of Calif., assignors to Data General Corporation, Sunnyvale, Calif.

Filed Jul. 22, 1985, Ser. No. 757,331

Int. Cl.⁴ H01L 7/54, 21/265

U.S. Cl. 437—29

15 Claims



1. A method of forming complementary metal oxide semiconductor transistors with field regions fabricated without using additional field masks comprising, in the sequence provided, the steps of:

- providing on a first conductivity type silicon substrate first and second spaced apart areas for said complementary metal oxide semiconductor transistors;
 - forming a masking member on said substrate protecting the first of said areas and exposing the second;
 - doping the second area with second conductivity type modifiers;
 - driving in said second conductivity type modifiers to form a well region;
 - further doping the second area with additional well dopant of said second conductivity type modifiers without increasing the size of said second area exposed by said masking member; and
 - fabricating complementary metal oxide semiconductor transistors in said first and second spaced apart areas.
11. A method of forming complementary metal oxide semiconductor transistors with field regions fabricated without using additional masking steps comprising, in the sequence provided, the steps of:
- providing on an n-type silicon substrate first and second spaced apart areas;
 - selectively applying silicon nitride to said first and second areas;

- C. applying a field oxide over portions of said silicon substrate;
- D. providing a well mask to substantially cover the first of said areas but not the second of said areas;
- E. doping the exposed second area with a p-type material;
- F. etching portions of said field oxide in said second area;
- G. forming a the p-well region by driving in said second conductivity type modifiers;
- H. uniformly applying additional p-type material to the substrate which passes into the substrate in the p-well region but not in regions covered with field oxide and silicon nitride; and
- I. fabricating complementary metal oxide semiconductor transistors in said first and second spaced apart areas.

4,713,330

VISUAL BIOASSAY FOR RHIZOBIUM COMPETITION VARIANTS

McLoughlin, Thomas J., Cottage Grove, Wis., assignor to Lubrizol Genetics, Inc., Wickliffe, Ohio

Filed Dec. 23, 1985, Ser. No. 812,251

Int. Cl. C12Q 1/04

U.S. Cl. 435—34

22 Claims

1. A method for separating a collection of one or more test Rhizobium strains into a Comp^{above} collection and a Comp^{below} collection, comprising in sequence the steps of:

- (a) inoculating a first legume plant with a mixture of a Fix⁺ test Rhizobium strain and a Fix⁻ reference Rhizobium strain, wherein the test and reference strains are both Nod⁺ on the plant, and the reference strain does not produce a phytotoxin;
- (b) growing the plant for a time sufficient for an uninoculated plant of the same variety grown under the same conditions to be yellow due to nitrogen deficiency; and
- (c) identifying the strain to be Comp^{above} if the plant is green due to nitrogen sufficiency or to be Comp^{below} if the plant is yellow due to nitrogen deficiency, wherein the Comp^{above} and Comp^{below} phenotypes are respectively more or less competitive than a Comp criterion, the criterion being measured relative to the reference strain;

whereby the test strain's Comp phenotype relative to the Comp criterion is determined.

4,713,331

MICROBIAL PRODUCTION OF A41030 ANTIBIOTICS

Karl H. Michel, and Ralph E. Kastner, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 637,096, Aug. 2, 1984, Pat. No. 4,559,323, which is a division of Ser. No. 443,496, Nov. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 361,301, Mar. 24, 1982, abandoned. This application Sep. 16, 1985, Ser. No. 776,541

Int. Cl. C12P 21/04; C12N 1/20; C12R 1/465; C07K 7/64

U.S. Cl. 435—68

11 Claims

1. A process for producing A41030 antibiotic complex containing A41030 factors A, B, C, D, E, F and G which comprises cultivating *Streptomyces virginiae* NRRL 15156, or an A41030-producing mutant thereof, in a culture medium containing assimilable sources of carbon, nitrogen and inorganic salts under submerged aerobic fermentation conditions until a recoverable amount of A41030 antibiotic complex is produced.

4,713,332

T CELL SPECIFIC CDNA CLONE

Tak W. Mak, Toronto, Canada, assignor to The Ontario Cancer Institute, Toronto, Canada

Continuation-in-part of Ser. No. 570,694, Jan. 13, 1984. This application Feb. 6, 1984, Ser. No. 577,526

Int. Cl. C12P 21/02, 19/34; C12N 15/00; C07H 15/12

U.S. Cl. 435—70

24 Claims

1. An isolated nucleic acid sequence encoding a polypeptide

which is at least part of the beta chain of a human T cell antigen receptor comprising at least about 936 nucleotides.

2. A nucleic acid of claim 1, wherein the nucleic acid is DNA.

3. A nucleic acid of claim 2, wherein the nucleic acid is a cDNA.

13. A method of preparing the cDNA of claim 3 which comprises obtaining mRNA from a human T cell, preparing



cDNA complementary to the mRNA, inserting the cDNA into an appropriate cloning vehicle, introducing the cloning vehicle into a suitable host, culturing the resulting host under appropriate conditions permitting production of multiple copies of the cDNA, recovering the cDNA so produced and screening the cDNA to determine whether said cDNA is expressed only in T cells.

18. A cloning vehicle comprising the nucleic acid of claim 1.

4,713,333

IMMOBILIZATION OF BIOCATALYSTS ON GRANULAR DIATOMACEOUS EARTH

John P. Chiang, Elkhart, and Oreste J. Lantero, Jr., Goshen, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 23, 1985, Ser. No. 779,053

Int. Cl. C12P 19/20; C12N 11/14

U.S. Cl. 435—96

19 Claims

9. An immobilized enzyme conjugate comprising porous, granular, diatomaceous earth having attached thereto the reaction product of a polyamine compound having pendant amine groups, an amine reactive material which is a multifunctional aldehyde, a multifunctional organic halide, a multifunctional anhydride, a multifunctional azo compound, a multifunctional isothiocyanate or a multifunctional isocyanate whose unreacted amine reactive groups have been reacted with free amine groups of enzyme or enzymes to bind it thereto.

4,713,334

PROCESS FOR THE SACCHARIFICATION OF CELLULOSES

Shizu Fujishima, Ikeda; Fumiko Yaku, Suita, and Tetsuo Koshijima, Kyoto, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 586,948, Mar. 7, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 843,809

Claims priority, application Japan, Mar. 18, 1983, 58-46707; May 20, 1983, 58-89480

Int. Cl. C12P 19/14, 7/14; C12N 9/42

U.S. Cl. 435—99

6 Claims

1. A process for the saccharification of celluloses, comprising degradatively decomposing a cellulosic material by cellulases in the absence of an alcohol to obtain a liquid portion containing saccharides and a solid matter containing cellulases; separating said liquid portion from said solid matter; and degradatively saccharifying additional cellulosic material with the use of said solid matter in an aqueous solution, an aqueous pH-buffered solution or an aqueous pH-buffered solution of polysaccharides or oligosaccharides.

4,713,335

PROTEIN MODIFICATION TO PROVIDE ENZYME ACTIVITY

Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois Glass Container Inc., Toledo, Ohio

Continuation of Ser. No. 418,344, Sep. 15, 1982, abandoned. This application Mar. 21, 1983, Ser. No. 476,954

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl. C12N 9/00, 9/14

U.S. Cl. 435—183

28 Claims

1. A process for chemically altering the substrate specificity of a native protein to produce an enzyme-like modified protein, comprising:

- a. selecting an enzyme to be modeled;
- b. grossly denaturing a native protein;
- c. partially renaturing said grossly denatured native protein to produce a partially denatured protein;
- d. contacting said partially denatured protein with an inhibitor for said model enzyme to form a partially denatured protein-model enzyme inhibitor complex; and
- e. cross-linking said partially denatured protein in said protein-inhibitor complex.

4,713,336

GENE FOR LIGNIN DEGRADATION AND USES THEREOF

Vadake R. Srinivasan; Jeffrey W. Cary; Younghae Chon, and Kenneth E. Narva, all of Baton Rouge, La., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Sep. 27, 1984, Ser. No. 655,193

Int. Cl. C12P 7/02; C12N 9/14, 15/00; C07H 15/12

U.S. Cl. 435—155

22 Claims

2. A vector comprising a DNA segment which codes for an aryl etherase protein, the segment being oriented within said vector such that in a host said segment is expressed to produce a non-native aryl etherase protein said segment being derived from a microorganism having all the identifying characteristic of ATCC 39873 or mutants thereof.

4,713,337

METHOD FOR DELETION OF A GENE FROM A BACTERIA

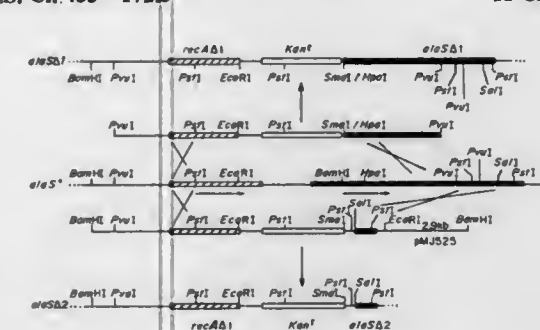
Maria Jasin, Ft. Lauderdale, Fla., and Paul R. Schimmel, Lexington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 3, 1985, Ser. No. 688,612

Int. Cl. C12N 15/00

U.S. Cl. 435—172.3

11 Claims



1. A method for deletion of any gene from an cell with RecA⁺ phenotype which comprises;

- (a) constructing a linear DNA fragment wherein the fragment has sequences homologous to regions separated by a sequence including nucleotides encoding the gene to be deleted on the cell chromosome, said fragment being of a length and extend of homology as required for binding between the chromosome and said fragment;
- (b) placing a second nucleotide sequence between the homologous sequences in the DNA fragment wherein inser-

tion of the second sequence into the cell chromosome in place of the gene to be deleted and expression of said inserted gene results in a detectable phenotype;

- (c) introducing the linear DNA fragment into the cell strain;
- (d) selecting for a double reciprocal recombination mediated by the RecA gene by culturing the cells containing the linear DNA under conditions wherein the phenotype encoded by the second nucleotide sequence is detected and cells with a double reciprocal recombination express the detectable phenotype; and
- (e) immediately converting the cells from RecA⁺ to RecA⁻

4,713,338

POROUS SPHERICAL GLASS FILTRATING BEADS AND METHOD FOR THE MANUFACTURING THEREOF

Carlos J. R. Gonzalez Oliver, Geneva; Olivier De Pous, Chene-Bougeries, and Michel Schneider, Troinex, all of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Aug. 6, 1986, Ser. No. 893,922

Claims priority, application European Pat. Off., Aug. 12, 1985, 85810368.2

Int. Cl. C12N 11/14; C03C 11/00

U.S. Cl. 435—176

21 Claims

1. Porous mineral or glass filtrating beads of substantially uniform spherical shape characterized in having a homogeneous metaloxane structure consisting essentially of silicon oxide and zirconium oxide and optionally at least another metal oxide selected from titanium and aluminium oxides.

21. A method for immobilizing enzymes on the beads of claim 1, comprising activating the beads surface with a compound bearing a ligand for binding enzymes, such as an alkoxysilane carrying functions like OH, SH, NH₂, NCO oxirane and others, contacting the activated beads with selected enzyme preparations and isolating said beads after binding of the enzymes to the beads is effective.

4,713,339

POLYCLONAL EXPRESSION VECTOR CONSTRUCTION

Arthur D. Levinson, Burlingame, and Christian C. Simonsen, San Jose, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed Jan. 19, 1983, Ser. No. 459,152

Int. Cl. C12N 5/00, 15/00, 5/02, 1/00; C12P 21/00, 21/02, 21/04, 19/34; C07H 21/04

U.S. Cl. 435—240.2

8 Claims

1. An expression vector capable of expressing in a vertebrate host cell culture a desired protein and a secondary protein, which vector comprises a DNA sequence encoding for a desired protein and a DNA sequence encoding for a secondary protein wherein both said DNA sequences are operably linked to the same promoter sequence and separated by translational stop and start codons.

4,713,340

BIODEGRADATION OF PENTACHLOROPHENOL

Ronald L. Crawford, Mound, Minn., assignor to Regents of the University of Minnesota, St. Paul, Minn.

Filed Jun. 13, 1984, Ser. No. 620,231

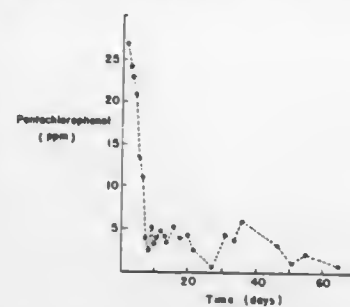
Int. Cl. C12N 1/20; C12R 1/20

U.S. Cl. 435—253

10 Claims

1. A method of detoxifying pentachlorophenol (PCP) by microbial degradation comprising culturing a PCP-degrading bacterium in an aqueous medium comprising dissolved PCP,

wherein said bacterium is a member of the genus *Flavobacterium*, and is capable of sustained growth in medium concentra-



tions of PCP between 250 mg/l and 400 mg/l as its sole source of carbon and energy.

4,713,341

STARTER CULTURES OF IMPROVED ACTIVITY FOR DAIRY PRODUCTS AND PROCESS OF MAKING SAME
Robert R. Bily, Box 3637, San Jose, Calif. 95156
Division of Ser. No. 532,673, Sep. 16, 1983, Pat. No. 4,544,636, which is a continuation-in-part of Ser. No. 507,928, Jun. 27, 1983, abandoned. This application Aug. 15, 1985, Ser. No. 765,694

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.⁴ C12N 1/20, 1/38; A23C 9/13

U.S. Cl. 435—253

2 Claims

1. A method of making bacterial cultures for use in producing a lactic food product comprising the steps of combining acid-producing bacteria with sterile culture media, further combining at least 0.01% lecithin by weight of the sterile culture media to the acid-producing bacteria and sterile culture media, then incubating the mixture of sterile culture media, acid-producing bacteria and lecithin to produce an active, viable bacteria culture of enhanced activity that may be added to a lactic medium for producing a food product.

4,713,342

NOVEL ISOLATE OF TRICHODERMA, FUNGICIDAL COMPOSITIONS CONTAINING SAID ISOLATE AND USE THEREOF

Ilan Chet; Alex Sivan, both of Ness Ziona, and Ylgal Elad, Kibbutz Netzer Sireni, all of Israel, assignors to Yissum Research Development Co. of the Hebrew University of Jerusalem, Jerusalem, Israel

Filed Mar. 13, 1984, Ser. No. 588,950

Claims priority, application Israel, Mar. 15, 1983, 68129

Int. Cl.⁴ C12N 1/14; A61K 35/70; A01N 63/04

U.S. Cl. 435—254

15 Claims

1. A biologically pure, stable culture of a strain of a mycoparasite of the species *Trichoderma harzianum* designated *Trichoderma harzianum* Rifai T-315 (ATCC No. 20671) or a mutant derived therefrom useful as a biological control agent.

8. A biocontrol composition comprising an effective amount of the culture of claim 1 and a suitable agronomically acceptable carrier.

4,713,343

BIODEGRADATION OF HALOGENATED ALIPHATIC HYDROCARBONS

John T. Wilson, Jr., and Barbara H. Wilson, both of Ada, Okla., assignors to The United States of America as represented by the Administrator of the U.S. Environmental Protection Agency, Washington, D.C.

Filed Aug. 29, 1985, Ser. No. 770,445

Int. Cl.⁴ C02F 3/02, 3/34; C12N 1/32, 1/26

U.S. Cl. 435—264

10 Claims

1. A process for the treatment of water which contains

halogenated aliphatic hydrocarbons to aerobically degrade said halogenated aliphatic hydrocarbons, said halogenated aliphatic hydrocarbons being one or more members selected from the group consisting of 1,1,2-trichloroethane, 1,1-dichloroethane, 1,2-dichloroethane, trichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, 1,2-dibromoethane, and vinyl chloride, the process comprising treating the water with a microorganism in the presence of a lower molecular weight alkane containing 1 to 4 carbon atoms, and oxygen, the microorganism comprising bacteria that can aerobically degrade low molecular weight alkanes by beginning their attack with the action of a monooxygenase to produce the corresponding alcohol, the bacteria acting to degrade said halogenated aliphatic hydrocarbons to form products comprising carbon dioxide and water.

4,713,344

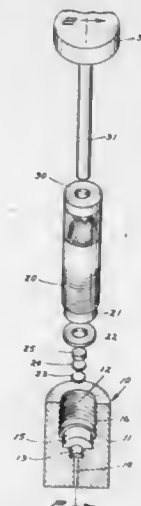
HAND OPERATED PRESS FOR TISSUE EXTRACTION
Albert H. Markhart, III, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jul. 11, 1984, Ser. No. 629,584

Int. Cl.⁴ C12M 1/00

U.S. Cl. 435—287

12 Claims



1. A press assembly for extracting and collecting usable samples of liquids from the cells of biological tissue for analysis comprising a housing, a chamber defined in said housing, said chamber having a central axis and an input end for receiving tissue to be pressed and including a subchamber section at an end of said housing opposite from the input end, the subchamber section having an end surface, a discharge passageway having a cross section size substantially smaller than the end surface, the discharge passageway being open through the end surface, and a pair of filter discs of substantially the same size as the end surface supported on the end surface, one on top of the other;

a screen member supported on the filter discs in the subchamber leading from said subchamber;
a barrel member threadably mounted in said housing, said barrel member having a bore coaxial with said subchamber and opening to said screen member, said bore being of substantially smaller diameter than the outer size of the barrel and substantially longer than its diameter; and
a plunger means slidably mounted in said bore, said plunger member including a head end of size to be useful for gripping by an operator to push the plunger member through the bore and to exert a pressure on material placed in the bore against said screen member, a first of said filter discs being next to the screen member on a side of the screen member opposite the bore for collecting debris passing through said screen member, liquids forced from tissue in the bore by operation of the plunger mem-

ber passing through the first filter disk for collection on the second filter disk for analysis.

4,713,345

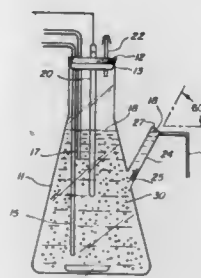
FERMENTATION METHODS AND APPARATUS
Steven L. Ramsden, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Filed Jul. 29, 1985, Ser. No. 760,288

Int. Cl.⁴ C12M 1/02

U.S. Cl. 435—305

7 Claims



1. A method of conducting a continuous fermentation reaction which comprises introducing into a fermentation vessel a flocculating microorganism and a fermentable medium, permitting fermentation to occur, and continually withdrawing fermented broth from the vessel through an effluent discharge conduit communicating with the interior of said vessel whereby flocculated microorganism cells separate by sedimentation from the fermentation broth and are retained in the fermentation vessel, said conduit having a volume substantially less than the total working volume of said vessel and being disposed at an angle of at least 60° but less than 90° from the horizontal, and having the inlet opening thereof disposed at an angle not exceeding 90° from the horizontal.

4,713,346

FORMATION OF ANALYZABLE BORON CONTAINING ADDUCTS

Paul M. Gallop; Edward Henson, both of Chestnut Hill, Mass., and Rudolf Flückiger, Basel, Switzerland, assignors to The Children's Medical Center Corporation, Boston, Mass.

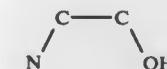
Filed Feb. 3, 1986, Ser. No. 825,619

Int. Cl.⁴ G01N 24/00, 30/00, 33/00

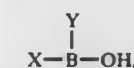
U.S. Cl. 436—86

29 Claims

1. A method of forming and analyzing analyzable adducts in a mixture of compounds, wherein the method comprises contacting a mixture containing one or more compounds containing the functionality



with a boron reagent such that the boron reagent reacts with said one or more compounds to form analyzable adducts, wherein —OH is either a hydroxy or the —OH portion of a carboxyl group, and N is part of an amino group, an imino group, or an aromatic heterocycle, and the boron reagent has the formula of either



where each X and Y is, independently, an alkyl group of 12 or fewer carbons or an aryl group of 6–20 carbons; or BZ₃, where each Z is, independently, an alkyl group of 12 or fewer carbons, or an aryl group of 6–20 carbons; and

4,713,347

MEASUREMENT OF LIGAND/ANTI-LIGAND INTERACTIONS USING BULK CONDUCTANCE
David H. Mitchell, and Ralph M. Mitchell, both of Pacific Palisades, Calif., assignors to Sensor Diagnostics, Inc., Irvine, Calif.

Filed Jan. 14, 1985, Ser. No. 691,271

Int. Cl.⁴ G01N 33/566, 27/26, 27/02, 33/544

U.S. Cl. 436—501

85 Claims

1. A method for determining the presence of a ligand in a fluid sample comprising:

(a) localizing antiligand which interacts with said ligand in at least one predetermined region, said predetermined region being at least partially contained within a test volume;
(b) exposing said predetermined region to said fluid sample; and
(c) measuring the bulk conductance of said test volume to determine the occurrence of ligand-antiligand interaction in said predetermined region by detecting changes in the bulk conductance of said test volume due to ligand-antiligand interaction in said predetermined region.

4,713,348

FLUORESCENT MULTIPARAMETER PARTICLE ANALYSIS

Edwin F. Ullman, Atherton, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 482,124, Apr. 5, 1983, Pat. No.

4,584,277. This application Oct. 22, 1985, Ser. No. 790,291

The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.

Int. Cl.⁴ G01N 33/566, 33/554, 33/544

U.S. Cl. 436—501

14 Claims

1. A method for determining a plurality of blood typing parameters, said parameters being epitopic sites and binding sites of specific binding members (SBM₁, SBM₂, . . . SBM_m), said binding members being ligands and reciprocal receptors respectively, wherein at least one parameter containing specific binding member or its reciprocal specific binding member is bound to a particle (SBM-P or RSBM-P),

said method involving at least one fluorescent label bound to a specific binding member (SBM-F) and at least one particle (P), different fluorescent labels and different particles being distinguishable by spectroscopic characteristics, which are emission, absorption and light scattering;

said method comprising:

combining in a liquid medium,
(a) a blood sample having at least two blood typing parameters to be measured;
(b) for parameter containing specific binding members bound to a particle (SBM₁-P₁, SBM₂-P₂, . . . SBM_m-P_m), fluorescent labeled specific binding member reciprocal to said specific binding member bound to said particle (RSBM₁-F₁, RSBM₂-F₂, . . . RSBM_m-F_m);
(c) for parameter containing specific binding members not bound to a particle (SBM₁, SBM₂, . . . SBM_m), (1) a particle bound to a specific binding member reciprocal to said parameter containing specific binding member (RSBM₁-P₁, RSBM₂-P₂, . . . RSBM_m-P_m) and (2) a fluorescent labeled specific binding member analogous to said parameter containing specific binding member (SBM₁-F₁, SBM₂-F₂, . . . SBM_m-F_m);

wherein the number of different particles (P_m) and fluorescent labels (F_m) are chosen to give signals (n) that distinguish each parameter in said sample and wherein sequential additions and sequential measurements may be made or simultaneous additions and simultaneous measurements may be made, and wherein n signals can distinguish 2ⁿ—1

parameters and wherein reciprocal binding members bind with each other;
irradiating at least a portion of said medium with light, wherein said medium is continuous and said particles are suspended in said continuous medium, and determining populations of particles having electromagnetic signals differing from threshold values; and
relating said populations to the presence of said parameters in said sample.

4,713,349

TEMPLET FOR SIMULTANEOUS SCREENING OF SEVERAL ANTIBODIES AND METHOD OF USING THE SAME

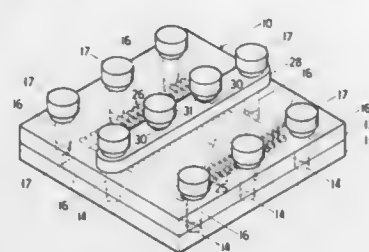
Andrew E. Levin, Cambridge, Mass., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 25, 1985, Ser. No. 705,094

Int. Cl.⁴ B01L 9/00; G01N 33/543, 33/548, 33/559

U.S. Cl. 436—515

18 Claims



1. A templet for use in screening antibodies immobilized on a carrier sheet, comprising:

- a lower plate having a flat central area on its top surface size to receive a carrier sheet to be laid thereon;
- an upper plate having a flat central area on its bottom surface with a plurality of parallel channels formed therein;
- means for holding the upper plate tightly against the lower plate at peripheral areas outside of the central areas of the upper and lower plates where the carrier sheet is to be laid; and
- means for applying pressure to the upper plate at a position above the parallel channels in the upper plate whereby a carrier sheet engaged between the upper and lower plates will be tightly engaged at the area of the parallel channels, wherein the means for applying pressure to the upper plate includes a bridge bar engaged to at least one of the plates at peripheral positions on either side of the central area of the plates and extending over the parallel channels, and wherein the bridge bar has holes therein at the peripheral ends thereof and including threaded holding screws adapted to pass through the holes in the bridge bar and through corresponding holes in the upper plate and into threaded engagement with threaded holes in the lower plate to firmly hold the bridge bar to the upper plate, and wherein at least one pressure screw is threadingly engaged to a threaded hole in the bridge bar in position to be turned to apply pressure to the area of the top surface of the upper plate above the parallel channels.

4,713,350

HYDROPHILIC ASSAY REAGENT CONTAINING ONE MEMBER OF SPECIFIC BINDING PAIR

Richard C. Siegel, Yorktown Heights; Christina S. Marx, Peekskill; Bartholomew Hargitay, White Plains, and Neil Wotherpoon, New York, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Oct. 24, 1983, Ser. No. 544,749

Int. Cl.⁴ G01N 33/546, 33/545, 33/543, 33/549

U.S. Cl. 436—533

20 Claims

1. A hydrophilic specific binding assay reagent which is prepared by a process comprising the steps of reacting a part-

ner of a specific binding pair and at least one hydrophilic moiety with haloalkyl moieties present on the surface of a solid phase thereby covalently coupling said partner of a specific binding pair and said at least one hydrophilic moiety to said solid phase to create a substantially complete hydrophilic coating thereon, said at least one hydrophilic moiety including at least one protein and at least one non-proteinaceous amine to which said solid phase is substantially impermeable and recovering the reagent so prepared from any unreacted binding partner.

4,713,351

MONOCLONAL ANTIBODY DIRECTED TO AN ANTIGEN DERIVED FROM HUMAN OVARIAN TUMORS AND A RADIOIMMUNOASSAY USING THE ANTIBODY

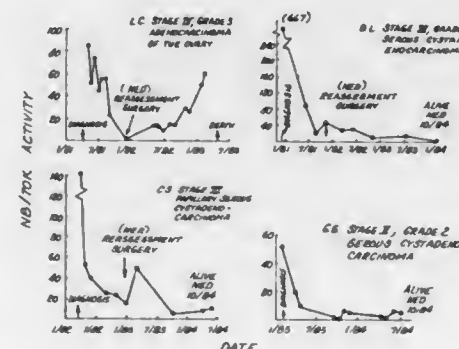
Suzanne Knauf, Fairport, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Continuation-in-part of Ser. No. 461,770, Jan. 28, 1983, Pat. No. 4,584,278, which is a continuation-in-part of Ser. No. 360,238, Mar. 19, 1982, abandoned. This application Jan. 9, 1986, Ser. No. 817,317

Int. Cl.⁴ G01N 33/536

U.S. Cl. 436—542

4 Claims



1. An improved radioimmunoassay, the NB12123 assay, to detect the presence of an ovarian tumor specific antigen, NB/70K, and the amount of NB/70K present, comprising the steps of isolating Fraction OCC, OCA, OCB or OCD or NB/70K or serum, adding said isolate to a dilution of NB12123 in PBS containing 2% normal rabbit serum in a container, allowing sufficient time for said monoclonal antibody to react with said isolate, after said time has expired adding a radioiodinated NB/70K to said container, allowing a sufficient time for said radioiodinated NB/70K to react with a complex of monoclonal antibody and isolate, adding a mixture of *Staphylococcus aureus* of the Cowan I strain bearing protein A, 2.5% (v/v), and rabbit anti-mouse globulin coupled to *Staphylococcus aureus* of the Cowan I strain bearing protein A, 5% (v/v), in the Triton-EDTA buffer to said container, centrifuging the container, decanting the supernatant and counting the radioactivity of the resulting pellet.

4,713,352

MONOCLONAL ANTIBODY PANEL FOR EARLY DIAGNOSIS AND THERAPY OF RENAL CARCINOMA

Neil H. Bander, Willet F. Whitmore, and Lloyd J. Old, all of New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 297,814, Aug. 31, 1981, Pat. No. 4,650,765. This application May 4, 1984, Ser. No. 607,168

Int. Cl.⁴ G01N 33/53, 33/566

U.S. Cl. 436—548

5 Claims

1. Monoclonal antibody panel derived from human renal carcinoma or normal epithelial antigen useful for diagnosing renal cancers in humans by recognizing with overlapping

reactivity a site of origin of most renal carcinomas comprising the distal end of the renal proximal tubule (pars recta) and adjacent portion thereto of the Loop of Henle and wherein the panel consists of monoclonal antibody S₄ (HB 8541), S₂₃ (HB 8540), F₂₃ (HB 8231), S₂₇ (HB 8428) and F₃₁ (HB 8548).

4,713,353

METHOD OF PRODUCING A TRANSPARENT PHOTOCATHODE

Rudolf Förster, Tomerdingen; Suso Weber, Langenau, and Hans-Jürgen Pyka, Nersingen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs GmbH, Fed. Rep. of Germany

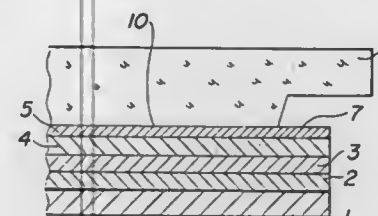
Filed Jul. 3, 1986, Ser. No. 881,967

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3524765

U.S. Cl. 437—2

Int. Cl.⁴ H01L 31/00

8 Claims



1. A method of producing a transparent photocathode in which one side of a wafer shaped semiconductor substrate is provided with several superposed layers, one layer of which is an active photocathode semiconductive layer, comprising applying a multi-layer wafer to a carrier surface so that the wafer projects beyond the carrier on all sides, effecting denudation of the wafer, and after a chemical denudation has been made on the substrate at least the overhanging parts of the multi-layer wafer are removed mechanically.

4,713,354

METHOD OF HEAT TREATMENT FOR REDUCTION OF DISLOCATION DENSITY NEAR III-V SUBSTRATE SURFACE

Takashi Egawa, and Yoshiaki Sano, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,363

Claims priority, application Japan, Feb. 28, 1985, 60-40130

Int. Cl.⁴ H01L 21/265, 21/322

U.S. Cl. 437—22

4 Claims



1. In a method of manufacturing semiconductor devices, which comprises producing III-V compound semiconductor substrates without dislocation density near the III-V com-

pound semiconductor substrate surface, comprising the steps of:

- heat treating said III-V compound semiconductor substrate in a gas atmosphere which includes an element constitute said III-V compound semiconductor substrate; and
- implanting ions for active regions after said heat-treating step.

4,713,355

BIPOLAR TRANSISTOR CONSTRUCTION

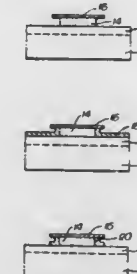
Neal F. Gardner, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 600,707, Apr. 16, 1984, Pat. No. 4,631,568, which is a continuation-in-part of Ser. No. 473,382, Mar. 8, 1983, abandoned. This application Sep. 8, 1986, Ser. No. 885,614

Int. Cl.⁴ H01L 21/425, 21/441

U.S. Cl. 437—31

22 Claims



1. A process for bipolar transistor fabrication, comprising the steps of:

- forming a base region overlying a collector region in a semiconductor material, the base and collector materials having opposite conductivity types;
- forming an appropriately patterned emitter region overlying the base region, of the same conductivity type as the collector region;
- forming a wall of insulating material on the base region and adjacent to the edges of the emitter region; and
- forming a conductive layer over the base and emitter regions but not over the wall of insulating material, whereby the conductive layer serves to establish separate electrical contacts with the base and emitter regions, and the wall of insulating material minimizes the size of inactive portions of the base region.

4,713,356

MANUFACTURING MOS SEMICONDUCTOR DEVICE WITH PLANARIZED CONDUCTIVE LAYER

Yoichi Hiruta, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 27, 1986, Ser. No. 833,594

Claims priority, application Japan, Feb. 28, 1985, 60-39235

Int. Cl.⁴ H01L 21/441

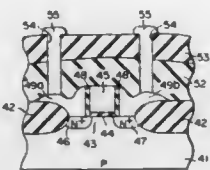
U.S. Cl. 437—41

11 Claims

1. A method of manufacturing a semiconductor device, comprising the sequential steps of:

- forming an element isolation region in a surface of a semiconductor substrate;
- forming a gate oxide film on an element region of said semiconductor substrate, said element region being surrounded by said element isolation region;
- selectively forming a gate electrode on said gate oxide film;
- forming source and drain regions in said semiconductor substrate using said gate electrode as a mask;
- selectively removing a portion of gate oxide film on said source and drain regions;
- forming an insulating film on side walls of said gate electrode;

- (g) depositing a conductive material layer on the entire surface of the resultant structure;
- (h) etching back said conductive material layer to totally remove said conductive material layer deposited on said gate electrode and on a top surface of said insulating film formed in step (f) to expose an upper surface of said gate electrode and said top surface of said insulating film to leave a portion of said conductive material layer remaining on said source and drain regions, a top surface of said



- portion of said conductive material layer remaining on said source and drain regions being substantially flush with said upper surface of said gate electrode and with said top surface of said insulating film;
- (i) forming an insulating protective film over the entire surface of the resultant structure;
- (j) forming contact holes in said protective film; and
- (k) filling a conductive material in said contact holes and forming wiring layers which are connected to said source and drain regions.

4,713,357

METHOD OF MAKING A CAPACITOR WITH REDUCED DIELECTRIC BREAKDOWN

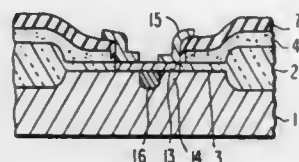
Toru Imamura, Kumamoto, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 553,944

Claims priority, application Japan, Nov. 19, 1982, 57-203400
Int. Cl.⁴ H01L 21/265, 21/28

U.S. Cl. 437-52

8 Claims



7. A method of manufacturing a semiconductor memory device having a plurality of memory cells, each of memory cells including a capacitive storage unit, said method comprising the steps of:
- selectively forming a thick field insulating layer on a surface of a semiconductor substrate except for active regions of said substrate and a contact portion of said substrate outside said active regions,
- selectively forming a thin insulating film as a dielectric film of said capacitive storage unit on said surface of said substrate in said active regions,
- forming a conductive film on said thin insulating film as an upper electrode of said capacitive storage unit, and on said thick field insulating layer and connected to said contact portion of said substrate, said first conductive film being continuously formed on a whole part of said field insulating layer positioned between said contact portion and said thin insulating film in the nearest active region to said contact portion,
- forming an insulating layer on said first conductive film, and

forming a second conductive film on said insulating layer, whereby electrical charges are accumulated in said first conductive film are discharged through said contact portion to said semiconductor substrate.

4,713,358

METHOD OF FABRICATING RECESSED GATE STATIC INDUCTION TRANSISTORS

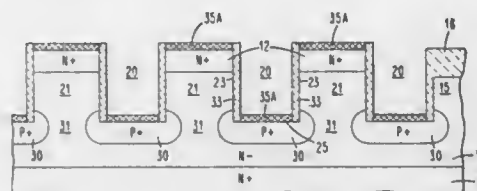
Emel S. Bulat, Framingham; Brian M. Ditchek, Milford, and Scott J. Butler, Rochdale, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 2, 1986, Ser. No. 858,762

Int. Cl.⁴ H01L 21/283, 21/265

U.S. Cl. 437-65

14 Claims



1. The method of fabricating a semiconductor device comprising
- providing a substrate of silicon of one conductivity type of relatively low resistivity having a flat, planar surface;
- growing an epitaxial layer of silicon of the one conductivity type of relatively high resistivity on said surface of the substrate, said epitaxial layer having a flat, planar surface parallel to the interface of the epitaxial layer and the substrate forming a body of silicon;
- introducing conductivity type imparting material of the one conductivity type into said epitaxial layer from said surface to form a layer of silicon of the one conductivity type of relatively low resistivity in said epitaxial layer adjacent to said surface;
- forming a layer of protective material on the surface of the body;
- removing portions of said layer of protective material to expose a plurality of parallel areas of said surface;
- removing silicon at the exposed areas to form a plurality of grooves in said body of silicon providing interposed ridges of silicon having surfaces in said surface of the body, said grooves extending through said layer of silicon of the one conductivity type of relatively low resistivity into the underlying layer of the one conductivity type of relatively high resistivity, each of said grooves having side walls formed by the adjacent ridges of silicon and an end wall;
- introducing conductivity type imparting material of the opposite conductivity type into the silicon at the end walls of said grooves to convert zones of silicon of the one conductivity type of relatively high resistivity to the opposite conductivity type;
- removing all protective material to expose the silicon at the side walls and end walls of said grooves and at the surfaces of said ridges;
- forming a layer of silicon oxide on the side walls and end walls of said grooves and on said surfaces of said ridges;
- removing the layer of silicon oxide from the end walls of said grooves and from said surfaces of said ridges to expose the silicon at said end walls of the grooves and at said surfaces of said ridges while leaving silicon oxide overlying the side walls of said grooves;
- depositing a silicide-forming metal overlying the silicon oxide at the side walls of the grooves, the silicon at the end walls of the grooves, and the silicon at the surfaces of the ridges;
- heating to cause the silicide-forming metal to react with the

underlying silicon to form metal silicide in ohmic contact with the silicon at the end walls of the grooves and at the surfaces of the ridges, the silicide-forming metal not reacting with the underlying silicon oxide layer on the side walls; and

removing the unreacted silicide-forming metal overlying the silicon oxide layer on the side walls while leaving the metal silicide in ohmic contact with the silicon at the end walls of the grooves and at the surfaces of the ridges.

4,713,359

INFRARED ABSORBING GLASS COMPOSITIONS

Daniel P. Lubelski, Rossford, and Rodney G. Baker, Toledo, both of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Apr. 14, 1986, Ser. No. 851,588

Int. Cl.⁴ C03C 3/078

U.S. Cl. 501-63

7 Claims

1. A glass composition comprising the following ingredients in approximate percent by weight:

Ingredients	Percent by Weight
SiO ₂	60-80
Na ₂ O	10-20
K ₂ O	0-10
CaO	5-16
MgO	0-10
Al ₂ O ₃	0-5
TiO ₂	0-0.5
SO ₃ ²⁻	0-0.5
Fe ₂ O ₃	0.3-0.86
SnO ₂	0.5-2.0
P ₂ O ₅	0.01-1

the composition absorbing infrared rays.

4,713,360

NOVEL CERAMIC MATERIALS AND METHODS FOR MAKING SAME

Marc S. Newkirk, Newark, Del., and Steven F. Dizio, Golts, Md., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 776,964, Sep. 17, 1985, which is a continuation-in-part of Ser. No. 705,787, Feb. 26, 1985, which is a continuation-in-part of Ser. No. 591,392, Mar. 16, 1984. This application Jan. 15, 1986, Ser. No. 818,943

Int. Cl.⁴ C04B 35/10, 35/56, 35/58

U.S. Cl. 501-87

29 Claims

1. A method for producing a self-supporting ceramic body, adapted or fabricated for use as an article of commerce, by oxidation of a parent metal to form a polycrystalline material consisting essentially of (1) the oxidation reaction product of said parent metal with a vapor-phase oxidant, and (2) one or more non-oxidized constituents of the parent metal, which comprises: heating said parent metal to a temperature above the melting point of said parent metal but below the melting point of the oxidation reaction product to form a body of molten metal and, at said temperature;

- (a) reacting said body of molten metal with said vapor-phase oxidant to form said oxidation reaction product,
- (b) maintaining at least a portion of said oxidation reaction product in contact with and between said body of molten metal and said oxidant, to draw molten metal through the oxidation reaction product towards the oxidant so that oxidation reaction product continues to form at the interface between the oxidant and previously formed oxidation reaction product, and leaving non-oxidized constituents of said parent metal dispersed through said polycrystalline material, and
- (c) continuing said reaction for a time sufficient to produce said ceramic body.

4,713,361

METALLIC CATALYST BODY HAVING THERMAL RADIATION PROTECTION

Wolfgang Maus, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Jan. 15, 1987, Ser. No. 3,558

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3601011

Int. Cl.⁴ B01J 35/04

U.S. Cl. 502-2

10 Claims

1. Metallic catalyst body, comprising a casing, and a metallic honeycomb structure having layers disposed within said casing, said metallic honeycomb structure having at least one other layer disposed outside said casing as thermal radiation protection.

4,713,362

SELECTIVE ZEOLITIC ADSORBENT AND A METHOD FOR ACTIVATION THEREOF

Peter J. Maroulis, Allentown; Charles G. Coe, Macungie; Steven M. Kuznicki, Easton; Patrick J. Clark, Palmerton, and David A. Roberts, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 22, 1986, Ser. No. 866,531

Int. Cl.⁴ B01J 29/06, 39/06

U.S. Cl. 502-85

26 Claims

26. A selective chromatographic adsorbent produced by activation of a zeolitic composition, wherein said zeolitic composition has at least a portion of any exchangeable ion capacity exchanged with a metal cation having a charge density of about 2.0 or greater, said activation comprising heating said exchanged zeolitic composition in a nonreactive oxidizing atmosphere from ambient temperature to about 400° C. and heat soaking at that temperature said exchanged zeolitic composition for a period of time sufficient to thoroughly dehydrate and react in an oxidizing atmosphere the zeolitic composition.

4,713,363

HIGH SURFACE AREA SUPPORTED NOBLE METAL CATALYSTS AND PROCESS FOR THEIR PREPARATION

Dennis A. Hucul, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 686,878, Dec. 27, 1984, abandoned. This application Oct. 10, 1986, Ser. No. 918,597

Int. Cl.⁴ B01J 21/04, 21/08, 23/40

U.S. Cl. 502-262

21 Claims

1. A composition of matter comprising a substrate of a metal oxide of volume from about $3 \times 10^{-9} \text{ m}^3$ to about $2 \times 10^{-3} \text{ m}^3$ having a surface area from about $50 \text{ m}^2/\text{g}$ to about $600 \text{ m}^2/\text{g}$, having dispersed on the surface thereof crystallites of a noble metal selected from the group consisting of ruthenium, rhodium, palladium, osmium, iridium, platinum and mixtures thereof, wherein the noble metal comprises from about 0.45 mmole/g to about 1.0 mmole/g based on total composition weight and the crystallites are sized so as to provide a dispersion of the noble metal of from about 50 percent to about 90 percent when measured by hydrogen chemisorption using the formula

$$D = 100 \times (W/M)$$

where

$$(W/M)$$

is the atomic ratio of chemisorbed hydrogen to the noble metal.

4,713,364

HEAT-SENSITIVE RECORDING MATERIAL

Naoto Arai, Osaka, Japan, assignor to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

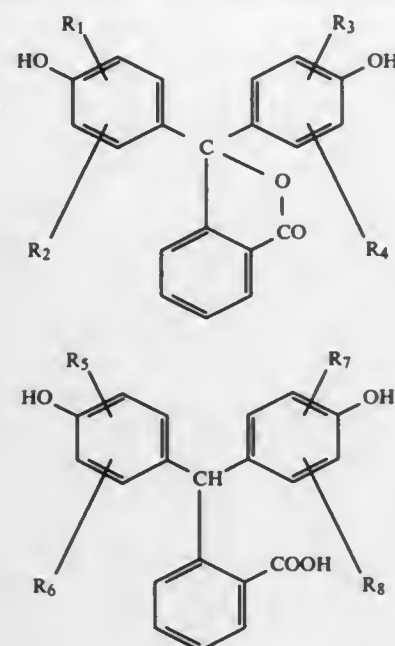
Filed Mar. 6, 1986, Ser. No. 836,554

Int. Cl.⁴ B41M 5/18

U.S. Cl. 503—209

5 Claims

1. A heat-sensitive recording material comprising a support having formed thereon a heat-sensitive recording layer comprising a colorless or pale-colored basic dye and a color developer capable of forming a color upon coming into contact with the basic dye, wherein said heat-sensitive recording layer further comprises at least one compound selected from the compounds represented by following formulae (I) and (II):



wherein R₁, R₂, R₃, R₄, R₅, R₆, R₇, and R₈ independently represent a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms.

4,713,365

ADHESIVES FOR LAMINATING THERMAL PRINT ELEMENTS

Daniel J. Harrison, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,053

Int. Cl.⁴ B41M 5/26

U.S. Cl. 503—227

17 Claims

1. A thermal print element comprising a support having thereon a layer containing a thermally-transferred dye image, said element having at least one layer of adhesive thereon comprising a linear, random copolyester of one or more aromatic dibasic acids and one or more aliphatic diols, modified with up to 30 mole % of one or more aliphatic dibasic acids, said copolyester having a melt viscosity of between about 1,000 and about 20,000 poise at 150° C.

4,713,366

ANTIGENIC MODIFICATION OF POLYPEPTIDES

Vernon C. Stevens, Dublin, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Filed Dec. 4, 1985, Ser. No. 804,642

Int. Cl.⁴ A61K 37/43; C07K 7/08, 7/10

U.S. Cl. 514—13

15 Claims

1. A modified polypeptide for isoimmunologically controlling biological action in a mammal by antibody formation, the modified polypeptide comprising a peptide having an amino

acid sequence substantially similar to the region of a mammalian luteinizing hormone, chorionic gonadotropin, follicle secreting hormone or thyroid stimulating hormone corresponding to the 38-57 region of the beta-subunit of human chorionic gonadotropin, said peptide having the two cysteine residues corresponding to the cysteine residues at positions 38 and 57 of the beta-subunit of human chorionic gonadotropin having their sulfur atoms linked in a disulfide bridge, said peptide having been chemically modified outside the body of said mammal, said peptide having the properties of:

- (a) in unmodified form, being non-immunogenic to said mammal and having a molecular structure similar to a fragment of an endogenous protein hormone, the biological function of which it is desired to inhibit, and
- (b) in modified form, causing antibodies to be formed in the body of the mammal which inhibit the biological function of said endogenous protein hormone following administration of the modified form into the body of said mammal.

4,713,367

RETRO-INVERSO ANALOGS OF THE BRADYKININ POTENTIATING PEPTIDE BPP_{5a}

Alessandro Sisto, Rome; Antonio S. Verdini, Monterotondo, and Antonino Virdia, Rome, all of Italy, assignors to Enichem S.p.A., Milan, Italy

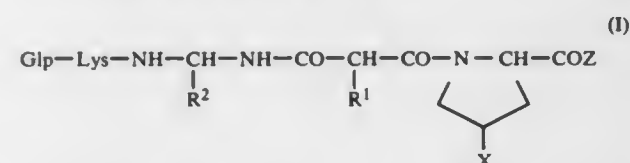
Filed Jan. 22, 1986, Ser. No. 821,449

Int. Cl.⁴ A61K 37/42; C07K 7/18, 7/02

U.S. Cl. 514—17

7 Claims

1. A peptide of the general formula



wherein R² and R¹ are the same or different and represent, each independently, the side chain of an amino acid residue present in the naturally occurring peptides, X represents -S-Ph or -O-CH₂-Ph, and Z is a hydroxy, alkoxy or amino group; and pharmaceutically acceptable salts thereof.

4,713,368

PEPTIDO-MIMETIC SUBSTANCES WITH HYPOTENSIVE ACTION

Alessandro Sisto; Antonio S. Verdini; Antonino Virdia; Giovanna De Luca; Giovanni Di Stazio, and Vincenzo Politi, all of Rome, Italy, assignors to Enricherche S.p.A., Milan and Polifarma S.p.A., Rome, both of Italy

Filed Jul. 17, 1986, Ser. No. 887,136

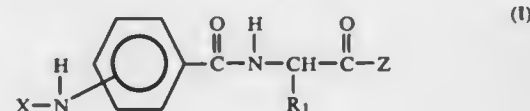
Claims priority, application Italy, Aug. 1, 1985, 21826 A/85

Int. Cl.⁴ A61K 37/64; C07K 7/02

U.S. Cl. 514—18

12 Claims

1. Peptido-mimetic compounds of hypotensive action definable by the general formula:



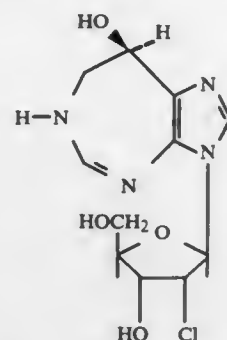
Rod: represents rhodnose,
 Acu: represents aculose,
 Cin A: represents cinerulose A and
 Cin B: represents cinerulose B,
 and dF=Cin B denotes that the two sugar units are linked, or
 a physiologically acceptable acid addition salt thereof.

12. A pharmaceutical composition for use as a cytostatic agent comprising a therapeutically effective amount of the compound according to claim 1 or its physiologically acceptable salts in association with a pharmaceutically acceptable carrier.

4,713,372

2-CHLOROPENTOSTATIN COMPOUND HAVING ADENOSINE DIAMINASE INHIBITORY ACTIVITY
 John P. Schaumberg, Ypsilanti; Gerard C. Hokanson; James C. French, both of Ann Arbor; Josefino B. Tunac, Troy, and Marjorie A. Underhill, Pigeon, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.
 Continuation of Ser. No. 590,239, Mar. 16, 1984, abandoned.
 This application Nov. 8, 1985, Ser. No. 796,139
 Int. Cl.⁴ A61K 31/70; C07H 17/02

U.S. Cl. 514—45 3 Claims
 1. The compound 2-chloropentostatin having adenosine deaminase inhibitory activity and possessing the structure



or a pharmaceutically acceptable acid addition salt thereof.
 3. A method of treating infections of DNA viruses in a mammal comprising administering to a mammal in need of such treatment an effective amount of a pharmaceutical composition in accordance with claim 2.

4,713,373

XYLAN SULFATES OF LOW MOLECULAR WEIGHT, PROCESS FOR THEIR PREPARATION AND MEDICAMENTS CONTAINING THEM
 Alain Bayol, Tournefeuille; Francis Blanc, Lattes; Jacqueline Lansen, Montpellier; Jean-Pierre Maffrand, and Jean-Marie Pereillo, both of Portet, all of France, assignors to Sanofi S.A., Paris, France

Filed Oct. 31, 1985, Ser. No. 793,657
 Claims priority, application France, Nov. 7, 1984, 84 17460
 Int. Cl.⁴ A61K 31/725; C08B 37/14, 37/00
 U.S. Cl. 514—54 18 Claims
 1. Xylan sulfates having an average degree of sulfation of from 1.5 to 2, from 0 to 10 percent uronic acid, from 30 to 40 percent pentoses and an average molecular weight of from 2000 to 5000 daltons.

4,713,374

GANGLIOSIDE DERIVATIVES
 Francesco della Valle, Padua, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia, S.p.A., Abano Terme, Italy
 Filed Jun. 26, 1985, Ser. No. 749,092
 Claims priority, application Italy, Jun. 27, 1984, 48492 A/84
 Int. Cl.⁴ C08G 18/08, 18/18
 U.S. Cl. 514—54 39 Claims
 1. A ganglioside derivative comprised of an oligosaccharide

moiety formed by 1 to 5 monosaccharides, at least one sialic acid moiety and at least one ceramide moiety, the carboxyl groups of said sialic acid moieties being esterified with an alcohol, said alcohol being a substituted or unsubstituted alcohol selected from the group consisting of a C₁₋₁₂ aliphatic alcohol, a C₁₋₁₂ araliphatic alcohol with only one benzene ring, a C₁₋₁₂ heterocyclic alcohol with one heterocyclic ring containing a heteroatom selected from the group consisting of N, S and O, a C₁₋₁₄ alicyclic alcohol, and a C₁₋₁₄ aliphaticcyclic alcohol containing only one cycloaliphatic ring, with the proviso that said ganglioside derivative is not the methyl ester of ganglioside G_{M1} or G_{M3}.

26. A method for the treatment of pathologies of the nervous system of one affected therewith, comprising administering thereto an effective nerve pathology treatment amount of a ganglioside derivative according to claim 1.

4,713,375

VISCOELASTIC SOLUTION
 Richard L. Lindstrom, 1065 W. Ferndale Rd., Wayzata, Minn. 55391, and Debra L. Skelnik, Box 344, Rte. 5, Cambridge, Minn. 55008

Filed Aug. 1, 1985, Ser. No. 761,406
 Int. Cl.⁴ A61K 31/70 1 Claim

U.S. Cl. 514—57
 1. A method of protecting cells and cell coatings during eye surgery, which method comprises bringing the cells or cell coatings into contact with a viscoelastic composition for use in ophthalmic surgery, which composition comprises effective amounts of:

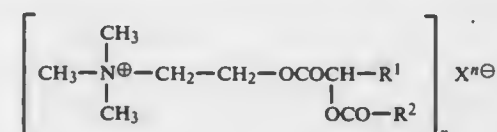
- a buffered solution which is at least one of a balanced salt solution, a buffered minimum essential medium, a phosphate buffered system, or TC 199;
- at least one of a cellulose gum, carboxypropyl methyl cellulose or hydroxypropyl methyl cellulose; and,
- chondroitin sulfate, the composition having a pH of 7.2-7.6 and an osmolality of 200-400 MOSM.

4,713,376

DEMENTIA-IMPROVING AND THERAPEUTIC AGENTS
 Fumio Kuzuya, Nagoya, and Hidetoshi Endo, Ichinomiya, both of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1986, Ser. No. 930,452
 Claims priority, application Japan, Nov. 19, 1985, 60-257881
 Int. Cl.⁴ A61K 31/685

U.S. Cl. 514—78 5 Claims
 1. A method of treating neuropsychiatric symptoms accompanying dementia in said patient which comprises administering to a patient a therapeutically effective amount of a therapeutic agent comprising, as an active ingredient, an acylox-yalkanoylcholine salt represented by the following formula:



wherein R¹ and R², which may be the same or different, represent lower alkyl groups of 1 to 5 carbon atoms; X represents a sulfonic acid residue; and n is the same as the number of the sulfonyloxy groups of the sulfonic acid residue and represents an integer of 1 to 4.

4,713,377

METHOD OF AMELIORATING OBSTRUCTIONS OF THE BOWEL
 Thomas L. Schulte, 218 Family Farm Dr., Woodside, Calif. 94062

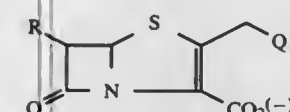
Continuation-in-part of Ser. No. 697,101, Feb. 1, 1985, Pat. No. 4,626,530, which is a continuation-in-part of Ser. No. 517,417, Jan. 17, 1984, Pat. No. 4,497,824, and a continuation-in-part of Ser. No. 456,896, Jan. 10, 1983, Pat. No. 4,469,702, said Ser. No. 517,417, and Ser. No. 456,896, each is a continuation-in-part of Ser. No. 276,566, Jun. 23, 1981, Pat. No. 4,369,190. This application Dec. 1, 1986, Ser. No. 936,282
 Int. Cl.⁴ A61K 31/615

U.S. Cl. 514—166 18 Claims
 1. A method of ameliorating an obstruction of the bowel, which comprises the rectal administration to the affected patient of an amount of biphenamine effective to enlarge the fecal passage of the bowel proximate the source of the obstruction.

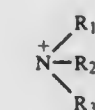
4,713,378

PENEM DERIVATIVES
 Ettore Perrone; Marco Alpegiani; Franco Zarini; Costantino D. Bruna, and Giovanni Franceschi, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy
 Filed Jun. 24, 1985, Ser. No. 747,829
 Claims priority, application United Kingdom, Jun. 29, 1984, 8416651

Int. Cl.⁴ C07D 499/00; A61K 31/425 14 Claims
 U.S. Cl. 514—192
 1. A compound of the formula

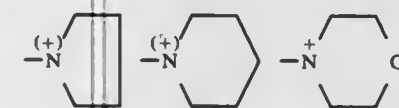


wherein R is a C₁₋₃ alkyl group substituted by a hydroxy group and Q⁺ represents a group



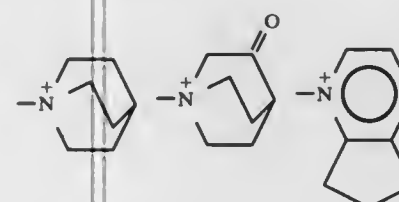
wherein

- R₁, R₂ and R₃ are each independently a C₁₋₄ alkyl radical or
- R₁ is C₁₋₄ alkyl unsubstituted or substituted by a cyano group and R₂, R₃ taken together with the nitrogen atom represent one of the heterocyclammonium radicals



or

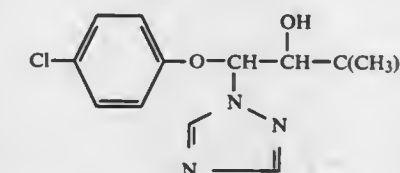
- R₁, R₂, R₃ taken together with the nitrogen atom represent one of the radicals



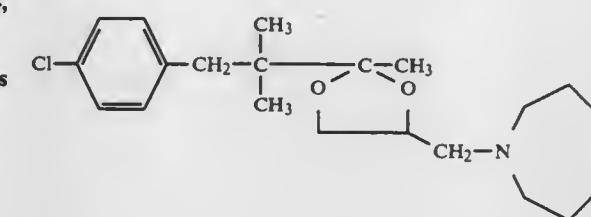
4,713,379

FUNGICIDAL AGENTS
 Wolfgang Krämer, Wuppertal; Joachim Weissmüller, Monheim; Wolf Reiser; Dieter Berg, both of Wuppertal; Wilhelm Brandes, Leichlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
 Filed May 17, 1985, Ser. No. 735,498
 Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 3420828

Int. Cl.⁴ A01N 43/46, 43/64 4 Claims
 U.S. Cl. 514—212
 1. A fungicidal composition comprising 1 to 50 parts by the weight of the compound of the formula



and 1 part by weight of the compound of the formula



4,713,380

PRODUCTION OF OPTICALLY PURE ORGANOBORANES
 Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich-Boranes, Inc., Milwaukee, Wis.
 Filed Jan. 16, 1985, Ser. No. 692,046
 Int. Cl.⁴ C07F 5/02

U.S. Cl. 568—1 32 Claims
 1. A process for upgrading to essentially 100% enantiomeric excess the optical purity of an organoborane intermediate represented by the formulae:



or



wherein Ipc is isopinocampheyl, and R* is alkyl having from 4 to 30 carbon atoms comprising the steps of:

- reacting an alkene selected from the group consisting of a cis-alkene, trans-alkene or tertiary-alkene with a hydroborating agent selected from the group consisting of monoisopinocampheylborane and diisopinocampheylborane;
- obtaining a solid intermediate; and
- recrystallizing the resulting solid hydroboration product from a suitable solvent to obtain a monoisopinocampheylalkylborane or diisopinocampheylalkylborane of essentially 100% enantiomeric excess.

4,713,381

OXODIAZINE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS THEREOF

Hideki Ao; Minoru Obata; Tsutomu Yamanaka, all of Oita, and Hiroshi Mikashima, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

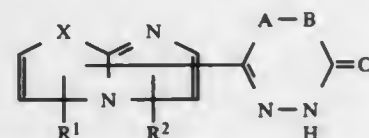
Filed May 27, 1986, Ser. No. 867,170

Claims priority, application Japan, May 25, 1985, 60-112715
Int. Cl.⁴ A61K 31/535, 31/54; C07D 487/04

U.S. Cl. 514-222

7 Claims

1. An oxodiazine compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein each of R¹ and R² is hydrogen, halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ alkoxy-C₁₋₄ alkoxy, phenyl-C₁₋₄ alkyl-oxy which may be optionally substituted by at least one substituent selected from the group consisting of halogen, C₁₋₄ alkyl and C₁₋₄ alkoxy on the phenyl nucleus, or phenyl which may be substituted by at least one substituent selected from the group consisting of halogen, C₁₋₄ alkyl and C₁₋₄ alkoxy on the phenyl nucleus; X is —S—, —CH=N— or —C(R³)=C(R⁴)—, where each of R³ and R⁴ is hydrogen, halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ alkoxy-C₁₋₄ alkoxy or phenyl-C₁₋₄ alkyl-oxy which may be optionally substituted by at least one substituent selected from the group consisting of halogen, C₁₋₄ alkyl and C₁₋₄ alkoxy on the phenyl nucleus; and one of A and B is oxygen or sulfur and the other is —C(R⁵)(R⁶)—, where each of R⁵ and R⁶ is hydrogen or C₁₋₄ alkyl.

7. A pharmaceutical composition comprising a compound of claim 1 in a therapeutically effective amount sufficient to inhibit platelet aggregation, increase blood flow, or act as an analgesic or anti-inflammatory agent with pharmaceutically acceptable additives.

4,713,382

N-PHENYL-4-PHENYL-1-PIPERAZINECARBOXAMIDES AND RELATED COMPOUNDS AS ANTIARRHYTHMIC AGENTS

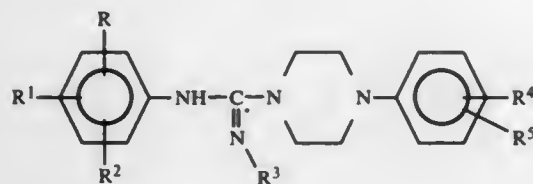
Jean-Claude Pascal, Cachan, France, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 30, 1985, Ser. No. 739,393

Int. Cl.⁴ A61K 31/495; C07D 295/06, 295/12
U.S. Cl. 514-255

20 Claims

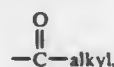
1. A compound of the formula:



in which:

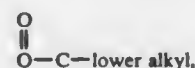
R, R¹ and R² are each independently hydrogen, halo, lower alkyl, lower alkoxy, —CF₃ or —NO₂, with the proviso that R is hydrogen when both R¹ and R² are iodo or —NO₂;

R³ is hydrogen, lower alkyl, lower alkyl—OH,



or lower alkenyl; and

R⁴ and R⁵ are each independently hydrogen, halo, lower alkoxy, —OH, —CH₃ or



and the pharmaceutically acceptable acid addition salts and esters thereof.

20. A method of treating arrhythmia in mammals which comprises administering to a mammal in need of such treatment a therapeutic amount of a compound of claim 1 or a pharmaceutically acceptable acid addition salt or ester thereof.

4,713,383

TRIAZOLOQUINAZOLINE COMPOUNDS, AND THEIR METHODS OF PREPARATION, PHARMACEUTICAL COMPOSITIONS, AND USES

John E. Francis, Basking Ridge, and Karl O. Gelotte, Watchung, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

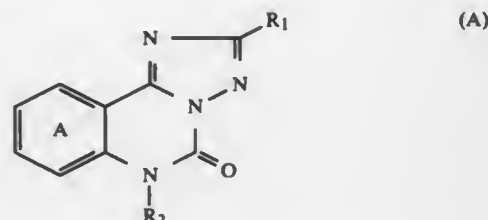
Continuation-in-part of Ser. No. 782,235, Sep. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 655,831, Oct. 1, 1984, abandoned. This application Mar. 26, 1986, Ser. No. 844,447

Int. Cl.⁴ A61K 31/505; C07D 487/04

U.S. Cl. 514-267

23 Claims

1. A [1,2,4]triazolo[1,5-c]quinazoline-5-one compound of the formula



wherein

R₁ is

(a) phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, hydroxy, halogen, or trifluoromethyl; or

(b) furyl, dihydrofuran, tetrahydrofuran, thienyl, dihydrothienyl, tetrahydrothienyl, pyran, pyridyl, or o-ribofuranosyl, each of which is bound to the triazoloquinazoline nucleus via a ring carbon atom, and each of which is unsubstituted or substituted by lower alkyl, hydroxy, amino, halogen, or hydroxy-lower alkyl;

R₂ is hydrogen or lower alkyl;

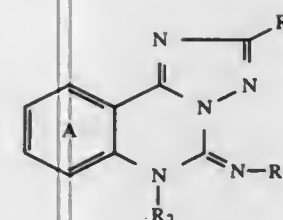
ring A is unsubstituted or substituted by a substituent selected from lower alkyl, lower alkoxy, hydroxy, halogen, trifluoromethyl, nitro, amino, C₁₋₃ alkylthio, C₁₋₂ alkylsulfon, C₁₋₂ alkylsulfenyl, and aryl-lower alkoxy, wherein said aryl portion is selected from phenyl, pyridyl, thienyl, and furyl, and said aryl portion is unsubstituted or further substituted by lower alkyl, halogen, hydroxy, nitro, amino, mono-lower alkylamino, or di-lower alkyl amino;

a tautomer thereof; and

a pharmaceutically acceptable salt of said compound of formula A or said tautomer.

7. A method of counteracting the effects of benzocarbamazepine comprising administering to a mammal in need of such administration of benzocarbamazepine counteracting effective amount of a compound according to claim 1 provided said compound does not have a benzyloxy group as a substituent on said ring A.

10. A 5-imino[1,2,4]triazolo[1,5-c]quinazoline compound of the formula



wherein

R₁ is

(a) phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, hydroxy, halogen, or trifluoromethyl; or

(b) furyl, thienyl, dihydrofuran, tetrahydrofuran, dihydrothienyl, tetrahydrothienyl, pyran, pyridyl, or o-ribofuranosyl, each of which is bound to the triazoloquinazoline nucleus via a ring carbon atom, and each of which is unsubstituted or substituted by lower alkyl, hydroxy, amino, halogen, or hydroxy-lower alkyl;

R₂ is hydrogen or lower alkyl;

R₃ is hydrogen, lower alkyl, C₃₋₂₀ cycloalkyl, lower alkenyl, lower alkynyl, amino-lower alkyl, mono-lower alkylamino-lower alkyl, di-lower alkyl-amino-lower alkyl, hydroxy-lower alkyl, aryl, or aryl-lower alkyl, provided the double and triple bonds present in said R₃ lower alkenyl and R₃ lower alkynyl groups are separated from the nitrogen to which R₃ is attached by at least one saturated carbon atom, said aryl group in R₃ is phenyl, pyridyl, thienyl, or furyl, which aryl group is unsubstituted or further substituted by lower alkyl, halogen, hydroxy, nitro, amino, mono-lower alkyl-amino, or di-lower alkyl-amino; and

ring A is unsubstituted or substituted by lower alkyl, lower alkoxy, hydroxy, halogen, trifluoromethyl, nitro, amino, C₁₋₃ alkylthio, C₁₋₂ alkylsulfon, C₁₋₂ alkylsulfenyl, or aryl-lower alkoxy, wherein said aryl group within said aryl-lower alkoxy is phenyl, pyridyl, thienyl, or furyl, which is unsubstituted or further substituted by lower alkyl, halogen, hydroxy, nitro, amino, mono-lower alkyl-amino, or di-lower alkyl-amino;

a tautomer thereof; and

a pharmaceutically acceptable salt of said compound or said tautomer.

15. A method counteracting the effects of adenosine and of treating asthma comprising administering to a mammal in need of such administration an effective amount of a compound of claim 10, a tautomer thereof, or a pharmaceutically acceptable salt of said compound or said tautomer.

4,713,384

SELECTIVE METHOD FOR BLOCKING 5HT₂ RECEPTORS

Marlene L. Cohen; Ray W. Fuller; William L. Garbrecht, all of Indianapolis, and Kathleen R. Whitten, Zionsville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 1, 1985, Ser. No. 782,338

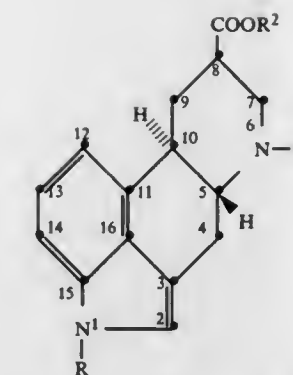
Int. Cl.⁴ A61K 31/48; C07D 457/04

U.S. Cl. 514-288

2 Claims

1. A method of blocking 5HT₂ receptors without effect on alpha receptors which comprises administering to a mammal having an excess of serotonin centrally or peripherally an 5HT₂ blocking dose which does not affect alpha receptors of an ergoline of the formula:

(E)



wherein R is primary or secondary C₁₋₈ alkyl, CH₂C₂₋₄ alkenyl, C₃₋₈ cycloalkyl or C₃₋₆ cycloalkyl-substituted C₁₋₅ primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R¹ is C₁₋₄ straight chain alkyl or allyl, and R² is hydroxy C₅₋₇ cycloalkyl, and pharmaceutically acceptable acid addition salts thereof.

4,713,385

ALKOXY AND DIALKOXYALKYL ESTERS OF DIHYDROLYSERGIC ACID AND RELATED COMPOUNDS USEFUL AS 5HT RECEPTOR ANTAGONISTS

Gifford P. Marzoni, and William L. Garbrecht, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 1, 1985, Ser. No. 782,341

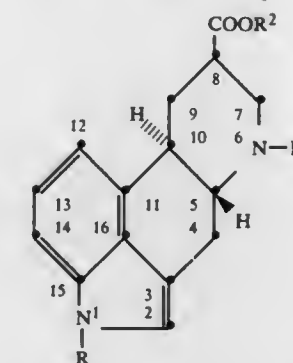
The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.⁴ A61K 31/48; C07D 457/04

U.S. Cl. 514-288

18 Claims

1. A compound of the formula:



wherein R is primary or secondary C₁₋₈ alkyl, C₂₋₄ alkenyl-CH₂, C₃₋₈ cycloalkyl or C₃₋₆ cycloalkyl substituted C₁₋₅ primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R¹ is allyl, H or C₁₋₄ straight-chain alkyl; and R² is a primary or secondary C₁₋₃ alkoxy C₂₋₆-alkyl or di(C₁₋₃ alkoxy)C₂₋₆ alkyl; and pharmaceutically-acceptable salts thereof.

4,713,386

TETRAHYDROAZETO [2,1-A]ISOQUINOLINES AND METHODS FOR TREATING DEPRESSION

Bruce E. Maryanoff, New Hope, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

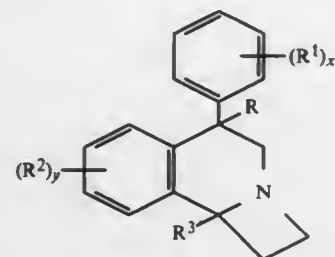
Filed Sep. 22, 1986, Ser. No. 909,793

Int. Cl.⁴ A61K 31/435; C07D 471/04

U.S. Cl. 514—294

16 Claims

1. A 1,4,5,9b-tetrahydroazeto[2,1-a]isoquinoline of the following formula (I):



wherein

R is hydrogen or alkyl;
R¹ is independently halogen, alkyl, alkoxy, alkylthio, perfluoroalkyl or nitro;
R² is independently halogen, alkyl or alkoxy;
R³ is hydrogen or alkyl;
x is the integer 0, 1 or 2; and
y is the integer 0, 1 or 2;
wherein said alkyl for R, R¹, R² and R³ is alkyl of about 1 to 4 carbons, said alkoxy for R¹ and R² is alkoxy of about 1 to 4 carbons, said alkylthio for R¹ is alkylthio of about 1 to 4 carbons and said perfluoroalkyl for R¹ is perfluoroalkyl of about 1 to 4 carbons,
and the pharmaceutically-acceptable acid-addition salts thereof.

13. A pharmaceutical composition for the treatment of depression which comprises a pharmaceutically-acceptable carrier or diluent and an amount sufficient to alleviate the symptoms of depression of 1,4,5,9b-tetrahydroazeto[2,1-a]isoquinoline of claim 1.

4,713,387

VASODILATING AND PLATELET AGGREGATION INHIBITING 1,4 DIHYDROPYRIDINES WITH AN IMIDAZOLYL OR PYRIDYL CONTAINING ESTER
Isao Watanabe, Toyama; Kaishu Momonol, Shinminato; Toru Hiraiwa, Toyama; Satoshi Ono, Toyama; Joji Nakano, Toyama; Katsuyuki Nagumo, Kawasaki, and Hiroyasu Takagi, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,305

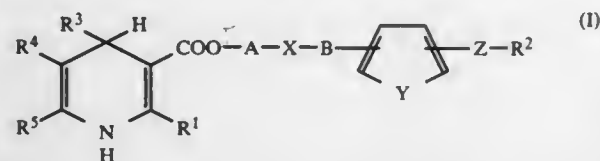
Claims priority, application Japan, Jun. 25, 1984, 59-130645; Jan. 7, 1985, 60-497; Feb. 26, 1985, 60-37130

Int. Cl.⁴ A61K 31/455; C07D 401/10, 401/12, 401/14

U.S. Cl. 514—332

36 Claims

1. A 1,4-dihydropyridine represented by the formula (I) or a pharmaceutically acceptable salt thereof:



wherein R¹ and R², which are the same or different, represent lower alkyl groups; R³ represents an imidazolyl or pyridyl group; R⁴ represents a phenyl group or a phenyl group substituted by at least one substituent selected from the group consisting of halogen atoms and nitro, cyano, azido, lower alkyl,

lower alkoxy, trihalo-lower alkyl, lower alkanesulfonyl, benzyl, phenethyl, methylbenzyl, chlorobenzyl, methoxybenzyl, phenyl, naphthyl, benzyloxy, phenethyloxy, p-chlorobenzyloxy, p-methoxybenzyloxy, phenoxy, naphthoxy, p-methylphenoxy, lower alkylthio, phenylthio, naphthylthio, p-methylphenylthio, benzylthio, phenethylthio, p-chlorobenzylthio, p-methoxybenzylthio and lower alkoxy-carbonyl groups; R⁴ represents a carboxyl group esterified with a group selected from the group consisting of lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, N,N-di(lower alkyl)amino-lower alkyl, N-benzyl-N-lower alkylamino-lower alkyl, N-(4-chlorobenzyl)-N-lower alkylamino-lower alkyl, N-phenyl-N-lower alkylamino-lower alkyl and N,N-dibenzylamino-lower alkyl; A represents an alkylene, alkyleneoxyalkylene or alkylene-thioalkylene group; B represents an alkylene or alkenylene group or a direct bond; X represents an oxygen or sulfur atom or a group of the formula



in which R⁶ represents a hydrogen atom or a lower alkyl, phenyl, naphthyl, benzyl, phenethyl, methylbenzyl, chlorobenzyl or methoxybenzyl group; Y represents an oxygen or sulfur atom or a vinylene group; and Z represents an oxygen or sulfur atom or an alkylene group.

36. A vasodilator or platelet aggregation inhibitor which comprises an effective amount of a compound or its pharmaceutically acceptable salt as claimed in claim 1, in combination with a pharmaceutically acceptable excipient, carrier or diluent.

4,713,388

CERTAIN 3- OR 4-BENZOYL-2-[(2-AMINOETHYL)THIO-PYRIDINES]**AND THEIR ANTI-ULCER PROPERTIES**

Elemér Ezer; Kalman Harsanyi; Hajnalka V. Pethő; Judit Matuz; Laszlo Szporny; Eszter Cholnoky; Csaba Kuthi; Ferenc Trischler; Bela Hegedűs; Marta Kopolnas, and Anna Kallay, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Oct. 3, 1985, Ser. No. 783,875

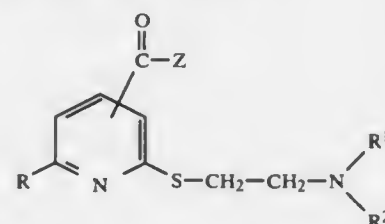
Claims priority, application Hungary, Oct. 5, 1984, 3775/84

Int. Cl.⁴ C07D 213/50, 213/70; A61K 31/44

U.S. Cl. 514—346

5 Claims

1. A compound of the Formula (I)



wherein

R is hydrogen or C₁ to C₄ alkyl;
Z is phenyl, 4-chloro-phenyl, or 2,5-dimethyl-phenyl;
R¹ and R² are each an

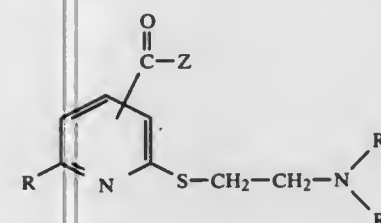


group; and
the



substituent is bonded to the 3- or 4-position of the pyridine ring; or a pharmaceutically acceptable acid addition salt thereof.

3. A gastrocytoprotective method of preventing ulcers which comprises the step of administering to a mammalian subject susceptible to gastric ulceration, a therapeutically effective amount of a compound of the Formula (I)



wherein

R is hydrogen or C₁ to C₄ alkyl;
Z is phenyl, 4-chloro-phenyl, or 2,5-dimethyl-phenyl;
R¹ and R² are each hydrogen, C₁ to C₄ alkyl, C₁ to C₄ alkyl phenyl, or an



group; and
the



substituent is bonded to the 3- or 4-position of the pyridine ring; or a pharmaceutically acceptable acid addition salt thereof.

4,713,389

FUNGICIDALLY AND BACTERICIDALLY ACTIVE ACYLATED SACCHARIN DERIVATIVES

Herbert Salzburg; Manfred Hajek, both of Cologne; Hermann Hagemann, Leverkusen; Engelbert Kühle, Bergisch-Gladbach; Wolfgang Führer, Hennef; Gerd Hänssler, Leverkusen; Wilhelm Brandes, Lelchlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,271

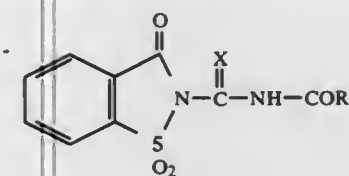
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433391

Int. Cl.⁴ A01N 47/38; C07D 275/06

U.S. Cl. 514—373

12 Claims

1. An acylated saccharin of the formula



in which

X is oxygen or sulphur,
R¹ is carbon atoms, halogenoalkyl or halogenoalkoxy with in each case 1 to 6 carbon atoms and 1 to 5 halogen atoms, alkoxy or alkylthio with in each case 1 to 10 carbon atoms,

or unsubstituted aryl, aryloxy or arylthio with in each case 6 or 10 carbon atoms, or aryl, aryloxy or arylthio with in each case 6 or 10 carbon atoms each of which is mono-, di-, tri-, tetra- or penta-substituted by halogen, alkoxy with 1 to 4 carbon atoms, alkoxy-carbonyl with 1 to 4 carbon atoms and/or N-halogenoalkyl-N-halogenoalkylthioamine with 1 to 3 carbon atoms and 1 to 5 halogen atoms per halogenoalkyl radical; or is cycloalkoxy with 3 to 6 carbon atoms or —NR³R⁴,

R³ is alkyl with 1 to 8 carbon atoms, and

R⁴ is alkyl with 1 to 4 carbon atoms, phenyl, halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 halogen atoms, alkoxy-carbonyl with 1 to 4 carbon atoms in the alkoxy part or phenoxy-carbonyl, or —NR³R⁴ is a saccharin radical.

11. A method of combating fungi and bacteria which comprises applying thereto or to a habitat thereof a fungicidally or bactericidally effective amount of an acylated saccharin according to claim 1.

12. The method according to claim 11, wherein the acylated saccharin is

N-(1,3-dichloroisopropyl-2-oxycarbonyl-aminocarbonyl)-saccharin,

N-(n-butyl-phenylaminocarbonylamino carbonyl)-saccharin,

N-(phenoxycarbonylaminocarbonyl)-saccharin,

N-(n-butoxycarbonylaminocarbonyl)-saccharin or

N-[2-(N-trifluoromethyl-N-dichloro-fluoromethylthioamino)-phenyl carbonyl-aminocarbonyl]-saccharin.

4,713,390

SULFURATED HYDANTOIN DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Pierre Dumont, Gembloux, and Jacques Poupaert, Louvain-la-Neuve, both of Belgium, assignors to Region Wallonne, Brussels, Belgium

PCT No. PCT/BE85/00007, § 371 Date Dec. 20, 1985, § 102(e) Date Dec. 20, 1985, PCT Pub. No. WO85/05103, PCT Pub. Date Nov. 21, 1985

PCT Filed Apr. 16, 1985, Ser. No. 821,736

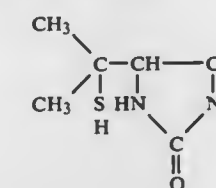
Claims priority, application Belgium, Apr. 27, 1984, 899531

Int. Cl.⁴ C07D 235/30; A61K 31/415

U.S. Cl. 514—389

7 Claims

1. A compound of the formula:



wherein R represents a lower alkyl group containing from 1 to 6 carbon atoms, a lower cycloalkyl group containing from 3 to 7 carbon atoms, or an aryl group with 6 carbon atoms, as well as their physiologically acceptable salts, their optical isomers, their mixtures and their racemic compounds.

6. A process for treating evolutive chronic polyarthritis which comprises administering an effective amount of a compound of any one of claims 1 to 3.

4,713,391

AZABICYCLOALKANE PHENYL SUBSTITUTED ALKANE CARBOXYLATES, THEIR PREPARATION AND USE AS ANTICHOLINERGIC AGENTS

Peter K. Chiang, Bethesda; Michelle M. Richard, Silver Spring; Felipe N. Padilla, Wheaton, all of Md.; Frank I. Carroll, Durham, and Philip Abraham, Cary, both of N.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C. and Research Triangle Institute, Research Triangle, N.C.

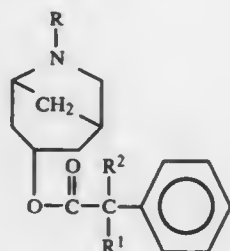
Filed Apr. 17, 1986, Ser. No. 855,857

Int. Cl.⁴ C07D 209/02; H61K 31/40

U.S. Cl. 514-412

11 Claims

1. An azabicycloalkane phenyl substituted alkane carboxylate compound having the formula



wherein R represents lower alkyl groups having 1 to 7 carbon atoms; R¹ represents hydrogen, phenyl, cyclohexyl, and cyclopentyl; and R² represents lower alkyl groups having 1 to 7 carbons, hydroxymethyl, and hydroxyl; and pharmaceutically acceptable acid addition salts thereof.

4,713,392

PESTICIDES

Michael Elliott, Stevenage; Norman F. Janes, Luton, and Bhupinder P. S. Khambay, Harrow Weald, all of England, assignors to National Research Development Corporation, England
Filed May 10, 1985, Ser. No. 732,642

Claims priority, application United Kingdom, May 16, 1984, 8412480

Int. Cl.⁴ A61K 31/275; C07C 49/657

U.S. Cl. 514-464

8 Claims

1. A compound of formula I



in which formula:

R₄ represents a group ArCR₁R₂— in which Ar represents a phenyl or naphthyl group optionally substituted by one or more halogen, alkoxy, haloalkoxy, methylenedioxy or C₁-C₆ alkyl or haloalkyl groups;

R₁ and R₂ together with the carbon to which they are attached jointly represent a C₃-C₆ cycloalkyl group optionally substituted by one or more halogen atoms or C₁-C₆ cycloalkyl groups and

R_B is phenyl, chloro- or fluorophenyl substituted by phenoxy, benzyl or benzoyl and D is hydrogen or cyano.

7. A pesticidal composition which comprises a compound according to claim 1 of formula I formulated with an inert carrier or diluent.

4,713,393

PHENYLPROPYL-2,3-DIHYDROBENZOFURANS USEFUL AS ANTI-INFLAMMATORY AGENTS

Michael N. Chang; Kathryn L. Thompson, both of Westfield, and David A. Boulton, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

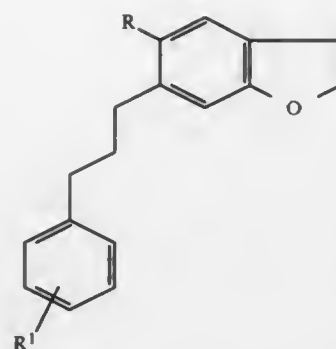
Filed Apr. 25, 1985, Ser. No. 727,317

Int. Cl.⁴ A61K 31/34; C07D 307/79

U.S. Cl. 514-469

19 Claims

1. A compound of formula:



or a pharmaceutically acceptable salt thereof wherein

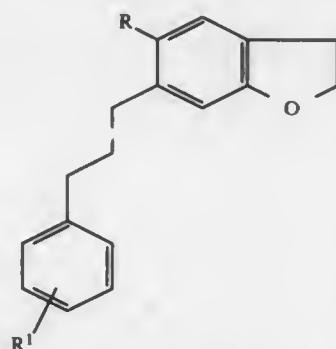
R¹ is

- (1) hydrogen;
- (2) halo;
- (3) loweralkoxy;
- (4) lower alkylthio;
- (5) lower alkyl sulfinyl;
- (6) lower alkyl sulfonyl;
- (7) phenylloweralkoxy;
- (8) loweralkyl;
- (9) loweralkenyl;
- (10) lower alkanoyl;
- (11) haloloweralkyl;
- (12) —COOH;
- (13) phenyl;
- (14) phenoxy;
- (15) cyano;
- (16) hydroxyloweralkyl;
- (17) halo loweralkanoyl;
- (18) loweralkanoyloxy;
- (19) hydroxy; or
- (20) loweralkanoyl or haloloweralkanoyl-loweralkyl;

R is

- (1) hydroxy;
- (2) loweralkoxy;
- (3) phenyl loweralkoxy; or
- (4) loweralkanoyloxy.

17. A method of treating or decreasing inflammation comprising the administration to a mammalian species in need of such treatment a therapeutically effective amount of a compound of formula



or a pharmaceutically acceptable salt thereof wherein

R¹ is

- (1) hydrogen;
- (2) halo;
- (3) loweralkoxy;
- (4) lower alkylthio;
- (5) lower alkyl sulfinyl;
- (6) lower alkyl sulfonyl;
- (7) phenylloweralkoxy;
- (8) loweralkyl;

- (9) loweralkenyl;
 - (10) lower alkanoyl;
 - (11) haloloweralkyl;
 - (12) —COOH;
 - (13) phenyl;
 - (14) phenoxy;
 - (15) cyano;
 - (16) hydroxyloweralkyl;
 - (17) halo loweralkanoyl;
 - (18) loweralkanoyloxy;
 - (19) hydroxy; or
 - (20) loweralkanoyl or haloloweralkanoyl-loweralkyl;
- R is
- (1) hydroxy;
 - (2) loweralkoxy;
 - (3) phenyl loweralkoxy; or
 - (4) loweralkanoyloxy.

4,713,394

TREATMENT OF NONACNE INFLAMMATORY AND INFECTIOUS DERMATOSES AND HAIR LOSS

Carl R. Thornfeldt, 1054 NW. 2nd Ave., Ontario, Ore. 97914
Continuation-in-part of Ser. No. 820,472, Jan. 17, 1986, abandoned. This application Jun. 11, 1986, Ser. No. 873,859

Int. Cl.⁴ A61K 31/19

U.S. Cl. 514-574

5 Claims

1. A method for the treatment of skin suffering from a condition selected from the group consisting of nonacne inflammatory dermatoses, infectious cutaneous disease, and inflammatory and hormone hair loss, said method comprising applying to the affected area a therapeutically effective amount of aze-laic acid.

4,713,395

ACETOHYDROXAMIC ACID DERIVATIVE

Louis Lafon, Paris, France, assignor to Societe Anonyme Dite: Laboratoire L. LaFon, Maisons Alfort, France

Filed Jul. 30, 1986, Ser. No. 890,561

Claims priority, application France, Jul. 31, 1985, 85 11685
Int. Cl.⁴ A61K 31/04, 31/085, 31/185; C07C 83/10

U.S. Cl. 514-575

3 Claims

1. 2-(5-Chloro-4-nitro-2-methoxybenzamido)aceto-hydroxamic acid.

3. A method for treating a patient suffering from overexcitement, which comprises administering to such a patient a pharmaceutically effective amount of 2-(5-chloro-4-nitro-2-methoxybenzamido)aceto-hydroxamic acid according to claim 1.

4,713,396

BENZOYLUREA DERIVATIVES

Katsuyata Ikura, Ninomiya; Kenji Hagiwara; Fumihiko Nagasaki, both of Odawara; Tomio Yamada; Hidemitsu Takahashi, both of Hiratsuka, and Renpei Hatano, Ohiso, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

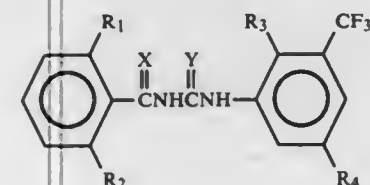
Filed Sep. 9, 1985, Ser. No. 773,933

Claims priority, application Japan, Sep. 20, 1984, 59-195804
Int. Cl.⁴ C07C 157/12, 127/22; A01N 47/34

U.S. Cl. 514-594

12 Claims

1. A compound having the formula



wherein

R₁ represents halogen or methyl;

R₂ represents hydrogen or halogen; each of R₃ and R₄ represents halogen; and each of X and Y represents oxygen or sulfur but both are not sulfur.

7. An insecticidal composition comprising an inert carrier and an effective amount of a compound of claim 1.

4,713,397

COMPOSITION FOR REDUCING NATURAL HAIR FALL-OUT

Shinichi Hirama, Kanagawa; Toshio Nishiyama, Tokyn; Youichi Ohta; Makoto Uzuka, both of Kanagawa; Kenichi Tomita, Tokyo; Kelsuke Nakajima, Kanagawa, and Kazumaro Furuse, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 513,276, Jul. 13, 1983, abandoned. This application Aug. 26, 1985, Ser. No. 768,931

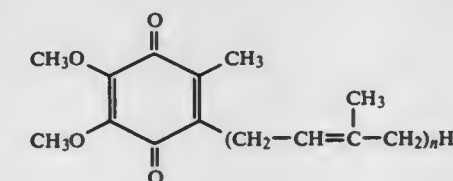
Claims priority, application Japan, Jul. 15, 1982, 57-123527

Int. Cl.⁴ A61K 31/12

U.S. Cl. 514-690

4 Claims

1. A method of reducing natural fall-out of hair on a human, which comprises topically applying to the human an effective amount of a ubiquinone of the formula:



wherein n represents an integer of from 7 to 10.

4,713,398

NATURALLY-DERIVED CAROTENE/OIL COMPOSITION

Arthur M. Nonomura, Del Mar, Calif., assignor to Microbio Resources, Inc., San Diego, Calif.

Filed Aug. 30, 1985, Ser. No. 771,401

Int. Cl.⁴ A61K 31/07, 31/40, 31/355

U.S. Cl. 514-725

16 Claims

1. A composition consisting essentially of naturally-derived carotene dispersed in a non-petroleum, naturally-derived edible oil, wherein said carotene is present as 1-5 weight percent of said composition.

4,713,399

FLEXIBLE POLYURETHANE FOAMS PREPARED FROM POLY(ALKYLENE CARBONATE) POLYOLS

Daniel D. Webb, Lake Jackson, Tex., and Donald G. Prier, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 30, 1985, Ser. No. 814,850

Int. Cl.⁴ C08G 18/14

U.S. Cl. 521-110

13 Claims

1. A polyurethane foam which is the reaction product of a reaction mixture comprising a poly(alkylene carbonate) polyol, a silicone surfactant, a blowing agent and a polyisocyanate, wherein the poly(alkylene carbonate) polyol is a polymer of an oxirane and carbon dioxide or a cyclic alkylene carbonate, said polymer having a carbon dioxide content of about 5-25% by weight and an equivalent weight from about 100 to 3000.

4,713,400

FOAMING SYSTEM FOR PHENOLIC FOAMS

Leon M. Zwollinski, Orchard Park, and Frank J. Dwyer, Buffalo, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 811,185, Dec. 20, 1985. This application May 19, 1986, Ser. No. 864,657
Int. Cl.⁴ C08J 9/14

U.S. Cl. 521-131

3 Claims

1. A mixture comprising a foamable rigid phenol formaldehyde resin and a fluorocarbon blowing agent system comprising a blend of wherein said blowing agent is selected from blends of (a) a fluorocarbon consisting of trichlorotrifluoroethane (CFC-113) and mixtures thereof with (b) dichlorotrifluoroethane, CFC-123 or CFC-123a, and mixtures thereof in a ratio of CFC-123 or CFC-123a to CFC-113 of about 1:9 to about 3:7 and wherein the total blowing agent is present in amounts of from about 2 to 40 parts by weight based on the weight of the phenol formaldehyde resin.

4,713,401

TITANOCENES AND A RADIATION-POLYMERIZABLE COMPOSITION CONTAINING THESE TITANOCENES

Martin Riediker, Gestaltenrainweg 75, 4125 Riehen; Kurt Meier, Ulmenstrasse 11, 4123 Allschwil, and Hans Zweifel, Leuen-gasse 4, 4057 Basle, all of Switzerland

Filed Dec. 11, 1985, Ser. No. 807,565

Claims priority, application Switzerland, Dec. 20, 1984, 6051/84

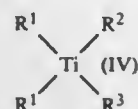
Int. Cl.⁴ C08F 2/50, 4/76; C08L 33/14

U.S. Cl. 522-65

10 Claims

1. A composition which is polymerizable upon irradiation which comprises

- (a) at least one non-volatile monomeric, oligomeric or polymeric compound having at least one polymerizable ethylenically unsaturated double bond, and
- (b) as photoinitiator, an effective amount of at least one titanocene of formula I



in which the two R¹ independently of one another are unsubstituted or substituted cyclopentadienyl⁺, indenyl⁺ or 4,5, 6,7-tetrahydroindenyl⁺, or both R¹ together are an unsubstituted or substituted radical of the formula II



in which X is $-(CH_2)_n$ with n=1, 2 or 3, alkylidene having 2 to 12 C atoms, cycloalkylidene having 5 to 7 ring carbon atoms, SiR₂⁴ or SnR₂⁴, and R⁴ is C₁-C₁₂-alkyl, C₅-C₁₂-cycloalkyl, C₆-C₁₆-aryl or C₇-C₁₆-aralkyl, R² is a 6-membered carbocyclic aromatic ring which is substituted in at least one of the two ortho-positions relative to the metal-carbon bond by $-CF_2Z$, in which Z is F or unsubstituted or substituted alkyl, or and R³ is as defined for R² or is halogen, pseudohalogen.

4,713,402

PROCESS FOR PREPARING ANTITHROMBOGENIC/ANTIBIOTIC POLYMERIC PLASTIC MATERIALS

Donald D. Solomon, Spring Valley, Ohio, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 30, 1985, Ser. No. 771,438

Int. Cl.⁴ A61K 17/18; B44D 5/12

U.S. Cl. 523-112

14 Claims

1. A process for producing plastic substrates having anti-thrombogenic and/or antibiotic properties without dissolving the substrate, characterized by

- (a) providing a dual organic solvent system, said dual organic solvent system comprising
 - (1) a chlorofluorocarbon component, said chlorofluorocarbon component being a member selected from the group consisting of 1,1,2-trichloro-1,2,2-trifluoroethane; 1,2-difluoro-1,1,2,2-tetrachloroethane; 1,1-difluoro 1,2,2,2-tetrachloroethane, and mixtures thereof;
 - (2) a petroleum ether component; and
 - (3) the ratio of said chlorofluorocarbon component to said petroleum ether component being within the range of between about nine parts chlorofluorocarbon to one part petroleum ether and one part chlorofluorocarbon to one part petroleum ether;
- (b) dissolving in said dual organic solvent system from said providing step a pre-formed quaternary ammonium antibiotic and/or antithrombogenic complex;
- (c) immersing a plastic material in said dual organic solvent system containing said quaternary ammonium antibiotic and/or antithrombogenic complex from said dissolving step, said plastic material being non-dissolvable in said organic solvent system;
- (d) removing in a first removing step said plastic material from said immersing step; and
- (e) removing in a second removing step said solvent from said dissolving step;
- (f) thereby providing a passively coated thin layer film of quaternary ammonium antibiotic and/or anticoagulant complex on said plastic surface.

4,713,403

DENTAL COMPOSITE RESIN COMPOSITION

Bunsaku Yoshida, Ichikawa, and Kentaro Tomioka, Chofu, both of Japan, assignors to G-C Dental Industrial Corporation, Tokyo, Japan

Filed Mar. 24, 1986, Ser. No. 843,195

Claims priority, application Japan, Apr. 2, 1985, 60-68533

Int. Cl.⁴ A61K 6/08

U.S. Cl. 523-115

14 Claims

1. A dental composite resin composition comprising as main components a polymerizable monomer, which is a monofunctional or polyfunctional acrylate or methacrylate, an inorganic filler and/or an organic filler, a gold powder and/or a gold-color alloy powder having a gold-color luster, and a redox polymerization catalyst.

4,713,404

PAINT FORMULATION COMPRISING A THERMALLY STABLE CAPPED THERMOPLASTIC PHENOLIC RESIN

Michael B. Cavitt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 755,260, Jul. 15, 1985, Pat. No. 4,632,971.

This application Sep. 15, 1986, Ser. No. 907,566

Int. Cl.⁴ C08K 5/41

U.S. Cl. 523-172

6 Claims

1. A paint formulation comprising

- (1) a thermally stable, thermoplastic phenolic resin prepared by reacting
 - (A)
 - (1) the reaction product of

- (a) at least one epoxy resin having an average of more than one vicinal epoxy group per molecule with
- (b) one or more polyhydric phenols; and optionally

(B)

- (2) one or more polyhydric phenols; with
 - (B) a material having only one vicinal epoxy group per molecule or mixture of such materials;
- in the presence of an effective quantity of a suitable catalyst and wherein the components are present in quantities which provide an equivalent ratio of component (A-1-a) to component (A-1-b) of from about 0.7:1 to about 0.95:1, the ratio of phenolic hydroxyl equivalents of component (A-2) to the phenolic hydroxyl equivalents of component (A-1) is from about 0:1 to about 20:1, and the ratio of epoxy equivalents from component (B) to phenolic hydroxyl equivalents in component (A) is from about 0.9:1 to about 1.1:1; and
- (II) at least one of
 - (A) one or more pigments;
 - (B) one or more dyes;
 - (C) one or more fillers; or
 - (D) any combination thereof.

4,713,405

 α -CYANOACRYLATE ADHESIVE COMPOSITION OF MATTER

Mitsuyuki Koga; Kenichiro Hirai; Toshio Sugimae, and Setsuo Fukushima, all of Sakura, Japan, assignors to Koatsu Gas Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 27, 1986, Ser. No. 879,380

Claims priority, application Japan, Jul. 19, 1985, 60-160903

Int. Cl.⁴ C08K 9/04, 5/55

U.S. Cl. 523-212

4 Claims

1. An α -cyanoacrylate adhesive composition of matter consisting essentially of α -cyanoacrylate, fumed silica having a surface treated with a dimethyldichlorosilane, and trialkyl borate, said trialkyl borate being represented by the general formula B(OR)₃ wherein R represents any alkyl group having 1 through 18 carbon atoms contained therein.

4,713,406

BINDERS FOR CATHODIC ELECTROCOATING

Eberhard Schupp, Schwetzingen; Rolf Osterloh, Gruenstadt; Werner Loch, Erpolzheim, and Klaas Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 25, 1986, Ser. No. 934,623

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542170

Int. Cl.⁴ C08L 63/02

U.S. Cl. 523-415

8 Claims

1. A binder for cathodic electrocoating which is based on polyadducts/polycondensates which carry basic nitrogen groups and are rendered water-dilutable by protonation with an acid, and one or more crosslinking agents for these polyadducts/polycondensates, and essentially consists of a mixture of (A) from 50 to 90% by weight of a polyadduct/polycondensate which carries basic nitrogen groups and is obtainable by reacting

- (a) an essentially epoxide-free adduct of a secondary amine and polyepoxide compound with
 - (b) a condensate of a diamine/polyepoxide adduct which is prepared in the presence of excess diamine and separated off from excess diamine after complete conversion of the epoxide groups, with one or more mono- and/or dicarboxylic acids of not less than 6 carbon atoms, with the proviso that the reaction of (a) with (b) is carried out at about 100°-250° C., and
- (B) from 10 to 50% by weight of a crosslinking agent which does not react with component (A) at room temperature but reacts with the latter at elevated temperatures with crosslinking,

the sum of the percentages stated under (A) and (B) being 100.

4,713,407

FLAME RETARDANT POLYESTER RESIN COMPOSITION

Philip E. Bailey, Worthington; Gordon E. Pickett, Reynoldsburg; Manfred Luttinger, Columbus, all of Ohio, and Takashi Umeda, Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 824,449, Jan. 31, 1986, abandoned. This application Jul. 7, 1986, Ser. No. 882,587

Int. Cl.⁴ C08K 5/15

U.S. Cl. 524-109

10 Claims

1. A polyester resin composition comprising: 100 parts by weight of a polyethylene terephthalate polyester resin (A) having an inherent viscosity of not less than 0.55 to 1.0 dl/g, from 20 to 70 parts by weight of glass fibers having a length of from 0.1 to 6 millimeter (B), from 2 to 8 parts by weight of a crystallization-accelerating agent selected from the group consisting of talc having an average particle diameter of from 0.5 to 10 micron, an ionomer having a melt index of from 0.5 to 5 gram per 10 minutes and a mixture thereof (C), from 10 to 25 parts by weight of a flame retardant selected from the group consisting of tetrachlorobisphenol A oligomer, halogenated polycarbonate oligomer, terminal epoxy compound of tetrabromobisphenol A oligomer, halogenated polystyrene and poly(dibromophenylene oxide) (D) and, as an auxiliary flame retardant, from 2 to 8 parts by weight of an antimony trioxide, and from 3 to 10 parts by weight of zinc borate (E).

4,713,408

POLYBUTYLENE TEREPHTHALATE RESIN COMPOSITION

Katsuhiko Takahashi, and Yoshihisa Tajima, both of Fuji, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Dec. 20, 1985, Ser. No. 811,561

Claims priority, application Japan, Dec. 21, 1984, 59-270315

Int. Cl.⁴ C08K 5/42, 5/04, 5/09; C08L 67/02

U.S. Cl. 524-161

5 Claims

1. A polybutylene terephthalate resin composition which comprises polybutylene terephthalate, a sulfonate anionic anti-static agent and an oxidized polyolefin wax formed by thermally cracking polyolefins in an oxidizing atmosphere or by introduction of polar radicals during polymerization.

5. A polybutylene terephthalate resin according to claim 1, wherein said anionic anti-static agent is a metal salt of an alkyl sulfonic acid wherein the alkyl radical has 1 to 22 carbon atoms, or a metal salt of an alkyl substituted aromatic sulfonic acid having an aromatic hydrocarbon nucleus wherein the alkyl radical has 1 to 25 carbon atoms.

4,713,409

VULCANIZABLE POLYMERIC COMPOSITIONS CONTAINING A ZINC DIMETHACRYLATE ADJUVANT AND METHOD FOR PREPARING THE ADJUVANT

Robert A. Hayes, Cuyahoga Falls, and Wendell R. Conard, Kent, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 653,177, Nov. 7, 1984, abandoned,

which is a continuation of Ser. No. 421,012, Sep. 21, 1982,

abandoned. This application Apr. 17, 1986, Ser. No. 853,250

Int. Cl.⁴ C08K 3/04; C08F 8/00

U.S. Cl. 524-518

14 Claims

1. Vulcanizable polymeric compositions comprising:

- (a) rubbery polymers selected from the group consisting of natural rubber, ethylene/propylene copolymers, ethylene/propylene/diene terpolymers, styrene/butadiene copolymers, nitrile rubbers, neoprene and blends thereof;
- (b) from about 25 to about 85 parts by weight per 100 parts by weight of said rubbery polymers of a zinc dimethacry-

late having a surface area of from about 3.7 to about 5.4 m²/g; and
(c) a cure effective amount of a peroxide curing agent.

4,713,410

SILICONE RELEASE COATING EMULSIONS WHICH STRATIFY WHEN BAKED

John Katchko, Palatine; Karel Kriz, Mt. Prospect, and Thomas H. Plaisance, Wilmette, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 13, 1986, Ser. No. 818,035
Int. Cl.⁴ C08J 0/00

U.S. Cl. 524—500

15 Claims

1. A heat curable aqueous emulsion coating composition adapted to deposit a release coating which stratifies to allow less silicone to effectively coat a given surface area comprising: (1) a fatty acid or fatty alcohol-containing hydroxy-functional polyester containing at least 5% of said fatty material and having a hydroxy value of at least about 40 and which is a free flowing liquid at room temperature; (2) a cross-linking agent for said hydroxy resin; and (3) at least one silicone reactive with said hydroxy-functional resin or said cross-linking agent to provide a release function, said hydroxy-functional polyester and said cross-linking agent serving to emulsify said silicone in the aqueous phase of said emulsion, said emulsion containing water in an amount of from 2% to 35%.

4,713,411

PIGMENT COMPOSITION AND PREPARATION PROCESS THEREOF

Kazuo Kanou, Saitte; Takamitsu Shinoda, Kashiwa, and Yukio Kanbara, Warabi, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1986, Ser. No. 869,325
Int. Cl.⁴ C08J 3/04

U.S. Cl. 524—560

16 Claims

1. A pigment composition consisting of an intimate mixture of:
75–95 wt. % based on the whole pigment composition of an organic pigment, and
5–25 wt. % based on the whole pigment composition of a polymer made up of 0–40 wt. % of styrene, 20–70 wt. % of a methacrylic ester and 20–50 wt. % of methacrylic acid, wherein the total proportion of styrene, methacrylic ester and methacrylic acid is at least 85 wt. % of the entire monomers.

4,713,412

EMULSION POLYMERIZED SEC-BUTYL ACRYLATE LATEXES SUITABLE FOR USE AS PRESSURE SENSITIVE ADHESIVES

Ralph G. Czerepinski, Midland, and Roland E. Gauderman, Clare, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 2, 1985, Ser. No. 762,083
Int. Cl.⁴ C08L 31/00, 33/00, 35/00

U.S. Cl. 524—833

3 Claims

1. An emulsion polymerized latex composition suitable for use as a pressure sensitive adhesive comprising: (a) from about 95 to about 97 percent by weight total polymer of sec-butyl acrylate and (b) from about 5 to about 3 percent by weight total polymer of acrylic acid.

4,713,413

REMOVAL OF ORGANIC HALIDES FROM HYDROCARBON SOLVENTS

Bruce R. Tegge, Madison; Frank G. Weary, Westfield, both of N.J., and Yasuo Sakaguchi, Yokohama, Japan, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 27, 1985, Ser. No. 814,100
Int. Cl.⁴ C08F 8/22

U.S. Cl. 525—54

11 Claims

1. In a process for halogenating butyl rubber, said rubber including minor amounts of at least one monomer from which said rubber is prepared, the halogenation being carried out by dissolving said rubber in a hydrocarbon solvent and contacting the rubber/solvent solution with a halogen wherein the halogen is chlorine or bromine, whereby said monomers are halogenated incidental to the rubber halogenation to form organic halides, the halogenated rubber being separated from the hydrocarbon solvent and the solvent being recovered for recycling in a subsequent halogenation process, at least a portion of said organic halides being concentrated in said solvent, the improvement which comprises removing substantially all of the organic halides selected from the group consisting essentially of 2-methyl-3-chloropropene-1,2-methyl-1,2-dibromo-3-chloropropane, tribromo isobutane or mixtures thereof from said solvent by contacting said solvent with an activated alumina at a temperature of at least 20° C. for a time sufficient to remove said halides from said solvent.

4,713,414

POLYOXYMETHYLENE MOLDING COMPOSITIONS EXHIBITING IMPROVED TOUGHNESS

Rajal M. Kusumgar, Livingston, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 16, 1986, Ser. No. 886,274
Int. Cl.⁴ C08L 51/00

U.S. Cl. 525—64

10 Claims

1. An oxymethylene polymer molding composition comprising a normally solid oxymethylene polymer having an inherent viscosity of at least 1.0 (measured at 60° C. in a 0.1 weight percent solution in p-chlorophenol containing 2 wt. % of alpha-pinene), a molecular weight of at least 10,000 and a melting point of at least 150° C., in an amount of from about 50 to about 95 wt. %, based on the weight of the total composition, a reactive titanate selected from the group consisting of neoalkoxy, trineodecanoyl titanate, neoalkoxy, dodecylbenzene-sulfonyl titanate, neoalkoxy, tri(dioctylphosphato) titanate, neoalkoxy, tri(dioctylpyrophosphato) titanate, neoalkoxy, tri(N-ethylaminoethylamino) titanate, and neoalkoxy, tri(m-amino) phenyl titanate, and present in an amount of from about 0.05 to about 5 wt. %, based on the weight of the total composition and based on 100% reactivity of the titanate, and a multiphase composite interpolymers in an amount of from about 1 to about 50 wt. %, based on the weight of the total composition.

4,713,415

RUBBER MODIFIED NYLON COMPOSITION

Richard E. Lavengood, Longmeadow; Allen R. Padwa, Worcester, and Alva F. Harris, Wilbraham, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 733,560, May 10, 1985, abandoned. This application Mar. 21, 1986, Ser. No. 842,338
Int. Cl.⁴ C08L 77/00

U.S. Cl. 525—66

7 Claims

1. A polymer blend comprising:
(A) 5 to 79.5 weight percent of a graft rubber composition comprising a graft copolymer of from 15 to 55 parts by weight of acrylonitrile and from 85 to 45 parts by weight of styrene, wherein monomers of acrylonitrile and styrene are polymerized in the presence of an grafted onto a substrate rubber having a glass transition temperature below 0° C., wherein the weight percentage of the rubber is in

the range of from 5 to 80 percent and the weight percentage of the graft copolymer is in the range of 95 to 20 percent of the graft rubber composition;
(B) 94.5 to 20 weight percent of a nylon polyamide resin; and
(C) 0.5 to 60 weight percent of a compatibilizer terpolymer of styrene, acrylonitrile and maleic anhydride capable of reaction with the polyamide resin, having a styrene:acrylonitrile weight ratio of 80:20 to 50:50 and a maleic anhydride content of 0.3 to 1.5 mole percent and wherein said compatibilizer terpolymer is miscible with the graft copolymer of said graft rubber composition;
wherein the percentage weights of components A, B and C are based on the total weight of components A, B and C in the blend.

4,713,416

THERMOPLASTIC COMPOSITIONS INCLUDING POLYPHENYLENETHER, HAVING IMPROVED IMPACT STRENGTH AND PROCESSABILITY CHARACTERISTICS

Luciano Del Giudice, Milan; Roberto Nocci, Novara; Umberto Giannini, Milan, and Giuseppe Gianotti, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Nov. 14, 1984, Ser. No. 671,314

Claims priority, application Italy, Nov. 15, 1983, 23717 A/83
Int. Cl.⁴ C08L 61/04, 71/04

U.S. Cl. 525—68

2 Claims

1. A thermoplastic composition consisting essentially of 60% by weight of poly-2,6-dimethyl-1,4 phenylenether, 30% by weight of a blend of polypropylene with an ethylene/propylene rubber and 10% by weight of a graft copolymer of styrene onto polypropylene.

4,713,417

POLYMERS FORMED FROM ALLYL-SUBSTITUTED OR METHALLYL-SUBSTITUTED, BICYCLIC, UNSATURATED DICARBOXYLIC ANHYDRIDES

Alfred Renner, Muntelier; Theobald Haug, Frenkendorf, and Bruno Schreiber, Aesch, all of Switzerland, assignors to Ciba-Gelby Corp., Ardsley, N.Y.

Continuation of Ser. No. 694,582, Jan. 24, 1985, abandoned. This application Jan. 5, 1987, Ser. No. 4,251

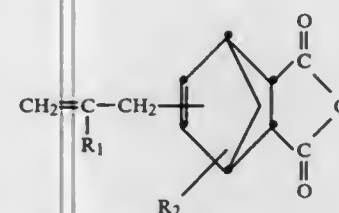
Claims priority, application Switzerland, Jan. 31, 1984, 448/84

Int. Cl.⁴ C08F 124/00; C08L 63/02

U.S. Cl. 525—117

6 Claims

1. A curable mixture containing a polymer obtained by the polymerization solely of a monomer or a mixture of monomers of the formula I



in which R₁ and R₂ independently of one another are hydrogen or methyl; and a separately added polyepoxide compound containing on average more than one epoxide group in the molecule.

4,713,418

BLENDS OF FLUOROPLASTICS AND FLUOROELASTOMERS

Anestis L. Logothetis, Wilmington, and Charles W. Stewart, Newark, both of Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Dec. 6, 1985, Ser. No. 805,543
Int. Cl.⁴ C08L 27/16, 27/18, 27/20

U.S. Cl. 525—200

17 Claims

1. A melt blended composition comprising (A) 100 parts by weight of a cured fluoroelastomer consisting essentially of from 79.9 to 52 mole % units derived from tetrafluoroethylene, 20 to 45 mole % units derived from a perfluoroalkylvinyl ether wherein the alkyl group contains from 1 to 10 carbon atoms, and 0.1 to 4.0 mole % cure site monomer units derived from vinylidene fluoride, trifluoroethylene, vinyl fluoride, CH₂=CHR_f where R_f is a perfluoroalkyl group containing from 1 to 5 carbon atoms, perfluorophenoxy substituted perfluoroalkylene vinyl ethers wherein the perfluoroalkylene group contains from 1 to 5 carbon atoms, N=C(R'_f-O)_nCF=CF₂ where R'_f is a perfluoroalkylene group of 2 or 3 carbon atoms and n is 1–4, fluoroolefins of 2 to 5 carbon atoms containing 1 or 2 bromo substituents or fluoroolefins of 2 to 5 carbon atoms, containing 1 or 2 iodo substituents, (B) and from 2 to 50 parts by weight of a thermoplastic perfluorocarbon copolymer containing at least 50 mole % units derived from tetrafluoroethylene having a melting point above 300° C. which is present as generally spherical particles having a particle size of less than about 10 microns, said composition being melt blended at a temperature which is sufficiently high to melt the thermoplastic tetrafluoroethylene copolymer.

4,713,419

THERMOPLASTIC OLEFIN ELASTOMER

Masahiro Takimoto, Mie; Junji Takeuchi, Nagoya, and Yoshio Yamazaki, Aichi, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 30, 1986, Ser. No. 857,308

Claims priority, application Japan, Apr. 30, 1985, 60-93226
Int. Cl.⁴ C08L 23/10, 23/16, 23/08

U.S. Cl. 525—211

4 Claims

1. A thermoplastic olefin elastomer of polyblend which comprises 30 to 70 wt% of ethylene-propylene-diene terpolymer (EPDM), 10 to 30 wt% of ethylene-vinyl acetate copolymer (EVA), and 20 to 50 wt% of polypropylene (PP), said EPDM having a Mooney viscosity ML₁₊₄ (100° C.) of 60 to 100 and containing 20 to 40 wt% of propylene and ethylenenorbornene as a third component, said EVA containing 10 to 30 wt% of vinyl acetate and having an Mn of 13,500 to 17,000, and said PP having an Mn of 30,000 to 110,000.

4,713,420

ABS COMPOSITIONS HAVING TRIMODAL RUBBER PARTICLE DISTRIBUTIONS

David E. Henton, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1982, Ser. No. 380,786

Int. Cl.⁴ C08L 47/00, 51/04, 55/02

(I) U.S. Cl. 525—236

10 Claims

1. An improved rubber-modified, impact-resistant polymeric composition comprising:
(a) a matrix comprising an interpolymers comprising monovinylidene aromatic monomer and ethylenically unsaturated nitrile monomer polymerized therein; and
(b) dispersed in such matrix in the form of discrete particles, from about 5 to about 40 weight percent, based on weight polymeric composition, of elastomeric material (rubber), wherein the improvement comprises the dispersed rubber comprising the following three rubber components;
(1) a small particle rubber component being from about 1 to about 94 weight percent of the rubber, the particles

4,713,425

CHIP RESISTANT PRIMER COMPOSITION V'

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Grosse Pointe Farms, and Dennis J. Grebur, Mt. Clemens, all of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 22, 1985, Ser. No. 800,942

Int. Cl.⁴ C08G 63/06, 63/20, 63/60; C08L 63/02

U.S. Cl. 525-438 20 Claims

1. An organic solvent based, thermosetting coating composition comprising

(A) hydroxy functional epoxy ester resin having a number average molecular weight (\bar{M}_n) between about 1,000 and about 4,000 and being the reaction product of (1) a chain extended product of diepoxide with diphenol and dicarboxylic acid and (2) acid component in chain termination, said acid component comprising primary hydroxy functional acid and reacted in about a 1 to 1 equivalent ratio to chain extended product, wherein said diepoxide is reacted substantially simultaneously with said diphenol and dicarboxylic acid in amounts sufficient to give a weight per epoxide between about 500 and about 2,500;

(B) linear polycaprolactone diol having a molecular weight between about 1500 and about 5000, wherein said (A) and (B) are included in said composition in a weight ratio between about 4:1 and 1:4; and

(C) blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups which have been blocked by reaction with an active hydrogen bearing blocking agent, which crosslinking agent de-blocks at the cure temperature of said composition, said crosslinking agent being included in said composition in an amount equal to between about 10 and 50 percent of the combined weight of said (A) and (B) in said composition.

4,713,426

BLENDS OF A BIPHENYL CONTAINING POLY(ARYL ETHER SULFONE) AND A POLY(ARYL ETHER KETONE)

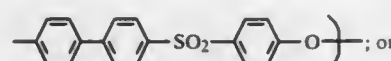
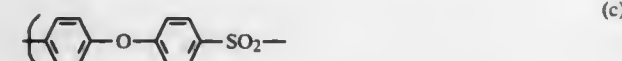
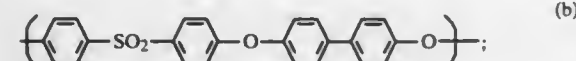
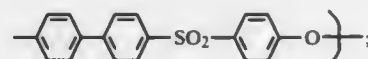
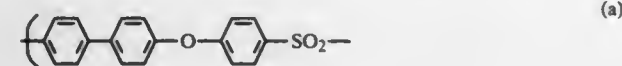
James E. Harris, Piscataway, and Lloyd M. Robeson, Whitehouse Station, both of N.J., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 655,580, Sep. 28, 1984, abandoned. This application Jun. 18, 1986, Ser. No. 876,294

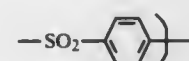
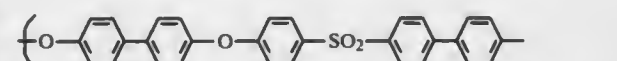
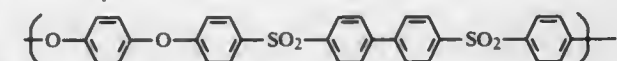
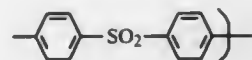
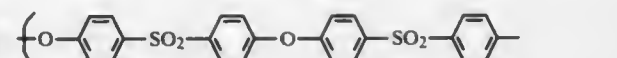
Int. Cl.⁴ C08L 61/00, 81/06

U.S. Cl. 525-471 11 Claims

1. A blend comprising from about 5 to about 95 weight percent of a poly(aryl ether ketone) and from about 95 to about 5 weight percent of a biphenyl containing poly(aryl ether sulfone) selected from poly(aryl ether sulfones) having the following repeating units:



(d) a copolymer having the repeating units:



arranged randomly along the chain.

4,713,427

HIGH SOLIDS COATING COMPOSITIONS

Mohinder S. Chattha, Livonia, and Ares N. Theodore, Farmington Hills, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US82/01090, § 371 Date Aug. 9, 1982, § 102(e) Date Aug. 9, 1982, PCT Pub. No. W084/00770, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 9, 1982, Ser. No. 432,896

Int. Cl.⁴ C08G 12/32, 12/12; C08L 61/24, 61/28

U.S. Cl. 525-510 29 Claims

1. A thermosetting coating composition comprising a mixture of components, said components of said mixture comprising:

(A) polyol having a number average molecular weight (\bar{M}_n) of between about 130 and about 5000;

(B) dicarboxylic acid anhydride comprising at least about 50 percent by weight of alkyl hexahydrophthalic anhydride, said dicarboxylic acid anhydride being included in said composition in an amount so as to provide between about 0.25 and about 1.5 anhydride groups for each hydroxyl group on said polyol;

(C) epoxy having one or more epoxide groups per molecule and having a number average molecular weight (\bar{M}_n) of between about 130-1500, said epoxy being included in said composition in an amount so as to provide at least about 1.0 epoxide group for each anhydride group; and

(D) amine-aldehyde crosslinking agent included in said composition in an amount sufficient to provide at least about 0.60 nitrogen crosslinking functional groups for each hydroxyl group initially present in said composition on said polyol (A), said coating composition being an essentially unreacted mixture of said components.

4,713,428

BRANCHED POLYESTERS

Rolf Mülhaupt, Marly; Alfred Renner, Muntelier, and Horst Lauterbach, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

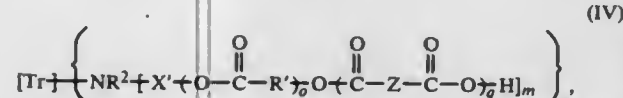
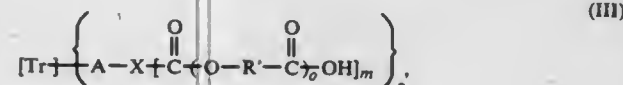
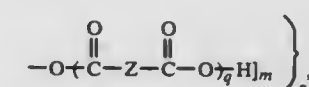
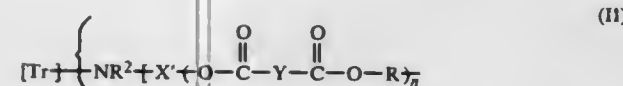
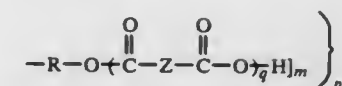
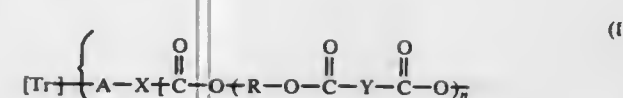
Filed Sep. 12, 1986, Ser. No. 907,253

Claims priority, application Switzerland, Sep. 16, 1985, 4011/85; Mar. 3, 1986, 846/86

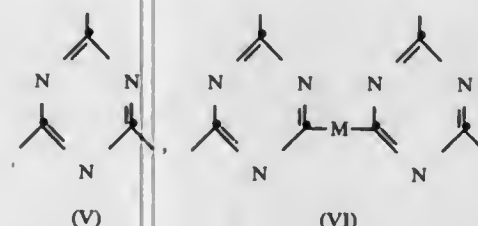
Int. Cl.⁴ C08F 283/00; C08G 59/14, 69/44

U.S. Cl. 525-523 20 Claims

1. A compound of formula I, II, III or IV



in which formulae
tr is a radical of formula V or VI



A is ---O--- or $\text{---NR}^1\text{---}$, R^1 is hydrogen, unsubstituted or substituted

$\text{C}_1\text{---C}_{20}$ alkyl, $\text{C}_5\text{---C}_{10}$ cycloalkyl, unsubstituted or substituted phenyl or $\text{C}_7\text{---C}_9$ aralkyl,

X is a di- or trifunctional radical of a hydroxycarboxylic or aminocarboxylic acid after removal of the functional groups, or

A and X together are the radical of a heterocyclic aminocarboxylic acid after removal of the carboxylic group, which radical is attached to the radical Tr through the nitrogen atom,

R^2 , if m is 1, has one of the meanings of R^1 , or R^2 , if m is 2, is a free electron pair,

R is the radical of an aliphatic, cycloaliphatic, aromatic, araliphatic or heterocyclic diol after removal of the two hydroxyl groups, which radical may carry substituents containing no active hydrogen atoms,

Y is the radical of an aliphatic, cycloaliphatic, aromatic, araliphatic or heterocyclic dicarboxylic acid after removal of the two carboxyl groups, which radical may carry substituents containing no active hydrogen atoms,

Z has one of the meanings of Y, but may additionally also carry carboxylic acid or sulfonic acid radicals as substituents,

R' is the divalent radical of an aliphatic, cycloaliphatic, aromatic or araliphatic hydroxycarboxylic acid after removal of the carboxyl group and the hydroxyl group, X' is the di- or trivalent radical of an aliphatic, cycloaliphatic,

aromatic or araliphatic aminoalcohol after removal of the amino and the hydroxyl group or groups, n is an integer from 0 to 40, o is an integer from 1 to 40, m is 1 or 2, q is 0 or 1 and p, dependent on the radical Tr, is 3 or 4,

M is a radical ---W---Q---W--- , wherein W is ---O--- , $\text{---NR}^1\text{---}$ or $\text{---NR}^1\text{---X''---NR}^1\text{---OC---}$, X'' is the divalent radical of an aliphatic, cycloaliphatic, aromatic or araliphatic diamine after removal of the amino groups, and

Q is a divalent oligomer radical containing 1 to 60 monomers units, which radical is selected from the group consisting of 1,2-polybutadiene, 1,4-polybutadiene, acrylonitrile/butadiene copolymers, polyethers or polydialkylsiloxanes, with the proviso that if Tr is a radical of formula V, the groups R and R' may only be aliphatic or cycloaliphatic radicals, and that the compounds do not have a melting point above 200° C. and that at least one of n and q in formula II is greater than 0.

16. A composition which contains (a) a resin containing at least one 1,2-epoxide group in the molecule, and

(b) a compound of formula I, II, III or IV according to claim 1.

4,713,429

METHOD FOR PRODUCTION OF COPOLYMER OF VINYL CYANIDE COMPOUND AND AROMATIC VINYL COMPOUND

Sadao Ikuma, Suzuka, Japan, assignor to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Jun. 27, 1986, Ser. No. 879,393

Claims priority, application Japan, Jun. 28, 1985, 60-141969

Int. Cl.⁴ C08F 2/18, 4/04, 212/10

U.S. Cl. 526-87 2 Claims

1. A method for producing by suspension polymerization a copolymer comprising a residue of a vinyl cyanide compound selected from the group consisting of acrylonitrile, methacrylonitrile and mixtures thereof, and a residue of an aromatic vinyl compound selected from the group consisting of styrene, α -methyl styrene, paramethylstyrene, 1-butylstyrene, styrene halide and mixtures thereof, having a substantially uniform composition and a content of the vinyl cyanide residue in a range of from 50 to 85% by weight, said method comprising

(a) as a first step charging the total quantity of said vinyl cyanide compound and a partial quantity of said aromatic vinyl compound at a compositional ratio wherein the content of the polymerized residue of vinyl cyanide compound in the resulting copolymer attains an intended content within a range of from 50 to 85% by weight;

(b) as a second step initiating the copolymerization reaction by adding an azo-type polymerization initiator having a decomposition half-life at 95° C. of two hours or longer to the compounds charged in said first step after said compounds are elevated to a temperature corresponding to a decomposition half-life T of the polymerization initiator represented by the following equation (I) and calculated as $t=0$:

$$T = \frac{\log 2}{\log \left(\frac{t_0 - t}{t_0 - t - 1} \right)} \quad (I)$$

where: t denotes an elapsed time (in minute) after initiation of the copolymerization reaction as counted from the instant after the polymerization initiator is added to the reaction system and continuous feeding of the aromatic vinyl compound is commenced, as the starting point; t_0 represents an arbitrary time (in minute) which is longer by two minutes or more than the time for the continuous feeding of the aromatic vinyl compound; and T is the decomposition half-life (in minute) of the polymerization initiator; and

(c) as a third step carrying out the copolymerization reaction, while immediately and continuously feeding the remainder of the aromatic vinyl compound to the reaction system after commencement of the copolymerization reaction, and elevating the temperature of the reaction system along a temperature (θ) corresponding to the decomposition half-life T of the polymerization initiator represented by the said equation (I), the quantity of aromatic vinyl compound fed in the third step being determined by the following formula (II):

$$W_{sa} = \frac{\eta(1 - X_{an})}{1 - \eta(1 - X_{an})} W_{an} - W_{si} \quad (II)$$

where: W_{sa} denotes the total quantity (kg) of the aromatic vinyl compound to be continuously fed in the third step; W_{an} and W_{si} respectively indicate the initial charging quantities (kg) of the vinyl cyanide compound and the aromatic vinyl compound used in the first step; η designates the yield of the copolymer with the total quantity of the monomeric compound as a reference; and X_{an} is the content of the vinyl cyanide compound present in the resulting copolymer.

4,713,430

PREPARATION OF ETHENE POLYMERS BY MEANS OF A ZIEGLER CATALYST SYSTEM

Juergen Kerth, Maxdorf, and Heinz Vogt, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 22, 1986, Ser. No. 945,085

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546018

Int. Cl.⁴ C08F 4/64

U.S. Cl. 526—159

1 Claim

1. A process for preparing finely divided homopolymers of ethene or copolymers of ethene with minor amounts of C_3 – C_8 -alpha-monoalkene by polymerizing the monomer(s) at 30°–150° C. and 1–200 bar by means of a Ziegler catalyst system composed of

(1) a titanium-containing catalyst component obtained as a precipitated product by bringing about a precipitation in a previously introduced organic liquid by introducing and bringing together with vigorous agitation

(1.1) a 0.1–10M solution of titanium tetrachloride in a liquid saturated aliphatic and/or aromatic hydrocarbon of 5–10 carbon atoms,

(1.2) a 0.1–10M solution of an organoaluminum compound of the empirical formula R_nAlCl_{3-n} , where n is a number within the range from 1.5 to 3 and R is alkyl of 1–12 carbon atoms, in a liquid saturated aliphatic and/or aromatic hydrocarbon of 5–10 carbon atoms and

(1.3) a C_2 – C_8 -alpha-monoalkene and

(2) an aluminum-containing catalyst component which is a trialkylaluminum which contains 1–12 carbon atoms per alkyl group, with the proviso that the atomic ratio of titanium in catalyst component (1):aluminum in catalyst component (2) lies within the range 1:1 to 1:200, which comprises using as the titanium-containing catalyst component (1) one where the precipitation has been brought about at temperatures within the range from –30° to +30° C. in a previously introduced organic liquid which, at the precipitation temperature, has a viscosity within the range from 1.5 to 30 mm²/s and comprises (a) a liquid saturated aliphatic and/or aromatic hydrocarbon of 5–10 carbon atoms and (b), dissolved therein, relatively small amounts of a polymer of a C_2 – C_8 -alpha-monoalkene, with the provisos that (i) for every gram-mole of the total amount of titanium tetrachloride used a total of from 2 to 20 liters of the previously introduced organic liquid, a total of from 0.5 to 5 gram-moles of the organoaluminum compound and a total of from 5 to 500 gram moles of the alpha-monoalkene are used and (ii) for every mole unit of the total amount of titanium tetrachloride used from 0.002 to 0.15 mole units per minute are converted into

precipitated product and from 0.02 to 1 mole unit per minute of the alpha-monoalkene are introduced into the precipitation system.

4,713,431

HIGH MOLECULAR WEIGHT DADMAC POLYMERS BY INVERSE EMULSION TECHNOLOGY

Bhopati R. Bhattacharyya, Downers Grove, Ill., and Philip D. Dalsin, Carlsbad, Calif., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 789,606, Oct. 21, 1985, abandoned.

This application Nov. 12, 1986, Ser. No. 930,967

Int. Cl.⁴ C08F 2/32

U.S. Cl. 526—207

2 Claims

1. A method of producing a high molecular weight water-in-oil emulsion of poly diallyl dimethyl ammonium chloride which comprises preparing a water-in-oil monomer emulsion of diallyl dimethyl ammonium chloride, said emulsion being further characterized as containing between 0.5–4% by weight of acrylamide based on the weight of diallyl dimethyl ammonium chloride monomer present in said emulsion, and then polymerizing said monomer emulsion in the presence of a low HLB emulsifier and a free radical initiator whereby a high molecular weight poly diallyl dimethyl ammonium chloride polymer is produced having an Intrinsic Viscosity greater than 2.

4,713,432

SOLID SOLUTION OF AMINE AND POLYMERIZED PHENOL

Madan M. Bagga, Cambri and Christopher H. Bull, Trumpington, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 847,371, Apr. 2, 1986, Pat. No. 4,659,779.

This application Jan. 12, 1987, Ser. No. 2,358

Claims priority, application United Kingdom, Apr. 2, 1985, 8508628

Int. Cl.⁴ C08F 12/24; C08G 59/68

U.S. Cl. 526—313

7 Claims

1. An accelerator for the cure of epoxide resins by nitrogen-containing latent curing agents which is a solid solution of a nitrogen base having a boiling point above 130° C. and an addition polymer of a phenol bearing an ethylenically unsaturated substituent.

4,713,433

LIQUID AND POLYMERIZABLE COMPOSITION SUITABLE FOR THE PRODUCTION OF ORGANIC GLASSES ENDOWED WITH HIGH ABRASION STRENGTH

Fiorenzo Renzi, Gorgonzola; Franco Rivetti, Schio; Ugo Romano, Vimercate, and Claudio Gagliardi, San Donato Milanese, all of Italy, assignors to Enichem Sintesi S.p.A., Palermo, Italy

Filed Mar. 26, 1987, Ser. No. 31,437

Claims priority, application Italy, Apr. 17, 1986, 20124 A/86

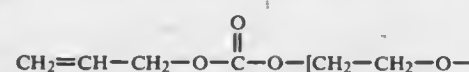
Int. Cl.⁴ C08F 220/26

U.S. Cl. 526—314

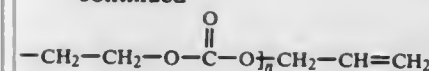
8 Claims

1. Liquid composition polymerisable to organic glasses endowed with a high abrasion strength, characterized in that it contains:

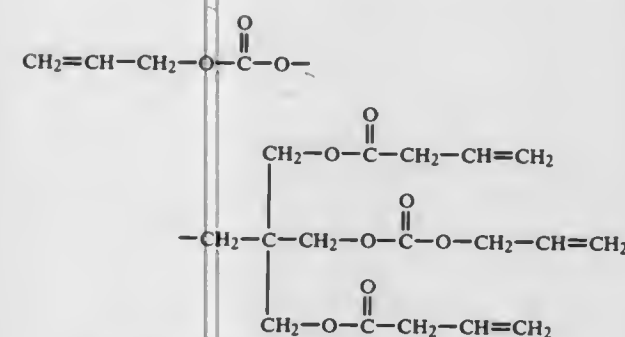
from 20 to 80% by weight of an oligomeric or essentially oligomeric product provided with two terminal allyl groups, definable by means of formula (I):



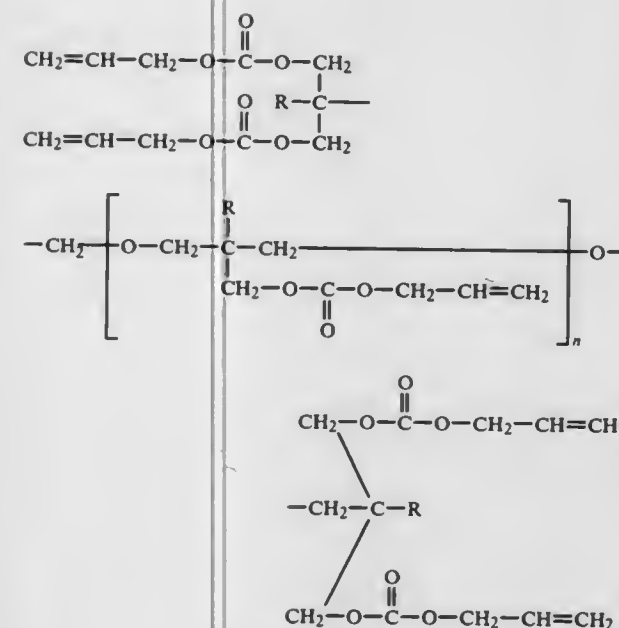
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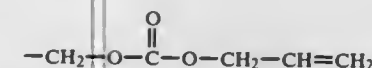
wherein: n assumes a value, or an average value, of from 2 to 5 (Component A); from 20 to 50% by weight of a monomeric, or essentially monomeric product provided with at least four terminal allyl groups, definable by means of formula (II):



or by means of formula (III):



wherein: R is the methyl or ethyl group; or it can be represented by the formula:



and n is either 0 or 1 (Component B); from 0 to 35% by weight of one or more reactive diluents provided with groups of allyl, vinyl or methacryl type (Component C).

4,713,434

CONTINUOUS EMULSION POLYMERIZATION PROCESS

Norbert Sutterlin, Ramstadt; Hans-Dieter Blitz, Jugenheim; Theodor Mager, Darmstadt; Karl-Heinz Jagsch, Gross-Gerau, and Dieter Tessmer, Russelsheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Jun. 10, 1983, Ser. No. 503,171

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222002

Int. Cl.⁴ C08F 2/00

U.S. Cl. 526—62

20 Claims

1. A process for the continuous preparation of aqueous synthetic resin dispersions which comprises:

- emulsifying one or more free-radically polymerizable monomers in an aqueous phase in the presence of an emulsifying agent, in an agitator vessel,
- initiating the free radical polymerization of said monomer of monomers in said aqueous phase, and
- passing said aqueous emulsion of the free-radically polymerizing monomer or monomers through at least one tubular reactor whose internal surface comprises a saturated polyolefin or a fluorinated saturated polyolefin.

4,713,435

PROCESS FOR PRODUCING AROMATIC POLYESTER

Hiroaki Sugimoto, Takatsuki; Kazuo Hayatsu, and Masahiro Fujiwara, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 27, 1986, Ser. No. 923,261

Claims priority, application Japan, Oct. 31, 1985, 60-245725

Int. Cl.⁴ C08G 73/10

U.S. Cl. 528—179

11 Claims

1. In a process for producing an aromatic polyester by polycondensation of either

- (a) aromatic hydroxycarboxylic acids containing at least 50 mole % of p-hydroxybenzoic acid, and/or ester-forming derivatives of these acids,
- (b) an aromatic dicarboxylic acid and/or an esterforming derivative of aromatic dicarboxylic acid, and
- (c) an aromatic dihydroxy compound and/or an esterforming derivative of aromatic dihydroxy compound, wherein the (a):(b) molar ratio and the (a):(c) molar ratio are each from 1:0 to 1:4, or
- (d) aromatic dicarboxylic acids containing at least 50 mole % of terephthalic acid, and/or esterforming derivatives of these acids and
- (e) aromatic dihydroxy compounds containing at least 50 mole % of at least one of hydroquinone, substituted hydroquinone, 4,4'-dihydroxydiphenyl, and/or ester-forming derivatives of these dihydroxy compounds,

the improvement comprising carrying out the polycondensation by using a liquid compound which has a higher boiling point at normal pressure than the temperature of this reaction and is inert to the reaction, in an amount satisfying the equation

$$\frac{\text{(theoretical quantity of aromatic polyester formed)}}{\{ \text{(theoretical quantity of aromatic polyester formed)} + \text{(quantity of liquid compound)} \}} = 0.70 \text{ to } 0.98, \text{ by weight.}$$

4,713,436
GLYCOSIDE-CONTAINING POLYESTER
PREPARATION PROCESS

John D. Downs; Raymond L. Drury, Jr.; Kenneth B. Moser, and
C. Deane Roth, all of Decatur, Ill., assignors to A. E. Staley
Manufacturing Company, Decatur, Ill.

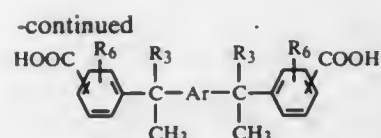
Filed Apr. 4, 1986, Ser. No. 848,434

Int. Cl.⁴ C08G 63/54, 63/48

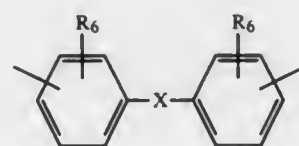
U.S. Cl. 528—295.3

16 Claims

16. A single step process for preparing an alkyd resin product wherein a polyol component containing at least a minor proportion of a glycoside reactant, a lower alkyl ester of a polybasic acid and a lower alkyl ester of a fatty acid are all charged to a reaction vessel and are simultaneously reacted at an elevated temperature while removing at least a substantial portion of the lower alcohol which is liberated during the course of the reaction process.



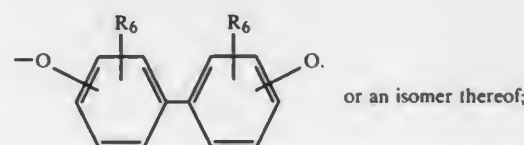
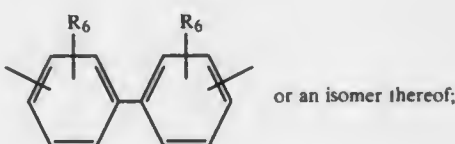
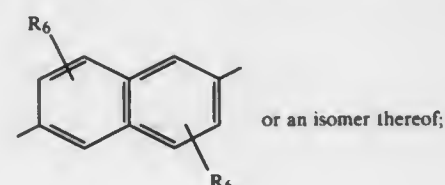
wherein R' and R'' are independently hydrogen, straight chain or branched C₁ to C₁₀ alkyl and C₆ to C₂₀ aryl groups; at least one of R' or R'' is hydrogen where amide bonds are formed; R₃ is a phenyl, a CF₃ or an alkyl group having from 1 to 10 carbon atoms; R₄ and R₅ are independently hydrogen, halogen, alkyl or alkoxy groups having from 1 to 4 carbon atoms, or aryl and aryloxy groups having from 6 to 20 carbon atoms; R₆ is an alkyl having more than one carbon atom, an aryl or aryloxy having from 6 to 20 carbon atoms; and Ar is



wherein X can be O, S, SO, SO₂.



CH₂, an alkylene or alkylidene having from 2 to 8 carbon atoms, a cycloalkylene or cycloalkylidene having from 5 to 14 carbon atoms, or a phenylene group which may be substituted by an alkyl or alkoxy group having from 2 to 4 carbon atoms, or by a halogen; the group Ar may also be selected from



and wherein the subject monomers are used in an amount of at least 50 mole % based on the total monomers used.

4,713,439

POLY(CARBONATE-IMIDE) POLYMER

Terry L. St. Clair, Poquoson, Va.; Shubha Maudgal, Bombay, India, and J. Richard Pratt, Poquoson, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

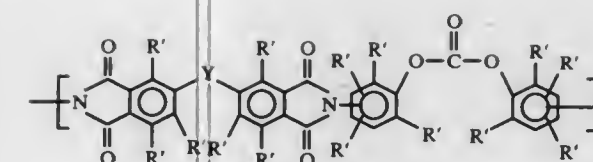
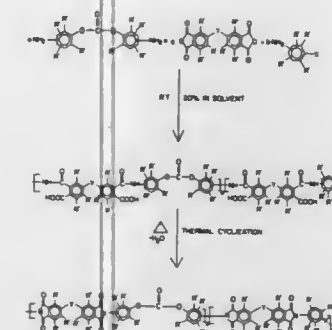
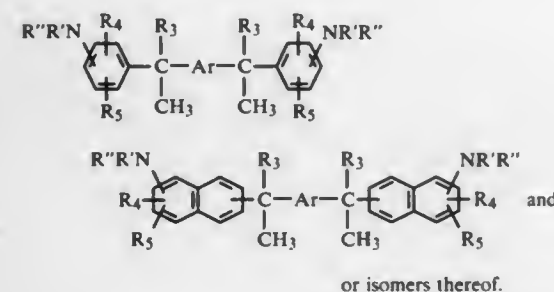
Filed Feb. 27, 1986, Ser. No. 834,978

Int. Cl.⁴ C08G 69/26

U.S. Cl. 528—353

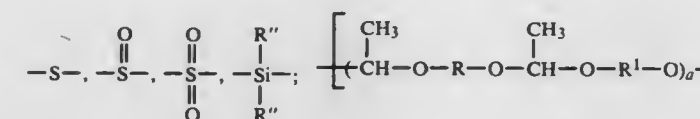
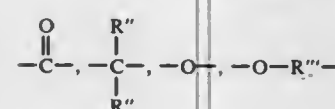
13 Claims

1. A poly(carbonate-imide) polymer comprising recurring units having the formula:



where

R' comprises a monovalent radical, having one to twenty carbon atoms, selected from hydrogen, alkyl, aryl, alkoxy, halogenated hydrocarbon, and N,N-dialkylamino; Y is nil or a divalent radical selected from



R'' comprises a monovalent radical, having one to twenty carbon atoms, selected from hydrogen, alkyl, aryl and halogenated hydrocarbon; and R''' comprises a divalent radical selected from alkylidene, arylidene, and halogenated hydrocarbon.

4,713,440

UREA/POLYAMINE/SECONDARY MONOAMINE/POLYALCOHOL CONDENSATE

Rolf Osterloh, Gruenstadt; Eberhard Schupp, Schwetzingen; Werner Loch, Eropolzheim, and Klaas Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 16, 1985, Ser. No. 776,378

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434318

The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.

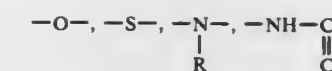
Int. Cl.⁴ C08G 71/02

U.S. Cl. 528—367

18 Claims

1. A process for the preparation of a urea condensate, wherein

- (A) one or more primary amines selected from the group consisting of diamines and polyamines are reacted with
- (B) urea,
- (C) one or more secondary monoamines and
- (D) one or more polyalcohols which contain two or more primary or secondary hydroxyl groups and in addition one or more of the groups ether oxygen



wherein R is alkyl of 1 to 12 carbon atoms, cycloalkyl, unsubstituted or substituted phenyl of 6 to 20 carbon atoms, hydroxyalkyl or 2 to 12 carbon atoms or a hydroxyalkyl radical obtained by an addition reaction of an epoxide compound with a secondary amine, or (E) a mixture of (D) and one or more polyalcohols which differ from (D) and contain two or more primary or secondary hydroxyl groups, at elevated temperatures and in the presence or absence of a catalyst, and the ammonia forced is separated off.

4,713,441

POLYACETAL HYDROGELS FORMED FROM DIVINYL ETHERS AND POLYOLS

Jorge Heller, Woodside, and Donald W. H. Penhale, Menlo Park, both of Calif., assignors to Sandoz Pharmaceuticals Corp., E. Hanover, N.J.

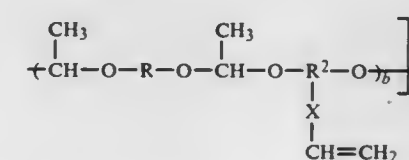
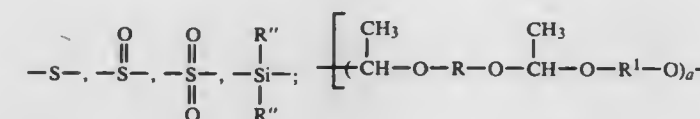
Filed Aug. 1, 1986, Ser. No. 892,520

Int. Cl.⁴ C08G 67/02

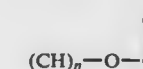
U.S. Cl. 528—392

9 Claims

1. A water-soluble polyacetal having the formula

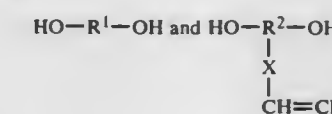
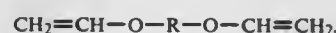


wherein; R, R¹, and R² are aliphatic, cycloaliphatic, or aromatic groups, and X represents groups such as (CH₂)_n, (CH₂)_nO, or



that connect the pendant unsaturation to the aliphatic, cycloaliphatic or aromatic R² groups, the ratio of a to b is 0.5 to 10, and n is 10-100.

9. A method of preparing a water-soluble polyacetal of claim 1, wherein monomers of the formula



are dissolved in a polar solvent in the presence of an acidic catalyst, and then evaporating the solvent to recover the polyacetal, wherein R, R¹, R² and X are as defined in claim 1.

4,713,442

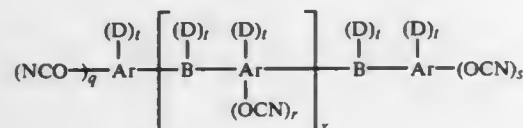
POLYAROMATIC CYANATE

Edmund P. Woo, Midland, and Daniel J. Murray, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 522,234, Nov. 16, 1985, Pat. No. 4,631,700. This application Feb. 27, 1986, Ser. No. 833,931 Int. Cl.⁴ C08G 73/00

U.S. Cl. 528—422 10 Claims

1. A polytriazine which comprises 1,3,5-triaryloxytriazines which comprise the reaction product of (a) between about 1 and 100 mole percent of an aromatic polycyanate which corresponds to the formula



wherein

Ar is an aromatic radical;

B is a C₇₋₂₀ polycyclic aliphatic radical;

D is independently in each occurrence any nonactive hydrogen-containing substituent;

q, r, and s are independently in each occurrence the integers 0, 1, 2, or 3;

with the proviso that the sum of q, r, and s is greater than or equal to 2;

t is independently in each occurrence an integer of between about 0 and 4 inclusive; and

x is a real number between about 0 and 5 inclusive;

(b) between about 0 and 99 mole percent of one or more cyanate containing compounds.

4,713,443

PROCESS FOR REMOVING ORGANIC COMPOUND HAVING HIGH BOILING POINT FROM A FLOATABLE POLYMER

Toshimitsu Nakashima, Takasago; Wataru Okada, Kobe, and Toragoro Mitani, Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan Filed Dec. 16, 1985, Ser. No. 809,107

Claims priority, application Japan, Dec. 17, 1984, 59-265842; Jul. 4, 1985, 60-148040

Int. Cl.⁴ C08F 6/24

U.S. Cl. 528—499 12 Claims

1. A process for removing an organic compound having a boiling point of not less than 100 C. from a floatable polymer containing the organic compound, which comprises contacting an aqueous slurry of the polymer with a non-condensable carrier gas at a temperature in the range of 60 C. to 90 C. by strongly agitating with an agitator at an impeller Reynolds number of not less than 10⁵ to attain a level of the organic compound which does not adversely affect the properties of the floatable polymer.

4,713,444

FINISHING METHOD OF POLYMER SLURRY

Kiyoshi Matsuyama, Ehime; Takatoshi Suzuki, Chiba, and Takeshi Chigusa, Ehime, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 664,171, Oct. 24, 1984, abandoned.

This application May 30, 1986, Ser. No. 868,486

Claims priority, application Japan, Oct. 28, 1983, 58-203057 Int. Cl.⁴ C08F 6/16

U.S. Cl. 528—502 3 Claims

1. A method for recovering a polymer from a slurry of said polymer which comprises:

homopolymerizing ethylene or propylene or copolymerizing ethylene or propylene with another olefin in a hydrocarbon solvent having 3 to 5 carbon atoms, using a filter

having a filtering zone which is composed of a filter element and an upper portion in a high pressure vessel, and continuously supplying a polymer slurry formed as it is or after it is washed, to the filtering zone in the filter having a filtering surface on which a slight quantity of polymer particles are retained,

whereby most of said hydrocarbon solvent is recovered by passing through said filtering surface and the polymer particles which form a cake accumulate upwardly and overflow from the upper portion of the filter to be recovered as a wet cake.

4,713,445

RENIN INHIBITORS AND TREATMENTS USING THEM

Michael Szelke, Ruislip; David M. Jones, Hayes, and Allan Hallett, Cheam, all of England, assignors to Aktiebolaget Hassle, Molndal, Sweden

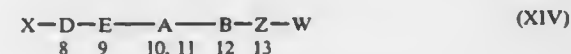
Continuation-in-part of Ser. No. 469,540, Feb. 7, 1983, which is a continuation-in-part of Ser. No. 290,620, Aug. 5, 1981, Pat. No. 4,424,207. This application Aug. 17, 1984, Ser. No. 641,639

Claims priority, application United Kingdom, Aug. 19, 1983, 8322414; European Pat. Off., Feb. 6, 1984, 84300733.7

Int. Cl.⁴ C07K 7/06, 5/10

U.S. Cl. 530—330 35 Claims

1. Compounds of the general formula

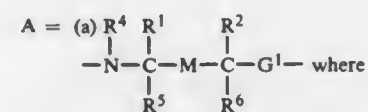


where

X=H or an N-protecting group or groups

D=absent or is Phe, αNal, βNal, Tyr, His, Trp or cyclohexyl alanyl as such or reduced at carbonyl

E=absent or is His Ala, Phe, Tyr, Trp, 2-aminobutyl or α, δ-diaminovaleryl as such or N-alkylated or reduced at carbonyl



R⁴, R⁵ and R⁶ the same or different =

(i) H or

(ii) alkyl or

(iii) —(CH₂)_n—OH or —(CH₂)_n—NH₂ when n = 2, 3, 4

G¹ (and G² appearing below) =

(i) —CH₂—(CH₂)_n— or

(ii) —(CH₂)_n—CO— or

(iii) —CO—(CH₂)_n—

R¹ and R², the same or different =

H, alkyl, ArCH₂ or cyclohexyl-methyl

M = (i) —CH(OH)—(CH₂)_n— or

(ii) —CH(NH₂)—(CH₂)_n— or

(iii) —CH₂—(CH₂)_n— or

(iv) —CO—(CH₂)_n— or

(v) —(CH₂)_n—N(R⁷)—, where

R⁷ = X

(vi) —CH(NH₂)—(CH₂)_n—CO—NH—

with the provisos (I) that when M = (i), (iii) or (iv) and n = 1 then two three or four, and

when M = (v) and n = 1 then three or four, of

D, E, B and Z are present

(II) when M = (i), (ii) or (iv) then R⁵ and R⁶ are

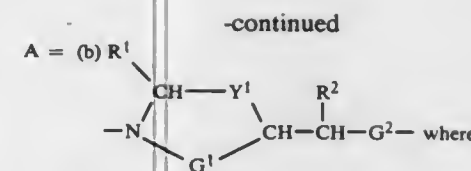
H and when M = (iii) or (v) then if one of R⁴, R⁵, R⁶

and R⁷ is said group —(CH₂)_n—OH or

—(CH₂)_n—NH₂ the others the same or different, are

H or alkyl

or



R¹, R² and G¹, G², the same or different, are as defined above and

Y = (i) —CO— or
(ii) —CH₂— or
(iii) —CH(OH)— or
(iv) —CH(NH₂)— or
(v) —CH₂—NR³— (R³ as above)

B = absent or is Val, Leu, Ile Phe either as such or Na-alkylated and/or reduced at carbonyl

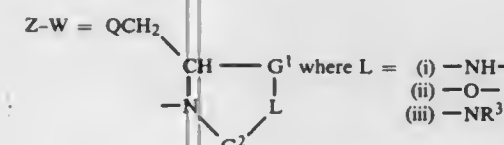
Z = absent or is His, Phe, Tyr, or cyclohexyl alanyl and is either as such or Na-alkylated and/or reduced at carbonyl

W = (a) —OH,
(b) —OR³ } R³ as above

(c) —NH₂, —NHR³, —N(R³)₂

(d) —N— where N is part of a heterocyclic ring

optionally substituted with R₃ or R³ CH₂—groups at one or more positions



and R³ and G¹ and G², the same or different, are as defined above and

Q = (i) H or
(ii) C₁₋₄ alkyl or
(iii) aryl or
(iv) imidazol-4-yl- or indol-3-yl

all compounds being in free form or protected at one or more remaining peptide, carbonyl, amino or other reactive groups including peptide nitrogen or in salt form at amino imidazole or carboxyl groups in particular as physiologically acceptable acid addition salts at basic centres.

4,713,446

VISCOELASTIC COLLAGEN SOLUTION FOR OPHTHALMIC USE AND METHOD OF PREPARATION

Dale P. DeVore, Chelmsford, Mass.; Robert A. Scherrer, White Bear Lake, and Matthew T. Scholz, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 773,310, Sep. 6, 1985, abandoned. This application Aug. 6, 1986, Ser. No. 890,847

Int. Cl.⁴ A61K 31/78; A61B 17/00

U.S. Cl. 530—356 31 Claims

1. A chemically-modified collagen compound which comprises at least two native collagen molecules which are coupled at at least one lysine epsilon amino group present on each said collagen molecule by a coupling group, said coupling group comprising at least two moieties selected from the group consisting of carbonyl and sulfonyl groups.

15. A method of making a chemically-modified collagen compound comprising the steps of

(a) adding to an aqueous solution of at least about 0.05 percent by weight native collagen, a coupling agent in an amount equal to about 1 to 600 moles of coupling agent per mole of native collagen, said coupling agent selected from the group consisting of di- and tri-carboxylic acid halides, di- and tri-sulfonyl halides, di- and tri-anhydrides, di- and tri-reactive active esters, and compounds having at least two moieties selected from the group consisting of

carboxylic acid halide, sulfonyl halide, anhydride and active ester; and

(b) reacting said native collagen and said coupling agent at a pH of above about 8 and at a temperature of between about 0° and 35° C., for a time period sufficient to either react or hydrolyze substantially all of said coupling agent.

4,713,447

PROCESS FOR PREPARING ALKYL GLYCOSIDES

James C. Letton, Forest Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 509,895, Jun. 30, 1983, abandoned. This application Sep. 28, 1983, Ser. No. 536,472

Int. Cl.⁴ C07G 3/00

U.S. Cl. 536—18.6 13 Claims

1. An improved process for preparing alkyl glycosides having from about 1 to about 30 carbon atoms in the alkyl chain, comprising the steps of:

(a) reacting a C₁ to C₃₀ monohydric alcohol with a source of reducing monosaccharide moiety, selected from the group consisting of reducing monosaccharides, corn syrup, molasses and the glycosides of C₁ to C₄ alcohols, in the presence of an acid catalyst; and

(b) neutralizing the catalyst with a base to a pH of from about 6.6 to about 7;

the improvement comprising neutralizing the catalyst with an organic base of the formula (RO)_nM, wherein R is a substituted or unsubstituted alkyl or acyl of from 1 to about 30 carbon atoms, M is selected from the group consisting of alkali metal, alkaline earth metal and aluminum and n is 1 when M is alkali metal, 2 when M is alkaline earth metal, and 3 when M is aluminum.

4,713,448

CHEMICALLY MODIFIED HYALURONIC ACID PREPARATION AND METHOD OF RECOVERY THEREOF FROM ANIMAL TISSUES

Endre A. Balazs, Ft. Lee; Adolf Leshchiner; Adelya Leshchiner, both of Fairview, all of N.J., and Philip Band, Brooklyn, N.Y., assignors to Biomatrix, Inc., Ridgefield, N.J.

Filed Mar. 12, 1985, Ser. No. 710,929

Int. Cl.⁴ C08B 37/08; C08F 8/00; C12P 19/04; C12R 1/46

U.S. Cl. 536—55.1 27 Claims

1. A method of obtaining a chemically modified hyaluronic acid preparation comprising:

(a) treating animal tissue containing hyaluronic acid with an aqueous treating mixture including, an aldehyde to effect chemical modification of the hyaluronic acid contained in the tissue, in situ,

(b) removing excess treating mixture from the reaction mixture,

(c) extracting the chemically modified hyaluronic acid from the treated animal tissue with water,

(d) separating the extract containing the chemically modified hyaluronic acid from the treated animal tissue, and

(e) recovering the chemically modified hyaluronic acid from the extract.

4,713,449

POLYSACCHARIDE POLYMER MADE BY XANTHOMONAS

Rebecca W. Vanderslice, and Shannon, Patrick, both of Boulder, Colo., assignors to Getty Scientific Development Company, Houston, Tex.

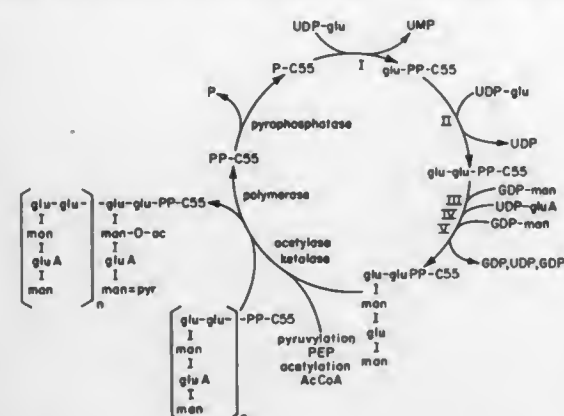
Filed Aug. 6, 1985, Ser. No. 762,878

Int. Cl.⁴ C08B 37/00, 37/18

U.S. Cl. 536—123 5 Claims

1. Water-soluble, polysaccharide polymer consisting essentially of glucose and mannose moieties, having D-glucose:D-

mannose ratio of about 2:1, wherein the D-glucose moieties are linked in a beta-[1,4] configuration, and the D-mannose moi-



eties are linked in an alpha-[1,3] configuration, generally to alternate glucose moieties.

4,713,450

2-THIACEPHEMS AND (SR) PENEMS DERIVATIVES
Marco Alpegiani; Angelo Bedeschi; Maurizio Foglio; Giovanni Franceschi, and Ettore Perrone, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy
Division of Ser. No. 558,629, Dec. 6, 1983, Pat. No. 4,585,874.

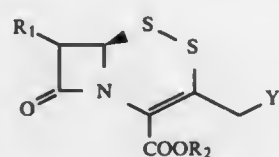
This application Jan. 24, 1986, Ser. No. 821,968
Claims priority, application United Kingdom, Dec. 8, 1982, 8235058; Aug. 27, 1983, 8323129

Int. Cl.⁴ C07D 513/02

U.S. Cl. 540-214

32 Claims

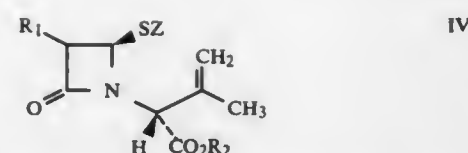
1. A process for preparing a 2-thiacephem derivative of formula II:



wherein R₁ represents a hydrogen atom; an alkyl group having from 1 to 12 carbon atoms optionally substituted with mercapto, protected mercapto, amino, hydroxy, or a cyano group; or a monocycloalkyl group having from 5 to 6 carbon atoms optionally substituted with either an alkyl group having from 1 to 6 carbon atoms or with mercapto, protected mercapto, amino, or hydroxy group;

R₂ represents a straight or branched alkyl group having from 1 to 6 carbon atoms; an alkenyl group having from 2 to 4 carbon atoms; phenyl, benzyl, 2- and 4-methoxybenzyl, 2- and 4-nitrobenzyl, 2,6- and 2,4-dimethoxybenzyl, 4-methoxycarbonylbenzyl, benzhydryl, o-nitro-benzhydryl, acetonyl, trimethylsilyl, diphenyl-t-butyl-silyl, acetoxymethyl, pivaloyloxymethyl, or phthalidyl group; and Y represents a hydrogen atom or

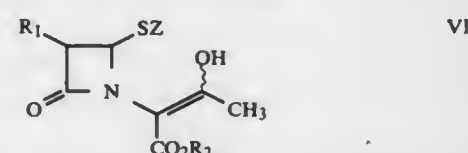
- (a) hydroxy or protected hydroxy group;
- (b) a formyloxy group or an acyloxy group having from 2 to 6 carbon atoms,
- (c) carbamoyloxy group;
- (d) an alkoxy group having from 1 to 4 carbon atoms or an alkylthio group having from 1 to 4 carbon atoms,
- (e) 1-pyridinium or carbamoyl pyridinium or
- (f) methyltetrazolylthio, characterized in that a compound of formula IV



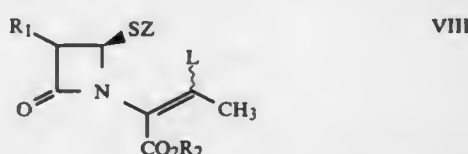
wherein R₁ and R₂ have the above meanings and Z represents

- (i) C₁-C₄ alkylthio, phenylthio, p-tolylthio, 2-benzothiazolylthio or 1-methyl-tetrazol-5-yl-thio;
- (ii) C₁-C₄ acylthio;
- (iii) succinimido or phthalimido or
- (iv) C₁-C₄ alkylsulphinyl, phenylsulphinyl or p-tolylsulphinyl;

is first ozonolyzed in an inert organic solvent by cooling up to -70° C. to give a compound of the formula



wherein R₁, R₂ and Z have the above meaning, treating with alkylsulphonyl halide, in an inert organic solvent, in the presence of an organic base and cooling up to -40° C. to obtain a compound of formula VIII:



wherein R₁, R₂ and Z have the above meaning and L represents an alkylsulphonyloxy which is reacted with a sulphide M₂S or hydrosulphide MHS, wherein M is sodium, potassium, ammonium, triethylammonium, pyridinium or tetrabutylammonium, in an organic solvent at from the room temperature to -50° C., to obtain the desired compound.

4,713,451

CRYSTALLINE DIMETHYLIMINOTHIEAMYCIN
William J. Leanza, Berkeley Heights, and Kenneth J. Willinger, Bridgewater, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

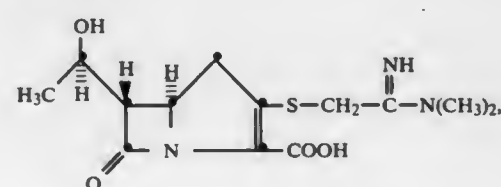
Filed Apr. 9, 1984, Ser. No. 597,944

Int. Cl.⁴ C07D 487/04; A61K 31/40

U.S. Cl. 540-350

1 Claim

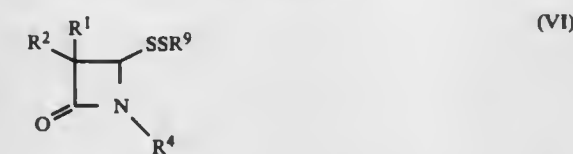
1. Crystalline 5R,6S-6-(1-R-hydroxyethyl) 2-(N,N-dimethylamidinoethylthio)-carbapen-2-em-3-carboxylic acid, having the formula;



and having the following X-ray powder diffraction parameters:

d-Spacing	Relative Intensity
8.15	8.29
7.62	7.02
6.51	17.73
5.27	16.40
4.85	100.00
4.76	35.05
4.45	32.98
4.14	24.01
3.90	30.40
3.85	18.71
3.79	9.90
3.66	8.46
3.25	30.80
3.16	15.20
3.07	18.02
3.02	26.72
2.90	12.95
2.71	7.83
2.62	11.34

phenylsulfonyl, hydroxy, C₁-C₄ alkoxy, C₁-C₄ acyloxy, benzoxyloxy, nitrosoxy, diphenylphosphonyloxy, methanesulfonyl, diphenylmethoxy, di(C₁-C₄ alkyl)amino or piperidin-1-yl), the process comprising reacting a dithioazetidinone derivative represented by the formula



wherein R¹, R² and R⁴ are as defined above and R³ is a substituted or unsubstituted, nitrogen-containing aromatic heterocyclic residue with a compound represented by the formula



wherein R³ is as defined above.

4,713,452

PROCESS FOR PREPARATION OF AZETIDINONE DERIVATIVES

Sigeru Torii; Hideo Tanaka, both of Okayama; Michio Sasaoka, Tokushima; Seiryu Uto, Tokushima, and Syozo Hayase, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

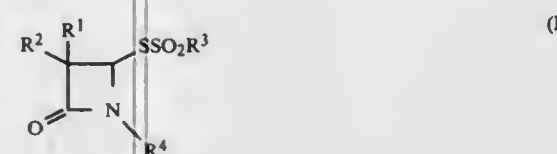
Filed Dec. 12, 1984, Ser. No. 680,723

Claims priority, application Japan, Dec. 12, 1983, 58-234723

Int. Cl.⁴ C07D 205/08; C07B 45/00; C07F 9/65, 7/10

U.S. Cl. 540-358

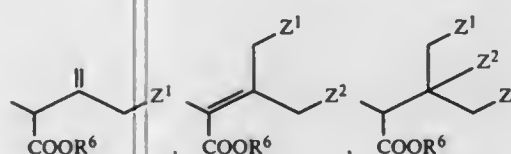
1. A process for preparing an azetidinone derivative represented by the formula



wherein R¹ is hydrogen, halogen or lower alkoxy, R² is hydrogen, a halogen, lower alkoxy, amino or a group



(in which R⁵ is substituted or unsubstituted phenyl, substituted or unsubstituted phenylmethyl, substituted or unsubstituted phenoxyethyl, or substituted or unsubstituted benzoyl), or R¹ and R², when taken together with the carbon atom in the azetidinone ring, are carbonyl, R³ is substituted or unsubstituted phenyl, and R⁴ is hydrogen or one of the following groups



(in which R⁶ is hydrogen or a carboxy protecting group, and Z¹ and Z² are the same or different and represent hydrogen, a halogen, C₁-C₄ alkylthio, phenylthio optionally substituted with 1 to 5 nitro groups or halogen atoms on the phenyl ring, 2-pyridylthio, 2-benzothiazolylthio, 1,3,4-thiadiazol-5-ylthio, 1,2,3,4-tetrazol-5-ylthio, O-ethylthiocarbonate, N,N-diethylthiocarbamate, phenyl-sulfonyl, p-methyl-

4,713,453

OXABICYCLOHEPTANE DERIVATIVES

Toshio Tatsuoka, Hyogo; Kenji Suzuki, Osaka; Kayoko Imao, Nara; Fumio Satoh, Kyoto; Seiji Miyano, and Kunihiro Sumoto, both of Fukuoka, all of Japan, assignors to Suntori Limited, Osaka, Japan

Filed Feb. 27, 1987, Ser. No. 19,973

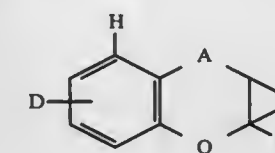
Claims priority, application Japan, Feb. 27, 1986, 61-42732

Int. Cl.⁴ C07D 417/00, 413/00, 405/00, 401/00

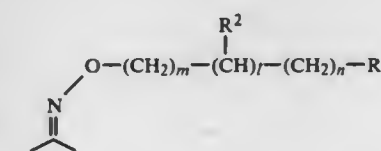
U.S. Cl. 544-60

5 Claims

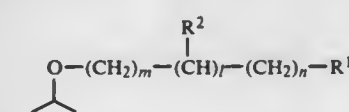
1. An oxabicycloheptane derivative having the following general formula or a pharmaceutically acceptable salt thereof:



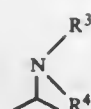
where D is a hydrogen atom, a halogen atom, a hydroxyl group, an alkoxy group, an arylalkoxy group, an acyloxy group, a dialkylcarbamoyloxy group or an amidoalkyloxy group; B is a substituted or unsubstituted phenyl, thienyl or furyl group; A is the group



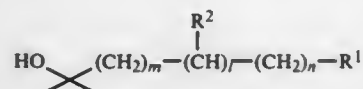
(where l is 0 or 1; m and n are each 1 or more, provided that m+n is an integer of 2-8; R¹ is an alkylamino group, a dialkylamino group, an arylalkylamino group, a morpholino group, a thiomorpholino group, a 1-pyrrolidinyl group, a piperidino group, an N-alkylpiperazinyl group, an N-hydroxyalkylpiperazinyl or a pyrrolizidinyl group; and R² is a lower alkyl group or a hydroxyl group), or the group



(where l, m, n, R¹ and R² are each the same as defined above), or the group



(where R^3 and R^4 which may be the same or different each represents a hydrogen atom, a lower alkyl group, an alkoxy-carbonyl group or an acyl group), or the group



(where m , l , n , R^1 and R^2 are each the same as defined above).

4,713,454 PREPARATION PROCESS OF (6R)-TETRAHYDRO-L-BIOPTERIN

Hideaki Sakai, Yokohama, and Tadashi Kanai, Chiba, both of Japan, assignors to Shiratori Pharmaceutical Co., Ltd., Narashino and Suntory Limited, Osaka, both of Japan
Filed Jan. 23, 1986, Ser. No. 824,288

Claims priority, application Japan, Jan. 28, 1985, 60-12477; Jan. 28, 1985, 60-12478

Int. Cl.⁴ C07D 475/04

U.S. Cl. 544—258

11 Claims

1. A process for the preparation of (6R)-tetrahydro-L-biopterin, which comprises:

hydrogenating L-erythro-biopterin or an acyl derivative thereof in the presence of an amine other than said biopterin starting material which controls the pH of the reaction medium to within the range of 10–13 and a platinum-based hydrogenation catalyst, and, in the event at least one acyl group remains in the hydrogenated biopterin product obtained,

removing the acyl group by hydrolysis.

4,713,455 CYCLIC DERIVATIVES OF ALKYL DIHYDROXYALKYLXANTHENES

Harald Furrer, Kelkheim; Hristo Anagnostopoulos, Taunusstein, and Ulrich Gebert, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 420,932, Sep. 17, 1982, Pat. No. 4,616,020. This application Apr. 4, 1986, Ser. No. 848,139

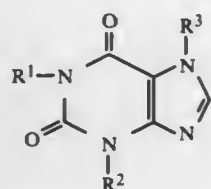
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138397

Int. Cl.⁴ C07D 405/06

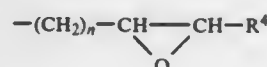
U.S. Cl. 544—267

11 Claims

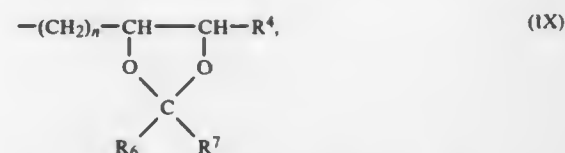
1. A compound of the formula



in which one of the radicals R^1 , R^2 and R^3 represents a group of formula IV



or formula IX



R^4 denoting hydrogen or methyl; R^6 and R^7 , independently of one another, being hydrogen, lower alkyl, phenylalkyl having up to 2 C atoms in the alkyl moiety or phenyl; n , when R^4 is hydrogen, denoting an integer from 2 to 6 and, when R^4 is methyl, denoting 1 to 5, the rest of the radicals R^1 , R^2 and R^3 , independently of one another, denoting hydrogen or alkyl having 1 to 12 C atoms in the positions R^1 and R^3 and having 1 to 4 C atoms in the position R^2 , the total number of carbon atoms in these two radicals being a maximum of 14.

4,713,456 PROCESS FOR THE PREPARATION OF 5-ACYLPYRIMIDINES

Hans-Ludwig Elbe, and Graham Holmwood, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,639

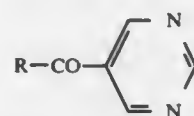
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431689

Int. Cl.⁴ C07D 239/26, 401/06, 403/06, 405/06, 407/06, 409/06, 411/06, 413/06

U.S. Cl. 544—335

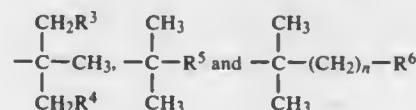
3 Claims

1. A process for the preparation of a 5-acylpyrimidine of the formula



in which

R represents straight-chain or branched alkyl with 1 to 12 carbon atoms, straight-chain or branched alkenyl with 3 to 6 carbon atoms, straight-chain or branched alkynyl with 3 to 6 carbon atoms or cycloalkyl and cycloalkylalkyl with in each case 3 to 7 carbon atoms in the alkyl part and in each case optionally mono-, di- or tri-substituted by identical or different alkyl substituents with 1 to 4 carbon atoms; or represents phenyl which is optionally mono-, di- or tri-substituted by identical or different substituents selected from the group consisting of halogen, hydroxyl, alkyl, alkoxy and alkylthio with in each case 1 to 4 carbon atoms; halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms; nitro, cyano and alkoxy-carbonyl with 1 to 4 carbon atoms in the alkoxy part, and phenyl and phenoxy, in each case optionally substituted by halogen; or furthermore represents 5- to 6-membered heteroaryl which has 1 to 3 oxygen, nitrogen and/or sulphur atoms, and is optionally mono-, di- or tri-substituted by identical or different substituents, possible substituents being the abovementioned substituents on phenyl, or represents the groupings



wherein

R^3 represents fluorine, chlorine or bromine;

R^4 represents hydrogen, fluorine, chlorine or bromine;

R^5 represents straight-chain or branched alkenyl with 2 to 4 carbon atoms, straight-chain or branched alkynyl with 3 to 5 carbon atoms, or the CHO group, alkoxyiminomethyl with 1 to 4 carbon atoms in each alkoxy part, dialkoxy-methyl with 1 to 4 carbon atoms in each alkoxy part, dioxolanyl and dioxanyl;

R^6 represents cyano, or represents phenyl which is optionally mono- di- or tri-substituted by identical or different substituents, possible substituents being the substituents on phenyl which have already been mentioned above, or represents the groupings $-XR^7$ and $-CONR^8R^9$, wherein

R^7 represents straight-chain or branched alkyl with 1 to 6 carbon atoms or halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms or represents phenyl or phenylalkyl, with 1 or 2 carbon atoms in the alkyl part, each of which is optionally mono-, di- or tri-substituted by identical or different substituents, possible substituents in each case being the substituents on phenyl which have already been mentioned above;

R^8 represents hydrogen or straight-chain or branched alkyl with 1 to 4 carbon atoms, or represents phenyl which is optionally mono- di- or tri-substituted by identical or different substituents, possible substituents being the substituents on phenyl which have already been mentioned above;

R^9 represents hydrogen or straight-chain or branched alkyl with 1 to 4 carbon atoms;

x represents oxygen or sulphur and

n represents the number 0, 1 or 2,

comprising reacting a methyl ketone of the formula



(a) in a first stage with a formylating reagent selected from the group consisting of a formic acid alkyl ester with 1 to 4 carbon atoms in the alkyl group, and phenyl formate, in the presence of a base at a temperature between -25°C . and $+60^\circ\text{C}$., thereby forming an enol-ketone of the formula



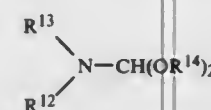
in which

R^{10} represents hydrogen or an alkali metal, in a second stage reacting the enol-lactone with formamidine or a salt thereof with an organic or inorganic acid, at a temperature between -25°C . and $+50^\circ\text{C}$., thereby to form a formamidine derivative of the formula



in a third stage reacting the formamidine derivative with an amino-formylating agent selected from the group consisting of

(α) a formamidine acetal of the formula



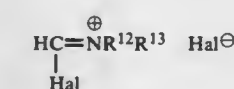
in which

R^{12} and R^{13} independently of one another represent methyl, ethyl, n-propyl, isopropyl or n-butyl, or R^{12} and R^{13} , together with the nitrogen atom to which they are bonded, represent pyrrolidinyl, piperidinyl, morpholinyl or N-methyl-piperazinyl, and R^{14} represents methyl, ethyl or n-propyl,

(β) an aminal ester of the formula



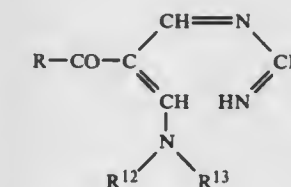
and
(γ) a formiminium halide of the formula



in which

Hal represents halogen,

at a temperature between -25°C . and $+50^\circ\text{C}$., thereby to form a compound of the formula

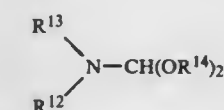


and, in a fourth stage cyclizing such compound by heating to a temperature between 0°C . and 100°C ., or

(b) in a first stage with a formylating reagent selected from the group consisting of a formic acid alkyl ester with 1 to 4 carbon atoms in the alkyl group, and phenyl formate, in the presence of a base at a temperature between -25°C . and $+60^\circ\text{C}$., to form an enol-ketone of the formula



in a second stage reacting the enol-lactone with an amino-formylating agent selected from the group consisting of
(α) a formamidine acetal of the formula

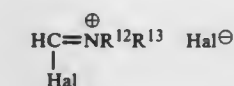


(β) an aminal ester of the formula

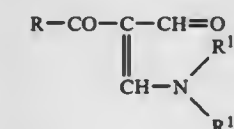


and

(γ) a formiminium halide of the formula



at a temperature between -25°C . and $+50^\circ\text{C}$., to form a compound of the formula



reacting such compound with formamidine at a temperature between -20°C . and $+30^\circ\text{C}$., and then cyclizing the product formed by heating to a temperature between 0°C . and 100°C .

4,713,457

ERGOLINE DERIVATIVES AND ACID ADDITION SALTS THEREOF

Sachio Ohno; Yuko Ebihara; Kiyoshi Mizukoshi, all of Aichi; Kenji Ichihara, Gifu; Takao Ban, and Mitsuaki Nagasaka, both of Aichi, all of Japan, assignors to Maruko Seiyaku Co., Ltd., Nagoya, Japan

Filed Feb. 21, 1986, Ser. No. 831,676

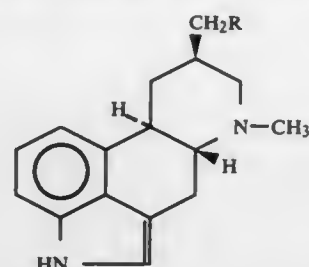
Claims priority, application Japan, Feb. 21, 1985, 60-33430; Dec. 28, 1985, 60-299203

Int. Cl.⁴ A61K 31/48; C07D 457/00

U.S. Cl. 546-67

3 Claims

1. An ergoline compound represented by the formula (I)



wherein R represents a 5-membered heterocyclic group which contains at least one nitrogen atom as a hereto atom and which is a monovalent group with the nitrogen atom of that group carrying the monovalency, selected from the group consisting of an imidazol-1-yl group, a 2-oxoxazolidin-3-yl group, a 1,2,4-triazol-1-yl group, a tetrazolyl group, a succinimido group, a 2-methylimidazol-1-yl group, a 2-ethylimidazol-1-yl group, a 2-isopropylimidazol-1-yl group, a 2-propylimidazol-1-yl group, a 2-phenylimidazol-1-yl group, a 2-ethyl-4-methylimidazol-1-yl group, a 5-ethoxycarbonyl-4-methylimidazol-1-yl group and a 4-ethoxycarbonyl-5-methylimidazol-1-yl group, and a pharmaceutically acceptable acid addition salt thereof.

4,713,458

PREPARATION OF ETHENYLIDENES

Kevin A. Frazier, Midland, Mich., and James M. Renga, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

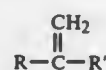
Continuation-in-part of Ser. No. 487,537, Apr. 23, 1983, abandoned. This application Aug. 21, 1984, Ser. No. 642,859

Int. Cl.⁴ C07D 491/044, 319/08, 213/14

U.S. Cl. 546-115

17 Claims

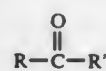
1. A process for the preparation of ethenylidene-containing compounds corresponding to the formula:



wherein R and R' are individually the same or different monovalent suitably inert C₁₋₂₀ organic radicals, or R and R' are collectively a suitably inert divalent organic radical capable of forming a ring having the



moiety as a member of said ring comprising contacting a carbonyl-containing compound corresponding to the formula:



where R and R' are as previously defined with dimethyl car-

bonate in the presence of a triorgano phosphine compound under conditions sufficient to form the desired ethenylidene compound.

4,713,459

PERFLUORO COMPOUNDS

Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa, Suita, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Division of Ser. No. 442,416, Nov. 17, 1982, Pat. No. 4,591,593.

This application Feb. 18, 1986, Ser. No. 830,094

Claims priority, application Japan, Nov. 27, 1981, 56-191357;

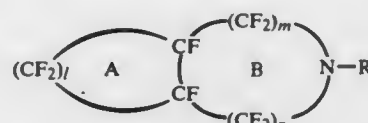
Jun. 25, 1982, 57-110200

Int. Cl.⁴ A61K 31/47, 31/40; C07D 209/10, 217/22

U.S. Cl. 546-150

11 Claims

1. A perfluoro compound represented by the formula,



wherein R denotes a lower perfluoroalkyl group, l is an integer of 3 or 4, n+m is an integer of 2 or 3, provided that n may be zero, and at least one of the ring fluorines of ring A or ring B is optionally replaced by a lower perfluoroalkyl group.

4,713,460

2,3-BIS-(POLY)CHLOROMETHYL)PYRIDINES

Michael A. DesJardin, Dublin; Thomas J. Dietsche, Berkeley, and Jon A. Orvik, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

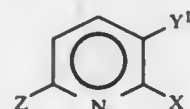
Filed Jul. 22, 1986, Ser. No. 888,897

Int. Cl.⁴ C07D 211/72, 211/84

U.S. Cl. 546-345

25 Claims

1. A 2,3-bis((poly)chloromethyl)pyridine compound of the formula



wherein

X and Y¹ each, independently represents CH₂Cl, CHCl₂, or CCl₃; and Z represents hydrogen or chloro; with the proviso that X and Y¹ do not both represent CH₂Cl or CCl₃.

4,713,461

PROCESS FOR PRODUCING GLUTACONIC ACID DERIVATIVES

Hiroshi Onoue, Nara, and Hiromi Takahashi, Hyogo, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Aug. 8, 1985, Ser. No. 763,784

Claims priority, application Japan, Aug. 24, 1984, 59-176954

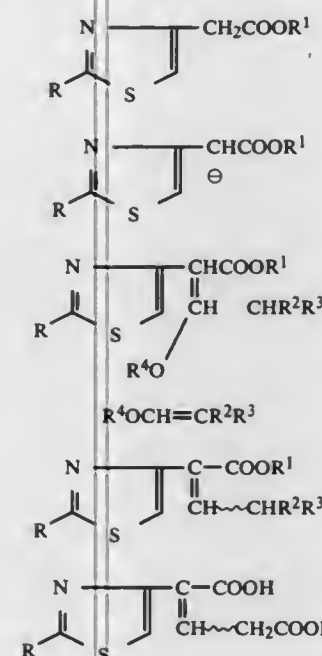
Int. Cl.⁴ C07D 277/38, 277/46

U.S. Cl. 548-194

7 Claims

1. A process for producing a glutaconic acid compound by a condensation reaction of a thiazoleacetic acid compound (I) and an alkoxyacrylic acid compound (II) in the presence of a base, which comprises treating a thiazoleacetic acid compound (I) with a base selected from a hydride or lower alkoxide of an alkali metal to produce a carbanion (Ia), mixing this carbanion with an alkoxyacrylic acid compound (II) to produce an alkoxyglutaric acid compound (Ib), eliminating the alcohol R⁴OH

from the latter compound (Ib) to produce a glutaconic acid compound (III), and optionally hydrolysing the glutaconic acid compound (III) to produce free glutaconic acid compound (IV), said reaction being carried out in the presence of a solvent at a temperature of from -30° C. to 100° C. for 5 minutes to 10 hours, and wherein 1 to 3 equivalents of said alkoxyacrylic acid compound (II) is treated with said thiazoleacetic acid compound (I) in the presence of 2 to 5 molar equivalent of said base in 3 to 20 parts by weight of said solvent, said compounds (I), (Ia), (Ib), (II), (III) and (IV) having the formulas:



wherein,

R is amino or amino substituted by 1C to 5C alkanoyl, halo-1C to 5C-alkanoyl, 2C to 6C alkoxyformyl, 8C to 15C aralkoxyformyl, or 3C to 8C alkylidene or aralkylidene; R¹ is 1C to 8C alkyl, 1C to 5C haloalkyl, 1C to 5C alkoxyalkyl, 1C to 8C sulfonylalkyl, 2C to 5C alkenyl, or 7C to 15C aralkyl; R² is hydrogen, cyano, or carboxy esterified by 1C to 8C alkyl, 1C to 5C haloalkyl, 1C to 5C alkoxyalkyl, 1C to 8C sulfonylalkyl, 2C to 5C alkenyl, or 7C to 15C aralkyl; R³ is hydrogen, cyano, or carboxy esterified by 1C to 8C alkyl, 1C to 5C haloalkyl, 1C to 5C alkoxyalkyl, 1C to 8C sulfonylalkyl, 2C to 5C alkenyl, or 7C to 15C aralkyl; and R⁴ is 1C to 5C alkyl or 7C to 15C aralkyl.

4,713,462

FLAMEPROOFING AGENTS, THEIR PREPARATION AND THEIR USE FOR PROVIDING POLYCARBONATES WITH A FLAME-RESISTANT FINISH

Hans-Jürgen Kress, Krefeld, and Klaus Kircher, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 661,770, Oct. 17, 1984, Pat. No. 4,661,543.

This application Nov. 26, 1986, Ser. No. 935,448

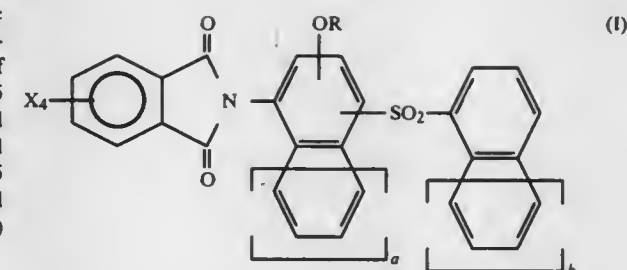
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337857

Int. Cl.⁴ C07D 209/48

U.S. Cl. 548-473

8 Claims

1. A phthalimide of the general formula



(I) wherein

X denotes hydrogen or up to four halogen atoms, a and b independently of each other denote 0 or 1 and R denotes a C₁-C₄-alkyl radical.

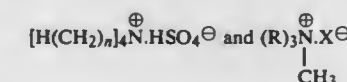
(Ia)

(Ib)

(II)

(III)

(IV)



wherein n is an integer having a value of from 3 to 10; R is alkyl having from 4 to 12 carbon atoms and X⁻ is Cl⁻ or Br⁻, to produce the corresponding N-epoxypropyl lactam.

4,713,464

PROCESS FOR PRODUCTION OF MALEIC ANHYDRIDE

Carlo Fumagalli, Valbrembo, and Giancarlo Stefani, Bergamo, both of Italy, assignors to Alusuisse Italia, S.p.A., Milan, Italy

Division of Ser. No. 789,151, Oct. 18, 1985, Pat. No. 4,668,652.

This application Jan. 27, 1986, Ser. No. 819,599

Claims priority, application Italy, Nov. 20, 1984, 23671 A/84

Int. Cl.⁴ C07D 307/60

U.S. Cl. 549-259

13 Claims

1. The method comprising partially oxidizing 1,3-butadiene, n-butane, but-1-ene, cis-but-2-ene, trans-but-2-ene or a mixture of at least two of said compounds, to maleic anhydride in the presence of a catalyst, said catalyst consisting of a vanadium-phosphorus complex oxide, the catalyst containing 1 to 1.3 atoms of phosphorus per atom of vanadium, the catalyst having pores, the pore volume of those pores which have a radius of 100 to 1,000 Å is at 30 percent of the total pore volume of the pores which have a radius of less than 10,000 Å, the catalyst being produced by the method comprising introducing a phosphorus-containing compound into an organic solvent, continuously adding a vanadium-containing compound to the reaction mixture over the course of 0.5 to 4 hours, 1 to 1.3 atoms of phosphorus being employed per atom of vanadium, continuously removing the water formed during the reaction directly from the reaction mixture, separating the reaction mixture, removing the solvent from the formed V-P-O complex oxide at a temperature of 90° to 150° C. and activating the

V-P-O complex oxide at a temperature of 200° to 300° C. to provide the catalyst.

4,713,465

FLAVANONE INTERMEDIATES FOR HALOGENOHYDROXYFLAVONES

Josef Krämer, Seeheim-Jugenheim; Klaus Irmscher, Darmstadt; Helmut Prücher, Heppenheim, and Rolf-Dieter Hesch, Hannover-Kleefeld, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 26, 1985, Ser. No. 801,703

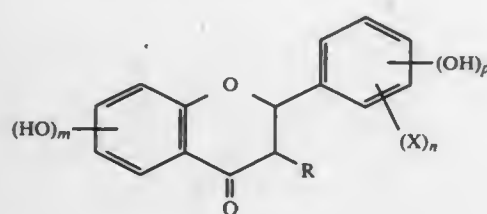
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1984, 3443007; Feb. 19, 1985, 3505611

Int. Cl.⁴ C07D 311/32

U.S. Cl. 549—403

1 Claim

1. A flavanone of the formula



wherein

R is alkyl of 1-3 C atoms,

X is F, Cl, Br or I, and

each of m, n and p is 1, 2 or 3, and the sum of n and p is not more than 5.

4,713,466

PROCESS FOR THE PREPARATION OF ISOSORBIDE-5-MONONITRATE

Ottorino De Lucchi; Fabiola Filippuzzi; Giorgio Modena, all of Padova, and Ettore Camera, Gorizia, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome and Dinamite, Udine, both of Italy

Filed May 12, 1986, Ser. No. 861,705

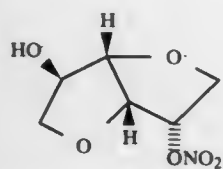
Claims priority, application Italy, May 10, 1985, 20660 A/85

Int. Cl.⁴ C07D 493/04

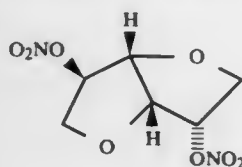
U.S. Cl. 549—464

10 Claims

1. A process for the preparation of isosorbide-5-mononitrate (I)



from isosorbide-2,5-dinitrate (II)



wherein the isosorbide-2,5-dinitrate (II) is treated, in a reaction medium consisting of an organic solvent either containing or not containing water, with a reduction system in the presence of not easily oxidisable coordinating metal ions.

4,713,467

PROCESS FOR PRODUCTION OF ISOTHIOCYANATES

Jeffrey E. Telschow, Tarrytown, and Danielle A. Bright, Spring Valley, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 6, 1986, Ser. No. 927,478

Int. Cl.⁴ C07C 161/04

U.S. Cl. 558—18

10 Claims

1. A process for forming an isothiocyanate which comprises oxidizing, with an oxygen-containing gas, a dithiocarbamate in the presence of a metal oxidation catalyst with adjustment of the pH to suppress the formation of undesired by-product.

4,713,468

TOLAN-TYPE NEMATIC LIQUID CRYSTALLINE COMPOUNDS

Haruyoshi Takatsu, Kodaira; Makoto Sasaki, Urawa; Yasuyuki Tanaka, and Hisato Sato, both of Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 692,570, Jan. 18, 1985. This application Feb. 11, 1987, Ser. No. 14,259

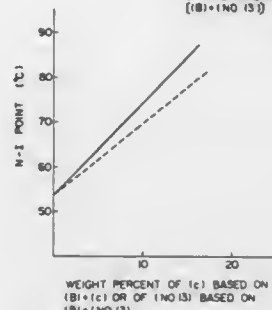
Claims priority, application Japan, Jan. 23, 1984, 59-8519; Jan. 24, 1984, 59-10658; Mar. 29, 1984, 59-59588; Mar. 29, 1984, 59-59589; Jun. 19, 1984, 59-124489; Dec. 11, 1984, 59-261413; Dec. 11, 1984, 59-261414

Int. Cl.⁴ C09K 19/30, 19/54; C07C 121/50, 25/24

U.S. Cl. 558—411

5 Claims

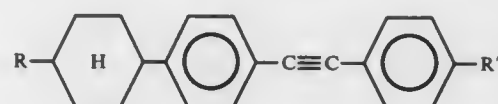
----- MIXED LIQUID CRYSTALS
CONTAINING KNOWN
COMPOUND
[(B)+(C)]
----- MIXED LIQUID CRYSTALS
CONTAINING COMPOUND
OF THE INVENTION
[(B)+(D)+(E)]



(I)

(II)

1. A compound of the general formula



wherein R represents a linear alkyl group having 1 to 10 carbon atoms, R' represents a linear alkyl group having 1 to 10 carbon atoms, a cyano group or a halogen atom; and the cyclohexane ring has a trans(equatorial-equatorial) configuration.

4,713,469

FLUORINE-CONTAINING MULTIFUNCTIONAL ESTER COMPOUND

Yoshio Takeuchi, Kosugi; Toru Kolzumi, Toyama, and Kozo Hori, Kosui, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

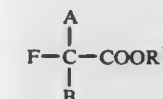
Continuation-in-part of Ser. No. 808,564, Dec. 13, 1985, abandoned. This application Mar. 27, 1986, Ser. No. 845,106
Claims priority, application Japan, Mar. 1, 1985, 60-41619; Mar. 1, 1985, 60-41620

Int. Cl.⁴ C07C 117/00, 69/14

U.S. Cl. 560—17

2 Claims

1. A fluorine-containing multi-functional ester compound of the formula:



wherein A is NO₂, Br or N₃, B is C₆H₅S or C₂H₅S, provided that when A is N₃ then B may also be Br, R' is selected from the group consisting of alkyl of 1 to 4 carbon atoms, phenyl, chlorophenyl, tolyl, xylyl, naphthyl, benzyl and phenethyl.

4,713,470

RACEMIZATION OF AMINO ACIDS

Stanley B. Mirviss, Stamford, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 22, 1985, Ser. No. 736,724

Int. Cl.⁴ C07B 57/00

U.S. Cl. 560—38

21 Claims

1. A process for the racemization of an optical isomer of an alpha amino acid or derivative thereof which comprises contacting said optical isomer under conditions conducive to racemization with, as a racemization catalyst the product formed when a hydroxy aromatic aldehyde is reacted with a chloroalkyl-substituted vinylbenzene polymer wherein the number of repeating polymer units ranges from about 100 to about 1,000,000 under reaction conditions so as to form an aromatic aldehyde-containing polymer wherein the aldehyde-substituted aromatic moiety is linked to the polymer through an ether linkage.

4,713,471

METHOD FOR THE PREPARATION OF BENZYLOXYPHENOXY PENTANOATES

Richard W. Brown, Richmond, and Richard D. Gless, Jr., Oakland, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

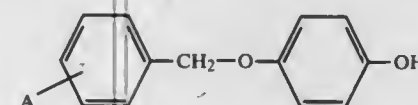
Filed Aug. 15, 1986, Ser. No. 896,794

Int. Cl.⁴ C07C 69/76

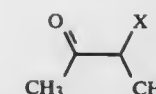
U.S. Cl. 560—53

10 Claims

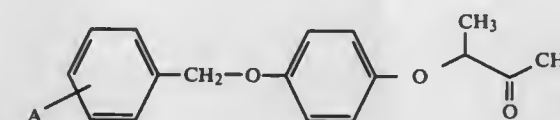
1. A method for the preparation of benzyloxyphenoxy pentanoates which comprises the steps of:
(a) reacting a benzyloxyphenol of the formula



wherein A is selected from the group consisting of hydrogen, lower alkyl having from 1 to 5 carbon atoms, or halogen, with a 3-halo-2-butanone of the formula



wherein X is selected from the group consisting of chlorine, iodine or bromine, in the presence of a base selected from carbonate salts of alkaline earth or alkali metals, a catalyst selected from the group consisting of alkali metal salts of iodine or bromine, preferably potassium iodide or sodium iodide, and a ketonic solvent preferably selected from the group consisting of methyl ethyl ketone, methyl isobutyl ketone or acetone, to produce a 3-(4-benzyloxyphenoxy)-2-butanone of the formula



wherein A is as previously defined; and

(b) reacting said 3-(4-benzyloxyphenoxy)-2-butanone with a dialkyl carbonate of the formula (RO)₂CO, wherein R is an alkyl group having from 1 to 4 carbon atoms in the presence of a base selected from an alkali or alkaline earth metal alkoxide or an alkali or alkaline earth metal or their hydrides, and an organic solvent to form 4-(4-benzyloxyphenoxy)-3-oxopentanoate.

4,713,472

PREPARATION OF DIMETHYL 4,4'-STILBENEDICARBOXYLATE AND INTERMEDIATES THEREFOR

Dale E. Van Sickle, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 15, 1986, Ser. No. 863,274

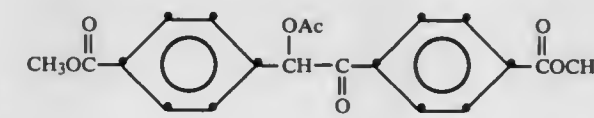
Int. Cl.⁴ C07C 69/76, 67/313, 67/32

U.S. Cl. 560—53

10 Claims

1. The process for preparing 4,4'-dimethylstilbenedicarboxylate comprising acetylating 4,4'-bis(methoxycarbonyl)benzoin to 4,4'-bis(methoxycarbonyl)benzoin acetate, hydrogenating 4,4'-bis(methoxycarbonyl)benzoin acetate to 1,2-bis(4-methoxycarbonylphenyl)ethanol, subjecting the 1,2-bis(4-methoxycarbonylphenyl)ethanol to either (1) dehydration at from about 20° C. to about 250° C. to produce the 4,4'-dimethylstilbenedicarboxylate, or (2) acetylation to produce 1,2-bis(4-carbomethoxyphenyl)-1-acetoxy ethane, which is then pyrolyzed at from about 200° C. to about 450° C. to produce the 4,4'-dimethylstilbenedicarboxylate.

7. The compound of the formula



4,713,473

PROCESS FOR TREATING 2-ETHYLHEXYL P-METHOXYCINNAMATE IN THE PRESENCE OF A PHENOL

Peter Schodel, Grüt; Rolf Schwarzenbach, Winterthur, and Hans U. Gonzenbach, Geneva, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Jan. 8, 1987, Ser. No. 1,279

Claims priority, application Switzerland, Jan. 15, 1986, 128/86; Oct. 16, 1986, 4137/86

Int. Cl.⁴ C07C 69/76

U.S. Cl. 560—053

7 Claims

1. A process for the treatment of 2-ethylhexyl p-methoxycinnamate which comprises heating 2-ethylhexyl p-methoxycinnamate in the presence of a phenol at a temperature of from about 150° C. to about 230° C. for a time sufficient to provide a material which tests Ames negative.

4,713,474

ALKANEDICARBOXYLIC DIESTER COMPOUNDS

Hiroyuki Akashi, Chikugo; Takeshi Inoue, and Shoichi Horie, both of Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP85/00641, § 371 Date Jul. 3, 1986, § 102(e) Date Jul. 3, 1986, PCT Pub. No. WO86/03193, PCT Pub. Date Jun. 5, 1986

PCT Filed Nov. 16, 1985, Ser. No. 887,452

Claims priority, application Japan, Nov. 20, 1984, 59-245672; May 21, 1985, 60-109867

Int. Cl.⁴ C07C 69/76

U.S. Cl. 560—66

1 Claim

1. An alkanedicarboxylic diester compound represented by the formula:



wherein n is an integer of 0-8 and R is benzyl group.

4,713,475

LONG CHAIN (4-HYDROXYPHENYL) PROPANOATE STABILIZERS

John D. Spivack, Spring Valley; David H. Steinberg, New York, both of N.Y., and Paul A. Odorisio, Edgewater, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

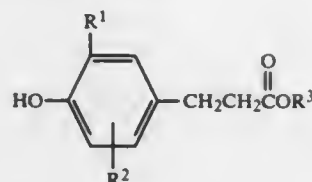
Filed Jun. 12, 1986, Ser. No. 873,556

Int. Cl.⁴ C07C 69/76

U.S. Cl. 560—75

13 Claims

1. A compound of the formula



wherein

R¹ and R² are independently alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 18 carbon atoms; and

R³ is alkyl of 35 to 50 carbon atoms or mixtures thereof.

4,713,476

PROCESS FOR THE PREPARATION OF ALIPHATIC DI- AND POLYURETHANES

Franz Merger, Frankenthal, and Friedrich Towae, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 135,247, Mar. 31, 1980. This application Jun. 26, 1986, Ser. No. 879,025

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917493

Int. Cl.⁴ C07C 125/073

U.S. Cl. 560—115

18 Claims

1. A process for the preparation of bis- or higher functional N-alkylcarbamates comprising:

- reacting an aliphatic primary di- or polyamine with urea and a primary or secondary aliphatic alcohol in an amino-group to urea to alcohol ratio of from about 1:0.9:1 to 1:5:20 at a temperature of from in excess of 190° C. to about 300° C.; and
- separating the bis- or higher functional N-alkyl carbamate product from unreacted and partly reacted starting materials, impurities, and by-products.

4,713,477

OMEGA CYCLOALKYL PROSTAGLANDINS

Paul W. Collins, Deerfield, and Alan F. Gasiecki, Vernon Hills, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 669,137, Nov. 7, 1984, which is a continuation-in-part of Ser. No. 551,238, Nov. 14, 1983, Pat. No. 4,499,296. This application Nov. 14, 1985, Ser. No. 798,197

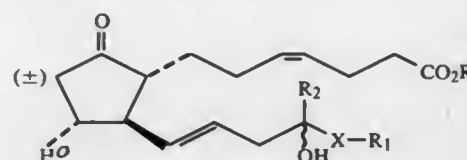
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.⁴ C07C 177/00

U.S. Cl. 560—118

9 Claims

1. A compound of the formula



wherein

R represents hydrogen or lower alkyl containing 1 to 6 carbon atoms;
X represents —CH₂—, —CH=CH—, —C≡C—, —C≡C—CH₂—, —CH=CH—CH₂—, —CH₂—CH₂—CH₂—, —CH₂—CH=CH—, —CH₂—C≡C—; and R₁ represents cyclopropyl, cyclobutyl, cyclopentyl, or 1-methylcyclopropyl or 1-methylcyclobutyl or XR₁ together represent 1-methyl-1-cyclopropylethyl or 1-methyl-1-cyclobutylethyl; R₂ represents lower alkyl having 1 to 4 carbons vinyl or ethynyl and the wavy line represents optional R or S stereochemistry.

4,713,478

PROCESS FOR THE PREPARATION OF DIALKYL 2-VINYLCYCLOPROPANE-1,1-DICARBOXYLATES

Richard G. Fayter, Jr., Fairfield, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 28, 1986, Ser. No. 936,001

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.⁴ C07C 69/743

U.S. Cl. 560—124

6 Claims

1. A process of preparing dialkyl 2-vinylcyclopropane-1,1-dicarboxylates which comprises condensing a di lower alkyl malonic ester with a 1,4-dihalobutene-2 in the presence of an alcoholic solution of a metallic alkoxide and recovering the dialkyl 2-vinylcyclopropane-1,1-dicarboxylate so produced.

4,713,479

SYNTHESIS OF HIGH-PURITY DIALKYL 2-VINYLCYCLOPROPANE-1,1-DICARBOXYLATE

Clarence E. Clark, Jr., Cincinnati, and Richard G. Fayter, Jr., Fairfield, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 28, 1986, Ser. No. 936,004

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.⁴ C07C 69/743

U.S. Cl. 560—124

8 Claims

1. A process of preparing dialkyl 2-vinylcyclopropane-1,1-dicarboxylates which comprises the two-step reaction sequence of:

- contacting a mixture of trans-1,4-dihalobutene-2 and cis-1,4-dihalobutene-2 with a thiol catalyst or a hydrogen bromide or hydrogen chloride catalyst and an initiator for the reaction at a temperature from about 25° C. to about 80° C. and for a time sufficient to permit the conversion of substantially all of the cis-1,4-dihalobutene-2 to trans-1,4-dihalobutene-2, thereafter;
- cyclocondensing a di lower alkyl malonic ester with said trans-1,4-dihalobutene-2 in the presence of an alcoholic solution of a metallic alkoxide and recovering the high purity dialkyl 2-vinylcyclopropane-1,1-dicarboxylate so produced.

4,713,480

METHOD FOR THE PRODUCTION OF CRYSTALLINE AMINO-PROTECTED-BETA-BENZYL-L-ASPARTIC ACID

John M. Pascone, Neshanic Station, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jan. 7, 1987, Ser. No. 1,076

Int. Cl.⁴ C07C 125/065

U.S. Cl. 560—157

13 Claims

1. A method for producing a crystalline amino-protected beta-benzyl-L-aspartic acid which comprises

- combining an oxycarbonyl compound providing an amino protecting group with beta-benzyl-L-aspartic acid and a tertiary amine organic base having a pK_a value of about 9 to about 12 in the presence of water and a water-immiscible polar organic solvent, and at a pH value of about 7.5 to about 9, and maintaining the resulting combination of constituents for a time period sufficient to produce a non-aqueous solution of a salt of amino-protected beta-benzyl-L-aspartic acid;
- recovering said non-aqueous solution;
- adding water and a water-insoluble, non-polar organic liquid phase modifier to said non-aqueous solution to produce a liquid having an aqueous phase and an organic liquid phase;
- acidifying said liquid to a pH value of about 0.5 to about 2; separating the organic liquid phase from the acidified liquid; and
- adding an additional amount of said organic liquid phase modifier to the separated organic liquid phase sufficient to induce crystallization of amino-protected beta-benzyl-L-aspartic acid from said separated organic liquid phase.

4,713,481

AMINE-FUNCTIONAL MONOETHYLENIC MONOMERS, ACRYLIC COPOLYMERS AND AQUEOUS COATING COMPOSITIONS CONTAINING THE SAME

Anthony J. Tortorello, Elmhurst, Ill., and Joseph D. Lukanich, Green Lake, Wis., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 865,784, May 22, 1986, Pat. No. 4,665,146.

This application Oct. 30, 1986, Ser. No. 924,831

Int. Cl.⁴ C07C 125/07

U.S. Cl. 560—159

11 Claims

1. A monoethylenically unsaturated polymerizable mono-

mer carrying a plurality of ketimine-blocked primary amine groups.

4,713,482

MALEIC OR PHTHALIC ACID HALF ESTERS OF ALKOXYLATED FATTY AMINES

Rosemarie Töpfl, Dornach, and Heinz Abel, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,420

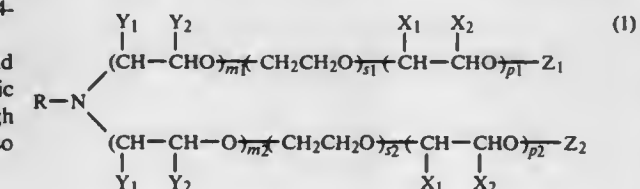
Claims priority, application Switzerland, Mar. 26, 1985, 1314/85; Nov. 15, 1985, 4898/85

Int. Cl.⁴ C07C 69/60, 69/80

U.S. Cl. 560—196

14 Claims

1. A maleic acid or phthalic acid half ester of the formula



or a quaternary ammonium compound thereof, wherein R is an aliphatic radical of 12 to 24 carbon atoms, one of Y₁ and Y₂ is hydrogen and the other is phenyl, one of X₁ and X₂ is hydrogen and the other is methyl, one of Z₁ and Z₂ is hydrogen and the other is the maleic acid radical or the phthalic acid radical, m₁ and m₂ are each 0 or 1, s₁, s₂, p₁ and p₂ are integers, with the sum of s₁+s₂ being 25 to 50 and the sum of p₁+p₂ being 4 to 15.

4,713,483

PROCESS FOR THE PRODUCTION OF OXALIC ACID DIESTERS

Klaus Langerbeins, Langen; Günther Schröder, Ober-Ramstadt, and Hans-Peter Boehm, Otterbrunn, all of Fed. Rep. of Germany, assignors to Röhm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Apr. 9, 1986, Ser. No. 849,858

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513255

Int. Cl.⁴ C07C 67/36

U.S. Cl. 560—204

23 Claims

1. The process for the production of a diester of oxalic acid, which comprises oxidatively carbonylating an alcohol with carbon monoxide and oxygen as oxidizers at a pressure of from 1 to 700 atmospheres and at a temperature of from 20° to 250° C. in a reaction phase which contains the said alcohol and a catalyst comprising palladium and at least one metal halide in catalytically effective amounts, together with an activated carbon which is pretreated before use by heating to 200° to 1500° C. in a gas atmosphere that is different from air and which contains at least one of the following gases:

- nitrogen
- (b1) ammonia or an alkyl derivative of ammonia;
- (b2) hydrazine or an alkyl derivative of hydrazine;
- (b3) hydrogen cyanide, dicyanogen or an alkyl nitrile;
- (b4) an unsaturated nitrile;
- (b5) an amide or a hydrazide of a C₁-C₂ carbonic acid or an N-alkyl derivative of an amide or a hydrazide of C₁-C₂ carbonic acid; or
- (c) carbon monoxide.

4,713,484

SINGLE PHASE CARBOXYLATION OF AROMATIC HALIDES TO CARBOXYLIC ACID SALTS

Ronald A. Epstein, Yonkers, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 796,687, Nov. 12, 1985. This application Dec. 22, 1986, Ser. No. 945,257

Int. Cl.⁴ C07C 51/14

U.S. Cl. 562—406

29 Claims

1. A process for preparing carboxylic acid salts comprising the single phase carbonylation of at least one organic halide in the presence of an alcohol, CO, and a base in conjunction with a palladium catalyst and an excess of tertiary phosphine, and wherein the base and excess phosphine is added during the reaction at a rate necessary to prevent side-product formation and catalyst decay.

4,713,485

PROCESS FOR PREPARING α -HYDROXY-ALKANOIC ACIDS AND COMPOUNDS OBTAINED BY THIS PROCESS

Jean-Daniel Andre, Sisteron; Pierre-Jean Grossi, Aramon; Alain Heymes, Sisteron, all of France, and Giovanni V. Manzaroli, Milan, Italy, assignors to SANOFI and Industria Chimica Prodotti FRANCIS S.p.A., Paris, France

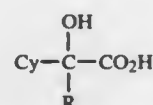
Filed Nov. 21, 1985, Ser. No. 800,228

Claims priority, application France, Nov. 29, 1984, 84 18201 Int. Cl.⁴ C07C 59/48

U.S. Cl. 562—470

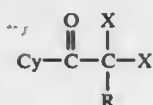
9 Claims

1. Process for preparing α -hydroxy-alkanoic acids of formula:



in which R represents a lower alkyl radical and Cy represents phenyl or a heterocyclic radical, both radicals optionally containing one or more substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl radicals and halogen atoms, wherein:

an α,α -dihalogenated ketone of formula:



in which R and Cy have the same meaning as above and X represents chlorine, bromine or iodine is treated in the presence of an aqueous solution of an alkali metal hydroxide and of a non polar organic solvent which is an aromatic or alicyclic hydrocarbon, the treatment being carried out at a temperature between the boiling temperature of the reaction medium at atmospheric pressure and 240° C. under pressure the alkali metal so formed is then acidified to obtain the desired acid.

4,713,486

NOVEL COMPOUNDS

Derek R. Buckle, Redhill, England, assignor to Beecham Group p.l.c., Brentford, England

Filed Oct. 21, 1985, Ser. No. 789,571

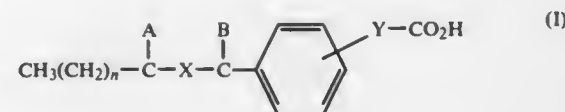
Claims priority, application United Kingdom, Nov. 11, 1982, 8232229; Nov. 12, 1982, 8232430; Nov. 23, 1982, 8233341; Jun. 10, 1983, 8315963; Jan. 21, 1983, 8316809; Jul. 6, 1983, 8318263; Jul. 30, 1983, 8320592

Int. Cl.⁴ C07C 63/64

U.S. Cl. 562—495

13 Claims

1. A compound of formula (I):



or a salt, ester or amide thereof, in which

Y is a group $-\text{O}(\text{CH}_2)_m-$, $-(\text{CH}_2)_m-$ or $-\text{CH}=\text{CH}-$ where

m is an integer of from 1 to 5

n is an integer of from

4 to 14

X represents a double or triple bond, and each of A and B represents hydrogen when X is a double bond, or both A and B are absent when X is a triple bond.

4,713,487

ETHER CARBOXYLATES AND PROCESS FOR PREPARING SAME

Fumimaro Sekine, Wakayama; Tomihiro Kurosaki, Osaka; Toshinao Ukena, and Hiroshi Kamitani, both of Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 22, 1986, Ser. No. 865,859

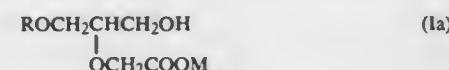
Claims priority, application Japan, Jun. 6, 1985, 60-123315; Jun. 25, 1985, 60-138484

Int. Cl.⁴ C07C 59/255

U.S. Cl. 562—587

2 Claims

1. An ether carboxylate of the general formula (Ia) or (Ib)



in which R represents a linear or branched alkyl or alkenyl group having from 4 to 32 carbon atoms and M represents hydrogen, alkali metal, alkanolammonium or lower alkylammonium.

4,713,488

METHOD FOR PRODUCING CYCLOALKYL AMINOPHENOL DERIVATIVES

Masayuki Omatsu; Naoki Yonese, both of Nishinomiya, and Mitsuru Kondo, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,546

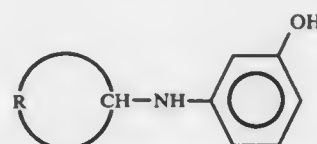
Claims priority, application Japan, Oct. 23, 1984, 59-223587

Int. Cl.⁴ C07C 85/08

U.S. Cl. 564—397

4 Claims

1. A method for producing a cycloalkyl aminophenol of the formula:



wherein R is a saturated hydrocarbon radical having 4 to 11 carbon atoms, which comprises reacting an aminophenol of the formula:

4,713,490

PROCESS FOR THE PREPARATION OF ALKYLTHIOACETAMIDINES

Michael Arndt, Wuppertal, and Hans P. Sehnem, Schwelm, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,799

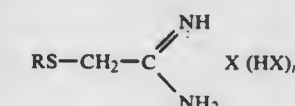
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1984, 3444494

Int. Cl.⁴ C07C 123/00

U.S. Cl. 564—225

10 Claims

1. A process for the preparation of an alkylthioacetamide of the formula



in which

R represents alkyl,
X represents halogen and
n represents 0 or 1,

wherein

(a) a chloroacetonitrile of the formula

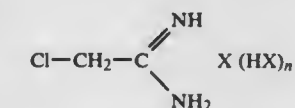


is reacted with an ammonium halide of the formula



in which

X has the meaning indicated above, in the presence of an alkali metal alcoholate and in the presence of an alcohol at a temperature between -20°C . and $\pm 30^\circ\text{C}$., to give a chloroacetamide of the formula



in which

X and n have the meaning indicated above, and

(b) the chloroacetamide is then reacted, if desired without being isolated, with an alkyl mercaptan of the formula



in which

R has the meaning indicated above, in the presence of an acid acceptor and in the presence of an alcohol at a temperature of between -20°C . and $\pm 30^\circ\text{C}$. and under a pressure between 1 and 10 bar, to give an alkylthioacetamide wherein 0.01 to 0.2 mole of alkali metal alcoholate and 1 to 2.00 moles of ammonium halide are employed in stage (a) for 1 mole of chloroacetonitrile and 1 mole of acid acceptor and 1 mole of alkyl mercaptan are added in stage (b).

4,713,491

NINA'S BUTTERCUP-TIHITIAN SQUASH

Nina M. Adams, 16531 Eucalyptus Rd., Hesperia, Calif. 92345

Filed Sep. 23, 1985, Ser. No. 779,132

Int. Cl.⁴ A01H 5/00

U.S. Cl. 800—1

2 Claims

1. A new variety of winter squash known as Nina's Buttercup-Tihitian Squash.

wherein R is as defined above, in the presence of a combination of a catalytic hydrogenation agent and hydrogen as a reducing agent, and an acid selected from the group consisting of mineral acids and alkanolic acids of 1 to 5 carbon atoms in an amount of 0.8 to 1.2 equivalents versus one equivalent of the aminophenol, at a temperature of from 5°C . to 50°C . and under a pressure of from atmospheric pressure to elevated pressure of less than 10 kg/cm².

4,713,489
PREPARATION OF N-SUBSTITUTED ARYLSULFONAMIDES

Gail H. Birum, Kirkwood, and Richard F. Jansen, St. Louis, both of Mo., assignors to Akzo America Inc., New York, N.Y.

Continuation of Ser. No. 662,923, Oct. 19, 1984. This application

Jan. 16, 1986, Ser. No. 820,876

Int. Cl.⁴ C07C 143/79

U.S. Cl. 564—90

18 Claims

1. A process for the preparation of N-substituted arylsulfonamides comprising the steps of: (a) reacting an aryl hydrocarbon with chlorosulfonic acid to form a crude chlorosulfonation reaction product, (b) combining said crude reaction product, an aliphatic amine, an alkali metal hydroxide or alkaline earth metal hydroxide and water in reactive contact to form an amidation reaction mixture, (c) maintaining the temperature of the amidation reaction at between about 50°C . and 100°C . and the pH at above about 7, for a period of time sufficient to form an amidation reaction product comprising an organic phase and an aqueous phase, said organic phase being rich in N-substituted arylsulfonamide, and said aqueous phase containing mostly by-products of said amidation reaction product, (d) separating said organic phase from said aqueous phase and (e) recovering said N-substituted arylsulfonamide from said organic phase.

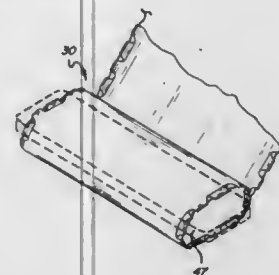
ELECTRICAL

4,713,492
STOWABLE LARGE AREA SOLAR POWER MODULE
 Joseph J. Hanak, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Oct. 21, 1985, Ser. No. 789,906
 The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.
 Int. Cl.⁴ H02N 6/00

U.S. Cl. 136—245

15 Claims



1. A stowable, deployable large area solar module comprising: a plurality of discrete, interconnected, flexible, large area solar panels; hinge means operatively disposed on said panels so as to provide for the relative planar displacement of the folded panels of said module when said panels are folded in overlying sandwiched relationship; said hinge means also operatively disposed so as to provide for the folded panels to be rolled into a stowable, substantially cylindrical configuration; said hinge means comprising:

a plurality of hinge knuckles associated with at least one edge of each large area panel, each of said knuckles including a passage therethrough adapted to receive pintle means, the knuckles of adjacent panels disposed in a spaced apart, generally coplanar, interdigitating relationship; and, flexible pintle means disposed so as to sequentially pass through said interdigitating knuckles, whereby said spaced apart knuckles allow for a degree of planar displacement of adjoining large area panels relative to one another, as well as allowing for the folding of said panels in a sandwiched relationship and said flexible pintle means allows for said panels to be rolled into said substantially cylindrical configuration.

4,713,493
POWER GENERATING OPTICAL FILTER
 Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.
 Continuation-in-part of Ser. No. 786,579, Oct. 11, 1985, Pat. No. 4,642,413. This application Dec. 6, 1985, Ser. No. 806,232
 The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

Int. Cl.⁴ H01L 31/06; G02B 5/20

U.S. Cl. 136—249

7 Claims



1. A power generating optical filter including a transparent substrate; a first substantially transparent electrode disposed atop at least a portion of the substrate; a body of photovoltaic material adapted to generate electron hole pairs in response to

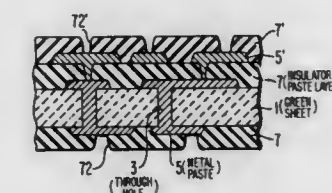
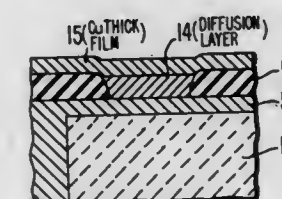
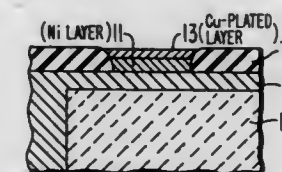
the absorption of incident radiation, said body disposed atop at least a portion of the first electrode; and a second substantially transparent electrode disposed atop at least a portion of the body of photovoltaic material; the first and second electrodes and the body of photovoltaic material each fabricated to preselected thicknesses and from materials characterized by preselected indices of refraction for cooperatively establishing optical interference effects, whereby said filter transmits at least a portion of selected wavelengths of radiation incident thereupon substantially differing from wavelengths transmitted by that body of photovoltaic material alone; and optical tuning layer means for modifying the optical transmission of the filter.

4,713,494
MULTILAYER CERAMIC CIRCUIT BOARD
 Shoji Oikawa, Yokohama; Hiroshi Yamagishi, Tokyo; Shigeru Saito, Yokohama; Tsuyoshi Fujita, Yokohama, and Takayoshi Watanabe, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1986, Ser. No. 851,729
 Claims priority, application Japan, Apr. 12, 1985, 60-76574
 Int. Cl.⁴ H05K 1/00

U.S. Cl. 174—68.5

17 Claims



13. A multilayer circuit board comprising: an insulating substrate; a first layer on at least one side of said insulating substrate, said first layer comprising a material selected from the group consisting of Mo, W and Mo-Mn; and a second layer on said first layer, said second layer comprising Cu and Ni.

4,713,495

DEVICE FOR SENDING AND RECEIVING A MESSAGE
Antti Jalava, Paipinen, Finland, assignor to Näkövammaisten Keskusliitto ry, Helsinki, Finland

PCT No. PCT/FI86/00042, § 371 Date Jan. 2, 1987, § 102(e)
Date Jan. 2, 1987, PCT Pub. No. WO86/06530, PCT Pub.
Date Nov. 6, 1986

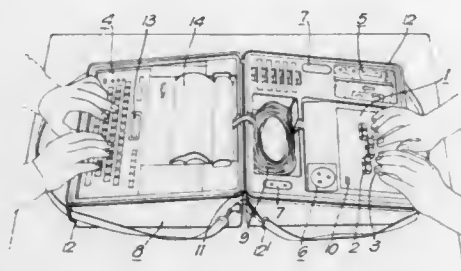
PCT Filed Apr. 30, 1986, Ser. No. 19,794

Claims priority, application Finland, May 2, 1985, 851745

Int. Cl.⁴ H04L 15/00

U.S. Cl. 178—2 R

8 Claims



1. Device for transmitting and receiving a message with the aid of the tactile sensation, characterized in that the equipment comprises, integrated in a box,

a console (1), which comprises several character keys (2), which can be placed in the mark position separately, as well as a corresponding number of feeling buttons (3), which can be placed in the mark position separately,

a control unit (6), by means of which a sign consisting of the keys placed in the mark position can be coded into an electric signal, as well as a coded electric signal be converted to a sign consisting of the mark positions of the feeling buttons,

a printer (4) connected to the control unit, by means of which printer a coded electric signal can be converted to an inkprint character, and an inkprint character be correspondingly converted to a coded signal,

a modem (6) connected to the control unit, by means of which said modem a coded electric signal can be modulated to a tele signal and be fed into the telecommunication network as well as a tele signal be received from the telecommunication network and be demodulated to a coded electric signal,

a recorder (5) connected to the control unit, in which a coded electric signal can be stored and out of which the said signal can be run back into the control unit,

a connecting device, by means of which the modem can be connected to a data communication network, and
a current source.

4,713,496

COORDINATE INPUT DEVICE

Kiyoshi Kimura, and Osamu Hara, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jun. 2, 1986, Ser. No. 869,401

Claims priority, application Japan, May 31, 1985, 60-117761
Int. Cl.⁴ G08C 21/00

U.S. Cl. 178—18

3 Claims

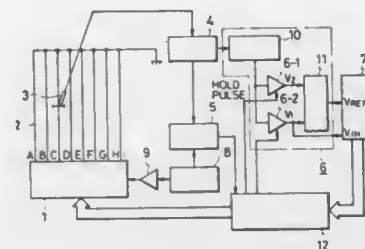
1. A coordinate input device of the type in which scanning signals are supplied in sequence to conductors embedded in parallel in an input plane, and the coordinate values of a position is determined on the basis of detected signals by a coordinate indicator arbitrarily pointable on said input plane, comprising

a switching circuit for supplying scanning signals sequentially to a plurality of conductors embedded in parallel in said input plane in such a way that scanning signals of the same phase are applied concurrently to at least two of said conductors,

a coordinate indicator for detecting a signal derived from

scanning signals transmitted on to said conductors in accordance with the operation of said switching circuit, and

a polarity discriminator for discriminating inversion of the polarity of the signal detected by said coordinate indicator,



wherein, with special attention to the scanning position where inversion of the polarity has been discriminated by said polarity discriminator, the level of said signal is detected before and after the polarity of said signal detected by said coordinate indicator has been inverted, and a position is determined where said coordinate indicator is pointed on the basis of said position of polarity inversion discriminated and said signal level.

4,713,497

SELF-STORING CORD AND REEL ASSEMBLIES FOR SHIELDED CABLES

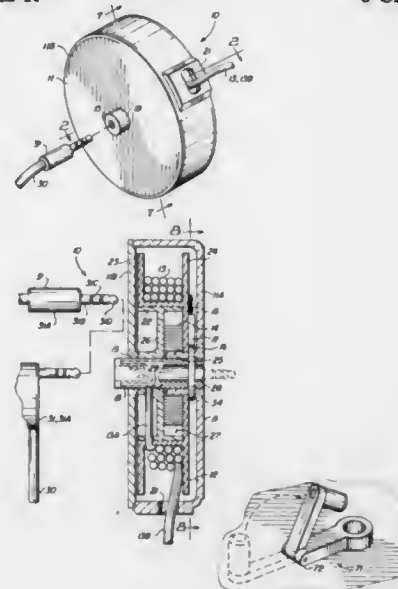
John N. Smith, 2161 E. Gemini Dr., Tempe, Ariz. 85283

Filed Jun. 3, 1982, Ser. No. 384,729

Int. Cl.⁴ H02G 11/00

U.S. Cl. 191—12.2 R

6 Claims



1. A retractable self-storing reel assembly for shielded and unshielded electrical cables comprising:

a casing,

a reel journaled for rotation in said casing,

said reel comprising an integral hollow hub, the inner periphery of which comprises a cable terminating socket,

a spring mounted within said casing to extend between said casing and said reel for rotatively biasing said reel in one direction,

a ratchet means extending between the inside periphery of said casing and said reel for controlling the rotational movement of said reel in a second rotative direction opposite to said first rotative direction,

one end of said hub providing an entranceway into said hub for the male end of an elongated first cable coaxially of

said reel, and the outer periphery of said hub in said casing forming an opening for receiving one end of a second cable mountable on said reel for connection to and termination in said hub, and
means providing an outlet in said casing for said second cable mountable on said reel in an area juxtapositioned to the periphery of said reel.

4,713,498

SWITCH GEAR

Bernd Ludwig, Marienheide, and Dirk Stiehl, Gummersbach, both of Fed. Rep. of Germany, assignors to Square D Starkstrom GmbH, Fed. Rep. of Germany

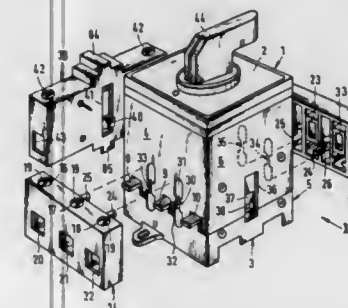
Filed Oct. 15, 1986, Ser. No. 918,906

Claims priority, application European Pat. Off., Oct. 24, 1985, 85113511.1

Int. Cl.⁴ H01H 9/00, 15/00

U.S. Cl. 200—5 R

24 Claims



1. A switch gear comprising a housing including opposite first and second sides and a third side therebetween, at least one main contact bridge in said housing means for supporting said main contact bridge for displacement between two switch positions, actuating means accessible at said third side for displacing said one main contact bridge between said two switch positions, two fixed contact rails carried by said housing and cooperating with said one main contact bridge for effecting therewith one closed and one open switch position, first and second of said two fixed contact rails being connectable by connector screws to electrical hook-up leads at said respective first and second housing sides, first and second separate housing compartments adjacent said respective first and second housing sides and housing associated ones of said connector screws, means for connecting said first and second fixed contact rails through said respective first and second separate housing compartments for connecting to said electrical hook-up leads by said connector screws, and means for selectively mounting said first and second separate housing compartments to the respective first and second housing sides at two positions mutually displaced by 180° whereby said connector screws can be accessed from two different opposing directions.

4,713,499

OPERATION CONTACT SYSTEM OF TRANSMITTER FOR THE RADIO-CONTROLLING TOY

Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1986, Ser. No. 892,945

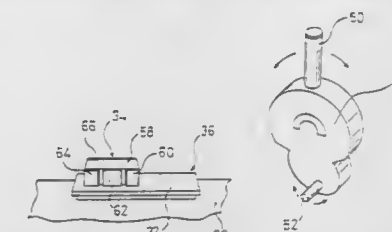
Int. Cl.⁴ H01H 15/00

U.S. Cl. 200—16 D

1 Claim

1. A contact system for a transmitter for use with a radio-controlled toy, comprising a printed circuit board having electrical contacts, a fixed contact assembly provided thereon and an externally operable movable contact assembly mounted in sliding relation to the fixed contact assembly; said fixed contact assembly comprising a contact plate electrically insulatingly carried by a horizontal plate for projection of a part of the contact plate therethrough, said horizontal plate being

attached to said printed circuit board with said contact plate extending through said printed circuit board, said contact plate being provided at one side with a plurality of mutually electrically insulated contacts and at its opposite side with a single contact electrically insulated from said mutually insulated contacts, said horizontal plate being adapted to guide said externally operable contact assembly for movement relative to said plurality of contacts and said single contact, said plurality of contacts of the contact plate being connected to said contacts provided in said printed circuit board, said externally



operable contact assembly comprising a movable sliding member slidably embracing said fixed contact assembly and a guide channel for ensuring said sliding embracing movement of said fixed contact assembly, said sliding member having a contact piece of conductive metal wire shaped to engage selected ones of said plurality of contacts during movement of said sliding member and simultaneously engage said single contact, said sliding member having means cooperating with an operational means of an operational lever for thus moving said sliding member.

4,713,500

ELECTRIC BYPASS SWITCH

Anthony Osborne, Duluth, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

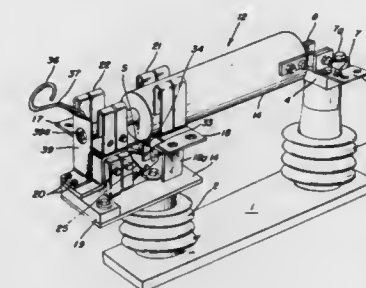
Continuation of Ser. No. 837,899, Mar. 10, 1986, abandoned.

This application Mar. 27, 1987, Ser. No. 32,991

Int. Cl.⁴ H01H 9/26, 31/10

U.S. Cl. 200—48 KB

9 Claims



1. An electric by-pass switch comprising a pair of spaced insulators, a pair of conductive terminals mounted on each of said insulators and insulated from each other, one pair of said conductive terminals being laterally spaced and adapted for connection with two terminals respectively of an electric apparatus and the other pair of said conductive terminals being laterally and longitudinally spaced and adapted for connection with infeed and outfeed power conductors respectively, a pair of laterally spaced hinge contacts hingedly mounted respectively on said one pair of said conductive terminals, a pair of longitudinally spaced jaw contacts mounted respectively on the other pair of said conductive terminals, conductive structure connected with one of said jaw contacts, a unitary rigid switch blade having a pair of concentric conductors comprising an inner conductor and an outer conductor fixed in position relative to each other and separated by mechanically strong insulating material therebetween, each concentric conductor

having two ends, the inner conductor of said concentric conductors projecting outwardly from each end of the outer one of said concentric conductors, corresponding ends of said pair of concentric conductors being pivotally secured to said hinge contacts respectively and the opposite ends of said pair of concentric conductors being engageable and disengageable with said jaw contacts respectively, a bypass conductor electrically connected with and movably mounted on said conductive structure, and means mounted on said switch blade for disjunctably engaging said by-pass conductor for causing said bypass conductor to engage and to disengage the other of said jaw contacts.

4,713,501

PARTITIONED SWITCHING PANEL WITH INSERTABLE SWITCHING CARRIAGE AND ADJUSTABLE SHUTTER MECHANISM

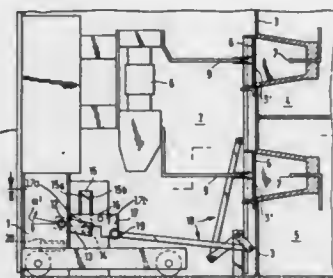
Johann Herrmann, Regensburg, Fed. Rep. of Germany, assignor to Sachsenwerk AG, Regensburg, Fed. Rep. of Germany
Filed Dec. 5, 1986, Ser. No. 938,720

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3542979

Int. Cl.⁴ H01H 9/20; H02B 1/14

U.S. Cl. 200—50 AA

13 Claims



1. In a partitioned switching panel including a power switch provided with first switch contacts and mounted on a carriage which is movable toward and away from cooperating stationary second switch contacts disposed behind a partition of the switching panel and accessible via openings in said partition, displaceable shutters mounted on said partitions for closing said openings when said first and second contacts are disconnected, and means for moving said carriage between a circuit breaking position wherein said first and second switch contacts are disconnected and an operating position wherein said first and second switch contacts are connected and for opening and closing said shutters when said carriage is in said circuit breaking position and such that the opening of said shutters is completed when movement of said carriage from said circuit breaking position toward said operating position begins; the improvement wherein said means for moving and for opening and closing comprises: a driven output shaft rotatably mounted on said carriage; an output lever having one end connected to said shaft for rotation therewith and having a cam follower mounted on its other end; a linear camming track fixedly mounted on said panel at a position to cooperate with said cam follower upon rotation of said shaft and such that initial movement along an initial section of said camming track when said carriage is at rest in said circuit breaking position does not result in movement of said carriage and continued movement of said cam follower along the remaining portion of said camming track causes movement of said carriage toward said operating position and said cam follower to traverse said track twice in opposite directions during such movement of said carriage to said operating position; a camming lever having first and second arms, said camming lever being rotatably mounted on said panel adjacent said camming track such that said first arm of said camming lever is engaged and pivoted by said cam follower during its said initial movement along said initial camming track section; and mechanical linkage means, connected to said second arm of said camming lever, for open-

ing said shutters in response to said first arm being engaged and moved by said cam follower.

4,713,502

CONTROLLER FOR CONTROLLING ELECTRICAL HEATERS

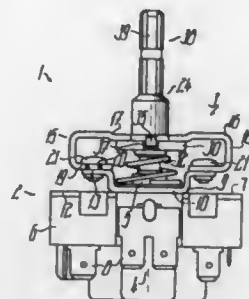
Willi Essig, Boeblingen; Hans Mayer, Kuernbach, and Siegfried Mannuss, Sternenfels, all of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,331

Int. Cl.⁴ H01H 3/16

U.S. Cl. 200—61.82

13 Claims



1. An attachment for a controller for controlling supply of electric energy to at least one electrical heating element, said controller having a housing for an electrical controlling means and a regulating shaft rotatable to different regulating positions about a regulating axis, said regulating shaft projecting from a front face of said housing and having connection means adapted for directly connecting said regulating shaft with a regulating handle, said attachment means located near the front face of said housing, comprising:

slide-to-turn means mounted on an outside of said housing in a vicinity of the front face,

said slide-to-turn having cooperating rotation stop members disposed at a distance from said housing, said stop members being engageable to lock the regulating shaft against rotation in at least one position thereof, and disengageable to release said regulating shaft for rotation by a disengaging axial slide movement of said stop members relative to one another,

said stop members being movable relative to one another in a direction parallel to the regulating axis of said regulating shaft in at least two relative axial positions, thereby engaging the stop members in one axial locking position whereupon the regulating shaft is locked against rotation, and disengaging the stop members in another axial position, thereby releasing the regulating shaft for rotation,

said slide-to-turn means having an intermediate shaft with a coupling means engageable on the regulating shaft in place of the regulating handle.

4,713,503

THREE PHASE VACUUM SWITCH OPERATING MECHANISM WITH ANTI-BOUNCE DEVICE FOR INTERRUPTER CONTACTS

Eugene L. Kamp, Fulton, Mo., assignor to A. B. Chance Company, Centalla, Mo.

Filed Aug. 26, 1986, Ser. No. 900,538

Int. Cl.⁴ H08H 33/66

U.S. Cl. 200—144 B

10 Claims

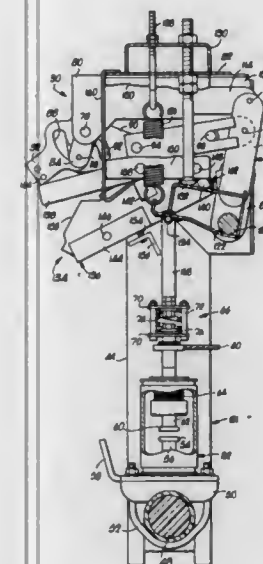
1. In an electrical switch having a pair of electrical contacts, a shaft supporting one of said contacts for movement with the latter between an open circuit position wherein said contacts are spaced from each other and a closed circuit position wherein said contacts are in direct engagement with each

other, and a spring loaded mechanism for moving said shaft toward said closed position, means for reducing the velocity of said shaft and said contact supported thereby as said shaft is moved by said spring loaded mechanism toward said closed circuit position and for suppressing bounce of said contacts after an initial engagement of the same comprising:

first elongated arm means presenting an impact surface;

pivot means mounting said first arm means to initially locate said impact surface in the path of said spring loaded mechanism as said mechanism moves said shaft toward said closed circuit position and for enabling swinging movement of said first arm means after initial contact of said impact surface with said mechanism in a direction initially away from the mechanism and subsequently back toward said mechanism to again contact the latter,

said initial contact of said impact surface with said mechanism causing said first arm means to absorb a portion of the kinetic energy of said mechanism and to thereby reduce the velocity of said shaft moved by said mechanism as said shaft shifts toward said closed circuit position;



second elongated arm means having an engagement surface; and

pivot means mounting said second arm means for free swinging movement toward and away from said first arm means during movement of said first arm means,

said pivot means mounting said second arm means being located to at least initially position said engagement surface of said second arm means in the path of swinging movement of said first arm means subsequent to initial impact of the latter by said mechanism, to cause said second arm means to absorb a portion of the kinetic energy of said first arm means that would otherwise be transferred from said first arm means back to said mechanism during subsequent rebounding contact therewith as said first arm means swings back toward said mechanism, and to thereby substantially reduce the kinetic energy transferred from said first arm means to said shaft in directions along the latter away from said closed circuit position so that the tendency of said contacts to separate by rebounding impact of said first arm means with said mechanism after said initial impact is.

4,713,504

CIRCUIT BREAKER WITH HINGED ARCING CONTACT

Alfred E. Maier, Chippewa, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

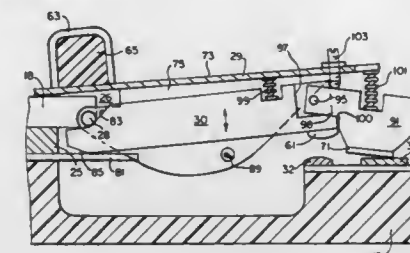
Continuation-in-part of Ser. No. 835,667, Mar. 3, 1986. This

application Jan. 28, 1987, Ser. No. 7,859

Int. Cl.⁴ H01H 33/12

U.S. Cl. 200—146 R

7 Claims



1. A circuit breaker with arcing contacts comprising: separable contact means including movable contact means and stationary contact means; the movable contact means including a movable main contact and a movable arcing contact; a contact carrier structure comprising a contact arm carrier and a plurality of parallel spaced contact arms; the plurality of contact arms being pivotally mounted on a first pivot; an operating mechanism for moving the contact carrier structure between open and closed positions of the movable and stationary contact means; each contact arm comprises a movable main contact; at least one of the parallel spaced contact arms supporting an arcing contact structure pivotally mounted on a second pivot on the arm, the second pivot being disposed between the first pivot and the arcing contact; the arcing contact structure being biased toward the stationary contact means so as to remain in momentary contact with the stationary contact means until after the movable main contact disconnects therefrom; and stop means between the contact arm carrier and the arcing contact structure and between the second pivot and the arcing contact for retaining the arcing contact structure in momentary contact with the stationary contact means, whereby any contact arcing occurring is diverted from the movable main contact.

4,713,505

LOAD BREAK SWITCH

K. Henry Date, and Ronald Wainio, both of So. Milwaukee, Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 373,613, Apr. 30, 1982, abandoned, which is a division of Ser. No. 231,279, Feb. 4, 1981, Pat. No.

4,343,030, which is a division of Ser. No. 940,104, Sep. 6, 1978, Pat. No. 4,293,834. This application Jan. 9, 1984, Ser. No.

Int. Cl.⁴ H01H 3/30

U.S. Cl. 200—153 SC

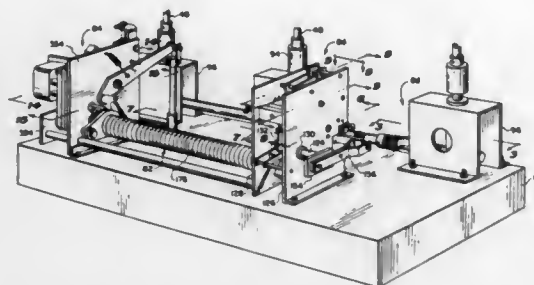
2 Claims

1. An operating mechanism for operating a disconnect switch having at least one pair of separable contacts movable to open and closed positions, which comprises:

a frame; an operating shaft supported by the frame for unidirectional rotation between two positions, the shaft being operably connected to effect opening of the disconnect switch when the shaft is rotated from its closed position to its open position, and to effect closing of the disconnect switch when the shaft is rotated from its open position to its closed position; releasable latching means, for stopping and holding the shaft in either its closed or opened positions;

latch releasing means for momentarily releasing the latching means;

torsion spring means for rotating the shaft in one direction between its opened and closed positions and for rotating the shaft in the same direction between its closed and opened positions;



spring charging means for charging the torsion spring in one direction to a preset value of stored energy;

latch locking means, for locking the latching means so that it can not be released by the latch releasing means, whenever the operating shaft is in its opened position and the energy stored by the torsion spring means is less than a preset value.

4,713,506

ELECTRICAL CONTACT MAKING ARRANGEMENT FOR MONITORING THE CONDITION OF A SCREW IN AN INSTALLED POSITION

Winfred Klink, Steinsdorfstrasse 1a, D-8000 München 22, Fed. Rep. of Germany

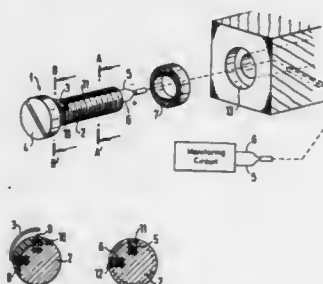
Filed Mar. 18, 1986, Ser. No. 840,739

Claims priority, application European Pat. Off., Mar. 20, 1985, 85 103249.0

Int. Cl.⁴ H01B 3/40

U.S. Cl. 200—158

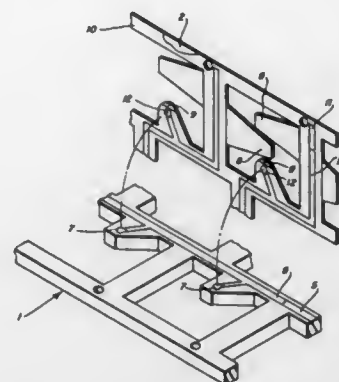
12 Claims



1. An electrical contact making arrangement for monitoring an angular position of a screw in an installed position thereof, the screw including at least a shank with a screw thread on at least a part thereof, the arrangement comprising first and second connecting contact means for connection to a monitoring circuit, a bridging contact on a portion of the shank of the screw extending in a peripheral direction thereof over only part of the periphery thereof, and a member disposed in an installed position of the arrangement around the portion of the shank having the bridging contact, the member moving the bridging contact to open and close the circuit when the screw is turned out of a reference set position.

4,713,507
KEY OPERATED SWITCH FOR KEYBOARD
Gottfried Burkhardt, Am Bahndamm 29, D8501 Winkelhaid, Fed. Rep. of Germany
Filed Oct. 3, 1986, Ser. No. 914,786
Int. Cl.⁴ H01H 13/52
U.S. Cl. 200—159 A

1 Claim



1. A key operated switch for keyboards comprising a key support,

a first printed conductor on said support,

a first insulating layer coating said first conductor except for a bared contact portion thereof,

a spring having an outer configuration overlying said key support having central cutouts defining a spring contact element inwardly directed from said outer configuration and two key return springs inwardly directed from said outer configuration,

a second insulating layer coating a side of said spring facing said first conductor,

a second printed conductor overlying said second insulating layer,

a third insulating layer covering said second conductor except for a bared contact portion thereof,

a key guide overlying said spring, and

a depressible key stem supported in said guide acting against said return springs and on said contact element to bring the bared contact portion of the second printed conductor into contact with said bared contact portion of said first printed conductor, thereby to connect said first and second printed conductors.

4,713,508
CIRCUIT BREAKER OPERATING MECHANISM EQUIPPED WITH A STORED ENERGY SYSTEM HAVING REMOVABLE AND REPLACEABLE CLOSING SPRING MECHANISMS

Pierre Baginski, Grenoble, and Jean-Pierre Nebon, St Martin-le-Vinoux, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Oct. 16, 1986, Ser. No. 919,427

Claims priority, application France, Oct. 31, 1985, 85 16347
Int. Cl.⁴ H01H 3/30

U.S. Cl. 200—153 SC

7 Claims

1. An operating mechanism of a high-rating multipole electrical circuit breaker, each pole having a pair of separable contacts including a movable contact actuated between a closed position and an opened position, said mechanism comprising:

a toggle device associated with a trip member and an opening spring for moving the movable contact towards the opened position, charging of the opening spring being carried out automatically when a closing operation is performed,

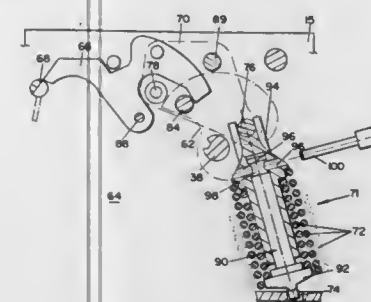
a stored energy system with an elastic device comprising at

least one closing spring arranged to move the movable contact to the closed position,

a rotatable recharging cam located in a charged position for charging said closing spring, and in a discharged position for allowing said closing spring to be decompressed,

a closing pawl cooperating with a latching bolt to lock the cam in the charged position, and to unlock the cam in the discharged position,

a kinematic transmission chain cooperating with said recharging cam and having a drive lever arranged between said stored energy system and the toggle device,

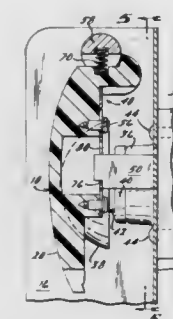
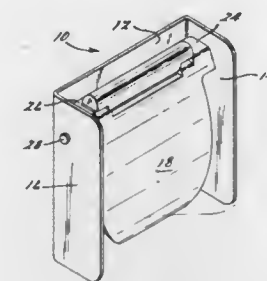


a telescopic link of said stored energy system having two parts with relative movement between which said closing spring is fitted,

a removable blocking device capable of locking said telescopic link when the two parts approach one another for the compression of said closing spring at the end of charging travel, and

a sub-assembly including said telescopic link and the compressed closing spring, which can be removed from the stored energy system upon release of said cam when the closing pawl is unlocked so as to cause a break in the kinematic transmission chain with the toggle device.

means whereby to permit release of said latch means from said stop means and simultaneous pivotal actuation of said



hand-lever by a simple contractive movement of said fingers.

4,713,510

PACKAGE FOR MICROWAVE COOKING WITH CONTROLLED THERMAL EFFECTS

James R. Quick, Warwick; James W. Mitchell, Newburgh, and Dennis A. Cooley, Port Jervis, all of N.Y., assignors to International Paper Co., New York, N.Y.

Filed Jun. 25, 1986, Ser. No. 878,110

Int. Cl.⁴ H05B 6/64

U.S. Cl. 219—10.55 E

17 Claims



4,713,509
PALM SWITCH ACTUATOR AND LATCH
Jerome E. Chebowski, Fremont, Ind., assignor to Rees, Inc., Fremont, Ind.

Filed Oct. 8, 1986, Ser. No. 916,899

Int. Cl.⁴ H01H 9/28

U.S. Cl. 200—328

26 Claims

1. An actuator-guard for palm switch comprising a supporting frame having a mounting surface;

a hand-lever pivotally attached adjacent one edge thereof to said supporting frame;

fixed stop means;

latch means carried by said hand-lever movable between stop-engaging and stop-disengaging positions whereby to be selectively engageable with and disengageable from said stop means;

actuator means coactive with said latch means operable to move the latter from said stop-engaging position to said stop-disengaging position,

said hand-lever being adapted to be manually pivotally actuated by placing the palm of the hand thereon with the fingers extending beyond said lever, and

said actuator means being disposed adjacent to said edge of said hand-lever for convenient actuation thereof and of said latch means to release said latch means from said stop

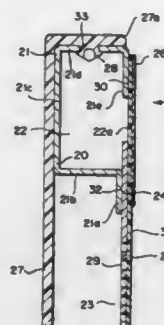
1. A microwave ovenable package that provides an intensified surface heating effect on a food product adapted to be placed in the package, a space within the package adapted to receive a food product, the package including at least one layer of a microwave energy-converting material and at least one layer of paperboard interposed between the layer of energy-converting material and the package space adapted to receive the food, whereby the energy-converting material converts a portion of microwave energy of the oven to heat, causing the transmission of thermal energy through the paperboard layer and to a food product adapted to be received in said space to thereby provide a surface heating effect on food adapted to be received in the space, the paperboard layer preventing any contact of the energy-converting material with a food product.

4,713,511

CONTINUOUS SUBSTANTIALLY PLANAR
MICROWAVE OVEN DOOR ASSEMBLYHiroyuki Katoh, Osaka, Japan, assignor to Sharp Kabushiki
Kaisha, Osaka, JapanContinuation of Ser. No. 784,589, Oct. 4, 1985, abandoned. This
application Mar. 23, 1987, Ser. No. 29,398Claims priority, application Japan, Oct. 15, 1984, 59-
155646[U]Int. Cl.⁴ H05B 6/76

U.S. Cl. 219—10.55 D

6 Claims



1. A substantially planar microwave oven door assembly, for sealing a heating chamber of a microwave oven, comprising: a substantially planar door body comprising a flange forming a choke cavity, said flange surrounding a central opening in said door body, said flange having first, second and third wall portions, said second wall portion connecting said first and third wall portions with an opening into said choke cavity existing between said first wall portion and said second wall portion; said first wall portion of said flange is located at an outer perimeter of said flange, said first wall portion being substantially planar and substantially parallel with one side of said second wall portion; said third wall portion of said flange is located at an inner perimeter of said flange; a substantially planar sealer plate operatively attached to said third wall portion with said sealer plate being located in the same plane as said first wall portion; and a door film laminated to and substantially covering entirely said first flange portion, said sealer plate and said opening into said choke cavity for providing a first side of the microwave oven door assembly with a continuous substantially planar surface.

4,713,512

MICROWAVE STABLE TABLEWARE

Wolfgang Wild, Joachim Straub, and Günter Landgraf, all of
Hanau, Fed. Rep. of Germany, assignors to W. C. Heraeus
GmbH, Hanau, Fed. Rep. of Germany

Filed Aug. 18, 1986, Ser. No. 897,772

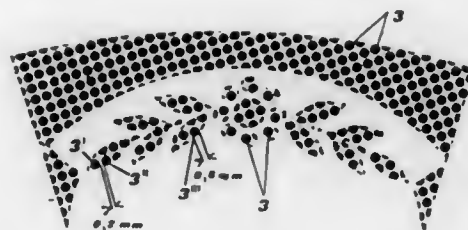
Claims priority, application Fed. Rep. of Germany, May 6,
1986, 3615272Int. Cl.⁴ H05B 6/80

U.S. Cl. 219—10.55 E

13 Claims

1. Microwave stable tableware comprising a body made of siliceous material and having applied thereto a precious metal decoration of a plurality of markings, wherein said markings

are separated by a distance of at least 0.2 mm from each other and the maximum extension of each of said markings is about 5



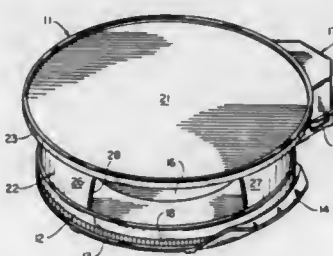
mm, wherein said decorated tableware can be exposed to a microwave field without destructive arcing.

4,713,513

MICROWAVE OVEN TURNTABLE SHELF STRUCTURE
Albert E. Colato, Woodbury, Minn., assignor to Plastics, Inc.,
Minneapolis, Minn.Division of Ser. No. 47,016, Jun. 11, 1979, Pat. No. 4,593,171.
This application Jun. 2, 1986, Ser. No. 869,599Int. Cl.⁴ H05B 6/78

U.S. Cl. 219—10.55 F

2 Claims



1. In apparatus for use in cooking food products in a microwave oven: a portable turntable having a base adapted to rest on a supporting surface in the oven cavity, a table rotatively mounted on the base, and a drive motor for rotating the table about a vertically extending axis, said turntable being adapted to be freely inserted into and removed from the cavity of the microwave oven, and a shelf structure removably mounted on the turntable having a horizontally extending platform for receiving a first food product and a plurality of legs depending from the platform and adapted to rest on the table of the turntable with the platform being spaced above the table by a distance great enough to permit a second food product to be heated on the table beneath the platform and the legs being spaced apart with an opening between two of the legs large enough to permit the second food product to be placed on and removed from the table without removing the shelf structure from the turntable.

4,713,514

MICROWAVE OVEN HAVING CONTROL MEANS
WHICH REDUCE THE RISK OF NO-LOAD OPERATIONJean-Pierre Hazan, Sucy-en-Brie, and Michel Steers, La Queue-
en-Brie, both of France, assignors to U.S. Philips Corporation,
New York, N.Y.

Filed Oct. 16, 1986, Ser. No. 919,909

Claims priority, application France, Feb. 28, 1986, 86 02821

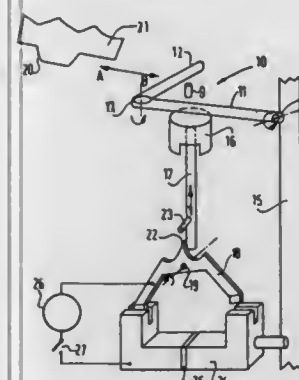
Int. Cl.⁴ H05B 6/68

U.S. Cl. 219—10.55 B

4 Claims

1. A microwave oven safety control comprising: an oven door operated cam member, said cam member being displaced in a first direction during opening of said oven door, and in a second opposite direction during closing of said door;

- a first pivot arm having one end connected to a rigid base about a pivot connection which permits said first arm to pivot in a vertical direction and which is biased upwardly by a spring;
- a second pivot arm located in the path of said cam member connected through a second pivot connection to a remaining end of said first pivot arm, said second pivot arm being pivoted in said first and second directions and being restrained from pivoting by a stop when said cam member moves in said first direction, forcing said first and second pivot arms downward about said first pivot connection, said second pivot arm being pivoted away from said stop



- when said cam member moves in said second direction, permitting said first and second arms to move upwardly; and
- a pendant type electrical switch having a linear actuation member which changes the state of said switch between a closed and open, and open and closed state only when it is moved in a downward direction, said linear actuating member being positioned under said first arm for actuation each time said first arm moves downwardly, whereby said electrical switching state changes from a closed state to an open state and then back to a closed state when said door is opened two consecutive times.

4,713,515

ELECTRODE HOLDER FOR ELECTRIC DISCHARGE
PROCESSING MACHINESJung W. Choi, 96-3 Saitobuncho, Kanagawa-ku, Yokohama-shi,
Kanagawa 221, JapanPCT No. PCT/JP86/00179, § 371 Date Nov. 19, 1986, § 102(e)
Date Nov. 19, 1986, PCT Pub. No. WO86/06014, PCT Pub.
Date Oct. 23, 1986

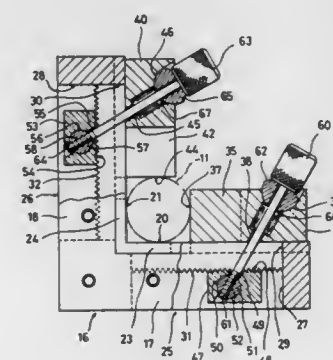
PCT Filed Apr. 11, 1986, Ser. No. 932,697

Claims priority, application Japan, Apr. 12, 1985, 60-
053662[U]Int. Cl.⁴ B23H 7/26

U.S. Cl. 219—69 E

4 Claims

1. An electrode holder for electric spark machine comprising: an L-shaped base block consisting of a first arm and a second arm extending perpendicular and continuous to each other, the inside faces of said first and second arms serving as reference plane for the abutment against a working electrode to be set, in which a recession is formed in the outside face, along a length thereof, of each of said first and second arms and an elongated slot is formed along the central part of said recession, the bottom of said recession being serrated at a constant small pitch to constitute an engaging portion;
- a first clamping member arranged slidable on the inside face of said first arm of said base block, said clamping member having a protuberant portion and cut-out portions at the inside end thereof, said protuberant portion rising up vertically from said reference plane of said first arm so that the end face of said protuberant portion serves as a



- plane of abutment against the electrode, said first clamping member being also formed with a hole for passing a clamping screw, said hole extending aslant from the outer end of said clamping member through the central portion thereof and connecting to said elongated slot of said first arm;
- a second clamping member arranged slidable on the inside face of said second arm of said base block, said second clamping member having at its inside end a cut-out portion and protuberant portions designed to fit with the corresponding protuberant portion and cut-out portions of said first clamping member, said protuberant portions of said second clamping member rising up vertically from said reference plane of said second arm so that the end faces of said protuberant portions serve as a plane of abutment against the electrode, said second clamping member being also formed with a hole for passing a clamping screw, said hole extending aslant from the outer end of said clamping member through the central portion thereof and connecting to said elongated slot of said second arm;
- a first engaging member having an engaging face serrated at

- a constant small pitch and designed to engage with the corresponding engaging portion of said first arm of said base block, said first engaging member being disposed movably in said recession of said first arm;
- a second engaging member having an engaging face serrated at a constant small pitch and designed to engage with the corresponding engaging portion of said second arm of said base block, said second engaging member being disposed movably in said recession of said second arm;
- a first clamping screw loosely passed through said hole of said first clamping member and through said elongated slot of said first arm of said base block, with the threaded end of said clamping screw being screwed into said first engaging member to secure said first clamping member and said first engaging member to said first arm of said base block; and
- a second clamping screw loosely passed through said hole of said second clamping member and through said elongated slot of said second arm of said base block, with the threaded end of said clamping screw being screwed into said second engaging member to secure said second clamping member and said second engaging member to said second arm of said base block.

4,713,516

PULSE GENERATOR FOR SPARK EROSION METAL WORKING

Ernst Bühler, Losone, and Antonio Rullo, Giubiasco, both of Switzerland, assignors to AG für Industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

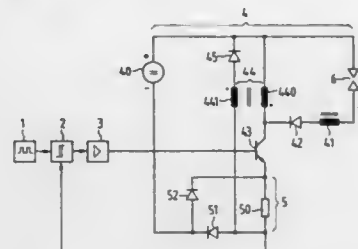
Filed May 10, 1985, Ser. No. 733,002

Claims priority, application Switzerland, May 11, 1984, 2354/84

Int. Cl.⁴ B23H 7/14; G05F 1/44

U.S. Cl. 219—69 P

15 Claims



1. In a spark erosion plant for the machining of a conductive workpiece by a tool electrode, a pulse generator comprising a voltage source for supplying electrical power to the spark gap formed between the workpiece and the tool electrode; a transformer having at least two windings with a first winding and a second winding being connected in parallel with the voltage source as a recuperation transformer, a first end of the first winding and a first side of the spark gap being operatively connected to a first terminal of the voltage source and a second end of the first winding being operatively connected to a second side of the spark gap through an inductor element, the second end of the first winding being further connected to a second terminal of the voltage source through a controllable switching element having a conductive state and a nonconductive state; a unidirectional current conducting element connected in series with the second winding to permit a recuperation current flow from the second winding to the positive terminal of the voltage source; and a drive means connected to the switching element for selectively placing the switching element in the conductive state, so that current can flow from the voltage source through the spark gap, the inductor element, and the switching element when the switching element is in the conductive state and, when the switching element is turned off, current continues to flow through the spark gap by way of the first winding of the recuperation transformer, the latter current being due to the energy stored in the inductor element during the time that the switching element is conductive and causing a recuperation current to flow through the voltage source from the second winding of the recuperation transformer.

4,713,517

CUT CONTOUR DISPLAY METHOD IN WIRE ELECTRIC DISCHARGE MACHINE

Mitsuo Kinoshita, Tokyo, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP85/00169, § 371 Date Dec. 4, 1985, § 102(e) Date Dec. 4, 1985, PCT Pub. No. WO85/04610, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 5, 1985, Ser. No. 807,038

Claims priority, application Japan, Apr. 7, 1984, 59-69693

Int. Cl.⁴ B23H 7/06; G05B 19/415

U.S. Cl. 219—69 W

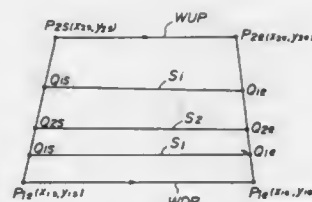
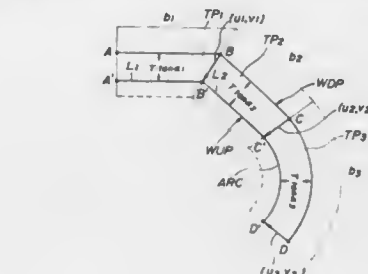
4 Claims

1. A cut contour display method in a wire electric discharge machine for subjecting a workpiece to taper cutting by moving a workpiece relative to a wire electrode and moving a wire tensioning guide horizontally, comprising the steps of:

(a) entering path data for a plurality of blocks defining a programmed path lying on an upper or lower surface of the workpiece, workpiece thickness I , data consisting of a taper angle α_1 in each block or vector (u_i, v_i) indicative of

a positional offset between the upper and lower surfaces of the workpiece at the ends of the block, and data specifying a number of cross sections parallel to the lower surface of the workpiece and cutting a taper-cut surface;

(b) obtaining a wire electrode path on whichever one of the upper and lower surfaces of the workpiece does not have the programmed path lying thereon by using the programme path, workpiece thickness T , taper angle α_1 or vector (u_i, v_i) indicative of the positional offset between the upper and lower surfaces of the workpiece at the end of the block;



(c) obtaining coordinate values of points on each cross-sectional contour at an end portion of each block by using data indicative of the wire electrode paths on the upper and lower surfaces of the workpiece and the number of cross section; and

(d) displaying, on a display unit, the wire electrode paths on the upper and lower surfaces of the workpiece as well as each cross-sectional contour of the taper-cut surface, by using the data indicative of the wire electrode paths on the upper and lower surfaces of the workpiece and coordinate values of the points on each cross-sectional contour at the end portion of each block.

4,713,518

ELECTRONIC DEVICE MANUFACTURING METHODS

Shunpei Yamazaki, Kenji Itoh, and Susumu Nagayama, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Jun. 3, 1985, Ser. No. 740,764

Claims priority, application Japan, Jun. 8, 1984, 59-117538; Oct. 8, 1984, 59-211769

Int. Cl.⁴ B23K 26/00

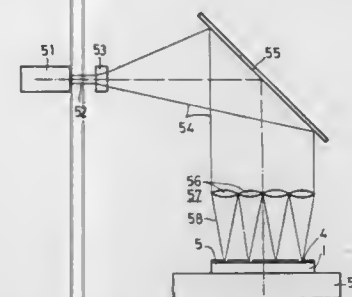
U.S. Cl. 219—121 LM

14 Claims

1. A method for the manufacture of an electronic device which is provided with at least a transparent conductive layer, comprising the steps of:

forming a transparent conductive layer on a transparent substrate having a surface of an insulator selected from the group consisting of organic and inorganic insulators, or on a non-single-crystal semi-conductor layer member, wherein the transparent conductive layer member has a thickness of two μm or less and consists principally of a sublimable metallic compound selected from the group consisting of oxides and nitrides, and wherein the non-single-crystal semi-conductor layer member consists princi-

pally of a sublimable semi-conductor which includes a dangling bond neutralizer selected from the group consisting of hydrogen and halogen; and exposing the transparent conductive layer member to irradiation by one or more pulsed laser beams which are squeezed in only one direction after expansion in cross-section and have a



wavelength of 400 nm or less and optical energy greater than the optical energy band gap of the transparent conductive layer member, thereby forming the transparent conductive layer which has a thickness of 2 μm or less and consists principally of the sublimable metallic oxide or nitride on the substrate or the non-single-crystal semi-conductor layer member.

4,713,519

APPARATUS FOR LASER BEAM WELDING THE LONGITUDINAL EDGES OF A CAN

Bernhard Bersch, Heinz Jüttner, and Ulrich Tenhaven, all of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Fed. Rep. of Germany

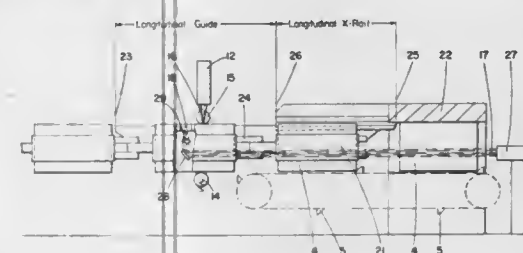
Continuation of Ser. No. 767,765, Aug. 21, 1985, abandoned.

This application Oct. 5, 1986, Ser. No. 915,862

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121 LC

7 Claims



1. An apparatus for producing welded can bodies from rectangular pieces of sheet material, said apparatus comprising a forming station means having a cylindrically shaped inner space surrounding a given axis and into which space rectangular pieces of sheet material may be successively fed in a direction tangentially of said inner space to bend each piece into a cylindrical shape, said forming station means having a first open end located at one point along said given axis and a second open end spaced downstream along said given axis from said first end, welding means providing a welding station located downstream along said given axis from said forming station, and means for moving each piece of sheet material after it is bent into a cylindrical shape by said forming station means downstream along said given axis from said forming station means to and past said welding station and for guiding such piece of material during such movement, said moving and guiding means being such that said cylindrical shape of each bent piece of material is maintained as it is moved from said forming station means to said welding station and such that the longitudinal edges of the piece are abutted at said welding station, said moving and guiding means further being such that a substantial portion of the inside cross-section of each bent piece of sheet material is empty throughout its passage from

said forming station means to said welding station so that an empty path extends parallel to said given axis from a point upstream of said first end of said forming station means to said welding station, said welding means including an outside welding means for directing a first laser welding beam onto the outside of a bent piece of sheet material at said welding station at a first point intersecting the abutting longitudinal edges of said piece to weld said abutting edges to one another as they are moved past said welding station, and an inside welding means for directing a second laser welding beam onto the inside of a bent piece of sheet material at said welding station at a second point intersecting the abutting longitudinal edges of said piece to also weld said abutting edges to one another as they are moved past said welding station, said inside welding means including a means for directing said second laser welding beam so that it passes through said point located upstream of said first open end of said forming station means and from said point travels parallel to said given axis along said empty path to said welding station, a mirror at the downstream end of said empty path for reflecting said second welding beam toward the inside surface of a bent piece of sheet material at said welding station, and a concentrating lens between said mirror and said inside surface of a bent piece of sheet material for concentrating said second beam onto said second point intersecting said abutting longitudinal edges of said bent piece of sheet material, each of said first and second welding beams having such an energy level that each of said beams welds less than the entire thickness of each piece of bent sheet material as such piece is moved past said welding station.

4,713,520

METHOD AND APPARATUS FOR INTERCONNECTING AND HERMETICALLY SEALING CERAMIC COMPONENTS

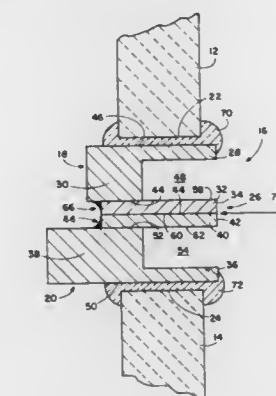
H. Lee Van Nice, Hillsboro; Myron A. Bostwick, Jr., Banks, and Keith F. Kongsli, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 24, 1986, Ser. No. 843,488

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121 LC

12 Claims



1. In a hollow enclosure that includes a first ceramic wall section having a first annular edge and a second ceramic wall section having a second annular edge, compact coupling means for interconnecting the first and second edges and providing a hermetic seal between them, said coupling means comprising: first and second annular coupling assemblies each including a first flange portion, a web portion and a second flange portion with an outer edge, the first flange portion of the first coupling assembly being fritted to the first annular edge of the first wall section, the first flange portion of the second coupling assembly being fritted to the second annular edge of the second wall section, and the outer edge of the second flange portion of the first coupling assembly being laser welded to the outer edge of the

second flange portion of the second coupling assembly, the thermal path from the laser weld through the second flange portion and web portion to the fritted connection of each coupling assembly being sized such that the coupling assemblies sufficiently attenuate a thermal shock wave generated during laser welding and sufficiently retard heat conduction from the location of the weld to the frit connections to maintain the frit connections intact during laser welding, the thermal path being substantially no longer than necessary to retard such heat conduction.

4,713,521

ELECTRONIC POTENTIOMETER SIMULATOR

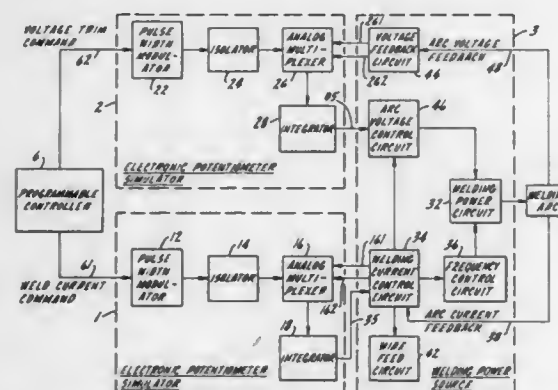
Richard A. Eldridge, Chicago Ridge, Ill., assignor to ESAB Welding Products, Inc., Chicago, Ill.

Filed Nov. 16, 1984, Ser. No. 672,545

Int. Cl. B23K 9/10

U.S. Cl. 219—130.5

1 Claim



1. Apparatus for providing an output control signal having a characteristic value variable between high and low limits represented by applied first and second respective limit signals comprising:

- means responsive to a variable analog input control signal for producing an intermediate digital pulse width modulated signal having a variable duty cycle which corresponds to and is produced as a function of variations in said analog input control signal;
- means for isolating said intermediate pulse width modulated signal from said analog input control signal to effectuate direct current isolation of said output control signal from said input control signal;
- an analog multiplexer with first and second inputs for receiving said first and second applied respective limit signals with a control input coupled to said isolated pulse width modulated signal with said applied first or said applied second limit signal switched to an output line of said multiplexer in response to said isolated pulse width modulated signal; and integrated means, coupled to said output line of said analog multiplexer, for time-averaging said switched signal on said output line to form said output control signal.

4,713,522

ELECTRIC HEATING APPLIANCE DETACHABLY MOUNTED IN A MOTOR VEHICLE

Shinichi Kimura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 706,834, Feb. 28, 1985, abandoned.

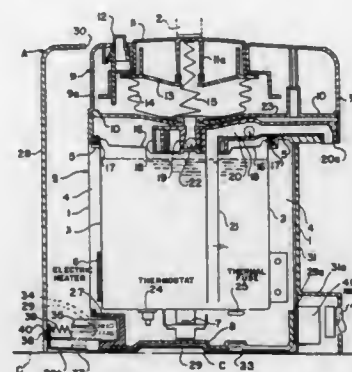
This application Oct. 10, 1986, Ser. No. 917,803

Claims priority, application Japan, Feb. 28, 1984, 59-28789(U); Feb. 28, 1984, 59-28790(U); Feb. 28, 1984, 59-28791(U)

Int. Cl. H05B 1/02, 3/00; A47J 27/00; F24H 1/22

U.S. Cl. 219—202

2 Claims



1. A heating unit detachably mountable in a motor vehicle and comprising
 - an outer casing adapted to be fixedly secured on a portion of a vehicle,
 - an electric heating appliance adapted to be removably supported in the outer casing,
 - said outer casing having a recessed portion for removably receiving said heating appliance,
 - said heating appliance having therein an electric heating element and a temperature sensor capable of producing switching signals indicative of heating appliance temperature,
 - a first electrical connector adapted to be connected to a power supply of the vehicle, said first electrical connector being on said outer casing,
 - a second electrical connector carried by said heating appliance,
 - said first and second electrical connectors being arranged to detachably mate with each other when said heating appliance is seated within said recessed portion of said outer casing,
 - a power control switch and means for actuating said power control switch in response to the switching signals produced by said temperature sensor in said heating appliance,
 - said power control switch and said switch actuating means being located in said outer casing at a location remote and shielded from said heating element of said heating appliance when said heating appliance is seated in said recessed portion of said outer casing,
 - said power control switch of said outer casing and said heating element of said heating appliance being connected in series with each other in a power supply circuit through said first connector of said outer casing and said second connector of said heating appliance,
 - said temperature sensor of said heating appliance and said switch actuating means being connected in series with each other through said first and second connectors in a control circuit in parallel with said power supply circuit, and
 - said outer casing only partially enclosing said heating appliance when said heating appliance is seated in said recessed portion of said outer casing so as to permit use of said heating appliance while so seated in said outer casing.

4,713,523

FIBER OPTIC CONNECTOR EPOXY CURING APPARATUS

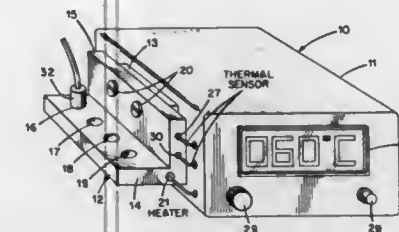
Donald C. MacDonald, Holbrook, Mass., assignor to GTE Government Systems Corporation, Waltham, Mass.

Filed Sep. 2, 1986, Ser. No. 902,550

Int. Cl. H05B 3/06

U.S. Cl. 219—385

1 Claim



1. Apparatus for heat curing a plurality of fiber optic connectors, comprised of:
 - a housing;
 - a heater control circuit within said housing having a thermal sensor input and a heater output;
 - a metal jig having a plurality of holes for receiving fiber optic connectors;
 - a first thermal sensor in thermal communication with said jig and electrical connector with said thermal sensing input of said heat control circuit;
 - a thermally and electrically insulating stand off member interposed between said jig and said housing;
 - a heater in thermal communication with said jig and in electrical communication with said heater output of said heater control circuit; and
 - mounting means for attaching said jig to an external surface of said housing, wherein said jig has a horizontal leg having said holes, and a vertical leg coupled to said mounting means, and wherein said heater is located at the junction of said legs.

4,713,524

PTC FUEL HEATER FOR HEATING ALCOHOL FUEL

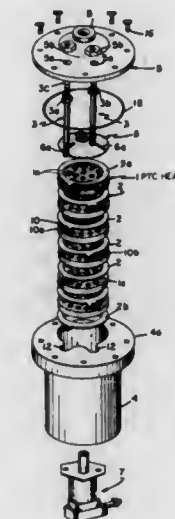
Vincent B. Leo, Raymond; Kenneth M. Cyll, W. Buxton, and Mason G. Ide, Gorham, all of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 21, 1986, Ser. No. 855,547

Int. Cl. H05B 3/82; F24H 1/10; F02M 31/12

U.S. Cl. 219—307

5 Claims



1. A fuel heater comprising:
 - a container having an electrically insulated interior defining a fuel flow path and further having an inlet and an outlet,

being connected to the opposite ends of said flow path for the passage of fuel therethrough; and

a stack of generally planar foraminous PTC heaters disposed in said container in the flow path between the inlet and the outlet and arranged transversely of the flow direction of the flow of fuel; and

an array of flat ring-like conductive elements, each having an electrical contact projecting from an edge thereof, the contact means of said array of elements being arranged in two rows, the electrical contact means in one row being arranged so as to be radially offset from the electrical contact means of the other row, each conductive element of each row being disposed between alternate PTC heaters in said stack, each of said conductive elements engaging substantially only the perimeter of the PTC heaters to leave the foraminous central portion thereof unobstructed to allow flow of fuel through said stack of PTC heaters from said inlet to said outlet; and

a pair of radially offset channels disposed on the interior of said container; and

electrical contact means of one row being disposed in one of said channels and electrical contact means of the other row being disposed in the other of said channels; and

means connecting the outsides of the opposite end-most PTC heaters in the stack to the opposite sides of a power supply and means connecting the electrical contact means of said one row and the electrical contact means of said other row to opposite sides of the same power supply.

4,713,525

MICROCOMPUTER CONTROLLED INSTANT ELECTRIC WATER HEATING AND DELIVERY SYSTEM

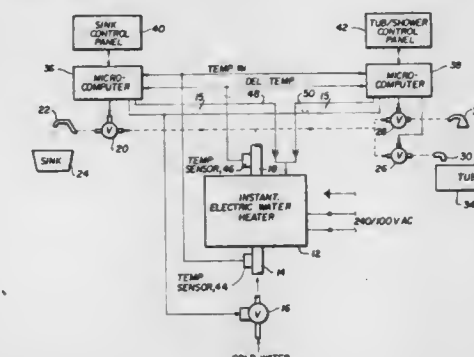
Calvin W. Eastep, Houston, Tex., assignor to Kowah, Inc., Houston, Tex.

Filed Jul. 23, 1986, Ser. No. 888,400

Int. Cl. H05B 1/02; F24H 1/10; G05D 23/00

U.S. Cl. 219—308

6 Claims



1. A computer controlled electric instant water heating system comprising:
 - an electric water heater having water inlet and outlet means and including a first plurality of separately energizable electric resistive heating elements located therein for raising the temperature in discrete equal first valued temperature increments, a second plurality of separately energizable resistive heating elements for raising the temperature in discrete equal second valued temperature increments, and at least one other separately energizable resistive heating element for raising the temperature a discrete third valued temperature increment, said first valued increments being greater than said second valued increments and said third valued temperature increment being less than said second valued increments;
 - at least one variable rate delivery valve connected to said outlet means for delivering water at a selected flow rate to a water tap;
 - first and second means for respectively sensing the ambient

inlet water temperature at said inlet means and the delivery water temperature at said outlet means;
means for selecting a desired delivery water flow rate at said water tap;
means for selecting a desired delivery water temperature at said water tap; and
digital computer means including means responsive to said temperature selecting means and programmed to constantly calculate the difference between the ambient inlet water temperature and the delivery water temperature, means responsive to said calculated temperature difference for electrically energizing at least one of said heating elements to bring the delivery water temperature to the selected delivery temperature, means for controlling display means to display the current delivery temperature, and means responsive to said flow rate selecting means for controlling said variable rate delivery valve to deliver water at the selected delivery rate to said water tap, said digital computer means being further programmed to permit water delivery to said water tap only under a predetermined valid set of user selected flow and temperature values and including means responsive to an invalid selection for causing system operation to occur at the closest possible allowable conditions of flow rate and temperature.

4,713,526

RESERVOIR FILLING ARRANGEMENT FOR A COFFEE MACHINE

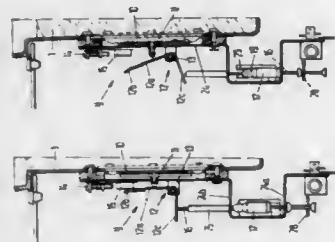
Gerard C. Smit, Amerongen, Netherlands, assignor to Smit-design B.V., Amerongen, Netherlands

Filed Sep. 22, 1986, Ser. No. 909,682

Int. Cl.⁴ A47J 31/00; H05B 1/00; F24H 1/00

U.S. Cl. 219—332

15 Claims



1. A valve control device for a coffee machine of the type including water supply conduit coupled thereto and a valve for controlling flow therein, the reservoir having a wall, said valve control device comprising a diaphragm capable of being disposed in said wall, stud means operably coupled to said diaphragm for movement thereby, a tilting member arranged proximate said stud means, a control circuit for operating the valve and bistable switch means in said control circuit, means mounting said tilting member for swivelling movement about a swivel axis between first and second positions, said first position being in the path of movement of said stud means and said second position operably coupled to said switch means and magnetic means for retaining said tilting member in said first position until overcome by movement of said stud means enabling movement of said tilting member to said second position.

4,713,527

RADIANT HEATING UNIT

Robert Kicherer, Felix Schreder, and Leonhard Dörner, all of Oberderdingen, Fed. Rep. of Germany, assignors to EGO Elektro Geräte Blanc u. Fischer, Fed. Rep. of Germany

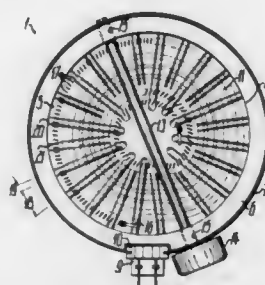
Filed May 28, 1986, Ser. No. 868,260

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519350

Int. Cl.⁴ H05B 3/68, 3/18

U.S. Cl. 219—464

24 Claims



1. A radiant heating unit, comprising:
an insulating support made from high temperature-resistant formed insulating material, at least one radiant heating resistor held in said insulating support, wherein the insulating support substantially comprises a granulation of an expanded mica, compressed with a binder.

4,713,528

COOKING APPARATUS WITH TIMER

Hidetoshi Hirata, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

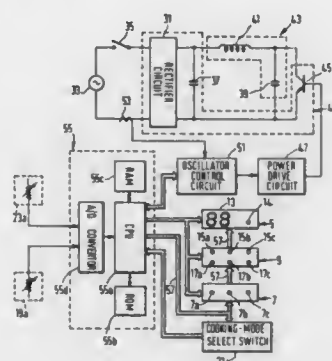
Filed Oct. 18, 1985, Ser. No. 788,872

Claims priority, application Japan, Nov. 9, 1984, 59-235190

Int. Cl.⁴ H05B 1/02

U.S. Cl. 219—492

7 Claims



1. A cooking apparatus comprising:
setting position means, including a variable resistor, for establishing a variable desired value based on a setting position thereof and producing an variable output signal corresponding to said desired value when said setting position is within a predetermined range, and producing an output signal representing no desired valve when said setting position is outside said predetermined range;
timer means for counting until achieving a value indicated by said output signal of said setting position means;
means for detecting whether said timer means is operative based on said output of said setting position means;
means for cooking until said timer means counts to said desired value; and
means for continuing said cooking indefinitely if said timer means is rendered inoperative by said output signal repre-

sending no desired value, before reaching said desired value.

4,713,529

ELECTROCEAMIC HEATING DEVICES WITH WELDED LEADS

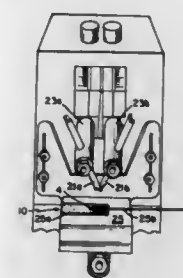
Lionel J. Melanson, Casco, and Richard C. Watson, Sebago Lake, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 15, 1986, Ser. No. 906,875

Int. Cl.⁴ H05B 3/44; H01C 1/144; B05D 5/12

U.S. Cl. 219—541

7 Claims



1. An electroceramic heater comprising:
a pair of metallic coatings forming metallic electrodes, electrically insulated from each other and a body of electroceramic material disposed therebetween, said body being capable of producing heat upon application of current to electrodes; and
a lead wire extending outwardly from each of the metallic electrodes; and
pads comprising a layer of copper metal disposed between each lead wire and the respective metallic electrode; and
said lead wires being welded to each of the respective electrodes by means of said pad, each of said lead wires having at least two impressions formed thereon, and said weld being formed between said impressions and between respective pad and lead wire.

4,713,530

HEATING ELEMENT COMBINED GLASS/ENAMEL OVERCOAT

Hans-Joachim Schittenhelm, Leverkusen; Werner Joseph, Cologne, and Gerhard Trögel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 26, 1986, Ser. No. 912,446

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536268

Int. Cl.⁴ H05B 3/16; H01C 1/012; B05D 1/36

U.S. Cl. 219—543

7 Claims

1. A panel heating element comprising (a) a metal substrate, (b) an aluminum boron-silicate insulating glass which forms a coating on the metal substrate, (c) one or more metallic resistance tracks applied to the substrate and (d) a mixture of a zirconium phosphate glass and a boron-titanium enamel which is applied as a layer over the metallic resistance tracks.

4,713,531

HEATING ELEMENT FOR TEXTILES

Peter Fennekels; Ernst Waltmann, both of Krefeld, and Walter Schumacher, Nettetal, all of Fed. Rep. of Germany, assignors to Girmes-Werke AG, Fed. Rep. of Germany

Filed Jul. 30, 1984, Ser. No. 635,427

Int. Cl.⁴ H05B 3/34; H01C 3/06

U.S. Cl. 219—545

19 Claims



1. A heating element for textiles comprising:
(a) a plane textile element,
(b) metallic conductors combined with said plane textile element and having metallic fibers and with a denier of natural or synthetic textile fibers and an average cross-section thickness of about 8 to 24 microns,
(c) said metallic conductors being resistance elements in that they are connectable to a source of electrical current and oppose electrical current flowing through them with a heat-producing resistance,
(d) said conductors being provided with an electrically-insulating sheath,
(e) said fibers behaving like textile fibers and therefore not noticeably changing the natural behavior of the textiles and withstanding crushing and bending stresses.

4,713,532

COMPACT OMNIDIRECTIONAL LASER SCANNER

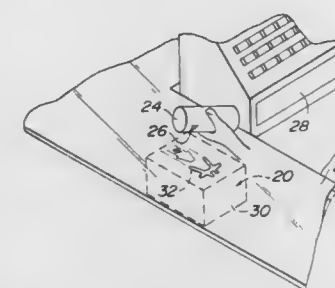
Carl H. Knowles, Moorestown, N.J., assignor to Metrologic Instruments, Inc., Bellmawr, N.J.

Filed Nov. 21, 1985, Ser. No. 800,486

Int. Cl.⁴ G06K 7/10

U.S. Cl. 235—467

14 Claims



1. A compact laser scanner for use at a counter to produce a scanning pattern thereabove and into which a bar code can be inserted to enable the reading of said code, said scanner comprising a housing of a height no greater than approximately six inches (15.2 cm) and taking up only a small area of said counter, said housing having a horizontal longitudinal axis, a horizontal transverse axis, a vertical axis, and a top including a generally horizontally disposed light transmissive opening, said scanner comprising laser beam generating means for producing a laser beam, beam sweeping means for cyclically sweeping said beam in said housing, and reflecting means comprising first, second and third portions, all of said means being located within said housing, said beam sweeping means and said reflecting means being oriented so that for each sweep of said beam in said housing said reflecting means projects a scanning pattern out of said light transmissive opening, said scanning pattern comprising three scan lines, said lines being a transverse line extending perpendicularly to said longitudinal axis, and a pair of side lines each extending at an angle to the transverse line and to each other, said first portion of said reflecting means comprising a first reflecting surface extending

generally perpendicularly to said longitudinal axis to produce said transverse line of said pattern, said second portion of said reflecting means comprising a second reflecting surface disposed generally to one side of said first reflecting surface, said third portion of said reflecting means comprising a third reflecting surface disposed generally to the other side of said first reflecting surface, each of said second and third reflecting surfaces having a longitudinal axis extending in a generally upward direction at a shallow angle to said vertical axis and taking up a substantial portion of the height of said housing, said beam sweeping means and said reflecting means being arranged so that said beam impinges said second and third reflecting surfaces adjacent the lower end of each from a generally horizontal direction and sweeps along said second and third reflecting surfaces in an upward direction generally parallel to said longitudinal axis thereof to a point adjacent the top thereof to produce said two side lines of said pattern.

4,713,533

CONCENTRIC DETECTOR ARRAY AND ASSOCIATED HYBRID SIGNAL PROCESSING FOR COARSE AND FINE ELECTRO-OPTICAL TRACKING

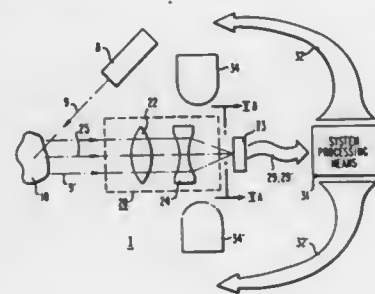
James C. Bremer, Gaithersburg; Fred S. Hurt, Ellicott City; John G. Romanski, Annapolis; Richard F. Kroopa, Pasadena, and Ronald G. Kraus, Severna Park, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 3, 1986, Ser. No. 816,097

Int. Cl.⁴ G01J 1/20

U.S. Cl. 250—203 R

18 Claims



1. A passive electro-optic tracking system for measuring the angular displacement of a target relative to the tracking system boresight comprising:

- a wide field of view optical detector means disposed along the boresight of said system further comprising a central fine track detector array portion of at least four quadrants and at least one concentric ring of coarse track detector elements about said central quadrant array portion, all of said fine track quadrants and coarse track elements operable to simultaneously receive optical energy emitted from said target and further operable to convert said received emitted optical energy into electrical energy;
- a signal threshold processor means comprising a coarse track signal processing means coupled to said coarse track detector elements, said processor means operable to analyze said electrical energy generated from said emitted optical energy from said target and further comprising a fine track signal processing means coupled to said central fine track quadrant array portion said fine track signal processing means operable to analyze said electrical energy produced from said optical energy striking said fine track quadrant array portion;
- a receiver telescope means positioned on a common colinear axis with said optical detector means, said telescope means operable to receive said optical energy emitted from said target and further operable to direct said optical energy towards said optical detector means;
- a two axis gimbal pointing system interconnected to said receiver telescope means comprising a multiplicity of motor drives, said two axis system operable to reposition

said receiver telescope means in relation to said target means;

- a command generator means interconnected between said fine track and said coarse track signal processing systems and said two axis gimbal pointing system, said command generator means operable to issue commands to said gimbal pointing system to reposition said receiver telescope means relative to said target means during said tracking system operation.

4,713,534

PHOTOTRANSISTOR APPARATUS WITH CURRENT INJECTION AMBIENT COMPENSATION

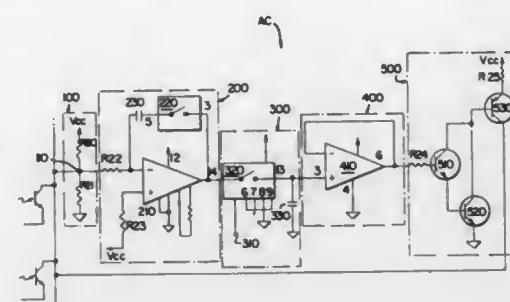
Timothy E. Masters, Georgetown, and Wayne J. Wehrer, Austin, both of Tex., assignors to Carroll Touch Inc., Round Rock, Tex.

Filed Feb. 18, 1986, Ser. No. 830,408

Int. Cl.⁴ H01J 40/14

U.S. Cl. 250—214 B

9 Claims



2. A phototransistor signal detection circuit for measuring the intensity of an incident light signal having an ambient compensation network for maintaining the output level of an ambient induced signal from a phototransistor wherein the signal detection gain can remain large while remaining within the operating range for varying ambient conditions; the detection circuit comprising:

- a first voltage source;
- voltage divider means connected to the first voltage source for establishing a voltage at the phototransistor collector dependent upon the phototransistor collector to emitter current upon excitation of the phototransistor;
- means for measuring an ambient signal corresponding to the voltage at the phototransistor collector under ambient conditions;
- means for sampling and holding the ambient signal upon excitation of the phototransistor by the incident radiation signal; and
- current injection means responsive to the ambient signal for injecting a current at the phototransistor collector to offset incremental changes in the phototransistor collector voltage induced by ambient excitation of the phototransistor.

4,713,535

OPTICAL KEYBOARD

Randy L. Rhoades, 1947 Delaware Ave., Swissvale, Pa. 15218

Filed Sep. 4, 1985, Ser. No. 772,553

Int. Cl.⁴ H01J 40/14; G06F 15/40

U.S. Cl. 250—221

15 Claims

- 1. Interface apparatus for a data processor comprising, a data entry terminal including an array of photosensors, a monitor for visually displaying data, said monitor associated with said data entry terminal, said photosensors being positioned in a X-Y coordinate system having a plurality of rows of photosensors parallel with a X-axis and a plurality of columns of photosensors parallel with a Y-axis for identifying each photosensor by a X and Y coordinate,

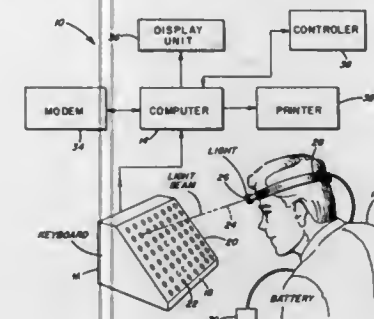
said photosensors being actuated or not actuated between an active state and an inactive state in dependence upon receipt of energy from a source of energy to generate input signals,

a microprocessor board having a data input terminal, data input lines electrically connecting said data input terminal in a first network to all of said sensors in said X-axis and in a second network to all of said photosensors in said Y-axis,

said data input terminal on said microprocessor board receiving input signals from said photosensors upon receipt of energy representing a selected X and Y coordinate in said array of photosensors,

data processing means for receiving output signals from said microprocessor board in response to said input signals from said actuated sensors as instructions to perform a task,

means associated with said data processing means for trans-



mitting data commands through said microprocessor board for display on said monitor,

bidirectional data means connecting said data entry terminal, said microprocessor board, and said data processing means for simultaneous transfer of data between said data entry terminal and said data processing means,

means on said microprocessor board for sensing said input signals from said array of photosensors sequentially row by row parallel to said X-axis to identify said photosensors aligned with said Y-axis being actuated,

said microprocessor board including an output terminal connected to said data processing means for transmitting said output signals representing each actuated photosensor by X and Y coordinates to said data processing means, and

said data processing means in response to said output signals from said microprocessor board being operable to perform said task in response to actuation of said photosensors when exposed to a source of energy.

4,713,536

MOLDED CODE MARK READER WITH ELONGATED READ BEAM

Reade Williams, South Hamilton, Mass., and Paul F. Scott, Granby, Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 814,853, Dec. 30, 1985, abandoned.

This application Jun. 23, 1987, Ser. No. 65,650

Int. Cl.⁴ G01N 9/04; G06K 7/10

U.S. Cl. 250—223 B

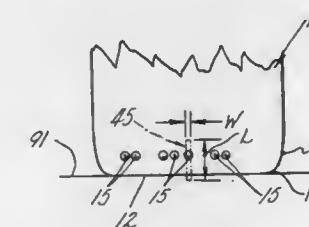
16 Claims

1. A method for reading raised code marks circumferentially arranged in a sector about a cylindrical sidewall of a container, said method comprising the steps of:

- rotating the container;
- illuminating the sector during the rotation with a substantially collimated light beam of elongated cross section as exhibited on the sidewall of the container to produce reflections from the container, the light beam cross-section having a width approximately equal to or less than a spacing between the code marks and a height substantially greater than the height of said code marks to accommo-

date vertical misalignment and being oriented relative to the code marks such that the light beam can essentially illuminate no more than one code mark at any time;

detecting light directed at a field optics assembly including light transmitted from a portion of the surface of said container substantially broader than the area of a raised code mark, such detected light including at least part of



the reflections of said collimated light beam from code marks, but substantially none of the reflections of said collimated light beam from other portions of the container; and

generating code identification signals corresponding over time to the intensity of the light detected by said field optics assembly.

4,713,537

METHOD AND APPARATUS FOR THE FINE POSITION ADJUSTMENT OF A LASER BEAM

Rino E. Kunz, Steinmaur; Jürgen R. Junghans, Biren z. Hof; Jean A. Knus, Zurich; Urs Murbach, Neuenhof, and Marcel F. Tuor, Rümlang, all of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

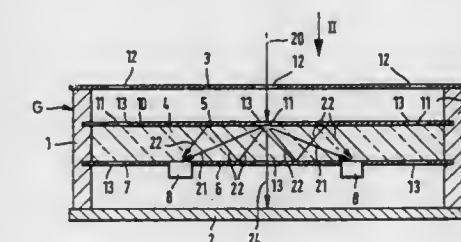
Filed Aug. 18, 1986, Ser. No. 897,259

Claims priority, application Switzerland, Aug. 23, 1985, 3644/85

Int. Cl.⁴ H01J 5/16

U.S. Cl. 250—227

23 Claims



1. An apparatus for evaluating the fine adjustment of a laser beam emitted by a laser and focused to a focal plane particularly the calibration of the beam deflection geometry, comprising:

- a substrate for placement in the focal plane of the laser beam, the substrate being essentially non-absorbent of the laser light of said beam, said substrate having a plurality of marks arranged for scattering, refracting, diffracting or otherwise deflecting the laser light; and
- a photoelectric device for the selective reception of the laser light scattered, refracted, diffracted or otherwise deflected, and for conversion of the received light into electrical signals.

4,713,538

OPTICAL FIBER APPARATUS AND METHOD FOR REMOTELY MEASURING AN EXTERNAL PARAMETER FROM A MONITORING POSITION

Evangelos Theodorou, London, England, assignor to Central Electricity Generating Board of Sudbury House, London, England

PCT No. PCT/GB84/00136, § 371 Date Dec. 12, 1984, § 102(e) Date Dec. 12, 1984, PCT Pub. No. WO84/04439, PCT Pub. Date Nov. 8, 1984

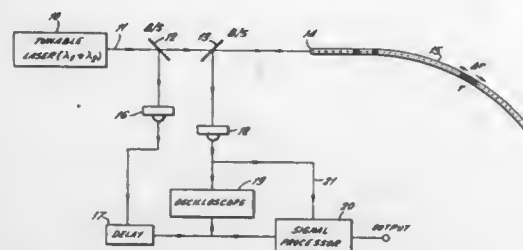
PCT Filed Apr. 19, 1984, Ser. No. 681,852

Claims priority, application United Kingdom, Apr. 26, 1983, 8311256

Int. Cl.⁴ G01D 5/34

U.S. Cl. 250—227

14 Claims



1. An apparatus for remotely measuring values of an external parameter at a plurality of locations from a monitoring position, said apparatus comprising:

an optical sensor means at each of the locations; lengths of optical fiber serially interconnecting the sensor means to the monitoring position with the monitoring position at one end of the string of interconnected sensor means, the optical sensor means each being such as to permit light to pass from one optical fiber length to the next with a loss co-efficient through the sensor means which is dependent on the external parameter to be measured;

means for launching light pulses into the end of the optical fiber length at the monitoring position and monitoring backscattered energy emerging from said fiber end to determine said loss co-efficient at selected sensor means by optical time-domain reflectometry, said means for launching and monitoring including means to detect and measure the energy of the backscattered light; timing means for controlling the detecting and measuring means to measure the backscattered energies at each of two temporally spaced times selected relative to the time of launching the light pulses to correspond to energy backscattered from a pair of points in the optical fiber lengths on opposite sides of a selected one of the sensor means; and

computing means connected to receive from said detecting and measuring means signals representing the two measured backscattered energies and arranged to compute therefrom a value for said loss co-efficient and thence said external parameter which is normalized to minimize any dependence on the launching energy of the light pulse.

4,713,539

PHOTOELECTRIC CONTROLLER DEVICE INCLUDING BRUSHES

Arthur F. Hackman, Box 12B, St. Jacob, Ill. 62281

Filed Sep. 12, 1986, Ser. No. 906,393

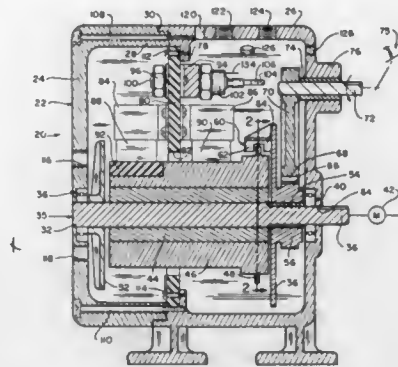
Int. Cl.⁴ G01D 5/34

U.S. Cl. 250—231 SE

25 Claims

1. A controller device including a rotatable assembly and a drive motor operatively connected to rotate the rotatable assembly, the rotatable assembly includes a member having an outer surface formed by conductive and relatively high resistance portions, a pair of spaced brushes in slidable contact with the outer surface, one of said brushes contacting the conductive portion only and the other contacting the conductive and

high resistance portions during rotation of the assembly, an annular flange having an opening formed therein on the rotatable assembly, a photocell having a light emitting portion located on one side of the annular flange and a light sensitive portion located on the opposite side of the annular flange whereby light from the light emitting portion can reach the light sensitive portion only at times when the opening is located therebetween, a circuit for the controller device including a source of energy, an electronic switching device having input, output, and gate electrodes, a load device and circuit



connections therebetween, the photocell and the brushes having circuit connections such that current flows from the energy source through the load device whenever the switching device is turned on by light from the light emitting portion of the photocell reaching the light sensitive portion thereof, said light sensitive portion having a circuit connection to the energy source and to the gate electrode of the switching device, current flowing through and between the brushes to the load whenever the switching device is turned on and as long as the brushes of said pair are both in contact with the conductive portion of the assembly.

4,713,540

METHOD AND APPARATUS FOR SENSING A MEASURAND

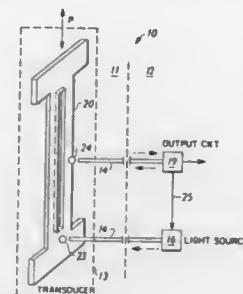
Anthony C. Gilby, Foxboro, Mass., and Dale E. Ihnat, Woonsocket, R.I., assignors to The Foxboro Company, Foxboro, Mass.

Filed Jul. 16, 1985, Ser. No. 755,646

Int. Cl.⁴ G01L 1/10; G01D 5/26

U.S. Cl. 250—231 R

27 Claims



1. Apparatus for use in the measurement of a physical parameter by photokinetic stimulation and optical detection of resonant mechanical structures, comprising:

- (a) resonant mechanical structure means for vibration;
- (b) means for communicating the physical parameter to said resonant mechanical structure means;
- (c) radiant energy source means for providing at least one radiant energy beam;
- (d) radiant energy pathway means for communicating said

radiant energy to a first area of said resonant mechanical structure;

- (e) means for directly converting said radiant energy to thermal energy conducted within at least a portion of the resonant mechanical structure to stimulate motion thereof at a frequency related to the physical parameter value; and
- (f) means for returning at least a portion of the radiant energy along at least a portion of said pathway means as a modulated signal related to the resonant structure vibration.

4,713,541

OPTICAL POSITION LOCATING DEVICE

Jean-Marie Renaud, Courbevoie; Paul Gambs, Ecully; Jean-Claude Perrot, Montigny en Cormeilles, and Jacques Taillebois, Plaisir, all of France, assignors to M.C.B., Courbevoie, France

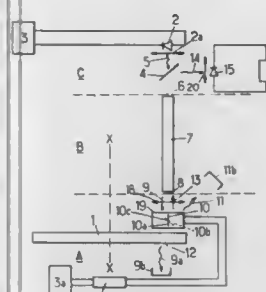
Filed Dec. 19, 1985, Ser. No. 810,719

Claims priority, application France, Dec. 21, 1984, 84 19712

Int. Cl.⁴ G01D 5/34

U.S. Cl. 250—231 SE

11 Claims



1. A position locating device comprising:

- (a) a data sensor which cooperates with a position code carrying element comprising optically coded tracks;
- (b) an optoelectronic module including an electronic signal processing unit; and
- (c) bidirectional optical fiber transmission means;

(i) said optoelectronic module including: at least one optoelectronic light emitter; bidirectional optical beam coupler; an optoelectronic reader for transforming light signals into electric signals to be processed by said electronic signal processing unit; a power supply for said optoelectronic light emitter and said optoelectronic reader;

said optoelectronic light emitter, said bidirectional optical beam coupler and said optoelectronic reader being disposed such that said optoelectronic light emitter emits light through said bidirectional optical beam coupler onto a first end of said bidirectional optical fiber transmission means and said optoelectronic reader receives light from said first end of said bidirectional optical fiber transmission means, through said bidirectional optical beam coupler;

(ii) said data sensor including: a series of micromirrors for modulating light output by a second end of said bidirectional optical transmission means, each of said micromirrors being disposed opposite an associated one of said optically coded tracks of said position code carrying element, respectively, and opposite said second end of said bidirectional optical transmission means, each of said micromirrors being pivotable between a first position in which said micromirror allows said light output by said second end of said bidirectional optical transmission means to pass therethrough so that said light reaches said associated optically coded track and returns from a reflecting zone of said optically coded track to said second end of said bidirectional optical transmission means and a second position in which said micromirror reflects said light

output by said second end of said bidirectional optical transmission means; means for urging said micromirrors into said second position; a control unit adapted for bringing said micromirrors successively and cyclically one by one into said first position; and a self contained power source for supplying power to said control unit.

4,713,542

TON BEAM NEUTRALIZER

Joseph E. Campana, Alexandria, Va., assignor to United States of America as represented by the Secretary of the Navy

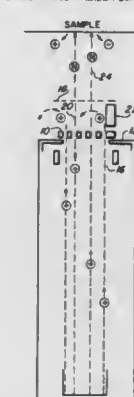
Filed Oct. 31, 1984, Ser. No. 666,597

Int. Cl.⁴ H01S 1/00, 9/00

U.S. Cl. 250—251

19 Claims

ION BEAM NEUTRALIZER SCHEMATIC



1. In an ion-to-neutral particle beam generator, a method of converting an energetic ion beam to an energetic neutral particle beam comprising:

- directing a beam of ions toward a metal surface; neutralizing said ions with said metal surface to produce a beam of neutralized particles; and repelling any remaining ions out of said beam of neutral particles; wherein said step of repelling said ions comprises passing said beam through an electrostatic repeller grid.

4,713,543

SCANNING PARTICLE MICROSCOPE

Hans-Peter Feuerbaum, Munich; Juergen Frosien, Ottobrunn, and Rainer Spehr, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 2, 1985, Ser. No. 751,020

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1984, 3429804

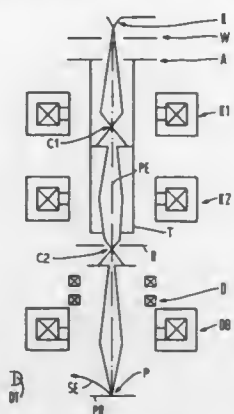
Int. Cl.⁴ H01J 37/04

U.S. Cl. 250—310

23 Claims

1. A scanning particle microscope comprising: a particle optics unit including means for generating a particle beam at a first energy, a lens system for generating at least one beam crossover, a particle deflection system and an objective lens for focussing the particles in said beam onto a specimen to be examined; and

means disposed within said particle optics unit for decelerating the particles in said beam from said first energy to a



second energy which is lower than said first energy by at least a factor of two.

4,713,544

OPTICAL SYSTEM FOR THE SIMULTANEOUS RECEPTION OF THERMAL AND LASER RADIATION
Ludger Grage, Eichenau, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

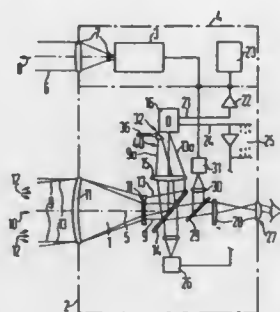
Filed Mar. 5, 1985, Ser. No. 708,250

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408082; Feb. 21, 1985, 3506088

Int. Cl.⁴ G02B 26/10

U.S. Cl. 250—334

26 Claims



1. An optical system for receiving laser radiation and thermal radiation, comprising:
 - a laser transmitter having an optical transmission axis and combined with a thermal image device,
 - scan means including a movable scan mirror operable to cyclically pivot back and forth;
 - a common receiving channel having an optical axis parallel to the optical axis of the transmitter laser, for receiving laser and thermal radiations and directing the same onto said scan mirror;
 - separation means optically coupled to said scan mirror for separating the laser and thermal radiations into separate convergent beam cones which proceed in different directions due to the movement of said scan mirror;
 - detector means; and
 - out-coupling means for receiving and coupling the separated radiations onto said detector means.

4,713,545
DEVICE FOR DETECTING OBJECTS, PARTICULARLY SUCH IN MOTION

Bo Norrgren, Akarp, and Nils Bjelk, Landskrona, both of Sweden, assignors to Besam AB, Landskrona, Sweden

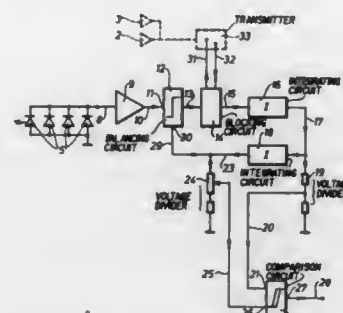
Filed Feb. 18, 1986, Ser. No. 830,395

Claims priority, application Sweden, Feb. 22, 1985, 8500891

Int. Cl.⁴ G01J 1/44

U.S. Cl. 250—338

6 Claims



1. In a device for detecting objects including a pulsed optical radiation source for transmitting light within the infra red range, and a receiver for receiving the radiation, which includes integration circuits having different integration times, means for comparing the outputs of the integration circuits, said means being adapted to deliver an operation signal as long as there is a difference in the outputs, the improvement wherein the integration circuits are connected in series, the integration circuit having the shorter integration time being connected to receive the signal level resulting from the received radiation.

4,713,546

HIGH PRESSURE SEAL

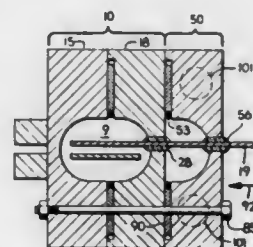
Charles R. Wojciechowski, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 20, 1984, Ser. No. 684,000

Int. Cl.⁴ G01T 1/18

U.S. Cl. 250—374

11 Claims



6. An ionization detector, comprising a first housing having first and second portions and surrounding a first chamber containing a fluid at a first pressure; a substrate which supports a plurality of conductive strips, penetrates the first housing through an opening in the first portion of the first housing, and enters the first chamber, said substrate being sealed to the first housing to inhibit leakage of fluid from said first chamber; a second housing attached to said first housing about said opening to reduce deformation of the first portion of the first housing; and a second chamber enclosed by said second housing and said first portion of said first housing and containing a fluid at a second pressure.

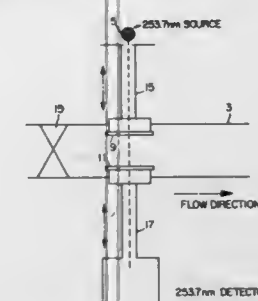
4,713,547
METHOD AND APPARATUS FOR MONITORING THE FLOW OF MERCURY IN A SYSTEM
Mark W. Grossman, Belmont, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Jan. 3, 1986, Ser. No. 816,035

Int. Cl.⁴ G01N 21/59

U.S. Cl. 250—373

21 Claims



1. A sensor for measuring the rate at which mercury passes through a system adapted for use with a narrow wavelength ultraviolet light beam source and an ultraviolet light detector, said sensor comprising:

means for forming a conduit for conveying mercury;
a pair of apertures disposed face to face and arranged on opposite sides of said conduit;
a pair of hollow support means, a portion of each being disposed inside of said conduit means and within one of said apertures;
a pair of optically transparent windows one of said windows being disposed upon each of the internal ends of said hollow support means;
means for adjusting the relative distance between the faces of said optically transparent windows;
means for forming a vacuum seal;
means for passing a narrow wavelength ultraviolet light beam through one of said windows, through the space between said windows and then through the other of said windows; and
means for passing the ultraviolet light passing through the other of said windows to an ultraviolet light detector such that absorption of the ultraviolet light is continuously measured thereby giving an indication of the rate at which mercury passes between said windows.

4,713,548

ELECTRON ATTACHMENT APPARATUS AND METHOD

Yong W. Kim, Bethlehem, Pa., and Thomas W. Harding, Wilmington, Del., assignors to Lehigh University, Bethlehem, Pa.

Filed Nov. 12, 1985, Ser. No. 796,906

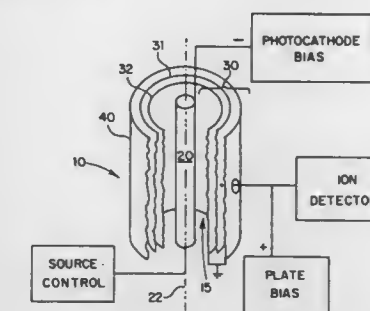
Int. Cl.⁴ H01J 27/24

U.S. Cl. 250—423 R

22 Claims

1. Apparatus for producing negative ions in a fluid medium which comprises
 - a photoelectron emitter, including a UV light source and means for controlling said source, a photocathode disposed to be irradiated by said source, and means for biasing said photocathode negative with respect to a reference potential;
 - a negative ion collector in radially-spaced, coaxial relationship with said emitter, including a receiving plate, and means for biasing said plate at a positive potential with respect to said photocathode, at least one of said photo-

cathode and said plate having cylindrical configuration; together with



means for introducing and retaining the fluid medium between said emitter and said collector for a time sufficient to produce negative ions in the fluid medium.

4,713,549

RADIATION IMAGE STORAGE PANEL

Satoshi Arakawa, and Masamitsu Nonomura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Apr. 3, 1986, Ser. No. 847,709

Claims priority, application Japan, Apr. 3, 1985, 60-70239

Int. Cl.⁴ G03C 5/16

U.S. Cl. 250—484.1

3 Claims



1. A radiation image storage panel comprising a support, a phosphor layer which comprises a binder and a stimutable phosphor dispersed therein and a protective film, superposed in this order, characterized in that said protective film comprises polyethylene terephthalate, and has the longitudinal strength and the lateral strength equal to each other or in a difference therebetween of not more than 10%, the value being determined based on the larger strength, in which said protective film has the longitudinal strength and the lateral strength in a total of not less than 25 kg/mm².

4,713,550

DOCUMENT SIZE DETECTION APPARATUS

Shunju Anzai, Nara; Hiromu Sasaki, Yamatokoriyama; Norihide Kunikawa, Yao, and Kazuyuki Ohgita, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 8, 1986, Ser. No. 916,725

Claims priority, application Japan, Oct. 8, 1985, 60-225047

Int. Cl.⁴ G03G 15/00

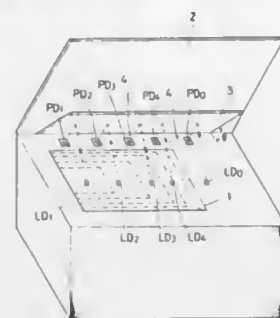
U.S. Cl. 250—560

4 Claims

1. A document size detection apparatus having a plurality of sensor portions including light emitting devices and photodetector devices disposed in the vicinity of an original table for detecting the size of a document mounted on the original table by means of reflected light or transmitted light, a comparator for comparing the output level of said sensor portion with a reference level, and decision means for determining the docu-

ment size depending on the output signal of the comparator, said document size detection apparatus comprising:

- means for changing the reference level for said comparator
- and for detecting the resultant output of the comparator;
- means for finding the condition in which the reference level becomes equal to the output level of said sensor portion;

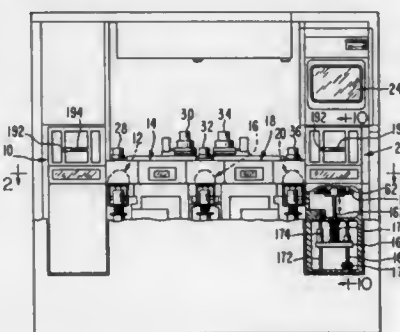


storage means for storing the value representing that condition, which are used in the adjustment mode without a document mounted on said original table; and reference level setting means for setting the reference level to be input to said comparator depending on the value stored in said storage means, which is used in the document size decision mode for detecting the size of a document mounted on said table.

4,713,551
SYSTEM FOR MEASURING THE POSITION OF A
WAFER IN A CASSETTE
Frederick P. Layman, and Michael J. Kuhlman, both of Fre-
mont, Calif., assignors to Varian Associates, Inc., Palo Alto,
Calif.

Filed Apr. 17, 1986, Ser. No. 853,272
Int. Cl.⁴ G01N 21/86

U.S. Cl. 250—561



1. A system for measuring the position of a wafer in a cassette, comprising:

- transmitter means for sending a closely collimated beam of radiation;
- receiver means for detecting the closely collimated beam of radiation;
- transport means for moving the cassette past the collimated beam of radiation at a constant rate of speed;
- signal processing means for translating interruptions in the collimated beam of radiation detected by said receiver means due to wafers passing through said beam as a function of time into position information by calculation of position using said constant rate of speed multiplied by elapsed time;
- computer means for receiving and storing information from said signal processing means and for controlling said transport means.

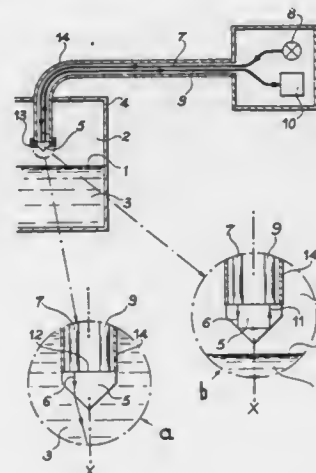
4,713,552
OPTICAL PROBE

Jean Denis, Mesnil le roi, and Jean-Michel Decaudin, Velaux, both of France, assignors to Electricite de France (Service National), Paris, France
PCT No. PCT/FR84/00106, § 371 Date Dec. 24, 1984, § 102(e)
Date Dec. 24, 1984, PCT Pub. No. WO84/04384, PCT Pub.
Date Nov. 8, 1984

PCT Filed Apr. 16, 1984, Ser. No. 694,388
Claims priority, application France, Apr. 22, 1983, 83 06672
Int. Cl.⁴ G01N 21/49

U.S. Cl. 250—577

11 Claims



1. Optical probe for the detection of the separating interface of two hostile media having different optical indices contained in an enclosure, comprising a cone made from a transparent material and having a predetermined refractive index able to refract an incident light beam if it is located in one of the two media whose refractive index is higher than the predetermined index and is able to reflect an incident light beam if it is located in one of the two media whose index is below the predetermined index, by means of a pair of optical fibres comprising an optical emission fibre for transmitting the incident light beam from a light source to the base of the cone and at least one optical reception fibre for transmitting the optionally reflected beam to an optoelectronic detector, the source and the detector being located outside the enclosure, characterized in that it comprises a tight casing having a reception recess for a base of the cone, said casing being closed by a cover provided with a conical opening for the passage of the cone, the casing having tight passages for the optical fibres and maintaining in a given relative position with respect to the base of the cone two of the respective ends of the two optical fibres of the said pair, two other respective ends of said two fibres being respectively positioned facing the source and facing the detector, the casing and the cone being made from materials able to resist chemical and thermal stresses in the two media.

4,713,553

FAST POWER-FAIL DETECTOR FOR POWER SUPPLIES WITH ENERGY HYSTERESIS

Greg M. Townsend, Palatine, and Giuseppe M. DiPrizio, Glendale Heights, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

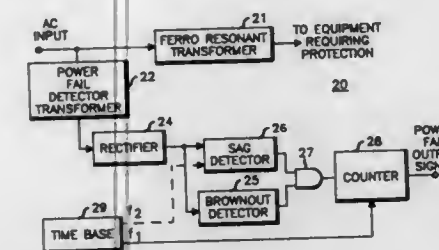
Filed Oct. 21, 1985, Ser. No. 789,866
Int. Cl.⁴ G01R 23/16; H03K 5/20

U.S. Cl. 307—64

36 Claims

1. A method for rapidly detecting power signal disturbances in power systems with transformers having energy storage decay profiles, the method comprising the steps of:
comparing the power signal against a dynamic reference signal;

comparing the power signal against a relatively absolute reference signal; and
generating a power-fail signal in response to either compari-



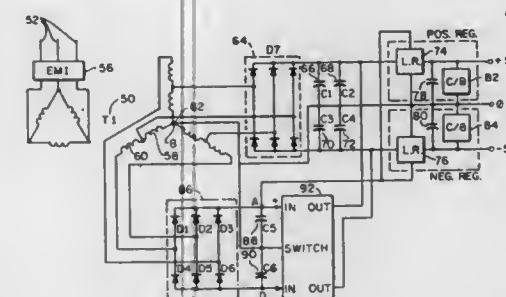
son approximating its respective reference, whereby the dynamic reference signal decay is long relative to the transformer energy storage decay profile and the power-fail signal indicates a power disturbance.

4,713,554
EXTENDED RANGE REGULATED POWER SUPPLY
 Ross Henderson, North Reading, Mass., assignor to Powercube
 Corporation, Billerica, Mass.

Filed Apr. 14, 1986, Ser. No. 851,227
Int. Cl.⁴ H02J 9/00

U.S. Cl. 307-64

5 Claims



1. A power supply for use with a unregulated input supply comprising:
 - a first means for receiving said unregulated input supply providing a first output;
 - a second means for receiving said unregulated input supply providing a second output;
 - a voltage regulator for receiving said first output at an input and providing a regulated output;
 - means for detecting a drop-out in said unregulated input supply potential and providing a control output signal in response to the drop-out in unregulated supply potential; and
 - a switch to selectively provide said second output to said voltage regulator input upon receipt of said control signal permitting said voltage regulator to continuously maintain a regulated output.

4,713,555
BATTERY CHARGING PROTECTION CIRCUIT
Robert D. Lee, Denton, Tex., assignor to Dallas Semiconductor
Corporation, Dallas, Tex.

Filed Apr. 8, 1987, Ser. No. 36,021
Int. Cl.⁴ H02J 9/02

U.S. Cl. 307-66

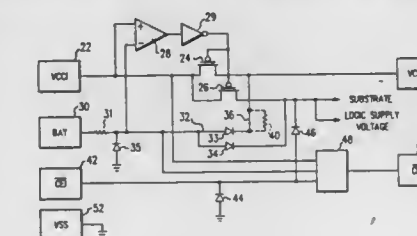
6 Claims

1. A power supply switching circuit embodied in a CMOS integrated circuit having an N-type substrate, said power supply switching circuit having a primary power source input terminal, a backup battery input terminal, and a power supply voltage output terminal, comprising:

(a) a comparison means for comparing the voltage at said primary power source input terminal to the voltage at said backup battery input terminal and for providing a first

logic state at a first internal node if the voltage at said primary power supply input terminal is greater than the voltage at said backup battery input terminal, and for providing a second logic state at said first internal node if the voltage at said primary power supply input terminal is less than the voltage at said backup battery input terminal;

(b) switching means coupled between said primary power supply input terminal and said power supply voltage output terminal for making a conductive path between said primary power supply input terminal and said power supply voltage output terminal when said first internal node is at said first logic state, and for providing a high impedance between said primary power source input terminal and said power supply voltage output terminal when said first internal node is at said second logic state;



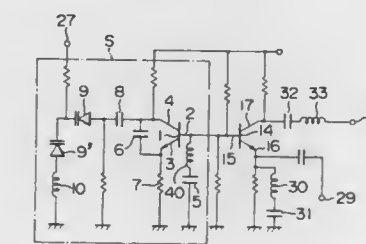
- (c) first diode means coupled between said backup battery input terminal and said substrate of said CMOS integrated circuit for permitting current to flow substantially only in the direction from said backup battery input terminal to said substrate;
- (d) second diode means coupled between said backup battery input terminal and a second internal node of said power supply switching circuit for permitting current to flow substantially only in the direction from said backup battery input terminal into said second internal node; and
- (e) conduction means coupled between said second internal node and said power supply voltage output terminal for passing current between said second internal node and said power supply output terminal.

4,713,556
FREQUENCY CONVERTER CIRCUIT

Akio Yamamoto, and Keiro Shinkawa, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1985, Ser. No. 798,241
Claims priority, application Japan, Nov. 9, 1984, 59-235093
Int. Cl.⁴ H03B 19/00, 5/00
U.S. Cl. 307-219.1 14 Claims

14 Claims



1. A frequency converter circuit for converting a high-frequency signal into an intermediate frequency signal, comprising:
 - a local oscillation circuit including:
 - a first transistor having first, second and third terminals, said first terminal of said first transistor being coupled to ground through a first inductance and a first capacitor,
 - a second capacitor connected between said second and third terminals, and
 - a resonance circuit having variable-capacity diodes and a

second inductance, said resonance circuit being connected to said second terminal of said first transistor through a third capacitor; and

a mixer circuit including:

a second transistor having a base connected to said first terminal of said first transistor so that an oscillation frequency signal is supplied from said first terminal of said first transistor to a base of said second transistor, said second transistor further comprising an emitter connected to a high frequency signal inputting terminal for inputting a high frequency signal to said second transistor, wherein said collector of said second transistor outputs an intermediate frequency signal which intermediate frequency signal is the difference signal between said oscillation frequency signal applied to the base of said second transistor and said high frequency signal applied to said emitter of said second transistor, and further wherein the emitter of said second transistor is connected to ground through impedances which substantially become zero with respect to said intermediate frequency signal.

4,713,557

BIDIRECTIONAL BUFFER AMPLIFIER

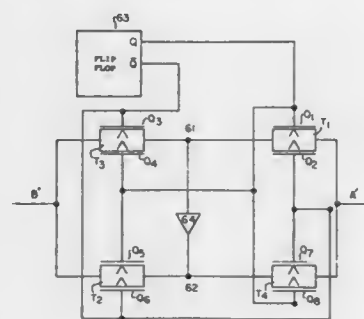
William S. Carter, Santa Clara, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Continuation of Ser. No. 655,008, Sep. 26, 1984. This application Feb. 11, 1987, Ser. No. 13,314

Int. Cl.⁴ H03K 17/56; H04B 3/38

U.S. Cl. 307-242

2 Claims



1. A bidirectional amplifier comprising:

an amplifier having an input lead and an output lead;
first transistor means responsive to the application of a control voltage for controllably conducting a first input signal from a first terminal to said input lead;

second transistor means responsive to the application of a control voltage for controllably conducting a second input signal from a second terminal to said input lead;

third transistor means responsive to the application of a control voltage for controllably conducting an output signal of said amplifier from said output lead to said first terminal;

fourth transistor means responsive to the application of a control voltage for controllably conducting said output signal of said amplifier from said output lead to said second terminal; and

means for selectively programming said first, second, third and fourth transistor means by using control voltages such that for a first program selection said first transistor means and said fourth transistor means conduct said first input signal and said output signal, respectively, and said second transistor means and said third transistor means block said second input signal and said output signal, respectively, and for a second program selection said second transistor means and said third transistor means conduct said second input signal and said output signal, respectively, and said first transistor means and said fourth transistor means

block said first input signal and said output signals, respectively; and

said means for selectively programming having a first lead connected to said first transistor means and said fourth transistor means, and having a second lead connected to said second transistor means and said third transistor means, so that said means for selectively programming generates said control voltages for controllably conducting said input and output signals independent of the state of said input signals.

4,713,558

PATIENT MONITOR FOR PROVIDING RESPIRATION AND ELECTROCARDIOGRAM SIGNALS

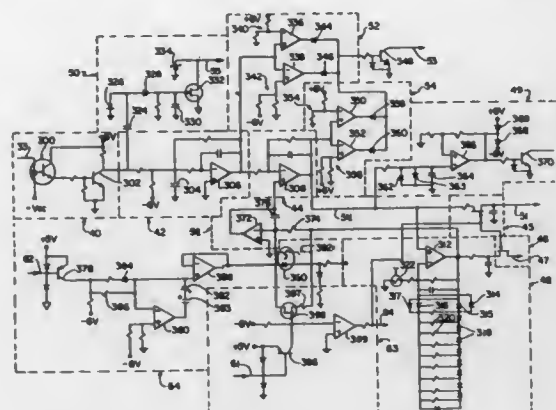
Donald J. Russell, Kennesaw, and Michael A. Sanders, Woodstock, both of Ga., assignors to Healthdyne, Inc., Marietta, Ga.

Division of Ser. No. 396,837, Jul. 9, 1982, Pat. No. 4,506,678, which is a continuation-in-part of Ser. No. 386,187, Jan. 7, 1982, abandoned. This application Jan. 30, 1985, Ser. No. 696,510

Int. Cl.⁴ H03K 5/153

U.S. Cl. 307-264

8 Claims



1. A baseline correction circuit, comprising:

a line carrying a signal intended to have a predetermined DC level;

first means for sensing said DC level and altering said DC level at a rate determined by a time constant when said DC level varies from said predetermined DC level;

second means for detecting said DC level and producing a baseline correction signal when said DC level is outside of a predetermined range; and

control means responsive to said baseline correction signal to alter said time constant of said first means so as to alter the rate at which said DC level is altered by said first means;

wherein said first means comprises a charge storage device, said time constant being a time constant of said charge storage device, and said control means comprises a first circuit for altering said time constant at a predetermined rate and by controlled variable amounts.

4,713,559

MULTIPLE INPUT AND MULTIPLE OUTPUT OR/AND CIRCUIT

Tho T. Vu, Fridley, and Kang W. Lee, Wayzata, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 29, 1985, Ser. No. 728,066

Int. Cl.⁴ H03K 19/02, 19/094, 19/084, 19/092

U.S. Cl. 307-446

18 Claims

1. A multiple input circuit comprising:

a plurality of groups of diodes, each said diode of each said group having an anode and a cathode;

a plurality of inputs wherein each said input is connected to only one said anode;

a plurality of nodes wherein each said node is connected to all said cathodes of only one said subplurality of said diodes;

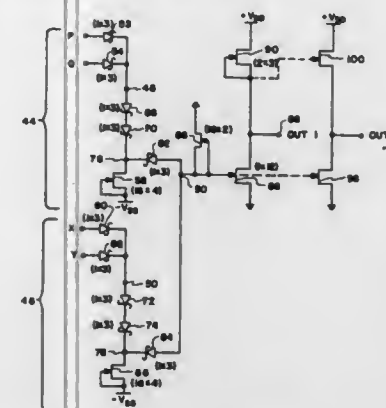
a plurality of current sinks wherein each of said current sinks is connected to only one said node of said plurality of nodes;

a plurality of diodes wherein each diode has a cathode connected to only one node of said plurality of nodes, and has an anode;

a common node connected to said anodes of said plurality of diodes;

a current source connected to said common node;

a first field effect transistor having a gate connected to said common node, having a source connected to a reference ground voltage potential and having a drain;



an output node connected to said drain of said first field effect transistor;

a second field effect transistor having a source connected to said drain of said first field effect transistor, and having a gate and a drain connected to a positive voltage source;

a first bootstrap diode having an anode connected to said drain of said second field effect transistor and having a cathode connected to said gate of said second field effect transistor; and

a second bootstrap diode having an anode connected to said gate of said second field effect transistor and having a cathode connected to said source of said second field effect transistor.

4,713,560

SWITCHED IMPEDANCE EMITTER COUPLED LOGIC GATE

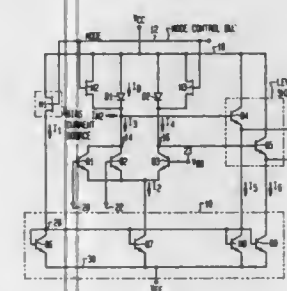
William H. Herndon, Sunnyvale, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Jan. 5, 1986, Ser. No. 871,639

Int. Cl.⁴ H03K 3/01, 17/60, 19/086, 19/02

U.S. Cl. 307-455

14 Claims



1. An apparatus for changing the power dissipation of an emitter coupled logic gate having at least two bipolar switching transistors having a common emitter terminal between

high and low power modes while substantially preserving the logic output voltages comprising:

a mode control bus for receiving a mode control signal;

means coupled to said emitter coupled logic gate and said mode control bus for establishing the bias current through all said bipolar switching transistors at either of a high or a low bias current level in response to said mode control signal; and

load impedance means coupled to said mode control bus and said emitter coupled logic gate, for switching, in response to said mode control signal, from a first level of impedance while said emitter coupled logic gate is operating at said high bias current level to a second higher impedance level when said emitter coupled logic operating at said low bias current level.

4,713,561

TRANSISTOR CIRCUIT WITH CONTROLLED COLLECTOR SATURATION VOLTAGE

Kazuyoshi Yamada, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 687,385, Dec. 28, 1984, abandoned.

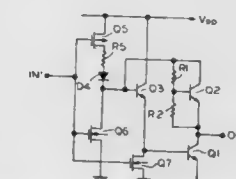
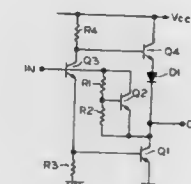
This application Feb. 10, 1987, Ser. No. 15,512

Claims priority, application Japan, Dec. 28, 1983, 58-247013

Int. Cl.⁴ H03K 19/003, 19/084, 19/088, 17/30

U.S. Cl. 307-456

9 Claims



1. A transistor circuit comprising: an input terminal for receiving an input signal; an output terminal for leading out an output signal;

a first transistor having an emitter, a base, and a collector, said collector of said first transistor being connected to said output terminal, said base and said collector of said first transistor being free from any connections to a Schottky diode;

a second transistor having a base and having a collector-emitter passage connected between said input terminal and the collector of said first transistor;

a PN junction element connected between said input terminal and the base of said first transistor;

a first resistor connected between the collector and base of said second transistor;

a second resistor connected between the base and emitter of said second transistor;

a load having one end connected to the collector of said first transistor; and

means for supplying operating power between said emitter of said first transistor and another end of said load, whereby said first transistor is prevented from being driven into saturation condition without using any Schottky diode.

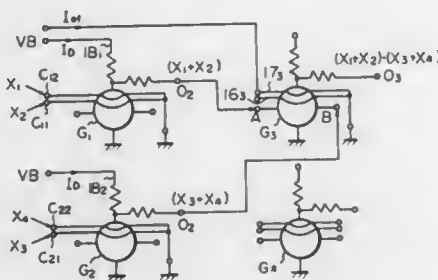
4,713,562

JOSEPHSON-JUNCTION LOGIC CIRCUIT

Shinya Hasuo, and Norio Fujimaki, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 820,587, Jan. 21, 1986, abandoned, which is a continuation of Ser. No. 363,862, Mar. 31, 1982, abandoned. This application Sep. 22, 1986, Ser. No. 910,301
Claims priority, application Japan, Mar. 31, 1981, 56-46392; Jun. 30, 1981, 56-102859; Dec. 28, 1981, 56-215711
Int. Cl.⁴ H03K 19/195

U.S. Cl. 307-462

13 Claims



1. A Josephson-junction logic circuit comprising: a plurality of Josephson-junction logic gates each including a superconductive inductance loop including an inductance and at least two Josephson junctions in said superconductive inductance loop; each said logic gate having: at least two current-injection lines for receiving at least two respective independent input signal currents to be injected at at least two respective different points of said superconductive inductance loop; and at least one magnetically coupled line, each placed so as to be magnetically coupled to said superconductive inductance loop and adapted for receiving a respective input signal current; each said logic gate having a respective threshold characteristic which is selectively shifted according to the respective input signal currents, and a selected logic function of said input signal currents being accordingly provided as an output of each said logic gate depending on the values of said input signal currents; each said logic gate having at least three inputs corresponding to said input signal currents and at least one output corresponding to the respective output logic function, a combination of at least two of the three inputs being selected to produce a desired logic function for each said logic gate, and wirings being coupled to said selected inputs and said outputs of said logic gates so that a predetermined logic function is output from the logic circuit.

4,713,563

D.C. BLOCK CAPACITOR CIRCUIT FOR REJECTION OF D.C. OFFSET

Christopher B. Marshall, Horley, England, and Richard C. French, Stansted, United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 12, 1986, Ser. No. 862,061

Claims priority, application United Kingdom, May 17, 1985, 8512491

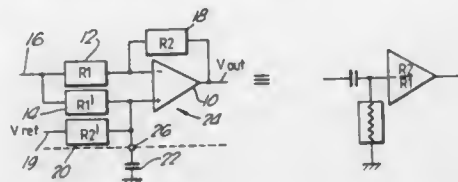
Int. Cl.⁴ G06G 7/12; H03D 1/24, 3/00; H04B 1/26

U.S. Cl. 307-490

17 Claims

1. A d.c. block capacitor circuit comprising an operational amplifier having an inverting input, a non-inverting input and an output, a first resistance means coupled between a signal input terminal and the inverting input, a second resistance means coupled between the output and the inverting input, a third resistance means coupled between the signal input terminal and the non-inverting input, a fourth resistance means coupled between the non-inverting input and a first reference

voltage point, the ratio of the value of the second resistance means to the value of the first resistance means being substantially the same as the ratio of the value of the fourth resistance



means to the value of the third resistance means, and a capacitor coupled between the non-inverting input and a second reference voltage point.

4,713,564

BOUNCE-NULLIFYING SWITCH UNIT

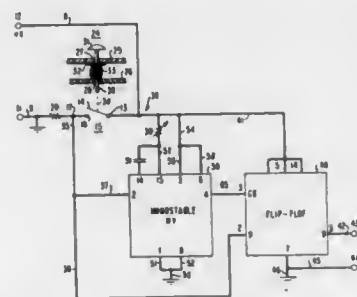
David B. Kimball, Shreveport, La., and Ruloff F. Kip, Jr., Westchester, N.Y., assignors to American Telephone and Telegraph Company, AT&T Information Systems, Holmdel and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Dec. 19, 1985, Ser. No. 810,958

Int. Cl.⁴ H03K 17/56, 5/01

U.S. Cl. 307-542.1

4 Claims



1. A bounce-nullifying switch unit comprising, input terminals for supplying d.c. power to said unit and consisting of a positive voltage terminal and a ground terminal, a switch and a resistor connected in series between said terminals with said switch and resistor having a junction therebetween and being relatively nearer to, respectively said positive voltage terminal and said ground terminal, said switch comprising contacts closeable and openable with each other and bounceable with each other after initial closure and initial opening thereof, and said series circuit being responsive to closing an opening of said contacts to develop at said junction between said switch and resistor a voltage relative to ground which is of high and low stable level when said contacts are, respectively, closed and open, and which voltage includes trains of impulses, developed after each initial closure and opening of such contacts and caused by such bouncing thereof and providing corresponding trains of positive-going rises respective to said impulses and manifested in said voltage, a semiconductor bistable flip-flop coupled to said junction to receive said voltage and changeable from a low, to a high voltage state, and from said high voltage state back to its low voltage state, only when the stable level of said voltage is, respectively, high and low, and only when, moreover said flip-flop is clocked by a positive going clock signal, a retriggerable monostable multivibrator coupled to said junction and responsive to a positive-going rise in said voltage to change from a stable "off" state to an unstable "on" state having a one-shot duration longer than the longest period of time between consecutive ones of such impulses insaid trains, said multivibrator having its output coupled to said flip-flop and being productive at said output, for clocking said flip-flop, or a positive-going clock signal produced by reversion of said multivibrator from its "on" state to

its "off" state, and said multivibrator being repetitively retriggered by said positive-going rises in said trains thereof to repetitively renew the "on" state of such multivibrator so as to delay the production of said clock signal until after termination of the last of the impulses in the train thereof following each closure and opening of said contacts.

4,713,565

SINGLE-PHASE MOTOR WITH A MAGNETIZED ROTOR

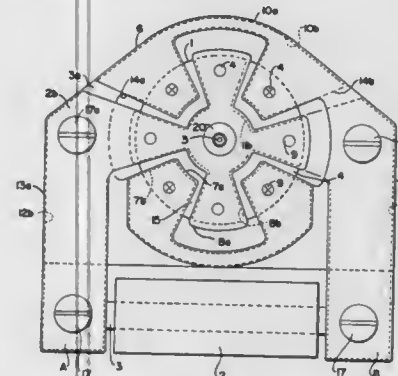
Michel Grosjean, 1, rue des Narcisses, Bienne 2504, Switzerland
PCT No. PCT/CH84/00112, § 371 Date Mar. 10, 1986, § 102(e)
Date Mar. 10, 1986, PCT Pub. No. WO86/00765, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 11, 1984, Ser. No. 855,305

Int. Cl.⁴ H02K 37/00

U.S. Cl. 310-49 R

7 Claims



1. A single-phased motor, comprising: a rotor having a first side and a second side and N pairs of poles, each of said pairs of poles having an axis of magnetization, the axes of magnetization being equidistant from and regularly distributed around an axis of rotation, each of said axes having a direction of magnetization, the directions of the magnetization of two adjacent axes being opposite one another; a coil for rotating said rotor, said coil having a core with an axis not coaxial with the axis of rotation of said rotor; a stator having N pole shoes, N/2 of which are located on each of said first and said second sides of the rotor, each of said stator pole shoes lying, while in a state of rest, substantially opposite one of said rotor poles having the same polarity as the stator pole shoe; a first and a second pair of polar pieces, said first pair located on the first side of said rotor and said second pair located on the second side of said rotor, each of said first and second pairs of polar pieces comprising a peripheral polar piece coplanar and interleaved with a central polar piece, said first pair of polar pieces magnetically interconnecting the stator pole shoes located on said first side of the rotor and said second pair of polar pieces magnetically interconnecting the stator pole shoes located on said second side of the rotor, wherein the stator pole shoes interconnected by said peripheral polar pieces extend therefrom toward the axis of rotation of the rotor and the stator poles shoes interconnected by said central polar pieces extend therefrom toward a periphery of the rotor; a plurality of connecting sections magnetically connecting each of said peripheral and central polar pieces to an end of the core of said coil; and a breach provided in each peripheral polar piece between two of the stator pole shoes interconnected thereby, the breach of each peripheral polar piece being angularly displaced with respect to each other such that the connecting section of each central polar piece extends through a breach.

4,713,566

APPARATUS FOR ENCLOSING AND COOLING TURBINE GENERATOR COLLECTOR SETS

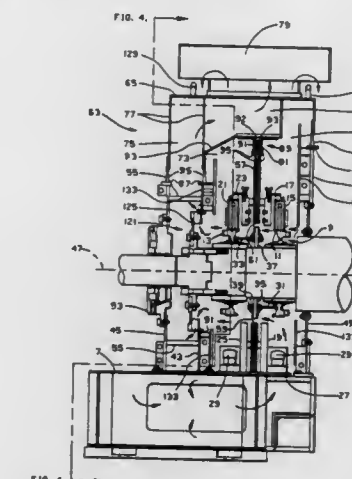
William G. Moore, Winter Springs, and Louis E. Nagoda, Winter Park, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 11, 1986, Ser. No. 940,671

Int. Cl.⁴ H02K 9/28, 13/00

U.S. Cl. 310-58

12 Claims



1. Apparatus for an electric power generator having a rotatable shaft, first and second collector rings axially spaced on said shaft and rotatable therewith, and first and second sets of stationary collector brushes supported angularly about, and in contact with, the first and second collector rings respectively; said apparatus comprising:

a generally planar baffle extending substantially transverse to said shaft between said collector rings and defining an aperture through which said shaft extends; enclosure means forming with the baffle a first chamber enclosing said first collector ring and first set of collector brushes, and a second chamber enclosing the second collector ring and the second set of brushes, said aperture defined by said baffle forming with the shaft an annular passage between said first and second chambers; seal means for substantially sealing off airflow between the baffle and the enclosure means; and ventilating means for introducing air into the first chamber and withdrawing the air from the second chamber, said collector rings and collector brushes being located in the respective chambers adjacent to said aperture in the baffle such that the air introduced into the first chamber flows over said collector brushes and collector rings in both chambers in passing from the first chamber to the second chamber through said annular passage.

4,713,567

ELECTROMAGNETIC BRAKE DEVICE FOR A SPORTS TRAINING APPARATUS

Rainer Fey, Schweinfurt, and Gerhard Dumbser, Niederwerrn, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG

Filed Sep. 26, 1986, Ser. No. 912,592

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535157

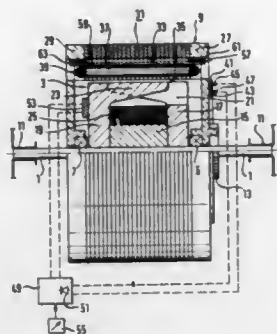
Int. Cl.⁴ A63B 69/16

U.S. Cl. 310-105

8 Claims

1. An electromagnetic brake device for a sports training apparatus, especially an ergometer, comprising: a stator and a rotor, rotatable in relation to the stator about an axis of rotation, wherein the stator and the rotor each comprise multi-pole iron circuits which together form a magnetic flux circuit, one of the iron circuits having a

magnetic remanence property, the iron circuits having windings allocated thereto, of which the winding allocated to the magnetically remanent iron circuit is formed as field winding and the other winding is formed as generator winding;



a slip ring arrangement for connecting the field winding with the generator winding;
a short-circuit winding allocated to the iron circuit of the generator winding; and
control circuit means for adjusting a magnitude of current fed to the field winding from the generator winding.

4,713,568

CLOSED MOTOR/TRANSMISSION UNIT

Peter Adam, Hochberg, and Peter Michel, Kleinrinderfeld, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

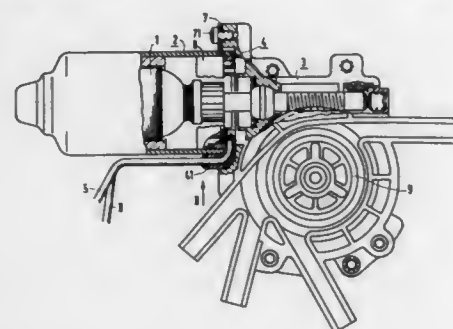
Filed Sep. 9, 1986, Ser. No. 905,627

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534339

Int. Cl.⁴ H02K 7/116

U.S. Cl. 310-112

10 Claims



1. A closed motor/transmission unit, especially for a window lifter, comprising:

- a motor housing for containing a motor, and having a motor housing face and a motor housing hole opening to said motor housing face, and a plurality of motor housing stops disposed on said motor housing face;
- a transmission housing for containing a transmission for driving said motor window lifter when coupled to said motor, and including a transmission housing face with a plurality of transmission housing stops having a distribution and spacing corresponding to said motor housing stops; said transmission housing face and said motor housing face being arranged and positioned in an abutting relationship with the motor housing stops contacting said transmission housing stops;
- a plurality of guide projections disposed on one of said motor housing face and transmission housing face;
- a seal consisting of an elastic material said seal having a peripheral sealing surface rim and fitting openings, said seal being disposed between said housing faces with said

- stops being disposed radially outwardly of said seal and said projections passing through said fitting openings;
- supply wires with a feedthrough integrally secured to said seal and passing through said motor housing hole to provide power to said motor, said supply wires and feedthrough being secured to said seal by one of a molding and a vulcanizing operation with said feedthrough disposed in said motor housing hole; and
- means for clamping the motor and transmission housings together to squeeze said seal between said faces.

4,713,569

LOW COGGING MOTOR

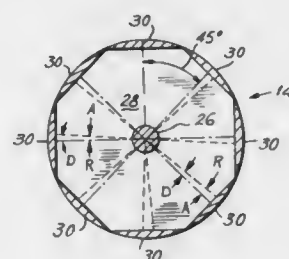
Myron Schwartz, St. James, N.Y., assignor to 501 Aeroflex Laboratories, Incorporated, Plainview, N.Y.

Filed Jun. 20, 1986, Ser. No. 876,634

Int. Cl.⁴ H02K 21/00

U.S. Cl. 310-152

4 Claims



1. An AC electric motor comprising a stator having a predetermined number of stator poles and stator windings which are AC energized to produce a rotating magnetic field and a rotor having a predetermined number of permanent magnet rotor poles characterized in that said rotor poles are circumferentially displaced by different displacement angles from respective corresponding reference positions which are mutually equally spaced about said rotor by angles equal to 360° divided by said predetermined number of rotor poles, each of said displacement angles being equal to an integral multiple of 360° divided by the product of the number of stator poles and the number of rotor poles.

4,713,570

MAGNETICALLY ENHANCED VARIABLE RELUCTANCE MOTOR SYSTEMS

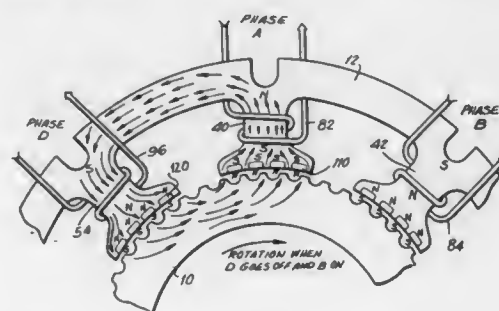
Robert Mastromattel, Newton, Mass., assignor to Pacific Scientific Co., Rockford, Ill.

Filed Jun. 4, 1986, Ser. No. 870,625

Int. Cl.⁴ H02K 21/38, 1/24

U.S. Cl. 310-154

32 Claims



1. a stepping motor, comprising:

- a stator;
- a plurality of stator poles on said stator;
- a winding on each of said stator poles;

- a plurality spaced stator teeth on said stator poles, each of said stator poles having at least one tooth;
- a mover movable relative to said stator;
- said mover having a plurality of spaced mover teeth located for movement along a first direction past said stator pole teeth;
- a plurality of sections of permanent magnetic material on said stator poles, each of said sections being located adjacent a stator tooth and poled in a direction transverse to the first direction;
- each pole having at least one of said sections, the sections on each of said stator poles being poled transverse to the first direction but opposite to the direction of the poling of the sections on an adjacent stator pole.

4,713,571

DRIVING CIRCUIT OF A VIBRATION WAVE MOTOR

Nobuyuki Suzuki, Yokohama; Masao Shimizu, Kawasaki, and Mitsuhiro Katsuragawa, Tanashi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

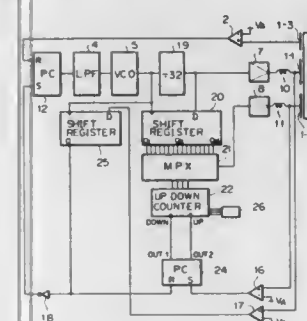
Filed Jan. 21, 1987, Ser. No. 5,871

Claims priority, application Japan, Jan. 23, 1986, 61-012880; Feb. 13, 1986, 61-029790; Feb. 14, 1986, 61-031395

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310-316

18 Claims



1. A vibration wave motor having a first member in which are disposed an electro-mechanical energy converting element portion to which a first frequency signal is applied and an electro-mechanical energy converting element portion to which a second frequency signal is applied and in the surface of which a travelling vibration wave is formed upon application of each of said frequency signals, and a second member driven relative to said first member by the vibration wave in said first member, said vibration wave motor having:

- a detecting circuit for detecting the phase difference between said first and second frequency signals; and
- a control circuit for controlling the phase difference between said first and second frequency signals on the basis of the result of the detection of said detecting circuit so as to be a particular phase difference.

4,713,572

ULTRASONIC TRANSDUCERS FOR ON-LINE APPLICATIONS

Gary A. Bokowski, and David W. Vahey, both of Columbus, Ohio, assignors to AccuRay Corporation, Columbus, Ohio

Filed Jun. 6, 1986, Ser. No. 872,049

Int. Cl.⁴ H01L 41/08

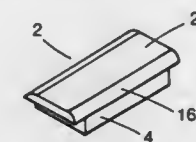
U.S. Cl. 310-323

19 Claims

1. A transducer for transmitting ultrasound through flexible sheet material such as paper, or receiving ultrasound therefrom in an on-line application, comprising:

- a piezoelectric element having the shape of a parallelepiped with corresponding dimensions of length, width, and thickness wherein length is greater than width and width is greater than thickness, and having an electrode film deposited on first and second surfaces whose dimensions are the length and width of the element, the dimensions of

the element being selected so that when a voltage pulse is applied across the first and second surfaces, the element undergoes resonant vibration, predominantly in a direction parallel to the first and second surfaces; and



- a nose piece having a joining surface that is rigidly attached to the second surface, and having a contacting surface for contact with the sheet material.

4,713,573

TRIGGER MECHANISM CONSTRUCTION FOR AN AUTOMOTIVE PASSENGER RESTRAINT SYSTEM

Willi Gansert, Kornwestheim; Eduard Lochbrunner, Hemmingen, and Harry Slansky, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

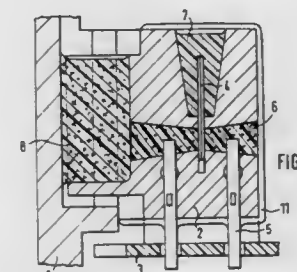
Filed May 16, 1985, Ser. No. 734,872

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3424005

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310-329

20 Claims



1. Trigger mechanism construction for an automotive passenger restraint system comprising

- a housing (2);
- a protective jacket (11) of silicone rubber surrounding said housing (2);
- a circuit substrate board (3) having apertures formed therein;
- a deceleration sensor (4) located within the housing;
- electrical terminal means (5) having a portion projecting inside the housing, and electrically connected to the deceleration sensor;
- externally formed projections on said terminal means (5) extending outside of the housing (2) for electrically and mechanically connecting the housing and the circuit substrate (3);
- the external projections extending into openings of the circuit substrate;
- and an electrically conductive adhesive (6) adhesively electrically and mechanically connecting the portions of the terminal means (5) located inside of the housing with the deceleration sensor.

4,713,574

IGNITER ELECTRODE LIFE CONTROL

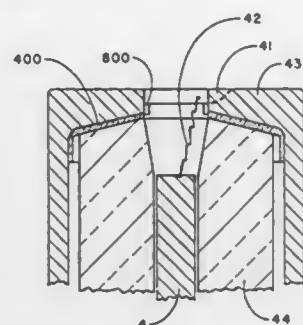
John C. Scott, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 7, 1985, Ser. No. 784,986

Int. Cl.⁴ H01J 13/20

U.S. Cl. 313—130

1 Claim



1. A jet engine igniter for use in combination with an ignition system for a jet engine, said jet engine igniter comprising: a center electrode which accomplishes ignition by discharging an electrical spark to an outer electrode, a ceramic insulator which surrounds the sides of the center electrode, and an outer electrode shell of stainless steel which encompasses the ceramic insulator, and an electrical insulation coating deposited between said outer electrode shell and said ceramic insulator, said electrical insulation coating being between 5 and 10 mils in thickness and composed of oxides of tungsten, or zirconium, said electrical insulation coating thereby having thermal expansion characteristics approximately equalling those of said outer electrode shell and thereby preventing electrode material erosion and undercoating of the outer electrode shell from the electrical spark of the center electrode during use.

4,713,575

METHOD OF MAKING A COLOR SELECTION DEFLECTION STRUCTURE, AND A COLOR PICTURE DISPLAY TUBE INCLUDING A COLOR SELECTION DEFLECTION STRUCTURE MADE BY THE METHOD

Alan G. Knapp, Crawley; Colin D. Overall, Reigate, and Richard A. M. Slater, Copthorne, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

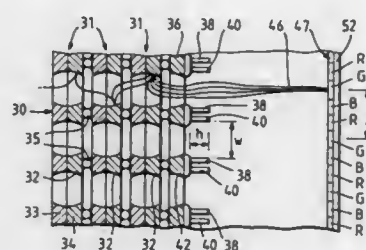
Filed Sep. 26, 1986, Ser. No. 911,849

Claims priority, application United Kingdom, Oct. 21, 1985, 8525905

Int. Cl.⁴ H01J 31/48, 9/12

U.S. Cl. 313—400

13 Claims



1. A method of making a color-selection deflection structure for a color picture display tube which includes a channel plate electron multiplier provided with an extractor electrode mounted on, and electrically insulated from, the output face of the electron multiplier, the method comprising the steps of forming a plurality of parallel slits in each of a pair of metal

sheets, each slit extending between opposite margins of the respective sheet, wherein each pair of adjacent slits in a respective metal sheet defines an elongate rectangular deflector electrode and strip portions which extend one from each end to the adjacent margin of the metal sheet, applying a glass to at least one of the metal sheets on a major surface of the deflector electrodes and of the margins of the metal sheet, heating the metal sheet(s) bearing the glass so as to produce an adherent coating of glass on the deflector electrodes and sheet margins, rotating the deflector electrodes on each sheet through $90 \pm 5^\circ$ about axes parallel to and offset from the longitudinal axis of the respective deflector electrode, juxtaposing the two sheets so that the deflector electrodes of one sheet are in registration with the deflector electrodes of the other metal sheet, forming an integral assembly by heating the pair of juxtaposed metal sheets so as to soften the glass and urging the registered pairs of deflector electrodes and opposed sheet margins respectively towards each other, wherein the spacing between the opposed deflector electrodes and between the opposed sheet margins is determined by spacing elements provided between the said deflector electrodes and between the said sheet margins, wherein the spacer elements have a softening point above the temperature to which the juxtaposed metal sheets were heated during the formation of the integral assembly.

12. A color picture display tube comprising an envelope having an optically transparent faceplate, a cathodoluminescent screen contiguous with the internal surface of the faceplate, an apertured channel plate electron multiplier mounted adjacent to, but spaced from, the screen, an extractor electrode mounted on, and insulated from, an output face of the electron multiplier, a color selection deflection structure mounted over, and insulated from, the extractor electrode, said structure comprising pairs of opposed electrodes, said deflector electrodes being insulated from each other by spacer elements, the pairs of opposed deflector electrodes comprising contiguous strip portions of juxtaposed metal sheets which are separated from each other by the spacer elements, which strip portions have been rotated about their ends so as to be at $90 \pm 5^\circ$ to the plane of their respective sheets.

4,713,576

COLOR PICTURE TUBE WITH SHADOW MASK

Akira Misumi, Ryoji Hirai, both of Mobara, and Rikizo Watanabe, Yasuki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Metals, Ltd., both of Tokyo, Japan

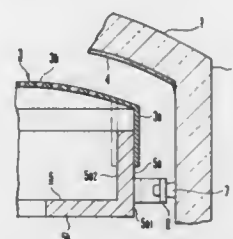
Filed Apr. 15, 1986, Ser. No. 852,228

Claims priority, application Japan, Apr. 24, 1985, 60-86439

Int. Cl.⁴ H01J 29/07; H01B 1/02

U.S. Cl. 313—402

9 Claims



1. A color picture tube comprising a shadow mask of a precipitation strengthening Fe-Ni alloy which contains Fe-Ni as a major constituent and has at least one additive element, which additive element forms precipitation strengthening phase of Ni_xX_y (wherein X is at least one element selected from the group consisting of Al, Ti, Nb, Ta and Zr; x is 2 to 4; and y is 0.5 to 1.5) and an average thermal expansion coefficient of not more than $6 \times 10^{-6}/^\circ\text{C}$. in a temperature range of 20°C . to 100°C .

4,713,577

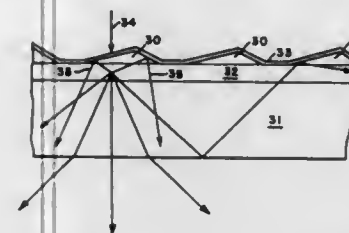
MULTI-LAYER FACETED LUMINESCENT SCREENS
Devlin M. Gualtieri, Ledgewood, and Shul T. Lai, Florham Park, both of N.J., assignors to Allied Corporation, Morris Township, N.J.

Filed Dec. 20, 1985, Ser. No. 811,184

Int. Cl.⁴ H01J 29/20; C09K 11/08

U.S. Cl. 313—468

20 Claims



1. A luminescent screen having at least two layers and comprising a luminescent crystalline sublayer that has a surface on which is a crystalline overlayer that has:

- (a) the same crystal structure as the sublayer, with the sublayer being a single crystal; and
- (b) a lattice constant that sufficiently exceeds the lattice constant of the sublayer that the overlayer is faceted; and
- (c) said sublayer comprising $Gd_3Ga_5O_{12}:M$ and said overlayer comprising $Gd_3Ga_5-b(Sb, In)_bO_{12}$ where b is in the range between 0 and about 2 and where M is at least one luminescent ion.

4,713,578

GETTER ASSEMBLY WITH DIFFUSION DIRECTING STRUCTURE

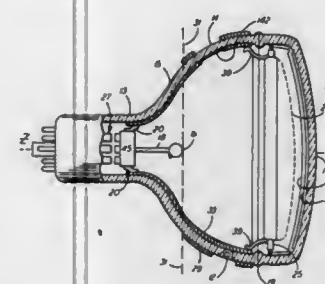
Mark A. Josephs, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Dec. 15, 1982, Ser. No. 449,897

Int. Cl.⁴ H01J 29/94; F04B 37/02

U.S. Cl. 313—481

5 Claims



1. In a cathode ray tube having an envelope formed of a sealed integration of neck, funnel and panel portions providing an enclosure for structural components including a multielectrode electron gun assembly located in said neck portion in a manner to project at least one electron beam to traverse a multiapertured member and impinge upon a cathodoluminescent screen disposed on the interior surface of said panel, the funnel portion containing external and internal electrically resistive coatings interrupted in at least one area to define a clear window in the funnel wall; and a getter assembly comprising a getter container and a wand connecting the container to the electron gun assembly;

an improved getter container comprising a cylindrically shaped metal receptacle containing a sidewall member and a bottom portion, a support member attached to the bottom of said receptacle, and effusion directing means consisting of: (a) an overlapping cover disc attached to top of said receptacle; and (b) first and second tabs extending outwardly from an opening in said sidewall, the getter

container located on the wand in a manner that the diffusion directors are in a plane approximately normal to said wand, and as viewed along the Z axis of the tube, is located approximately 90 degrees from the clear window area with the diffusion directors oriented to direct the diffusion of gettering material approximately 180 degrees away from said clear window area.

4,713,579

DOT MATRIX LUMINOUS DISPLAY

Masanobu Miura, Osaka, Japan, assignor to Takiron Co., Ltd., Osaka, Japan

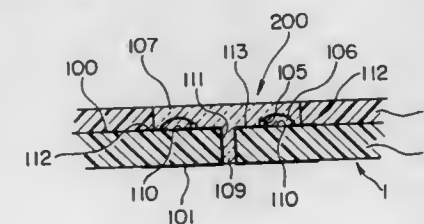
Filed Nov. 12, 1985, Ser. No. 796,829

Claims priority, application Japan, Nov. 12, 1984, 59-171487[U]; Apr. 5, 1985, 60-51480[U]

Int. Cl.⁴ H01L 33/00

U.S. Cl. 313—500

16 Claims



1. A dot matrix luminous display comprising: a dot matrix display board having a rigid insulating plate; first and second sets of electrodes provided on respective opposite surfaces of said insulating plate; a plurality of light emitting-elements on one surface of said plate and a plurality of through-holes in said plate through which said light emitting-elements are electrically coupled between said electrodes of said first and second sets, respectively; and a rubber elastic member which is flexible relative to said dot matrix display board, said rubber elastic member being provided over said one surface of said dot matrix display board, said rubber elastic member having a plurality of through-holes formed therein at locations corresponding to locations of said light-emitting elements, said through-holes in said member being filled with a thermosetting resin, wherein contraction of said thermosetting resin resulting from hardening of said thermosetting resin is absorbed by said rubber elastic member.

4,713,580

SEALING STRUCTURE FOR METAL VAPOR ARC DISCHARGE LAMPS

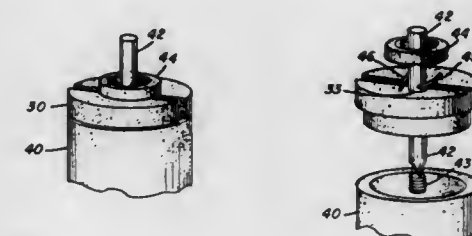
Carl M. Schoene, North Andover, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 19, 1986, Ser. No. 944,690

Int. Cl.⁴ H01J 61/36, 9/26

U.S. Cl. 313—624

10 Claims



1. A seal button for arc tube, said arc tube comprising a tubular envelope having an inside diameter and an outside diameter, said seal button comprising: a first circular portion having a diameter approximately equal to the outside diameter of the arc tube, said first

circular portion having a groove extending across said diameter of said first circular portion, said groove having a depth greater than or approximately equal to the thickness of said first circular portion; and
 a second circular portion concentric with and extending from said first circular portion, said second circular portion having a diameter of appropriate length for being inserted into an end of the arc tube;
 said seal button having an opening extending axially through the approximate center thereof, said opening being configured for receiving the electrical feedthrough portion of an electrode assembly.

4,713,581

METHOD AND APPARATUS FOR ACCELERATING A PARTICLE BEAM

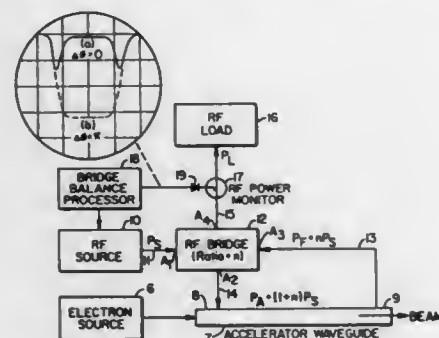
Jacob Halmson, Mountain View, Calif., assignor to Halmson Research Corporation, Palo Alto, Calif.

Continuation of Ser. No. 521,522, Aug. 9, 1983, abandoned. This application Dec. 20, 1985, Ser. No. 811,236

Int. Cl.⁴ H01J 25/10

U.S. Cl. 315—5.41

32 Claims



1. The method of accelerating a particle beam in a particle accelerator comprising the steps of:
 generating radio frequency energy of a given frequency, injecting the generated radio frequency energy in one arm of a radio frequency bridge network,
 injecting remnant radio frequency energy from the output of the accelerator in a third arm of the bridge network,
 directing the source energy and the accelerator remnant energy to the input of the accelerator via a second arm of the bridge network,
 directing bridge network imbalance energy to a load via a fourth arm of the bridge network,
 detecting the level of energy imbalance in the fourth arm of the bridge network,
 changing the given frequency of the generated energy in response to the detected energy imbalance to maintain the energy imbalance in the fourth arm at a minimum.

4,713,582

SPARK PLUG

Manabu Yamada; Ichirou Yoshida, both of Kariya; Shunzo Yamaguchi, and Morihiro Atsumi, both of Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
 Filed Apr. 3, 1986, Ser. No. 847,925

Claims priority, application Japan, Apr. 4, 1985, 60-71435

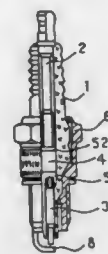
Int. Cl.⁴ H01B 1/06; H01T 13/02

U.S. Cl. 315—58

7 Claims

1. A spark plug comprising:
 an insulator having an internal passage extended in the axial direction of said spark plug and having two open ends;
 a terminal metal member fitted to one said open end of said internal passage of said insulator;
 a center electrode fitted to the other said open end of said internal passage of said insulator;

a resistor positioned between said terminal metal member and said center electrode inside of said internal passage of said insulator,
 said resistor being substantially free of elemental carbon and being made of a sintered material comprising by weight:
 from 0.9 to 3.0% of one conductive material selected from the group consisting of titanium nitride (TiN), titanium carbide (TiC), tungsten carbide (WC), titanium boride



(TiB₂), zirconium carbide (ZrC), hafnium carbide (HfC), silicon carbide (SiC), tantalum carbide (TaC), molybdenum silicide (MoSi₂) and mixtures thereof;
 from 9 to 40% of fine glass powder having a larger grain size than that of said conductive material;
 not more than 20% of ferrite; and
 from 60 to 90% of coarse glass powder having a larger grain size than that of said fine glass powder.

4,713,583

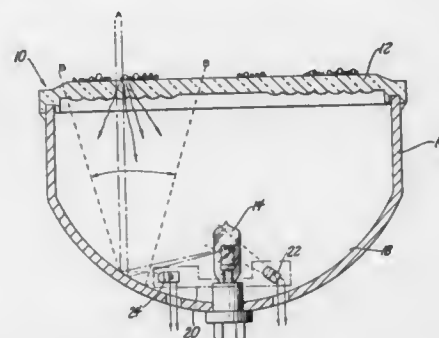
HEADLAMP CLEANING SYSTEM

Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098
 Continuation of Ser. No. 904,617, Sep. 8, 1986, abandoned. This application May 8, 1987, Ser. No. 48,997

Int. Cl.⁴ B60Q 1/02

U.S. Cl. 315—82

27 Claims



1. A vehicle headlamp assembly for use in a vehicle to indicate when the headlamps collect residue, said assembly comprising: a headlamp (10) including a transparent lens (12) with a light source (14) therebehind and a housing (16) having a reflective interior surface (18) about said light source (14) and said transparent lens (12), said assembly characterized by sensing means (20) within said housing (16) for sensing the amount of backscattered light radiation reflected from residue collected on the exterior of said transparent lens (12) and decreasing the amount of light radiation generated by said light source (14) and leaving said transparent lens (12), and control means (26)

responsive to said sensing means (20) for indicating when said amount of said backscattered light exceeds a predetermined magnitude.

4,713,584

VEHICLE LIGHT CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES

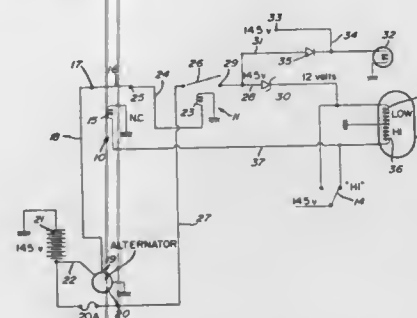
Pierre-Paul Jean, 620, avenue Georges, St-Louis-de-France, Quebec, Canada G8T 8V6

Filed Mar. 19, 1987, Ser. No. 28,125

Int. Cl.⁴ B60Q 1/02

U.S. Cl. 315—83

9 Claims



1. A vehicle light control system comprising a first and a second switching device, said first switching device being in a normally conductive state, said second switching device being in a normally non-conductive state, said first switching device having an input connection securable to a terminal of an alternator of said automobile vehicle, said alternator being connected to a car battery supply and providing a supply voltage when an engine of said vehicle is operated, said first switching device further having an output connection connected to said second switching device to change the operating state thereof when said supply voltage is present on said input connection, said second switching circuit having a low beam connection to which said car battery supply voltage is connected and fed to a low beam filament of headlights of said vehicle, said first switching device having a third connection securable to a vehicle headlight switch high beam position so that when said headlight switch is placed to said high beam position said first switching device is placed in a non-conductive state which in turn automatically places said second switching device in a non-conductive state to cut off said supply voltage to said low beam connection.

4,713,585

ION SOURCE

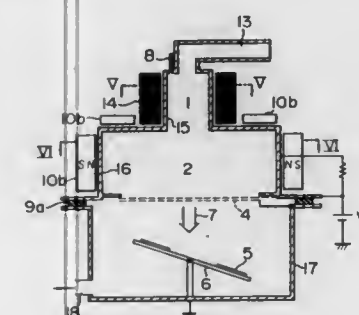
Yasunori Ohno; Tomoe Kurosawa, both of Hitachi; Tadashi Sato, Mito; Yukio Kurosawa, and Yoshimi Hakamata, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
 Filed Sep. 26, 1986, Ser. No. 911,790

Claims priority, application Japan, Sep. 30, 1985, 60-214627

Int. Cl.⁴ H01J 7/24

U.S. Cl. 315—111.81

10 Claims



1. An ion source, comprising a plasma producing chamber supplied with a gas for producing a plasma through high-frequency electric discharge, first magnetic means provided within said plasma producing chamber for limiting a plasma

region defined within said plasma producing chamber, beam extracting means for extracting an ion beam from said plasma producing chamber, a plasma expansion chamber provided in such a manner that said plasma producing chamber is across the plasma expansion chamber from said beam extracting means, and second magnetic means for confining and holding a plasma region having an area larger than that of the plasma region formed within said plasma producing chamber.

4,713,586

DECORATIVE LIGHT SETS

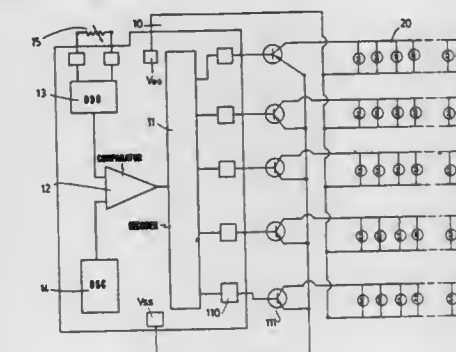
Chun C. Chiang, Hsinchu, Taiwan, assignor to Dar Yu Electronic Co., Ltd., Hsinchu, Taiwan

Filed Jul. 22, 1986, Ser. No. 888,926

Int. Cl.⁴ H05B 37/00

U.S. Cl. 315—200 A

3 Claims



1. An improved decorative light set comprising:
 (a) a plurality of sets of light bulbs, the light bulbs in each set being connected in parallel across first and second terminals;
 (b) a first d.c. voltage source, said first terminals being connected in series to said first d.c. voltage source;
 (c) a plurality of transistors respectively connected to said plurality of second terminals, a plurality of third terminals, and a plurality of fourth terminals;
 (d) a second d.c. voltage source, said third terminals being connected in series to said second d.c. voltage source;
 (e) a plurality of trigger means, each trigger means having an input terminal and an output terminal, the output terminal of each trigger means being connected to a corresponding fourth terminal;
 (f) decoding means having a plurality of output terminals respectively connected to said input terminals of said plurality of trigger means;
 (g) a comparing means having an output terminal connected to an input terminal of said decoding means;
 (h) a first oscillating means having an output terminal connected to a first input terminal of said comparing means; and
 a second oscillating means having an output terminal connected to a second input terminal of said comparing means,
 wherein said decoding means outputs signals for switching said transistors on in dependence on the output signals received from said comparing means, said switching on of said transistors controlling the activation of said corresponding sets of light bulbs.

4,713,587

MULTIPULSE STARTING AID FOR HIGH-INTENSITY DISCHARGE LAMPS

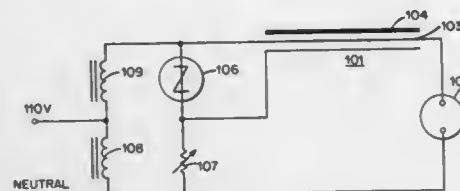
Wojciech W. Byszewski, Concord; Charles N. Fallier, Jr., Westford, and James N. Lester, Rockport, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass. and GTE Products Corporation, Stamford, Conn.

Filed Jan. 5, 1987, Ser. No. 495

Int. Cl.⁴ H05B 37/00

U.S. Cl. 315—289

10 Claims



1. A multipulse starting aid for a high intensity discharge lamp having a pair of terminals comprising a spiral line having a pair of lines wrapped in a spiral formation, said pair of lines being physically separated from each other forming a capacitor having a capacitance C, each of said lines having a pair of ends; a biddirectional solid state switch coupled at a point to one of said ends of one of said lines; means for coupling the other of said ends of said one of said lines to one of said terminals; resistive means, having a resistance R, for coupling from said biddirectional switch at a junction to the other of said terminals; means for coupling said junction to said one of said ends of the other of said lines; means for receiving an alternating current voltage source having a frequency F; first inductive means coupled across said receiving means; means for coupling said receiving means and said first inductive means to said other of said terminals; second inductive means coupled between said receiving means and said point, whereby, during starting, said first inductive means and said second inductive means act as an autotransformer, and during operation of said lamp, said second inductive means acts as a ballast; whereby the time constant RC is so adjusted that, upon receiving said alternating current voltage source, a waveform of voltage at said frequency F is presented across said pair of terminals of said lamp, together with a series of pulses at the peak of each half cycle of said waveform, thereby enhancing lamp startability.

4,713,588

IMAGE PICKUP TUBE

Shigehiko Takayama, Mitaka; Hitomi Suzuki, Akishima; Masanori Maruyama, Kokubunji; Masakazu Fukushima, Tokyo, and Mitsuhiro Kurashige, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Apr. 9, 1986, Ser. No. 849,832

Claims priority, application Japan, Apr. 10, 1985, 60-74287

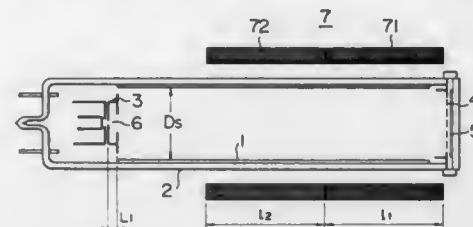
Int. Cl.⁴ H01J 29/58

U.S. Cl. 315—382

5 Claims

1. An image pickup tube comprising: a tube containing at one end an electron gun for generating an electron beam; a target provided at the other end of said tube and scanned with the electron beam; an electrostatic deflection electrode provided on the inner surface of said tube for generating an electrostatic field which deflects the electron beam;

a mesh electrode interposed between said target and said electron gun; and a focus coil system surrounding said tube, including means



for generating a magnetic field which focuses the electron beam on said target and which is distributed on the axis of said tube to have a peak of intensity which is offset toward said electron gun.

4,713,589

APPARATUS FOR LINEARITY CORRECTION ON HORIZONTAL DEFLECTION

Shigeru Kashiwagi, Iwai, Japan, assignor to Victor Company of Japan, Ltd., Japan

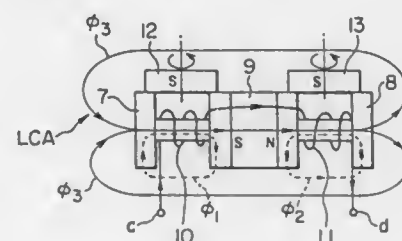
Filed Aug. 19, 1986, Ser. No. 897,981

Claims priority, application Japan, Aug. 20, 1985, 60-182575

Int. Cl.⁴ H01J 29/70, 29/76; H01F 21/00; H01H 1/00

U.S. Cl. 315—400

9 Claims



1. An apparatus for processing the waveform of a sawtooth current fed to a horizontal deflection coil to correct a horizontal deflection linearity on a screen of a picture tube, comprising:

a single permanent magnet; first and second saturable cores respectively coupled to north and south pole sides of said single permanent magnet with said single permanent magnet being coaxially interposed therebetween in substantially contact relation to each other so that a magnetic flux caused by said single permanent magnet circulates to pass through said first and second saturable cores in series; and first and second windings respectively wound around said first and second saturable cores in directions opposite to each other, connected in series to each other, and connected to said horizontal deflection coil, said first and second windings being arranged such that, when a current flows therethrough in a direction, a magnetic flux caused by said first winding is added to the magnetic flux generated by said single permanent magnet with respect to said first saturable core and the magnetic flux generated by said single permanent magnet is subtracted by a magnetic flux caused by said second winding with respect to said second saturable core.

4,713,590

CONTROL CIRCUIT FOR DC BRUSHLESS MOTOR PRODUCING CONSTANT OUTPUT TORQUE

Hirotohi Ohno, Sagami, Japan, assignor to Victor Company of Japan, Japan

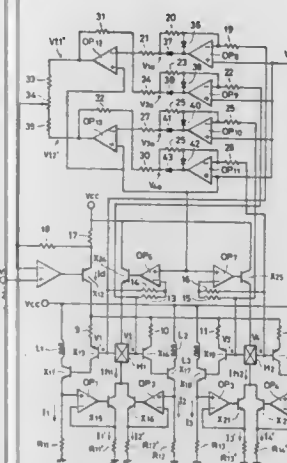
Filed Mar. 5, 1986, Ser. No. 836,626

Claims priority, application Japan, Mar. 7, 1985, 60-45240

Int. Cl.⁴ H02P 6/02

U.S. Cl. 318—254

18 Claims



1. A control circuit for controlling a multi-phase brushless DC motor to produce a constant level of torque in response to a torque control signal, the motor including a stator having a plurality of armature windings each corresponding to a specific phase of said motor and a rotor having a plurality of field magnet poles of successively alternating polarity, comprising:

a plurality of Hall generators corresponding to said motor phases, each including a pair of current terminals and a pair of voltage output terminals, positioned to sense magnetic flux linkage between said poles of said rotor and said corresponding armature windings and to produce sensing output signals from said voltage output terminals; armature winding current control means operable to control levels of current supplied to said armature windings; switching means controlled by said output signals from said Hall generators for selectively enabling and interrupting supply of current to said armature windings at levels determined by said armature winding current control means; a plurality of feedback control circuits each responsive to a level of current flow through an armature winding of one of said phases for supplying current to said current terminals of a Hall generator corresponding to said phase, in proportion to a level of current flow through said armature winding of said corresponding motor phase means for rectifying said output signals from each of said Hall generators and torque sensing signal generating means for summing the resultant rectified signals from respective ones of said Hall generators to produce a torque sensing signal, and; comparator means for comparing said torque sensing signal with said torque control signal to produce a torque error signal; said torque error signal being applied to said armature winding current control means to control said current supply levels by negative feedback, to thereby reduce variations in output torque of said motor.

18. A control circuit for controlling a multi-phase brushless DC motor to produce a constant level of torque in response to a torque control signal, the motor including a stator having a plurality of armature windings each corresponding to a specific phase of said motor and a rotor having a plurality of field magnet poles of successively alternating polarity, comprising, corresponding to each said phase:

a Hall generator positioned to sense magnetic flux linkage between at least one armature winding corresponding to

said phase, for producing a sensing output signal in response to said sensing; rectifying means for rectifying said sensing output signal to produce a torque sensing signal; comparator means for comparing said torque sensing signal with said torque control signal to produce a torque error signal; current control means for producing a controlled current at a level determined by said torque error signal; switching means for supplying a flow of current to said armature winding at a level determined by said controlled current during time intervals controlled by said sensing output signal, and; feedback means responsive to said armature current for producing a flow of current through said Hall generator at a level which is directly proportional to said armature current level.

4,713,591

CONTROL AND DRIVE ARRANGEMENT FOR MOVABLE MEMBERS

Paul S. McCloskey, 50 Carters Road, Dural, N.S.W., Australia (2158)

PCT No. PCT/AU85/00296, § 371 Date Jul. 30, 1986, § 102(e) Date Jul. 30, 1986, PCT Pub. No. WO86/03249, PCT Pub. Date Jun. 5, 1986

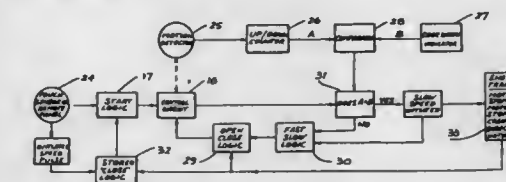
PCT Filed Nov. 29, 1985, Ser. No. 900,153

Claims priority, application Australia, Nov. 30, 1984, PG8373

Int. Cl.⁴ G05D 3/12

U.S. Cl. 318—257

9 Claims



1. A controller for controlling the movement of a member between first and second positions by drive means coupled with said member, said controller comprising:

(a) counting pulse generating means coupled with said member to provide counting pulses only during movement of said member, (b) counting means receiving and counting said counting pulses to provide a pulse count indicative of the position of said member relative to said first position, (c) means generating a pulse count corresponding to a third position of said member between said first and second positions, (d) comparator means comparing said position indicative pulse count and said third position pulse count, (e) motion indicator means responsive to said counting pulse generating means to register a moving or stationary condition of said member, (f) speed control means responsive to said comparator means to set the speed at which said member is driven to a first speed when said member is between said first and third positions and to a second speed when said member is moving towards said second position and is between said second and third positions, and (g) drive stopping means responsive to said comparator means and to said motion indicator means to deactivate said drive means when movement of said member toward said second position is arrested while said member is between said second and third positions.

4,713,592

APPARATUS FOR SENSING THE POSITION OF A STRUCTURAL MEMBER

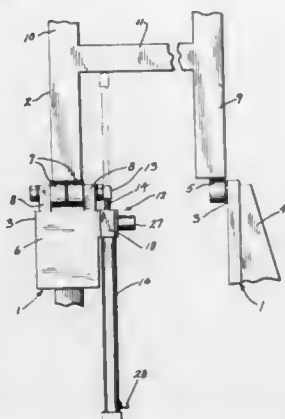
Lawrence C. Memmel, Mequon, Wis., assignor to Super Tool and Mfg. Corporation, Brookfield, Wis.

Filed Nov. 20, 1985, Ser. No. 800,136

Int. Cl.⁴ G05B 23/02; B23B 39/06; B23G 1/00

U.S. Cl. 318—565

3 Claims



1. An apparatus for sensing the location of a structural member on which a working operation is to be performed, comprising conveyor means to support and convey a structural member, a housing connected to said conveyor means and having a passage extending therethrough, a cylinder connected to the housing, a piston slidable within the cylinder, a rack connected to the piston and extending from one end of said cylinder and extending through said passage, a probe mounted on the outer end of the rack, a pinion disposed within the passage and engageable with the rack, means for journalling the pinion for rotation within said passage and including a rotatable shaft, resolver means mounted on the housing for generating a signal in accordance with rotation, connecting means connecting said shaft to said resolver means to transmit rotation of said shaft to said resolver means, and means for moving said piston within said cylinder to extend said rack and move said probe into engagement with said structural member, extension of said rack acting to rotate said pinion and correspondingly rotate said resolver means to establish a signal indicating the position of said structural member.

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METHOD AND DEVICE FOR DETERMINING THE OPERATING CONDITION OR STATUS OF AN ACTUATING OR ADJUSTING DRIVE OF A PRINTING MACHINE

Anton Rodi, Leimen, and Peter Blaser, Dielheim, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,077

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424349

Int. Cl.⁴ G05B 19/25; B41F 31/00

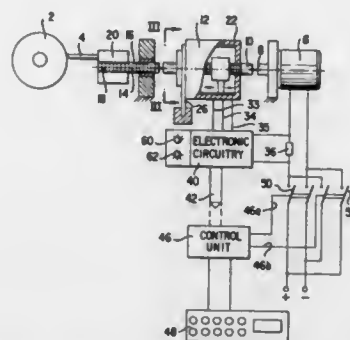
U.S. Cl. 318—572

12 Claims

1. Method of determining the position of a printing machine element being movable in a first and an opposite direction and being drivable by an electric motor operable in respective first and opposite directions, and a transmission having a given play therein, for linking the motor with the machine element, the method which comprises: driving the element in its first direction a distance being greater than the play; recording the value of at least one torque-dependent motor variable while the motor traverses the play while driving the element in its first direction as a first torque value; and using the first torque value during subsequent operation of the motor in the opposite direction by comparison of said first torque value with the instant

motor variable, for determining the end and the beginning of the play.

6. Device for determining an operating status of a printing machine element being movable in a first and an opposite direction comprising: an electric motor for driving said machine element, in said first and opposite directions; a transmission having a given play for coupling the motor with the



machine element; means for recording the value of at least one torque-dependent motor variable while driving the machine element in its first direction as a first value, while the motor transverse the play; and means for comparing said first value with the motor variable during subsequent operation of the motor in the opposite direction, and means responsive to said comparing means for determining the end and beginning of the play.

4,713,594

START-UP CONTROL FOR SWITCHED RELUCTANCE MOTOR

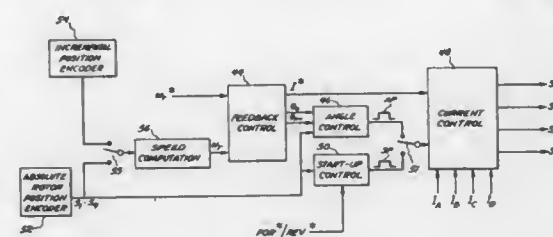
Bimal K. Bose, Latham, and Paul M. Szczesny, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1986, Ser. No. 915,291

Int. Cl.⁴ G05B 19/40

U.S. Cl. 318—685

16 Claims



1. A start-up method for starting a multiphase switched reluctance motor in a commanded direction from an initial arbitrary rotor position, the switched reluctance motor including a rotor rotatable in forward and reverse directions within a stator, the rotor having a plurality of rotor poles, the stator having a multiplicity of opposing stator pole pairs, each pair of opposing stator poles sharing a common winding, respectively, and defining a separate stator phase, respectively, the start-up method comprising the steps of:

determining, for the commanded direction, an inductance profile with respect to rotor angle for each stator pole pair; ascertaining the initial rotor position; correlating said initial rotor position with the slope of the inductance profile for each respective stator pole pair; and firing only stator pole pairs whose inductance profile has a positive slope at the initial rotor position, whereby rotation in the commanded direction is initiated.

4,713,595

CONTROL APPARATUS FOR ELEVATOR

Masashi Yonemoto, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

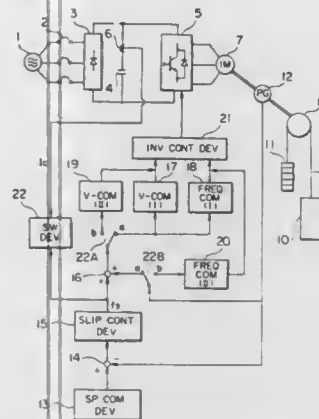
Filed Jul. 15, 1986, Ser. No. 885,761

Claims priority, application Japan, Jul. 19, 1985, 60-159564

Int. Cl.⁴ H02P 3/18; B66B 1/32

U.S. Cl. 318—759

7 Claims



1. In an elevator driven by an induction motor and having a slip control device for generating a slip frequency command signal on the basis of an error between a speed command value and a running speed value of the induction motor so as to control a VVVF type inverter which in turn provides a corresponding alternating current of variable voltage and frequency, said inverter having a smoothing capacitor on a D-C side thereof,

a control apparatus for stabilizing torque of the induction motor by smoothly changing operation of the induction motor from a powering mode to a regenerative mode, said control apparatus comprising:

a current detector for detecting charging current of the smoothing capacitor, and

a switching device having a portion for detecting polarity of the slip frequency command signal and means responsive to the charging current detected by said current detector and the slip frequency command signal generated by said slip control device for changing operation of the induction motor from the powering mode to the regenerative mode only when a voltage value based on the charging current has exceeded a preset reference voltage value after a negative sign of the slip frequency command signal is detected by the polarity detection portion.

4,713,596

INDUCTION MOTOR DRIVE SYSTEM

Bimal K. Bose, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 10, 1985, Ser. No. 753,463

Int. Cl.⁴ H02P 5/34

U.S. Cl. 318—802

6 Claims

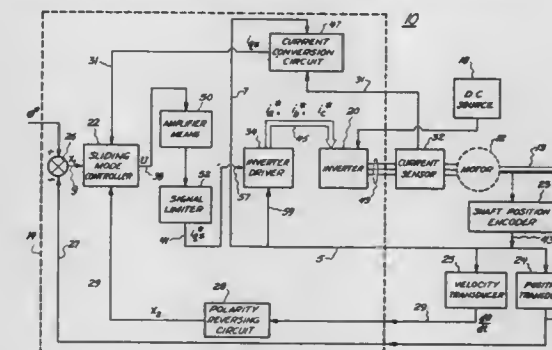
1. A drive control system for controlling an induction motor such that the position of the output shaft of said motor follows a predetermined trajectory defined by a coordinate plot of motor shaft position error against the first time derivative of said shaft position error;

said system comprising:

summing means including a plurality of summing inputs, a first summing input being coupled to receive an externally derived signal representative of the desired angular shaft position of said motor;

a first control loop coupled to apply a signal representative of the actual angular shaft position of said motor to a second summing input, said first control loop including

shaft position transducer means adapted to provide said actual shaft position signal; said summing means being adapted to provide a signal on its output representative of said shaft position error; a sliding mode controller including a first input coupled to the output of said summing means; a second control loop coupled to a second input of said sliding mode controller for applying a signal representative of shaft error velocity, said shaft error velocity signal being representative of said first time derivative of said shaft position error; said second control loop including shaft velocity transducer means adapted to provide an output signal representative of the actual angular shaft velocity of said motor;



said second loop further including a polarity reversing circuit coupled between said velocity transducer means and said second input of said sliding mode controller for providing said shaft error velocity signal to said second sliding mode controller input as a function of said shaft velocity signal;

said sliding mode controller being adapted to provide an analog command signal on its output having an amplitude representative of the torque component of the instantaneous motor current required to maintain the operation of said motor on said predetermined trajectory; and an inverter coupled to said motor and responsive to said command signal to apply 3-phase AC current to said motor, whereby said motor is caused to conform said actual shaft position to said desired shaft position by operating along said predetermined trajectory.

4,713,597

SILICON DIODE LOOPING ELEMENT FOR PROTECTING A BATTERY CELL

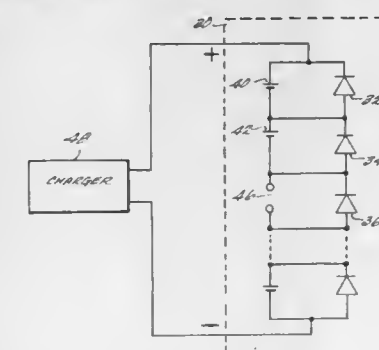
Morrie Altmejd, Toronto, Canada, assignor to Powerplex Technologies, Inc., Downsview, Canada

Filed Dec. 4, 1985, Ser. No. 804,468

Int. Cl.⁴ H02J 7/00

U.S. Cl. 320—13

14 Claims



1. A battery comprising:

a plurality of battery cells connected in series;
a plurality of diode looping elements, one looping element being connected in parallel across each said cell, each said looping element having its cathode connected to the anode of each said cell and said looping element having its anode connected to the cathode of each said cell;
said looping element being constructed so that when a predetermined amount of current is passed in a forward direction, said looping element fuses permanently into a short circuit state.

4,713,598

POWER SUPPLY ASSOCIATED WITH AC LINE RELAY SWITCH

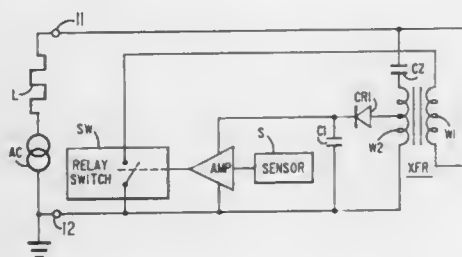
Edgar M. Smith, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 29, 1986, Ser. No. 924,317

Int. Cl.⁴ G05F 1/00

U.S. Cl. 323—245

14 Claims



1. A switch for an ac main line comprising:
first and second points of connection to respective portions of said ac main line that are to be selectively connected by said switch;
- a transformer having a primary winding and secondary winding each having respective first and second ends, the first end of said primary winding connecting to said first point of connection, the turns ratio between said secondary and primary windings being sufficiently high that said transformer behaves as a current transformer with regard to said primary winding connection;
- a relay switch, providing a main controlled current conduction path between its connections to the second end of said primary winding and to said second point of connection, and having a control circuit for receiving a control signal that controls selective conduction through the main controlled current conduction path of said relay switch;
- control means for applying said control signal to the control circuit of said relay switch; and
- means for supplying dc power to said control means, including:
means for rectifying at least a portion of the voltage appearing across said secondary winding when the main controlled current conduction path of said relay switch provides closed-circuit conduction, and
- means for rectifying a portion of the voltage appearing between said first and second points of connection when the main controlled current conduction path of said relay switch is relatively open-circuit nonconductive.

4,713,599

PROGRAMMABLE TRIMMABLE CIRCUIT HAVING VOLTAGE LIMITING

Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1985, Ser. No. 689,101

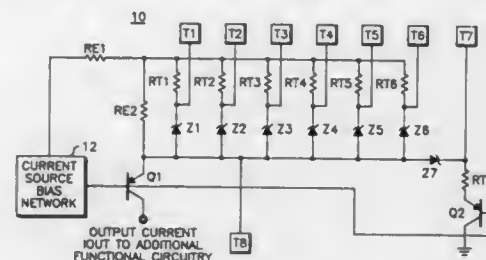
Int. Cl.⁴ G05F 3/26

U.S. Cl. 323—312

5 Claims

1. A trimmable circuit, comprising:
a first transistor, for generating an output current;
a plurality of programmable trimming networks, connected

to the emitter of said first transistor, for regulating the output current of said first transistor;
said plurality of programmable trimming networks including a programmable trimming network for decreasing the output current of said first transistor and a programmable trimming network for increasing the output current of



said first transistor, said trimming network for decreasing the output current of said first transistor including a second transistor; and
a voltage-divider circuit, connected to said plurality of programmable trimming networks, for limiting the voltage across any trimming network during programming.

4,713,600

LEVEL CONVERSION CIRCUIT

Kazunori Tsugaru, and Yasuhiro Sugimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

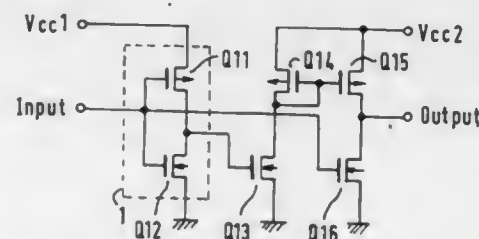
Filed Sep. 19, 1986, Ser. No. 909,295

Claims priority, application Japan, Sep. 24, 1985, 60-208855

Int. Cl.⁴ G05F 3/20

U.S. Cl. 323—351

4 Claims



1. A level conversion circuit comprising:
an input terminal means for applying a voltage signal of predetermined amplitude level;
an inverter circuit means applied by a first power supply and a second power supply and connected to said input terminal;
a first MOS transistor of a first channel type, the source of which is connected to said second power supply, and the gate of which is connected to the output of said inverter circuit means;
a current-voltage conversion means for converting from a source-drain current change of said first MOS transistor to voltage change, a first terminal of which is connected to the drain of said first MOS transistor, and a second terminal of which is connected to a third power supply;
a second MOS transistor of a second channel type, the source of which is connected to said third power supply, and the gate of which is connected to the first terminal of said current-voltage conversion means;
a third MOS transistor of the first channel type, the gate of which is connected to said input terminal, and source of which is connected to said second power supply, and drain of which is connected to the drain of said second MOS transistor;
an output terminal means for supplying a signal, the ampli-

tude level of which is different from that of the voltage level corresponding to the signal applied to said input terminal, which is connected to the drain of said third MOS transistor;
wherein said current-voltage conversion means is a fourth MOS transistor of the second channel type, the source of which is connected to a third power supply, and the drain and gate of which are shorted to form a common connection to the drain of said first MOS transistor.

4,713,601

POWER PROPORTIONING CONTROLLER FOR SOLID STATE RELAYS

Donald E. Zahm, and Gary R. Strickler, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 780,537, Sep. 26, 1985, abandoned. This

application Apr. 3, 1987, Ser. No. 33,842

Int. Cl.⁴ G05F 1/45

U.S. Cl. 323—322

10 Claims



1. A power proportioning controller comprising:
means for receiving an analog input signal;
an astable multivibrator means for generating a variable duty cycle digital signal, said multivibrator means including a capacitive means for alternately charging and discharging over predeterminable time intervals;
optoelectronic variable resistance means having input terminals coupled to said input signal receiving means and having output terminals coupled to said capacitive means for controlling the duty cycle of said digital signal in proportion to said analog input signal by altering the relationship of said charging and discharging time intervals;
solid state relay means energized by said variable duty cycle signal for delivering proportioned power to a load;
manually adjustable potentiometer means coupled in series with said output terminals of said optoelectronic variable resistance means; and
means for selectively shorting said output terminals of said optoelectronic variable resistance means and for selectively shorting said potentiometer means.

4,713,602

CIRCUIT RESISTANCE ADJUSTING DEVICE

Kenji Ueda, Ohtsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 14, 1986, Ser. No. 839,718

Claims priority, application Japan, Mar. 14, 1985, 60-52105

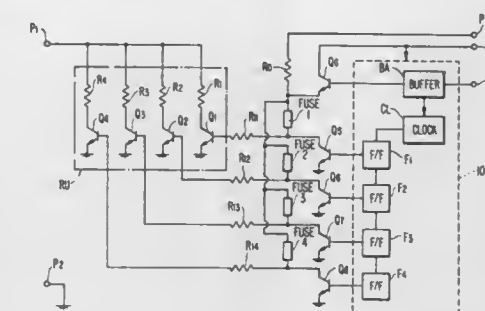
Int. Cl.⁴ G05B 24/02

U.S. Cl. 323—354

4 Claims

1. A circuit resistance adjusting device comprising resistance means including a plurality of resistances, switching means coupled with said resistance unit means for selectively connecting said plurality of resistances to produce a combined resistance, patterning means connected with said switching means for receiving a first signal for controlling said switching

means to selectively and sequentially connect said plurality of resistances in accordance with a predetermined pattern, and



holding means for receiving a second signal to hold said patterning means and fix the connection of said plurality of resistances so that said combined resistance is permanently fixed.

4,713,603

APPARATUS FOR THE MEASUREMENT OF THE FRACTION OF GAS IN A TWO-COMPONENT FLUID FLOW COMPRISING A LIQUID AND A GAS IN MIXTURE

Richard Thorn, Flørvåg, Norway, assignor to Den norske stats oljeselskap a.s., Norway

PCT No. PCT/NOR84/00046, § 371 Date Nov. 22, 1985, § 102(e)

Date Nov. 22, 1985, PCT Pub. No. WO85/02016, PCT Pub.

Date May 9, 1985

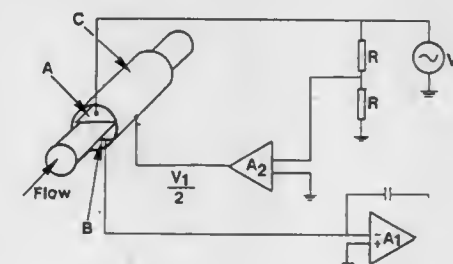
PCT Filed Oct. 29, 1984, Ser. No. 740,892

Claims priority, application Norway, Nov. 2, 1983, 833983

Int. Cl.⁴ G01N 27/22, 33/28

U.S. Cl. 324—61 P

4 Claims



1. An apparatus for measuring the fraction of gas in a fluid flow comprising a gas and a liquid, said apparatus comprising:
(a) a first electrode;
(b) a second electrode positioned such that said fluid flow passes between said first and second electrode;
(c) a third electrode surrounding said first and second electrode;
(d) a sine wave generator and an operational amplifier with capacitance feedback connected to said first and second electrode for supplying an electric field to said first and second electrode thereby establishing a capacitance between said first and second electrode;
(e) a voltage divider and a buffer amplifier that is connected to said sine wave generator and to said third electrode for keeping said third electrode at an electric potential equal to the electrical potential occurring about half way between said first and second electrode; and
(f) means for detecting changes in the capacitance between said first and second electrode thereby measuring the fraction of gas in said fluid flow.

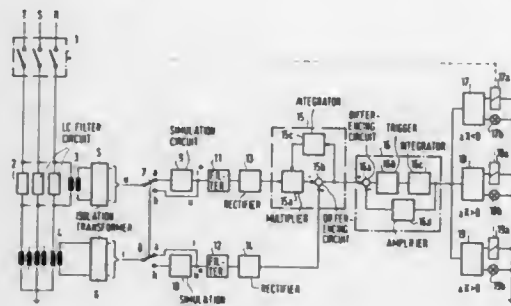
4,713,604

MONITORING DEVICE FOR DETECTING FAULTS IN AN ELECTRICAL DEVICE, PARTICULARLY IN AN LC FILTER CIRCUIT IN AN AC VOLTAGE NETWORK

Michael Becker, Uttenreuth, and Klaus Renz, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 10, 1985, Ser. No. 721,600

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3424082

Int. Cl.⁴ G01R 31/02; H01G 1/11; H02H 3/38
U.S. Cl. 324—500 5 Claims

1. A monitoring device operatively connectable to an electrical device for evaluating internal faults therein causing changes in impedance, said electrical device being connected to an electrical supply network via a network switch, said monitoring device comprising in combination:

- first measuring means operatively couplable to the electrical device for sensing a voltage drop thereacross;
- second measuring means operatively couplable to said electrical device for sensing a current flow therethrough;
- equivalent circuit means operatively linked to said first and said second measuring means for generating estimated values of said voltage drop and said current flow from actual values of said current flow and of said voltage drop, respectively;
- filter means operatively connected to said equivalent circuit means for filtering out fundamental frequencies of said estimated values and said actual values of said voltage drop and said current flow;
- rectifier means operatively coupled to said filter means for converting said fundamental frequencies into amplitude-proportional direct-current voltages;
- nonlinear control means including a transient comparator circuit operatively tied to said rectifier means for comparing a direct-current voltage corresponding to the estimated value of said voltage drop with a direct-current voltage corresponding to the actual value of said voltage drop, for comparing a direct-current voltage corresponding to the estimated value of said current flow with a direct-current voltage corresponding to the actual value of said current flow, and for generating signals upon detecting a substantially sudden deviation between the respective compared values; and

indicator and trip means operatively tied to said nonlinear control means for generating in response to signals therefrom an operator alert signal indicative of the functional status of said electrical device and for opening the network switch and thereby disconnecting said electrical device from the supply network upon the occurrence of a predetermined fault condition, said indicator and trip means including a multiplicity of independently operating limit and counting stages operatively and permanently connected in a Y-type configuration to a common output of said transient comparator circuit and responsive to respective threshold voltages of predetermined different magnitudes and directions for enabling the selective eval-

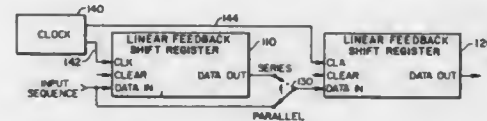
uation of internal faults of said electrical device simultaneously by said limit and counting stages.

4,713,605

LINEAR FEEDBACK SHIFT REGISTER FOR CIRCUIT DESIGN TECHNOLOGY VALIDATION

Venkatraman Iyer, Sunnyvale, and Gil S. Lee, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 17, 1984, Ser. No. 611,450

Int. Cl.⁴ G01R 31/28; G06F 11/00
U.S. Cl. 324—73 R 7 Claims

1. Digital integrated circuit device technology validation circuitry comprising:

- (a) first plural stage linear feedback shift register means connected to and responsive to a source of serial input data signals, at least one of said stages including said prototype device technology to be validated, for producing serial output data signals;
- (b) second linear feedback shift register means responsive to serial input data signals for generating a plurality of internal states; and
- (c) switch means connected to an output of said first linear feedback shift register means to said source of serial data, and to an input to said second linear feedback shift register means, for selecting the input to said second shift register means, and
- (d) clock means connected to said first and second shift register means for providing synchronous operation of said shift register means, whereby certain of the internal states of said second linear feedback shift register means correspond to a malfunction of said device technology in response to test signals applied to said first linear feedback shift register means by said source of serial input data signals, said resulting output communicated via said switch means to said second linear feedback shift register means following the application thereto of said test signals via said switch means.

4,713,606

SYSTEM FOR TESTING THE FAILURE OR SATISFACTORY OPERATION OF A CIRCUIT HAVING LOGIC COMPONENTS

André Laviron, Fontaine les Dijon, France, assignor to Commissariat à l'Energie Atomique, Paris, France

Filed Jul. 2, 1985, Ser. No. 751,328

Claims priority, application France, Jul. 18, 1984, 84 11388
Int. Cl.⁴ G01R 31/28; G06F 15/00

U.S. Cl. 324—73 R 2 Claims

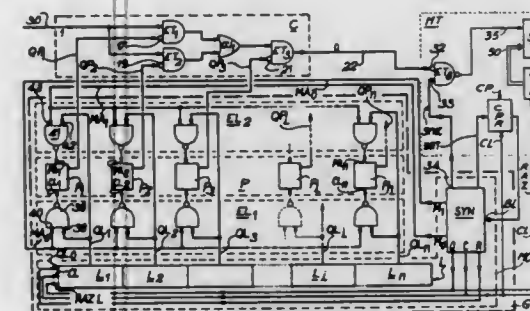
1. A system for testing the failure or satisfactory operation of a circuit having logic components, in which n components for a system of components marked 1 to n in a predetermined manner and interconnected to that said system has on one output a logic state corresponding to the failure or satisfactory operation state of the system and which depends on the failure or satisfactory operating state of each of the n components of the system, each of the n components of the system having at least one simulation input able to receive a signal simulating the failure or satisfactory operation of said system, comprising:

- a generator whose outputs are respectively connected to the simulation inputs of the components these generator outputs providing simulation signals having a first or a second logic state making it possible to bring one or more components respectively into the failure or satisfactory operation

state and then conversely and reciprocally bringing said component or components into a satisfactory operation or failure state, for one or more combinations from among the n components of the system;

testing means connected to the output of the system and able to mark the logic level of the output signal of the system, these testing means comprising:

- a counter having a loading input for loading a predetermined value corresponding to numbers of components to be simulated in the tested circuit, said counter having another input connected to an output of the generator for receiving an initialization signal on initializing the generator, and another input connected to an output of the generator providing a control pulse for controlling the countdown of said counter, an output of said



counter being connected to a stop control signal input of the generator for providing a signal to the generator when all the components have been simulated; another counter connected to an output of the generator for receiving a resetting signal, on initializing the generator and another input connected to the generator output for receiving such control pulse for controlling the incrementation of the counter content;

means for marking the logic level of the output signal of the system said means connected to the system output and to an output of the generator for receiving a synchronizing signal for each new combination of simulation signals, and connected to an output of said counter for marking the number of any component for which the change of logic level of the simulation signal applied thereto beings about a change of level of the output signal of the system.

4,713,607

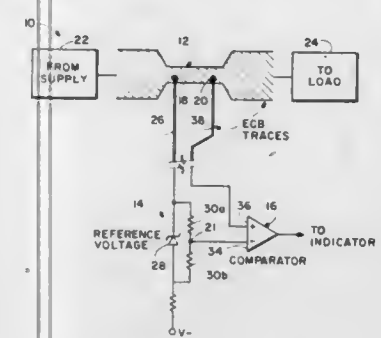
CURRENT SENSING CIRCUIT

Steven H. Pepper, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 23, 1985, Ser. No. 812,482

Int. Cl.⁴ G01R 31/02, 1/30

U.S. Cl. 324—73 PC 8 Claims



1. A current sensing circuit for sensing current level and signaling if such current exceeds a predetermined detection level, comprising:

a current path of a predetermined resistance between a first voltage sense point and a second voltage sense point; reference voltage means having an input coupled to one of the voltage sense points for sensing the voltage and shifting it a predetermined amount equal to the voltage produced across the predetermined resistance when the current through the predetermined resistance reaches the detection level; and

comparator means coupled to the reference voltage means and to the other voltage sense point for sensing and comparing the other sensed voltage with the shifted sensed voltage, the comparator means indicating that the current being sensed is below the predetermined detection level when the other sensed voltage exceeds the shifted sensed voltage and indicating that the current being sensed exceeds the predetermined level when the other sensed voltage is less than the shifted sensed voltage.

4,713,608

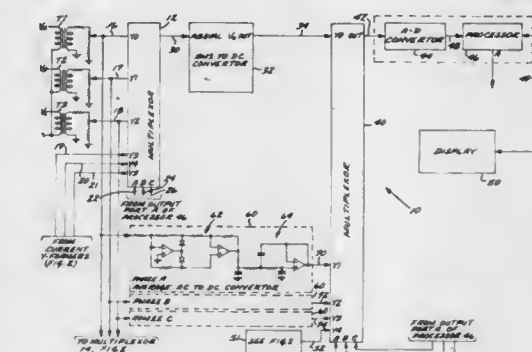
APPARATUS FOR PROVIDING COST EFFICIENT POWER MEASUREMENT

Robert D. Catiller, Garden Grove; John D. Faivre, Glendora, and Fah Rakpongs, Lakewood, all of Calif., assignors to Computer Power Systems Corporation, Carson, Calif.

Filed Mar. 6, 1986, Ser. No. 840,606

Int. Cl.⁴ G01R 21/06, 19/00

U.S. Cl. 324—142 36 Claims



1. Apparatus for measuring electrical power consumed in an electrical system comprising:

- means for generating at least a first signal representing an ac voltage provided to said system and at least a second signal representing an ac current provided to said system;
- first multiplexor means responsive to said first signal and said second signal, said first and second signals appearing at the output of said first multiplexor means in a controlled sequence;
- first means coupled to the output of said first multiplexor means for converting the controlled sequence signals at said multiplexor output to corresponding dc signals;
- second means coupled to said first converting means for converting said dc signals to digital signals; and
- means responsive to said digital signals for providing a third signal representing the product of said first and second signals, said third signal representing the apparent power provided to said system by said ac current and voltage signals.

4,713,609

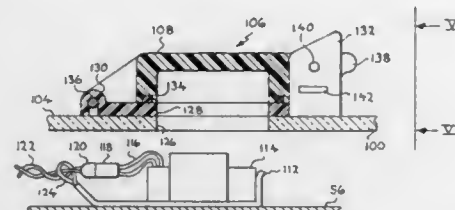
BATTERY BACKUP INSTALLATION FOR ELECTRIC METER

Peter F. Losapio; Warren R. Germer, both of Dover, N.H.; Maurice J. Ouellette, North Berwick, Me., and Ansell W. Palmer, Hampton, N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Sep. 5, 1985, Ser. No. 772,701
Int. Cl.⁴ G01R 1/04

U.S. Cl. 324—156

8 Claims



1. A battery installation for an electric meter, said electric meter including a cover, comprising:
 - a battery replacement hatch in said cover;
 - means for retaining a battery within said cover in a location accessible through said battery replacement hatch;
 - means for permitting at least partly withdrawing said battery through said battery replacement hatch without disconnecting battery power from said electric meter;
 - said electric meter including an electronic register module which is removable from a remainder of said electric meter;
 - said electronic register module containing volatile memory elements whose contents would be lost in the event that electric power is not maintained to said electronic register module; and
 - said means for permitting at least partly withdrawing includes means for permitting said battery to remain connected to said electronic register module when said electronic register module is removed from said remainder of said electric meter, whereby said electric power is maintained to prevent loss of data in said volatile memory elements when said electronic register module is removed from said electric meter.

4,713,610

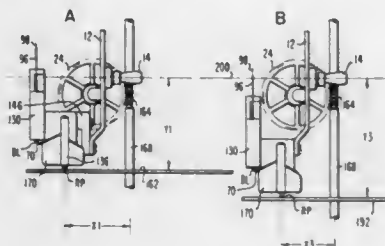
ELECTRIC METER WITH IMPROVED SENSING HEAD ASSEMBLY

Thomas G. Willis, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 29, 1984, Ser. No. 676,763
Int. Cl.⁴ G01R 11/02

U.S. Cl. 324—157

13 Claims



1. A meter apparatus, comprising:
 - a frame member;
 - a means for supporting a plurality of electronic components, said support means being flexible and generally non-conductive with a plurality of conductive paths connecting said electronic components;
 - a bracket rigidly supported by said frame member, said bracket being shaped to retain a portion of said flexible

- support means, said bracket having at least one retaining clip; and
- a sensing head shaped to be received in said retaining clip, said sensing head being shaped to receive a first device and a second device in a preselected angular relation, said first and second device each being mounted to said supporting means in electrical communication with preselected ones of said plurality of conductive paths.

4,713,611

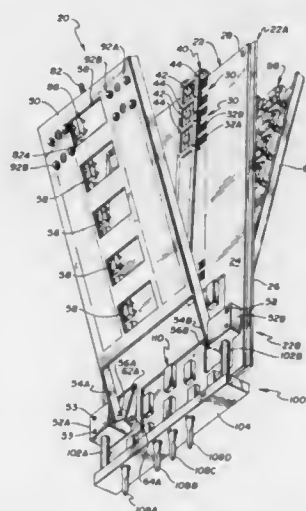
BURN-IN APPARATUS FOR INTEGRATED CIRCUITS MOUNTED ON A CARRIER TAPE

Russell V. Solstad, St. Paul; Millard Scott, New Hope, and William Holliday, Bloomington, all of Minn., assignors to VTC Incorporated, Bloomington, Minn.

Filed Jun. 23, 1986, Ser. No. 877,536
Int. Cl.⁴ G01R 35/00

U.S. Cl. 324—158 F

11 Claims



1. An apparatus for electrically and thermally burning in a plurality of integrated circuits mounted at spaced intervals on a carrier tape, each integrated circuit having a set of conductive leads extending outward and generally parallel to the carrier tape, the apparatus comprising:
 - a base having first and second generally parallel support surfaces for supporting the carrier tape during testing;
 - a first set of electrical contact arrays on the first support surface of the base, each array positioned for making electrical contact with leads from one of the integrated circuits mounted on the carrier tape;
 - a second set of electrical contact arrays on the second support surface of the base, each array positioned for making electrical contact with leads from one of the integrated circuits mounted on the carrier tape;
 - a first cover pivotally connected to the base and extending over the first set of electrical contact arrays on the first support surface when the first cover is in a closed position;
 - a second cover pivotally connected to the base and extending over the second set of electrical contact arrays on the second support surface when the second cover is in a closed position;
 - first pressure applying means carried by the first cover for urging the set of leads of each of the integrated circuits located adjacent the first support surface into contact with one of the first set of electrical contact arrays when the first cover is in its closed position;
 - second pressure applying means carried by the second cover for urging the set of leads of each of the integrated circuits located adjacent the second support surface into contact with one of the second set of electrical contact arrays when the second cover is in its closed position;

- locking means for selectively locking the first and second covers in the closed position; and
- means connected to the first and second sets of electrical contact arrays for testing the integrated circuits.

4,713,612

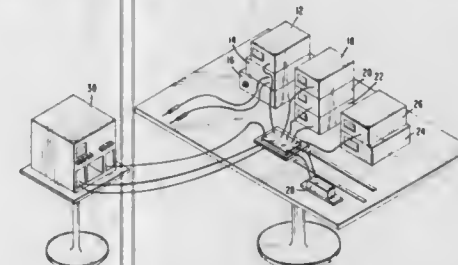
METHOD AND APPARATUS FOR DETERMINATION OF JUNCTION-TO-CASE THERMAL RESISTANCE FOR A HYBRID CIRCUIT ELEMENT

Henry Takamine, Gardena, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 14, 1986, Ser. No. 885,502
Int. Cl.⁴ G01N 25/00; G01R 31/26

U.S. Cl. 324—158 D

9 Claims



1. A method for determining the junction-to-case thermal resistance θ_{jc} of a solid-state circuit element mounted in a case, the circuit element having at least one semiconductor p-n junction, including the steps of:
 - (a) applying a calibration current through the junction;
 - (b) measuring a voltage drop across said junction for a plurality of temperatures to determine a temperature coefficient T_c with said calibration current flowing through said junction;
 - (c) applying a substantial increase in power to said solid-state circuit element and allowing said solid-state circuit element to reach a state of thermal equilibrium with a surrounding environment;
 - (d) measuring a total power dissipation P_T of said solid-state circuit element while keeping said base of said solid-state circuit element at a constant temperature;
 - (e) removing said increase in power to said solid-state circuit element and measuring a change in junction voltage drop ΔV_{BE} between low-power operation (only a small calibration current flowing) and high-power operation (substantially increased power to said solid-state circuit element); and
 - (f) determining said junction-to-case thermal resistance θ_{jc} by dividing said ΔV_{BE} with the product of said total power P_T and said temperature coefficient T_c .

4,713,613

DEVICE FOR MAGNETICALLY DETECTING DISPLACEMENT OF NON-MAGNETIC MOVABLE MEMBER

Tadashi Takahashi; Kunio Miyashita, and Syoichi Kawamata, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,013

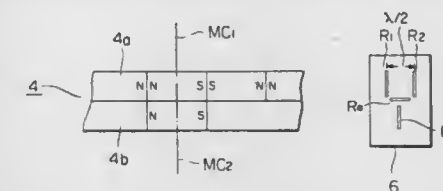
Claims priority, application Japan, Oct. 19, 1983, 58-194164
Int. Cl.⁴ G01B 7/28; G11B 5/39; H01L 43/08

U.S. Cl. 324—208

4 Claims

1. A device for magnetically detecting displacement of a non-magnetic movable member comprising a magnetic recording medium carried on the movable member, at least first and second tracks provided on the magnetic recording medium and juxtaposed to each other, the first track having a plurality of first magnetic signals recorded on a given length of the first track, each of the first magnetic signals including a pair of N and S poles and arranged so that the N and S poles are disposed alternately at uniform intervals along the first track, the second track having only one second magnetic signal recorded on a

length of the second track juxtaposed to the given length of the first track, the second magnetic signal including a pair of N and S poles which are respectively aligned with the N and S poles of one of the first magnetic signals recorded on the given length of the first track in a direction perpendicular to the moving direction of the movable member so as to enable prevention of magnetic leakage between the respective tracks, and magneto-resistance element means fixedly disposed adjacent to



the movable member and including first and second magneto-resistance element sets facing the first and second tracks, respectively, for producing electrical signals representing variations of resistance of the first and second magneto-resistance element sets, respectively, in response to the first and second magnetic signals recorded on the respective tracks when the movable member moves so as to enable determination of the displacement of the movable member in accordance with the electrical signals produced.

4,713,614

METHOD OF CORRECTING THE PHASE AND SHADING IN A NUCLEAR MAGNETIC RESONANCE TOMOGRAPHIC DEVICE

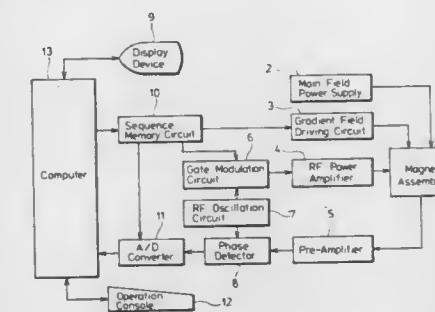
Kazuya Hoshino, and Hiroyuki Matsuura, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation and Yokogawa Medical Systems, Limited, both of Tokyo, Japan

Filed Feb. 20, 1986, Ser. No. 831,342

Claims priority, application Japan, Feb. 25, 1985, 60-35745
Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—307

1 Claim



1. A method of correcting phase and shading in a nuclear magnetic resonance tomographic device, comprising the steps of:
 - scanning a phantom to measure signals, subjecting said signals to a 2-dimensional inverse Fourier transformation by computer means and storing an image (Cij) thus obtained as it is in the form of a complex number in a memory means;
 - measuring an object to be examined by the same operational steps as recited in the foregoing steps and applying data processing to obtain an image (Oij) in the form of a complex number;
 - wherein said object and said phantom are placed in the same physical position during respective measurements; and
 - dividing the image (Oij) of said object with said image (Cij) of said phantom by the computer means, to correct distortion in the density of the image of the object and simultaneously correct distortion in the phase of the image of the

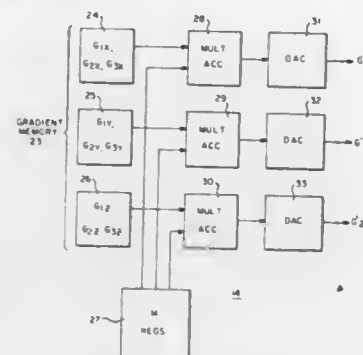
object, thereby obtaining an image of the object corrected for distortion in density and distortion in phase.

4,713,615

QUANTIZATION ERROR REDUCTION METHOD FOR PHASE ENCODE GRADIENT IN NMR IMAGING
Craig H. Barratt, Mountain View; Brian P. Wilfley, Los Gatos, and David M. Parish, Sunnyvale, all of Calif., assignors to Resonex, Inc., Sunnyvale, Calif.
Continuation-in-part of Ser. No. 771,068, Aug. 30, 1985. This application Jul. 25, 1986, Ser. No. 890,594
Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—307

10 Claims



1. A method for a nuclear magnetic resonance (NMR) imaging apparatus having gradient coils driven by gradient waveforms, said gradient waveforms being produced by digital to analog converters having a predetermined amplitude quantization resolution or step size, said waveforms including a first phase encode waveform which, by an incremental variation of its area, provides a parameter to spatially encode an image of a subject, said method comprising the following steps:

for said first phase encode waveform, having a fixed width and a variable amplitude, determining a desired plurality of amplitudes for providing said incremental variation of said area;

providing a plurality of said first phase encode waveforms having actual amplitudes within one said step size of said desired amplitudes, said actual amplitudes corresponding to said amplitude quantization resolution, whereby an area error is created by the difference between said actual and desired amplitudes;

and in the same spin echo sequence as a said first phase encode waveform providing an additional phase encode waveform having a width substantially smaller by at least an order of magnitude than said first waveform, such area substantially matching said area error.

4,713,616

NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS

Toru Shimazaki, and Hiroyuki Matsuura, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation and Yokogawa Medical Systems, Limited, both of Tokyo, Japan
Filed May 16, 1986, Ser. No. 864,000
Claims priority, application Japan, May 29, 1985, 60-116180
Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—309

2 Claims

1. A method of obtaining an NMR image of a plane section of an object to be examined, comprising the steps of concurrently impressing a 90° RF exciting pulse to excite said object and a negative Z gradient magnetic field to selectively excite only the spins in the plane section under examination;

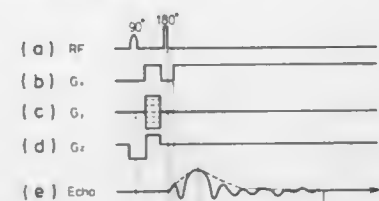
after termination of said 90° RF pulse, concurrently impressing a positive X gradient magnetic field, a Y gradient magnetic field and changing the negative Z gradient magnetic field to a positive Z gradient magnetic field, thereby

to phase encode and prepare for observation of the echo spins;

concurrently terminating said X gradient magnetic field, said Y gradient magnetic field, and said Z gradient magnetic field, and concurrently therewith impressing a 180° RF exciting pulse on said object to invert the spins;

terminating said 180° RF exciting pulse;

impressing an X gradient magnetic field to generate an echo signal on a receiving coil;



detecting the phase and amplitude of said echo signal; storing said echo signal in a memory and obtaining a two dimensional Fourier transform thereof; generating a signal to substitute for data missing during a negative time from the detected phase and amplitude continuity conditions; and operating on said Fourier transform and said generated signal substituting for the missing data, to thereby produce a reconstructed image.

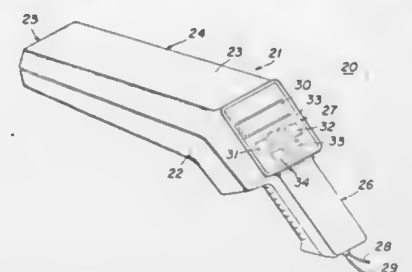
4,713,617

DIGITAL TIMING LIGHT

Steven E. Michalski, Milwaukee, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.
Filed Apr. 30, 1986, Ser. No. 857,359
Int. Cl.⁴ F02P 17/00

U.S. Cl. 324—395

18 Claims



1. Digital engine timing apparatus for use in testing a multi-cylinder internal combustion piston engine having a control system for sequentially providing fuel ignition in the engine cylinders in a predetermined order, said timing apparatus comprising: timing light means for providing a light pulse in response to an electrical trigger pulse; pickup means responsive to each ignition in a selected cylinder for generating a pickup signal; operator-actuated means for selectively producing a variable angular value representative of an angular relationship between ignition in the selected cylinder and a predetermined position of the associated piston; and processor means operating under stored program control and coupled to said timing light means and to said pickup means and to said operator-actuated means, said processor means including timing means for generating digital data corresponding to the time period between consecutive pickup signals, means for computing from only said angular value and said digital data a time delay value corresponding to said angular value, and means for producing said trigger pulse at a time spaced from said pickup signal by a predetermined function of said time delay value.

4,713,618

ON-LINE CALIBRATION SYSTEM FOR CHEMICAL MONITORS

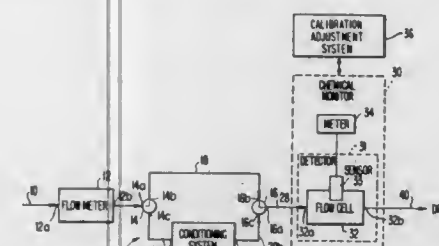
Gerald L. Carlson, Mt. Lebanon Township, Allegheny County; David F. Pensenstadler, N. Huntingdon; Warren E. Snider, Elizabeth Township, Allegheny County, and William A. Byers, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 2, 1985, Ser. No. 782,858

Int. Cl.⁴ G01N 27/56

U.S. Cl. 324—438

15 Claims



1. A system for on-line calibration of a chemical monitor including a detector for sensing the level of a selected chemical characteristic of a fluid sample stream and producing an output representative of the sensed level of the selected chemical characteristic, comprising:

means for supplying an influent fluid sample stream at a predetermined volumetric rate;

means for conditioning the influent fluid sample stream to provide a conditioned fluid sample stream having a predetermined level of the selected chemical characteristic;

means selectively operable to establish first and second fluid sample stream flow paths, the first flow path providing the influent fluid sample stream to the detector, and the second flow path providing the influent fluid sample stream to the conditioning means and the conditioned fluid sample stream to the detector; and

means for calibrating the output representative of the sensed level of the selected chemical characteristic with respect to the predetermined level of the selected chemical characteristic in the conditioned fluid sample stream.

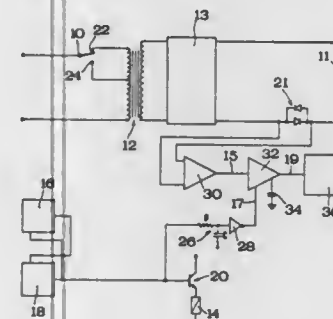
4,713,619

ELECTRONIC DEVICE FOR FEEDING ION PUMP

Mario Busso, Torino, and Marco Pierini, Genova, both of Italy, assignors to Varian S.p.A., Leini, Italy
Filed Nov. 19, 1985, Ser. No. 799,411
Claims priority, application Italy, Nov. 28, 1984, 68182 A/84
Int. Cl.⁴ G01L 21/30; F04B 37/14

U.S. Cl. 324—460

9 Claims



1. In an electronic device for feeding an ion pump and for improved measuring of the pressure in the pump, said device including a transformer having a primary winding divided into two sections, means for rectifying and filtering alternating

current supplied by said transformer, and an electrometer for detecting the current fed to said pump, the improvement wherein said transformer is controlled by a means for cyclically applying to said ion pump a first relatively high voltage and a second lower voltage, and further comprising means for converting into pressure values only the current values relating to feeding of said lower voltage.

4,713,620

DUAL SIGNAL AMPLITUDE MODIFYING AND COMBINING APPARATUS

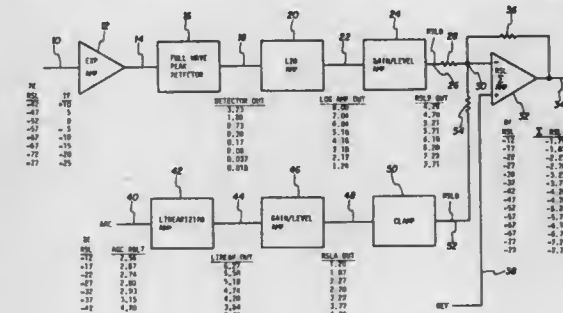
Ben R. Hallford, Wylie, and Karl R. Varian, Plano, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 22, 1986, Ser. No. 945,283

Int. Cl.⁴ H03K 17/00

U.S. Cl. 328—150

6 Claims



1. Apparatus for detecting received signal levels operating in conjunction with a part-time automatic gain control amplifier comprising, in combination:

summing amplifier means, including input and output means, said output means providing an indication of received signal level amplitude;

reference level means for providing a compensating reference signal to said summing amplifier means;

first detection means, connected to said summing amplifier means, for detecting linearly changing output signals from a monitored amplifier prior to initiation of automatic gain control feedback signals, the first detection means always supplying signals of at least the amplitude of said reference signal to said summing amplifier and supplying linearly changing signals having an amplitude greater than said reference signal as the amplitude of the signal being detected drops; and

second detection means, connected to said summing amplifier means, for detecting non-linear feedback signals generated in the automatic gain control amplifier and for supplying linearly changing signals to said summing amplifier means representative of those detected having an amplitude up to a maximum of the reference level signal.

4,713,621

PHASE SYNCHRONIZATION CIRCUIT

Haruhiko Nakamura, Yokohama, and Junya Tempaku, Yokosuka, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 28, 1985, Ser. No. 717,198

Claims priority, application Japan, Mar. 29, 1984, 59-059466
Int. Cl.⁴ H03K 3/86, 5/26

U.S. Cl. 328—55

10 Claims

1. A phase synchronization circuit for generating an output signal which is synchronized with a reference signal, said circuit comprising:

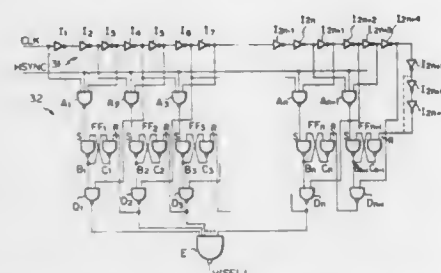
a delay circuit portion for delaying a clock signal, said delay circuit portion having a plurality of taps, said delay circuit producing delayed clock signals in sequence having different phases from said plurality of taps; and

a selection circuit portion being connected to said plurality of taps of said delay circuit portion, said selection circuit portion for selecting one of a plurality of outputs from said plurality of taps, said selection circuit portion including a plurality of adjacent selection circuit units, each selection circuit unit comprises,

a set/reset circuit having set and reset inputs and an output,

a first gate circuit having a first input terminal connected with one of said plurality of taps, a second input terminal connected with another of said plurality of taps, a third input terminal for receiving said reference signal and an output terminal connected with the set input of said set/reset circuit, said first gate circuit supplying said set/reset circuit with a set signal when the inputs to said input terminals form a predetermined relationship,

a second gate circuit having an input for receiving the output of said set/reset circuit and having another input for receiving the output of one of said delayed clock



signals, wherein said set/reset circuit in a preceding selection circuit unit of adjacent selection circuit units is reset by an output from said second gate circuit in a following selection circuit unit,

said synchronization circuit operating such that, when a potential of said reference signal has a first binary value a set operation followed by a reset operation of said set/reset circuits is carried successively in accordance with the transmission of said clock signal along said delay circuit portion, and when the potential of said reference signal is changed to a second binary value, set/reset circuits, other than said set/reset circuit which was set immediately before said change of potential, are maintained in a reset state so that said delayed clock signal of a corresponding tap of said delay circuit portion is delivered to said output signal through said second gate circuit which receives the output of said set/reset circuit which is set immediately before said change of potential.

4,713,622

MULTIPLE STATE TONE GENERATOR

Sanjay Wanchoo, Lauderhill, and David L. Muri, Sunrise, both of Fla., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 9, 1986, Ser. No. 917,587

Int. Cl.⁴ G01H 5/06

U.S. Cl. 328—61

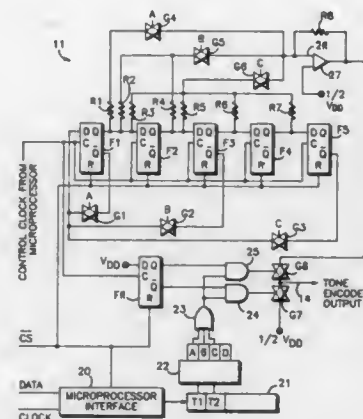
7 Claims

1. A tone generator for producing a plurality of output tone waveforms for a plurality of frequencies comprising: means for providing plural binary state waveforms

an encoder means for selectively converting said plural binary state waveforms into a first waveform having a first number of multilevel states and a second waveform having a second number of multilevel states, less than said first number of states,

control means operatively connected to said encoder for

selecting one of said first and second waveforms wherein said control means selects said second waveform for



higher frequency output tones and said first waveform for lower frequency output tones.

4,713,623

CONTROL SYSTEM FOR MATRIX PRINT HEAD

Dan C. Mower, Agoura; Peter H. Wolf, Campbell; Boyd E. Slade, Sunnyvale, and David Albertalli, San Jose, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

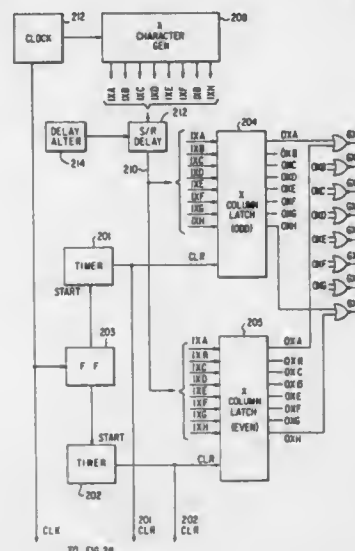
Continuation of Ser. No. 60,040, Jul. 24, 1979, which is a division of Ser. No. 905,705, Jun. 13, 1977, Pat. No. 4,167,342.

This application Dec. 14, 1981, Ser. No. 330,672

Int. Cl.⁴ H03K 17/00, 5/13; B41J 3/02

U.S. Cl. 328—72

2 Claims



1. A timing system for controlling dot-matrix printing heads which comprises:

- a clock providing a series of pulses;
- a pair of timers each providing an output pulse having a predetermined time duration in response to an input pulse;
- a flip flop providing input pulses alternately to said timers in response to clock pulses;
- a pair of latches each having a plurality of inputs, and a plurality of outputs corresponding to said inputs, the inputs of one of said latches being paralleled with the inputs of the other of said latches;
- a coupling means for coupling each of said timers to one of said latches whereby signals appearing at the inputs of said latches at the start of an output pulse coupled to said latch

will be coupled to the output of said latch for the duration of the output pulse coupled to said latch;

(f) a plurality of gating means coupled to the outputs of said latches, each of said gating means having an input coupled to an output of the first of said latches and another input coupled to the corresponding output of the other of said latches, whereby a signal from either of said latches will actuate said gate; and

(g) means for coupling the output of each of said gating means to a dot forming element of a dot-matrix printing head.

4,713,624

POWER AMPLIFIER WITH MODIFIED DYNAMIC RESPONSE

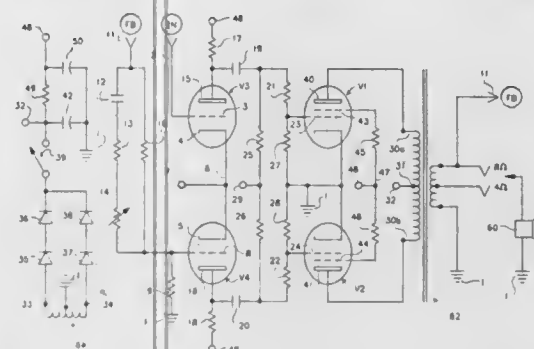
Randall C. Smith, 1317 Ross St., Petaluma, Calif. 94952

Filed Oct. 7, 1986, Ser. No. 916,156

Int. Cl.⁴ H03F 3/28

U.S. Cl. 330—118

5 Claims



1. In a power amplifier for amplifying audio signals generated by a musical instrument a method for modifying the dynamic response of the power amplifier, the method comprising the steps of:

- providing at least one pentode power amplifier tube means having at least a cathode element, a screen grid element and an anode element, for amplifying the audio signals and putting them out to a loudspeaker means,
- impressing the audio signals generated by the musical instrument on an electron beam amplitude control electrode of the tube means,
- charging a charge storage means having a predetermined discharge time constant with a charge of electrical energy to a predetermined potential,
- delivering the stored charge of electrical energy to the screen grid element of the tube means,
- establishing predetermined bias conditions for the tube means,
- whereby increased screen grid current flow causes the charge stored in the charge storage means to discharge in accordance with its discharge time constant, thereby changing the bias conditions of said tube means and modifying the dynamic response of said power amplifier to lower its power sensitivity in accordance with the predetermined discharge time constant of the charge storage means.

4,713,625

CIRCUIT FOR IMPROVING POWER SUPPLY REJECTION IN AN OPERATIONAL AMPLIFIER WITH FREQUENCY COMPENSATION

Roger A. Whitley, Georgetown, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 15, 1986, Ser. No. 941,878

Int. Cl.⁴ H03F 1/26

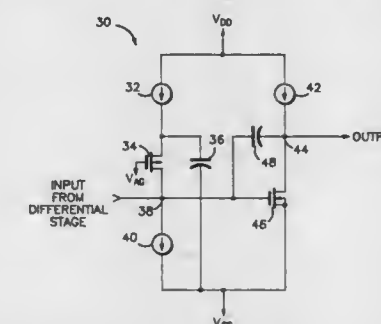
U.S. Cl. 330—149

6 Claims

1. An output gain stage with frequency stability compensation for receiving an input signal at an input terminal and

providing an output signal with high power supply rejection, comprising:

an output portion for receiving and amplifying the input signal to provide the output signal at an output terminal, said output portion adapted to be coupled to a power supply and having a current source coupled in series with a current sink transistor and a frequency stabilizing capacitor coupled between the input terminal and the output



terminal, said output signal having an error component of predetermined polarity resulting from error signals in the power supply; and

power supply compensation means coupled to the input terminal, for coupling a compensation component to the output signal, said compensation component having a magnitude substantially equal to the error component and a polarity opposite the predetermined polarity.

4,713,626

OPERATIONAL AMPLIFIER UTILIZING JFET FOLLOWERS

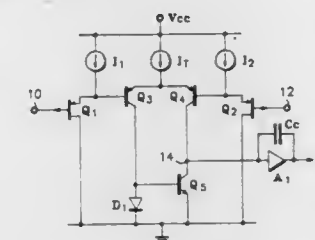
David M. Susak, Mesa, and Robert L. Vyne, Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 29, 1986, Ser. No. 947,127

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—253

5 Claims



1. An amplifier having first and second inputs, comprising: first and second emitter coupled transistor each having a base, collector and emitter terminals, said emitter terminals for coupling to a first source of supply voltage; current mirror means coupled to the collectors of said first and second transistor;

a first JFET having a source coupled to the base of said first transistor, a drain for coupling to a second source of supply voltage, and a gate coupled to said first input, and having a first I_{DSS} ;

a second JFET having a source coupled to the base of said second transistor, a drain for coupling to said second source of supply voltage, and a gate coupled to said second input, and having a second I_{DSS} ;

first means coupled to the source of said first JFET for supplying a first current thereto substantially equal to said first I_{DSS} ; and

second means coupled to the source of said second JFET for supplying a second current thereto substantially equal to said second I_{DSS} .

4,713,627

ACTIVE FILTER WITH BOOTSTRAPPING

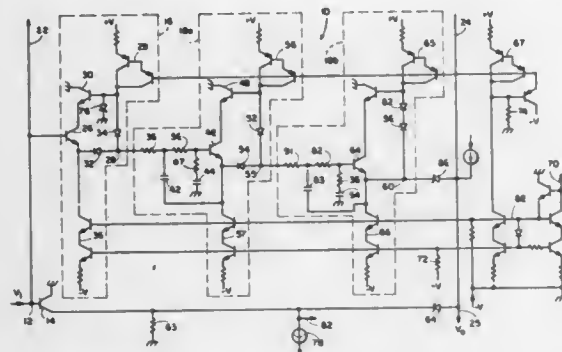
John L. Addis, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 10, 1986, Ser. No. 917,626

Int. Cl.⁴ H03F 3/04, 1/34

U.S. Cl. 330—306

10 Claims



1. An active filter comprising:
filter means for filtering an input signal to pass the signal in a predetermined bandwidth;
follower means coupled to the filter means for isolating the passed signal and feeding the passed signal back to the filter means to introduce phase shift into the input signal; and
bootstrap means coupled to the follower means for isolating the passed signal and feeding the passed signal back to the follower means to reduce capacitive effects of the follower means on the passed signal.

4,713,628

COMPENSATION AND BIASING OF WIDEBAND AMPLIFIERS

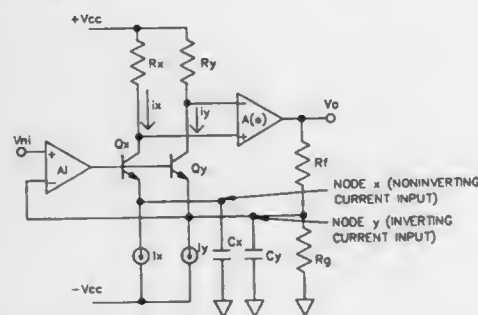
David A. Nelson, Ft. Collins, Colo., assignor to Comlinear Corporation, Fort Collins, Colo.

Filed Oct. 8, 1986, Ser. No. 916,621

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—254

8 Claims



1. A wideband amplifier employing current feedback and stray impedance cancelling circuitry to enhance high frequency performance, the wideband amplifier comprising:
first differential gain means having a noninverting input terminal for receiving a first input voltage, said first differential gain means also having an inverting input terminal and an output terminal;
first transistor means having a first terminal connected to the output terminal of said first differential gain means, said first transistor means also having second and third terminals;
second transistor means having a first terminal connected to the output terminal of said first differential gain means,

said second transistor means also having second and third terminals;
second differential gain means having a noninverting input terminal connected to the third terminal of said first transistor means, an inverting input terminal connected to the third terminal of said second transistor means, and an output terminal comprising an output terminal of said wideband amplifier;
first resistor means connected between the output terminal of said second differential gain means and the second terminal of said second transistor means to provide a feedback path therebetween; and
second resistor means connected between the second terminal of said second transistor means and a source of a second input voltage, said second resistor means being operative for setting the voltage gain of said wideband amplifier.

4,713,629

SEMI-CONDUCTOR TRANSFORMERLESS AUDIO AMPLIFIER

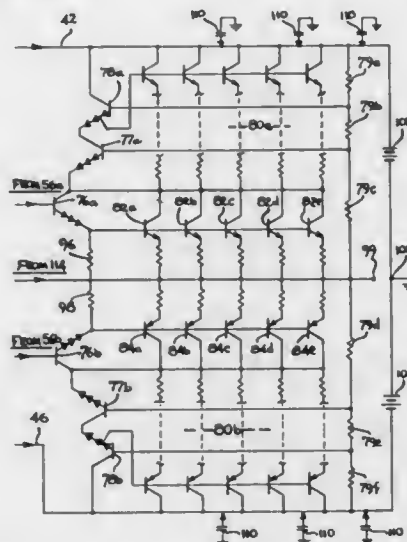
Brahm R. Segal, 4265 Carlton Avenue, Montreal, Quebec, Canada

Filed Nov. 19, 1986, Ser. No. 932,787

Int. Cl.⁴ H03F 3/18, 3/26

U.S. Cl. 330—263

5 Claims



1. A semi-conductor transformerless audio amplifier comprising:
a power source having positive and negative terminals providing equal positive and negative voltages with respect to a reference source,
an output terminal,
an input signal source,
voltage amplifier means connected between the positive and negative terminals of the power source for receiving said input signal and generating a pair of outputs in phase opposition in response thereto,
separate current amplifier means for respectively amplifying each of the outputs of said voltage amplifier means,
a voltage divider formed of equal value resistors connected in series between the positive terminal and the output terminal and between the negative terminal and the output terminal,
a first set of cascaded transistors connected with the emitter of the output transistor of the cascade coupled to the output terminal and with the base of the input transistor of the cascade driven by one of said current amplifier means,
a second set of cascaded transistors connected with the emitter of the output transistor of the cascade coupled to the output terminal and with the base of the input transis-

4,713,631

VARACTOR TUNING CIRCUIT HAVING PLURAL SELECTABLE BIAS VOLTAGES

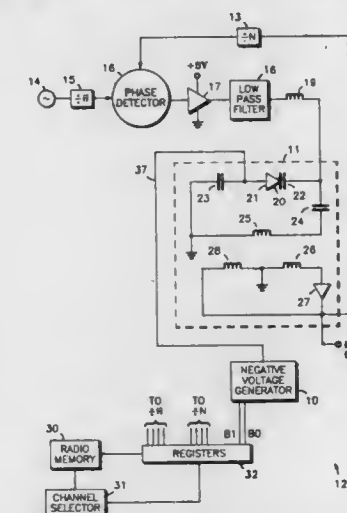
Ralph T. Enderby, Sunrise; Enrique Ferrer, Miami, and Wayne P. Shepherd, Sunrise, all of Fla., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jan. 6, 1986, Ser. No. 816,589

Int. Cl.⁴ H03B 5/08; H03H 5/12; H03L 7/18

U.S. Cl. 331—36 C

7 Claims



1. A variable capacitance circuit comprising:
a varactor having an anode side and a cathode side,
a first voltage bias means connected to one of said sides of the varactor for applying a variable voltage to the varactor,
a second voltage bias means connected to the other of said sides of the varactor for selectively applying one of a plurality of voltages to the varactor, wherein the first and second bias means cooperatively control the capacitance of the varactor,
the second voltage bias means including a voltage multiplier circuit having an output, and
a voltage divider network connected to the output of the voltage multiplier circuit for supplying said plurality of voltages.

4,713,632

BAND REFLECTION TYPE FET DIELECTRIC RESONATOR OSCILLATOR

Toshio Nishikawa, Nagaokakyo, and Sadahiro Tamura, Kyoto, both of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

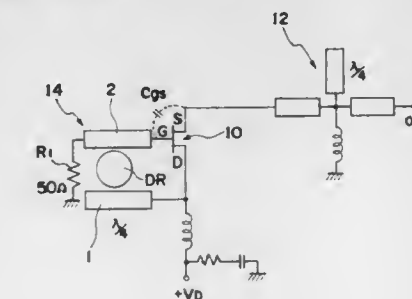
Continuation-in-part of Ser. No. 615,537, May 31, 1984, abandoned. This application May 16, 1986, Ser. No. 863,999

Claims priority, application Japan, Jun. 3, 1983, 58-99971

Int. Cl.⁴ H03B 5/18

U.S. Cl. 331—117 D

4 Claims



1. A band reflection type oscillator comprising:

tor of the cascade driven by the other of said current amplifier means,
a third set of cascaded transistors with the emitter of the output transistor of the cascade connected to the collectors of said first set of cascaded transistors and the collectors of said third set of transistors coupled to the positive power terminal, the base of the input transistor of the cascade of the third set of transistors being connected to a portion of the voltage divider between the positive terminal and output terminal, and
a fourth set of cascaded transistors with the emitter of the output transistor of the cascade connected to the collectors of said second set of cascaded transistors and the collectors of said fourth set of cascaded transistors coupled to the negative power terminal, the base of the input transistor of the cascade of the fourth set of transistors being connected to a portion of the voltage divider between the negative terminal and output terminal.

4,713,630

BPSK COSTAS-TYPE PLL CIRCUIT HAVING FALSE LOCK PREVENTION

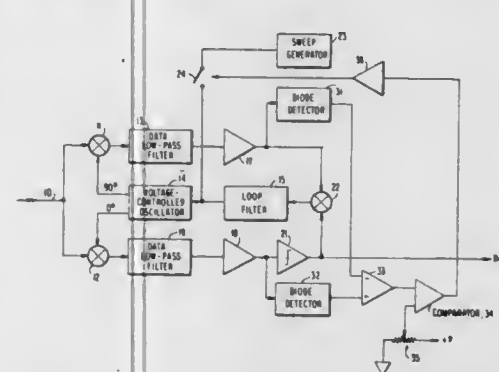
David Matthews, Mount Airy, Md., assignor to Communications Satellite Corporation

Filed Jul. 29, 1986, Ser. No. 890,231

Int. Cl.⁴ H03L 7/12; H04L 27/22

U.S. Cl. 331—4

7 Claims



1. A BPSK Costas-type PLL circuit in which false lock-in is prevented by distinguishing between true lock-in and false lock-in, comprising:
0° and 90° sub-loops, said 0° sub-loop comprising a first mixer receiving on a first input a BPSK IF signal, a first low-pass filter and amplifier coupled in series with one another and receiving as an input an output of said first mixer, a multiplier receiving on a first input an output of said first low-pass filter and amplifier, a loop filter having an input coupled to an output of said multiplier, and a voltage-controlled oscillator receiving as a control-voltage input an output of said loop filter, a 0° output of said voltage-controlled oscillator being coupled to a second input of said first mixer, and said 90° sub-loop comprising a second mixer receiving on a first input said BPSK IF signal, a second low-pass filter and amplifier coupled in series with one another and receiving as an input an output of said second mixer, said multiplier receiving on a second input an output of said second low-pass filter and amplifier, said 90° sub-loop including said loop filter and said voltage-controlled oscillator, A 90° output of said voltage-controlled oscillator being coupled to a second input of said second mixer;
sweep generator means coupled to said voltage-controlled oscillator for locking said 0° and 90° sub-loops on to said BPSK IF signal;
means for detecting a difference in AC signal levels in said 0° and 90° sub-loops; and
means for on/off controlling said sweep generator means in response to an output of said difference detecting means.

an FET having a source, a gate and a drain; a stripline connected to said gate; a resonator provided adjacent said stripline in a magnetically coupled relationship therewith; and a first stripline stub having a length equal to $(n/2 + \frac{1}{4})$ wavelength, wherein n is zero or a positive integer, said stub position adjacent said resonator in a magnetically coupled relationship therewith and having a first end which is connected to said drain and a second end which is open ended, thereby substantially grounding said drain in terms of high frequency and, at the same time, forming a positive feedback circuit between said drain and said gate through said resonator.

4,713,633

COVER ATTACHING ARRANGEMENT FOR CASING OF DIELECTRIC COAXIAL RESONATORS

Koji Saito, and Hiroshi Okawa, both of Kanazawa, Japan, assignors to Murata Manufacturing Co., Ltd., Nagakakyō, Japan

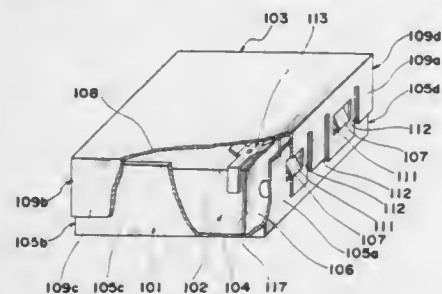
Filed Dec. 19, 1986, Ser. No. 943,391

Claims priority, application Japan, Dec. 24, 1985, 60-295736

Int. Cl.⁴ H01P 1/205

U.S. Cl. 333—222

6 Claims



1. A cover attaching arrangement for a casing of dielectric coaxial resonators, which comprises a casing having side walls extending upwardly approximately at right angles with respect to its bottom wall so as to accommodate the dielectric coaxial resonators therein, a cover member having side walls extending downwardly approximately at right angles with respect to its top wall and adapted to be fitted over said casing, said side walls of either one of said casing or said cover member being formed with engaging pieces, with the other thereof being formed with corresponding engaging openings so as to retain said casing unreleasable from said cover member upon fitting of said engaging pieces with said engaging openings, and a spring means provided between the dielectric coaxial resonator and said cover member or between said dielectric coaxial resonator and said casing so as to urge said cover member in a direction for engagement between said engaging pieces and said engaging openings.

4,713,634

SEMICONDUCTOR DEVICE MOUNTED IN A HOUSING HAVING AN INCREASED CUTOFF FREQUENCY

Shigeyuki Yamamura, Sagami-hara, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 5, 1985, Ser. No. 708,609

Claims priority, application Japan, Mar. 6, 1984, 59-042605

Int. Cl.⁴ H05K 5/04

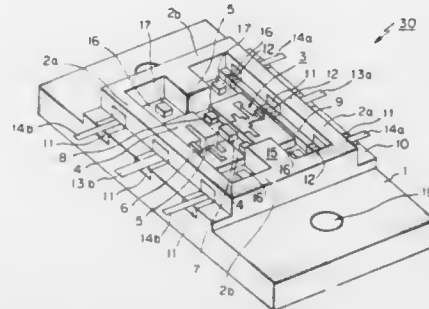
U.S. Cl. 333—245

3 Claims

1. A semiconductor device comprising: a metallic container comprising a bottom surface, a first pair of opposite side walls and a second pair of opposite side walls, said first pair of side walls being perpendicular to said second pair of side walls thereby forming a rectangular frame on said bottom surface, said container enclosing

a radio frequency semiconductor circuit having a semiconductor element on said bottom surface; input and output terminals connected to said circuit and penetrating through said first pair of opposite side walls of said container;

wherein said bottom surface includes a main space for mounting said radio frequency semiconductor circuit in the middle portion of the rectangular frame with respect to the direction parallel to the first pair of side walls and a supplementary space for mounting elements of a supplementary circuit in the end portions of the rectangular frame positioned to the side of said middle portion thereof;



a cap covering said container; and metallic projection means formed inwardly and integral with said second pair of side walls, said projection means extending between said cap and said bottom surface and being disposed within said supplementary space to narrow the cross-section of the container in a direction parallel to said first pair of side walls thereby reducing the effective length of said container to reduce the cutoff wavelength thereof and thus increase the cutoff frequency thereof, wherein at least a portion of said supplementary space is formed to the side of each projection means.

4,713,635

MULTI-PHASE CIRCUIT BREAKER WITH INTERPHASE BARRIER RETENTION

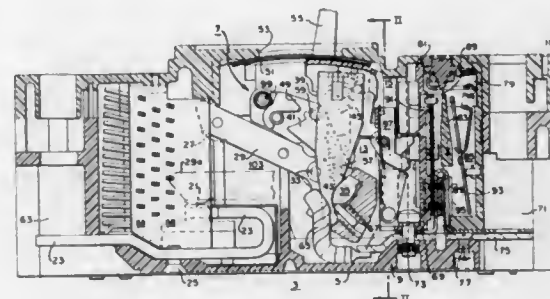
Robert H. Flick, Brighton Township, Beaver County; Lawrence D. Dennis, North Fayette Township, Allegheny County, and Roger E. Walker, Franklin Township, Beaver County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 1, 1986, Ser. No. 880,764

Int. Cl.⁴ H01H 75/00, 77/00, 83/00

U.S. Cl. 335—8

3 Claims



1. A multi-phase circuit breaker comprising: a housing having a detachable cover; a plurality of barriers separating the housing into isolated phase compartments; a circuit breaker structure within each compartment and having a pair of contacts operable to open and close an electric circuit; manually operable means for opening and closing the

contacts simultaneously in the compartments and including a crossbar extending transversely of the compartments and through the barriers; each barrier comprising first and second barrier portions, the first barrier portion being detachably mounted and having surfaces forming a crossbar-receiving opening and supporting the crossbar; and each second barrier portion being an integral part of the cover and being aligned and in abutment with a corresponding first barrier portion when the cover is mounted on the housing.

4,713,636

CIRCUIT-BREAKER

Helmut Lemmer, Marienheide-Kalsbach, and Josef Risthaus, Gammersbach, both of Fed. Rep. of Germany, assignors to Square D Starkstrom GmbH, Fed. Rep. of Germany

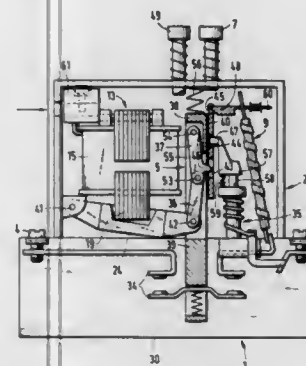
Filed Jul. 23, 1986, Ser. No. 888,422

Claims priority, application European Pat. Off., Mar. 21, 1986, 86103894.1

Int. Cl.⁴ H01H 77/00, 83/00, 81/00

U.S. Cl. 335—35

19 Claims



1. A circuit-breaker comprising a housing having an end, an actuator device positioned upon said end, thermal trippers and magnetic trippers mounted on one side of said actuator device, means for operationally connecting said thermal and magnetic trippers relative to said actuator device, an electromagnetic drive including an armature, said electromagnetic drive being mounted on a second side of said actuator device opposite said one side, a set of contacts adjacent said end, said set of contacts being operable through said thermal and magnetic tripper connecting means, a pair of pivotally connected links, means for connecting said pair of links between said armature and said thermal and magnetic tripper connecting means, a slider mounted adjacent and movable relative to said thermal and magnetic tripper connecting means, means for selectively engaging and disengaging said links relative to said slider, and means for connecting said thermal and magnetic trippers to said slider.

4,713,637

STORED ENERGY CIRCUIT BREAKER WITH RATCHET MECHANISM FOR CHARGING A CONTACT CLOSING SPRING

Alfred E. Maier, Chippewa, Pa.; David A. Leone, Lawrenceville, Ga., and Louis N. Ricci, Chippewa Township, Beaver County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1986, Ser. No. 913,880

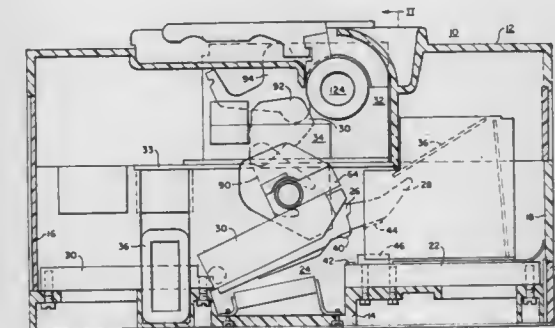
Int. Cl.⁴ H01H 3/00, 9/00, 51/00

U.S. Cl. 335—76

4 Claims

1. A circuit breaker comprising: a pair of contacts operable between open and closed positions; a crankshaft supported for rotational movement; closing spring means connected to the crankshaft;

a ratchet wheel mounted on the crankshaft for advancing the crankshaft; driving connection means between the ratchet wheel and the crankshaft; an oscillating drive wheel coupled with the ratchet wheel and movable between advanced and retracted positions for advancing the ratchet wheel; the ratchet wheel and the drive wheel having reciprocating interengaging parts for advancing the ratchet wheel; brake means coupled with the crankshaft to prevent retraction of the crankshaft when the drive wheel is retracted; operating means for advancing the ratchet wheel through the driving connection means to rotate the crankshaft from a spring discharged position to a spring charged position to charge the closing spring means; the closing spring means being dischargeable to actuate the contacts to the closed position; spring means biasing the drive wheel against the ratchet wheel whereby to engage the reciprocating interengaging parts when the operating means is advanced and enable disengagement of said parts when the operating means is retracted;



the brake means including a brake wheel mounted on the drive shaft and the ratchet wheel and brake wheel having reciprocating interengaging parts for preventing rotation of the crankshaft; the brake wheel and the drive wheel being disposed in opposite sides of the ratchet wheel; the operating means including a manual handle structure having a housing surrounding the assembly of the wheels and drive shaft and having a handle extending from the housing; the operating means includes a motorized drive having an output shaft and a wheel assembly including a motor driven drive wheel and a driven ratchet wheel; the reciprocating interengaging parts including a first lateral portion projecting from one side of one of the drive wheel and the ratchet wheel and a lateral-portion receiving hole in the other of the drive wheel and ratchet wheel, a second lateral portion projecting from one side of one of the brake wheel and the ratchet wheel and a second lateral-portion receiving hole in the other of the brake wheel and the ratchet wheel, and spring means biasing the drive wheel and brake wheel against the ratchet wheel so as to enable engagement of the lateral-portions with the holes.

4,713,638

POLARIZED ELECTROMAGNETIC RELAY

Yuichi Kamo, and Nobuo Mikami, both of Tokyo, Japan, assignors to NEC Corporation, Japan

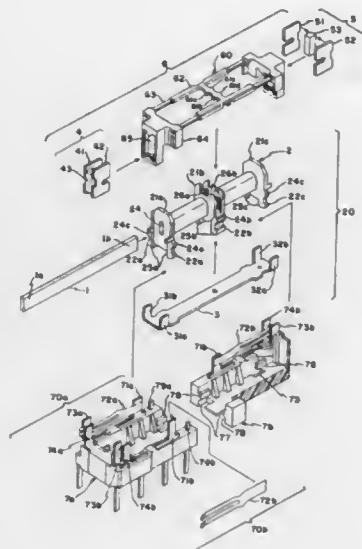
Filed Oct. 24, 1986, Ser. No. 923,087

Claims priority, application Japan, Oct. 25, 1985, 60-164274[U]; Oct. 25, 1985, 60-164275[U]; Oct. 25, 1985, 60-164276[U]; May 19, 1986, 61-115603; May 19, 1986, 61-75761[U]

Int. Cl.⁴ H01H 51/22

U.S. Cl. 335—79

20 Claims

**1. A polarized electromagnetic relay comprising:**

a movable block including a pair of permanent magnet units, each of said units being composed of a permanent magnet and a pair of generally U-shaped magnetic plates attached to opposite magnetic poles of said permanent magnet, respectively, each of said magnetic plates having a first end and a second end, said first end and said second end of each of said magnetic plates being opposed when attached to the poles of said permanent magnet, respectively, and a supporting member for supporting said permanent magnet units at its opposite ends, respectively, said supporting member actuating contact members responsive to movements of said permanent magnet units;

a core having opposite ends placed between the first ends of said magnetic plates, respectively;

a yoke having opposite ends, each of said opposite yoke ends being formed by a pair of opposing end pieces, the second ends of said magnetic plates being arranged in spaces, each of said spaces being defined by said opposing end pieces, respectively;

a spool including a longitudinal through-hole through which said core is inserted, flanges formed at opposite ends and a center portion of said spool, respectively, a plurality of protrusions protruding outwardly from both sides of each of said flanges, and a coil wound around said spool; and a pair of base members, each of said base members having groove and recesses for receiving the protrusions of said flanges of said spool, protrusions formed on side surfaces of inner walls of said base member for engaging the protrusions of said spool at the end of a longitudinal movement of the base member and contact members responsive to said movable block, said base members being assembled onto said spool from both ends thereof.

4,713,639

CIRCUIT BREAKER WITH PUSH-TO-TRIP BUTTON AND TRIP BAR

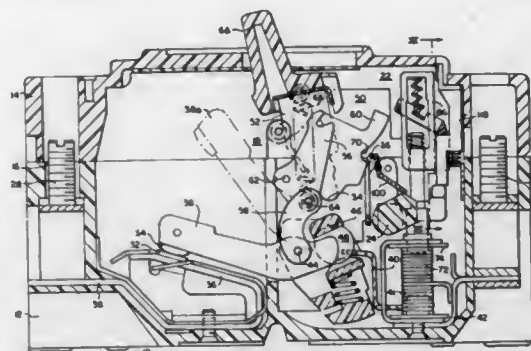
Kurt A. Grunert, Beaver, and Donald E. Schlosser, Beaver Falls, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 20, 1987, Ser. No. 17,304

Int. Cl.⁴ H01H 9/00

U.S. Cl. 335—172

5 Claims

**1. A circuit breaker comprising:**

a pair of separable contacts including a movable contact; a movable contact arm carrying the movable contact and movable between open and closed positions of the contacts;

an operable mechanism for actuating the contact arm and comprising a pivotally supported releasable member; latching means for latching the releasable member and including a latch lever movable between latched and unlatched positions of the releasable member;

trip means including a trip bar for releasably holding the latch lever in the latched position; the trip bar being movable between tripped and untripped positions;

trip delay means for avoiding premature unlatching of the trip bar and including a body movable against the trip bar and biased away therefrom;

a manually operated trip button having a first surface in contact with the trip bar; the trip delay means having an adjustment bar biased against the body for applying a prescribed pressure on the body; and

the adjustment bar having a second surface in contact with the trip button for holding the first surface in contact with the trip bar.

4,713,640

MOLDED-CASE CIRCUIT BREAKER WITH IMPROVED CONTACT ARM ASSEMBLY, TOGGLE LINK MEANS AND ARC SHIELD COMPONENT

Glenn L. Morphy, Oxford; Russell T. Borona, Seymour, and Francis L. Gelzheiser, Fairfield, all of Conn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1986, Ser. No. 944,137

Int. Cl.⁴ H01H 3/00

U.S. Cl. 335—194

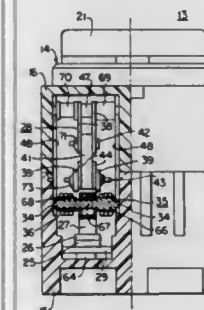
6 Claims

1. In combination with a circuit breaker having a stationary contact, a movable contact carried by an elongated contact arm, a trip assembly, a spring-biased operating mechanism, and a toggle assembly for swinging the contact arm and movable contact away from the stationary contact when the trip assembly is actuated and thereby rapidly separating said contacts, an improved mount assembly for said contact arm comprising:

a pair of spaced upstanding support members within the circuit breaker holding the trip assembly, operating mechanism, toggle assembly and contact arm in operative relationship;

a pivot shaft rotatably coupled to said support members and

extending laterally therebetween and through an opening in said contact arm, a pair of spacer members on said pivot shaft interposed between the side surfaces of said contact arm and the respective support members and maintaining said contact arm in predetermined spaced-apart relationship with said support members so that said contact arm and movable contact are swivable along a fixed predetermined arcuate path toward and away from the stationary contact when the circuit breaker is tripped and subsequently reset, said pair of support members comprising a pair of plates each having an aperture therein that are substantially aligned with one another, said pivot shaft terminating at each by an end segment that is seated in snug-fitting rotatable relationship with the apertured portion of the associated support plate, one of said spacer members comprising an integral part of said pivot shaft,



the other of said spacer members comprises a sleeve that is in slip-fitted encircling relationship with said pivot shaft at a location remote from the integral spacer portion thereof, the apertures in said support plates are of substantially circular configuration, the end segments of said pivot shaft are of substantially cylindrical configuration, the medial segment of said shaft is also of substantially cylindrical configuration and has a diameter larger than the diameters of the cylindrical end segments, and said spacer sleeve and integral spacer portion of said pivot shaft are also of substantially cylindrical configuration and of substantially the same diameter and length so that the contact arm is centrally located between said support plates, the diameter of said spacer sleeve and the integral spacer portion of said pivot shaft being larger than the diameter of the medial segment of said pivot shaft.

4,713,641

ELECTROMAGNETIC DEFLECTION UNIT

Anwar Osseyran; Jacobus J. M. Van De Meerakker, both of Eindhoven; Harmen Van Der Meulen, Veldhoven, and Halbe Oslinga, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1987, Ser. No. 32,421

Claims priority, application Netherlands, Apr. 14, 1986, 8600933

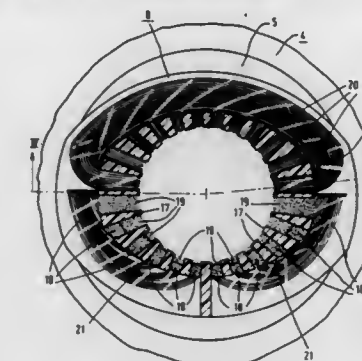
Int. Cl.⁴ H01F 5/02

U.S. Cl. 335—213

1 Claim

1. An improved electromagnetic deflection unit for a cathode-ray tube, such deflection unit comprising: a hollow annular support provided with a narrow end and a wide end and with a longitudinal axis; respective flanges at the narrow end and the wide end of the support, each flange having at least one tangential groove with a bottom portion and a plurality of mainly radial grooves merging into a said tangential groove, the radial grooves in at least the flange at the narrow end each having a longitudinally extending portion of predeter-

mined width and depth, which longitudinally extending portions are tangent to an inscribed circle; a first set of deflection coils for line deflection of an electron beam in a first direction transverse to said longitudinal axis, such deflection coils being wound directly onto said support on the inner surface thereof and the turns thereof traversing each of the tangential grooves and radial grooves of the flanges; and a second set of deflection coils for field deflection of said electron beam in a second direction transverse to said longi-



tudinal axis and transverse to said first direction, such deflection coils being wound directly onto the support and the turns thereof traversing said radial grooves in the flange, said improvement being characterized in that in the flange at the narrow end of said support:

the width and the depth of said longitudinally extending portion of each of said radial grooves are chosen so that the turns traversing these grooves substantially fill such portions of said grooves; and said bottom portions of said tangential grooves are located on the surface of an oval cylinder.

4,713,642

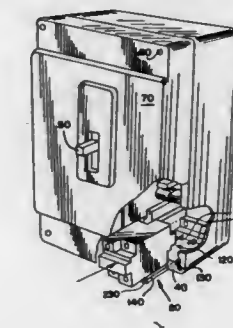
FACE CONNECTED INSTRUMENT TRANSFORMER
William R. Wolfe, Mt. Lebanon, and David Marschik, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1986, Ser. No. 860,711

Int. Cl.⁴ H01F 27/04, 29/02

U.S. Cl. 336—92

15 Claims



1. An instrument transformer having a plurality of transformation ratios for connection to at least one external circuit comprising: an elongated housing having at least one face with a plurality of longitudinally offset surfaces; a plurality of pairs of first circuit terminals disposed adjacent different ones of said surfaces such that each pair of said first circuit terminals is coplanar and longitudinally offset from each other pair of terminals; a plurality of first circuit windings disposed within said

housing, each winding electrically connected to one pair of said first circuit terminals;
one or more pairs of second circuit terminals disposed exteriorly on said housing;
one or more second circuit windings positioned within said housing in magnetic coupling relationship with at least one of said first circuit windings and electrically connected to said one or more pairs of second circuit terminals.

4,713,643

LOW LOSS CIRCUIT BREAKER AND ACTUATOR MECHANISM THEREFOR

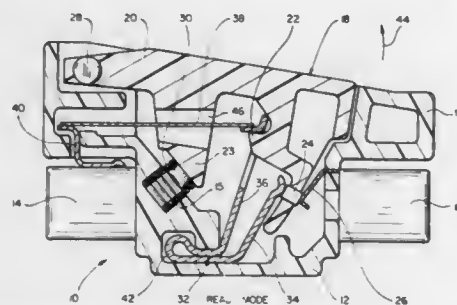
Samuel Baum, Redwood City, and John R. Yaeger, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 23, 1986, Ser. No. 945,927

Int. Cl.⁴ H01H 71/16

U.S. Cl. 337—140

10 Claims



1. An actuator mechanism comprising:
a pivotable arm having a latching portion and a contact portion;
a means for biasing exerting a biasing force with respect to said pivotable arm;
a bifurcated member having a contact arm in touching relationship with the contact portion of said pivotable arm and a flexure arm cooperating with the latching portion of said pivotable arm, the flexure arm releasably restraining said pivotable arm against the biasing force exerted by said biasing means; and
a shape memory alloy element operatively connected to the flexure arm wherein when said element is heated, said element cooperates with the flexure arm to remove the restraining of said pivotable arm, thereby releasing said pivotable arm to pivot and break the touching relationship of the contact portion and the contact arm.

4,713,644

VACUUM FUSE

William H. Nash, South Milwaukee, and Eugene C. Fowler, Milwaukee, both of Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Oct. 14, 1986, Ser. No. 918,238

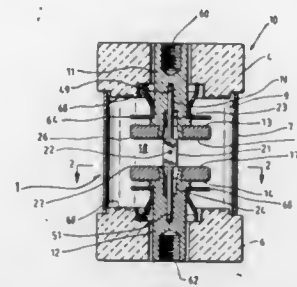
Int. Cl.⁴ H01H 85/04

U.S. Cl. 337—158

7 Claims

1. A vacuum fuse comprising,
means defining first and second spaced, generally parallel, confronting arcing surfaces arranged in general registry with each other,
fusible element means connected to and bridging the space between said arcing surfaces,
first and second electrically conductive contact rods electrically connected to said fusible element means and said arcing surfaces and projecting oppositely relative to the space between said arcing surfaces, a metallic, generally cylindrical housing member enclosing the space between said arcing surfaces,
end plates of an insulating material axially aligned with and

capping said housing member, said contact rods terminating substantially flush with said end plate,
and means providing a seal connection between said housing member, and said end plates and between end plates and



said contact rods so that the interior of said housing in which said arcing surfaces are arranged is sealed, said interior being open between said housing and arcing surfaces.

4,713,645

FIBER REINFORCED PRODUCTS AND METHOD FOR PRODUCING SAME

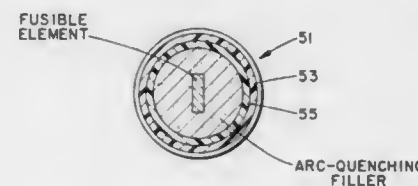
Fereidoon Razavi, Richmond Heights, Ohio, assignor to Monogram Industries, Inc., Providence, R.I.

Filed Jan. 24, 1985, Ser. No. 747,994

Int. Cl.⁴ H01H 85/02, 85/14

U.S. Cl. 337—246

12 Claims



1. An electric fuse comprising:
a fusible element;
an arc-quenching means surrounding said fusible element; and
a casing of scrim-mat laminate housing said fusible element and said arc-quenching means, said casing comprising:
a first tubular layer composed of glass fiber scrim comprised of two groups of generally parallel lengths of glass fiber, the lengths of the respective groups intersecting and defining openings therebetween, said first layer having an inner surface and an outer surface; and
a second tubular layer composed of glass fiber mat, said second layer having an inner surface and an outer surface;
the inner surface of one of said first and second tubular layers being engaged with and bonded to the outer surface of the other of said tubular layers by a resin therebetween.

4,713,646

GAS SENSOR AND METHOD OF PRODUCING THE SAME

Naomasa Sunano, Akashi; Naotatsu Asahi, Katsuta, and Toshio Yoshida, Kasukabe, all of Japan, assignors to Shinyei Kaisha, Hyogo and Hitachi, Ltd., Tokyo, both of Japan

Filed Jun. 24, 1985, Ser. No. 748,198

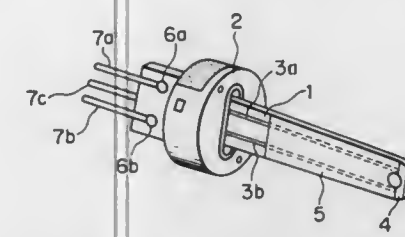
Int. Cl.⁴ H01L 7/00

U.S. Cl. 338—34

26 Claims

1. In a gas sensor comprising a pair of electrodes juxtaposed with each other on an electrically insulating substrate, a sensitive layer interposed electrically between said electrodes at

their one ends, and a protective film covering a part of said sensitive layer and a part of each of said electrodes, the improvement wherein said sensitive layer is a titanium oxide layer formed by spraying titanium oxide on said substrate at a high



temperature, wherein a diffusion reactive layer is provided between said titanium oxide layer and said substrate, and wherein the titanium oxide layer has fine grooves or pores in its surface portion.

4,713,647

THERMAL VACUUM HEATER ARRAY APPARATUS

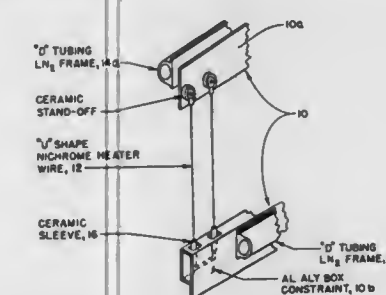
John E. Allen, Westminster; John D. Glover, Tustin, both of Calif., and Clayton C. Shepherd, Jr., Newport News, Va., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 1, 1986, Ser. No. 846,691

Int. Cl.⁴ H01C 10/10, 10/16

U.S. Cl. 338—316

7 Claims



1. A thermal vacuum heater array apparatus comprising in combination:
a support frame having an upper and lower support member, a plurality of heater wires attached to said upper support member, said plurality of heater wires being electrically isolated from said upper support member, said plurality of heater wires having a predetermined diameter to prevent buckling, each wire of said plurality of heater wires being linearly positioned with respect to each other along said upper support member, each wire being substantially U-shaped, both ends of wire being attached to said upper support member, the U-shape portion of said wire passing through openings in said lower support member, said U-shape portion of said wire including an electrical isolation means to prevent electrical contact between said wire and said lower support member, and
means for cooling operatively connected to said support frame for cooling said heater array apparatus.

4,713,648

VEHICLE RECORDING SYSTEM

Hugh A. McSweeney, P.O. Box 389, Malakoff, Tex. 75148

Filed Sep. 20, 1985, Ser. No. 778,223

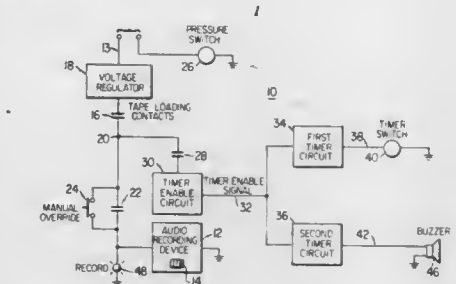
Int. Cl.⁴ B60Q 1/00

U.S. Cl. 340—52 D

14 Claims

1. A recording system for a vehicle having an engine, comprising:

an audio recording device for receiving a tape cartridge on which spoken messages are recorded;
a pressure switch mounted in the engine and responsive to pressure changes therein for generating a control signal at a predetermined engine operating condition;
means responsive to the control signal for generating a timer enable signal;



first timer means activated by the timer enable signal to generate a first timing signal over a first predetermined period; and
means responsive to the first timing signal over the first predetermined time period for activating the audio recording device to record any spoken message.

4,713,649

BIAS VOLTAGE COMPENSATED INTEGRATED CIRCUIT DIGITAL-TO-ANALOG CONVERTER

Youzi Hino, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

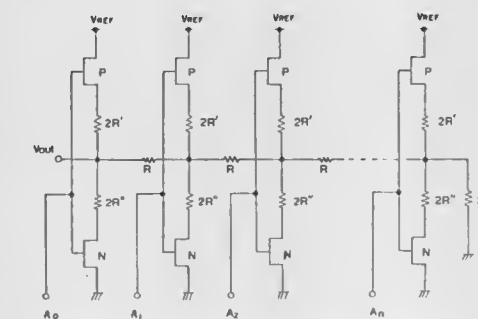
Filed Apr. 2, 1986, Ser. No. 847,093

Claims priority, application Japan, Dec. 29, 1982, 57-233909

Int. Cl.⁴ H03M 1/66

U.S. Cl. 340—347 DA

13 Claims



8. An integrated circuit digital-to-analog converter, comprising:

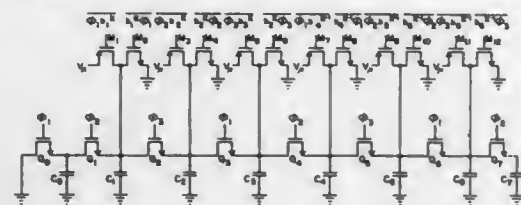
a substrate receiving a bias voltage;
a resistor network formed on said substrate and comprising network resistors operatively connected in series and forming connection points therebetween, each network resistor having a resistivity varying in accordance with the applied bias voltage;
a termination resistor formed on said substrate and operatively connected to one end of said resistor network; and
switching and compensation means, formed on said substrate and operatively connected to the other end of said resistor network and to the connection points of said resistor network, for receiving a digital signal and converting the digital signal to voltages applied to said resistor network, the voltages compensating for the variance in the resistivity of the network resistors caused by said bias voltage.

4,713,650

PIPELINED DIGITAL-TO-ANALOG CONVERTER
Gabor C. Temes, and Fong J. Wang, both of Los Angeles, Calif.,
assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 24, 1986, Ser. No. 922,658
Int. Cl.⁴ H03M 1/66

U.S. Cl. 340-347 DA

2 Claims



1. A digital to analog converter comprising:

a plurality of capacitor and transistor switch sections, each of said sections for converting three digits of a binary digital signal to an output analog voltage, each of said sections comprising:

first, second, and third pairs of input switching transistors, wherein the first transistor in each said pair is enabled and transfers a predetermined reference voltage only in response to a logic one in the input binary digit, while the second transistor in each said pair is enabled and thus transfers a ground voltage only in response to a logic zero in the same input binary digit,

first, second, and third output switching transistors coupled to said first, second, and third pairs of input switching transistors and responsive to first, second, and third independent and non-overlapping enabling signals, and

first, second, and third equal size capacitors coupled to said first, second, and third output switching transistors and to ground potential, wherein said first, second, and third capacitors are selectively connected to said ground potential or said reference or ground voltage from said input pairs of switching transistors in response to said applied binary digits, said enabling signals being sequentially applied to said first, second, and third output switching means to discharge said capacitors and combine stored charges thereon, such that an analog voltage representative of said applied digital signal is produced and selectively moved from said capacitor to capacitor from the least significant bits to the most significant bits in said applied digital signal.

4,713,651

INFORMATION DISPLAY SYSTEM
Meir Morag, 21 Shalom Asch Street, Tel Aviv, Israel
Filed Mar. 24, 1986, Ser. No. 843,079

Claims priority, application Israel, Mar. 29, 1985, 74762

Int. Cl.⁴ G08B 23/00

U.S. Cl. 340-407

5 Claims

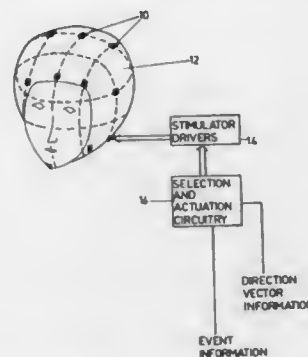
1. An information display system for providing event and direction indication information to an operator, comprising: means for receiving information signals having event and direction indication characteristics; means for transforming said received information signals into direction indications in a fixed reference coordinate system;

an egocentric coordinate system centered in the head of the operator, and wherein spatial orientation of said egocentric coordinate system varies with spatial orientation of the head of the operator;

means for transforming said direction indications in said fixed reference coordinate system to direction unit vectors in said egocentric coordinate system;

a plurality of tactile stimulators associated with the head of the operator to provide selected tactile stimuli thereto, and wherein said plurality of tactile stimulators are statically disposed generally omnidirectionally in 360 degree

space about said egocentric coordinate system centered in the head of the operator and means responsive to said direction unit vectors in said egocentric coordinate system for actuating selected ones of said plurality of tactile stimulators at locations on the head



of the operator corresponding to said event and direction indication characteristic of said received information signals, thereby providing the operator with selected tactile stimuli corresponding to said event and direction indication information.

4,713,652

ELECTRICAL APPARATUS

Steven J. French, Coventry, and David L. Neasham, Penkridge, both of England, assignors to Thorn Emi Electronics Limited, Hayes, England

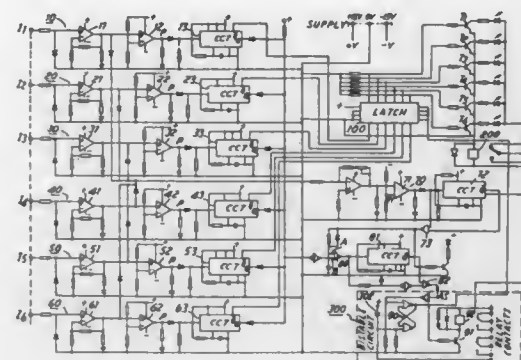
Filed Nov. 19, 1985, Ser. No. 799,643

Claims priority, application United Kingdom, Nov. 22, 1984, 8429487

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340-652

17 Claims



1. An electrical apparatus suitable for monitoring electrical continuity of the input arms of a rectifier circuit, the apparatus comprising a plurality of pulse generating means, each being associated with a respective input arm of the rectifier circuit and generating a succession of electrical pulses while an electrical signal prevails in said input arm, and

a plurality of first timing circuits, each being associated with a respective input arm of the rectifier circuit and generating a respective first electrical signal provided an interruption of a respective succession of electrical pulses persists for a first part of a preset interval of time, and a second timing circuit, being responsive to a said first electrical signal generated by any of said plurality of first timing circuits, to initiate an alarm signal provided said interruption persists for the remainder of said preset interval of time.

4,713,653

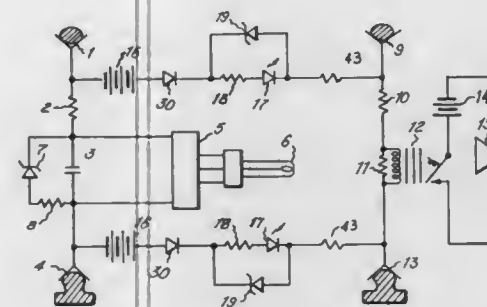
HIGH VOLTAGE PROTECTOR

Julian A. McDermott, Ridgewood, N.Y., assignor to Julian A. McDermott Corp., Ridgewood, N.Y.
Continuation of Ser. No. 428,496, Sep. 29, 1982, abandoned. This application Oct. 28, 1985, Ser. No. 792,183

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340-654

9 Claims



1. Apparatus for warning that an exposed member carrying high voltage is live, which comprises means for providing a first alarm when electrical energy is applied thereto, sensing means connecting said alarm providing means to said high voltage member and to a member at return potential to apply electrical energy to said alarm providing means from said high voltage member thereby causing operation of said first alarm providing means when said high voltage member is live, said sensing means including contactor means attachable to said high voltage member and to said member at return potential and having a means for providing a pair of connections to said high voltage member, means for providing a second alarm depending upon whether a circuit therethrough is completed for verifying the connection of said first alarm providing means to said high voltage member, one of said pair of connections being connected in common to said first alarm providing means and to said second alarm providing means, the other of said pair of connections being connected to said second alarm providing means to complete said circuit therethrough when both of said pair of connections are connected to said high voltage member, said contactor means including means for providing a second pair of connections to said member at return potential, means for providing a third alarm when a circuit therethrough is completed, and means connecting said third alarm providing means to said second pair of connections for completing said circuit therethrough when both connections of said second pair of connections are connected to said return potential member for verifying the connection of said first alarm providing means thereto.

4,713,654

SHAFT SPEED MONITOR

Ralph S. Sweany, R.R. 2, Box 616, Crothersville, Ind. 47229

Filed Mar. 3, 1986, Ser. No. 835,253

Int. Cl.⁴ G01B 21/00

U.S. Cl. 340-671

12 Claims

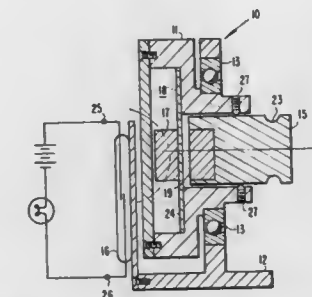
1. A shaft speed monitor for warning of an undesired velocity condition in a rotating shaft having an axis of rotation, comprising:

magnetic means for establishing an actuating magnetic field, the poles of said magnetic means defining an axis of magnetic polarity;

an electrical switch having alternate open and closed states, said switch being responsive to the actuating magnetic field and cooperating therewith to define on and off spatial domains wherein said switch is on when said magnetic means is oriented within an on-domain and said switch is off when said magnetic means is oriented within an off-domain;

mounting means for mounting and orienting said magnetic means and said electrical switch with respect to said shaft

to permit displacement by centrifugal force, generated by the rotation of said shaft, of the magnetic means with respect to the electrical switch such that said magnetic means can pass from within an on-domain to within an off-domain, in which the axis of magnetic polarity of said magnetic means is parallel to the axis of rotation of said shaft;



bias means for biasing said magnetic means within an on-domain when the shaft is at rest and for resisting displacement thereof by centrifugal force; and electrically operated output means operatively connected to said electrical switch for generating an output signal representative of the on-off condition of said switch.

4,713,655

METHOD OF MONITORING THE QUALITY OF A PACKAGE OF THREAD

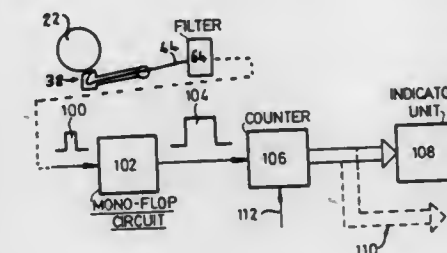
Hans-Jorg Sommer, Zurich; Heinz Mutter, Winterthur; Armin Wirz, Ossingen, and Felix Graf, Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Jun. 18, 1985, Ser. No. 745,885

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340-677

12 Claims



1. A method of monitoring the quality of a package of thread during package formation, said method comprising the steps of passing a thread through a predetermined thread path to form a thread package;

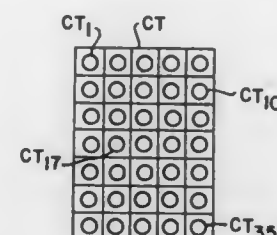
sensing a projection of thread beyond said predetermined path at a sensing location maintained at a predetermined spacing from said path at the thread package continuously during forming of the package;

producing an output signal in response to each sensing of a projection of thread at said location;

processing each output signal to produce a corresponding logic signal; and

logic processing the logic signals produced during formation of a package of thread to provide an indication of the quality of the package.

6 Claims



- (a) an electron beam source including a two-dimensional array of electron beam emitters for producing respective ones of said electron beams, each emitter being selectively energizable;
- (b) horizontal deflection means for repeatedly horizontally deflecting the electron beams in a first direction at a pre-defined rate of repetition;
- (c) selection means for simultaneously energizing a selected pattern of the electron beam emitters corresponding to a

(d) vertical deflection means for vertically deflecting the electron beams after said beams have been horizontally deflected a predetermined number of times to repeatedly form said portion of the image.

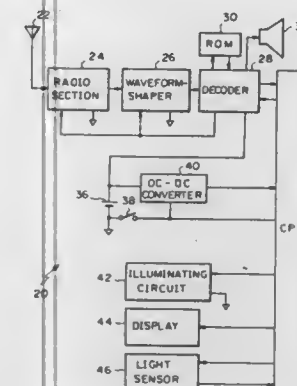
8 Claims

- (a) an electronic analyzer including means to analyze an audio signal into a plurality of frequency components and to produce, for each frequency component, an electric signal representative of that component of the audio signal,
- (b) a plurality of inductive motors associated at least one with each of said components,
- (c) a plurality of shafts, each carrying visible indicator means drivably coupled at least one to each of said motors,
- (d) means mounting said shafts whereby each shaft is rotatable independently of each other shaft, and
- (e) motor control means between the electronic analyzer and each of said motors whereby each motor is operable independently of each other motor, and controlled by respective ones of said frequency component electric signals.

7 Claims

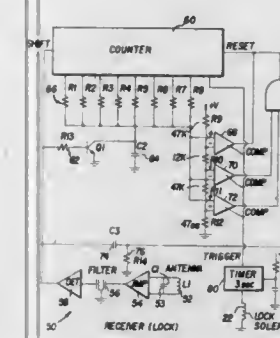
1. A system for forming an image from a pattern of excited dots on a cathode ray tube luminescent screen, said dots being

26 Claims



20. A pager, comprising:
display means for displaying a message;
means for sensing an external luminance level in the vicinity of said display means;
means for illuminating said display means when said message is being displayed on said display means and the sensed external luminance level falls below a predetermined level; and
control means for deactivating said sensing means for a predetermined time after the sensed external luminance level falls below said predetermined level.

14 Claims



1. An electronic key and lock system comprising: a key means comprising:
a first plurality of different resistive means;
means for generating a first signal having a plurality of different timing periods with each timing period determined by one of said resistive means; and
means for transmitting said first signal; and a lock means comprising:
a lock;
means for receiving said first signal;
a first charging means responsive to said received first signal; a second plurality of different resistive means connected

195-974 O.G.-87-16

with one connection in common and being selectively activable by said charging means;

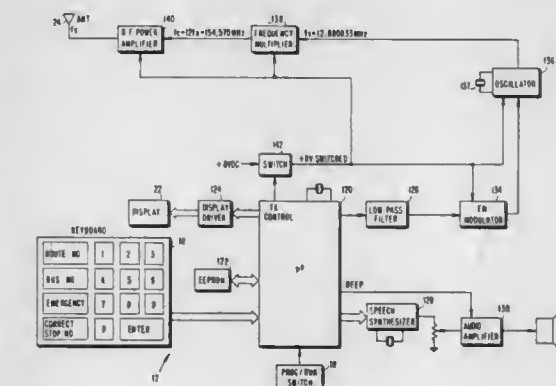
a first capacitor, said capacitor connected in series to said plurality of resistive means at the common connection and being charged by said charging means through one of said plurality of resistive means;

first discharging means for discharging said capacitor;

first comparing means connected to the junction of said second plurality of resistive means and said capacitor for comparing each consecutive timing period of said first signal with the timing period determined by a different one of said second plurality of resistive means; and

means for activating said lock in the event the consecutive timing period of said first signal match the timing periods determined by said second plurality of different resistive means.

9 Claims



- (a) memory means for storing data corresponding to said designated stop and for storing initial stop data corresponding to a preselected stop prior to said designated stop on said route;
- (b) receiver means for receiving and demodulating a modulated RF signal containing current stop data representing the current location of said vehicle;
- (c) alert signal generating means for generating a unique alert signal for each stop between said preselected stop and said designated stop on said transportation route, said alert signal generating means including means for detecting current stop data which corresponds with said initial stop data and current stop data which corresponds with said designated stop data;
- (d) a speech synthesizer, said speech synthesizer including means responsive to each unique alert signal for synthesizing a corresponding unique audio message;
- (e) a speaker coupled to an output of said speech synthesizer; wherein said receiver means is operative to receive and demodulate a modulated RF signal containing programming data which include said initial and designated stop data;
- (f) means for coupling said current stop data and said initial and designated stop data from said receiver means to said memory means;

(g) means for accessing a current bus number, route number, and stop number in said current stop data and for accessing a bus number, first route number, initial stop number, and designated stop number in said programming data; wherein said alert signal generating means generates a first unique alert signal if said current bus number, route number, and stop number match said bus number, first route number, and initial stop number, respectively, in said programming data, and generates a second unique alert signal if said current bus number, route number, and stop number match said bus number, first route number, and designated stop number, respectively, in said programming data;

(h) means for accessing a second route number, second initial stop number, and second designated stop number in said programming data;

wherein said alert signal generating means alternatively generates said first alert signal if said current bus number, route number, and stop number match said bus number, second route number, and second initial stop number, respectively, in said programming data, and alternatively generates said second alert signal if said current bus number, route number, and stop number match said bus number, second route number, and second designated stop number, respectively, in said programming data;

(i) means for identifying first, second, and third programming data words in said received programming data;

(j) means for interpreting first and second sequentially received portions of said first programming data word as a system number and a serial number, respectively;

(k) means for interpreting first, second, and third sequentially received portions of said second programming data word as said first route number, said second route number, and said bus number in said programming data, respectively; and

(l) means for interpreting first, second, third, and fourth sequentially received portions of said third programming data word as said initial stop number for said first route number, said designated stop number for said first route number, said initial stop number for said second route number, and said designated stop number for said second route number, respectively.

4,713,662

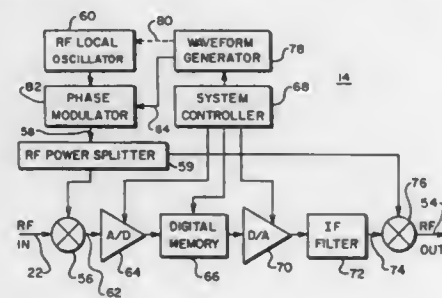
MODULATED DIGITAL RADIO FREQUENCY MEMORY
Richard J. Wiegand, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 17, 1986, Ser. No. 919,942

Int. Cl. G01S 7/38

U.S. Cl. 342-13

13 Claims



1. A modulated digital radio frequency memory suitable for use as a coherent radio frequency memory in a military electronic countermeasure system, said memory comprising:
an RF local oscillator;
means for modulating the signal from said local oscillator;
a first mixer for converting an RF input signal and the modulated local oscillator signal into an IF signal;
an A/D converter for converting said IF signal into digital values;

digital memory means for storing said digital values for later retrieval;

a D/A converter for converting retrieved digital values into an analog signal;

an IF filter for filtering said analog signal;

a second mixer for converting the filtered analog signal and said modulated local oscillator signal into an RF output signal; and

means for controlling the modulating and memory means such that the modulation on the local oscillator signal which is applied to the second mixer when specific digital values are being retrieved from the digital memory means is identical to the modulation which was on the local oscillator signal applied to said first mixer when said specific digital values were derived and stored in the digital memory means.

4,713,663

GUIDED VEHICLE CONTROL PROCESS AND APPARATUS

Serge Drabowitch, Chatenay Malabray; Michel Baril, Lesigny, and Guy Le Parquier, Paris, all of France, assignors to Thomson-CSF, Paris, France

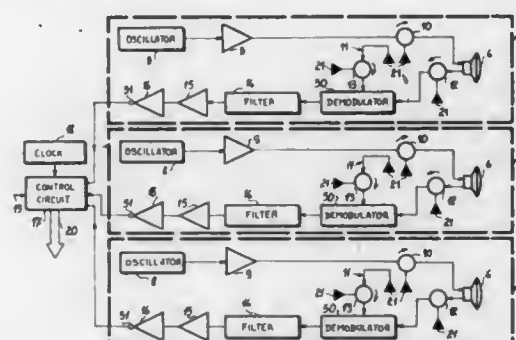
Filed Nov. 27, 1985, Ser. No. 802,352

Claims priority, application France, Nov. 30, 1984, 84 18328

Int. Cl. G01S 13/88; B61L 3/12

U.S. Cl. 342-70

13 Claims



1. An apparatus for the control of guided vehicles, comprising:

a plurality of electromagnetic wave reflecting beacons fixed to a track on which said guided vehicles travel wherein said beacons are arranged on said track in such a manner as to provide an indication of speed control of said guided vehicles; and

means for detecting said beacons, said means being fixed to the vehicle wherein said means for detecting includes a transmitting antenna, whose radiation axis has a non-zero angle θ with the plane perpendicular to the speed vector of the vehicle;

control circuit means connected to said means for detecting said beacons in order to control said guided vehicle.

4,713,664

POINT CLUTTER THRESHOLD DETERMINATION FOR RADAR SYSTEMS

John W. Taylor, Jr., Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1985, Ser. No. 738,126

Int. Cl. G01S 13/52

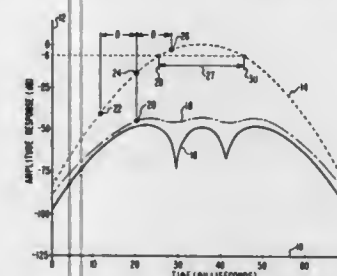
U.S. Cl. 342-91

24 Claims

1. An adaptive detection threshold system for a radar having a scanning antenna system, said threshold system comprising:
means for obtaining data corresponding to the amplitude of clutter signals received by the radar for different azimuths of the radar antenna;

means for selecting at least first, second and third values of

said data, with said first value being representative of the clutter amplitude received by the radar when its antenna is positioned in a first direction, said second value being representative of the clutter amplitude received by the radar when its antenna is positioned in a second direction, and said third value being representative of the clutter amplitude received by the radar when its antenna is positioned in a third direction, said second direction being located angularly between said first and third directions;



means for combining said first, second and third values;
means for controlling the detection threshold level for signals received when the radar antenna is in said second direction, with the controlling means being dependent upon a combined value derived from combining said first, second and third values; and
means for inhibiting detection when more than one of said first, second and third values exceeds a predetermined saturation limit.

4,713,665

GROUND SPEED SENSOR

James J. Phelan, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

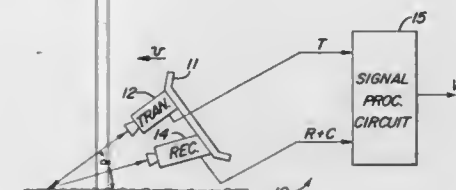
Continuation of Ser. No. 609,626, May 14, 1984, abandoned.

This application Feb. 2, 1987, Ser. No. 6,331

Int. Cl. G01J 9/44

U.S. Cl. 342-104

7 Claims



1. A velocity sensor for sensing the velocity of a vehicle moving over a terrain, the velocity sensor comprising:

a transmitter for transmitting a signal with a certain constant transmit frequency toward the terrain;

a receiver for receiving a signal reflected from the transmitter to the receiver by the terrain, the reflected signal having a variable reflected frequency dependent upon the speed and direction of the motion of the vehicle with respect to the terrain, the receiver also receiving a cross talk component signal having the same frequency as the transmit frequency, the receiver generating a combined signal having variable reflected frequency and constant transmit frequency components;

means for converting the transmit signal to an attenuated, phase-shifted signal;

a summing circuit having a first input receiving the combined signal, a second input receiving the attenuated, phase-shifted signal, the summing circuit operating to cancel the transmit frequency component of the combined signal, the summing circuit thereby providing at an output

thereof a modified signal with a substantially pure reflected frequency;

a first circuit for converting the modified signal to a first voltage having a magnitude proportional to the frequency of the modified signal;

a second circuit for converting the transmit signal to a second voltage having a magnitude proportional to the transmit frequency; and

a difference circuit receiving the first and second voltages and generating a third voltage representing a difference between the first and second voltages, the first and second circuits having similar components so that the third voltage is substantially unaffected by component drift.

4,713,666

METHOD OF PROCESSING THE SUM AND DIFFERENCE SIGNALS OF A RADAR OF THE MONOPULSE TYPE FOR ESTIMATING THE PARASITE PHASE INTRODUCED BETWEEN THESE SIGNALS BY THE ULTRAHIGH FREQUENCY FORMATION CIRCUITS OF THE SUM AND DIFFERENCE CHANNELS
Jean P. Poux, Orlando, Fla., assignor to Thomson-CSF, Paris, France

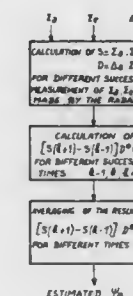
Filed Feb. 24, 1987, Ser. No. 17,627

Claims priority, application France, Feb. 28, 1986, 86 02877

Int. Cl. G01S 13/44

U.S. Cl. 342-152

4 Claims



1. A method of processing the sum Σ and difference Δ signals, in azimuth: Σ_a, Δ_a and in elevation: Σ_e, Δ_e , of a radar of the monopulse type, for estimating the parasite phase Ψ introduced between these signals by the ultrahigh frequency formation circuits of the sum and difference channels, comprising:
in calculating for each measurement made by the radar at least one case for the expressions S and D:
first case:

$$\begin{cases} S = \Sigma_a \cdot \Sigma_e \\ D = \Delta_a \cdot \Sigma_e \end{cases}$$

for estimating the azimuth parasite phase Ψ_a ;
second case:

$$\begin{cases} S = \Sigma_e \cdot \Sigma_a \\ D = \Delta_e \cdot \Sigma_a \end{cases}$$

for estimating the elevational parasite phase Ψ_e ;
third case:

$$\begin{cases} S = \Sigma_a \cdot \Sigma_e \\ D = \Delta_a \cdot \Sigma_e \end{cases}$$

for estimating the differential parasite phase $\delta\Psi = \Psi_a - \Psi_e$, respectively,
(where the symbol * designates the complex conjugate quan-

tity), it being understood that the radar wave emitted is polarized circularly and that the azimuth

and elevation monopulse receivers receive respectively only one of the circular polarization types: right hand or left hand;

in calculating the expression

$$[S(k+1) - S(k-1)]D^*(k)$$

it being understood that the radar antenna sweeps during time in azimuth in the first case and in the second case, in elevation in the second case and that $k-1$, k , $k+1$ designate three successive times such that the difference $S(k+1)(\theta) - S(k-1)(\theta)$ is of the same sign as $d_k(\theta)$, where $S(k+1)(\theta)$ and $S(k-1)(\theta)$ respectively designate the gain of the sum channel at angle θ , in azimuth in the first case and in the third case, in elevation in the second case, respectively at times $k+1$ and $k-1$, and where $d_k(\theta)$ designates the gain of the difference channel at angle θ and at time k , in the azimuth in the first and third cases, in elevation in the second case;

in calculating the mean value of the result of the preceding expression for several successive times corresponding to several measurements successively made by the radar, which allows an expression of the form $e^{j\Psi}$, a where Ψ is the parasite phase sought and "a" a real number of given absolute value and sign.

4,713,667

TARGET SUPPORT APPARATUS

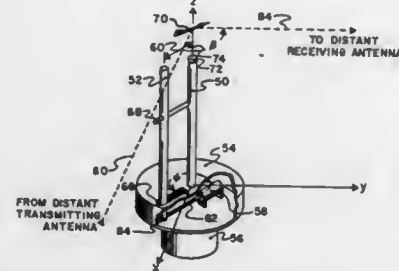
J. Leon Poirier, and Robert V. McGahan, both of Chelmsford, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 26, 1987, Ser. No. 30,401

Int. Cl.⁴ G01S 13/88

U.S. Cl. 342—192

8 Claims



1. Apparatus for supporting a target undergoing radar measurements comprising:

- a base assembly;
- azimuthal positioner means coupled to said base assembly for rotating said base assembly in an azimuthal plane;
- a first and a second column being parallel and attached perpendicular to said base assembly;
- column separation adjusting means for adjusting the spacing between said first column and said second column;
- target attitude positioning means affixed to the distal end of said first column; and
- means for affixing a target to said target attitude positioning means.

4,713,668

ADAPTIVE ANTENNA

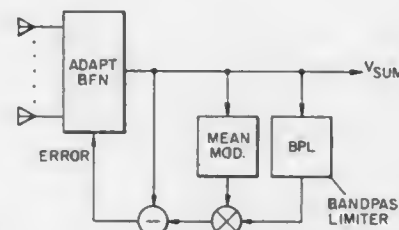
Francis G. Overbury, Great Dunmow; Christopher R. Ward, Bishop's Stortford, and Jeffrey G. Searle, Stansted Mountfitchet, all of Great Britain, assignors to STC plc, London, England

Filed Sep. 18, 1986, Ser. No. 908,563

Int. Cl.⁴ G01S 3/16, 3/28

U.S. Cl. 342—384

2 Claims



1. A steered adaptive antenna arrangement including an adaptive beamforming network to which the output signals of an array of antenna elements are applied, the network having a feedback wherein the summed output of the network is correlated with each element signal, applied to a limiter and added to a steering component whereby a derived value is used to drive an associated weight coefficient, characterised in that the summed output of the beamformer network is further applied to a desired signal estimator the output of which is subtracted from the summed output to provide the feedback input to be correlated with each element signal.

4,713,669

BINAURAL DOPPLER COLLISION ALERT SYSTEM FOR GENERAL AVIATION AIRCRAFT

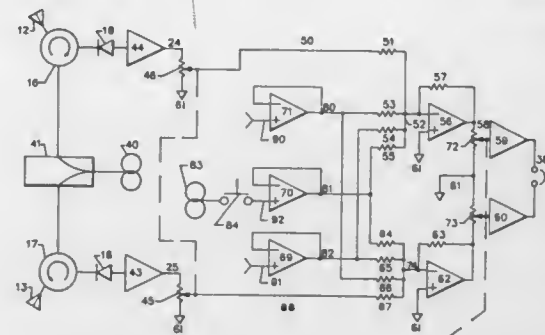
Howard P. Shuch, 14908 Sand La., San Jose, Calif. 95124

Filed Jul. 23, 1986, Ser. No. 888,759

Int. Cl.⁴ G01S 3/02

U.S. Cl. 342—455

6 Claims



1. A system for alerting the pilot of an aircraft, using said system, to the presence and location of another aircraft nearby, which constitutes a potential threat of collision with the user's aircraft, said system consisting of:

- a pair of continuous wave microwave doppler reflective radar transceivers disposed in the pilot's aircraft, each of said transceivers, respectively, including at least a horn microwave antenna for generating a directional microwave beam and receiving reflected signals from target objects in said beam, a source of microwave signals connected in common to both of said pair of continuous wave microwave doppler reflective radar transceivers, a duplexer, a mixer and an audio output means;
- the respective microwave beams from said continuous wave microwave antennas of said transceivers being directed orthogonally with respect to one another, at an angle of 45

degrees on either side of the longitudinal axis of the user aircraft, the overall beam width of the two beams covering a 180 degree area ahead of said user aircraft; each of said doppler radar transceivers being adapted to produce an audio signal when a threat object appears in said beams, said audio signals being applied to a binaural audio headset worn by the pilot;

said binaural audio headset being also connected with the communication system of the user aircraft, so that the pilot thereof may be in communication with the ground, or other aircraft as well as hear the binaural signals produced from the collision alert system audio;

the presence of said binaural audio signals being an indication of the presence of a target object, such as another aircraft, in the directional beams of said antennas, and the frequency of said binaural audio signals being an indication of the closing or separation rate between said target object and said user aircraft, the amplitude of said binaural signals being an indication of the range to the target object, and the phase difference between the respective audio signals heard in said binaural headset from each of said pair of doppler radar transceivers being indicative of the direction and location of said target object;

whereby the pilot of the user aircraft is alerted by the binaural audio signals heard in his headset and is able, aurally to locate the target aircraft with respect to the user aircraft, its rate of motion towards the user aircraft and the direction of motion, so as to take appropriate evasive action to avoid a collision.

4,713,670

PLANAR MICROWAVE ANTENNA HAVING HIGH ANTENNA GAIN

Toshio Makimoto, 15-3, Shinsenri Nishi-machi 2-chome, Toyonaka-shi, Osaka 565; Sadahiko Nishimura, 3-25, Tamatsukuri Motomachi, Tennoji-ku, Osaka 543; Masayuki Matsuo, Kobe; Toshio Abiko, Ibaraki; Hirohumi Ishizaki, Osaka; Minoru Kanda, Shijonawate; Hidetsugu Nunoya, and Mikio Komatsu, both of Kadoma, all of Japan, assignors to Toshio Makimoto; Sadahiko Nishimura and Matsushita Electric Works, Ltd., all of Osaka, Japan

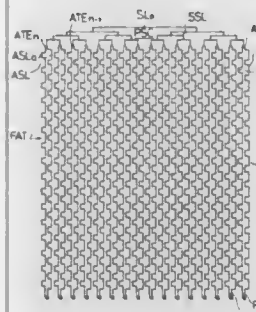
Filed Jan. 17, 1986, Ser. No. 819,610

Claims priority, application Japan, Jan. 21, 1985, 60-8771

Int. Cl.⁴ H01Q 1/38

U.S. Cl. 343—700 MS

6 Claims



1. A microwave planar antenna, comprising:

- a plurality of antenna elements, wherein each antenna element comprises two microstrip conductors, each conductor having first and second ends and being bent into a plurality of successively connected U-shaped sections, the two conductors being disposed in parallel with mutually staggered U-shaped sections, whereby the two microstrip conductors alternately approach and separate from each other;
- means for supplying power to the plurality of antenna elements, wherein the power supply means is a corporate-fed network coupled to the first ends of the microstrip conductors in the plurality of antenna elements; and
- a plurality of patch antenna means for radiating power

reaching the second ends of the microstrip conductors, wherein each patch antenna means couples the second ends of two microstrip conductors which comprise each antenna element, each patch antenna means is impedance-matched to the antenna element in which it couples the second ends of the two conductors, and each patch antenna means radiates as an antenna which is phase-matched to that antenna element.

4,713,671

THERMAL HEAD

Takehiro Takoshima, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

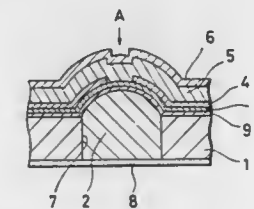
Filed Oct. 31, 1986, Ser. No. 926,370

Claims priority, application Japan, Nov. 1, 1985, 60-245426

Int. Cl.⁴ G01D 15/10; H05B 3/00

U.S. Cl. 346—76 PH

4 Claims



1. A thermal head having a glass glaze layer, a heat generating resistance layer, an electric power supplying conductor layer and a protecting layer formed on an insulating substrate, wherein said glass glaze layer is so formed that the lower portion thereof is embedded in said insulating substrate and the upper portion thereof is protruded from the surface of said insulating substrate, and a metal layer is disposed in contact with the lower surface of said glass glaze layer.

4,713,672

LASER BEAM PRINTER

Katsushi Horihata, Osaka, and Yoshizo Kawamori, Fujiidera, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

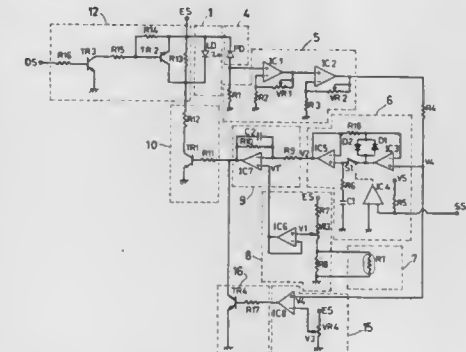
Filed Jul. 17, 1986, Ser. No. 887,175

Claims priority, application Japan, Jul. 24, 1985, 60-163571

Int. Cl.⁴ G01D 9/42; G11B 7/00; H01S 3/00

U.S. Cl. 346—108

6 Claims



1. A laser beam printer comprising:

- a. a beam source comprising a diode laser,
- b. a rotary polygonal mirror rotatable at a constant speed for reflecting a beam from the beam source,
- c. a photosensitive member to be scanned by the beam reflected from the rotary polygonal mirror,
- d. means for detecting the quantity of light of the beam from the beam source,

- e. means for amplifying the output of the light quantity detecting means,
- f. means for sampling the output of the amplifying means,
- g. temperature sensor means for detecting the temperature of the photosensitive member,
- h. means for producing a reference signal as adjusted by the output of the temperature sensor means,
- i. means for calculating the difference between the reference signal and the sampled signal,
- j. means for adjusting the current to be passed through the diode laser in accordance with the calculated difference,
- k. beam sensor means for detecting the beam from the rotary polygonal mirror to produce a horizontal synchronizing signal,
- l. means for switching the current through the diode laser, and
- m. control means for receiving image data and the horizontal synchronizing signal to drive the switching means.

4,713,673

IMAGE FORMING APPARATUS IN WHICH MULTIPLE DEVELOPING UNITS ARE SUPPORTED AND MOVED RELATIVE TO AN IMAGE CARRIER

Hirobumi Kessoku, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

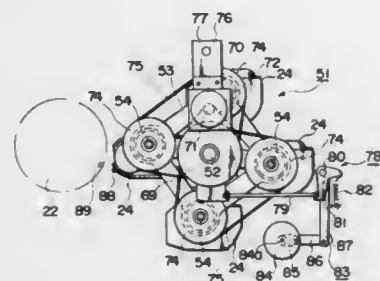
Filed Apr. 3, 1986, Ser. No. 847,457

Claims priority, application Japan, Apr. 8, 1985, 60-73848; Apr. 10, 1985, 60-75541

Int. Cl. G03G 15/01

U.S. Cl. 355-4

7 Claims



1. An image forming apparatus comprising:
 - (a) an image carrier adapted to carry a latent image thereon;
 - (b) a plurality of developing units for developing a latent image on the image carrier, said developing units adapted to contain developing agents of different colors;
 - (c) revolving means for revolving the developing units in parallel relation and selecting one of the developing units for use by stopping the revolving of the developing units at a predetermined position;
 - (d) support means, having a center of rocking, for supporting the revolving means at a distance from the center;
 - (e) shifting means for moving the revolving means supported by the support means toward or away from the image carrier; and
 - (f) locating means for determining the relative positions of the image carrier and the developing unit selected by the revolving means when the revolving means approaches the image carrier.

4,713,674

EXPOSURE DEVICE FOR SHEETS

Paulus G. Glezeman, Belfeld, and Gerhardus E. Romualdus Ter Horst, Al Grubbenvorst, both of Netherlands, assignors to OCE-Nederland B.V., Venlo, Netherlands

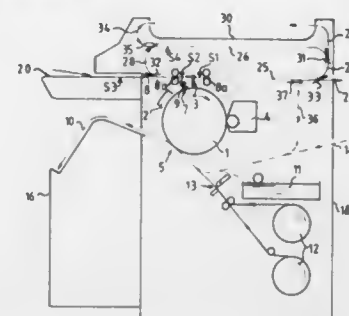
Filed Apr. 3, 1986, Ser. No. 847,633

Claims priority, application Netherlands, Apr. 4, 1985, 8500995

Int. Cl. G03G 15/00

U.S. Cl. 355-14 SH

10 Claims



1. An exposure device for originals, comprising an exposure station, a first endless conveyor path for repeatedly passing an original through said exposure station with the aid of a conveyor; reversible drive means for driving said conveyor, selectively switchable discharge means for discharging originals from said first endless conveyor path, first original measuring means for determining whether the length of said original on said conveyor is larger or smaller than a predetermined value and providing an output control signal when said length is smaller than said value; and control means connected to said measuring means for controlling said drive means such that in response to said control signal the control means controls at the time when said original has passed through said exposure station the reversal of said drive means and the time required to return the entire original back through said exposure station.

4,713,675

EXPOSURE APPARATUS

Yoshikiyo Yui, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

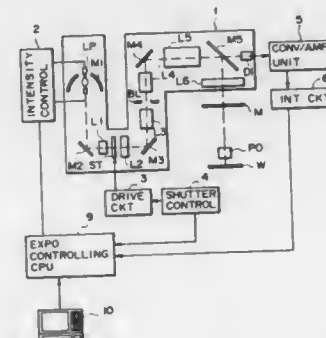
Filed Oct. 29, 1986, Ser. No. 924,435

Claims priority, application Japan, Oct. 31, 1985, 60-242943; Nov. 27, 1985, 60-265110

Int. Cl. G03B 27/72

U.S. Cl. 355-69

9 Claims



1. An exposure apparatus for exposing an object with light, said apparatus comprising:
 - a light source for emitting light of an intensity;
 - intensity controlling means operative on said light source to change the intensity of light to be emitted from said light source;

- shutter means operable to selectively pass/block the light from said light source;
- shutter controlling means operative on said shutter means to control the passage/blockage of the light by said shutter means;
- integrating means for converting a quantity of light passed through said shutter means into an electric value and for integrating the electric value;
- exposure setting means for setting an amount of exposure to be achieved on the object; and
- exposure controlling means for controlling said intensity controlling means and said shutter controlling means on the basis of the amount of exposure set by said setting means, said exposure controlling means being operable to define a delay time before initiation of the exposure of the object and after initiation of the operation of said intensity controlling means upon said light source.

4,713,676

LOGIC CIRCUIT ARRANGEMENT WITH FIELD EFFECT TRANSISTORS MATCHED THERETO

Hartwig W. Thim, Wolfauerstrasse 10, A4040 Linz, Austria

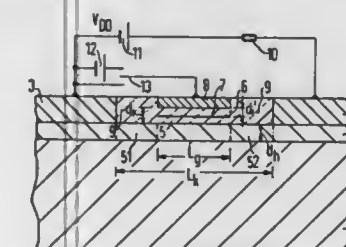
Filed Apr. 10, 1985, Ser. No. 721,797

Claims priority, application Austria, Apr. 10, 1984, 1194/84

Int. Cl. H01L 29/78

U.S. Cl. 357-23.5

8 Claims



1. A logic circuit arrangement suitable for short switching times, for large-scale integration with high component density, and for operation with a power supply with only one polarity of a supply voltage, comprising:
 - a stage having a field effect transistor whose drain is direct coupled to a gate of a field effect transistor of a following stage;
 - the field effect transistors each having an active semiconductor zone, source region, drain region, channel region, gate electrode, and gate insulation;
 - at least one of the transistors having a source, drain, and channel region all of the same conductivity type and which would result in a normally on depletion type transistor but for a buried and charged electrode layer positioned within the gate insulation and buried under the gate electrode;
 - a first insulating layer portion of the gate insulation separating said gate electrode and said electrode layer from one another, and a second insulating layer portion of the gate insulation separating the active semiconductor zone and said electrode layer from one another, the first and second layers having respective thicknesses d_1' and d_2-d_1' such that they cannot be tunneled through by charge carriers during normal operation of the circuit arrangement;
 - a respective insulating protective lateral spacing between the source and the buried electrode layer, and between the drain and the buried electrode layer, being substantially greater than the thicknesses d_1' and d_2-d_1' and chosen so that non-aligned portions in the active semiconductor zone laterally of a vertically aligned portion of the active semiconductor zone beneath the gate electrode are substantially undepleted by the buried electrode layer so as to remain normally on; and
 - the buried electrode layer having an area-specific electrical charge Q_{HSS} of Q_{HSS} which is from 1 to 1.2 times

$$\frac{\epsilon_s N_D}{2\epsilon_h d_i} \left(d_h^2 + 2d_h d_i \frac{\epsilon_h}{\epsilon_i} - \frac{2\psi_{mh}\epsilon_h}{\epsilon_i^2 N_D} \right) \quad (\text{Cb/cm}^2)$$

where ϵ_h is a dielectric constant of the semiconductor material of the active zone, ϵ_i is a dielectric constant of the gate insulation, d_h is a thickness of the active semiconductor zone, N_D is a doping of the active semiconductor zone with donors for n-conductive transistors, and ψ_{mh} is a work function difference of electrons (in volts) between a metal of the gate electrode and a material of the active semiconductor zone, said electrical charge having a magnitude which defines a transition from inhibiting and normally off with no voltage applied to the gate electrode to conductive operation of the transistor with voltage applied to the gate electrode which undepletes the vertically aligned portion.

4,713,677

ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY CELL INCLUDING TRENCH CAPACITOR

Howard L. Tigelaar, Allen; Bert R. Riemenschneider, Murphy, and James L. Paterson, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

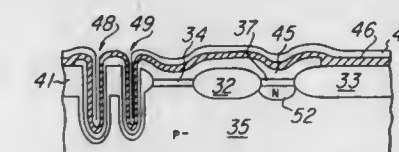
Continuation of Ser. No. 707,008, Feb. 28, 1985, abandoned.

This application Oct. 2, 1986, Ser. No. 914,517

Int. Cl. H01L 29/78, 27/02, 29/34

U.S. Cl. 357-23.5

6 Claims



1. An electrically erasable programmable read only memory cell which may be programmed using a reduced voltage level comprising:
 - (a) a substrate having moat regions formed therein, said moat regions having a gate oxide layer formed on the surface of said moat regions;
 - (b) field oxide regions disposed between said moat regions formed in said substrate, one of said field oxide regions containing at least one trench, each trench having a bottom and side walls formed of a first oxide layer;
 - (c) a floating gate disposed on the surface of said gate oxide layer, one of said field oxide regions and said first oxide layer;
 - (d) an insulating layer disposed over said floating gate; and
 - (e) an electrically conductive line disposed above and insulated from said floating gate by said insulating layer and serving as a word line for said memory, said conductive line having a substantially planar upper exposed surface over said trench.

4,713,678

DRAM CELL AND METHOD

Richard H. Womack, Dallas; Sanjay K. Banerjee, Richardson; Hisashi Shichijo, and Satwinder Malhi, both of Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 679,162, Dec. 7, 1984, abandoned. This application Nov. 13, 1986, Ser. No. 928,717

Int. Cl. H01L 29/78, 27/02, 29/06, 29/04

U.S. Cl. 357-23.6

10 Claims

6. A memory cell in a substrate comprising:
 - a conductive region formed in a trench formed in said sub-

to serve as color frame switching signals of said color imaging device.

4,713,684

IMAGE PROCESSING APPARATUS FOR DISCRIMINATING AND PROCESSING DIFFERENT FORMATS OF COLOR IMAGE SIGNALS

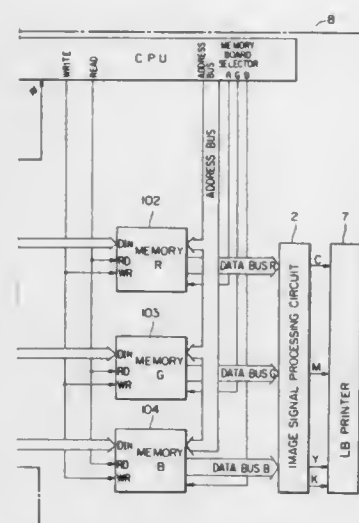
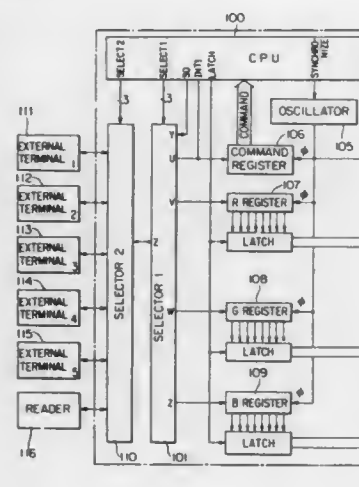
Naoto Kawamura, Yokohama, and Shunichi Abe, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 586,070, Mar. 5, 1984, abandoned. This application Apr. 17, 1987, Ser. No. 39,762

Claims priority, application Japan, Mar. 8, 1983, 58-37707
Int. Cl.⁴ H04N 1/46, 1/32, 1/40

U.S. Cl. 358—78

19 Claims



1. Color image data processing apparatus comprising:
input means including a common transmission channel and means for inputting to said common transmission channel a plurality of data signals, each data signal having a different one of a plurality of data formats in each of which a plurality of color component data are arranged during respective different periods of the data signal;
separation means for separating the plurality of color component data from each said data signal in accordance with the format of that data signal; and
memory means for storing the plurality of color component data separated by said separation means.

4,713,685

VIDEO MONITORING APPARATUS

Shigeru Nishimura, Machida, and Toshihisa Kuroda, Sagami-hara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

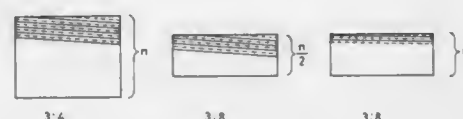
Filed Oct. 4, 1985, Ser. No. 784,021

Claims priority, application Japan, Oct. 5, 1984, 59-209104; Nov. 9, 1984, 59-236135; Dec. 14, 1984, 59-263861; Apr. 18, 1985, 60-82827; Jun. 19, 1985, 60-133231

Int. Cl.⁴ H04N 7/00, 7/01

U.S. Cl. 358—103

7 Claims



1. A video monitoring apparatus comprising:
a video camera for observing a scene and providing an analog signal thereof;
an analog-digital converter for converting an analog signal from said camera consisting of n scanning lines to a digital signal;
abridge and memory means for memorizing an abridged part of said digital signal abridged from said digital signal corresponding to said n scanning lines,
picture range conversion means for converting a picture range by reading out memorized data from said memory means, to reconstitute a picture signal consisting of n scanning lines, and
display means for displaying video pictures produced by said picture range conversion means.

4,713,686

HIGH SPEED INSTANTANEOUS MULTI-IMAGE RECORDER

Haruhiko Ozaki, Tadatoshi Yamada, Kunio Machida, Kiyoshi Ohno, Hirato Shimazaki, all of Tokyo; Hidekimi Inoue, Saitama, and Ryohei Uji, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

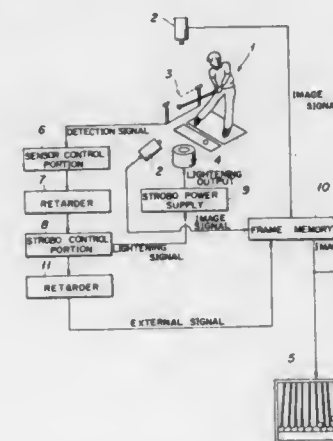
Filed Jun. 30, 1986, Ser. No. 880,269

Claims priority, application Japan, Jul. 2, 1985, 61-36762; Dec. 10, 1985, 60-277331

Int. Cl.⁴ H04N 7/18

U.S. Cl. 358—107

3 Claims



1. A high speed instantaneous multi-image recorder comprising:
at least one video camera, a sensor and a light emitting portion located so as to be directed towards a moving object;

a frame memory connected to said video camera to receive image signals from said video camera and connected to send images for one frame to a monitor in synchronism with an external signal;
a strobo arrangement connected to said light emitting portion and actuating it to produce a plurality of flashes for one frame of the video camera;
a first retarder connected to said sensor to receive detection signals coming from the sensor, the strobo arrangement being connected to receive signals from the first retarder; and
a second retarder connected to said strobo system for producing said external signal;
said frame memory being connected to receive said external signal from a second retarder, whereby said frame memory is synchronized with flashes emitted by said light emitting portion via said second retarder so that a plurality of instantaneous poses illuminated by a plurality of flashes of said light emitting portion within one frame of the video camera are displayed at the same time on said monitor.

4,713,687

SCAN LINE TYPE DYNAMIC OBSERVATION APPARATUS

Ryuichi Shimizu, Minoo, and Takashi Ikuta, Ibaraki, both of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Continuation of Ser. No. 580,986, Feb. 16, 1984, abandoned.

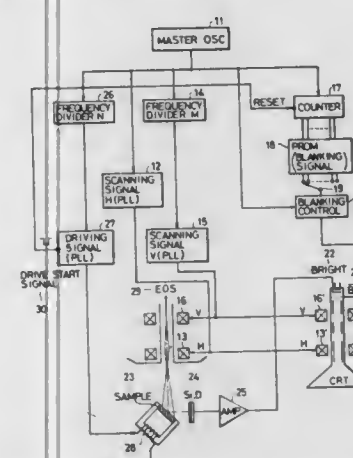
This application Jan. 13, 1986, Ser. No. 818,391

Claims priority, application Japan, Mar. 31, 1983, 58-56695; Mar. 31, 1983, 58-56696

Int. Cl.⁴ H04N 7/12

U.S. Cl. 358—138

2 Claims



1. A scan line type dynamic observation apparatus for successively sampling specific phases from image signals of a period of a repeating phenomenon which forms an object of observation which varies periodically and at high speed to obtain an image of a specific phase, the apparatus comprising:
image signal sampling means for sampling image signals from said object of observation in terms of the specific phase at fixed intervals;
synchronous scanning means for synchronously scanning said object of observation and a display during a period of sampling by said image signal sampling means;
fixed area scanning means for surface scanning with said synchronous scanning means in synchronization with said display over a fixed area of said object of observation; and
display means for displaying the image signal subjected to said sampling.

4,713,688

METHOD FOR INCREASING RESOLUTION IN A COMPATIBLE TELEVISION SYSTEM

Eckhard Güttner, Dortmund, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

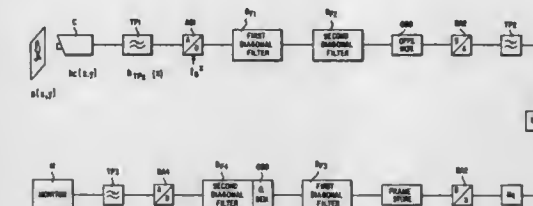
Filed Sep. 24, 1985, Ser. No. 779,599

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435265

Int. Cl.⁴ H04N 7/00

U.S. Cl. 358—141

3 Claims



1. A method for increasing image resolution in a compatible television system, in which system an optical image is scanned along vertically spaced horizontal raster lines by a high line number television camera, the resulting picture signal is subjected to a horizontal frequency band limitation for further digital processing, said method comprising,
at a transmitter:

sampling the resulting picture signal in the direction of horizontal frequencies in the spatial domain with a horizontal sample spacing corresponding to the vertical spacing between adjacent lines of the resulting picture signal;

effecting two-dimensional filtering of the sampled picture signal with respect to two mutually transverse diagonals of the scanned image;

offset modulating the filtered picture signal and band limiting the filtered picture signal to a selected bandwidth to produce a modified picture signal containing components capable of causing interference in a compatible receiver;

imparting to the components capable of causing interference a relatively reduced amplitude;

transmitting the signal which has been offset modulated, band limited and to which has been imparted relatively reduced amplitude components over a transmission channel to a receiver and,

at a receiver:

subjecting the signal arriving from the transmission channel to band limitation in the direction of horizontal spatial frequencies by means of a Nyquist filter;

sampling the signal leaving the Nyquist filter in an orthogonal raster, with a horizontal sample spacing corresponding to the vertical spacing between adjacent lines of the signal received at the receiver;

combining the received signal portions associated with two successive picture fields into a picture frame signal; effecting a first one-dimensional filtering of the resulting picture frame signal with respect to a first diagonal of the image represented by the picture frame signal;

offset demodulating the signal resulting from the first filtering while effecting relative amplitude increase of those components to which a relative amplitude reduction had been imparted before transmission;

effecting a second one-dimensional filtering of the offset demodulated signal with respect to a second diagonal transverse to the first diagonal; and
band limiting the two-dimensionally filtered signal before delivery to a television monitor.

1. For an AC coupled video imaging system such as one having a detector array and AC coupled amplifiers for providing a single serial input video signal representing a plurality of video lines, a video correction circuit comprising:

means responsive to the video signal for providing a difference video signal indicative of the running difference video between two versions of the video signal spaced one line apart, for all pairs of lines

histogram means responsive to said difference video signal for generating histogram data indicative of the number of occurrences of different values of said difference video signal;

detector means responsive to said histogram data for determining a dominant DC shift between ongoing consecutive video lines of the input video signal, and for providing a video correction signal based on said dominant DC shift; and

correction means responsive to video signal of the second of the consecutive video lines and said video correction signal for providing a corrected video signal.

4,713,695

SYSTEM FOR SUPERIMPOSING PLURAL TELEVISION PICTURES WITH EXTENT OF SUPERIMPOSITION BASED UPON A LINEAR COMBINATION OF THE PICTURE SIGNALS

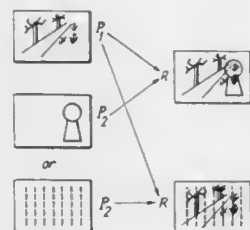
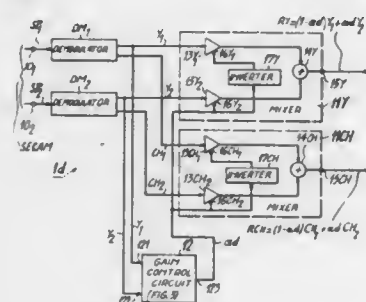
Guy Macheboeuf, Pullay par Verneuil sur Avre, France, assignor to Etablissement Public Telediffusion de France, Paris, France

Filed Jan. 28, 1986, Ser. No. 823,249

Claims priority, application France, Jan. 28, 1985, 85 01133
Int. Cl.⁴ H04N 5/262, 5/272

U.S. Cl. 358—183

22 Claims



1. A television picture superimposing system comprising mixing means including first and second variable gain amplifying means for amplifying first and second input picture signals having a predetermined peak-to-peak amplitude into first and second amplified picture signals and adding means for mixing said first and second amplified picture signals into a resulting picture signal, and means for deriving a single gain control signal based upon a predetermined linear combination of first and second signals derived respectively from said first and second input picture signals so that said resulting picture signal has said predetermined peak-to-peak amplitude, said gain control signal being applied, via analog inverting means and directly, to gain control inputs of said first and second variable gain amplifying means respectively.

4,713,696

PICTURE BLOCK RETRANSMISSION ARRANGEMENT RAPIDLY OPERABLE EVEN WHEN A TRANSMISSION PATH HAS AN INFERIOR QUALITY

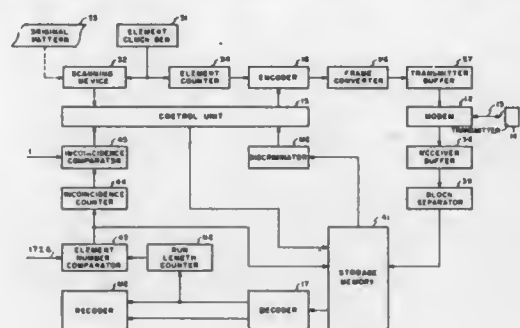
Takashi Ishikawa, Hiroshi Fukagawa, and Hiroyasu Matsui, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Oct. 23, 1986, Ser. No. 922,195

Claims priority, application Japan, Oct. 28, 1985, 60-242072
Int. Cl.⁴ H04N 1/413

U.S. Cl. 358—261

5 Claims



1. A picture block retransmission arrangement of a receiver for use in combination with a transmitter for transmitting a picture block signal comprising a plurality of band-compression encoded picture line signals which are representative of successive picture lines of an original pattern, respectively, said receiver comprising decoding means for decoding the picture block signal transmitted from said transmitter into a reproduced block signal comprising a plurality of reproduced line signals which are representative of said successive picture lines, wherein the improvement comprises,

checking means for checking whether each of said reproduced line signals is a correct line signal correctly representative of a corresponding one of said successive picture lines or is an incorrect line signal which is not correctly representative of a corresponding one of said successive picture lines;

retransmission requesting means for requesting said transmitter to again transmit said picture block signal as a retransmitted block signal when the incorrect line signals are not less in number than a predetermined number and

substituting means for substituting an again reproduced line signal for each said incorrect line signal to produce a substituted block signal when both said again reproduced line signal and said each incorrect line signal correspond to a single one of said successive picture lines, said again reproduced line signal being one of the reproduced line signals of the reproduced block signal into which said retransmitted block signal is decoded by said decoding means.

4,713,697

CAMERA APPARATUS

Makoto Gotou, Nishinomlya, Hiroshi Mitani, Dalto, and Yoshiaki Igarashi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 14, 1986, Ser. No. 851,528

Claims priority, application Japan, Apr. 18, 1985, 60-82864; Apr. 18, 1985, 60-82865; May 7, 1985, 60-96924; May 8, 1985, 60-97201; May 20, 1985, 60-10733

Int. Cl.⁴ H01J 31/50

U.S. Cl. 358—222

22 Claims

1. A camera apparatus comprising; a lens barrel unit mounting therein an image-pickup element; picture-signal processing means for generating a video signal from an electrical signal produced by image-pickup element; support unit that supports said lens barrel unit rotatably

about a rotation shaft thereof that crosses an axis of incident light entering into said lens barrel unit generally perpendicularly;

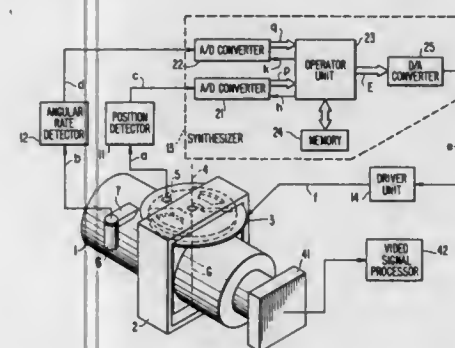
actuator means installed between said lens barrel unit and said support unit for rotating said lens barrel unit;

position-detection means for detecting a relative angle between said lens barrel unit and said support unit;

angular rate detection means for detecting an angular rate of said lens barrel unit about said rotation shaft viewed from an inertia coordinate;

synthesizing means for producing a signal in response to output signals of said position-detection means and said angle-speed detection means;

driver means for supplying power to said actuator means in response to said signal from said synthesizing means;



panning-operation detection means for detecting that panning operation is underway;

synthesizer-operation changing means for varying operations of said synthesizing means in accordance with an operative state of said panning-operation detection mean; and

means for first activating operation of said synthesizer-operation varying means as soon as said panning-operation detection means detects the activated panning operation and then causes specific driving force to be applied to said lens barrel unit corresponding to the actual condition of panning operation after varying operation of said synthesizing means.

4,713,698

WRITE-IN ELECTRONIC DISPLAY RECORDER

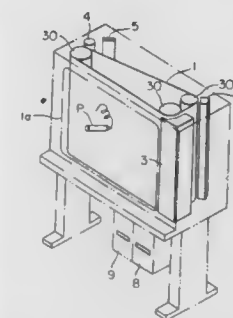
Teruomi Takahashi, Urayasu, and Tadashi Sato, Kokubunji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1986, Ser. No. 896,226

Claims priority, application Japan, Aug. 19, 1985, 60-181250
Int. Cl.⁴ H04N 1/21; G09G 3/26; G01D 9/00, 15/06

U.S. Cl. 358—296

11 Claims



1. An electronic display recorder capable of displaying and recording written image information, comprising:

a sheet-like board member on which image information is to be written;

support means for longitudinally movably supporting said board member;

a drive source for driving said board member;

first read means for reading the image information written on said board member;

second read means for reading image information of a document sheet;

means for writing the image information onto said board member in accordance with the image information read from said document sheet; and

means for recording the image information read by said first read means.

4,713,699

A METHOD OF CONTROLLING THE MOVEMENT OF A MEDIUM TO BE PRINTED

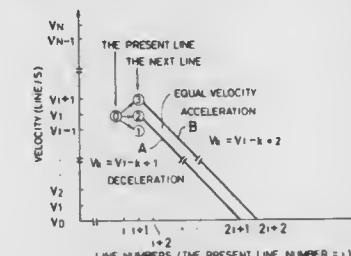
Kozoo Nakamura, Hitachiohta; Yasuyuki Kozima; Nagaharu Hamada, both of Hitachi, and Kunihiro Sakata, Hayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1986, Ser. No. 837,679

Claims priority, application Japan, Mar. 8, 1985, 60-44846
Int. Cl.⁴ H04N 1/22; G03G 15/00

U.S. Cl. 358—296

8 Claims



1. A method of controlling movement of a print medium to be printed, including:

printing means for printing image signals on a print medium as printing units of predetermined length, said printing units being printed at different printing velocities in accordance with the content of said image signals; and

moving means for moving said print medium, based on said printing units at a predetermined decelerating or accelerating rate of a moving velocity;

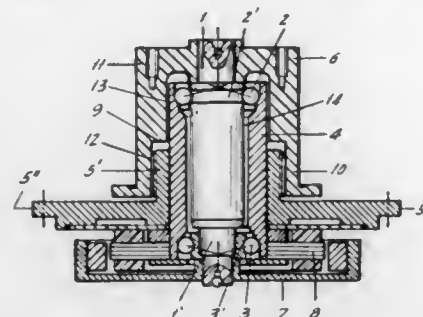
the method comprising steps of:

assigning an actual moving velocity at an arbitrary i -th (wherein $i=1, 2, 3, \dots$, and I) printing unit to be used as a first virtual moving velocity at an $(i+1)$ -th printing unit, and

determining an actual moving velocity for said print medium at said $(i+1)$ -th printing unit based on a second virtual moving velocity at an $(i+k)$ -th (wherein $k=1, 2, \dots, \leq I-i$) printing unit, which is determined by decelerating or accelerating from said first virtual moving velocity at said $(i+1)$ -th printing unit in accordance with said predetermined decelerating or accelerating rate, respectively, and a printing velocity at said $(i+k)$ -th printing unit.

and being axially displaceable in relation to said stepped-down area;

outer ring means connecting said first and said second bearings together in an axially spaced relationship established by said outer ring means; said outer ring means extending into said bore of said receiving part and contacting said receiving part in the axial region near said first bearing,



said bore being sized so that said receiving part is radially spaced outward from said outer ring means in the axial region away from said first bearing; and
a housing fixedly attached to said outer ring means adjacent said second bearing and having an axial portion disposed in said bore of said receiving part in said axial region away from said first bearing such that said axial portion extends between said outer ring means and said receiving part.

4,713,705

MEANS AND METHODS FOR IMPROVED TRANSDUCING OF FLEXIBLE DISK PACKS

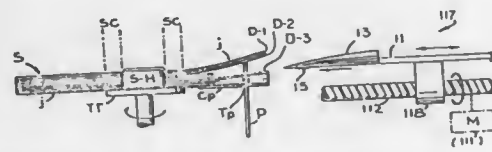
Dean DeMoss, Camarillo, and Herbert U. Ragle, Thousand Oaks, both of Calif., assignors to Unisys Corp., Detroit, Mich.
Continuation of Ser. No. 45,718, Jun. 5, 1979, Pat. No. 4,291,349, which is a continuation of Ser. No. 922,026, Jul. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 711,628, Aug. 4, 1976, Pat. No. 4,134,143. This application Jun. 18, 1981, Ser. No. 274,791

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.⁴ G11B 23/02, 25/04

U.S. Cl. 360-98

13 Claims



1. An improved partitionable disk record system including:
a disk pack comprising a stack of flexible recording disks adapted to be co-rotated and partitioned "end-wise" to present at least one prescribed partition gap, each gap exposing, at least partially, a selected disk recording surface for transducer entry;

transducer assembly means adapted to be selectively projected into an associated one of said gaps and maintain the gap, partitioningly, while presenting at least one transducer-head means into transducing relation with a respective selected recording surface; this assembly means including:
transducing actuator means adapted to selectively translate said transducer assembly means into, and out of, said associated gap; and,

transducer control means arranged and adapted to so translate the assembly means responsive to detection of said partitioning of the "selected" gap.

4,713,706

DEVICE FOR MOUNTING MAGNETIC HEAD

Shigenori Oosaka, and Kenji Negishi, both of Ashigarakami, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

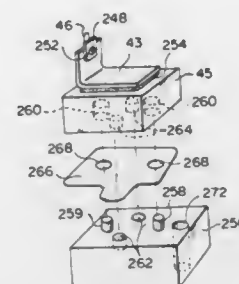
Filed Oct. 2, 1985, Ser. No. 782,898

Claims priority, application Japan, Oct. 5, 1984, 59-151114[U]

Int. Cl.⁴ G11B 5/50, 5/56, 21/24, 21/26

U.S. Cl. 360-104

4 Claims



1. A device for mounting a magnetic head to a head carriage, said carriage being arranged to move said head in the radial direction of a rotating magnetic disc for recording onto or reproducing from said magnetic disc, said device comprising:

a block solidly secured to said magnetic head;
positioning means for aligning said block with said head carriage, said positioning means including at least two positioning projections formed on one of said block and said head carriage and positioning holes for receiving said positioning projections formed on the other of said block and said head carriage; and

magnet attracting means for securing said block to said head carriage, said magnet attracting means including magnets for biasing said positioning projections against walls of said positioning holes in a direction parallel to the plane of said magnetic disc, said magnets being secured to facing planar surfaces of said block and said head carriage, the magnets secured to the block being offset from the magnets secured to the head carriage in the direction parallel to the plane of the magnetic disc so that an attractive force between complementary magnets includes components parallel and perpendicular to said direction.

4,713,707

TRACKING MOUNT FOR A CONTACTLESS RECORDING AND/OR REPRODUCING HEAD

Frieder Helzmann, Denens, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 21, 1985, Ser. No. 789,614

Int. Cl.⁴ G11B 5/55, 21/08

U.S. Cl. 360-106

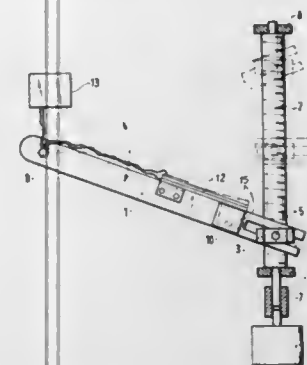
2 Claims

1. Device for movably mounting and for controllably moving a recording and/or reproducing flying transducer contactlessly across the surface of a record medium for selection of record or recording tracks on said medium and for tracking adjustment, comprising:

a swingable arm pivoted at a first end thereof and holding a said transducer near a second end thereof, said arm being pivoted so as to swing said transducer across said record medium at a constant spacing therefrom;
a lead-screw spindle having a threaded rider collar thereon slidably constrained so as to be propelled rectilinearly by rotation of said spindle, said spindle being mounted in bearings disposed so as to enable said rider to hold contact with said arm near said second end thereof over an operating swing range of said arm;

a close-fitting pin-and-cavity sliding linkage between said rider collar and said pivoted arm near said second end

thereof for causing swinging of said pivoted arm in response to rotation of said lead-screw spindle;
means including an electric motor for controllably rotating said lead screw spindle, and



piezoelectric means for shifting at least part of said transducer relative to said arm, whereby preliminary setting of said transducer on a track may be produced by driving said arm by rotating said lead-screw spindle and precision of tracking can be produced by shifting said transducer relative to said arm.

4,713,708

MAGNETORESISTIVE READ TRANSDUCER

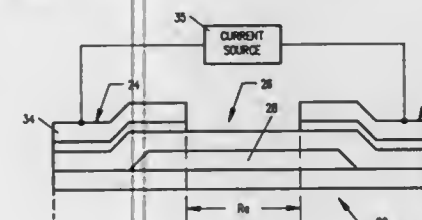
Mohamad T. Krounbi, San Jose, and Otto Voegeli, Morgan Hill, both of Calif., assignors to International Business Machines, Armonk, N.Y.

Filed Oct. 31, 1986, Ser. No. 926,076

Int. Cl.⁴ G11B 5/30

U.S. Cl. 360-113

13 Claims



1. A magnetic read transducer assembly comprising:
a thin film of magnetoresistive conductive layer formed of magnetic material, said magnetoresistive conductive layer having end regions separated by a central region;
a nonmagnetic decoupling layer covering only said central region of said magnetoresistive conductive layer;
a thin film of soft magnetic material extending over said end regions and said central region of said magnetoresistive conductive layer, said thin film of soft magnetic material being parallel to and in contact with said decoupling layer and separated from said magnetoresistive layer in said central region by said decoupling layer, said thin film of soft magnetic material being in contact with said magnetoresistive layer in said end regions to form end region magnetic assemblies;

means for producing a longitudinal bias, said means for producing a longitudinal bias being in direct contact with each of said end region magnetic assemblies to produce a longitudinal bias in said end regions only of a level sufficient to maintain said end region magnetic assemblies in a single domain state, said single domain states of said end region magnetic assemblies thereby inducing a single domain state in said central region of said magnetoresistive conductive layer;

spaced conductor means electrically connected to said magnetoresistive layer within said central region; and
means for supplying a bias current to said conductive means to magnetically bias said magnetoresistive layer with transverse bias in the part of said central region in which said bias current and said decoupling layer are both present, said transverse bias being of a level sufficient to maintain said magnetoresistive layer in a high sensitivity condition whereby, upon connection of said conductive means to a signal sensing means, said signal sensing means determining the resistance changes in said magnetoresistive layer as a function of the fields which are intercepted by said magnetoresistive layer.

4,713,709

TWIN HEAD FOR ELECTRONIC STILL CAMERA AND A METHOD FOR MAKING THE SAME

Isao Yasuda, Katano; Yoriobu Yoshisato, Hirakata; Hideki Yoshikawa, Osaka, and Kazuhiko Taketa, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

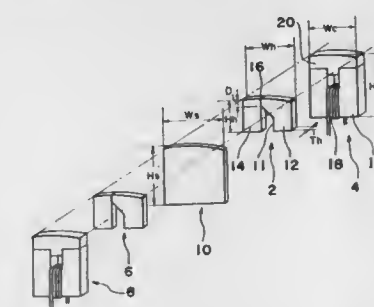
Filed Jul. 31, 1985, Ser. No. 760,796

Claims priority, application Japan, Aug. 7, 1984, 59-165314

Int. Cl.⁴ G11B 5/255, 5/29

U.S. Cl. 360-121

8 Claims



1. A twin head for use in an electronic still camera comprising:

a shield plate;
a first head chip member having an elongated face that faces a recording medium and a magnetic gap defined at an intermediate portion of said elongated face, said first head chip having a thickness of about 60 micrometers, the length W_h of said elongated face being such that $0.3 \text{ millimeter} \leq W_h \leq 1 \text{ millimeter}$
a second head chip member having an elongated face that faces a recording medium and a magnetic gap defined at an intermediate portion of said elongated face, said second head chip member having a thickness of about 60 micrometers, the length of W_h of said elongated face being equal to that of said first head chip member;
a first reinforcing core member having a magnetic portion with a coil opening therein and a non-magnetic portion facing the recording medium, and a coil wound around said coil opening;
a second reinforcing core member having a magnetic portion with a coil opening therein, and a non-magnetic portion facing the recording medium, and a coil wound around said coil opening of said second reinforcing core, wherein each of said first and second reinforcing core members has an elongated face which is flush with said elongated faces of said first and second head chip members;

said first and second head chip members being provided on opposite sides of said shield plate, said first reinforcing core member being provided on one side of said first head chip member remote from said shield plate, and said second reinforcing core member being provided on one side of said second head chip member remote from said shield plate, such that said elongated faces of said first and sec-

ond head chip members are flush with each other and that said magnetic gaps of said first and second head chip members are aligned with respect to each other.

4,713,710

COMPACT MULTIPLE MAGNETIC HEAD APPARATUS
Yutaka Soda, Tokyo; Hideko Imamura, Ibaragi; Hiroyuki Uchida, and Tetsuo Sekiya, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP85/00351, § 371 Date Feb. 25, 1986, § 102(e) Date Feb. 25, 1986, PCT Pub. No. WO86/00456, PCT Pub. Date Jan. 16, 1986

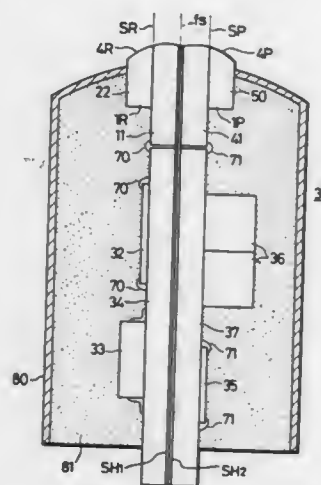
PCT Filed Jun. 21, 1985, Ser. No. 833,396

Claims priority, application Japan, Jun. 25, 1984, 59-130718

Int. Cl.⁴ G11B 5/31, 5/105, 5/265

U.S. Cl. 360-121

1 Claim



1. A combination magnetic head apparatus characterized in that a recording head portion in which on one surface of a first magnetic shield plate there are located a recording magnetic head element portion, a recording integrated circuit and a capacitor and a reproducing head portion in which on one surface of a second magnetic shield plate there are located a reproducing magnetic head element portion, a reproducing integrated circuit and a capacitor are bonded together on the other surfaces of said first and second magnetic shield plates and the overall arrangement thereof is incorporated into a shield case, wherein said recording magnetic head element portion includes a thin film magnetic head element formed on a magnetic substrate bonded to said first magnetic shield plate, a protective substrate is bonded thereto so as to cover the same, said reproducing magnetic head element portion includes a thin film magnetic head element formed on a substrate bonded to said second magnetic shield plate, a protective substrate is bonded thereto so as to cover the same, said recording head portion and said reproducing head portion are respectively provided with magnetic medium contact surfaces by cylindrical polishing around a polishing center displaced from an extension of the depth directions of the magnetic gaps.

4,713,711

THIN FILM MAGNETIC TRANSDUCER HAVING CENTER TAPPED WINDING

Robert E. Jones, Jr., San Jose; Rodney E. Lee, Aromas, and Tsu-Hsing Yeh, San Jose, all of Calif., assignors to International Business Machines, Armonk, N.Y.

Filed May 8, 1985, Ser. No. 731,690

Int. Cl.⁴ G11B 5/17

U.S. Cl. 360-123

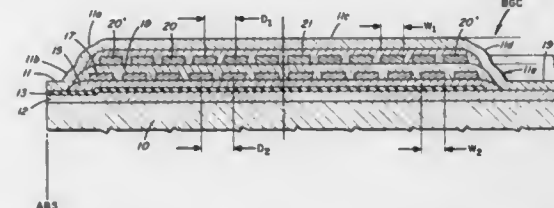
10 Claims

1. A thin film magnetic transducer including first and second pole piece elements having a coplanar tip portion, a transition region comprising a diverging portion

to define a spaced apart winding enclosure, and a back gap closure for completing a magnetic circuit;

a first planar and continuous winding of electrically conductive material extending into said enclosure, and insulated from said pole piece elements, said first winding having a plurality of conductor segments each of a first constant spacing;

a second continuous winding of electrically conductive material extending into said enclosure, parallel to said first winding and insulated from said first winding and from said pole piece elements, said second winding having a



plurality of conductor segments of a second constant spacing; and said conductor segments of said first and second winding having different center to center spacings and different widths, whereby the same number of conductor segments in each of said first and said second winding may be arranged in parallel planes within said enclosure without interfering with said transition region, and whereby the electrical characteristics, comprising both resistance and inductance, of each of said first and said second winding are substantially the same.

4,713,712

CASSETTE TYPE CLEANING DEVICE FOR THE CLEANING OF PLAYING/RECORDING HEAD, ERASING HEAD, AND CAPSTAN/PINCH ROLLER

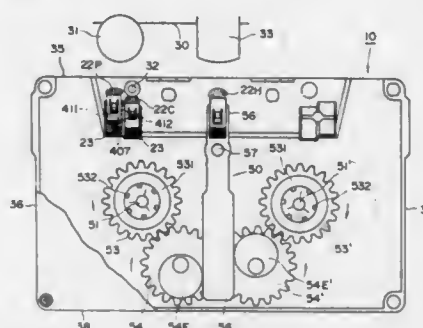
Ta-Chin Chou, 75, Hwa-Sheng Street, Shin-Lin, Taipei, Taiwan

Filed Jun. 2, 1986, Ser. No. 869,411

Int. Cl.⁴ G11B 5/41

U.S. Cl. 360-128

8 Claims



1. A cassette type cleaning device for cleaning the playing/recording head, the erasing head, and the capstan/pinch roller, comprising a housing, socket means for engaging said capstan, said pinch roller, said playing/recording head, and said erasing head, each of said socket means having lock means, cleaning tip assemblies within the housing, each of said assemblies including: a cotton tipped match-like stick, a tubular retainer having an outer wall, said cotton tipped, match-like stick being securely inserted into the inner space of said tubular retainer; the inner wall of the retainer being downwardly tapered so as to tightly hold said stick match therein, said retainer having an orifice at the bottom to facilitate removal of the cotton tipped stick, a resilient U-shaped tongue with protruding member on one side of the outer wall of the retainer, an upper and a lower cut on the opposite side of said outer wall, for engagement with said lock means of said socket means.

4,713,713

CLEANING TAPE CARTRIDGE USED IN VIDEOTAPE RECORDERS

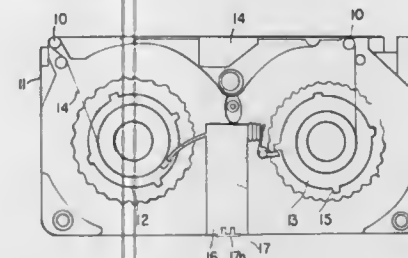
Siat-Ling Lu, No. 6, Alley 27, Lane 629, Nei-Hu Road, Taipei, Taiwan

Filed May 8, 1985, Ser. No. 731,735

Int. Cl.⁴ G11B 5/10

U.S. Cl. 360-128

10 Claims



1. A cleaning tape cartridge adapted to be inserted into a videotape recorder to clean the magnetic head of said recorder, said cleaning tape cartridge comprising:

- a cleaning tape adapted to traverse a path through said cartridge;
- a tape supply reel located adjacent a first end of said tape traversing path, said tape adapted to be unwound from said supply reel;
- a take-up reel located adjacent a second end of said tape traversing path, said tape adapted to be wound about said take-up reel; and
- a container adapted to contain cleaning solution, means for conducting said cleaning solution from said container, and means for applying said solution to said tape in even amounts as said tape is unwound from said supply reel, wherein said means for conducting said cleaning solution from said container and said means for applying said solution to said tape includes tubing having a first end attached to a first side wall of said container, said tubing having a second end which is attached to a liquid applicator, said liquid applicator abutting said tape on said supply reel and comprising means for applying said solution in even amounts to said tape as it is unwound from said supply reel, said cleaning container further comprising a second side wall and a compressible portion located on said second side wall, opposite to said first side wall of said container to which said tubing is attached, said compressible portion comprising means for forcing said liquid solution from said container, through said tubing and into said applicator, said device further comprising a pivotable guide bar which is pivoted during rotation of said take-up reel and which includes means for compressing said compressible portion of said container when said take-up reel rotates.

4,713,714

COMPUTER PERIPHERAL SHOCK MOUNT FOR LIMITING MOTION-INDUCED ERRORS

John E. Gatti, Scottsdale, and Carl R. Tarver, Phoenix, both of Ariz., assignors to Motorola Computer Systems, Inc., Cupertino, Calif.

Filed Nov. 26, 1985, Ser. No. 801,886

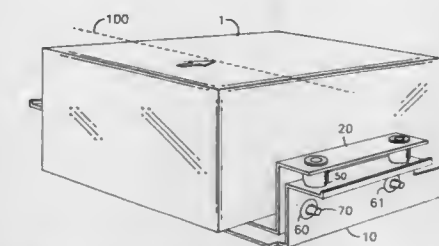
Int. Cl.⁴ G11B 17/02, 33/08; F16M 13/00

U.S. Cl. 360-137

14 Claims

1. A computer peripheral shock mount comprising: a computer peripheral housing enclosing a computer peripheral; a cradle member accommodating said housing; a mounting plate accommodating said cradle member; and limiting means for coupling said housing to said mounting plate, said limiting means comprising protuberant means

on said cradle member and means on said mounting plate for receiving said protuberant means;



whereby said computer peripheral is isolated from physical vibration shocks incurred by said mounting plate.

4,713,715

TAPE POSITION DISPLAY APPARATUS USING COUNTER ROLLER PULSES AND CTL PULSES

Fumiyoshi Abe, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

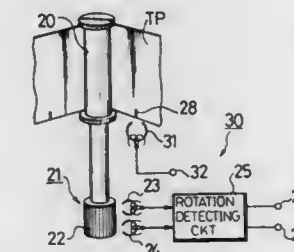
Filed Oct. 30, 1985, Ser. No. 792,850

Claims priority, application Japan, Oct. 31, 1984, 59-229713

Int. Cl.⁴ G11B 15/18

U.S. Cl. 360-137

5 Claims



1. Tape position display apparatus comprising: first generating means for generating first electrical pulses in response to transport of a tape; counter means for making a count of said first electrical pulses; second generating means for generating, in response to said transport, second electrical pulses from a control track signal recorded on said tape, said first electrical pulses normally occurring at a frequency which is an integral multiple of the frequency of said second electrical pulses; means including a subtracter responsive to said count for producing an output representative of a modular count, for detecting a phase difference between a particular value of said modular count and a particular one of said second pulses, and for making adjustments in the value of said modular count, each such adjustment being independent of the magnitude of said phase difference and in such a direction as to reduce said magnitude; and tape position display means for displaying tape position in partial dependence on the value of said modular count.

4,713,716

DETECTION DEVICE FOR CONTACT FUSION IN AN ELECTROMAGNETIC CONTACTOR

Koichi Takemura, Takatsuki, and Tadashi Shiomi, Osaka, both of Japan, assignors to Kabushiki Kaisha Kamiuchi Denki Seisakusho, Osaka, Japan

Filed May 15, 1986, Ser. No. 863,993

Claims priority, application Japan, May 15, 1985, 60-103160

Int. Cl.⁴ H02H 3/00, 7/00

U.S. Cl. 361-2

4 Claims

1. A contact fusion detection device in an electromagnetic contactor used with an electric motor conducting inching or plugging, comprising:

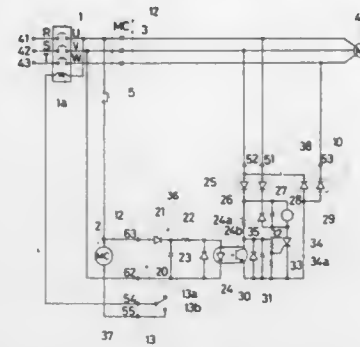
an electromagnetic contactor having main contacts and electromagnetic contactor coil, said electromagnetic contactor coil operating said main contacts;

a detecting means for detecting a voltage supplied to said electromagnetic contactor coil, said detecting means being disposed ahead of said main contacts of said electromagnetic contactor;

a detecting means for detecting a voltage supplied to said electric motor, said detecting means being disposed after said main contacts of said electromagnetic contactor;

an ON-OFF means and a relay coil for contact fusion detection, said ON-OFF means supplying and interrupting the supply of an electrical current to said relay coil for contact fusion detection and comprising a portion of said detection means for detecting said motor voltage;

a photocoupler means for connecting said voltage detection



means for detecting said voltage applied to said electromagnetic contactor coil to said voltage detection means for detecting said voltage applied to said electric motor; said ON-OFF means including an ON-OFF control means, voltage changes across said electromagnetic contactor coil being supplied to said ON-OFF control means via said photocoupler means;

a breaker means having a tripping coil, said breaker means being connected between a source of power and said main contacts of said electromagnetic contactor;

a detection relay means connected to said tripping coil of said breaker and connected to said means for detecting said voltage applied to said electric motor, wherein said contact fusion detection relay means is operated so as to supply a voltage to said tripping coil of said breaker so as to thereby open said breaker upon the detection of contact fusion.

4,713,717

PROTECTED REFRIGERATOR COMPRESSOR MOTOR SYSTEMS AND MOTOR PROTECTORS

Radi Pejouby, Marshfield, Mass.; Joseph G. Nield, Jr., Cumberland, R.I.; John R. D'Entremont, Foxboro; Beggs, Louis C., Attleboro, both of Mass., and Fabrizio Rotulo, Napoli, Italy, assignors to Texas Instruments, Dallas, Tex.

Filed Nov. 4, 1985, Ser. No. 794,876

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.⁴ H02H 3/08, 5/04

U.S. Cl. 361—26

15 Claims

1. A current and temperature responsive motor protector to be mounted in a selected manner on an electrical motor for providing both short time trip and ultimate trip protection for the motor comprising

a base,

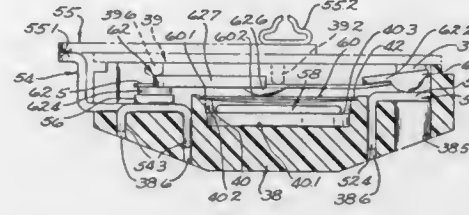
first contact means on the base normally engaging complementary contact means to close a motor circuit, the first contact means being movable to disengage the complementary contact means to open the circuit,

thermostat metal means mounted on the base to be disposed in selected thermal coupling to the motor when the pro-

tektor is mounted on the motor in said manner, the thermostat metal means being actuatable when heated to a selected temperature to move the first contact means to open the circuit, and

electrical resistance heater means responsive to increases in motor current on the occurrence of either short time trip or ultimate trip fault conditions in the motor for heating the thermostat metal means to said selected temperature, characterized in that

the electrical resistance heater means is formed of a material having a positive temperature coefficient of resistivity arranged to carry the motor current, the material of the heater means being selected to display a first electrical resistance in response to normal motor currents in the heater means, a second relatively higher electrical resis-



tance in response to ultimate trip motor current in the heater means, and a third substantially higher electrical resistance in response to short time trip motor current in the heater means, the heater means being proportioned and arranged with selected thermal coupling to the thermostat metal means to cooperate with the positive temperature coefficient of resistivity and the thermal coupling of the thermostat metal means to the motor to display said first resistance and permit normal running operation of the motor in response to normal motor currents in the heater means, to display said second resistance and heat the thermostat metal means to said selected temperature in response to ultimate trip currents in the heater means, and to display said third resistance and heat the thermostat metal means to said selected temperature in response to short time trip current in the heater means.

4,713,718

MICROPROCESSOR BASED MOTOR PROTECTIVE RELAY WITH MAXIMUM NUMBER OF STARTS PER TIME INTERVAL LIMITER

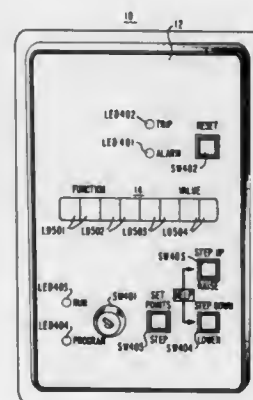
Bruce R. Quayle, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 31, 1987, Ser. No. 32,885

Int. Cl.⁴ H02H 5/04

U.S. Cl. 361—29

4 Claims



1. Electrical apparatus capable of being started to perform a

function provided that a maximum number of starts is not exceeded in a predetermined time interval (HSTRT), comprising:

control means for issuing a start command;

memory means cooperable with said control means for having stored therein sequential start time values each representative of a time difference between the occurrence of a predetermined start and sequential starts thereafter, the first of said start time values being defined as the oldest start time value and the next in sequence of said start time values being defined as the next oldest start time value;

counter means cooperable with said control means for keeping track of the number of starts;

timer means cooperable with said control means and said memory means for keeping track of the running Time (T) after said predetermined start;

comparison means cooperable with said control means, said counter means, said memory means and said timer means for comparing said running time (T) against said predetermined time value (HSTRT) and for providing an indication when said running Time is equal to or greater than said predetermined time value (HSTRT);

function means cooperable with said control means, said memory means, said counter means, said timer means and said comparison means for performing the following when said time (T) equals or exceeds said predetermined time value (HSTRT):

decrementing said running time and all said sequential start time values by said oldest start time value;

discarding said oldest start time value;

redefining in said memory means said thusly decremented next to the last oldest start time value as the oldest start time value;

decrementing said counter means by one start;

calculating means cooperable with said control means, said counter means and said memory means for allowing a start command to issue if said number of starts in said counter means does not exceed said maximum number of starts.

4,713,719

FAST ACTING OVERCURRENT PROTECTOR AND METHOD

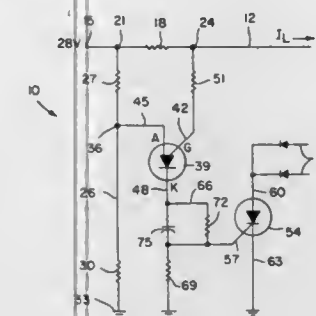
Michael M. Kugelman, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 7, 1986, Ser. No. 826,960

Int. Cl.⁴ H02H 9/02

U.S. Cl. 361—54

8 Claims



1. A sourcing system overcurrent protector configured for action in less than one microsecond in a solid state circuit including a current conduit having a corresponding supply voltage and configured to flow current to a load, comprising: a sensing means and crow-bar means, the sensing means being configured for triggering the crow-bar means; the sensing means including a programmable unijunction transistor (PUT) having anode, gate and cathode electrodes, a primary resistor positioned in the current conductor of a size configured to produce a predetermined voltage drop across the primary resistor when current flowing therethrough exceeds a desired

value; a programming means for providing the PUT anode electrode with a voltage value at which it is desired the PUT shall activate; a means whereby the gate of the PUT detects a voltage in a current flow direction downstream of the primary resistor; the crow-bar device having anode, cathode and gate electrodes, the crow-bar device gate electrode and the PUT cathode electrode being joined through signal differentiating circuit the signal differentiating circuit including a capacitor and being configured whereby not later than upon completion of charging of the capacitor, electrical flow through the PUT is terminated, and the signal differentiating circuit being joined through electrical resistance to a point of low reference voltage in the solid state circuit; one of the crow-bar device anode and cathode electrodes being joined to control electrode means for current consuming/switching devices contained in the solid state circuit and the other crow-bar device electrode being connected to a voltage in the solid state circuit.

4,713,720

FAST ACTING SOLID STATE AC CIRCUIT BREAKER

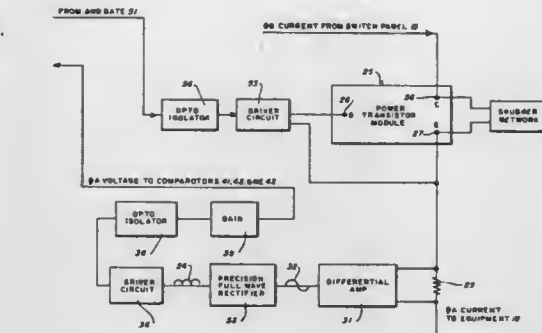
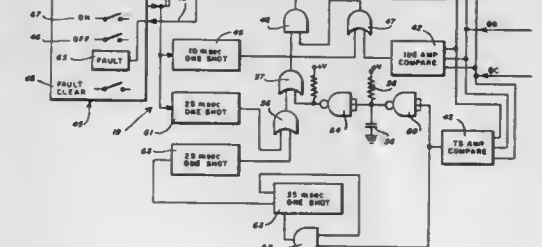
Robert T. Rogers, Blacksburg, Va., and James C. Siewert, Mobile, Ala., assignors to Litton Systems, Inc., Blacksburg, Va.

Filed May 14, 1986, Ser. No. 862,958

Int. Cl.⁴ H02H 7/20

U.S. Cl. 361—97

15 Claims



1. An AC circuit breaker comprising: a three terminal solid state device which may be turned On and Off; a current path through the AC circuit breaker comprising the solid state device; means for sensing current through the AC circuit breaker; comparator means establishing a plurality of time related threshold current levels for the AC circuit breaker which are effective during successive periods of time; and means for turning the solid state device from On to Off in less than 10 microseconds in response to current in the AC circuit breaker which exceeds one of the threshold current levels.

4,713,727

ELECTROMECHANICAL COMPONENT WITH SEALED HOUSING

Rolf D. Kimpel, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

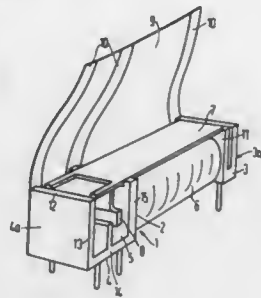
Filed Oct. 20, 1986, Ser. No. 920,721

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538621

Int. Cl.⁴ H05K 5/03

U.S. Cl. 361—334

8 Claims



1. An electromechanical component, having a base body which includes at least one switch chamber containing movable parts and at least one further mounting chamber containing stationary parts and filled with casting compound, and having a housing which surrounds the component in cuboid fashion, whereby an open housing side is in communication with the further mounting chamber and is closed by filling the casting compound in such that, after the casting, the switch chamber is closed fluid-tight both from the outside as well as from the further mounting chamber, said mounting chamber being closed by the housing and the casting compound, comprising the improvement wherein at least two of the closed housing sides positioned perpendicular to one another are formed by a foil glued onto the base body and bent off over at least one edge, whereby the base body forms bending edges as well as all around seating surfaces for the foil in the edge regions of at least one of the switch chamber and the mounting chamber.

4,713,728

LIGHTING CIRCUIT BREAKER PANELBOARD MODULAR ASSEMBLY

Rodney D. Raabe; Joseph J. Mrowka; Jon P. McCuin, all of Bristol, and Joseph F. Noonan, Manchester, all of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 705,454, Feb. 25, 1985, Pat. No. 4,631,634.

This application Aug. 4, 1986, Ser. No. 892,605

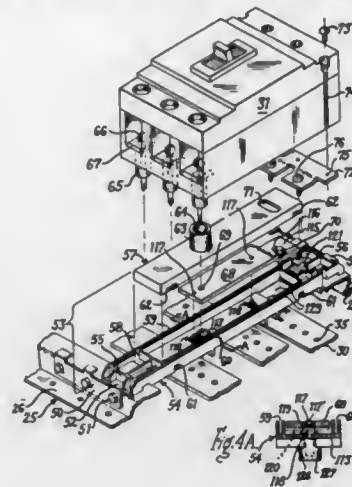
Int. Cl.⁴ H02H 9/00

U.S. Cl. 361—363

6 Claims

1. A circuit breaker panelboard assembly comprising: closure means housing at least one main circuit breaker and at least one branch circuit breaker; access means movably arranged on said closure means providing access to said main and said branch circuit breaker from outside of said closure; mounting means within said closure means supporting said branch circuit breaker and providing electrical connection between said branch circuit breaker and electrical bus bars within said closure means connectable with an external circuit; and shield means intermediate said access means and said main and branch circuit breakers preventing contact with electrical terminals on said main and branch circuit breakers; said mounting means comprising an adapter member having an insulative cover and an insulative base, said adapter

cover having first means integrally formed therein providing access to means electrically connecting said branch



circuit breaker with a branch strap within said adapter base.

4,713,729

DEVICE FOR AVOIDING LOCAL OVERHEATING ON MEASURING TRANSDUCERS

Kurt Eiermann, Pfungstadt, and Karl Ehinger, Karlstein, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft Corporation, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 798,799, Nov. 15, 1985, abandoned.

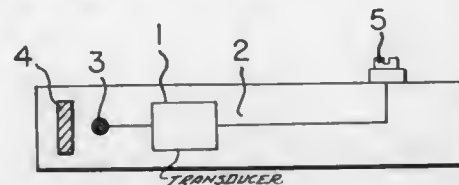
This application Mar. 19, 1987, Ser. No. 28,058

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443702

Int. Cl.⁴ H05K 7/20

U.S. Cl. 361—386

5 Claims



1. A device for avoiding local overheating comprising: an intrinsically safe measuring transducer; a sealing composition in which said transducer is embedded; a current limiting resistor connected to said transducer; and a single body made of a good heat conducting material spaced from but within the direct vicinity of the current limiting resistor and entirely embedded within said sealing composition so as to distribute heat more uniformly over the entire surface of said sealing composition than when said body is not present, said single body being the only good heat conducting material of said device so that heat is not dissipated at said surface of said sealing composition by other good heat conducting materials.

4,713,730

MICROWAVE PLUG-IN SIGNAL AMPLIFYING MODULE SOLDERMENT APPARATUS

Ben R. Hallford, Wylie, and Robert W. McKenzie, Lewisville, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 7, 1985, Ser. No. 785,302

Int. Cl.⁴ H05K 7/02

U.S. Cl. 361—419

4 Claims

1. The method of attaching a field effect transistor (FET) to one side of a substrate means having a ground plane on the opposite side where the gate and drain leads of the FET are

4,713,732

VEHICLE WARNING SYSTEM

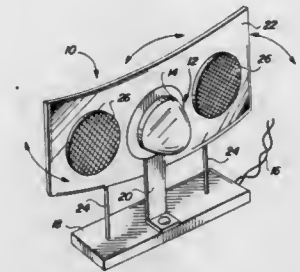
Charles Schamblin, 1714 S. "M" St., Bakersfield, Calif. 93304

Filed Jun. 5, 1986, Ser. No. 870,941

Int. Cl.⁴ B60Q 1/00

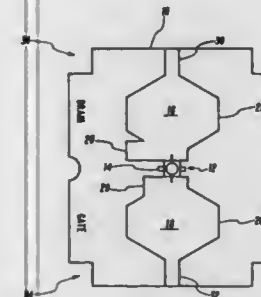
U.S. Cl. 362—61

10 Claims



electrically connected to the attachment side and the source lead of the FET must be electrically connected to the ground plane on said opposite side of said substrate means comprising, the steps of:

creating two parallel positioned slots through a substrate from a ground plane side of the substrate to the side opposite wherein a FET is to be attached; inserting the legs of a U-shaped piece of strap metal through said slots in said substrate wherein the bit portion of the U-shaped piece of strap metal is juxtaposed the ground plane and the legs of the U-shaped piece of strap metal extend through said two parallel positioned slots of the



substrate with a portion of the legs extending beyond the surface of the substrate means; bending the legs of the U-shaped piece of strap metal whereby the portion of the legs extending beyond the surface of the substrate means is substantially parallel to the surface of the substrate means; electrically connecting the bit portion of said U-shaped piece of strap metal to the ground plane of said substrate means; electrically connecting the source leads of a FET to the bent legs of said U-shaped piece of strap metal; and electrically connecting the gate and drain leads of the FET to corresponding gate and drain signal transmission means.

4,713,731

DOUBLE LAYER CAPACITOR

Donald L. Boos, Garfield Heights, and Allan V. Marse, Independence, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 665,256, Oct. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 374,139, May 3, 1982, abandoned. This application Sep. 15, 1986, Ser. No. 907,543

Int. Cl.⁴ H01G 9/04

U.S. Cl. 361—433

15 Claims

1. An improved double layer capacitor cell comprising: (a) a positive and a negative electrode both comprised of carbon in admixture with a liquid electrolyte having a voltage regulating ion selected from the group of bromide, chloride, fluoride and iodide in solution therein, the voltage regulating agent having a concentration ranging from about 0.01 to about 10 moles per liter of electrolyte; (b) a porous ionically conductive separator between said positive electrode and said negative electrode; and (c) a first and a second ion insulating connector impervious to the electrolyte wherein the first connector is electronically connected to said positive electrode and the second connector is electronically connected to said negative electrode.

4,713,733

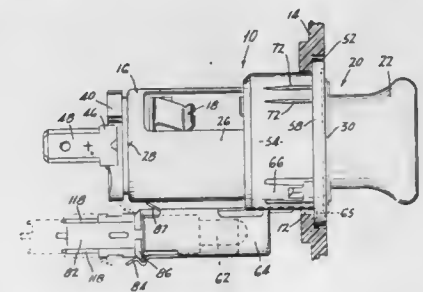
CIGAR LIGHTER INCORPORATING GLOW RING
Edward J. Fitz, Fairfield, and Dominic Pesapane, West Haven, both of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Mar. 25, 1987, Ser. No. 30,156

Int. Cl.⁴ F21V 33/00

U.S. Cl. 362—80

31 Claims



1. A cigar lighter assemblage for mounting on a panel through an opening of the panel from the front thereof, comprising in combination:

(a) a tubular socket having an opening for receiving an igniting unit,
(b) a light-conducting bushing surrounding said socket and constituting a bezel around the same,
(c) a lamp holder,
(d) cooperable means on said bushing and lamp holder for slidably mounting the lamp holder on the bushing between an extended position and a retracted position thereon, and
(e) means on said lamp holder, engageable with the panel to

shift the holder from its extended position to its retracted position as the bushing and holder are being frontally inserted in the opening of the panel.

4,713,734 WALL LAMPS

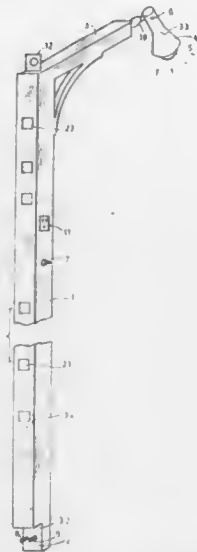
Thomas J. DeKay, 355 NE. Elm Ter., Pinecrest Lakes, Jensen Beach, Fla. 34957

Filed Nov. 24, 1986, Ser. No. 934,500

Int. Cl.⁴ F21S 1/02

U.S. Cl. 362-147

20 Claims



1. A wall lamp assembly which mounts an electric light on a planar vertical surface without exposed electric wiring, comprising:

- (a) elongate conduit means having a front surface and a rear surface for carrying and concealing from view electric wires for supplying electric power to said electric light;
- (b) electric light support means connected to the upper end of said conduit means, including at least one electric light socket means electrically connected to said wires for supplying electric power to said electric light;
- (c) electric plug means connected to, and supported by, the lower end of said conduit means, said plug means electrically connected to said wires and adapted for plugging into an electric outlet;
- (d) wall attaching means connected to said conduit means for attaching said assembly to said vertical surface; said plug means including prongs extending beyond said rear surface of said conduit means for electrically engaging a wall-mounted electric outlet when said conduit means is attached to said planar vertical surface.

4,713,735

FLASHLIGHT FOR USE IN VEHICLES

Paul D. Hiltman, 2543 Melinda Dr., Atlanta, Ga. 30345

Filed Oct. 20, 1986, Ser. No. 920,430

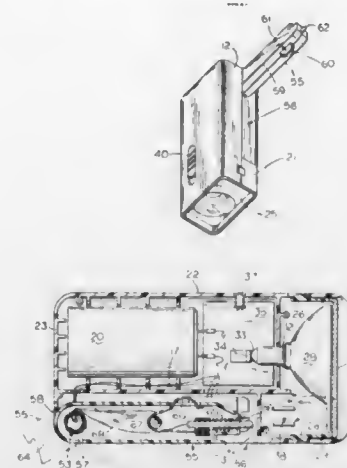
Int. Cl.⁴ F21L 7/00

U.S. Cl. 362-183

7 Claims

1. A flashlight for use in vehicles which have a cylindrical socket mounted on a dashboard that is coupled with a source of electric power, and with the flashlight comprising a housing formed with an elongated recess, a battery mounted within said housing, a lamp mounted within said housing and electrically coupled with said battery through switch means, and an elongated plug electrically coupled with said battery and mounted for pivotal movement between a stowed position substantially within said housing recess and operative positions protruding out of said recess for insertion into the socket for

recharging of said battery and for the mounted projection of a light beam by said lamp at variously selected directions from



the dashboard that are dependent upon the rotary position of said plug within the socket.

4,713,736

MULTIPLE COLOR LAMP

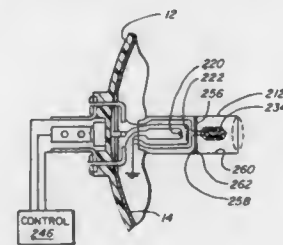
George C. Kasboske, Chicago, Ill., assignor to Quintech Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 791,417, Oct. 25, 1985, Pat. No. 4,644,452. This application Jan. 30, 1987, Ser. No. 9,238

Int. Cl.⁴ F21M 3/14

U.S. Cl. 362-214

17 Claims



1. In a lamp having a first bulb with a first light source and a first light transmitting surface for causing light transmitted therethrough by the first light source to have a first color, the improved comprising:

- a second bulb contained substantially within said first bulb, said second bulb having a second light transmitting surface for causing light transmitted therethrough to have a second color;
- a second source for transmitting light through said second light transmitting surface; and
- means for at least partially shielding said second light transmitting surface from light from said first light source.

4,713,737

ELECTRICAL LIGHTING FIXTURE WITH MULTIPLE ROTATION MECHANISM

Martin L. Lasker, Edison, N.J., and Joel S. Cohen, Oakland, Calif., assignors to Prescolite Inc., San Leandro, Calif.

Filed Apr. 7, 1986, Ser. No. 848,634

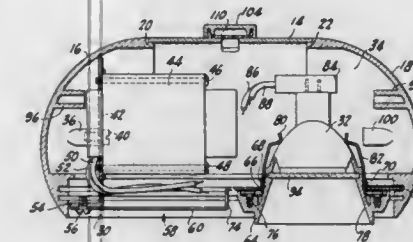
Int. Cl.⁴ F21V 21/28

U.S. Cl. 362-285

11 Claims

1. A lighting fixture mechanically connected to an object and electrically connected to a source of electrical power comprising:

- a. a lamp supporting body having an exterior and an interior thereto;
- b. means for rotating said lamp supporting body about a first axis, said rotating means comprising:
- a swivel member including a swivel arm which moves over said exterior of said lamp supporting body;
- a boss extending upwardly from said swivel arm, said boss being mechanically connected to the object;
- means for supporting said boss for movement with said swivel arm over said exterior of said lamp supporting body;
- c. means for supporting the lamp to the lamp supporting body, said lamp being connected to the source of electrical power;



- d. means for rotating said boss relative to said lamp supporting body held thereto about a second axis, greater than three hundred sixty degrees of arc about said second axis, including:
- said boss having a portion including a stop;
- a rotatable washer having a first stop which is capable of contacting said stop of said boss and having second and third stops; and
- a clamp which contacts said lamp supporting body, said clamp including first and second stops which contact said second and third stops of said washer, said clamp holding said swivel member and supported boss to said lamp supporting body.

4,713,738

LIGHT FIXTURE USING A HOLOGRAPHIC OPTICAL REFLECTOR

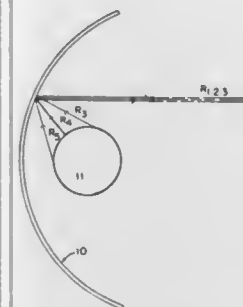
Charles S. Davis, 51 Wooster St., New York, N.Y. 10012

Filed Aug. 15, 1986, Ser. No. 897,294

Int. Cl.⁴ F21V 7/00

U.S. Cl. 362-296

4 Claims



1. An architectural lighting fixture comprising a reflective holographic optical element and means for fixing an incoherent light source in a spatial relationship to the reflective holographic optical element such that radiation from the light source impinges on the reflective holographic optical element and is directed by the reflective holographic optical element to a task area.

4,713,739

CLAM SHELL GEAR BOX HOUSING AND RETAINER

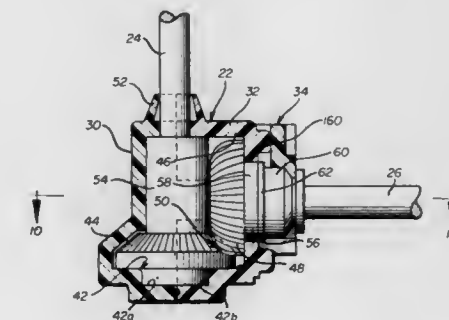
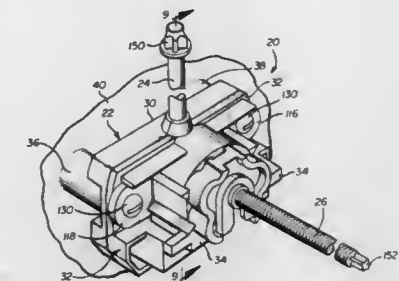
Francis E. Ryder, and Stephen P. Lisak, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala. and Textron, Inc., Providence, R.I., a part interest

Filed Jan. 6, 1987, Ser. No. 875

Int. Cl.⁴ B60Q 1/08

U.S. Cl. 362-424

21 Claims



1. An adjusting mechanism for a headlamp or the like, comprising: a two-piece molded housing member having a first housing piece and a second housing piece defining first and second orthogonally disposed gear-receiving bores when the first and second housing pieces are in assembled condition, with said bores generally intersecting at a peripheral location with respect to each other so as to receive respectively a drive gear member disposed in said first gear-receiving bore and an adjusting gear member disposed in said second gear-receiving bore, with the gear members being engageable at the locations where the first and second gear-receiving bores intersect; drive shaft-receiving means defined in said housing pieces for receiving and guiding a drive shaft for engagement with a drive gear received in said first gear-receiving bore and extending outwardly from the housing; adjusting shaft-receiving means defined in said second housing piece for receiving an adjusting shaft for engagement with an adjusting gear received within said second gear receiving bore and extending from said housing for engagement with a headlamp or the like, such that by rotation of the drive gear member, rotational movement will be imparted to the adjusting shaft in response to rotation of the first and second gear members when engaged, said rotational movement being usable to effect adjustment of a headlamp assembly or the like; wherein said first housing piece includes gear retainer wall means extending in the direction of said second gear-receiving bore for holding an adjusting gear member in place within said second gear-receiving bore and wherein said first and second housing pieces include cooperating interlocking tab means and slot means located closely adjacent the periphery of said first gear-receiving bore so as to maintain the housing pieces in an assembled condition and to resist spreading apart thereof in response to loading of the respective gears carried within said gear-receiving bores.

4,713,740

SWITCH-MODE POWER SUPPLY

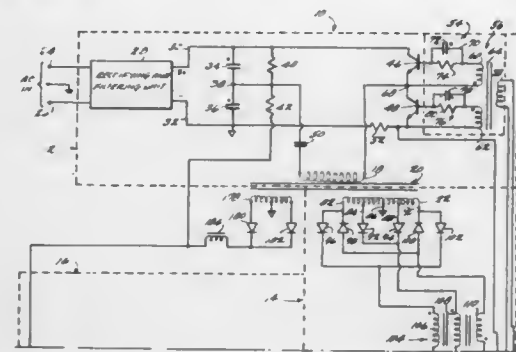
Richard B. Drabing, Los Altos, Calif., assignor to SMS Advanced Power, Inc., Cupertino, Calif.

Filed Jul. 27, 1984, Ser. No. 634,882

Int. Cl. H02M 3/335

U.S. Cl. 363-17

12 Claims



1. An apparatus for producing a regulated voltage, said apparatus comprising:

means for producing an unregulated voltage level; active regulating means, connected to receive said unregulated voltage level, for producing a regulated voltage level at an output terminal thereof, said regulating means including a power input terminal for receiving power to operate said active regulating means;

means, connected to said unregulated voltage level, for drawing current from said unregulated voltage level producing means;

current storing means, connected to both said current drawing means and to the output terminal of said regulating means, for storing said current drawn from said unregulated voltage level producing means and for also storing current produced by said regulating means; and

switching means for applying the current stored in said current storing means to the power input terminal of said regulating means when the amount of charge stored by said current storing means exceeds a predetermined level.

4,713,741

EXCITATION CONTROL APPARATUS FOR ROTARY ELECTRIC MACHINE

Tutomu Yamada, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

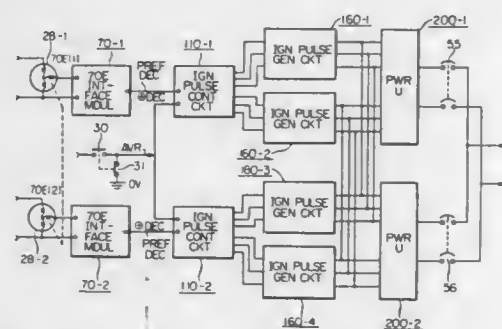
Filed Jul. 8, 1986, Ser. No. 883,508

Claims priority, application Japan, Jul. 9, 1985, 60-151892

Int. Cl. H02H 7/00; H02P 9/00

U.S. Cl. 363-50

2 Claims



1. An excitation apparatus for controlling excitation current to a field coil of a rotary electric machine to produce a constant output from the rotary electric machine, said apparatus comprising an AVR circuit producing an AVR signal,

two manual voltage setting units including two inductive voltage regulators providing outputs equal to each other, two interface module circuits including circuit means inverting the outputs of said manual voltage setting units into DC voltages and producing rectified, filtered outputs representing a manual set value for the output voltage of the generator,

two ignition pulse control circuits, each circuit connected to receive the manual set value representing output of each interface module and further connected to receive AVR signals and including means comparing the AVR signal and the set value representing output and producing a field current decrease preferring signal responsive to the comparison therebetween,

a plurality of sets of ignition pulse generator circuits connected to receive outputs from said ignition pulse control circuits and generate ignition pulses of six phases respectively, and

a plurality of power units connected to provide field excitation power to the rotary electric machine including thyristors, the ignition pulses from said ignition pulse generator circuits being connected to gates of said thyristors in parallel, whereby said field excitation power units prefer increase of the field current.

4,713,742

DUAL-INDUCTOR BUCK SWITCHING CONVERTER

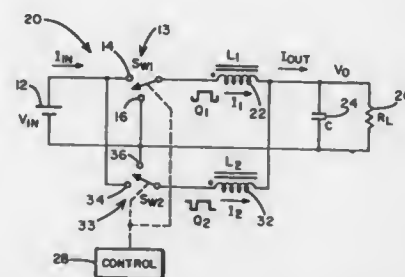
David W. Parsley, Draper, Utah, assignor to Sperry Corporation, Blue Bell, Pa.

Filed Oct. 9, 1986, Ser. No. 917,126

Int. Cl. H02M 3/10

U.S. Cl. 363-124

1 Claim



1. A DC-to-DC power converter for regulating the voltage supplied from a DC input power sourced from first and second input terminals to an output load having first and second output terminals,

regulating means comprising first and second switch means each constructed to switch between said first input terminal and said second input terminal so as to alternately complete and open first and second conduction paths to said first output terminal when so switched, and first and second inductive means each coupled in series in one of said conduction paths with one of said first and second switch means and to said first output terminal, each of said inductive means and its associated series-connected switch means being connected in parallel with the other of said inductive means and its associated series-connected switch means, and being wound with the same polarity sense, and control means coupled to said first and second switch means so that both the said switch means are on more than 50% of the time, and also so that after one of said switch means is switched off from said first input terminal the other of said switch means will be switched onto said first input terminal wherein current that flows in said first inductive means increases after said first switch means is switched to said first terminal and the current that flows in said second inductive means decreases after said second switch means is switched to said first terminal.

4,713,743

LOAD-COMMUTATED INVERTER AND SYNCHRONOUS MOTOR DRIVE EMBODYING THE SAME

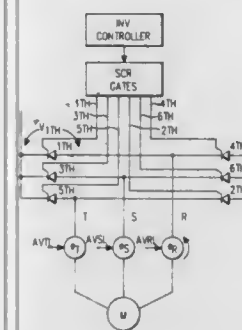
Alberto Abbondanti, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 6, 1987, Ser. No. 11,969

Int. Cl. H02M 7/521

U.S. Cl. 363-138

13 Claims

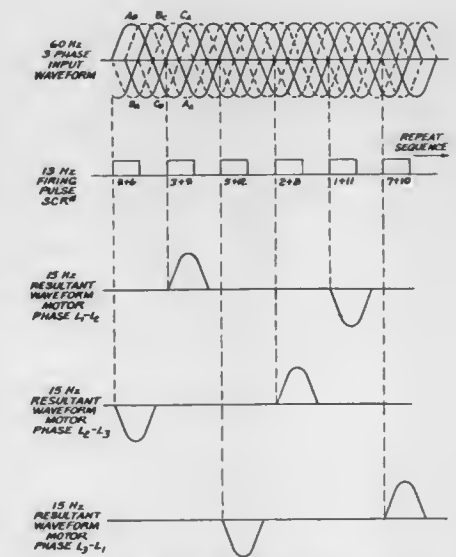
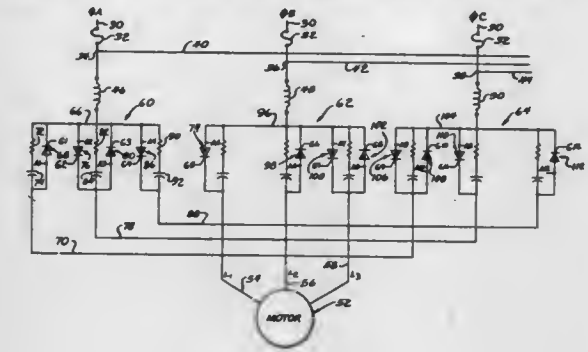


1. In a load commutated inverter system including a plurality of static power switches of the inverter controlled for supplying on respective phases, to a load and via load terminals, AC voltages and currents with a leading power factor, said power switches being controlled in a firing sequence in accordance with a predetermined phase order, the combination of:

means for controlling for conduction an incoming switch in said sequence during an overlap time interval allowing an outgoing switch in said sequence to be oppositely biased under the line-to-line voltage existing between the phase terminals of said incoming and outgoing switches; and

means responsive to said controlling means for applying to said outgoing switch an additional bias voltage during another time interval adjoining and extending beyond said overlap time interval, thereby to establish a time recovery period for said outgoing switch which is coextensive with said another time interval.

circuit means for effecting selective sequential firing of said plurality of SCRs at said zero crossings, firing of said SCRs



being respectively terminated upon reversal of a respective phase.

4,713,745

VECTOR-CONTROLLED UNRESTRICTED FREQUENCY CHANGER (UFC) SYSTEM AND VARIABLE SPEED AC MOTOR DRIVE USING SUCH A SYSTEM

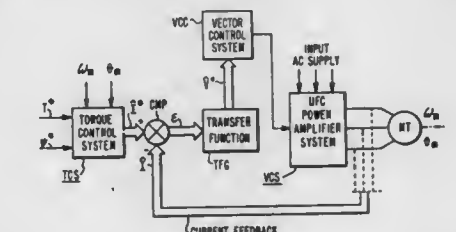
Colin D. Schauder, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 22, 1986, Ser. No. 888,911

Int. Cl. H02M 5/257

U.S. Cl. 363-161

9 Claims



1. In a UFC system including a plurality of static bilateral switches controlled for conduction to successively interconnect selected pairs of the input terminals of a three-phase AC voltage source with corresponding pairs of output terminals belonging to a three-phase load;

said selected pairs being selected in accordance with a predetermined sequential order in each load phase and for a

4,713,744

FRACTIONAL FREQUENCY CONVERTER USING ZERO SWITCHING OF INPUT FREQUENCY HALF WAVES

David B. Coston, Crossville, Ill., assignor to Torcon Products, Inc., Highland Park, Ill.

Filed Oct. 28, 1986, Ser. No. 924,049

Int. Cl. H02M 5/27

U.S. Cl. 363-160

19 Claims

1. A frequency converter is for a multi-phase electric motor comprising input means for connection to a multi-phase alternating current electric supply source, an output means for connection to a multi-phase utilization means such as a multi-phase electric motor, an SCR bridge comprising a plurality of SCRs interconnecting said input means and said output means, trigger circuit means connected to said SCR bridge for effecting selective firing of said plurality of SCRs, means connected to said input means for developing a plurality of timing pulses upon zero crossing of the input means phases, and logic circuit means interconnecting said timing pulse means and said trigger

predetermined succession of said load phases; the combination of:
 means responsive to said AC voltage source for deriving a signal representative of actual electrical degree run by said AC voltage source in a cyclic succession from a zero angle reference;
 means for providing a signal representative of an output voltage vector demand angle for said AC load;
 comparator means responsive to said actual electrical degree representative signal and to said vector demand angle representative signal for providing an address signal representative of the phase shift between said vector demand angle and said electrical degree;
 ROM means for storing electrical angle values related to said zero angle reference as addressed values, and for storing in relation thereto predetermined switch combinations commands;
 said ROM means being responsive to said comparator means for selecting a combination command in accordance with said address signal; and
 means responsive to said ROM means for establishing with said switches a switch combination for conduction in accordance with said address signal and the corresponding switch combination command.

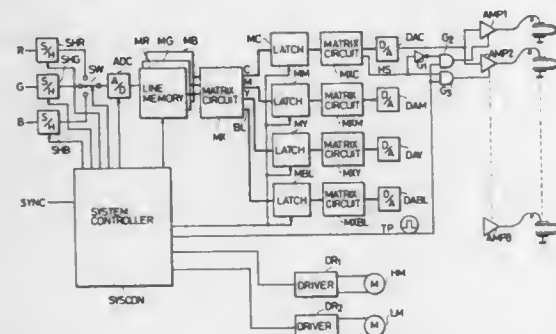
4,713,746

METHOD FOR FORMING PICTURES

Yoshitaka Watanabe, Tokyo; Nobuaki Sakurada, Yokohama; Hideaki Kawamura, Tokyo, and Yuichi Sato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
 Continuation of Ser. No. 801,504, Nov. 25, 1985, abandoned, which is a continuation of Ser. No. 491,654, May 5, 1983, abandoned. This application Dec. 23, 1986, Ser. No. 946,095
 Claims priority, application Japan, May 14, 1982, 57-81771; May 19, 1982, 57-84170; Jul. 17, 1982, 57-124768
 Int. Cl. G01D 15/16; H04N 1/23

U.S. Cl. 346-1.1

6 Claims



1. A method of forming on a medium a picture comprising a plurality of picture elements with different light-reflecting properties that provide different optical reflection densities by using picture forming elementary particles to form the picture elements, the method comprising the steps of:

- providing on the medium a first type of elementary particle having a first concentration to form picture elements the optical reflection densities of which are higher than a predetermined level and having a size varied in accordance with the optical reflection density of the picture element to be formed, substantially all of said first type of elementary particles having a size of a least about 80 microns;
- providing on the medium a second type of elementary particle having a second concentration lower than said first concentration to form picture elements the optical reflection densities of which are lower than the predetermined level and having a size varied in accordance with the optical reflection density of the picture element to be formed; and
- determining said predetermined optical reflection density

level so that, if the range of the optical reflection densities of the particles is defined by representing a minimum optical reflection density as 0 and a maximum optical reflection density as 1.0, optical reflection densities at least below about 0.3 are provided by the second type of particle.

4,713,747

NUMERICALLY CONTROLLED MACHINING METHOD USING PRIMARY AND COMPENSATING CUTTERS

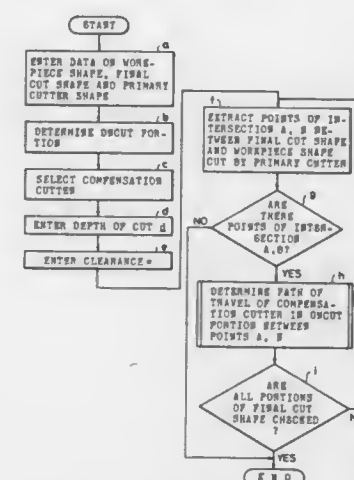
Tomomitsu Niwa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 532,133, Sep. 14, 1983, abandoned. This application May 14, 1986, Ser. No. 864,752

Claims priority, application Japan, Sep. 14, 1982, 57-159872
 Int. Cl. G05B 19/18

U.S. Cl. 364-170

13 Claims



1. An NC machining method for machining a workpiece with a primary cutter in a primary machining mode and then machining workpiece portions left uncut by the primary cutter with a compensation cutter in a compensation machining mode to thereby produce a desired final cut shape, said NC machining method comprising the steps of:

- entering data on the original shape of the workpiece, the desired final cut shape, and the shape of the primary cutter into an NC apparatus;
- automatically determining the uncut workpiece portions based on said entered data, said uncut workpiece portions comprising those portions of said workpiece which must be cut to achieve said final cut shape, but which cannot be reached using said primary cutter;
- automatically selecting a compensation cutter suitable for cutting off said uncut workpiece portions in the compensation machining mode;
- setting data on the depth of cut and selecting the clearance of the compensation cutter, said clearance being selected by setting a distance between the compensation cutter and workpiece so as to prevent the compensation cutter from contacting the workpiece;
- determining paths of travel of said compensation cutter from the uncut workpiece portions, the depth of cut of said compensation cutter, and said clearance of said compensation cutter; and
- cutting off said uncut workpiece portions by moving said compensation cutter along the determined paths of travel.

4,713,748
MICROPROCESSOR WITH BLOCK MOVE INSTRUCTION

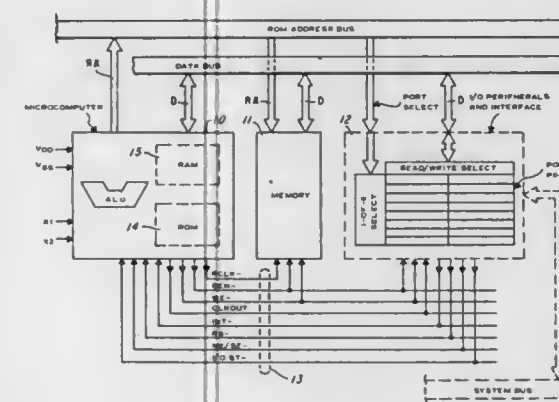
Surendar S. Magar, Daniel L. Essig, Richard D. Simpson, all of Houston, and Edward R. Cadel, Stafford, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 12, 1985, Ser. No. 701,827

Int. Cl. G06F 13/00

U.S. Cl. 364-200

8 Claims



1. A microcomputer system comprising:
 - (A) a microcomputer device formed in a single integrated circuit and having data input/output terminals and address terminals;
 - (B) memory means external to the microcomputer device having address input terminals and data output means;
 - (C) input/output peripheral means for transfer of information to or from external equipment, said peripheral means having address input means and data input/output means;
 - (D) external address bus means coupled to the address output terminals of the microcomputer device, and coupled to the address input means of said peripheral means and to the address input terminals of said memory means;
 - (E) external data bus means coupled to said data input/output terminals of the microcomputer device, and coupled to the data input/output means of said peripheral means and the data output means of the memory means;
 - (F) the microcomputer device comprising within said integrated circuit:
 - an arithmetic/logic unit having data input and data output;
 - a first read/write memory having an address input and having data input/output means;
 - internal data bus means coupled to the data input and data output of the arithmetic/logic unit and coupled to the data output of the arithmetic/logic unit and coupled to the data input/output means of the first read/write memory;
 - a second read/write memory having an address input and having data input/output means, the second read/write memory storing data or instruction words;
 - data memory address means connected to said address input of said first and second read/write memories for storing destination addresses specified by an instruction word;
 - program address means connected to the address input of the second read/write memory;
 - internal program bus means coupled to said data input/output means of said second read/write memory, to said data input/output terminals, and coupled to said program address means;
 - control means having an input coupled to said program bus means and generating microcontrol signals in response to instruction words, the microcontrol signals defining operation of the arithmetic/logic unit and

controlling the transfers to and from the internal bus means;
 said control means including means for executing a first block-move instruction for copying a series of sequential memory address contents from the external memory means to the first read/write memory, and a second block-move instruction for copying a series of sequential memory address contents from the external memory means to the second read/write memory, where in each of said first and second block move instructions the addresses for said series are generated from said program address means, and the destination addresses in said first or second read/write memory are generated in said data memory address means when executing an instruction before the first block-move instruction.

4,713,749

MICROPROCESSOR WITH REPEAT INSTRUCTION

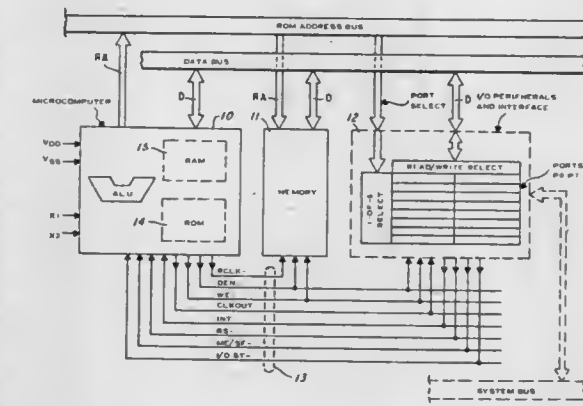
Surendar S. Magar, and Daniel L. Essig, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 12, 1985, Ser. No. 701,829

Int. Cl. G06F 13/00

U.S. Cl. 364-200

5 Claims



1. A microcomputer system comprising:
 - (A) a microcomputer device formed in a single integrated circuit and having data input/output terminals and address output terminals;
 - (B) memory means external to the microcomputer device having address input means and data output means;
 - (C) external address bus means coupled to the address output terminals of the microcomputer device, and coupled to the address input means of said memory means;
 - (D) external data bus means coupled to said data input/output terminals of the microcomputer device, and coupled to the data means and output means of the memory means;
 - (E) the microcomputer device comprising within said integrated circuit:
 - an arithmetic/logic unit having data input and data output;
 - read/write memory means having an address input and having data input/output means;
 - a plurality of data address means connected to said address input of said read/write memory means for storing destination addresses specified by an instruction word;
 - internal data bus means coupled to the data input and data output of the arithmetic/logic unit and coupled to said data address means and to said data input/output means of said read/write memory means;
 - program address means connected to said address input of said read/write memory means;
 - internal program bus means coupled to said data input/output means of said read/write memory means, to

said data input/output terminals, and coupled to said program address means;

control means having an input coupled to said program bus means to receive instruction words, said control means having outputs coupled to said arithmetic/logic unit, coupled to said internal data bus and program bus means, coupled to said program address means, and coupled to said data address means; said control means generating microcontrol signals on said outputs of the control means in response to said instruction words, the microcontrol signals defining operation of the arithmetic/logic unit and controlling the transfers to and from the internal data bus means and the internal program bus means; said instruction words being selected from an instruction set, said control means including means for storing a repeat count;

said control means including means for executing a "repeat" instruction followed by an instruction word selected from said instruction set, to cause said selected instruction word following said "repeat" instruction to be executed a number of times defined by a number contained in said "repeat" instruction and stored by said means for storing a repeat count; said selected instruction word storing data from said external memory means in said read/write memory means at said destination addresses contained in said data address means.

4,713,750

MICROPROCESSOR WITH COMPACT MAPPED PROGRAMMABLE LOGIC ARRAY

Nail G. Damouny, Sunnyvale; Min-Siu Huang, Mountain View; Dan Wilnai, Sunnyvale, and Yeshayahu Mor, Cupertino, all of Calif., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

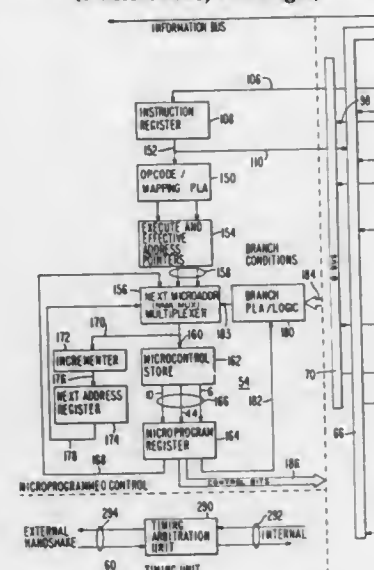
Continuation-in-part of Ser. No. 481,061, Mar. 31, 1983, Pat. No. 4,573,118. This application Oct. 30, 1984, Ser. No. 666,215

Int. Cl. G06F 9/22

U.S. Cl. 364-200

MICROFICHE APPENDIX INCLUDED (8 Microfiche, 433 Pages)

6 Claims



1. In a microprocessor having an ALU and an information bus:
 - a single programmable logic array containing a plurality of microcode addresses for different types of operations;
 - an instruction register connected to provide inputs to said programmable logic array;
 - a multiplexer connected to provide inputs to said instruction register, said multiplexer receiving inputs from an external

console connected to said information bus and from said ALU.

4,713,751

MASKING COMMANDS FOR A SECOND PROCESSOR WHEN A FIRST PROCESSOR REQUIRES A FLUSHING OPERATION IN A MULTIPROCESSOR SYSTEM

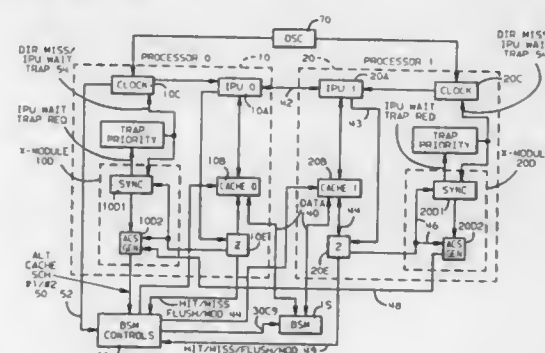
Patrick F. Dutton, Eadicott, and Earl W. Jackson, Jr., Apalachin, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1984, Ser. No. 664,283

Int. Cl. G06F 13/32

U.S. Cl. 364-200

5 Claims



1. A multiprocessor system comprising:
 - a memory;
 - a first processor connected to said memory, said first processor storing data therein;
 - a first command status register connected to said first processor, said first command status register for storing normal command information for the execution of instructions by said first processor and flushing command information for the execution of instructions by a second processor;
 - said second processor connected to said memory and to said first processor, said second processor requiring access to said data in said first processor to execute an instruction, said second processor causing said first processor to store flushing command information in said first command status register upon the detection of said data in said first processor;
 - a second command status register connected to said second processor, said second command status register storing normal command information for the execution of instructions by said second processor;
 - a memory control circuit connected to said memory, said first and said second processor, and said first and said second command status registers, said memory control circuit transferring data between said memory and said first processor in response to said normal command information in said first command status register during the execution of instructions by said first processor, and flushing said data in said first processor to said memory and masking normal command information in said second command status register in response to said flushing command information in said first command status register during the execution of instructions by said second processor.

4,713,752

BUFFER STORAGE SYSTEM

Hirosada Tone, Fuchu, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

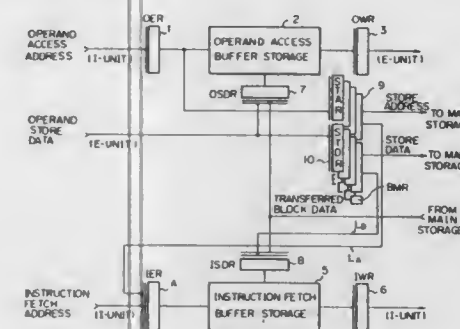
Filed Dec. 5, 1984, Ser. No. 678,684

Claims priority, application Japan, Dec. 7, 1983, 58-231104

Int. Cl. G06F 9/36

U.S. Cl. 364-200

14 Claims



1. A buffer storage system operatively connected with an instruction unit, an execution unit, and a main storage to set up a pipeline processor, comprising:
 - operand access buffer means for storing operand data accessed by an operand store address or an operand fetch address from said instruction unit and transferring the accessed operand data therefrom to said execution unit;
 - instruction fetch buffer storage means for storing instruction data accessed by an instruction fetch address from said instruction unit and transferring the accessed instruction data to said instruction unit;
 - feedback register means, operatively connected to said operand access buffer storage means, for temporarily storing the operand store address and the operand data and comprising store address register and store data registers, activated during an operand store operation, wherein said operand store address and corresponding operand data, respectively, sent from said execution unit are buffered and then transferred to said main storage by said information register means to provide a store-through method; and
 - feedback means, operatively connected between said feedback register means and said instruction fetch storage means, for applying the buffered operand store address and operand data, temporarily stored in said store address registers and said store data registers, respectively, to said instruction fetch buffer storage.

4,713,753

SECURE DATA PROCESSING SYSTEM ARCHITECTURE WITH FORMAT CONTROL

William E. Boebert, and Richard Y. Kain, both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 21, 1985, Ser. No. 703,638

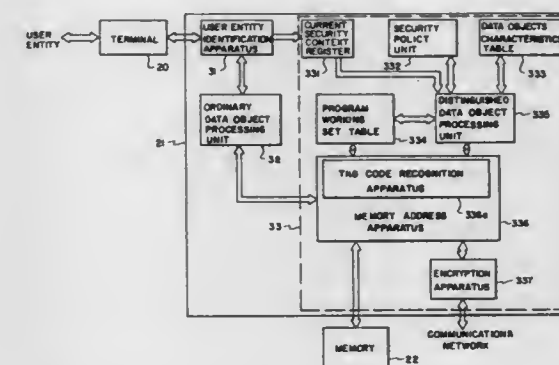
Int. Cl. G06F 1/00; H04L 9/00

U.S. Cl. 364-200

17 Claims

1. A data processing system having protected system files, wherein each protected system file is associated with a data format and wherein said data processing system operates in response to programs or groups of programs which perform specific tasks, comprising:
 - identification means for identifying a user interacting with said data processing system, said identification means relating preselected security attributes with said user; and
 - secure processor, connected to said identification means, for storing, at least temporarily, a security policy and for processing data in accordance with said security policy, said security policy defining permissible access rights to said protected system files in terms of possible values of data formats, possible values of said preselected security

attributes and functions of said specific tasks, wherein data stored in said secure processor can be altered only by a director entity of said data processing system and retrieved only by portions of said secure processor, said secure processor having generating means for generating an access rights signal for any one of said protected system



files, said access rights signal being determined by a comparison of said security policy to said predetermined security attributes, said data format associated with said any one of said protected system files and any functions to be performed with or upon said any one of said protected system files.

4,713,754

DATA STRUCTURE FOR A DOCUMENT PROCESSING SYSTEM

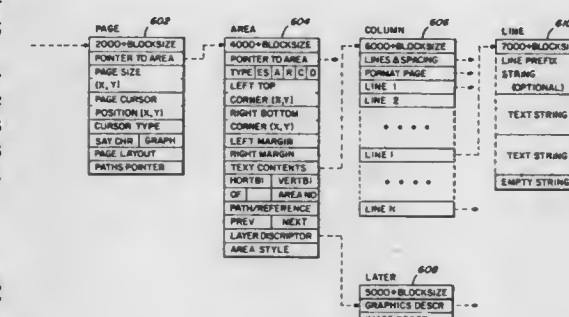
Arun K. Agarwal, Chelmsford; Suzanne C. Knapp, Lowell, and David R. Lakness, Chelmsford, all of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Oct. 9, 1984, Ser. No. 658,952

Int. Cl. G06F 15/40; 7, 00, 12/00

U.S. Cl. 364-200

12 Claims



1. In a document processing system including a memory means operable for storing therein data representative of information appearing in a document and a CPU means coupled to the memory means for storing and retrieving the document data therein, the CPU means further being operable for storing within the memory means and for processing therein data representative of information appearing in the document, a method of storing within and retrieving from the memory means data representing information appearing in a document, comprising the steps of:
 - for each document, storing within the memory means data representing a page block for defining at least one page,
 - for each page, storing within the memory means data representing an area block for subdividing the page into one or more contiguous and nonoverlapping areas, wherein each area contains at least one type of information, in an area containing text information,

storing within the memory means data representing a column block for defining at least one column for containing text information,
for each column, storing within the memory means data representing a line block for defining at least one line, and for each line, storing a string of at least one text character, storing within the memory means data representing information for defining attributes applying to the characters of the string, and
storing within the memory means data representing information for defining external data items associated with the line.

4,713,755

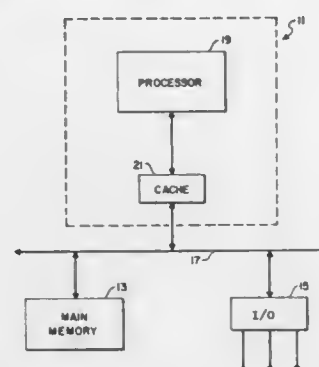
CACHE MEMORY CONSISTENCY CONTROL WITH EXPLICIT SOFTWARE INSTRUCTIONS

William S. Worley, Jr.; William R. Bryg, both of Saratoga, and Allen Baum, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 28, 1985, Ser. No. 750,381
Int. Cl.⁴ G06F 12/08

U.S. Cl. 364-200

5 Claims



1. A computer system having a multi-level memory hierarchy and means for maintaining the integrity of blocks of information stored at different levels in the hierarchy, comprising:
a processor for executing instructions and processing data, said processor executing a set of instructions for providing explicit control of the transfer of blocks of data between levels of the memory hierarchy;
memory for storing instructions and data;
an I/O channel connected to the memory for transferring data and instructions into and out of the memory;
a cache connected between the processor and the memory for storing selected blocks of information from the memory for use by the processor, and having associated with each stored block a valid status flag and a dirty status flag; and
an operating system resident in memory and accessible by the processor, containing the instructions in the instruction set, for causing the execution of certain of the instructions from the instruction set to ensure the consistency of the information stored in the cache with the information transferred into and out of memory.

4,713,756

NON-VOLATILE MEMORY DEVICE FOR A PROGRAMMABLE CONTROLLER

Ralph E. Mackiewicz, Madison Heights, and Michael A. Kuhn, Royal Oak, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

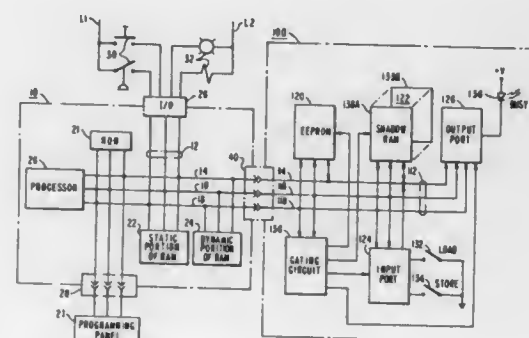
Filed Feb. 28, 1985, Ser. No. 706,571
Int. Cl.⁴ G06F 1/00, 13/00

U.S. Cl. 364-200

14 Claims

1. In a programmable controller including a data bus having data, address and control lines and having connected thereto a processor, input device means in communication with the processor via the data bus and external input devices for trans-

mitting information from external input devices to the processor, output device means in communication with the processor via the data bus and external output devices for transmitting information from the processor to the external output devices, volatile memory means for containing static information including a control program for controlling the outputs dependent on the status of the inputs and dynamic information including the status of timers and counters, and an external interface, a nonvolatile memory device for retaining the static and dynamic information contained in the volatile memory when the programmable controller is deenergized, comprising:
a memory device data bus having data, address, and control lines;
interface connection means in connection with the memory device data bus for removably attaching the memory device to the external interface of the programmable controller thereby connecting the memory data bus to the programmable controller data bus when the memory device is so attached;
controllable nonvolatile random access memory (RAM) means connected to the memory device data bus for storing information received via the memory device data bus, the nonvolatile RAM means retaining the information contained therein during the periods of time when the programmable controller is deenergized;



controllable input port means connected to the memory device data bus for receiving external signals including a LOAD signal for the leading of information contained in the nonvolatile RAM means into the processor and a STORE signal for the writing of information from the processor into the nonvolatile RAM means of the memory device, the LOAD signal and the STORE signal being transmitted to the processor on the occurrence thereof;
controllable output port means connected to the memory device data bus for providing a BUSY indicator when information is being transferred between the memory device and the central processor; and
gating circuit means responsive to the processor with the nonvolatile RAM means, the input port means, and the output port means being responsive to the gating circuit means, when enabled by the processor the gating circuit means:

- controlling the direction of information flow into and out of the nonvolatile RAM means in response to the occurrence of the STORE signal and the LOAD signal, respectively;
- enabling the output port means to provide the BUSY signal; and
- disabling the input port means until the transfer of information between the memory device and the programmable controller has been completed.

4,713,757

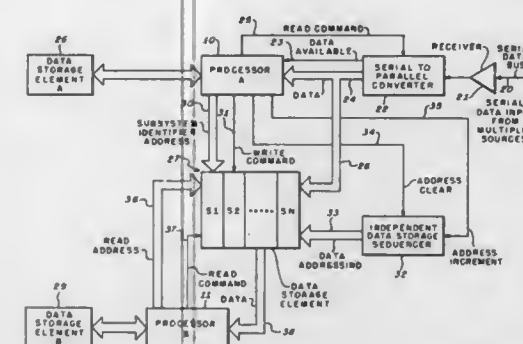
DATA MANAGEMENT EQUIPMENT FOR AUTOMATIC FLIGHT CONTROL SYSTEMS HAVING PLURAL DIGITAL PROCESSORS

Dale D. Davidson, and Douglas G. Endrud, both of Glendale, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 11, 1985, Ser. No. 743,535
Int. Cl.⁴ G06F 11/16

U.S. Cl. 364-200

9 Claims



1. Data management apparatus for an automatic flight control system having at least first and second digital data processor means, said first and second processor means including respective first and second data storage means, said system including sensor means for providing data signals to said first and second processor means for storage in said respective first and second data storage means, said apparatus comprising means for conveying said data signals from said sensor means to data bus means,
first data path means for directing said data signals from said data bus means to said first processor means for storage in said first data storage means,
independent data storage means,
second data path means for directing said data signals from said data bus means to said independent data storage means for storage therein,
independent address generator means for providing addresses to said independent data storage means at which to store said data signals, and
means for transfer directing said data signals stored in said independent data storage means to said second processor means for storage in said second data storage means.

4,713,758

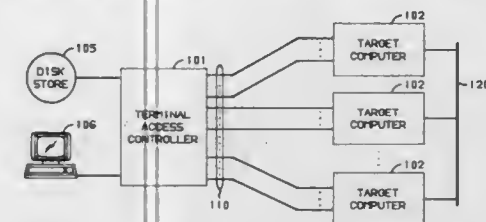
COMPUTER TESTING ARRANGEMENT

Nergal R. De Kelaita, Skokie; Joe T. Hall, Winfield, and Barrie D. Kletscher, Plainfield, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 29, 1985, Ser. No. 728,671
Int. Cl.⁴ G06F 11/00

U.S. Cl. 364-200

21 Claims



1. A computer testing arrangement comprising:
a plurality of test set ports;
a first and second memory queue;
a plurality of data storage files;
means for transferring data messages from said test set ports to said first memory queue;
means for reading and examining messages from said first

queue and for storing messages read from said first queue into said second queue together with a message designation indicative of message type;
means for transferring data messages having a first predetermined message designation from said second queue to a first one of said data storage files and for transferring data messages having another predetermined message designation from said second queue to another of said data storage files.

4,713,759

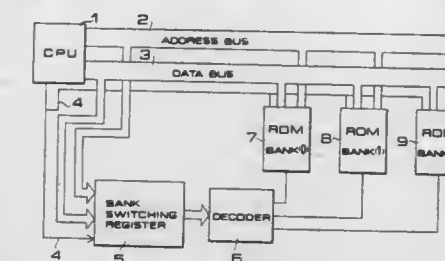
MEMORY BANK SWITCHING APPARATUS

Hideaki Yamagishi, and Tetsuro Oshimi, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,252
Claims priority, application Japan, Jan. 27, 1984, 59-12993
Int. Cl.⁴ G06F 12/06

U.S. Cl. 364-200

3 Claims



1. A memory bank switching apparatus comprising: an address bus, a data bus and a control line; a plurality of memory banks consisting of ROMs and storing mutually different programs therein connected in parallel to said address bus, said data bus and said control line; a CPU for feeding an address signal to said address bus and a write control signal to said control line and for transmitting and receiving a data signal over said data bus; and a bank switching register connected to said CPU through said address bus, said data bus and said control signal line; said bank switching register, when addressed by said address bus, being responsive to the write control signal for storing therein a number corresponding to a selected one of said memory banks from said data bus; and said bank switching register being connected to said memory banks for enabling the selected memory bank and for disabling the non-selected memory bank or banks.

4,713,760

TRANSACTION PROCESSING SYSTEM FOR SEPARATE REGISTRATION AND SETTLEMENT FUNCTIONS

Kazutoshi Yamada, Nagaokakyo, and Takao Yamaguchi, Joyo, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 11, 1985, Ser. No. 743,398
Claims priority, application Japan, Jun. 11, 1984, 59-120497
Int. Cl.⁴ G06F 15/20

U.S. Cl. 364-405

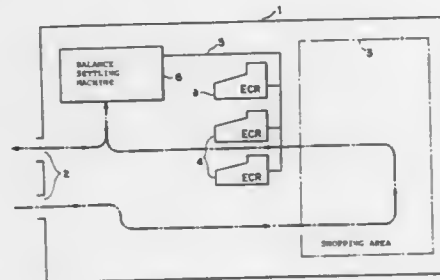
8 Claims

1. A transaction processing system comprising an electronic cash register machine and a balance settling machine,
(1) said electronic cash register machine including:
input means for entering at least the figures representing the prices for the items or services purchased by a customer and the actual amount of money temporarily paid by the customer for the purchased items or services;
storage means for holding at least the cumulative records of the figures for the purchased items or services as entered from the input means;
arithmetic and logic means responsive when the amount of money as received is actually entered from the input means, for determining whether there is any outstanding

balance of money to be returned, by comparing the actual amount of money and the cumulative figure records stored in the storage means and for calculating those two different data to find a balance data if the actual amount of money is greater than the total amount of the cumulative figure records;

first read/write means for writing an identifier code for identifying a particular customer onto a new recording medium to be handed to the particular customer and issuing the same recording medium, or for reading an existing recording medium containing the existing identifier code previously recorded; and

data transmit means responsive when the balance calculation actually occurs within the arithmetic and logic means, for delivering to the balance settling machine the cumulative figure records stored in the storage means together with the customer's identifier code, as well as the balance data if it is determined by the arithmetic and logic means that there is the outstanding balance of money to be returned; and



(2) said balance settling machine including:
second read means responsive when the customer actually inserts either of the recording mediums, for reading the identifier code contained in the recording medium;
receive means for accepting the data sent from the data transmit means within the electronic cash register machine;
print means responsive when the second read means actually reads the identifier code from the recording medium, for printing out the data associated with the particular customer's identifier code and accepted by the receive means on print medium and issuing a receipt slip; and
change deliver means responsive when the second read means actually reads the identifier code from the recording medium, for determining whether the data accepted by the receive means contains the balance data and delivering the balance of money equivalent to the balance data if it is determined that it is contained.

4,713,761

SYSTEM FOR CENTRALIZED PROCESSING OF ACCOUNTING AND PAYMENT FUNCTIONS

Murem S. Sharpe, Stamford; Eugene Bryson, Redding; Flavio Mandley, Woodbury; Eben M. Riordan, II, Southport, and Brian D. Flesser, Norwalk, all of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Filed Jul. 18, 1985, Ser. No. 756,420

Int. Cl. G06F 15/24

U.S. Cl. 364-406

16 Claims

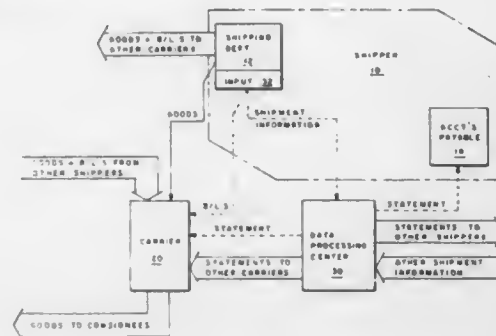
1. A system for accounting for Transaction costs comprising:

- input means for inputting Item Information and for producing Transaction Information in accordance with said Item Information, said input means being located at the premises of a buyer;
- data processing means responsive to said Transaction Information for:
 - (b1) maintaining accounts for said buyer and a group of sellers consisting of at least one seller;
 - (b2) determining Transaction costs and identifying a seller

from said group in accordance with said Transaction Information;

(b3) debiting said account of said buyer for the amount of said Transaction costs and crediting said account of said identified seller with said amount;

(b4) generating statements of their account for said buyer and said group of sellers; and,



(b5) after debiting said buyer's account said data processing system determining if additional funds are needed to cover said Transaction costs and, if so, generating an output to said buyer advising said buyer of the need for additional funds; and,

(c) communications means for transmitting said Transaction Information from said input means to said data processing means.

4,713,762

VEHICLE-MOUNTED ELECTRONIC DISPLAY GAUGE BOARD WITH SERIAL DATA TRANSFER

Osamu Igarashi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

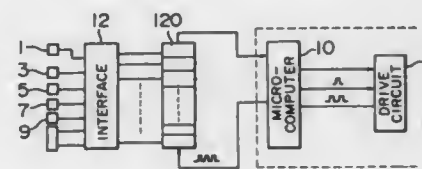
Filed Jun. 11, 1984, Ser. No. 619,377

Claims priority, application Japan, Jun. 13, 1983, 58-105257

Int. Cl. G06F 15/20

U.S. Cl. 364-424

3 Claims



1. A vehicle-mounted electronic display gauge board comprising:

- a display device for mounting in a vehicle and having a substrate which has an extended portion;
- a microcomputer mounted on said extended portion of said substrate and having an input for receiving external data representing various conditions and an output for producing information;
- a display drive circuit mounted on said extended portion of said substrate for driving said display device in response to the information from said microcomputer;
- a first terminal mounted on said extended portion of said substrate for outputting an instruction from said microcomputer;
- a second terminal mounted on said extended portion of said substrate for inputting said external data through serial transfer into said microcomputer in response to said instruction; and
- transmitting means for transmitting said instruction from said first terminal and for transmitting said external data to said second terminal, said transmitting means including

photo-electric converting means for converting the instruction from said first terminal into a light signal and for converting a light signal representing said external data into an electric signal to be applied to said second terminal, and an optical fiber for transmitting said light signal representing said instruction from said photoelectric converting means and for transmitting said light signal representing said external data to said photo-electric converting means;

wherein said photo-electric converting means includes a photo diode for converting the instruction from said first terminal into said light signal, a photo transistor for converting said light signal representing said external data into said electric signal to be applied to said second terminal, a first connector terminal connected to the input of said photo diode and adapted to be connected to said first terminal, a second connector terminal connected to the output of said photo transistor and adapted to be connected to said second terminal, and a connector for accommodating said photo diode, photo transistor, and first and second connector terminals therein, and

wherein an end portion of said optical fiber is divided into two parts and accommodated in said connector body, the divided two parts being optically coupled with said photo transistor and said photo diode in said connector body, respectively.

4,713,763

REGULATING APPARATUS WHICH INFLUENCES A MIXTURE-FORMING INSTALLATION OF AN INTERNAL-COMBUSTION ENGINE OF A MOTOR VEHICLE

Rainer Hofmann, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

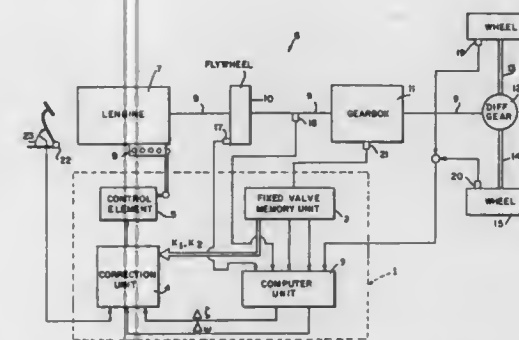
Filed Feb. 6, 1985, Ser. No. 698,797

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 3404154

Int. Cl. B60K 41/04

U.S. Cl. 364-424.1

3 Claims



1. In a vehicle having an engine, an explosive-mixture forming device such as a carburetor or injection system, deflectable accelerator pedal means for controlling the speed of the engine, a drive train including a drive shaft, a flywheel on the drive shaft, a gearbox having a plurality of gear stages, and a wheel assembly having at least one driven wheel, the improvement comprising:

- first sensor means for detecting deflection of the accelerator pedal means,
- second sensor means for detecting an angular velocity of the flywheel,
- third sensor means for detecting the torque of the drive shaft,
- fourth sensor means for detecting an angular velocity of the at least one driven wheel of the wheel assembly,
- fifth sensor means for detecting the identity of the gear stage in use in the gearbox, and
- feedback control means for attenuating vibration in the

vehicle drive train, the feedback control means including data processing means for receiving information from the first, second, third, fourth, and fifth sensor means and for monitoring vibrations in the drive train, and regulator means for controlling the explosive-mixture forming device to vary the quantity of explosive-mixture formed to vary thereby the torque of the engine so that vibration due to torsional rigidity of the drive train is lessened substantially,

wherein the data processing means includes a read-only memory unit, responsive to a parameter detected by the fifth sensor means, for supplying auxiliary control parameters including a parameter related to the angular velocity and torque of the drive shaft, a parameter related to the angular velocity of the at least one driven wheel, and a parameter related to a difference in the angular velocity and an angle of twist of the drive train, the control parameters supplied by the read-only memory unit being functionally related to the identity of the gear stage in use in the gearbox as detected by the fifth sensor means so that the control parameters are variable in response to a change in the gear stage, and

wherein the read-only memory unit supplies a plurality of additional auxiliary control parameters including a parameter related to the torsional rigidity of the drive train as a function of the gear stage in use in the gearbox.

4,713,764

TRANSMISSION CONTROL APPARATUS AND METHOD FOR VEHICLE TRAVELING UPHILL OR DOWNHILL

Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

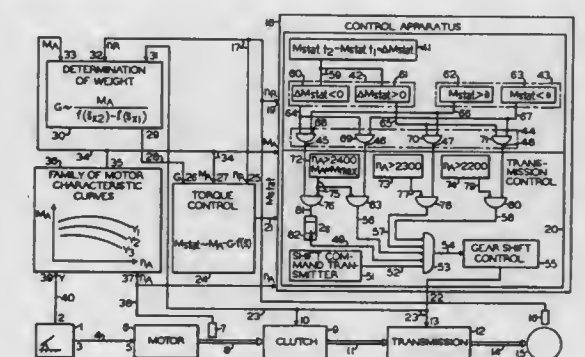
Filed Sep. 25, 1984, Ser. No. 654,607

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334726

Int. Cl. B60K 41/06, 41/28; G05D 13/64

U.S. Cl. 364-424.1

18 Claims



1. An on vehicle apparatus to determine the grade of a roadway as such vehicle traverses such roadway, said apparatus comprises:

- a means positioned on such vehicle for determining a constant speed drive torque (M_{stat}) of such vehicle and for generating a first signal value representative of M_{stat} ; and
 - a means connected to receive said first signal for comparing said value of said first signal with a value that is substantially equal to an M_{stat} of such vehicle on a substantially level roadway ($M_{stat}=a$), and for generating a second signal having a value that is representative of an uphill roadway grade when said value of M_{stat} is greater than $M_{stat}=a$, and for generating a third signal having a value that is representative of a downhill roadway grade when said value of M_{stat} is less than $M_{stat}=a$.
11. A method for determining the grade of a roadway as a

vehicle traverses such roadway, said method comprising the steps of:

- generating a first signal having a value that is representative of a constant speed drive torque (M_{stat}) of such vehicle;
- comparing said value of said signal generated in step (a) with a value that is substantially equal to an M_{stat} of such vehicle on a substantially level roadway ($M_{stat=a}$);
- generating a second signal having a value that is representative of an uphill roadway grade when said value of M_{stat} is greater than $M_{stat=a}$;
- generating a third signal having a value that is representative of a downhill roadway grade when said value M_{stat} is less than $M_{stat=a}$;
- inputting said second signal generated in step (c) and said third signal generated in step (d) into a transmission control of such vehicle; and
- controlling appropriate gearshift changes in response to said second signal and said third signal inputted to said transmission control in step (e).

4,713,765

CONTROL SYSTEM FOR AN ENGINE HAVING AN AIR INTAKE PASSAGE

Tomoaki Abe, Nagoya; Hideya Fujisawa; Norio Omori, both of Kariya; Masumi Kinugawa, Okazaki; Katsunori Ito, Aichi; Susumu Akiyama, Kariya; Tiaki Mizuno, Toyota, and Toshitaka Yamada, Nagoya, all of Japan, assignors to Nippon-denso Co., Ltd., Kariya, Japan

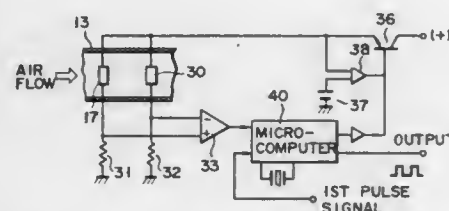
Filed Feb. 21, 1985, Ser. No. 704,032

Claims priority, application Japan, Feb. 24, 1984, 59-33595; Mar. 7, 1984, 59-43701; Mar. 7, 1984, 59-43702; Apr. 11, 1984, 59-72188; Apr. 16, 1984, 59-76267

Int. Cl. F02M 51/00; G01F 1/68

U.S. Cl. 364-431.05

12 Claims



- A control system for an engine having an air intake passage, comprising:
 - means for generating a first pulse signal at every predetermined angular rotation of said engine;
 - means disposed in said air intake passage for generating heat in accordance with an electric current supplied thereto and for measuring the temperature of itself;
 - means for detecting the temperature of air passing through said air intake passage;
 - means for establishing a reference temperature in accordance with the air temperature detected by said air temperature detecting means;
 - means for comparing the temperature of said heat generating means with the reference temperature established by said reference establishing means, said comparing means generating an output signal when the temperature of said heat generating means is higher than the reference temperature;
 - means for generating a second pulse signal having a period starting from the first pulse signal and ending with an output of said comparing means indicating that the temperature of said heat generating means attains the reference temperature, the period of said second pulse signal being indicative of an amount of air sucked into said engine per the predetermined angular rotation of said engine;
 - means for supplying said heat generating means with the

electric current during the period of said second pulse signal so that said heat generating means generates heat during said second pulse signal and dissipates heat thereafter; and

means for supplying said engine with fuel in accordance with the period of said second pulse signal.

4,713,766

METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

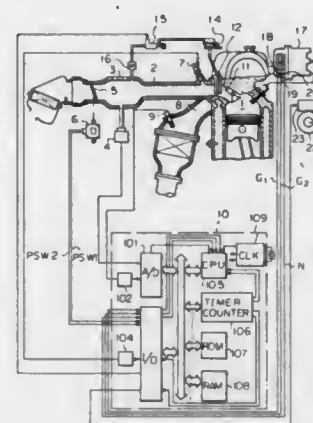
Nobuyuki Kobayashi; Takashi Hattori, both of Toyota; Katsunori Yagi, Toyoake, and Toshimitsu Ito, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 6, 1985, Ser. No. 730,581

Claims priority, application Japan, May 7, 1984, 59-089242 Int. Cl. F02D 5/02

U.S. Cl. 364-431.05

12 Claims



- A method for controlling the air-fuel ratio in an internal combustion engine having a throttle valve therein comprising the steps of:
 - determining whether or not the opening of said throttle valve reaches a definite value;
 - fetching a parameter of said engine as a first value showing the load thereof, when the opening of said throttle valve reaches said definite value;
 - calculating a second value of said parameter of said engine, smaller than said first value;
 - determining whether or not said parameter of said engine reaches said second value;
 - calculating whether a first state is set by the opening of the throttle valve reaching said definite value and whether a second state is set by said parameter of said engine reaching said second value;
 - calculating an air-fuel ratio in response to said first and second states; and
 - controlling the air-fuel ratio of said engine so that it is brought close to said calculated air-fuel ratio.
- An apparatus for controlling the air-fuel ratio in an internal combustion engine having a throttle valve therein, comprising:
 - means for determining whether or not the opening of said throttle valve is smaller than a definite value;
 - first switch means which is in an on-state only when the opening of said throttle valve is equal to or larger than said definite value;
 - second switch means which is turned on by the turning-on of said first switch means;
 - means for fetching a parameter of said engine as a first value showing the load thereof when said first switch means is turned on;
 - means for calculating a second value of said parameter of said engine smaller than said first value;

means for determining whether or not said parameter of said engine is smaller than said second value;

means for turning off said second switch means, when the opening of said throttle valve is smaller than said second value;

calculating a target air-fuel ratio in response to said second switch means; and

means for controlling the air-fuel ratio of said engine so that it is brought close to said target air-fuel ratio.

4,713,767

APPARATUS FOR CALCULATING POSITION OF VEHICLE

Akira Sato; Kazuo Sato; Takaharu Saito; Junkoh Shima; Kansei Mizutani, and Toshimasa Mikawa, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

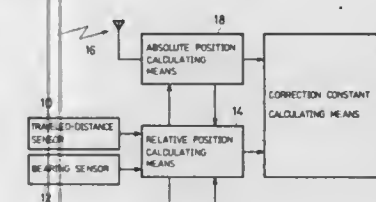
Filed May 6, 1985, Ser. No. 730,572

Claims priority, application Japan, May 9, 1984, 59-92590; Nov. 13, 1984, 59-239246

Int. Cl. G06F 15/50

U.S. Cl. 364-453

21 Claims



- A vehicle position calculating apparatus comprising:
 - traveled-distance sensor means for detecting a distance traveled by a vehicle;
 - bearing sensor means for detecting a vehicle advancing direction;
 - relative position calculating means for calculating a relative vehicle position with respect to a reference position, using an inertial navigation method employing the traveled distance detected by said traveled-distance sensor means and the vehicle advancing direction detected by said bearing sensor means;
 - absolute position calculating means for calculating an absolute vehicle position on the basis of a plurality of sets of fixed-station absolute position information and radio wave arrival direction information which are obtained in succession from a radio wave transmitted from at least one fixed station and the relative vehicle positions calculated by said relative position calculating means, at a plurality of points where the respective sets are obtained, the calculated absolute vehicle position being employed as a new reference position;
 - correction factor calculating means for calculating a correction factor on the basis of a relationship between the absolute vehicle position obtained by said absolute position calculating means and the relative vehicle position corresponding to the absolute vehicle position and obtained by said relative position calculating means; and
 - present vehicle position calculating means for calculating a present vehicle position by correcting a relative vehicle position with respect to said new reference position, using said correction factor.

4,713,768

METHOD OF LOCALIZING A MOVING BODY

Michitaka Kosaka, Sagami-hara; Katsumi Kawano, Fuchu, and Shoji Miyamoto, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

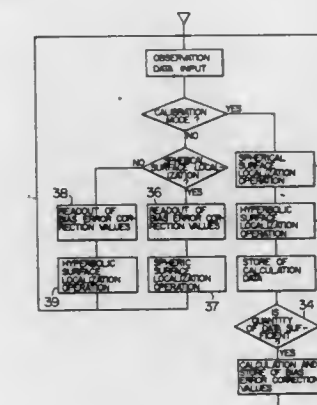
Filed Jan. 29, 1985, Ser. No. 696,077

Claims priority, application Japan, Feb. 20, 1984, 59-28533; Jul. 11, 1984, 59-142284

Int. Cl. G01C 15/20; G01S 3/02

U.S. Cl. 364-460

14 Claims



- A method of localizing a moving body using a localization system having a plurality of sensors disposed at different places for receiving energy of radiation, such as acoustic waves, electromagnetic waves, etc., emitted by the moving body, and a moving body localization calculation device connected to said plurality of sensors, said method comprising the steps of:
 - estimating the emission time of the radiation emitted by said moving body using the hyperbolic surface localization method,
 - estimating locations of said moving body using at least the spherical surface localization method, based on the estimated emission time of the radiation emitted by said moving body, and
 - calculating a location of said moving body on the basis of reception times of the radiation by said plurality of sensors and the locations of said moving body estimated by the spherical surface localization method.

4,713,769

METHOD AND APPARATUS FOR LOCATING AND DISPLAYING HISTORICAL INFORMATION WITHIN AN ELECTRONIC POSTAGE METER

Karen F. Hills, Norwalk, and Howell A. Jones, Southport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 11, 1985, Ser. No. 774,775

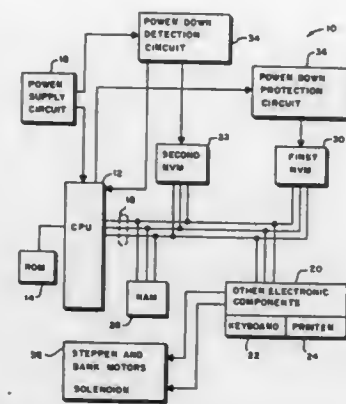
Int. Cl. G06F 15/20; G06G 7/48

U.S. Cl. 364-464

4 Claims

- A method for locating a most recently written record in an electronic postage meter including the steps of:
 - providing a first non-volatile memory (NVM) capable of storing accounting data which represents the postage meter transactions;
 - updating the first NVM in real time for each postage transaction to provide a current record of the accounting data for each postage transaction on-the-fly;
 - providing a second non-volatile memory (NVM) capable of storing accounting data representing the postage meter-transactions existing at a down cycle of the postage meter;
 - detecting a fatal state of the meter, said fatal state allowing programmed access to said first NVM;
 - locating information in the second NVM;
 - utilizing the information in the second NVM to locate a written transaction within the first NVM that represents

the most recently written record in the electronic postage meter; and



displaying the most recently written record in response to an external message.

4,713,770

SYSTEM AND METHOD FOR PREVENTING TOOL BREAKAGE

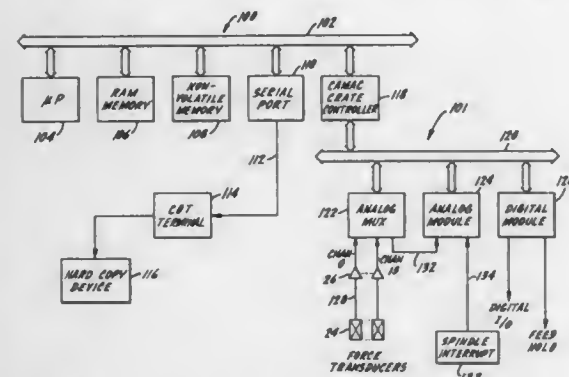
Michael L. Hayes, Chicago; Paul S. Mahr, Lockport, and John W. Tipple, Naperville, all of Ill., assignors to Kinetic Systems Corporation, Lockport, Ill.

Filed Apr. 19, 1985, Ser. No. 725,038

Int. Cl.⁴ G06F 15/46; G05B 19/18

U.S. Cl. 364-474

10 Claims



6. In an apparatus for the detection of worn or broken machine tools, the apparatus including a number of machine tools, machine tool drive means capable of serially applying machine tools to a workpiece in a number of machining steps constituting a machining operation, means translating a force applied by any machine tool to the workpiece into a signal, means transmitting the signal, automatic calculator means capable of selecting and receiving said signal and capable of commanding the machine tool drive means to cease applying a machine tool to the workpiece, the improvement comprising:

memory means associated with the machining step automatic calculator means, the memory means capable of storing for each a worn tool limit factor, a broken tool force limit, a learn cycle force limit, a first array of force value members derived from the receipt and periodic processing of said signal by the automatic calculator means for a first workpiece and subsequent arrays of force value members derived in a like manner for subsequent workpieces; the automatic calculator means comparing for each machining step each member of said first force value array to the learn cycle force limit for that machining step, the automatic calculator means commanding the machine tool drive means to cease applying a corresponding machine

tool to the workpiece in the event that any member of said first force value array exceeds said learn cycle force limit; the automatic calculator means for each machining step determining a largest member of said first force value array, using said largest member and a previously stored worn tool limit factor to obtain the worn tool force limit for that machining step;

the automatic calculator means, for each machining step, using said largest member of a force value array for a current workpiece and a previously stored broken tool limit factor to obtain as the broken tool force limit for that machining step as applied to the next workpiece;

the automatic calculator means, for each machining step as applied to any subsequent workpiece, receiving and periodically processing said signal into a corresponding subsequent array of force values;

the automatic calculator means comparing each member of the last said subsequent array to said worn tool force limit and a current broken tool force limit for that machining step, and commanding said machine tool drive means to cease applying the corresponding machine tool to said subsequent workpiece in the event that any member of the last said subsequent array exceeds the worn tool force limit or the current broken tool force limit for that machining step.

4,713,771

DIGITAL MINIMUM-MAXIMUM VALUE SEQUENCE PROCESSOR

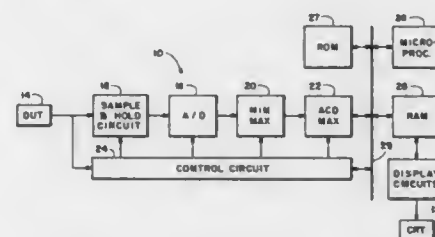
Roland E. Crop, Banks, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 28, 1985, Ser. No. 791,677

Int. Cl.⁴ G06F 15/20

U.S. Cl. 364-487

9 Claims



1. The method of displaying a representation of the amplitude variations of an analog signal, the method comprising the steps of:

- determining the minimum and maximum magnitudes of the signal during each of a plurality of successive measurement periods;
- comparing at least one of said maximum and minimum magnitudes associated with a selected one of said measurement periods to at least one of said maximum and minimum magnitudes associated with another of said measurement periods; and
- displaying a vector on a screen, said vector representing the amplitude variation of said analog signal during said selected measurement period, said vector having a first endpoint position on said screen displaced along a first screen axis according to the maximum magnitude determined for said selected measurement period and a second endpoint position on said screen displaced along said first axis according to the minimum magnitude determined for said selected measurement period, said endpoints being ordered along a second screen axis, orthogonal to the first screen axis, according to at least one said comparison

4,713,772

AUTOMATIC ON-LINE CHEMISTRY MONITORING SYSTEM HAVING IMPROVED CALIBRATION UNIT

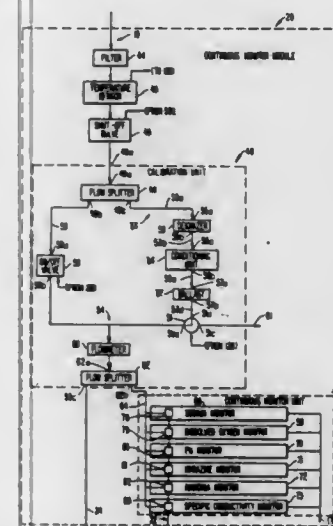
Gerald L. Carlson, Mt. Lebanon Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 18, 1985, Ser. No. 799,038

Int. Cl.⁴ G06F 15/46; G01N 1/16

U.S. Cl. 364-496

12 Claims



1. A system for automatic, continuous online monitoring of power plant steam cycle water at any of a plurality of different points in the power plant steam cycle, comprising:

- means for supplying, from at least a selected one of the plurality of points in the power plant steam cycle, a corresponding, selected influent fluid sample stream;
- for each selected influent fluid sample stream, a respectively associated continuous monitor module comprising:
- means for monitoring the temperature of the influent fluid sample stream and generating a corresponding temperature signal, and
- calibration means, including conditioning means for creating a pressure differential in the influent fluid sample stream from the second flow path and for utilizing the pressure differential to inject a mixed standard solution into the influent fluid sample stream to provide a conditioned influent fluid sample stream having predetermined chemical characteristics, and means selectively operable to establish the first and second fluid sample stream flow paths responsive to calibration actuation signals, the first flow path providing at least a portion of the influent fluid sample stream to said continuously monitoring means, and the second flow path providing the influent fluid sample stream to said conditioning means and at least a portion of the conditioned influent fluid sample stream to said continuously monitoring means;

means for receiving a fractional portion of each selected influent fluid sample stream and monitoring the cation conductivity thereof, and, in response thereto, generating a corresponding cation conductivity signal and providing a corresponding altered fluid sample stream from which cations have been removed;

ion chromatograph means for monitoring at least one chemical characteristic of each selected influent fluid sample stream and at least one selected chemical characteristic of the corresponding altered fluid sample stream responsive to a chromatograph actuation signal, and, in response to

said chromatograph actuation signal, generating corresponding first and second chromatograph signals; and control means, responsive to at least the temperature signal, the cation conductivity signal and the first and second chromatograph signals corresponding to each selected influent fluid sample stream, for calculating the cation conductivity of the respective, selected influent fluid sample stream using predetermined conductivity equations, comparing the calculated cation conductivity with the monitored cation conductivity for the respective influent fluid sample stream, and generating said calibration actuation signals and said chromatograph actuation signal responsive to said comparison, for supply to said respective continuous monitor module and said ion chromatograph means.

4,713,773

METHOD FOR DISTRIBUTING WIRE LOAD IN A MULTILAYER PACKAGE AND THE RESULTING PRODUCT

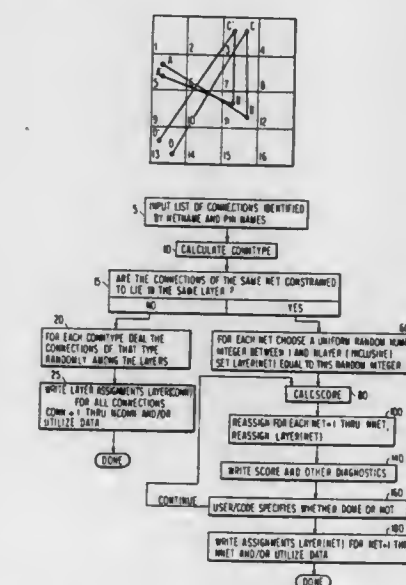
John F. Cooper, Saratoga, Calif.; Edward S. Kirkpatrick, Croton-on-Hudson, and Ralph Linsker, Scarsdale, both of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Aug. 10, 1984, Ser. No. 639,570

Int. Cl.⁴ G06F 15/32; 7/00

U.S. Cl. 364-491

12 Claims



1. In a multilayer interconnection board, a method for distributing connections comprising the steps of:

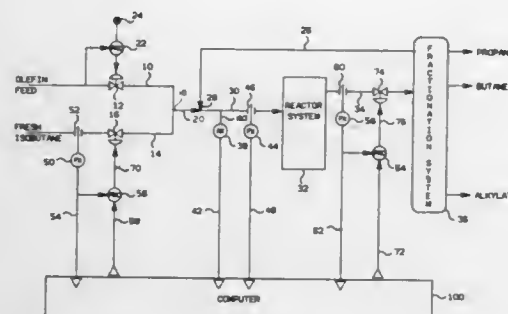
- reading connection data relating to the location of pins on the interconnection board at which the connections terminate;
- defining a connection type for each connection based on the locations of the pins of said connection; and
- distributing connections of one or more connection types among the layers of the interconnection board such that for each of these connection types, the difference between (i) the maximum number of connections of that type distributed to any layer and (ii) the minimum number of connections of that same type distributed to any layer is less than or equal to 1.

4,713,774

ALKYLATION REACTOR QUALITY CONTROL
 Gary L. Funk, and William B. Bard, both of Bartlesville, Okla.,
 assignors to Phillips Petroleum Company, Bartlesville, Okla.
 Filed Mar. 13, 1986, Ser. No. 839,245
 Int. Cl.⁴ G05D 11/13, 21/02

U.S. Cl. 364—500

9 Claims



1. Apparatus comprising:

- an alkylation reactor;
- a fractional distillation column means;
- means for withdrawing a mixture containing unreacted isoparaffin as a reactor effluent stream from said alkylation reactor, and for providing said reactor effluent stream as a feed to said fractional distillation column means wherein at least a portion of said unreacted isoparaffin is separated to form a predominately isoparaffin containing recycle stream;
- means for combining an isoparaffin-containing fluid stream with an olefin-containing fluid stream to form a combined isoparaffin and olefin stream;
- means for combining said recycle stream and said combined paraffin and olefin stream to form a combined feed stream and for providing said combined feed stream to said alkylation reactor;
- means for establishing a first signal representative of the desired isoparaffin-to-olefin ratio in said combined feed stream;
- means for establishing a second signal representative of the flow rate of said combined feed stream;
- means for establishing a third signal representative of the flow rate of said isoparaffin-containing fluid stream;
- means for establishing a fourth signal representative of the flow rate of said reactor effluent stream;
- analyzer means for detecting the concentration of olefin supplied through said combined feed stream, and for detecting the concentration of isoparaffin supplied through said combined feed stream, and for detecting the molecular weight of said combined feed stream;
- computer means responsive to said analyzer means and to said first, second, third and fourth signals for calculating a first control signal which is representative of the flow rate of said isoparaffin containing fluid stream required to maintain the actual isoparaffin to olefin ratio in said combined feed stream substantially equal to the desired isoparaffin to olefin ratio represented by said first signal, and for calculating a second control signal which is representative of the flow rate of said reactor effluent stream which will offset flow changes in said isoparaffin containing fluid stream by corresponding flow changes in said reactor effluent stream, whereby the liquid level in said alkylation reactor will be unaffected by changes in the flow rate of said isoparaffin containing fluid stream required to maintain the ratio represented by said first signal;
- means for manipulating the flow rate of said isoparaffin containing fluid stream in response to said first control signal, to thereby maintain the actual isoparaffin to olefin ratio in said combined feed stream substantially equal to the ratio represented by said first signal;
- means for manipulating the flow rate of said reactor effluent

stream in response to said second control signal, to thereby maintain the liquid level in said alkylation reactor essentially constant.

4,713,775

INTELLIGENT ASSISTANT FOR USING AND OPERATING COMPUTER SYSTEM CAPABILITIES TO SOLVE PROBLEMS

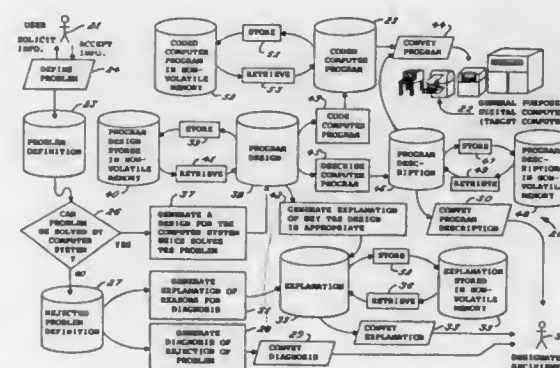
A. Carlisle Scott, Palo Alto; Jan E. Clayton, Los Altos Hills, both of Calif., and Jacques Garnier, Courbevoie, France, assignors to Teknowledge, Incorporated, Palo Alto, Calif. and Compagnie Generale de Geophysique, Colo.

Filed Aug. 21, 1985, Ser. No. 768,012

Int. Cl.⁴ G06F 15/20; G01V 1/28

U.S. Cl. 364—513

70 Claims



1. A computer system comprising, in combination, means for receiving a specification of a problem from a user, a memory having stored therein predefined knowledge about methods of solving problems relating to a certain problem area including knowledge about methods of employing certain capabilities of a target computer system to solve problems relating to said problem area, and means for using said predefined knowledge to determine whether it is impractical to design a computer program for said target computer system that uses said capabilities of said target computer system to solve the problem specified by said user, so that said problem specified by said user is rejected as inappropriate when it is impractical to design a computer program for using the capabilities of said target computer system to solve said problem.

4,713,776

SYSTEM FOR SIMULTANEOUSLY CODING AND DECODING A PLURALITY OF SIGNALS

Takashi Araseki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

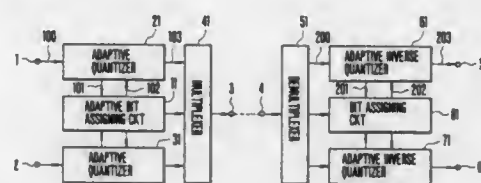
Filed May 16, 1984, Ser. No. 610,729

Claims priority, application Japan, May 16, 1983, 58-85293; May 19, 1983, 58-88007

Int. Cl.⁴ G10L 5/00

U.S. Cl. 364—513.5

8 Claims



1. A two channel simultaneous coding and decoding system comprising: an encoder unit including: first adaptive quantizing means inputted with a first digital

signal through a first channel for quantizing said first digital signal while sequentially updating its step size and outputting a first output signal and a first step size signal indicative of step size of said first adaptive quantizing means;

second adaptive quantizing means inputted with a second digital signal through a second channel for quantizing said second digital signal while sequentially updating its step size and outputting a second output signal and a second step size signal indicative of step size of said second adaptive quantizing means;

adaptive bit assigning means connected to said first and second adaptive quantizing means for receiving said first and second step size signals, respectively and adaptively assigning corresponding numbers of bits for said first and second channels, said adaptive bit assigning means further outputting an adaptive bit assignment signal; and

multiplexer means supplied with said first and second output signals and said adaptive bit assignment signal for rearranging said first and second output signals in accordance with said adaptive bit assignment signal and delivering an encoder input signal; and

a decoder unit including:

- demultiplexer means for receiving and rearranging said encoder output signal and providing first and second outputs;
 - first adaptive inverse quantizing means supplied with said first output of said demultiplexer means for inversely quantizing said first output while sequentially updating its step size; and
 - second adaptive inverse quantizing means inputted with said second output of said demultiplexer means for inversely quantizing said second output while sequentially updating its step size,
- wherein information relating to step size of said first and second inverse adaptive quantizing means is generated only in said decoder unit.

4,713,777

SPEECH RECOGNITION METHOD HAVING NOISE IMMUNITY

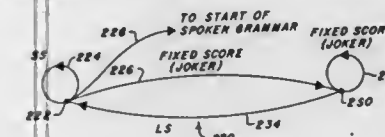
John W. Klovstad, Dorchester; Chin-Hui Lee, Cambridge, and Kalyan Ganesan, Burlington, all of Mass., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 27, 1984, Ser. No. 593,892

Int. Cl.⁴ G10L 5/00

U.S. Cl. 364—513.5

7 Claims



1. In a speech recognition apparatus wherein speech units are each characterized by a sequence of template patterns, and having means for processing a speech input signal for repetitively deriving therefrom, at a frame repetition rate, a plurality of speech recognition acoustic parameters, and means responsive to said acoustic parameters for generating likelihood costs between said acoustic parameters and said speech template patterns, and for processing said likelihood costs for determining the speech units in said speech input signal, a method for inhibiting a response to nonvocabulary utterances in a speech input for which template patterns have not been created, comprising the steps of repeatedly, at a frame repetition rate, generating acoustic parameters representing said speech input, generating likelihood costs at each frame time for said acous-

4,713,778

SPEECH RECOGNITION METHOD

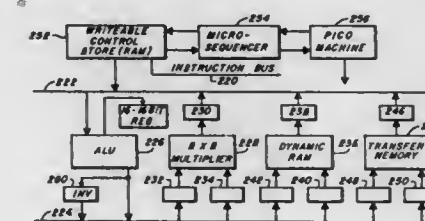
James K. Baker, West Newton, Mass., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 27, 1984, Ser. No. 593,895

Int. Cl.⁴ G10L 5/00

U.S. Cl. 364—513.5

3 Claims



1. In a speech recognition apparatus wherein speech units are each characterized by a sequence of template patterns, and having means for processing a speech input signal for repetitively deriving therefrom, at a frame repetition rate, a plurality of speech recognition acoustic parameters, and means responsive to said acoustic parameters for generating likelihood costs between said acoustic parameters and said speech template patterns, and for processing said likelihood costs for determining the speech units in said speech input signal, a method of template matching and cost processing for recognizing the correspondence of said speech input signal and said template patterns, said method comprising the steps of characterizing the allowable possible sequences of speech units as a grammar graph structure having a beginning node, an ending node and a plurality of intermediate nodes, all said nodes being connected by grammar arcs to at least one other node, initializing each said node with a high cumulative likelihood cost designating a bad score, generating likelihood costs representing the similarity of said acoustic parameters and selected ones of said template patterns, associating with each said node, at each frame time, a cumulative score corresponding to an accumulated template likelihood score in reaching said node, and generating a recognition decision when said cumulative score associated with the ending node is better than the cumulative score associated with any other node, storing a source representation of said grammar graph in a changeable memory of said responsive means, replacing said memory data with a representation of a second grammar graph, and generating a speech recognition decision based upon the second grammar graph, whereby said grammar source representing is software interchangeable and can be edited.

4,713,779

VIDEO CONVERTER

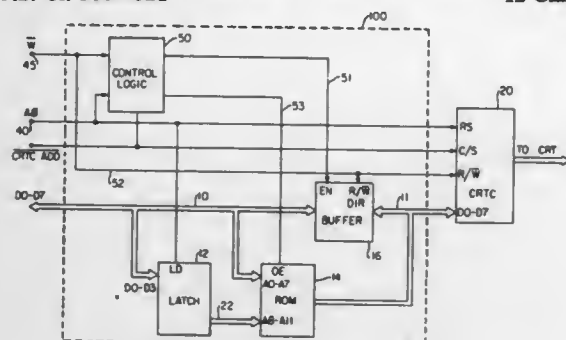
Alessandro Graciotti, Cupertino, and Herbert A. Kutscha, Los Gatos, both of Calif., assignors to Ing. C. Olivetti & Co. S.p.A., Invrea, Italy

Filed Mar. 8, 1985, Ser. No. 709,442

Int. Cl.⁴ G06F 15/68; H04N 5/14

U.S. Cl. 364—521

12 Claims



1. In an improved computer display adapted to be controlled by programmable display controller means, said display having a computer data bus for providing data to program said controller means with display parameters required by said display, and a controller data bus for transferring said data to said controller means, said display having predetermined characteristics requiring programming of said controller means with parameters defined by a first value of said data, said computer data bus being adapted to supply data having a second value defined for programming the controller means for another display having characteristics different from said predetermined characteristics, wherein the improvement includes a device for converting data having said second value into data having said first value, said device comprising:

memory means interposed between said computer data bus and said controller data bus and being connected to be addressed by data having said second value for providing to said controller data bus data having said first value; and control logic means connected to said memory means for selectively enabling and disabling said memory means, whereby said controller means is always programmed according to said first value.

4,713,780

ELECTRONIC MAIL

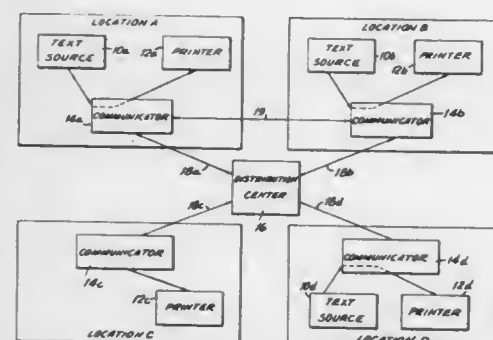
Thomas G. Schultz, Chicago, Ill.; Andrew Gross, Bridgewater, N.J.; Barbara Pappas, Massapequa Park; George D. Shifrin, New York, both of N.Y., and Lois Mack, Union City, N.J., assignors to Express Communications, Inc., New York, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,053

Int. Cl.⁴ G06K 15/02; H04L 15/34

U.S. Cl. 364—514

62 Claims



1. A method of transmitting from a source location to a

remote location the text data normally coupled from a source to a printer for displaying that text data at said remote location, comprising the steps of supplying one or more successive pages of the text data from the source; identifying the horizontal and vertical positions normally printed on each page of respective characters included in the text data supplied by said source; storing the identity of each character and its horizontal and vertical positions; transmitting to said remote location the identity of each character and its horizontal and vertical positions; converting the identities of the characters and their horizontal and vertical positions to display commands for driving a display device at said remote location; and supplying said display commands to said display device to display a substantially conforming line-by-line copy of the text data supplied by said source.

4,713,781

GRAIN DAMAGE ANALYZER

Lawrence J. Brizgis, Moline, Ill.; Daniel B. Keleher, Bettendorf, Iowa, and Vernon D. Bandelow, Cambridge, Ill., assignors to Deere & Company, Moline, Ill.

Filed Sep. 19, 1985, Ser. No. 777,886

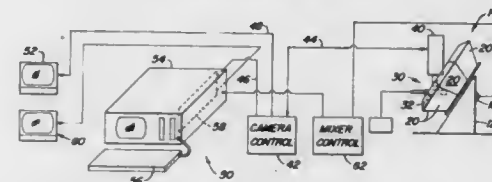
Int. Cl.⁴ G06F 15/20; G06G 7/48; H01J 40/14

U.S. Cl. 364—552

10 Claims

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 26 Pages)



1. A grain damage measuring system comprising:
a lamp for illuminating a grain sample with long wavelength ultraviolet electromagnetic radiation so that damaged portions of the grain may be distinguished from undamaged portions of the grain on the basis of electromagnetic radiation emitted by the sample and reflected from the sample;
a video camera receiving the radiation reflected and emitted from the grain sample, forming an image therefrom and generating a video signal representing the image; and
a signal processor comprising:
means for digitizing the video signal into a plurality of discrete picture elements (pixels), each pixel having a value representing an intensity of a corresponding part of the image; and
means for determining the number of pixels having values which exceed a predetermined threshold, said threshold being set so that pixel values exceeding the threshold correspond substantially only to portions of the image which represent damaged portions of the grain sample, said number being indicative of damage to the grain sample.

4,713,782

METHOD AND APPARATUS FOR MEASURING A TRANSFER FUNCTION

Ray Blackham, Marysville, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 23, 1984, Ser. No. 644,309

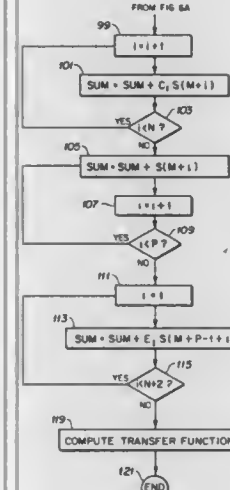
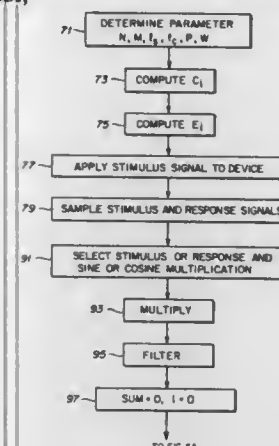
Int. Cl.⁴ G06F 15/20, 7/34

U.S. Cl. 364—553

10 Claims

1. A method for integrating a response signal over an integration period, comprising the steps of:
generating a stimulus signal at a stimulus frequency;
applying the stimulus signal to a device;
acquiring the response signal from the device;

sampling the response signal at a clock rate and thereby generating a plurality of response signal samples; separating the signal samples into preceding, central and succeeding sectors;
generating a preceding weighting polynomial and coefficients thereof;
generating a succeeding weighting polynomial and coefficients thereof;



multiplying the preceding sector of response signal samples by the coefficients of the preceding weighting polynomial; multiplying the succeeding sector of response signal samples by the coefficients of the succeeding weighting polynomial; and summing the central sector of response signal samples, the multiplied preceding sector of response signal samples and the multiplied sector of succeeding response signal samples.

4,713,783

DIGITAL TEMPERATURE INDICATING SYSTEM

Taylor C. Fletcher, 1534 Sunny Crest Dr., Fullerton, Calif. 92635

Filed Jun. 24, 1985, Ser. No. 747,882

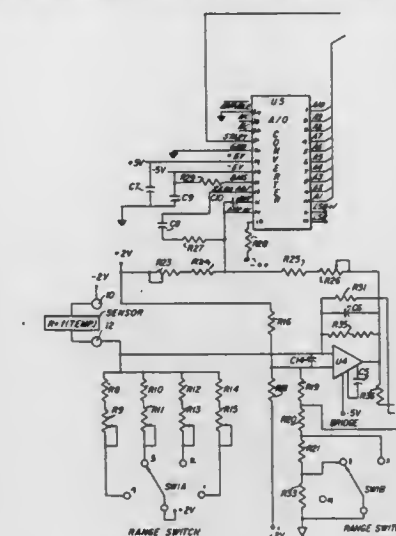
Int. Cl.⁴ G01K 7/00, 7/26

U.S. Cl. 364—557

6 Claims

1. A digital temperature indicating system comprising: a temperature sensor having an electrical resistance which is a function of the temperature being sensed; a bridge network connected to said sensor and including at least one variable resistance means for balancing the bridge at a particular resistance of said sensor representing a predetermined temperature; an analog-to-digital converter; first circuitry connecting the

bridge network to the analog-to-digital converter for applying analog output signals of said bridge to said converter to be converted into corresponding digital signals by said converter; a memory connected to said converter to be addressed by said digital signals to produce corresponding temperature-indicating digital signals in response thereto; a display means; second circuitry connected to said memory and to said display means and responsive to said temperature-indicating signals to cause the display means to exhibit temperature readings; first further



said two inputs to produce processed image data at said output;

first, second and third data bus lines, said first data bus line coupled to said first storage means, said second data bus line coupled to said second storage means, and said third data bus line coupled to said third storage means;

data bus line selecting means, coupled to said first, second, and third data bus lines at opposite ends from said storage means, for selectively connecting each of said first, second and third data bus lines to one of said inputs and said output of said processing circuit means, respectively, in any order, so that any of said first, second, and third storage means can be connected to any of said inputs and output of said processing means;

first address generating means for generating an address for said first storage means so that said first image data is supplied from said first storage means to one of said inputs or from said output of said processing circuit means to said first storage means through said first data bus line;

second address generating means for generating an address for said second storage means so that said second image data is supplied from said second storage means to one of the inputs or from said output of said processing circuit means to said second storage means through said second data bus line; and

third address generating means for defining addresses of said third storage means so that said third image data is supplied from said third storage means to one of said inputs or from said output of said processing circuit means to said third storage means through said third data bus line, said output of said processing circuit means being indicative of at least one of said addresses of said first, second and third address generating means based on a connecting mode of said data bus line selecting means.

4,713,790

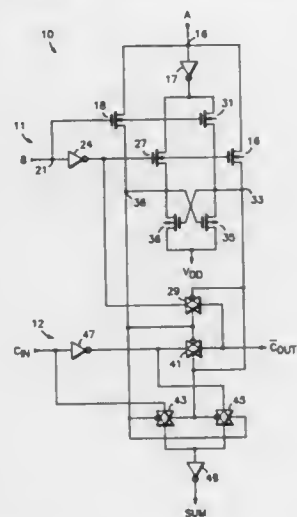
EXCLUSIVE OR/NOR GATE HAVING CROSS-COUPLED TRANSISTORS

Kevin L. Kloker, Arlington Heights, and Ronald H. Cieslak, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 31, 1985, Ser. No. 760,841
Int. Cl. G06F 7/50; H03K 19/21

U.S. Cl. 364-784

5 Claims



1. A logic gate for receiving first and second input signals at first and second input terminals, respectively, and providing exclusive OR and exclusive NOR signals of the input signals at first and second output terminals, respectively, comprising:

first inverter means having an input coupled to the first input terminal, and an output;

second inverter means having an input coupled to the second input terminal, and an output;

a first transistor of a first conductivity type having a first current electrode coupled to the output of the first inverter means, a second current electrode coupled to the first output terminal, and a control electrode coupled to the second input terminal;

a second transistor of the first conductivity type having a first current electrode coupled to the first input terminal, a second current electrode coupled to the second output terminal, and a control electrode coupled to the output of the first inverter means;

a third transistor of the first conductivity type having a first current electrode coupled to the first input terminal, a second current electrode coupled to the first output terminal, and a control electrode coupled to the output of the second inverter means;

a fourth transistor of the first conductivity type having a first current electrode coupled to the output of the first inverter means, a second current electrode coupled to the second output terminal, and a control electrode coupled to the output of the second inverter means;

a fifth transistor of a second conductivity type having a first current electrode coupled to the first output terminal, a second current electrode coupled to a terminal for receiving a power supply voltage, and a control electrode coupled to the second output terminal; and

a sixth transistor of the second conductivity type having a first current electrode coupled to the second output terminal, a second current electrode coupled to the terminal for receiving the power supply voltage, and a control electrode coupled to the first output terminal.

4,713,791

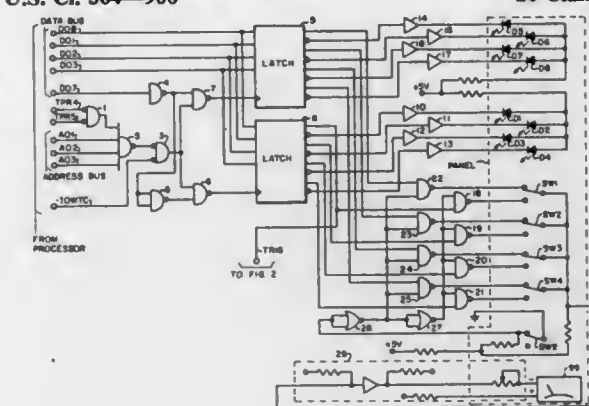
REAL TIME USAGE METER FOR A PROCESSOR SYSTEM

Robert A. Saluski, Phoenix, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Sep. 24, 1984, Ser. No. 653,190
Int. Cl. G06F 11/32

U.S. Cl. 364-900

20 Claims



1. A real time usage meter for measuring the execution time of processing system software, said real time usage meter comprising:

display means providing for visual display;

means for indicating being periodically transmitted by said processing system, said means for indicating including a status display word having a plurality of status bits, each status bit indicating the execution of a particular type of software task;

means for storing connected to said processing system, said means for storing being cyclically operated to store said status display data word;

gating means connected to said means for storing and to said display means, said gating means being cyclically oper-

ated to transmit said stored status display data word, indicating an instantaneous execution of said types of software tasks, to said display means for visual display, said cyclic transmission of said status bits over a predetermined period of time representing said execution time of said software tasks; and

switching means connected between said gating means and said display means, said switching means being operated in response to said status display data word to selectively transmit predetermined ones of said status bits to said display means for visual display.

4,713,792

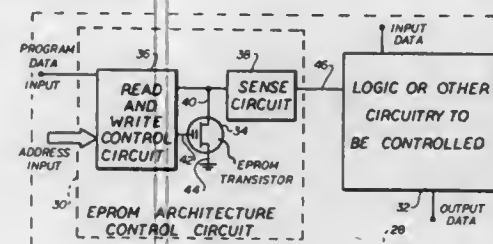
PROGRAMMABLE MACROCELL USING EPROM OR EEPROM TRANSISTORS FOR ARCHITECTURE CONTROL IN PROGRAMMABLE LOGIC CIRCUITS

Robert F. Hartmann, San Jose; Yiu-Fai Chan, Saratoga; Robert J. Frankovich, Cupertino; Jung-Hsing Ou, Sunnyvale; Hock C. So, Milpitas, and Sau-Ching Wong, Hillsborough, all of Calif., assignors to Altera Corporation, Santa Clara, Calif.

Filed Jun. 6, 1985, Ser. No. 742,089
Int. Cl. G06F 1/00

U.S. Cl. 364-900

19 Claims



1. A programmable macrocell in an integrated circuit device comprising:

electronic circuit means responsive to a program control signal and operative to perform a particular operation selected by said control signal on an input data signal and to develop a commensurate output data signal, said electronic circuit means including an inversion control circuit having exclusive NOR gate means with one input thereof receiving said control signal and another input thereof receiving said input data signal; and

architecture control means including one or more architecture control circuits each having

a programmable EPROM device having gate, drain and source electrodes and which when programmed generates a logic signal of a first state and when unprogrammed generates a logic signal of a second state, read and write control means connected to said EPROM device and responsive to an input program data signal and a corresponding address signal and operative to program said EPROM device by applying a programming potential thereto, and

sense means connected to said EPROM device for sensing the programmed or unprogrammed state of said EPROM device and for developing a commensurate control signal for input to said inversion control circuit, whereby in response to said control signal said inversion control circuit causes an input data signal to be inverted when an associated EPROM device is in said first state and to be not inverted when said EPROM device is in said second state.

4,713,793

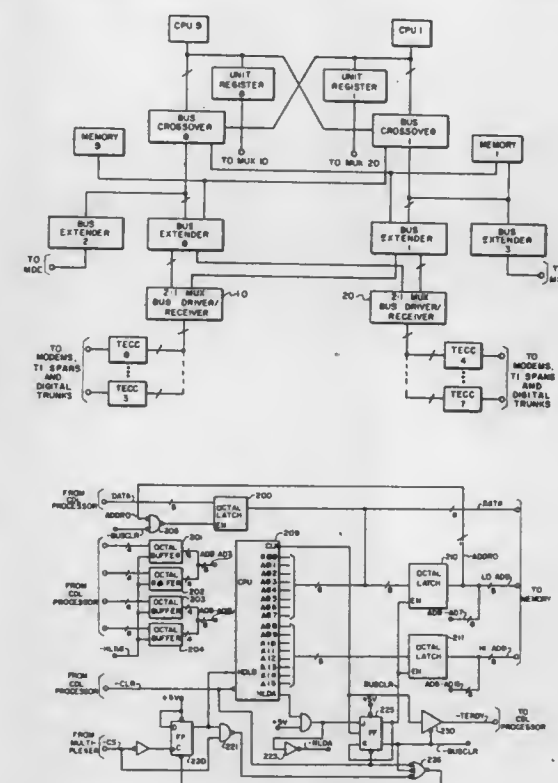
CIRCUIT FOR CCIS DATA TRANSFER BETWEEN A CPU AND A PLURALITY OF TERMINAL EQUIPMENT CONTROLLERS

Joseph A. Conforti, Phoenix, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 2, 1985, Ser. No. 803,694
Int. Cl. G06F 9/00

U.S. Cl. 364-900

14 Claims



1. In a Common Channel Interoffice Signalling (CCIS) system, a circuit for direct CCIS data transfer between an active CPU of a duplex pair of CPUs and a plurality of terminal equipment controllers, said circuit comprising:

first and second multiplexer means, each corresponding to said first and second CPU bus means, each said multiplexer means being connected to said active CPU via said corresponding first and second CPU bus means and said first multiplexer means being connected to a first plurality of said terminal equipment controllers and said second multiplexer means being connected to a second plurality of said terminal equipment controllers, each said multiplexer means being operated in response to said active CPU to connect said active CPU to each of said connected terminal equipment controllers;

each said terminal equipment controller including:

local CPU means;

memory means;

local bus means connected to said local CPU means and to said memory means, said local bus means being operated to transmit an address to said memory means and to transmit data from said local CPU means to said memory means and to transmit data from said memory means to said local CPU means;

requesting means connected to said active CPU via said corresponding multiplexer means and connected to said local CPU means, said requesting means being operated in response to a select signal transmitted from said active CPU to produce a request signal for transmission to said local CPU means;

said local CPU means being operated in response to said

request signal to disconnect itself from said local bus means and to produce an acknowledge signal; bus control means connected to said local CPU means, to said local bus means and to said first and second CPU bus means via said corresponding multiplexer means, said bus control means being operated in response to a first value of said acknowledge signal to connect said first CPU bus means to said local bus means for said direct CCIS data transmission to said memory means and said bus control means being operated in response to a second value of said acknowledge signal to connect said second CPU bus means to said local bus means for said direct CCIS data transmission to said memory means.

4,713,794

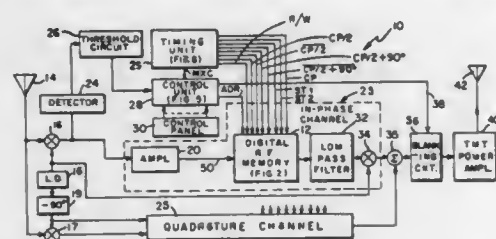
DIGITAL MEMORY SYSTEM

Roy E. Byington, Sudbury, and William M. Pease, Weston, both of Mass., assignors to Raytheon Company, Lexington, Mass. Division of Ser. No. 972,594, Dec. 22, 1978, Pat. No. 4,318,182. This application Feb. 22, 1982, Ser. No. 350,932

Int. Cl.⁴ G11C 27/00

U.S. Cl. 365—45

9 Claims



1. A method for storing digital samples representative of the level of an analog signal comprising the step of feeding the analog signal directly into a digital memory.

4,713,795

OPTICAL SWITCH, ESPECIALLY FOR INFORMATION STORAGE AND RETRIEVAL

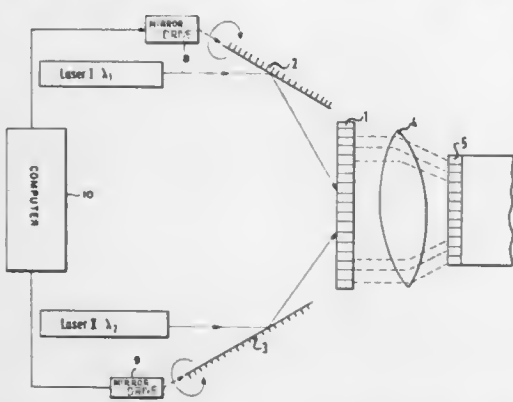
Theo Woike, Cologne; Wolfgang Krasser, Jülich, and Siegfried Haussühl, Erfstadt, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Oct. 29, 1985, Ser. No. 792,655

Int. Cl.⁴ G03C 1/72; G11C 13/00; G02F 1/01

U.S. Cl. 365—119

24 Claims



1. Optical switch capable of use for information storage, utilizing a medium capable of being converted from an original state to a metastable state by a radiative pumping by intensive light having a first wavelength (λ_1) and capable of being returned to said original state by intensive light having a second

wavelength (λ_2), comprising a source of light of said first and second wavelengths, said storage medium, means for directing radiation of said first and second wavelengths for localized incidence on said medium and photodetector means for measuring radiation coming from said medium,

said medium being a nitroprusside single crystal of the formula $M_m[Fe(CN)_5NO]nH_2O$, wherein M is a metal capable of forming a nitroprusside salt, m is a valence-determined number determined by the valence of the metal M and the -2 valence of the nitroprusside group $[Fe(CN)_5NO]$ and n is an integer in range 0, 1, 2, 3 . . . 10, said first light wavelength being in the range between 400 and 530 nm, said second light wavelength being in the range from 600 to 680 nm, and means being provided for cooling said single crystal at a temperature in the range between 140° K. and 210° K.

4,713,796

SEMICONDUCTOR INTEGRATED CIRCUIT

Katsumi Ogiue; Yukio Suzuki, both of Hinode; Ikuro Masuda, Hitachi; Masanori Odaka, Kodaira, and Hideaki Uchida, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

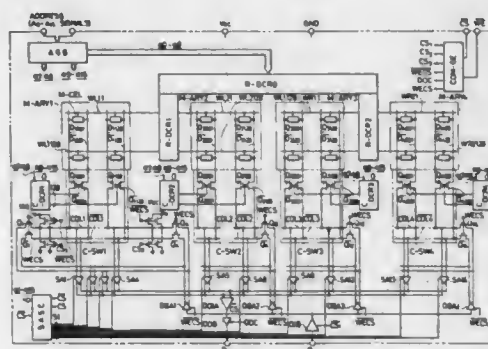
Filed Feb. 13, 1985, Ser. No. 701,226

Claims priority, application Japan, Feb. 13, 1984, 59-22811

Int. Cl.⁴ G11C 8/00

U.S. Cl. 365—189

12 Claims



1. A semiconductor integrated circuit comprising: a plurality of memory cells; an address circuit for selecting a specified memory cell from among said plurality of memory cells; a signal circuit coupled to said memory cells and including means for respectively reading and writing information from and into said memory cells; and a timing circuit coupled to said signal circuit for controlling operations of reading and writing information, wherein said address circuit includes a principal portion constructed of a first CMOS circuit, and at least a first bipolar output transistor, which executes at least one of charge and discharge of a signal output line of at least one circuit in said address circuit, and wherein said signal circuit includes an input circuit which supplies a data signal to a data line coupled to at least said specified memory cell, said input circuit including a principal portion constructed of a second CMOS circuit and at least a second bipolar output transistor, which executes at least one of charge and discharge of said data line.

4,713,797

CURRENT MIRROR SENSE AMPLIFIER FOR A NON-VOLATILE MEMORY

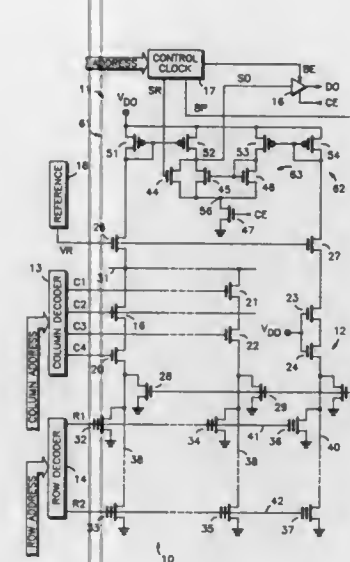
Bruce L. Morton, Round Rock, and Bruce E. Engles, Austin, both of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 25, 1985, Ser. No. 801,363

Int. Cl.⁴ G11C 7/02

U.S. Cl. 365—208

17 Claims



1. A memory having an array of non-volatile memory cells which are in either a programmed or unprogrammed state, wherein the programmed state is characterized as having a first conductivity and the unprogrammed state is characterized as having the second conductivity, comprising:

decoder means for selecting a memory cell in response to an address and for coupling said selected memory cell to a common data line; a reference memory cell which is unprogrammed and has the second conductivity; reference current means, coupled to the reference memory cell, for establishing a reference current proportional to the second conductivity; logic state current means, coupled to the data line, for establishing a logic state current proportional to the conductivity of the selected memory cell; first current mirror slave means, coupled to the reference current means, for establishing a reference current limit between a first power supply terminal and an output node as a predetermined proportion of the reference current; second current mirror slave means, coupled to the logic state current means, for establishing a control current limit between a second power supply terminal and the output node as a predetermined proportion of the logic state current, said control current limit being of a first magnitude if the logic state current is related to the first conductivity and being of a second magnitude if the logic state current is related to the second conductivity; and output means, coupled to the output node, for providing an output signal at a first logic state when the second current mirror slave establishes the control current limit at the first magnitude, and for providing the output signal at a second logic state when the second current mirror slave establishes the control current limit at the second magnitude.

4,713,798

METHOD OF AND APPARATUS FOR PROVIDING OBJECT DATA BY MACHINE VISION

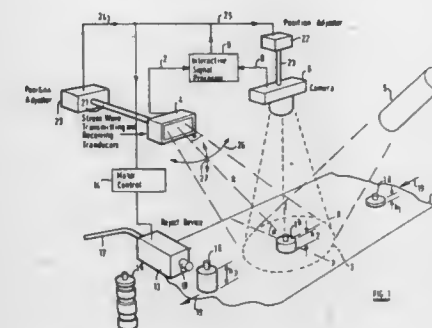
Leslie Kay, 82 Scarsborough Road, Christchurch, New Zealand Filed Dec. 4, 1984, Ser. No. 678,215

Claims priority, application New Zealand, Dec. 9, 1983, 206,544; United Kingdom, Jun. 5, 1984, 8414283

Int. Cl.⁴ G01S 9/66, 9/68

U.S. Cl. 367—96

22 Claims



1. A method for carrying out machine vision of an object in order to obtain data representative of selected parameters pertaining to the object, said method comprising: illuminating the object with at least two different kinds of energy supplied by two different sources so that each different kind of energy is reflected from the object; deriving, from each kind of energy reflected from the object, respective signals each containing data representative of at least one of the selected parameters, wherein, with respect to the at least one of the selected parameters, the signals derived from one kind of energy contain more accurate data than do the signals derived from the other kind of energy; processing the derived signals to obtain, from each kind of energy reflected from the object, a respective initial set of parameter-representative data elements, with at least one given data element representative of at least a given one of the selected parameters being absent from, deficient in, or requiring confirmation in one of the initial sets; selecting the at least one given data element from the other initial set in order to provide a combined set of data elements which constitute more accurate representations of the selected parameters than do either initial set; and applying the combined set of data elements to control performance of a given operation with respect to the object.

4,713,799

ULTRASONIC HORN WITH SIDELOBE SUPPRESSING CENTERPIECE

James J. Phelan, and Larry W. Ferguson, both of Bettendorf, Iowa, assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 660,819, Oct. 15, 1984, abandoned.

This application Sep. 10, 1986, Ser. No. 906,596

Int. Cl.⁴ H04R 1/02; G10K 11/00

U.S. Cl. 367—140

11 Claims

1. An ultrasonic horn assembly comprising: a horn with a tapered horn bore extending from a smaller diameter throat to a larger diameter mouth; an ultrasonic transducer mounted in the throat; a centerpiece comprising a headpiece having a base and a top and a stem projecting from the base, the stem and base cooperating to define an annular shoulder surface surrounding the stem and facing towards the transducer, the shoulder surface being axially spaced apart from the trans-

ducer, the stem having a blind bore extending therein which opens towards the transducer; and



including a baffle within said body and surrounding said stem of said shuttle, said stem passing through said baffle with clearance to provide passage means for communicating ambient pressure from outside said body to sides of both said operating seal and at least a portion of said operating piston opposite from said operating chamber or at least for allowing escape to the ambient surroundings of any pressurized gas from said operating chamber present at said portion of the opposite side of said operating piston, whereby at least substantially ambient pressure acts on the said portion of said operating piston at least until said shuttle moves.

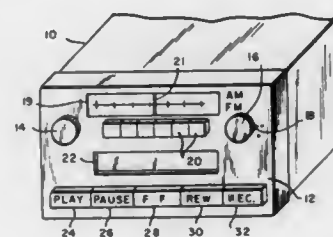
4,713,801

RADIO-TAPE RECORDER FOR AUTOMOTIVE USE
Arthur D. Hale, 32 Portuguese Bend Rd., Rolling Hills, Calif. 90274

Filed Feb. 20, 1986, Ser. No. 831,318
Int. Cl.⁴ G11B 31/00

U.S. Cl. 369—7

7 Claims



1. An in-dash mountable audio apparatus having a housing with a front face, said housing containing the following electrical systems;

- (A) a radio reception system comprising an antenna, a radio tuner, and a radio signal preamplifier;
- (B) a tape player and recorder system comprising a magnetic head, a motor drive, and a preamplifier;
- (C) an audio output system comprising a variable resistor, a main amplifier, and at least one speaker; and,
- (D) a power supply system comprising a power source, a main switch and a three-way switch having three electrical contact positions wherein: the first of said contact positions electrically engages the power supply only to the radio reception system and the audio output system; the second of said contact positions electrically engages the power supply only to the tape player and recorder system and the audio output system; and the third of said contact positions electrically engages the power supply simultaneously to the radio reception system, the tape player and recorder system, and the audio output system; and first, second and third manually-actuated controls accessible at said front face, said controls being separately and alternately operable to adjust said three-way switch respectively to one of the first, second and third of said contact positions.

4,713,802

DIGITAL SIGNAL REPRODUCING CIRCUIT
Hiroshi Kobata, and Tadashi Kojima, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 31, 1986, Ser. No. 846,208
Claims priority, application Japan, Mar. 30, 1985, 60-66891; Mar. 30, 1985, 60-66893; Mar. 30, 1985, 60-66890
Int. Cl.⁴ G11B 5/76, 5/09

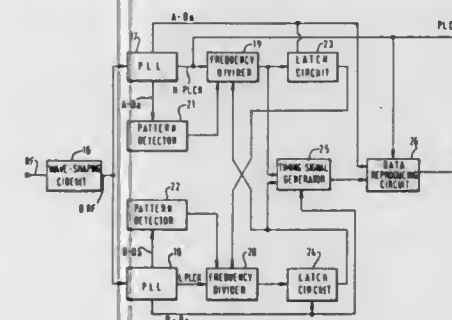
U.S. Cl. 369—59

22 Claims

1. A digital signal reproducing circuit comprising:
- a wave-shaping circuit for converting high-frequency signals comprising digital signals modulated by a predetermined modulation system into binary signals;
 - a phase locked loop circuit means for generating a first bit

synchronizing clock synchronized in phase to the leading edge of said binary signal and a leading edge detection data synchronized to said first bit synchronizing clock;

- a first and a second frequency divider means for dividing said first and second bit synchronizing clocks, respectively;
- a first and a second pattern detector means for detecting signal patterns specified in said binary signal, respectively;
- a synchronization means for synchronizing the output of said first and second frequency divider means after the signal



patterns are detected by said first or second pattern detector;

a timing signal generation means for detecting the phase difference of each output of said first and second frequency divider means after synchronized by means of said synchronization means and generating timing signals on the basis of the phase difference and said second data signal; and

data reproducing circuit means for producing digital signals corrected by said timing signals and said first data signal.

4,713,803

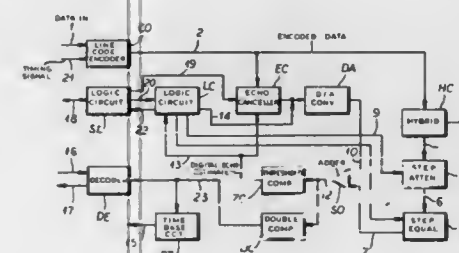
BIDIRECTIONAL DIGITAL TRANSMISSION SYSTEM WITH ECHO-CANCELLATION

Renato Ambrosio, S. Raffaele Cimenà, Alberto Brosio, Borgaro Torinese; Alfredo Fausone, Ivrea, and Adler Tofanelli, Collegno, all of Italy, assignors to SIP—Società Italiana per l'Esercizio Telefonico p.a., Turin, Italy

Filed May 8, 1986, Ser. No. 861,073
Claims priority, application Italy, May 14, 1985, 67441 A/85
Int. Cl.⁴ H04L 5/14

U.S. Cl. 370—32.1

5 Claims



1. A system for bidirectional digital transmission with echo cancellation, comprising:

- an encoder for encoding in line code a data signal received at an input of said encoder;
- a hybrid connected to an output of said encoder for supplying to a line a data signal encoded by said encoder and for receiving from said line a data signal transmitted thereover;
- a remotely-controllable attenuator connected to said hybrid;
- a remotely-controllable equalizer connected to said attenuator;
- an echo canceller connected to said output of said encoder

for supplying an estimated-echo signal correlated with said encoded data signal;

a first threshold comparator connected to supply a digital signal to said echo canceller with which said estimated-echo signal is also correlated;

an adder having a first input connected to an output of said equalizer and an output connected to said first threshold comparator for summing a data signal received from said line by said hybrid and processed through said attenuator and said equalizer with said estimated-echo signal and applying to said first threshold comparator a signal outputted by said adder and whose zero crossings are detected by said first comparator to generate said digital signal;

a digital-to-analog converter connected to an output of said echo canceller for receiving said estimated-echo signal, said digital-to-analog converter being connected to a second input of said adder for applying said estimated-echo signal thereto;

a second, double-threshold comparator connected to said output of said adder for detecting positive and negative threshold crossings of the signal outputted by said adder; a decoder connected to an output of said second comparator for decoding a signal outputted thereby and for delivering at an output of said decoder the data signal received from said line;

a time base circuit connected to said output of said second comparator for extracting synchronism information from the signal outputted by said second comparator;

a first logic circuit having an input receiving link time phase information, a first output connected to said echo canceller, and a second output; and

a second logic circuit connected to said second output of said first logic circuit and connected in turn to said digital-to-analog converter,

said first logic circuit being connected and arranged to alternately enable said echo canceller and said second logic circuit so that said digital-to-analog converter receives respectively said estimated-echo signal during a transmission and at an initial phase of establishment of a transmission link, a digital sequence which, converted into analog form by the digital-to-analog converter can be added in said adder to the data signal received from said line and resulting zero crossings are detected by said first comparator,

said second logic circuit being connected and arranged to receive information on zero crossings during said initial phase to generate respective control signals for said attenuator and said equalizer and applying said control signals to said attenuators and said equalizer for controlling transmission gain, said control signals being correlated with the amplitude of the data signal received from said line, said second logic circuit being further connected to said first logic circuit to send thereto a signal representing effected gain adjustment, and

said first logic circuit is further connected and arranged upon receipt of said signal representing effected gain adjustment to re-enable said echo canceller after it has been disabled following a prior transmission, to inhibit said second logic circuit for a succeeding transmission and to communicate a signal representing availability of the system for the succeeding transmission.

4,713,804

METHOD AND DEVICE FOR CONVERTING DIGITAL CHANNEL MULTIFRAMES INTO PACKET MULTIFRAMES

Michel Servel, Le Rhu Servel, 22300 Lannion, and Alain Thomas, 2, rue du Bal Landreau, 44400 Reze-les-Nantes, both of France

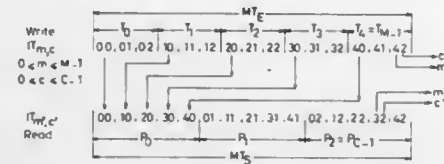
Filed Jul. 3, 1986, Ser. No. 881,681

Claims priority, application France, Jul. 3, 1985, 85 10180

Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370—68

8 Claims



1. A method for converting an inputting multiframe into an outgoing multiframe, said inputting multiframe having M frames, where M is an integer, each of said frames including words having a predetermined number of digits and assigned respectively to C time-division multiplexed digital channels, where C is an integer, said outgoing multiframe having C packets assigned respectively to said channels, each packet including M successive words of said respective channel, a word having a given rank and to be included in said outputting multiframe and a word having said given rank and included in said inputting multiframe being read and written consecutively in a same cell of a single memory, said memory having a capacity at least equal to MC word cells, and said MC cells of said memory being addressed according to an address order becoming identical to itself after a cycle of N multiframe periods, where N is the smallest integer so that $C^N \equiv 1 \pmod{(MC-1)}$.

4,713,805

METHOD AND DEVICE FOR SELECTING ONE STATION FROM A SET OF STATIONS DIALOGING WITH A MAIN STATION

Bernard Hénaff, Ploubezre, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

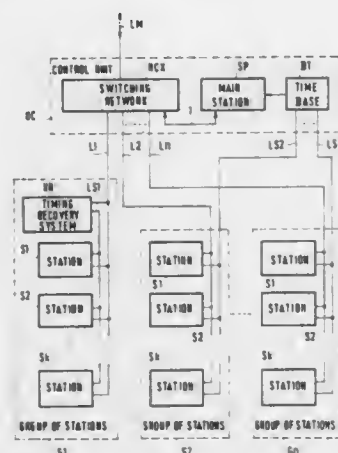
Filed Sep. 20, 1984, Ser. No. 652,390

Claims priority, application France, Sep. 27, 1983, 83 15294

Int. Cl.⁴ H04J 3/02; H04Q 19/00

U.S. Cl. 370—85

5 Claims



1. A method of selecting one station from a plurality of groups of stations dialoging with a main station over transmit

multiplex links carrying messages sent by the stations and receive multiplex links carrying messages sent by the main station, said transmit and receive multiplex links each comprising at least one multiplex line having a time slot in a repetitive frame reserved for dialog, each of said groups being connected to the main station by a transmit multiplex link and a receive multiplex link, wherein the stations in each group receive a synchronization signal, each station in each group which has information to send in the reserved time slot of the transmit multiplexed link sends a request within the group for reservation of this reserved time slot after a time delay, whose length depends on an address of the station within the group, has elapsed since reception of the synchronization signal, the main station consults each group of stations in succession by sending a consultation message to all stations in the group, and the station in the consulted group which has reserved the reserved time slot sends its message as soon as it receives the consultation message.

4,713,806

COMMUNICATION SYSTEM CONTROL ARRANGEMENT

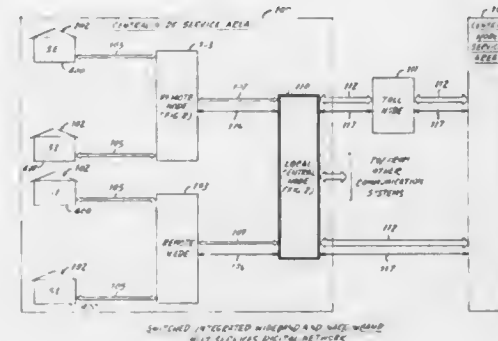
Lewis B. Oberlander, Buffalo Grove; David A. Spicer, Batavia, and Ralph V. Straubs, Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 14, 1986, Ser. No. 840,458

Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370—58

17 Claims



1. A control arrangement for a communication switching system having first and second communication networks configurable independently from each other separately to provide first and second communications, respectively, for terminal logical channels of the system, the system further including first and second network control means for configuring the first and the second networks, respectively, in response to receipt of requirements signals, the control arrangement comprising:

first program controlled means cooperative with both the first and the second network control means and operable in response to receipt of requirements signals and associated signals indicating the first communications for generating requirements signals for controlling the operation of the first network control means to configure the first network into at least one of (a) physical communication channels corresponding to the logical channels, and (b) physical communication paths between the physical channels and corresponding to logical communication paths, and being further operable in response to receipt of requirements signals and associated signals indicating the second communications for generating requirements signals for controlling the operation of the second network control means to configure the second network into at least one of (a) physical communication channels corresponding to the logical channels, and (b) physical commu-

nication paths between the physical channels and corresponding to logical communication paths; and second program controlled means independent in program from the first program controlled means and operable in response to receipt of call signals and associated signals indicating either one of the first and the second communications for any one of the logical channels for processing call information to generate, both independently of and for association with the first or the second communication indicating signals, the requirements signals for controlling the operation of the first program controlled means to establish the logical communication paths between the one logical channel and another at least one logical channel, independently of both the first and the second networks and the first and the second network control means.

4,713,807

INTELLIGENCE TRANSMISSION SYSTEM OF THE LOCAL AREA NETWORK TYPE

Keith Caves, and Douglas E. Woodman, both of Sawbridge-worth, Great Britain, assignors to STC plc, London, England

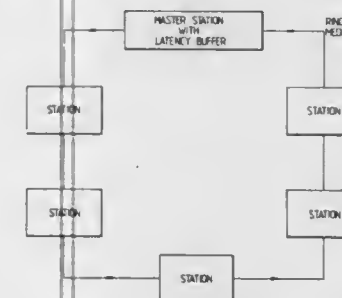
Filed May 22, 1986, Ser. No. 866,433

Claims priority, application United Kingdom, May 24, 1985, 8513248

Int. Cl.⁴ H04Q 11/04; H04J 3/00, 3/06

U.S. Cl. 370—94

11 Claims



1. An intelligence transmission system of the closed-loop type, in which a number of stations one of which acts as a Master Station are connected to the loop, in which the system handles both circuit-switched and packet-switched calls, in which in each TDM cycle a group of adjacent time slots is used as a framing group which occurs once per cycle of the system, which framing group includes a multi-bit group number (GN) portion which identifies a said slot or group of slots, in which on system start-up the value of the GN in the framing group is initially set to zero by the Master Station whereafter the value of the GN is incremented by the Master Station by unity on each system cycle, in which when the value of GN reaches the maximum number of slots available for circuit-switched connections, that value is reset to zero, whereafter the sequence recommences, in which only after the value of GN has reached its maximum for the first time a packet-switching token is emitted from the Master Station to incite to the other stations on the loop that packet-switched connections can be handled, whereafter the Master Station repeats the token each time the Master Station receives the token and in which the maximum value of GN attained during a said sequence, as read by a said station on the loop indicates to that station how many times slots are currently available for circuit-switched connections.

4,713,808

WATCH PAGER SYSTEM AND COMMUNICATION PROTOCOL

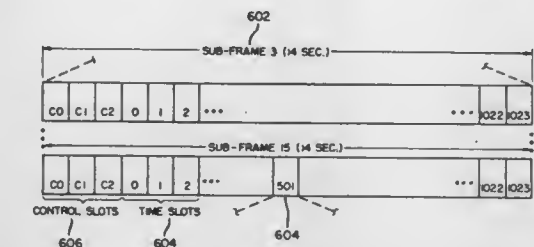
Garold B. Gaskill, Portland; Daniel J. Park; Robert G. Rullman, both of Beaverton; Donald T. Rose, Portland; Joseph F. Stiley, III; Lewis W. Barnum, both of Tigard, all of Oreg., and Don G. Hoff, Tiburon, Calif., assignors to A T & E Corporation, San Francisco, Calif.

Filed Nov. 27, 1985, Ser. No. 802,844

Int. Cl.⁴ H04J 3/24, 3/26

U.S. Cl. 370—94

20 Claims



1. A method of sending data as a data signal from a transmitter to a plurality of remote receivers on a common transmission channel, comprising: time dividing the transmission channel into frames of a first duration, subdividing each frame into a plurality of subframes, and further subdividing each subframe into a plurality of time slots of a second duration, each frame repeating at periodic time intervals equal to said first duration; numbering each subframe in the frame with a unique subframe number; numbering a predetermined set of the time slots in each subframe, including numbering each time slot in said set with a unique number in a predetermined series of time slot numbers; repeating said subframe and time slot numbers in each successive frame; assigning each receiver a receiver address comprising one of the time slot numbers and one of the subframe numbers; encoding the data for each receiver into a data packet of a predetermined length no greater than the duration of the time slots; encoding in each packet a packet address including the number of a time slot during which the packet is to be transmitted; transmitting a data signal comprising said packet during a time slot corresponding to the packet address; and receiving the data signal and decoding the packet therefrom at a receiver that has a receiver address corresponding to the packet address.

4,713,809

TIME DIVISION MULTIPLE ACCESS RADIO COMMUNICATIONS SYSTEM

Yasuhiro Mizota, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 21, 1986, Ser. No. 888,587

Claims priority, application Japan, Jul. 25, 1985, 60-165470

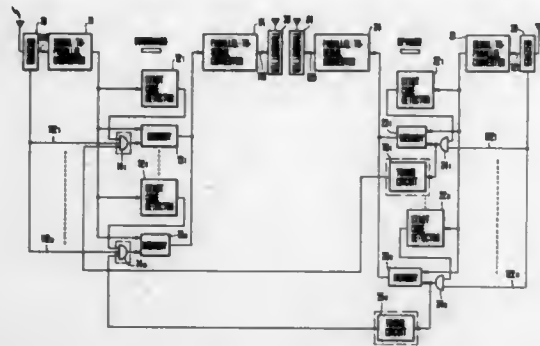
Int. Cl.⁴ H04B 3/36, 7/14

U.S. Cl. 370—97

6 Claims

1. A time division multiple access radio communication system comprising: one base station; a plurality of repeater stations for sequentially repeating a radio signal received by and transmitted from said base station; and a plurality of terminals for communicating the radio signal with said base station via said repeater stations, each of said repeater stations including repeater means for

repeating the radio signal using a time slot assigned to each of said terminals, wherein each of said repeater stations further comprises means for detecting a time slot in upward communication, and



means for activating said repeater means in association with only a time slot in downward communication corresponding to the detected time slot in upward communication.

4,713,810

DIAGNOSTIC TECHNIQUE FOR DETERMINING FAULT LOCATIONS WITHIN A DIGITAL TRANSMISSION SYSTEM

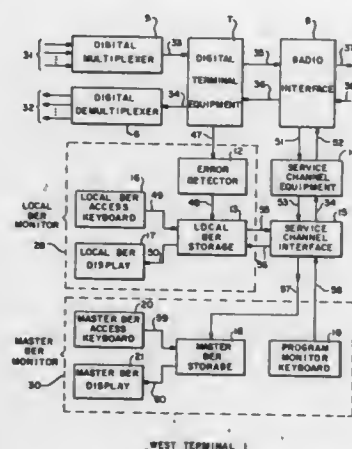
Stanley Chum, Union City, Calif., assignor to GTE Sprint Communications Corp., Mountain View, Calif.

Filed Sep. 19, 1985, Ser. No. 777,803

Int. Cl.⁴ H04L 1/00; G06F 11/10

U.S. Cl. 371-4

10 Claims



4,713,811

AUTOMATIC MODE SWITCHING UNIT FOR A SERIAL COMMUNICATIONS DATA SYSTEM

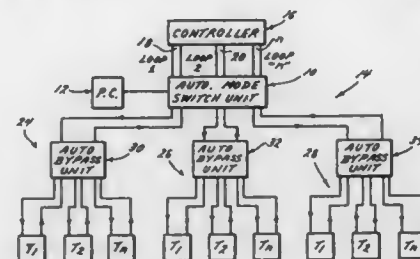
Ronald G. Frey, Emerson, N.J., assignor to Tytronix Corporation, Englewood, N.J.

Filed Nov. 7, 1985, Ser. No. 795,979

Int. Cl.⁴ G06F 11/20

U.S. Cl. 371-9

9 Claims



6. An automatic switching unit for use in combination with a backup processor and a series communications system such as for retail store operations, and where the series communications system includes a controller having multiple serial ports, each port being connected in a series loop with a plurality of data terminals for registering sales transactions, there being a plurality of such series loops, said switching unit comprising:

a monitor for monitoring each of the series loops to detect a malfunction of any port;

a switching network connected between the controller, backup processor, and data terminals;

means for operating the switching network in response to the monitor detecting a malfunction of any port for automatically connecting the backup processor and all the data terminals in those loops associated with serial ports detected to be malfunctioning in a single series loop, and for automatically disconnecting the malfunctioning ports from the single series loop;

whereby, upon the monitor detecting that one or more ports is malfunctioning, the processor is automatically substituted for the malfunctioning ports, and all the data terminals that had been connected in one or more series loops with the malfunctioning ports are automatically connected in a single series loop with the processor; and means for automatically wrapping each malfunctioning port in response to the monitor detecting its malfunction.

1. An in-service method of detecting marginal and failed transmission equipment in a digital telecommunication system having at least one repeater and two end terminals, comprising the steps of:

monitoring the BER (bit error rate) of the digital line signals at predetermined repeater and terminal locations;

storing and truncating at each of said predetermined terminal and repeater locations of the monitored BER such that at least the most significant digit and the exponent are included;

encoding the stored data at each of said locations for transmission over said telecommunication system;

transmitting said encoded data from each of said monitored repeater and terminal locations to a predetermined terminal;

receiving at said predetermined terminal said encoded data from each of said monitored locations;

decoding each encoded data from each monitored location;

4,713,812

METHOD AND APPARATUS FOR REPLACEMENT OF DATA AND OF A DATA MEMORY IN AN AUTOMOTIVE-TYPE ELECTRONIC CONTROL SYSTEM

Herbert Arnold, Eberdingen; Michael Horbelt, Kleinglattbach, and Werner Jundt, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

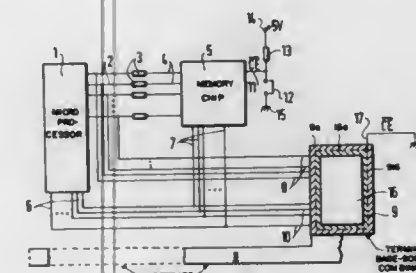
Filed Mar. 10, 1986, Ser. No. 838,176

Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518964

Int. Cl.⁴ G06F 11/04

U.S. Cl. 371-10

9 Claims



1. A method of supplying replacement data in an automotive data processing system having

a substrate (S);

a microprocessor (1) constructed in semiconductor hybrid technology, applied to the substrate;

a data memory chip (5) applied to the substrate;

a plurality of address lines (2, 4) and data lines (6, 7) connecting the microprocessor (1) and the memory chip (5); and

a terminal socket (9, 9a) also connected to the plurality of address lines (2, 4) and data lines (6, 7) leading to the microprocessor; comprising the steps of

recording said replacement data in an additional data memory (16);

applying a "disable" signal to an "enable-disable" input terminal (11) of the memory chip upon detection of malfunction, supply of erroneous data, or supply of inappropriate data from the memory chip (5); and

in one operation, simultaneously inserting the additional data memory (16) into the terminal socket (9, 9a) and applying an enabling potential to a terminal of the additional memory (16) to thereby place the additional data memory (16) in operative relation with the microprocessor (1).

4,713,813

LOGIC ANALYZER

Masayasu Sugimori, and Mitsuhiro Morishita, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,101

Claims priority, application Japan, Jul. 3, 1985, 60-146190

Int. Cl.⁴ G01R 31/28; G09G 1/08

U.S. Cl. 371-15

2 Claims

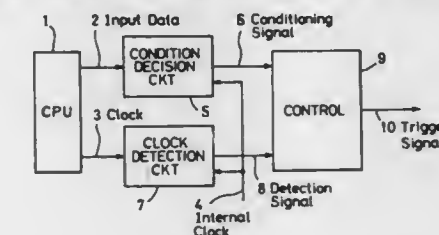
1. A logic analyzer including at least a sampling system for sampling input data with a sampling clock signal, comprising:

a condition decision circuit having inputs supplied with said input data and an internal clock signal for producing a conditioning signal in dependence on said input data in synchronism with said internal clock signal;

a clock detection circuit for deciding whether said sampling clock signal makes appearance within a predetermined period of said internal clock signal to produce a signal representative of the result of said decision; and

a control circuit having inputs supplied with said condition-

ing signal and said signal representative of said result for producing a trigger signal corresponding to said condition-



tioning signal in dependence on said signal representative of said result of decision.

4,713,814

STABILITY TESTING OF SEMICONDUCTOR MEMORIES

Georg Andrusch, Herrenberg; Joachim Baisch, Nufringen; Horst Barsuhn, Holzgerlingen, all of Fed. Rep. of Germany; Friedrich C. Wernicke, Fishkill, and Siegfried K. Wiedmann, Millwood, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

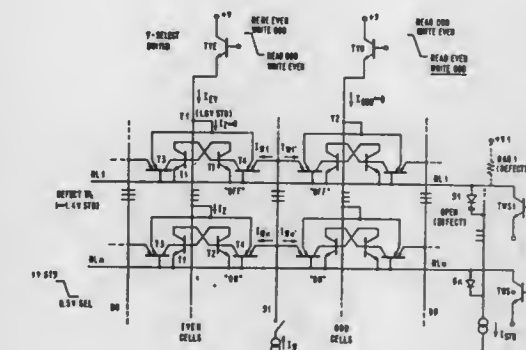
Filed Mar. 13, 1986, Ser. No. 839,315

Claims priority, application European Pat. Off., Mar. 29, 1985, 85103736.6

Int. Cl.⁴ G06F 31/28

U.S. Cl. 371-21

14 Claims



1. A method of testing a static semiconductor memory with inherent high data retention characteristics for defects in a standby supply system of said memory, said memory being provided typically in matrix form as an array of memory cells having bit positions arranged at the crosspoints of associated word and bit lines, said method comprising the steps of:

storing binary information in said cells in a given state, energizing said word lines so as to place said word lines in a standby mode to maintain said word lines in an unselected state,

performing via associated bit lines with said cells in said given storage state during said standby mode a disturb write operation of said cells, and

Checking subsequently for the memory cells subjected to the standby/disturb write operation the actual cell states, whereby a change along a word line of the given storage state of one of said cells is indicative of a defect-free standby supply system of the particular word line, whereas the presence of the given storage state of one of said cells along a word line under test is indicative of a failure in the standby supply system of that particular word line.

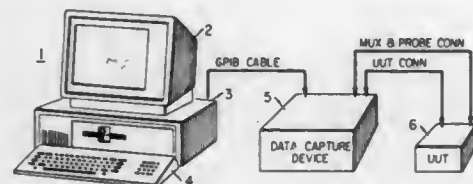
4,713,815 AUTOMATIC FAULT LOCATION SYSTEM FOR ELECTRONIC DEVICES

Dennis P. Bryan, Dunwoody, and John B. Rowe, Marietta, both of Ga., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 12, 1986, Ser. No. 839,020
Int. Cl. G01R 31/28

U.S. Cl. 371-29

25 Claims



1. In a fault locating system for locating faults in components and connections within an electronic device being tested, and including display means and input means for receiving diagnostic test procedure input, the method comprising:

displaying a plurality of test design input screens on the display means, said input screens being arranged to solicit author input in a sequential interactive manner to correspond to a series of testing steps to be accomplished, and to also solicit associated reference data values for selected electrical contact points within the electronic device, said reference data values being indicative of a condition of the electronic device from a designated starting point to each contact point; and

saving the author input solicited by the design input screens and received from the input means for subsequent recall to display the designed test process to an operator as a series of interactive step-by-step test procedure output screens, each of said test procedure output screens being arranged to solicit actual test data from a test probe arranged to be placed at various points in the electronic device being tested as directed by the test procedure output screens, and comparing said actual test data with the reference data values to provide an indicium representative of the result of such comparison.

4,713,816 THREE MODULE MEMORY SYSTEM CONSTRUCTED WITH SYMBOL-WIDE MEMORY CHIPS AND HAVING AN ERROR PROTECTION FEATURE, EACH SYMBOL CONSISTING OF 2^i+1 BITS

Willibrordus J. Van Gils, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

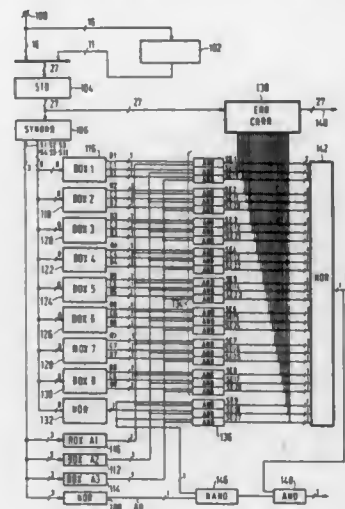
Filed Feb. 25, 1986, Ser. No. 833,644
Int. Cl. G06F 11/10

U.S. Cl. 371-38

8 Claims

1. A three module memory system, each module having an equal number of memory symbol locations, each memory symbol location having an equal number of 2^i+1 memory bit locations, a memory word thus containing $3(2^i+1)$ bits with $3 \leq i$, said memory system comprising input means for receiving user words of $2^{(i+1)}$ bits, encoding means fed by said input means for multiplying a user word received by a generator matrix (G) to produce a memory word for storing in three corresponding memory symbol locations, wherein $(G) = (P) \times (G) \times (Q)$, wherein (P) is an arbitrary regular matrix of dimensions $(2^{(i+1)} \times (2^i+1))$, (Q) is an arbitrary permutation matrix of dimensions $\{3 \times (2^i+1)\} \times \{3 \times (2^i+1)\}$ for effecting bit-wise permutation within a code symbol and/or symbol-wise permutation within a code word, the choice for (P) and (Q) including identity matrices, and wherein G is a

matrix of dimensions $(2^{(i+1)})$ rows and $3 \times (2^i+1)$ columns for implementing a bitwise systematic error protection code having



ing a minimum distance profile of (p, 2, 0) wherein p is at least equal to five.

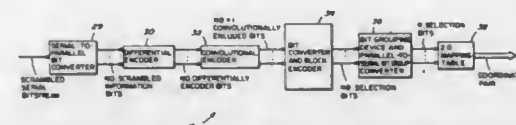
4,713,817 MULTIDIMENSIONAL, CONVOLUTIONALLY CODED COMMUNICATION SYSTEMS

Lee-Fang Wei, Westwood, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Apr. 25, 1985, Ser. No. 727,398
Int. Cl. G06F 11/10

U.S. Cl. 371-43

82 Claims



1. Apparatus for transmitting a stream of information bits by sending corresponding signals over a channel in a plurality of signaling slots, comprising

means for encoding the information bits that appear during a block of at least two said signaling slots by adding at least one redundant bit, to form a set of signal point selection bits for said block,

means for selecting, for each said set of signal point selection bits a multi-dimensional signal point drawn from a multi-dimensional constellation for said block, said multi-dimensional signal point selected for a particular said block being dependent on the multi-dimensional signal point selected for at least one other said block, said means for selecting being connected to be responsive to said means for encoding,

wherein said means for selecting establishes a correspondence between each possible combination of said signal point selection bits and the coordinates of a multi-dimensional signal point in said multi-dimensional constellation, wherein said means for encoding and said means for selecting define a partitioning of said multi-dimensional constellation into a plurality of multi-dimensional subsets and determine the subset from which said multi-dimensional signal point is selected based upon at least one of said signal point selection bits, said multi-dimensional constellation being a concatenation of constituent constellations each of which has fewer dimensions than said multi-dimensional constellation and is partitioned into constituent subsets, each said multi-dimensional subset being based upon said constituent subsets but being other than a con-

catenation of constituent subsets of said constituent constellations, and

means for modulating at least one carrier for transmission over said channel in accordance with each selected said multi-dimensional signal point, said means for modulating being connected to be responsive to said means for selecting, and wherein

said constituent subsets in each said constituent constellation are grouped to form constituent families such that the minimum distance between constituent points within each said constituent subset is greater than the minimum distance between constituent points within each said constituent family, which is in turn greater than the minimum distance between constituent points within said constituent constellation,

said multi-dimensional constellation is partitioned into said multi-dimensional subsets based on said distances of said constituent families and subsets,

said multi-dimensional subsets are grouped to form multi-dimensional families also based on said distances, and said constituent family comprises constituent subfamilies each of which comprises a plurality of said constituent subsets chosen such that the minimum distance between constituent points within each said constituent subfamily is greater than the minimum distance between constituent points within each said constituent family and is less than the minimum distance between constituent points within each said constituent subset, and said multi-dimensional constellation is partitioned into said multi-dimensional subsets also based on said distances of said constituent subfamilies.

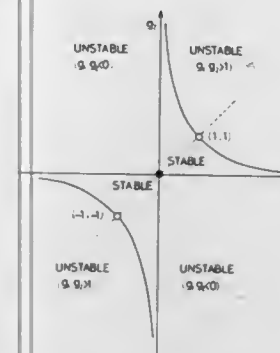
4,713,818 OPTICAL BISTABLE DEVICE

Chun-Shen Lee, Torrance, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.

Filed Dec. 5, 1984, Ser. No. 678,296
Int. Cl. H01S 3/00

U.S. Cl. 372-8

18 Claims



1. An optical bistable device comprising:

(a) an optical resonator capable of resonating a laser beam therein when said resonator has a stable geometry and incapable of resonating the same therein when said resonator has an unstable geometry, wherein said resonator includes means for changing from a stable geometry to an unstable geometry according to a change in intensity of said laser beam and magnitude of input energy supplied to said optical resonator,

(b) a pair of mirrors,

(c) an internal refractive medium disposed between said optical resonator and pair of mirrors,

(d) a light emitting substance placed in said optical resonator for emitting simulated light upon receiving a supply of the input energy wherein said simulated light forms a laser beam when resonated by said optical resonator, and the intensity of said laser beam depends upon the magnitude of the input energy;

(e) means for supplying said resonator and said light emitting substance with the input energy; and

(d) means for increasing and decreasing the magnitude of the input energy over first and second prescribed values, wherein the first prescribed value of the input energy is a value at which the resonator changes from a stable geometry to an unstable geometry when sufficient input energy exists for laser action to occur under the stable geometry, and the second prescribed value of the input energy is a value at which the resonator changes from an unstable geometry to a stable geometry under the same condition mentioned above.

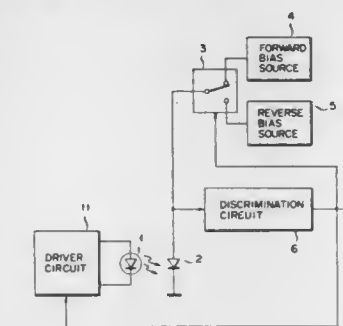
4,713,819 SEMICONDUCTOR LASER DRIVER

Shoji Yoshikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,698
Claims priority, application Japan, May 29, 1985, 60-115579
Int. Cl. H01S 3/10

U.S. Cl. 372-9

5 Claims



1. A discriminating device for determining a malfunction in a photodiode when the photodiode is connected in circuit, comprising:

circuit means for applying an operating potential of a first polarity to operating terminals of a photodiode to be tested;

test means for applying a test potential to said operating terminals of the photodiode, said test potential being of opposite polarity with respect to said operating potential; and

means coupled to said circuit means and said test means for determining if said photodiode is malfunctioning according to a terminal voltage developed across the operating terminals of said photodiode when the test potential is applied, said determining means including means for producing a discrimination signal when said terminal voltage is within a predetermined range indicative of normal functioning of said photodiode.

4,713,820 THERMAL LENSING-COMPENSATED LANTHANUM BERYLLATE LASER

Robert C. Morris, Ledgebrook; Margaret N. Long, Landing; Timothy C. Chin, Piscataway, and Donald F. Heller, Bound Brook, all of N.J., assignors to Allied Corporation, Morris Township, N.J.

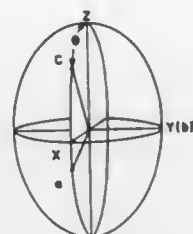
Filed Aug. 2, 1985, Ser. No. 762,100
Int. Cl. H01S 3/16; C09K 11/06

U.S. Cl. 372-41

11 Claims

1. A lanthanum beryllate single crystal that
(a) is doped with an element selected from the group consisting of praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and mixtures thereof; and
(b) has an elongated shape, in which the long direction is oriented at such an angle with respect to the crystallo-

graphic axes of the crystal that a plane polarized wave propagating in the crystal in the long direction will have



substantially zero temperature dependence of refractive index.

4,713,821

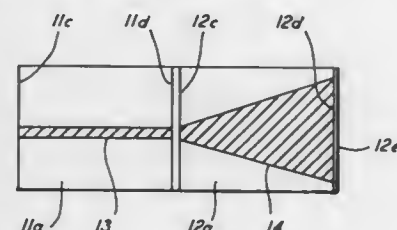
SEMICONDUCTOR LASER AND OPTICAL AMPLIFIER
James N. Bradford, Arlington; Jimmy R. Ames, Middleburg, and Andrew H. Montroll, Reston, all of Va., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 27, 1985, Ser. No. 780,879

Int. Cl.⁴ H01S 3/19

U.S. Cl. 372-44

16 Claims



1. A semiconductor light generating device comprising: laser diode means for generating a laser beam; and a multi-layered planar semiconductor optical power amplifier optically coupled to said laser diode means having a planar active region with an input and output cross sectional area perpendicular to said active region, said input area being smaller than said output area.

4,713,822

LASER DEVICE

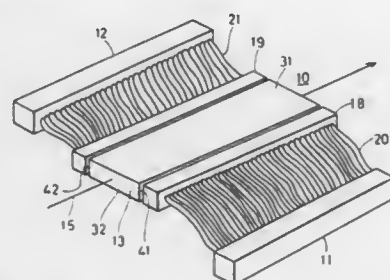
Chun-Shea Lee, Torrance, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.

Filed May 24, 1985, Ser. No. 737,485

Int. Cl.⁴ H01S 3/09

U.S. Cl. 372-69

6 Claims



1. A comprising: an optical resonator; a slab-geometry solid state laser medium disposed within said optical resonator and having a longitudinal axis and a

rectangular cross section transverse to said longitudinal axis, said rectangular cross section having a substantially constant height and width along said longitudinal axis, the width dimension being greater than the height dimension, the height of said rectangular cross section being defined by parallel top and bottom surfaces, the width of said rectangular cross section being defined by first and second side surfaces, and end faces of the medium along the longitudinal axis being fabricated at a Brewster angle with respect to the top or bottom surface so that the laser beam transmits in the medium along a zig-zag path bended by the top and bottom surfaces;

pumping means for optically exciting said slab-geometry laser medium through at least one of said first and second side surfaces;

wherein said pumping means is a laser-diode-pump module which comprises a laser-diode, a beam collimator which is disposed on a face of said side of slab-geometry laser medium, and an optical fiber bundle which guides the radiation beam emitted from said laser diode to said beam collimator.

4,713,823

PRE-COMBUSTION INTEGRATED RAM AIRBREATHING LASER

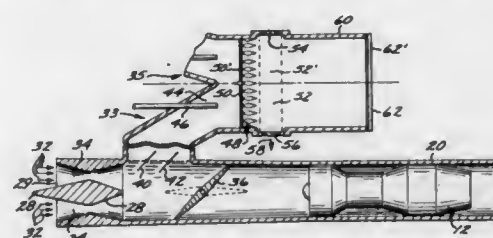
Eugene A. Smith, Vashon, Wash., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Sep. 27, 1985, Ser. No. 781,441

Int. Cl.⁴ H01S 3/09

U.S. Cl. 372-90

16 Claims



1. A Ram airbreathing gas dynamic laser provided on a mobile air vehicle having both a jet engine and a RAM type engine, comprising:

an air inlet duct directing air exterior the vehicle to the jet engine; the entrance to said inlet duct having a constricted inner diameter which preheats entering air when the mobile air vehicle is moving at high Mach speeds;

nozzle gate means positioned for diverting substantially all of said preheated air from said jet engine to a reservoir/-combustion chamber when said mobile air vehicle is operating on RAM engine power; said chamber having means for introducing fuel to said air and burning resulting air-fuel mixture;

a gas dynamic laser connected to the reservoir/combustion chamber, said laser including: means for aerodynamically expanding a burned air-fuel mixture supersonically, and an optical resonant cavity for stimulating lasing in said burned mixture; and

means for exhausting said burned mixture after passage through said gas dynamic laser.

4,713,824

NOBLE-METAL OVERCOATED, FRONT-SURFACE SILVER REFLECTORS

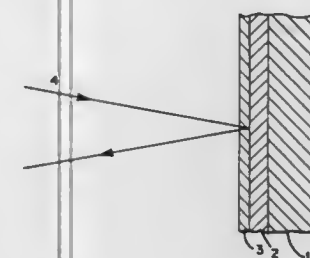
Donald F. Heller, Bound Brook, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 11, 1983, Ser. No. 465,734

Int. Cl.⁴ H01S 3/08

U.S. Cl. 372-99

8 Claims



1. In a reflector that includes a substrate having a reflective-silver coating on its front surface, the improvement comprising a partially-transparent gold overcoat on the coating.

4,713,825

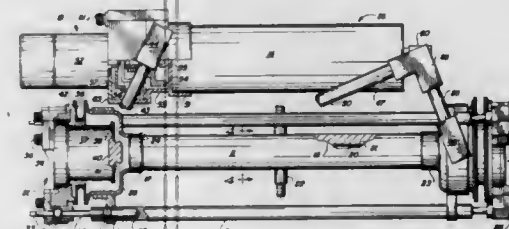
GAS LASER AND METHOD OF MAKING A GAS LASER
Anthony P. Adsett, Orlando, Fla., assignor to Litton Systems, Inc., Orlando, Fla.

Filed Jul. 2, 1986, Ser. No. 881,097

Int. Cl.⁴ H01S 3/08

U.S. Cl. 372-107

14 Claims



1. A gas laser apparatus comprising in combination: a ceramic waveguide means having a bore extending there-through and a pair of slots cut into the exterior of said bore for forming electrodes therein; an electrode formed in each of said ceramic waveguide slots and having electrode coats extending from said electrodes; an optical assembly having a mirror located on each end of said ceramic waveguide to each of said mirrors being attached to a metal ring in said optical assembly with a hardened fused glass frit material, said optical assembly metal ring is attached to a metal sleeve having a temperature expansion rate matched to the temperature expansion rate of a plurality of metal rods and said ceramic waveguide to expand said metal sleeve in a direction opposite from the expansion of said metal rods and ceramic waveguide; a gas ballast tank attached adjacent said ceramic waveguide, said gas ballast tank having a permanent magnet pump attached thereto for pumping the gas from said ballast tank through said ceramic waveguide, said magnetic pump having a permanent magnet coupling between an electric motor through a pump housing wall to permanent magnets attached to rotating vanes; and said plurality of metal rods connected between said optical assemblies, each of said plurality of metal rods having an adjustment screw on each end thereof movably connecting said optical assemblies to said rods for aligning the mirror of each optical assembly; whereby a laser has an adjustable mirror attached thereto with a high temperature glass frit seal.

4,713,826

METHOD AND APPARATUS FOR HOLDING OR INCREASING THE TEMPERATURE IN A METAL MELT
Hans J. Bebbler, Mülheim; Dieter Neuschütz, and Heinrich-Otto Rossner, both of Essen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Division of Ser. No. 785,592, Oct. 8, 1985, Pat. No. 4,632,700.

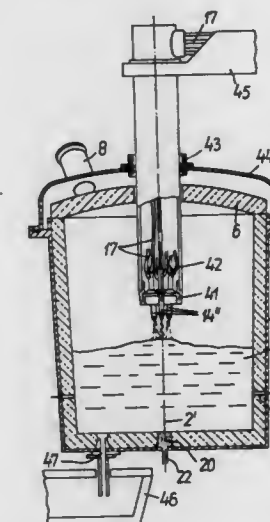
This application Sep. 3, 1986, Ser. No. 903,303

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437333; Nov. 30, 1984, 3443740

Int. Cl.⁴ H05B 7/00

U.S. Cl. 373-22

9 Claims



1. Apparatus for supplying thermal energy to a metal melt after having been discharged from a melting furnace, comprising: a receiving vessel for receiving the melt from the furnace; at least two water-cooled plasma torches each having a longitudinal axis and a central electrode from which a heating arc is generated during operation of the torches; means connected for supplying alternating current to said torches for operating said torches; a cover disposed above said vessel; means defining a passage through said cover from which said electrodes; means associated with said passage for establishing a gas-tight seal between said electrodes and said cover; mount means supporting all of said torches; and lifting means supporting said mount means and operable for adjusting the height of said torches relative to said vessel, wherein said mount means comprise: a central pipe extending through, and movable relative to, said passage; an insert support at the lower end of said pipe and carrying said torches; and means for supplying cooling water to the interior of said central pipe and said insert.

4,713,827

TERMINATOR FOR A CMOS TRANSCIVER DEVICE
Donald K. Lauffer, Poway; Gregory H. Milby; Paul M. Rostek, both of San Diego, and Ikuro J. Sanwo, San Marcos, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 10, 1986, Ser. No. 929,122

Int. Cl.⁴ H04L 25/12

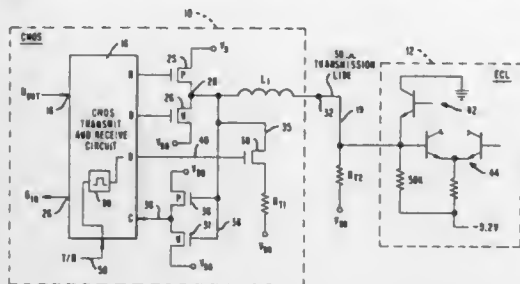
U.S. Cl. 375-7

6 Claims

1. A terminator for a transceiver device transmitting data signals to and receiving data signals from a second transceiver device over a transmission line therebetween, said terminator comprising:

a transmitter connected to the transmission line for transmitting data signals to the second transceiver device; a receiver connected to the transmission line for receiving data signals from the second transceiver device; and a termination resistor connected to the transmission line for

improving the transmission characteristics of the transmission line;
switch means between said termination resistor and the transmission line, said switch means having a first closed state wherein said transmission resistor is connected to the transmission line, and a second opened state wherein said



termination resistor is not connected to the transmission line; and
control means in said switch means for placing said switch means in said first closed state for a set portion of the time that said receiver is receiving data from the second transmitter device.

4,713,828

DATA REDUCTION CIRCUIT

Soenke Mehrgardt, March, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

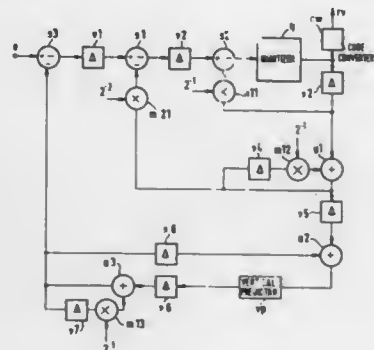
Filed Apr. 3, 1986, Ser. No. 847,646

Claims priority, application European Pat. Off., Apr. 3, 1985, 85104051.9

Int. Cl.⁴ H04B 14/06

U.S. Cl. 375-30

2 Claims



1. Data reduction circuit for reducing the number of bits of digital video signals with a differential pulse code modulator comprising:

- a vertical predictor;
 - a quantizer; and
 - a code converter for converting the output data of said quantizer into an output signal with the reduced number of bits; and
- the input data is fed to a first delay element, said input data changing at the rate of a clock signal;
said first delay element having its output coupled to the minuend input of a first subtractor;
the output of said first subtractor being connected via a second delay element to the minuend input of a second subtractor having its output coupled to the input of the quantizer;
the output of said quantizer being connected to the input of a third delay element having an output coupled to the first

input of a first adder and through a first 2^{-1} multiplier to a subtrahend input of said second subtractor;
the delay produced by each of said first, second and third delay elements being equal to the period of said clock signal;

said first delay element is preceded by the minuend-input-output path of a third subtractor;

the output of said first adder is coupled through a fourth 2^{-2} multiplier to the subtrahend input of said first subtractor, through a fourth delay element and a second 2^{-1} multiplier to the second input of said first adder, and through a fifth delay element to the first input of a second adder having its input connected to the input of said vertical predictor;

the output of said vertical predictor is coupled through a sixth delay element to the first input of a third adder whose output is connected to the subtrahend input of said third subtractor, through a seventh delay element and a third 2^{-1} multiplier to the second input of said third adder (a3), and through an eighth delay element to the second input of said second adder (a2); and

the delay of each of said fourth, fifth, sixth, and seventh delay elements is equal to that of said first delay element, while the delay of said eighth delay element is four times that of said first delay element.

4,713,829

CODED MODULATION SYSTEM WITH A SIMPLIFIED DECODER CAPABLE OF REDUCING THE EFFECTS OF CHANNEL DISTORTION

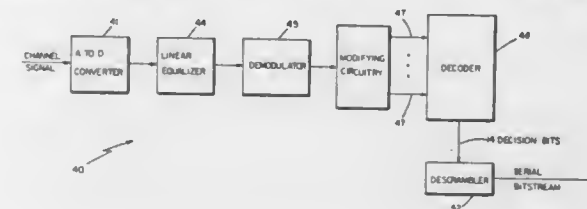
Vedat M. Eyuboglu, Boston, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Jun. 19, 1985, Ser. No. 746,538

Int. Cl.⁴ H04L 27/00

U.S. Cl. 375-37

30 Claims



1. A receiver for deciding which signal points were sent from a transmitter based on corresponding noise affected signals received via a distorting channel, said noise affected signals carrying information about a particular sequence of encoding states occupied in a succession of time intervals by a finite state device in said transmitter having a finite number of possible said encoding states, said receiver comprising

- modifying circuitry for generating a plurality of different modified versions of each said received signal, and
 - a decoder having a finite number of possible decoder states based on said possible encoding states, and for deciding which signal points were sent based on said decoder estimating a particular time sequence of said decoder states corresponding to said particular sequence of encoding states, by storing a number of path histories of previous signal points in said decoder, and using said modified versions to extend said path histories to later time intervals,
- said different modified versions of each said received signal numbering fewer than said number of said stored path histories.

4,713,830
CONTINUOUSLY VARIABLE SYNCHRONIZER APPARATUS

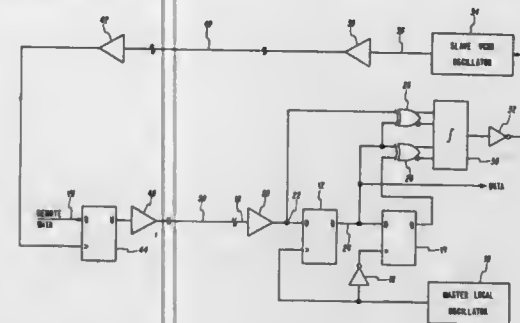
Mark A. McDonald, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 30, 1986, Ser. No. 880,470

Int. Cl.⁴ H04L 7/00; H03D 3/24

U.S. Cl. 375-109

5 Claims



- The method of compensating for variable transmission line time delays in received data comprising the steps of: receiving data from a remote location; generating a local master clock signal; detecting the phase difference between said local master clock signal and received data; adjusting the frequency of a clock output of a local slave oscillator in accordance with the detected phase difference; and supplying the clock output of the local slave oscillator to the remote location for use in correctly timing the output of data from said remote location.

4,713,831

COUNTING METHOD AND DEVICE

Jean-Bernard Morisod, Crissier, Switzerland, assignor to Bobst SA, Switzerland

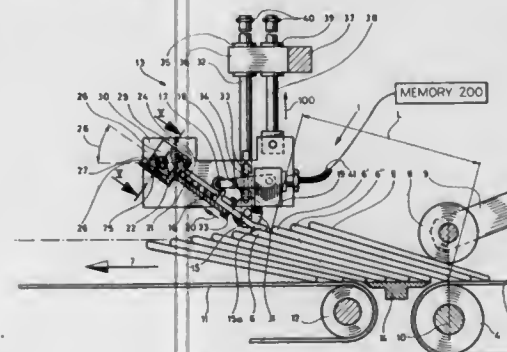
Filed Oct. 2, 1985, Ser. No. 783,175

Claims priority, application Switzerland, Oct. 12, 1984, 04893/84

Int. Cl.⁴ G06M 7/06

U.S. Cl. 377-8

9 Claims



1. In a device for counting the number of objects in a flow of objects being moved past a given point, said device including sensor means for engaging the objects in succession and activating first means to create a pulse for each object, which pulse is processed in a memory with the improvements comprising the device including a plate and a conveyor with a belt for moving the flow of objects along a plane beneath the sensing means, said sensor means having a portion engaging the leading edge of each object in succession with movement of the engaged object in the direction of the flow causing the portion to move and activate the first means to create the pulse, and means for shifting the first means and sensor means to lift the

portion out of engagement with the edge after creating the pulse to enable resetting the first means for forming the pulse and to engage an edge of the next following object of the flow, said means for shifting including means mounting the plate for movement along a path extending substantially perpendicular to the plane of the belt, said means for mounting including a pair of rods secured to the plate, said rods being mounted in a bearing arrangement on a frame of the conveyor for movement along the axis of the rods, one of said rods supporting a roller riding on the flow of objects so that as the roller moves over a leading edge of each object, the plate and rods are shifted perpendicularly away from the flow.

4,713,832

PROGRAMMABLE DIVIDER UP/DOWN COUNTER WITH ANTI-ALIASING FEATURE AND ASYNCHRONOUS READ/WRITE

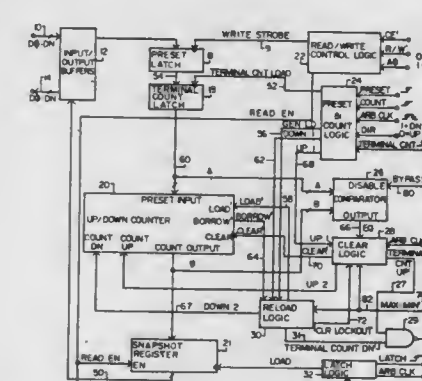
John Hutson, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 11, 1986, Ser. No. 851,063

Int. Cl.⁴ H03K 23/66, 21/40

U.S. Cl. 377-45

25 Claims



1. A bidirectional counter with programmable terminal count capability comprising:

- an up/down counter for counting up or down in response to count up and count down signals applied respectively to count up or count down inputs;
- first means for storing a current terminal count;
- second means coupled to said first means and to said up/down counter for comparing the current terminal count to the current count in said up/down counter and for clearing the up/down counter to zero when the two numbers are equal and the next count up signal is received;
- third means for causing the current terminal count to be loaded into said up/down counter as the current count in said up/down counter after the current count in said up/down counter becomes equal to zero and the next down count signal is received.

4,713,833

X-RAY SOURCE APPARATUS

David W. Turner; Andrew J. Dixon; Karl A. Gehring, all of Oxford, and Michael Keenlyside, Oxfordshire, all of United Kingdom, assignors to Kevex Corporation, Foster City, Calif. PCT No. PCT/GB83/00157, § 371 Date Feb. 17, 1984, § 102(e) Date Feb. 17, 1984, PCT Pub. No. WO84/00079, PCT Pub. Date Jan. 5, 1984

Continuation of Ser. No. 588,875, Feb. 17, 1984. This PCT application Jun. 16, 1983, Ser. No. 797,197

Claims priority, application United Kingdom, Jun. 17, 1982, 8217609

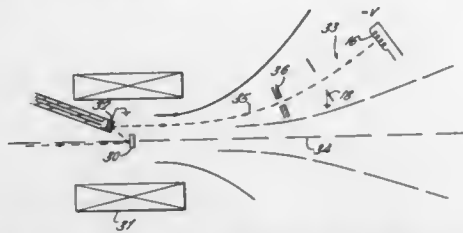
Int. Cl.⁴ G21G 4/00; H01J 35/00, 35/30

U.S. Cl. 378-119

8 Claims

1. An X-ray source apparatus comprising, in an evacuated

chamber, an X-ray target of a selected material which emits X-rays when bombarded with electrons of at least a predetermined energy; a source of electrons; means for accelerating electrons from said source to at least the predetermined energy; means for generating a magnetic field with curved lines of magnetic flux interlinking said target and said electron source and with the magnetic field having sufficient strength over the whole of the interlinking magnetic flux lines between said target and said electron source such that electrons of the energies of those accelerated from said source with compo-



nents at angles to the magnetic field are constrained by the field to execute helical paths adjacent said source and to travel generally in the direction of the lines of flux, said target being sized and positioned to intercept substantially all of those lines of flux that intercept said electron source so that substantially all the electrons from said source bombard said target to cause said target to emit X-rays; and aperture means blocking straight line paths between said source and said target but permitting passage of substantially all the electrons travelling along the flux lines from said source to said target.

4,713,834

MULTIPROCESSOR COMPUTING SYSTEM FEATURING SHARED GLOBAL CONTROL

David J. Brahm, Naperville; James M. Grinn, Warrenville; Edward L. Hepler, and Edward P. Schan, Jr., both of Woodridge, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J. Division of Ser. No. 430,681, Sep. 30, 1982, Pat. No. 4,626,634.

This application Jun. 20, 1986, Ser. No. 876,407

Int. Cl.⁴ H04M 3/28

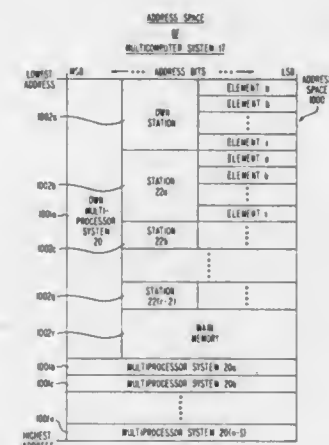
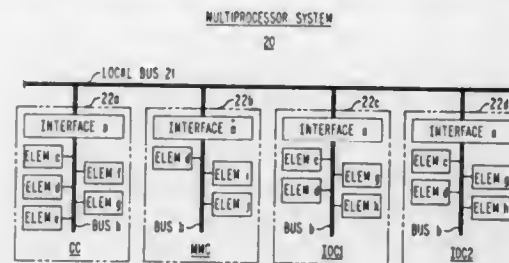
U.S. Cl. 379-28

17 Claims

1. In a data processing, communication, or telephone system, a multiprocessor comprising:
 - a plurality of identifiable stations each having a first plurality and a second plurality of addresses associated therewith, the addresses of the second plurality of addresses being common to all stations, and the addresses of the first plurality of addresses of each station being exclusive to that station and including addresses of the second plurality of addresses each combined with an address portion identifying the associated station;
 - each station including a plurality of addressable elements, each element having associated therewith a second address from the second plurality of addresses and a first address from the first plurality of addresses such that the first address is the second address combined with the address portion identifying the station;
 - the plurality of elements of each station including a plurality of elements that are common among stations in that for each common element there is another element in at least one other station that is a functional counterpart of the common element, each common element and its counterpart elements having the same second address associated with them;
 - a system communication bus interconnecting the plurality of stations;
 - each station including a station communication bus interconnecting the plurality of elements of the associated station; at least two of the plurality of stations each having processor means connected to the station bus, the processor means for generating the first address of an element of another station on the station bus to access the addressed element

of the other station, and further for generating the second address of an element of the associated station on the station bus to access the addressed element of the associated station;

each of the at least two stations having first interface means for connecting the system bus with the station bus in response to detecting an address from a first plurality of



addresses on the station bus, to transfer the address to the system bus; and
each station having second interface means for connecting the system bus with the station bus in response to detecting an address from the first plurality of addresses of the associated station on the system bus, to transfer the second address portion of the first address from the system bus to the station bus.

4,713,835

TELEPHONE ANSWERING MACHINE WITH AUTOMATIC RECORDING AND VISUAL DISPLAY OF TIME AND DATA

Raymond G. Bond, Long Beach, and Gerald L. Mock, Corona, both of Calif., assignors to Fortel Corporation, Compton, Calif.

Filed May 9, 1986, Ser. No. 861,355

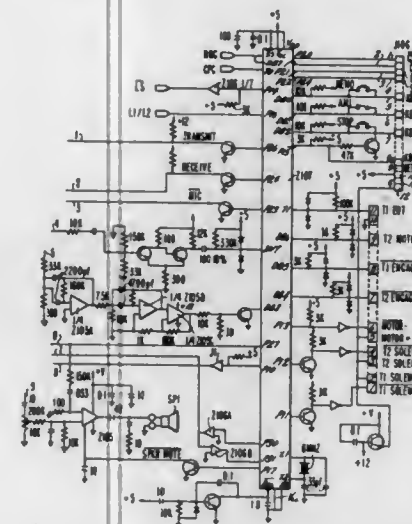
Int. Cl.⁴ H04M 1/65

U.S. Cl. 379-79

8 Claims

1. A telephone answering machine which includes a mechanism in which incoming messages received over a telephone line are recorded in sequence on a memory member, the combination of: ring detect circuitry connected to the telephone line and responsive to ring signals received over the telephone line for producing a control signal; a microcomputer connected to said ring detect circuitry and responsive to said control signal for delivering an outgoing message, for causing incoming messages received over the telephone line to be recorded on the memory member and for causing related data to be stored in said microcomputer; playback circuitry connecting said microcomputer to said mechanism for causing the mechanism to play back the messages and data recorded on the

memory member; first control circuitry connected to said microcomputer for controlling the mechanism at the termination of each message received over the telephone line to cause the memory member to move back to a blank portion adjacent to the beginning of the last incoming message recorded on said memory member; circuitry connecting said microcomputer to said memory member to cause the data stored in the microcomputer to be recorded on said memory member in the



corresponding blank portion and for subsequently introducing the data recorded on said memory member to said microcomputer during playback of the messages recorded on said memory member; a visual display device; and further circuitry connecting said microcomputer to said visual display device for causing the data recorded on the memory member to be displayed by said display device during playback of the messages recorded on said memory member.

4,713,836

TELEPHONE SET STRUCTURE HAVING A MEMBER CAPABLE OF BEING INSERTED IN INVERTIBLE POSITION

Takeshi Suzuki, Tokyo, Japan, assignor to NEC Corporation, Japan

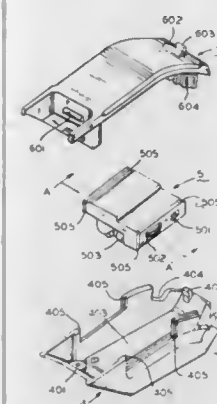
Filed Jul. 3, 1985, Ser. No. 752,142

Claims priority, application Japan, Jul. 6, 1984, 59-101428[U]; Sep. 17, 1984, 59-140609[U]

Int. Cl.⁴ H04M 1/23; H04Q 7/00

U.S. Cl. 379-58

12 Claims



1. A telephone set comprising a handset mounted on a base, manual actuatable control modular means separately mounted to be installed in said base in either of two positions, one of said two positions exposing said manual actuatable control modular

means on a right-hand side of said base and the other of said two positions exposing said manual actuatable control modular means on the left-hand side of said base, and means for mounting said base in either of two modes, one of said modes being a vehicle mount and the other of said modes being a portable mount.

4,713,837

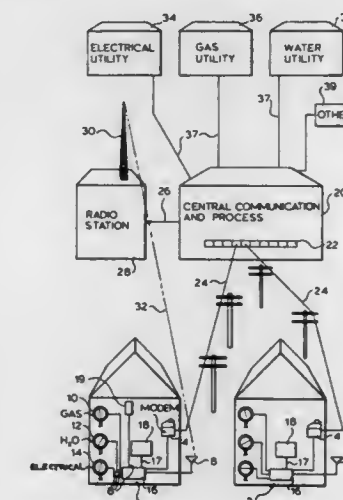
COMMUNICATION NETWORK
Alastair Gordon, 61 Dalewood Road, Toronto, Ontario, Canada M4P 2N4

Filed Dec. 24, 1985, Ser. No. 813,229

Int. Cl.⁴ H04M 11/00

U.S. Cl. 379-93

1 Claim



1. A communication system for transmitting information originating from a receiving and transmitting station and destined for another receiving and transmitting station over telecommunication channels comprising:
 - a plurality of receiving and transmitting stations, each having a unique address code, means for receiving a broadcast signal which can include address codes, means for determining whether the particular address code is contained within a received broadcast signal, an automatic telephone dialer, means for actuating said automatic dialer when the address code is determined to be contained in said received broadcast signal, and a telephone line associated with said telephone dialer,
 - a central processing facility including means to receive and automatically answer incoming telephone communications and store information including address codes transmitted during such communications, means to create an instructing signal containing particular address codes and incorporate such address codes in a broadcast signal, and a broadcast station which transmits such address codes to receiving and transmitting stations,
 - wherein information identifying the destined receiving and transmitting station is transmitted from an originating station to said central processing facility which incorporates the address code of the destined receiving and transmitting station in a broadcast signal which when received by said destined receiving and transmitting station determines the particular address code is included in the broadcast signal by said determining means and actuates said automatic telephone dialer completing a telephone communication with said central processing facility which upon identification of said particular receiving means transmits to said destined receiving and transmitting station the information.

4,713,838

AMPLIFIER WITH DOUBLE RAIL OUTPUT

Stanley D. Rosenbaum, and Calvin Plett, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 878,729, Jun. 26, 1986, Pat. No. 4,691,271.

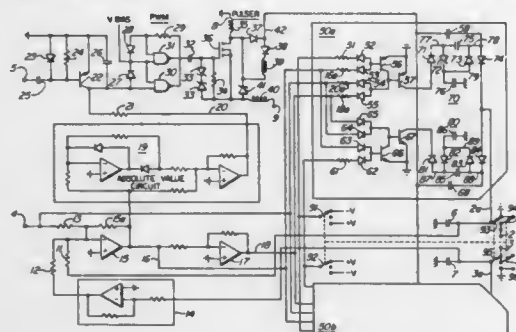
This application May 20, 1987, Ser. No. 51,802

Claims priority, application Canada, Oct. 28, 1985, 493989

Int. Cl.⁴ H04M 3/02

U.S. Cl. 379-252

8 Claims



1. An amplifier for amplifying a reference signal to provide therefrom at least one of an amplified replica of the reference signal and its complement comprising:

a reference signal terminal for application of the reference signal thereto;

amplification means including first and second outputs for supplying at least one of the amplified replica and its complement respectively, first and second power terminals for connection to a d.c. power source, and an input;

a network including a first resistor being connected between the first output and the input, a second resistor being connected between the second output and the input, and a third resistor being connected between the reference signal terminal and the input; and

a unity gain inverter being connected in series with one of the first and second outputs and a respective one of the first and second resistors.

4,713,839

RESEALABLE REUSABLE FLEXIBLE PLASTIC BAG WITH LOOP HANDLE

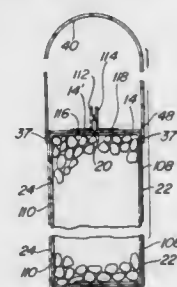
Harry R. Peppiatt, Doylestown, Pa., assignor to Paramount Packaging Corp., Chalfont, Pa.

Continuation-in-part of Ser. No. 388,381, Jun. 14, 1982, Pat. No. 4,573,203. This application Jan. 21, 1986, Ser. No. 821,561

Int. Cl.⁴ B65D 33/10, 33/16

U.S. Cl. 383-29

18 Claims



1. A resealable reusable flexible plastic bag comprising an outer unitary piece of flexible plastic material including generally rectangular front and rear plastic panels and a gusset connecting said panels at a first end portion of the bag, an inner unitary piece of flexible plastic material including generally rectangular front and rear panels and a gusset connecting said last-mentioned panels at said first end portion of the bag, the

ends of said inner and outer unitary pieces of flexible plastic material opposite said first end of the bag being open to facilitate introducing goods into the bag, the side edges of said gussets and said panels being connected together in a manner so that the bag when filled can approximate the shape of a hexahedron with said gusset of said outer piece of flexible plastic material being flattened and closing said first end portion of the bag, a handle defined by a loop of flexible plastic material having ends and being secured at each of its ends to a separate one of said panels of said outer piece of flexible plastic material adjacent said gusset of said outer piece of flexible plastic material, at least a portion of each of said gussets being frangible so as to facilitate access to the goods in the bag and thereafter permit reuse of the bag, and closure means having first and second mating portions separably connectable to each other and connected to said gusset of said outer piece of flexible plastic material so as to prevent access to the goods in the bag when said mating portions are connected together and for facilitating access to the goods in the bag when said mating portions are separated.

4,713,840

DATA COMMUNICATION SYSTEM

Yonosuke Hasegawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

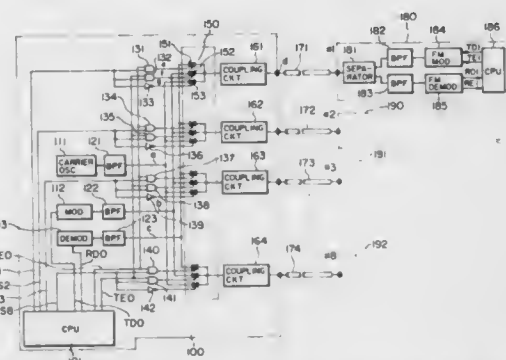
Filed Jun. 25, 1985, Ser. No. 748,638

Claims priority, application Japan, Jun. 25, 1984, 59-131278

Int. Cl.⁴ H04H 1/04

U.S. Cl. 455-2

3 Claims



1. A data communications system for performing data communications between a central control device and a plurality of terminal units, comprising:

a plurality of transmission paths coupling said central control device to a like numbered plurality of said terminal units;

means for applying a transmission carrier to ones of said transmission paths when said central control device neither transmits information to nor receives information from terminal units associated with said ones of said transmission paths;

means for suspending application of said carrier to a selected transmission path when communications are to be initiated between said central control device and the terminal unit associated with said selected path; and

at each terminal unit, means for detecting the suspension of reception of said carrier, said suspension constituting a transmission request directed to said terminal unit, and means for performing an up-data transmission to said central control device in response to a detected transmission request.

4,713,841

SYNCHRONOUS, ASYNCHRONOUS, DATA RATE TRANSPARENT FIBER OPTIC COMMUNICATIONS LINK

David R. Porter, Roanoke; James H. Bowen, Salem, and John M. Holland, Shawsville, all of Va., assignors to ITT Electro Optical Products, a division of ITT Corporation, Roanoke, Va.

Filed Jun. 3, 1985, Ser. No. 740,151

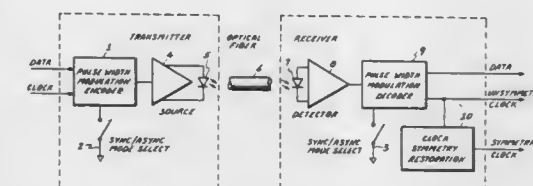
Int. Cl.⁴ H04B 9/00

U.S. Cl. 455-608

9 Claims

1. A circuit for receiving pulse width modulated data signals in an optical fiber communications system comprising: means for amplifying a pulse width modulated signal; means for comparing the amplified pulse width modulated signal with a reference quantity and means connected to said pulse amplifying means for limiting

the peak value of the amplified pulse width modulated signal, said limiting means including means connected to



an output of said comparing means for adjusting the duty cycle of the amplified pulse width modulated signal.

DESIGNS

DECEMBER 15, 1987

293,155

CONFECTION ON A STICK

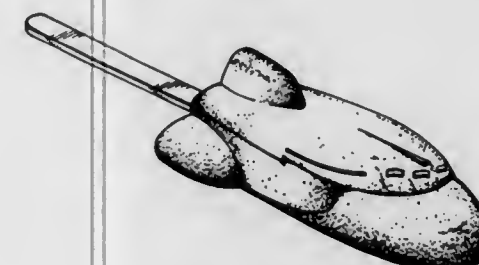
Sidney Barish, Richmond Hill, Canada, assignor to Dickie Dee Ice Cream (Canada) Ltd., Richmond Hill, Canada

Filed Feb. 21, 1985, Ser. No. 703,878

Claims priority, application Canada, Nov. 14, 1984, 14-11-84-3

Term of patent 14 years

U.S. Cl. D1-104



293,156

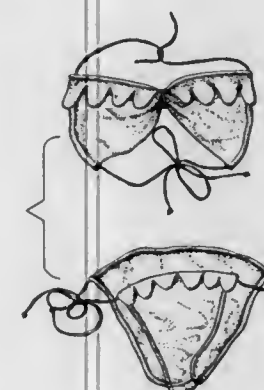
BATHING SUIT OR THE LIKE

Elena M. Dunnagan, Wilmington, N.C.

Filed Jun. 28, 1984, Ser. No. 625,555

Term of patent 14 years

U.S. Cl. D2-41



293,157
SHOE

Scott A. Williams, 2537 Michaelangelo Dr., Stockton, Calif. 95207

Filed Sep. 17, 1985, Ser. No. 776,926

Term of patent 14 years

U.S. Cl. D2-283



293,158

SPORT SHOE

Robert R. Campbell, New York, N.Y., assignor to BBC International Ltd., New York, N.Y.

Filed Jul. 12, 1984, Ser. No. 629,999

Term of patent 14 years

U.S. Cl. D2-309

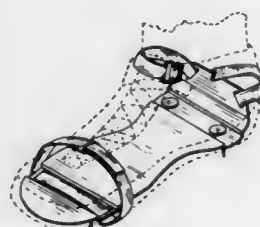


293,159
SHOEGuillaume Sacre, West Linn, Oreg., assignor to Danner Shoe Manufacturing Co., Portland, Oreg.
Filed Aug. 26, 1985, Ser. No. 769,354
Term of patent 14 years

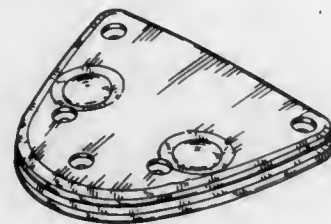
U.S. Cl. D2—313

293,160
ICE CREEPERLoren L. Le Droit, 613 E. 12th, North Platte, Nebr. 69101
Filed Jun. 24, 1985, Ser. No. 748,115
Term of patent 14 years

U.S. Cl. D2—317

293,161
CLOGGING DANCE TAP DEVICEWalter T. Stevens, Jr., 105 Fellowship Rd., Moorestown, N.J. 08057
Filed Jun. 24, 1985, Ser. No. 748,174
Term of patent 14 years

U.S. Cl. D2—317



293,162

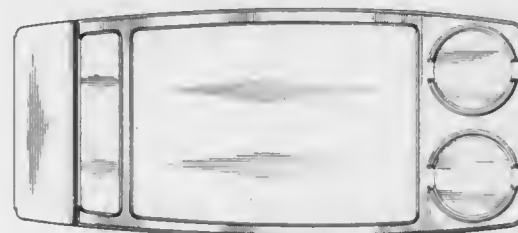
CARRIER ATTACHMENT FOR AN AUTOMOBILE SEAT OR THE LIKE

Bruce Carmichael, 750 Madison, Lebanon, Mo. 65536
Filed Nov. 9, 1984, Ser. No. 669,999
Term of patent 14 years

U.S. Cl. D3—40

293,163
CAR TRAYCharles S. Roth, 731 Arneill Rd., Camarillo, Calif. 93010
Filed May 9, 1986, Ser. No. 862,407
Term of patent 14 years

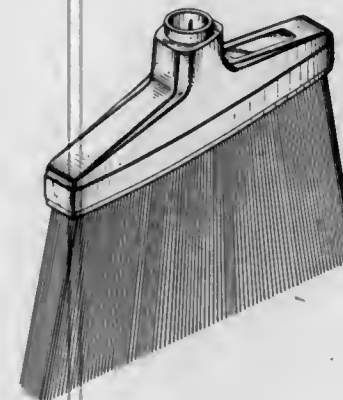
U.S. Cl. D3—40

293,164
CLEAT CLEANERAlan D. Shearer, 185 Katy La., Englewood, Ohio 45322
Filed Mar. 18, 1985, Ser. No. 713,036
Term of patent 14 years

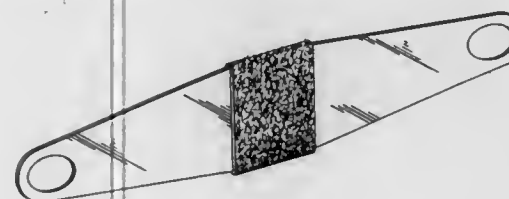
U.S. Cl. D4—118

293,165
ANGLED BROOMRobert W. Machacek, Villa Park, Ill., assignor to The Drackett Company, Cincinnati, Ohio
Filed Feb. 13, 1986, Ser. No. 833,451
Term of patent 14 years

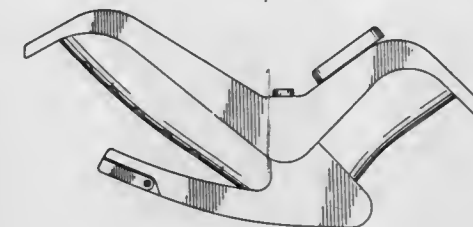
U.S. Cl. D4—135

293,166
WIRE WHEEL BRUSHWilliam G. Caswell, 2720 Donna Dr., Perry, Iowa 50220
Filed Apr. 19, 1985, Ser. No. 725,110
Term of patent 14 years

U.S. Cl. D4—137

293,167
INFANT SEATMerry S. Riehm, E. Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Aug. 2, 1985, Ser. No. 762,128
Term of patent 14 years

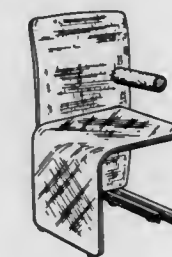
U.S. Cl. D6—333

293,168
CHAIRRose Tarlow, 405 S. Bedford Dr., Beverly Hills, Calif. 90212
Filed Jun. 10, 1985, Ser. No. 743,019
Term of patent 14 years

U.S. Cl. D6—334

293,169
CHAIRMaurizio Salvato, Gallarate, Italy, assignor to Saporiti Italia, S.p.A., Italy
Filed Mar. 15, 1985, Ser. No. 712,362
Claims priority, application Italy, Sep. 18, 1984, 23173/84[U]
Term of patent 14 years

U.S. Cl. D6—334



293,170

PORTABLE SEAT

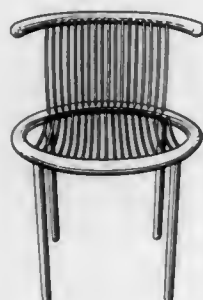
Frank L. Roberts, Thornhill, Canada, assignor to Bio-Support Industries Ltd., Toronto, Canada
 Filed Jul. 31, 1985, Ser. No. 760,803
 Term of patent 14 years

U.S. Cl. D6—368

293,171
CHAIR

Karl W. Lübke, Portlandstrasse 21, 4840 Rheda-Wiedenbrück, Fed. Rep. of Germany
 Filed May 14, 1985, Ser. No. 734,381
 Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 1863
 Term of patent 14 years

U.S. Cl. D6—370

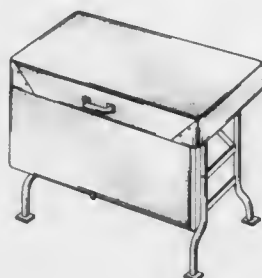


293,172

PORTABLE TABLE

Ralph N. Weiss, 2681 - 13th St. N., Naples, Fla. 33940
 Filed Jul. 8, 1985, Ser. No. 752,667
 Term of patent 14 years

U.S. Cl. D6—429

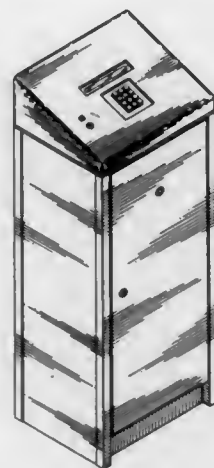


293,173

CONSOLE FOR CONTROLLING ACCESS TO MULTIPLE COMPARTMENT CABINETS

Richard J. Chester, Kennedy, N.Y., assignor to American Locker Group Incorporated, Jamestown, N.Y.
 Filed May 20, 1985, Ser. No. 735,767
 Term of patent 14 years

U.S. Cl. D6—432



293,174

DISPLAY STAND

Melvin M. Miller, 3617 Essex Ct., Bloomington, Ind. 47401
 Filed Mar. 21, 1985, Ser. No. 714,636
 The portion of the term of this patent subsequent to Feb. 12, 1999, has been disclaimed.
 Term of patent 14 years

U.S. Cl. D6—436

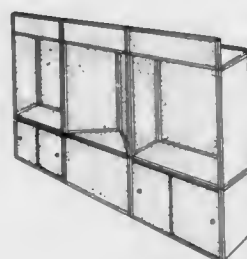


293,175

DISPLAY STAND

Melvin M. Miller, 3617 Essex Ct., Bloomington, Ind. 47401
 Filed Apr. 16, 1985, Ser. No. 723,931
 The portion of the term of this patent subsequent to Feb. 12, 1999, has been disclaimed.
 Term of patent 14 years

U.S. Cl. D6—436

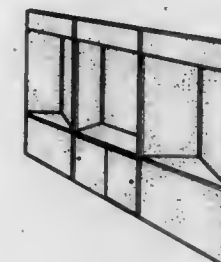


293,176

DISPLAY STAND

Melvin M. Miller, 3617 Essex Ct., Bloomington, Ind. 47401
 Filed Mar. 21, 1985, Ser. No. 714,578
 The portion of the term of this patent subsequent to Dec. 11, 1998, has been disclaimed.
 Term of patent 14 years

U.S. Cl. D6—436

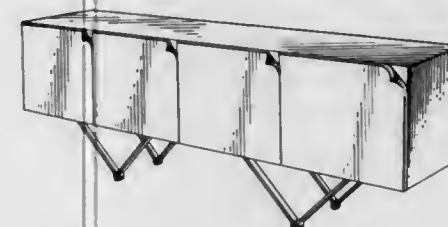


293,177

BUFFET

Demir Hamami, 4938 Battery La. Apt. 5, Bethesda, Md. 20814
 Filed Jul. 12, 1985, Ser. No. 754,143
 Term of patent 14 years

U.S. Cl. D6—446

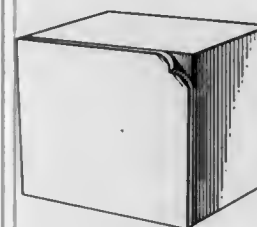


293,178

CABINET

Demir Hamami, 4938 Battery La. Apt. 5, Bethesda, Md. 20814
 Filed Jul. 12, 1985, Ser. No. 754,147
 Term of patent 14 years

U.S. Cl. D6—448

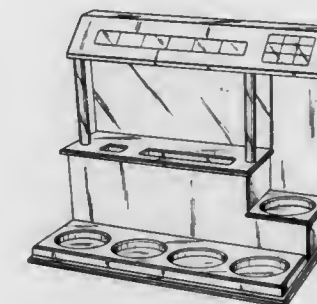


293,179

ENGLISH PUB ELECTRONIC BAR

Jonathan W. Balisteri, P.O. Box 11574, Costa Mesa, Calif. 92627
 Filed May 1, 1985, Ser. No. 729,370
 Term of patent 14 years

U.S. Cl. D6—474

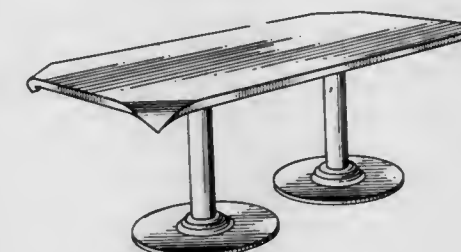


293,180

TABLE

Demir Hamami, 4938 Battery La., Apt. 5, Bethesda, Md. 20814
 Filed Jul. 12, 1985, Ser. No. 754,139
 Term of patent 14 years

U.S. Cl. D6—480

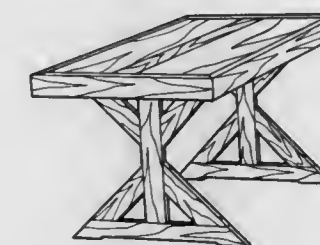


293,181

TABLE

Daniel S. Solaro, 10215 SE, 29th St., Bellevue, Wash. 98004
 Filed May 31, 1985, Ser. No. 739,660
 Term of patent 14 years

U.S. Cl. D6—484



293,182

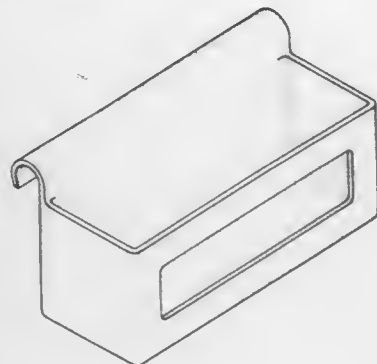
TISSUE BOX HOLDER

Clyde L. Carter, 1021 - 7th St. West, Birmingham, Ala. 35204

Filed Mar. 28, 1985, Ser. No. 717,003

Term of patent 14 years

U.S. Cl. D6—518



293,183

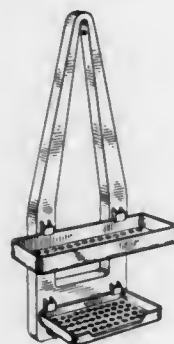
BATH CADDY

Willard Aaron, 616 Skokie La. South, Glencoe, Ill. 60022

Filed May 13, 1985, Ser. No. 733,099

Term of patent 14 years

U.S. Cl. D6—525



293,184

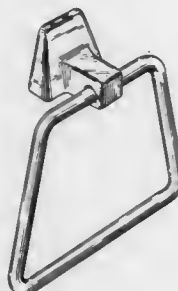
TOWEL HOLDER

John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.

Filed Jan. 4, 1985, Ser. No. 689,084

Term of patent 14 years

U.S. Cl. D6—546



293,185

WALL MOUNTED SUPPORT

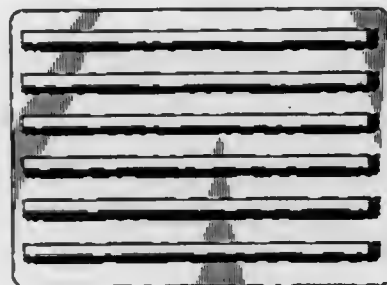
André Morin, Pointe Claire, Canada, assignor to Andre Morin

Designers Inc., Pointe Claire, Canada

Filed Dec. 3, 1984, Ser. No. 677,594

Term of patent 14 years

U.S. Cl. D6—553



293,186

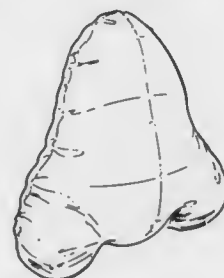
BACK SUPPORT PILLOW

Leon Parnham, 6 Windermere Crescent, Brighton, Victoria, Australia

Filed May 19, 1986, Ser. No. 864,129

Term of patent 14 years

U.S. Cl. D6—601



293,187

DECALCOMANIA OR THE LIKE FOR CHINA DINNERWARE

Jeanette Mattson, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,077

Term of patent 14 years

U.S. Cl. D7—39



293,188

DECALCOMANIA OR THE LIKE FOR CHINA DINNERWARE

Helen Zughaib, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,074

Term of patent 14 years

U.S. Cl. D7—39



293,189

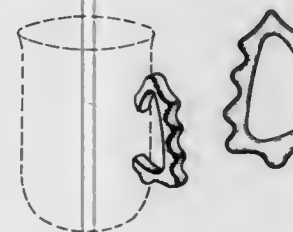
HANDLE FOR A CUP OR SIMILAR ARTICLE

Lucie S. Sandler, 6500 N. Kolmar, Lincolnwood, Ill. 60646

Filed Feb. 22, 1985, Ser. No. 704,170

Term of patent 14 years

U.S. Cl. D7—39



293,190

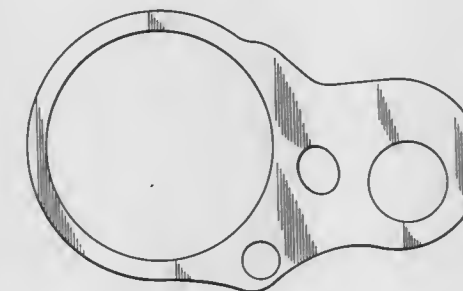
COMBINED PLATE AND CUP TRAY

Frederick P. Flanagan, Sr., 27 Forest Park Ave., Tyngsboro, Mass. 01879

Filed Jan. 31, 1985, Ser. No. 696,805

Term of patent 14 years

U.S. Cl. D7—71



293,191

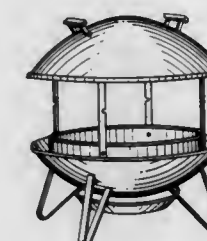
PORTABLE OUTDOOR FIREPLACE

James C. Stephen, Arlington Heights; Charles W. Lohmeyer, Barrington, and Bernard B. Bluestein, Des Plaines, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed May 28, 1985, Ser. No. 737,726

Term of patent 14 years

U.S. Cl. D7—332



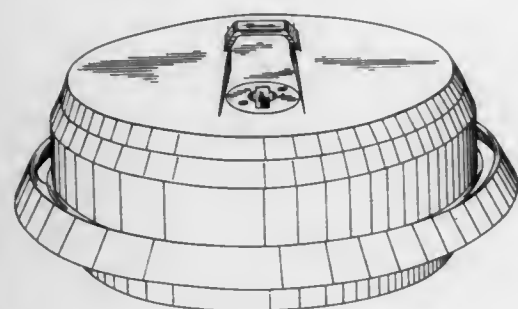
293,192

COMBINED COOK POT AND CONTAINER FOR FOODGiuseppe Baggioli, Via Como, 4, Lecco (Como), Italy
Filed Feb. 7, 1985, Ser. No. 699,074

Claims priority, application Italy, Aug. 7, 1984, 22817/84[U]

Term of patent 14 years

U.S. Cl. D7—354



293,193

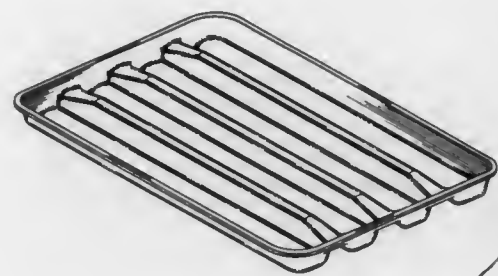
BREAD DOUGH TRAY

David L. Vandervoort, Orange County, Calif., assignor to Bridgford Foods Corporation, Anaheim, Calif.

Filed Jan. 11, 1985, Ser. No. 690,636

Term of patent 14 years

U.S. Cl. D7—357



293,194

FOOD SLICER

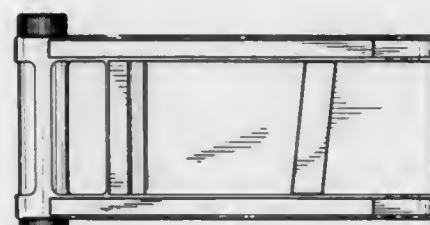
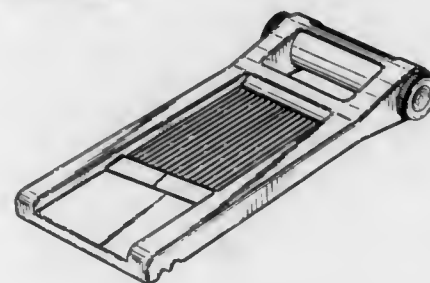
Julius Kreth, Pfungstadt, Fed. Rep. of Germany, assignor to Mike & Kimmel, Ltd., Kowloon, Hong Kong

Filed Jan. 29, 1985, Ser. No. 696,676

Claims priority, application United Kingdom, Aug. 1, 1984, 1021262

Term of patent 14 years

U.S. Cl. D7—381



293,195

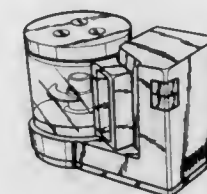
FOOD PROCESSOR

Young S. Kim, Terrace Sunnyvale, Calif., assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 1, 1984, Ser. No. 656,539

Term of patent 14 years

U.S. Cl. D7—384



293,196

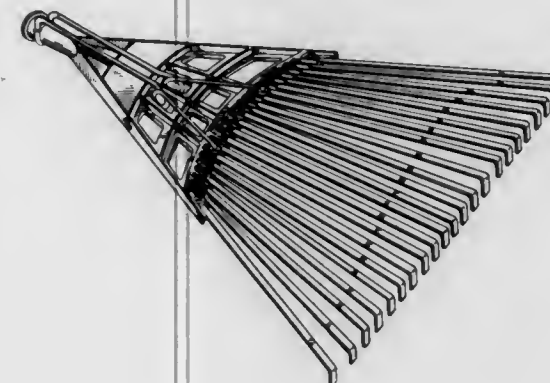
HEAD ASSEMBLY FOR A RAKE

Robert A. Germain, and William E. Portz, both of Anderson, S.C., assignors to USM Corporation, Farmington, Conn.

Filed Aug. 8, 1985, Ser. No. 763,747

Term of patent 14 years

U.S. Cl. D8—13



293,197

BOTTLE OPENER

Edwin A. Schumacher, and Edna E. Schumacher, both of Rte. 6, 307A-420, Greenville, Tex. 75401

Filed May 3, 1985, Ser. No. 730,063

Term of patent 14 years

U.S. Cl. D8—18



293,198

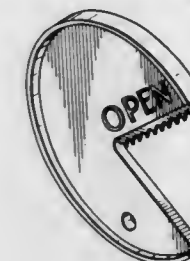
BOTTLE OPENER

Edwin A. Schumacher, and Edna E. Schumacher, both of Rte. 6, 307A-420, Greenville, Tex. 75401

Filed May 3, 1985, Ser. No. 729,940

Term of patent 14 years

U.S. Cl. D8—18



293,199

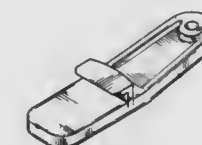
HAND-HELD CAN OPENER

J. David Grenley, 29 Lorelei La., Menlo Park, Calif. 94025

Filed Jul. 16, 1984, Ser. No. 631,537

Term of patent 14 years

U.S. Cl. D8—18



293,200

CORK PULLER

Charles A. Barone, 44 Lesley La., New Castle, Del. 19720

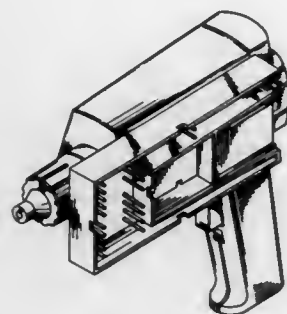
Filed Jan. 25, 1985, Ser. No. 694,805

Term of patent 14 years

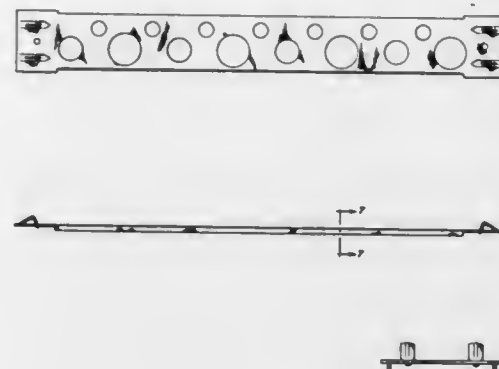
U.S. Cl. D8—42



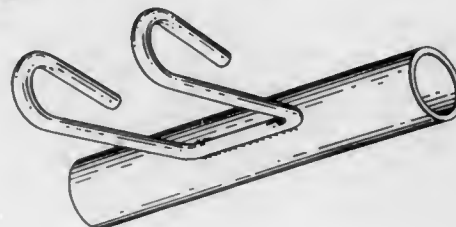
293,201
**COMBINED CORDLESS ELECTRIC DRILL, HOLSTER
 AND CHARGING BASE THEREFOR**
 Lawrence E. House, II, and Robert I. Somers, both of Raleigh,
 N.C., assignors to Black & Decker, Inc., Newark, Del.
 Division of Ser. No. 646,138, Aug. 31, 1984. This application
 Nov. 25, 1985, Ser. No. 789,125
 Term of patent 14 years
 U.S. Cl. D8—68



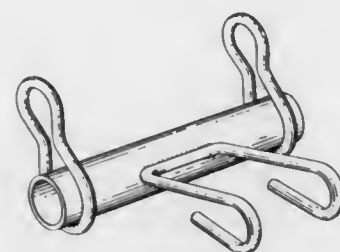
293,203
STUD MOUNT, PIPE SUPPORT BRACKET
 Thomas J. Hertensteiner, 16918 S. Edwards Rd., Cerritos, Calif.
 90701
 Filed Sep. 9, 1985, Ser. No. 774,151
 Term of patent 14 years
 U.S. Cl. D8—354



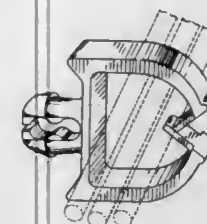
293,204
SUPPORT BRACKET FOR KEY BOX
 Antoine Trubiano, Pointe aux Trembles, Canada, assignor to
 Cari-All Inc., Montreal, Canada
 Filed Nov. 13, 1984, Ser. No. 670,269
 Term of patent 14 years
 U.S. Cl. D8—380



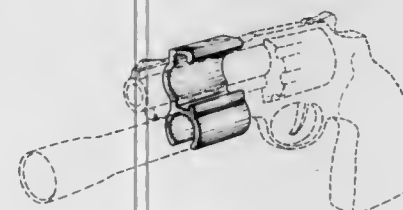
293,202
UTILITY KNIFE HANDLE
 Robert F. West, West Simsbury, and George F. Weimann, Avon,
 both of Conn., assignors to The Stanley Works, New Britain,
 Conn.
 Filed Feb. 16, 1984, Ser. No. 580,846
 Term of patent 14 years
 U.S. Cl. D8—99



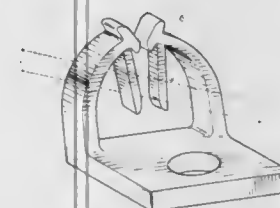
293,205
MINI ELECTRIC WIRE CLAMP
 Yoshihito Nakano, Yokohama, Japan, assignor to Kitagawa
 Industries Co., Ltd., Aichi, Japan
 Filed Jan. 3, 1985, Ser. No. 688,334
 Term of patent 14 years
 U.S. Cl. D8—395



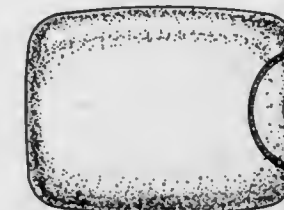
293,206
ILLUMINATION ATTACHMENT CLIP FOR FIREARMS
 David L. Beaty, 958 W. Emerald Cir., and William W. Lough-
 rige, 965 W. Enid Cir., both of Mesa, Ariz. 85202
 Filed Oct. 28, 1985, Ser. No. 791,717
 Term of patent 14 years
 U.S. Cl. D8—395



293,207
ELECTRIC WIRE CLAMP
 Yoshihito Nakano, Yokohama, Japan, assignor to Kitagawa
 Industries Co., Ltd., Nagoya, Japan
 Filed Jan. 3, 1985, Ser. No. 688,337
 Term of patent 14 years
 U.S. Cl. D8—396



293,208
DISPENSING BOTTLE
 Johannes van der Heijden, Hilversum, Netherlands, assignor to
 S. C. Johnson & Son, Inc., Racine, Wis.
 Filed Apr. 8, 1985, Ser. No. 721,009
 Term of patent 14 years
 U.S. Cl. D9—367



293,209
BOTTLE
 Piet C. Cahusak, Ede, Netherlands, assignor to Intradal Neder-
 land BV, Amersfoort, Netherlands
 Filed Oct. 1, 1984, Ser. No. 656,787
 Claims priority, application Benelux, May 30, 1984, 59035-00
 Term of patent 14 years
 U.S. Cl. D9—375



293,210
BOTTLE OR THE LIKE
 George R. Conrad, Elk Grove, Ill., assignor to Continental Plas-
 tic Containers, Inc., Stamford, Conn.
 Filed Feb. 5, 1985, Ser. No. 698,444
 Term of patent 14 years
 U.S. Cl. D9—405

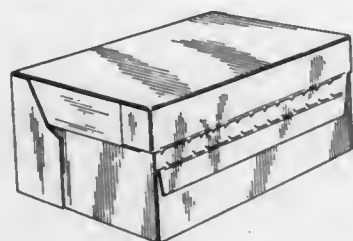


293,211
ICE CREAM CARTON

Richard E. DePaul, West Chester, Pa., and Jack E. Hutchinson, Sr., Newark, N.Y., assignors to Rendoll Paper Company, Rochester, N.Y.

Filed May 6, 1987, Ser. No. 46,505
Term of patent 14 years

U.S. Cl. D9—416

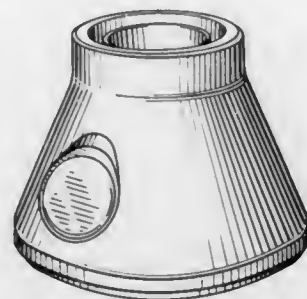


293,214
VALVE ACTUATOR CAP

James R. Crapser, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 18, 1985, Ser. No. 724,378
Term of patent 14 years

U.S. Cl. D9—448



293,212
COMBINED PACKAGING AND DISPLAY CONTAINER

Alessandro Zuliani, Udine, Italy, assignor to Cosatto SpA, Martignacco, Italy

Filed Mar. 1, 1985, Ser. No. 707,297

Claims priority, application Italy, Sep. 3, 1984, 60437/84[U]
Term of patent 14 years

U.S. Cl. D9—418

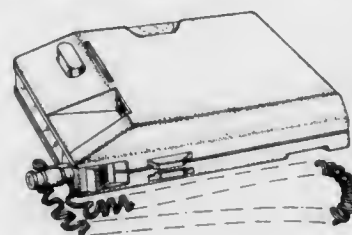


293,215
ELECTRONIC THERMOMETER

Robert H. Bruno, Avon; Laurie J. Burger, North Branford; Stuart Kipperman, Easton; Geoffrey R. Mayer, Trumbull; Donald E. Protzmann, Litchfield, and Robert F. Uhl, Cheshire, all of Conn., assignors to Sherwood Medical Co., St. Louis, Mo.

Filed Dec. 4, 1984, Ser. No. 677,921
Term of patent 14 years

U.S. Cl. D10—57



293,216
GOOSE CALLER

James Fernandez, P.O. Box 816, Groves, Tex. 77619

Filed Jan. 31, 1986, Ser. No. 824,740
Term of patent 14 years

U.S. Cl. D10—119

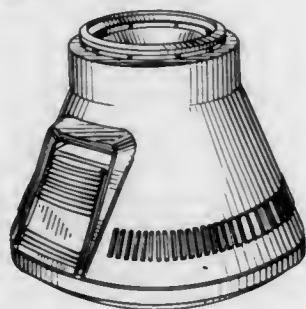


293,213
ACTUATOR CAP

James R. Crapser, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 18, 1985, Ser. No. 724,421
Term of patent 14 years

U.S. Cl. D9—448

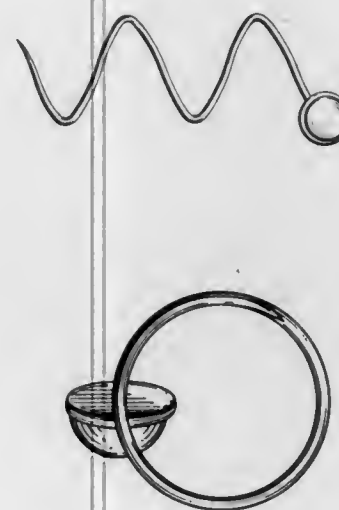


293,217
EAR ORNAMENT

Thomas O'Donovan, Harbor Square, Camden, Me. 04843

Filed May 30, 1985, Ser. No. 739,201
Term of patent 14 years

U.S. Cl. D11—78



293,218
CENTAUR FIGURE

Diane Insetta, 8444 San Jose Blvd., Jacksonville, Fla. 32217

Filed Jul. 26, 1985, Ser. No. 759,305
Term of patent 14 years

U.S. Cl. D11—159



293,219
TROPHY ORNAMENT

Ray H. Pierce, Gravenhurst, Canada, assignor to Tromar Corporation Ltd., Mississauga, Canada

Filed Nov. 12, 1985, Ser. No. 804,354
Term of patent 14 years

U.S. Cl. D11—161



293,220

TROPHY ORNAMENT

Ray H. Pierce, Gravenhurst, Canada, assignor to Tromar Corporation Ltd., Mississauga, Canada

Filed Aug. 30, 1985, Ser. No. 770,934

Term of patent 14 years

U.S. Cl. D11—161



293,221
TROPHY ORNAMENT

Ray H. Pierce, Gravenhurst, Canada, assignor to Tromar Corporation Ltd., Mississauga, Canada

Filed Aug. 30, 1985, Ser. No. 770,935

Term of patent 14 years

U.S. Cl. D11—161



293,222

FLOWER POT COVER

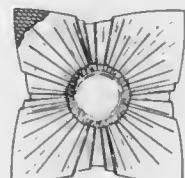
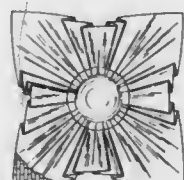
Donald E. Weder, Highland; Robert C. Abrams, Edwardsville, and Erwin H. Weder, Highland, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Sep. 21, 1984, Ser. No. 652,883

The portion of the term of this patent subsequent to Dec. 15, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



293,223

FLOWER POT COVER

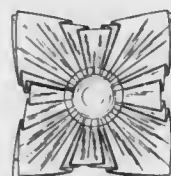
Donald E. Weder; Erwin H. Weder, both of Highland, and Robert C. Abrams, Edwardsville, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Sep. 21, 1984, Ser. No. 652,882

The portion of the term of this patent subsequent to Dec. 15, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



293,224

FLOWER POT COVER

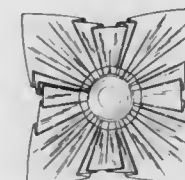
Donald E. Weder, and Erwin H. Weder, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Filed May 22, 1984, Ser. No. 613,053

The portion of the term of this patent subsequent to Dec. 15, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



293,225

SLIDE FASTENER CHAIN

Akira Hasegawa, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 638,991

Term of patent 14 years

U.S. Cl. D11—221



293,226

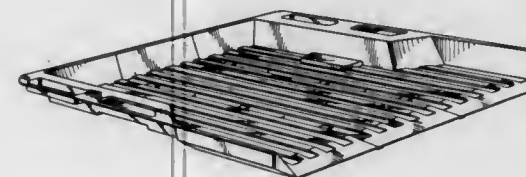
LINER FOR VEHICLE CARGO SPACE

Richard L. Whitson, Box 363, R.R. 6, Lawrence, Kans. 66044

Filed Apr. 22, 1985, Ser. No. 725,482

Term of patent 14 years

U.S. Cl. D12—98



293,227

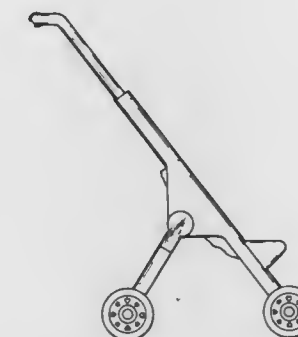
DOLL STROLLER

Craig J. McElhaney, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 2, 1985, Ser. No. 762,138

Term of patent 14 years

U.S. Cl. D12—129



293,228

MOTORCYCLE TIRE

Nobuyuki Sakaki, Hyogo, Japan, assignor to Sumimoto Rubber Industries, Ltd., Hyogo, Japan

Filed Mar. 22, 1985, Ser. No. 715,029

Claims priority, application Japan, Sep. 25, 1984, 59-39999

Term of patent 14 years

U.S. Cl. D12—145



293,229

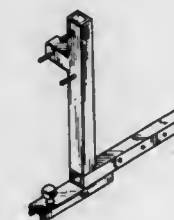
COMBINED SPARE TIRE AND TRAILER HITCH FOR STANDARD RECEIVER BARS

Roland A. Smith, 2483 American Ave., Hayward, Calif. 94545

Filed Nov. 8, 1985, Ser. No. 804,359

Term of patent 14 years

U.S. Cl. D12—162



293,230

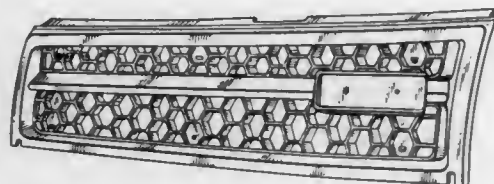
AUTOMOBILE RADIATOR GRILL

Norihiko Kawaoka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 30, 1985, Ser. No. 814,916

Term of patent 14 years

U.S. Cl. D12—163



293,233

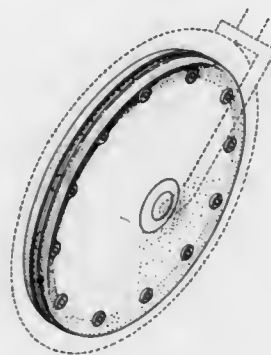
BICYCLE WHEEL COVER

Roger M. Berg, 8025 SW. 185th Ave., Beaverton, Oreg. 97007

Filed Aug. 20, 1986, Ser. No. 898,434

Term of patent 14 years

U.S. Cl. D12—204



293,231

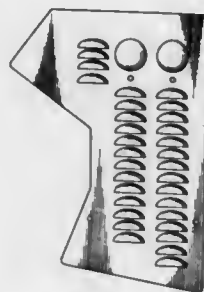
DEFLECTOR PLATE FOR THE UNDERBODY OF A SPORTS CAR

Rick L. Schneck, 15189 Marl St., Linden, Mich. 48451

Filed Dec. 20, 1984, Ser. No. 684,337

Term of patent 14 years

U.S. Cl. D12—190



293,234

BATTERY

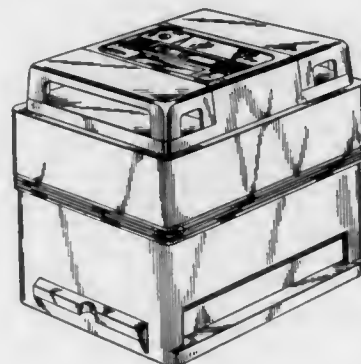
Garry Helou, Merrylands, and Kevin Whitley, South Hurstville, both of Australia, assignors to Repco Limited, Melbourne, Australia

Filed Sep. 16, 1985, Ser. No. 776,692

Claims priority, application Australia, Mar. 18, 1985, 0661/85

Term of patent 14 years

U.S. Cl. D13—8



293,232

REAR BUMPER FOR AN AUTOMOBILE

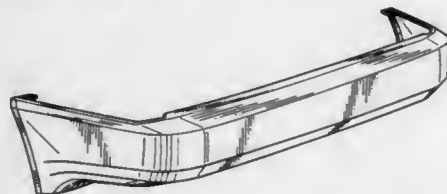
Masami Ikuma, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 10, 1985, Ser. No. 807,478

Claims priority, application Japan, Aug. 30, 1985, 60-36948

Term of patent 14 years

U.S. Cl. D12—169



293,235

HOLDER FOR ELECTRICAL CABLE MARKERS

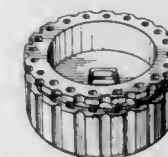
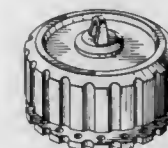
Torbjorn H. Loof, Otterbacken, Sweden, assignor to Partex Fabrikaktiebolag, Gullspang, Sweden

Filed Sep. 7, 1984, Ser. No. 648,107

Claims priority, application Sweden, Mar. 7, 1984, 84-0791; Mar. 7, 1984, 84-0792; Mar. 7, 1984, 84-0793

Term of patent 14 years

U.S. Cl. D13—13



293,237

TELEPHONE SET

Michael Brown, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 10, 1985, Ser. No. 807,402

Term of patent 14 years

U.S. Cl. D14—53



293,238

HANDSET TELEPHONE

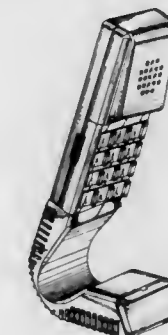
Francois Elie, Paris, France, assignor to Horlogerie Photographique Francais, Bonneville, France

Filed Aug. 4, 1986, Ser. No. 893,109

Claims priority, application France, Feb. 26, 1986, 86 0932

Term of patent 14 years

U.S. Cl. D14—64



293,236

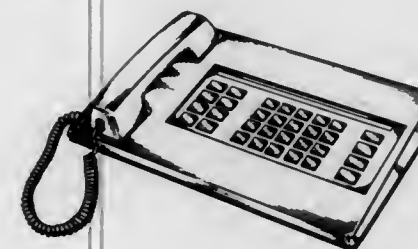
COMBINATION TELEPHONE HANDSET AND KEYBOARD CONSOLE BASE

Louis L. Mastro, Milford, and Robert L. Demick, East Detroit, both of Mich., assignors to Square D Company, Palatine, Ill.

Filed Oct. 26, 1984, Ser. No. 665,247

Term of patent 14 years

U.S. Cl. D14—53



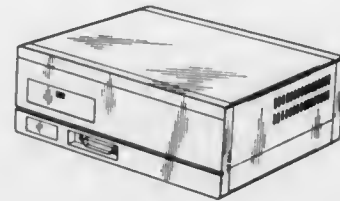
293,239

RADIO CONTROL UNIT OR SIMILAR ARTICLE
Kenneth W. Larson, Elmhurst, and Albert L. Nagele, Wilmette, both of, IL, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 17, 1985, Ser. No. 745,962
Term of patent 14 years
U.S. Cl. D14—68



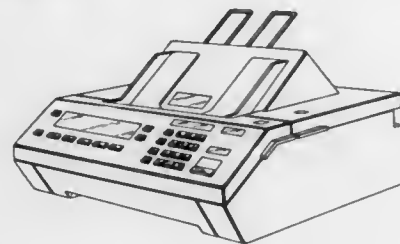
293,242

CONTROLLER FOR A POINT-OF-SALES SYSTEM
Shirou Hujimori, Koganei, and Masayoshi Miyazaki, Hatano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 25, 1985, Ser. No. 704,723
Claims priority, application Japan, Aug. 27, 1984, 59-35415
Term of patent 14 years
U.S. Cl. D14—100

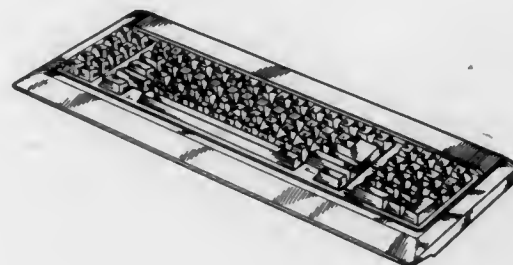


293,240

FACSIMILE TRANSCIEVER/RECEIVER
Masanori Hashimoto, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Jul. 30, 1985, Ser. No. 760,494
Claims priority, application Japan, Jan. 30, 1985, 60-3110
Term of patent 14 years
U.S. Cl. D14—94

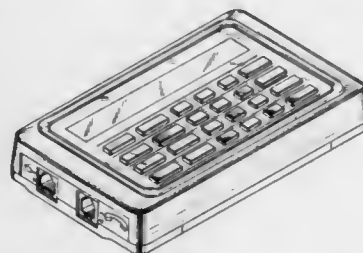
293,243
KEYBOARD

Yoshinori Kakiuchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Filed Nov. 21, 1985, Ser. No. 806,571
Claims priority, application Japan, May 21, 1985, 60-20977
Term of patent 14 years
U.S. Cl. D14—114



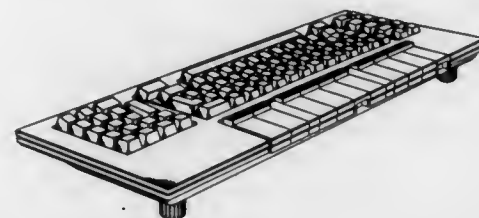
293,241

POCKET TERMINAL
Anthony W. Wan, Forest Hills, and Larry S. Kopp, New York, both of N.Y., assignors to Citicorp Credit Services, Inc., New York, N.Y.
Filed Oct. 16, 1985, Ser. No. 788,250
Term of patent 14 years
U.S. Cl. D14—100



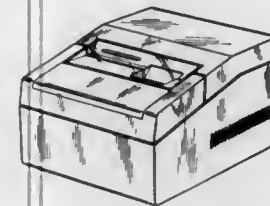
293,244

KEYBOARD OR SIMILAR ARTICLE
Robin Chu, San Francisco, and John W. Toor, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 28, 1985, Ser. No. 791,848
Term of patent 14 years
U.S. Cl. D14—100

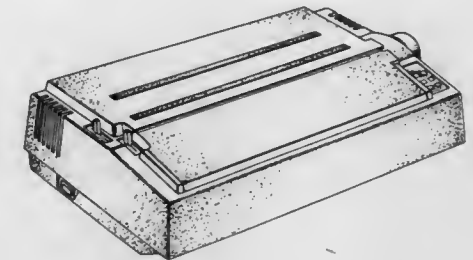


293,245

PRINTER FOR A POINT-OF-SALES SYSTEM
Shirou Hujimori, Koganei, and Kouichi Katou, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 25, 1985, Ser. No. 704,724
Claims priority, application Japan, Aug. 27, 1984, 59-35414
Term of patent 14 years
U.S. Cl. D14—100

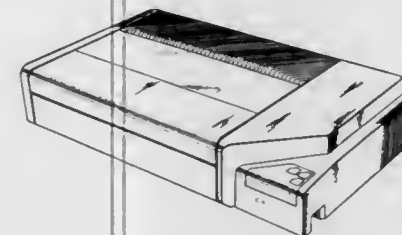
293,248
PRINTER

Nobuki Matsumoto, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed May 13, 1985, Ser. No. 733,598
Claims priority, application Japan, Nov. 13, 1984, 59-46753
Term of patent 14 years
U.S. Cl. D14—111



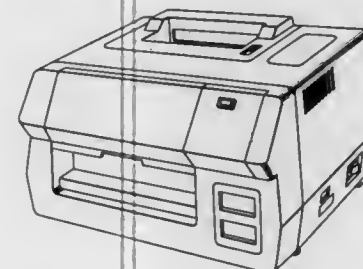
293,246

ELECTRONIC PRINTER
Lloyd C. Moore, King County, Wash., assignor to Output Technology Corporation, Spokane, Wash.
Filed Jan. 4, 1985, Ser. No. 688,698
Term of patent 14 years
U.S. Cl. D14—111



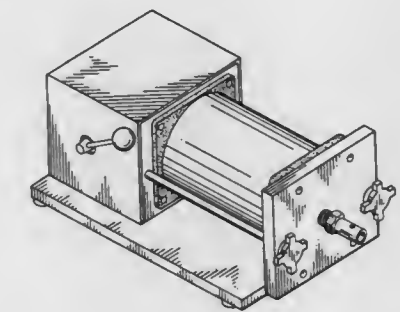
293,247

LASER PRINTER
Kenichi Nakade, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 2, 1985, Ser. No. 718,932
Claims priority, application Japan, Oct. 2, 1984, 59-40889
Term of patent 14 years
U.S. Cl. D14—111



293,249

CARBON DIOXIDE COMPRESSING GENERATOR FOR DRY ICE MANUFACTURE
Morton Mildner, West Orange, N.J., assignor to Bel-Art Products, Inc., Pequannock, N.J.
Filed Sep. 20, 1985, Ser. No. 778,236
Term of patent 14 years
U.S. Cl. D15—9



293,250

INDUSTRIAL ROBOT

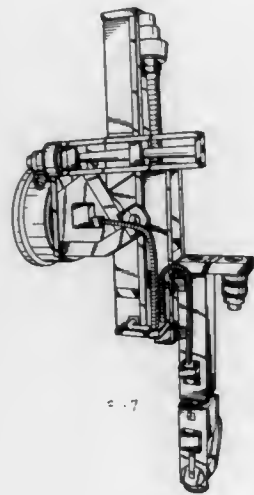
Herbert Kaufmann, and Ulf Back, both of Västerås, Sweden, assignors to Asea AB, Västerås, Sweden

Filed Dec. 2, 1985, Ser. No. 803,487

Claims priority, application Sweden, Jun. 4, 1985, 85-1451

Term of patent 14 years

U.S. Cl. D15—199



293,252

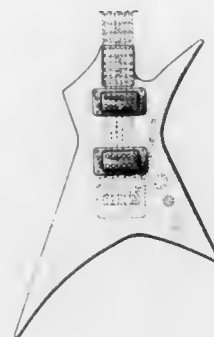
GUITAR BODY

Michael V. Powers, Meridian, Miss., assignor to Peavey Electronics Corporation, Meridian, Miss.

Filed Dec. 27, 1985, Ser. No. 814,243

Term of patent 14 years

U.S. Cl. D17—20



293,253

FONT OF TYPE

Rudolph Shepherd, 1208 Sheridan Ave., Chattanooga, Tenn. 37406

Filed Feb. 25, 1985, Ser. No. 705,234

Term of patent 14 years

U.S. Cl. D18—24

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293,254

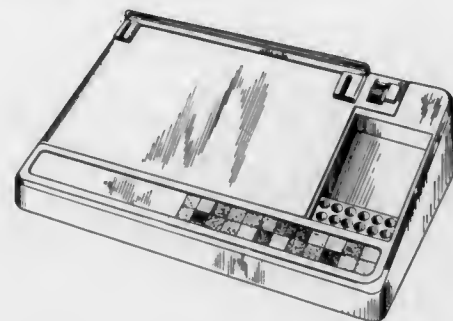
ACTIVITY DESK

Mel Appel, Livingston, and George Kress, Scotch Plains, both of N.J., assignors to The Mel Appel Company, Short Hills, N.J.

Filed Dec. 4, 1984, Ser. No. 677,928

Term of patent 14 years

U.S. Cl. D21—59



293,251

SPECTACLES

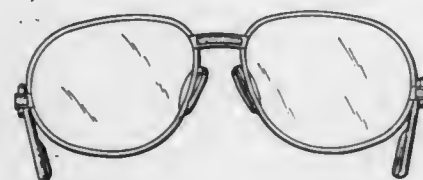
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland

Filed Dec. 17, 1985, Ser. No. 810,050

Claims priority, application Int'l Pat. Institute, Jun. 17, 1985, DM/005413

Term of patent 14 years

U.S. Cl. D16—102



293,255

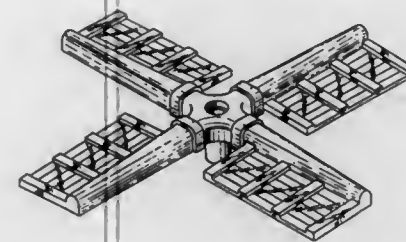
TOY WINDMILL ARM OR SIMILAR ARTICLE

Erik P. Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Dec. 4, 1985, Ser. No. 805,351

Term of patent 14 years

U.S. Cl. D21—119



293,256

TOY VEHICLE

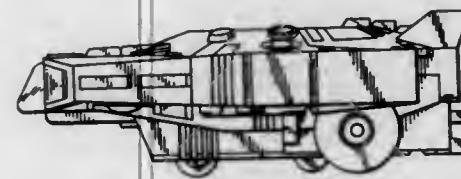
Tatsuya Suzuki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 805,211

Claims priority, application Japan, May 17, 1985, 60-20438

Term of patent 14 years

U.S. Cl. D21—128



293,258

TOY VEHICLE

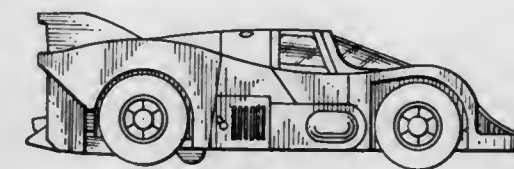
Mitsunori Noshiro, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 803,897

Claims priority, application Japan, May 17, 1985, 60-20435

Term of patent 14 years

U.S. Cl. D21—136



293,259

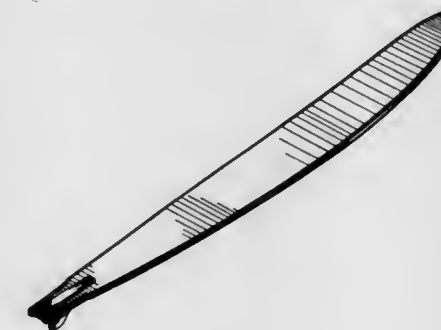
WATER SKI

Patrick J. Connelly, Freeland, and Denis J. Hoyt, Lynnwood, both of Wash., assignors to Connelly Skis, Inc., Lynnwood, Wash.

Filed Aug. 30, 1985, Ser. No. 771,062

Term of patent 14 years

U.S. Cl. D21—229



293,260

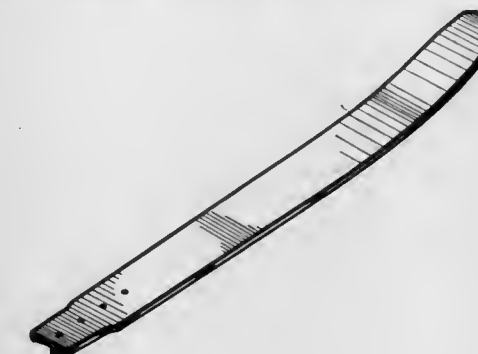
WATER SKI

Patrick J. Connelly, Freeland, and Denis J. Hoyt, Lynnwood, both of Wash., assignors to Connelly Skis, Inc., Lynnwood, Wash.

Filed Aug. 30, 1985, Ser. No. 771,063

Term of patent 14 years

U.S. Cl. D21—229



293,257

HANDLE FOR SPORT RACKET OR SIMILAR ARTICLE
Ian J. Miller, 31 Heywood Avenue, Diss, Norfolk, United Kingdom

Filed Feb. 26, 1985, Ser. No. 705,736

Claims priority, application United Kingdom, Nov. 24, 1984, 1023538

Term of patent 14 years

U.S. Cl. D21—230

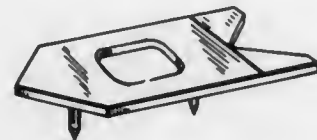


293,261
GOLFER'S AID

John E. Sadowski, 26826 Rouge River Dr., Dearborn Heights, Mich. 48127

Filed Nov. 19, 1984, Ser. No. 672,914
Term of patent 14 years

U.S. Cl. D21—234

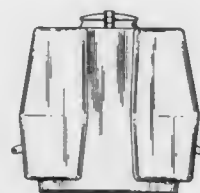
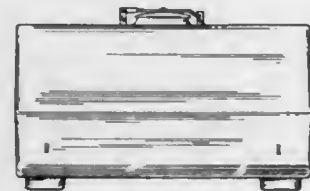


293,262
TANK

Michael T. Sayward, 1406 SW. 8th St., Pompano Beach, Fla. 33060

Filed Apr. 3, 1986, Ser. No. 847,880
Term of patent 14 years

U.S. Cl. D23—202

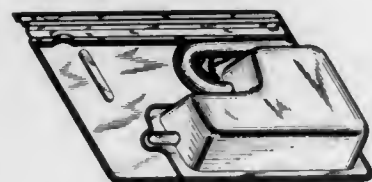


293,263

IN-TANK AUTOMATIC TOILET CLEANING DEVICE
Walter M. Ronayne, Westfield, N.J., assignor to Boyle-Midway Household Products, Inc., New York, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,397
Term of patent 14 years

U.S. Cl. D23—208

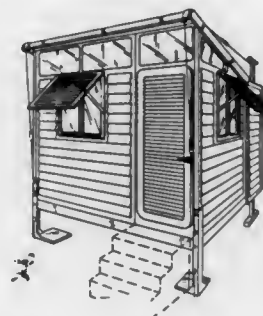


293,264
MODULAR HOME

Richard L. Stevenson, 8158 Manitoba, No. 3, Playa Del Rey, Calif. 90293

Filed Dec. 18, 1986, Ser. No. 943,154
Term of patent 14 years

U.S. Cl. D25—30

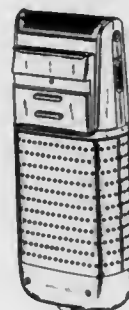


293,265
ELECTRIC DRY SHAVER

Roland Ullman, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jan. 16, 1985, Ser. No. 691,987
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 73 MR 9314
The portion of the term of this patent subsequent to Oct. 28, 2000, has been disclaimed.
Term of patent 14 years

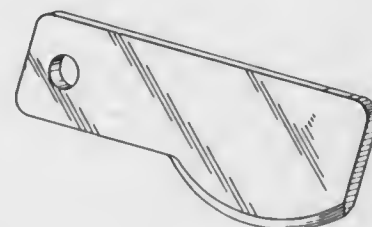
U.S. Cl. D28—49



293,266

SCRAPER FOR LOTTERY TICKETS
George Stanich, 609 - 21st St., West Des Moines, Iowa 50265
Filed Jan. 21, 1986, Ser. No. 820,062

Term of patent 14 years
U.S. Cl. D32—49

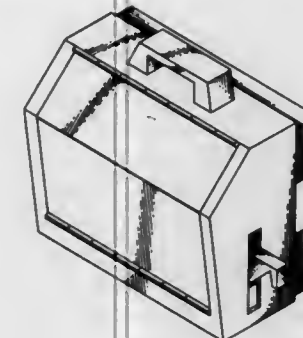


293,267
TRASH BAG CONTAINER

Clifton Massey, 1300 Clementine #11, Memphis, Tenn. 38106
Filed Jul. 30, 1985, Ser. No. 760,528

Term of patent 14 years

U.S. Cl. D34—7

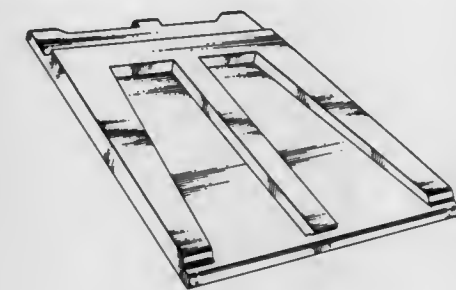


293,268
LID FOR A REFUSE CONTAINER

Kenneth M. Dewing, 1480 Nancy Cir., Porterville, Calif. 93257
Filed Nov. 22, 1985, Ser. No. 801,044

Term of patent 14 years

U.S. Cl. D34—11

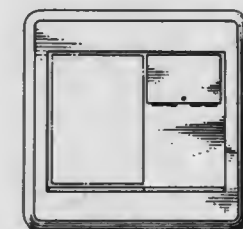
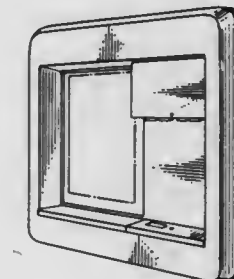


293,269

AUTOMATED TELLER SERVICE CENTER ENCLOSURE
Ernest F. J. Prinzhorn, Los Angeles, Calif., assignor to QRS Corporation, Los Angeles, Calif.

Filed May 13, 1985, Ser. No. 710,007
Term of patent 14 years

U.S. Cl. D99—28



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF DECEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A. B. Chance Company: See—
Kamp, Eugene L., 4,713,503, Cl. 200-144.00B.
- A. E. Staley Manufacturing Company: See—
Downs, John D.; Drury, Raymond L., Jr.; Moser, Kenneth B.; and Roth, C. Deane, 4,713,436, Cl. 528-295.300.
- A/S Alfred Benzon: See—
Kjornaes, Kim; and Linnemann, Jorgen, 4,713,248, Cl. 424-468.000.
- A/S Niro Atomizer: See—
Veltman, Preston L., 4,713,226, Cl. 423-242.000.
- A T & E Corporation: See—
Gaskill, Garold B.; Park, Daniel J.; Rullman, Robert G.; Rose, Donald T.; Stiley, Joseph F., III; Barnum, Lewis W.; and Hoff, Don G., 4,713,808, Cl. 370-94.000.
- A. W. Cash Valve Manufacturing Corporation: See—
Lair, John E.; Luckenbill, Lawrence F.; and Holliday, Richard J., 4,712,575, Cl. 137-218.000.
- Aaltonen, Lauri J.: See—
Lindemans, Willem; and Aaltonen, Lauri J., 4,712,607, Cl. 165-30.000.
- AB Volvo: See—
Elverdam, Peter, 4,712,662, Cl. 192-53.00F.
Naert, Michel S., 4,712,824, Cl. 296-65.00R.
- Abbondanti, Alberto, to Westinghouse Electric Corp. Load-commutated inverter and synchronous motor drive embodying the same. 4,713,743, Cl. 363-138.000.
- Abe, Fumiyoshi, to Sony Corporation. Tape position display apparatus using counter roller pulses and CTL pulses. 4,713,715, Cl. 360-137.000.
- Abe, Shunichi: See—
Kawamura, Naoto; and Abe, Shunichi, 4,713,684, Cl. 358-78.000.
- Abe, Tomoaki; Fujisawa, Hideya; Omori, Norio; Kinugawa, Masumi; Ito, Katsunori; Akiyama, Susumu; Mizuno, Tiaki; and Yamada, Toshitaka, to Nippondenso Co., Ltd. Control system for an engine having an air intake passage. 4,713,765, Cl. 364-431.050.
- Abel, Heinz: See—
Topfl, Rosemarie; and Abel, Heinz, 4,713,482, Cl. 560-196.000.
- Abel, Kent W.; and Attoe, Gary N., to Kimberly-Clark Corporation. Apparatus and method for ultrasonic bonding of a moving web. 4,713,132, Cl. 156-73.100.
- Abiko, Toshio: See—
Makimoto, Toshio; Nishimura, Sadahiko; Matsuo, Masayuki; Abiko, Toshio; Ishizaki, Hirohumi; Kanda, Minoru; Nunoya, Hidetsugu; and Komatsu, Mikio, 4,713,670, Cl. 343-700.0MS.
- Abraham, Philip: See—
Chiang, Peter K.; Richard, Michelle M.; Padilla, Felipe N.; Carroll, Frank I.; and Abraham, Philip, 4,713,391, Cl. 514-412.000.
- Abraham, William F., to Brunswick Valve & Control, Inc. Position controlled linear actuator. 4,712,441, Cl. 74-89.150.
- AccuRay Corporation: See—
Bokowski, Gary A.; and Vahey, David W., 4,713,572, Cl. 310-323.000.
- Ackel, Gary P.: See—
Kaiser, Timothy D.; and Ackel, Gary P., 4,712,602, Cl. 164-453.000.
- Acker, Norman J.: See—
Price, Macy J.; Johnson, Mack E.; and Acker, Norman J., 4,712,842, Cl. 312-196.000.
- Akeret, Peter, to IDN Inventions and Development of Novelties AG. Container having automatic doors and for accommodating data storage media. 4,712,678, Cl. 206-387.000.
- Acme Resin Corporation: See—
Armbruster, David R.; and Johnson, Calvin K., 4,713,294, Cl. 428-404.000.
- Acufex Microsurgical, Inc.: See—
Honkanen, George P., 4,712,545, Cl. 128-305.000.
- Adair, Paul C.; Hillenbrand, Gary F.; and Davis, Paul D., to Mead Corporation. The Imaging system employing photosensitive microcapsules containing 3-substituted coumarins and other photobleachable sensitizers. 4,713,312, Cl. 430-138.000.
- Adam, Peter; and Michel, Peter, to Siemens Aktiengesellschaft. Closed motor/transmission unit. 4,713,568, Cl. 310-112.000.
- Adams, John T.; and Goodale, John B., to Emerson Electric Co. Gas burner control system with mass flow sensor. 4,712,996, Cl. 431-20.000.
- Adams, Joseph S.; and Branton, Paul G., to Pow-R Tools Corporation. Manual recycler for detonating impact tool. 4,712,379, Cl. 60-632.000.
- Adams, Nina M. Nina's Buttercup-Titianian squash. 4,713,491, Cl. 800-1.000.
- Addis, John L., to Tektronix, Inc. Active filter with bootstrapping. 4,713,627, Cl. 330-306.000.
- Adenier, Herve: See—
Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve; and Kamoun, Ahmed, 4,713,256, Cl. 426-631.000.
- Adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG: See—
Greiner, Peter; Pfluger, Hubert; and Widmann, Horst, 4,712,318, Cl. 36-134.000.
- Adriaensen, Ludo; and Decouttere, Bernard, to N. V. Bekaert S. A. Process and apparatus for cleaning by electrochemical pickling with alternating current of specified frequency. 4,713,153, Cl. 204-144.500.
- Adsett, Anthony P., to Litton Systems, Inc. Gas laser and method of making a gas laser. 4,713,825, Cl. 372-107.000.
- Advanced Micro Devices, Inc.: See—
Iyer, Venkatraman; and Lee, Gil S., 4,713,605, Cl. 324-73.00R.
- AE PLC: See—
Deane, Norman P., 4,712,443, Cl. 74-470.000.
- AG fur industrielle Elektronik AGIE Losone b. Locarno: See—
Buhler, Ernst; and Rullo, Antonio, 4,713,516, Cl. 219-69.00P.
Lodetti, Attilio; and Blaser, Hansueli, 4,712,288, Cl. 29-557.000.
- Agarwal, Arun K.; Knapp, Suzanne C.; and Lakness, David R., to Wang Laboratories, Inc. Data structure for a document processing system. 4,713,754, Cl. 364-200.000.
- Agbay, Anthony J., to OMCO, Inc. Barrel lock with deterrent ring and key therefor. 4,712,395, Cl. 70-34.000.
- Agency of Industrial Science and Technology: See—
Akiyama, Shigeru; Ueno, Hidetoshi; Imagawa, Koji; Kitahara, Akira; Nagata, Sumio; Morimoto, Kazuo; Nishikawa, Tooru; and Itoh, Masao, 4,713,277, Cl. 428-131.000.
Fujishima, Shizu; Yaku, Fumiko; and Koshijima, Tetsuo, 4,713,334, Cl. 435-99.000.
- Agostini, Fabrizio, to Trast Enterprise S.r.l. Watch for displaying a line on the dial. 4,712,924, Cl. 368-76.000.
- Ahlemeyer, W. Bruce: See—
Boone, Joseph E.; and Ahlemeyer, W. Bruce, 4,713,661, Cl. 340-994.000.
- Ahlens, Klaas: See—
Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Ahlers, Klaas, 4,713,440, Cl. 528-367.000.
Schupp, Eberhard; Osterloh, Rolf; Loch, Werner; and Ahlers, Klaas, 4,713,406, Cl. 523-415.000.
- Ahmann, John E. Portable voting booth adapter. 4,712,757, Cl. 248-188.000.
- Aikou, Kenichi; Kurihara, Yoichi; and Goto, Tsugio, to Asahi Kasei Kogyo Kabushiki Kaisha. Electronic delay detonator. 4,712,477, Cl. 102-206.000.
- Air Products and Chemicals, Inc.: See—
Maroulis, Peter J.; Coe, Charles G.; Kuznicki, Steven M.; Clark, Patrick J.; and Roberts, David A., 4,713,362, Cl. 502-85.000.
- Aisin Seiki Kabushiki Kaisha: See—
Hochstein, Peter; and Imai, Nobuyuki, 4,712,433, Cl. 73-862.360.
Kodama, Hisashi; and Okabe, Yoshio, 4,713,045, Cl. 474-135.000.
Nakayama, Kouichi, 4,712,378, Cl. 60-525.000.
- Aisin-Warner Kabushiki Kaisha: See—
Sumiya, Koji; and Moroto, Shuzo, 4,712,635, Cl. 180-197.000.
- Ajmera, Prakash R.: See—
Jabarin, Saleh A.; and Ajmera, Prakash R., 4,713,269, Cl. 428-35.000.
Jabarin, Saleh A.; and Ajmera, Prakash R., 4,713,270, Cl. 428-35.000.
- Akashi, Hiroyuki; Inoue, Takeshi; and Horie, Shoichi, to Yoshitomi Pharmaceutical Industries, Ltd. Alkanedicarboxylic diester compounds. 4,713,474, Cl. 560-66.000.
- Akazawa, Kiyoshi: See—
Sasaki, Makoto; Yoshida, Jun; Shimizu, Yoshishige; Akazawa, Kiyoshi; Kishita, Eiji; and Hirata, Kaoru, 4,713,291, Cl. 428-373.000.
- Akiyama, Shigeru; Ueno, Hidetoshi; Imagawa, Koji; Kitahara, Akira; Nagata, Sumio; Morimoto, Kazuo; Nishikawa, Tooru; and Itoh, Masao, to Agency of Industrial Science and Technology; and Shinko Kosen Kogyo Kabushiki Kaisha. Foamed metal and method of producing same. 4,713,277, Cl. 428-131.000.
- Akiyama, Susumu: See—
Abe, Tomoaki; Fujisawa, Hideya; Omori, Norio; Kinugawa, Masumi; Ito, Katsunori; Akiyama, Susumu; Mizuno, Tiaki; and Yamada, Toshitaka, 4,713,765, Cl. 364-431.050.
- Aktiebolaget Hassle: See—
Szelke, Michael; Jones, David M.; and Hallett, Allan, 4,713,445, Cl. 530-330.000.
- Akzo America Inc.: See—
Birum, Gail H.; and Jansen, Richard F., 4,713,489, Cl. 564-90.000.
- Al Sin Seiki Kabushiki Kaisha: See—
Hochstein, Peter A.; and Imai, Nobuyuki, 4,712,432, Cl. 73-862.360.
- Alban, Eugene P. Aircraft controls simulator. 4,713,007, Cl. 434-45.000.

Albanese, Andres; and Cheng, Steven S., to Bell Communications Research, Inc. Distributed star network. 4,712,859, Cl. 350-96.160.

Albertalli, David: See—

Mower, Dan C.; Wolf, Peter H.; Slade, Boyd E.; and Albertalli, David, 4,713,623, Cl. 328-72.000.

Albrecht, Leonard N., to California Auto Trends. Convertible top apparatus for midengine automobiles. 4,712,828, Cl. 296-121.000.

Aldrich-Boranes, Inc.: See—

Brown, Herbert C., 4,713,380, Cl. 568-1.000.

Alfa Romeo Auto S.p.A.: See—

Braga, Renzo; Pasquali, Renato; and Mendicino, Franco, 4,712,825, Cl. 296-76.000.

Alkatis, Saulius A.: See—

Pinsky, Naum; and Alkatis, Saulius A., 4,713,306, Cl. 429-218.000.

Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostioich, Vladimir E.; and Stroy, Gary H., to Biotrack, Inc. Integrated drug dosage form and metering system. 4,712,460, Cl. 83-208.000.

Allen, John E.; Glover, John D.; and Shepherd, Clayton C., Jr., to United States of America, Air Force. Thermal vacuum heater array apparatus. 4,713,647, Cl. 338-316.000.

Allied Colloids Limited: See—

Clarke, John B.; Firth, John F.; and Walker, John R., 4,713,264, Cl. 427-207.100.

Allied Corporation: See—

Bose, Debasis; and Freilich, Alfred, 4,712,603, Cl. 164-463.000.

Cage, Jerry L., 4,712,841, Cl. 303-92.000.

Gualtieri, Devlin M.; and Lai, Shui T., 4,713,577, Cl. 313-468.000.

Heller, Donald F., 4,713,824, Cl. 372-99.000.

Kwon, Young D.; Kavesh, Sheldon; and Prevorsek, Dusan C., 4,713,290, Cl. 428-364.000.

Losser, Gerald L.; and Weaver, Richard D., 4,712,767, Cl. 251-129.140.

Marsh, Gary B.; Fanelli, Anthony J.; Armor, John N.; and Zambri, Patrick M., 4,713,233, Cl. 423-608.000.

Morris, Robert C.; Long, Margaret N.; Chin, Timothy C.; and Heller, Donald F., 4,713,820, Cl. 372-41.000.

Temple, Robert B.; and Colpaert, James J., 4,712,654, Cl. 188-71.800.

Zwolinski, Leon M.; and Dwyer, Frank J., 4,713,400, Cl. 521-131.000.

Alloy Metals, Inc.: See—

Stern, Marvin J., 4,713,217, Cl. 420-452.000.

Allwin, Roger P.; and Budke, Mark P., to Lindsey Completion Systems. Liner hanger assembly with combination setting tool. 4,712,614, Cl. 166-208.000.

Alnafissa, Fahad A. Solar system simulator. 4,713,011, Cl. 434-292.000.

Alpegiani, Marco; Bedeschi, Angelo; Foglio, Maurizio; Franceschi, Giovanni; and Perrone, Ettore, to Farmitalia Carlo Erba S.p.A. 2-thiacephems and (5R) penems derivatives. 4,713,450, Cl. 540-214.000.

Alpegiani, Marco: See—

Perrone, Ettore; Alpegiani, Marco; Zarini, Franco; Bruna, Costantino D.; and Franceschi, Giovanni, 4,713,378, Cl. 514-192.000.

Alps Electric Co., Ltd.: See—

Asano, Isao, 4,713,703, Cl. 360-97.000.

Kimura, Kiyoshi; and Hara, Osamu, 4,713,496, Cl. 178-18.000.

Takoshima, Takehiro, 4,713,671, Cl. 346-76.0PH.

Altera Corporation: See—

Hartmann, Robert F.; Chan, Yui-Fai; Frankovich, Robert J.; Ou, Jung-Hsing; So, Hock C.; and Wong, Sau-Ching, 4,713,792, Cl. 364-900.000.

Altmejd, Morrie, to Powerplex Technologies, Inc. Silicon diode loop element for protecting a battery cell. 4,713,597, Cl. 320-13.000.

Alumax, Inc.: See—

Koch, Alan A., 4,712,413, Cl. 72-361.000.

Aluminium Pechiney: See—

Chaffy, Joseph; Langan, Bernard; and Leroy, Michel, 4,713,161, Cl. 204-243.00M.

Alusuisse Italia, S.p.A.: See—

Fumagalli, Carlo; and Stefani, Giancarlo, 4,713,464, Cl. 549-259.000.

Alvarsson, Yngve. Method and machine for levelling concrete when casting large concrete areas. 4,712,943, Cl. 404-75.000.

Alyea, John W.: See—

Ellis, Roger H.; and Alyea, John W., 4,712,864, Cl. 350-96.220.

Amada Engineering & Service Co., Inc.: See—

Lee, Chun-Sheu, 4,713,818, Cl. 372-8.000.

Lee, Chun-Sheu, 4,713,822, Cl. 372-69.000.

Amax Inc.: See—

Cameron, Thomas B.; Swanson, Wilbur W.; Tartaglia, John M.; and Cox, Thomas B., 4,713,111, Cl. 75-68.00R.

Smit, Francis J.; Horst, William E.; and Bhasin, Anirudh K., 4,713,086, Cl. 44-51.000.

Ambrosio, Renato; Brosio, Alberto; Fausone, Alfredo; and Tofanelli, Adler, to SIP—Societa Italiana per l'Esercizio Telefonico p.a. Bidirectional digital transmission system with echo-cancellation. 4,713,803, Cl. 370-32.100.

American Can Company: See—

Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,712,990, Cl. 425-130.000.

American Hospital Supply Corporation: See—

Bickelhaupt, Roger; and Rold, Michael D., 4,713,059, Cl. 604-171.000.

Gille, Henrick K.; Willing, Richard S.; Bloom, William G.; Siegel, Bernard; Cheung, Tsang; Lobodzinski, Richard; and Gilroy, Keith, 4,712,567, Cl. 128-771.000.

American Screen Printing Equipment Company: See—

Motev, Phil, 4,712,474, Cl. 101-38.00A.

American Standard Inc.: See—

Stairs, Henry M., Jr., 4,712,256, Cl. 4-661.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: See—

Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Schan, Edward P., Jr., 4,713,834, Cl. 379-28.000.

De Kelaita, Nergal R.; Hall, Joe T.; and Kletscher, Barrie D., 4,713,758, Cl. 364-200.000.

Krause, John T.; Kurkjian, Charles R.; and Paek, Un-Chul, 4,713,105, Cl. 65-4.100.

Oberlander, Lewis B.; Spicer, David A.; and Straubs, Ralph V., 4,713,806, Cl. 370-58.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: See—

Presby, Herman M., 4,712,858, Cl. 350-96.150.

American Telephone and Telegraph Company, AT&T Information Systems: See—

Kimball, David B.; and Kip, Ruloff F., Jr., 4,713,564, Cl. 307-542.100.

Ames, Jimmy R.: See—

Bradford, James N.; Ames, Jimmy R.; and Montroll, Andrew H., 4,713,821, Cl. 372-44.000.

Ames, Theodore; and Brown, Vernon E., Jr., to Glacier Products, Inc. Apparatus for manufacturing soft ice cream and the like. 4,712,920, Cl. 366-144.000.

Amesbury Industries, Inc.: See—

Evans, Robert D.; and Blezard, Robert C., 4,713,130, Cl. 156-72.000.

Amoco Corporation: See—

Harris, James E.; and Robeson, Lloyd M., 4,713,426, Cl. 525-471.000.

Harris, James E.; Berger, Abe; Chopdekar, Vilas M.; Matzner, Markus; and Spanswick, James, 4,713,438, Cl. 528-337.000.

Smith, David J., 4,713,151, Cl. 204-58.500.

Amos, Charles W., to Owens-Illinois Closure Inc. Method and apparatus for marking and forming workpieces. 4,712,473, Cl. 101-4.000.

AMP Incorporated: See—

Forney, Edgar W., Jr.; and Hogendobler, Richard S., 4,712,296, Cl. 29-828.000.

Kobler, Robert J., 4,713,021, Cl. 439-272.000.

Ampex Corporation: See—

Hutson, John, 4,713,832, Cl. 377-45.000.

Amundson, David C.: See—

Thormander, Hans T.; Poore, John W.; Sholder, Jason A.; Thacker, James R.; and Amundson, David C., 4,712,555, Cl. 128-419.0PG.

Anagnostopoulos, Hristo: See—

Furrer, Harald; Anagnostopoulos, Hristo; and Gebert, Ulrich, 4,713,455, Cl. 544-267.000.

Andersen, David J.: See—

Poplawski, Judith A.; and Andersen, David J., 4,713,012, Cl. 434-373.000.

Andersen, George J.: See—

Karlis, Robert G.; Dole, Charles M.; Webster, Gary L.; and Andersen, George J., 4,712,713, Cl. 222-3.000.

Anderson-Cook, Inc.: See—

Killip, James T., 4,712,408, Cl. 72-88.000.

Killip, James T., 4,712,409, Cl. 72-88.000.

Killip, James T., 4,712,410, Cl. 72-108.000.

Anderson, George C.; and Paul, Richard J. Lidded nursery plant container. 4,712,329, Cl. 47-84.000.

Andiamo Inc.: See—

Myers, Jay E.; Myers, M. Todd; and Iravantchi, Siamak, 4,712,657, Cl. 190-28.000.

Ando Electric Co., Ltd.: See—

Sugimori, Masayasu; and Morishita, Mitsuhiro, 4,713,813, Cl. 571-15.000.

Ando, Shinji; Ohtaguro, Masami; Masuda, Takayoshi; and Watanabe, Yoshimoto, to Mitsui Toatsu Chemicals, Incorporated. Granule containing physiologically-active substance, method for preparing same and use thereof. 4,713,245, Cl. 424-438.000.

Ando, Yujiro: See—

Taniguchi, Osamu; Okada, Shinjiro; and Ando, Yujiro, 4,712,878, Cl. 350-350.00S.

Andolfi, Cesar P.: See—

DePasquale, John A.; Segalowitz, Ivar R.; and Andolfi, Cesar P., 4,712,359, Cl. 53-460.000.

Andre, Jean-Daniel; Grossi, Pierre-Jean; Heymes, Alain; and Manzaroli, Giovanni V., to SANOFI and Industria Chimica Prodotti FRANCIS S.p.A. Process for preparing α -hydroxy-alkanoic acids and compounds obtained by this process. 4,713,485, Cl. 562-470.000.

Andrew Corporation: See—

Dyott, Richard B., 4,712,866, Cl. 350-96.300.

Andrews, William H., to Comalco Aluminium Limited. Bauxite propant. 4,713,203, Cl. 264-117.000.

Andrusch, Georg; Baisch, Joachim; Barsuhn, Horst; Wernicke, Friedrich C.; and Wiedmann, Siegfried K., to International Business Machines Corporation. Stability testing of semiconductor memories. 4,713,814, Cl. 371-21.000.

Angelillo, Domenico, to Industrie Magneti Marelli S.r.l. Pneumatic valve for braking systems. 4,712,577, Cl. 137-270.000.

Anger, Wilhelm. Temple end piece for a temple of a spectacle frame. 4,712,893, Cl. 351-123.000.

Angus, James E. Load-out construction device. 4,712,664, Cl. 193-17.000.

Anno, Nobuo; and Arai, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Cylinder block structure for multicylinder internal combustion engines. 4,712,517, Cl. 123-41.740.

ANT Nachrichtentechnik GmbH: See—

Guttner, Eckhard, 4,713,688, Cl. 358-141.000.

Antolini, Adriano; Morigi, Rodolfo; and Saviotti, Giancarlo. Cover, particularly for vehicle seats. 4,712,832, Cl. 297-180.000.

Antonelli, Douglas C.; Branscomb, Patricia M.; Broockman, Eric C.; Dickson, LeRoy D.; Koppel, Caralee P.; Ossowski, Richard; and Stokes, Olen L., Jr., to International Business Machines Corporation. Method of inhibiting processing of duplicative coded label signals. 4,713,785, Cl. 364-569.000.

Antoninelli, Marc: See—

Metz, Pierre; and Antoninelli, Marc, 4,712,747, Cl. 244-3.220.

Antos, John M.; and Selina, John R., to Thetford Corporation. Portable toilet with valve actuating handle that automatically locks the valve in closed position during emptying of the holding tank. 4,712,255, Cl. 4-323.000.

Anzai, Katsushi; Harada, Osamu; Suematsu, Toshio; and Takeda, Yuji, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,712,522, Cl. 123-179.00L.

Anzai, Shunju; Sasaki, Hiromu; Kunikawa, Norihide; and Ohgita, Kazuyuki, to Sharp Kabushiki Kaisha. Document size detection apparatus. 4,713,550, Cl. 250-560.000.

Ao, Hideki; Obata, Minoru; Yamanaka, Tsutomu; and Mikashima, Hiroshi, to Yoshitomi Pharmaceutical Industries, Ltd. Oxodiazine compounds and pharmaceutical compositions thereof. 4,713,381, Cl. 514-222.000.

Aoi, Toshiaki: See—

Namba, Kenryo; Asami, Shigeru; Aoi, Toshiaki; Takahashi, Kazuo; and Kuroiwa, Akihiko, 4,713,314, Cl. 430-270.000.

Aoki, Kaoru: See—

Ogawa, Takayuki; Ito, Hideaki; Kimura, Naokazu; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitao; Watanabe, Takashi; Shinano, Kunizo; Kuwabara, Takashi; and Aoki, Kaoru, 4,712,742, Cl. 241-20.000.

Aoki, Kazumi; and Fujii, Minoru, to Sanden Corporation. Refrigerating unit for vending machine. 4,712,385, Cl. 62-333.000.

Aono, Toshiaki; and Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Heat developable photosensitive material. 4,713,319, Cl. 430-567.000.

Aoyama, Akimasa; Moritani, Takeshi; Yonezu, Kiyoshi; Negi, Taichi; and Okaya, Takuji, to Kuraray Co., Ltd. Laminar having good gas barrier properties with barrier layer of modified ethylene-vinyl alcohol copolymer. 4,713,296, Cl. 428-412.000.

AP Industries, Inc.: See—

Peele, Camille; Harwood, Jon W.; and Resuggan, Peter L., 4,712,295, Cl. 29-700.000.

Aqua-Chem Inc.: See—

Schneider, Burnett M., 4,713,195, Cl. 252-180.000.

Aquafine Corporation: See—

Iannicelli, Joseph, 4,713,225, Cl. 423-230.000.

Arai, Hisahiro: See—

Sasaki, Nobuyoshi; Baba, Susumu; and Arai, Hisahiro, 4,712,605, Cl. 164-516.000.

Arai, Mitsuru: See—

Yoshida, Toshiyuki; and Arai, Mitsuru, 4,712,377, Cl. 60-444.000.

Arai, Naoto, to Kanzaki Paper Mfg. Co., Ltd. Heat-sensitive recording material. 4,713,364, Cl. 503-209.000.

Arai, Takeo: See—

Anno, Nobuo; and Arai, Takeo, 4,712,517, Cl. 123-41.740.

Arakawa, Satoshi; and Nonomura, Masamitsu, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,713,549, Cl. 250-484.100.

Arakawa, Yoshio: See—

Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,713,459, Cl. 546-150.000.

Araseki, Takashi, to NEC Corporation. System for simultaneously coding and decoding a plurality of signals. 4,713,776, Cl. 364-513.500.

Ardrox Inc.: See—

Schiller, Harold, 4,713,144, Cl. 156-656.000.

Aretz, Werner; Berscheid, Hans G.; Huber, Gerhard; Fehlbauer, Hans-Wolfram; Kraemer, Hans P.; Sedlacek, Hans-Harald; Ganguli, Bimal N.; Sood, Ratan S.; Gandhi, Julia; and Reddy, Gauknappalli C., to Hoechst Aktiengesellschaft. Anthracene derivatives and their use as cytostatics. 4,713,371, Cl. 514-34.000.

Ariizumi, Ryoze; and Ejiri, Takashi, to Fujikura Rubber Limited. Pneumatically operated valve. 4,712,576, Cl. 437-270.000.

Arima, Takemi: See—

Morishita, Akira; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Hasegawa, Akinori; Arima, Takemi; and Kounou, Tadami, 4,712,451, Cl. 74-801.000.

Arito, Tatsunari; and Tojo, Yu, to Fuji Photo Film Co., Ltd. Method of preventing the occurrence of blackened margins on photosensitive sheets in electrophotography. 4,712,905, Cl. 355-3.0CH.

Armbruster, David R.; and Johnson, Calvin K., to Acme Resin Corporation. Foundry shell core and mold composition. 4,713,294, Cl. 428-404.000.

Armor, John N.: See—

Marsh, Gary B.; Fanelli, Anthony J.; Armor, John N.; and Zambri, Patrick M., 4,713,233, Cl. 423-608.000.

Armstrong World Industries, Inc.: See—

Bohm, Walter J.; Lewis, Robert D.; and Moggio, William A., 4,713,084, Cl. 8-561.000.

Arndt, Michael; and Sehnem, Hans P., to Bayer Aktiengesellschaft. Process for the preparation of alkylthioacetamides. 4,713,490, Cl. 564-225.000.

Arnold, Herbert; Horbelt, Michael; and Jundt, Werner, to Robert Bosch GmbH. Method and apparatus for replacement of data and of a data memory in an automotive-type electronic control system. 4,713,812, Cl. 371-10.000.

Arold, Klaus; Grimm, Hermann, deceased (by Grimm, Christel, executrix); and Koukal, Heinz, to Daimler-Benz Aktiengesellschaft. Heat exchanger for the independent heating of the driver and front-seat passenger side of a motor vehicle. 4,712,608, Cl. 165-41.000.

Arrendiell, Robert; and Ellis, Gwendolyn E. Nested plastic extension slide. 4,712,927, Cl. 384-23.000.

Aruga, Tamotsu: See—

Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakui; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,713,113, Cl. 106-22.000.

Arutjunian, Norair S.; Kornena, Elena P.; Kazarian, Robert V.; Ponomareva, Natalya A.; Redko, Grigory V.; Sakhno, Lidia T.; and Zhidkova, Irina S., to Krasnodarsky Politeknicheskyy Institut. Method for preparation of phosphatide concentrates from vegetable oils. 4,713,155, Cl. 204-155.000.

Asahi Kasei Kogyo Kabushiki Kaisha: See—

Aikou, Kenichi; Kurihara, Yoichi; and Goto, Tsugio, 4,712,477, Cl. 102-206.000.

Asahi, Naotatsu: See—

Sunano, Naomasa; Asahi, Naotatsu; and Yoshida, Toshio, 4,713,646, Cl. 338-34.000.

Asami, Shigeru: See—

Namba, Kenryo; Asami, Shigeru; Aoi, Toshiaki; Takahashi, Kazuo; and Kuroiwa, Akihiko, 4,713,314, Cl. 430-270.000.

Asano, Isao, to Alps Electric Co., Ltd. Information recording and reproducing apparatus. 4,713,703, Cl. 360-97.000.

Asano, Masao; Isobe, Ryosuke; Yamauchi, Yasuhisa; and Yamagishi, Hiroaki, to Konishiroku Photo Industry Co., Ltd. Magnetic recording media. 4,713,293, Cl. 428-403.000.

Asano, Toshiaki: See—

Kato, Masatake; Tsuji, Sadahiko; and Asano, Toshiaki, 4,712,883, Cl. 350-427.000.

Ashley, Bruce W.: See—

Hoover, Gary W.; Empson, Geuane; and Ashley, Bruce W., 4,712,326, Cl. 43-42.310.

ASM Fico Tooling, b.v.: See—

Fierkens, Richardus H. J.; and Pas, Ireneus J. T. M., 4,712,994, Cl. 425-543.000.

Aso, Hideo; Fujino, Hirohisa; and Saibe, Seiichi, to Tokyo Juki Industrial Co., Ltd. Button sewing machine. 4,712,493, Cl. 112-112.000.

Association Generale de Producteurs de Mais: See—

Cornet, Michel; and Michel, Pierre, 4,712,362, Cl. 56-16.500.

Astami Pty. Ltd.: See—

Wenham, Bruce T.; Cook, Raymond; and Hunter, Clifford R., 4,712,339, Cl. 52-173.0PS.

AT&T Bell Laboratories: See—

Kimball, David B.; and Kip, Ruloff F., Jr., 4,713,564, Cl. 307-542.100.

Ateliers de Constructions Electriques de Charleroi: See—

Plumier, Michel, 4,713,212, Cl. 376-258.000.

Ateliers Rolland S.A.: See—

Cornet, Michel; and Michel, Pierre, 4,712,362, Cl. 56-16.500.

Atlantic Richfield Company: See—

Wolcott, Herbert A.; and McHaney, James H., 4,712,579, Cl. 137-375.000.

Atochem: See—

Ganga, Roland A., 4,713,139, Cl. 156-500.000.

Atsumi, Morihiro: See—

Yamada, Manabu; Yoshida, Ichirou; Yamaguchi, Shunzo; and Atsumi, Morihiro, 4,713,582, Cl. 315-58.000.

Attoc, Gary N.: See—

Abel, Kent W.; and Attoc, Gary N., 4,713,132, Cl. 156-73.100.

Attwood Corporation: See—

Whitley, Warwick M., II, 4,712,501, Cl. 114-211.000.

Atwood, Mark T.; and Hall, Ronald H., to VerTech Treatment Systems, Inc. Process for mitigating scale formation in tube reaction apparatus. 4,713,177, Cl. 210-697.000.

Augendre, Claude; Rapidel, Jean-Loup; and Hennes, Jacques, to Facom. Wheel balancing machine, particularly for automobile wheels. 4,712,425, Cl. 73-460.000.

Augustin, Harald. Apparatus for the measurement of surface friction. 4,712,418, Cl. 73-9.000.

Automotive Products plc: See—

Leigh-Monstevens, Keith V.; and Mienko, David K., 4,712,640, Cl. 180-336.000.

Avco Corporation: See—

Dickey, Thomas A.; and Bodetka, George R., 4,712,372, Cl. 60-39.281.

Avery International Corporation: See—

Freedman, Melvin S., 4,713,273, Cl. 428-40.000.

Avny, Eli, to Sundstrand Corporation. Apparatus for limiting differential rotation. 4,712,449, Cl. 74-710.500.

Avondale Mills: See—

Lindsey, James N., 4,712,290, Cl. 28-178.000.

Awano, Yoshiyuki; and Narita, Hiroshi, to Du Pont de Nemours, E. I., and Company. Connector unit. 4,713,020, Cl. 439-267.000.

- Axytel, See—
Levavasseur, Jean R., 4,712,489, Cl. 109-25.000.
- Ayabe, Youzou; and Sugiyama, Shigeru. Containers for beverages. 4,712,702, Cl. 220-90.200.
- Ayata, Naoki, to Canon Kabushiki Kaisha. Alignment apparatus. 4,713,784, Cl. 364-559.000.
- B. F. Goodrich Company, The: See—
Kim, Heung-Tai, 4,712,992, Cl. 425-207.000.
Kugelman, Michael M., 4,713,719, Cl. 361-54.000.
- Baba, Susumu: See—
Sasaki, Nobuyoshi; Baba, Susumu; and Arai, Hisahiro, 4,712,605, Cl. 164-516.000.
- Baba, Takeshi; Imataki, Hiroyuki; Usui, Masayuki; Serizawa, Takashi; and Nose, Hiroyasu, to Canon Kabushiki Kaisha. Variable focal length lens. 4,712,882, Cl. 350-413.000.
- Babaiian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., to Vsesojuny Kardiologicheskoy Nauchny Tsentr Adkaemii Meditsinski Nauk SSSR; and Vsesojuny Nauchno-Issledovatel'skiy Ispytatelny Institut Meditsinski Tekhniki. Antianginal film and method of treating ischemic heart disease. 4,713,239, Cl. 424-81.000.
- Babel, Wolfgang, to Diehl GmbH & Co. Mine with alarm and triggering sensors. 4,712,479, Cl. 102-427.000.
- Bachel, Ernst; and Giebel, Wolfgang, to Siemens Aktiengesellschaft. Longitudinally divided sleeve of shrinkable material. 4,713,272, Cl. 428-36.000.
- Backer, Bruce E. Interconnecting "full bleed" modular panel and connective hardware system to form a variety of exhibit and office interior enclosures. 4,712,336, Cl. 52-71.000.
- Baer, James W., to Dazar Corporation. Optical system for fast access optical data storage device. 4,712,887, Cl. 350-484.000.
- Bagga, Madan M.; and Bull, Christopher H., to Ciba-Geigy Corporation. Solid solution of amine and polymerized phenol. 4,713,432, Cl. 526-313.000.
- Baggio, Giorgio, to Nordica S.p.A. Ski boot with a device for securing the foot of the skier. 4,712,316, Cl. 36-119.000.
- Baginski, Pierre; and Nebon, Jean-Pierre, to Merlin Gerin. Circuit breaker operating mechanism equipped with a stored energy system having removable and replaceable closing spring mechanisms. 4,713,508, Cl. 200-153.05C.
- Baier, Alfred S. Pipe stem replacement kit. 4,712,569, Cl. 131-328.000.
- Baika, Toyokazu; and Onaka, Hidemi, to Toyota Jidosha Kabushiki Kaisha. Lubricating mechanism for a rotary machine. 4,712,442, Cl. 74-467.000.
- Bailey, Philip E.; Pickett, Gordon E.; Luttinger, Manfred; and Umeda, Takashi, to Idemitsu Petrochemical Co., Ltd. Flame retardant polyester resin composition. 4,713,407, Cl. 524-109.000.
- Baisch, Joachim: See—
Andrusch, Georg; Baisch, Joachim; Barsuhn, Horst; Wernicke, Friedrich C.; and Wiedmann, Siegfried K., 4,713,814, Cl. 371-21.000.
- Baker, James K., to Exxon Research and Engineering Company. Speech recognition method. 4,713,778, Cl. 364-513.500.
- Baker, Rodney G.: See—
Lubelski, Daniel P.; and Baker, Rodney G., 4,713,359, Cl. 501-63.000.
- Baker, Ross G., Jr., to Intermedics, Inc. Pacemaker and method for ventricular rate limit operation and termination of pacemaker mediated tachycardia. 4,712,556, Cl. 128-419.0PG.
- Bakow, Leon: See—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,712,958, Cl. 411-506.000.
- Balaza, Endre A.; Leshchiner, Adolf; Leshchiner, Adelya; and Band, Philip, to Biomatrix, Inc. Chemically modified hyaluronic acid preparation and method of recovery thereof from animal tissues. 4,713,448, Cl. 536-55.100.
- Ball Corporation: See—
Lewis, Lindon L., 4,712,444, Cl. 74-479.000.
- Ballmoos, Roland V.: See—
Derouane, Eric G.; and Ballmoos, Roland V., 4,713,227, Cl. 423-305.000.
- Ban, Takao: See—
Ohno, Sachio; Ebihara, Yuko; Mizukoshi, Kiyoshi; Ichihara, Kenji; Ban, Takao; and Nagasaka, Mitsuaki, 4,713,457, Cl. 546-67.000.
- Banba, Nobuo: See—
Funato, Hiroyoshi; and Banba, Nobuo, 4,712,852, Cl. 350-371.000.
- Band, Philip: See—
Balaza, Endre A.; Leshchiner, Adolf; Leshchiner, Adelya; and Band, Philip, 4,713,448, Cl. 536-55.100.
- Bandelow, Vernon D.: See—
Briggs, Lawrence J.; Keleher, Daniel B.; and Bandelow, Vernon D., 4,713,781, Cl. 364-552.000.
- Bander, Neil H.; Whitmore, Willet F.; and Old, Lloyd J., to Sloan-Kettering Institute for Cancer Research. Monoclonal antibody panel for early diagnosis and therapy of renal carcinoma. 4,713,352, Cl. 436-548.000.
- Banerjee, Sanjay K.: See—
Womack, Richard H.; Banerjee, Sanjay K.; Shichijo, Hisashi; and Malhi, Satwinder, 4,713,678, Cl. 357-23.600.
- Barabas, Eugene S., to GAF Corporation. Water soluble complex of a poly(vinyl lactam) and chlorothiazide and process for producing same. 4,713,238, Cl. 424-80.000.
- Barbrick, August: See—
Mobley, Dewey F.; Warren, Janice M.; Barbrick, August; and Eisenmann, Gregg A., 4,713,026, Cl. 439-845.000.
- Bard, William B.: See—
Funk, Gary L.; and Bard, William B., 4,713,774, Cl. 364-500.000.
- Bardsley, Frank B.; and Sycha, Alec B., to Gearhart Tesel Limited. Connector apparatus. 4,712,846, Cl. 439-33.000.
- Bareket, Noah, to Lockheed Missiles & Space Company, Inc. Linear-scanned-array wavefront sensor. 4,712,913, Cl. 356-121.000.
- Baril, Michel: See—
Drabowitch, Serge; Baril, Michel; and Le Parquier, Guy, 4,713,663, Cl. 342-70.000.
- Barkdull, Howard L., Jr. Method of span construction. 4,712,335, Cl. 52-2.000.
- Barker, Sidney A.; and Somers, Peter J., to Imperial Chemical Industries PLC. Solubilization and hydrolysis of carbohydrates. 4,713,118, Cl. 127-38.000.
- Barl, Manfred: See—
Pilz, Georg; Buerger, Gert; Barl, Manfred; and Thiel, Gerhard, 4,713,201, Cl. 260-501.170.
Pilz, Georg; Buerger, Gert; Barl, Manfred; and Thiel, Gerhard, 4,713,437, Cl. 528-336.000.
- Barnert, Heiko: See—
Weirich, Walter; Barnert, Heiko; Oertel, Michael; and Schulten, Rudolf, 4,713,234, Cl. 423-648.00R.
- Barnum, Lewis W.: See—
Gaskill, Garold B.; Park, Daniel J.; Rullman, Robert G.; Rose, Donald T.; Stiley, Joseph F., III; Barnum, Lewis W.; and Hoff, Don G., 4,713,808, Cl. 370-94.000.
- Baron, Neville A. Process for recurving the cornea of an eye. 4,712,543, Cl. 128-303.100.
- Barratt, Craig H.; Wilfley, Brian P.; and Parish, David M., to Resonex, Inc. Quantization error reduction method for phase encode gradient in NMR imaging. 4,713,615, Cl. 324-307.000.
- Barre, Maurice; and Kalewicz, Zdzislaw. Pigmentary composition for the cathodic protection of metallic surfaces against corrosion, and process for preparing said composition. 4,713,112, Cl. 106-14.050.
- Barrett, Robert C., to Eastman Machine Company. Straight knife machine with safety features. 4,712,303, Cl. 30-275.000.
- Barsuhn, Horst: See—
Andrusch, Georg; Baisch, Joachim; Barsuhn, Horst; Wernicke, Friedrich C.; and Wiedmann, Siegfried K., 4,713,814, Cl. 371-21.000.
- Bartels, Inse E. H.: See—
Tolksdorf, Wolfgang F. M.; Bartels, Inse E. H.; Dammann, Hans O. B.; Klages, Claus-Peter; and Pross, Elke B., 4,712,855, Cl. 350-96.120.
- Bartels-Keith, Dorothy F., executrix: See—
Bartels-Keith, James R., deceased; Puttick, Anthony J.; and Taylor, Lloyd D., 4,713,313, Cl. 430-251.000.
- Bartels-Keith, James R., deceased (by Bartels-Keith, Dorothy F., executrix); Puttick, Anthony J.; and Taylor, Lloyd D., to Polaroid Corporation. Photographic system and novel compounds. 4,713,313, Cl. 430-251.000.
- BASF Aktiengesellschaft: See—
Kerth, Juergen; and Vogt, Heinz, 4,713,430, Cl. 526-159.000.
Merger, Franz; and Towae, Friedrich, 4,713,476, Cl. 560-115.000.
Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Ahlers, Klaas, 4,713,440, Cl. 528-367.000.
Pilz, Georg; Buerger, Gert; Barl, Manfred; and Thiel, Gerhard, 4,713,201, Cl. 260-501.170.
Pilz, Georg; Buerger, Gert; Barl, Manfred; and Thiel, Gerhard, 4,713,437, Cl. 528-336.000.
Schupp, Eberhard; Osterloh, Rolf; Loch, Werner; and Ahlers, Klaas, 4,713,406, Cl. 523-415.000.
- Basnett, David T., to Die-Mold Tool Ltd.; and Mold-Masters Limited. Replaceable rocker arm assembly for injection molding system. 4,712,995, Cl. 425-562.000.
- Battelle Memorial Institute: See—
Gonzalez Oliver, Carlos J. R.; De Pous, Olivier; and Schneider, Michel, 4,713,338, Cl. 435-176.000.
- Baum, Allen: See—
Worley, William S., Jr.; Bryg, William R.; and Baum, Allen, 4,713,755, Cl. 364-200.000.
- Baum, Samuel; and Yaeger, John R., to Raychem Corporation. Low loss circuit breaker and actuator mechanism therefor. 4,713,643, Cl. 337-140.000.
- Baumann, John A.: See—
Michel, Christian G.; Schachter, Rozalie; Kuck, Mark A.; Baumann, John A.; and Raccab, Paul M., 4,713,192, Cl. 252-62.30R.
- Bausch & Lomb Incorporated: See—
Bawa, Rajan; and Deichert, William G., 4,713,244, Cl. 424-429.000.
Dobner, Michael H., 4,712,890, Cl. 350-530.000.
- Bawa, Rajan; and Deichert, William G., to Bausch & Lomb Incorporated. Sustained-release formulation containing an amino acid polymer with a lower alkyl (C₁-C₄) polar solvent. 4,713,244, Cl. 424-429.000.
- Baxter Travenol Laboratories: See—
Hsu, Li-chien; and Heitzmann, Hal, 4,712,865, Cl. 350-96.290.
- Baxter Travenol Laboratories, Inc.: See—
Gianfilippo, Aleandro Di, 4,712,590, Cl. 141-83.000.
Link, William T., 4,712,563, Cl. 128-681.000.
- Bayer Aktiengesellschaft: See—
Arndt, Michael; and Sehnem, Hans P., 4,713,490, Cl. 564-225.000.
Elbe, Hans-Ludwig; and Holmwood, Graham, 4,713,456, Cl. 544-335.000.

- Kramer, Wolfgang; Weissmuller, Joachim; Reiser, Wolf; Berg, Dieter; Brandes, Wilhelm; and Reinecke, Paul, 4,713,379, Cl. 514-212.000.
- Kress, Hans-Jurgen; and Kircher, Klaus, 4,713,462, Cl. 548-473.000.
- Salzburg, Herbert; Hajek, Manfred; Hagemann, Hermann; Kuhle, Engelbert; Fuhrer, Wolfgang; Hansler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,713,389, Cl. 514-373.000.
- Schittenhelm, Hans-Joachim; Joseph, Werner; and Trogel, Gerhard, 4,713,530, Cl. 219-543.000.
- Bayerische Motoren Werke Aktiengesellschaft: See—
Stamm, Wolfgang; and Konig, Dieter, 4,712,289, Cl. 29-568.000.
- Baylor College of Medicine: See—
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- Bayol, Alain; Blanc, Francis; Lansen, Jacqueline; Maffrand, Jean-Pierre; and Percillo, Jean-Marie, to Sanofi S.A. Xylan sulfates of low molecular weight; process for their preparation and medicaments containing them. 4,713,373, Cl. 514-54.000.
- Beasom, James D., to Harris Corporation. Structure for high breakdown PN diode with relatively high surface doping. 4,713,681, Cl. 357-52.000.
- Bebber, Hans J.; Neuschutz, Dieter; and Rossner, Heinrich-Otto, to Fried. Krupp Gesellschaft mit beschränkter Haftung. Method and apparatus for holding or increasing the temperature in a metal melt. 4,713,826, Cl. 373-22.000.
- Beck, Walter; Berger, Siegfried; and Werner, Margrit, to Beck, Walter; and Werner, Margrit. Apparatus for aspirating secreted fluids from a wound. 4,713,052, Cl. 604-48.000.
- Becker, Carl, to Ciba-Geigy Corporation. Stable aqueous dyestuff preparations of finely dispersed water-insoluble or sparingly water-soluble dyes. 4,713,081, Cl. 8-527.000.
- Becker, Michael; and Renz, Klaus, to Siemens Aktiengesellschaft. Monitoring device for detecting faults in an electrical device, particularly in an LC filter circuit in an AC voltage network. 4,713,604, Cl. 324-500.000.
- Becton, Dickinson and Company: See—
Riuli, Arduino; E., 4,713,060, Cl. 604-199.000.
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- Bedeschi, Angelo: See—
Alpegiani, Marco; Bedeschi, Angelo; Foglio, Maurizio; Franceschi, Giovanni; and Perrone, Ettore, 4,713,450, Cl. 540-214.000.
- Beebe, William B. Pendulum type decorative and time indicating device. 4,712,925, Cl. 368-179.000.
- Beecham Group p.l.c.: See—
Buckle, Derek R., 4,713,486, Cl. 562-495.000.
- Beggs, Louis C.: See—
Pejouhy, Radi; Nield, Joseph G., Jr.; D'Entremont, John R.; Beggs, Louis C.; and Rotulo, Fabrizio, 4,713,717, Cl. 361-26.000.
- Begum, Selima; Ullah, Ismat; and Nunning, Bernard C., to Bristol-Myers Company. Etoposide oral dosage form. 4,713,246, Cl. 424-455.000.
- Beh-Forrest, Eric; and Flanagan, Thomas P., to National Starch and Chemical Corporation. Hot melt adhesive composition for book hinge joint. 4,712,808, Cl. 281-15.00R.
- Behringwerke Aktiengesellschaft: See—
Stuber, Werner, 4,713,369, Cl. 514-18.000.
- Beigang, Wolfgang; and Hoffman, Werner, to Uni-Cardan Aktiengesellschaft. Torque transmission assembly with enhanced torque transmitting characteristics. 4,713,040, Cl. 464-132.000.
- Beirnes, James R. Weatherstripping for side-hinged windows and doors. 4,712,330, Cl. 49-484.000.
- Bell Communications Research, Inc.: See—
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- Belt, Kenneth W.: See—
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- Bendix France: See—
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Carre, Jean-Jacques, 4,712,840, Cl. 303-24.00R.
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Kervagoret, Gilbert, 4,712,632, Cl. 180-143.000.
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- Benfaremo, Nicholas: See—
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- Berchem, Rutger; and Prokscha, Georg, to Berchem & Schaberg GmbH. Excavator tooth for earth moving equipment. 4,712,321, Cl. 37-142.00R.
- Berchem & Schaberg GmbH: See—
Berchem, Rutger; and Prokscha, Georg, 4,712,321, Cl. 37-142.00R.
- Berg, Dieter: See—
Kramer, Wolfgang; Weissmuller, Joachim; Reiser, Wolf; Berg, Dieter; Brandes, Wilhelm; and Reinecke, Paul, 4,713,379, Cl. 514-212.000.
- Berg, Roger M.; and Scott, Francis H., to UNI-BMX, Inc. Demountable disc covers for spoked wheels. 4,712,838, Cl. 301-37.05A.
- Berger, Abe: See—
Harris, James E.; Berger, Abe; Chopdekar, Vilas M.; Matzner, Markus; and Spanswick, James, 4,713,438, Cl. 528-337.000.
- Berger, Siegfried: See—
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- Bergmann, Friedhelm: See—
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- Bergstrom, James W.; and Podgorski, Theodore J., to Honeywell Inc. Readout for a ring laser gyro. 4,712,917, Cl. 356-350.000.
- Berke, Joseph J.: See—
Presser, Dwight W.; and Berke, Joseph J., 4,713,002, Cl. 433-30.000.
- Bersch, Bernhard; Juttner, Heinz; and Tenhaven, Ulrich, to Hoesch Aktiengesellschaft. Apparatus for laser beam welding the longitudinal edges of a can. 4,713,519, Cl. 219-121.0LC.
- Berscheid, Hans G.: See—
Aretz, Werner; Berscheid, Hans G.; Huber, Gerhard; Fehlhaber, Hans-Wolfram; Kraemer, Hans P.; Sedlacek, Hans-Harald; Ganguili, Bimal N.; Sood, Ratan S.; Gandhi, Julia; and Reddy, Gauknapalli C., 4,713,371, Cl. 514-34.000.
- Bertoglio, Guido, to Water Line S.A. Machine for filling bags with a liquid and sealing them. 4,712,360, Cl. 53-567.000.
- Bertorello, Mario, to Rotomors S.p.A. Systems including at least one vertical turning machine or the like and at least two auxiliary stations. 4,712,283, Cl. 29-33.00P.
- Besam AB: See—
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- Besser Company: See—
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- Beta Phase, Inc.: See—
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- Bethell, Michael R.; Gaines, Michael G.; Mowat, James F., Jr.; Wheeler, Roger D.; and Woidke, Richard P., to Monroe Auto Equipment Company. Gas pressurized shock absorber assembly. 4,712,353, Cl. 53-80.000.
- Bhasin, Anirudh K.: See—
Smit, Francis J.; Horst, William E.; and Bhasin, Anirudh K., 4,713,086, Cl. 44-51.000.
- Bhattacharyya, Bhupati R.; and Dalsin, Philip D., to Nalco Chemical Company. High molecular weight DADMAC polymers by inverse emulsion technology. 4,713,431, Cl. 526-207.000.
- Bickelhaupt, Roger; and Rold, Michael D., to American Hospital Supply Corporation. Dispenser for an elongated flexible member. 4,713,059, Cl. 604-171.000.
- Biedermann, Adam, to Joh. Winkhofer & Sohne. Chain tensioner. 4,713,043, Cl. 474-111.000.
- Bielka, Robert P.: See—
Kelly, L. Thomas; Hamel, Esther V. M.; and Bielka, Robert P., 4,713,054, Cl. 604-89.000.
- Bihn, Raymond J., to Champion Spark Plug Company. Spray gun nozzle assembly retainer clip and spray gun nozzle assembly. 4,712,739, Cl. 239-290.000.
- Bilco Tools Inc.: See—
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- Billon, Michel: See—
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- Bily, Robert R. Starter cultures of improved activity for dairy products and process of making same. 4,713,341, Cl. 435-253.000.
- Bio Medical Research Ltd.: See—
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- Biomatrix, Inc.: See—
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- Biotrack, Inc.: See—
Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostoich, Vladimir E.; and Stroy, Gary H., 4,712,460, Cl. 83-208.000.
- Birkenbach, Eugen J.; Eversole, Brad K.; and Magee, Kevin J., to J. I. Case Company. Self-leveling agricultural implement. 4,712,622, Cl. 172-328.000.
- Birum, Gail H.; and Jansen, Richard F., to Akzo America Inc. Preparation of N-substituted arylsulfonamides. 4,713,489, Cl. 564-90.000.
- Bissel, Steve F. Waterbed and holder assembly for use therewith. 4,712,260, Cl. 5-451.000.
- Bisson, Flavio, to Necchi Societa per Azioni. Automatic exchange of the size in an automatic sewing unit. 4,712,494, Cl. 112-121.120.
- Bixler, Craig A.; and Triner, Irvin R., to Molex Incorporated. Electrical connector and method of assembly. 4,713,023, Cl. 439-393.000.
- Bjelk, Nils: See—
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- Black, Jimmy C.: See—
Roberts, Bruce E.; Black, Jimmy C.; and Matlock, Dyer A., 4,713,260, Cl. 437-238.000.
- Blackham, Ray, to Hewlett-Packard Company. Method and apparatus for measuring a transfer function. 4,713,782, Cl. 364-553.000.
- Blade, Robert J., to Burroughs Wellcome Co. Pesticidal compounds. 4,713,200, Cl. 260-408.000.
- Blanc, Francis: See—
Bayol, Alain; Blanc, Francis; Lansen, Jacqueline; Maffrand, Jean-Pierre; and Percillo, Jean-Marie, 4,713,373, Cl. 514-54.000.
- Blanchette, Ronald L.: See—
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- Blankers, Johannes M. M.: See—
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- Blaser, Hansueli: See—
Lodetti, Attilio; and Blaser, Hansueli, 4,712,288, Cl. 29-557.000.
- Blaser, Peter: See—
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- Bleazard, Robert C.: See—
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- Blitz, Hans-Dieter: See—
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- Bloom, William G.: See—
Gille, Henrick K.; Willing, Richard S.; Bloom, William G.; Siegel, Bernard; Cheung, Tsang; Lobodzinski, Richard; and Gilroy, Keith, 4,712,567, Cl. 128-771.000.
- Blot, Jean-Claude, to Bendix France. Distribution valve assembly for a pneumatic brake booster. 4,712,468, Cl. 91-376.00R.
- Blum, Albert. Ground effect vehicle. 4,712,630, Cl. 180-117.000.
- Bobst SA: See—
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- BOC Group, Inc.: See—
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- Bock, Erich; and Rieger, Gerald, to Diehl GmbH & Co. Projectile with active components. 4,712,482, Cl. 102-501.000.
- Bodetka, George R.: See—
Dickey, Thomas A.; and Bodetka, George R., 4,712,372, Cl. 60-39.281.
- Boeber, William E.; and Kain, Richard Y., to Honeywell Inc. Secure data processing system architecture with format control. 4,713,753, Cl. 364-200.000.
- Boeckmann, Hugo, to Minigrip, Inc. Bag dispensing arrangement. 4,712,684, Cl. 206-554.000.
- Boehm, Hans-Peter: See—
Langerbeins, Klaus; Schroder, Gunther; and Boehm, Hans-Peter, 4,713,483, Cl. 560-204.000.
- Boeing Company, The: See—
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- Ridgwell, Robert H., 4,712,750, Cl. 244-117.00A.
- Victor, Paul F., 4,712,752, Cl. 244-129.100.
- Bogdanovic, Borislav; and Bonnemann, Helmut, to Studiengesellschaft Kohle mbH. Process for preparing finely divided metal powders. 4,713,110, Cl. 75-0.50A.
- Boggs, Gary D.: See—
Steppe, Dennis L.; Hood, Larry L.; and Boggs, Gary D., 4,713,051, Cl. 604-30.000.
- Bohrn, Walter J.; Lewis, Robert D.; and Moggio, William A., to Armstrong World Industries, Inc. Alginate gel particle inks or dye liquors for imparting color to textiles. 4,713,084, Cl. 8-561.000.
- Bokowski, Gary A.; and Vahey, David W., to AccuRay Corporation. Ultrasonic transducers for on-line applications. 4,713,572, Cl. 310-323.000.
- Bolt Technology Corporation: See—
Chelminski, Stephen V., 4,712,641, Cl. 181-113.000.
- Bonacci, Stephen T.; Douville, Richard L.; and Winter, Rodger C. Screen door assembly. 4,712,598, Cl. 160-84.00R.
- Bond, Michael E.; and Voreh, Fred R., to USM Corporation. Plastic wall anchor. 4,712,956, Cl. 411-55.000.
- Bond, Raymond G.; and Mock, Gerald L., to Fortel Corporation. Telephone answering machine with automatic recording and visual display of time and data. 4,713,835, Cl. 379-79.000.
- Boner, Heinrich: See—
Fullemann, Jorg; and Boner, Heinrich, 4,712,997, Cl. 431-89.000.
- Bonnemann, Helmut: See—
Bogdanovic, Borislav; and Bonnemann, Helmut, 4,713,110, Cl. 75-0.50A.
- Bonnet, Ludwig. Instrument for slitting stenoses in bodily passages. 4,712,547, Cl. 128-311.000.
- Boone, Joseph E.; and Ahlemeyer, W. Bruce, to Regency Electronics, Inc. Transportation vehicle location monitor generating unique audible messages. 4,713,661, Cl. 340-994.000.
- Boos, Donald L.; and Marse, Allan V., to Standard Oil Company. Double layer capacitor. 4,713,731, Cl. 361-433.000.
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- Bowald, Staffan F., to Swedish Graft Technique AB. Implant lens and method and apparatus for its production. 4,713,072, Cl. 623-6.000.
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- Brandes, Wilhelm: See—
Kramer, Wolfgang; Weissmuller, Joachim; Reiser, Wolf; Berg, Dieter; Brandes, Wilhelm; and Reinecke, Paul, 4,713,379, Cl. 514-212.000.
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- Bray, Donald T., to Nimbus Water Systems, Inc. Water purifier comprising stages mounted side-by-side to unitary header. 4,713,175, Cl. 210-259.000.
- Brearely, Malcolm; and Moseley, Richard B., to Lucas Industries public limited company. Vehicle braking system. 4,712,839, Cl. 303-3.000.
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- Breslow, David, to RTC Industries, Inc. Display shelf organizer. 4,712,694, Cl. 211-184.000.
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- Briant, Gervais: See—
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- Bricault, Gary S.: See—
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- Bridgeford, Douglas J., to Teepak, Inc. Process for seaming coated cellulose webs. 4,713,135, Cl. 156-218.000.
- Bridgestone Corporation: See—
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- Brilando, Frank P., to Schwinn Bicycle Company. Cycle exercisers. 4,712,789, Cl. 272-73.000.
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- Brother Kogyo Kabushiki Kaisha: See—
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- Natsume, Yukihito, 4,712,933, Cl. 400-248.000.
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- Brown, Arthur E. Balancers for various reciprocating machines using rotating balance weights. 4,712,436, Cl. 74-44.000.
- Brown, Byron L. Tool for cutting annular groove. 4,712,951, Cl. 408-158.000.
- Brown, David R.; Frost, Charles E., Jr.; and White, Kenneth A., to GTE Products Corporation. Quartz glass crucibles. 4,713,104, Cl. 65-18.100.
- Brown, Herbert C., to Aldrich-Bornes, Inc. Production of optically pure organoboranes. 4,713,380, Cl. 568-1.000.
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- Brown, Richard W.; and Gless, Richard D., Jr., to Stauffer Chemical Company. Method for the preparation of benzyloxyphenoxy pentanoates. 4,713,471, Cl. 560-53.000.
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- Brunswick Valve & Control, Inc.: See—
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- Herring, James M., Jr., 4,712,488, Cl. 105-224.100.
- Budke, Mark P.: See—
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- C. Reichert Optische Werke AG: See—
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- Cage, Jerry L., to Allied Corporation. Fail safe circuit for an anti-lock braking system modulator drive. 4,712,841, Cl. 303-92.000.
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- Cairns, John F.; and Cowell, Gawin W., to Imperial Chemical Industries PLC. Porous diaphragm for electrolytic cell. 4,713,163, Cl. 204-296.000.
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- Cameron, Robert W. Line throw-bag. 4,713,033, Cl. 441-84.000.
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- Dammann, Hans O. B.: See—
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- Energy Conversion Devices, Inc.: See—
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- Exxon Chemical Patents Inc.: See—
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- French, Richard C.: See—
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- French, Steven J.; and Neasham, David L., to Thorn Emi Electronics Limited. Electrical apparatus. 4,713,652, Cl. 340-652.000.
- Frere, Ronald J.: See—
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- Fresenius AG: See—
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- Frey, Ronald G., to Tytronix Corporation. Automatic mode switching unit for a serial communications data system. 4,713,811, Cl. 371-9.000.
- Fried. Krupp Gesellschaft mit beschränkter Haftung: See—
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- Friel, Joseph V.: See—
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- Fries, Wolfgang: See—
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- Fritz Chemical Company: See—
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- Fromm, Thomas W. Ice-cream carton, carton blank, and method of erecting same. 4,712,689, Cl. 206-626.000.
- Fromm, Thomas W. Ice-cream carton, carton blank, and method of erecting same. 4,712,730, Cl. 229-169.000.
- Frosien, Juergen: See—
Feuerbaum, Hans-Peter; Frosien, Juergen; and Spehr, Rainer, 4,713,543, Cl. 250-310.000.
- Frost, Charles E., Jr.: See—
Brown, David R.; Frost, Charles E., Jr.; and White, Kenneth A., 4,713,104, Cl. 65-18.100.

Fry, John A., to Quaker Industries, Inc. Home filing cabinet. 4,712,844, Cl. 312-265.000.

Fuehrer, Charles, to Stoffel Seals Corporation. Tamper indicating cap seal for container valves. 4,712,705, Cl. 220-270.000.

Fuhrer, Wolfgang: See—
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Fuji Electric Co., Ltd.: See—
Fujiwara, Norio; Takahashi, Nobuyuki; and Otsuki, Akihiro, 4,713,279, Cl. 428-142.000.

Fuji Kagakushi Kogyo Co., Ltd.: See—
Shini, Masami, 4,713,281, Cl. 428-207.000.

Fuji Photo Film Co., Ltd.: See—
Aono, Toshiaki; and Hara, Hiroshi, 4,713,319, Cl. 430-567.000.

Arakawa, Satoshi; and Nonomura, Masamitsu, 4,713,549, Cl. 250-484.100.

Arito, Tatsunari; and Tojo, Yu, 4,712,905, Cl. 355-3.0CH.

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Masaki, Kouichi; and Kitamoto, Tatsuji, 4,713,261, Cl. 427-129.000.

Mifune, Hiroyuki; Shishido, Tadao; and Suzuki, Yoshiaki, 4,713,321, Cl. 430-569.000.

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Oshikoshi, Yuji, 4,712,909, Cl. 355-20.000.

Sugimoto, Tadao; and Hayakawa, Toshiaki, 4,713,318, Cl. 430-567.000.

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Fujimori, Hiroyoshi; and Nagasaki, Tatsu, to Olympus Optical Co., Ltd. Illuminating and synchronizing device for color imaging equipment. 4,713,683, Cl. 358-42.000.

Fujimoto, Nobuaki, to Kitagawa Industries Co., Ltd. Substrate support of integral construction. 4,712,939, Cl. 403-24.000.

Fujino, Hirohisa: See—
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Fujisawa, Hideya: See—
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Fujisawa, Masayasu, to Hitachi, Ltd. Method and apparatus for severing wafers. 4,712,535, Cl. 125-13.00R.

Fujishima, Shizu; Yaku, Fumiko; and Koshijima, Tetsuo, to Agency of Industrial Science and Technology. Process for the saccharification of celluloses. 4,713,334, Cl. 435-99.000.

Fujita, Tsuyoshi: See—
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Fuller, Kevin S. Submerged bobber release device for fishing rods and the like. 4,713,031, Cl. 441-8.000.

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Cohen, Marlene L.; Fuller, Ray W.; Garbrecht, William L.; and Whitten, Kathleen R., 4,713,384, Cl. 514-288.000.

Fumagalli, Carlo; and Stefani, Giancarlo, to Alusuisse Italia, S.p.A. Process for production of maleic anhydride. 4,713,464, Cl. 549-259.000.

Funahashi, Toshihiko: See—
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Funk, Gary L.; and Bard, William B., to Phillips Petroleum Company. Alkylation reactor quality control. 4,713,774, Cl. 364-500.000.

Furrer, Harald; Anagnostopoulos, Hristo; and Gebert, Ulrich, to Hoechst Aktiengesellschaft. Cyclic derivatives of alkyl dihydroxyalkylxanthenes. 4,713,455, Cl. 544-267.000.

Furth, Harold P.; Janos, Alan C.; Uyama, Tadao; and Yamada, Masaaki, to United States of America, Energy. Spheromak reactor with poloidal flux-amplifying transformer. 4,713,208, Cl. 376-137.000.

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Fyler, Donald C., to Charles Stark Draper Laboratory, Inc., The. Control arm assembly. 4,712,971, Cl. 414-744.00R.

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Yoshida, Bunsaku; and Tomioka, Kentaro, 4,713,403, Cl. 523-115.000.

G. D. Searle & Co.: See—
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Gaetani, Frank J.: See—
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GAF Corporation: See—
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Gagliardi, Claudio: See—
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Gaines Pet Foods Corp.: See—
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Gallop, Paul M.; Henson, Edward; and Fluckiger, Rudolf, to Children's Medical Center Corporation, The. Formation of analyzable boron containing adducts. 4,713,346, Cl. 436-86.000.

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Ganesan, Kalyan: See—
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Ganguli, Bimal N.: See—
Aretz, Werner; Berscheid, Hans G.; Huber, Gerhard; Fehlhäber, Hans-Wolfram; Kraemer, Hans P.; Sedlacek, Hans-Harald; Ganguli, Bimal N.; Sood, Ratan S.; Gandhi, Julia; and Reddy, Gaunapalli C., 4,713,371, Cl. 514-34.000.

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Garcia, Joseph T. Collapsible sailboard dolly. 4,712,803, Cl. 280-47.13B.

Garden, Robert L. Ball dispensing apparatus and method. 4,712,712, Cl. 221-68.000.

Gardner, Neal F., to TRW Inc. Bipolar transistor construction. 4,713,355, Cl. 437-31.000.

Garin, John; Riggs, Allan J.; and Palmer, Robert S., to Westinghouse Electric Corp. Two servo axis, AC powered robot wrist. 4,712,973, Cl. 414-744.00A.

Garner, John N., to Northern Telecom Limited. Manufacture of telecommunications cable core units. 4,712,368, Cl. 57-314.000.

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Gaudreau, Charles H., Jr. Aquatic exercise apparatus. 4,712,788, Cl. 272-69.000.

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Gearhart Tesel Limited: See—
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Gely, Jean-Marie L.; Goutines, Marius J.; and Meauze, Georges, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Fairing for turbo-jet engine fan leading edge. 4,712,980, Cl. 416-224.000.

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Losapio, Peter F.; Germer, Warren R.; Ouellette, Maurice J.; and Palmer, Ansell W., 4,713,609, Cl. 324-156.000.

Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,713,728, Cl. 361-363.000.

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General Motors Corporation: See—
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Gerfast, Sten R. Axial fan. 4,712,977, Cl. 415-209.000.

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Giezeman, Paulus G.; and Romualdus Ter Horst, Gerhardus E., to OCE-Nederland B.V. Exposure device for sheets. 4,713,674, Cl. 355-14.0SH.

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Goras, Anders: See—
Johansson, Hans; and Goras, Anders, 4,712,420, Cl. 73-118.100.

Gordon, Alastair. Communication network. 4,713,837, Cl. 379-93.000.

Gordon, Linda A.: See—
Tarello, William R.; Gordon, Linda A.; and Whalen, T. Daniel, 4,713,061, Cl. 604-200.000.

Gordon, Philip J.: See—
Remz, Harvey M.; Gordon, Philip J.; Cunningham, John D.; and Melnik, Joseph D., 4,712,571, Cl. 132-88.700.

Goria, Luigi. Footwear with detachable visibility aids. 4,712,319, Cl. 36-137.000.

Gorski, George L.: See—
Zamzow, Donald D.; and Gorski, George L., 4,712,511, Cl. 119-51.00R.

Gorton, Lanny A.: See—
Pelmulder, John P.; Gorton, Lanny A.; Guleserian, Armen J.; and Livingston, John H., 4,712,583, Cl. 137-852.000.

Gosselink, Eugene P., to Procter & Gamble Company. The Block polyester and like compounds having branched hydrophilic capping groups useful as soil release agents in detergent compositions. 4,713,194, Cl. 252-174.230.

Goto, Tsugio: See—
Aikou, Kenichi; Kurihara, Yoichi; and Goto, Tsugio, 4,712,477, Cl. 102-206.000.

Gotoh, Hajime; Machida, Mamoru; and Sugiyama, Osamu, to Mitsubishi Rayon Co., Ltd. Paper-like product, method and apparatus for production thereof and prepreg formed of said paper-like product. 4,713,276, Cl. 428-113.000.

Gotou, Makoto; Mitani, Hiroshi; and Igarashi, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Camera apparatus. 4,713,697, Cl. 358-222.000.

Goutines, Marius J.: See—
Gely, Jean-Marie L.; Goutines, Marius J.; and Meauze, Georges, 4,712,980, Cl. 416-224.000.

Govind, Rakesh, to University of Cincinnati. Adsorption of gases by amine and phosphine complexed Mn(II) and compounds. 4,713,091, Cl. 55-73.000.

Grabber Manufacturing Company: See—
Jarman, Davis R.; and Hinson, Virgil H., 4,712,417, Cl. 72-447.000.

Graciotti, Alessandro; and Kutscha, Herbert A., to Ing. C. Olivetti & Co. S.p.A. Video converter. 4,713,779, Cl. 364-521.000.

Gradi, Reinhard: See—
Schimmel, Gunther; and Gradi, Reinhard, 4,713,229, Cl. 423-321.00R.

Graf, Felix; Schneeberger, Ruedi; and Symon, Georg, to Rieter Machine Works Limited. Method and apparatus for forming cross-wound packages. 4,712,746, Cl. 242-43.00R.

Graf, Felix: See—
Sommer, Hans-Jorg; Mutter, Heinz; Wirz, Armin; and Graf, Felix, 4,713,655, Cl. 340-677.000.

Grage, Ludger, to Siemens Aktiengesellschaft. Optical system for the simultaneous reception of thermal and laser radiation. 4,713,544, Cl. 250-334.000.

Graham, Walker O. Cleaning and yarn conditioning system for weaving machines. 4,712,587, Cl. 139-1.00C.

Grain Processing Corporation: See—
Ramsden, Steven L., 4,713,345, Cl. 435-305.000.

Gramelspacher, George W. Mail box structure. 4,712,731, Cl. 232-17.000.

Gramling, William D. Pressure-operated valving for oil and gas well swabs. 4,712,981, Cl. 417-56.000.

Grandjean, Richard, to Compagnie Industrielle de Mecanismes en abregé C.I.M. Door latch assembly, in particular for an automobile vehicle. 4,712,817, Cl. 292-336.300.

Grano, Frank J.: See—
Geering, Emil J.; and Grano, Frank J., 4,712,711, Cl. 220-457.000.

Grassauer, Willie K.: See—
Noel, Raymond; Robinson, William M.; Cherian, Gabe; Clifford, Thomas H.; Carlomagno, William D.; Deasy, William M.; Grassauer, Willie K.; Haygood, David K.; Sherlock, H. Paul; and White, Harry E., 4,712,721, Cl. 228-56.300.

Graviner Limited: See—
Spring, David J., 4,713,101, Cl. 62-8.000.

Grawi, Franklin L.; and Magnan, Michael B., to Ford Motor Company. Integrated engine air cleaner and venturi resonator. 4,713,097, Cl. 55-276.000.

Gray, John D.: See—
Triplett, Charles S.; and Gray, John D., 4,712,348, Cl. 52-408.000.

Gray, Ralph. Flight for use on a conveyor belt. 4,712,668, Cl. 198-698.000.

Greator, Cyril B.; Smith, Ian W. H.; and Hammersley, Graham J., to Stanton plc. Assembly and installation of pipes. 4,712,946, Cl. 405-170.000.

Greaves, Peter, to Dobson Park Industries plc. Typewriter carriage escapement mechanism having two sets of teeth. 4,712,934, Cl. 400-332.500.

Grebur, Dennis J.: See—
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,713,425, Cl. 525-438.000.

Greeb, Karl-Heinrich: See—
Senske, Wilhelm; Herkert, Roland; Marschall, Norbert; and Greeb, Karl-Heinrich, 4,713,311, Cl. 430-127.000.

Green Cross Corporation, The: See—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,713,459, Cl. 546-150.000.

Greenberg, Herbert S. Drinking vessel. 4,712,698, Cl. 215-100.00A.

Greer, John S.: See—
Hiltz, Ralph H.; Greer, John S.; and Friel, Joseph V., 4,713,182, Cl. 252-3.000.

Greiner, Peter; Pfluger, Hubert; and Widmann, Horst, to Adidas Sport-schuhfabriken Adi Dassler Stiftung & Co. KG. Gripping element for a sports shoe. 4,712,318, Cl. 36-134.000.

Gretag Aktiengesellschaft: See—
Kunz, Rino E.; Junghaus, Jurgen R.; Knus, Jean A.; Murbach, Urs; and Tuor, Marcel F., 4,713,537, Cl. 250-227.000.

Grill, Hans; and Tappen, Gerhard. Racking device. 4,712,691, Cl. 211-49.100.

Grimm, Christel, executrix: See—
Aroid, Klaus; Grimm, Hermann, deceased; and Koukal, Heinz, 4,712,608, Cl. 165-41.000.

Grimm, Hermann, deceased: See—
Aroid, Klaus; Grimm, Hermann, deceased; and Koukal, Heinz, 4,712,608, Cl. 165-41.000.

Grinn, James M.: See—
Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Schan, Edward P., Jr., 4,713,834, Cl. 379-28.000.

Groland, Hans: See—
Kjohl, Olav; Obrestad, Torstein; and Groland, Hans, 4,713,108, Cl. 71-32.000.

Grosjean, Michel. Single-phase motor with a magnetized rotor. 4,713,565, Cl. 310-49.00R.

Gross, Andrew: See—
Schultz, Thomas G.; Gross, Andrew; Pappas, Barbara; Shifrin, George D.; and Mack, Lois, 4,713,780, Cl. 364-514.000.

Gross, Peter L., to Gross, Thomas L., a part interest. Material handling rack with transportation means. 4,712,966, Cl. 414-458.000.

Gross, Thomas L.: See—
Gross, Peter L., 4,712,966, Cl. 414-458.000.

Grossi, Pierre-Jean: See—
Andre, Jean-Daniel; Grossi, Pierre-Jean; Heymes, Alain; and Manzaroli, Giovanni V., 4,713,485, Cl. 562-470.000.

Grossman, Mark W., to GTE Products Corporation. Method and apparatus for monitoring the flow of mercury in a system. 4,713,547, Cl. 250-373.000.

Groth, Hugh F.: See—
Duncan, L. Scot; Groth, Hugh F.; and Collins, John M., 4,712,740, Cl. 239-340.000.

Gruber, David: See—
Weinberger, Joseph; Bricault, Gary S.; Gruber, David; and Rakover, Eleonora, 4,712,907, Cl. 355-7.000.

Grunberg, Pierre, to Valeo. Method of automatically operating a clutch release bearing according to the speeds of the shafts coupled by an associated clutch. 4,712,658, Cl. 192-0.033.

Grunert, Kurt A.; and Schlosser, Donald E., to Westinghouse Electric Corp. Circuit breaker with push-to-trip button and trip bar. 4,713,639, Cl. 335-172.000.

GTE Communication Systems Corporation: See—
Conforti, Joseph A., 4,713,793, Cl. 364-900.000.

Saluski, Robert A., 4,713,791, Cl. 364-900.000.

GTE Government Systems Corporation: See—
MacDonald, Donald C., 4,713,523, Cl. 219-385.000.

GTE Laboratories Incorporated: See—
Bulat, Emel S.; Ditchek, Brian M.; and Butler, Scott J., 4,713,358, Cl. 437-65.000.

Byszewski, Wojciech W.; Fallier, Charles N., Jr.; and Lester, James N., 4,713,587, Cl. 315-289.000.

GTE Products Corporation: See—
Brown, David R.; Frost, Charles E., Jr.; and White, Kenneth A., 4,713,104, Cl. 65-18.100.

Byszewski, Wojciech W.; Fallier, Charles N., Jr.; and Lester, James N., 4,713,587, Cl. 315-289.000.

Grossman, Mark W., 4,713,547, Cl. 250-373.000.

Leo, Vincent B.; Cyll, Kenneth M.; and Ide, Mason G., 4,713,524, Cl. 219-307.000.

Melanson, Lionel J.; and Watson, Richard C., 4,713,529, Cl. 219-541.000.

Schoene, Carl M., 4,713,580, Cl. 313-624.000.

GTE Sprint Communications Corp.: See—
Chum, Stanley, 4,713,810, Cl. 371-4.000.

Gualtieri, Devlin M.; and Lai, Shui T., to Allied Corporation. Multi-layer faceted luminescent screens. 4,713,577, Cl. 313-468.000.

Guangxi, Yue: See—
Xu-Yi, Zhang; Guangxi, Yue; and Qiayu, Zheng, 4,712,514, Cl. 122-4.00D.

Guilbault, Lawrence J.: See—
Hoover, M. Fred; and Guilbault, Lawrence J., 4,713,236, Cl. 424-70.000.

Guilford Mills, Inc.: See—
Scheller, Holger, 4,712,281, Cl. 28-162.000.

Guleserian, Armen J.: See—
Pelmulder, John P.; Gorton, Lanny A.; Guleserian, Armen J.; and Livingston, John H., 4,712,583, Cl. 137-852.000.

Gulf Eastern Manufacturing Company: See—
Farthing, Denis, 4,712,967, Cl. 414-563.000.

Gulton Industries, Inc.: See—
Doshi, Vikram N., 4,713,145, Cl. 156-667.000.

Gunderman, Roland E.: See—
Czepinski, Ralph G.; and Gunderman, Roland E., 4,713,412, Cl. 524-833.000.

Gunn, John B., to International Business Machines Corporation. Apparatus for inspection of the walls of deep holes of minute diameter. 4,712,916, Cl. 356-241.000.

Gustavsson, Lennart, to Flakt A.B. Method and apparatus for producing a continuous web. 4,712,277, Cl. 19-296.000.

Guttner, Eckhard, to ANT Nachrichtentechnik GmbH. Method for increasing resolution in a compatible television system. 4,713,688, Cl. 358-141.000.

Haba, Tsuneo: See—
Yoshiki, Naokazu; Saito, Yutaka; and Haba, Tsuneo, 4,712,407, Cl. 72-68.000.

Hackman, Arthur F. Photoelectric controller device including brushes. 4,713,539, Cl. 250-231.05E.

Hadank, John M.; and Creger, Todd D., to Caterpillar Inc. Proportional valve control apparatus for fluid systems. 4,712,376, Cl. 60-427.000.

Haeffliger, William W.: See—
Pangburn, William E., 4,712,552, Cl. 128-355.000.

Hafner, Gunther: See—
Rapp, Wolfgang, deceased; Hafner, Gunther; and Letsche, Ulrich, 4,712,530, Cl. 123-502.000.

Hagemann, Hermann: See—
Salzburg, Herbert; Hajek, Manfred; Hagemann, Hermann; Kuhle, Engelbert; Fuhrer, Wolfgang; Hansler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,713,389, Cl. 514-373.000.

Hagiwara, Haruo; Tsukamoto, Hideo; and Tsubaki, Yasuhiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Dry cleaning apparatus. 4,712,392, Cl. 68-18.00C.

Hagiwara, Kenji: See—
Ikura, Katsuyuta; Hagiwara, Kenji; Nagasaki, Fumihiko; Yamada, Tomio; Takahashi, Hidemitsu; and Hatano, Renpei, 4,713,396, Cl. 514-594.000.

Haglund, Steve A.; Lohmann, Arthur M.; and Pickering-Johnson, Sharon A., to Honeywell Inc. Align at fire, safe and arm, and power supply module for a land mine. 4,712,478, Cl. 102-424.000.

Hahn, Granville J.: See—
Searl, Alonzo H.; Hahn, Granville J.; and Rutledge, Raleigh N., 4,713,271, Cl. 428-36.000.

Haimson, Jacob, to Haimson Research Corporation. Method and apparatus for accelerating a particle beam. 4,713,581, Cl. 315-5.410.

Haimson Research Corporation: See—
Haimson, Jacob, 4,713,581, Cl. 315-5.410.

Hajek, Manfred: See—
Salzburg, Herbert; Hajek, Manfred; Hagemann, Hermann; Kuhle, Engelbert; Fuhrer, Wolfgang; Hansler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,713,389, Cl. 514-373.000.

Hakamata, Yoshimi: See—
Ohno, Yasunori; Kurosawa, Tomoe; Sato, Tadashi; Kurosawa, Yukio; and Hakamata, Yoshimi, 4,713,585, Cl. 315-111.810.

Hakamatsuka, Yasuharu; and Yokoyama, Nobuyuki, to Olympus Optical Co., Ltd. Artificial tooth root. 4,713,006, Cl. 433-201.100.

Hako Minuteman, Inc.: See—
Palmer, Gary E., 4,712,270, Cl. 15-345.000.

Hale, Arthur D. Radio-tape recorder for automotive use. 4,713,801, Cl. 369-7.000.

Hale Fire Pump Company: See—
Eberhardt, H. Alfred, 4,712,516, Cl. 123-1.00A.

Haley, Charles T.: See—
Hardage, Timothy W.; Haley, Charles T.; and Walker, William D., 4,712,356, Cl. 53-446.000.

Haley, William J., to Borg-Warner Corporation. Hydraulic control system for continuously variable transmission. 4,712,453, Cl. 74-866.000.

Hall, Gary W. Joggers fluid weighted exerciser jug. 4,712,794, Cl. 272-122.000.

Hall, Joe T.: See—
De Kelaita, Nergal R.; Hall, Joe T.; and Kletscher, Barrie D., 4,713,758, Cl. 364-200.000.

Hall, Marilyn: See—
Jenkins, Robert H., Jr.; Mitchell, Edward; Gaetani, Frank J.; Mahusky, John J.; and Hall, Marilyn, 4,713,087, Cl. 44-53.000.

Hall, Richard A.; and Rosenfeld, Jeffrey I., to Standard Oil Company (Indiana). Process for obtaining narrow molecular weight distribution in vinyl aromatic mass polymerization system. 4,713,421, Cl. 525-242.000.

Hall, Ronald H.: See—
Atwood, Mark T.; and Hall, Ronald H., 4,713,177, Cl. 210-697.000.

Hallett, Allan: See—
Szelke, Michael; Jones, David M.; and Hallett, Allan, 4,713,445, Cl. 530-330.000.

Hallford, Ben R.; and Varian, Karl R., to Rockwell International Corporation. Dual signal amplitude modifying and combining apparatus. 4,713,620, Cl. 328-150.000.

Hallford, Ben R.; and McKenzie, Robert W., to Rockwell International Corporation. Microwave plug-in signal amplifying module solderment apparatus. 4,713,730, Cl. 361-419.000.

Halliburton Company: See—
Handke, Wayne A.; and Priest, Mark A., 4,712,618, Cl. 166-308.000.

Stepp, Lee W.; and Giroux, Richard L., 4,712,619, Cl. 166-327.000.

Halssig, Andreas: See—
Lindstadt, Klaus; Halssig, Andreas; Maier, Dietmar; and Scholz, Stefan, 4,712,480, Cl. 102-427.000.

Halverson, Ann M.: See—
Fong, Dodd W.; and Halverson, Ann M., 4,713,178, Cl. 210-734.000.

Hamada, Nagaharu: See—
Nakamura, Kozoo; Kozima, Yasuyuki; Hamada, Nagaharu; and Sakata, Kunihiro, 4,713,699, Cl. 358-296.000.

Hamajima, Kaneo; Dohmoto, Tadashi; Tanaka, Atsuo; and Kubo, Masahiro, to Toyota Jidosha Kabushiki Kaisha. Production of pistons having a cavity. 4,712,600, Cl. 164-97.000.

Hamano, Hideo; Sugita, Jun; and Watanabe, Takashi. Apparatus for converting interchangeable camera lens from manual into autofocus. 4,712,900, Cl. 354-400.000.

Hamel, Esther V. M.: See—
Kelly, L. Thomas; Hamel, Esther V. M.; and Bielka, Robert P., 4,713,054, Cl. 604-89.000.

Hammersley, Graham J.: See—
Greator, Cyril B.; Smith, Ian W. H.; and Hammersley, Graham J., 4,712,946, Cl. 405-170.000.

Hanak, Joseph J., to Energy Conversion Devices, Inc. Storable large area solar power module. 4,713,492, Cl. 136-245.000.

Handke, Wayne A.; and Priest, Mark A., to Halliburton Company. Multiple reservoir transportation assembly for radioactive substances, and related method. 4,712,618, Cl. 166-308.000.

Hansen, Charles A., to Ford Motor Company. Adjusting mechanism for tractor linkage. 4,712,445, Cl. 74-491.000.

Hansen, Lee E.: See—
Schoendorfer, Donald W.; and Hansen, Lee E., 4,713,176, Cl. 210-645.000.

Hansen, Walter J.: See—
Franklin, Duane R.; Evans, Archibald D.; and Hansen, Walter J., 4,712,653, Cl. 187-18.000.

Hanssler, Gerd: See—
Salzburg, Herbert; Hajek, Manfred; Hagemann, Hermann; Kuhle, Engelbert; Fuhrer, Wolfgang; Hansler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,713,389, Cl. 514-373.000.

Hansson, Curt, to Kraftelektronik AB. Electrostatic dust precipitator. 4,713,093, Cl. 55-139.000.

Hara, Hiroshi: See—
Aono, Toshiaki; and Hara, Hiroshi, 4,713,319, Cl. 430-567.000.

Hara, Osamu: See—
Kimura, Kiyoshi; and Hara, Osamu, 4,713,496, Cl. 178-18.000.

Harada, Osamu: See—
Anzai, Katsushi; Harada, Osamu; Suematsu, Toshio; and Takeda, Yuji, 4,712,522, Cl. 123-179.00L.

Haraguchi, Shosuke, to Canon Kabushiki Kaisha. Camera battery cover for a camera having a chamber for a built in battery. 4,712,898, Cl. 354-288.000.

Hardage, Timothy W.; Haley, Charles T.; and Walker, William D., to Food Machinery Sales, Inc. Tray loader. 4,712,356, Cl. 53-446.000.

Harder, Hans E.; and Kramer, Hermann, to Howmedica International, Inc. Bone nail and instruments for the treatment of fractures. 4,712,541, Cl. 128-92.0YY.

Hardglass Industry Co., Ltd.: See—
Fujiwara, Kenichi, 4,712,331, Cl. 49-488.000.

Hardie, Laurie S.; and Coleman, Leonard J. Vibratory sauna. 4,712,538, Cl. 128-24.100.

Harding, Thomas W.: See—
Kim, Yong W.; and Harding, Thomas W., 4,713,548, Cl. 250-423.00R.

Hargitay, Bartholomew: See—
Siegel, Richard C.; Marx, Christina S.; Hargitay, Bartholomew; and Witherspoon, Neil, 4,713,350, Cl. 436-533.000.

- Haring, Ulrich: See—
Kristen, Ulrich; Haring, Ulrich; Fischer, Francis; and Cron, Alain, 4,713,186, Cl. 252-30.000.
- Harrington, Richard H.; and Krapf, Charles W., to Measuretek, Inc. Calibration of weight scale utilizing a capacitive load cell. 4,712,627, Cl. 177-50.000.
- Harris, Alva F.: See—
Lavengood, Richard E.; Padwa, Allen R.; and Harris, Alva F., 4,713,415, Cl. 525-66.000.
- Harris, Charles F., Jr.; and Coleman, James C., to Ford Motor Company. Modular window assembly clip. 4,712,341, Cl. 52-208.000.
- Harris Corporation: See—
Beason, James D., 4,713,681, Cl. 357-52.000.
- Roberts, Bruce E.; Black, Jimmy C.; and Matlock, Dyer A., 4,713,260, Cl. 437-238.000.
- Roskind, James A., 4,713,786, Cl. 364-715.000.
- Harris, Donald L., to Cordis Leads, Inc. A pacer including a multiple connector assembly with removable wedge and method of use. 4,712,557, Cl. 128-419.00P.
- Harris, James E.; and Robeson, Lloyd M., to Amoco Corporation. Blends of a biphenyl containing poly(aryl ether sulfone) and a poly(aryl ether ketone). 4,713,426, Cl. 525-471.000.
- Harris, James E.; Berger, Abe; Chopdekar, Vilas M.; Matzner, Markus; and Spanswick, James, to Amoco Corporation. Amide and/or imide containing polymers and monomers for the preparation thereof. 4,713,438, Cl. 528-337.000.
- Harris, Ronald N.: See—
Crout, Charles J.; Frame, Charles W.; and Harris, Ronald N., 4,712,404, Cl. 72-8.000.
- Crout, Charles J.; Frame, Charles W.; and Harris, Ronald N., 4,712,405, Cl. 72-19.000.
- Crout, Charles J.; Frame, Charles W.; and Harris, Ronald N., 4,712,415, Cl. 72-8.000.
- Harris, Terence E.: See—
Hewison, George D.; and Harris, Terence E., 4,712,802, Cl. 277-212.00C.
- Harrison, Daniel J., to Eastman Kodak Company. Adhesives for laminating thermal print elements. 4,713,365, Cl. 503-227.000.
- Harrison, Eddie, Jr. Article carrier. 4,712,804, Cl. 280-47.13R.
- Harsanyi, Kalman: See—
Ezer, Elemer; Harsanyi, Kalman; Petho, Hajnalka V.; Matuz, Judit; Szporny, Laszlo; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kopolnas, Marta; and Kallay, Anna, 4,713,388, Cl. 514-346.000.
- Hartmann, Robert F.; Chan, Yiu-Fai; Frankovich, Robert J.; Ou, Jung-Hsing; So, Hock C.; and Wong, Sau-Ching, to Altera Corporation. Programmable macrocell using eeprom or eeprom transistors for architecture control in programmable logic circuits. 4,713,792, Cl. 364-900.000.
- Haruguchi, Kenji; Kohguchi, Takuma; and Sekiya, Osamu, to Sumitomo Heavy Industries, Ltd. Method of mounting blister on ship's hull in dry dock. 4,712,499, Cl. 114-77.00R.
- Haruna, Kazuo; and Shiozawa, Iwamitsu, to Seitetsu Kagaku Co., Ltd. Adsorption apparatus. 4,713,100, Cl. 55-387.000.
- Harwick, Milton C.; and Spector, George. Weight maximizer. 4,712,793, Cl. 272-118.000.
- Harwood, Jon W.: See—
Peele, Camille; Harwood, Jon W.; and Resuggan, Peter L., 4,712,295, Cl. 29-700.000.
- Hasan, Riaz, to Illinois Tool Works Inc. Washer with resilient head gripping means. 4,712,959, Cl. 411-533.000.
- Hasegawa, Akinori: See—
Morishita, Akira; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Hasegawa, Akinori; Arima, Takemi; and Kounou, Tadami, 4,712,451, Cl. 74-801.000.
- Hasegawa, Hiroshi; and Inoue, Mitsuhiro, to Hitachi Chemical Co., Ltd. Ceramic coated laminate and process for producing the same. 4,713,284, Cl. 428-246.000.
- Hasegawa, Kenji; Sato, Tetsuo; and Iwanami, Teruo, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Method for production of polyester structures with improved gas barrier property. 4,713,266, Cl. 427-412.500.
- Hasegawa, Yonosuke, to Pioneer Electronic Corporation. Data communication system. 4,713,840, Cl. 455-2.000.
- Hasuo, Shinya; and Fujimaki, Norio, to Fujitsu Limited. Josephson-junction logic circuit. 4,713,562, Cl. 307-462.000.
- Hatakeyama, Takuya; and Ohga, Shinji, to Uro Denshi Kogyo Kabushiki Kaisha. Connector for television distribution equipment. 4,713,024, Cl. 439-555.000.
- Hatamura, Yotaro. Multi-axis load sensor. 4,712,431, Cl. 73-862.040.
- Hatano, Renpei: See—
Ikura, Katsuyasu; Hagiwara, Kenji; Nagasaki, Fumihiko; Yamada, Tomio; Takahashi, Hidemitsu; and Hatano, Renpei, 4,713,396, Cl. 514-594.000.
- Hattori, Takashi: See—
Kobayashi, Nobuyuki; Hattori, Takashi; Yagi, Katsunori; and Ito, Toshimitsu, 4,713,766, Cl. 364-431.050.
- Haug, Theobald: See—
Renner, Alfred; Haug, Theobald; and Schreiber, Bruno, 4,713,417, Cl. 525-117.000.
- Haught, Alan F.: See—
Kesten, Arthur S.; Haught, Alan F.; and Couch, Harold T., 4,712,610, Cl. 165-104.120.
- Haussuhl, Siegfried: See—
Wolke, Theo; Krasser, Wolfgang; and Haussuhl, Siegfried, 4,713,795, Cl. 365-119.000.
- Hawks, Robert A. Rectal speculum with obturator. 4,712,536, Cl. 128-3.000.
- Hayakawa, Toshiaki: See—
Sugimoto, Tadao; and Hayakawa, Toshiaki, 4,713,318, Cl. 430-567.000.
- Hayase, Syozo: See—
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Uto, Seiryu; and Hayase, Syozo, 4,713,452, Cl. 540-358.000.
- Hayashi, Soichiro: See—
Toyoda, Eiji; and Hayashi, Soichiro, 4,713,722, Cl. 361-141.000.
- Hayatsu, Kazuo: See—
Sugimoto, Hiroaki; Hayatsu, Kazuo; and Fujiwara, Masahiro, 4,713,435, Cl. 528-179.000.
- Hayes, Michael L.; Mahr, Paul S.; and Tippi, John W., to Kinetic Systems Corporation. System and method for preventing tool breakage. 4,713,770, Cl. 364-474.000.
- Hayes, Robert A.; and Conard, Wendell R., to Firestone Tire & Rubber Company. The Vulcanizable polymeric compositions containing a zinc dimethacrylate adjuvant and method for preparing the adjuvant. 4,713,409, Cl. 524-518.000.
- Haygood, David K.: See—
Noel, Raymond; Robinson, William M.; Cherian, Gabe; Clifford, Thomas H.; Carlomagno, William D.; Deasy, William M.; Grassauer, Willie K.; Haygood, David K.; Sherlock, H. Paul; and White, Harry E., 4,712,721, Cl. 228-56.300.
- Hazan, Jean-Pierre; and Steers, Michel, to U.S. Philips Corporation. Microwave oven having control means which reduce the risk of no-load operation. 4,713,514, Cl. 219-10.55B.
- Hazelett Strip-Casting Corporation: See—
Kaiser, Timothy D.; and Ackel, Gary P., 4,712,602, Cl. 164-453.000.
- Healey, Fritz W.: See—
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- Healthdyne, Inc.: See—
Russell, Donald J.; and Sanders, Michael A., 4,713,558, Cl. 307-264.000.
- Hecking, Robert J., to Champion International Corporation. Air freshener container having resealable openings. 4,712,737, Cl. 239-58.000.
- Hedaya, Eddie: See—
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- Hegedus, Bela: See—
Ezer, Elemer; Harsanyi, Kalman; Petho, Hajnalka V.; Matuz, Judit; Szporny, Laszlo; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kopolnas, Marta; and Kallay, Anna, 4,713,388, Cl. 514-346.000.
- Hehl, Karl. Hydraulic control system for injection unit of injection molding machine. 4,712,991, Cl. 425-145.000.
- Heidelberger Druckmaschinen AG: See—
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- Rodi, Anton; and Blaser, Peter, 4,713,593, Cl. 318-572.000.
- Heinonen, Aaro. Device for cleaning up floors. 4,712,268, Cl. 15-231.000.
- Heinrich, Hansjorg; and Kraft, Josef, to Diehl GmbH & Co. Additive sealing sleeve for a propellant charge for large-calibered ammunition fired from barreled weapons. 4,712,481, Cl. 102-435.000.
- Heitzmann, Hal: See—
Hsu, Li-chien; and Heitzmann, Hal, 4,712,865, Cl. 350-96.290.
- Heiwado Boueki Kabushiki Kaisha: See—
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- Heizmann, Frieder, to Robert Bosch GmbH. Tracking mount for a contactless recording and/or reproducing head. 4,713,707, Cl. 360-106.000.
- Heller, Donald F., to Allied Corporation. Noble-metal overcoated, front-surface silver reflectors. 4,713,824, Cl. 372-99.000.
- Heller, Donald F.: See—
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- Heller, Jorge; and Penhale, Donald W. H., to Sandoz Pharmaceuticals Corp. Polyacetal hydrogels formed from divinyl ethers and polyols. 4,713,441, Cl. 528-392.000.
- Helling, Wilhelm. Apparatus for the application of a primer to a plastic profile or the like. 4,712,507, Cl. 118-208.000.
- Hemascience Laboratories, Inc.: See—
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- Hemmeter, George T. Sponge-block safety razor holder. 4,712,300, Cl. 30-41.000.
- Henaff, Bernard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Method and device for selecting one station from a set of stations dialoging with a main station. 4,713,805, Cl. 370-85.000.
- Henderson, Ross, to Powercube Corporation. Extended range regulated power supply. 4,713,554, Cl. 307-64.000.
- Heng, Jean-Paul; Jusseau, Marcel; and Humbert-Labeaumaz, Alain, to Cgee Alsthom. Junction block for optical fibers. 4,712,863, Cl. 350-96.210.
- Hennes, Jacques: See—
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- Henson, Edward: See—
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- Henton, David E., to Dow Chemical Company. The ABS compositions having trimodal rubber particle distributions. 4,713,420, Cl. 525-236.000.

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Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Schan, Edward P., Jr., 4,713,834, Cl. 379-28.000.
- Hergeth Hollingsworth GmbH: See—
Krusche, Peter, 4,712,276, Cl. 19-99.000.
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Senake, Wilhelm; Herkert, Roland; Marschall, Norbert; and Greeb, Karl-Heinrich, 4,713,311, Cl. 430-127.000.
- Herndon, William H., to Fairchild Semiconductor Corporation. Switched impedance emitter coupled logic gate. 4,713,560, Cl. 307-455.000.
- Herr, Leroy E.; Shea, Allan K.; and Kunkle, Timothy E., to White Consolidated Industries, Inc. Quarter turn valve. 4,712,768, Cl. 251-305.000.
- Herring, James M., Jr., to Budd Company. The Elastomeric member having flexible woven material bonded thereto in a railway truck primary suspension system. 4,712,488, Cl. 105-224.100.
- Herrmann, Johann, to Sachsenwerk AG. Partitioned switching panel with insertable switching carriage and adjustable shutter mechanism. 4,713,501, Cl. 200-50.0AA.
- Herron, Michael M., to Schlumberger Technology Corp. Quantitative determination by elemental logging of subsurface formation properties. 4,712,424, Cl. 73-152.000.
- Herwig, Jens; Norenberg, Hagen; Bergmann, Friedhelm; Stiller, Manfred; Schlemmermeyer, Horst; Schmidt, Wilfried; Straube, Hilmar; and Wolter, Helmut, to EC Erdolchemie GmbH. Device for emission-free sampling of volatile liquids. 4,712,434, Cl. 73-864.630.
- Herz, Arthur H.: See—
Bryan, Philip S.; and Herz, Arthur H., 4,713,322, Cl. 430-569.000.
- Herz, Claus P.: See—
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- Hesch, Rolf-Dieter: See—
Kramer, Josef; Irmscher, Klaus; Prucher, Helmut; and Hesch, Rolf-Dieter, 4,713,465, Cl. 549-403.000.
- Hesse, Hans, to Krauss-Maffei A.G. Chain tensioning device. 4,712,469, Cl. 91-422.000.
- Hewison, George D.; and Harris, Terence E., to Illinois Tool Works Inc. Sealing washers for headed fasteners. 4,712,802, Cl. 277-212.00C.
- Hewlett-Packard Company: See—
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- Worley, William S., Jr.; Bryg, William R.; and Baum, Allen, 4,713,755, Cl. 364-200.000.
- Heymes, Alain: See—
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- Hibino, Yoshitaka; and Kogure, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Method for directing an up-shift operation for a vehicle with a manual transmission. 4,712,452, Cl. 74-866.000.
- Higashi, Kenji; Ohnishi, Tadakazu; and Tsukuda, Ichizo, to Showa Aluminum Kabushiki Kaisha. Aluminum alloys having high strength and resistance to stress and corrosion. 4,713,216, Cl. 420-532.000.
- Higuchi, Seizun; Oga, Tomonari; Ikeda, Masao; and Nakano, Hirohumi, to Nippon Steel Corporation. Sn-based multilayer coated steel strip having improved corrosion resistance, weldability and lacquerability. 4,713,301, Cl. 428-628.000.
- Hill, Brian S.: See—
Tonyes, Henry J.; Keen, William T.; German, Harold W.; and Hill, Brian S., 4,713,250, Cl. 426-2.000.
- Hillenbrand, Gary F.: See—
Adair, Paul C.; Hillenbrand, Gary F.; and Davis, Paul D., 4,713,312, Cl. 430-138.000.
- Hillman, Robert S.: See—
Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostoich, Vladimir E.; and Stroy, Gary H., 4,712,460, Cl. 83-208.000.
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- Hiltman, Paul D. Flashlight for use in vehicles. 4,713,735, Cl. 362-183.000.
- Hiltz, Ralph H.; Greer, John S.; and Friel, Joseph V., to Mine Safety Appliances Company. Fire-fighting foam. 4,713,182, Cl. 252-3.000.
- Hino, Youzi, to Fujitsu Limited. Bias voltage compensated integrated circuit digital-to-analog converter. 4,713,649, Cl. 340-347.0DA.
- Hinson, Virgil H.: See—
Jarman, Davis R.; and Hinson, Virgil H., 4,712,417, Cl. 72-447.000.
- Hirai, Kenichiro: See—
Koga, Mitsuaki; Hirai, Kenichiro; Sugimae, Toshio; and Fukushima, Setsuo, 4,713,405, Cl. 523-212.000.
- Hirai, Ryoji: See—
Misumi, Akira; Hirai, Ryoji; and Watanabe, Rikizo, 4,713,576, Cl. 313-402.000.
- Hiraishi, Mamoru, to Heiwado Boueki Kabushiki Kaisha. Clasp for personal ornaments. 4,712,279, Cl. 24-241.00R.
- Hiraiwa, Toru: See—
Watanabe, Isao; Momonoi, Kaishu; Hiraiwa, Toru; Ono, Satoshi; Nakano, Joji; Nagumo, Katsuyuki; and Takagi, Hiroyasu, 4,713,387, Cl. 514-332.000.
- Hirama, Shinichi; Nishiyama, Toshio; Ohta, Youichi; Uzuka, Makoto; Tomita, Kenichi; Nakajima, Keisuke; and Furuse, Kazumaro, to Eisai Co., Ltd. Composition for reducing natural hair fall-out. 4,713,397, Cl. 514-690.000.
- Hirata, Chiaki: See—
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- Hirata, Hidetoshi, to Kabushiki Kaisha Toshiba. Cooking apparatus with timer. 4,713,528, Cl. 219-492.000.
- Hirata, Kaoru: See—
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- Hirose Electric Co., Ltd.: See—
Soma, Keiji, 4,713,025, Cl. 439-752.000.
- Hirose, Masayuki: See—
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- Hirschel, Ernst H., to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung. Tail end structure for an aircraft fuselage. 4,712,751, Cl. 244-119.000.
- Hiruta, Yoichi, to Kabushiki Kaisha Toshiba. Manufacturing MOS semiconductor device with planarized conductive layer. 4,713,356, Cl. 437-41.000.
- Hitachi Chemical Co., Ltd.: See—
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- Hitachi Engineering Co., Ltd.: See—
Ishimaru, Hitoshi; and Kobayashi, Toshiki, 4,713,209, Cl. 376-211.000.
- Hitachi, Ltd.: See—
Fujisawa, Masayasu, 4,712,535, Cl. 125-13.00R.
- Igarashi, Osamu, 4,713,762, Cl. 364-424.000.
- Ishimaru, Hitoshi; and Kobayashi, Toshiki, 4,713,209, Cl. 376-211.000.
- Ishizawa, Isamu; and Tamaki, Sigeo, 4,712,531, Cl. 123-556.000.
- Kokaku, Yuuichi; Kito, Makoto; and Honda, Yoshinori, 4,713,288, Cl. 428-336.000.
- Kosaka, Michitaka; Kawano, Katsumi; and Miyamoto, Shoji, 4,713,768, Cl. 364-460.000.
- Kuwahara, Kazuyoshi; Fukushima, Isao; Miura, Kuniaki; and Kano, Kenji, 4,713,700, Cl. 358-315.000.
- Misumi, Akira; Hirai, Ryoji; and Watanabe, Rikizo, 4,713,576, Cl. 313-402.000.
- Nakamura, Hiro; Ohkawa, Shuji; Ohtsuka, Yasuo; Tachikawa, Hajime; and Shinozaki, Toshiya, 4,712,970, Cl. 414-730.000.
- Nakamura, Kozoo; Kozima, Yasuyuki; Hamada, Nagaharu; and Sakata, Kunihiro, 4,713,699, Cl. 358-296.000.
- Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,713,796, Cl. 365-189.000.
- Ohno, Yasunori; Kurosawa, Tomoe; Sato, Tadashi; Kurosawa, Yukio; and Hakamata, Yoshimi, 4,713,585, Cl. 315-111.810.
- Oikawa, Shoji; Yamagishi, Hiroshi; Saito, Shigeru; Fujita, Taoyoshi; and Watanabe, Takayoshi, 4,713,494, Cl. 174-68.500.
- Sunano, Naomasa; Asahi, Naotatsu; and Yoshida, Toshio, 4,713,646, Cl. 338-34.000.
- Takahashi, Tadashi; Miyashita, Kunio; and Kawamata, Syoichi, 4,713,613, Cl. 324-208.000.
- Takayama, Shigehiko; Suzuki, Hitomi; Maruyama, Masanori; Fukushima, Masakazu; and Kurashige, Mitsuhiro, 4,713,588, Cl. 315-382.000.
- Terasawa, Yoshio; and Oikawa, Saburo, 4,713,679, Cl. 357-38.000.
- Umeda, Takao; Ooishi, Kazuya; Igawa, Tatsuo; and Hori, Yasuro, 4,712,876, Cl. 350-350.00S.
- Yamamoto, Akio; and Shinkawa, Keiro, 4,713,556, Cl. 307-219.100.
- Hitachi Metals, Ltd.: See—
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- Hittich, Reinhard: See—
Eidenschink, Rudolf; Krause, Joachim; Hittich, Reinhard; Poetsch, Eike; Scheuble, Bernhard; Weber, Georg; and Pohl, Ludwig, 4,713,197, Cl. 252-299.610.
- Ho, Tan T., to Lever Brothers Company. Stable, free-flowing particulate adjuncts for use in detergent compositions. 4,713,193, Cl. 252-91.000.
- Hochstein, Peter; and Imai, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Torque sensor for automotive power steering systems. 4,712,433, Cl. 73-862.360.
- Hochstein, Peter A.; and Imai, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Torque sensor. 4,712,432, Cl. 73-862.360.
- Hochstein, Peter A. Headlamp cleaning system. 4,713,583, Cl. 315-82.000.
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Schoening, Josef; and Elter, Claus, 4,713,213, Cl. 376-299.000.
- Wachholz, Winfried; and Weicht, Ulrich, 4,713,211, Cl. 376-238.000.
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- Hoechst Aktiengesellschaft: See—
Aretz, Werner; Berscheid, Hans G.; Huber, Gerhard; Fehlhaber, Hans-Wolfram; Kraemer, Hans P.; Sedlacek, Hans-Harald; Ganguli, Bimal N.; Sood, Ratan S.; Gandhi, Julia; and Reddy, Gauknapalli C., 4,713,371, Cl. 514-34.000.
- Furrer, Harald; Anagnostopoulos, Hristo; and Gebert, Ulrich, 4,713,455, Cl. 544-267.000.
- Schimmel, Gunther; and Gradl, Reinhard, 4,713,229, Cl. 423-321.00R.

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Bersch, Bernhard; Juttner, Heinz; and Tenhaven, Ulrich, 4,713,519, Cl. 219-121.0LC.
- Hoff, Don G.: See—
Gaskill, Garold B.; Park, Daniel J.; Rullman, Robert G.; Rose, Donald T.; Stiley, Joseph F., III; Barnum, Lewis W.; and Hoff, Don G., 4,713,808, Cl. 370-94.000.
- Hoffman, Werner: See—
Beigang, Wolfgang; and Hoffman, Werner, 4,713,040, Cl. 464-132.000.
- Hofmann, Franz; Trapp, Hans G.; Rietzsch, Rolf; Otto, Jürgen; Kaettlitz, Wolfgang; and Trinki, Gerd, to Georg Fischer Aktiengesellschaft. Ceramic filter and method for using same, 4,713,180, Cl. 210-773.000.
- Hofmann, Rainer, to Daimler-Benz Aktiengesellschaft. Regulating apparatus which influences a mixture-forming installation of an internal-combustion engine of a motor vehicle, 4,713,763, Cl. 364-424.100.
- Hogendobler, Richard S.: See—
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- Hok, Bertil, to Radisensor AB. Device for recording physiological pressures, 4,712,566, Cl. 128-748.000.
- Hokanson, Gerard C.: See—
Schaumburg, John P.; Hokanson, Gerard C.; French, James C.; Tunac, Josefino B.; and Underhill, Marjorie A., 4,713,372, Cl. 514-45.000.
- Hokkai Can Co., Ltd.: See—
Nakata, Akira; Matsumoto, Shiroh; Tozima, Hitoshi; and Minato, Masahiko, 4,712,706, Cl. 220-276.000.
- Holland, John M.: See—
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- Holliday, Richard J.: See—
Lair, John E.; Luckenbill, Lawrence F.; and Holliday, Richard J., 4,712,575, Cl. 137-218.000.
- Holliday, William: See—
Solstad, Russell V.; Scott, Millard; and Holliday, William, 4,713,611, Cl. 324-158.00F.
- Holmwood, Graham: See—
Elbe, Hans-Ludwig; and Holmwood, Graham, 4,713,456, Cl. 544-335.000.
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McCann, Gerald P.; Holoubek, Andrew J.; and Verley, Donald, 4,712,591, Cl. 141-88.000.
- Holthusen, Bernd, to Scangraphic Dr. Boger GmbH. Photosetting apparatus, 4,712,896, Cl. 354-5.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—
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- Hibino, Yoshihiko; and Kogure, Hiroshi, 4,712,452, Cl. 74-866.000.
- Kawaguchi, Takeshi; and Kawano, Akio, 4,712,638, Cl. 180-219.000.
- Midorikawa, Masashi; and Inoh, Isamu, 4,712,891, Cl. 350-604.000.
- Mogi, Tomonori; and Kashio, Yoshiaki, 4,712,637, Cl. 180-219.000.
- Sugama, Takayuki; Tabata, Hiroshi; and Honda, Tadanori, 4,712,759, Cl. 248-429.000.
- Suzuki, Takahisa; Kuwahara, Shinichi; and Kawashima, Yoshinori, 4,712,633, Cl. 180-149.000.
- Honda, Masahiro; and Maeda, Hironari, to Ube Industries, Ltd. Apparatus for stacking shaped materials on a pallet, 4,712,961, Cl. 414-42.000.
- Honda, Tadanori: See—
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- Honda, Yoshinori: See—
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- Honeywell Inc.: See—
Bergstrom, James W.; and Podgorski, Theodore J., 4,712,917, Cl. 356-350.000.
- Boebert, William E.; and Kain, Richard Y., 4,713,753, Cl. 364-200.000.
- Davidson, Dale D.; and Endrud, Douglas G., 4,713,757, Cl. 364-200.000.
- Erie, David G.; Roberts, Jon A.; and Lee, Eddie C., 4,713,682, Cl. 357-54.000.
- Haglund, Steve A.; Lohmann, Arthur M.; and Pickering-Johnson, Sharon A., 4,712,478, Cl. 102-424.000.
- Lee, James C., 4,712,857, Cl. 350-96.140.
- Vu, Tho T.; and Lee, Kang W., 4,713,559, Cl. 307-446.000.
- Honjo, Takeshi: See—
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- Honkanen, George P., to Acufex Microsurgical, Inc. Surgical instrument, 4,712,545, Cl. 128-305.000.
- Hood, Donald W.; Johnson, John A.; and Smartt, Herschel B., to EG&G, Inc. Concurrent ultrasonic weld evaluation system, 4,712,722, Cl. 228-104.000.
- Hood, Larry L.: See—
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- Hoover, Gary W.; Empson, Geuane; and Ashley, Bruce W. Noisemaking fishing lure, 4,712,326, Cl. 43-42.310.
- Hoover, M. Fred; and Ouilbault, Lawrence J., to Morton Thiokol, Inc. Polymeric amine conditioning additives for hair care products, 4,713,236, Cl. 424-70.000.
- Hoover, Thomas C.: See—
Regnier, Kent E.; Hoover, Thomas C.; and Walse, Alan S., 4,713,013, Cl. 439-62.000.
- Hooykaas, Carel W., to Pelt & Hooykaas B.V. Method of processing an iron-containing dust obtained in the preparation of iron or steel, 4,713,223, Cl. 423-140.000.
- Hopfensperger, Reinhold; and Taschner, Klaus, to Standard Elektrik Lorenz AG. Tangential blower, 4,712,976, Cl. 415-54.000.
- Hopkins, Daniel N.: See—
Ehlers, D. M.; and Hopkins, Daniel N., 4,712,616, Cl. 166-266.000.
- Horan, William J.; and Schweid, Jeffrey M., to General Foods Corporation. Emulsification system for creamy cheese food products, 4,713,255, Cl. 426-589.000.
- Horbelt, Michael: See—
Arnold, Herbert; Horbelt, Michael; and Jundt, Werner, 4,713,812, Cl. 371-10.000.
- Hori, Kozo: See—
Takeuchi, Yoshio; Koizumi, Toru; and Hori, Kozo, 4,713,469, Cl. 560-17.000.
- Hori, Yasuro: See—
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- Horie, Shinji, to Mitsubishi Petrochemical Company Limited. Colored resin composition, 4,713,310, Cl. 430-109.000.
- Horie, Shoichi: See—
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- Horiata, Katsushi; and Kawamori, Yoshizo, to Mita Industrial Co., Ltd. Laser beam printer, 4,713,672, Cl. 346-108.000.
- Horino, Seiya: See—
Uno, Kunihiko; Tamade, Yoshinori; Horino, Seiya; and Kodera, Tamotsu, 4,712,741, Cl. 241-16.000.
- Horiyama, Osamu: See—
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- Horn, Spencer C.; and Horn, Virginia. Apparatus for improved aeration of liquids, 4,713,172, Cl. 210-150.000.
- Horn, Virginia: See—
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- Hornbostel, Lloyd; and Butrymowicz, Dale, to Parker Pen Ltd. Process for preparing a part for color anodization, 4,713,150, Cl. 204-38.300.
- Horst, William E.: See—
Smit, Francis J.; Horst, William E.; and Bhasin, Anirudh K., 4,713,086, Cl. 44-51.000.
- Horvath, Barbara L.: See—
Horvath, Ronald F.; and Horvath, Barbara L., 4,712,709, Cl. 220-334.000.
- Horvath, Ronald F.; and Horvath, Barbara L. Fuel-intake device for vehicle tank, 4,712,709, Cl. 220-334.000.
- Hosch, Michael A.: See—
Dorner, Wolfgang C.; Hosch, Michael A.; and Wedell, Mark C., 4,712,355, Cl. 53-443.000.
- Hosel, Fritz; Marx, Hans-Jürgen; and Temburg, Josef, to Trutzschler GmbH & Co. KG. Method for driving a bale opener, 4,712,275, Cl. 19-80.00R.
- Hoshino, Kazuya; and Matsuura, Hiroyuki, to Yokogawa Electric Corporation; and Yokogawa Medical Systems, Limited. Method of correcting the phase and shading in a nuclear magnetic resonance tomographic device, 4,713,614, Cl. 324-307.000.
- Hoshino, Ryoichi: See—
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- Hoshino, Shigeo. Method and apparatus for electroplating objects, 4,713,149, Cl. 204-23.000.
- Hosomizu, Hiroshi; Tsuji, Kenji; and Kamiya, Makoto, to Minolta Camera Kabushiki Kaisha. Device for indicating an object distance for flash photography, 4,712,902, Cl. 354-416.000.
- Hovda, Keith D.: See—
Campbell, Kent D.; Dietsche, Laura J.; Crampton, Lee B.; Hovda, Keith D.; Tyson, George K.; and Wilson, Charles A., 4,713,231, Cl. 423-356.000.
- Hovel, William G., III. Dental floss packet and method for its manufacture, 4,712,572, Cl. 132-89.000.
- Howard, John; and Stirling, Marie, to Canadian Patents and Development Ltd. Sacrificial agents for enhanced oil recovery, 4,713,185, Cl. 252-8.554.
- Howard, P. Guy, to Spectra-Physics, Inc. Rapidly starting low power scan mechanism, 4,712,853, Cl. 350-6.500.
- Howard, Thomas R. Satellite retrieval apparatus, 4,712,753, Cl. 244-161.000.
- Howland, Leland L.; and Seshadri, Jayaram, to Thermo King Corporation. Compartmentalized transport refrigeration system, 4,712,383, Cl. 62-200.000.
- Howmedica International, Inc.: See—
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- Hsu, Chung: See—
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- Huber, Gerhard: See—
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- Hudgens, Stephen J.: See—
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- Huff, John: See—
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- Hughes Aircraft Company: See—
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- Lee, George M., 4,712,294, Cl. 29-600.000.
- Manoly, Arthur E., 4,712,293, Cl. 29-600.000.
- Takamine, Henry, 4,713,612, Cl. 324-158.00D.
- Zwirn, Robert, 4,713,694, Cl. 358-171.000.
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- Hull, Alan; and Yates, Michael J. Lift-tab container opener, 4,712,454, Cl. 81-3.270.
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- Hummel, Peter: See—
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- Hunt Leuchars and Hepburn Limited: See—
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- Hunter, Brook L.; Rizzie, Joseph W.; and Ward, Marvin L., to Technology for Energy Corporation. Electrical connector, 4,712,847, Cl. 439-155.000.
- Hunter, Clifford R.: See—
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- Huppertsberg, Frank, to Gebr. Wahlefeld GmbH & Co. KG. Suspension harness, 4,712,513, Cl. 119-96.000.
- Hurkmans, Antonius: See—
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- Hurt, Fred S.: See—
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- Hurten, Oskar; and Vogt, Hans, to Ford Motor Company. Side member support, 4,712,829, Cl. 296-203.000.
- Hntson, John, to Ampex Corporation. Programmable divider up/down counter with anti-aliasing feature and asynchronous read/write, 4,713,832, Cl. 377-45.000.
- Huttner, James; and Levine, Marc M., to Medical College of Ohio. Mechanical assist device for inserting catheters, 4,713,057, Cl. 604-164.000.
- Huynh, Anh N.; and Ziogas, Phoivos D., to National Distillers and Chemical Corporation. Ozonator power supply, 4,713,220, Cl. 422-186.160.
- HV Hofmann and Volkel: See—
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- Hy-Con Products, Inc.: See—
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- Hyodo, Akihiko: See—
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- IDN Inventions and Development of Novelities AG: See—
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- Igarashi, Yoshiaki: See—
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- Ihnat, Dale E.: See—
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- Iida, Sachihiko, to Kawasaki Steel Corporation. Method of cooling steel strip in continuous heat treating line, 4,713,125, Cl. 148-128.000.
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- Ikeda, Masao: See—
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- Illinois Tool Works Inc.: See—
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- Cogswell, Frederic N.; and Measuria, Umakant, 4,713,283, Cl. 428-240.000.
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- Ingersoll Cutting Tool Company: See—
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 Joh. Winklhofer & Sohne: See—
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 Johansson, Hans; and Goras, Anders, to Saab-Scania AB. Arrangement in a magnetic position indicator. 4,712,420, Cl. 73-118.100.
 Johncock, Annette; and Hudgens, Stephen J., to Energy Conversion Devices, Inc. Enhancement layer for positively charged electrophotographic devices and method for decreasing charge fatigue through the use of said layer. 4,713,309, Cl. 430-65.000.
 Johns Hopkins University: See—
 Wagner, Henry N., Jr., 4,712,561, Cl. 128-654.000.
 Johnson, Arthur C. W. Low-intensity infrared heating system with effluent recirculation. 4,712,734, Cl. 237-70.000.
 Johnson, Calvin K.: See—
 Armbruster, David R.; and Johnson, Calvin K., 4,713,294, Cl. 428-404.000.
 Johnson, D. Dale, to Ex-Cell-O Corporation. Actuator locking mechanism. 4,712,471, Cl. 92-24.000.
 Johnson, Don L.: See—
 Castelli, Joseph Q.; and Johnson, Don L., 4,712,843, Cl. 312-242.000.
 Johnson, Fred L., to Thomas, R. L.; and Rouse, W. J., a part interest. Power output mechanism for an internal combustion engine. 4,712,518, Cl. 123-48.00B.
 Johnson, John A.: See—
 Hood, Donald W.; Johnson, John A.; and Smartt, Herschel B., 4,712,722, Cl. 228-104.000.
 Johnson & Johnson Products, Inc.: See—
 Schiraldi, Michael T.; Perl, Martin M.; and Rubin, Howard, 4,713,243, Cl. 424-151.000.
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 Price, Macy J.; Johnson, Mack E.; and Acker, Norman J., 4,712,842, Cl. 312-196.000.
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 Johnson, Roy E. Split elastomer ring for repairing potheads and process of repairing a pothead therewith. 4,712,800, Cl. 277-1.000.
 Johnson, William B., to Ingersoll Cutting Tool Company. On-edge end-milling insert. 4,712,949, Cl. 407-42.000.
 Johnston, Norman W., to Libbey-Owens-Ford Co. Method of assembling a vehicle from modular components. 4,712,287, Cl. 29-469.000.
 Johnston, William H., to CSL Group Inc., The. Articulated boom mechanism for unloading bulk solid material from a ship. 4,712,962, Cl. 414-144.000.
 Jones, Darrell L.: See—
 Lim, Jack S.; and Jones, Darrell L., 4,712,620, Cl. 166-355.000.
 Jones, David M.: See—
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 Jones, Howell A.: See—
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Jones, Robert E., Jr.; Lee, Rodney E.; and Yeh, Tsu-Hsing, to International Business Machines. Thin film magnetic transducer having center tapped winding. 4,713,711, Cl. 360-123.000.
 Joseph Vogele AG: See—
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 Josephs, Mark A., to North American Philips Consumer Electronics Corp. Getter assembly with diffusion directing structure. 4,713,578, Cl. 313-481.000.
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 Jung, Rolf, to Laeis-Werke AG. Process of manufacturing a one-piece molding from a dry ceramic mass. 4,713,204, Cl. 264-120.000.
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 Kunz, Rino E.; Junghaus, Jürgen R.; Knus, Jean A.; Murbach, Urs; and Tuor, Marcel F., 4,713,537, Cl. 250-227.000.
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 Wakasa, Satoshi; and Okazaki, Toru, 4,712,985, Cl. 417-486.000.
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 Kimura, Motohiko, 4,712,969, Cl. 414-730.000.
 Kobata, Hiroshi; and Kojima, Tadashi, 4,713,802, Cl. 369-59.000.
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 Tsuguru, Kazunori; and Sugimoto, Yasuhiro, 4,713,600, Cl. 323-351.000.
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 Hofmann, Franz; Trapp, Hans G.; Rietzsch, Rolf; Otto, Jürgen; Kaettlitz, Wolfgang; and Trinki, Gerd, 4,713,180, Cl. 210-773.000.
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 Kaihara, Toshikazu: See—
 Ohta, Norio; Yanagishima, Fumiya; Kaihara, Toshikazu; Kishida, Akira; Sato, Kuniaki; and Ochiai, Masanobu, 4,713,154, Cl. 204-145.00R.
 Kain, Richard Y.: See—
 Boebert, William E.; and Kain, Richard Y., 4,713,753, Cl. 364-200.000.
 Kaiser, Timothy D.; and Ackel, Gary P., to Hazelett Strip-Casting Corporation. Pool-level sensing probe and automatic level control for twin-belt continuous metal casting machines. 4,712,602, Cl. 164-453.000.
 Kajihara, Isamu, to Morinaga & Co., Ltd. Apparatus for separating granular solids from carrying gas. 4,713,096, Cl. 55-204.000.
 Kakuzen, Hideo: See—
 Yoshida, Masaaki; Endo, Shigeki; Kisanuki, Shigeru; and Kakuzen, Hideo, 4,713,107, Cl. 65-157.000.
 Kalewicz, Zdzislaw: See—
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 Kallay, Anna: See—
 Ezer, Elemer; Harsanyi, Kalman; Petho, Hajnalka V.; Matuz, Judit; Szponry, Laszlo; Cholnok, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kopolnas, Marta; and Kallay, Anna, 4,713,388, Cl. 514-346.000.
 Kaller, Sigurd. Sealing gasket assembly. 4,712,801, Cl. 277-71.000.

- Kalnes, Tom N.: See—
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- Kamata, Mitsuo; and Yamashita, Yutaka, to Nissan Shatai Company, Limited. Anti-vibration structure of a steering arrangement. 4,712,446, Cl. 74-492.000.
- Kaminaga, Hiromitsu, to Yoshida Kogyo, K. K. Apparatus for connecting curtain wall units. 4,712,345, Cl. 52-235.000.
- Kamio, Masaru: See—
Sekimura, Nobuyuki; Kamio, Masaru; Takao, Hideaki; Motoi, Taiko; and Murata, Tatsuo, 4,712,874, Cl. 350-339.00F.
- Kamitani, Hiroshi: See—
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- Kamiya, Makoto: See—
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- Kamiyama, Kiichi; and Kato, Yasuo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Ocular position measuring apparatus. 4,712,895, Cl. 351-243.000.
- Kamo, Jun: See—
Takemura, Tohru; Itoh, Hajime; Kamo, Jun; and Yoshida, Haruhiko, 4,713,292, Cl. 428-373.000.
- Kamo, Takashi: See—
Ikai, Tadayoshi; and Kamo, Takashi, 4,712,419, Cl. 73-116.000.
- Kamo, Yuichi; and Mikami, Nobuo, to NEC Corporation. Polarized electromagnetic relay. 4,713,638, Cl. 335-79.000.
- Kamoun, Ahmed: See—
Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve; and Kamoun, Ahmed, 4,713,256, Cl. 426-631.000.
- Kamp, Eugene L., to A. B. Chance Company. Three phase vacuum switch operating mechanism with anti-bounce device for interrupter contacts. 4,713,503, Cl. 200-144.00B.
- Kanai, Tadashi: See—
Sakai, Hideaki; and Kanai, Tadashi, 4,713,454, Cl. 544-258.000.
- Kanbara, Yukio: See—
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- Kanbe, Junichiro; and Yoshinaga, Kazuo, to Canon Kabushiki Kaisha. Liquid crystal device. 4,712,872, Cl. 350-333.000.
- Kanbe, Junichiro; and Okada, Shinjiro, to Canon Kabushiki Kaisha. Liquid crystal optical device. 4,712,873, Cl. 350-337.000.
- Kanbe, Junichiro: See—
Okada, Shinjiro; Kanbe, Junichiro; Tsuboyama, Akira; and Inaba, Yutaka, 4,712,877, Cl. 350-350.00S.
- Tsuboyama, Akira; Katagiri, Kazuharu; and Kanbe, Junichiro, 4,712,875, Cl. 350-344.000.
- Kanda, Minoru: See—
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- Kane, Peter E., to Polaroid Corporation. Part positioning apparatus and method. 4,712,974, Cl. 414-757.000.
- Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—
Nakashima, Toshimitsu; Okada, Wataru; and Mitani, Toragoro, 4,713,443, Cl. 528-499.000.
- Kano, Kenji: See—
Kuwahara, Kazuyoshi; Fukushima, Isao; Miura, Kuniaki; and Kano, Kenji, 4,713,700, Cl. 358-315.000.
- Kanou, Kazuo; Shinoda, Takamitsu; and Kanbara, Yukio, to Daini-chiseika Color & Chemicals Mfg. Co., Ltd. Pigment composition and preparation process thereof. 4,713,411, Cl. 524-560.000.
- Kansai Netsukagaku Kabushiki Kaisha: See—
Yokoe, Jintaro; Takeuchi, Masami; and Tsuji, Toshiaki, 4,713,090, Cl. 55-68.000.
- Kanzaki Paper Mfg. Co., Ltd.: See—
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- Omatsu, Masayuki; Yonese, Naoki; and Kondo, Mitsuru, 4,713,488, Cl. 564-397.000.
- Kao Corporation: See—
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- Kapolnas, Marta: See—
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- Karlis, Robert G.; Dole, Charles M.; Webster, Gary L.; and Andersen, George J., to Cadbury Schweppes, PLC. Gas cylinder coupling and weighting mechanism for a carbonated drink dispenser. 4,712,713, Cl. 222-3.000.
- Karnitscher, Tamas: See—
David, Dezso; Rovo, Peter; Sipos nec Richter, Terez; Molnar, Gyorgy; Deme, Istvan; and Karnitscher, Tamas, 4,713,078, Cl. 8-94.150.
- Kasahara, Toshiharu; Ogami, Takayuki; and Kitayoshi, Hitoshi, to Takeda Riken Kogyo Kabushiki Kaisha. Burst signal generator. 4,713,788, Cl. 364-718.000.
- Kasbooke, George C., to Quintech Corporation. Multiple color lamp. 4,713,736, Cl. 362-214.000.
- Kaschig, Jurgen; and Finter, Jurgen, to Ciba-Geigy Corporation. Radiation-sensitive polymers which form a metal complex, process for the polymerization of acetylene, and coated material. 4,713,422, Cl. 525-326.700.
- Kasemo, Bengt: See—
Branemark, Per-Ingvarg; Kasemo, Bengt; and Lausmaa, Jukka, 4,712,681, Cl. 206-438.000.
- Kashio, Yoshiaki: See—
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- Kashiwagi, Shigeru, to Victor Company of Japan, Ltd. Apparatus for linearity correction on horizontal deflection. 4,713,589, Cl. 315-400.000.
- Kasprzak, David P., to Celotex Corporation. The Vinyl siding. 4,712,351, Cl. 52-573.000.
- Kastner, Ralph E.: See—
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- Katagiri, Kazuharu: See—
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- Katagiri, Takashi: See—
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- Katamine, Akihiko: See—
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- Katchko, John; Kirz, Karel; and Plaisance, Thomas H., to DeSoto, Inc. Silicone release coating emulsions which stratify when baked. 4,713,410, Cl. 524-500.000.
- Kato, Hiroshi: See—
Sakamoto, Teruo; Kawai, Sadao; Noda, Kinzaburo; Takeda, Toyohiko; and Kato, Hiroshi, 4,713,247, Cl. 424-461.000.
- Kato, Masatake; Tsuji, Sadahiko; and Asano, Toshiaki, to Canon Kabushiki Kaisha. Rear focus zoom lens. 4,712,883, Cl. 350-427.000.
- Kato, Yasuo: See—
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- Kato, Yutaka, to Matsushita Electric Works, Ltd. Jack for telephone set. 4,713,016, Cl. 439-137.000.
- Katoh, Hiroyuki, to Sharp Kabushiki Kaisha. Continuous substantially planar microwave oven door assembly. 4,713,511, Cl. 219-10.55D.
- Katoh, Mitsutaka: See—
Mikami, Kazuo; Yamashita, Tsukasa; and Katoh, Mitsutaka, 4,712,854, Cl. 350-96.120.
- Katsuno, Toshiyasu: See—
Nagai, Toshinari; Masui, Takatoshi; Satou, Yasushi; and Katsuno, Toshiyasu, 4,712,373, Cl. 60-274.000.
- Katsuragawa, Mitsuhiro: See—
Suzuki, Nobuyuki; Shimizu, Masao; and Katsuragawa, Mitsuhiro, 4,713,571, Cl. 310-316.000.
- Katz, Hart V.; and Kien, Gerald A., to International Acoustics Incorporated. Method and apparatus for evaluating of artificial heart valves. 4,712,565, Cl. 128-715.000.
- Kaufman, Lance R. Isolation transformer. 4,713,723, Cl. 361-179.000.
- Kauss, Wolfgang; and Mucheyer, Norbert, to Mannesmann Rexroth GmbH. Safety device for priority hydraulic consumer. 4,712,375, Cl. 60-405.000.
- Kavesh, Sheldon: See—
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- Kawaguchi, Takeshi; and Kawano, Akio, to Honda Giken Kogyo Kabushiki Kaisha. Suspension system for motorcycles. 4,712,638, Cl. 180-219.000.
- Kawai, Sadao: See—
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- Kawakami, Yoshio: See—
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- Kawamata, Syoichi: See—
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- Kawamori, Yoshizo: See—
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- Kawamura, Hideaki; Sakurada, Nobuaki; Sato, Yuichi; and Watanabe, Yoshitaka, to Canon Kabushiki Kaisha. Picture producing apparatus using multiple dot forming units and recording materials of different concentrations. 4,713,701, Cl. 358-298.000.
- Kawamura, Hideaki: See—
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- Kawamura, Naoto; and Abe, Shunichi, to Canon Kabushiki Kaisha. Image processing apparatus for discriminating and processing different formats of color image signals. 4,713,684, Cl. 358-78.000.
- Kawanishi, Toshiyuki: See—
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,713,113, Cl. 106-22.000.
- Kawano, Akio: See—
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- Kawano, Katsumi: See—
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- Kawasaki Jukogyo Kabushiki Kaisha: See—
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- Ogawa, Takayuki; Ito, Hideaki; Kimura, Naokazu; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitao; Watanabe, Takashi; Shinano, Kunizo; Kuwabara, Takashi; and Aoki, Kaoru, 4,712,742, Cl. 241-20.000.

- Kawasaki Steel Corporation: See—
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- Inokuti, Yukio; Ito, Yoh; and Funahashi, Toshihiko, 4,713,123, Cl. 148-113.000.
- Ohta, Norio; Yanagishima, Fumiya; Kaihara, Toshikazu; Kishida, Akira; Sato, Kuniaki; and Ochiai, Masanobu, 4,713,154, Cl. 204-145.00R.
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- Kay, Leslie. Method of and apparatus for providing object data by machine vision. 4,713,798, Cl. 367-96.000.
- Kaye, Gordon E.: See—
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- Kayukawa, Hiroaki: See—
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- Kazarian, Robert V.: See—
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- Kearney-National, Inc.: See—
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- Kechn, William T.: See—
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- Keenlyside, Michael: See—
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- Keleher, Daniel B.: See—
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- Kelly, L. Thomas; Hamel, Esther V. M.; and Bielka, Robert P. Implanted muscle powered drug dispensing system. 4,713,054, Cl. 604-89.000.
- Kemmerer, Klemens; and Hummel, Peter, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Inking roller for printing machines. 4,712,475, Cl. 101-348.000.
- Kendall Company, The: See—
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- Kenney Manufacturing Company: See—
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- Kent, Eric G., to Polysar Limited. Methods of adhering a self-fusing tape to a substrate. 4,713,133, Cl. 156-162.000.
- Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung: See—
Weirich, Walter; Barnert, Heiko; Oertel, Michael; and Schulten, Rudolf, 4,713,234, Cl. 423-648.00R.
- Woike, Theo; Krasser, Wolfgang; and Haussuhl, Siegfried, 4,713,795, Cl. 365-119.000.
- Kerth, Juergen; and Vogt, Heinz, to BASF Aktiengesellschaft. Preparation of ethene polymers by means of a Ziegler catalyst system. 4,713,430, Cl. 526-159.000.
- Kervagoret, Gilbert, to Bendix France. Assisted steering system for a motor vehicle. 4,712,631, Cl. 180-143.000.
- Kervagoret, Gilbert, to Bendix France. Assisted steering system for a motor vehicle. 4,712,632, Cl. 180-143.000.
- Kerwin, Daniel. Machine and method for applying miniaturized indicia to articles. 4,713,128, Cl. 156-64.000.
- Kessler, Milton. One-piece cap and brush and method of forming it. 4,712,936, Cl. 401-129.000.
- Kesoku, Hirobumi, to Kabushiki Kaisha Toshiba. Image forming apparatus in which multiple developing units are supported and moved relative to an image carrier. 4,713,673, Cl. 355-4.000.
- Kesten, Arthur S.; Haught, Alan F.; and Couch, Harold T., to United Technologies Corporation. Chemical heat pipe employing self-driven chemical pump based on a molar increase. 4,712,610, Cl. 165-104.120.
- Kester, Eugene A.; Reeves, Scott P.; and Zemanek, Danny, to Photoflex Products. Shock corded tripod stand. 4,712,756, Cl. 248-165.000.
- Keve Corporation: See—
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- Keyes, Melvin H., to Owens-Illinois Glass Container Inc. Protein modification to provide enzyme activity. 4,713,335, Cl. 435-183.000.
- Khambay, Bhupinder P. S.: See—
Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., 4,713,392, Cl. 514-464.000.
- Khromov, Gennady L.: See—
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,713,239, Cl. 424-81.000.
- Khudenko, Boris M.; and Zbar, Jack, to Insta, Inc. Method of concentrating multicomponent liquid products. 4,713,102, Cl. 62-535.000.
- Khurtsilava, Semen G.: See—
Iofis, Naum A.; Vetsel, Rudolf N.; Bukatov, Alexandr S.; and Khurtsilava, Semen G., 4,713,071, Cl. 623-2.000.
- Kicherer, Robert; Schreder, Felix; and Dörner, Leonhard, to EGO Elektro Geräte Blanc u. Fischer. Radiant heating unit. 4,713,527, Cl. 219-464.000.
- Kidani, Morio. Ball end mill cutter. 4,712,948, Cl. 407-42.000.
- Kidd, Geoffrey; Maher, Daniel V.; and Cywinski, Jozef, to Bio Medical Research Ltd. Electrical stimulation of muscle. 4,712,558, Cl. 128-421.000.
- Kiddle Products, Inc.: See—
Thom, Paul, 4,713,035, Cl. 446-141.000.
- Kien, Gerald A.: See—
Katz, Hart V.; and Kien, Gerald A., 4,712,565, Cl. 128-715.000.
- Kikendall, Garth D.: See—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,712,958, Cl. 411-506.000.
- Kikuchi, Yoshikazu; and Nakao, Reiro, to Corona Engineering Co., Ltd. Electrostatic precipitator. 4,713,092, Cl. 55-130.000.
- Killop, James T., to Anderson-Cook, Inc. Coarse pitch spline rolling. 4,712,408, Cl. 72-88.000.
- Killop, James T., to Anderson-Cook, Inc. Threading and projection forming on different size diameters. 4,712,409, Cl. 72-88.000.
- Killop, James T., to Anderson-Cook, Inc. Method and apparatus for cold sizing a round workpiece having multiple diameters. 4,712,410, Cl. 72-108.000.
- Kim, Heung-Tai, to B. F. Goodrich Company, The. Extruder with screw having core portion of polygonal cross-section. 4,712,992, Cl. 425-207.000.
- Kim, Jung J. Pressure applying apparatus. 4,712,539, Cl. 128-57.000.
- Kim, Yong W.; and Harding, Thomas W., to Lehigh University. Electron attachment apparatus and method. 4,713,548, Cl. 250-423.00R.
- Kimball, David B.; and Kip, Ruloff F., Jr., to American Telephone and Telegraph Company, AT&T Information Systems; and AT&T Bell Laboratories. Bounce-nullifying switch unit. 4,713,564, Cl. 307-542.100.
- Kimberly-Clark Corporation: See—
Abel, Kent W.; and Attoe, Gary N., 4,713,132, Cl. 156-73.100.
- Wang, Kenneth Y.; and Yeo, Richard S., 4,713,068, Cl. 604-366.000.
- Wang, Kenneth Y.; and Yeo, Richard S., 4,713,069, Cl. 604-378.000.
- Kimoto, Kiyoharu: See—
Sugahara, Kooichi; Shinno, Yoshio; and Kimoto, Kiyoharu, 4,712,519, Cl. 123-52.00M.
- Kimpel, Rolf D., to Siemens Aktiengesellschaft. Electromechanical component with sealed housing. 4,713,727, Cl. 361-334.000.
- Kimura, Kiyoshi; and Hara, Osamu, to Alps Electric Co., Ltd. Coordinate input device. 4,713,496, Cl. 178-18.000.
- Kimura, Mituo: See—
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- Kimura, Motohiko, to Kabushiki Kaisha Toshiba. Expandable and contractable arms. 4,712,969, Cl. 414-730.000.
- Kimura, Naokazu: See—
Ogawa, Takayuki; Ito, Hideaki; Kimura, Naokazu; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitao; Watanabe, Takashi; Shinano, Kunizo; Kuwabara, Takashi; and Aoki, Kaoru, 4,712,742, Cl. 241-20.000.
- Kimura, Shinichi, to Sharp Kabushiki Kaisha. Electric heating appliance detachably mounted in a motor vehicle. 4,713,522, Cl. 219-202.000.
- Kinetic Systems Corporation: See—
Hayes, Michael L.; Mahr, Paul S.; and Tippie, John W., 4,713,770, Cl. 364-474.000.
- King, Donald J.: See—
Lederman, Frederick E.; and King, Donald J., 4,712,661, Cl. 192-45.000.
- King, James L., to General Electric Company. Method of assembling a stationary assembly for a dynamoelectric machine. 4,712,292, Cl. 29-596.000.
- Kingston, Arthur G.; and DeLong, Carl R. Adjustable template for positioning tile of various sizes. 4,712,309, Cl. 33-527.000.
- Kinoshita, Mitsuo, to Fanuc Ltd. Cut contour display method in wire electric discharge machine. 4,713,517, Cl. 219-69.00W.
- Kinugawa, Masumi: See—
Abe, Tomoaki; Fujisawa, Hideya; Omori, Norio; Kinugawa, Masumi; Ito, Katsunori; Akiyama, Susumu; Mizuno, Tiaki; and Yamada, Toshitaka, 4,713,765, Cl. 364-431.050.
- Kioritz Corporation: See—
Matsubayashi, Tatsuhiko, 4,712,523, Cl. 123-188.00M.
- Kip, Ruloff F., Jr.: See—
Kimball, David B.; and Kip, Ruloff F., Jr., 4,713,564, Cl. 307-542.100.
- Kipperman, Stuart R.: See—
Bruno, Robert; Kipperman, Stuart R.; Mayer, Geoffrey R.; and Thomas, Michael, 4,713,064, Cl. 604-257.000.
- Kircher, Klaus: See—
Kress, Hans-Jürgen; and Kircher, Klaus, 4,713,462, Cl. 548-473.000.
- Kirchhan, James J. Containerized shock mount. 4,712,685, Cl. 206-591.000.
- Kirchhoff, Bernd; and Mecklenfeld, Hermann, to O&K Orenstein & Koppel Aktiengesellschaft. Apparatus for charging at least one top-loading crusher. 4,712,744, Cl. 241-80.000.
- Kirkland, Robert N., to U.S. Philips Corporation. Method and apparatus for deriving frame internal signals. 4,713,692, Cl. 358-150.000.
- Kirkpatrick, Edward S.: See—
Cooper, John F.; Kirkpatrick, Edward S.; and Linsker, Ralph, 4,713,773, Cl. 364-491.000.
- Kirz, Karel: See—
Katchko, John; Kirz, Karel; and Plaisance, Thomas H., 4,713,410, Cl. 524-500.000.

- Kisanuki, Shigeru: See—
Yoshida, Masaaki; Endo, Shigeki; Kisanuki, Shigeru; and Kakuzen, Hideo, 4,713,107, Cl. 65-157.000.
- Kiah, Karl E. Rafter angle measuring device. 4,712,307, Cl. 33-421.000.
- Kishida, Akira: See—
Ohta, Norio; Yanagishima, Fumiya; Kaihara, Toshikazu; Kishida, Akira; Sato, Kuniaki; and Ochiai, Masanobu, 4,713,154, Cl. 204-145.00R.
- Kishita, Eiji: See—
Sasaki, Makoto; Yoshida, Jun; Shimizu, Yoshishige; Akazawa, Kiyoshi; Kishita, Eiji; and Hirata, Kaoru, 4,713,291, Cl. 428-373.000.
- Kitagawa Industries Co., Ltd.: See—
Fujimoto, Nobuaki, 4,712,939, Cl. 403-24.000.
- Kitahara, Akira: See—
Akiyama, Shigeru; Ueno, Hidetoshi; Imagawa, Koji; Kitahara, Akira; Nagata, Sumio; Morimoto, Kazuo; Nishikawa, Tooru; and Itoh, Masao, 4,713,277, Cl. 428-131.000.
- Kitamoto, Tatsuji: See—
Masaki, Kouichi; and Kitamoto, Tatsuji, 4,713,261, Cl. 427-129.000.
- Kitaoaka, Takashi, to Kabushiki Kaisha Ishida Koki Seisakusho. Label printer with variable format. 4,712,929, Cl. 400-76.000.
- Kitaura, Eiji: See—
Yoda, Kunichi; Kitaura, Eiji; Tsunoda, Tutomu; and Kawakami, Yoshio, 4,713,278, Cl. 428-141.000.
- Kitayoshi, Hitoshi: See—
Kasahara, Toshiharu; Ogami, Takayuki; and Kitayoshi, Hitoshi, 4,713,788, Cl. 364-718.000.
- Kitazawa, Jitsuo: See—
Kokubo, Ichiro; Mizuta, Atsuo; Yamamoto, Yoshitaka; and Kitazawa, Jitsuo, 4,712,414, Cl. 72-366.000.
- Kitoh, Makoto: See—
Kokaku, Yuuichi; Kitoh, Makoto; and Honda, Yoshinori, 4,713,288, Cl. 428-336.000.
- Kjohl, Olav; Obrestad, Torstein; and Groland, Hans, to Norsk Hydro, a.s. NPK complex fertilizer. 4,713,108, Cl. 71-32.000.
- Kjornaes, Kim; and Linnemann, Jorgen, to A/S Alfred Benzon. Diffusion coated multiple-units dosage form. 4,713,248, Cl. 424-468.000.
- Klages, Claus-Peter: See—
Tolksdorf, Wolfgang F. M.; Bartels, Inse E. H.; Dammann, Hans O. B.; Klages, Claus-Peter; and Pross, Elke B., 4,712,855, Cl. 350-96.120.
- Klatt, Alfred, to WABCO Westinghouse Fahrzeugbremsen GmbH. Transmission control apparatus and method for vehicle traveling uphill or downhill. 4,713,764, Cl. 364-424.100.
- Klein, Douglas J.: See—
Klein, Paul E.; and Klein, Douglas J., 4,713,001, Cl. 433-18.000.
- Klein, Herbert H., to Unarco Industries, Inc. Knockdown storage rack with wedge connectors. 4,712,696, Cl. 211-192.000.
- Klein, Max, to Crane, Frederick G., Jr.; and Klein, Max, Trustee. High temperature filter material. 4,713,285, Cl. 428-283.000.
- Klein, Max, Trustee: See—
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- Klein, Paul E.; and Klein, Douglas J. Orthodontic bracket-mounted traction hook. 4,713,001, Cl. 433-18.000.
- Kleinewefers Textilmaschinen GmbH: See—
Meisen, Klaus; and Towes, Peter, 4,712,472, Cl. 100-37.000.
- Kletscher, Barrie D.: See—
De Kalita, Nergal R.; Hall, Joe T.; and Kletscher, Barrie D., 4,713,758, Cl. 364-200.000.
- Klimov, Sergei B.: See—
Negrutsky, Sergei B.; Klimov, Sergei B.; Negrutsky, Boris F.; and Churkin, Vladimir G., 4,712,772, Cl. 254-264.000.
- Klink, Winfred. Electrical contact making arrangement for monitoring the condition of a screw in an installed position. 4,713,506, Cl. 200-158.000.
- Klinkel, Wolfgang, to ILAPAK Research & Development S.A. Tubular bag closing machine. 4,713,047, Cl. 493-34.000.
- Klockner-Humboldt-Deutz AG: See—
Weber, Thomas, 4,712,371, Cl. 60-39.142.
- Kloker, Kevin L.; and Cieslak, Ronald H., to Motorola, Inc. Exclusive OR/NOR gate having cross-coupled transistors. 4,713,790, Cl. 364-784.000.
- Klovstad, John W.; Lee, Chin-Hui; and Ganesan, Kalyan, to Exxon Research and Engineering Company. Speech recognition method having noise immunity. 4,713,777, Cl. 364-513.500.
- Knapp, Alan G.; Overall, Colin D.; and Slater, Richard A. M., to U.S. Philips Corporation. Method of making a color selection deflection structure, and a color picture display tube including a color selection deflection structure made by the method. 4,713,575, Cl. 313-400.000.
- Knapp, Suzanne C.: See—
Agarwal, Arun K.; Knapp, Suzanne C.; and Lakness, David R., 4,713,754, Cl. 364-200.000.
- Knauf, Suzanne, to University of Rochester, The. Monoclonal antibody directed to an antigen derived from human ovarian tumors and a radioimmunoassay using the antibody. 4,713,351, Cl. 436-542.000.
- Knight, Eugene U., III: See—
Stocker, Elizabeth M.; and Knight, Eugene U., III, 4,713,008, Cl. 434-167.000.
- Knowles, Carl H., to Metrologic Instruments, Inc. Compact omnidirectional laser scanner. 4,713,532, Cl. 235-467.000.
- Knus, Jean A.: See—
Kunz, Rino E.; Junghaus, Jurgen R.; Knus, Jean A.; Murbach, Urs; and Tuor, Marcel F., 4,713,537, Cl. 250-227.000.
- Koatsu Gas Kogyo Co., Ltd.: See—
Koga, Mitsuyuki; Hirai, Kenichiro; Sugimae, Toshio; and Fukushige, Setsuo, 4,713,405, Cl. 523-212.000.
- Kobata, Hiroshi; and Kojima, Tadashi, to Kabushiki Kaisha Toshiba. Digital signal reproducing circuit. 4,713,802, Cl. 369-59.000.
- Kobayashi, Nobuyuki; Hattori, Takashi; Yagi, Katsunori; and Ito, Toshimitsu, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,713,766, Cl. 364-431.050.
- Kobayashi, Toshiki: See—
Ishimaru, Hitoshi; and Kobayashi, Toshiki, 4,713,209, Cl. 376-211.000.
- Kobler, Robert J., to AMP Incorporated. Sealed electrical connector and method of using same. 4,713,021, Cl. 439-272.000.
- Koch, Alan A., to Alumax, Inc. Billet heating process. 4,712,413, Cl. 72-361.000.
- Kocsis, Deborah L., to Dow Chemical Company. The. Method for controlling the flow of liquids through a subterranean formation. 4,712,617, Cl. 166-270.000.
- Kodama, Hisashi; and Okabe, Yoshio, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Auto-tensioner for belt systems and a method for adjusting tension degree. 4,713,045, Cl. 474-135.000.
- Kodera, Tamotsu: See—
Uno, Kunihiko; Tamade, Yoshinori; Horino, Seiya; and Kodera, Tamotsu, 4,712,741, Cl. 241-16.000.
- Koga, Mitsuyuki; Hirai, Kenichiro; Sugimae, Toshio; and Fukushige, Setsuo, to Koatsu Gas Kogyo Co., Ltd. α -cyanoacrylate adhesive composition of matter. 4,713,405, Cl. 523-212.000.
- Kogure, Hiroshi: See—
Hibino, Yoshitaka; and Kogure, Hiroshi, 4,712,452, Cl. 74-866.000.
- Kohguchi, Takuma: See—
Haruguchi, Kenji; Kohguchi, Takuma; and Sekiya, Osamu, 4,712,499, Cl. 114-77.00R.
- Kohne, Bernd: See—
Praefcke, Klaus; Kohne, Bernd; Poetsch, Eike; and Herz, Claus P., 4,713,196, Cl. 252-299.010.
- Koizumi, Toru: See—
Takeuchi, Yoshio; Koizumi, Toru; and Hori, Kozo, 4,713,469, Cl. 560-17.000.
- Kojima, Tadashi: See—
Kobata, Hiroshi; and Kojima, Tadashi, 4,713,802, Cl. 369-59.000.
- Kojima, Takao; and Ishiguro, Hiroyuki, to NGK Spark Plug Co., Ltd. Pump cell element for air-fuel ratio sensor. 4,713,166, Cl. 204-425.000.
- Kokaku, Yuuichi; Kitoh, Makoto; and Honda, Yoshinori, to Hitachi, Ltd. Magnetic recording medium. 4,713,288, Cl. 428-336.000.
- Kokubo, Ichiro; Mizuta, Atsuo; Yamamoto, Yoshitaka; and Kitazawa, Jitsuo, to Kabushiki Kaisha Kobe Seiko Sho. Rolling method of plate-like stock material by edger, and continuous hot rolling mill. 4,712,414, Cl. 72-366.000.
- Koller, David R.: See—
Udell, Theodore H.; and Koller, David R., 4,713,207, Cl. 264-515.000.
- Komaki, Toshiro, to Tachikawa Corporation. Shutter. 4,712,599, Cl. 160-133.000.
- Komatsu, Michiyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Sintered ceramic body. 4,713,302, Cl. 428-698.000.
- Komatsu, Mikio: See—
Makimoto, Toshio; Nishimura, Sadahiko; Matsuo, Masayuki; Abiko, Toshio; Ishizaki, Hirohumi; Kanda, Minoru; Nunoya, Hidetsugu; and Komatsu, Mikio, 4,713,670, Cl. 343-700.0MS.
- Komis, Glenna. External male urinary catheter with garment. 4,713,066, Cl. 604-353.000.
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Nomura, Etuzo; Sakakibara, Yasuo; Kozawa, Tetsuo; Nishida, Yukio; and Kondo, Ikuzo, 4,712,497, Cl. 112-315.000.
- Kondo, Kenshi, to Nihon Den-etsu Keiki Co. Ltd. Apparatus for soldering printed circuit boards. 4,712,963, Cl. 414-222.000.
- Koodo, Mitsuru: See—
Omatsu, Masayuki; Yonese, Nanki; and Kondo, Mitsuru, 4,713,488, Cl. 564-397.000.
- Kongslie, Keith F.: See—
Van Nice, H. Lee; Bostwick, Myron A., Jr.; and Kongslie, Keith F., 4,713,520, Cl. 219-121.0LC.
- Konig, Dieter: See—
Stamm, Wolfgang; and Konig, Dieter, 4,712,289, Cl. 29-568.000.
- Konishiroku Photo Industry Co., Ltd.: See—
Asano, Masao; Isobe, Ryosuke; Yamauchi, Yasuhisa; and Yamagishi, Hiroaki, 4,713,293, Cl. 428-403.000.
- Nakamura, Shinichi; and Ohbayashi, Keiji, 4,713,317, Cl. 430-551.000.
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- Koot, Hubertus H. M., to Mandhy Products B.V. Cuyk. Urine-receiving system. 4,713,065, Cl. 604-329.000.
- Koppel, Caralee P.: See—
Antonelli, Douglas C.; Branscomb, Patricia M.; Brookman, Eric C.; Dickson, LeRoy D.; Koppel, Caralee P.; Ossowski, Richard; and Stokes, Olen L., Jr., 4,713,785, Cl. 364-569.000.
- Kopperschmidt-Muller GmbH & Co. KG: See—
Luttermoller, Jurgen, 4,713,257, Cl. 427-27.000.
- Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., to Du Pont de Nemours, E. I., and Company. Chip resistant primer composition V". 4,713,425, Cl. 525-438.000.

- Kornena, Elena P.: See—
Arutjunian, Norair S.; Kornena, Elena P.; Kazarian, Robert V.; Ponomareva, Natalya A.; Redko, Grigory V.; Sakhno, Lidia T.; and Zhidkova, Irina S., 4,713,155, Cl. 204-155.000.
- Kosaka, Michitaka; Kawano, Katsumi; and Miyamoto, Shoji, to Hitachi, Ltd. Method of localizing a moving body. 4,713,768, Cl. 364-460.000.
- Kosakowski, Alex S.; and Lundqvist, Mats A., to Geotronics AB. Arrangement for holding an instrument in alignment with a moving reflector. 4,712,915, Cl. 356-152.000.
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Fujishima, Shizu; Yaku, Fumiko; and Koshijima, Tetsuo, 4,713,334, Cl. 435-99.000.
- Kostecki, John A.: See—
Earhart, Jonathan P.; Kostecki, John A.; and McNutt, Adrian C., 4,713,119, Cl. 134-3.000.
- Koukal, Heinz: See—
Arold, Klaus; Grimm, Hermann, deceased; and Koukal, Heinz, 4,712,608, Cl. 165-41.000.
- Kounou, Tadami: See—
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- Kovalchek, John G., to Fore-Sight Golf, Inc. Golf putter with sighting device. 4,712,797, Cl. 273-163.00R.
- Kowah, Inc.: See—
Eastep, Calvin W., 4,713,525, Cl. 219-308.000.
- Kozakae, Kunitoshi: See—
Takamiya, Kikuzo; Ishibashi, Hideyuki; and Kozakae, Kunitoshi, 4,712,450, Cl. 74-750.00B.
- Kozawa, Tetsuo: See—
Nomura, Etuzo; Sakakibara, Yasuo; Kozawa, Tetsuo; Nishida, Yukio; and Kondo, Ikuzo, 4,712,497, Cl. 112-315.000.
- Kozima, Yasuyuki: See—
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- Kraemer, Hans P.: See—
Aretz, Werner; Berscheid, Hans G.; Huber, Gerhard; Fehlhaber, Hans-Wolfram; Kraemer, Hans P.; Sedlacek, Hans-Harald; Ganguli, Bimal N.; Sood, Ratan S.; Gandhi, Julia; and Reddy, Gauknappalli C., 4,713,371, Cl. 514-34.000.
- Kraft, Josef: See—
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- Kraftelektronik AB: See—
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- Krall, Robert E., to CRX Medical, Inc. Radiopaque cyanoacrylates. 4,713,235, Cl. 424-5.000.
- Kramer, Hermann: See—
Harder, Hans E.; and Kramer, Hermann, 4,712,541, Cl. 128-92.0YY.
- Kramer, Josef; Irmscher, Klaus; Prucher, Helmut; and Hesch, Rolf-Dieter, to Merck Patent Gesellschaft mit beschränkter Haftung. Flavanone intermediates for halogenohydroxyflavones. 4,713,465, Cl. 349-403.000.
- Kramer, Wolfgang; Weissmuller, Joachim; Reiser, Wolf; Berg, Dieter; Brandes, Wilhelm; and Reinecke, Paul, to Bayer Aktiengesellschaft. Fungicidal agents. 4,713,379, Cl. 514-212.000.
- Krapf, Charles W.: See—
Harrington, Richard H.; and Krapf, Charles W., 4,712,627, Cl. 177-50.000.
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Arutjunian, Norair S.; Kornena, Elena P.; Kazarian, Robert V.; Ponomareva, Natalya A.; Redko, Grigory V.; Sakhno, Lidia T.; and Zhidkova, Irina S., 4,713,155, Cl. 204-155.000.
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- Kraus, Ronald G.: See—
Bremer, James C.; Hurt, Fred S.; Romanski, John G.; Kroupa, Richard F.; and Kraus, Ronald G., 4,713,533, Cl. 250-203.00R.
- Krause, Joachim: See—
Eidenschink, Rudolf; Krause, Joachim; Hittich, Reinhard; Poetsch, Eike; Scheuble, Bernhard; Weber, Georg; and Pohl, Ludwig, 4,713,197, Cl. 252-299.610.
- Krause, John T.; Kurkjian, Charles R.; and Paek, Un-Chul, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method for glass fiber splicing by flame fusion. 4,713,105, Cl. 65-4.100.
- Krauss-Maffei A.G.: See—
Hesse, Hans, 4,712,469, Cl. 91-422.000.
- Kremp, Jurgen: See—
Muller, Dietmar; and Kremp, Jurgen, 4,713,127, Cl. 149-98.000.
- Kress, Hans-Jurgen; and Kircher, Klaus, to Bayer Aktiengesellschaft. Flameproofing agents, their preparation and their use for providing polycarbonates with a flame-resistant finish. 4,713,462, Cl. 548-473.000.
- Kress, Willy. Drilling and percussion hammer. 4,712,625, Cl. 173-104.000.
- Krieteimer, Rickie F.; and Ross, Laurence W., to Confidence Corporation. Apparatus for analyzing malodors in the breath. 4,713,164, Cl. 204-400.000.
- Krinski, Thomas L.; and Steinmetz, Alan L., to Ralston Purina Company. Protein modified with a silanation reagent as an adhesive binder and process of producing. 4,713,116, Cl. 106-154.100.
- Kristen, Ulrich; Haring, Ulrich; Fischer, Francis; and Cron, Alain, to Lonza Ltd.; and Ciba-Geigy A.G. Lubricant additive in powder to paste form. 4,713,186, Cl. 252-30.000.
- Kroll, Menahem. Defensive system for use against hostile elements. 4,713,725, Cl. 361-232.000.
- Krounbi, Mohamad T.; and Voegeli, Otto, to International Business Machines. Magnetoresistive read transducer. 4,713,708, Cl. 360-113.000.
- Kroupa, Richard F.: See—
Bremer, James C.; Hurt, Fred S.; Romanski, John G.; Kroupa, Richard F.; and Kraus, Ronald G., 4,713,533, Cl. 250-203.00R.
- Krumme, John F., to Beta Phase, Inc. Intravenous tube and controller therefor. 4,713,063, Cl. 604-250.000.
- Krusche, Peter, to Hergeth Hollingsworth GmbH. Carding roller for processing staple fibers. 4,712,276, Cl. 19-99.000.
- Kubicki, Philip; and Richardson, Geoffrey. Bridge and tuning mechanism for stringed instruments. 4,712,463, Cl. 84-304.000.
- Kubo, Masahiro: See—
Hamajima, Kaneo; Dohmoto, Tadashi; Tanaka, Atsuo; and Kubo, Masahiro, 4,712,600, Cl. 164-97.000.
- Kubodera, Seiti; Ukai, Toshinao; and Okada, Hisashi, to Fuji Photo Film Co., Ltd. Heat-developable photographic materials. 4,713,316, Cl. 430-351.000.
- Kubota Ltd.: See—
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- Kuck, Mark A.: See—
Michel, Christian G.; Schachter, Rozalie; Kuck, Mark A.; Baumann, John A.; and Raccach, Paul M., 4,713,192, Cl. 252-62.30R.
- Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., to American Can Company. Apparatus for injection molding and injection blow molding multi-layer articles. 4,712,990, Cl. 425-130.000.
- Kugelman, Michael M., to B. F. Goodrich Company, The. Fast acting overcurrent protector and method. 4,713,719, Cl. 361-54.000.
- Kuhl, Henry Y. Apparatus for movably washing, rinsing and drying a stationary article. 4,712,573, Cl. 134-95.000.
- Kuhle, Engelbert: See—
Salzburg, Herbert; Hajek, Manfred; Hagemann, Hermann; Kuhle, Engelbert; Fuhrer, Wolfgang; Hansler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,713,389, Cl. 514-373.000.
- Kuhlman, Michael J.: See—
Layman, Frederick P.; and Kuhlman, Michael J., 4,713,551, Cl. 250-561.000.
- Kuhn, Michael A.: See—
Mackiewicz, Ralph E.; and Kuhn, Michael A., 4,713,756, Cl. 364-200.000.
- Kunikawa, Norihide: See—
Anzai, Shunju; Sasaki, Hiromu; Kunikawa, Norihide; and Ohgita, Kazuyuki, 4,713,550, Cl. 250-560.000.
- Kunkle, Timothy E.: See—
Herr, Leroy E.; Shea, Allan K.; and Kunkle, Timothy E., 4,712,768, Cl. 251-305.000.
- Kunz, Rino E.; Junghaus, Jurgen R.; Knus, Jean A.; Murbach, Urs; and Tuor, Marcel F., to Gretag Aktiengesellschaft. Method and apparatus for the fine position adjustment of a laser beam. 4,713,537, Cl. 250-227.000.
- Kuraray Co., Ltd.: See—
Aoyama, Akimasa; Moritani, Takeshi; Yonezu, Kiyoshi; Negi, Taiichi; and Okaya, Takuji, 4,713,296, Cl. 428-412.000.
- Kurashige, Mitsuhiro: See—
Takayama, Shigehiko; Suzuki, Hitomi; Maruyama, Masanori; Fukushima, Masakazu; and Kurashige, Mitsuhiro, 4,713,588, Cl. 315-382.000.
- Kurihara, Yoichi: See—
Aikou, Kenichi; Kurihara, Yoichi; and Goto, Tsugio, 4,712,477, Cl. 102-206.000.
- Kurkjian, Charles R.: See—
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- Kurland, Kenneth Z. Method for the repair of connective tissue. 4,713,075, Cl. 623-13.000.
- Kuroda, Toshihisa: See—
Nishimura, Shigeru; and Kuroda, Toshihisa, 4,713,685, Cl. 358-103.000.
- Kuroiwa, Akihiko: See—
Namba, Kenryo; Asami, Shigeru; Aoi, Toshiki; Takahashi, Kazuo; and Kuroiwa, Akihiko, 4,713,314, Cl. 430-270.000.
- Kurosaki, Tomihiro: See—
Sekine, Fumimaro; Kurosaki, Tomihiro; Ukena, Toshinao; and Kamitani, Hiroshi, 4,713,487, Cl. 562-587.000.
- Kurosawa, Ryuichi, to Toyota Jidosha Kabushiki Kaisha. Vehicle active suspension system incorporating acceleration detecting means. 4,712,807, Cl. 280-707.000.
- Kurosawa, Tomoe: See—
Ohno, Yasunori; Kurosawa, Tomoe; Sato, Tadashi; Kurosawa, Yukio; and Hakamata, Yoshimi, 4,713,585, Cl. 315-111.810.
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- Kusumgar, Rajal M., to Celanese Corporation. Polyoxymethylene molding compositions exhibiting improved toughness. 4,713,414, Cl. 525-64.000.

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Kutscha, Herbert A.: See—
Graciotti, Alessandro; and Kutscha, Herbert A., 4,713,779, Cl. 364-521.000.

Kuwabara, Takashi: See—
Ogawa, Takayuki; Ito, Hideaki; Kimura, Naokazu; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitao; Watanabe, Takashi; Shinano, Kunio; Kuwabara, Takashi; and Aoki, Kaoru, 4,712,742, Cl. 241-20.000.

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Kuwahara, Shinichi: See—
Suzuki, Takahisa; Kuwahara, Shinichi; and Kawashima, Yoshinori, 4,712,633, Cl. 180-149.000.

Kuznicki, Steven M.: See—
Maroulis, Peter J.; Coe, Charles G.; Kuznicki, Steven M.; Clark, Patrick J.; and Roberts, David A., 4,713,362, Cl. 502-85.000.

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Kwon, Young D.; Kavesh, Sheldon; and Prevorsek, Dusan C., to Allied Corporation. High strength and modulus polyvinyl alcohol fibers and method of their preparation, 4,713,290, Cl. 428-364.000.

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Chun, Kil Whan; and Kyllmann, Clemens A., 4,713,079, Cl. 8-101.000.

L. Schuler GmbH: See—
Roos, Gerhard; Daxling, Hartmut; and Michael, Wolfgang, 4,712,412, Cl. 72-345.000.

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Courtois, Jean-Claude, 4,712,656, Cl. 188-218.0XL.

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Siffert, Marcel; Briant, Gervais; Feuten, Pierre; Goacolou, Honore; Petitgrand, Jean-Claude; and Peyret, Francois, 4,712,423, Cl. 73-146.000.

LaDue, Philip G.; and Peglow, James D., to Standard Register Company. The Blank document guard in a check writing machine, 4,712,935, Cl. 400-645.100.

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Jung, Rolf, 4,713,204, Cl. 264-120.000.

Lafon, Louis, to Societe Anonyme Dite: Laboratoire L. LaFon. Acetohydroxamic acid derivative, 4,713,395, Cl. 514-575.000.

Lai, Shui T.: See—
Gualtieri, Devlin M.; and Lai, Shui T., 4,713,577, Cl. 313-468.000.

Lair, John E.; Luckenbill, Lawrence F.; and Holliday, Richard J., to a W. Cash Valve Manufacturing Corporation. Self-draining hose connection vacuum breaker and backflow preventer, 4,712,575, Cl. 137-218.000.

L'Air Liquide: See—
Madsac, Michel, 4,713,215, Cl. 419-8.000.

Lakness, David R.: See—
Agarwal, Arun K.; Knapp, Suzanne C.; and Lakness, David R., 4,713,754, Cl. 364-200.000.

Lalikos, James M.; and Waite, Harold K., to Titeflex Corporation. Self-damping convoluted conduit, 4,712,642, Cl. 181-207.000.

Lambert, Herbert L., to Waldorf Corporation. Double breakpart carton with sealable ends and blank for forming the same, 4,712,688, Cl. 206-602.000.

Lambert, Jean-Pierre: See—
Charbrol, Jean-Jacques; and Lambert, Jean-Pierre, 4,712,830, Cl. 297-42.000.

Lambert, Maurice, to Service National: Gaz de France. System for applied current cathodic protection of a structure, 4,713,158, Cl. 204-196.000.

Lancaster, Patrick R.; and Lancaster, William G., to Lantech, Inc. Dual rotating stretch wrapping apparatus and process, 4,712,354, Cl. 53-399.000.

Lancaster, Patrick R.; and Lancaster, William G., to Lantech, Inc. Power assisted roller-stretch apparatus and process, 4,712,686, Cl. 206-597.000.

Lancaster, William G.: See—
Lancaster, Patrick R.; and Lancaster, William G., 4,712,354, Cl. 53-399.000.

Lancaster, Patrick R.; and Lancaster, William G., 4,712,686, Cl. 206-597.000.

Landgraf, Gunter: See—
Wild, Wolfgang; Straub, Joachim; and Landgraf, Gunter, 4,713,512, Cl. 219-10.55E.

Langerbeins, Klaus; Schroder, Gunther; and Boehm, Hans-Peter, to Rohm GmbH Chemische Fabrik. Process for the production of oxalic acid diesters, 4,713,483, Cl. 560-204.000.

Langner, Carl, to SMS Concast Inc. Oscillator for a continuous casting mold, 4,712,447, Cl. 74-571.00R.

Langon, Bernard: See—
Chaffy, Joseph; Langon, Bernard; and Leroy, Michel, 4,713,161, Cl. 204-243.00M.

Lansen, Jacqueline: See—
Bayol, Alain; Blanc, Francis; Lansen, Jacqueline; Maffrand, Jean-Pierre; and Pereillo, Jean-Marie, 4,713,373, Cl. 514-54.000.

Lantech, Inc.: See—
Lancaster, Patrick R.; and Lancaster, William G., 4,712,354, Cl. 53-399.000.

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Lantero, Oreste J., Jr.: See—
Chiang, John P.; and Lantero, Oreste J., Jr., 4,713,333, Cl. 435-96.000.

Lanxide Technology Company, LP: See—
Newkirk, Marc S.; and Dizio, Steven F., 4,713,360, Cl. 501-87.000.

Lanzer, Heribert, to Steyr-Daimler-Puch AG. Drive mechanism for motor vehicles having two drive axles, 4,712,448, Cl. 74-665.0GC.

Laroche, Pierre, to Glaverbel. Method of modifying the wettability of glass beads, glass beads polymeric material incorporating such glass beads, and method of applying reflective markings to a surface, 4,713,295, Cl. 428-406.000.

Larson, Donald A., to North States Industries, Inc. Multiple panel play area, 4,712,773, Cl. 256-25.000.

Lasker, Martin L.; and Cohen, Joel S., to Prescolite Inc. Electrical lighting fixture with multiple rotation mechanism, 4,713,737, Cl. 362-285.000.

Lassmann, Manfred, to W. Schlafhorst & Co. Method and device for forming a thread joint, 4,712,367, Cl. 57-263.000.

Latham, Phillip A. Freeboard measuring device, 4,712,305, Cl. 33-126.500.

Latreille, Maurice G.: See—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,712,990, Cl. 425-130.000.

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Janos, Antal; and Jeno, Pobjics, 4,712,822, Cl. 296-24.00R.

Lauffer, Donald K.; Milby, Gregory H.; Rostek, Paul M.; and Sanwo, Ikuo J., to NCR Corporation. Terminator for a cmos transceiver device, 4,713,827, Cl. 375-7.000.

Lausmaa, Jukka: See—
Branemark, Per-Ingvar; Kasemo, Bengt; and Lausmaa, Jukka, 4,712,681, Cl. 206-438.000.

Lauterbach, Horst: See—
Mulhaupt, Rolf; Renner, Alfred; and Lauterbach, Horst, 4,713,428, Cl. 525-523.000.

Lavengood, Richard E.; Padwa, Allen R.; and Harris, Alva F., to Monsanto Company. Rubber modified nylon composition, 4,713,415, Cl. 525-66.000.

Laviron, Andre, to Commissariat a l'Energie Atomique. System for testing the failure or satisfactory operation of a circuit having logic components, 4,713,606, Cl. 324-73.00R.

Law, Kock-Yee; and Wescott, James M., to Xerox Corporation. Organic azo photoconductor imaging members, 4,713,307, Cl. 430-57.000.

Layman, Frederick P.; and Kuhlman, Michael J., to Varian Associates, Inc. System for measuring the position of a wafer in a cassette, 4,713,551, Cl. 250-561.000.

Leanza, William J.; and Wildonger, Kenneth J., to Merck & Co., Inc. Crystalline dimethyliminothienamycin, 4,713,451, Cl. 540-350.000.

Lear Siegler, Inc.: See—
Pareja, Ramon, 4,712,584, Cl. 138-30.000.

Lebedev, Vladimir K.; Chernenko, Ivan A.; Dyshlenko, Alexandr T.; Litvin, Leonid V.; and Tishura, Vladimir I. Method of friction welding, 4,712,724, Cl. 228-112.000.

LeClear, Douglas D., to Whirlpool Corporation. Dehumidifier having low profile receptacle, 4,712,382, Cl. 62-150.000.

Lederman, Frederick E.; and King, Donald J., to General Motors Corporation. Overrunning clutch cage, 4,712,661, Cl. 192-45.000.

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Klovstad, John W.; Lee, Chin-Hui; and Ganesan, Kalyan, 4,713,777, Cl. 364-513.500.

Lee, Chun-Sheu, to Amada Engineering & Service Co., Inc. Optical bistable device, 4,713,818, Cl. 372-8.000.

Lee, Chun-Sheu, to Amada Engineering & Service Co., Inc. Laser device, 4,713,822, Cl. 372-69.000.

Lee, Eddie C.: See—
Erie, David G.; Roberts, Jon A.; and Lee, Eddie C., 4,713,682, Cl. 357-54.000.

Lee, George M., to Hughes Aircraft Company. Method of forming a helical wave guide assembly by precision coining, 4,712,294, Cl. 29-600.000.

Lee, Gil S.: See—
Iyer, Venkatraman; and Lee, Gil S., 4,713,605, Cl. 324-73.00R.

Lee, Hans. Method and apparatus for performing suction lipectomy, 4,713,053, Cl. 604-49.000.

Lee, James C., to Honeywell Inc. NO₂ thin film electro-optic switch, 4,712,857, Cl. 350-96.140.

Lee, Kang W.: See—
Vu, Tho T.; and Lee, Kang W., 4,713,559, Cl. 307-446.000.

Lee, Robert D., to Dallas Semiconductor Corporation. Battery charging protection circuit, 4,713,555, Cl. 307-66.000.

Lee, Rodney E.: See—
Jones, Robert E., Jr.; Lee, Rodney E.; and Yeh, Tsu-Hsing, 4,713,711, Cl. 360-123.000.

Lee, Sae D.; and Palac, Kazimir, to Zenith Electronics Corporation. Means and method for manufacture of a high-resolution color cathode ray tube, 4,713,034, Cl. 445-45.000.

Legerius, Bengt E.; and Sundstrom, Inge, to Thorsman & Co. Aktebolag. Fire-sealed lead-through for framed building components, 4,712,342, Cl. 52-221.000.

Legris, Andre, to Societe Anonyme Styled Legris. Method and device for assembling several components, particularly connection fittings for fluid couplings, 4,712,809, Cl. 285-21.000.

Lehigh University: See—
Kim, Yong W.; and Harding, Thomas W., 4,713,548, Cl. 250-423.00R.

Leigh-Monstevens, Keith V.; and Mienko, David K., to Automotive Products plc. Hydraulic remote control for motor vehicle manual shift transmission, 4,712,640, Cl. 180-336.000.

Leine & Konig: See—
Schrumpf, Christian, 4,712,945, Cl. 405-132.000.

Leite, Peter G., to P.G.L. Industries, Inc. Security device for office machines, 4,712,763, Cl. 248-553.000.

Leith, William C. Rotating disc wood chip refiner, 4,712,745, Cl. 241-261.300.

Lemmer, Helmut; and Risthaus, Josef, to Square D Starkstrom GmbH. Circuit-breaker, 4,713,636, Cl. 335-35.000.

Leo, Vincent B.; Cyll, Kenneth M.; and Ide, Mason G., to GTE Products Corporation. PTC fuel heater for heating alcohol fuel, 4,713,524, Cl. 219-307.000.

Leone, David A.: See—
Maier, Alfred E.; Leone, David A.; and Ricci, Louis N., 4,713,637, Cl. 335-76.000.

Le Parquier, Guy: See—
Drabowitch, Serge; Baril, Michel; and Le Parquier, Guy, 4,713,663, Cl. 342-70.000.

Lepert, Claude, to Etablissements Pompes Guinard. Process and apparatus for circulating fluids by pumping, 4,712,984, Cl. 417-391.000.

Leroy, Michel: See—
Chaffy, Joseph; Langon, Bernard; and Leroy, Michel, 4,713,161, Cl. 204-243.00M.

Leshchiner, Adelya: See—
Balazs, Endre A.; Leshchiner, Adolf; Leshchiner, Adelya; and Band, Philip, 4,713,448, Cl. 536-55.100.

Leshchiner, Adolf: See—
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Lester, James N.: See—
Byzowski, Wojciech W.; Fallier, Charles N., Jr.; and Lester, James N., 4,713,587, Cl. 315-289.000.

Letsche, Ulrich: See—
Rapp, Wolfgang, deceased; Hafner, Gunther; and Letsche, Ulrich, 4,712,530, Cl. 123-502.000.

Letton, James C., to Procter & Gamble Company. The Process for preparing alkyl glycosides, 4,713,447, Cl. 536-18.600.

Levasseur, Jean R., to Axytel. Process for marking and/or destroying valuable documents in particular and device for making use of it, 4,712,489, Cl. 109-25.000.

Lever Brothers Company: See—
Chun, Kil Whan; and Kyllmann, Clemens A., 4,713,079, Cl. 8-101.000.

Ho, Tan T., 4,713,193, Cl. 252-91.000.

Levin, Andrew E., to Wisconsin Alumni Research Foundation. Template for simultaneous screening of several antibodies and method of using the same, 4,713,349, Cl. 436-515.000.

Levine, Marc M.: See—
Huttner, James; and Levine, Marc M., 4,713,057, Cl. 604-164.000.

Levinson, Arthur D.; and Simonsen, Christian C., to Genentech, Inc. Polycistronic expression vector construction, 4,713,339, Cl. 435-240.200.

Lewis, Lindon L., to Ball Corporation. Levered optical mount, 4,712,444, Cl. 74-479.000.

Lewis, Robert D.: See—
Bohrn, Walter J.; Lewis, Robert D.; and Moggio, William A., 4,713,084, Cl. 8-561.000.

Li, Felipe S., to Kendall Company. The Method for making a sponge collecting device, 4,713,136, Cl. 156-229.000.

Liang, Victor: See—
Fang, Robert; Wang, Jerry; Liang, Victor; Farb, Joseph; and Hsu, Chung, 4,713,329, Cl. 437-29.000.

Libbey-Owens-Ford Co.: See—
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Lubelski, Daniel P.; and Baker, Rodney G., 4,713,359, Cl. 501-63.000.

Liberty Gifts, Inc.: See—
Rubin, Gene L., 4,712,322, Cl. 40-156.000.

Licentia Patent-Verwaltungs GmbH: See—
Forster, Rudolf; Weber, Suso; and Pyka, Hans-Jurgen, 4,713,353, Cl. 437-2.000.

Senske, Wilhelm; Herkert, Roland; Marschall, Norbert; and Greeb, Karl-Heinrich, 4,713,311, Cl. 430-127.000.

Lichter, Robert J. Safe, 4,712,490, Cl. 109-69.000.

Liedle, William O. Adjustable reusable adapter system for temporary electric service, 4,712,762, Cl. 248-533.000.

Liht-R Technologies, Inc.: See—
Franklin, Duane R.; Evans, Archibald D.; and Hansen, Walter J., 4,712,653, Cl. 187-18.000.

Lightstone, Alexander W., to RCA Corporation. Optical fiber connector and method of assembling same, 4,712,862, Cl. 350-96.210.

Lim, Jack S.; and Jones, Darrell L., to Vetco Gray Inc. Upper marine riser package, 4,712,620, Cl. 166-355.000.

Lin, Lawrence H.: See—
Fusck, Richard L.; and Lin, Lawrence H., 4,712,851, Cl. 350-3.600.

Lindemann, Klaus, to Wabco Westinghouse Fahrzeugbremsen GmbH. Control system for a motor vehicle engine to prevent slipping of the vehicle drive wheels during acceleration, 4,712,634, Cl. 180-197.000.

Lindemans, Willem; and Aaltonen, Lauri J., to Freeze Control Pty. Ltd. Cryosystem for biological material, 4,712,607, Cl. 165-30.000.

Lindsey Completion Systems: See—
Allwin, Roger P.; and Budke, Mark P., 4,712,614, Cl. 166-208.000.

Dockins, Roy R., Jr.; and Lindsey, Hiram E., Jr., 4,712,615, Cl. 166-208.000.

Lindsey, Hiram E., Jr.: See—
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Lindsey, James N., to Avondale Mills. Textile and method of manufacture, 4,712,290, Cl. 28-178.000.

Lindstadt, Klaus; Halsig, Andreas; Maier, Dietmar; and Scholz, Stefan, to Diehl GmbH & Co. Re-securable mine, 4,712,480, Cl. 102-427.000.

Lindstrom, Richard L.; and Skelnik, Debra L. Viscoelastic solution, 4,713,375, Cl. 514-57.000.

Link, Erich: See—
Erndt, Hans; Link, Erich; Martin, Adolf; Palloch, Herbert; and Wittler, Hilmar, 4,712,660, Cl. 192-18.00B.

Link, William T., to Baxter Travenol Laboratories, Inc. Method of and apparatus for determining the diastolic and systolic blood pressure of a patient, 4,712,563, Cl. 128-681.000.

Linkow, Leonard I.; and Rinaldi, Anthony W., to Vent Plant Corporation. Submersible screw-type dental implant and method of utilization, 4,713,004, Cl. 433-174.000.

Linnemann, Jorgen: See—
Kjornaes, Kim; and Linnemann, Jorgen, 4,713,248, Cl. 424-468.000.

Linsker, Ralph: See—
Cooper, John F.; Kirkpatrick, Edward S.; and Linsker, Ralph, 4,713,773, Cl. 364-491.000.

Lippman, Violet: See—
Fox, John P.; Hedaya, Eddie; and Lippman, Violet, 4,713,324, Cl. 435-4.000.

Lisak, Stephen P.: See—
Ryder, Francis E.; and Lisak, Stephen P., 4,713,739, Cl. 362-424.000.

Listrom, Robin D.: See—
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Liton Systems, Inc.: See—
Adsett, Anthony P., 4,713,825, Cl. 372-107.000.

Rogers, Robert T.; and Siewert, James C., 4,713,720, Cl. 361-97.000.

Litvin, Leonid V.: See—
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Pelmulder, John P.; Gorton, Lanny A.; Guleserian, Armen J.; and Livingston, John H., 4,712,583, Cl. 137-852.000.

Lobodzinski, Richard: See—
Gille, Henrick K.; Willing, Richard S.; Bloom, William G.; Siegel, Bernard; Chung, Tsang; Lobodzinski, Richard; and Gilroy, Keith, 4,712,567, Cl. 128-771.000.

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Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Ahlers, Klaas, 4,713,440, Cl. 528-367.000.

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Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,712,958, Cl. 411-506.000.

Lockheed Missiles & Space Company, Inc.: See—
Mercado, Romeo I., 4,712,886, Cl. 350-482.000.

Lockheed Missiles & Space Company, Inc.: See—
Bareket, Noah, 4,712,913, Cl. 356-121.000.

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Loewen, Heinz; and Wenko, Wold, to Electronic Plating Service, Inc. Process for producing electrical contacts for facilitating mass mounting to a contact holder, 4,712,299, Cl. 29-882.000.

Lofton, Hugh P., to Huck Manufacturing Company. Tumbling media, 4,712,333, Cl. 51-164.500.

Logicar A/S: See—
Jensen, Jakob, 4,712,827, Cl. 296-99.00R.

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Chaudhuri, Ratan K.; Login, Robert B.; and Tracy, David J., 4,713,463, Cl. 548-517.000.

Logothetis, Anestis L.; and Stewart, Charles W., to Du Pont de Nemours, E. I., and Company. Blends of fluoroplastics and fluoroelastomers, 4,713,418, Cl. 525-200.000.

Lohmann, Arthur M.: See—
Haglund, Steve A.; Lohmann, Arthur M.; and Pickering-Johnson, Sharon A., 4,712,478, Cl. 102-424.000.

Lonati, Francesco, to Lonati SpA. Circular knitting machine incorporating a stitch density adjuster device, 4,712,390, Cl. 66-54.000.

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Long, Margaret N.: See—
Morris, Robert C.; Long, Margaret N.; Chin, Timothy C.; and Heller, Donald F., 4,713,820, Cl. 372-41.000.

- Lonza Ltd.: See—
Kristen, Ulrich; Haring, Ulrich; Fischer, Francis; and Cron, Alain, 4,713,186, Cl. 252-30.000.
- Looney, John H., to Xerox Corporation. Copy sheet offsetting device. 4,712,786, Cl. 271-207.000.
- Lopata, Ira L.: See—
Marshall, Howard B.; Kaye, Gordon E.; and Lopata, Ira L., 4,713,005, Cl. 433-180.000.
- Loral Electro-Optical Systems, Inc.: See—
Dawson, Christopher; Healey, Fritz W.; and Taylor, Leo O., 4,712,885, Cl. 350-443.000.
- Lord Corporation: See—
Miller, H. Timothy, 4,712,777, Cl. 267-140.100.
- Losapio, Peter F.; Germer, Warren R.; Ouellette, Maurice J.; and Palmer, Ansell W., to General Electric Company. Battery backup installation for electric meter. 4,713,609, Cl. 324-156.000.
- Looney, Walter N.; and Giometti, Paul F., to Facet Enterprises, Inc. Engine starter gearing. 4,712,435, Cl. 74-6.000.
- Lossner, Gerald L.; and Weaver, Richard D., to Allied Corporation. Solenoid control valve. 4,712,767, Cl. 251-129.140.
- Loughlin, Thomas G.: See—
Clarkson, Bruce A.; Frere, Ronald J.; Loughlin, Thomas G.; Taylor, William W., Jr.; and Mongeau, Peter, 4,712,398, Cl. 70-276.000.
- Louis, Raymond, to Gaz de France. Device for the melting of light metals. 4,712,774, Cl. 266-155.000.
- Low, R. Glenn. Modular construction system. 4,712,352, Cl. 52-809.000.
- Lowe, Gary C. Organizer for compact disc albums and the like. 4,712,679, Cl. 206-387.000.
- Lowe, Henry E. Litter material for small animals. 4,712,508, Cl. 119-1.000.
- Lu, Siat-Ling. Cleaning tape cartridge used in videotape recorders. 4,713,713, Cl. 360-128.000.
- Lubelski, Daniel P.; and Baker, Rodney G., to Libbey-Owens-Ford Co. Infrared absorbing glass compositions. 4,713,359, Cl. 501-63.000.
- Lubrizol Genetics, Inc.: See—
McLoughlin, Thomas J., 4,713,330, Cl. 435-34.000.
- Lucas Industries public limited company: See—
Brearley, Malcolm; and Moseley, Richard B., 4,712,839, Cl. 303-3.000.
- Dawes, Cyril; and Smith, Colin G., 4,713,122, Cl. 148-16.600.
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- Ikuma, Sadao, 4,713,429, Cl. 526-87.000.
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- Ehlers, D. M.; and Hopkins, Daniel N., 4,712,616, Cl. 166-266.000.
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- Moore, Timothy J. Container with integral fold-in closure lid, 4,712,725, Cl. 229-8.000.
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- Morag, Meir. Information display system, 4,713,651, Cl. 340-407.000.
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- Morell, Joseph; and Petrini, Roland, to Salomon S. A. Ski boot, 4,712,315, Cl. 36-117.000.
- Morgenstern, Bernd: See—
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- Mori, Toshihiko: See—
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- Morigi, Rodolfo: See—
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- Morton Thiokol, Inc.: See—
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- Moseley, Richard B.: See—
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- Motorola, Inc.: See—
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- Kloker, Kevin L.; and Cieslak, Ronald H., 4,713,790, Cl. 364-784.000.
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- Wanchon, Sanjay; and Muri, David L., 4,713,622, Cl. 328-61.000.
- Whalley, Roger A., 4,713,625, Cl. 330-149.000.
- Mowat, James F., Jr.: See—
Bethell, Michael R.; Gaines, Michael G.; Mowat, James F., Jr.; Wheeler, Roger D.; and Woidke, Richard P., 4,712,353, Cl. 53-80.000.

- Mower, Dan C.; Wolf, Peter H.; Slade, Boyd E.; and Albertalli, David, to Dataproducts Corporation. Control system for matrix print head, 4,713,623, Cl. 328-72.000.
- Moynihan, Patrick B. Air compressor accessory driven by portable electric drill, 4,712,983, Cl. 417-234.000.
- Mrowka, Joseph J.: See—
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,713,728, Cl. 361-363.000.
- Mucciarone, Domenick. Sealing spout for paper cartons, 4,712,714, Cl. 222-91.000.
- Mucheyer, Norbert: See—
Kauss, Wolfgang; and Mucheyer, Norbert, 4,712,375, Cl. 60-405.000.
- Mueller, Theodore V. Auxiliary door latch for children's safety, 4,712,816, Cl. 292-253.000.
- Mukaida, Yoshito: See—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,713,287, Cl. 428-336.000.
- Mulhaupt, Rolf; Renner, Alfred; and Lauterbach, Horst, to Ciba-Geigy Corporation. Branched polyesters, 4,713,428, Cl. 525-523.000.
- Muller, Dietmar; and Kremp, Jürgen, to Fraunhofer-Gesellschaft zur Förderung der angewandten. Triplebasic propellant powder and process for the production thereof, 4,713,127, Cl. 149-98.000.
- Mungall, Dennis R.: See—
Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostoich, Vladimir E.; and Sroy, Gary H., 4,712,460, Cl. 83-208.000.
- Munro, Dougald G. Tractor-trailer fluid pressure brake monitoring system, 4,712,422, Cl. 73-129.000.
- Murakami, Kakuji: See—
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,713,113, Cl. 106-22.000.
- Murakami, Yuichi: See—
Nakamura, Makoto; Takahashi, Mitsuru; Osawa, Namieki; and Murakami, Yuichi, 4,713,044, Cl. 474-135.000.
- Murata Manufacturing Co., Ltd.: See—
Nishikawa, Toshio; and Tamura, Sadahiro, 4,713,632, Cl. 331-117.00D.
- Saito, Koji; and Okawa, Hiroshi, 4,713,633, Cl. 333-222.000.
- Murata, Tatsuo: See—
Sekimura, Nobuyuki; Kamio, Masaru; Takao, Hideaki; Motoi, Taiko; and Murata, Tatsuo, 4,712,874, Cl. 350-339.00F.
- Murbach, Urs: See—
Kunz, Rino E.; Jung, Jurg R.; Knus, Jean A.; Murbach, Urs; and Tuor, Marcel F., 4,713,537, Cl. 250-227.000.
- Muri, David L.: See—
Wanchon, Sanjay; and Muri, David L., 4,713,622, Cl. 328-61.000.
- Murphy, Glenn L.; Borona, Russell T.; and Gelzeiser, Francis L., to Westinghouse Electric Corp. Molded-case circuit breaker with improved contact arm assembly, toggle link means and arc shield component, 4,713,640, Cl. 335-194.000.
- Murray, Daniel J.: See—
Woo, Edmund P.; and Murray, Daniel J., 4,713,442, Cl. 528-422.000.
- Murray, David L., to Deutz-Allis Corporation. Implement position adjusting device, 4,712,492, Cl. 111-88.000.
- Mutter, Heinz: See—
Sommer, Hans-Jorg; Mutter, Heinz; Wirz, Armin; and Graf, Felix, 4,713,655, Cl. 340-677.000.
- Myers, Jay E.; Myers, M. Todd; and Iravanchi, Siamak, to Andiamo Inc. Method and means for sealing a carrying case, 4,712,657, Cl. 190-28.000.
- Myers, M. Todd: See—
Myers, Jay E.; Myers, M. Todd; and Iravanchi, Siamak, 4,712,657, Cl. 190-28.000.
- N. V. Bekaert S. A.: See—
Adriaenssen, Ludo; and Decouttere, Bernard, 4,713,153, Cl. 204-144.500.
- Naert, Michel S., to AB Volvo. Vehicle back-seat, 4,712,824, Cl. 296-65.00R.
- Nagahiro, Michinori: See—
Maruno, Susumu; Nakata, Shinobu; Nagahiro, Michinori; and Minamide, Seiko, 4,712,930, Cl. 400-120.000.
- Nagai, Toshinari; Masui, Takatoshi; Satou, Yasushi; and Katsuno, Toshiyasu, to Toyota Jidosha Kabushiki Kaisha. Double air-fuel ratio sensor system having improved response characteristics, 4,712,373, Cl. 60-274.000.
- Nagasaka, Mitsuaki: See—
Ohno, Sachio; Ebihara, Yuko; Mizukoshi, Kiyoshi; Ichihara, Kenji; Ban, Takao; and Nagasaka, Mitsuaki, 4,713,457, Cl. 546-67.000.
- Nagasaki, Fumihiko: See—
Ikura, Katsuyuki; Hagiwara, Kenji; Nagasaki, Fumihiko; Yamada, Tomio; Takahashi, Hidemitsu; and Hatano, Renpei, 4,713,396, Cl. 514-594.000.
- Nagasaki, Tatsuo: See—
Fujimori, Hiroyoshi; and Nagasaki, Tatsuo, 4,713,683, Cl. 358-42.000.
- Nagata, Sumio: See—
Akiyama, Shigeru; Ueno, Hidetoshi; Imagawa, Koji; Kitahara, Akira; Nagata, Sumio; Morimoto, Kazuo; Nishikawa, Tooru; and Itoh, Masao, 4,713,277, Cl. 428-131.000.
- Nagayama, Susumu: See—
Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, 4,713,518, Cl. 219-121.00LM.
- Nagoda, Louis E.: See—
Moore, William G.; and Nagoda, Louis E., 4,713,566, Cl. 310-58.000.
- Nagumo, Katsuyuki: See—
Watanabe, Isao; Momono, Kaishu; Hiraiwa, Toru; Ono, Satoshi; Nakano, Joji; Nagumo, Katsuyuki; and Takagi, Hiroyasu, 4,713,387, Cl. 514-332.000.
- Nahas, Robert C.; and Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Process for curing a coating composition of an acrylic polymer and a polyisocyanate with an amine vapor catalyst, 4,713,265, Cl. 427-341.000.
- Nahill, George F.: See—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,712,990, Cl. 425-130.000.
- Nakagawa, Taiichi: See—
Morishita, Akira; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Hasegawa, Akinori; Arima, Takemi; and Kounou, Tadami, 4,712,451, Cl. 74-801.000.
- Nakagawa, Toyooki: See—
Terasaka, Katsunori; Sunbuchi, Hiroshi; and Nakagawa, Toyooki, 4,712,529, Cl. 123-492.000.
- Nakai, Masaaki: See—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,712,904, Cl. 354-475.000.
- Nakajima, Keisuke: See—
Hirama, Shinichi; Nishiyama, Toshio; Ohta, Youichi; Uzuka, Makoto; Tomita, Kenichi; Nakajima, Keisuke; and Furuse, Kazumaro, 4,713,397, Cl. 514-690.000.
- Nakamura, Haruhiko; and Tempaku, Junya, to Fujitsu Limited. Phase synchronization circuit, 4,713,621, Cl. 328-55.000.
- Nakamura, Hiro; Ohkawa, Shuji; Ohtsuka, Yasuo; Tachikawa, Hajime; and Shinozaki, Toshiya, to Hitachi, Ltd. Method for handling a work in a robot system, 4,712,970, Cl. 414-730.000.
- Nakamura, Kozoo; Kozima, Yasuyuki; Hamada, Nagaharu; and Sakata, Kunihiko, to Hitachi, Ltd. A method of controlling the movement of a medium to be printed, 4,713,699, Cl. 358-296.000.
- Nakamura, Makoto; Takahashi, Mitsuru; Osawa, Namieki; and Murakami, Yuichi, to Nissan Motor Co., Ltd. Belt tensioner unit for internal combustion engine or the like, 4,713,044, Cl. 474-135.000.
- Nakamura, Shinichi; and Ohbayashi, Keiji, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material, 4,713,317, Cl. 430-551.000.
- Nakamura, Shinichi: See—
Nakayama, Tomobumi; Mori, Toshihiko; Hirose, Masayuki; Ohbuchi, Toru; Miyata, Masanori; Nakamura, Shinichi; and Honjo, Takeshi, 4,712,908, Cl. 355-14.05H.
- Nakano, Hirohumi: See—
Higuchi, Seizun; Oga, Tomonari; Ikeda, Masao; and Nakano, Hirohumi, 4,713,301, Cl. 428-628.000.
- Nakano, Joji: See—
Watanabe, Isao; Momono, Kaishu; Hiraiwa, Toru; Ono, Satoshi; Nakano, Joji; Nagumo, Katsuyuki; and Takagi, Hiroyasu, 4,713,387, Cl. 514-332.000.
- Nakao, Rei: See—
Kikuchi, Yoshikazu; and Nakao, Rei, 4,713,092, Cl. 55-130.000.
- Nakashima, Seiichi; Toyoda, Kenichi; Inagaki, Shigemitsu; and Otsuka, Kazuhisa, to Fanuc Ltd. Cable supporting arrangement in industrial robots, 4,712,972, Cl. 414-744.00R.
- Nakashima, Toshimitsu; Okada, Wataru; and Mitani, Toragoro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for removing organic compound having high boiling point from a floatable polymer, 4,713,443, Cl. 528-499.000.
- Nakata, Akira; Matsumoto, Shiroh; Tozima, Hitoshi; and Minato, Masahiko, to Hokkai Can Co., Ltd. Easy open type can, 4,712,706, Cl. 220-276.000.
- Nakata, Shinobu: See—
Maruno, Susumu; Nakata, Shinobu; Nagahiro, Michinori; and Minamide, Seiko, 4,712,930, Cl. 400-120.000.
- Nakayama, Kouichi, to Aisin Seiki Kabushiki Kaisha. Driving apparatus for stirling cycle engine, 4,712,378, Cl. 60-525.000.
- Nakayama, Tomobumi; Mori, Toshihiko; Hirose, Masayuki; Ohbuchi, Toru; Miyata, Masanori; Nakamura, Shinichi; and Honjo, Takeshi, to Canon Kabushiki Kaisha. Image forming apparatus, 4,712,908, Cl. 355-14.05H.
- Nakovamainen Keskusliitto ry: See—
Jalava, Antti, 4,713,495, Cl. 178-2.00R.
- Nalco Chemical Company: See—
Bhattacharyya, Bhupati R.; and Dalsin, Philip D., 4,713,431, Cl. 526-207.000.
- Fong, Dodd W.; and Halverson, Ann M., 4,713,178, Cl. 210-734.000.
- Owen, David O.; and Connelly, Lawrence J., 4,713,222, Cl. 423-122.000.
- Nalesnik, Theodore E.; and Benfaremo, Nicholas, to Texaco, Inc. Precoupled mono-succinimide lubricating oil dispersants and viton seal additives, 4,713,189, Cl. 252-51.50A.
- Nalesnik, Theodore E., to Texaco Inc. Diisocyanate acid lubricating oil dispersant and viton seal additives, 4,713,191, Cl. 252-51.50A.
- Namba, Kenryo; Asami, Shigeru; Aoi, Toshiki; Takahashi, Kazuo; and Kuroiwa, Akihiko, to TDK Corporation. Optical recording medium, 4,713,314, Cl. 430-270.000.
- Nance, J. Gregg. Stringed instrument finger positioning guide, 4,712,464, Cl. 84-485.00R.

Narasimhan, Rajagopalan: See—
Childs, Ernest A.; and Narasimhan, Rajagopalan, 4,713,254, Cl. 426-582.000.

Narita, Hiroshi: See—
Awano, Yoshiyuki; and Narita, Hiroshi, 4,713,020, Cl. 439-267.000.

Narva, Kenneth E.: See—
Srinivasan, Vadake R.; Cary, Jeffrey W.; Chon, Younghae; and Narva, Kenneth E., 4,713,336, Cl. 435-155.000.

Nash, William H.; and Fowler, Eugene C., to Cooper Industries, Inc. Vacuum fuse, 4,713,644, Cl. 337-158.000.

Nation, Richard V.: See—
Edwards, Wayne; Nation, Richard V.; and Tomkins, Keith A., 4,712,957, Cl. 411-82.000.

National Distillers and Chemical Corporation: See—
Clark, Clarence E., Jr.; and Fayter, Richard G., Jr., 4,713,479, Cl. 560-124.000.

Fayter, Richard G., Jr., 4,713,478, Cl. 560-124.000.

Huynh, Anh N.; and Ziogas, Phoivos D., 4,713,220, Cl. 422-186.160.

National Research Development Corporation: See—
Elliott, Michael; Jones, Norman F.; and Khambay, Bhupinder P. S., 4,713,392, Cl. 514-464.000.

National Starch and Chemical Corporation: See—
Beh-Forrest, Eric; and Flanagan, Thomas P., 4,712,808, Cl. 281-15.00R.

Lunsford, David; and Walker, James L., 4,713,263, Cl. 427-206.000.

Natsume, Yukihito, to Brother Kogyo Kabushiki Kaisha. Ribbon guide device including a separate, longitudinally shiftable, ribbon guide member, 4,712,933, Cl. 400-248.000.

Nawojaki, Julius W.; and Nawojski, Walter. Variable speed control, 4,712,438, Cl. 74-63.000.

Nawojaki, Walter: See—
Nawojski, Julius W.; and Nawojski, Walter, 4,712,438, Cl. 74-63.000.

NCR Corporation: See—
Lauffer, Donald K.; Milby, Gregory H.; Rostek, Paul M.; and Sanwo, Ikuo J., 4,713,827, Cl. 375-7.000.

Neasham, David L.: See—
French, Steven J.; and Neasham, David L., 4,713,652, Cl. 340-652.000.

Nebon, Jean-Pierre: See—
Baginski, Pierre; and Nebon, Jean-Pierre, 4,713,508, Cl. 200-153.05C.

NEC Corporation: See—
Araseki, Takashi, 4,713,776, Cl. 364-513.500.

Imamura, Toru, 4,713,357, Cl. 437-52.000.

Ishikawa, Takashi; Fukagawa, Hiroshi; and Matsui, Hiroyasu, 4,713,696, Cl. 358-261.000.

Kamo, Yuichi; and Mikami, Nobuo, 4,713,638, Cl. 335-79.000.

Mizota, Yasuhiro, 4,713,809, Cl. 370-97.000.

Oyagi, Takashi; and Tsunoda, Kazuyuki, 4,713,659, Cl. 340-825.440.

Suzuki, Takeshi, 4,713,836, Cl. 379-58.000.

Yamada, Kazuyoshi, 4,713,561, Cl. 307-456.000.

Necchi Societa per Azioni: See—
Bisson, Flavio, 4,712,494, Cl. 112-121.120.

Negi, Taichi: See—
Aoyama, Akimasa; Moritani, Takeshi; Yonezu, Kiyoshi; Negi, Taichi; and Okaya, Takuji, 4,713,296, Cl. 428-412.000.

Negishi, Kenji: See—
Oosaka, Sigenori; and Negishi, Kenji, 4,713,706, Cl. 360-104.000.

Negrutsky, Boris F.: See—
Negrutsky, Sergei B.; Klimov, Sergei B.; Negrutsky, Boris F.; and Churkin, Vladimir G., 4,712,772, Cl. 254-264.000.

Negrutsky, Sergei B.; Klimov, Sergei B.; Negrutsky, Boris F.; and Churkin, Vladimir G. Power hydraulic gear, 4,712,772, Cl. 254-264.000.

Nelson, David A., to Comlinear Corporation. Compensation and biasing of wideband amplifiers, 4,713,628, Cl. 330-254.000.

Nelson Industries, Inc.: See—
Iles, Lawrence F.; and Goplen, Gary D., 4,712,643, Cl. 181-231.000.

Nestec, S.A.: See—
Cazin, Pierre, 4,712,683, Cl. 206-478.000.

Neumann, Joachim: See—
Emmenthal, Klaus-Dieter; and Neumann, Joachim, 4,712,581, Cl. 137-561.00A.

Neuschutz, Dieter: See—
Bebber, Hans J.; Neuschutz, Dieter; and Rossner, Heinrich-Otto, 4,713,826, Cl. 373-22.000.

Nevamar Corporation: See—
Ungar, Israel S.; O'Neill, Nelson L.; Scher, Herbert I.; and O'Dell, Robin D., 4,713,138, Cl. 156-307.400.

New Holland Inc.: See—
Strong, Russell W.; and Rutt, Kenneth S., 4,712,568, Cl. 130-272.000.

New Ocean Wind Products, Inc.: See—
Oser, Richard B., 4,712,498, Cl. 114-39.200.

Newkirk, Marc S.; and Dizio, Steven F., to Lanxide Technology Company, LP. Novel ceramic materials and methods for making same, 4,713,360, Cl. 501-87.000.

Newman, Bruce A., to Conoco Inc. Premium coking process, 4,713,168, Cl. 208-131.000.

Newman, Wyatt S., to North American Philips Corporation. Helical spring holder assembly, 4,712,778, Cl. 267-170.000.

NGK Insulators, Ltd.: See—
Matsuhisa, Tadaaki; and Sasaki, Shingo, 4,713,206, Cl. 264-328.200.

NGK Spark Plug Co., Ltd.: See—
Kojima, Takao; and Ishiguro, Hiroyuki, 4,713,166, Cl. 204-425.000.

NI Industries, Inc.: See—
Nicol, Steven M., 4,712,845, Cl. 312-319.000.

Nichols, Edward W.: See—
Cross, Michael A.; and Nichols, Edward W., 4,712,914, Cl. 356-121.000.

Nicia, Antonius J. A., to U.S. Philips Corp. Geodesic optical component, 4,712,856, Cl. 350-96.120.

Nicol, Steven M., to NI Industries, Inc. Self-opening receptacle assembly with adjustable rollers, 4,712,845, Cl. 312-319.000.

Nield, Joseph G., Jr.: See—
Pejouhy, Radi; Nield, Joseph G., Jr.; D'Entremont, John R.; Beggs, Louis C.; and Rotulo, Fabrizio, 4,713,717, Cl. 361-26.000.

Nielsen, Richard H., to Phillips Petroleum Company. Fluid feed method, 4,713,169, Cl. 208-157.000.

Nieuwstad, Ronald L., to Peder Smedvig Aksjeselskap. Down-hole blow-out preventers, 4,712,613, Cl. 166-53.000.

Nihon Den-Netzu Keiki Co. Ltd.: See—
Kondo, Kenshi, 4,712,963, Cl. 414-222.000.

Niinomi, Masahiro: See—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,713,287, Cl. 428-336.000.

Nikko Co., Ltd.: See—
Ishimoto, Zenichi, 4,713,499, Cl. 200-16.00D.

Nimbus Water Systems, Inc.: See—
Bray, Donald T., 4,713,175, Cl. 210-259.000.

Nippon Ester Co., Ltd.: See—
Tajimoto, Keizo; Katagiri, Takashi; Ichihashi, Eiji; and Otsubo, Hitoshi, 4,712,366, Cl. 57-245.000.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: See—
Hasegawa, Kenji; Sato, Tetsuo; and Iwanami, Teruo, 4,713,266, Cl. 427-412.500.

Nippon Hoso Kyokai: See—
Takayama, Shigehiko; Suzuki, Hitomi; Maruyama, Masanori; Fukushima, Masakazu; and Kurashige, Mitsuhiro, 4,713,588, Cl. 315-382.000.

Nippon Kogaku K.K.: See—
Sakato, Keiichi, 4,712,910, Cl. 355-53.000.

Nippon Soda Co., Ltd.: See—
Ikura, Katsuyata; Hagiwara, Kenji; Nagasaki, Fumihiko; Yamada, Tomio; Takahashi, Hidemitsu; and Hatano, Renpei, 4,713,396, Cl. 514-594.000.

Nippon Steel Corporation: See—
Higuchi, Seizun; Oga, Tomonari; Ikeda, Masao; and Nakano, Hirohumi, 4,713,301, Cl. 428-628.000.

Nippondenso Co., Ltd.: See—
Abe, Tomoaki; Fujisawa, Hideya; Omori, Norio; Kinugawa, Masumi; Ito, Katsunori; Akiyama, Susumu; Mizuno, Tiaki; and Yamada, Toshitaka, 4,713,765, Cl. 364-431.050.

Yamada, Manabu; Yoshida, Ichirou; Yamaguchi, Shunzo; and Atsumi, Morihiro, 4,713,582, Cl. 315-58.000.

Nirvana Espar Systems S.A.: See—
Montandon, Daniel, 4,712,500, Cl. 114-90.000.

Nishida, Yukio: See—
Nomura, Etuzo; Sakakibara, Yasuo; Kozawa, Tetsuo; Nishida, Yukio; and Kondo, Ikuzo, 4,712,497, Cl. 112-315.000.

Nishikawa, Tooru: See—
Akiyama, Shigeru; Ueno, Hidetoshi; Imagawa, Koji; Kitahara, Akira; Nagata, Sumio; Morimoto, Kazuo; Nishikawa, Tooru; and Itoh, Masao, 4,713,277, Cl. 428-131.000.

Nishikawa, Toshio; and Tamura, Sadahiro, to Murata Manufacturing Co., Ltd. Band reflection type FET dielectric resonator oscillator, 4,713,632, Cl. 331-117.00D.

Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, to Fuji Photo Film Co., Ltd.; and Japan Synthetic Rubber Co., Ltd. Magnetic recording medium, 4,713,287, Cl. 428-336.000.

Nishimoto, Kanichi, to Noritsu Kenkyu Center Co., Ltd. Photosensitive material treating apparatus, 4,712,899, Cl. 354-316.000.

Nishimura, Sadahiko: See—
Makimoto, Toshio; Nishimura, Sadahiko; Matsuo, Masayuki; Abiko, Toshio; Ishizaki, Hirohumi; Kanda, Minoru; Nunoya, Hidetsugu; and Komatsu, Mikio, 4,713,670, Cl. 343-700.0MS.

Nishimura, Shigeru; and Kuroda, Toshihisa, to Matsushita Electric Industrial Co., Ltd. Video monitoring apparatus, 4,713,685, Cl. 358-103.000.

Nishiyama, Toshio: See—
Hirama, Shinichi; Nishiyama, Toshio; Ohta, Youichi; Uzuka, Makoto; Tomita, Kenichi; Nakajima, Keisuke; and Furuse, Kazumaro, 4,713,397, Cl. 514-690.000.

Niskanen, Don L., to Teleflex Incorporated. Parklock control, 4,712,397, Cl. 70-248.000.

Nissan Motor Co., Ltd.: See—
Nakamura, Makoto; Takahashi, Mitsuru; Osawa, Namieki; and Murakami, Yuichi, 4,713,044, Cl. 474-135.000.

Omori, Kiyoshi, 4,712,826, Cl. 296-93.000.

Taguchi, Hiromi, 4,712,708, Cl. 220-319.000.

Terasaka, Katsunori; Sunbuichi, Hiroshi; and Nakagawa, Toyooki, 4,712,529, Cl. 123-492.000.

Ura, Syouzabu; Yasuda, Makoto; and Ooki, Yoshitaka, 4,712,532, Cl. 123-572.000.

Nissan Shatai Company, Limited: See—
Kamata, Mitsuo; and Yamashita, Yutaka, 4,712,446, Cl. 74-492.000.

Nissen, Harry S., to Danfoss A/S. Oil feeding apparatus for a rotary compressor, 4,712,986, Cl. 418-63.000.

Niwa, Masatake: See—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,712,904, Cl. 354-475.000.

Niwa, Tomomitsu, to Mitsubishi Denki Kabushiki Kaisha. Numerically controlled machining method using primary and compensating cutters, 4,713,747, Cl. 364-170.000.

Nocci, Roberto: See—
Del Giudice, Luciano; Nocci, Roberto; Giannini, Umberto; and Gianotti, Giuseppe, 4,713,416, Cl. 525-68.000.

Noda, Kinzaburo: See—
Sakamoto, Teruo; Kawai, Sadao; Noda, Kinzaburo; Takeda, Toyohiko; and Kato, Hiroshi, 4,713,247, Cl. 424-461.000.

Noe, Joel M. Cutting instrument for nasal surgery which cuts parallel to its length, 4,712,546, Cl. 128-305.000.

Noel, Raymond; Robinson, William M.; Cherian, Gabe; Clifford, Thomas H.; Carlomagno, William D.; Deasy, William M.; Grassauer, Willie K.; Haygood, David K.; Sherlock, H. Paul; and White, Harry E., to Raychem Corp. Solder delivery systems, 4,712,721, Cl. 228-56.300.

Nomix Manufacturing Co. Limited: See—
Gill, David C., 4,712,738, Cl. 239-74.000.

Nomura, Etuzo; Sakakibara, Yasuo; Kozawa, Tetsuo; Nishida, Yukio; and Kondo, Ikuzo, to Brother Kogyo Kabushiki Kaisha. Sewing machine, 4,712,497, Cl. 112-315.000.

Nonomura, Arthur M., to Microbio Resources, Inc. Naturally-derived carotene/oil composition, 4,713,398, Cl. 514-725.000.

Nonomura, Masamitsu: See—
Arakawa, Satoshi; and Nonomura, Masamitsu, 4,713,549, Cl. 250-484.100.

Noonan, Joseph F.: See—
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,713,728, Cl. 361-363.000.

Nordica S.p.A.: See—
Baggio, Giorgio, 4,712,316, Cl. 36-119.000.

Nordin, Lee. Crusher gap setting, 4,712,743, Cl. 241-30.000.

Norenberg, Hagen: See—
Hervig, Jens; Norenberg, Hagen; Bergmann, Friedhelm; Stiller, Manfred; Schlemmermeyer, Horst; Schmidt, Wilfried; Straube, Hilmar; and Wolter, Helmut, 4,712,434, Cl. 73-864.630.

Noritsu Kenkyu Center Co., Ltd.: See—
Nishimoto, Kanichi, 4,712,899, Cl. 354-316.000.

Noro, Masataka: See—
Yazaki, Takao; Noro, Masataka; and Matsui, Takashi, 4,713,282, Cl. 428-216.000.

Norrgrén, Bo; and Bjelk, Nils, to Besam AB. Device for detecting objects, particularly such in motion, 4,713,545, Cl. 250-338.000.

Norsk Hydro, a.s.: See—
Kjohl, Olav; Obrestad, Torstein; and Groland, Hans, 4,713,108, Cl. 71-32.000.

North American Philips Consumer Electronics Corp.: See—
Josephs, Mark A., 4,713,578, Cl. 313-481.000.

North American Philips Corporation: See—
Newman, Wyatt S., 4,712,778, Cl. 267-170.000.

North American Specialties Corp.: See—
Seidler, Jack, 4,712,850, Cl. 439-861.000.

North, Henry. Apparatus for producing a force, 4,712,439, Cl. 74-84.00R.

North States Industries, Inc.: See—
Larson, Donald A., 4,712,773, Cl. 256-25.000.

Northern Telecom Limited: See—
Garner, John N., 4,712,368, Cl. 57-314.000.

Lukas, Helmut H.; and Pacey, Grant K., 4,712,861, Cl. 350-96.210.

Rosenbaum, Stanley D.; and Plett, Calvin, 4,713,838, Cl. 379-252.000.

Northrop Corporation: See—
Smith, Eugene A., 4,713,823, Cl. 372-90.000.

Norton, Gary E.: See—
Findlay, John B.; Wu, Annie L.; and Norton, Gary E., 4,713,327, Cl. 435-17.000.

Nose, Hiroyasu: See—
Baba, Takeshi; Imataki, Hiroyuki; Usui, Masayuki; Serizawa, Takeshi; and Nose, Hiroyasu, 4,712,882, Cl. 350-413.000.

Novacco, Lawrence J.: See—
Farooque, Mohammad; and Novacco, Lawrence J., 4,713,303, Cl. 429-26.000.

Novatome: See—
Dumay, Jean-Jacques; and Malaval, Claude, 4,713,214, Cl. 376-312.000.

Novikova, Elizaveta B.: See—
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,713,239, Cl. 424-81.000.

Nozato, Fujio. Ball throwing machine, 4,712,534, Cl. 124-78.000.

Nunning, Bernard C.: See—
Begum, Selima; Ullah, Ismat; and Nunning, Bernard C., 4,713,246, Cl. 424-455.000.

Nunokawa, Kazuo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Ophthalmoscopic instrument having working position detecting means, 4,712,894, Cl. 351-208.000.

Nunoya, Hidetsugu: See—
Makimoto, Toshio; Nishimura, Sadahiko; Matsuo, Masayuki; Abiko, Toshio; Ishizaki, Hirohumi; Kanda, Minoru; Nunoya, Hidetsugu; and Komatsu, Mikio, 4,713,670, Cl. 343-700.0MS.

Nymark, Roald P., to Gerber Garment Technology, Inc. Restricting bracket for automatic transport system, 4,712,485, Cl. 104-172.400.

O&K Orenstein & Koppel Aktiengesellschaft: See—
Kirchhoff, Bernd; and Mecklenfeld, Hermann, 4,712,744, Cl. 241-80.000.

Obata, Minoru: See—
Ao, Hideki; Obata, Minoru; Yamanaka, Tsutomu; and Mikashima, Hiroshi, 4,713,381, Cl. 514-222.000.

Obeda, Edward G. Apparatus and method for ultrasonically joining sheets of thermoplastic materials, 4,713,131, Cl. 156-73.100.

Oberlander, Lewis B.; Spicer, David A.; and Straubs, Ralph V., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Communication system control arrangement, 4,713,806, Cl. 370-58.000.

Obero, Bhushan K., to Redland Roof Tiles Limited. Collation assemblies, 4,712,361, Cl. 53-540.000.

Obrestad, Torstein: See—
Kjohl, Olav; Obrestad, Torstein; and Groland, Hans, 4,713,108, Cl. 71-32.000.

O'Brien, Michael J.: See—
Ramsey, Douglas P.; and O'Brien, Michael J., 4,712,704, Cl. 220-254.000.

Occidental Chemical Corporation: See—
Geering, Emil J.; and Grano, Frank J., 4,712,711, Cl. 220-457.000.

OCE-Nederland B.V.: See—
Giezeman, Paulus G.; and Romualdus Ter Horst, Gerhardus E., 4,713,674, Cl. 355-14.0SH.

Ochiai, Masanobu: See—
Ohta, Norio; Yanagishima, Fumiya; Kaihara, Toshikazu; Kishida, Akira; Sato, Kuniaki; and Ochiai, Masanobu, 4,713,154, Cl. 204-145.00R.

Oda, Yasuhiro: See—
Okuzono, Shuichi; Tanaka, Tetsuo; Oda, Yasuhiro; Shintani, Takashi; and Emura, Noriaki, 4,713,083, Cl. 8-557.000.

Odaka, Masanori: See—
Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,713,796, Cl. 365-189.000.

Oddenino, Manrico, to Illinois Tool Works Inc. Perfected cap, particularly for motor vehicles, 4,712,703, Cl. 220-210.000.

O'Dell, Robin D.: See—
Ungar, Israel S.; O'Neill, Nelson L.; Scher, Herbert I.; and O'Dell, Robin D., 4,713,138, Cl. 156-307.400.

Odorisio, Paul A.: See—
Spivack, John D.; Steinberg, David H.; and Odorisio, Paul A., 4,713,475, Cl. 560-75.000.

Oertel, Michael: See—
Weirich, Walter; Barnert, Heiko; Oertel, Michael; and Schulten, Rudolf, 4,713,234, Cl. 423-648.00R.

Oetiker, Hans. Earless clamp structure, 4,712,278, Cl. 24-20.0TT.

Offermann, Ludwig, to Carl Still GmbH & Co. KG, Firma. Light construction plug for coke oven doors, 4,713,148, Cl. 202-248.000.

Oga, Tomonari: See—
Higuchi, Seizun; Oga, Tomonari; Ikeda, Masao; and Nakano, Hirohumi, 4,713,301, Cl. 428-628.000.

Ogami, Takayuki: See—
Kasahara, Toshiharu; Ogami, Takayuki; and Kitayoshi, Hitoshi, 4,713,788, Cl. 364-718.000.

Ogawa, Takayuki; Ito, Hideaki; Kimura, Naokazu; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitao; Watanabe, Takashi; Shinano, Kunizo; Kuwabara, Takashi; and Aoki, Kaoru, to Electric Power Development Co., Ltd.; Kawasaki Jukogyo Kabushiki Kaisha; and Sumitomo Heavy Industries, Ltd. Preparation of deashed high solid concentration coal-water slurry, 4,712,742, Cl. 241-20.000.

Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, to Hitachi, Ltd. Semiconductor integrated circuit, 4,713,796, Cl. 365-189.000.

Ohayon, Jacques J.; and Williams, Glen P., to Ohayon, Jacques J. Outpatient monitoring systems, 4,712,562, Cl. 128-672.000.

Ohbayashi, Keiji: See—
Nakamura, Shinichi; and Ohbayashi, Keiji, 4,713,317, Cl. 430-551.000.

Ohbuchi, Toru: See—
Nakayama, Tomobumi; Mori, Toshihiko; Hirose, Masayuki; Ohbuchi, Toru; Miyata, Masanori; Nakamura, Shinichi; and Honjo, Takeshi, 4,712,908, Cl. 355-14.0SH.

Ohga, Shinji: See—
Hatakeyama, Takuya; and Ohga, Shinji, 4,713,024, Cl. 439-555.000.

Ohgita, Kazuyuki: See—
Anzai, Shunju; Sasaki, Hiromu; Kunikawa, Norihide; and Ohgita, Kazuyuki, 4,713,550, Cl. 250-560.000.

Ohio State University Research Foundation, The: See—
Stevens, Vernon C., 4,713,366, Cl. 514-13.000.

Ohkawa, Shuji: See—
Nakamura, Hiro; Ohkawa, Shuji; Ohtsuka, Yasuo; Tachikawa, Hajime; and Shinozaki, Toshiya, 4,712,970, Cl. 414-730.000.

Ohnishi, Tadakazu: See—
Higashi, Kenji; Ohnishi, Tadakazu; and Tsukuda, Ichizo, 4,713,216, Cl. 420-532.000.

Ohno, Hiroto, to Victor Company of Japan. Control circuit for DC brushless motor producing constant output torque, 4,713,590, Cl. 318-254.000.

- Ohno, Kiyoshi: See—
Ozaki, Haruhiko; Yamada, Tadatoshi; Machida, Kunio; Ohno, Kiyoshi; Shimazaki, Hiroto; Inoue, Hidekimi; and Uji, Ryohei, 4,713,686, Cl. 358-107.000.
- Ohno, Sachio; Ebihara, Yuko; Mizukoshi, Kiyoshi; Ichihara, Kenji; Ban, Takao; and Nagasaka, Mitsuaki, to Maruko Seiyaku Co., Ltd. Ergoline derivatives and acid addition salts thereof, 4,713,457, Cl. 546-67.000.
- Ohno, Yasunori; Kurosawa, Tomoe; Sato, Tadashi; Kurosawa, Yukio; and Hakamata, Yoshimi, to Hitachi, Ltd. Ion source, 4,713,585, Cl. 315-111.810.
- Ohodaira, Osamu: See—
Wakisaka, Yoshiharu; Uo, Junko; Matsumoto, Kouichi; Ohodaira, Osamu; and Tanaka, Kentaro, 4,713,241, Cl. 424-93.000.
- Ohshima, Keiichi, to Seiko Epson Corporation. Color printer including a multiple color ink ribbon cartridge and tensioning device, 4,712,931, Cl. 400-196.100.
- Ohta, Masaki: See—
Inagaki, Mitukane; Ohta, Masaki; Hyodo, Akihiko; Takenaka, Kenji; Mitubata, Takashi; Suzuki, Shinichi; and Kayukawa, Hiroaki, 4,712,982, Cl. 417-222.000.
- Ohta, Norio; Yanagishima, Fumiya; Kaihara, Toshikazu; Kishida, Akira; Sato, Kuniki; and Ochiai, Masanobu, to Kawasaki Steel Corporation. Continuous annealing and pickling method and apparatus for steel strips, 4,713,154, Cl. 204-145.00R.
- Ohta, Youichi: See—
Hirama, Shinichi; Nishiyama, Toshio; Ohta, Youichi; Uzuka, Makoto; Tomita, Kenichi; Nakajima, Keisuke; and Furuse, Kazumaro, 4,713,397, Cl. 514-690.000.
- Ohtaguro, Masami: See—
Ando, Shinji; Ohtaguro, Masami; Masuda, Takayoshi; and Watanabe, Yoshimoto, 4,713,245, Cl. 424-438.000.
- Ohtaka, Keiji, to Canon Kabushiki Kaisha. Sharp focus detecting device, 4,712,901, Cl. 354-407.000.
- Ohtsuka, Yasuo: See—
Nakamura, Hiro; Ohkawa, Shuji; Ohtsuka, Yasuo; Tachikawa, Hajime; and Shinozaki, Toshiya, 4,712,970, Cl. 414-730.000.
- Oikawa, Saburo: See—
Terawasa, Yoshio; and Oikawa, Saburo, 4,713,679, Cl. 357-38.000.
- Oikawa, Shoji; Yamagishi, Hiroshi; Saito, Shigeru; Fujita, Tsuyoshi; and Watanabe, Takayoshi, to Hitachi, Ltd. Multilayer ceramic circuit board, 4,713,494, Cl. 174-68.500.
- Ojala, William: See—
Robinson, Donald L.; and Ojala, William, 4,712,870, Cl. 350-243.000.
- Okabe, Yoshio: See—
Kodama, Hisashi; and Okabe, Yoshio, 4,713,045, Cl. 474-135.000.
- Okada, Hisashi: See—
Kubodera, Seiti; Ukai, Toshinao; and Okada, Hisashi, 4,713,316, Cl. 430-351.000.
- Okada, Shinjiro; Kanbe, Junichiro; Tsuboyama, Akira; and Inaba, Yutaka, to Canon Kabushiki Kaisha. Ferroelectric display panel of varying thickness and driving method therefor, 4,712,877, Cl. 350-350.00S.
- Okada, Shinjiro: See—
Kanbe, Junichiro; and Okada, Shinjiro, 4,712,873, Cl. 350-337.000.
- Taniguchi, Osamu; Okada, Shinjiro; and Ando, Yujiro, 4,712,878, Cl. 350-350.00S.
- Okada, Wataru: See—
Nakashima, Toshimitsu; Okada, Wataru; and Mitani, Toragoro, 4,713,443, Cl. 528-499.000.
- Okamoto, Kyoichi: See—
Morishita, Akira; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Hasegawa, Akinori; Arima, Takemi; and Kounou, Tadami, 4,712,451, Cl. 74-801.000.
- Okamoto, Masayoshi; Suzuki, Katsuhisa; Hoshino, Ryoichi; and Sasaki, Hironaka, to Showa Aluminum Kabushiki Kaisha. Horizontal stack type evaporator, 4,712,612, Cl. 165-146.000.
- Okawa, Hiroshi: See—
Saito, Koji; and Okawa, Hiroshi, 4,713,633, Cl. 333-222.000.
- Okaya, Takuji: See—
Aoyama, Akimasa; Moritani, Takeshi; Yonezu, Kiyoshi; Negi, Taiichi; and Okaya, Takuji, 4,713,296, Cl. 428-412.000.
- Okazaki, Toru: See—
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- Oki Electric Industry Co., Ltd.: See—
Egawa, Takashi; and Sano, Yoshiaki, 4,713,354, Cl. 437-22.000.
- Okita, Tsutomu: See—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,713,287, Cl. 428-336.000.
- Okuzono, Shuichi; Tanaka, Tetsuo; Oda, Yasuhiro; Shintani, Takashi; and Emura, Noriaki, to Toyo Soda Manufacturing Co., Ltd. Alcoholic solution of sulphonic acid-containing copolymer dyed with basic dye, 4,713,083, Cl. 8-557.000.
- Old, Lloyd J.: See—
Bander, Neil H.; Whitmore, Willet F.; and Old, Lloyd J., 4,713,352, Cl. 436-548.000.
- Olson, Robert K.: See—
Reno, Mark E.; Olson, Robert K.; and Kalnes, Tom N., 4,713,167, Cl. 208-59.000.
- Olympic Optical Co., Ltd.: See—
Fujimori, Hiroyoshi; and Nagasaki, Tatsuo, 4,713,683, Cl. 358-42.000.
- Hakamatsuka, Yasuharu; and Yokoyama, Nobuyuki, 4,713,006, Cl. 433-201.100.
- Yoshikawa, Shoji, 4,713,819, Cl. 372-9.000.
- Omatsu, Masayuki; Yonese, Naoki; and Kondo, Mitsuru, to Kanzaki Paper Manufacturing Co., Ltd. Method for producing cycloalkyl aminophenol derivatives, 4,713,488, Cl. 564-397.000.
- OMCO, Inc.: See—
Agbay, Anthony J., 4,712,395, Cl. 70-34.000.
- Omori, Kiyoshi, to Nissan Motor Co., Ltd. Automotive window and molding assembly having a device for mounting a corner joint, 4,712,826, Cl. 296-93.000.
- Omori, Norio: See—
Abe, Tomoaki; Fujisawa, Hideya; Omori, Norio; Kinugawa, Masumi; Ito, Katsunori; Akiyama, Susumu; Mizuno, Tiaki; and Yamada, Toshitaka, 4,713,765, Cl. 364-431.050.
- Omron Tateisi Electronics Co.: See—
Mikami, Kazuo; Yamashita, Tsukasa; and Katoh, Mitsutaka, 4,712,854, Cl. 350-96.120.
- Ueda, Kenji, 4,713,602, Cl. 323-354.000.
- Yamada, Kazutoshi; and Yamaguchi, Takao, 4,713,760, Cl. 364-405.000.
- O'Neill, Nelson L.: See—
Ungar, Israel S.; O'Neill, Nelson L.; Scher, Herbert I.; and O'Dell, Robin D., 4,713,138, Cl. 156-307.400.
- Ono, Satoshi: See—
Watanabe, Isao; Momonoi, Kaishu; Hiraiwa, Toru; Ono, Satoshi; Nakano, Joji; Nagumo, Katsuyuki; and Takagi, Hiroyasu, 4,713,387, Cl. 514-332.000.
- Ono, Taizo: See—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,713,459, Cl. 546-150.000.
- Onoue, Hiroshi; and Takahashi, Hiromi, to Shionogi & Co., Ltd. Process for producing glutamic acid derivatives, 4,713,461, Cl. 548-194.000.
- Oonoza, Motohisa: See—
Ishii, Yugo; Oonoza, Motohisa; and Katamine, Akihiko, 4,712,428, Cl. 73-644.000.
- Ontario Cancer Institute, The: See—
Mak, Tak W., 4,713,332, Cl. 435-70.000.
- Ooishi, Kazuya: See—
Umeda, Takao; Ooishi, Kazuya; Igawa, Tatsuo; and Hori, Yasuo, 4,712,876, Cl. 350-350.00S.
- Ooki, Yoshitaka: See—
Ura, Syouzabu; Yasuda, Makoto; and Ooki, Yoshitaka, 4,712,532, Cl. 123-572.000.
- Oonaka, Hidemi: See—
Baika, Toyokazu; and Oonaka, Hidemi, 4,712,442, Cl. 74-467.000.
- Oosaka, Sigeneri; and Negishi, Kenji, to Fuji Photo Film Co., Ltd. Device for mounting magnetic head, 4,713,706, Cl. 360-104.000.
- Opprecht, Jurg: See—
Opprecht, Paul; Urech, Werner; and Opprecht, Jurg, 4,712,960, Cl. 413-74.000.
- Opprecht, Paul; Urech, Werner; and Opprecht, Jurg, to Elpatronic A.G. Openable can body, 4,712,960, Cl. 413-74.000.
- Orbital Engine Company Proprietary Limited: See—
Smith, Darren A.; and Thompson, Ian R., 4,712,524, Cl. 123-198.00A.
- Orndorff, Karl B.: See—
Sherwood, Edward F.; and Orndorff, Karl B., 4,712,651, Cl. 187-1.00R.
- Ortho Pharmaceutical Corporation: See—
Pascone, John M., 4,713,480, Cl. 560-157.000.
- Orvik, Jon A.: See—
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- Osawa, Namieki: See—
Nakamura, Makoto; Takahashi, Mitsuru; Osawa, Namieki; and Murakami, Yuichi, 4,713,044, Cl. 474-135.000.
- Osborne, Anthony, to Kearney-National, Inc. Electric bypass switch, 4,713,500, Cl. 200-48.0KB.
- Oscar Mayer Foods Corporation: See—
Mally, Timothy G., 4,712,458, Cl. 83-86.000.
- Oser, Richard B., to New Ocean Wind Products, Inc. Multiple support bar for manipulation of a hand-held sail assembly, 4,712,498, Cl. 114-39.200.
- Oshikoshi, Yuji, to Fuji Photo Film Co., Ltd. CRT composite image printing method and apparatus, 4,712,909, Cl. 355-20.000.
- Oshimi, Tetsuro: See—
Yamagishi, Hideaki; and Oshimi, Tetsuro, 4,713,759, Cl. 364-200.000.
- Osinga, Halbe: See—
Osseyran, Anwar; Van De Meerakker, Jacobus J. M.; Van Der Meulen, Harmen; and Osinga, Halbe, 4,713,641, Cl. 335-213.000.
- Osseyran, Anwar; Van De Meerakker, Jacobus J. M.; Van Der Meulen, Harmen; and Osinga, Halbe, to U.S. Philips Corporation. Electromagnetic deflection unit, 4,713,641, Cl. 335-213.000.
- Ossowski, Richard: See—
Antonelli, Douglas C.; Branscomb, Patricia M.; Broockman, Eric C.; Dickson, LeRoy D.; Koppel, Caralee P.; Ossowski, Richard; and Stokes, Olen L., Jr., 4,713,785, Cl. 364-569.000.
- Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Ahlers, Klaas, to BASF Aktiengesellschaft. Urea/polyamine/secondary monoamine/polyalcohol condensate, 4,713,440, Cl. 528-367.000.
- Osterloh, Rolf: See—
Schupp, Eberhard; Osterloh, Rolf; Loch, Werner; and Ahlers, Klaas, 4,713,406, Cl. 523-415.000.

- Ostoich, Vladimir E.: See—
Allen, Jimmy D.; Cobb, Michael E.; Hillman, Robert S.; Mungall, Dennis R.; Ostoich, Vladimir E.; and Stroy, Gary H., 4,712,460, Cl. 83-208.000.
- Otsubo, Hitoshi: See—
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- Otsuka Kagaku Kabushiki Kaisha: See—
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Uto, Seiryu; and Hayase, Syozo, 4,713,452, Cl. 540-358.000.
- Otsuka, Kazuhisa: See—
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- Otsuki, Akihiro: See—
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- Otto, Jurg: See—
Hofmann, Franz; Trapp, Hans G.; Rietzschner, Rolf; Otto, Jurg; Kaettlitz, Wolfgang; and Trinki, Gerd, 4,713,180, Cl. 210-773.000.
- Ou, Jung-Hsing: See—
Hartmann, Robert F.; Chan, Yiu-Fai; Frankovich, Robert J.; Ou, Jung-Hsing; So, Hock C.; and Wong, Sau-Ching, 4,713,792, Cl. 364-900.000.
- Ouellette, Maurice J.: See—
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- Overall, Colin D.: See—
Knapp, Alan G.; Overall, Colin D.; and Slater, Richard A. M., 4,713,575, Cl. 313-400.000.
- Overbury, Francis G.; Ward, Christopher R.; and Searle, Jeffrey G., to STC plc. Adaptive antenna, 4,713,668, Cl. 342-384.000.
- Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Power generating optical filter, 4,713,493, Cl. 136-249.000.
- Owen, Barry C.: See—
McDonald, Kenneth P.; Rangwala, Badruddin K.; Owen, Barry C.; and Rodocker, Frank A., 4,712,665, Cl. 198-346.200.
- Owen, David O.; and Connelly, Lawrence J., to Nalco Chemical Company. Iron removal from bayer process liquor, 4,713,222, Cl. 423-122.000.
- Owens-Corning Fiberglas Corporation: See—
McCague, John A., 4,713,106, Cl. 65-128.000.
- Owens-Illinois Closure Inc.: See—
Amos, Charles W., 4,712,473, Cl. 101-4.000.
- Owens-Illinois Glass Container Inc.: See—
Keyes, Melvin H., 4,713,335, Cl. 435-183.000.
- Owens-Illinois Plastic Products Inc.: See—
Jabarin, Saleh A.; and Ajmera, Prakash R., 4,713,269, Cl. 428-35.000.
- Jabarin, Saleh A.; and Ajmera, Prakash R., 4,713,270, Cl. 428-35.000.
- Panazzolo, Aldo, 4,712,680, Cl. 206-427.000.
- Oxley, Lonnie R., to Deere & Company. Quick attachable and detachable mower blade assembly, 4,712,364, Cl. 56-295.000.
- Oy Nokia AB: See—
Pennanen, Risto; and Pennala, Jyrki, 4,713,103, Cl. 65-3.110.
- Oy Tampella AB: See—
Saarinen, Esko, 4,713,147, Cl. 162-358.000.
- Oy Wartsila AB: See—
Rantanen, Rauno; and Westergard, Sivert, 4,712,506, Cl. 118-103.000.
- Oyagi, Takashi; and Tsunoda, Kazuyuki, to NEC Corporation. Pager with display, 4,713,659, Cl. 340-825.440.
- Ozaki, Haruhiko; Yamada, Tadatoshi; Machida, Kunio; Ohno, Kiyoshi; Shimazaki, Hiroto; Inoue, Hidekimi; and Uji, Ryohei, to Bridgestone Corporation. High speed instantaneous multi-image recorder, 4,713,686, Cl. 358-107.000.
- P.G.L. Industries, Inc.: See—
Leite, Peter G., 4,712,763, Cl. 248-553.000.
- Pacesetter Infusion, Ltd.: See—
Pelmulder, John P.; Gorton, Lanny A.; Guleserian, Armen J.; and Livingston, John H., 4,712,583, Cl. 137-852.000.
- Pacey, Grant K.: See—
Lukas, Helmut H.; and Pacey, Grant K., 4,712,861, Cl. 350-96.210.
- Pacific Scientific Co.: See—
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- Padgett, Bobby R. Fishhook and lure retrieving device, 4,712,324, Cl. 43-17.200.
- Padilla, Felipe N.: See—
Chiang, Peter K.; Richard, Michelle M.; Padilla, Felipe N.; Carroll, Frank I.; and Abraham, Philip, 4,713,391, Cl. 514-412.000.
- Padwa, Allen R.: See—
Lavengood, Richard E.; Padwa, Allen R.; and Harris, Alva F., 4,713,415, Cl. 525-66.000.
- Paek, Un-Chul: See—
Krause, John T.; Kurkjian, Charles R.; and Paek, Un-Chul, 4,713,105, Cl. 65-4.100.
- Page, Lawrence J. Lineman's safety strap assembly, 4,712,646, Cl. 182-9.000.
- Palac, Kazimir: See—
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- Palloch, Herbert: See—
Erndt, Hans; Link, Erich; Martin, Adolf; Palloch, Herbert; and Wittler, Hilmar, 4,712,660, Cl. 192-18.00B.
- Palmer, Ansell W.: See—
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- Palmer, Gary E., to Hako Minuteman, Inc. Brake drum encapsulator, 4,712,270, Cl. 15-345.000.
- Palmer, Robert S.: See—
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- Panazzolo, Aldo, to Owens-Illinois Plastic Products Inc. Reinforced self-centering plastic carrier for bottles, 4,712,680, Cl. 206-427.000.
- Pangburn, William E., to Haeffliger, William W., a part interest. Cushioned abrasive composite, 4,712,552, Cl. 128-355.000.
- Pappas, Barbara: See—
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- Parker Chemical Company: See—
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- Peele, Camille; Harwood, Jon W.; and Resuggan, Peter L., to AP Industries, Inc. Clamp apparatus, 4,712,295, Cl. 29-700.000.
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- Pejouhy, Radi; Nield, Joseph G., Jr.; D'Entremont, John R.; Beggs, Louis C.; and Rotulo, Fabrizio, to Texas Instruments. Protected refrigerator compressor motor systems and motor protectors, 4,713,717, Cl. 361-26.000.
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Baum, Samuel; and Yaeger, John R., 4,713,643, Cl. 337-140.000.

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- RCA Corporation: See—
Carrell, Ross M., 4,712,784, Cl. 271-108.000.
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Smith, Edgar M., 4,713,598, Cl. 323-245.000.
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- Red Man Pipe and Supply Company: See—
Evans, Richard B., 4,712,585, Cl. 138-44.000.
- Reddy, Gauknapalli C.: See—
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- Redko, Grigory V.: See—
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- Redland Roof Tiles Limited: See—
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- Reece, Marvin P.; and Rosan, Jose, Jr., to Rexnord Inc. Expandable fastener assembly. 4,712,955, Cl. 411-17.000.
- Rees, Inc.: See—
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- Reeves, Doyle E., to Hydril Company. Metal-to-metal wedge thread coupling connector. 4,712,815, Cl. 285-334.000.
- Reeves, Scott P.: See—
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- Regency Electronics, Inc.: See—
Boone, Joseph E.; and Ahlemeyer, W. Bruce, 4,713,661, Cl. 340-994.000.
- Regina Co., Inc., The: See—
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- Region Wallonne: See—
Dumont, Pierre; and Poupaert, Jacques, 4,713,390, Cl. 514-389.000.
- Regnier, Kent E.; Hoover, Thomas C.; and Walse, Alan S., to Molex Incorporated. Compliant high density edge card connector with contact locating features. 4,713,013, Cl. 439-62.000.
- Reil, Wilhelm; and Deutschbein, Ulrich, to Tetra Pak Finance & Trading S.A. Process for the production of a liquid package and apparatus for implementation of the process. 4,713,048, Cl. 493-74.000.
- Reillard, Ulrich, to M.A.N.Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Electronic valve control for sloughing machines. 4,712,682, Cl. 209-455.000.
- Reinecke, Paul: See—
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- Reinhardt, Peter: See—
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- Reinmuller, Johannes. Plastic implant. 4,713,073, Cl. 623-8.000.
- Reiser, Wolf: See—
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- Renaud, Jean-Marie; Gams, Paul; Perrot, Jean-Claude; and Taillebois, Jacques, to M.C.B. Optical position locating device. 4,713,541, Cl. 250-231.05E.
- Renga, James M.: See—
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- Renner, Alfred; Haug, Theobald; and Schreiber, Bruno, to Ciba-Geigy Corp. Polymers formed from allyl-substituted or methallyl-substituted, bicyclic, unsaturated dicarboxylic anhydrides. 4,713,417, Cl. 525-117.000.
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- Renz, Klaus: See—
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- Renzi, Fiorenzo; Rivetti, Franco; Romano, Ugo; and Gagliardi, Claudio, to Enichem Sintesi S.p.A. Liquid and polymerizable composition suitable for the production of organic glasses endowed with high abrasion strength. 4,713,433, Cl. 526-314.000.
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- Research Corporation Technologies, Inc.: See—
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- Research Development Corporation of Japan: See—
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- Resuggan, Peter L.: See—
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- Reynolds, Robert L. Drilling fixture and work holder. 4,712,950, Cl. 408-72.000.
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- Rhythm Watch Company Limited: See—
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- Ricci, Louis N.: See—
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- Ricciardelli, Robert H., to Criticare Systems, Inc. Liquid separator for gas analyzer. 4,713,095, Cl. 55-189.000.
- Ricciottiello, Salvatore R.; Smith, Marnell; Goldstein, Howard E.; and Zimmerman, Norman B., to United States of America, National Aeronautics and Space Administration. Ceramic/ceramic shell tile thermal protection system and method thereof. 4,713,275, Cl. 428-76.000.
- Rich, Donald R.: See—
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- Richard, Michelle M.: See—
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- Richardson, David G.: See—
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- Richardson, Geoffrey: See—
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- Richter Gedeon Vegyeszeti Gyar Rt.: See—
Ezer, Elemer; Harsanyi, Kalman; Petho, Hajnalka V.; Matuz, Judit; Szporny, Laszlo; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kopolnas, Marta; and Kallay, Anna, 4,713,388, Cl. 514-346.000.
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- Riella Serrature S.R.L.: See—
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- Risthaus, Josef: See—
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- Riuli, Arduino; E., to Becton, Dickinson and Company. Syringe assembly. 4,713,060, Cl. 604-199.000.
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- Rizzie, Joseph W.: See—
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- Robbins, Lanny A., to Dow Chemical Company, The. System and method for removing volatile components from an aqueous medium. 4,713,089, Cl. 55-52.000.
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- Roberts, Bruce E.; Black, Jimmy C.; and Matlock, Dyer A., to Harris Corporation. Method of ensuring adhesion of chemically vapor deposited oxide to gold integrated circuit interconnect lines. 4,713,260, Cl. 437-238.000.
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- Roberts, Jon A.: See—
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- Robinson, William M.: See—
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- Romanski, John G.: See—
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- Romeo, Aurelio: See—
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- Romine, Richard A. Portable and collapsible platform. 4,712,647, Cl. 182-96.000.
- Rommen, Hans; and Stoy, Erich, to SMS Schloemann-Siemag AG. Six-high roll stand with offset inner backup rolls. 4,712,416, Cl. 72-241.000.
- Romualdus Ter Horst, Gerhardus E.: See—
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- Roos, Gerhard; Dexling, Hartmut; and Michael, Wolfgang, to L. Schuler GmbH. Drawing apparatus in presses. 4,712,412, Cl. 72-345.000.
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- Rose, Donald T.: See—
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- Rose, Leo J. Sea wave dissipator apparatus and method for its manufacture. 4,712,944, Cl. 405-26.000.
- Roseano, Giancarlo, to Danieli & C. Officine Meccaniche SpA. Device to count bars. 4,712,666, Cl. 198-503.000.
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- Rosenbaum, Stanley D.; and Plett, Calvin, to Northern Telecom Limited. Amplifier with double rail output. 4,713,838, Cl. 379-252.000.
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- Rosenfeld, Jeffrey L.: See—
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- Rosenhouse, Harvey: See—
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- Roskind, James A., to Harris Corporation. Digital hardware selection filter. 4,713,786, Cl. 364-715.000.
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- Rostek, Paul M.: See—
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- Rotulo, Fabrizio: See—
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- Rouse, W. J.: See—
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- Rox, Rainer: See—
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- Roy, Suva B., to Du Pont de Nemours, E. I., and Company. Co-spray technique. 4,712,310, Cl. 34-5.000.
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- Russell, Frederick E., to Protectaire Systems Co. Method and apparatus for handling sludge. 4,713,181, Cl. 210-776.000.
- Russell, Michael J., to Geotech Engineering. Seismic air gun. 4,713,800, Cl. 367-144.000.
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- Ryder International Corporation: See—
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- Saab-Scania AB: See—
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- Sabet, Iraj, to Stella Werke AG. Apparatus for producing coated panels. 4,712,765, Cl. 249-91.000.
- Sachse, Hans-Ernst, to Sachse, Hans-Ernst. Guiding mandrin for drainage ducts. 4,713,058, Cl. 604-165.000.
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- St. Clair, Terry L.; Maudgal, Shubha; and Pratt, J. Richard, to United States of America, National Aeronautics and Space Administration. Poly(carbonate-imide) polymer. 4,713,439, Cl. 528-353.000.
- Saito, Koji; and Okawa, Hiroshi, to Murata Manufacturing Co., Ltd. Cover attaching arrangement for casing of dielectric coaxial resonators. 4,713,633, Cl. 333-222.000.
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- Saito, Takaharu: See—
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- Saito, Tatsuya, to Kai Cutlery Center Co., Ltd. Safety razor. 4,712,301, Cl. 30-47.000.
- Saito, Yutaka: See—
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- Sakaguchi, Yasuo: See—
Tegge, Bruce R.; Weary, Frank G.; and Sakaguchi, Yasuo, 4,713,413, Cl. 525-54.000.
- Sakai, Hideaki; and Kanai, Tadashi, to Shiratori Pharmaceutical Co., Ltd.; and Suntory Limited. Preparation process of (6R)-tetrahydro-L-biotin. 4,713,454, Cl. 544-258.000.
- Sakakibara, Yasuo: See—
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- Sakata, Kunihiro: See—
Nakamura, Kozoo; Kozima, Yasuyuki; Hamada, Nagaharu; and Sakata, Kunihiro, 4,713,699, Cl. 358-296.000.
- Sakato, Keiichiro, to Nippon Kogaku K.K. Exposure method and apparatus for semiconductor fabrication equipment. 4,712,910, Cl. 355-53.000.
- Sakhno, Lidia T.: See—
Arutjunian, Norair S.; Kornena, Elena P.; Kazarian, Robert V.; Ponomareva, Natalya A.; Redko, Grigory V.; Sakhno, Lidia T.; and Zhidkova, Irina S., 4,713,155, Cl. 204-155.000.
- Sakuma, Nobuo; and Takanashi, Keiichi, to Ricoh Company, Ltd. Lens system for deflected light beam. 4,712,884, Cl. 350-434.000.
- Sakurada, Nobuaki: See—
Kawamura, Hideaki; Sakurada, Nobuaki; Sato, Yuichi; and Watanabe, Yoshitaka, 4,713,701, Cl. 358-298.000.
- Watanabe, Yoshitaka; Sakurada, Nobuaki; Kawamura, Hideaki; and Sato, Yuichi, 4,713,746, Cl. 346-1.100.
- Salacuse, Frank S. Universal hanging packaging system. 4,712,671, Cl. 206-44.00R.
- Saladan, Carmelita: See—
Patel, Arvind D.; and Saladan, Carmelita, 4,713,183, Cl. 252-8.515.
- Salomon S. A.: See—
Morell, Joseph; and Petrini, Roland, 4,712,315, Cl. 36-117.000.
- Salts, Thomas R., to Besser Company. Bag palletizing system. 4,712,975, Cl. 414-786.000.
- Saluski, Robert A., to GTE Communication Systems Corporation. Real time usage meter for a processor system. 4,713,791, Cl. 364-900.000.
- Salvucci, Antonio: See—
Princiotta, Raymond A., Sr.; and Salvucci, Antonio, 4,712,787, Cl. 271-311.000.
- Salzburg, Herbert; Hajek, Manfred; Hagemann, Hermann; Kuhle, Engelbert; Fuhrer, Wolfgang; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, to Bayer Aktiengesellschaft. Fungicidally and bactericidally active acylated saccharin derivatives. 4,713,389, Cl. 514-373.000.
- Sanden Corporation: See—
Aoki, Kazumi; and Fujiu, Minoru, 4,712,385, Cl. 62-333.000.
- Sanders, Michael A.: See—
Russell, Donald J.; and Sanders, Michael A., 4,713,558, Cl. 307-264.000.
- Sandoz Pharmaceuticals Corp.: See—
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- Sanelli, Danilo. Knife having a handle coated with an elastomer, particularly for professional uses. 4,712,304, Cl. 30-343.000.
- Sangamo Weston, Inc.: See—
Simonetti, John J., 4,713,198, Cl. 252-301.170.
- Sanjoh, Akira: See—
Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezu, Tatsuya, 4,713,308, Cl. 430-65.000.
- Sano, Yoshiaki: See—
Egawa, Takashi; and Sano, Yoshiaki, 4,713,354, Cl. 437-22.000.
- SANOFI and Industria Chimica Prodotti FRANCIS S.p.A.: See—
Andre, Jean-Daniel; Grossi, Pierre-Jean; Heymes, Alain; and Manzaroli, Giovanni V., 4,713,485, Cl. 562-470.000.
- Sanofi S.A.: See—
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- Santa Barbara Research Center: See—
Malek, Fritz J., 4,712,867, Cl. 350-103.000.
- Santrade Limited: See—
Isakson, Karl B.; and Svahn, Bror G. K., 4,712,952, Cl. 408-211.000.
- Sanwo, Ikuro J.: See—
Lauffer, Donald K.; Milby, Gregory H.; Rostek, Paul M.; and Sanwo, Ikuro J., 4,713,827, Cl. 375-7.000.
- Sanyo Electric Co., Ltd.: See—
Yasuda, Isao; Yoshisato, Yoriobu; Yoshikawa, Hideki; and Taketa, Kazuhiko, 4,713,709, Cl. 360-121.000.
- Sasaki, Hiromu: See—
Anzai, Shunju; Sasaki, Hiromu; Kunikawa, Norihide; and Ohgita, Kazuyuki, 4,713,550, Cl. 250-560.000.
- Sasaki, Hironaka: See—
Okamoto, Masayoshi; Suzuki, Katsuhisa; Hoshino, Ryoichi; and Sasaki, Hironaka, 4,712,612, Cl. 165-146.000.
- Sasaki, Makoto; Yoshida, Jun; Shimizu, Yoshishige; Akazawa, Kiyoshi; Kishita, Eiji; and Hirata, Kaoru, to Mitsubishi Rayon Company Ltd. Fragrant fiber. 4,713,291, Cl. 428-373.000.
- Sasaki, Makoto: See—
Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, 4,713,468, Cl. 558-411.000.
- Sasaki, Nobuyoshi; Baba, Susumu; and Arai, Hisahiro, to M.C.L. Co., Ltd. Process for producing hollow cast article. 4,712,605, Cl. 164-516.000.
- Sasaki, Shingo: See—
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- Sasaoka, Michio: See—
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Uto, Seiryu; and Hayase, Syozo, 4,713,452, Cl. 540-358.000.
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Ohta, Norio; Yanagishima, Fumiya; Kaihara, Toshikazu; Kishida, Akira; Sato, Kuniaki; and Ochiai, Masanobu, 4,713,154, Cl. 204-145.00R.
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- Sato, Masao; Ichimura, Masaaki; and Sato, Kunio, to Sumitomo Cement Co., Ltd. Method for demolishing durable structures. 4,713,115, Cl. 106-118.000.

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- Takahashi, Teruomi; and Sato Tadashi, 4,713,698, Cl. 358-296.000.
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- Sato, Yuichi: See—
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Tatsuoka, Toshio; Suzuki, Kenji; Imao, Kayoko; Satoh, Fumio; Miyano, Seiji; and Sumoto, Kunihiro, 4,713,453, Cl. 544-60.000.
- Satou, Yasushi: See—
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- Sauvee, Jean-Paul, to Bendix France. Brake actuator with automatic adjustment. 4,712,655, Cl. 188-196.00D.
- Saviotti, Giancarlo: See—
Antolini, Adriano; Morigi, Rodolfo; and Saviotti, Giancarlo, 4,712,832, Cl. 297-180.000.
- Savvateev, Konstantin L.: See—
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,713,239, Cl. 424-81.000.
- Sawyer, Thomas F., to United States of America, Air Force. Apparatus for casting directionally solidified articles. 4,712,604, Cl. 164-513.000.
- Scangraphic Dr. Boger GmbH: See—
Holthausen, Bernd, 4,712,896, Cl. 354-5.000.
- Schachter, Rozalie: See—
Michel, Christian G.; Schachter, Rozalie; Kuck, Mark A.; Baumann, John A.; and Raccach, Paul M., 4,713,192, Cl. 252-62.30R.
- Schaefer, Daniel J.; and Belt, Kenneth W., to General Electric Company. Apparatus and method of acquiring physiological gating signals for magnetic resonance imaging of moving objects. 4,712,560, Cl. 128-653.000.
- Schaefer, Klaus-Dieter, to Ernst Leitz Wetzlar GmbH. Method and circuit arrangement for the automatic determination of an exposure value. 4,712,903, Cl. 354-433.000.
- Schäfer, Berthold, to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V. Missile. 4,712,748, Cl. 244-3.220.
- Schaffitz, Wolfgang, to Institut für Motorenbau Professor Huber e.V. Fuel injection system. 4,712,528, Cl. 123-446.000.
- Schamblin, Charles. Vehicle warning system. 4,713,732, Cl. 362-61.000.
- Schan, Edward P., Jr.: See—
Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Schan, Edward P., Jr., 4,713,834, Cl. 379-28.000.
- Scharf, James E. Grain box cleaner device. 4,712,821, Cl. 294-19.100.
- Schauder, Colin D., to Westinghouse Electric Corp. Vector-controlled unrestricted frequency changer (UFC) system and variable speed AC motor drive using such a system. 4,713,745, Cl. 363-161.000.
- Schaumburg, John P.; Hokanson, Gerard C.; French, James C.; Tunac, Josefine B.; and Underhill, Marjorie A., to Warner-Lambert Company. 2-chloropentostatin compound having adenosine diaminase inhibitory activity. 4,713,372, Cl. 514-45.000.
- Scheibli, Peter; and Seitz, Karl, to Ciba-Geigy Corporation. Process for dyeing or printing textile fibre materials with reactive dye containing vinyl sulfonyl-type group and chloro-triazinyl amino group. 4,713,082, Cl. 8-549.000.
- Scheller, Holger, to Guilford Mills, Inc. Napped warp-knitted fabric and method of producing same. 4,712,281, Cl. 28-162.000.
- Scher, Herbert I.: See—
Ungar, Israel S.; O'Neill, Nelson L.; Scher, Herbert I.; and O'Dell, Robin D., 4,713,138, Cl. 156-307.400.
- Scherer, Wilfried: See—
Moll, Helmut; Wiegand, Gerd; Schindler, Josef; Scherer, Wilfried; and Marth, Kurt, 4,712,723, Cl. 228-111.000.
- Schering Corporation: See—
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- Scherrer, Robert A.: See—
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- Scheuble, Bernhard: See—
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- Schiesler, Walter A. Extrusion means for producing rubber profiles. 4,712,989, Cl. 425-114.000.
- Schiller, Harold, to Ardrex Inc. Composition and method for stripping films from printed circuit boards. 4,713,144, Cl. 156-656.000.
- Schimko, Reinhold, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Flat knitting machine. 4,712,391, Cl. 66-115.000.
- Schimmel, Gunther; and Gradl, Reinhard, to Hoechst Aktiengesellschaft. Process for purifying phosphoric acid. 4,713,229, Cl. 423-321.00R.
- Schimmel, Paul R.: See—
Jasin, Maria; and Schimmel, Paul R., 4,713,337, Cl. 435-172.300.
- Schindl, Klaus P., to C. Reichert Optische Werke AG. Photometer for use with a microscope. 4,712,889, Cl. 350-511.000.
- Schindler, Josef: See—
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- Schiraldi, Michael T.; Perl, Martin M.; and Rubin, Howard, to Johnson & Johnson Products, Inc. Bioadhesive extruded film for intra-oral drug delivery and process. 4,713,243, Cl. 424-151.000.
- Schittenhelm, Hans-Joachim; Joseph, Werner; and Trogel, Gerhard, to Bayer Aktiengesellschaft. Heating element combined glass/enamel overcoat. 4,713,530, Cl. 219-543.000.
- Schlemmermeyer, Horst: See—
Herwig, Jens; Norenberg, Hagen; Bergmann, Friedhelm; Stiller, Manfred; Schlemmermeyer, Horst; Schmidt, Wilfried; Straube, Hilmar; and Wolter, Helmut, 4,712,434, Cl. 73-864.630.
- Schlosser, Donald E.: See—
Grunert, Kurt A.; and Schlosser, Donald E., 4,713,639, Cl. 335-172.000.
- Schloz, Gerhard; and Weitmann, Heinz, to Weitmann & Konrad GmbH & Co. KG. Apparatus for metering dusting powder. 4,712,716, Cl. 222-189.000.
- Schlumberger Technology Corp.: See—
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- Schmetz GmbH & Co. KG Unternehmensverwaltung: See—
Schmetz, Peter; and Gierse, Dieter, 4,713,124, Cl. 148-128.000.
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- Schmidt Feinteknik GmbH: See—
Schmidt, Rolf; and Schneider, Roland, 4,712,937, Cl. 401-213.000.
- Schmidt, Lothar, to Wamsler-Herd-Und Ofen GmbH. Process and apparatus for the controlled burning of a vertical stack of solid fuel. 4,712,491, Cl. 110-346.000.
- Schmidt, Rolf; and Schneider, Roland, to Schmidt Feinteknik GmbH. Plotter stylus with cap covered vent. 4,712,937, Cl. 401-213.000.
- Schmidt, Wilfried: See—
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- Schmitz, Jürgen, to Mannesmann Rexroth GmbH. Method and apparatus for compensating the variable weight of a mass acting on a hydraulic drive, in particular for the upright drive cylinder of a lapping machine. 4,712,470, Cl. 91-433.000.
- Schneeberger, Ruedi: See—
Graf, Felix; Schneeberger, Ruedi; and Symon, Georg, 4,712,746, Cl. 242-43.00R.
- Schneider, Burnett M., to Aqua-Chem Inc. Scale inhibitor. 4,713,195, Cl. 252-180.000.
- Schneider, Michel: See—
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- Schneider, Roland: See—
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- Schneider, Wesley. Liquid storage and delivery system for protective mask. 4,712,594, Cl. 141-114.000.
- Schoendorfer, Donald W.; and Hansen, Lee E., to Hemascience Laboratories, Inc. Plasmapheresis system and method. 4,713,176, Cl. 210-645.000.
- Schoene, Carl M., to GTE Products Corporation. Sealing structure for metal vapor arc discharge lamps. 4,713,580, Cl. 313-624.000.
- Schoening, Josef; and Elter, Claus, to Hochtemperatur-Reaktorbau GmbH. Nuclear reactor plant housed in a steel pressure vessel with a gas cooled small high temperature reactor. 4,713,213, Cl. 376-299.000.
- Scholten, Gerard J.; Dieleman, Louis F. A.; and Blankers, Johannes M. M., to U.S. Philips Corporation. Tape packing for electrical or electronic components. 4,712,675, Cl. 206-332.000.
- Scholz, Matthew T.: See—
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- Scholz, Stefan: See—
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- Schreder, Felix: See—
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- Schreib, Bernhard; and Schreiber, John K. Bird feeder made from a plastic bottle, including apparatus therefor and a method of making. 4,712,512, Cl. 119-52.00R.
- Schreib, John K.: See—
Schreib, Bernhard; and Schreiber, John K., 4,712,512, Cl. 119-52.00R.
- Schreiber, Bruno: See—
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- Schreiber Foods, Inc.: See—
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- Schrimpf, Christian, to Leine & König. System for sealing barrier constructions in subterranean galleries. 4,712,945, Cl. 405-132.000.
- Schroder, Gunther: See—
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- Schroder, Johann: See—
Bukoschek, Romuald L.; Eckel, Merowech; and Schroder, Johann, 4,712,386, Cl. 62-342.000.
- Schroder, Ulf. Crystallized carbohydrate matrix for biologically active substances, a process of preparing said matrix, and the use thereof. 4,713,249, Cl. 424-488.000.
- Schroeder, Clifford A. Molded fiberglass air return filter grille. 4,713,099, Cl. 55-385.00R.

- Schudel, Peter; Schwarzenbach, Rolf; and Gonzenbach, Hans U., to Olvaidan Corporation. Process for treating 2-ethylhexyl p-methoxycinnamate in the presence of a phenol. 4,713,473, Cl. 560-053.000.
- Schulte, Thomas L. Method of ameliorating obstructions of the bowel. 4,713,377, Cl. 514-166.000.
- Schulten, Rudolf: See—
Weirich, Walter; Barnert, Heiko; Oertel, Michael; and Schulten, Rudolf, 4,713,234, Cl. 423-648.00R.
- Schultz, Thomas G.; Gross, Andrew; Pappas, Barbara; Shifrin, George D.; and Mack, Lois, to Express Communications, Inc. Electronic mail. 4,713,780, Cl. 364-514.000.
- Schumacher, Walter: See—
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- Schupp, Eberhard; Osterloh, Rolf; Loch, Werner; and Ahlers, Klaas, to BASF Aktiengesellschaft. Binders for cathodic electrocoating. 4,713,406, Cl. 523-415.000.
- Schupp, Eberhard: See—
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- Schurter, Rolf; and Rempfler, Hermann, to Ciba Geigy Corporation. 2-(4-(5-chloro-3-fluoropyridin-2-yloxy)phenoxy)-propionic acid-propenyl ester with herbicidal activity. 4,713,109, Cl. 71-94.000.
- Schuster, Richard L., to Manville Corporation. Carton with improved handle. 4,712,728, Cl. 229-52.00B.
- Schwartz, Gerald L.: See—
Cahill, Richard F.; Eck, Jeffrey A.; Schwartz, Gerald L.; Theriault, John P.; Turek, Philip A.; Udd, Eric; Wagoner, Raymond E.; and Wanser, Keith H., 4,712,306, Cl. 33-304.000.
- Schwartz, Henry L., to Sequoia-Turner Corporation. Tube trap apparatus. 4,713,218, Cl. 422-99.000.
- Schwartz, Myron, to 501 Aeroflex Laboratories, Incorporated. Low cogging motor. 4,713,569, Cl. 310-152.000.
- Schwarzenbach, Rolf: See—
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- Schweid, Jeffrey M.: See—
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- Schwinn Bicycle Company: See—
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- Szymaki, Eugene J., 4,712,790, Cl. 272-73.000.
- Science & Creative Co., Ltd.: See—
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- Scott, A. Carlisle; Clayton, Jan E.; and Garnier, Jacques, to Teknowledge, Incorporated; and Compagnie Generale de Geophysique. Intelligent assistant for using and operating computer system capabilities to solve problems. 4,713,775, Cl. 364-513.000.
- Scott, Francis H.: See—
Berg, Roger M.; and Scott, Francis H., 4,712,838, Cl. 301-37.05A.
- Scott, John C., to United States of America, Air Force. Igniter electrode life control. 4,713,574, Cl. 313-130.000.
- Scott, Millard: See—
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- Scott, Paul F.: See—
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- Seah, Kiok K.: See—
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- Searl, Alonzo H.; Hahn, Granville J.; and Rutledge, Raleigh N., to Cosden Technology, Inc. Foamed polymer tubing. 4,713,271, Cl. 428-36.000.
- Searle, Jeffrey G.: See—
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- Sedlacek, Hans-Harald: See—
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- Segal, Brahm R. Semi-conductor transformerless audio amplifier. 4,713,629, Cl. 330-263.000.
- Segalowitz, Ivar R.: See—
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- Sehnem, Hans P.: See—
Arndt, Michael; and Sehnem, Hans P., 4,713,490, Cl. 564-225.000.
- Seidel, Peter; Pelzl, Leo; and Zell, Karl, to Siemens Aktiengesellschaft. Device connecting the shielding of plugs to a subrack ground. 4,712,849, Cl. 439-607.000.
- Seidler, Jack, to North American Specialties Corp. Terminal strip with attached support and method of manufacture. 4,712,850, Cl. 439-861.000.
- Seighman, Jos T., to Durkee Industrial Foods Corp. Process for encapsulating liquid acids and product. 4,713,251, Cl. 426-96.000.
- Seiko Epson Corporation: See—
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- Seiko Instruments & Electronics Ltd.: See—
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- Watanabe, Shinya; Tanaka, Fumihito; Yamaguchi, Kaneo; Shimada, Yoshio; and Matsushima, Kenichi, 4,713,690, Cl. 358-148.000.
- Seitetsu Kagaku Co., Ltd.: See—
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- Seitz, Karl: See—
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- Sekida, Minoru: See—
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- Sekimura, Nobuyuki; Kamio, Masaru; Takao, Hideaki; Motoi, Taiko; and Murata, Tatsuo, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal device having color filters on row or column electrodes. 4,712,874, Cl. 350-339.00F.
- Sekine, Fumimaro; Kurosaki, Tomihiro; Ukena, Toshinao; and Kamitani, Hiroshi, to Kao Corporation. Ether carboxylates and process for preparing same. 4,713,487, Cl. 562-587.000.
- Sekiya, Osamu: See—
Haruguchi, Kenji; Kohguchi, Takuma; and Sekiya, Osamu, 4,712,499, Cl. 114-77.00R.
- Sekiya, Tetsuo: See—
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- Selina, John R.: See—
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- Serizawa, Takashi: See—
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- Shah, Mahendra, to Schering Corporation. Sustained release dosage form. 4,713,237, Cl. 424-78.000.
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- Katoh, Hiroyuki, 4,713,511, Cl. 219-10.55D.
- Kimura, Shinichi, 4,713,522, Cl. 219-202.000.
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- Shepard & Associates: See—
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- Shepherd, Clayton C., Jr.: See—
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- Sherlock, H. Paul: See—
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- Sherwood, Edward F.; and Orndorff, Karl B., to Westinghouse Electric Corp. Elevator cab. 4,712,651, Cl. 187-1.00R.
- Sherwood Medical Company: See—
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- Shifler, Donald A., to Du Pont de Nemours, E. I., and Company. Water-dispersible synthetic fiber. 4,713,289, Cl. 428-361.000.
- Shifrin, George D.: See—
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- Shih, Tzyy Z. Fire escape device. 4,712,645, Cl. 182-5.000.
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- Shimizu, Ryuichi; and Ikuta, Takashi, to Research Development Corporation of Japan. Scan line type dynamic observation apparatus. 4,713,687, Cl. 358-138.000.
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- Shinano, Kunizo: See—
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- Shinkawa, Keiro: See—
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- Shinko Kosen Kogyo Kabushiki Kaisha: See—
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- Shinoda, Takamitsu: See—
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- Shintani, Takashi: See—
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- Shinyei Kaisha: See—
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- Shionogi & Co., Ltd.: See—
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- Sakamoto, Teruo; Kawai, Sadao; Noda, Kinzaburo; Takeda, Toyohiko; and Kato, Hiroshi, 4,713,247, Cl. 424-461.000.
- Wakisaka, Yoshiharu; Uo, Junko; Matsumoto, Kouichi; Ohodaira, Osamu; and Tanaka, Kentaro, 4,713,241, Cl. 424-93.000.
- Shiozawa, Iwamitsu: See—
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- Shirahata, Ryuji: See—
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- Shirasaki, Masataka, to Fujitsu Limited. Polarization rotation compensator and optical isolator using the same. 4,712,880, Cl. 350-377.000.
- Shiratori Pharmaceutical Co., Ltd.: See—
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- Shishido, Tadao: See—
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- Sholder, Jason A.: See—
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- Showa Aluminum Kabushiki Kaisha: See—
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- Okamoto, Masayoshi; Suzuki, Katsuhisa; Hoshino, Ryoichi; and Sasaki, Hironaka, 4,712,612, Cl. 165-146.000.
- Shuch, Howard P. Binaural doppler collision alert system for general aviation aircraft. 4,713,669, Cl. 342-455.000.
- Shurtz, Richard R., II; and Sharp, Edward J., to United States of America, Army. Birefringent artificial dielectric structures. 4,712,881, Cl. 350-406.000.
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- Sibalis, Dan, to Drug Delivery Systems Inc. Applicator for non-invasive transcutaneous delivery of medicament. 4,713,050, Cl. 604-20.000.
- Sidney Rich Associates, Inc.: See—
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- Siegel, Bernard: See—
Gille, Henrick K.; Willing, Richard S.; Bloom, William G.; Siegel, Bernard; Cheung, Tsang; Lobodzinski, Richard; and Gilroy, Keith, 4,712,567, Cl. 128-771.000.
- Siegel, Richard C.; Marx, Christina S.; Hargitay, Bartholomew; and Wotherspoon, Neil, to Technicon Instruments Corporation. Hydrophilic assay reagent containing one member of specific binding pair. 4,713,350, Cl. 436-533.000.
- Siemens Aktiengesellschaft: See—
Adam, Peter; and Michel, Peter, 4,713,568, Cl. 310-112.000.
- Bachel, Ernst; and Giebel, Wolfgang, 4,713,272, Cl. 428-36.000.
- Becker, Michael; and Renz, Klaus, 4,713,604, Cl. 324-500.000.
- Feuerbaum, Hans-Peter; Frosien, Juergen; and Spehr, Rainer, 4,713,543, Cl. 250-310.000.
- Grage, Ludger, 4,713,544, Cl. 250-334.000.
- Kimpel, Rolf D., 4,713,727, Cl. 361-334.000.
- Moll, Helmut; Wiegand, Gerd; Schindler, Josef; Scherer, Wilfried; and Marth, Kurt, 4,712,723, Cl. 228-111.000.
- Seidel, Peter; Pelzl, Leo; and Zell, Karl, 4,712,849, Cl. 439-607.000.
- Siemens-Elema AB: See—
Thornander, Hans T.; Poore, John W.; Sholder, Jason A.; Thacker, James R.; and Amundson, David C., 4,712,555, Cl. 128-419.0PG.
- Siewert, James C.: See—
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- Siffert, Marcel; Briant, Gervais; Feuten, Pierre; Goacolou, Honore; Petitgrand, Jean-Claude; and Peyret, Francois, to Laboratoire Central Des Ponts Et Chaussees. Process and apparatus for measuring the dynamic loads applied to a highway by the road traffic. 4,712,423, Cl. 73-146.000.
- Sigoloff, Jerome A., to Sidney Rich Associates, Inc. Footwear sole construction. 4,712,314, Cl. 36-112.000.
- Silcott, Terry L.; and French, Dale T., to Weyerhaeuser Company. Collapsible pallet container and multi-wall fibreboard container therefor. 4,712,687, Cl. 206-600.000.
- Simonetti, John J., to Sangamo Weston, Inc. High temperature plastic scintillators. 4,713,198, Cl. 252-301.170.
- Simonsen, Christian C.: See—
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- Simula, Inc.: See—
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- Sinnett, Kevin B. Retinal tack. 4,712,550, Cl. 128-334.00R.
- Sipos nee Richter, Terez: See—
David, Dezzo; Rofo, Peter; Sipos nee Richter, Terez; Molnar, Gyorgy; Deme, Istvan; and Karnitscher, Tamas, 4,713,078, Cl. 8-94.150.
- SIP—Societa Italiana per l'Esercizio Telefonico p.a.: See—
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- Sisto, Alessandro; Verdini, Antonio S.; and Virdia, Antonino, to Enichem S.p.A. Retro-inverso analogs of the bradykinin potentiating peptide BPP_{5a}. 4,713,367, Cl. 514-17.000.
- Sisto, Alessandro; Verdini, Antonio S.; Virdia, Antonino; De Luca, Giovanna; Di Stazio, Giovanni; and Politi, Vincenzo, to Eniricerche S.p.A.; and Polifarma S.p.A. Peptido-mimetic substances with hypotensive action. 4,713,368, Cl. 514-18.000.
- Sivan, Alex: See—
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- Skelnik, Debra L.: See—
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- SKF Kugallagerfabriken: See—
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- Slade, Boyd E.: See—
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- Slater, Richard A. M.: See—
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- Sloan-Kettering Institute for Cancer Research: See—
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- Small, Irwin A. Method of applying a chin implant, drill guide tool and implant. 4,713,077, Cl. 623-16.000.

- Smartt, Herschel B.: See—
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- Smidek, Otakar, to Von Roll AG. Elevator for transporting people and goods with an annular travelling cabin. 4,712,652, Cl. 187-1.00R.
- Smit, Francis J.; Horst, William E.; and Bhasin, Anirudh K., to Amax Inc. Oil-compatible coal/water mixtures. 4,713,086, Cl. 44-51.000.
- Smit, Gerard C., to Smitdesign B.V. Reservoir filling arrangement for a coffee machine. 4,713,526, Cl. 219-332.000.
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- Smith, Charles E. Fishing lure. 4,712,325, Cl. 43-42.240.
- Smith, Colin G.: See—
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- Smith, Darren A.; and Thompson, Ian R., to Orbital Engine Company Proprietary Limited. Fuel injection system. 4,712,524, Cl. 123-198.00A.
- Smith, David J., to Amoco Corporation. Electrodeposition of lithium. 4,713,151, Cl. 204-58.500.
- Smith, David V. Wire tag etching system. 4,713,315, Cl. 430-326.000.
- Smith, Edgar M., to RCA Corporation. Power supply associated with AC line relay switch. 4,713,598, Cl. 323-245.000.
- Smith, Eugene A., to Northrop Corporation. Pre-combustion integrated Ram airbreathing laser. 4,713,823, Cl. 372-90.000.
- Smith, Gerald P. Tire sealing and balancing composition. 4,713,114, Cl. 106-33.000.
- Smith, Ian K., to Solmecs Corporation N.V. Utilization of thermal energy. 4,712,380, Cl. 60-641.200.
- Smith, Ian W. H.: See—
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- Smith, John N. Self-storing cord and reel assemblies for shielded cables. 4,713,497, Cl. 191-12.20R.
- Smith, Marnell: See—
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- Smith, Randall C. Power amplifier with modified dynamic response. 4,713,624, Cl. 330-118.000.
- Smith, Roderick L., to Energy Adaptive Grinding, Inc. Centerless and center-type grinding system. 4,712,332, Cl. 51-103.0WH.
- SMS Advanced Power, Inc.: See—
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- SMS Concast Inc.: See—
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- SMS Schloemann-Siemag AG: See—
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- Snap-on Tools Corporation: See—
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- Snider, Warren E.: See—
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- So, Hock C.: See—
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- Societe Anonyme Styled Legris: See—
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- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": See—
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- Sogge, John, to FMC Corporation. Decking support means. 4,712,340, Cl. 52-177.000.
- Solmecs Corporation N.V.: See—
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- Solomon, Donald D., to Becton, Dickinson and Company. Process for preparing antithrombogenic/antibiotic polymeric plastic materials. 4,713,402, Cl. 523-112.000.
- Solow, Joseph E., to Wolo Manufacturing Corp. Automobile anti-theft device. 4,712,639, Cl. 180-287.000.
- Solstad, Russell V.; Scott, Millard; and Holliday, William, to VTC Incorporated. Burn-in apparatus for integrated circuits mounted on a carrier tape. 4,713,611, Cl. 324-158.00F.
- Soma, Keiji, to Hirose Electric Co., Ltd. Electric connector for multi-conductor flat cables. 4,713,025, Cl. 439-752.000.
- Somers, Peter J.: See—
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- Somfy: See—
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- Sommer, Hans-Jorg; Mutter, Heinz; Wirz, Armin; and Graf, Felix, to Rieter Machine Works, Ltd. Method of monitoring the quality of a package of thread. 4,713,655, Cl. 340-677.000.
- Sony Corporation: See—
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- Ishihara, Mitsugu; and Machida, Yukihiko, 4,713,702, Cl. 360-79.00A.
- Soda, Yutaka; Imamura, Hideko; Uchida, Hiroyuki; and Sekiya, Tetsuo, 4,713,710, Cl. 360-121.000.
- Sood, Ratan S.: See—
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- Soodalter, Arnold. Portioning, shaping and dispensing apparatus. 4,712,272, Cl. 17-32.000.
- Southworth, Glen R.; and Cornilsen, Robert J., to Colorado Video, Incorporated. Composite single video image system and method utilizing video peak storing memory. 4,713,693, Cl. 358-160.000.
- Sowell, Gene H. Athletic shoe. 4,712,317, Cl. 36-133.000.
- Sowman, Harold G.; and Kaar, David R., to Minnesota Mining and Manufacturing Company. Graded refractory cermet article. 4,713,300, Cl. 428-547.000.
- Spanwick, James: See—
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- Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, to Lockheed Corporation. Controlled expansion flush-head rivet design and method of installing same. 4,712,958, Cl. 411-506.000.
- Spector, George: See—
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- Spectra-Physics, Inc.: See—
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- Spectra-Tech, Inc.: See—
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- Spehr, Rainer: See—
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- Sperber, Henry V. Method and apparatus for containing insulation using netting. 4,712,347, Cl. 52-404.000.
- Sperry Corporation: See—
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- Spicer, David A.: See—
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- Spilker, Harry; Rox, Rainer; and Peschl, Heinz-Walter. Depository for radioactive waste and spent fuel cells. 4,713,199, Cl. 252-633.000.
- Spivack, John D.; Steinberg, David H.; and Odorisio, Paul A., to Ciba-Geigy Corporation. Long chain (4-hydroxyphenyl) propanoate stabilizers. 4,713,475, Cl. 560-75.000.
- Spring, David J., to Gravinier Limited. Cooling apparatus. 4,713,101, Cl. 62-8.000.
- Square D Starkstrom GmbH: See—
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- Ludwig, Bernd; and Stiehl, Dirk, 4,713,498, Cl. 200-5.00R.
- Srinivasan, Vadake R.; Cary, Jeffrey W.; Chon, Younghae; and Narva, Kenneth E., to Research Corporation Technologies, Inc. Gene for lignin degradation and uses thereof. 4,713,336, Cl. 435-155.000.
- SSI Technologies, Inc.: See—
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- SSMC Inc.: See—
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- Staerzl, Richard E., to Brunswick Corporation. Engine idle stabilization timing circuit. 4,712,527, Cl. 123-418.000.
- Stairs, Henry M., Jr., to American Standard Inc. Cover plate and mounting clip assembly. 4,712,256, Cl. 4-661.000.
- Stamm, Wolfgang; and Konig, Dieter, to Bayerische Motoren Werke Aktiengesellschaft. Installation for the automatic grinding of curved surfaces. 4,712,289, Cl. 29-568.000.
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- Standard Oil Company: See—
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- Standard Oil Company (Indiana): See—
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- Standard Register Company, The: See—
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- Stanley-Bostitch, Inc.: See—
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- Stanton plc: See—
Greatorex, Cyril B.; Smith, Ian W. H.; and Hammersley, Graham J., 4,712,946, Cl. 405-170.000.
- Stauffer Chemical Company: See—
Brown, Richard W.; and Gless, Richard D., Jr., 4,713,471, Cl. 560-53.000.
- Earhart, Jonathan P.; Kostecki, John A.; and McNutt, Adrian C., 4,713,119, Cl. 134-3.000.
- Epstein, Ronald A., 4,713,484, Cl. 562-406.000.
- Michel, Christian G.; Schachter, Rozalie; Kuck, Mark A.; Baumann, John A.; and Raccach, Paul M., 4,713,192, Cl. 252-62.30R.
- Mirviss, Stanley B., 4,713,470, Cl. 560-38.000.
- Telschow, Jeffrey E.; and Bright, Danielle A., 4,713,467, Cl. 558-18.000.
- STC plc: See—
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- Overbury, Francis G.; Ward, Christopher R.; and Searle, Jeffrey G., 4,713,668, Cl. 342-384.000.
- Steers, Michel: See—
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- Stefani, Giancarlo: See—
Fumagalli, Carlo; and Stefani, Giancarlo, 4,713,464, Cl. 549-259.000.
- Steinbach, Robert, to Chicago Lock Company. Removable cylinder lock. 4,712,400, Cl. 70-369.000.
- Steinberg, David H.: See—
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- Steinmetz, Alan L.: See—
Krinski, Thomas L.; and Steinmetz, Alan L., 4,713,116, Cl. 106-154.100.
- Stella Werke AG: See—
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- Stemmle, Denis J., to Xerox Corporation. Sheet stacking apparatus. 4,712,785, Cl. 271-187.000.
- Step On Inc.: See—
Ritten, Robert G., 4,712,503, Cl. 114-343.000.
- Stepp, Lee W.; and Giroux, Richard L., to Halliburton Company. Poppet valve. 4,712,619, Cl. 166-327.000.
- Steppe, Dennis L.; Hood, Larry L.; and Boggs, Gary D., to CooperVision, Inc. Cassette for surgical irrigation and aspiration and sterile package therefor. 4,713,051, Cl. 604-30.000.
- Stern, Marvin J., to Alloy Metals, Inc. Nickel base brazing alloy and method. 4,713,217, Cl. 420-452.000.
- Stevanato, Giovanni, to Vecta Glass Company Ltd. Ready to use syringe. 4,713,062, Cl. 604-203.000.
- Stevens, Vernon C., to Ohio State University Research Foundation. The. Antigenic modification of polypeptides. 4,713,366, Cl. 514-13.000.
- Stewart, Charles W.: See—
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- Stewart, Melvin T.: See—
Robbins, Daniel T.; and Stewart, Melvin T., 4,712,755, Cl. 248-49.000.
- Stewart, Wayne A. Hydraulic pump jack. 4,712,374, Cl. 60-369.000.
- Steyr-Daimler-Puch AG: See—
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- Sticht, Walter, to STIWA-Fertigungstechnik Sticht GesmbH. Conveyor arrangement. 4,712,484, Cl. 104-165.000.
- Stiehl, Dirk: See—
Ludwig, Bernd; and Stiehl, Dirk, 4,713,498, Cl. 200-5.00R.
- Stiley, Joseph F., III: See—
Gaskill, Garold B.; Park, Daniel J.; Rullman, Robert G.; Rose, Donald T.; Stiley, Joseph F., III; Barnum, Lewis W.; and Hoff, Don G., 4,713,808, Cl. 370-94.000.
- Stiller, Manfred: See—
Hervig, Jens; Norenberg, Hagen; Bergmann, Friedhelm; Stiller, Manfred; Schlemmermeyer, Horst; Schmidt, Wilfried; Straube, Hilmar; and Wolter, Helmut, 4,712,434, Cl. 73-864.630.
- Stirling, Marie: See—
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- STIWA-Fertigungstechnik Sticht GesmbH: See—
Sticht, Walter, 4,712,484, Cl. 104-165.000.
- Stocker, Elizabeth M.; and Knight, Eugene U., III. Method and means for teaching a set of sound symbols through the unique device of phonetic phenomena. 4,713,008, Cl. 434-167.000.
- Stockton, Thomas R., to Ford Motor Company. Non-lubricated drive belt system for a continually variable transmission. 4,713,041, Cl. 474-28.000.
- Stoffel Seals Corporation: See—
Fuehrer, Charles, 4,712,705, Cl. 220-270.000.
- Stohr, Benno, to PKL Papier-und Kunststoff-Werke Linnich GmbH. Package having welded seam closure with hot melt thickening. 4,712,690, Cl. 206-628.000.
- Stokes, Olen L., Jr.: See—
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- Stone, Wayne B., Jr., to Wood Manufacturing. Float activated siphon for automatic drip coffee maker. 4,713,253, Cl. 426-433.000.
- Stoneman, Everett L., to Rohr Industries, Inc. Jaw alignment pin for a stretch jaw chuck. 4,712,831, Cl. 279-123.000.
- Stoy, Erich: See—
Rommens, Hans; and Stoy, Erich, 4,712,416, Cl. 72-241.000.
- Strahan, Wilson L.: See—
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- Straub, Joachim: See—
Wild, Wolfgang; Straub, Joachim; and Landgraf, Gunter, 4,713,512, Cl. 219-10.55E.
- Straube, Hilmar: See—
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- Straubs, Ralph V.: See—
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- Strickler, Gary R.: See—
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- Strike, Gary P.: See—
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- Stringer, George E. Knife holder for wood chippers. 4,712,597, Cl. 144-176.000.
- Striplin, James W. Remote control unit console. 4,712,693, Cl. 211-164.000.
- Strolle, Clifford H.: See—
Nahas, Robert C.; and Strolle, Clifford H., 4,713,265, Cl. 427-341.000.
- Strong, Russell W.; and Rutt, Kenneth S., to New Holland Inc. Combine sieve adjustment mechanism. 4,712,568, Cl. 130-272.000.
- Stroy, Gary H.: See—
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- Stuber, Werner, to Behringwerke Aktiengesellschaft. Oligopeptidylargininol derivatives and their homologs, a process for their preparation, their use and agents containing them. 4,713,369, Cl. 514-18.000.
- Studiengesellschaft Kohle mbH: See—
Bogdanovic, Borislav; and Bonnemann, Helmut, 4,713,110, Cl. 75-0.50A.
- Su, Tien-Kuei, to Mobil Oil Corporation. Method for reducing melt fracture during extrusion of linear polyethylene homopolymers and copolymers by varying the geometry of the die exit face. 4,713,205, Cl. 264-176.100.
- Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: See—
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- Suematsu, Toshio: See—
Anzai, Katsushi; Harada, Osamu; Suematsu, Toshio; and Takeda, Yuji, 4,712,522, Cl. 123-179.00L.
- Sugahara, Kooichi; Shinno, Yoshio; and Kimoto, Kiyoharu, to Kubota Ltd. Intake manifold for a three-cylinder air-fuel mixture suction type engine. 4,712,519, Cl. 123-52.00M.
- Sugama, Takayuki; Tabata, Hiroshi; and Honda, Tadanori, to Honda Giken Kogyo Kabushiki Kaisha. Lock structure for seat slide device. 4,712,759, Cl. 248-429.000.
- Sugimae, Toshio: See—
Koga, Mitsuyuki; Hirai, Kenichiro; Sugimae, Toshio; and Fukushige, Setsuo, 4,713,405, Cl. 523-212.000.
- Sugimori, Masayasu; and Morishita, Mitsuhiro, to Ando Electric Co., Ltd. Logic analyzer. 4,713,813, Cl. 371-15.000.
- Sugimoto, Hiroaki; Hayatsu, Kazuo; and Fujiwara, Masahiro, to Sumitomo Chemical Company, Limited. Process for producing aromatic polyester. 4,713,435, Cl. 528-179.000.
- Sugimoto, Tadao; and Hayakawa, Toshiaki, to Fuji Photo Film Co., Ltd. Core/shell silver halide photographic emulsion and method for production thereof. 4,713,318, Cl. 430-567.000.
- Sugimoto, Yasuhiro: See—
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- Sugita, Jun: See—
Hamano, Hideo; Sugita, Jun; and Watanabe, Takashi, 4,712,900, Cl. 354-400.000.
- Sugiura, Hikoroku. Mixer for continuously mixing fluids. 4,712,921, Cl. 366-151.000.
- Sugiyama, Osamu: See—
Gotoh, Hajime; Machida, Mamoru; and Sugiyama, Osamu, 4,713,276, Cl. 428-113.000.
- Sugiyama, Shigeru: See—
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- Sullivan, Daniel C.; and Mazorol, Earl A., Jr., to ETA Systems, Inc. Cryostat cooling system. 4,712,388, Cl. 62-514.00R.
- Sullivan, Jeffrey R.: See—
McCauley, Durham S.; and Sullivan, Jeffrey R., 4,712,586, Cl. 138-89.000.
- Sumitomo Electric Industries, Ltd.: See—
Mano, Hiroshi, 4,713,070, Cl. 623-1.000.
- Sumitomo Cement Co., Ltd.: See—
Sato, Masao; Ichimura, Masaaki; and Sato, Kunio, 4,713,115, Cl. 106-118.000.
- Sumitomo Chemical Company, Limited: See—
Matsuyama, Kiyoshi; Suzuki, Takatoshi; and Chigusa, Takeshi, 4,713,444, Cl. 528-502.000.
- Sugimoto, Hiroaki; Hayatsu, Kazuo; and Fujiwara, Masahiro, 4,713,435, Cl. 528-179.000.
- Sumitomo Electric Industries, Ltd.: See—
Yoshida, Masaaki; Endo, Shigeki; Kisanuki, Shigeru; and Kakuzen, Hideo, 4,713,107, Cl. 65-157.000.
- Sumitomo Heavy Industries, Ltd.: See—
Haruguchi, Kenji; Kohguchi, Takuma; and Sekiya, Osamu, 4,712,499, Cl. 114-77.00R.
- Ogawa, Takayuki; Ito, Hideaki; Kimura, Naokazu; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitaro; Watanabe, Takashi; Shinano, Kunizo; Kuwabara, Takashi; and Aoki, Kaoru, 4,712,742, Cl. 241-20.000.
- Sumiya, Koji; and Moroto, Shuzo, to Aisin-Warner Kabushiki Kaisha; and Kabushiki Kaisha Shinsangyokaiatsu. Control apparatus for four-wheel drive vehicle. 4,712,635, Cl. 180-197.000.
- Sumoto, Kunihiro: See—
Tatsuoka, Toshio; Suzuki, Kenji; Imao, Kayoko; Satoh, Fumio; Miyano, Seiji; and Sumoto, Kunihiro, 4,713,453, Cl. 544-60.000.
- Sun, Yichang. Exhaust silencer for internal combustion engines. 4,712,644, Cl. 181-251.000.
- Sunano, Naomasa; Asahi, Naotatsu; and Yoshida, Toshio, to Shinyei Kaisha; and Hitachi, Ltd. Gas sensor and method of producing the same. 4,713,646, Cl. 338-34.000.
- Sunbuichi, Hiroshi: See—
Terasaka, Katsunori; Sunbuichi, Hiroshi; and Nakagawa, Toyooki, 4,712,529, Cl. 123-492.000.

Sundermeier, Gunter, to Paul Hettich GmbH & Co. Mounting plate for a furniture hinge which is adjustable in height. 4,712,271, Cl. 16-238.000.

Sundstrand Corporation: See—
Avny, Eli, 4,712,449, Cl. 74-710.500.
Crowe, Lawrence E., 4,712,384, Cl. 62-225.000.

Sundstrand Data Control, Inc.: See—
Peters, Rex B., 4,712,426, Cl. 73-505.000.
Peters, Rex B., 4,712,427, Cl. 73-517.0AV.

Sundstrom, Inge: See—
Legerius, Bengt E.; and Sundstrom, Inge, 4,712,342, Cl. 52-221.000.

Sunkist Growers, Inc.: See—
Borgman, Bradley N.; Cramer, Jerry W.; and Dossey, Don E., 4,712,818, Cl. 294-64.100.

Suntori Limited: See—
Tatsuoka, Toshio; Suzuki, Kenji; Imao, Kayoko; Satoh, Fumio; Miyano, Seiji; and Sumoto, Kunihiro, 4,713,453, Cl. 544-60.000.

Suntory Limited: See—
Sakai, Hideaki; and Kanai, Tadashi, 4,713,454, Cl. 544-258.000.

Super Tool and Mfg. Corporation: See—
Memmel, Lawrence C., 4,713,592, Cl. 318-565.000.

Survival Technology, Inc.: See—
Tarello, William R.; Gordon, Linda A.; and Whalen, T. Daniel, 4,713,061, Cl. 604-200.000.

Susak, David M.; and Vyne, Robert L., to Motorola Inc. Operational amplifier utilizing JFET followers. 4,713,626, Cl. 330-253.000.

Sutterlin, Norbert; Blitz, Hans-Dieter; Mager, Theodor; Jagsch, Karl-Heinz; and Tessmer, Dieter, to Rohm GmbH Chemische Fabrik. Continuous emulsion polymerization process. 4,713,434, Cl. 526-62.000.

Sutton, Quinten H., to RTE Corporation. Sliding current interchange. 4,713,018, Cl. 439-185.000.

Suyama, Tadakazu: See—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,713,459, Cl. 546-150.000.

Suzuki, Hitomi: See—
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Suzuki, Kaoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Processor and method of processing image data. 4,713,789, Cl. 364-724.000.

Suzuki, Katsuhisa: See—
Okamoto, Masayoshi; Suzuki, Katsuhisa; Hoshino, Ryoichi; and Sasaki, Hironaka, 4,712,612, Cl. 165-146.000.

Suzuki, Kenji: See—
Tatsuoka, Toshio; Suzuki, Kenji; Imao, Kayoko; Satoh, Fumio; Miyano, Seiji; and Sumoto, Kunihiro, 4,713,453, Cl. 544-60.000.

Suzuki Motor Company Limited: See—
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Suzuki, Nitro: See—
Ogawa, Takayuki; Ito, Hideaki; Kimura, Naokazu; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitro; Watanabe, Takashi; Shinano, Kunizo; Kuwabara, Takashi; and Aoki, Kaoru, 4,712,742, Cl. 241-20.000.

Suzuki, Nobuyuki; Shimizu, Masao; and Katsuragawa, Mitsuhiro, to Canon Kabushiki Kaisha. Driving circuit of a vibration wave motor. 4,713,571, Cl. 310-316.000.

Suzuki, Shinichi: See—
Inagaki, Mitukane; Ohta, Masaki; Hyodo, Akihiko; Takenaka, Kenji; Mitibata, Takashi; Suzuki, Shinichi; and Kayukawa, Hiroaki, 4,712,982, Cl. 417-222.000.

Suzuki, Takahisa; Kuwahara, Shinichi; and Kawashima, Yoshinori, to Honda Giken Kogyo Kabushiki Kaisha. Motor vehicle with handlebar. 4,712,633, Cl. 180-149.000.

Suzuki, Takatoshi: See—
Matsuyama, Kiyoshi; Suzuki, Takatoshi; and Chigusa, Takeshi, 4,713,444, Cl. 528-502.000.

Suzuki, Takeshi, to NEC Corporation. Telephone set structure having a member capable of being inserted in invertible position. 4,713,836, Cl. 379-58.000.

Suzuki, Yoshiaki: See—
Mifune, Hiroyuki; Shishido, Tadao; and Suzuki, Yoshiaki, 4,713,321, Cl. 430-569.000.

Suzuki, Yukio: See—
Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,713,796, Cl. 365-189.000.

Svahn, Bror G. K.: See—
Isaksson, Karl B.; and Svahn, Bror G. K., 4,712,952, Cl. 408-211.000.

Swanson Brothers, Inc.: See—
Swanson, Elrod H., 4,712,833, Cl. 297-219.000.

Swanson, Elrod H., to Swanson Brothers, Inc. Seat cushion for preventing slouching of an infant or weakened adult. 4,712,833, Cl. 297-219.000.

Swanson, Wilbur W.: See—
Cameron, Thomas B.; Swanson, Wilbur W.; Tartaglia, John M.; and Cox, Thomas B., 4,713,111, Cl. 75-68.00R.

Sweany, Ralph S. Shaft speed monitor. 4,713,654, Cl. 340-671.000.

Swedish Graft Technique AB: See—
Bowald, Staffan F., 4,713,072, Cl. 623-6.000.

Sweeney, Ronald M.: See—
Rimmer, James R.; and Sweeney, Ronald M., 4,712,358, Cl. 53-450.000.

Swilley, Dennis N. Chair with interlocking multiple components. 4,712,837, Cl. 297-442.000.

Swinton, Andrew D. Apparatus for providing a visual interpretation of an audio signal. 4,713,658, Cl. 340-815.110.

Sycha, Alec B.: See—
Bardsley, Frank B.; and Sycha, Alec B., 4,712,846, Cl. 439-33.000.

Symington, John M.; and Listrom, Robin D., to University of Toronto Innovations Foundation. Fixture for attaching prosthesis to bone. 4,713,003, Cl. 433-173.000.

Symon, Georg: See—
Graf, Felix; Schneeberger, Ruedi; and Symon, Georg, 4,712,746, Cl. 242-43.00R.

Syntex (U.S.A.) Inc.: See—
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Ullman, Edwin F., 4,713,348, Cl. 436-501.000.

Szczesny, Paul M.: See—
Bose, Bimal K.; and Szczesny, Paul M., 4,713,594, Cl. 318-685.000.

Szelke, Michael; Jones, David M.; and Hallett, Allan, to Aktiebolaget Hassle. Renin inhibitors and treatments using them. 4,713,445, Cl. 530-330.000.

Szporny, Laszlo: See—
Ezer, Elemer; Harsanyi, Kalman; Petho, Hajnalka V.; Matuz, Judit; Szporny, Laszlo; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kopolnas, Marta; and Kallay, Anna, 4,713,388, Cl. 514-346.000.

Szymiski, Eugene J., to Schwinn Bicycle Company. Cycle exerciser. 4,712,790, Cl. 272-73.000.

TAA Technique and Administration AG: See—
Frank, Wolfgang, 4,713,032, Cl. 441-74.000.

Tabata, Hiroshi: See—
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Tachikawa Corporation: See—
Komaki, Toshiro, 4,712,599, Cl. 160-133.000.

Tachikawa, Hajime: See—
Nakamura, Hiro; Ohkawa, Shuji; Ohtsuka, Yasuo; Tachikawa, Hajime; and Shinozaki, Toshiya, 4,712,970, Cl. 414-730.000.

Tack, Robert D.; and Pearce, Sarah L., to Exxon Chemical Patents Inc. Middle distillate compositions with improved cold flow properties. 4,713,088, Cl. 44-62.000.

Tae-Ho, Suh, to Fritz Chemical Company. Expandable wand pet toy. 4,712,510, Cl. 119-29.000.

Taguchi, Hiromi, to Nissan Motor Co., Ltd. Cap mounting structure of the governor valve for automatic transmission. 4,712,708, Cl. 220-319.000.

Taillebois, Jacques: See—
Renaud, Jean-Marie; Gambs, Paul; Perrot, Jean-Claude; and Taillebois, Jacques, 4,713,541, Cl. 250-231.0SE.

Taiyo Yuden Kabushiki Kaisha: See—
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Tajima, Yoshihisa: See—
Takahashi, Katsuhiko; and Tajima, Yoshihisa, 4,713,408, Cl. 524-161.000.

Takagi, Hiroyasu: See—
Watanabe, Isao; Momonoi, Kaishu; Hiraiwa, Toru; Ono, Satoshi; Nakano, Joji; Nagumo, Katsuyuki; and Takagi, Hiroyasu, 4,713,387, Cl. 514-332.000.

Takahashi, Hidemitsu: See—
Ikura, Katsuyata; Hagiwara, Kenji; Nagasaki, Fumihiko; Yamada, Tomio; Takahashi, Hidemitsu; and Hatano, Renpei, 4,713,396, Cl. 514-594.000.

Takahashi, Hiromi: See—
Onoue, Hiroshi; and Takahashi, Hiromi, 4,713,461, Cl. 548-194.000.

Takahashi, Katsuhiko; and Tajima, Yoshihisa, to Polyplastics Co., Ltd. Polybutylene terephthalate resin composition. 4,713,408, Cl. 524-161.000.

Takahashi, Kazuo: See—
Namba, Kenryo; Asami, Shigeru; Aoi, Toshiki; Takahashi, Kazuo; and Kuroiwa, Akihiko, 4,713,314, Cl. 430-270.000.

Takahashi, Ken; Hirata, Chiaki; and Ishioka, Yuji, to Suzuki Motor Company Limited. Engine and drive belt cooling system for an all terrain vehicle. 4,712,629, Cl. 180-68.100.

Takahashi, Mitsuru: See—
Nakamura, Makoto; Takahashi, Mitsuru; Osawa, Namieki; and Murakami, Yuichi, 4,713,044, Cl. 474-135.000.

Takahashi, Nobuyuki: See—
Fujiwara, Norio; Takahashi, Nobuyuki; and Otsuki, Akihiro, 4,713,279, Cl. 428-142.000.

Takahashi, Tadashi; Miyashita, Kunio; and Kawamata, Syoichi, to Hitachi, Ltd. Device for magnetically detecting displacement of non-magnetic movable member. 4,713,613, Cl. 324-208.000.

Takahashi, Teruomi; and Sato Tadashi, to Canon Kabushiki Kaisha. Write-in electronic display recorder. 4,713,698, Cl. 358-296.000.

Takamine, Henry, to Hughes Aircraft Company. Method and apparatus for determination of junction-to-case thermal resistance for a hybrid circuit element. 4,713,612, Cl. 324-158.00D.

Takamiya, Kikuzo; Ishibashi, Hideyuki; and Kozakae, Kunitoshi, to Bridgestone Cycle Co., Ltd. Stepless speed change device. 4,712,450, Cl. 74-750.00B.

Takanashi, Keinichi: See—
Sakuma, Nobuo; and Takanashi, Keinichi, 4,712,884, Cl. 350-434.000.

Takao, Hideaki: See—
Sekimura, Nobuyuki; Kamio, Masaru; Takao, Hideaki; Motoi, Taiko; and Murata, Tatsuo, 4,712,874, Cl. 350-339.00F.

Takao, Shoichi: See—
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Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, to Dainippon Ink and Chemicals, Inc. Tolan-type nematic liquid crystalline compounds. 4,713,468, Cl. 558-411.000.

Takayama, Shigehiko; Suzuki, Hitomi; Maruyama, Masanori; Fukushima, Masakazu; and Kurashige, Mitsuhiro, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Image pickup tube. 4,713,588, Cl. 315-382.000.

Takeda Riken Kogyo Kabushiki Kaisha: See—
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Takeda, Toyohiko: See—
Sakamoto, Teruo; Kawai, Sadao; Noda, Kinzaburo; Takeda, Toyohiko; and Kato, Hiroshi, 4,713,247, Cl. 424-461.000.

Takeda, Yuji: See—
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Takemura, Koichi; and Shiomi, Tadashi, to Kabushiki Kaisha Kamiuchi Denki Seisakusho. Detection device for contact fusion in an electromagnetic contactor. 4,713,716, Cl. 361-2.000.

Takemura, Tohru; Itoh, Hajime; Kamo, Jun; and Yoshida, Haruhiko, to Mitsubishi Rayon Co., Ltd. Multilayer composite hollow fibers and method of making same. 4,713,292, Cl. 428-373.000.

Takenaka, Kenji: See—
Inagaki, Mitukane; Ohta, Masaki; Hyodo, Akihiko; Takenaka, Kenji; Mitibata, Takashi; Suzuki, Shinichi; and Kayukawa, Hiroaki, 4,712,982, Cl. 417-222.000.

Taketa, Kazuhiko: See—
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Takeuchi, Junji: See—
Takimoto, Masahiro; Takeuchi, Junji; and Yamazaki, Yoshio, 4,713,419, Cl. 525-211.000.

Takeuchi, Masami: See—
Yokoe, Jintaro; Takeuchi, Masami; and Tsuji, Toshiaki, 4,713,090, Cl. 55-68.000.

Takeuchi, Yoshio; Koizumi, Toru; and Hori, Kozo, to Daikin Industries, Ltd. Fluorine-containing multifunctional ester compound. 4,713,469, Cl. 560-17.000.

Takiguchi, Isao, to Yazaki Corporation. Connecting structure for high voltage resistance wires. 4,713,015, Cl. 439-125.000.

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Miura, Masanobu, 4,713,579, Cl. 313-500.000.

Takoshima, Takehiro, to Alps Electric Co., Ltd. Thermal head. 4,713,671, Cl. 346-76.0PH.

Tamade, Yoshinori: See—
Uno, Kunihiko; Tamade, Yoshinori; Horino, Seiya; and Kodera, Tamotsu, 4,712,741, Cl. 241-16.000.

Tamaki, Sigeo: See—
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Tamura, Sadahiro: See—
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Tanabe, Tohru, to Rhythm Watch Company Limited. Electronic time-piece. 4,712,926, Cl. 368-251.000.

Tanaka, Atsuo: See—
Hamajima, Kaneo; Dohnomoto, Tadashi; Tanaka, Atsuo; and Kubo, Masahiro, 4,712,600, Cl. 164-97.000.

Tanaka, Fumihiko; Shimada, Yoshio; Yamaguchi, Kaneo; Matsushima, Kenichi; and Watanabe, Shinya, to Seiko Instruments & Electronics Ltd. Interface circuit of video signal hard copy apparatus. 4,713,691, Cl. 358-148.000.

Tanaka, Fumihiko: See—
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Tanaka, Kentaro: See—
Wakisaka, Yoshiharu; Uo, Junko; Matsumoto, Kouichi; Ohodaira, Osamu; and Tanaka, Kentaro, 4,713,241, Cl. 424-93.000.

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Okuzono, Shuichi; Tanaka, Tetsuo; Oda, Yasuhiro; Shintani, Takashi; and Emura, Noriaki, 4,713,083, Cl. 8-557.000.

Tanaka, Yasuyuki: See—
Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, 4,713,468, Cl. 558-411.000.

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Taniguchi, Osamu; Okada, Shinjiro; and Ando, Yujiro, to Canon Kabushiki Kaisha. Color image forming apparatus comprising ferroelectric smectic liquid crystal having at least two stable states. 4,712,878, Cl. 350-350.00S.

Tanji, Junichi; and Maekawa, Yukio, to Minolta Camera Kabushiki Kaisha. Positioning mechanism for positioning auxiliary optical

device relative to main optical device and the auxiliary optical device. 4,712,871, Cl. 350-257.000.

Tappen, Gerhard: See—
Grill, Hans; and Tappen, Gerhard, 4,712,691, Cl. 211-49.100.

Tarasoff, Serge, to Pomagalski S.A. Aerial ropeway transport installation with the rope stopping to detach the cars in the terminal. 4,712,486, Cl. 104-173.100.

Tarello, William R.; Gordon, Linda A.; and Whalen, T. Daniel, to Survival Technology, Inc. Cartridge with universal plastic hub. 4,713,061, Cl. 604-200.000.

Tartaglia, John M.: See—
Cameron, Thomas B.; Swanson, Wilbur W.; Tartaglia, John M.; and Cox, Thomas B., 4,713,111, Cl. 75-68.00R.

Tarver, Carl R.: See—
Gatti, John E.; and Tarver, Carl R., 4,713,714, Cl. 360-137.000.

Taschner, Klaus: See—
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Tatsumi, Shuhei: See—
Ogawa, Takayuki; Ito, Hideaki; Kimura, Naokazu; Ito, Hayami; Tatsumi, Shuhei; Takao, Shoichi; Suzuki, Nitro; Watanabe, Takashi; Shinano, Kunizo; Kuwabara, Takashi; and Aoki, Kaoru, 4,712,742, Cl. 241-20.000.

Tatsuoka, Toshio; Suzuki, Kenji; Imao, Kayoko; Satoh, Fumio; Miyano, Seiji; and Sumoto, Kunihiro, to Suntori Limited. Oxabicycloheptane derivatives. 4,713,453, Cl. 544-60.000.

Taylor, Arthur R.; and Wulfekotter, Dudley, to Formica Corporation. Modified melamine resin for use in decorative laminates. 4,713,299, Cl. 428-526.000.

Taylor, John W., Jr., to Westinghouse Electric Corp. Point clutter threshold determination for radar systems. 4,713,664, Cl. 342-91.000.

Taylor, Leo O.: See—
Dawson, Christopher; Healey, Fritz W.; and Taylor, Leo O., 4,712,885, Cl. 350-443.000.

Taylor, Lloyd D.: See—
Bartels-Keith, James R., deceased; Puttick, Anthony J.; and Taylor, Lloyd D., 4,713,313, Cl. 430-251.000.

Taylor, William: See—
Peters, Rudolph; Peters, Ronald; and Taylor, William, 4,712,549, Cl. 128-325.000.

Taylor, William W., Jr.: See—
Clarkson, Bruce A.; Frere, Ronald J.; Loughlin, Thomas G.; Taylor, William W., Jr.; and Mongeau, Peter, 4,712,398, Cl. 70-276.000.

TDK Corporation: See—
Namba, Kenryo; Asami, Shigeru; Aoi, Toshiki; Takahashi, Kazuo; and Kuroiwa, Akihiko, 4,713,314, Cl. 430-270.000.

Yoda, Kunitchi; Kitaura, Eiji; Tsunoda, Tsutomu; and Kawakami, Yoshio, 4,713,278, Cl. 428-141.000.

Technal International S.A.: See—
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Technicon Instruments Corporation: See—
Fox, John P.; Hedaya, Eddie; and Lippman, Violet, 4,713,324, Cl. 435-4.000.

Siegel, Richard C.; Marx, Christina S.; Hargitay, Bartholomew; and Waterspoon, Neil, 4,713,350, Cl. 436-533.000.

Technisch Ontwikkelingsbureau van Elten B.V.: See—
van Elten, Gerrit J.; Hurkmans, Antonius; and de Vries, Hugo V., 4,712,964, Cl. 414-281.000.

Technology for Energy Corporation: See—
Hunter, Brook L.; Rizzio, Joseph W.; and Ward, Marvin L., 4,712,847, Cl. 439-155.000.

Tecma Laboratories, Inc.: See—
Trenzeluk, Theodore, 4,713,242, Cl. 424-145.000.

Tecumseh Products Company: See—
Campen, Kenneth W., 4,712,521, Cl. 123-149.00C.

Teepak, Inc.: See—
Bridgeford, Douglas J., 4,713,135, Cl. 156-218.000.

Tegge, Bruce R.; Weary, Frank G.; and Sakaguchi, Yasuo, to Exxon Chemical Patents Inc. Removal of organic halides from hydrocarbon solvents. 4,713,413, Cl. 525-54.000.

Teknowledge, Incorporated: See—
Scott, A. Carlisle; Clayton, Jan E.; and Garnier, Jacques, 4,713,775, Cl. 364-513.000.

Tektronix, Inc.: See—
Addis, John L., 4,713,627, Cl. 330-306.000.
Carp, Roland E., 4,713,771, Cl. 364-487.000.
Pepper, Steven H., 4,713,607, Cl. 324-73.0PC.
Van Nice, H. Lee; Bostwick, Myron A., Jr.; and Kongslic, Keith F., 4,713,520, Cl. 219-121.0LC.

Teleflex Incorporated: See—
Niskanen, Don L., 4,712,397, Cl. 70-248.000.

Telschow, Jeffrey E.; and Bright, Danielle A., to Stauffer Chemical Company. Process for production of isothiocyanates. 4,713,467, Cl. 558-18.000.

Temburg, Josef: See—
Hosel, Fritz; Marx, Hans-Jurgen; and Temburg, Josef, 4,712,275, Cl. 19-80.00R.

Temes, Gabor C.; and Wang, Fong J., to Xerox Corporation. Pipelined digital-to-analog converter. 4,713,650, Cl. 340-347.0DA.

Tempaku, Junya: See—
Nakamura, Haruhiko; and Tempaku, Junya, 4,713,621, Cl. 328-55.000.

Temple, Robert B.; and Colpaert, James J., to Allied Corporation. Brake assembly with multiple adjustability. 4,712,654, Cl. 188-71.800.

- Tenhaven, Ulrich: See—
Bersch, Bernhard; Juttner, Heinz; and Tenhaven, Ulrich, 4,713,519, Cl. 219-121.0LC.
- Tennant, William A.: See—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,712,990, Cl. 425-130.000.
- Teraoka, Masao, to Tochigifujisangyo Kabushikigaisha. Viscous coupling for a drive shaft, 4,712,663, Cl. 192-58.00A.
- Terasaka, Katsunori; Sunbuchi, Hiroshi; and Nakagawa, Toyoaki, to Nissan Motor Co., Ltd. Air-fuel ratio control for transient modes of internal combustion engine operation, 4,712,529, Cl. 123-492.000.
- Terasawa, Yoshio; and Oikawa, Saburo, to Hitachi, Ltd. Reverse blocking type semiconductor device, 4,713,679, Cl. 357-38.000.
- Terumo Corporation: See—
Yamaguchi, Keiji, 4,712,564, Cl. 128-682.000.
- Tesch, Klaus. Device for mutually centering and clamping two pipe bodies to be welded to one another, 4,712,720, Cl. 228-49.300.
- Tessmer, Dieter: See—
Sutterlin, Norbert; Blitz, Hans-Dieter; Mager, Theodor; Jagsch, Karl-Heinz; and Tessmer, Dieter, 4,713,434, Cl. 526-62.000.
- Tetra Pak Finance & Trading S.A.: See—
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- Texaco Inc.: See—
Jenkins, Robert H., Jr.; Mitchell, Edward; Gaetani, Frank J.; Mahusky, John J.; and Hall, Marilyn, 4,713,087, Cl. 44-53.000.
- Nalesnik, Theodore E.; and Benfaremo, Nicholas, 4,713,189, Cl. 252-51.50A.
- Nalesnik, Theodore E., 4,713,191, Cl. 252-51.50A.
- Texas Instruments: See—
Pejouhy, Radi; Nield, Joseph G., Jr.; D'Entremont, John R.; Beggs, Louis C.; and Rotulo, Fabrizio, 4,713,717, Cl. 361-26.000.
- Texas Instruments Incorporated: See—
Magar, Surender S.; Essig, Daniel L.; Simpson, Richard D.; and Caudel, Edward R., 4,713,748, Cl. 364-200.000.
- Magar, Surender S.; and Essig, Daniel L., 4,713,749, Cl. 364-200.000.
- Mitchell, Allan T.; and Paterson, James L., 4,713,142, Cl. 156-653.000.
- Tigelaar, Howard L.; Riemenschneider, Bert R.; and Paterson, James L., 4,713,677, Cl. 357-23.500.
- Womack, Richard H.; Banerjee, Sanjay K.; Shichijo, Hisashi; and Malhi, Satwinder, 4,713,678, Cl. 357-23.600.
- Textron, Inc.: See—
Ryder, Francis E.; and Lisak, Stephen P., 4,713,739, Cl. 362-424.000.
- Thacker, James R.: See—
Thornander, Hans T.; Poore, John W.; Sholder, Jason A.; Thacker, James R.; and Amundson, David C., 4,712,555, Cl. 128-419.0PG.
- Theocharous, Evangelos, to Central Electricity Generating Board of Sudbury House. Optical fiber apparatus and method for remotely measuring an external parameter from a monitoring position, 4,713,538, Cl. 250-227.000.
- Theodore, Ares N.: See—
Chattha, Mohinder S.; and Theodore, Ares N., 4,713,427, Cl. 525-510.000.
- Therault, John P.: See—
Cahill, Richard F.; Eck, Jeffrey A.; Schwantz, Gerald L.; Therault, John P.; Turek, Philip A.; Udd, Eric; Wagoner, Raymond E.; and Wanser, Keith H., 4,712,306, Cl. 33-304.000.
- Thermo King Corporation: See—
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- Thetford Corporation: See—
Antos, John M.; and Selina, John R., 4,712,255, Cl. 4-323.000.
- Thiel, Gerhard: See—
Pilz, Georg; Buerger, Gert; Barl, Manfred; and Thiel, Gerhard, 4,713,201, Cl. 260-501.170.
- Pilz, Georg; Buerger, Gert; Barl, Manfred; and Thiel, Gerhard, 4,713,437, Cl. 528-336.000.
- Thim, Hartwig W. Logic circuit arrangement with field effect transistors matched thereto, 4,713,676, Cl. 357-23.500.
- Thom, Michael J., to Hunt Leuchars and Hepburn Limited. Mine support prop, 4,712,947, Cl. 405-288.000.
- Thom, Paul, to Kiddie Products, Inc. Toy telephone, 4,713,035, Cl. 446-141.000.
- Thomas, Alain: See—
Servel, Michel; and Thomas, Alain, 4,713,804, Cl. 370-68.000.
- Thomas, Michael: See—
Bruno, Robert; Kipperman, Stuart R.; Mayer, Geoffrey R.; and Thomas, Michael, 4,713,064, Cl. 604-257.000.
- Thomas, R. L.: See—
Johnson, Fred L., 4,712,518, Cl. 123-48.00B.
- Thompson, Ian R.: See—
Smith, Darren A.; and Thompson, Ian R., 4,712,524, Cl. 123-198.00A.
- Thompson, Kathryn L.: See—
Chang, Michael N.; Thompson, Kathryn L.; and Boulton, David A., 4,713,393, Cl. 514-469.000.
- Thomson Brandt Armements: See—
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- Thomson-CSF: See—
Drabowitch, Serge; Baril, Michel; and Le Parquier, Guy, 4,713,663, Cl. 342-70.000.
- Poux, Jean P., 4,713,666, Cl. 342-152.000.
- Thorn Emi Electronics Limited: See—
French, Steven J.; and Neasham, David L., 4,713,652, Cl. 340-652.000.
- Thorn, Richard, to Den norske stats oljeselskap a.s. Apparatus for the measurement of the fraction of gas in a two-component fluid flow comprising a liquid and a gas in mixture, 4,713,603, Cl. 324-61.00P.
- Thornander, Hans T.; Poore, John W.; Sholder, Jason A.; Thacker, James R.; and Amundson, David C., to Siemens-Element AB. Physiologically responsive pacemaker and method of adjusting the pacing interval thereof, 4,712,555, Cl. 128-419.0PG.
- Thornfeldt, Carl R. Treatment of nonacne inflammatory and infectious dermatoses and hair loss, 4,713,394, Cl. 514-574.000.
- Thorsman & Co. Aktiebolag: See—
Legerius, Bengt E.; and Sundstrom, Inge, 4,712,342, Cl. 52-221.000.
- Tiemann, James P. Helicopter blade and the like stand-off and folding device, 4,712,978, Cl. 416-1.000.
- Tien, Zu-Jean, to International Business Machines Corporation. Laser luminescence monitor for material thickness, 4,713,140, Cl. 156-626.000.
- Tigelaar, Howard L.; Riemenschneider, Bert R.; and Paterson, James L., to Texas Instruments Incorporated. Electrically erasable programmable read only memory cell including trench capacitor, 4,713,677, Cl. 357-23.500.
- Tippie, John W.: See—
Hayes, Michael L.; Mahr, Paul S.; and Tippie, John W., 4,713,770, Cl. 364-474.000.
- Tischer, Alessandro, to U.S. Philips Corporation. System for increasing the brightness of a multibeam dot-pattern cathode ray display tube, 4,713,657, Cl. 340-748.000.
- Tishura, Vladimir I.: See—
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- Titeflex Corporation: See—
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- Tochigifujisangyo Kabushikigaisha: See—
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- Tofanelli, Adler: See—
Ambrosio, Renato; Brosio, Alberto; Fausone, Alfredo; and Tofanelli, Adler, 4,713,803, Cl. 370-32.100.
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- Tokyo Juki Industrial Co., Ltd.: See—
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- Tokyo Kogaku Kikai Kabushiki Kaisha: See—
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- Nunokawa, Kazuo, 4,712,894, Cl. 351-208.000.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—
Komatsu, Michiyasu, 4,713,302, Cl. 428-698.000.
- Suzuki, Kaoru, 4,713,789, Cl. 364-724.000.
- Tolksdorf, Wolfgang F. M.; Bartels, Inse E. H.; Dammann, Hans O. B.; Klages, Claus-Peter; and Pross, Elke B., to U.S. Philips Corporation. Planar optical waveguide and method of manufacturing same, 4,712,855, Cl. 350-96.120.
- Tomioka, Kentaro: See—
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- Tomita, Kenichi: See—
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- Tomkins, Keith A.: See—
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- Tone, Hirosada, to Fujitsu Limited. Buffer storage system, 4,713,752, Cl. 364-200.000.
- Tong, Duncan, to Duncan Products Ltd. Swimming marine creature toys, 4,713,037, Cl. 446-158.000.
- Tonyes, Henry J.; Keehn, William T.; German, Harold W.; and Hill, Brian S., to Gaines Pet Foods Corp. Dog food palatability enhancer and process, 4,713,250, Cl. 426-2.000.
- Top Driver Enterprise Co., Ltd.: See—
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- Topfl, Rosemarie; and Abel, Heinz, to Ciba-Geigy Corporation. Maleic or phthalic acid half esters of alkoxylated fatty amines, 4,713,482, Cl. 560-196.000.
- Torcon Products, Inc.: See—
Coston, David B., 4,713,744, Cl. 363-160.000.
- Torii, Hisatsugu, to Fuji Photo Film Co., Ltd. Exposure mask for micro camera, 4,712,911, Cl. 355-74.000.
- Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; Uto, Seiryu; and Hayase, Syozo, to Otsuka Kagaku Kabushiki Kaisha. Process for preparation of azetidinone derivatives, 4,713,452, Cl. 540-358.000.
- Tortorello, Anthony J.; and Lukanich, Joseph D., to DeSoto, Inc. Amine-functional monoethylenic monomers, acrylic copolymers and aqueous coating compositions containing the same, 4,713,481, Cl. 560-159.000.
- Toshiba Tungaloy Co., Inc.: See—
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- Tourneux, Etienne: See—
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- Towae, Friedrich: See—
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- Towes, Peter: See—
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- Townsend, Greg M.; and DiPrizio, Giuseppe M., to Motorola Inc. Fast power-fail detector for power supplies with energy hysteresis, 4,713,553, Cl. 307-64.000.
- Toyama Chemical Co., Ltd.: See—
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- Watanabe, Isao; Momonoi, Kaishu; Hiraiwa, Toru; Ono, Satoshi; Nakano, Joji; Nagumo, Katsuyuki; and Takagi, Hiroyasu, 4,713,387, Cl. 514-332.000.
- Toyo Soda Manufacturing Co., Ltd.: See—
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- Toyoda, Eiji; and Hayashi, Soichiro, to Kabushiki Kaisha Toshiba. Superconducting system and method for controlling the same, 4,713,722, Cl. 361-141.000.
- Toyoda Gosei Co., Ltd.: See—
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- Toyoda, Kenichi: See—
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- Toyomitsu Kogyo Co., Ltd.: See—
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- Toyota Jidosha Kabushiki Kaisha: See—
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- Baika, Toyokazu; and Onaka, Hidemi, 4,712,442, Cl. 74-467.000.
- Buma, Shuichi; and Horiyama, Osamu, 4,712,775, Cl. 267-220.000.
- Hamajima, Kaneo; Dohnomoto, Tadashi; Tanaka, Atsuo; and Kubo, Masahiro, 4,712,600, Cl. 164-97.000.
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- Kodama, Hisashi; and Okabe, Yoshio, 4,713,045, Cl. 474-135.000.
- Kurosawa, Ryuichi, 4,712,807, Cl. 280-707.000.
- Nagai, Toshihiko; Masui, Takatoshi; Satou, Yasushi; and Katsuno, Toshiyasu, 4,712,373, Cl. 60-274.000.
- Sato, Akira; Sato, Kazuo; Saito, Takaharu; Shima, Junkoh; Mizutani, Kansei; and Mikawa, Toshimasa, 4,713,767, Cl. 364-453.000.
- Tozima, Hitoshi: See—
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- Tracy, David J.: See—
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- Trapp, Hans G.: See—
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- Trast Enterprise S.r.l.: See—
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- Trenzlek, Theodore, to Tecma Laboratories, Inc. Skin therapeutic mixture containing eupatorium extract, 4,713,242, Cl. 424-145.000.
- Trickel, Lorn L. Solar-energy-collecting structural unit and solar roof, 4,712,338, Cl. 52-90.000.
- Trigon Packaging Systems Limited: See—
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- Triner, Irvin R.: See—
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- Trinki, Gerd: See—
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- Triplett, Charles S.; and Gray, John D. Non-penetrating roof system, 4,712,348, Cl. 52-408.000.
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- Trogel, Gerhard: See—
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- Troup, Cathryn H., executor: See—
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- Troup, Edward M., deceased: See—
Wichman, William J.; and Troup, Edward M., deceased, 4,713,038, Cl. 446-168.000.
- Truitt, Robert B.; and Junius, V. Bruce, to Fluid Mechanics. Compact and cleanable apparatus for preventing scale formation in liquid systems, 4,713,159, Cl. 204-197.000.
- Truskolaski, Bernard S., to Minnesota Mining and Manufacturing Company. Decorative ribbon and sheet material, 4,713,267, Cl. 428-4.000.
- Trutzschler GmbH & Co. KG: See—
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- TRW Inc.: See—
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- Gardner, Neal F., 4,713,355, Cl. 437-31.000.
- Wood, Ruey E., Jr., 4,712,940, Cl. 403-133.000.
- Tsang, Chi-Hwa, to Intel Corporation. Anisotropic plasma etching of tungsten, 4,713,141, Cl. 156-643.000.
- Tsubaki, Yasuhiro: See—
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- Tsuji, Sadahiko: See—
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- Ueda, Kenji, to Omron Tateisi Electronics Co. Circuit resistance adjusting device, 4,713,602, Cl. 323-354.000.

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- U.S. Philips Corporation: See—
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- Van Gils, Willibrordus J., 4,713,816, Cl. 371-38.000.
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- Markhart, Albert H., III, 4,713,344, Cl. 435-287.000.
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- van Elten, Gerrit J.; Hurkmans, Antonius; and de Vries, Hugo V., to Technisch Ontwikkelingsbureau van Elten B.V. Storage system for products using supporting units, 4,712,964, Cl. 414-281.000.
- Vangen, Knut. Enclosure constructions for fish breeding, 4,712,509, Cl. 119-3.000.
- Van Gils, Willibrordus J., to U.S. Philips Corporation. Three module memory system constructed with symbol-wide memory chips and having an error protection feature, each symbol consisting of 21+1 bits, 4,713,816, Cl. 371-38.000.
- Van Nice, H. Lee; Bostwick, Myron A., Jr.; and Kongsie, Keith F., to Tektronix, Inc. Method and apparatus for interconnecting and hermetically sealing ceramic components, 4,713,520, Cl. 219-121.0LC.
- Van Sickle, Dale E., to Eastman Kodak Company. Preparation of dimethyl 4,4'-stilbenedicarboxylate and intermediates therefor, 4,713,472, Cl. 560-53.000.

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- Voith, Thomas P. Modular step ramp, 4,712,264, Cl. 14-69.500.
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- Vu, Tho T.; and Lee, Kang W., to Honeywell Inc. Multiple input and multiple output or/and circuit, 4,713,559, Cl. 307-446.000.
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- Wainio, Ronald: See—
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- Wainwright, H. Kent, to In-Situ, Inc. Combination hazardous liquid and water sensor, 4,712,505, Cl. 116-227.000.
- Waite, Harold K.: See—
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- Wakasa, Satoshi; and Okazaki, Toru, to Kabushiki Kaisha Komatsu Seisakusho. Diesel engine fuel injection pump capable of injection timing adjustment, 4,712,985, Cl. 417-486.000.
- Wakisaka, Yoshiharu; Uo, Junko; Matsumoto, Kouichi; Ohodaira, Osamu; and Tanaka, Kentaro, to Shionogi & Co., Ltd. Bacterial insecticide and production thereof, 4,713,241, Cl. 424-93.000.
- Waldorf Corporation: See—
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- Walker, James L.: See—
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- Walker, John R.: See—
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- Walker, Roger E.: See—
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- Walker, William D.: See—
Hardage, Timothy W.; Haley, Charles T.; and Walker, William D., 4,712,356, Cl. 53-446.000.
- Walkiewicz, Zigmunt J., Jr.; and Lynch, William C., to Clamco Corporation. Apparatus for severing wrapping film, 4,712,459, Cl. 83-171.000.
- Walse, Alan S.: See—
Regnier, Kent E.; Hoover, Thomas C.; and Walse, Alan S., 4,713,013, Cl. 439-62.000.
- Walsh, John V., to VSM Associates, Inc. Method and system for the removal of oxides of nitrogen and sulfur from combustion processes, 4,713,152, Cl. 204-130.000.

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Fennekels, Peter; Waltmann, Ernst; and Schumacher, Walter, 4,713,531, Cl. 219-545.000.

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Temes, Gabor C.; and Wang, Fong J., 4,713,650, Cl. 340-347.0DA.

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Wang Laboratories, Inc.: See—
Agarwal, Arun K.; Knapp, Suzanne C.; and Lakness, David R., 4,713,754, Cl. 364-200.000.

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Schaumburg, John P.; Hokanson, Gerard C.; French, James C.; Tunac, Josefine B.; and Underhill, Marjorie A., 4,713,372, Cl. 514-45.000.

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Mobley, Dewey F.; Warren, Janice M.; Barbrick, August; and Eisenmann, Gregg A., 4,713,026, Cl. 439-845.000.

Warrick, James C., to Simula, Inc. Adjustable seat cushion with tension limiting means, 4,712,834, Cl. 297-284.000.

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Tanaka, Fumihiro; Shimada, Yoshio; Yamaguchi, Kaneo; Matsushima, Kenichi; and Watanabe, Shinya, 4,713,691, Cl. 358-148.000.

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Eidenschink, Rudolf; Krause, Joachim; Hittich, Reinhard; Poetsch, Eike; Scheuble, Bernhard; Weber, Georg; and Pohl, Ludwig, 4,713,197, Cl. 252-299.610.

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Wedell, Mark C.: See—
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Weicht, Ulrich: See—
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Weir, Joseph W., III. Universal fittings, 4,712,812, Cl. 285-177.000.

Weirich, Walter; Barnert, Heiko; Oertel, Michael; and Schulten, Rudolf, to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung. Process and apparatus for conversion of water vapor with coal or hydrocarbon into a product gas, 4,713,234, Cl. 423-648.00R.

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Woidt, Jurgen; and Fries, Wolfgang, to Varta Batterie A.G. Process for manufacturing negative cadmium electrodes for sealed alkaline battery cells, 4,713,126, Cl. 148-6.14R.

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Carter, William S., 4,713,557, Cl. 307-242.000.

Xu-Yi, Zhang; Guangxi, Yue; and Qiayu, Zheng, to Qinghua University. Fluidized bed boiler and high temperature separators used therein. 4,712,514, Cl. 122-4.00D.

Yaeger, John R.: See—
Baum, Samuel; and Yaeger, John R., 4,713,643, Cl. 337-140.000.

Yagi, Katsunori: See—
Kobayashi, Nobuyuki; Hattori, Takashi; Yagi, Katsunori; and Ito, Toshimitsu, 4,713,766, Cl. 364-431.050.

Yaku, Fumiko: See—
Fujishima, Shizu; Yaku, Fumiko; and Koshijima, Tetsuo, 4,713,334, Cl. 435-99.000.

Yamada, Kazutoshi; and Yamaguchi, Takao, to Omron Tateisi Electronics Co. Transaction processing system for separate registration and settlement functions. 4,713,760, Cl. 364-405.000.

Yamada, Kazuyoshi, to NEC Corporation. Transistor circuit with controlled collector saturation voltage. 4,713,561, Cl. 307-456.000.

Yamada, Manabu; Yoshida, Ichirou; Yamaguchi, Shunzo; and Atsumi, Morihiro, to Nippondenso Co., Ltd. Spark plug. 4,713,582, Cl. 315-58.000.

Yamada, Masaaki: See—
Furth, Harold P.; Janos, Alan C.; Uyama, Tadao; and Yamada, Masaaki, 4,713,208, Cl. 376-137.000.

Yamada, Tadatoshi: See—
Ozaki, Haruhiko; Yamada, Tadatoshi; Machida, Kunio; Ohno, Kiyoshi; Shimazaki, Hirato; Inoue, Hidekimi; and Uji, Ryohei, 4,713,686, Cl. 358-107.000.

Yamada, Tomio: See—
Ikura, Katsuyata; Hagiwara, Kenji; Nagasaki, Fumihiko; Yamada, Tomio; Takahashi, Hidemitsu; and Hatano, Renpei, 4,713,396, Cl. 514-594.000.

Yamada, Toshitaka: See—
Abe, Tomoaki; Fujisawa, Hideya; Omori, Norio; Kinugawa, Masumi; Ito, Katsunori; Akiyama, Susumu; Mizuno, Tiaki; and Yamada, Toshitaka, 4,713,765, Cl. 364-431.050.

Yamada, Tutomu, to Mitsubishi Denki Kabushiki Kaisha. Excitation control apparatus for rotary electric machine. 4,713,741, Cl. 363-50.000.

Yamagishi, Hideaki; and Oshimi, Tetsuro, to Mitsubishi Denki Kabushiki Kaisha. Memory bank switching apparatus. 4,713,759, Cl. 364-200.000.

Yamagishi, Hiroaki: See—
Asano, Masao; Isobe, Ryosuke; Yamauchi, Yasuhisa; and Yamagishi, Hiroaki, 4,713,293, Cl. 428-403.000.

Yamagishi, Hiroshi: See—
Oikawa, Shoji; Yamagishi, Hiroshi; Saito, Shigeru; Fujita, Tsuyoshi; and Watanabe, Takayoshi, 4,713,494, Cl. 174-68.500.

Yamaguchi, Kaneo: See—
Tanaka, Fumihiro; Shimada, Yoshio; Yamaguchi, Kaneo; Matsushima, Kenichi; and Watanabe, Shinya, 4,713,691, Cl. 358-148.000.

Watanabe, Shinya; Tanaka, Fumihiro; Yamaguchi, Kaneo; Shimada, Yoshio; and Matsushima, Kenichi, 4,713,690, Cl. 358-148.000.

Yamaguchi, Keiji, to Terumo Corporation. Blood pressure measuring apparatus. 4,712,564, Cl. 128-682.000.

Yamaguchi, Shunzo: See—
Yamada, Manabu; Yoshida, Ichirou; Yamaguchi, Shunzo; and Atsumi, Morihiro, 4,713,582, Cl. 315-58.000.

Yamaguchi, Takao: See—
Yamada, Kazutoshi; and Yamaguchi, Takao, 4,713,760, Cl. 364-405.000.

Yamaki, Chikara, to Fan Out Co., Ltd. Whisk pick. 4,712,266, Cl. 15-167.100.

Yamamoto, Akio; and Shinkawa, Keiro, to Hitachi, Ltd. Frequency converter circuit. 4,713,556, Cl. 307-219.100.

Yamamoto, Mariko: See—
Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, 4,713,308, Cl. 430-65.000.

Yamamoto, Yoshitaka: See—
Kokubo, Ichiro; Mizuta, Atsuo; Yamamoto, Yoshitaka; and Kitazawa, Jitsuo, 4,712,414, Cl. 72-366.000.

Yamamura, Shigeyuki, to Fujitsu Limited. Semiconductor device mounted in a housing having an increased cutoff frequency. 4,713,634, Cl. 333-245.000.

Yamanaka, Tsutomu: See—
Ao, Hideki; Obata, Minoru; Yamanaka, Tsutomu; and Mikashima, Hiroshi, 4,713,381, Cl. 514-222.000.

Yamashita, Tsukasa: See—
Mikami, Kazuo; Yamashita, Tsukasa; and Katoh, Mitsutaka, 4,712,854, Cl. 350-96.120.

Yamashita, Yutaka: See—
Kamata, Mitsuo; and Yamashita, Yutaka, 4,712,446, Cl. 74-492.000.

Yamauchi, Yasuhisa: See—
Asano, Masao; Isobe, Ryosuke; Yamauchi, Yasuhisa; and Yamagishi, Hiroaki, 4,713,293, Cl. 428-403.000.

Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, to Semiconductor Energy Laboratory Co., Ltd. Electronic device manufacturing methods. 4,713,518, Cl. 219-121.0LM.

Yamazaki, Yoshio: See—
Takimoto, Masahiro; Takeuchi, Junji; and Yamazaki, Yoshio, 4,713,419, Cl. 525-211.000.

Yanagawa, Ichiro; and Wachi, Yuji, to Jidosha Kiki Co., Ltd. Air drier apparatus. 4,713,094, Cl. 55-163.000.

Yanagihara, Kenji: See—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,713,287, Cl. 428-336.000.

Yanagishima, Fumiya: See—
Ohta, Norio; Yanagishima, Fumiya; Kaihara, Toshikazu; Kishida, Akira; Sato, Kuniaki; and Ochiai, Masanobu, 4,713,154, Cl. 204-145.00R.

Yasuda, Isao; Yoshisato, Yorinobu; Yoshikawa, Hideki; and Taketa, Kazuhiko, to Sanyo Electric Co., Ltd. Twin head for electronic still camera and a method for making the same. 4,713,709, Cl. 360-121.000.

Yasuda, Makoto: See—
Ura, Syouzaburo; Yasuda, Makoto; and Ooki, Yoshitaka, 4,712,532, Cl. 123-572.000.

Yasunaga, Tadashi; and Shirahata, Ryuji, to Fuji Photo Film Co., Ltd. Manufacturing method for a magnetic recording medium. 4,713,262, Cl. 427-130.000.

Yates, Michael J.: See—
Hull, Alan; and Yates, Michael J., 4,712,454, Cl. 81-3.270.

Yazaki Corporation: See—
Takiguchi, Isao, 4,713,015, Cl. 439-125.000.

Yazaki, Takao; Noro, Masataka; and Matsui, Takashi, to Mitsubishi Petrochemical Co., Ltd. Films for use in stretch-packaging. 4,713,282, Cl. 428-216.000.

Yeh, Tsu-Hsing: See—
Jones, Robert E., Jr.; Lee, Rodney E.; and Yeh, Tsu-Hsing, 4,713,711, Cl. 360-123.000.

Yeo, Richard S.: See—
Wang, Kenneth Y.; and Yeo, Richard S., 4,713,068, Cl. 604-366.000.

Wang, Kenneth Y.; and Yeo, Richard S., 4,713,069, Cl. 604-378.000.

Yissum Research Development Co. of the Hebrew University of Jerusalem: See—
Chet, Ilan; Sivan, Alex; and Elad, Yigal, 4,713,342, Cl. 435-254.000.

Yoda, Kuniichi; Kitaura, Eiji; Tsunoda, Tsutomu; and Kawakami, Yoshio, to TDK Corporation. Magnetic recording medium. 4,713,278, Cl. 428-141.000.

Yokoe, Jintaro; Takeuchi, Masami; and Tsuji, Toshiaki, to Kansai Netsukagaku Kabushiki Kaisha. Adsorbent for separation-recovery of CO, preparing method thereof and process for separation-recovery of high purity CO, using the adsorbent. 4,713,090, Cl. 55-68.000.

Yokogawa Electric Corporation: See—
Hoshino, Kazuya; and Matsuura, Hiroyuki, 4,713,614, Cl. 324-307.000.

Shimazaki, Toru; and Matsuura, Hiroyuki, 4,713,616, Cl. 324-309.000.

Yokogawa Medical Systems, Limited: See—
Hoshino, Kazuya; and Matsuura, Hiroyuki, 4,713,614, Cl. 324-307.000.

Shimazaki, Toru; and Matsuura, Hiroyuki, 4,713,616, Cl. 324-309.000.

Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, to Green Cross Corporation, The. Perfluoro compounds. 4,713,459, Cl. 546-150.000.

Yokoyama, Nobuyuki: See—
Hakamatsuka, Yasuharu; and Yokoyama, Nobuyuki, 4,713,006, Cl. 433-201.100.

Yolken, Robert H. Microbial Enzyme assays. 4,713,328, Cl. 435-18.000.

Yonemoto, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for elevator. 4,713,595, Cl. 318-759.000.

Yonese, Naoki: See—
Omatsu, Masayuki; Yonese, Naoki; and Kondo, Mitsuru, 4,713,488, Cl. 564-397.000.

Yonezu, Kiyoshi: See—
Aoyama, Akinasa; Moritani, Takeshi; Yonezu, Kiyoshi; Negi, Taichi; and Okaya, Takuji, 4,713,296, Cl. 428-412.000.

Yoshida, Bunsaku; and Tomioka, Kentaro, to G-C Dental Industrial Corporation. Dental composite resin composition. 4,713,403, Cl. 523-115.000.

Yoshida, Haruhiko: See—
Takemura, Tohru; Itoh, Hajime; Kamo, Jun; and Yoshida, Haruhiko, 4,713,292, Cl. 428-373.000.

Yoshida, Ichirou: See—
Yamada, Manabu; Yoshida, Ichirou; Yamaguchi, Shunzo; and Atsumi, Morihiro, 4,713,582, Cl. 315-58.000.

Yoshida, Jun: See—
Sasaki, Makoto; Yoshida, Jun; Shimizu, Yoshishige; Akazawa, Kiyoshi; Kishita, Eiji; and Hirata, Kaoru, 4,713,291, Cl. 428-373.000.

Yoshida Kogyo, K. K.: See—
Kaminaga, Hiromitsu, 4,712,345, Cl. 52-235.000.

Yoshieda, Keiichi, 4,712,718, Cl. 227-62.000.

Yoshida, Masaaki; Endo, Shigeki; Kisanuki, Shigeru; and Kakuzen, Hideo, to Sumitomo Electric Industries, Ltd. Apparatus for producing porous preforms for optical fibers. 4,713,107, Cl. 65-157.000.

Yoshida, Toshio: See—
Sunano, Naomasa; Asahi, Naotatsu; and Yoshida, Toshio, 4,713,646, Cl. 338-34.000.

Yoshida, Toshiyuki; and Arai, Mitsuru, to Kabushiki Kaisha Komatsu Seisakusho. Control apparatus for hydraulic motor. 4,712,377, Cl. 60-444.000.

Yoshieda, Keiichi, to Yoshida Kogyo, K. K. Apparatus for assembling pairs of fastener elements. 4,712,718, Cl. 227-62.000.

Yoshikawa, Hideki: See—
Yasuda, Isao; Yoshisato, Yorinobu; Yoshikawa, Hideki; and Taketa, Kazuhiko, 4,713,709, Cl. 360-121.000.

Yoshikawa, Shoji, to Olympus Optical Co., Ltd. Semiconductor laser driver. 4,713,819, Cl. 372-9.000.

Yoshiki, Naokazu; Saito, Yutaka; and Haba, Tsuneo, to Mitsubishi Kinzoku Kabushiki Kaisha. Apparatus for working surface of metal pipe. 4,712,407, Cl. 72-68.000.

Yoshinaga, Kazuo: See—
Kanbe, Junichiro; and Yoshinaga, Kazuo, 4,712,872, Cl. 350-333.000.

Yoshisato, Yorinobu: See—
Yasuda, Isao; Yoshisato, Yorinobu; Yoshikawa, Hideki; and Taketa, Kazuhiko, 4,713,709, Cl. 360-121.000.

Yoshitomi Pharmaceutical Industries, Ltd.: See—
Akashi, Hiroyuki; Inoue, Takeshi; and Horie, Shoichi, 4,713,474, Cl. 560-66.000.

Ao, Hideki; Obata, Minoru; Yamanaka, Tsutomu; and Mikashima, Hiroshi, 4,713,381, Cl. 514-222.000.

Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, to Kabushiki Kaisha Toshiba. Electrophoto-

graphic photosensitive member using microcrystalline silicon. 4,713,308, Cl. 430-65.000.

Young, Jeffrey H. Fuel injector testing device. 4,712,421, Cl. 73-119.00A.

Young, William I., to Hy-Con Products, Inc. Container for static-sensitive articles. 4,712,674, Cl. 206-328.000.

Yuan, Lo J., to Top Driver Enterprise Co., Ltd. Electric torsion-controlled screwdriver with an improved automatic turn-off device. 4,712,456, Cl. 81-473.000.

Yui, Yoshiaki, to Canon Kabushiki Kaisha. Exposure apparatus. 4,713,675, Cl. 355-69.000.

Zahn, Donald E.; and Strickler, Gary R., to Dow Chemical Company, The. Power proportioning controller for solid state relays. 4,713,601, Cl. 323-322.000.

Zaid, Najib H. Dispersed oil soluble corrosion inhibitor and water soluble phosphonate scale inhibitor composition. 4,713,184, Cl. 252-8.552.

Zambri, Patrick M.: See—
Marsh, Gary B.; Fanelli, Anthony J.; Armor, John N.; and Zambri, Patrick M., 4,713,233, Cl. 423-608.000.

Zamzow, Donald D.; and Gorski, George L. Programmed mix and delivery system. 4,712,511, Cl. 119-51.00R.

Zarini, Franco: See—
Perrone, Ettore; Alpegiani, Marco; Zarini, Franco; Bruna, Costantino D.; and Franceschi, Giovanni, 4,713,378, Cl. 514-192.000.

Zarley, Donald H.: See—
Zarley, Marilyn J.; and Zarley, Donald H., 4,712,504, Cl. 116-222.000.

Zarley, Marilyn J.; and Zarley, Donald H. Tennis scoring means. 4,712,504, Cl. 116-222.000.

Zbar, Jack: See—
Khudenko, Boris M.; and Zbar, Jack, 4,713,102, Cl. 62-535.000.

Zell, Karl: See—
Seidel, Peter; Pelzl, Leo; and Zell, Karl, 4,712,849, Cl. 439-607.000.

Zemanek, Danny: See—
Kester, Eugene A.; Reeves, Scott P.; and Zemanek, Danny, 4,712,756, Cl. 248-165.000.

Zenith Electronics Corporation: See—
Lee, Sae D.; and Palac, Kazimir, 4,713,034, Cl. 445-45.000.

Zhidkova, Irina S.: See—
Arutjunian, Norair S.; Kornena, Elena P.; Kazarian, Robert V.; Ponomareva, Natalya A.; Redko, Grigory V.; Sakhno, Lidia T.; and Zhidkova, Irina S., 4,713,155, Cl. 204-155.000.

Zievers, James F.; and Eggerstedt, Paul, to Industrial Filter & Pump Mfg. Co. Mounting arrangement for a tube-type filter element. 4,713,174, Cl. 210-233.000.

Zimmerman, Norman B.: See—
Ricciello, Salvatore R.; Smith, Marcell; Goldstein, Howard E.; and Zimmerman, Norman B., 4,713,275, Cl. 428-76.000.

Ziogas, Phoivos D.: See—
Huynh, Anh N.; and Ziogas, Phoivos D., 4,713,220, Cl. 422-186.160.

Zulauf, Karlheinz; and Breuer, Lothar, to Wella Aktiengesellschaft. Apparatus for the metered removal of pasty or fluid substances. 4,712,593, Cl. 141-113.000.

Zurilla, Ronald W.; and Huff, John, to Parker Chemical Company. Alkaline resistant phosphate conversion coatings. 4,713,121, Cl. 428-472.300.

Zweifel, Hans: See—
Riediker, Martin; Meier, Kurt; and Zweifel, Hans, 4,713,401, Cl. 522-65.000.

Zwirm, Robert, to Hughes Aircraft Company. Noninvasive DC restoration to upgrade AC coupled systems. 4,713,694, Cl. 358-171.000.

Zwolinski, Leon M.; and Dwyer, Frank J., to Allied Corporation. Foaming system for phenolic foams. 4,713,400, Cl. 521-131.000.

501 Aeroflex Laboratories, Incorporated: See—
Schwartz, Myron, 4,713,569, Cl. 310-152.000.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF DECEMBER, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- AMP Incorporated: See—
Fedder, James L.; and Taylor, Attalee S., Re. 32,559, Cl. 439-325.000.
- Chan, Kwok Y., to Eastman Kodak Company. Autorewinding self-threading camera. Re. 32,558, Cl. 354-173.100.
- Conradty GmbH & Co. Metallektroden KG: See—
Kozioł, Konrad; and Wenk, Erich, Re. 32,561, Cl. 204-288.000.
- Eastman Kodak Company: See—
Chan, Kwok Y., Re. 32,558, Cl. 354-173.100.
- Fedder, James L.; and Taylor, Attalee S., to AMP Incorporated. Card edge connector locking device. Re. 32,559, Cl. 439-325.000.
- Givens, James A. Stabilized survival raft. Re. 32,560, Cl. 441-37.000.
- Kozioł, Konrad; and Wenk, Erich, to Conradty GmbH & Co. Metallektroden KG. Coated metal anode for the electrolytic recovery of metals. Re. 32,561, Cl. 204-288.000.
- Litz, Lawrence M., to Union Carbide Corporation. Process and apparatus for mixing a gas and a liquid. Re. 32,562, Cl. 261-91.000.
- Schlumberger Technology Corporation: See—
Scholberg, Andre, Re. 32,564, Cl. 324-373.000.
- Scholberg, Andre, to Schlumberger Technology Corporation. Apparatus for determining the resistivity of a subsurface earth formation at different lateral distances from a bore hole wall. Re. 32,564, Cl. 324-373.000.
- Stolar, Inc.: See—
Stolarczyk, Larry G., Re. 32,563, Cl. 324-334.000.
- Stolarczyk, Larry G., to Stolar, Inc. Continuous wave medium frequency signal transmission survey procedure for imaging structure in coal seams. Re. 32,563, Cl. 324-334.000.
- Taylor, Attalee S.: See—
Fedder, James L.; and Taylor, Attalee S., Re. 32,559, Cl. 439-325.000.
- Union Carbide Corporation: See—
Litz, Lawrence M., Re. 32,562, Cl. 261-91.000.
- Wenk, Erich: See—
Kozioł, Konrad; and Wenk, Erich, Re. 32,561, Cl. 204-288.000.

LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- American Safety Equipment Corp.: See—
Hollowell, William, B1 4,562,977, Cl. 242-107.40D.
- Clatworthy, Edward F.: See—
Smith, Darrell F., Jr.; and Clatworthy, Edward F., B1 4,445,944, Cl. 148-12.300.
- Hardee, Kim C., to Immos Corporation. Method of making single poly memory cell. B1 4,486,944, 12-15-87, Cl. 437-52.000.
- Hollowell, William, to American Safety Equipment Corp. Easily assembled seat belt retractor and method. B1 4,562,977, 12-15-87, Cl. 242-107.40D.
- Huntington Alloys, Inc.: See—
Smith, Darrell F., Jr.; and Clatworthy, Edward F., B1 4,445,944, Cl. 148-12.300.
- Immos Corporation: See—
Hardee, Kim C., B1 4,486,944, Cl. 437-52.000.
- Norwich, Daniel, to Telecredit Inc. Telephone scheduling system. B1 3,989,899, 12-15-87, Cl. 379-134.000.
- Smith, Darrell F., Jr.; and Clatworthy, Edward F., to Huntington Alloys, Inc. Heat treatments of low expansion alloys. B1 4,445,944, 12-15-87, Cl. 148-12.300.
- Telecredit Inc.: See—
Norwich, Daniel, B1 3,989,899, Cl. 379-134.000.

LIST OF DESIGN PATENTEEES

- Aaron, Willard. Bath caddy. 293,183, 12-15-87, Cl. D6-525.000.
- Abrams, Robert C.: See—
Weder, Donald E.; Abrams, Robert C.; and Weder, Erwin H., 293,222, Cl. D11-164.000.
- Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,223, Cl. D11-164.000.
- American Locker Group Incorporated: See—
Chester, Richard J., 293,173, Cl. D6-432.000.
- Andre Morin Designers Inc.: See—
Morin, Andre, 293,185, Cl. D6-553.000.
- Appel, Mel; and Kress, George, to Mel Appel Company, The. Activity desk. 293,254, 12-15-87, Cl. D21-59.000.
- Asea AB: See—
Kaufmann, Herbert; and Back, Ulf, 293,250, Cl. D15-199.000.
- Back, Ulf: See—
Kaufmann, Herbert; and Back, Ulf, 293,250, Cl. D15-199.000.
- Baggioli, Giuseppe. Combined cook pot and container for food. 293,192, 12-15-87, Cl. D7-354.000.
- Balisteri, Jonathan W. English pub electronic bar. 293,179, 12-15-87, Cl. D6-474.000.
- Barish, Sidney, to Dickie Dee Ice Cream (Canada) Ltd. Confection on a stick. 293,155, 12-15-87, Cl. D1-104.000.
- Barone, Charles A. Cork puller. 293,200, 12-15-87, Cl. D8-42.000.
- BBC International Ltd.: See—
Campbell, Robert R., 293,158, Cl. D2-309.000.
- Beatty, David L.; and Loughrige, William W. Illumination attachment clip for firearms. 293,206, 12-15-87, Cl. D8-395.000.
- Bel-Art Products, Inc.: See—
Milden, Morton, 293,249, Cl. D15-9.000.
- Berg, Roger M. Bicycle wheel cover. 293,233, 12-15-87, Cl. D12-204.000.
- BIO-Support Industries Ltd.: See—
Roberts, Frank L., 293,170, Cl. D6-368.000.
- Black & Decker, Inc.: See—
House, Lawrence E., II; and Somers, Robert I., 293,201, Cl. D8-68.000.
- Bluestein, Bernard B.: See—
Stephen, James C.; Lohmeyer, Charles W.; and Bluestein, Bernard B., 293,191, Cl. D7-332.000.
- Boyle-Midway Household Products, Inc.: See—
Ronayne, Walter M., 293,263, Cl. D23-208.000.
- Braun Aktiengesellschaft: See—
Ullman, Roland, 293,265, Cl. D28-49.000.
- Bridgford Foods Corporation: See—
Vandervoort, David L., 293,193, Cl. D7-357.000.
- Brown, Michael, to Northern Telecom Limited. Telephone set. 293,237, 12-15-87, Cl. D14-53.000.
- Bruno, Robert H.; Burger, Laurie J.; Kipperman, Stuart; Mayer, Geoffrey R.; Protzmann, Donald E.; and Uhl, Robert F., to Sherwood Medical Co. Electronic thermometer. 293,215, 12-15-87, Cl. D10-57.000.

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- Burger, Laurie J.: See—
Bruno, Robert H.; Burger, Laurie J.; Kipperman, Stuart; Mayer, Geoffrey R.; Protzmann, Donald E.; and Uhl, Robert F., 293,215, Cl. D10-57.000.
- Cahusak, Piet C., to Intradal Nederland BV. Bottle. 293,209, 12-15-87, Cl. D9-375.000.
- Campbell, Robert R., to BBC International Ltd. Sport shoe. 293,158, 12-15-87, Cl. D2-309.000.
- Cari-All Inc.: See—
Trubiano, Antoine, 293,204, Cl. D8-380.000.
- Carmichael, Bruce. Carrier attachment for an automobile seat or the like. 293,162, 12-15-87, Cl. D3-40.000.
- Carter, Clyde L. Tissue box holder. 293,182, 12-15-87, Cl. D6-518.000.
- Caswell, William G. Wire wheel brush. 293,166, 12-15-87, Cl. D4-137.000.
- Chap, John P., to Selfix, Inc. Towel holder. 293,184, 12-15-87, Cl. D6-546.000.
- Chester, Richard J., to American Locker Group Incorporated. Console for controlling access to multiple compartment cabinets. 293,173, 12-15-87, Cl. D6-432.000.
- Chu, Robin; and Toor, John W., to Xerox Corporation. Keyboard or similar article. 293,244, 12-15-87, Cl. D14-100.000.
- Citicorp Credit Services, Inc.: See—
Wan, Anthony W.; and Kopp, Larry S., 293,241, Cl. D14-100.000.
- Connelly, Patrick J.; and Hoyt, Denis J., to Connelly Skis, Inc. Water ski. 293,259, 12-15-87, Cl. D21-229.000.
- Connelly, Patrick J.; and Hoyt, Denis J., to Connelly Skis, Inc. Water ski. 293,260, 12-15-87, Cl. D21-229.000.
- Connelly Skis, Inc.: See—
Connelly, Patrick J.; and Hoyt, Denis J., 293,259, Cl. D21-229.000.
- Connelly, Patrick J.; and Hoyt, Denis J., 293,260, Cl. D21-229.000.
- Conrad, George R., to Continental Plastic Containers, Inc. Bottle or the like. 293,210, 12-15-87, Cl. D9-405.000.
- Continental Plastic Containers, Inc.: See—
Conrad, George R., 293,210, Cl. D9-405.000.
- Cosatto SpA: See—
Zuliani, Alessandro, 293,212, Cl. D9-418.000.
- Crapser, James R., to S. C. Johnson & Son, Inc. Actuator cap. 293,213, 12-15-87, Cl. D9-448.000.
- Crapser, James R., to S. C. Johnson & Son, Inc. Valve actuator cap. 293,214, 12-15-87, Cl. D9-448.000.
- Daewoo Electronics Co., Ltd.: See—
Kim, Young S., 293,195, Cl. D7-384.000.
- Danner Shoe Manufacturing Co.: See—
Sacre, Guillaume, 293,159, Cl. D2-313.000.
- Demick, Robert L.: See—
Mastro, Louis L.; and Demick, Robert L., 293,236, Cl. D14-53.000.
- DePaul, Richard E.; and Hutchinson, Jack E., Sr., to Rendoll Paper Company. Ice cream carton. 293,211, 12-15-87, Cl. D9-416.000.
- Dewing, Kenneth M. Lid for a refuse container. 293,268, 12-15-87, Cl. D34-11.000.
- Dickie Dee Ice Cream (Canada) Ltd.: See—
Barish, Sidney, 293,155, Cl. D1-104.000.
- Drackett Company, The: See—
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- Grenley, J. David. Hand-held can opener. 293,199, 12-15-87, Cl. D8-18.000.
- Hamami, Demir. Buffet. 293,177, 12-15-87, Cl. D6-446.000.
- Hamami, Demir. Cabinet. 293,178, 12-15-87, Cl. D6-448.000.
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- Yoder Brothers, Inc.: See—
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ISSUED DECEMBER 15, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

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		4,712,316	119	4,712,316	314	4,712,368		4,712,433		4,712,555
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		4,712,263	CLASS 42		427	4,712,376		4,712,441	112	4,712,563
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625		4,712,280	223 R	4,712,342	18	4,712,394				4,712,583
			235	4,712,343	34	4,712,395				CLASS 138
162		4,712,281	311	4,712,344	129	4,712,396				30
178		4,712,290	404	4,712,345	248	4,712,397				44
			408	4,712,346	276	4,712,398				89
27 C		4,712,282	484	4,712,347	364 A	4,712,399				CLASS 139
33 P		4,712,283	573	4,712,348	382	4,712,401				1 C
240		4,712,284	809	4,712,349	383	4,712,402				309
458		4,712,285	CLASS 53		417	4,712,403				CLASS 141
463		4,712,286	80	4,712,353	CLASS 71					25
469		4,712,287	399	4,712,354	32	4,713,108				4,712,589
557		4,712,288	443	4,712,355	94	4,713,109				83
568		4,712,289	446	4,712,356	8	4,712,404				4,712,590
596		4,712,292	430	4,712,357	19	4,712,415				4,712,591
600		4,712,293	460	4,712,358	23	4,712,406				98
		4,712,294	540	4,712,359	68	4,712,407				4,712,592
700		4,712,295	567	4,712,360	88	4,712,408				4,712,593
828		4,712,296	CLASS 55		108	4,712,409				114
852		4,712,297	52	4,713,089	241	4,712,410				4,712,594
861		4,712,298	68	4,713,090	344	4,712,411				201
882		4,712,299	73	4,713,091	345	4,712,412				CLASS 144
			130	4,713,092	366	4,712,413				3 R
41		4,712,300	139	4,713,093	447	4,712,414				4,712,597
47		4,712,301	163	4,713,094	CLASS 73					CLASS 148
107		4,712,302	189	4,713,095	9	4,712,418				6.14 R
275		4,712,303	204	4,713,096	116	4,712,419				12.3
343		4,712,304	276	4,713,097	118.1	4,712,420				B1
			345	4,713,098	119 A	4,712,421				4,713,126
126.5		4,712,305	385 R	4,713,099	129	4,712,422				16.6
304		4,712,306	387	4,713,100	146	4,712,423				113
421		4,712,307	CLASS 56		152	4,712,424				4,713,123
472		4,712,308	16.5	4,712,362	460	4,712,425				128
527		4,712,309	16.7	4,712,363	505	4,712,426				4,713,124
					517 AV	4,712,427				4,713,125
										CLASS 149
										98
										CLASS 156
										64
										71
										72
										73.1
										4,713,132
										4,713,133
										4,713,134
										162
										181
										218
										229
										233
										307.4
										4,713,136
										4,713,137
										4,713,138

500	4,713,139	CLASS 190	CLASS 211	80	4,712,744	170	4,712,778	542.1	4,713,564
626	4,713,140	28	4,712,657	261.3	4,712,745	220	4,712,775	CLASS 310	
643	4,713,141	CLASS 191	49.1	4,712,691	CLASS 242	256	4,712,780	49 R	4,713,565
653	4,713,142	12.2 R	4,713,497	119	4,712,692	CLASS 269		58	4,713,566
655	4,713,143	CLASS 192	184	4,712,693	43 R	4,712,746	105	105	4,713,567
656	4,713,144	0.033	4,712,658	164	4,712,694	107.4 D	4,712,781	112	4,713,568
667	4,713,145	13 R	4,712,659	184	4,712,695	CLASS 244		152	4,713,569
		18 B	4,712,660	191	4,712,696	3.22	4,712,747	154	4,713,570
		45	4,712,661	192	4,712,697	22	4,712,748	316	4,713,571
		53 F	4,712,662	189	4,712,697	117 A	4,712,749	323	4,713,572
84 R	4,712,598	58 A	4,712,663	100 A	4,712,698	119	4,712,750	329	4,713,573
133	4,712,599	CLASS 193	366	4,712,700	129.1	4,712,751	187	187	4,712,785
		17	4,712,664	CLASS 219	161	4,712,752	207	207	4,712,786
		CLASS 194	10.55 B	4,713,514	CLASS 248	311	4,712,787	196	4,712,842
		346.2	10.55 D	4,713,515	1	4,712,754	69	242	4,712,843
		503	10.55 E	4,713,516	49	4,712,755	73	265	4,712,844
		643	4,713,517	188	4,712,756	49	4,712,788	319	4,712,845
		698	4,713,518	188.7	4,712,757	118	4,712,790	CLASS 313	
		771	4,713,519	429	4,712,758	93	4,712,792	130	4,713,574
		803.01	4,713,520	451	4,712,759	118	4,712,793	400	4,713,575
		CLASS 195	4,713,521	451	4,712,760	122	4,712,794	468	4,713,576
		5 R	4,713,522	451	4,712,761	CLASS 273		481	4,713,577
		16 D	4,713,523	451	4,712,762	73 R	4,712,795	500	4,713,578
		48 KB	4,713,524	451	4,712,763	138 A	4,712,796	624	4,713,579
		50 AA	4,713,525	451	4,712,764	148 R	4,712,797	CLASS 315	
		61.82	4,713,526	451	4,712,765	163 R	4,712,798	5.41	4,713,581
		144 B	4,713,527	451	4,712,766	164	4,712,799	58	4,713,582
		153 SC	4,713,528	451	4,712,767	CLASS 277		82	4,713,583
		CLASS 196	4,713,529	451	4,712,768	1	4,712,800	83	4,713,584
		158	4,713,530	451	4,712,769	71	4,712,801	111.81	4,713,585
		159 A	4,713,531	451	4,712,770	212 C	4,712,802	289	4,713,586
		328	4,713,532	451	4,712,771	CLASS 279		382	4,713,587
		CLASS 197	4,713,533	451	4,712,772	123	4,712,831	400	4,713,588
		248	4,713,534	451	4,712,773	CLASS 280		47.13 B	4,713,590
		CLASS 200	4,713,535	451	4,712,774	47.13 R	4,712,803	565	4,713,591
		5 R	4,713,536	451	4,712,775	154.5 R	4,712,804	572	4,713,592
		16 D	4,713,537	451	4,712,776	707	4,712,805	685	4,713,593
		48 KB	4,713,538	451	4,712,777	CLASS 281		759	4,713,594
		50 AA	4,713,539	451	4,712,778	15 R	4,712,808	802	4,713,595
		61.82	4,713,540	451	4,712,779	CLASS 285		21	4,712,809
		144 B	4,713,541	451	4,712,780	21	4,712,810	93	4,712,811
		153 SC	4,713,542	451	4,712,781	113	4,712,811	177	4,712,812
		CLASS 198	4,713,543	451	4,712,782	177	4,712,812	351	4,713,600
		346.2	4,713,544	451	4,712,783	250	4,712,813	354	4,713,602
		503	4,713,545	451	4,712,784	325	4,712,814	CLASS 324	
		643	4,713,546	451	4,712,785	334	4,712,815	61 P	4,713,603
		698	4,713,547	451	4,712,786	CLASS 292		73 PC	4,713,607
		771	4,713,548	451	4,712,787	253	4,712,816	73 R	4,713,608
		803.01	4,713,549	451	4,712,788	336.3	4,712,817	142	4,713,609
		CLASS 199	4,713,550	451	4,712,789	CLASS 294		156	4,713,610
		5 R	4,713,551	451	4,712,790	19.1	4,712,821	157	4,713,611
		16 D	4,713,552	451	4,712,791	64.1	4,712,818	158 D	4,713,612
		48 KB	4,713,553	451	4,712,792	92	4,712,819	158 F	4,713,613
		50 AA	4,713,554	451	4,712,793	138	4,712,820	208	4,713,614
		61.82	4,713,555	451	4,712,794	CLASS 296		307	4,713,615
		144 B	4,713,556	451	4,712,795	24 R	4,712,822	309	4,713,616
		153 SC	4,713,557	451	4,712,796	37.8	4,712,823	334	4,713,617
		CLASS 201	4,713,558	451	4,712,797	65 R	4,712,824	373	4,713,618
		158	4,713,559	451	4,712,798	76	4,712,825	395	4,713,619
		159 A	4,713,560	451	4,712,799	93	4,712,826	438	4,713,620
		328	4,713,561	451	4,712,800	99 R	4,712,827	460	4,713,621
		CLASS 202	4,713,562	451	4,712,801	121	4,712,828	500	4,713,622
		248	4,713,563	451	4,712,802	203	4,712,829	CLASS 328	
		CLASS 204	4,713,564	451	4,712,803	CLASS 297		55	4,713,623
		5 R	4,713,565	451	4,712,804	42	4,712,830	61	4,713,624
		16 D	4,713,566	451	4,712,805	180	4,712,831	72	4,713,625
		48 KB	4,713,567	451	4,712,806	219	4,712,832	150	4,713,626
		50 AA	4,713,568	451	4,712,807	284	4,712,833	CLASS 330	
		61.82	4,713,569	451	4,712,808	304	4,712,834	118	4,713,627
		144 B	4,713,570	451	4,712,809	429	4,712,835	149	4,713,628
		153 SC	4,713,571	451	4,712,810	442	4,712,836	183	4,713,629
		CLASS 205	4,713,572	451	4,712,811	CLASS 301		253	4,713,630
		158	4,713,573	451	4,712,812	37 SA	4,712,838	254	4,713,631
		159 A	4,713,574	451	4,712,813	CLASS 303		263	4,713,632
		328	4,713,575	451	4,712,814	CLASS 307		306	4,713,633
		CLASS 172	4,713,576	451	4,712,815	3	4,712,839	CLASS 331	
		130	4,713,577	451	4,712,816	24 R	4,712,840	4	4,713,634
		144.5	4,713,578	451	4,712,817	92	4,712,841	36 C	4,713,635
		145 R	4,713,579	451	4,712,818	CLASS 309		117 D	4,713,636
		155	4,713,580	451	4,712,819	64	4,713,553	222	4,713,637
		182.4	4,713,581	451	4,712,820	219.1	4,713,554	245	4,713,638
		192.11	4,713,582	451	4,712,821	264	4,713,555	CLASS 335	
		CLASS 174	4,713,583	451	4,712,822	446	4,713,556	8	4,713,639
		196	4,713,584	451	4,712,823	455	4,713,557	35	4,713,640
		68.5	4,713,585	451	4,712,824	456	4,713,558	76	4,713,641
		CLASS 175	4,713,586	451	4,712,825	462	4,713,559	79	4,713,642
		231	4,713,587	451	4,712,826	463	4,713,560	172	4,713,643
		243 M	4,713,588	451	4,712,827	464	4,713,561	CLASS 336	
		CLASS 177	4,713,589	451	4,712,828	465	4,713,562	433	4,713,644
		296	4,713,590	451	4,712,829	466	4,713,563		
		400	4,713,591	451	4,712,830	467	4,713,564		
		403	4,713,592	451	4,712,831	468	4,713,565		
		425	4,713,593	451	4,712,832	469	4,713,566		
		CLASS 178	4,713,594	451	4,712,833	470	4,713,567		
		2 R	4,713,595	451	4,712,834	471	4,713,568		
		18	4,713,596	451	4,712,835	472	4,713,569		
		CLASS 180	4,713,597	451	4,712,836	473	4,713,570		
		68.1	4,713,598	451	4,712,837	474	4,713,571		
		117	4,713,599	451	4,712,838	475	4,713,572		
		143	4,713,600	451	4,712,839	476	4,713,573		
		149	4,713,601	451	4,712,840	477	4,713,574		
		197	4,713,602	451	4,712,841	478	4,713,575		
		198	4,713,603	451	4,712,842	479	4,713,576		
		219	4,713,604	451	4,712,843	480	4,713,577		
		287	4,713,605	451	4,712,844	481	4,713,578		
		336	4,713,606	451	4,712,845	482	4,713,579		
		CLASS 181	4,713,607	451	4,712,846	483	4,713,580		
		113	4,713,608	451	4,712,847	484	4,713,581		
		207	4,713,609	451	4,712,848	485	4,713,582		
		231	4,713,610	451	4,712,849	486	4,713,583		
		251	4,713,611	451	4,712,850	487	4,713,584		
		CLASS 182	4,713,612	451	4,712,851	488	4,713,585		
		5	4,713,613	451	4,712,852	489	4,713,586		
		9	4,713,614	451	4,712,853	490	4,713,587		
		96	4,713,615	451	4,712,854	491	4,713,588		
		CLASS 184	4,713,616	451	4,712,855	492	4,713,589		
		6.4	4,713,617	451	4,712,856	493	4,713,590		
		7.4	4,713,618	451	4,712,857	494	4,713,591		
		CLASS 186	4,713,619	451	4,712,858	495	4,713,592		
		41	4,713,620	451	4,712,859	496	4,713,593		
		CLASS 187	4,713,621	451	4,712,860	497	4,713,594		
		1 R	4,713,622	451	4,712,861	498	4,713,595		
		18	4,713,623	451	4,712,862	499	4,713,596		
		CLASS 188	4,713,624	451	4,712,863	500	4,713,597		
		71.8	4,713,625	451	4,712,864	501	4,713,598		
		196 D	4,713,626	451	4,712,865	502	4,713,599		
		218 XL	4,713,627	451	4,712,866	503	4,713,600		

194	4,713,640	475	4,712,904
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CLASSIFICATION OF PATENTS

29	4,713,329	145	4,713,036	166	4,713,377	68	4,713,416	587	4,713,487
31	4,713,355	158	4,713,037	192	4,713,378	117	4,713,417	588	4,713,488
41	4,713,356	168	4,713,038	212	4,713,379	200	4,713,418	589	4,713,489
52	4,713,357	233	4,713,039	222	4,713,381	211	4,713,419	590	4,713,490
65	4,713,358	255	4,713,382	255	4,713,382	236	4,713,420	591	4,713,491
238	4,713,260	267	4,713,383	267	4,713,383	242	4,713,421	592	4,713,492
270	4,712,576	288	4,713,384	326.7	4,713,384	351	4,713,422	593	4,713,493
		294	4,713,385	351	4,713,385	351	4,713,423	594	4,713,494
		332	4,713,386	438	4,713,386	438	4,713,425	595	4,713,495
		346	4,713,387	471	4,713,387	471	4,713,426	596	4,713,496
		373	4,713,388	510	4,713,388	510	4,713,427	597	4,713,497
		389	4,713,389	523	4,713,389	523	4,713,428	598	4,713,498
		412	4,713,391		4,713,391		4,713,430	599	4,713,499
		464	4,713,392		4,713,392		4,713,431	600	4,713,500
		469	4,713,393		4,713,393		4,713,432	601	4,713,501
		574	4,713,394		4,713,394		4,713,433	602	4,713,502
		575	4,713,395		4,713,395		4,713,434	603	4,713,503
		594	4,713,396		4,713,396		4,713,435	604	4,713,504
		690	4,713,397		4,713,397		4,713,436	605	4,713,505
		725	4,713,398		4,713,398		4,713,437	606	4,713,506
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December 22, 1987



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UNITED STATES PATENT AND TRADEMARK OFFICE
December 22, 1987 Volume 1085 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987, and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

Note that national stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office are also included below for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as	

Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and
Commissioner of Patents
and Trademarks.

Patent Cooperation Treaty (PCT) Update

Translation of the International Preliminary Examination Report (IPER) into Russian no longer required. Withdrawal by Japan of the reservation concerning filing a translation of the international application by 20 months and Number of Demands received by the IPEA/EP from U.S. applicants.

Translation of the IPER into Russian no longer required

The following information was released by the World Intellectual Property Organization (WIPO) on July 17, 1987.

Pursuant to PCT Rule 72.1 the USSR State Committee for Inventions and Discoveries has informed the International Bureau of a change in the languages into which it requires a translation of the International Preliminary Examination Report (IPER) by the International Bureau.

As from July 8, 1987, a translation of the IPER into Russian will no longer be required if the IPER has been established in English

Consequently, as of July 8, 1987, the payment of a multiple of the handling fee under PCT Rule 57.2(a) for a translation into Russian is no longer required if the Soviet Union is elected in demand for International Preliminary Examination filed in English. Nor will the supplement to the handling fee under PCT Rules 57.1(b) and 57.2(b) apply if the Soviet Union is elected in a later election under PCT Rule 56 filed with the International Bureau on or after July 8, 1987.

Withdrawal by Japan of the reservation concerning filing a translation of the international application by 20 months from the priority date

On Sept. 16, 1987, WIPO announced that on Sept. 8, 1987, the Government of Japan notified the withdrawal of the declaration made by it under PCT Article 64(2)(a) concerning the time limit applicable under Chapter II of the PCT for the furnishing of a translation of the international application. Thus, Japan will become bound by the provisions of PCT Chapter II without any reservations on Dec. 8, 1987.

Pursuant to the said declaration, the translation of an international application into Japanese must at present be furnished to the Japanese Patent Office in all cases within 20 months from the priority date.

The withdrawal of the said declaration has the effect that, as from Dec. 8, 1987, the provisions of PCT Article 39 (1)(a) (under which a translation of the international application into Japanese must be furnished within 30 months from the priority date) will apply in respect of the Japanese Patent Office as elected Office.

This 30 month time limit applies also to international applications which have been filed before Dec. 8, 1987, provided that Japan has been elected in a demand for international preliminary examination or in a later election prior to the expiration of the 19th month from the priority date and that on Dec. 8, 1987, 20 months from the priority date have not expired.

Number of demands for International Preliminary Examination filed by U.S. applicants with the European Patent Office as International Preliminary Examining Authority (IPEA/EP) as of Oct. 31, 1987

Pursuant to the Memorandum of Understanding between the European Patent Office (EPO) and the USPTO concerning monitoring Demands submitted to the IPEA/EP by U.S. applicants, published at 1080 O.G. 2 on July 7, 1987, the number of Demands filed by U.S. applicants (who filed their international applications with the United States Receiving Office) with the IPEA/EP as of Oct. 31, 1987 was 70.

DONALD J. QUIGG,
Assistant Secretary and
Commissioner of Patents
and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is

provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on December 18, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,488,313 through 4,489,442
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . \$ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (\$1.9(f)) \$ 225.00
By other than a small entity \$ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 \$ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (\$1.9(f)) \$ 55.00
By other than a small entity \$ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable \$ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge

are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

**PATENTS WHICH EXPIRED OCTOBER 4, 1987,
DUE TO FAILURE TO PAY MAINTENANCE FEES**

Patent Number	Serial Number	Issue Date
4,407,026	06/405,157	10/4/83
4,407,031	06/223,147	10/4/83
4,407,046	06/321,438	10/4/83
4,407,068	06/357,847	10/4/83
4,407,069	06/328,651	10/4/83
4,407,072	06/321,129	10/4/83
4,407,076	06/311,409	10/4/83
4,407,077	06/304,059	10/4/83
4,407,079	06/269,407	10/4/83
4,407,080	06/279,549	10/4/83
4,407,081	06/328,129	10/4/83
4,407,083	06/355,854	10/4/83
4,407,085	06/308,427	10/4/83
4,407,086	06/265,906	10/4/83
4,407,088	06/279,823	10/4/83
4,407,090	06/299,414	10/4/83
4,407,099	06/246,572	10/4/83
4,407,103	06/375,389	10/4/83
4,407,107	06/258,871	10/4/83
4,407,113	06/273,468	10/4/83
4,407,115	06/284,574	10/4/83
4,407,130	06/275,322	10/4/83
4,407,142	06/304,460	10/4/83
4,407,148	06/245,416	10/4/83
4,407,151	06/282,717	10/4/83
4,407,160	06/250,668	10/4/83
4,407,166	06/251,739	10/4/83
4,407,169	06/354,068	10/4/83
4,407,180	06/264,700	10/4/83
4,407,186	06/250,939	10/4/83
4,407,188	06/253,531	10/4/83
4,407,204	06/324,745	10/4/83
4,407,207	06/445,827	10/4/83
4,407,212	06/314,683	10/4/83
4,407,218	06/409,650	10/4/83
4,407,223	06/338,642	10/4/83
4,407,236	06/303,698	10/4/83
4,407,237	06/372,997	10/4/83
4,407,245	06/294,077	10/4/83
4,407,247	06/313,630	10/4/83
4,407,249	06/260,957	10/4/83
4,407,250	06/225,166	10/4/83
4,407,251	06/290,075	10/4/83
4,407,253	06/247,445	10/4/83
4,407,256	06/322,405	10/4/83
4,407,261	06/334,447	10/4/83
4,407,264	06/326,538	10/4/83
4,407,266	06/286,616	10/4/83
4,407,268	06/341,257	10/4/83
4,407,269	06/227,195	10/4/83
4,407,275	06/322,966	10/4/83
4,407,305	06/409,275	10/4/83
4,407,316	06/294,564	10/4/83
4,407,318	06/303,779	10/4/83
4,407,337	06/406,882	10/4/83
4,407,338	06/217,760	10/4/83
4,407,342	06/267,735	10/4/83
4,407,348	06/278,510	10/4/83
4,407,349	06/249,088	10/4/83
4,407,351	06/370,816	10/4/83
4,407,355	06/242,127	10/4/83
4,407,360	06/330,688	10/4/83
4,407,370	06/240,986	10/4/83
4,407,371	06/278,716	10/4/83
4,407,390	06/291,025	10/4/83
4,407,391	06/368,301	10/4/83

4,407,397	06/306,181	10/4/83
4,407,398	06/253,674	10/4/83
4,407,409	06/361,530	10/4/83
4,407,411	06/391,549	10/4/83
4,407,413	06/405,721	10/4/83
4,407,417	06/219,248	10/4/83
4,407,421	06/331,420	10/4/83
4,407,424	06/394,231	10/4/83
4,407,426	06/253,304	10/4/83
4,407,429	06/370,648	10/4/83
4,407,430	06/254,853	10/4/83
4,407,435	06/341,315	10/4/83
4,407,440	06/236,994	10/4/83
4,407,456	06/248,314	10/4/83
4,407,457	06/326,091	10/4/83
4,407,460	06/246,307	10/4/83
4,407,474	06/296,946	10/4/83
4,407,475	06/231,939	10/4/83
4,407,484	06/321,339	10/4/83
4,407,487	06/341,702	10/4/83
4,407,494	06/294,762	10/4/83
4,407,497	06/335,359	10/4/83
4,407,502	06/307,968	10/4/83
4,407,503	06/285,738	10/4/83
4,407,504	06/286,031	10/4/83
4,407,510	06/320,950	10/4/83
4,407,516	06/449,353	10/4/83
4,407,522	06/474,435	10/4/83
4,407,523	06/338,421	10/4/83
4,407,531	06/248,063	10/4/83
4,407,536	06/235,167	10/4/83
4,407,549	06/272,346	10/4/83
4,407,550	06/245,481	10/4/83
4,407,551	06/269,128	10/4/83
4,407,560	06/277,127	10/4/83
4,407,575	06/323,790	10/4/83
4,407,589	06/234,225	10/4/83
4,407,596	06/268,536	10/4/83
4,407,608	06/287,526	10/4/83
4,407,610	06/341,067	10/4/83
4,407,614	06/223,837	10/4/83
4,407,626	06/229,868	10/4/83
4,407,630	06/321,268	10/4/83
4,407,637	06/227,183	10/4/83
4,407,642	06/228,043	10/4/83
4,407,646	06/354,457	10/4/83
4,407,680	06/361,852	10/4/83
4,407,686	06/322,314	10/4/83
4,407,687	06/400,535	10/4/83
4,407,697	06/365,523	10/4/83
4,407,698	06/248,867	10/4/83
4,407,701	06/404,534	10/4/83
4,407,705	06/263,629	10/4/83
4,407,709	06/363,777	10/4/83
4,407,712	06/383,882	10/4/83
4,407,715	06/316,077	10/4/83
4,407,716	06/271,551	10/4/83
4,407,724	06/252,981	10/4/83
4,407,734	06/291,685	10/4/83
4,407,737	06/340,888	10/4/83
4,407,763	06/309,321	10/4/83
4,407,764	06/298,056	10/4/83
4,407,773	06/309,792	10/4/83
4,407,775	06/258,076	10/4/83
4,407,777	06/285,797	10/4/83
4,407,784	06/312,646	10/4/83
4,407,797	06/406,980	10/4/83
4,407,800	06/317,547	10/4/83
4,407,805	06/393,808	10/4/83
4,407,812	06/226,774	10/4/83
4,407,815	06/233,180	10/4/83
4,407,831	06/224,718	10/4/83
4,407,833	06/416,695	10/4/83
4,407,837	06/358,138	10/4/83
4,407,841	06/315,921	10/4/83
4,407,842	06/370,382	10/4/83
4,407,858	06/335,587	10/4/83
4,407,861	06/403,867	10/4/83
4,407,865	06/271,890	10/4/83

Patent Number	Serial Number	Issue Date
4,407,918	06/348,839	10/4/83
4,407,935	06/339,816	10/4/83
4,407,947	06/302,022	10/4/83
4,407,958	06/328,847	10/4/83
4,407,967	06/240,931	10/4/83
4,407,975	06/352,863	10/4/83
4,407,976	06/271,882	10/4/83
4,407,977	06/380,071	10/4/83
4,407,982	06/345,616	10/4/83
4,407,997	06/313,290	10/4/83
4,408,014	06/376,530	10/4/83
4,408,041	06/321,311	10/4/83
4,408,045	06/361,308	10/4/83
4,408,053	06/405,965	10/4/83
4,408,056	06/454,300	10/4/83
4,408,063	06/369,724	10/4/83
4,408,068	06/342,584	10/4/83
4,408,074	06/317,517	10/4/83
4,408,076	06/299,413	10/4/83
4,408,092	06/345,897	10/4/83
4,408,095	06/239,877	10/4/83
4,408,100	06/239,347	10/4/83
4,408,102	06/257,596	10/4/83
4,408,103	06/337,228	10/4/83
4,408,111	06/267,955	10/4/83
4,408,114	06/336,955	10/4/83
4,408,139	06/284,575	10/4/83
4,408,142	06/265,401	10/4/83
4,408,149	06/300,391	10/4/83
4,408,154	06/298,833	10/4/83
4,408,157	06/260,303	10/4/83
4,408,170	06/315,533	10/4/83
4,408,174	06/330,109	10/4/83
4,408,198	06/302,160	10/4/83
4,408,221	06/304,588	10/4/83
4,408,227	06/269,796	10/4/83
4,408,233	06/357,541	10/4/83
4,408,255	06/224,319	10/4/83
4,408,258	06/325,515	10/4/83
4,408,261	06/340,235	10/4/83
4,408,264	06/399,327	10/4/83
4,408,266	06/252,364	10/4/83
4,408,268	06/406,651	10/4/83
4,408,287	06/266,345	10/4/83
4,408,311	06/261,514	10/4/83
4,408,332	06/260,617	10/4/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,176,316, Re. S.N. 004,369, Filed Jan. 15, 1987, Cl. 380/32, SECURE SINGLE SIDEBAND COMMUNICATION SYSTEM USING MODULATED NOISE SUBCARRIER, Louis A. De Rosa, et al., Owner of Record: *International Telephone & Telegraph Corp., Nutley, N.J.*, Attorney or Agent: Paul W. Hemminger, et al., Ex. Gp.: 222

4,520,702, Re. S.N. 072,987, Filed July 14, 1987, Cl. 358/106, OPTICAL INSPECTION APPARATUS FOR MOVING ARTICLES, Malcolm W. Randall, Owner of Record: *Key Technology, Inc., Milton-Free Water, Oreg.*, Attorney or Agent: Richard J. St. John, et al., Ex. Gp.: 262

4,528,428, Re. S.N. 072,108, Filed July 9, 1987, Cl. 200/5A, KEY-HOLDING STRUCTURE OF KEYBOARD WITH CURVED OPERATING SURFACE OF KEYS, Hideo Gotoh, et al., Owner of Record: *Brothers Kogyo Kabushiki Kaisha, Aichi Ken, Japan*, Attorney or Agent: Roger W. Parkhurst, et al., Ex. Gp.: 214

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,287,923, Reexam. No. 90/001,373, Requested: Nov. 12, 1987, Cl. 81/429, SCREWING HEADS, Ewald Hornung, Owner of Record: *Feinwerkhaus Helfer & Co., Rinteln, Germany*, Attorney or Agent: Larson, Taylor, et al., Ex. Gp.: 320, Requester: Vermont American Corp., Louisville, Ky.

4,517,741, Reexam. No. 90/001,374, Requested: Nov. 12, 1987, Cl. 30/162, KNIFE WITH PLURAL REPLACABLE BLADE STORAGE AND MEANS FOR SINGLE BLADE EXTENSION, James M. Castelluzzo, Owner of Record: *Inventor, New York, N.Y.*, Attorney or Agent: Thomas M. Morrison, Ex. Gp.: 320, Requester: Vermont American Corp., Louisville, Ky.

4,592,230, Reexam. No. 90/001,372, Requested: Nov. 6, 1987, Cl. 73/295, APPARATUS AND METHOD OF DETERMINING THE LIQUID COOLANT LEVEL IN A NUCLEAR REACTOR, James P. Waring, et al., Owner of Record: *Scanpower, Inc., Bethesda, Md.*, Attorney or Agent: Eric P. Schellin, Ex. Gp.: 240, Requester: Fluid Components Inc., San Marcos, Calif.

4,688,092, Reexam. No. 90/001,375, Requested: Nov. 10, 1987, Cl. 358/109, SATELLITE CAMERA IMAGE NAVIGATION, Ahmed A. Kamel, et al., Owner of Record: *Ford Aerospace & Communications Corp., Palo Alto, Calif.*, Attorney or Agent: Edward Radlo, Ex. Gp.: 260, Requester: Owner

Errata

"All reference to Patent No. 4,707,164 to Robert S. Harris of Ind. for 'VAPOR RECOVERY SYSTEM' appearing in the Official Gazette of Nov. 17, 1987 should be deleted since no patent was granted."

"All reference to Patent No. 4,708,262 to George W. Ford, Jr. of Utah for 'FOAMER AND METHOD' appearing in the Official Gazette of Nov. 24, 1987 should be deleted since no patent was granted."

"All reference to Patent No. 4,709,338 to Roosevelt A. Fernandes of N.Y. for 'ELECTRICAL POWER LINE AND SUBSTATION MONITORING APPARATUS AND SYSTEM' appearing in the Official Gazette of Nov. 24, 1987 should be deleted since no patent was granted."

PATENT NOTICES

Certificates of Correction for the Week of Dec. 22, 1987

Re. 32,359	4,648,394	4,670,299	4,680,463
4,265,979	4,649,147	4,670,943	4,681,014
4,280,930	4,649,876	4,671,584	4,681,124
4,398,029	4,650,216	4,671,820	4,681,189
4,461,769	4,651,670	4,671,953	4,681,348
4,462,508	4,653,719	4,672,372	4,682,220
4,465,905	4,654,273	4,672,588	4,682,787
4,548,607	4,654,367	4,672,829	4,682,953
4,577,481	4,656,310	4,673,630	4,683,146
4,578,491	4,661,701	4,673,787	4,683,492
4,579,798	4,661,932	4,673,834	4,684,292
4,585,318	4,663,011	4,674,710	4,684,454
4,585,597	4,663,475	4,675,194	4,684,676
4,594,323	4,663,507	4,675,678	4,684,704
4,616,279	4,663,731	4,675,692	4,684,731
4,618,733	4,664,805	4,676,027	4,685,860
4,631,116	4,665,993	4,676,132	4,686,378
4,632,236	4,666,002	4,676,227	4,686,516
4,635,073	4,666,044	4,676,675	4,687,049
4,638,078	4,666,166	4,676,804	4,688,493
4,640,632	4,666,442	4,676,977	4,688,557
4,640,690	4,666,456	4,677,305	4,688,650
4,642,188	4,666,609	4,677,668	4,688,865
4,642,672	4,668,166	4,678,232	4,689,131
4,643,895	4,668,228	4,678,387	4,689,256
4,645,186	4,668,502	4,678,476	4,689,424
4,645,618	4,668,608	4,678,872	4,689,791
4,646,002	4,668,961	4,679,542	4,690,929
4,646,270	4,669,746	4,680,205	4,695,514
4,647,699	4,670,099	4,680,343	

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

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Box 4
Box 5

Mail for the Office of Personnel from NFC.

Mail for the Office of Legislation and International Affairs.

"No fee" mail related to trademarks (e.g. amendments to applications and request for extensions of time to file an opposition).

Mail directed to the Trademark Trial and Appeal Board should have "Attention TTAB" on the envelope in addition to "Box 5".

Mail for the Office of Procurement.

Box 6
Box 7

Reissue applications for patents involved in litigation and any subsequently filed papers for those applications.

Box 8

All papers for the Office of the Solicitor.

Box 9

Coupon orders for the U.S. patent and trademark copies.

Box 10

Orders for certified copies of patent and trademark applications.

Box 11

Electronic Ordering Service (EOS).

Box 12

Contributions to the Examiner Education Program.

Box AF

Amendments or responses to final rejections in patent applications, submitted under the expedited processing program.

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Mail related to File Wrapper and Continuations.

Box Interference

Communications relating to interferences and applications and patents involved in interferences.

Box M. Fee

Correspondence related to a patent that is subject to the payment of a maintenance fee.

Box Pat. Ext.

Applications for patent term extension.

Box PCT

Mail related to applications filed under the Patent Cooperation Treaty.

Box Reexam

Mail related to reexamination application.

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The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 21, 1987

PATENT EXAMINING GROUPS

Actual Filing Date of Oldest
New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	9-11-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-12-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	5-06-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-02-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-06-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during November 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,537,107 to 3,543,307, inclusive
Plant Patents	Numbers 2,996 to 3,007 inclusive

REEXAMINATIONS

DECEMBER 22, 1987

Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,555,957 (800th)

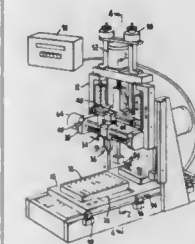
BI-DIRECTIONAL LIQUID SAMPLE HANDLING SYSTEM

Arthur E. Frankel, Palo Alto; Larry J. Johnson, San Jose, and Timothy J. Wennberg, San Francisco, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Reexamination Request No. 90/001,182, Mar. 6, 1987.
Reexamination Certificate for Patent No. 4,555,957, issued Dec. 3, 1985, Ser. No. 542,113, Oct. 14, 1983.

Int. Cl.⁴ G01N 35/06

U.S. Cl. 73—864.14



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-11 is confirmed.

1. A machine for automatically transferring at least a portion of a liquid sample in one receptacle to another receptacle, comprising:

a head assembly translatable between upper and lower positions along a vertical axis;
means for moving said head assembly along said vertical axis;

at least one pipette assembly mounted on said head assembly for movement therewith along said vertical axis and for movement in a single first horizontal axis, said pipette assembly including a support block carried on a first horizontal guide member and a pipette nozzle mounted on said support block and having a depending end for receiving tips, a slide block carried on a second horizontal guide member parallel to the first guide member, a plunger mounted on said slide block and depending within said pipette nozzle, and means for moving said plunger within said pipette nozzle to vary the internal volume of said nozzle and a tip supported thereby;

means for moving said pipette assembly relative to said head assembly along said first horizontal axis;

a table mounted beneath said head for translation along a second horizontal axis that is transverse to the first horizontal axis, said table having at least two work stations spaced along its axis of translation for respectively accommodating at least one tray having a plurality of receptacles;

means for moving said table along said second horizontal axis to place any selected one of said plurality of recepta-

cles in a tray mounted on said table at either of said work stations in registry with said pipette assembly; and means for controlling each of said moving means for said head assembly, pipette assembly, plunger and table to effect transfer of a liquid sample between at least one receptacle in said tray mounted at one of said stations to at least one receptacle located at the other of said work stations.

B1 4,587,458 (801st)

CONTROLLING CURRENT DENSITY

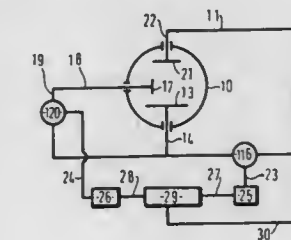
John Davenport, Cambridge, England, and Michael A. Russo, Treviso, Pa., assignors to TI (Group Services) Limited, Birmingham, England

Reexamination Request No. 90/001,259, Jun. 5, 1987.
Reexamination Certificate for Patent No. 4,587,458, issued May 6, 1986, Ser. No. 629,812, Jul. 11, 1984.

Claims priority, application United Kingdom, Feb. 17, 1984, 8404173

Int. Cl.⁴ G01N 23/00; H01J 7/24

U.S. Cl. 315—111.01



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-9 is confirmed.

1. Current density controlling apparatus, for controlling the density of an electric current at the surface of a workpiece during gaseous ionic surface treatment of the workpiece, including a chamber in which the workpiece is located and connected as one electrode of one polarity, a second electrode operative within the chamber and connected at the opposite polarity, gas supply means to provide a gaseous atmosphere within the chamber of required composition, temperature and pressure, wherein the improvement comprises a third electrode of known area within the chamber connected to be at the same polarity and potential as the workpiece, and located adjacent the workpiece and current measuring means connected to measure the current passing through the third electrode and thereby to provide one of a measurement and control of the common current density at the surface of the third electrode and of the workpiece.

REISSUES

DECEMBER 22, 1987

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,565

FOUR-WHEEL VEHICLE DRIVE SYSTEM

Kazuyoshi Hiraiwa, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Japan

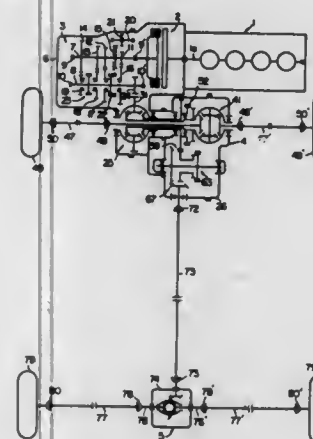
Original No. 4,476,953, dated Oct. 16, 1984, Ser. No. 411,814, Aug. 26, 1982. Application for reissue Apr. 10, 1986, Ser. No. 850,151

Claims priority, application Japan, Oct. 12, 1981, 56-162355

Int. Cl.⁴ B60K 5/04, 17/34

U.S. Cl. 180-249

10 Claims



1. A four-wheel drive system for a vehicle with first and second pairs of road wheels, comprising
 - a power unit having an output shaft rotatable about an axis in a lateral direction of the vehicle;
 - a power transmission gear unit including transmission input and output shafts each having an axis of rotation in a lateral direction of the vehicle;

- a final reduction gear rotatable about an axis parallel with the respective axes of rotation of the transmission input and output shafts, the transmission output shaft being held in driving engagement with said final reduction gear;
- a main transaxle gear casing having enclosed therein said transmission gear unit and said final reduction gear;
- an auxiliary transaxle gear casing secured to said main transaxle gear casing;
- a central differential gear assembly enclosed within said main transaxle gear casing and including a differential gear [housing] member coaxially rotatable with said final reduction gear about the axis of rotation of the final reduction gear and two output members enclosed within said differential gear [housing] member and rotatable at different speeds about axes substantially aligned with the axis of rotation of the differential gear [housing] member;
- a first wheel drive gear unit enclosed within said auxiliary transaxle gear casing and comprising a differential gear assembly operatively connected to the first pair of road wheels of the vehicle and including an input member rotatable with one of the two output members of the central differential gear assembly about an axis in a lateral direction of the vehicle;
- intermediate gear means enclosed within said auxiliary transaxle gear casing and including an input gear rotatable with the other of the two output members of the central differential gear assembly about an axis substantially aligned with the axis of rotation of the output member of the central differential gear assembly;
- a second wheel drive gear unit comprising a differential gear assembly operatively connected to the second pair of road wheels of the vehicle; and
- right-angle power transfer gear means enclosed within said auxiliary transaxle casing and operative to transmit driving power from said intermediate gear means to the differential gear assembly of the second wheel drive gear unit in a fore-and-aft direction of the vehicle.

PLANT PATENTS

GRANTED DECEMBER 22, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,063
VARIETY OF GERANIUM NAMED CLARET
Blair L. Winner, Lompoc, Calif., assignor to Denholm Seeds,
Lompoc, Calif.

Filed Nov. 22, 1985, Ser. No. 800,807
Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct variety of geranium plant substantially
as herein shown and described and parts therefor.

6,065
VARIETY OF GERANIUM NAMED VALERIE
Blair L. Winner, Lompoc, Calif., assignor to Denholm Seeds,
Lompoc, Calif.

Filed Nov. 22, 1985, Ser. No. 800,808
Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct variety of geranium plant substantially
as herein shown and described and parts therefor.

6,066
VARIETY OF GERANIUM NAMED DIPLOMAT
Blair L. Winner, Lompoc, Calif., assignor to Denholm Seeds,
Lompoc, Calif.

Filed Nov. 29, 1985, Ser. No. 802,981
Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct variety of geranium plant substantially
as herein shown and described and parts therefor.

6,064
VARIETY OF GERANIUM NAMED VICTORIA
Blair L. Winner, Lompoc, Calif., assignor to Denholm Seeds,
Lompoc, Calif.

Filed Nov. 22, 1985, Ser. No. 800,974
Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct variety of geranium plant substantially
as herein shown and described and parts therefor.

6,067
CHRYSANTHEMUM NAMED "RESIDENT"
Martinus van der Jagt, Ter Aar, Netherlands, assignor to Chry-
santhemum Breeders Association NV, Netherlands Antilles

Filed Sep. 30, 1985, Ser. No. 781,994
Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinctive variety of Chrysanthemum as de-
scribed and illustrated in the foregoing specification and ac-
companying drawings.

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PATENTS

GRANTED DEC. 22, 1987

ERRATA

For CLASS	See PATENT NO.
180-020	4,714,140
439-395	4,714,306
437-002	4,714,510
437-081	4,714,519
437-228	4,714,520
427-039	4,714,589
514-303	4,714,762
329-050	4,714,892

PATENTS

GRANTED DECEMBER 22, 1987

GENERAL AND MECHANICAL

4,713,842

PROTECTIVE MULTIPLE FEEDING MEANS GARMENT
Jerusha A. Patterson, 5902 31st Ave., #512, Hyattsville, Md.
20782

Filed Oct. 1, 1986, Ser. No. 913,974

Int. Cl.⁴ A41D 1/20

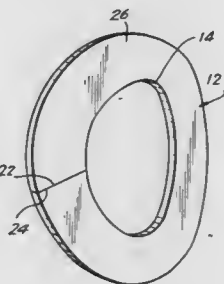
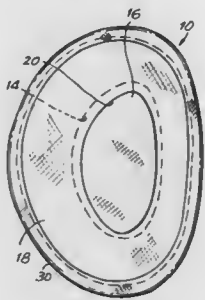
U.S. Cl. 2—104

4 Claims



1. A protective single-piece garment for a wearer, which allows a baby to be breast fed or bottle fed comprising: garment means that cover the chest area of the wearer; a series of receiving and securing elastic bottle holding loops arranged in inverted arcuate form and affixed to the front upper part of said garment above the breast area of the wearer to hold a bottle in the feeding position without support of the wearer's hand during feeding; and snap-away panel means secured in a fastened position on the breast area under said series of receiving and securing elastic means.

side of said sheet of plastic material in covering relation to said first central opening; and



an inner layer secured to an opposite side of said sheet of plastic material and having a second central opening in substantial alignment with said first central opening.

4,713,844

PROTECTIVE HELMET WITH FACE MASK SEALING MEANS

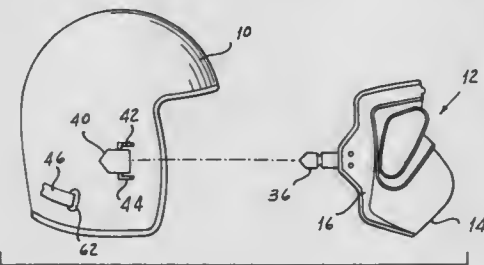
Charles A. Westgate, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.

Filed Jul. 16, 1986, Ser. No. 886,261

Int. Cl.⁴ A42B 3/02

U.S. Cl. 2—411

12 Claims



4,713,843

SELF-SUPPORTING EAR PROTECTOR

Karen Duncan, 15 Palmer St., Cos Cob, Conn. 06870

Continuation-in-part of Ser. No. 885,475, Jul. 14, 1986, abandoned. This application Feb. 2, 1987, Ser. No. 9,726

Int. Cl.⁴ A42B 1/06

U.S. Cl. 2—209

9 Claims

1. An ear protector comprising:
a flexible member including a flat, elongated sheet of a resilient, flexible plastic material substantially impervious to cold weather conditions and having opposite edges, said opposite edges abutting each other in a non-overlapping relation and sealed to each other to form said sheet into a continuous loop of substantially constant thickness having a general configuration of an ear to be protected, said continuous loop defining a first central opening therein;
an outer protective exposed layer of material secured to one

1. A helmet and face mask assembly including in combination, a helmet adapted to fit over the wearer's head, a face mask having a seal adapted to engage the wearer's face, interengageable means on said helmet and said face mask for securing said mask in position on said helmet in front of the wearer's face, means within said helmet adapted to be actuated to move the wearer's head forward relative to said helmet without changing the position of said mask on said helmet, and externally accessible means on said helmet operable to actuate said head-moving means to bring the wearer's face into engagement with said seal after said face mask has been attached to said helmet.

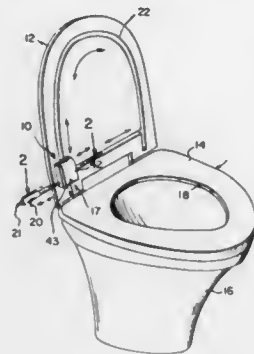
4,713,845

TOILET SEAT DISENFECTING DEVICE

Salvatore A. Bono, 885 Manor La., Bayshore, N.Y. 11706
Filed Nov. 17, 1986, Ser. No. 931,554Int. Cl.⁴ A47K 13/00

U.S. Cl. 4-233

6 Claims



1. A disinfecting device for a toilet seat having a hinged cover with the toilet seat being hinge mounted to a toilet bowl, said device comprising:

- (a) a toilet seat cover
- (b) a receptacle being of a size to cover rim width of the toilet seat;
- (c) means for mounting said receptacle to underside of the cover so as to slidably travel around perimeter of the cover when said receptacle is manually manipulated, the cover having a track extending around the perimeter of the underside thereof, said mounting means including a follower extending upwardly from center of said receptacle to engage with said track, said track having a tongue member extending inwardly from one side thereof, said follower having a ball member at remote end thereof, said ball member having a groove extending inwardly so as to receive said tongue member in said track to properly position said receptacle and prevent removal of said receptacle from underside of the cover; and
- (d) means for disinfecting the toilet seat, said means mounted with said receptacle and extends outwardly therefrom so as to make contact with the toilet seat when the cover is in a closed position over the toilet seat, said disinfecting means including a casing being of a size to removably fit within said receptacle, said casing having a hollow chamber and a pair of slots, each said slot at opposite ends of said casing, said disinfecting means further including a pair of reels each of which is positioned within said hollow chamber at said opposite ends of said casing and rotatably mounted to side walls thereof, a rubber pad mounted to underside of said casing, and an elongated disinfectant sheet stored on first of said reels at forward end of said casing, extending outwardly from said first slot around said rubber pad, into second slot and onto second of said reels at rearward end, to act as a wind up reel.

4,713,846

FOOT REST FOR TOILET

Frank S. Hodroski, Jr., R.D. 5, Box 24 A, Jackson, N.J. 08527
Filed Jun. 10, 1986, Ser. No. 872,669Int. Cl.⁴ E03D 11/00

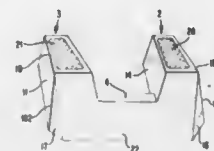
U.S. Cl. 4-254

5 Claims

1. A foot rest for use with a toilet, said toilet comprising a bowl and a base on which said bowl rests, said foot rest comprising:

- an inverted trough comprising:
 - a top surface having two extremities and a middle; and
 - two side walls connected to said top surface,
- said trough having a generally U-shaped cross-section, said trough further being hollow and shaped to define a generally U-shaped opening for receiving said base, said opening being

sufficiently large so that said foot rest may be moved relative to said base when said opening so receives said base, and so that said foot rest may be so moved to a position substantially completely underneath said toilet,



said foot rest being composed of a light-weight material; said foot rest being slidably adjustable during use of said toilet.

4,713,847

VACUUM TOILET SYSTEM

Sven Oldfelt, Vaxholm, and Sigvard Söderström, Hägersten, both of Sweden, assignors to Oy Wärtsilä Ab, Helsinki, Finland

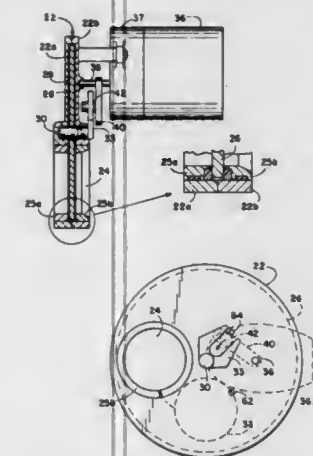
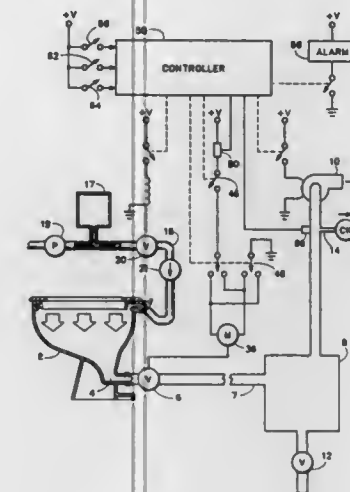
Filed Feb. 2, 1987, Ser. No. 9,709
Int. Cl.⁴ B64D 11/02; E03D 11/00

U.S. Cl. 4-316

14 Claims

1. A vacuum toilet system comprising a waste-receiving bowl defining an interior space for receiving waste material and having an outlet, a sewer pipe defining an interior space that can be placed at a pressure that is lower than that in the interior space of the waste-receiving bowl, and a discharge valve connected between the sewer pipe and the outlet of the waste-receiving bowl for controlling passage of material between the waste-receiving bowl and the sewer pipe, said discharge valve comprising valve portions that are movable selectively relative to one another between an open position in which the valve is open and a closed position in which the valve is closed, and a drive mechanism that acts on at least one of said valve portions for bringing about relative movement of said valve portions, and the system further comprising sensor means for sensing whether the drive mechanism is able to bring the valve portions to the closed position and providing a control signal in the event that the drive mechanism is unable to cause the valve portions to attain the closed position, a control device which is connected to the drive mechanism and responds to a user stimulus when the valve portions are in the closed position by causing the drive mechanism to bring the valve portions to the open position and subsequently causing the drive mechanism to bring the valve portions towards the

closed position, the control device responding to said control signal by causing the drive mechanism to bring the valve



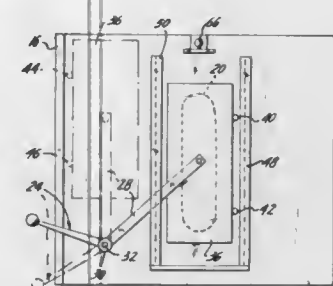
portions towards the open position and subsequently towards the closed position.

4,713,848

HYGIENIC WHEELCHAIR SEAT FOR EXTENDED USE
Jean R. Domovs, 22 Dayton Rd., Morris Plains, N.J. 07950, and Willard H. Rice, Meridith, N.H., assignors to Jean R. Domovs, Morris Plains, N.J.Filed Jul. 16, 1986, Ser. No. 886,359
Int. Cl.⁴ A47K 11/06

U.S. Cl. 4-480

8 Claims



1. A wheelchair seat for placement in a foldable wheelchair frame comprising

- (i) a rigid, substantially flat seat base operable to be received by a wheelchair frame and to support a person thereon in a seated position, said seat base having an elongated aperture defined in said seat base which

aperture is coaxial with the major axis of the perineum of a person when normally seated on said seat base, said aperture being of such minimal dimensions as to permit the normally free passage of urinary and fecal excretions through said aperture without detracting from the support provided by said seat base;

- (ii) an elongated arm member pivotably mounted on the underside of said seat base for rotation about an axis perpendicular to the major plane of said seat base, a portion of said arm member passing under said aperture;
- (iii) an elongated gate of a length and a width sufficient to occlude said aperture, said gate being rotatably mounted at a point on said arm member passing under said aperture;
- (iv) first stop means disposed on the bottom of said seat base and operable upon rotation of said arm member in a first direction to engage said gate at a first aperture-occluding position;
- (v) second stop means disposed on the bottom of said seat base and operable upon rotation of said arm member in a second, opposite, direction to engage said gate at a second, non-occluding, position; and
- (vi) support means disposed on said seat base beneath said aperture and said gate and operable to support a removable waste receptacle in a position vertically aligned with said aperture.

4,713,849

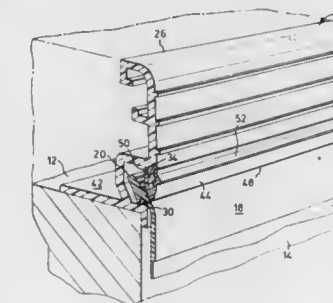
POOL LINER RETAINER WITH CLOSURE CLIP

William Kindness, Toronto, Canada, assignor to Kafko Manufacturing Limited, Mississauga, Canada

Continuation of Ser. No. 777,581, Sep. 19, 1985. This application Mar. 2, 1987, Ser. No. 20,228
Int. Cl.⁴ E04H 3/18

U.S. Cl. 4-496

14 Claims



1. A pool liner retainer comprising:

- an elongated retaining element including means defining a longitudinal holding channel for accommodating a pool liner bead, said holding channel having an upper wall, a rear wall, a bottom wall having an upwardly extending first flange, and a front wall defined by a downwardly extending second flange, said second flange extending from said top wall toward said bottom wall, the area between the bottom of said second flange and the top of said first flange forming a slot for insertion of the linear bead into said holding channel; and
- an elongated resilient clip means for insertion over said second flange from the bottom of said second flange and for entrapping the linear bead within said holding channel, said clip means including means defining a longitudinal cavity therein for receiving said second flange when said clip means is inserted over said second flange and for retaining said clip means on said second flange by tight fitting engagement with said second flange, whereby when said clip means is assembled on said second flange, forces acting on said pool liner will cause said liner bead to hook on said first flange and press said clip means into tighter engagement with said second flange thereby

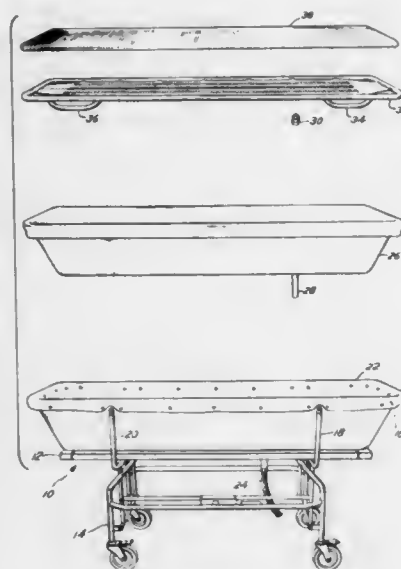
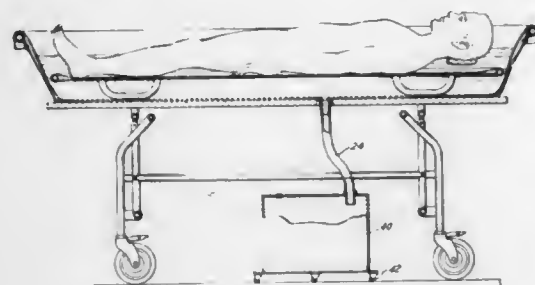
to prevent separation of said liner bead from said holding channel.

4,713,850

PATIENT IMMERSION VESSEL AND SYSTEM
Patrick Flaherty, Peoria, and Jon D. Bridgwater, Morton, both of Ill., assignors to Morton Metalcraft Company, Morton, Ill.
Filed Feb. 5, 1987, Ser. No. 11,319
Int. Cl.⁴ A47K 3/06

U.S. Cl. 4—585

14 Claims



1. An improved portable bathing apparatus especially useful for washing of toxic substances from a human in a prone position, said apparatus comprising, in combination:

- a support platform mounted on a support frame to define a generally horizontal table;
- a circumferential rail for the table, with means attached to the rail for raising and lowering the rail between a position generally coplanar with the table and a position above the plane of the table;
- a flexible, fluid impermeable sheet supported by the rail and defining a fluid vessel when the rail is raised, said vessel having a bottom supported by the table when the rail is in the raised position;
- a flexible, fluid impermeable, detachable liner detachably supported by the rail on the inside of the vessel defined by the sheet;
- a stainless steel stretcher supported on the platform inside the vessel, said stretcher supported by at least four elevating supports integral with the stretcher and depending from the stretcher, said stretcher including a horizontal

stainless steel stretcher bed, said bed including a plurality of slots along the length of the bed, said stretcher also including a circumferential stainless steel tube surrounding the bed and attached thereto, said supports depending from the tube, whereby a patient may be supported on the stretcher in the vessel for immersion or washing therein.

4,713,851

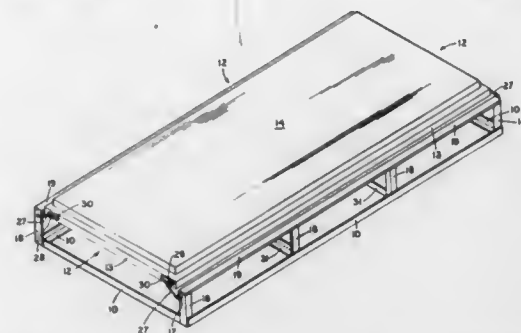
BED OR BUNK TORSION SPRING SUSPENSION SYSTEM

Von D. Rosquist, P.O. Box 161, LeVan, Utah 84639

Filed Jul. 2, 1985, Ser. No. 737,395

Int. Cl.⁴ A47C 19/16; B63B 29/10; B60J 1/00; F16F 3/00
U.S. Cl. 5—118

6 Claims



1. A suspension system for a bed or bunk which is adapted to maintain a mattress supported thereon in a substantially horizontal orientation, said suspension system comprising:

- a lower support frame which is adapted to lie in a substantially horizontal position;
- an upper mattress support frame having a substantially rigid skeletal structure comprising opposed, substantially parallel sides and opposite ends interconnected between said opposed sides, said upper frame being adapted to be positioned above the lower support frame;
- at least two elongated torsion spring members each including first and second ends and a torsion element connecting said first end to said second end;

means for mounting at least one of said torsion springs adjacent each of said sides and intermediate said upper support frame and said lower support frame such that said upper mattress support frame is supported above said lower support frame by said torsion springs, said mounting means comprising attachments for securing said first end of said torsion springs firmly to the corresponding sides of said lower frame such that each of said first ends is restrained from rotational movement about the longitudinal axis thereof, said mounting means further comprising connecting means which operably connect said second ends of said torsion spring members to the corresponding ends of said upper frame, with said connecting means being integrally attached to said mutually respective second ends of said torsion spring members and said second ends extending from said torsion elements of said torsion spring members at an angle from the longitudinal axis of said torsion spring members, said mounting means additionally comprising a lost motion means operably associated with said upper support frame for permitting substantially only vertical displacement of said upper support frame under the influence of the spring action of the torsion spring members whereby the torsion spring members dampen the vertical displacement between said upper support frame and said lower support frame, said lost motion means being formed in said ends of said upper support frame; and

said torsion element of said torsion springs extending generally parallel to the corresponding sides of said upper support frame and removed from the outer periphery of said upper support frame.

4,713,852

HYBRID WATER BED MATTRESS

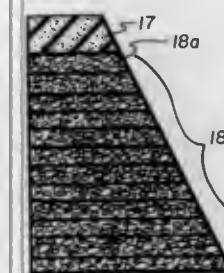
Moroni Fox, Sr., 2760 Claybourne Cir., Salt Lake City, Utah 84109, and Dana G. Fox, 4467 Nancy Dr., Salt Lake City, Utah 84120

Filed Mar. 24, 1986, Ser. No. 842,817

Int. Cl.⁴ A47C 27/08

U.S. Cl. 5—451

9 Claims



1. A hybrid water bed mattress having dimensions substantially similar to those of a conventional innerspring mattress comprising:

- a water-filled bladder; and
- a peripheral restraining member for providing lateral support for said bladder when it is filled with water, said restraining member comprising:
 - an encircling sidewall having an overall height substantially equivalent to the height of said bladder when filled with water and a width sufficient to resist, without substantial deflection of said sidewall, the lateral force applied to said sidewall by a water-filled bladder, said sidewall containing as at least a significant part of its lateral support structure a tough, resilient, substantially rigid polyethylene foam having a density of about 1.2 lbs. per cubic foot to about 2.0 lbs. per cubic foot, said polyethylene foam having at least two internal laminations of polyethylene foam slabs of substantially identical physical and chemical properties bonded together, the bonds between said slabs being substantially planar and substantially parallel to the lateral force applied to said sidewall by a water-filled bladder, said polyethylene foam having a significant resistance to take a deformation set upon exposure to significant loads over an extended period of time.

4,713,853

APPARATUS FOR IMPROVED WATER THERAPY

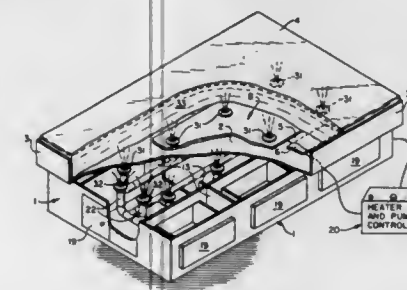
Dominic A. Ricchio, 6021 56th Ave., Kenosha, Wis. 53142

Division of Ser. No. 447,763, Dec. 8, 1982, which is a continuation-in-part of Ser. No. 371,456, Apr. 23, 1982. This application Aug. 19, 1986, Ser. No. 898,149

Int. Cl.⁴ A47C 27/08

U.S. Cl. 5—451

11 Claims



1. A waterbed for circulating streams of pressurized, heated water to massage a reclining person supported thereon, the waterbed comprising:

- an enclosure having a top membrane of water-impervious

material for supporting the reclining person in a floating manner on a volume of water that extends at least the length and width of the person;

a volume of water within said enclosure;

base means for supporting the enclosure in an elevated position;

a retainer of water-impervious material positioned between the base means and the enclosure;

an array of water inlets and at least one water outlet sealingly clamped to the retainer for support of the water inlets and water outlet in an elevated position by the base means, the water inlets opening into the interior of the enclosure and being aimed for directing streams of pressurized heated water upwardly towards the top membrane and the water outlet opening into the interior of the enclosure and being operable for conveying heated water out of the enclosure;

a water pump in fluid communication with the water outlet to draw the water from the enclosure and in fluid communication with the water inlets to provide recirculation, the water pump imparting sufficient pressure to the streams of pressurized heated water to drive the streams through the water in the enclosure to impinge on the top membrane.

4,713,854

CONSTANT FORCE CUSHION

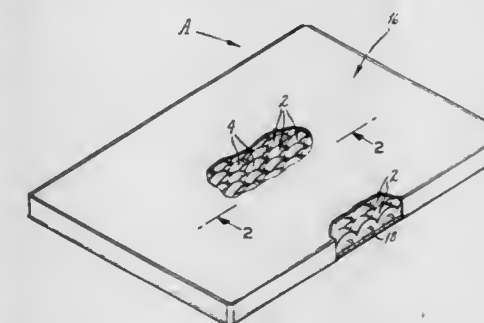
Robert H. Graebe, 4 Signal Hill Blvd., Belleville, Ill. 62223

Continuation-in-part of Ser. No. 451,445, Dec. 20, 1982, abandoned. This application Mar. 29, 1985, Ser. No. 717,329

Int. Cl.⁴ A47C 27/16

U.S. Cl. 5—481

20 Claims



1. A cushion comprising: arch-like segments formed from a resilient material and arranged in a plurality of side-by-side rows such that each row possesses a generally undulated configuration, each arch-like segment having a curved convex surface and a curved concave surface, as well as generally flat side surfaces between the curved convex and concave surfaces, the arch-like segments of the rows being arranged such that the curved convex surfaces are presented in one direction and the curved concave surface are presented in the opposite direction and further such that side faces of the arch-like segments in adjacent rows face each other and are located in close proximity to each other, the arch-like segments of any one row being offset with respect to the arch-like segments of a row adjacent to that one row so that curved surfaces of the arch-like segments in the two rows do not align.

19. A cushion comprising a plurality of strips which are located side-by-side and are formed from a resilient foam material, each strip having a front face which is presented toward the user of the cushion and a back face which is presented away from the user of the cushion and generally flat side faces extended between the front and back faces, the front and back faces of the strips being configured to provide a succession of arches along each strip with the arches being oriented to impart a generally undulated shape to each strip, the strips being positioned with the side faces of any one strip being close to and facing the side faces of the strips adjacent to that strip, and with such facing side faces being substantially detached from

each other so that the strip does not significantly impede flexure of the strips adjacent to it and vice-versa, the strips also being positioned such that the arches on any one strip are offset with respect to the arches of the strips adjacent to that one strip, so that the arches of adjacent strips do not align across the cushion.

4,713,855

PROCESS FOR MAKING SELF-DRILLING FASTENERS
Jacob Hyner, Waterbury, and Steven Gradowski, Torrington, both of Conn., assignors to Whyco Chromium Company, Inc., Thomaston, Conn.

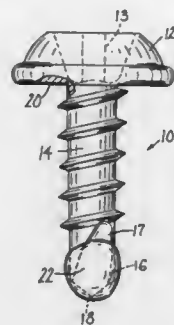
Division of Ser. No. 808,514, Dec. 13, 1985, Pat. No. 4,692,080.

This application May 4, 1987, Ser. No. 46,237

Int. Cl.⁴ B23G 9/00

U.S. Cl. 10—10 R

12 Claims



1. A process for making a screw fastener having a head, a shank and a tip area configured as a drill point comprising, applying a quick curing resin coating over the tip area of said fastener while leaving the remaining head and shank portion uncoated, curing said resin coating to form a frangible layer on said tip area and electroplating a corrosion resistant metal onto the uncoated remaining head and shank portion of the screw.

4,713,856

APPARATUS FOR CLEANING DIGITAL AUDIO DISCS
Eivind Clausen, Bellingham, Wash., assignor to Allsop, Inc., Bellingham, Wash.

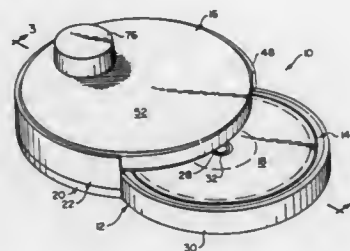
Continuation of Ser. No. 600,495, Apr. 16, 1984, Pat. No.

4,556,433. This application Nov. 4, 1985, Ser. No. 794,665

Int. Cl.⁴ B08B 11/02; G11B 3/58

U.S. Cl. 15—97 R

17 Claims



1. An apparatus adapted to clean an object, such as a digitally encoded disc, in a cleaning pattern with a wiping path having a path component extending between a peripheral portion and a middle portion of said object, said apparatus comprising:

- a. a base structure;
- b. a support member having a support contact surface to support an object to be cleaned at a support location in a general support plane to expose a surface of the object to be cleaned at a contact location having a contact plane, said contact location having a middle support axis having a substantial alignment component generally perpendicular to said contact plane;
- c. a cleaning member having a cleaning surface and being

mounted to said base structure so as to be positioned with the cleaning surface positioned at the contact plane, said cleaning member having a cleaning axis having a substantial alignment component parallel to said support axis and spaced laterally therefrom;

- d. said support member and said cleaning member being mounted for a first path of rotation relative to one another in a manner that the cleaning member rotates about its cleaning axis relative to said support member to cause relative cleaning motion of the cleaning member in a path moving across the contact plane toward and away from said support axis, said support member and said cleaning member also being mounted for a second path of relative rotation of the support contact surface about the support axis relative to the cleaning axis;
- e. drive transmitting means operatively connected between the support member and the cleaning member in a manner that relative rotation of one of said support member and cleaning member effects relative rotation of the other of said support member and cleaning member;
- f. said support member being rotatably mounted about said support axis which remains stationary relative to said base structure, and said cleaning member being mounted for rotation about said cleaning axis which remains stationary relative to said base structure during operation of said apparatus; and
- g. said drive transmitting means comprising a gear transmission, which further comprises at least a first gear mounted to said cleaning member and a second gear mounted to said support member, with said first and second gear members engaging one another directly;

whereby, as said cleaning member is rotated relative to the support member about the cleaning axis, there is relative rotation of the support member to shift the path of the cleaning motion of the cleaning member relative to the support surface.

4,713,857

APPARATUS FOR USE IN CLEANING THE TAPE OF A TAPE CASSETTE

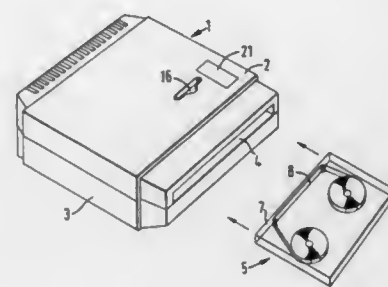
Don R. Cecil, Gwent, Great Britain, and Richard P. Evans, Wavre, Belgium, assignors to Paccault Limited, Gwent, England

Filed Dec. 4, 1986, Ser. No. 937,826

Int. Cl.⁴ B08B 11/02

U.S. Cl. 15—97 R

12 Claims



1. Apparatus for use in cleaning the tape of a tape cassette, the apparatus comprising:

- (a) a housing;
- (b) an aperture defined by the housing whereby a tape cassette can be inserted into the housing;
- (c) an opening defined by the housing through which a tape cleaning device can be inserted into the housing;
- (d) drive means in the housing for causing the tape of a tape cassette inserted into the housing to be driven past the cleaning device in contact therewith to be cleaned; and
- (e) electronic logic control circuitry in the housing for controlling the drive means in response to insertion of a cleaning device and a tape cassette.

4,713,858

LEAF COLLECTION APPARATUS FOR BLOWER-VACUUMS

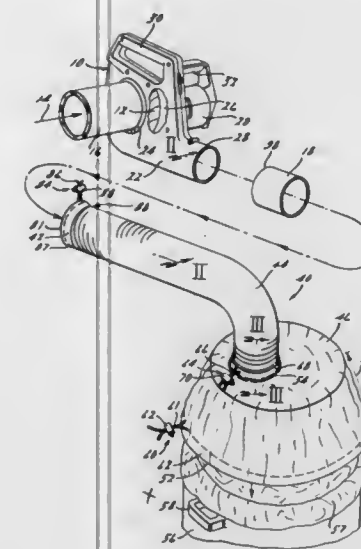
John D. Kelber, 1093 Suffield, Birmingham, Mich. 48009

Filed Apr. 14, 1986, Ser. No. 852,720

Int. Cl.⁴ A47L 5/32

U.S. Cl. 15—347

4 Claims



1. A leaf collection apparatus for attachment to a hand held portable vacuum device, said vacuum device including a vacuum inlet and an air outlet, said inlet for drawing leaves into said vacuum device and said outlet for ejecting leaves from said vacuum device into and through said leaf collection apparatus to deposit the leaves into a suitable container, said leaf collection apparatus comprising:

- an elongated flexible hose having a sleeve end and a discharge end;
- sleeve means operable for attachment between said outlet of the vacuum device and said sleeve end of said hose, said sleeve means attaching the sleeve end of the hose to the vacuum device and protecting the hose from being punctured by leaves entering said hose from said outlet;
- shroud means having a hose connecting end and a container end;
- first and second adjustable connection means integral with said hose connecting end and said container end respectively for allowing releasably adaptable connection of said shroud means between varying sizes of hoses and varying sizes of containers;
- third adjustable connection means at said sleeve end of said hose for allowing releasably adaptable connection to accommodate varying sizes of air outlets for allowing releasable adaptable connection to varying sizes of outlets of the vacuum device;
- said shroud means sealingly attached to said discharge end of said hose at said hose connecting end and sealingly attached to a suitable container at said container end by said first and second adjustable connection means respectively, said shroud means acting as an intermediary adapting member between said hose and the container for allowing deposit of leaves from said hose into the container, whereby said leaf apparatus is adaptable to deposit leaves in a variety of sizes of containers and is adaptable for connection to a variety of sizes of outlets of hand held portable vacuum devices.

4,713,859

PORTABLE CLEANING CONTAINER

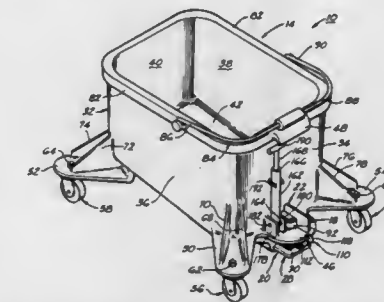
Don A. Smith, Jr., 811 Mockingbird La., Norman, Okla. 73071

Filed Sep. 5, 1986, Ser. No. 904,164

Int. Cl.⁴ A47L 13/50

U.S. Cl. 15—264

22 Claims



1. An improved portable cleaning station comprising: bucket means for containing a cleaning solution, the bucket means having a drain opening at its lowermost portion; valve means supported by the bucket means and communicating with the drain opening for selectively opening and closing the drain opening, the valve means having a drain spigot having a drain bore therein, the drain bore openly communicating with the drain opening of the bucket means when the valve means is in an open position such that cleaning solution in the bucket means is discharged from the bucket means in a substantially downward path via the drain opening and the drain bore, the drain spigot forming a substantially fluid-tight seal with the drain opening when the valve means is in a closed position such that cleaning solution is retained in the bucket means; and filter means supported by the underside of the bucket means for removing insoluble debris from the cleaning solution discharged through the drain opening and the drain bore, the filter means selectively movable between an extended position and a retracted position, in the extended position the filter means being disposed in a filtering relationship to the downward path of discharging cleaning solution, in the retracted position the filter means being disposed in a protected position beneath the bucket means.

4,713,860

HANDLE ASSEMBLY

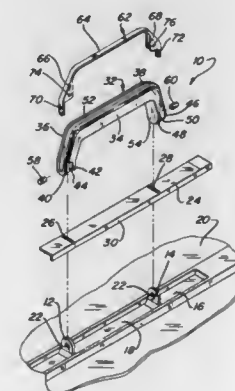
Lawrence R. Mobley, Parker, Mark B. Nordstrom, Denver, and Roger D. Winter, Lakewood, all of Colo., assignors to Samsone Corporation, Denver, Colo.

Filed Jan. 22, 1982, Ser. No. 341,745

Int. Cl.⁴ A45C 13/00

U.S. Cl. 16—111 R

12 Claims



1. A handle assembly comprising:

handle means including a gripping handle having an inner side, an outer side and ends;
 at least one exposed opening in an outer side of said gripping handle adjacent each of said ends through which coupling means are inserted;
 coupling means connecting said handle means to an article;
 and
 integral cover means joined to and substantially coextensive with said handle means and terminating adjacent said ends of said gripping handle and said cover means forming at least a portion of said outer side of said gripping handle and covering said openings and said coupling means so that said coupling means is substantially concealed from view.

4,713,861

HINGE PIN

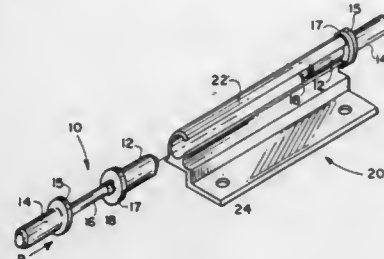
Joseph C. Bancroft, Longwood, Fla., assignor to Croft Metals, Inc., McComb, Miss.

Filed Jan. 16, 1986, Ser. No. 874,567

Int. Cl.⁴ E05D 11/00

U.S. Cl. 16—222

2 Claims



1. A hinge leaf assembly comprising:
 - (a) a hinge leaf having a barrel disposed along one edge thereof;
 - (b) a pair of plastic hinge pin and bearing elements each having
 - (i) a cylindrical bushing inserted in an end of said barrel, said bushing having a cylindrical bore therethrough;
 - (ii) a cylindrical hinge pin element attached concentrically to a cylindrical plug element, said plug element for insertion into a jamb hinge leaf;
 - (iii) a plurality of thin webs attaching an end of said hinge pin element to said bushing; and
 - (c) said hinge pin and bearing elements adapted to, upon compressive force being applied to ends of said plug elements toward said hinge leaf barrel, permit breakage of said webs, insertion of said pin elements through said bores, and seating of said plug elements and said bushings together to form bearing surfaces.

4,713,862

SIDE DOOR HINGE MECHANISM IN MOTOR VEHICLE
 Eichi Kinaga, Toyota, and Daiichi Shiraishi, Seto, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 31, 1985, Ser. No. 793,246

Claims priority, application Japan, Nov. 2, 1984, 59-231679; Nov. 2, 1984, 59-167005[U]; Nov. 2, 1984, 59-167006[U]; Nov. 2, 1984, 59-167009[U]; Nov. 2, 1984, 59-167011[U]

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.⁴ E05D 15/32

U.S. Cl. 16—223

6 Claims

1. A side door hinge mechanism in a motor vehicle having a quadric rotary link device for movably connecting a rocket proximal end of a side door to a side of a vehicle body, said hinge mechanism comprising:

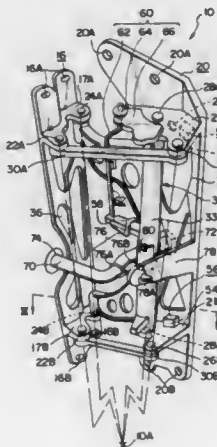
- a body side base formed long in the vertical direction along a surface of a front pillar of the vehicle body,
- a door side base formed long in the vertical direction along

a surface of the rocking proximal end of the side door of said vehicle body,

a plurality of top rotary center shafts and a corresponding plurality of bottom rotary center shafts aligned with said top rotary center shafts and positioned downwardly therefrom, said top and bottom rotary center shafts being located in pairs in top and bottom portions of said body side base and said door side base, each rotary center shaft of each pair of rotary center shafts being spaced from each other;

a first control arm connected at one end to one rotary center shaft of one pair of rotary center shafts on the body side base and at an opposite end to one rotary center shaft of one pair of rotary center shafts on the door side base; and
 a second control arm connected at one end to the other rotary center shaft in said pair of rotary center shafts on said body side base and at an opposite end to the other of said rotary center shafts in said pair of rotary center shafts on the said door side base;

wherein one of said first and said second arms is a top control arm rotatably connected at opposite ends thereof to said top rotary center shafts on one side of said body base and said door side base and a bottom control arm is rotatably connected at opposite ends thereof to said bottom rotary center shafts aligned with said top rotary center shafts at the opposite ends of said top control arm; and the other of said first arm and second arm is a main arm



formed integrally in the vertical direction and rotatably connected at opposite ends thereof in the vertical and widthwise directions thereof to said top and bottom rotary center shafts; and

wherein said main arm is formed integrally in the vertical direction, rotatably connected at upper opposite ends thereof to the top rotary center shafts disposed inwardly in the widthwise direction of the vehicle body, on the sides of the vehicle body and the side door, respectively, and rotatably supported at lower opposite ends thereof by the bottom rotary center shafts disposed inwardly in the widthwise direction of the vehicle body, which are opposed to said top rotary center shafts, said top control arm is rotatably supported at opposite ends thereof by the remaining top rotary center shafts, and said bottom control arm is rotatably supported at opposite ends thereof by the remaining bottom rotary center shafts;

said hinge mechanism is provided therein with a wire harness extending from said rocking proximal end of the side door to which said door side base is secured to the surface of the vehicle body to which said body side base is secured, said harness passing by the rotary center shafts of said main arm on the side of the vehicle body between the top and bottom rotary center shafts in the vertical direction;

said main arm is formed with a pipe portion supported at top and bottom ends thereof by the top and bottom rotary

center shafts on the side of the vehicle body and a space adjacent to the intermediate portion in the vertical direction of said pipe portion for allowing the wire harness to pass therethrough; and
 a harness protector made of resin is mounted to said pipe portion facing said space.

4,713,863

REUSEABLE CLAMP WITH AN OUTWARDLY PROJECTING EAR ON EACH OPPOSING END AND HAVING A HOOK SHAPED PROJECTION ON ONE EAR ADAPTED FOR INTERLOCKING COACTION WITH AN OPENING IN THE OTHER EAR

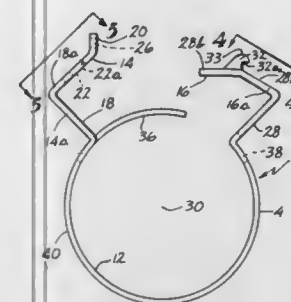
Ralph N. Jennings, Grafton, Ohio, assignor to Triad Metal Products Company, Cleveland, Ohio

Filed Jan. 20, 1987, Ser. No. 5,217

Int. Cl.⁴ B65D 63/02

U.S. Cl. 24—20 R

15 Claims



1. A reusable clamp comprising a strap of resilient material having a curved body portion and generally opposed end portions, one of said end portions having a projection extending outwardly therefrom and the other end portion including an opening formed therein through which is adapted to be received said projection, in the tightened condition of the clamp, said projection being adapted to engage the defining periphery of said opening and hold said end portions in connected condition, said projection including means facilitating the entry of said projection into said opening for holding the clamp in closed clamping condition, and for withdrawal of said projection from said opening to permit opening of said clamp, and wherein said one end portion of said strap comprises a section disposed substantially normal to the plane of the strap of said body portion and then a section which is bent generally diagonally upwardly and then a section bent to extend generally horizontally from said diagonal section, to form said one end portion of said strap, with said projection being disposed on said horizontal section, said other end portion of said strap comprising a first section which extends generally normal to the plane of said strap and then a section which is turned to extend generally at an angle of approximately 90° with respect to said first section, and then a further section which is tipped upwardly relative to said 90° section, said opening being disposed in said 90° section and being of triangular configuration in plan, with said projection being of hook-shaped configuration, said further section having a transversely extending opening therein.

4,713,864

SEPARABLE FASTENER WITH SLIDING SLEEVE
 Herman A. Hess, 7601 Bathurst Street, Apt. 1403, Thornhill, Ontario, M4J 4H5, Canada

Filed Mar. 23, 1987, Ser. No. 28,798

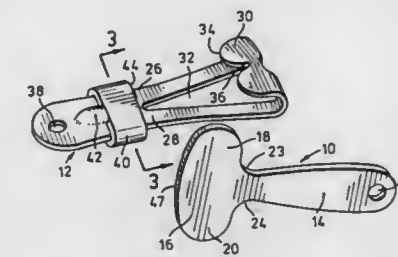
Int. Cl.⁴ A44B 19/00, 11/25

U.S. Cl. 24—590

6 Claims

1. A separable fastener comprising:
 a male member having a stem portion and a T-shaped head

portion with two arms projecting sideways from the stem portion,
 and a female member constituted by an elongated body with a tail portion and a forward portion that is bent with respect to the tail portion, the elongated body having an opening therethrough adjacent the bent forward portion, the opening being of sufficient length to permit insertion of one arm of the T-shaped head portion of the male member, said bent forward portion of the female member terminating at an edge which interferes with complete passage of the T-shaped head portion of the male member in any but one particular orientation of the male member with respect to the female member, said edge having an indentation adapted to receive the T-shaped head portion



when in said one particular orientation in order to avoid interference and permit complete passage of the T-shaped head portion through the opening, the opening further having a part wide enough to permit swivelling of the stem portion after passage of the T-shaped head portion through the opening.

the female member having a sleeve member mounted on the tail portion thereof for sliding movement along said tail portion, the sleeve member at all times embracing only said tail portion, the sleeve member being adapted to inhibit the male member from assuming said one particular orientation by partly obscuring said opening and lodging between the female member and one of the arms of the male member.

4,713,865

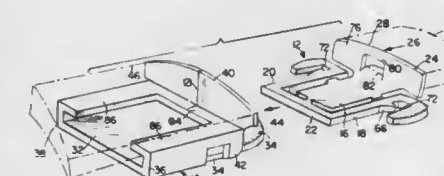
STREAMLINED UNOBSERVABLE JEWELRY CLASP, MEMBERS FORMING SAME AND BLANK
 Simon Geldwerth, Brooklyn, N.Y., assignor to Do-All Jewelry Mfg. Co., Inc., Springfield, N.J.

Filed Jul. 8, 1986, Ser. No. 883,345

Int. Cl.⁴ A44B 11/25

U.S. Cl. 24—616

22 Claims



1. A clasp for connecting one end of a piece of jewelry to the other end thereof, said clasp comprising:

- (a) a tongue member having a base with opposite sides, a front end on said base, and a transverse attachment portion at the rear end of the base for attachment to said one end of the piece of jewelry;
- (b) a box member having a base with a front end and with opposite, upstanding side walls, and a transverse attachment portion connecting said side walls at the front end of the base for attachment to said other end of the piece of jewelry;
- (c) the attachment portion of said box member forming a

- transverse opening wide enough to receive the front end of the base of said tongue member;
- (d) said tongue and box members being constructed and arranged such that said opposite sides of said tongue member slideably engage said upstanding side walls of said box member when the front end of said tongue member is inserted into said opening;
- (e) a pair of resilient detents on said tongue member integral with and defining the sides of the base thereof, said detents being spaced from the remainder of the base of said tongue member along the length of the base adjacent the edges thereof by slits to form a pair of resilient arms that are cantilevered to the base adjacent the front end thereof; and
- (f) a pair of detent receptors in said upstanding walls in said box member for receiving said detents and releasably preventing separation of the members when the latter are mated by inserting the front end of said tongue member into said opening until the attachment portion on said tongue member is adjacent to the attachment portion on said box member.

4,713,866

APPARATUS FOR ATTACHING CABLES TO MESSENGER WIRES

Horst Goldmann, Gilching; Guenter Einsle, Munich; Rudolf Brugger, Puchheim, and Josef Wacker, Hoehenrain, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

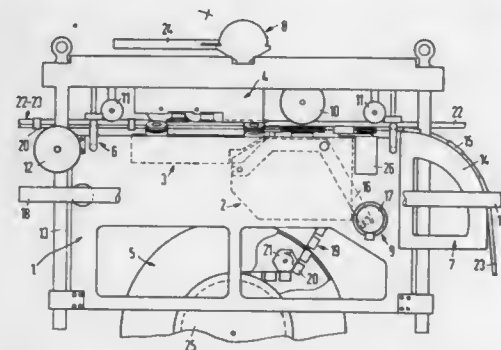
Filed Jan. 30, 1986, Ser. No. 824,097

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504959

Int. Cl.⁴ H02G 7/05

U.S. Cl. 29—33 K

11 Claims



1. In an apparatus for securing a cable to a messenger wire by applying fastening elements at spaced intervals as the apparatus moves along the messenger wire, said apparatus having a frame with means for supporting the frame on the messenger wire for movement thereon, supply means mounted in the frame to provide fastening elements in a form of a tape of interconnected fastening elements, feed means for applying the elements to a combination of the messenger wire and cable including means for separating the fastening element from the end of the tape and folding means including pairs of pressure rollers for shaping the ends of the fastening elements into a folded connection, the improvements comprising the feed means being mounted in the frame beneath the cable and messenger wire, the means for separating including shearing means having a plurality of chisels and a mating roller having an abutment surface coating with the chisels, the feed means including a lifting means for lifting served fastening elements into a position engaging the combination of the cable and messenger wire, said apparatus including drive means for actuating the feed means, said drive means having two belts which are positioned to engage the messenger wire on opposite sides as the apparatus moves along the wire, said feed means being releasably connected to the drive means to enable mov-

ing the apparatus without actuating the feed means, said two belts of the drive means engaging the free ends of the fastening element to move them toward each other and into engagement with opposite sides of the cable and messenger wire as the element moves from the feed means towards the folding means, said folding means being positioned above the messenger wire and having a wedge-shaped throat for receiving and moving the free ends of the elements close together to be engaged by the pairs of pressure rollers to form the folded connection.

4,713,867

PISTON RINGS WITH A GAP SEAL

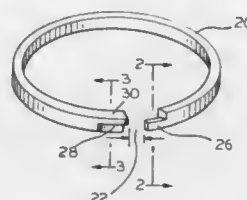
Duke Fox, 5305 Towson, Fort Smith, Ark. 72901

Filed Apr. 15, 1985, Ser. No. 723,097

Int. Cl.⁴ B23P 15/06

U.S. Cl. 29—156.6

15 Claims



1. A process for making a piston ring, said process comprising the steps of:
 - forming a circular ring;
 - forming a cut on the top edge and on the inside diameter cylindrical wall of the ring;
 - transversely slotting the ring at an end of the cut, thereby forming a gap with an associated elongated member;
 - forming a longitudinal slot along an edge of said ring adjacent said transverse slot, said elongated member nesting in said longitudinal slot when said ring is compressed to close said gap;
 - securing the ends of a flexible member extending across the slot exclusively on the outside diameter wall of said ring to hold said gap closed with said ring in said compressed state, said ring being otherwise unrestrained;
 - placing a plurality of said rings secured by said flexible member onto a mandrel and securely clamping said rings in abutment, whereby cumulative outside surfaces of said rings form an outside cylindrical wall; and
 - grinding said cumulative surfaces to form said secured and compressed rings into a substantially perfect circle, thereby completely removing entirely all of both said flexible member and the securing which attached said flexible member on said outside diameter wall of said ring.

4,713,868

INSTALLATION TOOL

Stanley E. Grabowski, Harrison, N.J., assignor to Richard Drzyzga, Edison and Michael Drzyzga, Jr., Clifton, both of, N.J., part interest to each

Filed May 12, 1986, Ser. No. 862,032

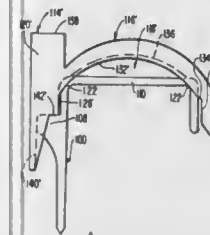
Int. Cl.⁴ B25B 27/14

U.S. Cl. 29—275

20 Claims

1. An installation tool for driving hooks having a rectangular or circular-shaped head and a shoulder extending therefrom for receiving striking forces, said tool comprising a body having an open mouth portion constructed to receive the rectangular and circular-shaped head of said hooks, said open mouth portion including a first profiled portion for receiving a portion of said rectangular-shaped head and a second profiled portion

for receiving a portion of said circular-shaped head, said first profiled portion being different from said second profiled



portion, and force applying means for applying a driving force to said shoulder sufficient for driving said hooks.

4,713,869

FRONT WHEEL DRIVE BOOT REMOVAL TOOL

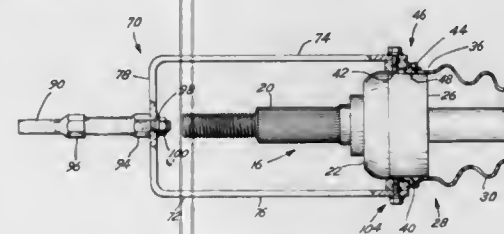
James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Filed May 2, 1986, Ser. No. 858,644

Int. Cl.⁴ B25B 27/14

U.S. Cl. 29—275

2 Claims



1. A universal joint boot, removal tool comprising, in combination:
 - an integral U-shaped yoke having first and second, elongate, parallel, spaced extension legs and a transverse interconnecting leg, said legs formed from a single bar, each of said extension legs having a generally constant size rectangular cross section end portion with a transverse ring locking aperture, at the end thereof opposite said interconnecting leg, the apertures being substantially coaxial and transverse to the extension legs, said interconnecting leg including a centrally-located attachment aperture;
 - an integral driver attachment adapted to engage said attachment aperture, said driver attachment being rigidly secured to said interconnecting leg of said integral U-shaped yoke;
 - a removable split ring member having a generally cylindrical inside surface with an inside diameter, and a generally circumferential abutment land on the inside surface for engagement with a universal boot assembly, the outside surface of the split ring member being generally cylindrical and also including first and second pairs of flanges extending outwardly from said ring member so as to define a pair of diametrically opposed slots in the outside surface of the ring member, said slots transversely spaced by a fixed distance substantially equal to the spacing of the ends of the extension legs, each slot adapted to receive one end of said extension legs in an assembled state, each slot further including a threaded fastening aperture, each aperture centrally located within said diametrically opposed slots and aligned with said ring-locking apertures of said legs in said assembled state; and
 - a pair of bolts rigidly, individually, and removably securing said extension legs in said split ring slots, said bolts engaging said threaded fastening apertures and extending only partially into said ring member to retain the ring member attached to the extension legs and prevent twisting of said ring member when mechanical force is applied to the tool through the driver attachment, said legs defining means

for cooperation with any ring member having cooperative, parallel, extension slots spaced said fixed distance regardless of the inner surface diameter and configuration.

4,713,870

PIPE REPAIR SLEEVE APPARATUS AND METHOD OF REPAIRING A DAMAGED PIPE

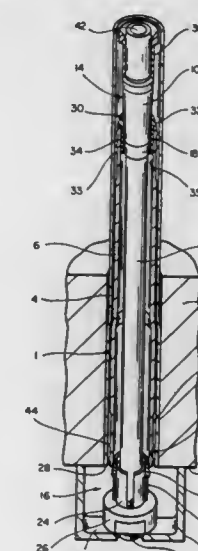
Laszlo Szalvay, San Carlos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 716,265, Mar. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 596,743, Apr. 4, 1984, abandoned. This application Dec. 17, 1986, Ser. No. 943,832

Int. Cl.⁴ B23P 6/00

U.S. Cl. 29—402.09

23 Claims



1. A method of repairing a damaged pipe, comprising the steps of:
 - assembling a repair apparatus assembly comprising a draw rod having an expanding means on each end thereof and a repair sleeve having two ends, the draw rod being contained within the sleeve with at least a portion of each of the expanding means protruding outside of the sleeve;
 - inserting the repair apparatus in the damaged pipe;
 - axially moving the expanding means towards one another, thereby engaging the expanding means with the ends of the sleeve;
 - further axially moving one expanding means toward the other expanding means while maintaining the other expanding means stationary, stopping movement of the one expanding means, then after the one expanding means stops moving, further axially moving the other expanding means toward the one expanding means while maintaining the one expanding means stationary, thereby fully expanding one end of the sleeve outwardly into engagement with the damaged pipe and then fully expanding the other end of the sleeve outwardly into engagement with the damaged pipe; and
 - physically removing the draw rod.

4,713,871

METHOD FOR PRODUCING AMORPHOUS ALLOY SHAPED ARTICLES

Masatada Araki, Handa; Yutaka Kuroyama; Yukihisa Takeuchi, both of Chita; Makoto Takagi, Okazaki, and Toru Imura, Nagoya, all of Japan, assignors to Nippon Oil & Fats Co., Ltd. and Nippon Denso Co., Ltd., both of Japan

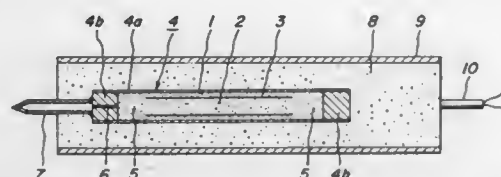
Filed Dec. 2, 1985, Ser. No. 803,238

Claims priority, application Japan, Dec. 12, 1984, 59-260844; Jul. 25, 1985, 60-162899

Int. Cl.⁴ B22F 1/00

U.S. Cl. 29—421 E

13 Claims



1. A method for producing an amorphous alloy shaped article, comprising arranging an amorphous alloy or atomized alloy raw material powder layer adjacent to a metal powder layer in one pressing vessel to form a laminated powder layer assembly, said metal powder layer having a shock impedance nearly equal to or a little different from that of the raw material powder layer, and then applying a shock pressure to the raw material powder layer.

4,713,872

METHOD OF ATTACHING FASTENING ELEMENT TO A PANEL

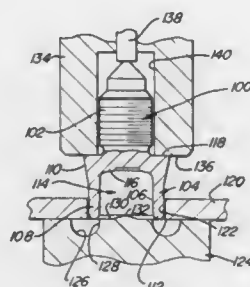
Rudolph R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich. Continuation-in-part of Ser. No. 773,387, Sep. 6, 1985, Pat. No. 4,633,560, which is a division of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 458,099, Mar. 28, 1983, Pat. No. 4,459,073, and a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701 said Ser. No. 458,099 is a division of Ser. No. 229,274, abandoned, said Ser. No. 504,074 is a continuation of said Ser. No. 229,274.

This application Apr. 16, 1986, Ser. No. 852,689

Int. Cl.⁴ B21D 39/00; B23P 11/00

U.S. Cl. 29—512

9 Claims



7. A method of permanently attaching a metal element to a metal panel, said panel having a predetermined substantial thickness greater than 0.1 inches and a generally circular aperture through said panel having a generally cylindrical internal surface, said element having an annular barrel portion closed at a driving end, said barrel portion including internal and external surfaces terminating in an opposite free end, said barrel portion external surface including a conical surface portion tapered outwardly from adjacent said free end to said driving end surface, and having a minor diameter generally equal to the internal diameter of said panel aperture, said method comprising the following steps performed in a generally continuous sequence.

- (a) locating said element barrel portion free end adjacent said panel with said annular barrel portion generally coaxially aligned with said panel aperture and a die member located on the opposite side of said panel, said die member including a concave annular die cavity having an inner surface generally conforming to and coaxially aligned with said internal barrel portion and a panel supporting surface on at least opposed sides of said die cavity supporting said panel;
- (b) driving said barrel portion free end through said panel aperture, into said die cavity, said barrel portion conical external surface plastically deforming said panel aperture cylindrical surface to generally conform to and mate with said conical barrel surface, said mating conical surfaces resisting further penetration of said barrel portion through said panel aperture; and
- (c) while plastically deforming said barrel portion free end radially outwardly in said die cavity, entrapping and thickening said barrel portion and turning said barrel portion free end to engage said panel spaced from said aperture, forming an enlarged annular rim end portion on said barrel portion being hook-shaped in cross section and preventing pull-out of said element from said panel aperture.

4,713,873

WELD FIXTURE MOUNTING METHOD

Raymond D. Gold, Wauke, and Leo W. Riegel, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

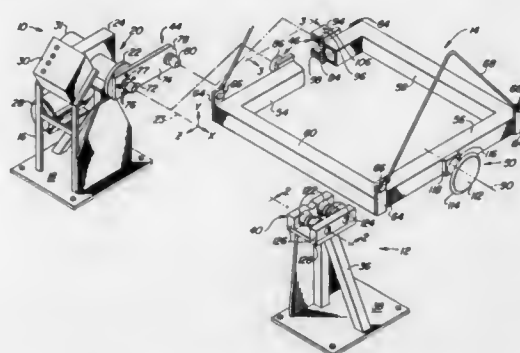
Division of Ser. No. 742,243, Jun. 7, 1985, Pat. No. 4,641,820.

This application May 8, 1986, Ser. No. 860,958

Int. Cl.⁴ B23Q 7/00

U.S. Cl. 29—559

21 Claims



1. A method of connecting an elongated fixture to rotatable headstock and tailstock positioners for rotation about a rotational axis, the fixture having a headstock and a tailstock end, the method comprising the steps of:

- (a) providing slidably engageable mounting structure on the headstock positioner and complementary mating structure on the headstock end of the fixture;
- (b) providing a roller on the tailstock end of the fixture and a complementary roller assembly on the tailstock positioner;
- (c) centering the headstock end of the fixture with respect to the headstock positioner, said step of centering including slidably engaging the mounting structure and mating structure; and
- (d) locating the fixture both linearly and centrally with respect to both the headstock and tailstock devices, said step of locating including lowering the tailstock roller onto the roller assembly and urging the tailstock roller to a preselected axial location while causing sliding movement between the mounting structure and the mating structure, thereby accommodating axial movement of the fixture as the fixture is located linearly.

4,713,874

TELEPHONE WIRE-AND-JACK ATTACHMENT DEVICE AND KIT

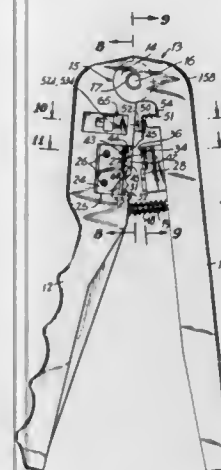
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.

Continuation of Ser. No. 780,760, Sep. 27, 1985, abandoned. This application Jun. 30, 1986, Ser. No. 880,463

Int. Cl.⁴ H01R 43/04

U.S. Cl. 29—566.4

5 Claims



1. A hand-held tool for cutting and stripping a telephone wire and attaching and electrically connecting jack connectors to said telephone wire, said hand-held tool comprising:

- a first hand-held jaw member,
- a second hand-held jaw member cooperating with said first hand-held jaw member and pivotably attached thereto at a top portion thereof, said jaw members cooperating with each other to define hand gripped open and closed positions,
- cooperating cutting members adjacently disposed upon said first and second jaw members for cutting and stripping telephone wire, when said telephone wire is inserted between said cutting members and when said jaw members are moved from said open to said closed position,
- a contoured aperture having a jack connector shape, disposed upon said first jaw member for placement of a jack connector containing said cut and stripped telephone wire, and
- means disposed upon said second jaw member for attaching and electrically connecting said telephone wire to said jack connector placed in said first jaw member, when said jaw members are moved from said open to said closed position, and
- said cooperating cutting members comprising:
- a unitary knife blade having a straight cutting edge, mounted on said first jaw member,
- a flat surface on said second jaw member for cooperating with the cutting edge of said unitary knife blade when moving from the said open to closed position, for severing a wire by cutting it through,
- a pair of wall surfaces in said first jaw member, perpendicular to said knife blade, defining a recess extending below the said cutting edge, for holding the wire perpendicular to the unitary blade for effecting a square cut of the wire by the blade and flat surface, and
- a knife blade, mounted on said second jaw member,
- a second pair of wall surfaces in said first jaw member perpendicular to said knife blade, and a wall surface perpendicular to said second pair, defining a recess for holding the wire perpendicular to the unitary blade for effecting a square cut of the wire by the blade and flat surface,
- said straight cutting edge and said second jaw member blades' cutting edges are opposed for cutting into said

wire when moved from the said open to closed position, and
a rod, mounted on a bottom portion of one of the jaw members, distal from the unitary blade and from the jack connector placement means, and a mating face on the other jaw member for establishing a controlled gap between said straight cutting edge and said second jaw member blade's cutting edge when they are moved from the said open to closed position.

4,713,875

TOOL CHANGER

Erich Dormehl, Allendorf/Nordeck, Fed. Rep. of Germany, assignor to Heyligenstaedt & Comp. Werkzeugmaschinenfabrik GmbH, Giessen, Fed. Rep. of Germany

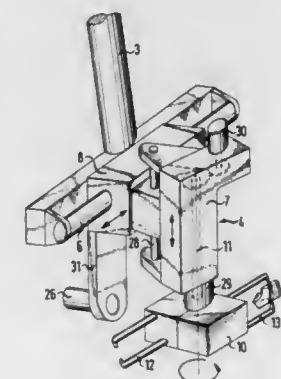
Filed Nov. 25, 1986, Ser. No. 936,543

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1985, 3541563

Int. Cl.⁴ B23Q 3/157

U.S. Cl. 29—568

4 Claims



1. Tool changer for a lathe with inclined bed with at least one tool carriage with a drumtype turret arranged on an upper bed as well as another tool carriage with a drumtype turret arranged on a lower bed, the tool changer having a ram that can move into the lathe with inclined bed and that has a double gripper head with two gripper arms arranged opposite to each other, characterized in that the tool changer (4) has a first guideway (6) arranged parallel to the plane of the machine bed (5) on which guideway (6) a tool changer head (7) is movable holding the double gripper head (10) pivotable about an axis (11) that is arranged rectangularly to the first guideway (6) and thus to the plane of the machine bed (5), that the gripper arms (12, 13) are each arranged at the same distance to the axis (11) of the double gripper head (10) and at both sides of the axis (11) and that the double gripper head (10) is movable along its axis (11).

4,713,876

MACHINE TOOL WITH GANG HEAD INTERCHANGE DEVICE

Masayoshi Takagi, Kariya; Yukio Hoshino, Gamagouri, and Hiroki Yamauchi, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 16, 1987, Ser. No. 26,375

Claims priority, application Japan, Mar. 25, 1986, 61-66604

Int. Cl.⁴ B23Q 3/157

U.S. Cl. 29—568

13 Claims

1. A machine tool having a device for interchanging gang heads each of which holds a plurality of tools rotatably, said machine tool comprising:

- a base;
- a tool support mounted on the base so as to be movable in a first horizontal direction;
- a tool drive means for driving the tools held by the gang heads selectively mounted on the tool support, the tool

drive means including a driving shaft mounted in the tool support;

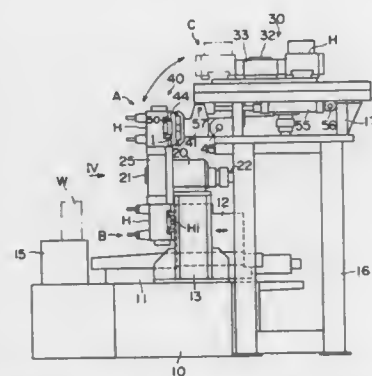
a frame means;

a revolving body held by the frame means above the tool support and capable of rotating about an axis extending in the first horizontal direction;

a first holding means mounted on the revolving body and capable of holding at least two gang heads simultaneously to the revolving body;

a rotating means for rotating the revolving body in such a way that at least two gang heads placed in first and second positions, respectively, are interchanged, the first position being a location at which each gang head is mounted to the tool support, the first and second positions being disposed on opposite sides of the axis of the revolving body;

tiltable body mounted on the frame means so as to be tiltable about an axis extending in a second horizontal direction perpendicular to the first horizontal direction;



a second holding means mounted on the tiltable body for holding at least one gang head on the tiltable body;

a tilting means for moving the tiltable body between its horizontal and vertical positions to convey said at least one gang head between the second position and a third position which is displaced 90° upwardly and rearwardly from the second position around the axis of the tiltable body;

a gang head magazine mounted on the frame means and capable of indexing a plurality of gang heads within a horizontal plane so that they may move into the third position in turn; and

a guide means which is mounted on the tiltable body and which guides at least two gang heads rotated by the revolving body when the tiltable body is placed in its horizontal position and which cooperates with the magazine to guide the plural gang heads indexed within the magazine when the tiltable body is placed in its vertical position.

4,713,877

METHOD OF FORMING PERMANENT MAGNETS WITHIN A MOTOR YOKE

Edward H. Abbott, Ann Arbor; Robert H. Erickson, West Bloomfield, and William F. Horn, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 5, 1986, Ser. No. 826,435

Int. Cl. H01F 41/00, 1/36; H02K 15/00

U.S. Cl. 29—596

8 Claims

1. A method of forming multipoled ring magnets comprising the steps of:

preparing a predetermined mixture of a ceramic hexaferrite platelet material;

forming said mixture into a predetermined hollow cylindrical shape;

providing a cylindrical metal housing of predetermined dimensions wherein the inside diameter is slightly larger

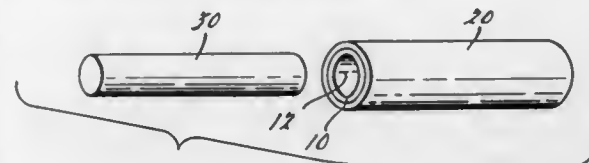
than the outside diameter of said cylindrically formed mixture;

placing said cylindrically formed mixture into said housing;

providing a cylindrical mandrel having a predetermined outer diameter that is slightly less than that of the index diameter of said cylindrical mixture;

evacuating volatile gases from said housing;

hermetically sealing said housing containing said ceramic material mixture and said mandrel;



applying inert gas at predetermined pressure and temperature to said sealed housing for a predetermined period of time to effect densification and platelet alignment of said ceramic material mixture;

allowing said sealed housing to cool;

removing said mandrel;

cutting said housing, bearing the densified ceramic magnetic material, into predetermined lengths and magnetically charging the densified ceramic magnetic material to form multipoled ring magnets.

4,713,878

MOLD METHOD FOR SUPERCONDUCTIVE JOINT FABRICATION

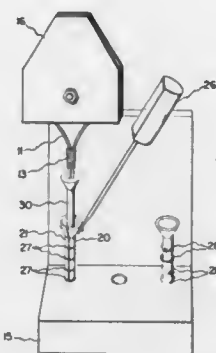
Robert C. Kumpitsch, Johnstown, and James P. Retersdorf, Gloversville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1984, Ser. No. 678,443

Int. Cl. H01L 39/24

U.S. Cl. 29—599

29 Claims



1. A method for forming superconductive joints in multifilamentary superconductor wire embedded in a metal matrix, said method comprising the steps of:

disposing the ends of the multifilamentary superconductor wires to be joined in a hot liquid metal stripping bath for removal of said metal matrix;

removing said wire ends from said stripping bath;

disposing said wire ends in a hot lique superconductive solder;

removing said wire ends from said hot liquid superconductive solder;

inserting said wire ends in a mold and filling said mold with hot liquid superconductive solder; and solidifying said solder.

4,713,879

METHOD OF MANUFACTURING A DEVICE HAVING AN ELECTRIC RESISTANCE LAYER AND THE USE OF THE METHOD

Gerardus A. H. M. Vrijssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

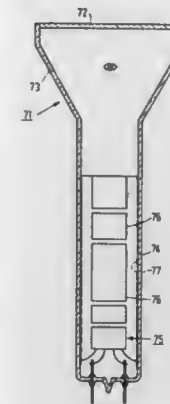
Filed Mar. 24, 1986, Ser. No. 843,329

Claims priority, application Netherlands, Mar. 28, 1985, 8500905

U.S. Cl. 29—620

Int. Cl. B05D 5/12

10 Claims



1. A method of manufacturing a device in which a homogeneous electrical resistance layer of a resistive material having a resistivity of at least 10 ohm. cm is formed on an insulating substrate, characterized in that from a stable binder-free suspension containing ruthenium hydroxide and glass particles a layer is provided on the insulating substrate from which an electrical resistance layer, which contains 1-6 percent by weight of ruthenium oxide, is formed by heating.

4,713,880

LEAD MAKING MACHINE

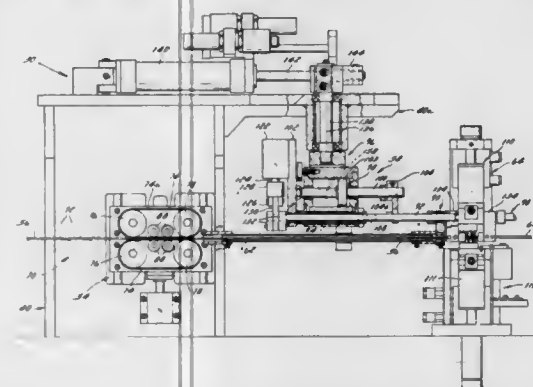
Robert O. Dusel, Brookfield; Harold J. Keene, Waukesha, both of Wis.; James Berres, Houston, Tex., and Gerald Blaha, Waukesha, Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Continuation of Ser. No. 849,564, Apr. 8, 1986, abandoned. This application Mar. 11, 1987, Ser. No. 24,887

Int. Cl. H01R 43/04

U.S. Cl. 29—564.4

11 Claims



1. A lead making machine for accepting insulated wire from a wire source and producing electrical leads, comprising:

a metering means for pushing wire into said machine and measuring the length of wire as it is pushed in;

movable gripping means for gripping said wire and said lead and placing them at certain positions for processing; and

flexible tube means for receiving wire from said metering

means and directing it to said gripping means regardless of the movement of said gripping means;

a frame-like support member for supporting the various parts;

cutting means located on said support member for cutting the wire once a predetermined length of wire has been pushed into the machine by said metering means, thus creating a lead of predetermined length;

stripping means carried with said cutting means for cutting through insulation on said wire and said lead at adjacent ends thereof approximately simultaneously with the cutting of the wire by said cutting means, and holding the insulation after the cutting;

means for reciprocally moving said gripping means axially from an extended position to a retracted position, thereby pulling said wire and said lead out of said stripping means after said insulation is cut, and thereby removing said insulation from the end of said wire and from the end of said lead and creating a stripped wire end and a stripped lead end;

terminal attachment means mounted on said support member for attaching electrical terminals to at least one of said stripped lead end and said stripped wire end;

means for rotating said gripping means about a vertical axis which extends through the approximate center of gravity of said gripping means, to position said stripped wire end and said stripped lead end at said terminal attachment means for attachment of an electric terminal to a least one of said stripped wire end and said stripped lead end; and

electronic visual inspection means for visually inspecting at least one of said stripped wire end and said stripped lead end to determine whether said end is properly stripped within certain predetermined parameters, and for disabling said terminal attachment means from attaching a terminal to an end which does not satisfy those parameters.

4,713,881

TOOL FOR INSTALLING AN ECCENTRIC LOCKING COLLAR ON A BEARING

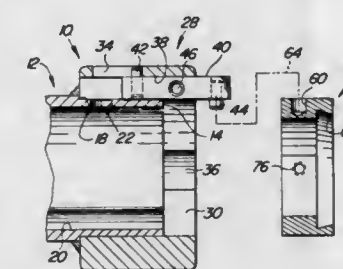
Ronald W. Lange, Bettendorf, Iowa; David F. Reynolds, Colona, Ill.; David R. Lolley, Bettendorf, Iowa, and Gary L. Freeman, Hampton, Ill., assignors to Deere & Company, Moline, Ill.

Filed Mar. 11, 1986, Ser. No. 838,652

Int. Cl. B21D 53/10; B23P 19/04; B25B 13/14

U.S. Cl. 29—724

11 Claims



1. A locking collar tool for assembling and tightening an eccentrically cammed locking collar onto a mating eccentrically cammed extended inner race of a bearing, the bearing being mounted on a shaft and accessible from an end of the shaft, rotation of the collar relative to the inner race generating a locking force between the inner race and the shaft and the collar having a generally cylindrical outer surface including a drive hole, comprising:

a sleeve having a holder end and a drive end and a longitudinal axis and including:

a generally cylindrical socket included in the holder end for receiving and holding the collar generally coaxial with the longitudinal axis of the sleeve; and

a tongue carried by the holder end, having a radially

inwardly extending drive pin and being axially shiftable so that the drive pin may move from a receiving position spaced axially outside the collar holding socket and a retaining position axially within the socket, so that the locking collar drive hole may be engaged by the drive pin and collar and tongue may be moved axially so that the collar is supported in the socket with the tongue drive pin drivably engaging the drive hole of the collar.

4,713,882

DEVICE FOR COMPRESSING BY HAMMERING A TUBE OF A STEAM GENERATOR SET IN A TUBE PLATE

Claude Bianchi, Paris; Yves Fournier, Chatenoy le Royal, and Paul Jacquien, Tassin la Demi Lune, all of France, assignors to Framatome, Courbevoie, France

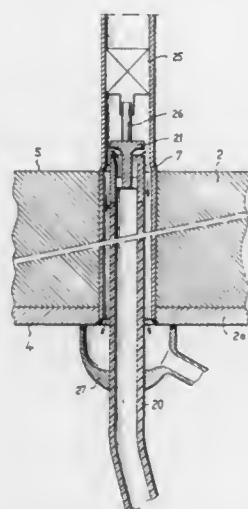
Division of Ser. No. 795,594, Nov. 6, 1985. This application Sep. 10, 1986, Ser. No. 905,418

Claims priority, application France, Nov. 9, 1984, 84 17130; Jul. 3, 1985, 85 10175

Int. Cl.⁴ B23P 15/26

U.S. Cl. 29—727

12 Claims



1. A device for compressing a steam generator tube set in a tube plate so that one end of the tube is flush with a first side of sides of the tube plate and the tube projects from a second opposite side of the tube plate, the setting of the tube having been effected by a rolling of the wall of the tube inside the tube plate between the end of the tube flush with said first side and a zone located in the region of said second side of the tube plate, said device comprising means fixed around the end of the tube flush with said first side of the tube plate in a sealed manner and constituting a case in which is slidable a first flexible tubular sheath, a shaped nozzle carried on an end of the first sheath, and guide means in the tube, suction means connected to the case, and means for injecting gas charged with particles connected to the first sheath, the nozzle having a portion for guiding the particles in a radial direction to the tube when the sheath is introduced in said tube and guided by said guide means.

4,713,883 PRODUCTION LINE FOR PALLET MOUNTED ELECTRIC MOTOR STATORS

Luciano Santandrea, Tavarnelle Val Di Pesa, and Sabatino Luciani, Sesto Fiorentino, both of Italy, assignors to Axis S.p.A., Italy

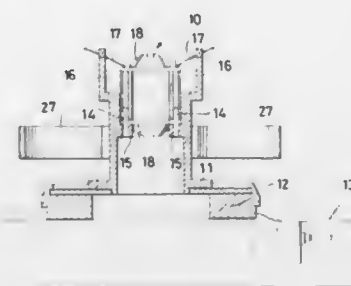
Filed Mar. 18, 1986, Ser. No. 840,671

Claims priority, application Italy, Jul. 11, 1985, 21532 A/85; Oct. 21, 1985, 53954/85[U]; Oct. 21, 1985, 53955/85[U]

Int. Cl.⁴ B23D 19/00

U.S. Cl. 29—736

6 Claims



1. A production line for electric motor stators, which production line includes a plurality of stator-working stations therein and conveyor belt means in proximity to the stator-working stations for advancing the stators from station to station, comprising a plurality of pallets for rigidly, fixedly, individually supporting stators thereon during movement of said stators from station to station, said pallets including a base which rests on said conveyor belt means, an upwardly-extending hollow body within which the stator is fixed and appendices extending from said body arranged to temporarily receive the ends of wire windings formed on the stator at one of the stator-working stations; and, mechanical means in proximity to the stator-working stations for removing said pallets from the conveyor belt means and for rotating said pallets so that the respective stators become disposed in positions corresponding with the working stations located along the production line.

4,713,884

CARPET PAD KNIFE

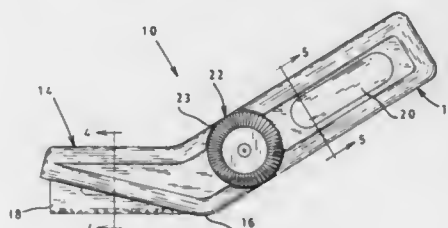
Cecil A. Dunnagan, 313 Witherspoon, Gallatin, Tenn. 37066

Filed Sep. 8, 1986, Ser. No. 904,208

Int. Cl.⁴ B26B 29/00

U.S. Cl. 30—294

8 Claims



1. A knife for cutting carpet pad material without wrinkling said material during cutting, which comprises:

a handle unit, said handle unit having a rearward portion for grasp by a user of said knife, and a forward portion joined at a selected angle to said rearward portion at a heel, said handle divided into a pair of substantially mirror-image first and second side members divided at a median plane extending from said rearward portion to said forward portion, each said first and second side members defining an upper and a lower edge; a knife blade releasably held between said side members at said forward portion, said blade having a straight exposed cutting edge extending from proximate a forward extremity of said forward por-

tion to proximate said heel for cutting said carpet pad material when said knife is moved toward said user, said blade held in said forward portion at an orientation whereby said cutting edge is aligned with said heel and disposed substantially parallel to said carpet pad material during cutting to achieve a slicing action when said rearward portion of said handle is at said selected angle to facilitate grasp of said handle by said user whereby said heel compresses said carpet pad material and said cutting edge slices said pad material without wrinkling thereof during use of said knife; and

a thumbwheel unit for releasably fastening said side members in side-by-side alignment, said thumbwheel unit having a shaft substantially perpendicular with said median plane and a thumbwheel attached to one end of said shaft exterior one of said side members, said thumbwheel extending at least to said upper edge of said first side member to be readily accessible for rotation by a thumb of said user, said shaft penetrating and being rotatable in said first side member adjacent said thumbwheel and threadably engaged with said second of said side members, said shaft provided with an encircling captive washer axially positioned at said median plane whereby counterclockwise rotation of said thumbwheel and said shaft by said user causes said captive washer to move said first side member away from said second member to release said blade from between said side members.

4,713,885

SAFE UTILITY KNIFE

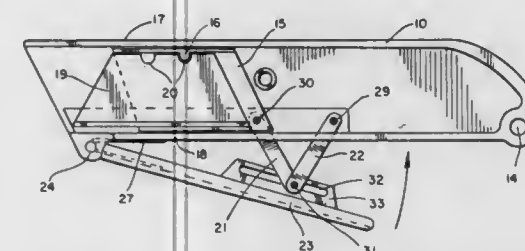
Ronald Keklak, 637 Church St., Amston, Conn. 06231; Michael V. Couture, 228 Pine St., Holyoke, Mass. 01040, and John C. Whitehouse, R.F.D. #1, Winsted, Conn. 06098

Filed Dec. 8, 1986, Ser. No. 939,004

Int. Cl.⁴ B26B 1/08

U.S. Cl. 30—162

4 Claims



1. A safe utility knife comprising a handle body portion having a linear guideway, a blade slide and blade mounted for movement in the linear guideway and being shiftable therein between a blade enclosed non-use position to a blade extended use position where the blade projects outside of said guideway, and a toggle mechanism including a pair of toggle links connected between said blade slide and guideway and a lever pivoted to the guideway and having a lost motion connection with said toggle links, means biasing the toggle mechanism in a direction maintaining said blade in the enclosed non-use position, and the handle body portion having substantially a pistol configuration including a hand grip, and said lever being in the form of a trigger at the forward side of the hand grip.

4,713,886

PIERCING TOOL

Takashi Ikeda, 2-19-3 Shinsakae Naka Ku, Nagoya, Japan

Filed Mar. 17, 1986, Ser. No. 840,903

Int. Cl.⁴ B26F 1/00

U.S. Cl. 30—366

2 Claims

1. A device for locating an object concealed behind a piercable member which is less resistant to piercing than the concealed object, comprising:

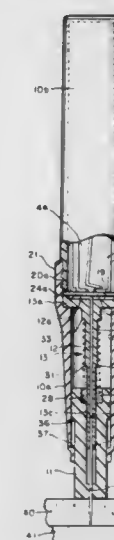
a handle, said handle being elongated and tubular in shape

with a forward portion and a rearward portion, said handle having a bore defined therein by an interior sidewall with said bore extending through said forward handle portion,

an elongated needle mounted on said handle, said needle being adapted to be driven through the piercable member by force applied to said handle, said needle being mounted within said handle bore and having a piercing portion with a sharpened end extending beyond said handle, and a shank portion,

a collar member having a portion surrounding and embracing at least a part of said needle piercing portion, said collar member being mounted to telescope within said handle bore during penetration of the piercable member, said collar member having a cylindrical shape with a bore extending therethrough along its longitudinal axis,

a rigid sleeve surrounding said needle shank portion, said needle piercing portion and a portion of said sleeve being received within said collar member bore with said sleeve embraced therein, said collar member sliding along the outside of said sleeve and the inside of said handle bore during penetration of the piercable member by said needle,



a spring mounted concentric with said sleeve with one end of said spring engaged with said sleeve and another end of said spring engaged with said collar member for biasing said collar member outboard relative to said handle bore such that said collar member portion is proximate said sharpened needle end upon initial penetration of the piercable member by said needle,

said forward and rearward portions of said handle being detachably fixed together, said sleeve including a laterally widened base portion which engages with a shoulder extending within said handle bore to limit outboard movement of said sleeve, said needle shank portion having its inboard end bent normal to the needle axis, said bent needle end being adjacent the inboard side of said base portion when said needle is inserted into said sleeve,

and further including a coin overlying said bent needle end and said sleeve base portion, said coin forming a stop against inboard movement of said needle and base, said coin being forced against said base and said base being forced against said shoulder by a bearing surface formed on said rearward handle portion which engages said coin when said handle portions are fixed together,

location of the object being indicated by an increased resistance to needle insertion after passage of the needle through the less resistant piercable member.

4,713,887
XY TABLE

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Takaoka, Japan

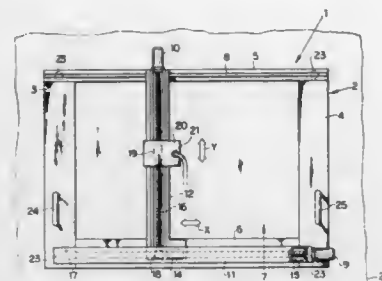
Filed Nov. 14, 1986, Ser. No. 930,459

Claims priority, application Japan, Nov. 20, 1985, 60-258786

Int. Cl.⁴ G01D 15/16; B43L 13/02

U.S. Cl. 33—1 M

7 Claims



1. An XY table comprising:

a frame (2) having a pair of first and second side members (3, 4), a connection member (6) for connecting one end of the first side member (3) with one end of the second side member (4) and a fixed rail member (5) one end of which is fixed to the other end of the first side member (3) and the other end of which is fixed to the other end of the second side member (4) in such a way that the first and second side members (3, 4), the fixed rail member (5) and the connection member (6) are arranged in combination so as to increase rigidity of the frame (2);

an auxiliary rail (11) fixed along the connection member (6) in parallel with the rail member (5), the auxiliary rail (11) extending between the first and second side members (3, 4);

a movable rail (12) slidable along the rail member (5) and the auxiliary rail (11) while the movable rail (12) is always at a right angle to both the rail member (5) and the auxiliary rail (11);

a first nut (14) fixed to one end of the movable rail (12); a male screw member (15) engaging the first nut (14) and extending along the auxiliary rail (11);

a first motor (9) placed at one end of the auxiliary rail (11) for rotating the male screw member (15) so that the nut (14) can move along the male screw member (15) between the first and second side members (3, 4);

a screw shaft (16) extending along the movable rail (12) between the rail member (5) and the auxiliary rail (11);

a second motor (10) placed at the other end of the movable rail (12) for rotating the screw shaft (16);

a second nut (19) engaging the screw shaft (16);

a moving means (20) fixed to the nut (19) so as to move along the movable rail (12) between the rail member (5) and the auxiliary rail (11) when the second motor (10) rotates the screw shaft (16);

a working head (21) attached to the moving means (20) for processing an object (22), such as a plasma cutting torch, a machining tool or marking-off means;

setting means (23) fixed to the frame (2) for detachably setting the frame (2) to the object (22); and

means (67, 68, 69, 76, 77) electrically connected to the first and second motors (9, 10) for controlling position of the working head (21).

4,713,888
MEASURING TAPE FOR DIRECTLY DETERMINING
PHYSICAL TREATMENT AND PHYSIOLOGICAL
VALUES

James B. Broselow, 24 White Eagle Ranch, Hickory, N.C. 28601

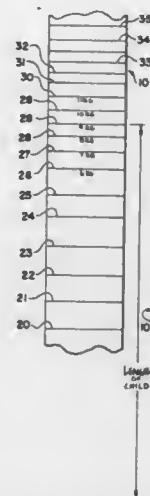
Continuation-in-part of Ser. No. 789,497, Oct. 21, 1985,

abandoned. This application Sep. 23, 1986, Ser. No. 910,490

Int. Cl.⁴ G01B 3/02

U.S. Cl. 33—137 R

8 Claims



1. A measuring tape for measuring the heel-to-crown height of a patient, said measuring tape having indicia thereon representing increments of a physical treatment value based upon a direct correlation between the heel-to-crown height of a patient and that treatment value.

4,713,889
ILLUMINATED GUNSIGHT

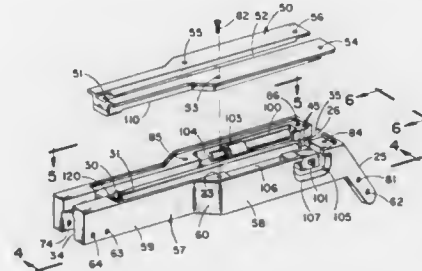
Julio A. Santiago, 13713 Susan La., Burnsville, Minn. 55337

Filed Nov. 14, 1986, Ser. No. 930,864

Int. Cl.⁴ F41G 1/32

U.S. Cl. 33—241

18 Claims



1. An illuminated sighting device for external attachment to a weapon to enable a user to aim and shoot a weapon in day-time or low-light conditions comprising:

a housing for external attachment to a weapon, said housing having a front end and a rear end, said housing including a sighting channel extending along said housing, said sighting channel having a bottom section;

a light-emitting diode located in the bottom of said sighting channel to form a first illuminated sight of a first intensity, said light-emitting source attached to one end of said housing;

a light-conducting rod having a first end and a second end, said first end of said light-conducting rod located adjacent said light-emitting diode to transmit illumination from said light emitting diode to said second end of said light-conducting rod to form a second illuminated sight, said sec-

ond illuminated sight located in the bottom of said sighting channel and attached to said housing, said second illuminated sight of a second intensity, said second intensity different from said first intensity, said second illuminated sight and said first illuminated sight spaced from each other to enable a user to aim a weapon attached to said housing during low-light conditions; and means in said housing to permit alignment of said sighting device with respect to a weapon attached thereto.

4,713,890
MISLEVEL SENSING DEVICE

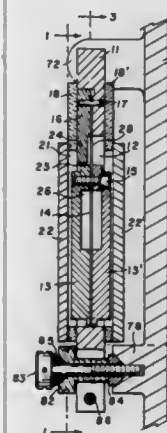
Leon W. Wells, Closter, and Werner Hauschild, Whippany, both of N.J., assignors to Cubic Corporation, San Diego, Calif.

Filed Jan. 12, 1987, Ser. No. 2,419

Int. Cl.⁴ G01C 9/06, 9/12

U.S. Cl. 33—366

13 Claims



13. In a pendulum assembly comprising an elongate leaf spring member having a significantly greater width than thickness and being fixedly clamped at its respective ends between planar face pairs of a body member and a weight member, thereby suspending said weight member for gravity-influenced movement with respect to said body member with resulting flexure of said leaf member, the improvement comprising an opening through said leaf member substantially centrally-disposed in the width thereof intermediate and spaced from said body and weight members and having a width significantly reducing the cross-sectional area of said leaf member in the region of said opening, thereby concentrating the flexure of said leaf in said region and away from the edges of said body member face pair.

4,713,891
COLUMN MARKER

Nancy M. Cayton, Fairmount, W. Va., assignor to Educational Experiences, Inc., Fairmount, W. Va.

Filed Mar. 9, 1987, Ser. No. 23,358

Int. Cl.⁴ B43L 7/00; G01B 3/04

U.S. Cl. 33—494

9 Claims



1. A book page column marker for providing indications of appropriate column widths of material to be printed on book pages, said column marker comprising:

an elongated ruler member defining a straightedge along one edge thereof and a display surface adjacent said straightedge for displaying indicia;

indicia on said display surface including a plurality of sets of elongated bars, each of said sets having a plurality of

side-to-side adjacent bars, each bar being parallel to said straightedge and to each other but not being in side-to-side adjacent relationship to bars in another set, at least one of said bars in each of a plurality of said sets being longer than the other bars of the set, said indicia further including lines perpendicular to said straightedge extending from the ends of each elongated bar to said straightedge, said indicia further including set-identifying indicia for identifying each bar set to be used for marking a particular number of columns to be printed on a book page and said indicia further including bar-identifying indicia for identifying the particular size book pages with which each bar in each set is to be used;

wherein the length dimension of each bar corresponds to the width of a column for the number of columns indicated by the set-identifying indicia for its respective set and for the size of the page as indicated by the bar-identifying indicia for the respective bar;

whereby a user who wishes to layout material to be printed on a page decides how many columns of printed material per page he wishes to have, chooses the particular elongated-bar set on the marker corresponding to said number of columns per page, ascertains the size of the page on which he wishes to print material, chooses the particular elongated bar in said particular elongated bar set corresponding to that size page, and uses said particular elongated bar to layout columns on the page.

4,713,892
APPARATUS FOR THE PROTECTION OF A MOVABLE
ELONGATE MACHINE PART

Bernhard Strauss, Nattheim, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenhime/Brenz, Oberkochen, Fed. Rep. of Germany

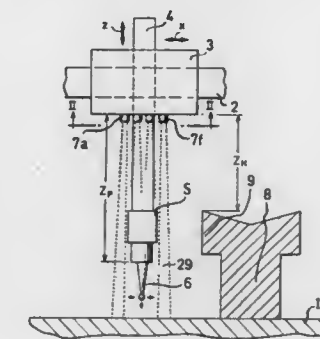
Filed Jul. 8, 1986, Ser. No. 910,123

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 3527063

Int. Cl.⁴ G01B 7/28

U.S. Cl. 33—559

10 Claims



1. In a multiple-coordinate measuring machine wherein an elongate quill carries a work-contact probe-equipped probe head at its outer end and is guided for x-axis positioning in a carriage having x-y displaceability, an angularly distributed plurality of ultrasonic echo-ranging transducers mounted to said carriage at uniform radial and angular spacing about said quill, each of said transducers being oriented for directional response on an axis substantially parallel to the quill axis and in radial clearance with said probe head, whereby a generally annular envelope of directional ultrasonic-response capability surrounds said probe head for various z-axis positions thereof, separate x, y, and z-axis drives for said carriage and quill, and ultrasonic proximity-detection circuitry associated with said transducers and operative to modify at least one of said drives upon proximity detection of an object within the field of at least one of said transducers, said proximity-detection circuitry including means limiting the operative range of proximity

detection to distances less than at least the effective z-axis extent of said quill and probe.

4,713,893

THERMAL DRYER CONTROL SYSTEM

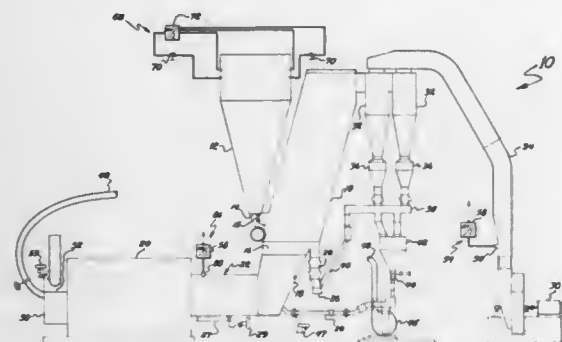
Frederick A. Webb, Bethel Park, Pa., assignor to Consolidation Coal Co., Pittsburgh, Pa.

Filed Oct. 31, 1986, Ser. No. 925,759

Int. Cl.⁴ F26B 21/06

U.S. Cl. 34—25

4 Claims



1. A method for controlling the weight of wet material in a storage means to be dried by a thermal drying system comprising the steps of:

feeding wet material into a storage means, withdrawing said wet material from said storage means, introducing said wet material onto a support means within a drying chamber,

moving said support means within said drying chamber with said wet material positioned thereon, passing hot gas delivered from a source over said wet material,

measuring the temperature of said hot gas after said hot gas has passed over said wet material on said support means, regulating the temperature of said hot gas after said hot gas has passed over said wet material to a preselected temperature independently of the temperature of said hot gas delivered from said source by controlling the amount of wet material introduced onto said support means within said drying chamber,

continually measuring the weight of said wet material within said storage means,

increasing the temperature of said hot gas delivered from said source when said wet material weight exceeds a predetermined amount, so that the temperature of said hot gas after said hot gas passes over said wet material exceeds said preselected temperature, and

increasing the amount of said wet material introduced onto said support means within said drying chamber to control said temperature of said hot gas after said hot gas passes over said wet material to said preselected temperature and thereby reducing the weight of said wet material within said storage means to said predetermined amount.

4,713,894

AUTOMATED DRYER CONTROL SYSTEM

Philip M. Roth, Garfield; Nathan M. Itskovitch, Hillsdale, and Arthur Sussman, Alpine, all of N.J., assignors to Intraspac, Inc., Bogota, N.J.

Filed Aug. 7, 1984, Ser. No. 638,416

Int. Cl.⁴ F26B 21/10

U.S. Cl. 34—30

27 Claims

11. A method for automatically controlling the operation of a dryer, comprising:

cyclically applying heat to the load to be dried so that the temperature of the load varies cyclically in a series of cycles including a learn cycle and one or more conditioning cycles subsequent to said learn cycle;

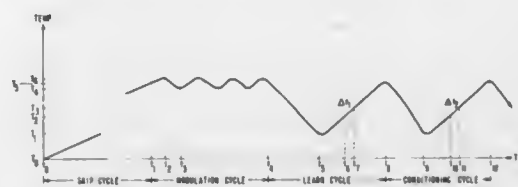
determining the time interval for the load to be dried to

reach one predetermined temperature from another predetermined temperature during said learn cycle and during each of said conditioning cycles;

providing adjustable frequency clock pulses;

adjusting the frequency of said clock pulses so that a predetermined number of clock pulses are produced during a time equal to said time interval determined during said learn cycle;

totalizing said clock pulses during the time interval determined during each of said conditioning cycles;



comparing said totalized number of clock pulses for each of said conditioning cycles to said predetermined number of clock pulses; and

ending the application of heat in response to the occurrence of a predetermined relationship between said totalized number of clock pulses for one of said conditioning cycles and said predetermined number of clock pulses, whereby application of heat is ended when the thermal response exhibited by the load in said conditioning cycles bears a predetermined relationship to the thermal response exhibited by the load during said learn cycle.

4,713,895

SPORTS SHOE COVER

Francois Vallières, 545 Poulin, Thetford Mines, Quebec, Canada G6G 4T8

Filed Jul. 8, 1986, Ser. No. 883,370

Int. Cl.⁴ A43B 3/02, 3/00

U.S. Cl. 36—1.5

5 Claims



1. A protective gaiter for sports shoes comprising a first flexible sheet portion completely covering the upper and heel of the sports shoe, and a second flexible sheet portion covering the ankle and lower calfs of a wearer, a first hook and pile type fastener tape fixed in spaced-apart areas about the periphery of the sole of the sports shoe, and cooperating second hook and pile type fastener tape fixed to the lower margin of the first sheet portion at spaced-apart locations for attachment to the first fastener tape, said fastener tapes being distributed over the toe area and along the sides of the sole of the shoe at a plurality of locations, the first and second tapes cooperating to retain the gaiter on the shoe to thereby inhibit flapping of the gaiter relative to the shoe during running, whereby ventilation openings are provided between the spaced-apart fastening tapes.

4,713,896

INSHORE SUBMERSIBLE AMPHIBIOUS MACHINES

Eric G. Jeanens, 1978 McDougall Street, Kelowna, British Columbia, Canada V1Y 1A3

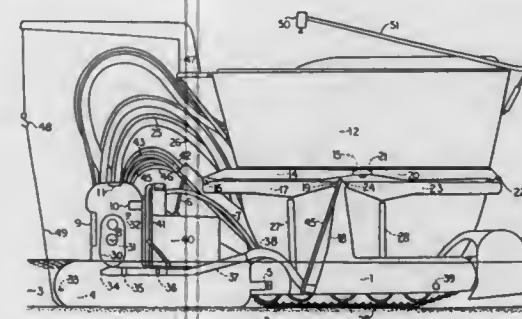
Continuation-in-part of Ser. No. 631,764, Jul. 17, 1984, abandoned, and a continuation-in-part of Ser. No. 478,882, Mar. 23, 1983, abandoned, and a continuation-in-part of Ser. No. 358,602, Mar. 15, 1982, abandoned, and a continuation-in-part of Ser. No. 249,602, Apr. 10, 1981, abandoned. This application

Sep. 6, 1985, Ser. No. 773,181

Int. Cl.⁴ B63G 8/00

U.S. Cl. 37—54

57 Claims



1. A submersible amphibious vehicle comprising: as a self-contained unit means, at least one open-bottomed pneumatic chamber means adapted to house personnel and equipment on land, on water or underwater; a propulsion unit means connected by means to said chamber and provided with means for propelling it on land, in the air, on the floor of a body of water, on the surface of the water, and anywhere in between; a safety chamber unit means resting on said propulsion unit means and connected thereto by an extendable linkage means whereby as said vehicle progresses from dry land into deeper water said propulsion unit means remains on the bottom of said water; said safety chamber means remains on said water surface as said linkage means extends, said safety chamber means being of sufficient displacement to carry said propulsion unit means and said open-bottomed pneumatic chamber means, whereby said propulsion unit means and its attached open-bottomed pneumatic chamber means are lifted from the bottom through said linkage means as the depth of water exceeds the maximum extension of said linkage means.

4,713,897

REVERSIBLE DIGGING TEETH AND HOLDER THEREFOR

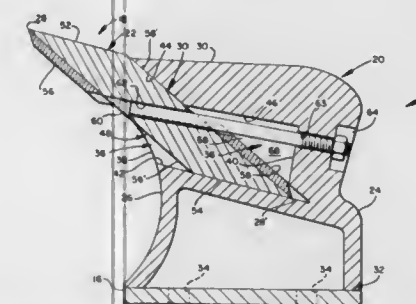
Charles W. Hempbill, 1106 Green Valley La., Duncanville, Tex. 75116

Filed Apr. 22, 1985, Ser. No. 725,434

Int. Cl.⁴ E02F 5/06

U.S. Cl. 37—83

3 Claims



3. In a digging machine of the type having an endless chain to which a plurality of tooth receiving holders are attached,

with there being a digging tooth removably received within each holder, the improvement comprising:

said holder includes means forming a forwardly opening tooth-receiving pocket within a forward marginal end thereof, means by which said holder can be attached respectively to a digging machine for excavating material; said tooth is in the form of a frustum of a polygon, said polygon has oblique faces (48, 50) arranged in opposition to one another and means at each marginal end of each face which define cutting edges (56, 58) which extend from and are parallel to said faces (48, 50), said cutting edges of the tooth being provided with a layer of hard surfacing material which increases the thickness of the tooth, the cutting edges being arranged parallel to one another;

said pocket receives one of the opposed marginal ends of the tooth therewithin, with the cutting edge (58) of said one opposed marginal end residing within the pocket, means by which the configuration of the pocket is made complementary respective to the configuration of the marginal end of the tooth which is received therewithin so that one oblique face (58') and one sidewall (54) of the tooth engages the pocket sidewalls (42, 44) in close tolerance relationship;

said pocket has an entrance defined by a forward end of the holder which terminates in a shoulder (44), said shoulder lies within a plane which is parallel to the opposed faces (48, 50) of the tooth; said pocket includes another inner wall (42) which is aligned parallel respective to the opposed ends of said tooth, and abuttingly engages the end (54) of the tooth which is enclosed within said pocket; said polygon is a quadrilateral and the oblique faces are in the form of diamonds having apexes at the corners of the quadrilateral;

and fastener means for releasably holding the tooth in attached relationship within the pocket.

4,713,898

RAILROAD MOUNTED TRENCH DIGGER

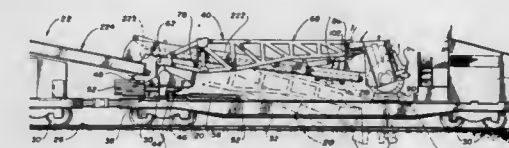
Timothy B. H. Bull, Annandale, and Raymond C. Wahl, Minnetonka, both of Minn., assignors to Loram Maintenance of Way, Inc., Hamel, Minn.

Filed Dec. 16, 1985, Ser. No. 809,150

Int. Cl.⁴ E02F 5/08, 3/24

U.S. Cl. 37—96

7 Claims



1. A railroad mounted trenching apparatus for digging a ditch in the ground along a road bed for a railway, comprising: a carriage having opposed sides and including rail engaging wheels for mounting said carriage on a railway; a boom base rotatably carried by said carriage at a generally upright boom base pivot axis; a cutting head support boom pivotably carried by said boom base; a cutting head for disturbing said ground into a loosened composite, operably carried by said support boom forwardly of said boom base pivot axis; first power means operably coupled to said support boom for pivoting said support boom about said boom base between raised and lowered positions; second power means operably coupled to said boom base for rotating said boom base about said generally upright boom base pivot axis; first conveyor means extending along said cutting head support boom for conveying said loosened composite from

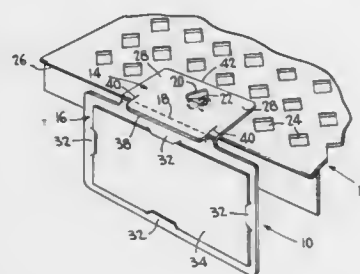
said cutting head to a first conveyor means discharge end rearwardly of said boom base pivot axis;
second conveyor means pivotally carried by said boom base at a generally upright second conveyor means pivot axis oriented rearwardly of said boom base pivot axis, said second conveyor means including a second conveyor means discharge end rearwardly of said second conveyor means pivot axis and a second conveyor means receiving end oriented forwardly of said second conveyor means pivot axis below said first conveyor means discharge end, whereby said support boom and said first conveyor means clears said second conveyor means when said cutting head is rotated about said boom base pivot axis for positioning said cutting head on either side of said carriage, and said second conveyor discharge end remains substantially stationary relative to said carriage as said cutting head is shifted from side to side of said carriage.

4,713,899

INFORMATION DISPLAY ELEMENT FOR SHELF AND PRICE CHANNEL USE

Jacob Fast, 7561 NW 9th St., Plantation, Fla. 33317
Filed Oct. 7, 1986, Ser. No. 916,368
Int. Cl.⁴ G09F 3/18; A47B 96/06
U.S. Cl. 40—10 R

6 Claims



1. A display element for attachment to an apertured shelf for displaying product information at a forward edge of the shelf, the display element comprising a plastic sheet having a display panel and an attachment panel with a fold line extending transversely across the sheet substantially at a junction between the panels, the attachment panel including a slit defining a depressable head for working into an aperture of the shelf adjacent to the forward edge and thereby attaching the element to the shelf in a manner allowing the display panel to be folded down about the fold line in front of the shelf, the slit further defining sections of the attachment panel adjacent the head for engaging an upper surface of the shelf and precluding upward tilting of the element wherein the sheet includes a generally transversely located channel-shaped slit having an elongate base portion adjacent and parallel the fold line, and orthogonal limbs extending from the base portion toward a free end edge of the attachment panel to form a portion of the sheet defined between the base portion of the slit and said free edge for flexing into a concave price channel with the display panel extending below the price channel to form a price channel flag.

4,713,900

BOWL EMBLEMS

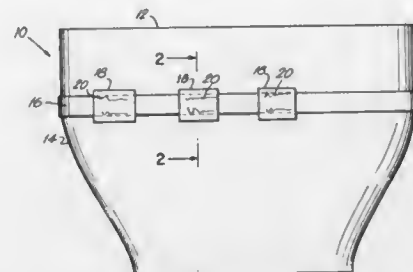
Luther Calloway, Jr., and George Spector, both of 233 Broadway Rm 3615, New York, N.Y. 10007
Filed Dec. 10, 1984, Ser. No. 680,326
Int. Cl.⁴ G09F 3/00

U.S. Cl. 40—324

2 Claims

2. An emblem with reversible opposite sides having means on each side adapted to be slidably mounted respectively on an internal track and an external track comprising a groove

with a first flange on one side superimposed on an opposite of said groove, said second flange including flexible spaced arms



whereby said first flange is adapted for an internal track and said second flange and arms is adapted for an external track.

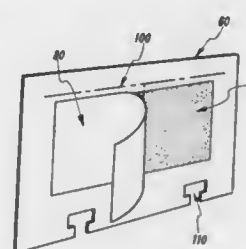
4,713,901

SYSTEM FOR RETAINING AND DISPLAYING BUSINESS CARDS

Virginia J. Wells, and Gerald B. Klein, both of Broomfield, Colo., assignors to Gerald B. Klein, Broomfield, Colo.
Filed Feb. 3, 1986, Ser. No. 825,385
Int. Cl.⁴ B42F 19/04

U.S. Cl. 40—360

5 Claims



1. A system for retaining and displaying conventional business cards, said system comprising:
a frame means for holding a multiplicity of file cards in the form of planar sheets;
at least one file card being disposed in said frame means;
means for removably attaching each said file card to said frame means;
adhesive means disposed on and covering a portion of a surface of each file card;
a protective peel-off covering disposed over the adhesive means, said covering being removable to expose the adhesive means; registration means provided on said file card to at least one side of the area of adhesive, said registration means delimiting the edge of a conventional business card to be affixed to the file card; and
a conventional business card affixed to at least one file card by and in juxtaposition over said exposed adhesive means such that said business card is displayed.

4,713,902

AMBIDEXTROUS OR LEFT-HANDED MAGAZINE CATCH FOR A PISTOL

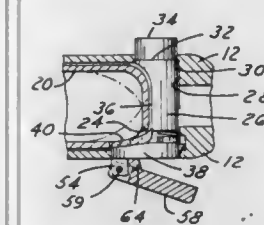
Kevin Wigton, 11245 Old Hamburg Rd., Hamburg, Mich. 48139
Filed Oct. 23, 1985, Ser. No. 790,399
Int. Cl.⁴ F41C 27/00

U.S. Cl. 42—7

5 Claims

1. In a pistol comprising a barrel, a handle and a magazine insertable in the handle, said handle including a transverse button pin extending from the left side of the handle and integral means extending from the button pin to engage and release the insertable magazine,
the improvement comprising a lever on the right side of the

handle, means on said integral means extending from said button pin and on the lever for engagement therebetween



and a bifurcated fulcrum on said lever in engagement with said handle and astraddle said button pin.

4,713,903

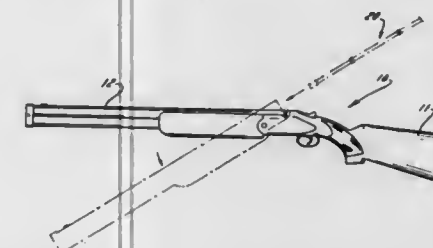
CHOKE ASSEMBLIES FOR SHOTGUNS

Donald R. Mainland, Racine, Wis., assignor to Kolar Arms, Racine, Wis.

Filed Jun. 2, 1986, Ser. No. 869,351
Int. Cl.⁴ F41C 21/10, 27/00

U.S. Cl. 42—79

2 Claims



1. A choke assembly for installation in the bore of the barrel of a shotgun of predetermined gauge to reduce the gauge of the shotgun bore and to provide a shot pattern of a predetermined characteristic comprising:

- a tube having a breech end and a muzzle end, said tube comprising a tube bore having a gauge less than said predetermined gauge, said tube comprising integrally formed axially spaced apart supporting bosses on the exterior thereof of nearly the same diameter as said bore of said shotgun barrel, at least one of said supporting bosses on said tube being located near the muzzle end of said tube, said tube being fabricated of metal selected from a class of metals consisting of aluminum, magnesium and alloys thereof;
 - a choke having a breech end and a muzzle end, said choke comprising a choke bore, said choke comprising at least two integrally formed axially spaced apart supporting bosses on the exterior thereof of nearly the same diameter as said bore of said shotgun barrel, one of said two supporting bosses being located near said breech end of said choke and the other being located near said muzzle end of said choke, said choke being fabricated of metal selected from a class of metals consisting of steel, stainless steel, titanium and alloys thereof;
- and connecting means for connecting said breech end of said choke and said muzzle end of said tube and comprising external threads on said breech end of said choke and internal threads in said muzzle end of said tube which are inter-engaged with each other and solidified adhesive disposed therebetween, said internal threads on said tube being formed within said one supporting boss located at said muzzle end of said tube;
- and said external threads on said choke being formed adjacent said one supporting boss located near said breech end of said choke.

4,713,904

AUTOMATIC CHOKE SHOT GUN

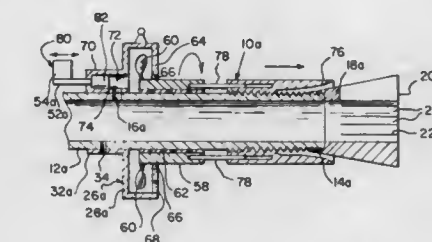
Mark S. Anderson, 812 N. 80th Pl., Kansas City, Kans. 66112, and George Spector, 233 Broadway, RM 3615, New York, N.Y. 10007

Filed Jun. 16, 1986, Ser. No. 874,559

Int. Cl.⁴ F41C 21/00

U.S. Cl. 42—79

2 Claims



- An automatic shotgun choke which comprises:
- (a) a shotgun barrel having an externally threaded muzzle and circumferentially spaced radially disposed gas ports extended therethrough spaced rearwardly from said muzzle;
- (b) a collar threaded on said muzzle of said shotgun barrel, said collar having a choke sleeve with a tapering outer surface extended forwardly therefrom, said sleeve having radially disposed slots extended therethrough providing fingers with the outer diameter of said sleeve gradually enlarging from said collar to forward end of said sleeve;
- (c) a choke assembly mounted on said muzzle, said assembly extending from a point rearwardly of said radially disposed gas ports through said shotgun barrel to said fingers, a rearward end of said assembly having an annular portion mounted on the outer surface of said shotgun barrel providing a gas chamber having exhaust holes, said portion having an annular flange extended rearwardly therefrom, said flange being secured to said shotgun barrel;
- (d) a gas operated member in said chamber moveably mounted on said shotgun barrel and positioned forwardly of said radially disposed gas ports through said shotgun barrel, said gas operated member being activated by pressure of gases of combustion passing through said radially disposed gas ports of said shotgun barrel;
- (e) a choke ring forming part of said choke assembly extending partially around said fingers;
- (f) means connecting said choke ring to said gas operated member whereby gases of combustion passing through said radially disposed gas ports in said shotgun barrel actuate said member causing said choke ring to move forward thereby constricting said fingers of said sleeve;
- (g) means for adjusting the gas port size comprising a valve member slidable over said ports having an external operation shaft extending into said chamber for adjusting said valve, wherein
- (h) said gas operated member having radially disposed fan blades extended therefrom and said member being rotatably mounted on said shotgun barrel;
- (i) wherein said choke assembly surrounds said fan blades of said member and has a first annular web having an annular sealing member extending to the outer surface of said shotgun barrel;
- (j) said portion including a vent rib having inlet ports there-through formed on upper portion of said flange, said inlet ports positioned over said gas ports with said vent rib communicating with said chamber to allow pressure of gases of combustion to pass through said gas ports of said shotgun barrel to rotate said fan blades then leave through said exit ports;
- (k) said choke ring being threaded on said muzzle of said shotgun barrel rearwardly of said collar; and
- (l) said gas operated member including telescopic rods con-

necting said gas operated member to said choke ring whereby gases of combustion passing through said casing will turn said member to rotatably drive said choke ring forwardly contracting said fingers of said sleeve.

4,713,905

ATTACHMENT FOR A FIREARM

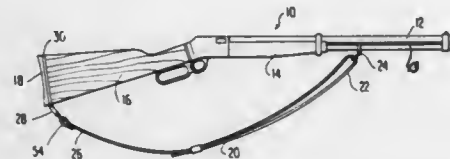
Timothy C. Dupuy, 12416 S. Harrells Ferry Rd., Bldg. 4-D, Baton Rouge, La. 70816

Filed Dec. 17, 1986, Ser. No. 942,738

Int. Cl.⁴ F41C 23/02

U.S. Cl. 42-85

7 Claims



1. A rear sling attachment for a firearm having a longitudinally extending stock and a butt plate at the rear end of the stock, said attachment comprising a plate member attached between the stock and butt plate and extending vertically between top and bottom edges of the stock, said plate being dimensioned equally as the end of the stock and butt plate whereby the edges of said plate lie flush with the edges of said stock and butt plate, and said plate having sleeve means extending downwardly and forwardly from the bottom edge thereof for receiving a swivel on the rear end of a firearm sling whose front end is attached to the front end of the firearm.

4,713,906

FISHING LURE OF THE SPOON TYPE

Patsy S. Distaffen, 278 Brayton Rd., Rochester, N.Y. 14616

Filed Dec. 9, 1985, Ser. No. 806,452

Int. Cl.⁴ A01K 85/00

U.S. Cl. 43-42.5

5 Claims



1. A fishing lure of the spoon type, said lure comprising:
a body member having rounded leading and trailing edges and defining openings adjacent to said leading and trailing edges respectively for attaching a fishing line and a fishing hook to said body member, said leading edge having a radius of curvature less than the radius of curvature of the trailing edge, said body member further having a convex portion measured from said leading edge toward said trailing edge and a concave portion measured from said trailing edge toward said leading edge, the radius of curvature of said convex portion being critically related to the radius of curvature of the concave portion so as to be approximately equal to four times the radius of curvature of said concave portion, whereby due to the particular shape of said body member, when said body member is towed in the water by a fishing line, said body member will move in unpredictable directions and will wobble about its longitudinal axis so as to attract fish to said hook irrespective of towing speed.

4,713,907

UPRIGHT JIG

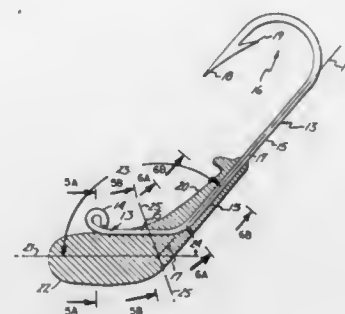
David H. Dudeck, White Bear Lake, Minn., assignor to Heron Manufacturing, Inc., Little Canada, Minn.

Filed Apr. 29, 1987, Ser. No. 43,867

Int. Cl.⁴ A01K 85/00

U.S. Cl. 43-42.39

12 Claims



1. A fishing jig comprising:

a fishhook means having a shank with an eye at one end thereof and joined oppositely from said eye along a major axis thereof to a hooking portion that substantially curves about toward said eye to end in a point;
an orienting body of a mass greater than that of said fishhook means affixed to said shank by a connection portion of said orienting body to extend past, though leaving exposed, said eye so that most of said mass of said orienting body is located in a platform portion thereat on that side of said eye opposite said hooking portion where joined with said shank, said orienting body connection portion being joined with said orienting body platform portion at a body intersection, said platform portion being arranged substantially about a reference plane which reference plane is intersected by said shank major axis in passing through said reference plane at an intersection angle which is other than a right angle, and said platform portion, in being so arranged, extends substantially radially outward along said reference plane from said body intersection relatively far in a single selected first angular range as compared to its radial extent in said reference plane in a second angular range which includes those angles outside said first angular range with sides of said platform portion, where intersected by said reference plane, lying substantially along radii at least near said body intersection.

4,713,908

BAIT GUARD FOR A FISH HOOK

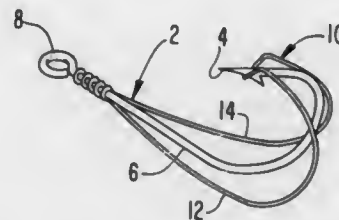
Newsome E. Corbitt, III, 3724 Beaulec Rd., Jacksonville, Fla. 32217

Filed Jul. 9, 1986, Ser. No. 884,176

Int. Cl.⁴ A01K 83/00

U.S. Cl. 43-43.4

14 Claims



1. A bait guard for use with a fish hook, said fish hook having a rearward eye portion, a shank portion, and a forward hook portion, said bait guard comprising:
means for guarding bait, said means being attached to the eye portion, comprising:
an elongated flexible member secured to the eye portion,

extending forwardly along at least one side of the shank portion, following the curve of the hook portion and extending rearwardly to and in engagement with a barb on the end of the hook portion.

4,713,909

INDOOR AND OUTDOOR CLOTH FARM

Peter Roper, 957 E. 224th St., Bronx, N.Y. 10466, and George Spector, 233 Broadway, 3615 Woolworth Bldg., New York, N.Y. 10007

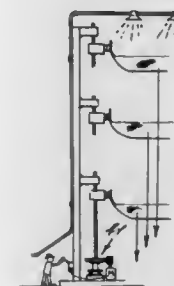
Continuation of Ser. No. 905,475, May 12, 1978, abandoned.

This application Mar. 29, 1982, Ser. No. 363,292

Int. Cl.⁴ A01G 9/02

U.S. Cl. 47-17

4 Claims



1. A plant cultivator comprising a cloth structure adapted to hold cultivating material for growing plants with means for varying retention of irrigating liquid in said cultivator in combination with means for supporting said structure in horizontal position at various elevations above a base surface wherein said structure includes a plurality of vertically spaced superimposed sections, first said means comprising removable cloth layers.

4,713,910

BARRIER POST FOR PARKING LOTS AND PASSAGEWAYS

Heinrich Quante, Recklinghausen, Fed. Rep. of Germany, assignor to ARMO Gesellschaft für Bauelemente, Bau- und Wohnbedarf GmbH, Recklinghausen, Fed. Rep. of Germany PCT No. PCT/DE85/00518, § 371 Date Aug. 12, 1986, § 102(e) Date Aug. 12, 1986, PCT Pub. No. WO86/03531, PCT Pub. Date Jun. 19, 1986

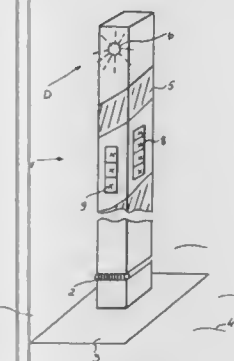
PCT Filed Dec. 10, 1985, Ser. No. 907,685

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445218; Apr. 23, 1985, 3514626

Int. Cl.⁴ E01F 13/00

U.S. Cl. 49-49

13 Claims



1. Barrier post for the temporary blocking of access to parking places, driveways and access roads, the post being anchored in the ground and swingable around an articulation located in the ground area, the articulation extending trans-

versely to the longitudinal axis of the post, characterized in that the post is provided with a drive activating an oscillation around the articulation, said drive being actuable by means of a receiver responsive to a portable emitter;
said post being arranged to be inclined in the approach direction and said drive being set to keep the post locked in an erect position;
said post built as a hollow bar housing the drive and the receiver with the articulation being a hinge;
said drive operating a capstan whose cable end is fastened in the ground in front of the post considered in the approach direction, and is guided over a deflecting roller in an area near the hinge; and
said drive being an electromotor supplied by solar cells which are distributed over an external surface of the post.

4,713,911

AUXILIARY WINDOW LOCK

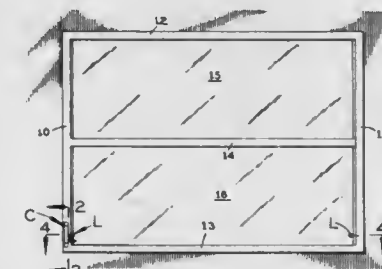
John B. Maguire, 1412 SW. 28 Ave., Deerfield Beach, Fla. 33441

Filed Nov. 24, 1986, Ser. No. 933,857

Int. Cl.⁴ E05C 17/00

U.S. Cl. 49-394

6 Claims



1. In combination with an awning window having:
a frame bordering a window opening;
a plurality of window panels in said frame in succession vertically;
and a mechanical linkage operatively coupled to said panels for adjusting said panels between substantially vertical closed positions and open positions at acute angles to the vertical, said linkage including a movable rigid linkage arm which in one position causes said linkage to position said window panels in their closed positions;
the improvement wherein:
said linkage arm and said window frame adjacent said linkage arm have holes which are aligned in said one position of said linkage arm;
said improvement further comprising:
a locking pin snugly but slidably insertable in and removable from said aligned holes in the window frame and said linkage arm in said one position of said linkage arm.

4,713,912

LENS AND PATTERN HOLDER

Georges Zouekl, 4812 Verdun Avenue, Verdun, Quebec, Canada H4G 1N1

Filed Mar. 18, 1986, Ser. No. 840,930

Claims priority, application Canada, May 8, 1985, 481082

Int. Cl.⁴ B24B 9/14

U.S. Cl. 51-101 LG

7 Claims

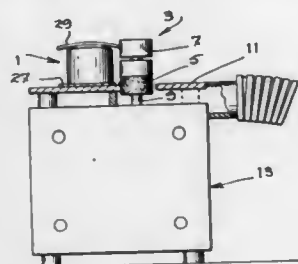
1. A lens and pattern holder for use with a grinding tool comprising a rotary grinding ring mounted in coaxial relationship with respect to a guiding ring of the same diameter, said holder comprising:

a solid body having a pair of opposite surfaces spaced apart so that the peripheries thereof respectively face said grinding ring and guiding ring, said solid body having a main axis perpendicular to its opposite surfaces;

means on one of said opposite surfaces for detachably connecting thereto a relatively thin pattern having a peripheral edge extending away from the periphery of said one surface, said connecting means comprising a single set of two pins spaced apart on said one surface and projecting therefrom to engage a pair of corresponding holes provided in said pattern, said pins extending substantially through said pattern and being symmetrically positioned with respect to the main axis of said body;

means on the other of said opposite surfaces for detachably mounting thereon a lens, said mounting means comprising a sticking pad; and

visual means on said other surface for use as a guide to properly position and align the lens with respect to the pattern connected to the one surface of said body when mounting said lens onto said other surface, said visual means comprising three visible dots aligned onto said



other surface of said body so as to extend in a plane passing through the axes of the pins, one of said dots being centrally positioned onto the main axis of said body while the two other dots are symmetrically positioned close to the periphery of said other surface,

whereby a finished lens mounted on the other surface of said body can be used as a guide for shaping and finishing the peripheral edge of a blank pattern connected to the one surface of said body, such a shaping and finishing being obtained by pressing and rotating said finished lens and blank pattern against said guiding ring and said grinding ring, respectively, or, alternatively, a finished pattern mounted on the one surface of said body can be used as a guide for shaping and finishing the peripheral edge of a lens, such a finishing being obtained by pressing and rotating said finished pattern and said lens against said guiding ring and said grinding ring, respectively.

4,713,913

AIR SLIDE POSITIONING FOR GRINDING SPINDLES
Meryle D. W. Adler, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 9, 1986, Ser. No. 883,744
Int. Cl.⁴ B24B 49/08

U.S. Cl. 51—165.9

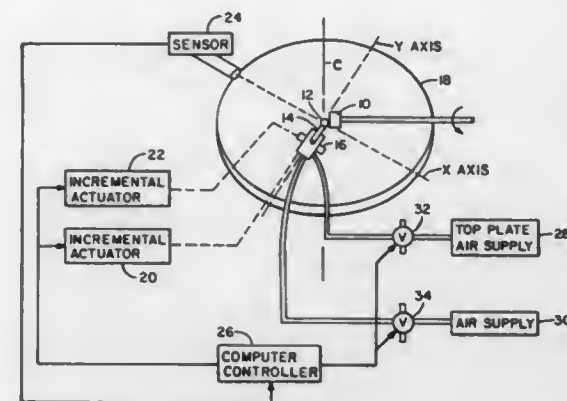
10 Claims

1. In a machine for shaping a workpiece, said machine having a tool and holder for said workpiece, an improved air slide for precisely determining the relative position between said tool and a center line of a rotary table upon which it is mounted comprising:

- a center rail;
- a carriage mounted for linear travel on said rail, one of said tool and said holder being mounted on said carriage;
- said carriage comprising an upper plate, two side guides and a bottom plate;
- means for directly supplying a thin film of air between said center rail and said carriage not greater than about 10 microns so that said carriage can be moved linearly on said rail to precise alignment between said tool and said center line of said rotary table;
- said means for supplying a thin film of air directly to said carriage including two independent air supplies, a first supply at a first pressure for said upper plate and a second supply at a lesser second pressure for said side guides and

bottom plate, and said first supply having a first pressure greater than the pressure of said second supply sufficient to overcome the force generated by the weight on said carriage and the force of air from said second supply on the top surface of said bottom plate;

means for selectively stopping the supply of said air to lock said carriage on said rail in the position of said precise alignment; and



said means for selectively stopping the supply of aid air includes a valve for stopping said first supply of air to said upper plate wherein the force of air from said second supply locks said carriage in place when said first supply of air is stopped, without materially affecting the flow of air from said second supply.

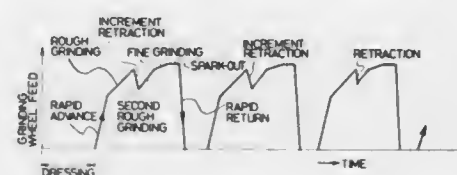
4,713,914

INTERNAL GRINDING METHOD
Jinichiro Oshima, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Jan. 28, 1986, Ser. No. 823,207
Claims priority, application Japan, Jan. 29, 1985, 60-15001
Int. Cl.⁴ B24B 5/00, 17/00

U.S. Cl. 51—281 P

10 Claims



1. A grinding method for grinding a workpiece in repeated grinding cycles during which a grinding tool undergoes advancing movement relative to the workpiece to grind a surface of a workpiece and relative retracting movement from the ground surface of the workpiece through a correction distance to correctively grind the ground surface, the method comprising the steps of: dressing a grinding tool; repeatedly carrying out one grinding cycle during which the dressed grinding tool undergoes relative retracting movement through a relatively large correction distance until the dressed grinding tool recovers a certain abrading capacity during the course of the grinding cycles; and thereafter repeatedly carrying out another grinding cycle during which the recovered grinding tool undergoes relative retracting movement through a relatively small correction distance.

4,713,915

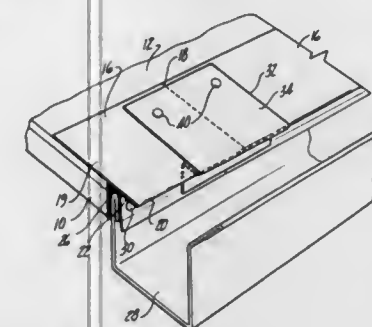
EDGE CLIP FOR AN EAVES TROUGH MOUNTING ADAPTER

Ronald L. Sweers, 6165 E. Atherton Rd., Burton, Mich. 48519
Continuation of Ser. No. 644,818, Aug. 27, 1984, abandoned.
This application May 20, 1986, Ser. No. 867,899

Int. Cl.⁴ E04D 13/06

U.S. Cl. 52—11

3 Claims



1. In combination:

an inward-to-outward downwardly sloping roof surface; at least two eaves trough adapter strips of the type having: a roof flange adapted to flatly abut against and overlie said roof surface, said roof flange including an outer flange edge disposed outward of said roof surface; a drip flange extending slantingly upwardly from said outer flange edge parallel to and towards said roof surface; and a gutter-receiving portion extending downwardly from said drip flange;

a clip for securing said adapter strips on said roof surface in end-to-end abutment with one another, said clip comprising: a first inward-to-outward downwardly sloping flat portion adapted to flatly abut against and overlie the locus of abutment of the roof flanges of said two adapter strips, said first portion being disposed parallel to said roof surface, and including an outer clip edge outward of said roof surface; a second outward-to-inward upwardly sloping plate portion extending parallel to said roof surface and to said first flat portion and extending from said outer edge of said first flat portion and towards said roof surface, said second portion adapted to overlie and flatly abut against the locus of abutment of the drip flanges of said two adapter strips, and including an inner edge outward of said roof surface and inward of said outer clip edge; and a third flat portion extending downwardly from said inner edge of said second portion, said third portion adapted to overlie and flatly abut against the locus of abutment of said gutter-securing portions of said two adapter strips; and means for securing said clip to said roof surface and said two adapter strips;

wherein said clip closely conforms in shape to the flange portions of said eaves trough adapter strips for both simultaneously aligning said abutted adapter strips and for sealing the locus of abutment of said adapter strips against leakage, and wherein the width of said clip is at most equal to the width of said roof flange along said downwardly sloping roof surface.

4,713,916
CEILING DOME

Raymond E. Brooks, Jr., Largo, Fla., assignor to Hardwood Lighting Designs Corp., Largo, Fla.

Filed Oct. 8, 1986, Ser. No. 924,950

Int. Cl.⁴ G09F 7/18

U.S. Cl. 52—39

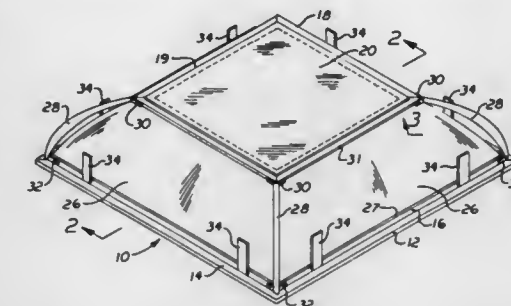
15 Claims

1. A factory manufactured ceiling dome for diffusing light comprising:

- a. a top frame having a planar shelf for receiving a top panel

on an upper surface and a notch on a bottom surface of the planar shelf with a first slotted track in the notch;

b. a bottom frame having an outwardly projecting flange for overlapping a ceiling and an upwardly projecting lip with a notch in a top surface containing a second slotted track;



c. four arched linking members each having a bracket at a first and second end, the bracket at the first end attached to the top frame and the bracket at the second end attached to the bottom frame; and

d. light diffusing panels with an upper edge in the first slotted track and a lower edge in the second slotted track.

4,713,917

FRICTIONAL ENERGY ABSORBING DEVICE AND/OR METHODS OF ABSORBING ENERGY

Ian G. Buckle, and John P. Michael, both of Auckland, New Zealand, assignors to DFC New Zealand Limited, Wellington, New Zealand

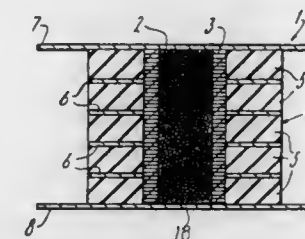
Continuation of Ser. No. 732,292, May 9, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 38,482

Claims priority, application New Zealand, May 11, 1984, 208129

Int. Cl.⁴ E04B 1/98

U.S. Cl. 52—167

31 Claims



1. A cyclic shear energy absorber adapted to be interposed between two members, the two members including either two structures or one structure and a base, for absorbing energy due to induced motion between the two members, comprising: a body; a first end portion of said body engageable to one of the members, a second end portion of said body engageable to the other one of the members, a core in said body containing granular material extending between said first and second end portions, and said granular material being confined by said first and second end portions to occupy a substantially constant volume during deformation of said body due to relative movement of the two members, and having confining means disposed about said core in the region between said first and second portions whereby said granular material is densely packed within said core so that cyclic shear energy imposed on said body causes incipient dilation of said granular material, which incipient dilation is at least in part suppressed by said confining means whereby inter-

particle frictional forces within said granular material dissipate said imposed cyclic shear energy;
 said substantially constant volume being deformed along with said core during deformation thereof while still maintaining its said substantially constant volume;
 said confining means comprising alternating layers of resilient material and stiffer material;
 said confining means having a flexible wall surface;
 said flexible wall surface comprising a flat member generally spirally wound about the outer surface of said core, said flexible wall surface being formed by the individual winding layers;
 at least some of said individual winding layers being separated from their adjacent layers by a layer of resilient material.

4,713,918

MODULAR WALL SYSTEM

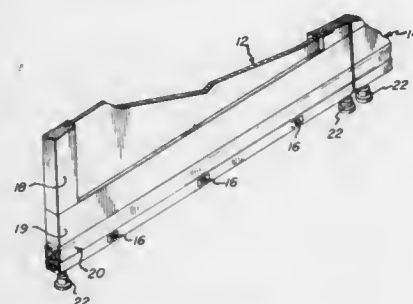
Victor E. Cioffi, Mahwah, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jan. 30, 1986, Ser. No. 824,150

Int. Cl.⁴ E04F 17/08, 19/08; H02G 3/12, 3/16

U.S. Cl. 52—221

11 Claims



1. A modular wall system comprising:
 a wall panel;

an elongate base having a substantially uniform cross-section along its length, said base comprising an extruded unitary beam having a web extending from a top flange to a bottom flange, said beam being symmetric with respect to a central plane, said web being coincident with said central plane said beam having a mid-flange located between and spaced from said top and bottom flanges, said flanges extending in substantially parallel relation to each other and substantially perpendicular relation to said central plane, each said flange having two ends spaced substantially equal distance from said central plane, said flanges and said web defining on each side of said central plane a first duct between said top and mid-flange and a second duct between said mid-flange and said bottom flange;

means for securing said wall panel to said top flange;
 said top flange having a lower surface intersecting with said top flange ends to define two edges extending along the length of said beam, said mid-flange having upper and lower surfaces intersecting with said mid-flange ends to define four edges extending along the length of said beam, said bottom flange having an upper surface intersecting with said bottom flange ends to define two edges extending along the length of said beam;

for each said edge, said flange surfaces adjacent said edge sloping inwardly toward its respective flange to define a retaining protrusion, said beam including a stop lug for each said protrusion spaced a predetermined distance from said edge to define between each said protrusion and its respective lug a channel;

an elongate cover plate for each said duct to provide independent access to each of the four ducts in said base, each cover plate having an interior face, each said face having margin areas extending the length of the plate and abutting said flange ends, each said margin area having a rail

extending into said channel between said retaining protrusion and said stop lug of the abutting flange; and
 for each cover plate and its two associated flanges, said edges of said flanges being spaced a predetermined flange distance, each said cover plate rail protruding from its margin area and having a convex surface, said convex surface including a base adjacent the margin area, an apex, and a tip, said apexes being spaced a predetermined apex distance larger than said flange distance, said base and said tip of one rail being spaced from said base and said tip of said other rail distances less than said flange distance, thereby permitting insertion of said .aps between said edges and forcing of said apexes into said channels to retain each said cover plate with respect to its flanges.

4,713,919

LASER WELDED CEILING GRID MEMBERS

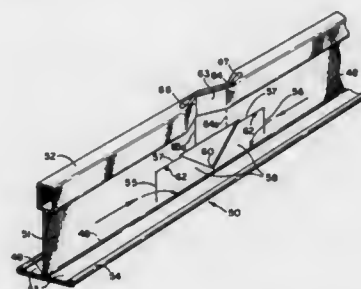
William J. Platt, Collingdale, Pa., assignor to National Rolling Mills Inc., Malvern, Pa.

Filed Sep. 5, 1986, Ser. No. 904,024

Int. Cl.⁴ E04C 3/32, 3/04; B23K 9/00

U.S. Cl. 52—232

21 Claims



11. A metal inverted T shaped ceiling grid member, comprising
 a vertical central web having a bulb at the top and having two web sidewalls with upper and lower portions,
 a pair of oppositely disposed horizontal flanges extending outwardly from the bottom of the web for supporting ceiling tiles,
 and a laser weld joining the two web sidewalls together along the exposed longitudinal portion of the joint formed by the two web sidewalls after the grid member has been constructed to increase the strength and rigidity of the ceiling grid member.

4,713,920

MODULAR TONGUE AND GROOVE REMOVABLE PANEL PARTITION SYSTEM

Stanley Oginsz, Pink Dogwood Farm, Hadensville, Va. 23067

Filed Jun. 23, 1986, Ser. No. 877,235

Int. Cl.⁴ E04B 2/74

U.S. Cl. 52—582

5 Claims

1. A modular panel unit comprising:
 first and second plates having the planes of their surfaces in parallel orientation to one another;
 first and second vertically oriented U-shaped channel brackets perpendicularly affixed to the inner surfaces of the plates at their respective outer edges;
 a vertically oriented U-shaped tongue of narrower width than the channel brackets so as to freely move within the channel brackets;
 a plurality of tongue retraction brackets each having a slotted opening, affixed to the inside of the channel bracket in one edge of a panel unit at specified positions;
 a plurality of other tongue retraction brackets, attached to the tongue at specified positions corresponding to the

positions of the slotted tongue retraction brackets and having connecting means mounted thereon such that the



4,713,922

FRAME MOUNTING STRUCTURE FOR A HOUSING OPENING AND METHOD THEREFOR

John P. Ingold, 2590 Beaumont, Green Bay, Wis. 54301

Filed Sep. 10, 1986, Ser. No. 905,861

Int. Cl.⁴ E04C 2/38

U.S. Cl. 52—656

19 Claims

connecting means cooperate with the slotted openings in the slotted tongue retraction brackets.

4,713,921

STUD FOR WALLS

Gerrard O. Minialoff, and Martin J. Minialoff, both of P.O. Box 107, R.R. #1, Kleinburg, Ontario, Canada L0J 1C0

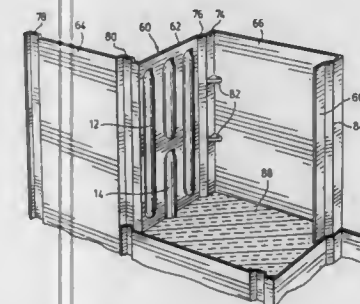
Filed Jan. 3, 1986, Ser. No. 870,057

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.⁴ E04C 1/10

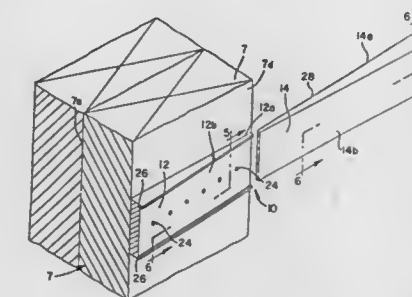
U.S. Cl. 52—579

10 Claims



1. A panel formed from a single sheet of metal and comprising:
 an exterior panel portion, which is generally planar and includes a first coupling channel, which has a shallow, trapezoidal cross-section and extends adjacent a free edge of the exterior panel portion, and a second coupling channel, which has a shallow trapezoidal cross-section and which extends adjacent an opposite edge of the exterior panel portion, for engaging a first coupling channel of another panel, each of the trapezoidal cross-sections including inwardly inclined sides and a central planar portion parallel to the exterior panel portion;

an interior panel portion, adapted to be overlaid by an exterior panel portion, which interior panel portion is generally planar; and
 a stud extending between the interior and exterior panel portions and including a plurality of rows of slits extending along the length of the stud with parts adjacent each slit being displaced relative to one another, with adjacent rows being spaced from one another and with the slits of adjacent rows staggered so that a bridging portion between two slits of one row is adjacent a slit of an adjacent



1. Wedge shim means for attaching building opening jamb framework to a building studding surface for plumbing the framework having sides for hanging a closure member on the framework sides in plumb relationship therewith, said shim means comprising:

a pair of tapered shims each having a sloped surface lying against other with the slope surface of one shim going in the opposite direction of the other,

one of said pair of shims having an outer generally flat surface generally parallel to the outer flat surface of the other shim and each shim flat surface being angulated with respect to its respective slope surface, said one shim having its flat surface being adapted to be affixed to the studding surface,

each shim having top and bottom edge portions and complementary intercoupling and interlocking means on both the top and bottom edge portions for interlocking the one shim to the other shim whereby the other shim is movably supported on the one shim with the sloped surface of each shim movably engaging and facing the other,

said other shim being movably mounted on said one shim for varying the width of the shim means and having its flat surface facing for engagement with the framework,

said shim means being adjustable to provide for adjustment of the position of one shim with respect to the other along their slope surfaces to determine the thickness of the wedge means to accommodate the spacing between the stud surface of the studding and the jamb surface of the framework to provide for plumbing of the framework on the building studding; and

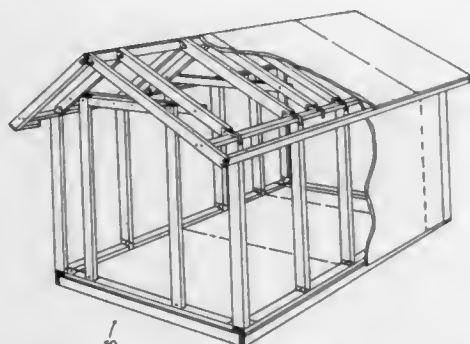
the shims being adapted to be fastened together in immobilized manner to one another after the other movable shim has been placed lengthwise of each other within said one shim to provide the desired shim thickness and for fastening the shims to the studding and the framework to the shims.

4,713,923
METHOD AND MEANS FOR BUILDING A PITCHED
ROOF BUILDING USING ONLY SQUARE-END
FRAMING MEMBERS
 Ulrich Stelaff, and David O. Hamel, both of Madison, Wis.,
 assignors to United Steel Products Company, Montgomery,
 Minn.

Filed May 13, 1985, Ser. No. 733,085
 Int. Cl.⁴ E04B 1/48, 7/06

U.S. Cl. 52—713

14 Claims



1. Apparatus for enabling square-end roof rafters to be used in framing and erecting a pitched roof on a building by an individual working unassisted in which said building includes a roof ridge member, at least one building sidewall having upper and lower stud wall plates and a plurality of square end rafters, said apparatus comprising:

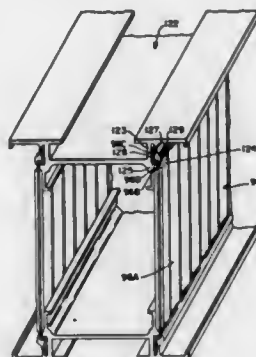
- (a) a plurality of symmetrically configured roof-ridge-to-rafter-end connectors each configured with a pair of channel shaped terminal portions consisting of a generally rectilinear channel back and a pair of spaced channel sides being perpendicular to and integrally connected with said channel back and parallel to one another for receiving rafter end extremities, said channel shaped terminal portions being integrally connected in separated channel-back to channel-back juxtaposition by a central planar portion disposed mutually perpendicular to said channel sides and channel backs of said channel shaped terminal portions and forming with said channel backs of said channel shaped terminal portions a channel configured pocket for receiving a lower portion of a roof ridge member extending transversely to said rafters wherein said central planar portion comprises the back of said channel configured pocket and said channel backs of said channel shaped terminal portions comprise the sides of said channel configured pocket, said channel sides of said channel shaped terminal portions being further configured to receive a bolt through each facing pair thereof, and wherein each of said channel backs comprises a substantially rectilinear planar portion having a pair of side edges integrally connected with said pair of channel sides, a bottom edge integrally connected with said central planar portion and a free edge opposite said bottom edge and said adjacent to each of said side edges which is free of connection with any further structure and
- (b) a plurality of rafter-end-to-stud-wall-plate connectors each configured with a substantially rectilinear central planar portion having four edges defining the end extremities of said central planar portion, said four edges including a first pair of edges disposed on opposite sides of said central planar portion and lying generally parallel to one another and a second pair of edges disposed on opposite sides of said central planar portion, lying generally parallel to one another between the end extremities of said first pair of edges and being generally perpendicular to said first pair of edges, a first pair and a second pair of spaced parallel facing planar portions extending from said first and second pair of edges, respectively said first planar portion pair being disposed perpendicular to said central

planar portion, said second planar portion pair being disposed mutually perpendicular to both said central planar portion and said first planar portion pair and projecting from said central portion in a direction opposite that of said first planar portion pair, said second planar portion pair configured to extend beyond an end extremity of said central planar portion defined by one of said first pair of edges for receiving the end of a rafter in the spacing between parallel planar portions thereof, said roof-ridge-to-rafter-end connectors and said rafter-end-to-stud-wall-plate connectors, when used in complementary fashion with one each attached to opposite end extremities of a rafter enabling an individual working alone to erect a pitched roof frame on a building using only squared-end rafters.

4,713,924
STRUCTURAL BEAM AND PANEL SYSTEMS AND
METHODS AND APPARATUS FOR MAKING THE SAME
 Andrew J. Toti, 311 W. River Rd., Modesto, Calif. 95351
 Division of Ser. No. 396,609, Jul. 9, 1982, Pat. No. 4,526,024.
 This application Jun. 28, 1985, Ser. No. 750,413
 Int. Cl.⁴ E04C 3/30

U.S. Cl. 52—731

7 Claims



1. An elongated sheet metal panel formed by rotating die comprising a first portion including a major central portion having transverse corrugations formed therein to a depth of at least about 0.100 inch, a transition step portion adjacent said first portion having transverse serrations, and at least one marginal edge portion which is either uncorrugated or has longitudinal corrugation or relatively light transverse corrugations therein, said transition portion and said edge portion having substantially the same overall length as said corrugated first portion so that said panel is substantially straight.

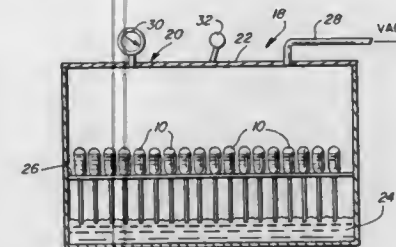
4,713,925
METHOD AND APPARATUS FOR FILLING A
PLURALITY OF FLEXIBLE PIPETTE TYPE VESSELS
 N. H. Kafkis, 8537 Skokie Blvd., Skokie, Ill. 60077
 Continuation-in-part of Ser. No. 718,489, Apr. 1, 1985,
 abandoned. This application Jun. 11, 1986, Ser. No. 872,819
 Int. Cl.⁴ B65B 31/02

U.S. Cl. 53—432

19 Claims

1. A method of filling a plurality of vessels, comprising: providing a plurality of vessels having filling ports therein, said vessels having a body at one end and an elongated filling and discharge tube extending therefrom with said port at the end of said tube; sorting said tubes to align said bodies and said tubes; providing a loading or filling rack with a slot in one side thereof; loading said tubes into said loading rack with said tubes extending through said slot; providing a container for filling said vessels;

filling at least a portion of said container with a liquid with which to fill said vessels;
 inserting said rack with said vessels into said container with said filling ports submerged in said liquid;
 sealing and evacuating said container to a desired negative pressure to evacuate said vessels;
 releasing said pressure to fill said vessels with said liquid;
 removing said rack with said filled vessels therein;



providing a sealing mechanism;
 inserting said tubes in said rack into said sealing mechanism and sealing said tubes; and
 providing a labeling mechanism and providing a vessel loading mechanism for said rack and said vessels and unloading said sealed vessels from said rack into said loading mechanism and labeling said vessels after discharging said vessels from said loading mechanism.

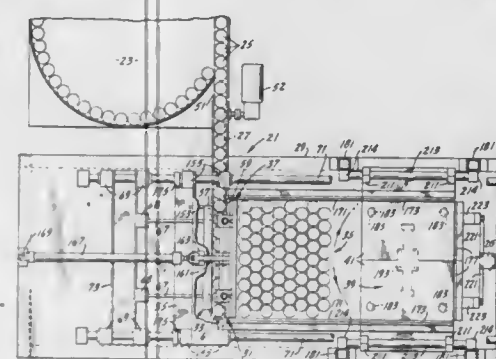
4,713,926
PACKAGING MACHINE AND METHOD
 John Mennie, Granville; Donald L. Troglio, and Larry E. Zielinski, both of Mark, all of Ill., assignors to Wheeling Stamping Company, Wheeling, W. Va.

Filed Jun. 26, 1986, Ser. No. 878,634

U.S. Cl. 53—443

Int. Cl.⁴ B65B 35/30

8 Claims



1. A machine for density packing of cylindrical plastic objects in layers in containers of rectangular, horizontal cross-section, including:

- an elongated table,
 a vertical transfer mechanism for the plastic objects located at one end of the table,
 means to load the cylindrical plastic objects onto the table at the end of the table opposite to the vertical transfer mechanism end to form a row of cylindrical plastic objects on the table extending across the width thereof with the plastic objects in the row in close contact,
 said means to load the cylindrical plastic objects onto the table including a belt conveyor extending across the width of the table, a feeder supplying cylindrical plastic objects in a row to the belt conveyor and a stop at the end of the belt conveyor away from the feeder to limit the number of cylindrical plastic objects in the row, the location of the stop relative to the belt conveyor being adjustable to vary the number and position of the cylindrical plastic objects in the row being formed so that the cylindrical plastic

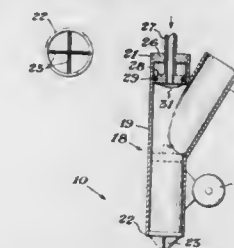
objects in one row are staggered relative to the cylindrical plastic objects in an adjacent row,
 means to move each individual row of cylindrical plastic objects along the table towards the vertical transfer mechanism after the row is formed to thereby assemble a predetermined number of rows of cylindrical plastic objects into a matrix of plastic objects with the plastic objects in the matrix in close contact,
 means to move the assembled matrix of cylindrical plastic objects to a position under the vertical transfer mechanism,
 a lifting mechanism formed as part of the vertical transfer mechanism, and
 means to operate the lifting mechanism to sequentially:
 lift all of the plastic objects of the matrix from the table;
 lower the matrix of plastic objects to a selected vertical position below the table and release them in unison to form a layer of plastic objects in the container; and
 raise the lifting mechanism to a position above the table to await the next assembled matrix of plastic objects being loaded on the table a row at a time.

4,713,927
PROCESS AND APPARATUS FOR PACKAGING
 Louis C. Rubens, and Willard E. Alexander, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 15, 1986, Ser. No. 863,625
 Int. Cl.⁴ B29D 27/04

U.S. Cl. 53—472

10 Claims



1. A process of packaging an article within a paper board container the steps of the method comprising providing a paper board container having sufficient dunnage wherein to position the article in a generally desired location within the paper board container, closing the paper board container, slitting a portion of the top of the paper board container, injecting into the paper board container through the slit portion under superatmospheric pressure a sufficient quantity of partially collapsed foamed synthetic resinous particles, reducing the pressure within the paper board container to atmospheric pressure and thereby causing partially collapsed particles to expand and contact adjacent particles, the article and paper board container walls and thereby form a plurality of deformed particles maintaining the article in a desired relationship to the paper board container walls.

4,713,928
AUTOMATIC PACKAGING MACHINE FOR CLOSING
OVER FILLED BOXES

Steven Tisma, Chicago, Ill., assignor to Tisma Machine Corporation, Chicago, Ill.

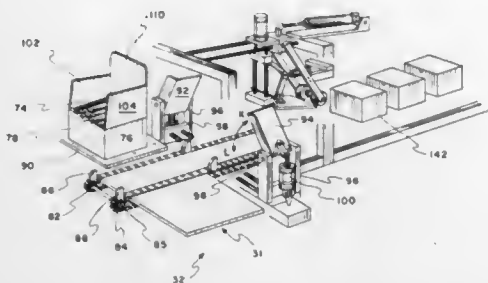
Filed Sep. 9, 1986, Ser. No. 905,705

U.S. Cl. 53—526

10 Claims

1. An automatic packaging machine comprising a loading station means for simultaneously and sequentially picking up a plurality of elongated products and depositing them in a spaced parallel alignment within a box, when picked up each of said products having an initial volume which is substantially greater than the volume which the same product will have after it has settled over time within said box, whereby said box

needs to be overfilled at said loading station so that it will be full after said products have settled, said box having a pair of opposed end flaps which are large enough to at least jointly cover the space through which said products are inserted into the box, means for advancing said over filled box to a closing station, means for thereafter closing a lid of said box without damage to said over filled products, immediately reducing the volume of said products to the volume which they would have after said products have settled, said closing means comprising



a pair of pivoted paddle-like members which swing over and close said end flaps to press said overfilled products into said box, means for thereafter folding a top flap over said box and tucking an end of said top flap therein, each of said paddle-like members having a generally L-shaped cross section with a small end of said L-shape projecting upwardly toward said end of said top flap, and means for folding an end of said top flap over said small end of said L-shape in order to form said end of said top flap into a tuck flap.

4,713,929

HARVESTING OF AQUATIC VEGETATION BY HELICOPTERS

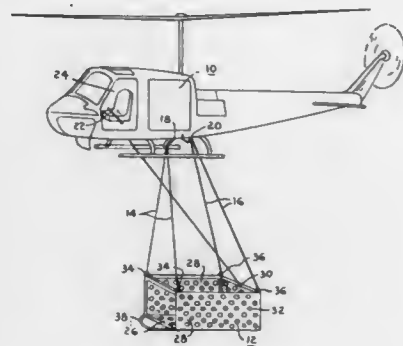
Robert W. Smith, Alva, Fla., assignor to Colony Services Inc., LaBelle, Fla.

Filed Mar. 9, 1987, Ser. No. 23,713

Int. Cl.⁴ A01D 44/00

U.S. Cl. 56—8

6 Claims



1. The method of harvesting aquatic vegetation by helicopter which comprises the steps of: (1) providing a container having an open front and bottom, sides and back walls, a series of apertures in the walls to permit the escape of water; (2) suspending the container beneath a helicopter; (3) providing controls to vary the angular relation of the container between a position where the bottom of the container is substantially horizontal in a loading position and a forwardly tilted angular position to an unloading position to permit gravity to discharge the harvested aquatic vegetation from the container; (4) flying the helicopter over a patch of aquatic vegetation with the bottom of the container in a substantially horizontal position submerged to a desired depth to harvest the aquatic vegetation and with the open front of the bucket in alignment with aquatic vegetation to induce the vegetation to flow into the container and to be compacted therein by the forward speed of the

helicopter; (5) increasing the elevation of the container to withdraw the container from the water; (6) flying the helicopter to an aquatic vegetation unloading area; and (7) tilting the container angularly forwardly to the unloading position to permit gravity to unload the container.

4,713,930

MOBILE BRUSH CUTTER

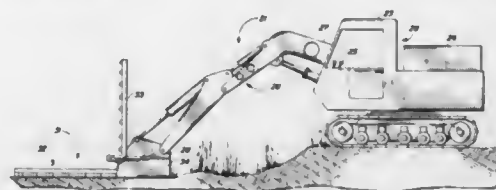
Peter E. Whiting, 281 Brook Street, Framingham, Mass. 01701

Filed May 13, 1986, Ser. No. 862,873

Int. Cl.⁴ A01D 55/00

U.S. Cl. 56—10.8

20 Claims



1. A mobile brush cutter comprising:
a vehicle;
a boom having one end pivotally supported by said vehicle; hydraulic power system means mounted on said vehicle and having controls operable by an operator thereof;
a cutter supported by an opposite end of said boom and operatively coupled to said hydraulic power system; said cutter comprising an elongated bed knife having a face and one end connected to said opposite end of said boom and having bed teeth that define longitudinally spaced apart slots in said face for receiving stalks and a moving knife juxtaposed face to face to said bed knife and mounted for longitudinal reciprocating movement relative to said bed knife, said moving knife having moving teeth that define a plurality of cutting edges each shaped and arranged to reciprocate through a cutting zone transversely adjacent to a different one of said slots; and
retainer means fixed to said bed knife and shaped and arranged for sliding engagement with outer end portions of said moving teeth so as to prevent transverse separation thereof from said bed knife.

4,713,931

APPARATUS FOR VACUUM SPINNING

Elbert F. Morrison, Clarksville, Va.; Danny R. Bradley, Bullock, and D. C. Reece, Oxford, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 386,078, Jun. 7, 1982, Pat. No. 4,507,913. This application Dec. 3, 1984, Ser. No. 677,487

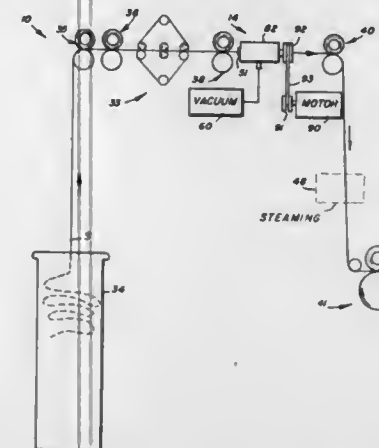
Int. Cl.⁴ D01H 5/28, 1/12; D02G 1/06

U.S. Cl. 57—328

38 Claims

1. Apparatus for forming yarn comprising: an elongated hollow shaft having a first end and a second end, a through-extending passageway from the first end to the second end, at least a portion of the entire circumference of the shaft being perforated; means for mounting said shaft for rotation about an axis; means for rotating said shaft about its axis; means for passing textile fibers through the through-extending passageway of said shaft linearly, generally along the axis of rotation thereof, the fibers being fed into the first end thereof; means for applying a vacuum to the exterior of said shaft so that at least some of the fibers or free ends of fibers passing through said shaft will draw toward the shaft perforations, and will be caused to rotate with said shaft as the remaining fibers are maintained generally parallel and move generally linearly along

the axis of rotation; means for withdrawing formed yarn from the second end of said shaft, opposite said first end thereof; and



wherein the perforations in said portion of said hollow shaft comprise perforations that slant in the direction of said second end from the through-extending passageway.

4,713,932

SUPPORTING DISK FOR A SUPPORTING-DISK BEARING OF AN OPEN-END SPINNING MACHINE

Werner Zott, Donzdorf, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

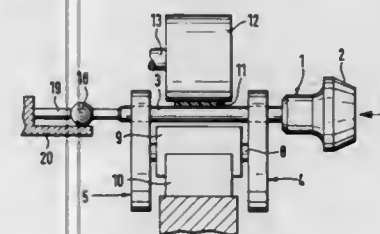
Filed Apr. 14, 1987, Ser. No. 38,139

Claims priority, application Fed. Rep. of Germany, May 10, 1986, 3615777

Int. Cl.⁴ D01H 7/882, 1/241

U.S. Cl. 57—406

15 Claims



1. A supporting disk for a supporting-disk bearing for a shaft of an open-end spinning rotor, comprising:
a disk-shaped basic body made of rigid material and provided with a central bore for receiving a shaft; and
a ring circumferentially surrounding and fitted to the basic body, said ring, forming a smooth uninterrupted, essentially cylindrical running outer surface for supporting a rotor shaft, said ring being formed of ring material other than the material of the basic body and serving to provide damping support to a rotor shaft.
wherein an inner surface of the ring has a profiling by means of which the thickness of the ring in its central area is reduced with respect to its edge areas.

4,713,933

HELICOPTER WITH A TURBINE POWER UNIT FITTED WITH AN EXHAUST SCREENING DEVICE

Gianluigi Bandera, Gallarate, Italy, assignor to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Italy

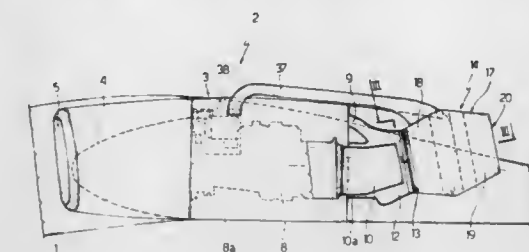
Filed May 28, 1986, Ser. No. 867,792

Claims priority, application Italy, Jun. 7, 1985, 67530 A/85

Int. Cl.⁴ F02C 7/12

U.S. Cl. 60—39.5

5 Claims



1. A helicopter comprising a turbine power unit, an exhaust screening device, and at least a first cooling duct for externally conveying air cooling internal parts on the helicopter, the said power unit comprising an engine compartment, a second duct for cooling the said engine compartment, a turbine engine housed inside the said compartment, a dynamic outside-air intake, an engine intake duct and a bypass duct, both connected to the said dynamic intake, and an engine exhaust nozzle; characterized by the fact that it comprises a manifold (12); an input of said manifold (12) being connected to an output of said nozzle (10), said bypass duct (9), and said cooling ducts (10a, 15) to receive therefrom respective fluid flows to form a fluid mixture; an output of said manifold (12) being connected to an input of said screening device (14) to feed the same with said mixture; and said screening device (14) comprising a number of ejectors (27, 28, 29, 30) which are located so as to activate the fluid flows through said bypass and cooling ducts (9, 10a, 15), and through each of which a part of said fluid mixture flows.

4,713,934

GAS TURBINE ENGINE AIR INTAKE

Terence R. Pellow, Watford, United Kingdom, assignor to Rolls-Royce plc, London, England

Filed Nov. 2, 1982, Ser. No. 438,636

Claims priority, application United Kingdom, Nov. 21, 1981, 8135122

Int. Cl.⁴ F02G 3/00

U.S. Cl. 60—39.092

3 Claims



1. An air intake for a compressor of a gas turbine engine comprising:
a primary duct defined by an annular wall, said primary duct having an air inlet for receiving air and an air outlet arranged to deliver air therefrom to the compressor of the gas turbine engine, said primary duct being at least partially arcuate in cross-sectional form whereby said air outlet is offset laterally from said air inlet and air flowing

through said duct follows a tortuous path, a portion of said annular wall of said primary duct being frangible and being arranged to be impacted by any foreign body above a predetermined weight ingested through said air inlet, said frangible portion of said annular wall being formed by a sheet of light alloy having lines of weakness extending about and defining a periphery of the portion of said annular wall, said lines of weakness being defined by regions of reduced thickness in said sheet, and further lines of weakness in said sheet defined by regions of reduced thickness in said sheet, said further lines of weakness extending in said sheet from said lines of weakness defining the periphery of said portion and terminating together, said further lines of weakness being thinner than said lines of weakness defining said periphery of said portion whereby when said sheet is penetrated by a foreign body, said sheet divides along said further lines of weakness to define a plurality of flaps hinged to said wall by said lines of weakness extending about the periphery of said portion; and

a secondary duct extending from said primary duct, said portion of said wall defining a barrier between said primary duct and said secondary duct, said secondary duct being arranged to receive said foreign body when said portion is penetrated.

4,713,935

VECTORABLE NOZZLES FOR AIRCRAFT

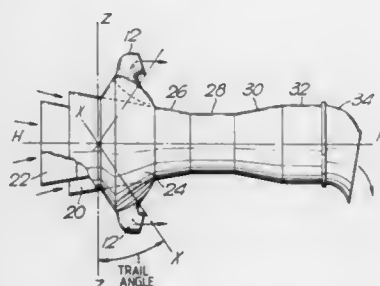
Gary F. Szuminski, Marietta, and Douglas J. Nightingale, Jonesboro, both of Ga., assignors to Rolls-Royce Inc., New York, N.Y.

Filed Apr. 8, 1986, Ser. No. 849,492

Int. Cl.⁴ F02K 1/00

U.S. Cl. 60—229

13 Claims



1. A gas turbine engine for installation in an aircraft fuselage which includes a storage cavity, the engine comprising:

- a compressor means;
- a first vectorable nozzle having an exit area and being positioned to receive air compressed by the compressor means;
- a valve means which in a first position interrupts the flow of compressed air from the compressor means and thereby renders the nozzle inoperable, and in a second position allows air from the compressor means to flow to the nozzle and thereby render the nozzle operable;
- combustion means connected for receiving air from the compressor means;
- turbine means positioned to receive gases from the combustion means and connected to drive the compressor means;
- and a second vectorable nozzle positioned to receive and direct gases from the turbine means;
- means for mounting said first nozzle for rotation about an axis which is angled relative to a first plane which is perpendicular to the longitudinal centerline of said engine and having said exit area offset from said axis of rotation;
- means for rotating said mounting means to move said nozzle between a stowed position within said cavity wherein said valve means is in said first position and an operating position

outside said cavity wherein said valve means is in said second position;

said engine further including a fairing means provided to cover the fuselage cavity in both the deployed and the stowed positions of said first nozzle;

said fairing means comprising a first portion fixed relative to the nozzle which acts to fair the forward end of the cavity when the nozzle is in the fully deployed or stowed position, and a movable second portion which acts to fair the rear portion of the cavity in both the deployed and stowed positions of the first nozzle.

4,713,936

MOTOR SEAL PROTECTOR VALVE

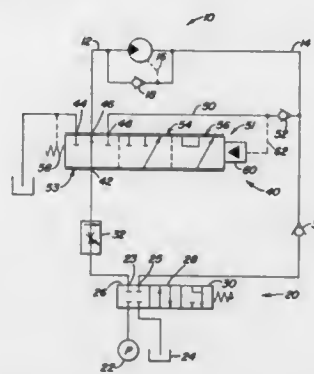
Dennis R. Barber, Waterloo; Larry M. Delfs, Cedar Falls, and Ronnie F. Burk, Waterloo, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 18, 1985, Ser. No. 799,057

Int. Cl.⁴ F15B 13/042; F16K 21/04

U.S. Cl. 60—403

3 Claims



1. In a hydraulic system including a source of system pressure, a source of reservoir pressure, and a hydraulic motor having an inlet for receiving system pressure and having an outlet communicated with reservoir pressure, characterized by:

pressure-responsive valve means for blocking communication of system pressure with the motor inlet and for communicating the motor inlet with reservoir pressure in response to an overpressure condition at the motor outlet, the valve means comprising a valve having a valve bore therein, an inlet connecting the valve bore to a system pressure, a first outlet communicating the valve bore with reservoir pressure, a second outlet communicating the valve bore with the motor inlet, a third outlet communicating the valve bore with the motor outlet via a return passage, a valve member movable in the bore to a first position wherein the inlet is connected to the second outlet and the first and third outlets are blocked, to a second position wherein the first and second outlets are blocked and wherein the inlet is connected to the third outlet and to a third position wherein the first and second outlets are connected to each other and wherein the inlet is connected to the third outlet, a spring biased to urge the valve member to the first position, a pressure-operated pilot for moving the valve member to the second and third positions and a pilot line communicating the pilot with the return pressure.

4,713,937

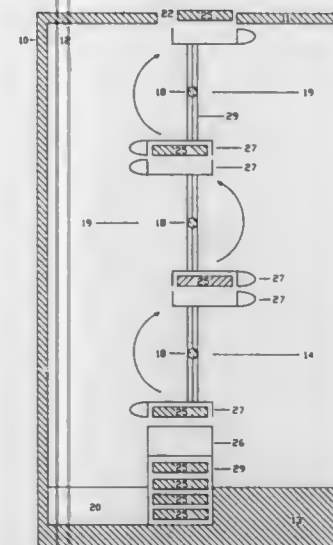
MULTIPLE DRIVE BUOYANCY ENGINE

Dennis A. De Shon, 7242 Seven Oaks Ave., Baton Rouge, La. 70821

Continuation-in-part of Ser. No. 771,363, Aug. 30, 1985, abandoned. This application Apr. 21, 1986, Ser. No. 854,048 Int. Cl.⁴ F03B 17/02

U.S. Cl. 60—495

1 Claim



1. A multiple drive buoyancy engine, comprising:

- a plurality of vertically stacked drive units disposed in a vessel containing mercury;
- drive units having axial drive shafts extending outwardly thereof and supported by sealed bearings in the vessel walls;
- drive units incorporating electromagnetic capture modules, designed to receive capsules, and which are positioned at the extreme ends of hydrodynamically designed arms;
- said capture modules designed to hold capsules through their lift cycle, and to release capsules, at the top of the lift cycle, into the lowermost capture module of the next subsequent drive unit;
- said capsules having rigid walls, and containing air;
- a rotational-speed programmed, computer controlled airlock, pressurized by an air compressor, which injects capsules into the lowermost capture modules as they are rotated into alignment;
- meshing gears on each of the protruding drive shaft axes, which ensure rotational alignment and sequencing of the capture modules to receive capsules.

4,713,938

GAS TURBINE ENGINE GASEOUS FUEL INJECTOR

Jeffrey D. Willis, Coventry, United Kingdom, assignor to Rolls-Royce plc, London, United Kingdom

Filed Apr. 29, 1986, Ser. No. 856,987

Claims priority, application United Kingdom, Jun. 7, 1985, 8514478

Int. Cl.⁴ F02C 1/00

U.S. Cl. 60—742

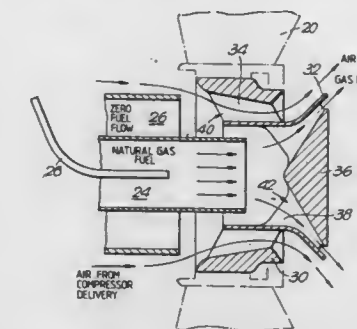
3 Claims

1. A gas turbine fuel injector comprising:

- an outer gaseous fuel duct having a downstream end;
- a central gaseous fuel duct coaxially positioned within said outer fuel duct and having a downstream end projecting therefrom;
- said outer gaseous fuel duct and said central gaseous fuel duct comprising a pair of pipes, one located within the other, and having at one end a flange attachment for the securing of the assembly to the engine casing, the injector terminating at the other end in a pair of outlets, each having an axis, means for supplying natural gas fuel to said

central gaseous fuel duct and means for supplying gaseous fuel from a coal gasifier to said outer gaseous fuel duct;

- an outer ring;
- a plurality of swirl vanes extending inwardly from said outer ring;
- a central duct member supported from said outer ring by said swirl vanes, said central duct having an upstream end and a downstream end;
- a plurality of further swirl vanes extending inwardly from said central duct member;
- a pintle supported from said central duct member by said further swirl vanes;
- said outer ring, central duct member and pintle defining



between them an outer annular flow passage and an inner annular flow passage, said outer annular flow passage and said inner annular flow passage each decreasing in cross-sectional area in a direction of flow therethrough;

said central gaseous fuel duct having the downstream end thereof extending into said central duct member for directing gaseous fuel therefrom into said inner annular flow passage; and

said outer gaseous fuel duct having means for spacing said downstream end thereof a distance from said inner and outer flow passages and said upstream end of said central duct member to direct gaseous fuel into both said inner annular flow passage and said outer annular flow passage.

4,713,939

LINEAR DRIVE MOTOR WITH SYMMETRIC MAGNETIC FIELDS FOR A COOLING SYSTEM

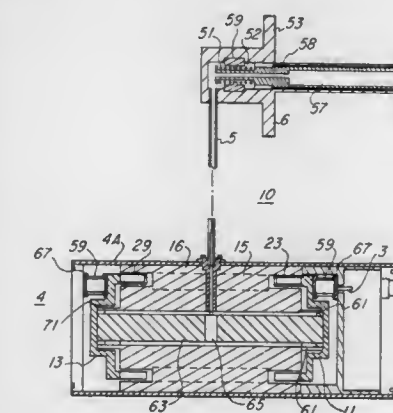
William C. Keith, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 23, 1986, Ser. No. 867,850

Int. Cl.⁴ F25B 9/00; H01L 25/00

U.S. Cl. 62—6

6 Claims



1. A cooling system comprising:

- a combination of a compressor and dual armature linear induction motor including a stator having a generally

cylindrical shape, a first end and a second end and a first magnetic means centrally located between the first end and second end within the body of the stator, the magnetic means provides a first and second magnetic fields;

a first armature shaped to operatively fit on the first end of the stator and including a second magnetic means for providing a third magnetic field;

a second armature shaped to fit on the second end of the stator and having a third magnetic means for providing a fourth magnetic field;

a conduit through the center of the stator and extending outward for conducting a coolant between the combination of a compressor and dual armature linear induction motor and an expander;

a first piston connected to the first armature and extending into the stator;

a second piston connected to the second armature and also extending into the stator;

the first and second pistons operatively mounted in the stator to compress and expand a predefined volume located at conduit at the center of the stator;

the expander being operatively connected to the conduit for receipt of the coolant; and

a power supply for providing current to the combination of a compressor and dual armature linear induction motor to cause the first and second pistons to alternately compress and expand the predefined volume in response to the provided current.

4,713,940

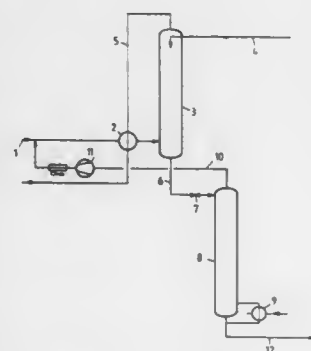
PROCESS FOR OBTAINING C_2+ OR C_3+ HYDROCARBONS FROM GASEOUS MIXTURES
Gerhard Ranke, Poecking, and Friedrich Siegert, Wolfrahtshausen, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany
Filed Nov. 7, 1986, Ser. No. 927,986

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539554

Int. Cl.⁴ F25J 3/00

U.S. Cl. 62—17

13 Claims



1. A process for obtaining C_2+ or C_3+ hydrocarbons from gaseous mixtures that contain hydrocarbons and dissolved inert gases comprising: scrubbing the gaseous mixture with a physical liquid solvent selective for C_2+ or C_3+ hydrocarbons; expanding the enriched liquid solvent to an intermediate pressure below its critical pressure; stripping the expanded enriched liquid solvent by heating and partial evaporation to remove said dissolved inert gases; and subsequently regenerating the solvent.

4,713,941

CRYOGENIC VESSEL

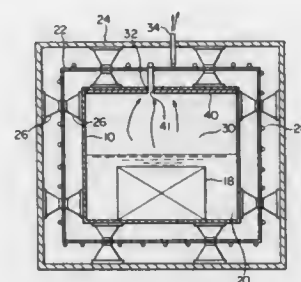
Katsuyoshi Toyoda, and Takashi Murai, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Nov. 26, 1986, Ser. No. 934,992

Claims priority, application Japan, Nov. 28, 1985, 60-266154; Nov. 28, 1985, 60-266155; Nov. 28, 1985, 60-266156

Int. Cl.⁴ F17C 7/02

U.S. Cl. 62—50

5 Claims



1. A cryogenic vessel for maintaining an electrical apparatus at a cryogenic temperature, comprising:

a cryogen tank including a substantially flat top wall and containing therein the electrical apparatus and a cryogen for cooling said electrical apparatus;

a radiation shield, enclosing said cryogen tank, for thermally shielding said cryogen tank against heat radiation from the outside;

an outer housing enclosing therein said radiation shield;

thermally insulating support means for supporting said cryogen tank and said radiation shield in a thermally insulating relationship;

a cooling tube for passing evaporated cryogen in said cryogen tank on said radiation shield for substantially uniformly cooling said radiation shield, said cooling tube having its inlet in the of said outer housing; and

cooling means disposed on the top wall of said cryogen tank for substantially uniformly cooling the top wall of said cryogen tank.

4,713,942

METHOD FOR COOLING AN OBJECT WITH THE AID OF SUPERFLUID HELIUM (HE II) AND APPARATUS FOR IMPLEMENTING THE METHOD

Albert Hofmann, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Aug. 15, 1986, Ser. No. 900,912

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529391

Int. Cl.⁴ F25D 25/00

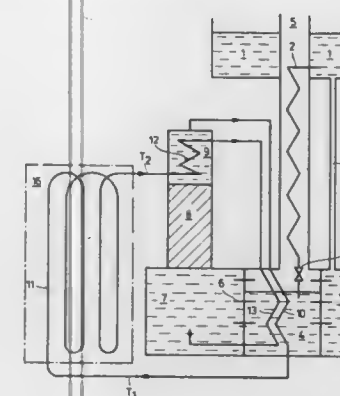
U.S. Cl. 62—62

11 Claims

1. A method of cooling a substrate, comprising steps for:

(a) cooling a substrate by contact with superfluid helium (He II) at a temperature between about 1.7° K. and 2.1° K. with a forced flow of He II to remove heat from the substrate and convert said Helium II to Helium I, and

(b) utilizing thermal power obtained from the heat being removed from the substrate to force a current of super-



fluid helium (He II) through the substrate by means of a fountain effect pump.

4,713,943

EVAPORATIVE COOLER INCLUDING AN AIR-TO-AIR COUNTER-FLOW HEAT EXCHANGER HAVING A REVERSE TEMPERATURE PROFILE

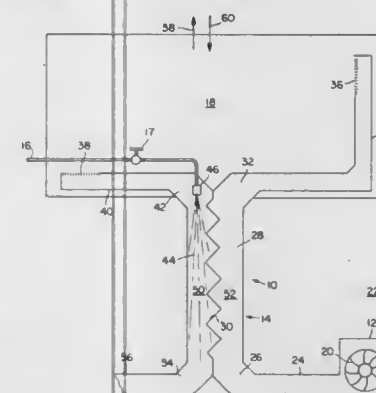
Christopher E. Wainwright, 1246 W. Kiowa Cir., Mesa, Ariz. 85202

Continuation-in-part of Ser. No. 550,711, Nov. 9, 1983, abandoned, which is a continuation of Ser. No. 305,397, Sep. 25, 1981, abandoned. This application Sep. 20, 1985, Ser. No. 778,412

Int. Cl.⁴ F28D 5/00

U.S. Cl. 62—304

22 Claims



1. A method of cooling an enclosed space comprising the steps of:

supplying ambient air from the atmosphere;

cooling the ambient air at a constant humidity in an air-to-air counter-flow heat exchanger configuration;

directing the cooled supply air from the heat exchanger to the enclosed space to be cooled;

withdrawing return air from the enclosed space;

adding moisture to the return air evaporating the moisture in a reverse temperature profile; and

simultaneously heating the return air with the heat extracted from the supply air in the heat exchanger while increasing the specific humidity of the return air by increasing its ability to absorb the evaporated liquid, thereby enabling an even greater reduction in the temperature of the supply air by increased heat exchange between the supply air and the return air exhausting the relatively warm, humid return air to the atmosphere.

4,713,944

INTERMITTENTLY OPERATING SORPTION APPARATUS WITH SOLID SORBENT FOR HEAT AND COLD STORAGE

Gerhard Januschkowetz, Munich, Fed. Rep. of Germany, assignor to Schiedel GmbH & Co., Munich, Fed. Rep. of Germany

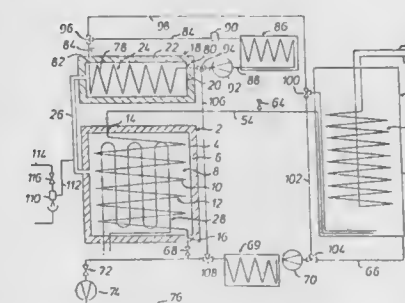
Filed Sep. 8, 1986, Ser. No. 904,649

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1985, 3532093

Int. Cl.⁴ F25B 17/08

U.S. Cl. 62—480

32 Claims



1. An intermittently operating sorption apparatus for heat and cold storage comprising

a thermally insulated storage vessel comprising

a gas-tight housing and a mass of solid sorption agent contained therein,

a heating means capable of heating the solid sorption agent, and

a first heat-exchange means comprising a first pressure-resistant conduit;

a second heat-exchange means defining at least one of a thermally insulated evaporator and a condenser, said heat-exchange means comprising a second pressure-resistant conduit;

means for placing said first and second conduits in flow communication with one another;

separate in- and out-flow control devices operatively connected to said second conduit;

a mass of working medium of a substance capable of being in the liquid state; and

connecting means defining pressure-resistant and poorly heat-conducting connections for conducting the working medium between said storage vessel and said second heat-exchange means.

4,713,945

TURRET FOR CRYOSTAT

Michael L. Rappaport, Ramat Hasharon, and Leif Blumenau, Beersheva, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Jul. 15, 1986, Ser. No. 885,649

Claims priority, application Israel, Jul. 30, 1985, 75968

Int. Cl.⁴ F25B 19/00

U.S. Cl. 62—514 R

15 Claims

1. A turret arrangement in a cryostat used in magnetic resonance (MR) systems, said turret arrangement providing access to the interior of a vacuum vessel integral to the cryostat; said cryostat comprising:

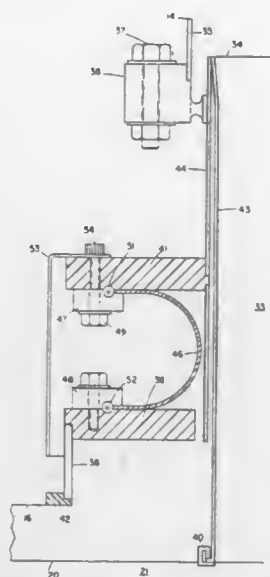
(a) said vacuum vessel shaped in the form of a horizontal cylinder having a bore extending therethrough along the longitudinal axis of said cylinder;

(b) said vacuum vessel containing a liquified gas container;

(c) said liquified gas container providing the cooling necessary to obtain superconducting conditions and being shaped in the form of a horizontal cylinder having a bore therethrough that is coaxial with the bore of said vacuum vessel;

(d) said container being caused to move within the vacuum

vessel axially, radially and transversely due to temperature extremes within said cryostat;
(e) a turret extending radially outward from said vacuum vessel;



- (f) a neck tube rigidly attached to and extending radially from said container toward the outside of said vacuum vessel through said turret; and
(g) bearingless means for movably attaching said neck tube to said vacuum vessel whereby, when said container moves, stresses on said neck tube are minimized.

4,713,946

ORNAMENTAL CHAIN

Reiner Hoerkens, Bahnhofstrasse 31, D-6903 Neckargemünd, Fed. Rep. of Germany

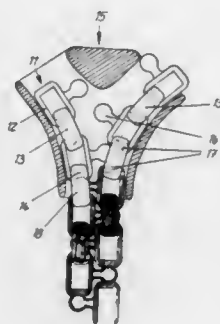
Filed Feb. 14, 1986, Ser. No. 829,495

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1985, 3507546

Int. Cl.⁴ A44C 11/00

U.S. Cl. 63—4

15 Claims



1. In an ornamental chain comprising a multiplicity of teeth arranged in two juxtaposed rows, each of said teeth having a tooth portion directed toward the other row and arranged to extend between and to interengage with two adjacent teeth of the other row so as to interconnect said rows, and
interconnecting means connecting adjacent teeth of each of said rows to each other and resisting a separation of adjacent teeth of the same row along said row while permitting adjacent teeth of the same row to move relative to each other when said tooth portions of said teeth of each row are disengaged from adjacent teeth of the other row, the improvement residing in that

each of said teeth has an end portion which is remote from the other row,
the end portion of each of said teeth of each row comprises two crosspieces, which are spaced apart along said row and extend transversely to a plane containing said chain when it lies on a flat support,
a plurality of rings are provided, each of which surrounds two adjacent ones of said crosspieces of adjacent teeth of the same row,
said crosspieces and said rings constitute said interconnecting means,
each of said rings connecting the teeth of each row is adapted to interengage with said tooth portion of a tooth of the other row to restrict the movement of said tooth portion transversely to said plane,
said end portion of each of said teeth is formed at least on one side with a concave recess, and
the tooth portion of each of said teeth is formed at least on one side with a convexly curved portion adapted to extend into said concave recess of a tooth of the other row.

4,713,947

COMFORT RING

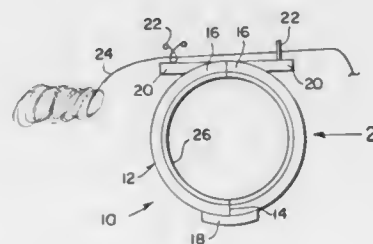
William K. Collins, 479 Middle Drive Rd. 6, Bridgeton, N.J. 08302, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Mar. 13, 1987, Ser. No. 25,373

Int. Cl.⁴ D04B 35/00, 37/00

U.S. Cl. 66—1 A

4 Claims



1. A split crocheting ring comprising:
(a) a shank having a split bight and terminating in a pair of offset upper ends;
(b) a flat spring mounted across said split bight of said shank;
(c) a pair of plates, each of which is mounted to one side of one of said offset upper ends of said shank whereby when said plates are squeezed longitudinally towards each other, said shank will open wider to allow said ring onto a finger; and
(d) a pair of guide members, each of which is mounted on one of said plates, said guide members being opposed at a right angle to each other so that yarn can be fed by hand therethrough for a fabric forming process such as crocheting and the like.

4,713,948

DOUBLE BED FLAT KNITTING MACHINE WITH SINKERS LOCATED BETWEEN THE NEEDLES

Henning Schmidt; Walter Nedele, both of Reutlingen, and Hermann Schmodde, Albstadt, all of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 29,195

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609539

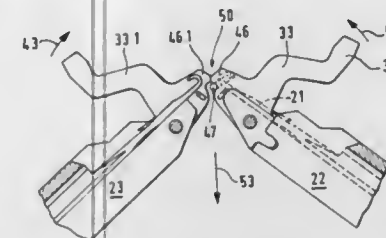
Int. Cl.⁴ D04B 15/06, 15/24

U.S. Cl. 66—106

5 Claims

1. A double bed flat knitting machine having needles, which are longitudinally movable in their needle beds, and sinkers between the needles, which sinkers are movable about a common longitudinal axis between a rear and a forward position

and which are controlled by cam elements of the cam carriage, the sinkers being provided, in the stitch-forming region, with a projection, with a stitch-receiving throat underneath the projection and with a loop-forming edge, characterized in that the loop-forming edge of each sinker is formed, with respect to the



direction of take-down of the knitted fabric, after and underneath the yarn-receiving throat, and further characterized in that the sinkers of the two needle beds are located opposite one another, and in their forward position, in which they form the bridge over the gap between the needle beds are in contact with one another through their projections.

4,713,949

SHELF SYSTEM FOR APPLIANCE

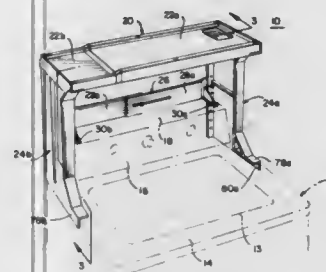
John R. Wilcox, Farrell, Pa., assignor to Top Shelf Company, Inc., West Middlesex, Pa.

Filed Oct. 3, 1985, Ser. No. 783,633

Int. Cl.⁴ D06F 39/00

U.S. Cl. 68—235 R

8 Claims



1. A shelf assembly for use with an appliance, the appliance having a top work surface with opposing side edges and a control panel disposed at a rear portion of and extending above the top work surface, said shelf assembly comprising:

- (a) a tray for providing an additional work surface and having opposing first and second ends;
(b) first and second side support panels disposed substantially vertically, each of said first and second side support panels having a top end attached to a corresponding one of said first and second ends of said tray and a bottom end resting upon the top work surface; and
(c) a bracket extending between and attached at opposite ends to said first and second side support panels respectively, said bracket having at least one foot disposed at a height above the top work surface and resting on the top of the control panel to steady said shelf assembly and to orient said additional work surface horizontally.

4,713,950
DEVICE ADAPTED TO MOVE THE SHARPENING GRINDING WHEELS IN A LEATHER SPLITTING MACHINE CLOSE TO AND AWAY FROM A CUTTING BLADE

Paolo Mascetti, Milan, Italy, assignor to Camoga S.p.A., Milan, Italy

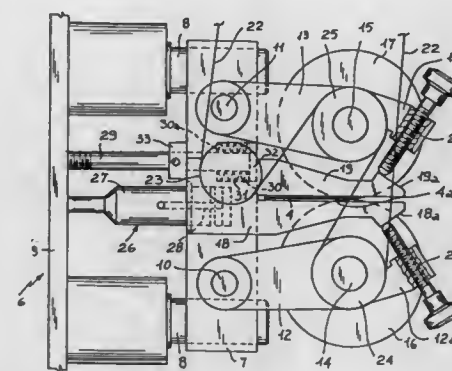
Filed Jul. 30, 1986, Ser. No. 891,769

Claims priority, application Italy, May 7, 1986, 21753 B/86

Int. Cl.⁴ C14B 1/18

U.S. Cl. 69—10

11 Claims



1. A device to move the sharpening grinding wheels in a leather splitting machine close to and away from a cutting blade comprising:

- a pair of grinding wheels symmetrically disposed relative to the bevel of the cutting blade;
a carriage slidably movable along guiding rods;
a pair of arms each of them having one end pivoted on said carriage and the opposite end connected to one of the grinding wheels;
control means adapted to automatically move the carriage from a position in which the sharpening grinding wheels are operatively engaged on the cutting blade bevel to a position in which the grinding wheels are spaced apart from the cutting blade; and
repositioning means designed to automatically return the grinding wheels into engagement with the bevel of the cutting blade.

4,713,951

SEPARABLE KEY HOLDER

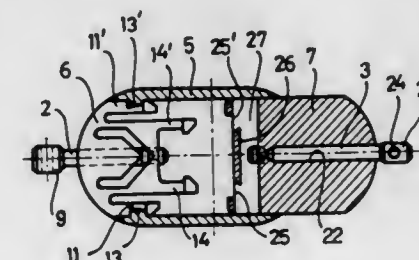
Johannes F. Ros, LT Blaricum, Netherlands, assignor to Innovative Concepts Europe B.V., Netherlands

Filed Nov. 4, 1985, Ser. No. 794,725

Int. Cl.⁴ A47G 29/10

U.S. Cl. 70—456 R

9 Claims



7. A separable key holder comprising:
a first sleeve member comprising:
an axially disposed orifice opening into one end thereof;
a coupling pin slidably receivable in the orifice and having a first and second end thereof, the first end being provided with a first ring-shaped element for the ac-

commodation of keys thereon and the second end comprising:

- a narrowed cylindrical portion; and
- a conical portion; and
- a pair of resilient spring lips axially extending inside the sleeve and integral therewith, each of the pair having a free end thereof, said free end terminating in a hook-shaped tip, and each of the pair being provided with a triangular shaped protrusion adapted to cooperate with the conical portion to resiliently and laterally displace the lips; and
- a second member adapted to be slidably received in the first member and comprising:
 - a fixed pin mounted to one end thereof and provided with a second ring-shaped member for the accommodation of keys thereon; and
 - a pair of apertures adapted to receive and engage the hook-shaped tips;

wherein, when the coupling pin is axially displaced, the conical section thereof engages the cooperating protrusions of the lips and laterally displaces said lips, thereby permitting the hooked tips thereof to disengage from the apertures and the two holder members to be detached from each by axially displacing them with respect to each other.

4,713,952

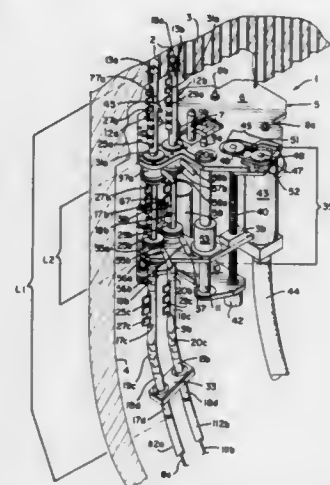
TOOL AND METHOD FOR ROTOPEENING THE PERIPHERAL TUBES IN A TUBESHEET

Robert D. Senger, Unity Township, Westmoreland County; William E. Pirl, Trafford, and Charles H. Roth, Jr., North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 5, 1986, Ser. No. 826,453

Int. Cl.⁴ B21D 7/06

U.S. Cl. 72—53



24. An improved apparatus for remotely rotopeening the inside walls of the peripheral tubes in a tubesheet, wherein the periphery of the tubesheet abuts a wall, comprising:

- (a) at least one rotopeening spindle having a flexible and rotatable outer housing formed from a plurality of jointed segments, each of which is substantially the same length;
- (b) a frame means for supporting said spindle, wherein said frame means includes a wall abutting side where said spindle is movably mounted, and a top plate having a connecting and aligning means for detachably connecting said top plate to the tubesheet, and for aligning the spindle into registry with the open end of a selected tube, and
- (c) an advancing and retracting means mounted on said wall abutting side of said frame means including a first spindle gripper mounted on said top plate of said frame means for selectively gripping and ungrasping the housing of the spindle, and a second spindle gripper reciprocally mov-

able on said wall abutting side of said frame means for selectively gripping and ungrasping the housing of the spindle in cooperation with said first spindle gripper in order to remotely and incrementally advance and retract said spindle housing through said top plate, wherein the stroke of said reciprocally movable second gripper is less than the length of two of the segments forming the spindle housing in order to insure that the motion generated by the reciprocally movable second gripper will serve to insert the flexible spindle into the open end of a selected tube.

4,713,953

SUPERPLASTIC FORMING PROCESS

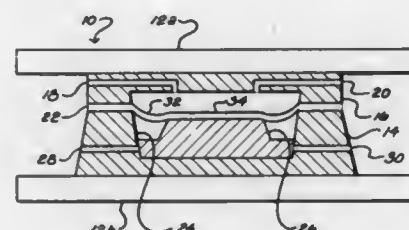
Parviz Yavari, Torrance, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Dec. 9, 1985, Ser. No. 806,894

Int. Cl.⁴ B21D 26/02

U.S. Cl. 72—60

15 Claims



1. A method for forming superplastic material in a gas pressurized die having a die cavity defining a topography, said method is partitioned into a plurality of stages corresponding to differing extensions of said material into said die cavity, comprising

- determining one of a plurality of rectangular box shapes models which more closely reflects the shape of said die cavity,
- analytically modeling in three dimensions the die cavity to one of said plurality of rectangular box shapes having a height, width and length,
- analytically modeling a plurality of three dimensional shapes of the superplastic material as said superplastic material deforms into a part defined by said die cavity topography, each of said plurality of three dimensional shapes corresponds to a respective one of said stages,
- determining radius equations based upon spherical models penetrating said die cavity, each of said radius equation is based upon spherical models penetrating said die cavity, each of said radius equations corresponds to a respective one of said stages,
- determining thickness equations based upon said spherical models penetrating said die cavity, each of said thickness equations is based upon spherical models penetrating said die cavity, each of said thickness equations corresponds to respective said stages,
- determining a gas pressure versus time profile comprising determining the pressure versus time profile for each of a plurality of time segments each of which corresponds to a respective one of said stages,
- heating said superplastic material to above one-half of the melting point of said superplastic material whereby said superplastic material exhibits superplastic properties, and
- applying gas pressure pursuant to said gas pressure versus time profile, said gas pressure is applied against said superplastic material forcing said superplastic material into said die cavity thereby forming said part defined by said cavity topography.

4,713,954

THREAD ROLLING DIES

Richard H. Corrette, Cleveland, Ohio, assignor to Colt Industries Operating Corp., West Hartford, Conn.

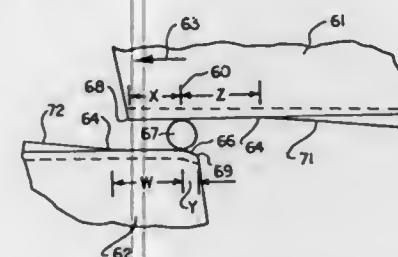
Division of Ser. No. 573,019, Jan. 23, 1984, Pat. No. 4,631,947.

This application May 12, 1986, Ser. No. 861,937

Int. Cl.⁴ B21H 3/06

U.S. Cl. 72—88

5 Claims



1. A pair of thread rolling dies comprising each die providing a working face extending from a start end to a finish end and provided with thread forming grooves angulated at the helix angle of the threads to be formed, said thread forming grooves cooperating to form threads on a fastener blank by causing said blank to roll between said working faces from said start end to said finish end, a given location on said fastener being progressively and repeatedly formed alternately by thread forming grooves on one working face and then by thread forming grooves on the other working face, an inclined roll-on ramp at the start end of one die along which said blank moves until it is gripped between said working faces to commence the forming of threads thereon, the gripping of said blank between said dies occurring at a location spaced from the start end of said one die by a distance substantially equal to the length of said roll-on ramp, said thread forming grooves being positioned with respect to said working faces so that a match point exists at a location spaced from said start end of said one die and substantially when said blank is first gripped between said working faces.

4,713,955

METHOD PERMITTING THE INCREASE OF OPERATIONS OF COLD PILGER MILLS AND AN APPARATUS FOR THE EMBODIMENT OF THIS METHOD

Pierre Peytavin, Neuilly-sur-Seine, France, assignor to Vallourec, France

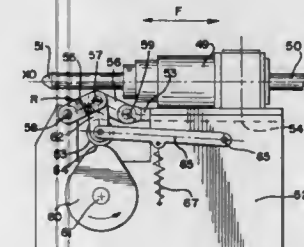
Continuation of Ser. No. 688,298, Jan. 2, 1985, Pat. No. 4,658,617. This application Oct. 22, 1986, Ser. No. 922,057

Claims priority, application France, Jan. 5, 1984, 84 00697

Int. Cl.⁴ B21B 21/00

U.S. Cl. 72—208

5 Claims



1. A recoil apparatus for use on a cold pilger mill having a mandrel connected to a mandrel holding shaft, the mandrel located in a pipe blank contacted by grooved rolls which are mounted in a rolls carriage effecting an oscillating movement along the rolling axis of the pipe blank, the recoil apparatus recoiling the mandrel upstream from the pipe blank and there-

after returning the mandrel to its initial position, the recoil apparatus comprising:

- a shaft pincer mounted on the mill slideably with respect to the rolling axis, the shaft pincer seizing the mandrel holding shaft near its upstream end;
 - an articulated holding part connected at a downstream position to the shaft pincer and at an upstream position to the mill, the articulated holding part having at least one pivoted joint along its length; and
 - means connected to the pivoted joint for periodically pivoting the articulated holding part about its pivoted joint thereby temporarily shortening the distance between the shaft pincer and the upstream position of the mill connected to the articulated holding part;
- whereby the mandrel, holding shaft and shaft pincer are periodically shifted upstream and returned to their initial position.

4,713,956

APPARATUS FOR MANUFACTURING SPRING UNITS

Noboru Sasaki, Yasuji Iwata, and Teruo Mukai, all of Tokyo, Japan, assignors to France Bed Co., Ltd., Tokyn, Japan

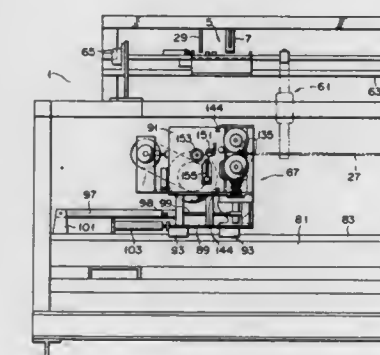
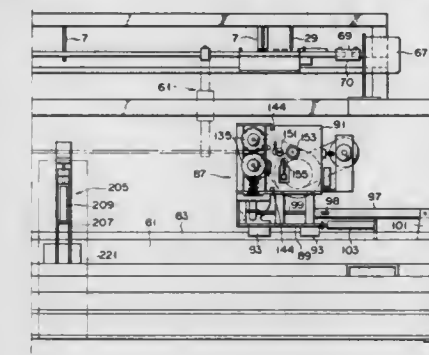
Filed Jun. 29, 1984, Ser. No. 626,435

Claims priority, application Japan, Jul. 4, 1983, 58-120342; Jul. 4, 1983, 58-120343; Jul. 4, 1983, 58-120344; Jul. 4, 1983, 58-120345; Jul. 4, 1983, 58-120346; May 14, 1984, 59-94728

Int. Cl.⁴ B21F 35/02, 45/00

U.S. Cl. 72—137

28 Claims



1. An apparatus for manufacturing coil spring units from a wire (27) comprising:

- means (51, 53, 57, 59) for slightly curving both ends of the wire (27);
- a frame (1) having guide rails (83);
- first and second movable bodies (87) mounted to be freely slidable on the guide rails (83);
- means for driving said bodies along the guide rails; first and second holding means (135) respectively carried on

the paired movable bodies (87) to hold both end sections (27a) of the end-bent wire (27); means (61) for supplying the end-bent wire (27) to the first and second holding means (135) and means for fixedly securing the wire relative to said guide rails; first and second coil forming means (151, 153, 155) respectively carried on the movable bodies (87) to bend into a spiral coil those portions of the wire (27) which respectively extend from the first and second holding means as the movable bodies (87) move toward each other, each of the first and second coil forming means (151, 153, 155) including shaping roller means (153) in abutting contact with the wire (27) to bend it like a coil, guide member means (151) arranged between the shaping roller (153) and the associated one of the first and second holding means (135) for guiding the wire (27) supplied from the associated holding means (135) to the shaping roller (153), the diameter of one turn of the spiral being determined by the distance between the shaping roller means (153) and the guide member means (151), and pitch rod means (155) arranged between the guide member (151) and the shaping roller means (153) to determine the pitch of the spiral formed by the shaping roller means (153).

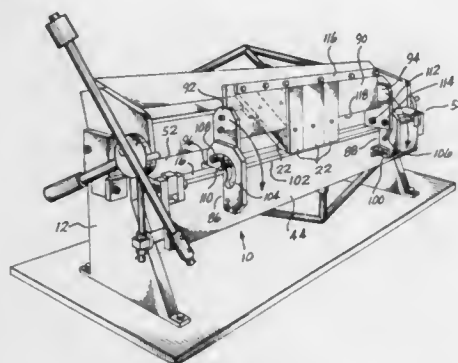
4,713,957

REVERSE BEND ATTACHMENT FOR A SHEET METAL BRAKE

Ernest J. Eder, 16810-27th Ave. SW., and Laverne D. Goodwin, 16901-27th Ave. SW., both of, Seattle, Wash. 98166
Filed Aug. 12, 1986, Ser. No. 895,788
Int. Cl.⁴ B21D 5/04

U.S. Cl. 72—319

15 Claims



1. For use with a sheet metal box and pan brake of a type comprising a bed including a sheet metal support having an elongated edge; clamp means including forming edge means which is positioned substantially vertically above the support edge when the clamp means is functioning to clamp a sheet metal member against said support; and a bending leaf which is pivotally attached to said bed, for pivotal movement between a down position and an up position, said bending leaf having an edge surface which is generally coplanar with the support surface of the bed when the bending leaf is in its down position, said bending leaf having an outer side and a right angle outer corner formed where said edge surface intersects the outer side of the bending leaf, a reverse bend making attachment comprising:

a pair of spaced apart end mounts detachably connectable to said brake, each said end mount having a first position for extending over the support of the bed and a second position for extending downwardly from the first portion outwardly adjacent the outer side of the bending leaf; a bending member extending longitudinally between said end mounts; means pivotally connecting the bending member to said end

mounts, for pivotal movement between a start position and a forming position; said bending member having a force applying surface means, wherein when the bending member is in its start position, and a sheet metal member is clamped between the bed and the clamp means of the brake, and extends horizontally outwardly from the outer side of the bending leaf, said surface means makes contact with an upper surface portion of the sheet metal member at a location immediately outwardly of said right angle corner on the bending leaf; and said means for pivotally connecting comprising a pair of arcuate slots, one in each end mount, having centers substantially coinciding with said right angle corner, and bearing means carried by the bending member and extending into said slots, said bearing means mounting the bending member for pivotal movement between its start and bending positions about an axis coinciding with said right angle corner on the bending leaf.

4,713,958

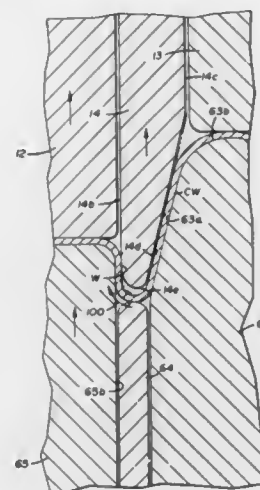
METHOD AND APPARATUS FOR FORMING CONTAINER END PANELS

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Oct. 30, 1986, Ser. No. 924,835
Int. Cl.⁴ B21D 51/44

U.S. Cl. 72—348

10 Claims



1. A method of forming a container end panel from a blank of material comprising the steps of:
(A) forming a cup-shaped member having a formed bottom panel and an annular peripheral section; and
(B) holding a portion of said peripheral section and forming a countersink radius adjacent said bottom panel by pulling material from said peripheral section.

4,713,959

TOOL FOR COUPLING SECTIONS OF AIR CONDITIONING DUCTS

Richard Bennett, 1600 E. Ocean Blvd. #8, Long Beach, Calif. 90802

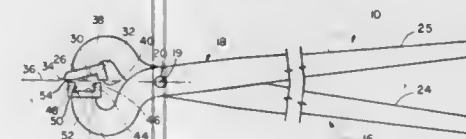
Filed May 30, 1986, Ser. No. 868,686
Int. Cl.⁴ B21D 7/06

U.S. Cl. 72—410

18 Claims

1. A tool for use in connecting together sections of air conditioning ducts comprising a pair of co-operating first and second levers which are joined at a fulcrum between their extremities to define opposing handles on one side of said fulcrum and opposing jaws on the opposite side of said fulcrum, and said jaw of said first lever has a bearing surface including a flat face

and a heel disposed at right angles to each other to concavely face said jaw of said second lever, and said jaw of said second lever is of a U-shaped configuration concavely facing said jaw of said first lever and has a flat floor, a heel and a lip, configured so that said heel of said jaw of said second lever extends outwardly from said flat floor between said flat floor and said



fulcrum and is aligned to bear against said heel of said jaw of said first lever, and the edge of said heel of said jaw of said second lever remote from said fulcrum and proximate to said flat floor is chamfered, and said lip projects outwardly from said flat floor to bear against a portion of said bearing surface of said jaw of said first lever.

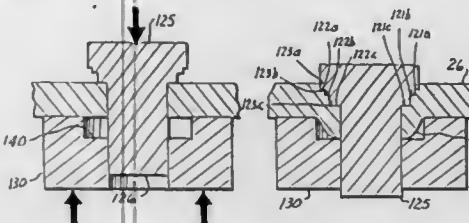
4,713,960

METHOD FOR FORMING A COUNTERSINK IN A PLATE

J. Scott Gassaway, 2356 Glendon, Los Angeles, Calif. 90064
Division of Ser. No. 562,849, Dec. 19, 1983, Pat. No. 4,634,009.
This application Aug. 8, 1986, Ser. No. 894,967
Int. Cl.⁴ B21D 53/00

U.S. Cl. 72—412

2 Claims



1. A method to form a countersink in a plate having a pair of parallel surfaces, a hole through said plate between said surfaces, said plate being made of a material which can be work-hardened, said method comprising:

utilizing a punch having an axis, an axially extending substantially circular cylindrical stem and a peripheral head adjacent to said stem, said head having a pressure face adjacent to said stem, coaxial therewith, and projecting radially beyond it, said pressure face having a plurality of ring-like steps, each step having a substantially flat base surface and a substantially circular cylindrical peripheral wall surface, the diameter of each step farther from said stem being larger than the diameter of its contiguous step that is close to said stem, said stem having no radial dimension larger than the dimension contiguous to the step closest to said stem;

leaving unrestrained an annular ring of one of said plate surfaces contiguous to said hole, and restraining said one surface against axial displacement around said ring, whereby the metal within said ring is capable of limited axial displacement;

pressing said punch into said hole, stem first, the diameter of the stem closely approximating the diameter of the hole, continuing to press the punch into said hole with such a force and at such a rate as to cause deformation, but not shearing, of the metal, whereby the steps indent into the other of said plate surfaces to form a stepped countersink with coldworked surfaces, and the material inside said ring deforming downwardly to form a raised ring, and the diameter of the hole below said countersink equalizing that of the stem; and withdrawing the punch from the plate.

4,713,961

TRANSFER PRESS

Herbert Hoehn, Goeppingen, and Kurt Strommer, Kuchen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

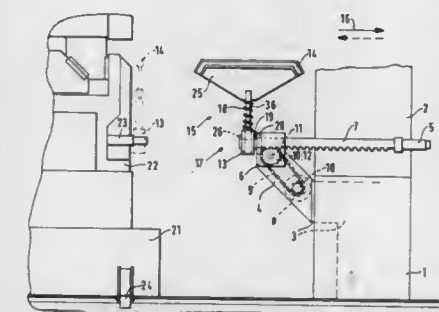
Filed Feb. 11, 1986, Ser. No. 828,183

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504765

Int. Cl.⁴ B21D 43/20

U.S. Cl. 72—419

18 Claims



1. An installation for transferring workpieces from a moveable work station means to a plurality of different idle areas, each associated with a press installation whereat the workpiece can be stored, comprising: a plurality of press installations each having an idle area adjacent thereto; each press installation including a movable work station means moveable between idle areas; gripping and retaining means arranged at each idle area for gripping and retaining supporting element means used to hold workpieces; each supporting element means detachably attached to mounting means carried by the moveable work station means to be moved adjacent an area of one of the idling areas by said gripping and retaining means; said mounting means coordinated to each gripping and retaining means; said gripping and retaining means being operable to be set into rotary motion by a rotary drive means; said gripping and retaining means moveable towards said mounting means to detach said supporting element means from said mounting means; said rotary drive means rotating said supporting element means after detachment from said mounting means; and said gripping and retaining means being able to move said supporting element means into the idle area of its associated press installation.

4,713,962

TEST DEVICE FOR A DENTAL PERCUSSION INSTRUMENT

Juergen Wohlgemuth, Darmstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

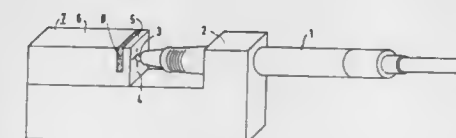
Filed Nov. 27, 1985, Ser. No. 802,255

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445507

Int. Cl.⁴ G01L 5/00

U.S. Cl. 73—11

12 Claims



1. A test device for a dental percussion instrument, which instrument contains a movably seated ram which is accelerated to a definite speed preferably with the assistance of a magnetic drive, which is electronically controlled to sequentially move the ram toward a test subject in free flight with a constant

speed and after impact of the end of the ram against the test subject, the ram being returned to its initial position by the drive, said test device including a test member being situated externally of the percussion instrument and having a seating surface for the end of the ram to strike, and means for mounting said test member to have the elasto-mechanical properties corresponding to those of the test subject, said means for mounting including a carrier member of a solid body of material with a slot to form the test member as a component part of said carrier member.

4,713,963

METHOD AND DEVICE FOR VACUUM CHROMATOGRAPHY

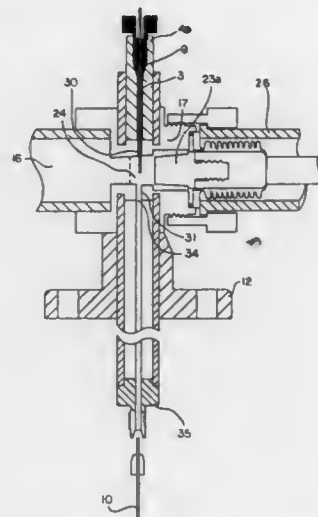
Daryl Sharp, 317 Woodhaven, Chapel Hill, N.C. 27514

Filed Jun. 26, 1986, Ser. No. 879,022

Int. Cl.⁴ G01N 31/08

U.S. Cl. 73—23.1

21 Claims



1. A device for analysis of a sample using a mass spectrometer and a sample introduction column, said sample introduction column having a first end and a second end, said sample being deposited in a thin film on an adsorbent coating on the interior of the first end of the sample introduction column comprising:

- an MS transfer column having a bore greater in diameter than the exterior of said sample introduction column; said bore having a chromatographic surface; said MS transfer column having a first end and a second end; said first end of said MS transfer column being insertable into the mass spectrometer source;
- a means for connecting the second end of said sample introduction column to a carrier gas source;
- an enclosed chamber into which the second end of said MS transfer column and the first end of said sample introduction column may be inserted;
- a means for axially aligning the sample introduction column and MS transfer column;
- a means for applying a vacuum source to said enclosed chamber;
- a means for supporting said sample introduction column at a point outside of said enclosed chamber; and
- a means for moving said sample introduction column along its axis so that the extent to which it is inserted into the MS transfer column may be controlled.

4,713,964 DEVICE FOR OPTICAL TURBIDITY MEASURING OF GASES

Gregor Ioannides, Furth, Fed. Rep. of Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig holland.Stiftung & Co. KG, Fuerth/Bay, Fed. Rep. of Germany

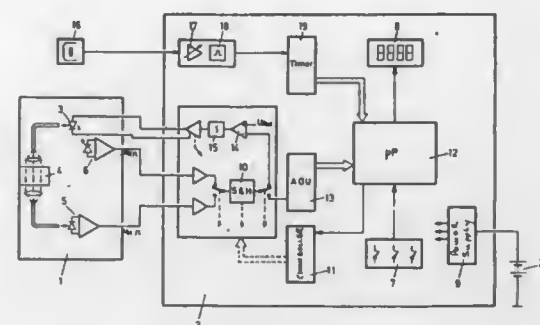
Filed Jul. 16, 1986, Ser. No. 887,022

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526458

Int. Cl.⁴ G01M 15/00

U.S. Cl. 73—116

13 Claims



1. A device for measuring the soot content of gases discharged by diesel engines comprising: a chamber disposed in a flow of gases discharging from said engine; a light source for projecting light through said chamber; a light sensor disposed opposite said light source for generating a signal corresponding to the intensity of light passing from said source through said chamber; and signal processing means for processing said signal and generating output signals indicative of said soot content, said signal processing means including means for storing a plurality of signals from the light sensor and determining the average and peak values of said signals for a predetermined number of said signals.

4,713,965

METHOD AND SYSTEM FOR DETECTING FUEL INJECTION TIMING IN A DIESEL ENGINE

Fumiaki Kobayashi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

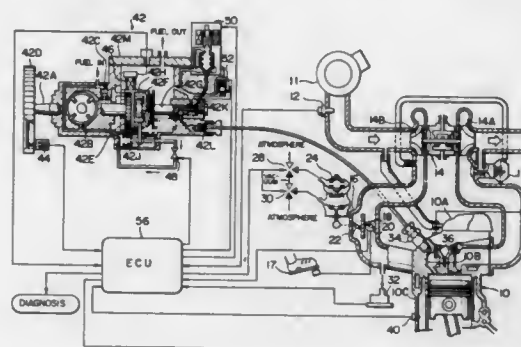
Filed Jul. 7, 1986, Ser. No. 882,380

Claims priority, application Japan, Jul. 8, 1985, 60-149498

Int. Cl.⁴ G01M 15/00

U.S. Cl. 73—119 A

16 Claims



1. A method of detecting fuel injection timing in a diesel engine having a fuel injection pump, wherein a member is provided for converting rotary motion of a pump driving shaft into reciprocating motion of a fuel pressure-feed plunger, said converting member being rotatable relative to said pump driv-

ing shaft to vary the starting position of the compression stroke of said fuel pressure-feed plunger so as to control fuel injection timing, comprising the steps of:

- (a) directly detecting a crank angle reference position which corresponds to a specific crank angle from rotation of a member rotatable in association with rotation of said engine, which is disposed outside said fuel injection pump;
- (b) detecting a predetermined pump angle from rotation of said converting member relative to said pump driving shaft, in said fuel injection pump; and
- (c) determining fuel injection timing from the phase difference between the crank angle reference position and the predetermined pump angle.

4,713,966

METHOD AND APPARATUS FOR VOLUME MEASUREMENT

Carl H. Thyren, Malmö, and Tore Hesthamar, Lund, both of Sweden, assignors to Enpece AB, Lund, Sweden

PCT No. PCT/SE85/00537, § 371 Date Oct. 16, 1986, § 102(e)

Date Oct. 16, 1986, PCT Pub. No. WO86/03834, PCT Pub.

Date Jul. 3, 1986

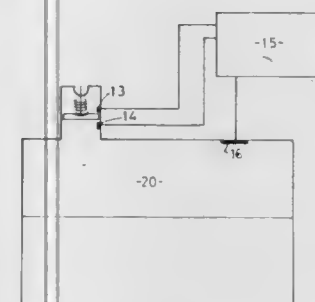
PCT Filed Dec. 20, 1985, Ser. No. 916,545

Claims priority, application Sweden, Dec. 21, 1984, 8406547

Int. Cl.⁴ G01F 17/00

U.S. Cl. 73—149

2 Claims



1. A method of measuring the volume (v) of a gas in a container, comprising varying the container volume according to a sine wave between a minimum and a maximum value, said variation being effected at a constant frequency but at a varying amplitude, in order to obtain a predetermined pressure difference (Δp) of the gas in the container; determining the volume difference (ΔV) corresponding to said predetermined pressure difference (Δp) by detecting the points of time when at least two points on said sine wave are attained which correspond to two predetermined values of the container volume; measuring the time between the said two points on said sine wave and using said measurement for calculating the maximum and the minimum value of the volume (V), which are used for calculating the volume difference (ΔV) corresponding to said predetermined pressure difference (Δp); and calculating the volume (V) on the basis of the formula $V = \Delta V p_0 / \Delta p$ wherein p_0 = the static pressure and $\eta = C_p / C_v$, wherein C_p and C_v are the specific heat capacity at, respectively, constant pressure and constant volume of the gas within the container.

4,713,967

METHOD AND APPARATUS FOR MEASURING A WATER CONDITION

Ronald R. Overs, 96 Fox Hunt La., East Amherst, N.Y. 14051, and Darold Wobshall, Williamsville, N.Y., assignors to Ronald R. Overs, East Amherst, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,248

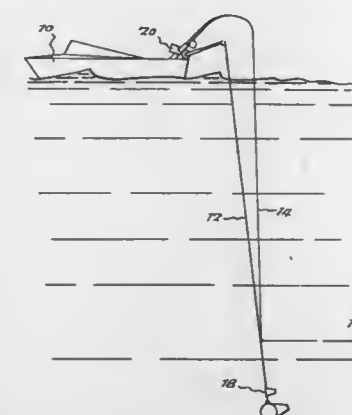
Int. Cl.⁴ G08C 19/00; H04B 3/46

U.S. Cl. 73—170 A

18 Claims

1. A method for measuring at least one water condition proximate a desired location in the water, said method comprising: positioning a sensor for such condition proximate said

location, which sensor provides an electrical signal proportional to said condition, modulating a high frequency radio signal using said electrical signal to form a modulated radio signal, transmitting said modulated signal along a conductive



line, detecting said modulated signal from the line and utilizing said detected signal to drive an observable indicator of said condition, wherein said desired location is proximate a fishing bait and the conductive line is a down rigger line.

4,713,968

METHOD AND APPARATUS FOR MEASURING THE MECHANICAL ANISOTROPY OF A MATERIAL

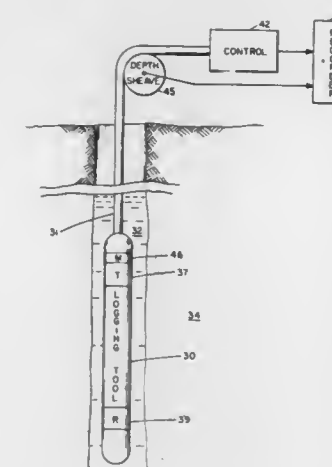
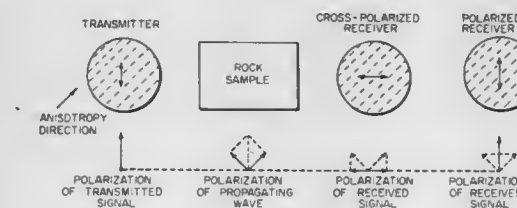
David P. Yale, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 22, 1986, Ser. No. 865,999

Int. Cl.⁴ G01V 1/40; E21B 49/00

U.S. Cl. 73—594

12 Claims



1. A method for determining the azimuthal direction of the mechanical anisotropy of a material, comprising the steps of: (a) transmitting polarized shear acoustic energy through said material with a polarized transmitting shear transducer,

- said acoustic energy being repolarized within said material into a pair of shear waves of differing polarizations, a first of said shear waves having a polarization parallel to the azimuthal direction of the mechanical anisotropy of the material and a second of said shear waves having a polarization perpendicular to the azimuthal direction of the mechanical anisotropy of the material;
- (b) receiving polarized shear acoustic energy which has traveled through said material with a polarized receiving shear transducer which is cross-polarized with respect to said transmitting shear transducer,
 - (c) synchronously rotating the azimuthal direction of said shear acoustic energy transducers with respect to said material, and
 - (d) measuring the amplitudes and phases of both the transmitted and received shear acoustic energies as a function of the azimuthal rotation of said transmitting and receiving shear acoustic energy transducers,
 - (e) comparing the phase of said cross-polarized received shear acoustic energy with the phase of the transmitted shear acoustic energy as a function of the azimuthal rotation of said shear acoustic energy transducers,
 - (f) detecting the pair of perpendicular azimuthal directions for which the amplitude of the cross-polarized received shear acoustic energy is at a minimum,
 - (g) detecting at least a first quadrant between said pair of perpendicular azimuthal directions for which said transmitted and cross-polarized received shear waves are in-phase with respect to one another,
 - (h) detecting at least a second quadrant between said pair of perpendicular azimuthal directions in which said transmitted and cross-polarized received shear acoustic energies are out-of-phase with respect to one another, and
 - (i) identifying the azimuthal direction of the mechanical anisotropy of said material from the relationship of said pair of perpendicular azimuthal directions and said first and second quadrants.

4,713,969

DIFFERENTIAL PRESSURE TRANSMISSION APPARATUS

Akira Ishii, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

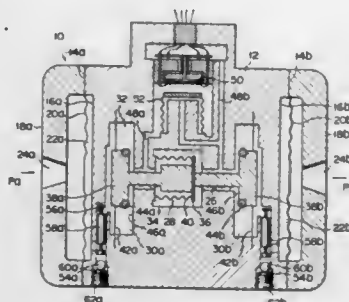
Continuation of Ser. No. 655,445, Sep. 28, 1984, abandoned. This application Apr. 10, 1987, Ser. No. 37,129

Claims priority, application Japan, Sep. 30, 1983, 58-182620; Sep. 30, 1983, 58-182646

Int. Cl.⁴ G01L 13/02, 13/06

U.S. Cl. 73-706

21 Claims



1. A differential pressure transmission apparatus comprising:
 - a body having therein a pressure transmission passage filled with a pressure transmission medium, said pressure transmission passage having a high-pressure side end and a low-pressure side end, these ends being open at the outer surface of the body;
 - a high-pressure side pressure-receiving diaphragm, mounted on the body and closing the high-pressure side end of the pressure transmission passage, for receiving a high-pres-

sure side pressure and for transmitting the pressure to the medium;

- a low-pressure side pressure-receiving diaphragm, mounted on the body and closing the low-pressure side end of the pressure transmission passage, for receiving a low-pressure side pressure and for transmitting the pressure to the medium;
- differential-pressure/displacement converting means disposed in the body, partitioning the pressure transmission passage into a high-pressure side section and a low-pressure side section, and being displaceable according to pressure differences between these sections;
- a pressure-sensing element for detecting pressure differences between the pressure in the high-pressure side section and the pressure in the low-pressure side section;
- first throttle means, disposed in the high-pressure side section, for attenuating pressure variations transmitted from the high-pressure side pressure-receiving diaphragm, said first throttle means establishing a first throttling cross-sectional area disposed between a first portion of the high-pressure side section adjacent the high-pressure side pressure-receiving diaphragm and a remaining portion of the high-pressure side section;
- second throttle means, disposed in the low-pressure side section, for attenuating pressure variations transmitted from the low-pressure side pressure-receiving diaphragm, said second throttle means establishing a second throttling cross-sectional area disposed between a first portion of the low-pressure side section adjacent the low-pressure side pressure-receiving diaphragm and a remaining portion of the low-pressure side section;
- first and second medium seal ports formed in the body;
- first filling means for filling the high-pressure side section with the medium, the first filling means comprising means for establishing first filling flow paths having respective minimum cross-sectional areas that are greater than the first throttling cross-sectional area and that respectively communicate the first and remaining portions of the high-pressure side section with the first medium seal port; and
- second filling means for filling the low-pressure side section with the medium, the second filling means comprising means for establishing second filling flow paths having respective minimum cross-sectional areas that are greater than the second throttling cross-sectional area and that respectively communicate the first and remaining portions of the low-pressure side section with the second medium seal port.

4,713,970

THERMAL DIFFUSION FLUID FLOW SENSOR

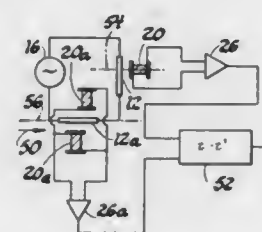
David K. Lambert, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 645,253, Aug. 29, 1984, Pat. No. 4,576,050. This application Mar. 12, 1986, Ser. No. 838,929

Int. Cl.⁴ G01F 1/68; G01P 5/10

U.S. Cl. 73-861.05

7 Claims



1. A fluid flow sensor for location contiguous to a body of fluid subject to flow to be measured, comprising:
 - a thin film substrate having a thermal diffusivity substantially less than that of the fluid and having a thermal conductivity substantially greater than that of the fluid;

thermal oscillation means on the surface of the substrate for generating thermal oscillations in the fluid, whereby thermal oscillations are propagated through the fluid at a rate dependent on fluid flow to substrate surface locations spaced from the oscillation means;

primary and reference thermal oscillation detector means on the substrate surface equally spaced from the oscillation means for providing primary and reference output signals corresponding to the thermal oscillations at the detector means, the reference detector means having the same sensitivity to temperature and pressure as the primary detector means;

the oscillation means and the primary detector means having an axis of symmetry parallel to the nominal direction of flow so that the primary detector output signal is substantially insensitive to small changes in flow direction and being arranged for sensing thermal oscillations propagated generally in one direction parallel to the nominal direction of flow;

the oscillation means and reference detector means having an axis of symmetry parallel to the nominal direction of flow so that the reference detector output signal is as insensitive to small changes in flow direction as the primary output signal and being arranged for sensing thermal oscillations propagated in the opposite direction parallel to nominal direction of flow; and

signal responsive means coupled to the primary and reference detector means for producing an output correlated to the fluid flow near the substrate surface, and the signal responsive means includes means for compensating for effects of changes in fluid pressure and temperature and small changes in flow direction comprising circuitry for determining the relative phase of the detector outputs.

4,713,971

DEVICE FOR DETERMINING THE VELOCITY IN A FLOWING FLUID BY USE OF THE ACOUSTIC DOPPLER-EFFECT

Wilhelmus Johannes, Tuinstraat 37, 2613 RB Delft, Netherlands

PCT No. PCT/NL85/00035, § 371 Date May 27, 1986, § 102(e)

Date May 27, 1986, PCT Pub. No. WO86/01605, PCT Pub.

Date Mar. 13, 1986

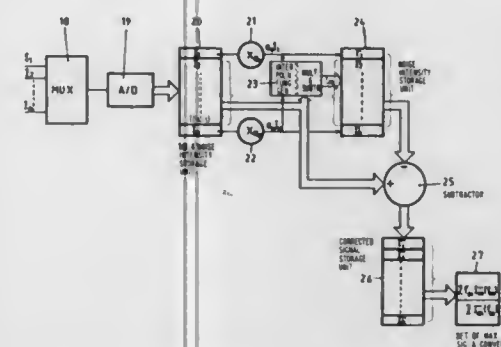
PCT Filed Aug. 23, 1985, Ser. No. 865,727

Claims priority, application Netherlands, Aug. 24, 1984, 8402588

Int. Cl.⁴ G01F 1/66

U.S. Cl. 73-861.25

3 Claims



1. In a device for determining the velocity in a flowing fluid, of the type including an ultrasound transmitter and a receiver coupled therewith for receiving ultrasounds reflected from the fluid, which are amplified and demodulated therein so as to produce a low-frequency Doppler-signal, a spectrum analyzer for detecting the frequency of said Doppler-signal, consisting of a number (n) of bandpass filters of different passband frequency ranges, peak detectors for measuring the energy values of the respective individual frequency components passed by said bandpass filters, and a calculation unit for calculating the

frequency at which the low-frequency Doppler-signal appears to have a maximum, the latter being a measure for the mean flow velocity, the improvement comprising, in combination means, in said calculation unit, for providing a first decrementation factor for the frequency component passed by the bandpass filter which has the lowest passband frequency range and a second decrementation factor, which is smaller than said first decrementation factor and therefore produces more decrementation than said first decrementation factor, for the frequency passed by the bandpass filter which has the highest passband frequency range, interpolating means for providing respective decrementation factors for said frequency components passed respectively by the remainder of said bandpass filters, by reference to a monotonic interpolation function for interpolating between said first and second decrementation factors, means for multiplying said measured energy values respectively by said decrementation factors to produce noise energy values and means for subtracting said noise energy values from the respective corresponding measured energy values to produce corrected energy values.

4,713,972

POCKET AIR VELOCITY GAUGE

Hans-Dieter Stockburger, Richard Wagner Str. 15, 7730 Villingen-Schwenningen, Fed. Rep. of Germany

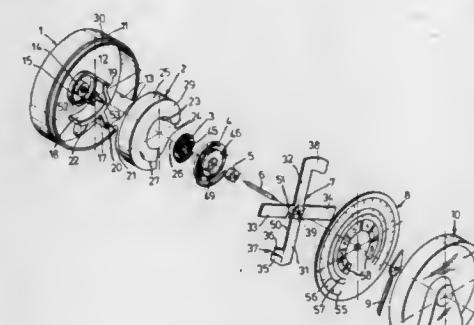
Filed Jun. 19, 1986, Ser. No. 876,225

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3522001

Int. Cl.⁴ G01F 1/28

U.S. Cl. 73-861.76

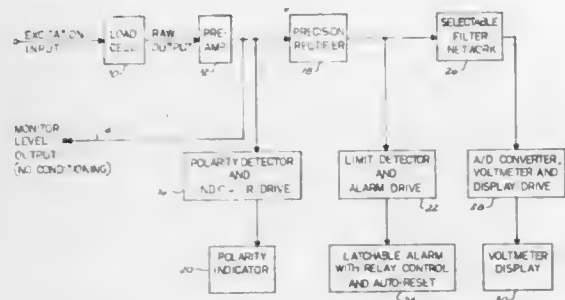
18 Claims



1. A pocket air velocity gauge comprising, a housing defining a space, a central pointer shaft mounted for rotation to said housing about an axis, means defining a ring channel in said space around said axis, said housing having an inlet into one end of said channel and an outlet into an opposite end of said channel for the flow of air into said inlet, in a flow direction along said channel and out of said outlet, said channel increasing in cross-sectional area from said inlet to said outlet, a lever arm connected to said pointer shaft, an air vane connected to said lever arm and disposed in said ring channel, air entering said inlet opening striking said vane to rotate said lever arm around said axis, a first restoring spring operatively connected to said lever arm for exerting a restoring force on said lever arm for biasing said vane toward said inlet, said first restoring spring being active to bias said vane through the entire rotation of said lever arm, a second restoring spring, engagement means operatively connected between said second restoring spring and said lever arm for connecting said second restoring spring to said lever arm only after said lever arm has rotated a selected angle to bias said vane back toward said inlet only after said lever arm has rotated said selected angle, a pointer connected to said pointer shaft and a dial scale connected to said housing over which said pointer moves to indicate a rotation of said pointer shaft.

4,713,973

INDICATOR WITH STAGED DATA PROCESSING
Joseph T. Woyton, 106 Braddock Dr., Mauldin, S.C. 29662
Filed Oct. 15, 1985, Ser. No. 787,058
Int. Cl.⁴ G01L 1/22; G01D 1/18
U.S. Cl. 73—862.67 21 Claims



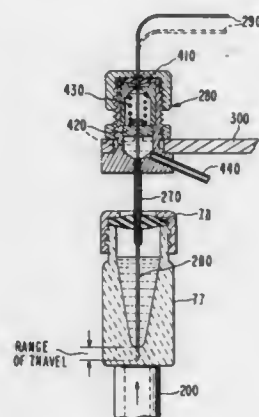
1. An apparatus of multiple, generally separate stages for processing input data comprising mechanical-deformation data from a load cell comprising a strain gauge, said apparatus comprising:

- pre-amplifier means for receiving and amplifying said data generally without otherwise conditioning same;
- rectifier means, separate from said pre-amplifier means, for rectifying said amplified data;
- meter means, responsive to said rectified, amplified data, for outputting and displaying an absolute signal level indication thereof, and
- polarity indicator means, responsive to said amplified generally non-conditioned data which has a substantially wide bandwidth, for outputting and displaying a polarity indication thereof, whereby absolute signal level and relatively high-frequency polarity indications are separately and accurately provided.

4,713,974

AUTOSAMPLER

Stanley A. Stone, State College, Pa., assignor to Varian Associates, Inc./Scientific Systems, Inc., Palo Alto, Calif.
Filed Apr. 18, 1986, Ser. No. 853,493
Int. Cl.⁴ G01N 30/24
U.S. Cl. 73—864.23 19 Claims



1. An autosampler for use in liquid chromatography comprising:

- carousel means for holding at least one vial rack having a plurality of recesses for receiving liquid-containing vials;
- a fixed needle assembly for withdrawing liquid from said vial;
- vial lifter means in vertical alignment with said fixed needle assembly for lifting individual vials out of said vial recesses and impaling said vials on said needle assembly;

means for moving said carousel to align said vial recesses with said vial lifter means;
said needle assembly comprising a sample needle having a limited range of vertical travel such that the needle will move upward when it contacts the bottom of a vial being lifted.

4,713,975

DENSE STAR POLYMERS FOR CALIBRATING/CHARACTERIZING SUB-MICRON APERTURES

Donald A. Tomalla, and Larry R. Wilson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 30, 1986, Ser. No. 868,979
Int. Cl.⁴ G01N 33/00, 33/483, 15/08

U.S. Cl. 73—865.8 18 Claims

1. In a substance having at least one aperture of a diameter of about 10,000 Angstroms or less, a process for measuring and characterizing the diameter of said aperture, comprising:

- (a) contacting said substance with a solution of a plurality of dense star polymers having at least one core branch emanating from a core, each core branch having at least one terminal group provided that (1) the ratio of terminal groups to the branches emanating from the core is 2:1 or greater, (2) the density of terminal groups in the dense star polymer is at least 1.5 times that of an extended conventional star polymer having similar core and monomeric moieties and a comparable molecular weight and number of core branches wherein each of such branches of the extended conventional star polymer bears only one terminal group, (3) a molecular volume that is equal to or less than 80 percent of the molecular volume of said extended conventional star polymer, and (4) the two-dimensional molecular diameter of the dense star polymer is in the range from about 8 to about 10,000 Angstroms;
- (b) passing through or into said aperture at least one dense star polymer having a molecular diameter of about equal to or less than the diameter of said aperture; and
- (c) calculating the diameter of said aperture from measurements of either those dense star polymers passing therethrough or thereto said aperture, of those dense star polymers not passing therethrough or thereto, or of the combined measurements of those dense star polymers passing therethrough or thereto said aperture and those not passing therethrough or thereto.

4,713,976

DIFFERENTIAL HAVING A GENERALLY SPHERICAL DIFFERENCING ELEMENT

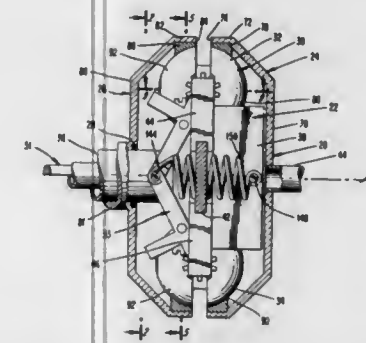
Donald F. Wilkes, Albuquerque, N. Mex., assignor to Vern Heinrichs, Toronto, Canada

Continuation-in-part of Ser. No. 714,950, Mar. 22, 1985, abandoned. This application May 16, 1985, Ser. No. 734,347
Int. Cl.⁴ F16H 15/00

U.S. Cl. 74—190 18 Claims

1. A differential mechanism comprising:
- support means for mounting the mechanism on a central axis;
 - input means for delivering rotary power to the mechanism;
 - output means for receiving rotary power from the mechanism, supported by the input means;
 - differencing means for establishing a rotary speed relationship between the input means and the output means, the differencing means frictionally engaging the output means at a first zone and frictionally engaging the input means at a second zone, the distance of the first zone and the distance of the second zone from the central axis being essentially constant, said differencing means including a generally spherical element frictionally engaging both the input means and the output means at the first and second zones, and being rotatable about a ball axis, the ball axis being

adjustable in a plane defined by said ball axis and the central axis such that the angle between the ball axis and the central axis is related to the relative rotational speeds of the input means and the output means, and the ball axis being movable through an angle of about 120° including a position disposed between the first zone and the second zone so that the input means and the output means can rotate in the same direction as well as in opposite directions;



loading means carried by the support means, engaging the differencing means to exert a radially outwardly directed force pressing the spherical element to the first zone and the second zone; and
control means operably connected with the differencing means for regulating the differencing means to control the rotary speed relationship between the input means and the output means.

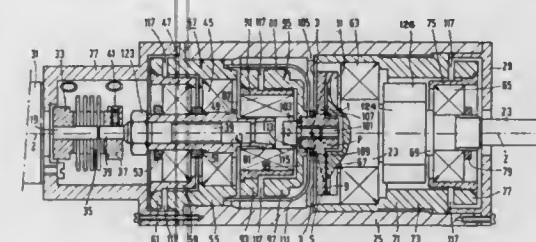
4,713,977

FRICITION-DISK TRANSMISSION COMPRISING A TILTABLE DISK

Marinus P. Koster; Hermanus M. J. R. Soemers, and Marinus J. J. Dona, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1986, Ser. No. 839,408
Claims priority, application Netherlands, Nov. 15, 1985, 8503140

Int. Cl.⁴ F16H 15/16 7 Claims
U.S. Cl. 74—191



1. A friction-disk transmission comprising
- a first shaft and a second shaft, each of said first shaft and said second shaft extending along a common axis of rotation, and each of said first shaft and said second shaft being rotated about said common axis;
 - a circular disk arranged between said first shaft and said second shaft, said circular disk being tilted at a point on said common axis about two orthogonal axes intersecting at said point, said two orthogonal axes being perpendicular to said common axis;
 - drive means coupled with said circular disk for providing eccentric motion about said common axis;
 - stationary fixing means surrounding said circular disk for preventing said circular disk from being rotated about said common axis;
 - spring means annularly surrounding said circular disk for

supporting said circular disk to said stationary fixing means, said spring means being secured to an inner portion of said stationary fixing means and an outer portion of said circular disk; and
supporting means coupled with said second shaft for determining rotation of said circular disk about said two orthogonal axes, said circular disk being rolled with frictional contact across said supporting means;
wherein a contact point between said circular disk and said supporting means provides said frictional contact in a circular path, said supporting means occupying a fixed axial position with respect to said common axis.

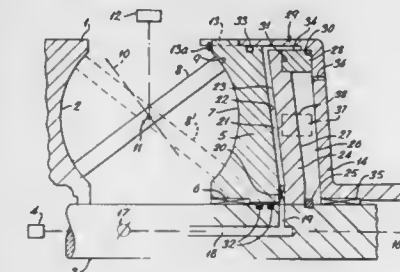
4,713,978

AUTOMOTIVE TRANSMISSIONS OF THE ROLLING TRACTION TYPE

Forbes G. D. B. Perry, Charlbury, England, assignor to National Research Development Corporation, London, England
Filed Jan. 23, 1986, Ser. No. 828,851

Claims priority, application United Kingdom, Jan. 30, 1985, 8502318

Int. Cl.⁴ F16H 15/38, 15/08 9 Claims
U.S. Cl. 74—200



1. A rolling traction automotive transmission comprising:
- a rotary first component;
 - second and third components;
 - means to generate an axial force to urge the said rotary first component into rolling contact with said second component, said means comprising a clearance between said first and said third components, which clearance includes an annular chamber coaxial with the said first component and adapted to be filled with pressurized fluid;
 - a first axially-facing bounding surface of said chamber, presented by said first component;
 - a second axially-facing bounding surface of said chamber, presented by said third component;
 - a ring seal presenting a sealing face which provides a third bounding surface of said chamber and bridges the said clearance between said first and third components;
 - said sealing face facing radially-outwardly relative to said first component, so that pressurized fluid within said chamber bears radially-inwardly relative to said first component against said ring seal, so putting said ring seal into compressive hoop stress.

4,713,979

TRANSMISSION WITH REVERSE MECHANISM

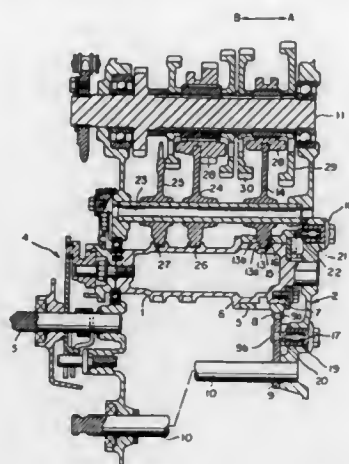
Osamu Muto, Tokyo; Masanori Masumura, and Yoshiaki Hori, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,359
Claims priority, application Japan, Dec. 27, 1985, 60-294707
Int. Cl.⁴ F16H 5/06

U.S. Cl. 74—337.5 6 Claims

1. A transmission having forward gears and a reverse gear, comprising
- a forward shift drum having a forward gear lead groove therein;

a reverse shift drum concentrically arranged with said forward shift drum, said reverse shift drum being rotatable relative to and axially fixed relative to said forward shift drum, said reverse shift drum having a reverse gear lead



groove therein overlapping said forward gear lead groove; and
a shift fork pin for one of the forward gears and the reverse gear being engaged in said forward and reverse lead grooves.

4,713,980

LUBRICATION MECHANISM IN POWER TRANSFER DEVICE FOR FOUR WHEEL DRIVE

Shuichiro Ida; Toshio Yoshinaka, and Shuji Nagano, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

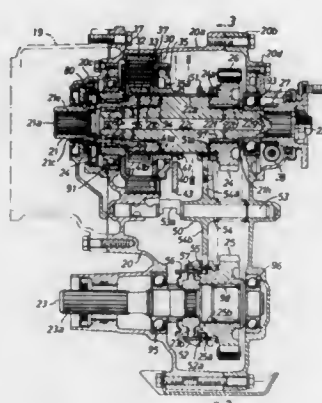
Filed May 27, 1986, Ser. No. 866,911

Claims priority, application Japan, May 24, 1985, 60-112908

Int. Cl.⁴ F16H 57/04

U.S. Cl. 74-467

10 Claims



1. A power transfer device adapted for use in combination with a primary power transmission for automotive vehicles, comprising:

- a housing;
- an input shaft rotatably mounted within said housing and having an input end for drive connection to an output shaft of said power transmission;
- an output shaft arranged coaxially with said input shaft and rotatably mounted within said housing for relative rotation to said input shaft;
- an auxiliary change-speed mechanism arranged within said housing and mounted on said input shaft, said change-speed mechanism having an input element mounted on

said input shaft for rotation therewith and an output element connectable to said output shaft; and
a sleeve member axially slidably mounted on said output shaft and shiftable between a first position in which it effects a drive connection between said input and output shafts and a second position in which it effects a drive connection between the output element of said change-speed mechanism and said output shaft;
wherein a bearing retainer is secured in a fluid-tight manner to an outer end of said housing, said bearing retainer retaining a bearing carried on said housing for supporting thereon said input shaft, and wherein an oil pump assembly is contained within a cavity of said bearing retainer and mounted on said input shaft at the outside of said housing to be driven by rotation of said input shaft, said pump assembly being arranged to pump up lubricating oil stored in said housing and supply it into an axial bore in said input shaft adjacent to said pump assembly.

4,713,981

REMOTE ACTUATING MECHANISM

Werner Zahn, Altlussheim, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

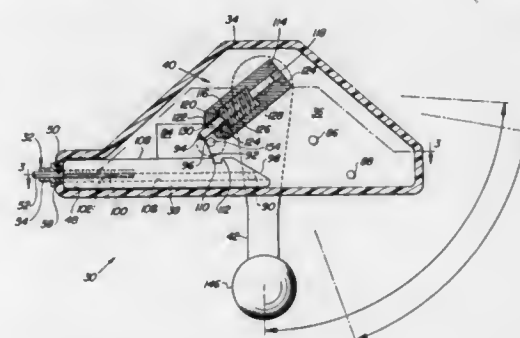
Filed Jul. 3, 1986, Ser. No. 881,886

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1985, 3523762

Int. Cl.⁴ G05G 11/00

U.S. Cl. 74-479

9 Claims



1. A remote actuating mechanism comprising:
 - an actuating lever;
 - a driver rigidly coupled to said actuating lever for swinging motion therewith and having a spring loaded driving pin; and
 - a longitudinally movable transmission unit having a recess for receiving the driving pin in a positively coupled engagement relationship sustainable over a range of movement less than the swinging range of movement of said lever and driver, the spring loading of said driving pin permitting said driver to engage said recess at any position over said range.

4,713,982

INTEGRAL GEAR BOX AND ELECTRICAL GENERATING SYSTEM

Theodore D. Fluegel, and Daniel M. Ryan, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 27, 1985, Ser. No. 813,784

Int. Cl.⁴ F16H 37/08, 47/04; F02C 7/275

U.S. Cl. 74-686

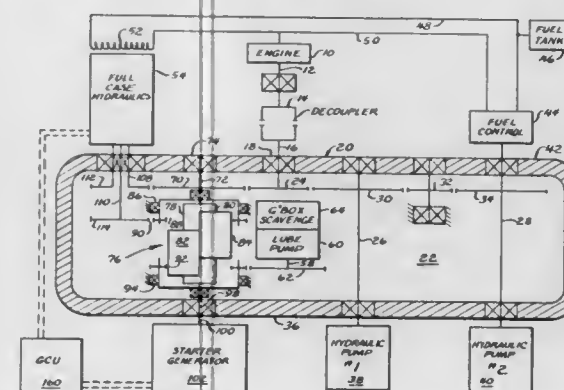
4 Claims

1. In a power plant including a turbine with a shaft, and a power take-off from the shaft, a gear box and accessory unit comprising:

- a first housing for said gear box;
- an input shaft extending into said first housing and connectable to said power take-off;
- a differential within said first housing including a carrier

shaft mounting first and second meshed planet gears, a control ring gear meshed with one of said planet gears and an input/output ring gear meshed with the other of said planet gears, said carrier shaft being coupled to said input shaft;

a second housing containing a hydraulic speed trimmer and mounted on the exterior of said first housing and having two hydraulically interconnected hydraulic pump/motor units, said units each having a shaft entering said first housing and coupled to a respective one of said carrier shaft and said control ring gear, and a displacement control for at least one of said units; and



a third housing containing a starter/generator and mounted on the exterior of said first housing and having a shaft extending into said first housing and coupled therein to said input/output ring gear;

a fuel system drive gear within said first housing and coupled to said input shaft, said fuel system drive gear being operable to drive a fuel pump mounted on the exterior of said first housing;

a heat exchanger including a liquid flow path in heat exchange relation with said hydraulic speed trimmer and said second housing; and

means defining a fuel flow path connected to said pump and including said liquid flow path whereby fuel may serve as a coolant for cooling said hydraulic speed trimmer.

4,713,983

WIDE RANGE TRANSMISSION

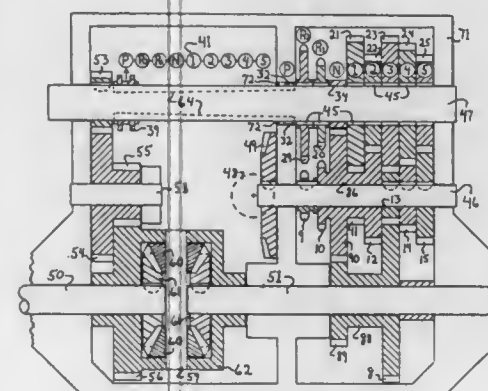
Kenneth P. Rundle, 8304 Brookside Rd., Independence, Ohio 44131

Continuation-in-part of Ser. No. 727,834, Apr. 26, 1985, abandoned. This application Jan. 14, 1987, Ser. No. 3,452

Int. Cl.⁴ F16H 37/08, 3/08

U.S. Cl. 74-701

6 Claims



1. In a transmission; a housing, an input mainshaft and an output countershaft journaled parallel in said housing, a num-

ber of first intermeshing gearsets on said shafts for establishing a number of fast speed drives at respective ratios between said shafts, said fast speed drives having fast speed driver gears nonrotatable on said mainshaft and having respective fast speed driven gears rotatable on said countershaft, and a number of second intermeshing gearsets on said shafts for establishing a number of slow speed drives at respective ratios between said shafts, said slow speed drives having slow speed driver gears all rotatable as one in a first cluster on said mainshaft and having respective slow speed driven gears individually rotatable on said countershaft, and a layshaft supported in said housing parallel to said mainshaft so that said mainshaft is disposed generally between said layshaft and said countershaft, a reduction gear rotatable in a second cluster with a low driver gear on said layshaft, said reduction gear intermeshing with one said fast speed driver gear, said low driver gear intermeshing with a low driven gear rotatable on said mainshaft, said low driven gear being a driving member of said first cluster, clutch means shiftable to drivingly connect said speed driven gears and said countershaft one at a time.

4,713,984

DRIVE STAGE CONTROL MECHANISM FOR AUTOMATIC TRANSMISSION

Masahiro Ohkubo, Kadoma, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

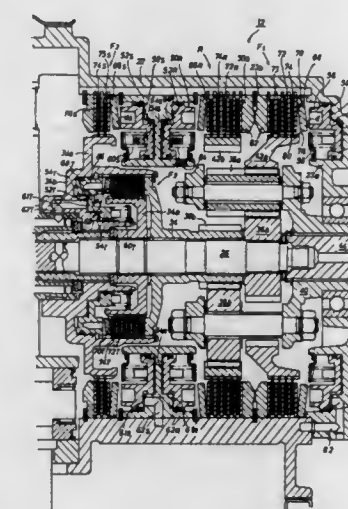
Filed Jul. 2, 1986, Ser. No. 881,297

Claims priority, application Japan, Jul. 8, 1985, 60-150828

Int. Cl.⁴ F16H 47/00

U.S. Cl. 74-732

4 Claims



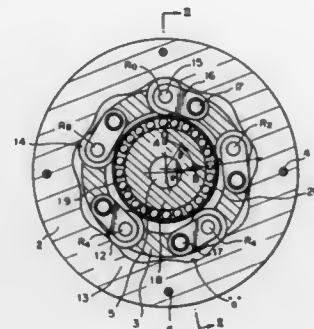
1. In an automatic transmission providing a planetary gear transmission which carries out a change-over operation of drive stage of plural planetary gear elements by hydraulically engaging and disengaging plural friction elements from a rear stage of a torque converter transmitting an engine power by means of fluid; a drive stage control mechanism for automatic transmission, in which a piston for engagement and disengagement of said friction elements by means of hydraulic force is provided, a pressed surfaces of said piston is formed into plural concentric stepped surfaces, a pressure oil passage port interconnecting with a control valve controlling charge and discharge of hydraulic pressure is provided at any one stage of said plural stepped surfaces, a passage having an orifice and leading the hydraulic pressure from said any one stage to another stage and having a throttling function is provided, and an elastic member effecting a pressure force on a friction element when engaging the friction element is provided between said piston and said friction element, said elastic member have a maximum spring force set larger than a hydraulic pressing load acting on a pressed surface at any stage of said piston to which said hydraulic pressure is first applied.

4,713,985

TRANSMISSION APPARATUS

Shimon Ando, Hitachi, Japan, assignor to Kabushiki Kaisha Advance Kaihatsu Kenkyujo, Tokyo, Japan
Continuation of Ser. No. 913,581, Sep. 30, 1986, abandoned, which is a continuation of Ser. No. 739,105, May 30, 1985, abandoned. This application Apr. 6, 1987, Ser. No. 33,870
Claims priority, application Japan, May 31, 1984, 59-112073
Int. Cl.⁴ F16H 1/28, 15/50
U.S. Cl. 74-804

17 Claims



1. A transmission apparatus for changing the rotational speed between a first and a second shaft at a predetermined changing ratio, comprising:

an annular casing having an inner surface;
wave generator means having a cylindrical outer surface fixed to and rotatable with the first shaft;
at least three drive rollers;

carrier means, including first means rotatably mounting each of the drive rollers, connected to and rotatable with the second shaft for rotation within the casing, said first means including second means swingably supporting each of the rotatable drive rollers for permitting constant contact of the drive rollers with the outer surface of the wave generator means and the inner surface of the casing;

the inner surface of the annular casing having teeth with a radial configuration selected to position each of the rollers at the intersection of first and second wave-shaped curves, said curves defining an envelope formed by the teeth on the inner surface of the casing and the outer surface of the wave generator means during rolling movement of the drive rollers on the outer surface of the wave generator means at times when the carrier means and the wave generator means are rotating relative to one another at the predetermined changing ratio, the selected radial configuration being effective to provide constant physical contact of the drive rollers with the outer surface of the wave generator means and the teeth on the inner surface of the casing;

the first curve corresponding to a line passing through the rotational centers of the drive rollers at times when the rollers roll along the teeth on the surface of the casing;
the second curve corresponding to a line passing through the rotational centers of the drive rollers at times when the rollers roll along the outer surface of the wave generator means; and

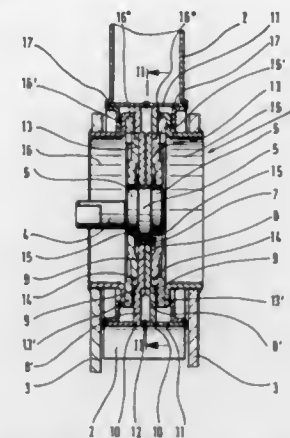
the second curve having a wave length corresponding to an internal multiple of the wave length of the first curve with both first and second curves having the same amplitude.

4,713,986

HINGE FITTING

Heinz P. Cremer; Harald Wolslefer, both of Kaiserslautern; Manfred Hoffmann, Lohnsfeld; Elmar Deegener, Kaiserslautern, and Günter Franzmann, Rockenhausen, all of Fed. Rep. of Germany, assignors to Kelper Recaro GmbH & Co., Fed. Rep. of Germany
Filed Aug. 19, 1986, Ser. No. 898,034
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529887
U.S. Cl. 74-805

13 Claims

Int. Cl.⁴ F16H 1/28

1. A hinge fitting for a pivotable connection of the back rest of a vehicle seat with the seat frame or the seat rails in such a manner that the back rest can be locked in a selectable position, said hinge fitting being arranged between the back rest and a pair of spaced plates in said seat frame, comprising first and second fitting elements which are adapted to be pivotably connected with each other by a hinge pin and having a first planetary gearing set, the planetary gear of which is rotatably mounted on an eccentric supported by the hinge pin, said first planetary gearing set meshing with a crown gear forming a first central gear which is rigidly arranged on one fitting element, a second planetary gearing set which is formed as an identical mirror-image of said first planetary gearing set relative to a plane perpendicular to the hinge axis, wherein said first and second planetary gearing sets have the same reduction ratio, and the eccentrics of the first and second planetary gearing sets are rotated toward each other at most by a small angle, means for supporting said first central gear and the second central gear around the entire periphery thereof, a structural element surrounding and connected with said first and second planetary gears, means connecting said first and second central gears with said spaced plates in said seat frame, wherein said means for supporting the first and second central gears around the entire periphery thereof is connected with said structural element and is located between said spaced plates in said seat frame.

4,713,987

REDUCTION RATIO CONTROL FOR CONTINUOUSLY VARIABLE TRANSMISSION

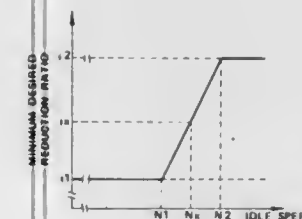
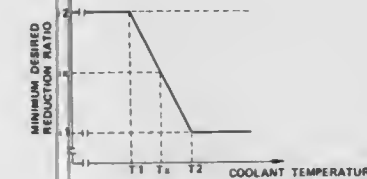
Toshio Matsumura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 24, 1984, Ser. No. 603,311
Claims priority, application Japan, May 27, 1983, 58-92415
Int. Cl.⁴ B60K 41/16
U.S. Cl. 74-866

2 Claims

1. A control for controlling a reduction ratio in a continuously variable transmission of a vehicle having an engine drivingly connected to the continuously variable transmission, the control comprising:

means for determining a desired reduction ratio within a

predetermined reduction ratio range and generating a desired reduction ratio indicative signal;
sensor means for sensing engine temperature of the engine and generating a sensor signal indicative of said engine temperature;
means responsive to said sensor signal for determining a minimum reduction ratio within a minimum reduction ratio range based on possible values of said engine temperature and generating a minimum reduction ratio indicative signal, said determined minimum reduction ratio decreasing as said sensed engine temperature increases;
means responsive to said desired reduction ratio indicative signal and said minimum reduction ratio indicative signal for generating an output signal indicative of said desired reduction ratio indicative signal when said desired reduction ratio indicative signal is greater than said minimum reduction ratio indicative signal and indicative of said minimum reduction ratio indicative signal when said de-



sired reduction ratio indicative signal is not greater than said minimum reduction ratio indicative signal; and
means for adjusting the continuously variable transmission to establish a reduction ratio indicated by said output signal;

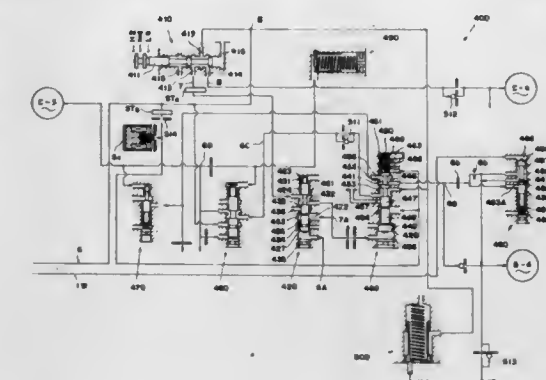
wherein said minimum reduction ratio determining means determines the minimum reduction ratio as a maximum reduction ratio achievable in accordance with the construction of the continuously variable transmission when the engine temperature is lower than a first predetermined value, determines the minimum reduction ratio as a minimum value achievable in accordance with the construction of the transmission when the engine temperature is higher than a second predetermined value which is higher than the first predetermined value, and determines the minimum reduction ratio as a reduction ratio which is variable responsive to the engine temperature when the engine temperature is between the first predetermined value and the second predetermined value.

4,713,988

TRANSMISSION CONTROL DEVICE

Yoshiharu Harada, Toyota; Yutaka Taga, Aichi; Kagenori Fukumura, Toyota; Yoichi Hayakawa, Toyoake, and Masao Kawai, Chiryu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin-Warner Kabushiki Kaisha, both of Aichi, Japan
Filed Jan. 21, 1986, Ser. No. 820,156
Claims priority, application Japan, Jan. 19, 1985, 60-7763; Jan. 19, 1985, 60-7764
Int. Cl.⁴ B60K 41/06
U.S. Cl. 74-868

6 Claims



1. A transmission control device for a transmission which comprises a main transmission having a plurality of speed changing ratios and a sub transmission connected to the output shaft of the main transmission and having a plurality of speed changing ratios, the transmission control device comprising: an electronic controller means for receiving outputs from a plurality of sensors capable of sensing a running state of a vehicle and for producing an output indicative thereof;
a main hydraulic controller means and a sub hydraulic controller means for controlling the main transmission and the sub transmission, respectively, in accordance with the output from the electronic controller means, and
wherein the sub hydraulic controller means comprises:

- a hydraulic pressure source;
- a first hydraulic change-over means connected to the hydraulic pressure source via a line pressure passage;
- a second hydraulic change-over means for inhibiting the speed changing operation of the sub transmission in response to a signal from the electronic controller in accordance with the state of running of the vehicle; and
- a third hydraulic change-over means connected to the hydraulic pressure source via the line pressure passage, the first hydraulic change-over means via a first hydraulic passage, the second hydraulic change-over means via a second hydraulic passage, a direct-coupling hydraulic passage, and a reduced-speed hydraulic servomotor via a reduced-speed hydraulic passage, and wherein the third hydraulic change-over means comprises:
 - a first valve means connected to the first hydraulic change-over means via the first hydraulic passage and the second hydraulic change-over means via the second hydraulic passage,
 - a second valve means connected to the hydraulic pressure source via the line pressure passage, the second hydraulic change-over means via the second hydraulic passage, the direct-coupling hydraulic servomotor via the direct-coupling hydraulic passage, the reduced speed hydraulic servomotor via the reduced speed hydraulic passage, and the first valve means via a third hydraulic passage, and wherein:
 - the first hydraulic change-over means selectively connects the line pressure passage to the first hydraulic passage according to a manual operation,
 - the second hydraulic change-over means controls the

charge and discharge of hydraulic pressure to and from the second hydraulic passage in accordance with the vehicle running state,

the first valve means controls the state of communication between the first hydraulic passage and the third hydraulic passage in accordance with the hydraulic pressure in the second hydraulic passage,

the second valve means selectively connects the line pressure passage to at least one of the direct-coupling hydraulic passage and the reduced-speed hydraulic passage in accordance with the hydraulic pressure in the second and third hydraulic passage, and wherein: the second valve means selectively connects the line pressure passage to one of the direct-coupling hydraulic passage and the reduced-speed hydraulic passage in accordance with the hydraulic pressure in the second hydraulic passage when the line pressure passage is disconnected to the first hydraulic passage by the first hydraulic change-over means, and

the second valve means selectively connects the line pressure passage to one of the direct-coupling hydraulic passage and the reduced-speed hydraulic passage in accordance with the hydraulic pressure in the third hydraulic passage which is selectively connected to the first hydraulic passage in accordance with the hydraulic pressure in the second hydraulic passage when the line pressure passage is connected to the first hydraulic passage by the first hydraulic change-over means.

4,713,989

SHIFT SHOCK SUPPRESSION IN AUTOMATIC TRANSMISSION

Yoichi Hayakawa, Toyooka; Masao Kawai, Chiryu; Seichi Nishikawa, Toyokawa, and Kagenori Fukumura, Toyota, all of Japan, assignors to Aisin Warner Limited, Japan

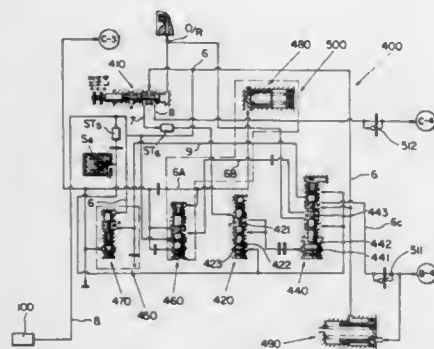
Filed Sep. 23, 1985, Ser. No. 779,252

Claims priority, application Japan, Sep. 28, 1984, 59-204545

Int. Cl.⁴ B60K 41/04

U.S. Cl. 74-869

5 Claims



1. A hydraulic control system for an automatic transmission having a main transmission and an auxiliary transmission connected to said main transmission, said control system comprising:

- a hydraulic fluid pressure source;
- a regulator valve for regulating an output fluid pressure from said source;
- a first hydraulic servo for setting said auxiliary transmission in a high speed operating range responsive to said output fluid pressure of said pressure regulator valve;
- a second hydraulic servo for setting said auxiliary transmission in a low speed operating range responsive to said output fluid pressure of said pressure regulator valve;
- a valve means for selectively supplying said output fluid pressure to one of said hydraulic servos and for draining said output fluid pressure from the other of said hydraulic

servos through a first conduit communicating with said first hydraulic servo and a second conduit communicating with said second hydraulic servo;

a check valve-equipped flow control valve in said second conduit for controlling the flow rate of said output fluid pressure supplied to said second hydraulic servo;

a drain conduit connected to said valve means for draining said second hydraulic servo, said drain conduit having an outlet end portion; and,

a shift timing mechanism having a shift timing valve in said drain conduit and a drain orifice located in said outlet end portion of said drain conduit, said shift timing valve comprising a valve body movable between a first position for communicating between said drain conduit and a drain port and a second position blocking communication between said drain conduit and said drain port, said valve body being biased toward said first position by said output fluid pressure supplied to said first hydraulic servo, the shift timing valve being thereby adapted to accelerate drainage of said output pressure from said second hydraulic servo responsive to increases in supply fluid pressure to said first hydraulic servo, whereby shift shock is effectively suppressed.

4,713,990

BOLT EXTRACTING TOOL

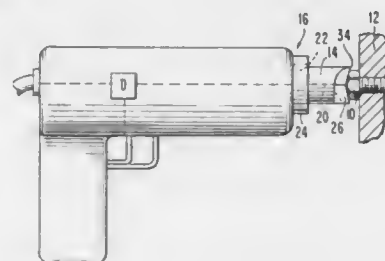
Denzil C. Poling, Rte. 6, Box 80, Hagerstown, Md. 21740

Filed Jul. 18, 1986, Ser. No. 886,684

Int. Cl.⁴ B25B 13/50

U.S. Cl. 81-53.2

10 Claims



1. In combination

- (a) a bit for being hammered into bolts for extracting bolts comprising a body having an axis of rotation, the body including a shank end adapted to mate with and rotationally engage a rotatable complementary engaging member of an impact wrench, engagement of which allows forced rotation of the bit by the impact wrench, the body having a toothed end opposite the shank, the toothed end of the bit body having only two bolt-engagable teeth disposed symmetrically about the axis of the body and about a line perpendicular to the axis of rotation of the body at another end of the body opposite the shank end the shank end having an impact surface perpendicular to the axis of rotation of the body for being hammered for driving the biting edge of each tooth into the bolt, each of the teeth of the bit including a biting edge disposed away from the shank end for being driven into a bolt by hammering the shank end and thereby engaging and biting the teeth into a bolt to be extracted, each of the biting edges of the teeth being defined by an acute angle formed between a first planar working face and a second face, said first planar working face being parallel with the body axis for acting against a corresponding surface formed by a hammering the tooth in the bolt for rotating the bolt, said second face extending away from the biting edge of each tooth, said second face passing through and intersecting with a line perpendicular to the first planar working face for allowing the teeth to be hammered into the bolt, each of the biting edges being defined by a peripheral end disposed away from the body axis and an inner portion between the peripheral end and the body axis, the biting edge being

inclined towards the shank end from the peripheral end to the inner portion of the edge for cutting into the bolt and allowing the teeth to be hammered into the bolt; and

(b) an impact wrench including said rotatable complementary engaging member operatively connected to an impact drive, the engaging member mating with and rotatably engaging the shank end of the body for forced rotation of the bit to extract bolts.

4,713,991

TOOL FOR MANUALLY ROTATING THE STAR WHEEL OF A BRAKE ADJUSTER

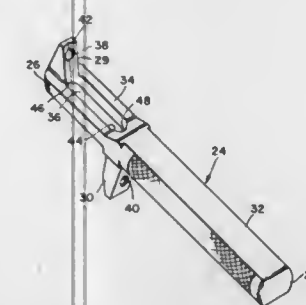
Robert T. Gaug, 1476 St. Stephens Church Rd., Crownsville, Md. 21032

Filed Sep. 28, 1982, Ser. No. 425,374

Int. Cl.⁴ B25B 13/02

U.S. Cl. 81-176.1

7 Claims



1. A tool for manually rotating the star wheel of a brake adjuster comprising an elongated body having front and rear ends, a first projection on said body adjacent the front end thereof and extending in one direction substantially normal to the axis thereof, a second projection on said body spaced rearwardly of the first projection and intermediate the ends of said body, said projection extending normal to the axis of said body in a direction opposite from said first projection, the spacing between said second projection and the rear end of said body defining a handle, means on each of said projections engageable with a first tooth of a star wheel, first and second abutment means on said body each being on a side of said body opposite a respective projection, and each being abuttingly engageable with a respective second tooth on said star wheel when a projection is engaged with a respective first tooth so as to enable said wheel to be rotated in either direction and with said handle disposed in substantially the same positions relative to the star wheel regardless of the direction in which it is rotated.

4,713,992

PROCESS AND APPARATUS FOR TRUNCATING TUBES

Jean-Paul Languillat, Vallieres Par Thorigny sur Oreuse, France, assignor to Lhomme S.A., Pont sur Yonne, France

Filed May 5, 1986, Ser. No. 859,402

Claims priority, application France, May 6, 1985, 85 06868

Int. Cl.⁴ B23B 5/14

U.S. Cl. 82-48

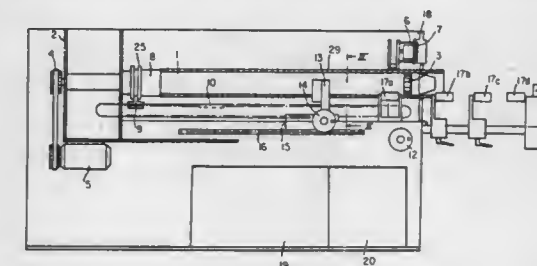
7 Claims

1. An apparatus for truncating a tube positioned on a mandrel and having a free end that moves forwardly in an axial direction and a travelling end comprising:

- (a) a mandrel having one end attached to a frame and an opposite free end on which a tube to be cut is mounted;
- (b) a slide having a forward end coaxially mounted on said mandrel so as to contact said trailing end of the tube;
- (c) means to move said slide operably connected to said slide so as to advance the tube axially from said one end towards said free end of said mandrel;
- (d) means for cutting located adjacent said free end of the mandrel;

(e) an abutment for engaging the free end of the tube;

(f) a reference system for determining the distance between said slide and said means for cutting and for controlling



said means to move the slide, said reference system being positioned laterally with respect to said mandrel in communication with said slide.

4,713,993

TABLE SAW GUIDE CONSTRUCTION

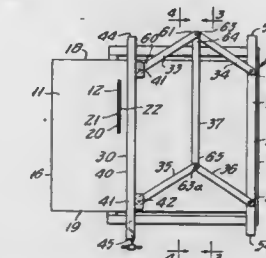
Robert H. Litowitz, Old Pump House, Harriman Rd., Irvington, N.Y. 10533

Filed Aug. 6, 1986, Ser. No. 893,868

Int. Cl.⁴ B26D 1/00, 3/00, 7/06

U.S. Cl. 83-34

3 Claims



1. An improved guide construction for power driven table saws having a cutting blade moving in a given plane, and a generally horizontally positioned table having an outwardly facing surface perpendicular to the plane of said cutting blade, said construction comprising: first and second elongated guide bars, a pivotally interconnected linkage interconnecting said first and second guide bars for maintaining said bars in mutually parallel relatively movable relation, said linkage including a third centrally disposed elongated bar, and at least four links pivotally interconnected to points on said third bar and one of said first and second guide bars to form a pair of parallelograms; clamping means for selectively clamping an outwardly facing surface of said first guide bar against a planar surface of said cutting blade, clamping means for selectively clamping said second guide bar to said table; and clamping means for selectively clamping said first guide bar to said table; whereby said construction is positioned for guiding a workpiece by first engaging said first member against said blade, moving said second guide bar to desired position on said table, clamping said second guide bar to said table, releasing said first guide bar from engagement against said blade, relocating said first guide bar to appropriate guiding location; and clamping said first guide bar at said last mentioned location to said table.

4,713,994

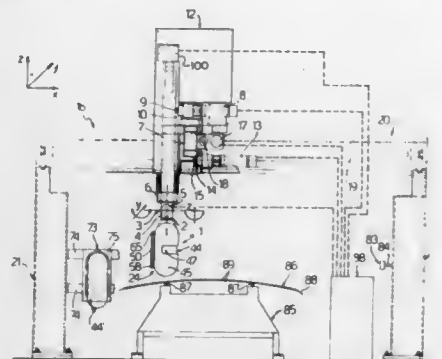
CUTTING DEVICE FOR SHEETS MADE OF PLASTIC MATERIAL

Giorgio Gaglielmetti, Mondovì; Guido Carosello, Turin, and Luigi Gilli, Luserna S. Giovanni, all of Italy, assignors to Saint-Gobain Vitre (Les Miroirs), Courbevoie, France
Filed Jun. 25, 1986, Ser. No. 878,440

Claims priority, application France, Jun. 25, 1985, 85 09627
Int. Cl.⁴ B23D 53/00

U.S. Cl. 83—71

14 Claims



1. An automatic sheet cutting device for cutting transparent or translucent sheets temporarily or permanently assembled with other elements of a pane, by a routing operation, comprising:

- a cutting head;
- a continuous band saw blade mounted on said cutting head;
- means for moving said blade along a path relative to said head;
- means for moving said head along three orthogonal cartesian axes;
- means for rotating said head about two orthogonal axes; and
- electronic and numeric control means for controlling said movement and rotation of said head.

4,713,995

HOLE PUNCH ASSEMBLY

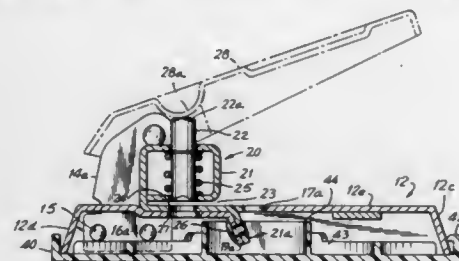
Richard A. Davi, Glenwood, N.J., assignor to Rolodex Corp., Secaucus, N.J.

Filed Oct. 3, 1985, Ser. No. 783,677

Int. Cl.⁴ B26F 1/02

U.S. Cl. 83—167

6 Claims



1. A hole punch assembly for punching holes in sheet materials, comprising:

- (a) a base member having an upper surface and at least two downwardly folded sides located on opposite sides of the base member and at least one centrally located downward depression and opening provided therein;
- (b) at least one spring-loaded punch unit fixedly attached to said base member within said depression and opening in said base member to a downward extension portion of the depression, said punch unit including a frame folded so as to provide a gap therein adjacent the base member, a punch rod and a compression spring located around the punch rod, and a spring-retaining shoulder ring rigidly

attached to the punch rod between the frame and the compression spring upper end, the lower surface of said gap being located flush with the upper surface of the base member;

- (c) dual upright supports rigidly attached to the downwardly folded opposite sides of said base member, each said upright support extending upwardly through an opening provided adjacent to two opposite sides of the base member;
- (d) a formed handle pivotally attached to the upper ends of said dual upright supports, said handle having at least one downwardly depressed rib disposed so as to contact the upper end of the punch rod in said punch unit whenever the handle is pressed downwardly; and
- (e) a tray member enclosing the lower side of said base member for retaining punched out material chips therein, said tray member being provided with four upwardly flanged sides which enclose the base member downwardly folded sides by projections on the upwardly flanged sides of the tray member, with at least two of said flanged sides, each of which being provided with at least two projections; and being removable from the base member for periodic disposal of the accumulated chips.

4,713,996

AUTOMATIC RHYTHM APPARATUS WITH TONE LEVEL DEPENDENT TIMBRES

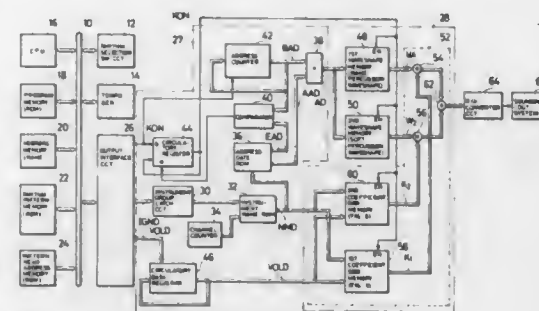
Shigenori Oguri, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 6, 1986, Ser. No. 836,840

Claims priority, application Japan, Mar. 11, 1985, 60-47667
Int. Cl.⁴ G10H 1/08, 1/40, 7/00

U.S. Cl. 84—1.03

10 Claims



9. An automatic rhythm apparatus, comprising:

- first and second waveshape memory means storing first and second waveshapes, respectively, wherein the first waveshape corresponds to plural cycles of the tone produced by a percussion instrument when struck with a first strength and the second waveshape corresponds to plural cycles of the tone produced by said percussion instrument when struck with a second strength which is different from the first strength;
- tone command signal generating means for generating tone command signals designating the timings and volumes of different tones to be produced;
- reading-out means connected to said first and second waveshape memory means and to said tone command signal generating means for reading out the first and second waveshapes in parallel fashion at timings designated by the tone command signals; and
- mixing means for mixing the first and second waveshapes in accordance with the volume designated by the tone command signal for each tone, thereby to provide different output waveshapes corresponding to different volumes.

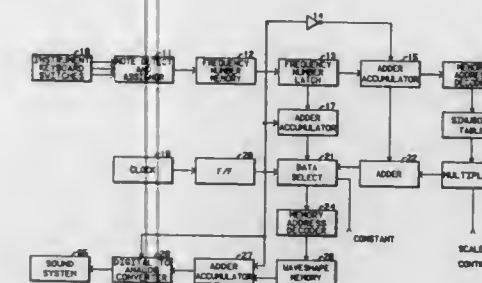
4,713,997

DUAL MODE MUSICAL TONE GENERATOR USING STORED MUSICAL WAVEFORMS

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd, Hamamatsu, Japan
Filed Jul. 18, 1986, Ser. No. 886,710
Int. Cl.⁴ G10H 1/08, 7/00

U.S. Cl. 84—1.22

13 Claims



1. In combination with a keyboard operated musical instrument having an array of keyswitches, apparatus for producing a dual musical tone comprising;

- an assignor means whereby a detect data word is generated in response to each actuated keyswitch in said array of keyswitches and one of a plurality of tone generators is assigned to each actuated keyswitch and whereby a corresponding detect data word is provided to the corresponding said assigned tone generator; and
- said plurality of tone generators each of which comprises,
 - a frequency number generator means whereby, a frequency number is generated corresponding to said detect data word provided to said corresponding assigned tone generator,
 - a waveshape memory for storing a preselected set of waveshape data words,
 - a memory addressing means whereby said preselected set of waveshape data words are read out sequentially from said waveshape memory at a memory address advance rate response to said generated frequency number,
 - a dual memory addressing means whereby said preselected set of waveshape data words are read out sequentially from said waveshape memory at a time variant memory advance rate,
 - a select means for selectively reading out waveshape data words from said waveshape memory alternately in response to said memory addressing means and in response to said dual memory addressing means,
 - a combination means for combining waveshape data words read out from said waveshape memory by said memory addressing means and by said dual memory addressing means to form a sequence of composite waveshape data words, and
 - a conversion means for producing said dual musical tone responsive to said sequence of composite waveshape data words.

4,713,998

BOW FROG

Sidney Weiss, 331 N. Lucerne Blvd., Los Angeles, Calif. 90004
Filed Mar. 26, 1987, Ser. No. 30,331

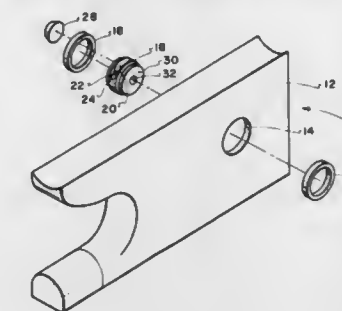
Int. Cl.⁴ G10D 3/16

U.S. Cl. 84—282

5 Claims

1. A frog for musical instruments comprising a base portion, an aperture extending transversely through said base portion, a cylinder rotatably positioned within said aperture having means located generally centrally of said cylinder for releasably retaining the knotted end of a hair band, means for rotat-

ing said cylinder within said aperture to wind said hair band onto or off of said cylinder to adjust the tension of said hair



band, and means of releasably locking said cylinder in a desired position within said aperture.

4,713,999

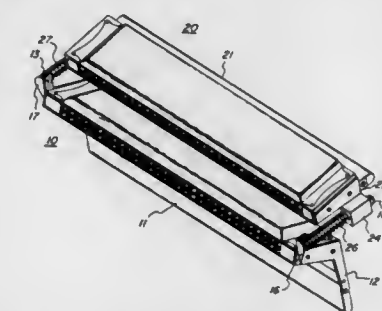
DUAL HARMONICA ARRAYS AND HARMONICA RECEPTACLES

Raymond J. Burt, 30 3rd St., Waterford, N.Y. 12188
Filed Jun. 5, 1986, Ser. No. 870,798

Int. Cl.⁴ G10G 5/00

U.S. Cl. 84—379

19 Claims



1. A dual harmonica receptacle comprising (A) a first immovable harmonica receptacle section for holding a first harmonica in a lower forward position comprising a handle, terminal handle brackets having inwardly facing rectangularly hollow grooved forward head sections and superimposed on each of the forward head sections of the terminal handle brackets, an inwardly facing slotted super structure, (B) a second movable upper harmonica receptacle section for holding a second harmonica in an upper rear position having a handle and terminal brackets with inwardly facing rectangularly grooved sections and exterior fixed riders sized to fit within and override the inwardly facing slots of the super structures of the terminal handle brackets of (A) and (C) means for altering the relative positions of the receptacle sections of (A) and (B).

4,714,000

PICCOLO FLUTE

Anton J. Braun, Mainzer Strasse 21, 6073 Egelsbach, Fed. Rep. of Germany

Filed Jan. 29, 1986, Ser. No. 823,530

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 3502842

Int. Cl.⁴ G10D 7/02

U.S. Cl. 84—384

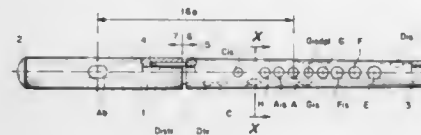
8 Claims

1. A piccolo transverse flute of the "Orchestra Boehm flutes" family comprising:

- a head part with a mouth hole or embouchure hole and a closure cap with an adjustable seal on its free frontal side;
- a body part with finger holes, said body part further comprising a hole setting scheme for a concert pitch a'=440

Hz wherein distances between the individual centers of finger holes from a center of a finger hole A in mm are approximately:

G sharp (A flat) dpl: 10.60
G sharp (A flat): 12.00
G: 23.20
F sharp (G flat): 35.50
F: 50.20
E: 66.00
D sharp (E flat): 80.20



D (terminal hole): 105.50
D sharp (E flat) tr.: 64.80
Dtr: 52.80
C sharp (D flat): 48.50
C: 32.20
B: 22.50
A sharp (B): 12.00

wherein a terminal finger hole is located on its free frontal side, and wherein the body part exhibits only one C hole (C).

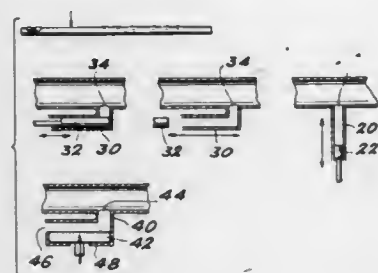
4,714,001

DEVICE FOR OBTAINING QUARTER-TONES AND OTHER MICRO-INTERVALS ON MUSICAL WIND INSTRUMENTS WITH LATERAL HOLES

Jean Kergomard, Coulans sur Gee, and Xavier Meynial, Gif sur Yvette, both of France, assignors to Centre National de la Recherche Scientifique and Institut de Recherche et de Coordination Acoustique Musique IRCAM, both of Paris, France
Filed Sep. 19, 1986, Ser. No. 909,333
Int. Cl.⁴ G10D 7/00

U.S. Cl. 84—386

7 Claims



1. A device for obtaining quarter-tones and other micro-intervals on musical wind instruments with lateral holes, comprising for each register of the instrument at least one auxiliary tube branched in the vicinity of the instrument head, said at least one auxiliary tube having a first end in contact with said instrument and a second open end, and a manual control mechanism comprising means to selectively block each said at least one auxiliary tube adjacent said first end and to selectively open the second end.

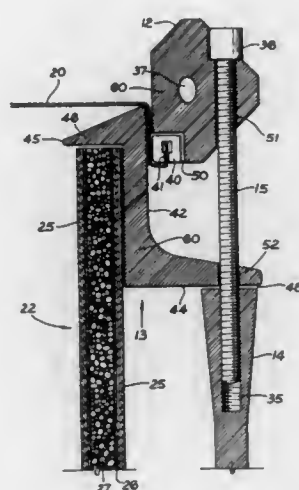
4,714,003 PERCUSSION MUSICAL INSTRUMENT DRUM-HEAD SKIN TENSIONING ASSEMBLY AND DRUM SHELL CONSTRUCTION THEREFOR

Terry P. Cleland, 1769 Woodview Avenue, Pickering, Ontario, Canada

Filed Mar. 11, 1986, Ser. No. 838,328
Claims priority, application Canada, Mar. 13, 1985, 476373
Int. Cl.⁴ G10D 13/02

U.S. Cl. 84—413

1 Claim



1. A drum head skin tensioning assembly comprising in combination;
inner and outer hoop rings, said inner ring being essentially L-shaped in cross sectional view and comprised of a vertical flange, an outwardly directed foot-flange and an inwardly directed drum stop flange on the upper edge of said vertical flange, said outer ring overlapping the upper portion of said inner hoop ring;
an annular step formed in the lower inner edge of said outer ring to accommodate a locking hoop, said drum skin being secured between said locking hoop and said annular step; means co-acting with said rings for varying the tension of said skin by varying the extent of overlap between said rings;
a drum shell, said inwardly directed stop flange being adapted to abut an upper perimeter edge of said drum shell;
said inwardly directed drumstop flange being held in abutment with the upper perimeter of said drum shell by the tensioning means being secured to a second outer hoop ring adapted to maintain another drum skin in abutting force against a lower perimeter edge of said drum shell, said drum shell being of cylindrical configuration;
a tension varying means in the form of a set of aligned apertures in said outer ring of said foot flange, and threadable cap screws extending through said set of apertures for torquing down the assembly in overlapping position after the drum has been set in abutment with the inner ring stop flange and the second upper hoop has been tensioned to mate with the lower drum head skin against the lower part of the drum shell perimeter edge;
said drum shell being composed of a cylinder made from a sheet of rigid foam spaced between and attached by epoxy cement to sheets of woven carbon fibres overlying both sides of said rigid foam sheet and abutting together along a line in a mould to provide a cylindrical shape when said line is fastened together by an epoxy cement seam.

4,714,003 ELECTROMAGNETIC LAUNCHER WITH A PASSIVE INDUCTIVE LOOP FOR RAIL ENERGY RETENTION OR DISSIPATION

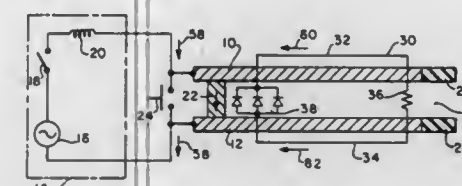
George A. Kemeny, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1985, Ser. No. 702,771

Int. Cl.⁴ F41F 1/02

U.S. Cl. 89—8

17 Claims



1. An electromagnetic projectile launcher comprising:
a pair of conductive rails, having a breech end and a muzzle end;
a source of electric current;
means for switching current from said current source to said rails;
means for conducting current between said rails and for propelling a projectile along said rails;
means for electrically insulating;
a first conductive loop which is electrically insulated by said insulating means from said rails and inductively coupled to said rails to link magnetic flux produced between said rails by current flowing through said rails; and
means for controlling current flow in said conductive loop.

4,714,004

APPARATUS FOR HORIZONTALIZATION OF REVOLVABLE WEAPON PLATFORM

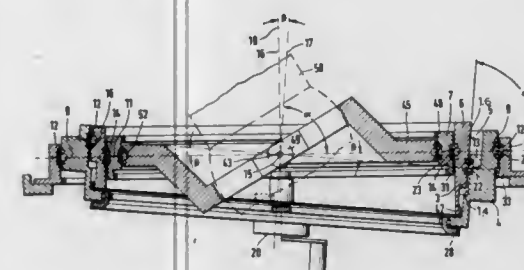
Udo Weinfurth, Düsseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany
Filed Sep. 23, 1985, Ser. No. 779,204

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1984, 3436081

Int. Cl.⁴ F41F 23/06

U.S. Cl. 89—37.09

3 Claims



1. An apparatus to horizontalize a revolvable weapon platform, which, in order to compensate for lateral tilt and inclined position, relative to a stationary basis, is mounted on the gun-carriage of a vehicle, as an intermediate carrier for a weapon turret, which comprises: two ring shaped hollow bodies that are connected for common and mutually opposed rotatory movement, the facing lateral surfaces of the said hollow bodies running parallel and forming inclined planes facing a bearing surface of the first hollow body which is fixed preferably in the vehicle body, one side of the second hollow body comprising a horizontalizable receiving surface for the weapon platform, whereby a swing axis of the weapon platform assumes a horizontal position when both hollow bodies assume a mutually turned position, and the weapon platform simultaneously assumes a horizontally but oppositely directed turned position to

the hollow bodies, around the swing axis, characterized thereby

that the weapon platform is arranged within the radial inner region of the hollow body enclosed in the first hollow body; and the first hollow body is arranged within the radial inner region of the vehicle body; and a two-ply steep angle roller bearing is arranged between the weapon platform and the second hollow body, between the first hollow body and the vehicle roof, and between the first and second hollow bodies; whereby the axes of rotation, respective to each two-ply steep angle roller bearing, as well as the operative surfaces of the bearings vertical to the axes of rotation, intersect at a point with a turret axis of a barrel weapon arranged on the weapon platform; and that furthermore the hollow bodies are form locked connected with the platform via a reversing gear coupled to a horizontalizing gear, so that the during rotatory movements of the hollow bodies required for horizontalization, the direction of the platform remains unchanged in its peripheral direction by means of the reversing gear.

4,714,005
POWER TRANSMISSION

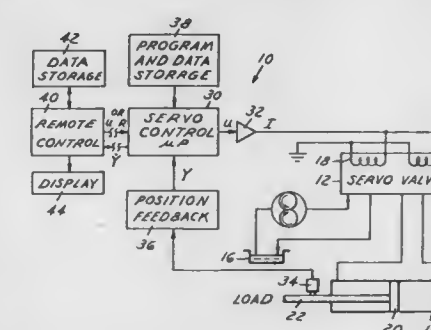
Richard S. Leemhuis, Troy, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Jul. 28, 1986, Ser. No. 889,617

Int. Cl.⁴ F15B 13/16; F17D 3/00

U.S. Cl. 91—361

12 Claims



1. In an electrohydraulic servo system which includes a servo valve for variably feeding hydraulic fluid from a source to a load, means coupled to the load for providing signals as a function of motion at the load, means for selectively providing command signals, and servo control means responsive to said command signals and to said motion signals for controlling fluid flow at said valve as a continuing function of said command signals between flow limits, a method of measuring fluid flow characteristics at said valve comprising the steps of:

- generating a preselected raw flow command signal and feeding said raw flow command signal to said servo control means,
- measuring said motion signal indicative of motion at the load and determining velocity of motion at said load obtained responsive to said preselected raw flow command signal,
- repeating said steps (a) and (b) for a plurality of differing raw flow command signals, and
- storing velocity at said load determined in said step (b) as a function of corresponding raw flow command signals generated in said step (a).

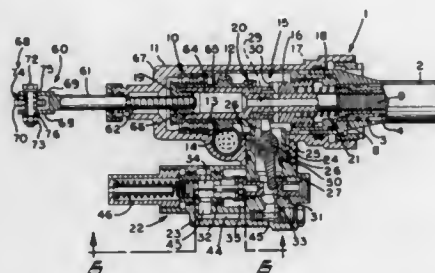
4,714,006

FLUID ACTUATOR WITH FEEDBACK MECHANISM
James N. Tootle, Kalamazoo, and Eugene J. Martin, Portage, both of Mich., assignors to Pneumo Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 352,046, Feb. 24, 1982, Pat. No. 4,463,057. This application Jul. 29, 1982, Ser. No. 403,012
Int. Cl.⁴ F01B 25/26

U.S. Cl. 92-5 R

19 Claims



1. A fluid actuator comprising a cylinder, a piston axially movable within said cylinder, a rotatable member operatively connected to said piston such that axial movement of said piston causes rotation of said rotatable member, and linear feedback means driven by said rotatable member for indicating the position of said actuator, said feedback means including an output member whose movements are proportional to the rate of movement and position of said piston, said feedback means including a feedback screw having a threaded connection with said rotatable member, and means for restraining said feedback screw against rotation, whereby rotation of said rotatable member will cause axial movement of said feedback screw, said means for restraining said feedback screw against rotation comprising a linkage mechanism, said linkage mechanism comprising a first lever to which said feedback screw is connected to prevent rotational movement of said feedback screw laterally relative to said first lever, and a second lever connecting said first lever to said actuator preventing lateral movement of said levers relative to said actuator.

4,714,007

SHUTTLE PISTON CYLINDER

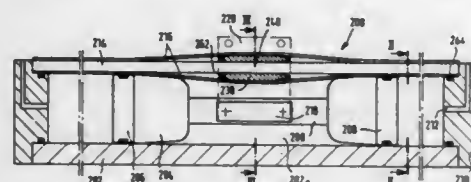
Dieter Maisch, Fellbach, Fed. Rep. of Germany, assignor to Herion-Werke KG, Fellbach, Fed. Rep. of Germany
Filed Mar. 18, 1986, Ser. No. 841,091

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509891

Int. Cl.⁴ F01B 29/00

U.S. Cl. 92-88

14 Claims



1. A shuttle piston cylinder device, comprising:
a cylinder defining an axis and having a cylinder barrel provided with a longitudinal slot extending in axial direction thereof;
a piston reciprocating in axial direction within said cylinder;
a transmission element connected to said piston and projecting through said slot for transmitting the movement of said piston; and
a one-piece sealing band permanently anchored within said slot and provided with two spaced flexible inner and outer sealing lips lying against said cylinder barrel for sealing said slot towards the inside of said cylinder as well as

towards the exterior, said sealing lips being liftable off said cylinder barrel by said transmission element without moving said sealing band from said slot, said transmission element being a bracket having a double bend extending between said sealing lips to lift the latter from said cylinder barrel and including a web extending essentially radially through said longitudinal slot and two shanks connected to said web at its respective ends and extending slantingly away from said sealing band, said sealing lips lying on said shanks when being lifted.

4,714,008

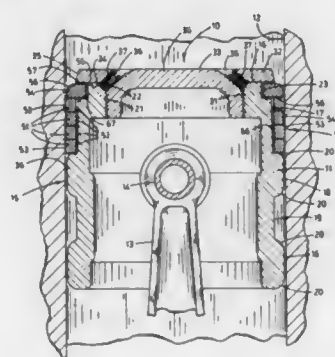
PISTON FOR INTERNAL COMBUSTION ENGINES AND THE LIKE

Walter B. Bowers, 6046 N. Remington St., Fresno, Calif. 93704
Filed Nov. 21, 1985, Ser. No. 800,448

Int. Cl.⁴ F16J 1/04

U.S. Cl. 92-219

8 Claims



1. A piston for operation within a cylinder and wherein the cylinder has an internal cylinder wall the piston comprising:
a piston body having a primary cylindrical surface with a diameter substantially conforming to the interior diameter of said cylinder, the primary cylindrical surface composed of a pair of annular portions having diameters substantially conforming to the interior diameter of the cylinder with an annular recess interposed between the annular portions of said pair of annular portions, said piston body further having a first end and a secondary surface of smaller diameter than said diameter of the primary cylindrical surface disposed axially of the piston body between the primary cylindrical surface and the first end;
a cap having a surface adapted for exposure to a fluid within the cylinder;
at least one piston ring disposed in an operational position substantially concentrically of and about said secondary surface of the piston body, and an annular space extends about the piston between the piston ring and the primary cylindrical surface operable to receive oil in operation and to carry said oil along the cylinder wall to enhance lubrication; and
means releasably mounting the cap on the first end of the piston body capturing the piston ring in said operational position.

4,714,009

CEILING AIR DIFFUSER

Marvin L. DeHart, Mesquite, and Dale B. Johnson, Garland, both of Tex., assignors to Phillips Industries Inc., Dayton, Ohio

Filed Aug. 4, 1986, Ser. No. 892,292

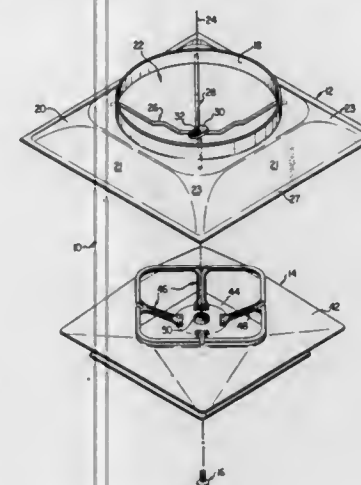
Int. Cl.⁴ F24F 13/06

U.S. Cl. 98-40.13

6 Claims

1. An air diffuser for diffusing conditioned air from a duct to a room, comprising:
a base having an inlet portion for attachment to the duct, an

air passage having a center line being defined through the base for flow of the conditioned air therethrough when the base is connected to the duct;
a cone assembly for diffusing air passing through the air passage in the base into the room when positioned in a selected orientation to the base;



said base including a cone assembly suspension being formed by at least one rod extending into the air passage to approximate the center line;
means for attaching said cone assembly to said suspension at a single point; and
a cone alignment assembly comprising a channel formed on the cone assembly to receive a portion of said rod to align the cone assembly with the base.

4,714,010

INDUSTRIAL EXHAUST VENTILATION SYSTEM

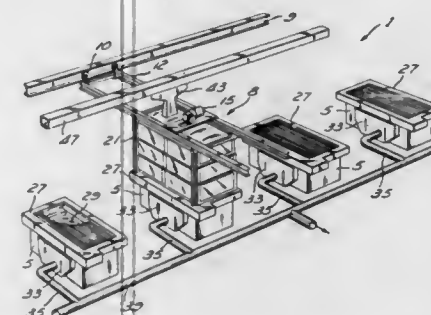
W. James Smart, Newport Beach, Calif., assignor to CM & E/California, Inc., Santa Ana, Calif.

Filed Apr. 12, 1985, Ser. No. 722,777

Int. Cl.⁴ B05C 3/02; B08B 15/02

U.S. Cl. 98-115.4

2 Claims



1. An industrial ventilation system comprising:
a cover assembly having a reciprocating cover supported by an outer cover frame, said cover having a closed position and an open position and means for moving said cover between said open and closed position;
a source of industrial exhaust gases emanating from a structure that receives said reciprocating cover assembly, with said source of exhaust gases separated from the surrounding environment when said cover is in the closed position, and access to the source is provided when said cover is in the open position;
at least one exhaust opening formed in said outer cover frame, said exhaust opening providing an air passageway for the industrial exhaust gases through said cover assembly regardless of the cover position;

an exhaust collector means communicating with said air passageway;
a workload enclosure received by said cover assembly, forming a fume containment region therewith when the reciprocating cover is in an open position;
means for moving said workload enclosure, permitting the selective engagement and disengagement of the enclosure with said cover assembly; and
a hoist for carrying a workload attached to said workload enclosure in a manner wherein the workload is carried within and surrounded by the workload enclosure prior to the engagement of said workload enclosure with the cover assembly,
whereby a workload can be brought to the cover assembly and thereafter lowered by the hoist through the open cover while simultaneously containing the exhaust gases within the fume containment region.

4,714,011

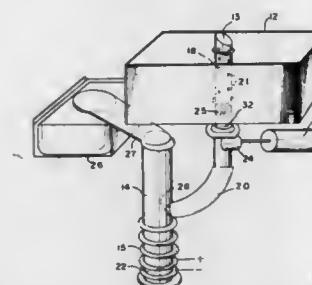
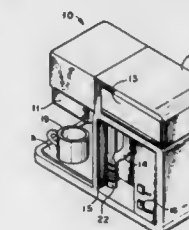
PORTABLE BEVERAGE BREWING APPARATUS

Binh T. Ly, 1101 NW. 52nd St., #2, Ft. Lauderdale, Fla. 33309
Filed Oct. 20, 1986, Ser. No. 920,376

Int. Cl.⁴ A47J 31/00, 31/30

U.S. Cl. 99-279

9 Claims



1. A beverage brewing apparatus comprising:
a housing, said housing having an open-top container adapted to receive therein a quantity of water, said open-top container having an opening at the bottom thereof for draining water therefrom by gravity;
puncturing means at the bottom of said open-top container, said puncturing means adapted to puncture a puncturable water container;
a reservoir having a pair of openings below said open-top container for receiving water from said open-top container;
first conduit means associated with said open-top container and connected to one of said reservoir openings for conveying water into the reservoir;
first electric heating means associated with said reservoir for heating and transforming the water in said reservoir into steam;
a removable insert container receivable within said housing for storing ingredients necessary to brew a beverage; and
second conduit means associated with said insert container and said other reservoir opening for directing said steam from said reservoir to said beverage making ingredients.

4,714,012

COOKING VESSEL WITH AN INNER HEAT CONDUCTIVE JACKET AND THE LIKE

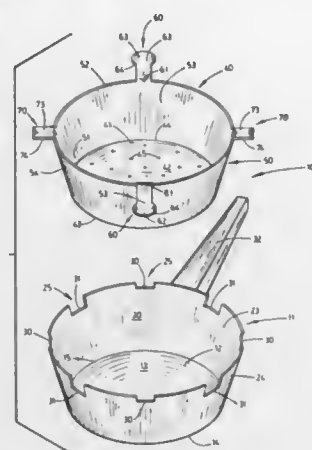
Rosario A. Hernandez, 1138 W. Cambridge Ave., Fresno, Calif. 93705

Filed Sep. 15, 1986, Ser. No. 906,930

Int. Cl.⁴ A47J 37/12

U.S. Cl. 99-444

5 Claims



1. A cooking vessel which permits the transmission of heat energy to a food product being processed, comprising:

an outer heat conductive jacket of predetermined dimension, said outer jacket having a substantially vertical side wall, a top edge and a bottom surface, said side wall having formed therein a multiplicity of vertically disposed slots of varying length that extend downwardly from the top edge; and

an inner heat conductive jacket conformably dimensioned for substantially close telescoping receipt internally of the outer heat conductive jacket, the inner jacket having a substantially vertical nonporous side wall of substantially uniform height, a top edge, and a bottom surface, the top edge mounting a pair of handles and a pair of stabilizing bars, said handles and stabilizing bars adapted to mate with the multiplicity of vertical slots formed in the side wall of the outer jacket, the bottom surface of said inner jacket having formed therein a multiplicity of small drainage holes that permits a liquid to pass therethrough.

4,714,013

COLLAPSIBLE COOKING UNIT

Terrence D. Telfer, 64 NW, Portland Ave., Bend, Oreg. 97701

Filed Nov. 26, 1986, Ser. No. 935,275

Int. Cl.⁴ F24C 1/16; B65D 6/12

U.S. Cl. 99-449

7 Claims

1. A heating unit for consumables comprising:

(a) a hollow vessel comprising a plurality of adjacent pairs of confronting side panels, each of said panels having a side edge and a bottom edge, each side panel of one of said pairs of said panels having adjacent sections, said adjacent sections of each side panel of said one pair of side panels having adjacent edges parallel to the side edges of said panels;

(b) first hinge means hingedly connecting adjacent side edges of said side panels for folding and extending said hollow vessel;

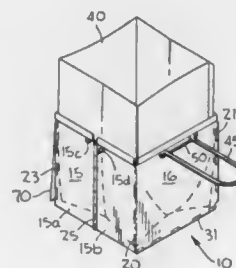
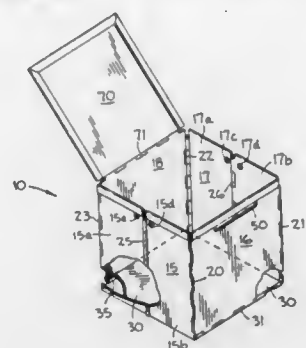
(c) second hinge means hingedly connecting adjacent sections of each side panel of said one pair of side panels for folding and extending said hollow vessel;

(d) a bottom panel hingedly connected to the lower edge of a side panel other than the side panels of said one pair of said panels and engaging the bottom edges of said side panels other than the bottom edge of said side panel to which it is hingedly connected for forming a bottom wall for said hollow vessel;

(e) a cover panel hingedly connected to the upper edge of a

side panel that confronts the side panel to which said bottom panel is hingedly connected;

(f) said one pair of said panels being formed with an upper section and with confronting openings in the upper section thereof; and



(g) a handle with free ends removably insertable in said openings and pivoted within said openings, said handle including a central section between said free ends arranged for suspending said hollow vessel.

4,714,014

AUTOMATIC CRIMPING MECHANISM FOR PROTEINACEOUS PATTIES

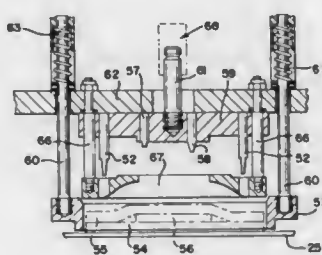
Carroll P. Hartl, and James M. Heltman, both of Madison, Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Feb. 25, 1986, Ser. No. 833,637

Int. Cl.⁴ A22C 17/00

U.S. Cl. 99-450.2

16 Claims



1. An apparatus for knitting layers of proteinaceous patties together, comprising:

conveyor means for longitudinally transporting a product at a predetermined rate, the product including a plurality of proteinaceous patties;

crimper means having a crimper assembly including a crimper head with a plurality of projections for entering the proteinaceous patties wherein said crimper assembly rotates in a generally arcuate path in a substantially vertical plane with respect to the conveyor means, which is substantially horizontally oriented, wherein the crimper means includes actuation means for moving the plurality of projections of projections with a back and forth motion, wherein said crimper head includes an outer ring member

that generally engages and moves with a belt of said conveyor means during crimping, and said crimper head further includes a plurality of pins inwardly spaced from the periphery of said outer ring, and wherein said outer ring is mounted for generally upward movement thereof upon its engagement with the belt; and

camming means for generally downwardly positioning said crimper head into engagement with the proteinaceous patty product while same is conveyed by said conveyor assembly generally under said crimper assembly, said camming means further being for moving said crimper head to correspond to said predetermined rate of the conveyor means once the engagement between said crimper head and the proteinaceous patty product has been attained, and said camming means also being for generally upwardly withdrawing said crimper head from its said engagement with the proteinaceous patty product after crimping has been completed;

whereby said plurality of proteinaceous patties of the product are knitted together while the product is being longitudinally transported by said conveyor assembly.

4,714,015

SEALING ARRANGEMENT FOR A MEDIUM-CONTAINING CHAMBER OF A DUAL BELT PRESS

Gerhard Stäbler, Murr, Fed. Rep. of Germany, assignor to Santrade Ltd., Lucerne, Switzerland

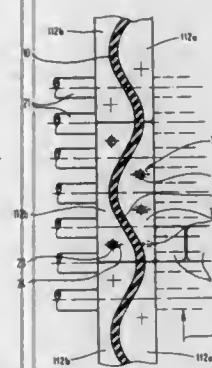
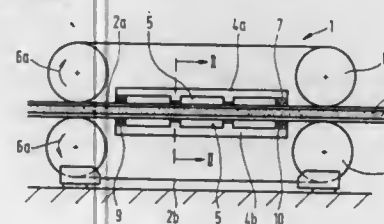
Filed Jun. 24, 1986, Ser. No. 878,022

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 3525154

Int. Cl.⁴ B30B 5/04

U.S. Cl. 100-154

10 Claims



1. In a dual belt press of the type comprising opposed movable belts and means defining a chamber disposed adjacent one of said belts for containing a medium to be applied to said one belt, said chamber-defining means including a frame, and sealing means for sealing said medium in said chamber, said sealing means comprising first sealing portions extending generally parallel to the direction of belt travel and second sealing portions extending transversely of the direction of belt travel, at least said first sealing portions each comprising:

holder means attached to said frame and defining a serpentine groove extending generally in the direction of belt

travel and being disposed generally in a plane, said holder means comprising separate ledges disposed on opposite sides of said groove and defining said groove, each said ledge comprising a plurality of pieces abutting each other in the direction of belt travel, pieces on opposite sides of said groove being displaceable in a direction transverse to the direction of belt travel and parallel to said plane of said groove, and

a sealing strip mounted in said groove so as to be of serpentine configuration generally in the direction of belt travel, said strip being insertable in said groove means with said ledges mutually separated and secured in response to said ledges being brought together.

4,714,016

BUNDLING APPARATUS WITH FLEXIBLE ROPE TYPE COMPRESSOR

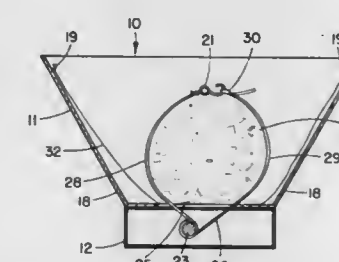
Joseph N. Bond, 28 Sarina Dr., Commack, N.Y. 11725

Filed Nov. 10, 1986, Ser. No. 929,742

Int. Cl.⁴ B30B 5/04

U.S. Cl. 100-212

17 Claims



1. An arrangement for bundling elongated flexible elements, comprising

means for supporting a plurality of the elements to be bundled with substantially the same orientation; an elongated torque member mounted on said supporting means for rotation about an axis;

means for rotating said torque member, including a hand crank mounted on said torque member for joint rotation therewith;

at least one elongated flexible bundling member having two end portions with effective lengths that are at least sufficient for said end portions jointly to surround said plurality of the elements to be bundled, and a central portion interconnecting said end portions and connected to said torque member for becoming wound around said torque member during the rotation thereof with attendant simultaneous reduction in said effective lengths of said end portions; and

means for connecting said end portions of said bundling rope with one another for said end portions to compress said elements into a compact bundle as said effective lengths of said end portions are being reduced.

4,714,017

PYROTECHNIC VARIABLE DELAY CONNECTOR

George G. Kelly, Hawkesbury; Henry McLaughlin, Brownsburg, and James R. Simon, Lacbute, all of Canada, assignors to CXA Ltd./CXA LTEE, Brownsburg, Canada

Filed May 4, 1987, Ser. No. 45,407

Claims priority, application Canada, Sep. 26, 1986, 519148

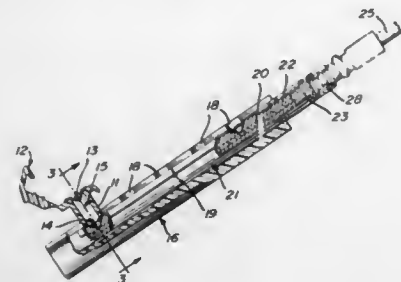
Int. Cl.⁴ C06C 5/64

U.S. Cl. 102-275.3

7 Claims

1. A pyrotechnic delay connector adapted for initiating a detonation wave in an acceptor cord at a variable time interval after said connector receives a shock wave for a donor device, said time interval being adjustable at the blast site and wherein said connector consists essentially of an elongated, hollowed-out body comprising a first attachment means for firmly hold-

ing said donor device, an exothermically burning delay composition located within said hollowed-out body, an explosive transfer charge abutting said delay composition and second attachment means for firmly holding said acceptor detonating cord in initiation relationship with said transfer charge and characterized in that said elongated hollowed-out body has a



plurality of lightly sealed notches extending from the surface of the body to expose to initiation the delay composition, said notches being spaced at a variety of distances from said transfer charge and said first attachment means being adapted to bring said donor detonating cord into initiation relationship over a selected one of said notches.

4,714,018

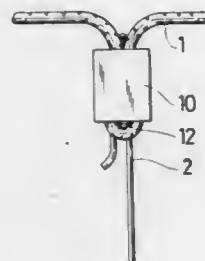
METHOD AND MEANS FOR CONNECTING FUSES
Lars-Gunnar Löfgren, Nora, Sweden, assignor to Nitro Nobel AB, Gytterp, Sweden

Filed Jun. 30, 1986, Ser. No. 880,020

Claims priority, application Sweden, Jul. 1, 1985, 8503278
Int. Cl.⁴ C06C 5/04; F41D 1/04

U.S. Cl. 102-275.7

19 Claims



8. A method for transmitting a signal from a detonating cord to a shock wave initiatable low energy fuse comprising the steps of:

forming a fold in the cord so that two halves of the fold extend away from the length of the cord adjacent the fold; positioning a length of the fuse within signal receiving distance of both fold halves; and initiating the cord.

4,714,019

INSERTS FOR COATING AN EXPLOSIVE CHARGE, AND FORMING A ROD-SHAPED PROJECTILE, AND PROCESS FOR MANUFACTURE OF INSERTS

Hendrik Lips, and Joerg Peters, both of Duesseldorf, Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,903

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1985, 3525613

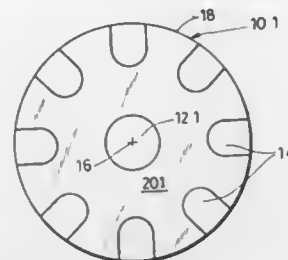
Int. Cl.⁴ F42B 1/02

U.S. Cl. 102-307

8 Claims

1. A liner, essentially of the form of a hollow spherical cap or calotte, for being arranged on the shaped front of an explosive charge, preferably of a projectile, said liner being earmarked for being collapsingly shaped on the explosion of said

explosive charge in order to form a rod shaped projectile with rear end flaring out which allows for the aerodynamic stabilization of said rod shaped projectile, said liner comprising: zones which are symmetrically arranged to the center of said liner, said zones having mechanical properties which differ from



the mechanical properties of the region neighboring said zones, said difference of said mechanical properties resulting in a predetermined dynamic behavior of the material forming said liner such, that said behavior satisfies the demands which are set by said aerodynamic stabilization of said rod shaped projectile.

4,714,020

ENABLING DEVICE FOR A GAS GENERATOR OF A FORCED DISPERSION MUNITIONS DISPENSER

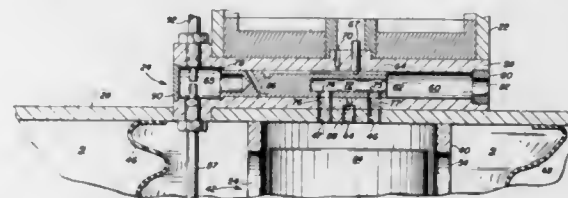
John P. Hertsgaard, Minneapolis, and W. Keith Gallant, Plymouth, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 30, 1987, Ser. No. 8,692

Int. Cl.⁴ F42B 4/06

U.S. Cl. 102-351

20 Claims



1. An enabling device 24 for a pyrotechnic gas generator 42, said device having two states, a disabled state and an enabled state, said device comprising:

a housing 58;

detonator means 70 mounted in the housing 58 for producing a detonation responsive to a fire signal;

said device 24 in its disabled state having means for venting 64, 60, 82 the products of the detonation of the detonator 70 to the environment exterior of the housing 58, and means for venting 46, 47, 76, 77, 74, 75, 72, 60 and 82 gases produced by a gas generator 42, to the environment exterior of the housing 58;

said device 24 in its enabled state including means forming an uninterrupted firing train 86, 88, 44, between the detonator means 70 and gas generator 42 for initiating the release of gas from the gas generator 42; and

means responsive to a signal 57 for causing the enabling device 24 to change from its disabled state to its enabled state.

4,714,021

BURIED SYSTEM COMPRISING A SIGNALIZATION DEVICE

Jean-Pierre Tranin, Fontenay Aux Roses, France, assignor to U.S. Philips Corporation, New York, N.Y.

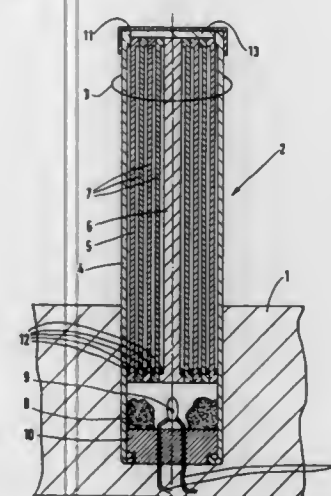
Filed May 16, 1986, Ser. No. 864,167

Claims priority, application France, May 21, 1985, 85 07608

Int. Cl.⁴ F42B 23/24

U.S. Cl. 102-401

6 Claims



1. A buried system with a primary operation comprising a signalization device including a telescopic arrangement of a plurality of coaxial tubes and comprising means for increasing the internal pressure in order to develop the telescopic arrangement, means for controlling the increase of the internal pressure from a predetermined instant, means for providing a seal between each tube and its adjacent outer tube thereby providing tightness to the telescopic arrangement and means for ensuring the maintenance of tightness during the development of the telescopic arrangement, said means for providing tightness to the telescopic arrangement being toric joints or rings disposed around the coaxial tubes and said means for ensuring the maintenance of tightness within the telescopic arrangement being a washer, which is fixed at the top of the central coaxial tube and whose edges bear on the top of the outer coaxial tube.

4,714,022

WARHEAD WITH TANDEM SHAPED CHARGES

Alain Chaumeau, Levet; Eric Crotet, Mehun sur Yèvre; Alain Kerdraon, and Jean-Paul Ragonnet, both of Bourges, all of France, assignors to Etat Francais, Paris, France

Filed Sep. 4, 1985, Ser. No. 772,463

Claims priority, application France, Sep. 5, 1984, 84 13633

Int. Cl.⁴ F42B 3/08

U.S. Cl. 102-476

9 Claims

1. An armor-defeating warhead of the type intended for attack against an active armored target, comprising a forward shaped charge, a rearward shaped charge, means for mounting said forward and rearward charges in tandem, and delay timing means for imparting an activation delay in the detonations of said charges from the forward to the rearward charge; wherein said forward charge is provided with a metallic liner having an average thickness substantially between 1 and 2 percent of the diameter of said forward charge, so as to generate, when detonated, an explosive core having a target impact speed of between substantially 1,000 and 2,500 meters per second for impacting said active armored target without deto-

nation thereof, and wherein said delay timing means imparts an activation delay of between substantially 50 and 300 sec be-



tween initiation of the forward charge and subsequent initiation of the rearward charge.

4,714,023

NON-TOXIC SHOT

John E. Brown, 8 Northwood Dr., St. Catharines, Canada

Filed Mar. 27, 1986, Ser. No. 844,519

Int. Cl.⁴ F42B 11/04

U.S. Cl. 102-516

7 Claims

1. A non-toxic wildlife shot pellet for shotgun shells and the like comprising a lead shot pellet having an essentially uniform coating of nickel-phosphorous alloys having a Rockwell hardness of at least 45, where said coating is applied to said pellet by an electroless nickel-phosphorous alloy coating process.

4,714,024

NOSE FOR AN INERTIAL PROJECTILE

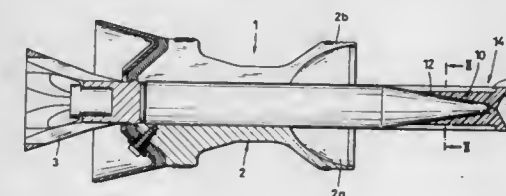
Jürgen Böcker, Oberhausen; Klaus W. Klein, Neuss; Klaus Gersbach, Willich, all of Fed. Rep. of Germany; Jean-Claude Sauvestre, Saint-Doulchard, and Patrick Montier, Bourges, both of France, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany and L'Etat Francais represente par le Delege Ministeriel pour l'Armement, Paris, France

Continuation-in-part of Ser. No. 603,133, Apr. 23, 1984, abandoned. This application Jun. 13, 1986, Ser. No. 874,048
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314751

Int. Cl.⁴ F42B 13/16

U.S. Cl. 102-521

2 Claims



1. In an inertial projectile having a large length to diameter ratio with a segmented sabot surrounding the projectile body, whose segments are held to the projectile body by force locking bonding agents during passage through a gun barrel showing a frontal synclinal recess, which after the projectile has left the gun barrel causes a breaking up and separation of the segments from a front end due to high pressure within the recess from an oncoming airstream, the improvement comprising:

a conical projectile nose protruding over a front edge of the sabot;
a cylindrical projectile mantle enlarged hood which protects the sabot, during separation of the segments from the projectile body, from pressure fluctuations, and which increases the drag coefficient of the projectile;
said nose corresponding substantially with one of its frontal diameters to the diameter of the cylindrical projectile mantle enlarged hood;
said hood releasing itself from the projectile nose only after separation of the sabot from the projectile body, thereby decreasing the drag coefficient of the projectile.

4,714,025

ARRANGEMENT FOR A SWITCHBOARD DESK

Per Olov T. Wallin; Bengt H. Wärell; Åke P. Svensson, all of Televerket, S-123 86 Farsta; Kurt A. Lundström, Televerket Industridivisionen, Svedjer. 12 S-931 36 Skellefteå, and Lars A. Johansson, Kamomillgången 25, 611 45 Nyköping, all of Sweden

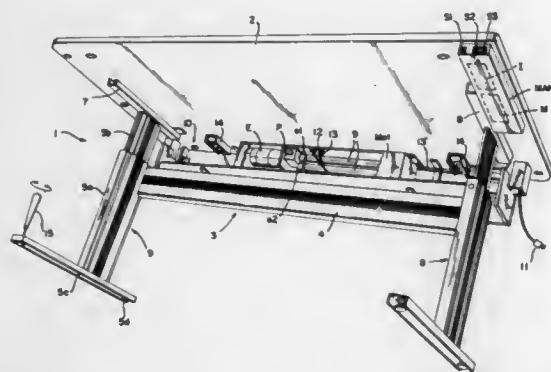
PCT No. PCT/SE85/00110, § 371 Date Nov. 18, 1985, § 102(e) Date Nov. 18, 1985, PCT Pub. No. WO85/04083, PCT Pub. Date Sep. 26, 1985

PCT Filed Mar. 12, 1985, Ser. No. 803,760

Claims priority, application Sweden, Mar. 16, 1984, 8401479 Int. Cl.⁴ A47B 85/00

U.S. Cl. 108—20

7 Claims



1. An arrangement for adjusting the height of a table, comprising:

a table top and at least two telescopic legs for supporting said table top above a floor;

hydraulic cylinders positioned in each of said telescopic legs for adjusting the length of said telescopic legs, said hydraulic cylinders being connected to at least one hydraulic pump for supplying hydraulic fluid to said hydraulic cylinders said hydraulic pump being driven by a single electric motor;

a first switching device for controlling rotation of said electric motor in a first direction and driving said hydraulic pump in a first direction thereby supplying hydraulic fluid to said hydraulic cylinders for moving said table top downwardly;

a second switching device for controlling rotation of said electric motor in a second direction and driving said hydraulic pump in a second direction thereby supplying hydraulic fluid to said hydraulic cylinders for moving said table top upwardly; said first and second switching devices comprising first and second manual switches connected to first and second relays for supplying electric current for rotating said electric motor in said first and second directions, respectively, and wherein each of said switching device has two contact fingers to disrupt the current supply to said electric motor upon simultaneous activation of both manual switches;

a monitoring device for monitoring the height position of said table top; said monitoring device comprising a poten-

tiometer mounted to a drive shaft of said electric motor, and connected to a voltage source, said potentiometer having slider contact connected to a digital voltmeter for indicating the height position of said table top; and an indication device for indicating of said position.

4,714,026

PALLET FOR MATERIAL HANDLING

Akio Yamaguchi, Saitama, and Kazushi Yoshikawa, Mie, both of Japan, assignors to Honda Giken Kogyo Kabushi Kaisha, Tokyo, Japan

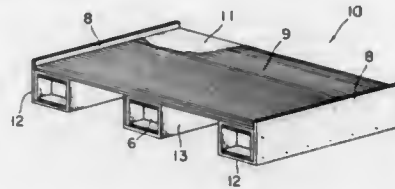
Filed Apr. 7, 1986, Ser. No. 849,208

Claims priority, application Japan, Apr. 17, 1985, 60-80066; Apr. 17, 1985, 60-56178[U]; Apr. 17, 1985, 60-56179[U]

Int. Cl.⁴ B65D 19/00

U.S. Cl. 108—51.1

20 Claims



1. A pallet for material handling, comprising:

a deck board made of corrugated fibreboard and having a lower surface facing downward, an upper surface facing upward, and at least two vertical side walls facing side-way opposite each other, said upper surface having a friction efficiency;

means for enhancing said friction coefficient of said upper surface and including a member arranged on said upper surface with a friction coefficient greater than that of said upper surface;

square tubular legs fixed to said lower surface and each constituting a square-frame, said square tubular legs being composed of corrugated fibreboard and having an open end portion and an axial direction;

means for strengthening said square tubular legs against bending and collapse, said strengthening means including a plastic resin pad arranged within said square tubular legs;

means for sealing said end portions of said tubular legs and including a cap; and

means for reinforcing at least two of said square tubular legs to resist bending in said axial direction and for preventing slippage of material to be handled, said reinforcing and preventing means including a protruded end portion formed on each of said two square tubular legs as an extended part thereof, said protruded end portion being arranged to project upward beyond said member on said upper surface and being attached to a respective one of said two vertical side walls, said protruded end portion including a third vertical side wall parallel to said two vertical side walls.

4,714,027

KNOCKDOWN FURNITURE

Kurt J. Stern, 337 N. Crescent Heights Blvd., Los Angeles, Calif. 90048

Filed Oct. 14, 1986, Ser. No. 919,202

Int. Cl.⁴ A47B 47/00

U.S. Cl. 108—111

6 Claims

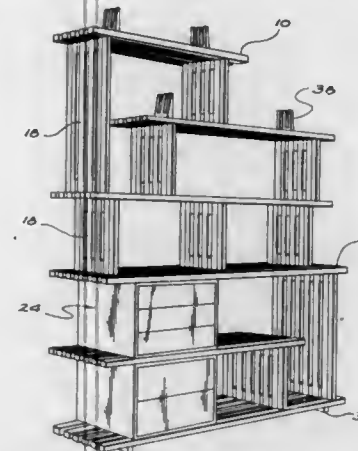
1. An article of furniture comprising, in combination:

(a) a plurality of horizontally-oriented shelves, each of said shelves comprising a plurality of spaced-apart slats;

(b) a plurality of mortises within each of said shelves, said mortises being formed by notches in opposed slats thereof;

(c) said plurality of mortises being arranged into a plurality

- of sets of mortises, each of said sets being arranged transverse to the length of said shelves;
(d) said sets of mortises including a group of sets that are equally spaced by a first amount along the lengths of said shelves;
(e) said sets adjacent the opposed ends of each of said shelves being spaced by a second amount from the sets of said group, said second amount being less than said first amount;
(f) a plurality of vertical supports, each of said supports being oriented perpendicular to at least one of said shelves



and including a plurality of tenons for interlocking the mortises of said at least one shelf.

(g) at least one foot member, said member including a plurality of tenons for interlocking one of said shelves;

(h) at least one unit comprising at least one drawer, said unit having a top surface and a bottom surface arranged substantially parallel thereto, said top and bottom surfaces being separated by an amount that is equal to the height of said vertical supports; and

(i) said unit includes pairs of parallel rails fixed to its top and bottom surfaces and arranged so that said unit is slidably mounted with respect to a pair of said shelves.

4,714,028

HEIGHT ADJUSTABLE TABLE

Angela Uredat-Neuhoff, Lindern/Oldenburg, Fed. Rep. of Germany, assignor to Inaba Seisakusho Ltd., Tokyo, Japan

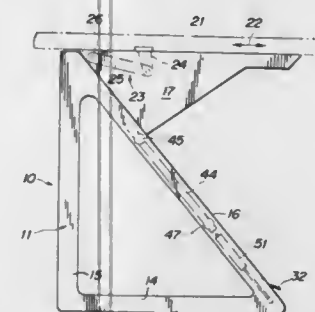
Filed Mar. 24, 1986, Ser. No. 843,336

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512201; Apr. 3, 1985, 8510001[U]

Int. Cl.⁴ A47B 11/00

U.S. Cl. 108—144

8 Claims



1. A height adjustable table comprising:

at least one side frame including a level element adapted to be placed on a floor and a hollow oblique element having an upper portion and connected to the level element to extend obliquely upwardly therefrom;

a horizontal table top;
at least one table top side support having an upper horizontal surface for supporting said horizontal table top thereon; height adjusting means including a rod connected to said table top side support and located within said hollow oblique element and means for moving said rod within said hollow oblique element to move said side support and table top supported thereon to a desired height relative to said side frame;
means for securing said rod and thus said side support and table top at said desired height; and
an adjusting device connecting said table top and said side frame for moving said table top laterally on the upper horizontal surface of said table top side support while said side support and table top are moved to said desired height with minimal lateral movement of said table top relative to the side frame.

4,714,029

LOCKABLE CASSETTE FOR VALUABLE OBJECTS

Gustav L. Idegren, Mellösa; Lars-Göran L. Gyllstal, Karltraneholm, and István V. Bartha, Flen, all of Sweden, assignors to Inter Innovation AB, Stockholm, Sweden

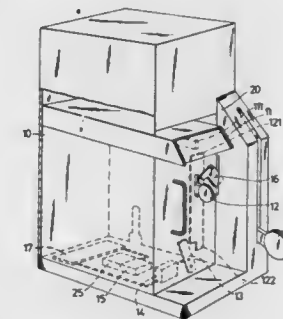
Filed Jan. 23, 1986, Ser. No. 824,398

Claims priority, application Sweden, Feb. 1, 1985, 8500455

Int. Cl.⁴ E05G 1/00; E05B 49/04; G07D 1/50; G07F 9/06

U.S. Cl. 109—45

1 Claim



1. A lockable cassette system for accommodating valuable papers or objects, comprising: a cassette (10), a displaceable lid (11) for accessing an interior of the cassette, the cassette being closed and locked when withdrawn from a surrounding housing (20), and when inserted into the housing enabling the electrical activation of a latch (13), said latch having a first position blocking the displacement of the lid, and being movable to a second, non-blocking position provided that said electrical activation takes place in accordance with a pre-set program through the mutual engagement of respective contact members (15, 25) individually mounted on the cassette and the housing, such engagement supplying a predetermined signal pattern to a locking circuit in the cassette in accordance with the pre-set program, wherein:

- (a) the locking circuit includes a programmable memory (171), a comparison circuit (172) and a logic circuit (173),
(b) the memory is accessible for external programming when the cassette is removed from the housing and opened with the aid of a locking code, without necessitating any disturbing or destructive measures, and when in operation feeds a series of pulses to the comparison circuit,
(c) the comparison circuit serially compares, pulse for pulse, pulses fed thereto from the memory with a series of locking code pulses fed thereto from an external control source via the engaged contact members,
(d) the logic circuit (173) blocks a latch opening function of the locking circuit in the absence of agreement between any two pulses in corresponding positions in the comparison circuit, such blocking of said opening function not being discernable externally until a serial comparison of

the entire series of locking code pulses has been completed, and
(e) the logic circuit initiates the latch opening function of the locking circuit only upon the completion of said serial comparison when agreement is found between all compared pulses.

4,714,030

SECURITY CABINET WITH DISGUISED ELECTRONIC CONTROL PANEL

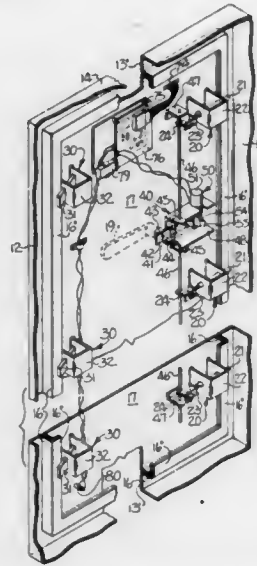
David M. Cole, Roanoke, Va., assignor to Tread Corporation, Roanoke, Va.

Filed Dec. 3, 1984, Ser. No. 677,219

Int. Cl.⁴ E05G 1/04; E05B 49/00

U.S. Cl. 109—61

10 Claims



1. In a cabinet of metal construction and adapted to be used for protecting one's valuables, said cabinet having a front wall with an opening therein for accommodating a door, a door-jamb defining the door opening in the front wall and including door stop means along at least opposite sides thereof, and a door hingedly connected to said metal cabinet along one side of the doorjamb and adapted when closed to abut against the door stop means and close the opening,

the combination therewith of first and second locking means mounted adjacent respective opposite side edges of said door and cooperating with said doorjamb when the door is closed to normally maintain the cabinet door in locked closed position, said first locking means being adjacent the free side edge of the door remote from the hinged side edge of the door and being movable from a retracted unlocked position, allowing the door to be opened, to an extended locked position for engaging the doorjamb and preventing outward movement of the door,

handle means movably mounted on the outside of the door, means interconnecting said handle means and said first locking means and responsive to movement of said handle means relative to said door for moving said first locking means to either the locked or unlocked position,

electrically operable latching means operably connected to said interconnecting means and normally maintaining said interconnecting means in a latched position for maintaining the cabinet door in the locked closed position and comprising a solenoid mounted on the inside of the door and having a longitudinally movable arm, a latching bar pivotally connected to said door and normally positioned in latching engagement with said means interconnecting said handle means and said first locking means and pivotally moveable by said solenoid arm upon energization of said solenoid to an unlatching position, and electronic control means including a disguised control panel

mounted on the outer face of said door and electrically connected to said latching means, said disguised control panel having a visually hidden array of switches thereon arranged so that a predetermined preselected sequence of actuation of said array of switches effect actuation of said latching means for movement thereof from said latched position to an unlatched position for permitting retraction of said first locking means by manual movement of the handle on the door to thereby permit the door to the cabinet to be opened, and wherein said electronic control means further includes a self-contained electrical power source carried inside the cabinet and further comprising an electrical outlet located on said cabinet and accessible from the outside of said cabinet and being connected to said electronic control means so that said electronic control means may be operated by a suitable external source of electrical power should the main power source included in said electronic control means not function properly when the cabinet is locked.

4,714,031

COMBUSTOR FEEDING ARRANGEMENT

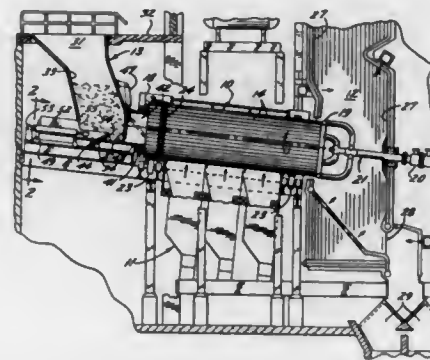
John T. Healy, Irvine, and Joel W. Johnson, Newport Beach, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 5, 1987, Ser. No. 510

Int. Cl.⁴ F23K 3/12, 3/16

U.S. Cl. 110—109

6 Claims



1. A feeding arrangement for a combustor having an open end for receiving combustible material comprising, in combination, a wall closing said open end of said combustor and defining a doorway, a generally vertical chute including said wall, leading to said doorway and having a lower floor aligned with the bottom of the doorway, a ram mounted for reciprocation over said lower floor and into and through said doorway, a door mounted to normally close said doorway and being movable to open the doorway when pushed by said ram and combustible material, means for biasing said door toward a closed position, and means for reciprocating said ram, said ram, door and biasing means cooperating to positively push material into and through said doorway by only reciprocating said ram.

4,714,032

POLLUTION-FREE PRESSURIZED COMBUSTION UTILIZING A CONTROLLED CONCENTRATION OF WATER VAPOR

Norman L. Dickinson, Monte Sereno, Calif., assignor to Dipac Associates, Monte Sereno, Calif.

Filed Dec. 26, 1985, Ser. No. 813,486

Int. Cl.⁴ F23D 1/00

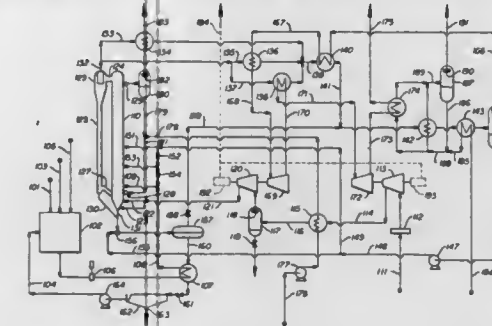
U.S. Cl. 110—347

18 Claims

1. A continuous combustion process comprising pressurizing an aqueous slurry of fuel particles containing alkali in an

amount at least the chemical equivalent of the sulfur in the fuel particles;

pressurizing an oxygen-containing gas; mixing the pressurized fuel slurry, the pressurized oxygen-containing gas and particles of recycled solid products in an inlet zone of an elongated reactor to form a mixture comprising a gaseous phase of oxygen-containing gas and water vapor in which the particles of fuel, alkali and recycled solid products are entrained; permitting combustible portions of the fuel particles to burn at a temperature not exceeding 1600° F. as the mixture flows from the inlet zone to a reactor outlet while maintaining a partial pressure of water vapor of at least 3 atmospheres, as measured at the outlet, forming a reactor



effluent comprising gaseous products in which particles of net and recycled solid products are entrained; passing the effluent through a gas-solids separating device, forming gaseous products carrying fine particles of unseparated solid products and separated net and recycled solid particles; returning the recycled portion of the separated solid particles to the inlet zone; withdrawing the net portion of the separated solid particles; cooling the gaseous products containing the unseparated particles at essentially combustion pressure, by extracting useful heat therefrom, to a temperature below their dew-point, forming a flue gas and a fines slurry containing the unseparated solid particles.

4,714,033

SHANK-MOUNTED PRESS WHEEL ASSEMBLY

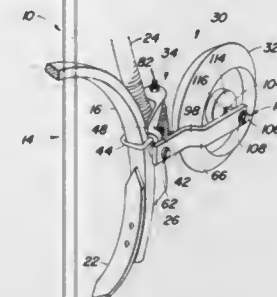
Lowell H. Neameyer, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 6, 1986, Ser. No. 893,526

Int. Cl.⁴ A01C 7/20

U.S. Cl. 111—85

8 Claims



1. In an implement having a shank-supported tool adapted for forward movement through the soil, a shank-mounted press wheel assembly adapted for connecting a fore-and-aft extending press wheel arm to the shank, the assembly comprising: a bracket body having an upright central portion adapted for positioning against the aft face of the shank, an upper end portion connected to the upper end of the central portion and including forwardly projecting and transversely

spaced ears adapted for positioning closely adjacent the sides of the shank, a lower end portion connected to the lower end of the central portion and including a rearwardly projecting transversely apertured pivot area closely adjacent the aft face of the shank, and a leg extending rearwardly from the upper end portion; means pivotally connecting the press wheel arm to the pivot area for rocking vertically with respect to the bracket body; a down-pressure spring; means for supporting the down-pressure spring between the leg and the press wheel arm; and clamp means for selectively securing the body to the aft face and permitting adjustment of the body vertically along the length of the shank.

4,714,034

BUTTON FEEDING DEVICE FOR BUTTON ATTACHING MACHINES

Gerhard Riss, and Richard Fuerhoff, both of Bielefeld, Fed. Rep. of Germany, assignors to Durkoppwerke GmbH, Fed. Rep. of Germany

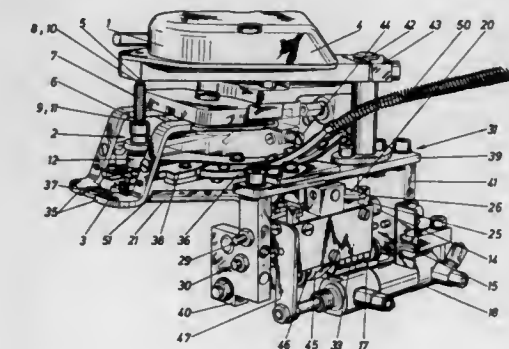
Filed May 30, 1986, Ser. No. 869,110

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1985, 3519659

Int. Cl.⁴ D05B 3/22

U.S. Cl. 112—113

13 Claims



1. A button feeding device for aligning a button and placing it in sewing position, comprising: receiving means for receiving a button from a magazine and locating it in an alignment station; driver disk means at said alignment station for rotating such button to align it so that holes in the button are in a desired position; button clamp means at a sewing station for receiving such button after alignment and placing the button at a sewing position; pin holder means for holding such button in operative engagement with said driver disk means for being aligned thereby and transferring the button to said button clamp means after alignment; alignment shaft means on which said driver disk means is mounted for rotation, said alignment shaft means having a first longitudinal axis; and drive means having a second longitudinal axis for rotating said alignment shaft means; said alignment shaft means being displaceable such that said second longitudinal axis is displaceable with respect to said first longitudinal axis, while still being rotatable by said drive means.

4,714,035

PLACKET LINING MACHINE

Elbert Engle, Ashville, Ala., assignor to Chesebrough-Pond's, Inc.

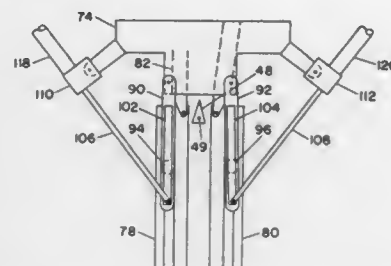
Division of Ser. No. 498,463, May 31, 1983, Pat. No. 4,606,286.

This application Jul. 23, 1986, Ser. No. 889,317

Int. Cl.⁴ D05B 3/10

U.S. Cl. 112-114

6 Claims



1. Apparatus for clamping and straightening a segmented edge on a piece of material comprising a clamp support moveable between clamping and unclamping positions, at least two clamp members mounted to said clamp support, at least one of said clamp members being arranged to pivot with respect to said support and said other clamp member on a pivot axis, and means for adjusting the spacing of said pivot axis with respect to said other clamp.

4,714,036

GUIDING DEVICE FOR THE FORMATION OF A FOLD ALONG THE EDGE OF A FABRIC

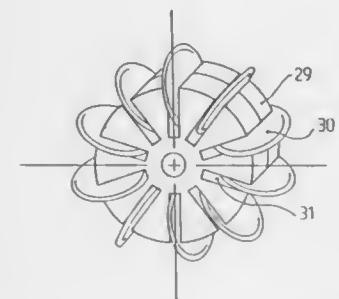
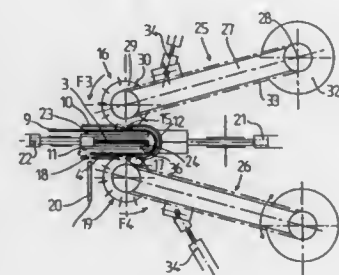
Jean-Pierre Raisin, Troyes, and Alain Canaud, Estissac, both of France, assignors to Institut Textile DeFrance, Boulogne-Billancourt, France

Filed Apr. 20, 1987, Ser. No. 39,699

Int. Cl.⁴ D05B 35/02, 35/06, 35/10

U.S. Cl. 112-147

6 Claims



1. A guiding device for forming a regular fold on a supple piece before a stitching station intended for automatically closing the fold, wherein it comprises, placed in the vicinity of the stitching

station and upstream thereof in the direction D of displacement of the piece in the course of stitching,

a. a passive guiding assembly, consisting of two elements, one being placed inside the other during formation of the fold;

the inner element whose two upper and lower faces are plane and horizontal, the lower face being substantially in the working plane of the stitching station,

the outer element having the form of a U and enveloping the inner element on one side and the two horizontal faces, these two elements being positioned with respect to each other so that there exists between said elements a U-shaped recess sufficient to allow passage of the supple piece and effecting formation of the fold, upon passage of the piece in the bent part of said recess,

b. a correction device comprising:

a device for detecting the presence of the piece placed, beneath the passive guiding assembly, at a distance approximately equal to the width of the desired fold with respect to the bent part of the recess between the two elements of the passive assembly;

an active guiding assembly consisting of at least one active guide, abutting on the supple piece when it is in contact with one of the faces of the inner element, and ensuring displacement of the piece substantially transversely with respect to the direction D of stitching as a function of the instructions given by the detection device.

4,714,037

NEEDLE LOOPER ASSEMBLY FOR NON-THREADED NEEDLE LOCKSTITCHING

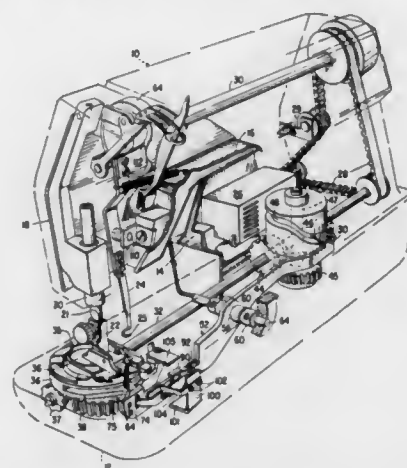
Ralph E. Johnson, Convent Station, and Donald Rodda, Butler, both of N.J., assignors to The Singer Company, Stamford, Conn.

Continuation of Ser. No. 97,599, Nov. 26, 1979, abandoned. This application Aug. 12, 1981, Ser. No. 292,071

Int. Cl.⁴ D05B 57/08

U.S. Cl. 112-184

5 Claims



1. A needle looper assembly for a lockstitch sewing machine having a frame of a total height and including a bed of uniform height less than $\frac{1}{2}$ of said total height, a drive means supported within said frame, a looptaker driven by said drive means, said needle looper assembly being supported in said bed and being used to draw a loop of upper thread down through a work material supported on said bed to said looptaker for concatenation with a lower thread; said needle looper assembly comprising:

a lever pivotally carried within said bed, a needle rigidly clamped to one end of said lever substantially normal thereto, a means associated with said needle for selectively retaining said upper thread; means driven by said drive means for oscillating said lever to urge said needle to an elevated position through said work material and to a

retracted position adjacent said looptaker; and, means supported within said bed for actuating said retaining means for receiving said upper thread when extended through said work material, for retaining said upper thread when traveling through said work material to said retracted position adjacent said looptaker, and for releasing said upper thread to said looptaker when retracted to said position adjacent said looptaker.

4,714,038

METHOD FOR SEWING ZIPPER CHAIN TO ELONGATED FABRIC PIECES

Ronald J. Boser, Huntington, N.Y., assignor to Yoshida Kogyo K. K., Tokyo, Japan

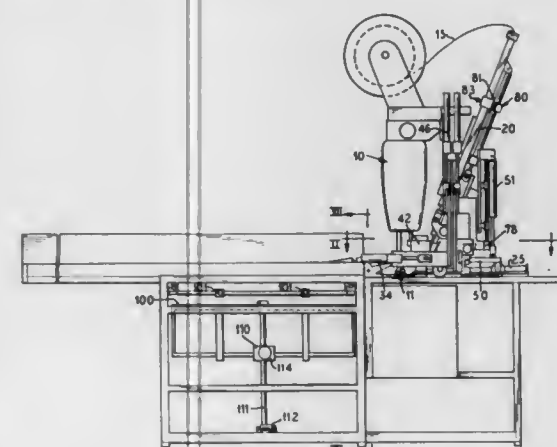
Division of Ser. No. 894,117, Aug. 7, 1986, Pat. No. 4,674,422.

This application May 4, 1987, Ser. No. 45,477

Int. Cl.⁴ D05B 23/00, 97/00

U.S. Cl. 112-265.2

1 Claim



1. A method of sewing a pair of fabric pieces to zipper chain comprising the step of:

aligning the fabric pieces with longitudinal edges to be sewn in spaced relation, advancing the fabric pieces individually and simultaneously to a sewing station while simultaneously folding over the longitudinal edge of each fabric piece, positioning a chain at said sewing station immediately above said fabric, sewing simultaneously the sides of said chain to respective folded edges of the fabric through the length of the longitudinal edges of the fabric while continuously feeding said chain and feeding and guiding properly folded fabric to the sewing station; pulling the sewn materials through the sewing station under substantially constant tension; sensing the trailing end of the fabric edges and cutting said chain at a length at least as long as the length of the said edges; cutting the sewing thread following completion of the sewing of the chain and fabric.

4,714,039

SEWING MACHINE DRIVING SYSTEM

Masami Shimada, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 15, 1986, Ser. No. 919,177

Claims priority, application Japan, Oct. 17, 1985, 60-231687

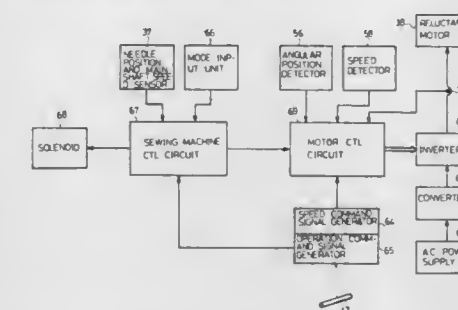
Int. Cl.⁴ D05B 69/22

U.S. Cl. 112-275

18 Claims

1. A sewing machine driving system comprising: a reluctance motor operatively coupled to a sewing machine main shaft and having a stator and a rotor; a drive circuit for driving said reluctance motor;

an angular position detector for detecting the angular position of said rotor with respect to said stator; a needle position detector for detecting the position of a sewing needle connected to said main shaft; a first control unit responsive to a drive command and a



signal from said angular position detector for driving said reluctance motor at variable speeds; and a second control unit responsive to a stop command and signals from said angular position detector and said needle position detector for braking said reluctance motor to stop said sewing needle in a prescribed needle position.

4,714,040

SEWING MACHINE FOUR MOTION SPEED

Noboru Kasuga, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Japan

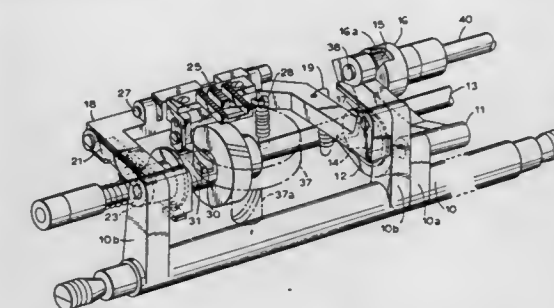
Filed Jul. 15, 1986, Ser. No. 886,542

Claims priority, application Japan, Jul. 15, 1985, 60-106976[U]

Int. Cl.⁴ D05B 27/02

U.S. Cl. 112-323

2 Claims



1. A feeding mechanism of a sewing machine including a feed dog vertically and horizontally movable to feed a fabric to be sewn with respect to a needle plate, a feed shaft (10) rockable about a horizontal axis to move the feed dog in a horizontal plane, cam and link means for rocking said feed shaft about said horizontal axis, and a further shaft (13) rotated to drive a loop taker (37) and said cam and link means, the feeding mechanism comprising a first feed base (18) having one end pivotally connected to said feed shaft; a second feed base (26) to which said feed dog is secured, said second feed base being pivotally supported on said first feed base at another end thereof; a first cam (23) secured to said further shaft (13) for rotation therewith, said first cam engaging said first feed base to vertically shift the same while said first feed base is moved in a horizontal plane by said feed shaft, and a second cam (31) secured to said further shaft (13) for rotation therewith, said second cam engaging said second feed base to vertically shift the same while said first feed base is moved in said horizontal plane.

4,714,041

STRUCTURE OF SURFACE EFFECT SHIP WITH SIDE WALLS

Robert Jaffre, Lorient, and Yvon Ropars, Mours, both of France, assignors to Etat Français, Paris, France

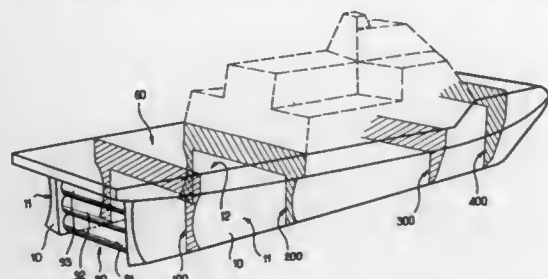
Filed Apr. 8, 1986, Ser. No. 849,274

Claims priority, application France, Apr. 9, 1985, 85 05311

Int. Cl.⁴ B63B 3/32, 1/32

U.S. Cl. 114—67 A

10 Claims



1. A surface effect ship including a catamaran-type supported structure with two side hulls connected by a central box structure, able to operate either as displacement vehicle or as an air cushion lifted vehicle, wherein said ship comprises:

- a plurality of continuous longitudinal stiffeners with said sidewalls for bearing longitudinal bending stresses;
- continuous transverse framing within said central box structure connecting said side hulls thereto and built-in within said hulls for bearing transverse bending stresses; and
- at least one stiffened transverse bulkhead located toward the bow and at least one stiffened transverse bulkhead located toward the stern of said ship, respectively, to bear transverse bending stresses applied on the stern and the bow of said ship resulting from diagonal twist moments on said ship, each said bulkhead comprising a transverse beam-like structure within said central box structure, said beam like structure comprising a vertical web portion strengthened within said central box structure by upper and lower horizontal flanges, said web portion extending continuously down within said hulls, each said bulkhead longitudinally subdividing the hulls and said central box structure of said ship and providing structural integrity thereto.

4,714,042

BARGE COUPLER ASSEMBLY

Frank Schulte, Box 26, Mayo, Fla. 32066

Filed Oct. 24, 1986, Ser. No. 923,042

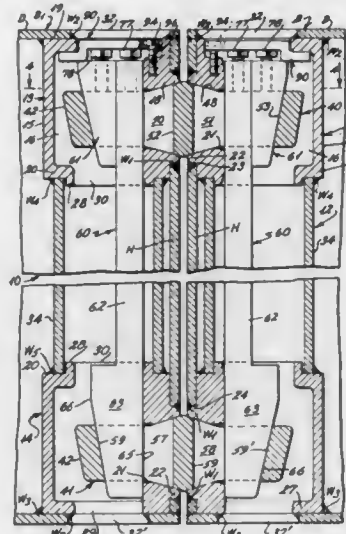
Int. Cl.⁴ B63B 3/08

U.S. Cl. 114—77 R

18 Claims

1. A coupling apparatus for selectively connecting two or more floating marine structures wherein each structure includes a hull portion and a deck portion comprising upper and lower aligned and vertically spaced coupler housings which are mounted to the hull portions of each structure, each of said upper and lower coupler housings having a first opening therein which is generally horizontally oriented outwardly with respect to the hull of the floating marine structure and a second opening which is vertically oriented upwardly generally perpendicularly with respect to said first opening, at least said upper coupler housing having a third downwardly oriented opening therein which is generally axially aligned with said second opening of said lower coupler housing, a first connector means removably disposed within said first openings of said upper coupler housings and a second connector means removably disposed within said first openings of said lower coupler housings, each of said first and second connector means having an intermediate portion and opposite end portions, said end portions being of a size to pass through said first openings and into said upper and lower coupler housings, said first openings being defined by side walls of predetermined configuration, said intermediate portion of said first and second

connector means being of a size to be cooperatively seated with said side walls defining said first openings into said upper and lower coupler housings and including an outermost flange portion which extends outwardly beyond said first openings in said upper and lower coupler housings so that said flange portion will retain said upper and lower coupler housings in



spaced relationship with respect to one another, and retainer means extendable through said upper coupler housings and into said lower coupler housings and engageable with said first and second connector means to retain said first and second connector means within said upper and lower coupler housings, respectively.

4,714,043

POWERED V-BERTH PLATFORM

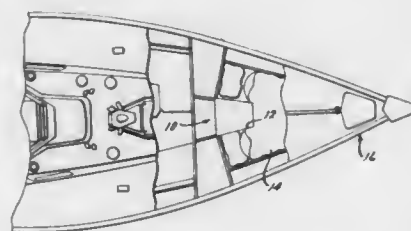
William L. Sheppard, 36655 Romulus Rd., Romulus, Mich. 48174

Filed Aug. 11, 1986, Ser. No. 895,461

Int. Cl.⁴ B63B 29/06, 29/10

U.S. Cl. 114—343

14 Claims



1. A powered platform for use in combination with a conventional V-berth comprising:

- (a) a generally horizontal, flat, cushion element having a shape in plan substantially corresponding to that of the gap in the V-berth;
- (b) a vertically extending support structure supporting said cushion element for movement between a lowered seating position and a raised sleeping position in which it is substantially flush with said V-berth; and
- (c) powered drive means for moving said support structure between said two positions.

4,714,044

PAINTING APPARATUS FOR VEHICLE BODY

Uhee Kikuchi, Sayama, and Tadashi Takeo, Sakado, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

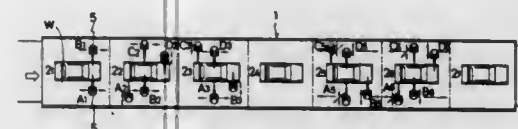
Filed Jul. 2, 1986, Ser. No. 881,302

Claims priority, application Japan, Jul. 2, 1985, 60-143900

Int. Cl.⁴ B05B 13/04, 15/12; B05D 1/02

U.S. Cl. 118—314

5 Claims



1. A painting apparatus for a vehicle body comprising a long paint booth through which the vehicle is conveyed, said paint booth including a plurality of stage means positioned longitudinally in series, at least two of said plurality of stage means being provided with painting robots disposed therein such that while the vehicle body is passed through the painting booth, inner and outer panel regions thereof are painted by said painting robots, wherein the vehicle body is stopped at each of said stage means, and each of the painting robots comprises a multi-axis robot and bell-type atomizer attached thereto, and wherein said plurality of stage means are in communication with one another without partitions therebetween.

4,714,045

DEVICE FOR WETTING THREADS, FILMS OR THREAD BUNDLES WITH LIQUIDS

Ulrich Reinehr; Rolf-Burkhard Hirsch; Joachim Dross, and Hermann-Josef Jungverdorben, all of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

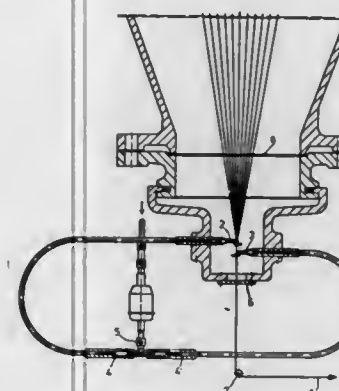
Filed Apr. 11, 1986, Ser. No. 851,064

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515091

Int. Cl.⁴ B05C 3/12

U.S. Cl. 118—420

5 Claims



1. In a spinning shaft end device for wetting threads, films or thread bundles which are transported from top through bottom thereof with a liquid including having means for releasing the liquid, conduits and a storage container and transporting means, the improvement wherein the means for releasing the liquid has at least two slotted nozzles positioned one above the other and opposite each other and each having a horizontal slot, and rods attached at slot ends, which, seen from above, form an angle with the slot of from 100° to 170°.

4,714,046

ELECTROGRAPHIC MAGNETIC BRUSH DEVELOPMENT APPARATUS AND SYSTEM

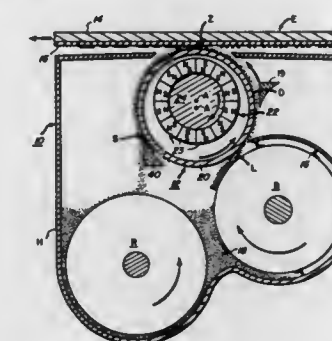
Bruce B. Steele, Wyandotte, Mich.; Allen J. Rushing, Webster, and Kelly S. Robinson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 20, 1985, Ser. No. 799,769

Int. Cl.⁴ G03G 15/09

U.S. Cl. 118—657

9 Claims



1. Magnetic brush apparatus for applying a magnetically attractive developer to a moving electrostatic image-bearing member at a development zone to effect development of such image, said apparatus comprising a cylindrical sleeve of non-magnetic material having a single magnetic core piece positioned therein, said core piece being rotatably driven and adapted to transport developer over a major portion of the sleeve surface, said core piece having a rotational axis which is displaced from the longitudinal axis of said cylindrical sleeve, said rotational axis lying in a first plane passing through the sleeve axis which is angularly displaced with respect to a second plane connecting the sleeve axis and the line of closest contact between said sleeve and said image-bearing member, said annular displacement being between 0° and 20° in a direction upstream of said second plane, as determined by the direction of rotation of said core piece.

4,714,047

METHOD AND DEVICE FOR FORMING ULTRAFINE PARTICLE FILM OF COMPOUND

Hirotane Ikeda, Nishio; Tadashi Hattori, Okazaki; Minoru Ohta, Okazaki, and Shinichi Mukainakano, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

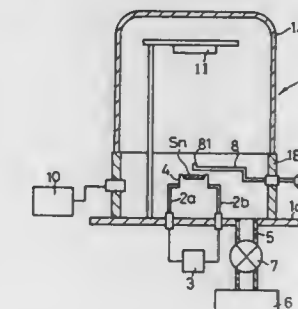
Filed Apr. 18, 1986, Ser. No. 853,761

Claims priority, application Japan, Apr. 20, 1985, 60-84930

Int. Cl.⁴ C23C 14/08, 14/26

U.S. Cl. 118—724

3 Claims



1. A device for forming an ultrafine particle film of compound, comprising: a vessel for forming a reactive gas atmosphere; an evaporation source for retaining and heating a material to be evaporated;

a base plate on which ultrafine particles of compound are to be deposited;
said evaporation source being provided in the base portion within said vessel;
said base plate being provided in the upper portion within said vessel;
said evaporation source and said base plate being disposed so as to be opposed to each other in the vertical direction; and
a gas introducing pipe for supplying a reactive gas into said vessel; said gas introducing pipe having a gas injection port which is positioned in an interaction area adjacent to said evaporation source, in which evaporation of said material concentrically exists,
wherein said gas injection port is positioned at a center of said interaction area,
wherein said gas injection port is formed into a nozzle provided with a plurality of small holes through which said reactive gas injects,
wherein said gas injection port is positioned above said evaporation source so as to face said evaporation source.

4,714,048

LIQUID FLOW SENSING DEVICE

Keith W. Jefferies, Palmerston North, and Murray D. Long, Foxton, both of New Zealand, assignors to Allflex International Limited, Palmerston North, New Zealand

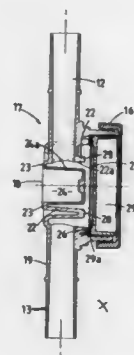
Filed Nov. 15, 1985, Ser. No. 798,687

Claims priority, application New Zealand, Nov. 19, 1984, 210240

Int. Cl.⁴ A01J 7/00

U.S. Cl. 119-14.08

25 Claims



1. A liquid flow sensing device comprising:

- a flow sensor having a flow passage through which liquid can flow, said flow passage having a first wall and a second wall, said flow sensor comprising a body having an annular space therein and into which opens an inlet whose cross-sectional area is substantially the same as the cross-sectional area of said annular space, said body having an outlet coaxially disposed with respect to said inlet, said annular space being formed at least in part by said first wall and said second wall and disposed such that the axis of said annular space is at substantially right angles to the axis of said inlet and outlet,
- a first electrode disposed with a first wall of the flow passage so as to extend about a portion of the flow passage so as to extend about a portion of the flow passage,
- a second electrode disposed with a second wall of the flow passage in that portion of the flow passage about which the first electrode extends such that a least portions of the electrodes are in an opposing disposition,
- electronic detection means coupled to said electrodes for detecting a varying capacitance between the electrodes as the amount of liquid flow through the passage varies and flow passage closure means comprising a diaphragm mounted with said body, said diaphragm having a first surface which can sealably close said annular space such

that the fluid flow to said outlet is prevented, and a second surface exposed to a chamber in which a sub-atmospheric pressure can be established.

4,714,049

APPARATUS TO REDUCE OR ELIMINATE FLUID BED TUBE EROSION

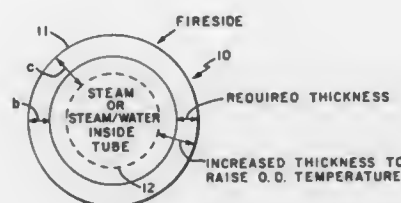
Daniel E. McCoy, Donald L. Garver, and George Hileman, all of Williamsport, Pa., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Oct. 8, 1986, Ser. No. 916,689

Int. Cl.⁴ F22B 1/00

U.S. Cl. 122-4 D

13 Claims



1. A fluidized bed boiler or reactor, comprising a housing, a reaction chamber within said housing, air distribution means within said reaction chamber, a plurality of heat exchange tubes approximately horizontally disposed and arranged with a fluidized bed region within the chamber, wherein the improvement comprises:

- fin means being associated with said heat exchange tubes, said fin means comprise a plurality of individual fins circumferentially arranged around said heat exchange tubes and spaced from each other along the axis of said heat exchange tubes by a distance of between 0.25-2.00 inches and said heat exchange tubes having an outer diameter in the range between 1-6 inches, whereby the fire-side temperature of said heat exchange tubes is increased so as to result in the coating of said heat exchange tubes with a thin film of material from said fluidized bed region which protects said heat exchange tubes from erosion.

4,714,050

PRE-HEATER

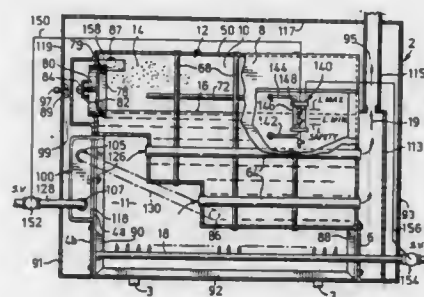
David J. Nichols, Brampton, Canada, assignor to Garland Commercial Ranges Limited, Mississauga, Canada

Filed Aug. 29, 1985, Ser. No. 770,569

Int. Cl.⁴ F22B 5/00

U.S. Cl. 122-13 R

2 Claims



1. An industrial oven, including the combination of:

- (a) a steam generating tank having a fluid inlet and steam outlet;
- (b) walls depending from said tank and defining a combustion chamber therebelow;
- (c) said tank presenting a stepped portion within said combustion chamber;
- (d) a preheater associated with one of said walls exteriorly

- of said combustion chamber and having a water inlet therein, and a water outlet thereof, said preheater water outlet communicating with the tank inlet;
- (e) said preheater located in the region adjacent said tank and opposite said stepped portion so as to concentrate heat energy between said preheater and said stepped portion of said tank;
- (f) said preheater including a wall adapted to contact an overlap one of said stepped portions in said combustion chamber;
- (g) means for generating heat energy within said combustion chamber so as to preheat water within said preheater and generate steam from water within said tank;
- (h) means for controlling the introduction of water into said preheater and into said tank so as to minimize the drop of steam pressure in said tank during introduction of water into said tank;
- (i) said tank including a steam generator in the region adjacent said steam outlet for separating water from said steam in said tank.

4,714,052

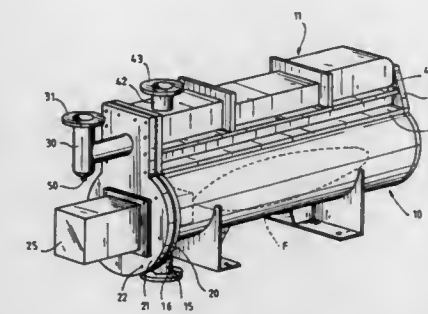
INDUSTRIAL GAS OPERATED LIQUID HEATER
Jean-Pierre Gilfaut, Saint Andre d'Apchon; André Peze, St Leger S/Roanne; Jean-Paul Ravillard, and Jean-Claude Thevenet, both of Roanne, all of France, assignors to Barriquand, Roanne, France

Filed May 30, 1986, Ser. No. 868,946

Claims priority, application France, May 31, 1985, 85 08201
Int. Cl.⁴ F22B 7/12

U.S. Cl. 122-149

12 Claims



1. An industrial gas operated liquid heater comprising a tubular hearth, a gas burner connected to a front end face of said hearth so that the hearth defines a first path of travel for combustion fumes emanating from said burner, a heat exchanger connected to said tubular hearth and forming therewith a one-piece unitary assembly, said heat exchanger comprising a plurality of spaced apart chambers extending longitudinally adjacent to said hearth and communicatively connected thereto so as to provide a plurality of discrete second paths of travel for combustion fumes issuing from the tubular hearth while defining between adjacent chambers a plurality of channels for passage of liquid in heat exchanging relation to said chambers, a shroud having portions surrounding said tubular hearth in spaced relation thereto so as to provide an annular space substantially enclosing said tubular hearth for accommodating liquid flow therethrough, said shroud additionally having portions surrounding said plurality of chambers and cooperating therewith to define the paths of liquid flow whereby liquids introduced into the heater flow through both the annular space surrounding the hearth and through said plurality channels of the heat exchanger in heat exchanging relation to the combustion fumes flowing through the hearth and through the chambers of the heat exchanger.

4,714,053

WATER HEATER CLEANING APPARATUS

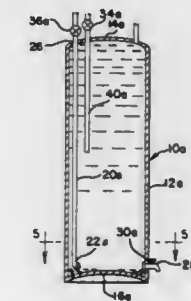
Richard C. Perry, 905 Linden Ct., Western Springs, Ill. 60558

Filed Jul. 23, 1986, Ser. No. 888,352

Int. Cl.⁴ F22B 37/50, 37/52

U.S. Cl. 122-382

5 Claims



1. An apparatus for cleaning a residential or commercial water heater or the like without draining and refilling said heater, comprising a vertically-disposed water heater having a

4,714,051

POWER SOURCE UTILIZING ENCAPSULATED LITHIUM PELLETS AND METHOD OF MAKING SUCH PELLETS

John T. Buford, Winnebago, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

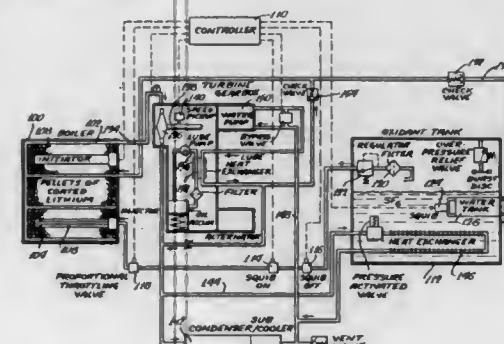
Division of Ser. No. 618,893, Jun. 8, 1984, Pat. No. 4,634,479.

This application Aug. 29, 1986, Ser. No. 901,575

Int. Cl.⁴ F22B 1/00, 3/00

U.S. Cl. 122-21

6 Claims



1. An energy source comprising:

- a boiler having an oxidation chamber and a working fluid chamber in heat exchange relation therewith;
- means connected to said working fluid chamber for conveying heated working fluid therein to a point of use;
- a body of lithium pellets in said oxidation chamber, said pellets being coated with a thin layer of predominantly fluorine substituted polymeric material;
- a controllable heat source in said body for elevating the temperature of some of said pellets sufficiently to initiate an oxidation reaction between said some pellets and the coating thereon;
- a controllable oxidant inlet for said oxidation chamber; and an oxidant supply chamber connected to said inlet for controlled supply of a lithium oxidant to said oxidation chamber to maintain an oxidation reaction with the lithium once it is initiated.

cylindrical side wall, a top, and a bottom; a first opening in said side wall and adjacent said bottom; a water supply tube which enters said first opening, said water supply tube terminating at a nozzle which permits entry of a stream of water in a generally horizontal spray pattern along said bottom for flushing and agitating any foreign matter along said bottom, and a drain cock within a second opening in said side wall and diametrically opposed to said first opening, said drain cock being open while flushing said tank bottom so that said foreign matter is removed through said drain cock.

4,714,054

MOISTURE TRAP FOR A MOISTURE SEPARATOR REHEATER

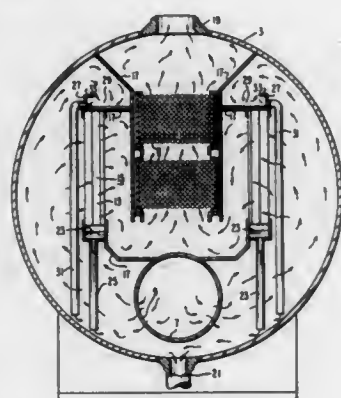
Paul G. Minard; James Alba, both of Winter Springs, and David A. Pacyna, Orlando, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 2, 1986, Ser. No. 847,337

Int. Cl.⁴ F22G 1/00

U.S. Cl. 122—483

5 Claims



1. A moisture separator reheater comprising:
 - a elongated shell;
 - a steam inlet for influent moisture laden motive steam;
 - a reheater tube bundle extending lengthwise in a central portion of the elongated shell;
 - a plurality of chevron shaped vanes disposed side by side to form moisture separating means to remove entrained moisture from the motive steam passing therethrough;
 - a plurality of plates cooperatively associated with each other, the shell, the tube bundle, and the moisture separator means forming a barrier between the steam inlet and the reheater tube bundle so that all of the motive steam passes over the chevron shaped vanes before entering the reheater tube bundle;
 - at least one of the plates being disposed above the chevron shaped vanes and having a vertically extending wall portion to form a trough disposed above the chevron shaped vanes to collect moisture separated from the moisture laden motive steam as the motive steam flows through the shell from the steam inlet to the moisture separator means;
 - the vertically extending wall portion of the trough having an upper margin disposed above any moisture collected therein and having an additional wall portion which extends from the upper margin back over a portion of the trough;
 - a drain in the shell; and
 - draining means in fluid communication with the trough extending through the vertically extending wall portion and disposed to direct moisture collected in the trough to the drain in the shell and thereby preventing the moisture collected above the separator from forming droplets which drip down adjacent the inlet to the chevron shaped vanes and become reentrained in the motive steam thereby eroding the inlet ends of the chevron shaped vanes.

4,714,055

WATER AND STEAM SEPARATING DEVICE FOR DRYING MOIST STEAM

Patrick Sundheimer, Saint-Maur-des-Fosses, France, assignor to Framtome & Cie, Courbevoie, France

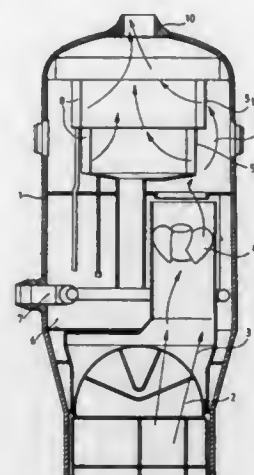
Filed Sep. 17, 1985, Ser. No. 777,132

Claims priority, application France, Sep. 17, 1984, 8414212

Int. Cl.⁴ F22B 1/06

U.S. Cl. 122—488

3 Claims



1. A device for separating water and steam for the drying of moist steam which has a rising current at the inlet and at the outlet of the separating device, said device comprising at least one assembly interposed in the path of the steam and formed by drying elements and a perforated vertical panel having an inlet side, which receives the moist steam which reaches, after having passed through the perforated panel, a zone enclosing the drying elements comprising baffles constituted by walls disposed in a general vertical direction and transverse with respect to the path of the steam for deviating the stream of steam, and troughs for recovering the water separated from the steam, disposed vertically and in such manner that their horizontal cross-sectional shape has a hollow part which faces toward the incident stream of steam, wherein the perforated vertical panel comprises a grid of expanded metal produced by the cutting of a sheet of metal followed by stretching of the sheet in the course of which the bands separating the cutout cells assume an identical inclination relative to the plane of the sheet and constitute inclined strips defining the cells, the grid being disposed so that the strips are downwardly inclined in the direction of the travel of the steam through the panel for the deflection of said steam so that its path is substantially horizontally or slightly downwardly inclined at the moment it comes into contact with the drying elements, the stream of steam having thus no vertically upwardly directed component of its speed vector when it comes into contact with the troughs.

4,714,056

TWO-CYCLE ENGINE

Takumi Tottori, Fujimi; Kenji Oki, Asaka; Kazuo Ooyama, Niiza, and Toshio Mizushima, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Jul. 29, 1985, Ser. No. 760,306

Claims priority, application Japan, Aug. 3, 1984, 59-162791; Feb. 15, 1985, 60-27951; Feb. 15, 1985, 60-27953

Int. Cl.⁴ F02B 75/02

U.S. Cl. 123—65 PE

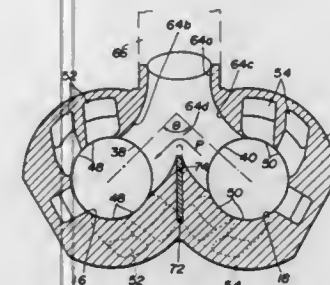
3 Claims

1. A two-cycle engine comprising:
 - a cylinder block having at least one pair of first and second cylinders, said first and second cylinders having a pair of first and second exhaust ports, respectively;
 - a pair of first and second pistons received respectively in said

first and second cylinders for reciprocal movement therealong, each of said first and second exhaust ports being selectively closed and opened by a respective one of said first and second pistons during the movement thereof along a respective one of said cylinders;

crankshaft means to which said first and second pistons are operatively connected in such a manner that said first and second pistons are reciprocable 180° out of phase along the respective cylinders, a final portion of the duration of opening of one of said exhaust ports overlapping an initial portion of the duration of opening of the other;

exhaust passage means having means communicating said first and second exhaust ports with each other adjacent



- thereto, said exhaust passage means comprising an exhaust manifold which has a pair of branch passages communicating respectively with said first and second exhaust ports at one end thereof and a main passage at which said pair of branch passages join together at the other ends thereof to provide a branched portion;
- a partition wall member mounted on said cylinder block for movement into and out of said branched portion of said exhaust manifold; and
- actuator means operable to control the movement of said partition wall member in accordance with the engine speed at the final portion of the duration of opening of one of said exhaust ports.

4,714,057

VARIABLE VALVE CONTROL SYSTEM FOR A PISTON INTERNAL-COMBUSTION ENGINE

Klaus Wichart, Vienna, Austria, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

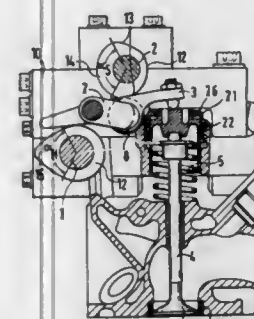
Filed May 30, 1986, Ser. No. 868,711

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519319

Int. Cl.⁴ F01L 1/34

U.S. Cl. 123—90.15

13 Claims



1. A variable valve control system including an internal-combustion engine, having an intake valve operable by valve lever means that can be pivoted around a shiftable bearing point, said system including:
 - continuously rotating lift camshaft means and continuously

rotating control camshaft means for controlling the pivoting of the valve lever means;

phase-shifting means for phase-shifting the control camshaft means with respect to the lift camshaft means in response to operating parameters of the engine; and

a crank pivotably arranged at a stationary bearing point, wherein said valve lever means, is disposed on said crank; wherein said control camshaft means rotates at the same speed as the lift camshaft means; and wherein said valve lever means is pivoted against the force of valve spring means.

4,714,058

SPARK-IGNITED INTERNAL COMBUSTION ENGINE

Hiroyuki Oda, and Akira Kageyama, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

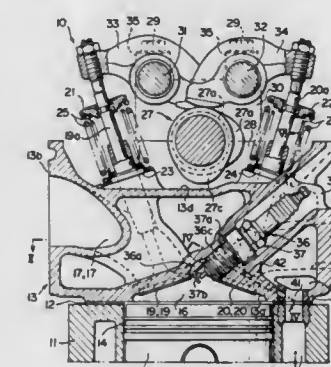
Filed Dec. 2, 1985, Ser. No. 803,606

Claims priority, application Japan, Dec. 10, 1984, 59-261335; Dec. 14, 1984, 59-265085

Int. Cl.⁴ F01P 3/02; F01L 1/26

U.S. Cl. 123—90.22

13 Claims



1. A spark-ignited engine comprising a cylinder block having at least one cylinder in which a piston is slidably received, and a cylinder head fixedly mounted on the cylinder block to form at least one combustion chamber therebetween, each combustion chamber being provided with a plurality of intake ports each of which is opened and closed by an intake valve, at least one exhaust port which is opened and closed by an exhaust valve and a spark plug screwed into a threaded plug hole formed in the cylinder head so that the igniting tip thereof projects into the combustion chamber wherein the improvement comprises at least one bore for forming a coolant passage provided in the wall of the cylinder head defining the combustion chamber to extend between the exhaust port and the plug hole, a single camshaft for driving the intake valve and the exhaust valve over the combustion chamber, wherein a plurality of the intake ports are located on one side with respect to the camshaft and the at least one exhaust port and the spark plug are located on another side with respect to the camshaft, and the coolant passage is a linear passage having one end communicating with a coolant inlet formed in the cylinder head through which coolant from the cylinder block enters the cylinder head, and another end opening into a water jacket above the combustion chamber.

4,714,059

SINGLE OVERHEAD CAMSHAFT ENGINE

Shuji Masuda, and Hiroyuki Oda, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 29, 1986, Ser. No. 857,064

Claims priority, application Japan, Apr. 30, 1985, 60-94504

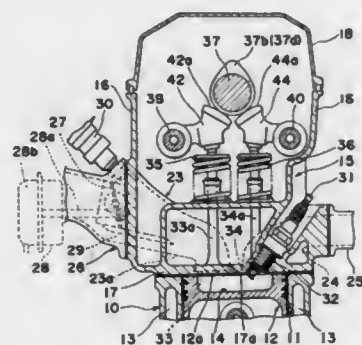
Int. Cl.⁴ F01L 1/26

U.S. Cl. 123—90.23

26 Claims

1. An internal combustion engine with single overhead camshaft which comprises:

- a cylinder block having at least one cylinder bore defined therein and accommodating therein a piston for reciprocal movement in a direction parallel to the longitudinal axis of the cylinder bore;
- a cylinder head mounted firmly on the cylinder block and having a bottom wall, said bottom wall defining a combustion chamber in cooperation with the piston and a wall of the cylinder block surrounding the cylinder bore, said combustion chamber having a volume variable in dependence on the movement of the piston within the cylinder bore, at least a surface area of the bottom wall which confronts the combustion chamber being a planar surface; said piston, having a flat top end face, confronting, and generally in parallel relationship with, the planar surface of the bottom wall of the cylinder head, and having a cavity defined in said flat top end face;
- said bottom wall having a pair of intake ports defined therein for the introduction of intake gas into the combustion chamber, and also having a pair of exhaust ports defined therein for the discharge of exhaust gases from the combustion chamber;
- separate intake valve means, one for each of the intake ports, for selectively opening and closing the respective intake ports, and separate exhaust valve means, one for each of the exhaust ports, for selectively opening and closing the respective exhaust ports generally in opposite sense to the selective opening and closing of the intake ports, all of said intake and exhaust valve means are supported by the cylinder head for movement in a direction generally perpendicular to the planar surface of the bottom wall;



- a camshaft rotatably supported by the cylinder head above and between the intake valve means and the exhaust valve means so as to extend transversely of the longitudinal axis of the cylinder bore and having first and second cam means operatively associated respectively with the intake and exhaust valve means;
- a support shaft means supported by the cylinder head;
- first and second rocker arm means, swingably mounted on the support shaft means, and operatively associated respectively with the intake and exhaust valve means, the first rocker arm means being operable to transmit a movement of the first cam means on the camshaft to the intake valve means for driving said intake valve means, said second rocker arm means being operable to transmit a movement of the second cam means to the exhaust valve means for driving said exhaust valve means;
- a generally elongated combustion aiding means constituted by an ignition plug or a fuel injector nozzle and supported by the cylinder head so as to incline relative to the planar surface of the bottom wall while extending intermediate between exhaust passage means communicated respectively with the exhaust ports, said combustion aiding means having one end exposed to the combustion chamber;
- said support shaft means including a first support shaft for supporting the first rocker arm means and a second support shaft for supporting the second rocker arm means; said first and second support shafts being positioned on

respective opposite sides of the camshaft adjacent the intake valve means and the exhaust valve means and arranged in symmetrical relation to each other, said second support shaft extending parallel to the camshaft, at least a portion of said combustion aiding means being positioned substantially directly below said second support shaft in a noninterfering relation with said second support shaft.

4,714,060 COMPOSITE ENGINE

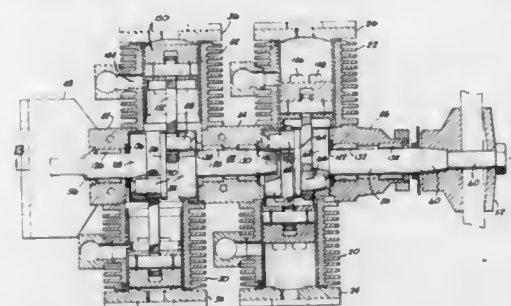
Raymond P. Kesteloot, Lake Havasu, Ariz., assignor to R K W Industries, Inc., Balboa Island, Calif.

Filed Feb. 4, 1986, Ser. No. 825,859

Int. Cl.⁴ F02F 7/00

U.S. Cl. 123—195 R

11 Claims



1. A crankshaft for a composite engine, comprising a first bearing shaft having a first main crank web at one end thereof;
 - a second bearing shaft having a second main crank web at one end thereof;
 - first and second intermediate crank webs each having first and second substantially identical crank pins positioned eccentrically and diametrically opposed therein and said first and second main crank webs including holes therein to receive respectively said first crank pins from said first and second intermediate crank webs; and
 - a third main crank web and an intermediate bearing shaft having a fourth main crank web at one end thereof, said third main crank web having a concentric hole therein to receive a second end opposite said one end of said intermediate bearing shaft and said third and fourth main crank webs including holes for receipt of said second crank pins.
10. A composite engine comprising
- a crankshaft; and
- a crankcase rotatably supporting said crankshaft and including a main crankcase having a first mounting face at one end thereof normal to said crankshaft, an intermediate crankcase having a second mounting face thereof capable of mating with said first face and a third mounting face at a second end thereof, said second and third mounting faces being normal to a central crankshaft axis and a crankcase hub having a fourth mounting face capable of mating with said first mounting face and with said third mounting face, said second and fourth mounting faces having thrust shoulders normal to said crankshaft axis and said main crankcase and said intermediate crankcase each having an internal thrust shoulder, said internal thrust shoulder of said main crankcase being displaced from and facing in the same axial direction as said first mounting face and said internal thrust shoulder of said intermediate crankcase being displaced from and facing in the same direction as said third mounting face.

4,714,061 INLINE MULTIPLE CYLINDER ENGINE FOR MOTORCYCLES

Yoshiharu Nakayama, Hamamatsu, and Youichi Ohnishi, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

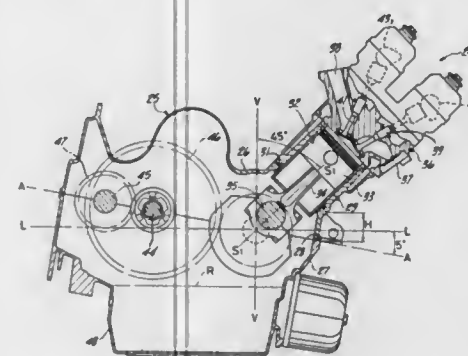
Filed Jul. 29, 1985, Ser. No. 759,946

Claims priority, application Japan, Jul. 31, 1984, 59-160599

Int. Cl.⁴ B62D 61/02

U.S. Cl. 123—195 R

7 Claims



1. In a power plant of the type employed for powering a motor vehicle having a longitudinal axis comprising a main casing comprised of a lower member and an upper member having mating faces lying in a plane, an engine output shaft rotatable about a first forwardly disposed axis, and a change speed transmission having a primary shaft driven by said engine output shaft, and rotatable about a second axis parallel to said first axis, a secondary shaft rotatable about a third axis parallel to said first and said second axes and disposed rearwardly of said first and said second axes and gearing means driving said secondary shaft from said primary shaft, said first, second and third axes all lying in said plane, and a cylinder block affixed to said upper member of said main casing in proximity to the forward edge thereof, the improvement comprising said plan being inclined to the horizontal and extending downwardly in a forward direction so that said first axis lies below said second axis and said second axis lies below said third axis.

4,714,062 SUB-COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Shigetoshi Toeda, Kokubu, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 603,231, Apr. 23, 1984, abandoned.

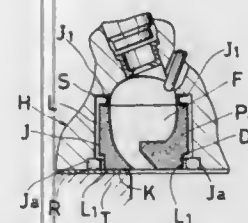
This application May 21, 1986, Ser. No. 870,294

Claims priority, application Japan, Apr. 27, 1983, 58-75648

Int. Cl.⁴ F02B 3/00

U.S. Cl. 123—273

8 Claims



1. In a cylinder head in an internal combustion engine having a cylinder body to which the cylinder head is installed, with a gasket placed therebetween, the cylinder head including a pre-combustion chamber having a cylindrical portion for receiving a ceramic hot plug; and a ceramic hot plug disposed in

said cylindrical portion of said pre-combustion chamber; the improvement comprising:

- an annular shoulder in said pre-combustion chamber, said annular shoulder defining the upper end of said cylindrical portion of said pre-combustion chamber;
- an annular elastic member disposed between said annular shoulder and the upper end of said ceramic hot plug and compressed therebetween;
- the ceramic hot plug being shaped to conform to the cylindrical portion of the pre-combustion chamber so that a small clearance is provided between the ceramic hot plug and the peripheral wall of said pre-combustion chamber; and
- means for preventing said ceramic hot plug from dropping out of said cylindrical portion of said pre-combustion chamber prior to installation of the cylinder head on the cylinder body, wherein said means contacts said ceramic hot plug prior to installation of the cylinder head and, after installation of said cylinder head, the ceramic hot plug is urged toward the upper end of said cylindrical portion of the pre-combustion chamber so that a clearance is provided between said means and said ceramic hot plug and said ceramic hot plug is held between said elastic member and the gasket member disposed between said cylinder head and said cylinder body.

4,714,063 INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hiroyuki Oda; Akihito Nagao; Masanori Misumi; Akinori Yamashita, and Katsumi Okazaki, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

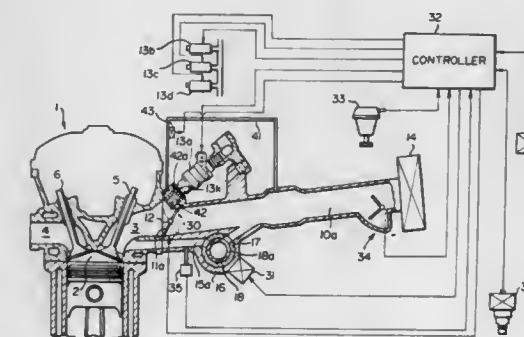
Filed Sep. 16, 1986, Ser. No. 907,996

Claims priority, application Japan, Sep. 17, 1985, 60-205786; Sep. 17, 1985, 60-205787; Sep. 17, 1985, 60-205788; Sep. 17, 1985, 60-205789

Int. Cl.⁴ F02B 31/00

U.S. Cl. 123—308

14 Claims



1. An intake system for an internal combustion engine comprising a first valve means provided to open and close an intake passage leading to each combustion chamber, a bypass passage for introducing intake air into each combustion chamber by-passing the first valve means, and a second valve means provided to open and close the bypass passage, the first valve means being operated to close the intake passage in a light load range and to open the same in a heavy load range, and the second valve means being operated to close the bypass passage in the middle of each intake stroke, wherein the improvement comprises a first valve control means which controls the first valve means so that the opening of the intake passage is increased as the engine load increases after exceeding a predetermined value, and a second valve control means which controls the second valve means to delay the time the bypass passage is closed with increase in the engine load so that the time the bypass passage is opened substantially overlaps with the time

the intake valve is opened when the engine load reaches the predetermined value.

4,714,064

CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Shigeki Imazu, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

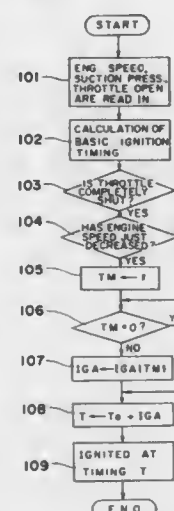
Filed Apr. 23, 1986, Ser. No. 854,864

Claims priority, application Japan, Apr. 25, 1985, 60-90162

Int. Cl.⁴ F02M 3/07; F02P 5/04

U.S. Cl. 123—339

7 Claims



1. A control device for an internal combustion engine which comprises:

- an ignition timing setting means for setting an ignition timing of said engine;
- an idling detecting means for detecting an idling operating condition of said engine;
- an idling speed control means for controlling the idling engine speed to a target speed by controlling the amount of intake air after having received a signal from said idling detecting means;
- a deceleration detecting means for detecting whether said engine has decreased into an idle operating speed range; and
- an ignition timing correcting means for advancing said ignition timing set by said ignition timing setting means relative to ordinary idling ignition timing when said engine has entered into said idling operating condition after detection of decreased speed of said engine by said deceleration detecting means by receiving said signal from said idling detecting means and a signal from said deceleration detecting means, said ignition timing correcting means maintaining the advanced ignition timing during a predetermined time of the idling operating condition of said engine.

4,714,065

METHOD AND DEVICE FOR SUPPLYING FUEL AND AIR TO AN INTERNAL COMBUSTION ENGINE

Felix G. Cascajosa, Madrid, Spain, assignor to Latimer N.V., Curacao, Netherlands Antilles

Filed Jun. 17, 1985, Ser. No. 745,871

Claims priority, application European Pat. Off., Aug. 14, 1984, 84109685

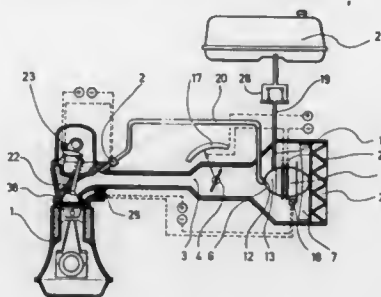
Int. Cl.⁴ F02M 34/00

U.S. Cl. 123—452

28 Claims

1. A device for supplying fuel and air to an internal combustion engine (1) comprising a fuel pump (13), the outlet (12) of which is connected to at least one injection nozzle (2) through a fuel line (20) and an air intake pipe (3) having disposed

therein a throttle (4) and being provided with said injection valve (2) being characterized in a pump device (5) provided with two pump impellers (6, 7) which are arranged such that they are co-axial and adapted to be rotated about an ideal axis of rotation and which are disposed in separate flow channels (9, 10) and provided with co-operating pole carrier members



(8a, 8b), said pump impellers constituting the contra-rotating parts of an electric motor, which does not have any output shaft and which exclusively drives said pump impellers (6, 7), the first pump impeller (6) being part of said fuel pump (13) and the second pump impeller (7) being designed as an air compressor impeller arranged in the area of the intake pipe (3).

4,714,066

FUEL INJECTOR SYSTEM

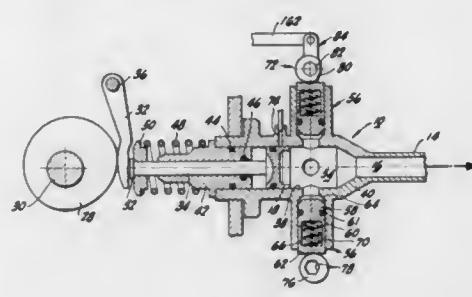
Robert D. Jordan, 885 Carthage Ct., Concord, Calif. 94578

Filed Aug. 14, 1980, Ser. No. 178,142

Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—447

5 Claims



1. An improved liquid injector system for combustion engines comprising:

- a liquid pump mechanism having a liquid chamber with a reciprocal drive piston, said pump mechanism containing a drive liquid, and including a delivery conduit for said drive liquid;
- means for connecting the reciprocal drive piston to a drive source for reciprocating said drive piston in said liquid chamber;
- at least one control cylinder communicating with said liquid chamber, said control cylinder having a displaceable control piston for varying the effective volume of said liquid chamber and an input drive means operably connected to said control piston for displacing said control piston in said control cylinder in accordance with input variables, wherein periodic delivery of drive fluid in said delivery conduit is varied in accordance with displacement of said control piston in said control cylinder; and
- a liquid injector mechanism connected to a liquid source, the injector mechanism having an injector nozzle and a cylinder with a displaceable power piston separating a first liquid chamber on one side of said piston and a second liquid chamber on the other side of said piston, said first chamber being connected to said delivery conduit of said pump mechanism and said second chamber being con-

nected to said liquid source and to said injector nozzle, wherein periodic delivery of drive liquid to said first chamber generates displacements in power piston forcing fluid from said supply source through said injector nozzle; wherein said injector nozzle has an annular divergent orifice of predetermined maximum size, said nozzle being constructed with an inner displaceable stem having a displacement stop and a conically divergent end and constructed with a fluid passage with an inner stop seat and with an outer divergent wall coincident with said conically divergent end, said stem including bias means for biasing said displacement stop away from said stop seat when fluid is not forced through said injector nozzle by said power piston, said displacement stop being displaceable against said stop seat during high pressure fluid injection, said orifice being formed between said divergent end of said stem and said divergent wall upon displacement of said stem and engagement of said stop wherein said orifice has a predefined limited discharge area for discharge of fluid in particulate spray upon injection.

4,714,067

ELECTRONIC FUEL INJECTION CIRCUIT WITH ALTITUDE COMPENSATION

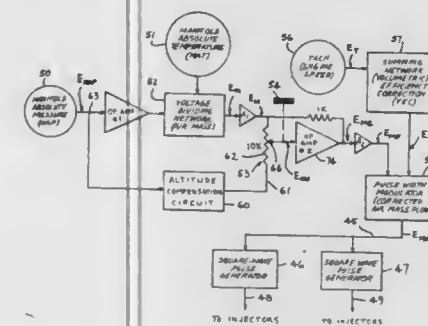
Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 23, 1986, Ser. No. 946,189

Int. Cl.⁴ F02D 41/34

U.S. Cl. 123—494

9 Claims



1. In an electronic fuel-injection control circuit for an internal-combustion engine, wherein a manifold absolute pressure sensor and a manifold absolute temperature sensor feed signals through a combining network to the resistance element of a potentiometer having a variable tap from which a control voltage is derived as a function of desired throttle setting, the improvement wherein compensation means are provided coupled to said potentiometer for altering the relationship between said control voltage and said manifold absolute pressure sensor signal as a function of ambient atmospheric pressure.

4,714,068

METHOD AND DEVICE FOR CONTROLLING FUEL INJECTION QUANTITY OF ELECTRONIC CONTROL DIESEL ENGINE

Masaomi Nagase, Toyota; Eiji Takemoto, Oobu; Noritaka Ibuki, Oogaki, and Takashi Hasegawa, Tajimi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 29, 1986, Ser. No. 868,097

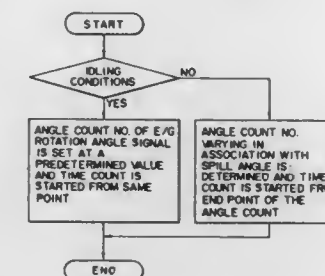
Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—506

10 Claims

1. A method of controlling a fuel injection quantity in an electronic control diesel engine, wherein said fuel injection quantity is controlled by an electromagnetic spill valve on-off operated at a target spill angle in accordance with an angle count number and a time count number of an engine rotation,

based on an engine rotation angle signal outputted through a predetermined crank angle, comprising the steps of: detecting whether idling conditions exist or not; setting said angle count number of said engine rotation angle signal at a predetermined fixed value during detected idling conditions and starting a time count of said time count number from the end point of said predetermined



fixed angle count number to on-off operate said electromagnetic spill valve; and determining said angle count number varying in association with said target spill angle during detected non-idling conditions and starting said time count of said time count number from the end point of said angle count number to on-off operate said electromagnetic spill valve.

4,714,069

VOLLEYBALL SETTING MACHINE

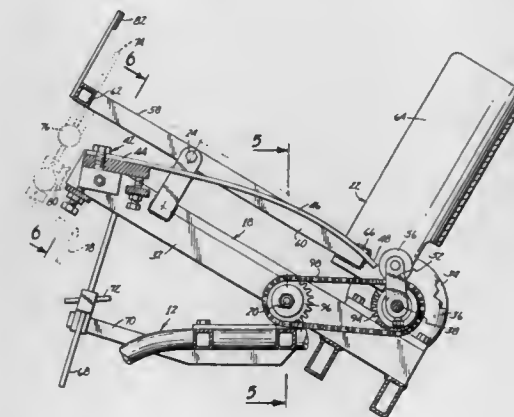
Harold C. Ulrich, Box 282, Blooming Prairie, Minn. 55917

Filed Jun. 5, 1986, Ser. No. 871,062

Int. Cl.⁴ F41B 7/00

U.S. Cl. 124—26

11 Claims



1. A machine for projecting resilient balls upward into predetermined trajectories by mechanical impact, said machine including:

- (a) a floor supported main frame;
- (b) a propulsion assembly mounted to the main frame and including a power operated propulsion arm having a ball engaging forward end portion;
- (c) a ball guide path assembly supported with respect to the main frame and including a ball positioning track adapted to position a ball-to-be-projected in a preferred aligned relation with respect to said forward end portion of the propulsion arm and including a discharge chute adapted to affect the trajectory of the ball after it has been projected by the propulsion arm;
- (d) means for delivering a ball to be projected to said ball positioning track;
- (e) said propulsion assembly including controllable means for initiating operation of the propulsion arm when the ball-to-be-projected is in said preferred aligned relation;

- (f) wherein the propulsion assembly is adjustably mounted with respect to the main frame and the ball guide path assembly is mounted on the propulsion assembly; and
- (g) adjustable propulsion assembly positioning means is provided between the propulsion assembly and the main frame to selectively vary the angular relation of the propulsion assembly to the main frame, thus to vary the angular relation of the guide path assembly to the floor.

4,714,070

GUARD FOR PROTECTING A COMPOUND BOW

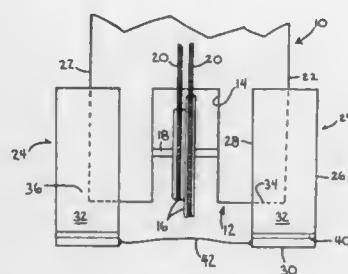
Ronnie J. Shelton, 1826 E. Line, Sapulpa, Okla. 74066

Filed Jul. 25, 1986, Ser. No. 889,475

Int. Cl.⁴ F41B 5/00

U.S. Cl. 124—86

9 Claims



1. A guard for attachment to a compound bow provided with a pair of limbs each having a pair of split limb end portions and a notch having a pulley transversely mounted therein, the split limb end portions each having a lateral edge surface and one end surface, said guard comprising:

- a pair of bodies each including a back surface and at least one end surface, the back surface including a cavity therein adapted to receive the lateral edge surface and the end surface of a split limb end portion of the compound bow, when one of said bodies is attached to each split limb end portion of a bow limb, the bodies extend a greater distance along the longitudinal axis of the bow limb from the split limb ends than the pulley, whereupon, when the compound bow is resting in an upright position on a horizontal surface upon the guard, the pulley is suspended from the surface protecting it from damage.

4,714,071

SLING ATTACHMENT TO AN ARCHERY BOW

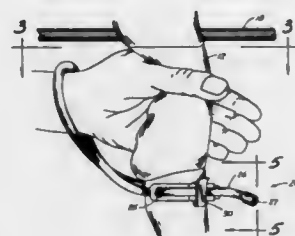
Charles A. Saunders, 8380 - 36th Ave., Columbus, Nebr. 68601

Filed Dec. 8, 1986, Ser. No. 939,629

Int. Cl.⁴ F41B 5/00

U.S. Cl. 124—88

5 Claims



1. A sling attachment for an archery bow of a type having a handle, a pair of limbs extending in opposite directions from said handle and a bow string interconnecting the outer ends of said limbs, said sling comprising:

- a generally U-shaped bracket;
- means for attaching a central portion of said U-shaped bracket to the front of said bow at a position just below said handle;

an elongated member having a first end and a second end; first connecting means attached to one end of said U-shaped member for attaching said first end of said elongated member thereto, said first connecting means comprising two spaced apart holes extending therethrough, said one end of said elongated member extending through both of said holes;

second connecting means disposed on the other end of said U-shaped member, said second connecting means including an opening in the other end of said U-shaped member and having a portion of said elongated member slidably received through said opening; and

clip means attached to an intermediate portion of said U-shaped member, between said opening and said attaching means, for selectively holding said other end of said elongated member stationary with respect to said U-shaped bracket.

4,714,072

MECHANICALLY ATTACHED TWO COMPONENT CERAMIC FIBER SYSTEM

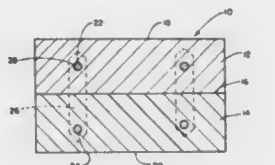
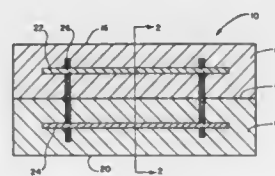
Fredrick H. Fidler, Evans, Ga., and Thomas B. Lowe, North Augusta, S.C., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 18, 1986, Ser. No. 887,677

Int. Cl.⁴ F24C 1/00

U.S. Cl. 126—1 F

16 Claims



1. Apparatus for attaching one layer of fibrous material comprising a first tubular member received in a first layer of fibrous material, a second tubular member received in a second layer of fibrous material, and means for connecting said first tubular member and said second tubular member including a link member having a pair of apertures therein to receive said first tubular member and said second tubular member.

4,714,073

HEATING APPARATUS OPERATING WITH GASEOUS FUEL AND DESIGNED TO BE CONNECTED TO A SMOKE PIPE

Michel Hervé, Rosny sous Bois, France, assignor to S.A. Fondries du Lion, Frasnes Lez Couvin, Belgium

Filed Jul. 30, 1986, Ser. No. 892,090

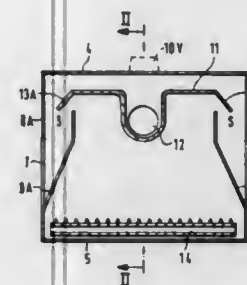
Int. Cl.⁴ F24C 3/00

U.S. Cl. 126—91 R

7 Claims

1. Independent heating apparatus operating with gaseous fuels and designed to be connected by a discharge pipe to a smoke pipe, of the type comprising a heating body formed by a housing having a front wall, a rear wall, a pair of lateral end walls each provided with an opening, a top wall and a bottom wall equipped with an elongated burner disposed in a burner chamber in said housing, a backflow damping device in said housing and defining said chamber, and means for controlling both a gas flow to said burner and auxiliary apparatus for operation said heater, wherein said discharge pipe is horizon-

tally mounted on one of said walls of said heating body and said damping device comprises two siphons disposed symmetrically on either side of said discharge pipe, each siphon forming a passage between said chamber and said discharge pipe and the respective opening associated with the respective



siphon above the level of a horizontal axis of said pipe, said axis being disposed in a median transverse plane of said heating body and each of said siphons being disposed substantially in line with the respective opening formed in the corresponding lateral end wall, each opening being disposed near a respective end of said elongated burner.

4,714,074

METHOD FOR PROTECTING HUMAN OR ANIMAL ORGANS AGAINST RADIATION

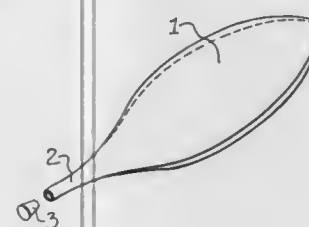
Pierre Rey, Lagny; Clement Abbou, Fontenay s/Bois; Jacqueline Leandri, Paris, and Alain J. P. R. Sezeur, Cachan, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Jun. 28, 1985, Ser. No. 750,414

Int. Cl.⁴ A61N 5/12

U.S. Cl. 128—1.1

15 Claims



1. A method of treatment comprising placing in the body of a patient operated upon for a tumor, at the operating site, after excision or reduction of the tumor in the cavity left by the exeresis of the tumor, and prior to treatment by ionizing radiation, an elastomeric balloon which in an evacuated state is folded upon itself and relatively small in volume, filling the balloon to enlarge it into a substantially spherical form and to push aside adjacent tissues and organs surrounding the tumor site for freeing it from the presence of healthy tissues or organs which can be injured by ionizing radiation, and irradiating the tumor site with ionizing radiation from an external source while the balloon is in place.

4,714,075

BIOPSY CHANNEL FOR ENDOSCOPE

Allan I. Krauter, Syracuse, and Robert L. Vivencio, Auburn, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Feb. 10, 1986, Ser. No. 828,134

Int. Cl.⁴ A61B 1/00

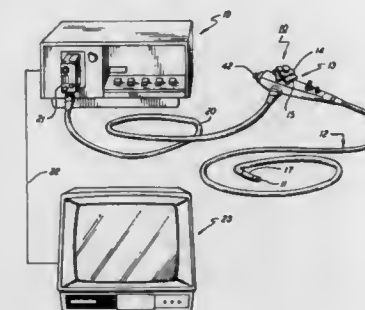
U.S. Cl. 128—4

4 Claims

1. An endoscope including an insertion tube that is connected at its proximal end to a control housing and having a bendable steering unit for maneuvering a viewing head located at the distal end of the tube, the steering unit being located near

the distal end of the insertion tube adjacent the viewing head, said endoscope further including

a lubricious biopsy channel passing through the inside of the insertion tube having a first tubular section contained within the steering unit that is joined to a second tubular section that passes back into the control housing, said first section being formed of a bendable heat softenable thermoplastic material that is encircled by open mesh metal fabric,



said second section being formed of a stiffer plastic material that has a greater resistance to bending than the first section, and

the open mesh metal fabric having fibers that are at least partially embedded in the outer surface of the first section for reinforcing said section to prevent the section from closing when bent to a small radius.

4,714,076

DEVICE FOR THE SETTING OF BONE SEGMENTS

Pierre-Andre Comte, Liestal, Switzerland; Caius Burri, Ulm, Fed. Rep. of Germany; Lutz Claes, Ulm, Fed. Rep. of Germany; Heinz Gerngross, Ulm, Fed. Rep. of Germany, and Remy Meier, Bubendorf, Switzerland, assignors to Synthes, Paoli, Pa.

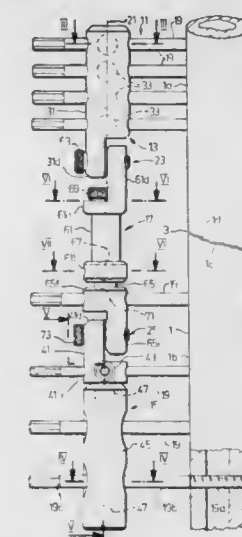
Filed Dec. 12, 1984, Ser. No. 680,664

Claims priority, application Switzerland, Jan. 19, 1984, 230/84

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 ZW

30 Claims



1. A bone setting device comprising a plurality of pins for insertion into the bone fragments to be set, two elongated holders for retaining said pins, pin clamping means in said holders for clamping said pins, an elongated connecting link, each end of said link being hinged, with hinge means having a

hinge bolt, to one of said holders and pivotable about an axis defined by the bolt and perpendicular to the longitudinal axes of the holders and the link, and holder clamping means for clamping said holders relative to said link at positions about said axes, at least one of said pin clamping means comprising a generally spherically shaped guiding body having at least one slot in its surface to provide compressibility in said body, a through hole in said body for receiving a pin and for enabling said pin to be pivoted in space, the holder in which the pin clamping means having the guiding body is positioned comprising two clamping elements each having at least one recess for receiving a portion of the guiding body and screw means for pressing said clamping elements together to compress and clamp the guiding body, said hinge means comprising tightening means enabling the holder to be locked to the link.

4,714,077

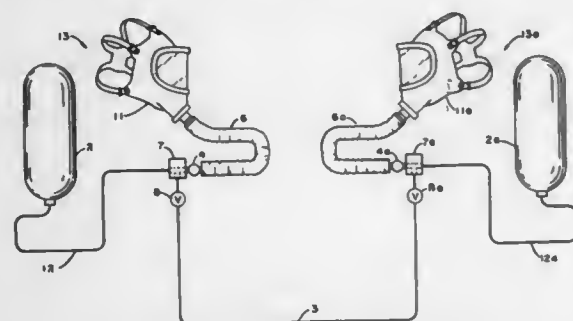
REPLENISHABLE SELF CONTAINED BREATHING APPARATUS

William M. Lambert, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Feb. 24, 1986, Ser. No. 832,371
Int. Cl. A62B 9/04, 7/00

U.S. Cl. 128-202.27

9 Claims



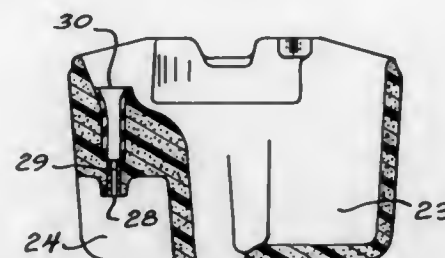
1. A high pressure gas transfer system comprising a first and second breathing apparatus, each apparatus comprising, a high pressure breathing gas tank having an outlet, coupling means having a first opening fluidically connected to said outlet, said coupling means having second and third openings, the second opening being an outlet from the apparatus, pressure reducing means fluidically connected to said third opening, and means fluidically connected to said pressure reducing means for delivering breathing gas to a user; the pressure of breathing gas in the tank of said first apparatus being at a higher pressure than the pressure of breathing gas in the tank of said second apparatus, a detachable high pressure conduit fluidically interconnecting the said second opening of the first apparatus with the said second opening of the second apparatus, first valve means for selectively opening and closing the said second opening of the first apparatus, said first valve means for permitting flow from the tank of the first apparatus into the high pressure conduit when said first valve means is open, second valve means for selectively opening and closing the said second opening of the second apparatus, said second valve means for permitting flow into the tank of the second apparatus from the high pressure conduit when said second valve means is open, whereby breathing gas is transferred from the tank of the first apparatus to the tank of the second apparatus when the first and second valve means are opened.

4,714,078 INSERT FOR HEATED HUMIDIFIER USED IN RESPIRATORY THERAPY

Bernard R. Paluch, 500 Glenn Ave., Wheeling, Ill. 60090-6016
Continuation-in-part of Ser. No. 677,394, Dec. 3, 1984, abandoned. This application Jul. 9, 1986, Ser. No. 884,775
Int. Cl. A61M 16/00

U.S. Cl. 128-203.17

3 Claims



1. In a heated humidifier used in respiratory therapy consisting of a first reservoir removably attached to a cover, said cover having: (a) an inlet port for gas entry, said port being the upper terminus of a first conduit leading into a tower open at its bottom and top, the tower containing a perforated disc near the bottom of said tower, the first conduit terminating at and being in open communication with the underside of the disc, said disc acting to disperse the gas entering the inlet port; (b) a gas exit port, and; (c) a double well the improvement consisting of a solid removable, space filling, volume reducing insert for said first reservoir constructed of a noncompressible, non-absorbent, sterilizable material contoured to fit said first reservoir and dimensioned so as to occupy at least 35% of the volume of the first reservoir, the insert formed with a depression, in open communication at its bottom surface with the first reservoir, acting as a second reservoir receiveably accommodating the double well and tower, a chamber formed on a side of the insert adjacent to the second reservoir, a second conduit extending from its lower terminus at the upper portion of the chamber through the body of the insert to its upper terminus at the top of the insert, a float valve pivotally connected at one end to the top of said chamber, said valve having means to positively close the lower terminus of the second conduit.

4,714,079

ATRIUM-CONTROLLED HEART PACEMAKER

Sven-Erik Hedberg, Kongsängen; Anders Lekholm, Bromma, and Anders Lindgren, Täby, all of Sweden, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

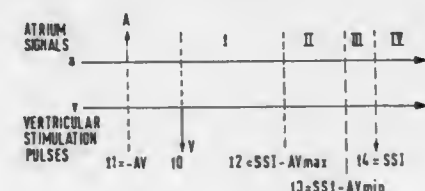
Filed Sep. 24, 1986, Ser. No. 910,998

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535568

Int. Cl. A61N 1/36

U.S. Cl. 128-419 PG

3 Claims



1. An atrium-controlled heart pacemaker operable with a maximum AV delay (AVmax), a minimum AV delay (AVmin) and a smallest synchronous interval (SSI) between two ventricular stimulation pulses comprising:
means for sensing an atrial event in said heart;
means for sensing a ventricular event in said heart;

means for supplying a ventricular pulse to said heart after an AV delay following a sensed atrial event;
means for controlling said means for supplying said ventricular pulse for operating said pacemaker in a DDD mode when said sensed atrial event occurs after a point in time SSI-AVmin, operating said pacemaker at a highest synchronous rate corresponding to said SSI when said sensed atrial event occurs between points in time SSI-AVmin and SSI-AVmax, and causing no ventricular stimulation pulse to be supplied when said sensed atrial event occurs before said point in time SSI-AVmax;
an AV control unit in said means for controlling, said AV control unit normally generating a signal upon the occurrence of each sensed atrial event for initiating generation of a ventricular pulse;
means for inhibiting the transmission of said sensed atrial event to said AV control unit when said sensed atrial event occurs before said point in time SSI-AVmax;
a timer in said means for inhibiting, said timer having an input connected to said means for sensing said ventricular event, said timer assuming a first logic state at an output thereof for a period commencing with the occurrence with said ventricular event and concluding at said point in time SSI-AVmax, and thereafter assuming second logic state; and
logic means in said means for inhibiting, said logic means having inputs connected to said means for sensing an atrial event and to said output of said timer, and having an output connected to an input of said AV control unit for preventing through-connection of said sensed atrial event to said input of said AV control unit while said output of said timer is in said first logic state.

4,714,080

METHOD AND APPARATUS FOR NONINVASIVE MONITORING OF ARTERIAL BLOOD OXYGEN SATURATION

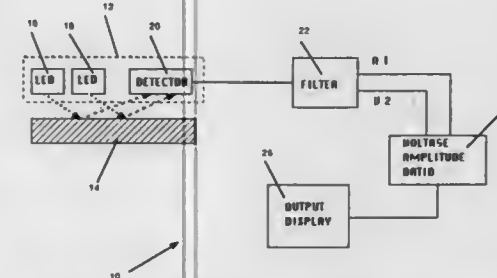
Reuben W. Edgar, Jr.; Dennis W. Gilstad, and Ronald L. Branstetter, all of San Antonio, Tex., assignors to Nippon Colin Co., Ltd., Komaki, Japan

Filed Oct. 6, 1986, Ser. No. 915,688

Int. Cl. A61B 5/00

U.S. Cl. 128-633

17 Claims



1. A blood oxygen saturation monitoring system comprising:
a first source of electromagnetic radiation at a first wavelength;
a second source of electromagnetic radiation at a second wavelength;
means for positioning said first and second sources of electromagnetic radiation to illuminate a sample of blood;
sensing means for receiving electromagnetic radiation reflected by said sample of blood, said reflected electromagnetic radiation comprising an AC component and a DC component, said sensing means producing an output signal corresponding only to the AC components of the reflected portions of said first and second electromagnetic radiation;
means for producing a quotient of said AC voltage components; and
means for calculating blood oxygen saturation by correlat-

ing said quotient of said AC voltage components with an oxygen saturation reference curve, said reference curve being uniquely representative of the blood oxygen saturation characteristics of a particular individual.

4,714,081

METHODS FOR NMR ANGIOGRAPHY

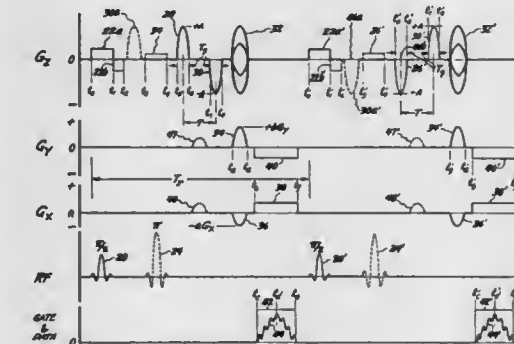
Charles L. Dumoulin, Ballston Lake, and Howard R. Hart, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,683

Int. Cl. A61B 5/05

U.S. Cl. 128-653

22 Claims



1. A method for providing a nuclear magnetic resonance (NMR) angiographic projection image of flowing fluids in at least a selected portion of a sample, comprising the steps of:
(a) immersing the sample in a main static magnetic field;
(b) nutating, in the initial portion of each of a first sequence and a second sequence of a sequential pair of imaging sequences, the spins of all nuclei of a selected species;
(c) providing an evolution time interval after step (b) in each of the pair of sequences;
(d) applying, in the evolution time interval of at least one of the first and second sequences of each sequence pair, a pair of flow-encoding gradient field pulses in a first magnetic field gradient impressed upon the sample, in a first direction selected to establish one axis of the NMR angiographic projection image, to cause a resulting NMR response signal from the spin of moving nucleus to differ from the NMR response signal resulting from the spin of a substantially stationary nucleus;
(e) then applying a magnetic field gradient pulse in a second direction, orthogonal to the first direction, to dephase, and enhance suppression of, response signals from spins from all stationary nuclei of the selected species;
(f) then acquiring, responsive to at least a second magnetic field gradient impressed upon the sample in the second direction, a set of data from the NMR response signals evoked from at least the sample portion in each of a response data acquisition portion of the first and second sequences;
(g) subtracting the data of one of the NMR response signal data sets acquired in the first and second sequences from the data of the other data set to substantially remove response data obtained from the substantially stationary nuclei; and
(h) generating, responsive to the remaining response data, the NMR angiographic projection image as a two-dimensional projection, lying in a plane in the first and second directions, of the fluid flow in the three-dimensional sample.

4,714,082

SMOKING ARTICLE

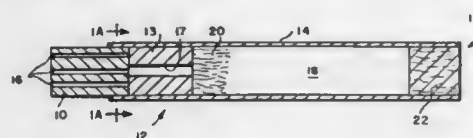
Chandra K. Banerjee, Pfafftown; Ernest G. Farrier; John H. Reynolds, IV, 1, both of Winston-Salem; Henry T. Ridings, Lewisville; Andrew J. Sensabaugh, Jr.; Michael D. Shannon, both of Winston-Salem, and Gary R. Shelar, Greensboro, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 650,604, Sep. 14, 1984, Ser. No. 684,537, Dec. 21, 1984, and Ser. No. 769,532, Aug. 26, 1985. This application Oct. 23, 1985, Ser. No. 790,484

Int. Cl.⁴ A24B 15/28; A24D 1/18

U.S. Cl. 131-359

103 Claims



1. A cigarette-type smoking article comprising:
 - (a) a combustible fuel element less than about 30 mm in length prior to smoking, having a density of at least about 0.5 g/cc;
 - (b) a physically separate aerosol generating means including an aerosol forming material in conductive heat exchange relationship with the fuel element; and
 - (c) means for delivering the aerosol produced by the aerosol generating means to the user.

4,714,083

MAKING OF MULTI-ELEMENT SMOKING ARTICLE ROD

John A. Luke, Eastleigh, England, assignor to British-American Tobacco Company Limited, London, England

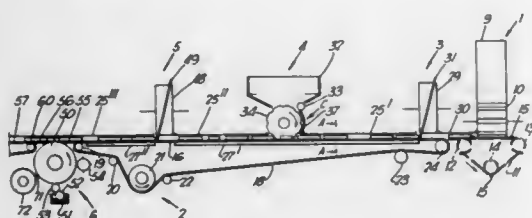
Filed Jan. 29, 1986, Ser. No. 823,597

Claims priority, application United Kingdom, Feb. 15, 1985, 8503956

Int. Cl.⁴ A24C 5/47

U.S. Cl. 131-94

10 Claims



1. A method of making multi-element smoking article rod of non-circular cross-section, wherein first rod lengths of non-circular cross-section are guided lengthwise along a first feed path, serially and in axial-orientation controlled manner, to and through an intercalating station, second rod lengths of a cross-section similar to that of said first rod lengths are guided lengthwise along a second feed path, serially and in axial-orientation controlled manner, to said station, said second rod lengths are intercalated with said first rod lengths at said station so that the intercalated second rod lengths are co-axial with adjacent first rod lengths and are disposed with an axial orientation common with that of said adjacent first rod lengths, and downstream of said station the rod lengths are guided lengthwise and co-axially along a third feed path, with maintenance of the common axial orientation of first and second rod lengths, to wrapping means, in operation of which wrapping means sheet wrapper material is applied to interattach first and second rod lengths; and wherein one of said first and second rod lengths are tobacco rod lengths.

4,714,084

METHOD AND APPARATUS FOR SIMULTANEOUSLY APPLYING AND BLENDING MAKE-UP IN ONE STEP

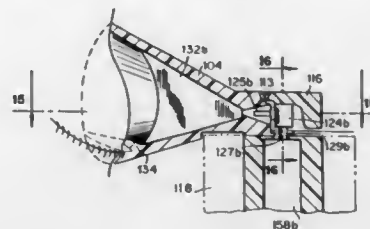
Craig Berry, 69 Sylvan Rd. N., Westport, Conn. 06880, and Marc Benaett, 240 W. 15th St., New York, N.Y. 10011

Filed Oct. 16, 1985, Ser. No. 788,197

Int. Cl.⁴ A45D 40/00, 40/30

U.S. Cl. 132-88.7

25 Claims



1. A directional shield member for use in simultaneously applying and blending at least one spray or pigmented cosmetic in one step, which produces a gradient in the amount of at least one pigmented cosmetic on the skin, the directional shield member comprising:
 - a directional shield for defining a skin surface area upon which the pigmented cosmetics are deposited, disposed between at least one spray of pigmented cosmetic and the skin surface area upon which the pigmented cosmetics are to be deposited, and
 - at least one stencil wall for directing the spray of at least one pigmented cosmetic to produce the gradient.

4,714,085

COSMETIC STICK FOR A POWDER PENCIL

Reinhard von Kleinsorgen, Nuremberg, Fed. Rep. of Germany, assignor to Schwan-Stabli Schwanhäusser GmbH & Co., Fed. Rep. of Germany

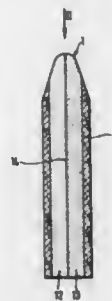
Filed Oct. 26, 1983, Ser. No. 545,633

Claims priority, application Fed. Rep. of Germany, May 6, 1983, 8313487[U]

Int. Cl.⁴ A45D 40/20; A61K 7/02

U.S. Cl. 132-88.7

12 Claims



1. A cosmetic stick for an elongate powder pencil for directly applying powder to the skin, having a stable stick body comprising powder base material, pigment and, optionally, a binding agent and an adhesion-enhancing agent, wherein the stick body is formed from at least two elongate stick portions which are joined together over their length and of which one portion contains a pigment or pigments differing in color from the pigment or pigments contained in the other portion, and wherein said portion, in addition to said powder base material, pigment and, optionally, said binding agent and said adhesion-enhancing agent, contains particulate material comprising particles which are of greater hardness than the particles of said powder base material and which are of a particle size of between 10 and 100μ.

4,714,086

APPARATUS FOR WASHING AND DRYING SUBSTRATES

Yoshifumi Kishida, Nara, and Masayoshi Takenchi, Akishima, both of Japan, assignors to Sharp Corporation and Dainichi Shoji Co., Ltd., both of Japan

Division of Ser. No. 724,029, Apr. 17, 1985, Pat. No. 4,643,774.

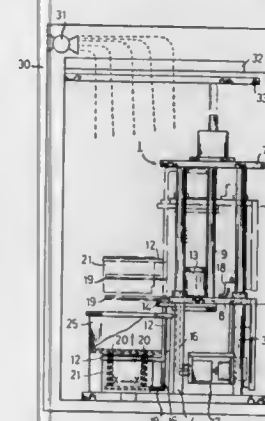
This application Sep. 25, 1986, Ser. No. 911,427

Claims priority, application Japan, Apr. 19, 1984, 59-077516

Int. Cl.⁴ B08B 3/10

U.S. Cl. 134-83

7 Claims



1. An apparatus for washing and drying a substrate comprising:
 - a movable base;
 - stud means along which said base is arranged to be substantially vertically movable;
 - a carrier for receiving at least one substrate therein;
 - clamping means arranged on said movable base for clamping said carrier;
 - oscillating means arranged on said movable base for oscillating the substrate;
 - a wash liquid vessel for immersing said carrier therewithin; and
 - means for feeding drying gas to the substrate received in said carrier during drawing-up of said carrier from said vessel while being oscillated.

4,714,087

FUEL ADDITIVE PROPORTIONING APPARATUS AND METHOD

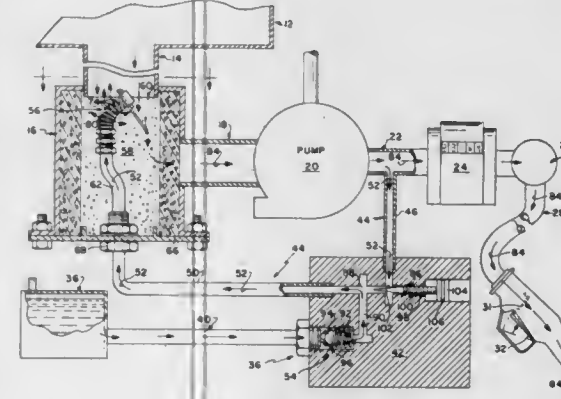
Jamieson B. Jones, 188 Drum Hill Rd., Wilton, Conn. 06897

Filed Mar. 27, 1987, Ser. No. 31,510

Int. Cl.⁴ G05D 11/03

U.S. Cl. 137-3

25 Claims



23. A method for delivering a fuel additive to a fuel flowing through a pump from an upstream side to a discharge side

thereof for flow through a dispenser controlled by a dispensing valve, the method comprising:

- (a) passing a portion of the fuel from said discharge side along a bypass path through a flow control back to said upstream side, said flow control permitting flow there-through only when fuel is being discharged through said dispensing valve; and
- (b) in response to fuel flow through said flow control, supplying a controlled amount of said fuel additive into said fuel portion in said bypass path, whereby said additive is supplied only when fuel is being discharged through said dispensing valve.

4,714,088

WATER SAVING FLOAT FOR A WATER TANK

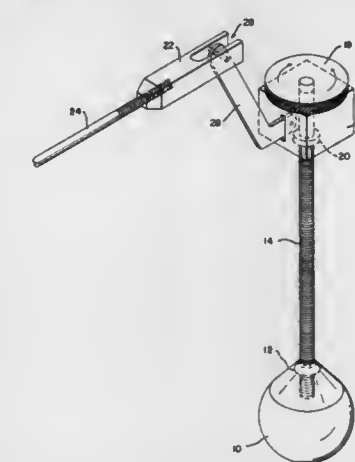
James M. Ivins, Box 10-20, St. Michaels, Md. 21663

Filed May 29, 1987, Ser. No. 55,357

Int. Cl.⁴ F16K 31/18, 31/28, 33/00

U.S. Cl. 137-426

15 Claims



1. A water saving float assembly for selecting various water levels in a water closet which comprises: a float means, a threaded rod upon which said float means is adjustably secured for determining the various water levels, a link connecting block through which a portion of said rod extends for adjusting the height of said float, an adjusting wheel secured to said rod above said link connecting block and the water levels for controlling the adjustable height of said rod, a connecting link secured at one end to said link connecting block, a connecting adaptor for connecting another end of said connecting link, said adaptor being adjustably connected to a valve control rod of a water control valve whereby the amount or water allowed to flow into said water closet will be controlled by the adjustment of said float means as a result of the above adjustable elements.

4,714,089

ELECTROMAGNETIC PROPORTIONAL CONTROL VALVE

Kazuhiro Ueda; Toshiaki Yamaguchi; Kouji Kajiyama, all of Wakayama, and Osamu Matsumoto, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1986, Ser. No. 901,369

Claims priority, application Japan, Oct. 3, 1985, 60-220643

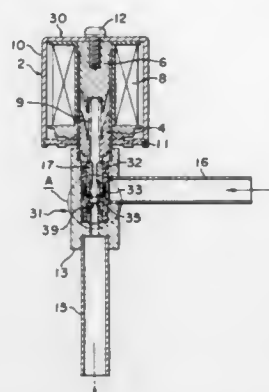
Int. Cl.⁴ F16K 31/06, 47/08

U.S. Cl. 137-614.18

4 Claims

1. An electromagnetic proportional control valve comprising:
 - a control valve main body having fluid inlet means and fluid outlet means;
 - a sleeve in said main body and having a slit in communication with said inlet means;

a valve seat in said sleeve at a position such that a fluid passageway is defined from said inlet means through said slit, said valve seat and said outlet means, respectively; a spool slidably fitted in said sleeve; electromagnetic means connected to said spool for moving said spool to selectively close said slit in said sleeve, such that said spool comprises means for varying an opening



area of said fluid passageway, whereby fluid flow through said passageway may be controlled; a ball movable with said spool and comprising means for sealingly matingly engaging with said valve seat when said spool is in a position for fully closing said slit; and spring means for pressing said ball into tight mating engagement with said valve seat when said spool is in said position for fully closing said slit.

4,714,090

MIXING APPARATUS FOR GASES

David C. Sampson, Cowling, England, assignor to The BOC Group plc, Winklesham, England

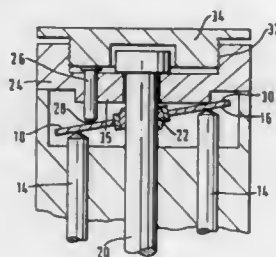
Filed Oct. 8, 1986, Ser. No. 916,357

Claims priority, application United Kingdom, Oct. 10, 1985, 8525058

Int. Cl.⁴ F16K 11/00, 11/065

U.S. Cl. 137—636

8 Claims



1. A gas machine for mixing a desired concentration of first and second gases for delivery to a patient, said machine comprising a valve body, said valve body having first and second valves each having a valve stem the axial movement of which controls the flow of the first and second gases through their respective first and second valves, each valve stem having one end engaging a control surface of a thrust plate mounted for axial and pivotal movement on a support shaft, a bearing means surrounding said support shaft, said bearing means allows said thrust plate to pivot and slide axially along said support shaft, a first actuator means on said valve body having at least one variable plunger that is disposed within said first actuator means and being separate from said thrust plate but in abutting engagement with said thrust plate, said first actuator means variably moving the plunger selectively along the control surface of said thrust plate for pivoting the thrust plate about said shaft so that one valve stem is moved axially relative to the other thereby increasing the rate of flow of one gas through its

respective valve whilst concomitantly decreasing the rate of flow of the other gas through its respective valve to vary the relative proportions of the gases without varying their total flow rate, and a second actuator means disposed within said first actuator means for adjustably engaging and abutting said at least one plunger for moving the thrust plate axially along said shaft towards and away from the valve stems thereby to vary the total rate of flow of the gases without varying the relative proportion of each gas flowing through its respective valve.

4,714,091

MODULAR GAS HANDLING APPARATUS

Wilfried R. Wagner, Basking Ridge, N.J., assignor to Emcore, Inc., South Plainfield, N.J.

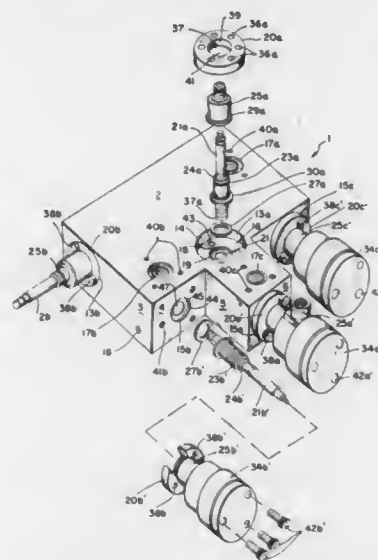
Continuation of Ser. No. 743,317, Jun. 10, 1985, abandoned.

This application Sep. 3, 1986, Ser. No. 903,885

Int. Cl.⁴ F16K 11/10

U.S. Cl. 137—884

38 Claims



1. Apparatus for handling gaseous streams comprising a unitary modular flow block including a first valve passage extending into said modular flow block, said first valve passage including a first valve entrance aperture and a first valve seat, whereby a first valve including a reciprocating valve shaft mounted in said first valve passage can selectively open and close said first valve seat, a second valve passage extending into said modular flow block, said second valve passage including a second valve entrance aperture and a second valve seat, whereby a second valve including a reciprocating valve shaft mounted in said second valve passage can selectively open and close said second valve seat, a first gas flow path extending through said modular flow block along a first predetermined path which includes a portion connecting said first valve seat with said second valve passage at a predetermined location between said second valve seat and said second valve entrance aperture, and a second gas flow path extending through said modular flow block along a second predetermined path which includes said second valve seat, whereby closing of said first valve seat closes said first gas flow path and closing of said second valve seat closes said second gas flow path, while a gas flowing through said first gas flow path can flush said predetermined location in said second valve passage even when said second valve seat has been closed and flushing of said second valve seat can be controlled by said first valve.

4,714,092

BALL VALVE AND FLOWING FLUID PRESSURE AMPLIFIER

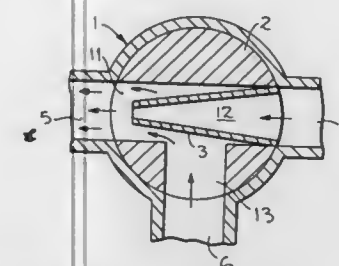
George S. Sanders, Las Vegas, Nev., assignor to Agricultural Aviation Engineering Company, Las Vegas, Nev.

Filed Feb. 2, 1987, Ser. No. 9,886

Int. Cl.⁴ F16K 11/087

U.S. Cl. 137—894

12 Claims



1. A ball valve assembly comprising:

- a housing;
- a ball rotatably mountable within said housing about an axis of the ball about which any cross-section thereof has a uniform outline curve, said ball defining therewithin:
 - a first passage of uniform cross-sectional shape and area extending through the ball with the central axis through said first passage being substantially perpendicular to the rotational axis of the ball; and
 - a second passage of uniform cross-sectional shape and area opening into said first passage from one side of the ball with the central axis through said second passage being substantially perpendicular to the rotational axis of the ball; and
- a tapered tubular section in which the inner and outer dimensions vary over its length with the outer shape and dimensions of the larger end thereof being substantially the same as the inner shape and dimensions of one end of said first passage to be captured therewithin with the smaller end of the tubular section extending toward the other end of said first passage to define a tapering annular cavity between the inner walls of said first passage and the outer walls of the tapered tubular section, said cavity tapering into the ball from the other end of first passage with said second passage in communication with said cavity;
- said housing defining first and second ports for communicating with opposite ends of said first passage and a third port for communicating with the second passage or being closed by the solid surface of the ball in response to the rotation of the ball, said third port also being disposed to communicate with the second passage when said first and second ports are in communication with said one and other ends of the first passage, respectively,
- said first port conducting fluid under pressure into said first passage, said third port conducting fluid into said second passage when said first and second ports are in communication with said first passage and said second passage is in communication with said third port, said tapered tubular section increasing the velocity of fluid flow through said first passage to create a negative pressure in said tapering annular cavity for inducing fluid in said second passage to flow into said first passage when said first and second ports are in communication with opposite ends of said first passage and said second passage is in communication with said third port, said second port discharging therefrom atomized fluid by the shearing action of the increased velocity of said fluid under pressure when said first and second ports are in communication with opposite ends of said first passage and said second passage is in communication with said third port, said first passage being cleansed of fluid remaining therein which was induced from said second passage when said first and second ports are in

communication with said first passage and said third port is closed by the solid surface of the ball.

4,714,093

BLADDER TYPE FLUID ACCUMULATOR FOR HYDRAULIC SYSTEM

Hiroshige Kawano, Amagasaki, Japan, assignor to Nakamura Koki Co., Ltd., Hyogo, Japan

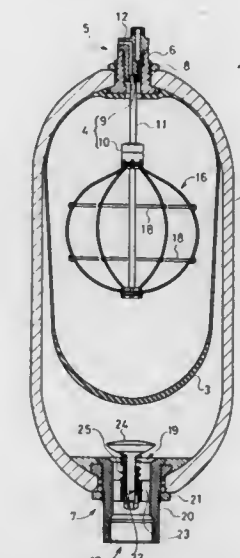
Filed Aug. 1, 1986, Ser. No. 891,966

Claims priority, application Japan, Aug. 3, 1985, 60-171356

Int. Cl.⁴ F16L 55/04

U.S. Cl. 138—30

13 Claims



- 1. A bladder-type accumulator for accumulating pressurized hydraulic fluid in a hydraulic system, comprising:
 - a containment means for accumulating the hydraulic fluid by receiving the same;
 - a collapsible bladder capable of internal pressurization, disposed within the containment means such that the accumulated fluid occupies space between an outside surface of the bladder wall and an inside surface of the containment means, the wall of said bladder moving in correspondence with a pressure differential across the collapsible bladder wall;
 - a bladder condition detecting means disposed within the bladder for actuation by movement of the collapsible bladder walls;
 - the detecting means comprising a tube, a slider moved along the tube in response to movement of the collapsible bladder wall; and, detecting switch means disposed in said tube for detecting movement of said slider with respect thereto.

4,714,094

GAS-OIL PRESSURE ACCUMULATOR

Constantino Tovagliaro, Milan, Italy, assignor to Magnaghi Oleodinamica S.p.A., Milan, Italy

Filed May 23, 1986, Ser. No. 867,339

Claims priority, application Italy, May 30, 1985, 20963 A/85

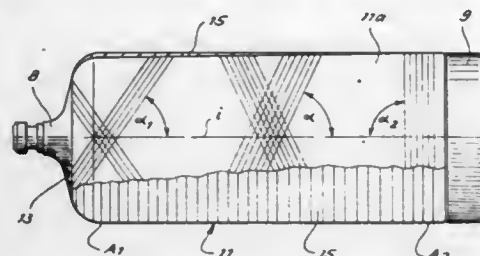
Int. Cl.⁴ F16L 55/04; B65D 8/08

U.S. Cl. 138—31

4 Claims

- 1. A gas-oil pressure accumulator comprising:
 - a cylindrical body having closable ends and at least one of which is formed with a cap, said body defining a cylinder; and
 - a piston slidable in said cylinder and subdividing the interior of said cylinder into a liquid-containing chamber and into a gas-containing chamber adapted to be pressurized, said body being formed of an internal core and a thin metallic

material secured to said cap and an envelope of composite material of high-strength fibers impregnated with synthetic resin, said high-strength fibers being provided in a principal layer having a helical arrangement of variable pitch over a cylindrical portion of said body, and a secondary layer of fibers having a circumferential arrangement and a thickness that decreases from a junction zone between said cap and said cylindrical portion to a zone at an end of said body opposite that at which said cap is provided.



secondary layer of fibers having a circumferential arrangement and a thickness that decreases from a junction zone between said cap and said cylindrical portion to a zone at an end of said body opposite that at which said cap is provided.

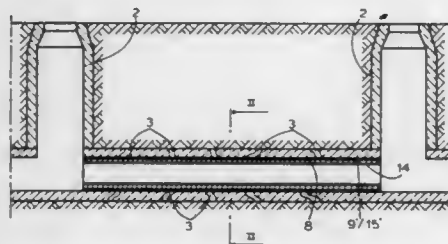
4,714,095 METHOD OF SALVAGING A PIPE CONDUIT BURIED UNDER GROUND

Hans Müller, Brauergildestrasse 5, 4938 Schieder-Schwalenberg, and Hermann Suerbaum, Schieder-Schwalenberg, both of Fed. Rep. of Germany, assignors to Hans Müller, Schieder-Schwalenberg, Fed. Rep. of Germany

Filed Nov. 13, 1986, Ser. No. 930,658
Int. Cl.⁴ F16L 55/16; B29C 17/00

U.S. Cl. 138—98

11 Claims



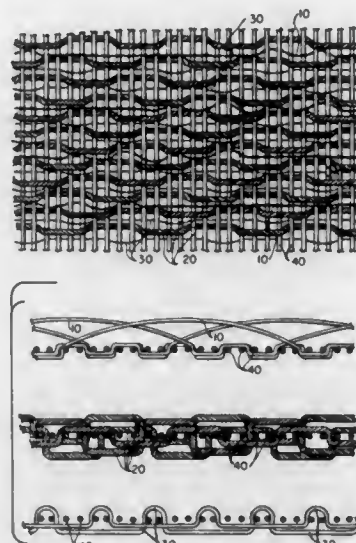
1. A method of salvaging a conduit which is buried under ground, especially a sewer pipe, comprising the steps of permeating resin-absorbing inner layer of a lining hose, which further includes an impermeable outer layer that outwardly adjoins and surrounds the inner layer, with one resin; placing the lining hose into the conduit; providing a surface region of a calibrating hose which is to contact the inner layer of the lining hose with a layer containing another resin; shaping the lining hose to conformingly line the conduit, including introducing the calibrating hose into the lining hose in such a manner that the resin-containing layer of the calibrating hose contacts the inner layer of the lining hose and pressing the calibrating hose against the lining hose to urge the latter against the conduit; and hardening at least one of the first and second resins.

4,714,096 ELASTIC FABRIC PROVIDED WITH A LOOPED GRIPPING SURFACE

Normand D. Guay, Westerly, R.I., assignor to George C. Moore Co., Westerly, R.I.

Filed Dec. 3, 1985, Ser. No. 804,271
Int. Cl.⁴ D03D 27/04, 15/08; A44B 18/00
U.S. Cl. 139—391

8 Claims



1. An elastic fabric comprising: a plurality of texturized multifilament warp loop yarns for forming upwardly extending loops on the face surface of said fabric, monofilament weft yarn interwoven with said loop yarns, a plurality of elastomeric warp yarns interwoven with said loop yarns and with said weft yarn for providing elastic stretch of said fabric, and a plurality of texturized warp back yarns interwoven with said loop and elastomeric warp yarns and with said weft yarn for forming the back surface of said fabric wherein said weft yarn is of a sufficiently heavy denier to maintain weftwise stability of said fabric in its stretched and unstretched condition.

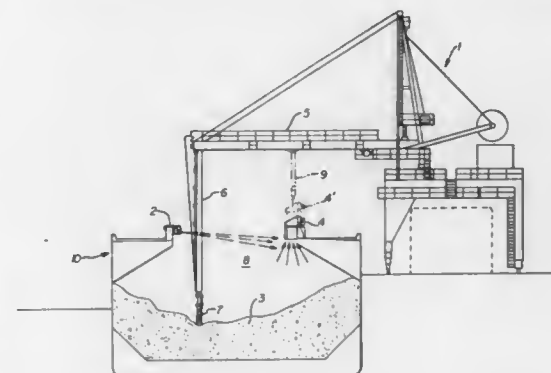
4,714,097 DUST CONTAINMENT SYSTEM FOR BULK CARGO CONTAINERS

Willard Binzen, Gibsonia, Pa., and Robert S. Catan, Greenlawn, N.Y., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1986, Ser. No. 918,537
Int. Cl.⁴ B65B 1/04

U.S. Cl. 141—5

15 Claims



11. A method for containing dust-like particulate material

within the hold of a bulk cargo container during loading and unloading operations, said method comprising the steps of: establishing a plurality of spaced-apart, coherent primary air streams at one side of an open hatch of said cargo hold and directing said primary air streams across the top of said cargo hold along a substantially horizontal pathway, each of said primary air streams creating a secondary air stream therearound which gradually diverge, forming a substantially continuous stream of air across the top of the cargo hold; capturing fugitive, dust-like particulate material and entraining said particulates within said horizontal stream of air; collecting said horizontal stream of air and said entrained particulate material at an opposite side of said cargo hold from said source of primary air streams; filtering said entrained particulate material from the horizontal air stream; exhausting said filtered air stream to the atmosphere; and returning said collected particulate material to said cargo hold.

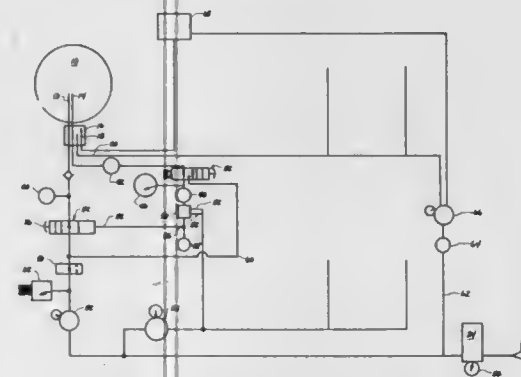
4,714,098 BALL INFLATION APPARATUS

Robert W. Stuckel, 1385 Howard St., Elk Grove Village, Ill. 60007

Filed Jun. 8, 1983, Ser. No. 501,991
Int. Cl.⁴ A63B 41/00

U.S. Cl. 141—85

6 Claims



1. An apparatus for inflating a hollow object comprising: (a) a reference source of fluidic pressure; (b) a first fluid conduit connected to said reference pressure source for transmitting fluid under pressure to said object; (c) a second fluid conduit arranged coaxially with said first fluid conduit for transmitting fluid under pressure from said object; (d) pressure control means fluidically connected between said reference pressure source and said first fluid conduit for controlling pressure to said first fluid conduit in response to a pressure signal; and (e) sensing means fluidically connected to said second fluid conduit for sensing pressure therein and fluidically connected to said pressure control means for actuation thereof, comprising: a first chamber having a first flexible diaphragm mounted therein, and wherein sensed pressure is provided to one side of said first diaphragm and reference pressure is provided to the other side of said first diaphragm from said reference pressure source, and further comprising an outlet for passing fluid under pressure from said reference pressure source when said sensed pressure is less than said reference pressure, said outlet being arranged to be closed by said first diaphragm when said sensed pressure is greater than said reference pressure; and wherein said sensing means further comprises a second chamber having a flexible second diaphragm mounted therein and wherein pressure from the said outlet

of said first chamber is provided to one side of said second diaphragm in said second chamber, and reference pressure is provided to the other side of said second diaphragm in said second chamber, and further comprising an outlet for passing fluid under pressure from said reference pressure source and arranged to be closed by said second diaphragm when said pressure from said outlet of said first chamber is greater than said reference pressure, whereby a pressure signal is generated to actuate said pressure control means when said sensed pressure exceeds said reference pressure.

4,714,099 VEHICLE AND TIRE THEREFORE

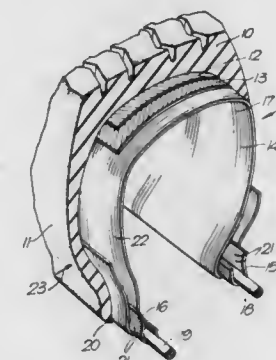
James N. McGlashen, Winstanley, England, assignor to Apsley Metals Limited, United Kingdom

Filed Mar. 31, 1986, Ser. No. 846,215
Claims priority, application United Kingdom, Apr. 9, 1985, 8509003

Int. Cl.⁴ B60C 15/06

U.S. Cl. 152—523

1 Claim



1. A pneumatic tire having a pair of bead portions each of which is reinforced by a bead core and at least one bead reinforcing ply having bead reinforcing cords therein that are substantially parallel with each other and aligned in the same direction with respect to a relative rotational direction of the tire when mounted on a vehicle, the cords of the reinforcing plies in one bead portion being substantially parallel to the cords in the reinforcing plies in the other bead portion, said tire having a direction mark on an external surface related to the direction of the reinforcing cords in the bead reinforcing plies.

4,714,100 METHOD AND APPARATUS FOR CHANGING A MOLD BOX ON A MOLDING MACHINE

Kenneth E. Bellis, Rochester; Jackson E. Brown, Mt. Clemens, and Pheroze J. Nagarwalla, Rochester Hills, all of Mich., assignors to Roberts Corporation, Lansing, Mich.

Filed Dec. 3, 1986, Ser. No. 937,579
Int. Cl.⁴ B22C 11/04, 17/02, 25/00

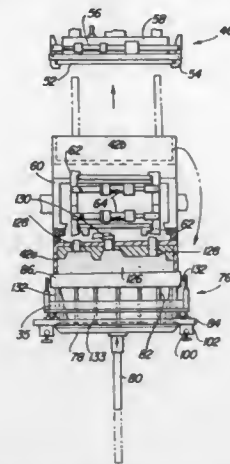
U.S. Cl. 164—18

21 Claims

1. Apparatus for changing a mold box (42a) on a molding machine (20), said machine (20) being of the type including a rotatable frame (60), at least one mold box (42a) on said frame (60) having a mold cavity therein for forming a mold (126) and being rotatable with said frame (60) from a molding position in which a mold (126) is formed in said mold cavity to a mold discharge position in which a mold (126) may be removed from said one mold box (42a), means (76) for receiving and lowering said mold (126) from said one mold box (42a) when said one mold box is in said discharge position thereof, and means (84) for transferring said mold (126) laterally from said receiving means (76) to an unloading position, comprising:

means (62, 64, 134) for releasably mounting said one mold box (42a) on said frame (60); and, means (132) on said receiving means (76) for supporting said one mold box (42a) on said receiving means when said one box (42a) is released from said frame (60), whereby said one mold box (42a) may be vertically shifted by said mold receiving means (76) between a lowered position and a raised position in which said one mold box (42a) may be mounted or released from said frame (60).

13. A method for changing a mold box (42) on a molding machine (20), said molding machine (20) being of the type including a rotatable frame (60), at least one mold box (42a) on said frame having a mold cavity therein for forming a mold (126) and being rotatable with said frame (60) from a molding position in which a mold (126) is formed in said mold cavity to a mold discharge position in which a mold may be removed



from said one mold box (42a), means (76) for receiving and lowering said mold (126) from said one mold box (42a) when said one mold box (42a) is in said discharge position thereof, means (84) for transferring said mold (126) laterally away from said receiving means (76) to an unloading position, and a reciprocable press head (46) including a press plate (52) for compressing molding material within said mold cavity, comprising the steps of:

- raising said mold receiving means (76) to an elevated position engaging said one mold box (42a);
- releasing said one mold box (42a) from said frame (60);
- supporting said one mold box (42a) on said mold receiving means (76);
- lowering said mold receiving means (76) with said one mold box (42a) supported thereon; and
- removing said one mold box (42a) from said mold receiving means (76).

4,714,101

METHOD AND APPARATUS FOR EPITAXIAL SOLIDIFICATION

Bruce E. Terkelsen, Cheshire, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Continuation of Ser. No. 250,521, Apr. 2, 1981, abandoned, which is a continuation of Ser. No. 121,567, Feb. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 969,130, Dec. 13, 1978, abandoned. This application Sep. 29, 1986, Ser. No. 913,834

Int. Cl.⁴ B22D 27/04

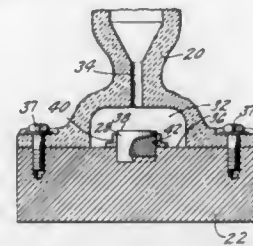
U.S. Cl. 164—122.2

13 Claims

1. For epitaxially casting metal, apparatus comprised of a chill plate, a mold in contact with the chill plate and a seed positioned on the chill plate; the mold having in a substantially vertical array an article cavity and a starter cavity, the starter cavity connected to the article cavity by a selector cavity of substantially smaller dimension than that of the starter cavity; the mold further having means for introducing molten metal into its cavities; characterized in that a portion of the seed is

positioned within the mold starter cavity, the portion having a first surface aligned with the entrance to the selector cavity to enable epitaxial solidification from the first surface into the selector cavity; and the starter cavity having substantially greater volume than the volume of the portion of the seed contained therein, to provide within the starter cavity a reservoir for metal which may be flowed across the seed; the seed projected into the starter cavity to enable molten metal to surround the seed at a second surface in addition to the first surface to provide additional heating to the seed; the seed having a barrier layer at the second surface, to prevent molten metal from adhering to the seed and to facilitate its removal from the solidified casting.

11. The method of casting metals into an article having controlled crystallographic orientation using a seed and a chill plate which comprises:



- placing a cold seed on the lateral surface of a cold chill plate so the seed projects above the surface of the chill plate with a controlled orientation thereto;
- heating a mold and then placing it on the chill plate with a controlled orientation thereto, so the seed is contained within a cavity of the mold and so there is created a lateral space cavity surrounding the seed;
- filling the mold with molten metal in a manner which causes a portion of the molten metal to flow across the part of the seed projecting from the chill plate, to heat and melt a portion of the seed;
- flowing the metal which sweeps across the seed into said lateral space cavity; and
- epitaxially solidifying the molten metal from the seed.

4,714,102

CASTING METHOD AND AN APPARATUS THEREFOR
Hirokuni Koya, Zama, Japan, assignor to Toshiba Machine Co., Ltd., Tokyo, Japan

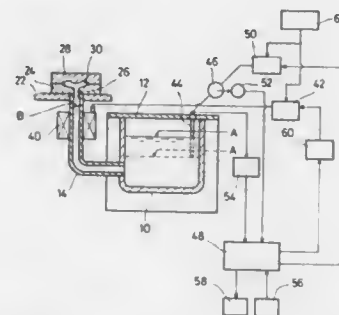
Filed Jan. 6, 1987, Ser. No. 1,021

Claims priority, application Japan, Jan. 11, 1986, 61-002892; Jan. 11, 1986, 61-002893

Int. Cl.⁴ B22D 17/32

U.S. Cl. 164—457

4 Claims



1. A casting method for use with a retaining furnace for molten material which communicates with a mold through a supply conduit having an electromagnetic induction pump for impelling a molten material from the retaining furnace through the supply conduit directly into a cavity of a mold at low

pressure, the method comprising providing in the retaining furnace a level-detecting sensor which is vertically movable by means of a servo-motor and generates a signal of the detected level, coupling the servo-motor to a pulse generator for generating a signal of the position of the level of the molten material, storing in a computer data relative to a predetermined injection pressure and variations thereof to determine optimum casting conditions of the molten material, inputting into the computer the detected level signal from the level detecting sensor in the form of a level position signal from the pulse generator for computing the optimum injecting conditions, and outputting from the computer a control instruction to a voltage control device of the electromagnetic induction pump such as to maintain constant the melt level in the supplying conduit between casting operations regardless of variation in the melt level of the furnace.

3. A casting apparatus for use with a retaining furnace for a molten material, which retaining furnace communicates with a mold through a supply conduit, the supply conduit having an electromagnetic induction pump for impelling molten material from the retaining furnace through the supply conduit directly into a cavity of a mold at a low pressure, the retaining furnace having therein a level-detecting sensor which is vertically movable, a servo-motor for vertically moving the sensor, said sensor generating a signal of the detected level of molten material in the furnace, a converter for outputting the detected level signal and a pulse generator coupled with the servo-motor for generating a signal of the level position of said level sensor, a computer and controlling means for previously storing data relative to injection pressure and a variation thereof to achieve optimum casting conditions of the molten material, means for inputting the detected level signal from the level-detecting sensor in the form of the level position signal from the pulse generator for computing the optimum injecting conditions, and means for outputting a control instruction from the computer to a voltage control device of the electromagnetic induction pump so as to maintain constant the melt level in the supply conduit regardless of variations in the melt level in the furnace between casting operations.

4,714,103

CONTINUOUS CASTING MOLD

Raymond L. Polick, Pittsburgh; Kenneth D. Tamburrino, Aliquippa, both of Pa., and Edmund H. Becker, Schwerte, Fed. Rep. of Germany, assignors to Mannesmann Demag Corporation, Coraopolis, Pa.

Filed Oct. 10, 1986, Ser. No. 917,705

Int. Cl.⁴ B22D 11/124

U.S. Cl. 164—486

14 Claims

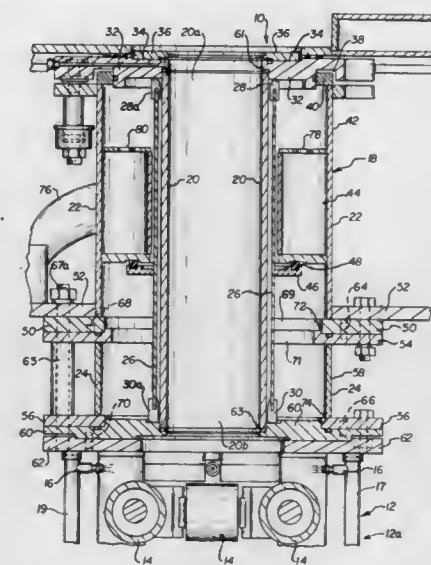
1. A device in the continuous casting of molten metal comprising:

- a mold assembly, comprising:
 - mold member means having a wall cavity throughout with opposed opened ends, one end for receiving said molten metal and the other end for progressively discharging said metal in a cast form which cast form has an outer surface which separates away from said wall cavity upon solidification thereof;
 - said mold member means including at least two different lengths of mold members,
 - first cooling means disposed around said mold member means for receiving and distributing coolant to effect said solidification of said molten metal,
 - fluid inlet means for introducing said coolant into said mold assembly,
 - said first cooling means having inner wall means disposed around and adjacent to said mold member means between which said coolant travels,
 - said inner wall means including at least two different lengths of inner walls which correspond to that of said mold members,
 - annular extension means connectable to at least said first

cooling means for extending the length of said mold assembly, and

mounting means in said mold assembly for said mold member means and said inner wall means of said first cooling means for replacement of said mold member and of said inner wall in said mold assembly with a different mold member and a different inner wall for said first cooling means, each being selected such as to have a length which corresponds to that of said mold assembly, which length of said mold assembly is dependent on the use or non-use of said extension means, whereby a longer length for said mold member means and said inner wall means used in conjunction with said extension means provides a longer solidification period for said separating of said cast form surface from said wall cavity.

13. A method for the continuous casting of molten metal into a cast form, employing a casting machine with a mold assem-



bly including at least two different length of mold members having a molten metal receiving end and a cast form discharging end, and with first cooling means having at least two different length inner wall means with different lengths and arranged around said mold member, the steps comprising:

- introducing coolant between said inner wall means and said mold member to effect solidification of said molten metal, connecting an extension means to said first cooling means for increasing the solidification period for said metal, when using said extension means, replacing a shorter length mold member and a shorter length inner wall means with a longer length mold member and a longer length inner wall means, which longer lengths substantially correspond to the length of said first cooling means with said extension means connected thereto, and
- introducing said coolant between said longer length mold member and inner wall means.

4,714,104

METHOD OF CONTINUOUSLY CASTING A METAL AND AN APPARATUS FOR CONTINUOUSLY CASTING THE SAME

Yutaka Ouchi; Akio Sugino; Kazuo Sugaya, and Kazuo Kimizima, all of Tsuchiura, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Division of Ser. No. 843,508, Mar. 25, 1986, Pat. No. 4,668,288. This application Mar. 9, 1987, Ser. No. 24,597

Claims priority, application Japan, Mar. 26, 1985, 60-61667

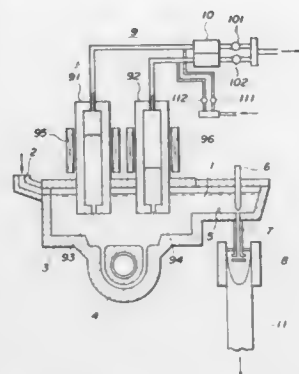
Int. Cl.⁴ C21C 7/10; C22B 9/04, 9/05

U.S. Cl. 164—504

5 Claims

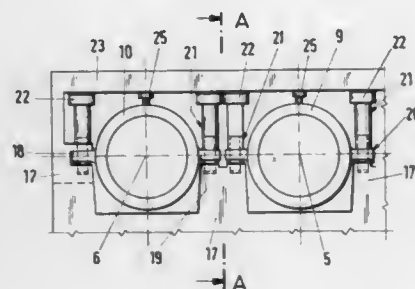
1. An apparatus for continuously casting a metal comprising,

a preserving container for accommodating a continuously supplied molten metal to be poured into a mould, and vacuum degassing means composed of at least two degassing chambers each being provided with opening dipped into said molten metal of said container for receiving and exhausting said molten metal,



4,714,105
MACHINE FOR CONTINUOUS, MULTISTRAND CASTING IN THE HORIZONTAL
Franz Keutgen, Lissendorf; Achim Kubon, Neukirchen-Vluyn; Dieter Perings, Buedesheim; Peter Stadler, Siegen; Peter Voss-Spilker, Kempen, and Karl-Hermann Apel, Siegen, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Dueseldorf, Fed. Rep. of Germany
Filed Apr. 6, 1987, Ser. No. 34,897
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611287

Int. Cl.⁴ B22D 11/08
U.S. Cl. 164—420

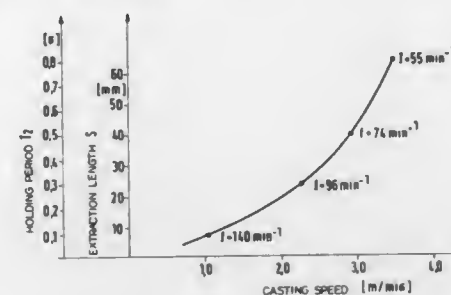


1. In a machine for continuous casting of multiple casting strands and ingots in the horizontal, which machine includes a distributor and feeding vessel, and a plurality of horizontal casting molds, a structure for placing and positioning as well as orienting the molds in alignment with a respective plurality of continuous casting lines, comprising:

a carriage on which said distributing vessel as well as said molds are mounted in conjunction with respective slide locks, said carriage being movable in relation to said lines of casting including movement along said lines of casting; a plurality of stationary mounts, having particular invariable positions in relation to said lines of casting; and locking means for connecting said molds on the carriage, to said mounts whenever said carriage has a particular position in relation to said mounts.

4,714,106
METHOD OF HORIZONTAL CONTINUOUS CASTING
Achim Kubon, Neukirchen, and Peter Voss-Spilker, Kempen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Dueseldorf, Fed. Rep. of Germany
Filed Jun. 27, 1985, Ser. No. 751,545
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1984, 3426168

Int. Cl.⁴ B22D 11/128
U.S. Cl. 164—484

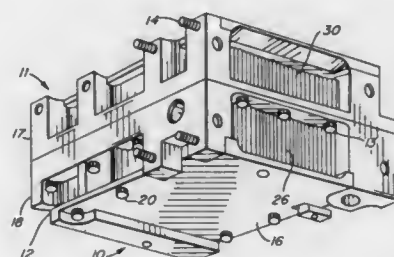


1. In a method for continuous casting of metal in particular steel in a horizontal casting mode and under utilization of a cycle being comprised of an extraction stroke, a first holding period, a retraction stroke and another holding period and wherein extraction pulling is carried out at a particular speed and for a particular length and retraction is carried out at a particular speed and for a particular length, the improvement comprising:

maintaining constant the retraction speed, the retraction length and the first holding period between an extraction stroke and a retraction stroke; and varying extraction speed and extraction length as well as the other holding period between a retraction stroke and the next following extraction stroke.

4,714,107
TITANIUM HEAT EXCHANGER FOR LASER COOLING
Anthony P. Adsett, Orlando, Fla., assignor to International Laser Systems, Inc., Orlando, Fla.
Filed Mar. 5, 1981, Ser. No. 240,774

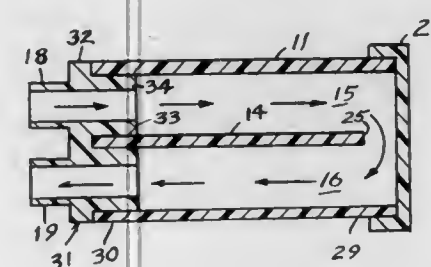
Int. Cl.⁴ B28D 7/02
U.S. Cl. 165—16 A



12. A heat exchanger apparatus comprising in combination: a titanium wall liquid passageway having an input and an output, a plurality of titanium walls, at least two of said titanium walls being between 0.020 and 0.040 inches thick and having a plurality of elongated titanium ribs formed thereon, each titanium wall's ribs coacting with the ribs on the other titanium wall by each rib on one wall protruding between pairs of ribs on the other wall; and a cooling fluid passageway adjacent at least one, titanium wall of said titanium walled liquid passageway and having a plurality of metal cooling fins of higher thermal conductivity formed thereon and attached to one said titanium

wall whereby a heat exchanger has a titanium passageway for a liquid to be cooled.

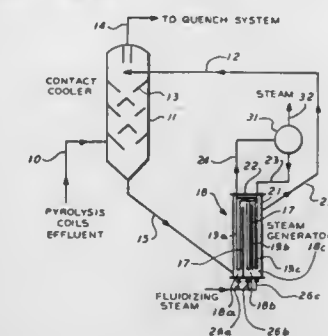
4,714,108
HEAT PUMP SYSTEM
John J. Barry, Erie, Pa., assignor to Pyramid Industries, Inc., Erie, Pa.
Continuation-in-part of Ser. No. 732,963, May 13, 1985, abandoned. This application Aug. 18, 1986, Ser. No. 897,322
Int. Cl.⁴ F28D 7/12
U.S. Cl. 165—45



1. An apparatus for using heat from a first subterranean fluid or the like for heating a second fluid comprising: an elongated pipe generally circular in cross-section having a first end, a second end and a length sufficient to permit said pipe to extend into the earth, into contact with fluid in said earth, a heat exchanger having a coil therein, said coil being connected to said pipe, said pipe having a diametrically disposed partition integrally attached to the inside wall of said pipe and having fillet corners at each side with said partition at the junctures of said partition and said pipe, said partition extending from said first end to a position closely adjacent said second end, providing a first flow channel and a second flow channel, a closure closing said second end providing communication between said first flow channel and said second flow channel, a plug closing said first end, said plug having a cylindrical body with a first hole and a second hole, said first hole is spaced from said second hole and extends therethrough and a diametrically extending slot is disposed in one side thereof, said plug being received in said first end of said pipe with an end of said partition received in said slot whereby a flow path is provided from said first hole through said first flow channel through said second flow channel to said second hole, a first nipple is molded to said plug communicating with said first hole, a second nipple is molded to said plug overlying said second hole providing connection to said holes, said pipe being connected to said nipples and to said heat exchanger, said pipe being disposed in a well containing first fluid for pumping heat from said first fluid to said second fluid, a pump being connected in series with one said nipple for circulating water through said pipe and through said heat exchanger.

4,714,109
GAS COOLING WITH HEAT RECOVERY
Utah Tsao, 1887 Kennedy Blvd., Jersey City, N.J. 07305
Filed Oct. 3, 1986, Ser. No. 916,011
Int. Cl.⁴ F25D 15/00
U.S. Cl. 165—104.18

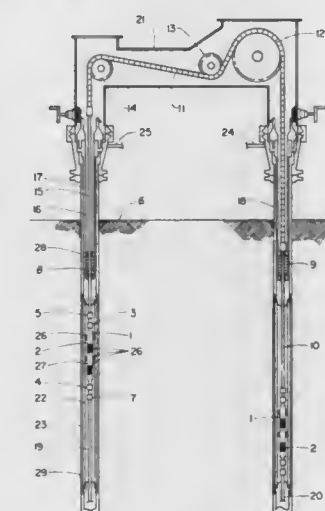
19 Claims



1. A process for cooling a gas and recovering heat therefrom, comprising: contacting a hot gas with finely divided solids to cool the gas and heat the solids; separating the gas and heated solids; passing heated solids through at least two zones; maintaining the solids as a fluidized bed in said at least two zones; and recovering heat from the heated solids in the at least two zones by heat exchange with a heat transfer fluid.

4,714,110
DEVICE TO RELIEVE SUCKER ROD TORQUE BELOW GROUND LEVEL IN A PETROLEUM WELL
Edward D. Dysarz, 11423 Triola La., Houston, Tex. 77072
Continuation-in-part of Ser. No. 668,515, Nov. 4, 1984, Pat. No. 4,676,311. This application Aug. 7, 1986, Ser. No. 893,991
Int. Cl.⁴ E21B 17/10; F16D 1/12
U.S. Cl. 166—68

4 Claims



1. An apparatus for use in a sucker rod string having a polished rod for relieving torque below said polished rod and inside of a well while said sucker rod string is moving up and down inside of said well, comprising: a body, said body that is suitably fastened to the lower end of said polished rod; at least one set of rollers that are suitably mounted within said body by axles, said rollers with a diameter greater than the width of said body; a lower swivel, said lower swivel that is suitably fastened to the lower end of said body at the top of said lower swivel, said lower swivel is further suitably attached at the lower

end of said body to the upper end of said sucker rod string, said lower swivel to isolate said sucker rod string from said body by allowing said sucker rod string to rotate freely without causing said body to rotate;

a guide, said guide being a tube that is square in section and is set vertically within said well, said guide is suitably fastened to said well at top and bottom of said guide, said guide to have an inside dimension that is slightly greater than the diameter of said rollers to allow said rollers to roll on the inside of said guide, said guide to restrain said rollers set and held within said body, allowing said body and rollers to move freely up and down within said guide while restraining said body and said rollers from rotating horizontally.

4,714,111

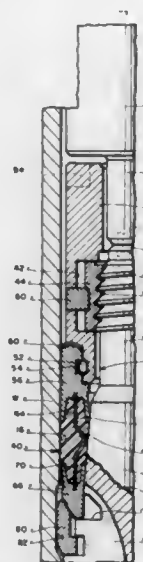
WEIGHT/PRESSURE SET PACK-OFF FOR SUBSEA WELLHEAD SYSTEMS
Norman Brammer, Ventura, Calif., assignor to Vetco Gray Inc., Houston, Tex.

Filed Jul. 31, 1986, Ser. No. 891,704

Int. Cl.⁴ E21B 33/04

U.S. Cl. 166—182

11 Claims



1. In combination:
 - a vertical outer body member having an internal cylindrical sealing surface;
 - a vertical inner body member within said outer body member and having an external conical sealing surface;
 - said inner body member being radially spaced from said outer body member to define a tapered annulus between said sealing surfaces;
 - one of said body members having an abutment;
 - conically tapered multi-start threads on said inner body member;
 - a tapered pack-off assembly including supporting means movable longitudinally toward said abutment;
 - said tapered pack-off assembly carried by said supporting means which when energized will sealingly engage said sealing surfaces of said annulus;
 - said supporting means having a split ring capable of expanding and contracting radially;
 - said split ring having conically tapered multi-start threads on its inner wall capable of mating with said multi-start threads on said inner body member;
 - a running tool adapted for connection to a running string, means releasably connecting said supporting means to said running tool and positioning said pack-off assembly above said annulus;
 - said running tool having means for engaging the top of said inner body member and which when engagement occurs said multi-start threads are partially overlapping and par-

tially threaded and said tapered pack-off is partially within said tapered annulus but in unenergized condition, said partial overlapping and threading being a function of the weight of said running string and said split ring, and means for moving said pack-off assembly longitudinally toward said abutment to engage said abutment and expand said pack-off into an energized condition in sealing engagement with said sealing surfaces of said annulus.

4,714,112

METHOD FOR CONTROLLING ROCK DISSOLUTION AND PIPE CORROSION DURING OIL WELL STEAM INJECTION

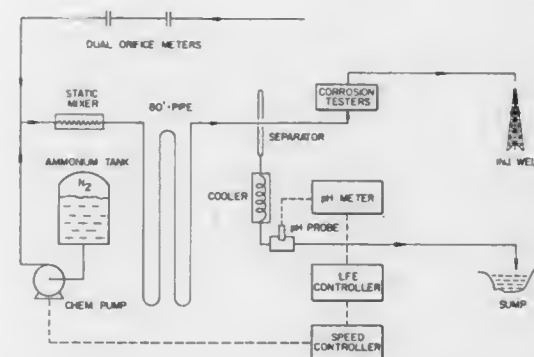
Andrew Nigrini, La Habra Heights, and Liming Hsueh, Buena Park, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 848,662, Apr. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 728,063, Apr. 29, 1985, and a continuation-in-part of Ser. No. 654,331, Sep. 24, 1984, abandoned. This application Jun. 22, 1987, Ser. No. 65,198

Int. Cl.⁴ E21B 43/22, 47/00, 47/06

U.S. Cl. 166—252

38 Claims



18. A method for inhibiting silica dissolution while preventing pipe corrosion for use in the vicinity of a well penetrating a hydrocarbon-containing formation, comprising:

- (a) injecting steam into said well, said steam having a liquid phase and a vapor phase, and including an effective amount of a salt to reduce the pH of said liquid phase of said steam to a range of about 8.0 to about 10.0 said salt comprising a volatile cationic component and a nonvolatile anionic component; and
- (b) monitoring the pH of said liquid phase of said steam and continually adjusting the addition of said salt to maintain the pH of said liquid phase of said steam within the range of from about 8.0 to about 10.0.

29. A method for recovering hydrocarbons from a silicate or carbonate containing hydrocarbon-bearing formation penetrated by at least one well, wherein said method inhibits formation dissolution while preventing pipe corrosion, said method comprising the steps of:

- (a) injecting steam into said well, said steam produced from a water having added thereto an effective amount of a salt to reduce the pH of the residual liquid phase of said steam to within the range of from about 8.0 to about 10.0, said salt comprising a volatile cationic component and a nonvolatile anionic component;
- (b) monitoring the pH of said residual liquid phase of said steam and continually adjusting the addition of said salt to maintain the pH of said liquid phase within the range of from about 8.0 to about 10.0;
- (c) producing said hydrocarbons.

4,714,113
ALKALINE WATER FLOODING WITH A PRECIPITATION INHIBITOR FOR ENHANCED OIL RECOVERY

Shantil M. Mohnot, Copley, Ohio, and Paritosh M. Chakrabarti, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 5, 1986, Ser. No. 938,496

Int. Cl.⁴ E21B 43/22

U.S. Cl. 166—270

18 Claims

1. A process for the enhanced recovery of oil from a subterranean reservoir penetrated by at least one injection well and at least one production well wherein the reservoir includes an aqueous phase containing dissolved divalent metal cations, the process comprising injecting through an injection well an aqueous solution including an alkaline material sufficient to provide a solution pH of above about 8 and a predetermined amount of water-soluble precipitation inhibitor selected from the group consisting of polyacrylates and acrylate-containing copolymers having a number average molecular weight of from about 500 to about 50,000, polymaleic anhydrides, organo-phosphonates or carboxylate-containing organo-phosphonates selected from the group consisting of aminotrimethylenephosphonic acid, hydroxyethanediphosphonic acid, ethylenediaminetetramethylenephosphonic acid, diethylenetriaminopentamethylenephosphonic acid, hexamethylenediaminetetramethylenephosphonic acid, phosphinopolycarboxylic acid, phosphonobutane tricarboxylic acid and alkali metal or ammonium salts thereof, said predetermined amount being sufficient to prevent substantial precipitation of divalent metal hydroxides or divalent metal carbonates in the injection well or the immediate vicinity of the injection well.

4,714,114

USE OF A PROPPANT WITH CONTROLLED PULSE FRACTURING

Lloyd G. Jones, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,739

Int. Cl.⁴ E21B 43/267

U.S. Cl. 166—280

15 Claims

1. A method for treating fractures resultant from controlled pulse fracturing comprising:

- (a) placing a high energy impulse device containing a propellant into a wellbore contained in a subterranean formation near said formation's productive interval;
- (b) injecting into said wellbore a proppant, of a size sufficient to prop said fractures, suspended in a liquid which liquid covers said productive interval; and
- (c) igniting said propellant in said high energy impulse device which generates fracturing pressure and maintains a peak pressure load sufficiently above the in-situ stress pressure but below the rock yield stress for a time sufficient to create more than two simultaneous multiple radial fractures to allow fluid penetration, proppant entry into resultant fractures, and extension of said fractures.

4,714,115

HYDRAULIC FRACTURING OF A SHALLOW SUBSURFACE FORMATION

Duane C. Uhri, Grand Prairie, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 8, 1986, Ser. No. 938,892

Int. Cl.⁴ E21B 43/26

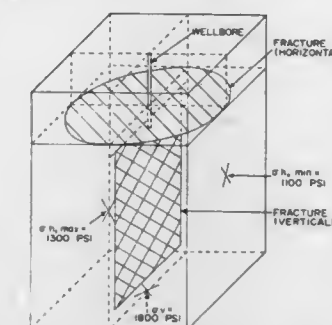
U.S. Cl. 166—308

11 Claims

1. A method for propagating a vertical hydraulic fracture in an earth formation surrounding a borehole where the original in-situ stresses favor a horizontal fracture, comprising the steps of:

- (a) firstly supplying fracturing fluid to said formation at a first depth within said borehole to propagate a horizontal

fracture favored by the original in-situ stresses of the formation, and
(b) secondly supplying fracturing fluid to said formation at a



second depth within said borehole, while maintaining pressure in said horizontal fracture, to propagate a vertical fracture as favored by the in-situ stresses as altered by the propagating of said horizontal fracture.

4,714,116

DOWNHOLE SAFETY VALVE OPERABLE BY DIFFERENTIAL PRESSURE

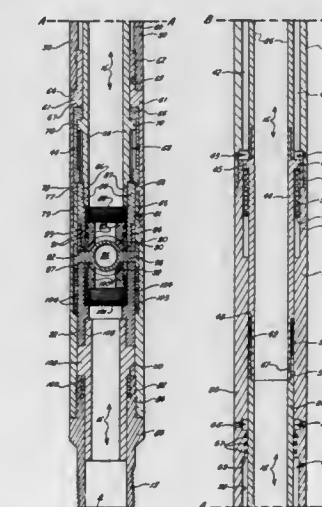
Travis J. Brunner, P.O. Box 802, Houma, La. 70361-0802

Filed Sep. 11, 1986, Ser. No. 906,165

Int. Cl.⁴ E21B 34/06

U.S. Cl. 166—321

10 Claims



1. an oil well downhole safety valve operable by downhole annulus pressure, comprising

- a. a tool body having a continuous [well]wall defining a longitudinal flow bore for conveying liquid, and adapted to travel through a well annulus as part of a work string;
- b. a valve body slideably mounted within the tool longitudinal flow bore;
- c. seal means carried by the valve body for forming a seal between the valve body and the continuous wall of the tool body;
- d. a valving member carried by the valve body for travel therewith and movable between open flow and closed flow positions for valving the flow bore;
- e. drive means operative by annulus pressure for moving the valving member between open flow and closed flow positions and comprising a pair of opposing pistons attached to the valve body with drive surfaces of differing surface areas; and
- f. a pair of openings through the tool body and positioned respectively above and below the pair of pistons, for

allowing annulus pressure to communicate with the flow bore and with the piston drive surfaces so that annulus pressure simultaneously acting upon the piston drive surfaces can move the valving member.

4,714,117

DRAINHOLE WELL COMPLETION

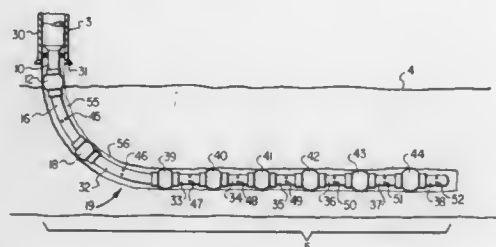
James A. Dech, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 20, 1987, Ser. No. 40,419

Int. Cl.⁴ E21B 33/124, 33/13

U.S. Cl. 166—380

4 Claims



1. In a method for completing a curved drainhole wellbore defined by a wall formed by drilling into at least one subsurface geologic formation, the improvement comprising inserting into said drainhole wellbore a casing string composed of alternating casing subs and external casing packer subs, each of said casing subs being solid and not perforated when said casing string is inserted into said wellbore, each of said external casing packer subs carrying an elastic member adapted to expand away from said casing packer sub toward and into contact with the adjacent wall of said drainhole wellbore, whereby, except for the end most casing sub, each said closing sub carries first and second external casing packer subs on either end thereof so that upon expansion of said elastic members carried by said first and second external casing packer subs the intermediate casing sub is isolated in the annulus outside said casing string assembly and inside said drainhole wellbore, and activating said external casing packer subs by pumping an activating fluid into said casing string to expand essentially all elastic members on said casing string at essentially the same time by expanding the elastic member into contact with said drainhole wellbore wall thereby to form isolated zones along said casing string, said isolated zones extending from outside said casing string to said drainhole wellbore wall, and thereafter perforating at least one of said solid casing subs to establish fluid flow contact between the interior of said casing string and said geologic formation.

4,714,118

TECHNIQUE FOR STEERING AND MONITORING THE ORIENTATION OF A POWERED UNDERGROUND BORING DEVICE

Glen Baker, Kent; Albert W. Chau, Redmond, and John E. Mercer, Kent, all of Wash., assignors to FlowMole Corporation, Kent, Wash.

Filed May 22, 1986, Ser. No. 866,241

Int. Cl.⁴ E21B 7/08, 44/00

U.S. Cl. 175—26

27 Claims

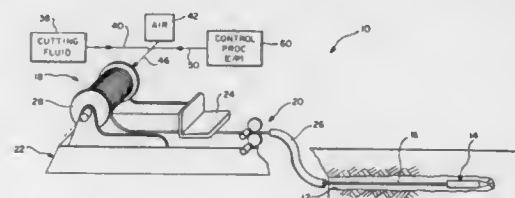
1. An apparatus for providing a continuous underground tunnel, comprising:

- (a) an elongated boring device having a central elongation axis and an axially extending main body, a forward boring head coaxially positioned with and rotatably mounted to said main body, and a nozzle on said boring head in a forward facing position off axis with respect to said device;
- (b) means for supplying fluid under pressure to said nozzle whereby to produce a pressurized fluid jet at the output of said nozzle in a direction forward of and off axis with

respect to said device, said jet being sufficiently strong to bore through soil;

- (c) means for urging the boring device forward as said jet is being produced whereby to cause the device to move forward into the area being bored out by said jet; and
- (d) means for moving said boring head and nozzle about the axis of the device in a first way for causing the device to move forward along a straight path and in a second way for causing the device to move forward along a particular curved path that depends upon the way in which the boring head is rotated, said means for moving said boring head including means for rotating said boring head in said one way at a constant speed around the axis of said boring device so as to cause the boring device to move along a straight path and means for moving said boring head in said second way about the axis of said boring device such that said fluid jet spends more time along a particular segment of its path about said axis than on the rest of its path of movement so that the particular segment of said path determines the particular curved path taken by the boring device.

11. In an apparatus for providing an underground tunnel by means of an elongated boring device which is caused to move through the soil underground, the improvement comprising



means for monitoring the pitch angle defined by the elongation axis of said boring device relative to a horizontal ground plane, independent of the roll position of the device, said monitoring means including a sensor carried by said device for producing signals corresponding to the pitch of the device independent of its roll position and means for detecting and processing said signals, said sensor including

- (a) a closed, hollow tubular container having its axis positioned parallel with the elongation axis of said boring device and defining a co-axially extending internal chamber having opposite ends,
- (b) electrical circuit means including first and second contact means located within and at the opposite ends of said chamber and a third contact means located within and extending around said chamber at a point intermediate its opposite ends,
- (c) an electrolytic solution partially filling said chamber so as to make contact with all three of said contact means, the extent of contact being made by the solution with said first and second contact means depending on the pitch angle of said boring device but independent of its roll position and said signals depending upon the extent of contact being made by the solution with said first and second contact means.

4,714,119

APPARATUS FOR HARD ROCK SIDEWALL CORING A BOREHOLE

Joel J. Hebert, Houston, and Jo-Yu Chuang, Sugar Land, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 25, 1985, Ser. No. 791,246

Int. Cl.⁴ E21B 25/02, 49/06

U.S. Cl. 175—20

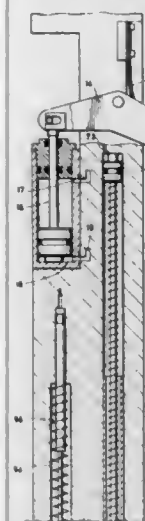
12 Claims

1. A device for cutting a core from the sidewall of a borehole comprising:

- (a) an elongated housing lowerable into the borehole;

means for anchoring said housing at a desired position in the borehole;

- at least one guide plate fixedly mounted inside said housing in a generally vertical position, said guide plate having therein a J-shaped slot with an elongate leg thereof disposed in a generally horizontal position and a shorter leg extending upward therefrom; core drilling means;
- first and second pins extending from the side of said drilling means into said J-shaped slot of said at least one guide



plate, and arranged in a line parallel to an axis of said drilling means; and

- drive means for driving said first pin along said J-shaped slot for pivoting said drilling means between a substantially vertical position and a substantially horizontal position, said drive means including a drive plate pivotally mounted to said housing, means for coupling said drilling means to said drive plate for pivotal movement therewith and means for pivotally moving said drive plate to drive said first pin along said J-shaped slot.

4,714,120

DIAMOND DRILL BIT WITH CO-JOINED CUTTERS

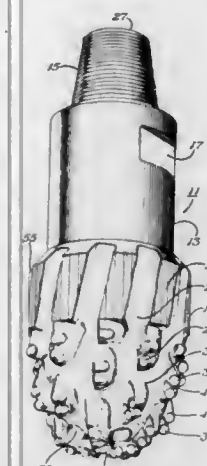
William W. King, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 823,706, Jan. 29, 1986, abandoned. This application Apr. 23, 1987, Ser. No. 42,546

Int. Cl.⁴ E21B 10/46

U.S. Cl. 175—329

2 Claims



1. An earth boring bit, comprising:

- (a) a body including a metallic shank on one end with a tubular

bore and with means for connection to a drill string member and rotation about a longitudinal axis;

- a cast matrix bonded to the metallic shank and forming a face of the bit, the bit face having a plurality of cutting elements mounted within backings of the matrix and extending radially on the bit face from a central location to an outermost gage portion, the cutting elements having cutting surfaces for dislodging geological formations;
- at least one fluid opening communicating the bit face with the tubular bore of the bit for circulating fluids to the bit face; and
- wherein the cutting elements are arranged in groupings, the groupings including a plurality of cutter blades comprised of at least four cutters joined by a common backing, the cutter blades being mounted on the bit face adjacent the fluid opening and extending radially on the bit face from the central location in the direction of the gage portion but terminating short of the gage portion, the groupings on the bit face also being provided as pairs of cutters which are co-joined by a common backing of the matrix, the co-joined pairs being spaced-apart radially and circumferentially from adjacent co-joined pairs and from the cutter blades, the bit groupings on the bit face further being characterized in that none of the groupings extend from the central location completely to the outermost gage portion, so that fluid circulated through the fluid opening to the face of the bit can pass through the spaces defined between the groupings of cutters in an unchanneled fashion.

4,714,121

WHEEL SCALE ASSEMBLY

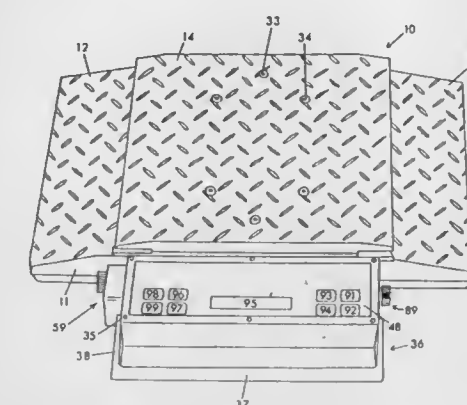
William P. Kroll, 2382 Pioneer Trail, Medina, Minn. 55340; Robert E. K. Kroll, 300 Shelard Pkwy., St. Louis Park, Minn. 55426; Mark W. Kroll, 13011 Brenwood Trail, Minnetonka, Minn. 55343, and Karl J. F. Kroll, 5217 W. Mill Rd., Minnetonka, Minn. 55345

Filed Feb. 3, 1987, Ser. No. 10,324

Int. Cl.⁴ G01G 19/02, 23/14, 21/24

U.S. Cl. 177—134

20 Claims



1. A portable electronic wheel scale comprising:

- a thin, lightweight housing structure having opposing ramp ends and an interiorly disposed opening having a bottom surface,
- opposing bearing surfaces fixed to said bottom surface,
- at least one load cell having at least one strain gauge in communication therewith, said load cell having a rectangular body structure and having opposing bearing means extending downward at its ends for engaging said bearing surfaces,
- a load cell retaining structure fixed to said housing structure, said retaining structure having opposing vertically movable and lateral movement restricting elongated flexible members, and

- e. a platform member fastened to said load cell and to said vertically movable flexible and lateral movement restricting members of said load cell retaining structure.

4,714,122

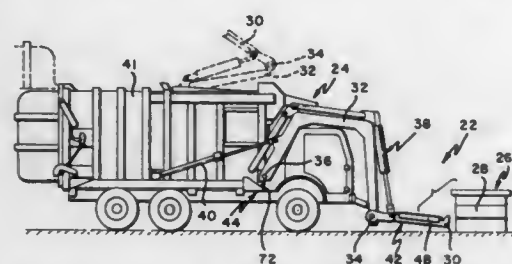
WEIGHING SYSTEM FOR REFUSE TRUCKS

Gregory H. Appleton, Gardner, and Paul D. Mikelk, Berlin, both of Mass., assignors to Breakthru Industries, Inc., Clinton, Mass.

Filed Oct. 20, 1986, Ser. No. 922,064
Int. Cl.⁴ G01G 19/08, 19/12

U.S. Cl. 177-139

10 Claims



1. Weighing system for a refuse truck having a refuse receptacle which has top opening and lifting means for engaging and lifting a refuse container which has a top opening from a resting position outside of the truck to an inverted position above the opening of the refuse receptacle to permit the contents of the refuse container to fall into the refuse receptacle, said refuse truck being a front end loader which has a pair of forwardly-extending support arms for engaging complementary support fixtures of a refuse container and a lifting boom for lifting the support arms and a refuse container which is supported on said support arms from a position in front of the truck to a position above the top opening of the refuse receptacle, said weighing system comprising:

- (a) a transducer which is mounted on the lifting means of said refuse truck for sensing the weight of a refuse container when the container is supported by the lifting means, said transducer being effective for generating an electrical analog signal which is proportional to the weight which is sensed by the transducer, said transducer comprising a transducer fixture which is mounted on each support arm, said transducer fixture comprising:
 - (1) a housing which is fixed to the support arm,
 - (2) a pressure load cell which is supported on said housing, said load cell having a main body and an upwardly-extending sensing element which is mounted on said main body for vertical movement relative to said main body, and
 - (3) a pressure plate which is supported on the sensing element of said pressure load cell and which is guided by said housing for vertical movement relative to said housing, said pressure plate having an upper surface for supporting the refuse container,
- (b) electrical digitizing means for converting said analog signal to a digital signal which is indicative of the weight which is sensed by the transducer,
- (c) a source of electrical power, and
- (d) switch means including a normally open limit switch which is operatively connected between said transducer and said source of electrical power so that said transducer is energized only when said switch is closed, said limit switch being mounted on said refuse truck so that the switch is closed as a result of the action of said lifting means at a point during the lifting of a full refuse container and the lowering of an empty refuse container when the container is fully supported by said lifting means.

4,714,123
FARM MACHINE WITH IMPROVED TRANSMISSION DEVICE

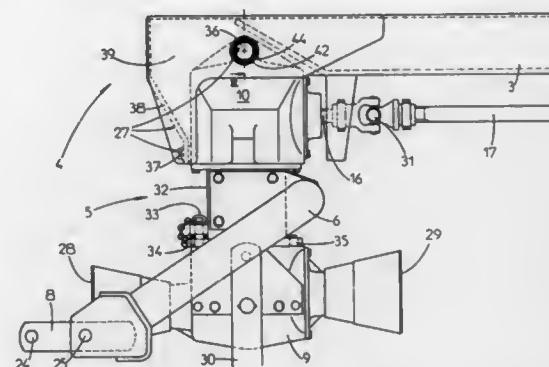
Rino Ermacora, and Thierry Krebs, both of Saverne, France, assignors to Kuhn, S.A., Saverne, France

Filed Mar. 27, 1986, Ser. No. 844,562

Claims priority, application France, Mar. 28, 1985, 85 04897
Int. Cl.⁴ B60K 25/06; A01B 71/06

U.S. Cl. 180-14.4

9 Claims



1. A farm machine to be pulled by a tractor, said farm machine comprising:

- (a) working elements;
- (b) a body arranged to support said working elements;
- (c) a beam unit arranged for connecting said body to a tractor during use, said beam unit comprising:
 - (i) a tongue having a front part, a rear part, and a longitudinal axis, said tongue being fastened at its rear part to said body;
 - (ii) a transmission housing comprising an upper part and a lower part rotatable relative to said upper part about an at least approximately vertical axis; and
 - (iii) a hitching member fastened to said lower part of said transmission housing and adapted to be connected to the tractor during use;
- (d) transmission output drive means arranged to transmit rotary movement from said transmission housing to said working elements, said rotary movement being received by said working elements; and
- (e) fastening means for fastening said upper part of said transmission housing to said tongue, said fastening means comprising:
 - (i) a connecting pin which extends transversely entirely through said upper part of said transmission housing, said connecting pin being axially secured by first securing means, and
 - (ii) second securing means for blocking rotation of said transmission housing around said connecting pin.

4,714,124

GUIDANCE SYSTEM FOR SELF-GUIDED VEHICLE

Donald L. Laib, Forest Grove, Oreg., assignor to Forest Grove Industries, Inc., Forest Grove, Oreg.

Filed Jun. 9, 1986, Ser. No. 872,034

Int. Cl.⁴ B62D 1/24

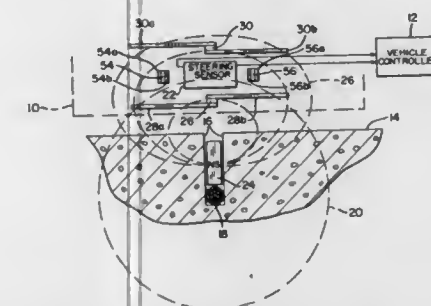
U.S. Cl. 180-168

35 Claims

1. In combination with a self-guided vehicle of the type which is guided along a predetermined path defined by an operative portion of a magnetic field of an elongate current-carrying conductor mounted separate from said vehicle, an apparatus for providing information to said vehicle comprising:

- (a) a permanent magnet;
- (b) magnetic sensor means on said vehicle for sensing the magnetic field of said permanent magnet;
- (c) said permanent magnet being positioned adjacent to said

current-carrying conductor within said operative portion of the magnetic field of said conductor in a predetermined location along said conductor and having a magnetic



permeability substantially no greater than that of free space so as to substantially prevent distortion by said magnet of said operative portion of the magnetic field of said conductor.

4,714,125

SINGLE LATERALLY BENDABLE TRACK SNOWMOBILE

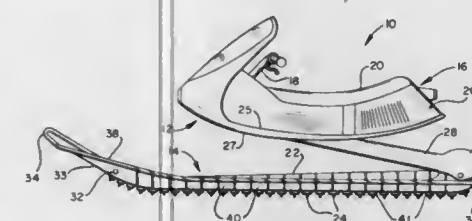
Jack C. Stacy, Jr., Rte. 3, Box 107A, Santa Fe, N. Mex. 87501

Filed May 5, 1986, Ser. No. 859,381

Int. Cl.⁴ B62D 11/22

U.S. Cl. 180-182

19 Claims



1. A single track vehicle having a main body, a track assembly spaced from and underlying said main body, a suspension arm by which the main body is supported in spaced relationship relative to the track assembly;

said track assembly includes an endless, flexible track means and a track support means; means capturing said track means in an oblated form relative to said track support means for ground supporting the vehicle from the track means;

means by which one of the suspension arm is connected to the track support means; and, the other end of the suspension arm is connected to said main body so that the suspension arm provides the only support for the main body.

4,714,126

FOUR-WHEEL DRIVE VEHICLE

Takashi Shinozaki, and Takeshi Kawaguchi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 836,228, Feb. 28, 1986, abandoned.

This application Mar. 2, 1987, Ser. No. 21,556

Claims priority, application Japan, Dec. 28, 1982, 57-232860

Int. Cl.⁴ B60K 17/34

U.S. Cl. 180-233

6 Claims

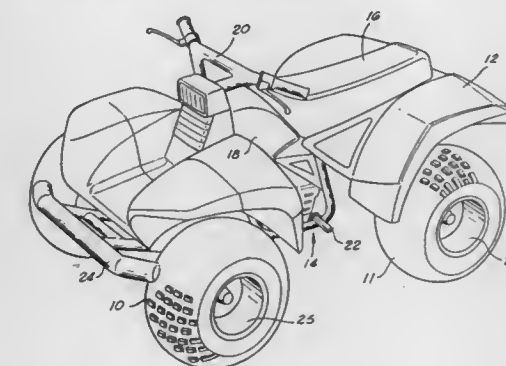
1. A four-wheel drive vehicle of the type wherein the rider straddles the vehicle, comprising:

a frame supportive of said rider and containing structural members arranged for mounting an engine and drive elements therefrom;

rotatable drive shafts driven by said drive elements disposed forwardly and rearwardly, respectively, of said frame; each of said drive shafts connecting wheels at their opposite ends, said wheels being disposed laterally outwardly of said frame;

front and rear swing arms each having one end pivotally connected to said frame and their free ends mounting each of the respective drive shafts for rotation; front and rear cushion members operatively connected between said swing arms and said frame;

a head tube on the forward end of said frame;



a steering mechanism operatively supported by said head tube;

said front swing arm comprising an integrated assemblage of structural members including opposed sides diverging outwardly from the pivoted end of said swing arm and terminating closely adjacent the forwardly disposed wheels of said vehicle;

steering hubs rotatably mounting each of said front wheels, said steering hubs being pivotally attached to the opposed sides of the free end of said front swing arm; and said steering mechanism operatively connecting each of said steering hubs.

4,714,127

CONTROL APPARATUS FOR A VEHICLE WITH DISENGAGEABLE FOUR-WHEEL DRIVE

Cristoforo Fanti, Milan; Gianclaudio Travaglio, Arese; Luciano Ferrario, Rho, and Saverio Moscatelli, Milan, all of Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy

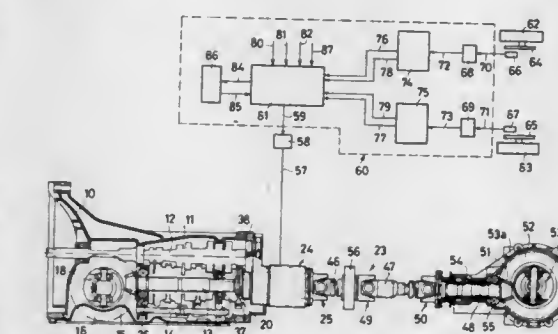
Filed Aug. 4, 1986, Ser. No. 892,361

Claims priority, application Italy, Aug. 6, 1985, 21871 A/85

Int. Cl.⁴ B60K 23/08, 17/34

U.S. Cl. 180-233

4 Claims



1. A control apparatus particularly for a four-wheel drive vehicle in which one wheel group is always engaged, the output shaft of the change-speed gearbox being connected permanently to the differential of said one wheel group and being connected selectively to the differential of the other

wheel group by separable connection means and actuator means, said control apparatus comprising means which sense the respective speed of the wheels of the always engaged group and are operationally connected to a control unit comprising comparator means arranged to compare the wheel speed signals with predetermined limiting values to establish whether they are greater or less than said limiting values and to provide signals indicative of the results of the comparison, said control unit being operationally connected to said actuator means, characterised by also comprising means for sensing the position of the brake pedal and means for sensing the commencement of travel of the accelerator pedal and also operationally connected to said control unit, said control unit comprising logical operation means in cooperation with said comparator means and responsive to said signals is able to feed to said actuator means first signals for causing said connection means to disconnect the differential of said other wheel group from the output shaft of the gearbox should the speed be less than the predetermined limit, and second signals for causing said connection means to connect said differential of said other wheel group with the output shaft of the gearbox should the speed exceed the predetermined limit, said control unit further comprising processor means arranged to obtain from the signals of said wheel speed sensors signals indicative of the speed variations and the direction of said variations in order to distinguish acceleration from deceleration, said comparator means being also able, in the presence of a signal indicating that the travel of the accelerator pedal has commenced, to compare the acceleration signals with a predetermined limiting value to establish whether these are greater or less than said limiting value, and to provide signals indicative of the results of the comparison, said logical operation means being also able to exclude said first signals and able to feed to said actuator means said second control signals for causing said connection means to make said differential rigid with the output shaft of the gearbox should the acceleration exceed the predetermined limit, said comparator means being further able, in the presence of a signal indicating operation of the brake pedal, to compare the deceleration signals with a predetermined limiting value to establish whether they are greater or less than said limiting value and to provide signals indicative of the results of the comparison, said logical operation means being able to exclude said second signals and being able to feed said first signals to said actuator means in order to cause said connection means to disconnect the differential of said other wheel group from the output shaft of the gearbox, even at a speed exceeding said limiting value, should the deceleration be greater than the respective limiting value.

4,714,128

STOP MEMBER MECHANISM FOR USE IN A FOUR-WHEEL DRIVE VEHICLE

Toshio Yoshinaka, Nagoya, and Shuji Nagano, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Oct. 24, 1986, Ser. No. 922,695

Claims priority, application Japan, Oct. 24, 1985, 60-163254[U]

Int. Cl.⁴ G05G 5/10; F16B 21/00

U.S. Cl. 180—247

6 Claims

1. A four-wheel drive system for use in a vehicle including a first and a second pair of road wheels, an engine including an output shaft, and a transmission including input and output shafts, the input shaft of the transmission being selectively connected to the output shaft of the engine, the output shaft of the transmission selectively being in driving engagement with the input shaft of the transmission, the four-wheel drive system comprising:

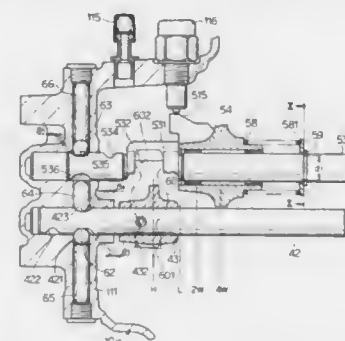
- a first spline member which is rotatable about a first rotational axis, said first spline member being driven by the output shaft of the transmission;
- a second spline member which is rotatable about the first rotational axis of said first spline member, said second spline member being located adjacent to said first spline member, said second spline member including a first en-

gagement means and a first disengagement preventing means;

an engagement sleeve member being slidably mounted on said first spline member, said engagement sleeve member including a second engagement means and a second disengagement preventing means, the second engagement means of said engagement sleeve member selectively engaging with the first engagement means of said second spline member, the second disengagement preventing means of the engagement sleeve member selectively engaging with the first disengagement preventing means of the second spline member, said engagement sleeve member being selectively positioned at one of an engagement position and a disengagement position;

a shaft member being located parallel to the first rotational axis of said first spline member, said shaft member being selectively positioned at one of a first position and a second position, the first position of said shaft member corresponding to the engagement position of said engagement sleeve member, the second position of said shaft member corresponding to the disengagement position of said engagement sleeve member, said shaft member including a projection, a first notch and a second notch, a width of the first notch being larger than a width of the second notch;

a locking member being biased toward said shaft member, said locking member being selectively inserted in one of the first and second notches of said shaft member, such that when the shaft member is positioned at the first position,



tion, the locking member is inserted into the first notch of said shaft member and a first space is defined in the longitudinal direction of said shaft member between a side of the locking member and a corresponding side of the first notch, and when the shaft member is positioned at the second position, the locking member is inserted into the second notch of said shaft member and two sides of the locking member are in contact with corresponding sides of the second notch;

a fork member being slidably mounted on said shaft member, said fork member including an engagement finger, the engagement finger engaging with said engagement sleeve member, the fork member being selectively positioned at one of a third position and a fourth position, the third position of the fork member corresponding to the first position of the shaft member, and the fourth position of the fork member corresponding to the second position of the shaft member;

a biasing means which forces the fork member to move toward the projection of the shaft member; and

a stop member being secured to the shaft member, the stop member being located adjacent to the biasing means, the stop member including a tentative holding portion and a firmly gripping portion, such that when the stop member contacts the shaft member at the tentative holding portion thereof, such contact is temporary and the stop member can be easily removed from the shaft member to adjust spatial relationships between the engagement sleeve member, the fork member and the shaft member, and when the

stop member contacts the shaft member at the firmly gripping portion thereof, the stop member is firmly secured to the shaft member to prevent the engagement sleeve member, the fork member and the shaft member from changing spatial relationships therebetween.

4,714,129

TRANSMISSION SYSTEM WITH INTERMEDIATE DIFFERENTIAL FOR ALL-WHEEL DRIVE VEHICLE

Robert Mueller, Moensheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

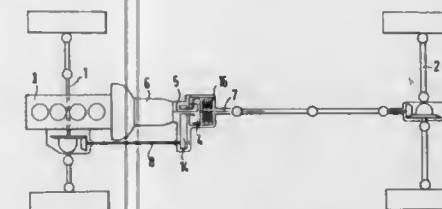
Filed Mar. 3, 1986, Ser. No. 835,647

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507492

Int. Cl.⁴ B60K 17/346, 17/348

U.S. Cl. 180—248

3 Claims



1. All wheel drive arrangement for a motor vehicle having an intermediate differential arranged between a front and a rear axle, said arrangement comprising:

transfer means for transferring a first range of rotational moments to the front axle from said rear axle as a function of a rotational speed difference between said front and rear axles when said front axle is rotating faster than said rear axle, and transferring a second range of rotational moments to the rear axle from said front axle as a function of said rotation speed difference between said front and rear axles when said rear axle is rotating faster than said front axle;

wherein said transfer means include plate clutch means comprising:

clutch housing means;

outer clutch plate means rotationally fixed to said clutch housing means;

clutch hub means rotationally fixedly connected to a driven shaft means; and

inner clutch plate means, said inner clutch plate means being drivingly engageable with said driven shaft means by said clutch hub means;

wherein said inner clutch plate means includes a first portion of said inner clutch plate means, wherein said first portion is drivingly engageable with said outer clutch plate means when said front axle is rotating faster than said rear axle, and a second portion of said inner clutch plate means which is drivingly engageable with said outer clutch plate means when said rear axle is rotating faster than said front axle;

further including a one way clutch means disposed between said second portion and said clutch hub means, for decoupling said second portion from said outer clutch plate means when said front axle is rotating faster than said rear axle.

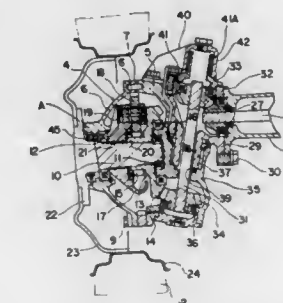
4,714,130

AXLE REDUCTION APPARATUS FOR TRACTOR

Tsugunobu Ujita, and Seiichi Takahashi, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan
Continuation of Ser. No. 842,051, Feb. 14, 1986, abandoned, which is a continuation of Ser. No. 586,499, Mar. 5, 1984, abandoned. This application Mar. 26, 1987, Ser. No. 31,201
Claims priority, application Japan, Jul. 28, 1983, 58-138977
Int. Cl.⁴ B60K 17/30

U.S. Cl. 180—262

7 Claims



1. An axle reduction apparatus for a tractor comprising: an axle reduction casing (4) which supports a ring gear (7) and includes first (6) and second (5) casing members detachably attached to each other with said ring gear secured therebetween;

an axle (10) having inner and outer end portions disposed centrally of said axle reduction casing;

first bearing means (12) supported in said first casing member for receiving said outer end portion of said axle;

second bearing means (11) supported in said second casing member for receiving said inner end portion of said axle;

an integrated gear (13) fitted on an outer surface of said axle for relative rotation with respect thereto, said integrated gear including an input gear (14) and a sun gear (15) formed integrally relative to each other;

a carrier member (17) fixedly secured on the outer surface of said axle outwardly adjacent to said sun gear, said carrier carrying planet gears (18) in mesh with said sun and ring gears, respectively;

third bearing means (21) supported on said carrier member between said carrier member and said integrated gear; and

fourth bearing means (16) supported outwardly of said second bearing means, said integrated gear being supported on said fourth bearing means.

4,714,131

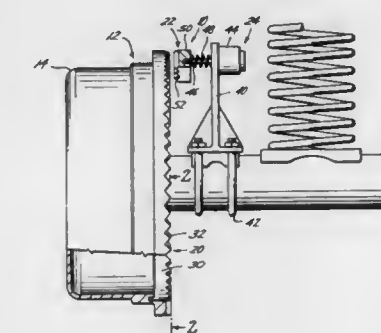
WAFFLE SAFETY DEVICE

Lester R. Wisegerber, 38 Brown La., Dayton, Tex. 77535
Filed Apr. 17, 1986, Ser. No. 853,192

Int. Cl.⁴ B60R 25/10

U.S. Cl. 180—287

15 Claims



1. A vehicle movement warning and movement deterrence

device adapted for coupling adjacent a vehicle wheel assembly, comprising:

- a first waffle surface having a plurality of undulations and operatively coupleable to the wheel assembly for rotation in a path of travel with the wheel assembly;
 - a second waffle surface having a plurality of undulations complementally dimensioned for meshing engagement with the undulations of the first waffle surface; and
 - shift means coupled to said second waffle surface for mounting the second waffle surface to the vehicle adjacent said path of travel and for selective shifting of said second waffle surface into operative meshing engagement with the first waffle surface,
- said undulations being configured and said shift means operable with the waffle surfaces in meshing engagement to impede movement of the first waffle surface relative to the second waffle surface and to create an audible clatter when the first waffle surface moves relative to the second waffle surface and the respective undulations slip past each other.

4,714,132

SUSPENSION OF VEHICLE

Tetsuo Hattori, and Shoichi Seko, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

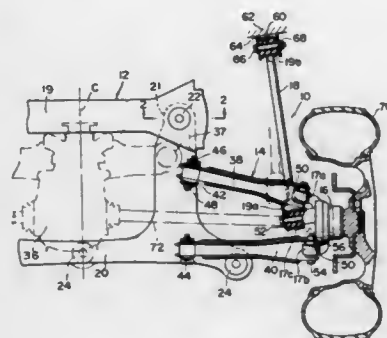
Filed Nov. 5, 1986, Ser. No. 927,097

Claims priority, application Japan, Nov. 5, 1985, 60-246327

Int. Cl.⁴ B60D 21/00

U.S. Cl. 180—312

11 Claims



1. A suspension of a vehicle having a differential, said suspension comprising:

- a subframe formed as a unit having a plurality of elastic insulators, four of said insulators being disposed at the front leftward and rightward portion and a rear leftward and rightward portion, said subframe being coupled to a car body through said plurality of insulators, said differential being mounted on said subframe;
- at least one suspension arm disposed on each side of the subframe between the front and rear insulators and coupled at an inner end thereof with the subframe so as to be pivotable in a vertical direction;
- a wheel carrier pivotably coupled with an outer end of the suspension arm in the vertical direction; and
- a strut bar disposed longitudinally of the car body and coupled at one end thereof with either said wheel carrier and suspension arm and at the other end with the car body respectively pivotably in the vertical direction.

4,714,133

METHOD AND APPARATUS FOR AUGMENTATION OF SOUND BY ENHANCED RESONANCE

John E. Skaggs, Jr., 320 N. Poppy, Lompoc, Calif. 93436

Filed Jun. 14, 1985, Ser. No. 744,537

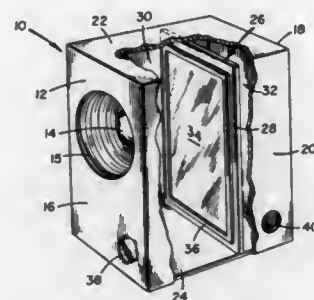
Int. Cl.⁴ G10K 13/00; H05K 5/00

U.S. Cl. 181—160

20 Claims

1. In a loudspeaker enclosure formed of a front wall and an imperforate rear wall with side walls joining said front and rear

walls and having at least one driver mounted in the front wall, the improvement comprising means disposed within the enclosure in spaced relation to the rear wall for acoustically coupling the driver to the air within the enclosure and to materials



forming the enclosure, the coupling means comprising at least one acoustical resonator disposed within the enclosure, the resonator including a frame and a sheet-like screen formed of flexible, nonresonant material mounted in a substantially stretched configuration by the frame.

4,714,134

SAFETY BELTS AND THE LIKE

Fredrik A. Grufman, 13, Larsbergsvägen, 181 38 Lidingö, Sweden

PCT No. PCT/SE85/00386, § 371 Date Jun. 10, 1986, § 102(e)

Date Jun. 10, 1986, PCT Pub. No. WO86/02278, PCT Pub.

Date Apr. 24, 1986

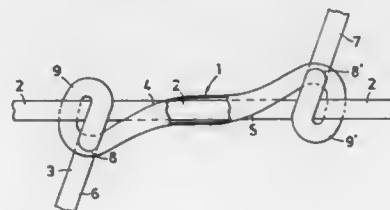
PCT Filed Oct. 8, 1985, Ser. No. 872,655

Claims priority, application Sweden, Oct. 10, 1984, 8405074

Int. Cl.⁴ A62B 1/16

U.S. Cl. 182—3

7 Claims



1. A safety belt, comprising:

- a first rope; and
 - a hose-shaped second rope having an inner diameter that expands radially at times when said second rope is compressed axially and contracts radially at times when said second rope is extended axially, said second rope including axially spaced apart first and second openings defining a tubular lead-through therebetween, said first rope passing through said first and second openings of said second rope so that a portion of said first rope is contained in said lead-through, said second rope being looped around said first rope to form first and second knotted portions respectively surrounding said first and second openings;
- whereby moving said first and second knotted portions toward each other permits said first rope to move axially through said lead-through of said second rope and moving said first and second knotted portions away from each other locks said lead-through to said portion of said first rope contained in said lead through.

4,714,135

RAPPEL RESCUE SYSTEM

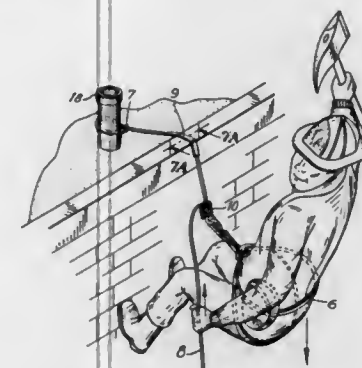
Robert L. Bell, Verona, N.J., and Joseph J. Dillon, Malverne, N.Y., assignors to Rappel Rescue Systems, Inc., Fairfield, N.J.

Filed Jan. 22, 1986, Ser. No. 820,962

Int. Cl.⁴ A62B 1/14, 35/00

U.S. Cl. 182—6

7 Claims



1. A rappel rescue system adapted to be worn by rescue personnel which comprises a body harness, a fastening means for attaching said body harness to a carrier pouch and said carrier pouch containing therein a snap ring secured to one end of a rappel line, an appropriate length of said rappel line in a deployment bag, an edge guard protective pad movable along said rappel line, a figure-of-eight descender pre-rigged on to said rappel line and an end-stop ring secured to the end of said rappel line.

4,714,136

LADDER SUPPORT FOR EAVESTROUGH OR GUTTER

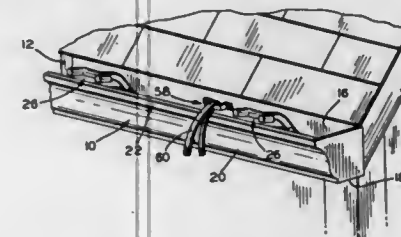
Fernand R. Morin, Windsor, Canada, assignor to Wolverine Aluminum Distributing Ltd., Windsor, Canada

Filed May 7, 1987, Ser. No. 46,645

Int. Cl.⁴ E04D 13/04; E06C 7/48; E04G 21/24

U.S. Cl. 182—107

21 Claims



1. A ladder support to be mounted in an eave trough for supporting a ladder spaced in front of a front rim of the eave trough, said support comprising two main legs having means at first ends adapted to engage the eave trough at the juncture of a back wall and a bottom thereof, said legs being of sufficient length to extend above and beyond the front rim of the eave trough, means at second ends of said legs to engage the ladder and resist sideways movement thereof, outwardly-extending legs connected to intermediate portions of said main legs, and means at outer ends of said outwardly-extending legs for engaging the rim of the eave trough for resisting movement of said main legs.

4,714,137

BUILDING SAFETY RESCUE DEVICE

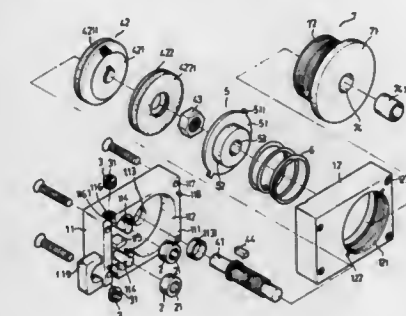
Hung-Chang Chou, No. 5, Shin Ho 2nd Road, Tainan, Taiwan

Filed Apr. 29, 1986, Ser. No. 857,094

Int. Cl.⁴ A62B 1/14

U.S. Cl. 182—193

2 Claims



1. A building safety survival rescue cable device, comprising:

- a lower shell casing having a cutout portion therein with an opening therethrough and also having side walls with a pair of cable guide holes passing therethrough;
- a pair of pulley shafts secured in the cutout portion of the lower shell casing;
- a pair of relatively small pulleys engaged with the pair of pulley shafts;
- a mandrel being arranged in the lower shell casing and having one end passing through the opening in the cutout portion of the lower shell casing;
- a pair of braking elements mounted on the mandrel in the cutout portion of the lower shell casing;
- a large pulley engaged between the pair of braking elements;
- an upper shell casing secured over the lower shell casing and having a cutout portion aligned with the cutout portion of the lower shell casing;
- compression means, mounted on the mandrel, for acting upon the pair of braking elements;
- a compression spring means, arranged around the mandrel, for forcing the compression means into engagement with the pair of compression means; and
- a descent speed adjustment button secured in the cutout portion of the upper shell casing, said button having an opening for engaging an opposite end of the mandrel, said button also having a bolt portion for exerting force upon the compression spring means, and said button further having a knob handle means for changing the amount of force exerted by the bolt portion upon the compression spring means.

4,714,138

ENGINE SUMP DRAINING DEVICE

Samuel G. Zaccane, 1315 N. 13th Ave., Melrose Park, Ill. 60160

Filed Sep. 5, 1986, Ser. No. 903,704

Int. Cl.⁴ F16D 3/14, 1/12

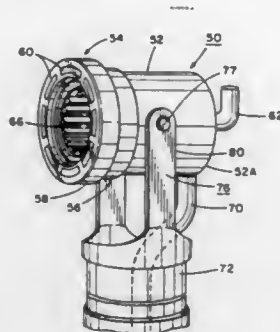
U.S. Cl. 184—1.5

2 Claims

1. A device for draining fluid from an engine sump of the type having a threaded drain plug comprising:

- a housing having an open end and a closed end;
- annular sealing means mounted to said housing for forming a fluid tight seal between the sump and the open end of said housing;
- a shaft extending into said housing through an opening in the closed end thereof;
- resilient sealing means forming a fluid tight seal between said shaft and said closed end of said housing while permitting axial and rotational movement of said shaft with respect to said closed end;
- socket means connected to the end of said shaft within said housing for non-rotatably engaging said plug for removal

thereof from said sump upon rotational movement of said shaft;
a flexible drain tube connected over an opening in said housing for draining said housing of fluid following removal of said plug from said sump,
a yoke pivotably mounted to said housing for swinging



movement about an axis extending in a direction transverse to the longitudinal axis of said shaft, tubular means having an open end disposed in proximity to said yoke, and said drain tube extends into said open end of said tubular means.

4,714,139

LUBRICATING SYSTEM FOR GAS TURBINE ENGINES AND PUMP FOR SUCH A SYSTEM

Joachim Lorenz, Riedenzhofen, and Martin Gattinger, Eichenhofen, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen Union Muenchen GmbH, Munich, Fed. Rep. of Germany

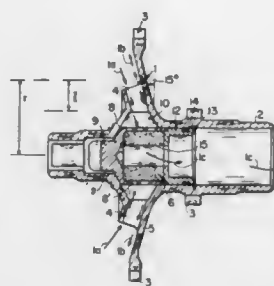
Filed Sep. 24, 1986, Ser. No. 911,293

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535107

Int. Cl.⁴ F01M 9/06

U.S. Cl. 184-6.11

12 Claims

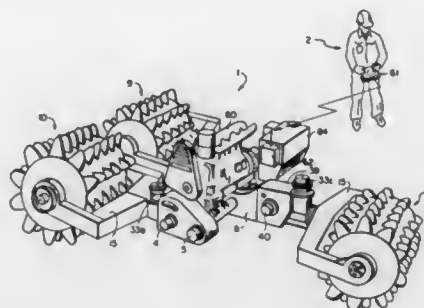


1. A pump for separating a gas from a liquid, comprising pump housing means (106), a pump wheel, hollow shaft means for rotatably supporting said pump wheel in said pump housing means and for providing a gas discharge duct for venting separated gas, approximately radially extending flow channels in said pump wheel, porous filter means (6) located in a central zone of said hollow shaft for cooperation with said flow channels, said porous filter means having a large surface area relative to a volume of said porous filter means, screen drum means surrounding said filter means, said screen drum means having screen openings which are relatively large compared to pores in said porous filter means, said porous filter means being connected to said radial channels through said relatively large openings in said screen drum means, and wherein said pump wheel has a wall extending outwardly beyond the radial channels and forming a wheel disk having an outer circumference provided with drive means for driving said pump wheel.

4,714,140
MULTI-AXIS ARTICULATED ALL TERRAIN VEHICLE
John H. Hatton, 5275 Craner Ave., North Hollywood, Calif. 91601, and Gregory L. Batt, #2 8741 Montcalm Street, Vancouver, British Columbia, Canada (V6; 4R1)
Filed Mar. 17, 1986, Ser. No. 840,591
Int. Cl.⁴ B62D 57/02

U.S. Cl. 180-20

16 Claims



1. A multi-axis all terrain vehicle comprising, in combination:
a frame having a front end and a rear end and a longitudinally extending central axis;
a pair of front wheel assemblies each including a rotatably mounted wheel;
means for mounting said front wheel assemblies on said frame front end in laterally spaced relationship on opposite sides of said central axis;
said front wheel assemblies mounting means arranged to permit each of said front wheel assemblies to pivot independently on a vertical steering axis, to pivot independently on a transverse horizontal axis and to rotate independently on an axis parallel to said frame central axis for rocking when traversing a hill;
a rear wheel assembly including a rotatably mounted wheel;
means for mounting said rear wheel assembly on said frame rear end on said central axis;
said rear wheel mounting means arranged to permit said rear wheel assembly to pivot on a vertical axis, to pivot on a transverse horizontal axis and to rotate on an axis corresponding to said frame central axis for rocking when traversing a hill;
said wheels having an axial length sufficient for supporting said frame in an upright orientation; and
means for driving at least one of said wheels.

4,714,141

BABY CARRIAGE WHEEL STOPPING DEVICE
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Sep. 9, 1986, Ser. No. 905,783

Claims priority, application Japan, Sep. 24, 1985, 60-145837[U]

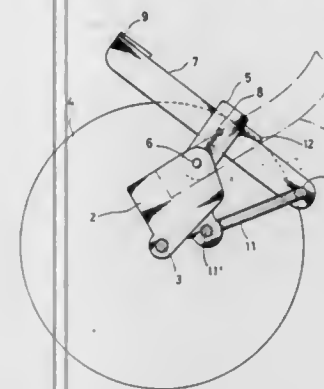
Int. Cl.⁴ B62B 9/08

U.S. Cl. 188-20

1 Claim

1. A wheel stopping device for a baby carriage comprising carriage rear leg means having a lower end, base means (2) rigidly secured to said lower end of said rear leg means, rear wheel means (4) and axle means (3) for rotatably mounting said rear wheel means to said base means, a lever support member (5), first journal means (6) turnably connecting one end of said lever support member to said base means, an operating lever (7), second journal means (8) turnably connecting said operating lever (7) to said lever support member (5) so that said operating lever (7) forms a rocker type lever, one end of said operating lever extending rearwardly for forming an operating portion to be operated by a foot, the other end of said operating lever (7) having a through-hole (10), a brake rod (11), third journal means (11') pivotally connecting one end of said brake

rod to said base means said brake rod being bent to extend outwardly along a lateral surface of said rear wheel means, said brake rod having a bent again portion extending through said through-hole (10) of said operating lever (7) to form fourth journal means, said bent again portion being positioned out of contact with an outer peripheral surface of said rear wheel means when said operating lever (7) is in a released position in which said first journal means (6) and said second journal means (8) are located approximately on a common radial line through said axle means (3), said base means (2), said lever support member (5), said operating lever (5), and said brake



rod (11) being shaped and positioned relative to one another so that said first, second, and fourth journal means lie substantially in alignment on a chord line of said rear wheel means with said first journal means (6) disposed between said second journal means (8) and said fourth journal means (10) for pressing said bent again portion of said brake rod against the outer peripheral surface of said rear wheel means to thereby inhibit the rotation of said rear wheel means when said operating lever (7) is pushed into a braking position in which said operating lever is self-locked due to said alignment of said first, second, and fourth journal means on said chord line.

4,714,142

RAILWAY CAR HAND BRAKE WITH RELEASE GOVERNOR

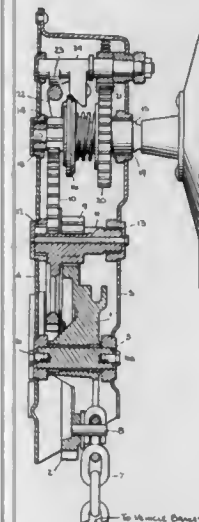
Robert W. Shepherd, Hamburg, N.J., assignor to Elcon-National, Inc., Totowa, N.J.

Continuation-in-part of Ser. No. 613,470, May 24, 1984, abandoned. This application Jun. 2, 1987, Ser. No. 57,731

Int. Cl.⁴ G05G 1/08; F16D 51/10

U.S. Cl. 188-185

13 Claims



1. A brake operating mechanism for the brakes of a vehicle

which apply a variable load on said mechanism as the brakes are released comprising:

a rotatable, wind-up drum with means for connecting it to the brakes of said vehicle, said drum being rotatable in a wind-up direction for setting the brakes of said vehicle with a predetermined braking force on such connecting means and being rotatable in the opposite, unwinding direction for releasing said brakes of said vehicle, said drum having a brake setting position when it is wound-up in said wind-up direction and applies said predetermined braking force to said brakes and having a brake release position when it is unwound in said unwinding direction and said brakes are released;

a rotatable shaft;
drive means including a plurality of gears interconnecting said rotatable shaft and said rotatable, wind-up drum for causing rotation of said rotation of said rotatable, wind-up drum in said wind-up direction with rotation of said rotatable shaft and rotation of the gears in first directions;
detent means coupled to said rotatable shaft for preventing rotation thereof in a second direction and thereby, preventing rotation of said gears in second directions opposite to said first directions and preventing rotation of said wind-up drum in said opposite unwinding direction; and
release means for disabling said detent means with respect to preventing rotation of said gears in said second directions; wherein the improvement comprises:

braking means coupled to one of said gears for applying a braking force which is sufficient to retard the rotation of said gears in said second direction when the force applied to said connecting means is less than about 30% of said predetermined braking force but which is insufficient to cause significant retardation of said rotation of said gears when said force applied to said connecting means is greater than about 30% of said predetermined braking force for thereby permitting said gears to rotate upon initial release of said release means at a rate which is substantially unaffected by said braking means but which is thereafter substantially reduced by said braking means and reduces wear on said gears and prevents damage to said brake operating mechanism during rotation of said gears in said second directions, said braking means being responsive to the rate of rotation of said one of said gears for applying a retarding force opposing rotation of said gears in said second directions which is independent of any force maintained on said release means, which is dependent upon the rate of rotation of said one of said gears and which increases with an increase in the rate of rotation of said one of said gears to a value which is insufficient to significantly retard the rate of rotation of said gears upon initial release of said release means and hence, of said wind-up drum in said unwinding direction, said braking means exerting insignificant rotation retarding action on said one of said gears when said one of said gears is rotated at a rate produced by manually rotating said shaft even when said release means is operated whereby said one gear is not retarded in rotation when said shaft is manually rotated to apply said brakes of said railway car and said brakes connected to said wind-up drum are fully released independently of said release means after it has been operated to disable said detent means.

4,714,143

HANDLE AND PANEL ASSEMBLY FOR PORTFOLIO
Frank Saliba, 115 W. 30th St., New York, N.Y. 10001

Filed May 5, 1986, Ser. No. 859,483

Int. Cl.⁴ A45C 3/02, 13/22

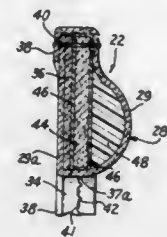
U.S. Cl. 190-115

3 Claims

1. In a retractable inverted U-shaped handle having a bight portion, front and rear covers, and legs downwardly extending from the bight portion in combination with an outer pocket of a portfolio, said pocket having an outer finished cover, a lining, apertures in said cover and lining for said handle permitting

reciprocation into said pocket between said outer cover and lining, that improvement consisting of:

- a laminated hand grasp portion of said handle located at the top between the legs thereof consisting of a front cover wrap-around portion of sheet material defining a mound-like protuberance at the bottom and a rear portion of sheet material extending from said front portion;
- a mound shaped pad of synthetic foam plastic which is held within said front wrap-around portion;
- a flat fiberboard reinforcement element having a width



slightly smaller than said hand grasp portion adhered to said pad by adhesive means;

said bight portion of said rear cover being adhesively laminated to said fiberboard reinforcement element and including an inside rear portion which provides part of the rear cover of said handle; and

said front wrap-around portion and said inside rear portion being stitched together at the top outer edge of said handle by stitching passing through said fiberboard reinforcement element, said inside rear portion and both said front and rear portions.

4,714,144

METHOD FOR CONTROLLING AMT SYSTEM START FROM STOP OPERATION

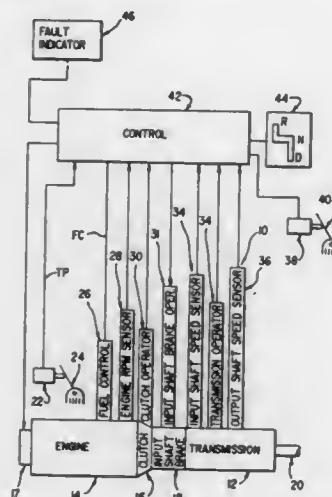
Donald Speranza, Canton, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 18, 1986, Ser. No. 853,483

Int. Cl.⁴ B60K 41/02

U.S. Cl. 192-0.084

7 Claims



1. A method for controlling a vehicle automatic mechanical transmission system for vehicles having an operator actuated throttle pedal, a throttle-controlled engine, a transmission having a plurality of gear ratio combinations selectively engageable between a transmission input shaft and a transmission output shaft, said transmission input shaft being operatively connected to said engine by means of a selectively engageable and disengageable friction coupling, said automatic mechanical transmission system comprising an information processing unit having means for receiving a plurality of input signals includ-

ing (1) an input signal indicative of the rotational speed of the engine; and (2) an input signal indicative of the operator's setting of the throttle pedal, said processing unit including means for processing said input signals in accordance with a program for generating output signals whereby said transmission system is operated in accordance with said program, and means associated with said transmission system effective to actuate said transmission system to effect engagement of said gear ratio combinations in response to said output signals from said processing unit,

said processing unit having means to sense vehicle start from stop operation and, in a vehicle start from stop operation, issuing output signals to control means for controlling the amount of engagement of said friction coupling, said control means having a first state in which said friction coupling is completely disengaged, a second state in which said friction coupling is completely engaged and a third state occurring during the transition from said first state to said second state, when said friction coupling engageable elements are partially engaged, said control means being operative during said third state to engage said coupling elements sufficiently to maintain the speed of rotation of said engine at a value in predetermined relation to the adjustment position of said throttle whereby a function E is minimized where:

E is a function of $N-A$

where:

N is a value indicative of engine speed,

A is a value indicative of a predetermined desired engine speed at current throttle position;

the method characterized by:

calculating the value of E;

comparing the value of E to a predetermined reference value; and

preventing increased supply of fuel to the engine, regardless of the throttle pedal setting, if E is equal to or greater than said reference value.

4,714,145

SPEED RESPONSIVE CONTROL FOR OPERATING VEHICLE CLUTCH

Kazumasa Kurihara, and Kenji Arai, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

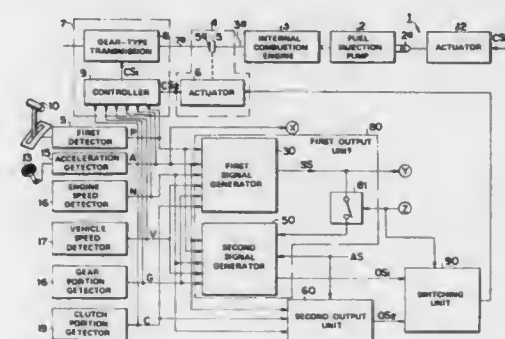
Filed Oct. 23, 1986, Ser. No. 922,361

Claims priority, application Japan, Oct. 30, 1985, 60-243412

Int. Cl.⁴ B60K 41/28

U.S. Cl. 192-0.052

16 Claims



1. A clutch controlling apparatus for automatically carrying out the operation of a clutch device operated in response to an electric signal in relation to the amount of operation of an accelerator pedal; said apparatus comprising:

a first means for producing a first signal relating to the amount of operation of the accelerator pedal;

a second means for producing a second signal relating to the operating speed of the accelerator pedal;

a first output means responsive to the first signal for producing a first operation control signal for carrying out the complete engaging operation of the clutch device in relation to the amount of operation of the accelerator pedal;

a second output means responsive to the first signal for producing a second operation control signal for operating the clutch device in a semi-engaged state at an amount of semi-engagement related to the amount of operation of the accelerator pedal; and

a third means responsive to the first and second signals for selectively supplying to the clutch device either the first or second operation control signal in accordance with the amount and speed of operation of the accelerator pedal.

4,714,146

FRICTION COUPLING ELEMENT OF AUTOMATIC TRANSMISSION

Shuzo Moroto, Handa; Koji Sumiya, Nishio; Kazuaki Watanabe, Toyota; Seitoku Kato, Toyota; Koji Kobayashi, Toyota, and Yutaka Taka, Aichi, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

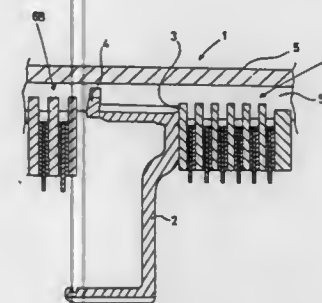
Filed Aug. 6, 1985, Ser. No. 763,006

Claims priority, application Japan, Aug. 6, 1984, 59-165513; Aug. 8, 1984, 59-166960

Int. Cl.⁴ F16D 13/68, 25/10; B60K 17/02

U.S. Cl. 192-85 AA

5 Claims



1. In an automatic transmission with a stationary or rotational member; a first friction coupling device for selectively engaging a first rotatable member to the stationary or rotational member and having a first friction element engaged with an axially extending internal spline formed on the stationary or rotational member, and a first hydraulic servo producing an operational load; and a second friction coupling device for selectively engaging a second rotatable member to the stationary or rotational member and having a second friction element engaged with said spline formed on the stationary or rotational member, and a second hydraulic servo producing an operational load, said first and second friction coupling devices being mounted in the stationary or rotational member in a longitudinal direction; a support mechanism for said friction coupling devices comprising:

a hydraulic servo drum having an outer cylinder engaged with said spline formed on the stationary or rotational member, a side wall connected to said outer cylinder and an inner cylinder connected to said side wall to form said second hydraulic servo;

a snap ring mounted on said stationary or rotational member at one side of said hydraulic servo drum and adapted to receive the operational load of said first friction coupling device through said hydraulic servo drum, said snap ring being in the form of a tapered ring; and

a stepped portion formed on said stationary or rotational member at the other side of said hydraulic servo drum and adapted to receive the operational load of said second friction coupling device through said hydraulic servo drum.

4,714,147

DOUBLE CLUTCH FOR A MOTOR VEHICLE TRANSMISSION

Imre Szodfridt, Stuttgart, and Richard Knoblauch, Ditzingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

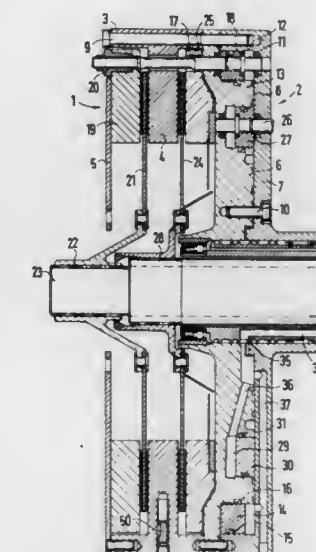
Filed Jul. 25, 1986, Ser. No. 889,248

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526630

Int. Cl.⁴ F16D 25/10

U.S. Cl. 192-87.15

17 Claims



1. A double clutch for alternately coupling a central shaft and a hollow shaft concentric thereto of a change-speed transmission of a motor vehicle with a housing means of the double clutch adapted to be operatively connected with an engine crankshaft, comprising first and second clutch disk means, center plate means operatively connected with the clutch housing means to rotate in unison therewith, hydraulic piston means for alternately pressing the first clutch disk means operatively connected with the central shaft from one side against the center plate means and for pressing the second clutch disk means operatively connected with the hollow shaft from the other side against the center plate means, said hydraulic piston means being constructed as a plurality of annular pistons, and hydraulic plate means, the annular pistons being secured in said hydraulic plate means, said hydraulic plate means being operatively connected with the clutch housing means, and several pin means substantially symmetrically extending through said annular pistons which upon pressure actuation of the annular pistons act on the clutch disk means by way of a pressure plate means.

4,714,148

PROGRESSIVELY ACTING FRICTION DISK SUITABLE FOR AUTOMOBILE VEHICLE CLUTCHES

Jacques Alas, Eaubonne, and Michel Bacher, Domont, both of France, assignors to Valeo, Paris, France

Filed May 30, 1985, Ser. No. 739,366

Claims priority, application France, May 30, 1984, 84 08525

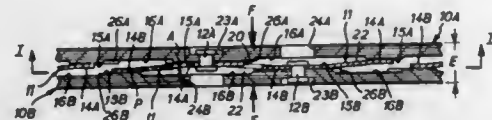
Int. Cl.⁴ F16D 13/64, 69/04

U.S. Cl. 192-107 C

14 Claims

1. Friction disk comprising circumferentially distributed support vanes and two annular friction facing members at its periphery, said friction facing members being disposed one on each side of said support vanes and each friction facing member being axially fastened to said support vanes but axially mobile relative to one another, each of said support vanes including a bent sheet metal member having a bent disengaged configuration in which said friction facing members are rela-

tively remote from one another and an oppositely bent engaged configuration in which said friction facing members are close together, and said support vanes featuring a circumferential succession of bends delimiting a circumferential succession of bearing surfaces for one of said friction facing members alternating with bearing surfaces for the other of said friction facing members, and said friction facing members having bearing areas which cooperate with said bearing surfaces and recesses between said bearing areas axially recessed relative to said bearing areas, a part of said sheet metal member constituting



each of said support vanes located between the bearing surface for one of said friction facing members and the bearing surface for the other of said friction facing members being flexed when said friction facing members are moved towards one another, whereby said part of said sheet metal member has a positive slope for one of the engaged or disengaged configurations of the corresponding support vane and a negative slope for the other of the engaged or disengaged configuration of the corresponding support vane after passing through a partially engaged configuration where each vane is substantially flat and has substantially no slope.

4,714,149 SELF PROPELLED AUGER AND SEPARABLE VEHICLE THEREFOR

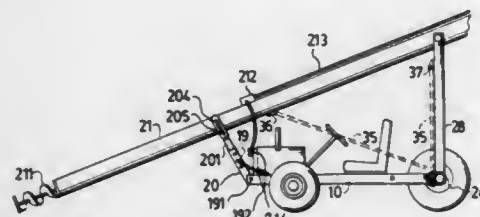
Edward Tiede, 1360 Elm Street, Kelowna, British Columbia, Canada V1Y 3W6

Filed Oct. 9, 1986, Ser. No. 917,198

Int. Cl.⁴ B65G 21/10

U.S. Cl. 198—312

19 Claims



1. A vehicle for propelling an auger, said auger including an elongate auger tube, an axle having ground wheels thereon and strut means for supporting the auger above the axle, said vehicle comprising a frame having one end and an end opposed thereto, a pair of ground wheels on the frame for supporting said one end of the vehicle, means on the frame at said opposed end of the vehicle adapted for releasably coupling the frame to the axle of the auger whereby the frame can be supported on said pair of ground wheels and on said axle of said auger such that when attached the frame is supported on the pair of ground wheels and on the axle, an engine on the frame, drive transmission means for transmitting drive from said engine to said engine to said pair of ground wheels and steering means for steering movement of said pair of ground wheels.

4,714,150 DROP SHUTTLE

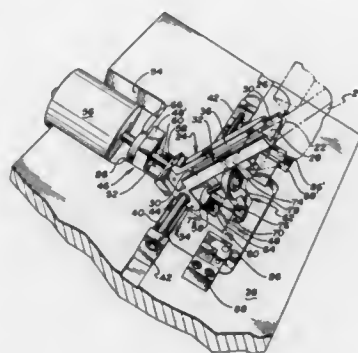
Steven G. Kantrud, Crystal; Steven V. Ericson, Wyoming, and Karl R. Seidel, Jr., St. Paul, all of Minn., assignors to Micro Component Technology, Inc., St. Paul, Minn.

Filed Sep. 4, 1985, Ser. No. 772,361

Int. Cl.⁴ B65G 37/00

U.S. Cl. 198—463.3

11 Claims



1. Apparatus for receiving an integrated circuit device passing down an inclined platen to a pick-up station, transporting the device laterally with respect to a direction in which the device has passed down the platen, and depositing the device into an output chute, comprising:

- (a) a shuttle having an entrance at one end registrable with the station and the chute;
- (b) a shaft mounting an end of said shuttle opposite said end having said entrance for pivoting thereabout and lateral movement therealong between a first position in registration with the station and a second position in registration with the chute;
- (c) a drive arm for concurrently moving said shuttle laterally and pivoting said shuttle between said first and second positions, said arm having a first end at which it is mounted for pivoting to define a plane generally perpendicular to a plane defined by an axis aligned along the direction in which the device has passed down the platen and an axis about which said drive arm pivots, and a second end at which it is operatively connected to said shuttle; and
- (d) actuation means for pivoting said drive arm.

4,714,151 APPARATUS FOR SUPPORTING AND ENCLOSING CONVEYOR SYSTEMS

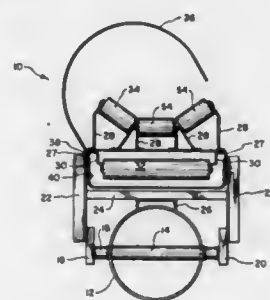
Colin D. Campbell, West Jordan, and David R. Campbell, Salt Lake City, both of Utah, assignors to Cambelt International Corporation, Salt Lake City, Utah

Filed Apr. 30, 1986, Ser. No. 858,012

Int. Cl.⁴ B65G 21/00

U.S. Cl. 198—860.5

5 Claims



1. An apparatus for supporting and totally enclosing a belt conveyor system comprising:

an elongated structural support tube;
a plurality of internal support pipes disposed generally transversely within the interior of the elongated structural support tube such that when the apparatus is in operation the internal support pipes lie in the generally horizontal plane;
a plurality of auxiliary support pipes disposed within the center of the internal support pipe;
struts securely attached to each end of the auxiliary support pipes and extending generally upwardly;
braces attached to each pair of struts at a point on said struts such that the braces are disposed above the structural support tube and are positioned generally parallel to the auxiliary support pipes;
support brackets securely attached to the underside of the braces and resting on the structural support tube;
trusses attached to the tops of said struts and running in a generally horizontal direction parallel to a belt conveyor system;
a belt conveyor system attached to said trusses and disposed above said braces;
a top cover attached to at least one truss and configured such that when in place it covers said belt conveyor system; and
a lower enclosure attached to at least one truss and configured such that when in place it cooperates with the top cover to totally enclose said belt conveyor.

4,714,152 ACCUMULATOR

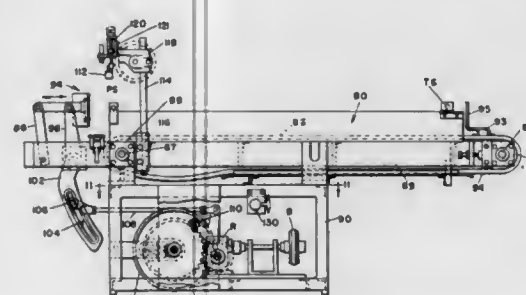
Graham J. Ross, Hingham, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Continuation of Ser. No. 720,707, Apr. 8, 1985, abandoned. This application Mar. 19, 1987, Ser. No. 28,074

Int. Cl.⁴ B65G 1/00

U.S. Cl. 198—347

10 Claims



1. Apparatus for transporting articles comprising a first conveyor defining a horizontal supporting surface movable along a predetermined path for transferring articles in single file along said path, an accumulator arranged adjacent said first conveyor comprising a second conveyor defining a horizontal supporting surface in the plane of the supporting surface of the first conveyor with one end adjacent but spaced from the first conveyor and the other end remote therefrom, the supporting surfaces of said second conveyor being movable toward and away from the supporting surface of the first conveyor, a dead plate disposed between the first and second conveyors having a supporting surface in the plane of the supporting surfaces of the first and second conveyors, a stabilizer bar mounted above the dead plate for vertical movement up and down relative to the dead plate for clamping articles moved onto the dead plate to the dead plate, a pusher bar disposed at the side of the first conveyor opposite the second conveyor for reciprocal movement transversely of the first conveyor to a position adjacent the dead plate to move articles from the first conveyor onto the dead plate, a backup bar disposed above the second conveyor at the side of the dead plate remote from the first conveyor movable in one direction of movement with the second conveyor to stabilize containers on the second conveyor following elevation of the stabilizing bar from the tops of the containers

to release the containers for movement as the containers are moved from the dead plate onto said second conveyor and in an opposite direction with the second conveyor to displace the containers resting on the dead plate from the dead plate onto the first conveyor, and means for sequencing movement of the pusher bar, stabilizer bar, second conveyor and backup bar such that the transfer of articles from the first conveyor to the dead plate is effected by elevation of the stabilizer bar and movement of the pusher bar transversely of the first conveyor to push the articles from the first conveyor onto the dead plate into engagement with the backup bar, followed by lowering of the stabilizer bar into engagement with the articles pushed onto the dead plate into engagement with the backup bar and retraction of the pusher bar and displacement of the articles from the second conveyor is effected by movement of the second conveyor and backup bar into engagement with the articles held clamped to the dead plate by the stabilizer bar, followed by elevation of the stabilizer bar and movement of the second conveyor and backup bar in consonance to transfer the articles from the dead plate onto the first conveyor and control circuitry for sequencing operation of the pusher bar, stabilizer bar, backup bar and second conveyor to effect transfer and retransfer as a consequence of backup of articles downstream of the accumulator and clearance of the articles downstream of the accumulator.

4,714,153 DEVICE FOR TRANSPORTING CANS

Jürg Bischofberger, Elsau, and Manfred Feige, Frauenfeld, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

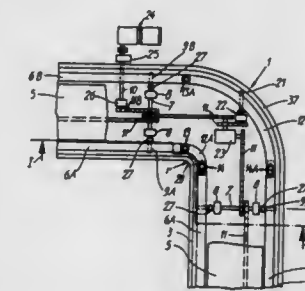
Filed Jun. 1, 1984, Ser. No. 616,403

Claims priority, application Switzerland, Jun. 8, 1983, 3133/83

Int. Cl.⁴ B65G 25/02

U.S. Cl. 198—457

8 Claims



1. A can transporting device comprising
a vertical can guide system having a pair of vertical boards for guiding a can horizontally therebetween in a non-linear transport direction;
a horizontal guide plate between said boards for supporting the can thereon; and
a can feed means for moving the can in a horizontal step-wise manner along said guide plate and between said boards, said can feed means including two pairs of straight rails between said boards, each said pair of rails being connected to each other in parallel relation and in angular relation to the other pair of rails, a pair of curved rails interconnecting said pairs of straight rails, and means for simultaneously moving said straight and curved rails through an endless path with the can supported on said rails during a forward movement of said rails in said path and with said rails spaced below said guide plate during a rearward movement of said rails in said path.

4,714,154

MATERIAL AND TRANSFER LOADING APPARATUS
Karl Harhoff, Werne, and Egon Melis, Lünen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen GmbH, Lünen, Fed. Rep. of Germany

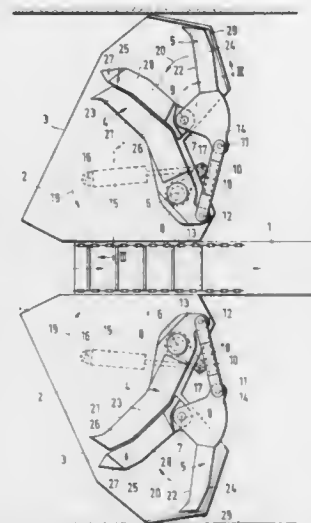
Filed Dec. 16, 1986, Ser. No. 942,486

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1985, 3546192

Int. Cl.⁴ B65G 65/02

U.S. Cl. 198—514

13 Claims



1. Loading apparatus for use in loading loose material; said apparatus comprising means defining a loading surface for receiving the material, first and second loading blades, means for pivotably supporting the blades relative to the loading surface, each loading blade having a first front face which extends at a relatively steep angle in relation to the loading surface and a second rear face which extends at a relatively shallow angle in relation to the loading surface, means for pivotably moving the loading blades in unison back and forth over the loading surface in a reciprocable manner in delivery and return strokes to cause the material to be transferred over the loading surfaces predominantly by the first faces of the blades and means defining a fixed step between the blades to assist the transfer of material by the blades, said step having a front face relative to the blade which is foremost relative to the delivery strokes which extends at a comparatively steep angle in relation to the loading surface.

4,714,155

RUNWAY FOR A CONVEYOR MEANS USING LINEAR MOTORS

Seiji Watanabe, Teiji Horimoto, both of Sano, and Susumu Koizumi, Oyama, all of Japan, assignors to Hitachi Kiden Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Dec. 3, 1985, Ser. No. 804,258

Claims priority, application Japan, Dec. 3, 1984, 59-183889[U]

Int. Cl.⁴ B65G 35/00

U.S. Cl. 198—619

3 Claims

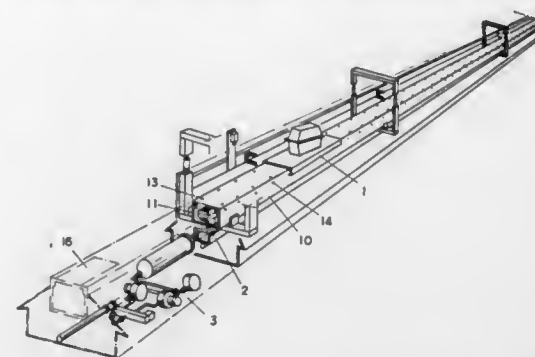
1. A runway for use in a conveyor of the type wherein a transportation pallet straddles the runway, is floated in the air by air discharged from the runway, and is moved along the runway by linear motors spaced along the runway, said runway comprising:

a longitudinal body of integral, one-piece construction, said body have an upper surface and opposite outwardly facing side surfaces;

an open space extending longitudinally through said body generally centrally thereof and forming an area for mounting linear motors within said runway;

two air ducts extending longitudinally through said body at

positions symmetrically thereof and symmetrically of said open space;
upper air discharge holes extending through said body from each said air duct upwardly to said upper surface;



lateral air discharge holes extending through said body from each said air duct outwardly to the respective said side surface;
said upper and lateral air discharge holes being spaced longitudinally along said body.

4,714,156

HANGER FOR SUSPENDERS

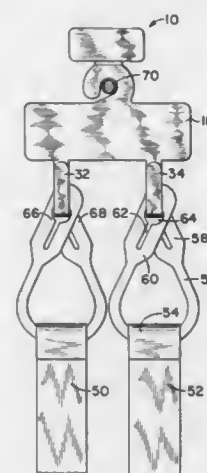
Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B&G Plastics, Inc., New York, N.Y.

Filed Jul. 7, 1986, Ser. No. 882,486

Int. Cl.⁴ A47G 25/36, 25/48

U.S. Cl. 206—296

3 Claims



1. In combination, suspenders of the type having first and second straps, each strap having a pair of stems connected therewith, each stem having a slot extending therethrough for receipt of a trouser button in use of said suspenders, and a display hanger comprising an integral flat body having a hook portion and a lower portion, said lower portion including first and second mutually transversely spaced elongate members depending from said lower portion and including openings therethrough adjacent said lower portion, each said member being folded upon itself and having a projection extending therefrom, each said projection being retentively resident in said opening of said member thereof, said elongate members being configured in cross-section to permit passage thereof through said slots of a stem pair and configured in length such that two stems are resident in each said member in such folded condition.

4,714,157

MEDIA STORAGE APPARATUS

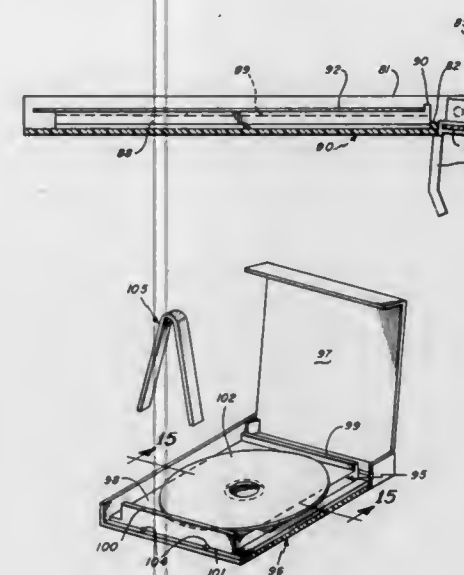
James V. Morrone, 25 Sea Foam Ave., Winthrop, Mass. 02152

Filed Jul. 18, 1985, Ser. No. 756,716

Int. Cl.⁴ B65D 85/57

U.S. Cl. 206—309

16 Claims



1. A storage case for the disk-type media comprising a base and cover and hinge means intercoupling the base and cover to permit the storage case to fold between closed and open position, in combination with a pick-up means adapted for insertion in the hole in the disk for picking the disk up, said pick-up means comprising a hand held fork member having opposite resilient legs adapted to fit within the hole in the disk.

8. A storage case for a disk-type media comprising a base and cover and hinge means intercoupling the base and cover to permit the storage case to fold between closed and open positions, said cover having a rear wall, said base having a bottom wall terminating short of the rear of the base to provide a rear base opening defined in part by the base bottom wall rear edge, in combination with a removable clip for maintaining the cover in a substantially upright position in the open position of the case, said clip including a pair of said walls defining a recess into which the cover rear wall engages to hold the clip on the case, and means for engaging the base bottom wall rear edge only in the open position of the case and to so limit the open position to a substantially upright one.

4,714,158

MOLDED TOOL TRAY ASSEMBLY

John P. Oltman, Donald N. Sulentic, and Richard D. Purchase, all of Cedar Falls, Iowa, assignors to Waterloo Industries, Inc., Waterloo, Iowa

Continuation of Ser. No. 764,343, Aug. 12, 1985, abandoned.

This application Sep. 24, 1986, Ser. No. 910,866

Int. Cl.⁴ A45C 11/26

U.S. Cl. 206—349

6 Claims

1. A tray assembly comprising, in combination:

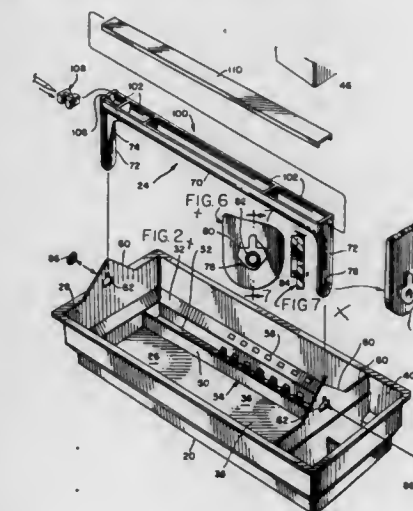
a substantially rectangular tray member having a bottom, a sidewall and at least a first interior partition, said bottom and said sidewall defining a tray cavity having a predetermined length and width, said first interior partition secured to said sidewall across said width of said tray cavity so as to define a tray compartment and a storage compartment within said tray cavity;

a removable storage box adapted to securely fit within said storage compartment;

a pair of substantially parallel flanges extending from said

sidewall and said first interior partition, said substantially parallel flanges being centrally aligned with respect to said width of said tray cavity, said substantially parallel flanges defining substantially aligned handle apertures; and

a handle extending between said substantially parallel flanges and including a grasping portion connecting two end portions, said end portions defining a pair of oppositely extending tabs adapted to engage said substantially aligned handle apertures, said handle being selectively rotatably between an operative position wherein the grasping portion may be manually encircled for grasping and carrying, and an inoperative position, said handle lying substantially adjacent and inside said sidewall in said inoperative position, whereby access is provided to the tray member and the handle does not overextend the side



wall, each of said substantially aligned handle apertures of said substantially parallel flanges including an upper substantially upright locking slot and a lower rotation-permitting opening, each of said oppositely extending tabs being rotatable with substantial freedom within said lower rotation-permitting opening of said substantially aligned handle apertures, said oppositely extending tabs including a key portion adapted to engage said upper substantially upright locking slot in said operative position;

said substantially parallel flanges and said handle end portions cooperatively defining lock means for selectively securing said handle in said operative position, whereby said substantially rectangular tray member is secured with respect to said handle; and

said handle grasping portion defining a handle storage area therein and including closure means for closing said handle storage area.

4,714,159

PACKAGE FOR SCISSORS

Olavi Lindén, Björkkulla, Finland, assignor to Oy Fiskars AB, Helsinki, Finland

Filed Aug. 28, 1986, Ser. No. 901,538

Claims priority, application Finland, Aug. 25, 1985, 853310

Int. Cl.⁴ B26D 73/00; B26B 29/04

U.S. Cl. 206—349

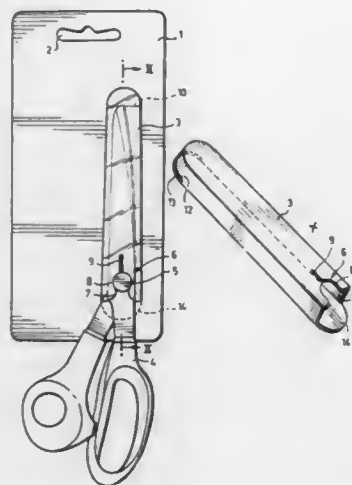
3 Claims

1. A display package for an article of cutlery that comprises an elongated blade portion and a handle portion connected to one end of the blade portion and having a protruding head on one of said portions adjacent to the connection between them, said display package comprising a panel of cardboard or the like and an elongated sheath wherein said blade portion is received, said display package being characterized by:

A. said sheath

(1) being of substantially stiff material,

- (2) having opposing spaced apart front and rear walls,
- (3) having wall portions connected with said front and rear walls along the length of the sheath to define opposite sides thereof and cooperating with the front and rear walls to define a closed end of the sheath, the opposite end of the sheath being open for lengthwise insertion of said blade portion thereinto;
- (4) the end of said rear wall comprising a pair of tongues,
 - (a) one of which projects endwise beyond the open end of the sheath and
 - (b) the other of which is defined by a slit in the sheath, in the closed end portion thereof, that is adjacent to said rear wall and has its length parallel to the surfaces thereof, and



- (5) one of said walls being formed with a detent portion which is near said open end of the sheath and which is engageable with a snap action with said head as the blade portion is inserted lengthwise into the sheath, to releasably confine the blade portion against withdrawal from the sheath; and
- B. said panel having an elongated slot in which said sheath is closely receivable with
- (1) said tongues overlying one surface of the panel adjacent to opposite ends of the slot,
 - (2) said front wall spaced beyond the opposite surface of the panel, and
 - (3) said handle portion overlying said opposite surface of the panel to cooperate with the tongues in confining the sheath against displacement out of said slot.

4,714,160

DISPENSER OF ARTICLES

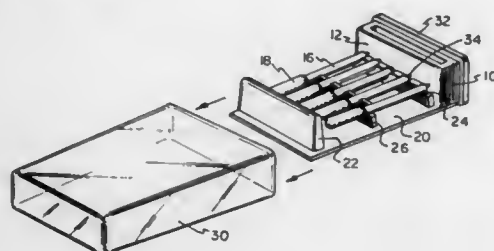
Robert Bennett, Easton, Conn., assignor to RJS Industries Inc., Marlboro, N.J.

Filed Oct. 23, 1986, Ser. No. 922,329

Int. Cl.⁴ B65D 85/24; A45D 40/20

U.S. Cl. 206—385

5 Claims



1. A dispenser of articles comprising:

- a horizontally elongated rectangular base having first and second opposite flat surfaces;
- a plurality of elongated spaced articles, each article consisting of an elongated rod having a coating on one end and secured at the other end by an integral short thin prong to the first base surface, said articles extending in a common direction perpendicular to the base and lying in a common plane;
- an elongated support member lying in a plane parallel to said common plane and having two opposite ends, and being secured at one end to said base, said member being spaced from said articles;
- a horizontally elongated plate parallel to said base and secured at one of its elongated edges to the other end of the member, said plate being disposed remote from said base and adjacent but spaced from the coated end of each of the articles;
- first and second parallel elongated article support elements, the first element being secured to said member in a position adjacent said one member end and extending in a direction perpendicular to said common direction, the second element being secured to said member in a position intermediate the first element and the plate, each article contacting both of the elements; and
- a transparent hollow cover detachably engaging the base with the second base surface being exposed to enclose the elements, plate, support member, and articles, the cover, when engaging the base, being spaced from the articles.

4,714,161

SECURITY CASSETTE HOLDER

Stanley R. Thorud, Brooklyn Center, Minn., assignor to Liberty Diversified Industries, Minneapolis, Minn.

Continuation-in-part of Ser. No. 771,342, Aug. 30, 1985,

abandoned. This application Nov. 1, 1985, Ser. No. 794,088

Int. Cl.⁴ B65D 25/10, 85/672

U.S. Cl. 206—387

7 Claims



1. A tamper-proof display holder for a magnetic tape cassette comprising:
 - an elongated holder having a tape cassette storage compartment defined by top, bottom, side, and end wall segments;
 - an opening in one end of said compartment through which a tape cassette may be inserted into said compartment; and
 - restraint means for securely preventing the removal of said tape cassette from said storage compartment comprising an aperture through one of said wall segments adjacent to said opening, and a stop member having an elongated body extending through said aperture and projecting across the trailing side of a tape cassette with respect to its direction of insertion through said opening with said elongated body being located in blocking position with respect to said tape cassette trailing side a predetermined distance from a second wall segment of said compartment opposite said compartment opening to confine a tape cassette between said elongated body and said second wall segment, said stop member comprising a push fastener having a head extending transversely of said elongated body separated along the length of said elongated body from a shoulder extending transversely of said body, by a recessed neck tightly held in said aperture in forced-fit engagement therewith, with a portion of said one wall segment defining said aperture securely, directly engaged between said head and said shoulder, whereby said fastener cannot be removed.

3. A tamper-proof display holder for a magnetic tape cassette comprising:

- an elongated holder having a tape cassette storage compartment defined by top, bottom, side, and end wall segments; an opening in one end of said compartment through which a tape cassette may be inserted into said compartment; and restraint means for securely preventing the removal of said tape cassette from said storage compartment comprising an aperture through one of said wall segments adjacent to said opening, and a stop member having an elongated body extending through said aperture and projecting across the trailing side of a tape cassette with respect to its direction of insertion through said opening with said elongated body being located in blocking position with respect to said tape cassette trailing side a predetermined distance from a second wall segment of said compartment opposite said compartment opening to confine a tape cassette between said elongated body and said second wall segment, said elongated body of said stop member terminating short of and in spaced-apart relation to a third wall segment of such storage compartment opposite said one wall segment having said aperture therein, whereby said third wall segment may not be pushed inwardly to contact said stop member in an effort to displace it.

7. A tamper-proof display holder for a magnetic tape cassette comprising:

- an elongated holder having a tape cassette storage compartment defined by top, bottom, side, and end wall segments; an opening in one end of said compartment through which a tape cassette may be inserted into said compartment; and restraint means for securely preventing the removal of said tape cassette from said storage compartment comprising an aperture through one of said wall segments adjacent to said opening, and a stop member having an elongated body extending through said aperture and projecting across the trailing side of a tape cassette with respect to its direction of insertion through said opening with said elongated body being located in blocking position with respect to said tape cassette trailing side a predetermined distance from a second wall segment of said compartment opposite said compartment opening to confine a tape cassette between said elongated body and said second wall segment, said stop member having a head on its upper end; and

- a recess formed within said one wall segment of said storage compartment, with said head being seated in said recess flush with the upper surface of said one wall segment.

4,714,162

FLUORESCENT LIGHT BULB HOLDER

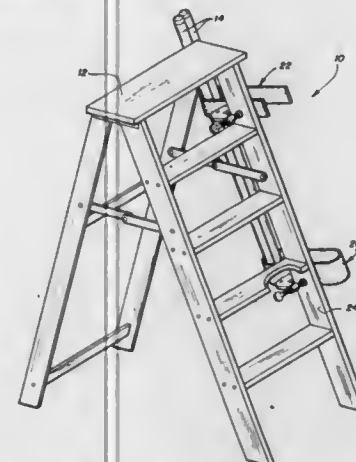
Kim A. Harrison, P.O. Box 1224, Desoto, Tex. 75115

Filed Dec. 17, 1986, Ser. No. 942,601

Int. Cl.⁴ B65D 85/42

U.S. Cl. 206—419

13 Claims



1. A removable holder for receiving a plurality of fluores-

- cent light bulbs, each bulb having first and second ends, the holder is for use with a ladder having a side rail, comprising:
 - first means for detachably mounting to the side rail of the ladder for receiving one end of the fluorescent light bulbs; and
 - second means for detachably mounting to the side rail of the ladder for receiving fluorescent light bulbs between the first and second ends thereof, said second means including a generally U-shaped member having parallel legs, such that a plurality of fluorescent light bulbs may be received between said parallel legs.

4,714,163

STACKABLE SHIPPING EDGE PROTECTOR

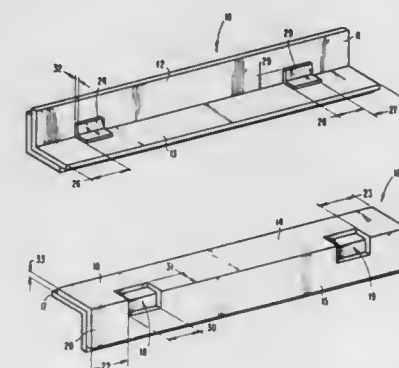
Robert E. Reeves, Indianapolis, Ind., assignor to Pakway Container Corp., Indianapolis, Ind.

Filed Feb. 5, 1987, Ser. No. 11,295

Int. Cl.⁴ A47B 95/00; B65D 81/02

U.S. Cl. 206—518

13 Claims



1. A stackable shipping edge protector comprising:
 - a main body having a right angle shaped cross section extending substantially the length thereof and forming a pair of inwardly facing surfaces and a pair of outwardly facing surfaces; and,
 - pressure sensitive adhesive means provided on said pair of inwardly facing surfaces and having a first length and a first width being operable to removably secure said main body to a corner edge of a product to protect same during shipment thereof; and wherein:
- said main body includes a recessed portion on said pair of outwardly facing surfaces aligned with said adhesive means located on said pair of inwardly facing surfaces, said recessed portion of a size greater than said adhesive means to nestably receive said adhesive means on an identical shipping edge protector stacked thereatop without adhesively securing stacked edge protectors together.
9. A stackable shipping edge protector comprising:
 - a multi-ply fibreboard main body having an L shaped cross section extending substantially the length thereof, said main body having an outer sheet and an inner sheet fixedly secured together, said outer sheet including a pair of openings extending therethrough with said inner sheet extending longitudinally with said outer sheet and extending over each of said pair of openings forming a pair of recesses in said main body opening outwardly; and,
 - a pair of exposed adhesive means to removably secure said main body to an external object, said adhesive means fixedly secured to said inner sheet to face inwardly being located adjacent said pair of recesses to be nestably received in a pair of recesses of an adjacent identical edge protector when stacked thereatop.

4,714,164

STACKING TAB FOR TAPERED CONTAINER

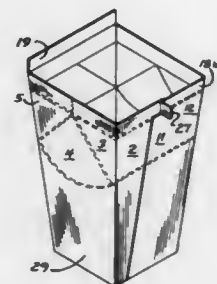
George Bachner, Barrington, Ill., assignor to Nimco Corporation, Crystal Lake, Ill.

Filed Dec. 16, 1985, Ser. No. 809,935

Int. Cl.⁴ B65D 21/02

U.S. Cl. 206—518

32 Claims



1. In a blank of foldable sheet material for a container having a tapered body and bottom closure arrangement, said blank having a side seam area for underlapping and a side seam area for overlapping, the underlapping and overlapping forming a sealed side seam area extending the length of said body, a destacking tab comprising:

a substantially rectangular adhesive area within said overlapping side seam area, said adhesive area adapted to resist sealing during formation of said sealed side seam area and adapted for folding to protrude in an erect position relative to said sealed side seam area upon sealing, said adhesive area having a width less than the width of said side seam area for overlapping whereby a continuous sealed side seam area is formable upon lapping and sealing.

4,714,165

STORAGE RACK

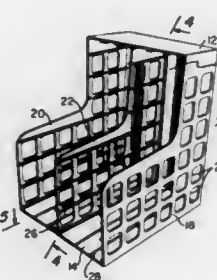
Jack Solomon, 169 Lindell Blvd., Long Beach, N.Y. 11561

Filed Jul. 17, 1985, Ser. No. 756,016

Int. Cl.⁴ B42F 17/12

U.S. Cl. 211—11

10 Claims



1. A storage rack comprising: housing means formed with front, back and bottom panels, a partial top panel, and one side panel so that the housing is open on one side; said partial top, bottom and side panels containing a plurality of correspondingly arranged tracks so that the tracks of the partial top and bottom panels meet the tracks of the side panel; and at least one divider which is detachably engaged in and slideable along said tracks into and out of the open side of said housing, said divider including latching means for releasably locking said divider in said housing, said latching means including a part adapted to (i) resiliently project into a recess in said housing so as to detachably secure said divider when said divider is in position fully within said housing and (ii) withdraw from the recess so as to allow said divider to slide along said tracks, without tilting out

of engagement with the tracks, when manual force is applied on the divider in the direction of the open side.

4,714,166

SUPPORTING RACK FOR COOKING UTENSILS

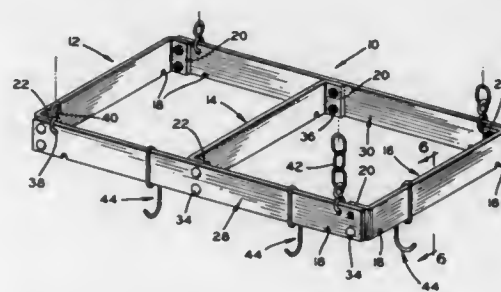
William L. Hann, Bryan, and Stanley E. Fuller, Toledo, both of Ohio, assignors to Commercial Aluminum Cookware Company, Perrysburg, Ohio

Continuation of Ser. No. 719,546, Apr. 3, 1985, abandoned. This application May 12, 1986, Ser. No. 861,932

Int. Cl.⁴ A47F 5/08

U.S. Cl. 211—113

1 Claim



1. A supporting rack for a plurality of cooking utensils comprising a bar of predetermined thickness, width and length, said bar having a notch in a lower longitudinal edge thereof near an end of said bar, a rigid suspending member supported by said bar for longitudinal movement therealong, said member being of a one-piece rod having a bar-engaging portion, a straight shank, and a hook, said bar-engaging portion comprising a straight web of a length exceeding the width of said bar, a structurally-integral end lip at one end of said web, extending outwardly from said web and back toward said web, a structurally-integral connecting lip at the other end of said web, extending outwardly therefrom in the same general direction as said end lip and back toward said web, said shank being structurally integral with an outer end of said connecting lip, extending away from said end lip, extending below said bar, and being substantially parallel to said web, said hook curving outwardly from said shank in a direction toward said connecting lip and being structurally integral with said shank, and said end lip, said connecting lip, and said hook being in a common plane, the minimum distance between the inner end of said notch and the opposite longitudinal edge of said bar being less than the minimum distance between the juncture of said end lip and said web and the outer end of said connecting lip at the juncture with said shank, said suspending member further comprising a second straight shank extending below said bar and being positioned in parallel relationship to and spaced from said first straight shank, said straight shanks being spaced apart a distance substantially exceeding the thickness of said bar to enable said bar-engaging portion to be turned and engaged with said bar, a second hook curving outwardly from said second shank in a direction away from said connecting lip and being structurally integral with said second shank, a straight connecting link having one end structurally integral with an upper end of said second shank and having another end structurally integral with an end of said end lip, said connecting link extending diagonally downwardly in the same direction as said end lip and maintaining said straight shanks in their spaced, parallel positions, said second hook, said connecting link, and said first hook being in a common plane.

4,714,167

PLASTIC LINERLESS CLOSURE

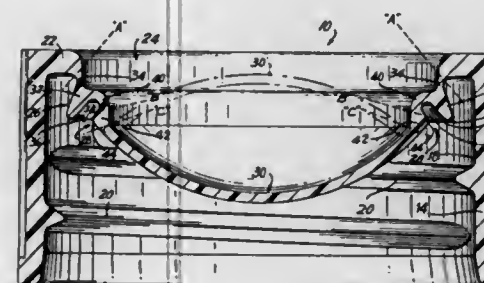
Jeffrey Sandhaus, Rte. 9W, Sneden's Landing, Palisades, N.Y. 10964

Continuation of Ser. No. 675,603, Nov. 28, 1984, Pat. No. 4,574,966, which is a continuation-in-part of Ser. No. 549,477, Nov. 7, 1983, Pat. No. 4,550,841, which is a continuation-in-part of Ser. No. 441,546, Nov. 15, 1982, Pat. No. 4,479,585, which is a continuation-in-part of Ser. No. 399,237, Jul. 19, 1982, Pat. No. 4,442,945, which is a continuation-in-part of Ser. No. 335,216, Dec. 28, 1981, Pat. No. 4,413,742. This application Mar. 10, 1986, Ser. No. 838,116

Int. Cl.⁴ B65D 41/04

U.S. Cl. 215—270

5 Claims



1. A closure and container combination, comprising: a container having an open end, said end having a top surface and an inner surface; and, a closure, adapted to be applied to said open end of said container, having a skirt, and a top coupled to said skirt, said top including: a sealing member adapted to engage said top surface of said end of said container with application of said closure to said end; an inner sealing region having an outwardly facing sealing surface adapted to be situated contiguous with said inner surface of said end of said container with application of said closure to said end; a central region coupled to said inner sealing region; and, means, coupled to said skirt, for enhancing engagement of said sealing member with said top surface of said end of said container in response to lifting of said inner sealing region relative to said skirt.

4,714,168

CONTAINER FOR DISPOSABLE EXPENDED MEDICAL SUPPLIES

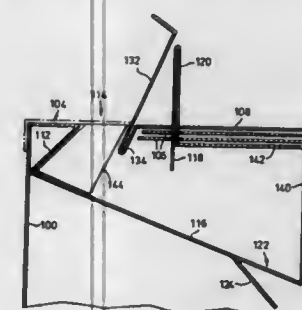
William G. Johnson, 472 Indian Road, Burlington, Ontario, Canada L7T 3T3, and Gary B. Romagnoli, 41 Allan Drive, St. Catharines, Ontario, Canada L2N 1G1

Filed Jun. 30, 1986, Ser. No. 879,953

Int. Cl.⁴ B65D 5/42, 5/46; A61M 5/32

U.S. Cl. 220—1 T

13 Claims



1. A container for disposable syringes comprising a body structure defining an interior chamber and a laterally elongated upper opening in an upward and forward surface of the container, the opening having a length and width sufficient to accept expended medical syringes of commonly used sizes broadside on, an upwardly opening lid for covering the opening and connected by a hinge to the rear of the elongated opening for movement upward and away from the opening, a laterally elongated chute extending into the body structure and having a front wall extending downwardly and rearwardly from the opening to a lower opening into the chamber, a wall extending downwardly from the hinge of the lid into the chute to form within the chute and beneath the lid a labyrinth sufficiently restricted and tortuous to arrest passage of a human hand through a chute short of the lower opening of the latter, and a movable flap supported transversely in the lower opening of the chute for movement into the interior chamber, whereby to control passage to the rear of the lower end of the front wall of the chute, into the interior chamber, of a syringe dropped down the chute.

gated upper opening in an upward and forward surface of the container, the opening having a length and width sufficient to accept expended medical syringes of commonly used sizes broadside on, an upwardly opening lid for covering the opening and connected by a hinge to the rear of the elongated opening for movement upward and away from the opening, a laterally elongated chute extending into the body structure and having a front wall extending downwardly and rearwardly from the opening to a lower opening into the chamber, a wall extending downwardly from the hinge of the lid into the chute to form within the chute and beneath the lid a labyrinth sufficiently restricted and tortuous to arrest passage of a human hand through a chute short of the lower opening of the latter, and a movable flap supported transversely in the lower opening of the chute for movement into the interior chamber, whereby to control passage to the rear of the lower end of the front wall of the chute, into the interior chamber, of a syringe dropped down the chute.

4,714,169

COLLAPSIBLE/EXPANDABLE SHIPPING RACK

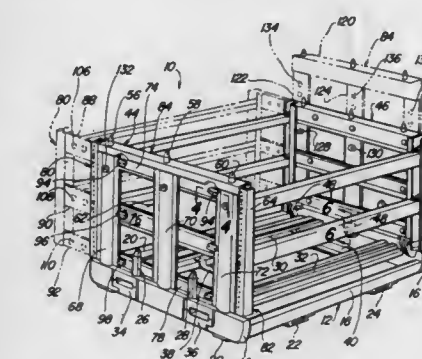
Daniel J. Keenan, Rochester, and Donald A. Hoss, Southfield, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 26, 1987, Ser. No. 30,329

Int. Cl.⁴ B65D 19/06

U.S. Cl. 220—8

5 Claims



1. A collapsible/expandable shipping rack comprising a generally rectangular bottom wall, a pair of oppositely disposed end walls, hinge means securing each end wall at the lower marginal edges thereof to the bottom wall, each end wall adapted to be pivoted from an upright position to a collapsed position over the bottom wall, each end wall comprising a central support section which is secured by the hinge means to the bottom wall, a pair of width expanding sections, horizontal track means on the central support section, each of the width expanding sections being mounted on the horizontal track means for horizontal movement to expand or contract the width of the rack, first latching means on the central support section to releasably latch the width expanding sections in a desired position, a height expanding section, vertical track means on the central support section, the height expanding section being mounted on the vertical track means for vertical movement to expand or contract the height of the rack, second latching means on the central support section to releasably latch the height expanding section in a desired position, a plurality of side rails of a length to extend between the width expanding sections when the end walls are in an upright position to form a side wall structure, third latching means on the width expanding sections to releasably latch the side rails to the width expanding sections, the side rails maintaining the end walls in an upright position when latched in place and being removable by unlatching the third latching means to permit pivoting of the end walls into a collapsed position over the bottom wall.

4,714,170

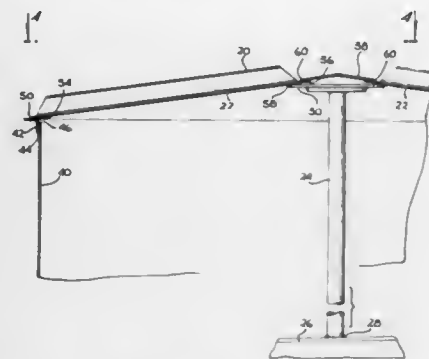
LARGE STORAGE TANK STRUCTURES

Leslie D. Scott, Atascadero, Calif., assignor to Trusco Tank Inc., San Luis Obispo, Calif.

Filed Apr. 17, 1986, Ser. No. 853,132
Int. Cl.⁴ B65D 6/32, 6/34

U.S. Cl. 220—5 A

13 Claims



1. A storage tank comprising:
 - a welded steel floor having all continuous welds;
 - a welded steel cylindrical side wall continuous welded to said floor from both sides of said side wall;
 - a plurality of roof panels, at least some of said roof panels having at least one rafter continuous welded to the upper surface thereof spaced apart from the edges of said panels such that said upper surface of said panels remains substantially free from any such rafters immediately adjacent to said edges of said panels;
 - each of said roof panels being continuous welded along its edges directly to the edges of adjacent panels to form the roof of said storage tank with said rafters external thereto, said roof panels adjacent the periphery of said roof being continuous welded at least indirectly to the upper periphery of said side wall by continuous welds, whereby said floor, side wall and roof panels define a continuous welded storage tank enclosure.

4,714,171

FUEL TANK VENT SYSTEM

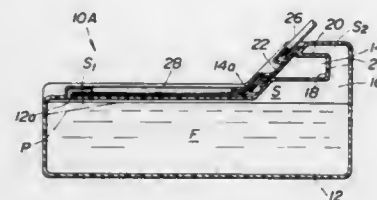
Michiaki Sasaki, Hadano, and Junya Ohno, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 31, 1986, Ser. No. 948,041

Claims priority, application Japan, Jan. 10, 1986, 61-3010; May 6, 1986, 61-103587

Int. Cl.⁴ F16K 45/00; B65B 31/00

U.S. Cl. 220—85 VR

14 Claims



1. A fuel tank vent system comprising:
 - a fuel tank constructed of moulded plastics, said fuel tank being formed with a depressed portion which protrudes into a vapor chamber defined at an upper portion of the interior of the fuel tank;
 - a structure of moulded plastics which is incorporated with said depressed portion to define an enclosed chamber at a position above the maximum level of fuel in the fuel tank; first means for providing a fluid communication between an

upper portion of said enclosed chamber and an upper portion of said vapor chamber; and second means for providing a fluid communication between a lower portion of said enclosed chamber and a lower portion of said vapor chamber.

4,714,172

VAPOR RECOVERY SYSTEMS

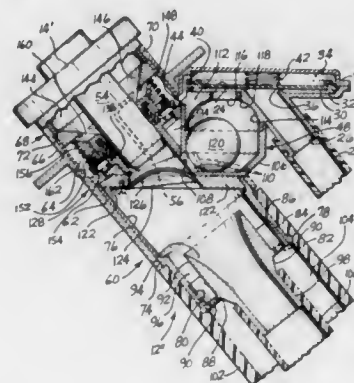
John M. Morris, Auburn, Wash., assignor to GT Development Corporation, Tukwila, Wash.

Filed Dec. 23, 1986, Ser. No. 946,426

Int. Cl.⁴ B01D 53/04

U.S. Cl. 220—86 R

31 Claims



1. A refueling vapor recovery system, comprising:
 - a liquid fuel tank including a fill tube having an inlet into which a liquid fuel fill nozzle is inserted for introduction of liquid fuel into said fuel tank, and a removable closure cap for said fill tube;
 - a vapor storage means;
 - a vapor recovery passageway extending from the fuel tank to the vapor storage means;
 - a signal pressure region in said fill tube which is at an elevated first pressure when the closure cap is installed on the fill tube and there is vapor pressure within the fuel tank, and which is at a second lower pressure when the closure cap is removed and liquid fuel is being introduced into the fill tube;
 - vapor valve means within said vapor recovery passageway; and
 - control means for said vapor valve means functioning to close said vapor valve means in response to the signal pressure region being at said first pressure, and to open the vapor valve means in response to the signal pressure region being at said second pressure, and wherein liquid fuel being introduced into the fuel tank when the vapor valve means is open displaces vapor out from said fuel tank through the vapor recovery passageway to the vapor storage means.

4,714,173

LEAK-PROOF CLOSURES

Guillermo E. Ruiz, 800 W. 35 St., Hialeah, Fla. 33012

Filed May 12, 1986, Ser. No. 861,893

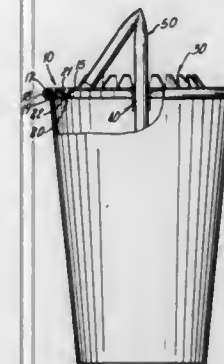
Int. Cl.⁴ A47G 21/18

U.S. Cl. 220—90.4

7 Claims

1. A closure for openings in containers for liquids that are withdrawn with a straw, comprising:
 - A. cover means tightly engaged to the rims of said openings including an orifice connecting the inside of said container to the outside and further including a tubular extension member mounted to the periphery of said orifice and having a diameter that allows a leak-proof fit of said straw;

B. one-way valve means mounted to said cover means so arranged and constructed that air is allowed in from the



outside and said liquid is not allowed to come out regardless of the position of said container; and C. anchorage means for holding the end of said straw bent.

4,714,174

SPILL PROOF CONTAINER

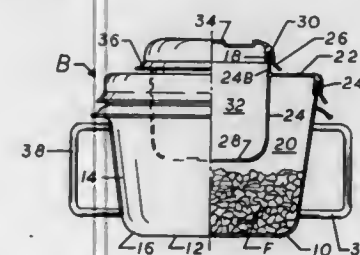
James A. Williams, No. 9 Terraza Del Oeste, Harvey, La. 70058

Filed Sep. 23, 1986, Ser. No. 910,504

Int. Cl.⁴ B65D 51/18; A47G 19/32, 23/06

U.S. Cl. 220—90.4

12 Claims



1. A "spill-proof" bowl for eating at least somewhat dry, granular foodstuff by hand, comprising:
 - a container base having a peripheral wall attached around its periphery and extending upwardly from said base for forming a container having a hollow interior therein between the interior surfaces of said wall and said base, said container including a relatively large, open end opposite its base for access to said hollow interior;
 - a cover located on the relatively large, open end of said container for substantially closing off said hollow interior; and
 - a tubular portion located in a relatively small opening in said cover and positioned above said base, said relatively small opening having a lateral dimension substantially equal to the lateral dimension of the human hand of the size for which it was designed, said tubular portion including a lower portion extending downwardly from said relatively small opening a distance below said cover and having a relatively small, lower, open end at its lower end separated up from said base for forming an open closure means spaced in said hollow interior below the midpoint between said cover and said base for providing visual and selective access to said hollow interior when open, and
 - an upper portion attached to said lower portion and extending upwardly from said relatively small, open end of said lower portion to terminate in an open, upper end extended and spaced above said cover and said container base having a diameter at least equal to the diameter of said relatively small, open end for access to a tubular passage having a diameter at least equal to the diameter of said

relatively small, open end depending downwardly through said tubular portion to communicate with said hollow interior of said container by means of said open closure means; said tubular portion isolating a foodstuff contained between the interior surfaces of said wall and the exterior of said tubular portion away from said relatively small opening when the bowl is tipped over but allowing free access to the foodstuff in the hollow interior by the user's hand without any otherwise un-necessary open area into said interior, "spill proofing" the bowl, said lower end further having an annular portion surrounding the periphery of said relatively small, open end which curves radially inward to form an inwardly directed lip for further isolating the foodstuff contained in said hollow interior from entering said relatively small, open end when the "spill-proof" bowl is tipped over, said annular portion having an opening suitable for access to the foodstuff by the human hand and providing an inwardly directed lip which radially widens outward to the diameter of said tubular passage for restraining entry into the tubular passage when the "spill-proof" bowl is tipped over; and

closing means spaced above said upper, open end and removably located on said open, upper end for closing off said open closure means and egress and access to the dry, granular foodstuff located in said hollow interior of said container by means of said tubular passage and said open closure means.

4,714,175

TANK LIQUID INTERFACE SEPARATION DECK WITH LEVELING LINES

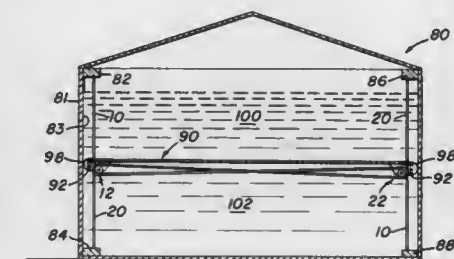
Don H. Coers, Naperville, Ill., assignor to CBI Industries, Inc., Plainfield, Ill.

Filed Dec. 1, 1986, Ser. No. 936,588

Int. Cl.⁴ B65D 1/24

U.S. Cl. 220—216

6 Claims



1. In combination:
 - a liquid storage tank having vertical walls said walls comprising an interior surface;
 - a vertically movable deck inside said tank and having a center and an outer periphery that substantially conforms to said interior surface of said tank vertical walls in horizontal section;
 - said deck outer periphery spaced inwardly from said interior surface of said tank vertical walls to provide a rim space;
 - a deck leveling means comprising complementary first and second leveling lines and first and second pulley means on said deck for receiving said lines;
 - said pulley means being radially spaced from the center of the deck;
 - said first pulley means being diametrically opposite said second pulley means;
 - said first leveling line being attached at one end to the upper portion of said tank above and aligned with said first pulley means;
 - said first leveling line being attached at the other end to the lower portion of said tank below and aligned with said second pulley means;

said first leveling line extending down from said attachment at the upper portion of said tank to underlap said first pulley means;
 said first leveling line further extending from said first pulley means to overlap said second pulley means;
 said first leveling line then extending down from said second pulley means to said attachment at the lower portion of said tank;
 said second leveling line being attached at one end to the upper portion of said tank above and aligned with said second pulley means;
 said second leveling line being attached at the other end to the lower portion of said tank below and aligned with said first pulley means;
 said second leveling line extending down from said attachment at the upper portion of said tank to underlap said second pulley means;
 said second leveling line further extending from said second pulley means to overlap said first pulley means; and
 said second leveling line then extending down from said first pulley means to said attachment at the lower portion of said tank.

4,714,176

LIQUID SUPPLY RESERVOIR

Peter J. A. Wijnen, AP Horst, Netherlands, assignor to Oec-Nederland B.V., Venlo, Netherlands

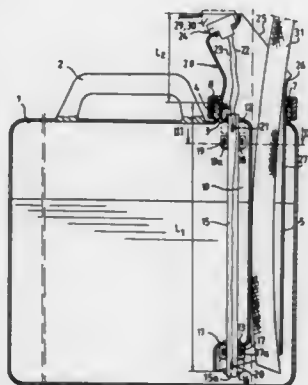
Continuation of Ser. No. 815,567, Jan. 2, 1986. This application May 11, 1987, Ser. No. 49,011

Claims priority, application Netherlands, Jan. 24, 1985, 8500188

Int. Cl.⁴ B67D 5/22

U.S. Cl. 222-51

5 Claims



1. In a liquid-supply reservoir of a liquid-using machine having a closable opening at the top of the reservoir in which are detachably secured both a pipe extending to near the base of the reservoir and a liquid-level sensing device forming a unit with the pipe, which pipe has an open end outside the reservoir through which a flexible conduit having one end connected to the liquid-using machine can be passed such that the other end is close to the base of the reservoir, the improvement wherein a part of the pipe has a recess formed on one side of an outside wall of the pipe, the liquid-level sensing device comprises a sensor secured to the outside wall of the pipe near a termination of the recess such that the sensor within the recess fits completely therein and every part of the pipe and sensor unit fits in the closeable opening with a slight amount of play.

4,714,177

DEVICE FOR THE METERING OF A CHEMICAL, PARTICULARLY FOR SEED TREATMENT

David B. Morris; Andrew C. Rollett, and Donald M. Roberts, all of Bury St. Edmunds, United Kingdom, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

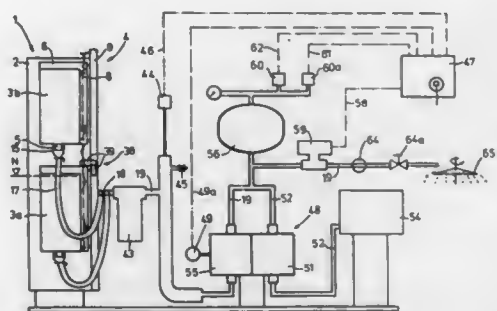
Filed Jul. 7, 1986, Ser. No. 882,667

Claims priority, application United Kingdom, Jul. 26, 1985, 8518943

Int. Cl.⁴ B67D 5/00

U.S. Cl. 222-58

11 Claims



1. In a device for the metering of a liquid chemical, particularly for seed treating, having a reservoir for the chemical connected by a supply line to an atomiser via a metering unit and an actuating valve, the improvement comprising: a storage system unit which has a section for the reservoir in the form of a plurality of dispenser packs each having outlets facing downwards and each outlet connected by a coupling to a manifold in the supply line, means automatically tightly closing the couplings when they are decoupled and a hoist mechanism for the packs which allows each pack to be emptied separately and sequentially, the pack currently to be emptied travelling upwards by means of the hoist mechanism at such a speed that, during the emptying process, the height of the liquid level in that pack, referred to an arbitrary reference point of the fixed part of the metering unit, remains substantially constant and in which arrangement the entire liquid-containing system from the reservoir to the atomiser is closed off with respect to the environment, wherein the hoist mechanism further comprises, at each pack location, mechanical sequencing latches and pairs of first and second higher latches, the mechanical sequencing latches initially holding the packs in a lower position and releasing a first pack automatically following loading of a set of packs, the first higher latch restraining a pack at a final emptying position, the second higher latch on contact by the respective pack releasing the first higher latch associated with the immediately preceding pack location to release the pack in that location for further upwards movement and, the mechanical sequencing latches, allowing release of successive packs, on movement of the preceding pack to the final emptying position.

4,714,178

COLLAPSIBLE STORAGE AND DISPENSING VESSEL

Aleck Bohl, Denver; John Meyers, Broomfield, and Leandro Valdez, Littleton, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Feb. 24, 1987, Ser. No. 18,877

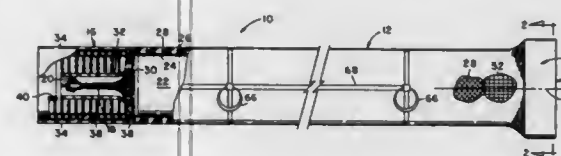
Int. Cl.⁴ B65D 35/16, 81/02

U.S. Cl. 222-107

11 Claims

1. A collapsible fluid storage vessel comprising:
 a generally cylindrical body formed of elastomer in which is embedded a reinforcement material;
 an outlet attached to the body portion and in communication with the interior of the vessel;
 a flattened ramp end portion extending from the body and formed by pinching together an end of the cylindrical body; and

an insert formed of reinforced elastomer bridging and bonded to juxtaposed interior sidewall portions of the cylindrical body at an end thereof adjacent said flattened



ramp portion, adapted and arranged to inhibit separation of the flattened ramp end portion upon pressurization of the storage vessel.

4,714,179

POSITIVE DISPLACEMENT PAINT PUSHOUT APPARATUS

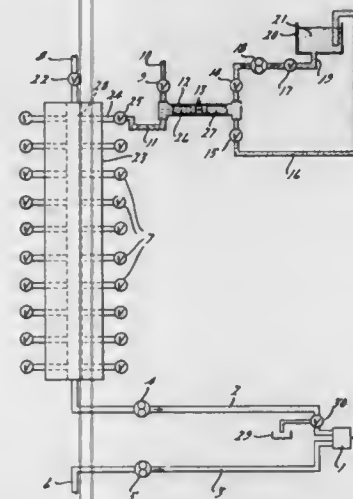
Charles H. Otterstetter, Southgate; Duane C. Schowiak, Novi, and Paul Stueckle, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 15, 1985, Ser. No. 711,882

Int. Cl.⁴ B05B 12/14

U.S. Cl. 222-148

8 Claims



1. An apparatus for dispensing a measured amount of solvent at a precisely controlled flow rate into a painting apparatus, which comprises:

- (A) a chamber separated into variable volume first and second compartments by separating means which is free to move within said chamber so as to vary the volume of said first and second compartments;
- (B) means for dispensing solvent into said first compartment;
- (C) means for dispensing said solvent from said first compartment into said painting apparatus;
- (D) metering means comprising a motor driven, positive displacement gear pump for dispensing viscous fluid at said precisely controlled flow rate into said second compartment; and
- (E) means for dispensing said viscous fluid from said second compartment,

wherein during a solvent fill cycle, said solvent is dispensed into said first compartment while at the same time an equal amount of said viscous fluid is dispensed from said second compartment, and wherein during a solvent dispensing cycle, said viscous fluid is dispensed at said precisely controlled flow rate into said second compartment while at the same time an equal amount of said solvent is dispensed at said precisely controlled flow rate from said first compartment into said painting apparatus.

4,714,180

INJECTION MOLDED, SELF SEALING TOP ASSEMBLY FOR OPEN MOUTH COFFEE POTS

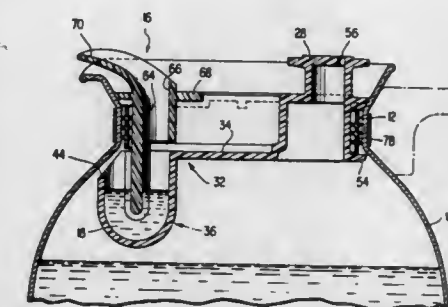
Wayne B. Stone, Jr., Bethesda, Md., assignor to Wood Manufacturing, Flippin, Ark.

Continuation of Ser. No. 598,767, Apr. 10, 1984, Pat. No. 4,638,929, which is a continuation-in-part of Ser. No. 532,980, Sep. 16, 1983. This application Oct. 1, 1986, Ser. No. 914,073

Int. Cl.⁴ G01F 11/26

U.S. Cl. 222-456

1 Claim



1. A top assembly for an open mouth coffee pot through which coffee is introduced from the exterior of a pot to the interior thereof and subsequently dispensed from the interior of a pot externally thereof; said top assembly having liquid flow passage means extending therethrough; said flow passage means including a liquid trap for retaining a volume of coffee therein following the introduction of coffee therethrough into a coffee pot and for retaining a volume of coffee therein following the dispensing of coffee therethrough from a coffee pot; said top assembly including two parts, said parts mechanically interfitting to define said liquid trap; said top assembly having a first cylindrical surface and a second cylindrical surface below said first cylindrical surface; said second cylindrical surface having a diameter less than the diameter of said first cylindrical surface; said first cylindrical surface including first seal means for sealing the top assembly against the open mouth of a coffee pot; said second cylindrical surface including second seal means for sealing the top assembly against the open mouth of a coffee pot; said first and second seal means selectively operational so that only one of said sealing means is in sealing relationship with the open mouth of a coffee pot, thus being able to seal said top assembly with respect to the open mouth of either of two different size open mouth coffee pots; and restricted vent means opening on opposite sides of said seal means.

4,714,181

CONDIMENT BOTTLE CAP

Thomas A. Kozlowski, Brunswick; Robert O. Lindstrom, Bay Village; Thomas D. Loughrin, Medina, and Kathleen J. Baka, Lakewood, all of Ohio, assignors to Durkee Industrial Foods Corp., Cleveland, Ohio

Filed Aug. 21, 1986, Ser. No. 898,618

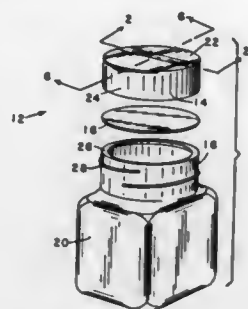
Int. Cl.⁴ B67D 3/00

U.S. Cl. 222-480

8 Claims

1. A molded, plastic cap, suitable for large condiment bottles, of the type adapted to be threaded onto the mouth of the bottle and to contain an inner sealing liner compressed by the cap against the bottle mouth rim, comprising
 a circular end having an inside surface and an exposed top-side surface;
 an annular skirt depending from said end having inner threads;
 a reinforcing bridge portion extending across said cap end from one side to the other;
 aperture means on opposite sides of said bridge portion;
 lid means adapted to close said aperture means;
 said end inside surface defining a flat, circular land portion

contiguous with the skirt and having a width dimension effective to press seal the sealing liner against the bottle mouth rim;
said bridge portion including longitudinally extending rib means forming a longitudinally extending reduced thick-

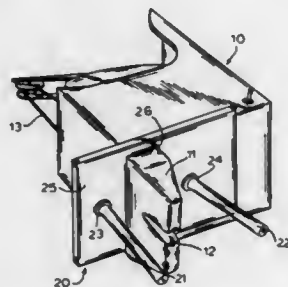


ness center part, said rib means being effectively flush on the inside surface with the land portion to resist distortion of the inner sealing liner and extending upwardly from said topside surface, the lid means being hinged to said longitudinally extending rib means.

4,714,182

METHOD AND APPARATUS FOR MAKING BOWS
David Hecht, 14 E. 90th St., New York, N.Y. 10128
Filed Jan. 28, 1987, Ser. No. 7,771
Int. Cl.⁴ A41H 43/00; D04D 7/10
U.S. Cl. 223-46

8 Claims



1. An apparatus for making bows from ribbon comprising: wrapping means for wrapping a tie around a plurality of layers of ribbon, said wrapping means including a head having a ribbon receiving slot therein, said head being operable to apply and wrap the tie around the plurality of layers of ribbon in response to movement of the ribbon to a predetermined point in said slot, and positioning means mounted on the head of said wrapping means, said positioning means comprising respective ribbon receiving members on each side of said head for receiving layers of ribbon thereon, first portions of said positioning means being spaced further from each other than second portions thereof, said second portions being positioned adjacent said predetermined point, whereby movement of the ribbon along said positioning means to said predetermined point produces a slack in the layers of ribbon.
2. A method of making a bow comprising the steps of: wrapping a ribbon around second portions of two rods each of which have first portions spaced closer to each other than second portions thereof while simultaneously positioning a central portion of the wrapped ribbon in align-

ment with a slot in a head of an automatic tie member wrapping and twisting apparatus; moving the central portion of the wrapped ribbon onto the first portion of each rod and into the slot to cause a slack to develop in the central portion of the ribbon and to cause operation of the apparatus whereby a tie is wrapped around the ribbon and the free ends thereof twisted to maintain the same in place; and removing said ribbon from said rods and spreading apart the superimposed layers of the ribbon to form the bow.

4,714,183

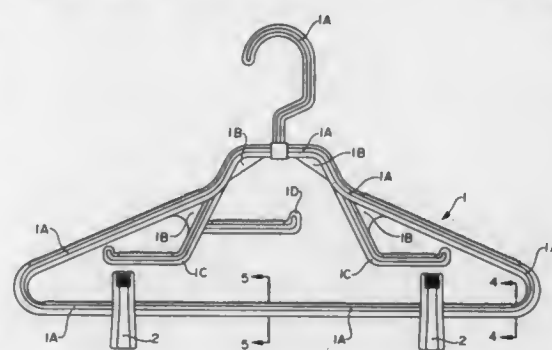
PLASTIC HANGER WITH A GROOVED CIRCULAR CROSS-SECTION

Sergio Tontarelli, Via Giolitti 62-San Rocchetto, Castelfidardo, Italy

Filed Nov. 21, 1986, Ser. No. 933,111
Int. Cl.⁴ A47G 25/28

U.S. Cl. 223-91

6 Claims



1. A unitary integrally-molded plastic hanger intended for multiple usage, comprising a molded plastic frame, the frame having two substantially identical and diametrically opposed side channels formed therein, the channels being substantially "V"-shaped and running along the entire frame, the frame including a lower horizontal cross bar having a substantially circular cross-section provided with said side channels formed therein, thereby defining an upper arc and a lower arc intermediate of the channels, and the upper arc being formed on a radius which is larger than the radius forming the lower arc.

4,714,184

CAMERA CARRIER

Leon Young, Pacific Palisades, Calif., and Edward J. Klassen, deceased, late of Pacific Palisades, Calif. by Amelia K. Klassen, legal representative, assignors to Fotima International Ltd., Los Angeles, Calif.

Filed Mar. 13, 1987, Ser. No. 25,356
Int. Cl.⁴ A45F 5/00

U.S. Cl. 224-253

16 Claims

1. A camera carrier for use in supporting and carrying a camera from a person's belt, said camera carrier comprising: a frame having a slot formed therethrough for reception of the belt of a person carrying the camera, said slot permitting mounting of said frame onto the belt; a support plate extending outwardly from said frame when said frame is mounted at the belt of a person carrying the camera; a carrier plate having a size and shape for seated support upon said support plate; means for connecting said carrier plate to the camera; a spring reel assembly mounted on said frame; and a flexible tether line connected between said spring reel assembly and said carrier plate, said spring reel assembly applying a spring force to said tether line for normally winding said tether line into said spring reel assembly when said carrier plate is seated upon said support plate,

said spring reel assembly permitting extension of said tether line upon manual removal of said carrier plate from

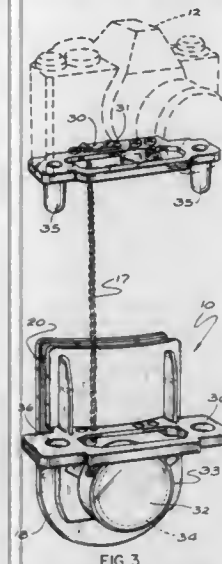


FIG. 3

said support plate to permit normal photographic use of the camera without disconnecting the camera from said carrier plate.

4,714,185

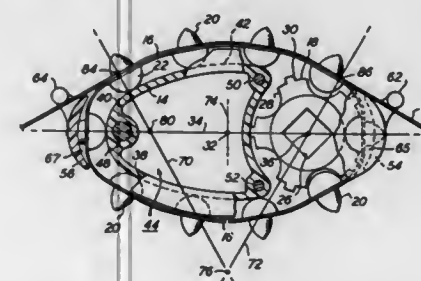
PERFORATED WEB FEEDING APPARATUS

Leo J. Hubbard, Rio Grande, P.R., and Leo J. Kerivan, Somerset, Mass., assignors to Precision Handling Devices, Inc., Fall River, Mass.

Filed Aug. 7, 1985, Ser. No. 763,155
Int. Cl.⁴ G03B 1/22

U.S. Cl. 226-74

30 Claims



1. Apparatus for feeding perforated webs having perforations spaced from each other, which apparatus comprises an endless belt having pins spaced from each other at a pitch equal to the spacing of said perforations and engageable with said web in said perforations, said belt also having drive elements, a frame defining an elliptical path for said belt with opposite major curved surfaces about major radii, along one of which major surfaces a number of said pins engage said perforations, a sprocket journaled in said frame and engageable with said drive elements, and guide members spaced upstream and downstream of at least said one curved surface and opposed to end surfaces of said frame adjacent minor curved surfaces defined by the minor radii of said elliptical path for engaging said web and maintaining it wrapped around at least the entire extent of said one curved surface and in contact with said belt along said one curved surface.

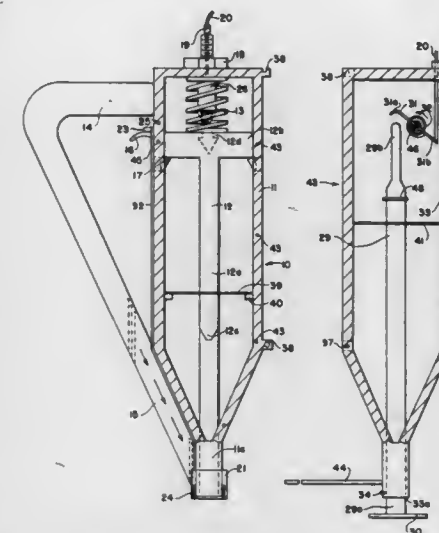
4,714,186

FASTENER DRIVING TOOL

Reno S. Williamson, Rte. 1, Box 223, Nakina, N.C. 28455
Filed Apr. 22, 1986, Ser. No. 854,500
Int. Cl.⁴ B25C 1/00, 1/02

U.S. Cl. 227-146

20 Claims



1. A fastener driving tool comprising: a fastener driver housing of a size adapted to be carried by a user and having at least one open end; hammer means reciprocative within said fastener driver housing toward and away from said open end; bias means within said fastener driver housing for biasing said hammer means toward said open end; trigger means on said fastener driver housing for releasably holding said hammer means in a cocked position away from said open end in opposition to said bias means; a cocking means housing of a size adapted to be carried by said user and containing cocking means adapted to be actuated by said user's foot, said cocking means being further adapted to move said hammer means away from said open end in opposition to said bias means; and connecting means for operably connecting said cocking means to said hammer means.

4,714,187

RELOADING UNIT FOR SURGICAL FASTENING INSTRUMENTS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

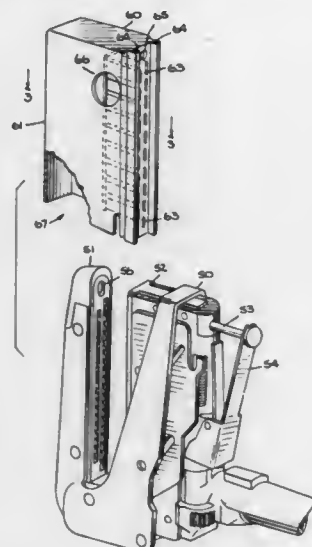
Filed Nov. 26, 1986, Ser. No. 935,407
Int. Cl.⁴ A61B 17/00

U.S. Cl. 227-19

15 Claims

1. A transfer magazine for providing a charge of staples to a staple cartridge in a surgical fastening instrument which comprises: pusher means having a plurality of staple support members spaced from one another, each of said support members being generally shaped to conform to the inner surface of a staple; a plurality of staples disposed on said staple support members, and holding means having therein a plurality of receptacles adapted to mate with and hold each of said staples on said support members prior to transfer to the staple cartridge, said holding means being adapted to slidably move with respect to said staples and support members to release said staples held therein and facilitate loading a charge of staples into the staple cartridge of the surgical fastening instrument.

11. A method of performing multiple stapling functions utilizing a stapling instrument which comprises the steps of: firing the instrument to expend a charge of staples contained in a staple cartridge of the instrument; providing a new charge of staples in a transfer magazine for reloading said staple cartridge, said transfer magazine including therein a plurality of staples corresponding substantially to the number of staples carried in said staple cartridge; opening the instrument to separate the staple cartridge and anvil portions of the stapling assembly; positioning said transfer magazine between the open portions of said stapling assembly;



aligning said transfer magazine and staple cartridge to facilitate transfer of said staples in said magazine to said cartridge with a closed end of each of said plurality of said staples first entering said cartridge thereby aligning the free end of the legs of the staple with the opening in said cartridge; and closing said surgical instrument sufficiently to cause said staple cartridge and anvil portions of said stapling assembly to close upon said transfer magazine disposed therebetween so as to cause transfer of the staples from said transfer magazine to said staple cartridge.

4,714,188

METHOD OF MAKING METAL SCULPTURES
Kenneth C. Flynn, Forest Woods Ct., Rte. 3, Box 139A, Hedgesville, W. Va. 25427

Filed Oct. 20, 1986, Ser. No. 920,406

Int. Cl.⁴ B23K 31/00

U.S. Cl. 228—120

18 Claims



16. The method of making a metallic sculpture that comprises the steps of:

- sculpting a core to an artistic shape from a solid capable of being changed to a fluid form;
- applying support elements to the core in its solid state outwardly therefrom, at selected, spaced locations occurring with a frequency sufficient to cause said elements to define a sheath support structure generally similar in shape to said core;
- applying a metallic material in molten form to said elements to form a sheet-like sheath about the core which will include both said metallic material and said elements, and will be of a shape generally duplicating that of the core; and
- thereafter changing the form of the core from its solid to its fluid state so as to remove the core and leave said sheath as a finished metallic sculpture comprised wholly of said metallic material and said support elements.

4,714,189

BRAZING EUTECTIC AND METHOD
Stuart J. Tovey, Aldershot, England, assignor to Schlumberger Electronics (U.K.) Limited, Farnborough, England

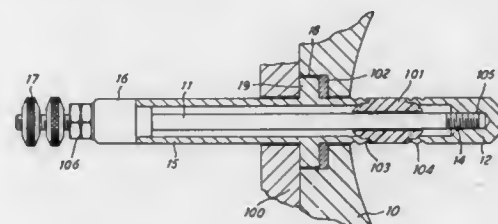
Filed Mar. 26, 1986, Ser. No. 844,427

Claims priority, application United Kingdom, Mar. 27, 1985, 8507909

Int. Cl.⁴ H01B 17/30; B23K 1/04

U.S. Cl. 228—122

7 Claims



1. A method of brazing a ceramic component to another component, including the steps of: forming a ceramic component to be brazed in a ceramic of average grain size of substantially between 5 and 15 microns and of purity exceeding 99% with a maximum silica content of substantially 0.2%, introducing between components a eutectic of substantially the composition:
80% to 90% silver
5% to 6% copper
less than 6% titanium,
and sufficient in quantity to fill gap therebetween, and subjecting the components to a temperature in excess of eutectic liquidus temperature whilst maintaining the components in a vacuum.

4,714,190

FAST FOOD TAKE OUT CARTON WITH COVER

Diane M. Morrocco, 71 Haviland St., Bristol, Conn. 06010

Filed Sep. 11, 1986, Ser. No. 905,955

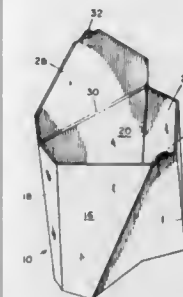
Int. Cl.⁴ B65D 5/34

U.S. Cl. 229—1.5 B

7 Claims

1. A scoop-type carton for fast food items, said carton being of thermally insulating material and comprising a body portion including a bottom and side panels upstanding from said bottom, a cover and an integral hinge connecting said cover and one of said side panels at said open end, said cover conforming in size and shape to said open end, said cover being movable between an open position in which items can be scooped into said body portion and said cover extends longitudinally from said panel to which it is connected by said hinge and a closed position in which it is folded down to cover said open end, said

hinge being biased to hold said cover normally longitudinally extending from said one of said side panels in said open position,



tion, and having a built-in bias tending to maintain said cover in, or return it to, said open position.

4,714,191

DISPENSING CARTON FOR PLASTIC BAGS

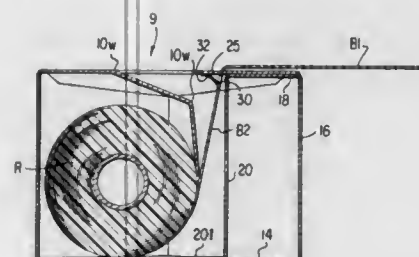
Paul D. Richardson, Cincinnati, Ohio, assignor to International Paper Company, Purchase, N.Y.

Filed Mar. 11, 1987, Ser. No. 24,428

Int. Cl.⁴ B65D 85/67

U.S. Cl. 229—121

14 Claims



1. A one piece paperboard blank for a carton to contain plastic bags in a roll and from which to dispense such bags individually, said blank comprising:

- (a) top (10), back (12), bottom (14), front (16), inner top (18) and inner front (20) panels in the order named from one end of the blank to the other and foldable with respect to each other;
- (b) said top panel having score lines (10s) along which its inner part (10i) may be severed from its outer parts (10o);
- (c) at least one of said top, back, bottom, and front panels having a pair of side flaps (10f, 12f, 14f, 16f) foldably attached along its side edges (10e, 12e, 14e, 16e); and
- (d) said inner top panel having a tab (25) defined by a slit (25s) in the inner front panel, said tab being arranged to be disposed generally in the plane of the surface of the inner top panel in the erected carton.

4,714,192

SLIDABLE TRAY INSERT FOR MAILBOXES

Albert L. Harlow, Jr., Norwalk, and Arthur M. Felske, Westport, both of Conn., assignors to EZ Mail Corporation, Bridgeport, Conn.

Continuation of Ser. No. 702,060, Feb. 15, 1985, Pat. No.

4,600,143. This application Jul. 10, 1986, Ser. No. 883,928

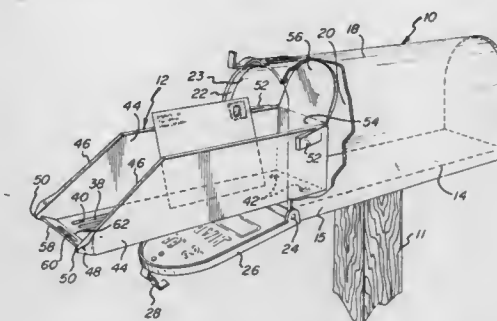
The portion of the term of this patent subsequent to Jul. 15,

2003, has been disclaimed.

Int. Cl.⁴ B65P 91/00

U.S. Cl. 232—17

18 Claims



1. A slidable tray insert for use in combination with a rural mailbox having a bottom panel, a back panel and a U-shaped roof portion defining an enclosure with an entrance opening at one end thereof, and a door member pivotally mounted adjacent said entrance opening for movement between an open position permitting access to the enclosure through the entrance opening and a closed position covering the entrance opening, comprising: a generally rectangular bottom wall, a pair of side walls extending upwardly from said bottom wall, an end wall extending upwardly from said bottom wall and transversely between said side walls, and a handle disposed on said bottom wall spaced from said side walls, said handle being connected to the bottom wall by hinge means permitting pivoting movement of said handle between an upwardly inclined position and a position flush with said bottom wall.

4,714,193

SELECTOR VALVE DEVICE

Kenji Yogo, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

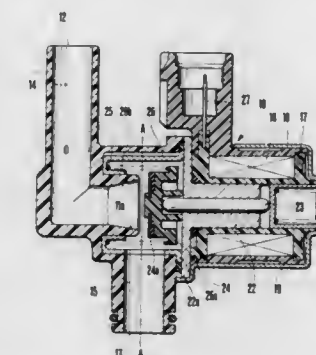
Filed Nov. 6, 1986, Ser. No. 927,582

Claims priority, application Japan, Nov. 6, 1985, 60-248439

Int. Cl.⁴ F02M 1/10

U.S. Cl. 236—75

3 Claims



1. In a selector valve device comprising: a body having an inlet port and an outlet port, a fluid passageway communicating with said inlet port and outlet port, a valve to open and close said fluid passageway, an outer periphery yoke made of magnetic material and fixed to said body, an inner core dis-

posed on the axis of said outer yoke, a bobbin made of non-magnetic material and fixed to the outer periphery of said inner core, a solenoid coil wound on said bobbin and forming a magnetic circuit with said outer periphery yoke and inner core, a plunger disposed in said magnetic circuit and attracted by said inner core when said solenoid coil energized, a shaft for connecting said plunger with said valve at the operation time, a first spring biasing said valve to its closed position through said shaft, and a second spring biasing said valve to an opened position resisting the biasing force of said first spring, said second spring being made of shape-memory alloy so as to expand to a memorized shape at high temperature, an improvement wherein:

a metal heat transfer member is disposed between said inner core and said body, a first end of said metal heat transfer member being formed as a flange portion and closely contacted to the flange portion of said inner core, and a second end of said metal heat transfer member being contacted to one end of said second spring.

4,714,194

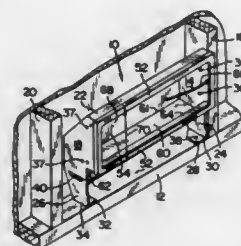
HOUSING FOR WALL MOUNTED HEATING UNIT
Harold J. Eckman, Milwaukie, Oreg., assignor to Cadet Manufacturing Company, Vancouver, Wash.

Filed Jul. 11, 1985, Ser. No. 754,366

Int. Cl.⁴ F24H 9/02; F24D 19/06

U.S. Cl. 237-70

14 Claims



1. A sheet metal housing for a heating unit, suitable for mounting within a building wall of frame construction including generally vertical members separated from one another within said building wall by a standard spacing, the housing comprising:

- a body including an upright back wall;
- a bottom member extending generally forward from said back wall;
- a pair of opposite upright end walls extending generally forward from said back wall, said end walls defining a body length which is less than said standard spacing;
- a respective leg extending downwardly beneath said bottom member as an extension of each of said end walls, each said leg including a bottom end; and
- means associated with at least one said leg for defining at least one bend line thereon, said at least one bend line defining a spacer distance extending along the respective leg a distance equal to the difference between said body length and said standard spacing, so that when said respective leg is bent along said bend line, and a portion of said leg is thereby placed in a horizontal position, said body length and said portion together extend over a distance equal to said standard spacing.

4,714,195

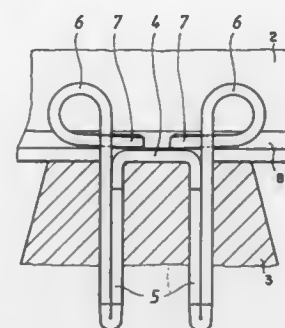
TRACK SPIKE WITH A SINGLE OR DOUBLE SHAFT
Walter Creutz, Dortmund; Peter Dahlhaus, Radevormwald, and Heinz Hofmann, Dortmund, all of Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Fed. Rep. of Germany
Filed Sep. 10, 1985, Ser. No. 774,539

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 3437839

Int. Cl.⁴ E01B 9/08

U.S. Cl. 238-349

2 Claims



1. A track spike for wood ties having resiliently spaced double shaft portions each with a spring loop and a crosspiece therebetween, each double shaft portion being over relative to a corresponding bore in a wood tie, characterized in that the crosspiece carrying shaft portions are offset resiliently over at most one quarter of their length via a bend of the upper part thereof in a direction toward the corresponding rail foot, the crosspiece thus being maintained in pressure engagement with the corresponding rail foot despite squeezing of the shaft portions together during insertion into their respective bores.

4,714,196

FARM CHEMICAL DELIVERY SYSTEM
Richard D. McEachern, Carrollton; Willie W. Jordan, Garland; Gerald C. Gebheim, Arlington, and Joe M. Robinson, Childress, all of Tex., assignors to AgRobotics, Inc., Childress, Tex.

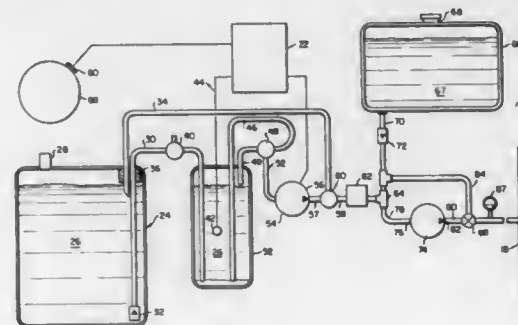
Continuation of Ser. No. 680,604, Dec. 11, 1984, abandoned.

This application Aug. 8, 1986, Ser. No. 894,719

Int. Cl.⁴ B05B 7/00

U.S. Cl. 239-62

6 Claims



1. A chemical metering system for delivering chemicals to a spray apparatus for dispensing chemical spray from a moving vehicle, said metering apparatus delivering said chemicals at a constant preselected application rate, the spray apparatus having a main fluid pump pumping carrier fluid from a carrier fluid supply along a carrier fluid flow path to a nozzle system, the chemical metering system comprising:

- at least one chemical supply tank;
- at least one positive displacement chemical metering pump communicating with said supply tank for continuously

delivering chemicals from the chemical supply tank to the carrier fluid flow path upstream of the nozzle system;
a ground speed sensing means for measuring vehicle ground speed;

a control module which includes motor control circuit to vary the speed of the chemical metering pump responsive to the vehicle speed sensed by the vehicle ground speed sensing means, and responsive to the operator inputs for the width of spray swath and the rate of chemicals to be dispensed per unit area of the terrain to maintain the preselected application rate;

said control module controlling the speed of the chemical metering pump in response to the width of spray swath and the speed sensing means generating a voltage signal related to ground speed, the control module having at least one range switch means for setting the width of spray swath, said range switch means being connected to a first resistance means for modifying the voltage signal from the speed sensing means transmitted to the chemical metering pump, said control module further having a concentration selector assembly for operator selection of the desired rate of chemical to be delivered to the ground, the concentration selector assembly having a second resistance means for further modifying the voltage signal from the ground speed sensing means in response to the selection of the desired rate, the control module and speed sensing means controlling the rotation of the chemical metering pump to permit the desired rate of chemical to be delivered to the ground independent of vehicle speed and carrier fluid flow, the range switch means for setting the width of spray swath permitting the chemical delivery system to be used with diverse nozzle configurations without recalibration of the speed sensing means and concentration selector assembly.

4,714,197

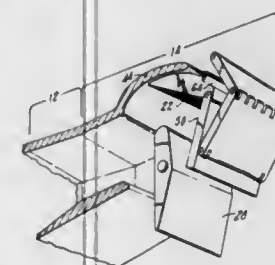
2-D PROPULSIVE LIFT NOZZLE
Edward B. Thayer, Jupiter, and Eric J. Ward, West Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 2, 1986, Ser. No. 881,375

Int. Cl.⁴ B64C 15/00

U.S. Cl. 239-265.29

7 Claims



1. An exhaust nozzle for directing a flowing stream of gas, including an exhaust duct comprising:

- two opposed, spaced apart sidewalls;
 - an upper flap assembly disposed between the two sidewalls; and
 - a lower flap assembly disposed between the two sidewalls, the lower flap assembly, the upper flap assembly, and the two sidewalls together defining a flow path for the gas stream,
- the upper flap assembly including
- a dorsal flap having a fore edge and an aft edge and being pivotable about a first fixed axis disposed within the gas flow path and extending between the two sidewalls, and
 - a downstream flap, having a fore edge and an aft edge, the fore edge of the downstream flap being pivotally connected to the aft edge of the dorsal flap for cooperatively defining a movable exhaust gas directing barrier,
- the lower flap assembly including
- a ventral flap having a fore edge and an aft edge and being

rotatable about a second fixed axis disposed intermediate the fore and aft edges thereof and extending between the two sidewalls;

a fixed dorsal wall, disposed between the two sidewalls and extending downstream adjacent the upper flap assembly; means, slidably engageable between the dorsal wall and the dorsal flap, for sealing against gas leakage therebetween; a first actuator, including a first pair of disks each disposed adjacent one of the two sidewalls, the first pair of disks cooperatively supporting the dorsal flap therebetween and being each centrally rotatable about the first fixed axis;

a linkage assembly, including

- a fairing link having a first end engaged with the aft end of the downstream flap, and a second end;
- a connecting link, having a first end engaged with the fairing link second end, and a second end engaged with the dorsal flap; and
- a thrust link, having a first end connected to a second actuator and a second end engaged with either the connecting link or the fairing link for selectably positioning the downstream flap.

4,714,198

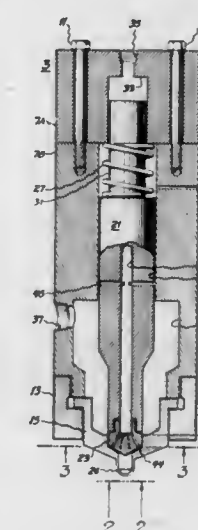
DUAL FUEL SINGLE INJECTOR NOZZLE
Sudhir D. Savkar, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1986, Ser. No. 937,246

Int. Cl.⁴ B05B 7/12

U.S. Cl. 239-409

5 Claims



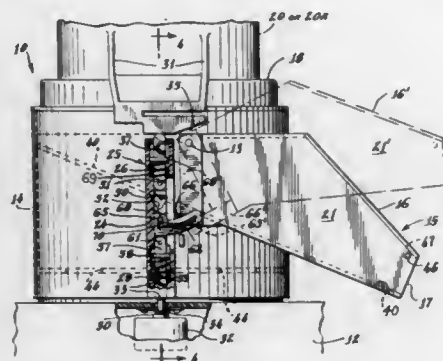
1. A dual fuel nozzle comprising:

- a housing defining an interior bore, a first and second chamber, a coal/water slurry inlet port and a pilot fuel inlet port, said first chamber in flow communication with the coal/water slurry inlet port and the second chamber in flow communication with the pilot fuel inlet port.
- said housing further including a nozzle cup, said nozzle cup defining a plurality of apertures extending from the interior of the nozzle cup to the exterior of the nozzle cup, said nozzle cup in flow communication with said first and second chambers;
- bias means; and
- a plunger slidably mounted in said bore, a portion of said plunger passing through said first chamber, one end of said plunger defining a valve, the valve engageable with a seat defined by said housing, said bias means urging said valve towards said seat, a portion of said plunger passing through said first chamber having an increasing diameter in a direction away from the valve end, said valve capable

output from said control logic means to the bowl mill controls.

4,714,203 CHUTE OPERATED CONTROL FOR A FOOD PROCESSOR

James E. Williams, Stamford, Conn., assignor to Cuisinart Research & Development, Inc., Greenwich, Conn.
Filed May 27, 1982, Ser. No. 382,718
Int. Cl.⁴ B02C 23/04
U.S. Cl. 241—36 11 Claims



1. In a food processor of the type including a housing having an electric motor drive, a bowl mountable on said housing for enclosing a rotary food processing tool within said bowl by said electric motor drive, removable components including a cover adapted to be secured in position on said bowl, a feed tube forming a passageway for feeding food items into said bowl, the improvement comprising:

- a chute having a first end positioned on said bowl and a mouth adapted to direct food processed by said food processing tool out of said bowl,
- a fixed inclined ramp mounted in said bowl beneath said food processing tool and extending on a downward slope toward the mouth of said chute for causing food processed by said rotary food processing tool to be deposited on said inclined ramp for sliding down said ramp into said chute for discharge from said bowl,
- an openable hinged lid having a first end mounted for pivotal movement on said bowl and a second end forming a portion of the mouth of said chute, said lid normally covering said chute and being openable by swinging said second end of said lid away from said mouth, and
- motor drive control means coupled to said lid for disabling said motor drive when said lid on said chute is swung open for providing access to said inclined ramp for wiping food materials off of said ramp.

4,714,204

IMPELLER-TYPE CUTTER DRUM FOR A CHOPPER

Günter John; Karl-Heinz Kretschmer, both of Neustadt, and Jürgen Röllich, Ehrenberg, all of German Democratic Rep., assignors to VEB Kombinat Fortschritt Landmaschinen, Neustadt in Sachsen, German Democratic Rep.
Continuation of Ser. No. 752,303, Jul. 3, 1985, abandoned. This application Oct. 14, 1986, Ser. No. 918,674
Claims priority, application German Democratic Rep., Jul. 4, 1984, 264915

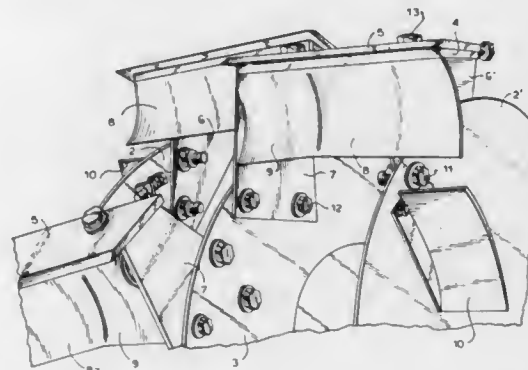
Int. Cl.⁴ B02C 18/22

U.S. Cl. 241—55

13 Claims

1. An impeller-type cutter drum for a chopper, the drum comprising:
- a drum body centered on and rotatable in one direction about an axis, and having a center drum disk generally perpendicular to the axis and right and left outer drum

disks parallel to the center disk, the center disk being between the outer disks;
respective right and left sets of holders each between its respective outer disk and the center disk, the holders being generally angularly equispaced about the disks to right and left axial sides of the center disk;
respective straight right and left blades having cutting edges, the blades being secured to the holders and each extending from respective inner ends at the center disk to respective outer ends at its respective outer disk, the blades being angled from the center disk back to the outer disks with the inner end of each blade trailing its respective outer blade end in the direction; and
respective right and left impeller vanes extending generally



parallel to and along the blades radially inward therefrom and each having

- a respective generally straight inner portion at the center disk and having an inner end at the center disk and an outer end, each inner portion being angled forward in the direction from the respective inner-portion outer end to the respective inner-portion inner end and
- a respective generally straight outer portion at the respective outer disk, angled forward in the direction from the respective inner-portion outer end toward the respective outer disk, mainly leading the respective inner portion in the direction, about at least three times longer than the respective inner portion, and meeting the outer end of the respective inner portion at an angled junction open forward in the direction.

4,714,205

DEVICES FOR CRUSHING, MASHING AND/OR GRINDING FOODSTUFFS

Willi Steinko, Nassau, Fed. Rep. of Germany, assignor to Mike & Krenkel Ltd., Kowloon, Hong Kong
Continuation of Ser. No. 635,386, Jul. 30, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 903,873
Claims priority, application United Kingdom, Aug. 1, 1983, 8320670

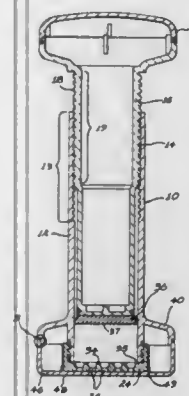
Int. Cl.⁴ B02C 19/08

U.S. Cl. 241—95

14 Claims

1. A device for crushing, mashing and/or grinding foodstuff, such as garlic, comprising:
- a hollow cylindrical housing with an external screw thread extending from a first end thereof, and an internal screw thread adjacent a second end thereof,
 - a central ram of length substantially equal to the length of the housing and of cross-section substantially equal to the inner cross-section of the housing, the ram having an external screw thread along a part of its length threadably engaging said internal screw thread on the housing such that twisting of the ram relative to the housing advances or retracts the ram in the housing,
 - an inner end to said ram which mates tightly with said hollow cylindrical housing,

a cup-shaped member having a perforated rigid grinding plate which covers the said first end of said housing, and a cylindrical wall portion extending from the plate, said wall portion having an internal screw thread matingly engaging said external screw thread on the housing, the cup-shaped member being removably mounted on said first end of the housing by means of said screw threads



whereby said plate mates with said first housing end to give a substantially crevice-free circular line join, said inner end of the ram having a shape which mates closely with the inner surface of said grinding plate so that when said ram is advanced fully to said first end of said housing substantially all of the foodstuff is forced through the perforations in said grinding plate.

4,714,206

BAG-RECEIVING CHUTE FOR COFFEE GRINDER

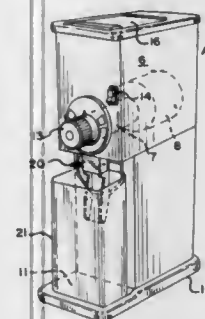
Charles A. Nidiffer, Decatur, and Raymond E. Van Camp, Rochester, both of Ill., assignors to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Apr. 1, 1986, Ser. No. 846,711

Int. Cl.⁴ B02C 19/00, 23/00

U.S. Cl. 241—100

8 Claims



1. A bag-receiving discharge chute combination for a coffee grinder having a downwardly facing discharge opening from which different sized batches of ground coffee are discharged into bags of correspondingly different heights, comprising:
- a substantially vertical downwardly extending elongated, channel-shaped chute body adapted to be attached at its upper end to an overhanging portion of the coffee grinder so that ground coffee discharges into the upper end of the chute, the open side of said chute faces away from the grinder, and the back side of said chute is spaced from the grinder; and,
 - a bag mouth spreader mounted on said chute body so as to prevent a bag mouth from being held with respect to said chute body so as to prevent free discharge of ground coffee therefrom.

4,714,207

IMPACT BAR FOR A COMMUNUTING ROTOR

Hermann Schrödl, Gallsbach, Austria, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

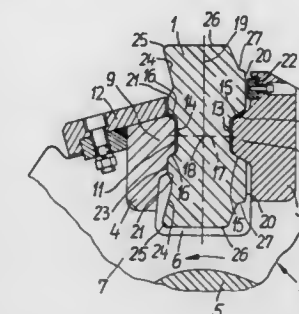
Filed Jul. 17, 1986, Ser. No. 886,441

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1985, 3525442

Int. Cl.⁴ B02C 13/28

U.S. Cl. 241—189 R

18 Claims



1. In an impact bar adapted to assume an installed state in a rotor of a comminuting machine; the rotor having a rotary axis, a plane of rotation and a direction of rotation; the impact bar having a length extending generally radially as viewed relative to said rotary axis in said installed state, a leading side and a trailing side as viewed relative to said direction of rotation in said installed state, and a cross-sectional area taken along a sectional plane extending parallel to said plane of rotation as viewed in said installed state; said cross-sectional area being curved in a generally C shape open towards said leading side and being symmetrically relative to a symmetry plane being generally perpendicular to said length; said cross-sectional area having a constriction lying in said symmetry plane; said trailing side being adapted to be supported against tangential forces at a location situated radially outwardly of said constriction as viewed relative to said rotary axis in said installed state; the improvement wherein said constriction is formed by a first and a second groove at said leading side and said trailing side; each groove being cross-sectionally symmetrical to said symmetry plane and each having a groove bottom and lateral groove flanks constituting holding faces for taking up forces oriented generally radially as viewed relative to said rotary axis in said installed state.

4,714,208

MAGNETIC BRAKE CONTROL FOR FISHING REEL

Joseph M. Holahan, and J. Myles Holahan, both of Anderson, S.C., assignors to Ryobi American Corporation, Bensenville, Ill.

Filed Sep. 16, 1985, Ser. No. 776,488

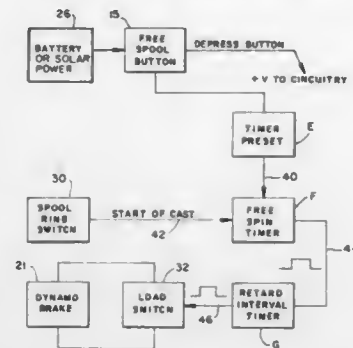
Int. Cl.⁴ A01K 89/02

U.S. Cl. 242—84.52 B

12 Claims

1. A fishing reel comprising a frame, a revolving spool mounted on a spool shaft connecting end members of the frame of the reel, a rotor mounted on the spool shaft, conductors carried by the rotor, a dynamo brake positioned adjacent to one of said end members of the frame, an electronic control means and timing means for controlling said brake, a source of direct electrical current, switch means, an actuator adapted to

actuate said switch means to close the electrical circuit to the spool from the wound cable and the removable flange to active said electronic control means and timing means for leave the wound cable on the removable flange.



braking of the spool for a selected time and to open said switch to release the spool from braking for a selected time.

4,714,209

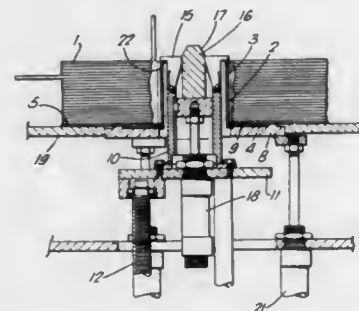
COIL FORMING METHOD

Vincent L. Allard, Staines, England, assignor to BICC Public Limited Company, London, England
Continuation of Ser. No. 746,182, Jun. 18, 1985, abandoned.
This application Oct. 20, 1986, Ser. No. 921,734
Claims priority, application United Kingdom, Jun. 20, 1984, 8415734

Int. Cl.⁴ B65H 54/00, 67/00; B21C 47/02

U.S. Cl. 242—25 R

11 Claims



6. In combination, a spool and an apparatus for separating a coil of cable from the spool, the spool of said combination comprising:

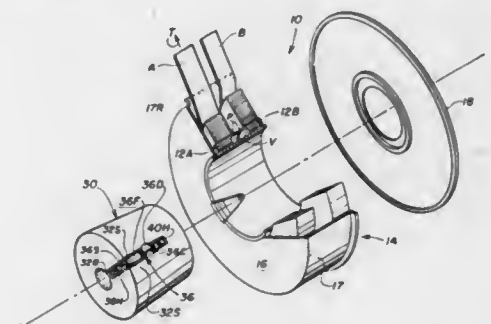
a removable flange having an aperture extending there-through;

an elongated spool barrel of generally constant outer cross section along its length, said cross section being dimensioned to enable said spool barrel to pass through said aperture in said removable flange; and the apparatus of said combination comprising;

means for selectively effecting relative movement between said removable flange and said spool barrel such that in a first relative position said spool barrel extends through said aperture and from said removable flange, and such that in a second relative position, said spool barrel is substantially free of said coil and substantially spaced from said removable flange.

11. A method of forming a coil of cable comprising the steps of: providing a spool comprising a longitudinally extending barrel and a spool flange fixedly connected to one end of the barrel; providing a removable flange having an aperture extending therethrough dimensioned to receive the spool barrel; moving the spool barrel through the aperture in the removable flange, such that the removable flange is generally adjacent the spool flange; winding a predetermined length of cable around the spool barrel and on the removable flange; and separating

4,714,210
DISPENSING APPARATUS
Gary W. Howell, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jun. 23, 1986, Ser. No. 877,616
Int. Cl.⁴ B65H 16/02, 23/08
U.S. Cl. 242—55.3 5 Claims



1. Apparatus for dispensing a strip of material mounted on each one of a pair of separate spools, the apparatus comprising: a hub having an axial dimension sized to receive both of the spools in spaced axial adjacency, the hub having an axially extending slot therein, the slot being arranged in the hub so as to expose a portion of a selected one but not the other of the spools receivable thereon;
- a spindle insertable into the hub, the spindle having a bore and a groove formed therein, the groove being defined by a pair of sidewalls and a base;
- a rotation retarding member mounted within the groove in the spindle and projectable through the slot in the hub to abut the selected spool in a friction generating relationship so as to inhibit the rotation of the selected spool with respect to the hub, a portion of the member abutting against a sidewall of the groove and arranged so that any torque imposed on the member by rotation of the selected spool is transmitted to the spindle; and
- a biasing spring disposed in the bore, the spring biasing the member into the friction generating relationship with the spool.

4,714,211

PACKING FILM DISPENSER

Harrison Hwang, No. 23, Lin Tsuo Road, Shenkang, Taichung Hsien, Taiwan

Filed Jul. 15, 1986, Ser. No. 885,770

Int. Cl.⁴ B65H 23/06; B44C 7/00

U.S. Cl. 242—96

9 Claims

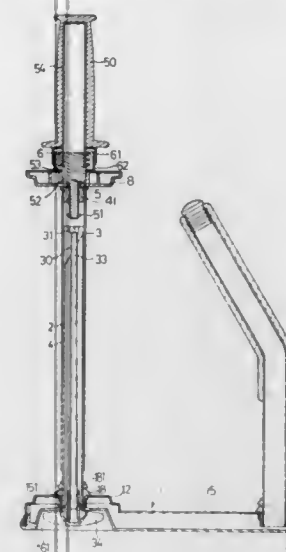
1. A film dispenser particularly suited for wrapping plastic packing film under tension about an object of large volume wherein the dispenser comprises

a rigid base tapering from a wide portion to a narrow portion,

a handle extending from said narrow portion,

an adjustable film roll support means extending from said wide portion and comprising an elongated wedging means telescoping within an outer tube, said wedging means cooperating with said outer tube to secure said tube at a

desired extension, and tension applying means attached to said outer tube at the upper end thereof cooperating with



said base to apply tension across the width of a roll of packing film.

4,714,212

PNEUMATIC TAPE TENSIONING DEVICE FOR A CASSETTE LOADING MACHINE

Angelo Bosco, San Donato, and Edgardo Magnaghi, Peschiera Borromeo, both of Italy, assignors to Telefunken Robotecnica S.R.L., Sao Gio Vanni, Italy

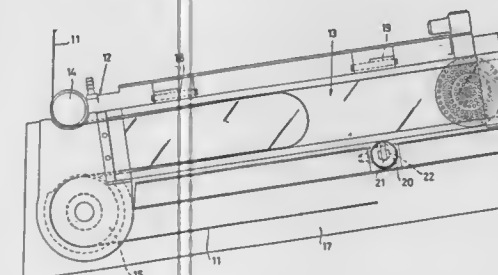
Filed Oct. 14, 1986, Ser. No. 918,328

Claims priority, application Italy, Oct. 11, 1985, 22451 A/85

Int. Cl.⁴ B65H 19/20; G11B 15/58

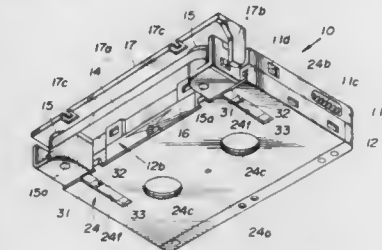
U.S. Cl. 242—182

6 Claims



1. A tape-tensioning arrangement in a machine for the loading of tape onto cassettes, including a tape-tensioning mechanism located between a spool from which tape is wound off and two processing stations at which alternative loading of cassettes takes place comprising: a closed tensioning container having an inlet and outlet and on the inside of which a vacuum is utilized to tension the tape and into and out of which the tape coming from the spool enters and exits, curved elements for guiding the tape into the inlet and out of the outlet of the container, wherein said tensioning container and the respective curved element for the guiding of the tape from its outlet are both mounted on a joint carrier that is pivotally mounted, and control means are provided to angularly pivot and thus shift said carrier alternately into one or the other of two positions, aligned to one or the other of the two processing stations in order to feed the tape directly to the correct station.

4,714,213
MAGNETIC TAPE CASSETTE WITH MAGNETIC TAPE PROTECTIVE CLOSURE AND BIAS MEANS THEREFOR
Toshihiro Watanabe, and Hiroshi Meguro, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 18, 1986, Ser. No. 886,685
Claims priority, application Japan, Jul. 26, 1985, 60-114800
Int. Cl.⁴ G03B 1/04; G11B 23/04
U.S. Cl. 242—198 13 Claims



1. A magnetic tape cassette comprising:

a cassette casing housing a pair of tape reels and defining a cut-out formed at the front end of its floor and a front end opening through which a magnetic tape is exposed to the outside of said cassette casing;

a closure member slidably attached to said cassette casing for openably closing said cut-out, said closure member being movable between a first position closing the cut-out and a second position shifted rearwardly from said first position and thereby opening said cut-out; and

a torsion spring associated with said closure member for biasing the latter toward said first position, said torsion spring being secured to said closure member for movement therewith and having one end engaging the inner periphery of said cassette casing so as to accumulate spring force as said closure member shifts toward said second position.

4,714,214

APPARATUS FOR PRODUCING BIAXIAL TILTABLE SUPPORT FOR A ROTATIONAL BODY

Lars J. Schleimann-Jensen, Danderyd, and Fred H. E. Anderson, Järfälla, both of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

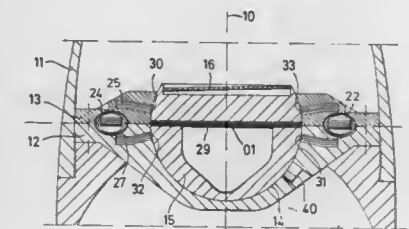
Filed May 20, 1986, Ser. No. 865,223

Claims priority, application Sweden, May 22, 1985, 8502509-6

Int. Cl.⁴ F42B 15/02; G01C 19/06

U.S. Cl. 244—3.16

20 Claims



1. Apparatus for producing biaxial tilttable support of a rotational body comprising:

a rotational body having an at least partly outer spherical surface portion;

a stationary part having a recess therein with an inner spherical surface portion substantially corresponding to the outer spherical surface portion of said rotational body, said body being rotationally disposed in said stationary part on a spin axis;

means for maintaining a small gap between the inner and

outer spherical surface portions of said stationary part and said rotational body respectively;

torque producing means being arranged about said rotational body for producing torques on said body causing controlled tilting thereof with respect to two mutually perpendicular turning axes normal to said spin axis;

the improvement characterized in that said torque producing means comprises:

a plurality of magnetic yokes in said stationary part, electrical windings being on each of said yokes, each of said yokes having magnetic poles at its ends, each of said poles being situated on the inner spherical surface portion of the recess of said stationary part and being substantially diametrically opposite one another;

said rotational body comprising a part of magnetic material terminating at the outer surface portion of said body for forming return paths for magnetic flux flowing between each of said poles of each respective one of said plurality of yokes, the magnetic part having a center plane passing through it; and

each of the poles of said respective one of said plurality of yokes being arranged obliquely relative to the center plane of the magnetic part with respective opposing poles situated on an opposite side of the center plane in a non-deflected position of said body;

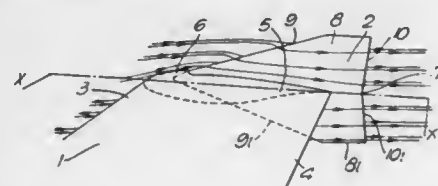
whereby in response to selective activation of the electrical windings of said plurality of yokes, by cooperation between the magnetic poles of the yokes and the magnetic part of said body, torques are transferred to said body producing controlled tilting of said body with respect to the mutually perpendicular turning axes.

4,714,215

AIRCRAFT WING AND WINGLET ARRANGEMENT
 Jeffrey A. Jupp, Filton, and Peter H. Rees, Hatfield, both of United Kingdom, assignors to British Aerospace PLC, London, England
 Continuation-in-part of Ser. No. 601,081, Apr. 16, 1984, abandoned. This application Jun. 12, 1986, Ser. No. 873,526
 Claims priority, application United Kingdom, Apr. 15, 1983, 8310224

Int. Cl.⁴ B64C 23/06
 U.S. Cl. 244—199

2 Claims



1. An aircraft wing including, main wing means (1) having a median plane (X—X) and a wing tip region of specified chord having a leading edge region (3) and a trailing edge region (4) and winglet means (2) extending upwards and/or downwards from the median plane (X—X) of said wing tip region, the winglet means having a root region (5) with both a forward extremity (6) and a rearward extremity (7) in the region of the median plane, the forward extremity of the winglet means lying at or rearward of the leading edge region of the main wing means, a tip region (8) remote from the median plane, a leading edge region (9) extending between the forward extremity and the tip region of high sweep back (Q) over at least part of its length, and a trailing edge region (10) extending between the rearward extremity of the root region and the tip region, the value of the square of the distance from the tip region to the root region divided by the area bounded by and including the root region, the tip region, the leading edge region, and the trailing edge region being 1.5 or less, and characterized by having a cambered profile which is so shaped to cause a median line (44) to droop at the leading edge region (9) in a direction outboard with reference to the main wing means

when said winglet means (2) extends upwards from said median plane (X—X) and in a direction inboard with reference to the main wing means when the winglet means (2) extends downwards, whereby in air flow break-away conditions the air flow over the winglet means changes from conventional attached flow to vortex flow and the vortex sheets of said vortex flow extend over an inboard facing surface of the upwardly extending winglet means and over an outboard facing surface of the downwardly extending winglet means, and whereby the bending load exerted upon the main wing means by the presence of the winglet means increases relatively slowly as main wing lift increases.

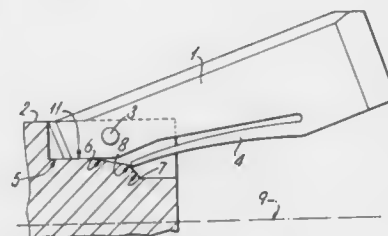
4,714,216

FIN ERECTING MECHANISMS

Spencer D. Meston, and John W. Phillips, both of Bristol, United Kingdom, assignors to British Aerospace Public Limited Company, England
 Filed Mar. 24, 1986, Ser. No. 843,382
 Claims priority, application United Kingdom, Mar. 23, 1985, 8507614

Int. Cl.⁴ B64C 5/12
 U.S. Cl. 244—3.29

14 Claims



1. A fin erecting mechanism comprising:
 support means;
 a fin member including means for pivotably attaching said fin member to the support means and which is movable from a stowed to a deployed position; and
 spring means attached to the fin member at one end and which is supported by the support means at the other end, the spring means being operable to deploy the fin member by moving it from its stowed to its deployed position said spring means comprising a cantilever, said cantilever attached to said fin member at a point remote from said attaching means, said cantilever having a free end extending toward said attaching means.

4,714,217

KITE LINE TAKE-UP DEVICE

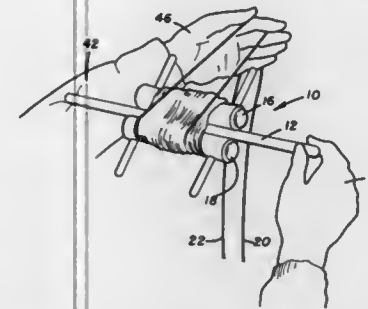
Daniel Prentice, 2021 Folsom St., San Francisco, Calif. 94110
 Filed Feb. 26, 1986, Ser. No. 833,908
 Int. Cl.⁴ B64C 31/06; B65H 75/40

U.S. Cl. 244—155 R

17 Claims

1. A control and take-up assembly for use with a multi control line kite comprising:
 an axle;
 a pair of elongated handles, each having an axis, each handle having affixed thereto at least one of the control lines;
 means for temporarily affixing said elongated handles to said axle to form a take-up assembly such that the axes of said

handles are substantially parallel to the axis of said axle, and the handles laterally displaced on opposite sides of



said axis of said axle a distance at least equal to the radius of said axle.

4,714,218

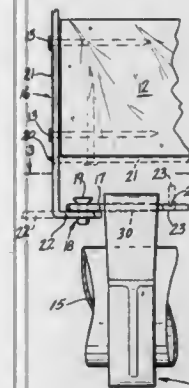
HANGER FOR PIPE CLAMP

Charles S. Hungerford, Jr., 6 Beechwood Ct., Woodbury, Conn. 06798

Filed Jul. 17, 1986, Ser. No. 886,411

Int. Cl.⁴ F16L 3/02
 U.S. Cl. 248—62

10 Claims



1. In combination, a support bracket and a pipe clamp, said bracket defining a pair of relatively movable strap means, a first strap means being operable to connect with a fixed support at a selected position, fastening means for effecting the connection between said first strap means and said fixed support at said selected position and a second strap means operable to engage releasably said pipe clamp whereby said pipe clamp can be spaced from said fixed support a distance which is a function of said selected position, said pipe clamp being operable in said spaced condition to engage said second strap means with freedom to assume a plurality of angular or rotational positions relative to said fixed support wherein the first strap means and the second strap means in the hinged condition define an L-shaped configuration, so that said pipe clamp when engaged by said second strap means is rotatable relative to said first strap means when said first strap means is secured to said fixed support through at least 180°.

4,714,219

CHRISTMAS LIGHT HANGERS

Noble R. Mayse, P.O. Box 5973, Concord, Calif. 94524

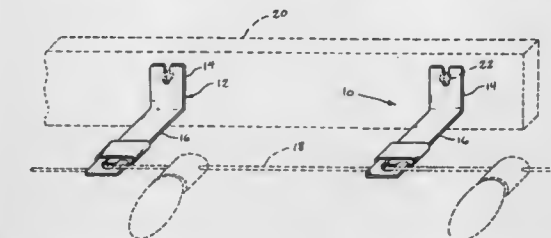
Filed Jan. 8, 1987, Ser. No. 1,411

Int. Cl.⁴ F16L 3/08
 U.S. Cl. 248—65

5 Claims

1. A Christmas light string holder, comprising:

a. bracket means having first and second legs, said bracket means having a substantially L-shaped design;
 b. first slot means formed in said first leg, said first slot means facilitating an attachment of said first leg to a static structure through a use of a fastener;
 c. second slot means formed in said second leg, said second slot means serving to receive said Christmas light string so



as to effect a securement thereof to said holder, said second slot means including a first slot portion formed in said second leg and a second slot portion in communication with said first slot portion and being substantially orthogonally directed relative thereto; and,
 d. locking means for fixedly holding said Christmas light string in said second slot means, said locking means comprising a slidable sleeve movable along said second leg.

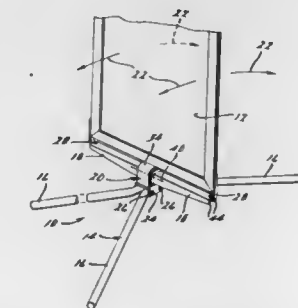
4,714,220

SIGN STAND ASSEMBLY

David U. Hillstrom, Novi, Mich., and Dennis R. Cope, Kent, Ohio, assignors to Marketing Displays, Inc., Farmington Hills, Mich. and B. F. Goodrich Company, New York, N.Y.
 Continuation-in-part of Ser. No. 824,745, Jan. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 784,906, Oct. 7, 1985, abandoned. This application Sep. 9, 1986, Ser. No. 905,673

Int. Cl.⁴ F16M 13/00
 U.S. Cl. 248—160

45 Claims



1. A sign stand assembly for supporting a sign, said sign stand assembly comprising: a base; at least one sign-supporting member securable to the sign; and resilient biasing means interconnecting said base and said sign-supporting member for normally biasingly supporting said sign-supporting member in a generally upright position relative to said base, said resilient biasing means including at least one elastomeric member resiliently and torsionally deflectable about a torsion axis for allowing said sign-supporting member to pivotally deflect relative to said base from said generally upright position in response to predetermined forces exerted on said sign-supporting member, and said sign stand assembly further including means for compressively preloading said elastomeric member.

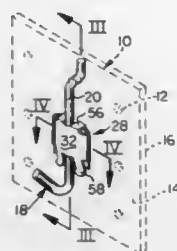
4,714,221

PEGBOARD BRACKET RETAINER

Philip G. Cawrey, 1573 Alvamar Dr., Lawrence, Kans. 66046
Filed Feb. 25, 1987, Ser. No. 18,424
Int. Cl.⁴ A47B 96/06

U.S. Cl. 248—221.1

14 Claims



1. A retainer for perforated board brackets wherein the board includes front and rear surfaces intersected by perforations and the bracket includes an elongated stem located adjacent the board surface, comprising, in combination, a rear member adapted to be inserted between the bracket stem and the board front surface, said rear member including lateral edges and first and second end regions, a front member having lateral sides defining a horizontal width as great as the width of said rear member and first and second end regions, guides defined upon said front member lateral sides mating with said rear member lateral edges whereby said front and rear members may be interconnected with the bracket stem located therebetween, stem locating means defined upon one of said members, and a stabilizer projection defined upon one of said rear member end regions for reception into a board perforation.

4,714,222

BRACKET STRUCTURE FOR DENTAL PURPOSES

Helmut Kiesel, and Klaus Stoeckl, both of Bensheim, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

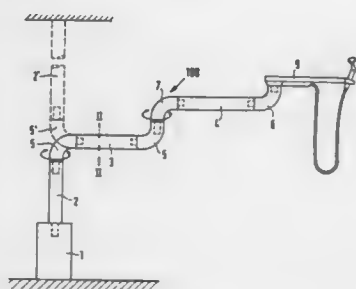
Filed Nov. 26, 1985, Ser. No. 801,878

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3445020

Int. Cl.⁴ E04G 3/00

U.S. Cl. 248—282

17 Claims



1. In a bracket structure having one or more straight carrier members and elbow members, the improvement comprising at least one of the carrier members and at least one of the elbow members having mutual mating plug-in parts to form a rigid connection therebetween with coating means including ridges and channels to prevent twisting between the parts and to enable a disassembly of the parts and reassembly with the positions offset relative to one another by at least 180°.

4,714,223

MOUNTING DEVICE FOR FOG LAMP

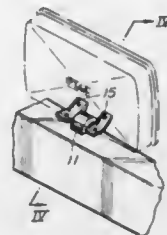
Masashi Kamaya, Tokyo, Japan, assignor to PIAA Corporation, Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,441

Int. Cl.⁴ E04G 3/00

U.S. Cl. 248—291

3 Claims



1. A mounting device for a fog lamp having a frame and comprising:
a support mounted on a vehicle, said support including rounded protrusions formed on opposite sides thereof;
a pair of rotating parts having rounded depressions engageable with the protrusions; and
a pair of bolts swivelingly connecting said pair of rotating parts with said support wherein said pair of rotating parts are connected to said frame of the fog lamp.

4,714,224

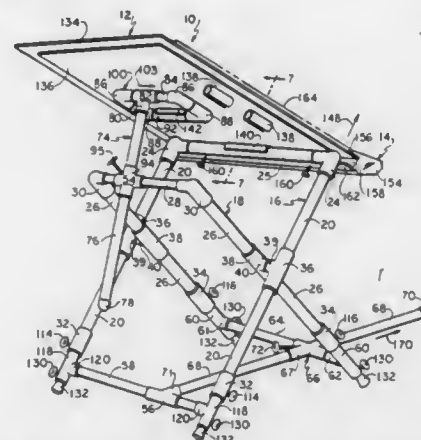
COLLAPSIBLE EASEL FOR ARTISTS

Bobbie G. Calmes, 2449 Seracedar St., Baton Rouge, La. 70816
Filed Mar. 12, 1987, Ser. No. 25,185

Int. Cl.⁴ A47B 97/08

U.S. Cl. 248—465

7 Claims



1. A collapsible easel for use by an artist comprising in combination; a platform structure having a supportive top surface area, opposite side edges, opposite end edges, receiving means secured to one end portion and one side portion of the back surface area and a co-pivotal receiving means securing one of its ends to the central portion thereof, having its opposite end pivotal 360 degrees therefrom; and

a composite outer leg unit including a first pair of parallel main legs having upper ends connecting at right angles to opposite ends of an inwardly disposed rigid horizontal member interconnecting a rotatable outwardly disposed first upper horizontal member, and lower ends connected to a first pair of opposed side coupling means, a first lower horizontal member having opposite ends connected at right angles, by a first pair of opposed side rigid connective means, to lower ends of a first parallel pair of co-extensible auxiliary legs correspondingly housed longitudinally in said first pair of main legs, a pivotal connective

means engaged in the horizontal axis of said first lower horizontal member; and
a composite inner leg unit appropriately shorter in overall length and width than said composite outer leg unit includes a second pair of parallel main legs having upper ends connecting at right angles to opposite ends of a second upper horizontal member, and lower ends connected to a second pair of opposed side coupling means, a second lower horizontal member having opposite ends connected at right angles, by a second pair of opposed side rigid connective means, to lower ends of a second parallel pair of co-extensible auxiliary legs correspondingly housed longitudinally in said second pair of main legs, a first pivotal guide means pivotally interconnected in the horizontal axis of said second lower horizontal member, by bearing means contained therein, having a first releasable locking means, a second pivotal guide means pivotally interconnected in the horizontal axis of said second upper horizontal member, by bearing means contained therein, having a second releasable locking means; and
said composite leg units share a stabilizer bar means having one end secured into said pivotal connective means extending perpendicularly in alignment therefrom slidably engaging through said first pivotal guide means connecting its opposite free end into a cap means, co-axial means interconnected between the upper and lower ends of each said first and second main leg having opposite facing branch members pivotally joined by bearing means contained therein in a common horizontal axis thereof, thereby enabling said composite leg units to be pivoted in opposite directions away from their inoperative co-planar collapsed position to operative extended positions within quadrant arcs thereof pivotally disposing said stabilizer bar means respectively from an inoperative vertical position to an operative horizontal position thereof and locking therein by said first locking means to supportively maintain said extended positions; and
leveling legs individually housed longitudinally in each said auxiliary leg having their outer lower ends secured into individual base member; and
each said pair of auxiliary legs co-extend slidably downward from their respective housed positions thereby providing said easel with height and leveling adjustment when same is in an operative extended position; and
each said leveling leg individually extend slidably downward from their respective housed positions thereby providing said easel with leveling and height adjustment when same is in an operative extended position; and
each said side coupling means and each said side rigid connective means include a releasable locking means in their lower portions maintaining respectively said auxiliary legs and said leveling legs in their extended or fully retracted positions and each also include a bushing means secured into lower apertures corresponding to said auxiliary and leveling legs; and
said composite inner leg unit also includes a pivotal support means comprised of a slidable hinging connective means, a turn-mount means interconnected at right angles to a parallel pair of opposite side members, having a lever bar means connecting one end into said hinging connective means extending perpendicularly therefrom intersecting slidably through said second pivotal guide means connecting its opposite end into a cap means, thereby providing a pivotally coordinated counter pivotal structure thereof, transferable from an inoperative co-planar position in said composite inner leg unit to operative pivotal and translatable positions within a 360 degree arc from said second upper horizontal member when said composite leg units are pivotally extended in said operative positions.

4,714,225

FOUNDATION SYSTEM FOR GROUND-MOUNTED MASTS

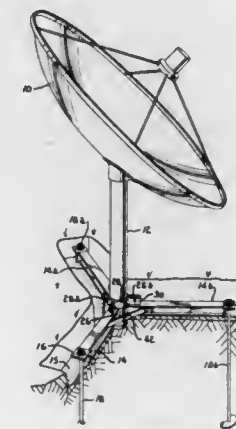
Jerald P. Skinner, 3014 Eveningside Dr., Topeka, Kans. 66614; Richard A. Zlotky, 246 Yorkshire, Topeka, Kans. 66606, and Robert L. Diel, 2537 Michigan, Topeka, Kans. 66605

Continuation-in-part of Ser. No. 751,622, Jul. 2, 1985, abandoned. This application Sep. 9, 1986, Ser. No. 905,509

Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—523

7 Claims



1. In combination, a portable in-ground foundation system mounting a pipe mast comprising:
a foundation structure adapted for installation in the ground just below the surface thereof and having a central mounting hub receiving a lower end portion of said mast, said structure comprising a plurality of initially separate, unitary arms each having an inner end at said hub and radiating outwardly therefrom to present an outer end remote from said hub,
a plurality of thin shaft, screw-type earth anchors each having a shank secured to and depending from a corresponding arm adjacent the outer end thereof for anchoring the foundation system in the ground, the inner end of each arm being provided with a clamp element integral therewith and partially embracing said mast,
said clamp elements on respective arms presenting said mast-receiving hub and each such element including a collar segment conforming to said mast to provide surface-to-surface contact therewith,
fastening means releasably joining said clamp elements together and uniting said arms in a manner such that said collar segments circumscribe said lower end portion of the mast to provide a torsion-resistant joint supporting the mast on the arms, and
adjustable means connecting said shanks of the anchors to said arms for leveling said structure.

4,714,226

METHOD AND APPARATUS FOR MOUNTING A DAVIT ON A ROOF STRUCTURE

Stephen E. Tracy, Seattle, Wash., assignor to Spider Staging, Inc., Renton, Wash.

Filed Jun. 24, 1986, Ser. No. 877,807

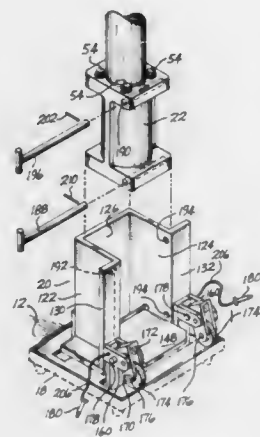
Int. Cl.⁴ F16M 13/00

U.S. Cl. 240—544

24 Claims

16. A davit mount, comprising:
a base member formed to include a pair of spaced apart front and rear first and second hook receiving openings, said hook receiving channel openings being substantially rectangular in shape, being long and narrow, and being parallel to each other, a support portion between the hook receiving openings and hook engaging portions bordering said hook receiving openings;

a mobile davit socket having first and second sidewalls spaced opposite each other, a front wall interconnected between the first and second sidewalls, a bottom, an open top, and a rear open fourth side, first hook means depending from the socket on the open fourth side of the socket, said first hook means including a first end wall which depends downwardly from the socket, and a first hook member which extends forwardly from said first end wall, and second hook means depending from the front wall the socket, said second hook means including a second end wall which extends downwardly from the socket, and a second hook member which extends laterally from said second end wall in the same direction as the first hook member, and away from the socket; said hook receiving openings in the base member being sized and shaped to receive the hook members when said hook members are aligned with said hook receiving openings, so that the davit socket can be transported to the base member and the hook members put into alignment with the hook receiving openings in the base member, and the socket can be moved to insert the hook members through said hook receiving openings and place the bottom of the



socket on the support portion of the base member between the hook receiving openings, and then the socket can be shifted in the direction that the hook members extend, to place the hook members below the hook engaging portions of the base member, said shifting movement creating an open space in the hook receiving opening into which the first hook member was inserted, rearwardly of the first end wall;

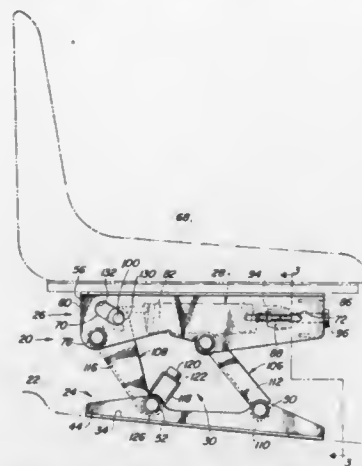
a swing member located between the first and second sidewalls, said swing member having first and second ends, and hinge means pivotally connecting the first end of said hinge member to the first and second sidewalls at positions near the bottom and the front wall of the socket, for swinging movement of said swing member between an up position and a down position; and
a filler member connected to said swing member, said filler member being positioned such that when the swing member is in its down position the filler member is received within said space in the hook receiving opening which is positioned outwardly of the first end wall, and such filler member is in a position to block a shifting movement of the socket back into a position in which the hook members are in removal alignment with the hook receiving openings.

4,714,227
SEAT SUSPENSION FOR AN OFF-ROAD VEHICLE
David R. Holm, Oconomowoc, and Rudolph A. Peterson, Jr., Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Nov. 17, 1986, Ser. No. 931,286
Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—595

18 Claims



1. A seat suspension system for an off-road vehicle comprising:

means for connecting said suspension to said vehicle;
means, operatively connected to said suspension connection means, for connecting a seat to said suspension;
means, operatively connected to said seat connection means, for attenuating the acceleration of said seat connection means toward said suspension connection means; and
means, operatively connected to said suspension connection means, for directly contacting said attenuation means prior to said suspension connection means and said seat connection means colliding thereby reducing the sudden jerk produced by said collision.

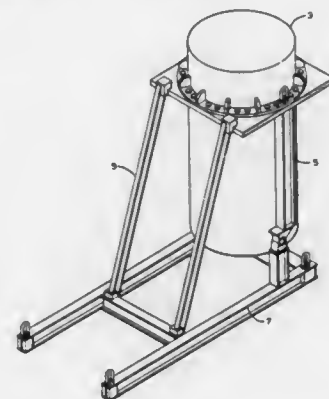
4,714,228
SELF-ADJUSTABLE SUPPLEMENTAL SUPPORT SYSTEM FOR A CYLINDRICAL CONTAINER IN A HOUSING

Ronald M. Blaushild, Wilkensburg, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 30, 1987, Ser. No. 10,505
Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—608

9 Claims



1. A self-adjustable supplemental supporting system for a cylindrical container having an external surface within a cylin-

drical housing having an inner surface, wherein the container has an outwardly extending flange at the upper region thereof resting on a radially inwardly directed complementary support flange about the upper region of the inner surface of the cylindrical housing and axially supporting the cylindrical container within the housing at a spaced relation from the inner surface and bottom of the housing, comprising:

a support ring attached to the external surface of the cylindrical container;
a plurality of radially outwardly extending bracket units secured to said support ring; and
a plurality of resilient supporting bar units secured to the inner surface of said cylindrical housing in confronting relationship to said bracket units; such that the bracket units are seated on said resilient supporting bar units to prevent radial movement of the cylindrical container within the cylindrical housing.

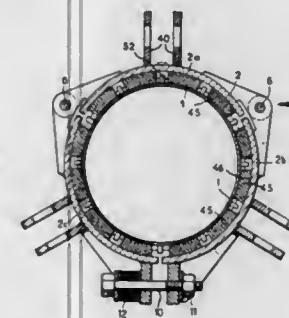
4,714,229
ANTI-VIBRATORY SUPPORT DEVICE FOR A PIPE WHOSE THICKNESS IS SMALL RELATIVE TO THE DIAMETER

Christian Force, St. Cheron, and Alain Lescure, Chaville, both of France, assignors to Novatome, Le Plessis-Robinson, France
Filed Apr. 26, 1985, Ser. No. 727,645

Claims priority, application France, Apr. 27, 1984, 84 06642
Int. Cl.⁴ F16L 3/10

U.S. Cl. 248—610

7 Claims

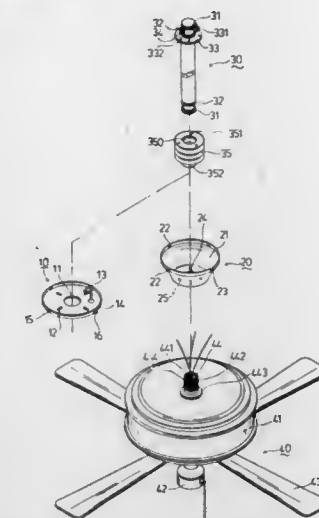


1. An anti-vibratory support device for a pipe whose thickness is small relative to its diameter and whose operating temperature is elevated, said device comprising a collar for fixing to an installation in which the pipe is to be mounted and surrounding the pipe in such manner as to define an annular space around the pipe, and a deformable and elastic annular means interposed between the collar and the pipe, said collar comprising at least two rigid annular sectors disposed in the extension of one another in spaced relation so as to define a gap therebetween, each rigid sector carrying at least one of its ends, articulation means substantially complementary to articulation means carried by the succeeding rigid sector, so as to constitute an articulation having an articulation axis parallel to an axis common to the pipe and the collar, an elastic junction means interconnecting at least two successive rigid sectors at one end of the rigid sectors and enabling the collar to be closed, and the deformable annular means interposed between the collar and the pipe comprising at least two successive deformable annular sector structures, each sector structure comprising a maintaining case fixed to a rigid sector of the collar and having a cylindrical inner bearing wall having the same diameter as the pipe, and a plurality of parallelepipedic pads made from knitted stainless steel wire disposed in said case and interposed between an inner cylindrical surface of the collar and said inner bearing wall of the case, said elastic junction means of the collar permitting the exertion of forces of radial direction on the deformable annular sector structures so as to put them under compression between the collar and the pipe.

4,714,230
CONVERTIBLE SUSPENSION MOUNTING SYSTEM FOR CEILING FANS
Ming-Chien Huang, Taichung Hsien, Taiwan, assignor to St. Island Intl. Patent & Trademark Office, Taipei, Taiwan
Filed Sep. 30, 1985, Ser. No. 781,914
Int. Cl.⁴ B42F 13/00

U.S. Cl. 248—613

1 Claim



1. A convertible suspension mounting system for use with a ceiling fan which utilizes a support structure comprising a disk member having a central opening and a plurality of threaded orifices provided therein for being fastened to a ceiling surface and a housing body having an annular opening and screw holes in its bottom side and a plurality of round holes in its upper periphery connected to the disk member through the threaded orifices, the ceiling fan having a threaded pipe fitting provided on top thereof for effecting connection with the support structure, said mounting system operations comprising:

a tubular connecting member having a threaded portion and a through hole respectively provided at its upper and lower portions for being vertically received at its upper portion in the annular opening of the housing body and for permitting connection at its lower portion to the threaded pipe fitting of the ceiling fan;
a circular coupling member, whose diameter is larger than that of the annular opening of the housing body, having an axial opening in its center, with a diameter larger than that of the connecting member, and a plurality of screw holes located in its side surface, said coupling member being connected to the upper portion of said connecting member through the axial opening;
a stop element fixed in the through hole at the upper portion of said connecting member over said circular coupling member to secure the latter in position; and
an axially flexible pipe sleeve of shock absorbing material having a through opening with a diameter larger than that of the connecting member and smaller than that of said circular coupling member positioned around the upper portion of said connecting member between said circular coupling member and the bottom side of the housing body, a reinforced portion formed at the top and bottom areas of said sleeve;
a plurality of screw holes symmetrically located therein for permitting connection with said circular coupling member and the bottom side around the annular opening of the housing body; and
a tubular neck portion formed around its lower end with a diameter larger than that of the through opening and smaller than that of the annular opening of the housing body for movably receiving the upper portion of said connecting member therein, said connecting member thereby being provided with suffi-

cient axial deviation so as always to be kept perpendicular to the ground level of a building in which the ceiling fan is mounted under various ceiling conditions.

4,714,231

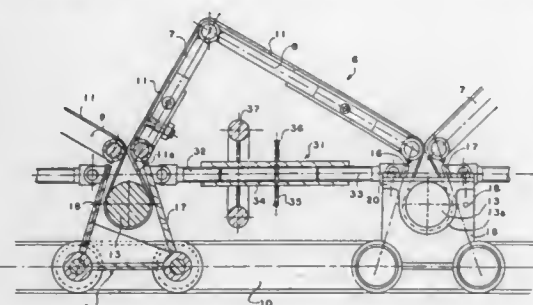
ADJUSTABLE MOLD FOR THE MANUFACTURE OF CONCRETE ELEMENTS SUCH AS STAIRCASES

Bernard Colman, 7 Rue Jean Bouyssou, 31500 Toulouse, France
Filed Apr. 8, 1986, Ser. No. 850,909

Int. Cl.⁴ B28B 7/22

U.S. Cl. 249—14

17 Claims



1. Adjustable mold for the manufacture of concrete staircase elements, said mold comprising a frame (1) on which is mounted a base (2), a forward lateral wall, a rear lateral wall (4) and two longitudinal walls (5), the said base being constituted by juxtaposed molding elements (6) each arranged in a dihedral angle which dihedral angle is constituted by a wall (7) intended to form the tread and by a wall (8) intended to form the riser characterized in that each molding element (6) is supported by carriages (9) movably mounted on horizontal guide rails (10), longitudinal to the mold, mounted on the frame (1) and in that a flexible strip (11) sealed to the concrete is stretched by stretchers (12) mounted at each extremity of the mold and is forced to cover and to conform to the shape of the base (2) of the mold by winding on rollers (13), each roller being mounted beneath the base (2) between two molding elements (6), and by gripping between the molding elements when these latter are maintained pressed the ones against the others by jacks (14).

4,714,232

BEARING RING FOR FIXING A MOUNTING BLOCK ON THE PROGRESSIVELY VARIABLE CURVED FINISHED FACE OF A SEMI-FINISHED LENS OR MOLD BLANK

Gérard Blot, Draveil, France, assignor to Essilor International Cie Generale d'Optique, Creteil, France

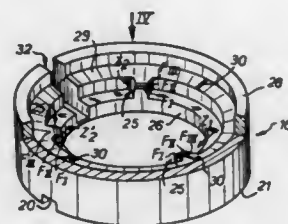
Filed Jan. 23, 1986, Ser. No. 824,562

Claims priority, application France, Feb. 1, 1985, 85 01422

Int. Cl.⁴ B24B 4/06

U.S. Cl. 249—90

14 Claims



1. A bearing ring for semi-finished ophthalmic lens or lens mold blanks having progressive convex faces of different curvature, said bearing ring comprising a plurality of bearing areas for contact with any selected one of a plurality of different semi-finished blanks within a selected range, said bearing areas being circumferentially spaced around an axis, said bearing

ring having a reference plane perpendicular to said axis and axially inwardly of said bearing areas, all of said bearing areas being generally inclined relative to said reference plane, each of said bearing areas extending between two bearing areas ends radially and axially offset relative to each other, each of said bearing areas having a median plane containing said axis and extending radially through a middle of said bearing area, planes tangential to respective ends of each of said bearing areas and orthogonal to said medial plane forming an obtuse dihedral angle having a concave side facing towards said reference plane, each of said bearing areas comprising a plurality of bearing facets for selective contact with a semi-finished blank, all of said bearing facets being generally inclined relative to said reference plane and all being orthogonal to the corresponding median plane, the inclination of each of said bearing facets of each of said bearing areas being different from that of other bearing facets of the same bearing area, said bearing facets being in radial succession on circumferences of different diameter according to their inclination, end bearing facets of each of the bearing areas being coincident with corresponding end tangential planes.

4,714,233

ADAPTER BRACKET FOR MAKING A VALVE FIRE SAFE

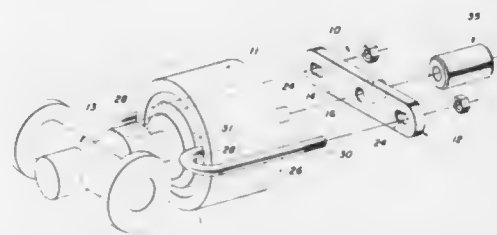
Danny R. Oates, Lake Charles, La., assignor to Conoco Inc., Ponca City, Okla.

Filed Jan. 20, 1987, Ser. No. 5,533

Int. Cl.⁴ F16K 31/00

U.S. Cl. 251—14

5 Claims



1. Apparatus for converting a conventional gate valve to a fire safety valve, wherein said gate valve includes a slide gate operated by an actuator which overcomes a biasing spring and maintains said valve in an open position by fluid pressure and an end of an actuator rod which projects beyond a first surface of an actuator housing, said apparatus comprising:

an adapter plate, said plate having a first flat side, with a cylindrical extension protruding from a second opposite side of said adapter plate, said cylindrical extension having an inner diameter sufficiently large to non-engagingly receive said actuator rod, the outside of said cylindrical extension being threaded;

means for securing said adapter plate to the exterior of said actuator housing with said first flat side toward said actuator housing;

said cylindrical extension being adapted to be threadingly engaged by an actuator rod-engaging cap, at least a portion of said rod-engaging cap being made of fusible material, said fusible material portion of said cap engaging the end of said actuator rod;

wherein said rod-engaging cap engages the end of said actuator or rod and holds said valve in its open position in spite of the loss of fluid pressure unless and until said fusible material is exposed to sufficient heat to melt it, whereby said fusible material will significantly contract enabling said valve to close under action of said biasing spring in the absence of fluid pressure.

4,714,234

LOW POWER ELECTROMAGNETIC VALVE

Theodore J. Falk, Clarence, and Lawrence E. Morris, Bowmansville, both of N.Y., assignors to Greatbatch Enterprises, Inc., Clarence, N.Y.

Continuation of Ser. No. 415,672, Sep. 9, 1982, abandoned. This application Jul. 11, 1985, Ser. No. 754,203

Int. Cl.⁴ F16K 31/04

U.S. Cl. 251—129.17

20 Claims



16. In an electromagnetic valve including a housing having an interior fluid containing region including first and second chambers, first and second ports in fluid communication with said first and second chambers, respectively, electromagnet means carried by said housing and located external to said fluid containing region of said housing, and an armature positioned in said fluid containing region of said housing having a pole portion located between said first and second chambers for magnetic attraction by said electromagnet means causing movement of said armature for opening and closing one of said ports, the improvement comprising:

- (a) barrier means of fluid-imperious material separating said electromagnet means and said fluid containing region of said housing;
- (b) a body of magnetically permeable material in said housing fluid containing region between said first and second chambers and having a passage therethrough for receiving said armature pole portion in a movable, close-fitting relation, said body having a fluid passage therein in fluid communication with said first and second chambers and separate from said armature pole portion receiving passage to allow fluid in said region to flow through said body between said first and second chambers; and
- (c) means for defining a magnetic circuit including said electromagnet means, said body, the included portions of said barrier means between said electromagnet means and said body, said armature pole portion and a gap in said fluid containing region of said housing between said armature pole portion and said electromagnet means for moving said armature toward said electromagnet means to close said gap in response to electrical energization of said electromagnet means.

4,714,235

CONSTANT DISPLACEMENT DUAL POSITION CAM STOP ASSEMBLY

Cal R. Brown, Euclid; Michael T. Gallagher, Mayfield Hts., and Peter C. Williams, Cleveland Heights, all of Ohio, assignors to Whitey Co., Highland Hts., Ohio

Filed Jun. 16, 1986, Ser. No. 873,005

Int. Cl.⁴ F16K 51/00

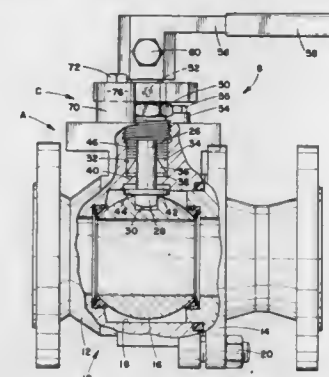
U.S. Cl. 251—288

8 Claims

1. A stop assembly for a valve including a valve member mounted for rotational movement between first and second positions and including a rotatable drive member for moving said valve member between said first and second positions, said stop assembly comprising:

- a stop member operatively associated with said drive member for rotation representative of drive member rotation;
- a cam member adjustably mounted on said valve for engagement with said stop member to adjustably define said first

and second positions, said cam member being configured to maintain a constant preselected angular spacing between said first and second positions irrespective of its position of adjustment.



4,714,236

BALL VALVE, PARTICULARLY FOR GASES

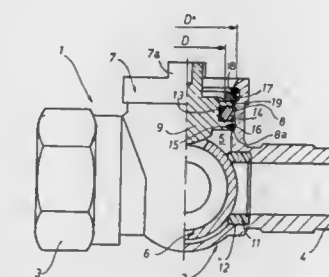
Antonio Filiberti, Via Per Alzo, 48, 28017 S. Maurizio D'Ospaglio, Novara, Italy

Continuation-in-part of Ser. No. 846,033, Mar. 31, 1986, abandoned. This application Jan. 30, 1987, Ser. No. 8,778

Claims priority, application Italy, Jan. 24, 1986, 20736/86[U] Int. Cl.⁴ F16K 3/22

U.S. Cl. 251—315

11 Claims



1. A ball valve, comprising:

- (A) a valve body bounding a fluid flow-through passage and having a tubular jut extending along an axis;
- (B) inlet and outlet fittings on the body and communicating with the passage;
- (C) a ball shutter mounted in the passage for turning about the axis;
- (D) a pair of seals mounted in the passage on opposite lateral sides of the shutter, each seal sealingly engaging a respective fitting and a respective side of the shutter during said turning;
- (E) control means for opening and closing the valve, including a control block mounted in the jut for turning about the axis and operatively connected to the shutter, and a handle located exteriorly of the body and mounted on the control block for turning the latter and, in turn, the shutter about the axis between open and closed valve positions;
- (F) means on the jut for bounding an annular, enlarged groove which opens radially inwardly toward the axis;
- (G) said control block having a mounting surface, and an annular, reduced neck extending axially above the mounting surface; and
- (H) means for aligning the control block for turning about the axis, including
 - (i) an annular washer surrounding the reduced neck with radial clearance and mounted on the mounting surface for radially inward displacement toward the neck, and

for radially outward displacement into the enlarged groove, and

(ii) an elongated resilient locking element insertable lengthwise into and along the enlarged groove, said locking element resiliently bearing against, and inwardly and outwardly displacing, different portions of the washer during such insertion, said locking element lockingly securing the control block in alignment with the axis after insertion.

4,714,237

SOFT SEAT FOR METERING VALVE

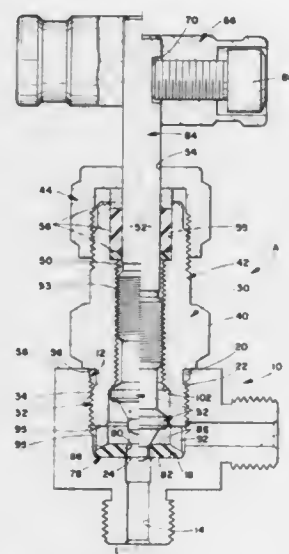
Ray D. Linderman, Streetsboro, and Peter C. Williams, Cleveland Heights, both of Ohio, assignors to Whitey Co., Highland Hts., Ohio

Filed May 14, 1986, Ser. No. 863,598

Int. Cl.⁴ F16K 1/42

U.S. Cl. 251—330

2 Claims



1. A metering valve comprising:

- a valve body having a valve chamber and first and second passages communicating therewith on opposite sides of a valve seat in said valve chamber, said first passage extending through an end wall of said chamber and said second passage extending through a sidewall thereof;
- a bonnet member operatively associated with said valve chamber at an open area spaced from said end wall;
- an annular unitary, non-metallic seat insert received in said valve chamber, said seat insert including:
 - a base portion having a first surface in mating relation with said end wall and a second surface generally parallel and spaced from said first surface, said base portion also having an aperture extending therethrough for generally coaxial communication with said first passage, said base portion first surface including a generally planar annular region surrounding said aperture and a radially tapering surface portion extending axially from said planar annular region toward said second surface at an outer periphery of said base portion,
 - plural leg portions extending outwardly from said tapering surface portion generally axially of said seat insert for abutting engagement with and axial encapsulation by said bonnet member such that said seat insert is secured against rotational and axial movement in said valve chamber, said leg portions being disposed radially inward from said base portion outer periphery and having a predetermined peripheral width dimension less than the cross-sectional dimension of said second passage to facilitate fluid flow between said passages in any

rotated position of said seat insert in said valve chamber; and,

- a valve stem operatively received through said bonnet member for selective advancement and retraction relative to said valve seat, said valve stem having an axial length such that advancement of said valve stem toward said valve seat in the absence of said seat insert provides abutting sealing engagement between said valve stem and valve seat.

4,714,238

HYDRAULIC JACKING SYSTEM FOR UNSEATING WEDGE FROM ROPE SOCKETS

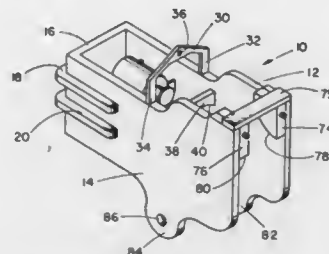
Willie D. Spradley, Rte. 2, Box 155 G, Carthage, Tex. 75633, and Paul J. Creswell, Rte. 1, Box 274, Beckville, Tex. 75631

Filed Mar. 5, 1987, Ser. No. 22,033

Int. Cl.⁴ B66F 3/24

U.S. Cl. 254—93 R

12 Claims



1. Apparatus for unseating wire rope wedges from the wire rope connectors of drag line system and other heavy duty equipment wherein said wire rope connectors define a tapered socket within which is received a tapered wedge that secures an end of the wire rope within the wire rope connector, comprising:

- (a) a housing adapted to be disposed about at least a portion of said wire rope connector;
- (b) shoulder means within said housing positioned for restraining engagement with a portion of said wire rope connector;
- (c) a transverse restraining pin supported by said housing and being positioned for restraining engagement with another portion of said wire rope connector; and
- (d) power energized means supported by said housing and imparting an unseating force to said wedge and moving said wedge to said unseated position within said socket for release of wire rope disposed about said wedge.

4,714,239

SHARPENER MOUNTING CONSTRUCTION

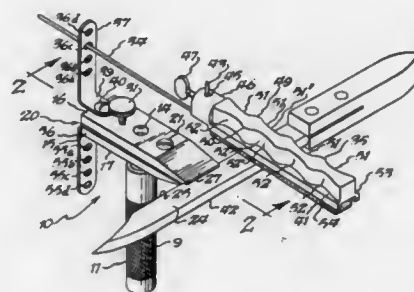
Arthur L. LeVine, P.O. Box 800, Williamsville, N.Y. 14221

Division of Ser. No. 614,685, May 29, 1984, which is a division of Ser. No. 325,758, Nov. 30, 1981, Pat. No. 4,471,951. This application Mar. 7, 1986, Ser. No. 837,143

Int. Cl.⁴ B24B 3/54

U.S. Cl. 269—3

5 Claims



1. A sharpener clamp construction for mounting on a mount-

ing post comprising a sharpener body including first and second contiguous clamp members for clamping a knife, end portions on said first and second contiguous clamp members, first and second knife clamping means on said end portions of said first and second knife clamping members, respectively, inner and outer opposite sides on each of said first and second clamp members, said inner sides facing each other and said outer sides facing away from each other, first and second mounting post receiving bore means extending inwardly into each of said first and second clamp members, respectively, from said outer sides toward said inner sides for receiving the end of said mounting post for mounting said sharpener clamp construction on said end of said mounting post in two orientations 180° displaced from each other, and securing means for securing said first and second clamp members in assembled relationship.

4,714,240

LAMINA RETRIEVAL APPARATUS

Harry A. H. Spence-Bate, Morley, Australia, assignor to Joyce Florence Spence-Bate, Morley, Australia

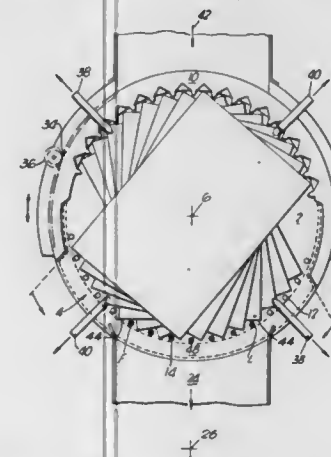
Filed Jan. 29, 1986, Ser. No. 823,765

Claims priority, application Australia, Jan. 29, 1985, PG9069

Int. Cl.⁴ B65H 3/30

U.S. Cl. 271—3.1

6 Claims



1. A lamina retrieval device arranged to hold a stack of laminae in a fanned out angularly displaced disposition with each lamina lying flat on the adjacent lamina of the stack comprising

- an axially elongate cage,
- said cage including a plurality of elongate parallel guides extending in axial direction of the cage, said guides forming retention means for the stack each guide acting to retain the stack in its fanned out disposition by interposing between adjacent corners of the laminae of the stack, at least some of said guides being movable to open said cage, and
- removal means for removing a desired lamina from said stack.

4,714,241

RECIRCULATING DOCUMENT FEEDER

Kent A. Randall, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,563

Int. Cl.⁴ B65H 39/10

U.S. Cl. 271—3.1

1 Claim

1. A document feeder for recirculating simplex or duplex document sheets to and from a scanning station of a reproduction apparatus for enabling selective production of pre-collated or post-collated simplex or duplex copies of simplex or duplex document sheets, said document feeder comprising:

means for holding a stack of document sheets;

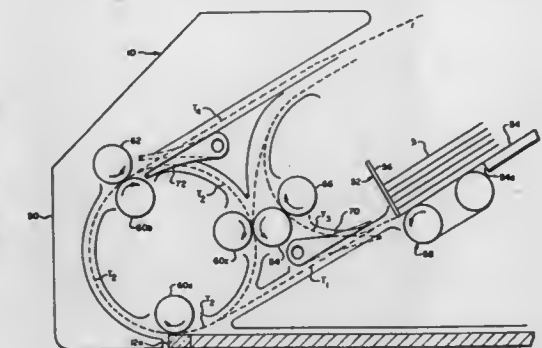
means for defining a first document sheet transport path in which a document sheet is moved from said stack holding means to said scanning station;

means for defining a second document sheet transport path in which a document sheet is moved in relation to said scanning station for scanning such document;

means for defining a third document sheet transport path in which a document sheet is turned over;

means for defining a fourth document sheet transport path in which a document sheet is moved from said second path defining means to said stack holding means;

first diverter means selectively movable to a first position for directing a transported document sheet from said first path defining means to said third path defining means, or



to a second position for directing a transported document sheet from said first path defining means to said second path defining means;

second diverter means selectively movable to a first position for retaining a transported document sheet in said second path defining means for recirculation past said scanning station, or to a second position for directing a transported document sheet from said second path defining means to said fourth path defining means; and

control means for positioning said first diverter means in its second position when document sheets are of the simplex type and in its first position when document sheets are of the duplex type, and for positioning said second diverter means in its second position when copies are to be made for post-collation and in its first position when copies are to be made for pre-collation.

4,714,242

SHEET FEEDING APPARATUS

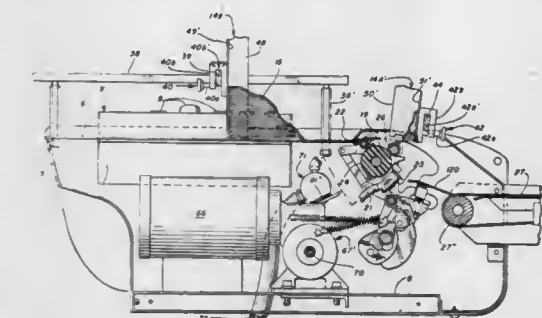
Martin Selak, 578 S. Warrington Rd., Des Plaines, Ill. 60016

Filed Mar. 21, 1986, Ser. No. 842,622

Int. Cl.⁴ B65H 3/08

U.S. Cl. 271—100

6 Claims



1. In feeding apparatus including a horizontal support for a stack of sheets; stacking means for retaining on said horizontal support a vertical stack of sheet material, said horizontal sup-

port terminating short of the front end of the stack to provide a feed opening exposing the front end portion of the bottom sheet in the stack; support ledge-forming means confronting said feed opening for supporting the weight of the front end of the stack of sheets; and means for withdrawing the front end portion of the bottommost sheet from the bottom of the stack through said feed opening and including suction cup means having a gripping plane for engaging the bottom surface of the exposed front end portion of the bottommost sheet in the stack and by force of suction pulling the same downwardly from the stack through the feed opening, a movable support structure for said suction cup means and including carrier means bodily movable between an initial lowered position to a raised position where the suction cup means carried thereby initially contact and then push upwardly against the exposed end portion of the bottommost sheet in the stack and suction cup mounting means upon which said suction cup means are directly supported, said mounting means being mounted for pivotal movement upon said carrier means so that the suction plane of the mouths of said suction cup means can be adjusted to different angles of inclination relative to said carrier means, and position control means for controlling the position and inclination of said mounting means on said carrier means by raising said carrier means to a position where the suction cup means on said mounting means initially engages the bottom surface of the bottommost sheet of the stack, with the suction plane thereof parallel to the sheet, then raising the same a small distance further while tilting said mounting means on said carrier means in a direction away from the said support ledge-forming means and without any substantial horizontal movement thereof away from said support ledge-forming means, and following which said carrier means is lowered to pull the front end of the bottommost sheet past said support ledge-forming means with a wiping contact thereof to withdraw only the bottommost sheet from the stack; the improvement wherein said position control means includes elevation adjusting means for manually progressively adjusting the peak elevation reached by said carrier means and the suction cup means carried thereby, and said position control means including stationary cam means against which a follower portion of said suction cup mounting means rides to vary the inclination of said mounting means relative to said carrier means, said follower portion engaging a different portion of said cam means as the elevation of said carrier means is varied.

4,714,243

PAPER TRAY FOR A PRINTING DEVICE

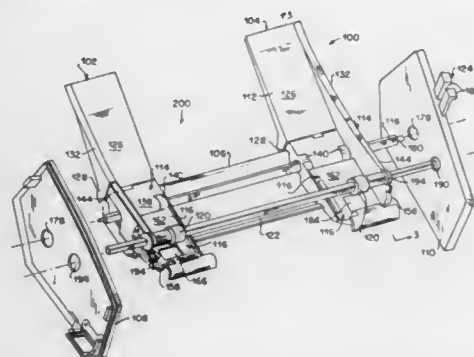
Tadeusz Staniszewski, Budd Lake, N.J., assignor to Ziyad Incorporated, Denville, N.J.

Filed Jan. 28, 1986, Ser. No. 823,472

Int. Cl.⁴ B65H 1/00

U.S. Cl. 271—171

21 Claims



1. A paper tray for storing a stack of individual sheets of paper to be fed therefrom to a printing device, said paper tray comprising first paper supporting means for supporting one lateral portion of said stack, second paper supporting means for supporting another lateral portion of said stack, and a support

guide movably supporting said first and second paper supporting means in spaced-apart relationship to accommodate stacks of individual sheets of paper having different widths between their lateral portions, said first paper supporting means including a first paper support having a first member and a second member paper support having a second member, said first paper support pivotally attached to said second paper support between a locked and unlocked position, said first member engaging said second member when said first paper support is in said locked position to prevent movement of said first paper supporting means along said support guide and said first member disengaging from said second member when said first paper support is in said unlocked position to permit movement of said first paper supporting means along said support guide.

4,714,244

ROWING MACHINE WITH IMPROVED MECHANICAL FEATURES

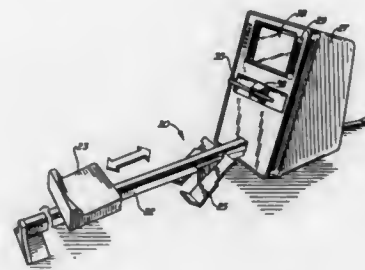
George Kolomayets; Allen Ryan, both of Chicago, Ill.; Augustine Nieto, Newport Beach, Calif., and Bryan Andrus, Chicago, Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Apr. 4, 1986, Ser. No. 848,705

Int. Cl.⁴ A63B 69/06

U.S. Cl. 272—72

8 Claims



1. In a rowing exercise machine having a user interface means with a cable for accepting user exercising stroke movements, each stroke having a power and return portion, the machine further having a shaft, a cable drum carried on the shaft and adapted to have the cable unwound therefrom and rewound thereon to impart rotation to the shaft and to a flywheel connected to the shaft for receiving and conserving angular momentum imparted thereto, and means for opposing the rotational displacement of said flywheel, an improved user interface comprising:

- a strain relief spring;
- a stainless steel eye staked into one end of said spring, an end of said cable being staked into the opposite end of said spring;
- a handle secured to said eye;
- a cable port through which said cable extends from the drum to the handle, said cable port is made of nylon; said cable port also has a centrally located aperture therein with cross sections which are generally oval in shape to allow the cable to be pulled out from said port along a line generally parallel to the base or at an upward angle with respect to said line without rubbing against said port; said aperture has a sidewall a first portion of which lies in a first plane generally parallel to said base and a second portion which lies in a second plane at an angle with respect to said first plane wherein said first aperture sidewall portion guides the cable straight out of said cable port along said line and said second aperture sidewall portion guides the cable out of the port at an upward angle.

4,714,245

PIVOTAL SKIPPING ROPE HANDLES HAVING SPRING RESISTANCE

Myung H. Cho, 205-153, Cheongryang 2-Dong, Dongdaemoon-Ku, Seoul, Rep. of Korea

Division of Ser. No. 466,983, Feb. 15, 1983, Pat. No. 4,572,503.

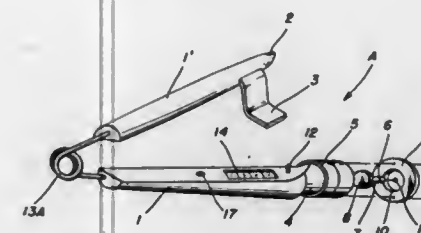
This application Aug. 2, 1985, Ser. No. 761,895

Claims priority, application Rep. of Korea, Jan. 17, 1983, 1983-329[U]

Int. Cl.⁴ A63B 5/20, 21/30

U.S. Cl. 272—75

3 Claims



1. A handle of a skipping rope comprising:
 - a first handle member being substantially semi-circular in cross section and having a first end, a gripping portion and a second end;
 - a second handle member being substantially semi-circular in cross section and having a first end, a gripping portion and a second end;
 - connecting means for pivotally connecting said first end of said first handle member to said first end of said second handle member, said connecting means being a coil spring having a first end operatively connected to said first end of said first handle member, and a second end operatively connected to a first end of said second handle member; whereby said connecting means is additionally provided for biasing said handle members away from each other and for providing a resistance for an individual grasping said handle members and attempting to compress said handle members together;
 - supporting means rotatably mounted relative to the second end of at least one handle member, including means for attaching a jump rope to said at least one handle member; and
 - retaining means operatively mounted adjacent to the second end of said at least one handle member for retaining said first handle member relative to said second handle member and forming a substantially circular handle.

4,714,246

EXERCISE DEVICE

Pierre A. Parisien, 400 Stewart Ave., #704, Ottawa, Ontario, Canada K1N 6L2

Filed Oct. 2, 1986, Ser. No. 914,317

Int. Cl.⁴ A63B 21/06, 59/00, 67/20

U.S. Cl. 272—93

4 Claims

1. An exercise device consisting of a disk provided with two diametrically opposed handles to which disk is tethered at the center a resilient ball, the tether being of flexible but substantially inelastic material and of a length slightly shorter than the

radius of said disk, thus allowing the ball to bounce back and forth against said disk, said ball being free to move in any



direction and to strike said disk at any point of contact within the limits imposed by the length of said tether.

4,714,247

PLANCHE TRAINER

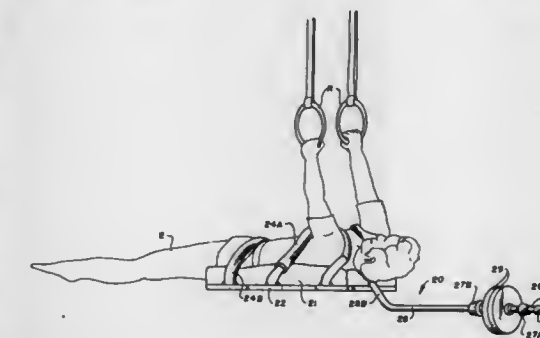
Siegfried H. Gerstung, 1306 Westellen Rd., Baltimore, Md. 21204

Filed Feb. 25, 1987, Ser. No. 18,479

Int. Cl.⁴ A63B 7/00

U.S. Cl. 272—109

10 Claims



1. A device for assisting a person to learn a gymnastic feat, comprising:
 - a board adapted to extend from the back of the person's neck to the lower end of the person's buttocks, said board having a front face;
 - a pad means, secured to the front face of the board for protecting the person's body from contact with the board;
 - a pole being secured to the board and having a portion extending beyond the board, said pole having a first portion adjacent to the board which is angled rearwardly from the board's front face and a second portion extending from said first portion generally parallel to the board; and means, secured to the board, for harnessing the device to the person's body.

4,714,248

BASKETBALL RETURN DEVICE

Richard E. Koss, 3530 E. 8th Ave., Denver, Colo. 80206

Continuation-in-part of Ser. No. 761,320, Aug. 1, 1985. This

application Jul. 7, 1986, Ser. No. 882,170

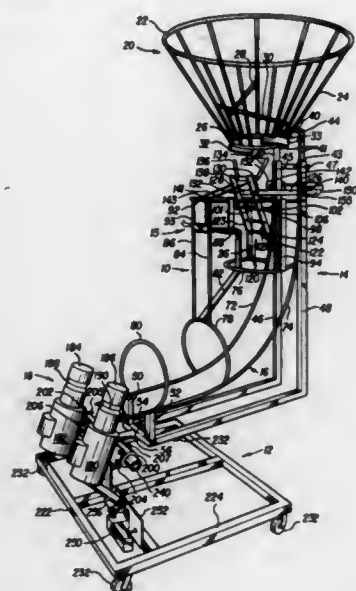
Int. Cl.⁴ A63B 69/40

U.S. Cl. 273—1.5 A

6 Claims

4. A basketball return mechanism, comprising: a lower support frame; an upper support frame pivotally mounted on said lower support frame;

means for rotating said upper support frame with respect to said lower support frame;
 ball receiving means attached to said upper support frame;
 ball propelling means;
 means for transporting a ball from said ball receiving means to said ball propelling means;
 ball retaining means having a first position and a second position, said retaining means preventing passage of a ball from said ball receiving means to said ball transporting means with said retaining means in said first position and permitting passage with said retaining means in said second position;



means biasing said retaining means toward said first position;
 actuator means for moving said retaining means to said second position;
 means for detecting the position of a player relative to said basketball return mechanism, and for producing a first output signal upon detection of said player; and
 control means responsive to said first output signal from detecting means, said control means operable to produce a second output signal in response to said first output signal, said second output signal causing said actuator means to move said retaining means to said second position.

4,714,249

ANTEATER GAME

Gordon A. Barlow, Glenview, Ill., assignor to Gordon Barlow Design, Skokie, Ill.

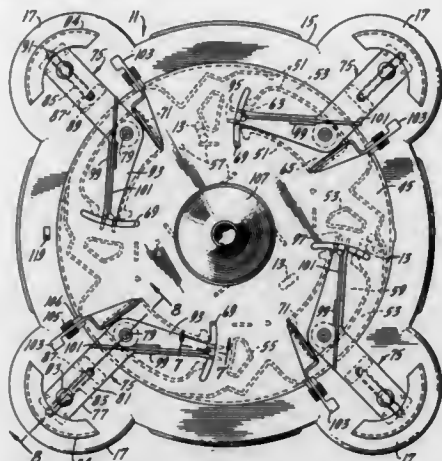
Filed May 7, 1987, Ser. No. 46,778
 Int. Cl.⁴ A63F 9/00

U.S. Cl. 273-1 G

8 Claims

1. A game including an annular plastic housing having a central opening extending from the top to the bottom thereof, a rotatable disk located in the central opening, means to rotate the disk in at least one direction of rotation, a transparent cover mounted on the annular housing enclosing the top of the central opening, the transparent cover positioned on the annular plastic housing a small distance above the rotatable disk to provide a raceway between the disk and the cover, a plurality of walls depending from the transparent cover, with the walls terminating slightly above the rotatable disk, the walls shaped to form pockets and flow paths as well as barricades for the pockets around the periphery of the cover, a plurality of small, somewhat cylindrical plastic parts lo-

cated on the disk to be moved through the raceway upon rotation of the disk,
 each pocket having an inlet opening facing the direction of rotation of the disk and an outlet opening facing away from the direction of rotation of the disk,
 means to open and close the outlet opening of each pocket, with said means normally being biased to an outlet closing position,
 an arm swingable in an arc across a portion of the top of the cover installed at each pocket,



each arm having a guide portion normally biased to a position to block the entrance to its pocket, and each guide portion having a pair of fingers positioned to receive one of the small, plastic cylindrical parts lengthwise and admit to the pocket when the guide is located at the entrance to its pocket.

4,714,250

GOLF BALL AND TEE SETTER

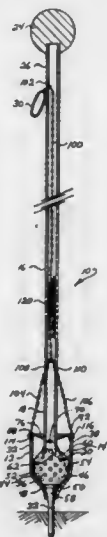
Clyde E. Henthorn, 4766 Echorock Dr., Columbus, Ohio 43229

Filed Sep. 6, 1985, Ser. No. 773,315

Int. Cl.⁴ A63B 57/00

U.S. Cl. 273-32.5

6 Claims



1. A remotely operable golf ball and tee setter which comprises:
 a handle having an upper portion and a lower portion;
 retaining means located about said lower portion and adapted to simultaneously retain a golf ball and tee in alignment for insertion of the tee into the ground, said retaining means being movable between an open position and a closed position, and being adapted to retain said ball and tee when in said closed position and to discharge said

ball and tee with said ball mounted on said tee when in said open position;
 said retaining means includes first and second movable members;
 pivotal mounting means for pivotally mounting said first and second members to said handle;
 operating means for moving said retaining means between said closed position and said open position;
 said operating means including first spring means applying a continuous equal force to each of said first and second movable members and acting to bias said retaining means toward said open position and to align said retaining means such that the axis of said handle is aligned with the axis of said ball and said tee; and
 second spring means producing a force greater than said first spring means and acting to bias said retaining means toward said closed position.

4,714,251

BALL BAT

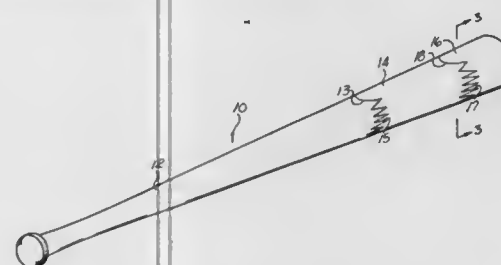
David C. Cook, Valparaiso, Ind., assignor to Thomas O. Cook, Orlando Park, Ill., a part interest

Filed Jan. 6, 1986, Ser. No. 816,320

Int. Cl.⁴ A63B 59/06

U.S. Cl. 273-72 R

5 Claims



1. A ball bat comprising an elongated body which includes a handle end portion and a barrel end portion, said elongated body having a progressively decreasing cross sectional area from the barrel end to the handle end, said handle end portion formed of a light hard wood, said barrel end portion formed of a softer wood than the handle end portion, said body further including a portion intermediate said handle end portion and said barrel end portion, said intermediate portion formed of a heavy wood relative to said handle end light wood and barrel end soft wood, said handle end portion joined to said intermediate portion at one end thereof, said barrel end portion joined to an opposite end of said intermediate portion to form said bat body.

4,714,252

DUAL-WEIGHTED GOLF PUTTER HEAD

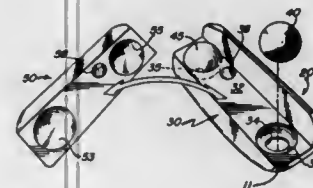
Harry G. Roraback, 55 Scenic Hill La., Monroe, Conn. 06468

Filed Nov. 20, 1986, Ser. No. 932,943

Int. Cl.⁴ A63B 53/08

U.S. Cl. 273-171

7 Claims



1. A golf putter head adapted to be mounted on a shaft

having a handle to form a golf putter, the golf putter head comprising:

- (A) an elongated strike plate defining a substantially flat face surface for striking a golf ball, the face surface extending from a toe end of the golf putter head to a heel end of the golf putter head;
- (B) a sole extending rearwardly from the lower portion of the strike plate, the sole forming the lower portion and defining the bottom surface of the golf putter head;
- (C) a weighting means comprising solely a pair of spherical weights fabricated of a heavier material than the sole, one of the weights being mounted behind the strike plate near the toe of the golf putter head and the other of the weights being mounted behind the strike plate near the heel of the golf putter head said sole being convexly curved from the toe to the heel, and further defining hemispherical cavities for receiving the spherical weights, said cavities intersecting the bottom surface of the sole so that the weights are visible through the bottom surface of the putter head.

4,714,253

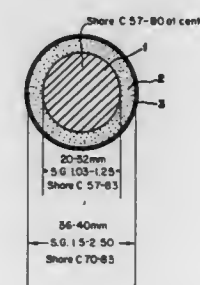
THREE-PIECE SOLID GOLF BALL

Akihiro Nakahara, Ibaraki, and Taketo Matsuki, Nishinomiya, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Continuation-in-part of Ser. No. 602,165, Apr. 19, 1984, abandoned. This application Sep. 10, 1985, Ser. No. 774,452
 Claims priority, application Japan, Apr. 21, 1983, 58-70811
 Int. Cl.⁴ A63B 37/06

U.S. Cl. 273-228

6 Claims



1. A three-piece solid golf ball having high durability and improved rebound characteristics which comprises a two-piece solid center made of a resilient elastomeric material having a central core and an outer layer, and a cover made of an impact and wear resistant material, wherein

- (1) the central core has a diameter of 20 to 32 mm and a specific gravity of 1.03 to 1.25, with the center point of the central core having a hardness (Shore C) within the range of 57 to 80 with the center core, at a distance between 5 mm and 10 mm from its center point, having a shore hardness higher than that at the center point but not more than 83, and
- (2) the outer layer has an outer diameter of 36 to 40 mm, a specified gravity of 1.30 to 2.50 and a hardness (Shore C) of 70 to 83.

4,714,254

BOARD GAME SIMULATING EDUCATIONAL METHODS INVOLVING SCHOOL OR COLLEGE CURRICULUMS

Danny L. Calloway, 3814-6 Chamberlayne Ave., Richmond, Va. 23227

Filed Dec. 10, 1985, Ser. No. 807,443

Int. Cl.⁴ A63F 3/00

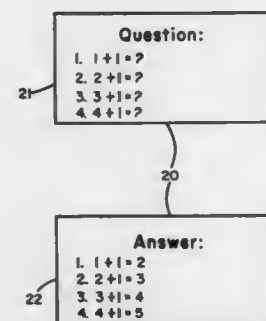
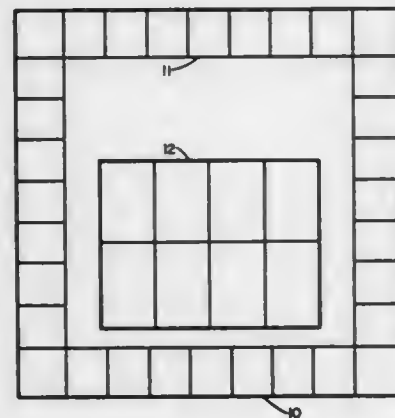
U.S. Cl. 273-249

18 Claims

1. A board game apparatus comprising:
 a playing board having an outer playing path and an inner playing path, said outer and inner playing paths being

separate and unconnected, said outer playing path comprising an endless arrangement of connected playing spaces, said inner playing path comprising a plurality of spaces representing classrooms;

a plurality of playing pieces for use by the players, said playing pieces comprising two playing pieces for each player, a first of said playing pieces being adapted to be placed on the outer playing path to indicate a player's position on that playing path and a second of said two playing pieces being adapted to be placed on the inner playing path to indicate a player's position on that playing path; a number selecting means for indicating the number of playing spaces in the outer path that a player is to move his playing piece;



a first set of cards having indicia thereon representing problems or questions to be solved by the players, said first set of cards representing tests;

at least some of said spaces on said outer playing path having indicia relating to said first set of cards such that when a player's playing piece lands on one of said spaces having said indicia therein, the player is directed to pick up one of said first cards representing tests;

said first set of cards being related to said inner playing path such that upon correctly solving the problem(s) or answering the question(s) contained thereon, a player can move his second playing piece to the next playing space on said inner path.

4,714,255

EDUCATIONAL BOARD GAME

Daniel P. Henry, 825 SE. 39th Ave.; Fredrick E. LaTorre, 5541 NE. 3rd Pl., both of Ocala, Fla. 32671, and Willard I. Pope, P.O. Box 5692, Ocala, Fla. 32678

Filed Jan. 10, 1986, Ser. No. 872,602

Int. Cl. A63F 3/00

U.S. Cl. 273-249

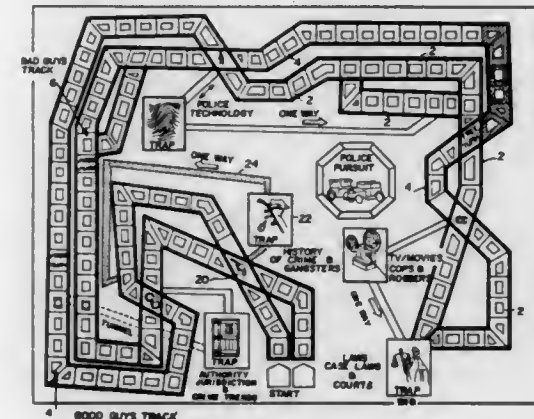
9 Claims

1. An educational board game apparatus comprising:

(a) a pair of tokens each one representing one of the players;

(b) a game board with a multiplicity of consecutive playing sections arranged thereon, each of said playing sections

having indicia thereon and arranged cooperatively to define a continuous first track and continuous second track, each of the tracks defining a path along which the tokens are moveable in random increments, the two tracks intersecting each other at a plurality of predetermined intersection points, each of the intersection points connected via a path to a retaining area and in turn a one way path leading back to the first or second track, each of the tracks including a starting space, a finishing space and as many different indicia as there are intersection points;



(c) a random number generating means for advancing the tokens around the game board from section to section; and

(d) a plurality of decks of cards, one deck per intersection point, each card in each deck having at least two levels of questions thereon of different levels of difficulty concerning the field of criminal justice, each of the cards of each deck identified by indicia common to the corresponding intersection point and distinct from the indicia on the cards of the other categories.

4,714,256

AUTOMATIC RESET TARGET ASSEMBLY

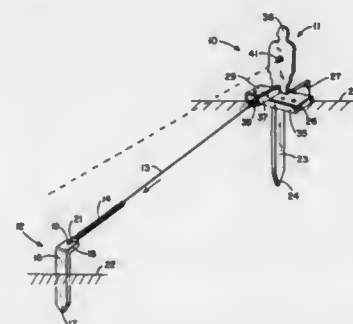
Kenneth J. Mosser, P.O. Box 242, Clarissa, Minn. 56440

Filed Jul. 28, 1986, Ser. No. 889,876

Int. Cl. F47J 7/04

U.S. Cl. 273-392

22 Claims



17. A target assembly comprising: target means adapted to be hit with a moving projectile, said target means including first means for anchoring the target means to a support, a movable member, second means connecting the movable member to the first means for movement between the first generally upright position and a second generally non-upright position, silhouette means attached to said member, said member normally holding the silhouette means in a generally upright position, and third means including an arm connected to the movable member, line means connected to the arm, and anchor means attached to the support remote from the target means connected to the line means, said line means including biasing

means for biasing the movable member and silhouette means to the normally upright position and allowing said silhouette means and movable member to move to a non-upright position when hit with a projectile.

4,714,257

ANNULAR SLIDING BODY FOR A SLIDING SEAL AND PROCESS FOR USE THEREOF

Juergen Heinrich, Schoenwald; Axel Krauth, Selb; Karl-Heinz Victor, Castrop-Rauxel, and Heinz Peeken, Aachen, all of Fed. Rep. of Germany, assignors to Hoechst Ceramtec Aktiengesellschaft and Pacific Wietz GmbH & Co. KG., both of, Fed. Rep. of Germany

PCT No. PCT/EP83/00100, § 371 Date Dec. 9, 1983, § 102(e) Date Dec. 9, 1983, PCT Pub. No. WO83/03651, PCT Pub. Date Oct. 27, 1983

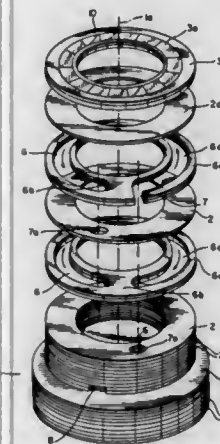
PCT Filed Apr. 8, 1983, Ser. No. 568,122

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213378

U.S. Cl. 277-1

Int. Cl. F16J 15/34

41 Claims



1. An annular sliding body for use in a sliding seal in which sliding surfaces of a sliding component and a counter component form a gap for fluid therebetween, said sliding body constituting one of said sliding component and said counter component and having a sliding surface on an axial face thereof formed by a thin flexible ceramic membrane layer, said sliding body further having arranged therein immediately beneath said flexible membrane layer at least one chamber extending only part way around the circumference of said sliding body and at least one radially extending solid portion supporting said membrane layer under part of the circumference of said sliding body; said membrane layer being elastically deformable above said chamber in a direction perpendicular to said sliding surface, so that a hydrodynamic effect may be produced.

35. A process for using a ceramic sliding body for a sliding seal having a sliding surface at one end formed by a flexible ceramic membrane covering at least one chamber in said body, said ceramic sliding body defining together with a counter component a gap in which there is a fluid, said process comprising elastically deforming said flexible ceramic membrane in a direction perpendicular to said sliding surface to produce a hydrodynamically enhanced spacial form on the sliding surface.

4,714,258

BALANCED ROTARY SEAL ENSURING TIGHTNESS OF A HYDRAULIC TURBINE SHAFT

Albert Sauron, 6 Rue des Moissons, 38170 Seyssins, and Alexandre Smetanine, 20 Place Louis Juvet, 38100 Grenoble, both of France

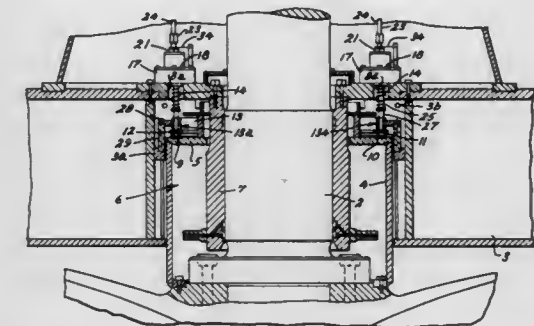
Filed Jan. 28, 1986, Ser. No. 823,428

Claims priority, application France, Feb. 1, 1985, 85 01603

Int. Cl. F01D 25/18; F16J 15/34

U.S. Cl. 277-72 R

9 Claims



1. A seal assembly for sealing a rotary driven shaft having rotary driven components movable therewith from adjacent non-rotating components and wherein an annular erodable wearing plate is movably carried by the rotary driven components so as to be oriented in surrounding relationship to the drive shaft, the seal assembly comprising a pair of concentric annular seal means, holder means for supporting said annular seal means against the annular wearing plate so as to create an annular space between said annular seal means which is in fluid communication with the wear plate, a plurality of fluid conveying means oriented about the rotary driven shaft, means for connecting each of said fluid conveying means to said holder means so as to be in communication with said annular space between said annular seal means, a first force applying means for selectively urging said holder means and said annular seal means against the annular wear plate, second counteracting force means operably connected to adjust the movement of said holder means, said second counteracting force means limiting the movement of said holder means and said annular seal means against the wear plate by counteracting the pressure applied thereto by said first force applying means, and means for supplying fluid through said fluid conveying means so as to lubricate and cool the area of contact between said annular seal means and the wear plate.

4,714,259

SEALING RING STRUCTURE WITH STRESSING RING

Theo Mack, Leinfelden-Echterdingen, and Roy Edlund, Stuttgart, both of Fed. Rep. of Germany, assignors to Busak + Luyken GmbH & Co., Fed. Rep. of Germany

Filed Apr. 16, 1987, Ser. No. 38,956

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613880

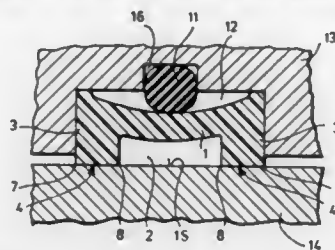
Int. Cl. F16J 15/24

U.S. Cl. 277-165

6 Claims

1. Sealing ring structure comprising a sealing ring made of a tough-elastic plastic material fitted into the groove of one of two machine elements moving relative to each other, and a stressing ring made of a rubber-elastic material arranged between the said sealing ring and the bottom of the groove and loading the sealing ring in the radial direction, the axial extension of the said stressing ring being considerably smaller than that of the sealing ring and its axial position, relative to the sealing ring, being fixed by means of stops in such a manner that the sealing ring is loaded in the area of an edge, wherein

that sealing surface of the said sealing ring which rests against the other machine component comprises an annular recess and



the said stressing ring is arranged approximately centrally relative to the said recess.

4,714,260

STEEL LAMINATE GASKET

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co. Ltd., Tokyo, Japan

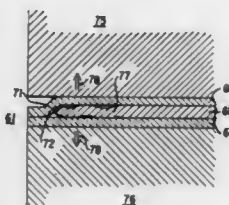
Filed Feb. 24, 1987, Ser. No. 18,222

Claims priority, application Japan, Jun. 26, 1986, 61-096713[U]

Int. Cl.⁴ F16J 15/08

U.S. Cl. 277-235 B

8 Claims



1. A steel laminate gasket for an internal combustion engine having at least one hole therein;

a first plate having at least one first hole corresponding to the hole of the engine and at least one first inner portion around the first hole,

a second plate having at least one second hole corresponding to the hole of the engine, at least one second inner portion situated around the second hole and abutting against the first plate, at least one curved portion extending radially outwardly from the second inner portion relative to the second hole and extending diagonally relative to the second inner portion, and an outer portion extending outwardly from the curved portion parallel to the second inner portion, and

at least one middle plate situated between the first and second plates, said middle plate having at least one third hole slightly larger than the first and second holes, at least one inner edge formed around the third hole, said inner edge being situated adjacent to the curved portion, at least one bead formed around the third hole adjacent the inner edge, and an outside portion formed outside the bead, said middle plate, when the gasket is compressed, actuating so that the inner edge abuts against the curved portion of the second plate to allow the bead to form strong sealing pressure thereat.

4,714,261

STEERING WHEEL FIXING CONSTRUCTION FOR TOY VEHICLES

Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Aug. 25, 1986, Ser. No. 899,809

Claims priority, application Japan, Aug. 29, 1985, 60-132549[U]

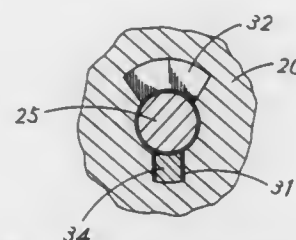
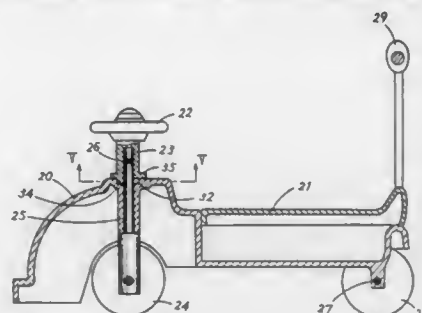
Int. Cl.⁴ B62K 5/08; B62M 1/00

U.S. Cl. 280-7.1

1 Claim

1. A steering wheel fixing construction for a toy vehicle,

comprising a front wheel support rod rotatably supporting front wheels, said support rod having a rod portion projecting beyond an upper surface of a toy body, said projecting rod portion being adapted to removably receive a sleeve which is integral with a steering wheel, said toy body having a portion of its upper surface extending around said front wheel support rod, said body portion having a relatively narrow groove and a relatively wide groove, said sleeve comprising an engaging



projection sized to snugly fit in said narrow groove, the arrangement being such that said engaging projection can be selectively positioned in said narrow groove or said wide groove, said sleeve having an uninterrupted flange with a diameter sufficient for covering said engaging projection, said wide groove, and said narrow groove, said flange resting on said upper surface of said toy body for preventing an injury to a user of said toy vehicle by said engaging projection.

4,714,262

VARIABLE LENGTH TIE ROD ASSEMBLY

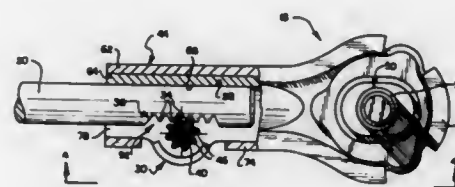
Ruey E. Wood, St. Clair Shores, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Jun. 17, 1986, Ser. No. 875,104

Int. Cl.⁴ B62D 7/16

U.S. Cl. 280-95 R

3 Claims



1. An assembly comprising:

a tie rod having an end portion with teeth formed thereon; a ball and socket assembly comprising a ball stud and a socket housing, said socket housing having a first housing portion for receiving said ball stud and a second housing portion for receiving said end portion of said tie rod;

a pinion having a plurality of teeth for engaging said teeth formed on said end portion of said tie rod and rotatable to effect relative axial movement between said socket housing and said tie rod;

said second housing portion having means for supporting said pinion for rotation relative thereto to effect said relative axial movement between said socket housing and said tie rod; and

means disposed adjacent opposite axial ends of said pinion for applying force against opposite portions of said second housing portion to press said opposite portions of said second housing portion against said tie rod to hold said tie rod against axial movement relative to said socket housing and to simultaneously lock said pinion against rotation, said force applying means being releasable to relieve said opposite portions of said second housing portion from pressing on said tie rod and to enable rotation of said pinion to effect axial adjustment between said tie rod and said socket housing.

4,714,263

AXLE OSCILLATION ADJUSTMENT MEANS

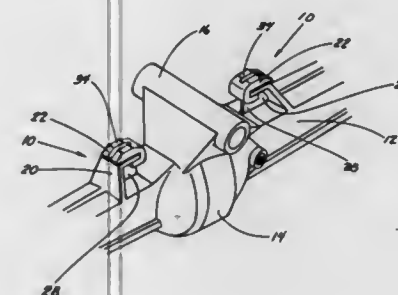
Donald C. Marek, Hickory Hills, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 17, 1986, Ser. No. 908,391

Int. Cl.⁴ B60G 11/22, 11/00, 25/00

U.S. Cl. 280-111

19 Claims



1. In a tractor of the type having a tractor body, an axle tiltable about a center point with respect to the tractor body, and means on either side of the center point for limiting the range of axle tilting, the improvement wherein each limiting means comprises:

a fixed bolster secured to the tractor body in position above the axle;

a base fixed with respect to the axle, projecting upwardly therefrom, and having a first top abutment surface vertically aligned with and engagable with the bolster; and

a mounted member removably securable to the base in a working position and having a second top abutment surface which is above the first top abutment surface when the mounted member is in the working position, whereby the second abutment surface restricts oscillation of the axle more than the first abutment surface.

4,714,264

COUPLING STRUCTURE BETWEEN A TOWING VEHICLE AND A TOWED VEHICLE

Emile Woestelandt, 180 Rue Du Gal de Gaulle, 59370 Mons En Baroeul, France

Filed Apr. 25, 1986, Ser. No. 855,713

Claims priority, application France, Apr. 26, 1985, 85 06808

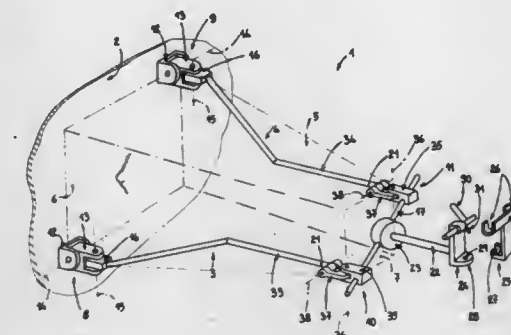
Int. Cl.⁴ B60D 1/14

U.S. Cl. 280-456 R

23 Claims

1. A coupling structure adapted to be used between a towing vehicle and a towed vehicle to damp drifting motions, such as yawing and pitching, of the towed vehicle relative to the towing vehicle, said coupling structure comprising only two real arms (3, 4) located substantially along diagonally opposed corners of an imaginary truncated pyramid (5) having imaginary spaced rectangular bases (6, 7), a first imaginary rectangular base (6) being larger than a second imaginary rectangular base (7), the rectangular bases having imaginary sides which are disposed to be substantially horizontal and vertical, said

two real arms (3, 4) further being disposed substantially along two diagonally opposed edges of an imaginary pyramid having a vertex at a point located near a rear axle of the towing vehicle, said real arms being articulated at points both on the towed



vehicle (2), at two diagonally opposed vertices (8, 9) of the large base (6), and at an end nearest the towing vehicle at of two diagonally opposed vertices (10, 11) of the small base (7) of the imaginary truncated pyramid.

4,714,265

AUTOMATICALLY ALIGNED TOW BAR HITCH

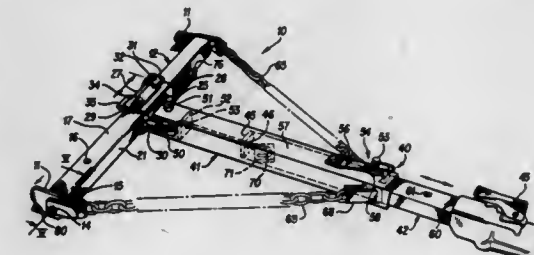
John N. Franklin, 9 Fairway Ave., Iola, Kans. 66749

Filed Apr. 7, 1987, Ser. No. 35,177

Int. Cl.⁴ B60D 1/14

U.S. Cl. 280-491 D

16 Claims



1. A tow bar apparatus which is mounted to a trailing vehicle for use in connecting the trailing vehicle to a towing vehicle and wherein the towing vehicle is provided with a point of connection extending from the rear end thereof, comprising a cross bar means having opposite ends and a central portion, bracket means for mounting said cross bar means to the trailing vehicle so as to be positioned generally forwardly with respect thereto, slide means movably supported with respect to said cross bar means between a first position adjacent one of said ends of said cross bar means and a second position generally along said central portion of said cross bar means, a hitch bar assembly having a first portion and a second portion slidably extended with respect to and generally axially of said first portion, pivot means for mounting said hitch bar assembly to said slide means, hitch means connected to said second portion of said hitch bar assembly, cable means having first and second end portions and an intermediate portion, means for connecting said first end portion of said cable means to said second portion of said hitch bar assembly, second means for securing said second end of said cable means to said cross bar means, and means for engaging said intermediate portion of said cable means with said slide means whereby as said second portion of said hitch bar assembly is urged outwardly with respect to said first portion thereof, said cable means will urge said slide means into said second position generally centrally of said cross bar means.

4,714,266

SKI RUNNING-SURFACE PLASTIC COATING

Werner Feichtlbauer, Antiesenhofen, Austria, assignor to Trak Incorporated, Wardhill, Mass.

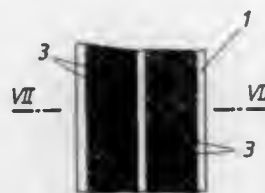
Filed Oct. 7, 1985, Ser. No. 785,568

Claims priority, application Austria, Oct. 9, 1984, 3188/84
The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.⁴ A63C 5/00

U.S. Cl. 280—604

12 Claims



1. In a running-surface plastic coating for a ski which comprises a running surface forming a climbing aid and having a multiplicity of teeth which are aligned in the longitudinal direction of the ski and terminate toward the rear end of the ski in a pointed end capable of being bent upwards, said teeth being defined by two families of parallel spaced-apart running-surface cuts intersecting each other in the running surface, the individual families of cuts being inclined to a normal of the running surface in opposite directions, the improvement wherein the running surface cuts at least substantially have the shape of circular segments and include an angle of at least 60° with a running-surface normal, and that the relative spacing of the running-surface cuts is at most 1 mm.

4,714,267

CROSS COUNTRY SKI ASSEMBLY

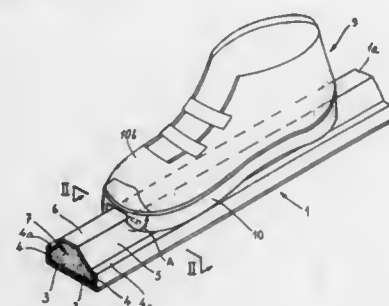
Roger Abondance, Rives; Pierre Corbet, Grenoble; Francois Jodelet, Voiron, and Jean-Francois Andre, Voiron, all of France, assignors to Skis Rossignol S.A., Voiron, France
Filed May 28, 1985, Ser. No. 738,552

Claims priority, application France, May 29, 1984, 84 08813; Feb. 19, 1985, 85 02989

Int. Cl.⁴ A63C 9/20

U.S. Cl. 280—615

23 Claims



1. A cross-country ski assembly, comprising:
a cross-country ski constituted of a ski body formed with:
a bottom surface for engagement with snow,
a ridge unitary with said body and extending over substantially the entire length of the ski and over a major portion of the width thereof and defining the top of the ski, and
a pair of longitudinal flanks laterally bounding the ski while extending upwardly from said bottom surface to substantially the level of a bottom of said ridge, said ridge comprising:

an upper surface substantially parallel to said bottom surface, and

a pair of oblique faces diverging downwardly and outwardly from said upper surface to the bottom of said ridge;

a boot member adapted to receive a foot of a skier and having a sole formed with a longitudinal groove extending continuously from a toe to the heel of said boot member and complementary in shape to that of said ridge and adapted to rest upon said ridge over the entire length of said sole; and

means at a front end of said member defining a pivot axis coupling said member to said ski body, said pivot axis extending through said ridge transversely of said ridge below said upper surface and above said bottom of said ridge and said longitudinal flanks.

4,714,268

FOLDING GOLF CART

Graham W. Mather; Graham R. Warwick, both of Coventry, and Graham A. Bazeley, Bedworth, all of England, assignors to Fisherwell Limited, England

Continuation of Ser. No. 833,117, Feb. 26, 1986, abandoned.

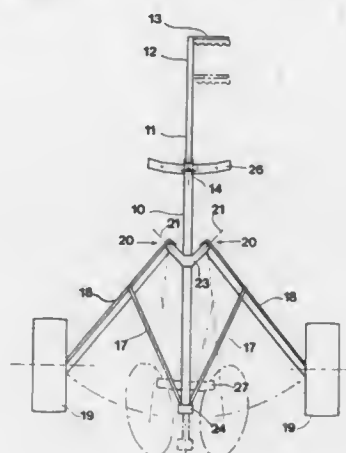
This application Mar. 23, 1987, Ser. No. 29,047

Claims priority, application United Kingdom, Feb. 26, 1985, 8504925

Int. Cl.⁴ B62D 3/04

U.S. Cl. 280—646

5 Claims



1. A folding golf cart having an open support position and a folded position comprising:

a single frame member having a central longitudinally extending hollow stem;

golf bag support means connected to said stem for supporting a golf bag on the cart;

a handle member telescopically carried in said stem, an upper end of said handle member projecting upwards beyond a first end of said stem and having a handle to be grasped, a second opposite end of said handle member projecting downwards beyond a lower opposite end of said stem and having a mounting mechanism, said mounting mechanism being engageable with the ground for supporting the cart when the cart is in said support position;

wheel support arms pivotally connected with respect to said stem and extending on opposite sides of said stem for motion between a laterally extending support position and a folded position adjacent said stem;

a wheel rotatably supported by each of said support arms; and

folding means for moving said support arms between said support and folded positions, said folding means being coupled between each of said support arms and said mounting mechanism so that telescopic movement of said

handle member along the length of said stem moves said support arms between the support position wherein said wheels are laterally spaced from one another with said mounting mechanism being in engagement with the lower end of said stem for supporting the cart in a stable manner and the folded position wherein said wheels are adjacent said stem to reduce the size of the cart for transportation.

4,714,269

WIDE BASE TYPE SUSPENSION ASSEMBLY WITH PARALLELOGRAM TORQUE BEAMS AND FOUR AIR SPRINGS

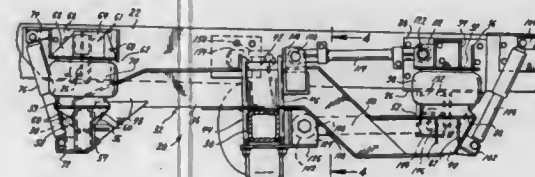
John E. Raidel, Rt. 1, Box 400-M, Springfield, Mo. 65804

Filed Nov. 18, 1986, Ser. No. 931,808

Int. Cl.⁴ B60G 3/16, 11/26

U.S. Cl. 280—683

7 Claims



1. A vehicle suspension system for a vehicle having a chassis that includes a longitudinally extending frame rail member and an axle spaced below the frame rail member, comprising a longitudinally extending beam assembly having forward and rearward ends and a medial section therebetween, means to connect the medial section to the axle at a location that positions the beam assembly below and outboard of the frame rail member, a front air spring and a rear air spring, means to support the bottom of the rear air spring from the rearward end of the beam assembly, means to support the top of the rear air spring from the frame rail member, means to support the bottom of the front air spring from the forward end of the beam assembly, means to support the top of the front air spring from the frame rail member, an upper torque rod having a forward end and a rearward end, a lower torque rod having a forward end and a rearward end, front bracket means supported by the medial section of the beam assembly and having upper and lower connectors, the lower connector being positioned inboard of the upper connector and of the beam, rear bracket means supported by the frame rail member at a location adjacent the rear air spring and having upper and lower connectors, the lower connector of the rear bracket means being positioned inboard of the upper connector of the rear bracket means, bushing means to pivotally connect the forward and rearward ends of the upper torque rod to the upper connectors of the front and rear bracket means respectively, and relatively large bushing means to pivotally connect the forward and rearward ends of the lower torque rod to the lower connectors of the front and rear bracket means respectively to provide a longitudinal parallelogram defined by the torque rods, the lower torque rod being substantially larger in cross-sectional area than the upper torque rod to accommodate the relatively large bushing means and to provide push and pull force transmission through the lower torque rod.

4,714,270

INDEPENDENT WHEEL SUSPENSION WITH TOE CORRECTING LINK

Manfred Rumpel, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 18, 1985, Ser. No. 789,229

Int. Cl.⁴ B60G 5/00

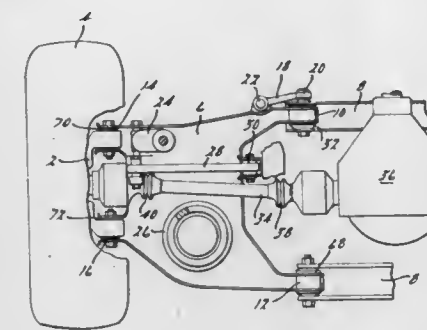
U.S. Cl. 280—690

16 Claims

1. A suspension system for motor vehicle comprising:
a wheel carrier;

a roadwheel and tire assembly rotatably mounted to said wheel carrier

a control arm pivoted at one end to the chassis of said vehicle at two locations separate longitudinally from each other and pivoted at a second end to said wheel carrier at two locations separated longitudinally from each other; and



means operatively associated with said control arm and responsive to recession of said control arm for displacing said control arm such that said control arm will urge said roadwheel and tire assembly in the direction of toe-in, with said means causing said control arm to rotate in a horizontal plane about one of said pivots connecting said control arm to said chassis, while moving transversely with respect to the other of said pivots connecting said control arm to said chassis.

4,714,271

SUSPENSION CONTROLLER

Shuichi Buma, Toyota; Toshio Onuma, Susono; Kaoru Ohashi, Okazaki, and Masami Ito, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

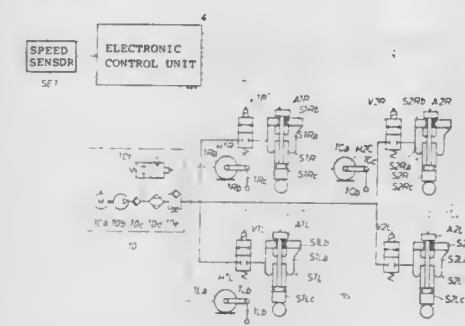
Filed Oct. 8, 1986, Ser. No. 916,721

Claims priority, application Japan, Oct. 26, 1985, 60-239776

Int. Cl.⁴ B60G 9/00

U.S. Cl. 280—707

12 Claims



1. A suspension controller for a vehicle having variable suspension means for controlling a distance between a body and a wheel axle of said vehicle, said controller comprising:
vehicle height detection means for providing a vehicle height signal representative of said distance;
vehicle speed detection means for providing a vehicle speed signal representative of a vehicle speed;
vehicle height determination means for providing a first soft signal indicative of an alteration of said variable suspension means to a soft state when a change in said vehicle height signal within a predetermined period exceeds a predetermined value and said vehicle speed signal is within a predetermined speed range, said predetermined period being set such that said variable suspension means maybe altered before a rear wheel of said vehicle moving

at said predetermined speed range reaches a front wheel position thereof;
 vehicle speed determination means for providing a hard signal representative of alteration of said variable suspension to a harder state when said vehicle speed signal exceeds a first reference speed signal and for providing a second soft signal representative of alteration of said variable suspension to softer state when said vehicle speed signal is less than a second reference speed signal which is set to be less than said first reference speed signal; and
 preference means responsive to said vehicle height determination means and said vehicle speed determination means for providing a preference for said first soft signal to said suspension means over said hard signal and said second soft signal when said vehicle speed signal is within an overlapped range in which said predetermined speed range overlaps a range between said second reference speed and said first reference speed.

4,714,272

SUSPENSION CONTROLLER

Shunichi Buma, Toyota; Toshio Onuma, Susono; Kaoru Ohashi, Okazaki, and Masami Itou, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

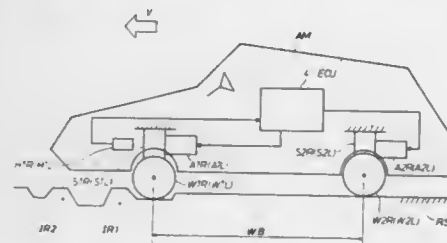
Filed Sep. 24, 1986, Ser. No. 910,977

Claims priority, application Japan, Oct. 2, 1985, 60-221658

Int. Cl.⁴ B60G 11/26

U.S. Cl. 280—707

12 Claims



1. A suspension controller for a vehicle comprising:
 front vehicle height detection means for detecting a vehicle height at a front wheel and for generating a vehicle height signal;
 determination means for deriving vehicle height data from the vehicle height signal, for determining if a difference between a maximum and minimum of the vehicle height data during a predetermined period is greater than a reference value, the predetermined period being shorter than a cycle time of a resonant vibration of an unsprung mass of the vehicle, and for generating a determination signal when the difference is greater than the reference value; and
 suspension characteristic alteration means responsive to the determination signal for alternating a suspension characteristic at the rear wheel of the vehicle before the rear wheel reaches a position at which the difference has been determined to be greater than the reference value.

4,714,273

VEHICLE FOR TRANSPORTING ELONGATED OBJECTS

Melvin P. Kejr, 1704 Cloud Cir., Salina, Kans. 67401

Filed Jan. 6, 1986, Ser. No. 816,239

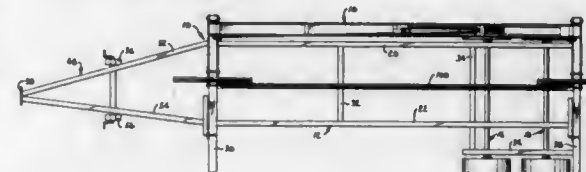
Int. Cl.⁴ B60P 1/02

U.S. Cl. 280—789

5 Claims

1. A vehicle for transporting elongated objects, said vehicle comprising:
 a horizontally extending, elongated bed including at least one longitudinally extending intermediate member and a longitudinally extending side member spaced laterally from said intermediate member, and front and rear cross

members secured to said intermediate member and to said one side member;
 wheel and axle means secured to the bed for supporting the latter;
 an upright, rigid frame carried by the bed adjacent only one side of the latter extending longitudinally of the bed and including frame components extending upwardly from the bed, the opposite side of the bed being unobstructed by upwardly extending frame components, the bed including a longitudinally extending side member on said opposite side which is substantially shorter than the intermediate member and other side member;



a plurality of arms carried by the frame and cantilevered over the bed; and
 power means for selectively raising said arms relative to the bed to lift an object resting on said arms to a position spaced vertically of the bed to placement of another object on the bed, the relatively short side member providing clearance at the side of the vehicle for the unobstructed raising and lowering of auxiliary lifting apparatus for placing the objects on the arms and bed respectively from the unobstructed side of the bed.

4,714,274

SEAT BELT RETRACTOR

Hideyuki Nagashima, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

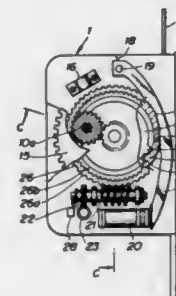
Filed May 19, 1986, Ser. No. 864,484

Claims priority, application Japan, May 23, 1985, 60-109246

Int. Cl.⁴ B60R 21/10

U.S. Cl. 280—801

8 Claims



8. A seat belt retractor for use in a motor vehicle comprising:
 a housing;
 a belt take-up shaft rotatably mounted to said housing;
 biasing means for biasing said take-up shaft in a belt retracting direction to retract a seat belt;
 a tensionless means for causing the seat belt to assume a tensionless state wherein said take-up shaft is prevented from rotating in the belt retracting direction;
 a motor actuated slack control means for rotating said belt take-up shaft;
 first output means for controlling said tensionless means and said motor actuated slack control means so as to provide the seat belt in a first set position in a tensionless state with a desired slack;
 belt position memory means;
 means for storing in said memory means a first signal representing the first set position;
 belt position detecting means for outputting a second signal

representative of a newly set position of the seat belt when the vehicle is ready for reverse driving;
 means for storing the second signal in said memory means;
 second output means for actuating said tensionless means based on the second signal from said memory means so as to cause the seat belt in the newly set position to assume the tensionless state; and
 means for actuating said biasing means, tensionless means, and motor actuated slack control means based upon said first signal from said memory means to retract said belt to said first set position in a tensionless state after completion of reverse driving.

4,714,275

TOY STICKER COLLECTION ALBUM AND COLLECTIBLE STICKERS THEREFOR

James E. Engel, Lombard, and Sidney Diamond, Chicago, both of Ill., assignors to Diamond Publishing, Niles, Ill.

Filed Oct. 27, 1986, Ser. No. 923,764

Int. Cl.⁴ B42D 1/00; G09F 1/10; G02B 27/22; G09B 11/06

U.S. Cl. 281—15 R

15 Claims



1. A toy picture collection album, comprising:
 an album including a front cover, a back cover and a plurality of pages secured between said front cover and said back cover,
 each page of said plurality of pages includes at least one image, each said image being of at least one first color,
 a pattern covering each said image, said pattern being of at least one second color,
 a filter, said filter including a sheet of transparent film, said film tinted said second color, and
 a collectible item, said collectible item including first and second sides, said first side including an illustration corresponding to said at least one image, means on said second side for securing said collectible item on to one of said plurality of pages over said at least one image.

4,714,276

MULTIPLE-PART FORM WITH ONE OR MORE PARTS REMOVABLY RETAINED BY TEMPORARY ADHESION IN STUB AREA

Walter G. Greig, Lewiston, N.Y., assignor to Moore Business Forms, Inc., Glenview, Ill.

Filed Sep. 25, 1986, Ser. No. 911,411

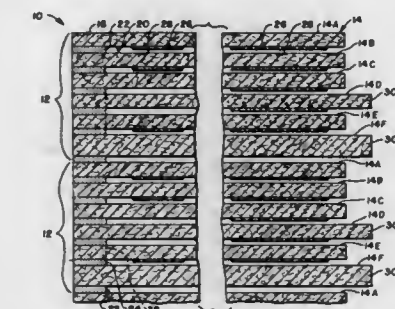
Int. Cl.⁴ B32B 7/06, 7/10, 7/12

U.S. Cl. 283—63 R

5 Claims

1. A preprinted form pad, comprising:
 a stack of two-sided sheets preprinted on one side with at least one of verbal and non-verbal indicia, said sheets being grouped serially by set in at least one set, each set being comprised of a plurality of said sheets;
 said preprinted indicia on at least two of said sheets in each set differing from sheet to sheet;
 each said sheet being serially connected to neighboring said sheets in said stack along at least one respective margin of each, at least one of such connections in each set being by means of a strip of non-drying, lightly tacky pressure-sensitive adhesive which is adapted to permit each respective sheet bearing such adhesive to be easily peeled free of the

respective underlying said sheet and temporarily adhered by such adhesive to another surface, and at least another



of such connections in each set being by means of a strip of permanent adhesive.

4,714,277

LONGITUDINALLY DIVIDED SLEEVE OF SHRINKABLE MATERIAL

Ernst Bachel, Geltendorf, and Wolfgang Giebel, Planegg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

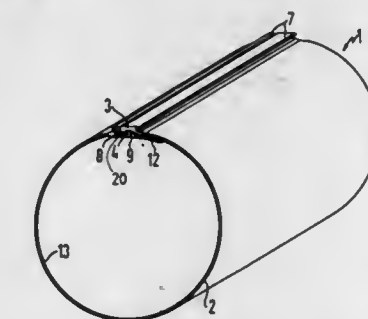
Filed Apr. 24, 1986, Ser. No. 855,354

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515242

Int. Cl.⁴ F16L 47/00

U.S. Cl. 285—39

11 Claims



1. In a longitudinally divided sleeve of shrinkable material comprising a lock closure along longitudinal edges, said lock closure comprising one longitudinal locking groove along one edge and one lock element mating with said groove along a second longitudinal edge, the improvements comprising the region of the closure having a higher degree of cross-linking than the remaining shrinkable portions of the sleeve, said longitudinal locking groove along said one longitudinal edge being formed by two longitudinally extending legs inclined toward one another to form the longitudinal locking groove having a narrower mouth than base, said lock element along the second longitudinal edge being provided with a longitudinally hook-shaped part having an angle of inclination matched to the angle of inclination of one of said pair of legs forming the one longitudinal locking groove, said lock element including a resilient projection at its end, said projection protruding along the base of the locking groove and coacting with the hook part to match the width of the base of said locking groove so that when the hook is inserted into the longitudinal locking groove, the resilient projection prevents unintentional removal of the hook part from said groove.

4,714,278

PLASTIC PART PROVIDED WITH A METAL THREADED ELEMENT

Heiner Gassmann, Esslingen; Siegfried Beck, Stuttgart, and
Werner Heinlein, Wiernsheim, all of Fed. Rep. of Germany,
assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of
Germany

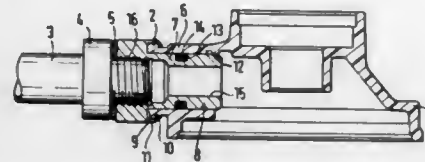
Continuation of Ser. No. 170,225, Jul. 18, 1980, abandoned. This
application Apr. 15, 1986, Ser. No. 852,385

Claims priority, application Fed. Rep. of Germany, Sep. 15,
1979, 2937443

Int. Cl.⁴ F16L 55/00

U.S. Cl. 285—169

5 Claims



1. A plastic housing cover for a valve, said cover including
an open upper end and an open base of larger diameter than
said upper end which open base seats upon said valve to cover
said valve, said cover further including an integral connector
sleeve formed as a unitary part of said cover outwardly there-
from and including a cylindrical bore therein, said connector
sleeve having a connector end with a radially extending should-
er, a metal nipple having a passage therethrough with threads
on an inner surface of one end of said passage, said nipple
having a first nonthreaded outer cylindrical end portion radi-
ally outwardly of said threaded end of said passage, said first
nonthreaded outer cylindrical end portion having a diameter
which is greater than the diameter of said radially extending
shoulder of said connector end of said connector sleeve, said
nipple including a second cylindrical end portion having an
outer diameter smaller than said first cylindrical end portion
and substantially the same diameter as said bore of said connec-
tor sleeve for securing said second cylindrical end portion of
said nipple in said bore of said connector sleeve and for connec-
ting a fluid pressure line connected to said threaded end of
said nipple to said connector end of said connector sleeve,
further wherein said connector sleeve is cylindrical and ar-
ranged to receive said second end portion of said threaded
metal nipple in a sealing fashion, and a seal means between said
second end portion of said threaded metal nipple and said
connector sleeve for assuring a seal therebetween.

4,714,279

EXHAUST PIPE COUPLER

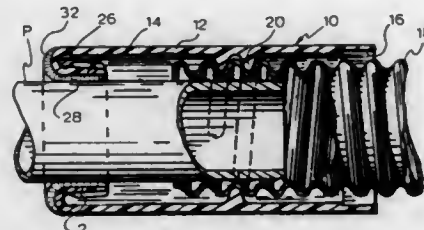
Lincoln Custean, 404 Notre-Dame Sud, Robertsonville, Quebec,
Canada G0N 1L0

Filed Nov. 3, 1986, Ser. No. 925,963

Int. Cl.⁴ F16L 33/00

U.S. Cl. 285—239

12 Claims



1. A coupler for releasably connecting an evacuation hose to
the exhaust pipe of a motor vehicle, comprising a cylindrical
body having one end adapted to be sealingly connected to one
end of said evacuation hose and a flexible annular wall partially
closing the other end of said body, a central hole defined by

said annular wall having a diameter which is smaller than the
minimum diameter of the exhaust pipe to be fitted within said
body, the internal diameter of said body being larger than the
maximum diameter of an exhaust pipe to be fitted within said
body, said annular wall having radial slits extending there-
through and to said hole to define generally sector-shape flexi-
ble resilient flaps, and further including spaced first spacer
members protruding from the exterior face of said flaps
wherein when said body is slipped onto an exhaust pipe the
flaps are bent inwardly and said spacer members frictionally
engage said exhaust pipe whereby said first spacer members
define air channels therebetween and between said flaps and
the exterior wall of said exhaust pipe, said air channels opera-
tively interconnecting the interior of said cylindrical body
with exterior ambient air for free through-flow ventilating
circulation of air substantially longitudinally of said exhaust
pipe.

4,714,280

HEAT-SHRINKABLE CONNECTION COMPRISING A VARIABLE CHANNEL AND A COOPERATING ELEMENT

Hans Winterhoff, Hagen, Fed. Rep. of Germany, assignor to
RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Ger-
many

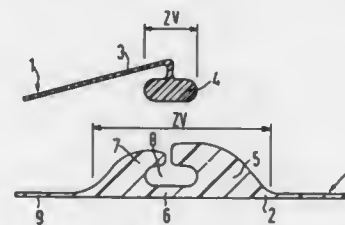
Filed May 16, 1986, Ser. No. 863,859

Claims priority, application Fed. Rep. of Germany, May 17,
1985, 3517857

Int. Cl.⁴ F16L 47/00

U.S. Cl. 285—381

16 Claims



1. A heat-shrinkable connection having heat-deformable
connecting elements composed of an axially elongated channel
and of a cooperating element thickened at its end, comprising
the improvement wherein said channel is composed of a pair of
opposed, longitudinally elongated and continuous leg parts,
which have dimensioned stability under the application of
heat, and of at least one shrink region, being a floor of said
channel formed integrally with said leg parts, said shrink re-
gion being laterally shrinkable to cause said opposed leg parts
to move towards each other to engage said cooperating ele-
ment in a positively locking fashion under the application of
heat.

4,714,281

DEVICE AND METHOD FOR TYING A TWISTED CLINCH KNOT

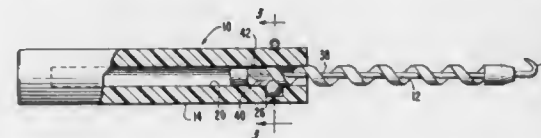
Richard M. Peck, 3113 Club Dr., Allentown, Pa. 18103

Filed Jan. 2, 1987, Ser. No. 178

Int. Cl.⁴ B65H 69/04

U.S. Cl. 289—1.5

15 Claims



1. A hand-held device for tying a twisted clinch knot com-

prising a worm shaft, a handle defining a recess shaped to
receive said shaft, a first stop means for determining a forward-
most position of said shaft relative to said handle and for retain-
ing a first end of said shaft within said handle, a securing means
disposed on a second forward end of said shaft for securing an
article to which said knot is to be tied, and a protrusion dis-
posed on an interior wall of said handle that is received within
threads of said shaft, wherein said protrusion is maintained in a
substantially stationary position relative to said handle and
causes said worm shaft to rotate as it moves from a rearward
position, relative to said handle, toward said forwardmost
position.

4,714,282

BLAST-RESISTANT DOOR LATCHING SYSTEM

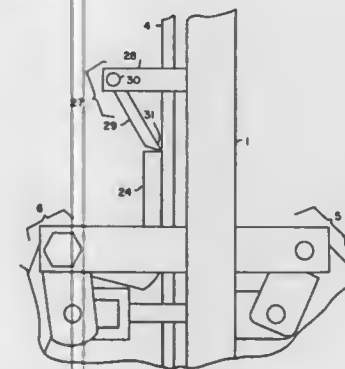
Dale K. Henderson, Vienna, Va., assignor to Temet, USA, Inc.,
Del.

Filed Jan. 29, 1986, Ser. No. 823,523

Int. Cl.⁴ E05B 65/10

U.S. Cl. 292—36

6 Claims



1. A blast door assembly comprising
(a) a door having an outer side and an inner side;
(b) moving latch means disposed on said door and switch-
able between a door latching position and a door unlatching
position;
(c) a vertically shiftable travel bar means operably con-
nected to the moving latch means, and having an upper
position in which the moving latch means unlatches the
door and a lower position in which the moving latch
means latches the door, said travel bar means gravitation-
ally biasing said moving latch means toward the latched
position;
(d) an inertial stop means acting to block the upward un-
latching movement of said travel bar means in the event of
a blast, but not interfering with unlatching during normal
use of the door;
(e) outer handle means operably connected to the travel bar
means for opening the door from the outside; and
(f) inner panic bar means operably connected to the travel
bar means for opening the door from the inside, said inner
panic bar means being operable independently of said
outer handle means.

4,714,283

CLAMPING TYPE CABINET LOCK

Donald J. Dignan, South Euclid, Ohio, assignor to The Eastern
Company, Strongsville, Ohio

Continuation of Ser. No. 602,173, Apr. 19, 1984, abandoned.

This application Aug. 6, 1986, Ser. No. 894,378

Int. Cl.⁴ E05C 9/02

U.S. Cl. 292—48

14 Claims

1. A lock for releasably retaining a movable closure member
such as cabinet door in a closed position with respect to an
opening-defining structure such as a door frame, wherein the
lock comprises:

(a) elongated operating unit means including first frame
means for mounting on a selected one of a pair of rela-
tively movable members such as a cabinet door and its

associated door frame, with the first frame means having
opposed forward and rearward sides thereof;

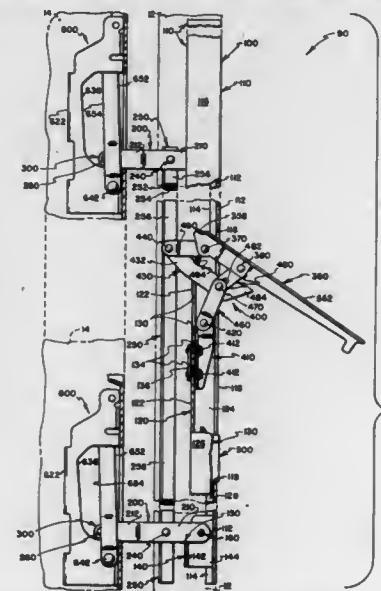
(b) at least one strike unit means including second frame
means for mounting on the other of the relatively movable
members;

(c) the strike unit means including strike channel means
connected to the second frame means for defining an
elongate strike channel, including elongate track means
extending longitudinally along one side of the elongate
strike channel for defining a pair of elongate, longitudi-
nally extending, laterally spaced strike channel track sur-
faces, with the strike channel being bounded along at least
portions of said one side by the pair of elongate, longitu-
dinally extending, laterally spaced strike channel track sur-
faces;

(d) the operating unit means having components which are
movable relative to the first frame means including:

(i) handle means pivotally connected to the first frame
means for movement relative to the first frame means
between a nested position defined within the first frame
means, and an operating position projecting from the
forward side of the first frame means;

(ii) arm means pivotally connected to the first frame
means and disposed on the rearward side of the first



frame means for movement relative to the first frame
means between released and clamped positions;

(iii) strike-engaging means carried on the arm means for
engaging the strike channel track surfaces and for being
guided by the strike channel track surface for move-
ment longitudinally along the strike channel and for
being releasably retained therein by the engagement
between the strike-engaging means and the strike chan-
nel track surfaces;

(iv) operating means for drivingly interconnecting the
handle means and the arm means for concurrent pivotal
movement relative to the first frame means such that,
when the handle means is moved to its operating posi-
tion from its nested position, the arm means is caused to
move from its clamped position to its released position
whereby the strike-engaging means is moved within the
strike channel to a position wherein it can be inserted
into and removed from the strike channel, and when the
handle means is moved to its nested position from its
operating position at a time when the strike-engaging
means is received within the strike channel, the arm
means is caused to move from its released position to its
clamped position whereby the strike-engaging means is
caused to move along the strike channel to a position
wherein the strike-engaging means is retained within

the strike channel by the engagement of the strike-engaging means with the track surfaces; and,
(v) latch means connected to the first frame means and having movable formation means for releasably engaging and selectively retaining the operating handle in its nested position.

4,714,284

LATCH ASSEMBLY

Marc F. Varlet, 8 rue des Ecoles, 56410 Etel, France

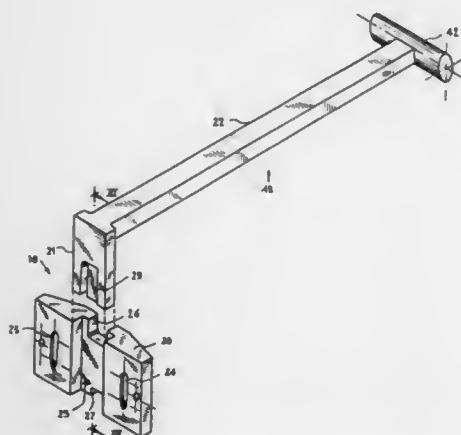
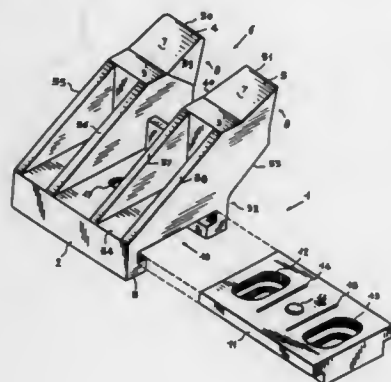
Filed Apr. 24, 1984, Ser. No. 603,297

Claims priority, application France, Apr. 29, 1983, 83 07546

Int. Cl.⁴ E05C 19/06

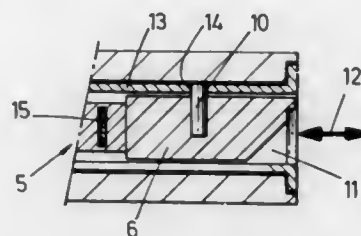
U.S. Cl. 292-91

3 Claims



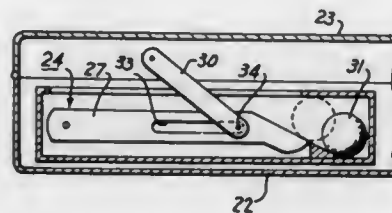
1. A latch assembly comprising a first member and a second member, said first and second members being formed with respective means for catching said first member in said second member upon movement of said members towards each other, and a first attachment member and second attachment member, each being formed with means for attaching to one of a fixed and a movable frame member, with said first and second members and respective first and second attachment members being formed with cooperative attachment for selectively attaching the respective first and second members to one respective attachment member and the other first or second member to the other respective attachment member, said first member being formed with a flexible arm and a transversely disposed catch piece at the end thereof and said second member being formed with catch means to hold the catch piece upon said movement of said members toward each other, said catch means comprising two horns having bearing surfaces and forming a groove therebetween, wherein the catch piece rides the horns and catches there behind with the arm disposed in the groove.

4,714,285
FIRE-BREAK DOOR
Richard J. Langham, St. Peter Port, Great Britain, assignor to D.R.I.M. Limited, Great Britain
Filed Jan. 17, 1985, Ser. No. 692,785
Claims priority, application Belgium, Mar. 27, 1984, 0/212637
Int. Cl.⁴ E05B 17/20
U.S. Cl. 292-163 5 Claims



1. A fire-break door comprising a door having at least one lock including a lock housing with a spring biased latch contained therein, said latch being moved from a latched position to a retracted position by an operating member, said spring bias urging said latch toward said latched position, said door cooperating with a door-closer for enabling it to automatically move said door back to the closed position, means comprising a fusible material secured in the entrance to the lock housing wherein the latch lies when in its recessed position, so as to lock said latch in such a recessed position by means of the fusible material to retain the latch in said retracted position against the bias action of the spring, said fusible material engaging said latch to prevent the latch from entering a keeper of the lock until said fusible material melts, said fusible material letting the latch be released to said latched position where it enters a keeper of the lock under the bias action of said spring in response to an abnormal rise in the temperature adjacent to the door, the operating member cooperating with the latch which is released by the fusible material for manually returning the latch into said retracted position against the spring bias action of the spring for opening the door whereby said door may be opened easily after the latch has been released in response to said high temperature.

4,714,286
AUXILIARY LOCKING MECHANISM FOR A CASE
Ken Yamamoto, 22-5 4 chome, Nishisakado Sakado-shi, Saitama-ken, Japan
Continuation of Ser. No. 406,475, Aug. 9, 1982, abandoned. This application Jul. 29, 1985, Ser. No. 760,057
Claims priority, application Japan, Aug. 25, 1981, 56-125402; May 24, 1982, 57-75995
Int. Cl.⁴ E05C 17/24
U.S. Cl. 292-263 10 Claims



1. In a case having a body and a hinged lid attached to the said body the improvement comprising:
first lock means in said case for locking and securing said hinged lid in a closed position;
release means for releasing said first lock means for opening said lid;

auxiliary lock means connecting said body to said hinged lid said auxiliary locking means having means for holding said hinged lid in a partially open position when said case is positioned vertically with said first lock means released; said auxiliary lock means including means for automatically releasing said holding means to allow said hinged lid to fully open when said case is shifted from said vertical position to a horizontal position.

4,714,287
BENDING BAR TO BE USED AS A BUMPER OF A VEHICLE

Josef Merkle, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

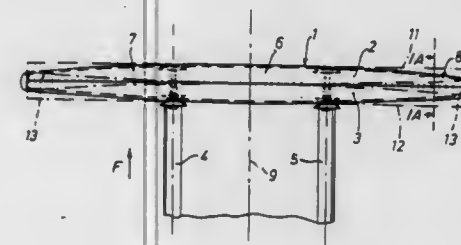
Filed Mar. 21, 1986, Ser. No. 842,256

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1985, 3510590

Int. Cl.⁴ B60R 19/04

U.S. Cl. 293-102

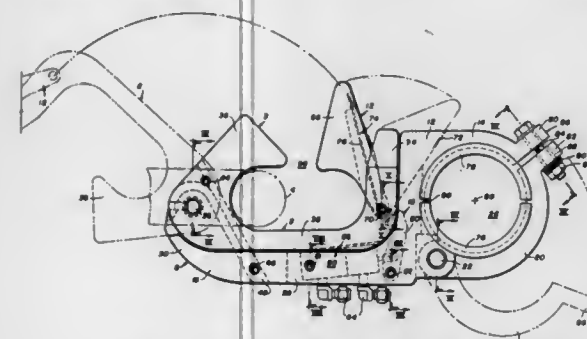
27 Claims



1. A bending bar for use as a bumper of a vehicle, a middle part located between two side parts, the side parts projecting on opposite sides of the middle part, the bending bar being mounted to two supports, the middle and side parts comprising:

- a front half-shell comprising a middle web part and two leg parts, and
 - a rear half-shell comprising a middle web part and two leg parts,
- one of said half-shells being connected, extensively along its length, to the other half shell by deformation of at least a portion of said one half-shell to generate a tensile prestress to prevent buckling of the legs and the webs of the half-shells.

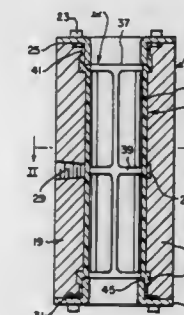
4,714,288
REMOTE RELEASE TOW HOOKS
Richard C. Tietze, Ft. Pierce, Fla., assignor to Harbor Branch Oceanographic Institution Inc., Ft. Pierce, Fla.
Filed Apr. 13, 1987, Ser. No. 40,044
Int. Cl.⁴ B66C 1/36
U.S. Cl. 294-82.33 5 Claims



1. A device with which a tow line may be attached to a towed object and then detached remotely which comprises:

a body member, a trip member, latch means and a keeper member,
said body member comprising a pivot portion and a tow portion integral with said pivot portion, both said portions lying in the same longitudinal plane,
said pivot portion including a first arcuate section integral with said tow portion, a second arcuate section hinged to said first arcuate section and fastener means to forceably close said second section upon said first section forming a circular opening in the said pivot portion transverse to said longitudinal plane, which opening serves as the means for connection of said device to said towed object,
said tow portion being J-shaped with an elongated leg section that extends along the longitudinal axis of said body member and an arcuate end section,
said trip member being C-shaped and integrally including an arcuate proximal section, a distal section and a central section,
said trip member being pivoted by said proximal section of said tow portion end section to swing between a latched position and a release position, and including spring means to bias said trip member into said latched position,
said latch means comprising a hook member pivoted at its fixed end on said elongated leg section to swing in said longitudinal plane, a ledge on said trip member positioned so the said hook member can engage said ledge to retain said trip member in said latched position and piston means to move said hook member into and out of engagement with said ledge, and
said keeper means comprising a keeper member of generally triangular cross-section pivoted at one end of said trip member distal section to swing from a tow line admission position wherein it enters a mating notch in said first arcuate section of said pivot portion to a tow line retention position out of said notch toward said arcuate proximal section and spring means to bias said keeper member into said retention position.

4,714,289
GRIPPER ASSEMBLY
Thomas E. Arzenti, Munhall, and William E. Pirl, Penn Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation of Ser. No. 785,292, Oct. 7, 1985, abandoned. This application Jan. 9, 1987, Ser. No. 5,388
Int. Cl.⁴ B66C 1/46
U.S. Cl. 294-119.3 10 Claims



1. A gripper assembly for releasably engaging and firmly holding an object, said assembly including a retainer having an opening therein bounded by an inner wall of the retainer, a pliable flexible member extending over the surface of said inner wall, cooperative means near the ends of said flexible member and near the ends of said retainer for mounting said flexible member along substantially the whole length of the inner wall of said retainer to define an expandable pressure-tight volume between said flexible member and said inner wall, an annular

groove in the inner wall of said retainer intermediate its said ends in communication with said expandable volume, said groove being interposed between axial sections of said inner wall, and a port in said retainer, directly connected in fluid-transfer communication to said groove, coextensive with a peripheral section of said groove, for injecting through said groove a fluid into said expandable volume between said retainer and flexible member to extend said flexible member to engage said object under the pressure of said fluid, the axial length of said groove being substantially equal to the cross dimension of said port where said port is connected to said groove and said port directing said fluid into said groove whence it is transmitted into said expandable volume.

4,714,290

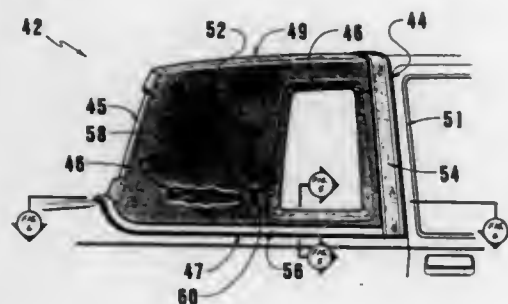
SIMULATED PADDED CAR ROOF COVER
David D. Eash, Woodbine, Md., assignor to E&G Classics, Inc., Columbia, Md.

Filed Mar. 10, 1986, Ser. No. 837,687

Int. Cl.⁴ B62D 25/06

U.S. Cl. 296—210

12 Claims



1. A cover for covering an exterior portion of an automobile roof, comprising:
means for simulating a padded vinyl automobile roof without the use of padding, said means including:
(a) a shell having an outer surface and an inner surface, said inner surface of said shell adapted to be secured to the exterior portion of the automobile roof;
(b) recess means formed in said outer surface of said shell; and
(c) a vinyl covering secured directly to said outer surface of said shell.

4,714,291

LUMBAR SUPPORT

Takemi Hattori, Kariya, and Nobuhiko Takeda, Oobu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

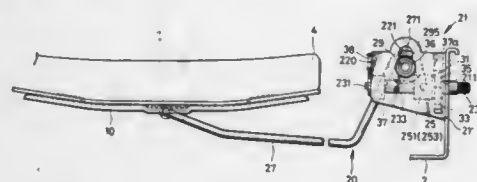
Filed Mar. 20, 1987, Ser. No. 28,403

Claims priority, application Japan, Mar. 31, 1986, 61-47822[U]

Int. Cl.⁴ A47C 3/00

U.S. Cl. 297—284

3 Claims



1. In a lumbar support comprising a seat back body, a resilient member supported by said seat back body, a lumbar plate one surface of which is abutted against said resilient member in such a manner that said resilient member is embraced by said lumbar plate and said seat back body, and plate moving means

for moving said lumbar plate back and forth, an improvement wherein said plate moving means comprises:

- a base portion supported by said seat back body and having a pair of opposing oblong holes;
- a screw rod supported for free rotation on said base portion and having a male screw provided on its outer peripheral surface;
- a nut member having a centrally formed female screw threadedly engaged with the male screw of said screw rod, said nut member being moved axially of said screw rod by turning the latter;
- an anchor member connecting said lumbar plate to an outer circumferential surface of said nut member and having a ring-shaped pivot portion at an end portion thereof on the side of said nut member; and
- a distance compensating pin means having a pin passed through the ring-shaped pivot portion and supported at the oblong holes so as to be movable in the longitudinal direction of the oblong holes, wherein when said nut member is moved axially of said screw rod, the distance compensating pin moves in the longitudinal direction of the oblong holes so as to compensate for a change in distance between the center of the ring-shaped pivot portion and the center of rotation of said screw rod.

4,714,292

BABY CARRIAGE

Kenzo Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

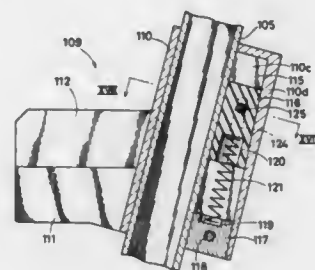
Continuation of Ser. No. 751,039, Jul. 1, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 942,064

Claims priority, application Japan, Jul. 4, 1984, 59-101863[U]; Sep. 10, 1984, 59-13744[U]; Mar. 18, 1985, 60-54805[U]

Int. Cl.⁴ A47C 7/50

U.S. Cl. 297—437

9 Claims



1. A baby carriage, comprising footrest means, a pair of front legs having front wheels attached to lower ends of said front legs, said footrest means extending between said pair of front legs, a pair of slide means secured to said footrest means and slidably engaging each of said front legs for up and down movement of said footrest means along said front legs, whereby said pair of front legs function as guide rods for an upward and downward sliding movement of said footrest means, means for inhibiting said sliding movement of said footrest means, and means for fixing the level of said footrest means at a desired position, said footrest means comprising a foot support member for supporting the feet of an infant placed on the seat of the baby carriage, each of said slide means having a remote wall forming a clearance between it and an outer surface of said front leg and opposite to said outer front leg surface, said remote wall having an inner wall surface with a shape such that the clearance between it and the outer surface of said front leg in gradually narrowed toward the top, said inhibiting means comprising a stopper vertically movable in the clearance between the inner wall surface of said remote wall and the outer surface of said front leg, whereby said stopper in its upper limit position is pressed against the inner

wall surface of said remote wall and against the outer surface of said front leg opposed thereto, thereby inhibiting said slide means for sliding relative to said front leg, said footrest means further including a spring for constantly urging said stopper to move upward, and guide means (123, 124, 125) arranged for guiding said stopper along and in parallel with said outer front leg surface, whereby said stopper (116) is in frictional contact with said outer front leg surface at all times, and wherein said guide means comprise elongated holes (123, 124) in said slide means, and a pin (125) passing through said stopper (116) and through said elongated holes (123, 124), said elongated holes (123, 124) extending in parallel to said outer front leg surface for said guiding of said stopper along said front leg.

4,714,293

DUST CONTROL FLUIDS SPRAY ARM

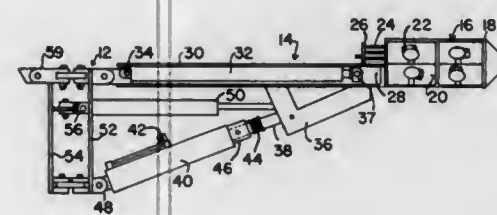
John H. Watson, Shinnston, W. Va., assignor to Sun Hydraulics, Inc., Shinnston, W. Va.

Filed Mar. 17, 1986, Ser. No. 839,999

Int. Cl.⁴ F21C 35/22

U.S. Cl. 299—12

23 Claims



1. A dust control attachment for a long wall mining device having cutters, comprising:
a mounting member attached to said long wall mining device,
a connecting means pivotally mounted on said mounting member,
an elongated boom element pivotally mounted to said connecting means in a manner whereby said boom element is movable in two planes relative to said mounting member, actuation means connected to said boom element and said connecting means for pivoting said boom element relative to said mounting member, said boom element being movable independently of movement of the cutters,
shock absorption means on said actuation means for minimizing the effect of shock impact force from falling objects on said boom element, said shock absorption means being capable of absorbing shock impact forces impacting at an angle relative to said boom element,
means on said boom element for dispersing pressurized fluid whereby said fluid is dispersed in proximity to the cutter, and
means for supplying fluid to said dispersing means.

4,714,294

DRUM AND CUTTER ASSEMBLY FOR A PLANING MACHINE

Leo Swan, Jefferson, Md., assignor to Equipment Development Company, Inc., Frederick, Md.

Filed Jun. 20, 1986, Ser. No. 876,489

Int. Cl.⁴ E01C 23/09

U.S. Cl. 299—39

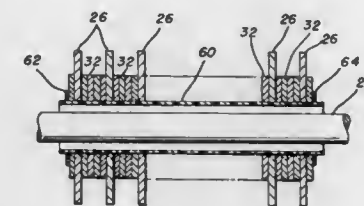
19 Claims

11. A cutter assembly for mounting on a rotatable drum of a planing machine, comprising:

- (a) a tubular member of predetermined length and thickness and being fabricated from material which pulverizes upon being subjected to torquing and compressional forces while in place on said planing machine during a planing operation.
- (b) a plurality of circular cutting elements arranged in predetermined cutting pattern along said tubular member;

- (c) a plurality of spacer members selectively arranged on either side of said cutting elements; and
- (d) retaining means on each end of said tubular member for holding said cutting elements and spacer members in place thereon.

18. A method of preassembling a set of cutting elements on an elongated fracturable tube for subsequent mounting on a cutter shaft of a planing machine, comprising the steps of:



- attaching a retaining clip to one end of said tube; selectively placing said set of cutting elements and a set of spacers on said tube in direct contact therewith and in a predetermined order to form a desired linear cutting pattern;
- attaching a retaining clip to the other end of said tube; and thereafter mounting the entire unit on said cutter shaft.

4,714,295

SCRAPER ROLLER MOUNTING MEANS FOR SCRAPER MACHINES FOR SCRAPPING OFF ROADS
Reinhard Wirtgen, Hohner Strasse 2, D-5461 Windhagen, Fed. Rep. of Germany

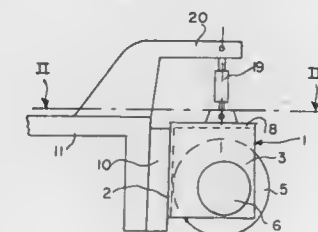
Filed Feb. 14, 1986, Ser. No. 829,499

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1985, 3506551

Int. Cl.⁴ E01C 23/12

U.S. Cl. 299—39

10 Claims



1. Scraper roller mounting means for scraper machines for scraping off road surfaces with a frame arranged transversely to a direction of travel and attached to a chassis by vertically adjustable mounting means, in which frame a scraping roller is mounted rotatably by its end faces and is drivable by a motor at least at one end face thereof,
wherein the frame (1) is guided on the chassis (11) by slide and thrust guide means (9,10) aligned vertically,
wherein said slide and thrust guide means (9,10) comprise two spaced guide rails (12) attached to the chassis (11), each having an approximately T-shaped guide channel cross-section and two sliding elements (13) attached to the frame (1) and each having a cross-section adapted with play to the respective guide channel cross-section, and
wherein at least a part (15) of each sliding element (13) located in the guide channel (14) is of substantially circular construction.

4,714,296

HYDRAULIC CONTROL VALVE

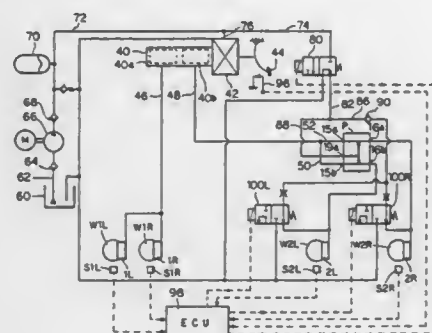
Yuzo Imoto, Kariya; Hideo Wakata, Nagoya; Toshihiro Takei, Okazaki, and Yoshiyuki Hattori, Toyooka, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 19, 1985, Ser. No. 800,113

Claims priority, application Japan, Nov. 20, 1984, 59-245455
Int. Cl.⁴ B60T 13/00, 8/44

U.S. Cl. 303—6 C

13 Claims



1. A hydraulic control system for a vehicle having driving wheels comprising:

means for selectively producing a first hydraulic pressure; wheel cylinder means for braking said driving wheels in response to said production of said first hydraulic pressure;

a hydraulic pump pumping a fluid up to a second hydraulic pressure;

selector valve means, serially connected to said hydraulic pump, for selecting either a by-pass position in a normal mode or, in response to a slip condition of said wheels, selecting a connecting position, and for passing said second hydraulic pressure through said selector valve means when said selector valve means is in said connecting position;

means, connected serially between said wheel cylinder means and said selector valve means, for selectively applying said second hydraulic pressure from said selector valve means to said wheel cylinder means in response to said slip condition of said wheels; and

a hydraulic control valve connected serially between said first hydraulic pressure producing means and said wheel cylinder means, and commonly connected, with said second hydraulic pressure applying means, to said wheel cylinder means, said hydraulic control valve including:

a valve body having first and second chambers formed separately therein;

an input port formed in said valve body so as to communicate with said first chamber, and to receive said first hydraulic pressure from said first hydraulic pressure producing means;

an output port formed in said valve body so as to communicate with said first chamber and to output said first hydraulic pressure to said wheel cylinder means;

a pressure reducing piston provided slidably within said first chamber so as to selectively interconnect said input and output ports;

means for biasing said pressure reducing piston to interconnect said input and output ports, said pressure reducing piston and said biasing means including means for reducing said first hydraulic pressure applied to said input port at a fixed ratio to a lower hydraulic pressure provided at said output port when said first hydraulic pressure applied to said input port is higher than a predetermined level;

a third port formed in said valve body so as to communicate with said second chamber, and to receive said second hydraulic pressure from said selector valve

means when said selector valve means selects said connecting position; and control piston means for disconnecting said input and output ports when said second hydraulic pressure is applied to said third port.

4,714,297

FLUID PRESSURE BRAKE CONTROL PORTION

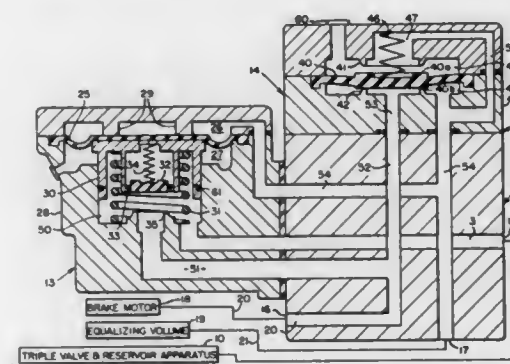
Lawrence E. Vaughn, Watertown, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 27, 1986, Ser. No. 844,660

Int. Cl.⁴ B60T 15/32

U.S. Cl. 303—33

2 Claims



1. A fluid brake control system for a multiple truck vehicle comprising triple valve and reservoir means on the vehicle for governing supply of fluid from a reservoir to brake motor means on the respective trucks comprising;

(a) a fluid pressure control portion connected between the triple valve and reservoir means and a predetermined brake motor of the brake motor means for limiting fluid pressure in that motor;

(b) the fluid pressure control portion comprising;

(1) proportioning valve means for proportioning fluid pressure delivered to the predetermined fluid brake motor relative to fluid pressure delivered to the fluid pressure control portion by the triple valve means, and

(2) inshot poppet valve means for selectively governing the proportioning valve means during brake application;

(c) the fluid pressure control portion comprising a pipe bracket through which the proportioning valve means and the inshot poppet valve means have interconnecting fluid passages;

(d) the proportioning valve means having a diaphragm separating upper and lower fluid chambers in proportioning valve housing means;

(1) a piston spring biased against the diaphragm in the lower chamber;

(2) a poppet valve contained within the piston disposed to be spring biased downwardly to at times actuate its face against a seat in the proportioning valve housing means to close a fluid passage from the triple valve to the brake motor through the pipe bracket; and

(3) the upper chamber being connected by a fluid passage through the pipe bracket to an equalizing volume; and

(e) the inshot poppet valve means being operable to permit the proportioning valve means to be effective to reduce fluid pressure delivered to the fluid motor as compared to fluid pressure delivered to the proportioning valve means by the triple valve and reservoir means only after a predetermined minimum pressure has been applied to the fluid motor.

4,714,298

AIRCRAFT WHEEL BRAKE METERING AND DESPIN VALVE

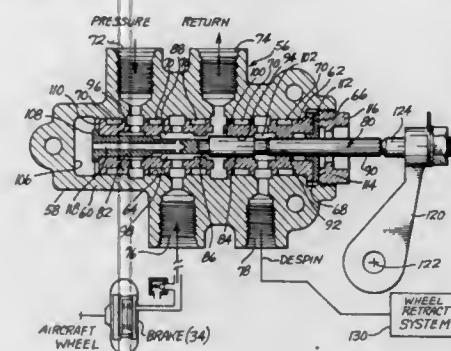
Jacob A. Mall, Hertzia, Israel, assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 13, 1984, Ser. No. 681,300

Int. Cl.⁴ B64C 25/10

U.S. Cl. 303—100

14 Claims



1. A metering and despin valve for use in an aircraft to control pressure and flow to and from a wheel brake on a retractable landing gear, said valve comprising:

a housing including wall means defining an elongated first chamber having an open end and a closed end, said housing further including a supply pressure port, a return pressure port, a brake port and a despin port;

an elongated sleeve within said first chamber, said sleeve including an inner end, an outer end, and an elongated second chamber having an open inner end and an open outer end, said sleeve being inserted into the housing through the open end of the first chamber;

retainer means at the open end of the first chamber for securing the sleeve within the housing;

an elongated port control member within said second chamber, including a control end portion which projects from the second chamber, through and then outwardly beyond said retainer means;

said port control member comprising a pair of axially spaced apart lands and an annular galley between the lands;

said sleeve including first passageway means communicating the second chamber with the supply pressure port, second passageway means communicating the second chamber with the brake port, third passageway means communicating the second chamber with the return port and fourth passageway means communicating the second chamber with the despin port;

said port control member having a retracted position in which said annular galley communicates the first passageway means, and hence the supply pressure port, with the second passageway means, and hence the brake port, and the second land means closes the third passageway means; said port control member having an extended position in which the first land closes the first passageway means, and the annular galley connects the second passageway means, and hence the return port; with the third passageway means, and hence the despin port;

said port control member functioning to meter brake pressure from the supply pressure port to the brake port in response to the port control member being moved from its extended position to its retracted position;

said port control member comprising an annular command pressure chamber located between the second land and the control end portion;

said control end portion being smaller in diameter than said first and second lands;

said command pressure chamber being always in communication with the fourth passageway means;

said command pressure chamber having a radial surface at the end thereof adjacent said second land, functioning as a

pressure surface directed to produce a force acting on the port control member, in response to hydraulic pressure in the command pressure chamber, for urging the port control member toward a brake applying retracted position; and

said port control member being inserted into the second chamber from the inner end of said second chamber, prior to the sleeve being inserted into the first chamber.

4,714,299

BRAKE PRESSURE CONTROL SYSTEM

Koji Takata, and Yukinori Nishiyama, both of Itami, Japan, assignors to Sumitomo Electric Industries, Limited, Japan

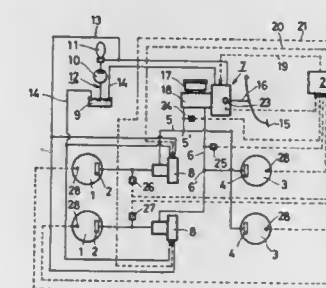
Filed May 1, 1984, Ser. No. 605,790

Claims priority, application Japan, May 10, 1983, 58-82968; May 30, 1983, 58-97499

Int. Cl.⁴ B60T 8/58, 8/64, 11/00, 8/44

U.S. Cl. 303—100

12 Claims



1. A brake pressure control system for a vehicle having a hydraulically operated front brake and a hydraulically operated rear wheel brake, a brake pedal actuable by an operator, and hydraulic means for operating said front and rear brake means upon operation of said brake pedal, comprising;

said hydraulic means including brake pressure control means for electronically controlling the brake pressure of said front wheel brake and said rear wheel brake independently of each other;

pedal force detecting means for measuring the amount of force applied to said brake pedal;

wheel speed detecting means for detecting the rotational speed of each of the wheels;

brake pressure detecting means for detecting the brake line pressure controlled by said brake pressure control means; and data processing means for giving signals to said brake pressure control means and being programmed

(1) for controlling the deceleration of the vehicle calculated with information obtained by said wheel speed detecting means according to a desired deceleration calculated with the information obtained by said pedal force detecting means;

(2) to relieve and restore the brake pressure to avoid a wheel lock condition when a potential wheel lock is sensed on the basis of the information obtained by said wheel speed detecting means; and

(3) to control the distribution of brake pressure between said front wheel brake and said rear wheel according to an ideal distribution computed with presupposed effectiveness coefficient of said brakes, the brake pressure detected by said brake pressure detecting means and the deceleration computed from said wheel speed detecting means when a potential wheel lock condition is not sensed.

8. A brake pressure controller for use with a brake system having a first brake pressure line for supplying pressure to a first wheel brake and a second brake pressure line for supplying pressure to a second wheel brake, said controller comprising a first control means selectively operable by an operator and having a first pressure-receiving portion communicating with said first brake pressure line for supplying fluid pressure

thereto and a second pressure-receiving portion communicating with said second brake pressure line for supplying fluid pressure thereto, means for controlling the sum of a thrust acting on said first pressure-receiving portion and a thrust acting on said second pressure-receiving portion in relation to the operator input and to a sensed condition for varying the thrust acting for a given operator input to prevent an undesired braking condition, and a second control means having a third pressure-receiving portion communicating with said first brake pressure line and a fourth pressure-receiving portion communicating with said second brake pressure line and means for varying the relative pressure supplied by said second control means to said first and second brake pressure lines for controlling the difference between a thrust acting on said third pressure-receiving portion and a thrust acting on said fourth pressure-receiving portion.

4,714,300

PRESSURE MODULATOR FOR ANTI-SKID BRAKE SYSTEMS

Gerhard Heess, Tamm, Fed. Rep. of Germany; Dean Karnopp, Davis, Calif., and Anton van Zanten, Ditzingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

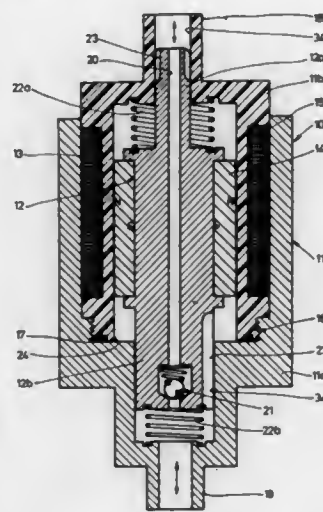
Filed Jul. 23, 1986, Ser. No. 888,659

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1985, 3526189

Int. Cl.⁴ B60T 8/42

U.S. Cl. 303—115

23 Claims



1. A pressure modulator for a motor vehicle brake system actuated via a pressurized brake fluid and including a master cylinder and at least one wheel brake, comprising a pressure-tight housing including means defining a pump cylinder disposed between said master cylinder and said at least one wheel brake, said pump cylinder provided with a pump plunger longitudinally displaceable therein forming an armature, said armature encompassed by a surrounding electromagnetic coil disposed securely in said housing, at least part of said armature being comprised of a polarized permanent magnet operable for displacement by an exciter current supplied to said electromagnetic coil further to displace the pump plunger in a first direction to force brake fluid to flow to at least one driven wheel associated with a wheel brake, which driven wheel is tending to spin due to excessive drive mount applied thereto, whereby the rising brake fluid pressure in said wheel brake causes wheel spin thereof to be reduced.

4,714,301
HYDRAULIC ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Public Limited Company, United Kingdom

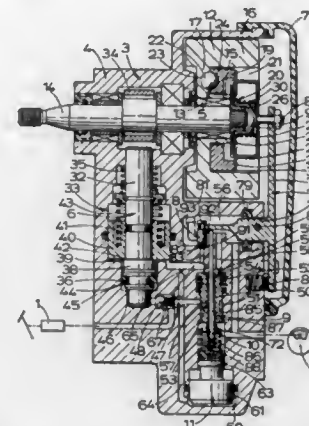
Filed Mar. 6, 1986, Ser. No. 837,004

Claims priority, application United Kingdom, Mar. 15, 1985, 8506707

Int. Cl.⁴ B60T 8/42, 13/70

U.S. Cl. 303—116

6 Claims



1. An hydraulic anti-skid braking system for a vehicle comprising a brake on a wheel of the vehicle, a supply of operating fluid for applying said brake, skid sensing means for emitting skid signals in accordance with the behaviour of said wheel when said brake is applied, a modulator assembly for modulating said supply of operating fluid to said brake in accordance with said skid signals and incorporating an expansion chamber, valve means between said supply and said brake and movable between an open position and a closed position, and an hydraulic pump to control re-application of said brake following emission of said skid signal, and a dump valve to initiate operation of said pump following movement of said valve means into said closed position, said dump valve being movable between a closed position and an open position, transmission means acting between said skid sensing means, and said dump valve and said valve means, to hold said dump valve in said closed position and said valve means in said open position when no skid signal is present, and means defining a lost-motion connection in said transmission means, said lost-motion connection being so constructed and arranged as to permit said valve means to move into said closed position and subsequently for said dump valve to move into said open position, whereafter operation of said pump is initiated, wherein said modulator assembly comprises a stepped bore, and a time-delay piston of differential area working in said stepped bore and having a first end of smaller area exposed to pressure of said valve means and a second end of greater area exposed to pressure in said expansion chamber which is equal to that applied to said brake, equalisation of said pressures acting on said first and second ends of said time-delay piston causing said piston to move in a direction progressively to open said valve means whereby to ensure that fluid from said supply flows into said brake at a rate faster than the rate at which said fluid is returned from said brake to said supply by said pump.

5. An hydraulic anti-skid braking system for a vehicle comprising a brake on a wheel of the vehicle, a supply of operating fluid for applying said brake, skid sensing means for emitting skid signals in accordance with the behaviour of said wheel when said brake is applied, a modulator assembly for modulating said supply of operating fluid to said brake in accordance with said skid signals and incorporating an expansion chamber, valve means between said supply and said brake, and an hydraulic pump to control re-application of said brake following emission of said skid signal, and a dump valve operable by said skid sensing means following closure of said valve means,

whereafter operation of said pump is initiated, wherein said modulator assembly comprises a stepped bore, and a time-delay piston of differential area working in said stepped bore and having a first end of smaller area exposed to pressure of said valve means and a second end of greater area exposed to pressure in said expansion chamber which is equal to that applied to said brake, equalisation of said pressures acting on said first and second ends of said time-delay piston causing said piston to move in a direction progressively to open said valve means whereby to ensure that fluid from said supply flows into said brake at a rate faster than the rate at which said fluid is returned from said brake to said supply by said pump, including a flow-regulator valve incorporating a variable orifice and a fixed orifice, and the pressure at said supply to which said first end of the piston of smaller area is exposed is applied to said brake through said variable orifice in said flow-regulator valve, and said pressure in the expansion chamber is applied to said second end of said piston which is of greater area through said fixed orifice, and wherein said flow-regulator valve comprises a bore, a spool working in said bore, and said spool is provided with a through-bore, and a valve head is engageable with a seating in said spool at one end of said through-bore to isolate said supply from said brake in response to operation of said skid sensing means followed by closure of said dump valve and a progressive reduction in the size of said variable orifice, movement of said time-delay piston towards the flow-regulator valve causing movement of said spool relatively away from said head and in a direction to increase progressively the effective size of said variable orifice.

4,714,302

VEHICLE TRACK

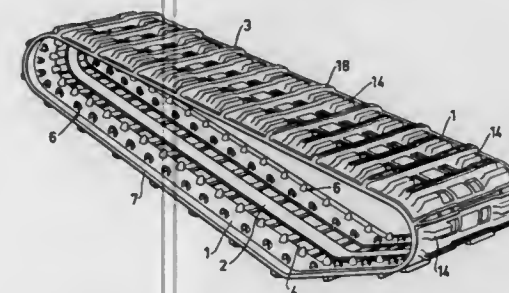
Assar Svensson, Ersmark, and Dan Granlund, Skellefteå, both of Sweden, assignors to Skega Aktiebolag, Ersmark, Sweden
Continuation of Ser. No. 000,446, Jan. 2, 1979, abandoned. This application Aug. 11, 1981, Ser. No. 291,967

Claims priority, application Sweden, Feb. 1, 1978, 7800024

Int. Cl.⁴ B62D 55/24

U.S. Cl. 305—35 EB

6 Claims



1. A vehicle track intended to be driven over spaced toothed drive wheels, preferably of rubber, and be supported on supporting wheels, comprising longitudinal inner and outer traction members formed of the same piece of an elastomer material and extending in parallel with each other, which traction members between themselves have tooth spaces for cooperation with the drive wheels, and transverse carrying members located on the outside of the track and connecting said longitudinal traction members, which longitudinal traction members and carrying members have cast-in reinforcements, and the reinforcement of each carrying member includes a beam of metal cast in the carrying member and having substantially U-shaped cross-section, the legs of which face outward and have a shorter height than the carrying member, and guide tongues located on the inside of the track are provided for cooperation with the supporting wheels of the vehicle, characterized in that the guide tongues are located on the outer traction members adjacent the tooth spaces and are connected directly to the beams, and that the portions of the carrying members which extend over the outer traction members have

4,714,303

HOUSING AND SECURING STRUCTURE FOR RADIO COMMUNICATION DEVICE

Narumi Suzuki, Ohtawara, and Hisamitsu Takagi, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

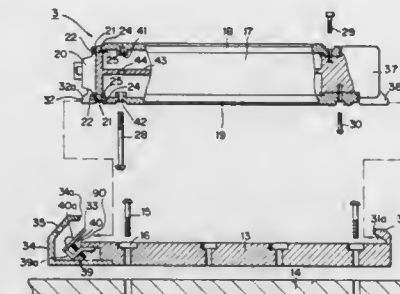
Filed Jun. 27, 1985, Ser. No. 749,278

Claims priority, application Japan, Aug. 30, 1984, 59-179331

Int. Cl.⁴ A42B 81/00

U.S. Cl. 312—7.1

11 Claims



1. A housing and securing structure for a radio communication device including communication circuits, comprising: a case for housing a radio communication device, said case including an upper lid, a bottom lid and a main housing body having one of the communication circuits mounted thereon; mount means, having a mount surface, for mounting said case such that said bottom lid faces said mount surface of said mount which is secured to a vehicle; means for securing said case of said mount means, said securing means including a projection member which projects in the direction parallel to said mount surface and a pressing plate with an aperture, which plate defines a recess for receiving said projection member between said pressing plate and said mount means, said projection member being disposed on and integrally assembled with one of said case and said mount means and said pressing plate being disposed on the other one of said case and said mount means; a bracket immovably with respect to said mount means; a first screw being screwed into said bracket through said aperture of said pressing plate and having a head which engages and urges said engagement member, located between said pressing plate and said mount means with which said bracket is immovably assembled, onto said projection member; a second screw inserted from said bottom lid side into said case, penetrating through said main housing body and screwed into said upper lid from the inside thereof to simultaneously combine said upper lid, bottom lid and main housing body into one unit; a panel having a connector for connecting to said communications circuit, said panel being disposed on an outer surface of said case and integrally assembled with said case which is mounted on said mount means; means for attaching said panel to said case, said means comprising a projection piece and a receiver for receiving said projection piece, one of said projection piece and said receiver being disposed on the upper and lower edges of said panel, and the remaining one of said projection piece and said receiver being disposed on said upper lid and said bottom lid, said panel being integrally assembled with said upper lid, said bottom lid and said main housing by said second screw; and a cover disposed over said pressing plate and having a hole formed therein for insertion of an instrument for manipulation of said first screw, said hole being smaller than the head of said first screw, said cover being disposed at a

distance from said bracket which is shorter than the length of said first screw, so that the cover prevents the first screw from being completely unscrewed and dropping out of said bracket.

4,714,304

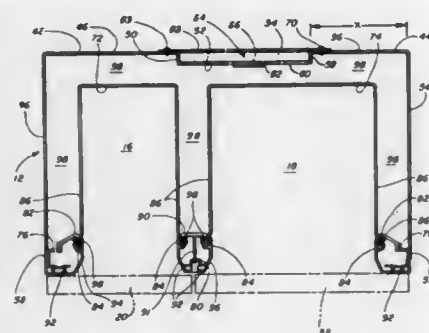
BUILT-IN REFRIGERATOR CABINET

George W. Sisk, Center Township, Vanderburgh County; Shelby A. Lynn, Johnson Township, Gibson County; John P. Keil, Ohio Township, Warrick County, and John T. Woods, Scott Township, Vanderburgh County, all of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 29, 1986, Ser. No. 946,900

Int. Cl.⁴ F25D 11/02

U.S. Cl. 312-214

18 Claims



12. A cabinet for a refrigerator/freezer having a machine compartment at the top thereof, comprising:
first and second outer shell sections, each of said shell sections having an outer sidewall and a backwall, said backwall including an inner forwardly turned flange and an inwardly extending distal portion;
first securing means for securing said distal portion of said first shell section in selected overlapping relation to said distal portion of said second shell section to define a rearwardly opening recess;
a cover section overlying said rearwardly opening recess defining a duct;
second securing means for securing said cover section to said backwall sections;
a first liner having a selected width within and spaced inwardly from said outer shell sections;
a second liner having a selected width within and spaced inwardly from said outer shell sections and said first liner;
first breaker means for securing said first and second liners to said first and second outer shell sections;
second breaker means for securing said first liner to said second liner; and
a body of insulation disposed between said outer shell sections and said liners, wherein said duct and said insulation together act as a beam to provide added strength to the cabinet.

4,714,305
SPICE RACK

Robert S. Service, 1914 Selby Ave., Los Angeles, Calif. 90025
Filed Aug. 15, 1986, Ser. No. 897,018

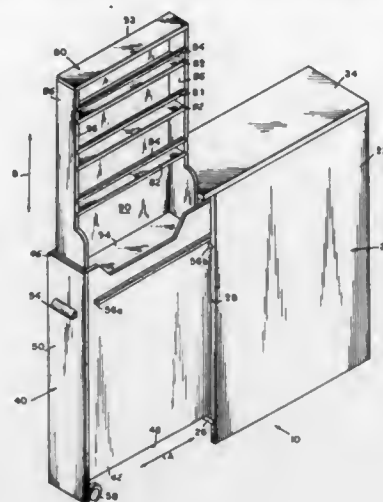
Int. Cl.⁴ A47B 88/04

U.S. Cl. 312-306

9 Claims

1. A spice rack assembly comprising three sections, a hollow outer cabinet open on one side and having a top wall, a hollow inner receptacle member open at the top and having substantially continuous front, back, and side walls, means to slide said inner receptacle member laterally through said side opening of said outer cabinet, a spice rack member having a back, opposite sides, and a plurality of shelf members interconnecting the opposite sides means to slide said spice rack member vertically to a predetermined position above said top wall of said hollow outer cabinet to expose at least one of said shelf members,

through said top opening of said inner receptacle member subsequent to said inner receptacle being laterally slid through said cabinet open side, said means to slide said spice rack mem-



ber vertically including sliding guide sets in cooperative association on the back of said spice rack member and the back of said inner receptacle member.

4,714,306

INSULATION DISPLACEMENT CONNECTION (IDC) TYPE CABLE CONNECTOR AND A METHOD FOR ASSEMBLING A CABLE THERETO

Hideo Miyazawa; Ikuhiro Andoh, both of Yokohama; Hiromichi Koyama, Suzaka, and Mitsuru Kobayashi, Nagano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

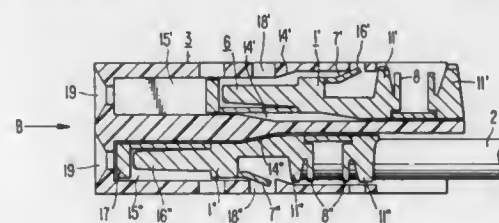
Filed Feb. 6, 1987, Ser. No. 11,601

Claims priority, application Japan, Feb. 7, 1986, 61-025005

Int. Cl.⁴ H01R 4/24

U.S. Cl. 439-395

13 Claims



1. A cable connector having a plurality of contacts to be engaged with respective counterpart of opposite connector, said cable connector comprising:
plurality of contact terminals made from metal each of which being provided with,
a contact part provided at one end of said contact terminal for contacting to corresponding terminals of opposite connector, and
a connection part provided at another end of said contact terminal for connecting cable thereto;
a housing made from insulator for holding said contact terminals, said housing being provided with holes corresponding to each contact terminals for holding them separated from each other; and
a pre-loading means for holding said contact terminals at a first and second position in said hole in the housing, in said first position said connection part of said contact terminal is exposed from the hole of said housing, while in said second position said connection part of said contact terminal is entirely covered by wall of said hole in the housing.

4,714,307

CATADIOPTRIC INFRARED LENSES

John M. Palmer, Clwyd, Wales, assignor to Pilkington P.E. Limited, United Kingdom

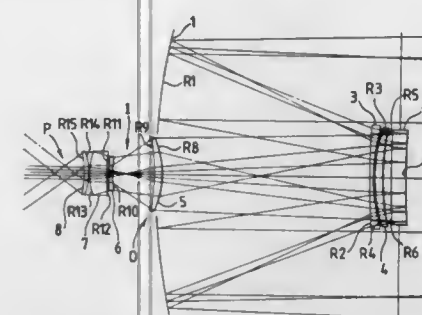
Filed Jul. 10, 1986, Ser. No. 883,919

Claims priority, application United Kingdom, Jul. 13, 1985, 8517727

Int. Cl.⁴ G02B 17/08, 13/14

U.S. Cl. 350-1.3

16 Claims



1. A catadioptric lens comprising a primary mirror having an opening, a Mangin secondary mirror of a first optically transmissive material, and a pair of refracting lens elements respectively of second and third optically transmissive materials different from each other and from said first optically transmissive material, said pair of elements being disposed in the light paths between the primary mirror and the Mangin secondary mirror and between the Mangin secondary mirror and the opening in the primary mirror.

4,714,309

REFLECTION HOLOGRAMS

Brian H. Woodcock, and Stuart S. Duncan, both of Clwyd, Wales, assignors to Pilkington P.E. Limited, United Kingdom

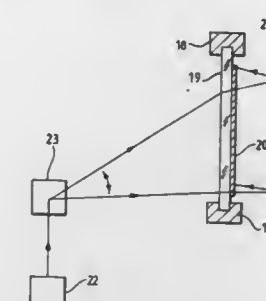
Filed Jun. 5, 1985, Ser. No. 741,540

Claims priority, application United Kingdom, Jun. 9, 1984, 8414761

Int. Cl.⁴ G02B 5/32; G03H 1/04

U.S. Cl. 350-3.7

17 Claims



1. A method of making a reflection hologram including the steps of directing an illuminating beam towards a photosensitive film from a substantially fixed apparent beam source position, moving the illuminating beam angularly relative to the film in a manner such that said substantially fixed apparent beam source position remains substantially stationary relative to the film, and reflecting the illuminating beam back to the film after passage therethrough from a reflector spaced from the film so as to cause interference in the film between the illuminating beam and the beam reflected from the reflector.

4,714,310

METHOD AND APPARATUS FOR DYNAMIC FOCUSING CONTROL OF A RADIANT ENERGY BEAM

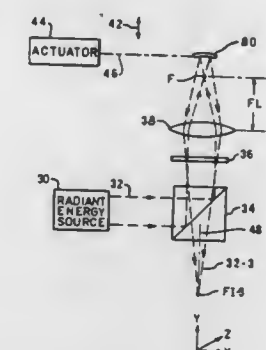
Norman A. Peppers, Belmont, and Louis F. Schaefer, Palo Alto, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Apr. 21, 1986, Ser. No. 854,222

Int. Cl.⁴ G02B 26/08, 17/00

U.S. Cl. 350-6.6

2 Claims



4,714,308

ULTRAVIOLET REFLECTING MIRROR

Mitsuharu Sawamura, Yokohama, and Yasushi Taniguchi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,521

Claims priority, application Japan, Feb. 29, 1984, 59-35959

Int. Cl.⁴ G02B 5/28

U.S. Cl. 350-1.7

6 Claims



1. An ultraviolet reflecting mirror comprising in sequence (a) a substrate; (b) a high reflection factor film provided on said substrate; and (c) one or more sets of dielectric material layers comprising a first layer of low refractive index film and a second layer of high refractive index film on said first layer; said high reflection factor film having a film thickness of at least 250 angstroms and being capable of reflecting a light beam by its surface; said higher refractive index film and said low refractive index film, each having an optical film thickness of approximately $(2n-1)\lambda/4$, wherein n is a natural number, λ is the design wavelength, and $150\text{ nm} \leq \lambda \leq 300\text{ nm}$; and in at least one of said sets of dielectric material layers at least one of said high refractive index film and said low refractive index film have an optical film thickness of at least $3\lambda/4$.

2. A system for dynamic control of the divergence or convergence of a radiant energy beam comprising,
a radiant energy source,
spherical focusing lens means in the path of radiation from the radiant energy source to provide a converging radiant energy beam,
a movable cylindrical reflector for reflecting the radiant energy beam from the spherical focusing lens means back through the focusing lens means, and
means for moving the cylindrical reflector along the beam axis for controlling convergence or divergence of the reflected energy beam from the spherical focusing lens

means, convergence or divergence of the reflected radiant energy beam from the spherical focusing lens means being unequally affected in both of two perpendicular planes containing the beam axis, one of which planes extends across the cylindrical reflector and the other of which extends longitudinally thereof.

4,714,311 CONTROLLABLE INTEGRATED OPTICAL COMPONENT

Franz Auracher, Baierbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

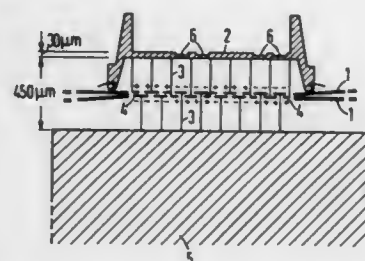
Filed Jul. 16, 1984, Ser. No. 631,401

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337513

Int. Cl.⁴ G02B 6/12

U.S. Cl. 350—96.11

20 Claims



1. A controllable integrated optical component, comprising: a conductive first strip of a microwave line including a substrate having electro-optical property; a conductive second strip of the microwave line disposed spaced from and generally parallel to said substrate; at least one optical waveguide in said substrate between said first and second strips; and a plurality of electrodes which may be charged with alternate electrical potentials disposed between said first and second strips, each of said electrodes connected to a respective strip.

4,714,312 ELECTROSTATICALLY BIASED ELECTROOPTICAL DEVICES

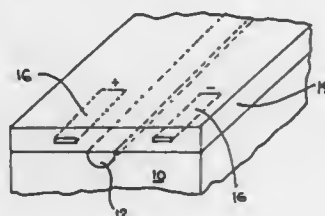
Suwat Thanlyavarn, Pasadena, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 19, 1986, Ser. No. 864,231

Int. Cl.⁴ G02B 6/12

U.S. Cl. 350—96.14

6 Claims



1. An electrooptical device, comprising: an electrooptical substrate; an optical waveguide formed in the substrate; an insulating layer formed over the substrate; and a pair of metal electrodes embedded within the insulating layer, the electrodes being completely enclosed within the insulating layer and bearing opposite electrostatic charges, to generate a desired electric biasing field to influence the waveguide, without requiring an external voltage source.

4,714,313 STAR COUPLER FOR OPTICAL FIBERS

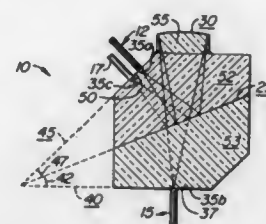
Narinder S. Kapany, Woodside, and Fred C. Unterlechner, Palo Alto, both of Calif., assignors to Kaptron, Inc., Palo Alto, Calif.

Filed May 2, 1984, Ser. No. 606,119

Int. Cl.⁴ G02B 6/28

U.S. Cl. 350—96.16

19 Claims



1. A star coupler with monitoring means comprising: a first bundle of N input fibers having respective ends registered at a first plurality of input fiber locations in a first region; a second bundle of N monitor fibers corresponding to said N input fibers and having respective ends registered at a second plurality of monitor fiber locations in a second region, said second plurality of monitor fiber locations and said first plurality of input fiber locations having corresponding geometries; an integrating element having an entrance portion and an exit portion, said entrance portion being registered in a third region, said integrating element having the property that light entering said entrance portion at any point thereof exits said exit portion over substantially the entire extent thereof; a beam splitter; and at least one imaging element; said beam splitter and said at least one imaging element being disposed relative to said first, second, and third regions so that when light emanates from any given one of said input fiber ends, a minor portion of said light emanating from said given one of said input fiber ends is imaged at the corresponding monitor fiber location so as to enter the corresponding monitor fiber, and a major portion of said light emanating from said given one of said input fiber ends is imaged at a sub-region in said third region so as to enter said entrance portion of said integrating element.

4,714,314 MODE DEPENDENT, OPTICAL TIME DELAY SYSTEM FOR ELECTRICAL SIGNALS

Andrew C. Yang, Concord; Richard Payne, Sudbury, and Richard A. Soref, Newton, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1985, Ser. No. 698,721

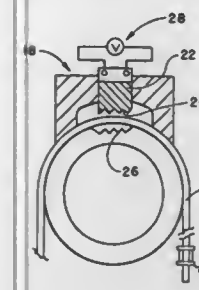
Int. Cl.⁴ G02B 6/36, 7/26

U.S. Cl. 350—96.20

11 Claims

1. A mode dependent, optical time delay system for electrical signals comprising: a highly multi-mode optical fiber having a step index profile and a longitudinal axis; means for receiving an incoming electrical signal, converting said electrical signal into an optical signal, and feeding said optical signal into one end of said multi-mode optical fiber at a predetermined angle with respect to said longitudinal axis of said fiber; means located a predetermined distance, L, from the other end of said multi-mode optical fiber for preselectively controlling the mode of said optical signal passing through said multi-mode fiber; and means positioned in optical alignment with the other end of

said multi-mode optical fiber for receiving said optical signal after propagating therethrough and for converting said optical signal into an electrical output signal, said electrical output signal being time delayed by a predetermined amount, Δt , in direct relation to the mode of said



optical signal propagating through said multi-mode optical fiber, said mode being altered by said mode controlling means and said amount of time delay, Δt , being equal to $nL\theta^2/2c$, wherein n equals the core index of said fiber; θ equals the ray angle of said mode propagating through said fiber; and c equals the speed of light.

4,714,315 METHOD FOR CONNECTING ELEMENTS OF OPTICAL COMMUNICATION TECHNOLOGY TO ONE ANOTHER OR TO ELEMENTS OF RELEASABLE PLUG CONNECTIONS

Dieter Krause, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

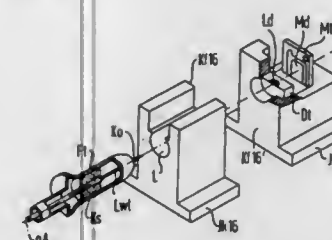
Filed Oct. 15, 1985, Ser. No. 787,112

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1984, 3438340

U.S. Cl. 350—96.20

Int. Cl.⁴ G02B 6/36

17 Claims



16. An optical transmitter module comprising a laser diode, a coupling optics and a light waveguide, wherein the optical axis of the coupling optics is aligned in a prescribable adjusted position relative to the optical axis of the laser diode, said module including a first adjustment member receiving the light waveguide and the coupling optics, a second optical adjustment member receiving the laser diode, said first adjustment member and said second adjustment member each having coupling faces aligned orthogonally relative to the optical axis of the coupling optics and of the laser diode, respectively, said first and second adjustment members being positioned with the coupling faces lying against one another without play and being connected to one another by at least one spot weld in a region of a part of seam formed by edges of the coupling faces spaced inwardly from a circle circumscribing the profile of the coupling faces.

4,714,316 OPTICAL FIBER UNIT HAVING PROTECTIVE ASSEMBLY

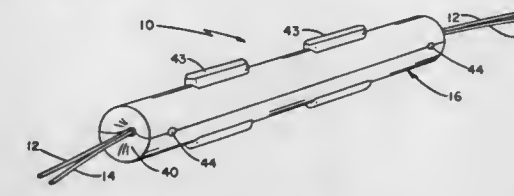
Wayne E. Moore, Holliston; Stephen R. Quinn, Medfield; Wesley M. Tufts, Holliston, and William F. Gasko, Berlin, all of Mass., assignors to Aster Associates, Milford, Mass.

Filed Aug. 20, 1985, Ser. No. 767,492

Int. Cl.⁴ G02B 6/26

U.S. Cl. 350—96.20

16 Claims



1. An optical fiber unit comprising: an optical fiber means configured to provide an optical function, a performed rigid, hollow internal protective body having a preformed space of limited length into which said optical fiber means extends with a relatively close fit, said internal protective body being of a material of hardness and coefficient of thermal expansion substantially matched to that of said fiber means and said fiber means being bonded thereto, an outer protective body surrounding said internal protective body, at least a portion of said outer protective body being injection-molded, said body having a performed recess shaped to receive and support said rigid internal protective body, said internal body seated in said recess, a mass of relatively soft uniting material disposed in a manner to secure said internal protective body to said performed portion of said outer protective body, said injection-molded portion of said outer protective body, being of substance less rigid and brittle than said internal protective body, effectively surrounding and protecting said internal protective body and the fibers therewithin from the environment in which the unit is intended for use, and stress relief means associated with said outer protective body through the outer protective body in a manner that is effective to prevent breakage of said fiber means under conditions of stress on said fiber means.

4,714,317 BICONIC OPTICAL FIBER CONNECTOR/ATTENUATOR

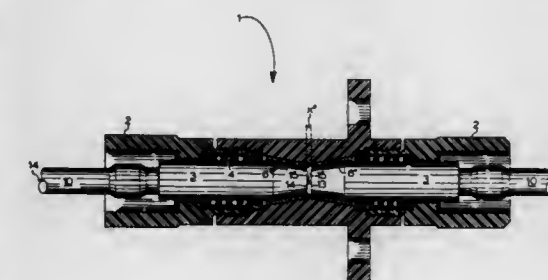
Otto I. Szentesi, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Apr. 14, 1986, Ser. No. 851,463

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.21

3 Claims



1. A biconic optical fiber connector adapted to introduce into an optical fiber transmission line a predetermined amount of attenuation comprising:

- (a) a male member, a portion of which is frustoconical shaped and has a terminal free surface;
- (b) a socket member having a frustoconical shape, adapted to receive the frustoconical shaped portion of the male member;
- (c) a first optical fiber disposed in the male member, having a terminal free end in communication with the terminal free surface of the male member;
- (d) a second optical fiber having a terminal free end, the terminal free end of the first optical fiber being in alignment with and exposed to the terminal free end of the second optical fiber; and,
- (e) a shim with an aperture in it, having outside and inside surfaces delimiting a frustoconical shape and a predetermined wall thickness between them, received in the socket and disposed over the frustoconical portion of the male member, the wall thickness of the shim causing the free ends of the first and second optical fibers to be separated one from another a predetermined distance so as to introduced into an optical fiber transmission line which includes the first and second optical fibers a predetermined amount of attenuation that is a function of the shim's wall thickness.

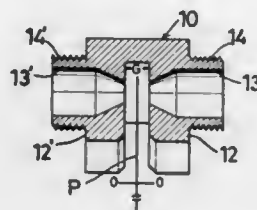
4,714,318

CONNECTOR FOR OPTICAL FIBERS WITH A GAP
Kyoza Hayashi, and Shigeru Noda, both of Osaka, Japan, assignors to Samitomo Electric Industries, Ltd., Japan
Filed May 14, 1982, Ser. No. 378,127
Claims priority, application Japan, May 22, 1981, 56-74775[U]

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350-96.21

6 Claims



2. An optical connector for connecting a pair of optical fibers together with a gap between their opposed ends, comprising: a body for supporting a pair of optical fibers therein, a pair of sleeves, means on said body for mounting each of said sleeves in a centered relation to the other of said sleeves, a pair of lenses each fixed in a respective of said sleeves, and a pair of plugs and means for mounting each of said plugs in centralized location relative to a respective of said sleeves, each of said plugs being formed with a hole for holding the end of an optical fiber in forced engagement with the lens of the respective sleeve, a pair of nuts adapted to be screwed on the ends of said body and to engage an annular flange formed on said plug.

4,714,319

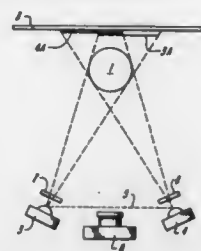
APPARATUS FOR RELIEF ILLUSION
Yehoshua Y. Zeevi, Department of Electrical Engineering, Technion Israel Inst. of Tech., Haifa, Israel, and Antonio Medina, Filipinas 46, Madrid 3, Spain
Filed Sep. 30, 1983, Ser. No. 537,514
Int. Cl.⁴ G02B 27/22

U.S. Cl. 350-144

13 Claims

1. A system for forming a representation having three-dimensional characteristics of an object comprising, energy source means for directing energy onto said object from a plurality of points spaced apart from one another whereby said energy may be reflected and detected to

form an image of said object having shadows formed by said energy emanating from said plurality of points, means for detecting said reflected energy in the form of said image, with the energy from different ones of said points defining separable shadows,



and means for optically segregating for viewing separately by each of a viewer's eyes said separable shadows of said detected image.

4,714,320

DISPLAY SYSTEMS

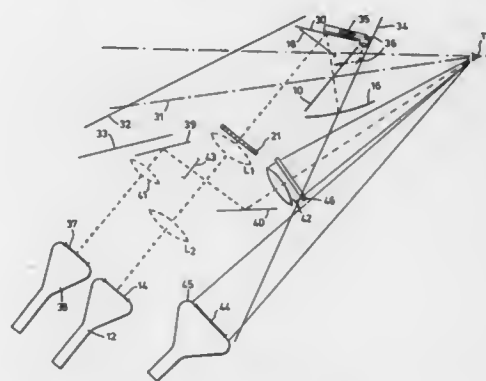
John R. Banbury, Fleet, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 308,192, Aug. 21, 1981. This application Dec. 3, 1984, Ser. No. 677,329
Claims priority, application United Kingdom, Aug. 21, 1980, 8027278; Jul. 8, 1981, 8121142

Int. Cl.⁴ G02B 27/14; G09G 3/02

U.S. Cl. 350-174

8 Claims



1. A head-up display system comprising:

means providing a display object and a HUD optical relay means for forming a real image of the display object and together defining an optical axis, the HUD optical relay means including two lens systems each having at least one optical surface axially separated from one another; and associated collimated monitor means including means providing a monitor object, monitor optical relay means for forming a real image of the monitor object, a monitor collimator for producing a collimated image of the monitor object at the observer's viewing position and first and second reflectors for directing light from the monitor optical relay to the monitor collimator; the monitor object and the first reflector being located on the opposite side of the said optical axis with respect to the second reflector and the monitor collimator and the first reflector being so located as to direct light from the monitor optical relay across the optical axis between the two lens systems; and axial separation of the two lens systems being sufficient not to obstruct the monitor means.

4,714,321

OPTICAL VIEWING APPARATUS

Sillitto: Hillary G., Edinburgh, Scotland, assignor to Ferranti Plc, Cheadle, England

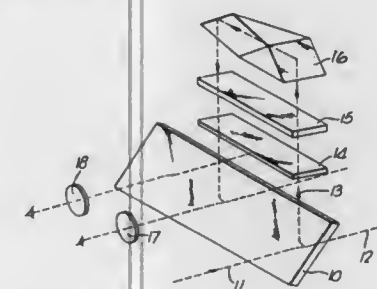
Filed Jul. 28, 1986, Ser. No. 889,631

Claims priority, application United Kingdom, Aug. 6, 1985, 8519730

Int. Cl.⁴ G02B 27/14

U.S. Cl. 350-174

9 Claims



1. Optical viewing apparatus having means for permitting the viewing of an external target along a sight-line by a sensing device and for projecting a beam of laser radiation towards the target, which includes a viewing window having two surface and transparent to radiation at a wavelength to which the sensing device is sensitive arranged at an angle to the sight-line and having a viewing area through which the target may be viewed by the sensing device and a laser output area through which the beam of laser radiation passes, an anti-reflection coating on that surface of the viewing window remote from the target, and optical deflection means for deflecting laser radiation reflected from the other surface of the viewing window in the laser output area into the viewing area for reflection by the other surface of the viewing window into the field of view of the sensing device to form an aiming mark.

4,714,322

REAR VIEW MIRROR WITH DAY/NIGHT SETTING AND ADJUSTABLE PANORAMIC VIEW

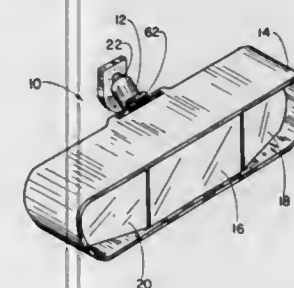
Charles Cook, 4001 N. Chapman, Shawnee, Okla. 74801

Filed Mar. 3, 1986, Ser. No. 835,751

Int. Cl.⁴ B60R 1/04; G02B 17/00

U.S. Cl. 350-281

2 Claims



1. A rear view mirror assembly comprising:

(a) a support member adapted to fasten to and be suspended to the center of the windshield terminating in an adjustable ball and socket coupling displaced away from the windshield;

(b) a mirror housing;

(c) an over center means pivotally attached to said mirror housing through an upper and a lower axis and further attached between said upper and lower axis to said support member through said adjustable ball and socket coupling such that the selection of positions of the over center means displaces the lower axis and housing relative to the

upper axis creating a selectable change in the tilt of said housing;

- (d) a plurality of prismatic mirror segments sequentially positioned within said mirror housing with the centrally located mirror segment rigidly fixed to said housing and each successive mirror segments vertically hinged to said adjacent mirror segments within said housing; and
- (e) a plurality of adjustable means each threadably attached to said housing and one of said successive hinged mirror segments such as to adjust said hinged mirror segments relative to said housing and thereby direct said hinged mirror segment towards a desired direction of view.

4,714,323

FERROELECTRIC LIQUID CRYSTAL DEVICE HAVING CHIRAL SMECTIC AND NEMATIC LIQUID CRYSTAL COMPOSITION

Kazuharu Katagiri, Tama; Kazuo Yoshinaga, Tokyo; Shinjiro Okada, Kawasaki, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

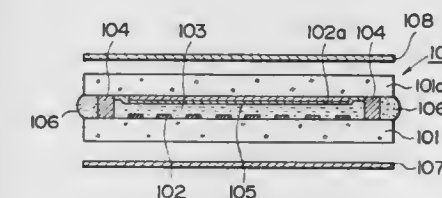
Filed Sep. 6, 1985, Ser. No. 773,222

Claims priority, application Japan, Sep. 11, 1984, 59-191162

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350-350 S

27 Claims



1. A liquid crystal apparatus comprising:

(a) a liquid crystal device comprising a plurality of picture elements arranged in a plurality of rows and columns, each picture element comprising a pair of oppositely spaced electrodes and a ferroelectric liquid crystal having a first optically stable state and a second optically stable state disposed between the pair of oppositely spaced electrodes, said ferroelectric liquid crystal being a composition comprising a liquid crystal compound showing at least nematic phase and a liquid crystal compound showing at least chiral smectic phase; and

(b) means for applying either one of a first voltage signal exceeding a first threshold voltage of the ferroelectric liquid crystal and a second voltage signal exceeding a second threshold voltage of the ferroelectric liquid crystal to the picture elements on a row for orienting the ferroelectric liquid crystal to either one of the first and second optionally stable states.

16. A liquid crystal apparatus comprising:

(a) a liquid crystal device comprising a plurality of picture elements arranged in a plurality of rows and columns, each picture element comprising a pair of oppositely spaced electrodes and a ferroelectric liquid crystal having a first optically stable state and a second optically stable state disposed between the pair of oppositely spaced electrodes, said ferroelectric liquid crystal being a composition comprising a liquid crystal compound showing at least nematic phase and a liquid crystal compound showing at least chiral smectic phase; and

(b) means for applying a first voltage signal for orienting the ferroelectric liquid crystal to the first optically stable state to a selected picture element on a row of picture elements, and a second voltage signal for orienting the ferroelectric liquid crystal to the second optically stable state to the remaining picture elements on the row.

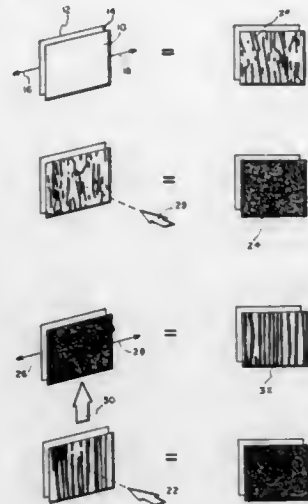
4,714,324

APPARATUS UTILIZING DISPERSION SHEAR
Richard J. McClure, and Frederick J. Jeffers, both of San Diego, Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 19, 1985, Ser. No. 777,652
Int. Cl.⁴ G02B 26/02

U.S. Cl. 350—362

8 Claims



1. Apparatus for use with a dispersion of magnetic particles, said apparatus comprising
 - a. first and second spaced apart means for receiving said dispersion of magnetic particles therebetween,
 - b. drive means for relatively moving said first and second means to impart shearing forces to said dispersion of said magnetic particles, and
 - c. means for applying a magnetic field perpendicular to the plane of shear experienced by said dispersion, the strength of said field being sufficient to orient similarly the dipoles associated with said particles and thereby cause said particles to repel mutually each other to effect a high perfect dispersion thereof.

4,714,325

MAGNETO-OPTICAL PRINTING HEAD AND METHOD OF GREY-SCALE IMAGE GENERATION USING SUCH A PRINTING HEAD

Bernhard Hill, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

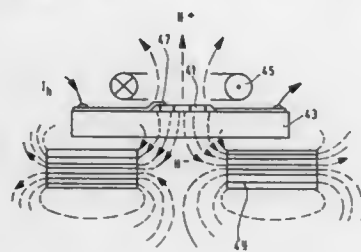
Filed Sep. 12, 1985, Ser. No. 775,190

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435426

Int. Cl.⁴ G02F 1/09

U.S. Cl. 350—376

10 Claims



1. Magneto-optical printing head for generating a picture in the form of at least one line of light spots, comprising a light source, an imaging optical system and, situated between the source and imaging optics, a magneto-optical light-switching mask with light-switching elements, which by means of heat pulses selectively generated from thin-film resistors applied to the light-switching elements, and by means of a coil generating

a magnetic field can be thermomagnetically switched between two possible states with the direction of magnetisation either parallel or antiparallel to the surface normals, characterized by an arrangement situated close to the light-switching elements for generating a static magnetic field in one direction, said coil generating a switchable magnetic field in the opposite direction, whereby the light-switching elements within a line cycle can be individually switched on in n possible steps by the single switching of all light-switching elements into a (first) starting state by the action of the magnetic field generated with the coil and subsequent individual switching of each light-switching element into the second state by the action of heat pulses at $n-1$ points of time and of the static magnetic field.

4,714,326

METHOD AND ELEMENT FOR OPTICAL MODULATION

Masayuki Usui, Yokohama; Hiroyuki Imataki, Kawasaki; Takashi Serizawa; Takeshi Baba, both of Yokohama, and Hiroyasu Nose, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

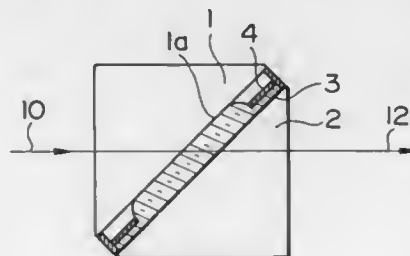
Filed Feb. 27, 1985, Ser. No. 706,269

Claims priority, application Japan, Mar. 5, 1984, 59-41837

Int. Cl.⁴ G02B 26/00

U.S. Cl. 350—485

17 Claims



1. An optical modulation method comprising:
 - providing a transparent member having a surface,
 - providing an elastomeric body disposed spaced apart from the surface,
 - providing a pressing member having an opening substantially in contact with the elastomeric member,
 - irradiating the surface with a light beam; and
 - causing the protrusion of the elastomeric body out of the opening of the pressing member to contact the surface so that the proportion of the light beam transmitted through the surface is changed.

4,714,327

OBLIQUE OBSERVATION ATTACHMENT FOR MICROSCOPES

Charles H. Marshall, Washington, D.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 14, 1986, Ser. No. 839,489

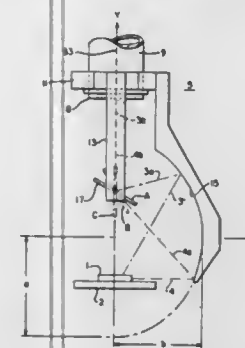
Int. Cl.⁴ G02B 21/18

U.S. Cl. 350—504

11 Claims

1. An oblique observation attachment for use in conjunction with a microscope operable in a three axis (X, Y, Z) cartesian coordinate system to provide normal and oblique optical inspection of populated planar subjects, comprising:
 - a retaining ring means positioned around said microscope parallel to said X axis and perpendicular to said Y axis operable to attach said oblique observation attachment to said microscope and further operable to maintain said oblique observation attachment on a common colinear axis with the objective lens of said microscope;
 - a support ring means positioned around said retaining ring means encircling same, said support ring means parallel to said X axis and perpendicular to said Y axis said support

- ring means operable to support said oblique observation attachment;
- at least one planar reflective means support member interconnected to said support ring positioned parallel to said Y axis and perpendicular to X axis operable to support a planar reflective means;
- a planar reflective means interconnected to said planar reflector means support member positioned on a common colinear axis with said objective lens of said microscope operable to be pivoted about a point upon said planar reflective means member through 360° of rotation about the Z axis and further operable to reflect optical energy;



- an X-Y stage positioned beneath said planar reflective means on a common colinear axis with said planar reflective means and said objective lens of said microscope, said X-Y stage operable to hold and support said populated planar subjects;
- and a plano-elliptical reflective means positioned parallel to said Y axis and perpendicular to said X axis, said plano-elliptical reflective means operable to receive and reflect optical energy from said populated planar subject held by said X-Y stage and further operable to reflect said optical energy to said planar reflective means whereby said optical energy is then reflected to said objective lens of said microscope by said planar reflective means.

4,714,328

OPERATING MICROSCOPE APPARATUS

Naoyuki Takahashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

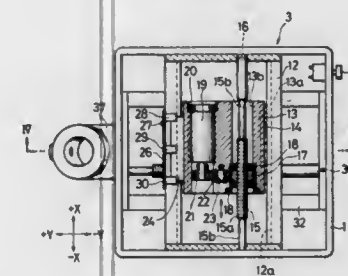
Continuation-in-part of Ser. No. 666,124, Oct. 29, 1984, abandoned, which is a continuation of Ser. No. 326,652, Dec. 2, 1981, abandoned. This application Jul. 16, 1986, Ser. No. 884,668

Claims priority, application Japan, Dec. 4, 1980, 55-171332

Int. Cl.⁴ G02B 21/24

U.S. Cl. 350—521

7 Claims



1. An operating microscope apparatus comprising a stand, a supporting arm mounted slidably and rotatably on said stand, a fitting shaft supported rotatably on said supporting arm, and a microscope assembly moving device fixed to said fitting shaft and mounting a microscope assembly, said microscope assembly moving device comprising a case supporting thereon said

microscope assembly, a first member fixed to said fitting shaft, a second member slidably at touched to said case and mounted movably on said first member, a third member fixed to said second member, and a fourth member secured to said case and movable to said third member and movable in the direction perpendicular to the moving direction of said second member.

4,714,329

VISUAL AID ESPECIALLY FOR WEAK-SIGHTED PERSONS

Lars Hellström, Mölndal, Sweden, assignor to N.V. Optimed, Izegem, Belgium

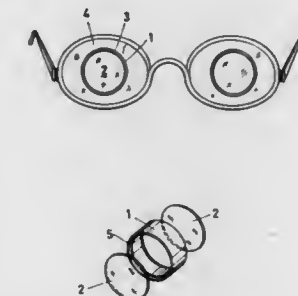
Filed Oct. 7, 1985, Ser. No. 785,252

Claims priority, application Sweden, Oct. 9, 1984, 8405034

Int. Cl.⁴ G02C 1/00; G02B 25/00

U.S. Cl. 351—158

4 Claims



1. A visual aid for a particular weak-sighted person to improve the vision of the person, comprising a pair of spectacle glasses, having a spectacle glass positioned in front of each eye, to be worn by the weak-sighted person as a vision aid, each spectacle glass having an opening therein, the shape of which matches the exterior shape of a sleeve, into which sleeve at least one lens is interchangeably fitted having particular desirable optical properties for the particular eye in front on which the sleeve and lens are positioned in the spectacle glass, said at least one lens being interchangeable with other lenses to compensate for changes in the desirable optical properties for the particular eye, and the position of each sleeve in each spectacle glass being adjustable by sliding of the sleeve within its corresponding opening until a particular desirable ophthalmic position of the sleeve in front of the eye is selected, at which the sleeve is positioned within its corresponding opening in the spectacle glass such that the visual aid can be adjusted to improve the vision of the person by changing lenses and also by adjustably sliding and positioning the sleeve in its corresponding opening.

4,714,330

DEVICE FOR DETECTING AND/OR MEASURING VISUAL DEFICIENCIES

Jean-Claude Hennequin, Lizy sur Ourco, France, assignor to Essilor Internationale, Creteil, France

Filed Sep. 4, 1985, Ser. No. 772,327

Claims priority, application France, Sep. 7, 1984, 84 13766

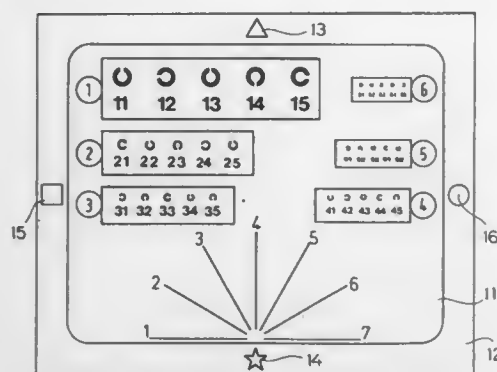
Int. Cl.⁴ A61B 3/02

U.S. Cl. 351—239

6 Claims

1. A device for measuring the level of visual acuity of a patient, comprising a test image which is adapted to be presented to the patient and which includes a plurality of visual acuity test sign series in which the test signs of each one of said series are so dimensioned that they correspond to a visual acuity level which is different from that of the test signs of any other one of said series, said series being so disposed in succession that each one of said test sign series corresponds to a visual acuity level higher by a predetermined increment than the visual acuity level to which corresponds the preceding test sign series, wherein said test signs are identified by different respective reference signs, each one of said reference signs

being located at close proximity to the test sign which it identifies, and wherein the reference signs identifying respectively



the test signs of any selected one of said series are so dimensioned that they correspond to the lower visual acuity level of the series immediately preceding said selected series.

4,714,331

METHOD AND APPARATUS FOR AUTOMATIC FOCUSING

Kazuyuki Oda, Kawasaki; Yoshikiyo Yui, Kawasaki; Yoshiharu Kataoka, Kawasaki, and Hideo Hata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

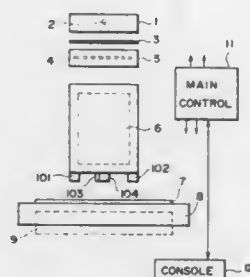
Filed Mar. 24, 1986, Ser. No. 843,392

Claims priority, application Japan, Mar. 25, 1985, 60-058534; Apr. 3, 1985, 60-069178; May 9, 1985, 60-096677; May 13, 1985, 60-099509; May 13, 1985, 60-099510; May 13, 1985, 60-099511; Jun. 18, 1985, 60-130859; Jun. 18, 1985, 60-130860; Oct. 17, 1985, 60-230027

Int. Cl.⁴ G03B 27/34

U.S. Cl. 353-122

34 Claims



1. A distance calculating device, comprising: distance measuring means for measuring the difference between a surface of an object and a predetermined plane; storing means having portions corresponding respectively to said distance measuring means, for storing information as to the effectiveness of each of measured distances by said distance measuring means, respectively, in accordance with points of measurement on the surface of the object; and means for calculating the distance between the surface of the object and the predetermined plane by reference to said storing means and by use of only an effective distance, of said measured distances, in accordance with the points of measurement on the surface of the object.

4,714,332

FILM DATA READING DEVICE

Masaharu Eguchi; Yoichi Tosaka; Ichiro Ohnuki, all of Tokyo; Yoshihiko Aihara, and Akira Ishizaki, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

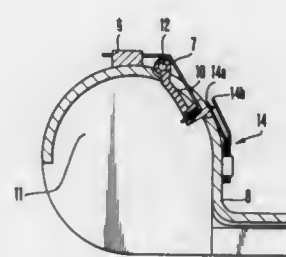
Filed Oct. 3, 1985, Ser. No. 783,847

Claims priority, application Japan, Oct. 8, 1984, 59-209827; Dec. 24, 1984, 59-272543

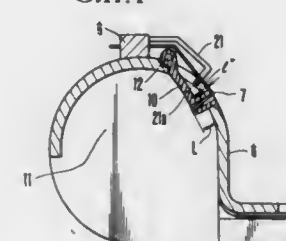
Int. Cl.⁴ G03B 7/24

U.S. Cl. 354-21

9 Claims



G.11A



1. A film data reading device, comprising:
 - (a) contact means arranged to read a film data by coming into contact with a data code part formed on a film cartridge, said contact means being arranged to be freely protrusible into and retractable from a cartridge loading chamber; and
 - (b) protecting means arranged to encompass at least a portion of said contact means, said protecting means being arranged also to be freely protrusible into and retractable from said cartridge loading chamber, wherein said contact means is arranged to be not protruding from said protecting means toward the inside of said cartridge loading chamber when said chamber is not loaded with a film cartridge.
2. A film data reading device, comprising:
 - (a) contact means arranged to read a film data by coming into contact with a data code part formed on a film cartridge, said contact means being arranged to be freely protrusible into and retractable from a cartridge loading chamber;
 - (b) protecting means arranged to encompass at least a portion of said contact means, said protecting means being arranged also to be freely protrusible into and retractable from said cartridge loading chamber; and
 - (c) detecting means for detecting loading of a film cartridge, said detecting means being arranged to detect the movement of said contact means and that of said protecting means when said chamber is loaded with a film cartridge.

4,714,333

WATER-PROOF WINDOW STRUCTURE OF WATER-PROOF CAMERA

Hideo Tamamura, and Hiroshi Maeno, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

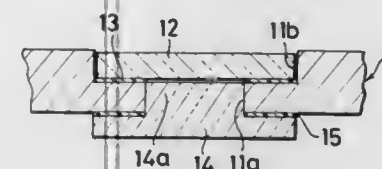
Filed Jul. 31, 1985, Ser. No. 761,187

Claims priority, application Japan, Aug. 4, 1984, 59-119990[U]

Int. Cl.⁴ G03B 17/08

U.S. Cl. 354-64

9 Claims



8. A camera, comprising:
 - (A) a camera body;
 - (B) a first member arranged on one side of the camera body by insert molding;
 - (C) second members arranged on another side of the camera body having about 90° angle relative to one side, said second members being cemented together from the inner and outer sides of the camera body in such a manner as to hold the camera body therebetween.

4,714,334

METHOD OF COLOR PHOTOGRAPHY OF BLACK AND WHITE OBJECT

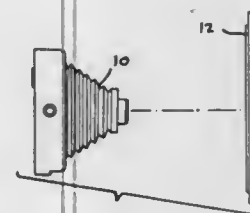
Clarence C. Edwards, 4256 E. Capitol St., Washington, D.C. 20019

Continuation of Ser. No. 895,901, Aug. 12, 1986. This application Nov. 25, 1986, Ser. No. 935,639

Int. Cl.⁴ G03B 17/50, 29/00

U.S. Cl. 354-76

8 Claims



1. The method of providing a color photographic image of a continuous tone object comprising:
 - (a) providing color film of the type comprising a support and plural emulsions each sensitive to a different color and a separable sheet carrying developer for the emulsions, the development of the said plural emulsions being in timed sequence after activation of the developer,
 - (b) exposing a continuous tone object onto said color film,
 - (c) initiating the activation of the developer, and
 - (d) separating said separable sheet from said emulsions prior to full development to thereby stop development and to obtain a print of color different than a fully developed print.

4,714,335

CAMERA WITH DOOR RELEASE AND FILM REWIND INTERLOCK

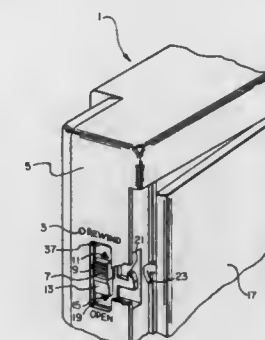
Stephen G. Malloy Desormeaux, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 2, 1986, Ser. No. 881,307

Int. Cl.⁴ G03B 1/00, 17/02

U.S. Cl. 354-214

8 Claims



1. An improved photographic camera of the type wherein (a) a rewind member is manually movable from an original position to a rewind position to initiate automatic rewinding of an exposed filmstrip back into a light-tight cartridge in said camera and (b) a release member is manually movable from a latch position for securing a rear door of said camera closed to a release position for releasing said door to permit the door to be opened in order to remove the cartridge from said camera, and wherein the improvement comprises:

means for supporting said rewind member and said release member substantially adjacent each other when the rewind member is in its original position and the release member is in its latch position and for supporting said rewind member and said release member spaced from each other when the rewind member is in its rewind position and the release member is in its latch position; and means for preventing said release member from being manually moved to its release position when said rewind member and the release member are adjacent each other and for allowing said release member to be manually moved to its release position when said rewind member and the release member are spaced from each other, whereby said rear door is safeguarded against being opened before automatic rewinding of an exposed filmstrip is initiated.

4,714,336

FOCAL PLANE SHUTTER FOR CAMERAS

Akira Suzuki, Itabashi, Japan, assignor to Copal Company Limited, Tokyo, Japan

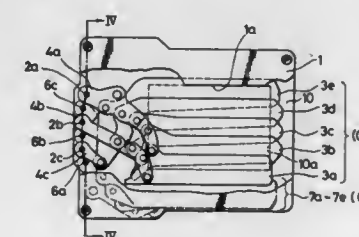
Filed Jun. 13, 1986, Ser. No. 874,152

Claims priority, application Japan, Jun. 14, 1985, 60-89588[U]

Int. Cl.⁴ G03B 9/40

U.S. Cl. 354-246

5 Claims



1. A focal plane shutter for cameras including a base plate having an exposure aperture therein and an opening blade assembly and closing blade assembly arranged on said base

plate to open and close the exposure aperture, at least one of said opening blade assembly and closing blade assembly comprising:

- a light interrupting blade group including first shutter blades and a second shutter blade partly overlapping one of said first shutter blades to open and close the exposure aperture,
 - a first arm pivoted on said base plate and pivoted to said first shutter blades and second shutter blade respectively at different positions to support said first shutter blades and second shutter blade,
 - a second arm pivoted on said base plate and pivoted to said first shutter blades respectively at different positions to form a parallel link mechanism in cooperation with said first arm, and
 - a third arm pivoted on said base plate and pivoted to said second shutter blade respectively at different positions to form a parallel link mechanism in cooperation with said first arm,
- said first arm being pivoted on said base plate by fitting a shaft standing on said base plate into a bearing sleeve carrying said first arm, and
- said second arm and third arm being pivoted on said base plate by fitting shafts provided in said base plate respectively into holes made in said second arm and third arm.

4,714,337

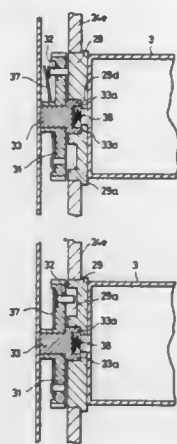
SAFETY MEANS FOR PROCESS KIT

Fumio Nishino, Tokyo; Shigeyoshi Onoda, Yokohama; Akibiro Nomura, Kawasaki; Morikazu Mizutani, Tokyo; Shinji Kanemitsu, Ichikawa, and Mototada Toriumi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Continuation of Ser. No. 849,185, Apr. 7, 1986, abandoned, which is a division of Ser. No. 450,210, Dec. 16, 1982, Pat. No. 4,591,258. This application Dec. 2, 1986, Ser. No. 937,476 Claims priority, application Japan, Dec. 22, 1981, 56-208489; Mar. 5, 1982, 57-35626; May 14, 1982, 57-81763; May 17, 1982, 57-82649

Int. Cl. G03G 15/00

U.S. Cl. 355-3 DR

8 Claims



1. A process unit mountable into and demountable from a main assembly, comprising:

- an image bearing member rotatable about a rotational axis thereof;
- process means actable on said image bearing member;
- a casing for supporting said process means and for rotatably supporting said image bearing member;
- a member for receiving a rotational drive force from the main assembly to rotate said image bearing member when said unit is mounted in the assembly;
- an electrically conductive member provided at the rotational axis of said image bearing member, for sliding contact with an electrically conductive member of said

main assembly to electrically connect said conductive shaft with the conductive member of the main assembly.

4,714,338

ELECTROSTATIC COPYING APPARATUS

Kazumi Iida, Matsubara; Yosuke Ohata, Habikino; Keiichi Hyodo, Kobe; Kazunori Akiyama, Takatsuki; Tadashi Umeda, Takada, and Keiichi Kishimoto, Nara, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan Division of Ser. No. 596,121, Apr. 3, 1984, Pat. No. 4,636,057.

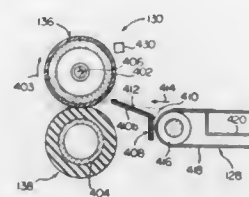
This application Jun. 20, 1986, Ser. No. 876,606

Claims priority, application Japan, Apr. 12, 1983, 58-63051

Int. Cl. G03G 15/00

U.S. Cl. 355-3 FU

4 Claims



1. An electrostatic copying apparatus comprising:
 - a fixing device with an electrical heating element,
 - a temperature detecting means for detecting temperature at a predetermined location with respect to the fixing device and providing a temperature signal representative of the temperature at said location,
 - a copying cycle signal producing means for producing a copying cycle signal when copying is to be performed,
 - a power supply switch, and
 - control means responsive to the temperature signal and to the copying cycle signal for controlling the electrical heating element and the state of the power supply switch; wherein said control means, upon the closing of the power supply switch, causes the electrical heating element to energize until the temperature detecting means provides a temperature signal representing a first predetermined temperature T_1 suitable for fixation, and thereafter, when the copying cycle signal producing means produces the copying cycle signal, said control means controls the energization and deenergization of the electrical heating element on the basis of whether the temperature detected by the temperature detecting means is the first predetermined temperature T_1 , and wherein when the copying cycle signal producing means does not produce the copying cycle signal and the temperature detecting means provides a temperature signal representing a temperature decrease to a second predetermined temperature T_2 below the first predetermined temperature T_1 , said control means deenergizes the electrical heating element and causes the power supply switch to assume an off state, the second temperature T_2 providing for reliable fixation in an immediately started copying cycle.

4,714,339

THREE AND FIVE AXIS LASER TRACKING SYSTEMS

Kam C. Lau, Gaithersburg, and Robert J. Hocken, Barnesville, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Feb. 28, 1986, Ser. No. 834,728

Int. Cl. G01B 9/02

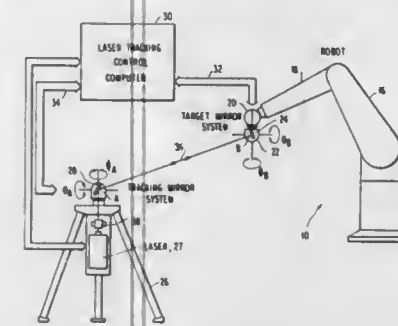
U.S. Cl. 356-4.5

15 Claims

7. A laser tracking system, comprising:
 - a laser light source associated with a tracking point (A) for producing a beam of coherent light;
 - a first rotatable planar reflector (28) associated with said

tracking point for reflecting said beam from said laser light source into a first beam;

- a retroreflector (120) associated with a target point (B) for reflecting a beam incident thereupon into a second beam anti-parallel to said incident beam, said tracking point and said target point being separated by a separation;
- control means for controlling said first reflector to direct said first beam to said retroreflector at said target point, said control means controlling said first reflector to rotate



- in at least two degrees of freedom, said control means including means (128) associated with said tracking point for determining the planar position of a light beam falling thereupon and receiving said second beam;
- angular measuring means for measuring said at least two degrees of freedom; and
- interferometric means (124,48) associated with said tracking point for measuring said separation by interfering said light beam from said laser light source before it is reflected by said first reflector.

4,714,340

METHOD AND APPARATUS FOR INSPECTING HIGH SPEED CONVERTED WEB

W. C. Stillwagon, 7610 Bell Mill Rd., Dunwoody, Ga. 30338

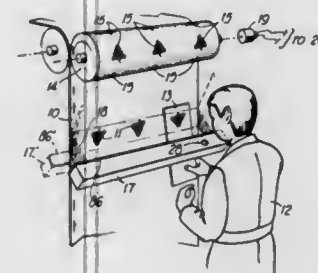
Continuation of Ser. No. 674,098, Nov. 23, 1984, abandoned.

This application Feb. 25, 1987, Ser. No. 18,597

Int. Cl. G01P 3/40

U.S. Cl. 356-23

19 Claims



1. A method of inspecting a high speed printed web having spaced repetitive impressions printed thereon, comprising the steps of:

- translating said web past a flash tube assembly including at least one flash tube adapted to be stroboscopically excited; generating trigger pulses which in a first mode of operation are synchronized at a frequency determined by the movement of the web, and in a second mode of operation continue to be synchronized with the web but are periodically advanced in a controlled manner;
- exciting said at least one flash tube with the trigger pulses to produce light flashes; and
- directing said light flashes to one surface of the web whereby a stroboscopic effect is produced, such that in said first mode of operation a virtually stationary or locked image of the impression on the web is produced

and in said second mode of operation a panned or scrolled image of the impression on the web is produced which is incrementally advanced but which remains synchronized to the web between said advancements.

4,714,341

MULTI-WAVELENGTH OXIMETER HAVING A MEANS FOR DISREGARDING A POOR SIGNAL

Kenji Hamaguri, Minamikawachi, and Takao Sakai, Habikino, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

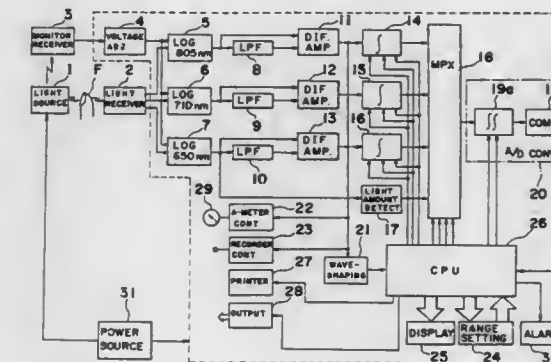
Filed Feb. 21, 1985, Ser. No. 704,772

Claims priority, application Japan, Feb. 23, 1984, 59-33952; Mar. 12, 1984, 59-47769

Int. Cl. G01N 33/16

U.S. Cl. 356-41

12 Claims



1. An oximeter for measuring oxygen saturation in arterial blood comprising:

- light source means for projecting light to a body member to be measured;
- light responsive means for receiving the light which has transmitted through said body member and for generating at least first, second and third signals at three different wavelengths;
- calculating means for calculating at least first oxygen saturation data using first and second signals and second oxygen saturation data using first and third signals;
- determining means for determining whether or not a difference between said first and second oxygen saturation data is within a predetermined level; and
- means for designating said first and/or second oxygen saturation data as valid when said difference is within said predetermined level, and as invalid when said difference is not within said predetermined level.

4,714,342

FIBER OPTICAL INTERFEROMETRIC TEMPERATURE SENSOR WITH RAMP MODULATION

David A. Jackson, Canterbury, England; Michael Corke, Wheaton, Ill., and Alan D. Kersey, Washington, D.C., assignors to Kent Scientific and Industrial Projects Limited, Kent, England

PCT No. PCT/GB84/00138, § 371 Date Dec. 18, 1984, § 102(e) Date Dec. 18, 1984, PCT Pub. No. WO84/04385, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 24, 1984, Ser. No. 684,925

Claims priority, application United Kingdom, Apr. 21, 1983, 8310835

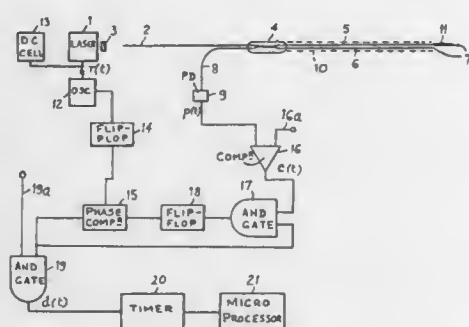
Int. Cl. G01J 5/38; G01B 9/02

U.S. Cl. 356-44

7 Claims

1. An optical temperature sensor comprising:
 - an all-fiber Michelson interferometer,
 - said interferometer comprising an input and an output, a signal optical fiber and a reference optical fiber formed

from single mode optical fiber and having unequal lengths to provide optical path length imbalance, said signal and reference optical fibers having proximal ends for coupling to said input and output and distal ends remote therefrom, said distal ends being adapted to reflect light beams propagated in said signal and reference optical fibers back towards said proximal ends thereof, means defining a temperature sensing zone of said signal optical fiber at and adjacent said distal end thereof, and directional coupling means coupling said input and output of said interferometer to said proximal ends of said signal and reference optical fibers, said directional coupling means being adapted to mix said light beams reflected back to said proximal ends of said signal and reference optical fibers to produce an interference pattern at said output of said interferometer corresponding to the optical phase shift between said light beams respectively propagated in said signal and reference optical fibers which phase shift is related to the temperature at said sensing zone of said signal optical fiber,



a laser light source controlled by a laser injection current, means coupling said laser light source to said input of said interferometer, whereby said directional coupling means injects light from said laser light source into said proximal ends of both said signal and reference optical fibers to propagate said light beams therein, means for modulating said laser injection current with a modulation signal to produce a moving said interference pattern at said output of said interferometer, photodetector means for monitoring said moving interference pattern at said output and producing a photodetector output signal corresponding thereto, and means for processing said photodetector outputs signal with respect to time for continuously monitoring a predetermined time period related to the movement of said interference pattern, whereby to derive a signal identifying the temperature detected at said sensing zone of said signal optical fiber.

4,714,343

OPTICAL FIBER CHARACTERISTIC MEASUREMENT
Takashi Ide, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 4, 1986, Ser. No. 848,229

Claims priority, application Japan, Apr. 15, 1985, 60-80003

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.⁴ G01N 21/84

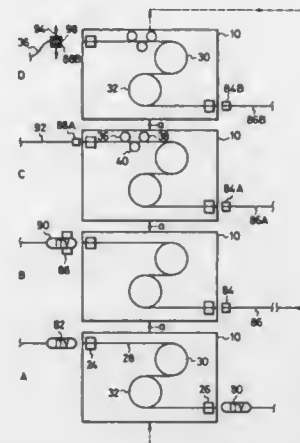
U.S. Cl. 356—73.1

24 Claims

1. A single mode optical fiber characteristic measuring device comprising:
a set stage for setting an optical fiber under measurement on a carrier and
measuring stages for measuring characteristics of said optical fiber on said carrier arranged successively in the direction of movement of said carrier, each measuring stage having optical measuring systems incident and emergent ends, said carrier on which said optical fiber under measurement being adapted to be moved to said measuring

stages successively, and at each of said measuring stages the two ends of said optical fiber under measurement being aligned with said optical measuring system incident and emergent ends, respectively, so that a characteristic measurement assigned to said stage is performed,

holders for holding the two ends of an optical fiber under measurement, and a first optical fiber bending unit adapted to accurately bend said optical fiber with a first radius of curvature in such a manner that the bend corresponds to



one circumference of a circle having said first radius of curvature, to control the propagation mode in said optical fiber being provided on said carrier, and

a second optical fiber bending unit adapted to bend said optical fiber under measurement with a second radius of curvature smaller than said first radius of curvature in such a manner that the bend corresponds to more than one circumference of the circle having said second radius of curvature is provided on said carrier or at a predetermined measuring stage or stages.

4,714,344

LASER APPARATUS FOR MONITORING GEOMETRIC ERRORS

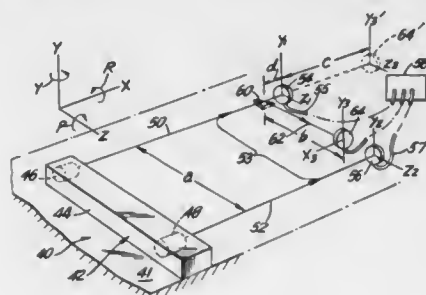
Martin R. Hamar, 70 Linden Tree Rd., Wilton, Conn. 06897

Filed Apr. 24, 1986, Ser. No. 855,898

Int. Cl.⁴ G01B 11/26; G01C 1/00

U.S. Cl. 356—152

12 Claims



1. A laser system for monitoring geometric errors, said system comprising:

a first lasing element operative to produce a first laser beam;
a second lasing element operative to produce a second laser beam such that the first and second laser beams are parallel;

a first target generally in line with the first laser beam and operative to produce a signal identifying the point of impingement of the first laser beam thereon;

a second target generally in line with the second laser beam

and operative to produce a signal defining the point of impingement of the second laser beam thereon;

a beam splitter disposed intermediate said first lasing element and said first target, said beam splitter being operative to permit a portion of the first laser beam to pass therethrough and impinge upon the first target and further being operative to divert a portion of the first laser beam therefrom;

a third target in line with the diverted portion of the first laser beam and operative to produce a signal defining the point of impingement thereon by the diverted portion of the first laser beam, the beam splitter and the first, second and third targets being fixedly mounted relative to one another with the distances of the beam splitter to the first and third targets respectively being unequal, such that the signals produced by the third target are identical to signals that would be produced by a target disposed along the portion of the first laser beam passing through the beam splitter but at a location spaced from the first target; and control means operatively connected to the first, second and third targets, said control means being operative to receive the signals from the first, second and third targets and to calculate the geometric errors based on the received signals.

4,714,345

SAMPLE ARRANGEMENT FOR SPECTROMETRY, METHOD FOR THE MEASUREMENT OF LUMINESCENCE AND SCATTERING AND APPLICATION OF THE SAMPLE ARRANGEMENT
Bernhard Schrader, Soniusweg 20, 4300 Essen, Fed. Rep. of Germany 15

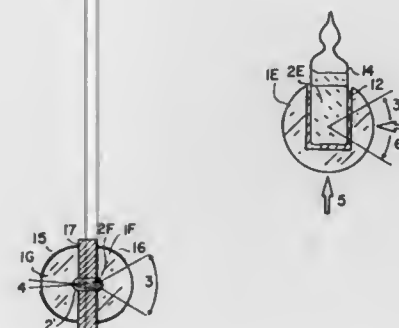
Filed Jun. 27, 1985, Ser. No. 749,882

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3424108

Int. Cl.⁴ G01N 21/03, 21/05, 21/65

U.S. Cl. 356—246

8 Claims



1. Sample arrangement for spectrometry, especially for Raman spectrometry, comprising an essentially spherical container of transparent solid material, and a sample at the center of the spherical container, said spherical container having an outer surface, light illuminated and light exiting portions of which define windows provided with anti-reflection coatings and having light reflecting layers on other surface portions of said outer surface of said spherical container, said container comprising two separate half spheres, the sample being provided in a separate sample holder serving to space apart said two half spheres and to maintain the sample between the half spheres of the container a the center thereof, the sample holder having an axis perpendicular to planar surfaces of the half spheres.

4,714,346
FREQUENCY CHIRPED INTERFEROMETRIC DISPLACEMENT SENSORS AND MECHANICAL TRANSLATION TIPS THEREFOR

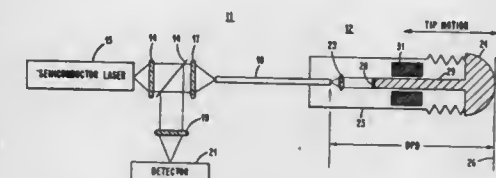
Elliot Eichen, Arlington; Paul Melman, Newton, both of Mass., and Kenneth Cook, Troy, Mich., assignors to GTE Laboratories Incorporated, Waltham, Mass. and GTE Valeron Corporation, Troy, Mich.

Filed Sep. 22, 1986, Ser. No. 909,816

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—349

11 Claims



1. A mechanical translation tip for a frequency chirped interferometric displacement sensor comprising

a tip member having

a first surface adapted to engage a test surface,
a second surface having high reflectivity, and
an axial portion joining said surfaces;

an optical fiber having two ends;
a reference surface;

a lens;

a bearing in cooperation with said portion for axial movement of said tip member therewithin; and

housing means for engaging said tip member, said bearing, said fiber, said reference surface, and said lens therewithin, whereby

said housing means is adopted to translationally engage said member so that said first surface is external to said housing means and said second surface is internal to said housing means,

said bearing is fixedly held within said housing means for axial movement of said tip member therewithin, and said fiber and said lens are so oriented within said housing means whereby some of the light entering one of said ends of said fiber travels through said fiber, exiting from the other of said ends, said exiting light from said other end being collimated by said lens and directed to said second surface, the collimated light from said lens being reflected back through said lens by said second surface of high reflectivity, the reflected back light being focused by said lens onto said other end of said fiber, the focused light being transmitted back through said one end of said fiber, and whereby the rest of the light traveling through said fiber is reflected back by said reference surface to said one end of said fiber.

4,714,347

OPTICAL SMOKE DETECTORS

Martin T. Cole, 29 Stafford St., Huntingdale, Victoria, Australia

Filed Aug. 13, 1984, Ser. No. 640,345

Claims priority, application Australia, Aug. 12, 1983, PG0822

Int. Cl.⁴ G01N 21/53; F21V 7/04

U.S. Cl. 356—339

6 Claims

5. Apparatus for detecting impurities such as smoke in a gas, said apparatus comprising

(a) means forming a sampling chamber;

(b) inlet and outlet ports spaced from one another for flowing through said chamber gas to be sampled;

(c) a window in said chamber between said ports;

(d) a light source having an elongate component outside said chamber and adjacent said window for admitting into said chamber a first portion of light emitted from said source;

(e) reflector means; and

(f) means supporting said reflector means adjacent said

source for reflecting into said chamber a further portion of light emitted from said source;
(g) said reflector means including an elongate component



adjacent the corresponding component of said source and being configured to reflect into said chamber substantially all light emitted by said source other than said first portion.

4,714,348

METHOD AND ARRANGEMENT FOR OPTICALLY DETERMINING SURFACE PROFILES

Gunter MaKosch, Sindelfingen-Maichingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

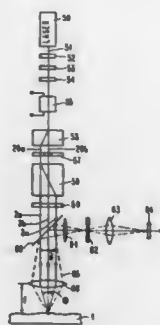
Filed Dec. 11, 1986, Ser. No. 940,667

Claims priority, application European Pat. Off., Dec. 23, 1985, 85116503.5

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—351

10 Claims



1. A method of optically determining the profile of a surface comprising the steps of illuminating said surface with a first light beam with substantially vertical incidence, superposing said first light beam in the area of said surface with two coherent light beams that impinge symmetrically to the first light beam under selectable oblique angles of incidence to generate a three-beam interference field with a periodic intensity modulation in a vertical direction, and measuring the intensity of the light emanating from selected areas of said surface.

4,714,349

PHOTOELECTRIC LENGTH OR ANGLE MEASURING INSTRUMENT

Erich Huber, Schoenberg/Gemünde Kienberg, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,337

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1983, 3327849

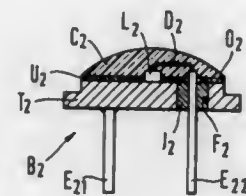
Int. Cl.⁴ G01B 11/02, 11/26

U.S. Cl. 356—374

7 Claims

1. In a photoelectric position measuring system for accu-

ately measuring the relative position of two objects of the type comprising a graduation carrier adapted to be coupled to a first object, a graduation defined by the graduation carrier, and a scanning unit operative to scan the graduation and adapted to be coupled to a second object, the position of which is to be measured, the scanning unit comprising a scanning plate, a light emitting diode element positioned to illuminate the graduation, and at least one photosensor allocated to the scanning plate to scan the graduation, the improvement comprising:



the light emitting diode element situated on a carrier; and the carrier comprising a light absorbing surface immediately surrounding the light emitting diode element, the carrier and light absorbing surface operative to substantially prevent light rays emerging laterally from the light emitting diode element from undergoing reflections off the carrier in the direction of the graduation and the scanning plate and thereby improve the accuracy of the relative position measurement.

4,714,350

TWO-WING NON-INTERMESHING ROTORS OF INCREASED PERFORMANCE FOR USE IN INTERNAL BATCH MIXING MACHINES

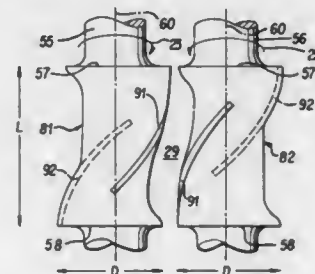
Narku O. Nortey, Trumbull, Conn., assignor to Farrel Corporation, Ansonia, Conn.

Filed Oct. 31, 1986, Ser. No. 925,319

Int. Cl.⁴ B29B 1/06; B01F 7/02

U.S. Cl. 366—84

11 Claims



1. For use in an internal mixing machine of the batch type, including housing means defining a mixing chamber shaped to accommodate two counter-rotating non-intermeshing winged rotors on parallel horizontal axes in said mixing chamber, said housing means having a closable inlet for introducing materials into the mixing chamber and a closable outlet for discharging the mixed materials from said mixing chamber, a pair of improved non-intermeshing two-wing rotors comprising:

first and second non-intermeshing rotors each having first and second wings, each wing having a wing tip of generally helical configuration, said rotors having a ratio between their axial length L and their major diameter D in the range of 1.4 to 2.1, said first wing on each rotor having its wing tip originating at a first end of the rotor at a zero angular position with respect to the rotor axis and having its wing tip oriented at a first helix angle A₁ in the range from 25° to 40°, said second wing on each rotor having its wing tip originating at a second end of the rotor at an angular position with

respect to the rotor axis in the range from 176° to 184° and having its wing tip oriented at a second helix angle A₂ in the range from 35° to 55°, said wing tip of said first wing having a twist angle T₁ in the range from 80° to 110°, said wing tip of said second wing having a twist T₂ in the range from 90° to 120°, said second helix angle A₂ being larger than said first helix angle A₁ in the range from 5° to 15°, and said first and second rotors being adapted to be installed in such mixing chamber with the first end of the first rotor at the same end of said mixing chamber as the second end of the second rotor.

4,714,351

GLOBE MAPS AND DERIVED PRODUCTS

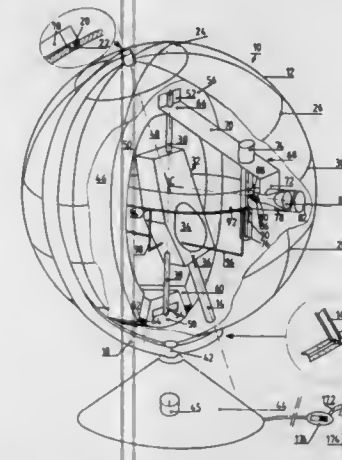
Jean-Paul Domen, 75 rue du Moulin Vert, 75014 Paris, France

Filed Sep. 23, 1986, Ser. No. 910,500

Int. Cl.⁴ G04B 19/26, 19/22

U.S. Cl. 368—17

12 Claims



1. A globe map with simulated sunlighting comprising a spherical shell with a translucent wall mounted on a support, said shell having an internal light source and a circular contour screen cooperating to create on said wall two substantially hemispherical zones respectively illuminated and dark and electromechanical clockworks designed to rotate said hemispherical zones around the center of said globe in accordance with the rhythm of the days and of the years, said clockworks having a body and two output shafts including a day shaft arranged along the axis of the poles and rigidly connected to said shell and a year shaft arranged along a diameter of said circular contour screen and rigidly connected to said screen, the axes of said shafts intersecting substantially at the center of said spherical shell along an angle substantially equal to the angle of inclination of the plane of the equator on the ecliptic, said screen comprising a central cavity designed to allow free passage of said body during the rotation of said screen around the axis of said year shaft.

4,714,352

ELECTRONIC DEVICE POWERED BY SOLAR CELLS

Wolfgang Ganter, Schramberg, Fed. Rep. of Germany, assignor to Junghans Uhren GmbH, Schramberg, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,462

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524290

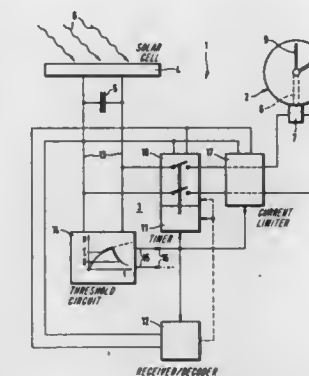
Int. Cl.⁴ G04B 1/00, 9/00; H02J 7/00

U.S. Cl. 368—64

8 Claims

1. An electrical apparatus for use in conjunction with means for converting radiant energy into electrical charge comprising:

a means for storing said charge, said means having a voltage corresponding to the amount of charge stored;
at least one means for consuming said charge stored by said storage means; and
threshold means responsive to said voltage of the storage means for enabling the charge stored in said storage means



to be applied to said consuming means when said voltage of the storage means exceeds a first predetermined value, the threshold means blocking the charge stored in said storage means from said consuming means when said voltage of the storage means is less than a second predetermined value that is less than said first predetermined value.

4,714,353

LAUNDERING BAG FOR PAIRED ITEMS

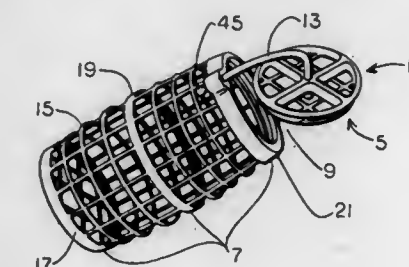
C. Mark Leaphart, 500 Zimacrest Rd., Crossroad Apts., Columbia, S.C. 29210

Filed Aug. 6, 1986, Ser. No. 893,695

Int. Cl.⁴ B65D 30/04

U.S. Cl. 383—117

12 Claims



1. A laundering bag for paired items comprising:
an open weave fabric or plastic net;
a reinforcement structure maintaining said open weave fabric or plastic net in an uncollapsed state;
said reinforcement structure defining an opening at one end of said open weave fabric or plastic net and formed of a plurality of circular ribs; and
a means for closing said opening.

4,714,354

SUPPORT DEVICE FOR TRAVEL ASSEMBLY

Toyokazu Satomi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

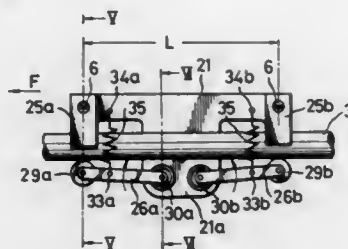
Filed Dec. 20, 1985, Ser. No. 811,730

Claims priority, application Japan, Dec. 29, 1984, 59-276672; Dec. 29, 1984, 59-276673

Int. Cl.⁴ F16C 29/00

U.S. Cl. 384—38

3 Claims



1. A support device for supporting on a guide shaft a travel assembly moving along said guide shaft, comprising:

- (a) at least two slide bearings equipped with V-shape grooves, fixed to said travel assembly and being in contact with said guide shaft so as to slidably move on said guide shaft; and
- (b) rollers respectively disposed opposite said bearings across said guide shaft;
- (c) arms supported on said travel assembly and supporting said rollers;
- (d) one-way clutches coupling said arms and said travel assembly to permit the arms to rotate only in the direction in which they move the rollers toward the respective slide bearings; and
- (e) elastic means biasing said rollers toward and into contact with said guide shaft, with relatively small elastic biasing force.

4,714,355

COMPENSATING DEVICE FOR ROLLING STANDS WITH ROLLS SUPPORTED AT ONLY ONE END

Alfredo Poloni, Ronchi Dei Legionari; Fausto Drigani, Zugliano Di Pozzuolo Del Friuli, and Roberto Canzutti, Percoto, all of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

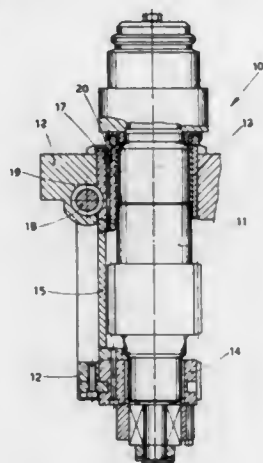
Filed Mar. 12, 1986, Ser. No. 838,792

Claims priority, application Italy, Mar. 12, 1985, 83344 A/85

Int. Cl.⁴ F16C 17/02

U.S. Cl. 384—193

6 Claims



1. A roll for a rolling stand supported at only one end, comprising:

a shaft;
an upper and a lower bearing carrying the shaft;
a connection means between said upper bearing, which is slightly rounded longitudinally, and said lower bearing fixing said bearings to each other; and means providing a plurality of springs which allow said connection means to provide a resiliently yielding constraint between said upper bearing and said lower bearing to allow the upper bearing to follow deformation of the shaft; wherein said springs cooperate with screws to resiliently yieldingly secure said upper bearing to said lower bearing through said connecting means; wherein said springs are preloaded springs; wherein said springs are cup or Belleville springs; wherein said springs are lodged in the upper or lower portion of at least one of the bearings; and wherein said springs are located circumferentially.

4,714,356

COMPOSITE THRUST BEARING FORMED BY A RADIAL BEARING WITH AT LEAST ONE SEPARATE AXIAL THRUST COLLAR

Philippe Damour, St. Jean de la Ruelle; Alain Patoureau, Orleans, both of France; Jack J. Somma, Warren, and Ronald J. Thompson, Howell, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

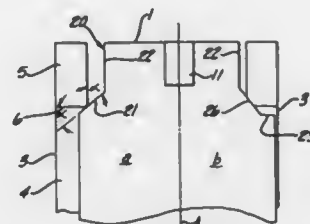
Filed Apr. 18, 1986, Ser. No. 853,531

Claims priority, application France, Apr. 22, 1985, 85 06064

Int. Cl.⁴ F16C 17/10

U.S. Cl. 384—275

6 Claims



1. A composite thrust bearing for a rotary shaft comprising at least two members and wherein one such member is a radial half bearing in which the rotating shaft may be supported and rotate and the other such member is an axial thrust collar preventing axial movement of the shaft, said half bearing being of bimetallic strip including a bearing material on the radially inner surface and a steel backing member on the radially outer surface, one such member having a radially extending boss at each radial end thereof, said other member including a notch at each radial end, each said notch having an axially extending shoulder, each said boss extending radially and being received within a respective said notch and having a stop shoulder welded to said axially extending shoulder of each said notch, said axially extending shoulder of each said notch including a sloped shoulder portion in line contact with said boss stop shoulder prior to welding and meeting said stop shoulder at an included angle ranging approximately from 20° to 65° whereby the welding operation is facilitated by said line contact and whereby should the weld break the collar will be loosely retained on the radial half bearing as a result of the interengagement of the stop shoulder with the shoulder of said notch.

4,714,357

SEGMENTAL BEARING SHOE

Ronald W. Groth, Grafton, and Robert J. Nowakowski, Mequon, both of Wis., assignors to Orion Corporation, Grafton, Wis.

Filed Jun. 2, 1986, Ser. No. 869,276

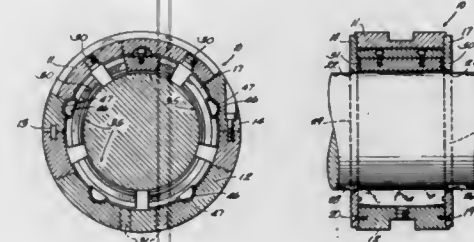
Int. Cl.⁴ F16C 17/03

U.S. Cl. 384—312

3 Claims

1. A segmental bearing assembly that rotatably supports a

member comprising a housing having a plurality of recesses with each recess presenting an elongated concave surface; a bearing shoe body supported in the housing; a bearing surface on said body for engagement with the rotating surface of the member, separately fabricated elongated pivot removably mounted on the surface of said body that is opposite said bearing surface; a convex surface extending longitudinally of said pivot for engagement with the concave surface of said recess to enable the bearing shoe to pivot relative to the housing; and at least one fastener attaching said pivot to said body; a slot



formed in the surface of said body for receiving said pivot to secure said pivot in position on said body;

wherein the surface of said elongated pivot is semicircular in cross section, the outer extremity of said surface of said pivot being arced longitudinally to form a convex configuration along the length of the pivot, said convex configuration with radius of curvature, at all intervals, more than twice the length of that of the said semicylindrical surface, to enable the bearing shoe to rock in both directions so that it will align itself to accommodate the loading applied by the rotating member.

4,714,358

CAGE FOR LIPLESS ROLLER BEARINGS

Oswald Bayer, Aldhausen; Martin Grehn, and Werner Planek, both of Dittelbrunn, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

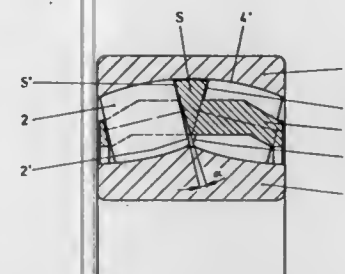
Filed Jan. 28, 1986, Ser. No. 823,260

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504059

Int. Cl.⁴ F16C 33/48

U.S. Cl. 384—470

6 Claims



1. A cage for a lipless roller bearing having a plurality of rollers therein, the cage comprising
a support ring for supporting an end of each roller; the support ring having
a radially outward portion which is disposed toward the outer race of the bearing;
a radially inward portion;
side portions extending radially between the outward and inward portions, which oppose the supported ends of the rollers and define a lubrication-receiving space, between the support means and each supported roller end, which widens with distance from the outward portion toward the interior of the bearing; and
a substantially continuous side for supporting an end of more

than one such roller; the support ring side and the corresponding opposed supported roller ends having substantially planar surfaces;
wherein said planar surfaces define an angle therebetween of about 10° to 3°.

4,714,359

ROLLING BEARING ARRANGEMENT, IN PARTICULAR FOR WORK ROLLS IN HIGH-SPEED ROLLING MILLS

Heinrich Winter, and Walter Küfner, both of Schweinfurt, Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

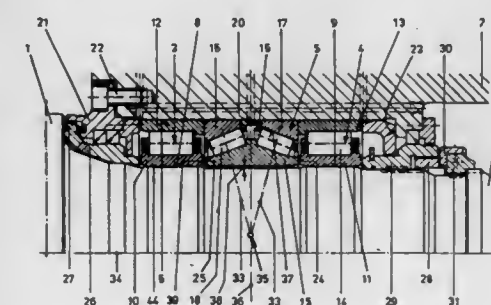
Filed Feb. 25, 1987, Ser. No. 18,623

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607729

Int. Cl.⁴ F16C 19/38

U.S. Cl. 384—571

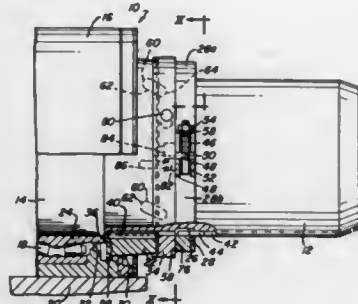
9 Claims



1. In a rolling bearing arrangement for supporting a journal of a work roll or the like by means of first and second cylindrical rolling bearings for carrying radial loads, each cylindrical rolling bearing having an outer ring means, an inner ring means and a first row of rolling bodies arranged therebetween, and by means of an inclined rolling bearing arranged between said first and second cylindrical rolling bearings for carrying axial loads in both axial directions, said inclined rolling bearing having an outer ring means, an inner ring means, and first and second rows of rolling bodies arranged therebetween, said outer ring means and said inner ring means of said inclined rolling bearing each having first and second raceways on which said first and second rows of rolling bodies respectively roll, whereby said outer ring means of said cylindrical and inclined rolling bearings are axially and radially fixedly arranged in series in a common bore of a rolling mill stand, said inner ring means of said cylindrical rolling bearings are axially and radially fixedly arranged on said journal, and said inner ring means of said inclined rolling bearing has first and second radial end surfaces which are respectively axially supported on opposing end surfaces of said inner ring means of said respective cylindrical rolling bearings, the improvement wherein:

- (a) said first and second rows of rolling bodies of said inclined rolling bearing have radially inwardly directed lines of load transmission which intersect;
- (b) said rolling bodies of said inclined rolling bearing are arranged to be displaced in both directions transverse to the rolling direction on at least one of the respective raceways;
- (c) said end surfaces of said inner ring means of said inclined rolling bearing are arranged to be slidably displaced in a substantially radial direction on said respective opposing end surfaces of said inner ring means of said cylindrical rolling bearings; and
- (d) a radial play is provided between said inner ring means of said inclined rolling bearing and said journal which is greater than the radial play between said inner ring means of said respective cylindrical rolling bearings and said journal.

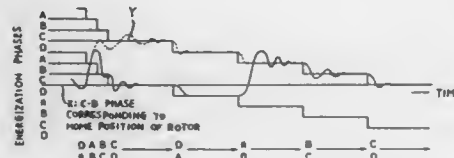
4,714,360
THRUST MECHANISM FOR MILL ROLL BEARING ASSEMBLY
 Andrew Petros, 620 Oakdale Rd., Oakdale, Pa. 15071
 Filed Oct. 6, 1986, Ser. No. 915,720
 Int. Cl.⁴ F16C 35/06
 U.S. Cl. 384—620 12 Claims



1. In a bearing thrust apparatus which is adapted to be received on the roll neck of the mill roll and is operable to selectively apply thrust loads to the roll bearings, the combination comprising:

- a clamp ring adapted to be received coaxially on such a roll neck and releasably secured thereon in a fixed axial and rotary orientation with respect thereto;
- a spacer ring adapted to be received coaxially on such a roll neck in rotationally fixed orientation with respect thereto and in axially movable relation with respect to said clamp ring;
- said spacer ring including contact means for engaging such roll bearings to impart such axial thrust loads thereto;
- a thrust ring adapted to be received coaxially on such a roll neck axially intermediate said spacer ring and said clamp ring and being axially rotatable with respect to such a roll neck;
- link means cooperable with said spacer ring and said thrust ring to impart axial motion to said spacer ring in response to axial rotation of said thrust ring to apply such thrust loads to such roll bearings; and
- interengagement means cooperable with said thrust ring and said clamp ring to positively retain said thrust ring in any of a plurality of rotary positions thereof with respect to said roll neck.

4,714,361
STEPPER MOTOR HOMING METHOD AND SYSTEM
 Kiyoshi Yamakawa, Komaki, and Satoshi Yoshimoto, Gifu, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
 Filed Mar. 9, 1987, Ser. No. 23,792
 Claims priority, application Japan, Mar. 11, 1986, 61-53090
 Int. Cl.⁴ B41J 1/30, 7/96
 U.S. Cl. 400—144.2 12 Claims

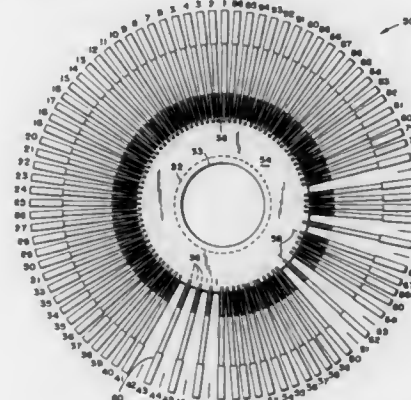


5. A combination comprising:
- a stepping motor including windings for sequentially establishing a plurality of energization phases, and a movable element which is movable in opposite directions;
 - a motor driver circuit connected to said windings, for moving said movable element in one of said opposite directions, by repeating an energization cycle in which said windings are energized in a predetermined sequence at a

predetermined energization interval from one energization phase to another;

- a mechanical blocking means for mechanically blocking said movable element from further moving from a predetermined home position in said one direction; and
- homing control means operable after said movable element has been mechanically blocked by said mechanical blocking means, for activating said motor driver circuit to energize at least one of said windings which corresponds to at least one of said energization phases that precedes, in said predetermined sequence, another of said energization phases which corresponds to said predetermined home position of said movable element, said at least one of said windings being energized for a time span longer than said predetermined energization interval of said energization cycle, for each of said at least one energization phase preceding said another energization phase, said homing control means then activating said motor driver circuit to maintain said another energization phase, and thereby hold said movable element at said predetermined home position.

4,714,362
TYPEWRITER DAISY WHEEL
 George Shrimme, Dallas, Tex., assignor to Contitronix Inc., Garland, Tex.
 Filed Jun. 11, 1982, Ser. No. 387,501
 Int. Cl.⁴ B41J 1/30
 U.S. Cl. 400—144.2 9 Claims



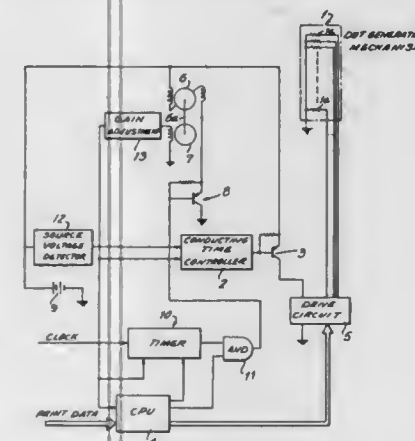
1. A daisy wheel for a printer having a plurality of petals with a character head on the end of each petal comprising:
- (a) a plurality of equally spaced petal positions about the circumference of said daisy wheel, and
 - (b) pre-determined ones of said petals positioned on, before or after said equally spaced positions whereby such petals are irregularly spaced about the circumference of said daisy wheel.

4,714,363
PRINT CONTROL DEVICE FOR A DOT MATRIX PRINTER
 Masahiro Minowa, Shiojiri, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
 Filed May 20, 1985, Ser. No. 736,481
 Claims priority, application Japan, May 18, 1984, 59-100152; Mar. 14, 1985, 60-51011
 Int. Cl.⁴ B41J 19/30 12 Claims

1. A print control device for use in a dot matrix printer, the dot matrix printer comprising a DC power source and a print generating mechanism which is moved along the length of a platen by DC motor coupled to the DC power source, the print control device comprising:

detecting means for responding to rotation of the DC motor to provide a synchronizing signal which is related to the angular position of the DC motor;

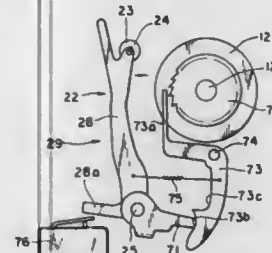
- timer means responsive to the synchronizing signal to provide a signal for decoupling the DC motor from the DC power source for a predetermined period of time;
- controller means responsive to the synchronizing signal for energizing the print generating mechanism during the predetermined period of time;
- switch means coupled between the DC power source and the DC motor, the switch means responsive to the decou-



pling signal to cut off the supply of DC power to the motor;

- gate means having a first input receiving the decoupling signal from the timer means, a second input, and an output coupling to the switch means; and
- computer means having the synchronizing signal and a print data signal as inputs, the computer means having a print control signal as an output which is fed to the second input of the gate means, the gate means responding to the absence of a decoupling control signal and to the presence of a print signal to energize the DC motor.

4,714,364
AUTOMATICALLY RETURNED PAPER BALL ASSEMBLY OF A PRINTER
 Hiromi Takada, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
 Filed Aug. 9, 1985, Ser. No. 764,239
 Claims priority, application Japan, Aug. 10, 1984, 59-166584; Aug. 10, 1984, 59-166585
 Int. Cl.⁴ B41J 13/20 7 Claims

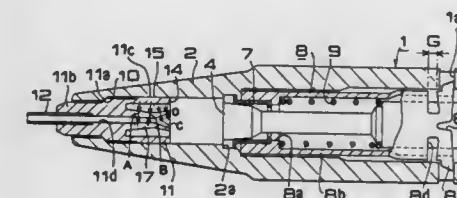


1. Apparatus for setting a sheet of paper in position around a rotatably supported platen roller, comprising:
- a rotatably supported platen roller;
 - driving means for rotating said platen roller;
 - a paper bail assembly including at least one bail roller, said paper bail assembly being pivotally supported and capable of taking a set position where said bail roller is pressed against said platen roller, a first retracted position wherein said bail roller is separated away from said platen roller

and a second retracted position where said bail roller is further separated away from said platen roller, said paper bail assembly being normally biased toward said set position;

- position control means for controlling the position of said paper bail assembly, said position control means being operatively coupled to said paper bail assembly and said platen roller and temporarily holding said paper bail assembly in said first or second retracted position when said paper bail assembly is manually moved thereto;
- detecting means for detecting said paper bail assembly when said paper bail assembly is manually moved to said second retracted position, and for generating a detection signal in response to detecting that the paper bail assembly is at said second retracted position; and
- drive control means for controlling said driving means, said drive control means being responsive to said detection signal from said detecting means to cause said driving means to rotate said platen roller first in a normal direction over a first predetermined amount and then in a reverse direction over a second predetermined amount, wherein said rotation of said platen roller in the reversed direction causes said paper bail assembly to return to said set position through an automatic interaction with said position control means.

4,714,365
MECHANICAL PENCIL
 Hidebei Kageyama, and Yukimasa Kuwabara, both of Saitama, Japan, assignors to Kabushikikaisha Kotobuki, Kyoto, Japan
 PCT No. PCT/JP86/00032, § 371 Date Mar. 14, 1986, § 102(e) Date Mar. 14, 1986, PCT Pub. No. WO86/04300, PCT Pub. Date Jul. 31, 1986
 PCT Filed Jan. 25, 1986, Ser. No. 849,506
 Claims priority, application Japan, Jan. 26, 1985, 60-9595; Jan. 26, 1985, 60-9596; Oct. 22, 1985, 60-161400; Dec. 28, 1985, 60-203143
 Int. Cl.⁴ B43K 21/16 4 Claims

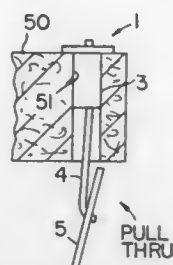


4. A lead feeding slider for a mechanical pencil comprising an axially movable slider means inserted into a fore means of said mechanical pencil, said slider means integrally provided with a resilient sliding contact member holding a lead with a first predetermined frictional resistance and a sliding member placed in sliding contact with the inner peripheral surface of the fore means in the outer peripheral surface thereof with a frictional resistance greater than the first frictional resistance.

4,714,366
LOOSE-LEAF DOCUMENT BINDER
 John E. Boudrot, 216 College Farm Rd., Waltham, Mass. 02154
 Filed May 15, 1986, Ser. No. 863,574
 Int. Cl.⁴ B42F 3/00, 11/00; F16B 21/00, 21/12
 U.S. Cl. 402—13 19 Claims

1. A fastener device for holding together pages of a document by securing the pages of the document together at holes that align for all pages along one margin of the document, the holes in each page being the same pre-determined diameter and positioned with respect to the page margin comprising:
- (a) a relatively rigid cylindrical member having a head at one

- end, the diameter of the cylinder being less than the pre-determined diameter of the holes in the pages, and the head at one end being greater than said pre-determined diameter of the holes in the pages,
- (b) an elastic member extending from the opposite end of said cylinder and
- (c) a bar member that is attached at the center thereof to the extending end of said elastic member,
- (d) whereby the fastener device, oriented with one end of the bar against said opposite end of the cylinder so that the bar and the cylinder are substantially aligned with the bar



extending from said opposite end of the cylinder, may be inserted, the bar end first, into one side of the document through the aligned holes in the pages of the document up to the inside of said head so that the bar emerges from the other side of the document through the aligned holes and the emerging end of the bar may be pulled through the document so that the bar fully emerges from said other side of the aligned holes, turned transverse to the elastic member, and released, whereupon the elastic member urges the bar and head together and so secures the document pages together.

4,714,367

COUPLING ASSEMBLY FOR JOINING TWO PROFILED RAILS

Heinz G. Baus, 35 Wartbodenstrasse, CH-3626 Hünibach-Thun, Switzerland

Division of Ser. No. 585,999, Mar. 5, 1984, Pat. No. 4,611,947.

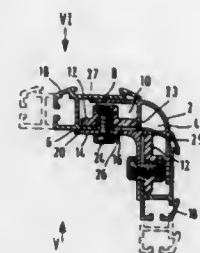
This application Jun. 20, 1986, Ser. No. 876,422

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3310005

Int. Cl.⁴ F16B 7/00; F16D 1/12

U.S. Cl. 403—104

9 Claims



1. A coupling assembly comprising: a multi-walled first elongated profiled hollow rail having a longitudinal axis, an inner space running along said axis and an opening into the inner space of said rail, said opening extending essentially over the full length of said first rail and giving access to said inner space; a clamping element having a bearing surface and being constructed of a size and shape to allow passage thereof across said opening, said clamping element being formed with a threaded hole; means mounting said clamping element in said inner space for non-rotational but translational movement relative to said axis; means defining a fixed clamping surface in said inner space, said clamping surface and said bearing surface defining therebetween a clamping gap; said first profiled rail having a wall formed with a hole therethrough facing said threaded hole of said clamping member; a screw extending

freely through said wall hole and screwed into said threaded hole of said clamping member, constructed so that rotation of said screw causes said translational movement of said clamping member and variation in the width of said clamping gap; and a second profiled rail having a leg inserted into said clamping gap, whereby rotation of said clamping screw in one direction produces a clamping pressure on said leg to secure said profiled rails together and rotation of said screw in reverse direction loosens said pressure and frees said profiled rails from one another so as to allow relative spatial adjustment of said rails, said second profiled rail having a longitudinal axis and said leg having a slot which extends into said leg from a free longitudinal edge of said leg substantially perpendicularly to the longitudinal axis of said second rail, and wherein said screw extends through said slot.

4,714,368

BUSH WITH A SPHERICAL SLIDING SURFACE

Kouji Sawada, Toyota; Kiyokatsu Miura, Gamagori; Keiichiro Suzuki, Shizuoka; Hidetaka Idosako, and Hideo Kazusa, both of Hamamatsu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Ishikawa Tekko Kabushiki Kaisha, both of Japan

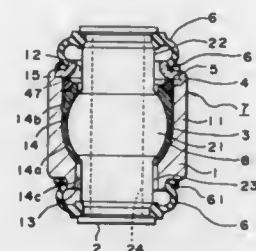
Filed Oct. 14, 1986, Ser. No. 917,961

Claims priority, application Japan, Oct. 11, 1985, 60-154413[U]

Int. Cl.⁴ F16C 11/06

U.S. Cl. 403—132

11 Claims



1. A bush with a spherical sliding surface comprising: a socket constructed of a hollow, generally cylindrical body having an axial mid-portion, first and second axial ends, and apertures at each axial end and having an inside surface which is spherically shaped from said axial mid-portion toward said first axial end and cylindrically shaped from said axial mid-portion toward said second axial end; a ball-integral shaft having a ball portion having opposed axial ends and a shaft portions integrally connected to said opposed axial ends of the ball portion, said ball portion being located in said socket and said shaft portions extending through said apertures of said socket along a longitudinal axis;
2. a bearing body having a first and second axial ends disposed in the socket, said first and second axial ends corresponding to said first and second axial ends of said socket, said bearing body slidably housing said ball portion of said ball-integral shaft therein, said bearing body comprising a hollow, generally cylindrical, single body having an outside surface matching the shape of said inside surface of said socket and a spherical inside surface matching the shape of an outside surface of said ball portion of said ball-integral shaft, a contact surface between said bearing body and said ball-portion of said ball-integral shaft extending between said opposed axial ends of said ball portion of said ball-integral shaft and forming said spherical sliding surface of the bush, said bearing body including a step formed in a shoulder portion proximate said first axial end, said step comprising a first surface which is substantially perpendicular to said longitudinal axis and a second surface which is oblique to said longitudinal axis said bearing body having a plurality of slits extending in an

axial direction from said second axial end to a mid-portion of said bearing body, said bearing body being constructed of polyacetals;

- a cushion for pre-loading said bearing body, said cushion being ring-shaped and having axial end portions, said cushion being located in at least one of said first and second end portions of said socket with an axial end of said cushion seated in said step of said bearing body, said cushion being constructed of a polymeric elastic material which is softer than the polyacetals of said bearing body, said cushion including axially receding recesses in at least one of said axial end portions of said cushion such that said at least one axial end portion includes said axially receding recesses and axially extending ribs spaced between said recesses, and said cushion being assembled in said socket with said axially extending ribs being compressed so as to provide a preload force on said first and second surfaces of said step; and
- a plug for closing a periphery of one of said apertures of said socket, the plug fixed to a mouth of said socket adjacent to the aperture, and being in contact with one axial end of said cushion so as to pre-load said bearing body via said cushion.

4,714,369

RAIL CONNECTOR

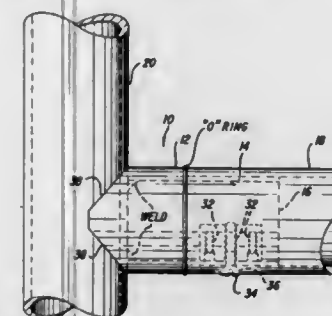
Thomas Souza, Jr., 145 Hekill St., Kailua, Hi. 96734

Filed Dec. 19, 1986, Ser. No. 943,706

Int. Cl.⁴ F16B 7/00

U.S. Cl. 403—190

17 Claims



1. A rail connector for connecting a rail to a post or the like comprising: an elongate circular tubular member including a reduced sleeve at one end thereof which is adapted to substantially conform to an inner surface of the rail, said sleeve having a generally longitudinal slot therein which allows said sleeve to expand and contract in order to conform to the inner surfaces of rails of varying diameters; an adjusting means for adjusting the diameter of said sleeve by applying force to said sleeve along the edges of said longitudinal slot whereby the rail is held to said sleeve; and a mounting means for mounting said adjusting means to the rail prior to the insertion of said sleeve into the rail with said adjusting means in alignment with said longitudinal slot.

4,714,370

COMMODITY SHELF ADAPTORS

Geng-Nong Chen, No. 56, Alley 22, Lane 157, Sec. 5 Fu An Road, Tainan City, Taiwan

Filed Nov. 6, 1986, Ser. No. 928,156

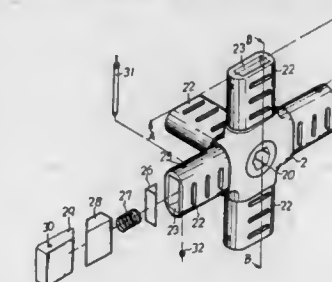
Int. Cl.⁴ F16D 1/00

U.S. Cl. 403—217

6 Claims

1. An improved shelf joint for use in a commodity shelf rack or stand comprising: a body of the joint; a screw for insertion into said body, said screw including top and bottom surfaces, a threaded portion around the periphery of said top surface,

- a conical surface between said threaded portion and said bottom surface;
- a plurality of shaft arms extending from said body incorporated onto said body and having a hollow passage through each of said shaft arms and a side opening in communication with said hollow passage;
- each of said shaft arms having located therein in said hollow passage and extending in a radial direction from said screw
- a thrust block having a sloping face facing toward said conical surface of said screw and in contact with said conical surface and a flat face perpendicular to said radial direction from said screw,
- a buffer spring with its axis extending along said radial direction from said screw and having one end for contacting said flat face of said thrust block,
- a deviation block mounted for movement along said radial direction from said screw having a flat face for contacting said buffer spring on an opposite end of said buffer



spring from the end for contacting said thrust block and having a sloping face on its opposite side from its said flat face, and a check block pivotally mounted in said shaft arm near one end of said check block and having a sloping face on the opposite end from where it is pivotally mounted wherein said sloping face of said check block contacts and moves along said sloping face of said deviation block to a position outside said shaft arm extending through said side opening in said shaft arm communicating with said hollow passage within said shaft arm.

4,714,371

SYSTEM FOR THE TRANSMISSION OF POWER

Arthur R. Cuse, 336 S. Occidental Blvd., Los Angeles, Calif. 90057

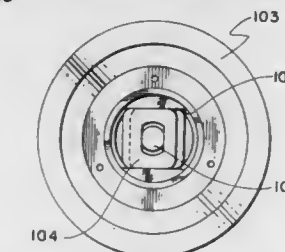
Filed May 20, 1986, Ser. No. 864,872

Claims priority, application Mexico, Sep. 13, 1985, 206624

Int. Cl.⁴ F16B 3/00; B25G 3/28

U.S. Cl. 403—355

18 Claims



1. A coupling apparatus for rotary power transmission and axial movement between a first elongated rotary member and a second rotary member substantially concentric with the first elongated rotary member, including: a channel portion formed in an interior portion of the second rotary member and having at least one flat guide surface, at least one drive key positioned within the channel portion of the second rotary member and including another flat guide surface complementary to the one flat guide surface to allow linear sliding movement between the drive key and the channel portion along the flat guide surfaces and

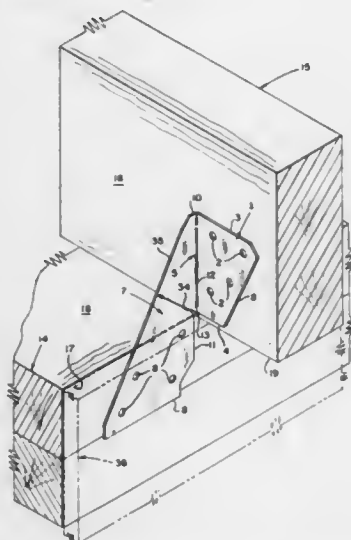
to prevent relative rotational movement between the drive key and the channel portion, the at least one drive key additionally including an opening for receiving the first elongated rotary member, and means for coupling the first elongated rotary member within the opening of the drive key to allow axial movement between the first elongated rotary member and the drive key and to prevent relative rotational movement between the first elongated rotary member and the drive key.

4,714,372 HURRICANE TIE

Alfred D. Commins, Danville, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.
Filed Aug. 18, 1986, Ser. No. 897,702
Int. Cl.⁴ B25G 3/36

U.S. Cl. 403-400

3 Claims



1. A sheet metal tie for connecting wood members in building structures comprising:

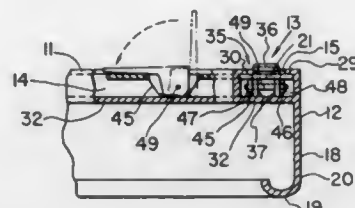
- a unitary body member including a truncated, generally right angled triangular, base member having an area dimensioned for and pierced by a plurality of nail holes and including a generally straight base edge and a generally straight truncated edge joined by an inside edge;
- a truncated generally right angled triangular web member having an area dimensioned for and pierced by a plurality of nail holes and including a generally straight base edge and a truncated edge joined by an inside edge and joined to said base member along said respective inside edges;
- said triangular web member having a relatively larger area than said triangular base member and said generally triangular members being arranged in reverse apex order with respect to one another;
- said base and web members lie in planes which are mutually angularly related to each other;
- the juncture of said inside edge of said web member and said truncated edge of said base member is formed with a radius curve; and
- said truncated edge of said web member is generally in alignment with a portion of said base edge of said base member adjacent said inside edge of said base member.

4,714,373 PICTURE FRAME CLAMP

Theodore R. Heekin, Bay Village, Ohio, assignor to Valco/Valley Tool & Die, Inc., North Royalton, Ohio
Filed Jun. 19, 1986, Ser. No. 875,922
Int. Cl.⁴ F16B 12/50

U.S. Cl. 403-402

12 Claims



1. A clamping device used in the construction of a metal picture frame which is formed of metal framing members that are joined in mitered relation, each of the members having an enclosed channel with a longitudinally extending slot that is bordered by a pair of flanges which are spaced in parallel relation from a channel bottom, the device comprising:

- an L-shaped rigid plate having a pair of outstanding legs which are at right angles to each other;
- a rotatable lever associated with each of the legs, the levers each having a cam and a connecting handle which a person uses to rotate the lever and
- means mounting the levers on the legs for rotation about an axis which is normal to the longitudinal axes of the channel and slot, the mounting means, handle and cam of each lever being disposed in relation to each other such that the cam will engage the channel bottom while remaining free of the flanges and simultaneously force the rigid plate against adjacent flanges of the framing members and cause relative movement between the framing members and legs, whereby adjacent framing members are moved into tighter mitered relation, when the handle is rotated from an unlocked position where the cam is disengaged from the channel bottom, to a locked position where the handle abuts the adjacent leg of the plate in farthest spaced relation from the other leg.

4,714,374 ROAD SURFACE LAYER REPRODUCING MACHINE

Tohru Mihara, Kyoto, Japan, assignor to Taisei Road Construction Co., Ltd., Tokyo, Japan
Filed Jul. 2, 1986, Ser. No. 882,136
Claims priority, application Japan, Apr. 16, 1986, 61-57238[U]

Int. Cl.⁴ E01C 23/06

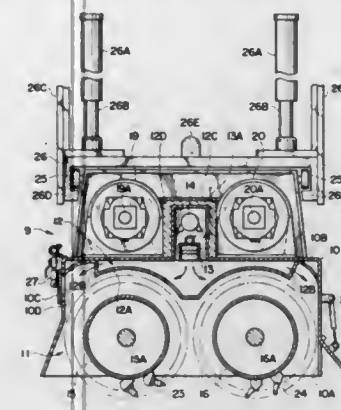
U.S. Cl. 404-91

4 Claims

1. A rotor unit for a road surface layer reproducing machine for scarifying/mixing asphalt pavement comprising:

- a support frame, said support frame including a mixing chamber in a lower section thereof, said mixing chamber having an opening at a lowermost end thereof, said support frame further including a heating room in an upper portion thereof, said heating room including heating means for heating said mixing chamber to and maintaining said mixing chamber at a temperature which is greater than the ambient temperature;
- a plurality of power cylinder means operatively coupling said support frame member to a lower portion of a vehicle body of the road surface layer reproducing machine; and
- a plurality of rotor means mounted to said support frame so as to be disposed in said mixing chamber such that a longitudinal axis of each said rotor means extends perpendicularly to a direction of movement of the vehicle body, the longitudinal axis of each said rotor means being disposed substantially parallel to one another such that said rotor

means are mounted in rows, each said rotor means being adapted to rotate about its respective longitudinal axis



such that each rotor means rotates in a direction opposite to a next adjacent rotor means.

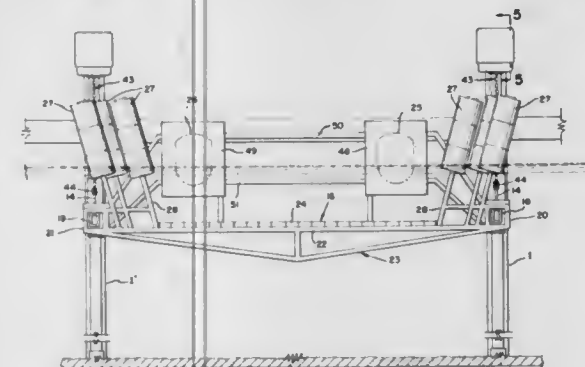
4,714,375 SEAPLANE AND DOCK LIFT

Ernest W. Stevenson, Danville, and Randall E. Nahas, Alamo, both of Calif., assignors to Levitator, Inc., Glenbrook, Nev.
Continuation-in-part of Ser. No. 671,007, Nov. 13, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 877,013
The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.

Int. Cl.⁴ B63C 3/06

U.S. Cl. 405-3

14 Claims



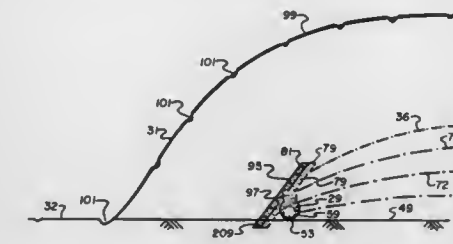
1. A watercraft lift mounted in the soil beneath a body of water comprising:

- A pair of laterally spaced free standing load bearing stanchion members engaging the soil beneath said body of water;
- a base plate connected to the top of each of said stanchions;
- a bracket member connected to each of said base plates laterally disposed from said stanchion members and adapted for connection to a stabilizing member;
- a sleeve assembly slidably mounted on each of said stanchion members for travel thereon;
- a fork member connected to each of said sleeve assemblies and extending laterally from said stanchion members and generally parallel to each other;
- a platform connected to each of said fork members extending laterally between said stanchions for engaging said watercraft;
- a lifting member connected to said sleeve assembly; and
- mechanical multiplying means mounted on said stanchion members and connected to said lifting member for lifting substantially said entire platform above said body of water.

4,714,376 HILLSLOPE LANDSLIDE STABILITY DRAIN

S. Abdollah Jenab, 1289 North 400 East, #3, Logan, Utah 84321
Filed Dec. 31, 1984, Ser. No. 687,652
Int. Cl.⁴ E02B 11/00; E02D 3/10
U.S. Cl. 405-45

18 Claims



1. An apparatus for draining groundwater from a water saturated zone of a hill having contour lines associated therewith, a failure surface and an impermeable substantially horizontal geological positioned below said water saturated zone, said system consisting of:

- a pair of first, cylindrical elongate horizontal bore within said hill, said first bores being oriented parallel to a hill contour line and remote from a failure surface of said hill, each of said first bores having a proximal end and a distal end, each of said proximal ends being positioned laterally from a failure surface of said hill whereby said proximal end is outside of a flow path of slough material which has detached itself from said hill along said failure surface, each of said distal ends being positioned within said hill within said saturated zone;
- a plurality of second, cylindrical elongate horizontal bores within said hill associated with each first bore, each of said second bores being oriented parallel to a hill contour line and remote from said hill failure surface, each plurality of said second bores having said second bores positioned one above another and above a respective first bore wherein each second bore overlaps an adjacent second bore whereby each second bore communicates with each adjacent second bore, one of said second bores overlapping a respective first bore;
- an upright region of said hill positioned above each uppermost second bore and below an exterior surface of said hill, said upright region being retained undisturbed and in situ whereby said upright region retains its natural anchorage and cohesion action between said hill and face of said hill;
- an association of said plurality of second bores defining a pair of upstanding necks one of said necks extending from each said first bore upwards, said necks being each inclined from an imaginary vertical line passing through said first bores;
- a rigid, upstanding, impermeable elongate apron positioned along an upstanding wall of each said neck and extending along a length of said neck region wherein each said apron is positioned sufficiently below said upright hill region to retain said region undisturbed and in situ;
- a conduit means having porous walls adapted to receive fluid from without said conduit means and convey said fluid along a predetermined path, said conduit means being positioned within each of said bores, substantially horizontally and within said hill remote from a failure surface of said hill wherein a longitudinal axis of said conduit means is substantially parallel to the contour lines of said hill;
- outlet means mounted on said conduit means for continuously directing fluid from said conduit means and conveying that fluid to a location away from said hill;
- wherein each of said first bores is positioned adjacent said impermeable strata and below said saturation zone and each respective said apron intersects said strata whereby said geological strata and said aprons form a pair of geo-

logical "L"-shaped cross sectioned impermeable pockets within said hill to entrap groundwater and channel said groundwater to said conduit means.

4,714,377

METHOD OF LAYING PIPE SECTIONS

Hartley Sandt, Orange Park, and Henry Happy, Jacksonville, both of Fla., assignors to Price Brothers Company, Dayton, Ohio, a part interest

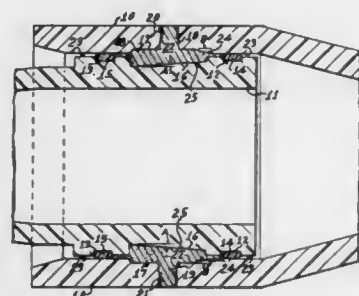
Division of Ser. No. 698,020, Feb. 4, 1985, Pat. No. 4,647,080.

This application Oct. 28, 1986, Ser. No. 923,966

Int. Cl.⁴ B63B 35/04

U.S. Cl. 405—154

20 Claims



1. A method of laying, testing, and assembling sections of pipe into an indefinite length of piping which comprises the sequential steps of:

- (1) positioning an inner pipe section and an outer pipe section in general longitudinal alignment for joining by telescoping the two sections together, the two sections when joined having aligned circumferential recesses in their facing surfaces adjacent the telescoping ends, and the inner section having a pair of circumferential grooves spaced on opposite ends of the recess;
- (2) placing two spaced ring sealing gaskets around the inner section respectively in the grooves;
- (3) telescoping the inner section with gaskets in the grooves into the outer section to a predetermined depth;
- (4) attaching two conduits to the recesses by two respective passageways through the outer section at generally vertically diametrically opposite positions;
- (5) pressurizing the space between the sealing gaskets by closing one conduit and introducing a fluid under superatmospheric pressure into the other conduit to test the sealing capabilities of the gaskets in the assembled joint;
- (6) covering the joined pipe sections with earth and allowing the sections to settle and extending the conduits from the pipe sections to above ground level;
- (7) thereafter introducing a solidifiable fluid grout through the conduit attached to the lower passageway until the recess is filled with grout and substantially no air bubbles are present; and
- (8) allowing the grout to solidify.

4,714,378

APPARATUS AND METHOD FOR TRENCHING SUBSEA PIPELINES

John B. Lincoln, Applecross, Australia, assignor to Ocean Engineering Systems, Pty., Ltd., Applecross, Australia

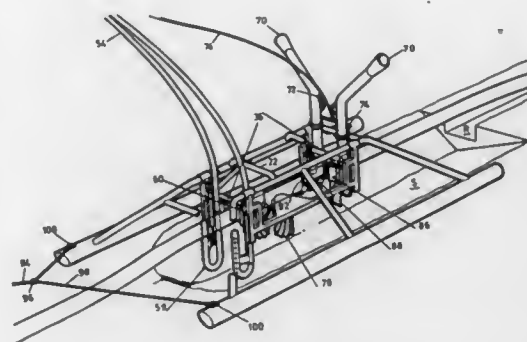
Filed May 15, 1985, Ser. No. 734,370

Claims priority, application Australia, May 22, 1984, 28500/84

Int. Cl.⁴ E02F 3/88, 5/10; F16L 1/04

U.S. Cl. 405—163

7 Claims



1. Apparatus for trenching a pre-laid subsea pipeline of indefinite length, comprising:

a sled including a frame and two laterally spaced pipeline- and trench-straddling supports constructed and arranged to run on the seabed and to define with said frame a tunnel extending longitudinally of the sled, such tunnel being open to the front and to the rear;

roller cradle means on said frame for supporting a segment of the pipeline in an elevated condition relative to the seabed, with the pipeline upstream and downstream of that segment sloping downwards to the seabed to the front of the sled and, to the rear of the sled, into a trench formed by the apparatus;

at least one vertically adjustable jet manifold mounted on said frame near the front of said tunnel, each said jet manifold being constructed and arranged to fluidize soft seabed in a region of the seabed which is sufficiently wide for trenching the pipeline, but which is insufficiently wide as to destroy support for said laterally spaced supports of said sled;

at least one vertically adjustable eductor tube mounted on said frame near the rear of said tunnel, each said eductor tube being constructed and arranged to suck-up loosened seabed material from said seabed region and remove such material sufficiently to trench the pipeline behind said apparatus;

a set of counter-rotating, vertical axis mechanical cutters mounted to said frame intermediate said at least one jet manifold and said at least one eductor tube and being movably mounted for movement to and from a working position located beneath said elevated segment of the pipeline;

means for advancing said sled along the pipeline;

means for supplying a pressurized working fluid to said at least one jet manifold for jetting into said seabed in said region;

motor means for powering said mechanical cutters in such a sense as to cut into said seabed in said region when said cutters are disposed in said working position; and

means for supplying an upwardly-moving stream of pressurized fluid in said at least one eductor tube for sucking loosened seabed material from said region to create said trench.

4,714,379

PIPELAY IN SLURRY TRENCH

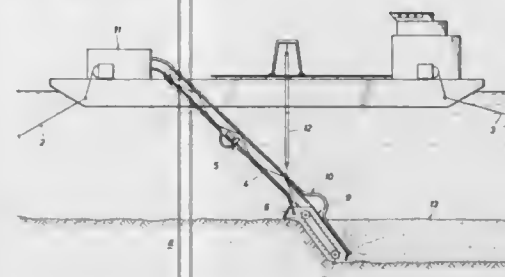
Robert T. Gilchrist, Jr., Houston, Tex., assignor to Shell Western E&P Inc., Houston, Tex.

Filed Nov. 26, 1986, Ser. No. 935,423

Int. Cl.⁴ F16L 1/04; E02F 5/02

U.S. Cl. 405—163

5 Claims



1. A method for laying a pipeline offshore in the seafloor, comprising:

- excavating a deep trench in the seafloor;
- filling the trench with a slurry to maintain the integrity of the seafloor trench until the pipeline can be laid thereinto;
- laying the pipeline on top of the slurry; and
- sinking the pipeline through the slurry and downwardly in the trench.

4,714,380

APPARATUS TO MANEUVER CABLES OR CONDUITS PASSING OVER A DIRECTION CHANGER

Alain Coutarel, Paris, France, assignor to Coflexip, Paris, France

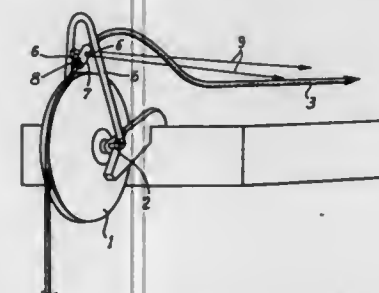
Filed Apr. 11, 1986, Ser. No. 850,547

Claims priority, application France, Apr. 11, 1985, 85 05440

Int. Cl.⁴ B23B 35/04; F16L 1/00

U.S. Cl. 405—168

11 Claims



1. An apparatus for maneuvering a line such as a cable or flexible conduit having thereon at least one rigid outer accessory with a diameter greater than that of the line around a direction changing means over which the line is moved, said apparatus comprising, maneuvering means mounted adjacent said direction changing means, means for retaining the accessory on the maneuvering means, means mounting the maneuvering means for movement with respect to the direction changing means, so that said retaining means moves said accessory along a path outside a surface of the direction changing means which is engaged by the line, from a first position in which the accessory is picked up by the retaining means upstream from the direction changing means, to a second position in which the accessory is located downstream from the direction changing means and is released from said retaining means, and means for taking up the tension in the conduit during the movement of the maneuvering means between said first and second positions.

4,714,381

MACHINE FOR LAYING CONDUIT AND METHODS FOR USE THEREOF

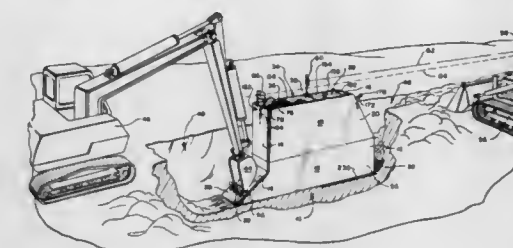
G. Brent Hatch, Box 996, 2661 South Hwy. 23, Mendon, Utah 84325, assignor to G. Brent Hatch and Susan W. Hatch, both of Mendon, Utah

Filed May 2, 1985, Ser. No. 729,566

Int. Cl.⁴ F16L 1/02

U.S. Cl. 405—178

126 Claims



1. An apparatus for laying conduit within a trench, comprising:

- a boxlike structure having end walls and side walls, said boxlike structure being separable into an upper portion and a lower portion and further comprising:
- a fill bin compartment internal of said boxlike structure for receiving fill material and delivering fill material to the bottom of the trench; and
- a conduit laying compartment adjacent said fill bin compartment, said conduit laying compartment permitting the conduit to be fed through said conduit laying compartment to the desired resting position at the bottom of the trench;

drawing means connected rigidly to said lower portion for grasping and advancing said boxlike structure along the bottom of the trench; said drawing means having a configuration that facilitates application of vertical, longitudinal and lateral forces on said boxlike structure thereby permitting an operator of the apparatus to maneuver said boxlike structure on grade along the bottom of the trench; and securing means for securing the upper portion of said boxlike structure to the lower portion, said securing means being capable of disengagement enabling the upper portion to be unconnected and removed from the lower portion while the lower portion remains within the trench thereby permitting the lower portion to be pulled along the bottom of the trench once the upper portion is removed.

4,714,382

METHOD AND APPARATUS FOR THE OFFSHORE INSTALLATION OF MULTI-TON PREFABRICATED DECK PACKAGES ON PARTIALLY SUBMERGED OFFSHORE JACKET FOUNDATIONS

Jon E. Khachaturian, 3829 Birchfield Dr., Harvey, La. 70058

Filed May 14, 1985, Ser. No. 734,402

Int. Cl.⁴ E02B 17/00

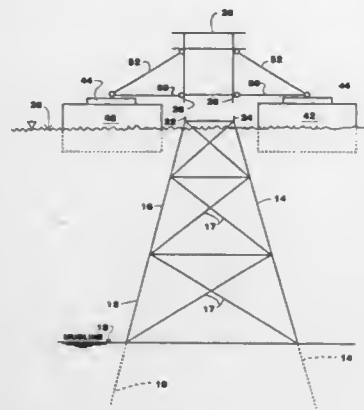
U.S. Cl. 405—204

23 Claims

1. A method for the offshore installation of multi-ton prefabricated deck package on a jacket foundation, comprising the steps of:

- a. transporting the prefabricated deck package to the site of the jacket base on a first transport barge;
- b. attaching a triangular truss-like lifting assembly to the deck package at multiple positions on the deck package that are at least on generally opposite sides of the deck package, and at upper and lower positions on the deck package respectively and at vertices of the triangular truss-like lifting assembly, the triangular truss-like lifting assembly including at least three chords, including a horizontal chord normally in tension during the lifting process

- which has a variable length and a diagonally extending chord normally in compression during the lifting process;
- structurally supporting the triangular truss-like lifting assembly with one or more lift barges;
 - removing the transport barge as a support for the deck package so that the deck is supported by the triangular truss-like lifting assembly and lift barges, with the deck



- package forming a load carrying portion of the triangular truss-like lifting assembly;
- aligning the deck package with the jacket so that the deck package can be placed on the jacket; and
 - lowering the deck package upon the jacket by changing the length of the horizontal chord of each triangular truss-like lifting assembly.

4,714,383

INSERT ROTARY CUTTER

Hiroshi Shimomura, Nakano; Kazuo Iizuka, Warabi; Makoto Harano, and Akifumi Hamada, both of Takaoka, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo and Ryoco Seiki Co., Ltd., Takaoka, both of Japan

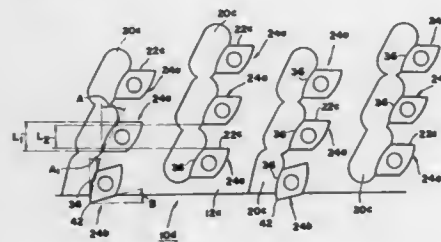
Filed Jul. 21, 1986, Ser. No. 887,626

Claims priority, application Japan, Jul. 23, 1985, 60-112820[U]; Oct. 8, 1985, 60-154232[U]; Oct. 8, 1985, 60-154233[U]; Oct. 8, 1985, 60-154234[U]

Int. Cl.⁴ B23C 5/20

U.S. Cl. 407—42

9 Claims



1. An insert rotary cutter for processing a metal workpiece comprising:

a cutter body of a generally circular cross-section having an axis of rotation therethrough; and

one or more cutter inserts each comprising a generally quadrilateral plate defined by a front face, a rear face disposed generally parallel to said front face and two opposed pairs of side faces, and having a thickness between said front and rear faces smaller than a width between a respective one of said opposed pairs of side faces, said insert having a pair of main cutting edges defined by intersections of said front face with said opposed pair of side faces, each of said one opposed pair of side faces sloping inwardly in a direction away from said front face and being convexly curved along their respective lengths whereby said pair of main cutting edges are convexly curved, said insert being

releasably mounted on a periphery of said body in such a manner that one of said main cutting edges is indexed in a peripheral cutting position, and that said front face is facing radially outwardly of said body so that one of said opposed pair of side faces serves as a rake surface for said indexed main cutting edge, said rake surface having a foremost and a rearmost end, said rake surface for said indexed main cutting edge being disposed so as to have a positive axial rake angle and a radial rake angle both increasing progressively from said foremost end of the rake surface toward said rearmost end thereof.

4,714,384

TOOL AND INSERT, PREFERABLY FOR TURNING

Stig E. V. Lagerberg, Sandviken, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

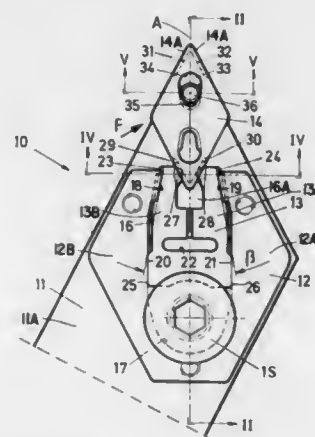
Filed May 16, 1986, Ser. No. 863,934

Claims priority, application Sweden, May 17, 1985, 8502451

Int. Cl.⁴ B23B 27/16

U.S. Cl. 407—103

16 Claims



1. A tool comprising:
 - a shank including:
 - an upper surface, and
 - a projection upstanding from said upper surface and including first contact surface means,
 - an insert including:
 - a lower surface for engaging said upper surface, cutting edge means at a front end of said insert,
 - a hole for receiving said projection and including second contact surface means arranged to engage said first contact surface means on opposite sides of an imaginary front-to-rear reference line extending through said insert, and
 - third contact surface means disposed adjacent a rear end of said insert,
 - a unit disposed to the rear of said insert and movable forwardly and rearwardly, said unit including fourth contact surface means arranged to contact said third contact surface means on opposite sides of said reference line, said first and fourth contact surface means oriented to force said lower surface downwardly against said upper surface in response to said insert being urged forwardly by said unit, and
 - means for urging said unit forwardly.

4,714,385

POLYCRYSTALLINE DIAMOND AND CBN CUTTING TOOLS

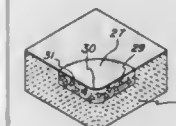
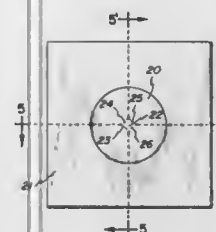
Ranga Komanduri, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 27, 1986, Ser. No. 833,928

Int. Cl.⁴ B23P 15/28

U.S. Cl. 407—119

5 Claims



1. A process for producing a composite of a circular polycrystalline diamond layer adhered in the recess of a cemented carbide substrate structure which comprises forming a cemented carbide substrate structure comprised of a substrate with a disk-shaped recess wherein said recess is substantially centrally disposed in a face of said substrate with an element of cemented carbide substantially centrally disposed within said recess, said element having four curved sides with each said curved side being in the shape of a tool nose of predetermined radius, said cemented carbide being comprised of polycrystalline metal carbide containing a metallic cementing agent, filling said recess with crystals of diamond, heating the resulting assembly under an applied pressure to a temperature above the melting point of said metallic cementing agent but below a temperature which has any significant deleterious effect on said assembly for a period of time sufficient to form said composite and recovering said composite, the thickness of said polycrystalline diamond layer being substantially equivalent to the depth of said recess, the height of said element being substantially equivalent to the thickness of said diamond layer.

5. A composite useful for slicing into a plurality of cutting tools comprised of a disk-shaped polycrystalline diamond or cubic boron nitride layer integrally adhered to a substrate structure, said substrate structure being comprised of a substrate having a disk-shaped recess, a face of said layer being adhered to the bottom surface of said recess, the peripheral portion of said layer being adhered to the wall of said recess, the thickness of said polycrystalline layer being substantially equivalent to the depth of said recess, an integral element of said substrate structure being substantially centrally disposed within said recess passing cross-sectionally through said polycrystalline layer, the height of said element being substantially equivalent to the thickness of said polycrystalline layer, said element being in the shape of four tool noses of predetermined radii in contact with said polycrystalline layer, the mass of said substrate structure being significantly larger than the mass of said layer, said substrate structure being comprised of polycrystalline metal carbide containing a metallic cementing agent.

4,714,386

LOCKSMITHS' METHOD AND APPARATUS FOR COMBINATION SAFES

Peter J. Phillips, Redondo Beach, Calif., assignor to Lockmasters, Inc., Nicholasville, Ky.

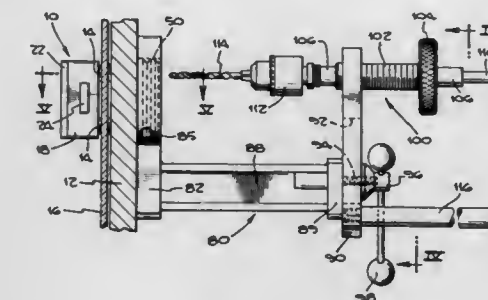
Division of Ser. No. 832,169, Feb. 20, 1986, Pat. No. 4,662,201.

This application Jan. 20, 1987, Ser. No. 4,155

Int. Cl.⁴ B23B 47/28; E05B 63/00

U.S. Cl. 408—72 R

8 Claims



1. An apparatus for locating and drilling an access hole through the door of a safe and into a combination lock mounted on the inside thereof within the area of the lock's dial ring at a given position relative to the spindle of the lock using a drill motor and bit, comprising:

an annular-shaped drill fixture made of a hard material, said fixture having generally planar, parallel front and rear surfaces, an inner diameter sized to pass said spindle coaxially therethrough, an outer diameter the same as, or greater than, the diameter of said dial ring, and at least one drill guide hole therethrough normal to said front and rear surfaces, said guide hole having substantially the same diameter as said access hole and located in said fixture at a radial position equal to the radial position of said access hole relative to said spindle;

means for mounting said fixture to said door coaxially with said spindle at an angular position on said door such that said drill guide hole is positioned coaxially over said access hole position; and

derrick means for mounting said drill motor and bit to said drill fixture such that the axis of said bit is positioned generally orthogonal to said door, including means for adjustably-positioning said bit coaxially with said drill guide hole and for clamping said bit in said position, further including means for advancing said bit into said drill guide hole, through said door, and into said lock.

4,714,387

GEAR CUTTING PROCESS

Seishichi Ohno, Kawaguchi, Japan, assignor to Nissho Seiko Kabushiki Kaisha, Japan

Filed Nov. 8, 1985, Ser. No. 796,520

Claims priority, application Japan, Nov. 13, 1984, 59-237645

Int. Cl.⁴ B23F 23/10

U.S. Cl. 409—51

3 Claims

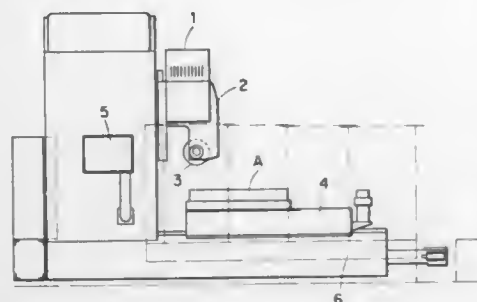
1. A gear cutting method for cutting a work with a milling cutter of a gear cutting machine having a cutting blade formed in a shape similar to an involute curve, said gear cutting machine including a main body having a bed on which a table is rotatably mounted, comprising the steps of:

setting the work on the table intermittently rotating on the bed of said main body of said gear cutting machine;

measuring and obtaining a heat expansion amount of said work in advance;

compensating the feeding amount and the processing pitch of said milling cutter according to the expanded dimen-

sion of said work at the time when said work is expanded by cutting heat; and



cutting said work from a lower part to an upper part thereof by said milling cutter.

4,714,388

DUAL PINION ANTI-BACKLASH CARRIAGE DRIVE FOR A MACHINE TOOL

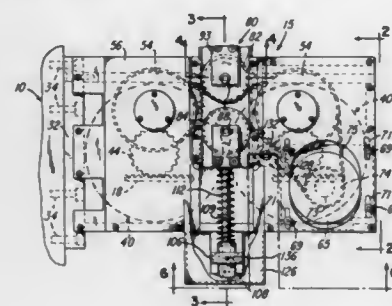
G. Daniel Siler, Dayton, Ohio, assignor to Dayton Machine Tool Company, Dayton, Ohio

Filed Oct. 14, 1986, Ser. No. 918,296

Int. Cl.⁴ B23Q 23/00

U.S. Cl. 409—146

13 Claims



1. Apparatus adapted for moving a carriage or slide along guide ways of a machine tool having an elongated rack, said apparatus comprising a frame, a set of gearboxes supported by said frame and having corresponding input and output shafts, a set of pinions connected to said output shafts and positioned to engage the rack at longitudinally spaced locations, a reversible motor supported by said frame and having a motor shaft, a set of pulleys connected to said motor shaft and to said input shafts of said gearboxes, an endless flexible elongated belt having longitudinally spaced teeth and connecting said pulleys to provide for driving said pinions through said gearboxes in response to rotation of said motor shaft, a set of belt tension wheels engaging said belt, means supporting said belt tension wheels for movement as a unit relative to said frame, and means for biasing said belt tension wheels in a manner to produce a selected tension in said belt and a corresponding torque on each of said input shafts of said gearboxes for preloading said pinions against the rack.

4,714,389

TOOL HOLDER

Frank John, Lohne, Fed. Rep. of Germany, assignor to J. Kubn GmbH Co., Dorsten, Fed. Rep. of Germany

PCT No. PCT/DE86/00036, § 371 Date Oct. 14, 1986, § 102(e)

Date Oct. 14, 1986, PCT Pub. No. WO86/04842, PCT Pub.

Date Aug. 28, 1986

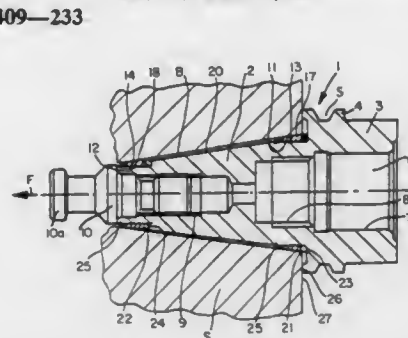
PCT Filed Feb. 5, 1986, Ser. No. 924,846

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504905

Int. Cl.⁴ B23C 5/26

U.S. Cl. 409—233

9 Claims



1. In a tool holder having a shank portion insertable into a conical receiving part of a main spindle of a machine tool for clamping therein, a flange portion forming a front extension of the shank portion, a face on the front portion for bearing against the front face of the main spindle, a cylindrical guide on the front region of the shank portion, a tapered ring on the front portion of the shank portion engageable with the surface of the conical receiving part of the main spindle, and an elastic bearing between the flange portion and the tapered ring, the improvement comprising:

- a rear region on the shank portion within the conical receiving part of the main spindle;
- a second cylindrical guide on said rear region of the shank portion for engagement with the surface of the conical receiving part of the main spindle at a position spaced from the first-mentioned tapered ring; and
- a second elastic bearing between said shank portion and said second tapered ring.

4,714,390

BORING TOOL

Otto Eckle, Loechgau, and Walter Roser, Besigheim, both of Fed. Rep. of Germany, assignors to Komet Stahlhalter und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 885,068

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1985, 8520724[U]

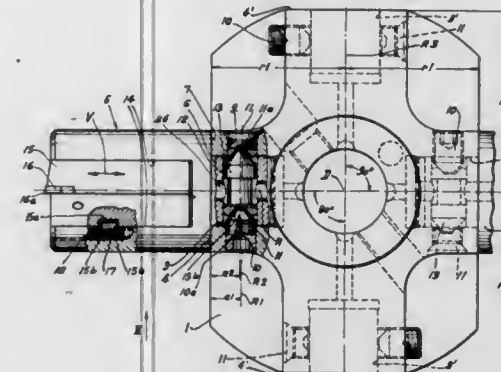
Int. Cl.⁴ B23B 29/26

U.S. Cl. 409—234

2 Claims

1. In a boring tool, comprising a mounting body which can be connected to a machine tool spindle having an axis of rotation and which has a respective radially extending mounting for the shank of a respective tool head at each of two locations which are diametrically oppositely disposed with respect to its axis of rotation, and which has an abutment surface which fixes the respective tool head in the radial direction with respect to said mounting body, further comprising a cutting bit carrier which has a cutting bit and which is radially displaceable on each tool head with respect to said axis of rotation, and further comprising a clamping means with which the tool head can be connected to said mounting body, wherein the improvement comprises said mounting body, which is of a hub-like configuration, being provided at locations which are diametrically oppositely disposed with respect to said axis of rotation with a respective first mounting bore with having an axis extending radially with respect to said axis of rotation, said first mounting

bore being each surrounded by a first abutment surface extending perpendicularly to said axis of said mounting bores, wherein said tool head is provided with a fitting spigot which fits into each of said first mounting bores and which is concentrically surrounded by an annular surface extending perpendicularly with respect to an axis of said fitting spigot, said mounting body having two further, diametrically oppositely disposed, radial second mounting bores whose axes are arranged in displaced relationship through 90° in the direction of rota-



tion of said mounting body with respect to said axes of said first mounting bores, wherein second abutment surfaces of said second mounting bores are at a different spacing from said axis of rotation than said first abutment surfaces of said first mounting bores and wherein the spacings of said first and second abutment surfaces of said first and second mounting bores differ by an amount which is somewhat smaller than the maximum radial adjustment travel of the cutting bit carrier on said tool head.

4,714,391

EXPANSION ANCHOR ASSEMBLY

Arndt Bergner, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft

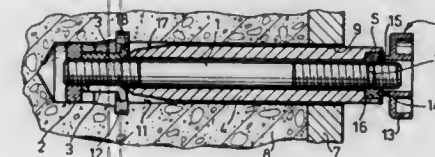
Filed Jul. 21, 1986, Ser. No. 887,324

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1985, 3526094

Int. Cl.⁴ F16B 13/06

U.S. Cl. 411—54

5 Claims



1. Expansion anchor assembly for use in an axially elongated borehole extending inwardly from the surface of a receiving material with an annular undercut in the borehole spaced inwardly from the receiving material surface, comprising an axially elongated threaded anchor stud having a leading end and a trailing end with the leading end arranged to be inserted first into the borehole, a head part secured on said anchor stud at the leading end thereof with said head part extending radially outwardly from said anchor stud, locking elements extending in the axial direction of said anchor stud and extending from said head part toward the trailing end of said stud, a conically shaped member encircling said anchor stud and in contact with the ends of said locking elements spaced from said head part and being displaceable in the axial direction of said anchor stud toward the leading end thereof relative to said locking elements for radially outwardly displacing said locking elements into the annular undercut, and annular abutment member in threaded engagement with said anchor stud and

arranged adjacent said conically shaped member for axially displacing said conically shaped member toward the leading end of said anchor stud, wherein the improvement comprises that said annular abutment member has an axially extending outer surface located within the axial projection of the radially outer surface of said conically shaped member, and said abutment member has a surface extending transversely of the axial direction of said anchor stud and facing away from the leading end of said anchor stud, the end of said abutment member closer to the leading end of said anchor stud and means in said surface of said abutment member for engaging a tool for threading said abutment member on said anchor stud bears against said conically shaped member, said conically shaped member is axially elongated and has end surface facing away from the leading end of said anchor bolt, an axially extending recess formed in the end surface of said conically shaped member, the diameter of said recess corresponds to at least the maximum diameter of said abutment member.

4,714,392

SELF-LOCKING SHEET-METAL NUT

Klaus Muller, Well-Haltingen; Bernd Mutz, Schoppsheim, and Helmo Daler, Lorrach, all of Fed. Rep. of Germany, assignors to A. Raymond, Lorrach, Fed. Rep. of Germany

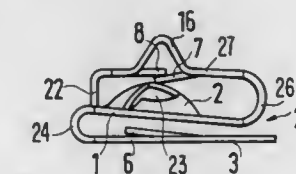
Filed Oct. 10, 1986, Ser. No. 917,484

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1985, 3536473

Int. Cl.⁴ F16B 37/02, 37/04

U.S. Cl. 411—175

7 Claims



1. A self-locking, sheet-metal nut comprising a generally flat thread leg having an embossed thread portion with an aperture therein for receipt of a threaded member and a pair of locking tabs resiliently and integrally connected to one end of said leg that extend over and are spaced from the aperture, said tabs being approximately perpendicular to the axis of the threaded member and having clamping edges which are directed toward each other from opposite sides of the aperture and that form an opening downstream of the aperture smaller than the core diameter of the threaded member to be threaded into the nut, wherein the tab having a clamping edge on the side of the opening opposite from said one end of said leg is connected to a pair of webs that extend past the opening and on either side of the tab nearest said end with each web being connected to said leg by an outer U-shaped connecting bend, and wherein the tab nearest said one end is connected to said leg by an inner U-shaped connecting bend, whereby upon turning of said threaded member through said aperture the clamping edges are forced apart and resiliently grip the core of the member to lock it in place.

4,714,393

PANEL LAYING MACHINE

Kenneth H. Betts, Mississauga, Canada, assignor to Construction Specialties Limited, Mississauga, Canada

Filed Jan. 8, 1985, Ser. No. 689,682

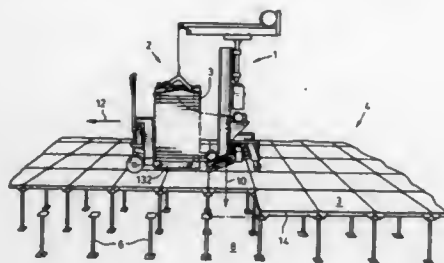
Int. Cl.⁴ E01C 11/23

U.S. Cl. 414—10

26 Claims

22. A panel laying machine, comprising: a chassis; support wheels rotatably mounted to the chassis; a mast extending upwardly from the chassis; a jib mounted on the mast for turning about a vertical axis relative to the chassis; panel grip-

per means including a plurality of gripping elements engageable with a panel to selectively grip or release a panel; a flexible elongate support element suspending the gripper means from the jib; drive means carried by the jib for displacing the support element to raise and lower the gripper means, the gripper means including operating means manually actuable by an operator to cause the gripping elements to selectively grip or release a panel; load sensor means for sensing the load carried by the support element and coupled to said gripper operating means so as to maintain the gripping elements in engagement



with a panel and prevent release thereof while the load sensor means senses that the load carried by the support element exceeds a predetermined value; an electric drive motor for driving the machine and connected to at least one support wheel by a transmission; an electrically driven compressor, for providing a source of compressed air, wherein the gripper operating means and the support element drive means are both driven by compressed air; and inter-lock means in the electrical supplies to the electric drive motor and to the compressor, which inter-lock means ensures that electrical power is only ever supplied to one of the motor and the compressor.

4,714,394

METHOD AND APPARATUS FOR DEPOSITING A PROPER NUMBER OF FLEXIBLE WORK PIECES IN A PROPER POSITION

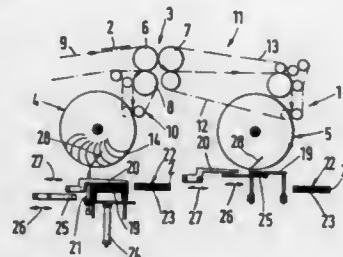
Guenther Ehlscheid, and Gilbert Hauschild, both of Neuwied, Fed. Rep. of Germany, assignors to Winkler & Duennel Maschinenfabrik und Eisengieserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 719,709, Apr. 4, 1985, abandoned. This application Feb. 24, 1986, Ser. No. 834,111 Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413952

Int. Cl.⁴ B65G 57/04

U.S. Cl. 414—41

6 Claims



1. An apparatus for stacking a predetermined number of flexible work pieces coming in a first number of columns from a production machine, in determined positions to form stacks of said work pieces to be supplied to a packaging machine, comprising first conveyor means (9) for transporting said columns of work pieces, a branching station (3) for each of said columns located at a downstream end of said first conveyor means for guiding sequentially arriving work pieces to move alternately into two different directions, two depositors (4, 5) for each branching station located to alternately receive work pieces from said branching station, each of said depositors comprising a plurality of compartments for temporarily holding work pieces received from said branching station, two

stacking tables (19) for each pair of depositors positioned so that one stacking table cooperates with one depositor (4) of a pair and the other stacking table (19) cooperates with the other depositor (5) of the same pair, a separate compression member (20) provided for each stacking table for pressing work pieces down on the respective stacking table, a separate stack pushing mechanism arranged for each stacking table to horizontally push a stack off the respective stacking table, second conveyor means (23) including two conveyors, one of which is located to receive work piece stacks from one stacking table while the other conveyor is located to receive work piece stacks from the other stacking table as the work piece stacks are pushed off said stacking tables for collecting stacks of work pieces on said second conveyor means from a plurality of said stacking tables, third conveyor means (30,31) for receiving stacks of work pieces from said second conveyor means, and transfer means (35) for transferring work piece stacks from said second conveyor means to said third conveyor means, whereby said several columns of work pieces are consolidated into a second number of rows of work piece stacks, said second number being smaller than said first number.

4,714,395

LIFTING PLATFORM FOR PANELS AND METHOD OF OPERATION THEREOF

Gino Benuzzi, deceased, late of Bologna, and by Piergiorgio Benuzzi, heir-at-law, 5, Via Angelo Custode, Bologna, both of Italy

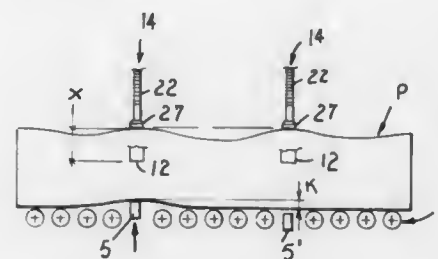
Filed Jan. 7, 1986, Ser. No. 816,763

Claims priority, application Italy, Jan. 8, 1985, 12403 A/85

Int. Cl.⁴ B65H 1/14, 5/10

U.S. Cl. 414—114

6 Claims



3. A lifting platform for feeding packs of panels to a machining line, said platform cooperating with a carriage provided with a plurality of co-planar pushes which are actuated to skim horizontally over the top of a stack of panels built up on a loading table of said platform, to transfer a pack of predetermined height (X) onto an adjoining horizontal working table, comprising:

- (a) a plurality of lifters having a localized action, arranged within recesses formed in the loading table, said lifters being vertically movable between a lowered rest position below the supporting surface defined by the top surface of the loading table and a lifted position above the said supporting surface, said lifters being arranged in the same vertical planes as said pushers and being liftable individually and selectively by controlled amounts by lifting units;
- (b) a plurality of dimension feelers supported by a stationary structure above the lifting platform for contacting the top surface of said stack of panels, said dimension feelers being arranged vertically in line with each of said lifters, said dimension feelers being vertically movable between an upper inoperative position and a lower working position in which the said feelers reach the same horizontal level of the co-planar pushers;
- (c) computer-controlled actuation means operating in response to the vertical movement of the dimension feelers, following upward movement of the loading table to bring a pack of predetermined height (X) with its lowermost

panel in alignment with the surface of the working table, said actuation means selectively effecting the actuation of the lifting units for the lifting of the lifters.

4,714,396

PROCESS FOR CONTROLLING THE CHARGING OF A SHAFT FURNACE

Gilbert Bernard, 6 rue Robert Schuman, Hemdange; Emile Breden, 29 rue du Village, God brange, and Emile Lonardi, 30 rue de Schouweiler, Bascgarage, all of Luxembourg

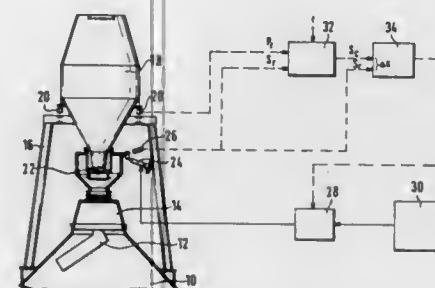
Filed May 12, 1986, Ser. No. 862,083

Claims priority, application Luxembourg, May 10, 1985, 85892

Int. Cl.⁴ B65G 25/00

U.S. Cl. 414—161

7 Claims



1. A process for controlling the charging of a shaft furnace of the type having a rotary or oscillating distribution spout for distributing charge material over the charging surface of the furnace, wherein the furnace includes one or more hoppers for the storage of charge material above the furnace, each hopper being provided with a dosing valve for regulating the flow of charging material from the hopper to the spout, the furnace further including a weighing system for determining the contents of the hoppers, the weighing system determining the extent to which the valve must be initially open for the contents of the hopper to flow out within a given period, and memorizes, for different types of material and different charging conditions, the theoretical curves of a given constant out flow and the corresponding position of the dosing valve required to ensure the outflow within the given period, these curves indicating at each moment the reference flow Q_c and the position of the dosing valve including the steps of:

- determining the real flow Q_r of charge material at given intervals by measuring the reduction of weight ΔP in the contents of the hopper per unit time Δt ;
- comparing the real flow Q_r with the reference flow Q_c ;
- opening the dosing valve whenever the real flow Q_r is above the reference flow Q_c .

4,714,397

AUTOMATIC PARTS FEEDER

Kuniaki Ohkuma; Reiji Nakagawa; Hisao Miyao, all of Saitama; Shinichi Yoshimura; Toshio Suzuki, both of Tokyo; Toyooki Hayashi, Saitama; Masayasu Arakawa, Saitama, and Hideharu Koizumi, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 801,006

Claims priority, application Japan, Nov. 22, 1984, 59-247221; Nov. 22, 1984, 59-247222; Nov. 22, 1984, 59-247223; Nov. 22, 1984, 59-247224

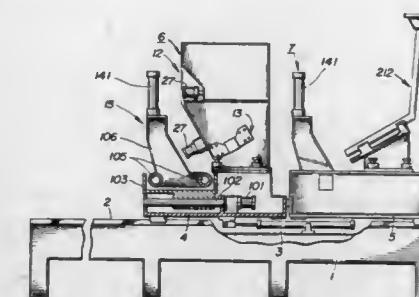
Int. Cl.⁴ B65H 1/00

U.S. Cl. 414—222

14 Claims

- 1. An automatic parts feeder comprising:
 - a bed;
 - a base means movable on said bed in a first direction;
 - a hopper assembly mounted on said base means for containing parts;

delivery means for successively delivering the parts from said hopper assembly to a transfer means; said transfer means transferring the parts received from said delivery means to a supply means; said supply means supplying the parts received from said transfer means to a processing device in a second direction substantially normal to said first direction; and



said supply means comprising a movable assembly movable relative to said base means in both said first and second directions, a swing arm pivotally supported on said movable assembly and angularly movable between a substantially vertical upstanding position and an inclined position, and parts receiver means detachably mounted on said swing arm for receiving, holding, and releasing the parts.

4,714,398

DRIVE ARRANGEMENT FOR A COMBINE HARVESTER UNLOADING AUGER

Helmuth Rohwedder, Zweibrücken, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

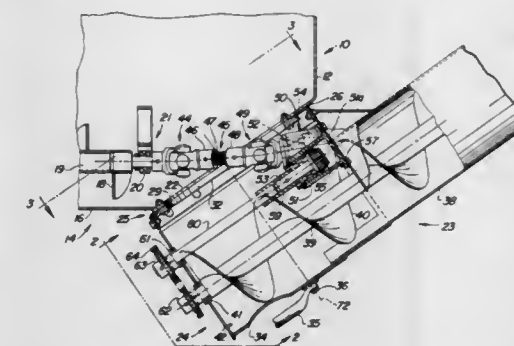
Filed Nov. 27, 1985, Ser. No. 802,657

Claims priority, application European Pat. Off., Dec. 7, 1984, 84114894.3

Int. Cl.⁴ B65G 67/24

U.S. Cl. 414—503

20 Claims



1. An unloading arrangement for the grain tank of a combine harvester including a delivery auger within the tank having a delivery end for delivering grain to an aperture in a wall of the tank, and an external unloading conveyor outwardly and upwardly extending when in unloading operation and having an unloading auger within a housing, said housing including a boot portion having an inlet in a grain-receiving relationship with the tank wall aperture and means for pivotally supporting the unloading conveyor for swinging about a pivot axis, said pivot axis passing through said inlet, the delivery auger being drivably connected to the unloading auger by drive means including first and second intermediate shafts, and a bevel gear box characterized in that:

the first intermediate shaft comprises a telescoping shaft assembly having a universal joint at each end, one of said joints being connected to the delivery auger delivery end and in that the second intermediate shaft and the gear box

are carried by the boot portion substantially laterally offset from the unloading conveyor pivot axis, the gear box including an input connected to the other of said universal joints and an output connected to the second intermediate shaft, and in that the distance between the delivery auger end and the gear box varies as the unloading conveyor swings.

4,714,399

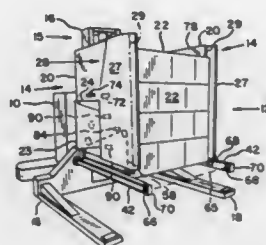
AUTOMATICALLY-GUIDED VEHICLE HAVING LOAD CLAMP

John E. Olson, Portland, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed May 2, 1986, Ser. No. 859,063
Int. Cl.⁴ B66F 9/00, 9/06

U.S. Cl. 414—621

23 Claims



1. In a driverless vehicle for handling a load having a rearward-facing surface proximate said vehicle and a forward-facing surface remote from said vehicle, said vehicle including drive means for selectively moving at least a portion of said vehicle in a load-engaging direction or stopping said portion of said vehicle, a load clamp comprising:

- a pair of transversely openable and closeable arms extending forwardly from said portion of said vehicle in said direction and mounted on said portion of said vehicle so as to move in unison therewith in said direction;
- said arms including respective clamp pad means for selectively releasably engaging said load, said clamp pad means having a forward extremity;
- forward sensor means for sensing said rearward-facing surface of said load as said portion of said vehicle approaches said rearward-facing surface along said direction; and
- control means responsive to said forward sensor means for causing said drive means to move said portion of said vehicle forwardly in said direction a predetermined distance after said forward sensor means senses said rearward-facing surface of said load and to stop the forward movement of said portion of said vehicle independently of any sensing of any forward-facing surface of said load before said forward extremity of said clamp pad means extends forwardly of said forward-facing surface of said load.

4,714,400

PLURAL ROBOTIC DRIVE

Joseph A. Barnett, Endicott; Joseph M. Gomez; William F. Green, both of Vestal; Vincent M. Lisica, and Arnold B. Rosenthal, both of Vestal, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 14, 1986, Ser. No. 851,509
Int. Cl.⁴ B25J 9/02

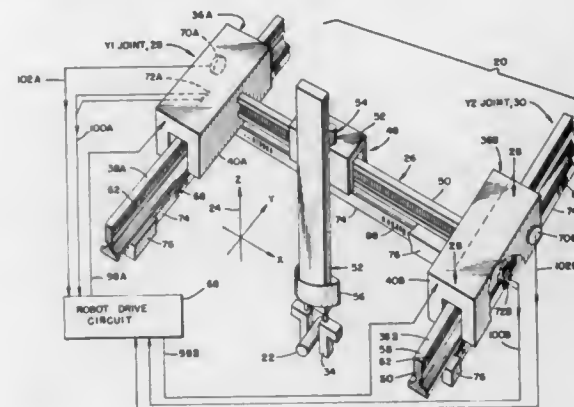
U.S. Cl. 414—751

18 Claims

1. A robotic system comprising:
- a beam for the support of a load, said beam having first and second ends;
 - a first rail and a second rail spaced apart from said first rail, said first rail supporting said first end of said beam, said second rail supporting said second end of said beam;
 - a first robotic joint means riding on said first rail for moving said first end of said beam along said first rail; a second

robotic joint means riding on said second rail for moving said second end of said beam along said second rail;

- a first sensing means for sensing a position of said first end of said beam;
- a second sensing means for sensing a position of said second end of said beam, said first joint means including first circuit means responsive to a position signal of said first sensing means for applying power to said first joint means to move said first beam end to a first desired position, said second joint means including second circuit means responsive to a position signal of said second sensing means for applying power to said second joint means to move said second beam end to a second desired position in registration with said first desired position; and



cross-coupling circuitry connected between said first and said second circuit means, and connecting with said first and said second sensing means, for varying an amount of power applied to said first joint means relative to said second joint means to equalize positions between said first and said second ends of said beam; and wherein said cross-coupling circuitry is responsive to a difference between velocities of said first and said second joint means, said first and said second circuit means obtaining said velocities as a rate of change in position sensed by said first sensing means and a rate of change in position sensed by said second sensing means.

4,714,401

GOVERNING MODE CHANGE-OVER APPARATUS

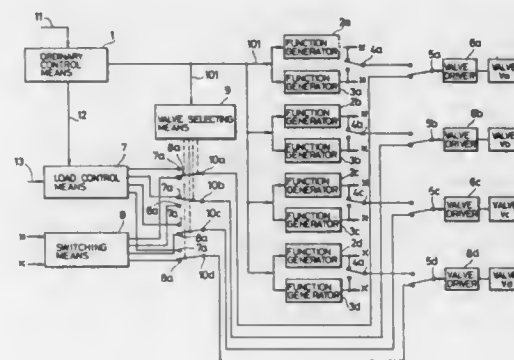
Hiraku Ikeda, and Hidesumi Kuwashima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,196

Claims priority, application Japan, Oct. 31, 1984, 59-227754
Int. Cl.⁴ F01D 17/04

U.S. Cl. 415—30

4 Claims



1. A governing mode change-over apparatus of a steam

turbine with a plurality of steam control valves for controlling steam supply to respective nozzles annularly arranged in the turbine, the apparatus comprising:

- a control means for controlling the turbine to operate at a set load and generating a steam control valve opening demand signal;
- first function generator means for said steam control valves for converting said steam control valve opening demand signal into a signal for opening said control valves in a throttle governing mode;
- second function generator means for said steam control valve for converting said steam control valve opening demand signal into a signal for opening said control valves in a nozzle governing mode;
- driving means for driving said steam control valves to control the opening thereof according to said signal from one of said first and second function generator means;
- switching means for switching said first and second function generator means from one another and electrically connecting one of said first and second functioning generator means to said driving means;
- load control means for comparing actual load with the set load and generating an electrical signal, for controlling the degree of opening of said control valve so as to nullify difference between the actual load and the set load;
- steam control valve opening switching means, electrically connected to both said first and second function generator means, for generating valve opening signals for governing mode switching; and
- valve selecting means, electrically connected to said control means, for selecting at least one of said steam control valves in accordance with steam control valve opening signals from said control means so as to subject said selected valve to load control in accordance with signals from said load control means during the switching of the governing modes, and the other valves to opening degree switching operation for change over of the governing mode according to signals from said steam control valve opening switching means.

4,714,402

MECHANISM FOR ACTUATING DEFLECTOR OF PELTON WHEEL

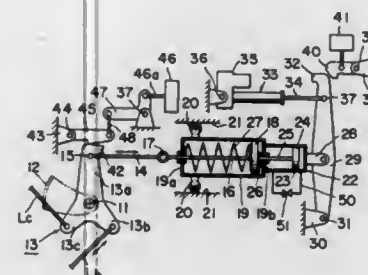
Kentaro Ichikawa, Chigasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 17, 1986, Ser. No. 908,308

Claims priority, application Japan, Sep. 18, 1985, 60-206056
Int. Cl.⁴ F04D 15/02

U.S. Cl. 415—35

8 Claims



1. A mechanism for actuating a deflector of a Pelton wheel comprising a deflector arm for rotating the deflector, an operating rod whose one end is pin connected to said deflector arm and whose other end carries a spring bearing plate, a cylinder in which said spring bearing plate is enclosed, and which is guided for movement in the axial direction of said operating rod, spring means which is disposed in the bore of said cylinder on the side of said operating rod and whose stored energy pulls said operating rod, a swinging lever whose one end is pivotally supported and whose midpoint is connected to one end of said cylinder, an electric servomotor connected to the free end of

4,714,403

DOWN-HOLE DEVICES FOR IMPARTING ROTARY MOTION

Michael K. Russell, Prestbury, and Colin Arlott, Bredon, both of England, assignors to NL Industries, Inc., New York, N.Y.

Filed Sep. 24, 1985, Ser. No. 779,740

Claims priority, application United Kingdom, Oct. 4, 1984, 8425109

Int. Cl.⁴ E21B 4/02

U.S. Cl. 415—107

11 Claims



1. A down-hole device for converting the kinetic energy of the mud flow passing along a drill string into rotary motion for driving a generator or a measuring or signalling instrument, the device comprising a rotary drive member arranged to have its rotational axis disposed along the axis of the drill string, an annular bladed impeller coaxial with the drive member to which it is operatively coupled to impart driving torque thereto and having a plurality of radially outwardly projecting blades distributed about the circumference thereof and arranged to be driven by the mud flow, an annular impeller bearing, and an annular bladed stator coaxial with the drive member and having a plurality of radially outwardly projecting blades distributed about the circumference thereof and arranged immediately upstream of the impeller so as to act on the mud flow before it reaches the impeller, the blades of the stator being canted relative to the mud flow and relative to the blades of the impeller at such an angle that a small or negligible thrust results at the impeller bearing due to the combined effect of the mud flow acting on all the blades of the impeller.

4,714,404

APPARATUS FOR CONTROLLING RADIAL CLEARANCE BETWEEN A ROTOR AND A STATOR OF A TURBOJET ENGINE COMPRESSOR

Alain M. J. Lardellier, Melun, France, assignor to Societe Nationale d'Etudes et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.), France

Filed Dec. 17, 1986, Ser. No. 942,987

Claims priority, application France, Dec. 18, 1985, 85 18749
Int. Cl.⁴ F01D 11/08

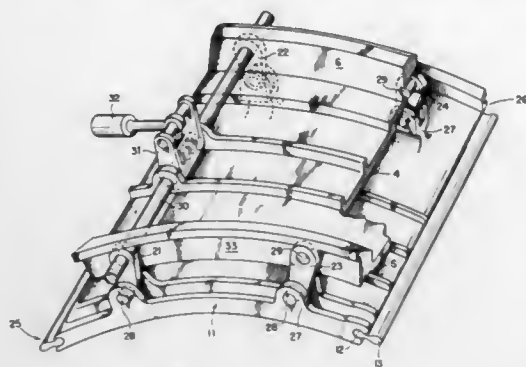
U.S. Cl. 415—127

12 Claims

1. Apparatus for controlling the radial clearance between a rotor and a stator of a high-pressure compressor in a turbojet engine having a longitudinal axis and an outer casing surrounding the compressor, comprising:

- a plurality of circumferential segments having upstream and downstream edges arranged so as to form an inner casing located between the outer casing and the rotor so as to define a radial clearance with the rotor, each of the segments having a plurality of stator vanes mounted thereon;
- a control shaft rotatably attached to the outer casing and extending generally parallel to the longitudinal axis;
- upstream and downstream link means connecting each of the segments with the outer casing, each link means comprising:
 - a first link member having a first end attached to the

- control shaft so as to rotate therewith and a second end pivotally attached to the segment; and,
 (ii) a second link member pivotally attached to the outer casing and to the segment such that the second link member extends generally parallel to the first link mem-



- ber so as to form a parallelogram with the outer casing and the segment; and,
 (d) control means connected to the control shaft so as to rotate the control shaft thereby moving the associated segment in a substantially radial direction so as to vary the clearance between the segment and the rotor.

4,714,405 CENTRIFUGAL PUMP

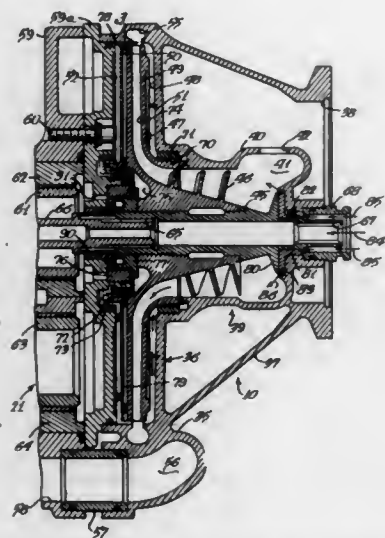
John G. Schaefer, Jerome K. Aarestad, and Terry L. Whitesel, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 502,104, Jun. 8, 1983, abandoned. This application Sep. 11, 1986, Ser. No. 906,676

Int. Cl.⁴ F01D 25/32

U.S. Cl. 415—169 R

2 Claims



1. In a closed loop aircraft engine fuel system, a centrifugal pump having a casing, an impeller stage and an inducer section; a hollow impeller shaft rotatably mounted in said casing and having a spiral-bladed inducer located in a fluid chamber of the inducer section; and an impeller with front and rear shrouds located in an impeller cavity of the casing and spaced from the adjacent walls of the impeller cavity; a front end of the impeller shaft having a planar thrust bearing positioned in said fluid chamber; a journal bearing mounted in said casing and having a tubular section for rotatably mounting said front end of the impeller shaft and a planar section for coaxial with said planar thrust bearing; said tubular and planar sections of the journal bearing being lubricated by fuel flowing toward said hollow

impeller shaft; front and rear labyrinth seals associated one with each of said impeller front and rear shrouds and the casing and located near the inner ends of the shrouds and at different distances from the axis of rotation of the impeller shaft, said front labyrinth seal surrounding and opening to the downstream end of the spiral-bladed inducer to have fuel leakage therethrough return to the fuel being supplied to the impeller at a location circumferentially outward of the inducer and where the supplied fuel is at an elevated pressure; said casing having a volute with a volute entrance surrounding the outer periphery of the impeller; an additional seal positioned inwardly of the rear labyrinth seal to substantially seal a space behind the innermost part of the rear shroud; and means for pumping fuel from said substantially sealed space to the volute entrance, said means for pumping fuel from said substantially sealed space comprising, a shrouded secondary pump having a plate fixed to and spaced from said rear shroud with pumping ribs therebetween and having an inlet communicating with said substantially sealed space; said rear labyrinth seal being to the rear of said plate and said plate being spaced from the adjacent wall of the impeller cavity whereby there is a part of the impeller cavity to the rear of said plate which communicates with the volute entrance and is out of direct communication with said substantially sealed space; said volute entrance also communicating with the space between the front impeller shroud and adjacent impeller cavity wall whereby an imbalance of pressure forces acting on the rear of said plate and the front impeller shroud urges the planar thrust bearing toward the journal bearing planar section.

4,714,406 TURBINES

Geoffrey S. Hough, Littleover, England, assignor to Rolls-Royce plc, London, England

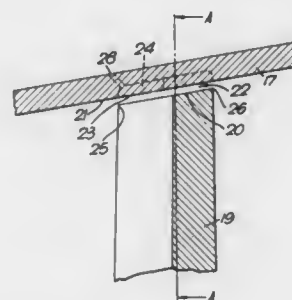
Continuation of Ser. No. 848,345, Apr. 4, 1986, abandoned, which is a continuation of Ser. No. 630,237, Jul. 12, 1984, abandoned. This application Jun. 25, 1987, Ser. No. 65,139

Claims priority, application United Kingdom, Sep. 14, 1983, 8324670

Int. Cl.⁴ F01D 11/08

U.S. Cl. 415—170 R

4 Claims



1. A turbine comprising:
 at least one annular array of rotary aerofoil blades having radially outer tips;
 an annular gas passage, said annular array of rotary aerofoil blades being enclosed within said annular gas passage so that the axes of said array of aerofoil blades and said gas passage are coaxial; and
 an annular member surrounding at least said radially outer tips of said aerofoil blades and having a radially inner surface which is in radially spaced apart relationship with said aerofoil blade tips, said annular member defining the radially outer boundary of at least a portion of the axial extent of said annular gas passage,
 means in the portion of said radially inner surface which is adjacent said blade tips for directing the flow of any gas passing in operation through said turbine which flows

across the gap between said annular member and said blade tips as a boundary layer having a vorticity and defining a leakage to substantially follow an absolute ideal flow path for gases in the region of said aerofoil blade tips, said gas directing means imparting energy of the vortices to said blade tips with a reduction in loss of efficiency despite leakage of gases through said gap;
 said gas directing means comprising a plurality of grooves spaced peripherally about said annular member with each groove being in the form of two slots which intersect at an angle to form a chevron.

4,714,407 AEROFOIL SECTION MEMBERS FOR TURBINE ENGINES

John C. Cox; Stephen E. Morgan; Martin Hamblett, and Alfred Rubini, all of Derby, England, assignors to Rolls-Royce plc, London, England

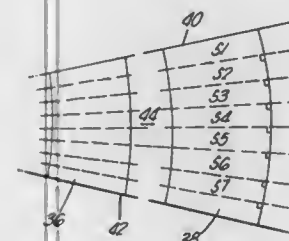
Filed Jul. 22, 1985, Ser. No. 757,260

Claims priority, application United Kingdom, Sep. 7, 1984, 8422662

Int. Cl.⁴ F04D 29/24, 29/54

U.S. Cl. 415—192

17 Claims



1. An aerofoil for a gas turbine engine, the aerofoil having an aerodynamic profile defined by a number of elemental aerofoil sections stacked relatively to one another, the elements of the aerofoil trailing edge between the elemental aerofoil sections being arranged to define at least partially, the trailing edge of the aerofoil, the aerofoil trailing edge forming one boundary of the geometric throat window between adjacent aerofoils in an array of aerofoils, an elemental length of said trailing edge extending perpendicular to the local streamlines of the gas flow passing through said throat window.

4,714,408 RADIATOR FAN

Takeshi Abe, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

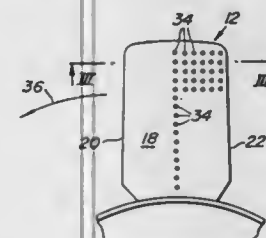
Filed Jun. 5, 1986, Ser. No. 870,961

Claims priority, application Japan, Jun. 6, 1985, 60-121415

Int. Cl.⁴ F04D 29/38

U.S. Cl. 416—91

6 Claims



1. A radiator fan comprising:
 a plurality of blades adapted to rotate about an axis in a predetermined direction and extending radially outwardly from said axis, each having a leading edge and a trailing edge, each of said blades being contoured to provide a first

surface extending from said leading edge to said trailing edge, and a second surface extending from said leading edge to said trailing edge, each of said blades causing a longer line of flow generated along said first surface than a line of flow generated along said second surface when said radiator fan rotates through fluid about said axis in said predetermined direction;

each of said blades having formed therethrough a number of passages, each having a fluid flow inlet opening disposed in said second surface and a fluid flow outlet opening being located within at least an area portion of said first surface bounded by a radially outermost edge of each of said blades;

wherein each of said number of passages extends from said fluid inlet opening to said fluid outlet opening in a predetermined direction which forms a predetermined acute angle with a direction of rotation of said blade, in order to allow the entrance of fluid into each passage when eddies are formed on said first surface of said blades.

4,714,409 HELICOPTER ROTOR

Samuel J. M. Denison, Marlow, and David P. Bashford, Rnislip, both of England, assignors to Westland plc, Yeovil, England

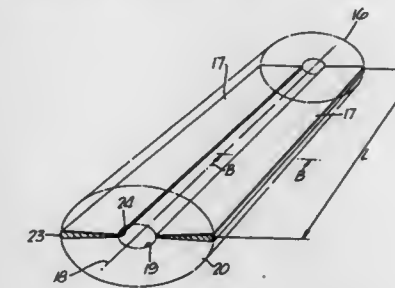
Filed Oct. 2, 1986, Ser. No. 914,626

Claims priority, application United Kingdom, Oct. 15, 1985, 8525342

Int. Cl.⁴ B64C 27/38

U.S. Cl. 416—134 A

12 Claims



1. A helicopter rotor including a rotor hub for rotation about an axis and a plurality of radially extending rotor blades each attached to the hub by an elongated flexure member to permit pitch changes and flap and lag movements of the attached rotor blade, wherein each flexure member includes a plurality of longitudinally extending reinforcing plates which in cross section extend generally radially for 360° around a geometric centre of the flexure member, said reinforcing plates being enclosed in a resilient matrix material.

4,714,410 TRAILING EDGE SUPPORT FOR CONTROL STAGE STEAM TURBINE BLADE

Bynum V. Hancock, King, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 18, 1986, Ser. No. 897,672

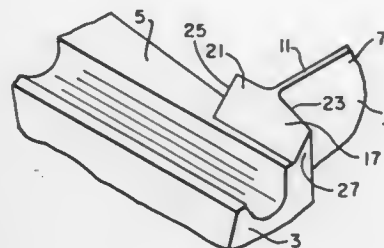
Int. Cl.⁴ F01D 5/30

U.S. Cl. 416—193 A

18 Claims

1. A rotatable blade for a steam turbine comprising:
 a root portion;
 a root platform portion disposed radially outwardly with respect to the root portion;
 an airfoil portion extending radially outwardly from the platform portion and having a leading and a trailing edge; said root platform portion having an extension which supports the trailing edge of the airfoil portion;
 said extension being wedge shaped and having two generally

right trapezoidal surfaces and two triangular shaped sides; and



said root platform having a notch with a generally right trapezoidal surface which receives and supports the wedge shaped extension of the adjacent blade when the blades are disposed in a circular array on a steam turbine.

4,714,411

FLUID PRESSURE INTENSIFIER DEVICE

Robin H. J. Searle, Yeovil, England, assignor to Normalair-Garrett (Holdings) Limited, Yeovil, England

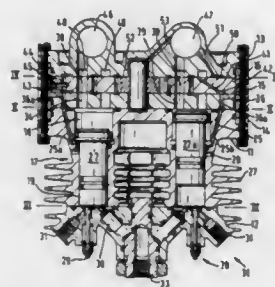
Filed Jun. 16, 1986, Ser. No. 874,863

Claims priority, application United Kingdom, Jun. 24, 1985, 8515944

Int. Cl.⁴ F04B 9/08

U.S. Cl. 417-246

6 Claims



1. In a fluid pressure intensifier device having a plurality of piston and cylinder compression stages of sequentially decreasing volume, flow passages for conducting fluid to be pressure intensified sequentially through said stages, and means for operating said stages in sequence to effect stagewise pressure intensification of fluid, the improvement comprising an individual pressure fluid powered driving mechanism for each said piston and cylinder compression stages, each of said driving mechanisms comprising a driving piston and cylinder assembly integrated with the compression stage associated therewith, said compression stages being arranged in a circle about an axis, and control means for causing said driving mechanisms to operate in sequence, said control means comprising a port plate rotatable about said axis and controlling pressure fluid inlet and outlet connections to the driving piston and cylinder assemblies, a positive displacement pressure fluid motor actuated by the pressure fluid powering said driving piston and cylinder assemblies for rotating said port plate, said positive displacement motor comprising a gerotor motor having an outer gear comprising said rotatable port plate.

4,714,412 FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Wilfried Böhlinger, Flein; Franz Ehlm, Stuttgart; Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg, and Helmut Laufer, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany Division of Ser. No. 610,724, May 16, 1984, Pat. No. 4,649,883.

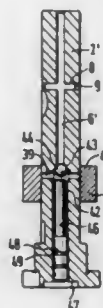
This application Dec. 15, 1986, Ser. No. 941,867

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3326973

Int. Cl.⁴ F04B 49/02, 49/00

U.S. Cl. 417-289

13 Claims



1. A fuel injection pump for internal combustion engines comprising a pump housing, a pump cylinder (4) in said pump housing, a reciprocating pump piston (2') in said pump cylinder (4) which encloses a work chamber (5), a suction chamber (16) in said pump housing, an intake bore (15) in said pump housing and said pump cylinder through which said work chamber can be supplied with fuel from said fuel suction chamber in said pump housing during an intake stroke, a valve (20) in said intake bore between said fuel suction chamber and said work chamber for shutting off a fuel supply from said fuel suction chamber to said work chamber, said work chamber being connected during at least a portion of a supply stroke of said pump piston with at least one fuel injection line in said pump housing that leads to an injection valve of an engine, a longitudinal extending relief conduit (6') in said pump piston which leads exclusively from said work chamber to a transverse conduit (39) that leads to a radially extending relief opening located in the pump piston, said relief opening being closable by means of a quantity adjusting device (22) that is axially displaceable on a portion of said pump piston which protrudes into said fuel suction chamber of said pump housing that is filled with fuel under pressure and beyond a pump piston stroke determined by an axial position of said quantity adjusting device, said relief opening being adjustable into communication via a control edge (40) of said quantity adjusting member with said suction chamber, said longitudinally extending relief conduit is said pump piston includes a conduit segment (42) of larger diameter than said relief conduit (6') which extends from above said transverse conduit (39) to a lower end of said piston, a stop (46, 55) disposed in said conduit segment (42) of larger diameter below said transverse conduit (39), and a check valve (44) which opens in the fuel flow direction and closable upon a suction stroke of the pump piston is disposed in said conduit segment of larger diameter in said pump piston juxtaposed said transverse conduit (30), and a valve seat for said check valve at a transition between the diameters of said relief conduit and said conduit segment including said stop.

4,714,413 SPEED SENSITIVE POWER STEERING PUMP UNLOAD VALVE

James J. Duffy, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/00486, § 371 Date Apr. 16, 1982, § 102(e)

Date Apr. 16, 1982, PCT Pub. No. WO83/03581, PCT Pub.

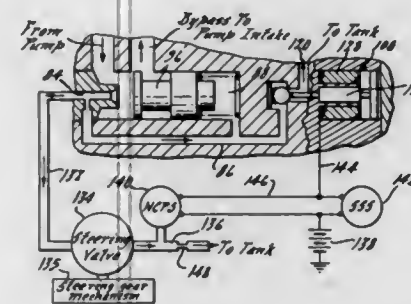
Date Oct. 27, 1983

PCT Filed Apr. 16, 1982, Ser. No. 386,850

Int. Cl.⁴ F04B 49/02, 49/00

U.S. Cl. 417-293

6 Claims



1. In a power steering system having a fluid pressure operated steering valve and a steering gear mechanism, a power steering pump and a fluid circuit interconnecting the pump and the steering valve, the improvement comprising:

a pressure regulating flow control valve for the power steering pump;

said pump having a high pressure flow delivery passage and a low pressure return passage;

said flow control valve being situated in and partly defining said circuit for establishing controlled communication between said high pressure passage and said return passage;

means for subjecting a pressure differential force on said flow control valve that is proportional in magnitude to the fluid flow delivered by said pump whereby an increased fluid flow delivery by the pump is accompanied by an increase in the pressure forces tending to increase bypass flow from said delivery passage to said return passage; and vehicle speed sensitive valve means for deactivating said flow control valve by eliminating the flow proportional differential force acting on said flow control valve at speeds greater than a predetermined value whereby the flow control valve acts solely as a pressure regulator bypass valve.

4,714,414

PLURAL-STAGE GAS COMPRESSOR

Bernard F. Miller, Corning, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 26, 1986, Ser. No. 911,795

Int. Cl.⁴ F04C 18/356, 23/00, 29/02, 29/04

U.S. Cl. 418-11

7 Claims

1. A plural-stage gas compressor, comprising:

a gear housing;

said housing having (a) a pair of spaced-apart, parallel, side walls, and (b) a gear chamber formed therewithin;

a driving gear rotatably confined within said chamber;

a primary, driven gear interpositioned between said walls, and in meshed, driven engagement with said driving gear;

a secondary, driven gear interpositioned between said walls, and in meshed, driven engagement with said primary, driven gear;

a primary shaft (a) coupled to said primary gear for rotation therewith, and (b) journaled in said walls rotatably supporting said primary gear in said chamber on a rotary axis; and

a secondary shaft (a) coupled to said secondary gear for rotation therewith, and (b) journaled in said walls, rotatably supporting said secondary gear in said chamber on a rotary axis.

ably supporting said secondary gear in said chamber, on a rotary axis; wherein

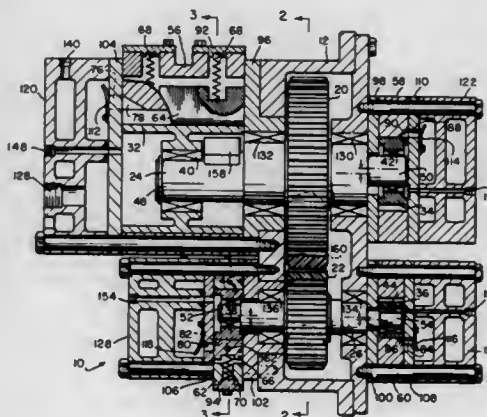
each of said shafts has integral pins, on opposite ends thereof, eccentric to, albeit parallel with, said rotary axis of its associated shaft; and

said pins of each said shaft are parallel to each other, albeit having eccentricities which dispose them at a given angular distance apart from each other, relative to said rotary axis of their associated shaft; further including

separate compartments, defining gas compression chambers therewithin, replaceably fixed to external surfaces of said walls; wherein

each of said compartments has (a) a circumferential wall and a gas inlet port formed in said circumferential wall for admitting gas therethrough, radially, into said compression chamber of said compartment, and (b) an outer, end plate, at an outermost, axial end, and in closure, of said compression chamber;

each of said end plates has a gas outlet port formed therein for admitting gas therethrough, axially, from said compression chamber associated therewith; and including



an outer, removable header coupled to, and parallel with, each of said end plates; wherein

each of said headers has means therewithin subdividing said header into a plurality of galleries;

one of said galleries have valving means therewithin for controlling a conduct of gas through said outlet port from an associated gas compression chamber;

another of said galleries comprises means for cooling said one gallery;

said cooling means comprises means for conducting coolant through said another gallery;

each of said headers comprises means in traverse of end plate and said header, and isolated from fluid communication with said galleries, for injecting coolant, axially, into its associated gas compression chamber;

each of said compression chambers has a rotary piston confined therein; and

each of said pins has one of said rotary pistons journaled thereon.

4,714,415

SCROLL COMPRESSOR WITH CLOSED COMPRESSION SPACES HAVING VALVES TO REDUCE STARTING TORQUE

Takao Mizuno; Naoshi Uchikawa; Akira Murayama; Takahiro Tamura, and Ryoichi Kuroshima, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1986, Ser. No. 893,177

Claims priority, application Japan, Aug. 27, 1985, 60-186625

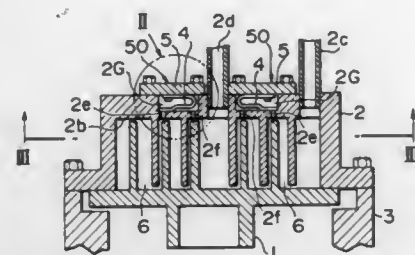
Int. Cl.⁴ F04C 18/04, 29/10

U.S. Cl. 418-14

4 Claims

1. A scroll compressor including an orbiting scroll means

and a fixed scroll means, each of said scroll means including an end plate and a spiral wrap formed on said end plate in an upstanding position, said orbiting and fixed scroll means being assembled together with wraps thereof meshing inwardly with each other, and said orbiting scroll means is driven to execute an orbital motion relative to said fixed scroll means so that a plurality of closed spaces defined at symmetrical positions by the wraps and end plates of said orbiting and fixed scroll means are successively reduced in capacity while moved toward a center of said fixed and orbiting scroll means, and communicate with a discharge port provided in said fixed scroll means after the reduction in capacity, wherein two valve chamber



means are symmetrically formed at positions on the end plate of said fixed scroll means, sealing flange means are provided for closing said valve chamber means, first and second communication port means are provided and open into each valve chamber means for communicating with a closed space in mid course of a compression stage and for communicating with another closed space of a minimum capacity which is further advanced toward a discharge side of the compressor than the closed space in mid course of the compression stage and located just before a communication with the discharge port, and valve plate means for opening and closing said respective first communication port means are provided on inner walls of said sealing flange means.

4,714,416

QUIET RUNNING COMPRESSOR

Kiyoshi Sano, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

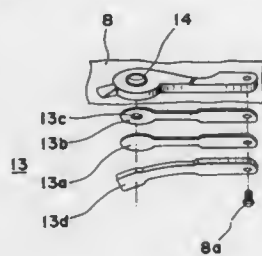
Filed Jul. 23, 1985, Ser. No. 758,076

Claims priority, application Japan, Jul. 26, 1984, 59-155825

Int. Cl.⁴ F04C 18/34; F16K 15/16

U.S. Cl. 418-63

2 Claims



1. A valve arrangement for a compressor for compressing fluid, the compressor having a sealed casing having a suction inlet and a discharge outlet spaced from the suction inlet on the casing, a cylinder mounted within the casing and having an inlet opening extending radially therethrough open at one to and communicating with the suction inlet, a piston driven within the cylinder for drawing in fluid from the suction inlet and for compressing the drawn in fluid, and a discharge section having a discharge port extending therethrough having one end open to and communicating with the cylinder for allowing the compressed fluid to discharge therethrough to the discharge outlet, said valve arrangement comprising:

a first resilient plate having one end fixed relative to said cylinder and the other end positioned against said discharge section over the other end of the discharge port,

said other end of said first resilient plate having a portion partially covering said discharge port and a hole extending therethrough coaxial with said discharge port, the ratio of the cross-sectional area of said hole to the cross-sectional area of said discharge port being between 0.05 and 0.3 for minimizing the force exerted by the compressed fluid discharged through said discharge port onto said other end of said first resilient plate thereby reducing noise associated with the contact of said other end of said first plate with said discharge section when said first plate is deflected away from said discharge section and off of said discharge port under the influence of said force; and a second resilient plate overlying said first resilient plate opposite said discharge port, said second resilient plate having one end fixed relative to said cylinder and the other end positioned against said other end of said first resilient plate and over said hole for covering said hole and said other end of said discharge port, said second resilient plate being deflected away from the discharge section by said force exerted by the compressed gas discharging through the discharge port to uncover said hole and the discharge port.

4,714,417

INTERNAL AXIS SINGLE-ROTATION MACHINE WITH INTERMESHING INTERNAL AND EXTERNAL ROTORS

Felix Wankel, Eichwaldstrasse 54, D-8990 Lindau, Fed. Rep. of Germany

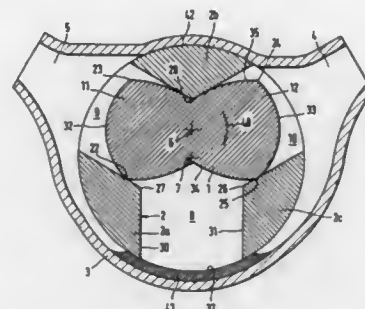
Filed Jun. 12, 1985, Ser. No. 743,786

Claims priority, application Switzerland, Jun. 12, 1984, 2822/84

Int. Cl.⁴ F01C 21/12, 1/10; F04C 15/02, 2/00

U.S. Cl. 418-159

2 Claims



1. An internal axis single-rotation machine comprising: a casing defining an internal machine volume which is partially enclosed by diametrically facing sealing parts defined by internal wall portions of said casing and having inlet means and outlet means for effecting fluid flow through said internal volume; an internal rotor and an external rotor having a generally circular outer periphery both mounted within said casing for rotation about their own centers of gravity at different angular velocities; said internal rotor having a cross-sectional configuration defining a number of lobes having external peripheral faces and lateral faces which meet each other at radially external sealing corner areas; said external rotor having a cross-sectional configuration defining internal lateral faces defining a number of recesses, which faces meet each other at internal sealing corner areas; peripheral surface areas defined on said outer periphery of said external rotor arranged to engage with said diametrically facing sealing parts of said casing to maintain a continuous sealing contact therebetween during rotation of said external rotor relative to said casing thereby to

prevent fluid flow through said internal volume around the outer periphery of said external rotor; said internal rotor and said external rotor rotating at angular velocities having a ratio therebetween which corresponds to the ratio between said number of lobes and said number of recesses and being arranged in a cooperating rotating relationship during relative rotation thereof, wherein a continuous sealing engagement between said rotors is maintained in that said radially external sealing corner areas of said internal rotor kinematically describe said internal lateral faces of said external rotor, said internal sealing corner areas of said external rotor kinematically describe said internal lateral faces of said internal rotor, and a meshing gear-like contact is maintained between said internal lateral faces of said external rotor and said lateral faces of said internal rotor, said internal rotor extending to the periphery of said external rotor at certain points during the relative rotation therebetween, with said recesses of said external rotor extending to the periphery of said external rotor to open radially outwardly thereof and moving past said inlet means and said outlet means of said casing; said internal lateral faces of said external rotor being flat with said internal rotor and said external rotor rotating relative to one another with a speed ratio of 3:2.

4,714,418

SCREW TYPE VACUUM PUMP

Katsumi Matsubara; Riichi Uchida; Masatoshi Muramatsu, all of Ibaraki; Kotaro Naya, Ebina, and Tsuneharu Takagi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

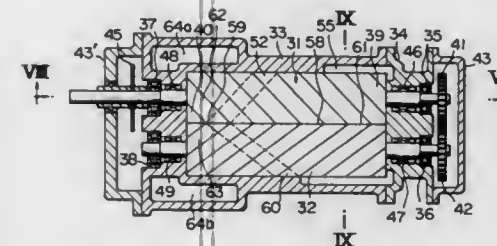
Filed Feb. 13, 1985, Ser. No. 701,199

Claims priority, application Japan, Apr. 11, 1984, 59-70830; Dec. 26, 1984, 59-272860

Int. Cl.⁴ F04C 18/16

U.S. Cl. 418-201

19 Claims



1. A screw vacuum pump comprising: a male rotor having a plurality of spiral lands and grooves and a shaft portion and operative to rotate about said shaft portion; a female rotor having a plurality of spiral lands and grooves and a shaft portion and operative to rotate about said shaft portion while being maintained in meshing engagement with said male rotor; and casings defining a space for containing said two rotors and providing a suction port and a discharge port communicating with said space; said two rotors each having a wrap angle related to the position of said suction port and the position of said discharge port, said wrap angles being greater than 360°; a plurality of working chambers defined by said two rotors and said casings including a plurality of sealed working chambers out of communication with both the suction port and the discharge port, said plurality of sealed working chambers comprising a plurality of working chambers having their volume reduced when the two rotors rotate while being maintained in meshing engagement with each other, and a plurality of working chambers having their volumes maintained substantially constant when the two rotors rotate while being maintained in meshing engagement with each other, and wherein at least one of said working chambers having their volume reduced and at least one of said working chambers having their volume maintained substantially constant are provided in each of the grooves and separated from each other by meshing portions of said two rotors.

4,714,419

CANDY DISPENSING APPARATUS

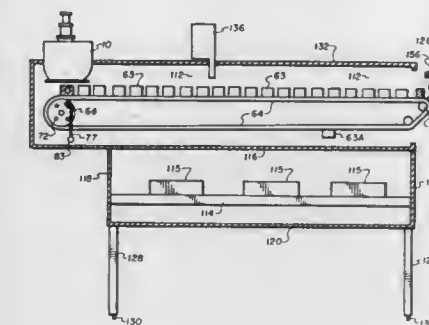
A. Lamont Nielsen, 2392 E. 2900 South, Salt Lake City, Utah 84109

Continuation-in-part of Ser. No. 595,322, Mar. 30, 1984, abandoned. This application May 21, 1986, Ser. No. 866,460

Int. Cl.⁴ B29C 41/22, 41/42; B67D 5/00

U.S. Cl. 425-126 S

10 Claims



1. A transfer clamp for use in removing articles from a conveyor belt, said clamp comprising: at least one first elongate panel, having a longitudinal axis, defining at least one substantially "V"-shaped slot spacedly positioned along one side of said first panel, said "V"-shaped slot having an interior region dimensioned to receive a stick portion of a lollipop mold assembly; at least one second elongate panel positioned parallel and adjacent said first panel, said second panel defining at least one substantially "L"-shaped slot spacedly positioned along one side of said second panel to register with the positioning of said "V"-shaped slot, said "L"-shaped slot having an elongate inlet channel and a retention channel; a first drive means associated with said second panel for displacing said second panel along said first panel between two conditions, a first condition wherein an interior region of said "V"-shaped slot is aligned with said inlet channel of said "L"-shaped slot, whereby a stick may be inserted into said aligned slots, and a second condition wherein said interior region of said "V"-shaped slot is not aligned with said inlet channel of said "L"-shaped slot, wherein said retention channel of said "L"-shaped slot in association with said interior region of said "V"-shaped slot substantially encircle of stick inserted into said "V"-shaped slot.

4,714,420

PLANT FOR THE CONTINUOUS AND AUTOMATED MANUFACTURING OF AGGLOMERATED SINTERED, VULCANIZED AND PRESSED ARTICLES

Milorad S. Milisavljevic, Lucerne, Switzerland, assignor to PTP Patentierte Technologische Prozesse AG, Lucerne, Switzerland

PCT No. PCT/CH83/00142, § 371 Date Aug. 19, 1985, § 102(e) Date Aug. 19, 1985, PCT Pub. No. WO84/02493, PCT Pub. Date Jul. 5, 1984

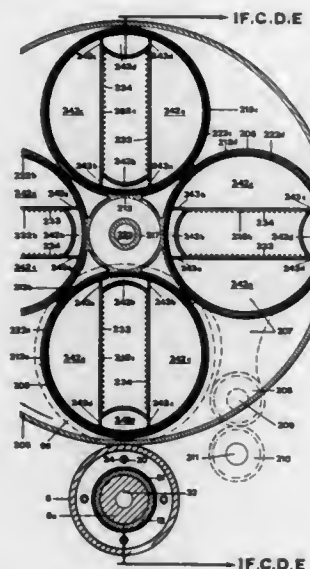
PCT Filed Dec. 14, 1983, Ser. No. 770,865

Claims priority, application Switzerland, Dec. 20, 1982, 7401/82

Int. Cl.⁴ B29C 33/34

U.S. Cl. 425—161

57 Claims



1. In a plant for a manufacture in an automated and continuous manner of agglomerated, sintered and vulcanized articles, which are formed by converting and pressing materials, including minerals, synthetics, mixtures and alloys, which has at least one forming element to press or compress materials fed into a mold by feeding elements, at least one element for a thermal, chemical, mechanical or similar treatment of the pressed articles, and at least one device to remove manufactured articles from the mold, the improvement wherein a frame is provided which carries the whole plant, in order to feed the material into one or more working units positioned on the frame around the feeding elements, whereby each working unit is divided into fixed sectors each serving as a base for a press forming element and/or treatment element and/or one element for the removal from the mold are tightly fixed on the frame and a carousel is fixed on the frame, said carousel being provided with a number of mobile sectors equal to the number of said fixed sectors and turning with respect to the fixed sectors for transporting part of each mold or the formed articles from one fixed sector of the working unit to the next fixed sector of the working unit.

4,714,421

QUICK-SWITCH MOLD SET WITH CLAMP MEANS

Nicholas D'Agostino, Pompton Lakes, N.J., assignor to National Tool & Manufacturing Co., Inc., Kenilworth, N.J.

Filed Feb. 11, 1987, Ser. No. 13,641

Int. Cl.⁴ B29C 45/26

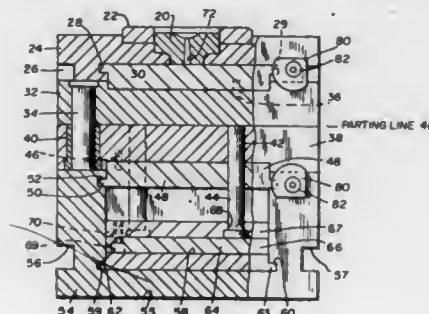
U.S. Cl. 425—192 R

21 Claims

1. A quick-switch mold set which is constructed so that a mold cavity may be formed in mold plates which are carried in that portion which is secured by selectively manipulable clamp means, this mold set having means for clamping in a selected position to upper and lower platens in molding apparatus, the quick-switch mold set having the quick-switch removable

portion containing desired aligning means, the construction of the quick-switch mold set including:

- (a) a top clamping housing member adapted to receive and retain a sprue bushing including a nozzle-receiving means and a sprue passageway therethrough for molten material, said housing member including inwardly-facing grooves disposed in an opposed and facing position;
- (b) a first upper-T-plate having ear portions sized to be precisely slideably in the grooves in said top clamp housing member and with a stop limit for lateral movement of these ears of said T-plate in the grooves, and with said T-plate movable for interchanging mold sets in an in-and-out direction;
- (c) an upper interchangeable mold plate removably retained in the mold set and means for retaining alignment and positioning with said first T-plate;
- (d) a lower interchangeable mold plate selectively adapted to be brought to a contiguous face relationship and establishing a parting line with the upper mold plate, this mold plate also removably retained in this mold set for interchanging;
- (e) a plurality of leader pins and bushings arrayed and disposed to be retained in the upper and lower mold plates and maintain alignment during open and closed condition, these leader pins and bushings remaining with and as the upper and lower mold plates are removed for the interchange;
- (f) a bottom clamping housing having upstanding side portions extending upwardly to the leader pins and bushings



and providing a stop surface for said pins and bushings, said bottom clamping housing side portions having inwardly-facing and opposed grooves;

- (g) a second intermediate T-plate having ear portions sized to be slideable in the opposed grooves in the side portions of the bottom clamping housing and with a stop limit for lateral movement of the T-plate provided by the side portion of the bottom clamping housing, and means for retaining said second lower mold plate in alignment with said intermediate T-plate;
- (h) a plurality of return pins disposed to be carried in and movable in holes in the intermediate T-plate and lower mold plate;
- (i) plate means for securing said plurality of return pins so as to maintain said return pins in a common plane and attitude during molding;
- (j) at least one upper clamp which is secured and carried by the top clamping housing and with said clamp disposed so as to be selectively movable from a tightened condition where said clamp retains the ear portion of the upper first T-plate and upper mold plate and, when loosened, is moved to a pass condition whereby said upper first T-plate and upper mold plate are adapted to pass said upper clamp when interchange is to be made, and
- (k) at least one lower clamp which is secured and carried by said bottom clamp housing and with said clamp disposed so as to be selectively movable from a tightened condition where said clamp retains an ear portion of the second intermediate T-plate and lower mold plate and, when

loosened, this lower clamp is moved to a pass condition whereby said lower mold plate and second intermediate T-plate are adapted to pass said lower clamp when interchange is to be made.

4,714,422

ROTARY PLASTICATOR SCREW INJECTION MACHINE

Gregory W. Meeker, Webster; Norris E. Bleck, Rochester, both of N.Y.; Marc A. Rizzi, Orange, and Carl M. Irick, Monroe, both of Conn., assignors to Farrel Corporation, Ansonia, Conn.

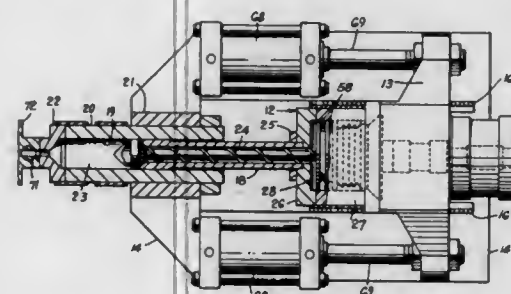
Continuation of Ser. No. 612,682, May 22, 1984, abandoned.

This application Dec. 12, 1985, Ser. No. 808,231

Int. Cl.⁴ B29C 45/02

U.S. Cl. 425—204

8 Claims



1. Apparatus for injection molding plastic articles including the combination of:

a base,

a rotary processor for plasticating plastic and polymeric material and mounted on said base for guided reciprocation, said processor comprising a housing having a rotor mounted for rotation in said housing, the rotor having a plurality of annular channels which provide moving surfaces of a plurality of annular passages which passages are closed by a mating surface of the housing, the housing having an inlet through which material to be plasticated is fed to at least one of the passages and fixed members projecting from the housing into the channels for restraining the material to be acted on by the moving surfaces and to direct the material to successive passages and toward an outlet section of the housing;

an elongate screw rotatable in a sleeve, an end of said sleeve being secured to and extending from the processor housing into a bore in a barrel, with a first end of the screw communicating with the outlet section of the processor and a second end of the screw communicating with a chamber formed in the bore at an other end of the sleeve; motor means for rotating the rotor and the screw in unison for plasticating and otherwise operating on the material fed through the inlet and successive passageways, through the outlet section and along the screw into the chamber, the sleeve and the barrel being fixedly mounted to the processor housing for enlarging the chamber by reciprocation of the processor housing relative to the base, to accommodate plasticated material fed by the screw and for reducing the volume of the chamber for forcing the plasticated material therefrom;

and piston cylinder means acting between the barrel and the processor housing for following retraction of the sleeve during enlargement of the chamber and for driving the sleeve and screw therein axially in a direction opposite said retraction for forcing the plasticated material from the chamber.

4,714,423

EVACUATING DEVICE FOR PLUNGER MOLDING APPARATUS

Isao Hattori, and Shigeru Furukawa, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

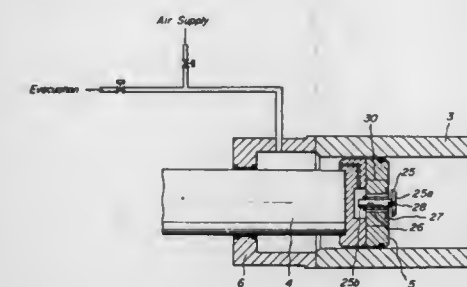
Filed Dec. 29, 1986, Ser. No. 947,830

Claims priority, application Japan, Dec. 13, 1986, 61-191133[U]

Int. Cl.⁴ B29C 47/54, 47/76

U.S. Cl. 425—376 R

3 Claims



1. An apparatus comprising:

a material cylinder for receiving a blank to be extruded, a ram head slidably engageable in said material cylinder, a hydraulic plunger having a piston connected to said ram head, an evacuating cap provided slidably in an air-tight manner on said piston and having evacuating pipes, and a blowdown valve provided in said ram head for closing an opening an air blow aperture formed in said ram head, wherein said ram head comprises a flat surface which is in contact with said blank in said material cylinder, and an O-ring arranged in said flat surface of said ram head about said air blow aperture, and said blowdown valve comprises a T-shaped head which is movable into contact with said flat surface of said ram head through said O-ring to close said air blow aperture when the ram head is being advanced in said material cylinder to extrude said blank therefrom.

4,714,424

VACUUM MOLD

Toshiyuki Kinugasa; Tamio Furuya, both of Hidaka; Yoshiki Ishige, Tokorozawa; Yuichi Tsuchimoto, Sakado, and Shoji Takahashi, Iruma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,774

Claims priority, application Japan, Oct. 18, 1984, 59-219173; Apr. 5, 1985, 60-71987

Int. Cl.⁴ B29C 51/10

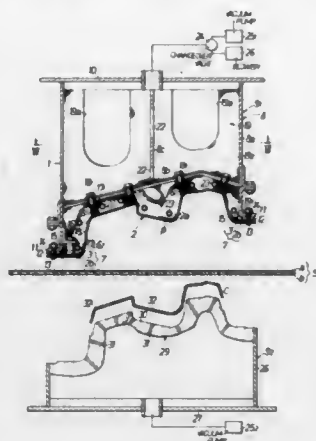
U.S. Cl. 425—388

22 Claims

1. A vacuum mold for vacuum-forming a heated plastic sheet with an imprinted grain pattern on the surface of the sheet, said mold comprising:

an electrocast shell including a microporous body having a front casting surface with a grain pattern thereon, said microporous body having a multitude of fine vacuum holes uniformly distributed at said front-casting surface, and a back-up body on the rear surface of the microporous body, said back-up body comprising a multitude of adjoining small particles in contact with one another at contact points thereof, said particles being connected to one another at said contact points and providing vent spaces between said particles, said vent spaces being in communication with said fine vacuum holes in said microporous body, said back-up body comprising a first layer on said electrocast shell and a second layer laminated on said first layer, said particles in said first layer including a multitude

of adjoining steel balls connected at contact points by a thermosetting plastic, said particles in said second layer



including a multitude of adjoining glass particles connected at contact points by the thermosetting plastic.

4,714,425

PREPARATION OF A PLASTIC FOR ITS EXTRUSION PARTICULARLY IN THE FORM OF A GAGED BEAD INTENDED TO BE USED AS A SEAL AND INTERLAYER IN MULTIPLE GLAZINGS

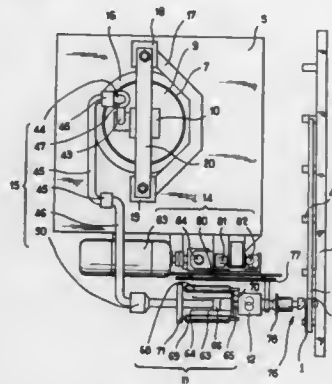
Karl Lenhardt, Neuhausen-Hamberg, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Courbevoie, France
Filed Jul. 10, 1985, Ser. No. 753,608

Claims priority, application France, Jul. 10, 1984, 84 10946; Sep. 17, 1984, 84 14181; Sep. 17, 1984, 84 14182; Sep. 17, 1984, 84 14183; Sep. 17, 1984, 84 14184

Int. Cl.⁴ B29C 47/92

U.S. Cl. 425-461

17 Claims



1. An installation for preparing a plastic material of the type having a butyl rubber base from a mass of said material in the raw state having a high viscosity and a high hardness, and for extruding said plastic in the form of a gaged bead having a viscosity and a hardness lower than those of said material in the raw state, comprising:

- a tank containing raw plastic material and having a cover applied with pressure against said material, said cover having an outlet orifice and a shape such that the section of the volume of material enclosed by said cover is smaller the closer said material is to said outlet orifice, said cover also being equipped on a face thereof oriented toward the material with heating appendages that can plunge into said material,
- a first pump in fluid communication with said outlet orifice for providing a continuous delivery of said material under a high pressure,
- variable volume magazine means located downstream from

said pump in a direction of material flow, for providing continuous delivery of said material under pressure, said magazine means consisting of a cylinder and a piston returned to the inside of the cylinder with a constant force less than the force exerted by the material feeding said magazine, and
an output nozzle downstream from said magazine.

4,714,426

IGNITION SYSTEM FOR OIL BURNER

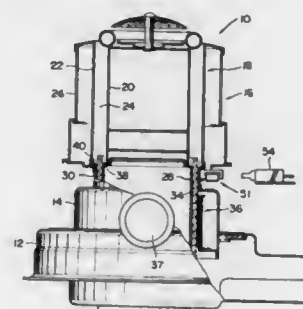
Yutaka Nakanishi, Kounan; Toshihiko Yamada, Aichi; Yuji Sanada, Aichi, and Takashi Kawai, Aichi, all of Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Dec. 24, 1986, Ser. No. 946,223

Claims priority, application Japan, Dec. 28, 1985, 60-204586[U]; Jun. 28, 1986, 61-99745[U]; Jun. 28, 1986, 61-99746[U]

Int. Cl.⁴ F23Q 2/08

U.S. Cl. 431-132

14 Claims



1. An ignition system for an oil burner including a wick arranged between outer and inner cylinders of a wick receiving construction and raised at an upper end portion thereof to a lower portion of a combustion cylinder construction placed on said wick receiving construction, comprising:

- an ignition window provided at an upper region of said outer cylinder of said wick receiving construction;
- a closing door for tightly closing said ignition window, said closing door being movably arranged opposite to said ignition window;
- a door actuating means for actuating said closing door;
- an actuation arm arranged so as to be pivotally movable;
- an ignition heater mounted on said actuation arm so as to be approachable to said ignition window;
- a connection means for operatively connecting said actuation arm to said door actuating means to actuate said closing door in synchronism with said actuation arm, to thereby open said ignition window when said ignition heater is approached to said ignition window; and
- an actuation regulator for setting pivotal movement of said actuation arm within a predetermined range.

4,714,427

FIXING DEVICE FOR COPYING MACHINE

Ichiro Tsuruoka, Tokyo, and Mitsuru Takahashi, Miyagi, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 817,824, Jan. 10, 1986, abandoned. This application Apr. 6, 1987, Ser. No. 36,128

Claims priority, application Japan, Apr. 26, 1985, 60-088877 Int. Cl.⁴ F27B 9/28; H05B 1/00; F26B 3/18

U.S. Cl. 432-59

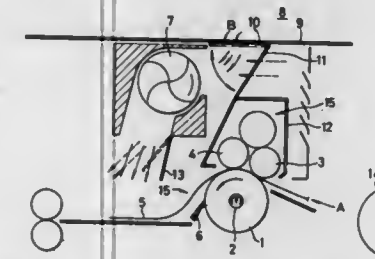
6 Claims

1. A fixing device for use in a wet-type copying machine, comprising:
a main rotatable body;
means for heating said main rotatable body; and
means for holding a sheet, which has a front side and a back side and carries on its front side a wet-type unfixed toner image, against said main rotatable body as heated by said

heating means over a predetermined interval on the main rotatable body to allow the toner image to be fixed to the sheet and also to allow the sheet to be fed by said main rotatable body;
wherein:

- the back side of said sheet makes contact with the main rotatable body while the front side, which carries said wet-type unfixed toner image, faces away from the main rotatable body and makes contact with said means for holding;
- the surface of the main rotatable body which makes contact with the back side of the sheet is smooth; and
- the surface of the means for holding which makes contact with the front side of the sheet has a multiplicity of fine projections;

said holding means comprises an auxiliary roller adjacent



to said main rotatable body for concurrent rotation therewith so that portions of said auxiliary roller and said main rotatable body will move in one direction, said main rotatable body and said auxiliary roller being capable of feeding a sheet held therebetween;
said main rotatable body comprises a main roller heated by said heating means; and
said auxiliary roller comprises at least two auxiliary rollers spaced from each other, said main roller and adjacent ones of said auxiliary rollers being relatively positioned such that an angle formed between a first line tangential to both said main roller and an upstream one of said adjacent auxiliary rollers in the direction of feed of the sheet and a second line tangential to the downstream auxiliary roller at point where said first line intersects the peripheral surface of said downstream auxiliary roller is an obtuse angle.

4,714,428

METHOD OF COMPREHENSIVE DISTORTION CORRECTION FOR A COMPUTER IMAGE GENERATION SYSTEM

William M. Bunker, and Donald M. Merz, both of Ormond Beach, Fla., assignors to General Electric Company, Philadelphia, Pa.

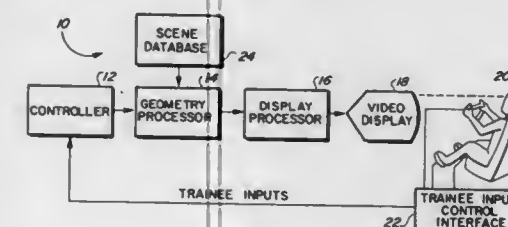
Continuation of Ser. No. 810,737, Dec. 19, 1985, abandoned.

This application Jan. 28, 1987, Ser. No. 9,649

Int. Cl.⁴ G09B 9/00

U.S. Cl. 434-43

38 Claims



1. In an image generating system of the type for converting digital data into a sequence of display frames of image data in projector space suitable for display on a video image system in viewer space, the image system forming a display by individually illuminating each of a plurality of color pixels, each of the

frames of image data defining a plurality of faces and each of the frames being divided into a plurality of spans, including an electronic control means for converting the digital data, a method for correcting for geometric distortion and optical distortion comprising the steps of:

- (a) identifying data for a frame of display, the data defining face locations in viewer space, each of the faces associated with at least one span and being arranged in a descending order of priority;
- (b) calculating transformation coefficients for mapping projector space span corners into viewer space;
- (c) determining the highest priority face for each span;
- (d) determining an area within a viewer space span covered by the highest priority face;
- (e) computing pixel image data representative of the pixels within the projector space span covered by the face;
- (f) repeating step (c) through step (f) until the last face is processed into pixel image data or until all areas of the spans are fully covered by faces; and
- (g) transferring the pixel image data to the video image system.

4,714,429

ARITHMETIC EDUCATIONAL DEVICE

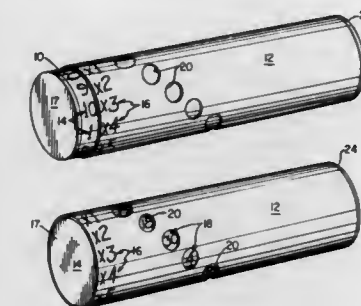
Morton Phillips, 67-70 Yellowstone Blvd., Forest Hills, N.Y. 11375

Filed Dec. 22, 1986, Ser. No. 945,369

Int. Cl.⁴ G09B 19/02

U.S. Cl. 434-198

7 Claims



1. An educational device comprising an outer cylinder and an inner cylinder within said outer cylinder, said inner cylinder having an end extending from said outer cylinder and being rotatable and axially movable with respect to said outer cylinder, said inner cylinder having a series of first numbers peripherally arrayed around the end extending from said outer cylinder, said outer cylinder including a series of windows and a series of second numbers peripherally arrayed around the end from which the inner cylinder extends such that each of said second numbers can be aligned with each of said first numbers when said end of the inner cylinder extends from the outer cylinder by rotating one of said cylinder, said inner cylinder further including rows of third numbers corresponding to an arithmetic operation between said first numbers and said second numbers, said third numbers being physically arranged on said inner cylinder relative to said windows so that said third numbers do not appear in said windows when said inner cylinder extends from said outer cylinder but said third numbers appear in said windows when said inner cylinder is inserted into said outer cylinder so as to reflect the result of an arithmetic operation between aligned first and second numbers.

4,714,430

ELECTRIC CONTACT DEVICE FOR PROTECTIVE GAS BAG IMPACT INSTALLATIONS IN AUTOMOTIVE VEHICLES

Gregor Zeller, Aschaffenburg, Fed. Rep. of Germany, assignor to Petri A.G., Fed. Rep. of Germany

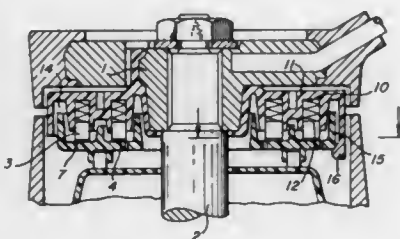
Filed Mar. 24, 1986, Ser. No. 842,948

Claims priority, application European Pat. Off., Mar. 23, 1985, 85103482.7

Int. Cl.⁴ H01R 39/00

U.S. Cl. 439—15

14 Claims



1. A continuous contact electrical connector for installation in a vehicular steering wheel assembly comprising: an annular housing exhibiting a fixed contact path disposed in an annular bottom trough of said housing; a cover mounted to rotate with a steering wheel exhibiting a ring contact disposed in an annular groove aligned with said contact path; a plurality of springs located between said ring contact and said cover, in said annular groove, biasing said ring contact downward against said contact path.

4,714,431

ELECTRICAL DISTRIBUTION SYSTEM HAVING AN IMPROVED PLUG-IN ASSEMBLY FOR CURRENT TAP-OFF

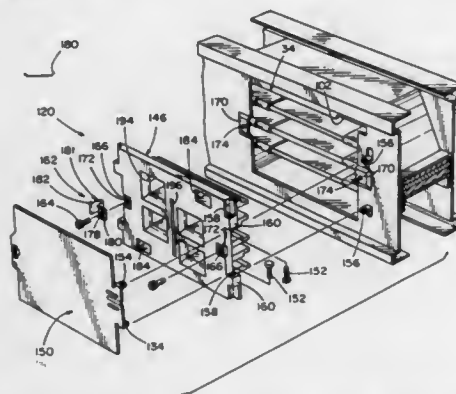
Gilbert A. McGoldrick, Hamilton, Ohio, and Allan E. Slicer, Brookville, Ind., assignors to Square D Company, Palatine, Ill.

Filed Sep. 13, 1984, Ser. No. 650,378

Int. Cl.⁴ H02G 5/08

U.S. Cl. 439—212

7 Claims



1. A plug-in busway section having a pair of side rails, each including a top portion, a bottom portion and a main side portion, and a plurality of plug-in openings located along the length of the section to facilitate tap-off from such locations to bus bars which are spaced apart at those locations, the improvement comprising: an insulating base providing separate openings to each of said bus bars, said base having a first pair of support posts along one side of said base, each support post having an opening for receiving a fastener. A door for covering said base, said door having a first pair of

ears extending outward from one side of said door, each ear overlapping a respective one of said posts and, having an opening in registration with a respective opening in one of said posts;

a second pair of ears extending from said main side portion of said rail in generally parallel relationship with the respective first pair of ears, said second pair of ears each having an opening in registration with a respective opening in said first pair of ears and a respective opening in one of said posts; and

a first fastener extending through one of said first ears, one of said second ears and into said opening in one of said posts, and

a second fastener extending through the other first ear, the other second ear and into said opening in the other post.

4,714,432

HERMETIC SEAL FOR ELECTRICAL COAXIAL CONNECTOR

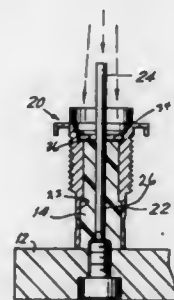
Richard A. Huggins, Islip Terrace, N.Y., assignor to Automatic Connector, Inc., Commack, N.Y.

Filed Dec. 5, 1985, Ser. No. 804,921

Int. Cl.⁴ H01R 13/52

U.S. Cl. 439—271

10 Claims



1. A method for forming a hermetic seal without using a glass seal for a coaxial connector which comprises a center contact surrounded by a body, a form configured between said center contact and said body, said non-glass hermetic seal being located in said form, said method comprising the steps of: assembling said center contact, said body and a holder as one unit to provide said form between said center contact and said body, vertically holding said unit on said holder, forming said non-glass hermetic seal by the steps of applying a material consisting essentially of a light curable viscous chemical compound to fill the form between said center contact and said body, and supplying light to said compound to cure said viscous chemical compound and thereby form said non-glass hermetic seal effectively only by said light cured compound.

4,714,433

ELECTRICAL CONNECTOR WITH POSITION ASSURANCE AND DOUBLE LOCK

Frederick H. Rider, Jr., Youngstown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1987, Ser. No. 5,607

Int. Cl.⁴ H01R 13/639

U.S. Cl. 439—310

3 Claims

1. In combination with first and second electrical connector bodies that are movable together from a separated to a fully mated position, a cooperating primary and secondary lock means to assure that the connector bodies reach the fully mated position and to provide double locking between the connector bodies, comprising:

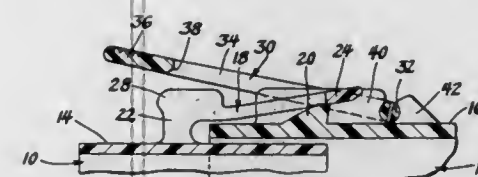
a cantilevered primary locking arm on the first connector body extending from a base, said base further including a

keeper projection extending in the opposite direction to said locking arm,

a latching member on the second connector body with which said primary locking arm engages as said connector bodies are moved to the fully mated position, thereby providing a primary lock between said fully mated connector bodies, said arm remaining only partially engaged with said latching member when said connector bodies are only partially mated, and,

a secondary locking arm on the second connector body extending from a pivot to a forward camming end, said secondary locking arm being being rotatable about said

mutually complementary guiding formations disposing the circuit identification member above the support and constraining said circuit identification member to slide side-to-side so as to overlie selectively each of said rows of fastening devices while exposing the other of said rows of wire fastening devices for manipulation, portions of said circuit identification member being aligned with said connecting devices, respectively, and having areas exposed to view for bearing circuit-identification marks whereby such circuit identification marks are and remain aligned with said connecting devices, respectively, as the circuit identification member is shifted side-to-side.



pivot by pushing said camming end toward said second connector body, thereby engaging said camming end and said keeper projection to move said first connector body toward said second connector body, when said connector bodies are only partially mated, and thereby assure that said primary locking arm becomes fully engaged with said latching member, whereupon said camming end snaps beneath said keeper projection to indicate that said connector bodies have reached the fully mated position, said camming end also serving to capture said primary locking arm base, whereby a double lock between said connector bodies is cooperatively provided.

4,714,434

TERMINAL BLOCK WITH CIRCUIT MARKER

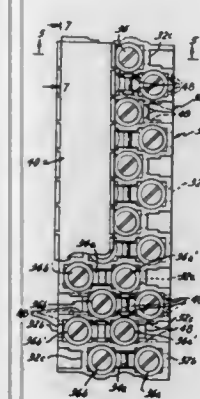
Alexander R. Norden, 350 Central Park West, New York, N.Y. 10025

Filed Feb. 6, 1986, Ser. No. 826,584

Int. Cl.⁴ H01R 9/24

U.S. Cl. 439—488

8 Claims



1. A multiple-circuit terminal block, including a series of connecting devices each of which has first and second wire fasteners, a support essentially of electrical insulation having opposite first and second sides and having a top extending side-to-side, and a circuit identification member, said connecting devices being carried by said support and being spaced apart from each other along the support, the first and second wire fasteners of each connecting device being spaced apart and being aligned with each other side-to-side on said support, said wire fasteners being disposed for manipulation by a tool from above said support, the first wire fasteners and the second wire fasteners of said connecting devices being distributed in a first row and in a second row, respectively, along said support, said circuit identification member and said support having

1. In an edge card arrangement for electrically connecting conductors of a flat flexible circuit member to a second circuit member including

an edge card connector connected to said second circuit member including an elongated dielectric housing with an edge card socket defined therein and a plurality of terminals having one end adapted to electrically mate with the second circuit member and another end adapted to electrically mate with circuits in said flexible circuit member, and

a rigidized flexible circuit assembly adapted to be received in said edge card socket including a rigid carrier, a flexible circuit member including a first insulative layer and a plurality of exposed conductors disposed thereon, the flexible circuit member being bonded on said carrier so that the first insulative layer is disposed adjacent a carrier surface and the exposed conductors face away from the carrier, wherein the improvement comprises:

an in-line filtered interconnect including: said carrier including a filter circuit having spaced apart first and second contact pads disposed on a major surface thereof; at least one of said flexible circuit conductors overlying and aligned with said first and second contact pads and a portion of said conductor extending between said first and second contact pads being discontinuous; means for electrically connecting said overlying conductor to the first and second contact pads; and at least one of the terminals of the connector electrically engaged to the conductor, whereby a signal travelling along the conductor is transmitted through electrical connecting means to said first contact pad, through the filter circuit to said second

contact pad, through connecting means and emerges at the exposed conductor for engagement by the terminal.

4,714,436

TEST CLIP WITH GROUNDING ADAPTOR FOR CABLE CONNECTOR

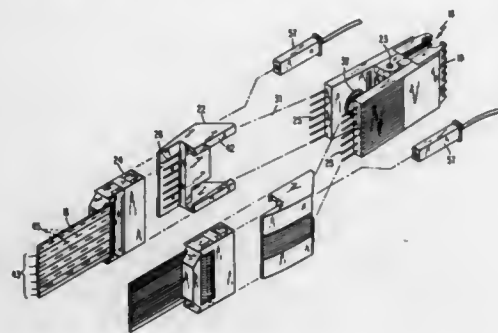
Wayne R. Jones, Alderwood Manor, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Dec. 15, 1986, Ser. No. 942,533

Int. Cl.⁴ H01R 4/66, 9/07

U.S. Cl. 439—497

18 Claims



1. A connector for connecting a plurality of leads of a unit under test (UUT) to a testing apparatus through an interface cable, said connector, comprising:

a plurality of test conductors, each test conductor having a contact end for contacting a lead under test and a connector end for connecting to said cable;

first arm means for supporting said test conductors; and reference voltage pin adaptor means comprising a plurality of commonly bussed pins and means for attaching said adaptor means to said first arm means.

4,714,437

ELECTRICAL CONNECTOR

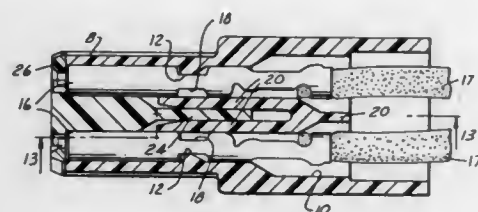
Joseph J. Dyki, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 20, 1987, Ser. No. 5,066

Int. Cl.⁴ H01R 13/40

U.S. Cl. 439—595

3 Claims



1. A separable electrical connector comprising: an elongated, rigid, nonconductive, generally tubular member substantially open at either end; a plurality of apertures extending axially through said tubular member;

a plurality of outboard ramping retention abutments formed integrally with said tubular member upon at least one inner surface of a radially outboard portion of said tubular member so that each of said apertures has at least one of said abutments extending radially inward into said aperture;

a plurality of axially connectable cylindrical electrical terminals adapted for coupling to the ends of insulated wires, where each terminal has an annular external recess in its cylindrical peripheral surface, with one of said terminals seated in each of said apertures such that said annular

external recess of each terminal is engaged with at least one of said outboard ramping retention abutments;

a central land located within said tubular member and defining a portion of each of said apertures with said central land comprising a plurality of axially extending terminal guide fingers cantilevered from a bulkhead extending transversely across the interior of said tubular member, with each of said fingers having a portion extending in juxtaposition to one of said ramping retention abutments; and

spacer means axially engaged with said central land for displacing said terminal guide fingers in the direction of said ramping retention abutments so that said ramping retention abutments will retain said terminals within said apertures, said spacer means comprising a unitary cover overlying an entire mating face on one of said ends of said tubular member and having a plurality of apertures extending therethrough for receiving a plurality of mating terminals, with at least one of said apertures corresponding to each of said apertures in said tubular member, said spacer means further comprising a plurality of blades cantilevered to said cover, with each of said blades interposed between two of said terminal guide fingers.

4,714,438

ELECTRIC CABLE JOINTS

Ronald D. Williams, St. Helens, England, assignor to BICC Public Limited Company, London, England

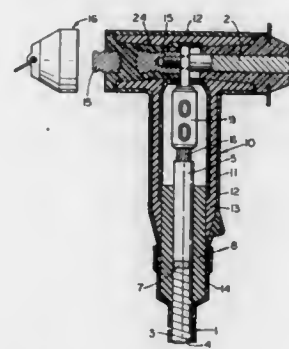
Filed Jun. 30, 1986, Ser. No. 880,030

Claims priority, application United Kingdom, Jul. 19, 1985, 8518256; Oct. 8, 1985, 8524781

Int. Cl.⁴ H01R 13/53, 13/658

U.S. Cl. 439—610

6 Claims



1. An electric cable joint comprising:

at least one cable end having at least one core, said cable end being cut back to expose respective ends of a central conductor, of dielectric material surrounding said conductor and of a dielectric screen surrounding said dielectric material;

at least one inner component in the form of a sleeve made of an insulating material heat-shrunk onto said core and extending across said end of the dielectric screen;

and at least one outer component of resilient material which is interference fit with said inner component.

4,714,439

ELECTRICAL CONNECTOR

Eduardo J. Marabotto, Miami; Mark S. Bresin, Coral Springs, both of Fla., and Bick R. Drake, Warren, Mich., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 3, 1986, Ser. No. 881,753

Int. Cl.⁴ H01R 13/24, 13/52; H01M 2/26, 10/38

U.S. Cl. 439—627

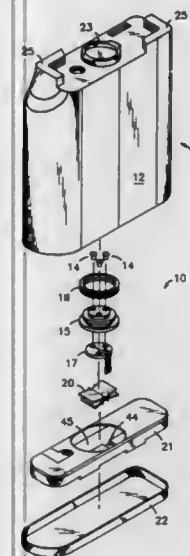
8 Claims

1. An electrical connector for providing electrical connection between a battery located in a compartment of a battery

housing, and a mating connector, said electrical connector comprising:

a body portion including a substantially cylindrical cavity, and adapted to be seated at one end of said compartment, a plurality of electrical contacts,

a contact block located in said cavity and having a contact carrying surface with the plurality of said contacts extending from said surface,



a peripheral resilient seal about the contact block, the seal being seated in said cylindrical cavity for providing a water seal with said body portion while allowing both longitudinal and tilting movement of the contact block relative to said body portion, and

biasing means operatively engaging the contact block for applying a resilient biasing force to the contact block and the contacts for providing electrical connection of said contacts to said mating connector.

4,714,440

UNIVERSAL ADAPTER AND METHODS OF AND APPARATUS FOR MAKING SAME

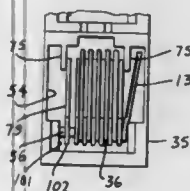
Erle M. Hutchins, Bel Air, Md., assignor to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Oct. 28, 1985, Ser. No. 792,086

Int. Cl.⁴ H01R 23/02

U.S. Cl. 439—676

17 Claims



1. A modular adapter having one end portion capable of being inserted into a jack cavity and another end portion capable of receiving modular plugs, said adapter comprising:

a housing having a plug end portion for receipt in a jack cavity and a jack end portion having first and second jack cavities, said first jack cavity being defined by a plurality of spaced partitions, a ceiling and portions depending from said ceiling and spaced apart a distance equal to a width of a locking tab of a plug destined to be received therein, each of the depending portions in said first cavity being spaced from an adjacent sidewall of the housing and

disposed between an outermost one of the partitions and the adjacent sidewall; and

a plurality of metallic contact elements including a first group each of which extends from a retroflexed end portion thereof in the first jack cavity to said plug end portion and a second group each of which extends from the first jack cavity to the second jack cavity with each end of each contact element of said second group having a retroflexed configuration, the retroflexed end portion of at least one of said contact elements in said first cavity being disposed in a receiving space formed between one of the outermost partitions and an adjacent spaced sidewall of said housing and the retroflexed end portions of other ones of said contact elements in said first cavity being disposed between adjacent partitions.

4,714,441

ELECTRICAL SOCKET

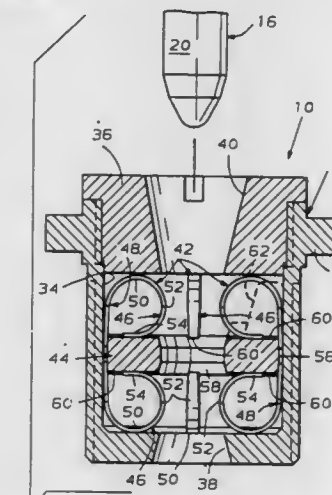
Ned E. Corman, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 29, 1987, Ser. No. 8,679

Int. Cl.⁴ H01R 13/11

U.S. Cl. 439—842

10 Claims



1. An electrical socket for receiving a pin, comprising a housing means defining cavity means, first disc means disposed in said cavity means and having an opening therethrough; and

a plurality of contact means, each having a resilient, curved beam means on each end of a connecting strap means, said contact means positioned on and around said first disc means with said beam means on each contact means being on each side thereof, said beam means cooperating with adjacent beam means to define passages on each side of said disc means to resiliently receive the pin for electrical engagement therewith.

4,714,442

LOW PROFILE LEAD SOCKET

William B. Walkup, Barrington, Mass., assignor to Augat Inc., Mansfield, Mass.

Filed Jan. 12, 1987, Ser. No. 2,101

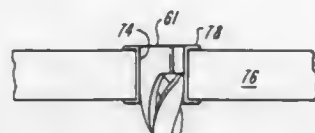
Int. Cl.⁴ H01R 13/11

U.S. Cl. 439—844

5 Claims

1. A lead socket for insertion into a plated-through hole in a printed circuit board to receive a lead inserted therein comprising:

a conductive, generally cylindrical portion having a longitudinal axis and upper and lower openings;



a plurality of conductive, compliant fingers each extended from the cylindrical portion and angled about the longitudinal axis in a generally conical helix configuration.

4,714,443

FLEXIBLE EXHAUST DUCT

John B. Chaplin, Edgewater, Md., and Charles S. Whipple, Slidell, La., assignors to Textron Inc., Providence, R.I.
Filed Aug. 20, 1986, Ser. No. 898,352
Int. Cl.⁴ B63H 21/32

U.S. Cl. 440—89

6 Claims



1. In a marine vessel having oppositely facing hull sides and powered by internal combustion engine means, the improvement comprising:

exhaust ducts connected to said engine means for conveying engine exhaust therefrom outwardly through openings provided in each of said hull sides; and elongated exhaust conduits mounted on each of said hull sides in flow communication with said openings, said exhaust conduits extending substantially coextensive with said hull sides in a direction lengthwise of said vessel and having rearwardly opening nozzles for directing said engine exhaust from said engine means rearwardly of said vessel, and said exhaust conduits are arranged and formed of a flexible and inflatable material inflatable in response to the pressures of said engine exhaust to provide deformable pneumatic cushion-like bumpers for protecting said hull sides.

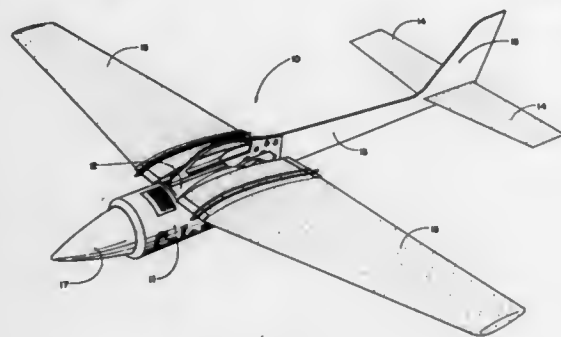
4,714,444

DRINK CAN GLIDER

Robert D. Rendel, Rte. #1, Box 826, Laurinburg, N.C. 28352
Filed May 12, 1986, Ser. No. 862,265
Int. Cl.⁴ A63H 27/18

U.S. Cl. 446—61

13 Claims



1. an improved aircraft comprising: a wing saddle means; wing means; means for releasably securing said saddle means to said wing means; tail means; means for releasably securing

said tail means to said saddle means; and means for releasably mounting at least one can-type means to said saddle means whereby an improved aircraft utilizing at least one can as a fuselage is provided.

4,714,445

WARMED ANIMAL TOY

Charles B. Templeton, 701 Don Mills Rd. #2600, Toronto, Canada M3C-1R9

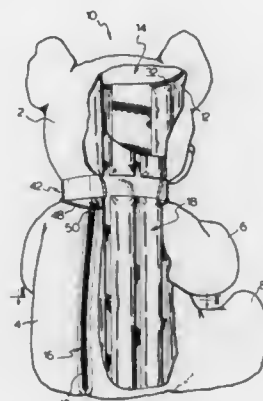
Filed Sep. 22, 1986, Ser. No. 909,587

Claims priority, application Canada, Sep. 27, 1985, 491772

Int. Cl.⁴ A61F 7/08

U.S. Cl. 446—74

22 Claims



1. A soft, lightweight toy comprising: flexible, heat-transmitting cover means defining an enclosed recess therein, flexible bladder means removably received in the recess, the bladder means having an outer wall and an inner wall and retaining therebetween a first material having a high density, high specific heat and high thermal conductivity, the outer wall located adjacent inside surfaces of the cover means, the inner and outer walls spaced relatively small distances apart so that the bladder means provides a relatively thin layer of said first material underlying the cover means over substantial portions of inside surfaces of the cover means yet with the layer of said first material having sufficient thickness to provide a substantial heat reservoir or sink.

4,714,446

TOY FIGURE WITH EXPANDABLE LATCH

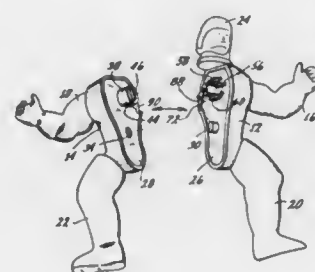
Sam Y. Lee, Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 16, 1986, Ser. No. 908,127

Int. Cl.⁴ A63H 11/06

U.S. Cl. 446—311

5 Claims



1. A toy figure comprising: a first torso half;

a second torso half releasably coupled to said first torso half; expandable latch means for releasably holding said first and second torso halves together; spring means within one of said first and second torso halves for biasing said torso halves apart; and cable means releasably coupled to said first and second torso halves for expanding said expandable latch means in order to allow said spring means to separate said torso halves.

4,714,447

POWER TRAIN OF MOWING MACHINE

Yoshiaki Hironaka, Yokohama, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 701,237, Feb. 13, 1985, abandoned.

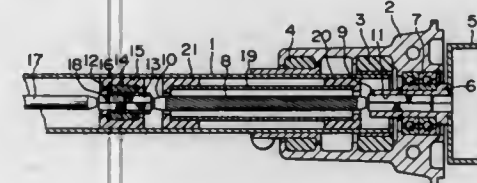
This application Apr. 8, 1986, Ser. No. 850,445

Claims priority, application Japan, Feb. 14, 1984, 59-19585[U]

Int. Cl.⁴ F16C 1/06

U.S. Cl. 464—52

1 Claim



1. A power train of a mowing machine comprising: a relatively short flexible shaft connected at one end thereof to an output shaft of a prime mover connected to a rear end of a hollow straight operating rod, said flexible shaft extending axially through said operating rod; a joint member of cylindrical configuration rotatably journaled by a bearing mounted to an inner surface of the operating rod near the rear end thereof through a vibration damping member, said joint member being connected to an opposite end of said flexible shaft; a relatively long rigid transmission shaft connected at one end thereof to said joint member, said rigid transmission shaft extending through said operating rod and connected at an opposite end thereof to a cutter blade device connected to a forward end of the operating rod; and a sleeve member mounted to an inner surface of said operating rod through a vibration damping member, said sleeve member being located around said flexible shaft.

4,714,448

TORSIONAL DAMPER DEVICE

Hervé Focqueur, Franconville, and Bernard Jumel, Pierrefitte, both of France, assignors to Valeo, Paris, France

Filed Dec. 26, 1985, Ser. No. 813,678

Claims priority, application France, Dec. 27, 1984, 84 19877

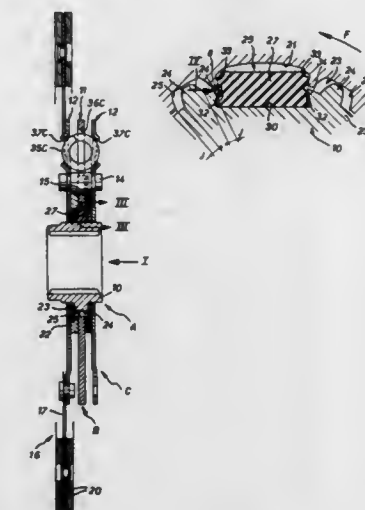
Int. Cl.⁴ F16D 3/12

U.S. Cl. 464—68

15 Claims

1. Torsional damper device for an automotive vehicle clutch, wherein at least two coaxial parts are mounted to rotate relative to each other against circumferentially acting elastic means disposed therebetween within limits of relative angular movement determined by meshing means with clearance provided between the coaxial parts in cooperation with centering means adapted to urge the coaxial parts in the circumferential direction towards an intermediate rest position between the limits of relative angular movement, the centering means at least one elastic member constituting part of the circumferentially acting elastic means collocated with the meshing means with clearance of the coaxial parts and adapted, for the rest position of the latter, to bear at each circumferential end against shoulders of the coaxial parts which are oblique to each other as the flanks of a dovetail groove, at least one of said shoulders terminating in a sharp edge, the elastic member comprising a simple circumferentially elongated block of elastic material which is disposed chordally of the damper device,

the circumferential ends of the elastic member being free of any covering and adapted to bear directly against the corresponding shoulders of the coaxial parts between which said elastic member is circumferentially disposed, and an axial



recess being disposed in the one of said circumferential ends of the elastic member facing said sharp edge for receiving the sharp edge so as to avoid contact between the sharp edge and the elastic member in the course of operation.

4,714,449

APPARATUS FOR REDUCING VEHICLE DRIVE TRAIN VIBRATIONS

Guenter Woerner, Kernen; Ernst Tscheplak, Weinstadt, and Franz Moser, Wendlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

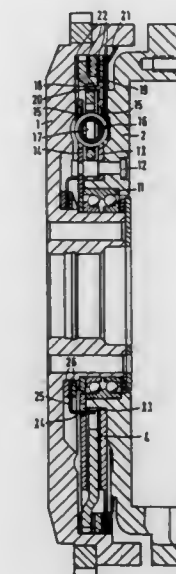
Filed Jun. 4, 1986, Ser. No. 870,346

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519912

Int. Cl.⁴ F16D 13/60; F16F 15/12

U.S. Cl. 464—68

10 Claims



1. Apparatus for reducing the transmission of vibrations from an engine to a transmission line, comprising: a divided flywheel having first and second flywheel elements, one said element being drivingly connected to said

engine and the other said element being drivingly connected to said transmission line;
 spring mounting means for drivingly coupling said first and second flywheel elements;
 first abutment means connected to said first flywheel element for abutting said spring mounting means;
 second abutment means connected to said second flywheel element for abutting said spring mounting means;
 first slip clutch means for providing a first frictional connection between said first abutment means and said first flywheel element, said first slip clutch means permitting relative rotation between said flywheel elements in response to forces above a first predetermined threshold level;
 second slip clutch means for providing a second frictional connection between said first abutment means and said first flywheel element, said second slip clutch means frictionally connecting said flywheel elements only after a threshold relative displacement between said flywheel elements is exceeded;
 wherein said first frictional connection is below a maximum torque of said engine and a sum of said first and second frictional connections is greater than said maximum torque of said engine.

4,714,450

ELASTOMERIC HIGH TORQUE, CONSTANT VELOCITY JOINT

Francis E. Byrnes, White Plains, N.Y.; Donald L. Ferris, Newtown, Conn.; Edward S. Hibyan; William L. Noehren, both of Trumbull, Conn., and Peter C. Ogle, Woodbridge, Conn., assignors to United Technologies Corporation, Hartford, Conn.

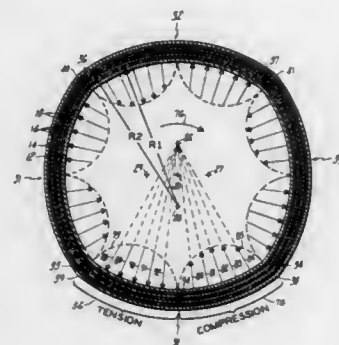
Continuation of Ser. No. 622,809, Jun. 20, 1984, abandoned.

This application Nov. 14, 1986, Ser. No. 931,002

Int. Cl. B64C 27/35; F16C 27/06; F16D 3/76

U.S. Cl. 464—90

6 Claims



1. A constant velocity joint comprising:
 an inner shell having an exterior surface having a first contour defined by an axis, at least three arc segment generating points equally offset from the axis and symmetrically distributed thereabout on a plane which is normal to the axis, and a first radius from each of the at least three arc segment generating points, each first radius defining an arc segment of said first contour, said first contour having a nearly spherical axial profile with polar symmetry;
 an outer shell disposed about the inner shell and having an interior surface having a second contour defined by the axis, the at least three arc segment generating points, and a second radius larger than the first radius from each of the at least three arc segment generating points, each second radius defining an arc segment of said second contour, said second contour having a nearly spherical axial profile with polar symmetry; and
 at least one elastomeric layer disposed between the exterior surface of the inner shell and the interior surface of the outer shell, said at least one elastomeric layer being

bonded on the respective exterior surface of the inner shell and interior surface of the outer shell and being precompressed therebetween such that rotation of the inner shell relative to the outer shell about said axis causes the at least one elastomeric layer to bend in contiguous regions of compression and tension normal to said at least one elastomeric layer along each arc segment to transmit a torque between the inner and outer shell.

4,714,451

V BELT STEPLESS VARIABLE TRANSMISSION

Ryo Yoshida, and Hiroshi Aikawa, both of Ikeda, Japan, assignors to Daihatsu Motor Company Limited, Osaka, Japan

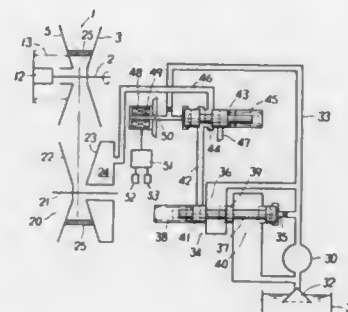
Filed Jun. 24, 1985, Ser. No. 748,401

Claims priority, application Japan, Jun. 23, 1984, 59-129478

Int. Cl. F16H 9/04

U.S. Cl. 474—28

6 Claims



1. A V belt stepless variable transmission comprising: a driving pulley connected with a drive shaft, a stationary conical disc fixed thereto, and a movable conical disc movable with respect to said drive shaft; a driven pulley connected with a driven shaft, a stationary conical disc fixed thereto, and a movable conical disc axially movable with respect to said driven shaft; and an endless V belt running across both said pulleys,

said driving pulleys being provided with a tension adjusting means disposed between said driving shaft and said movable conical disc at said driving pulley so as to mechanically apply to said movable conical disc thrust corresponding to input torque to thereby adjust tension on said V belt,

said tension adjusting means having a cam with a cam face and axially slidable with respect to said drive shaft and rotatable, and a contact member contactable with said cam face so as to rotate integrally with said drive shaft to thereby give thrust to said cam, said cam being fixed to said movable conical disc at said driving pulley,

said driven pulley having a hydraulic actuating cylinder for axially shifting said movable conical disc at said driven pulley, and

said variable transmission being provided with a pulley ratio control means for supplying and discharging fluid to and from said hydraulic actuating cylinder so as to actuate said movable conical disc at said driven pulley, thereby controlling the pulley ratio.

4,714,452

ORIENTED FLAT BELT CONTINUOUSLY VARIABLE TRANSMISSION USING PULLEYS WITH GUIDEWAYS

Emerson L. Kumm, 1035 E. Laguna Dr., Tempe, Ariz. 85282, and Theodore C. Kraver, 225 W. Orchid La., Phoenix, Ariz. 85021

Filed Jun. 6, 1986, Ser. No. 871,254

Int. Cl. F16H 11/02, 55/54

U.S. Cl. 474—49

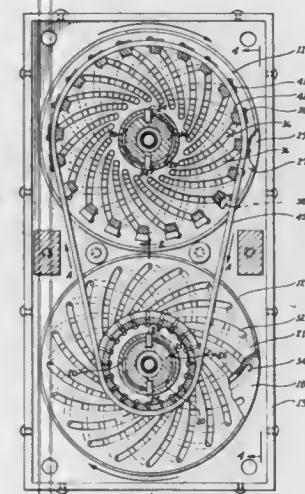
4 Claims

1. A belt drive system comprising a driving pulley and a driven pulley, a belt extending around said pulleys, each of said

driving and said driven pulleys including a first pair of inner pulley disks having logarithmic spiral guideways of one sense formed therein and mounted for rotation as a unit on a shaft and fixed to said shaft and a second pair of outer pulley disks having logarithmic spiral guideways of an opposing sense formed therein and mounted for rotation as a unit on said shaft but having limited circular movement relative to said first pair of pulley disks,

one of said second pair of pulley disks being disposed adjacent but exterior to one of said first pair of pulley disks and the other one of said second pair of pulley disks being disposed adjacent but exterior to the other one of said first pair of pulley disks,

the logarithmic spiral guideways of said one of said first pair of pulley disks and the logarithmic spiral guideways of said one of said second pair of pulley disks forming first intersections,



the logarithmic spiral guideways of said other one of said first pair of pulley disks and the logarithmic spiral guideways of said other one of said second pair of pulley disks forming second intersections, belt drive elements extending between respective ones of said first and said second intersections,

said belt extending around the belt drive elements of said driving pulley and the belt drive elements of said driven pulley, and having a designated direction of rotation,

the sense of said logarithmic spiral guideways of said first pair of inner pulley disks of said driving pulley being opposed to said designated direction of rotation,

the sense of said logarithmic spiral guideways of said first pair of inner pulley disks of said driven pulley being the same as said designated direction of rotation,

and means associated with said second pair of outer pulley disks of each of said driving and driven pulleys for rotating said second pair of outer pulley disks relative to said first pair of inner pulley disks.

4,714,453

DRIVE CHAIN ADJUSTMENT MECHANISM FOR VEHICLES HAVING TWO REAR WHEELS

Shieji Takayanagi, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1986, Ser. No. 865,691

Claims priority, application Japan, May 23, 1985, 60-76850[U]

Int. Cl. F16H 7/10

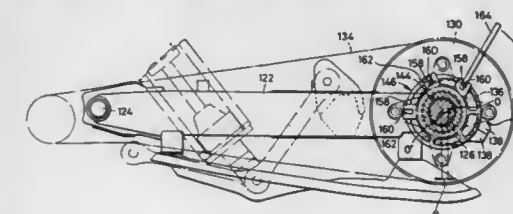
U.S. Cl. 474—112

2 Claims

1. A drive chain adjustment mechanism for vehicle having two rear wheels, which includes:

a swing arm pivotally mounted at its front end on a body frame;

a pipe member fixed to the rear end of said swing arm; a holder member having therethrough an eccentric bore, said holder member being inserted into and clamped and fixed with said pipe member, and being rotatably supported in place during chain adjustment; an axle for the rear wheels, rotatably inserted into said eccentric bore in said holder member; and



a driven sprocket mounted between one end of said holder member and one of said two rear wheels and fitted over said axle, said holder member being provided at said one end with a plurality of projections having recessions to receive a tool for turning said holder member, each said recession opening through the extremem end and on one side of its respective projection.

4,714,454

APPARATUS FOR PRODUCING MACHINE-DIRECTION HEAT SEALS

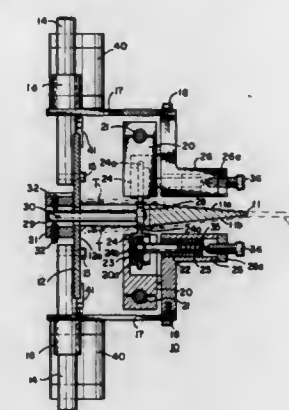
Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 8, 1986, Ser. No. 904,445

Int. Cl. B31B 23/64, 23/86

U.S. Cl. 493—193

6 Claims



1. In a machine for making draw tape bags having front and back panels from thermoplastic film wherein the opposing panels of a moving web of folded film have each of their edges opposite the fold folded over to form a hem comprising two opposing layers of film in each edge to provide a pair of opposing hems for receiving the draw tape, apparatus for heat sealing the respective layers of film in the pair of hems in the moving web of the film comprising:

structure including a member having a pair of spaced surfaces over which pass the two layers of film of each hem of the pair of hems,

a first block supported by said structure with respect to one of said surfaces and on one side of one hem of the pair of hems,

a plurality of rollers mounted on said first block at spaced locations in tandem in the direction of web movement for engaging the outermost layer of film in said one of the hems along a path in the direction of web movement,

a second block supported by said structure with respect to the other one of the said surfaces and on one side of a

second hem of the pair of hems, said second block having a plurality of rollers mounted thereon in spaced locations in tandem in the direction of web movement for engaging the outermost layer of film in said second hem along a path in the direction of web movement, means supported by said structure between the pair of hems for engaging the other layer of the film in each of the hems and cooperating with said rollers on said blocks, and means for heating each of said blocks and the respective plurality of rollers, each said plurality of rollers being heated and freely rotatable whereby movement of the hems through the heat sealing apparatus causes each said plurality of heated rollers mounted on said blocks to rotate and produce the heat seals in the pair of hems.

4,714,455

HEM FOLDER WITH INTEGRAL TAPE INSERTER FOR MAKING DRAW TAPE BAGS

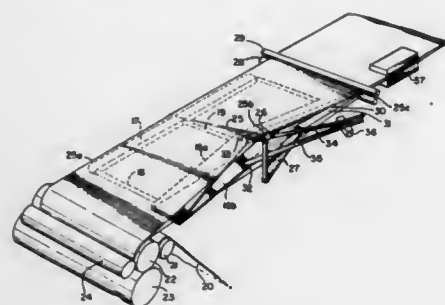
Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 6, 1986, Ser. No. 871,238

Int. Cl.⁴ B31B 1/90

U.S. Cl. 493—225

12 Claims



1. A machine for making draw tape bags from a moving web of folded thermoplastic film having two folded faces, each having an edge comprising:

two spaced folding surfaces each having a width, over which said web impinges on said surfaces, wider than the final bag length, said surfaces decreasing in width to said final bag length to control said final bag length, one folded face of said web passing over one side of each of said surfaces;

means for tucking each edge of said web between said surfaces onto the other side of each surface to produce a hem in each edge of said web so that said web is at the final length of said bag upon leaving said surfaces;

slot in said surfaces in the area of said decreasing width; and means for feeding a tape through said slots into the hems of said moving web.

4,714,456

SOLID BOWL CENTRIFUGE WITH TERMINAL CLARIFICATION DEVICE

Wolfgang Bender; Dieter Mrotzek, both of Burscheid; Bernd Koglin, Bergisch Gladbach, and Karl-Heinz Steiner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,713

Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518885

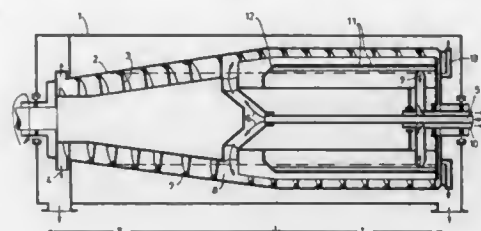
Int. Cl.⁴ B04B 7/16

U.S. Cl. 494—36

5 Claims

1. In a solid bowl screw centrifuge having a cylindrical clarifying part, a conical demounting part, a screw, means mounting the screw in the two parts for rotation, a suspension inflow opening into the end of the clarifying part between the clarifying part and the demounting part, a liquid discharge including an overflow weir or a stripping pipe on the clarifying

part and a solids discharge on the demounting part, the improvement wherein the means mounting the screw in the cylindrical clarifying part comprises a cylindrical hollow



screw core having a peripheral surface at least partly comprising an after-clarifying device through which fluid flows in a radial direction, and wherein the liquid discharge is situated within the after-clarifying device.

4,714,457

METHOD AND APPARATUS FOR USE IN PREPARATION OF FIBRINOGEN FROM A PATIENT'S BLOOD

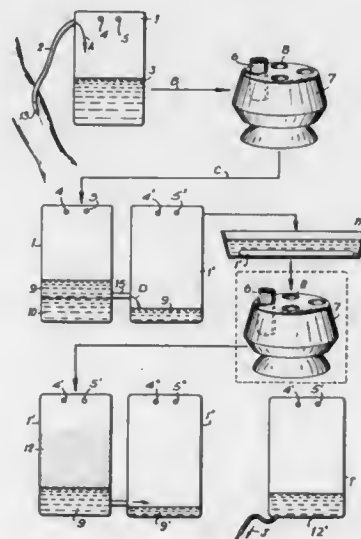
Robert Alterbaum, 101 West 15th St., New York, N.Y. 10011

Filed Sep. 15, 1986, Ser. No. 906,894

Int. Cl.⁴ B04B 5/02; B01D 43/00

U.S. Cl. 494—37

8 Claims



1. A method for use in the autologous preparation of fibrin glue wherein a patient's blood is separated in a centrifuge having cylindrical cups pivotally mounted to a rotor to obtain plasma and wherein the plasma is separated in the centrifuge to produce concentrated fibrinogen, comprising the steps of:

- (A) transferring the blood or plasma into a substantially flat packet;
- (B) fixing the packet containing the blood or plasma in a recess of a substantially cylindrical insert fixture assembly;
- (C) inserting said cylindrical-shaped insert fixture assembly in a cup of the centrifuge having a complementary cylindrical shape so that the insert fixture assembly is held snugly within said centrifuge cup;
- (D) centrifuging the blood or plasma contained within said packet fixed in said insert fixture assembly held in said centrifuge cup to separate the blood or plasma into components; and
- (E) forming fibrin glue from one of said separated components.

4,714,458

THREE STAGE VALVE WITH FLEXIBLE VALVE SEAT

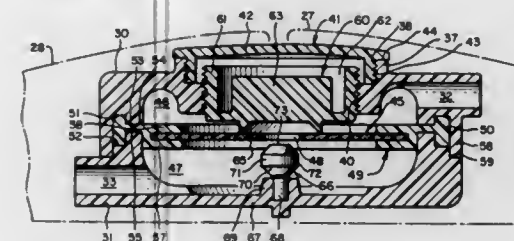
Michael D. Hooven, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Dec. 23, 1985, Ser. No. 812,771

Int. Cl.⁴ A61M 27/00

U.S. Cl. 604—9

7 Claims



1. A valve for regulating the flow of fluid from one location in the body to another location, comprising:

a bio-compatible housing;

a flexible one-piece bio-compatible diaphragm dividing the interior of said housing into first and second interior chambers, said diaphragm including an integral valve seat portion defining a fluid passageway opening from said first interior chamber to said second interior chamber, and defining a first valving surface concentrically oriented with respect to the axis of said fluid passageway, said valve seat portion having a static position within said housing in the absence of a pressure differential between said chambers;

inlet port means for establishing fluid communication between said first interior chamber and the one location;

outlet port means for establishing fluid communication between said second interior chamber and the other location;

means comprising an elongated bio-compatible valve stem member attached at one end to said housing primarily within said second chamber and extending therefrom along the axis of said fluid passageway toward said first chamber, said valve stem member defining a plurality of additional valving surfaces for coaxing with said first valving surface to form a flow restriction within said passageway between said first and second chambers;

said additional valving surfaces including, progressing from said first chamber toward said second chamber, a first surface of generally relatively lesser radial extent from said axis for providing a relatively lesser flow restriction in said passageway, a second surface of generally relatively greater radial extent for providing a relatively greater flow restriction in said passageway and a third surface of generally lesser radial extent similar to said first surface to provide a relatively lesser flow restriction in said passageway;

valve closure means coaxing with said valve seat portion in said static position to close said passageway to provide a first valving mode wherein flow between said first and second interior chambers is prevented; and

said valve seat portion being displaceable from said static position in a direction along said axis of said fluid passageway away from said valve closure member in response to an increase in pressure differential between said first interior chamber and said second interior chamber to cause said first valving surface to successively coax with said first, second and third surfaces of said valve stem member thereby providing second, third and fourth valving modes, in said second valving mode fluid flow occurring between said interior chambers so as to maintain a first substantially constant predetermined pressure in said first chamber, in said third valving mode fluid flow remaining substantially constant between said chambers notwithstanding changes in differential pressure, and in said fourth valving mode fluid flow occurring between said

chambers to maintain a second substantially constant predetermined pressure in said first interior chamber.

4,714,459

THREE STAGE INTRACRANIAL PRESSURE CONTROL VALVE

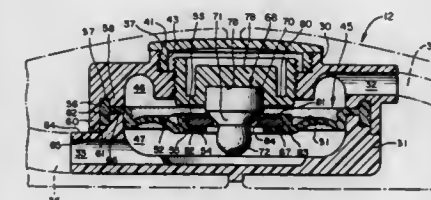
Michael D. Hooven, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Dec. 23, 1985, Ser. No. 812,779

Int. Cl.⁴ A61M 27/00

U.S. Cl. 604—9

2 Claims



1. A subcutaneous implantable valve for regulating the flow of body fluids from one location in the body to another location, comprising:

a housing having first and second interior chambers;

inlet port means for establishing fluid communication between said first chamber and the one location;

outlet port means for establishing fluid communication between said second chamber and the other location;

a flexible diaphragm in said housing and dividing the same into said first and second chambers, said diaphragm being moveable in response to pressure differentials established between said first and second chambers;

a relatively rigid valve seat mounted on said diaphragm for movement therewith, said valve seat being disc-shaped and centrally thereof defining an annular fluid flow passageway having an interior wall which is flat in an axial direction and which extends in the direction of fluid flow between said first and second chambers, said interior wall defining a first valving surface; and

a one-piece valve stem of over-all generally cylindrical configuration mounted on said housing and projecting into said first interior chamber toward said second chamber and in coaxial alignment with said fluid flow passageway, said valve stem in the direction of fluid flow consisting of a cylindrical upper mounting portion of relatively substantial axial extent and having a relatively large diameter, said mounting portion having a substantial part thereof fixed in said housing to mount said valve stem thereon, said mounting portion in the direction of fluid flow merging with a first frusto-conical portion of decreasing diameter defining a second valving surface for engagement with said valve seat to establish a first condition of fluid flow whereby in the absence of fluid pressure differential fluid flow between said first and second chambers is prevented, said first portion in the direction of fluid flow merging with a second generally frusto-conical portion of increasing diameter defining a third valving surface cooperating with said second valving surface to coax with said first valving surface to establish a second condition of fluid flow wherein a first substantially constant predetermined pressure is maintained in said first chamber, and said second portion in the direction of fluid flow merging with a third generally spherical portion defining a fourth valving surface of progressively decreasing diameter cooperating with said third valving surface to coax with said first valving surface to establish a third condition of fluid flow wherein a substantially constant rate of fluid flow from said first chamber into said second chamber is maintained, said fourth valving surface further coaxing with said first valving surface to establish a fourth condition of fluid flow wherein a second substantially constant

predetermined pressure is maintained in said first chamber.

4,714,460

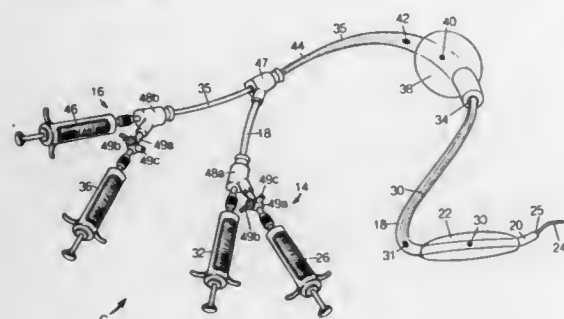
METHODS AND SYSTEMS FOR RETROGRADE PERFUSION IN THE BODY FOR CURING IT OF THE DISEASE OR IMMUNE DEFICIENCY

Reynaldo Calderon, 1202 Harvard, Houston, Tex. 77008
Continuation of Ser. No. 518,685, Jul. 29, 1983, abandoned. This application Jun. 6, 1986, Ser. No. 871,528

Int. Cl.⁴ A61B 1/06

U.S. Cl. 604—28

12 Claims



1. A method for treating a tumor in the body of a patient, comprising the steps of:

- (a) placing a catheter having a suction lumen and an infusion lumen extending beyond the suction lumen and a seal associated with each of such lumens in a vein of the patient near the tumor;
- (b) sealing the flow of fluid in the patient's vein between the infusion lumen and the suction lumen with the infusion seal;
- (c) sealing the flow of fluid in the patient's vein past the suction lumen with the suction seal;
- (d) injecting a chemotherapeutic agent from the infusion lumen into the patient's vein so that it may perfuse through the tumor; and
- (e) collecting the chemotherapeutic agent in the suction lumen after perfusion through the tumor.

4,714,461

CATHETER ASSEMBLY WITH AIR PURGING FEATURE

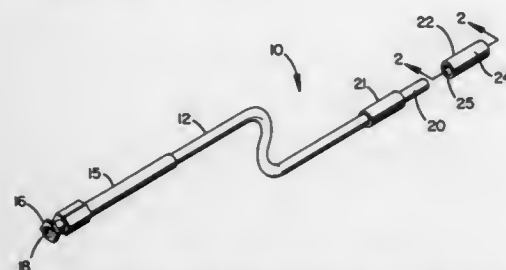
Jonathan B. Gabel, Bloomfield, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 7, 1985, Ser. No. 795,819

Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—53

1 Claim



1. A method for using a liquid-filled catheter for a desired activity in a body passage, said catheter having a tube with a normally closed distal end and with a liquid-receiving lumen, the method comprising the steps of:

- creating a temporary fluid path between a lumen of a flexible tube via the distal end thereof and the environment outside of the catheter;
- introducing liquid into said lumen so that said liquid travels toward said fluid path;
- purging air from said lumen through said fluid path via the

distal end of said tube as the liquid travels toward said fluid path;
closing said temporary fluid path subsequent to the purging of air from said lumen whereby the catheter retains the liquid inside said lumen;
inserting the distal end of said liquid-filled catheter into a body passage; and
performing the desired activity in the body passage with said liquid-filled catheter.

4,714,462

POSITIVE PRESSURE PROGRAMMABLE INFUSION PUMP

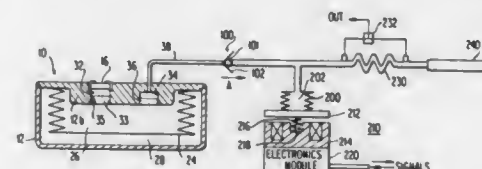
Robert A. DiDomenico, Norfolk, Mass., assignor to Intermedics Infusaid, Inc., Norwood, Mass.

Filed Feb. 3, 1986, Ser. No. 824,986

Int. Cl.⁴ A61M 5/14

U.S. Cl. 604—67

23 Claims



1. An infusion system for implantation in a living body comprising:

- a fluid reservoir maintaining a liquid for delivery to an infusion site under positive pressure with respect to body pressure at said infusion site;
- a drug pressurant chamber receiving fluid from said fluid reservoir;
- a positive displacement pump to vary the volume of said drug pressurant chamber and thereby either fill said chamber by increasing its volume or pressurize said chamber to expel fluid from said chamber by reducing its volume;
- valve means interposed between said reservoir and said chamber to prevent backflow of said fluid into said reservoir;
- flow restriction means between said chamber and said infusion site;
- means to control actuation of said positive displacement pump comprising:
- programmed means to couple said source of power to said solenoid and thereby regulate the flow of fluid to said infusion site in accordance with a predetermined fluid delivery rate, and
- an external programmer programmed for varying actuation of said positive displacement pump, said programmer comprising:
- a processor input means to provide instructions to said processor, memory means for storing data from said processor indicative of actuation rates for said positive displacement pump, means to transfer said data to said programmed means, a real time clock for providing a time input to said processor, a program memory and a non-volatile memory, and wherein said means to transfer data comprises a receiver/transmitter to establish a communication link with said programmed means.

4,714,463

SEQUENCE VALVE FOR PIGGYBACK IV ADMINISTRATION WITH TUBE REVERSAL PREVENTION

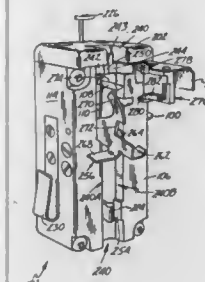
G. Kent Archibald, White Bear Lake, and Frank A. Slaker, New Brighton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 676,020, Nov. 29, 1984, Pat. No. 4,673,389. This application Nov. 15, 1985, Ser. No. 798,331

Int. Cl.⁴ A61M 5/14

U.S. Cl. 604—81

19 Claims



12. An IV administration system comprising:
 - a first source of a first IV fluid;
 - a second source of a second IV fluid;
 - an IV control device having an inlet and an outlet for delivering IV fluids;
 - a first flexible tube connected between the first source and the inlet;
 - a second flexible tube connected between the second source and the inlet;
 - a sequence valve positioned between the first and second sources and the inlet for selectively occluding the first and second flexible tubes in sequence, the sequence valve comprising:
 - a base having channel means for receiving the first and second flexible tubes;
 - crank means pivotally connected to the base for movement about a first pivot axis along a first path between first and second crank positions;
 - bias means for providing a bias force to the crank means which urges the crank means toward the second crank position;
 - occluder means connected to a first end of the crank means for occluding the first flexible tube when the crank means is in the first crank position, and for occluding the second flexible tube when the crank means is in the second crank position;
 - releasable latch means connected to the base for latching the crank means in the first crank position and for releasing the crank means in response to a control signal to allow the bias force to pivot the crank means to the second crank position;
 - tube retainer means connected to the base for pivoting about a second axis along a second path between an open position in which tubes can be inserted into or removed from the channel and a closed position which holds the tubes in the channel means; and
 - gate means for pivoting about a third axis along a third path between an open position in which the first tube can be inserted into or removed from the channel means, and a closed position which holds the first tube in the channel means where the first, second and third axes are positioned so that at least two of the first, second and third paths intersect, wherein the gate means includes means for preventing the tube retainer means from moving along the second path to its closed position unless the gate means is in its closed position; and
 - means for providing the control signal to the sequence valve.

4,714,464

MECHANISM FOR COUPLING THE ASPIRANT LINE OF AN IRRIGATION/ASPIRATION MACHINE TO THE PRESSURE MONITORING SECTION

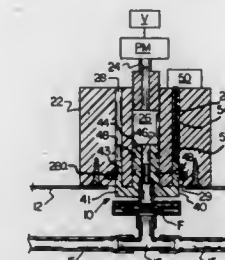
Walter A. Newton, Lenoir, N.C., assignor to Entravision, Inc., Lenoir, N.C.

Filed Oct. 27, 1986, Ser. No. 923,277

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—118

8 Claims



1. A safety mechanism for irrigation/aspiration machines of the type which include a peristaltic pump producing a vacuum in an aspirant line and which machines include a vacuum monitoring section for sampling the pressure in said aspirant line, said safety mechanism comprising:

- (a) a receptacle on said machine having a passageway through which said air samples pass and having an arming switch with "on" and "off" positions, said peristaltic pump being armed responsive to the activation of said arming switch;
- (b) a coupling means seatable in said receptacle in sealed relationship thereto for connecting said aspirant line to said vacuum monitoring section;
- (c) said coupling means further including a means for activating said arming switch when said coupling is fully seated on said receptacle in said sealed relationship; whereby, upon improper seating of said coupling means, said arming switch is deactivated and said pump is deactivated.

4,714,465

UROSTOMY APPLIANCE

Peter L. Steer, Surrey, England, assignor to Craig Medical Products Ltd., Sussex, England

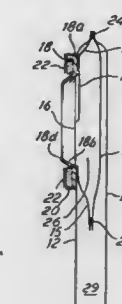
Continuation of Ser. No. 633,725, Jul. 23, 1984, abandoned. This application May 12, 1986, Ser. No. 863,817

Claims priority, application United Kingdom, Aug. 22, 1983, 8322544

Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—340

2 Claims



1. A one-piece urostomy appliance comprising a drainage bag secured to one side of an apertured flange which is in turn secured on its body side opposite the urostomy appliance to an apertured adhesive pad for securing the appliance to the body of the user, the body side of the apertured flange being provided with a flexible skirt encircling the stoma aperture and located adjacent the radially inner boundary of the adhesive

pad, the flexible skirt extending from the rim of the flange aperture through the aperture in the adhesive pad towards the body of the wearer and extending beyond the skin-contacting surface of the adhesive pad on the body side of the pad, the rim of the flexible skirt adapted to make sealing contact with the skin of the body of the wearer spaced apart from and around the stoma to impede leakage of urine towards the inner boundary of the adhesive pad and the surface of the skin of the wearer, said apertured flange further comprising a substantially semi-circular arcuate rib or hood which extends into the bag and is positioned to keep a front or inner wall of the bag away from the stoma of the wearer.

4,714,466

ABSORBENT MEMBER FOR TAMPON

Masatake Dohzono; Iwao Miyashita, and Norihiro Abe, all of Matsuyama, Japan, assignors to Kao Corporation, Tokyo, Japan

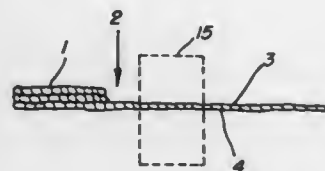
Filed Jan. 7, 1986, Ser. No. 816,860

Claims priority, application Japan, Jan. 25, 1985, 60-12244; Jan. 25, 1985, 60-12247

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—378

8 Claims



1. An absorbent member having a front part and a rear part which comprises a first portion on the front part and a second portion on the rear part, said first portion having a smaller fiber density than the second portion wherein said density increases along the longitudinal direction of said member.

4,714,467

REINFORCED FIBER BONE REPLACEMENT IMPLANT HAVING TREATED SURFACES AND A METHOD FOR ITS MANUFACTURE

Fritz Lechner, Garmisch-Partenkirchen; Herbert Heissler, Munich; Wolfgang Scheer, Holzkirchen; Wolfgang Siebels, Munich, and Rudolf Ascherl, Garmisch-Partenkirchen, all of Fed. Rep. of Germany, assignors to M A N Technologie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 25, 1986, Ser. No. 843,733

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3511779; Jul. 5, 1985, 3524020

Int. Cl.⁴ A61F 2/36; B29C 67/14; B65H 81/00

U.S. Cl. 623—16

9 Claims



1. A bone replacement implant comprising a resin body having embedded within it reinforcement fibers, the surface of the body being roughened, and ends of at least some of the reinforcement fibers being exposed on the surface of the body.

4,714,468

PROSTHESIS FORMED FROM DISPERSION STRENGTHENED COBALT-CHROMIUM-MOLYBDENUM ALLOY PRODUCED BY GAS ATOMIZATION

Kathy K. Wang, Suffern, N.Y.; Larry J. Gustavson, Dover, and John H. Dumbleton, Ridgewood, both of N.J., assignors to Pfizer Hospital Products Group Inc., New York, N.Y.

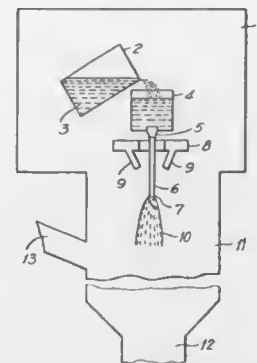
Division of Ser. No. 765,298, Aug. 13, 1985, This application

Jan. 27, 1987, Ser. No. 7,064

Int. Cl.⁴ B22F 1/00; C22C 19/07, 29/12

U.S. Cl. 623—16

6 Claims



1. A prosthesis made by forging a high-strength, corrosion-resistant, high temperature stable, ductile alloy having homogeneously distributed dispersed oxides and fine, equiaxed grain structure after high temperature exposure, said alloy being produced by gas atomization and consisting essentially of the following percentage composition by weight:

chromium	26 to 30
molybdenum	5 to 7
manganese	0 to 1
silicon	0 to 1
iron	0 to 0.75
nickel	0 to 1.0
carbon	0 to 0.35
nitrogen	0 to 0.25
oxygen	0.003 to 0.020
oxide-forming metal	0.003 to 0.20

and the balance cobalt, apart from trace amounts of incidental impurities; in which the oxide-forming metal is a metal selected from the group consisting of magnesium, calcium, aluminum, yttrium, lanthanum, titanium and zirconium, which forms high temperature-stable, non-accretive, fine oxide particles which oxide has a free energy of formation greater than the oxide of the matrix metal and is homogeneously distributed in the dispersed phase; and said alloy after fabrication by gas atomization, thermomechanical processing and further high temperature exposure has an ultimate tensile strength of 160–200 k.s.i., a 0.2% offset yield strength of 75–100 k.s.i., an elongation of 37 to 60%, and a fatigue strength at 10^7 cycles of 70–95 k.s.i.

4,714,469

SPINAL IMPLANT

Robert V. Kenna, Hobe Sound, Fla., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Feb. 26, 1987, Ser. No. 19,283

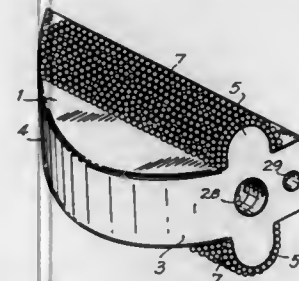
Int. Cl.⁴ A61F 2/44, 5/04; A61B 17/00

U.S. Cl. 623—17

9 Claims

1. A spinal implant comprising a rigid solid body having a first surface, a second surface and a third surface of predetermined thickness between and perpendicular to said first and second surfaces, each of said first and second surfaces being defined by a substantially D-shaped profile the curved portion

of which conforms to the outer profile of the vertebrae between which the implant is adapted to be implanted, said predetermined thickness being chosen to correspond to the space between said vertebrae, each of said first and second surfaces



having an elongated protuberance of substantially semi-circular cross-section extending the full width of the surface parallel to the straight side of the D, and at least a portion of each first and second surface having a porous coating thereon.

4,714,470

GROOVED PROSTHETIC IMPLANT

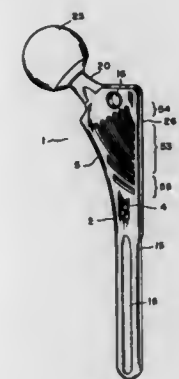
John D. Webb, Jr., Etna Green; Roy Y. Hori, Warsaw, and George E. Simpson, Fort Wayne, all of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Feb. 19, 1986, Ser. No. 830,827

Int. Cl.⁴ A61F 2/30

U.S. Cl. 623—18

18 Claims



1. A prosthetic implant including a stem having a proximal end and a distal end and a pair of sidewalls each including a plurality of discrete grooves arcuately disposed at the proximal end of the stem wherein the stem further includes a medial side and a lateral side separating the pair of sidewalls, and wherein the plurality of grooves are each segments of curves generated from radii having a center of curvature offset from the stem in a generally lateral direction.

4,714,471

FEMUR PROSTHESIS PART OF A KNEE JOINT ENDOPROSTHESIS

Hans Grunzel, Lübeck, Fed. Rep. of Germany, assignor to S + G Implants GmbH, Lübeck, Fed. Rep. of Germany

Continuation of Ser. No. 779,512, Sep. 24, 1985, abandoned. This application Oct. 22, 1986, Ser. No. 921,840

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435243

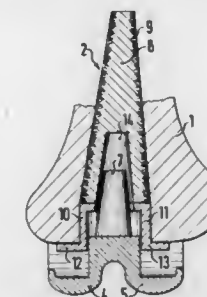
Int. Cl.⁴ A61F 2/38

U.S. Cl. 623—20

1 Claim

1. A femur prosthesis part of a knee joint endoprosthesis comprising a pair of convex sledges connected by a bridge and adapted to be supported on concave tibia slide surfaces, comprising a metallic stem of the femur prosthesis part to be anchored irreleasably by an open-cell metallic layer in the hole of the femur bone, said stem being provided at its lower end with

a tapering cone-shaped bore and downwardly extending fork arms provided with lateral flanges having upper surfaces for supporting the lower cut face of the femur bone, said fork arms defining therebetween a bore having tapered walls communicating with said tapered cone-shaped bore, a conical pin hav-



ing a tapered wall surface for engagement with tapered walls of said bores, said conical pin being supported by said bridge for insertion into said bores, said pair of sledges having depressions to accommodate and receive the undersurfaces of said lateral flanges.

4,714,472

KNEE PROSTHESIS WITH ACCOMMODATION FOR ANGULAR MISALIGNMENT

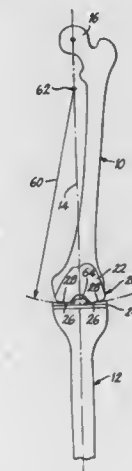
Robert G. Averill, Ringwood; Alex Khowaylo, Allendale, and Christopher G. Sidebotham, Bergenfield, all of N.J., assignors to Osteonics Corp., Allendale, N.J.

Filed Jan. 20, 1987, Ser. No. 4,525

Int. Cl.⁴ A61F 2/38

U.S. Cl. 623—20

5 Claims



1. In a knee prosthesis having a femoral component and a tibial component, the tibial component including a bearing member and the femoral component including an arcuate element for confronting and engaging the bearing member to accomplish articulation of the prosthesis, the femoral component and the tibial component ordinarily being aligned axially along a mechanical axis passing through the femoral head of the corresponding hip joint and the engagement between the arcuate element of the femoral component and the bearing member of the tibial component ordinarily taking place along complementary articular surface areas of the arcuate element and the bearing member, the improvement comprising misalignment accommodating means for accommodating limited angular misalignment between the femoral component and the tibial component while maintaining engagement between the arcuate element and the bearing member along complementary articular surface areas, said misalignment accommodating means including complementary medial-lateral surface profile

contours along the complementary articular surface areas, said surface profile contours having a medial-lateral articular radius defining an arcuate profile, the origin of which radius lies generally along said mechanical axis such that upon angular misalignment of the femoral component and the tibial component, the resulting relative medial-lateral displacement of the articular surface areas will be accommodated while area engagement between the arcuate element and the bearing member is maintained along said complementary articular surface areas.

4,714,473

KNEE PROSTHESIS

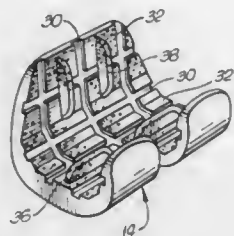
Roy D. Bloebaum, Phoenix, Ariz., assignor to Harrington Arthritis Research Center, Phoenix, Ariz.

Filed Jul. 25, 1985, Ser. No. 759,453

Int. Cl.⁴ A61F 2/38

U.S. Cl. 623—20

31 Claims



1. A prosthetic joint, comprising:

a femoral component having a base surface for biological ingrowth attachment to the femur of a patient; and
a tibial component having a base surface for biological ingrowth attachment to the tibia of a patient;
said base surfaces of said femoral and tibial components each being defined by a plurality of relatively shallow and relatively smooth channels subdividing said base surfaces into a plurality of attachment zones, said attachment zones including a selected porous biological ingrowth material, said ingrowth material being applied as a coating to said attachment zones, said channels being uncoated.

4,714,474

TIBIAL KNEE JOINT PROSTHESIS WITH REMOVABLE ARTICULATING SURFACE INSERT

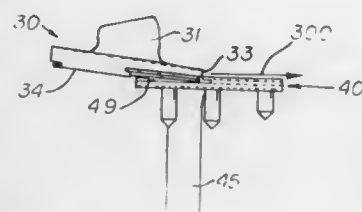
John G. Brooks, Jr., Memphis, and Walter P. Spires, Jr., Cordova, both of Tenn., assignors to Dow Corning Wright Corporation, Arlington, Tenn.

Filed May 12, 1986, Ser. No. 861,892

Int. Cl.⁴ A61F 2/38

U.S. Cl. 623—20

5 Claims



1. A surgically implantable knee joint prosthesis for the replacement of at least one articulating surface of a proximal tibia comprising, in combination,

a base having an anterior region and a posterior region corresponding to the anterior and posterior surfaces of the tibia on which it is implanted, the regions being bounded by a lateral and a medial edge, said base having a lower surface adapted to be permanently fixed to a surgically

prepared superior surface of said proximal tibia and said base having an upper surface having a first retaining wall means comprising at least one undercut raised retaining wall extending along at least a portion of the peripheral edge of the posterior region of the upper surface of said base and further extending along at least a portion of the peripheral medial and lateral edges of the upper surface of said base and a second raised retaining wall means on said upper surface which is opposite and separated from the first wall means on both the lateral and the medial edge of said base, said second wall means comprising at least one raised wall extending along at least a portion of the central one-fourth to two-thirds of the peripheral edge of the anterior region of said upper surface, and

a removable articulation insert of a hard synthetic polymer having an upper surface which is configured to receive at least one condyle present on a distal femur situated above said tibia and a lower surface which is adapted to closely mate with and slidably engage said first retaining wall means and to pass over and contact said second wall means in a locking engagement such that the insert is firmly held within said base until such time as the insert is released by raising the lower surface of the insert above said second wall and sliding the insert anteriorly away from said base, said base and the insert being constructed of materials suitable for implantation within the body and having physical properties which permit such sliding and locking engagement, the separation between said first wall means and said second wall means being sufficient to permit said insert to be slidably engaged and received in the above manner.

4,714,475

TIBIAL MEMBER OF A KNEE JOINT ENDOPROTHESIS

Hans Grundei, Lübeck, and Reinhard Aigner, Munich, both of Fed. Rep. of Germany, assignors to S + G Implants GmbH, Lübeck, Fed. Rep. of Germany

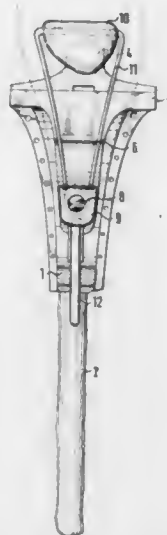
Filed Feb. 19, 1986, Ser. No. 831,363

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507155

Int. Cl.⁴ A61F 2/38

U.S. Cl. 623—20

4 Claims



1. In a tibial member of a knee joint prosthesis used as a substitute for a resected tibia head comprising a proximal joint portion connected to an intermediate bridge element, a distal stem portion extending distally from said bridge element adapted to be anchored in a prepared tibia and a clamping element adapted to be secured to said bridge element for fastening tendon extremities of a patella thereto, the improvement

comprising said bridge element having front and rear surfaces wherein said front surface is provided with an elongated downwardly directed flap member secured thereto at a proximal region near said joint portion and at a distal region rear said stem; said flap member having formed in a distal region thereof a concave pan having rounded edges to cooperatively mate with a complementary convex rear surface of said clamping element whereupon engagement of said clamping element to said pan operatively secures said tendon extremities therebetween.

4,714,476

WRIST JOINT PROSTHESIS

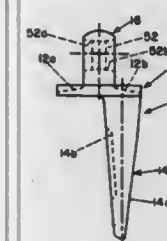
Chitranjan S. Ranawat, Alpine, N.J.; Lee R. Straub, New York; Allan E. Inglis, Rye, both of N.Y., and Albert H. Burstein, Stamford, Conn., assignors to New York Society for the Relief of the Ruptured and Crippled, New York, N.Y.

Filed Jan. 27, 1987, Ser. No. 6,984

Int. Cl.⁴ A61F 2/42

U.S. Cl. 623—21

5 Claims



1. A total wrist joint prosthesis comprising a metal radial component having a stem adapted to be received in the distal portion of the radial medullary canal and secured therein; a plate-like portion adapted to reside at the distal end of the residual anatomical radius, and a boss extending distally from the plate-like portion, the boss being offset from the axis of the stem in both the ulnar and volar directions, having a transverse hole and having a spherical surface along its volar, distal and dorsal aspects; a metal metacarpal component having a generally U-shaped body portion composed of laterally spaced-apart legs that are adapted to straddle the boss of the radial component and a base interconnecting the legs and having stems that extend distally from the base and are adapted to be received in the proximal portions of the second and third metacarpals and to be secured therein; a metal axle extending between and joined to the legs of the metacarpal component and passing through the hole in the boss of the radial component; a sleeve of polymeric material surrounding the portion of the axle within the hole, the sleeve being in clearance with the hole to afford constrained radio-ulnar angulation and axial rotation of the metacarpal component relative to the radial component; and a generally U-shaped bearing component of a polymeric material received proximally to the boss within the base portion of the metacarpal component, the bearing component having a spherical seat matching and engageable by the spherical surface of the radial boss for flexural articulation of the prosthetic joint and having dorsal and volar surfaces adapted to engage the dorsal and volar aspects of the plate-like portion of the radial component and in conjunction with engagements between the sleeve and the hole in the boss restrain extension and flexion of the metacarpal component to magnitudes corresponding substantially to those of an anatomical wrist joint, and having convexly curved proximal surfaces that are adapted to engage distal surfaces of the plate-like portion of the radial component on either side of the boss to restrain radio-ulnar angulation of the metacarpal component to a magnitude corresponding substantially to those of the anatomical wrist joint.

4,714,477
BALL-AND-SOCKET JOINT PROSTHESIS WITH BEARING INSERT

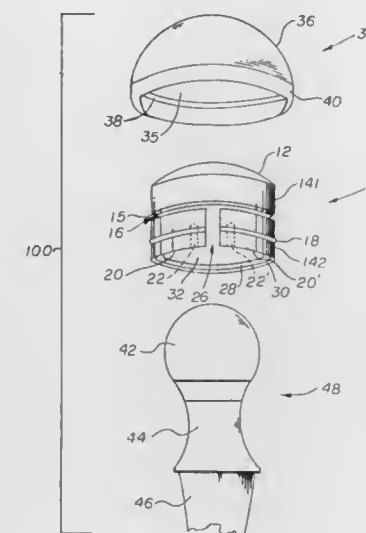
Alfred J. Fichera, Cordova, and Samuel J. Chiarizzio, Memphis, both of Tenn., assignors to Dow Corning Wright Corporation, Arlington, Tenn.

Filed Aug. 8, 1986, Ser. No. 894,589

Int. Cl.⁴ A61F 2/34

U.S. Cl. 623—22

10 Claims



1. A ball-and-socket joint prosthesis which comprises:
(A) a shell element having an inside surface and an outside surface; and
(B) a generally spherical ball component for insertion within
(C) a bearing insert element which is open-ended at its bottom, the bottom of the insert opening to a generally spherical inside surface for receiving the ball component, the insert having an outside surface which is shaped to mate with the inside surface of the shell, the dimensions of the inside surface of the insert being such that after insertion, the ball component is allowed to freely swivel, but is retained within the insert after the insert containing the ball component is locked within the shell,
the shell element and the insert element having a locking mechanism consisting of a protruding portion extending a major distance around a side surface of one element for locking engagement with an opposed mating depression in the other element,
the insert having a substantially horizontal slot, situated above that portion of the locking mechanism present on the insert, which slot extends around a major portion of the insert but less than the entire periphery of the insert to thereby provide a connecting portion;
the insert having a single slot extending from the bottom of the insert up to the horizontal slot to thereby form at least one movable finger attached to the remainder of the insert by the connecting portion, the single slot having a sufficient width and each finger having dimensions relative to the ball component to permit removal of the insert containing the ball component from the shell when the single slot is at least partially closed through use of
a means on the insert for moving at least one finger and permitting at least partial closure of the single slot.

being at least partially axially coextensive such that said first and second source means are capable of simultaneously depositing glass particles on the same longitudinal region of said core member, and means for independently varying the velocities of movement of said first and second source means such that at any given time the velocity of said first source means is different from that of said second source means and such that the velocities of said first and second source means are continuously variable during the reciprocating movement thereof.

4,714,489

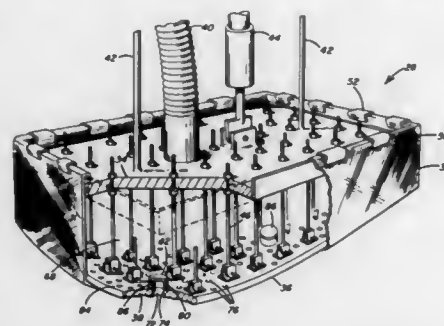
VACUUM PRESS CONSTRUCTION

Terry A. Bennett, Monroeville, Pa., and James E. Carino, Evansville, Ind., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 5, 1987, Ser. No. 616
Int. Cl.⁴ C03B 23/02

U.S. Cl. 65—104

18 Claims



1. An apparatus for press bending heat softened glass sheets having at least one aperture of the type including means to heat said sheets to their heat softened temperature, a first vacuum mold with an apertured lower wall having a sheet engaging surface conforming to the final desired shape of said sheet, a second mold with an engaging surface complementing at least a portion of said sheet engaging surface of said first mold wherein said heat softened glass sheet is sandwiched in pressing engagement therebetween, means to convey said heat softened sheet from said heating means to said molds and means to draw a vacuum through said first mold, the improvement comprising:

a hole in said engaging surface of said vacuum mold positioned adjacent said aperture in said heat softened glass sheet in facing relation thereto; and means to seal said hole to prevent vacuum from being drawn therethrough, said sealing means spaced from said engaging surface of said first mold.

16. A method of shaping a heat softened glass sheet having at least one aperture comprising:

heating said glass sheet to its heat softened temperature; providing a hole in a shaping surface of a vacuum mold; aligning said sheet with said shaping surface of said vacuum mold to align said hole in said shaping surface with said aperture in said glass sheet;

engaging said glass sheet with said shaping surface; drawing a vacuum through said vacuum mold to hold said shaped glass sheet thereagainst; while sealing said hole in said shaping surface so as to prevent vacuum from being drawn therethrough.

4,714,490
CONCRETION PREVENTING AGENT FOR FERTILIZERS

Tetsuji Iwasaki, Wakayama, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Apr. 23, 1986, Ser. No. 856,066

Claims priority, application Japan, May 8, 1985, 60-97557
Int. Cl.⁴ C05G 3/00

U.S. Cl. 71—27

5 Claims

1. A method for preventing a fertilizer from concretion comprising mixing said fertilizer with from about 0.005 to 1.0 percent by weight, based on the weight of the fertilizer, of a compound of the formula:



(1)

in which R is an alkyl, an alkenyl, a hydroxyalkyl or a hydroxyalkenyl, having 4 to 30 carbon atoms and being either straight chained or branched.

4,714,491

DIPHENYL ETHER HERBICIDES

Michael P. Prisbylla, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

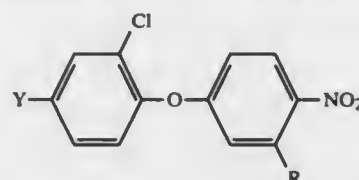
Filed Oct. 7, 1983, Ser. No. 539,784

Int. Cl.⁴ A01N 57/02; C07F 9/40

U.S. Cl. 71—86

10 Claims

1. A method for controlling undesirable weed pests which comprises applying to the locus where control is desired a herbicidally effective amount of a compound having the formula

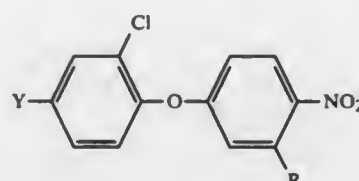


wherein Y is chlorine or trifluoromethyl, and wherein R is selected from those having the formula



in which R' is selected from the group consisting of lower alkyl groups having from 1 to 3 carbon atoms and agriculturally acceptable salts thereof.

3. As compounds, diphenyl ether derivatives of the formula



wherein Y is chlorine or trifluoromethyl, and wherein R is selected from those having the formula



in which R' is selected from the group consisting of lower alkyl groups having from 1 to 3 carbon atoms.

4,714,492

CERTAIN 2-PHENYL-4-OXO-NICOTINATES AND THEIR USE FOR INDUCING MALE STERILITY IN A CEREAL GRAIN PLANT

Glenn R. Carlson, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

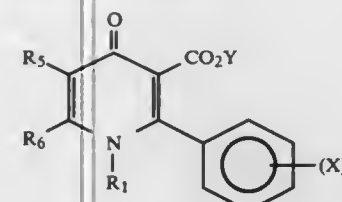
Continuation of Ser. No. 260,577, May 5, 1981, which is a continuation-in-part of Ser. No. 250,711, Apr. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 148,079, May 12, 1980, abandoned. This application Jul. 1, 1983, Ser. No. 509,981

Int. Cl.⁴ C07D 211/84; A01N 43/40

U.S. Cl. 71—94

16 Claims

1. A compound of the formula:



wherein

R₁ is a (C₁-C₆)alkyl or allyl group;
R₅ is a hydrogen or bromine atom or a (C₁-C₃)alkyl group;
R₆ is a (C₁-C₆)alkyl group;
Y is hydrogen,
X is hydrogen or halogen atom; and
n is the integer 1 or 2 and the agronomically acceptable acid addition, sodium or potassium salts thereof.

4,714,493

ISOTHIUREA HERBICIDAL COMPOSITION

Marcelo Kogan, Wilton, Conn.; Stephen E. Dinizo, San Lorenzo, and Llewellyn W. Fancher, New Castle, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 24, 1985, Ser. No. 737,639

Int. Cl.⁴ A01N 38/08; C07C 119/18

U.S. Cl. 71—99

3 Claims

1. The compound N,N'-(N"-isopropylcarbonyl)-N"-isopropylcarbonyl)-S-ethylisothiourea.

4,714,494

TROUGH SHEAR DIFFUSOR APPARATUS FOR FLUXING MOLTEN METAL AND METHOD

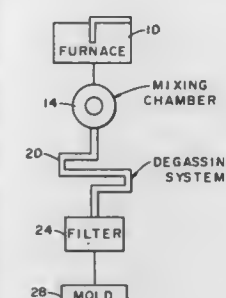
Charles E. Eckert, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1986, Ser. No. 939,145

Int. Cl.⁴ C21C 7/00

U.S. Cl. 75—66

18 Claims



1. A method for removing impurities from a molten metal which comprises:

(a) flowing molten metal at a velocity of at least 0.1 cm/second through an enclosed passageway having an inlet section and an outlet section and consisting essen-

tially of a top wall, sidewalls, and a bottom wall, at least one of such walls further comprising one or more porous portions through which said molten metal flows;

(b) introducing into said enclosed passageway, through said porous wall portion, in a direction generally normal to the flow of molten metal in said passageway, gas capable of removing impurities from said molten metal within said enclosed passageway;

whereby the velocity of said molten metal flow through said porous wall portion normal to said gas flow will be capable alone of detaching gas bubbles as they are formed in said passageway, in the absence of moving parts in said passageway, resulting in smaller bubbles with larger gas/metal interface to achieve high contact area between said gas and said molten metal to thereby remove said impurities from said molten metal.

4,714,495

SOLVENT, INK AND COATED PAPER FOR CARBONLESS COPYING SYSTEM

Yoshio Okada, Matsudo; Masahiro Akatsu, and Yohichi Ohira, both of Iwaki, all of Japan, assignors to Kupeha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1986, Ser. No. 932,570

Claims priority, application Japan, Apr. 9, 1986, 61-81780
Int. Cl.⁴ C09D 11/00

U.S. Cl. 106—21

12 Claims

1. A solvent composition for carbonless copying, comprising a mixture of diisopropylnaphthalene isomers having a content of 2,7-isomer of 50 wt.% or more.

4,714,496

WAX COMPOSITIONS

Clement H. Luken, Jr., Highland Heights, and Donald V. Kinsman, Fort Thomas, both of Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,044

Int. Cl.⁴ C08L 91/06

U.S. Cl. 106—270

11 Claims

1. A wax composition comprising
(a) a paraffin melting in the range 50° C. to 65° C.;
(b) a C₁₆ or C₁₈ saturated fatty acid or fatty acid mixture comprised predominantly of C₁₆ and C₁₈ saturated fatty acids; and
(c) an alpha-alkyl-branched carboxylic acid obtained by the free radical addition of a C₂₀₋₄₄ alpha-olefin or alpha-olefin mixture with a carboxylic acid having from 3 to 36 carbon atoms, said wax composition containing 90 to 98 parts by weight (a) and (b) present in a ratio from 9:1 to 1:9 and 2 to 10 parts by weight (c).

4,714,497

PROCESS FOR THE PREPARATION OF FERROUS PARTS OF A COLOR TELEVISION TUBE AND FURNACE FOR OPERATING SUCH A PROCESS

Bernard Poncet, Lyons, France, assignor to Videocolor, Montrouge, France

Filed Feb. 6, 1984, Ser. No. 577,401

Int. Cl.⁴ C23C 8/14

U.S. Cl. 148—6.35

7 Claims

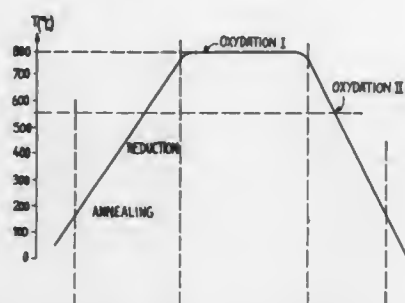
1. A method for preparing discrete ferrous components, comprising the steps:

positioning the components on a substantially planar carrier; introducing the components into a single chamber furnace; subjecting the components to increasing temperature in the presence of a reducing gas as it passes through a first section of the chamber wherein the pressure of the gas is above ambient and flows continuously through the chamber to a furnace exit;

subjecting the components to stable temperature in a first oxidation environment while passing through a second

section of the chamber directly connected to the first section, without intervening barriers in between, wherein the reducing gas flows from the first to the second section and mixes with an oxidation gas;

subjecting the components to decreasing temperature in a second oxidation environment while passing through a



third section of the chamber directly connected to the first and second sections, without intervening barriers therebetween;

directing the components out of the furnace after traversing the three sections of the single chamber, along a substantially planar path and wherein the gas in the third section exits therefrom to create gas flow through the chamber.

4,714,498

PROCESS FOR PRODUCING LARGE SECTION, LARGE MASS FORGED SLEEVES FROM LARGE DIAMETER INGOTS OF ALLOY 625

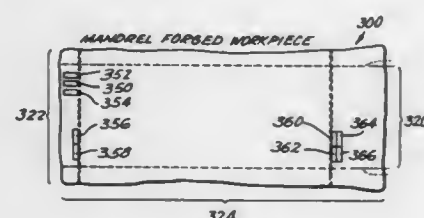
Ashok K. Khare, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Jan. 27, 1986, Ser. No. 879,479

Int. Cl.⁴ C22F 1/10

U.S. Cl. 148—11.5 N

22 Claims



1. A process for producing large section, large mass forged sleeves from large diameter ingots of alloy 625 consisting essentially of a limiting composition by weight percentage of 58.0 min. nickel, 20.0–23.0 chromium, 5.0 max. iron, 8.0–10.0 molybdenum, 3.15–4.15 columbium (plus tantalum), 0.10 max. carbon, 0.50 max. manganese, 0.50 max. silicon, 0.015 max. phosphorus, 0.015 max. sulphur, 0.40 max. aluminum, 0.40 titanium, and 1.0 max. cobalt (if determined), comprising the steps of:

(a) forming a workpiece from the large diameter ingot which further comprises the substeps of,

(1) making a first saw cut through a toe portion of the ingot near an as cast end traverse to the longitudinal axis of the ingot and removing from the ingot a slice of predetermined width, and forming a first sawed end of the workpiece at the sawed surface,

(2) facing the first sawed end of the workpiece,

(3) trepanning a bore in the ingot in the first sawed end of a predetermined diameter to a predetermined depth with a trepanning means,

(4) making a second saw cut through the toe portion of the ingot to separate the workpiece from the remainder of the ingot a predetermined distance from the first sawed

end traverse to the longitudinal axis of the ingot and forming a second sawed end for the workpiece, with the second saw cut being made at a distance less than or equal to the depth of the trepanned bore in the ingot,

(5) facing the second sawed end of the workpiece;

(b) saddle forging the workpiece which further comprises the substeps of,

(1) heating the workpiece to a temperature of 2125° F.,

(2) placing the workpiece on a preheated saddle forging mandrel,

(3) working the workpiece by rotating the workpiece in steps with a first manipulator means and at each step applying a saddle forging die having a width substantially the same as the total length of the workpiece, with the saddle forging die applying a pressure of 3000 tons to the workpiece until the saddle forging stops moving when the saddle forging die is applied, and rotating the workpiece for each successive step an amount to allow an overlap of a new step's press location with the previous step's press location;

(4) preheating the workpiece to a temperature of 2125° F. and repeating step (b)(3) until the trepanned bore in the workpiece is opened to a predetermined diameter;

(c) mandrel forging the saddle forged workpiece which further comprises the substeps of,

(1) heating the workpiece to a temperature of 2125° F.,

(2) placing the workpiece on a preheated mandrel forging mandrel,

(3) working the workpiece with a preheated top mandrel forging die and a preheated bottom mandrel forging die by moving the workpiece in its axial direction in steps, with each step being a portion of a mandrel forging die width, and at each step axially rotating the workpiece with a second manipulator means in increments until the workpiece is rotated at least 360° at each step, with the mandrel forging dies applying a maximum pressure of 3000 tons to the workpiece at each increment of axial rotation of the workpiece at each step, with each increment of axial rotation being an amount to allow an overlap of a new rotation increment's press location with the previous rotation increment's press location, and working the workpiece until it stops moving when the mandrel forging dies are applied,

(4) reheating the workpiece to 2125° F. and repeating step (c)(3) until a predetermined length of the workpiece is achieved,

(5) air cooling the workpiece to room temperature;

(d) thermal treating the workpiece followed by annealing the workpiece; and

(e) finish machining the workpiece to form the finished large section large mass forged sleeve.

4,714,499

FULL LENGTH FORGING METHOD FOR PRODUCING LARGE SECTION, LARGE MASS CYLINDRICAL SLEEVES OF ALLOY 625

Ashok K. Khare, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Oct. 1, 1986, Ser. No. 913,939

Int. Cl.⁴ C22F 1/10

U.S. Cl. 148—11.5 N

27 Claims

1. A process for producing a large section, large mass sleeve of alloy 625 consisting essentially of a limiting composition by weight percentage of 58.0 min. nickel, 20.0–23.0 chromium, 5.0 max. iron, 8.0–10.0 molybdenum, 3.15–4.15 columbium (plus tantalum), 0.10 max. carbon, 0.50 max. manganese, 0.50 max. silicon, 0.015 max. phosphorus, 0.015 max. sulphur, 0.40 max. aluminum, 0.40 titanium, and 1.0 max. cobalt (if determined), comprising the steps of:

(a) forming a workpiece from an ingot, with the formed workpiece having a length slightly longer than the predetermined full length of the finished large section, large

mass cylindrical sleeve and a trepan bore of a predetermined diameter along the longitudinal axis;

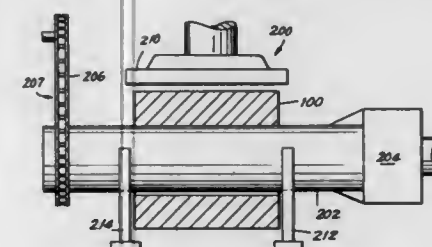
(b) saddle forging the workpiece which further comprises the substeps of,

(1) heating the workpiece to a temperature of 2000° F.,

(2) placing the workpiece on a preheated saddle forging mandrel,

(3) placing the saddle mandrel with the workpiece disposed thereon on a pair of saddles, with the saddles being positioned such that a first saddle supports a first end of the saddle forging mandrel and a second saddle supports a second end of the saddle forging mandrel with a small gap being formed between a first end of the workpiece disposed on the saddle forging mandrel and the first saddle and a small gap being formed between a second end of the workpiece disposed on the saddle forging mandrel and the second saddle,

(4) engaging a first end of the saddle forging mandrel with a manipulator means and engaging the saddle forging mandrel near the second end with a chain drive assembly,



(5) working the workpiece by rotating the workpiece in steps with the manipulator means and the chain drive assembly and at each step applying a saddle forging die having a length longer than the full length of the workpiece, with the saddle forging die applying a pressure of 3000 tons to the workpiece at each step until the workpiece stops moving, with each successive step being an amount which allows an overlap of a new step's press location with the previous step's press location,

(6) reheating the workpiece to a temperature of 2000° F. and repeating substeps (b)(2), (3), (4) and (5) for a predetermined number of heats,

(7) reheating the workpiece to a temperature of 2000° F. for the final heat, repeating steps (b)(2), (3) and (4) and then repeating substep (b)(5) after the workpiece cools to a temperature below 1950° F., and

(8) air cooling the workpiece to room temperature;

(c) thermal treating the workpiece followed by annealing the workpiece; and

(d) finish machining the workpiece to form the finished large section, large mass cylindrical sleeve.

4,714,500

METHOD FOR THERMAL TREATMENT OF PEARLITIC RAIL STEELS

Wilhelm Heller; Jürgen Flügge, both of Duisburg, and Gerhard Ratz, Butzbach, all of Fed. Rep. of Germany, assignors to Krupp Stahl AG, Bochum, Fed. Rep. of Germany

Filed Dec. 2, 1985, Ser. No. 803,744

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446794

Int. Cl.⁴ C21D 9/04

U.S. Cl. 148—12 R

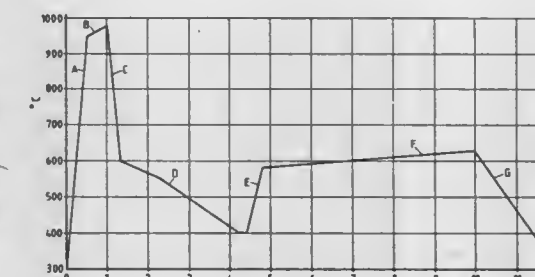
6 Claims

5. A method for heat treatment of pearlitic steels consisting of

0.55 to 0.82% carbon
0.25 to 0.50% silicon
0.80 to 1.30% manganese
≤0.035% phosphorous
≤0.040% sulfur

≤0.30% chromium
≤0.10% nickel
≤0.05% molybdenum
0.05 to 0.20% vanadium
0.02 to 0.10% columbium
0.010 to 0.025% nitrogen
0.010 to 0.070% aluminum

the rest being iron and usual melt impurities,



wherein after finishing hot-rolling of the rails at temperatures of about 950° to 1,000° C. compressed air is blown onto the rail head portion to provide a fine lamellar pearlitic structure in the rail head portion and after finishing the pearlite transformation at 400° C. the rail head portion is again heated up to about 600° to 650° C., whereafter the complete rail including head, web and base is rapidly cooled by means of a quenching media to a temperature of less than 100° C.

4,714,501

METHOD FOR THERMAL TREATMENT OF ALLOY FOR HEAT TRANSFER PIPES

Kazuo Yamanaka, Minooshi; Hiroo Nagano, Kobeshi; Takao Minami, Amagasaki; Yaataka Okada, Narashi; Mamoru Inoue, Kobeshi; Hiroshi Susukida, Takasago; Kichiro Onimura, Takasago; Toshio Yonezawa, Takasago; Nobuya Sasaguri, Takasago; Katsuji Kawaguchi, Takasago, and Takaya Kusakabe, Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of Japan

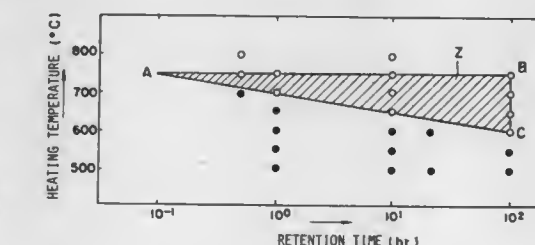
Continuation of Ser. No. 550,022, Nov. 8, 1983, abandoned. This application Nov. 15, 1985, Ser. No. 798,702

Claims priority, application Japan, Aug. 29, 1983, 58-156427

Int. Cl.⁴ C22F 1/10

U.S. Cl. 148—13

1 Claim



1. A process for producing an alloy for heat transfer pipes with excellent alkali stress corrosion cracking resistance, said alloy consisting essentially of, in percent by weight:

not more than 0.15% C,
not more than 1.0% Si,
not more than 1.0% Mn,
25 to 35% Cr,
40 to 70% Ni,
not more than 0.5% Al,
0.01 to 1.0% Ti;

0.5 to 5.0% of a metal selected from the group consisting of Mo, W van V and mixtures thereof, not more than 0.030% P, not more than 0.020% S and the balance Fe and impurities, which process comprises

- (1) maintaining a mixture containing the metallic components at a temperature from T°C. to (T°C.+100° C.), where T°C. is the temperature at which a carbide in the alloy is solubilized, for a period of from 1 to 120 minutes;
- (2) cooling the resulting mixture to a temperature of from room temperature to 200° C., and
- (3) thermally treating the resulting product at a temperature from 600° to 750° C. for a period of time from 0.1 to 100 hours while the mixture is within the area defined by the hatched portion of FIG. 2 hereof.

4,714,502

SOFT MAGNETIC STAINLESS STEEL FOR COLD FORGING

Yoshinobu Honkura, Konan; Kouji Murata, and Takashi Yokoyama, both of Tokai, all of Japan, assignors to Aichi Steel Works, Ltd., Aichi, Japan

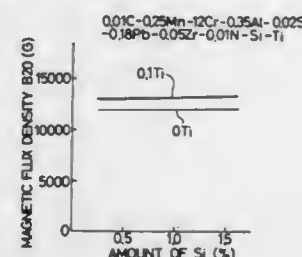
Filed Jul. 18, 1986, Ser. No. 886,675

Claims priority, application Japan, Jul. 24, 1985, 60-163747

Int. Cl.⁴ C22C 38/28

U.S. Cl. 148—307

6 Claims



1. A soft magnetic stainless steel having a magnetic flux density of not less than 13,000 G, a tensile strength of not more than 41 kgf/mm² and a critical compressibility of not less than 50% in cold forging, consisting essentially of, by weight, up to 0.03% of C, 0.40 to 1.10% of Si, up to 0.50% of Mn, 9.0 to 19.0% of Cr, 0.31 to 0.60% of Al, 0.010 to 0.030% of S, 0.10 to 0.30% of Pb, 0.02 to 0.25% of Ti, 0.02 to 0.10% of Zr, and up to 0.03% of N, and the balance of Fe and inevitable impurities, with a proviso that the C+N content is not more than 0.040% and the Si+Al content is not more than 1.35%.

4,714,503

EMULSION-CONTAINING EXPLOSIVE COMPOSITIONS

Lawrence A. Cescon, Portogruaro, Italy; Robert W. Trebilcock, Littleton, Colo., and Robert H. Moffett, Lovettsville, Va., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 787,442, Oct. 15, 1985, Pat. No. 4,619,721. This application Oct. 2, 1986, Ser. No. 912,760

The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.

Int. Cl.⁴ C06B 45/02

U.S. Cl. 149—21

28 Claims

1. In a storage-stable emulsion blend explosive comprising a sensitized blend of inorganic oxidizing salt particles and a water-in-oil emulsion comprising a carbonaceous fuel having components which form a continuous emulsion phase, an aqueous solution of an inorganic oxidizing salt forming a discontinuous phase dispersed as discrete droplets within said continuous phase, and an emulsifying agent, the improvement comprising inorganic oxidizing salt particles containing at least about 10 percent by weight of a fines component comprised of inorganic oxidizing salt particles which are smaller than 297 micrometers, the weight ratio of said emulsion to the total

inorganic oxidizing salt particles being in the range of about from 20/80 to 70/30.

4,714,504

PROCESS OF LAMINATING A PHOTOSENSITIVE LAYER OF A SUBSTRATE

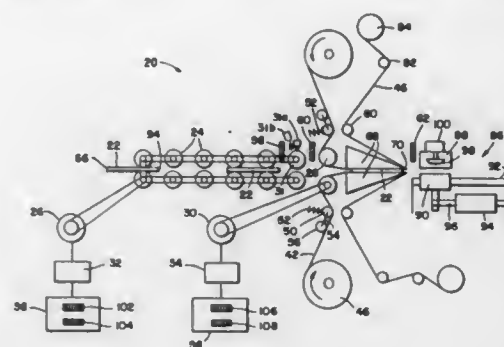
Michael J. Cummings, Vestal; Donald E. Hanford, Barton, and Robert M. Japp, Vestal, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Oct. 10, 1986, Ser. No. 917,716

Int. Cl.⁴ B30B 15/34, 31/04, 31/10

U.S. Cl. 156—64

14 Claims



1. A process for laminating discrete sections of a supported photosensitive layer to a sheet substrate comprising the steps of:

- advancing the substrate to and through a nip between converging surfaces of opposed heated application rolls;
- supplying a continuous length of the supported photosensitive layer to the nip;
- interrupting the steps of advancing the substrate when it reaches a first location positioned between the application rolls and of supplying the photosensitive layer to the nip;
- moving the converging surfaces of each of the application rolls from an inactive disengaged position transversely toward the substrate to an active position to cause pressure contact between the photosensitive layer and the substrate whereby the photosensitive layer is laminated to the substrate;
- pausing for a first predetermined period of time with the application rolls in the active positions;
- again advancing the substrate between the application rolls while the application rolls are in the active position;
- again supplying the photosensitive layer to the nip;
- interrupting the step of again advancing the substrate when it reaches a second location positioned between the application rolls and of supplying the photosensitive layer to the nip while continuing to hold the application rolls in the active position for a second predetermined period of time; and
- withdrawing the application rolls to the inactive position after a lapse of the second predetermined period of time.

4,714,505

METHODS FOR HANDLING SHEET MATERIAL

Anthony G. Goodfellow, Maghull, and Anthony R. Wright, Southport, both of England, assignors to W & A Bates Limited, United Kingdom

Filed Feb. 1, 1985, Ser. No. 697,243

Claims priority, application United Kingdom, Feb. 10, 1984, 8403494

Int. Cl.⁴ B29D 30/30; B29C 31/00; G01B 21/02

U.S. Cl. 156—64

4 Claims

1. A method of feeding a ply of tire building fabric to a tire building former comprising laying a ply of fabric onto a table at a first location, transversely tilting the table while providing

a flow of air beneath the ply to permit the ply to float over the table surface into appropriate alignment against a raised side abutment of the table thus arranging the ply on the table to align one side edge of said ply with a first datum line, applying a gripping device to the ply and transversely moving the gripping device and ply in an alignment preserving manner to a second location to align said one edge with a second datum line parallel with the first datum line and which is in predetermined relationship to a tire building former to enable the ply to be fed in appropriate axial alignment to the former.

4,714,506

METHOD FOR MAKING A DUNNAGE SHOCK ABSORBER

Hiroshi Yamashiro, 5-15-13 Kamiva, Setagaya-ku, Tokyo, and Ko Suzuki, 984-9 Kamigo, Ebina-shi, Kanagawa Prefecture, both of Japan

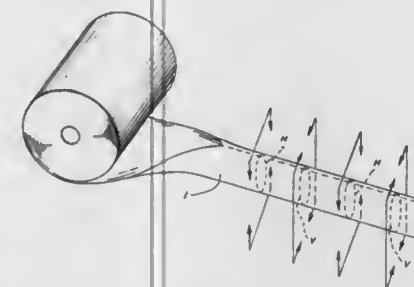
Continuation-in-part of Ser. No. 725,244, Apr. 19, 1985, abandoned, which is a continuation of Ser. No. 476,497, Mar. 18, 1983, abandoned. This application Jun. 6, 1985, Ser. No. 742,091

Claims priority, application Japan, Jul. 1, 1982, 57-98267[U]; Jul. 10, 1982, 57-104753[U]; Sep. 24, 1982, 57-164885; Jul. 13, 1984, 59-145417

Int. Cl.⁴ B32B 31/14

U.S. Cl. 156—80

14 Claims



1. A process for producing a plastic shock absorber for packing comprising the steps of: heat sealing plastic film material having at least a two layer wall structure to form a hollow cylindrical body; and heat sealing said cylindrical body at alternating horizontal and vertical strips at suitable intervals to create a continuous series of linked, generally trigonal-shaped hollow units while blowing a gas into said cylindrical body, said gas being cooler than the ambient air when injected into said cylindrical body thereby reducing the cooling time of the heat pressed strips and producing swelled, sealed trigonal-shaped units capable of providing efficient shock absorption.

4,714,507

SURFACE COATING AGENT AND METHOD FOR USING THE SAME IN CIVIL AND CONSTRUCTION ENGINEERING

Yoshiyuki Ohgushi, 8-2, Nagao 2-chome, Johnan-ku, Fukuoka, Japan

Filed Nov. 6, 1985, Ser. No. 795,392

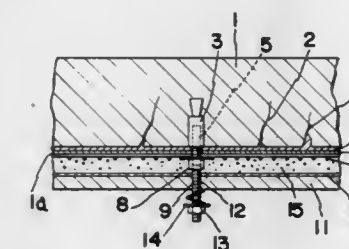
Int. Cl.⁴ B32B 31/12, 7/08

U.S. Cl. 156—91

7 Claims

2. A method for using a surface coating agent for civil engineering and construction engineering wherein said method comprises (i) applying a composite polymer emulsion essentially consisting of carboxy-modified styrene-butadiene, cyclohexyl methacrylate and styrene polymers onto a lower surface of a floor plate so as to form a composite polymer film, (ii) mounting a plurality of bolts onto the lower surface of said floor plate so as to suspend a concrete panel from said floor plate while defining a filler space between the concrete panel and said lower surface of said floor plate, (iii) applying an upwardly urging pressure to said concrete panel plate by

spring means mounted on said respective bolts, and filling a surface coating agent essentially consisting of a mixture made of (a) a principal ingredient including cement, silica sand, iron oxide, zinc oxide and glycine and (b) a composite polymer



emulsion including carboxy-modified styrene-butadiene, cyclohexyl methacrylate, and styrene polymers as main constituents in a mixing ratio of 5.0:1 under pressure into said filler space against the biasing force of said concrete panel.

4,714,508

FIXTURE AND METHOD FOR MAKING SPIRAL WOUND HOSE

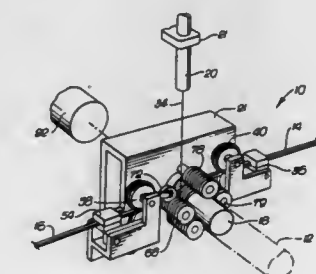
Donald R. Chivens, Northridge, and Paul Greskovics, Manhattan Beach, both of Calif., assignors to Alopex Industries, Inc., San Marcos, Calif.

Filed Mar. 25, 1986, Ser. No. 843,509

Int. Cl.⁴ B23K 27/00

U.S. Cl. 156—195

8 Claims



1. A method of making spiral wound hose, comprising the steps of:

- spirally winding an inner strip of thermoplastic material onto a mandrel, the inner strip having a generally U-shaped geometry defined by a central web joined at opposite ends to a pair of generally parallel ribs, said inner strip winding step comprising winding the strip in a radially outwardly open orientation with the ribs of adjacent spiral turns in generally abutting back-to-back relation;
- spirally winding an outer strip of thermoplastic material onto the mandrel over the inner strip, the outer strip having an outboard wall joined at its opposite ends to a pair of generally parallel legs, said outer strip winding step comprising winding the outer strip in a radially inwardly open orientation with the outboard wall overlying adjacent ribs of adjacent spiral turns of the inner strip and with the legs disposed in axially outboard positions relative to said adjacent ribs; and
- laser welding the inner and outer strips together along a continuous line of contact at the juncture of the outboard wall of the outer strip and the underlying adjacent ribs of the inner strip to form the spiral wound hose.

4,714,509

METHOD AND APPARATUS FOR LAYING DOWN TAPES

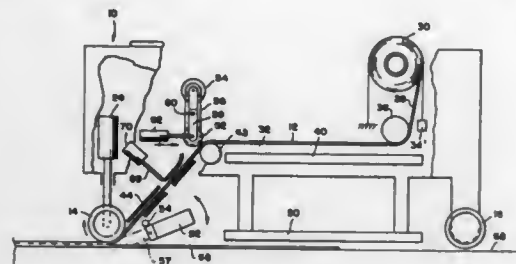
Mark B. Gruber, New Castle, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Jul. 2, 1984, Ser. No. 626,907

Int. Cl.⁴ B32B 31/26

U.S. Cl. 156—272.2

4 Claims



1. A method of building and consolidating a composite structure from a fiber-reinforced, thermoplastic, polymeric tape, said method comprising the steps of advancing successive lengths of tape toward and at an angle to a work surface, pressing the advancing length on the preceding length, with a consolidating force, during relative movement between the two lengths, and directing a beam of high temperature, radiant energy at and across the nip between the advancing and preceding lengths of tape, with the center of the beam on the structure, heating the mating surfaces of the matrices to the melting point substantially simultaneously through 5–20% of the thickness of each tape by directing a major portion of the radiant energy at the preceding length on the building structure and the rest of the radiant energy at the advancing tape, the speed of relative movement and the temperature of the radiant energy interrelated to heat, fuse and join the thermoplastic, polymeric matrices at the mating surfaces of the tapes being consolidated.

4,714,510

METHOD OF BONDING PROTECTIVE COVERS ONTO SOLAR CELLS

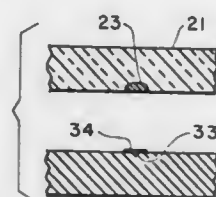
James F. Holt, Medway, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 25, 1986, Ser. No. 900,055

Int. Cl.⁴ C03C 27/02, 27/10; H01L 31/00, 31/18

U.S. Cl. 437—2

7 Claims



1. A method for bonding a protective cover to a solar cell having on an active surface thereof at least one area including the photovoltaic junction of said solar cell and a metallic gridwork defining said at least one area and providing an electrical contact for said solar cell, said method comprising the steps of:

- (a) providing a substrate;
- (b) depositing onto said substrate said metallic gridwork of said solar cell;

- (c) overlaying said cover in contact with said metallic gridwork on said substrate;
- (d) heating said cover, metallic gridwork and substrate under pressure to impress said metallic gridwork into the surface of said cover contacting said metallic gridwork;
- (e) removing said cover and metallic gridwork from said substrate;
- (f) applying a thin metallic adherent layer on said solar cell in configuration corresponding to that of said metallic gridwork of said solar cell;
- (g) applying a metallic compatibility layer to said solar cell over said metallic adherent layer in substantially identical configuration thereto;
- (h) overlaying said cover and metallic gridwork onto said solar cell with said metallic gridwork in registration with said metallic compatibility layer; and
- (i) bonding said metallic gridwork to said metallic compatibility layer where said cover is protectively attached to said solar cell.

4,714,511

METHOD AND APPARATUS FOR ADHERING A TAPE OR SHEET TO A SEMICONDUCTOR WAFER

Kunimichi Nakao, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

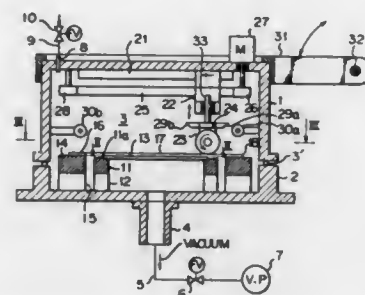
Filed Feb. 25, 1986, Ser. No. 833,308

Claims priority, application Japan, Feb. 27, 1985, 60-39996

Int. Cl.⁴ B32B 31/20

U.S. Cl. 156—285

12 Claims



1. An apparatus for adhering a tape or sheet material having an adhesive back surface to a back surface of a substantially disk-shaped semiconductor wafer having a front surface with an electric pattern being formed thereon, said apparatus comprising:

- a housing having a vacuum working chamber therein;
- a table provided in said working chamber and having a cylindrical supporting section for horizontally supporting the semiconductor wafer thereupon in a manner such that only a peripheral portion of said front surface of said semiconductor wafer is in contact therewith;
- means for provided in said working chamber for holding said tape or sheet material at a predetermined position such that said adhesive back surface of said tape or sheet material is located to said back surface of said semiconductor wafer and a predetermined clearance is maintained therebetween;
- means for physically pressing said tape or sheet material against said semiconductor wafer in order to provisionally adhere them together along at least the periphery thereof using such slight pressure that said wafer will not be damaged; and
- a valve means for regulating air pressure in said vacuum working chamber for successive complete adhering.

4,714,512

POLYURETHANE COATINGS AND ADHESIVES

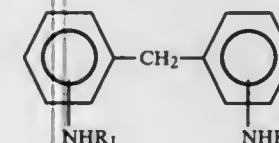
David W. House, Arlington Heights, and Ray V. Scott, Jr., Addison, both of Ill., assignors to UOP Inc., Des Plaines, Ill. Continuation-in-part of Ser. No. 715,719, Mar. 25, 1985, Pat. No. 4,578,446. This application Jan. 23, 1986, Ser. No. 821,722

Int. Cl.⁴ C09J 5/10

U.S. Cl. 156—306.6

38 Claims

1. A method of bonding two surfaces each of which is selected from the group consisting of rubber, plastics, wood, metal, fabrics, paper, and leather comprising placing between said surfaces of film of a polyurethane resulting from the reaction of an isocyanate terminated urethane prepolymer, said prepolymer being the adduct of from about 1.5 to about 4.0 equivalents of a polyisocyanate with 1 equivalent of a polyol, with from about 0.80 to about 1.2 equivalents of a secondary aromatic diamine as the sole curing agent of the structure,



where each alkyl group, R₁ and R₂, contains from 4 to about 20 carbon atoms, pressing together said surfaces so that each surface is in contact with the film under pressure, heating the film to a temperature between 75° and 150° C. for a time sufficient to melt the film, and cooling the film while maintaining the surfaces under pressure for a time sufficient to achieve adhesion.

4,714,513

APPARATUS FOR FUSION WELDING PLASTIC PIPE JOINTS

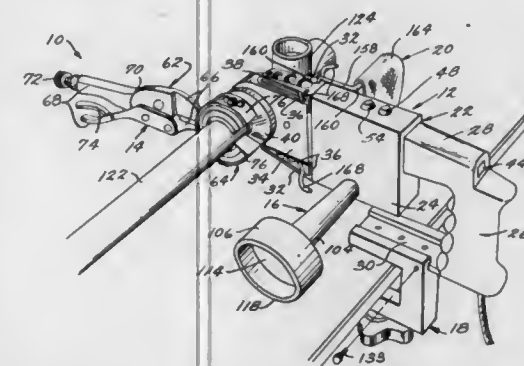
Roy E. McAlister, 5285 N. Red Rock Dr., Phoenix, Ariz. 85018

Filed Apr. 9, 1984, Ser. No. 598,154

Int. Cl.⁴ B29C 65/02, 65/18

U.S. Cl. 156—359

37 Claims



1. Apparatus for use in fusion welding joints in a plastic pipe system comprising:

- a heating device including;
- a housing providing a rearwardly disposed pistol grip handle,
- a heating member having opposed sides facing in directions corresponding to opposed sides of said pistol grip handle,
- means for securing said heating member in heat insulating relation to said housing in a forwardly extending position with respect to said pistol grip handle,
- a secondary handle structure detachably fixedly secured to a side of said housing at one end thereof and extending outwardly therefrom,
- depth gauge means on the outer end of said secondary handle for receiving the end of a plastic pipe and determining the depth to which said pipe end should be heated to

fusion weld the same into a mating socket of a plastic fitting,

a clamping device operable to be clamped in rounding engagement with the exterior periphery of the plastic pipe at a position inwardly of the depth thereof determined by said depth gauge means,

a heatable socket member detachably fixedly secured to one side of said heating member for receiving in heat conducting relation therein a plastic pipe end up to the depth determined by the position of said clamping device thereon,

a heatable plug member detachably fixedly secured to the other side of said heating member for receiving in heat transmitting relation thereof a mating socket of a plastic fitting,

said heating device further including means for controllably heating said heating member so as to bring said heatable socket member and said heatable plug member to a desired temperature, and

timing signal means for providing signal means for enabling an operator to determine the time when the pipe end and mating socket should be removed from heat transmitting relation with the heated socket and plug members respectively.

4,714,514

BASEPLATE CONSTRUCTION FOR AN IRON USED TO FACE SEAM CARPET WITH HOT MELT ADHESIVE TAPE

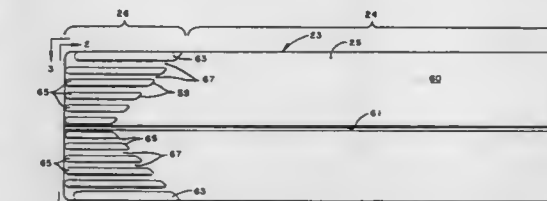
Merle R. Hoopengardner, Lafayette, Calif., assignor to Orcon Corporation, Union City, Calif.

Filed Jun. 20, 1986, Ser. No. 876,838

Int. Cl.⁴ B29C 65/20; D06F 75/38

U.S. Cl. 156—391

7 Claims



1. A carpet seaming iron of the kind used for making a face seam between two pieces of carpet by heating a layer of hot melt adhesive on a carpet seaming tape positioned beneath the carpet backings at the seam and extending along the length of the seam, said iron comprising,

baseplate means having a lower surface engageable with the hot melt adhesive layer on the tape for heating the hot melt adhesive to a molten condition as the iron is moved along the tape,

handle means for manually moving the iron along the tape and beneath the carpet backings at the seam,

surface means on the upper surface of the iron and engageable with the undersides of the carpet backings for progressively lifting the backings from the tape at the front of the iron, as the iron is moved along the tape, and then lowering the backings onto the layer of molten adhesive at the back of the iron,

groove means formed in the lower surface of the baseplate means and including a longitudinally extending, center groove having a length, depth, width, and alignment effective to form, in the layer of molten adhesive produced behind the moving iron, a raised center bead of a sufficient height and stiffness to coat the side edges of the carpet backings with hot melt adhesive as the undersides of the carpet backings are lowered onto the layer of molten adhesive and to thereby cause said side edges of the backings to be locked directly together through the adhesive interposed between said side edges, and

flat surface means at the forward part of the lower surface of the baseplate means having a sufficient length to heat the hot melt adhesive to a molten state and to therefore speed up the seaming process, said flat surface means including a flat surface which extends from the front of the baseplate over the first $\frac{1}{4}$ to $\frac{1}{2}$ of the lower surface for providing good heating contact of that forward surface with the adhesive, and

wherein the rearward part of said lower surface has a ribbed surface formed with a number of longitudinally extending ribs projecting from the plane of said flat surface to meter the molten adhesive evenly over the full width of the tape and wherein the leading edges of the ribs are longitudinally offset so as to form a V shape construction for helping to funnel molten adhesive both into the channels between the ribs and into said center groove at the apex of the V as the iron is moved along the tape.

4,714,515

STRAIGHT LINE CONTAINER LABELING APPARATUS

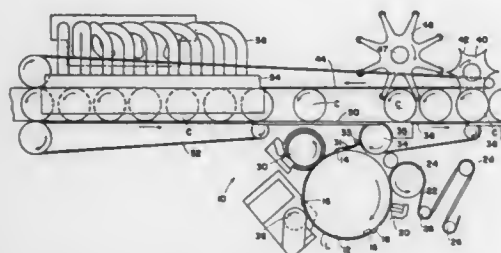
Wolfgang W. Hoffmann, Modesto, Calif., assignor to Shibuya America Corporation, Modesto, Calif.

Filed Sep. 22, 1986, Ser. No. 910,024

Int. Cl.⁴ B65C 3/12, 9/04, 9/34

U.S. Cl. 156—450

6 Claims



1. Labeling apparatus comprising:

- a main drive belt moving in one linear direction;
- a labeling belt moving in the opposite linear direction;
- said belts being generally parallel and spaced to engage diametrically opposite sides of a generally cylindrical container so that a container therebetween is rotated thereby;
- said drive belt moving at a greater speed than that of said labeling belt so that a container therebetween is moved slowly in the direction of movement of said drive belt;
- means for delivering containers between said belts at the upstream end of said drive belt; and
- means for delivering gummed labels to the upstream end of said labeling belt.

4,714,516

METHOD TO PRODUCE VIA HOLES IN POLYMER DIELECTRICS FOR MULTIPLE ELECTRONIC CIRCUIT CHIP PACKAGING

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 26, 1986, Ser. No. 912,455

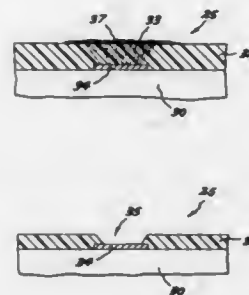
Int. Cl.⁴ B44C 1/22; B29C 37/00; C03C 15/00, 25/06

U.S. Cl. 156—628

12 Claims

1. A method for producing holes in a polymer film, said method comprising the steps of:
 - irradiating a spot on said film, where said hole is desired, with a burst of focused electromagnetic energy at a level

sufficient to damage said film without substantial ablation of said film; and



plasma etching said irradiated film so as to remove said damaged film.

4,714,517

COPPER CLEANING AND PASSIVATING FOR TAPE AUTOMATED BONDING

Devi P. Malladi, Campbell; Ranjan Mathew, San Jose, and Divyesh P. Shah, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 8, 1986, Ser. No. 861,210

Int. Cl.⁴ C23F 1/00; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—629

8 Claims

1. In the process for cleaning and passivating copper parts that are to be employed for assembling semiconductor devices the steps of:

- cleaning said copper parts in a strong caustic solution;
- passivating said copper parts in an aqueous solution of a mild organic acid;
- rinsing said copper parts in water;
- drying said copper parts; and
- thermocombination bonding said cleaned and passivated parts.

4,714,518

DUAL LAYER ENCAPSULATION COATING FOR III-V SEMICONDUCTOR COMPOUNDS

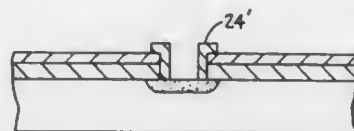
Arumugam Satyanarayan, Bradford, and Aland K. Chin, Sharon, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 14, 1987, Ser. No. 3,317

Int. Cl.⁴ B44C 1/22

U.S. Cl. 156—635

17 Claims



10. A process for providing a metallized contact to a III-V compound semiconductor of the type having an encapsulation coating thereon consisting of a layer of silicon deposited on the III-V compound semiconductor at a deposition temperature not exceeding the congruent evaporation temperature of the III-V compound semiconductor, said silicon layer, in turn, being overlaid with a layer of silicon nitride, said process comprising:

- defining select areas to etch on the outside surface of the silicon nitride layer by masking those areas on the outside surface of the silicon nitride layer not to be etched;
- reactive ion etching the silicon nitride layer in the areas selectively defined for etching;
- plasma etching the silicon layer in the areas selectively defined for etching;

electron beam evaporation titanium and gold in sequence to overlay the select areas of the III-V compound exposed by said etching; and

heating said titanium and gold to provide an alloy of titanium and gold.

4,714,519

METHOD FOR FABRICATING MOS TRANSISTORS HAVING GATES WITH DIFFERENT WORK FUNCTIONS

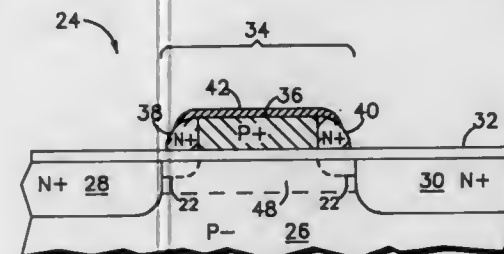
James R. Pfeister, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1987, Ser. No. 31,304

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 437—81

11 Claims



1. A process for fabricating an insulated gate field effect transistor (IGFET) comprising the steps of:

- providing a semiconductor substrate;
- forming a layer of gate dielectric material on the semiconductor substrate;
- providing a doped semiconductor material gate region on the gate dielectric material, the gate region doped with an impurity of a first conductivity type;
- forming a conformal layer of a doped semiconductor material over the gate region and the gate dielectric material layer, the conformal layer doped with an impurity of a second conductivity type; and
- performing an anisotropic etch of the conformal layer of doped semiconductor material to leave sidewalls on the gate region, where the gate region forms a central portion of a gate and the sidewalls form end portions of the gate.

4,714,520

METHOD FOR FILLING A TRENCH IN AN INTEGRATED CIRCUIT STRUCTURE WITHOUT PRODUCING VOIDS

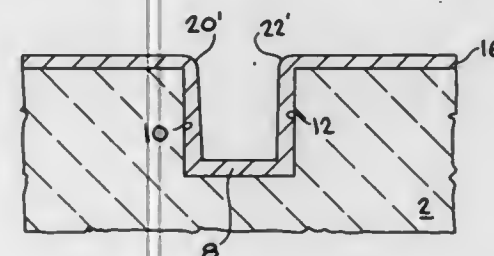
Peter S. Gwozdz, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 25, 1985, Ser. No. 759,621

Int. Cl.⁴ B23P 15/00; B44C 1/22; B05D 5/12

U.S. Cl. 437—228

18 Claims



1. A process for filling a trench in an integrated circuit structure without forming a void in said trench which comprises:

- (a) partially filling said trench with an etchable material;
- (b) etching said material in said trench with an etchant capable of preferentially removing material on the sidewall of said trench adjacent the top of said trench at a rate faster

than the rate of removal of material on the sidewall of said trench adjacent the bottom of said trench; and

- (c) then filling the remainder of said trench with filler material; whereby said filler material subsequently deposited adjacent the top of said trench will not close off said trench prior to complete filling of the bottom of said trench with said filler material wherein said etchable material is deposited in said trench using a vapor deposition process; wherein said etching step comprises a vapor etch carried out at a temperature greater than 300° C. and a partial pressure of at least 1 Torr to provide a graduated etching of said sidewalls of said trench by said high partial pressure of said etchant, relative to the partial pressure of said deposition, which inhibits penetration of said etching into said trench.

4,714,521

TWIN WIRE FORMER WITH AN IMPERMEABLE BELT INSIDE THE TOP WIRE

Haruyoshi Fujiwara, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP85/00632, § 371 Date Jun. 25, 1986, § 102(e) Date Jun. 25, 1986, PCT Pub. No. WO86/02961, PCT Pub. Date May 22, 1986

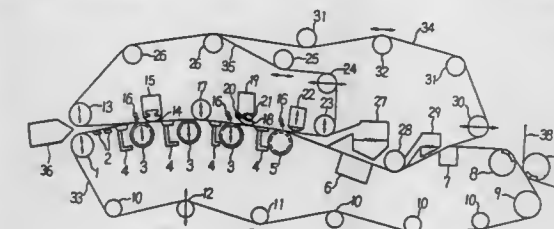
PCT Filed Nov. 13, 1985, Ser. No. 882,978

Claims priority, application Japan, Nov. 15, 1984, 59-241475

Int. Cl.⁴ D21F 9/02, 1/00

U.S. Cl. 162—300

1 Claim



1. A twin wire former comprising:

- a top endless wire loop adjacent a bottom wire endless loop and between which a dewatering section is defined;
- a water impermeable belt disposed within said top endless wire loop, said belt travelling along the inner side of said top wire over a first portion of said dewatering section, said top and said bottom wire loops and said belt being positioned so that dewatering occurs in said first portion of the dewatering section on only one side of the twin wire former through the bottom wire, and in a subsequent portion of the dewatering section through both the top and the bottom wires;
- a plurality of adjustable rolls or adjustable shoes within said belt and said top wire and over which said belt travels in said first portion of the dewatering section; and
- adjusting means for adjusting the positions of said rolls or said shoes for varying the relative wrapping angles of the belt and the wires.

4,714,522

DEVICE FOR DECELERATING FAST-FLOW CURRENTS OF WHITE WATER

Herbert Holik, Ravensburg, Fed. Rep. of Germany, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jul. 23, 1986, Ser. No. 888,363

Claims priority, application Switzerland, Jul. 30, 1985, 03300/85

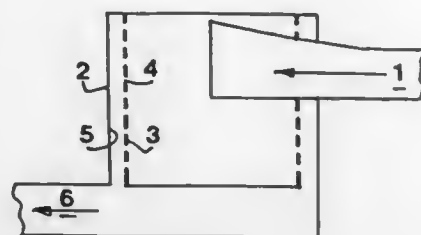
Int. Cl.⁴ D21F 1/68

U.S. Cl. 162—264

9 Claims

1. Paper making apparatus comprising a high speed paper

making machine having a base and in which is generated a fast-flowing current of white water; a stilling tower having a bounding wall and containing a screen cage spaced radially inward from said wall and including a curved inner wall; duct means at or above the elevation of the base of the paper making machine and in communication with the inside of the screen cage and structured for guiding white water out of said machine and causing it to flow along the curved inner wall of the screen cage at substantially its speed of generation, the screen



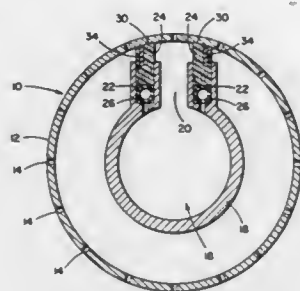
cage also including through openings which divide white water flowing along its inner wall into a multiplicity of individual jets which are directed radially to impinge upon, and thereby to be decelerated by, said bounding wall, said openings constructed so that the jets strike the bounding wall perpendicularly and do not flow obliquely to the bounding wall; and a channel connected with a lower region of the stilling tower for collecting and discharging white water which descends along the bounding wall following said impingement of the jets upon that wall.

4,714,523

SUCTION ROLL SEAL STRIPS WITH TEFLON INSERT
William D. Sawyer, Jr., and William D. Sawyer, Sr., both of 100 Enterprise St., West Monroe, La. 71291
Filed Dec. 18, 1986, Ser. No. 943,043
Int. Cl.⁴ D21F 3/10

U.S. Cl. 162—371

4 Claims



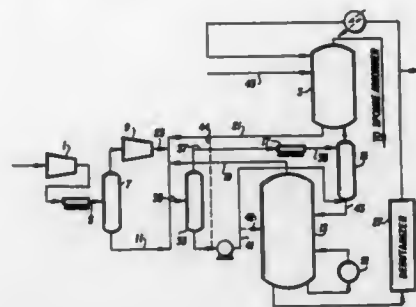
1. In a suction roll of a paper making machine having a rotatable perforated cylindrical shell and a vacuum box means disposed stationarily internally of the shell with said vacuum box including an edge structure defining a slot extending throughout the width of the suction roll in operative communication with said vacuum box, and sealing strips extending from said edge structure in the vacuum box and engaging the internal surface of the perforated shell for forming a seal so that vacuum induced in the vacuum box is associated with the internal surface of the perforated shell, each sealing strip comprising a body member of wear resistant material having an outer surface forming an interface with the internal surface of the shell, the improvement wherein each sealing strip further includes a lengthwise inlay strip of PTFE material exposed at said outer surface of the sealing strip for rubbing against the internal surface of the shell and smearing across said outer surface thereby providing reduced friction and improved lubrication at said interface.

4,714,524 APPARATUS FOR MINIMIZING RECYCLING IN AN UNSATURATED GAS PLANT

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Division of Ser. No. 688,084, Dec. 31, 1984, Pat. No. 4,605,493.
This application Apr. 18, 1986, Ser. No. 853,517
Int. Cl.⁴ C10G 7/02

U.S. Cl. 196—98

4 Claims



1. An unsaturated gas plant, comprising:

first means for receiving a low pressure gas and separating said low pressure gas into a liquid output and a gaseous output;

an absorber for receiving unstabilized gasoline and a lean hydrocarbon oil, and producing a gaseous overhead product and an absorber bottoms product therefrom;

a stripper for receiving and separating a liquid hydrocarbon input into a gaseous overhead product and a liquid bottoms product;

first conduit means interconnecting the first means, the absorber and the stripper for supplying an admixture comprising the liquid and gaseous outputs from said first means, said absorber bottoms product and the gaseous overhead product from said stripper to a high temperature separator for separating said admixture into a liquid hydrocarbon output and a gaseous output, said high temperature separator being connected to said stripper for conveying said liquid hydrocarbon output thereto and further connected to a condenser in series with a low temperature separator for conveying said gaseous output from said high temperature separator thereto for separating a condensed gaseous output from said condenser into a gaseous overhead product output and a liquid bottoms product, said low temperature separator being connected to said absorber for conveying said gaseous overhead product output thereto and further connected to said stripper for conveying said liquid bottoms product output thereto.

4,714,525

PROCESS FOR SEPARATING HIGH PURITY WATER
Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, Nev.

Continuation of Ser. No. 371,411, Apr. 23, 1982, which is a division of Ser. No. 111,229, Jan. 11, 1980, Pat. No. 4,331,513, which is a continuation of Ser. No. 823,677, Aug. 11, 1979, abandoned, which is a continuation of Ser. No. 590,071, Jun. 25, 1975, abandoned, which is a division of Ser. No. 497,451, Aug. 14, 1974, Pat. No. 4,008,046, which is a division of Ser. No. 126,623, Mar. 22, 1971, Pat. No. 3,872,223. This application Jan. 3, 1986, Ser. No. 815,783
Int. Cl.⁴ C02F 1/04; C01B 5/02

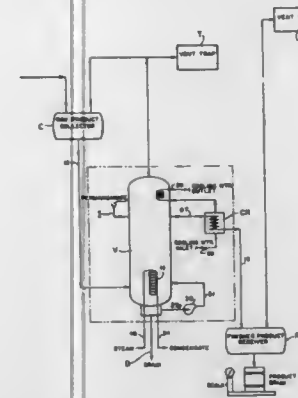
U.S. Cl. 203—10

8 Claims

1. A process for separating essentially pure water enriched in deuterium from liquid water which contains dissolved contaminant matter, comprising:

(a) supplying said liquid water to the lower section of a closed vessel, said closed vessel comprising said lower

section, an upper section and an intermediate section communicating between said lower and upper sections, (b) heating and vaporizing said water in said lower section, (c) passing said vaporized water from step (b) upwardly in said intermediate section of said closed vessel, (d) withdrawing from said intermediate section a portion of said vaporized water which has traversed the major part of said intermediate section, (e) passing the other portion of said vaporized water upwardly through the remaining part of said intermediate section into said upper section,



(f) condensing vaporized water from step (e) in said upper section,

(g) passing all of the condensed water from said upper section to said lower section downwardly through said intermediate section to said lower section in countercurrent contact with the vaporized water passing therein,

(h) condensing vaporized water withdrawn in step (d), and (i) collecting condensed essentially pure water enriched in deuterium from step (h) essentially free of said matter.

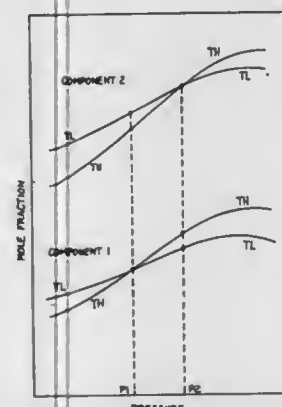
4,714,526

SUPERCRITICAL FLUID EXTRACTION METHOD FOR MULTI-COMPONENT SYSTEMS

Kenneth Pennisi, and Eldred Chimowitz, both of Rochester, N.Y., assignors to The University of Rochester, Rochester, N.Y.

Continuation of Ser. No. 743,339, Jun. 10, 1985, abandoned.
This application Mar. 17, 1987, Ser. No. 26,603
Int. Cl.⁴ B01D 3/34; C07C 3/20, 51/44
U.S. Cl. 203—49

30 Claims



1. A process for extracting n pure components from a multi-component system, where n is the number of components in the system, where each of said n components has a cross-over pressure point different from the other components thereby resulting in a range of cross-over pressure points from a highest

cross-over pressure point through a next highest cross-over pressure point to lower cross-over pressure points, and where said cross-over pressure point for any n component comprises a pressure being defined on a plot of component solubility versus pressure where temperature isotherms for said component cross, which comprises the steps of

- (1) passing a supercritical fluid through a first enclosed region, said region containing said multi-component system, at a first temperature sufficient to maintain the supercritical fluid in its supercritical state and at a pressure near a cross-over pressure point of any component present in said system thereby generating a fluid component mixture,
- (2) passing said fluid-component mixture from said first enclosed region into a second enclosed region,
- (3) changing said temperature to a second temperature in said second enclosed region to change the solubility of all components in said mixture having different cross-over pressure points causing said components to deposit in said second enclosed region,
- (4) drawing off the remaining fluid-component mixture and passing said mixture into a third enclosed region,
- (5) changing the temperature in said third enclosed region to said first temperature plus an incremental factor causing only the component present in said remaining mixture near the cross-over pressure point to deposit therein,
- (6) drawing off the remaining fluid-component mixture, and
- (7) repeating steps 1-5 on the components deposited in step 3 until all n components have been purified.

4,714,527

PROCESS FOR MEASURING THE POTENTIAL DIFFERENCE BETWEEN A SAMPLE LIQUID AND A REFERENCE ELECTROLYTE

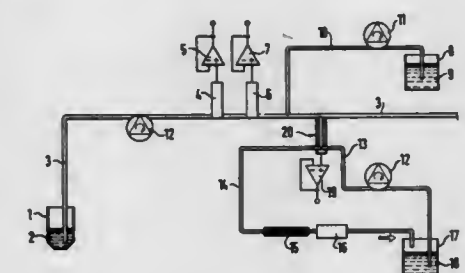
Gerhard Hofmeier, Karl Petersen, and Wolfgang Schroeder, all of Hamburg, Fed. Rep. of Germany, assignors to Eppendorf Geratebau Netheler + Hinz GmbH, Hamburg, Del.X
Filed May 8, 1986, Ser. No. 860,860

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517131

Int. Cl.⁴ G01N 27/46

U.S. Cl. 204—1 T

4 Claims



1. A process for measuring a potential difference between a flow of sample liquid delivered by pumping and a reference electrolyte, comprising the steps of:

- providing an apparatus defining a channel for a sample liquid flow and comprising a reference electrode in contact with said sample flow, said electrode comprising a reference element and defining a capillary channel having a first and second end and extending transversely to said sample flow, said first end opening into said sample flow and said second end receiving reference electrolyte to be fed into said capillary channel;
- pumping said sample flow transverse to said capillary channel through said sample flow channel; and
- pumping a flow of reference electrolyte transverse to said capillary channel and over said second end before said potential difference is measured.

4,714,528

PROCESS FOR PRODUCING ALUMINUM SUPPORT FOR LITHOGRAPHIC PRINTING PLATE

Makoto Takeuchi; Etsuo Kitazumi; Hirokazu Sakaki, and Yoshio Okishi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 18, 1986, Ser. No. 886,625

Claims priority, application Japan, Jul. 26, 1985, 60-165545

Int. Cl.⁴ C25F 3/04; B24C 1/08; C23F 1/02

U.S. Cl. 204—33

16 Claims

1. A process for producing an aluminum support for a lithographic printing plate, which comprises roughening an aluminum plate surface by a liquid honing process to form a first grain thereon and then modifying the first grain by a brush graining process.

14. The process of claim 1, wherein the modified surface is anodized to form an anodic oxidation film thereon in an amount of 0.1 to 10 g/m².

4,714,529

METHOD OF COATING METAL SURFACES IN OIL-BASED LUBRICANTS

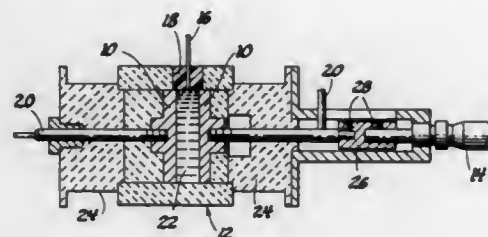
Su-Chee S. Wang, Sterling Heights, and Simon C. Tung, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1985, Ser. No. 809,126

Int. Cl.⁴ C25D 11/00, 11/36

U.S. Cl. 204—56.1

4 Claims



1. A method of forming a friction-reducing and wear-reducing film on the surface of a cast iron anode means spaced apart from a cathode means both immersed in an oil-based lubricant by an electrochemical process comprising the steps of blending an electrolytic additive of a dialkyl hydrogen phosphate into said oil-based lubricant such that sufficient electrical current may pass in said lubricant, passing an electrical current of sufficient current density between said anode and cathode means whereby a friction-reducing and wear-reducing film is formed substantially of iron phosphate on the surface of said anode means.

4,714,530

METHOD FOR PRODUCING HIGH PURITY QUATERNARY AMMONIUM HYDROXIDES

Cecil H. Hale; Alan R. Tanner, and Bryan M. Hale, all of Austin, Tex., assignors to Southwestern Analytical Chemicals, Inc., Austin, Tex.

Filed Jul. 11, 1986, Ser. No. 884,505

Int. Cl.⁴ C25F 5/00

U.S. Cl. 204—131

25 Claims

1. A process of improving the purity of quaternary ammonium hydroxides obtained by the electrolysis of the corresponding quaternary ammonium salt which comprises the steps of

- charging an aqueous solution containing the quaternary ammonium hydroxide to the anolyte compartment of an electrolysis cell which comprises an anolyte compartment and a catholyte compartment containing water separated from each other by a cation-exchange membrane,
- passing a direct current through the electrolysis cell to

produce a high purity quaternary ammonium hydroxide in the catholyte compartment, and
(c) recovering the high purity quaternary ammonium hydroxide from the catholyte compartment.

4,714,531

PROCESS FOR COATING AN ELECTRICALLY CONDUCTIVE SUBSTRATE AND AN AQUEOUS COATING COMPOSITION BASED ON CATIONIC BINDER

Chantal H. Guioth, Rantigny; Etienne G. Maze, Breuil Le Vert, and Jean J. Trescol, Nogent Sur Oise, all of France, assignors to Akzo NV, Arnhem, Netherlands

Filed Jul. 7, 1986, Ser. No. 882,378

Claims priority, application Netherlands, Jul. 5, 1985, 8501938

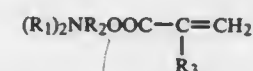
Int. Cl.⁴ C25D 13/06

U.S. Cl. 204—181.7

17 Claims

1. A process for coating a substrate, comprising applying to said substrate an aqueous coating composition based on a cationic binder obtained by polymerization of a monomer mixture in the presence of 1-20 parts by weight of a polyethylenically unsaturated compound,

said monomer mixture consisting of (a) 1-30% by weight of a hydroxy(cyclo)alkyl (meth)acrylate of which the (cyclo)alkyl group contains 2-8 carbon atoms, (b) 4-45% by weight of an amino (meth)acrylate of the formula:



wherein at least one of the groups R₁ is a hydrocarbon group containing 1-12 carbon atoms and the other group R₁ is a hydrocarbon group containing 1-12 carbon atoms or a hydrogen atom, or the two groups R₁, together with the nitrogen atom attached thereto, form a heterocyclic group, R₂ is a hydrocarbon group containing 2-12 carbon atoms and R₃ is a hydrogen atom or a methyl group, (c) 0-80% by weight of a monovinyl aromatic hydrocarbon containing 8-14 carbon atoms, and (d) 0-15% by weight of a different monoethylenically unsaturated monomer containing 2-20 carbon atoms;

said polyethylenically unsaturated compound being an epoxy group-free of a bisphenol bisglycidyl ether and an ethylenically unsaturated amino amine formed from (a) a polyamine having 1-12 primary amino groups and 1-2 secondary amino groups and (b) an ethylenically unsaturated monocarboxylic acid having 18-24 carbon atoms; amino groups present in said binder being at least partially neutralized with an acid.

4,714,532

PROCESS FOR COATING AN ELECTRICALLY CONDUCTIVE SUBSTRATE AND AN AQUEOUS COATING COMPOSITION BASED ON A CATIONIC BINDER

Chantal H. Guioth, Rantigny; Etienne G. Maze, Breuil Le Vert, and Jean J. Trescol, Nogent Sur Oise, both of France, assignors to Akzo NV, Arnhem, Netherlands

Filed Jul. 7, 1986, Ser. No. 882,382

Claims priority, application Netherlands, Jul. 5, 1985, 8501936

Int. Cl.⁴ C25D 13/06

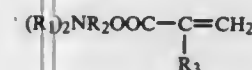
U.S. Cl. 204—181.7

16 Claims

1. A process for coating a substrate, comprising applying to said substrate an aqueous coating composition based on a cationic binder obtained by polymerization of a monomer mixture in the presence of 1-45 parts by weight of a polyethylenically unsaturated compound per 100 parts by weight of the monomer mixture,

said monomer mixture consisting of (a) 1-30% by weight of

a hydroxy(cyclo)alkyl(meth)acrylate of which the cyclo(alkyl) group contains 2-8 carbon atoms, (b) 4-45% by weight of an amino(meth)acrylate of the formula:



where at least one of the groups R₁ is a hydrocarbon group containing 1-12 carbon atoms and the other group R₁ is a hydrocarbon group containing 1-12 carbon atoms or a hydrogen atom, or the two groups R₁, together with the nitrogen atom attached thereto, form a heterocyclic group, R₂ is a hydrocarbon group containing 2-12 carbon atoms and R₃ is a hydrogen atom or a methyl group, (c) 0-80% by weight of a monovinyl aromatic hydrocarbon containing 8-14 carbon atoms, and (d) 0-50% by weight of a different monoethylenically unsaturated monomer containing 2-20 carbon atoms;

said polyethylenically unsaturated compound being a butadiene polymer built up of 70-100% by weight of 1,3-butadiene and 0-30% by weight of a copolymerizable monomer and having a number average molecular weight of 460-5400;

amino groups present in said binder being at least partially neutralized with an acid.

4,714,533

ELECTROLYSER FOR HIGHLY-ACTIVE TRITIATED WATER

André Rahier, Soumagne; René D. W. Cornelissen, Mol, and Aimé Bruggeman, Retie, all of Belgium, assignors to Studicentrum voor Kernenergie, S.C.K., Brussels, Belgium

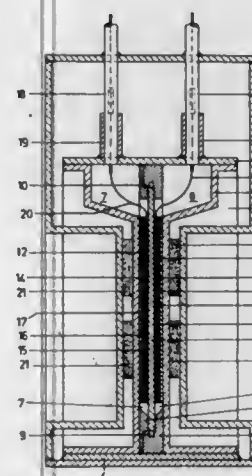
Filed Apr. 18, 1986, Ser. No. 853,604

Claims priority, application Belgium, Apr. 25, 1985, 2/60672

Int. Cl.⁴ C25B 9/00, 11/08, 13/04

U.S. Cl. 204—262

16 Claims



1. An electrolyser for highly-active tritiated water, which electrolyser comprises a cell, which cell has:

- a tightly-sealed cell housing,
- an inorganic porous gas separator which has a porosity between 30 and 70%, and a pore diameter between 10 and 100 μm, and is gas impermeable when soaked-through with liquid, which separator divides said cell housing into two compartments,
- two electrodes which are respectively mounted in said two compartments and which both lie in moistening contact with the gas separator, in such a way that when said latter separator is moistened, said electrodes are also moistened,
- current-supply lines which connect to said electrodes,

two gas outlets which connect respectively to the two compartments, and

at least one liquid inlet which opens on the gas separator in such a way that said latter separator is moistened by capillarity with the liquid fed through the liquid inlet.

12. An electrolyser as defined in claim 1, which further comprises cooling means which are mounted in front of the electrodes, on the outer side of the cell housing.

4,714,534

ELECTROLYTIC HALOGENATOR DEVICE

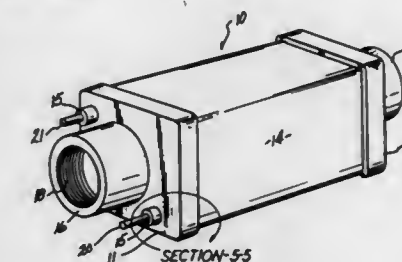
David L. Fair, Cheshire; Robert A. Dean, Guilford, both of Conn., and Arlon G. Sangster, Sterling, Mass., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 20, 1986, Ser. No. 876,545

Int. Cl.⁴ C25B 9/00, 11/02, 9/04

U.S. Cl. 204—269

12 Claims



1. An electrolytic cell for the production of halogen for use as a sanitizing agent in water, comprising in combination:

- a plurality of generally planar electrode plates having a halogen evolving coating and assembled in interleaved fashion, the electrode plates further having two opposing substantially parallel sides, a first side being longer than a second side, and interconnected by an obliquely angled third side with respect to the two opposing substantially parallel sides and a fourth side, the plurality of electrode plates being assembled so that the first longer side of each electrode plate is alternately arranged with respect to the adjacent electrode plates on an opposing side;
- a first bus bar and a second bus bar connectable to a source of electrical power external of the electrolytic cell connected to the plurality of generally planar electrode plates adjacent the intersection of the first longer side and the obliquely angled third side such that the first bus bar is connected to every other electrode plate and the second bus bar is connected to the remaining electrode plates;
- a housing surrounding the plurality of electrode plates within which the plurality of electrode plates fit;
- a plurality of electrode plate retaining means within the housing forming a plurality of grooves into which the two opposing parallel sides of the electrode plates fit to hold each electrode plate in place to maintain uniform spacing between the adjacent electrode plates;
- an inlet end closure means with an inlet conduit to close the inlet end of the electrolytic cell and to permit water to flow into the cell for electrolysis, the inlet end closure means further having a first cone-shaped orifice through which the first bus bar passes and a second cone-shaped orifice through which the second bus bar passes;
- an outlet end closure means with an outlet conduit to close the outlet end of the electrolytic cell and to permit water and halogen to flow out of the cell;
- a first fixture and a second fixture connected to the housing through which pass the first bus bar and the second bus bar prior to exiting the cell; and
- a first elastomeric seal fitting about the first bus bar and a second elastomeric seal fitting about the second bus bar, the first elastomeric seal and the second elastomeric seal being compressed into the first and second cone-shaped orifices, respectively, by the pressure of the inlet end closure means transmitted through the first fixture and the

second fixture, respectively, to the first and second elastomeric seals to effect a liquid-tight seal at the first and second cone-shaped orifices.

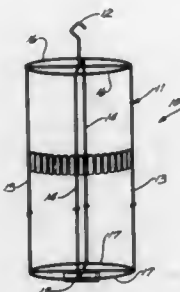
4,714,535

MOLDED FRAMEWORK FOR ELECTROLESS AND ELECTROLYTIC PLATING RACKS

Robert L. Coombes, Jr., La Canada Flintridge; Merrill J. Owen, La Canada; Terence C. Colwell, West Covina, and Donald E. Walker, Upland, all of Calif., assignors to Crown City Plating Co., El Monte, Calif.

Filed May 22, 1986, Ser. No. 865,758

Int. Cl.⁴ B05C 11/00, 11/16; C25D 17/08; A47F 5/08
U.S. Cl. 204—297 W 28 Claims



1. A product substrate assembly mountable on the framework of a plating rack comprising:
 - a runner system comprising at least one runner and means for releasably engaging the framework of the plating rack; and
 - at least one product substrate removably attached to the runner.

4,714,536

PLANAR MAGNETRON SPUTTERING DEVICE WITH COMBINED CIRCUMFERENTIAL AND RADIAL MOVEMENT OF MAGNETIC FIELDS

Kenneth F. Freeman, Mountain View; Charles B. Garrett, San Jose; David J. Harra, San Francisco, and Lawrence C. Lei, Mountain View, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

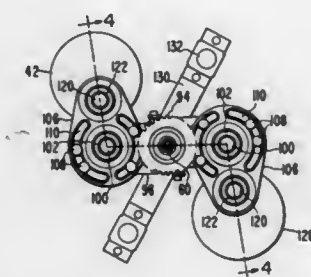
Continuation of Ser. No. 769,232, Aug. 26, 1985, abandoned.

This application Mar. 31, 1987, Ser. No. 32,916

Int. Cl.⁴ C23C 14/34

U.S. Cl. 204—298

32 Claims



1. A crossed field sputtering device for sputtering material on a planar substrate:
 - a source of coating material having a target surface;
 - means for locating a planar substrate to be coated in a first position spaced from and facing said target surface;
 - means for establishing an electrical field in the space between said means for locating a substrate to be coated and said target surface;
 - magnetic means on the side of said source opposite said substrate locating means, said magnetic means forming a

magnetic field in said space intersecting said electrical field; and
means for establishing relative lateral epicycloidal motion between said magnetic means and said target surface, said epicycloidal motion of said magnetic means occurring in a plane parallel to said target surface, said epicycloidal motion changing steadily with time, so that said magnetic means traverses a steadily changing area of said target surface whereby coating material is uniformly sputtered upon a surface of a substrate to be coated while said target surface is eroded relatively uniformly.

4,714,537

PROCESS FOR CYCLIC DEWAXING/REGENERATION OF HYDROCARBON FEEDSTOCKS

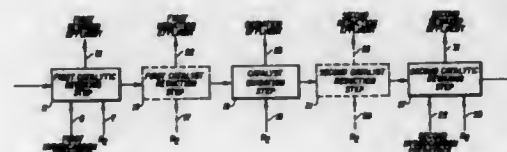
Diane V. Jorgensen, Wilmington; Clinton R. Kennedy, Talleyville, both of Del., and Stephen S. Wong, Medford, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 709,858, Jun. 8, 1985, abandoned. This application Jun. 11, 1986, Ser. No. 873,661

Int. Cl.⁴ C10G 47/02, 23/90

U.S. Cl. 208—111

28 Claims



1. A process for catalytically dewaxing a hydrocarbon feedstock comprising straight chain paraffins and slightly branched paraffins, comprising the following steps:
 - contacting said feedstock at isomerization conditions with a regenerated catalyst having isomerization activity and comprising a highly dispersed palladium-containing crystalline-silicate zeolite having the structure of Zeolite Beta to produce an effluent stream having a pour point less than that of said feedstock;
 - wherein said catalyst has been regenerated by an oxidation step comprising contacting said catalyst with an oxidizing stream consisting essentially of inert gas and 0.1 to 10 volume % oxygen, at a temperature between about 200° and about 540° C. and a pressure from atmospheric to 25,000 kPa at a contact time sufficient to substantially restore said isomerization activity of said catalyst.

4,714,538

TRIMETALLIC REFORMING CATALYST

Mark D. Moser, Hoffman Estates, and Randy J. Lawson, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 910,099, Sep. 22, 1986, Pat. No. 4,677,094.

This application Apr. 10, 1987, Ser. No. 36,732

Int. Cl.⁴ C10G 35/06

U.S. Cl. 208—139

5 Claims

1. A process for the catalytic reforming of naphtha charge stock comprising contacting the naphtha and hydrogen at reforming conditions with a catalytic composite comprising a uniformly dispersed platinum component, a uniformly dispersed tin component, a surface-impregnated metal component selected from the group consisting of rhodium, ruthenium, cobalt, nickel, and mixtures thereof and a halogen component on a refractory support having a nominal diameter of at least 650 microns.

4,714,539

REFORMING OF HYDROCARBONS UTILIZING A TRIMETALLIC CATALYST

Mark D. Moser, Hoffman Estates, and R. Joe Lawson, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 910,099, Sep. 22, 1986, Pat. No. 4,677,094. This application Apr. 10, 1987, Ser. No. 37,679

Int. Cl.⁴ C10G 35/06

U.S. Cl. 208—139

9 Claims

1. A hydrocarbon conversion process comprising reforming of naphtha charge stock having a sulfur concentration less than 300 wt. ppb at reforming conditions with a catalytic composite comprising a uniformly dispersed platinum component, a uniformly dispersed tin component, a surface-impregnated metal component selected from the group consisting of rhodium, ruthenium, cobalt, nickel, iridium, and mixtures thereof and a halogen component on a refractory support having a nominal diameter of at least 650 microns.

4,714,540

REFORMING OF HYDROCARBONS UTILIZING A TRIMETALLIC CATALYST

Mark D. Moser, Hoffman Estates, and R. Joe Lawson, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 910,099, Sep. 22, 1986, Pat. No. 4,677,094. This application Apr. 13, 1987, Ser. No. 37,750

Int. Cl.⁴ C10G 35/06

U.S. Cl. 208—139

7 Claims

1. A hydrocarbon conversion process comprising reforming of naphtha charge stock having a water concentration less than 50 wt. ppm at reforming conditions with a catalytic composite comprising a uniformly dispersed platinum component, a uniformly dispersed tin component, a surface-impregnated metal component selected from the group consisting of rhodium, ruthenium, cobalt, nickel, iridium, and mixtures thereof and a halogen component on a refractory support having a nominal diameter of at least 650 microns.

4,714,541

METHOD AND APPARATUS FOR IMPROVING CYCLONE EFFICIENCY

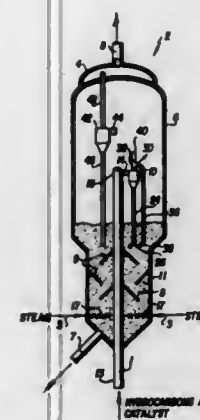
Frank M. Buyan, Yardley, Pa., and Mark S. Ross, Lawrenceville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 22, 1985, Ser. No. 801,102

Int. Cl.⁴ F27B 15/08; C10G 35/14

U.S. Cl. 208—161

33 Claims



1. An apparatus for separating solid catalyst particles from gases in a fluid catalytic cracking unit and returning the separated catalyst particles to a bed of particles below the apparatus which comprises

- (i) a cyclone having a gas outlet tube through which a cyclone overhead stream comprising catalyst solids and gases pass in spiral flow.
- (ii) a cylinder having an upstream end and a downstream end

wherein said cylinder has smooth internal side walls and an inside diameter at least equal to the inside diameter of said cyclone gas outlet tube, said cylinder being axially aligned and in communication with said cyclone gas outlet tube and comprising sidewalls defining an opening;

- (iii) a solids collector conduit tangentially attached to said sidewalls at the periphery of said opening;
- (iv) a gas outlet conduit attached to said downstream end of said cylinder, said gas outlet conduit being axially aligned with said cylinder and;
- (v) a solids discharge conduit attached to and extending downwards from the solids collector conduit for returning the collected solids to the bed of catalyst.

4,714,542

DISTILLATION VAPOR AND FEED MIXING PROCESS

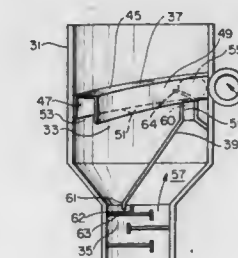
William Lockett, Jr., Bernardsville, N.J., assignor to Encon Associates Inc., Bernardsville, N.J.

Filed Jan. 6, 1986, Ser. No. 816,416

Int. Cl.⁴ B01D 3/30

U.S. Cl. 208—347

10 Claims



1. In a distillation process wherein vaporizing liquid feed is being fed into a flash zone located within a column and contacted with rising vapors from the stripping section therein an improvement, for more complete mixing of the vaporizing liquid feed with the rising vapors from the stripping section in order to achieve a lower partial pressure effect on the feed to improve overall fractionation-energy efficiency, to minimize entrainment of heavy liquid droplets in vapors leaving the flash zone, and, to improve the flow of liquid on the top stripping tray, which improvement comprises:

- (a) introducing the vaporizing liquid into the flash zone located within the column at an angle approximately tangential to the column via a nozzle and through a mixing and separation chamber having a port at its upstream end at the nozzle and an open downstream end at the flash zone, said chamber being constructed to approximately conform to the inside cross-sectional configuration of the column at the flash zone, and having side walls, a bottom and a top and having a rising vapors inlet port near the upstream end, said chamber having a length which is less than the full perimeter of the column at the flash zone;
- (b) enhancing the efficiency of the contacting and mixing of all of the rising vapors with the vaporizing liquid feed by redirecting all of the rising vapors from the column into said chamber near its upstream end by physically partitioning at least a part of the column with a partition baffle located in the flash zone to direct the rising vapors to the rising vapors inlet of said chamber; and,
- (c) further enhancing the efficiency of the contacting and mixing of all of the rising vapors with the vaporizing liquid feed by creating a spinning action with a deflector baffle located at said rising vapors inlet whereby high velocity feed inspirates all of the rising vapors so as to create the spinning action in said chamber and so as to thereby effect intimate mixing of all rising vapors from the stripping section with the vaporizing liquid feed.

4,714,543 METHOD OF TREATING BROWN COAL FOR LIQUEFACTION

Tetsuo Matsumura; Toshio Ohzawa; Akihiro Kawashima; Osamu Ohkuma; Saburo Sawada; Shun'ichi Yanai; Hiroshi Yoshimura, and Yasuo Sugino, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe; Idemitsukosan Kabushiki Kaisha, Tokyo; Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo and Azisakiyu Kabushiki Kaisha, Tokyo, all of Japan

Continuation of Ser. No. 548,852, Apr. 10, 1983, abandoned.

This application Feb. 4, 1986, Ser. No. 825,990

Int. Cl.⁴ C10G 1/00, 1/06

U.S. Cl. 208—412 3 Claims

1. A process for the liquefaction of brown coal, which comprises:

- increasing the temperature of a brown coal slurry in a solvent to 250° to 400° C. under pressure;
- dewatering said brown coal slurry as the temperature of the coal slurry increases in step (a) by the application of steam which is obtained from a gas-liquid phase separation step;
- preheating said dewatered brown coal slurry and hydrogen gas in a preheater;
- feeding the heated slurry and hydrogen to at least four hydrogenation reactor towers connected in series where hydrogenation of the brown coal is conducted and in which high concentration metal salt-containing slurries form;
- withdrawing said salt-containing slurries from the bases of at least first two hydrogenation reactor towers and passing said slurries to at least two high pressure settling vessels connected in series in which a high solids content slurry and a low solids content slurry, as a supernatant, form;
- recovering said low solids contents slurry and recycling this slurry to the first of said hydrogenation reactor towers;
- withdrawing all of the reaction mixture exiting the last of the hydrogenation reaction towers and passing the withdrawn reaction material to the first of a plurality of settling vessels connected in series in which the reaction mixture separates into relatively small amounts of high solids content slurry and supernatant material;
- distilling said supernatant material to recover liquefied coal material; and
- deashing the high solids content slurry withdrawn from said settling vessels.

4,714,544

PROCESS FOR DRESSING KAOLINITE BY FLOTATION
Wolfgang von Rybinski; Holger Tesmann, both of Duesseldorf, and Bohuslav Dobias, Regensburg, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 834,072

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506808

Int. Cl.⁴ B03D 1/00

U.S. Cl. 209—167 18 Claims

1. A process for the selective separation of kaolinite from feldspar by flotation in aqueous pulp comprising:

- suspending an ultrafine particle size mineral mixture comprising feldspar and kaolinite in water to form an aqueous pulp at a pH of from about 5 to 8;
- treating the aqueous pulp with a water-soluble salt of Al³⁺ or Fe³⁺ and a collector comprising an anionic surfactant, said collector and water-soluble salt being present in sufficient concentration to provide a kaolin float and a feldspar sink in step (c)
- subjecting the treated pulp to a flotation treatment to float kaolinite; and

- recovering kaolinite from the resulting float and feldspar from the resulting flotation residue.

4,714,545

FLUID PROPORTIONING PUMP SYSTEM

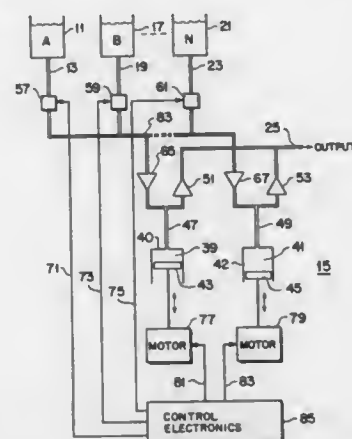
H. Bryan Bente; Alan C. Herman, both of Half Moon Bay; Joel Myerson, Berkeley; Benjamin G. Shaw, Palo Alto, and Andrew Stefanski, Menlo Park, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 20, 1986, Ser. No. 841,922

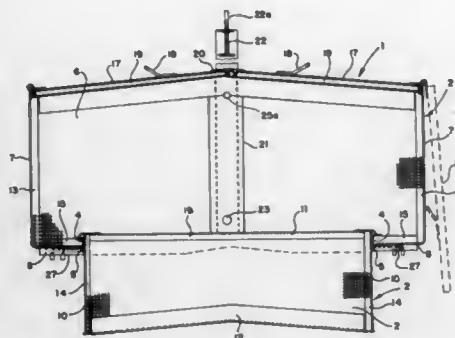
Int. Cl.⁴ B01D 15/08; F04B 41/06

U.S. Cl. 210—101

9 Claims



said lower part including means both for compressing and for providing filtration area which increases from said first



position to said second position, for slurry within said upper part.

4,714,550

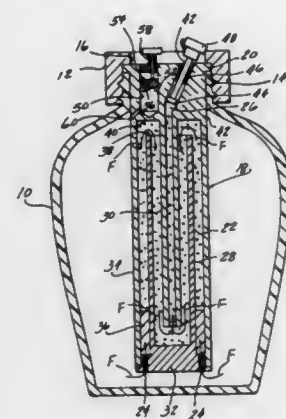
CANTEEN CARRIED WATER PURIFIER SYSTEM
William S. Malson, Warren, and John W. Sharpe, Ferndale, both of Mich., assignors to Water Systems Development Corporation, Fraser, Mich.

Filed Sep. 23, 1985, Ser. No. 779,275

Int. Cl.⁴ B01D 29/08, 35/02

U.S. Cl. 210—244

2 Claims



1. In a canteen including a hollow, watertight container having a neck at its upper end, and cap means detachably mounted on said neck;

the improvement comprising:

an elongate, tubular purifier assembly inserted into said container through said neck and a lip projecting radially outwardly from said assembly at its upper end and resting upon the top of said neck and sealingly clampable against said neck by said cap means when said cap means is mounted on said neck, said assembly having means defining an internal chamber having a top and bottom and substantially filled with particles of a water purifying material; fluid inlet means at the lower end of said assembly for establishing fluid communication between said chamber and the interior of said container; means at the upper end of said assembly defining a fluid outlet means from said chamber; means defining a restricted flow passage in said chamber directing the flow of fluid through said chamber from said inlet means to said outlet means including a first tube located within said chamber extending upwardly from the bottom of said chamber and having an open upper end adjacent to and spaced below the top of said chamber, a second tube projecting downwardly from the top of said chamber into said first tube and having an open lower end located adjacent to and spaced above the bottom of said first tube, and passage means at the upper

end of said second tube placing the interior of said second tube in fluid communication with said outlet means to define a fluid passage of a length substantially greater than the length of said chamber; manually operable pump means in said assembly for pumping fluid in said container through said chamber to said outlet, said pump means comprising means defining a pump chamber in said assembly adjacent the upper end of said assembly, said pump chamber having means defining an outlet opening into the upper portion of the interior of said container when said lip is seated on said neck, and piston means manually reciprocable in said pump chamber for pumping air from said pump chamber into the interior of said chamber; and filter means mounted in the flow passage of said assembly for filtering fluid flowing into said chamber via said inlet means.

4,714,551

5/2-WAY COMMUTATING VALVE, PARTICULARLY FOR REVERSE-FLUSH FILTERS

Bruno Bachhofer, Stäntisstrasse 85, 7981 Bavendorf, and Anton Locher, Bergstrasse 6, 7981 Torkenweiler, both of Fed. Rep. of Germany

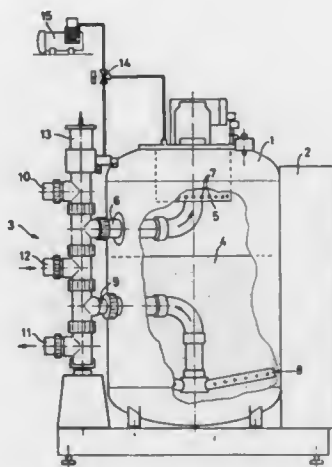
Filed Jun. 4, 1985, Ser. No. 741,164

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423424

Int. Cl.⁴ B01D 23/24

U.S. Cl. 210—278

8 Claims



1. A 5/2-way commutating valve comprising:

an elongate housing having a longitudinal axis, opposed ends, a hollow interior extending along the longitudinal axis between said ends and five connecting members spaced apart along the longitudinal axis and each having a flow passage communicating with said hollow interior and extending transversely of the longitudinal axis; means defining a plurality of annular valve seats disposed in said hollow interior, with each said valve seat being located between a respective pair of connecting members; a central rod located in, and extending along, said hollow interior and movable along the longitudinal axis of said housing; spring means operatively associated with said central rod for urging said central rod in a selected direction along the longitudinal axis of said housing; first and second valve elements each mounted on said central rod in the vicinity of a respective end of said housing and each located to form a sealing connection with a respective valve seat; and a double-sided valve element carried by said central rod at a location between said first and second valve elements and movable with said central rod between respective posi-

tions to form, in each of the respective positions, a sealing connection with a respective one of two of said valve seats, said double-sided valve element being mounted to said central rod to have a limited mobility along the longitudinal axis relative to said central rod.

4,714,552

IN-LINE FLUID FILTERING DEVICES AND DISC-FILTERS USEFUL IN SUCH DEVICES

Elhanan Tabor, Carmiel, Israel, assignor to AR-KAL Plastics Products Belt Zera (1973), Israel

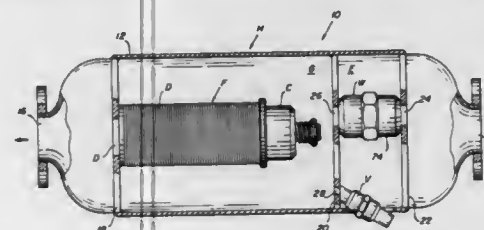
Filed Apr. 4, 1986, Ser. No. 848,313

Claims priority, application Israel, Jul. 24, 1985, 75896; Aug. 23, 1985, 76173

Int. Cl.⁴ B01D 75/00

U.S. Cl. 210—329

16 Claims



1. An in-line liquid filter device comprising:

- A housing having an inlet port at one side and an outlet port at another, opposite side thereof;
- a first compartment within the housing communicating with the outlet port;
- a filter installed within the first compartment, the filter comprises a stack of individual filter elements through which the liquid is adapted to pass from one side-surface to another side-surface thereof ("the filtering flow direction"), and reversely from the other side-surface to the one side-surface for flushing the filter elements ("the flushing flow direction");
- a second compartment within the housing communicating with the inlet port at one side and with the first compartment at another side thereof;
- a first valve within the second compartment for controlling the flow of the liquid from the inlet port to the first compartment;
- a second valve within the second compartment for controlling the flow of liquid from the first compartment to outside the housing;
- means for selectively closing the first valve; and
- means for feeding liquid to the filter while the first valve is closed so that the liquid flows through the filter elements in the flushing direction and drains by the second valve for enabling release of said elements from compact engagement sufficient to enable improved ringing by reverse flow flushing liquid.

4,714,553

TREATMENT OF CATALYST PARTICLES

Pierre Crouzet, Martigues, France, assignor to BP Chemicals Limited, London, England

Filed Jan. 12, 1987, Ser. No. 2,162

Claims priority, application France, Jan. 20, 1986, 86 00724

Int. Cl.⁴ B01D 21/00

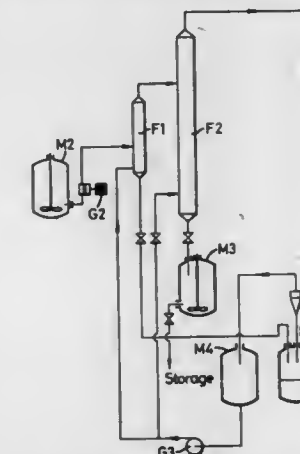
U.S. Cl. 210—533

3 Claims

1. Apparatus comprising: means for the liquid elutriation of a solid Zielger-Natta type alpha-olefin polymerisation catalyst, consisting of at least one transition metal compound belonging to Groups IV, V or VI of the Periodic Table of Elements, and a magnesium compound, including a tank M2 for the preliminary preparation of a catalyst sus-

pension in the elutriation liquid and having means adapted to maintain uniformity of the suspension,

a vertical elutriation column F1 having a height H' and a diameter D' such that the ratio H'/D' is equal to or greater than 5, such column having: (a) a tube for the introduction of the catalyst suspension prepared in the tank M2 or of the catalyst suspension substantially freed from fine particles coming from the outlet of the top of column F2 as the case may be, at a level lying between H'/2 and the bottom of the column; (b) a tube for the introduction of the elutriation liquid at a level lower than that of the introduction of the catalyst suspension; (c) an outlet from the top of the column of a catalyst suspension substantially free from



large particles; and (d) an outlet from the bottom of the column of a catalyst suspension comprising mainly large particles, and/or vertical elutriation column F2 having a height H and a diameter D such that the ratio H/D is equal to or greater than 10 such column having: (a) a tube for the introduction of the catalyst suspension prepared in the tank M2 or of the catalyst suspension substantially free from large particles coming from the outlet at the top of the column F1, as the case may be, such tube being disposed at a level above H/2 and below 7 H/8; (b) a tube for the introduction of the elutriation liquid at a level lying below H/2; (c) an outlet from the top of the column of the catalyst particles substantially freed from fine particles.

4,714,554

CROSS-AXIS SYNCHRONOUS FLOW-THROUGH COIL PLANET CENTRIFUGE FREE OF ROTARY SEALS: APPARATUS AND METHOD FOR PERFORMING COUNTERCURRENT CHROMATOGRAPHY

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 3, 1986, Ser. No. 915,797

Int. Cl.⁴ B01D 15/08

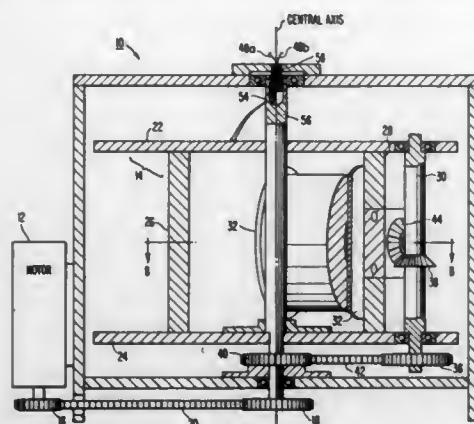
U.S. Cl. 210—635

17 Claims

12. A method of countercurrent chromatographic separation, comprising the steps of:

placing first and second immiscible fluid phases in a chromatographic column wrapped around a cylindrical column holder for rotation therewith, said chromatographic column having a head and a tail end and a central first longitudinal axis, said chromatographic column being fixed within a frame with respect to a second longitudinal axis positioned away from said column holder; rotating said column holder about said central first longitudinal axis while simultaneously and synchronously revolving said column holder around said second longitudinal axis, positioned away from said column holder, in a manner such that the longitudinal axis of said column holder is

constantly tangent to and coplanar with a path defined by the revolution of said column holder around said second utilizing said scavenging means to maintain a concentration gradient of said antigen across said membrane and to achieve



longitudinal axis, whereby eluent is discharged at said tail or head end;
collecting said eluent discharged from said tail or head end.

an improved capture rate of said antigen by said immunoreactive scavenging means.

4,714,555

AGENT FOR SEPARATION

Tohru Shibata, and Ichiro Okamoto, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan
Continuation of Ser. No. 696,137, Jan. 29, 1985, abandoned. This application Mar. 11, 1987, Ser. No. 24,877

Claims priority, application Japan, Jan. 31, 1984, 59-15760
Int. Cl.⁴ B01D 15/08

U.S. Cl. 210—635 12 Claims
1. A method of separating, by chromatography, an optical isomer from a racemic modification containing the same, which comprises the step of flowing a solution of said racemic modification in contact with cellulose trinitrate as a chromatographic resolving agent.

4,714,556

BLOOD PURIFICATION

Clara M. Ambrus, 143 Windsor Ave., Buffalo, N.Y. 14209, and Csaba Horvath, 69 Pine Crest Rd., Orange, Conn. 06477
Continuation-in-part of Ser. No. 406,495, Aug. 9, 1982, abandoned, and Ser. No. 650,772, Sep. 13, 1984, Pat. No. 4,612,122, which is a continuation-in-part of Ser. No. 473,814, Jun. 29, 1981, abandoned, which is a continuation-in-part of Ser. No. 278,631, Jun. 29, 1981, abandoned. This application Mar. 13, 1985, Ser. No. 711,304

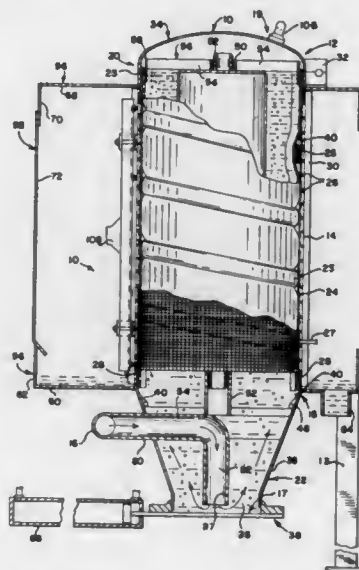
Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—638 18 Claims
1. A process for removing antigens from blood fluid comprising the steps of (1) immobilizing a specific immunoreactive scavenging means for said antigen within a porous exterior surface of said membrane, (2) passing an antigen-bearing blood fluid along a retentive-barrier side of an anisotropic membrane the barrier layer of which will not allow passage of the blood cells, (3) assuring a unidirectional diffusion process is the only steady-state process for carrying any other blood components through said membrane by maintaining the porous side of said membrane in a closed container of constant volume, and (4)

4,714,557
PRESSURE FILTER CAKE-BREAKING METHOD AND APPARATUS

Francis M. Croket, Farmington Hills, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.
Filed Jan. 12, 1986, Ser. No. 873,361
Int. Cl.⁴ B01D 29/14, 29/38

U.S. Cl. 210—769 10 Claims

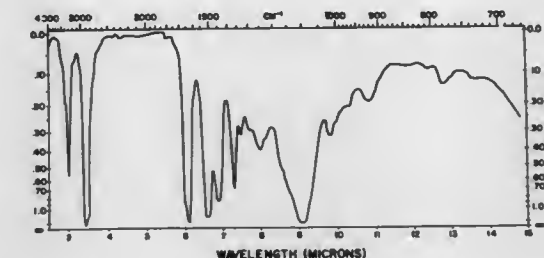


1. A method of filtering comprising the steps of providing a vessel adapted to receive a liquid to be filtered, providing an inlet for the liquid to be filtered near the bottom of the vessel, providing a mesh screen so as to form an internal wall in the vessel, providing a filter media overlaying the inner side of the mesh screen, inletting liquid to be filtered into the vessel such that the liquid passes through the filter media and mesh screen, introducing pressurized air into said vessel in contact with

the top of the liquid being filtered to force the liquid through the filter media and mesh screen, ceasing the inletting of liquid to be filtered after a caking buildup of materials filtered from the liquid has occurred on the inner surface of the filter media, and expanding a conduit helically wound between the filter media and the mesh screen to thereby break away the buildup of filtered materials from the filter media.

4,714,559
ANTISTATIC AGENTS WHICH ARE DIAMINES OF TRIALKYLACETIC ACIDS AND DIAMINES
Robert J. Steltenkamp, Somerset, and Michael A. Camara, Jackson, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Continuation of Ser. No. 734,508, May 16, 1985, Pat. No. 4,619,775. This application Jul. 8, 1986, Ser. No. 883,193
Int. Cl.⁴ D06M 3/30

U.S. Cl. 252—8.8 2 Claims



1. An antistatic agent for filamentary and fibrous materials which is N,N'-ethylene-bis-neodecanoamide.

4,714,560
Patent Not Issued For This Number

4,714,561
ACYLATED ETHER AMINE AND LUBRICANTS AND FUELS CONTAINING THE SAME

Donald I. Hoke, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio
Division of Ser. No. 560,254, Dec. 9, 1983, Pat. No. 4,581,038, which is a continuation of Ser. No. 298,449, Sep. 1, 1981, abandoned. This application Mar. 27, 1986, Ser. No. 844,903
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.⁴ C10M 133/56, 133/16 21 Claims

U.S. Cl. 252—51.5 A
1. An additive composition for use in lubricants comprising the reaction product of a mixture of reactants comprising (A) an alkenyl substituted succinic acylating agent where the alkenyl substituent contains from about 8 to about 30 carbon atoms and (B) an ether amine of the general formula:



where n is a number ranging from about 2 to about 4 and R is a straight-chain or branched-chain alkyl radical containing from about 8 to about 22 carbon atoms.

4,714,562
AUTOMATIC DISHWASHER DETERGENT COMPOSITION

Brian J. Roselle, Fairfield, and Dennis W. Weatherby, Franklin, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

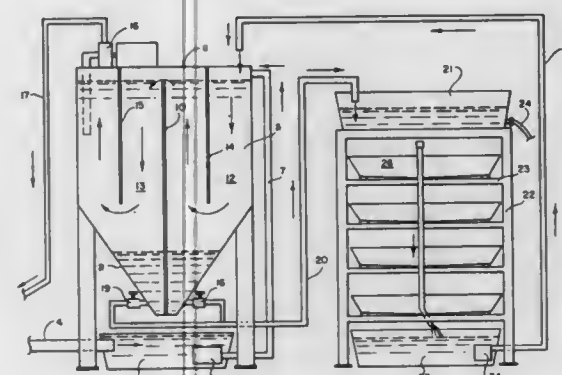
Filed Mar. 6, 1987, Ser. No. 22,837

Int. Cl.⁴ C11D 3/395, 3/40

U.S. Cl. 252—94 20 Claims

1. A detergent composition comprising:
(1) from about 5% to about 90% by weight of detergency builder material on an anhydrous basis;
(2) chlorine bleach ingredient to provide from about 0.1% to about 5%, of available chlorine based on the weight of the detergent composition;
(3) from 0% to about 15% by weight of surfactant; and
(4) from 0.0005% to about 0.2% relatively water-soluble stilbene dye which is color-stable to chlorine bleach.

4,714,558
WASTEWATER TREATMENT SYSTEM
Tom D. Barbee, and James Ufheil, both of Louisville, Ky., assignors to The Barbee Co., Inc., Louisville, Ky.
Filed Apr. 2, 1986, Ser. No. 847,241
Int. Cl.⁴ B01D 21/02, 23/02, 25/02
U.S. Cl. 210—776 5 Claims



2. A wastewater treatment system for the effluent from a cleaning booth having a cleaning fluid inlet and a wastewater outlet, a feed pipe for delivering wastewater from the cleaning booth, a settling tray connected to said feed pipe for providing for removal of floating contaminants in the wastewater, a settling tank having a plurality of interconnected passageways therein, means connecting said settling tray with an inlet at the upper end of said settling tank, means for removing sludge from the lower end of said settling tank, a holding tank, means for delivering the sludge from the lower end of said settling tank to said holding tank, a plurality of filter trays, hose means for delivering the sludge from the holding tank to the plurality of filter trays, means for delivering the filtrate from said filter trays to the inlet at the upper end of said settling tank, and means for connecting the outlet of said settling tank to the inlet of said cleaning booth.

4,714,563

ANTIMICROBIAL TOILET BARS

Theresa M. Kajs, Maineville, and Cynthia A. Berge, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 18, 1986, Ser. No. 888,305

Int. Cl.⁴ C11D 1/50

U.S. Cl. 252—107

7 Claims

1. An antimicrobial toilet bar comprising:
 - (a) from about 50% to about 90% of a surfactant selected from the group consisting of soaps and anionic synthetic surfactants and mixtures thereof; and
 - (b) from about 0.1% to about 10% of an antimicrobial agent selected from the group consisting of chlorhexidine and salts of chlorhexidine wherein said salts have a solubility in water at 20° C. of less than about 2.6% (w/v), said agent having a particle size of from about 1 to about 40 microns.

4,714,564

HIGH PERFORMANCE MULTIFUNCTIONAL CORROSION INHIBITORS ESPECIALLY FOR COMBINING AT 20 TO 50 WEIGHT PERCENT WITH SOAP OR PAINT

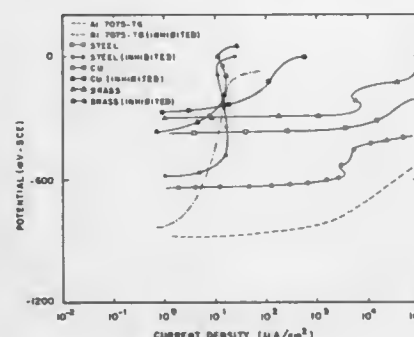
Charles T. Lynch, Fairborn; Fred W. Vahldiek, Dayton, and Mohammad Khobai, Fairborn, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 21, 1982, Ser. No. 370,236

Int. Cl.⁴ C11D 9/16; C23F 11/06, 11/18; C09K 3/00

U.S. Cl. 252—110

4 Claims



1. A soap formulation comprising from 20 to 50 weight percent of a multifunctional corrosion inhibiting composition, said composition consisting essentially of the following components in the approximate concentrations indicated, in weight percent:

Component	Concentration
Alkali metal borate	68.0 to 70.0
Alkali metal nitrate	8.5 to 14.0
Alkali metal nitrite	13.5 to 17.5
Alkali metal metasilicate	0.5 to 1.7
Alkali metal phosphate	0.8 to 0.9
Mercaptobenzothiazole (MBT)	0.25 to 0.5
At least one selected surfactant and, optional, the following components:	1.05 to 2.0
Zinc sulfate	1.0 to 2.0
Benzotriazole (BT)	0.25 to 0.5

3. A paint formulation comprising from 20 to 50 weight percent of an encapsulated, dry multifunctional corrosion inhibiting composition, said composition consisting essentially of the following components in the approximate concentrations indicated, in weight percent:

Component	Concentration
Alkali metal borate	68.0 to 70.0
Alkali metal nitrate	8.5 to 14.0
Alkali metal nitrite	13.5 to 17.5
Alkali metal metasilicate	0.5 to 1.7
Alkali metal phosphate	0.8 to 0.9
Mercaptobenzothiazole (MBT)	0.25 to 0.5
At least one selected surfactant and, optional, the following components:	1.05 to 2.0
Zinc sulfate	1.0 to 2.0
Benzotriazole (BT)	0.25 to 0.5

4,714,565

HOMOGENEOUS CONCENTRATED LIQUID DETERGENT COMPOSITIONS CONTAINING A MONOESTER OF A DICARBOXYLIC ACID

Jean Wevers, Grimbergen; Christian R. Barrat, Brussels, both of Belgium, and Frederick E. Hardy, Newcastle upon Tyne, United Kingdom, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 25, 1986, Ser. No. 856,085

Claims priority, application United Kingdom, May 3, 1985, 8511305

Int. Cl.⁴ C11D 1/83

U.S. Cl. 252—174.19

9 Claims

1. A concentrated homogeneous liquid detergent composition containing:
 - (a) from 10% to 50% by weight of a mixture of anionic synthetic and nonionic surface-active agents;
 - (b) less than 50% by weight of water;
 - (c) from 2% to 50% by weight of a water-soluble monoester of a dicarboxylic acid selected from the group consisting of dodecanol succinate, tridecanol phthalate, tetradecanol phthalate, pentadecanol phthalate, hexadecanol phthalate, heptadecanol phthalate, and octadecanol phthalate;
 - (d) the non-ionic surface-active agent is present at a level of at least 5% by weight of the total composition; and
 - (e) said composition has a pH, in a 1% solution in water at 20° C., in the range of from 6 to 9 and said composition is free of cumene and xylene sulfonate hydrotropes.

4,714,566

PROCESS FOR PRODUCING W/O/W TYPE MULTIPLE EMULSION

Yasuyuki Takahashi; Shigeru Aizawa; Shigeru Tamai; Toshiro Yoshida, and Takeshi Takahashi, all of Tokyo, Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 610,465

Claims priority, application Japan, Mar. 2, 1984, 59-038667

The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.

Int. Cl.⁴ B01J 13/00; B01F 17/34

U.S. Cl. 252—314

3 Claims

1. A process for producing a W/O/W type multiple emulsion which comprises adding, to water or an aqueous phase, an oil phase to which 1.0 to 10% of monoerucin or dierucin is added, mixing them to form an O/W emulsion, stirring the emulsion to effect phase inversion, adding the resulting W/O emulsion to an aqueous phase, and stirring them.

4,714,567

REACTING ALUMINA HYDRATE SOL AND AN ORGANIC MATERIAL TO FORM A STABLE MONOLITHIC GEL

Max E. Roha, Brecksville, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 31, 1985, Ser. No. 793,281

Int. Cl.⁴ B01J 13/00

U.S. Cl. 252—315.2

16 Claims

1. A method for preparing a stable monolithic gel comprising alumina hydrate combined with an organic material, said method comprising
 - (a) preparing a sol comprising a colloidal dispersion of alumina hydrate in an aqueous solution,
 - (b) mixing said sol and an organic reactant selected from the group consisting of polycarboxylic acids having esterified acid groups and anhydrides of polycarboxylic acids, and
 - (c) reacting said alumina hydrate with said organic reactant, thereby to form a monolithic gel comprising alumina hydrate chemically combined with an organic material.

4,714,568

NEW BLOWING AGENT COMBINATION BASED ON AZODICARBONAMIDE, PRODUCTION THEREOF AND USE THEREOF FOR FOAMING POLYMERS

Helmut Hurnik, Leverkusen; Manfred Finzenhagen, Cologne, and Werner Jeblick, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 486,070, Apr. 18, 1983, abandoned. This application Oct. 23, 1984, Ser. No. 663,896

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215835; European Pat. Off., Apr. 14, 1983, 83 103 589.4; Japan, Apr. 25, 1983, 58-71547; Canada, Apr. 26, 1983, 426758; Spain, Apr. 27, 1983, 521885

Int. Cl.⁴ C09K 3/00

U.S. Cl. 252—350

6 Claims

1. Blowing agent combination for a free foaming process consisting essentially of azodicarbonamide doped with one or more surface-active agents in an amount of about 0.0001 to 2% by weight of azodicarbonamide and one or more metal compounds in an amount of about 0.0001 to 2% by weight of azodicarbonamide.

4,714,569

PROCESS FOR PREPARING CONDUCTIVE COATING COMPOSITION

Hiroshi Nishino, Yokobama, and Kazuo Okabe, Warabi, both of Japan, assignors to Toska Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1986, Ser. No. 888,196

Int. Cl.⁴ H01B 1/06

U.S. Cl. 252—511

6 Claims

1. A process for preparing a conductive coating composition, comprising the steps of:
 - (a) reacting (i) a mixture of graphite and carbon black, the ratio of graphite to carbon black being 2.5 to 0.8:1 by weight, with (ii) a mixture of a vinyl monomer having a functional group, the functional group being a member selected from the group consisting of a carboxy, an amino, a hydroxy and an acid anhydride group, and a comonomer, the ratio of the vinyl monomer - comonomer mixture to the graphite - carbon black mixture being 0.7 to 1:1, in the presence of a peroxide catalyst, to form a graft copolymer on the surfaces of said graphite and said carbon black;
 - (b) adding to the reaction mixture an azo compound having the capacity to substantially complete polymerization; and
 - (c) adding to the product formed in (b) a curing agent which reacts with the functional group of said vinyl monomer to produce a network structure inside the product.

4,714,570

CONDUCTOR PASTE AND METHOD OF MANUFACTURING A MULTILAYERED CERAMIC BODY USING THE PASTE

Seiichi Nakatani, Neyegawa; Satoru Yuhaku, Osaka; Hideyuki Okinaka, Toyonaka; Toru Ishida; Osamu Makino, both of Hirakata, and Tatsuro Kikuchi, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

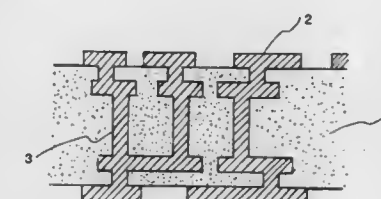
Filed Jul. 17, 1985, Ser. No. 756,081

Claims priority, application Japan, Jul. 17, 1984, 59-147832; Jul. 17, 1984, 59-147833; Sep. 6, 1984, 59-186777; Sep. 6, 1984, 59-186775; Feb. 8, 1985, 60-23846; Feb. 8, 1985, 60-23845; Feb. 8, 1985, 60-23844

Int. Cl.⁴ H01B 1/06

U.S. Cl. 252—518

6 Claims



1. A conductor paste comprising: an inorganic component comprising CuO powder at 85 to 98 wt % and at least one of Bi₂O₃, CdO, MnO₂ and Al₂O₃ at 2 to 15 wt %; an organic binder; and a solvent for the binder.
4. A conductor paste comprising: an inorganic component comprising a powder of one of NiO, Fe₂O₃ and CoO, at 85 to 98 wt % and at least one of Bi₂O₃, CdO, MnO₂, Al₂O₃, and CuO, at 2 to 15 wt %; an organic binder; and a solvent for the binder.

4,714,571

PROCESS FOR PURIFICATION OF PHOSPHOLIPIDS

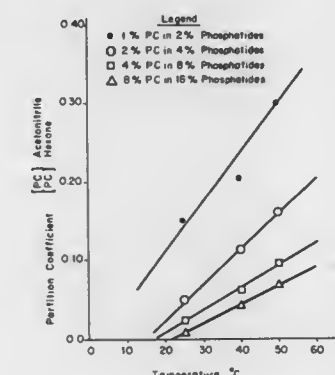
Paul A. Tremblay, Mercerville, and John J. Kearns, Princeton, both of N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 579,535, Feb. 13, 1984, abandoned. This application Feb. 6, 1985, Ser. No. 698,668

Int. Cl.⁴ C11C 1/00

U.S. Cl. 260—403

44 Claims



1. A process for purifying individual phospholipids from mixtures thereof, which comprises separating phosphatidylcholines from the phospholipid mixtures by non-chromatographic extraction with acetonitrile.

4,714,572

METHOD FOR THE MANUFACTURE OF COMPOSITE EXPLOSIVES

Sigurd Back, and Jan-Olof Nyqvist, both of Karlskoga, Sweden, assignors to Nobel Kemi AB, Karlskoga, Sweden
Filed Sep. 26, 1986, Ser. No. 911,699

Claims priority, application Sweden, Sep. 27, 1985, 8504469
Int. Cl.⁴ C06B 21/00

U.S. Cl. 264—3.4

19 Claims

1. A two-stage wet granulation method for producing a composite explosive whose major components are hexogen or octogen, and trinitrotoluene, aluminum powder, and phlegmatization wax wherein said aluminum powder is in the form of pure, untreated powder which comprises suspending in water a first wet granulation stage, said hexogen or octogen, and said phlegmatization wax;

adding thereto a primary portion of said trinitrotoluene in the molten state or under such temperature conditions that said trinitrotoluene melts, the amount of said primary portion of said trinitrotoluene is such as to give homogeneous and uniformly-sized granules with the ingredients suspended in water;

cooling said primary portion of said trinitrotoluene to thereby form primary granules with the other components suspended in water;

mixing said aluminum powder in the form of pure, untreated powder into the remaining secondary portion of said trinitrotoluene in the molten state to form a homogeneous mixture; and

adding said homogeneous mixture in a second wet granulation stage to the granules suspended in the water to thereby form secondary granules.

4,714,573

METHOD OF MANUFACTURING MOLDED SLIDE FASTENER COUPLING ELEMENTS

Hiroshi Yoshida, Kurobe, Japan, assignor to Yoshida Kogyo K., Tokyo, Japan

Division of Ser. No. 671,313, Nov. 14, 1984, Pat. No. 4,659,301.

This application Aug. 28, 1986, Ser. No. 901,362

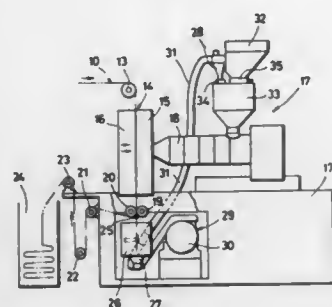
Claims priority, application Japan, Nov. 15, 1983, 58-214828; Dec. 29, 1983, 58-245936

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.⁴ B29B 17/02; B29D 5/00

U.S. Cl. 264—37

2 Claims



1. In the manufacture of a slide fastener chain having molded thereon rows of coupling elements made of a thermoplastic material, a process which comprises the steps of: cutting and removing runners and sprues from the rows of coupling elements immediately after the fastener chain has been withdrawn from a mold; pelletizing the runners and sprues to a predetermined particle size; recycling the thus pelletized material for re-use in combination with a fresh supply of thermoplastic chips; and controlling a supply of the pelletized material and the fresh supply of thermoplastic chips to fall within a predetermined ratio.

4,714,574

PROCESS FOR MAKING POLYURETHANE FOAM

Rudolf J. Tenhagen, Longirod, Switzerland, assignor to BP Chemicals Limited, London, England

PCT No. PCT/GB82/00185, § 371 Date Feb. 9, 1983, § 102(e) Date Feb. 9, 1983, PCT Pub. No. WO83/00117, PCT Pub. Date Jan. 20, 1983

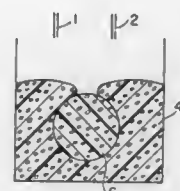
PCT Filed Jun. 24, 1982, Ser. No. 468,058

Claims priority, application United Kingdom, Jun. 27, 1981, 8119908

Int. Cl.⁴ B29C 67/22

U.S. Cl. 264—45.1

17 Claims



1. A process for the production of a flexible polyurethane foam article with regions of different hardness, which process comprises introducing into a mould a first foam formulation and a second foam formulation, the two formulations giving foam of different hardness and prepared by mixing together a polyol stream and an isocyanate stream in a mixer

characterised in that the process comprises first introducing the first formulation to give a relatively soft foam and then introducing the second formulation to give a relatively hard foam, the second foam formulation being introduced directly on to the first formulation, at a time corresponding to a volume expansion of the first foam formulation in the range +100% to +2300% so as to form one or more relatively hard regions embedded within and surrounded by the relatively soft foam.

4,714,575

METHOD FOR MANUFACTURING RIM COMPOSITES

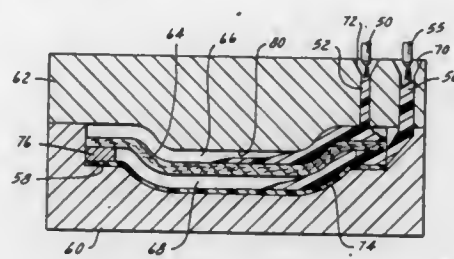
Frank J. Preston, Hampton, N.H., assignor to Ex-Cell-O Corporation, Walled Lake, Mich.

Filed May 27, 1986, Ser. No. 867,162

Int. Cl.⁴ B29C 67/22, 45/14

U.S. Cl. 264—46.4

4 Claims



1. In a method of manufacturing a composite RIM article, by use of a RIM mold with a female body including a cavity therein separated by a divider to divide the cavity into lower and upper air-filled spaces which are filled respectively with a low viscosity RIM mixture and a high viscosity RIM mixture by simultaneously injecting the respective mixtures as separate streams into one or the other of the lower and upper air-filled spaces in an amount to fill such spaces, the improvement comprising: preforming the divider from glass fibers to form open pores throughout the divider; filling one space receiving the high viscosity material at a rate which prevents it from passing into the pores of the glass fibers; and filling the other space at a rate which permits the low viscosity material to penetrate

and fill the pores of the glass fibers without passing into the one space to prevent significant amounts of the low viscosity material mixing with the high viscosity material; and reacting the RIM materials in the mold to concurrently form a high strength armature in the space receiving the low viscosity material, a foam cover in the other space and a high strength interface boundary therebetween.

4,714,576

METHOD OF MANUFACTURING A POLYPHENYLENE SULFIDE POTTED POLE AND COIL ASSEMBLY

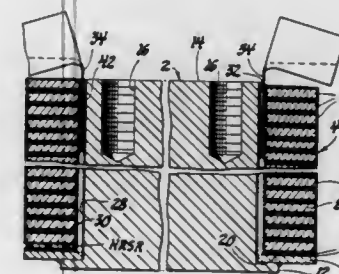
Dale L. Cotton, LaGrange, and Frank J. Nachman, Downers Grove, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 808,671, Dec. 16, 1985, abandoned, which is a continuation of Ser. No. 550,749, Nov. 10, 1983, abandoned. This application Jun. 2, 1986, Ser. No. 869,586

Int. Cl.⁴ B29C 67/22, 39/10

U.S. Cl. 264—46.5

17 Claims



1. In the process of making a pole and coil assembly for a dynamo-electric machine including the principal steps of positioning said coil about said pole so as to provide a space therebetween defined primarily by the inside surface of said coil and the outside surface of said pole and filling said space with dielectric insulation the improvement comprising:

- providing said coil surface with an adherent, substantially impermeable coating of polyphenylene sulfide;
- substantially filling said space with a foamable insulation in its solid state, said foamable insulation comprising a molding grade polyphenylene sulfide and a thermally activated blowing agent therefor;
- sealing off said space to substantially contain said foamable insulation during subsequent heating of said assembly;
- heating said assembly to melt said polyphenylene sulfide insulation and to activate said blowing agent for foaming said insulation within the confines of said space, said heating being sufficient to bond said foam to said coating and said pole and to so swell said polyphenylene sulfide insulation that the swollen polyphenylene sulfide insulation substantially completely fills said space and constrictively engages said pole;
- solidifying said foamed insulation in substantially its swollen state.

4,714,577

METHOD FOR PRODUCING A WOOD-TYPE GOLF CLUB HEAD

Itsushi Nagamoto; Tatsuo Nakanishi, and Ryohel Tajima, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 11, 1986, Ser. No. 905,952

Claims priority, application Japan, Dec. 20, 1985, 60-287193

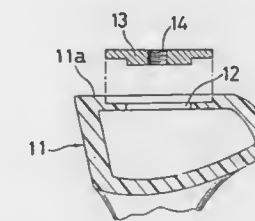
Int. Cl.⁴ B29C 67/00

U.S. Cl. 264—46.6

14 Claims

1. An improved method for producing a wood-type golf club head comprising the steps of

setting a lid having a threaded hole to a bottom seat hole in a hollow crude shell of a crude golf club head,



filling crude foamable synthetic resin of a prescribed amount with metal pieces into the interior of said hollow crude shell via said threaded hole in said lid, and heating said crude golf club head for foaming.

4,714,578

MOLDING OF INTEGRAL SOCKET CONNECTION IN CENTRIFUGALLY CAST FIBERGLASS REINFORCED PIPE

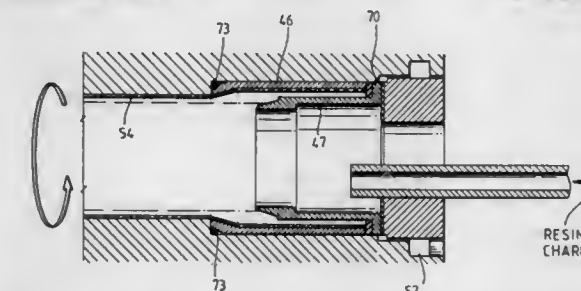
Larry L. Cagle; Keith D. Andersen, and Victor E. Lurvey, all of Sand Springs, Okla., assignors to Fibercast Company, Sand Springs, Okla.

Filed Sep. 26, 1984, Ser. No. 654,796

Int. Cl.⁴ B29C 5/04

U.S. Cl. 264—255

4 Claims



1. The method for forming a centrifugally cast pipe with an integral socket comprising:

- inserting a bell end slip into an empty mold tube of a centrifugal casting machine;
- inserting a sock of fibrous reinforcing material into the mold tube of the centrifugal casting machine, the sock of fibrous material inserted with a mandrel;
- rotating the mold so as to distribute the fibrous reinforcing material onto the mold and away from the mandrel;
- stopping the rotating mold and removing the mandrel;
- expanding the fibrous reinforcing material to conform the fibrous reinforcing material to the inside diameter of the bell end slip;
- placing the socket form tooling into the mold tube;
- securing the bell end slip and socket form tooling in place with a locking ring;
- rotating said mold to further expand the glass fabric;
- injecting into the bore of the mold tube at least one thermosetting resin while continuing to rotate the mold to distribute the thermosetting resin(s) longitudinally thereof; and
- maintaining the temperature of said mold while rotating the mold to cure the thermosetting resin(s).

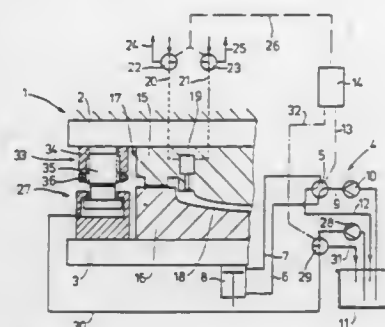
4,714,579
METHOD AND AN APPARATUS FOR THE PRODUCTION OF SHAPED ARTICLES

Heinrich Boden, Leverkusen, and Walter Schnelder, Overath, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany
 Filed Jun. 4, 1986, Ser. No. 870,586

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1985, 3522377

Int. Cl.⁴ B29C 45/67, 67/22; C08G 18/08
 U.S. Cl. 264—328.6

12 Claims



1. A method for producing shaped articles in which:
 - (a) a mold tool is placed in a first position in which the shaping surfaces of the mold tool are brought together but are not completely closed to a distance of up to 5 mm from the closed position,
 - (b) introducing a reaction mixture into the molded tool,
 - (c) completely closing the mold tool when the mold is filled with reaction mixture,
 - (d) building up the pressure in the closed mold tool,
 - (e) curing the article thus-molded,
 - (f) opening the mold tool and,
 - (g) removing the molded article from the mold tool.

4,714,580
PLASTIC VESSEL HAVING ORIENTED COATING AND PROCESS FOR PREPARATION THEREOF

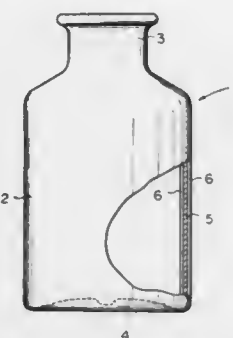
Yoshitsugu Maruhashi, Yokohama; Isao Tanikawa, Ayase, and Sadao Hirata, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed May 23, 1983, Ser. No. 496,996

Claims priority, application Japan, May 28, 1982, 57-89963
 Int. Cl.⁴ B29C 45/14

U.S. Cl. 264—516

4 Claims



1. A process for the preparation of coated oriented plastic vessels, which comprises coating an aqueous latex of a vinylidene chloride copolymer on at least one surface of a bottomed parison composed of amorphous polyethylene terephthalate, drying the coated latex to form a coated structure provided with an outermost surface coating layer on a polyethylene terephthalate substrate and subjecting the coated structure to biaxial draw-blow-molding at a temperature higher than the

glass transition temperature of the vinylidene chloride copolymer but lower than the melting point of the vinylidene chloride copolymer under such a condition that the temperature of the coating layer of the coated structure is lower by at least 5° C. than the average temperature of the polyethylene terephthalate substrate, at a draw ratio in the axial direction of 1.10 to 20 and at a draw ratio in the circumferential direction of 1.20 to 50, at which temperature draw-molding of said parison is possible, to thereby form the coated structure into a shape of a vessel while drawing the coating layer so that the coating layer of the vinylidene chloride copolymer has such a molecular orientation that the sum of two-dimensional orientation coefficients (1+m) in the axial direction and circumferential direction is at least 0.4 as measured according to the polarized light fluorometry and the coating layer is not substantially peeled at the low-temperature burst test conducted at -5° C.

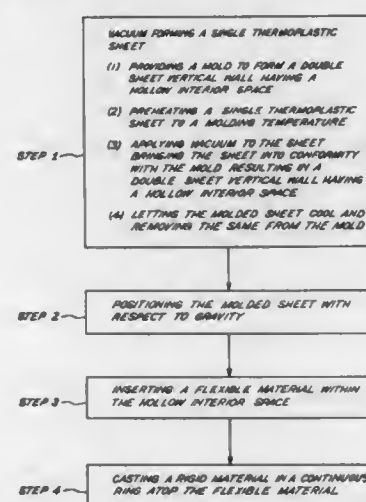
4,714,581
METHOD FORMING THREE DIMENSIONAL SIGN DISPLAY CHARACTER

Frank A. Witt, Lexington, S.C., assignor to Colite Industries, Inc., West Columbia, S.C.

Continuation of Ser. No. 141,144, Aug. 17, 1980, abandoned, which is a division of Ser. No. 956,101, Oct. 30, 1978, Pat. No. 4,202,123, which is a continuation of Ser. No. 700,218, Jun. 28, 1976, Pat. No. 4,122,616. This application Jul. 10, 1986, Ser. No. 883,857

Int. Cl.⁴ B29C 51/10, 39/10, 67/18, 67/22
 U.S. Cl. 264—553

2 Claims



1. A method of forming a sign display element from a sole unitary thin thermoplastic sheet comprising the steps of:

A. configuring the thermoplastic sheet including:

1. providing a mold with configured mold surfaces which is adapted for thermoforming the thermoplastic sheet into the configuration of said sign display element having a base of a particular shape and a double sheet vertical wall circumscribing the outer perimeter of said base with the two sheets of the wall being spaced apart to form a hollow interior space within the wall;
2. preheating a thin thermoplastic sheet;
3. thermoforming the thermoplastic sheet over the mold with the application of a vacuum to the thermoplastic sheet to aid in causing the sheet to be conformed to the mold; and
4. cooling and removing the molded sheet from the mold; and

B. rigidifying the molded sheet including:

1. positioning the vacuum formed sheet having the hollow interior space opening upwardly to form a mold form for performing the following steps;

2. introducing supporting material into the bottom of the said hollow interior space of the vacuum molded sheet in contact with the two sheets of the wall;
3. pouring a curable resin material inside said hollow interior space on the top surface of said supporting material to a predetermined depth; and
4. curing said resin to a rigid material connecting the two sheets of the wall to form the sign display element.

4,714,582
ACTUATING DEVICE FOR LINEARLY MOVING A CLUSTER OF CONTROL ELEMENTS IN A NUCLEAR REACTOR

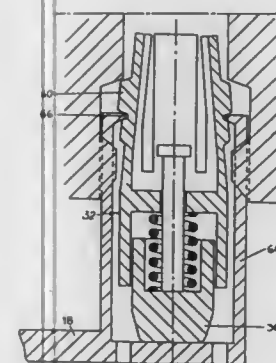
Jean-Pierre Denizon, Craponne, France, assignor to Fragma, Courbevoie, France

Filed Jan. 7, 1986, Ser. No. 816,781

Int. Cl.⁴ G21C 7/06

U.S. Cl. 376—233

13 Claims



1. For use in a nuclear reactor having an upper stationary structure, a lower stationary structure and a core under said lower stationary structure,

an actuating device for vertically moving a cluster of control elements between an upper position in engagement with said upper stationary structure and a lower position where said cluster is retained by said lower stationary structure, said actuating device comprising:

a vertical shaft movable along its axis and comprising gripping means at the lower end thereof, grab means fast with said cluster and located at a top end thereof, said grab means having resilient fingers arranged to engage said gripping means and to be latched by snap fitting on the upper stationary structure in a predetermined position,

said gripping means being so shaped as to engage with said resilient fingers when the latter are unlatched from said upper structure and when said gripping means are raised beyond the predetermined position which causes locking of the grab on the upper stationary structure, whereas said lower fixed structure is arranged for causing forced disengagement of said gripping means when the latter are lowered by said shaft beyond a rest position of the grab means on said lower stationary structure, raising of the gripping means then driving the grab means by a simple abutment force.

4,714,583
METHOD AND APPARATUS FOR COMPACTING SPENT NUCLEAR REACTOR FUEL RODS

William J. Wachter, Wexford, Pa., assignor to U.S. Tool & Die, Inc., Allison Park, Pa.

Continuation-in-part of Ser. No. 291,230, Aug. 10, 1981. This application Dec. 30, 1985, Ser. No. 814,481

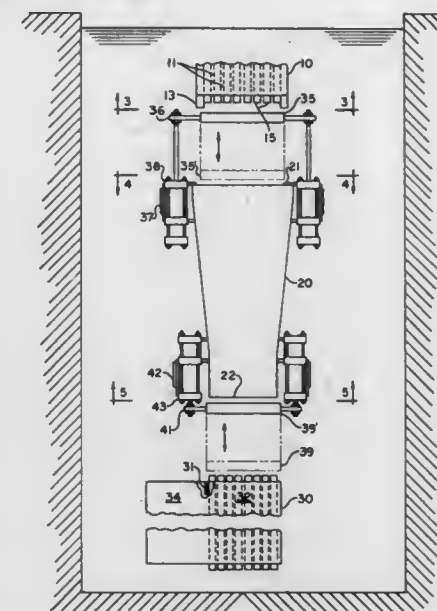
Int. Cl.⁴ G21C 19/32

U.S. Cl. 376—261

18 Claims

1. A nuclear fuel handling system including a storage container, a fuel assembly having an array of nuclear fuel rods, and

a gripper apparatus to move the array of fuel rods between the fuel assembly and the storage container, said gripper apparatus including the combination of gripper means supported by a frame to releasably engage at least diametrically opposite sides of fuel rods of said array,



means for pressing said gripper means into engagement with said fuel rods, and
 reciprocative means to move said gripper means between spaced-apart gripping and release positions for advancing said spent fuel rods an increment of length thereof in one axial direction relative to said storage container.

4,714,584
FLOW LIMITING HEAD ADAPTER EXTENSION
 Denis J. Altman, Jeannette, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 12, 1985, Ser. No. 701,053

Int. Cl.⁴ G21C 1/01, 7/00

U.S. Cl. 376—353

17 Claims



7. In a nuclear reactor which includes a pressure vessel having a vessel head, a core in the vessel, elements for controlling the reactivity of the core, drive rods which pass through the vessel head for displacing the elements, and a plurality of head adapters which pass through the vessel head, each head adapter having an inner diameter and forming part of a drive rod housing enclosing a respective drive rod, each housing enclosing a region which communicates with the interior of the vessel and which is closed at the top, the improvement comprising a device associated with a respective housing and constituting a housing extension located within said vessel, said device including means for connecting said device to the head

adapter forming part of said respective housing, said means for connecting having a substantially constant inner diameter substantially equal to that of said adapter, and means located at the lower end of said extension and supported by said connecting means for forming, with the associated drive rod and within said associated housing, an annular fluid passage, said means for forming having an inner diameter less than that of said means for connecting so as to give said annular fluid passage a cross-sectional area not exceeding a selected value at least upon the occurrence of a leak in said associated housing.

4,714,585

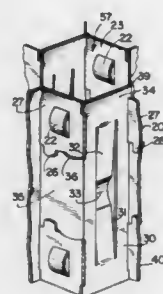
INTERLOCKING EGG-CRATE TYPE GRID ASSEMBLY
Steven J. Kast, Niskayuna, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 15, 1985, Ser. No. 712,056

Int. Cl.⁴ G21C 3/34

U.S. Cl. 376-442

12 Claims



1. A spacer grid assembly for supporting a plurality of nuclear fuel pins in a closely-spaced array, comprising:

- a first grid strip comprising a plurality of segments, disposed at an angle to each other with alternate segments being substantially parallel to each other, each of said segments carrying at least one dimple for contacting said fuel pins;
- a second grid strip comprising a plurality of segments disposed at an angle to each other with alternate segments being substantially parallel to each other, each alternate segment of said second strip carrying a resilient contact for contacting said fuel pins;
- a third grid strip comprising a plurality of segments disposed at an angle to each other with alternate segments being substantially parallel to each other, each of said segments of said third strip carrying at least one dimple for contacting said fuel pins; and
- interlocking means formed on said grid strips for interlocking said first and third grid strips with said second grid strip to form an array of grid cells having a hexagonal cross section and said segments of said first and third grid strips are substantially coplanar, and wherein said interlocking means includes first tabs positioned on alternate segments of said first and third grid strips for interlocking with first slots formed on other alternate segments of said second grid strips that do not carry said resilient contacts.

4,714,586

METHOD OF PREPARING A DIMENSIONALLY STABLE ELECTRODE FOR USE IN A MCFC

Thomas E. Swarr, South Windsor, and Wayne G. Wnuck, Stafford Springs, both of Conn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1986, Ser. No. 823,718

Int. Cl.⁴ B22F 3/10; C22C 32/00

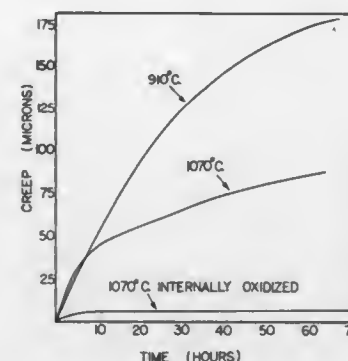
U.S. Cl. 419-2

9 Claims

1. A method of forming a dimensionally stable electrode

structure for use in a fuel cell stack containing molten alkali metal carbonate electrolyte, said method comprising:

- providing a porous plaque of nickel-chromium alloy having no more than 5 weight percent chromium;
- Selectively oxidizing the chromium in said plaque by exposure for at least one hour to a sufficient oxidizing potential



to oxidize chromium in the presence of nickel, said exposure provided by contacting said plaque with a gas mixture containing steam and hydrogen in a volumetric ratio of about 80-120 volumes of steam to one volume of hydrogen at a temperature of 600° C. to 800° C. to form said stable electrode structure.

4,714,587

METHOD FOR PRODUCING VERY FINE MICROSTRUCTURES IN TITANIUM ALLOY POWDER COMPACTS

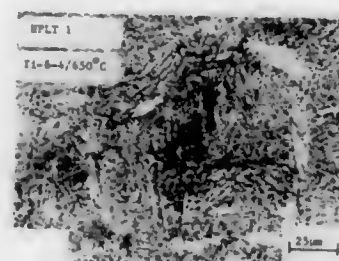
Daniel Eylon, Dayton, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 11, 1987, Ser. No. 13,818

Int. Cl.⁴ C21D 1/00

U.S. Cl. 419-29

18 Claims



1. A process for producing titanium alloy articles having a desired microstructure which comprises the steps of:

- providing a prealloyed titanium powder;
- filling a suitable mold with said powder; and
- consolidating the powder in the filled mold at a pressure of at least 30 ksi and a temperature about 60 to 80 percent of the beta transus temperature of said alloy, in degrees-C., for about 4 to 48 hours.

4,714,588

ALUMINUM ALLOY HAVING IMPROVED PROPERTIES

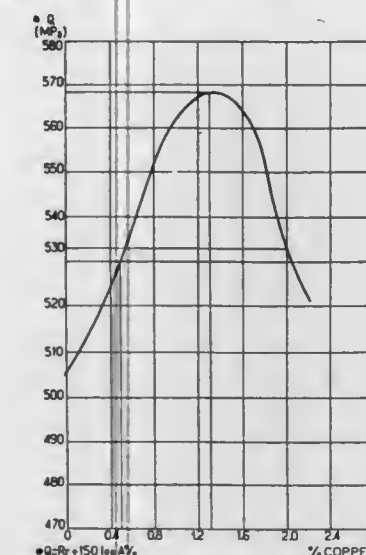
Roger Huet, Grenoble, France, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 20, 1984, Ser. No. 683,851

Int. Cl.⁴ C22C 21/02

U.S. Cl. 420-534

4 Claims



1. An aluminum alloy consisting essentially of about the following percentages of materials:

Si	6.5 to 7.5%
Mg	0.50 to 0.70%
Cu	1.2 to 1.4%

the remainder being constituted by aluminum, grain refiner and impurities the content of which is lower than 1.0%.

4,714,589

METHOD OF AND DEVICE FOR COATING THE INSIDE OF TUBES

Cornelis P. Auwerda, Eindhoven, Netherlands; Peter E. E. Geltner, Aachen, and Hans-Jürgen Lydtin, Stolberg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

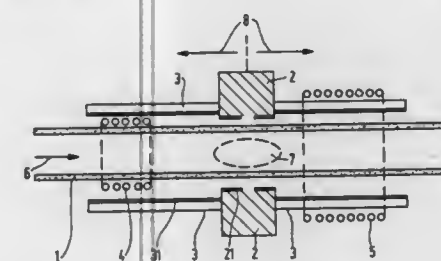
Filed Jun. 30, 1986, Ser. No. 880,263

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528275

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427-39

25 Claims



1. A method of coating the inside of a tube of an electrically insulating material with a second electrically insulating material by reactive deposition of the second electrically insulating material from a gas mixture which is passed through the tube, the tube being heated thermally and the deposition being activated by a plasma which is produced by microwaves and is

reciprocated in the tube, characterized in that the tube is heated at least partly by the energy supplied by the plasma to the tube wall and is kept at the reaction temperature in that the thermal losses of the tube to the ambient are reflected back to the tube wall by a heat-reflecting element.

4,714,590

CONDITIONING STRIP FOR PERFORMING MEDICAL ANALYSES ON A SAMPLE OF LIQUID AND USING DRY REAGENTS

Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France

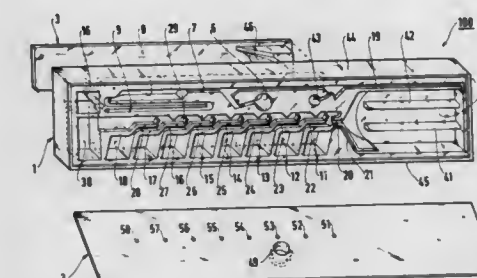
Filed Mar. 17, 1986, Ser. No. 840,614

Claims priority, application France, Mar. 26, 1985, 85 04477

Int. Cl.⁴ G01N 21/07, 35/04

U.S. Cl. 422-102

3 Claims



1. A conditioning strip for performing medical analyses on a sample of liquid and using dry reagents, said strip being constituted by a container and a lid made of transparent plastic material, means defining an opening in said lid, a stopper for closing said opening, the container having longitudinal side walls and being compartmented in order to form,

- a receptacle for said liquid sample, said receptacle being in communication with said opening through said lid, a calibrated cell,
- a capillary duct connecting said receptacle to said calibrated cell, an overflow chamber, means connecting said calibrated cell to said overflow chamber;
- a diluent tank for containing a diluent liquid situated beneath said calibrated cell and communicating via an inlet orifice within said container, said inlet orifice being closed by said lid; a mixing vat situated at one end of said strip and communicating via respective capillary ducts with said calibrated cell and with said diluent tank, all of said above-mentioned capillary ducts being parallel to the longitudinal side walls of said container;
- a series of reaction vats along one of said container longitudinal side walls, for containing respective solid reagents, and said reaction vats being connected via respective capillary ducts to a common duct in communication via capillary duct, with said mixing vat and acting as an overflow duct and terminating in a common overflow vat.

4,714,591

APPARATUS AND METHOD INVOLVING SUPERCRITICAL FLUID EXTRACTION

Michael M. Avedesian, Beaconsfield, Canada, assignor to Domtar Inc., Montreal, Canada

Continuation of Ser. No. 653,146, Sep. 22, 1983, abandoned, which is a division of Ser. No. 563,500, Dec. 22, 1983, Pat. No. 4,493,797. This application Jun. 9, 1986, Ser. No. 871,752

Int. Cl.⁴ C07G 1/00

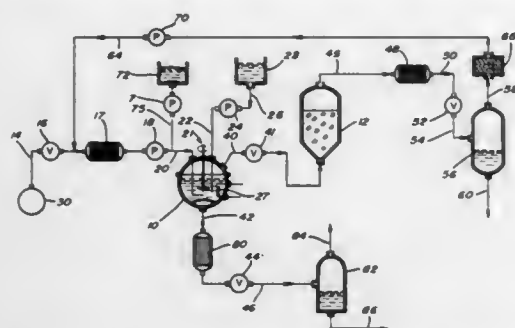
U.S. Cl. 422-140

2 Claims

1. An autoclave extractor to enable continuous extraction of a compound from a solution, with supercritical fluid under supercritical conditions, which extractor comprises:

- a means for defining a pressurable chamber,

said chamber having a first end, and opposite said first end a second end, and
 between said first end and said second end an intermediate chamber portion,
 (b) said first end having a first outlet means provided with a first pressure let-down valve control,
 (c) said second end having a second outlet means provided with a second pressure let-down valve control,
 (d) means for defining a zone separator between said second outlet means and said intermediate chamber portion,
 (e) a first means for feeding into said intermediate chamber portion, a compound in solution, and
 (f) a second means for feeding into said intermediate chamber portion, a supercritical fluid under supercritical condition,
 whereby in said intermediate chamber portion provided with said means for feeding a compound in solution, and said means for feeding a supercritical fluid under supercritical condition, said compound is preferentially transferred from said solution into said supercritical fluid, and



said first let-down valve means causing a gradual pressure difference between said intermediate chamber and said first outlet, and thereby a flow of said supercritical fluid containing the compound from said intermediate chamber to said first outlet wherein said flow has a gradual decreasing pressure caused by both said first pressure let-down valve and the pressure from said supercritical fluid entering through said second feed means, whereby for each pressure differential, there is a much greater corresponding density differential between said supercritical fluid containing the compound, and the depleted solvent, said density differential causing separation of the supercritical fluid containing compound from the depleted solvent and the escape of said supercritical fluid containing compound through said first outlet,
 and said zone separator preventing a substantial pressure drop in said intermediate chamber portion while enabling simultaneously the passage therethrough of the solvent depleted from said compound in said intermediate chamber portion to said second outlet.

4,714,592

RADIAL FLOW CATALYTIC REACTOR INCLUDING HEAT EXCHANGE APPARATUS WITHIN THE BED
 Jun Zanma, Yachiyo; Yoshinori Nishimura, Chiba; Kazuo Shyoji, Funabashi; Makoto Shimagaki, Sakura, and Yoichi Nakajima, Chiba, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 690,028

Claims priority, application Japan, Jan. 18, 1984, 59-6826

Int. Cl. B01J 8/04

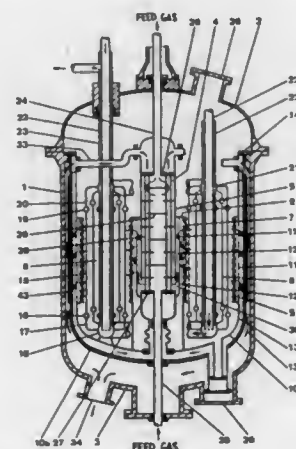
U.S. Cl. 422-192

16 Claims

1. In a reactor including an outer pressure vessel having an inlet passage for feeding gaseous feed materials into said pressure vessel and an outlet passage for discharging a product gas therefrom, a bed of a granular catalyst and means for flowing a reactant gas comprising the gaseous feed materials through said granular catalyst so that it reacts to form a product gas, means for cooling the product gas and preheating the gaseous

feed materials, and means for cooling the reactant gas as the reactant gas passes through said catalyst bed, the improvement which comprises:

said outer pressure vessel is upright and cylindrical, and comprises a bottom cover and a removable top cover;
 said cooling and preheating means comprises a heat exchanger centrally mounted within said outer pressure vessel coaxially therewith, said heat exchanger comprising a substantially cylindrical outer shell, upper and lower partition plates subdividing the interior of said shell in the lengthwise direction thereof, a plurality of heat exchanger tubes extending from said upper partition plate to said lower partition plate, said heat exchanger tubes opening above said upper partition plate and opening below said lower partition plate, said partition plates being positioned so as to define a shell-side heat exchange compartment therebetween, an upper chamber above said upper partition plate and a lower chamber below said lower partition plate, said shell of said heat exchanger having openings at opposite end portions thereof so that a gas can enter said compartment near one end of said compartment and be discharged from the opening at the other end of said compartment, said inlet passage for the gaseous feed materials being in communication with said shell-side heat exchange compartment of said heat exchanger so that the gaseous feed materials undergo heat exchange and are thereby preheated before being fed to said catalyst bed;



said catalyst bed comprises spaced-apart inner and outer cylindrical gas-permeable catalyst retainers being positioned and arranged so as to define an intercylinder space therebetween coaxial with said outer pressure vessel and said heat exchanger, said inner catalyst retainer being of smaller diameter than said outer catalyst retainer, and a bottom wall extending beneath said catalyst retainers and fixedly connecting said catalyst retainers to each other, said catalyst retainers and said bottom wall being spaced apart from the inner periphery of said outer pressure vessel, said granular catalyst being packed in the intercylinder space between said inner and outer catalyst retainers above said bottom wall;

said cooling means comprises a cooling structure having a coolant inlet passage and a coolant outlet passage which both extend through said top cover of said outer pressure vessel, and a multiplicity of vertical cooling tubes which extend through said catalyst bed, said granular catalyst being packed around said cooling tubes, each of said cooling tubes being in communication with said coolant inlet passage and said coolant outlet passage so that a liquid coolant may be circulated through said cooling structure to absorb reaction heat generated in said catalyst bed;

a cylindrical, gas-impermeable, outer, partition wall coaxial with said outer pressure vessel and located between said

outer pressure vessel and said outer gas-permeable catalyst retainer and spaced therefrom and positioned so as to define a first outer gas flow passageway between said outer pressure vessel and said cylindrical outer partition wall and a second inner gas flow passageway between said cylindrical outer partition wall and said outer catalyst retainer, whereby the product gas from said catalyst bed is discharged through said outer catalyst retainer into said second inner gas flow passageway, flows through said second inner flow passageway and thence into the tubes of said heat exchanger, undergoes heat exchange with the gaseous feed materials, in said heat exchanger, thereby cooling the product gas, and then is fed through said first outer gas flow passageway to said product gas outlet formed on said outer pressure vessel.

4,714,593

REFORMING APPARATUS

Akio Naito; Hirohisa Uozu, and Toru Numaguchi, all of Chiba, Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

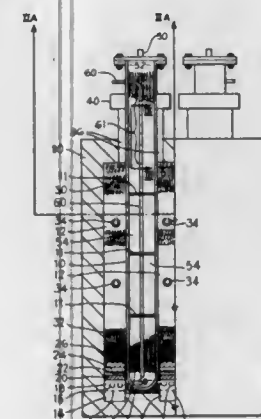
Filed Mar. 6, 1987, Ser. No. 22,840

Claims priority, application Japan, Mar. 10, 1986, 61-53346

Int. Cl. B01J 7/00, 8/06

U.S. Cl. 422-197

12 Claims



1. A reaction apparatus comprising: at least one reaction vessel for effecting an endothermic reaction and heat generation means on the outside of and in contact with said reaction vessel;

said heat generation means comprising a mixing chamber at one end of said heat generation means, means for supplying primary fuel gas to said mixing chamber and means for supplying an oxygen-containing gas to said mixing chamber so that said fuel gas and said oxygen-containing gas are mixed together in said mixing chamber;

a preheating chamber for receiving said mixture of said fuel gas and said oxygen-containing gas and preheating said mixture;

a gas-permeable catalyst bed containing a catalyst for causing combustion of said preheated mixture, said catalyst bed being disposed adjacent to said preheating chamber for receiving said preheated mixture therefrom;

a combustion chamber for receiving the burning mixture from said catalyst bed, said combustion chamber containing secondary fuel gas supply means for supplying additional fuel gas to said combustion chamber, said combustion chamber containing heat-transfer bodies at least partially filling said combustion chamber;

and first discharge means for discharging gaseous products of combustion from said combustion chamber, wherein said mixing chamber, said preheating chamber, said gas-permeable catalyst bed, said combustion chamber and said first discharge means are arranged in series in that order

from said one end of said heat generation means to the opposite end thereof;

said reaction vessel being contacted by said combustion chamber, whereby heat is transferred from said combustion chamber to said reaction vessel;

means for supplying a reactant gas to said reaction vessel at a location beyond said opposite end of said heat generation means, thence flowing said reactant gas through said reaction vessel in a direction opposite to the direction in which fuel gas and gaseous products of combustion of said fuel gas flow through said heat generation means whereby to cause the reactant gas to react to form a reaction product gas, at least one discharge passage means extending into said reaction vessel for isolating said reaction product gas from said reactant gas and flowing it through said reaction vessel in the same direction as the direction in which fuel gas gaseous products of combustion thereof flow through said heat generation means;

and second discharge means for discharging said reaction product gas from said discharge passage means.

4,714,594

REACTOR FOR VAPOR PHASE EPITAXY

André S. Mircea, 31 rue Frederic Mistral, 91330 Yerres, France

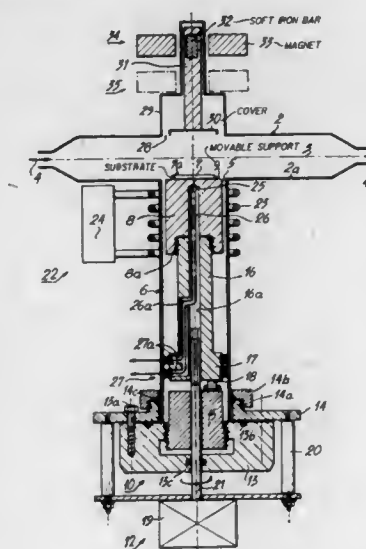
Filed Jun. 25, 1985, Ser. No. 748,443

Claims priority, application France, Jun. 27, 1984, 84 10154

Int. Cl. C30B 35/00, 25/10; C23C 16/00; B05D 5/12

U.S. Cl. 422-245

5 Claims



1. A reactor for vapour phase epitaxy on one face of at least one substrate, comprising:

at least one substrate;

at least one support on one face of which is placed the substrate;

means for heating the substrate;

tubular chamber means for circulation of an epitaxy gas stream therein, wherein the chamber means has a planar wall with at least one opening formed therein for receiving the face of the support provided with the substrate, and wherein said chamber means includes a longitudinal axis and a gas inlet and outlet means located at opposite ends of said chamber for flow of gas in a single direction along the longitudinal axis of said chamber and parallel to said face of said support;

positioning means for positioning the face of the support substantially in said at least one opening of said planar wall and parallel to said direction of said gas flow and means for rotating the face of the support about an axis perpendicular to the support face and perpendicular to said direction of said gas stream.

4,714,595

TISSUE STORAGE SYSTEM

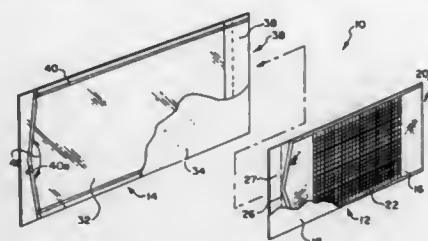
Jack Anthony, Lake Bluff; Arnold C. Bilstad, Deerfield; Wayne T. Leblong, Crystal Lake, and Robert J. Kruger, Arlington Heights, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 27, 1984, Ser. No. 686,948

Int. Cl.⁴ B65D 81/00

U.S. Cl. 422—294

24 Claims



1. A storage system comprising:

- a first thin film container for containing material to be sterilized, having means defining a sealable opening, means defining a transparent portion for viewing the material contained therein and a gas permeable portion to allow gas sterilization of the interior of said first container; and
- a second thin film container, dimensioned to contain said first container, having a selectively sealable opening which includes a gas permeable portion and which is selectively sealable in a first sealed position that allows gas sterilization of the first container through said gas permeable portion of said second container, said second container being selectively sealable in a second sealed position in which said second container provides a gas barrier, and a gas impermeable transparent portion for viewing the material in said second container providing a gas barrier when sealed.

4,714,596

PROCESS FOR THE RECOVERY IN THE FORM OF TETRAVALENT FLUORIDE OF URANIUM EXTRACTED FROM PHOSPHATE-BEARING SOLUTIONS

Antoine Floreaneig, Saint Genis Laval, France, assignor to Uranium Pechiney, Courbevoie, France

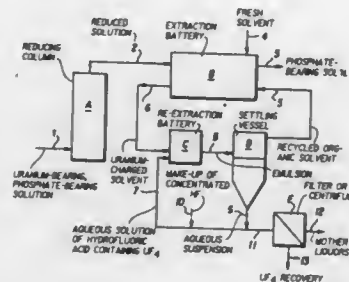
Filed Nov. 6, 1985, Ser. No. 795,410

Claims priority, application France, Nov. 16, 1984, 84 17993

Int. Cl.⁴ C01G 43/06

U.S. Cl. 423—10

15 Claims



1. A process for the recovery of uranium from a phosphate-bearing solution, comprising:

- reducing the uranium in the phosphate-bearing solution to the tetravalent state;
- extracting the said uranium from the said phosphate-bearing solution with an organic solvent comprising a hydrocarbon and either (b1) a mono- and a dialkylphenylphosphoric acid or (b2) an alkylpyrophosphoric acid;
- re-extracting the uranium from the organic solvent by contacting the said organic solvent with an aqueous solu-

tion of hydrofluoric acid containing UF₄ as a suspension and present in an amount sufficient to enhance uranium extraction from the said organic solvent, to obtain an emulsion;

- separating the organic solvent from which uranium has been removed from the emulsion formed in step (c) to obtain an aqueous suspension;
- recycling the said organic solvent obtained from step (d) to extraction step (b) with a make-up amount of pure organic solvent; and
- recovering UF₄ from the aqueous suspension obtained in step (d).

4,714,597

CORROSION INHIBITOR FOR CO₂ ABSORPTION PROCESS USING ALKANOLAMINES

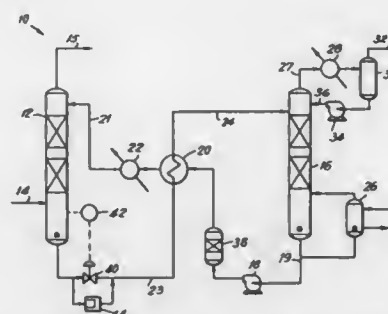
Juan A. V. Trevino, San Nicolas de los Garza, Mexico, assignor to Hylsa, S.A., Monterrey, Mexico

Filed Jun. 26, 1986, Ser. No. 879,059

Int. Cl.⁴ C01B 17/16, 31/20

U.S. Cl. 423—228

8 Claims



1. In a process for the recovery of carbon dioxide from a feed gas containing the same and at least half of said gas being composed of either hydrogen or carbon monoxide or both which may also contain sulfur compounds, by contacting the gas in ferrous metal processing equipment with a circulating alkanolamine solution containing copper and treating said solution rich in CO₂ with heat to release the CO₂ thereby producing a lean solution and cooling and returning the so-treated lean solution to the contacting step, the improvement which comprises maintaining a corrosion inhibiting means consisting essentially of copper ions and zinc ions in said circulating solution in an amount effective to inhibit corrosion of the ferrous metal processing equipment and/or degradation of the solvent by bringing said circulating solution into contact with a metal selected from bronze and brass.

4,714,598

METHODS OF DESULFURIZING GASES

D. Alan R. Kay, Burlington, Ontario, Canada, and William G. Wilson, Allegheny County, Pittsburgh, Pa. 15229

Division of Ser. No. 718,989, Apr. 2, 1985, Pat. No. 4,604,268, which is a continuation-in-part of Ser. No. 521,751, Aug. 8, 1983, Pat. No. 4,507,149, which is a continuation-in-part of Ser. No. 471,773, Mar. 3, 1983, which is a continuation of Ser. No. 174,024, Jul. 31, 1980, Pat. No. 4,397,683. This application Mar. 31, 1986, Ser. No. 846,272

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.⁴ B01D 53/36; C01B 17/00; B01J 8/00

U.S. Cl. 423—230

2 Claims

1. A method for desulfurizing gases formed by the incomplete combustion of sulfur containing hydrocarbons at high temperature in which gases the sulfur is mainly in the form of one of hydrogen sulfide and sulfur carbonyl whereby the sulfur is removed to sufficiently low levels that when combustion of the gases is completed the gases emitted the atmosphere have a sulfur content which is less than one pound of sulfur per

million British thermal units produced by combustion of fuel or its equivalent comprising the steps of:

- Controlling the incomplete combustion of the sulfur containing hydrocarbons so that the ratio of carbon monoxide to carbon dioxide (CO/CO₂) ratio at standard conditions (32° F. and one atmosphere pressure) is greater than one; and
- Reacting the gases whose CO/CO₂ ratio is greater than one and whose sulfur content is in the form of either H₂S and sulfur carbonyl (COS) with cerium oxide, whereby the H₂S content of the desulfurized gases is less than 1000 part per million when the ratio of the CO/CO₂ is greater than one and the temperature is less than 1600° C.

4,714,599

PROCESS FOR PREPARING RHOMBOHEDRAL SYSTEM BORON NITRIDE USING NABH₄ AND NH₄CL

Tadao Sato, and Toshihiko Ishii, both of Sakura, Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

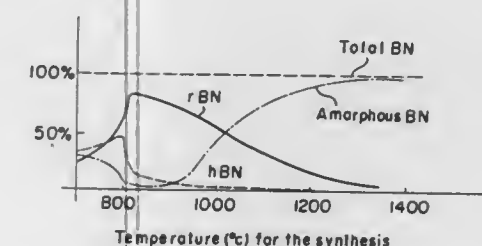
Continuation-in-part of Ser. No. 440,998, Nov. 12, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 643,318

Claims priority, application Japan, Apr. 15, 1982, 57-63067

Int. Cl.⁴ C01B 21/064

U.S. Cl. 423—290

8 Claims



1. A process for preparing rhombohedral system boron nitride, which comprises mixing NaBH₄ with at least an equimolar amount of NH₄Cl, and heating the resulting mixture in a non-oxidizing atmosphere at a temperature of at least 750° C. and lower than 1000° C. for at least 3 hours.

4,714,600

PROCESS FOR PRODUCTION OF PHOSPHORIC ACID FROM DRY MATRIX BY SO₃ TREATMENT AND EXTRACTION

Patrick R. Driscoll, Spotswood, and Ross A. Kremer, Ringoes, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,509

Int. Cl.⁴ C01B 25/16

U.S. Cl. 423—319

6 Claims

1. A process for producing phosphoric acid from phosphate ore matrix comprising:

- drying the phosphate ore matrix;
- acidulating the dry matrix with sulfur trioxide in the presence of sulfuric acid catalyst;
- removing said sulfur trioxide from the matrix;
- treating the acidulated matrix with sufficient water to convert phosphorus values to orthophosphoric acid; and
- extracting the orthophosphoric acid with methanol or ethanol.

4,714,601

PROCESS FOR PREPARING A HIGH SILICA FAUJASITE ALUMINOSILICATE, ECR-4

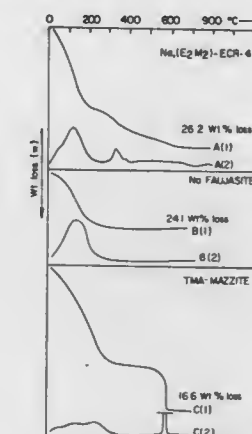
David E. W. Vaughan, Flemington, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 4, 1984, Ser. No. 606,940

Int. Cl.⁴ C01B 33/28

U.S. Cl. 423—329

3 Claims



1. A process for preparing an aluminosilicate having a faujasite structure, a silica to alumina mole ratio of at least five, and ions within the super cages of said aluminosilicate selected from the group consisting of bis-(2-hydroxyethyl)dimethylammonium ions and bis-(2-hydroxypropyl)dimethylammonium ions which comprises the steps of:

- preparing a reaction mixture comprising sodium aluminate, alum, water, sodium silicate, aluminum sulfate, an organic template and nucleating seeds of about the composition 13.33 Na₂O:Al₂O₃:12.55SiO₂:267H₂O, said reaction mixture having a composition, in terms of mole ratios of oxides, within the following ranges:
(Na,T)₂O:Al₂O₃: 1.6 to 8
SiO₂:Al₂O₃: 4 to 20
H₂O:Al₂O₃: 100 to 400
wherein T represents a bis-(2-hydroxyethyl)dimethylammonium or bis-(2-hydroxypropyl)dimethylammonium group, and said seeds being present in an amount to yield 0.1 to 10 mole percent of the total final alumina content in said aluminosilicate;
- blending the reaction mixture sufficiently to form a substantially homogeneous mixture;
- maintaining the reaction mixture between 90° and 120° C. under autogenous pressure for a sufficient period of time to form crystals of said aluminosilicate; and
- recovering said aluminosilicate crystals.

4,714,602

PROCESS FOR THE PREPARATION OF SOLID SODIUM HYDROGEN CYANAMIDE

Helmut Krommer, Fasanenstrasse, D-8223 Trostberg; Karl-Heinz Neuhauser, Am-Ederberg 3, D-8261 Taufkirchen-Gallenbach, and Stefan Weiss, Sonnenleite 8, D-8223 Trostberg, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 745,789, Jun. 17, 1985, abandoned. This application Jul. 16, 1986, Ser. No. 886,014

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1984, 3422595

Int. Cl.⁴ C01C 3/16

U.S. Cl. 423—369

7 Claims

1. A process for the preparation of solid sodium hydrogen cyanamide, which comprises:

- reacting cyanamide with sodium hydroxide in aqueous solution; and
- concentrating the aqueous solution containing sodium hydrogen cyanamide with a drier device which uses a

heating gas, said drier device being either a spray drier or an atomization drier, wherein the heating gas enters said drier device at a temperature of 110° C. to 200° C. and exits at a cooler temperature of 40° C. to 120° C. to produce a fine-particled powder having a moisture content of approximately 1 to 3% by weight.

4,714,603

SPHERICALLY SHAPED PRECIPITATED CALCIUM CARBONATE, ITS PREPARATION AND USE

Dennis B. Vanderhelden, Easton, Pa., assignor to Pfizer, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 662,103, Oct. 18, 1984, abandoned. This application May 8, 1986, Ser. No. 860,946
Int. Cl.⁴ C01F 5/24, 11/18

U.S. Cl. 423—432

9 Claims



1. A precipitated calcite having particles of substantially spherical morphology with an average spherical diameter of from about 2 to 10 microns, a particle size distribution such that at least about 50 weight percent of the particles lie within 50 percent of the average spherical diameter, a specific surface area of from about 1 to 15 square meters per gram, a void volume of from about 0.5 to 1.0 cubic centimeter per gram, and a plurality of up to about 5000 surface nodules per particle, the nodules having a height of from about 0.02 to 1.0 micron and an aspect ratio of less than about 2.

4,714,604

METHOD OF SEPARATING HF AND SiF₄ FROM HCl

Robert S. Olson, Lafayette, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 13, 1986, Ser. No. 896,165

Int. Cl.⁴ C01B 7/07

U.S. Cl. 423—488

20 Claims

10. A method of separating HF from a mixture of HF and HCl comprising:
contacting said mixture with SiO₂ to form a mixture of SiF₄ and HCl;
establishing an aqueous solution of SiF₄ and HCl having a concentration of HCl at a level effective to provide a relative volatility SiF₄/HCl at greater than 1;
distilling said solution of SiF₄ and HCl to remove said SiF₄ from said HCl and
collecting SiF₄ as an aqueous distillate; and
collecting aqueous HCl as a bottom product.

4,714,605

TECHNETIUM-99m LABELED DIOXIME COMPLEXES

Thomas A. Feld, Calif.; Pedro N. Juri, Lawrenceville, both of N.J., and Elizabeth N. Treher, Washington Crossing, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

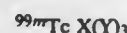
Filed Oct. 14, 1986, Ser. No. 918,434

Int. Cl.⁴ A61K 43/00; C07F 13/00

U.S. Cl. 424—1.1

12 Claims

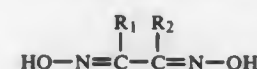
1. A technetium-99m dioxime complex having the formula



wherein

X is a halogen; and

Y is a vicinal dioxime having the formula



or a pharmaceutically acceptable salt thereof, wherein R₁ and R₂ are each independently hydrogen, halogen, alkyl, aryl, amino or a 5 or 6-membered nitrogen or oxygen containing heterocycle, or together R₁ and R₂ are —(CR₃R₄)_n—wherein n is 3, 4, 5 or 6 and R₃ and R₄ are each independently hydrogen or alkyl.

4,714,606

METHOD OF STAINING AND IDENTIFYING CELLS AND COMPOSITIONS THEREOF

Lawrence Kass, Hinckley, Ohio, assignor to Cytocolor Incorporated, Hinckley, Ohio

Continuation-in-part of Ser. No. 610,381, May 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 494,971, May 16, 1983, abandoned. This application Aug. 13, 1985, Ser. No. 765,348

Int. Cl.⁴ G01N 1/00, 33/48

U.S. Cl. 424—3

29 Claims

1. A method for differentiating, identifying and enumerating cells from each other among a plurality of cells of hematopoietic origin selected from the group consisting of blood cells, bone marrow cells and lymph node cells which comprises fixing said cells in an organic fixative and subsequently staining said fixed cells with a staining amount of a water soluble quaternary azo dye, identified as Basic Blue 41, (C.I. 11154) to obtain a plurality of stained cells; said stained cells having individual color characteristics which permit the differentiation, identification and enumeration of each cell.

4,714,607

NMR CONTRAST AGENTS

Jo Klaveness, Oslo, Norway, assignor to Nycomed AS, Oslo, Norway

Filed May 30, 1985, Ser. No. 739,228

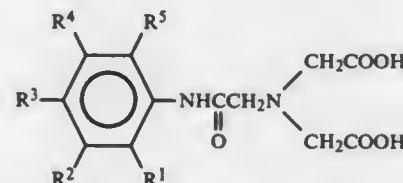
Claims priority, application United Kingdom, May 30, 1984, 8413772

Int. Cl.⁴ A61K 49/00; G01N 31/00, 33/48

U.S. Cl. 424—9

27 Claims

1. An NMR contrast agent comprising at least one water-soluble non-radioactive paramagnetic metal chelate together with at least one physiologically acceptable carrier or excipient, wherein the chelating entity is a chelating agent of formula I



wherein R¹ to R⁵, which may be the same or different, each represent hydrogen or halogen atoms, optionally halogenated alkyl or alkoxy groups or carboxyl groups, or a physiologically acceptable salt thereof.

4,714,608

AQUEOUS DENTAL PREPARATION CONTAINING FLUORIDE IONS AND THE USE THEREOF

Gunnar Rølla, Kragstveien 13, 0391 Oslo 3, Norway

Filed Jun. 9, 1986, Ser. No. 879,229

Claims priority, application Norway, Oct. 9, 1984, 844037

Int. Cl.⁴ A61K 7/18

U.S. Cl. 424—52

10 Claims

1. A dental preparation for topical application on teeth, containing fluoride ions in aqueous solution, having a maximum pH of about 2 and a minimum pH which is not so low as to be harmful.

4,714,609

SKIN TANNING COMPOSITION

Anthony A. Carden, Fort Worth, Tex., assignor to Laverne Stanley, Fort Worth, Tex.

Filed Jul. 21, 1986, Ser. No. 887,287

Int. Cl.⁴ A61K 7/42, 7/44

U.S. Cl. 424—59

2 Claims

1. A method of tanning the human epidermis which comprises applying to said epidermis a composition comprising a cosmetic base, and an effective amount of vanillin, the vanillin being present in an amount effective to react with the skin epidermis to produce a carbonyl-amine reaction which results in accelerated tanning of the epidermis upon exposure to the sun's rays.

4,714,610

LOW pH HAIR CONDITIONER COMPOSITIONS CONTAINING AMINE OXIDES

Terry Gerstein, Brunswick, N.J., assignor to Revlon, Inc., New York, N.Y.

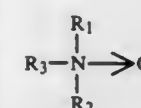
Continuation-in-part of Ser. No. 632,745, Jul. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 406,668, Aug. 9, 1982, abandoned. This application Dec. 27, 1985, Ser. No. 814,105

Int. Cl.⁴ A61K 7/075

U.S. Cl. 424—70

17 Claims

1. A cationic hair conditioning composition comprising:
(a) an amine oxide of the formula:



wherein R₁ and R₂ are the same or different moieties and are selected from lower (C₁–C₄) alkyl, alkoxy and hydroxy alkyl groups, and R₃ is an alkyl group containing 8 to 22 carbon atoms; and

(b) water and sufficient acid to provide a pH for said composition of from about 3.8 to about 2.4 and an amine oxide concentration from about 0.5% to about 10% based on the total weight of said hair conditioning composition.

4,714,611

STABLE COMPOSITION OF GAMMA-INTERFERON

Akagi Yasaburo, Takatsuki; Miura Yasumoto, Kawanishi, and Hoshino Tetsuo, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 22, 1985, Ser. No. 693,669

Claims priority, application Japan, Jan. 23, 1984, 59-10857; Jan. 9, 1985, 60-2585

Int. Cl.⁴ A61K 45/02; C07K 15/26

U.S. Cl. 424—85

25 Claims

1. A human γ-interferon composition frozen or lyophilized in the presence of an aqueous solution comprising 3 to 50 mg/ml dextran or hydroxyethylstarch or a combination thereof.

4,714,612

COMPOSITION FOR ORAL APPLICATION

Tsuneaki Nakamura, Odawara; Tatsuo Kiyoshige, Hadano, and Shuji Sasaki, Hiratsuka, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,393

Claims priority, application Japan, Jun. 28, 1984, 59-132103

Int. Cl.⁴ A61K 39/395

U.S. Cl. 424—85

8 Claims

1. A method for preventing Bacteroides gingivalis from colonizing in the mouth comprising intraorally administering an effective amount of a non-specific γ-globulin to prevent Bacteroides gingivalis from colonizing in the mouth.

4,714,613

METHOD OF SUPPRESSING CELL GROWTH BY IMMUNOTHERAPY

Daniel Shouval, Jerusalem, Israel; David A. Shafritz, Larchmont, N.Y., and Jack R. Wands, Waban, Mass., assignors to The Albert Einstein College of Medicine of Yeshiva University, New York, N.Y. and The General Hospital Corporation, Boston, Mass.

Filed Sep. 30, 1982, Ser. No. 428,653

Int. Cl.⁴ A61K 39/42, 39/00; C12P 21/00; C12Q 1/02

U.S. Cl. 424—86

6 Claims

1. A method of selectively suppressing the growth of HBV infected hepatocytes or hepatoma cells which express or present, or which are capable of expressing or presenting HBsAg on the surface thereof, wherein said HBsAg is coded for by the DNA of the HBV, which comprises administering to said cells, while in the presence of other cells which do not express or present said HBsAg, a growth suppressing amount of a complement fixing monoclonal antibody against said HBsAg.

4,714,614

PROCESS FOR INDUCING SUPPRESSIVENESS TO FUSARIUM VASCULAR WILT DISEASES

Frances M. Scher, Fort Collins, Colo., assignor to Colorado State University, Fort Collins, Colo.

Continuation of Ser. No. 335,895, Dec. 30, 1981, abandoned.

This application Oct. 29, 1984, Ser. No. 665,096

Int. Cl.⁴ A01N 63/00

U.S. Cl. 424—93

25 Claims

1. A *Fusarium oxysporum* growth suppression composition which comprises a *Fusarium oxysporum* disease suppressive amount of at least one *Fusarium oxysporum* disease suppressant selected from the group consisting of a *Fusarium oxysporum* disease suppressive strain of *Pseudomonas putida* having the identifying characteristics of NRRL B-15001, and said *Fusarium oxysporum* disease suppressing strain of *Pseudomonas putida* in combination with a *Fusarium oxysporum* disease suppressing ferric iron chelating agent which forms a chelate whose stability is greater than the stability of the ferric iron chelate of ethylenediaminetetraacetic acid or the corresponding ferric iron chelate of said agent, and a biologically compatible carrier.

4,714,615

SKIN TREATMENT COMPOSITIONS COMPRISING UNOXIDIZED NERVE TISSUE

Rina Youssefeyeh, 67 Amburst Way, Princeton, N.J. 08550

Continuation-in-part of Ser. No. 599,010, Apr. 11, 1984, abandoned. This application Apr. 11, 1986, Ser. No. 850,569

Int. Cl.⁴ A61K 35/12

U.S. Cl. 424—95

5 Claims

1. A method for cleansing human skin comprising topically applying to said human skin a composition comprising: from 1.5 to 2.5 parts by weight of a powdery, cosmetically acceptable inorganic substance selected from the group consisting of calcium acetate, calcium carbonate, calcium formate, calcium gluconate, calcium lactate, calcium oxalate, calcium phosphate, calcium stannate, magnesium carbonate, magnesium

aluminum silicate, zinc carbonate, zinc aluminum silicate, silica, talc and mixtures thereof and 1 part by weight of oxidized cattle spinal cord.

4,714,616

PREPARING NATURALLY SWEET YOGURT WITH SACCHAROMYCOPSIS SP. AND RHIZOPUS SPP.

Anthony H. Kao, 91 Lawai Street, Honolulu, HI. 96825

Continuation of Ser. No. 620,323, Jun. 12, 1984, abandoned.

This application Sep. 29, 1986, Ser. No. 913,561

Int. Cl.⁴ A23C 9/12; A23L 1/20; C12G 1/00

U.S. Cl. 426—42

9 Claims

1. A process for preparing a yogurt product having a bland, unique, sweet taste, said process comprising the successive steps of:

- (a) heating dairy or a vegetable-based milk to a temperature sufficient to sterilize the milk;
- (b) homogenizing the sterilized milk to uniformly distribute the fat particles therein;
- (c) inoculating the homogenized milk of step (b) with an inoculant consisting essentially of rice wine containing a milk coagulating amount of *Saccharomycopsis* sp. and *Rhizopus* spp. and allowing the culture to grow until the milk is coagulated;
- (d) pasteurizing the milk coagulum of step (c); and
- (e) cooling the pasteurized milk coagulum to yield a bland, sweet-tasting yogurt product.

4,714,617

PROCEDURE FOR SEGREGATION OF MIXTURE OF SUBSTANCES CONTAINING ORGANIC COMPONENTS

Hans J. Gähns, Dusseldorf, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 644,040, Aug. 24, 1984, abandoned.

This application Mar. 27, 1986, Ser. No. 845,474

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331906

Int. Cl.⁴ A24B 15/24; A23F 5/20

U.S. Cl. 426—427

12 Claims

1. In a procedure for decaffeinating raw coffee by high pressure extraction wherein a gaseous solvent is charged into the coffee in an extractor under high pressure conditions to dissolve the caffeine of the coffee, the mixture of solvent and coffee components then being conveyed to a separator in a separation stage from which the coffee components are extracted and removed and with the solvent being conveyed from the separator for reuse in a further extraction procedure, the improvement being in the solvent being selected from the group consisting of CO₂, N₂ and mixtures thereof, admixing at least one additive selected from the group consisting of CO₂, N₂ and Ar to the charged solvent immediately before or directly into the separation stage, the additive reducing the solvent capacity of the solvent and functioning to facilitate the achievement of a precipitation in the separator for at least a portion of the components to be extracted, the additive containing at least one material different from the solvent to permit the later separation of the additive from the solvent, segregating the mixture of solvent/additive from which the precipitated components have been removed into solvent and additive components in a preparation stage, thereafter again adding the solvent to the mixture of substances for purposes of continued extraction, and again admixing the additive components to the charged solvent by conveying the additive components in a circuit which does not include the extractor.

7. In a procedure for the denicotinization of tobacco by high pressure extraction wherein a gaseous solvent is charged into the tobacco in an extractor under high pressure conditions to dissolve the nicotine of the tobacco, the mixture of solvent and tobacco components then being conveyed to a separator in a separation stage from which the tobacco components are extracted and removed and with the solvent being conveyed from the separator for reuse in a further extraction procedure, the improvement being in the solvent being selected from the

group consisting of CO₂, N₂ and mixtures thereof, admixing at least one additive selected from the group consisting of CO₂, N₂ and Ar to the charged solvent immediately before or directly into the separation stage, the additive reducing the solvent capacity of the solvent and functioning to facilitate the achievement of a precipitation in the separator for at least a portion of the components to be extracted, the additive containing at least one material different from the solvent to permit the later separation of the additive from the solvent, segregating the mixture of solvent/additive from which the precipitated components have been removed into solvent and additive components in a preparation stage, thereafter again adding the solvent to the mixture of substances for purposes of continued extraction, and again admixing the additive components to the charged solvent by conveying the additive components in a circuit which does not include the extractor.

4,714,618

PROCESS FOR TREATING FROZEN BLOCK MEAT

Eiichi Matsuda, Kagawa, Japan, assignor to Fine Foods Research Cooperative Union, Kagawa, Japan

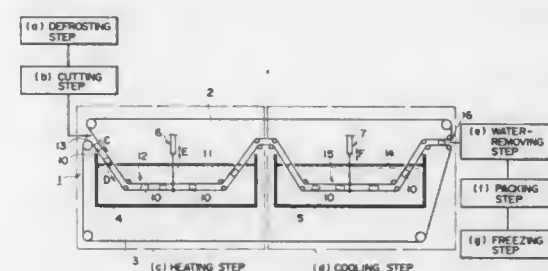
Filed Apr. 13, 1987, Ser. No. 37,664

Claims priority, application Japan, May 17, 1986, 61-113191

Int. Cl.⁴ A23B 4/06; A23L 3/36

U.S. Cl. 426—524

6 Claims



1. A process for treating frozen block meat, comprising the steps of:

- subjecting the frozen block meat to an environment maintained at a temperature of between -4° C. and 0° C. for defrosting the frozen block meat;
- cutting the defrosted block meat into pieces of a thickness of about 30 mm or less;
- heating the cut meat with steam or hot water having a temperature of 80°-100° C. for a period of 30-90 seconds;
- then cooling the heated cut meat in cold water having a temperature of 5° C. or below for a period of 1-30 seconds; and
- then freezing the cooled cut meat after removing the cold water which deposits on the surface of the cooled cut meat.

4,714,619

AMINOMALONYL ALANINE COMPOUNDS AS DIETARY SWEETENERS

Herbert H. Seltzman, Raleigh, and Yung-Ao Hsieh, Durham, both of N.C., assignors to Research Triangle Institute, N.C.

PCT No. PCT/US85/01764, § 371 Date May 19, 1986, § 102(e) Date May 19, 1986, PCT Pub. No. WO86/01690, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 18, 1985, Ser. No. 893,551

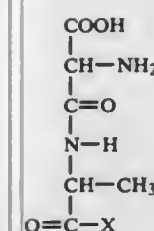
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.⁴ A23L 1/236, 2/38

U.S. Cl. 426—548

7 Claims

1. Aminomalonyl-D-alanine derivatives having the formula:



and pharmaceutically acceptable salts thereof, wherein X is —NHR or —OR with R being alkyl of from 3 to 10 carbon atoms, or —NH₂.

4,714,620

SOFT, SUGARLESS AERATED CONFECTIONERY COMPOSITION

Frank J. Bunick, Budd Lake; Sheryl A. Hutchinson, Lake Hiawatha, and Ralph Cifrese, Morristown, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 12, 1986, Ser. No. 941,257

Int. Cl.⁴ A23G 3/00

U.S. Cl. 426—572

37 Claims

1. A sugarless chewable aerated confectionery composition which comprises: a hydrogenated starch hydrolysate in an amount of about 35% to about 89%, cellulose in an amount of about 1% to about 10% wherein the cellulose is a non-water soluble and a water soluble cellulose such that the ratio of water soluble to non water soluble cellulose is about 1:3 to about 3:1, a whipping agent in an amount of about 0.1% to about 7.5%, fat in an amount of about 2% to about 10%, and a final water content of about 7% to about 12%.

4,714,621

COATING METHOD

Carl E. Gullberg, Storvreta, Sweden, assignor to Pharmacia AB, Upsala, Sweden

PCT No. PCT/SE86/00157, § 371 Date Dec. 2, 1986, § 102(e) Date Dec. 2, 1986, PCT Pub. No. WO86/06268, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 8, 1986, Ser. No. 946,512

Claims priority, application Sweden, Apr. 24, 1985, 8501990

Int. Cl.⁴ A01N 1/02; B05D 3/12; A61B 15/00

U.S. Cl. 427—2

1 Claim



1. In a method for applying a coating of allergen on a steel tip of an instrument which is to be employed for in vivo allergy diagnosis and which has stop means adjacent to the steel tip so that solely said tip can penetrate the skin, the improvement that the steel tip plus those portions of the stop means that lie in the immediate proximity of said tip are acid-pickled and then coated with allergen to thus cause an active amount of allergen to adhere to said tip.

4,714,622

BLAST MATERIAL FOR MECHANICAL PLATING AND CONTINUOUS MECHANICAL PLATING USING THE SAME

Shigeru Omori; Masatsugu Watanabe, and Fumio Oboshi, all of Okayama, Japan, assignors to Dowa Iron Powder Co., Ltd., Okayama, Japan

Division of Ser. No. 753,879, Jnl. 11, 1985, Pat. No. 4,655,832.

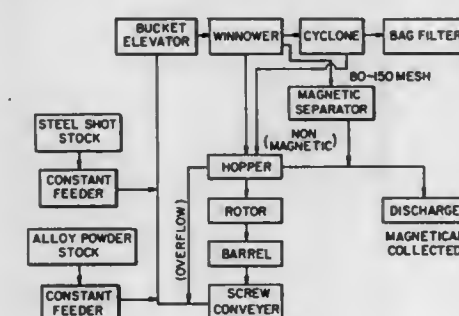
This application Oct. 27, 1986, Ser. No. 923,475

Claims priority, application Japan, Jul. 30, 1984, 59-157341

Int. Cl.⁴ B05D 1/12

U.S. Cl. 427—11

4 Claims



1. A continuous mechanical plating process comprising projecting a blast material consisting of a mixture of 60-970% by weight of steel shot and 10-40% by weight of a coating alloy powder comprising 2.5-50% by weight of Fe and a maximum of 5% by weight of at least one of Al, Cu, Sn, Mg and Si, the balance being Zn and inevitable impurities, said coating alloy powder having an average hardness of 140-450 Hv, onto the surface to be treated, and projecting said blast material repeatedly, characterized in that a magnetic separation step is interposed in the course of repetition of the projecting, whereby fine iron powder produced during blasting is removed from said mixture.

4,714,623

METHOD AND APPARATUS FOR APPLYING METAL CLADDING ON SURFACES AND PRODUCTS FORMED THEREBY

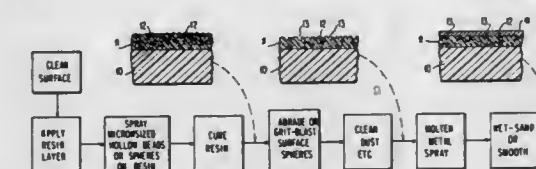
Louis M. Riccio, P.O. Box 81, DeVault, Pa. 19432, and Alexander A. Bosna, 135 Summit Rd., Malvern, Pa. 19355

Division of Ser. No. 706,989, Feb. 28, 1985, Pat. No. 4,618,504, and a continuation-in-part of Ser. No. 563,430, Dec. 20, 1983, Pat. No. 4,521,475, each is a continuation-in-part of Ser. No. 481,412, Apr. 1, 1983. This application Feb. 13, 1986, Ser. No. 829,047

Int. Cl.⁴ B05D 1/06, 1/08

U.S. Cl. 427—27

22 Claims



1. In a method of applying an antifouling coating to a marine surface of a metal selected from the group comprising copper and/or copper alloys—such as copper-nickel, the improvement comprising the steps of:

- (1) coating said marine surface with a curable adhesive resin,
- (2) spraying a layer of inorganic hollow spheres in the size range of greater than 10 microns onto said adhesive resin prior to curing of same,
- (3) curing said curable layer,
- (4) after step (3), abrading said layer of hollow inorganic spheres to fracture same and produce a matrix of anchor

sites, undercuts, nooks and crannies in the surface thereof, and
 (5) thermally spraying molten metal particles on said matrix to fill said undercuts, nooks and crannies with said metal in one or more passes thereof.

4,714,624

HIGH TEMPERATURE OXIDATION/CORROSION RESISTANT COATINGS

Subhash K. Naik, Milford, Conn., assignor to Textron/Avco Corp., Providence, R.I.

Filed Feb. 21, 1986, Ser. No. 831,677

Int. Cl.⁴ B05D 1/00, 1/08

U.S. Cl. 427—34

8 Claims

1. A process for manufacturing an individual engine component having a simplified airfoil shape which comprises first aluminide-coating said component; then overcoating same with a MCrAlY composition wherein M is a solid solution of molybdenum and a second metal selected from the group consisting of nickel, cobalt and mixtures thereof, the composition being comprised of from about 0.1 to about 18% by weight of molybdenum, about 30 to about 70% by weight of the second metal, about 10 to about 40% by weight of chromium about 6 to about 20% by weight of aluminum and about 0.01 to about 3% by weight of yttrium; and then subjecting said component to diffusional heat treatment.

4,714,625

DEPOSITION OF FILMS OF CUBIC BORON NITRIDE AND NITRIDES OF OTHER GROUP III ELEMENTS

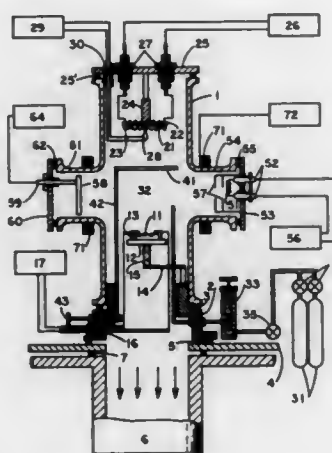
Kasturi L. Chopra, 16 West Ave., IIT, Hauz-Khas, New Delhi, India; Roitan F. Bunshah, 8138 Zitola Ter., Playa Del Rey, Calif. 90293; Chandra V. Deshpandey, 3426 Jasmine Ave., Los Angeles, Calif. 90036, and Vasant D. Vankar, Dept. of Physics, IIT, Hauz-Khas, New Delhi, India

Filed Aug. 12, 1985, Ser. No. 764,345

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—35

16 Claims



1. A process for depositing a film of a nitride of a Group III element in the periodic table of elements on a substrate, comprising the steps of

supporting the substrate in a vacuum;
 evaporating an easily evaporable compound containing a Group III element in the condensed state selected from the group consisting of boric acid and organometallic compounds of aluminum, indium and gallium, by a resistance-heated evaporation source to produce a vapor of said compound or its dissociated products in a zone between the resistance-heated evaporation source and the substrate;
 introducing ammonia gas into said zone;
 extracting low-energy electrons from a heated emitter by a d.c. electric field directed across the path of said vapor in

said zone, which electric field is produced by applying an electric potential between the emitter and the anode of about 20 to 200 volts;

directing a beam of the low-energy electrons laterally through said zone for colliding with the ammonia gas and said vapor to produce ions of ammonia and said vapor and energetic neutral atoms which react with each other and with atoms of ammonia and said vapor in said zone, resulting in a deposit of a nitride of a Group III element on the substrate; and

providing a magnetic field surrounding the beam of low-energy electrons so as to increase the collision probability with atoms of the reactants.

4,714,626

PROCESS FOR TREATING CONDUCTIVE PROFILES, PARTICULARLY METALLIC CONDUCTIVE WIRES, THE INSTALLATION FOR CARRYING SAID PROCESS INTO EFFECT, AND TREATED PROFILES SO OBTAINED

André Poncelet, Ville Houdlemont; Hyacinthe Getti, Herserange, and Michel Faugouin, Gorcy, all of France, assignors to Tecnor, Puteaux and Sa "PGF"Procédé de Galvanisation de Fils, Gorcy, both of, France

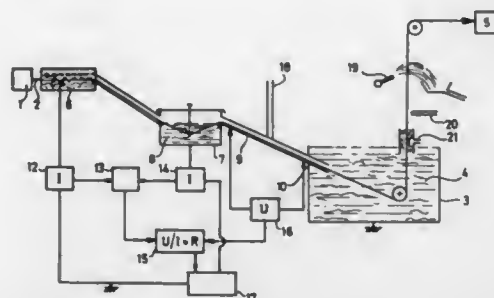
Filed Jan. 15, 1986, Ser. No. 819,224

Claims priority, application France, Jan. 22, 1985, 85 00852

Int. Cl.⁴ C23C 2/00, 2/38

U.S. Cl. 427—49

10 Claims



1. A process for coating continuous elements made of electrically conductive material, comprising:

drawing said elements through a series of stages comprising successively passing said elements through a preliminary degreasing bath of an electrolytic solution, an intermediate contact bath of electrolytically conductive liquid, and a treatment bath of a liquid metal to be deposited on said elements, and bringing said preliminary bath, said intermediate contact bath, and said treatment bath to different voltages making an adjustable heating current circulate along a section of said elements between said intermediate contact bath and said treatment bath and maintaining thereby said treatment bath metal in the liquid state and periodically reversing relative to a first contact at the level of the degreasing bath, the polarity of a second contact, at the level of the contact bath and relative to a third contact, at the level of said treatment bath.

4,714,627

METHOD OF GOLD DEPOSITION USING VOLATILE ORGANOGOLD COMPLEXES

Richard J. Puddephatt, and Ilse Treurnicht, both of London, Canada, assignors to Ontario Development Corp., Ontario, Canada

Continuation-in-part of Ser. No. 676,398, Nov. 29, 1984, abandoned. This application Dec. 17, 1985, Ser. No. 810,322

Int. Cl.⁴ B05D 3/06; C23C 16/06

U.S. Cl. 427—53.1

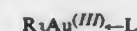
13 Claims

1. A method for depositing gold onto a target surface, comprising:

vaporizing an organogold complex under conditions of a dynamic vacuum of at least about 10^{-2} mbar and moderate heating in the range of about 30° C. to about 80° C., said complex having the formula:



or



wherein R may be an alkyl, alkenyl, alkynyl, aryl or aralkyl group having up to 12 carbon atoms; and L may be —CNR' or —PR'' wherein R' is a C₁₋₆ alkyl, or an aryl or aralkyl group having up to 10 carbon atoms, and R'' is a C₁₋₃ alkyl, or aryl;

heating the target surface also under a dynamic vacuum of at least about 10^{-2} mbar to at least the temperature of decomposition for the organogold complex, said heating being in the range of about 100° C. to about 250° C.; and introducing the vaporized complex into contact with the heated target surface while maintaining the vacuum thereby causing decomposition of the complex and deposition of gold onto the target surface.

4,714,628

PROCESS AND APPARATUS FOR TREATING A MATERIAL BY A THERMOIONIC EFFECT WITH A VIEW TO MODIFYING ITS PHYSICOCHEMICAL PROPERTIES

Jean-Francois Eloy, Saint Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

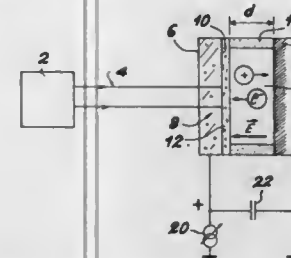
Filed Feb. 12, 1987, Ser. No. 13,699

Claims priority, application France, Feb. 25, 1986, 86 02568

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—53.1

19 Claims



1. A process for treating a material with a view to modifying its physicochemical properties by ion implantation of at least one dopant, wherein it comprises the following stages:

deposition of a dopant film on a surface of a substrate, positioning of the material facing said film-coated surface, whilst leaving a space between the film and the material, irradiation of the film through the substrate by a pulsed, collimated laser beam having a given wavelength in order to form dopant ions by explosive vaporization of the dopant, the substrate being transparent to said wavelength and, simultaneously producing an electric field in said space for accelerating the dopant ions with a view to their thermoionic implantation in the material.

11. An apparatus for treating a material with a view to modifying its physicochemical properties by the ion implantation of at least one dopant, wherein it comprises:

a substrate having first and second opposite surfaces, the first surface being covered with a dopant film and can be positioned facing the material, whilst maintaining a space between the film and the material,

a source producing a collimated, pulsed laser beam with a given wavelength, directed onto the second surface of the substrate which is transparent to said wavelength, the laser beam being able to interact with the dopant film for

forming dopant ions by explosive vaporization of said dopant and
 electrical means for producing, simultaneously with the laser pulse, an electric field in said space in order to accelerate the dopant ions with a view to their thermoionic implantation in the material.

4,714,629

METHOD FOR TREATING AGGREGATE MATERIALS WITH WAX AND COMPOSITIONS THEREOF WITH BITUMEN FOR ROAD SURFACES

Benjamin L. Davis; Joseph M. Dixon, both of Essex, and Nicholas D. Page, Kent, all of England, assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 23, 1986, Ser. No. 854,972

Int. Cl.⁴ E01C 7/22; B05D 7/00

U.S. Cl. 427—138

10 Claims

1. A method for imparting hydrophobic properties to stone chippings and other aggregate materials suitable for use in road surfaces, which comprises treating the chippings or aggregate having a size of 3 to 28 mm with an aqueous wax emulsion to at least partially coat the surface of the chippings or aggregate with wax.

10. A composition comprising wax coated aggregate and bitumen binder in which said aggregate has been treated with an aqueous wax emulsion to coat its surfaces at least partially with wax.

4,714,630

METHOD AND APPARATUS FOR APPLYING ADHESIVE TO THE EDGES OF OPEN CONTAINER ENDS

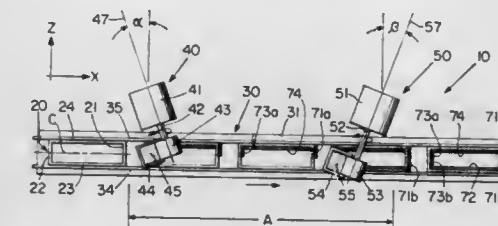
Christopher Carr, and William T. Rembold, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 4, 1986, Ser. No. 848,676

Int. Cl.⁴ B05D 5/10; B05C 1/02

U.S. Cl. 427—207.1

22 Claims



1. An apparatus for applying adhesive to the open end of a container, said container having oppositely disposed, parallel, front and rear wall panels, oppositely disposed side wall panels, said wall panels having distal edges which are coplanar and cooperatively define said open end, and a center line in the plane of said distal edges which is parallel to said front and rear wall panels and aligned with the center of said oppositely disposed side wall panels, said apparatus comprising:

(a) conveying means for moving said container along a line of movement through an adhesive application area of said apparatus, said conveying means including attachment means for substantially immovably supporting said container thereon at least during adhesive application procedures;

(b) an adhesive application area including a pair of rotary adhesive applicators for applying adhesive to said distal edges and portions adjacent said edges, said adhesive applicators each having an outer surface adapted to carry a layer of adhesive and a central axis which is oriented in a non-normal relationship to at least one of said center line and said line of movement of said container such that as said container passes said adhesive applicators, the rotary

adhesive applicators contact said distal edges of said container wall panels; and

(c) rotation control means for maintaining a relative speed differential between the container being moved along said conveying means and the rotating adhesive applicators, whereby contact of said rotating adhesive applicators and the open edges of said container wall panels causes a predetermined amount of adhesive to be deposited on the distal edges and portions adjacent said edges of said open end of said wall panels.

21. A method for applying adhesive to the upper edges and upper portions of the open ends of containers, said containers each having oppositely disposed, parallel, front and rear wall panels, oppositely disposed side wall panels, said wall panels having distal edges which are coplanar and cooperatively define said open end, and a center line in the plane of said distal edges which is parallel to said front and rear wall panels and aligned with the center of said oppositely disposed side wall panels, said method comprising the steps of:

(a) supplying said containers along a conveying means to an adhesive application area along a line of movement established by said conveying means such that the center line of each container is substantially parallel to said line of movement;

(b) conveying said containers through said adhesive application area at predetermined speed, said containers being substantially immovably supported by attachment means on said conveying means at least during the time said containers are being conveyed through said adhesive application area; and

(c) applying adhesive to the distal edges and portions adjacent said edges of said front, rear and side wall panels of said containers by contacting such open edges with two or more rotary adhesive applicators at said adhesive application area, said rotary adhesive applicators rotating at a predetermined speed and each having a central axis of rotation which is oriented in a non-normal relationship to at least one of said center line and said line of movement of such containers, said predetermined speed of such rotary adhesive applicators establishing a relative speed differential with said moving containers such that upon contact between said rotary applicators and the distal edges of a container, adhesive is removed from the applicators and deposited on said container along such distal edges and upper portions of said wall panels.

4,714,631

Rapidly Removable Undercoating for Vacuum Deposition of Patterned Layers onto Substrates

Brian E. Aufderheide, Cedarburg, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Continuation of Ser. No. 770,338, Aug. 28, 1985, abandoned.

This application Sep. 29, 1986, Ser. No. 912,650

Int. Cl.⁴ C23C 16/00

U.S. Cl. 427—250

10 Claims

1. In the combination of a substrate, a patterned undercoating on a surface of the substrate, and a layer of vacuum deposited material over the patterned layer of undercoating,

the improvement wherein the undercoating comprises a combination of the following ingredients:

(1) a water soluble film-forming polymer consisting of a polymer having a Water Solubility Rate, measured as defined in the specification, in the range of 1 to 10 hours;

(2) a solubility accelerator consisting of a compound compatible with the film-forming polymer and having a Water Solubility Rate, measured as defined in the specification, of 30 minutes or less; and

(3) a solid particular material insoluble in the film-forming polymer and providing a rough surface topology to a dried layer of the undercoating;

the undercoating and vacuum deposited material thereover

characterized in being removable from the substrate by washing with water for one minute or less.

4,714,632

Method of Producing Silicon Diffusion Coatings on Metal Articles

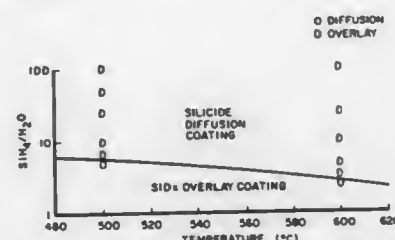
Alejandro L. Cabrera, Fogelsville; John F. Kirner; Robert A. Miller, both of Allentown, and Ronald Pierantozzi, Orefield, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 11, 1985, Ser. No. 807,890

Int. Cl.⁴ C23C 16/24

U.S. Cl. 427—255.1

36 Claims



1. A method of forming a silicon diffusion coating on the surface of a metal said metal subject formation of a surface oxide that can be reduced by a furnace treatment under controlled atmosphere, the steps comprising:

(a) pretreating said metal by heating said metal under conditions of, temperature less than 1200° C. under a controlled atmosphere reducing to elemental constituents of said metal to reduce or prevent formation of a barrier coating on exposed surfaces of said metal; and

(b) treating said metal under conditions where said metal article can be maintained at a temperature of less than 1000° C. under a controlled atmosphere consisting of silane at least 1 part per million by volume, balance hydrogen or hydrogen and inert gas mixture wherein said atmosphere contains silane to oxygen in a molar ratio greater than 2.5 and oxygen to hydrogen in a molar ratio less than 2×10^{-4} whereby silicon is diffused into the surface of said metal article.

4,714,633

Expanding and Shrinking Member

Selmaosuke Horiki; Reiji Makino; Kuninori Ito, all of Nagoya, and Tetsuji Unno, Aichi, all of Japan, assignors to Nagoya Oilchemical Co., Ltd., Tokai, Japan

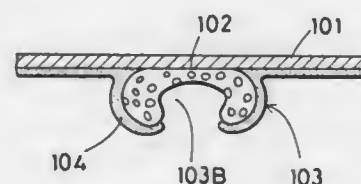
Filed Jun. 1, 1987, Ser. No. 57,012

Claims priority, application Japan, Jun. 3, 1986, 61-084506[U]

Int. Cl.⁴ B05D 1/32, 5/00; B32B 7/05

U.S. Cl. 427—282

9 Claims



1. An expanding and shrinking member comprises a panel which consists of a thermoplastic foam having closed cells and (a) cavity(ies) is(are) formed on one side of said panel and an adhesive layer is formed on the other side of said panel.

6. A method of surface treatment comprising attaching the expanding and shrinking member of claim 1 to a part of the surface of an article to be protected from a surface treatment by the adhesive layer of said member effecting said surface

treatment on said surface of the article, and heating said expanding and shrinking member to expand and then shrink and separate from said part of said surface of said article.

4,714,634

Preparation of Graft Copolymer and Paint Use Thereof

Tadafumi Miyazono; Yoshio Eguchi, both of Osaka; Akiharu Ogino, Tokyo; Haruhiko Sawada, Kanagawa, and Yoshitaka Okude, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Mar. 11, 1985, Ser. No. 711,801

Claims priority, application Japan, May 28, 1984, 59-108164

Int. Cl.⁴ C08G 63/00; B05D 3/02, 1/36; B32B 27/06

U.S. Cl. 427—409

3 Claims

1. A coating composition to be used as a base coat in a 2-coat and 1-bake coating system comprising as a resinous vehicle an acrylic graft copolymer and a crosslinking agent, said acrylic graft copolymer being obtained by reacting a cellulose ester with a mono- or di-ester of an acid selected from the group consisting of a mono-ester of maleic acid, a mono-ester of fumaric acid, a di-ester of maleic acid and a di-ester of fumaric acid so as to chemically combine the cellulose ester and the mono- or di-ester of said acid through an ester bonding and copolymerizing the thus obtained cellulose acetate butyrate bearing a copolymerizable double bonding with other polymerizable monomer(s).

4,714,635

Automatic Spraying Method

Takeshi Mochizuki; Katsumasa Iwasawa; Ikuya Shiraishi, all of Kanagawa, and Kazuki Terafuchi, Hiroshima, all of Japan, assignors to Iwata Air Compressor Mfg. Co., Ltd., Tokyo, Japan

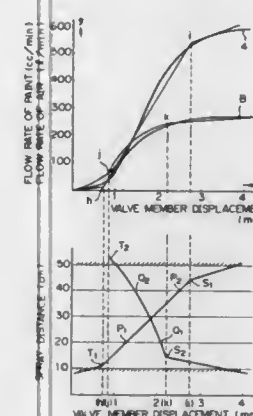
Filed Aug. 26, 1986, Ser. No. 900,626

Claims priority, application Japan, Sep. 4, 1985, 60-195352

Int. Cl.⁴ B05D 1/02

U.S. Cl. 427—421

1 Claim



1. An automatic spraying method wherein the amount of displacement of a valve member is calculated from data representing a particular spray distance by means of a microcomputer, and the valve member is activated on the basis of the displacement amount thus obtained, said method comprising the steps of:

experimentally obtaining in advance a curve representing the relationship between the valve member displacement amount and the flow rate of a fluid which is to be jetted out;

approximating said curve by a plurality of straight lines or parabolas to define a plurality of sections, obtaining the respective positions of the boundary points of these straight lines or parabolas and the slopes or average slopes thereof, and calculating the ratio between the respective slopes of the sections which are adjacent to each other; carrying out trial spraying at two different spray distances

within a range of valve member displacement amounts included in one section so as to provide a desired coating, and obtaining the relationship between the spray distance and the valve member displacement amount which provides coatings similar to each other at two points; and determining an equation of a straight line or a curve in said section by means of said microcomputer on the basis of data concerning said two points and data which determines said section to be a straight line or a parabola, determining an equation of a straight line or a curve in a section which is adjacent to said section from the equation already obtained and said slope ratio, storing these equations in memory means, and calculating a valve member displacement amount for input data representing a particular spray distance on the basis of said stored equations.

4,714,636

Liquid Crystal Device for Color Display

Koujiro Yokono, Yokohama; Masaru Kamio, Atugi, and Yukitoshi Ohkubo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

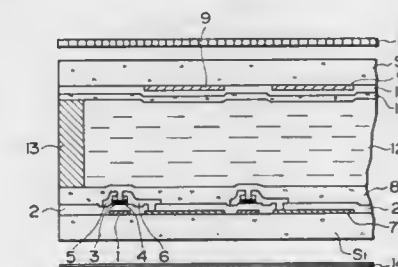
Filed Apr. 12, 1985, Ser. No. 722,397

Claims priority, application Japan, Apr. 20, 1984, 59-79891

Int. Cl.⁴ C09K 3/34

U.S. Cl. 428—1

5 Claims



1. A liquid crystal device for color display, comprising: a pair of oppositely spaced base plates having facing surfaces; a liquid crystal disposed between the facing surfaces of the base plates so as to form a plurality of picture elements; a plurality of color filters formed on the facing surface of one of the base plates so as to provide each picture element with a color filter; each individual color filter having a blue, green or red color; and a transparent electrode formed on the plurality of color filters; each of said color filters comprising a vapor-deposited colorant layer of an organic pigment; said colorant layer having a thickness of about 1,000 angstroms to 1 micron.

4,714,637

Radiant Heat Resistant Stencilable Inflatable and Method

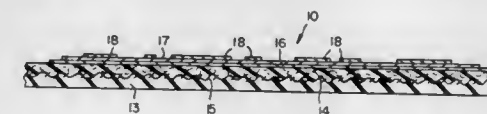
Hildreth W. Stevenson, Medina, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 23, 1986, Ser. No. 866,533

Int. Cl.⁴ B32B 3/06

U.S. Cl. 428—35

4 Claims



1. In a radiant heat resistant inflatable structure, a stenciling

zone comprising: at least one ply of a structural fabric integral with a structural fabric ply of the inflatable structure having one aluminum coating thereover, and at least one thickness of an aluminum paint thereover, the aluminum paint having an aluminum content at least sufficient in the number of coats applied over the structural fabric to preclude for 90 seconds air loss as a result of heat damage from stenciling applied thereover when tested in accordance with FAA/TSO-69A, Appendix II.

4,714,638

IRRADIATED MULTILAYER FILM FOR PRIMAL MEAT PACKAGING

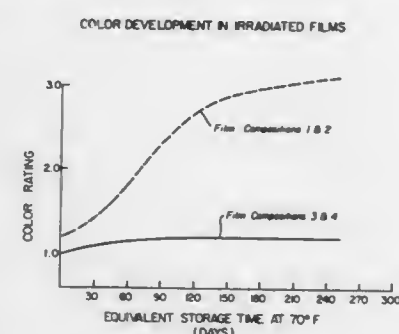
Stanley Lustig, Park Forest; Jeffrey M. Schuetz, Woodridge, and Stephen J. Vicik, Darien, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Jun. 14, 1985, Ser. No. 744,680

Int. Cl.⁴ B32B 27/08

U.S. Cl. 428—35

58 Claims



1. a heat-shrinkable, biaxially stretched multilayer film suitable for packaging primal and sub-primal meat cuts and processed meats, said film containing a barrier layer comprising a vinylidene chloride-methyl acrylate copolymer containing from about 5 to about 15 weight percent of methyl acrylate, based on the weight of said copolymer.

4,714,639

METHODS AND MATERIALS FOR THERMOELECTRIC AND LIGHT-HEAT CONVERSION

Yoshiyuki Higashigaki, Kashiwa; Yoshikazu Yoshimoto, Tenri; Tomonari Suzuki, Kashiwara; Shigeo Nakajima, Nara, and Toshio Inoguchi, Kashiwara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

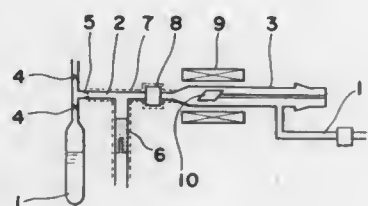
Filed Mar. 20, 1986, Ser. No. 841,829

Claims priority, application Japan, Mar. 22, 1985, 60-59276; Mar. 26, 1985, 60-64571

Int. Cl.⁴ B27N 5/02; C01B 31/04; C09C 1/56

U.S. Cl. 428—36

14 Claims



1. A material capable of converting light energy into heat energy comprising:

a hollow light transmissive member having a thin carbon layer adhered to the inner surface of the hollow member, said layer having a translucent mirror metallic luster characteristic.

4,714,640
(ALUMINA ELECTRICALLY CONDUCTIVE) GUIDE ARTICLE

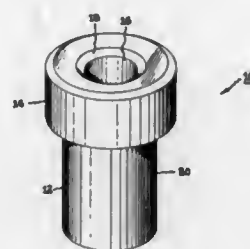
Charles G. Morgan, Laurens, S.C., assignor to General Electric Co., N.Y.

Filed Feb. 4, 1986, Ser. No. 826,165

Int. Cl.⁴ C04B 35/10

U.S. Cl. 428—36

3 Claims



1. An alumina based electrically conductive ceramic guide article to remove the static electricity charge from continuously moving textile and synthetic organic polymer filaments and tapes when placed in physical contact with said guide article comprising a polished body of sintered polycrystalline alumina ceramic material having a central opening through which the filamentary material is transported which further includes a radiused contour at both ends of said opening, said ceramic material having a rounded grain size not to exceed about 4.0 microns average diameter together with electrical resistivity not to exceed about 1×10^8 ohm-centimeters, and said ceramic material also consisting essentially of in approximate weight percent based on the starting batch formulation at least 94% Al_2O_3 , 1-4.5% TiO_2 and at least one component selected from the group consisting of MnO_2 , Fe_2O_3 or mixture thereof wherein the amount of MnO_2 and Fe_2O_3 present ranges from 0-4% and 0-3%, respectively.

4,714,641

FERROMAGNETIC FILMS FOR HIGH DENSITY RECORDING AND METHODS OF PRODUCTION

Bernhard F. Cordts, Topsfield, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 561,692, Dec. 15, 1983, Pat. No. 4,520,040.

This application Mar. 4, 1985, Ser. No. 707,995

Int. Cl.⁴ B22D 25/00

U.S. Cl. 428—610

4 Claims

1. A ferromagnetic film comprising: a metallic substrate material having low solubility for a selected ferromagnetic material; and a plurality of particles of said selected ferromagnetic material in the surface layer of said substrate, said particles having a maximum dimension in the range between 50 and 500 Angstroms.

4,714,642

CARBON FIBER MULTIFILAMENTARY TOW WHICH IS PARTICULARLY SUITED FOR WEAVING AND/OR RESIN IMPREGNATION

J. Eugene McAliley, Rock Hill, S.C.; Gene P. Daumit, Charlotte; Frederick A. Ethridge, Waxhaw, both of N.C., and James R. Crozier, Jr., Rock Hill, S.C., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 647,739, Sep. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,728, Aug. 30, 1983, Pat. No. 4,534,919. This application Jun. 27, 1985, Ser. No. 748,781

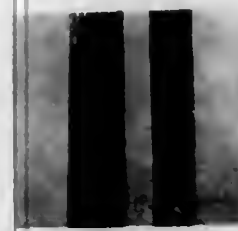
Int. Cl.⁴ B32B 5/12

U.S. Cl. 428—113

63 Claims

1. A multifilamentary tow of carbonaceous fibrous material which is particularly suited for use as fiber reinforcement in a resin matrix comprising approximately 1,000 to 50,000 adjacent

substantially continuous filaments containing at least 70 percent carbon by weight having a length of at least 100 meters, wherein the individual filaments of said multifilamentary tow are randomly decolimated and commingled with numerous filament cross-over points throughout the length of the multifilamentary tow so as to create a multitude of interstices be-



tween adjacent filaments which are well adapted to receive and retain a matrixforming resin as evidenced by an ability of the filaments of said multifilamentary tow when subjected to the flaring test described herein while in a substantially untwisted state to resist lateral expansion to a width which is as much as three times the original width as a result of said commingling of adjacent filaments.

4,714,643

DETERGENCY BOOSTER CLOTHS AND DISPENSER THEREFOR

Werner Kuenzel, Langenfeld, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

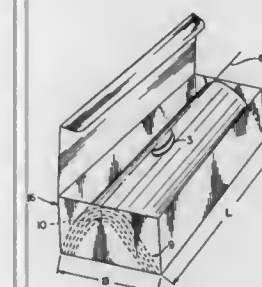
Continuation of Ser. No. 818,570, Jan. 13, 1986, Pat. No. 4,648,510. This application Oct. 21, 1986, Ser. No. 921,667

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1985, 3500936

Int. Cl.⁴ B65D 79/00, 83/08, 85/62; C11D 17/06

U.S. Cl. 428—131

6 Claims



1. A detergency booster cloth adapted for easy removal from a dispensing container in which a plurality of said cloths are disposed in a stacked arrangement, said booster cloth comprising a sheet of a material which dissolves in water under laundering conditions and which contains releasable active detergency boosters, said sheet containing a curved incision therethrough to facilitate grasping the sheet when said sheet is disposed in said container in such a manner that the sheet is held in convex flexure in the area containing said incision.

4,714,644

SANDING PAD

Larry D. Rich, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 30, 1986, Ser. No. 947,695

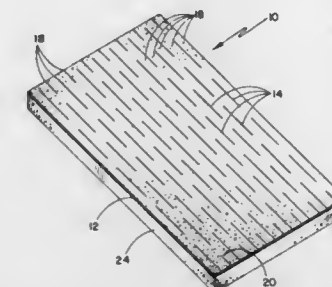
Int. Cl.⁴ B24D 11/00; B32B 3/10, 5/18

U.S. Cl. 428—136

6 Claims

1. A sanding pad particularly useful for simultaneously sanding intersecting surfaces at a corner, said pad comprising: a rectangular backing sheet having first and second surfaces

and having through slits along closely spaced parallel lines, with said slits along each line forming most of said line and being spaced by a plurality of unslit parts of said sheet; a coating of abrasive granules adhered along said first surface; and



a layer of resiliently compressible foam adhered on and coextensive with the second surface of said backing sheet, said foam having sufficiently low density to afford bending said backing sheet at about a right angle along one of said lines to deform said foam adjacent the line about which said sheet is bent while retaining in generally planar condition the two portions of said sheet on opposite sides of the line about which the sheet is bent.

4,714,645

ELECTRONIC PARTS AND PROCESS FOR THE MANUFACTURE OF THE SAME

Shinroku Kawasumi, Kamakura, Japan, assignor to Mitsubishi Mining & Cement Co., Ltd., Tokyo and Kawasumi Laboratories, Inc., Kamakura, both of Japan

Continuation of Ser. No. 693,827, Jan. 23, 1985, abandoned, which is a continuation of Ser. No. 433,956, Oct. 13, 1982, abandoned. This application Jul. 7, 1986, Ser. No. 883,290

Claims priority, application Japan, Oct. 20, 1981, 56-166335

Int. Cl.⁴ B32B 5/16; B05D 3/02

U.S. Cl. 428—209

17 Claims

1. An electronic component comprising a ceramic substrate having at least a portion of said substrate coated with a fired electroconductive precious metal-containing electrode layer, said electrode layer having a surface thereof which consists essentially of said electroconductive precious metal, said electrode layer further comprising a plurality of microgranular ceramic particles having an average diameter of not greater than 1 micron which particles have been coated with said electroconductive precious metal and fired, said particles being in metal-to-metal contact whereby the surface portions of the outer surface layer of said fired particles form said surface of said electrode layer, said ceramic particle portion of said electrode layer consisting of from 90 to 10% by weight of said electrode layer.

4,714,646

ELECTROPHORETIC INSULATION OF METAL CIRCUIT BOARD CORE

David L. Fletcher, Georgetown, and Arthur E. Graham, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 842,978, Mar. 24, 1986, abandoned.

This application Jun. 17, 1987, Ser. No. 60,962

Int. Cl.⁴ B32B 3/00; B05D 5/12

U.S. Cl. 428—204

4 Claims

1. A printed circuit comprising a metal sheet with via holes for electrical connection between opposite surfaces of said sheet, said sheet being electrically insulated at said opposite surfaces and in said via holes by a continuous coating, formed

without etching said holes to create an overhang of said coating, of electrically insulating organic resin containing fumed silicon dioxide thoroughly dispersed within said resin in an amount of about 2 percent to about 10 percent by weight of said fumed silicon dioxide to the weight of said resin, part of the circuitry of said printed circuit comprising a metal coated on said resin and silicon dioxide coating.

4,714,647

MELT-BLOWN MATERIAL WITH DEPTH FIBER SIZE GRADIENT

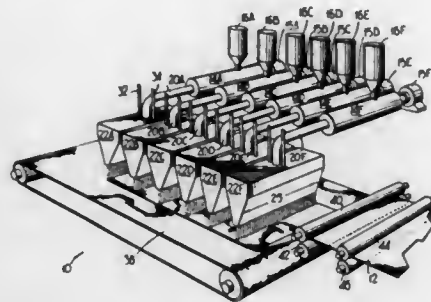
Peter W. Shipp, Jr., Woodstock, and Clifford M. Vogt, Roswell, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 2, 1986, Ser. No. 858,995

Int. Cl.⁴ B32B 7/02

U.S. Cl. 428—212

8 Claims



5. A filter medium comprising a composite web of melt-blown thermoplastic fibers, the web having a fiber size gradient across its depth, wherein the gradient results from sequentially depositing and interbonding a number of layers of melt-blown thermoplastic fibers having the same composition but different sizes onto a collector.

4,714,648

PREPREGS AND METHOD FOR PRODUCTION THEREOF

Yasuhisa Nagata, Shizuoka, Japan, assignor to Toho Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1985, Ser. No. 761,290

Claims priority, application Japan, Aug. 1, 1984, 59-160211; Aug. 8, 1984, 59-164898

Int. Cl.⁴ B32B 7/00; D04H 1/08; D02G 3/00

U.S. Cl. 428—245

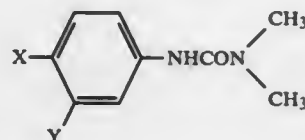
18 Claims

1. A prepreg obtained by impregnating fibers with an epoxy resin composition by a hot melt method, wherein the epoxy resin composition comprises components (A), (B) and (C), wherein

(A) is an epoxy resin,

(B) is a hardening agent composition consisting of a hydrazide type hardening agent for an epoxy resin, and having a melting point of not higher than 160° C., and (B) further contains at least one compound selected from the group consisting of alcohols and phenols having a melting point of not less than 50° C., and

(C) is a urea compound represented by the formula



wherein X and Y each represents H, Cl, and OCH₃.

4,714,649

CARBONIZABLE FABRICS OF ACTIVATED, CARBONIZED FIBERS AND DIFFERENTLY ACTIVATED OR UNACTIVATED FIBERS

William Edwards, Runcorn, England, assignor to C.C. Developments, Limited, London, England

Filed Dec. 13, 1984, Ser. No. 681,384

Claims priority, application United Kingdom, Dec. 29, 1983, 8334560

Int. Cl.⁴ B32B 7/00

U.S. Cl. 428—257

16 Claims

1. An activated carbon fabric comprising first, activated, carbonized fibre and second, differently activated or unactivated fibre said first and second fibres being derived from different precursors, said second fibre being derived from a fibre preoxidised and formed with the precursor for the first fibre into a fabric which is then subjected to carbonisation and activation treatment.

4,714,650

STAINPROOF, FLAME-RESISTANT COMPOSITE SHEET MATERIAL

Tsutomu Obayashi, Tokyo; Kazuhide Ino, Souka; Yoshiji Hiraoka, Musashino, and Saburo Baba, Nagarevama, all of Japan, assignors to Hiraoka & Co., Ltd., Tokyo, Japan

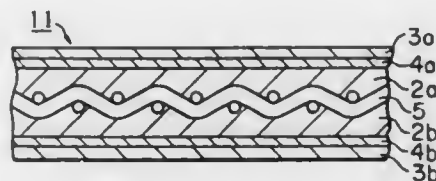
Filed Oct. 2, 1986, Ser. No. 914,374

Claims priority, application Japan, Jan. 29, 1985, 60-13445; Feb. 14, 1985, 60-25240; Jun. 4, 1985, 60-119671; Jun. 4, 1985, 60-119672; Jun. 28, 1985, 60-140412; Jun. 29, 1985, 60-141523; Aug. 12, 1985, 60-175655; Aug. 12, 1985, 60-175656; Aug. 12, 1985, 60-175657; Aug. 17, 1985, 60-180039; Aug. 20, 1985, 60-181076; Aug. 28, 1985, 60-187178

Int. Cl.⁴ B32B 7/00, 3/10

U.S. Cl. 428—265

16 Claims



1. An improved composite sheet material comprising:

(a) at least one stainproof surface layer containing at least one synthetic thermoplastic polymeric material having a high stain-resistance and weathering resistance selected from the group consisting of polyacrylic polymer resin materials and fluorine-containing polymer resin materials; and

(b) at least one silicone polymer layer containing at least one member selected from the group consisting of silicone resins and silicone rubber, and having a surface portion thereof modified by means of a corona discharge treatment, through which resultant corona discharge-treated surface portion, the silicone polymer layer is bonded to the stainproof surface layer.

4,714,651

ELASTIC ROOFING AND SEALING MATERIALS

Ludwig Hartmann, and Ivo Ruzek, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Continuation of Ser. No. 537,855, Sep. 30, 1983, abandoned, which is a continuation of Ser. No. 343,110, Jan. 27, 1982, abandoned. This application May 20, 1985, Ser. No. 736,419

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145266

Int. Cl.⁴ B32B 27/02

U.S. Cl. 428—286

12 Claims

1. A high strength elastic roofing and sealing material comprising at least one nonwoven bonded organic fabric carrier layer comprising up to about 25% of thermoplastic bonding fibers, said carrier layer being bonded through the use of thermal calendering followed by the application of a copolymer dispersion, said bonded carrier layer having a coating of bitumen on both sides thereof such that the carrier layer is impregnated with bitumen, wherein the carrier layer possesses the following characteristics:

(a) an area weight of from about 50–350 g/m², and;

(b) a permanent residual deformation after relaxation ϵ_{∞} , in the temperature range of between -20° C. to +70° C. in the range of a forced deformation elongation caused by a stress ϵ_s of 0.03% to 0.30%, the value of which is given by:

$$\epsilon_{\infty} \leq 29.6226 - \epsilon_s^2 - 15.5418 - \epsilon_s^2 + 2.9359 - \epsilon_s - 0.0769.$$

4,714,652

PROCESS FOR FIRE-PROOFING POROUS SYNTHETIC SHEET MATERIAL PARTICULARLY ARTIFICIAL LEATHER

Giorgio Poletto, Clitè, Italy, assignor to Lorica S.p.A., Italy

Continuation-in-part of Ser. No. 741,283, Jun. 4, 1985, abandoned. This application Aug. 15, 1986, Ser. No. 898,817

Claims priority, application Italy, Jun. 6, 1984, 67584 A/84

Int. Cl.⁴ B05D 5/00; B32B 5/14, 27/00, 27/40

U.S. Cl. 428—308.4

11 Claims

1. A process for fireproofing porous synthetic sheet material comprising a porous polyurethane matrix and a compact polyurethane resin film, said process comprising the steps of:

treating said sheet material with a fireproofing solution consisting of a solution of water and 24% up to 60% by weight of any fireproofing/retarding substance, preferably of the type employed in extinguishing forest fires, containing ammonium salts, in such a manner as to permeate the entire section of said sheet material;

and then treating said sheet material with a softening solution consisting of a solution of water and 8% up to 20% by weight of any softening substance, preferably of the type employed in softening laundry, containing a linear hydrocarbon chain of about 12 up to 18 carbon atoms coupled with a radical selected from the group consisting of —SO₃X wherein X is an alkali metal, and —(OCH₂CH₂)_yOH wherein y is an integer comprised between 1 and 18; in said softening solution being added an appropriate amount of the same fireproofing/retarding substance contained in said fireproofing solution.

9. Artificial leather for manufacturing clothing, shoes, upholstery and similar, treated according to the fireproofing process of claim 1.

4,714,653

METALLIZABLE SUBSTRATE COMPOSITES AND PRINTED CIRCUITS PRODUCED THEREFROM

Robert Cassat, Ternay, France, assignor to Rhone-Poulenc Recherches, Courbevoie, France

Continuation of Ser. No. 666,036, Oct. 29, 1984, abandoned. This application Feb. 2, 1987, Ser. No. 11,359

Claims priority, application France, Oct. 28, 1983, 83 17507

Int. Cl.⁴ C08K 9/06; C09J 5/00

U.S. Cl. 428—328

26 Claims

1. A substrate composite, including a central core layer comprising fibrous cellulosic material or flaked mica within a matrix of a thermosetting resin binder, said central core element having coextensively laminated to at least one of the face surfaces thereof, a lamina of a thermosetting resin comprising a particulate array of non-conductive metal oxide filler material distributed therethrough, at least a portion of said metal oxide being borohydride reduced to form unstable metal hydride intermediates into the depth of said lamina.

4,714,654

MAGNETIC RECORDING MEDIUM

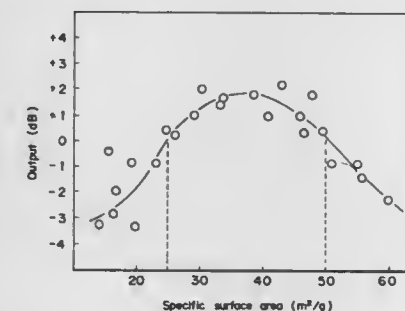
Takeo Ito; Hajime Takeuchi, both of Yokohama; Minoru Hashimoto, Kawasaki, and Tatsumi Maeda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 19, 1984, Ser. No. 683,582

Int. Cl.⁴ C04B 35/26; G11B 5/68, 5/70

U.S. Cl. 428—328

16 Claims



1. A magnetic recording medium comprising a hexagonal crystalline system ferromagnetic powder having a specific surface area of 25 to 50 m²/g and an average grain diameter in the range of 0.02 to 0.2 μm, said powder being dispersed in a resinous binder, wherein said binder is present with said ferromagnetic powder in a blending proportion that is adjusted to the range of 10 to 40 parts by weight of the binder based on 100 parts by weight of the ferromagnetic powder.

4,714,655

PRESSURE-SENSITIVE ADHESIVE CONTAINING HEAT-SENSITIVE MATERIALS, AND METHOD OF MAKING THE SAME

Binoy K. Bordoloi, Covina; Yehuda Ozari, Arcadia, both of Calif., and Gerald R. Dever, Mentor, Ohio, assignors to Avery International Corporation, Pasadena, Calif.

Filed Oct. 4, 1985, Ser. No. 784,521

Int. Cl.⁴ B05D 3/06

U.S. Cl. 428—345

26 Claims

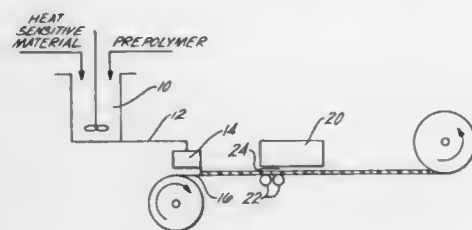
1. A process for the production of a pressure-sensitive-adhesive stock containing a heat-sensitive material which comprises:

(a) forming a mixture of a select amount of at least one heat-sensitive material in a fluid prepolymer, said mixture having a viscosity sufficient to enable casting of the mixture onto a substrate, said prepolymer being polymerizable when subjected to the action of ultraviolet radiation, electron-beam radiation, or a combination thereof, and

substantially non-deleteriously reactive with said heat-sensitive material;

(b) casting said mixture onto a substrate; and

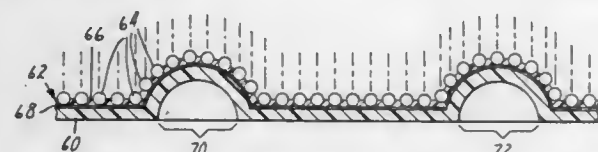
(c) exposing said cast mixture to the radiant action of ultraviolet radiation, electron-beam radiation, or a combination thereof, for a time sufficient to convert said prepolymer into a pressure-sensitive adhesive containing a releasable amount of said heat-sensitive material.



23. A pressure-sensitive-adhesive stock comprising a face material and a pressure-sensitive adhesive containing a heat-sensitive material, said pressure-sensitive adhesive being formed by polymerizing a thin layer of a mixture of at least one heat-sensitive material in a fluid prepolymer onto a substrate, and exposing the mixture to the action of ultraviolet radiation, electron-beam radiation, or a combination thereof, for a time sufficient to convert the fluid prepolymer into a pressure-sensitive adhesive containing a releasable amount of the heat-sensitive material.

4,714,656 SHEET CONTAINING CONTOUR-DEPENDENT DIRECTIONAL IMAGE AND METHOD FOR FORMING THE SAME

Thomas I. Bradshaw, Afton; Bruce D. Orenstein, and Jack E. Cook, both of St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 778,866, Sep. 23, 1985, abandoned. This application Dec. 19, 1986, Ser. No. 944,458
Int. Cl.⁴ B32B 9/04; G03C 3/00; B65D 33/14
U.S. Cl. 428—411.1 29 Claims



1. A contour-dependent, directionally imaged sheet which comprises:

- (A) a monolayer of closely spaced transparent microlenses,
- (B) means for securing said microlenses to said sheet in a monolayer arrangement; and
- (C) a set of axial markings, each axial marking being located at the rear of a microlens such that the set of said axial markings is visible from the front of the sheeting an intact image only when said sheet is in substantially a predetermined nonplanar contour and is viewed within a predetermined conical field of view.

19. A method comprising:

- (A) arranging into a nonplanar contour a sheeting comprising a monolayer of closely spaced transparent microlenses and a means for securing said microlenses to said sheeting in a monolayer arrangement; and
- (B) directing highly collimated light in an imagewise fashion at a selected angle of incidence to the face of the sheeting to form an axial marking at the rear of each microlens which said light strikes, which markings compose a set of axial markings which is visible as an intact image only when said sheet is in substantially said nonplanar contour

and is viewed within a conical field of view, the central axis of which is the angle of incidence of the irradiation.

4,714,657 MELAMINE BASED PROTECTIVE COATINGS FOR THERMOPLASTIC SUBSTRATES

Clayton B. Quinn; Richard R. McClish, and James E. Moore, all of Mount Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.
Filed Apr. 18, 1985, Ser. No. 724,841
Int. Cl.⁴ B32B 27/36

U.S. Cl. 428—412

9 Claims

1. A composite comprising a thermoplastic polycarbonate substrate having applied to at least one surface thereof a water, mar- and solvent-resistant coating comprising the reaction products of:

- (a) an aminoplast derived component; and
- (b) a polyester polyol consisting essentially of the reaction products of diacids and diols wherein said diacids comprise at least 50% by number aliphatic diacids in which the carboxylic acid groups are separated by at least two intervening carbon atoms, said diols comprise at least 50% by number aliphatic diols in which the carbon atoms containing hydroxyl groups are separated by at least two intervening carbon atoms, and wherein the hydroxyl number is from about 50 to about 175.

4,714,658 METHOD FOR TREATING POLYMER SURFACES BY CORONA DISCHARGE AND THEN WITH REDUCING AGENT AND RESULTING ARTICLE

Marjory A. Kadash, Roswell, Ga., and Frederick C. Schwab, Metuchen, N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Dec. 30, 1985, Ser. No. 814,715
Int. Cl.⁴ B32B 27/32

U.S. Cl. 428—523

18 Claims

1. A method of treating polymer articles which are capable of being surface oxidized under corona discharge conditions comprising the steps of:

- (a) subjecting the articles to corona discharge sufficient to introduce surface oxygen containing groups including hydroperoxide groups; and
- (b) immediately thereafter subjecting the article to a treatment with an alkali metal iodide or an alkaline earth metal iodide to convert at least some of said hydroperoxide groups to hydroxyl groups.

4,714,659 THERMAL PROTECTIVE SHIELD

Hakan Lindgren, and Björn Anderson, both of Hallstahammar, Sweden, assignors to Bulten-Kanthal AB, Hallstahammar, Sweden
PCT No. PCT/SE83/00485, § 371 Date Aug. 27, 1984, § 102(e) Date Aug. 27, 1984, PCT Pub. No. WO84/02763, PCT Pub. Date Jul. 19, 1984

PCT Filed Dec. 29, 1983, Ser. No. 645,742
Claims priority, application Sweden, Dec. 30, 1982, 8207507
Int. Cl.⁴ B32B 15/00

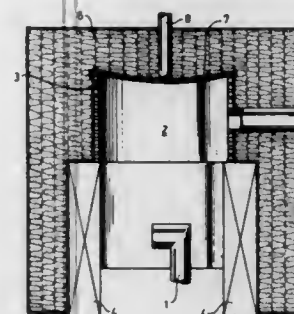
U.S. Cl. 428—685

4 Claims

1. A thermal protective shield for protection against hot gases at high operating temperatures comprising at least two layers of which an outer layer for facing the hot gases consists of an alloy containing iron, chromium, and aluminum, characterized in that:

- two of said layers consist of plates which are intimately joined together all over a surface corresponding to the entire surface subject to exposure to hot gases;
- the outer plate has a thickness of at least about 1 mm and consists of 15–25 weight % chromium, 3–8 weight %

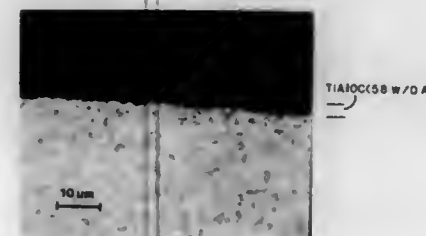
aluminum, no more than a total of about 2% of other substances as additives or impurities, and the rest iron; and



the plate joined to said outer plate consists of a metal alloy having high mechanical strength at high temperatures.

4,714,660 HARD COATINGS WITH MULTIPHASE MICROSTRUCTURES

Alfred S. Gates, Jr., Lindenhurst, Ill., assignor to Fansteel Inc., North Chicago, Ill.
Filed Dec. 23, 1985, Ser. No. 812,455
Int. Cl.⁴ B24D 11/00; B32B 15/04; C04B 41/32
U.S. Cl. 428—698 15 Claims



1. A surface-coated article for cutting and wear applications comprising:

- (a) a substrate selected from the group consisting of cemented carbide, hard metals and high-temperature ceramics, and
- (b) a first chemical vapor deposition coating on said substrate comprised of a composite layer of at least two simultaneously co-deposited phases, a first of said phases being selected from the group consisting of: a carbide, carbonitride, nitride, oxycarbide, oxycarbonitride, silicide or boride of titanium, zirconium, hafnium, vanadium, niobium and tantalum; a carbide, silicide or boride of chromium, molybdenum and tungsten; and a carbide or nitride of silicon and boron; and a second of said phases being selected from the group consisting of an oxide or oxynitride of aluminum, titanium, zirconium, hafnium, magnesium, silicon and calcium, or stabilized zirconium oxide; said co-deposited phases comprising at least one phase present in fiber, rod-like or columnar form oriented with longitudinally axes in a direction normal to the substrate/coating interface in said composite layer.

4,714,661 MOLTEN CARBONATE FUEL CELL

Thomas D. Kaun, New Lenox, and James L. Smith, Lemont, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jul. 8, 1986, Ser. No. 883,217
Int. Cl.⁴ H01M 8/04, 2/08

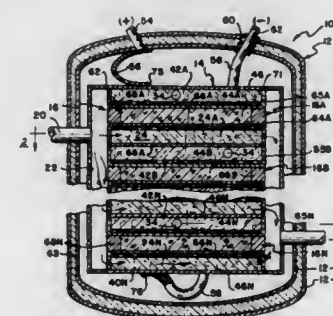
U.S. Cl. 429—14

4 Claims

1. A molten-electrolyte fuel cell device including a vertical, stacked array of individual fuel cells having at least four major

vertical surfaces with vertical edge sections joining the vertical surfaces, the cells including anode and cathode electrodes separated by electrolyte material with the respective electrodes of all the cells being exposed along opposite and common vertical surfaces to provide access to fuel or oxidant gases and removal of waste gases therefrom, said fuel cell device comprising:

- an array housing enclosing the array and having vertical sides cooperating with the edge sections of the array in a sealing relationship to define at least four isolated gas manifolds,
- a plurality of electrode holders arranged in spaced pairs, each of said electrode holders including a generally planar inner perforated section and first and second pairs of facing transverse lateral edge portions, said first pair of transverse lateral edge portions each having a plurality of



apertures therein, wherein the inner perforated sections of adjacent pairs of electrode holders are in generally parallel alignment and the transverse lateral edge portions of adjacent pairs of electrode holders are directed away from one another;

spacer means disposed between and in contact with adjacent pairs of electrode holders for defining a substantially closed space within which is disposed the electrolyte;

dry sealing means disposed between and in sealed contact with said spacer means and adjacent pairs of electrode holders for confining the electrolyte between an adjacent pair of electrode holders; and

means including first and second manifolds for providing fuel and oxidant gases respectively to said anode and cathode electrodes and third and fourth manifolds for removing waste gases respectively from said anode and cathode electrodes.

4,714,662 POWER MODULE ASSEMBLY OF ELECTROCHEMICAL CELLS

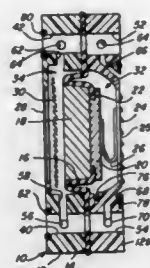
William R. Bennett, North Olmsted, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.
Continuation-in-part of Ser. No. 862,613, May 12, 1986, abandoned. This application Mar. 17, 1987, Ser. No. 27,061
Int. Cl.⁴ H01M 12/06

U.S. Cl. 429—27

10 Claims

1. A power module of the type including a plurality of power cells arranged in longitudinal stacked relation, each power cell including a frame, a gas-consuming cathode mounted at one end of the frame, a consumable anode, a flexible diaphragm mounting the anode in the frame to provide for longitudinal and angular movement of the anode as the anode is consumed, the flexible diaphragm cooperating with the frame to define a sealed expansion chamber on the side of the anode opposite the cathode, first means for introducing fluid under pressure into the expansion chamber to bias the anode toward the cathode, the flexible diaphragm cooperating with the frame to define a sealed flow passage between the anode and the cathode, second means for introducing electrolyte into

the flow passage, means spacing and sealing adjacent cell frames providing separate passage means for soluble gas to the



gas-consuming cathode, and third means for introducing soluble gas into the separate passage means.

4,714,663

SULFONATED POLYSULFONE BATTERY MEMBRANE FOR USE IN CORROSIVE ENVIRONMENTS

Charles Arnold, Jr., and Roger Assink, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 14, 1986, Ser. No. 918,194
Int. Cl.⁴ H01M 6/24

U.S. Cl. 429—101 20 Claims
1. In a device for the production of electrical energy by electrochemical methods, which device contains an electrolyte and a membrane separating two electrolyte solutions, the improvement wherein the membrane is an oxidative resistant, conductive, ion-selective membrane comprising a catenated aromatic polymer having an absence of tertiary hydrogens.

4,714,664

ELECTRICAL BATTERY

Mads A. Laustsen, Valby, and Karen Kümmel, Lyngby, both of Denmark, assignors to A/S Hellestens, Koge, Denmark
Filed May 29, 1986, Ser. No. 868,796

Claims priority, application Denmark, Jun. 17, 1985, 2732/85
Int. Cl.⁴ H01M 6/14

U.S. Cl. 429—105 2 Claims
1. An electrical battery with a non-aqueous electrolyte/cathode comprising thionyl chloride or sulfur chloride and a metal salt dissolved therein and with an anode of metal from group 1 or 2 of the Periodic Table or alloys of these, characterized in that the electrolyte contains the added stabilized SO₃ compound C₅H₅N:SO₃ (pyridine sulfur trioxide) in an amount effective to improve the delayed action properties of the electrical battery.

4,714,665

SECONDARY BATTERY

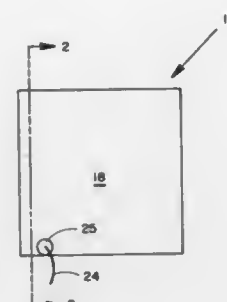
Sanford A. Siegel, Baton Rouge, and Stephen A. Noding, Brusly, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 23, 1986, Ser. No. 945,918
Int. Cl.⁴ H01M 4/60

U.S. Cl. 429—192 20 Claims
1. A secondary battery which comprises:
(a) an ionically and electronically conductive first polymer film having substantially uniformly distributed therewithin an electrochemical species which contributes to the ionic conductivity of said first polymer film and which is electrochemically reduced when said battery is being discharged and electrochemically oxidized when said battery is being charged;
(b) an ionically and electronically conductive second polymer film having substantially uniformly distributed therewithin an electrochemical species which contributes to the ionic

conductivity of said second polymer film and which is electrochemically oxidized when said battery is being discharged and electrochemically reduced when said battery is being charged; and

(c) an ionically conductive third polymer film in contact with said first and said second polymer films, said third polymer film comprising,
(i) a polymer,



(ii) a plasticizer for said polymer, and
(iii) an electrolyte for said battery, which electrolyte is disassociatingly solubilized in said plasticizer, said plasticizer and the solubilized electrolyte being substantially uniformly distributed within said polymer, said ionically conductive third polymer film being substantially electronically non-conductive under discharging voltages and electronically conductive under charging voltages.

4,714,666

PERYLENE TETRACARBOXYLIC ACID IMIDE PIGMENTS IN AN ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Wolfgang Wiedemann, Geisenheim-Johannisberg; Ernst Spietschka, Idstein, and Helmut Troester, Koenigstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 23, 1986, Ser. No. 888,496
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1985, 3526249

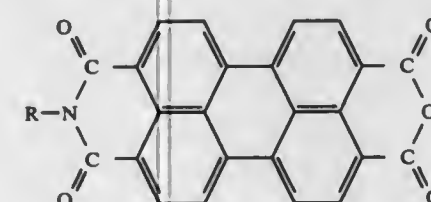
U.S. Cl. 430—59 16 Claims
1. An electrophotographic recording material comprising an electrically conductive base material and a photoconductive layer provided on said base material, said photoconductive layer comprising at least one layer containing an asymmetrically substituted perylene-3,4,9,10-tetracarboxylic acid imide as charge carrier-producing compound, a photoconductor as charge transport compound, and a binder, wherein said acid imide is a charge carrier-producing compound represented by one of the following formulas:



where
R denotes hydrogen, alkyl, hydroxyalkyl, alkoxyalkyl, aryl or aralkyl and
A denotes a radical selected from a phenylene, a naphthylene and a more highly fused aromatic carbocyclic or heterocyclic radical, said radical being unsubstituted or substituted by a halogen, an alkyl group, a cyano group or a nitro group;



where
R and R' are different from each other and denote hydrogen or a group selected from alkyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, aryl, aralkyl and heteroaryl, said group being unsubstituted or substituted by a halogen, alkyl group, cyano group or nitro groups;



where
R denotes hydrogen or a group selected from alkyl, hydroxyalkyl, alkoxyalkyl, aryl and aralkyl, said group being unsubstituted or substituted by a halogen, an alkyl group, a cyano group or a nitro group.

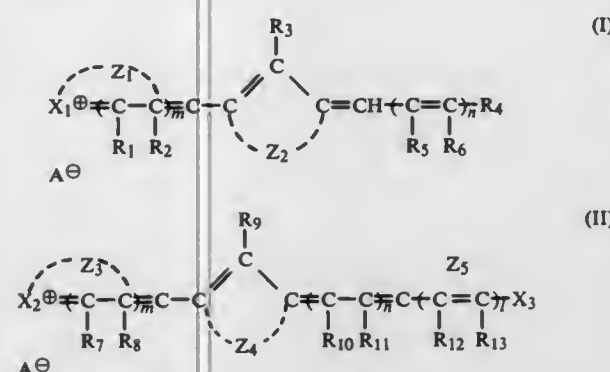
4,714,667

OPTICAL INFORMATION RECORDING MEDIUM

Tsutomu Sato, Masaakira Umehara, Michiharu Abe, Hideaki Oba, and Yutaka Ueda, all of Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1985, Ser. No. 808,413
Claims priority, application Japan, Dec. 18, 1984, 59-265247
Int. Cl.⁴ G03C 1/72

U.S. Cl. 430—270 9 Claims
1. An optical information recording medium comprising a substrate and a recording layer on said substrate, said recording layer comprising at least one compound having the formula (I) or (II):



wherein X₁, X₂ and X₃ represent O, S or Se; A⁻ represents an anion; l, m and n represent 0 or 1; R₄ represents a substituted or non-substituted aryl group or heterocyclic group; R₃ and R₉ represent hydrogen, alkyl, chloro or bromo, R₅, R₆, R₁₀ and R₁₁ represent hydrogen or an alkyl group; R₁, R₂, R₇, R₈, R₁₂ and R₁₃ represent hydrogen or a substituted or non-substituted alkyl, aryl or styryl group; Z₁, Z₃ and Z₅ represent atomic groups necessary for forming a substituted or non-substituted pyrylium, thiapyrylium, selenapyrylium, benzopyrylium, benzothiapyrylium, benzoselenapyrylium, naphthopyrylium, naphthothiapyrylium or naphthoselenapyrylium; Z₂ and Z₄

represent atomic groups necessary for forming a substituted or non-substituted five-membered carbocyclic ring or six-membered carbocyclic ring; and said five-membered ring and six-membered ring may be condensed with an aromatic ring said recording information medium being adapted to have information recorded thereon by irradiating said recording medium with laser light to cause an optical change in the form of spaced-apart pits in said recording layer and being adapted to regenerating such information by laser light

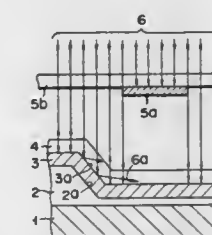
4,714,668

METHOD FOR PATTERNING LAYER HAVING HIGH REFLECTANCE USING PHOTOSENSITIVE MATERIAL

Tsunehisa Uneno, Tokyo; Yutaka Kamata, and Sinji Miyazaki, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 510,224, Jul. 1, 1983. This application Jun. 24, 1986, Ser. No. 878,004
Claims priority, application Japan, Jul. 5, 1982, 57-115449
Int. Cl.⁴ G00F 7/26; G03C 1/84

U.S. Cl. 430—316 5 Claims



1. A method for patterning a layer having high reflectance, which is defined as 90% or greater, comprising the steps of: providing a semi-conductor substrate for support of said layer, wherein said layer is conductive and includes an inclined surface portion; directly forming on said layer a light-absorbing film having a ratio of transmitted light intensity to exposing incident light intensity of not more than 30%; said film covering the inclined surface portion of said layer, said film comprising at least one light absorbing material selected from a group consisting of silicon oxide and aluminum oxide, said silicon oxide and aluminum oxide having nonstoichiometric compositions, said light absorbing material being formed by plasma CVD, photo-CVD or ion plating; forming a photosensitive material film on said light-absorbing film; irradiating a selected region of said photosensitive material film with the exposing incident light; developing said photosensitive material film to form a first pattern; selectively etching said light-absorbing film using said first pattern as a mask so as to form a second pattern; and selectively etching said layer having the high reflectance using said second pattern as a mask.

4,714,669

RADIATION-SENSITIVE POLYCONDENSATES, THEIR PREPARATION, MATERIAL COATED THEREWITH AND THE USE THEREOF

Josef Pfeifer, Therwil, and Rudolf Duthaler, Zürich, both of Switzerland, assignors to Ciba-Gelgy Corporation, Ardsley, N.Y.

Filed Mar. 27, 1986, Ser. No. 845,084

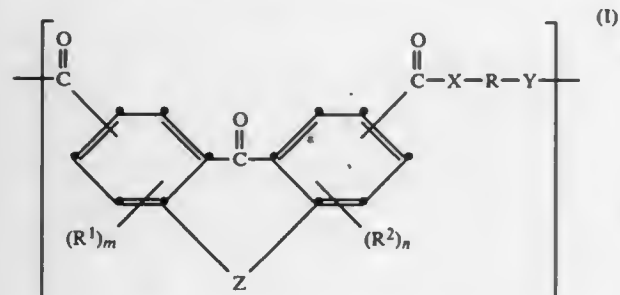
Claims priority, application Switzerland, Apr. 11, 1985, 1552/85

Int. Cl.⁴ G03C 5/00; B05D 3/06

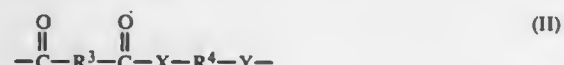
U.S. Cl. 430—325

40 Claims

1. A process for the production of a photographic or relief image which comprises irradiating through a photomask with high-energy radiation a coating or film of a radiation-sensitive linear saturated homo- or polycondensate selected from the group consisting of polyesters, polyamides and polyester amides and containing at least one recurring structural unit of formula I



and, in the case of a copolycondensate, also recurring structural units of formula II



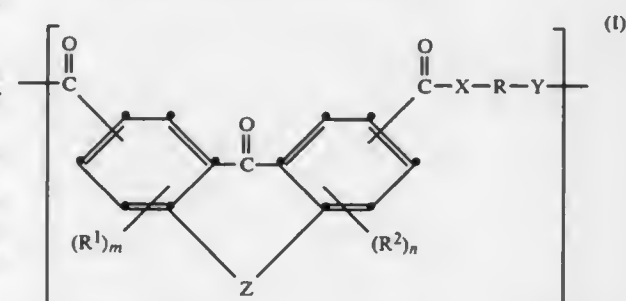
wherein

m and n are each independently of the other an integer from 0 to 3,
X and Y are each independently of the other —S—, —O— or —NR⁵—,
Z is a direct bond, —CH₂—, —O—, —S—, —SO—, —SO₂—, —CO—, —NR⁶— or —CR⁶R⁷, where R⁶ is a hydrogen atom, C₁–C₁₀alkyl, phenyl, naphthyl or phenyl(C₆H₂), where a is 2 to 4, and R⁷ has the same meaning as R⁶ but is not a hydrogen atom,
R¹ and R² are each independently of the other C₁–C₁₀alkyl, halogen, —CN, —NO₂, C₁–C₁₂alkoxy, phenoxy, naphthoxy or phenyl(C₆H₂), wherein a is 1 to 4,
R is an unsubstituted or substituted divalent aliphatic, cycloaliphatic, araliphatic or aromatic radical, and, if X and Y are the —NR⁵— group, R and one of R⁵, when taken together, are C₅–C₇alkylene to which the second —NR⁵— group is attached, or R is methylene, ethylene or propylene, and both radicals R⁵ of the —NR⁵— group, when taken together, are ethylene or propylene or, if one of X or Y is —S— or —O— and the other is —NR⁵—, R and R⁵ together are C₅–C₇ alkylene,
R⁴ has independently the same meaning as R,
R³ is a divalent saturated aliphatic or aromatic radical, and
R⁵ is a hydrogen atom, alkyl, cycloalkyl, aryl, aralkyl or alkaralkyl,

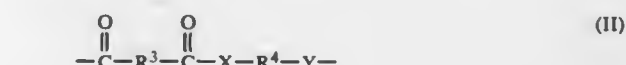
said copolycondensate containing at least 10 mol.% of the structural units of formula I, based on the copolycondensate, to crosslink the exposed, irradiated material, and subsequently treating with a solvent to remove the uncrosslinked material from the unexposed areas to form a photographic or relief image.

21. A process for the production of a protective layer which comprises

irradiating with high-energy radiation a coating or film of a radiation-sensitive linear saturated homo- or polycondensate selected from the group consisting of polyesters, polyamides and polyester amides and containing at least one recurring structural unit of formula I



and, in the case of a copolycondensate, also recurring structural units of formula II



wherein

m and n are each independently of the other an integer from 0 to 3,
X and Y are each independently of the other —S—, —O— or —NR⁵—,
Z is a direct bond, —CH₂—, —O—, —S—, —SO—, —SO₂—, —CO—, —NR⁶— or —CR⁶R⁷, where R⁶ is a hydrogen atom, C₁–C₁₀alkyl, phenyl, naphthyl or phenyl(C₆H₂), where a is 2 to 4, and R⁷ has the same meaning as R⁶ but is not a hydrogen atom,
R¹ and R² are each independently of the other C₁–C₁₀alkyl, halogen, —CN, —NO₂, C₁–C₁₂alkoxy, phenoxy, naphthoxy or phenyl(C₆H₂), wherein a is 1 to 4,
R is an unsubstituted or substituted divalent aliphatic, cycloaliphatic, araliphatic or aromatic radical, and, if X and Y are the —NR⁵— group, R and one of R⁵, when taken together, are C₅–C₇alkylene to which the second —NR⁵— group is attached, or R is methylene, ethylene or propylene, and both radicals R⁵ of the —NR⁵— group, when taken together, are ethylene or propylene or, if one of X or Y is —S— or —O— and the other is —NR⁵—, R and R⁵ together are C₅–C₇ alkylene,
R⁴ has independently the same meaning as R,
R³ is a divalent saturated aliphatic or aromatic radical, and
R⁵ is a hydrogen atom, alkyl, cycloalkyl, aryl, aralkyl or alkaralkyl,

said copolycondensate containing at least 10 mol.% of the structural units of formula I, based on the copolycondensate, to crosslink the exposed, irradiated material to form the protective layer.

4,714,670

DEVELOPER INCLUDING AN ALIPHATIC CYCLIC CARBONATE IN THE OIL PHASE EMULSION

Luigi Amariti, Voorbees, and Llandro C. Santos, Cherry Hill, both of N.J., assignors to Imperial Metal & Chemical Company, Philadelphia, Pa.

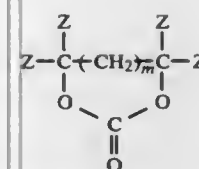
Filed Jun. 9, 1986, Ser. No. 871,833

Int. Cl.⁴ G03C 5/00

U.S. Cl. 430—331

13 Claims

1. An emulsion developer for diazo-sensitized printing plates comprising, an oil phase consisting essentially of a partially water-soluble aliphatic cyclic carbonate having the formula:



where n is an integer from 0–2, and Z is selected from hydrogen, C₁–C₃ alkyl, hydroxyl alkyl or chloroalkyl, chlorine, hydroxy or phenyl, said carbonate having dissolved therein a resinous material which adheres to the imaged areas of said printing place, surfactant to keep any pigment dispersed in said oil phase and to maintain said oil phase in emulsion, and an aqueous phase containing water having dispersed therein a protective colloid, finely divided particles, and surfactant to keep these materials in suspension in the emulsion and to prevent the emulsified oil phase from coalescing in the aqueous phase of the emulsion, said carbonate being present in an amount in excess of that needed to saturate the aqueous phase of said emulsion and sufficient to maintain said resinous material in solution in the oil phase of said emulsion.

4,714,671

COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A POLYMERIC GELATINE PLASTICIZER

Günter Helling, Odenthal, and Wolfgang Himmelmann, Leverkusen, both of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 25, 1986, Ser. No. 855,701

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516466

Int. Cl.⁴ G03C 1/31, 1/04, 7/26

U.S. Cl. 430—545

7 Claims

1. Colour photographic recording material comprising at least one light-sensitive silver halide emulsion layer and at least one light-sensitive or non-light-sensitive gelatine-containing binder layer containing a dispersion of a photographic auxiliary substance, an oil former and a gelatine plasticizer wherein the gelatine plasticizer is a polymer latex in which the dispersed particles consist to an extent of from 80 to 95% by weight of a soft core wherein the polymer has a glass transition temperature T_g below —10° C. and from 5 to 20% by weight of a hard shell wherein the polymer has a glass transition temperature T_g above 36° C.

7. Recording material according to claim 1, characterised in that the photographic auxiliary substance is a coupler, in particular a colour coupler.

4,714,672

IMMUNOASSAYS INVOLVING COMPLEMENT LYSING OF CHROMOPHORE CONTAINING MICROCAPSULES

Kyujji Rokugawa, and Yasuko Tamayama, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 8, 1984, Ser. No. 618,936

Claims priority, application Japan, Jun. 14, 1983, 58-106345

Int. Cl.⁴ G01N 33/53, 33/555

U.S. Cl. 435—7

6 Claims

1. An immunoassay method for quantitatively determining the amount of antigen or antibody in a sample comprising the steps of:

(a) mixing (1) a sample containing antigen or antibody to be quantitatively determined with (2) microcapsules containing an optically determinable substance, said microcapsules having surfaces on which are bound an antibody or an antigen specific to said antigen or antibody to be quantified and (3) a complement which is capable of lysing said microcapsules to form a reaction mixture in which occurs an immune reaction between said antibody or antigen on said surfaces of said microcapsules and said antigen or antibody in said sample, said immune reaction causing said complement to lyse said microcapsules thereby releasing

said optically determinable substance from said microcapsules into said reaction mixture;
(b) detecting the absorbance of said reaction mixture during said immune reaction by optical measurements simultaneously at two different wavelengths; and
(c) quantifying the amount of said antigen or antibody in said sample by calculating the differences of said absorbances at said different wavelengths.

4,714,673

METHOD FOR MEASUREMENT OF CONCENTRATION OF SUBSTANCE

Manfred Kessler, An der Hornwiesen 50, and Jens Höper, Moorbachweg 28, both of D-8520 Erlangen, Fed. Rep. of Germany

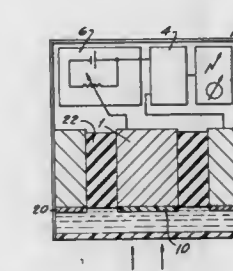
Filed Sep. 10, 1984, Ser. No. 648,883

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332745

Int. Cl.⁴ C12Q 1/54

U.S. Cl. 435—14

23 Claims



1. A method for determining the concentration of H₂O₂ by the steps of: providing a metal measuring electrode, a reference electrode, a proton impermeable lipophilious base membrane containing both a carrier and ions selected from the group consisting of lipophilious ions, carrier bound ions, and both lipophilious and carrier bound ions, and an electrolyte chamber containing an electrolyte; and locating said electrodes adjacent said chamber wherein said base membrane seals said measuring electrode from direct contact with said electrolyte; providing a polarization voltage across said electrodes; providing circuit indicating means operatively connected to said electrodes; providing H₂O₂ in said electrolyte; and determining H₂O₂ concentration from said indicating means.

4,714,674

CHEMOTACTIC ASSAY FOR IMMUNOGENICITY

Michael A. Palladino, San Mateo, Calif., assignor to Genentech, Inc., San Francisco, Calif.

Filed Feb. 28, 1985, Ser. No. 707,005

Int. Cl.⁴ A61K 39/00; C12Q 1/02, 1/34; G01N 33/531

U.S. Cl. 435—18

25 Claims

1. A method for determining the likelihood that a composition containing a protein made in recombinant culture will be immunogenic in recipients, comprising contacting leukocytes with the composition, and observing for chemotactic effect of the composition.

4,714,675

STABILIZED SENSITIVITY TEST DISK

Yoshinobu Miyashita, Osaka; Tadashi Hamanaka, Kobe, and Kenzi Iwata, Osaka, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 16, 1983, Ser. No. 504,956

Claims priority, application Japan, Apr. 13, 1982, 57-61336

Int. Cl.⁴ C12Q 1/18, 1/34

U.S. Cl. 435—32

8 Claims

1. In a sensitivity test disk used for determining the sensitiv-

ity of microorganisms to antibacterial agents, said sensitivity test disk being obtained by impregnating a disk carrier with an aqueous solution of antibacterial agent and drying said disk carrier, the improvement wherein a stabilizer consisting essentially of a water-soluble polymer in a concentration of 0.1 to 1.0% by weight of the aqueous solution, having film-forming properties is dissolved in the aqueous solution of antibacterial agent, said polymer, upon drying of the impregnated disk carrier to give a sensitivity test disk, forms a film of which covers the antibacterial agent to protect it from atmospheric moisture.

4,714,676

PROTEIN MODIFICATION TO PROVIDE ENZYME ACTIVITY

Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois Glass Container Inc., Toledo, Ohio
Continuation of Ser. No. 419,116, Sep. 16, 1982, abandoned. This application Mar. 21, 1983, Ser. No. 476,955
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.⁴ C12N 11/14, 11/02, 9/00, 9/14

U.S. Cl. 435—176

49 Claims

1. A process for chemically altering the substrate specificity of a native protein to produce an immobilized enzyme-like modified protein comprising:

- selecting an enzyme to be modeled;
- partially denaturing a native protein in the presence of an inhibitor for said model enzyme to form a partially denatured native protein model enzyme inhibitor complex;
- contacting said partially denatured protein-model enzyme inhibitor complex with a solid support for a time sufficient and at a temperature sufficient to absorb and immobilize said partially denatured protein-model enzyme inhibitor complex on said solid support and
- cross-linking said absorbed, immobilized protein-model enzyme inhibitor complex to form an immobilized enzyme-like modified protein.

4,714,677

PROTEIN MODIFICATION TO PROVIDE ENZYME ACTIVITY

Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois Glass Container Inc., Toledo, Ohio
Continuation of Ser. No. 418,884, Sep. 16, 1982, abandoned. This application Mar. 21, 1983, Ser. No. 477,553

Int. Cl.⁴ C12N 9/00, 11/10, 9/14

U.S. Cl. 435—183

30 Claims

1. A process for chemically altering the substrate specificity of a native protein to produce a predetermined modified enzyme-like protein comprising:

- selecting an enzymatically active protein to be modeled;
- immobilizing an inhibitor of said predetermined enzyme model on a solid support;
- partially denaturing said native protein and
- cross-linking said partially denatured native protein in the presence of said support immobilized inhibitor of said model enzyme.

4,714,678

TEMPERATURE SENSITIVE STRAIN OF BOVINE VIRAL DIARRHOEA VIRUS

Jean-Claude Delgoffe, Bierges; Michèle Lobmann, Rosieres, and Nathan Zygraich, Brussels, all of Belgium, assignors to Smith-Kline-RIT, Belgium

Division of Ser. No. 434,155, Oct. 13, 1982, Pat. No. 4,618,493. This application Jul. 31, 1986, Ser. No. 871,732

Int. Cl.⁴ C12N 7/00, 7/06; A61K 39/12

U.S. Cl. 435—235

1 Claim

1. An isolated and purified temperature sensitive strain of bovine viral diarrhoea virus having the temperature sensitive growth characteristics of the C.N.C.M. 1-199 virus strain.

4,714,679

IN VITRO PROPAGATION OF GRAPE

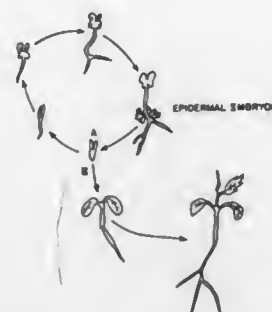
William R. Krul, Narragansett, R.I., assignor to The Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, Providence, R.I.

Continuation of Ser. No. 446,442, Dec. 3, 1982. This application Jun. 27, 1985, Ser. No. 749,306

Int. Cl.⁴ A01G 1/00

U.S. Cl. 435—240.48

1 Claim



1. A method for controlling the growth of plant embryos for either self-replicative or vine development modes, which includes:

- initiating somatic embryogenesis by placing callus cultures in a medium conducive for self-replication of embryos for a first period of time during which the embryos germinate and are characterized by late torpedo stage embryos prior to root and shoot elongation;
- culturing for vine development at least some of the embryos of step (a) in a medium having cytokinin activity for a second period of time at the end of which time the embryos are characterized by green divided cotyledons;
- transferring the embryos of step (b) to a medium free of cytokinin activity until such time that they develop sufficiently for transfer to a non-agar growth support medium.

4,714,680

HUMAN STEM CELLS

Curt I. Civin, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Feb. 6, 1984, Ser. No. 670,740

Int. Cl.⁴ C12N 5/02; G01N 33/577

U.S. Cl. 435—240.25

5 Claims

1. A suspension of human cells comprising pluripotent lymphohematopoietic stem cells substantially free of mature lymphoid and myeloid cells.

4,714,681

QUADROMA CELLS AND TRIOMA CELLS AND METHODS FOR THE PRODUCTION OF SAME

Christopher L. Reading, Kingwood, Tex., assignor to The Board of Regents, The University of Texas System Cancer Center, Austin, Tex.

Continuation of Ser. No. 279,248, Jul. 1, 1981, Pat. No. 4,474,893. This application Jun. 18, 1984, Ser. No. 621,394

The portion of the term of this patent subsequent to Oct. 2, 2001, has been disclaimed.

Int. Cl.⁴ C12N 5/00, 15/00; C07K 15/04

U.S. Cl. 435—240.27

56 Claims

1. A quadroma cell, wherein said quadroma cell is the fusion product of a first hybridoma cell which produces an antibody having specific binding affinity to a first desired antigen and a second hybridoma cell which produces an antibody having specific binding affinity for a second desired antigen, and wherein said quadroma cell produces a recombinant monoclonal antibody having specific binding affinity for both said first and said second desired antigens.

15. A trioma cell, wherein said trioma cell is the fusion

product of a hybridoma cell which produces an antibody having specific binding affinity to a first desired antigen and a lymphocyte which produces an antibody having specific binding affinity to a second desired antigen, and wherein said trioma cell produces a recombinant monoclonal antibody having specific binding affinity for both said first and said second desired antigens.

4,714,682

FLUORESCENT CALIBRATION MICROBEADS SIMULATING STAINED CELLS

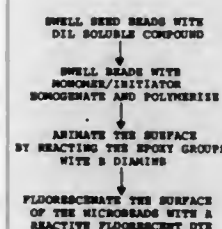
Abraham Schwartz, Durham, N.C., assignor to Flow Cytometry Standards Corporation, Research Triangle Park, N.C.

Division of Ser. No. 805,654, Dec. 11, 1985, which is a continuation-in-part of Ser. No. 685,464, Dec. 24, 1984. This application Apr. 3, 1987, Ser. No. 33,625

Int. Cl.⁴ G01N 31/00

U.S. Cl. 436—10

3 Claims



1. The method of making a calibration microbead standard to minimize aggregation and maximize yield comprising the steps:

- homogenizing a highly insoluble ($<10^{-3}$ g/l) compound of molecular weight <1000 in a surfactant solution to obtain a first homogenate;
- swelling small seed microbeads, 0.1–3μ in diameter, with said first homogenate;
- homogenizing an aqueous surfactant solution containing a large stabilizing alkaline halide salt with a mixture of oil soluble polymerizable monomers within which is dissolved 0.5–5% by weight an oil soluble initiator to obtain a second homogenate;
- swelling the seed microbeads a second time with said second homogenate; and
- placing said twice swollen microbeads under conditions appropriate to cause said initiator to polymerize the monomers in the swollen microbeads.

4,714,683

POLYPEPTIDE TUMOR INHIBITORS AND ANTIBODIES THERETO

Mohammed Shoyab, Seattle; Hans Marquardt, Mercer Island, and George J. Todaro, Seattle, all of Wash., assignors to Oncogen, Seattle, Wash.

Filed Jan. 25, 1985, Ser. No. 694,712

Int. Cl.⁴ G01N 33/53, 33/534, 33/577, 33/68

U.S. Cl. 436—547

18 Claims

1. A method for retarding the growth of neoplastic cells which comprises:

- applying to neoplastic cells a growth retarding amount of a polypeptide of at least about 15 amino acids having a sequence the same as a sequence of a neoplastic cell retarding polypeptide found in mammalian brain, with the proviso that there are not more than two amino acid changes and an insertion or deletion of not more than three amino acids.

4,714,684

METHOD OF FORMING SINGLE CRYSTAL LAYER ON DIELECTRIC LAYER BY CONTROLLED RAPID HEATING

Kazuyuki Sugahara; Tadashi Nishimura; Shigeru Kusunoki, and Yasuo Inoue, all of Hyogo, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

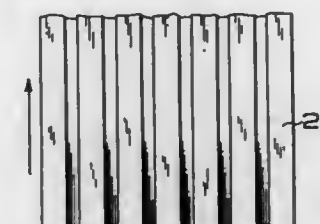
Filed Mar. 26, 1986, Ser. No. 844,324

Claims priority, application Japan, Jan. 9, 1986, 61-001465

Int. Cl.⁴ H01L 21/263; C30B 13/06

U.S. Cl. 437—19

7 Claims



1. A method of manufacturing a semiconductor device comprising:

- forming a first dielectric layer on a semiconductor substrate, forming an amorphous or polycrystalline semiconductor layer on said first dielectric layer,
- forming a second dielectric layer of substantially uniform thickness on said semiconductor layer,
- forming a third dielectric layer on said second dielectric layer, said third dielectric layer being flat on its lower surface but having a plurality of parallel grooves in its upper surface to form regions at the bottom of said grooves having a lesser thickness than the thickness of the remaining regions thereof, and
- melting and recrystallizing said semiconductor layer by the irradiation of laser beams thereby converting said semiconductor layer into single crystals.

4,714,685

METHOD OF FABRICATING SELF-ALIGNED SILICON-ON-INSULATOR LIKE DEVICES

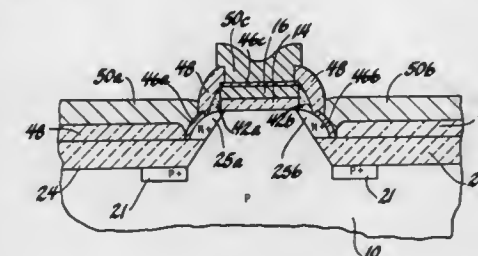
Peter J. Schubert, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1986, Ser. No. 939,183

Int. Cl.⁴ H01L 21/365, 41/425

U.S. Cl. 437—41

6 Claims



1. A process for forming an MOS transistor which has relatively low parasitic capacitances comprising the steps of:

- forming on a semiconductor body a mesa which includes a first layer for use as a gate region of the transistor and a first insulator layer, a portion of which dielectrically isolates the mesa from the supporting semiconductor body, such portion being suitable for use as a gate insulator of the transistor;
- etching the semiconductor body for forming a platform having sloped sidewalls on the top of which is supported the mesa;

forming a second insulating layer extending over the exposed semiconductor body and partially up the sidewalls of the platform, leaving an upper portion of the sidewalls of the platform exposed; growing semiconductor regions laterally out from such exposed portion of the sidewalls for forming a pair of opposed semiconductor regions adaptable for use as the source and drain of the transistor; and doping such regions using the mesa as a mask for adapting them to serve as self-aligned source and drain regions of the transistor.

4,714,686

METHOD OF FORMING CONTACT PLUGS FOR PLANARIZED INTEGRATED CIRCUITS

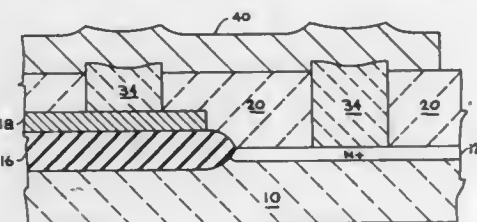
Craig S. Sander, Cupertino, and Balaji Swaminathan, Mountain View, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 31, 1985, Ser. No. 761,206

Int. Cl.⁴ H01L 21/283, 21/308

U.S. Cl. 437-195

6 Claims



1. An improved method for forming conductive plugs in contact windows in a dielectric layer overlying junction regions in an integrated circuit structure comprising:

- forming contact windows in said dielectric layer in a pattern conforming to said junction regions;
- forming a layer of polysilicon on said dielectric layer to fill said contact windows;
- performing an etching process which etches said polysilicon filler material and said dielectric layer at approximately the same rate, such that all said filler material is removed from the surface of said dielectric layer, leaving said filler material only in said windows such that the perimeter surface of said window filler material extends above or below the surface of said dielectric layer by approximately no more than 0.3 microns;
- forming a first masking layer over said plugs in windows overlying junction regions having a first conductivity type;
- doping, with a second conductivity type dopant, the plugs in windows overlying junction regions having said second conductivity type;
- removing said first masking layer;
- forming a second masking layer over said plugs doped with said second conductivity type dopant;
- doping, with a first conductivity type dopant, the plugs in windows overlying junction regions having said first conductivity type; and
- removing said second masking layer; whereby each window has a plug therein having a conductivity type matching the underlying junction region.

4,714,687

GLASS-CERAMICS SUITABLE FOR DIELECTRIC SUBSTRATES

Louis M. Holleran, Elmira, and Francis W. Martin, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 27, 1986, Ser. No. 923,432

Int. Cl.⁴ C03C 10/04, 10/08, 3/085, 3/062

U.S. Cl. 501-9

9 Claims

1. A glass-ceramic body exhibiting a dielectric constant less than 6 and containing willemite as the predominant crystal phase and cordierite as a secondary crystal phase, said body having a composition essentially free from Li_2O , Na_2O , and K_2O and consisting essentially, expressed in terms of weight percent on the oxide basis, of 15-45% ZnO , 3-15% MgO , 10-30% Al_2O_3 , and 30-55% SiO_2 .

4,714,688

PROCESS FOR REGENERATING USED CATALYSTS BY MEANS OF HYDROGEN PEROXIDE AQUEOUS SOLUTION STABILIZED WITH AN ORGANIC COMPOUND

Chan Trinh Dinh, Le Vesinet; Alain Desvard, Elancourt, and Germain Martino, Poissy, all of France, assignors to Institut Francais du Pétrole, Ruell-Malamison, France

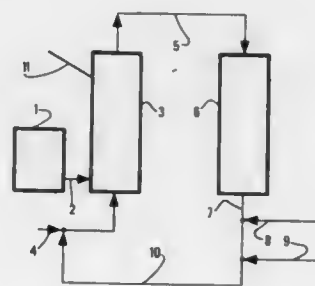
Filed Mar. 7, 1986, Ser. No. 836,866

Claims priority, application France, Mar. 8, 1985, 85 03409

Int. Cl.⁴ B01J 23/94, 23/92, 38/52, 38/62

U.S. Cl. 502-33

13 Claims



1. A process for regenerating an at least partially deactivated sulfur-containing catalyst after its use for the hydro-treatment of a hydrocarbon charge containing at least one vanadium, nickel or iron metal, said deactivation resulting from the deposit of at least one of said metals onto the catalyst, said catalyst initially comprising an inorganic carrier and at least one active metal or compound of an active metal from group VIB and/or VIII, said process consisting essentially of the following successive steps:

- The sulfur-containing deactivated catalyst is roasted in the presence of an oxygen-containing gas at 300°-600° C. so as to remove at least 90% of the sulfur;
- the catalyst obtained in step (a) is contacted with a hydrogen peroxide aqueous solution containing a stabilizing amount of at least one organic compound selected from the group consisting of an alcohol and mixtures of alcohols, so as to remove at least 10% of the deposited vanadium, nickel or iron metals; and
- the regenerated catalyst is separated from the hydrogen peroxide aqueous solution.

4,714,690

PROCESS FOR THE REGENERATION OF CATALYSTS FOR THE GAS-PHASE REDUCTION OF AROMATIC NITRO COMPOUNDS

Günter Stammann, Cologne; Zoltan Kricsfalussy; Helmut Waldmann, both of Leverkusen; Joachim Schneider, and Harald Medem, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 7, 1986, Ser. No. 894,581

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530820

Int. Cl.⁴ B01J 23/96, 23/94, 38/16; C07C 45/11

U.S. Cl. 502-54

16 Claims

1. A process for the regeneration of a catalyst for the gas-phase reduction of aromatic nitro compounds to aromatic amines comprising treating the catalyst in a catalyst zone at a temperature of 200° C. to 600° C., wherein the catalyst contains a metal selected from the group consisting of copper, iron, nickel, palladium, platinum and mixtures thereof, said metal being in metallic form or in the form of compounds, with a gas mixture which contains (a) oxygen and (b) a nitrogen compound selected from the group consisting of inorganic amines, organic amines and nitrogen oxides, said regeneration being conducted until no temperature change is observed in the catalyst zone, or until no CO_2 is detectable in gas exiting said zone and at a pressure of 0.1 to 30 bars, wherein the oxygen is fed at a rate of 5 to 100 l/h and the nitrogen compound is fed at a rate of 2 to 1,000 g/h per liter of bulk volume of the catalyst.

2. A process according to claim 1 wherein the gas mixture further comprises steam.

10. A process according to claim 1, wherein the nitrogen compound is selected from the group consisting of ammonia, hydrazines, hydroxylamines, organic amines having 1 to 6C atoms and 1 to 3N atoms, NO , NO_2 , N_2O , N_2O_2 , N_2O_3 , N_2O_4 , N_2O_5 and mixtures thereof.

4,714,690

SILICATE-BOUND ZEOLITE GRANULATES, PROCESS FOR THEIR PRODUCTION AND USE

Hans Strack, Alzenau, and Peter Kleinschmit, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 597,281, Apr. 6, 1984, abandoned. This application Oct. 24, 1985, Ser. No. 791,032

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1983, 3312876

Int. Cl.⁴ B01J 29/06

U.S. Cl. 502-64

28 Claims

1. Silicate-bound zeolite granulates, comprising zeolite dispersed in an alkali silicate binder, the binder having an alkali metal cation, the zeolite having a first metal cation which is essentially absent from the composition of the binder, and wherein the zeolite also additionally contains a second metal cation which second cation is present in the binder.

2. The silicate-bound zeolite granulates of claim 1 further comprising the original cation in the binder having been essentially completely exchanged by a different cation.

3. The silicate-bound zeolite granulates of claim 2 further comprising the binder is sodium silicate wherein the sodium ions are essentially completely exchanged by a different cation.

4. The silicate-bound zeolite granulates of claim 3 further comprising the binder is sodium silicate wherein the sodium ions are essentially completely exchanged by a member selected from magnesium, calcium, barium, aluminum, and the rare earths.

4,714,691

HETEROGENEOUS CATALYST PROCESS

Dixie E. Goins, Baton Rouge, La.; Silas W. Holmes, Columbia, and Edward A. Burt, Orangeburg, both of S.C., assignors to Ethyl Corporation, Richmond, Va.

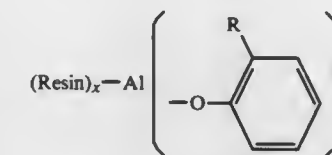
Division of Ser. No. 748,733, Jun. 25, 1985, Pat. No. 4,631,349. This application Aug. 25, 1986, Ser. No. 900,304

Int. Cl.⁴ B01J 31/06

U.S. Cl. 502-152

14 Claims

1. A resin-bonded aluminum phenoxide catalyst containing the structure



wherein R is tert-alkyl, x is 1 or 2, y is 1 or 2 and $x + y = 3$ and the Resin is the residue of a solid polymeric resin.

4,714,692

MICROEMULSION IMPREGNATED CATALYST COMPOSITE AND USE THEREOF IN A SYNTHESIS GAS CONVERSION PROCESS

Hayim Abrevaya, Chicago, and William M. Targos, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 3, 1986, Ser. No. 847,981

Int. Cl.⁴ B01J 23/46, 37/02

U.S. Cl. 502-261

6 Claims

1. A method for depositing a metal component on a refractory inorganic oxide support carrier whereby said metal component is substantially present as metal particles which are less than about 200 Å and do not vary more than 20 Å in size which method comprises:

- contacting a metal-containing water in hydrocarbon microemulsion liquid impregnant medium comprising aqueous cores containing ions of dissolved unreduced metal therein with said inorganic oxide support carrier under conditions sufficient to fixate said metal-containing aqueous cores to said support;
 - separating said support from said impregnant medium; and
 - immobilizing said unreduced metal contained in said aqueous cores by calcining said support in a fluidized bed at temperature conditions sufficient to effect removal of organics from the support but insufficient to effect metal agglomeration on the support and then reducing the calcined support at temperature conditions sufficient to effect metal reduction, but insufficient to effect metal agglomeration on the support.
3. The method of claim 1 characterized in that said metal component comprises ruthenium.
5. The method of claim 1 further characterized in that said metals are dissolved in said water core at a concentration greater than 0.1 moles per liter.

4,714,693

METHOD OF MAKING A CATALYST COMPOSITION COMPRISING UNIFORM SIZE METAL COMPONENTS ON CARRIER

William M. Targos, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 3, 1986, Ser. No. 847,982

Int. Cl.⁴ B01J 21/04, 21/08, 21/12, 23/40

U.S. Cl. 502-261

14 Claims

1. A method of producing a catalyst, which catalyst comprises about 0.1 to about 20 wt. % of an active metal component of an inorganic oxide support material, which comprises the sequential steps of:

- (a) contacting the support material with an impregnant solution containing water core microemulsions suspended in a liquid medium, with a metal component being present in the microemulsions as a dissolved metal ion in a non-reduced state at a concentration above 0.1 moles per liter;
- (b) separating the support material and the impregnant solution;
- (c) drying the impregnated support material, and then
- (d) reducing said metal component present on the support material, with the size distribution of the metal component deposited by steps (a)-(d) being such that at least 90 wt. % of said metal component is present as metal particles which do not vary more than 20 Å in size.

4,714,694

ALUMINUM-STABILIZED CERIA CATALYST COMPOSITIONS, AND METHODS OF MAKING THE SAME

Chung-Zong Wan, Somerset, and Joseph C. Dettling, Howell, both of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Filed Jun. 30, 1986, Ser. No. 880,270
Int. Cl.⁴ B01J 23/10, 23/56

U.S. Cl. 502—304

52 Claims

15. A method of making a catalyst composition comprising a mixture of an activated alumina and an aluminum-stabilized ceria and one or more platinum group metal catalytic components, the method comprising:

- (a) dispersing one or more platinum group metal catalytic components on an activated alumina;
- (b) impregnating bulk ceria or a bulk ceria precursor with a liquid dispersion of an aluminum-stabilizer precursor and calcining the impregnated ceria to provide an aluminum-stabilized ceria;
- (c) dispersing one or more non-rhodium platinum group metal components on the aluminum-stabilized ceria; and
- (d) combining the ceria from step (b) with the activated alumina to form an alumina-ceria mixture.

4,714,695

METHOD FOR THE PREPARATION OF HIGH ACTIVITY PALLADIUM BASED CATALYSTS

Christos Paparizos, Willowick; Wilfrid G. Shaw, Lyndhurst, and James L. Callahan, Wooster, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Continuation of Ser. No. 724,535, Apr. 18, 1985, Pat. No. 4,623,635. This application Apr. 16, 1986, Ser. No. 852,733
Int. Cl.⁴ B01J 23/42, 31/00, 27/24, 27/057

U.S. Cl. 502—339

6 Claims

1. A palladium metal based catalyst having the formula



where

E is one or more metals selected from the group consisting of groups IIA, IIIA, IVA, VA, IB, VIIB or VIII;

a, d and e are from about 0 to 3 with the proviso that at least d or e ≠ 0, and

Te, Zn and E are promoter elements,

prepared by the steps of:

forming an aqueous solution of a palladium compound;

adding to said solution a powder of a reducing metal selected from the group consisting of Zn and said E group promoter metals, said metal being more electropositive than palladium, in an amount sufficient to reduce all of the palladium in said palladium compound to palladium metal;

reducing the palladium to its metallic state on the surface of said reducing metal; and

separating the resulting catalyst from said solution.

NOVEL DERIVATIVES OF ARGININE VASOPRESSIN ANTAGONISTS

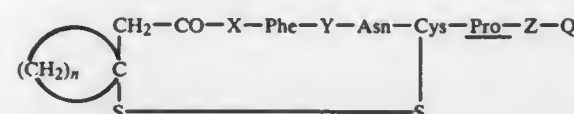
Maurice Manning, Toledo, Ohio, and Wilbur H. Sawyer, Scarsdale, N.Y., assignors to Medical College of Ohio, Toledo, Ohio and Trustees of Columbia University, New York, N.Y., a part interest

Filed Jan. 26, 1984, Ser. No. 574,257
Int. Cl.⁴ A61K 37/34; C07K 7/16

U.S. Cl. 514—11

28 Claims

1. A compound of the formula



wherein n is 4 or 5; X is (D- or L-)Tyr(R), D-Phe, D-Val, D-Leu, D-Ile, D-Nva, D-Nle, D-Cha, D-Abu, D-Thr, D-Asn, D-Gln or D-Met; Y is Val, Ile, Thr, Ala, Lys, Cha, Nva, Met, Nle, Orn, Ser, Asn, Gln, Phe, Tyr, Gly, Abu or Leu; Z is (D- or L-)Arg, Orn or Lys; Q is Arg(NH₂), Ser(NH₂), (D- or L-)Ala(NH₂), Gly, OH or NH₂ and R is methyl, ethyl, propyl or butyl, provided that when Y is Val or Gln, R is also H.

4,714,697

N⁶-BICYCLOADENOSINES AND METHODS OF USE

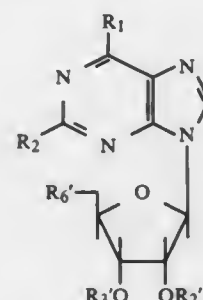
Bharat Trivedi, Canton, Mich., assignor to Warner Lambert Company, Morris Plains, N.J.

Filed Sep. 9, 1985, Ser. No. 772,983
Int. Cl.⁴ A61K 31/70; C07H 19/167

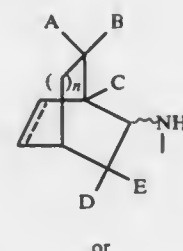
U.S. Cl. 514—46

14 Claims

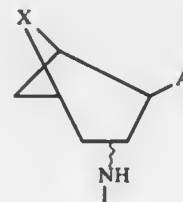
1. A compound of the formula



wherein R₁ is of formula



IIA



IIB

in which NH— is either endo or exo; is a double or single bond; n is zero, one, or two; A and B are either both

hydrogen or both methyl; D and E are also either both hydrogen or both methyl; C is hydrogen or methyl; and the proviso that when D and E are methyl then A and B are both hydrogen and C is methyl but when D and E are hydrogen then A, B, and C are all hydrogen or all methyl; X is —C(CH₃)₂—, —CH₂—, —CH₂CH₂—, or —CH=CH—; R₂ is hydrogen, halogen, SR where R is hydrogen or lower alkyl, NRⁱRⁱⁱ where Rⁱ and Rⁱⁱ are independently hydrogen, lower alkyl, phenyl or phenyl substituted by lower alkyl, lower alkoxy, halogen, or trifluoromethyl; R₁ⁱ and R₃ⁱ are independently hydrogen, lower alkanoyl, benzoyl, or benzoyl substituted by lower alkyl, lower alkoxy, halogen, or trifluoromethyl, or when taken together, R₂ⁱ and R₃ⁱ may be lower alkylidene; R₆ⁱ is halogen, hydrogen or R₅O where R₅ is hydrogen, lower alkanoyl, benzoyl, or benzoyl substituted by lower alkyl, lower alkoxy, halogen, or trifluoromethyl; and the —NH— is attached to either one or the other of the adjacent carbons; its individual diastereomers or mixtures thereof, or a pharmaceutically acceptable acid addition salt thereof.

12. A pharmaceutical composition for treating pain or inflammation comprising an analgesic or antiinflammatory effective amount of a compound as claimed in claim 1 together with a pharmaceutically accepted carrier.

4,714,698

8-ALKYLTHIO-2-PIPERAZINO-PYRIMIDO[5,4-D]-PYRIMIDINES

Josef Roch; Armin Heckel; Josef Nickl; Erich Muller; Berthold Narr, all of Biberach; Rainer Zimmermann, Mittelbiberach, and Johannes Weisenberger, Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Riss, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,095

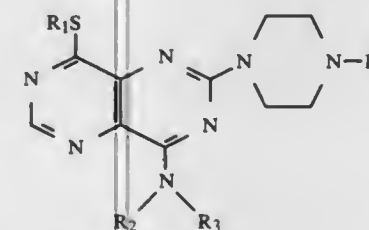
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3423092

Int. Cl.⁴ A61K 31/505; C07D 471/04

U.S. Cl. 514—212

5 Claims

1. An 8-alkylthio-2-piperazino-pyrimido[5,4-d]pyrimidine of the formula:



wherein

R₁ is alkyl group having 1 to 3 carbon atoms;

R₂ is a hydrogen atom, an allyl group or an alkyl group having 1 to 4 carbon atoms;

R₃ is an alkyl group having 1 to 6 carbon atoms or an allyl, cyclohexyl, phenyl, benzyl, 2-hydroxyethyl, 2-hydroxy-n-propyl or 3-hydroxy-n-propyl group; or

R₂ and R₃ together with the nitrogen atom between them form a pyrrolidino, piperidino, hexamethyleneimino or heptamethyleneimino group;

or a physiologically acceptable acid addition salt thereof.

4. In accordance with claim 1, 8-methylthio-2-piperazino-4-pyrimidino-pyrimido[5,4-d]pyrimidine or a physiologically acceptable acid addition salt thereof.

4,714,699

2-TOLYLMORPHOLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Louis Lafon, Paris, France, assignor to Societe Anonyme Dite: Laboratoire L. Lafon, Maisons Alfort, France

Continuation of Ser. No. 660,219, Oct. 12, 1984, abandoned.

This application Mar. 18, 1987, Ser. No. 27,350

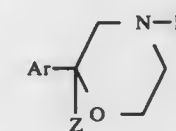
Claims priority, application France, Oct. 14, 1983, 83 16406

Int. Cl.⁴ A61K 31/535; C07D 295/02

U.S. Cl. 514—227

7 Claims

1. A 2-tolylmorpholine derivative corresponding to the general formula



(I)

(in which Ar is a tolyl group, Z is H and R is a C₁—C₄ alkyl group), which is selected from the group of 2-tolyl-4-alkylmorpholines consisting of

- (a) 2-p-tolyl-4-isopropylmorpholine and its addition salts,
- (b) 2-m-tolyl-4-methylmorpholine and its addition salts,
- (c) 2-p-tolyl-4-methylmorpholine and its addition salts,
- (d) 2-o-tolyl-4-tert-butylmorpholine and its addition salts,
- (e) 2-p-tolyl-4-tert-butylmorpholine and its addition salts.

7. A therapeutic composition which contains, in association with a physiologically acceptable excipient, at least one 2-tolyl-4-alkylmorpholine derivative selected from the group consisting of 2-p-tolyl-4-isopropylmorpholine, 2-m-tolyl-4-methylmorpholine, 2-p-tolyl-4-methylmorpholine, 2-o-tolyl-4-tert-butylmorpholine, 2-p-tolyl-4-tert-butylmorpholine and their addition salts.

4,714,700

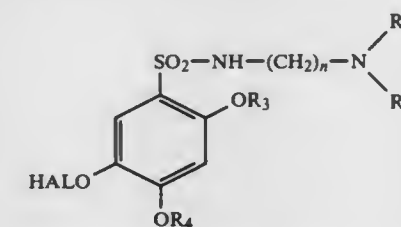
N-SUBSTITUTED 2,4-DIALKOXY BENZENESULFONAMIDES AND PHARMACEUTICAL COMPOSITIONS

Jean-Paul Fournier, Versailles, and Patrick Choay, Paris, both of France, assignors to Choay S.A., Paris Cedex, France
Division of Ser. No. 370,168, Apr. 20, 1982, abandoned. This application Feb. 12, 1985, Ser. No. 700,478
Int. Cl.⁴ A61K 31/435, 31/535; C07D 295/12

U.S. Cl. 514—229

10 Claims

1. A compound of the formula:



and the physiologically acceptable salts thereof, wherein

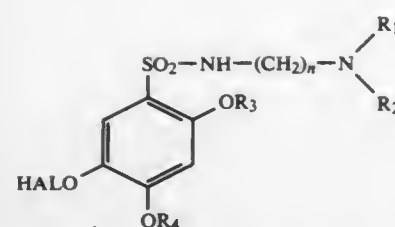
n is 2 or 3;

R₃ and R₄ are lower alkyl,

R₁ and R₂ together with the nitrogen to which they are attached, represent a heterocyclic group selected from the group consisting of pyrrolidino, morpholino or piperidino, and

wherein HALO is chloro or bromo.

6. A pharmaceutical composition which comprises a pharmaceutical carrier and a phenobarbital sleep potentiating effective amount of a compound of the formula:



and the physiologically acceptable salts thereof, wherein n is 2 or 3;
 R_3 and R_4 are lower alkyl;
 R_1 and R_2 together with the nitrogen to which they are attached, represent a heterocyclic group selected from the group consisting of pyrrolidino, morpholino, or piperidino; and wherein
 HALO is chloro or bromo.

4,714,701

ANTIVIRAL COMPOUNDS

Lilia M. Beauchamp, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.
 Filed May 2, 1986, Ser. No. 859,076

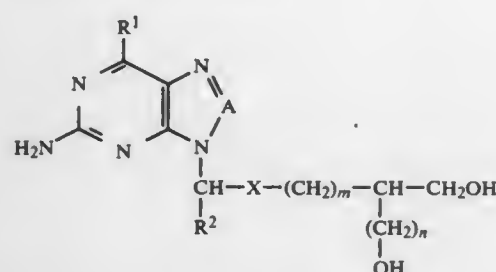
Claims priority, application United Kingdom, May 2, 1985, 8511222; May 2, 1985, 8511224

Int. Cl.⁴ C07D 473/18; A61K 31/52

U.S. Cl. 514-258

11 Claims

1. A compound of formula (I)



wherein A is a N; R^1 is a hydrogen, cl, Br, hydroxy or amino, R^2 is hydrogen or C_{1-4} alkyl, X is oxygen or sulphur and m and n are each 0 or 1 provided that $m+n=1$; or a physiologically acceptable salt or ester thereof.

4,714,702

QUINAZOLINONE DERIVATIVE

Ichizo Inoue, Kawanishi; Toyonari Oine, Nara; Yoshihisa Yamada, Kyoto; Ryuichi Ishida, Suita, and Takashi Ochiai, Kobe, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Continuation of Ser. No. 564,006, Dec. 21, 1983, abandoned.

This application Jul. 21, 1986, Ser. No. 888,631

Claims priority, application Japan, Jan. 13, 1983, 58-4707

Int. Cl.⁴ A61K 31/505; C07D 239/90

U.S. Cl. 514-259

2 Claims

2. A pharmaceutical composition which comprises a pharmaceutically effective amount of 2-fluoromethyl-3-(2-methyl-4-chlorophenyl)-6-amino-4(3H)-quinazolinone or a pharmaceutically acceptable acid addition salt thereof and pharmaceutically acceptable carrier therefor.

4,714,703

METHOD OF INHIBITING HERPETIC LESIONS

Joseph H. Burckhalter, 2201 Melrose, Ann Arbor, Mich. 48104
 Continuation of Ser. No. 774,902, Sep. 11, 1985, abandoned, which is a continuation of Ser. No. 672,148, Nov. 16, 1984, abandoned, which is a continuation of Ser. No. 485,997, Apr. 18, 1983, abandoned. This application Mar. 31, 1986, Ser. No. 846,841

Int. Cl.⁴ A61K 31/505

U.S. Cl. 514-274

5 Claims

1. A method of inhibiting surface lesions associated with human herpes simplex infection comprising:
 administering to any such lesion an effective lesion-inhibiting amount of a pharmaceutical composition in topical dosage form containing as active component about 0.1 to about 5 percent by weight of 5-fluorouracil based on the total weight of the composition.

4,714,704

ALKOXY CYCLOALKANOL ESTERS OF DIHYDROLYSERGIC ACID USEFUL AS 5HT RECEPTOR ANTAGONISTS

William L. Garbrecht; Gifford P. Marzoni, both of Indianapolis, and Kathleen R. Whitten, Zionsville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

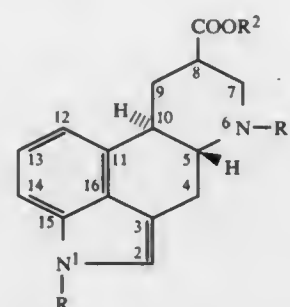
Filed Oct. 1, 1985, Ser. No. 782,340

Int. Cl.⁴ A61K 31/48; C07D 457/04

U.S. Cl. 514-288

4 Claims

1. A method of blocking 5HT₂ receptors which comprises administering to a mammal having an excess of serotonin centrally or peripherally an 5HT₂ blocking dose of a compound of the formula



wherein R is primary or secondary C_{1-8} alkyl, CH_2-C_{2-4} alkenyl, C_{3-8} cycloalkyl or C_{3-6} cycloalkyl substituted C_{1-5} primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R^1 is C_{1-4} straight chain alkyl; and R^2 is C_{1-3} alkyloxy C_{5-7} cycloalkyl; and pharmaceutically-acceptable salts thereof.

4,714,705

4-NITROGEN SUBSTITUTED ISOQUINOLINOL COMPOUNDS HAVING CARDIOTONIC, PHOSPHODIESTERASE FRACTION III INHIBITING PROPERTIES AND/OR RENAL VASODILATING PROPERTIES

Ramesh M. Kanojia, Somerville; Robert Falotico, Belle Mead, both of N.J.; Alfonso J. Tobia, Doylestown, Pa., and Jeffery B. Press, Rocky Hill, N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

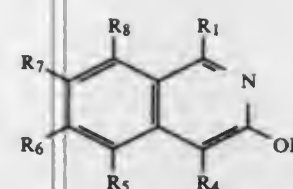
Filed Jul. 7, 1986, Ser. No. 882,655

Int. Cl.⁴ A61K 31/47; C07D 217/24

U.S. Cl. 514-309

16 Claims

1. A compound having a structure that corresponds to the formula:



wherein

R_1 is a radical selected from the group consisting of hydrogen, lower alkyl, phenyl, naphthyl, halo lower alkyl, halo phenyl and halo naphthyl wherein the halogen is selected from chloro, bromo, iodo and fluoro;

R_4 is a radical selected from the group consisting of nitro, nitroso, amino, disubstituted amino wherein the substituent is a lower alkyl group having 1-5 carbon atoms, and radicals of the formula $NHCO(Y)(R)_n$ wherein Y is O or $N(H)_x$ wherein x and n are independently zero, 1 or 2 and R is hydrogen, lower alkyl, cycloalkyl having 3-6 carbon atoms, phenyl, naphthyl, lower alkyl phenyl, lower alkyl naphthyl and substituted phenyl, naphthyl, lower alkyl phenyl and lower alkyl naphthyl wherein the substituent is selected from hydroxy, lower alkoxy, lower alkylthio, halogen, halo lower alkyl, CN, NO₂, SO₂ H and COZ wherein Z is OR or $NR'R''$ wherein R' is hydrogen or lower alkyl and R and R'' are hydrogen, lower alkyl, aminolower alkyl, lower alkylaminolower alkyl and lower dialkylaminolower alkyl alkynyl having 3-5 carbon atoms or lower alkoxy; with the proviso that if Y is oxygen R is other than hydrogen and n is 1; and when n is 2, x is zero; and

R_5 , R_6 , R_7 and R_8 are independently selected from the group consisting of hydrogen, halogen, hydroxy, and lower alkoxy; and R_5 and R_6 , R_6 and R_7 or R_7 and R_8 when taken together each form $O-CH_2-O$; and the pharmaceutically acceptable salts thereof.

16. A method for stimulating vasodilation in a mammal comprising administering to said mammal a unit dose of the pharmaceutical composition according to claim 10.

4,714,706

PYRIDYLOXY DERIVATIVES AND THEIR USE AS INSECTICIDES

Hiroshi Kisida, Tokyo; Sumio Nishida, Takarazuka, both of Japan, and Makoto Hatakoshi, Seattle, Wash., assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 30, 1986, Ser. No. 868,716

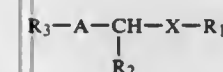
Claims priority, application Japan, May 30, 1985, 60-117189

Int. Cl.⁴ A61K 31/44; C07D 213/63, 213/64

U.S. Cl. 514-345

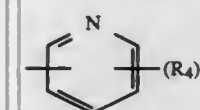
7 Claims

1. A nitrogen-containing heterocyclic compound of the formula:



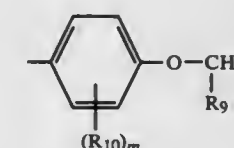
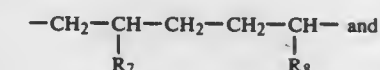
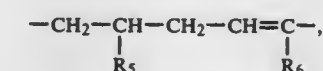
wherein

R_1 is either one of the following groups:



and wherein R_4 is a hydrogen atom, a halogen atom or a methyl group and l is an integer of 1 or 2;
 R_2 is a hydrogen atom or a methyl group;
 R_3 is an alkyl group, an alkoxy group, an alkenyl group or an alkenyloxy group, each having not more than 8 carbon atoms and optionally being substituted with an alkoxy

group having not more than 5 carbon atoms, a haloalkoxy group having not more than 5 carbon atoms, a halogen atom, a nitro group or an amino group;
 A is one of the following groups:



wherein R_5 , R_6 , R_7 , R_8 and R_9 are, the same or different, each a hydrogen atom or a methyl group, R_{10} is a hydrogen atom, a halogen atom or a lower alkyl group and m is an integer of 1 to 4; and

X is an oxygen atom.

6. A composition for preventing or exterminating insects which comprises as an active ingredient an insecticidally effective amount of the compound according to claim 1, and an inert carrier or diluent.

4,714,707

ARYL SUBSTITUTED HETEROCYCLES FOR TREATING GASTROINTESTINAL MOTILITY DYSFUNCTION

Donald E. Kuhla, Doylestown; William L. Studt, Harleysville; Henry F. Campbell, Lansdale, and John Yelnosky, Warrington, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

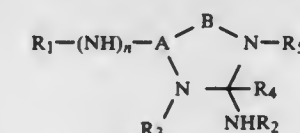
Filed Jan. 13, 1984, Ser. No. 570,526

Int. Cl.⁴ A61K 31/095, 31/39, 31/42, 31/425

U.S. Cl. 514-361

3 Claims

1. A method of treating a patient suffering from a gastrointestinal motility dysfunction comprising medicating said patient with an effective gastrointestinal motility normalizing amount of a compound according to the formula



wherein:

A is nitrogen or carbon;
 B is oxygen, sulfur, NR_6 of $C=X$;
 X is oxygen or sulfur;
 n is 0 or 1, provided that n is 0 when A is nitrogen;
 R_1 , R_2 and R_6 are each independently phenyl, substituted phenyl, hydrogen, alkyl or aralkyl;
 R_3 and R_4 form a double bond and R_5 is hydrogen or alkyl when A is nitrogen;
 R_4 and R_5 form a double bond and R_3 forms a double bond with A when A is carbon;
 provided that at least one of R_1 and R_2 is other than hydrogen and alkyl; and
 wherein:
 substituted phenyl means phenyl substituted by one or more of halo, alkyl, haloalkyl, nitro, amino, alkylamino, hydroxy, aralkoxy or alkoxy;
 or, a pharmaceutically acceptable acid addition salt thereof.

4,714,708

**DERIVATIVES OF CIS,
ENDO-2-AZABICYCLO[5.3.0]DECANE-3-CARBOXYLIC
ACID, AND THEIR USE FOR TREATING
HYPERTENSION**

Hansjörg Urbach, Kronberg; Rainer Henning, Frankfurt am Main; Volker Teetz, Hofheim am Taunus, and Reinhard Becker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 14, 1983, Ser. No. 561,230

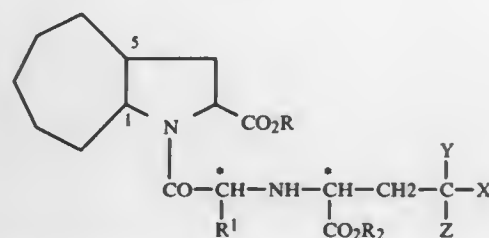
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246503

Int. Cl.⁴ C07D 209/02; A61K 31/40

U.S. Cl. 514—412

13 Claims

1. A compound of the formula I



in which the hydrogen atoms on the bridgehead C atoms 1 and 5 have the cis-configuration relative to one another and the carboxyl group on C atom 3 is oriented endo to the bicyclic ring system and in which

R denotes hydrogen, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl or (C₆-C₁₂)-aryl-(C₁-C₄)-alkyl,

R¹ denotes hydrogen, allyl, vinyl or a side chain of an optionally protected, naturally occurring α-amino-acid R¹CH(NH₂)-COOH,

R² denotes hydrogen, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl or (C₆-C₁₂)-aryl-(C₁-C₄)-alkyl,

Y denotes hydrogen or hydroxyl,

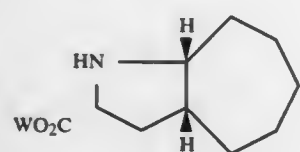
Z denotes hydrogen or

Y and Z together denote oxygen,

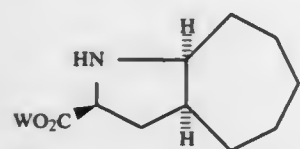
X denotes (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, (C₅-C₉)-cycloalkyl, (C₆-C₁₂)-aryl which can be substituted once, twice or three times by at least one member selected from the group consisting of (C₁-C₄)-alkyl, (C₁-C₄)-alkoxy, hydroxyl, halogen, nitro, amino, (C₁-C₄)-alkylamino, di-(C₁-C₄)-alkylamino and methylenedioxy, or denotes indol-3-yl,

and its physiologically acceptable salts.

9. A compound of the formulae IIIa and/or IIIb



(IIIa)



(IIIb)

in which W denotes hydrogen, alkyl having 1-6 carbon atoms or aralkyl having 7 or 8 carbon atoms, and its salts with physiologically acceptable acids and (in the case where W=hydrogen) with physiologically acceptable bases.

**4,714,709
N-(2,10-DIOXA-TRICYCLO-[5,3,1,0^{3,4}]-UNDECANE-5-yl)-
TRYPTAMINE DERIVATIVES AND MEDICAL
COMPOSITIONS THEREOF**

Peter W. Thies; Samuel David, both of Hanover; Ulrich Kuehl, Gehrden; Gerd Buschmann, Hanover, and Peter Flecker, Bad Vilbel, all of Fed. Rep. of Germany, assignors to Kall-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany
Filed Sep. 24, 1984, Ser. No. 653,707

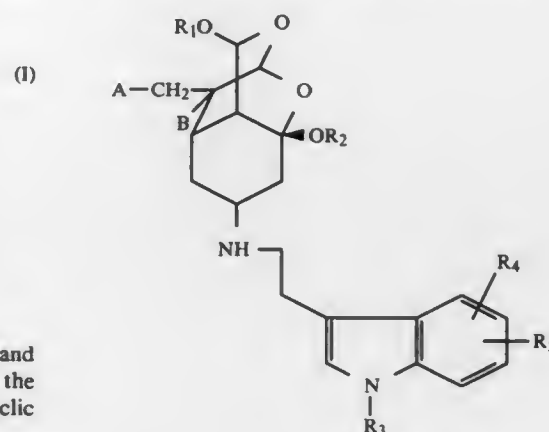
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335826

Int. Cl.⁴ A61K 31/40; C07D 405/12

U.S. Cl. 514—414

16 Claims

1. A compound corresponding to the formula



wherein

R₁ is hydrogen, a C₁-C₄ lower alkyl group, or a benzyl group;

R₂ is a C₁-C₄ lower alkyl or lower alkanoyl group;

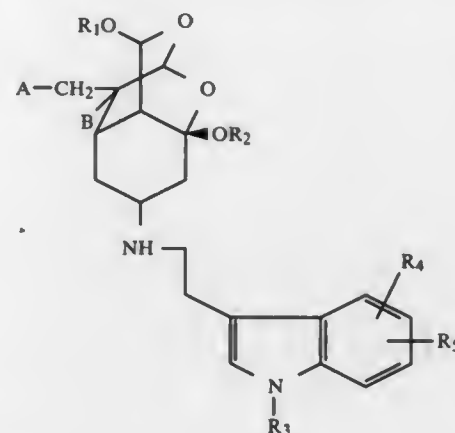
R₃ is hydrogen or a C₁-C₄ lower alkyl group;

R₄ is hydrogen, a C₁-C₄ lower alkoxy group or a hydroxy group;

R₅ is hydrogen, a C₁-C₄ lower alkoxy group, or a hydroxy group;

and A and B either are each hydrogen or together represent a bond between their respective carbons and pharmaceutically acceptable acid addition salts thereof.

14. A pharmaceutical composition comprising a pharmacologically effective amount of a compound corresponding to the formula:



wherein

R₁ is hydrogen, a C₁-C₄ lower alkyl group, or a benzyl group;

R₂ is a C₁-C₄ lower alkyl or lower alkanoyl group;

R₃ is hydrogen or a C₁-C₄ lower alkyl group;

R₄ is hydrogen, a C₁-C₄ lower alkoxy group or a hydroxy group;

R₅ is hydrogen, a C₁-C₄ lower alkoxy group, or a hydroxy group; and at least one additional substance selected from the group consisting of conventional pharmaceutical carriers and auxiliary substances.

4,714,710

**INSECTICIDAL AND ACARICIDAL OXETANE AND
THIETANE DERIVATIVES, COMPOSITIONS, AND
METHOD OF USE THEREFOR**

Heinrich Franke; Hartmut Joppien, and Helga Franke, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany
Filed Sep. 9, 1986, Ser. No. 905,275

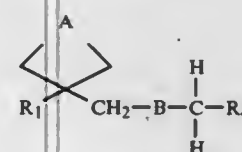
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1985, 3532478

Int. Cl.⁴ A01N 43/20; A61K 31/335, 31/38; C07D 305/06

U.S. Cl. 514—430

18 Claims

1. A compound of the formula



in which

R₁ is phenyl or phenyl substituted by C₁-C₄-alkyl, halo-C₁-C₄-alkyl, C₁-C₄-alkoxy, halo-C₁-C₄-alkoxy or methylenedioxy,

R₄ is phenoxyphenyl or halophenoxyphenyl,

A is O or S and

B is CH₂ or O.

8. An insecticidal or acaricidal composition which comprises an insecticidal or acaricidal effective amount of a compound according to claim 1, in admixture with conventional additives or carriers.

14. A method of combatting insects or acarids which comprises applying to the insect, acarid or their locus, an effective insecticidal or acaricidal amount of a compound according to claim 1.

4,714,711

**6-HYDROXY-2(2-HYDROXY-4-METHOXYPHENYL)-
BENZOFURAN DERIVATIVES TO INHIBIT
LEUKOTRIENE BIOSYNTHESIS**

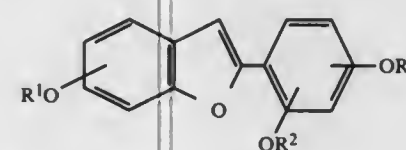
Douglas K. Miller, Westfield, N.J., and Henry Joshua, Staten Island, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Nov. 5, 1986, Ser. No. 927,200

Int. Cl.⁴ A61K 31/36

U.S. Cl. 514—464

2 Claims

1. A method of inhibiting mammalian leukotriene biosynthesis or action which comprises administering to a patient in need of such treatment an effective amount of a compound of formula:



wherein:

R¹, R² and R³ independently are:

(1) hydrogen; or

(2) alkyl having 1-6 carbon atoms.

4,714,712

**CARBOXYLIC ACID ESTERS AND INSECTICIDES
CONTAINING THEM AS THE ACTIVE INGREDIENT**
Noritada Matsuo, Rochester, N.Y.; Kazunori Tsushima, Nishinomiya; Sumio Nishida, Takarazuka, and Toshihiko Yano, Ikoma, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 18, 1986, Ser. No. 853,607

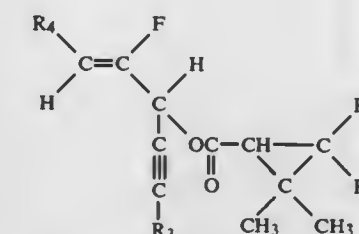
Claims priority, application Japan, Apr. 26, 1985, 60-91971; Jun. 4, 1985, 60-121233

Int. Cl.⁴ C07C 69/743, 69/747; A01N 53/00

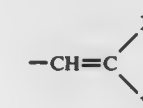
U.S. Cl. 514—531

22 Claims

1. A compound represented by the formula,

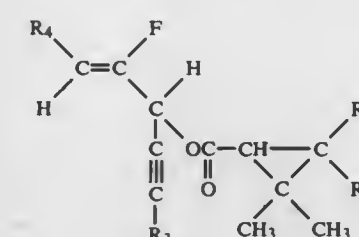


wherein R₁ represents a hydrogen atom R₂ represents a group of the formula

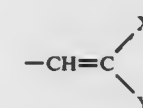


in which X and Y are the same or different and represent a methyl group, a halogen atom or a halogenated lower alkyl group, R₃ represents a hydrogen atom and R₄ represents a hydrogen atom, a lower alkyl group, a lower alkenyl group or a lower alkynyl group.

15. An insecticidal composition which comprises as an active ingredient an insecticidally effective amount of a compound represented by the formula,



wherein R₁ represents a hydrogen atom; R₂ represents a group of the formula



in which X and Y are the same or different and represent a methyl group, a halogen atom or a halogenated lower alkyl group, R₃ represents hydrogen atom; and R₄ represents a hydrogen atom, a lower alkyl group, a lower alkenyl group or a lower alkynyl group, and an inert carrier.

4,714,713

PHENYLALANINE DERIVATIVES AND USES THEREOF
Koji Fukushima, Tama; Yoshiko Seto, Funabashi; Kazuhiro Kawada, Yokkaichi; Koji Toi, and Izumi Kumashiro, both of Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 28, 1986, Ser. No. 901,364

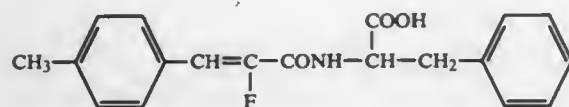
Claims priority, application Japan, Sep. 2, 1985, 60-193565

Int. Cl.⁴ A61K 31/195

U.S. Cl. 514—563

3 Claims

1. A phenylalanine derivative having the structural formula:



or a pharmaceutically acceptable acid addition salt thereof.

2. A pharmaceutical composition comprising (a) a phenylalanine derivative as claimed in claim 1, and (b) insulin.

4,714,714

ARACHIDONIC ACID ANALOGS

Raj N. Misra, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 638,335, Aug. 6, 1984, Pat. No. 4,599,439.

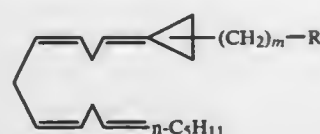
This application Mar. 7, 1986, Ser. No. 837,241

Int. Cl.⁴ C07C 61/35; A61K 31/19

U.S. Cl. 514—572

14 Claims

1. A compound having the structure

wherein R is CH₂OH or CO₂H and m is 1 or 2.

10. A composition for inhibiting allergic conditions in a mammalian species, comprising an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier thereof.

4,714,715

METHOD OF FORMING FIRE RETARDANT INSULATING MATERIAL FROM PLASTIC FOAM SCRAP AND THE RESULTANT PRODUCT

Benjamin Mosier, 8330 Westglen Dr., Houston, Tex. 77063

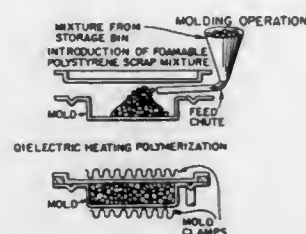
Continuation-in-part of Ser. No. 609,482, May 11, 1984, Pat. No. 4,596,682. This application Mar. 7, 1986, Ser. No. 837,185

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.

Int. Cl.⁴ B29C 67/72, 67/16, 39/10, 65/04

U.S. Cl. 521—54

14 Claims



1. The method of forming fire retardant insulating material from rigid plastic foam scrap, comprising:

- comminuting said scrap to obtain pieces having maximum dimensions of less than one inch;
 - preparing a moldable mixture of said comminuted scrap with a heat-foamable thermosetting resin composition, the resin component of said composition being selected from the class consisting of phenol-formaldehyde and melamine-formaldehyde resins, said resin being in resole form and containing a blowing agent and a surfactant, from 10 to 150 parts by volume of said resin being present per 100 parts of said scrap in said mix; and
 - applying dielectric heating to said moldable mixture in enclosed molds to obtain integrated molded bodies composed of resin-encapsulated scrap pieces, said dielectric heating being effective for rapidly foaming said resin and curing it to a predominately closed cell structure surrounding said scrap pieces.
4. The fire retarding insulating material produced by the method of claim 1.

4,714,716

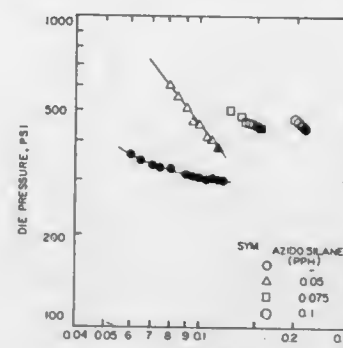
LIGHTLY CROSSLINKED LINEAR OLEFINIC POLYMER FOAMS AND PROCESS FOR MAKING
Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 16, 1984, Ser. No. 672,001

Int. Cl.⁴ C08J 9/14

U.S. Cl. 521—80

12 Claims



1. A process for preparing a lightly crosslinked linear olefin polymer foam material having a substantially closed-cell structure, comprising the steps of:

- melt processing under pressure a linear olefin polymer or blend of linear olefin polymers,
- mixing a volatile blowing agent and a sufficient amount of one crosslinking agent selected from the group consisting of azido functional silanes, multifunctional vinyl monomers, and oxygen, together with said linear olefin polymer or blend of linear olefin polymers to form a flowable admixture, and,
- extruding said admixture through a die to a zone of lower pressure and activating said blowing agent to expand said linear olefin polymer or blend of linear olefin polymers to a closed-cell structure crosslinked with itself to form said lightly crosslinked foam material.

4,714,717

POLYESTER POLYOLS MODIFIED BY LOW MOLECULAR WEIGHT GLYCOLS AND CELLULAR FOAMS THEREFROM

Michael E. Londrigan, Safety Harbor, and Michael J. Skowronski, Largo, both of Fla., assignors to Jim Walter Resources, Inc., Birmingham, Ala.

Filed Apr. 6, 1987, Ser. No. 34,970

Int. Cl.⁴ C08G 18/14

U.S. Cl. 521—131

45 Claims

1. A polyester polyol composition suitable for use in a foam-forming reaction with an organic polyisocyanate in the manu-

facture of a polyurethane or polyisocyanurate foam and characterized by a hydroxyl number of from about 150 to about 950 and a Brookfield viscosity at 25° C. of from about 500 to about 500,000 cps, the polyester polyol being the reaction product of polycarboxylic acid and polyol components, wherein the polyol component comprises

(a) at least one alkylene glycol of the formula:



wherein R₁ is a straight or branched chain alkylene group having two to five carbon atoms, and is unsubstituted or substituted by at least one member selected from the group consisting of halogen, hydroxy, nitro and amino,

(b) at least one higher alkylene glycol, and

(c) optionally at least one additional polyol.

4,714,718

NYLON MOLDINGS AND THEIR PRODUCTION

Peter Horn, Heidelberg; Edwin Baumann, Schifferstadt, and Matthias Marx, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 782,926

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436359

Int. Cl.⁴ C08L 77/00

U.S. Cl. 521—134

7 Claims

1. A cellular nylon molding having a substantially cell-free skin and prepared by activated alkaline lactam polymerization in a mold, which comprises

- 70-99 parts by weight of polycaprolactam,
- 1-30 parts by weight of a polyamide selected from the group consisting of an aliphatic polyamide having a melting point of below 200° C. and/or an aromatic/aliphatic polyamide having a glass transition temperature of from 100° to 170° C. and having a K value (0.5% strength in 1:1 phenol/o-dichlorobenzene) of from 30 to 75 which is amorphous or contains less than 30% of crystalline components and has a solubility of not less than 5% by weight in caprolactam at 120° C., and
- 3 to 100% by volume, based on (A) and (B), of gas-filled cells having a mean diameter of less than 0.2 mm.

4,714,719

CATALYST FOR PREPARATION OF POLYURETHANE AND PROCESS FOR THE PREPARATION

Harumasa Yamasaki, Wakayama; Masayoshi Morii, Naga; Yukinaga Yokota, Sennan; Akira Mamada, and Yoshiyuki Nabata, both of Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Nov. 4, 1986, Ser. No. 927,287

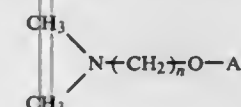
Claims priority, application Japan, Nov. 13, 1985, 60-254085; Nov. 13, 1985, 60-254087

Int. Cl.⁴ C08G 18/18

U.S. Cl. 521—163

7 Claims

1. A process for preparing a polyurethane which comprises reacting a polyol and a polyisocyanate in the presence of a catalyst comprising a compound having the formula:



in which n is an integer of 2 to 12, A is CH₂CHRCH₂NH₂ and R is hydrogen or methyl.

4,714,720

BROMINATED POLYETHERPOLYOLS, PROCESS FOR THEIR PREPARATION AND THE USE OF BROMINATED POLYETHERPOLYOLS IN THE MANUFACTURE OF RIGID POLYURETHANE FOAMS
André Collin, Ligny, Belgium, assignor to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Oct. 10, 1986, Ser. No. 917,473

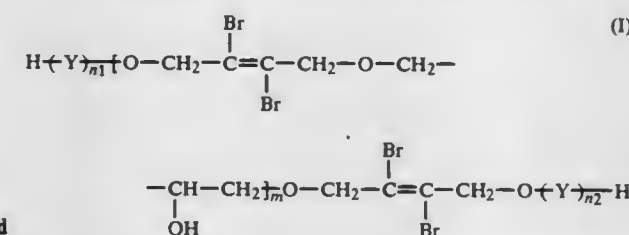
Claims priority, application France, Oct. 10, 1985, 85 15166

Int. Cl.⁴ C08G 18/14

U.S. Cl. 521—171

6 Claims

1. Brominated polyetherpolyols of general formula



in which:

Y denotes oxyalkylene radicals derived from ethylene oxide, propylene oxide and/or butylene oxide, m denotes a number such that 1 ≤ m ≤ 2, and n₁ and n₂ denote numbers such that 1 ≤ (n₁ ≤ n₂) ≤ 5.

4,714,721

COMPOSITE PLASTICS-BASED MATERIAL FOR PROSTHESIS PURPOSES

Henning Franek, Braunsfeld-Tiefenbach; Heinz Broemer, Wetzlar; Klaus Deutscher, deceased, late of Wetzlar (by Anneliese Deutscher, heir), and Roland Schaefer, Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

PCT No. PCT/DE85/00172, § 371 Date Feb. 5, 1986, § 102(e) Date Feb. 5, 1986, PCT Pub. No. WO86/00021, PCT Pub. Date Jan. 3, 1986

PCT Filed May 22, 1985, Ser. No. 842,259

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421157

Int. Cl.⁴ A61K 6/06, 49/04; A61L 25/00

U.S. Cl. 523—113

26 Claims

1. A composition for prosthesis purposes, comprising a polymerizable material and a radiopaque filler, wherein the radiopaque filler comprises an oxide of gadolinium and an oxide of strontium as a component combination which causes x-ray absorption.

4,714,722

FLY ASH REACTIVE FILLER FOR DEHYDRATING AND BONDING AQUEOUS POLYMERIC COMPOSITIONS

Daniel J. Najvar; Brian G. Pope, both of Baton Rouge, La., and Norman R. Loeffler, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 747,593, Jun. 24, 1985, abandoned.

This application Aug. 20, 1986, Ser. No. 898,858

Int. Cl.⁴ C08J 9/32

U.S. Cl. 523—218

12 Claims

1. A method for accelerating the dehydration of an aqueous polymeric dispersion composition comprising polymeric particles and mineral filler dispersed in an aqueous medium and improving bonding of the solids contained therein, the method consisting essentially of adding Class C fly ash as the sole water-reducing agent to said composition in an amount sufficient to significantly reduce the dehydration time of said composition compared to compositions which are identical save for the absence of Class C fly ash.

4,714,723

ADHESIVE SOLUTIONS, MORE ESPECIALLY FOR WATER-ACTIVATABLE ADHESIVE COATINGS ON WALLPAPERS

Lutz Hoppe, and Eugen Reinhardt, both of Walsrode, Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,450

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447206

Int. Cl.⁴ C08L 1/26, 1/08; C09J 3/04

U.S. Cl. 524—42

6 Claims

1. An adhesive solution, especially for wallpapers prepared from:

- (1) a from 2 to 20%, by weight, dispersion of cellulose ethers in an aliphatic C₁—C₄ alcohol; and
- (2)
 - (a) from 0.05 to 2.0%, by weight, of an aqueous solution of methyl cellulose ether and/or hydroxyalkyl methyl cellulose ether which is soluble in water and in a mixture of methanol and methylene chloride and which is swellable in methanol or
 - (b) from 2 to 40%, by weight, of an aqueous solution of a hydrolyzate, of a copolymer of styrene and acrylonitrile, which is also soluble in methanol, an alcohol-to-water weight ratio of from 0.5:1 to 3.5:1 having to be maintained in the adhesive solution.

4,714,724

DIBROMONEOPENTYL PHOSPHATE MELAMINE SALT FLAME RETARDANT

Alfred K. Jung, Ridgewood; Joseph Silberberg, Brooklyn, and Edward D. Weil, Hastings-on-Hudson, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 146,583, May 5, 1980, Pat. No. 4,373,103.

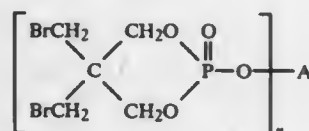
This application Sep. 29, 1982, Ser. No. 426,562

Int. Cl.⁴ C08K 5/34

U.S. Cl. 524—100

2 Claims

1. A composition comprising a normally flammable polymer of styrene and a minor proportion, sufficient to impart flame-retardant properties to said compositions, of a salt of 5,5-bis(bromomethyl)-2-hydroxy-2-oxo-1,3,2-dioxaphosphorinane having the structure



where A is a protonated amino-s-triazine group and n is an integer corresponding to the valence of A.

4,714,725

MEMBRANES

Brian N. Hendy, Middlesbrough, and John W. Smith, Liverpool, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 793,756, Nov. 1, 1985, abandoned. This application Apr. 6, 1987, Ser. No. 35,235

Claims priority, application United Kingdom, Nov. 12, 1984, 8428525

Int. Cl.⁴ C08K 5/15; C08L 71/04

U.S. Cl. 524—108

7 Claims

1. A solution comprising a sulphonated polyaryletherketone and a solvent mixture which contains at least three components each of which is a non-solvent or poor solvent for the sulphonated polyaryletherketone and which are

- (a) a liquid or a low melting solid containing at least one hydroxylic group and having a delta-H with a value of at least 8;
- (b) a liquid or a low melting solid having a delta-D with a

value of at least 8 and a delta-P with a value of not more than 3; and

- (c) a liquid or a low melting solid having a delta-P with a value of at least 8.5 and a delta-H with a value of not more than 3;

wherein the solvent mixture forms a single liquid phase and none of the components of the solvent mixture reacts or complexes with another of the components of the solvent mixture or with the sulphonated polyaryletherketone.

5. The solution of claim 1 in which component (a) of the solvent mixture has a delta-H of at least 8, a delta-D of not more than 8 and a delta-P of at least 6; component (b) of the solvent mixture has a delta-D of at least 8, a delta-P of not more than 3 and a delta-H of not more than 4; and component (c) of the solvent mixture has a delta-P of at least 8.5, a delta-H of not more than 3 and a delta-D of at least 7.5.

6. The solution of claim 5 wherein the solvent mixture contains at least 20% by weight of 1,4-dioxane, at least 10% by weight of acetonitrile and not more than 40% by weight of water, the total amounts of the three components aggregating to 100% by weight.

4,714,726

LOW TEMPERATURE SINGLE STEP CURING POLYIMIDE ADHESIVE

Celia H. Ketley, Beverly, Mass., assignor to W. R. Grace & Co., Lexington, Mass.

Filed Jun. 4, 1986, Ser. No. 870,461

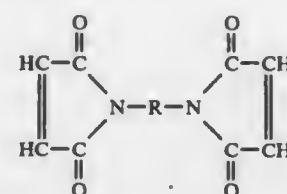
Int. Cl.⁴ C08K 5/15

U.S. Cl. 524—11

12 Claims

1. A silver-filled paste comprising

- (a) silver powder;
- (b) a resin having the formula:



wherein R comprises a divalent linking group; and

- (c) a solvent for the resin which comprises one or more electron donor groups.

4,714,727

AQUEOUS EMULSION COATING FOR INDIVIDUAL FIBERS OF A CELLULOSIC SHEET PROVIDING IMPROVED WET STRENGTH

Robert M. Hume, III, Cottage Grove, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Jul. 25, 1984, Ser. No. 634,372

Int. Cl.⁴ C08J 0/00

U.S. Cl. 524—271

15 Claims

1. A basic emulsion composition, that can provide water resistance to a cellulosic sheet while preserving its affinity with aqueous compositions, which comprises in an emulsion:

- (a) a major proportion of water;
- (b) an effective water resistance providing amount comprising about 0.02 to 15 wt-% based upon the total emulsion composition of a mixture of a wax compound and a rosin compound;
- (c) an effective amount comprising about 0.01 to 5 wt-% based upon the total emulsion composition of an emulsion stabilizer comprising the reaction product of a relatively strong basic component and a relatively weak acidic component; and
- (d) an effective amount comprising about 0.01 to 10 wt-% of the total emulsion composition of a chelating agent result-

ing in the chelation of ionic species in the water and in the cellulosic sheet.

4,714,728

AQUEOUS DISPERSIONS OF ACIDIC ETHYLENE INTERPOLYMERS

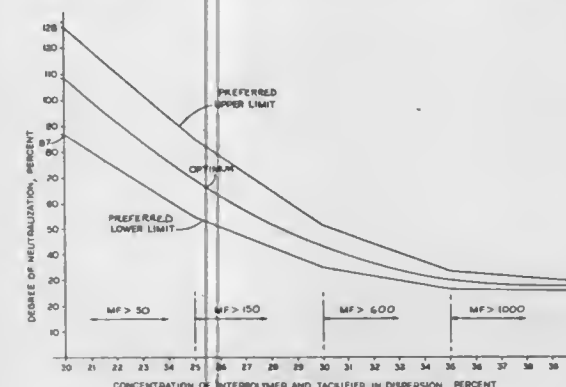
Stephen L. Graham, Houston, and David O. Plunkett, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 18, 1986, Ser. No. 887,846

Int. Cl.⁴ C08F 2/16, 8/00, 8/30

U.S. Cl. 524—272

34 Claims



1. An aqueous dispersion, consisting essentially of:

- (a) an ethylene interpolymer having an acid number of at least about 117, a melt flow of at least about 50, and comprising from 15 to 24 percent, by weight of said interpolymer, of interpolymerized ethylenically unsaturated carboxylic acid;
- (b) from about 5 to about 2000 parts by weight per 100 parts of said interpolymer of a rosin tackifier having an acid number of at least about 76 and a melt flow of at least 50, said tackifier being compatible and codispersible with said interpolymer;
- (c) water in an amount sufficient to provide a solids content of the dispersion of from about 10 to about 60 percent; and
- (d) water soluble alkali in an amount effective to obtain a degree of neutralization of from about 20 to about 130 percent, to disperse at least 99 weight percent of said interpolymer and said tackifier, and to provide a viscosity of the dispersion which is less than about 1500 Pa-s.

21. A method of preparing an aqueous dispersion, comprising the steps of:

- (a) mixing components consisting essentially of:
 - (i) an ethylene interpolymer having an acid number of at least about 117, a melt flow of at least about 80, and comprising from 15 to 24 percent, by weight of said interpolymer, of interpolymerized ethylenically unsaturated carboxylic acid;
 - (ii) from about 5 to about 2000 parts by weight per 100 parts of said interpolymer of a rosin tackifier having an acid number of at least about 76 and a melt flow of at least 50, said tackifier being compatible and codispersible with said interpolymer;
 - (iii) water in an amount sufficient to provide a solids content of the mixture of from about 10 to about 60 percent; and
 - (iv) water soluble alkali in an amount effective to obtain a degree of neutralization of from about 20 to about 130 percent; and
- (b) heating and agitating said mixture sufficiently to disperse therein at least 99 weight percent of said interpolymer and said tackifier.

4,714,729

ULTRAVIOLET LIGHT-STABLE IGNITION RESISTANT THERMOPLASTIC MOLDING COMPOSITIONS

Mark R. Christy, and Ernest L. Ecker, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 27, 1986, Ser. No. 822,723

Int. Cl.⁴ C08K 5/10

U.S. Cl. 524—281

13 Claims

1. An ignition resistant composition comprising in admixture a resin selected from the group consisting of acrylonitrile butadiene styrene, polystyrene, styrene acrylonitrile/ethylene propylene diene rubber terpolymer blends, and mixtures thereof, and 2,4,6-trihalophenyl tribromoneopentyl carbonate, pentahalophenyl 2,4,6-trihalophenyl carbonate, or a mixture thereof, the halogen being Br, Cl, I, F, and mixtures thereof in an amount effective to improve ignition resistance and at least one property selected from the group consisting of ultraviolet light stability and impact strength.

4,714,730

ACID MODIFIED ADHESIVE COMPOSITIONS

Paul C. Briggs, Charlestown, and Donald E. Gosiewski, West Peabody, both of Mass., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 4, 1986, Ser. No. 870,710

Int. Cl.⁴ C08K 5/09

U.S. Cl. 524—321

27 Claims

1. An adhesive composition comprising:

- (a) an acrylic or methacrylic ester based monomer;
- (b) a polymerization catalyst;
- (c) a sulfur-bearing composition selected from the group of chlorosulfonated polyethylene and a mixture of sulfonyl chloride with chlorinated polyethylene in a polymerizable vinyl monomer or a mixture of monomers and a polymerization catalyst; and
- (d) an effective amount of a strong organic acid wherein the acid has a dissociation constant (K_d or K_{1d}) within the range of from about 1×10^{-4} to about 10×10^{-1} or wherein an 0.2N aqueous solution of the acid has a pH in the range of from about 1.2 to 2.3.

4,714,731

METAL CONTAINER COATING COMPOSITIONS COMPRISING STABLE EMULSIONS OF WATER RESISTANT POLYVINYL ALCOHOL-STABILIZED VINYL CHLORIDE-ETHYLENE COPOLYMERS

John G. Iacoviello, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 747,134, Jun. 20, 1985, Pat. No. 4,678,829, which is a continuation-in-part of Ser. No. 622,592, Jun. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 572,726, Jan. 20, 1984, abandoned. This application Mar. 13, 1987, Ser. No. 25,769

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.⁴ C08F 2/16; C08K 3/20

U.S. Cl. 524—459

18 Claims

1. A metal container coating composition comprising

- (a) about 45 to 95 wt % of a stable aqueous vinyl chloride-ethylene copolymer emulsion, the copolymer having a T_g from 0° to 50° C., consisting essentially of about 65 to 90 wt % vinyl chloride, about 5 to 35 wt % ethylene, and up to about 10 wt % C₃—C₁₀ alkenoic acid or nitrogen-containing comonomer, provided that when the nitrogen-containing comonomer is acrylamide up to about 1 wt % is present, and prepared by the emulsion polymerization of the monomers in the presence of an emulsifying system consisting essentially of about 3 to 15 wt % polyvinyl alcohol which is 70 to 91 mole % hydrolyzed, which emulsion polymerization process comprises forming an aqueous emulsion reaction mixture containing

substantially all the polyvinyl alcohol and a portion of the total vinyl chloride monomer, pressurizing the reaction mixture with an ethylene pressure sufficient to provide the copolymer with a 5 to 35 wt % ethylene content, initiating the reaction mixture by the addition of a free radical generating source and continuing polymerization until the rate of polymerization begins to decrease, adding the remaining vinyl chloride over a period of time while continuing polymerization until the reaction is no longer self-sustaining, and removing the unreacted ethylene and reducing the vinyl chloride free monomer content of the emulsion, (b) about 5 to 40 wt % of a crosslinking resin, based on emulsion solids, (c) up to about 10 wt % organic solvent, and (d) 0 to 5 wt % acid catalyst.

4,714,732

RUBBER COMPOSITION FOR TIRE INNER LINER
Takashi Hoshino, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 25, 1986, Ser. No. 899,672

Claims priority, application Japan, Sep. 12, 1985, 60-200589
Int. Cl.⁴ C08K 5/01; C08L 9/00, 15/02

U.S. Cl. 524—474

5 Claims

1. A rubber composition for an inner liner of a tire, comprising:

- a rubber component including halogenated butyl rubber ranging from 60 to 100 parts by weight, and diene rubber not more than 40 parts by weight; and
 - a hydrocarbon oil softener ranging from 3 to 15 parts by weight relative to 100 parts by weight of said rubber component, said softener including a paraffin component constituting not less than 60 weight%, and an aromatics component constituting not more than 5 weight%;
- said rubber composition having a storage elastic modulus at 10° C. after vulcanization, not higher than 1.4×10^8 dyn/cm², and a storage elastic modulus at -45° C., not higher than 8.0×10^9 dyn/cm².

4,714,733

RUBBER COMPOSITION

Kunio Itob; Takeshi Fukuda, and Hiroshi Yoshioka, all of Anaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1987, Ser. No. 34,640

Claims priority, application Japan, Feb. 13, 1987, 62-30993
Int. Cl.⁴ C08K 3/36; C08L 83/06, 7/00, 83/04

U.S. Cl. 524—493

6 Claims

1. A rubber composition which comprises:
- (A) 100 parts by weight of a combination composed of (A-1) from 50 to 97% by weight of a rubbery copolymer of ethylene and propylene, and
 - (A-2) from 50 to 3% by weight of an organopolysiloxane represented by the average unit formula



in which R¹ is a substituted or unsubstituted monovalent hydrocarbon group, the groups denoted by R¹ in a molecule having at least two aliphatically unsaturated linkages, and the subscript n is a positive number in the range from 1.90 to 2.05, and having an average degree of polymerization of at least 500; (B) from 5 to 200 parts by weight of a reinforcing silica filler having a specific surface area of at least 50 m²/g; (C) from 1 to 20 parts by weight of a first organosilane compound represented by the general formula



in which R² is a substituted or unsubstituted monovalent hydrocarbon group selected from the class consisting of alkyl groups having 1 to 6 carbon atoms, cycloalkyl groups having

5 to 8 carbon atoms, phenyl group, vinyl group and 3,3,3-trifluoropropyl group, X is an atom or group selected from the class consisting of hydrogen atom, alkyl groups having 1 to 4 carbon atoms and alkoxy-substituted alkyl groups having 2 to 6 carbon atoms and the subscript m is zero, 1 or 2, or a partial hydrolysis-condensation product thereof having an average degree of polymerization not exceeding 100; and (D) from 0.1 to 10 parts by weight of a second organosilane compound having a thiocarbamyl group in a molecule represented by the general formula



in which R³ is a monovalent group selected from the class consisting of alkyl groups having 1 to 4 carbon atoms, alkoxy-substituted alkyl groups having 2 to 6 carbon atoms, cycloalkyl groups having 5 to 8 carbon atoms and phenyl group, R⁴ is a monovalent hydrocarbon group selected from the class consisting of alkyl groups having 1 to 4 carbon atoms, cycloalkyl groups having 5 to 8 carbon atoms and phenyl group, R⁵ is a divalent hydrocarbon group of a straightly linear or cyclic structure having 1 to 8 carbon atoms, R⁶ is a hydrogen atom or a monovalent hydrocarbon group selected from the class consisting of alkyl groups having 1 to 4 carbon atoms and phenyl group, the subscript a is 1, 2 or 3 and the subscript b is a positive integer of from 2 to 6.

4,714,734

RUBBER COMPOUNDS

Takatsugu Hashimoto, Higashiyamato; Akihiro Maehara, Musashimurayama; Seisuke Tomita, Tokorozawa; Yuichi Funahashi; Junichiro Watanabe, both of Ota; Kazuo Sugiyama, and Hironori Matsumoto, both of Tokyo, all of Japan, assignors to Bridgestone Corp.; Toshiba Silicone Co., Ltd. and Japan Synthetic Rubber Co., Ltd., all of Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,776

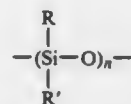
Claims priority, application Japan, Feb. 26, 1985, 60-37034; Feb. 26, 1985, 60-37035

Int. Cl.⁴ C08K 3/04

U.S. Cl. 524—496

21 Claims

1. A rubber compound comprising 100 parts by weight of a polyorganosiloxane of the following general formula



wherein R and R' are independently selected from the group consisting of an aromatic ring substituent, an alkyl substituent, and a halogenated alkyl substituent; n is an integer of not smaller than 3; and wherein at least 6 mole percent of said substituents are an aromatic ring substituent having a Small's molecular attraction constant of not smaller than 700; and 2 to 200 parts by weight of carbon black having an average particle size not larger than 1000 angstroms.

4,714,735

ORIENTED ELASTOMERIC FILM AND METHOD OF MANUFACTURE

William J. Hodgson, Jr., Baytown, and Jeffrey A. Middlesworth, Webster, both of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed May 8, 1985, Ser. No. 732,127

Int. Cl.⁴ C08L 77/00, 45/00, 33/04, 35/02

U.S. Cl. 524—514

9 Claims

1. An oriented film having a blend composition comprising from 10 to 40 weight percent of an olefinic elastomers, from 2

to 10 weight percent of a normally liquid process oil, and from 50 to 80 weight percent of a thermoplastic ethylene copolymer, said film being stretch oriented in draw ratio of between 1.3:1 and 6:1 and being dimensionally stable, thermally unstable in the stretch oriented condition and contractible to a thermally stable and elastic condition by application of heat.

4,714,736

STABLE POLYAMIDE SOLUTIONS

Roger L. Juhl; James L. Potter, and Sotiros C. Polemenakos, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 29, 1986, Ser. No. 869,152

Int. Cl.⁴ C08J 3/06; C08L 77/06; C08G 69/46

U.S. Cl. 524—608

3 Claims

1. A method for storing an uncrosslinked polyamide solution, comprising the steps of:
- reacting an aqueous polyalkylene polyamine with a saturated aliphatic dicarboxylic acid having from 3 to 10 carbon atoms to prepare an uncrosslinked polyamide;
 - diluting the polyamide with water to form an aqueous polyamide solution having a concentration of polyamide of from about 30% to about 60% by weight;
 - acidifying the aqueous polyamide solution with sufficient acid to reduce the pH of the solution to below about 9; and
 - storing the acidified uncrosslinked solution at ambient temperature for more than three days.

4,714,737

PROCESS AND COMPOSITION

Dwight J. Patterson, Evansville, Ind., assignor to General Electric, Mt. Vernon, Ind.

Filed Dec. 19, 1986, Ser. No. 943,460

Int. Cl.⁴ C08L 69/00; C08J 3/00

U.S. Cl. 524—611

6 Claims

1. A method for producing a high molecular weight aromatic polycarbonate composite material which comprises
- a. coating the reinforcing material with a catalyst system which polymerizes aromatic cyclic carbonate oligomers to high molecular weight aromatic polycarbonate under appropriate conditions;
 - b. contacting the catalyst system coated reinforcing material with a mixture of aromatic cyclic carbonate oligomers and;
 - c. polymerizing the mixture of aromatic cyclic carbonate oligomers to high molecular weight aromatic polycarbonate.

4,714,738

ACRYLIC POLYMERS CONTAINING HYDROLYZABLE MOIETIES FROM ORGANOSILANE COMPOUNDS

Wen H. Chang, Gibsonia; Paul J. Prucnal; John R. Pfeffer, both of Pittsburgh; Edward L. Dufford, Sarver, and Ronald R. Ambrose, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

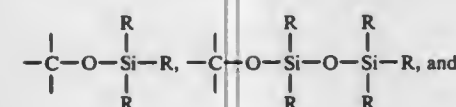
Filed Apr. 30, 1985, Ser. No. 728,973

Int. Cl.⁴ C08F 8/00

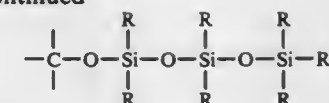
U.S. Cl. 525—58

23 Claims

1. An ungelled acrylic resin composition comprising an acrylic polymer having in a molecule thereof at least one group containing a silicon atom said group selected from:



-continued



wherein each R independently is selected from the group of moieties consisting of Y, hydrogen, a C₁-C₁₀ group joined to Si through an Si-C linkage, and OR⁷ in which R⁷ represents alkyl having at least 4 carbon atoms, aryl, alkylaryl, arylalkyl, aryloxyalkyl, or alkyloxyalkyl, wherein Y represents an easily hydrolyzable group; provided that said acrylic resin composition contains an amount of easily hydrolyzable Y moieties such that the ratio of the number of grams of said ungelled acrylic resin composition to equivalents of easily hydrolyzable Y moieties in said ungelled acrylic resin composition is in a range of from 40 to 667.

4,714,739

CURABLE SILICONE SEMI-INTERPENETRATING POLYMER NETWORKS AND METHODS OF MAKING SAME

Barry C. Arkles, Orelana, Pa., assignor to Petrarch Systems Inc., Bristol, Pa.

Continuation-in-part of Ser. No. 370,000, Apr. 20, 1982, Pat. No. 4,500,688. This application Feb. 6, 1984, Ser. No. 577,113

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314355; Japan, Apr. 20, 1983, 58-68531

Int. Cl.⁴ C08L 83/05, 9/00

U.S. Cl. 525—92

29 Claims

1. A melt processable composition comprising a polymeric thermoplastic matrix, a hydride group-containing silicone, a non-silicone polymer containing at least one unsaturated group, and a catalyst which will catalyze the reaction of said polymer with said hydride group-containing silicone, said silicone and said polymer being selected and present in sufficient amounts to react with each other by vulcanization within said polymeric thermoplastic matrix to form a silicone semi-interpenetrating polymer network, said vulcanization of said silicone and said polymer being initiated during thermoplastic melt-processing of said composition.

4,714,740

LOW COEFFICIENT OF FRICTION NYLON BLEND

Michael C. Lee, Troy, and Mark A. Golden, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 812,849, Dec. 23, 1985. This application Jul. 14, 1986, Ser. No. 892,625

Int. Cl.⁴ C08L 77/06

U.S. Cl. 525—179

1 Claim

1. A thermoplastic polyblend molding composition consisting of an intimate admixture of
- (a) 90 to 60% by weight of total polyblend composition of nylon 66,
 - (b) 5 to 40% by weight of total polyblend composition of a thermoplastic additive of polymethylmethacrylate, and
 - (c) 5 to 20% by weight of total polyblend composition of a thermoplastic additive of polytetrafluoroethylene,
- the total of (a) (b) and (c) being equal to 100%, whereby said thermoplastic additives improve the friction and wear properties of said polyblend composition.

4,714,741

DEGRADABLE POLYMER COMPOSITION

Dennis C. Balduff, Toledo, and Saleh A. Jabarin, Holland, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 856,638, Apr. 25, 1986, abandoned, which is a continuation of Ser. No. 726,487, Apr. 24, 1985, abandoned, which is a continuation of Ser. No. 524,279, Aug. 18, 1983, abandoned. This application Oct. 17, 1986, Ser. No. 919,981

Int. Cl.⁴ C08L 23/06

U.S. Cl. 525—185

1 Claim

1. A degradable polymer composition comprising:
 - (a) an ethylene-carbon monoxide copolymer only in an amount sufficient to provide a total of substantially about 0.005 to 0.05 percent by weight of CO in the composition; and
 - (b) a low density polyethylene constituting substantially the balance of the composition.

4,714,742

CYANAMIDE DERIVATIVES AS VULCANIZATION RATE MODIFIERS

Roger J. Hopper, and Carl R. Parks, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 20, 1986, Ser. No. 920,531

Int. Cl.⁴ C08C 19/20, 19/22

U.S. Cl. 525—346

7 Claims

1. A sulfur vulcanizable composition comprising a sulfur vulcanizable rubber and at least one compound having the general structural formula:



wherein R and R' may be the same or different radicals selected from the group comprised of alkyl radicals of 1-20 carbon atoms, aralkyl radicals of 7-20 carbon atoms and alkenyl radicals of 3-20 carbon atoms wherein the alkenyl function is at the two position or greater.

4,714,743

EPOXY-POLYESTER GRAFT COPOLYMERS SUITABLE FOR CHIP RESISTANT COATING COMPOSITION I

Panagiotis I. Kordomenos, Mt. Clemens, and Andrew H. Der- van, Grosse Pointe Farms, both of Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 23, 1986, Ser. No. 877,639

Int. Cl.⁴ C08G 59/16, 63/66

U.S. Cl. 525—418

8 Claims

1. A hydroxy functional epoxy-polyester graft copolymer suitable for use in a thermosetting composition, which copolymer has a number average molecular weight (M_n) of between about 2,000 and about 20,000, said copolymer being the product of polymerization of lactone monomers in the presence of hydroxy functional epoxy ester resin precursor having reactive hydroxyl groups, said lactone monomers being polymerized and reacted with hydroxyl groups of the precursor without chain extension of the precursor to form pendent hydroxyl terminated polymer chains, wherein the polymerization reaction mixture comprises between about 10 and about 80 weight percent said hydroxy functional epoxy ester resin precursor and between about 90 and about 20 weight percent said lactone monomers, said precursor being the reaction product of:
 - (i) modified diepoxide being the product of polymerization of lactone monomers in the presence of diepoxide which has been chain extended with diphenol, wherein said lactone monomers, reacted to form said modified diepox-

ide, and said diphenol are employed in a molar ratio of at least about 2:1, respectively; and

- (ii) hydroxy functional secondary amine in chain termination reaction in about 1:1 equivalent ratio.

4,714,744

EPOXY-POLYESTER GRAFT COPOLYMERS SUITABLE FOR CHIP RESISTANT COATING COMPOSITION I

Panagiotis I. Kordomenos, Mt. Clemens, and Andrew H. Der- van, Grosse Pointe Farms, both of Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 23, 1986, Ser. No. 877,908

Int. Cl.⁴ C08G 59/16, 63/18, 63/20

U.S. Cl. 525—438

10 Claims

1. A hydroxy functional epoxy-polyester graft copolymer suitable for use in a thermosetting composition, which copolymer has a number average molecular weight (M_n) of between about 2,000 and about 20,000, said copolymer being the product of polymerization of lactone monomers in the presence of hydroxy functional epoxy ester resin precursor having reactive hydroxyl groups, said lactone monomers being polymerized and reacted with hydroxyl groups of the precursor without chain extension of the precursor to form pendent hydroxyl terminated polymer chains, wherein the polymerization reaction mixture comprises between about 10 and about 80 weight percent said hydroxy functional epoxy ester resin precursor and between about 90 and about 20 weight percent said lactone monomers, said precursor being the reaction product of:
 - (i) modified diepoxide being the product of polymerization of lactone monomers in the presence of diepoxide which has been chain extended substantially simultaneously with diphenol and dicarboxylic acid, said diepoxide being reacted substantially simultaneously with said diphenol and dicarboxylic acid in amounts sufficient to give a weight per epoxide of between about 500 and about 2500, wherein said lactone monomers reacted to form said modified diepoxide and the combined said diphenol and dicarboxylic acid, are employed in a molar ratio of at least about 2:1, respectively; and
 - (ii) hydroxy functional secondary amine in chain termination reaction in about 1:1 equivalent ratio.

4,714,745

EPOXY-POLYESTER GRAFT COPOLYMERS SUITABLE FOR CHIP RESISTANT COATING COMPOSITION I'

Panagiotis I. Kordomenos, Mt. Clemens, and Andrew H. Der- van, Grosse Pointe Farms, both of Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 23, 1986, Ser. No. 877,645

Int. Cl.⁴ C08G 63/20, 59/16

U.S. Cl. 525—438

9 Claims

1. A hydroxy functional epoxy-polyester graft copolymer suitable for use in a thermosetting composition, which copolymer has a number average molecular weight (M_n) of between about 2,000 and about 20,000, said copolymer being the product of polymerization of lactone monomers in the presence of hydroxy functional epoxy ester resin precursor having reactive hydroxyl groups, said lactone monomers being polymerized and reacted with hydroxyl groups of the precursor without chain extension of the precursor to form pendent hydroxyl terminated polymer chains, wherein the polymerization reaction mixture comprises between about 10 and about 80 weight percent said hydroxy functional epoxy ester resin precursor and between about 90 and about 20 weight percent said lactone monomers, said precursor being the reaction product of:
 - (i) modified diepoxide being the product of polymerization of lactone monomers in the presence of diepoxide which has been chain extended with dicarboxylic acid, wherein said lactone monomers, reacted to form said modified diepoxide, and said dicarboxylic acid are employed in a molar ratio of at least about 2:1, respectively; and

- (ii) hydroxy functional secondary amine in chain termination reaction in about 1:1 equivalent ratio.

4,714,746

PROCESS FOR THE PREPARATION OF AROMATIC POLYESTER-CARBONATES HAVING IMPROVED NOTCHED IMPACT STRENGTH, AND POLYESTER-CARBONATES PREPARED THEREBY AND THEIR USE FOR THE PRODUCTION OF MOULDINGS, FILMS AND COATINGS

Volker Serini; Dieter Freitag, both of Krefeld, and Dietrich Rathmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Oct. 14, 1986, Ser. No. 918,771

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1985, 3537664

Int. Cl.⁴ C08L 67/02

U.S. Cl. 525—439

10 Claims

1. Process for the preparation of aromatic polyester-carbonates based on diphenols, aromatic dicarboxylic acids, carbonic acid derivatives, characterized in that
 - I. 10 to 90% by weight, relative to the sum of I + II, of a polyester-carbonate having an ester group content of 5 to 35 mol %, relative to the sum of the ester and carbonate groups of the polyester-carbonate I, and
 - II. 90 to 10% by weight, relative to the sum of I + II, of a polyester-carbonate having an ester group content of 60 to 95 mol %, relative to the sum of ester and carbonate groups of the polyester-carbonate II, are homogenized in the melt.
9. Polyester-carbonates produced by the process according to claim 1 wherein after mixing in the melt, at least 50% by weight of component I has an ester group content of 5 to 35 mol-% and at least 50% by weight of component II has an ester group content of 60 to 95 mol-%.

4,714,747

MANUFACTURE OF BUTYL RUBBER

Mario Bruzzone; Silvano Gordini, both of San Donato Milanese, and Ken Wyllie, Milan, all of Italy, assignors to Enichem Elastomeri S.p.A., Italy

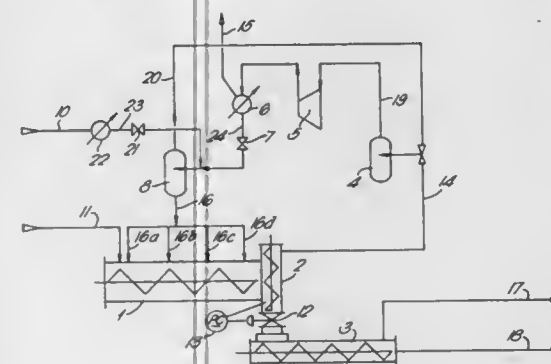
Filed Jun. 16, 1986, Ser. No. 874,851

Claims priority, application United Kingdom, Jun. 17, 1985, 8515254

Int. Cl.⁴ C08F 2/14, 236/04

U.S. Cl. 526—64

9 Claims



1. A continuous process for the manufacture of butyl rubber by the polymerisation of a monomer mixture comprising essentially at least 90% by weight of isobutene and 0.5 to 10% by weight (based on the weight of mixture) of at least one conjugated diene comonomer by continuously supplying a feed stream of the monomer mixture and halogenated hydrocarbon polymerisation medium together with catalyst to an extruder type reactor and polymerising therein, characterised by the steps of (a) cooling the feed stream of monomers and haloge-

nated hydrocarbon polymerisation medium to a polymerisation temperature of -70°C . to $+15^{\circ}\text{C}$. by vapourisation of a portion thereof under reduced pressure; (b) supplying the cooled feed stream to a reactor which is a self-cleaning screw extruder and polymerising therein under boiling plug-flow conditions at a constant pressure of 0.1 to 4 Bar using a "high" temperature aluminium halide catalyst and (c) removing, at the reactor outlet, polymer product at a concentration of at least 50% for recovery and a vapourised mixture of unreacted monomers and polymerisation medium, for recycle, whereby no separate refrigerant is required.

4,714,748

NOVEL POLYTETRAFLUOROETHYLENE FINE POWDER

Jyuzaemon Hoashi, Ibaraki; Syozo Fumoto, Suita, and Kiyoshi Oshita, Sakai, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 721,508, Apr. 11, 1985, abandoned, which is a continuation of Ser. No. 561,048, Dec. 13, 1983, abandoned. This application Apr. 29, 1986, Ser. No. 858,836

Claims priority, application Japan, Dec. 14, 1982, 57-219569

Int. Cl.⁴ C08F 14/26

U.S. Cl. 526—255

8 Claims

1. A polytetrafluoroethylene fine powder having an average molecular weight of at least 6,000,000, an amorphous index larger than 0.1 and a number average primary particle size of 0.1 to 0.8 micron and further having a first clear endothermic peak at a temperature of $347 \pm 3^{\circ}\text{C}$. and a second endothermic peak or shoulder at a temperature between 330°C . and the temperature of said first endothermic peak on a crystalline melting chart recorded by a differential scanning calorimeter.

4,714,749

FULLY SATURATED PETROLEUM RESIN AND HOT MELT PRESSURE SENSITIVE ADHESIVE

FORMULATIONS UTILIZING SAME AS TACKIFIER
Vincent L. Hughes, and Ralph W. Looney, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 511,518, Jul. 7, 1983, abandoned. This application Oct. 10, 1986, Ser. No. 918,616

Int. Cl.⁴ C08F 10/14

U.S. Cl. 526—290

7 Claims

1. A fully saturated aliphatic petroleum resin possessing in its backbone structure a preponderance of substituted cyclohexane rings and having a number average molecular weight (M_n) of 400 to 800, a softening point of 40°C . to 70°C ., a glass transition temperature (T_g) of less than 45°C . and, when admixed at the total weight level of 60% with a polystyrene-hydrogenated polydiene-polystyrene saturated midblock thermoplastic elastomer of M_n from about 30,000 to about 200,000 as measured by GPC, provides a HMPSA having a rolling ball tack of less than 10 cm and a Polyken probe tack greater than 400 gm/cm², said resin being produced by the Friedel-Crafts polymerization of a $\text{C}_5\text{-C}_6$ fraction from steam cracked naphtha or light refinery streams having a boiling range from 20°C . to 80°C ., said resin having a major proportion of the polymerizable content comprising piperylene and 2-methyl-2-butene or similar branched olefins.

4,714,750

**SYNTHESIS OF PRODUCTS FROM
POLYOXYALKYLENE AMINES AND
2,6-DI-T-BUTYLPHENOL FOR USE AS EPOXY
ACCELERATORS AND CURING AGENTS**

Robert A. Grigsby, Jr., Georgetown, and George P. Speranza, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 25, 1986, Ser. No. 878,456

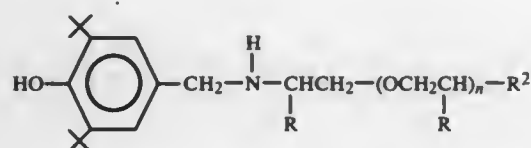
The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.⁴ C08G 59/00, 59/40, 8/28, 91/16

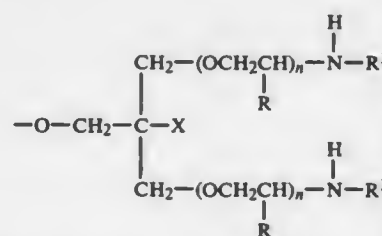
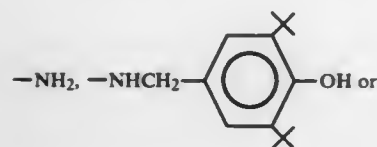
U.S. Cl. 528—99

33 Claims

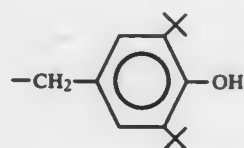
1. A compound having the formula:



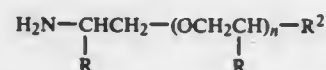
wherein (1) R represents hydrogen, —CH_3 or $\text{—CH}_2\text{CH}_3$; (2) n represents an integer having a value of 1 to 70, and (3) R² represents an alkoxy group having 1 to 20 carbon atoms,



wherein R and n are defined as above, X represents hydrogen or an alkyl group containing from 1 to 3 carbon atoms, and R³ represents hydrogen or

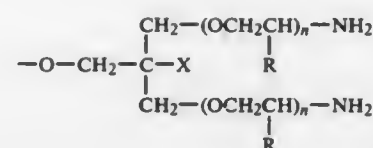


27. A process for preparing Mannich condensates comprising reacting 2,6-di-t-butylphenol with formaldehyde and a polyoxyalkylene amine having the formula:



wherein

- (a) R represents hydrogen, —CH_3 or $\text{—CH}_2\text{CH}_3$
(b) n represents an integer having a value of 1 to 70, and
(c) R² represents an alkoxy group having 1 to 20 carbon atoms, —NH_2 or



wherein R and n are defined as above, and X represents hydrogen or an alkyl group containing from 1 to 3 carbon atoms.

4,714,751

**CROSSLINKABLE RESIN, PHOTSENSITIVE
RECORDING MATERIAL BASED ON THIS
CROSSLINKABLE RESIN, AND PRODUCTION OF A
LITHOGRAPHIC PRINTING PLATE USING THIS
PHOTSENSITIVE RECORDING MATERIAL**

Gunnar Schornick, Neuleiningen; Albert Elzer, Otterstadt, and Reiner Hofmann, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,191

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447355

Int. Cl.⁴ C08G 59/14, 63/12; G03C 1/27

U.S. Cl. 528—103

8 Claims

1. A crosslinkable oligomeric resin which is soluble or dispersible in an aqueous alkaline solution, contains acryloyl and/or methacryloyl groups and free carboxyl groups and has a mean molecular weight (number average) of from about 1,000 to 10,000 and an acid number of from 50 to 150, obtained by reacting a diol or polyol compound containing one or more (meth)acryloyl groups with a polyfunctional carboxylic acid or a cyclic anhydride of a polyfunctional carboxylic acid, with formation of an acidic partial ester of the carboxylic acid, and then subjecting some of the free carboxyl groups of the resulting reaction product to a chain-extending reaction with a diepoxide and/or a polyepoxide.

4,714,752

**2,2-BIS (4 HYDROXYPHENYL) ALKYL POLY
DERIVATIVES FOR USE IN AFTER-TREATMENT OF
CONVERSION COATED METALS**

Stanley M. Sokalski, Southfield, Mich., assignor to Detrex Corporation, Southfield, Mich.

Filed Jul. 28, 1986, Ser. No. 890,916

Int. Cl.⁴ C23C 22/82

U.S. Cl. 528—153

12 Claims

1. An aqueous composition including polymeric water soluble or water dispersible material useful in the treatment of metals to enhance the corrosion resistance and paint adhesion characteristics thereof comprising up to about 10% by weight of a polymer which has been polymerized under basic conditions having the general formula:

4,714,754

POLYETHERIMIDE ESTERS

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 10, 1986, Ser. No. 929,041

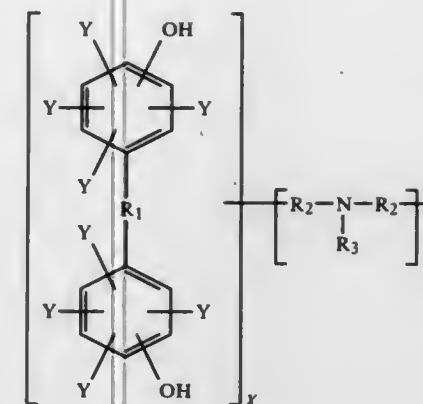
Int. Cl.⁴ C08G 63/44, 69/00, 69/44

U.S. Cl. 528—288

46 Claims

1. A polyetherimide ester composition comprising the reaction products of:

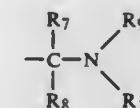
- (i) a mixture of at least one low molecular weight diol and at least one high molecular weight diol; and
(ii) a set of reactants selected from
(a) (i) at least one high molecular weight poly(oxyalkylene)diamine, and (ii) at least one tricarboxylic acid or a derivative thereof, or
(b) at least one high molecular weight polyoxyalkylene diimide diacid.



wherein

W and X are each 2 or more up to a number at which the polymer is not soluble or dispersible in water; and in which R₁ is an alkyl group having from 1 to about 5 carbon atoms; R₂ is an alkyl group having from 1 to about 5 carbon atoms; R₃ is an alkyl or hydroxyalkyl group having from 1 to about 5 carbon atoms;

each Y is hydrogen, Z, CR₄R₅OR₆, CH₂Cl, an alkyl group having from 1 to 18 carbon atoms, or an aryl group; and wherein Z is represented by the formula



R₄ through R₁₀ are hydrogen, or an alkyl, aryl, hydroxyalkyl, amino-alkyl, mercapto-alkyl, or phospho-alkyl moiety, said R₄ through R₁₀ being of carbon chain lengths up to a length at which the polymer is not soluble or dispersible in water; and

X is from 2 up to a number at which the polymer is not soluble or dispersible in water.

4,714,753

**THERMOPLASTIC POLYETHERIMIDE ESTER
ELASTOMERS EXHIBITING IMPROVED HYDROLYTIC
STABILITY**

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 1, 1986, Ser. No. 936,529

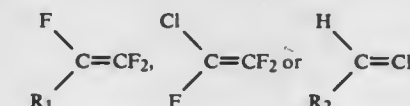
Int. Cl.⁴ C08G 63/18

U.S. Cl. 528—288

35 Claims

1. A polyetherimide ester composition exhibiting improved hydrolytic stability comprising the reaction products of:

- (i) at least one diol;
(ii) at least one dicarboxylic acid or an ester forming reactive derivative thereof; and
(iii) a set of reactants selected from
(a) (i) an amount at least effective to improve the hydrolytic stability of said composition of at least one high molecular weight bisaminoalkyl polytetrahydrofuran, and (ii) at least one tricarboxylic acid or derivative thereof, or
(b) an amount at least effective to improve the hydrolytic stability of said composition of at least one polyoxytetramethylene dialkylenediimide diacid.



wherein R₁ is —R_f or $\text{—R}_f\text{—X}$ in which —R_f is perfluoroalkyl radical of 1-12 carbon atoms, $\text{—R}_f\text{—}$ is a perfluoroalkylene diradical of 1-12 carbon atoms in which the attaching valences are at each end of the chain, and X is H or Cl; and R₂ is —R_f or $\text{—R}_f\text{—X}$, that was obtained by polymerizing tetrafluoroethylene and perfluoro(alkyl vinyl ether) and any other above-mentioned monomers that may be present in a halocarbon solvent until the copolymer is present in an amount of 5 to 15% by weight, which comprises

A. contacting the slurry with water until the slurry water

4,714,765

RHODANINE DERIVATIVES AND PROCESS FOR PREPARING THE SAME
Kazuo Ogawa, and Takaji Honna, both of Tokushima, Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

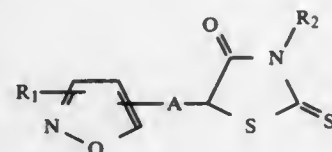
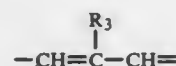
Filed Dec. 19, 1985, Ser. No. 810,594

Claims priority, application Japan, Jul. 10, 1985, 60-152632
Int. Cl.⁴ C07D 417/06

U.S. Cl. 548—183

9 Claims

1. A rhodanine derivative represented by the formula

wherein R₁ is lower alkyl, A is a group of the formula(in which R₃ is hydrogen or lower alkyl) or methylene, and R₂ is hydrogen or a group of the formula $-(CH_2)_nCOOH$ (in which n is an integer of 1 to 6) or a salt thereof

4,714,766

PROCESS FOR THE PREPARATION OF 2-CHLOROBENZOXAZOLES

Johannes Becherer, Maintal; Reinhardt Handte, Gablingen; Hans J. Nestler, Königstein/Ts, and Ulrich Kussmaul, Karben, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 647,439, Sep. 5, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,148

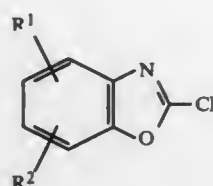
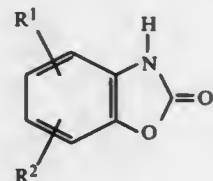
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334417

Int. Cl.⁴ C07D 263/54

U.S. Cl. 548—217

9 Claims

1. The process for the preparation of 2-chlorobenzoxazoles of the formula

wherein R¹ and R², independently of one another, are hydrogen or halogen, which comprises introducing a benzoxazolinone of the formula

in portions or continuously to a 120° to 200° C. hot solution of 2 to 10 moles per mole of the benzoxazolinone of phosphorus pentachloride in an inert solvent.

4,714,767

PROCESS FOR THE SEPARATION OF A BASIC AMINO ACID FROM A FERMENTATION BROTH USING CATION EXCHANGE RESINS

Kiyoshi Tanaka, Tokyo; Masaru Saeki, Saga; Tsutomu Matsui, Yanagawa; Yoshihiro Koga, Saga, and Tetsuya Kawakita, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,881

Claims priority, application Japan, Jul. 11, 1984, 59-143802
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.Int. Cl.⁴ C07D 233/64; C07C 101/24

U.S. Cl. 548—344

10 Claims

1. A process for separating basic amino acids from a liquid containing the same using a plurality of cation exchange resin towers in series, which comprises effecting repetitive adsorption and elution steps in sequence, wherein the washing water employed in said adsorption and elution steps is obtained by recycling the latter portion of a liquid discharged from a first tower of the adsorption step into an adsorption step in a subsequent cycle, or by recycling a liquid discharge from a first tower at the elution step into an elution step in a subsequent cycle.

4,714,768

N-(CHLOROCARBONYLOXY)-5-NORBORNENE-2,3-DICARBOXIMIDE, PROCESS FOR ITS PRODUCTION AND ITS USE

Peter Henklein; Manfred Becker; Werner Büttner, all of Berlin; Fritz Loth; Horts Dautzenberg, both of Teltow; Klaus Forner; Rudolf Dölling, both of Berlin; Karl-Heinz Graul, Quedlinburg; Wolf-Rainer Halatsch, Glienicke, and Christian Rupprich, Berlin, all of German Democratic Rep., assignors to Akademie Der Wissenschaften Der DDR, Berlin, German Democratic Rep.

Filed Aug. 27, 1984, Ser. No. 644,777

Claims priority, application German Democratic Rep., Aug. 25, 1983, 2541961; Aug. 25, 1983, 2541978; Aug. 25, 1983, 2541986; Oct. 28, 1983, 2560562; Oct. 28, 1983, 2560570

Int. Cl.⁴ C07D 209/02

U.S. Cl. 548—435

1 Claim

1. N-(chlorocarbonyloxy)-5-norbornene-2,3-dicarboximide

4,714,769

PROCESS FOR THE SYNTHESIS OF ORGANOFUNCTIONAL SILANES USING ISATOIC ANHYDRIDE OR DERIVATIVES THEREOF

Mario De Antoniis, Monterotondo; Mario Fiorini, and Giuseppina Mazzamurro, both of Rome, all of Italy, assignors to Eniricerche S.p.A., Milan, Italy

Filed Jun. 24, 1986, Ser. No. 877,900

Claims priority, application Italy, Jul. 1, 1985, 21374 A/85
Int. Cl.⁴ C07F 7/10; B32B 27/36, 9/00, 17/06

U.S. Cl. 556—419

10 Claims

1. Benzamide-2-amino-N-3-triethoxysilylpropyl.

4,714,770

DYE SILANE COMPOSITIONS

Li-Chien Hsu, Mission Viejo, and Hal Heltzmann, Irvine, both of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

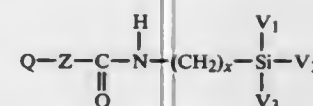
Filed Jan. 5, 1987, Ser. No. 537

Int. Cl.⁴ C07F 7/08, 7/10, 7/12

U.S. Cl. 556—419

9 Claims

1. A dye containing silicon composition having the formula



wherein Q is a polynuclear aromatic hydrocarbon based fluorescent dye; "selected from the group of polynuclear aromatic dyes consisting of pyrene, perylene, benzopyrene and derivatives thereof" X is an integer of from 1 to 50. Z is a hydrocarbon of up to 50 carbon atoms; and V₁, V₂, and V₃ are independently any hydrocarbon of up to 50 carbon atoms or hydrogen, halogen, alkenyl, acyloxy, alkoxy, amine or amide, with the proviso that at least one of the V₁, V₂, or V₃ substituents be a "hydrogen, halogen, alkenyl, acyloxy, alkoxy, amine or amide." derivatives thereof.

4,714,771

PROCESS FOR PREPARING HALOGENATED TRIALKYL PHOSPHATE ESTERS

Ming-Biann Liu, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 27, 1985, Ser. No. 802,145

Int. Cl.⁴ C07F 9/09

U.S. Cl. 558—102

58 Claims

37. A method of producing a halogenated trialkyl phosphate ester which comprises:

admixing a haloneopentyl alcohol containing a halogen selected from the group consisting of Br, Cl, I and mixtures thereof, a solvent suitable to dissolve the haloneopentyl alcohol and the phosphorus oxyhalide, said solvent being substantially inert to hydrogen halide, and a catalyst selected from the group consisting of Mg, MgCl₂, MgSO₄, MgCl(OH), (C₂H₅)₃NHCl, AlCl₃, (C₂H₅)₄NCl, TiCl₄, SnCl₄ and ZrCl₄;

refluxing said admixtures sufficiently to form a halogenated trialkyl phosphate ester precipitate; and recovering said precipitate.

4,714,772

FUNCTIONALIZED MONOMERS FROM 1-(1-ISOCYANATO-1-METHYLETHYL)-3 OR 4-(1-METHYLETHENYL) BENZENE

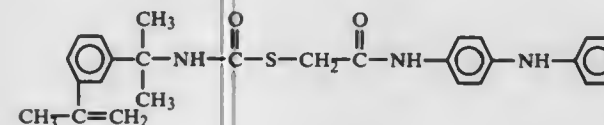
Howard A. Colvin; Kirkwood S. Cottman, both of Akron, and Dane K. Parker, Massillon, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 737,742, May 28, 1985. This application Dec. 16, 1985, Ser. No. 809,688

Int. Cl.⁴ C07C 155/02

U.S. Cl. 558—240

2 Claims

1. A free radical emulsion polymerizable composition of matter having the structural formula:



4,714,773

HYDROCYANATION OF BUTADIENE

Morris Rapoport, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 9, 1987, Ser. No. 5,431

Int. Cl.⁴ C07C 120/02

U.S. Cl. 558—338

8 Claims

1. A continuous process for the production of 3,4-pentenitriles which comprises reacting butadiene and hydrogen cyanide in the presence of a zerovalent nickel catalyst of formula Ni[P(OR)₃]₄ and excess ligand having the formula P(OR)₃

4,714,774

BENZOIC ACID DERIVATIVES AND THEIR PRODUCTION

Akira Nohara, and Yoshitaka Maki, both of Kyoto, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 25, 1985, Ser. No. 791,543

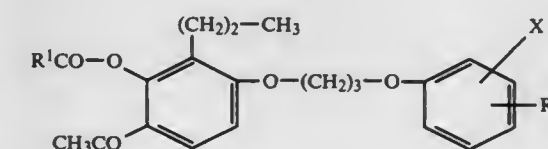
Claims priority, application PCT Int'l Appl., Oct. 30, 1984, PCT/JP84/00520; Japan, Sep. 25, 1985, 60-213578

Int. Cl.⁴ C07C 69/76

U.S. Cl. 560—053

11 Claims

1. A compound of the formula:

wherein R¹ stands for a lower alkyl group, R² stands for an optionally protected carboxyl group and X stands for a halogen or a salt thereof.

4,714,775

PHENYLCYCLOHEXYL DICARBOXYLATES

Anne-Marie Giroud, La Tronche, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 1, 1986, Ser. No. 913,938

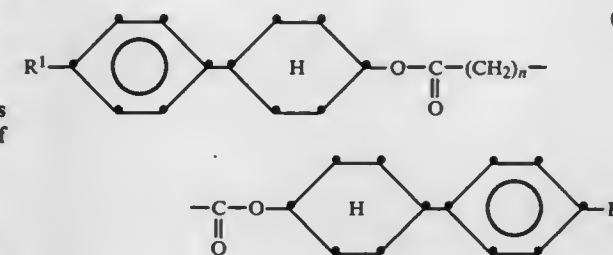
Claims priority, application France, Oct. 2, 1985, 85 14621

Int. Cl.⁴ C07C 69/353

U.S. Cl. 560—194

5 Claims

1. A compound of the formula:

in which R¹ and R², which can be the same or different, represent a hydrogen atom or an alkyl radical having 1 to 12 carbon atoms and n is an integer between 2 and 16.

4,714,776

ANTIALLERGIC AGENTS

Randy L. Bell, North St. Paul, and George G. I. Moore, Woodbury, both of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

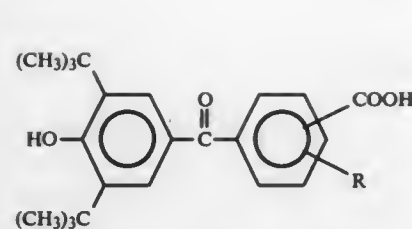
Filed Jul. 22, 1985, Ser. No. 757,686

Int. Cl.⁴ C07C 65/32, 69/76

U.S. Cl. 562—460

7 Claims

1. A compound of the formula



wherein R is hydrogen, lower alkyl, lower alkoxy or chloro; or a derivative thereof selected from a lower alkyl ester, a (lower)-alkylamino(lower)alkyl ester, a pharmaceutically acceptable (lower)alkylamino(lower)alkyl ester acid-addition salt and a pharmaceutically acceptable carboxylate salt.

4,714,777

CYCLOPROPANONE HYDRATE DERIVATIVES

Paul Dowd, Pittsburgh; Christopher Kaufman, Dravosburg, both of Pa., and Robert H. Abeles, Newton Centre, Mass., assignors to University of Pittsburgh, Pittsburgh, Pa.

Continuation of Ser. No. 622,841, Jan. 21, 1984, abandoned.

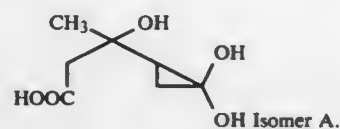
This application Jan. 6, 1986, Ser. No. 817,762

Int. Cl.⁴ C07C 61/04

U.S. Cl. 562—506

1 Claim

1. A cyclopropanone hydrate derivative of the structural formula:



4,714,778

ALKENYLATED TOLUENEDIAMINES FOR USE IN PREPARING POLYURETHANE/UREA SYSTEMS

William F. Burgoyne, Jr., Allentown, and Dale D. Dixon, Kutztown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

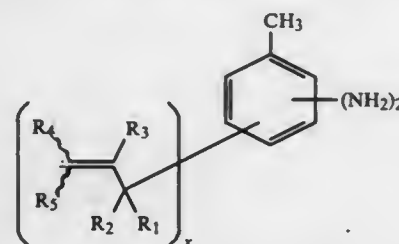
Filed Mar. 7, 1986, Ser. No. 837,461

Int. Cl.⁴ C07C 87/58

U.S. Cl. 564—305

31 Claims

1. A toluenediamine composition having one alkenyl substituent ortho to an amine group and the amine groups are in the 2,3-, 2,4-, 2,6- or 3,4-position represented by the formula:



wherein R₁, R₂, R₃, R₄ and R₅ are hydrogen, C₁₋₃ aliphatic, phenyl, halogen or alkoxy radicals, or R₂ and R₄ or R₅ are bridged via an alkylene radical—(CH₂)_y—wherein y=2 to 5, and x is one provided that in said formula at least one of R₁, R₂, R₃, R₄ or R₅ is C₁ or greater and provided that not more than one is a phenyl, halogen or alkoxy radical.

4,714,779

AROMATIC ARYL AMINE POLYMERS

S. Richard Turner, Bridgewater, N.J., and John F. Yanus, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

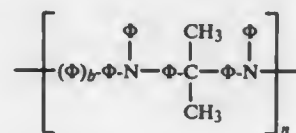
Filed Nov. 20, 1980, Ser. No. 208,605

Int. Cl.⁴ C07C 87/50

U.S. Cl. 564—330

3 Claims

1. A polymer of the formula



wherein

Phi=phenyl or phenylene

b=0, 1, 2, or 3

n=3 or greater.

4,714,780

METHOD FOR MAKING TETRAHYDROXYDIPHENYLSULFIDE AND PRODUCT OBTAINED THEREFROM

Thomas L. Guggenheim, Glenville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

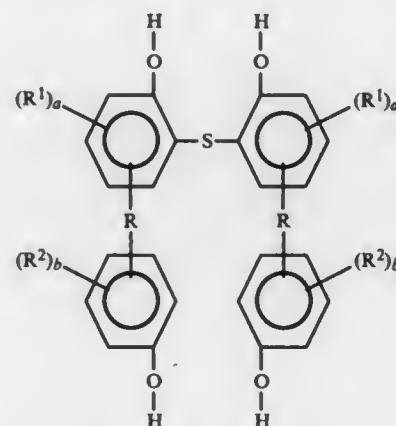
Filed Feb. 3, 1986, Ser. No. 824,915

Int. Cl.⁴ C07C 149/30

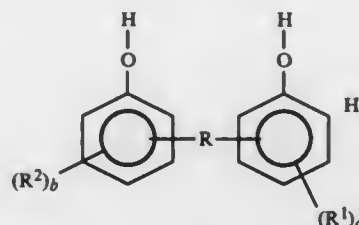
U.S. Cl. 564—430

4 Claims

1. A method for making a tetrahydroxydiphenylsulfide of the formula,



(1) effecting reaction under substantially anhydrous conditions between at least five moles of bisphenol of the formula,



per mole of sulfur dichloride, in the presence of an effective amount of a Lewis acid catalyst and an inert organic solvent, and

(2) recovering the tetrahydroxydiphenylsulfide from the mixture of (1).

where R is a C₍₁₋₂₀₎ divalent organo radical selected from the

group consisting of C₍₁₋₈₎ alkylene radicals, C₍₆₋₁₃₎ arylene radicals, or chloro, nitro, alkoxy or alkyl substituted C₍₆₋₁₃₎ arylene radicals, —O—, —S—,



—OR⁴O—, and —SR⁴S— radicals, R¹ and R² are members selected from the group consisting of C₍₁₋₈₎ alkyl radicals, C₍₁₋₈₎ alkoxy radicals, C₍₆₋₁₃₎ aryloxy radicals, and R³S— radicals, R³ is methyl or phenyl, R⁴ is a C₍₆₋₁₄₎ arylene radical, a is a whole number equal to 0 to 3 inclusive and b is a whole number equal to 0 to 4 inclusive.

4. 2,2-bis[2-bis(4-hydroxyphenyl)propane]sulfide.

4,714,781

PROCESS FOR PRODUCING 4-RING-SUBSTITUTED PHENYL LOWER ALKYL KETONES

Balaram B. G. Gupta, North Plainfield, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Mar. 27, 1986, Ser. No. 844,641

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.⁴ C07C 45/46

U.S. Cl. 568—319

20 Claims

1. A process for the production of 4-lower alkyl- or 4-phenyl ring-substituted phenyl lower alkyl ketone by reaction of a lower alkyl- or phenyl-substituted benzene with a lower alkanic acid comprising contacting a feed stream comprising said substituted benzene and acid at an elevated temperature with a medium-pore, pentasil-type molecular sieve as catalyst.

4,714,782

PROCESS FOR PREPARING OPTICALLY ACTIVE 4-HYDROXY-2-CYCLOPENTENONES

Masayoshi Minai, Moriyama, and Yuji Ueda, Izumi, both of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Feb. 12, 1985, Ser. No. 700,890

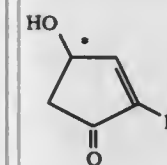
Claims priority, application Japan, Feb. 14, 1984, 59-026647; Mar. 23, 1984, 59-056987

Int. Cl.⁴ C07C 45/78

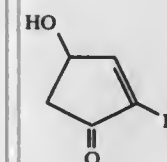
U.S. Cl. 568—347

13 Claims

1. A process for preparing an optically active 2-substituted or unsubstituted-4-hydroxy-2-cyclopentenone of the formula:

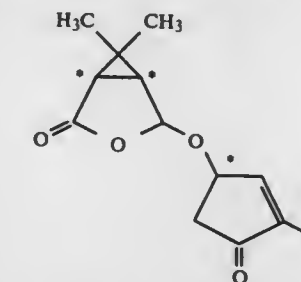


wherein R is a hydrogen atom, an allyl group or a propargyl group, which comprises reacting the corresponding 2-substituted or unsubstituted-4-hydroxy-2-cyclopentenone of the formula:



wherein R is defined above with a lactone chosen from (1R,5S)-6,6-dimethyl-4-hydroxy-3-oxabicyclo[3.1.0]hexan-2-one or (1S,5R)-6,6-dimethyl-4-hydroxy-3-oxabicyclo[3.1.0]hexan-2-one in a molar ratio of 1.5 : 2.1 in the presence of p-toluenesulfonic acid or benzenesulfonic acid in the coexis-

tence of an organic solvent under elimination of water as an azeotropic mixture with the organic solvent to obtain a reaction mixture comprising (1R,5S)-6,6-dimethyl-3-oxa-4(R)-[1(R)-4-oxo-2-substituted or unsubstituted-2-cyclopentenyl]oxybicyclo[3.1.0]hexan-2-one or (1S,5R)-6,6-dimethyl-3-oxa-4(S)-[1(S)-4-oxo-2-substituted or unsubstituted-2-cyclopentenyl]oxybicyclo[3.1.0]hexan-2-one of the formula:



wherein R is as defined above, wherein one of the isomers is contained in a considerably larger amount than the other isomer, separating the isomer having the larger content from the reaction mixture and hydrolyzing the separated isomer to give the optically active 2-substituted or unsubstituted-4-hydroxy-2-cyclopentenone.

4,714,783

SEPARATION OF NITROBENZALDEHYDE ISOMERS

Hermann A. Zinnen, Evanston, and Thad S. Franczyk, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 12, 1986, Ser. No. 861,792

Int. Cl.⁴ C07C 76/06

U.S. Cl. 568—424

20 Claims

1. A process for separating the isomers of nitrobenzaldehyde from a feed mixture comprising at least two isomers of nitrobenzaldehyde, which comprises contacting said mixture at adsorption conditions with an adsorbent comprising an X-type zeolite having sodium or lithium cations at exchangeable cationic sites, a Y-type zeolite having sodium, lithium, potassium, magnesium or calcium cations at the cation exchangeable sites, or a crystalline aluminum phosphate zeolite, selectively adsorbing one of said isomers to the substantial exclusion of the other isomers, and recovering a high purity nitrobenzaldehyde as a raffinate stream.

4,714,784

METHOD FOR REMOVING N-BUTYRALDEHYDE FROM GAS STREAMS

Eckhard Moeller, Wolfgang H. E. Mueller, and Manfred Z. Hausen, all of Marl, Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,035

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1985, 3528124

Int. Cl.⁴ C07C 45/78

U.S. Cl. 568—492

8 Claims

1. A method for removing n-butyraldehyde from gas streams, comprising washing a gas stream at 0°–40° C. with a 0.5–10% by weight aqueous alkali solution in the absence of solubilizing agents.

4,714,785

METHOD FOR CONVERTING ORGANIC CHLOROFORMATE TO THE CORRESPONDING ORGANIC CHLORIDE

James A. Manner, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 15, 1986, Ser. No. 907,246

Int. Cl.⁴ C07C 41/01, 19/02, 17/00

U.S. Cl. 568—614

12 Claims

1. A method for preparing the corresponding halide of an organic haloformate of the general formula,



wherein X is chlorine or bromine, R₁ is selected from the group consisting of C₁-C₃₀ alkyl, C₅-C₆ cycloalkyl, C₁-C₄ alkyl substituted C₆-C₆ cycloalkyl, phenyl, alkyl substituted phenyl of the general formula, (R₂)₆Ph—, wherein Ph is phenylene, R₂ is C₁-C₁₈ alkyl and b is an integer of from 1 to 3, phen(C₁-C₁₈) alkyl and C₁-C₁₈ alkyl-substituted phen(C₁-C₁₈) alkyl having a total of from 7 to about 28 carbon atoms, R' is the substituted ethylene group, —CH₂—CH(R'')—, wherein R'' is selected from hydrogen, methyl, ethyl and mixtures thereof, and n is a number from 0 to 40, provided that when R₁ is phenyl or alkyl substituted phenyl, n is at least 1, which comprises heating said haloformate for a time and at temperatures sufficient to convert the haloformate to the corresponding halide in the presence of a catalytic amount of an activated carbon catalyst.

4,714,786

VINYLPHENOL DERIVATIVES, THEIR PREPARATION AND THEIR USE

Hans-Heiner Wnesi, Dossenheim; Bernd Janssen, Ludwigshafen; Fritz-Frieder Frickel, Deidesheim, and Axel Nuernbach, Grunstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,586

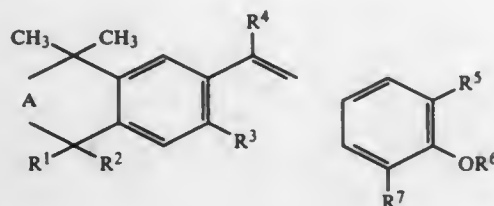
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602473

Int. Cl.⁴ C07C 43/215

U.S. Cl. 568—633

6 Claims

1. A vinylphenol derivative of the formula I



where

A is a methylene or ethylene radical which is unsubstituted or substituted by C₁-C₄-alkyl, R¹ and R² are each hydrogen or methyl, R³ is hydrogen, C₁-C₄-alkyl, C₁-C₄-alkoxy or halogen, R⁴ is hydrogen, C₁-C₄-alkyl, cyclopropyl or cyclobutyl, R⁵ and R⁷ are each hydrogen or —OR⁸, where R⁸ is hydrogen, C₁-C₄-alkyl or C₁-C₄-alkanoyl, and R⁶ is hydrogen or is C₁-C₄-alkyl which is unsubstituted or substituted by carboxyl, C₁-C₄-alkoxycarbonyl, hydroxyl, C₁-C₄-alkoxy and/or amino or mono- or di-C₁-C₄-alkylamino, or is C₁-C₂₀-alkanoyl or is benzoyl which is unsubstituted or substituted as described for the C₁-C₄-alkyl group, or is aralkyl which is unsubstituted or similarly substituted in the aryl moiety, and R⁶ and R⁸ together may furthermore form a radical C=O, C=S, —CH₂CH₂— or CR⁹R¹⁰, where R⁹ and R¹⁰ are each

hydrogen, C₁-C₄-alkyl or phenyl, and its physiologically tolerated salts.

4,714,787

PRODUCTION OF ETHERS FROM LINEAR OLEFINS

Weldon K. Bell, Pennington, and Werner O. Haag, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 772,090

Int. Cl.⁴ C07C 41/06

U.S. Cl. 568—697

4 Claims

1. A process for the manufacture of methyl isopropyl ether from methanol and a C₃ hydrocarbon fraction that contains about 20 to 100 wt % of propylene, which process comprises: preparing a mixture of said hydrocarbon fraction and 0.1 to 10 mols of methanol per mol of propylene contained in said fraction, contacting said mixture with a solid insoluble acidic catalyst comprising materials having the structure of Zeolite Beta, said contacting being effected under a combination of conditions effective to selectively form said ether, said conditions including 1.0 to 300 atmospheres pressure, a temperature of 50° C. to about 300° C., and a WHSV of 0.5 to 50, and recovering from said contacted mixture a fraction comprising methyl isopropyl ether.

4,714,788

TERTIARY OLEFIN PROCESS

Robert C. Michaelson, Kinnelon, N.J., and Jeffrey S. Plotkin, Monsey, N.Y., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jul. 14, 1986, Ser. No. 885,528

Int. Cl.⁴ C07C 41/06, 41/44

U.S. Cl. 568—697

12 Claims

1. In a process for separating C₄ to C₇ tertiary mono-olefin(s) present in a C₄ to C₇ hydrocarbon mixture containing diolefins which comprises selectively reacting said tertiary mono-olefin mixture with a primary alcohol in the presence of an acid catalyst to convert the tertiary mono-olefin(s) to tertiary ether(s), separating the tertiary ether(s) from the unreacted hydrocarbon mixture to produce a tertiary ether(s) containing stream and contacting said tertiary ether(s) containing stream with a catalyst to decompose the tertiary ether(s) to tertiary olefin(s) and a primary alcohol, the improvement which comprises hydrogenating the tertiary ether(s) containing stream after that stream has been separated from the unreacted hydrocarbon mixture and prior to the decomposition step to saturate the unsaturated ether(s) formed from the diolefins present in the hydrocarbon mixture.

4,714,789

HALO-BIPHENYL TERTIARY ALCOHOLS USEFUL IN THERAPY IN THE TREATMENT OF ATHEROSCLEROSIS

Henri Cousse; André Delhon; Jean-Pierre Rieu, and Jean-François Patoiseau, all of Castres, France, assignors to P. F. Medicament, Paris, France

Filed Jul. 14, 1986, Ser. No. 884,959

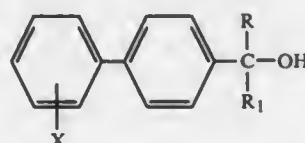
Claims priority, application France, Jul. 26, 1985, 85 11582

Int. Cl.⁴ C07C 33/34

U.S. Cl. 568—807

4 Claims

1. Halo-biphenyl tertiary alcohols of general formula (I):



(I)

in which:

X represents a chlorine or bromine atom in ortho or meta position,

R and R₁ are identical or different and represent an alkyl group of low molecular weight having 1 to 4 carbon atoms, inclusive.

4,714,790

FLUORO ALCOHOLS AND INSECTICIDAL ESTERS THEREOF

Michael J. Bushell, Wokingham, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Aug. 18, 1986, Ser. No. 897,345

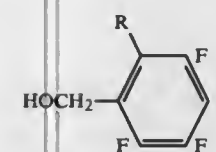
Claims priority, application United Kingdom, Sep. 13, 1985, 8522656

Int. Cl.⁴ C07B 49/00

U.S. Cl. 568—807

1 Claim

1. A process for preparing a compound of formula:



wherein R is alkyl or alkenyl of up to 6 carbon atoms or aryl of up to 10 carbon atoms which comprises reacting pentafluorobenzyl alcohol with a Grignard reagent of formula R—Mg—X where X is halogen, wherein the Grignard reagent is added slowly to an excess of the pentafluorobenzyl alcohol and the temperature of the reaction is maintained at or below 40° C. during the addition.

4,714,791

PROCESS FOR RECOVERING PRIMARY NORMAL ALIPHATIC HIGHER ALCOHOLS

Shoshehiro Inada, Amagasaki; Kurune Furukawa, Kyoto; Takachika Masui, Hirakata; Keijiro Honda, Kagoshima; Joji Ogasawara, Kobe, and Giichi Tsubakimoto, Kakogawa, all of Japan, assignors to Seitetsu Kagaku Co., Ltd.; Shinko Selto Co., Ltd. and Shinko Sugar Production Co., Ltd., all of Japan

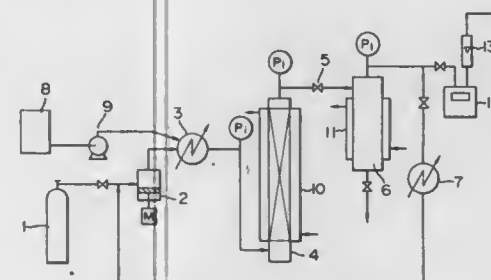
Filed May 19, 1986, Ser. No. 864,246

Claims priority, application Japan, May 31, 1985, 60-119514

Int. Cl.⁴ C07C 29/76, 31/125, 31/02

U.S. Cl. 568—913

15 Claims



1. A process for recovering primary normal aliphatic higher alcohols having 20 to 36 carbon atoms, which comprises contacting sugarcanes, or products obtained from the sugarcanes, as an extraction raw material with a fluid in a subcritical or supercritical state being at least at about its critical temperature and about its critical pressure as an extractant, thereby extracting a trace amount of primary normal aliphatic higher alcohols having 20 to 36 carbon atoms contained in the extraction raw materials as an extract and separating the extracted alcohols from the extract.

4,714,792

PROCESS FOR THE PRODUCTION OF 1,2,3-TRICHLOROPROPANE

Dieter J. Müller, and Heinrich Wehmeyer, both of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,168

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 3432720

Int. Cl.⁴ C07C 17/06

U.S. Cl. 570—261

20 Claims

1. A process for the production of 1,2,3-trichloropropane as predominant product comprising reacting allyl chloride with sulfur chloride, in the presence of a catalytically effective amount of an aliphatic amine, an aromatic amine, a phosphine or a phosphine oxide.

4,714,793

PROCESS FOR SEPARATING AN ETHYLENICALLY UNSATURATED HYDROCARBON FROM A HYDROCARBON MIXTURE

Ahazuérus T. van Eijl, Terneuzen, Netherlands, assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 524,176, Aug. 17, 1983, Pat. No. 4,596,655. This application May 2, 1986, Ser. No. 859,103

Int. Cl.⁴ C07C 7/20

U.S. Cl. 585—4

2 Claims

1. A process for inhibiting polymerization of styrene characterized by contacting a styrene containing fluid with an N-aminoalkyl piperazine.

4,714,794

SYNTHETIC OILS

Toshio Yoshida, Kawasaki, and Harumichi Watanabe, Yokohama, both of Japan, assignors to Nippon Oil Co., Ltd., Nishishimbashi, Japan

Continuation of Ser. No. 799,405, Nov. 19, 1985, abandoned. This application May 15, 1987, Ser. No. 50,760

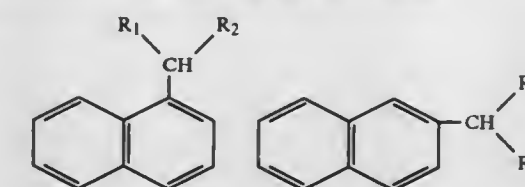
Claims priority, application Japan, Nov. 28, 1984, 59-249771; Nov. 28, 1984, 59-249773

Int. Cl.⁴ C07C 2/58, 15/24

U.S. Cl. 585—26

12 Claims

1. A method of lubrication which consists of applying to the structure to be lubricated a synthetic oil which comprises as the active ingredient a mixture of monoalkylnaphthalenes represented by the following general formulae,



Wherein R₁, R₂, R₃ and R₄ are each a straight-chain alkyl group and the total of the carbon atoms in R₁ and R₂ or in R₃ and R₄ is 5 to 23, and the molar ratio of α-substituted monoalkylnaphthalenes to β-substituted monoalkylnaphthalenes being at least 1.0.

4,714,795

Patent Not Issued For This Number

4,714,796

PRODUCTION OF HIGHER MOLECULAR WEIGHT HYDROCARBONS FROM METHANE

Selim M. Senkan, Chicago, Ill., assignor to Illinois Institute of Technology, Chicago, Ill.

Filed Apr. 21, 1987, Ser. No. 40,853

Int. Cl.⁴ C07C 1/00

U.S. Cl. 585—328

31 Claims

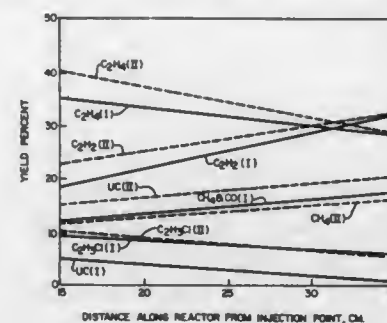
1. A process for producing higher molecular weight hydro-

carbons from a gas comprising halogenated methanes, said process comprising:

oxidatively pyrolyzing said halogenated methanes under non-flame conditions in the presence of an oxygen-containing gas.

14. A process for producing higher molecular weight hydrocarbons from a gas comprising methane, said process comprising: halogenating said methane by a process of reacting said methane with a reactant selected from the group consisting of halogen containing gas and hydrogen halide, said hydrogen

halide in the presence of oxygen, to form halogenated methanes and oxidatively pyrolyzing said halogenated methanes



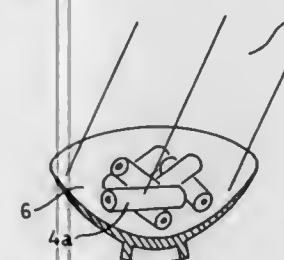
under non-flame conditions in the presence of an oxygen-containing gas.

ELECTRICAL

4,714,797

COMPOSITE ELECTROMOTIVE APPARATUS UTILIZING SOLAR ENERGY AND THE LIKE
Toki Nagai, 9-4, Tairamachi 1-chome, Meguro-ku, Tokyo, Japan
PCT No. PCT/JP83/00379, § 371 Date May 9, 1985, § 102(e)
Date May 9, 1985, PCT Pub. No. WO84/02584, PCT Pub. Date Jul. 5, 1984

PCT Filed Oct. 26, 1983, Ser. No. 648,556
Claims priority, application Japan, Dec. 28, 1982, 57-229846
Int. Cl.⁴ H01L 35/00
U.S. Cl. 136—206 10 Claims



1. A composite electromotive apparatus utilizing solar energy and the like, said apparatus comprising:
at least one concave lens for use as a heat-collecting condenser;
a thermoelectromotive unit system which utilizes the Seebeck effect and the Peltier effect comprising:
thermocouple(s) (7) of which the high-temperature side(s) (7a) is/are positioned at the focal point (3) of the lens (2), said thermocouple acting as a thermo-acceptor and a thermoelectric motivator;
a photovoltaic unit system having a unitary photo-acceptor;
a fan means for removing heat from said photo-acceptor, said fan means rotating by itself by utilizing convection, radiation, and other phenomena; and
a magnetic electromotive/electric generator unit system (17) driven by the rotation of the said fan means.

4,714,798

TITANIUM NITRIDE ELECTRODES FOR THERMOELECTRIC GENERATORS

Robert F. Novak, Farmington Hills; Duane J. Schmatz, Dearborn Heights, and Thomas K. Hunt, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1985, Ser. No. 813,170

Int. Cl.⁴ H01L 35/14

U.S. Cl. 136—239 17 Claims
1. An article suitable for use in thermoelectric generators, which article comprises a solid electrolyte and a film of titanium nitride adhering to the surface of said solid electrolyte, said film having a thickness less than about 10 microns.

4,714,799

OVERHEAD CONDUCTOR DAMPER WITH STAMPED AND SAND-CAST PARTS

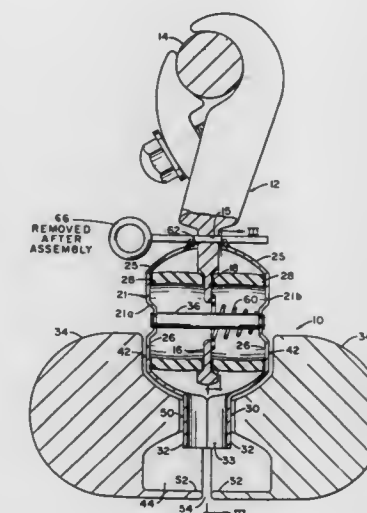
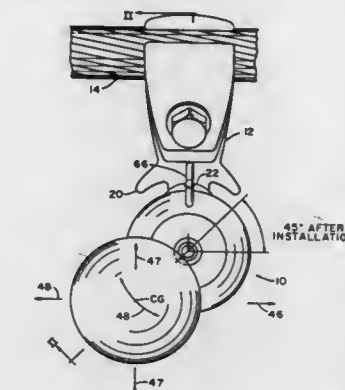
Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 6, 1985, Ser. No. 805,819

Int. Cl.⁴ H02G 7/14

U.S. Cl. 174—42 23 Claims
1. A device for damping vibrations of an overhead conductor comprising:
a weight member comprised of opposed weight halves each having a spherical outer surface, said weight halves being made of a relatively heavy metal material cast in a sand-casting mold,
a clamp arm,
opposed hollow elastomer damping members,
a housing structure made from stamped metal components located between the weight halves and resiliently securing

said damping members between the clamp arm and opposed sides of the housing structure, and



pin means securing the weight halves and housing structure together.

4,714,800

STRESS CONTROL/INSULATING COMPOSITE ARTICLE WITH AN OUTER SURFACE HAVING CONVOLUTIONS AND ELECTRIC POWER CABLE TERMINATED THEREWITH

Alan D. Atkins; Kenneth Elliott, both of Swindon, and John S. T. Looms, East Molesey, all of Great Britain, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 681,042, Dec. 12, 1984, abandoned.

This application Jun. 24, 1986, Ser. No. 881,504

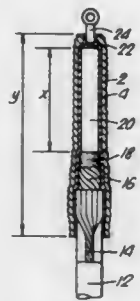
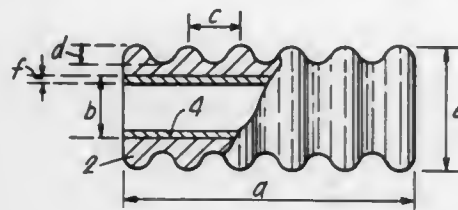
Claims priority, application United Kingdom, Dec. 13, 1983, 8333249

Int. Cl.⁴ H02G 15/068; H01B 17/32, 17/42, 17/64
U.S. Cl. 174—73 R 17 Claims

1. A generally tubular article comprising an outer component of electrically insulating material having an outer surface extending longitudinally thereof said outer surface having along at least a part of its length a convoluted portion in the form of periodic protrusions and troughs, said protrusions having a peak-to-peak separation and a peak-to-trough height of about 15% and about 6% respectively of the outer diameter of the article; and an inner component of electrically stress grading material.

15. An electric power cable terminated by a generally tubular article comprising an outer component of electrically insulating material having an outer surface extending longitudinally thereof, said outer surface having along at least part of its

length a convoluted portion in the form of periodic protrusions and troughs, said protrusions having a peak-to-peak separation



and a peak-to-trough height of about 15% and about 6% respectively of the outer diameter of the article, and an inner component of electrically stress grading material.

4,714,801

SEALANT COMPOSITION

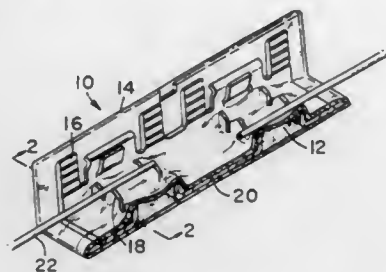
Francis F. Koblitz, York, and Lynn K. Snyder, Spring Grove, Pa., assignors to AMP Incorporated, Harrisburg, Pa. Continuation of Ser. No. 620,411, Jun. 14, 1984, abandoned.

This application Aug. 20, 1985, Ser. No. 767,566

Int. Cl.⁴ H01R 4/00; H02G 13/06, 15/08

U.S. Cl. 174—88 R

10 Claims



1. An electrical connector for electrically and sealingly connecting electrical wires therein, comprising:

an electrical terminal having terminating section means in which the electrical wires can be electrically terminated when pressure is applied to terminate the wires therein; an outer housing film along which the terminating section means extends;

sealant material in a gel condition disposed along said terminating section means, said sealant material having a viscosity in the range of 180 to 280 units of 0.1 mm each as measured by the ASTM D217 Standard Test Methods for Cone Penetration of Lubricating Grease, said sealant material comprising a homogeneous mixture of a polymeric adipate polyester having an average molecular weight in the range of 2200 to 6000 as calculated from solution viscosity measurements, and a fumed silica, the polyester forming about 80 to 85 percent by weight of the mixture while the fumed silica forms about 15 to 20 percent by weight of the mixture;

an inner film secured to said outer film and covering said

sealant material, said inner film being ruptured when a terminating force is applied to said terminating section means to terminate the wires disposed therein to thereby terminate the wires therein and the sealant material being flowable under pressure created by the terminating force causing the sealant material to surround and seal the connection established between the wires and the terminating section means, the sealant material being non-migratory thereby remaining in its gel condition in the established sealing position.

4,714,802

APPARATUS AND METHOD FOR DETERMINING THE SOURCE DIRECTION OF LOCAL AREA NETWORK TRANSMISSIONS

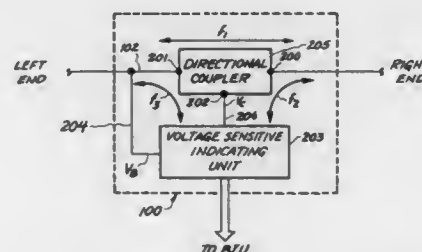
Charles R. Stein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 14, 1986, Ser. No. 896,499

Int. Cl.⁴ H04B 3/03

U.S. Cl. 178—1

9 Claims



1. A direction sensor for determining the direction from which information signals carried on a transmission medium of a communication system arrive at a node, said sensor adapted for coupling to said node and comprising:

means for providing a first output signal when an information signal is received from a first direction along said medium;

means for providing a second output signal when an information signal is received from a second direction along said medium;

first indicating means having an input coupled to receive said first output signal and responsive thereto for providing a first digital data value indicating that said information signal has been received from said first direction; and second indicating means having an input coupled to said medium and responsive to said information signals for providing a second digital data value indicating the presence of said information signals on said medium such that the combination of said first and second digital values indicates the source direction of said information signal.

4,714,803

OVERRUNNING CLUTCH WITH SEALING MEMBER

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1986, Ser. No. 876,771

Int. Cl.⁴ F16D 15/00

U.S. Cl. 192—41 R

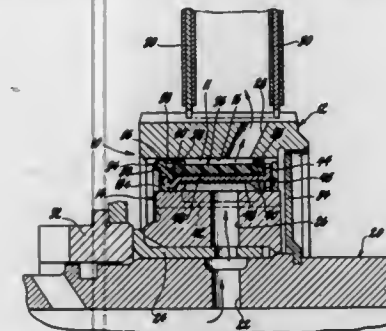
3 Claims

1. In an overrunning clutch of the type that is installable in an annular space between a pair of relatively rotatable and substantially coaxial races with a lubricant in said annular space, and in which one of said races has a cylindrical surface that moves with a running eccentricity relative to said race coaxes as said races rotate, an improved low friction means for confining said lubricant within said annular space, comprising,

a clutch cage installable to the other of said races, said cage being sized relative to said annular space so that a portion of said cage may radially float within said annular space by an amount at least equal to said running eccentricity,

a generally annular support member joined to said cage portion near one side of said annular space so as to move with said cage portion and sized so as to substantially block the flow of said lubricant through said one side of said annular space without rubbing on said cylindrical surface, and

a sealing member joined to said support member and seal-



ingly engageable with said cylindrical surface so as to further block the flow of lubricant from said side of said annular space in cooperation with said support member, said sealing member, by virtue of being joined to said support member, being also radially floatable and thereby engage said eccentrically moving cylindrical surface in such a way as to prevent an increase in rubbing friction from said running eccentricity.

4,714,804

ROTARY SWITCH HAVING ROTARY CONTACTS WITH AN AMORPHOUS ALLOY COATING

Keiji Yasuda, Handa; Yukihisa Oda, Chiryu; Shigemitsu Hamajima, Oobu; Masami Ishii, Toyota; Katsumi Nakanishi, Nagoya; Takayoshi Tsuzuki, Toyota, and Jyun Tsuda, Ama, all of Japan, assignors to Aisin Selki Kabushikikaisha, Aichi, Japan

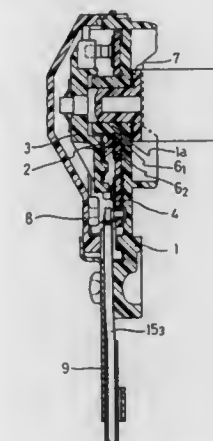
Filed Feb. 10, 1986, Ser. No. 827,585

Claims priority, application Japan, Feb. 8, 1985, 60-023972

Int. Cl.⁴ H01H 1/02, 19/08, 21/12

U.S. Cl. 200—11 DA

5 Claims



5. An electric contactor device comprising:

a base having an annular boss;

a rotatable shaft extending through a bore formed in the boss;

a printed circuit board fixedly mounted on the base so as to extend in a direction perpendicular to the rotatable shaft and carrying a plurality of split electrodes having their surface coated by an amorphous conductive layer and also having printed electrode leads which continue from the electrodes, said amorphous conductive layer being made of nickel-phosphorus alloy having a high phosphorus

content of 21 to 25 atom percent by an electroless plating bath containing nickel ions, a reducing agent for said nickel ions, a pH buffer, a nickel ion sequestering agent, a small amount of a stress reducing agent and trisodium N-(2-hydroxyethyl)ethylenediamine-N,N',N'-triacetate as a first phosphorus deposition promoter in water;

a slider arm fixedly mounted on the rotatable shaft and disposed in opposing relationship with the printed circuit board;

a conductive slider member secured to the slider arm and disposed for engagement with the surface of the amorphous conductive layer;

a plurality of lead wires connected to the printed electrode leads;

and a casing member fixedly connected to the base so as to enclose a space in which the printed circuit board and the slider arm are received.

4,714,805

SELECTIVE SWITCH

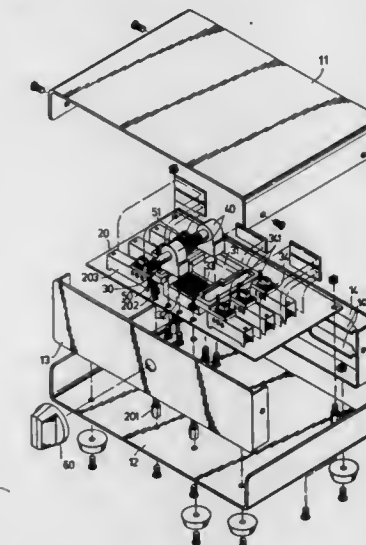
Sun C. Chen, Taipei, Taiwan, assignor to Turn-Luckily Intl., Ltd., Huntington Beach, Calif. and Hozn Auto & Soft Co., Ltd., Taipei, Taiwan

Filed Aug. 15, 1986, Ser. No. 896,718

Int. Cl.⁴ H01H 15/06

U.S. Cl. 200—16 A

5 Claims



1. An improved selective switch comprising:

a printed circuit board, including a circuit and including at least two sets of spaced-apart contacts;

a rotating shaft, including a pinion fixed thereon;

two bearings, journaling said rotating shaft proximate to said printed circuit board; and

a first sliding member movable in a first direction, slidably mounted on said printed circuit board, including at least two sets of at least two spaced-apart conductive portions fixed thereon, each of said at least two conductive portions of each of said sets being spaced relative to one another in a second direction, said second direction being generally perpendicular to said first direction, and a rack fixed thereon and meshed with said pinion of said rotating shaft for driving said at least two sets of conductive portions of said first sliding member in said first direction so as to slide between said at least two sets of spaced-apart contacts on said printed circuit board for alternative connection and disconnection with respective ones of said at least two sets of spaced-apart contacts;

whereby when said rotating shaft is rotated, by means of the linking-up motion of said pinion and said rack, said first sliding member will be driven to slide on said printed

circuit board so that the selective control of said selective switch is achieved.

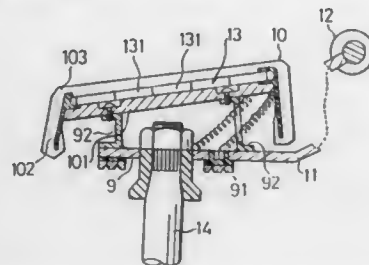
4,714,806

STEERING WHEEL WITH TAPE SWITCH ASSEMBLY
Shuji Inui, Nagoya, and Yoshio Sano, Inazawa, both of Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai, Japan
Continuation of Ser. No. 697,448, Feb. 1, 1985, abandoned. This application Nov. 5, 1986, Ser. No. 928,646
Claims priority, application Japan, Feb. 10, 1984, 59-018554[U]

Int. Cl.⁴ H01H 9/02

U.S. Cl. 200—61.55

3 Claims



1. A steering wheel structure having a pad portion comprising:

- a hard base plate;
- a plate switch disposed on and overlying substantially the entire area of said plate and comprising a plurality of tape-shaped switches arranged closely adjacent side-by-side, each of said tape-shaped switches being generally in the shape of an elongated tape, of greater length than width, and comprising a pair of opposed electrodes each of T-shaped section extending the full length of the tape and sandwiched between insulating elastic tape-like backing strips and means for maintaining said electrodes normally spaced apart but capable of being urged into contact at any portion along the length thereof by localized pressure on a backing strip, said means including an elastic spacer between said electrodes of each pair; and
- a soft covering member disposed over and covering said plate switch, whereby said plate switch extends over a large area of said pad portion and is operable by a push on substantially any portion of said pad portion area.

4,714,807

LOW VOLTAGE VACUUM CIRCUIT INTERRUPTER
Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.
Division of Ser. No. 770,931, Aug. 30, 1985, Pat. No. 4,667,071.
This application Mar. 2, 1987, Ser. No. 21,364
Int. Cl.⁴ H01H 33/66

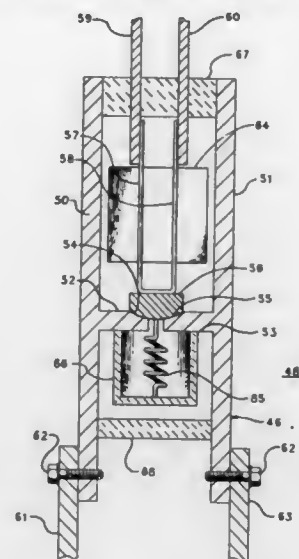
U.S. Cl. 200—144 B

7 Claims

1. A vacuum circuit interrupter comprising:

- a hermetically sealed closure;
- a contact structure within said closure for interrupting current through an external electric circuit;
- said contact structure comprising a pair of first and second metal supports, said first support having a first shaped extension in spaced relation to a second shaped extension on said second support, said first and second shaped extensions comprising fixed contacts arranged for electrical connection with a movable bridging contact; and
- contact separation means within said closure and attached to said bridging contact at one end for driving said bridging contact out of electrical connection with said fixed contacts when an electrical control signal is applied to said separating means;
- said contact separation means comprising a pair of spaced

parallel wires arranged between a plurality of metal plates for becoming electrodynamically repulsed by said electrical signal



4,714,808

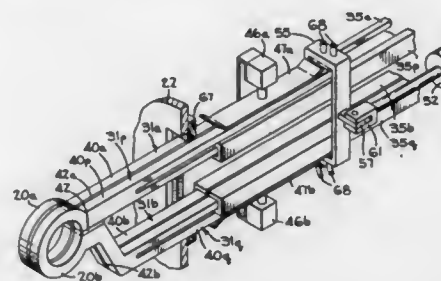
INDUCTION HEATING PRESSURE WELDING WITH LINEAR BUS BAR JOINT
Charles A. Brolin, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 2, 1986, Ser. No. 902,858

Int. Cl.⁴ B23K 13/00

U.S. Cl. 219—9.5

7 Claims



1. An induction heating pressure welding apparatus comprising an induction coil, means for clamping two articles to be welded along interfacing portions to the apparatus at a predetermined spaced apart distance between the interfacing portions for providing clearance for receiving the insertion of the coil therebetween, means for moving the coil for inserting and removing the coil between the interfacing portions of two articles, an induction power supply, means for carrying an electric current from the power supply to the coil, and means for moving at least one of the clamping means toward the other clamping means for pressure welding the heated interfacing portions of the articles together, the coil moving means and the current carrying means comprising:

- first and second sets of elongated bus bars, each set having a first bus bar with one end connected to the power supply and an opposite end extending toward the coil and having a channel extending from end to end, and a second bus bar with a longitudinally extending flanged portion of a shape matching the channel in the first bus bar, the flanged portion slidably mounted in the channel of the first bus bar, one end of the second bus bar connected to the coil,

the other end slidably connected to the power supply, and means for insulating the two sets from one another for completing an electrical circuit between the power supply and the coil; and
means for moving the second bus bar of each set in unison longitudinally with respect to the first bus bar of each set for inserting and removing the coil between the interfacing sections of the two articles.

4,714,809

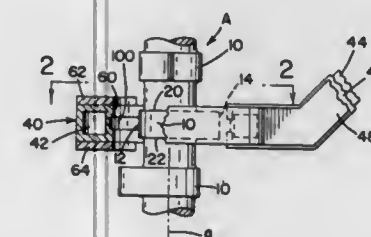
METHOD AND APPARATUS FOR SHAPING THE SURFACES OF CAMS ON A CAMSHAFT
Michael R. Hammond, Clawson, and Donald E. Novorsky, Pleasant Ridge, both of Mich., assignors to Tocco, Inc., Boaz, Ala.

Filed Aug. 15, 1986, Ser. No. 896,965

Int. Cl.⁴ H05B 6/40

U.S. Cl. 219—10.43

30 Claims



1. As method for controlling the shape of a generally linear elongated steel surface formed in a work piece of hardenable steel, said steel surface extending between and contiguous with edge surface defining the ends of said steel surface, each edge surface having a predetermined, peripheral configuration, said method comprising:

- (a) providing an inductor having a generally linearly elongated continuous heating surface configured generally similar to said steel surface and generally parallel therewith;
- (b) providing at least one elongated uniformly cross-sectioned groove in said inductor heating surface and extending in a preselected linear location with respect to said inductor heating surface;
- (c) positioning said work piece with said steel surface facing said heating surface with an air gap between said heating and steel surfaces with said groove facing a selected band of said work piece steel surface;
- (d) energizing said inductor with a current having frequency of less than about 50 KHz for a time less than about 3.0 seconds with a power density of about 20-70 KW/in² at said steel surface whereby said steel surface is raised to a temperature above the hardening temperature of said steel at a rate which is different for said selected band of said steel surface than that for the remainder of said steel surface; and,
- (e) immediately quench hardening said steel surface with a liquid quenching substance whereby the shape of said steel surface is controlled.

4,714,810

MEANS AND METHODS FOR HEATING SEMICONDUCTOR RIBBONS AND WAFERS WITH MICROWAVES
Murray D. Sirkis, Tempe, Ariz., assignor to Arizona Board of Regents, Tempe, Ariz.

Filed Jul. 28, 1986, Ser. No. 890,406

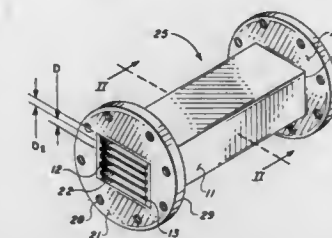
Int. Cl.⁴ H05B 6/70

U.S. Cl. 219—10.55 M

19 Claims

1. A waveguide holder for positioning thin semiconductor materials within a microwave field for heating thereby said holder comprising: an elongated hollow housing having a four

walled rectangular cross section and a first and a second open end; a first and second shelf-like member, each mounted adjacent to a different one of said walled housing in spaced facing relationship to each other, each of said shelf-like members having a plurality of support surfaces disposed on the inner



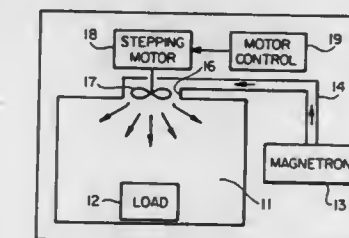
4,714,811

MICROWAVE OVEN AND METHOD WITH CONTROLLED HEATING PROFILE
John E. Gerling, Modesto, Calif., and Ji T. Ren, Chengdu, China, assignors to Jova Enterprises, Inc., Modesto, Calif.
Filed Jul. 18, 1986, Ser. No. 888,024

Int. Cl.⁴ H05B 6/74

U.S. Cl. 219—10.55 F

20 Claims



1. In a microwave oven: a cavity for receiving a load to be heated, means for introducing microwave energy into the cavity to heat the load, a rotator for effecting relative rotation between the load and the mode patterns of the microwave energy within the oven cavity, a stepping motor connected to the rotator for moving the rotator in discrete steps between a plurality of angular positions, and preprogrammable means for applying a series of control signals of individually programmed timing to the stepping motor to control the amount of time the rotator remains in each of its angular positions and thereby provide a predetermined pattern of heating in the load.

4,714,812

APPARATUS AND METHOD FOR PROCESSING DIELECTRIC MATERIALS WITH MICROWAVE ENERGY

Duane B. Haagsen, Edina; Darcy C. Moses, Rush City, and Leonard S. Smith, Minneapolis, all of Minn., assignors to John F. Woodhead, III, Deep Haven, Minn.

Filed May 8, 1985, Ser. No. 731,981

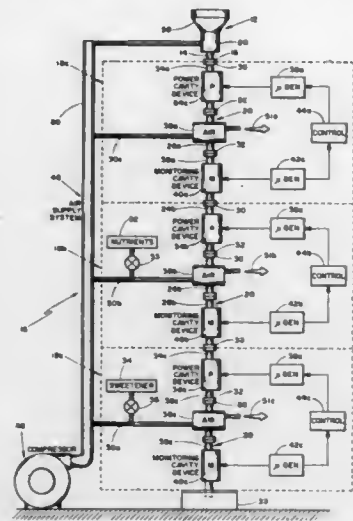
Int. Cl.⁴ H05B 6/70

U.S. Cl. 219—10.55 A

43 Claims

1. Microwave apparatus comprising a plurality of vertically oriented and tandemly arranged cavity devices, means for individually tuning each of said cavity devices, dielectric conduit means extending through each of said cavity devices,

respective means for supplying microwave power to each of said cavity devices, respective means for varying the amount of microwave power supplied to each of said cavity devices and including means for determining the amount of power being supplied to each of said cavity devices, respective means for determining the amount of power reflected from each of



said cavity devices, and respective monitoring means for each of said cavity devices for determining an electrical characteristic of a material passing through said dielectric conduit means, each of said monitoring means constituting a tunable cavity device including a shiftable piston, said dielectric conduit means also extending through the piston of each of said monitoring cavity devices.

4,714,813

MIXER FOR USE WITH MICROWAVE OVEN

Paul M. Trenchard, 39 Penylan Road, Cardiff, CF2 5HZ, United Kingdom

PCT No. PCT/GB85/00226, § 371 Date Jan. 10, 1986, § 102(e) Date Jan. 10, 1986, PCT Pub. No. WO85/05560,

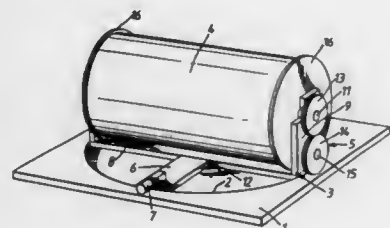
PCT Filed May 28, 1985, Ser. No. 823,870

Claims priority, application United Kingdom, May 29, 1984, 8413558; Oct. 5, 1984, 8425174

Int. Cl.⁴ H05B 6/78

U.S. Cl. 219—10.55 F

11 Claims



1. A mixer for use with a microwave oven, said mixer comprising an openable and closable, generally cylindrical drum and a cradle, said drum being journaled in said cradle, said cradle having means for engaging a turntable drive spindle of a microwave oven to rotate therewith and to permit rotation of said drum with said drive spindle about an axis extending transversely through said drum as said drive spindle rotates said cradle, roller means carried on said cradle to rest on and to roll in a circular path on a stationary, flat surface as said drum and cradle are rotated by said drive spindle, and transmission means including at least some of said roller means for causing said drum to rotate about its own longitudinal axis as it rotates with said drive spindle.

4,714,814
WELDING MACHINE FOR WELDING TONGUES ONTO SHEET-METAL MEMBERS

Felix Kramer, Friedlisberg, Switzerland, assignor to Elpatronic AG, Switzerland

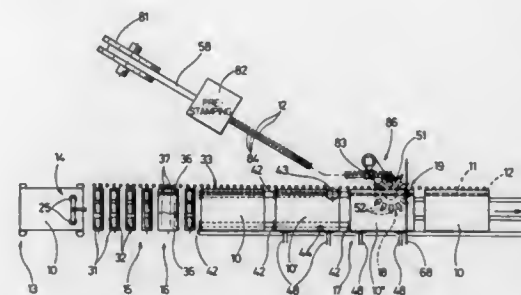
Filed Oct. 28, 1986, Ser. No. 924,065

Claims priority, application Switzerland, Oct. 30, 1985, 4672/85

Int. Cl.⁴ B23K 9/12, 11/00; B21D 51/44

U.S. Cl. 219—79

6 Claims



1. A welding machine for welding a tongue (12) onto a sheet metal member (10), comprising:
a welding station;
a sheet metal conveyor (15) for rhythmically moving the sheet metal member through said welding station one behind the other;
a positioning device (17) for locating the sheet metal member at a welding position in said welding station;
a pre-stamping device for sequentially impressing in a sheet metal strip spaced tongues and corresponding markings at fixed distances from the tongues;
a drive means receiving said pre-stamped sheet metal strip for advancing said pre-stamped sheet metal strip by engaging said markings;
a punch means receiving from said drive means said pre-stamped sheet metal strip such that a foremost one of said markings which corresponds to a foremost one of said tongues engages a centering device, said punch means detaching said centered foremost tongue from said sheet metal strip at a punch position;
a tongue conveyor means including at least one tongue receiver adapted to receive and fixedly hold a punch tongue, said tongue conveyor means for locating said tongue receiver first at a punch position in registration with said punch means centering device and subsequently at said welding position in registration with a corresponding one of said sheet metal members, said welding position being separated from said punch position.

4,714,815

DUAL LASER BEAM BRAZING OF FINE WIRES

Richard E. Swarts, Simsbury; E. Marston Moffatt, Glastonbury, and Mario T. Lopiccolo, Southington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 4, 1986, Ser. No. 926,933

Int. Cl.⁴ B23K 26/00

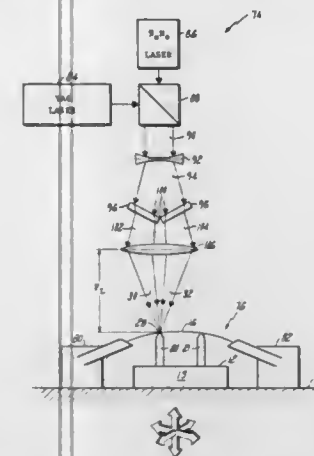
U.S. Cl. 219—121 LC

11 Claims

1. The method of bonding a wire having upper and lower surfaces and having a first diameter value, in lap relationship to a mounting surface having a second diameter value larger than the first diameter value, comprising the steps of:

selecting the wire from a first metal and selecting the mounting surface from a second metal;
positioning the lower surface of the wire in a contact area of the mounting surface;
applying first and second high energy beams simultaneously to first and second target areas located on the mounting surface on opposite sides of, and separate from, said contact area, said first and second beams each having

beam spot diameters less than the second diameter at the point of incidence of said beams to said first and second target areas;
maintaining said high energy beams incident to said first and



second target areas for a time necessary to melt the second metal of said contact area sufficient to wet the first metal of the wire therewith to form a metallurgical bond therebetween; and
removing said beams simultaneously from said target areas.

4,714,816

MONITORING FACILITY FOR ELECTRIC WELDING EQUIPMENT, IN PARTICULAR AS USED FOR METAL BOX MANUFACTURE

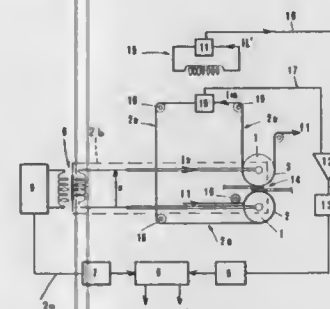
Luigi Pazzaglia, Bologna, Italy, assignor to Cefin S.p.A., Bologna, Italy

Filed Jun. 15, 1987, Ser. No. 62,205

Int. Cl.⁴ B23K 11/24

U.S. Cl. 219—109

7 Claims



1. Monitoring facility for electric welding equipment, in particular as used for metal box manufacture, comprising:
welding rollers that operate in conjunction with a continuous electrode wire looped around guide rollers, fed at a rate matching the surface speed of the welding rollers, and creating an external circuit in parallel to the weldment located between the rollers, which is in receipt of a welding current deriving from the pulsed output voltage supplied by a converter and flowing substantially constant, at least within each half-period;
a first transducer applied to the circuit created by the electrode wire, serving to measure current flowing in the electrode circuit, which consists in an active component directly proportional to resistance at the weldment and a reactive component deriving from the magnetic field generated by the welding current, and to supply an output signal proportional to the electrode current measured;
a second transducer applied to a separate and exclusively inductive circuit within the magnetic field generated by the welding current, serving to measure the current flow-

ing in the inductive circuit, which is proportional to the inductive component of the current measured by the first transducer, and to supply an output signal proportional to the current measured;

a filter circuit into which the first and the second transducer are cascaded, serving to eliminate the inductive component from the current measured by the first transducer, by subtracting from it the value of the inductive current measured by the second transducer, and to supply an output signal directly proportional to welding resistance; means by which to verify quality of the single weldments, hence of the entire metal box, and enable subsequent rejection of sub-standard items, incorporating a micro-processor, to which the output signal from the filter circuit is supplied in digital form, that is in possession at least of the maximum and minimum parametric limits within which the filtered output signal must fall to ensure acceptable quality of the weld, and supplies a first output signal reflecting a sub-standard weld only when the signal received from the filter circuit fails to register within the prescribed parametric limits.

4,714,817

METHOD AND APPARATUS FOR LOCATING AND MACHINING AN IDLE BYPASS HOLE IN A CARBURETOR BODY

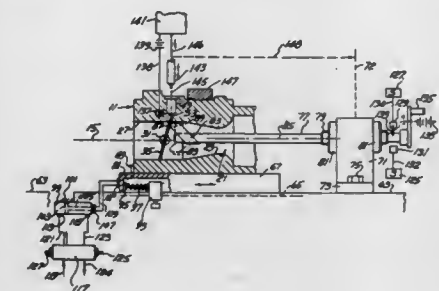
Albert Bolden, Harper Woods, Mich., assignor to USEC, Inc., Grosse Pointe Woods, Mich.

Filed Oct. 6, 1986, Ser. No. 916,025

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121 LK

24 Claims



1. The method of locating and cutting an idle bypass hole in a carburetor body having a venturi section and a throttle section on a longitudinal axis and a normally closed pivotal throttle plate within the throttle section, comprising:
adjustably mounting a carrier upon a fixture base for guided longitudinal movements thereon;
locating and clamping a carburetor body upon the carrier with its axis parallel to the direction of movement of the carrier;
mounting a stationary contact finger upon said base extending toward said carrier;
advancing said carburetor body with said venturi section and throttle section progressively receiving said contact finger until said contact finger is in firm engagement with said throttle plate adjacent its periphery;
clamping the carrier upon the base;
fixedly mounting a power laser cutting unit having a bushing and a focused laser beam on a cutting axis at right angles to said longitudinal axis and at a predetermined center distance to a fixed axis of reference parallel to the cutting axis relative to the mounting of said contact finger;
said cutting axis being arranged at a preset critical distance from the closed throttle plate where it engages the throttle section; and
successively cutting an idle bypass hole through said carburetor body into said throttle section upstream of said throttle plate.

4,714,818

MAGNETIC CONTROL DEVICE FOR ARC WELDING
Karel Mazac, Friedberg, Fed. Rep. of Germany, assignor to Kuhn Schweissanlagen und Roboter GmbH, Augsburg, Fed. Rep. of Germany

PCT No. PCT/EP85/00506, § 371 Date Jul. 10, 1986, § 102(e)
Date Jul. 10, 1986, PCT Pub. No. WO86/02028, PCT Pub. Date Apr. 10, 1986

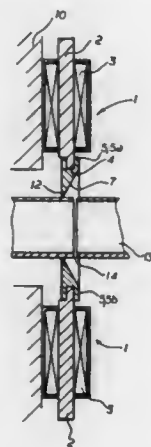
PCT Filed Oct. 1, 1985, Ser. No. 876,887

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436633

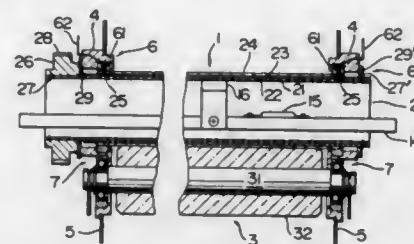
Int. Cl.⁴ B23K 9/08

U.S. Cl. 219—123

6 Claims



tively, said current collecting bearings supporting said heating roll against contact by said pressure roll, and said current



collecting bearings and the heat generating electric resistance layer of said heating roll being electrically connected with each other.

4,714,820

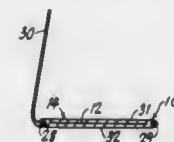
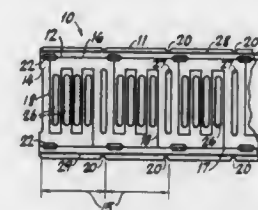
ELECTRICALLY HEATED CURLING WRAPPER
Herbert M. Morrison, Trumbull, Conn., and Jorge Del Mar, Hobe Sound, Fla., assignors to Clairol Incorporated, New York, N.Y.

Filed Aug. 22, 1985, Ser. No. 768,264

Int. Cl.⁴ H05B 3/54; A45D 2/36; H01C 3/06

U.S. Cl. 219—222

2 Claims



1. A device for the electric arc welding of two annular workpieces along an endless annular weld seam path lying in a plane, said device comprising:

- at least two radially extending flat unipolar magnet cores lying generally in said plane of said path and surrounding said seam path with narrow pole faces of said cores;
- a respective coil on each of said cores;
- a protection ring in addition to said cores subdivided into individual segments each of which is attached to a respective pole face of a respective one of said cores, each segment of said protection ring having a segment of a frustoconical inner surface of said ring surrounding said weld seam path so that an axis of said frustoconical inner surface and an axis of said workpieces to be welded coincide, said inner surface of said protection ring including an angle with said axes of at least 50°, the thickness of said segments of said ring being greater than the width of said pole faces where said segments of said ring are attached to the cores; and

fastening means passing through said segments of said ring and the respective cores for fastening each of said segments of said ring to the respective core.

4,714,819

DIRECTLY HEATING FIXING APPARATUS HAVING CURRENT COLLECTING BEARINGS

Keitaro Yamashita, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jul. 14, 1986, Ser. No. 884,956

Claims priority, application Japan, Jul. 17, 1985, 60-157643; Jul. 17, 1985, 60-157644; Jul. 17, 1985, 60-157645

Int. Cl.⁴ H05B 3/00

U.S. Cl. 219—216

9 Claims

1. A directly heating-type fixing apparatus having a heating roll which includes a heat generating electric resistance layer and a covering layer of a heat resistant toner releasing material, both layers being formed on a surface of a cylindrical body, and a pressure roll which is arranged to contact said heating roll under pressure, the apparatus further comprising a pair of current collecting bearings each made of an electrically conductive material provided at ends of said heating roll, respec-

1. An electrically heatable hair wrapper comprising:
a flat, elongated base;

- a plurality of parallel resistance heating circuits longitudinally extending along and secured to said base, said parallel resistance heating circuits being arranged in periodic serpentine patterns, the two ends of each pattern transversely of the length of said base respectively connected to parallel continuous buses adjacent the longitudinal edges of said base, said buses periodically provided along their length with areas for receiving connecting means to connect at least one of said circuits to a source of electrical power;

at least one indicator means on said base for indicating where said base and buses may be transversely cut while preserving the continuity of a selected one or ones of said parallel resistance heating circuits; and

a bendable shape-retaining cuttable wire secured to each longitudinal edge of said base outwardly of said parallel conducting buses.

4,714,821

HEAT ACCUMULATOR

Leif Jakobsson, Vindön 8736, Henån, Sweden (440 90)

PCT No. PCT/SE83/00366, § 371 Date Jun. 27, 1984, § 102(e)

Date Jun. 27, 1984, PCT Pub. No. WO84/01814, PCT Pub. Date May 10, 1984

PCT Filed Oct. 26, 1983, Ser. No. 626,858

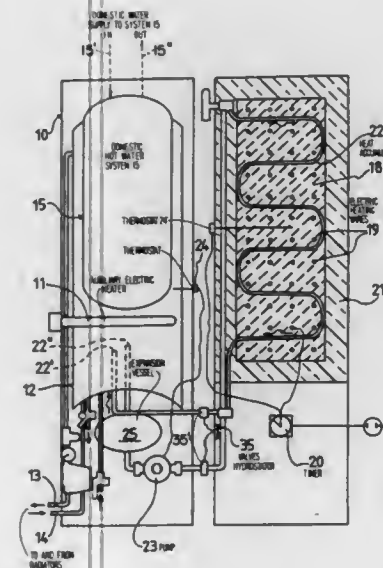
Claims priority, application Sweden, Oct. 26, 1982, 8206155;

Nov. 11, 1982, 8206403; Nov. 11, 1982, 8206404; May 6, 1983, 8302610

Int. Cl.⁴ H05B 1/02; F24H 7/02; F24D 11/00

U.S. Cl. 219—326

7 Claims



1. A heating system comprising a heat accumulator arranged in heat exchange relation with a heating boiler containing a fluid having a relatively low boiling point to be heated for use, said heat accumulator comprising a body of a material having a high heat capacity and a high melting point which is arranged for being heated by electric energy to a temperature considerably higher than the maximum temperature of said boiler, and an electric heating means for heating said body; said body including a conduit containing a fluid in a liquid phase having a relatively low boiling point; the fluid in said conduit being arranged in heat transferring communication with the fluid in said boiler for heating said boiler fluid; and a circulation pump having the suction side thereof in communication with an expansion vessel and said boiler, said expansion vessel being vented to the atmosphere; means responsive to the temperature of the fluid in said boiler for controlling the starting and stopping of said pump; said conduit having a predetermined volume which is relatively small as compared to the capacity of said pump; said pump having a relatively high initial startup speed to initially drive any vaporized fluid out of said conduit, and being designed and arranged to return to a relatively lower, second speed for normal operation after said initial startup; and said pump being stopped if a predetermined temperature is reached in said boiler thereby creating in said conduit of said body of said heat accumulator dry vaporized fluid of moderate pressure as established by said expansion vessel.

4,714,822

COOKER WITH MEANS FOR AUTOMATICALLY CONTROLLING THE HEATING OF A PAN WITH FOOD MATERIAL

Walter Braun, Alsdorf; Reinhard Kersten, and Egbert Kuhl, both of Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

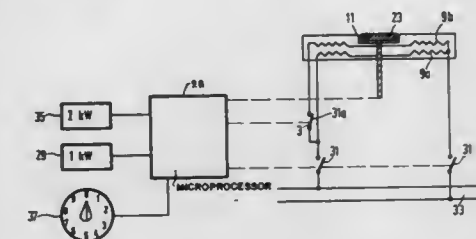
Filed Mar. 31, 1986, Ser. No. 846,672

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512545; Aug. 26, 1985, 3530403

Int. Cl.⁴ H05B 3/68

U.S. Cl. 219—449

8 Claims



1. A method for automatically controlling heating of a pan with food material in order to avoid boiling over at an end of a heating process, whereby during the heating process rise in temperature of a base of the pan is continuously determined as a function of time by means of a temperature sensor, comprising:

- setting at a beginning of the heating process power supplied to an electric hotplate to a constant value;
- continuously monitoring with a microprocessor in equal time intervals the temperature of the base of the pan and determining rise in the temperature of the pan base as a function of time;
- comparing the actual value of the rise in the temperature of the pan base at a pan-base temperature above about 70° C. with a desired value, and when deviations occur, changing the heating power to achieve an actual value of the rise in temperature equal to the desired value; and
- switching the heating power off at a pan-base temperature above 90° C. when a bending point in the temperature rise of the pan base is determined.

4,714,823

ATTENUATOR FOR EXTRANEEOUS LIGHT FLUCTUATIONS IN A MICROSCOPE WITH AUTOMATIC BRIGHTNESS CONTROL

Bernd Spruck, Heubach-Lautern, and Siegfried Gerber, deceased, late of Oberkochen, both of Fed. Rep. of Germany (by Hannelore Gerber, Silvia Gerber, Eberhard Gerber, Bernhard Gerber, legal representatives), assignors to Carl-Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Mar. 31, 1986, Ser. No. 845,964

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513146; Oct. 7, 1985, 3535749

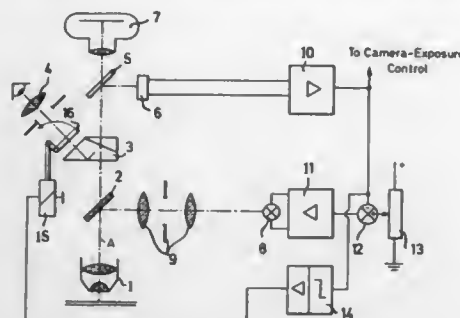
Int. Cl.⁴ G01J 1/32

U.S. Cl. 250—205

6 Claims

1. In a microscope having an objective and an eyepiece disposed in a path of a viewing ray, a light source for object illumination, a photoreceiver coupled to said viewing ray path for providing an output signal as a function of the intensity of light transverse said path, first control means coupled to said photoreceiver and to said light source for automatically maintaining a preselected level of intensity of said light source, means for selectively including in said ray path any of a plurality of available optical elements, and second control means for decreasing said light along said path during the operation of changing said included optical element, said second control means comprising: first and second threshold means coupled to said photoreceiver for providing, respectively, a first and second threshold output signal, said threshold output signals

being provided by said first and second threshold means, respectively, whenever a differentiated signal from said photoreceiver rises above one predetermined level or falls below



4,714,824

PHOTOELECTRIC TRANSDUCER WITH ADJUSTABLE SENSITIVITY TO INCIDENT LIGHT WAVELENGTH
Shinichi Terazono, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

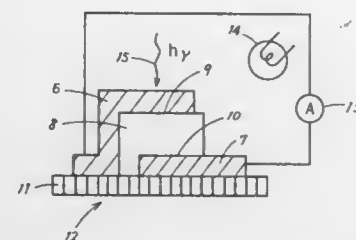
Filed Apr. 7, 1986, Ser. No. 848,564

Claims priority, application Japan, Apr. 16, 1985, 60-83018

Int. Cl.⁴ H01J 40/14

U.S. Cl. 250-211 R

20 Claims



1. A photoelectric transducer, comprising:
at least one photosensitive element, said photosensitive element including first and second electrodes provided spaced apart from each other, at least one of said first and second electrodes being transparent to transmit incident light, said element further including an amorphous semiconductor provided between and in contact with said first and second electrodes for performing photoelectric conversion upon receipt of said incident light; and,
an auxiliary light source provided by a side of said transparent electrode for irradiating said photosensitive element.

4,714,825

SYSTEM FOR CALIBRATING THE TIME AXIS OF AN X-RAY STREAK TUBE

Koichiro Oba, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 4, 1985, Ser. No. 805,425

Claims priority, application Japan, Dec. 11, 1984, 59-261438

Int. Cl.⁴ G01D 18/00

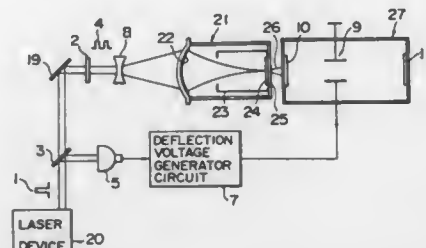
U.S. Cl. 250-213 VT

3 Claims

1. A system for calibrating the time axis of an X-ray streak tube, said streak tube including a first photocathode, deflection means and a phosphor surface, comprising:

a light source for generating a train of light pulses, said light pulses being spaced by a predetermined interval of time;
X-ray tube means including a second photocathode, focusing means and an X-ray target, said X-ray tube means

generating a train of X-rays when said second photocathode is exposed to said light pulses;
means for exposing said first photocathode of said streak tube to said train of X-rays, said first photocathode emitting an electron beam in response thereto;



4,714,826

APPARATUS AND METHOD FOR TESTING OUTPUTS OF LOGIC CIRCUITS BY MODULATING OPTICAL SEQUALS

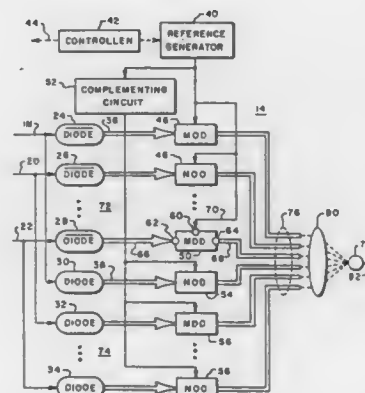
Anastasio P. Goutzoulis, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 18, 1986, Ser. No. 897,673

Int. Cl.⁴ G01R 19/14

U.S. Cl. 250-213 A

23 Claims



1. An optical system for testing high-speed logic devices producing high and low logic level signals at a plurality of output terminals, said system comprising:

first means for producing a first plurality of optical signals corresponding to products of actual output logic signals from a logic device and complements of desired logic signals, said plurality of optical signals including light only when said actual output logic signals and said complements of said desired logic signals are both at high logic levels;

second means for producing a second plurality of optical signals corresponding to products of complements of said actual output logic signals from said logic device and said desired logic signals, said second plurality of optical signals including light only when said complements of said actual output logic signals and said desired logic signals are both at logic high levels;

means for detecting when light is included in either of said first or second plurality of optical signals, wherein detec-

tion of light indicates the occurrence of a logic error in one or more of said actual output logic signals.

4,714,827

PHOTO-ELECTRIC CONVERSION DEVICE WITH DARK CURRENT COMPENSATION

Shigeyuki Akita, Okazaki, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

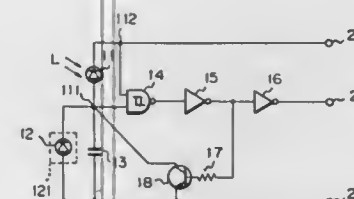
Filed Jan. 13, 1986, Ser. No. 818,606

Claims priority, application Japan, Jan. 18, 1985, 60-8222

Int. Cl.⁴ H01J 40/14

U.S. Cl. 250-214 C

7 Claims



1. A photo-electric conversion device for converting a light intensity into an oscillation frequency in a digital signal form, comprising:

a first photodiode in which a current is changed in accordance with a light intensity;
a second photodiode connected in series with said first photodiode for passing a current in the same direction as in said first photodiode;
a light shielding structure for shielding said second photodiode with regard to light;
a capacitor, connected in series with said first photodiode and in parallel with said second photodiode, for charging/discharging a current from said first photodiode; and
an oscillator structure for performing a switching operation in accordance with a charging/discharging operation of said capacitor so as to generate an oscillation voltage output, wherein an electric charge which is caused by a dark current from said first photodiode flowing through said capacitor is discharged through said second photodiode such that said capacitor is always charged only by a current caused by received light detected by said first photodiode.

4,714,828

OPTOELECTRIC TRANSDUCER

Claude Bacon, Neauphle le Chateau; Rene Baptiste, Maurepas; Henri Feissel, Paris; Gilbert Takats, Saint Denis, and Christian Cabrol, Plaisir, all of France, assignors to Bull S.A. (Societe Anonyme), Paris, France

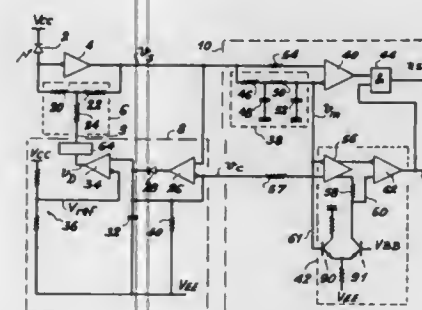
Filed Mar. 14, 1986, Ser. No. 839,719

Claims priority, application France, Mar. 14, 1985, 85 03745

Int. Cl.⁴ H01J 40/14

U.S. Cl. 250-214 C

17 Claims



1. An optoelectronic circuit transducer comprising a diode

(2) for providing a current in response to reception of a light signal, an amplifier (4) having an input connected to receive current from said diode and having an output, a negative feedback transfer impedance (6) connected between the amplifier output and the amplifier input, a stabilizing means (8) stabilizing the negative feedback of the transfer impedance responsive to the level of the peak (v_c) of the output signal (v_s) of the amplifier (4), and an automatic threshold device (10) supplying an output signal (RSD) in response to an output signal of said amplifier, and wherein said transfer impedance includes first, second, and third resistors, each resistor having a first end connected to a common node, and said first resistor also has a second end connected to the amplifier input, said second resistor also has a second end connected to the amplifier output, and said third resistor also has a second end connected to said stabilizing means (8).

4,714,829

FIBRE OPTIC SENSING DEVICE AND METHOD
Arthur H. Hartog, and David N. Payne, both of Southampton, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 495,400, May 17, 1983, abandoned.

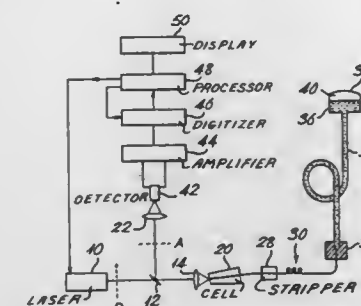
This application Mar. 17, 1986, Ser. No. 841,019

Claims priority, application United Kingdom, May 18, 1982, 8214384

Int. Cl.⁴ H01J 5/16

U.S. Cl. 250-227

8 Claims



1. Detector apparatus including a fibre optic sensor comprising:

a length of optical fibre having a core and a sheath respectively comprising materials the refractive indices of which vary differentially in accordance with a physical variable to be sensed and which causes corresponding changes in the back-scattering of radiation injected into the optical fibre,

optical pulse supply means for supplying to said length of optical fibre a pulse of electromagnetic radiation at wavelengths in a range including visible, ultraviolet and infra-red wavelengths,

mode filter means for rendering said detector apparatus substantially insensitive to changes in a numerical aperture of said fibre core;

radiation sensing means positioned to receive optical radiation back-scattered by the length of optical fibre, detector means responsive to said radiation sensing means to provide an output signal dependent on the intensity of the back-scattered radiation,

processor means coupled to said detector means for deriving from said output signal a control signal dependent on sensor variations in said physical variable comparator means to compare changes in said control signal with a predetermined algorithm, and

output means responsive to said control signal for providing an output signal dependent on said sensor variations.

4,714,830

LIGHT BEAM POSITIONER WITH SCAN DISTORTION COMPENSATION

Takeshi Usui, Tokyo, Japan, assignor to NEC Corporation, Japan

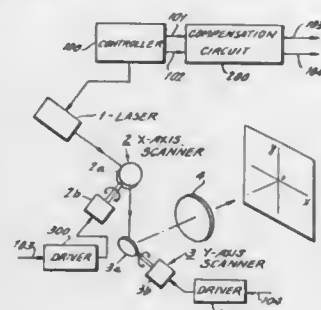
Filed Apr. 21, 1986, Ser. No. 854,042

Claims priority, application Japan, Apr. 19, 1985, 60-82650

Int. Cl.⁴ H01J 3/14

U.S. Cl. 250-234

3 Claims



1. A light beam positioner, comprising:
 - first beam scanning means for deflecting a light beam at a first angle in a first direction in response to a first compensated control signal;
 - second beam scanning means for receiving the light beam which is produced by said first beam scanning means and, in response to a second compensated control signal, for deflecting the received light beam at a second angle in a second direction which is orthogonal to the first direction;
 - an objective lens for focusing the light beam produced by said second beam scanning means;
 - controller means for generating first and second uncompensated control signals which are respectively proportional to the first and second angles;
 - scan distortion compensating means for generating first and second intermediate signals which are dependent on the first and second uncompensated control signals, subtracting the first intermediate signal from the first uncompensated control signal to generate the first compensated control signal, and adding the second intermediate signal to the second uncompensated control signal to generate the second compensated control signal; and
 - drive means for driving the first and second beam scanning means responsive to the first and the second compensated control signals, respectively.

4,714,831

SPHERICAL RETARDING GRID ANALYZER

Gregory J. Clark, Katonah; Praveen Chaudhari, Briarcliff Manor; Jerome J. Cuomo, Lindendale; Margaret A. Frisch, Mahopac, and James L. Speldell, Carmel, all of N.Y., assignors to International Business Machines, N.Y.

Filed May 1, 1986, Ser. No. 859,102

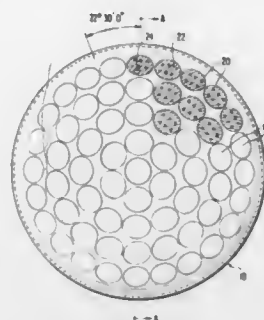
Int. Cl.⁴ H01J 40/04

U.S. Cl. 250-305

13 Claims

1. A spherical grid for focussing charged particles comprising:

a rigid spherical frame having a number of openings therein; and



flat grid elements defining a mesh for said spherical grid placed in said openings.

4,714,832

PHOTOMETER

Walter Fabinski, Kriftel, Fed. Rep. of Germany, assignor to Hartmann & Braun AG, Frankfurt am Main, Fed. Rep. of Germany

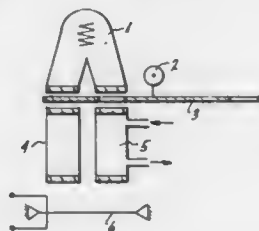
Filed Jul. 10, 1985, Ser. No. 753,659

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426472; Dec. 20, 1984, 3446436

Int. Cl.⁴ G01N 21/35

U.S. Cl. 250-343

12 Claims



1. Photometer including one measuring beam, traversing a chamber containing measuring gas, the improvement comprising a solid state detector positioned directly adjacent an existing window of the chamber and being comprised of a foil made of polyvinylidene-fluoride, polyvinyl fluoride, or polyvinyl chloride and having an area being at least as large as the cross sectional area of radiation leaving said measuring chamber, and means for extracting a measuring signal from the foil.
6. Photometer, including at least one measuring beam traversing a measuring chamber containing measuring gas, the improvement comprising:
 - a solid state detector being comprised of a foil made of polyvinylidene-fluoride, polyvinyl fluoride, or polyvinyl chloride, and having an area being as large as a cross-sectional area of radiation leaving said measuring chamber; said foil being contained in a gas-filled, infrared absorbing, receiving and detecting chamber, having a window facing said measuring gas containing chamber to receive therefrom radiation, the radiation received by and in said receiving chamber being pyroelectrically as well as piezoelectrically effective;
 - means for extracting a measuring signal from the foil; and
 - means connected for separating a piezoelectric component from a pyroelectric component as contained in said measuring signal.

4,714,833

ARRANGEMENT FOR DETECTING SECONDARY AND/OR BACKSCATTER ELECTRONS IN AN ELECTRON BEAM APPARATUS

Harald Rose, Darmstadt; Joachim Zach, Nauheim, and Burkhard Lischke, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

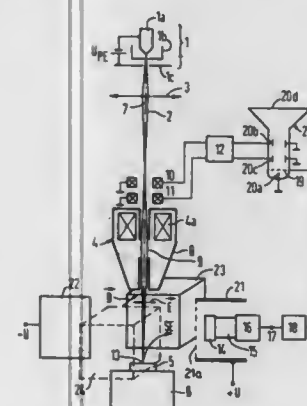
Filed Aug. 11, 1986, Ser. No. 895,310

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532781

Int. Cl.⁴ H01J 37/244

U.S. Cl. 250-397

14 Claims



1. An arrangement for detecting secondary electrons and/or backscatter electrons resulting from a primary electron beam being focused substantially along an electron-optical axis onto a specimen, comprising:
 - at least two electrodes disposed in a plane perpendicular to the electron-optical axis;
 - means for generating an electrical extraction field between said at least two electrodes to extract the secondary electrons and/or backscatter electrons to at least one of said electrodes;
 - at least one detector disposed directly behind and adjacent to one electrode to which the electrons are extracted;
 - at least two magnetic pole members disposed in the plane of said at least two electrodes and generating a magnetic field substantially perpendicular to the electrical extraction field, the strength and direction of the magnetic field exerting a force on electrons in the primary beam to compensate a force exerted on the primary beam electrons by the electrical extraction field but the magnetic field exerting a force on the secondary electrons and/or backscatter electrons to promote extraction toward said detector.

4,714,834

METHOD AND APPARATUS FOR GENERATING ION BEAMS

Murray R. Shubaly, Deep River, Canada, assignor to Atomic Energy of Canada, Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 703,502, Feb. 20, 1985. This application Aug. 19, 1985, Ser. No. 767,048

Claims priority, application Canada, May 9, 1984, 4539753

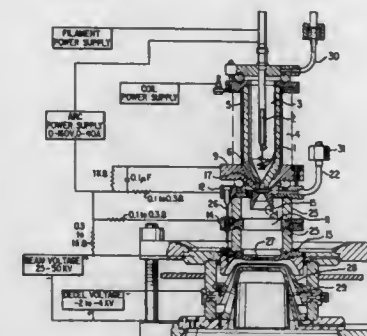
Int. Cl.⁴ H01J 27/20

U.S. Cl. 250-427

15 Claims

1. An ion beam source apparatus of the type comprising cathode means in a cathode chamber for generating an electron beam, means for collimating said electron beam, aperture means in said cathode chamber for admitting the collimated electron beam into an ionizing chamber for containing an ion plasma, anode means at one end of said ionizing chamber adjacent said aperture means, and ion beam extraction means at the opposite end of said ionizing chamber, CHARACTERIZED IN THAT said aperture means is a bore in said cathode chamber having a smaller cross-section adjacent said cathode

means, said smaller cross-section being sufficient for electron beam passage therethrough, and said aperture means including



a predetermined length thereof having a predetermined uniform cross-section larger than said smaller cross-section.

4,714,835

OPTICAL POSITION-MEASURING SENSOR

Torgny Brågårdh; Bertil Hök, and Christer Övren, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 486,118, Apr. 18, 1983, abandoned.

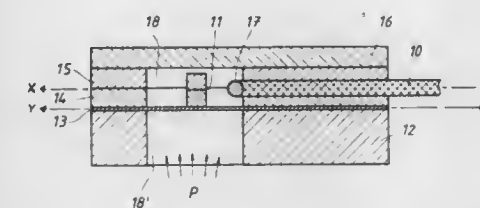
This application Nov. 6, 1985, Ser. No. 795,742

Claims priority, application Sweden, Apr. 21, 1982, 8202484

Int. Cl.⁴ G01D 5/26; G01J 3/443

U.S. Cl. 250-486.1

16 Claims



1. An optical position-measuring sensor capable of determining the strength of an activating force which comprises a monolithic structure which includes a flexible diaphragm which in its rest position extends in a plane and which can be flexed in a direction perpendicular to said plane by an activating force, and two masses of luminescent material resting on said flexible diaphragm so as to be moved when said flexible diaphragm is flexed, said two masses of luminescent material emitting, on excitation, different characteristic spectra, and a wave guide, one end portion of said wave guide being stationarily mounted on said monolithic structure, said one end portion of said wave guide being straight and defining a center line which is parallel to said plane in which said flexible diaphragm extends in its rest position, said wave guide being capable of receiving luminescent light emitted by said two masses of luminescent material when excited, the wave guide and flexible diaphragm being positioned such that movement of said flexible diaphragm by an activating force which acts in a direction perpendicular to said plane causes said two masses to move relative to said one end portion of said wave guide, so as to change the proportion of luminescent light received by said wave guide from said two masses, so as to provide data from which the strength of said activating force is determined.

4,714,836

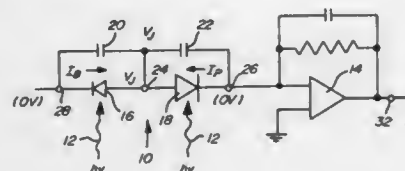
PHOTOSENSITIVE PIXEL WITH EXPOSED BLOCKING ELEMENT

Kolchi Kitamura, Troy; Louis D. Swartz, Holly; Clive Catchpole, Birmingham, and Zvi Yaniv, Farmington Hills, all of Mich., assignors to Orcon Imaging Systems, Inc., Troy, Mich.

Filed Sep. 16, 1986, Ser. No. 907,926
Int. Cl.⁴ H04N 3/15; H01L 27/14

U.S. Cl. 250-578

27 Claims



1. A circuit for providing a detectable signal corresponding to the quantity of radiation incident upon a photosensitive pixel, the circuit comprising:

a photogenerative element including at least first and second electrodes;

means for selectively blocking current flow through at least a portion of the circuit, said blocking means including at least first and second electrodes;

the first electrode of the photogenerative element and the first electrode of the blocking means being electrically interconnected; and

the second electrode of the photogenerative element and the second electrode of the blocking means held substantially at a common potential; whereby the stored detectable signal will not be dissipated by carrier pairs photogenerated by unmasked current blocking means.

4,714,837

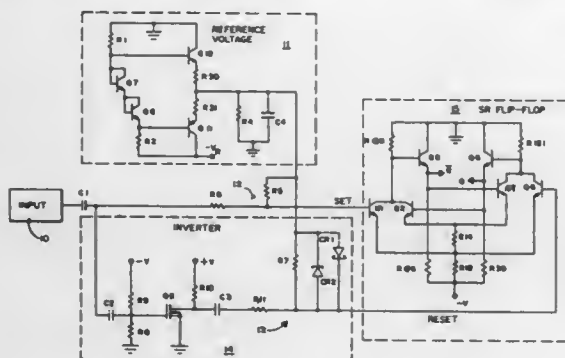
HIGH SPEED FLIP-FLOP

Bart A. Wilson, Salt Lake City; Vaughn J. Jenkins, Bountiful, and Dale D. Fonesbeck, Daysville, all of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Jun. 18, 1986, Ser. No. 886,916
Int. Cl.⁴ H03K 3/286

U.S. Cl. 307-289

10 Claims



1. A high speed, edge-triggered flip-flop circuit comprising, set/reset flip-flop circuit means, source means for supplying input signals, inverter means connected to receive said input signals from said source means and to produce inverted input signals, reference voltage source means for producing a reference voltage,

first summing means connected to receive said reference voltage from said reference voltage source means and said input signals from said source means and to provide an

output signal representative of the combination thereof to a first input of said flip-flop circuit means, and second summing means connected to receive said reference voltage from said reference voltage source means and said inverted input signals from said inverter means and to provide an output signal representative of the combination thereof to a second input of said flip-flop circuit means, said first and second summing means comprise resistance networks.

4,714,838

SECOND HARMONIC GENERATION WITH N,N'-SUBSTITUTED BARBITURIC ACIDS

Roberta E. Harelstad, Eagan, and John Stevens, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 31, 1986, Ser. No. 925,300
Int. Cl.⁴ H03F 7/00

U.S. Cl. 307-427

12 Claims



1. A second harmonic generator comprising a laser source of coherent light radiation at a fixed fundamental frequency, an organic molecular crystalline compound, means for directing the output radiation of the laser onto the compound, and output means for utilizing the second harmonic frequency, said compound being a N,N'-substituted barbituric acid which crystallizes in a non-centrosymmetric configuration, said compound being transparent to radiation at said fixed fundamental frequency and said second harmonic frequency.

4,714,839

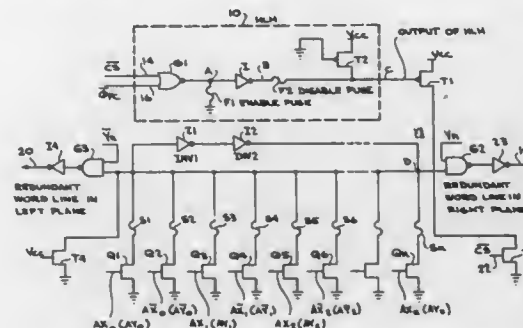
CONTROL CIRCUIT FOR DISABLING OR ENABLING THE PROVISION OF REDUNDANCY

Shine C. Chung, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 27, 1986, Ser. No. 844,927
Int. Cl.⁴ H03K 19/03, 19/096

U.S. Cl. 307-441

12 Claims



6. A logic circuit for activating and deactivating redundant elements comprising:

(a) high-low-high circuit means including:

a NOR gate having two inputs and an output; said NOR gate having one input connected to receive a chip select signal and the other input connected to receive a precharging pulse signal;

an enable fuse having a first end connected to the output of said NOR gate and a second end connected to a ground potential;

a first inverter having an input and an output, the input of said first inverter being connected to the first end of said enable fuse;

a disable fuse having a first end connected to the output of said first inverter and a second end connected to an output node; and

a P-channel MOS transistor having its source connected to a supply potential, its gate connected to the ground potential, and its drain connected to the output node;

(b) dynamic latch means including:

a second P-channel MOS transistor having a source connected to the supply potential, a gate connected to the drain of said first P-channel MOS transistor, and a drain; an N-channel MOS transistor having its drain connected to the drain of said second P-channel MOS transistor, its gate connected to the chip select input signal and its source connected to the ground potential;

a second inverter having an input and an output;

a third inverter having an input and an output, said third inverter having its input connected to the output of said second inverter and its output connected to the input of said second inverter so as to form a latch, the output of said third inverter being further connected to the drain of said N-channel transistor;

a first NAND gate having two inputs and an output, said first NAND gate having its first input connected to the drain of said N-channel transistor and its second input connected to a true address signal;

a fourth inverter having an input and an output, the input of said fourth inverter being connected to the output of said first NAND gate and the output of said fourth inverter being connected to a redundant element control line in a right plane;

a second NAND gate having two inputs and an output, said second NAND gate having its first input connected to the drain of the N-channel transistor and its second input connected to a complement address signal; and

a fifth inverter having an input and an output, the input of said fifth inverter being connected to the output of said second NAND gate and the output of said fifth inverter being connected to a redundant element control line in a left plane.

4,714,840

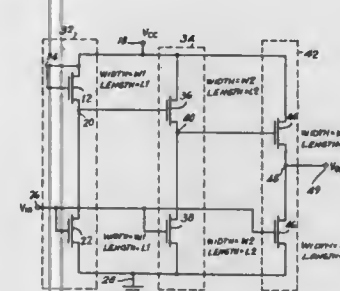
MOS TRANSISTOR CIRCUITS HAVING MATCHED CHANNEL WIDTH AND LENGTH DIMENSIONS

Robert J. Proebsting, Plano, Tex., assignor to Thomson Components - Mostek Corporation, Carrollton, Tex.

Filed Dec. 30, 1982, Ser. No. 454,778
Int. Cl.⁴ H03K 17/687

U.S. Cl. 307-443

1 Claim



1. A circuit arrangement including first and second voltage supply terminals between which the voltage supply is to be applied, an input terminal to which an input signal is to be applied, and an output terminal at which an output signal is to be derived, and first, second and third amplifier stages, each stage including a driver transistor and a load transistor, each transistor being of the enhancement node type and including a source and a drain spaced by a channel and an insulated gate overlying the channel, the drive and load transistors of each stage having equal channel lengths and widths, in each stage the source of the driver transistor being connected to the first voltage supply

terminal, the drain of the driver transistor being connected to the source of the load transistor at a source-drain node, the drain of the load transistor being connected to the second voltage supply terminal, and the gate of the driver transistor being connected to the input terminal, in the first stage, the gate of the load transistor being connected to the drain of the load transistor, in the second stage, the gate of the load transistor being connected to the source-drain node of the first stage, in the third stage, the gate of the load transistor being connected to the source-drain node of the second stage, and the source-drain node of the third stage being connected to the output terminal.

4,714,841

DOUBLE-SIDED LOGIC INPUT DIFFERENTIAL SWITCH

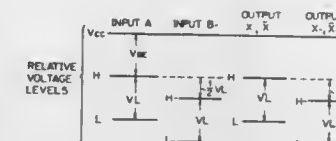
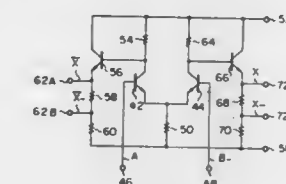
Norio Shoji, Tokyo, and Masashi Takeda, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,596

Claims priority, application Japan, Jun. 30, 1984, 59-136236
Int. Cl.⁴ H03K 19/086, 19/092, 19/003, 17/60

U.S. Cl. 307-455

20 Claims



1. A logic circuit of the kind employing a differential amplifier having a plurality of transistors connected in a common emitter configuration, and a constant current source connected to said differential amplifier and a voltage source, comprising: first input means connected to a base of a first one of said plurality of differential amplifier transistors for receiving a binary input signal having a preselected difference between high and low amplitudes thereof;

second input means connected to a base of a second one of said plurality of differential amplifier transistors for receiving a second binary input signal also having said preselected difference between high and low amplitudes thereof and being level shifted relative to said first input signal by an amount equal to $\frac{1}{2}$ of said preselected difference; and

output means connected to a collector of one of said differential amplifier transistors for producing output signals having amplitude levels responsive to said first and second binary input signals, with at least one of said output signals being level shifted by said $\frac{1}{2}$ of said preselected difference to be available as said second binary input signal to a following logic circuit, whereby said output signals are obtained without a reference voltage being applied to said differential amplifier.

4,714,842

INTEGRATED INJECTION LOGIC CIRCUITS

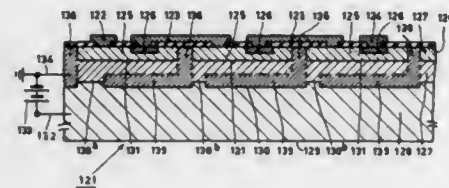
Cornelis M. Hart, and Arie Slob, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y. Division of Ser. No. 876,219, Feb. 9, 1978, Pat. No. 4,286,177, which is a continuation of Ser. No. 674,065, Apr. 5, 1976, abandoned, which is a continuation of Ser. No. 505,663, Sep. 13, 1974, abandoned, which is a continuation of Ser. No. 253,348, May 15, 1972, abandoned. This application Dec. 3, 1980, Ser. No. 212,582

Claims priority, application Netherlands, May 22, 1971, 7107040

The portion of the term of this patent subsequent to Aug. 25, 1999, has been disclaimed.
Int. Cl.⁴ H03K 19/091

U.S. Cl. 307—477

18 Claims



1. A monolithic integrated logic circuit comprising:

a common semiconductor body provided with a plurality of bipolar transistors adjacent a major surface thereof and each including outer zones and a first type conductivity medial active zone making rectifying contact with said outer zones and forming at least three successive active zones through which current can be caused to flow when appropriately biased,

biasing means to cause current flow through the semiconductor bipolar transistors, said biasing means comprising at least one current injector having an elongated current injection region and a succeeding region forming a current injector rectifying junction with said elongated region, at least said elongated region and said rectifying junction being separate from the transistor active zones, said rectifying junction being spaced from a respective medial active zone of at least first and second transistors, said medial active zones being displaced side by side and lengthwise of said elongated current injection region and both facing said current injector rectifying junction,

means for forward biasing said current injector rectifying junction so as to cause the injection of charge carriers from said elongated region into said succeeding region and thereby tending to cause collection of charge carriers by the medial active zones of both said first and second transistors, thereby tending to cause a rectifying junction between each medial active zone and an adjacent active zone of each of said first and second transistors to become forward biased tending to produce current flow through said first and second transistors' active zones,

the charge carrier-collecting relationship of the medial active zone of said first transistor to the current injector rectifying junction being different from the corresponding relationship for said second transistor and such that the latter's medial active zone can receive a bias current higher than that which can be received by the first transistor's medial active zone, thereby enabling the second transistor to operate at a higher current level than the first transistor,

and means interconnecting said first and second transistors as part of the same logic circuit for initiating or utilizing their current flow in said logic circuit.

4,714,843

SEMICONDUCTOR CHIP POWER SUPPLY MONITOR CIRCUIT ARRANGEMENT

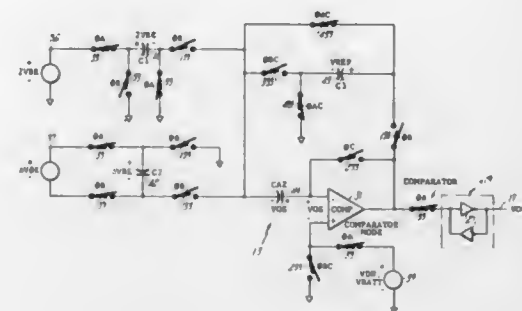
Michael D. Smith, Lewisville, Tex., assignor to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed Aug. 30, 1985, Ser. No. 771,319

Int. Cl.⁴ G06G 7/10; H03F 1/02; H03K 5/00

U.S. Cl. 307—491

4 Claims



1. A circuit arrangement for monitoring the power supply of N-well CMOS device comprising

an amplifier (31) having two inputs including an inverting input,

a non-inverting input and a single output, and adapted to be switched between modes including a comparator mode and an amplifying mode,

an output terminal, an input terminal to which is applied the supply voltage being monitored,

a first switch means, serially connected between the output of the amplifying means and the output terminal, which when closed connects the output of the amplifying means to the output terminal,

a second switch means, connected between the input terminal and one of the two inputs of the amplifying means, which when closed provides a sample of the supply voltage on said one input of the amplifying means,

a ground terminal,

a third switch means, connected between the ground terminal and said one input of the amplifying means, which is operated out of phase with said second switch,

a first capacitor means having first and second terminals across which is periodically stored a reference voltage for comparison with the supply voltage,

means for periodically storing the reference voltage on said first capacitor means,

fourth, fifth, sixth, and seventh switch means,

an input capacitor means including first and second terminals of which said first terminal is connected to the other of the two inputs of the amplifier means, and of which said second terminal is connected to the first terminal of the first capacitor by way of said fifth switch and to the second terminal of the first capacitor means by way of the sixth switch means, said second terminal of the first capacitor means also being connected to the ground terminal by way of the seventh switch means,

the fourth switch means being connected between the output of the amplifier means and said other input of the amplifier, and

means for periodically connecting said one terminal of the input capacitor means to the output of the amplifier means.

4,714,844

LOGARITHMIC COMPRESSION CIRCUIT

Kazuhiko Muto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

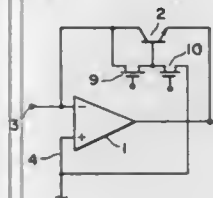
Filed Apr. 4, 1986, Ser. No. 848,292

Claims priority, application Japan, Apr. 11, 1985, 60-75273

Int. Cl.⁴ G06G 7/24; H03K 5/22, 17/687

U.S. Cl. 307—494

7 Claims



1. A logarithmic compression circuit comprising:

an operational amplifier having inverting and noninverting inputs and an output;

a transistor having an emitter, a collector and a base for logarithmic compression, one of the emitter and collector of said transistor being connected to the inverting input of said operational amplifier, the other of the emitter and collector of said transistor being connected to the output of said operational amplifier; and

switching means, connected between the base of said transistor and the non-inverting input of said operational amplifier, for connecting the base of said transistor to the non-inverting input of said operational amplifier in response to a generation of a low level signal at the inverting input of said operational amplifier and for connecting the base of said transistor to the inverting input of said operational amplifier in response to a generation of a high level signal at the inverting input of said operational amplifier.

4,714,845

LOW OFFSET VOLTAGE FOLLOWER CIRCUIT

Daniele Devecchi, Desio, and Guido Torelli, Alessio, both of Italy, assignors to SGS Microelettronica SpA, Agrate Brianza, Italy

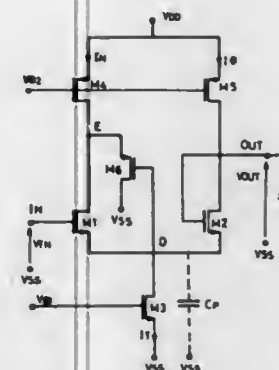
Filed Nov. 28, 1986, Ser. No. 936,112

Claims priority, application Italy, Nov. 27, 1985, 23010 A/85

Int. Cl.⁴ H03K 17/687, 19/003, 3/353; H03G 1/04

U.S. Cl. 307—496

8 Claims



1. A low offset voltage gain comprising at least one input terminal for connection to a voltage generator and at least one output terminal for connection to a load, and using complementary MOS type transistors, said voltage follower circuit comprising first, second and third transistors having a first type of conductivity, and fourth, fifth and sixth transistors having a second type of conductivity which is opposite to said first type of

conductivity, said first and second transistors having source electrodes connected to a drain electrode of said third transistor, said third transistor having source and gate electrodes which are respectively connected to a first terminal of a supply voltage source and to a first voltage reference means for keeping said gate electrode at a constant potential with respect to said first terminal of said supply voltage source, a gate electrode of the first transistor forming said input terminal of said follower circuit, said fourth and fifth transistors having source electrodes connected to a second terminal of said supply voltage source, said fourth and fifth transistors having gate electrodes connected to a second voltage reference means for keeping said gate electrodes at a constant potential with respect to said second terminal of said supply voltage source, said fourth transistor having a drain electrode connected to a drain electrode of said first transistor and to a source electrode of said sixth transistor, said sixth transistor having drain and gate electrodes which are respectively connected to said first terminal of said supply voltage source and to source electrodes of said first and second transistors, said second transistor having drain and gate electrodes connected to a drain electrode of said fifth transistor at a circuit node which forms said output terminal of said follower circuit.

4,714,846

APPARATUS FOR THE EXAMINATION OF OBJECTS WITH ULTRA-SOUND, COMPRISING AN ARRAY OF PIEZO-ELECTRIC TRANSDUCER ELEMENTS

Patrick R. Pesque, Perigny, and Jean-Marie C. Nicolas, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

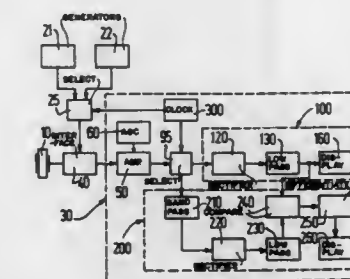
Filed Oct. 22, 1986, Ser. No. 921,982

Claims priority, application France, Oct. 25, 1985, 85 15849

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—317

2 Claims



1. An apparatus for the examination of objects with ultrasound, comprising:

a linear array of piezo-electric transducer elements each having a width W and a thickness T, wherein the thickness T of each of the transducer elements is equal to one half of a wavelength corresponding to a first frequency F for which on a diagram of curves $F \cdot T = f(W/T)$ of the distribution of the resonant frequencies there exists a first vibratory mode at the said first frequency F and a second vibratory mode at or near a second frequency equal to 2F; transmission means which excite the elements at the first frequency F using excitation signals having a spectrum which excludes the second frequency 2F; and means functionally connected to the elements for receiving and processing echo signals which are received by the elements at said frequency 2F.

4,714,847

ADVANCED PIEZOELECTRIC POWER SWITCHING DEVICES EMPLOYING PROTECTIVE GASTIGHT ENCLOSURE AND METHOD OF MANUFACTURE

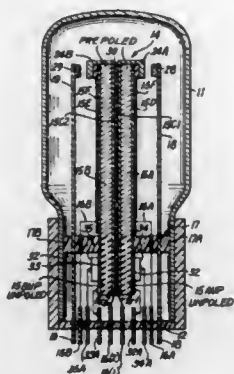
John D. Harnden, Jr., Schenectady; William P. Kornrumpf, Albany, and George A. Farrall, Rexford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1984, Ser. No. 685,108

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—332

27 Claims



1. A controlled atmosphere bender-type piezoelectric ceramic electrical switching device that is operated as a normally-open three-position switch comprising a gastight protective enclosure secured to a base member for supporting the enclosure and sealing closed the interior of the enclosure in a gastight manner, at least one bender-type piezoelectric ceramic switching device having movable contacts that is positioned between a pair of fixed contacts to close one of said fixed contacts upon selective energization of said bender-type switching device producing movement in the direction of said fixed contact whereas the other of said fixed contacts is closed upon successive selective energization of said bender-type switching device causing movement in the opposite direction toward said other fixed contact and with both of said fixed contacts being opened by return movement of said bender-type switching device to its original unenergized position when energization of said bender-type switching device is discontinued, said bender-type switching device comprising a bender member formed by a two juxtaposed selectively prepolarized ceramic planar plate elements secured together sandwich fashion with each plate element having at least inner and outer conductive surfaces formed on the planar surfaces thereof together with respective terminal means for selective application of energizing electric operating potentials to the prepolarized portions of the respective plate elements, said bender-type piezoelectric ceramic switching device being physically supported on said base member within said enclosure by clamping means secured on opposite sides of the bender member at non-prepolarized portions of the respective plate elements and physically supporting the bender member cantilever fashion with only the prepolarized portions thereof being freely movable whereas the non-prepolarized portions of said piezoelectric ceramic plate elements clamped under said clamping means remain both electrically neutral and physically unstrained, said movable contacts within said gastight enclosure being located on the prepolarized portions of the respective ceramic plate elements and moved by the free movable end of said bender member, said fixed contacts physically mounted within said gastight enclosure and selectively engageable by said movable contacts upon the selective application of an energizing electric operating potential to a respective one of the piezoelectric plate elements for causing the prepolarized portion of the bender member to bend and close the electric switch contacts of said bender-type piezoelectric ceramic electrical switching device to allow electric current flow therethrough, respective electrically conductive lead means connected to respective one of said coacting movable and fixed

contacts and extending to respective terminal means supported by said base member outside said protective gastight enclosure for selectively supplying electric load current to a load outside said enclosure via said coacting movable and fixed contacts, and switch energization circuit means operatively associated with said bender-type piezoelectric ceramic electrical switching device which selectively applies a source of bender energization potential to the prepolarized movable bender portion of each ceramic plate element in a successive manner and having the same polarity as the polarity of the prepolarized electric field previously permanently induced in said selectively prepolarized movable bender portion so that no depolarization of the ceramic plate elements occur during successive operations of the bender-type piezoelectric ceramic electrical switching device.

4,714,848

ELECTRICALLY INDUCED MECHANICAL PRECOMPRESSION OF FERROELECTRIC PLATES

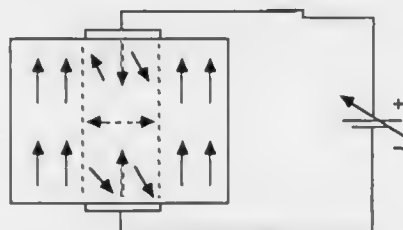
Peter J. Chen, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 2, 1987, Ser. No. 20,996

Int. Cl.⁴ H01L 41/08; H04R 17/00

U.S. Cl. 310—359

11 Claims



1. A method of mechanically precompressing a ferroelectric plate having opposed surfaces and including an outer portion surrounding a central portion, said method comprising the steps of:
electrically polarizing said plate, whereby the plate is axially stretched and laterally shrunk; and
electrically partially depolarizing only the central portion of said plate, whereby the central portion is laterally expanded against the outer portion of said plate.

4,714,849

LINEAR STEPPING MOTOR

Sakae Yamamoto, Atsugi, and Tsutomu Mizuno, Kanagawa, both of Japan, assignors to Amada Company, Limited, Japan

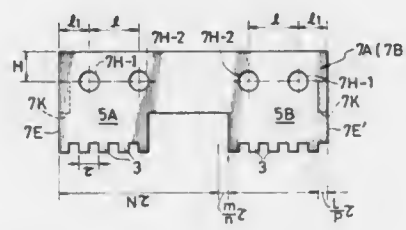
Filed Jul. 12, 1985, Ser. No. 754,131

Claims priority, application Japan, Feb. 9, 1985, 60-022770

Int. Cl.⁴ H02K 41/00

U.S. Cl. 310—12

4 Claims



1. A linear stepping motor comprising:
a long non-exciting iron core formed with a number of denticles having a constant pitch τ ;
a first exciting core having two field legs formed with a

number of denticles having a constant pitch τ , a first field leg of said two field legs arranged to provide no phase shift with respect to the denticles of said non-exciting iron core, a second field leg arranged to provide a phase shift of no more than $(L/P) \cdot \tau$ with respect to the same denticles of said non-exciting iron core, where L denotes an integer smaller than the number of field leg poles P ;
a second exciting core having the same shape and dimension of said first exciting core and having two field legs formed with a number of denticles having the constant pitch τ , a first field leg of said two field legs arranged to provide a phase shift of no more than $(L/P) \cdot \tau$, a second field leg arranged to provide no phase shift with respect to the denticles of said non-exciting iron core in diagonal phase-shift positional relationship between the field legs of said two exciting cores;
a pair of permanent magnets respectively mounted on said two excited iron cores; and
a yoke mounted on said pair of permanent magnets to form a magnetic field in a transverse direction of a longitudinal motion of said linear stepping motor.

4,714,850

STEPPING MOTOR

Yasuhiro Akiba, Osaka; Masato Namba, Katano; Seiji Kikuchi, Nishinomiya, and Hidenobu Soejima, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP85/00611, § 371 Date Jul. 8, 1986, § 102(e) Date Jul. 8, 1986, PCT Pub. No. WO86/03071, PCT Pub. Date May 22, 1986

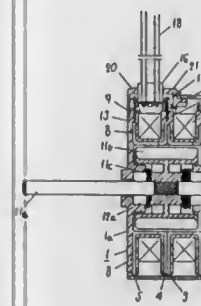
PCT Filed Nov. 5, 1985, Ser. No. 887,031

Claims priority, application Japan, Nov. 8, 1984, 59-235536

Int. Cl.⁴ H02K 37/00

U.S. Cl. 310—49 R

6 Claims



1. A stepping motor comprising:
a rotor which includes a columnar- or cylindrical-shaped permanent magnet magnetized in multiple poles on its periphery and a rotary shaft on its center,
a pair of first stator yokes having an inner radius that is slightly larger than an outer radius of said rotor and having plural pole teeth with uniform intervals in the axial direction and arranged so that a pair of said pole teeth are placed alternately and on a same periphery,
a pair of second stator yoke having an inner radius that is slightly larger than the outer radius of said rotor and having plural pole teeth with uniform intervals in the axial direction and arranged so that a pair of said pole teeth are placed alternately and on a same periphery and are disposed back to back on a same axis of said first stator yokes with a rotation of stepping angle,
a cylindrical housing monolithically resin-moulded together with said first yokes and said second yokes, a bearing holder member on one side end plane of said cylindrical housing and provided at its center with a bearing for rotatably holding said rotary shaft,
a coil bobbin member formed on an outer radius part of said cylindrical housing,
a stator coil winding wound on said coil bobbin,
a bracket which is inserted in an inner radius part of an open

side of said cylindrical housing and is provided with a bearing for rotatably holding said rotor shaft, and a frame of cup shape in which said stator is inserted and which combines said bearing holding member with said bracket.

4,714,851

SINGLE-PHASE SYNCHRONOUS MOTOR COMPRISING A TWO-POLE PERMANENT-MAGNET ROTOR

Leo Bertram, Stolberg, Fed. Rep. of Germany, and Hugo Schemmann, Schaesberg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

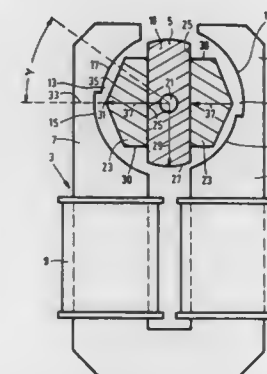
Filed May 21, 1986, Ser. No. 866,034

Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518694

Int. Cl.⁴ H02K 21/12

U.S. Cl. 310—156

8 Claims



1. A single phase synchronous motor comprising
a stator having two arcuate poles, each pole having an arc portion of large diameter and an arc portion of small diameter, said arc portions of large diameter being diametrically opposed, said arc portions of small diameter being diametrically opposed,
a two-pole permanent magnet rotor between the poles of said stator, said rotor having median plane in which the axis of rotation lies, the direction of magnetization of said rotor being parallel to said median plane, the peripheral surface of the rotor having a shape which deviates from a cylindrical shape, the dimension of the rotor in the direction of magnetization being largest near the median plane.

4,714,852

PERMANENT-MAGNET FIELD SYNCHRONOUS MOTOR

Shigeki Kawada; Yoichi Amemiya; Masatoyo Sogabe, all of Hachioji, and Kazushi Kumagai, Hino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP85/00473, § 371 Date Jun. 24, 1986, § 102(e) Date Jun. 24, 1986, PCT Pub. No. WO86/01651, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 28, 1985, Ser. No. 862,358

Claims priority, application Japan, Aug. 29, 1984, 59-178242

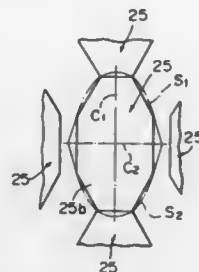
Int. Cl.⁴ H02K 21/12

U.S. Cl. 310—156

2 Claims

1. A permanent-magnet field synchronous motor comprising:
a rotor body having a cylindrical outer surface; and
a plurality of permanent magnets attached to said cylindrical outer surface of said rotor body, each of said permanent magnets having a constant thickness, such that an outer surface thereof extends circumferentially parallel with said cylindrical outer surface of said rotor body, each permanent magnet having a polygonal shape, said polygo-

nal shape having a shape approximating that formed by a contour line superimposed upon said rotor body, said contour line having the shape of a half-sine curve above a center line superimposed circumferentially around said rotor body and said contour line having a mirror image of the half-sine curve below the centerline, said polygonal



shape also being inscribed in said contour line, and wherein each of said plurality of permanent magnets have the same configuration and are arranged and spaced from one another circumferentially around said rotor body, and are arranged with at least one of said permanent magnets being adjacent to another in the axial direction of the rotor body.

4,714,853

LOW PROFILE ELECTRIC MOTOR

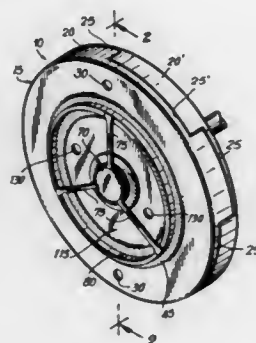
Albert Palmero, Harwinton, and Charles Hansen, Wolcott, both of Conn., assignors to Tri-tech, Inc., Waterbury, Conn.

Filed Sep. 4, 1986, Ser. No. 903,470

Int. Cl.⁴ H02K 21/14

U.S. Cl. 310-257

7 Claims



1. A synchronous electric motor comprising, in combination: an annular permanent magnet rotor having rotor poles of alternating polarity around its circumference; an outer stator comprising a first pair of pole pieces of annular configuration in opposed relationship with each other to form an annular space therebetween, each of said first pair of pole pieces being disposed around the outer periphery of said rotor, each said pole piece in said first pair including on its inner periphery spaced-apart, axially extending salient stator pole in magnetic flux relationship with the rotor poles, with the stator poles of the respective pole pieces being interleaved with one another; an inner stator comprising a second pair of pole pieces of annular configuration in opposed relationship with each other to form an annular space therebetween, each of said second pair of pole pieces being disposed within the inner periphery of said rotor, each said pole piece in said second pair including on its outer periphery spaced-apart, axially extending salient stator poles in magnetic flux relationship

with the rotor poles, with the stator poles of the respective pole pieces being interleaved with one another; first annular energizing means surrounding the outer periphery of the rotor and comprising electrically conductive wire annularly wound substantially entirely within the annular space between the first pair of stator pole pieces for producing a magnetic field in the salient stator poles of said first pair; and second annular energizing means within the inner periphery of the rotor and comprising electrically conductive wire annularly wound substantially entirely within the annular space between the second pair of stator pole pieces for producing a magnetic field in the salient stator poles of said second pair; and means for sequentially energizing said first and second energizing means to respectively produce the corresponding magnetic field with said fields in different phase relationship with each other.

4,714,854

ELECTRIC MOTOR WITH A MULTIPOLAR PERMANENT MAGNET ROTOR

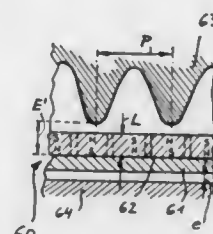
Claude Oudet, Besancon, France, assignor to Portescap, La Chaux-de-fonds, Switzerland

Filed Jun. 30, 1986, Ser. No. 880,160

Int. Cl.⁴ H02K 37/14

U.S. Cl. 310-328

6 Claims



2. An electric motor comprising a stator and a movable member with a multipolar permanent magnet formed of a magnetic material having a substantially linear demagnetization characteristic in the field of use of said multipolar permanent magnet, said movable member having two parallel, substantially planar surfaces on a first one of which appears the magnetic poles of said permanent magnet, said planar surfaces being spaced apart by a distance L substantially smaller than the diameter of said parallel surfaces, the direction of magnetization being perpendicular to said surfaces, and said permanent magnet having on said first one of said planar surfaces at least one series of magnetic poles of one polarity, the centers of said magnetic poles being spaced apart from each other by a length P measured along the path of their movement, said movable member comprising a flat yoke part of magnetically permeable material having a substantially constant thickness and forming the second of said substantially planar surfaces, the stator of the motor comprising at least one magnetic circuit coupled with at least one electric energizing coil, said circuit comprising at least one polar part facing said first substantially planar surface of the movable member and defining with said yoke part part of an air-gap having a width that varies along the direction of movement of said movable member and has a minimum value E', the regions where said minimum values occur being spaced along the direction of movement of said movable member at least approximately by said length P, wherein said minimum value E' satisfies the relationship $0.385 P + 1.4 \leq P/2E' \leq 0.706 P + 1.85$, P and E' being measured in mm.

4,714,855

PIEZO-ELECTRIC ACTUATOR AND STEPPING DEVICE USING SAME

Toshitaka Fujimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

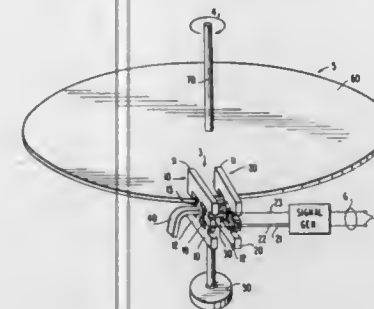
Filed May 7, 1986, Ser. No. 860,392

Claims priority, application Japan, May 7, 1985, 60-96225

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310-328

5 Claims



1. A stepping device comprising; a clamping assembly comprising first and second laterally spaced clamps, each clamp comprising two generally parallel arms having forward and rearward ends, first and second supports between said arms physically connecting said two arms at longitudinal spaced positions intermediate of said forward and rearward ends, one of said supports comprising an electric distortion element having elongation distortion in a direction tending to separate said arms, the other support constituting a hinge connection between said two arms, and a second electric distortion effect element fixedly connected at its end to respective sides of said supports constituting said hinge connection between the arms of said clamps, and a plate having an edge thereof positioned between opposed forward ends of said two arms of both clamps and mounted for movement in a direction through the gaps between the forward ends of said arms of said first and second clamps, such that controlled periodic application of electrical voltage selectively to said first electric distortion effect elements and said second electric distortion element of said assembly causes step movement of said plate relative to said first and second clamps.

4,714,856

COLOR CATHODE RAY TUBE WITH PLURAL ELECTRON GUN ASSEMBLIES

Shigeo Takenaka, Eiji Kamohara, and Takashi Nishimura, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

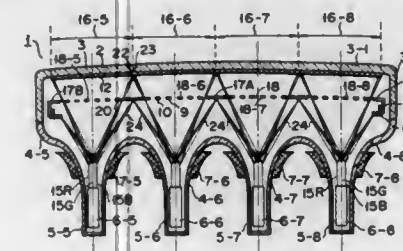
Filed May 1, 1986, Ser. No. 858,002

Claims priority, application Japan, May 10, 1985, 60-97901

Int. Cl.⁴ H01J 29/07, 29/50, 29/82, 29/86

U.S. Cl. 313-2.1

6 Claims



1. A color cathode ray tube comprising: a vacuum envelope including a panel having a single faceplate and a skirt extending from said faceplate, a plurality

of funnels coupled to said panel, and a plurality of necks respectively extending from said plurality of funnels; a plurality of electron gun assemblies respectively accommodated in said plurality of necks, each electron gun emitting a plurality of electron beams; a plurality of deflection units respectively mounted around said plurality of funnels, each deflection unit being arranged to deflect electron beams emitted from a corresponding one of said plurality of electron gun assemblies; a screen formed on said faceplate, including phosphor elements for emitting rays of different colors in response to impinging electron beams, and defined by a plurality of continuous segment regions scanned with electron beams emitted from corresponding ones of said plurality of electron gun assemblies and deflected by corresponding ones of said plurality of deflection units; and a mask received in the vacuum envelope and facing said faceplate and having a plurality of effective row and column regions corresponding to said plurality of segment regions and non-effective regions for surrounding and partitioning said effective row and column regions, said effective regions being provided with apertures for allowing passage of electron beams therethrough to impinge on said phosphor elements in the corresponding segment regions and said apertures being formed at predetermined pitches.

4,714,857

INFRARED REFLECTIVE LAMP WITH ENVELOPE HAVING STRAIGHT SECTIONS

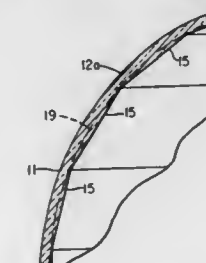
Irving S. Goldstein, Teaneck, N.J., assignor to Duro-test Corporation, North Bergen, N.J.

Filed Apr. 21, 1986, Ser. No. 854,324

Int. Cl.⁴ H01K 1/28, 1/32

U.S. Cl. 313-112

15 Claims



1. An incandescent electric lamp comprising: an envelope, a wall of the envelope having an inner curved surface and a generally curved outer surface, an incandescent filament located within said envelope, means connecting said incandescent filament to a source of electrical power to cause it to incandesce, the curved inner surface of said envelope defined by a plurality of interconnected, substantially flat chord surfaces interposed to each other at an angle, and a coating of infrared reflecting visible light transmissive material coated on the inner surface of the envelope, whereby the inner curved surface of the envelope and orientation of said chord surfaces reflect infrared energy radiated by said filament back toward said filament.

4,714,858

CAPPED ELECTRIC LAMP COMPRISING A METAL SLEEVE HAVING A CORNER DEPRESSION TO ENGAGE AN ASSOCIATED RECESS IN AN INSULATOR BODY

Rudolf Sanders, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

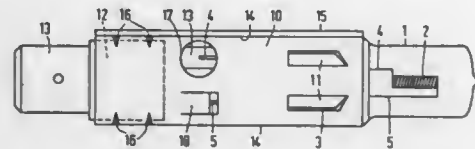
Continuation of Ser. No. 753,210, Jul. 9, 1985, abandoned. This application Mar. 5, 1987, Ser. No. 22,472

Claims priority, application Netherlands, Aug. 17, 1984, 8402524

Int. Cl.⁴ H01J 5/48, 5/50

U.S. Cl. 313-318

7 Claims



1. In a capped electric lamp comprising:

- a lamp vessel sealed in a vacuum-tight manner having an electric element arranged therein and having a pinch;
- a first and second current supply conductor, each conductor extending from the outside of said lamp vessel to said electric element, at least one conductor passing through said pinch;
- a metal sleeve having a substantially rectangular cross-section, said pinch of said lamp vessel being firmly fixed therein, said sleeve having a plurality of corners formed by intersections of respective planes of the sleeve;
- an insulator body having a substantially rectangular cross-section, said insulator body enclosed in said metal sleeve; and
- a contact member connected to said first current supply conductor, said contact member being immovably enclosed at least partially over its length by said insulator body and having one of its ends projecting from said insulator body and said metal sleeve;

the improvement wherein comprising said insulator body being immovably held in said metal sleeve by at least one depression in at least one corner of said metal sleeve, said depression engaging a recess of said insulator body, and said depression being mainly a plastic deformation.

4,714,859

MAGNETRONS

Michael J. Clark, Watford, England, assignor to The M-O Valve Company Limited, England

Filed Mar. 21, 1986, Ser. No. 842,318

Claims priority, application United Kingdom, Mar. 25, 1985, 8507721

Int. Cl.⁴ H01J 23/22

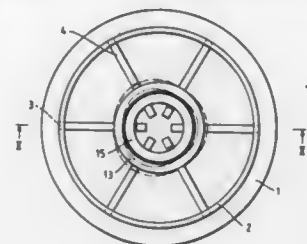
U.S. Cl. 315-39.67

7 Claims

1. A resonant cavity magnetron, comprising:

- a cylindrical anode having an axis and a plurality of inwardly extending radial vanes which together define multi-resonating cavities, said vanes having free edges;
- a cathode extending along the axis of said anode to define an interaction space between the free edges of said vanes and said cathode; and
- at least two coaxial straps of differing materials, said straps being connected to alternate different ones of said vanes and passing freely the vanes to which they are not connected, at least one of said straps having a greater coefficient of linear expansion than the vanes which it straps such that, on an increase in operating temperature, the straps with the greater coefficient of linear expansion will deform outwardly between its connections to its

associated vanes to reduce the inter-strap and strap-to-vane capacitance in such a manner as to compensate for



the frequency variation which would otherwise have been caused by the temperature rises.

4,714,860

ION BEAM GENERATING APPARATUS

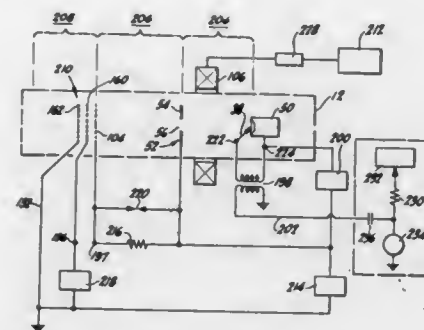
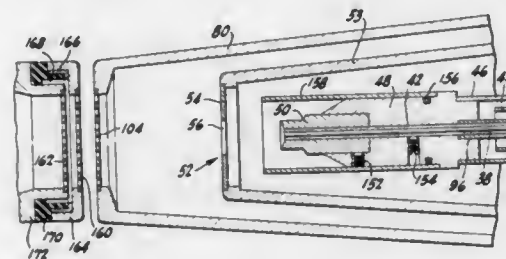
Ian G. Brown, 1088 Woodside Rd., Berkeley, Calif. 94708, and James Galvin, 2 Commodore #276, Emeryville, Calif. 94608

Filed Jan. 30, 1985, Ser. No. 696,460

Int. Cl.⁴ H01J 7/24; H05B 31/26

U.S. Cl. 315-111.81

10 Claims



1. An ion generating apparatus comprising:

- a structure providing a vacuum chamber;
- a cathode and an anode placed apart a selected distance in one region within said vacuum chamber;
- a source of electrical power defining an electrical potential between said cathode and anode;
- means for producing an electrical arc between said cathode and anode sufficient to vaporize and ionize a portion of said cathode to form a plasma;
- means for guiding said plasma away from said cathode and anode region in a predetermined direction to another region spaced from said anode and cathode;
- means for extracting ions from said plasma in said another region spaced from said cathode and anode region.

4,714,861

HIGHER FREQUENCY MICROCHANNEL PLATE

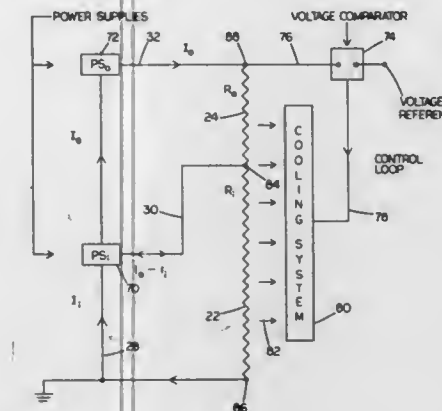
Christopher H. Tossy, Sturbridge, Mass., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

Filed Oct. 1, 1986, Ser. No. 913,955

Int. Cl.⁴ H01J 7/24, 43/00

U.S. Cl. 315-117

11 Claims



1. A microchannel plate comprising a plurality of arrays, a first array in an electron-amplifying direction from a second array having a surface zone resistance lower than that of said first array.

- In combination, a microchannel plate, a constant-current power supply for imposing voltage to cause current flow in said microchannel plate, cooling means for said microchannel plate, and control means to regulate said cooling means to maintain operation of said microchannel plate at a predetermined temperature.

4,714,862

CIRCUIT ARRANGEMENT FOR IGNITING AND OPERATING GAS DISCHARGE LAMPS

Horst Dannert, Aachen; Hans-Günther Ganser, Stolberg; Ralf Schäfer, Aachen, and Hans-Peter Stormberg, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

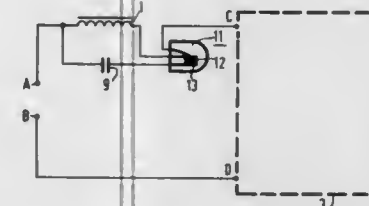
Filed Oct. 15, 1985, Ser. No. 787,394

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 3438002

Int. Cl.⁴ H05B 37/00

U.S. Cl. 315-244

11 Claims



- A circuit arrangement for igniting and operating gas discharge lamps comprising: a choke coil connected between a lamp and an a.c. supply source and having an inductance L, an ignition device connected to the lamp, a capacitor having a capacitance C connected in parallel with at least a part of the choke coil in order to pass an ignition current to the lamp that is higher than the normal lamp operating current, characterized in that the capacitor has a capacitive reactance that lies in a range between a minimum capacitive reactance of 3 times the

choke coil inductive reactance and a capacitive reactance of approximately 20 times the choke coil inductive reactance.

4,714,863

VIBRATION DAMPING MEANS FOR THE LINE CATHODES OF AN IMAGE DISPLAY APPARATUS

Toshinobu Yokoyama, Hirakata; Sadao Watanabe, Ashiya, and Takatsugu Kurata, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

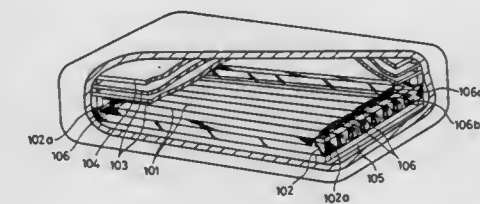
Filed Aug. 15, 1985, Ser. No. 766,003

Claims priority, application Japan, Aug. 30, 1984, 59-181324; Sep. 10, 1984, 59-189015

Int. Cl.⁴ H01J 29/70

U.S. Cl. 315-366

6 Claims



1. An image display apparatus comprising:

- line cathodes for emitting electron beams;
- electron beam controlling means for controlling convergence, deflection and intensity of said electron beams;
- a phosphor screen having a phosphor layer which emits light at impingement by said electron beams;
- supporting means for supporting and stretching said line cathodes;
- vibration damping means having at least a damping string which is provided across and lightly touching said line cathodes; and
- a vacuum enclosure containing the above-mentioned components therein.

4,714,864

THROTTLE CONTROL DEVICE FOR VEHICLES

Kazutoshi Yogo, and Hideo Wakata, both of Nagoya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

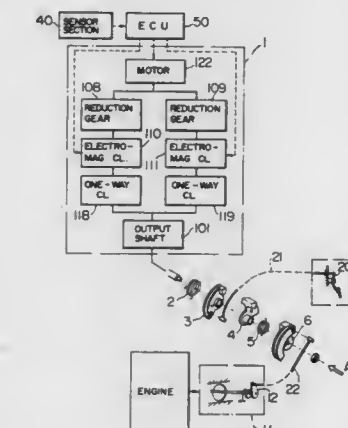
Filed May 23, 1986, Ser. No. 866,348

Claims priority, application Japan, May 27, 1985, 60-113932; Feb. 11, 1986, 61-28324

Int. Cl.⁴ B60K 31/00; F02D 29/00

U.S. Cl. 318-52

17 Claims



- A vehicle engine throttle control device comprising: control means having at least one of first means to effect traction control for reducing the opening of a throttle valve of the vehicle engine upon detection of any slip of driving wheels of the vehicle, and a second means to

effect an automatic drive control for controlling the vehicle cruising speed in conformity with a command speed; a first lever operatively connected to an accelerator of the vehicle;

said control means including an actuator for producing an actuating power in accordance with throttle opening control instructions;

a second lever operatively connected to said actuator so as to be actuated by said actuating power of said actuator, said second lever being operatively connected also to an engine throttle valve so as to be able to vary the opening of said throttle valve;

a third lever adapted to be urged by said first lever and by said second only in one direction; and

spring means disposed between said third lever and one of said first and second levers, said spring means being operative, when said second lever is moved with respect to said first lever in a direction to close said throttle valve, to prevent said one lever from being moved by said second lever.

17. A vehicle engine throttle control device comprising: control means having at least one of a first means to effect traction control for reducing the opening of a throttle valve of the engine upon detection of any slip of driving wheels of the vehicle, and a second means to effect automatic drive control for controlling the vehicle cruising speed in conformity with a command speed;

a lever operatively connected to an accelerator of the vehicle;

said control means including an actuator for producing an actuating power in accordance with throttle opening control instructions;

another lever operatively connected to said actuator so as to be actuated by said actuating power of said actuator, the another lever being operatively connected to said throttle valve so as to be able to vary the opening of said throttle valve; and

spring means arranged to resiliently act between said levers such that, when the first-said lever is moved in a direction to open said throttle valve, the another lever is also moved in the same direction and such that, when the another lever is moved independently of the first-said lever in a direction to close said throttle valve, said spring means takes up at least a part of the movement of the another lever to prevent the first-said lever from being moved by the another lever.

4,714,865

OVERLOAD PROTECTION DEVICE

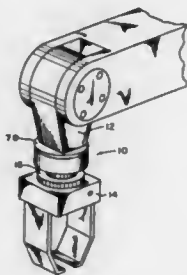
Laurence D. Chin, West Newton; Christopher J. Hiscock, Georgetown, and Wayne H. Domeler, Boston, all of Mass., assignors to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Jun. 12, 1986, Ser. No. 873,619

Int. Cl.⁴ G05B 9/02

U.S. Cl. 318—563

18 Claims



1. An overload protector adapted to be secured between a robot arm and a tool, comprising:

a cylinder having a central axis, an open end and a closed end,

a floating piston located within the cylinder and having a central axis,

a plurality of electromagnetic sensors for generating an electronic signal proportional to the strength of the sensed electromagnetic field secured to the cylinder and lying in a common plane normal to the cylinder axis and equally spaced, angularly, relative to the cylinder axis,

a magnet for generating an electromagnetic field associated with each sensor, the magnets being secured to the piston in a common plane normal to the piston axis and equally spaced, angularly, relative to the piston axis,

means for pressurizing the closed end of the cylinder to move the piston toward the open end,

means to limit the movement of the piston toward the open end of the cylinder at a position where the common plane of the magnets and the common plane of the sensors are coincident, and

means responsive to the electronic signals from the sensors for depressurizing the cylinder when the piston and cylinder are moved relative to each other and the piston moves toward the closed end of the cylinder and the common plane of the magnets and the common plane sensors are moved out of coincidence and the resultant relative movement between at least one magnet and its associated sensor cause a signal to be generated by at least one of the sensors to deviate substantially from a predetermined value.

4,714,866

RATE-OF-CHANGE SIGNAL GENERATOR USING SAMPLING TECHNIQUES

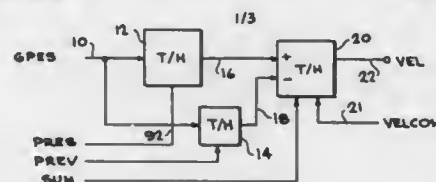
Rudolph J. Sterner, Cupertino, and Steven Harris, Milpitas, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 28, 1986, Ser. No. 856,730

Int. Cl.⁴ G05B 21/02

U.S. Cl. 318—636

11 Claims



1. An apparatus for generating a first signal related to the rate of change of a second analog signal which has a constant value during each of a plurality of successive frame sample times comprising:

a first track and hold amplifier for tracking and holding the amplitude of said second signal at a first time during each frame sample time;

a second track and hold amplifier for tracking and holding the amplitude of said second signal at a second time during each frame sample time;

means for determining the amplitude difference in the amplitudes of the samples held in said first and second track and hold amplifiers; and

means for tracking and holding the amplitude of the difference signal at a third time between said first and second times in each successive frame sample time following the first frame sample time.

4,714,867

METHOD AND APPARATUS FOR CONTROLLING A STEPPER MOTOR WITH A PROGRAMMABLE PARABOLIC VELOCITY PROFILE

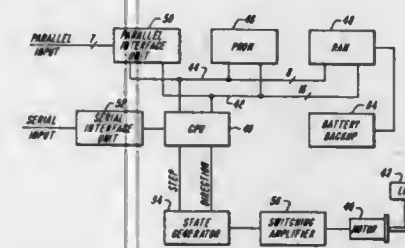
Simyon Palmin, Sharon, and Vladimir Shlain, Brookline, both of Mass., assignors to Design Components Incorporated, Franklin, Mass.

Filed Sep. 30, 1986, Ser. No. 913,537

Int. Cl.⁴ H02P 8/00

U.S. Cl. 318—696

16 Claims



1. A method for controlling a stepper motor comprising: supplying to the stepper motor a series of electrical pulses of suitable amplitude and pulse width to advance the stepper motor; and controlling the times between said pulses to provide a parabolic stepper motor velocity profile between a start/stop velocity V_0 at a time $t=0$ and a maximum velocity V_m at a time $t=T$.

4,714,868

CHARGING AND DISCHARGING CONTROL CIRCUIT FOR A STORAGE BATTERY

Toshio Maruyama; Noriaki Shibuya, and Yukihiko Nakata, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

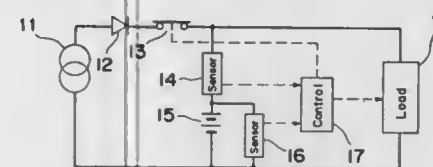
Filed Oct. 3, 1985, Ser. No. 783,565

Claims priority, application Japan, Oct. 4, 1984, 59-209449

Int. Cl.⁴ H02J 7/00

U.S. Cl. 320—5

6 Claims



1. A charging and discharging control circuit for a storage battery, comprising:

charging control means for detecting a voltage across said storage battery and disabling the charging of said battery when said voltage reaches a first predetermined level; and discharging control means for detecting the total amount of voltage discharged from said battery and disabling the discharging of said battery when said total amount of voltage reaches a second predetermined level, said charging control means resetting said discharging control means simultaneously with the disabling of said charging of the storage battery.

4,714,869

EXCITATION CONTROL APPARATUS FOR SYNCHRONOUS MACHINE

Naganori Onitsuka, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

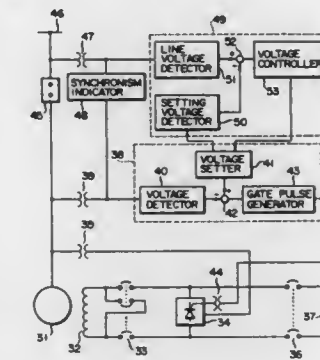
Filed Jul. 7, 1986, Ser. No. 882,393

Claims priority, application Japan, Jul. 10, 1985, 60-150115

Int. Cl.⁴ H02P 9/30

U.S. Cl. 322—20

4 Claims



1. An excitation control apparatus for controlling an excitation of a synchronous machine comprising: voltage setting means for previously generating an output voltage equal to a rated output voltage of a synchronous machine; voltage control means for controlling the output voltage of said voltage setting means so that the output voltage thereof becomes equal to a voltage of a line at a time when said synchronous machine is started; first voltage detecting means for detecting an output voltage of said synchronous machine; and voltage adjusting means for automatically controlling an excitation current of the synchronous machine after the synchronous machine has been started so that the output voltage of the synchronous machine becomes equal to the output voltage of the line.

4,714,870

ARRANGEMENT FOR CONTROLLING AN A.C. VOLTAGE

Alf B. Nilsson, Malmö, Sweden, assignor to Aktiebolaget Electrolux, Sweden

Filed Oct. 23, 1986, Ser. No. 922,337

Claims priority, application Sweden, Nov. 7, 1985, 8505272

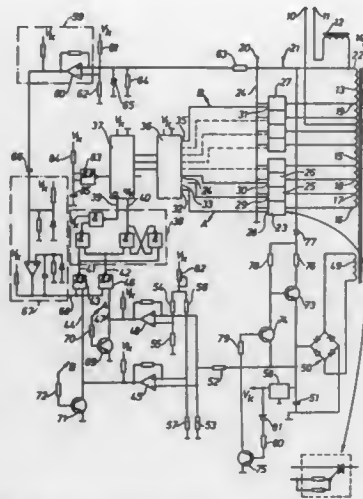
Int. Cl.⁴ G05F 1/20

U.S. Cl. 323—258

4 Claims

1. In an arrangement for controlling on A.C. voltage for supplying a load wherein the load is connected to the secondary winding of a transformer, the primary winding of the transformer has a number of taps which are selectively connectable to an external A.C. voltage source, an electronic control device is responsive to the magnitude of the terminal voltage of the external A.C. voltage source for stepwise connecting the different taps automatically to thereby connect that tap which causes the voltage supplied to the load to be of a predetermined value, the electronic control device comprising controllable two-way electronic switches, the number of which corresponds to the number of said taps, the improvement wherein the electronic control device further comprises means connected to control the operation of the electronic control device so as to close the switch to be activated next before the switch then conducting is opened whereby the last

two mentioned switches are only momentarily closed at the same time to short circuit a portion of the secondary winding



and the phase shift between the voltage and current therein is momentarily eliminated.

4,714,871

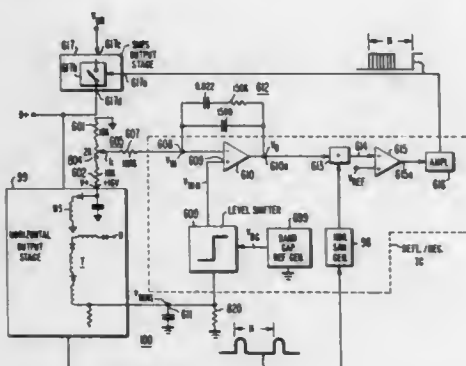
LEVEL SHIFTER FOR A POWER SUPPLY REGULATOR IN A TELEVISION APPARATUS

Jack Craft, Bridgewater; Michael L. Low, Dover, and Bernard J. Yorkanis, S. Plainfield, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 18, 1986, Ser. No. 943,187
Int. Cl.⁴ G05F 3/20

U.S. Cl. 323—315

19 Claims



1. A power supply that includes a level shifter that level shifts an input voltage that controls an output voltage of said power supply, comprising:

- a source of supply voltage;
- a controllable conductive element coupled to said supply voltage for generating therefrom said output voltage;
- means, including a comparator, coupled to said conductive element for varying, in accordance with an output signal of said comparator, the conduction of said conductive element to control said output voltage;
- a current mirror arrangement including a transistor and responsive to a current in a first circuit branch for generating a current in a first main current conducting electrode of said transistor that is the current mirror of said current in said first circuit branch, said first main current conducting electrode being coupled at a junction terminal to a second circuit branch for conducting at least a portion of a current in said second circuit branch;
- a source of said input voltage coupled to said transistor for varying said current in said first main current conducting

electrode to produce a current that varies in accordance with said input voltage and that is related to a difference between said current in said first main current conducting electrode and said current in said second circuit branch;

a first resistance coupled to said junction terminal for conducting said difference related current to develop a voltage thereacross that varies in accordance with said input voltage; and

- a source of temperature compensated first voltage coupled via said first resistance to said junction terminal such that said voltage across said resistance is combined with said first voltage for developing a temperature compensated second voltage at said junction terminal that varies in accordance with said input voltage and that is level shifted in accordance with said first voltage, said temperature compensated, level shifted, second voltage being coupled to an input of said comparator for varying said output signal of said comparator in accordance therewith to control said output voltage.

4,714,872

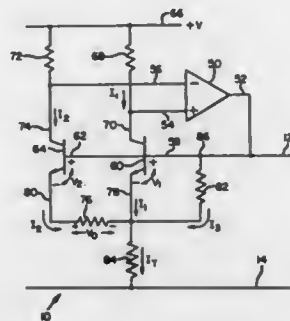
VOLTAGE REFERENCE FOR TRANSISTOR CONSTANT-CURRENT SOURCE

Einar O. Traa, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 10, 1986, Ser. No. 884,119
Int. Cl.⁴ G05F 3/20

U.S. Cl. 323—314

12 Claims



1. In an electrical circuit that includes a first semiconductor device which has a first junction of semiconductor materials characterized by a temperature-varying conduction voltage and which receives an applied voltage to provide at a particular temperature a constant current flow across the first junction, a method of developing an applied voltage that maintains a substantially temperature-invariant constant current flow across the first junction, comprising:

- selecting a second semiconductor device which has a second junction characterized by a temperature-varying conduction voltage which is substantially the same as that of the first junction of the first semiconductor device;
- developing from the second semiconductor device a first current component which changes in direct proportion to the temperature-varying conduction voltage of the second junction;
- developing from the second semiconductor device a second current component which flows across the second junction and which changes in direct proportion to the temperature-varying conduction threshold voltage of the second junction;
- proportioning and summing the first and second current components to provide a composite current which remains substantially constant independent of temperature;
- developing a constant voltage which is proportional to the composite current; and
- forming the applied voltage as the sum of the constant voltage and the temperature-varying conduction voltage of the second junction, thereby to provide an applied voltage

having a temperature-varying component that compensates for temperature variations in the voltage of the first semiconductor device and a constant voltage component that causes the first semiconductor device to maintain constant current flow across the first junction.

4,714,873

MICROWAVE NOISE MEASURING APPARATUS

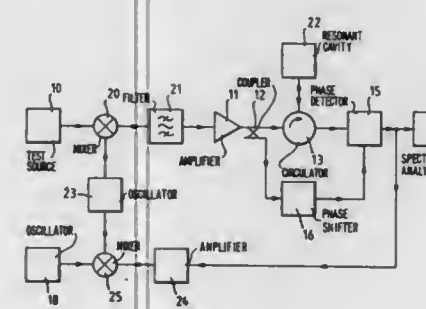
Hugh McPherson, Tweeddale, and Jeffrey Stoker, Edinburgh, both of Scotland, assignors to Ferranti, plc, Cheadle, England
Filed Aug. 19, 1986, Ser. No. 897,800

Claims priority, application United Kingdom, Aug. 23, 1985, 8521184

Int. Cl.⁴ G01R 23/16; G01S 7/40

U.S. Cl. 324—57 N

6 Claims



1. Apparatus for measuring the phase noise content of the output of a microwave signal source, which includes a microwave cavity resonant at a fixed frequency differing from that of the source by between 1% and 10% of the cavity resonant frequency, signal generating means operable to generate a signal representing the difference between the frequency generated by the microwave signal source and the resonant frequency of the cavity, mixing means operable to combine the outputs of the microwave signal source and of the signal generating means to provide a signal having a frequency equal to the resonant frequency of the cavity for application thereto, and phase detector means responsive to an output from the cavity and to an output from the mixing means in phase quadrature therewith to provide a signal representing the phase noise content of the output of the microwave signal source.

4,714,874

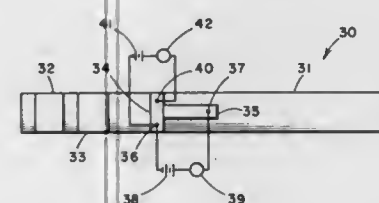
TEST STRIP IDENTIFICATION AND INSTRUMENT CALIBRATION

James R. Morris, South Bend, and James A. White, Elkhart, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Nov. 12, 1985, Ser. No. 797,214
Int. Cl.⁴ G01R 27/02; G01N 21/78

U.S. Cl. 324—65 R

2 Claims



1. A method for identifying a reagent test device having an electrically conductive region and calibrating a reagent test device measuring instrument for the identified reagent test device comprising

- contacting a conductive region of a reagent test device in a first location with electrical probes to make a first resistance or conductance measurement signal,
- contacting the same or a different conductive region of said

reagent test device in a second location with electrical probes to make a second resistance or conductance measurement signal,

ratioing the first and second measurement signals, and transmitting the ratioed signals to an instrument, thereby identifying the reagent test device and calibrating said instrument.

4,714,875

PRINTED CIRCUIT BOARD FAULT LOCATION SYSTEM

John W. Bailey; Paul A. Hayter; Brian R. Mason, and Graham N. Turner, all of Berkshire, England, assignors to Mars, Inc., McLean, Va.

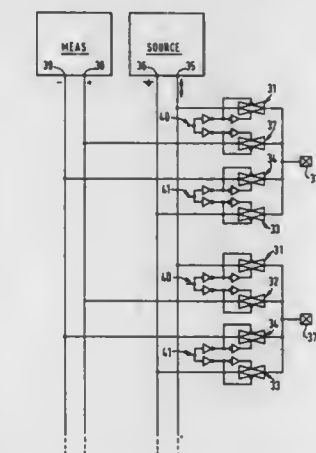
Filed Apr. 12, 1985, Ser. No. 722,406

Claims priority, application United Kingdom, Apr. 16, 1984, 8409794; Mar. 29, 1985, 8508319

Int. Cl.⁴ G01R 31/28, 31/02

U.S. Cl. 324—73 PC

21 Claims



1. A fault location system for testing the viability of components on a printed circuit board under test, said system comprising an array of bidirectionally current conducting analog switching networks each of said switching networks connected to a test point suitable for connection to a node of said printed circuit board, a stimulus source means for selective application of stimuli to components on said printed circuit board, a measurement facility selectively connectable to enable the response of components on said printed circuit board to said stimuli to be measured, means for establishing a source of reference potential, and control means arranged to control the switching networks so as selectively to connect said test points either to said stimulus source or to said reference potential source and simultaneously also to a corresponding input of said measurement facility, said switching networks each comprising four bidirectionally current conducting solid-state analog switches each having a control electrode addressable by said control means for determining the current conduction condition of the respective switch, a first of said switches in each said switching network having its current conduction path connected between a terminal of said stimulus source and the respective test point and its control electrode connected to a first selection terminal of the control means, a second of said switches in each said switching network having its current conduction path connected between said test point and a terminal of said reference potential source and its control electrode connected to a second selection terminal of the control means, a third of said switches in each said switching network having its current conduction path connected between said test point and a first terminal of said measurement facility and its control electrode connected to a third selection terminal of the control means, and a fourth of said switches in each said switching network having its current conduction path connected between said test point and a second terminal of said measure-

ment facility and its control electrode connected to a fourth selection terminal of the control means.

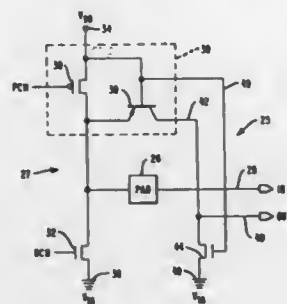
4,714,876

CIRCUIT FOR INITIATING TEST MODES

Richard B. Gay, and Harold S. Crafts, both of Fort Collins, Colo., assignors to NCR Corporation, Dayton, Ohio
Filed Apr. 14, 1986, Ser. No. 851,620
Int. Cl.⁴ G01R 17/02

U.S. Cl. 324—73 R

4 Claims



1. In an input/output circuit having a p-channel output driver transistor, an n-channel output driver transistor and a pad connected between the p-channel output driver transistor and the n-channel output driver transistor, said pad for receiving signals to be inputted into said input/output circuit and for being driven by the n-channel output driver transistor and the p-channel output driver transistor for providing output signals, said p-channel output driver transistor formed on an n-type substrate and having its source connected to a reference terminal for receiving a reference voltage, its drain connected to the pad, and its gate for receiving output drive signals, means for adding a function to the input/output circuit comprising:

- a parasitic PNP transistor having its emitter formed by the drain of said p-channel output driver transistor, its base formed by the substrate of said p-channel output driver transistor for providing an emitter-base junction, and its collector formed by a p-diffusion in said substrate, said collector controlled by said emitter-base junction such that current flows therethrough when a voltage is applied to said pad which is sufficient to forward bias said emitter-base junction, and does not flow when said emitter-base junction is reversed biased;
- a load device connected to said collector for providing an electrical load when said emitter-base junction is forward biased; and
- a conductor connected intermediate said collector and said load device for providing an added function voltage of a first level when said emitter-base junction is forward biased, and for providing an added function voltage of a second level when the enabling voltage applied to said pad is not sufficient to forward bias said emitter-base junction.

4,714,877

THREE-VOLTAGE LEVEL DETECTOR FOR INDICATING A HIGH LEVEL, MID-LEVEL OR LOW LEVEL VOLTAGE

Samuel K. Kong, Union City, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1985, Ser. No. 803,467

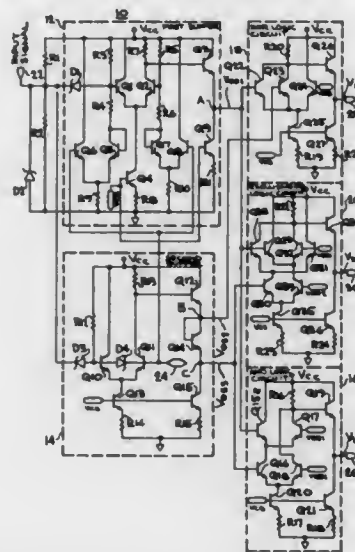
Int. Cl.⁴ G01R 19/14

U.S. Cl. 324—133

16 Claims

1. A three-voltage level detector comprising:
input means for receiving at an input terminal of the detector an input logic signal having either a high level, mid-level or low level voltage;
first level sensing buffer means responsive to said input logic signal for generating a first output sense voltage indicative

of whether said input logic signal is either at the (a) high level voltage or (b) mid-level or low level voltage;
said first sensing means including a differential amplifier formed of first and second bipolar transistors having their emitters coupled together, said first transistor defining an input transistor and having its base coupled to said input logic signal, said second transistor defining a reference transistor and having its base coupled to a first sensing voltage;
second level sensing means responsive to said input logic signal for generating a second output sense voltage indicative of whether said input logic signal is either at the (a) high level or mid-level voltage or (b) low level voltage;



- first logic means responsive to said first and second output sense voltages for generating at a first output terminal of the detector a first output signal being in a high level only when said input logic level is at the high level voltage;
second logic means responsive to said first and second output sense voltages for generating at a second output terminal of the detector a second output signal being in a high level only when said input logic level is at the low level voltage; and
third logic means responsive to said first and second output sense voltages for generating at a third output terminal of the detector a third output signal being in a high level only when said input logic level is at the mid-level voltage.

4,714,878

APPARATUS FOR FORMING THE ACTUAL VALUE OF A TORQUE IN A THREE-PHASE SYNCHRONOUS MACHINE WITH CURRENT-BLOCK FEEDING

Rolf-Jürgen Steinigeweg, Herzogenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 18, 1986, Ser. No. 840,697

Claims priority, application Fed. Rep. of Germany, May 6, 1985, 3516208

Int. Cl.⁴ G01L 3/00; H02P 5/00

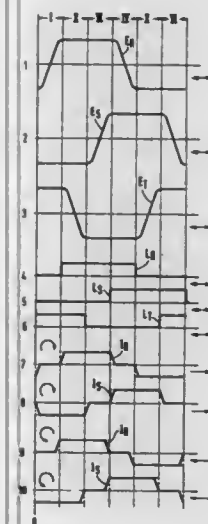
U.S. Cl. 324—158 MG

6 Claims

6. An apparatus for forming an actual value of a torque exerted in a three-phase synchronous machine, said synchronous machine having current-block feeding wherein three a-c current signals are fed to respective windings of said synchronous machine, each of said signals taking the form of a positive rectangular waveform having pulses interleaved in time with pulses of a negative rectangular waveform, each pulse of one of the waveforms being spaced in time from each adjacent pulse of the other of said waveforms by 60° of an operating cycle of said synchronous machine, each of said signals being staggered in time with respect to the other two of said signals

by 120° of the operating cycle of said synchronous machine, the pulses of said waveforms having leading and trailing edges whose current levels change in finite amounts of time, said apparatus comprising:

- first generating means for producing a first measurement signal proportional to the current of one of the a-c current signals;
- second generating means for producing a second measurement signal proportional to the current of another of said a-c current signals;
- first inverter means connected to said first generating means for generating a first inverted signal equal in magnitude and opposite in polarity to said first measurement signal;
- second inverter means connected to said second generating means for generating a second inverted signal equal in magnitude and opposite in polarity to said second measurement signal;
- switching means operationally linked to said first and said second generating means and to said first and said second



- inverter means for selectively transmitting said first and said second measurement signal and said first and said second inverter signal;
- adding means operatively coupled to said switching means for generating sums of signals transmitted therefrom;
- third generating means responsive to rotation of a rotor of said synchronous machine for producing a plurality of signals containing information as to the leading and trailing edges of the pulses of the a-c current signals; and
- control means operatively tied to said switching means and said third generating means for operating said switching means at the beginnings of six equispaced time intervals during the operating cycle of said synchronous machine to transmit to said adding means one of said first and said second measurement signal and said first and said second inverted signal during four of said time intervals and to transmit to said adding means one of said first measurement signal and said first inverted signal and one of said second measurement signal and said second inverted signal during the other two of said time intervals.

4,714,879

HOLDING AND TESTING DEVICE FOR ELECTRONIC MODULES WITHIN FLAT CARRIERS

Bernd Krause, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

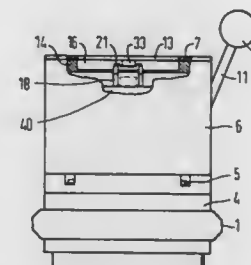
Filed Sep. 17, 1986, Ser. No. 908,238

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533658

Int. Cl.⁴ G01R 31/02, 1/04

U.S. Cl. 324—158 F

19 Claims

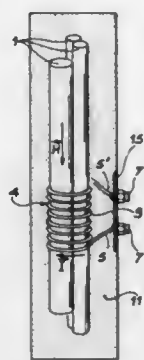


1. A holding and testing device for electronic modules having terminal legs lying in a single plane for connection to a test installation, the electronic modules being mounted in flat carriers having openings for positional fixing, comprising:

- a movable plate;
- an arrangement of spring contacts on said movable plate for conductive connection between individual terminal legs of a module and the test installation;
- fixing pins extending from said movable plate for engagement with said openings in said flat carriers;
- guide pins having beveled free ends and extending from said movable plate parallel to and in the same direction as said arrangement of spring contacts;
- a perforate plate including a receptacle formed as a trough for said flat carrier, said perforate plate being above said movable plate and including clearances corresponding to individual ones of said spring contacts and to said fixing pins and to said guide pins;
- said spring contact arrangement being displaceable relative to said receptacle;
- said fixing pin in an initial latched position having free ends projecting through said clearances in said perforate plate and engaging said openings of said flat carrier in said receptacle trough;
- first and second horizontally displaceable slides in said perforate plate and including at least one engagement opening in each slide for said guide pins;
- each of said guide pins having a tip lying against the edge of a respective one of said engagement openings when in an initial latched position so that said first and second slides are horizontally movable toward one another upon vertical displacement of said guide pins;
- laterally extending tongues affixed to said first and second slides and extending over said flat carrier when said slides are horizontally displaced to fix the electronic module in position in combination with said fixing pins; and
- said movable plate being movable into a latched test position wherein said spring contacts produce electrical connections to individual terminal legs of the electronic module.

4,714,880
WIDE FREQUENCY PASS BAND MAGNETIC FIELD DETECTOR
 Paul Charmet, Montlbery, France, assignor to Commissariat a l'Energie Atomique, Paris, France
 Filed Jun. 5, 1986, Ser. No. 870,872
 Claims priority, application France, Jun. 7, 1985, 85 08665
 Int. Cl.⁴ G01R 33/02; H01F 17/04
 U.S. Cl. 324—258

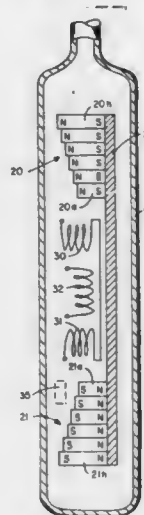
9 Claims



1. A magnetic field detector comprising:
 at least one bar of a ferromagnetic material about which are wound in a single layer several loops of a conductive coaxial cable which is cut at a point midway between the two ends of said cable into half-portions including a first portion and a second portion wherein said first and second portions are connected in such a way that the sheath of the first portion is connected to the core of the second portion and the sheath of the second portion is connected to the core of the first portion, each of said ends of the cable being used for measuring an output voltage of the detector, said voltage being indicative of a magnetic field to be detected.

4,714,881
NUCLEAR MAGNETIC RESONANCE BOREHOLE LOGGING TOOL
 Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.
 Filed Jul. 15, 1986, Ser. No. 885,634
 Int. Cl.⁴ G01R 33/20
 U.S. Cl. 324—303

6 Claims

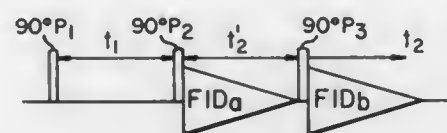


1. A nuclear magnetic resonance borehole logging tool comprising:
 (a) an elongated logging sonde,
 (b) a first array of magnets positioned within said sonde and

polarized in a direction perpendicular to the longitudinal axis of said sonde,
 (c) a second array of magnets positioned within said sonde at an axially spaced-apart position from said first array and polarized in a direction perpendicular to the longitudinal axis of said logging sonde such that it is 180° out-of-phase with the polarization of said first array,
 (d) magnetic material positioned within said logging sonde in juxtaposition with a first set of common poles of the magnets of said first array,
 (e) magnetic material positioned within said logging sonde in juxtaposition with a second set of common poles of the magnets of said second array which are of opposite polarity to that of said first set of common poles, and
 (f) means for positioning and orienting said logging sonde against the wall of a borehole such that said first and second arrays are in juxtaposition with the borehole wall and said magnetic material is between both said first set of common poles of said first array and said second set of common poles of said second array and the borehole fluid, whereby the magnetic lines of induction between said first and second arrays travel outward into the formation surrounding the borehole to create a homogeneous static magnetic field parallel to the axis of the borehole and travel inward through said magnetic material to create a weaker static magnetic field in the direction of said borehole fluid.

4,714,882
TWO-DIMENSIONAL NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY METHOD
 Kuniaki Nagayama, Tokyo, Japan, assignor to JEOL, Ltd., Tokyo, Japan
 Filed Nov. 18, 1985, Ser. No. 799,128
 Claims priority, application Japan, Dec. 14, 1984, 59-263988
 Int. Cl.⁴ G01R 33/20
 U.S. Cl. 324—307

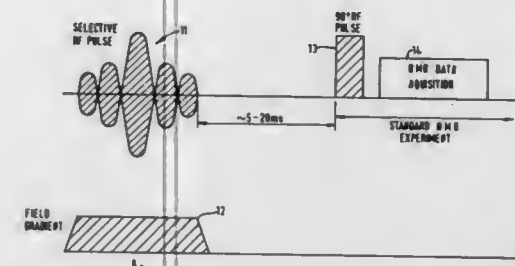
4 Claims



1. A two-dimensional nuclear magnetic resonance spectroscopy method comprising the steps for:
 (a) applying a pulse train consisting of at least three RF pulses having the same phase to a nucleus to be observed, the pulses containing the resonance frequency of the nucleus, then detecting free induction decay signal FIDa emanating from the nucleus during interval t_1 between the second and third pulses of the pulse train, detecting free induction decay signal FIDb emanating from the nucleus during interval t_2 subsequent to the third pulse of the pulse train, and storing these two signals in first and second data files, respectively;
 (b) repeating the step (a) above N times while putting at least one of the three pulses of the pulse train out of phase with the others, storing the free induction decay signals FIDa and FIDb obtained by each measurement in their respective data files;
 (c) repeating the steps (a) and (b) with different values of the interval t_1 between the first and second pulses of the pulse train;
 (d) forming a linear combination of data items stored in the data files assigned either to the free induction decay signals FIDa or to FIDb; and
 (e) subjecting the formed data to double Fourier transformation with respect to t_2 or t_2' and t_1 .

4,714,883
METHOD AND APPARATUS FOR OBTAINING LOCALIZED NMR SPECTRA
 Roger Ordridge, Eynsham, England, assignor to Oxford Research Systems Limited, Eynsham, England
 Filed Jun. 18, 1985, Ser. No. 746,191
 Claims priority, application United Kingdom, Jun. 21, 1984, 8415852; Mar. 13, 1985, 8506457
 Int. Cl.⁴ G01R 33/20
 U.S. Cl. 324—309

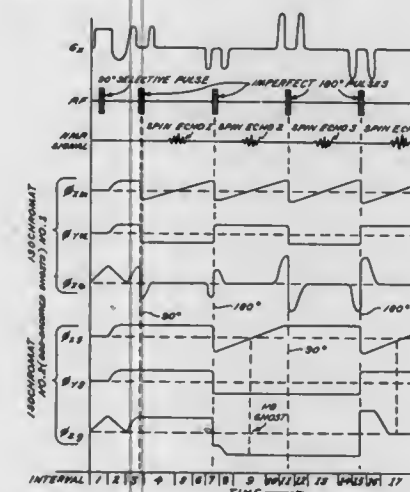
17 Claims



1. A method of obtaining an NMR spectrum from a first region lying wholly within a second region of a sample material, which method comprises obtaining a signal indicative of a first NMR spectrum from substantially all of the second region of the sample material, applying to the sample a magnetic field gradient, and simultaneously applying to the sample an RF perturbing pulse having an amplitude and a frequency distribution such as to perturb nuclear spins in the said first region, but not outside it, removing the magnetic field gradient, and thereafter obtaining from the sample a signal indicative of a second NMR spectrum before relaxation of the perturbed spins in the said first region, and comparing the said first and second signals to obtain a difference spectrum attributable to the said first region.

4,714,884
METHOD OF ELIMINATING EFFECTS OF SPURIOUS NMR SIGNALS CAUSED BY IMPERFECT 180 DEGREE RF PULSES
 Gary H. Glover, Delafield, Wis., assignor to General Electric Company, Waukesha, Wis.
 Continuation of Ser. No. 873,797, Jun. 13, 1986, abandoned.
 This application Apr. 27, 1987, Ser. No. 47,554
 Int. Cl.⁴ G01R 33/20
 U.S. Cl. 324—309

31 Claims

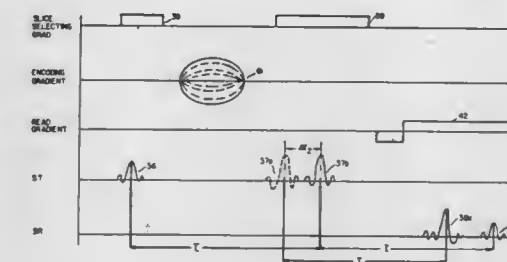


1. In an NMR imaging method employing multiple spin-echo pulse sequences, a method for eliminating ghosting artifacts in an NMR image comprising the steps of:

maintaining a static magnetic field along a first axis of an NMR imaging sample;
 exciting a plurality of nuclear spins in a region of said NMR sample by irradiating said sample with an RF pulse;
 irradiating said NMR sample with a series of 180° RF pulses such that each RF pulse inverts the orientation of a first group of said excited nuclear spins by 180°, whereupon inherent imperfections in at least one of said 180° pulses cause a second group of said excited nuclear spins to change orientation by an angle other than 180°;
 applying first and second magnetic field gradient pulses to the NMR sample before and after, respectively, the application of at least one of the 180° RF pulses thereby causing no net accumulation of phase in the first group of excited nuclear spins;
 applying an imaging gradient after said at least one 180° RF pulse in order to focus said plurality of nuclear spins and thereby create an NMR spin-echo signal;
 sampling said NMR signal during a predetermined time interval between 180° pulses in order to detect said spin-echo signal; and
 modulating each pair of first and second magnetic field gradients with respect to other pairs associated with said series of 180° RF pulses in order to prevent refocusing of said second group of nuclear spins for the duration of all of said time intervals during which the NMR signal from the sample is detected for the purpose of constructing an image.

4,714,885
MAGNETIC RESONANCE IMAGING
 Zvi Paltiel, Rehovot, and Amir Ban, Tel Aviv, both of Israel, assignors to Elscint Ltd., Haifa, Israel
 Filed Aug. 4, 1986, Ser. No. 892,105
 Int. Cl.⁴ G01R 33/20
 U.S. Cl. 324—312

9 Claims



1. A method of magnetic resonance imaging for obtaining data contributions of first and second spectral components from a subject using a single magnetic resonance scan, said method comprising the steps of:

(a) using a scan sequence that separates echo signals from said first and second spectral components by 90 degrees and provides a resultant echo signal and the phase angle β between the resultant echo signals and a horizontal axis of a cartesian co-ordinate system;
 (b) determining the angle α between the horizontal axis and the echo signal of said first spectral component; and
 (c) subtracting the angle α from the angle β to rotate the resultant echo signals so that the first and second spectral components align with the horizontal and vertical axes of the cartesian co-ordinate system respectively.

4,714,886

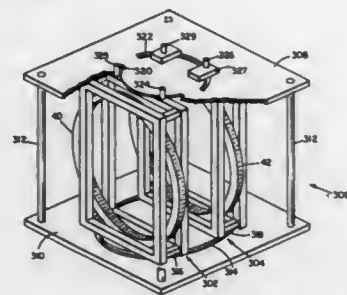
MAGNETIC RESONANCE ANALYSIS OF SUBSTANCES IN SAMPLES THAT INCLUDE DISSIPATIVE MATERIAL
Howard J. Halpern, Chicago, Ill., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Filed Jul. 16, 1985, Ser. No. 755,666

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—316

23 Claims



1. Magnetic resonance apparatus for deriving data representative of an image of the distribution of a predetermined substance within a sample, comprising

means for establishing a magnetic field within said sample, means for stimulating magnetic resonance within said sample to produce a magnetic resonance signal indicative of said distribution of said predetermined substance, and means for detecting said resonance signal and deriving said data representative of said image from said resonance signal,

said means for establishing a magnetic field comprising a pair of coils that are positioned respectively on opposite sides of said sample and are splayed relative to each other to generate a magnetic field gradient along an axis of said sample, each said coil being substantially ring-shaped and lying substantially in a plane.

4,714,887

NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS

Ralph Meissner, Erlangen, and Walter Popp, Emskirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

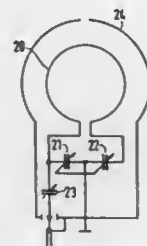
Filed Apr. 8, 1986, Ser. No. 849,404

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515190

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—322

10 Claims



1. A nuclear magnetic resonance tomography apparatus for representing internal regions of an examination subject comprising:

means for generating a fundamental magnetic field in which said examination subject is disposed;
means for generating a plurality of selected gradient magnetic fields in which said examination subject is disposed;
means for exciting nuclear spins in said examination subject; and

a surface coil for acquiring signals corresponding to the displacement of said nuclear spins from an equilibrium

position having a ring with free ends connected to ground through respective capacitances and a high-frequency shielding at least partially covering said ring, said shielding having a gap aligned with a center of said ring and symmetrically completely dividing said shielding.

4,714,888

APPARATUS FOR OBSERVING THE PASSAGE OF A PIG IN A PIPELINE

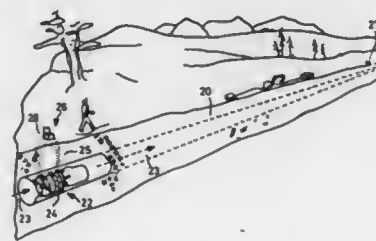
Hartley A. French, 67 Aldershot Crescent, Willowdale, Ontario, Canada L2P 1L7, and Anthony C. Richardson, 2679 Midland Ave., Agincourt, Ontario, Canada M1S 1R8

Filed Jun. 11, 1984, Ser. No. 619,256

Int. Cl.⁴ G01V 3/08; G01R 33/02; G08B 5/00

U.S. Cl. 324—326

18 Claims



1. Apparatus for observing the passage of a pig in a pipeline which comprises sensor means responsive to a change in ambient magnetic field resulting from the passage of a pig, control means operable by said sensor means, visual signal means movable between a ready position and an operative position and resettable holding means for holding said signal means in said ready position, said sensor means including a movable element which is physically displaced by said change in ambient magnetic field resulting from the passage of a pig, said control means including monitoring means for monitoring physical displacement of said movable element, said monitoring means producing a control signal upon the passage of a pig and means for applying said control signal to said holding means to cause said holding means to release said signal means to move from the ready position to the operative position.

4,714,889

METHOD OF INTERPRETING IMPEDANCE DISTRIBUTION OF AN EARTH FORMATION USING PRECURSOR LOGGING DATA PROVIDED BY A MULTI-ELECTRODE LOGGING ARRAY STATIONARY WITHIN A BOREHOLE

Carroll W. Chapman, Anaheim, and Jorg A. Angehrn, Brea, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 31, 1985, Ser. No. 761,123

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.⁴ G01V 3/18

U.S. Cl. 324—366

21 Claims

1. Method of synthesizing the true response characteristics of a combination of different hole-centered electric logging tools in a variety of difficult borehole conditions as provided by (1) determining impedance values of an earth formation penetrated by a borehole filled with a drilling mud of resistivity (R_m), and forming impedance matrices with said impedance values, and (2) selectively manipulating the impedance values so as to synthesize operations of different hole-centered tools over an associated depth increment with surprising accuracy, wherein each of said impedance matrices is associated with a matrix gather indexed to one of a series of finite, overlapping depth scan increments of the formation measured along the borehole, each scan increment being dependent on the array length L of an electrode array to define shallow and deep depth markers as well as being centrally indexed to the

depth in the borehole of a mid-central electrode assembly of the array at the time of data collection, and thereby provide a true indication of the formation resistivity (R_t) even though the formation is interspaced from the borehole by an invaded zone of resistivity (R_{xo}) of unknown lateral extent due to drilling mud filtrate invasion, comprising the steps of:

- calibrating an array of hole centered M electrode assemblies of equal incremental electrode spacing "a" to obtain sets of calibration factors normalized to known current and voltage patterns in a known resistivity zone of response, said electrode assemblies having a known internally ordered numbering index, and each comprising a current electrode and a potential electrode, said sets of calibration factors each being addressable as a function of borehole conditions including said difficult borehole conditions as well as by particular synthetic computer focused array type;
- positioning the array in the borehole, wherein the absolute depth of at least one electrode assembly is known with respect to a predetermined depth datum level measured from the earth's surface;
- while the array is substantially stationary within the borehole, injecting current from each of said electrode assemblies—one at a time—into the adjacent formation;
- at each occurrence of current injection, measuring the

true resistivity of the formation even in the presence of high true resistivity to mud resistivity contrasts and irrespective of whether or not synthetic sets of potential or sets of current values are later used as initiators of subsequently generated responses of computer focused synthetic tool arrays;

- inverting each modified matrix gather to form inverted modified matrix gathers;
- generating computer focused response parameters using the same current and voltage patterns of step (i) and based on said inverted modified impedance matrix gathers; and
- searching sets of calibration factors of step (i) until the product of a particular set and the response parameters of step (x) for all synthetic tool array types is essentially a constant whereby the difficult borehole condition is deduced even in the presence of high true resistivity to mud resistivity contrasts and irrespective of the fact that synthetic sets of potential patterns have been used as initiators of the subsequently generated computer focused response parameters.



4,714,890

FLOW MEASURING APPARATUS WITH ANALOG, ESSENTIALLY LINEAR OUTPUT

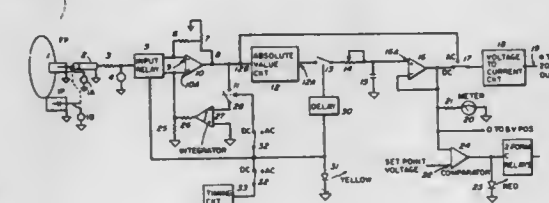
Ronald L. Dechene, Boxford, and Robert E. Newton, Tewksbury, both of Mass., assignors to Auburn International, Inc., Danvers, Mass.

Filed Oct. 9, 1984, Ser. No. 658,587

Int. Cl.⁴ G01R 27/60

U.S. Cl. 324—454

1 Claim



1. Flow measuring apparatus for determining quantitatively, in a linear, analog reading, available in real time, the flow rate of a solid particle containing fluid moving in a conduit comprising, in combination,

- triboelectric sensor electrode means in said conduit constructed and arranged in the flow stream in said conduit for a physical charge transfer from said particles in the flow to said electrode means where said charge transfer rate is proportional to said flow rate,
- means for establishing a directly coupled ground path for said electrode means to conduct to ground such current as is produced at said electrode means through interaction with the flow stream,
- means for converting said current to a voltage signal,
- means for substantially continuously adjusting the zero of said voltage signal to compensate for zero drift essentially without desensitizing said voltage signal, and
- means for converting said voltage signal to an absolute value unipolar voltage at high output gain, said absolute value voltage being proportional to said flow rate, and
- means for applying said absolute value voltage to activate an output for adjusting the flow condition.

absolute potential at a common electrode assembly and the potential differences between adjacent pairs of assemblies as a function of internal indexing numbers of active current and potential sensing electrodes of the assemblies used in the measurements;

- advancing the array along the borehole an incremental distance equal to the electrode assembly spacing "a" between adjacent assemblies and repeating steps (iii) and (iv), again with the array being substantially stationary within the borehole;
- re-repeating steps (iii)–(v) until the collection of all current and potential data has been completed;
- calculating impedance values from the measured absolute and difference potential values and their associated injected currents, each value being indexed to said known internal indexing numbers of active current and potential electrodes used in the measurements;
- reindexing the impedance values into impedance entries of a series of overlapping modified matrix gathers, each gather being associated with a predetermined zone of said formation coincident with depth of the mid-central assembly as the steps (iii) and (iv) occur, and comprising $M \times M$ impedance entries where M is the largest internal indexing number of the array and in which the ratio of the number of difference impedance entries to absolute entries is about $M-1:1$ whereby each $M \times M$ matrix gather is surprisingly useful in deducing

4,714,891

METHOD AND APPARATUS FOR IMPROVING THE SAFETY AND EXTENDING THE RANGE OF IONIZATION GAUGE SYSTEMS

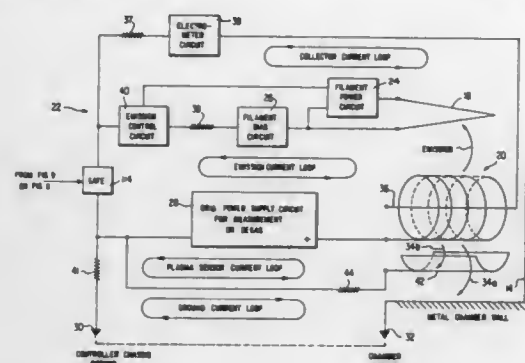
Charles F. Morrison, Jr., Boulder, Colo., assignor to Granville-Phillips Company, Boulder, Colo.

Filed Sep. 23, 1985, Ser. No. 778,719

Int. Cl.⁴ G01N 27/62; H02H 3/00

U.S. Cl. 324-459

70 Claims



1. In an ionization gauge system for measuring the pressure in a chamber, said system including a gauge including a filament, a grid, and a collector, controller circuitry for controlling current applied to said filament and a voltage applied to said grid, and electrometer circuitry for measuring the current through said collector to determine the chamber pressure where said controller circuitry, electrometer circuitry and said chamber are connected to a ground potential, the improvement comprising

means for sensing a ground current caused by plasma generated within said gauge and coupled to said chamber from said grid, said ground current flowing from the walls of said chamber to said ground potential and then from said ground potential through said controller circuitry to said grid; and

means responsive to said ground current sensing means for disabling said controller circuitry in response to the sensed ground current being substantially less than the ground current expected for a given chamber pressure to thereby detect an abnormality in the ground current and thus protect a human operator from such abnormality in the ground current.

4,714,892

DIFFERENTIAL PHASE SHIFT KEYING DEMODULATOR

Keiji Ishizuka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

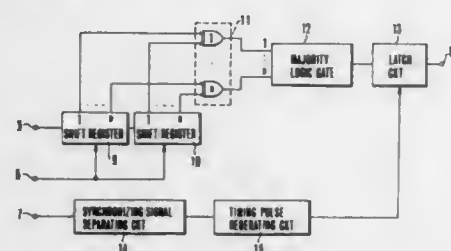
Filed Jul. 25, 1986, Ser. No. 890,832

Claims priority, application Japan, Aug. 2, 1985, 60-169676

Int. Cl.⁴ H04L 27/22

U.S. Cl. 329-50

11 Claims



1. A differential phase shift keying demodulator, comprising:
(a) delay means for delaying a modulated signal;

(b) comparison means for comparing a signal produced from said delay means with said modulated signal;

(c) producing means capable of producing in parallel outputs of said comparison means which are related to said modulated signal obtained at different points of time within a transmission period for one bit of said modulated signal; and

(d) output means for producing one demodulated signal based on all the outputs of said comparison means which are produced from said producing means.

4,714,893

APPARATUS FOR MEASURING THE POTENTIAL OF A TRANSMISSION LINE CONDUCTOR

William R. Smith-Vaniz, Darien and Richard L. Sieron, Fairfield, both of Conn., assignors to Niagara Mohawk Power Corporation, Syracuse, N.Y.

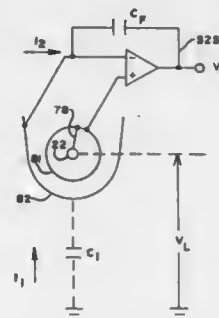
Division of Ser. No. 484,681, Apr. 13, 1983. This application

Mar. 18, 1986, Ser. No. 841,092

Int. Cl.⁴ G01R 15/06, 1/30

U.S. Cl. 324-126

9 Claims



1. Apparatus for measuring voltage on an above ground power line conductor comprising:

a generally toroidal shaped housing removably attached to said above ground conductor;

means for electrically connecting said housing to said conductor, whereby said housing and said conductor are at the same potential;

a metal plate mounted on the surface of said housing, said plate and said housing being separated by insulating material; and

said plate connected to said housing through a low impedance measuring means whereby said plate and said housing are at the same potential and whereby an equivalent capacitor is formed between said plate and ground;

said low impedance measuring means connected to said plate and said housing comprising an operational amplifier for measuring current equal to current in said equivalent capacitor, said current in said equivalent capacitor being proportional to the voltage on said power line conductor.

4,714,894

OPERATIONAL AMPLIFIER

Zdzislaw Gulczynski, 19 Greenhalge St., Medford, Mass. 02155

Filed Mar. 24, 1986, Ser. No. 843,165

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1985, 3510729

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330-260

5 Claims

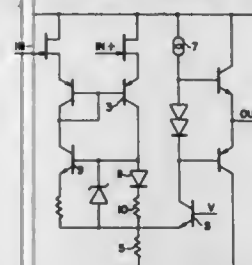
1. Operational amplifier for amplifying a signal applied to signal input terminals thereof, comprising:

two voltage followers providing equally polarized unidirectional output currents, each voltage follower having an input and an output terminal, and exhibiting an input offset voltage and an output impedance;

the signal input terminals being connected to the input terminals of the voltage followers;

a transistor having base, emitter and collector; the output terminals of the voltage followers being connected across the base and the emitter of the transistor; a current source exhibiting an output impedance and being coupled to the collector of the transistor;

a first amplifying means having an input and an output terminal and exhibiting an input offset voltage, for amplifying a voltage applied to the input terminal thereof;



the input terminal of the first amplifying means being connected to the collector of the transistor;

the output terminal of the first amplifying means providing an output signal of the operational amplifier; and

a second amplifying means exhibiting an input offset voltage and being connected to the collector and the base of the transistor, for amplifying the collector voltage thereof and providing a current to the base thereof.

4,714,895

INTERNAL ALL-DIFFERENTIAL OPERATIONAL AMPLIFIER FOR CMOS INTEGRATED CIRCUITS

Germano Nicollini, Piacenza, Italy, and Daniel Senderowicz, Berkeley, Calif., assignors to SGS Microelettronica SpA, Catania, Italy

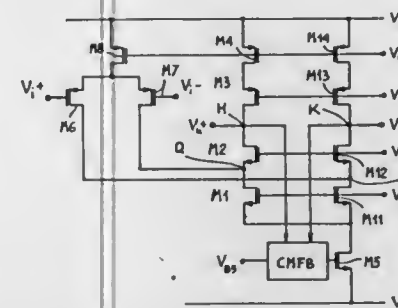
Filed Oct. 14, 1986, Ser. No. 918,101

Claims priority, application Italy, Oct. 14, 1985, 22475 A/85

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330-258

6 Claims



1. An internal all-differential operational amplifier for integrated circuits of the CMOS type, comprising two CMOS cascode circuits, identical to each other, each having a first and a second transistors with a channel having a first polarity and a third and fourth transistors with a channel having the opposite polarity, the drain of the first transistor being connected to the source of the second transistor, the drain of the fourth transistor being connected to the source of the third transistor, the drains of the second and of the third transistor being connected to each other and forming one of the output terminals of said amplifier, the sources of the first transistors of the two cascode circuits being both connected to the drain of a fifth transistor having said first polarity, the source of which is fed by a first supply voltage, and the sources of the fourth transistors of the two cascode circuits being fed by a second supply voltage, the two input signals being applied, by means of a capacitor and switching means simulating input resistors, to the

respective gates of said two first transistors, the other three gates of each cascode circuit being biased by respective fixed biasing voltages, the gate of the fifth transistor being biased by a dedicated fixed biasing voltage by means of capacitor and switching means constituting a common-mode feedback circuit.

4,714,896

PRECISION DIFFERENTIAL AMPLIFIER HAVING FAST OVERDRIVE RECOVERY

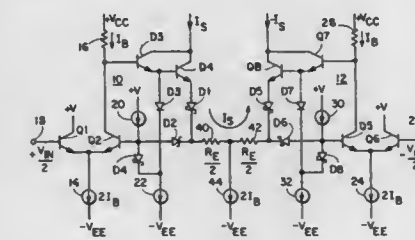
John L. Addis, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 15, 1986, Ser. No. 919,112

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330-261

1 Claim



1. A differential amplifier having two identical halves, each half comprising:

a buffer amplifier input stage comprising an emitter coupled pair of transistors, wherein a base of a first transistor of said pair is coupled to an input terminal;

a primary feedback path, from collector to base of a second transistor of said pair, comprising Darlington-connected third and fourth transistors and a first and second diode; and

a secondary feedback path, from collector to base of said second transistor of said pair, comprising said third transistor and a third and fourth diode;

wherein only one of said primary and secondary feedback paths is operable with said buffer amplifier input stage at a time;

said halves being coupled together to form a differential amplifier wherein both said primary feedback paths conduct in a first operating condition, and wherein a secondary feedback path conducts in one of the halves in a second operating condition.

4,714,897

MONOLITHICALLY INTEGRATABLE SIGNAL AMPLIFIER STAGE WITH HIGH OUTPUT DYNAMICS

Bruno Murari, Monza; Mauro Pasetti, and Nazzareno Rossetti, both of Milan, all of Italy, assignors to SGS Microelettronica SpA, Agrate Brianza, Italy

Filed Dec. 17, 1985, Ser. No. 809,877

Claims priority, application Italy, Dec. 28, 1984, 24276 A/84

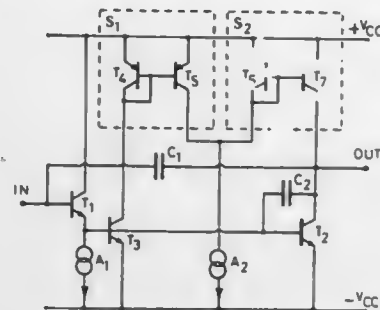
Int. Cl.⁴ H03F 3/04

U.S. Cl. 330-288

8 Claims

1. A monolithically integratable signal amplifier stage comprising a first and a second semiconductor circuit element, each having a first and a second terminal and a control terminal, said control terminal of said first circuit element being an input terminal of said amplifier stage; wherein said second terminal of said first circuit element is connected to a first terminal of a supply voltage generator, and said first terminal of said first circuit element is coupled to both said control terminal of said second circuit element and, via a first constant current generator, to a second terminal of said supply voltage generator to which is also connected said first terminal of said second circuit element; said signal amplifier also comprising a third semiconductor circuit element having a first and a second terminal and a control terminal and at least a first and a second

current mirror circuit coupled to said first terminal of said supply voltage generator and each having an input and an output, said first terminal and control terminal of said third circuit element being respectively connected to said second terminal of said supply voltage generator and to said first terminal of said first circuit element, said input of said first current mirror circuit being connected to said second terminal



of said third circuit element, and said output of said first current mirror circuit and said input of said second current mirror circuit are both connected to said second terminal of said supply voltage generator via a second constant current generator and said output of said second current mirror circuit and said second terminal of said second circuit element are connected together so as to constitute an output terminal of said amplifier stage.

4,714,898

DEVICE FOR PROTECTING THE FINAL STAGE OF A POWER AMPLIFIER AGAINST SHORTING

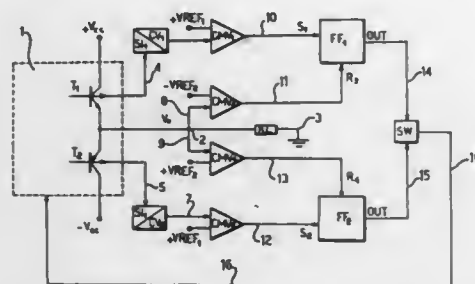
Edoardo Botti, Mortara, and Fabrizio Stefani, Cardano al Campo, both of Italy, assignors to SGS Microelettronica S.p.A., Italy

Filed Jun. 6, 1986, Ser. No. 872,081

Int. Cl.⁴ H03F 1/42

U.S. Cl. 330-298

3 Claims



1. Apparatus for protecting the final stage of a power amplifier operating on a low voltage supply against shorting, the low voltage supply having a positive pole (+Vcc) and a negative pole (-Vcc), said final stage being of the push-pull type which comprises a first transistor (T1) connected between the positive pole (+Vcc) of the supply voltage and a terminal of the load (RL), and a second transistor (T2) connected between the negative pole (-Vcc) of the supply voltage and said terminal of the load (RL), another terminal of the load being grounded, characterized in that the apparatus comprises a first current sensor (SI1) responsive to current flowing through the first transistor (T1), and a second current sensor (SI2) responsive to current flowing through the second transistor (T2), respective first (CV1) and second (CV2) current-to-voltage converters issuing respective voltage signals (V1, V2) indicative of the current values sensed by said sensors (SI1, SI2), a first voltage comparator (CMV1) for comparing said voltage signal (V1) from the first converter (CV1) with a first set reference positive voltage

(+VREF1), a second voltage comparator (CMV2) for comparing said voltage signal (V2) from the second converter (CV2) with said set reference voltage (+VREF1), said first and second voltage comparators being adapted to process and issue respective output signals (S1, S2) on either of said voltage signals (V1 or V2) exceeding said positive set reference voltage (+VREF1), third (CMV3) and fourth (CMV4) voltage comparators for comparing the instant value (Vo) applied to the load (RL) with the negative value and positive value, respectively, of a second set reference voltage (VREF2), said third and fourth voltage comparators (CMV3, CMV4) issuing respective output signals (R3, R4) according to whether the instant absolute value of the voltage (Vo) applied to the load (RL) exceeds the absolute value of said second set reference voltage (VREF2), a first bistable circuit (FF1) to be activated by the output signals (S1, R3) from said first (CMV1) and said third (CMV3) voltage comparators, where both are provided, a second bistable circuit (FF2) to be activated by the output signals (S2, R4) from said second (CMV2) and said fourth (CMV4) voltage comparators, and a change-over switch (SW) connected in circuit to the amplifier (1) and controlled by the output signals from either of said bistable circuits.

4,714,899

FREQUENCY SYNTHESIZER

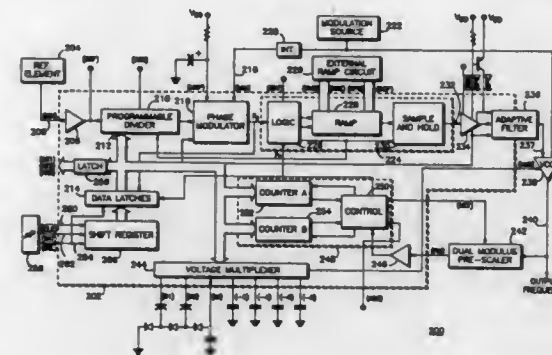
Gary Kurtzman, No. Richland Hills; Joseph P. Heck, Fort Worth; Kenneth A. Hansen, Bedford, all of Tex.; Ralph Endrey, Sunrise, Fla., and Bronis Vidugiris, Arlington Heights, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1986, Ser. No. 913,426

Int. Cl.⁴ H03L 7/06, 7/10

U.S. Cl. 331-1 A

16 Claims



1. A programmable frequency synthesizer, comprising:
means for providing a reference signal;
means for adaptively dividing said reference signal to provide a divided signal;
voltage controlled oscillator means for providing an output signal in response to a control signal;
means for simultaneously frequency modulating said output signal and said divided signal with an information signal to provide, respectively, a modulated output signal and a modulated divided signal, whereby the frequency synthesizer may be modulated down to approximately zero hertz;
prescaler means for dividing said modulated output signal to provide a scaled output signal;
means for comparing said modulated divided signal and said scaled output signal to provide a phase error signal;
means for adaptively filtering said phase error signal to provide said control signal;
means for controlling at least said adaptive divider means and said adaptive filtering means;
means for serially programming said control means,

whereby, the frequency synthesizer may be rapidly reprogrammed.

4,714,900

CURRENT OUTPUT CIRCUIT HAVING WELL-BALANCED OUTPUT CURRENTS OF OPPOSITE POLARITIES

Hiroshi Sata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

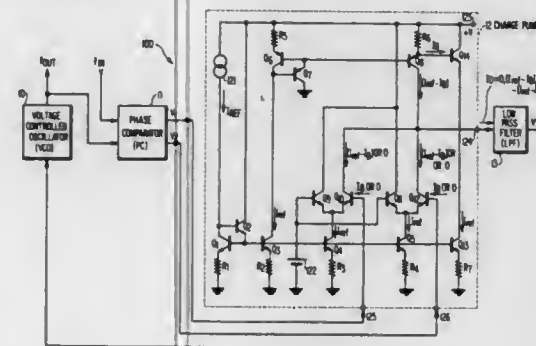
Filed Nov. 21, 1986, Ser. No. 933,511

Claims priority, application Japan, Nov. 21, 1985, 60-262805

Int. Cl.⁴ H03L 7/00

U.S. Cl. 331-8

10 Claims



1. A current output circuit comprising a plurality of input terminals receiving a plurality of input voltage signals, respectively, a reference current source generating a reference current, a plurality of first current-producing means coupled to said reference current source each for producing a first current having a first amplitude, an output terminal outputting an output current of a polarity determined by said input voltage signals, a plurality of switching means coupled between said first current-producing means and said output terminal, respectively, and having control terminals coupled to said input terminals, respectively, for switching paths of said first current therebetween in response to said input voltage signals at their control terminals, respectively, to supply to said output terminal an output current of a first polarity having one or more integer times of an amplitude which is said first amplitude of said first current minus a second amplitude of a current expended by one of said switching means, a second current-producing means coupled to said reference current source for producing a second current having said first amplitude, a third current-producing means coupled to said reference current source for producing a third current having said second amplitude, and means coupled to said second and third current-producing means and to said output terminal for subtracting said third current from said second current to supply to said output terminal an output current of a second polarity having an amplitude which is said first amplitude of said second current minus said second amplitude of said third current.

4,714,901

TEMPERATURE COMPENSATED COMPLEMENTARY METAL-INSULATOR-SEMICONDUCTOR OSCILLATOR

Babu L. Jain; Pardeep K. Jain, both of Santa Clara, and Michael S. Briner, San Jose, all of Calif., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 15, 1985, Ser. No. 787,813

Int. Cl.⁴ G05F 3/24, 3/26; H02J 1/04; H03K 3/354

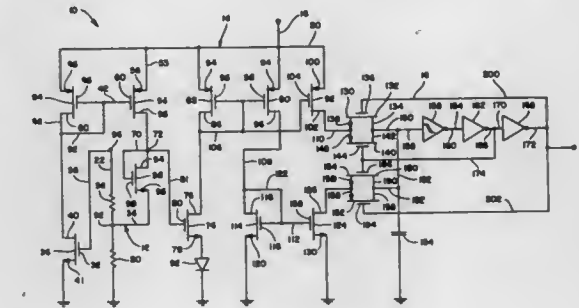
U.S. Cl. 331-176

19 Claims

1. A temperature compensated metal-insulator-semiconductor current source fabricated as a monolithic integrated circuit on a semiconductor die, comprising: means for receiving electrical energy; means for summing a temperature stable reference voltage and a threshold voltage to produce a bias voltage; and means for biasing a metal-insulator-semiconductor field effect transistor with a difference between said bias voltage

and a temperature dependent voltage across a p-n semiconductor junction to generate a substantially temperature independent current through said metalinsulator-semiconductor field effect transistor.

9. A temperature compensated metal-oxide-semiconductor oscillator fabricated as a monolithic integrated circuit on a semiconductor die, comprising: means for receiving electrical energy; means for summing a temperature stable reference voltage and a threshold voltage to produce a bias voltage;



means for biasing a metal-oxide-semiconductor field effect transistor with a difference between said bias voltage and a temperature dependent voltage across a p-n semiconductor junction to generate a current through said metal-oxide-semiconductor field effect transistor which is substantially temperature independent; and means for producing an oscillating electrical signal receiving said substantially temperature independent current to be energized thereby, whereby said oscillating electrical signal has a substantially temperature independent period.

4,714,902

GASEOUS NON LINEAR DISPERSION LASER BEAM CONTROL

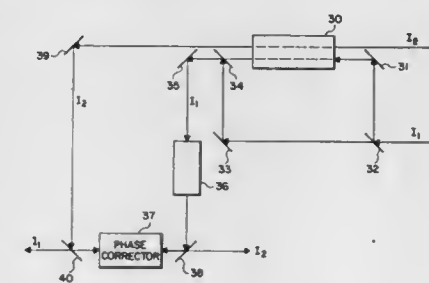
Mordechai Rokni, Mevasseret, Israel, and Allen M. Flusberg, Newton, Mass., assignors to AVCO Everett Research Laboratory, Inc., Everett, Mass.

Filed Jun. 17, 1985, Ser. No. 745,044

Int. Cl.⁴ G02F 1/32; G02B 6/36

U.S. Cl. 332-7.51

16 Claims



1. In the method of controlling a laser beam the steps comprising:
(a) providing a gaseous medium comprising a mixture of a first gas and a buffer gas, said first gas being provided at about one thousandth of an atmosphere and having a first resonance transition and a second higher transition where both said transitions are allowed electric dipole transitions, said buffer gas being provided at about one tenth of an atmosphere and substantially collisionally broadening said first and second transitions of said first gas;
(b) maintaining said gaseous medium at "a pressure" said pressure whereby spectral broadening of the said first and second transitions is collision-dominated;

- (c) causing a first controlling laser beam having a first wavelength to be incident on said gaseous medium, said first wavelength being at least near resonance with said first transition and inducing a predetermined nonthermal change in the refractive index of said gaseous medium at a second wavelength as a result of absorption by said first gas at said first transition and thereby producing an excited state of atoms in the absence of producing a thermal gradient; and
- (d) causing a controlled laser beam having a predetermined wavelength to be incident on said gaseous medium, said predetermined wavelength being at least near said second wavelength and also at least near resonance with said second transition whereby said controlled laser beam sees said predetermined change in the refractive index produced by said nonthermal change in the said refractive index, the energy of said controlled laser beam being substantially greater than that of said controlling laser beam and producing interference fringe planes in said gaseous medium as it passes through said gaseous medium and the angle of incidence of said controlled laser beam with respect to said fringe planes is the Bragg angle given by the first quadrant angle whose sine is half the ratio between the wavelength of the controlled laser beam and the spacing between said interference fringe planes.

4,714,903

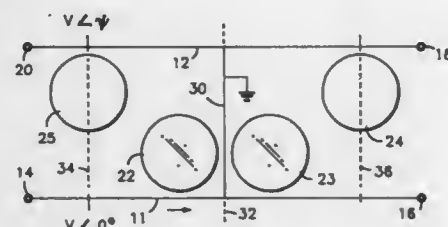
DIELECTRIC RESONATOR DIRECTIONAL FILTER Jerry C. Brand, Scottsdale, Ariz., assignor to Motorola, Inc., Schanmburg, Ill.

Filed Jan. 20, 1986, Ser. No. 876,607

Int. Cl.⁴ H01P 1/213, 7/10, 5/18

U.S. Cl. 333—110

2 Claims



1. A dielectric resonator directional filter having an operating frequency comprising:
 first and second parallel spaced apart transmission lines having an input defined by the first of said transmission lines and an output defined by the second of said transmission lines;
 at least four dielectric resonators positioned adjacent said transmission lines and coupled thereto by magnetic field lines, a first pair of said resonators being positioned adjacent the first transmission line and equally spaced on opposite sides of a dividing line, a second pair of said resonators being positioned adjacent the second transmission line and equally spaced on opposite sides of the dividing line, resonators on one side of the dividing line being coupled by magnetic field lines and resonators on the other side of the dividing line being coupled together by magnetic field lines, and said resonators being spaced apart along said transmission lines so that substantially all electric energy at the operating frequency applied to the input appears at the output; and
 a shield positioned between the first pair of resonators and between the second pair of resonators to prevent magnetic coupling between resonators of the pairs.

4,714,904

MAGNETOSTATIC WAVE DEVICE UNIT

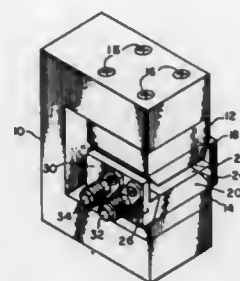
David A. Willems, Hoagland, Ind., assignor to ITT Aerospace Optical, Fort Wayne, Ind.

Filed Nov. 5, 1986, Ser. No. 927,774

Int. Cl.⁴ H03H 9/10

U.S. Cl. 333—148

15 Claims



1. A magnetostatic wave device magnetic biasing unit comprising:
 a soft iron yoke;
 first and second magnets secured opposite one another on said yoke to form a gap between said magnets;
 first and second pole pieces secured to said first and second magnets, respectively, and tapered toward each other to form first and second opposed faces, respectively, within which magnetic flux produced by said magnets is concentrated;
 a nonmagnetic metallic carrier member having a tapered opening within which said second tapered pole piece is fitted in electrical contact with said carrier member, said second opposed face of said second pole piece and the surface of said carrier member at the smaller end of said tapered opening lying in a common plane and forming a support surface adapted to support a magnetostatic wave device;
 and means mounted on said carrier member for coupling an input signal from a signal source to a magnetostatic wave device supported by said second pole piece and said carrier member and for coupling an output signal from a magnetostatic wave device supported by said second pole piece and said carrier member to a utilization unit.

4,714,905

SMC FILTER AND METHOD OF MANUFACTURE THEREOF

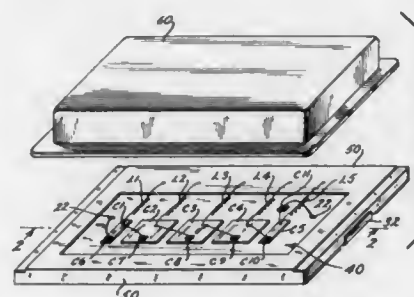
Richard Bernstein, Oxford; William H. Anthony, Salisbury, both of Md., and David A. Lupfer, Cazenovia, N.Y., assignors to K & L Microwave, Salisbury, Md.

Filed Oct. 8, 1986, Ser. No. 916,559

Int. Cl.⁴ H03H 3/00, 7/01, 7/075

U.S. Cl. 333—167

5 Claims



5. In a surface mount-type chip providing a filter circuit having lands screened onto a dielectric substrate as first plates

of filter capacitors, and discrete air core inductors attached thereto for said filter, the improvement comprising:

- a metallic coating on substantially all surface areas of said substrate, except for a central top portion of said substrate containing said lands and exposed portions of vias from said central top portion to surface mounting lead portions on a bottom of said substrate, said coating providing a second plate for said capacitors and a ground plane for said circuit and a portion of an EMI and RFI shield for said circuit; and
 a formed metallic cover attached to said ground plane and spaced from and covering said inductors and lands, said cover providing a remainder of said EMI and RFI shield, while providing a physical shield for said inductors, and a solid, uniform profile adapted for subsequent handling by a pick and place component handling head.

4,714,906

DIELECTRIC FILTER WITH VARIABLE CENTRAL FREQUENCY

Bertrand D'Albaret, Cormeilles en Parisis, and Antoine Colombani, Ville D'Avray, both of France, assignors to Compagnie D'electronique et de Piezo-electricite, Argenteuil, France

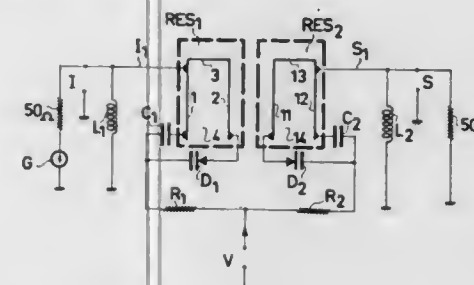
Filed May 23, 1985, Ser. No. 737,161

Claims priority, application France, May 30, 1984, 84 08498

Int. Cl.⁴ H01P 1/20

U.S. Cl. 333—202

9 Claims



1. A tunable dielectric filter comprising a series of dielectric resonators including at least a first and a last resonator, each resonator comprising a ceramic body having at least six surfaces, two surfaces being opposed to one another and metallized to form a pair of opposed electrodes, and two other surfaces being opposed to one another and being free of electrodes, each of the electrodes having first and second ends, the first ends of each opposed electrodes being interconnected by a fifth surface of the ceramic body that is metallized with a coating that extends between the first ends of the two opposed electrodes, the second ends of the two opposed electrodes being connected by a sixth surface of the ceramic body that is free of any electrode to form a capacitive zone,
 input and output means for coupling a signal to and from the filter, the input means being connected to a first end of one of the opposed metallized electrodes of the first resonator of the series and the output means being connected to a first end of one of the opposed metallized electrodes of the last resonator of the series, and
 separate variable capacitance means being connected between the second ends of the two opposed electrodes of each resonator.

4,714,907

MINIATURE ELECTRICAL CIRCUIT BREAKER WITH MULTIPLE MOVING CONTACTS AND THERMOMAGNETIC TRIP RELEASE

William Bartolo, Eybens; Louis Boillot, Grenoble; René Chalande, Montmelian; Patrick De Robertis, Vizille; Jacky Ducheneand, Grenoble, and Jean-Claude Ramaciotti, Echirolles, all of France, assignors to Merlin Gerin, Grenoble Cedex, France

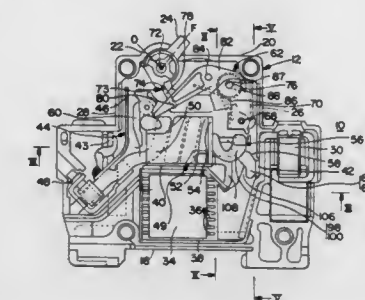
Filed Jul. 8, 1986, Ser. No. 883,331

Claims priority, application France, Jul. 31, 1985, 85 11839; Jan. 3, 1986, 86 00111

Int. Cl.⁴ H01H 75/08, 77/04, 81/02

U.S. Cl. 335—45

13 Claims



1. A low voltage miniature electric circuit breaker with insulated casing equipped with a mechanism controlled by a thermomagnetic trip release, comprising:
 a first thermal trip release having a bimetallic strip cooperating with said mechanism when an overload current exceeds a thermal tripping threshold;
 a second electromagnetic trip release for protection against short-circuit current, comprising a control coil electromagnet, made up by helical winding of a deformable conductor having a preset rigidity;
 an end turn of said coil being extended with the same conductor by a tail cooperating with an adjustment device for the thermal tripping threshold of the first thermal trip release;
 said tail being arranged as an adjustable support part of the bimetallic strip which has a foot inserted by soldering between said tail and an adjacent electrical connection means electrically connected to a contact pad, to cause the current to flow thicknesswise through the foot of the bimetallic strip; and
 a hinge located along said tail between the foot of the bimetallic strip and the end turn of the coil, to allow relative movement of one part of said tail due to the action of the thermal tripping threshold adjusting device, the other part of the tail connected to the end turn of the coil remaining appreciably stationary.

4,714,908

ELECTROMAGNETIC DEFLECTION-DISTORTION CORRECTOR

Seiji Watabe, Honjo; Isao Yokoyama, Nikaho; Masanori Sasaki, Kisakata; Yotaro Toyoshima; Sumio Takahashi, both of Nikaho, Japan, and Tsutomu Maeda, Wako, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 6, 1985, Ser. No. 806,167

Claims priority, application Japan, Dec. 13, 1984, 59-261826

Int. Cl.⁴ H01F 1/00

U.S. Cl. 335—212

7 Claims

1. An electromagnetic deflection-distortion corrector for a cathode-ray tube display unit of the electromagnetic deflection type, the corrector comprising: a plurality of permanent magnets arranged adjacent and around the tubular rear wall of the cathode-ray tube display unit, and adjustor means for moving each permanent magnet forward and backward, towards and away from the tube wall in a direction parallel to the longitudinal

4,714,914

LIQUID IMMERSION ALARM

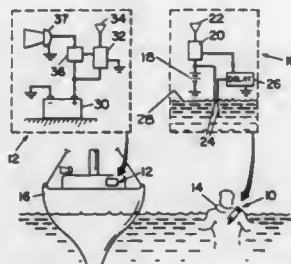
Richard A. Boe, Keyport, Wash., assignor to Automatic Safety Products, Mammoth Lakes, Calif.

Continuation of Ser. No. 558,015, Dec. 5, 1983, abandoned. This application Apr. 15, 1986, Ser. No. 853,379

Int. Cl.⁴ G08B 23/00

U.S. Cl. 340—573

15 Claims



1. A liquid immersion device adapted to be worn by a user and insensitive to the random presence of said liquid, comprising:

- a battery power source having first and second terminals with said second terminal connected to ground;
- a load device having an input terminal connected to said first terminal of said battery power source and a ground terminal;
- a liquid activated switch having first and second terminals with said first terminal connected to said first terminal of said battery power source;
- a delay circuit having first, second and third terminals, including:
 - said first terminal connected to said second terminal of said liquid activated device, said second terminal connected to said ground terminal of said load device and said third terminal connected to ground;
 - an electrically activated solid state flip flop switch having a set terminal;
 - electronic integrating accumulation circuit means for delaying the activation of said electrically activated solid state flip flop switch connected to said set terminal; and
 - electronic integrating decumulation circuit means to control the accumulation of said first mentioned electronic integrating accumulation circuit means connected between said set terminal and ground;
- said delay circuit thus connecting said second terminal of said battery power source to said ground terminal of said load through said delay circuit after said first and second terminals of said liquid activated device are immersed in liquid for a predetermined time period, whereby said timed immersion causes said battery power source to be connected to said load device to transmit an alarm signal.

4,714,915

PORTABLE ELECTROSTATIC FIELD SAFETY MONITOR

Marcel Hascal, 1 Boldmere Crescent, Willowdale, Ontario, Canada M2J 2R8; Sergio Lopez, 83 Milldock Drive, Scarborough, Ontario, Canada M1C 4B8; Andrew Danielski, 180 Sherwood Street, Oshawa, Ontario, Canada L1G 3L8, and Adrian Mihai, 181 Robert Hicks Drive, Willowdale, Ontario, Canada M2R 3R3

Filed Sep. 29, 1986, Ser. No. 912,976

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340—657

12 Claims

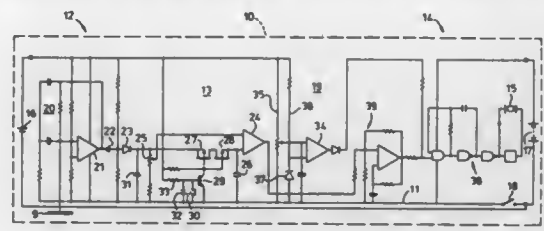
1. A portable monitoring system for detecting a radiated electrostatic field and producing an audible warning when the intensity of the detected field exceeds a selected predetermined value, comprising

- detector circuit means for deriving a d.c. signal corresponding to the detected field intensity,
- comparator means for comparing the d.c. signal with a

selected reference level for producing an output signal when the d.c. signal level exceeds said reference level, the comparator means including a differential amplifier having a first input circuit connected to receive said d.c. signal and a second input circuit connected to receive a signal defining said reference level, and

audible alarm means responsive to said output signal for sounding a warning,

characterized in this, that the monitoring system further



comprises a storage device connected in said second input circuit of the differential amplifier for storing the signal defining said reference level, the storage device being interconnected with the output of the detector circuit means by a manually operable switching circuit, said switching circuit including a delay device and being operable to apply the d.c. signal to the storage device after a predetermined delay thereby to reset the reference level so as to correspond to the detected field intensity at a location selected by the user.

4,714,916

VOLTAGE LOSS DETECTOR

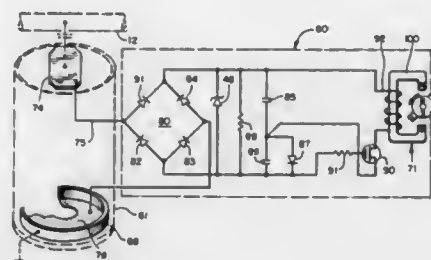
Edmund O. Schweitzer, Jr., 2433 Center St., Northbrook, Ill. 60062

Filed Mar. 28, 1986, Ser. No. 845,860

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340—664

20 Claims



1. A loss of voltage detector for producing a control effect in response to the loss of voltage in a monitored conductor, comprising:

- a first capacitor;
- a second capacitor;
- charge circuit means powered by alternating voltage in the monitored conductor for developing a charge current for charging said first and second capacitors to respective predetermined charge levels;
- charge transfer circuit means operable following interruption of said charge current for transferring a portion of said charge on said first capacitor to said second capacitor, the terminal voltage across said second capacitor progressively increasing as said charge is transferred; and
- trigger circuit means responsive to the voltage across said second capacitor increasing beyond a predetermined threshold level for discharging said first capacitor to provide the control effect.

4,714,917

APPARATUS FOR DETECTING CRACKS IN A FLEXIBLE COUPLING

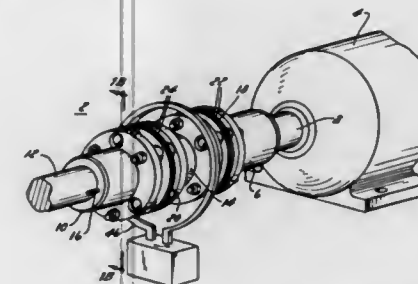
Louis F. Counter, Greendale; Richard C. Born, Wauwatosa; LeRoy M. Walters, Milwaukee; Lowell B. Ziese, Greendale, and Lawrence G. Searing, Milwaukee, all of Wis., assignors to Rexnord Inc., Brookfield, Wis.

Filed Oct. 10, 1986, Ser. No. 917,765

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340—679

19 Claims



1. An apparatus for detecting cracks in a flexible disc of a flexible coupling connected between a rotary power source and a device driven through the flexible coupling by the power source comprising:

- an electrically insulated conductive line on the flexible disc, the conductive line being normally continuous and being discontinuous upon cracking of the disc;
- first circuit means mounted on the coupling and connected to the conductive line for generating and transmitting a first signal while the conductive line is continuous and a second signal while the conductive line is discontinuous; and
- stationary second circuit means for receiving the first and second signals from the first circuit means and providing an indication of either the first signal or the second signal.

4,714,918

WINDOW VIEW CONTROL

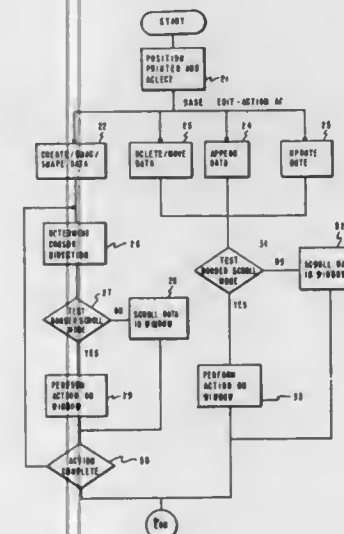
Barbara A. Barker, Round Rock, and Irene H. Hernández, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,545

Int. Cl.⁴ G09G 1/16

U.S. Cl. 340—724

9 Claims



1. In a display computer system, a method of controlling a view of information displayable within a window upon editing

said information wherein said window is displayable over other information being displayed on said system, said method comprising:

- (a) providing said system with both an information scrolling mode and a border scrolling mode of operation;
- (b) selecting one of said modes operation; and
- (c) causing window to increase in size, responsive to a border scrolling mode being selected, upon the addition of new information to said existing information being displayed in said window.

4,714,919

VIDEO DISPLAY WITH IMPROVED SMOOTH SCROLLING

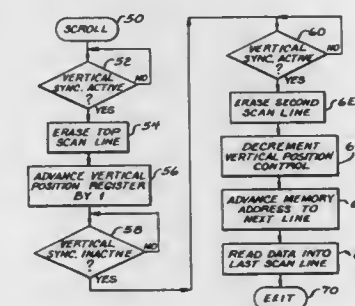
Mark J. Foster, Stevensville, Mich., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 30, 1984, Ser. No. 635,385

Int. Cl.⁴ G09G 1/16

U.S. Cl. 340—726

7 Claims



1. In a video display system including a raster-scanned video display unit sequentially scanned by an electron beam for producing a video image thereon, wherein said video image is formed by a plurality of scan lines on said video display unit and wherein a vertical sync pulse occurs in a consistent pattern between sequential scans of said video display unit by said electron beam during a vertical retrace interval, a method for the continuous smooth scrolling of said video image on said video display unit comprising the sequence of steps of:

- detecting a first vertical sync pulse during a first vertical retrace interval;
- erasing the contents of the first scan line of the video image during said first vertical retrace interval;
- displacing the video image upward one scan line during said first vertical retrace interval;
- detecting a second, next-subsequent vertical sync pulse during a second, next-subsequent vertical retrace interval;
- erasing the contents of the second scan line of the video image during said second vertical retrace interval;
- displacing the video image downward one scan line during said second vertical retrace interval;
- starting the next sequential scan of said display unit with a third scan line of said video image at the first line of the raster; and
- updating the last scan line of said video image.

4,714,920

METHOD FOR REPRESENTING THREE DIMENSIONAL STRUCTURES

Dieterich Andernach, Seebuck, and Manfred Wurm, Zorneding, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,407

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3327117

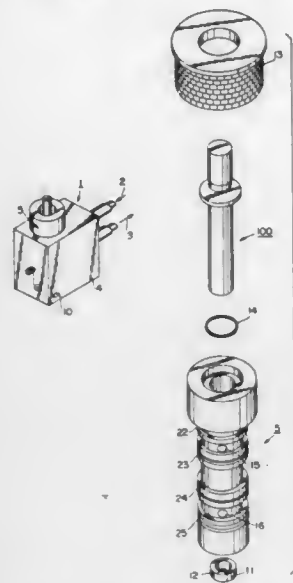
Int. Cl.⁴ G09G 1/16

U.S. Cl. 340—747

16 Claims

- 1. A method for controlling a device to represent in a single

feed chamber according to an angle (α) capable of varying from 0° to 360°, each of these modules (1) comprising an orifice



(10) designed to receive a spindle (31) around which the module can rotate according to an angle (β).

4,714,933

LASER PICTURE-DRAWING APPARATUS

Akira Suzuki, Numazu, Japan, assignor to Toshiba Machine Co., Ltd., Tokyo, Japan

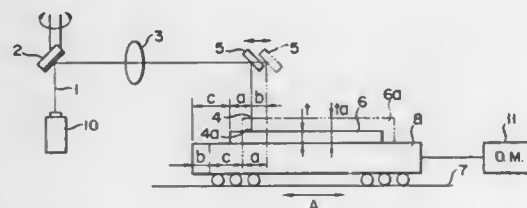
Filed Oct. 8, 1986, Ser. No. 916,786

Claims priority, application Japan, Oct. 8, 1985, 60-224065

Int. Cl.⁴ G01J 9/42; G03G 15/28; G01J 1/20

U.S. Cl. 346—108

7 Claims



1. A laser picture-drawing apparatus comprising: support means for supporting a medium having a surface on which a figure is to be drawn, a light source for emitting a laser beam, means for deflecting the laser beam, focussing means for focussing the deflected beam as a focal point on the surface to be drawn, reflecting means disposed movably along an optical axis between said focussing means and the surface to be drawn, for reflecting the beam from said focussing means in a figure-drawing direction, drive means for moving said reflecting means along the optical axis at a distance according to the thickness of the medium.

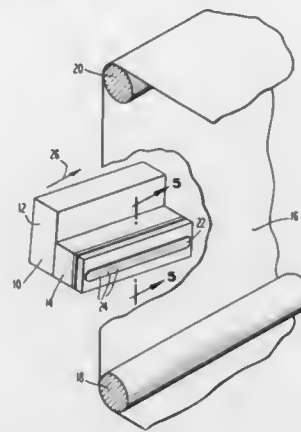
4,714,934
APPARATUS FOR PRINTING WITH INK JET
CHAMBERS UTILIZING A PLURALITY OF ORIFICES
Robert L. Rogers, Sandy Hook, Conn., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Nov. 26, 1985, Ser. No. 801,925

Int. Cl.⁴ G01D 15/16

U.S. Cl. 346—140 R

7 Claims



1. An impulse ink jet apparatus for printing bars in a bar code comprising a plurality of side-by-side chambers extending along a line slanted with respect to the direction of scanning, each of said chambers including a plurality of orifices arrayed along a line extending substantially transverse to the scanning direction and means for ejecting a plurality of droplets from the orifices of each chamber including a plurality of transducers, one of said transducers being coupled to each of said chambers, said plurality of orifices for each of said chambers being arrayed along a line extending to right angles to said scanning direction such that the overall field of droplets ejected from each of said plurality of orifices prints a segment of a bar but does not overlap with the overall field of droplets ejected from each other said plurality of orifices which print a different segment of the bar.

4,714,935

INK-JET HEAD DRIVING CIRCUIT

Mitsuru Yamamoto; Nobuaki Sakurada, both of Yokohama, and Yoshitaka Watanabe, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 609,803, May 14, 1984, abandoned.

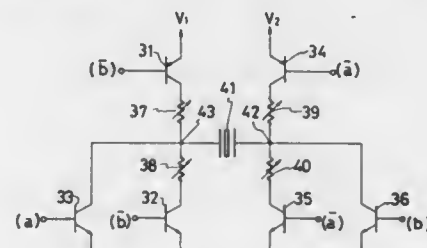
This application Sep. 23, 1986, Ser. No. 910,818

Claims priority, application Japan, May 18, 1983, 58-86952; May 27, 1983, 58-93783; Jun. 3, 1983, 58-99089

Int. Cl.⁴ G01D 15/16

U.S. Cl. 346—140 R

10 Claims



1. An ink-jet head driving circuit comprising: a pressure chamber adapted to be filled with a recording liquid; a piezo-electric element having a polarization direction for emitting recording liquid by deforming said pressure

- chamber due to the charge and discharge of said piezo-electric element;
- first charging means for charging said piezo-electric element with a voltage of a first level at a first polarity opposed to the polarization direction of said piezo-electric element;
- second charging means for charging said piezo-electric element with a voltage of a second level at a second polarity which is different from said first polarity, said second charging means deforming said pressure chamber by charging said piezo-electric element at said second polarity so as to emit recording liquid, said second polarity being the polarization direction of said piezo-electric element;
- voltage applying means for applying a voltage of said first level to said piezo-electric element through said first charging means, and for applying a voltage of said second level to said piezo-electric element through said second charging means, said voltage applying means comprising adjusting means for adjusting at least one of said first-level voltage and said second-level voltage;
- first means for adjusting the time width during which said first-level voltage is applied by said voltage applying means;
- second means for adjusting the time width during which said second-level voltage is applied by said voltage applying means; and
- discharging means for controlling a discharge time constant of said piezo-electric element, wherein said discharging means includes a discharge path having a resistor therein.

4,714,936

INK JET PRINTER

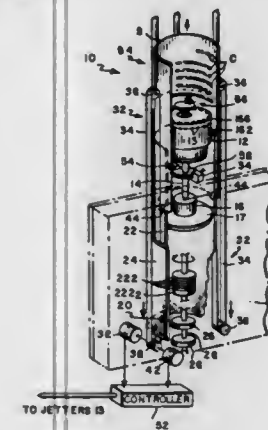
Richard R. Helinski, Hudson; Carl D. Lutz, Derry; Thomas R. Peer, Londonderry, and Philip A. Eno, East Hampstead, all of N.H., assignors to Howtek, Inc., Hudson, N.H.

Filed Jun. 24, 1985, Ser. No. 749,861

Int. Cl.⁴ G01D 15/16

U.S. Cl. 346—140 R

21 Claims



1. A rotary ink jet printer comprising
 - A. a print wheel including a rotary support member for positioning within a printing medium wrapped as a collinear semicylinder about the print wheel;
 - B. means for rotating the support member about its rotary axis;
 - C. a plurality of ink jetters supported by the support member, each said jetter being arranged to project ink droplets radially from the support member in response to electrical signals;
 - D. an ink reservoir mounted to the support member below said jetters, said ink reservoir having a plurality of different ink chambers, one of said chambers being substantially larger than the other chambers;
 - E. means for conducting ink from each chamber to selected jetters of said plurality of jetters when said support member is rotated, the number of jetters to which ink is con-

- ducted from said one chamber being substantially greater than the number of jetters of which ink is conducted from each of the other chambers and the entrances of said conducting means from all of said chambers being located adjacent to the walls of said chambers furthest from said rotary axis;
- F. means for aiming each jetter independently of the others in a first direction parallel to said rotary axis so that said print wheel can print a succession of dots in a plurality of different colors at a plurality of different line positions on the printing medium; and
- G. means for applying electrical signals selectively to said jetters.

4,714,937

INK DELIVERY SYSTEM

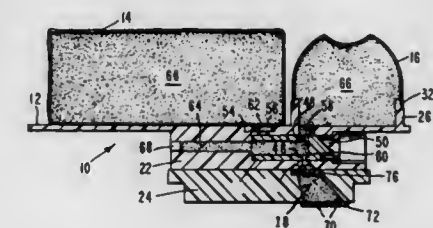
George T. Kaplinsky, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 2, 1986, Ser. No. 914,225

Int. Cl.⁴ G01D 15/16

U.S. Cl. 346—140 R

15 Claims



1. An ink delivery system comprising in combination:
 - (a) an ink bag for storing a quantity of ink;
 - (b) a print head for delivering ink to a printing medium;
 - (c) a bladder for providing a supply of ink to said print head;
 - (d) a valve for providing a closed mode, a refill mode for conveying ink from said ink bag to said bladder, and a print mode for conveying ink from said bladder to said print head; and
 - (e) means for supporting said ink bag, said bladder, said print head and said valve in cooperative association.

4,714,938

WARNING APPARATUS FOR CAMERA

Kazuyuki Kazami; Toshiyuki Nakamura, both of Tokyo, and Hiroshi Wakabayashi, Yokohama, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

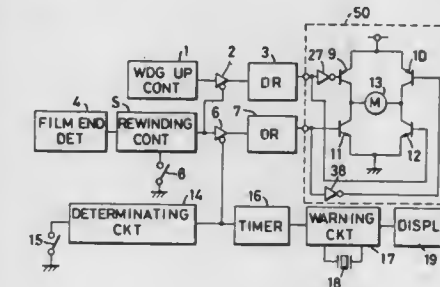
Filed Jan. 27, 1987, Ser. No. 7,171

Claims priority, application Japan, Jan. 29, 1986, 61-11351[U]; Mar. 31, 1986, 61-47730[U]

Int. Cl.⁴ G03B 1/12

U.S. Cl. 354—173.1

6 Claims



1. A camera capable of automatically rewinding a film into a cartridge, comprising:
 - (a) detection means for detecting completion of a film rewinding operation and producing a detection signal;

- (b) warning means, responsive to the detection signal, for warning; and
 (c) control means for controlling said warning means, said control means having timer means for measuring a predetermined period of time.

4,714,940

IMAGE PROCESSING APPARATUS HAVING DISPLAY MEANS TO MONITOR AND DISPLAY INFORMATION FROM A DATE INPUT SECTION

Yataka Inoue, Urawa; Mitsuru Kurata, Kawasaki; Nobuhiro Kasama, Yokohama; Masao Hosaka, Sagami-hara; Toshiaki Yagasaki, Hino; Hiroshi Tanloka, Tokyo, and Tadashi Yamakawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

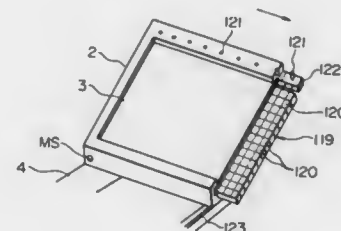
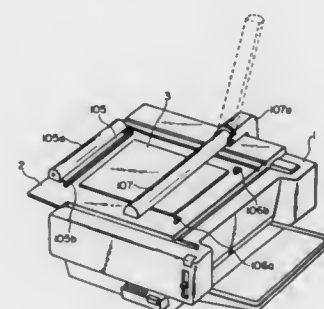
Filed Aug. 9, 1984, Ser. No. 639,142

Claims priority, application Japan, Aug. 16, 1983, 58-149369; Aug. 16, 1983, 58-149370; Aug. 17, 1983, 58-149122; Aug. 17, 1983, 58-149123; Aug. 31, 1983, 58-158052; Aug. 31, 1983, 58-158053; Aug. 31, 1983, 58-158054; Sep. 5, 1983, 58-161950; Sep. 27, 1983, 58-177037; Sep. 27, 1983, 58-177038; Sep. 27, 1983, 58-177039; Sep. 27, 1983, 58-177040; Oct. 1, 1983, 58-181829; Oct. 1, 1983, 58-181830; Oct. 14, 1983, 58-190984; Dec. 2, 1983, 58-226754

Int. Cl.⁴ G03G 15/04

U.S. Cl. 355—3 R

10 Claims



1. An image processing apparatus comprising:
 inputting means for inputting data;
 displaying means for displaying an image in response to an information signal from said inputting means;
 an original plate for placing an original thereon;
 a presser plate for pressing said original placed on said original plate;
 exposing means for exposing said original pressed toward said original plate by said presser plate;
 image processing means for processing an original image in response to reflected light from said original exposed by said exposing means and selectively forming said original and said displayed image on the basis of light provided when said displayed image is processed; and
 lighting means, provided at the back side of said displaying means, for lighting only portions of said displayed image at an exposure position, wherein said displaying means is arranged on the side of the pressing surface of said presser plate.

4,714,939

ELECTROGRAPHIC REPRODUCTION APPARATUS

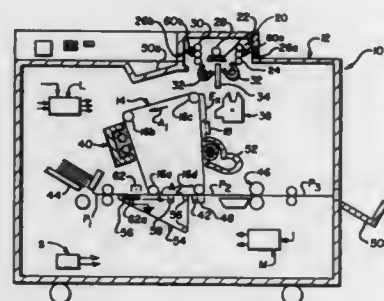
Douglas K. Ahern, Rochester; William Y. Fowlkes, Fairport, and Donald S. Rimai, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 794,879, Nov. 4, 1985. This application Aug. 7, 1986, Ser. No. 894,174

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—3 TR

12 Claims



1. Electrographic reproduction apparatus capable of producing simplex or duplex copies on a receiver member traveling along a path, said apparatus including:

- a first dielectric member movable along a first path, a portion of such first path being tangent to one side of such receiver member travel path;
 means for sequentially forming transferable images, corresponding to information to be reproduced, on said first dielectric member;
 a second member movable along a second path, one portion of said second path being tangent to such receiver member travel path on the opposite side from said first path, and another portion of said second path being located to position a portion of said second member in image transfer relation to said first dielectric member; and
 transfer means, located adjacent to the portion of the second path where said first and second members are in image transfer relation, for selectively establishing an electrostatic transfer field of a first effective direction for transferring one transferable image from said first dielectric member to said second member or of a second effective direction for transferring said one transferable image from said second member to one side of a receiver member.

4,714,941

COPYING APPARATUS HAVING A CONTROLLED SCANNING SPEED ACCORDING TO A COPYING MAGNIFICATION

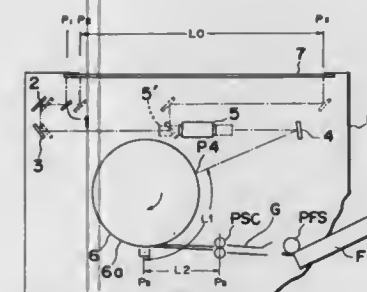
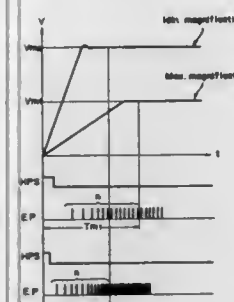
Toshio Yamagishi, Nara, and Katsuyoshi Fujiwara, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
 Filed Apr. 15, 1986, Ser. No. 852,210

Claims priority, application Japan, Apr. 16, 1985, 60-83263; Apr. 16, 1985, 60-83264

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—8

3 Claims



1. A copying apparatus comprising:
 original document scanning means for scanning an original document to be copied, said original document scanning means including a reciprocating optical unit and an original document platform or the like, to scan at a constant speed, with the scanning speed thereof being controlled according to copying magnifications;
 means for preliminarily scanning by said original document scanning means before a copying exposure scanning at speeds corresponding to at least two different copying magnifications;
 means for measuring an acceleration time of said original document scanning means from a home position to a reference position in a constant speed moving section corresponding to said at least two different copying magnifications by said preliminary scanning;
 means for calculating an acceleration time corresponding to any required copying magnification based on information of the acceleration time corresponding to said at least two different copying magnifications; and
 means for setting timing for feeding a leading edge of a copy paper sheet to a transfer position, based on a reference time obtained by adding time required for an exposure position on a photoreceptor drum to reach the transfer position, to said calculated acceleration time.

4,714,942

REVERSAL IMAGE DEVELOPMENT TYPE ELECTROPHOTOGRAPHIC PRINTING SYSTEM

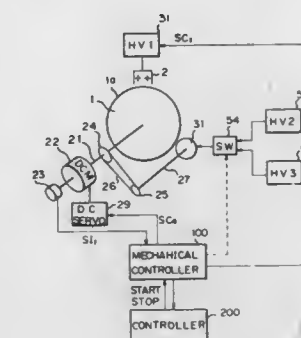
Akio Nakanishi, Funabashi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 18, 1986, Ser. No. 875,669

Claims priority, application Japan, Jun. 18, 1985, 60-132530
 Int. Cl.⁴ G03G 15/00, 15/08

U.S. Cl. 355—14 R

17 Claims



1. A two component reversal image development type electrophotographic printing system comprising:
 rotatable means having light sensitive means mounted thereon;
 precharging means including:
 a precharger provided adjacent to an outer surface of said rotatable means; and
 a first power supply, connected to said rotatable means and said precharger, supplying a high voltage to said precharger and charging said light sensitive means to a predetermined voltage;
 exposing means, connected to said light sensitive means, for exposing said charged light sensitive means to light beams for forming latent images in said charged light sensitive means;
 developing means, connected to said light sensitive means, for developing images at portions of said light sensitive means on which said latent images are formed, said developing means including:
 image developing roller means co-rotatable with said rotatable means and containing magnets and a sleeve covered thereon;
 a second power supply, connected to said image developing roller means, for supplying a first bias voltage having a predetermined value which is equal to or greater than zero and having a polarity which is an inverted polarity of the high voltage from said first power supply to said image developing roller means for preventing a deposition of a printing medium on said light sensitive means until a portion of the light sensitive means precharged by the precharging means passes said image developing roller means; and
 a third power supply, connected to said image developing roller means, for supplying a second bias voltage having a predetermined value and having the same polarity as the first power supply, to said image developing roller means for performing an image developing operation in a normal condition;
 discharging means, connected to said light sensitive means, for discharging charges on said light sensitive means; and
 controlling means, connected to said rotatable means and said image developing roller means, for controlling at least a start of said rotatable means and said image developing roller means, and energization and de-energization of said first, second and third power supplies, in a predetermined sequence in accordance with various positions of said precharging means, said image developing roller

means, and said discharging means, and a rotational speed of said rotatable means, in at least the start-up condition.

4,714,943

IMAGING DEVICE

Kenji Sakakibara, Ichinomiya; Michitoshi Akao, Nagoya; Shigeyuki Hayashi, Nagoya, and Jun Sakai, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

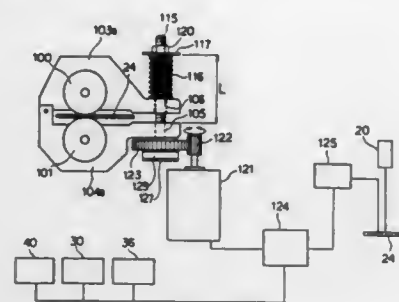
Filed Mar. 4, 1987, Ser. No. 21,637

Claims priority, application Japan, Mar. 11, 1986, 61-51409; Mar. 11, 1986, 61-51410; Mar. 27, 1986, 61-43929[U]

Int. Cl.⁴ G03B 27/32, 27/52

U.S. Cl. 355—27

13 Claims



1. An imaging device comprising:
means for exposing a light on a photo and pressure sensitive recording sheet for forming a latent image thereon;
means for applying a pressure on said recording sheet for developing said latent image thereon; and
means for controlling a degree of pressing applied to said recording sheet by said pressure applying means.

4,714,944

VARIABLE-MAGNIFICATION COPYING MACHINE WITH AUTOMATIC MAGNIFICATION

Syoichiro Yoshiura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

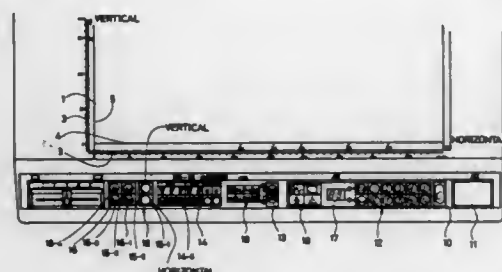
Continuation of Ser. No. 697,013, Jan. 31, 1985, abandoned. This application Sep. 24, 1986, Ser. No. 910,863

Claims priority, application Japan, Jan. 31, 1984, 59-17396

Int. Cl.⁴ G03B 27/52

U.S. Cl. 355—55

4 Claims



1. A variable-magnification copying machine incorporating functions for executing a copying operation in response to a magnification set for selected copy paper sizes as compared to a draft paper of a given size comprising:
orthogonally disposed scales adapted for visually measuring the length of the horizontal and vertical edges of the draft paper and further adapted for indicating a correspondence between the size of the draft paper and one of a plurality of standard draft paper sizes;
key input means for inputting data denoting the length of the horizontal and vertical edges of the draft paper as visually measured along said orthogonally disposed means in a

variable sizing mode and alternatively for inputting one of a plurality of standard draft paper sizes in a preset sizing mode;
means for selecting a copy paper size in said variable sizing mode;
calculating means, responsive to said key input means and said means for selecting a copy paper size, for computing a ratio between the inputted lengths of the horizontal and vertical edges of both the draft and copy papers in said variable sizing mode;
said calculating means alternatively computing a ratio between the inputted standard draft paper size and a selected copy paper size in said preset sizing mode;
selecting means, responsive to said calculating means, for selecting the smaller ratio of the computed lengths of the horizontal and vertical edges as the variable magnification in either of said variable sizing mode or said preset sizing mode; and
automatic setting means, responsive to said selecting means, for setting a copying magnification for the copying operation.

4,714,945

LIGHT EXPOSURE CONTROLLER

Katsuyoshi Fujiwara, Osaka, and Shunju Anzai, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

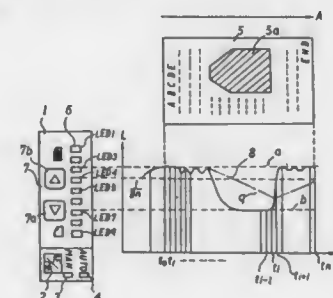
Filed Dec. 18, 1985, Ser. No. 810,244

Claims priority, application Japan, Dec. 20, 1984, 59-271468

Int. Cl.⁴ G03B 27/72

U.S. Cl. 355—69

4 Claims



1. A light exposure controller, comprising:
a lamp for illuminating an original document on a copy document table;
means for detecting a quantity of light reflected by said original document;
means for controlling a light volume of said lamp according to the detected quantity of light; and
mode selector means for selecting either of an automatic or manual exposure control for said lamp, wherein the light volume is set at a mean value of the light volume for the most recent automatic control mode copying operation when the automatic control mode is switched over to the manual mode.

4,714,946

CONTINUOUS FORM FEEDER FOR A REPRODUCING MACHINE AND PROCESS

Teddy A. Bajgert, Boulder; Neall H. Bunker; James L. Cochran, both of Longmont; Willis J. Duane, and Arturo Mojica, both of Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 27, 1985, Ser. No. 802,648

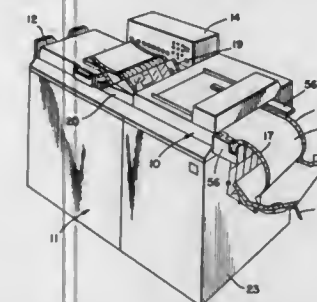
Int. Cl.⁴ G03B 27/62

U.S. Cl. 355—75

55 Claims

1. A multipurpose document feeder for a reproducing machine including means for viewing a document and for forming an image thereof on a desired copy substrate, said document feeder comprising:

document feeding means selectively operable in a first mode wherein one or more individual document sheets are serially fed to said viewing means or in a second mode wherein said document comprises a continuous web which is incrementally advanced over said viewing means;
continuous web supporting means arranged adjacent said document feeding means for supporting a fanfolded stack of said web;
means for supporting said web supporting means for movement selectively between a first stored position, corre-



sponding to said first mode, wherein it does not interfere with operation of said feeding means in said first mode of operation and a second operative position, corresponding to said second mode, wherein it is operative to support said web for feeding by said feeding means to said viewing means in said second mode of operation; and
control means responsive to the movement of said web supporting means between its respective first and second positions for automatically conditioning said feeding means to operate in its corresponding first or second mode of operation.

4,714,947

CONTACT PRINTER FOR PHOTOCENSITIVE MATERIALS

Fumihiko Nishida; Seiji Nanri, and Makoto Yahata, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

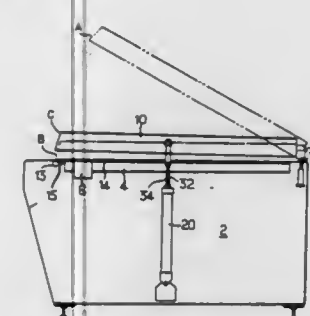
Filed Jul. 17, 1986, Ser. No. 886,778

Claims priority, application Japan, Jul. 18, 1985, 60-110831[U]

Int. Cl.⁴ G03B 27/04

U.S. Cl. 355—95

20 Claims



1. A contact printer for printing from an original to photosensitive material, comprising:
a printing table for mounting the photosensitive material thereon, said table being adapted to move up and down;
a light source for exposing said photosensitive material through the original;
a light transmitting plate member having an effective printing area;

a frame member for supporting said light transmitting plate member;
a packing member disposed to be outside said effective area of said light transmitting plate member, for defining an airtight space between said printing table and said light transmitting plate member;
original moving means for moving said original in a plane adjacent to said printing table orthogonally in X-direction and Y-direction relative to said photosensitive material;
air supply means for blowing air into a space between said original and said photosensitive material to provide a laminar flow of air therein; and
frame member moving means for opening and closing said frame member relative to said printing table, said frame member moving means being adapted for moving said frame member between a first position at which said frame member is opened and a second position at which said airtight space is defined by said printing table, said light transmitting plate member, and said packing member, and for holding said frame member at a third position at which said frame member is slightly opened to be between said first and second positions so as to define a corresponding space between said original film and said photosensitive material after said printing table is moved downward, whereby said original can be moved in X-direction and Y-direction by said original moving means while said original is supported in said space by said laminar flow of air blown by said air supply means so that contact between the moving original and the photosensitive material is avoided.

4,714,948

HEMT WITH EPITAXIAL NARROW BANDGAP SOURCE/DRAIN CONTACTS ISOLATED FROM WIDE BANDGAP LAYER

Takashi Mimura, Machida, and Satoshi Hiyanizumi, Komae, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 371,505, Apr. 23, 1982, abandoned.

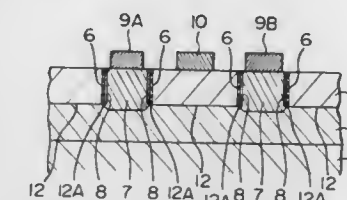
This application Mar. 13, 1986, Ser. No. 839,826

Claims priority, application Japan, Apr. 23, 1981, 56-61702

Int. Cl.⁴ H01L 29/205, 29/80

U.S. Cl. 357—22

4 Claims



1. A semiconductor device comprising:
a first single crystalline semiconductor layer;
a second single crystalline semiconductor layer doped with N-type impurities, having an electron affinity less than that of said first single crystalline semiconductor layer, a heterojunction being formed between said first and second single crystalline semiconductor layers;
a gate electrode formed on said second single crystalline semiconductor layer;
an electron-storing layer for storing electrons and acting as a conduction channel, formed adjacent to said heterojunction and within said first single crystalline semiconductor layer, due to the difference in electron affinity between said first and second single crystalline semiconductor layers;
a pair of conduction layers comprising substantially the same semiconductor material as said first single crystalline semiconductor layer, being highly doped with N-type impurities, and extending through said second single crys-

talline semiconductor layer into said first single crystalline semiconductor layer to a depth level with the depth of said heterojunction and forming an epitaxial connection with said first single crystalline semiconductor layer; an insulating layer, interposed between said conduction layers and said second single crystalline semiconductor layer, composed of oxide or nitride of said second single crystalline semiconductor layer; and a pair of electrodes, respectively, formed on said pair of conduction layers and electrically connected to said conduction channel via said conduction layer, said pair of electrodes electrically connected to each other through said conduction channel.

4,714,949

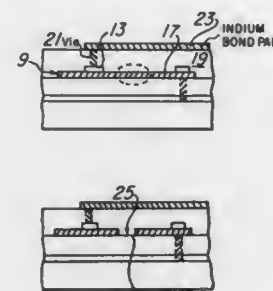
ELECTROSTATIC DISCHARGE PROTECTION USING THIN NICKEL FUSE

Arturo Simmons; Shawn T. Walsh, both of Garland, and Charles G. Roberts, McKinney, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 656,111, Sep. 28, 1984, abandoned. This application Sep. 12, 1986, Ser. No. 907,130
Int. Cl.⁴ H01L 29/78, 27/14, 27/10, 27/02

U.S. Cl. 357—23.13

12 Claims



1. A MIS array semiconductor device in which each device comprises:

- a semiconductor substrate,
- a first insulating layer on said substrate, and
- an electrically conductive layer on said insulating layer, said conductive layer being patterned into an MIS element, said element including a gate and a fuse, said first insulating layer forming the gate insulator and defining a first via therethrough associated with said MIS element, said fuse being a narrow portion of said conductive layer connected at one end to said gate and connected at the other end to said substrate through said first via, said gate connected to a bond pad, said narrow portion of width being sufficiently thin to blow the fuse with a voltage applied to said gate relative to said substrate that is below the minimum voltage required to damage said insulating layer or substantially move fixed charge in said insulating layer,
- whereby said fuse short circuits the MIS capacitor formed by said gate with said substrate until said fuse is blown.

4,714,950

SOLID-STATE PHOTO SENSOR DEVICE

Kazuhiro Kawajiri; Hiroshi Tamura; Haruji Shinada; Mitsuo Saito, and Yuzo Mizobuchi, all c/o Fuji Photo Film Co., Ltd., No. 798, Miyasodai, Kaisei-machi, Ashigarakami-gun Kanagawa, Japan

Filed Jun. 27, 1985, Ser. No. 749,400

Claims priority, application Japan, Jul. 4, 1984, 59-137333

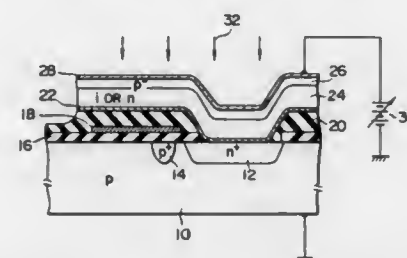
Int. Cl.⁴ H01L 27/14, 31/00

U.S. Cl. 357—30

19 Claims

1. A solid-state photo sensor device comprising:

a first electrode layer for allowing light to pass there-through;
a first amorphous silicon layer of a first conductivity type disposed below said first electrode layer;
a second amorphous silicon layer of a second conductivity type, other than the first conductivity type, disposed below said first amorphous silicon layer;
said first and second amorphous silicon layers each containing impurity elements whose concentration ranges from about 0 molPPM to 200 molPPM;
said second amorphous silicon layer being disposed on a second electrode layer;
said second electrode layer overlying a first insulating layer except in an area where said second electrode layer is electrically connected to a first type impurity region, said



first type impurity region being disposed in a substrate and forming a p-n diode with said substrate;
a gate insulation layer overlying said substrate, except in said area where said second electrode layer is electrically connected to said first type impurity region;
a gate electrode being disposed between said gate insulation layer and said first insulation layer; and
a potential barrier region of a second type impurity being disposed in said substrate, separate from said first type impurity region,
wherein the device delivers photocarriers in the form of an electric current, excited at least in said second amorphous silicon layer,
and wherein the device also delivers photocarriers, in the form of an electric current, that are excited in said first amorphous silicon layer.

4,714,951

INTEGRATED CIRCUIT DEVICE WHICH INCLUDES A CONTINUOUS LAYER WHICH CONSISTS OF CONDUCTING PORTIONS WHICH ARE OF A SILICIDE OF A REFRACTORY METAL AND INSULATING PORTIONS WHICH ARE OF AN OXIDE OF THE METAL

Annie Baudrant, St. Martin D'Heres, and Michel Marty, Grenoble, both of France, assignors to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux EFCIS, Grenoble, France

Division of Ser. No. 673,425, Nov. 20, 1984, Pat. No. 4,593,454.

This application Feb. 26, 1986, Ser. No. 833,845

Claims priority, application France, Nov. 22, 1983, 8318565

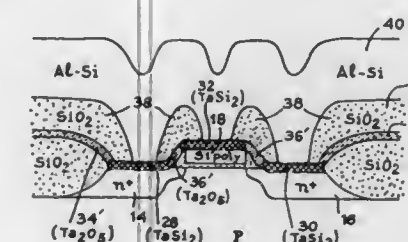
Int. Cl.⁴ H01L 29/78, 27/02, 23/48

U.S. Cl. 357—67

7 Claims

1. An integrated circuit device including a semiconductive chip having a plurality of separate silicon surface regions to each of which a low resistance electrical connection is to be provided,
an insulating oxide layer overlying portions of the chip between said separate surface regions, and
a continuous layer overlying said chip consisting of conducting portions and insulating portions,
the conducting portions being of a silicide of a given refractory metal and contiguous to the silicon surface regions

for providing low resistance electrical connection thereto, and



the insulating portions being of an oxide of the given metal and contiguous to the insulating oxide layer.

4,714,952

CAPACITOR BUILT-IN INTEGRATED CIRCUIT PACKAGED UNIT AND PROCESS OF FABRICATION THEREOF

Kouichi Takekawa, and Manabu Bonkohara, both of Tokyo, Japan, assignors to NEC Corporation, Japan

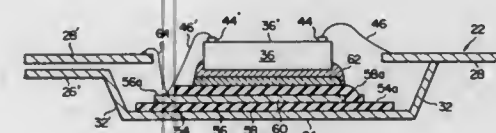
Filed Oct. 30, 1985, Ser. No. 792,971

Claims priority, application Japan, Nov. 1, 1984, 59-230954

Int. Cl.⁴ H05K 03/46

U.S. Cl. 357—75

22 Claims



1. A capacitor built-in integrated circuit packaged unit comprising an electrically conductive support member having an extensive area larger than said capacitor, integrated circuit,

- first and second lead elements associated with said conductive support member, said first lead element being electrically connected to said conductive support member and said second lead element being electrically isolated from said conductive support member,
- a stack having a plurality of layers and comprising a first insulating layer of a highly dielectric material formed on said conductive support member, a first electrically conductive layer formed on said first insulating layer, said first insulating layer having a portion exposed by said first electrically conductive layer, a second insulating layer formed on said first electrically conductive layer and having a portion directly lying on the exposed portion of said first insulating layer, said first electrically conductive layer as a whole being less extensive than said first insulating layer and having a portion exposed by said second insulating layer, a second electrically conductive layer formed on said second insulating layer, said second electrically conductive layer as a whole being less extensive than said second insulating layer and than said first electrically conductive layer, and a layer of an electrically conductive adhesive material formed on the second electrically conductive layer,
- a semiconductor integrated circuit chip having first and second electrodes which are electrically isolated from each other, said semiconductor integrated circuit chip having a surface portion bonded to said second electrically conductive layer via said electrically conductive adhesive material,
- first coupling means electrically connecting the first electrode to said first lead element, and
- second coupling means electrically connecting the sec-

ond electrode to the exposed portion of said first electrically conductive layer and to said second lead element.

4,714,953

WELDED WIRE COOLING

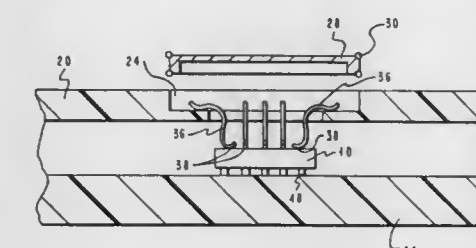
Marvin L. Buller, Austin, Tex.; Douglas L. Lumbr, St. Albans, Vt.; Douglas W. Phelps, Burlington, Vt.; Sigvart J. Samuelsen, Burlington, Vt., and William C. Ward, Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1986, Ser. No. 861,799

Int. Cl.⁴ H01L 23/34, 23/36

U.S. Cl. 357—81

6 Claims



1. A semiconductor packaging configuration comprising: a substrate;
a semiconductor device mounted on the substrate;
a cover attached to the substrate, overlying the semiconductor device; and
a plurality of metallic filaments directly connecting preselected heat generating areas on semiconductor material in the semiconductor device to the cover, for dissipating heat generated in the semiconductor device.

4,714,954

READ START PULSE GENERATOR FOR TIME BASE CORRECTOR

Tadaaki Yoshinaka, and Takao Inoue, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 5, 1986, Ser. No. 826,223

Claims priority, application Japan, Feb. 16, 1985, 60-28913

Int. Cl.⁴ H04N 9/475

U.S. Cl. 358—19

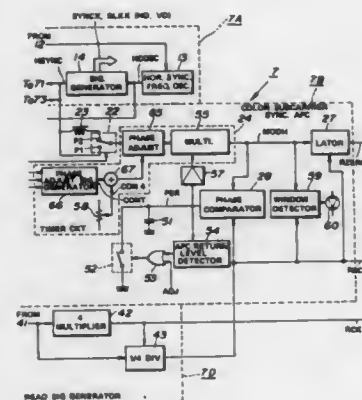
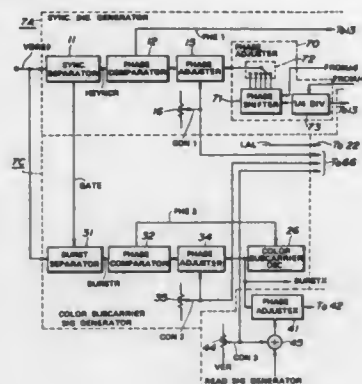
8 Claims

3. In a read clock generator for a time base corrector having: a synchronizing signal generator including a horizontal synchronizing phase adjusting device, responsive to a reference pulse signal including a reference synchronizing signal, for generating a read synchronizing signal adjustable in phase relative to the reference synchronizing signal,
a color subcarrier signal generator including a subcarrier phase adjusting device, responsive to the reference pulse signal including a reference burst signal, for generating a burst signal adjustable in phase relative to the reference burst signal, and
a read signal generator including a hue adjusting device, responsive to the adjusted burst signal, for generating a read subcarrier signal and a read clock signal both adjustable in phase relative to and synchronized with the adjusted burst signal;
a read start pulse generator of color subcarrier synchronizing phase controller type, which comprises:
a switching circuit responsive to the adjusted synchronizing signal for outputting a trigger signal, the phase of the trigger signal being delayed a half period of the subcarrier signal for each horizontal scanning line;
a timer circuit including a horizontal synchronization color subcarrier phase adjusting device, responsive to the trigger signal, for outputting an adjustable timer output, the

timer time thereof being approximate to a timing at which a read start pulse signal is generated;

a latch circuit responsive to the timer output for latching a logical level of the timer output at a timing at which the adjusted burst signal is zero in voltage level and for generating the start pulse signal in synchronization with the read subcarrier signal;

a phase comparator for making a phase comparison between the timer output and the read subcarrier signal and outputting a phase error signal between the two to said timer circuit to control the timer time so that the phase error signal becomes zero; and



means for automatically adjusting the phase of the timer output by cancelling a phase offset between the read synchronizing signal and the read subcarrier signal due to the adjusted read synchronizing signal and the adjusted read subcarrier signal;

whereby once the timer circuit is adjusted, it is unnecessary to readjust the adjusted timer time even after the horizontal synchronization phase adjusting device, the subcarrier phase adjusting device, and the hue adjusting device have been adjusted.

4,714,955

SOLID-STATE COLOR IMAGE PICKUP APPARATUS
Ryuji Nishimura; Minoru Kato, both of Yokohama; Masaru Noda, Kanagawa, and Takuya Imaide, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 5, 1986, Ser. No. 927,140
Claims priority, application Japan, Nov. 6, 1985, 60-247052; Jan. 20, 1986, 61-7914

Int. Cl.⁴ H04N 9/07, 9/077

U.S. Cl. 358-48

10 Claims

1. A signal processing apparatus for obtaining a video signal in which color aliasings were suppressed for a color video camera having an image pickup device consisting of a number of photoelectric converting elements which are two-dimen-

sionally arranged and four kinds of color separation optical filters which are repetitively arranged on the surfaces of said photoelectric converting elements in accordance with a predetermined order, said signal processing apparatus comprising:

an image pickup device for outputting a first signal, a second signal, a third signal, and a fourth signal respectively corresponding to said four kinds of color separation optical filters; and

color signal producing means for producing a first color signal and a second color signal by processing said first to fourth signals on the basis of arithmetic operations of the following expressions:

$$C_1 = \alpha S_1 - \beta S_2 + \gamma S_3 - \delta S_4$$

$$C_2 = \alpha' S_1 + \beta' S_2 - \gamma' S_3 - \delta' S_4$$

wherein respective arithmetic operational ratios α , β , γ , δ , α' , β' , γ' , and δ' of said first and second color signals are set so as to substantially satisfy the following condition

$$\alpha S_1 + \beta S_2 = \gamma S_3 + \delta S_4 \text{ or } \alpha' S_1 + \gamma' S_3 = \beta' S_2 + \delta' S_4.$$

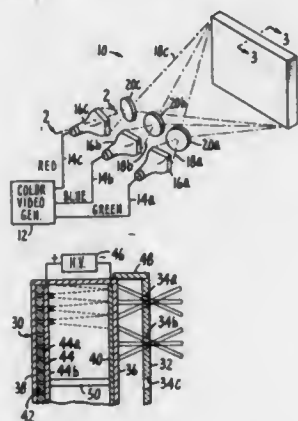
4,714,956 COLOR DISPLAY APPARATUS AND METHOD THEREFOR

Ronald L. Yin, 2045 Sea Cliff Way, San Bruno, Calif. 94066
Continuation-in-part of Ser. No. 422,741, Sep. 24, 1982, Pat. No. 4,562,461, which is a continuation-in-part of Ser. No. 309,820, Oct. 8, 1981, abandoned. This application Dec. 9, 1985, Ser. No. 806,673

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.
Int. Cl.⁴ H04N 5/74

U.S. Cl. 358-60

21 Claims



1. A method of converting a plurality of electrical signals into a color visual display, said method comprising the steps of: generating a plurality of beams of electrons; modulating each beam of electrons by one of said plurality of

electrical signals to produce a plurality of beams of modulated electrons;

converting each beam of modulated electrons into a beam of modulated light to produce a plurality of beams of modulated light;

directing said plurality of beams of modulated light at a two-dimensional photocathode screen in an evacuated envelope;

optically masking each beam of modulated light such that each beam of modulated light impinges a different location on said photocathode screen, said screen having a plurality of different locations;

releasing electrons from said photocathode screen in response to said plurality of beams of modulated light impinging thereon;

accelerating said electrons to a two-dimensional phosphor screen in said envelope, said phosphor screen having a plurality of different phosphor compositions, in a plurality of different locations, each phosphor composition in a different location releasing visible light of a different color in response to electrons impinging thereon;

releasing visible light from said phosphor screen in response to electrons impinging thereon; and

moving said plurality of beams of modulated light to impinge said photocathode screen in different locations whereby the movement of said plurality of beams of modulated light forms said color visual display.

4,714,957

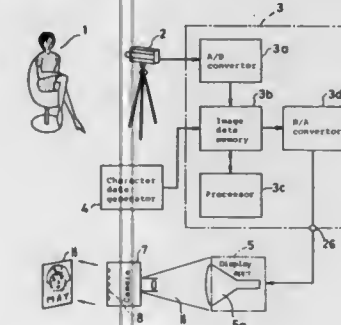
APPARATUS AND METHOD FOR MAKING A STAMP
Hiroji Takano, Yawata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 29, 1986, Ser. No. 901,786

Claims priority, application Japan, Sep. 2, 1985, 60-193510
Int. Cl.⁴ H04N 1/032, 1/387

U.S. Cl. 358-93

8 Claims



1. Method for making a stamp comprising:

step of producing image data signal from an object,

step of processing said image data signal to produce a signal of line pattern of edges of said object,

step of producing an optical image of photoactive rays from said signal of line pattern,

step of irradiating a photosensitive resin layer formed on a substrate with said photoactive rays of said optical image, and

step of developing a latent image made by said irradiation on said photosensitive resin layer to produce a stamp of said line pattern.

4,714,958

VIDEO PROCESSOR

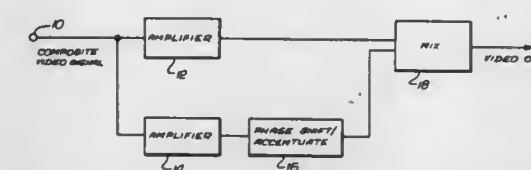
Gary L. Holz, San Diego, and Walter M. Foster, El Cajon, both of Calif., assignors to BMP, Las Vegas, Nev.

Filed Nov. 14, 1983, Ser. No. 550,880

Int. Cl.⁴ H04N 5/14

U.S. Cl. 358-166

11 Claims



1. A video processor for improving picture quality comprising:

input means for receiving a composite video signal having a varying magnitude level and dividing the video signal into first and second video signals;

modification means for receiving the second video signal and selectively accentuating the magnitude of the second video signal between relatively low magnitude portions and relatively high magnitude portions, wherein the modification means includes phase shift means for selectively phase shifting portions of the second video signal with respect to the first video signal to provide a modified second video signal; and

mixing means for combining the modified second video signal with the first video signal to provide an accentuated video output signal.

4,714,959

BI-DIRECTIONAL AMPLIFIER FOR CONTROL AND VIDEO SIGNALS IN A CLOSED CIRCUIT TELEVISION SYSTEM

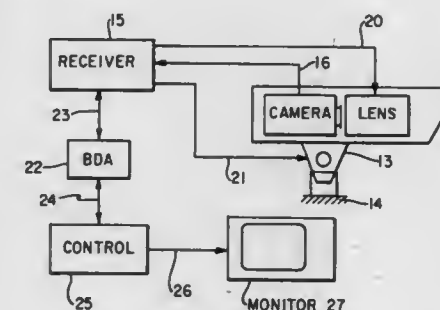
Yacov A. Pshtitsky, Bayside, N.Y., assignor to Vicon Industries, Inc., Melville, N.Y.

Filed Jul. 22, 1986, Ser. No. 888,767

Int. Cl.⁴ H04N 1/00, 5/14, 5/228, 5/222

U.S. Cl. 358-184

18 Claims



1. A bi-directional amplifier for use in a closed circuit T.V. system in which video signals from a camera and camera control signals from a control console are transmitted between said camera and said control console, said camera being mounted remotely from said console and coupled thereto by a single link, said video signal including a picture information portion and a vertical back porch, said control signals being placed on said single link during said vertical back porch of said video signal, said system further including a receiver for receiving said camera control signals and for generating signals for controlling said camera, said bi-directional amplifier comprising:

means for detecting a start pulse from said receiver associated with the start of said vertical back porch;

sample and hold means for detecting a d.c. level of said vertical back porch; and
switch means comprising a first switch for transmitting said video signal from said camera to said control console during said picture information portion of said video signal and not transmitting said video signal from said camera during said back porch, second switch means for coupling the output of said sample hold to said control console during said vertical back porch of said video signal for maintaining said d.c. level and not coupling the output of said sample and hold to said control console during said picture information portion and third switch means for coupling said control signals to said camera during said vertical back porch and not coupling said control signals to said camera during said picture information portion.

4,714,960

TELEVISION RATE OPTICAL SCANNER

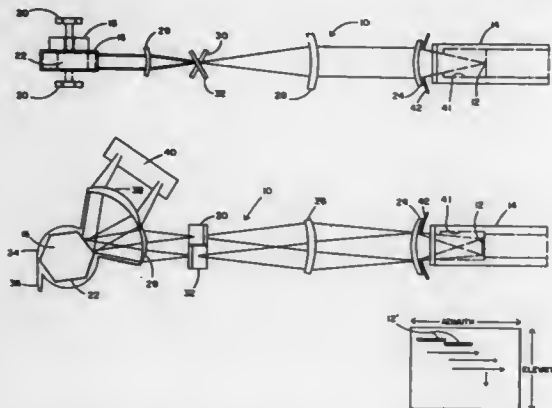
Peter Laakmann, Highland Dr., The Highlands, Seattle, Wash. 98177

Filed Jun. 3, 1985, Ser. No. 740,829

Int. Cl.⁴ H04N 3/08

U.S. Cl. 358—206

26 Claims



1. An afocal opto-mechanical scanner configured to produce television rate two-dimensional scans; the scanner comprising:
a multifaceted polygon mirror for spinning around an axis centered and parallel to the mirror faces and defining a first scan direction for optical energy;
a second scan mirror scanning in a second scan direction substantially orthogonal to said first scan direction;
an optical relay between said first and second scan mirrors relaying the optical energy between the first scan mirror and the second scan mirror to create a non-astigmatic two-dimensional scan;
an enclosure for housing said polygon mirror substantially at atmospheric pressure when at rest and providing a reduction in operating pressure through centrifugal pumping action when at operating speed without requiring a separate pump.

4,714,961
PROCESS AND CIRCUIT ARRANGEMENT FOR THE REMOTE PICK UP AND REPRODUCTION OF IMAGES OF STATIC OR MOVING OBJECTS

Heinz-Günter Haubold, Jülich, and Peter Hiller, Düren, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

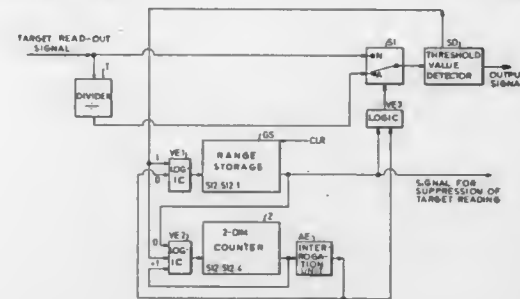
Filed May 13, 1986, Ser. No. 862,764

Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517737

Int. Cl.⁴ H04N 5/235

U.S. Cl. 358—209

10 Claims



1. A process for the remote pickup and reproduction of images of static or dynamic objects, comprising the steps of:
registering individual images of an object in a standard image pickup cycle with a pickup camera;
integrating accumulation of electric charges upon a target of said pickup camera representing image-density characteristics of each of said individual images;
line-scan reading said target and generating electrical signals representing the integrated electric charges;
interrupting the line-scan reading of the electric charges of at least a region of said target at which accumulation of said charge is less than a predetermined threshold charge level for a predetermined number of said standard image pickup cycles following the interruption;
following said predetermined number of standard image pickup cycles, recommencing the line-scan reading of said electric charges while normalizing the read level of charges at said region in the production of said signals from said electric charges;
storing values representing said signals; and
reproducing images by outputting the stored values such that when an interruption of line-scan reading of said electric charges directly follows a preceding said interruption, a value representing a signal previously stored is used in the reproduction of an image during the following interruption,
said predetermined number of said standard image pickup cycles for which the reading of electric charges is interrupted is selected as a function of the speed of the object whose images are registered.

4,714,962

DUAL ELECTRONIC CAMERA, PREVIEWING, AND CONTROL

Alfred B. Levine, 2924 Terrace Dr., Chevy Chase, Md. 20815
Division of Ser. No. 834,923, Feb. 28, 1986, which is a continuation-in-part of Ser. No. 617,344, Jun. 4, 1984, Pat. No. 4,588,282. This application Feb. 17, 1987, Ser. No. 15,143

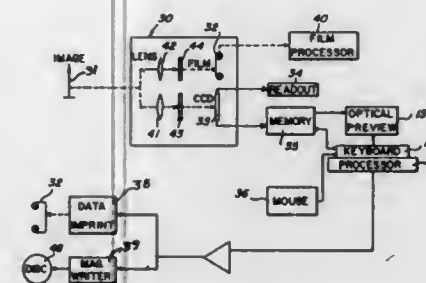
Int. Cl.⁴ H04N 7/18

U.S. Cl. 358—209

20 Claims

1. A dual camera for concurrently electronically imaging objects and photographically imaging said objects;
said camera having an electro-optic sensor and associated electronic memory with capability to sequentially image and record a series of still electronic images;
said camera having accommodation for receiving conven-

tional photographic film and means for concurrently exposing said film to sequentially record a series of still latent images, with each film latent image corresponding to a different one of the recorded electronic images;



and means for reading out and displaying any one of the electronic images prior to development of the photographic film, thereby to display the content of the corresponding one of the latent images in the photographic film prior to development of the photographic film.

4,714,963

ASYNCHRONOUS STILL TIMING FOR A VIDEO CAMERA PRODUCING MOVIE OR STILL IMAGES

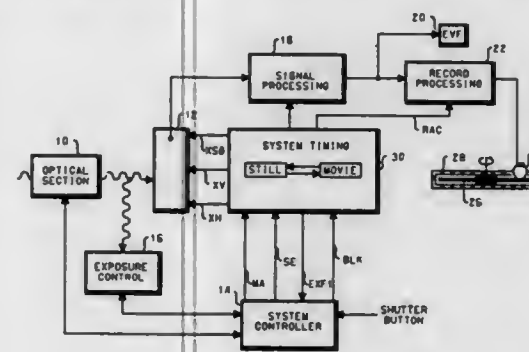
Richard M. Vogel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 3, 1986, Ser. No. 882,121

Int. Cl.⁴ H04N 3/14

U.S. Cl. 358—213.26

11 Claims



1. A still video camera of the type having an image sensor that generates a charge pattern in response to image light from an object and operates thereupon either as a signal source for a movie image, according to a specific image repetition rate, or as a signal source for a still image, the camera further including a release switch for initiating a still exposure period, said camera comprising:

means for generating a continuous stream of movie phasing signals for operating upon the charge in the image sensor at a rate that is substantially greater than the image repetition rate;
transfer means for applying said movie phasing signals to the image sensor when the image sensor operates as a signal source for a movie image;
means for generating a still phasing signal for operating the image sensor as a signal source for a still image; and
means responsive to actuation of the release switch for interrupting the application of said movie phasing signals to the image sensor and for substituting therefor said still phasing signal synchronously with respect to said movie phasing signals and asynchronously with respect to said image repetition rate.

4,714,964

INTERMEDIATE GRADIENT IMAGE FORMING METHOD

Takashi Sasaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

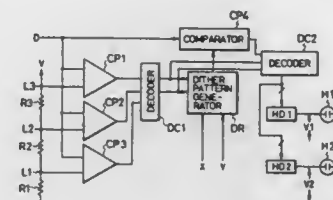
Continuation of Ser. No. 752,532, Jul. 8, 1985, abandoned. This application Dec. 23, 1986, Ser. No. 946,098

Claims priority, application Japan, Jul. 13, 1984, 59-146207

Int. Cl.⁴ H04N 1/23; G01D 15/16

U.S. Cl. 358—298

8 Claims



1. A method of reproducing an original image by providing a half-tone image with an optical reflection density range substantially the same as that of the original image, utilizing dots the optical reflection density of which is modulated in accordance with a predetermined modulation technique, the method comprising the steps of:

providing coloring agents having at least two different concentrations;
forming dots on a recording surface using the coloring agents, wherein dots of at least two sizes can be used for each coloring agent, the optical reflection density of the maximum-size dots formed using the minimum-concentration coloring agent being higher than the optical reflection density of the minimum-size dots formed using the maximum-concentration coloring agent;
locating the dots on the recording surface in a matrix which represents an element of the picture and has a plurality of elementary areas, each of which is available for the formation of dots therein; and
selecting for each elementary area one of (a) no dot, (b) the minimum-size dot of the minimum-concentration coloring agent, (c) the minimum-size dot of the maximum-concentration coloring agent, (d) the maximum-size dot of the minimum-concentration coloring agent and (e) the maximum-size dot of the maximum-concentration coloring agent, in the named order in response to increasing optical reflection density of the image, wherein the selection is performed by comparing the optical reflection density level of the image with a reference level that is varied from one elementary area to another.

4,714,965

WRITE CLOCK PULSE GENERATOR USED FOR A TIME BASE CORRECTOR

Tadaaki Yoshinaka, Takao Inoue, and Kazuo Tomita, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,745

Claims priority, application Japan, Dec. 25, 1984, 59-279427

Int. Cl.⁴ H04N 9/89, 5/85, 5/78

U.S. Cl. 358—320

8 Claims

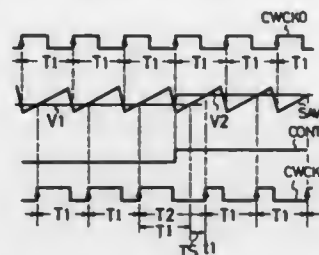
1. An apparatus for processing a plurality of component video signals which originally each extended over a horizontal interval and which have been time-compressed and arranged in sequence in one horizontal interval of said component video signals, each of said time-compressed component video signals starting at a respective starting position within the respective

horizontal interval that is different from the starting position of another of said time-compressed component video signals in said respective horizontal interval, said apparatus comprising:

means for generating a sampling clock pulse;

sampling means for sampling said time-compressed component video signals at times determined by said sampling clock pulse and producing sampled time-compressed component video signals;

means for time-expanding said sampled time-compressed component video signals from said sampling means;



control signal generator means for generating a control signal representing said different starting positions of said time-compressed component video signals, respectively, within each said horizontal interval; and

phase shifter means for shifting a phase of said sampling clock pulse in response to said control signal so that said sampling clock pulse is synchronized with each of said time-compressed component video signals at the respective starting position thereof.

4,714,966

ELECTRONIC PHOTOGRAPHY SYSTEM WITH STILL AND MOTION PICTURE MODES

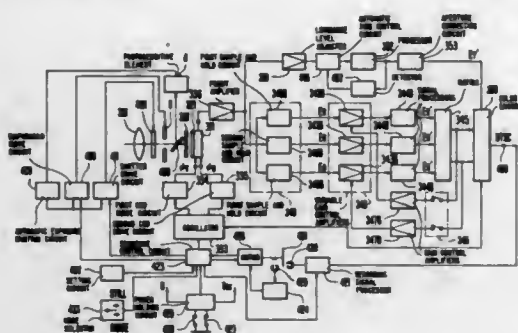
Syuichiro Saito, Kanagawa, and Tadashi Okino, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha

Filed Dec. 8, 1983, Ser. No. 559,221

Claims priority, application Japan, Dec. 14, 1982, 57-218876
Int. Cl.⁴ H04N 5/238, 5/781

U.S. Cl. 358—335

30 Claims



23. An image pick-up apparatus, comprising:
- (a) image pick-up means for converting an image of an object into a picture image signal;
 - (b) control means for controlling the level of picture image signal so it appears at a predetermined level;
 - (c) indication means for indicating the amount of picture image signal to be picked up by the image pick-up means; and
 - (d) characteristic changing means for changing response characteristics of the control means according to the output of the indication means.

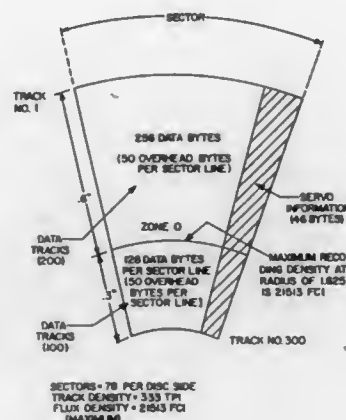
4,714,967 **BINARILY RELATED VARIABLE RATE RECORDER** John F. Bizjak, Porto Alegre, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 14, 1985, Ser. No. 798,043

Int. Cl.⁴ G11B 5/09

U.S. Cl. 360—48

3 Claims



1. For use with a computer disc having a format which is such that the data stored, or to be stored thereby, is arranged in generally pie-shaped sectors, said sectors being divided into at least two radially disposed recording zones for recording non-interleaved data in either said zone, each said zone having a respective number of tracks, the first zone being radially outward of the second zone, and the tracks of the first zone being adapted to record respective full blocks of data, said full blocks being respectively comprised of the same given number of data bytes, and the tracks of said second zone being respectively adapted to record half-blocks of data, said half-blocks being respectively comprised of half the number of data bytes which comprise said full blocks,

apparatus comprising

- a. means for receiving data and disc storage address information from a host computer,
 - b. microprocessor means
 - c. a random access memory for use in controlling the flow of data from said host computer to said computer disc,
 - d. magnetic head means, and
 - e. means for controlling the positioning of said magnetic head means relative to said disc, said microprocessor means being connected to said means for receiving and said means for controlling head positioning for positioning said magnetic head means in accordance with said address information and, depending on whether recording is to be effected in a first or second zone of said disc, for causing data to be withdrawn from said random access memory in full or successive half blocks thereof, said apparatus further comprising means for providing first and second clocking signals corresponding respectively to the recording of full and half-blocks of data, said first clocking signal being different in frequency from said second clocking signal,
- said means for receiving data and disc storage address information receiving data bytes comprised of parallel arrangements of bits, and said apparatus further comprising means for receiving and converting the output of said random access memory to a serial bit format, said clocks being applied to said means for receiving and converting for operating that means selectively at the frequency of said first and second clocking signals.

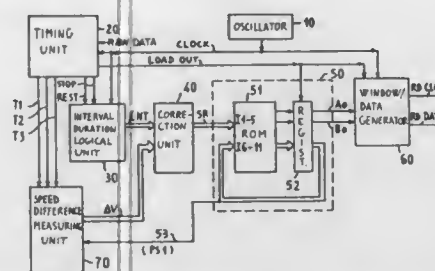
4,714,968 **DIGITAL APPARATUS FOR DATA RECOVERY SYSTEM** Bonifacio Troletti, Boario Terme, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Mar. 3, 1986, Ser. No. 835,415

Claims priority, application Italy, Mar. 21, 1985, 20007 A/85
Int. Cl.⁴ G11B 5/09

U.S. Cl. 360—51

3 Claims



1. Digital apparatus for a data recovery system wherein the data is read out from a moving magnetic media and is affected by a speed error and by peak shift, said system comprising a unit for measuring the duration of intervals between first and second subsequently read out pulses, a speed correcting unit for converting the measured duration of said intervals into a duration corrected for errors in speed, a peak shift recovery unit for generating signals identifying, depending on the peak shift of a first pulse and the corrected duration of a following interval, a nominal duration of said following interval and the peak shift of the second pulse ending said following interval, said digital apparatus comprising:

means for receiving a binary signal representative of the peak shift direction of each subsequent read out pulse;

a first counter for counting a preestablished number of subsequent read out pulses;

a second counter coupled to said first counter to receive said binary signal to effect the algebraic sum of the peak shift direction of said preestablished number of read out pulses and to generate a binary code representative of peak shift difference; and,

circuit means having outputs and inputs coupled to receive said binary code from said second counter and a speed error code fed back from said outputs which is representative of a previously measured speed error, said circuit means generating a new, updated speed error code, as a function of said binary code and said previously generated speed error code, said circuit means including means connected to said outputs for applying said updated speed error code to said speed error correcting unit and to said inputs of said circuit means.

4,714,969

METHOD AND APPARATUS FOR ERASING A SIGNAL RECORDED ON A MAGNETIC DISK

Gene L. Bischoff, Elba, and James E. Elly, Buffalo, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,237

Int. Cl.⁴ G11B 5/03, 15/48

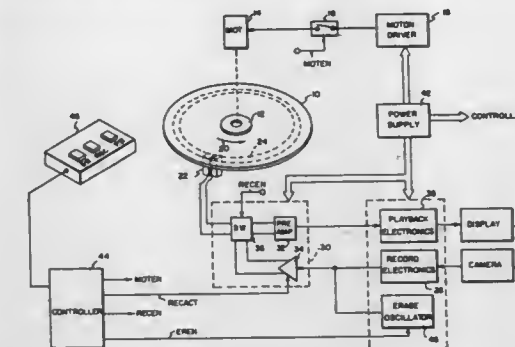
U.S. Cl. 360—66

12 Claims

1. A method of erasing a signal recorded on a recirculating

track on a rotating magnetic medium, said method comprising the steps of:

generating an alternating current erasing signal; and



decelerating the medium while applying said erasing signal to the track during an erasing interval that is substantially coterminous with said deceleration of the medium.

4,714,970

REPRODUCING APPARATUS HAVING RECORDING SPEED DISCRIMINATING SYSTEM

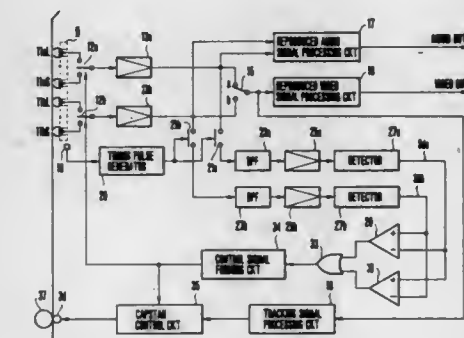
Hiroo Edakubo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1986, Ser. No. 855,172

Claims priority, application Japan, Apr. 25, 1985, 60-087613
Int. Cl.⁴ G11B 15/44; H04N 5/782

U.S. Cl. 360—73

21 Claims



1. A reproducing apparatus for reproducing information signals from a tape-shaped recording medium on which a plurality of pilot signals of different frequencies for tracking control and information signals are recorded in superimposing relation, comprising:

- (a) transporting means for transporting said tape-shaped recording medium selectively at one of at least two different running speeds for the purpose of reproducing said information signals;
- (b) a pair of head means for reproducing said information signals recorded on said tape-shaped recording medium, said pair of head means including at least one rotating head, respectively;
- (c) a pair of separation means for respectively separating, from a signal by each of said pair of head means, a predetermined frequency component related to said plurality of pilot signals;
- (d) comparison means for comparing the levels of signals produced from said pair of separation means; and
- (e) discriminating means for discriminating whether or not transporting speed of said transporting means is coincident with a transporting speed employed in recording said information signals, said discrimination being made on the basis of an output of said comparison means.

4,714,971

METHOD AND APPARATUS FOR REPRODUCING SIGNALS HAVING IMPROVED ROTARY HEAD TRACKING CONTROL

Hiraku Sigiki, Saitama; Makoto Yamada, and Shinji Miyamori, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

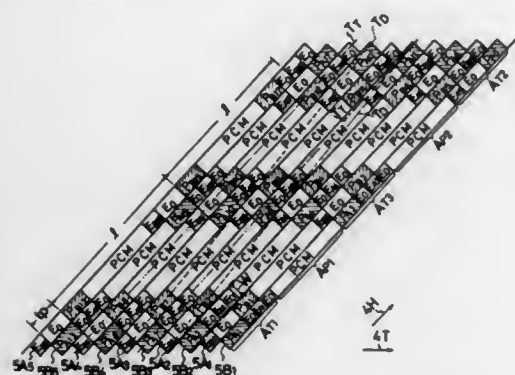
Filed Aug. 26, 1985, Ser. No. 769,422

Claims priority, application Japan, Sep. 7, 1984, 59-187368

Int. Cl.⁴ G11B 5/584, 5/09, 15/467

U.S. Cl. 360—77

6 Claims



1. A method for reproducing signals recorded in a plurality of slant tracks on a recording medium by a rotary head, the signals in the tracks containing a digital information signal in a first predetermined area on said slant tracks and a tracking control signal including a tracking pilot signal and a signal used for erasing a previously recorded signal in a second predetermined area, comprising the steps of:

- reproducing the tracking pilot signals recorded at respective second predetermined areas from both tracks adjacent a track being traced by a rotary head to provide levels of said tracking pilot signals;
- comparing said levels of said tracking pilot signals reproduced from said adjacent tracks;
- generating a head tracking signal in response to said level comparison;
- controlling a tracking alignment of the rotary head relative to said slant tracks in response to said head tracking signal;
- detecting the level of said tracking control signal recorded in said second area of said track being traced; and
- adjusting the level of said head tracking signal in response to said detected level of said tracking control signal so as to accurately track said track being traced.

4,714,972

HOUSING FOR A MAGNETIC DISK MEMORY HAVING A DISK PACK SEAT AT OPPOSITE SIDES OF THE DISK PACK

Johann Biermeier, Munich, and Wilhelm Brand, Rosenheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 696,203

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 3404223

Int. Cl.⁴ G11B 5/012, 5/54

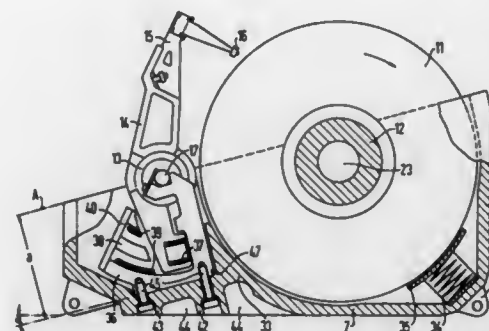
U.S. Cl. 360—97

10 Claims

1. A housing for a magnetic disk memory which comprises a disk pack including an axial spindle rotationally seated at opposite sides thereof in the housing and driven by a motor internal of the disk pack and a magnetic head rotational positioner apparatus having an axis of rotation parallel to the axis of rotation of said disk pack, said housing comprising:

- a support shell and a cover mating to said support shell along a parting line spaced from and parallel to the axis of rotation of said disk pack;
- said shell comprising an end wall extending at a predeter-

mined acute angle with respect to said parting plane and first and second lateral walls extending perpendicular to said end wall and each defining a respective spindle bearing region within said support shell, said regions each including means for rotationally supporting said spindle; said end wall including an attachment surface for said rotational positioner extending parallel to said parting plane and spaced therefrom a predetermined distance to define



the emersion depth of said rotational positioner into said supporting shell; said end wall comprising a plurality of projecting webs on the exterior thereof extending essentially perpendicular to said attachment surface and transversely of said end wall; and means extending through said projecting webs for attaching said rotational positioner to said attachment surface.

4,714,973

SHUTTER ASSEMBLY FOR USE IN A DISC CARTRIDGE

Yoshitake Kato; Minoru Fujita, both of Ibaragi, and Hiroshi Maruyama, Toride, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

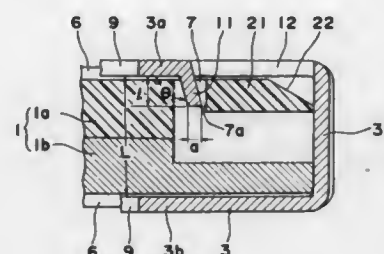
Filed May 9, 1986, Ser. No. 861,422

Claims priority, application Japan, May 9, 1985, 60-96599; May 9, 1985, 60-96600

Int. Cl.⁴ G11B 23/03

U.S. Cl. 360—133

9 Claims



1. A disc cartridge comprising: a cartridge case comprising a first half case and a second half case, a drive shaft insertion opening defined in a central portion of said cartridge case, a shallow recess defined in a front portion of each half case, corresponding head accessing openings defined in each of said shallow recesses and a guide slot provided on at least one of said first half case and said second half case near a front edge of said cartridge case extending parallel to said front edge of said cartridge case; a magnetic disc rotatably mounted in said cartridge case; and a shutter slidably mounted on said cartridge case for opening and closing said head accessing openings, movable along said respective guide slot, said shutter being formed in a general U character shape comprising first and second parallel flat plates joined by a connecting plate, said shutter presenting an open end for insertion of said shutter on

said cartridge case, each of said first and second flat plates being provided with openings which coincide with said head accessing openings during opening of the shutter, said shutter being provided with at least one projection provided on at least one of said first and second flat plates closely positioned to said connecting plate extending angularly inward relative to the other of said respective plates, said at least one projection including an elongated portion terminating at a free end, said elongated portion extending at an obtuse angle from said flat plate toward said connecting plate, said projection being made of a resin material which allows said projection to temporarily deform as the shutter is mounted on said cartridge case and to spring back to be captured in one of said guide slots.

4,714,974

CURRENT LIMITER

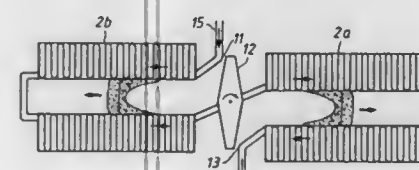
Emile Schreurs; Stefan Joader, and Stefan Valdemarsson, all of Västerås, Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Filed Dec. 22, 1986, Ser. No. 944,528

Int. Cl.⁴ H01H 9/30, 33/00

U.S. Cl. 361—12

10 Claims



1. A current limiter comprising a contact means having at least two cooperating contacts at least one of which being movable, connecting members for connecting the current limiter into a circuit, and at least two substantially parallel, resistive runner rails adjacent to the contact means, said runner rails causing the arc produced upon contact opening when a short-circuit current flows in the circuit, under the influence of the magnetic field generated by the current, to move away from the contact means with the foot points of the arc running along the rails, an increasing resistance being inserted into the circuit, each runner rail comprises an insulated tape made of an electrically conductive material and being folded and packed to form a solid resistance package, the confronting surfaces of the two runner rails being at least partially uninsulated to form running paths for the foot points of the arc.

4,714,975

SELF-CONTAINED GROUND FAULT TEST FEATURE IN CIRCUIT BREAKER

Robert F. Dvorak, Mount Vernon, Iowa, assignor to Square D Company, Palatine, Ill.

Filed Apr. 5, 1985, Ser. No. 720,130

Int. Cl.⁴ H02H 3/16

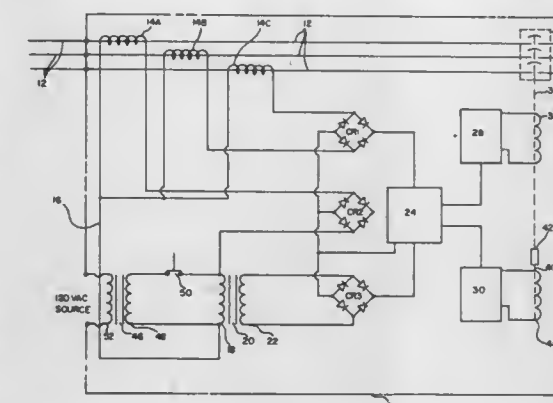
U.S. Cl. 361—44

4 Claims

1. An electric circuit breaker having the capability to detect the occurrence of a ground fault, said circuit breaker being connected to a phase conductor, said circuit breaker comprising:

- a pair of separable contacts;
- trip means connected to said contacts to separate said contacts upon the occurrence of an overcurrent;
- an indicator means to indicate the occurrence of a ground fault upon the receipt of a signal;
- signal means for sending a signal to said indicator means upon the occurrence of a simulated or actual ground fault, said signal means comprising a first transformer having a primary winding and a secondary winding, the primary winding being connected with the phase conductor, the secondary winding being electrically connected to said

indicator means, wherein a current is induced in the secondary winding of said first transformer upon the occurrence of a simulated or actual ground fault; and a simulator to simulate a ground fault to activate said signal means by supplying a current to the primary winding of



said first transformer, said simulator comprising a second transformer, having a primary winding and a secondary winding, the second transformer secondary winding being electrically connected to the first transformer primary winding.

4,714,976

MULTIPOLE BREAKING DEVICE WITH REMOTE CONTROL

Bernard Pin, Meylan, France; André Delbosse, and Ivan Dubreucq, both of Brussels, Belgium, assignors to Merlin Gerin, France

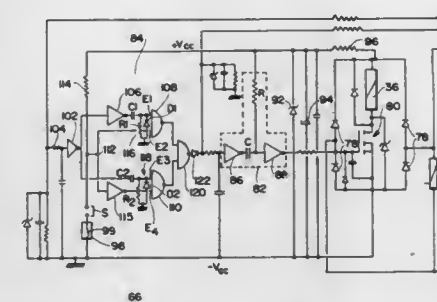
Filed Mar. 17, 1986, Ser. No. 840,085

Claims priority, application France, Mar. 26, 1985, 8504620

Int. Cl.⁴ H02H 1/01; H01H 47/28

U.S. Cl. 361—114

8 Claims



1. A multipole breaking device with electric remote control, comprising:

- a breaking device per pole equipped with a bistable mobile main contact moveable between a closed and an opened position;
- a trip release for moving the mobile main contact to the opened position in the event of a fault occurring;
- a first mechanism for automatically tripping said trip release;
- a first manual device for resetting the first mechanism;
- a second mechanism, mechanically linked with the mobile main contact of each pole, for manually opening and closing the mobile main contact;
- a remote control unit comprising an electromagnetic actuator, including an electromagnet, associated with the second mechanism;
- a second manual device, coupled to the second mechanism to enable manual opening and closing of said mobile main contact;
- an electronic circuit, including a static switch connected in a

power supply circuit of the electromagnet, for controlling excitation of the electromagnet in such a way as to bring about in the set position of the first mechanism a status change of the bistable mobile contact on each control pulse applied to the static switch,

- a mobile main contact position detector,
- a selector having an active and an inactive status for switching the position detector into or out of the electronic circuit,
- a first input terminal assigned to a first electrical pulse control of the electronic circuit,
- a second input terminal associated with a second mixed control of said electronic circuit, said second control being designed for a logic control by a hold signal when said position detector is in the electronic circuit, and for a second pulse control, independent of said first pulse control, when said position detector is out of the electronic circuit.

4,714,977

ELECTRONIC DELAY TIMER

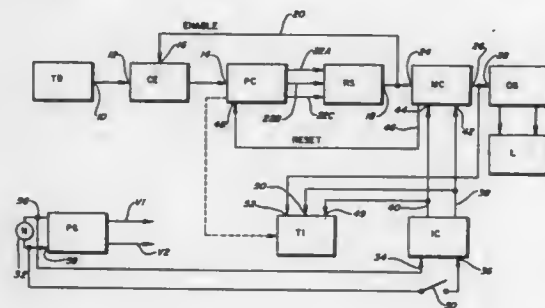
John S. Hoelzer, Wauwatosa; Richard J. Graefe, Milwaukee, and James T. Libert, Waukesha, all of Wis., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 702,444, Feb. 19, 1985, abandoned, which is a continuation of Ser. No. 363,326, Mar. 29, 1982, abandoned. This application Jun. 5, 1987, Ser. No. 59,248

Int. Cl.⁴ H01H 47/32

U.S. Cl. 361-196

12 Claims



1. A machine tool timing relay having immunity from electrical noise on a control signal comprising:
 - an oscillator capable of generating pulses having a predetermined frequency;
 - means for adjusting said predetermined frequency over a continuous range of frequencies;
 - a counter capable of counting said pulses and capable of generating an output signal after a predetermined number of said pulses are counted;
 - means responsive to a start signal for initiating said counter to count said pulses;
 - an optical isolator circuit, responsive to said control signal for generating a light, detecting said light, and generating said start signal in response to said detecting said light in order to isolate said counter from electrical noise mixed with said control signal;
 - an electrical contact; and
 - an output circuit responsive to said output signal for operating said electrical contact when said counter generates said output signal so that said contact is operated after said counter counts a predetermined number of said pulses, thereby providing control over said contact after an interval of time required for said oscillator to generate said predetermined number of said pulses, and said means for adjusting said frequency providing continuous adjustment of said interval of time.

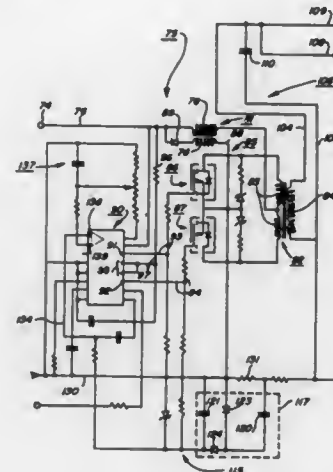
4,714,978
POWER SUPPLY FOR A.C. COROTRONS
James A. Coleman, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 17, 1986, Ser. No. 853,251

Int. Cl.⁴ E03G 15/00

U.S. Cl. 361-235

6 Claims



1. An a.c. power supply circuit for a corona discharge device of a xerographic type copying or printing machine, comprising:
 - (a) a pulse width modulator providing alternating drive signals of adjustable pulse width at a predetermined fixed frequency;
 - (b) an output transformer having primary and secondary windings;
 - (c) push-pull amplifier means for applying power to said transformer primary winding in response to said drive signals to operate said transformer whereby said transformer secondary winding generates an a.c. power output;
 - (d) an output line coupling said transformer secondary winding with said corona device;
 - (e) sensing means for sensing current in said corona device and providing a control signal representative thereof to said modulator,
 - said modulator adjusting the pulse width of said drive signals in response to said control signal to thereby adjust the a.c. power output of said transformer and maintain current in said corona device substantially constant, and
 - (f) filter means for filtering said transformer a.c. power output so as to provide a substantially uniform sinusoidal a.c. power output to said corona device,
 - said filter means including said transformer.

4,714,979

PROTECTED POTTED METALLIZED FILM CAPACITOR

George I. Duncan, Glenview, and Stephen L. Phelps, Chicago, both of Ill., assignors to Advance Transformer Company, Chicago, Ill.

Filed Dec. 16, 1986, Ser. No. 943,478

Int. Cl.⁴ H01G 4/40

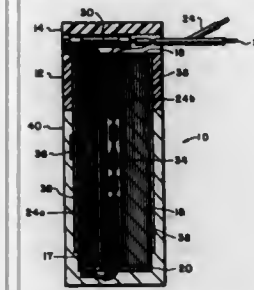
U.S. Cl. 361-274

8 Claims

3. An AC capacitor having a protective fault interruptor system for its capacitor section, wherein said capacitor is a dry metallized film high intensity discharge ballast type capacitor, wherein said capacitor includes a metallized film capacitor section, shooed edges serving as contact points for each plate of said capacitor, wherein said contact points are spaced apart from one another, said capacitor being connectable to a circuit through electrical leads from said contact points, a case, potting material securing said capacitor section and a portion of said leads within said case, and said leads extending through a

side wall of said case, wherein the protective fault interruptor system for said capacitor section comprising:

- a fuse;
- a thermal protector;



said fuse and said thermal protector connected in series with said capacitor section through at least one of said leads; and
said fuse, said thermal protector, said capacitor section and the connections to said at least one connecting lead all positioned within said case.

4,714,980

MEMORY CARD

Kazuya Hara, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

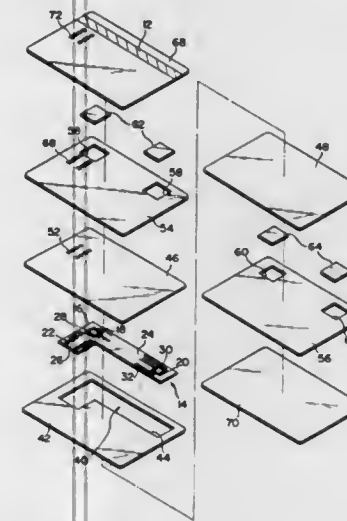
Filed Sep. 19, 1986, Ser. No. 909,516

Claims priority, application Japan, Sep. 24, 1985, 60-210815

Int. Cl.⁴ H05K 1/14

U.S. Cl. 361-395

9 Claims



1. A memory card comprising:
 - a center sheet having a cavity;
 - an IC module located in said cavity of said center sheet and including a circuit board on which an IC chip and a plurality of external connecting terminals are mounted;
 - a first laminated structure formed of a plurality of sheets, each of which has substantially the same plane size as that of said center sheet and laminated to each other, and having a plurality of holes for exposing said external connecting terminals of said IC module to the outside, said first laminated structure being bonded to one side surface of said center sheet;
 - a second laminated structure formed of a plurality of sheets, each of which has substantially the same plane size as that of said center sheet and laminated to each other, said second laminated structure being bonded to the other side surface of said center sheet, the sheets of said second laminated structure being the same in number as the sheets

of said first laminated structure, at least one of said first and second laminated structures having an opening at a position corresponding to said IC chip of said IC module located in said cavity of said center sheet, the area of said opening being a little larger than that of said IC chip; and a metal member located in said opening.

4,714,981

COVER FOR A SEMICONDUCTOR PACKAGE

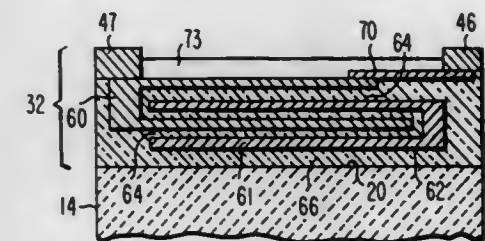
Robert B. Gordon, Springfield Township, Delaware County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 9, 1986, Ser. No. 849,901

Int. Cl.⁴ H05K 5/03

U.S. Cl. 361-400

8 Claims



1. A cover covering a semiconductor package, said semiconductor package including a plurality of leads adapted for making electrical contact with an electrical circuit external to said semiconductor package, said cover comprising:
 - (a) a body having a major surface which is substantially planar and an attaching surface opposite said planar surface for attaching said body to said semiconductor package;
 - (b) a composite layer containing a passive circuit and including at least one electrical contact, said composite layer disposed on said major surface; and
 - (c) a terminal attached to said electrical contact not in direct or indirect electrical contact through said semiconductor package with said semiconductor package including said leads and adapted for making electrical contact to said electrical circuit external to said semiconductor package independently of said leads.

4,714,982

SUBSTRATE FOR A SEMICONDUCTOR PACKAGE HAVING IMPROVED I/O PIN BONDING

Chandrika Prasad, Poughkeepsie, and Andrew F. Szweczyk, Troy, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

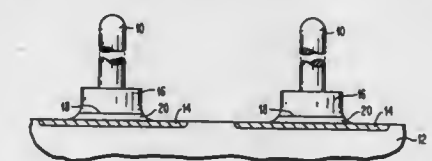
Division of Ser. No. 626,185, Jun. 29, 1984, Pat. No. 4,634,041.

This application Mar. 24, 1986, Ser. No. 843,472

Int. Cl.⁴ H01L 23/48

U.S. Cl. 361-404

5 Claims



1. In a substrate for an integrated circuit semiconductor package having at least one integrated circuit semiconductor device mounted on the top surface, and I/O pins mounted on the bottom surface electrically connected to the device through internal metallurgy in the substrate; the improvement comprising:

solder wettable pin pads on the bottom surface of said substrate, each having a predetermined area,
I/O pins bonded to said pin pads, each pin having a bonding surface with an area significantly less than the area of each of said pin pads, said I/O pins located on said pin pads whereby the periphery of each of said pin pads is spaced from the periphery of each of said respective bonding surfaces,
a brazing material of an alloy that at least includes Ag, and a metal selected from the group consisting of In and Sn and mixtures thereof disposed only between the bonding surfaces of each of said pins and each of the central areas of each of said pin pads thereby bonding the pins to the substrate but leaving peripheral pad areas devoid of brazing alloy.

4,714,983

UNIFORM EMISSION BACKLIGHT

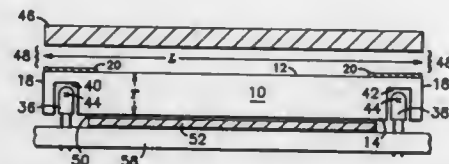
Warren R. Lang, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 10, 1985, Ser. No. 743,226

Int. Cl.⁴ F21V 13/04

U.S. Cl. 362-27

17 Claims



1. An apparatus for providing a source of light emitted throughout a predetermined area, said apparatus comprising:
a first lamp having a light source therein;
a transparent member exhibiting a critical angle (θ_c with respect to air and having a polished top surface relative to an opposing frosted bottom surface, the bottom surface having a boundary substantially with air, said member having a first cavity therein located proximate a first end of said member, said first lamp being inserted into said first cavity so that said first lamp light source resides inside said member at a distance D_1 from the top surface; and
a first opaque section located on said member top surface opposing said member first cavity so that said first opaque section extends toward the central area of said member top surface for a distance greater than $D_1 \times \tan(\theta_c)$ from a point opposing the light source.

4,714,984

NIGHT LIGHT ASSEMBLY

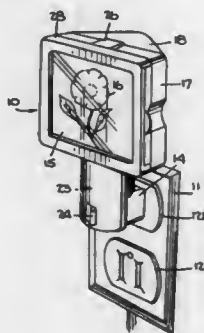
Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Sep. 3, 1986, Ser. No. 903,153

Int. Cl.⁴ F21V 33/00

U.S. Cl. 362-101

7 Claims



1. A night light assembly which plugs into and is supported

by an electrical wall outlet whose existing orientation is either horizontal or vertical, said assembly comprising:

- A reflector shell having a vent therein and an open front;
- A low-wattage bulb housed in said shell and held in a socket mounted on a case attached to the underside of the shell, said case having a plug projecting therefrom provided with prongs which are insertable into said outlet to supply power to the bulb whereby the resultant light is directed toward the open front;
- A frame secured to the open front of the shell adapted to accommodate a window cartridge; and
- A removable window cartridge insertable in said frame, said cartridge being constituted by a transparent window which covers the open front of the shell, a pad of porous material placed behind the rear face of the plate and formed of a material permeable to said light, said pad being impregnated with a volatile aromatic liquid; and a sheet of translucent material adherable to the front face of the plate and having a picture thereon, said sheet being adhered to the plate so that the orientation of the picture is consistent with the existing orientation of the outlet, whereby when the bulb is powered, it back illuminates the picture which, in the absence of such illumination, is rendered visible by front ambient light illumination, the head from the powered bulb volatilizing the liquid to produce an aromatic vapor which is discharged through said vent.

4,714,985

TRICK-OR-TREAT CARRIER WITH FALSE BOTTOM

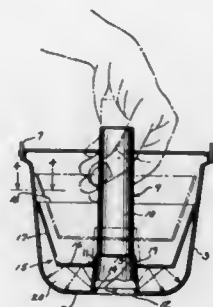
Charles P. Hickey, 1904-27 St., Monroe, Wis. 53566

Filed Mar. 26, 1987, Ser. No. 30,506

Int. Cl.⁴ F21V 33/00

U.S. Cl. 362-154

9 Claims



1. A carrier for use wherein a number of items are to be collected and carried in darkness, said carrier comprising, in combination:

- a unitary carryable bucket-like container (2) having an open top (4), a side wall (3) and a bottom wall (5),
- a light source (11) disposed within said container adjacent said bottom wall,
- and a false bottom member (15) removably disposed within said container and spaced from said bottom wall to form a light deflecting chamber (20),
- said false bottom member forming means to storingly receive collected items, and to carry said items out of said carrier when said false bottom member is removed from said container.

4,714,986

VEHICULAR REFLECTOR-LIGHT SOURCE COMBINATION UNIT

Ewald Wurster, Grünwald, Fed. Rep. of Germany, assignor to Patent Treuhand Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

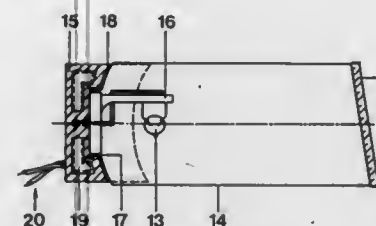
Filed May 16, 1986, Ser. No. 863,962

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519611

Int. Cl.⁴ P21V 29/08

U.S. Cl. 362-267

19 Claims



1. Vehicular reflector-light source and supply circuit combination unit having
a reflector (2, 14) having a reflecting surface and a back surface;
a high-pressure discharge lamp (4, 13) requiring high voltage starting pulses located within the reflector opposite the reflecting surface thereof; and
a supply circuit unit (6, 19) including a high voltage connection electrically connected to the high-pressure discharge lamp,
comprising, in accordance with the invention,
a unitary, sealed housing (5, 15) of insulating material immediately and directly located against the reflector at the back surface thereof, and retaining said supply circuit within said housing,
the discharge lamp (4, 13) being secured and fitted to the supply circuit (6, 19) including said high voltage connection; and
adhesive sealing means (11, 18) continuously sealing and adhering contiguous surfaces between the reflector (2, 14) and the housing (5, 15) to retain said high voltage connection within a sealed system defined by the housing sealed and adhered to the reflector.

4,714,987

READILY ASSEMBLABLE LAMPSHADE, OR THE LIKE

Michael R. Dene, 60-Coverly Ave. N., Staten Island, N.Y. 10301

Filed Mar. 4, 1987, Ser. No. 21,691

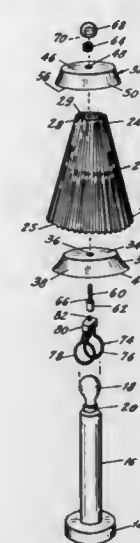
Int. Cl.⁴ F21V 1/06

U.S. Cl. 362-352

13 Claims

1. A conically shaped device, comprising:
a tubular article comprised of a tube of a flexible pleated material, the article having an exterior, an interior, opposite axial ends and an upper end region adjacent one axial end thereof;
an outer shell comprising a downwardly depending, peripheral skirt having a first inner diameter, the skirt of the outer shell being disposed over at least a portion of the exterior at the upper end region of the article;
an inner shell having a second outer diameter, which is larger than the first diameter of the skirt, the inner shell being disposed inside the tubular article toward the upper end region of the tubular article, the inner shell engaging the interior of the tubular article at a location below where the outer shell engages the exterior of the tubular article; and
clamping means for drawing the outer and inner shells

toward each other, and thereby for clamping the upper end region of the article between the shells, the shapes and



sizes of the outer and inner shells deforming the tubular article into a conical shape.

4,714,988

FEEDFORWARD FEEDBACK CONTROL HAVING PREDICTIVE DISTURBANCE COMPENSATION

Kazuo Hiroi, Hachioji, and Kojiro Ito, Machida, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

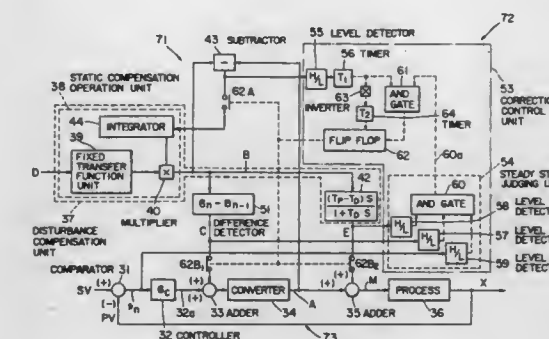
Continuation-in-part of Ser. No. 477,384, Mar. 21, 1983, Pat. No. 4,563,735. This application Feb. 6, 1985, Ser. No. 698,791

Claims priority, application Japan, Mar. 26, 1982, 57-47349; Mar. 26, 1982, 57-47350; Aug. 25, 1982, 57-147155; Feb. 7, 1984, 59-19335

Int. Cl.⁴ G05B 13/02

U.S. Cl. 364-165

20 Claims



1. A process control system which adapts itself optimally to variations in disturbance, comprising:
feedback control means for outputting a feedback control signal that is computed by comparing a set value and a process value;
feedforward control means for detecting a disturbance and for outputting a disturbance compensation signal to compensate for the disturbance based on a feedforward control model; and
gain adaptive means for comparing said disturbance compensation signal and a manipulated signal, which is a function of said feedback control signal and said disturbance compensation signal, and for correcting the gain of said feedforward control model so that the difference between the disturbance compensation signal and the manipulated signal is reduced.

4,714,989

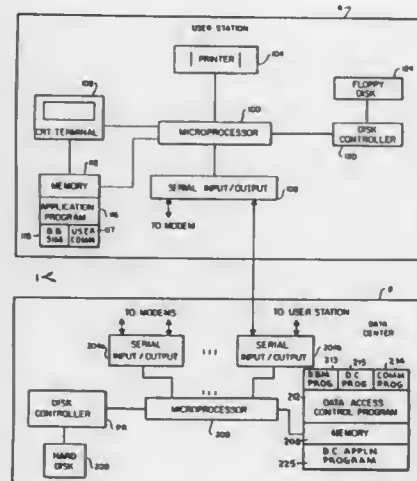
FUNCTIONALLY STRUCTURED DISTRIBUTED DATA PROCESSING SYSTEM

Roger E. Billings, 3420 Pink Hill Cir., Blue Springs, Mo. 64015
Continuation of Ser. No. 826,721, Feb. 6, 1986, abandoned,
which is a continuation of Ser. No. 350,159, Feb. 19, 1982,
abandoned. This application Oct. 20, 1986, Ser. No. 921,219

Int. Cl.⁴ G06F 15/16

U.S. Cl. 364-200

14 Claims



1. A method of operating a distributed data processing system including a plurality of independent, not necessarily uniform, general purpose user computers to run respective user application programs to process user data and a data center computer to store, retrieve, and update user data, said user computers being selectively interconnected with said data center computer by respective data communication hardware over data communication network means, said method comprising the steps of:

- managing in a data center computer by means of a data base manager program a user data base of user data items to perform data operations of storing, updating, and retrieving said user data items in response to data base calls for such operations from a user computer;
- running a user application program in a general purpose user computer to process user data, said user application program indirectly issuing data base calls for data operations regarding user data items in response to requirements for said data operations by said user application program;
- in response to a data base call regarding a user data item from a user application program, initiating by said user computer only a data communication link with said data center computer over data communication network means;
- communicating said data base call from said user computer to said data center computer;
- performing by said data center computer said data operation regarding said user data item defined by said data base call; and
- communicating an appropriate response to said data base call from said data center computer to said user computer.

4,714,990

DATA STORAGE APPARATUS

Peter L. L. Desyllas, Wilmslow, and Nicholas P. Holt, Hadfield, Via Hyde, both of United Kingdom, assignors to International Computers Limited, London, England

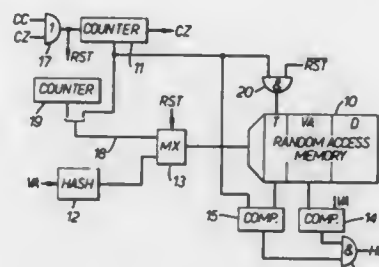
Filed Aug. 22, 1983, Ser. No. 525,152

Claims priority, application United Kingdom, Sep. 18, 1982, 8226663

Int. Cl.⁴ G06F 12/12, 13/00

U.S. Cl. 364-200

6 Claims



1. Data storage apparatus comprising:

- a cyclic counter,
- a data store having a plurality of individually addressable locations each of which is arranged to contain a data item and an associated tag, which tag is set to the value of the counter when the data item is written into the store,
- means for comparing the tag read out from a currently addressed location of the store with the current value of the counter and operative to generate a signal, indicating that the data item is valid, in response to the tag being equal to the current value in the counter,
- means for incrementing the value of the counter so as to render invalid all data items with a tag equal to a preceding value of the counter, and
- clearing means operative at n points in each cycle of the counter, where n is an integer greater than 1, to use the value in said counter to address and clear a different portion of the store at each of said n points, each said portion comprising 1/nth of the store, whereby, by the time the counter has been incremented through a complete cycle of values, every location in the store will have been cleared.

4,714,991

MICROPROGRAM CONTROL APPARATUS HAVING VARIABLE MAPPING BETWEEN MICROINSTRUCTION CONTROL BITS AND GENERATED CONTROL SIGNALS

John R. Eaton, Salford, England, assignor to International Computers Limited, London, England

Filed Feb. 1, 1985, Ser. No. 697,484

Claims priority, application United Kingdom, Feb. 21, 1984, 8404480

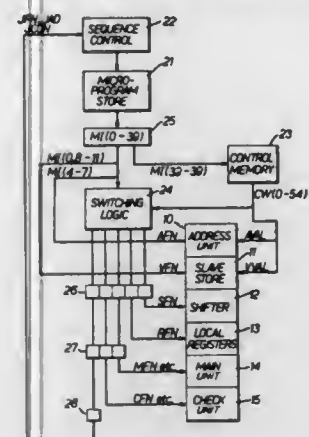
Int. Cl.⁴ G06F 9/22

U.S. Cl. 364-200

9 Claims

1. A microprogram control unit for producing control signals on a plurality of control signal lines, the unit comprising:
 - a microprogram store for holding a plurality of microinstructions each comprising an address field and a plurality of control bits,
 - a control word memory for holding a plurality of control words each of which specifies a particular set of correspondence between the control bits and the control signal lines,
 - means for reading out a microinstruction from the microprogram store and utilizing the address field of that microinstruction to address the control word memory, thereby reading out one of the control words, and
 - switching means responsive to the control word from the

control word memory, for connecting the control bits of the microinstruction read from the microprogram store to



selected control signal lines as specified by the control word.

4,714,992

COMMUNICATION FOR VERSION MANAGEMENT IN A DISTRIBUTED INFORMATION SERVICE

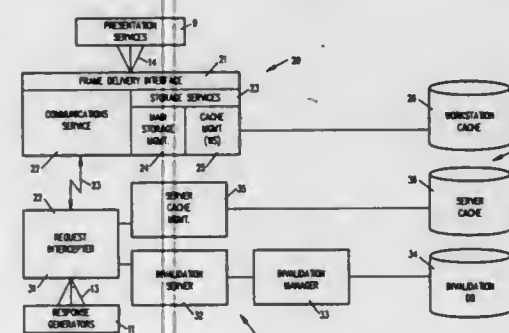
Henry M. Gladney, Saratoga; Douglas J. Lorch, and Richard L. Mattson, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1985, Ser. No. 801,897

Int. Cl.⁴ G06F 1/00

U.S. Cl. 364-200

10 Claims



1. A method for managing obsolescence of replicas of data objects, the objects being utilized in multiple nodes of a distributed processing system in which at least one node operates as an object source location having access to a source database containing source data objects and at least one other node operates as an object replica location having means for storing replicas of requested objects received from a source location, each source data object being alterable whereby replicas of altered objects stored at replica locations may become obsolete, comprising the steps of:

- responsive to a request from a first replica location to ascertain obsolescence of data objects, extracting at the source location identifiers of a set of obsolete objects;
- communicating said identifiers, if any, as an atomic demand/response transaction to said first replica location;
- rendering inaccessible at said first replica location any replicas corresponding to those identifiers received from the source location; and
- removing from the source location those identifiers communicated to said first replica location.

4,714,993

APPARATUS AND METHOD FOR EFFECTING DYNAMIC ADDRESS TRANSLATION IN A MICROPROCESSOR IMPLEMENTED DATA PROCESSING SYSTEM

David L. Livingston, Binghamton; Daniel J. Sucher, Vestal, and Bruce M. Walk, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

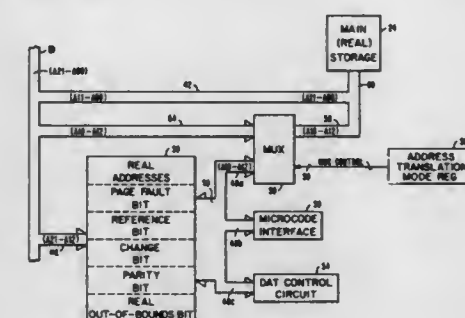
Continuation of Ser. No. 542,933, Oct. 18, 1983, abandoned.

This application Sep. 26, 1986, Ser. No. 912,165

Int. Cl.⁴ G06F 12/10

U.S. Cl. 364-200

9 Claims



1. A dual purpose apparatus capable of operating in translation mode and segmentation mode for effecting virtual to real address translations using fixed page sizes in a microprocessor implemented data processing system having predetermined real storage and virtual storage while in said translation mode, and for effecting real storage segmentation while in said segmentation mode, comprising:

- a microprocessor address bus;
- table storage means connected to said address bus for storing a plurality of dual purpose pages, said storage means capable of storing the total number of pages possible in said predetermined virtual storage, each of said pages further comprising:
 - a translation information field; and
 - a real out-of-bounds bit;
- accessing means, connected to said storage means, for accessing only said translation information field when said apparatus is in said translation mode and for accessing only said real out of bounds bit when said apparatus is in said segmentation mode.

4,714,994

INSTRUCTION PREFETCH BUFFER CONTROL

Vojin G. Oklobdzija, Putnam County, and Daniel T. Ling, Westchester County, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 30, 1985, Ser. No. 728,724

Int. Cl.⁴ G06F 9/38

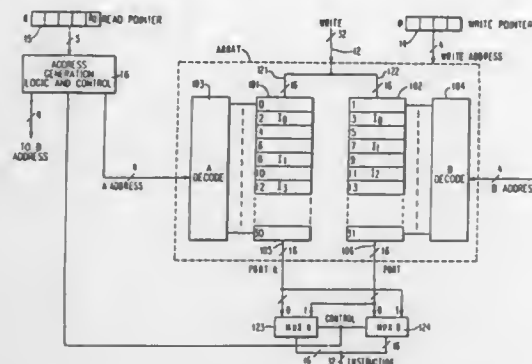
U.S. Cl. 364-200

8 Claims

1. A method of controlling an instruction prefetch buffer that stores the code for a number of instructions that have already been executed as well as the code for a number of instructions yet to be executed, said method comprising the steps of:

- storing an instruction fetch pointer which is supplied to said buffer as a write pointer that points to the location where a new word is to be written into the buffer;
- writing instructions into said buffer at the locations pointed to by said instruction fetch pointer;
- storing an instruction execution pointer which is supplied to said buffer as a read pointer that points to the location from which an instruction is to be read from the buffer;
- reading instructions from locations in the buffer pointed to by said instruction execution pointer;
- decoding each instruction read from the buffer to determine if it is a branch or jump instruction;

determining if a target instruction of a branch or jump instruction is within a range of instructions which may be stored in the buffer;
determining for those target instructions found to be within said range if the target instruction is in the buffer; and



setting the instruction execution pointer to the location of the target instruction found to be in the buffer, said target instruction being either preceding or following a current instruction in the buffer.

4,714,995

COMPUTER INTEGRATION SYSTEM

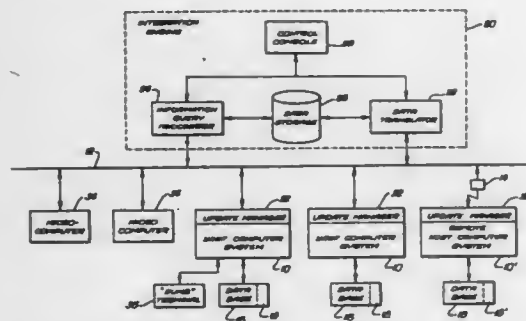
Anthony T. Materna; Roger A. Vossler, both of Santa Monica, and Frank M. Stepczyk, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 13, 1985, Ser. No. 775,927

Int. Cl.⁴ G06F 15/16

U.S. Cl. 364-200

11 Claims



1. In a system for integrating a plurality of host computer systems having separate and local data bases having different organization and record formats with at least some items of data being included in more than one of the local data bases, said data items being designated "shared data items", and integrating system for ensuring that the values of the shared data items in the different local data bases are maintained consistent with each other, the integrating system comprising: data translator means for translating data items received from any one of the local data bases for use in any other of the local data bases;

a communications network connecting the computer systems and the data translator means;

a plurality of update managers, each update manager being in communication with one of the host computer systems having a local data base, and each update manager including update capture means for transmitting to the data translator means over the communications network the values of any changes made by the update manager associated with the host computer to shared data in that computer's local data base, and update receiver means for

receiving translated data base changes from the data translator over the communications network;

wherein the data translator means translates data base changes from the data base organization and record format in which they are received into one or more other data base organizations and record formats, and transmits the translated changes over the communications network to each of the host computer local data bases, thereby ensuring consistency of the separate local data bases without imposing on any of them a particular data base organization or record format.

4,714,996

IMPACT CALCULATION FOR VERSION MANAGEMENT IN A DISTRIBUTED INFORMATION SERVICE

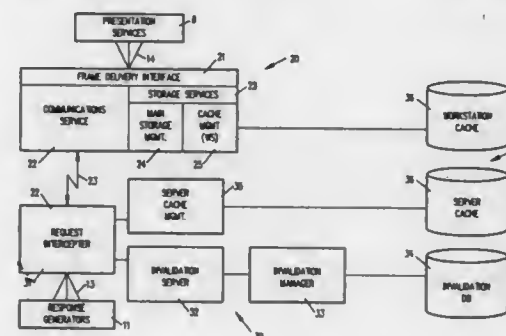
Henry M. Gladney, Saratoga; Douglas J. Lorch, and Richard L. Mattson, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1985, Ser. No. 801,896

Int. Cl.⁴ G06F 9/00

U.S. Cl. 364-300

16 Claims



1. In a system for managing obsolescence of replicas of data objects, the objects being utilized in multiple nodes of a distributed processing system having at least one node operating as a source location having access to a source database containing data objects and at least one node operating as an object replica location having means for storing replicas of requested data objects received from a source location, each source data object being alterable whereby a change in a source data object will cause an impact to its replicas, a method for calculating the impact of a change to a source data object within the system, comprising the steps at the source location of:

(a) responsive to the change in the source data object, assigning a version number to the change and generating an identifier of a portion of the source database affected by the change;

(b) responsive to said identifier, generating a list of replicas including objects from the affected portion of the source database; and

(c) for a replica location in communication with the source location, recording a bad messages table of replicas in the list along with the version number assigned to the change for communication to the replica location.

4,714,997

DATA REDUCTION IN REPROJECTION SYSTEMS

Carl R. Crawford, and David A. Freundlich, both of Haifa, Israel, assignors to Elscint Incorporated, Boston, Mass.

Continuation of Ser. No. 500,347, Jun. 2, 1983, abandoned. This

application May 6, 1986, Ser. No. 859,236

Int. Cl.⁴ G06F 15/42

U.S. Cl. 364-414

7 Claims

1. An arrangement for improving the processing time for systems that include reprojection means, said reprojection means reprojecting initial image data to obtain reprojections

for use in correcting for polychromatic artifacts in diagnostic medical images of a subject, said arrangement comprising:

(a) scanning means for directing radiation through said subject and detecting an intensity distribution of the radiation traversing the subject;

(b) means for providing a set of original projections derived from the detected intensity distribution;

(c) back-projector means for back-projecting said set of original projections to provide an original amount of initial image data for an initial image;

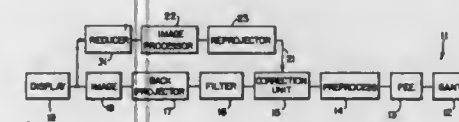
(d) image processor means for processing a reduced amount of said initial image data into initial image correcting data based on at least two or more constituent tissues having different energy dependent radiation attenuation characteristics;

(e) reprojector means for converting a reduced amount of said initial image correcting data into correcting reprojections;

(f) means separate from said reprojector means for reducing the original amount of initial image data supplied to said image processor means to speed up the correction operations of said image processor and said reprojector while maintaining the original amount of initial image data; and

(g) correction means for connecting said correcting reprojections to said back-projector means to provide image correcting data to correct said initial image data and to thereby provide corrected image data having reduced polychromatic artifact data but having an unreduced amount of image data equal to the amount in said initial image.

4. An arrangement for improving the processing time of systems that include reprojector means for generating repro-



jections used to reduce polychromatic artifacts in computerized tomographically (CT) produced images of a subject, said arrangement comprising:

(a) means for directing radiation through said subject;

(b) means for detecting a radiation intensity distribution of the radiation traversing the subject;

(c) means for providing a set of original projections derived from the detected radiation intensity distribution;

(d) means for selecting only certain projections of said set of original projections;

(e) back-projector means for back projecting said selected certain projections of said set of original projections to provide a correction image having reduced data;

(f) means for processing said correction image to provide correction data;

(g) means for reprojecting said correction data to provide correction reprojections;

(h) means for combining said correction reprojections and said projections to provide a set of corrected projections having substantially the same number of projections as said set of original projections; and

(i) means for connecting said set of corrected projections to said back projector means to provide a corrected image.

6. An arrangement for improving the processing time of systems that include reprojector means for generating reprojections used to reduce polychromatic artifacts in computerized tomographically (CT) produced images of a subject, said arrangement comprising:

(a) means for directing radiation through said subject;

(b) means for detecting a radiation intensity distribution of the radiation traversing the subject;

(c) means for providing a set of original projections derived from said detected radiation intensity distribution;

(d) back-projecting means for back projecting said set of original projections to form initial image data;

(e) image processor means including data compression means for providing compressed image correcting data;

(f) reprojector means for providing compressed image correcting reprojections;

(g) means for connecting said compressed image correcting reprojections to said back projector means to obtain compressed image correction data;

(h) means for expanding said compressed image correction data to provide image correction data; and

(i) means for combining said image correction data and said image data to provide a corrected image.

4,714,998

FUEL INJECTION SYSTEM MONITORING EQUIPMENT

Stephen Bussey, Buckingham; Barry Cockburn, Gawcott, and Alastair E. F. Heath, Great Horwood, all of England, assignors to Leslie Hartridge Limited, Buckinghamshire, England

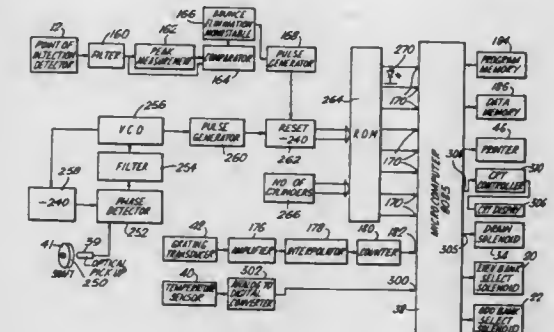
Filed Feb. 8, 1985, Ser. No. 700,443

Claims priority, application United Kingdom, Feb. 13, 1984, 8403749

Int. Cl.⁴ G06F 3/14; G01M 15/00

U.S. Cl. 364-431.01

7 Claims



1. Fuel injection system monitoring equipment for metering the outputs from the different lines of a multi-line fuel injection system, comprising (a) a plurality of inputs to which respective lines of a multi-line fuel injection system are connectable, (b) a single commencement of injection detector for at least one of the lines positioned to detect the commencement of injection of that line and to issue a commencement of injection signal upon such detection, (c) a commencement of injection pulse generator connected to receive commencement of injection signals from the commencement of injection detector and to issue a commencement of injection pulse upon receipt of a signal from the commencement of injection detector, (d) a fuel injection pump running speed indicator which serves to pick up the rotational speed of the pump shaft and to issue indicator pulses at an output of the running speed indicator, at a rate which is proportional to that rotational speed, (e) a counter having an input connected to receive the said indicator pulses to provide a count of such pulses received by the counter, and a reset input connected to receive commencement of injection pulses from said commencement of injection pulse generator, so that the counter is reset when it receives a commencement of injection pulse, (f) an artificial commencement of injection pulse generator connected to said counter to generate an artificial commencement of injection pulse in dependence upon the count in the counter having a predetermined value representing a predetermined fraction of the time interval between two successive real commencement of injection pulses, whereby artificial commencement of injections pulses are generated for at least one line other than said one of the lines, (g) volumetric measure means connected to receive liquid from all the inputs and to produce metering signals indicative of the volume of liquid which passes into said measure means

4,715,003

METHOD FOR TEMPERATURE COMPENSATION AND MEASURING CIRCUIT THEREFOR

Hans W. Keller, and Michael Von Ritter, both of Winterthur, Switzerland, assignors to Keller AG für Druckmesstechnik, Switzerland

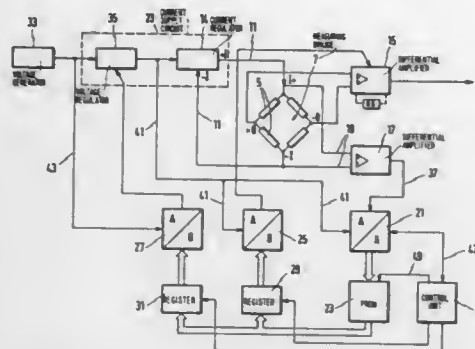
Filed Jul. 23, 1985, Ser. No. 758,068

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427743

Int. Cl.⁴ G06F 15/20

U.S. Cl. 364—571

27 Claims



1. A method for compensation of an analog, temperature dependent differential output signal of a pressure measuring circuit in a piezoresistive pressure transducer, said measuring circuit including a measurement bridge disposed on a pressure measurement cell, wherein an analog difference/output signal of said measurement bridge is provided to an output differential amplifier for generating said differential output signal, said method including the steps of:

- storing a plurality of fixed compensation values in a digital memory means;
- converting a temperature dependent analog voltage difference/input signal of said measurement bridge to a digital difference signal;
- providing said digital difference signal to said memory means and generating, as the output of said memory means and as a function of the magnitude of said digital difference signal, at least one digital compensation signal, each digital compensation signal corresponding to one of said stored compensation values;
- converting each digital compensation signal into a corresponding analog compensation signal; and
- providing each analog compensation signal to said pressure measuring circuit for compensation of said differential output signal, thus to generate a temperature compensated pressure measurement signal.

4,715,004

PATTERN RECOGNITION SYSTEM

Satoshi Kabasawa, Osaka, Japan; Ming-Shiun Hsieh; Shih-Ming Chang, both of Taipei, Taiwan, and Chu-Hong Lin, Tainan, Taiwan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 18, 1984, Ser. No. 611,734

Claims priority, application Japan, May 23, 1983, 58-91122

Int. Cl.⁴ G10L 5/00

U.S. Cl. 364—513.5

5 Claims

1. A pattern recognition system comprising: pattern-extracting means for converting an input signal into a time sequence A_i ($i=1, 2, \dots, I$) of characteristic patterns;

representative reference template memory means for storing representative reference templates B^m ($m=1, 2, \dots, M$) from among a plurality of reference templates B^m , said representative reference templates having smallest distances among said reference templates to the others of said reference templates;

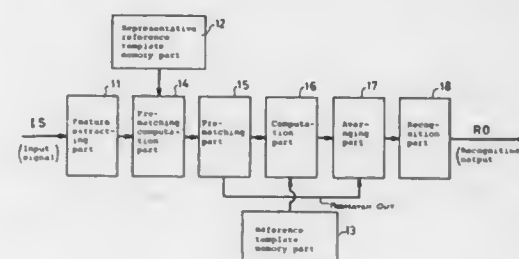
reference template memory means for storing reference

templates B_n^m ($n=1, 2, \dots, N$) which are other than said representative reference templates B^m ($m=1, 2, \dots, M$) and have same feature parameters as said representative reference templates;

pre-matching computation means for computing a matching between said time sequence A_i ($i=1, 2, \dots, I$) of characteristic patterns and said representative reference templates B^m ;

pre-matching means for outputting a number j of smallest pre-matched distances, which are given by said pre-matching computation means, together with j corresponding category codes, where j is greater than 2;

computing means for computing a matching between said time sequence A_i ($i=1, 2, \dots, I$) of characteristic patterns and only those of said reference templates which correspond to said category codes issued from said pre-match-



ing means among said reference templates stored in said reference template memory means;

averaging means for producing an average of a smallest k distance(s) for each group of:

- distances between said time sequence A_i ($i=1, 2, \dots, I$) and said reference templates B_n^m ($n=1, 2, \dots, N$), and
 - a distance between said time sequence A_i ($i=1, 2, \dots, I$) and said representative reference template B^m obtained by said pre-matching computation means, for each of said j category codes obtained from said pre-matching means; and
- recognition means for recognizing a category code corresponding to a group which includes a representative reference template B^m and reference templates B_n^m ($n=1, 2, \dots, N$) that are nearest to said time sequence A_i ($i=1, 2, \dots, I$).

4,715,005

TERRAIN/SEASCAPE IMAGE GENERATOR WITH MATH MODEL DATA BASE

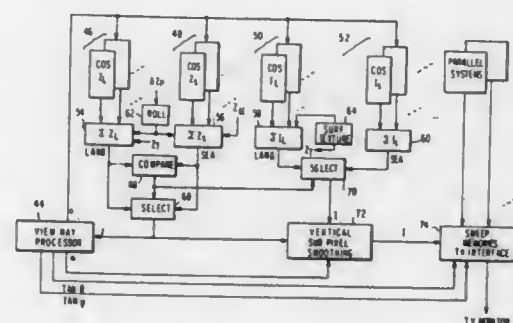
Robert A. Heartz, DeLand, Fla., assignor to General Electric Company, Philadelphia, Pa.

Filed Aug. 8, 1984, Ser. No. 638,706

Int. Cl.⁴ G09B 9/08

U.S. Cl. 364—521

23 Claims



1. A method of real-time computer generation of visual scenes comprising the steps of:

4,715,007

INSTRUMENT FOR MEASURING FILM THICKNESS

Toshio Fujita, Yokohama, and Kouzi Hasegawa, Kamifukuoka, both of Japan, assignors to Kett Electric Laboratory, Tokyo, Japan

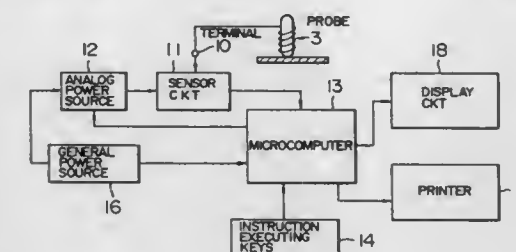
Filed Feb. 5, 1985, Ser. No. 698,471

Claims priority, application Japan, Jul. 31, 1984, 59-159294

Int. Cl.⁴ G01B 7/10

U.S. Cl. 364—563

3 Claims



generating math models of land and sea elevation posts for the visual scene to be generated;

defining a horizontal field of view as a predetermined number of increments between sweeps perpendicular to a boresight from a view point;

defining a vertical field of view as a predetermined number of increments between view rays perpendicular to a boresight from a view point;

incrementing a predetermined change in range along the boresight from the view point and for each range increment, stepping a view ray down by an increment corresponding to an incremental change in the tangent of the view angle;

accumulating an elevation value of the view ray for each incremental change in the tangent of the view angle;

for each range increment, comparing the math model for land elevation posts with the math model for sea elevation posts and selecting the larger of the two;

comparing at each range increment the accumulated elevation value of the view ray with the selected math model of elevation posts; and

if a view ray strikes the selected elevation post, reading the data for that post to a display means, otherwise incrementing said math models of land and sea elevation posts.

4,715,006

IMAGE FORMING APPARATUS

Satoshi Nagata, Tama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

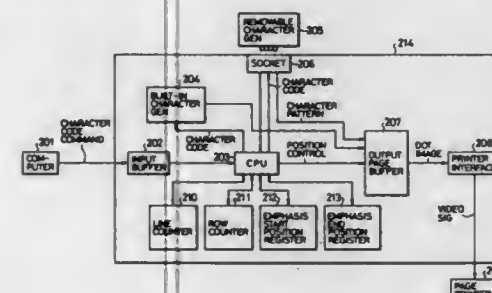
Continuation of Ser. No. 654,106, Sep. 25, 1984, abandoned. This application Mar. 23, 1987, Ser. No. 30,292

Claims priority, application Japan, Sep. 30, 1983, 58-180670; Jan. 31, 1984, 59-14297

Int. Cl.⁴ B41B 25/08

U.S. Cl. 364—523

18 Claims



1. An image forming apparatus comprising:

first pattern generating means for generating a first pattern signal corresponding to input information;

second pattern generating means for generating a second pattern signal corresponding to input information, said second pattern generating means being removable with respect to the apparatus and storing specific data representative of particular characteristics of the second pattern signal;

discriminating means for determining whether or not said second pattern generating means is mounted on the apparatus; and

output means for outputting image data corresponding to the first pattern signal from said first pattern generating means and/or the second pattern signal from said second pattern generating means, said output means operating in accordance with said discriminating means and including modified image data output means for outputting modified image data corresponding to the input information by utilizing a pattern signal which can be generated by the apparatus even if the pattern signal corresponding to the input information is not present in the apparatus.

4,715,008

HAND-HELD DIGITAL THICKNESS GAGE

Robert L. Jones, La Habra, Calif., assignor to NDT Instruments, Inc., Huntington Beach, Calif.

Filed Dec. 17, 1982, Ser. No. 450,845

Int. Cl.⁴ G01B 17/02

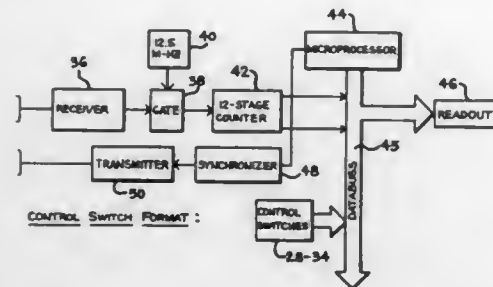
U.S. Cl. 364—563

21 Claims

1. An improved ultrasonic thickness gage of the type having a transmitter for transmitting an ultrasonic pulse through a transducer into a specimen under test, a receiver for receiving the echo pulse through a transducer from said specimen, a high frequency oscillator and digital counter, the counter accumulating pulse generated by the oscillator during the time period between transmitting and receiving the ultrasonic pulses and generating a count signal indicative of such time period, a device for storing a signal which represents the velocity of sound in a test specimen of the material and for calculating the thickness of the specimen by multiplying the time period signal by the velocity signal, and a display for displaying a visual indication of the calculated thickness; the improvement

wherein said storing and calculating device comprises a microprocessor, and wherein said gage further comprises:

- a keyboard having at least one key for selectively changing said velocity signal in a desired direction to register a new velocity signal, and
- means in said microprocessor responsive to said velocity



changing key for calculating said thickness based on said new velocity signal, wherein said keyboard comprises at least one key connected to said microprocessor for selectively locking and unlocking said velocity signal whereby said key for selectively changing said velocity signal is rendered ineffectual and effectual depending on the status of said locking key.

4,715,009

DEVICE FOR DETERMINING ANGULAR POSITION OF A ROTATING PART

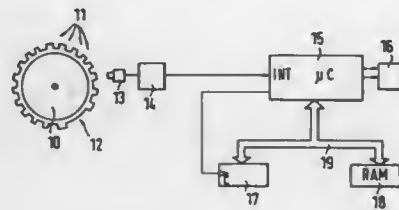
Heinz Böhmeler, Pleidelsheim; Rolf Däumer, Weil der Stadt; Dieter Mayer, Wangen In Allgau, and Egbert Perenthaler, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE85/00080, § 371 Date Nov. 12, 1985, § 102(e) Date Nov. 12, 1985, PCT Pub. No. WO86/00415, PCT Pub. Date Jan. 16, 1986

PCT Filed Mar. 13, 1985, Ser. No. 804,656
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423664

Int. Cl.⁴ G01P 3/42

U.S. Cl. 364—565

4 Claims



1. Device for determining angular position of a rotating disk having on its circumference uniformly distributed angle markers and a reference marker differing from said angle markers, comprising a receiver unit for sensing spaces between corresponding points of successive angle markers and delivering output pulses at a cycle rate of the rotating disk, a continuously clocked counter coupled to said receiver unit to deliver in response to each output pulse a count of clock pulses; said clock rate exceeding a maximum cycle rate of said disk; storage means coupled to said counter to store four successive counts from said counter; and comparing means connected to said storage means to compare the stored four successive counts, said comparing means delivering three successive difference values whereby a reference marker is recognized when the intermediate difference value deviates by a predetermined magnitude from the remaining two difference values.

4,715,010

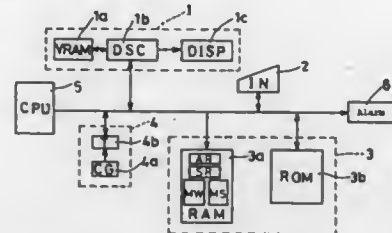
SCHEDULE ALARM DEVICE

Tomohiro Inoue; Shinji Tsugel, and Shigeki Iguchi, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Aug. 13, 1985, Ser. No. 765,239

Claims priority, application Japan, Aug. 14, 1984, 59-169563
Int. Cl.⁴ G06F 15/62, 3/02, 3/14

U.S. Cl. 364—705

2 Claims



1. A schedule alarm device comprising:
input means for selectively inputting at least one of schedule data and memorandum data, both said data having preselected times associated therewith;
memory means responsive to said input means for storing said schedule data and said memorandum data;
timer means for determining time;
display means for displaying at least one of said schedule data and said memorandum data;
alarm means for producing an audible alarm upon display of at least one of schedule data and memorandum data; and
control means for controlling said display means such that said schedule data is displayed in response to the time determined by said timer means coinciding with said preselected time associated therewith and for controlling said display means such that said memorandum data is displayed in response to the time determined by said timer means coinciding with said preselected time associated therewith, said control means permitting simultaneous display of said schedule data and said memorandum data on said display means when said respective preselected times coincide.

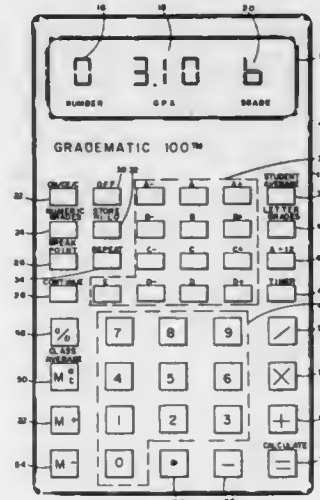
4,715,011

GRADE AVERAGING CALCULATOR

John L. Brittan, 1113 Brunn Ave., St. Joseph, Mich. 49085
Filed Dec. 4, 1984, Ser. No. 678,217

Int. Cl.⁴ G06F 3/00, 7/00; G09B 7/00
U.S. Cl. 364—734

30 Claims



1. A calculator for use by teachers for converting numeric scores into student letter grades comprising:

means for inputting a high numeric standard and a low numeric standard;
means for calculating numeric ranges between said high and low numeric standards, each of said ranges corresponding to a letter grade;
means for inputting a student numeric score;
means for determining the numeric range encompassing the student numeric score and for determining the corresponding student letter grade; and
display means for displaying the corresponding student letter grade.

4,715,012

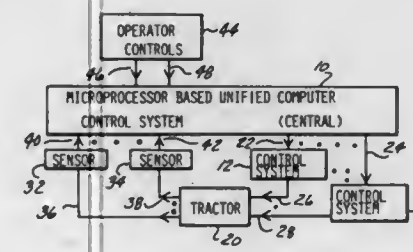
ELECTRONIC TRACTOR CONTROL

Otto Mueller, Jr., Detroit, Mich., assignor to Massey-Ferguson Services N.V., Curaçao, Netherlands Antilles
Filed Oct. 15, 1980, Ser. No. 191,240

Int. Cl.⁴ G06F 15/20

U.S. Cl. 364—900

9 Claims



1. A unified control system in combination with a tractor having a cab, an engine, and a plurality of controlled subsystems including a rear-mounted implement hitch; said unified control system including

a principal control unit having a principal microprocessor associated with the cab of said tractor

first and second subservient control units each having operating condition sensors and a subservient microprocessor, said first subservient control unit being associated with the engine of said tractor, and said second subservient control unit being associated with the rear-mounted implement hitch of said tractor, and each of said control units controlling at least one associated subsystem in response to sensed operating conditions;

communication link means connecting said control units to each other and capable of transmitting data descriptive of said sensed operating conditions from the subservient control units to said principal control unit;

data requesting means associated with one of said subservient control units for requesting from said principal control unit data descriptive of an operating condition of a subsystem associated with the other of said subservient control units; and

operating means associated with said one subservient control unit for generating control signals to an associated subsystem in response to said requested data.

4,715,013

COPROCESSOR INSTRUCTION FORMAT

Douglas B. MacGregor; John Zolnowsky, and David Mothersole, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 485,676, Apr. 18, 1983, abandoned.
This application Jul. 25, 1986, Ser. No. 889,591

Int. Cl.⁴ G06F 9/00

U.S. Cl. 364—900

2 Claims

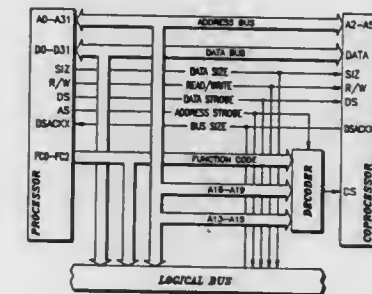
1. In a data processing system responsive to a single stream of instructions, wherein the data processing system comprises:
a general purpose processor adapted to independently de-

code and execute each of a first predetermined subset of said instructions; and

any of a plurality of special purpose coprocessors each adapted to cooperate with the processor in the independent decoding and execution of each of a respective second predetermined subset of said instruction;

the processor comprising:
first means for receiving each of said instructions comprising said stream of instructions;

second means for detecting in a predetermined operation bit field of each of said received instructions a predetermined bit value characteristic of each and every one of said instructions comprising said second subset of said instructions;



PROCESSOR - COPROCESSOR SYSTEM BLOCK DIAGRAM

third means for providing to said coprocessor from a predetermined command bit field of each of said detected instructions any of a plurality of predetermined command signal values each of which indicates a predetermined command which must be performed by said coprocessor in support of the execution of said detected instruction by the processor;

fourth means for receiving from said coprocessor a response to the receipt of said command, said response comprising any of a plurality of response signal values each of which indicates whether a predetermined task must be performed by said processor in support of the performance of said command by said coprocessor; and

fifth means for performing said task if indicated by said received response signal value.

4,715,014

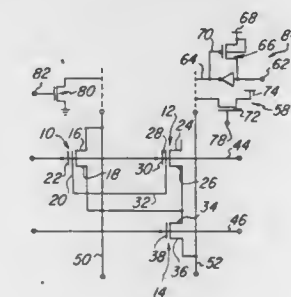
MODIFIED THREE TRANSISTOR EEPROM CELL
James A. Tuvell, Houston, and Michael C. Smayling, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 1, 1985, Ser. No. 793,880

Int. Cl.⁴ G11C 11/40

U.S. Cl. 365—185

7 Claims



1. An electrically erasable programmable semiconductor memory cell having an associated conducting column line, read/write line, sense line and row line, comprising:
a floating gate transistor having a control gate, a floating

gate and a source to drain path at a face of a semiconductor body, the source to drain path coupled at one end to said column line;

switch means connected between said read/write line and another end of the source to drain path of said floating gate transistor and having a gate coupled to said row line for controlling the opening and closing of said switch in response to a selection voltage signal on said row line; and tunnel means coupled to the floating gate of said floating gate transistor, to said read/write line, to said sense line and to said switch means, said tunnel means responsive to predetermined voltages on said sense line, read/write and row lines to selectively tunnel electrons to or from said floating gate and in response to cause the voltage potential on said floating gate to fall or rise and wherein for read cycles said column line is coupled to ground and said read/write line is precharged.

4,715,015

DYNAMIC SEMICONDUCTOR MEMORY WITH IMPROVED SENSE SIGNAL

Toshio Mimoto, Nara, and Yoshiji Ota, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

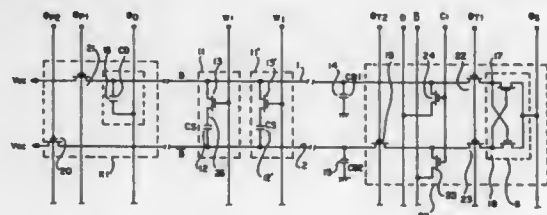
Filed May 29, 1985, Ser. No. 738,870

Claims priority, application Japan, Jun. 1, 1984, 59-113742; Jun. 4, 1984, 59-116310; Jun. 4, 1984, 59-116311; Jun. 4, 1984, 59-116312; Jun. 4, 1984, 59-116313

Int. Cl.⁴ G11C 11/24

U.S. Cl. 365-210

8 Claims



1. A dynamic semiconductor memory comprising memory cells, each including a first bit line and a second bit line for inputting and outputting information, said first and second bit lines being complementary to each other, a storage capacitor means for storing information and a selecting means for selecting said storage capacitor means, one end of said storage capacitor means being connected to said second bit line and the other end of said storage capacitor means being connected through said selecting means to said first bit line,
- a sense amplifier means for amplifying a differential voltage outputted to said complementary first and second bit lines,
- a control means adapted to connect said sense amplifier means and said second bit line only during a period when said differential voltage is inputted to said sense amplifier means and to disconnect said second bit line from said sense amplifier means during an active period of said sense amplifier means, and
- a dummy storage capacitor with one end connected to said first bit line and the other end connected to a dummy control signal line.

4,715,016 MEMORY SAFEGUARD DEVICE FOR MICROPROCESSOR

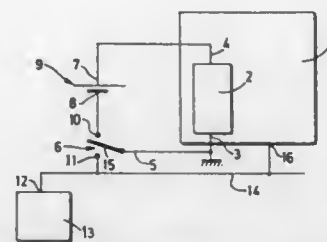
Sylves Lamiaux, Yerville, and Alex Kuhn, Pontoise, both of France, assignors to Societe d'Applications Generales d'Electricite et de Mecanique (SAGEM), Paris, France

Filed Oct. 7, 1985, Ser. No. 784,773

Claims priority, application France, Oct. 15, 1984, 8415759 Int. Cl.⁴ G11C 11/40

U.S. Cl. 365-229

3 Claims



1. A microprocessor memory safeguard device, comprising: a safeguard battery having a pair of terminals; and connection means for connecting said terminals to terminals of a microprocessor memory, said connection means comprising a switching means with (i) a first input terminal, (ii) a second input terminal and (iii) a common terminal adapted to be connected to (i) one of said terminals of said microprocessor memory and (ii) a logic zero input of said microprocessor, one of said first input terminal and said second input terminal of said switching means being connected to one of said terminals of said battery, the other of said terminals of said battery being adapted to be connected to another terminal of said microprocessor memory, the other of said first input terminal and said second input terminal of said switching means being adapted to be connected to an initialization line for initializing said microprocessor, and said common terminal being engageable with said other of said first input terminal and said second input terminal of said switching means to engage said switching means with said initialization line.

4,715,017

SEMICONDUCTOR MEMORY DEVICE WITH PLURAL LATCHES FOR READ OUT

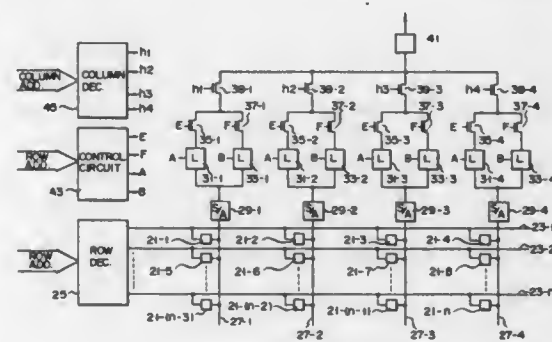
Hiroshi Iwahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 20, 1985, Ser. No. 703,435

Claims priority, application Japan, Feb. 21, 1984, 59-30692 Int. Cl.⁴ G11C 7/00

U.S. Cl. 365-239

15 Claims



1. A semiconductor memory device addressed by a row address signal and a column address signal and comprising: memory cells, arranged in a matrix of rows and columns, for storing data;

bit lines and word lines connected to said memory cells; first latching means, connected to said bit lines, for latching data of said memory cells of a row specified by the row address signal;

second latching means, being connected to said bit lines, for latching data of said memory cells of a row specified by the row address signal;

reading means for reading out data latched by said first latching means in response to the column address signal, and, after completion of reading of the data stored in the first latching means, for reading out data stored in the second latching means;

whereby said second latching means latches the stored data of the memory cells of the next row to be read out in response to the row address signal while said reading means is reading out the data stored in the first latching means.

4,715,018

OBC LOCATION SYSTEM

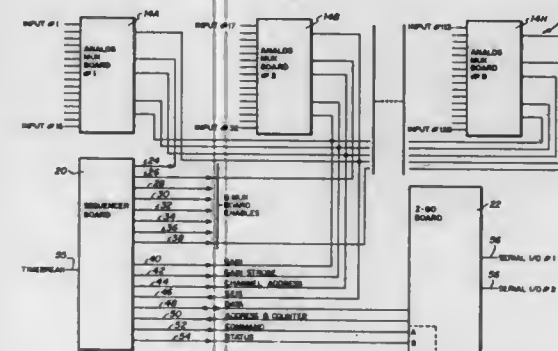
Ronald B. Blair, Lewisville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 15, 1986, Ser. No. 819,076

Int. Cl.⁴ G01V 1/38

U.S. Cl. 367-19

9 Claims



1. A data processing circuit for determining the location of an ocean bottom cable having at least one acoustic pulse detector which produces an electrical signal in response to remotely generated acoustic pulses fired at different locations comprising:

multiplexer circuit for receiving a plurality of analog differential seismic signal and providing a single analog time-multiplexed seismic signal comprised of a plurality of channels, each channel corresponding to one of said plural analog differential seismic signals;

sequencer circuit connected to said multiplexer circuit, said sequencer circuit receiving said time-multiplexed seismic signal from said multiplexer circuit; and

processor circuit connected to said sequencer circuit, said processor circuit processing data from said sequencer circuit to locate said at least one acoustic pulse detector of said ocean bottom cable;

wherein said sequencer circuit further comprises:

means for setting a threshold value for each of said channels of said time-multiplexed seismic signal;

means for sampling said channels of said time-multiplexed seismic signal;

means for comparing each of said sampled channels of said time-multiplexed seismic signal to its channel threshold value;

means for measuring time elapsed between time of start of sampling of each of said channels of said time-multiplexed seismic signal and time when each of said sampled channels of said time-multiplexed seismic signal exceeds its channel threshold value; and

means for transmitting said time measurements to said processor circuit.

4,715,019

BOREHOLE LOGGING METHOD FOR DETERMINING THE DAMPING OF ACOUSTIC TUBE WAVES IN SUBSURFACE FORMATIONS ALONG A BOREHOLE WALL

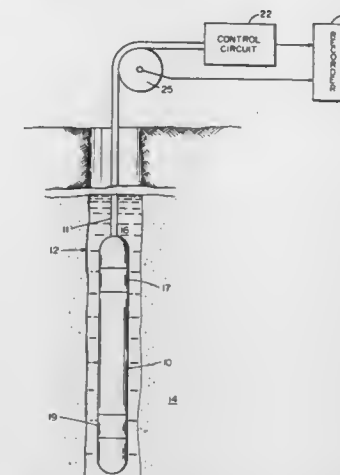
William L. Medlin, and Gary L. Zumwalt, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 27, 1986, Ser. No. 822,504

Int. Cl.⁴ G01V 1/28

U.S. Cl. 367-31

3 Claims



1. An acoustic well logging method for determining the damping of acoustic energy in a subsurface formation surrounding a borehole, comprising the steps of:

(a) traversing a borehole with a well logging tool containing an acoustic transmitter and at least one spaced-apart receiver,

(b) exciting said transmitter with a steady-state sine wave tone burst during an initial portion of a fixed time period to cause said transmitter to resonate and generate acoustic tube waves,

(c) removing the excitation of said transmitter during a terminal portion of said fixed time period, whereby amplitudes of said tube waves build-up to a steady-state value during said initial portion of said time period and decay from said value over a terminal portion of said time period,

(d) recording the amplitudes of said tube waves at said receiver during at least the terminal portion of said time period,

(e) determining an amplitude peak of each sine wave cycle of said tube waves,

(f) determining a logarithm of said amplitude peaks,

(g) generating a logarithmic plot of said amplitude peaks of said recorded tube waves,

(h) determining a slope of said logarithmic plot of tube wave amplitudes,

(i) determining a negative inverse of said slope of said logarithmic plot, and

(j) multiplying said negative inverse of the slope of said logarithmic plot by π (Pi) as a measure of damping of said tube waves in the subsurface formation along the borehole wall.

4,715,020

SIMULTANEOUS PERFORMANCE OF MULTIPLE SEISMIC VIBRATORY SURVEYS

Ralph A. Landrum, Jr., Houston, Tex., assignor to Western Atlas International, Inc., Del.

Filed Oct. 29, 1986, Ser. No. 925,810

Int. Cl.⁴ G01V 1/00

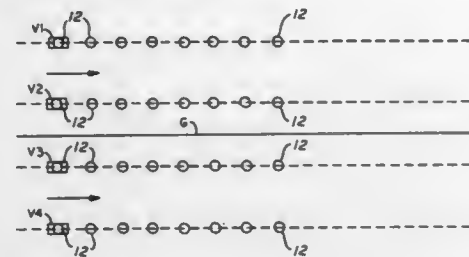
U.S. Cl. 367-38

16 Claims

1. A method of conducting n seismic surveys simultaneously

at substantially the same location where n is a whole number greater than two comprising:

- simultaneously transmitting n times with n vibratory sources, n signals;
- detecting the n signals resulting from the n simultaneous transmissions of the n signals;



varying the initial phases of said transmitted signals among n initial phases to enable the signal transmitted by each of the n vibratory sources to be separated from the n detected signals by data processing.

4,715,021

METHOD FOR FILTERING AND COMBINING SEISMIC DATA HAVING DIFFERENT SPECTRAL CHARACTERISTICS

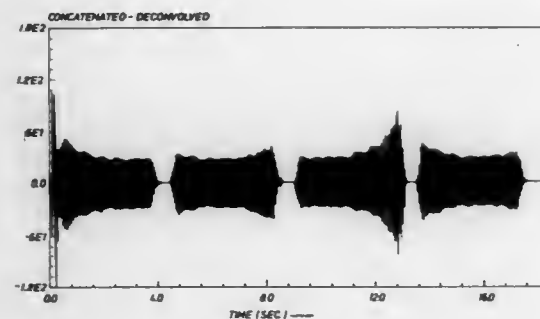
Karen K. Dittert, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Aug. 8, 1984, Ser. No. 638,814

Int. Cl.⁴ G01V 1/28, 1/36

U.S. Cl. 367-41

7 Claims



1. A method of filtering and combining seismic data having different spectral characteristics, including the steps of:

- (a) transmitting a plurality of seismic signals into a subterranean earth formation, each of said signals having a characteristic frequency amplitude spectrum;
- (b) generating a plurality of reference signals each of which is substantially identical to a different one of said plurality of seismic signals;
- (c) recording a return portion of each of said seismic signals, after said seismic signal has propagated through the subterranean earth formation, to produce a plurality of seismic traces;
- (d) generating a correlating signal for each reference signal trace such that the sum of the correlations of each of said correlating signals with its associated trace is an approximately minimum phase signal whose frequency amplitude spectrum is the sum of the frequency amplitude spectra of the individual reference signals;
- (e) correlating each trace with its associated correlating signal; and
- (f) stacking the correlated signals generated in step (e).

4,715,022

DETECTION MEANS FOR MUD PULSE TELEMETRY SYSTEM

David E. Yeo, Santa Ana, Calif., assignor to Scientific Drilling International, Houston, Tex.

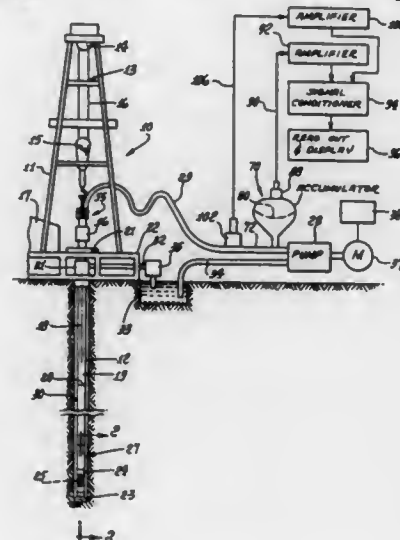
Continuation of Ser. No. 771,462, Aug. 29, 1985, abandoned.

This application Jan. 14, 1986, Ser. No. 885,523

Int. Cl.⁴ G01V 1/40

U.S. Cl. 367-83

13 Claims



1. In apparatus transmitting signals from within a well bore to the surface, and for detecting such signals, there being a drill pipe string and rotary bit means in the well bore, the combination comprising

- (a) first means for supplying a stream of drilling fluid to the drill pipe string for flow downwardly in the bore as a down stream, said first means including a flow line and a fluid pump connected with said line and operable to pressurize said drilling fluid,
- (b) structure in the well bore and to which said drill string is connected for passing drilling fluid to the bit means, the fluid then flowing back up the well bore in a return stream,
- (c) a first passage associated with said structure for diverting flow of some of the drilling fluid, and a valve associated with said structure and operable to interruptedly control flow of diverted fluid, via said passage, thereby to produce pulses in said down stream, the pulses traveling upwardly to fluid in said line, and characterized as providing acoustic particle velocity changes,
- (d) an instrument associated with said valve, in the bore, for controlling said operation of the valve as a function of data to be transmitted to the surface,
- (e) an accumulator connected with said line and defining a chamber into which said pulses are transmitted, the accumulator including a diaphragm in said chamber, one side of the diaphragm contacted by said fluid, and there being second fluid at the opposite side of the diaphragm and to which said pulses are transmitted via the diaphragm, the diaphragm movable to different positions in the chamber in response to operation of the pump,
- (f) the pump producing pulsations in the drilling fluid in the line between the pump and the accumulator and at a first pulsation frequency f_1 , the accumulator filtering said pulsations to reduce their amplitudes in the drilling fluid between the accumulator and the bit means, the valve operating to produce said pulses having a second frequency or frequencies substantially greater than f_1 in the drilling fluid between the valve and the accumulator,
- (g) and a first pressure transducer located to detect said pulses in the second fluid, irrespective of the position of the diaphragm in response to operation of the pump,

(h) the accumulator and transducer together providing a means for converting changes in acoustic particle velocity into pressure changes.

4,715,023

COAXIAL, DUAL CHAMBER SEISMIC AIR GUN

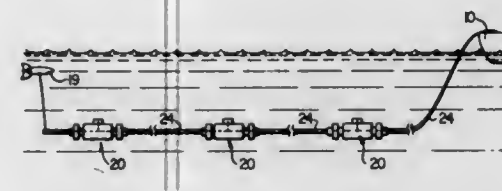
Bernard Otto, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 18, 1987, Ser. No. 27,369

Int. Cl.⁴ H04R 23/00

U.S. Cl. 367-144

17 Claims



1. A marine seismic source array for generating acoustical waves in water, said array comprising:

- a seismic array bundle adapted to be towed by a vessel through a body of water; said bundle having a main, central air supply passage extending therethrough adapted to provide a passageway for compressed air under high pressure throughout said array;
- a plurality of air guns, each air gun comprising: an elongated housing having a central bore extending therethrough along the longitudinal axis of said housing; a first chamber having an inlet and an outlet in said housing; first valve means for opening and closing said outlet of said first chamber;
- means in said housing for supplying air from said central bore in said housing to said inlet of said first chamber when said outlet is closed to thereby provide a charge of air under pressure in said first chamber; and
- means for opening said first valve means to discharge said charge of air through said outlet of said first chamber; and
- means for connecting each of said housing of said plurality of air guns into said seismic array bundle at spaced intervals whereby said central bore in each of said housings is coaxial with said central air supply passage and forms an integral part thereof.

4,715,024

OPTICAL HEAD WITH PROVISION FOR TRACKING AND FOCUSING CONTROL

Tohru Musha, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

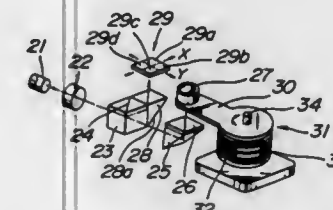
Continuation of Ser. No. 603,299, Apr. 24, 1984, Pat. No. 4,644,516. This application Nov. 19, 1986, Ser. No. 932,343

Claims priority, application Japan, Apr. 28, 1983, 58-73846

Int. Cl.⁴ G11B 7/00

U.S. Cl. 369-44

3 Claims



1. An optical head for reproducing information recorded

along at least one information track on a substantially planar optical record medium, comprising:

- a base member including a portion which extends in a first direction parallel to a plane containing said at least one information track;
- a light source arranged on said base member for emitting a light beam;
- a reflecting member arranged on said base member for reflecting said light beam emitted from the light source in a second direction substantially perpendicular to said first direction as well as to said plane containing said at least one information track;
- objective lens means arranged on said base member and being movable in said second direction for effecting a focussing control as well as in a third direction perpendicular to said second direction for effecting a tracking control, and having an optical axis parallel to said second direction for projecting said light beam reflected by said reflecting member onto the record medium as a fine spot, for collecting a light flux reflected by the record medium, and for directing the light flux toward said reflecting member;
- electromagnetic driving means having a portion arranged on the base member adjacent to said reflecting member for moving said objective lens in said second and third directions in accordance with a focussing error and a tracking error, respectively;
- a beam splitting member arranged on the base member for directing the light beam emitted from the light source to said reflecting member and for directing the light flux reflected by the reflecting member in a fourth direction; and
- light detecting means arranged on the base member for receiving the light flux emanating from said beam splitting member and for deriving a signal representing information recorded on the record medium and signals representing said focussing error and tracking error, respectively.

4,715,025

DISC-RECORD PLAYER COMPRISING A DISC-LOADING MECHANISM

Antonius A. C. Eljseman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

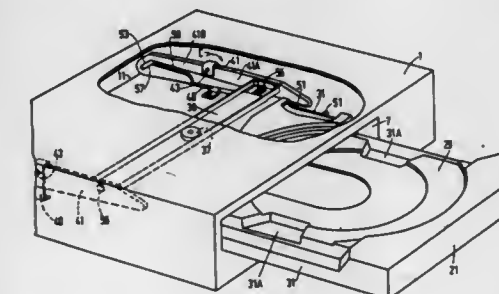
Filed Aug. 22, 1985, Ser. No. 768,399

Claims priority, application Netherlands, Mar. 4, 1985, 8500593

Int. Cl.⁴ G11B 17/04, 1/00

U.S. Cl. 369-75.2

5 Claims



1. A disc record player comprising
a frame,
a housing having a front opening therein,
a turntable mounted for rotation in said frame
a drawer movable horizontally on a rectilinear path in inward and outward directions through said opening for transferring a disc respectively to and from said turntable,
a pressure member support spanning said turntable and carrying a pressure member above said turntable for urging said disc against said turntable, said support being movable vertically between an operative position and an

inoperative position remote therefrom, said support being movable along a pair of rectilinear guides in the frame on opposite sides of the turntable,

a pair of levers generally parallel to the direction of movement of said drawer on opposite sides thereof, each lever being pivotable about a spindle supported in said frame, each lever having a first lever arm extending from said spindle toward said front opening and a second lever arm extending from said spindle away from said front opening, each first lever arm cooperating with said pressure member support, each second lever arm carrying a first coupling means for cooperation with a respective second coupling means on the drawer, one of each pair of cooperating coupling means comprising a wall portion which is inclined viewed in the inward direction of movement of the drawer, a guide element of the other coupling means of each pair being moved over said wall portion during the inward movement of the drawer to cause the lever to be pivoted and the pressure member to be moved vertically into the operative position.

4,715,026

CIRCUIT ARRANGEMENT FOR A COMMUNICATIONS SYSTEM FOR THE TRANSMISSION OF MESSAGE INFORMATION FROM NARROWBAND AND BROADBAND TERMINAL EQUIPMENT WITHIN A LOCAL NETWORK CONSTRUCTED AS A LOOP

Joerg Eberspaecher, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

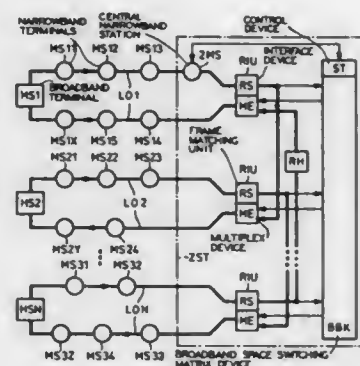
Filed May 7, 1986, Ser. No. 860,580

Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3517006

Int. Cl.⁴ H04J 15/00

U.S. Cl. 370-1

3 Claims



1. In a circuit arrangement for a communications system for the transmission of serial bit message information, particularly multiplex data transmission in optical transmission systems comprising light waveguides, the circuit arrangement being of the type comprising a loop local network including broadband and narrow band terminals adapted to different types of data transmission with respect to quantity of data transmission and data transmission rate within a frame and the method of transmission, the improvement comprising:

- a plurality of loop sub-networks in the loop local network, each of said loop sub-networks comprising at least one broadband terminal and a plurality of narrow band terminals serially connected via light waveguides and supplementing one another up to the maximum data quantity with respect to the maximum quantity of data to be transmitted in a frame within a predetermined time;
- a centrally-controlled broadband space switching matrix device;
- a plurality of sub-loop interface devices each including first and second transmitting outputs and first and second receiving inputs, said first transmitting output connected

to said broadband space switching matrix device and to said first receiving input of an adjacent sub-loop interface device, said first receiving input connected to said broadband space switching matrix device, and said second transmitting output and said second receiving input connected to the light waveguides of the respective loop sub-networks and each of said interface devices acquiring the data of said broadband and narrow band terminals;

each of said sub-loop interface devices comprising a frame matching unit for augmenting transit time in the respective loop sub-network to a whole multiple of the frame duration, and a multiplex device for combining the data received from said broadband space switching matrix device and the adjacent sub-network to form a new, complete frame; and

a central narrow band station connected in one of said loop sub-networks and connected to and controlled by said broadband space switching matrix device to control call setup and clear down between said broadband terminals via said broadband space switching matrix device.

4,715,027

INTEGRATED OPTIC MULTI/DEMULTIPLEXER

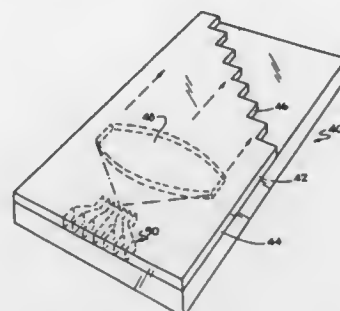
Amaresh Mahapatra, Lexington, and Donald H. McMahon, Carlisle, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 29, 1986, Ser. No. 868,098

Int. Cl.⁴ H04B 9/00

U.S. Cl. 370-3

13 Claims



1. An integrated optic device comprising a thin, planar substrate made of a transparent dielectric material and having integrally formed therein, perpendicular to the major plane of said substrate, an echelon grating structured to receive electromagnetic radiation within a given bandwidth and diffract it into components of different wavelength angularly dispersed with respect to one another so that at a predetermined distance away from said echelon grating said components are spatially separated for individual coupling and subsequent use, said echelon comprising a plurality of steps whose physical dimensions are at least several times larger than the wavelength of radiation encompassed by said given bandwidth to provide said device with a high resolution for separating a plurality of communication channels closely spaced in wavelength and for facilitating the fabrication of said echelon grating in integrated optic format using either photolithography, ion milling, or r.f. plasma etching.

4,715,028

OPTICAL COMMUNICATION SYSTEM

Donald H. McMahon, Carlisle, and Gilbert L. Johnson, Jr., Marlborough, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 13, 1986, Ser. No. 874,118

Int. Cl.⁴ H04B 9/00

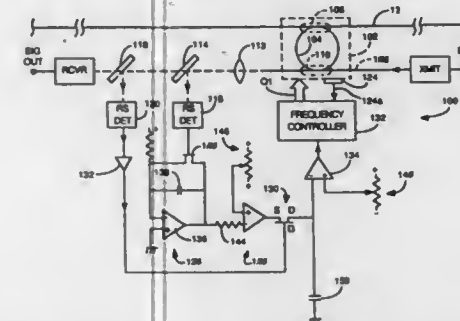
U.S. Cl. 370-3

42 Claims

1. An optical communications system, comprising:

an optical pathway for propagating information bearing light signals;

at least first and second terminal devices coupled to said optical pathway for effecting communications through said optical pathway, each of said terminal devices including a controllable resonant structure controlled to support a plurality of resonant modes occurring at respective resonant mode frequencies;



means for propagating a reference signal onto said optical pathway, said reference signal varying in frequency between at least a first and one other reference frequency in a periodic manner; and

means for controlling said resonant structure of each of said terminal devices to support resonant modes at respective resonant mode frequencies having a selected frequency relationship with at least one of the first and one other reference frequency.

4,715,029

FDMA COMMUNICATIONS CHANNEL SYNCHRONIZER

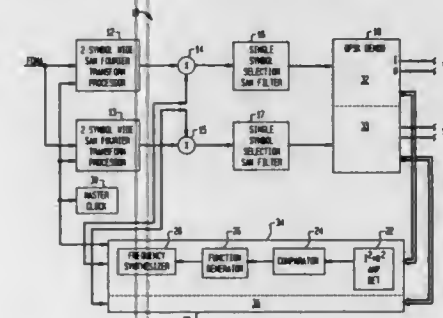
Rex J. Crookshanks, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 2, 1986, Ser. No. 881,432

Int. Cl.⁴ H04J 4/00

U.S. Cl. 370-70

4 Claims



1. A method of synchronizing an FDMA signal constituted by nonsynchronized channels having a common predetermined symbol period, said method comprising the steps of:

- (a) receiving said FDMA signal;
- (b) sampling said FDMA signal over pairs of adjacent symbol periods to obtain samples;
- (c) Fourier transforming each said sample so as to obtain a series of pulses extending over a common bandwidth;
- (d) frequency translating each of said pulses by a translation frequency, said translation frequency being the sum of a respective frequency and a dither having a cycle two symbol periods in duration, so that the frequency translated pulses share a common frequency range substantially half that of their common bandwidth;
- (e) filtering said pulses to exclude frequencies outside said common frequency range;

- (f) detecting and storing the amplitudes of said pulses;
- (g) forming a discriminate for each FDMA channel by comparing amplitudes of successive pulses corresponding to that channel; and
- (h) adjusting each said translation frequency of step d in response to said discriminate.

4,715,030

LOCAL AREA NETWORK BRIDGE

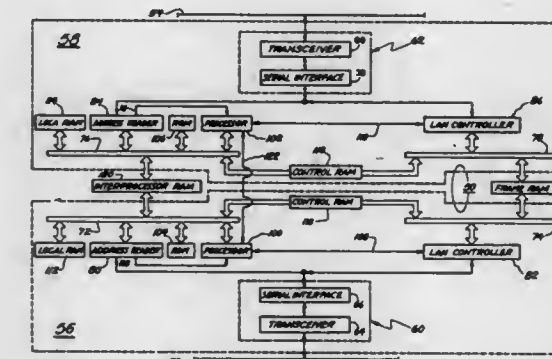
Steven R. Koch, Seabrook, Md.; Charles R. Stein, Schenectady, N.Y.; William T. Hatfield, Schenectady, N.Y.; Neil R. Shapiro, Schenectady, N.Y., and William C. Hughes, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,618

Int. Cl.⁴ H01J 3/02

U.S. Cl. 370-85

24 Claims



1. Apparatus for establishing a bridge between a pair of communication networks, each of said networks being adapted to carry bit-serial message frames between devices coupled thereto, each said message frame having a leading portion including an address portion, said apparatus comprising:

a pair of bridge sides each coupled to a respective one of said networks for transmitting and receiving message frames to and from its associated communication network;

memory means, accessible by said bridge sides, for retrievably storing message frames;

each of said bridge sides including:

interface means for receiving an incoming message frame from or transmitting an outgoing message frame to its associated communication network;

processor means for determining whether said incoming message frame is transmissible from one of said networks to the other, said processor means providing a first signal upon determining said incoming message frame is transmissible;

said processor means providing a second signal effective to initiate the transmission of said outgoing message frame;

controller means for directing said incoming message frame from said interface means to said memory means, said controller means responsive to said second signal to direct said outgoing message frame from said memory means to said interface means;

means for reading and storing the address portion of said incoming message frame concurrently with said controller means directing said incoming message frame to said memory means, the stored address portion being immediately accessible by said processor means for determining the transmissibility of said incoming message frame;

said pair of bridge sides coupled together such that each of said bridge sides can function as either a receiving bridge side for receiving said incoming message frame or a transmitting bridge side for transmitting said outgoing message frame; and

upon said processor means on said receiving bridge side providing said first signal, said processor means on said transmitting bridge side responsively providing said second signal to said controller means on said transmitting bridge side;

whereby said receiving bridge side address reading means reads and stores said address portion, said receiving bridge side processor means having immediate access to said address portion to determine therefrom the transmissibility of said incoming message frame concurrently with said controller means directing said incoming message frame to said memory means.

4,715,031

VEHICULAR DATA TRANSFER COMMUNICATION SYSTEM

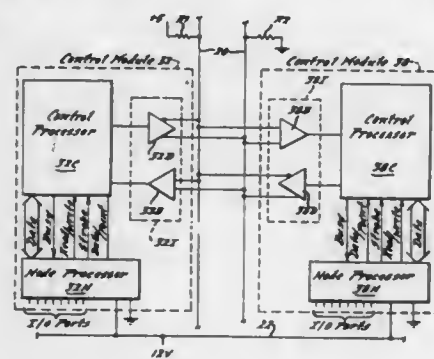
Robert D. Crawford, Plymouth; Wayne J. Johnson, Dearborn Heights, both of Mich.; Theo Kimber, Jr., Huntsville, Ala.; Douglas Nollf, Scio Township, Washtenaw County, Mich.; Jack R. Volk, and Donald C. Franks, both of Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 23, 1985, Ser. No. 779,200

Int. Cl.⁴ H04J 3/02

U.S. Cl. 370-85

6 Claims



1. A data transfer communication system comprising:
 - a common data bus;
 - a plurality of communication control modules;
 - each control module having an unique identifying address and being programmed to perform one or more predetermined functions;
 - each control module being connected to said data bus and each containing means for receiving and means for transmitting data messages from or to other control modules on said common data bus;
 - each control module includes means for formatting data messages for transmitting on said common data bus into one of at least two types of messages each of which includes in sequence, a common but unique START signal of a predetermined field length to indicate the start of a data message transmission, a PRIORITY signal of a second predetermined field length to indicate the code of the relative degree of priority the formatted data message has for transmission on a predetermined hierarchy of priority, a TYPE CONTROL signal of a third predetermined field length to indicate the code of which one of said at least two types of data messages is being formatted for transmission, a FUNCTION or RECEIVER ADDRESS signal of a fourth predetermined field length indicating the code of the function to be performed by other control modules connected to said data bus or the unique identifying address of a specific control module intended to receive the data message; and
 - each control module further contains means for storing its unique identifying address and function codes of the specific predetermined functions it is programmed to control.

4,715,032 METHOD AND APPARATUS FOR THE CONNECTION OF A CLOSED RING THROUGH A TELEPHONE EXCHANGE

Olof E. Nilsson, Rönninge, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE84/00220, § 371 Date Jan. 16, 1985, § 102(e) Date Jan. 16, 1985, PCT Pub. No. WO84/05009, PCT Pub. Date Dec. 20, 1984

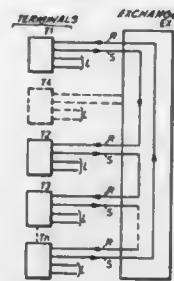
PCT Filed Jan. 8, 1984, Ser. No. 692,029

Claims priority, application Sweden, Jun. 9, 1983, 8303284

Int. Cl.⁴ H04J 3/00; H08Q 3/00

U.S. Cl. 370-86

5 Claims



1. In the utilization of a digital telecommunication system including an exchange including connecting circuits adapted for being controlled by signals, and a plurality of terminals including at least three terminals, each of said terminals including a send channel and a receive channel, a method of connecting the terminals in a closed loop so that any pair of terminals can communicate comprising the steps of physically connecting the channels of each terminal to the exchange, and establishing communication between any pair of said terminals by coupling all of the terminals in series in a closed loop such that the pair of terminals communicate with each other through intervening of said terminals in said loop, said establishing communication being effected by connecting the send channel of each of the terminals to the receive channel of the next sequential of the terminals in said loop by controlling the connecting circuits of the exchange to connect the same until said closed loop is formed, transmitting from each terminal of the pair to the other terminal of the pair through said loop, and adding a further terminal to said loop by physically connecting the further terminal to the exchange and, within the exchange, signalling the connecting circuits to connect the send and receive channels of the further terminal respectively to the receive and send channels of two other terminals in the loop so as to include the further terminal in the loop.

4,715,033

STATE INFORMATION COMMUNICATION IN A TDMA SATELLITE COMMUNICATION NETWORK WITH HIGH FRAME AVAILABILITY

Akio Saburi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 13, 1985, Ser. No. 733,714

Claims priority, application Japan, May 14, 1984, 59-96147

Int. Cl.⁴ H04Q 11/04; H04J 3/06

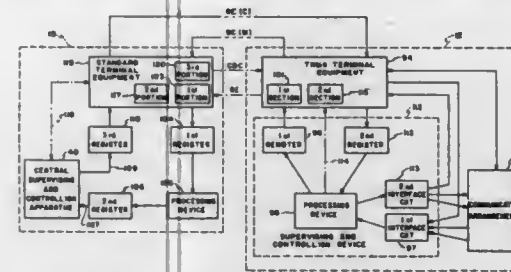
U.S. Cl. 370-104

11 Claims

1. An arrangement for sending information about the operational state of a terrestrial station in a time division multiple access satellite communication network, said arrangement comprising at least one earth station and at least one standard earth station which periodically generates standard bursts; each of said standard bursts defining a time division multiple access frame consisting of said standard burst and a remaining part; said remaining part comprising a first and a second part; said first part being for transmission of data bursts which are produced by said terrestrial station, said at least one earth station, and said at least one standard earth station; said terrestrial station including communication devices for transmitting

the data bursts produced by said terrestrial station and for receiving the data bursts produced by said at least one earth station and said at least one standard earth station; said communication devices having a plurality of supervisory conditions which are to be monitored and which specify the states of operation of said communication devices;

collecting means for collecting, one at a time, a set of state information signals; each of said sets of state information



signals being representative of at least one of said operational states of said communication devices; and

signal sending means responsive to a collected signal from said collecting means for sending said collected signal in a predetermined part which is selected in said second part with reference to each of said standard bursts and in common to said terrestrial station and said at least one earth station.

4,715,034

METHOD OF AND SYSTEM FOR FAST FUNCTIONAL TESTING OF RANDOM ACCESS MEMORIES

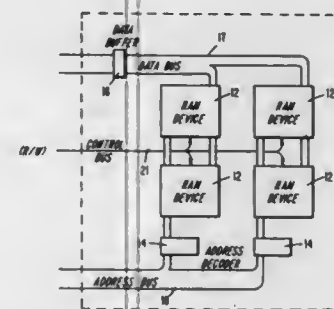
David M. Jacobson, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Mar. 4, 1985, Ser. No. 708,749

Int. Cl.⁴ G06F 11/26

U.S. Cl. 371-21

24 Claims



14. Apparatus for fault testing a random access memory system having a plurality of memory cells, each being nominally uniquely addressable, comprising:
 - reversible pseudorandom bit generation means for generating a reversible pseudorandom bit sequence;
 - means for addressing the cells of said memory through selectively first and second address sequences;
 - means for writing said pseudorandom bit sequence into said memory through said first address sequence;
 - means for reading the contents of said memory through said second address sequence while controlling said pseudorandom bit generation means to generate said pseudorandom bit sequence in reverse, and for comparing said contents read with expected contents of cells in said second address sequence obtained from said pseudorandom bit sequence in reverse to detect any differences;
 - means responsive to differences detected by said comparing means for identifying memory faults; and
 - means for indicating said faults.

4,715,035

METHOD FOR THE SIMULATION OF AN ERROR IN A LOGIC CIRCUIT AND A CIRCUIT ARRANGEMENT FOR IMPLEMENTATION OF THE METHOD

Michael Boehner, Neubiberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

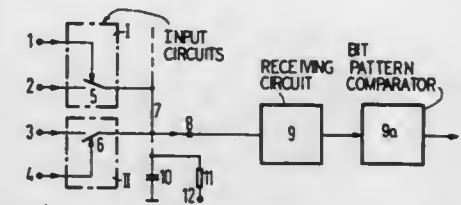
Filed Apr. 16, 1986, Ser. No. 852,661

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519606

Int. Cl.⁴ G06F 11/22; G01R 31/28

U.S. Cl. 371-23

17 Claims



1. A method for simulating an error in a logic circuit which is designed for optionally connecting two logic levels to a bus via at least two input circuits which include switch elements which receive input bit patterns, comprising the steps of:
 - constructing a simulation model containing an error corresponding to simultaneously connecting both logic levels to the bus, including a logic circuit model, first and second bus model versions which are selectively useable with the logic circuit model;
 - applying an input bit pattern to the logic circuit model, producing undefined logic level and imaging the undefined logic level to a first logic level with the first bus model version;
 - applying the input bit pattern to the logic circuit model, producing the undefined logic level and imaging the undefined logic level to a second logic level; and
 - comparing the output bit patterns with error-free reference bit patterns.

4,715,036

DATA ENCODER SYSTEM

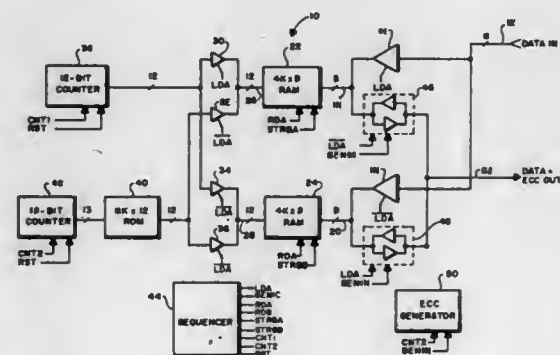
Alan E. Oakes, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 16, 1986, Ser. No. 864,588

Int. Cl.⁴ G06F 11/10

U.S. Cl. 371-37

8 Claims



1. An encoding device for implementing an encoding scheme in which an error-correction-code (ECC) generator is employed to generate from a sector of sequentially received data words an output block comprising the data words and ECC words generated from groups of data words within the sector, the encoding scheme including a processing order in

which the sequence of data words in at least some of the groups is different from the sequence in which the words are received so that the data words must be applied to the ECC generator in a processing sequence that is different from the sequence in which the data words are received, the encoding device comprising:

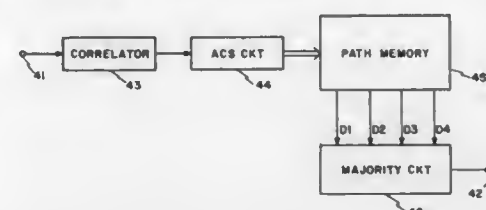
- A. a device input port for receiving device input signals representing successive data words in a sector of data words for which error-correction coding is to be generated;
- B. a data memory having a plurality of data-memory locations and adapted for application of address signals and data signals thereto, the data memory being operable to store in data-memory locations designated by address signals applied thereto data represented by data signals applied thereto and to produce a data-memory output representing the data stored in the data-memory locations designated by address signals applied thereto;
- C. input means for operating the data memory, by application of address signals thereto and by application of the device input signals as data signals thereto, to store in the data memory the data words represented by the device input signals;
- D. an ECC generator, having a generator input port and a generator output port, for receiving at the generator input port a generator input representing a succession of data words and for producing at the generator output port a generator output representing ECC words generated from groups of the data words represented by the generator input;
- E. generator input means for applying the data-memory output to the generator input port during predetermined ECC-generation time periods for generation of ECC words therefrom;
- F. generator output means for applying the generator output as data signals to the data memory during predetermined ECC-storage time periods to store in the data memory the ECC words represented by the generator output;
- G. a device output port;
- H. device output means for applying to the device output port, during predetermined output time periods, the data-memory output;
- I. a counter for producing a counter output representing periodically incremented count values; and
- J. an address memory, including a plurality of address-memory locations and connected to receive the counter output as address-memory address signals, for generating address-memory outputs representing the contents of address-memory locations specified by address-memory address signals applied thereto, the address memory containing in successive address-memory locations designated by the counter output during the ECC-generation time periods the addresses of successive words in the processing sequence and containing in the address-memory locations designated by the counter output during the ECC-storage time periods the addresses of locations in the data memory into which ECC words are to be stored, whereby the address memory specifies the processing order of the encoding scheme;
- K. address-application means for applying the address-memory outputs to the data memory as data-memory address signals; and
- L. output-address means for operating the data memory by application of a sequence of address signals thereto during the predetermined output time periods to produce a data-memory output representing an output block comprising the data words and ECC words generated therefrom in accordance with the encoding scheme, whereby the output means applies to the output port signals representing an output block generated in accordance with the encoding scheme.

4,715,037
VITERBI DECODER COMPRISING A MAJORITY
CIRCUIT IN PRODUCING A DECODED SIGNAL
Toshiharu Yagi, Tokyo, Japan, assignor to NEC Corporation,
Japan

Filed Feb. 25, 1985, Ser. No. 705,073
Claims priority, application Japan, Feb. 27, 1984, 59-36820
Int. Cl. G06F 11/10

U.S. Cl. 371-43

2 Claims



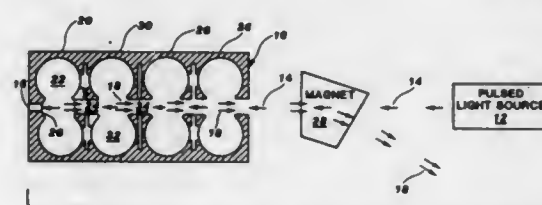
1. A Viterbi decoder for use in producing a decoded signal by correcting and decoding convolutional codes in synchronism with a succession of time slots, said Viterbi decoder including a path memory for memorizing, at each of said time slots, survivor paths in terms of information bits associated with the respective survivor paths of a predetermined number of time slots, and a majority circuit consisting of a read-only memory for deciding a decoded datum of said decoded signal for each of the time slots to provide a predetermined one of said information bits 0 and 1 in response to a majority of said information bits and to provide a predetermined one of said information bits 0 and 1 in response to a tie situation where the number of said information bits 0 equals the number of said information bits "1".

4,715,038
OPTICALLY PULSED ELECTRON ACCELERATOR
John S. Fraser, and Richard L. Sheffield, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 20, 1985, Ser. No. 736,033
Int. Cl. H01S 3/00

U.S. Cl. 372-2

14 Claims

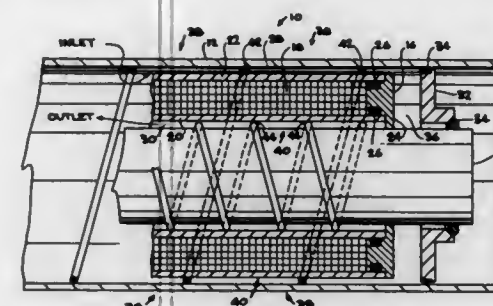


1. An optically pulsed electron accelerator comprising:
 - a. a pulsed light source for providing discrete incident light pulses;
 - b. a photoemissive source for receiving the light pulses emitted by said pulsed light source and for emitting electron bursts having substantially the same duration as the incident light pulses; and
 - c. a first radio frequency-powered accelerator cell for accelerating electron bursts emitted by said photoemissive electron source, said first radio frequency-powered accelerator cell having portions defining a cavity traversed by the electron bursts and having an inside wall on which said photoemissive electron source is disposed, said first radio frequency-powered accelerator cell having portions defining a first aperture through which the electron bursts leave said first radio frequency-powered accelerator cell.

4,715,039
INTERNAL RESONATOR WATER COOLED ION LASER
Mike F. Miller, and Kim M. Gunther, both of Mountain View, Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.
Filed Jul. 12, 1985, Ser. No. 754,497
Int. Cl. H01S 3/00

U.S. Cl. 372-37

17 Claims



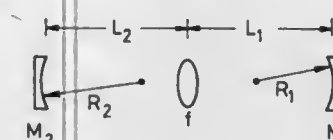
1. An integrated resonator tube-magnet-laser tube apparatus for an ion laser, comprising:
 - a resonator tube;
 - a magnet concentrically mounted in a spaced relationship within the resonator tube and defining between the magnet and resonator an outer coolant flow channel;
 - a plasma tube concentrically mounted in a spaced relationship within the magnet and defining between the magnet and plasma tube an inner coolant flow channel.

4,715,040
LASER SYSTEM
Chun-Shen Lee, Torrance, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.

Filed Apr. 11, 1985, Ser. No. 722,078
Int. Cl. H01S 3/08

U.S. Cl. 372-98

5 Claims



1. The method of outputting a laser beam with predetermined beam profile, comprising the steps of:
 - providing a pair of mirrors defining an optical cavity;
 - disposing a laser medium in the optical cavity; and
 - inserting an optically aberrated element into the optical cavity so that an optical resonator containing the aberrated element exhibits high power loss in a local region of a beam cross section where the magnitude of beam intensity is substantially zero, and shows low power loss in the remaining region of the beam cross section where the magnitude of the beam intensity is finite.

4,715,041
BATH ELECTRODE FOR POT FURNACE
Karl Bühler, and Anton Meuth, both of Nussbaumen, Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

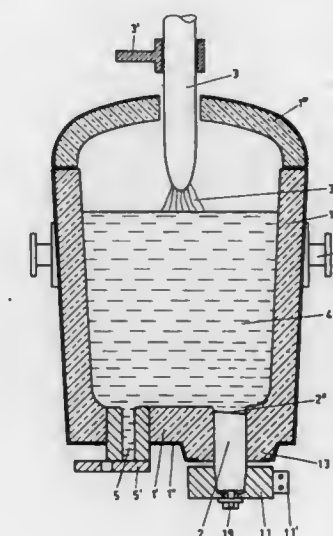
Filed Jun. 20, 1985, Ser. No. 746,882
Claims priority, application Switzerland, Jul. 6, 1984, 3274/84
Int. Cl. H05B 7/02

U.S. Cl. 373-72

10 Claims

1. A hot furnace comprising:
 - (a) a pot containing a melted metal having a surface;
 - (b) at least one power electrode;

- (c) at least one bath electrode; and
- (d) an external cooling device for cooling a cooling surface of said at least one bath electrode, wherein:
- (e) the occurrence of a critical temperature (t^*) at said cooling surface of said at least one bath electrode is delayed by the provision of the extension of said at least one bath



- electrode and a bulge of said pot surrounding said at least one bath electrode and
- (f) the time during which said cooling surface of said at least one bath electrode remains below the critical temperature (t^*) in degrees K. at said cooling surface of said at least one bath electrode is determined by the formula:

$$\frac{t^* - t_K}{t_{max} - t_K} = 1 - \left\{ \frac{8}{\pi^2} \cdot \frac{l_A + l_Z}{l_A} \cdot \left[\sin^2 \frac{\pi \cdot l_A}{2(l_A + l_Z)} \right. \right. \\ \left. \left. 1 - 2 \cdot e^{-\frac{12 \cdot \pi^2 \cdot \lambda \cdot T}{4 \cdot (l_A + l_Z)^2}} + \sin^2 \frac{3 \cdot \pi \cdot l_A}{2(l_A + l_Z)} \cdot 3 - 2 \cdot e^{-\frac{32 \cdot \pi^2 \cdot \lambda \cdot T}{4 \cdot (l_A + l_Z)^2}} + \right. \right. \\ \left. \left. \sin^2 \frac{5 \cdot \pi \cdot l_A}{2(l_A + l_Z)} \cdot 5 - 2 \cdot e^{-\frac{52 \cdot \pi^2 \cdot \lambda \cdot T}{4 \cdot (l_A + l_Z)^2}} + \dots \right] \right\}$$

wherein (t_{max}) is the temperature in degrees K. of said at least one bath electrode at the surface of the melted metal, (t_K) is the temperature in degrees K. at said cooling surface of said at least one bath electrode at the beginning of uncoupling of the external cooling, (T) is the uncoupling time in seconds, (l_A) is the length of said at least one bath electrode from the surface of the melted metal to said cooling surface of said at least one bath electrode in meters, (l_Z) is the length of the extension of said at least one bath electrode beyond said cooling surface in meters, (λ) is the heat conductivity of said at least one bath electrode in W/K-m, and (c) is the specific heat capacity of said at least one bath electrode in W-s/m²-K.

4,715,042

FURNACE COOLING SYSTEM AND METHOD

Ronald G. Heggart, Caledonia; Willard K. McClintock, Edison, and Randy J. Engstrom, Marion, all of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

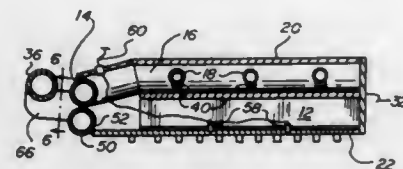
PCT No. PCT/US85/01977, § 371 Date Aug. 8, 1986, § 102(e) Date Aug. 8, 1986, PCT Pub. No. WO86/02436, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 15, 1985, Ser. No. 900,168

Int. Cl.⁴ F27D 1/12

U.S. Cl. 373—74

26 Claims



1. In a furnace or vessel for containing molten metal, said furnace or vessel having a roof and a sidewall, at least one of the roof and sidewall including an inner plate exposed to the heat of the metal and an outer plate spaced therefrom and defining with the inner plate an enclosed space therebetween the improvement comprising:

spray means extending into the enclosed space for directing a spray of fluid coolant against the inner plate for maintaining an acceptable temperature at the inner plate; and pump means connected with the enclosed space for evacuating the fluid coolant from the enclosed space after the coolant is sprayed against the inner plate, whereby undesirable build-up of coolant and undesirable build-up of pressure of the coolant in the enclosed space are prevented.

4,715,043

CROSS-COIL TYPE INDICATING INSTRUMENT

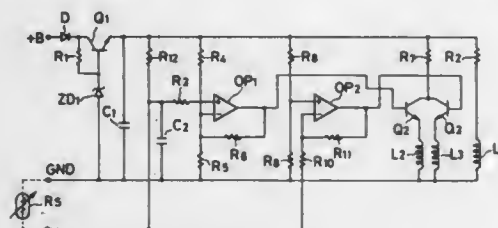
Hideo Chikase, Shimada, Japan, assignor to Yazaki Corporation, Japan

Filed Aug. 22, 1986, Ser. No. 899,318

Int. Cl.⁴ G08C 5/30; H03K 17/96

U.S. Cl. 374—184

11 Claims



1. A cross-coil type indicating instrument having a sensor having an output, a magnet, a plurality of mutually crossed coils wound around said magnet and connected to said output of said sensor, said instrument indicating a value of a detected physical quantity, as for example temperature, by means of a rotation of the magnet in response to an electrical signal that corresponds to the sensor output to the coils, comprising:

- a first coil which is wound so as to generate a predetermined magnetic field H_1 and to be continuously excited,
- a second coil which is wound so as to generate a magnetic field H_2 that crosses the magnetic field H_1 ,
- a third coil which is wound so as to generate a magnetic field H_3 that is approximately in the opposite direction to the magnetic field H_2 ,
- a first control circuit having input terminals connected to said sensor and an output terminal connected to said second coil, for controlling only the current flow supplied to the second coil in accordance with a magnitude of the physical quantity detected by the sensor, said first control

circuit controlling the current flow in such a manner that a magnitude of the current flow supplied to said second coil decreases with increase in the magnitude of the physical quantity detected until the magnitude of the physical quantity reaches a first reference value, and the current flow is interrupted after the magnitude of the physical quantity exceeds the first reference value, and

- a second control circuit having input terminals connected to said sensor and having an output terminal connected to said third coil, for controlling only the current flow supplied to the third coil in accordance with the magnitude of the physical quantity detected by the sensor, said second control circuit controlling the current flow in such a manner that the current flow is not supplied to the third coil until an increasing magnitude of the physical quantity reaches a second reference value being greater than the first reference value, and after the magnitude of the physical quantity exceeds the second reference value a current flow whose magnitude increases with increase in the magnitude of the physical quantity, is supplied to said third coil.

4,715,044

AUTOMATIC SYNCHRONOUS/ASYNCHRONOUS MODEM

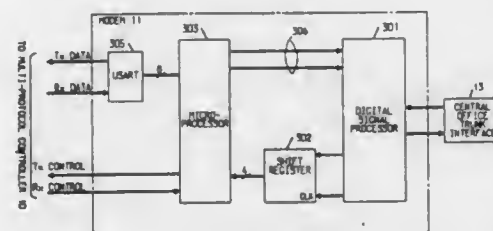
William J. Gartner, Red Bank, N.J., assignor to American Telephone & Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Jul. 3, 1986, Ser. No. 881,721

Int. Cl.⁴ H04L 27/02

U.S. Cl. 375—8

12 Claims



1. A circuit for interposition between a communication line and a processor, said communication line having data transmission thereon, said circuit comprising means for monitoring each new data transmission on said communication line for a preset interval at the start of said new data transmission, means operable under control of said monitoring means for detecting whether a particular new data transmission is in synchronous format or in asynchronous format, and means for providing a first signal when a new one of said data transmissions is detected as being synchronous and for providing a different signal when said new data transmission is detected as being asynchronous.

4,715,045

SYSTEM PROTOCOL FOR COMPOSITE SHIFT KEYING COMMUNICATION SYSTEM

Kenneth A. Lewis, Ridgefield, Conn.; Alan N. Alpern, Manhattan, N.Y.; Andrew C. Frank, and Stuart E. Ross, both of Danbury, Conn., assignors to GridComm, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 650,777, Sep. 13, 1984, Pat. No. 4,577,333. This application Mar. 17, 1986, Ser. No. 840,497

Int. Cl.⁴ H04B 15/00; H04L 27/10; H04J 3/16

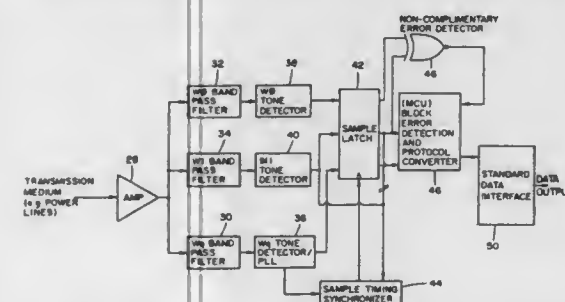
U.S. Cl. 375—58

31 Claims

1. A composite shift key method of communication for binary signals, comprising:
 - a transmitting binary signals from a transmitting transceiver having a transmitter and a receiver by transmitting a first

summed signal having a first qualifying signal at a qualifying signal frequency W_{qt} as one of the summed signal components only when a binary signal, either a binary zero or a binary one, is desired to be transmitted, and algebraically summing a first frequency signal W_1 with the first qualifying signal W_{qt} to produce a first summed signal which is transmitted when a binary one is desired to be transmitted, and by algebraically summing a second signal at a second frequency signal W_0 with the qualifying signal W_{qt} to produce a second summed signal which is transmitted when a binary zero is desired to be transmitted, and ceasing transmission of the first qualifying signal at the qualifying signal frequency W_{qt} as a transmitted signal or as a component of a composite summed signal when neither a binary zero nor a binary one is desired to be transmitted;

- receiving the transmitted signals at a receiving transceiver having a transmitter and a receiver, identifying a binary one signal only when the qualifying signal W_{qt} and the first frequency signal W_1 are received simultaneously as



the first summed signal, and identifying a binary zero signal only when the qualifying signal W_{qt} and the second frequency signal W_0 are received simultaneously as the second summed signal; and

- signalling from the receiving transceiver to the transmitting transceiver when the first qualifying signal W_{qt} is received simultaneously with the first frequency signal W_1 as the first summed signal or when the first qualifying signal W_{qt} is received simultaneously with the second frequency signal W_0 as the second summed signal, that the binary signal transmission is being successfully received, by transmitting from the receiving transceiver a second qualifying signal W_{qr} , and dropping the transmission of the second qualifying signal W_{qr} when the first qualifying signal W_{qt} is not received simultaneously with the first frequency signal W_1 as the first summed signal or when the qualifying signal W_{qt} is not received simultaneously with the second frequency signal W_0 as the second summed signal, to signal to the transmitting transceiver that the binary signal transmission is not being successfully received.

4,715,046

FREQUENCY AGILE SIGNAL GENERATOR FOR EMULATING COMMUNICATIONS ENVIRONMENTS

Charles W. True, III, Annandale, and John K. Brady, Sterling, both of Va., assignors to Science Applications International Corporation, LaJolla, Calif.

Filed Jun. 20, 1986, Ser. No. 876,450

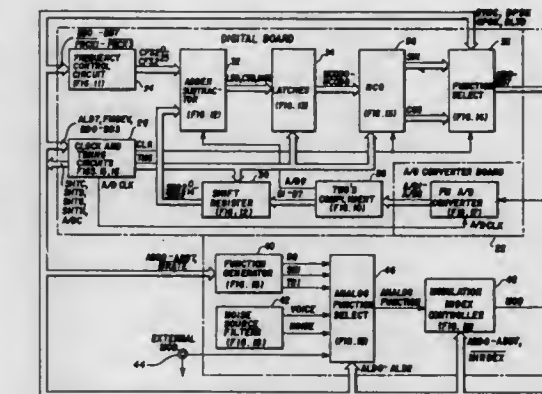
Int. Cl.⁴ H04L 27/04, 27/12, 27/20

U.S. Cl. 375—61

19 Claims

1. A signal generator for producing an output signal which emulates a communication signal of predetermined base frequency and modulation characteristics comprising:
 - means for generating digital command signals specifying the desired characteristics of the output signal;
 - means responsive to said digital command signals for generating a digital base frequency signal representing the base frequency of the output signal;
 - means responsive to said digital command signals for gener-

ating an analog modulation signal having desired modulation characteristics; means responsive to said analog modulation signal for generating a digital modulation signal representing a desired modulation of said base frequency signal; means for selectively modulating said digital base frequency signal with said digital modulation signal to produce a modulated digital base frequency signal;



a digital-to-analog converter for converting the modulated digital base frequency signal to an analog output signal; and means for selectively modulating the amplitude of the analog output signal in response to said analog modulation signal.

4,715,047

DIGITAL DIFFERENTIAL PHASE SHIFT KEYED DEMODULATOR

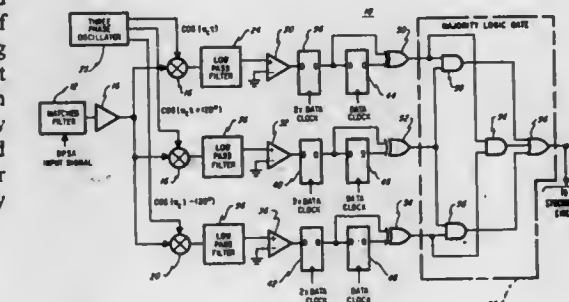
Allan R. Hambley, Atlantic Mine, Mich., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 4, 1986, Ser. No. 848,063

Int. Cl.⁴ H04L 27/22

U.S. Cl. 375—84

33 Claims



1. A differential phase shift keyed demodulator for recovering information from a phase modulated signal, comprising:
 - first means for dividing the XY vector phase plane into a plurality of sectors, wherein each one of said plurality of sectors is assigned a code, and for determining the sector in which the instantaneous phase of the phase modulated signal lies at a given time; and
 - second means for comparing the instantaneous phase of the phase modulated signal at successive times, by comparing the sector code in which the instantaneous phase of the phase modulated signal lies at successive times wherein the phase difference as determined by the phase modulated signal being in different sectors, represents the information.

4,715,048

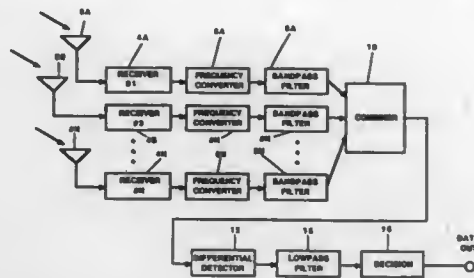
FREQUENCY OFFSET DIVERSITY RECEIVING SYSTEM Tatsuro Masamura, Tokyo, Japan, assignor to Canadian Patents And Development Limited, Ottawa, Canada

Filed May 2, 1986, Ser. No. 858,915

Int. Cl.⁴ H04B 7/08

U.S. Cl. 375—100

18 Claims



1. A diversity receiving system for receiving a digital signal transmitted at a predetermined signal symbol rate, comprised of:

- a plurality of spaced apart receivers, each including an antenna, for receiving said signal via a plurality of transmission paths, and means for frequency translating the received signal from respective ones of said receivers and generating respective intermediate signals having frequencies displaced from each other by an integral multiple of said signal symbol rate;
- means for combining said intermediate signals;
- differential detector means for receiving said combined signals and generating a plurality of output cross or dot product signals in response thereto;
- low pass filter means for filtering interference components of said cross product signals and generating a coherent signal in response thereto; and
- decision circuit means for receiving said coherent signal and generating an output data signal in response thereto.

4,715,049

CLOCK RECOVERY AND RETIMING SCHEME WITH SAW FILTER PHASE TRIMMING TO ACHIEVE DESIRED SYSTEM PHASE ADJUSTMENT

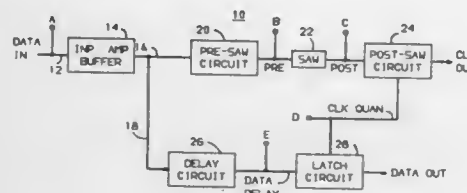
George E. Andrews, Fleetwood; Paul C. Davis, Reading; Dennis C. Farley; Stanley H. Kravitz, both of Coopersburg; Thrygve R. Meeker, Allentown; Owe G. Petersen, Reading, and Arthur W. Schelling, Emmaus, all of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 12, 1986, Ser. No. 838,709

Int. Cl.⁴ H04L 7/00

U.S. Cl. 375—106

5 Claims



1. Apparatus for recovering a clock signal from a received data signal and retiming said received data signal, said apparatus including

- means for performing data retiming; and
- means for performing clock recovery, said means for performing clock recovery including a SAW filter configured to provide a phase delay ($\Delta\Phi$) equal to the difference in phase between the data retiming means ($\Phi_1 + \Phi_2$) and

the clock recovery means exclusive of said SAW filter (Φ_3).

4,715,050

DIGITAL PHASE-LOCKED LOOP CIRCUIT

Kolchi Tanaka, and Satoshi Itoh, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

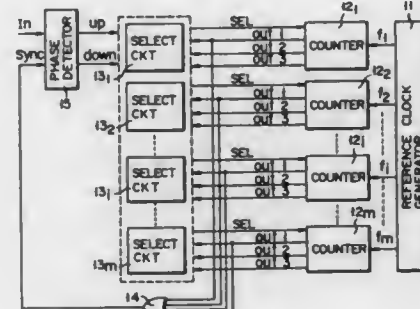
Filed Mar. 9, 1987, Ser. No. 23,227

Claims priority, application Japan, Mar. 31, 1986, 61-71151

Int. Cl.⁴ H03D 3/24; H04L 7/04

U.S. Cl. 375—111

6 Claims



1. A digital phase-locked loop circuit comprising:
 - a reference clock generator for generating an M, where M is an integer of 2 or more, number of reference clock inputs having a frequency substantially the same as N times, where N is an integer, the frequency of an input signal and sequentially phase-shifted by $2\pi/M$ radians;
 - an M number of counters for frequency dividing the M number of reference clock inputs, the respective counters being sequentially operated upon receipt of a selection signal and each delivering a first, second and third output signal in a predetermined timing relation;
 - a phase detector for making a phase comparison between the first output signal of a selected one of said M number of counters and said input signal and producing one of a first signal representing a phase delay of said first output signal of said selected counter and a second signal representing a phase advance of said first output signal of said selected counter; and
 - a selection circuit for receiving the signals of said phase detector and the output signals of said M number of counters and sequentially delivering the selection signal in a cyclic fashion in a predetermined direction to said M number of counters to decrease the phase difference between both the signals supplied to said phase detector so that the first output signal of the selected counter is used as a synchronization output signal.

4,715,051

ELECTRONIC POTENTIOMETER

Joseph J. Giardina, 32 Judson, Apt. 14B, Edison, N.J. 08817

Filed Apr. 12, 1985, Ser. No. 722,773

Int. Cl.⁴ G06M 3/00; H03K 23/00, 21/08

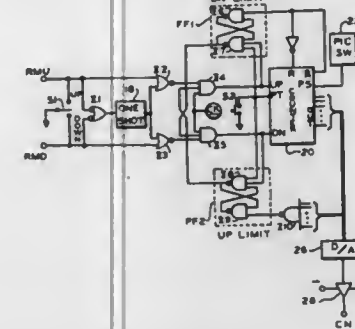
U.S. Cl. 377—45

16 Claims

1. An adjuster for providing a potentiometric type of adjustment, comprising:

- a control generator for providing a bidirectionally adjustable digital signal, the direction of adjustment of said digital signal being immediately reversible, said control generator having means for producing from and in response to said digital signal an adjusting signal which is analog and bidirectionally adjustable;
- drive means coupled to said control generator for providing a drive signal in response to said adjusting signal, said drive means having a pair of sources of potential and a pair of variably conductive devices, said pair of variably conductive devices each having a control electrode and a pair

of controlled electrodes, each control electrode being commonly coupled to said control generator, each pair of controlled electrodes being separately coupled to a different corresponding one of said sources, and
a transducer means having an input coupled to said drive means and an output electrically isolated from said input, said output of said transducer means being operable to



conduct by a variable amount in response to said adjusting signal to simulate potentiometric action, said transducer means comprising a pair of transducers serially connected to define three terminals of said output, each of said transducers having a transducer input, each of said pair of controlled electrodes of said drive means being separately coupled to a different corresponding one of said inputs of said transducers.

4,715,052

FREQUENCY DIVIDE BY N CIRCUIT

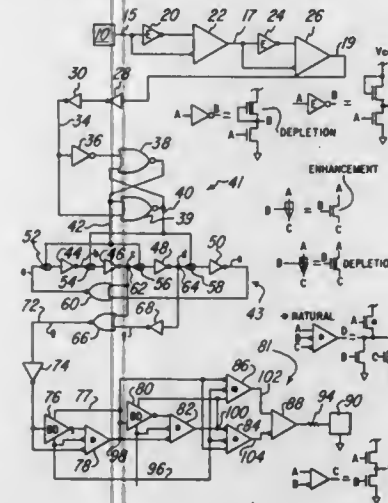
Mark A. Stambaugh, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 10, 1986, Ser. No. 838,066

Int. Cl.⁴ H03K 21/10, 23/44, 23/48

U.S. Cl. 377—108

14 Claims



1. A frequency divide by n circuit, where n is an odd integer, comprising:

- means for splitting an incoming clock signal of frequency "f" into a first and a second clock signal, said first and second clock signals being nonoverlapping and complementary relative to one another, and having a frequency "f";
- a shift register circuit comprising:
 - a first stage, having a pass gate therein which is controlled by said first complementary clock signal;
 - a second stage, having a pass gate therein which is controlled by said second complementary clock signal;
 - a plurality of intermediate stages, each of said intermediate

stages having a pass gate therein which is controlled by one of said complementary clock signals, said intermediate stages connected in a series with said first and second stages with first and second complementary clock signals controlling pass gates in alternating stages; and
feedback logic having a first input connected to said second stage, having a second input connected to an intermediate stage in said series, and having an output connected to said first inverting stage, for providing a feedback signal to said first inverting stage, said feedback signal having a frequency of f/n; and
output logic, having a first input connected to one of said intermediate stages, and having a second input connected to an adjacent one of said intermediate stages, so that the output signal of said output logic has a frequency of f/n and a duty cycle corresponding to that of said incoming clock signal.

4,715,053

METHOD FOR MONITORING THE CRYSTALLOGRAPHIC TEXTURE OF METALLIC TUBES BY USE OF X-RAY DIFFRACTION

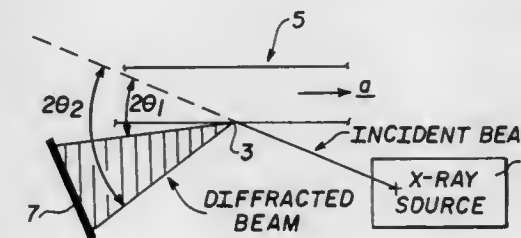
Robert J. Comstock, Penn Township, Westmoreland County, and George P. Sabol, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 25, 1985, Ser. No. 695,115

Int. Cl.⁴ G01N 23/07

U.S. Cl. 378—73

25 Claims



1. A process for characterizing the crystallographic texture of a surface of a metallic tube, by use of X-ray diffraction, comprising:

- directing X-rays from a source, at an angle to the surface of the metallic tube, onto said metallic tube such that X-rays are diffracted therefrom;
- detecting diffracted x-rays simultaneously over a predetermined range of scattering angles at a spaced location from said metallic tube with an electronic position-sensitive X-ray detector sufficient to detect said X-rays over the predetermined range of scattering angles;
- effecting relative movement between said X-ray source and said metallic tube both in a rotational direction about the axis of the tube and in an axial direction; and
- measuring intensities from multiple Bragg peaks of the diffracted X-rays included in the predetermined range of scattering angles detected by the position-sensitive X-ray detector from a plurality of locations on said tube.

4,715,054

PLASMA X-RAY SOURCE

Yasuo Kato, Zama; Kunio Harada, Hachioji; Shigeo Kubota, Kokubunji; Yoshio Watanabe, Tokyo, and Seichi Murayama, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,776

Claims priority, application Japan, Nov. 9, 1984, 59-234925

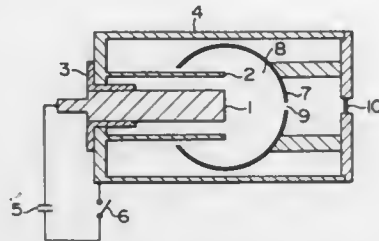
Int. Cl.⁴ H01J 35/00; H05G 1/00

U.S. Cl. 378—122

6 Claims

1. A plasma X-ray source comprising:
 - an inner cylindrical electrode;

an outer cylindrical electrode disposed coaxially and with a predetermined distance with respect to said inner cylindrical electrode;
 an electrically insulating means disposed between an extremity of said inner cylindrical electrode and that of said outer cylindrical electrode corresponding thereto;
 a discharge vessel disposed to envelop said inner and outer cylindrical electrodes;



means for applying a pulse voltage between said inner and outer cylindrical electrodes to produce plasma in said discharge vessel; and
 an electrically conductive spherical shield disposed to envelop a space where said plasma is pinched, said electrically conductive spherical shield being maintained at a potential equal to that applied to said outer cylindrical electrode.

4,715,055

COMPOSITE ROTARY ANODE FOR X-RAY TUBE AND PROCESS FOR PREPARING THE COMPOSITE

Thomas M. Devine, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 702,165, Feb. 15, 1985, Pat. No. 4,645,121.

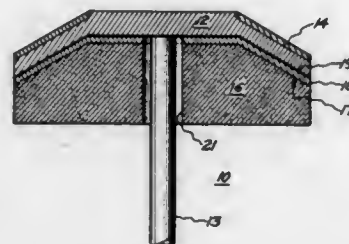
This application Aug. 25, 1986, Ser. No. 900,042

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ H01J 35/10

U.S. Cl. 378—144

10 Claims



1. In an anode assembly for a rotating X-ray anode wherein a graphite body is joined to the surface of a metal component of said anode assembly, the metal of said metal component being selected from the group consisting of molybdenum, molybdenum alloys, tungsten and tungsten alloys, the improvement wherein said graphite body and the surface of said metal component are separated by a crack-free metallurgically bonded intermediate compound laminate, said compound laminate comprising a crack-free layer of carbide of metal from said metal component and a continuous layer of platinum or platinum alloy adjacent thereto, said layer of carbide being less than about 0.2×10^{-3} inch (0.0051 mm) thick and being metallurgically bonded to the surface of said metal component and said layer of platinum or platinum alloy being metallurgically bonded to said graphite body.

4,715,056 APPARATUS FOR SLIT RADIOGRAPHY

Hugo Vlasbloem, Maasland, and Simon Duinker, Bloemendaal, both of Netherlands, assignors to bv Optische Industrie "De Oude Delft", Delft, Netherlands

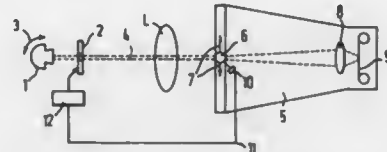
Filed Mar. 18, 1985, Ser. No. 713,198

Claims priority, application Netherlands, Mar. 16, 1984, 8400845

Int. Cl.⁴ G21K 1/04

U.S. Cl. 378—152

26 Claims



1. An apparatus for slit radiography, which comprises:
 an X-ray source;
 an X-ray detector for collecting radiation passing through a body to be radiographed;
 a slit diaphragm positioned between said X-ray source and said body for forming a substantially planar X-ray beam;
 a plurality of attenuating elements positioned along said slit diaphragm forming a plurality of attenuating sections;
 means for scanning said body with said planar X-ray beam;
 detection means cooperating with said X-ray detector and comprising a plurality of response sections juxtaposed along a direction of said slit diaphragm, each of said response sections being responsive to radiation collected on said X-ray detector to produce an electric signal representative of intensity of thus collected radiation, each of said response sections of said detection means corresponding to a respective attenuating section of said plurality of attenuating sections; and
 means for simultaneously controlling each of said attenuating sections during scanning of said body in response to said electric signal produced at a respective response section of said detection means.

4,715,057

X-RAY APPARATUS WITH SPRING WEIGHT COMPENSATION

Alfred Hahn, Erlangen; Bodo Kamm, Moehrendorf; Karl Weiss, Buckenhof, and Johannes Dummert, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

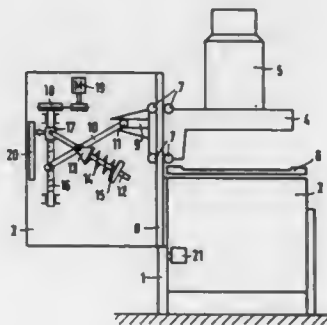
Filed May 1, 1986, Ser. No. 857,967

Claims priority, application Fed. Rep. of Germany, May 6, 1985, 8513305[U]

Int. Cl.⁴ G01N 21/00, 21/34, 23/00

U.S. Cl. 378—197

9 Claims



9. An x-ray apparatus comprising:
 an x-ray source and an x-ray detector;
 an apparatus base;

a tiltable part attached to said base;
 guide rails mounted on said tiltable part;
 a displaceable carriage supporting x-ray parts for moving along said guide rails on said tiltable part; said carriage having a slot-shaped opening therein;
 a spring weight compensation device for said carriage for providing compensating forces adjustably dependent on the position of the tiltable part;
 a load lever hinged to said tiltable part at one end and being displaceable in said slot-shaped opening at an opposite end;
 a threaded spindle journaled for rotation about its longitudinal axis which is positioned generally parallel to the longitudinal axis of said guide rails;
 a motor having a driving engagement with said spindle to cause said spindle to rotate about its longitudinal axis;
 a nut captured on said spindle;
 a rod pivotally attached at one end to said nut;
 a sleeve slidingly carried on said rod intermediate the ends of said rods;
 a spring carried on said rod engageable at one end with said sleeve and at an opposite end held fixed relative to said rod to urge said sleeve toward said nut;
 said load lever being pivotally attached intermediate its ends to said sleeve such that said spring will provide a biasing force intermediate the ends of said load lever;
 said nut being held against rotation so as to generate a reciprocating movement of said nut on said spindle upon operation of said motor;
 an angle sensor operable to detect the angle of said tiltable part;
 a length sensor operable to detect the position of said nut on said spindle;
 a control circuit for controlling said motor; the output of said sensors being connected to said control circuit;
 said motor, said spindle and said nut forming an arrangement for adjusting the biasing force of said spring by movement of said nut so as to generate the desired weight compensation for said carriage.

4,715,058

PROTECTIVE CIRCUIT FOR THE OVERVOLTAGE PROTECTION OF A SUBSCRIBER LINE INTERCONNECT CIRCUIT

Robert Lechner, Otterfing; Hans-Werner Rudolf, and Roland Krimmer, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

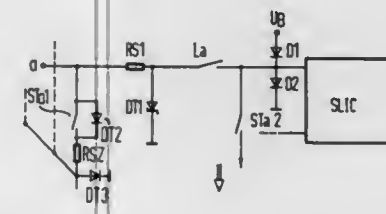
Filed Mar. 2, 1987, Ser. No. 20,809

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3613721

Int. Cl.⁴ H04M 7/00; H02H 3/20

U.S. Cl. 379—27

5 Claims



1. A protective circuit for providing overvoltage protection of a subscriber line interconnect circuit of a digital time multiplex-communication network having an electronic interface circuit and for providing overvoltage protection of the electronic switches associated with the subscriber line circuit for test accessibility, comprising:

means providing for each conductor of a core pair of the connected subscriber line circuit for each corresponding connection of the subscriber line interconnect circuit an

isolation of the separate conductors of the core pair from the connected subscriber line circuit;
 a separate test access connection to the conductors of the core pair to the corresponding connections of the active subscriber line interconnect circuits;
 a threshold setting element connected between the line side of an isolation switch and an access switch for each conductor of the core pair of the subscriber line circuit for accessing one conductor of the core pair, of identical construction to that of the threshold setting element associated with the other conductor of the core pair such that overvoltages are conducted to ground potential both via a grounded terminal of the circuit and through a second threshold setting element bridging said access switches for accessing one conductor of the the core pair, which is connected to ground potential via a third threshold setting element.

4,715,059

CONVERSATIONAL VIDEO PHONE

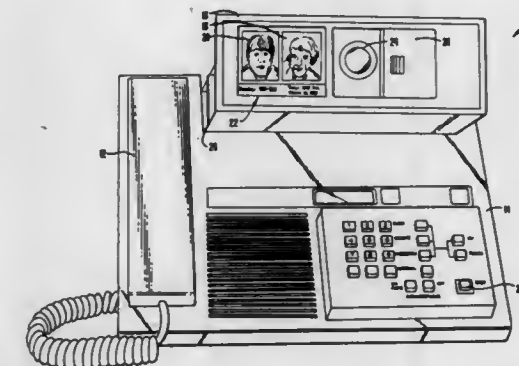
Michael A. Cooper-Hart, Cupertino; Lawrence D. Emmons; James S. Mackley, both of Grass Valley, and David H. Stokes, Nevada City, all of Calif., assignors to Luma Telecom, Inc., Santa Clara, Calif.

Filed Nov. 7, 1985, Ser. No. 795,967

Int. Cl.⁴ H04M 11/00; H04N 7/14

U.S. Cl. 379—53

23 Claims



1. A conversational freeze-frame video phone for transmitting a single frame of a video gray scale source image over an ordinary telephone line, comprising:
 camera means for capturing said video source image;
 a memory coupled to said camera means for storing said single frame of said video source image;
 means for mapping said video source image onto a video source image field of from 2000 to 5,000 pixels;
 video source image display means for displaying said video source image field on a first display screen area having an area of approximately one square inch as a real time mirror image of said video source image;
 means, coupled to said telephone line, for asynchronously transmitting a modulated signal representing said source image field in a burst having an approximate duration of three seconds or less;
 means, coupled to said telephone line, for asynchronously receiving a modulated signal representing a remote video image field;
 means for demodulating said received signal;
 remote video image display means for displaying said remote image field on a second display screen area immediately adjacent said first display screen area having an area of approximately one square inch and adapted to display said remote video image field line by line as each line is received by said receiving means; and
 means, coupled to said telephone line, for transmitting and receiving an audio signal.

4,715,060

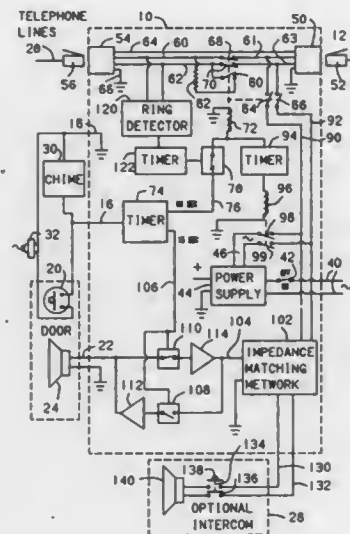
DOOR MESSAGE APPARATUS WITH TELEPHONE ANSWERING DEVICE

Bernard N. Lipscher, and Kevin G. Coleman, both of 1342 Grant Street Station, Pittsburgh, Pa. 15230

Filed Jul. 15, 1985, Ser. No. 754,577

Int. Cl.⁴ H04M 1/65; G11B 31/00

U.S. Cl. 379—70



1. A control unit for a combination telephone and door message apparatus, comprising a message line,

means for connecting the message line to an automatic telephone answering and recording mechanism which responds to a ring signal on the message line to generate electrical audio signals on the message line by playing a prerecorded outgoing message and then to record electrical audio signals of an incoming message from the message line;

telephone line disconnecting means for normally connecting the message line to a telephone line such that the message playback and recording mechanism responds to a ring signal on the telephone line to transmit the prerecorded outgoing message on the telephone line and to record an incoming message from the telephone line;

door connecting means, normally disconnected from the message line, for connecting the message line to door speaker and microphone means to broadcast the outgoing message on the door speaker and microphone means and to generate the incoming message on the message line from the door speaker and microphone means;

means adapted for connection to a doorbell switch to sense operation of the doorbell switch; and

means responsive to the sensing of the operation of the doorbell switch including means for operating the telephone line disconnecting means to disconnect the telephone line from the message line, means for operating the door connecting means to connect the door speaker and microphone means to the message line, and means for generating a ring signal on the message line so that the automatic telephone answering and recording mechanism operates to transmit the prerecorded outgoing message over the message line to the door speaker and microphone means and to record a subsequent message on the message line from the door speaker and microphone means.

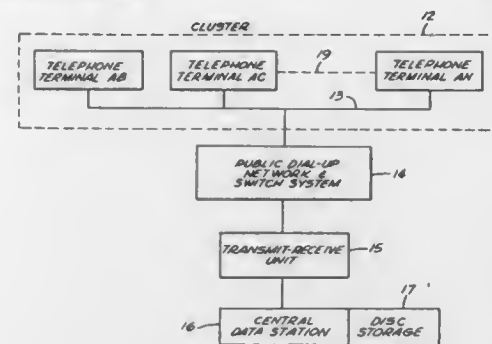
COORDINATED MULTIPLE TELEPHONE STATION SYSTEM

Daniel Norwich, Tampa, Fla., assignor to Telecredit, Inc., Los Angeles, Calif.

Filed May 30, 1986, Ser. No. 868,464

Int. Cl.⁴ H04M 1/57

8 Claims U.S. Cl. 379—91



1. A cluster calling system for use with a dial-up telephone network to contact and interface a central data station for possible multiple inquiries during single dial-up, comprising:

at least one cluster of telephone terminals adapted to be connected for accessing a call line of said dial-up telephone network, said terminals including means to formulate data signals for inquiries;

at least one transmit-receive unit adapted to be connected to said dial-up telephone network for individually interfacing said cluster of telephone terminals through said dial-up network and adapted to be coupled to said central data station, said transmit-receive unit further including means operable upon a dial-up communication with said cluster to poll each of said telephone terminals in said cluster for the existence and communication of data signals manifesting an inquiry to said central data station and to terminate communication with said cluster upon completion of a poll sequence of said telephone terminals absent the existence of data signals manifesting an inquiry to said central data station.

4,715,062

SPEAKERPHONE CONTROL CIRCUIT HAVING LOW GAIN STATES AND METHOD FOR CONTROLLING GAIN OF SPEAKERPHONE

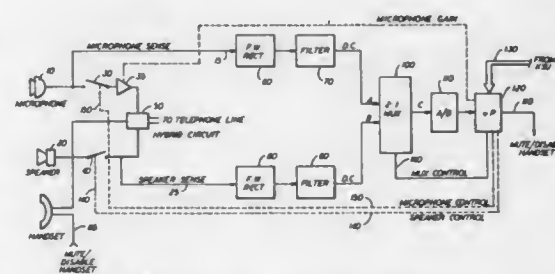
Vincent V. Korsky, Shelton, and Raymond T. Pajer, Southbury, both of Conn., assignors to TIE/communications, Inc., Shelton, Conn.

Filed Mar. 22, 1985, Ser. No. 714,721

Int. Cl.⁴ H04M 9/08

U.S. Cl. 379—390

68 Claims



1. A speakerphone control circuit comprising: first electronic switch means coupled between an input transducer of the speakerphone and a telephone line;

second electronic switch means coupled between an output transducer of the speakerphone and the telephone line; first means for sensing the level of a first signal present on an output from the input transducer; second means for sensing the level of a second signal transmitted to an input to the output transducer; and control means coupled to said first and second sensing means and to said first and second electronic switch means for evaluating said first and second signals, said control means comprising means for determining whether said speakerphone should be in a first talk mode, a first listen mode, a low gain talk mode or a low gain listen mode, the first signal being attenuated in said low gain talk mode by a first control signal from said control means whereby said first electronic switch means is cyclically turned on and off and said second signal being attenuated in said low gain listen mode by a second control signal from said control means whereby said second electronic switch means is cyclically turned on and off.

second detecting means having a predetermined response characteristic varying by an amount opposite to said pre-selected amount in response to the detector control signal for detecting the presence of the microphone audio signals and producing an output signal;

first control means coupled to the output signal of said first detecting means for generating the gain control signal having a magnitude related to the output signal of said first detecting means, said first control means further including means coupled to the first detecting means output signal for integrating the first detecting means output signal to produce an integrated output signal, and means coupled to said integrating means for generating a gain control signal current having a magnitude related to the integrated output signal of said integrating means; and second control means coupled to the output signal of said first detecting means and the output signal of said second detecting means for generating the detector control signal.

4,715,063

SPEAKERPHONE FOR RADIO AND LANDLINE TELEPHONES

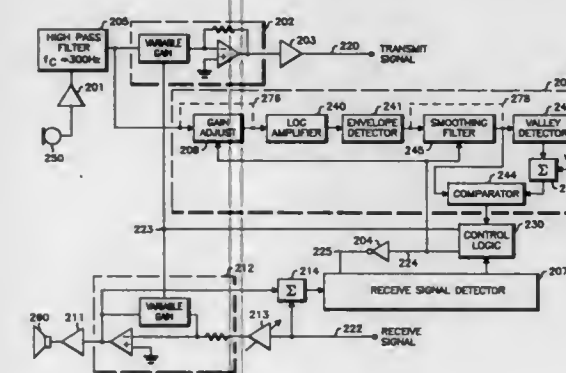
Kenneth R. Haddad, Schaumburg, and Richard J. Vilmur, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 767,543, Aug. 20, 1985, abandoned. This application Jul. 21, 1986, Ser. No. 889,301

Int. Cl.⁴ H04M 9/08

U.S. Cl. 379—390

6 Claims



1. A speakerphone including a microphone and a speaker and being coupled to a communications path for applying to said communications path microphone audio signals and applying incoming audio signals from said communications path to said speaker, said speakerphone further comprising:

first amplifying means having a gain varying in predetermined proportion with a gain control signal for amplifying the incoming audio signals;

second amplifying means having a gain varying in opposite proportion to said predetermined proportion with the gain control signal for amplifying the microphone audio signals;

first detecting means having a predetermined response characteristic varying by a pre-selected amount in response to a detector control signal for detecting the presence of the incoming audio signals and producing an output signal;

4,715,064

ADAPTIVE HYBRID CIRCUIT

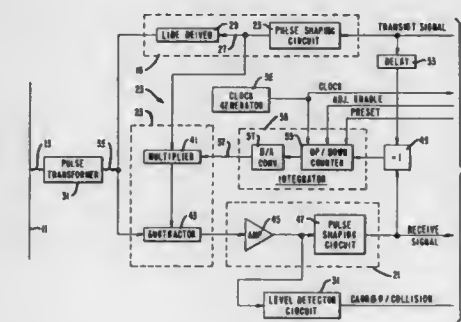
Albertus M. G. Claessen, Montfoort, Netherlands, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 22, 1984, Ser. No. 623,302

Int. Cl.⁴ H04B 3/03

U.S. Cl. 379—392

15 Claims



1. An adaptive hybrid circuit coupled to a transmission line and between a transmitter and a receiver of a local station for adaptively cancelling a crosstalk component from said transmitter to said receiver, said adaptive hybrid circuit comprising:

means for comparing an output signal from said receiver with a transmitter signal to be transmitted by said transmitter to develop a first control signal which varies in amplitude as a function of the comparison of said output signal with said signal to be transmitted; and adjustment means responsive to said control signal, said transmitter signal and a composite signal from said transmission line containing said crosstalk component from said transmitter and a received signal component for generating an estimate of said crosstalk component and combining the estimate with the composite signal to apply to said receiver a residual signal representing the received signal component.

DESIGNS

DECEMBER 22, 1987

293,270
SHOE

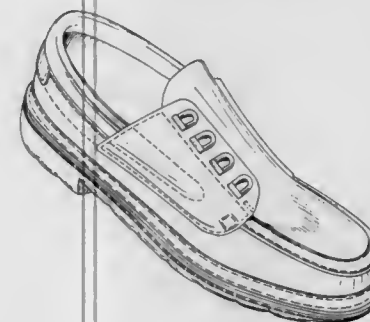
Alfred D. Radford, Combe, England, assignor to Clarks Limited, Somerset, England

Filed Jul. 26, 1985, Ser. No. 759,437

Claims priority, application United Kingdom, Mar. 20, 1985, 1025669

U.S. Cl. D2—313

Term of patent 14 years



293,273
BOOT SOLE

Seel de Meij, Hogelandsingel 135, 7512 GD Enschede, Netherlands

Filed Aug. 16, 1985, Ser. No. 766,404

Claims priority, application Hague, Feb. 28, 1985, DM/004851

U.S. Cl. D2—320

Term of patent 14 years



293,271
SHOE SOLE

Edward Lussier, Hingham, Mass., assignor to Reebok International, Ltd., Canton, Mass.

Filed Jul. 1, 1985, Ser. No. 750,596

U.S. Cl. D2—320

Term of patent 14 years



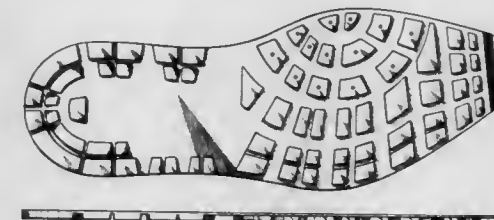
293,274
SHOE SOLE

Brian F. Igoe, Wrentham, Mass., assignor to Reebok International, Ltd., Canton, Mass.

Filed Jul. 1, 1985, Ser. No. 750,278

U.S. Cl. D2—320

Term of patent 14 years



293,272
BOOT SOLE

Seel de Meij, Hogelandsingel 135, 7512 GD Enschede, Netherlands

Filed Aug. 16, 1985, Ser. No. 766,403

Claims priority, application Hague, Mar. 21, 1985, DM/004962

U.S. Cl. D2—320

Term of patent 14 years



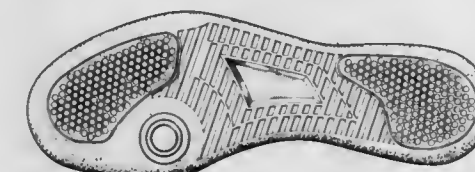
293,275
SHOE SOLE

Jeffrey P. Bua, Duxbury, Mass., assignor to Reebok International, Ltd., Canton, Mass.

Filed Sep. 6, 1985, Ser. No. 773,321

U.S. Cl. D2—320

Term of patent 14 years

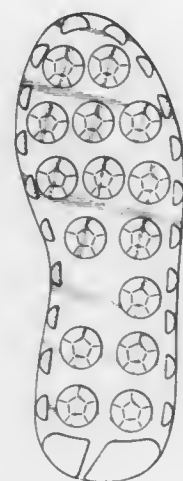


293,276
SHOE SOLE

Ellen Schmidt-Devlin, Beaverton, and Stephen D. Gomez, Portland, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Filed Aug. 21, 1985, Ser. No. 767,839
Term of patent 14 years

U.S. Cl. D2—321

293,277
SHOE TREE

Norbert Schmid, Fellbach, Fed. Rep. of Germany, assignor to Norbert Schmid KG, Fellbach, Fed. Rep. of Germany
Filed Apr. 19, 1984, Ser. No. 602,192

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, MR 965

U.S. Cl. D2—314.1

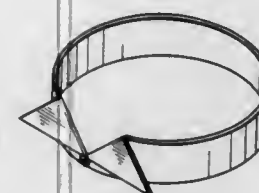
Term of patent 14 years

293,278
COLLAR

Harold J. Smith, 3828 Bobstone Dr., Sherman Oaks, Calif.
91423

Filed Aug. 26, 1985, Ser. No. 769,600
Term of patent 14 years

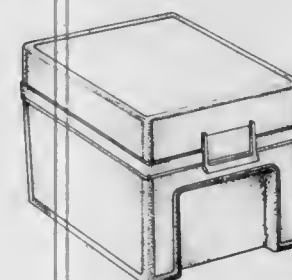
U.S. Cl. D2—602

293,279
DISKETTE FILE BOX

Dale M. Evans, Windsor, Wis., assignor to Don Evans, Inc., DeForest, Wis.

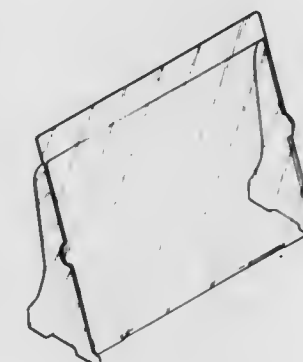
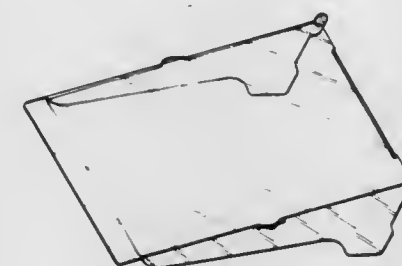
Filed Aug. 12, 1985, Ser. No. 764,721
Term of patent 14 years

U.S. Cl. D3—35

293,280
COMBINATION SIGN CARD AND PHOTOGRAPH
HOLDER

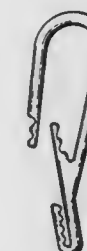
Richard M. Liptak, Parma Heights, Ohio, assignor to Integral Design, Inc., Cleveland, Ohio
Continuation-in-part of Ser. No. 524,389, Aug. 18, 1983, Pat. No. Des. 282,182. This application Apr. 12, 1985, Ser. No. 722,401

Term of patent 14 years
U.S. Cl. D6—314

293,281
ORNAMENT HANGER

Susan M. White, 4737 N. Lowell, Chicago, Ill. 60630
Filed Jul. 12, 1985, Ser. No. 754,429

Term of patent 14 years
U.S. Cl. D8—373

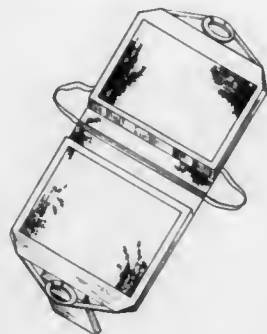


293,282
PORTABLE SEAT

L. James Ashford, 11876 Colby Chase Rd., Florissant, Mo. 63033

Filed Oct. 15, 1984, Ser. No. 662,432
Term of patent 14 years

U.S. Cl. D6—368

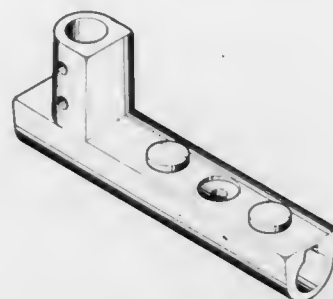


293,285
CONNECTOR FOR ATTACHING AN INFANT SEAT TO A TABLE

Chin-Chou Ho, 58 Ching Fong Street, Taipei, Taiwan

Filed Jul. 23, 1985, Ser. No. 758,158
Term of patent 14 years

U.S. Cl. D6—491



293,283
SOFA

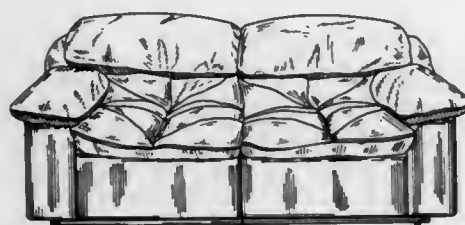
Marco Formenti, Via Monte Basso 8, Seregno, Italy (20038)

Filed Feb. 13, 1984, Ser. No. 579,557

Claims priority, application Italy, Sep. 9, 1983, 22948/83[U]

Term of patent 14 years

U.S. Cl. D6—381



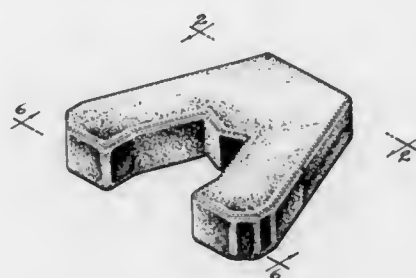
293,286
SEAT CUSHION

Jaroslav G. Alfer, 1331 Lilac Ter., Los Angeles, Calif. 90026

Filed Jun. 10, 1985, Ser. No. 742,958

Term of patent 14 years

U.S. Cl. D6—596



293,287
COMBINED KEY RING, TORCH, PHOTOGRAPH HOLDER AND LCD WATCH

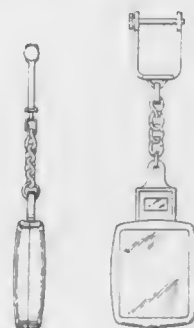
Michele Cauque, Paris, France, and Avry Ben-Zeev, Kowloon, Hong Kong, assignors to Sparklight Corporation, Kowloon, Hong Kong

Filed Mar. 20, 1985, Ser. No. 713,800

Claims priority, application United Kingdom, Sep. 20, 1984, 84 1 022 166/86

Term of patent 14 years

U.S. Cl. D3—62



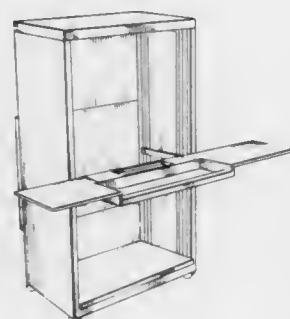
293,284
COMPUTER WORKSTATION

David Wright, Shrewsbury, and Richard M. Latino, Holden, both of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Feb. 4, 1985, Ser. No. 697,665

Term of patent 14 years

U.S. Cl. D6—425



293,288
TOOTHBRUSH

Kenneth D. Cron, Glen Head, and Nannette Sauvigne', Great Neck, both of N.Y., assignors to STL Enterprises, Glen Head, N.Y.

Filed Jul. 2, 1986, Ser. No. 881,465

Term of patent 14 years

U.S. Cl. D4—104



293,290
MUG

Young O. Kim, 969 Helen Dr., Millbrae, Calif. 94030

Filed Jun. 27, 1985, Ser. No. 749,524

Claims priority, application Rep. of Korea, Apr. 29, 1985, 4871

Term of patent 14 years

U.S. Cl. D7—8



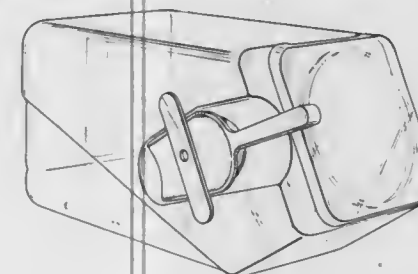
293,289
COMBINATION FOOD CONTAINER AND SCOOP

Peter Edwards, Hayward; Budd Steinhilber, Stinson Beach, and Ken Gilliam, San Francisco, all of Calif., assignors to Harmony Foods, Inc., Santa Cruz, Calif.

Filed May 12, 1986, Ser. No. 862,599

Term of patent 14 years

U.S. Cl. D7—79



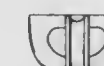
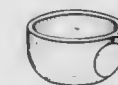
293,291
PUNCH CUP

Erik L. Hansen, Roskilde, Denmark, assignor to Rosti A/S, Denmark

Filed May 8, 1985, Ser. No. 731,799

Term of patent 14 years

U.S. Cl. D7—9



293,292

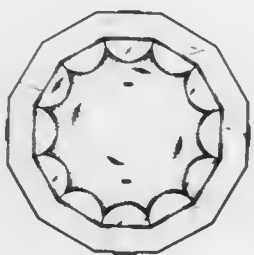
COVERED ENTREE PLATE

Charles E. Finsilver, Hartsdale; Terry L. Taylor, Pound Ridge, both of N.Y.; Roger E. Worm, Minneapolis, Minn., and Nabil El-Hag, Putnam Valley, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 23, 1985, Ser. No. 768,667

Term of patent 14 years

U.S. Cl. D7-16



293,294

VACUUM BOTTLE

Mamoru Fujiyama, Osaka, Japan, assignor to Zojirushi Vacuum Bottle Co., Ltd., Osaka, Japan

Filed Feb. 5, 1985, Ser. No. 698,494

Claims priority, application Japan, Sep. 19, 1984, 59-38893

Term of patent 14 years

U.S. Cl. D7-77



293,293

CUP HOLDER

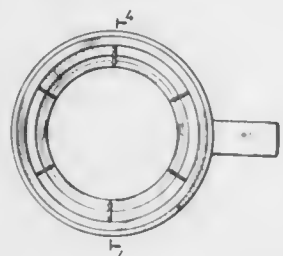
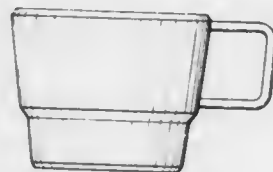
Patricia J. Isles, 14a Fieldhouse Road, Balham, London SW12, United Kingdom

Filed Jan. 9, 1985, Ser. No. 689,857

Claims priority, application United Kingdom, Jul. 17, 1984, 1020969

Term of patent 14 years

U.S. Cl. D7-70



293,295

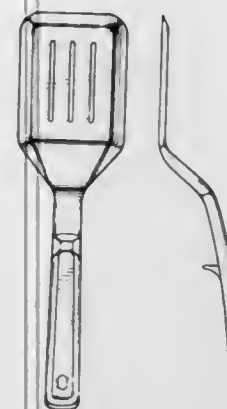
TURNER

Stanley A. Johnson, Brookfield, Wis., assignor to The Vollrath Company, Sheboygan, Wis.

Filed Mar. 18, 1985, Ser. No. 712,869

Term of patent 14 years

U.S. Cl. D7-102



293,296

TORCH FOR EXOTHERMIC CUTTING ELECTRODES

David B. Chaney, Powell, Ohio, assignor to Arcair Company, Lancaster, Ohio

Filed Aug. 1, 1984, Ser. No. 636,524

Term of patent 14 years

U.S. Cl. D8-30



293,297

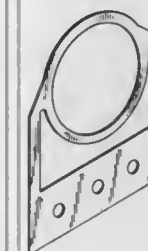
HANGER FOR A CYLINDRICAL CONTAINER

Nimrod P. Wood, 11102 NE. Beech, Portland, Oreg. 97220

Filed Aug. 19, 1985, Ser. No. 766,560

Term of patent 14 years

U.S. Cl. D8-373



293,298

PACKAGING CONTAINER

David Picard, Chemin des Marais 158, 1255 Veyrier, and Albert Petter, Chemin Moise Duboule 31, 1209 Geneva, both of Switzerland

Filed Jun. 5, 1985, Ser. No. 741,736

Claims priority, application Hague, Dec. 17, 1984, DM/004535

Term of patent 14 years

U.S. Cl. D9-322



293,299

DOUBLE LID FOR A CONTAINER

Boris Parad, 847 Division St., Northbrook, Ill. 60062

Filed Dec. 7, 1984, Ser. No. 679,583

Term of patent 14 years

U.S. Cl. D9-446



293,300

WRISTWATCH

Takashi Nikaido, Tachikawa; Yoshio Ono, Oume, and Masao Wada, Chofu, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1985, Ser. No. 740,546

Claims priority, application Japan, Dec. 10, 1984, 59-50732

Term of patent 14 years

U.S. Cl. D10-32



293,301

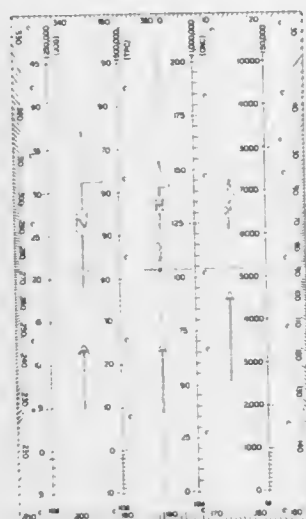
BAR SCALE TEMPLATE

Michael H. Deering, 114 London La., Jacksonville, N.C. 28540

Filed May 30, 1985, Ser. No. 739,095

Term of patent 14 years

U.S. Cl. D10—62



293,303

NECKLACE

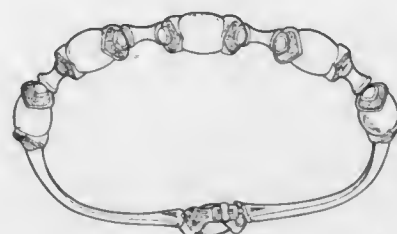
Marina Bulgari, Athens, Greece, assignor to Marina B Creation

S.A., Vaduz, Liechtenstein

Filed Jun. 4, 1985, Ser. No. 740,985

Term of patent 14 years

U.S. Cl. D11—3



293,304

FLOWER POT COVER

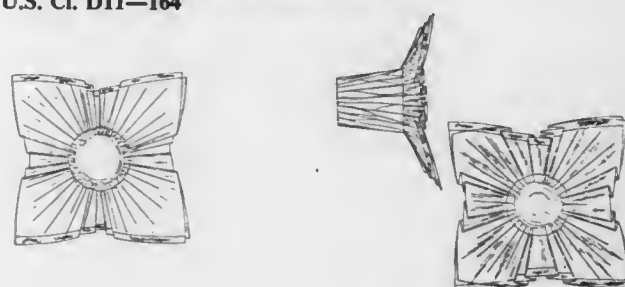
Donald E. Weder; Erwin H. Weder, both of Highland, and Robert C. Abrams, Edwardsville, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Sep. 21, 1984, Ser. No. 653,018

The portion of the term of this patent subsequent to Dec. 22, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



293,302

WRIST WATCH BAND

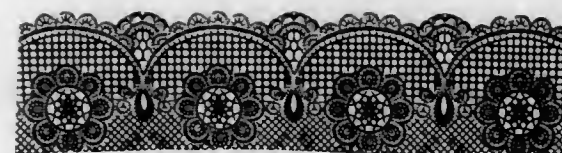
Eddy Schoepfer, La Chaux-du-Milieu, Switzerland, assignor to Fabrique Ebel, Societe Anonyme, Switzerland

Filed Apr. 3, 1985, Ser. No. 719,314

Claims priority, application Hague, Oct. 4, 1984, DM/004260

Term of patent 14 years

U.S. Cl. D11—3



293,305

FLOWER POT COVER

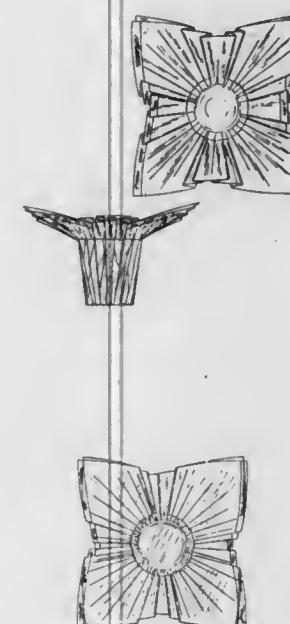
Donald E. Weder; Erwin H. Weder, both of Highland, and Robert C. Abrams, Edwardsville, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Sep. 21, 1984, Ser. No. 652,727

The portion of the term of this patent subsequent to Dec. 22, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



293,307

FLOWER POT COVER

Donald E. Weder; Erwin H. Weder, both of Highland, and Robert C. Abrams, Edwardsville, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Sep. 21, 1984, Ser. No. 653,204

The portion of the term of this patent subsequent to Oct. 6, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



293,306

FLOWER POT COVER

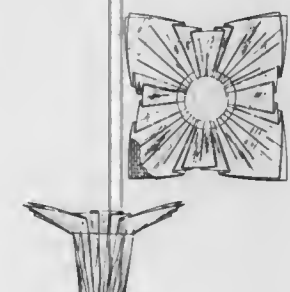
Donald E. Weder; Erwin H. Weder, both of Highland, and Robert C. Abrams, Edwardsville, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Sep. 21, 1984, Ser. No. 653,015

The portion of the term of this patent subsequent to Dec. 15, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164

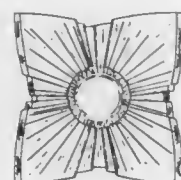
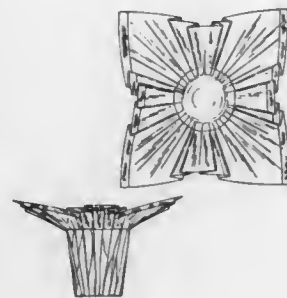


293,308

FLOWER POT COVER

Donald E. Weder; Erwin H. Weder, both of Highland, and Robert C. Abrams, Edwardsville, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Sep. 21, 1984, Ser. No. 652,726
Term of patent 14 years

U.S. Cl. D11—164

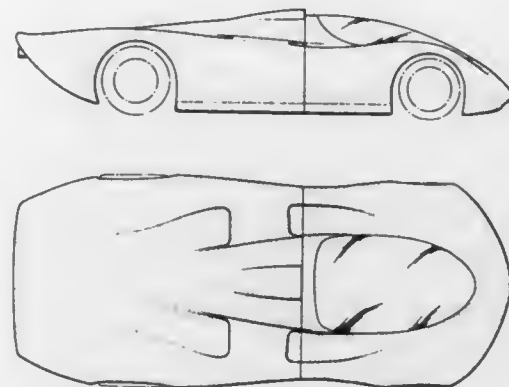


293,310

VEHICLE BODY

Gary N. Clark, Taylor; Kirk H. Jones, Troy, and Edward T. Welburn, Jr., Detroit, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 13, 1985, Ser. No. 776,129
Term of patent 14 years

U.S. Cl. D12—90

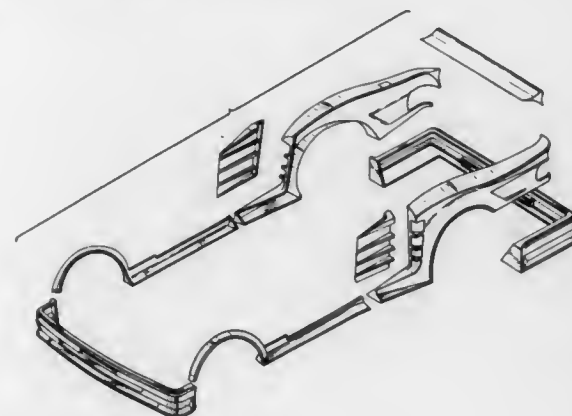


293,311

EXTERIOR BODY PANEL KIT FOR ATTACHMENT TO AN AUTOMOBILE BODY

Vittorio Strosek, Utting, Fed. Rep. of Germany, assignor to Silver Star Motors, Inc., Pompano Beach, Fla.
Filed Feb. 20, 1985, Ser. No. 703,592
Term of patent 14 years

U.S. Cl. D12—169



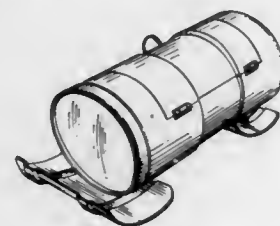
293,309

UTILITY SLED

James R. Robertson, 284 N. Amherst Rd., Bedford, N.H. 03102, and Harold E. Charles, 1 Woodland Dr., Manchester, N.H. 03104

Filed Feb. 21, 1985, Ser. No. 704,062
Term of patent 14 years

U.S. Cl. D12—6



293,312

MOTORCYCLE FRONT FENDER EXTENSION

Alwin J. Stabel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.
Filed Oct. 31, 1985, Ser. No. 793,620
Term of patent 14 years

U.S. Cl. D12—186

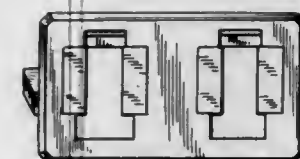
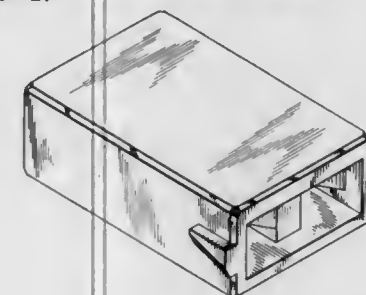


293,313

ELECTRICAL CONNECTOR HOUSING

Joseph G. Justiano, Bethpage, and Wolfgang F. Bienwald, Melville, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Nov. 2, 1984, Ser. No. 667,772
Term of patent 14 years

U.S. Cl. D13—27



293,314

WORK STATION SPINE ASSEMBLY

Bruce P. Hannah, Cold Spring, N.Y.; David D. McClanahan, Lansdale, and Lee Denny, Quakertown, both of Pa., assignors to Knoll International, Inc., New York, N.Y.
Filed Jun. 8, 1984, Ser. No. 618,491
Term of patent 14 years

U.S. Cl. D13—40



293,315

TELEVISION TUNER

Yosuke Suzuki, Yokohama, and Takahide Sano, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1985, Ser. No. 711,649
Term of patent 14 years

U.S. Cl. D14—84

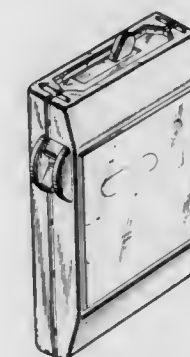


293,316

PORTABLE CASSETTE PLAYER

Richard Demenus, New York, N.Y., assignor to Acoustiguide Corporation, New York, N.Y.
Filed Jul. 24, 1985, Ser. No. 758,455
Term of patent 14 years

U.S. Cl. D14—6



293,317

DIGITAL TELEPHONE AND DATA EXCHANGE EQUIPMENT CABINET

Mitsuhiko Umezu; Tooru Nakajima; Hiroshi Kikkawa, and Mamoru Miyazaki, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 842,890
Claims priority, application Japan, Sep. 12, 1985, 60-38774
Term of patent 14 years

U.S. Cl. D14—52



293,318

TELEPHONE BASE WITH KEYBOARD DIALING MEANS

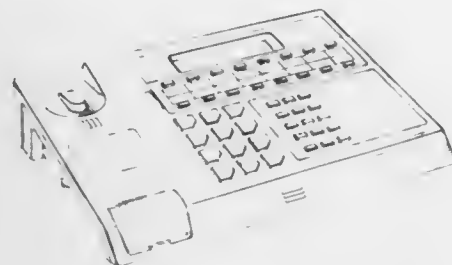
Robin Rhodes, Nottingham, England, assignor to Plessey Overseas Limited, Essex, England

Filed Feb. 10, 1986, Ser. No. 827,853

Claims priority, application United Kingdom, Aug. 17, 1985, 1028670

Term of patent 14 years

U.S. Cl. D14-62



293,319

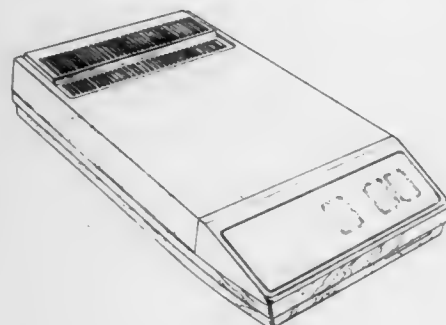
TELECONFERENCE CONTROL UNIT

Hari Matsuda, Evanston, and Carl J. Whitaker, Wheeling, both of Ill., assignors to Shure Brothers, Inc., Evanston, Ill.

Filed Nov. 4, 1985, Ser. No. 803,869

Term of patent 14 years

U.S. Cl. D14-52



293,320

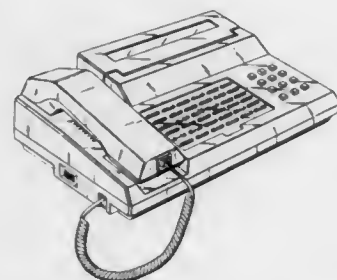
MULTI-LINE TELEPHONE SET

Daniel H. Ng, Huntington Beach, Calif., assignor to New Generation Technology, Huntington Beach, Calif.

Filed Jan. 27, 1986, Ser. No. 822,594

Term of patent 14 years

U.S. Cl. D14-58



293,321

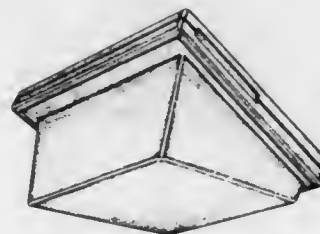
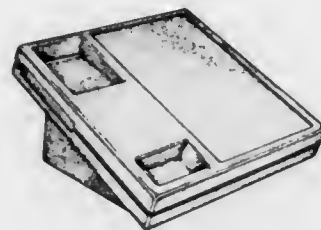
TELEPHONE STAND

John Kowalik, Freehold; Ronald Longhitano, Oldbridge Township, Middlesex County; Stephen G. Miggels, Wyckoff; Walter J. Shakespeare, Middletown, and G. Varadarajan, English-town, all of N.J., assignors to American Telephone & Telegraph Company, AT&T Information Systems Inc., Murray Hill, N.J.

Filed Jun. 19, 1986, Ser. No. 876,383

Term of patent 14 years

U.S. Cl. D14-60



293,322

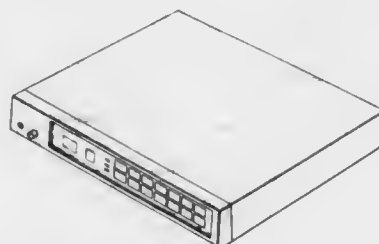
AUDIO TUNER

Naoko Hoshino; Takashi Abe, both of Chiba, and Yosuke Suzuki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 12, 1985, Ser. No. 722,446

Term of patent 14 years

U.S. Cl. D14-71



293,323

KNIFE HOLDER FOR TUFTING MACHINES

Ian Slattery, Hixson, Tenn.; Harold B. Bardsley, Euxton, Near Chorley, and Ian Beverly, Blackburn, both of England, assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed May 17, 1985, Ser. No. 735,216

Claims priority, application United Kingdom, Apr. 2, 1985, 1025927

Term of patent 14 years

U.S. Cl. D15-78



293,324

INDUSTRIAL ROBOT

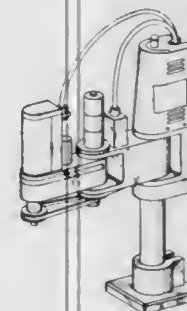
Atsuyuki Gotou, Mitaka; Masato Shibayama, Sayama; Takeshi Abe, Tokyo; Ryouichi Hisatomi, and Takeshi Sasaki, both of Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 28, 1985, Ser. No. 770,242

Claims priority, application Japan, Jul. 17, 1985, 60-30202

Term of patent 14 years

U.S. Cl. D15-199



293,325

CAMERA

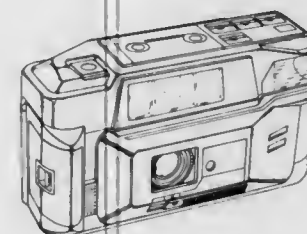
Takaharu Kato, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,136

Claims priority, application Japan, Nov. 30, 1984, 59-049296

Term of patent 14 years

U.S. Cl. D16-6



293,326

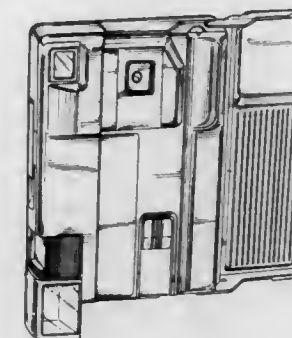
CAMERA

Bruce A. Leonard, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1985, Ser. No. 747,734

Term of patent 14 years

U.S. Cl. D16-6



293,327

CONTROL PANEL FOR A COPIER OR THE LIKE

W. Patrick Fricke, and Larry D. Harrison, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,818

Term of patent 14 years

U.S. Cl. D16-32



293,328

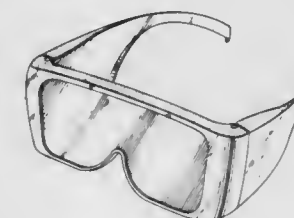
SUNGLASSES

Marvin G. Murphy, 34 E. Las Flores, Arcadia, Calif. 90016, and Mark A. Hase, 1421 S. 5th Ave., Arcadia, Calif. 91006

Filed Apr. 2, 1986, Ser. No. 847,811

Term of patent 14 years

U.S. Cl. D14-102



293,329
TOY VEHICLE

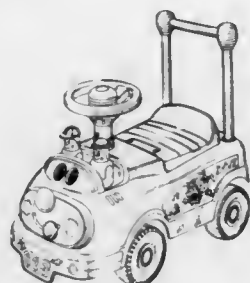
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Taira Hanashima, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,981

Claims priority, application Japan, May 27, 1985, 60-22085

Term of patent 14 years

U.S. Cl. D21-78



293,332
GUITAR

David Wintz, 2042 Portsmouth, Houston, Tex. 77098

Filed Nov. 25, 1985, Ser. No. 806,358

Term of patent 14 years

U.S. Cl. D17-14



293,330
STUFFED TOY BEAR

Leigh C. Latta, III, Joseph, Ore., assignor to The Dexter-Portfolio Co., Joseph, Ore.

Filed Jun. 6, 1985, Ser. No. 741,952

Term of patent 14 years

U.S. Cl. D21-159



293,333
ELECTRIC GUITAR BODY

Richard Excellente, 1018 Brighton St., Union, N.J. 07083

Filed Oct. 28, 1985, Ser. No. 791,745

Term of patent 14 years

U.S. Cl. D17-20



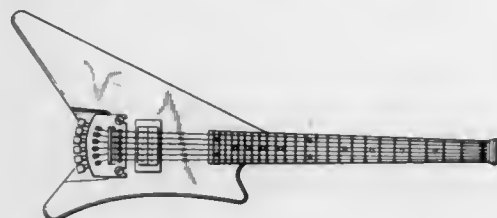
293,331
GUITAR

Mark Erlewine, 1605 Wethersfield Rd., Austin, Tex. 78703, and William Squier, c/o Silverman & Shulman, 136 E. 57th St., New York, N.Y. 10022

Filed Aug. 8, 1985, Ser. No. 763,511

Term of patent 14 years

U.S. Cl. D17-14



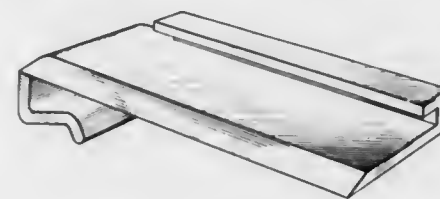
293,334
PAPER GUIDE CLIP

James R. Humbert, P.O. Box 3677, South Bend, Ind. 46628

Filed Nov. 21, 1985, Ser. No. 806,008

Term of patent 14 years

U.S. Cl. D18-22



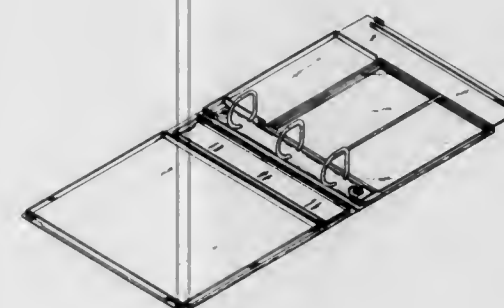
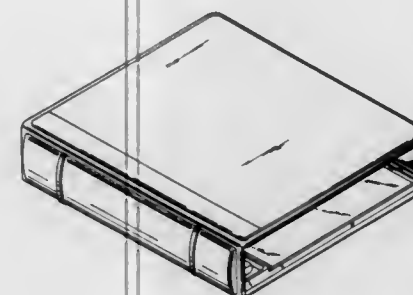
293,335
CASE FOR MAGNETIC MEDIA, PROGRAMS AND THE LIKE

Robert A. Egly, 38 Whitewater Dr., Corona del Mar, Calif. 92625

Filed Jun. 8, 1984, Ser. No. 618,531

Term of patent 14 years

U.S. Cl. D19-27



293,336
COCKTAIL COMPOSER GUIDE

Paul A. Fenner, P.O. Box 38, Guildford, Surrey GU1 1DR, England

Filed Dec. 11, 1984, Ser. No. 680,493

Term of patent 14 years

U.S. Cl. D19-64



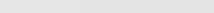
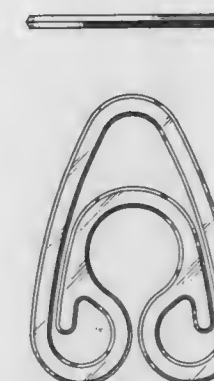
293,337
PAPER CLIP

Fred Burgdorf, 46711 Crawford #15, Fremont, Calif. 94539

Filed Jun. 20, 1985, Ser. No. 746,632

Term of patent 14 years

U.S. Cl. D19-65



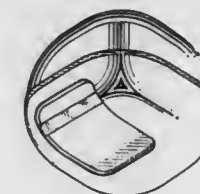
293,338
STAMP DISPENSER

Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.

Filed Mar. 21, 1985, Ser. No. 714,571

Term of patent 14 years

U.S. Cl. D19-67

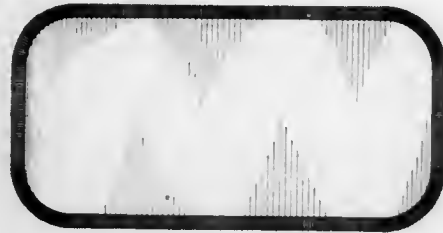


293,339
SIGNBOARD

Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.

Filed Nov. 4, 1985, Ser. No. 794,412
Term of patent 14 years

U.S. Cl. D20—10

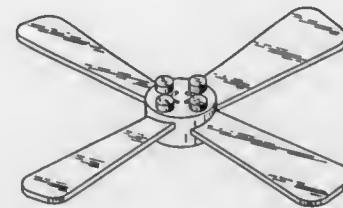


293,341
TOY PROPELLER

Jan Ryaa, Billund, and Edel S. Andersen, Randbol, both of Denmark, assignors to Interlego A.G., Baar, Switzerland

Filed Dec. 4, 1985, Ser. No. 805,193
Term of patent 14 years

U.S. Cl. D21—108

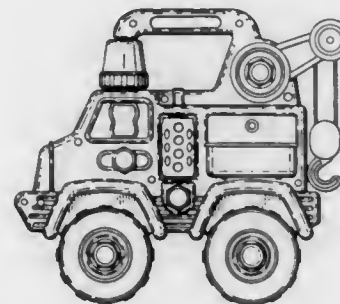
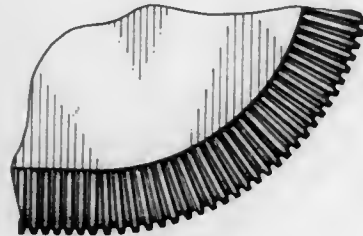


293,342
TOY TOW TRUCK

Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Great Britain

Filed Feb. 19, 1985, Ser. No. 702,487
Claims priority, application United Kingdom, Jan. 14, 1985, 1024392

Term of patent 14 years
U.S. Cl. D21—139



293,340
SCOOTER

Mort Heilig, Monterey Park, Calif., assignor to Supercruiser, Inc., Monterey Park, Calif.

Filed Feb. 2, 1987, Ser. No. 9,832
Term of patent 14 years

U.S. Cl. D21—81



293,343
STUFFED TOY FERRET

Leigh C. Latta, III, Joseph, Oreg., assignor to The Dexter-Portfolio Co., Joseph, Oreg.

Filed Jun. 6, 1985, Ser. No. 741,951
Term of patent 14 years

U.S. Cl. D21—148

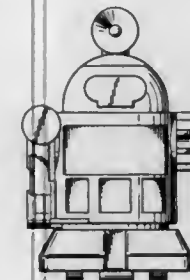


293,344
TOY ROBOT

Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,826
Claims priority, application Japan, May 10, 1985, 60-19123
Term of patent 14 years

U.S. Cl. D21—150

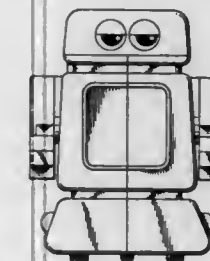


293,345
TOY ROBOT

Toshiaki Takizawa, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,828
Claims priority, application Japan, May 10, 1985, 60-19124
Term of patent 14 years

U.S. Cl. D21—150

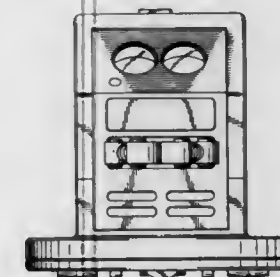


293,346
TOY ROBOT

Hiroshi Horiuchi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,829
Claims priority, application Japan, May 17, 1985, 60-20439
Term of patent 14 years

U.S. Cl. D21—150

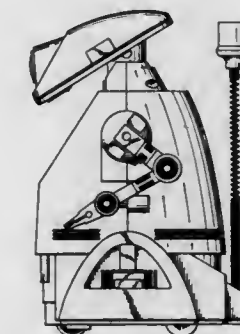
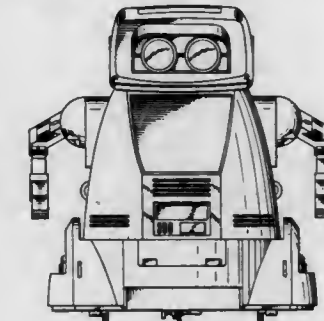


293,347
TOY ROBOT

Keiichi Murasaki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,831
Claims priority, application Japan, May 17, 1985, 60-20441
Term of patent 14 years

U.S. Cl. D21—150



293,348
SWIMMING FROG TOY

Michael Tong, Hong Kong, Hong Kong, assignor to Playart Limited, Hong Kong, Hong Kong

Filed Apr. 23, 1985, Ser. No. 726,256
Claims priority, application United Kingdom, Oct. 24, 1984, 1022842

Term of patent 14 years
U.S. Cl. D21—158



293,349
CLOTH BAR

Rhonda K. Zidell, 3903 Beaconsdale Dr., Austin, Tex. 78759
Filed Jun. 3, 1985, Ser. No. 740,345
Term of patent 14 years
U.S. Cl. D21-159



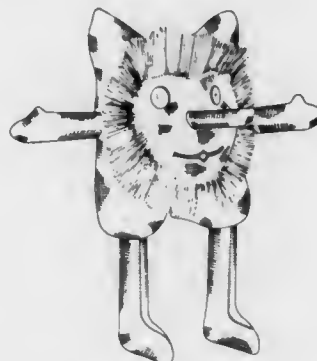
293,351
DOLL

Linda L. Calkin, R.D. 3, Box 708, Stockton, N.J. 08559
Filed Jun. 24, 1985, Ser. No. 748,411
Term of patent 14 years
U.S. Cl. D21-166



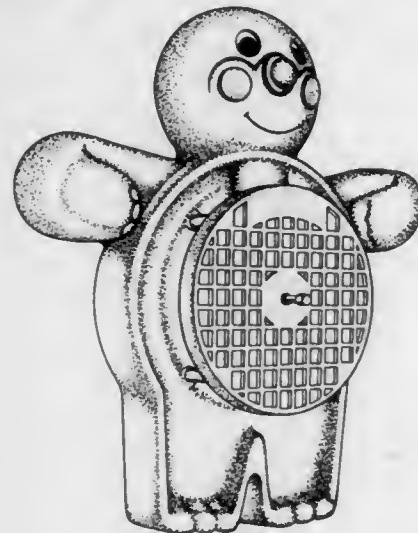
293,352
DOLL

Linda L. Calkin, R.D. 3, Box 708, Stockton, N.J. 08559
Filed Jun. 24, 1985, Ser. No. 748,410
Term of patent 14 years
U.S. Cl. D21-166



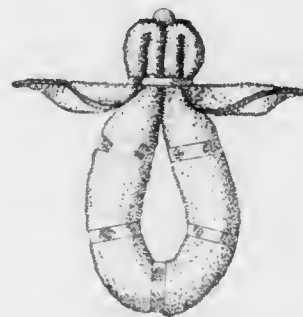
293,350
TOY FIGURE

Douglas L. Fetterman, Rochester, Mich., assignor to Kenner
Parker Toys Inc., Beverly, Mass.
Filed Mar. 11, 1985, Ser. No. 710,769
Term of patent 14 years
U.S. Cl. D21-166



293,353
CLOTH BEE

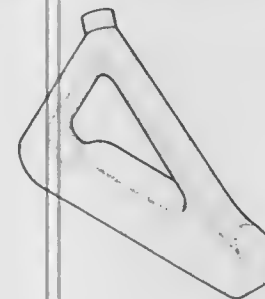
Rhonda K. Zidell, 3903 Beaconsdale Dr., Austin, Tex. 78759
Filed Jun. 3, 1985, Ser. No. 740,350
Term of patent 14 years
U.S. Cl. D21-185



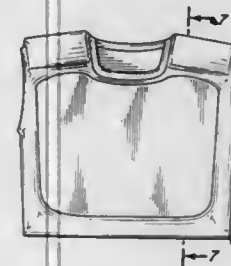
293,354
SHOULDER AND BACK WEIGHT FOR EXERCISING
Preston Nelson, 3400 Ocee St., Houston, Tex. 77063
Filed Jul. 25, 1985, Ser. No. 758,862
Term of patent 14 years
U.S. Cl. D21-196



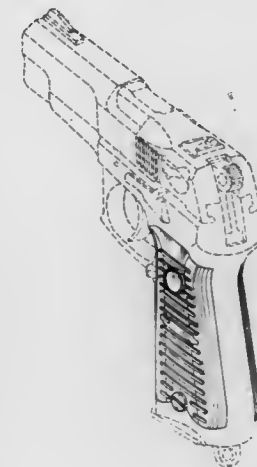
293,355
PUTTER HEAD
Gordon D. Wampler, 302 Sutton Bridge Rd., Box 701, Gadsden,
Ala. 35901
Filed Aug. 26, 1985, Ser. No. 780,591
Term of patent 14 years
U.S. Cl. D21-218



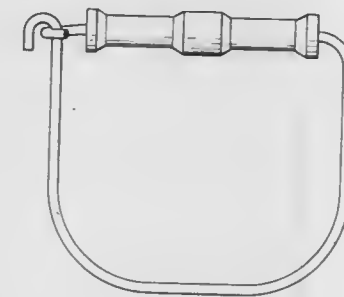
293,356
FLOTATION AID
Lawrence Holden, 4954 Hazeltine, Sherman Oaks, Calif. 91403
Filed Sep. 20, 1985, Ser. No. 778,472
Term of patent 14 years
U.S. Cl. D21-238



293,357
SET OF GRIP PANELS FOR A HANDGUN
William B. Ruger, Croydon, N.H., and Lawrence L. Larson,
Branford, Conn., assignors to Sturm, Ruger & Company, Inc.,
Southport, Conn.
Filed Dec. 19, 1984, Ser. No. 683,786
Term of patent 14 years
U.S. Cl. D22-108



293,358
FISH CARRIER
David E. Hearn, 6512 SE. 50th Ave., Portland, Ore. 97206
Filed May 30, 1985, Ser. No. 739,307
Term of patent 14 years
U.S. Cl. D22-134



293,359

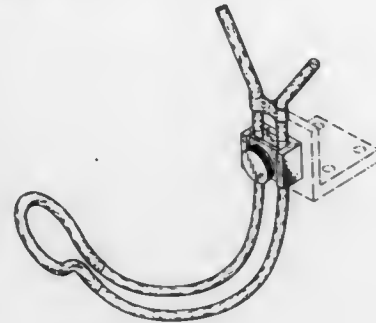
ADJUSTABLE FISHING ROD SUPPORT

James M. Gust, Box 205, and Ronald L. Yoder, Box 227, both of Topeka, Ind. 46571

Filed Jan. 16, 1985, Ser. No. 692,656

Term of patent 14 years

U.S. Cl. D22—147

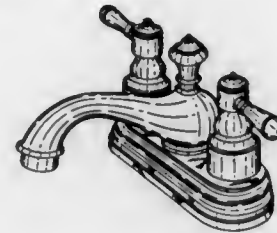
293,362
FAUCET

Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Jul. 12, 1985, Ser. No. 754,603

Term of patent 14 years

U.S. Cl. D23—241



293,360

ELEVATED WATER TANK

Lloyd E. Anderson, Sr., Des Moines, Iowa, assignor to Pitt-Des Moines Inc., Pittsburgh, Pa.

Filed Apr. 3, 1985, Ser. No. 719,431

Term of patent 14 years

U.S. Cl. D23—202



293,363

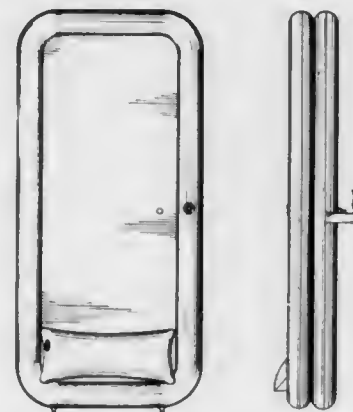
INFLATABLE BATHTUB

Lloyd Everard, 15824 SE. 296th, Kent, Wash. 98042

Filed Sep. 16, 1985, Ser. No. 776,428

Term of patent 14 years

U.S. Cl. D23—277



293,364

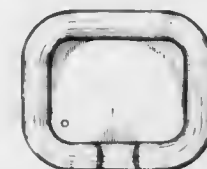
INFLATABLE SINK

Lloyd Everard, 15824 SE. 296th, Kent, Wash. 98042

Filed Oct. 4, 1985, Ser. No. 784,540

Term of patent 14 years

U.S. Cl. D23—289



293,361

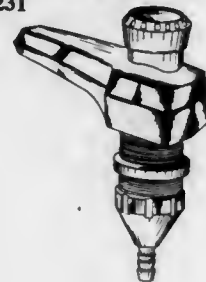
GALLEY HAND PUMP

Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.

Filed May 6, 1985, Ser. No. 730,794

Term of patent 14 years

U.S. Cl. D23—231



293,365

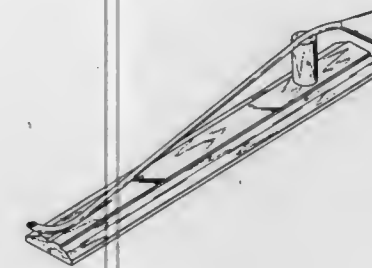
WICK BEARING LIGHTING DEVICE

Ivan T. George, 566 Ridge Cir., Huntingdon Brook, Pa.

Filed Feb. 11, 1985, Ser. No. 700,794

Term of patent 14 years

U.S. Cl. D7—416



293,367

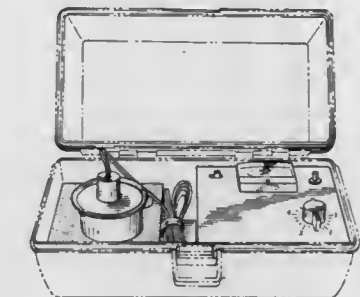
WATER TREATMENT UNIT FOR CONTAINMENT IN A PORTABLE HOUSING

John Spink, Chesterfield, Mo., assignor to Scienco, Inc., St. Louis, Mo.

Filed Sep. 9, 1985, Ser. No. 774,147

Term of patent 14 years

U.S. Cl. D23—207



293,366

AIR FRESHENER

William J. O'Neil, Jr., Cincinnati; David A. Jones, Kettering, both of Ohio, and Phillip L. Brookshire, Cincinnati, all of Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Apr. 9, 1985, Ser. No. 721,356

Term of patent 14 years

U.S. Cl. D23—366



293,368

MICROWAVE DISTILLATION APPARATUS

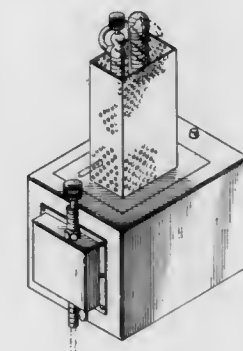
Narbik A. Karamian, Bethesda, Md., assignor to Raf-Tan Inc., Bethesda, Md.

Filed Apr. 8, 1985, Ser. No. 720,852

The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.

Term of patent 14 years

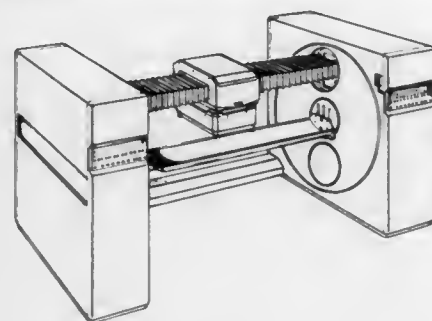
U.S. Cl. D23—207



293,369

MEDICAL DIAGNOSTIC POSITIONER FOR DIAGNOSTIC IMAGING OR TOMOGRAPHY
Allan J. Perusek, Mentor; Ernest F. Jablonski, W. Farmington, and Robert H. Hartzell, North Royalton, all of Ohio, assignors to Technicare Corporation, Solon, Ohio
Filed May 22, 1985, Ser. No. 736,906
Term of patent 14 years

U.S. Cl. D24-2



293,372

DENTAL PICK
Thomas E. Butt, 350 W. Fulton St., Wytheville, Va. 24382
Filed Apr. 18, 1985, Ser. No. 724,472
Term of patent 14 years

U.S. Cl. D24-10

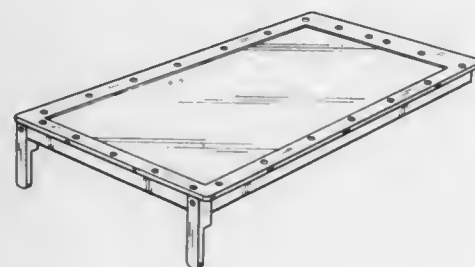


293,370

SURGICAL TABLE FOR SUPPORT OF THE ARM AND HAND

Ronald A. Sanderson, Calabasas; John L. Wilson, North Hollywood, and Nolan M. Maples, Burbank, all of Calif., assignors to Cal-Surgical, Inc., Sun Valley, Calif.
Filed Feb. 8, 1985, Ser. No. 700,010
Term of patent 14 years

U.S. Cl. D24-3

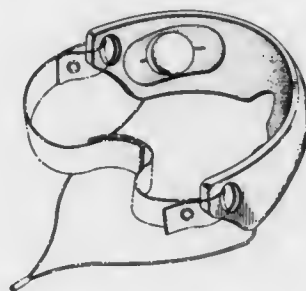


293,373

HEADSET FOR USE IN APPLYING ELECTRICAL SIGNALS TO THE TEMPLES

Stephen C. Beck, 1350 Summit Rd., Berkeley, Calif. 94708
Filed Jul. 1, 1985, Ser. No. 752,462
Term of patent 14 years

U.S. Cl. D24-17

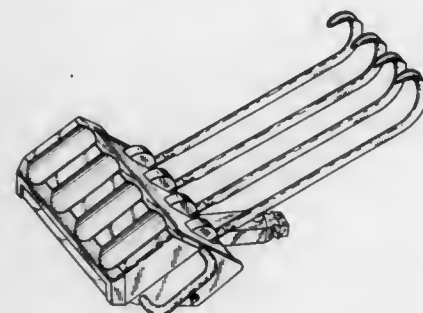


293,371

DENTAL HANDPIECE SUPPORT UNIT

Carl G. Nordstrom, Newberg, and Matthew H. Parlier, Sheridan, both of Oreg., assignors to A-Dec, Inc., Newberg, Oreg.
Filed Dec. 16, 1985, Ser. No. 808,996
Term of patent 14 years

U.S. Cl. D24-5



293,374

ASSAY CARDS

Max Herzberg, Moshav Sataria, and Falk Fish, Tel Aviv, both of Israel, assignors to Orgenics, Ltd., Yavne, Israel
Filed Nov. 19, 1984, Ser. No. 672,928
Term of patent 14 years

U.S. Cl. D24-17



293,375

SURGICAL LAPAROTOMY PAD

Thomas Denny, East Brunswick, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.
Filed Dec. 19, 1983, Ser. No. 562,761

The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years

U.S. Cl. D24-34

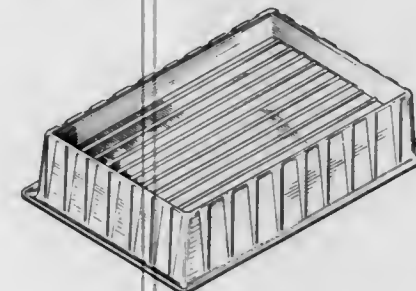


293,376

WATER HOLDING TUB FOR SUN TANNING

James C. Blackwell, R.R. 2, Box 138, Franklin, Ind. 46131
Filed Apr. 15, 1985, Ser. No. 723,073

Term of patent 14 years
U.S. Cl. D24-39



293,377

URINE MEASURING JUG

Gilbert R. Chadbourne, Fairfield, Me., assignor to Keyes Fibre, Waterville, Me.

Filed Feb. 7, 1985, Ser. No. 699,144
Claims priority, application United Kingdom, Aug. 8, 1984, 1021403

Term of patent 14 years
U.S. Cl. D24-56



293,378

EAR CLEANER

Merrill D. Alkire, 503 Marymount Rd., #1131, Salina, Kans. 66401

Filed Jun. 12, 1985, Ser. No. 743,793
Term of patent 14 years
U.S. Cl. D24-59



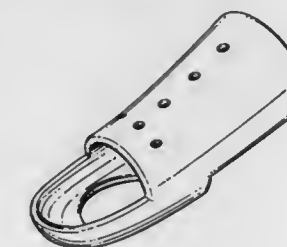
293,379

FINGER SPLINT

Helmut D. Link, Hamburg, Fed. Rep. of Germany, assignor to Waldemar Link GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,715
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1984, 8432615[U]; Nov. 20, 1984, 66 MRAR 2862/84
Term of patent 14 years

U.S. Cl. D24-64



293,380

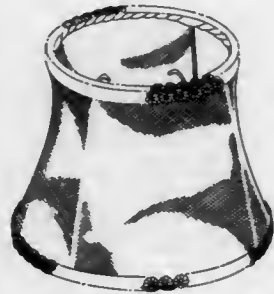
VOTIVE CANDLE LAMP SHADE

Lynn H. Wells, 2260 Rushmore Dr., Marietta, Ga. 30062

Filed Jun. 19, 1985, Ser. No. 746,265

Term of patent 14 years

U.S. Cl. D26—23



293,382

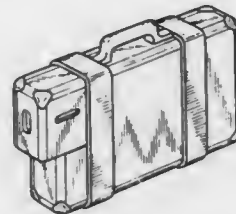
LIGHTER OR THE LIKE

Kaname Ichikawa, Tokyo, Japan, assignor to Modern Royal Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1985, Ser. No. 805,757

Term of patent 14 years

U.S. Cl. D27—41

293,383
HAMPER

Rick L. Thompson, Burlington, Iowa, assignor to Burlington Basket Company, Burlington, Iowa

Filed Nov. 14, 1985, Ser. No. 805,207

Term of patent 14 years

U.S. Cl. D32—37

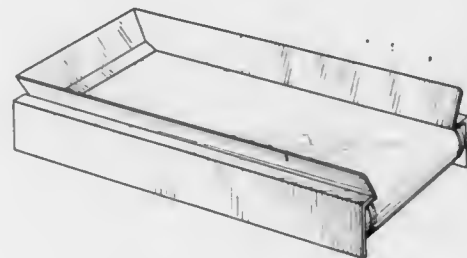
293,384
CONVEYOR

Paul L. Brulé, Plainwell, Mich., assignor to Ventureprise, Inc., Kalamazoo, Mich.

Filed Dec. 16, 1985, Ser. No. 809,527

Term of patent 14 years

U.S. Cl. D34—29



293,381

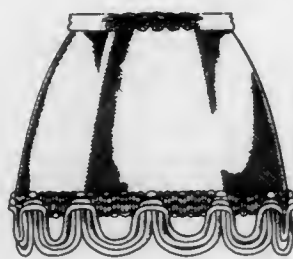
VOTIVE CANDLE LAMP SHADE

Lynn H. Wells, 2260 Rushmore Dr., Marietta, Ga. 30062

Filed Jun. 19, 1985, Ser. No. 746,264

Term of patent 14 years

U.S. Cl. D26—23



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF DECEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Raymond: See—
Muller, Klaus; Mutz, Bernd; and Daler, Helmo, 4,714,392, Cl. 411-175.000.
- A/S Hellesens: See—
Laustsen, Mads A.; and Kummel, Karen, 4,714,664, Cl. 429-105.000.
- Aarestad, Jerome K.: See—
Schaefer, John G.; Aarestad, Jerome K.; and Whitesel, Terry L., 4,714,405, Cl. 415-169.000.
- Abbott, Edward H.; Erickson, Robert H.; and Horn, William F., to Ford Motor Company. Method of forming permanent magnets within a motor yoke. 4,713,877, Cl. 29-596.000.
- Abbou, Clement: See—
Rey, Pierre; Abbou, Clement; Leandri, Jacqueline; and Sezeur, Alain J. P. R., 4,714,074, Cl. 128-1.100.
- Abe, Michiharu: See—
Sato, Tsutomu; Umehara, Masaakira; Abe, Michiharu; Oba, Hideaki; and Ueda, Yutaka, 4,714,667, Cl. 430-270.000.
- Abe, Norihiro: See—
Dohzono, Masatake; Miyashita, Iwao; and Abe, Norihiro, 4,714,466, Cl. 604-378.000.
- Abe, Takeshi, to Nissan Motor Co., Ltd. Radiator fan. 4,714,408, Cl. 416-91.000.
- Abeles, Robert H.: See—
Dowd, Paul; Kaufman, Christopher; and Abeles, Robert H., 4,714,777, Cl. 562-506.000.
- Abundance, Roger; Corbet, Pierre; Jodelet, Francois; and Andre, Jean-Francois, to Skis Rossignol S.A. Cross country ski assembly. 4,714,267, Cl. 280-615.000.
- Abrevaya, Hayim; and Targos, William M., to UOP Inc. Microemulsion impregnated catalyst composite and use thereof in a synthesis gas conversion process. 4,714,692, Cl. 502-261.000.
- Addis, John L., to Tektronix, Inc. Precision differential amplifier having fast overdrive recovery. 4,714,896, Cl. 330-261.000.
- Adler, Meryle D. W., to Corning Glass Works. Air slide positioning for grinding spindles. 4,713,913, Cl. 51-165.900.
- ADM Tronics Unlimited, Inc.: See—
Di Mino, Alfonso; and Di Mino, Andre, 4,714,911, Cl. 338-195.000.
- Adsett, Anthony P., to International Laser Systems, Inc. Titanium heat exchanger for laser cooling. 4,714,107, Cl. 165-16.00A.
- Advance Transformer Company: See—
Duncan, George I.; and Phelps, Stephen L., 4,714,979, Cl. 361-274.000.
- Advanced Micro Devices, Inc.: See—
Chung, Shine C., 4,714,839, Cl. 307-441.000.
- Gwozdz, Peter S., 4,714,520, Cl. 437-228.000.
- Kong, Samuel K., 4,714,877, Cl. 324-133.000.
- Sander, Craig S.; and Swaminathan, Balaji, 4,714,686, Cl. 437-195.000.
- Serner, Rudolph J.; and Harris, Steven, 4,714,866, Cl. 318-636.000.
- Agency of Industrial Science and Technology: See—
Sugahara, Kazuyuki; Nishimura, Tadashi; Kusunoki, Shigeru; and Inoue, Yasuo, 4,714,684, Cl. 437-19.000.
- Agfa Gevaert Aktiengesellschaft: See—
Helling, Gunter; and Himmelmann, Wolfgang, 4,714,671, Cl. 430-545.000.
- Agou, Masanobu: See—
Sato, Nobukatsu; Kuraiyama, Haruo; and Agou, Masanobu, 4,714,764, Cl. 546-271.000.
- Agricultural Aviation Engineering Company: See—
Sanders, George S., 4,714,092, Cl. 137-894.000.
- AgRobotics, Inc.: See—
McEachern, Richard D.; Jordan, Willie W.; Gebheim, Gerald C.; and Robinson, Joe M., 4,714,196, Cl. 239-62.000.
- Ahern, Douglas K.; Fowlkes, William Y.; and Rimai, Donald S., to Eastman Kodak Company. Electrographic reproduction apparatus. 4,714,939, Cl. 355-3.0TR.
- Aichi Steel Works, Ltd.: See—
Honkura, Yoshinobu; Murata, Kouji; and Yokoyama, Takashi, 4,714,502, Cl. 148-307.000.
- Aigner, Reinhard: See—
Grundei, Hans; and Aigner, Reinhard, 4,714,475, Cl. 623-20.000.
- Aihara, Yoshihiko: See—
Eguchi, Masaharu; Tosaka, Yoichi; Ohnuki, Ichiro; Aihara, Yoshihiko; and Ishizaki, Akira, 4,714,332, Cl. 354-21.000.
- Aikawa, Hiroshi: See—
Yoshida, Ryo; and Aikawa, Hiroshi, 4,714,451, Cl. 474-28.000.
- Air Products and Chemicals, Inc.: See—
Burgoyne, William F., Jr.; and Dixon, Dale D., 4,714,778, Cl. 564-305.000.
- Cabrera, Alejandro L.; Kirner, John F.; Miller, Robert A.; and Pierantozzi, Ronald, 4,714,632, Cl. 427-255.100.
- Iacoviello, John G., 4,714,731, Cl. 524-459.000.
- Rowles, Howard C., 4,714,487, Cl. 62-24.000.
- Aisin Seiki Kabushiki Kaisha: See—
Hattori, Takemi; and Takeda, Nobuhiko, 4,714,291, Cl. 297-284.000.
- Yogo, Kenji, 4,714,193, Cl. 236-75.000.
- Aisin Seiki Kabushiki Kaisha: See—
Yasuda, Keiji; Oda, Yukihisa; Hamajima, Shigemitsu; Ishii, Masami; Nakanishi, Katsumi; Tsuzuki, Takayoshi; and Tsuda, Jyou, 4,714,804, Cl. 200-11.0DA.
- Aisin-Warner Kabushiki Kaisha: See—
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,713,988, Cl. 74-868.000.
- Aisin Warner Limited: See—
Hayakawa, Yoichi; Kawai, Masao; Nishikawa, Seiichi; and Fukumura, Kagenori, 4,713,989, Cl. 74-869.000.
- Moroto, Shuzo; Sumiya, Koji; Watanabe, Kazuaki; Kubo, Seitoku; Kobayashi, Koji; and Taga, Yutaka, 4,714,146, Cl. 192-85.0AA.
- Aizawa, Shigeru: See—
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,714,566, Cl. 252-314.000.
- Ajinomoto Co., Inc.: See—
Fukushima, Koji; Seto, Yoshiko; Kawada, Kazuhiro; Toi, Koji; and Kumashiro, Izumi, 4,714,713, Cl. 514-563.000.
- Tanaka, Kiyoshi; Sacki, Masaru; Matsushita, Tsutomu; Koga, Yoshihiro; and Kawakita, Tetsuya, 4,714,767, Cl. 548-344.000.
- Akademie Der Wissenschaften Der DDR: See—
Henklein, Peter; Becker, Manfred; Buttner, Werner; Loth, Fritz; Dautzenberg, Horts; Forner, Klaus; Dolling, Rudolf; Graul, Karl-Heinz; Halatsch, Wolf-Rainer; and Rupprich, Christian, 4,714,768, Cl. 548-435.000.
- Akao, Michitoshi: See—
Sakakibara, Kenji; Akao, Michitoshi; Hayashi, Shigeyuki; and Sakai, Jun, 4,714,943, Cl. 355-27.000.
- Akatsu, Masahiro: See—
Okada, Yoshio; Akatsu, Masahiro; and Ohira, Yohichi, 4,714,495, Cl. 106-21.000.
- Akiba, Yasuhiro; Namba, Masato; Kikuchi, Seiji; and Soejima, Hidenobu, to Matsushita Electric Industrial Co., Ltd. Stepping motor. 4,714,850, Cl. 310-49.00R.
- Akiyama, Kazunori: See—
Iida, Kazumi; Ohata, Yosuke; Hyodo, Keiichi; Akiyama, Kazunori; Umeda, Tadashi; and Kishimoto, Keiichi, 4,714,338, Cl. 355-3.0FU.
- Aktiebolaget Electrolux: See—
Nilsson, Alf B., 4,714,870, Cl. 323-258.000.
- Akzo NV: See—
Guioth, Chantal H.; Maze, Etienne G.; and Trescol, Jean J., 4,714,531, Cl. 204-181.700.
- Guioth, Chantal H.; Maze, Etienne G.; and Trescol, Jean J., 4,714,532, Cl. 204-181.700.
- Alas, Jacques; and Bacher, Michel, to Valeo. Progressively acting friction disk suitable for automobile vehicle clutches. 4,714,148, Cl. 192-107.00C.
- Alba, James: See—
Minard, Paul G.; Alba, James; and Pacyna, David A., 4,714,054, Cl. 122-483.000.
- Albert Einstein College of Medicine of Yeshiva University, The: See—
Shouval, Daniel; Shafritz, David A.; and Wands, Jack R., 4,714,613, Cl. 424-86.000.
- Alexander, Willard E.: See—
Rubens, Louis C.; and Alexander, Willard E., 4,713,927, Cl. 53-472.000.
- Alfa Romeo Auto S.p.A.: See—
Fanti, Cristoforo; Travaglio, Gianclaudio; Ferrario, Luciano; and Moscatelli, Saverio, 4,714,127, Cl. 180-233.000.
- Allard, Vincent L., to BICC Public Limited Company. Coil forming method. 4,714,209, Cl. 242-25.00R.
- Allflex International Limited: See—
Jefferies, Keith W.; and Long, Murray D., 4,714,048, Cl. 119-14.080.
- Allied Corporation: See—
Koenig, James P.; Knight, David J.; Szudy, James E.; Bartholomew, Roy E.; and Wurst, William R., 4,714,483, Cl. 55-163.000.
- Allsop, Inc.: See—
Clausen, Eivind, 4,713,856, Cl. 15-97.00R.
- Alopex Industries, Inc.: See—
Chivens, Donald R.; and Greskovics, Paul, 4,714,508, Cl. 156-195.000.
- Alpern, Alan N.: See—
Lewis, Kenneth A.; Alpern, Alan N.; Frank, Andrew C.; and Ross, Stuart E., 4,715,045, Cl. 375-58.000.

Alterbaum, Robert. Method and apparatus for use in preparation of fibrinogen from a patient's blood. 4,714,457, Cl. 494-37.000.

Altman, Denis J., to Westinghouse Electric Corporation. Flow limiting head adapter extension. 4,714,584, Cl. 376-353.000.

Aluminum Company of America: See—

Eckert, Charles E., 4,714,494, Cl. 75-66.000.

Hawkins, Ronald G., 4,714,799, Cl. 174-42.000.

Huet, Roger, 4,714,588, Cl. 420-534.000.

Roha, Max E., 4,714,567, Cl. 252-315.200.

Amada Company, Limited: See—

Yamamoto, Sakae; and Mizuno, Tsutomu, 4,714,849, Cl. 310-12.000.

Amada Engineering & Service Co., Inc.: See—

Lee, Chun-Shen, 4,715,040, Cl. 372-98.000.

Amariti, Luigi; and Santos, Llandro C., to Imperial Metal & Chemical Company. Developer including an aliphatic cyclic carbonate in the oil phase emulsion. 4,714,670, Cl. 430-331.000.

Ambrose, Ronald R.: See—

Chang, Wen H.; Prucnal, Paul J.; Peffer, John R.; Dufford, Edward L.; and Ambrose, Ronald R., 4,714,738, Cl. 525-58.000.

Ambrus, Clara M.; and Horvath, Csaba. Blood purification. 4,714,556, Cl. 210-638.000.

Amemiya, Yoichi: See—

Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Kumagai, Kazushi, 4,714,852, Cl. 310-156.000.

American Telephone & Telegraph Company: See—

Gartner, William J., 4,715,044, Cl. 375-8.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: See—

Andrews, George E.; Davis, Paul C.; Farley, Dennis C.; Kravitz, Stanley H.; Meeker, Thrygve R.; Petersen, Owe G.; and Schelling, Arthur W., 4,715,049, Cl. 375-106.000.

American Telephone and Telegraph Company, AT&T Technologies, Inc.: See—

Hutchins, Erle M., 4,714,440, Cl. 439-676.000.

AMP Incorporated: See—

Corman, Ned E., 4,714,441, Cl. 439-842.000.

Koblitz, Francis F.; and Snyder, Lynn K., 4,714,801, Cl. 174-88.000.

AMSTED Industries Incorporated: See—

Crocket, Francis M., 4,714,557, Cl. 210-769.000.

Andernach, Dieterich; and Wurm, Manfred, to Dr. Johannes Heidenhain GmbH. Method for representing three dimensional structures. 4,714,920, Cl. 340-747.000.

Andersen, Keith D.: See—

Cagle, Larry L.; Andersen, Keith D.; and Lurvey, Victor E., 4,714,578, Cl. 264-255.000.

Anderson, Bjorn: See—

Lindgren, Hakan; and Anderson, Bjorn, 4,714,659, Cl. 428-685.000.

Anderson, Fred H. E.: See—

Schleimann-Jensen, Lars J.; and Anderson, Fred H. E., 4,714,214, Cl. 244-3.160.

Anderson, Mark S.; and Spector, George. Automatic choke shot gun. 4,713,904, Cl. 42-79.000.

Ando, Shimon, to Kabushiki Kaisha Advance Kaihatsu Kenkyujo. Transmission apparatus. 4,713,985, Cl. 74-804.000.

Andoh, Ikuhiro: See—

Miyazawa, Hideo; Andoh, Ikuhiro; Koyama, Hiromichi; and Kobayashi, Mitsuru, 4,714,306, Cl. 439-395.000.

Andre, Jean-Francois: See—

Abondance, Roger; Corbet, Pierre; Jodelet, Francois; and Andre, Jean-Francois, 4,714,267, Cl. 280-615.000.

Andrews, George E.; Davis, Paul C.; Farley, Dennis C.; Kravitz, Stanley H.; Meeker, Thrygve R.; Petersen, Owe G.; and Schelling, Arthur W., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Clock recovery and retiming scheme with saw filter phase trimming to achieve desired system phase adjustment. 4,715,049, Cl. 375-106.000.

Andrus, Bryan: See—

Kolomayets, George; Ryan, Allen; Nieto, Augustine; and Andrus, Bryan, 4,714,244, Cl. 272-72.000.

Angehrn, Jorg A.: See—

Chapman, Carroll W.; and Angehrn, Jorg A., 4,714,889, Cl. 324-366.000.

Anthony, Jack; Bilstad, Arnold C.; Leblong, Wayne T.; and Kruger, Robert J., to Baxter Travenol Laboratories, Inc. Tissue storage system. 4,714,595, Cl. 422-294.000.

Anthony, William H.: See—

Bernstein, Richard; Anthony, William H.; and Lupfer, David A., 4,714,905, Cl. 333-167.000.

Anzai, Shunju: See—

Fujiwara, Katsuyoshi; and Anzai, Shunju, 4,714,945, Cl. 355-69.000.

Apel, Karl-Hermann: See—

Keutgen, Franz; Kubon, Achim; Perings, Dieter; Stadler, Peter; Voss-Spieler, Peter; and Apel, Karl-Hermann, 4,714,105, Cl. 164-420.000.

Appleton, Gregory H.; and Mikel, Paul D., to Breakthru Industries, Inc. Weighing system for refuse trucks. 4,714,122, Cl. 177-139.000.

Aprica Kassai Kabushikikaisha: See—

Kassai, Kenzou, 4,714,141, Cl. 188-20.000.

Kassai, Kenzou, 4,714,261, Cl. 280-7.100.

Kassai, Kenzou, 4,714,292, Cl. 297-437.000.

Apsley Metals Limited: See—

McGlashen, James N., 4,714,099, Cl. 152-523.000.

AR-KAL Plastics Products Beit Zera (1973): See—

Tabor, Elhanan, 4,714,552, Cl. 210-329.000.

Arai, Kenji: See—

Kurihara, Kazumasa; and Arai, Kenji, 4,714,145, Cl. 192-0.052.

Arakawa, Masayasu: See—

Ohkuma, Kuniaki; Nakagawa, Reiji; Miyao, Hisao; Yoshimura, Shinichi; Suzuki, Toshio; Hayashi, Toyooki; Arakawa, Masayasu; and Koizumi, Hideharu, 4,714,397, Cl. 414-222.000.

Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; and Imura, Toru, to Nippon Oil & Fats Co., Ltd.; and Nippon Denso Co., Ltd. Method for producing amorphous alloy shaped articles. 4,713,871, Cl. 29-421.00E.

Archibald, G. Kent; and Slaker, Frank A., to Minnesota Mining and Manufacturing Company. Sequence valve for piggyback IV administration with tube reversal prevention. 4,714,463, Cl. 604-81.000.

Arizona Board of Regents: See—

Sirkis, Murray D., 4,714,810, Cl. 219-10.55M.

Arkles, Barry C., to Petrarch Systems Inc. Curable silicone semi-interpenetrating polymer networks and methods of making same. 4,714,739, Cl. 525-92.000.

Arlott, Colin: See—

Russell, Michael K.; and Arlott, Colin, 4,714,403, Cl. 415-107.000.

ARMO Gesellschaft fur Bauelemente, Bau- und Wohnbedarf GmbH: See—

Quante, Heinrich, 4,713,910, Cl. 49-49.000.

Arnold, Charles, Jr.; and Assink, Roger, to United States of America, Energy. Sulfonated polysulfone battery membrane for use in corrosive environments. 4,714,663, Cl. 429-101.000.

Artos Engineering Company: See—

Dusel, Robert O.; Keene, Harold J.; Berres, James; and Blaha, Gerald, 4,713,880, Cl. 29-564.400.

Arzenti, Thomas E.; and Pirl, William E., to Westinghouse Electric Corp. Gripper assembly. 4,714,289, Cl. 294-119.300.

Ascherl, Rudolf: See—

Lechner, Fritz; Heissler, Herbert; Scheer, Wolfgang; Siebels, Wolfgang; and Ascherl, Rudolf, 4,714,467, Cl. 623-16.000.

ASEA Aktiebolag: See—

Brogardh, Torgny; Hok, Bertil; and Ovren, Christer, 4,714,835, Cl. 250-486.100.

Schreurs, Emile; Joader, Stefan; and Valdemarsson, Stefan, 4,714,974, Cl. 361-12.000.

Assink, Roger: See—

Arnold, Charles, Jr.; and Assink, Roger, 4,714,663, Cl. 429-101.000.

Aster Associates: See—

Moore, Wayne E.; Quinn, Stephen R.; Tufts, Wesley M.; and Gasko, William F., 4,714,316, Cl. 350-96.200.

AT&T Information Systems Inc.: See—

Gartner, William J., 4,715,044, Cl. 375-8.000.

Atkins, Alan D.; Elliott, Kenneth; and Looms, John S. T., to Raychem Corporation. Stress control/insulating composite article with an outer surface having convolutions and electric power cable terminated therewith. 4,714,800, Cl. 174-73.00R.

Atlantic Richfield Company: See—

Dech, James A., 4,714,117, Cl. 166-380.000.

Atomic Energy of Canada, Limited: See—

Shubaly, Murray R., 4,714,834, Cl. 250-427.000.

Auburn International, Inc.: See—

Dechene, Ronald L.; and Newton, Robert E., 4,714,890, Cl. 324-454.000.

Aufderheide, Brian E., to W. H. Brady Co. Rapidly removable undercoating for vacuum deposition of patterned layers onto substrates. 4,714,631, Cl. 427-250.000.

Augat Inc.: See—

Walkup, William B., 4,714,442, Cl. 439-844.000.

Auracher, Franz, to Siemens Aktiengesellschaft. Controllable integrated optical component. 4,714,311, Cl. 350-96.110.

Automatic Connector, Inc.: See—

Huggins, Richard A., 4,714,432, Cl. 439-271.000.

Automatic Safety Products: See—

Boe, Richard A., 4,714,914, Cl. 340-573.000.

Auwerda, Cornelis P.; Geittner, Peter E. E.; and Lydtin, Hans-Jurgen, to U.S. Philips Corporation. Method of and device for coating the inside of tubes. 4,714,589, Cl. 427-39.000.

AVCO Everett Research Laboratory, Inc.: See—

Rokni, Mordechai; and Flusberg, Allen M., 4,714,902, Cl. 332-7.510.

Avedesian, Michael M., to Domtar Inc. Apparatus and method involving supercritical fluid extraction. 4,714,591, Cl. 422-140.000.

Averill, Robert G.; Khowaylo, Alex; and Sidebotham, Christopher G., to Osteonics Corp. Knee prosthesis with accommodation for angular misalignment. 4,714,472, Cl. 623-20.000.

Avery International Corporation: See—

Bordoloi, Binoy K.; Ozari, Yehuda; and Dever, Gerald R., 4,714,655, Cl. 428-345.000.

Axis S.p.A.: See—

Santandrea, Luciano; and Luciani, Sabatino, 4,713,883, Cl. 29-736.000.

Aziasekiyu Kabushiki Kaisha: See—

Matsumura, Tetsuo; Ohzawa, Toshio; Kawashima, Akihiro; Ohkuma, Osamu; Sawada, Saburo; Yanai, Shun'ichi; Yoshimura, Hiroshi; and Sugino, Yasuo, 4,714,543, Cl. 208-412.000.

B. F. Goodrich Company: See—

Hillstrom, David U.; and Cope, Dennis R., 4,714,220, Cl. 248-160.000.

Stevenson, Hildreth W., 4,714,637, Cl. 428-35.000.

B&G Plastics, Inc.: See—

Kolton, Chester; and Spater, Stuart S., 4,714,156, Cl. 206-296.000.

Baba, Saburo: See—

Obayashi, Tsutomu; Ino, Kazuhide; Hiraoka, Yoshiji; and Baba, Saburo, 4,714,650, Cl. 428-265.000.

Baba, Takeshi: See—

Usui, Masayuki; Imataki, Hiroyuki; Serizawa, Takashi; Baba, Takeshi; and Nose, Hiroyasu, 4,714,326, Cl. 350-485.000.

Babcock & Wilcox Company, The: See—

Fidler, Fredrick H.; and Lowe, Thomas B., 4,714,072, Cl. 126-1.00F.

Bachel, Ernst; and Giebel, Wolfgang, to Siemens Aktiengesellschaft. Longitudinally divided sleeve of shrinkable material. 4,714,277, Cl. 285-39.000.

Bacher, Michel: See—

Alas, Jacques; and Bacher, Michel, 4,714,148, Cl. 192-107.00C.

Bachhofer, Bruno; and Locher, Anton. 5/2-Way commutating valve, particularly for reverse-flush filters. 4,714,551, Cl. 210-278.000.

Bachner, George, to Nimco Corporation. Stacking tab for tapered container. 4,714,164, Cl. 206-518.000.

Back, Sigurd; and Nyqvist, Jan-Olof, to Nobel Kemi AB. Method for the manufacture of composite explosives. 4,714,572, Cl. 264-3.400.

Bacou, Claude; Baptiste, Rene; Feissel, Henri; Takats, Gilbert; and Cabrol, Christian, to Bull S.A. (Societe Anonyme). Optoelectric transducer. 4,714,828, Cl. 250-214.00C.

Bailey, John W.; Hayter, Paul A.; Mason, Brian R.; and Turner, Graham N., to Mars, Inc. Printed circuit board fault location system. 4,714,875, Cl. 324-73.00C.

Bajger, Teddy A.; Bunker, Neall H.; Cochran, James L.; Duane, Willis J.; and Mojica, Arturo, to International Business Machines Corporation. Continuous form feeder for a reproducing machine and process. 4,714,946, Cl. 355-75.000.

Baka, Kathleen J.: See—

Kozlowski, Thomas A.; Lindstrom, Robert O.; Loughrin, Thomas D.; and Baka, Kathleen J., 4,714,181, Cl. 222-480.000.

Baker, Glen; Chau, Albert W.; and Mercer, John E., to FlowMole Corporation. Technique for steering and monitoring the orientation of a powered underground boring device. 4,714,118, Cl. 175-26.000.

Balduff, Dennis C.; and Jabarin, Saleh A., to Owens-Illinois Plastic Products Inc. Degradable polymer composition. 4,714,741, Cl. 525-185.000.

Bally Manufacturing Corporation: See—

Kolomayets, George; Ryan, Allen; Nieto, Augustine; and Andrus, Bryan, 4,714,244, Cl. 272-72.000.

Ban, Amir: See—

Paltiel, Zvi; and Ban, Amir, 4,714,885, Cl. 324-312.000.

Banbury, John R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Display systems. 4,714,320, Cl. 350-174.000.

Bancroft, Joseph C., to Croft Metals, Inc. Hinge pin. 4,713,861, Cl. 16-222.000.

Bandera, Gianluigi, to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Helicopter with a turbine power unit fitted with an exhaust screening device. 4,713,933, Cl. 60-39.500.

Banerjee, Chandra K.; Farrier, Ernest G.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., to R. J. Reynolds Tobacco Company. Smoking article. 4,714,082, Cl. 131-359.000.

Baptiste, Rene: See—

Bacou, Claude; Baptiste, Rene; Feissel, Henri; Takats, Gilbert; and Cabrol, Christian, 4,714,828, Cl. 250-214.00C.

Barbee Co., Inc.: See—

Barbee, Tom D.; and Ufheil, James, 4,714,558, Cl. 210-776.000.

Barbee, Tom D.; and Ufheil, James, to Barbee Co., Inc., The. Wastewater treatment system. 4,714,558, Cl. 210-776.000.

Barber, Dennis R.; Dells, Larry M.; and Burk, Ronnie F., to Deere & Company. Motor seal protector valve. 4,713,936, Cl. 60-403.000.

Barker, Barbara A.; and Hernandez, Irene H., to International Business Machines Corporation. Window view control. 4,714,918, Cl. 340-724.000.

Barlow, Gordon A., to Gordon Barlow Design. Antester game. 4,714,249, Cl. 273-1.00G.

Barnett, Joseph A.; Gomez, Joseph M.; Green, William F.; Lisica, Vincent M.; and Rosenthal, Arnold B., to International Business Machines Corporation. Plural robotic drive. 4,714,400, Cl. 414-751.000.

Barrat, Christian R.: See—

Wevers, Jean; Barrat, Christian R.; and Hardy, Frederick E., 4,714,565, Cl. 252-174.190.

Barriquand: See—

Gilfaut, Jean-Pierre; Peze, Andre; Ravillard, Jean-Paul; and Thevenet, Jean-Claude, 4,714,052, Cl. 122-149.000.

Barry, John J., to Pyramid Industries, Inc. Heat pump system. 4,714,108, Cl. 165-45.000.

Barry Wright Corporation: See—

Chin, Laurence D.; Hiscock, Christopher J.; and Domeier, Wayne H., 4,714,865, Cl. 318-563.000.

Bartha, Istvan V.: See—

Idegren, Gustav L.; Gyllstal, Lars-Goran L.; and Bartha, Istvan V., 4,714,029, Cl. 109-45.000.

Bartholomew, Roy E.: See—

Koenig, James P.; Knight, David J.; Szudy, James E.; Bartholomew, Roy E.; and Wurst, William R., 4,714,483, Cl. 55-163.000.

Bartlett, David, to EMX International Limited. Loop data link. 4,714,925, Cl. 340-825.550.

Bartolo, William; Boillot, Louis; Challande, Rene; De Robertis, Patrick; Duchenaud, Jacky; and Ramaciotti, Jean-Claude, to Merlin

Gerin. Miniature electrical circuit breaker with multiple moving contacts and thermomagnetic trip release. 4,714,907, Cl. 335-45.000.

BASF Aktiengesellschaft: See—

Horn, Peter; Baumann, Edwin; and Marx, Matthias, 4,714,718, Cl. 521-134.000.

McAliley, J. Eugene; Daumit, Gene P.; Ethridge, Frederick A.; and Crozier, James R., Jr., 4,714,642, Cl. 428-113.000.

Schornick, Gunnar; Elzer, Albert; and Hofmann, Reiner, 4,714,751, Cl. 528-103.000.

Wuesi, Hans-Heiner; Janssen, Bernd; Frickel, Fritz-Frieder; and Nuerrenbach, Axel, 4,714,786, Cl. 568-633.000.

Bashford, David P.: See—

Denison, Samuel J. M.; and Bashford, David P., 4,714,409, Cl. 416-134.00A.

Batt, Gregory L.: See—

Hatton, John H.; and Batt, Gregory L., 4,714,140, Cl. 180-20.000.

Baudrant, Annie; and Marty, Michel, to Societe pour d'Etude et la Fabrication de Circuits Integres Speciaux EFCS. Integrated circuit device which includes a continuous layer which consists of conducting portions which are of a silicide of a refractory metal and insulating portions which are of an oxide of the metal. 4,714,951, Cl. 357-67.000.

Baumann, Edwin: See—

Horn, Peter; Baumann, Edwin; and Marx, Matthias, 4,714,718, Cl. 521-134.000.

Baus, Heinz G. Coupling assembly for joining two profiled rails. 4,714,367, Cl. 403-104.000.

Baxter Travenol Laboratories, Inc.: See—

Anthony, Jack; Bilstad, Arnold C.; Leblong, Wayne T.; and Kruger, Robert J., 4,714,595, Cl. 422-294.000.

Hsu, Li-Chien; and Heitzmann, Hal, 4,714,770, Cl. 556-419.000.

Bayer Aktiengesellschaft: See—

Bender, Wolfgang; Mrotzek, Dieter; Koglin, Bernd; and Steiner, Karl-Heinz, 4,714,456, Cl. 494-36.000.

Boden, Heinrich; and Schneider, Walter, 4,714,579, Cl. 264-328.600.

Hurnik, Helmut; Finzenhagen, Manfred; and Jeblick, Werner, 4,714,568, Cl. 252-350.000.

Morris, David B.; Rollett, Andrew C.; and Roberts, Donald M., 4,714,177, Cl. 222-58.000.

Reinehr, Ulrich; Hirsch, Rolf-Burkhard; Dross, Joachim; and Jungverdorben, Hermann-Josef, 4,714,045, Cl. 118-420.000.

Serini, Volker; Freitag, Dieter; and Rathmann, Dietrich, 4,714,746, Cl. 525-439.000.

Stammann, Gunter; Kricsfalussy, Zoltan; Waldmann, Helmut; Schneider, Joachim; and Medem, Harald, 4,714,689, Cl. 502-54.000.

Bayer, Oswald; Grehn, Martin; and Planek, Werner, to FAG Kugelfischer Georg Schafer (KGaA). Cage for lipless roller bearings. 4,714,358, Cl. 384-470.000.

Bazeley, Graham A.: See—

Mather, Graham W.; Warwick, Graham R.; and Bazeley, Graham A., 4,714,268, Cl. 280-646.000.

BBC Brown, Boveri & Company, Limited: See—

Buhler, Karl; and Menth, Anton, 4,715,041, Cl. 373-72.000.

Beauchamp, Lilia M., to Burroughs Wellcome Co. Antiviral compounds. 4,714,701, Cl. 514-258.000.

Becherer, Johannes; Handte, Reinhardt; Nestler, Hans J.; and Kusmaul, Ulrich, to Cassella Aktiengesellschaft. Process for the preparation of 2-chlorobenzoxazoles. 4,714,766, Cl. 548-217.000.

Beck, Siegfried: See—

Gassmann, Heiner; Beck, Siegfried; and Heinlein, Werner, 4,714,278, Cl. 285-169.000.

Becker, Edmund H.: See—

Pollick, Raymond L.; Tamburrino, Kenneth D.; and Becker, Edmund H., 4,714,103, Cl. 164-486.000.

Becker, Manfred: See—

Henklein, Peter; Becker, Manfred; Buttner, Werner; Loth, Fritz; Dautzenberg, Horts; Forner, Klaus; Dolling, Rudolf; Graul, Karl-Heinz; Halatsch, Wolf-Rainer; and Rupprich, Christian, 4,714,768, Cl. 548-435.000.

Becker, Reinhard: See—

Urbach, Hansjorg; Henning, Rainer; Teetz, Volker; and Becker, Reinhard, 4,714,708, Cl. 514-412.000.

Becton, Dickinson and Company: See—

Gabel, Jonathan B., 4,714,461, Cl. 604-53.000.

Bell, Randy L.; and Moore, George G. I., to Riker Laboratories, Inc. Antiallergic agents. 4,714,776, Cl. 562-460.000.

Bell, Robert L.; and Dillon, Joseph J., to Rappel Rescue Systems, Inc. Rappel rescue system. 4,714,135, Cl. 182-6.000.

Bell, Weldon K.; and Haag, Werner O., to Mobil Oil Corporation. Production of ethers from linear olefins. 4,714,787, Cl. 568-697.000.

Bellis, Kenneth E.; Brown, Jackson E.; and Nagarwalla, Pheroze J., to Roberts Corporation. Method and apparatus for changing a mold box on a molding machine. 4,714,100, Cl. 164-18.000.

Bender, Wolfgang; Mrotzek, Dieter; Koglin, Bernd; and Steiner, Karl-Heinz, to Bayer Aktiengesellschaft. Solid bowl centrifuge with terminal clarification device. 4,714,456, Cl. 494-36.000.

Bennett, Marc: See—

Berry, Craig; and Bennett, Marc, 4,714,084, Cl. 132-88.700.

Bennett, Richard. Tool for coupling sections of air conditioning ducts. 4,713,959, Cl. 72-410.000.

Bennett, Robert, to RJS Industries Inc. Dispenser of articles. 4,714,160, Cl. 206-385.000.

Bennett, Terry A.; and Carino, James E., to PPG Industries, Inc. Vacuum press construction. 4,714,489, Cl. 65-104.000.

- Bennett, William R., to Gould Inc. Power module assembly of electrochemical cells. 4,714,662, Cl. 429-27.000.
- Bente, H. Bryan; Herman, Alan C.; Myerson, Joel; Shaw, Benjamin G.; and Stefanski, Andrew, to Hewlett-Packard Company. Fluid proportioning pump system. 4,714,545, Cl. 210-101.000.
- Benuzzi, Gino, deceased; and by Benuzzi, Piergiorgio, heir-at-law. Lifting platform for panels and method of operation thereof. 4,714,395, Cl. 414-114.000.
- Benuzzi, Piergiorgio, heir-at-law: See—
Benuzzi, Gino, deceased; and Benuzzi, Piergiorgio, heir-at-law, 4,714,395, Cl. 414-114.000.
- Berge, Cynthia A.: See—
Kajs, Theresa M.; and Berge, Cynthia A., 4,714,563, Cl. 252-107.000.
- Bergner, Arndt, to Hilti Aktiengesellschaft. Expansion anchor assembly. 4,714,391, Cl. 411-54.000.
- Bernard, Gilbert; Breden, Emile; and Lonardi, Emile. Process for controlling the charging of a shaft furnace. 4,714,396, Cl. 414-161.000.
- Bernstein, Richard; Anthony, William H.; and Lupfer, David A., to K & L Microwave. SMC filter and method of manufacture thereof. 4,714,905, Cl. 333-167.000.
- Berres, James: See—
Dusel, Robert O.; Keene, Harold J.; Berres, James; and Blaha, Gerald, 4,713,880, Cl. 29-564.400.
- Berry, Craig; and Bennett, Marc. Method and apparatus for simultaneously applying and blending make-up in one step. 4,714,084, Cl. 132-88.700.
- Bertram, Leo; and Schemmann, Hugo, to U.S. Philips Corporation. Single-phase synchronous motor comprising a two-pole permanent-magnet rotor. 4,714,851, Cl. 310-156.000.
- Betts, Kenneth H., to Construction Specialties Limited. Panel laying machine. 4,714,393, Cl. 414-10.000.
- Bianchi, Claude; Fournier, Yves; and Jacquien, Paul, to Framatome. Device for compressing by hammering a tube of a steam generator set in a tube plate. 4,713,882, Cl. 29-727.000.
- BICC Public Limited Company: See—
Allard, Vincent L., 4,714,209, Cl. 242-25.00R.
Williams, Ronald D., 4,714,438, Cl. 439-610.000.
- Biermeier, Johann; and Brand, Wilhelm, to Siemens Aktiengesellschaft. Housing for a magnetic disk memory having a disk pack seat at opposite sides of the disk pack. 4,714,972, Cl. 360-97.000.
- Billings, Roger E. Functionally structured distributed data processing system. 4,714,989, Cl. 364-200.000.
- Bilstad, Arnold C.: See—
Anthony, Jack; Bilstad, Arnold C.; Leblong, Wayne T.; and Kruger, Robert J., 4,714,595, Cl. 422-294.000.
- Binzen, Willard; and Catan, Robert S., to Dravo Corporation. Dust containment system for bulk cargo containers. 4,714,097, Cl. 141-5.000.
- Bischofberger, Jurg; and Feige, Manfred, to Rieter Machine Works, Ltd. Device for transporting cans. 4,714,153, Cl. 198-457.000.
- Bischoff, Gene L.; and Elly, James E., to Eastman Kodak Company. Method and apparatus for erasing a signal recorded on a magnetic disk. 4,714,969, Cl. 360-66.000.
- Bizjak, John F., to Eastman Kodak Company. Binarly related variable rate recorder. 4,714,967, Cl. 360-48.000.
- Blaha, Gerald: See—
Dusel, Robert O.; Keene, Harold J.; Berres, James; and Blaha, Gerald, 4,713,880, Cl. 29-564.400.
- Blair, Ronald B., to Mobil Oil Corporation. OBC location system. 4,715,018, Cl. 367-19.000.
- Blaushild, Ronald M., to United States of America, Energy. Self-adjustable supplemental support system for a cylindrical container in a housing. 4,714,228, Cl. 248-608.000.
- Bleck, Norris E.: See—
Meeker, Gregory W.; Bleck, Norris E.; Rizzi, Marc A.; and Irick, Carl M., 4,714,422, Cl. 425-204.000.
- Bloebaum, Roy D., to Harrington Arthritis Research Center. Knee prosthesis. 4,714,473, Cl. 623-20.000.
- Blot, Gerard, to Essilor International Cie Generale d'Optique. Bearing ring for fixing a mounting block on the progressively variable curved finished face of a semi-finished lens or mold blank. 4,714,232, Cl. 249-90.000.
- Blumenau, Leif: See—
Rappaport, Michael L.; and Blumenau, Leif, 4,713,945, Cl. 62-514.00R.
- BMP: See—
Holz, Gary L.; and Foster, Walter M., 4,714,958, Cl. 358-166.000.
- Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, The: See—
Krul, William R., 4,714,679, Cl. 435-240.480.
- Board of Regents, The University of Texas System Cancer Center, The: See—
Reading, Christopher L., 4,714,681, Cl. 435-240.270.
- BOC Group plc, The: See—
Sampson, David C., 4,714,090, Cl. 137-636.000.
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- Brammer, Norman, to Vetco Gray Inc. Weight/pressure set pack-off for subsea wellhead systems. 4,714,111, Cl. 166-182.000.
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- Briggs, Paul C.; and Gosiowski, Donald E., to Illinois Tool Works Inc. Acid modified adhesive compositions. 4,714,730, Cl. 524-321.000.
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Jupp, Jeffrey A.; and Rees, Peter H., 4,714,215, Cl. 244-199.000.
- British Aerospace Public Limited Company: See—
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- Brooks, Raymond E., Jr., to Hardwood Lighting Designs Corp. Ceiling dome. 4,713,916, Cl. 52-39.000.
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- Brown, John E. Non-toxic shot. 4,714,023, Cl. 102-516.000.
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- Buford, John T., to Sundstrand Corporation. Power source utilizing encapsulated lithium pellets and method of making such pellets. 4,714,051, Cl. 122-21.000.
- Buhler, Karl; and Menth, Anton, to BBC Brown, Boveri & Company, Limited. Bath electrode for pot furnace. 4,715,041, Cl. 373-72.000.
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- Bull, Timothy B. H.; and Wahl, Raymond C., to Loram Maintenance of Way, Inc. Railroad mounted trench digger. 4,713,898, Cl. 37-96.000.
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- Bunshah, Roitan F.: See—
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- Burckhalter, Joseph H. Method of inhibiting herpetic lesions. 4,714,703, Cl. 514-274.000.
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- Burk, Ronnie F.: See—
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- Burroughs Wellcome Co.: See—
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- Burstein, Albert H.: See—
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- Calderon, Reynaldo. Methods and systems for retrograde perfusion in the body for curing it of the disease or immune deficiency. 4,714,460, Cl. 604-28.000.

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- Canadian Patents And Development Limited: See—
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- Muto, Kazuhiko, 4,714,844, Cl. 307-494.000.
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- Sasaki, Takashi, 4,714,964, Cl. 358-298.000.
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- Chevron Research Company: See—
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- Chikasue, Hideo; to Yazaki Corporation. Cross-coil type indicating instrument. 4,715,043, Cl. 374-184.000.
- Chimowitz, Eldred: See—
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- Chin, Aland K.: See—
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- Chin, Laurence D.; Hiscock, Christopher J.; and Domeier, Wayne H.; to Barry Wright Corporation. Overload protection device. 4,714,865, Cl. 318-563.000.
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- Cho, Myung H. Pivotal skipping rope handles having spring resistance. 4,714,245, Cl. 272-75.000.
- Choay, Patrick: See—
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- Christy, Mark R.; and Ecker, Ernest L.; to Dow Chemical Company. The Ultraviolet light-stable ignition resistant thermoplastic molding compositions. 4,714,729, Cl. 524-281.000.
- Chrysler Motors Corporation: See—
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- Chuang, Jo-Yu: See—
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- Chung, Shine C.; to Advanced Micro Devices, Inc. Control circuit for disabling or enabling the provision of redundancy. 4,714,839, Cl. 307-441.000.
- Ciba-Geigy Corporation: See—
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- Cifrese, Ralph: See—
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- Cioffi, Victor E.; to Nabisco Brands, Inc. Modular wall system. 4,713,918, Cl. 52-221.000.
- Civin, Curt I.; to Johns Hopkins University. The Human stem cells. 4,714,680, Cl. 435-240.250.
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- Claessens, Albertus M. G.; to NCR Corporation. Adaptive hybrid circuit. 4,715,064, Cl. 379-392.000.
- Clairel Incorporated: See—
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- Clark, Gregory J.; Chaudhari, Praveen; Cuomo, Jerome J.; Frisch, Margaret A.; and Speidell, James L.; to International Business Machines. Spherical retarding grid analyzer. 4,714,831, Cl. 250-305.000.
- Clark, Michael J.; to M-O Valve Company Limited. The Magnetrons. 4,714,859, Cl. 315-39.670.
- Clausen, Eivind; to Allsop, Inc. Apparatus for cleaning digital audio discs. 4,713,856, Cl. 15-97.00R.
- Cleland, Terry P. Percussion musical instrument drum-head skin tensioning assembly and drum shell construction therefor. 4,714,002, Cl. 84-413.000.
- CM & E/California, Inc.: See—
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- Coers, Don H.; to CBI Industries, Inc. Tank liquid interface separation deck with leveling lines. 4,714,175, Cl. 220-216.000.
- Cohen, Robert K. Quadrature phase signal processor. 4,714,913, Cl. 340-347.00P.
- Cole, David M.; to Tread Corporation. Security cabinet with disguised electronic control panel. 4,714,030, Cl. 109-61.000.
- Cole, Martin T. Optical smoke detectors. 4,714,347, Cl. 356-339.000.
- Coleman, James A.; to Xerox Corporation. Power supply for a.c. corotrons. 4,714,978, Cl. 361-235.000.
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- Colgate-Palmolive Company: See—
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- Colite Industries, Inc.: See—
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- Colman, Bernard. Adjustable mold for the manufacture of concrete elements such as staircases. 4,714,231, Cl. 249-14.000.
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- Colony Services Inc.: See—
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- Colorado State University: See—
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- Colt Industries Operating Corp.: See—
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- Columbia University, Trustees of: See—
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- Colvin, Howard A.; Cottman, Kirkwood S.; and Parker, Dane K.; to Goodyear Tire & Rubber Company. The Functionalized monomers from 1-(1-isocyanato-1-methylethyl)-3 or 4-(1-methylethyl) benzene. 4,714,772, Cl. 558-240.000.
- Colwell, Terance C.: See—
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- Combustion Engineering, Inc.: See—
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- Commercial Aluminum Cookware Company: See—
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- Giroud, Anne-Marie, 4,714,775, Cl. 560-194.000.
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- Comstock, Robert J.; and Sabol, George P.; to Westinghouse Electric Corp. Method for monitoring the crystallographic texture of metallic tubes by use of X-ray diffraction. 4,715,053, Cl. 378-73.000.
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- Consolidation Coal Co.: See—
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- Construction Specialties Limited: See—
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- Contitronix Inc.: See—
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- Cook, Charles. Rear view mirror with day/night setting and adjustable panoramic view. 4,714,322, Cl. 350-281.000.
- Cook, David C.; to Cook, Thomas O., a part interest. Ball bat. 4,714,251, Cl. 273-72.00R.
- Cook, Jack E.: See—
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- Cook, Kenneth: See—
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- Cook, Thomas O.: See—
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- Cooper-Hart, Michael A.; Emmons, Lawrence D.; Mackley, James S.; and Stokes, David H.; to Luma Telecom, Inc. Conversational video phone. 4,715,059, Cl. 379-53.000.
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- Holleran, Louis M.; and Martin, Francis W., 4,714,687, Cl. 501-9.000.
- Powers, Dale R., 4,714,488, Cl. 65-13.000.
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- Costruzioni Aeronautiche Giovanni Agusta S.p.A.: See—
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- Coutarel, Alain. Apparatus to maneuver cables or conduits passing over a direction changer. 4,714,380, Cl. 405-168.000.
- Couture, Michael V.: See—
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- Covert, Charles H.; Gifford, William E.; Kemler, Craig G.; and Pad-dock, Gordon R., to General Motors Corporation. Fuel vapor storage canister. 4,714,485, Cl. 55-189.000.
- Cox, John C.; Morgan, Stephen E.; Hamblett, Martin; and Rubini, Alfred, to Rolls-Royce plc. Aerofoil section members for turbine engines. 4,714,407, Cl. 415-192.000.
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- Crawford, Carl R.; and Freundlich, David A., to Elscint Incorporated. Data reduction in reprojection systems. 4,714,997, Cl. 364-414.000.
- Crawford, Robert D.; Johnson, Wayne J.; Kimber, Theo, Jr.; Nollf, Douglas; Volk, Jack R.; and Franks, Donald C., to Ford Motor Company. Vehicular data transfer communication system. 4,715,031, Cl. 370-85.000.
- Cremer, Heinz P.; Wolsiefer, Harald; Hoffmann, Manfred; Deegener, Elmar; and Franzmann, Gunter, to Keiper Recaro GmbH & Co. Hinge fitting. 4,713,986, Cl. 74-805.000.
- Creswell, Paul J.: See—
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- Creutz, Walter; Dahlhaus, Peter; and Hofmann, Heinz, to Hoesch Aktiengesellschaft. Track spike with a single or double shaft. 4,714,195, Cl. 238-349.000.
- Cripps, Martin D.; and Field, Anthony J., to National Research Development Corporation. Interconnection networks. 4,714,922, Cl. 340-825.000.
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- Crocket, Francis M., to AMSTED Industries Incorporated. Pressure filter cake-breaking method and apparatus. 4,714,557, Cl. 210-769.000.
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- Crozier, James R., Jr.: See—
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- Custeau, Lincoln. Exhaust pipe coupler. 4,714,279, Cl. 285-239.000.
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- Cytocolor Incorporated: See—
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- Daiel Chemical Industries, Ltd.: See—
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- Daimler-Benz Aktiengesellschaft: See—
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- Woerner, Guenter; Tschepplak, Ernst; and Moser, Franz, 4,714,449, Cl. 464-68.000.
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- Dainippon Screen Mfg. Co., Ltd.: See—
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- Davidson, Eldon F. Digital averaging filter particularly suited for use with air navigation receivers. 4,714,929, Cl. 342-439.000.
- Davis, Benjamin L.; Dixon, Joseph M.; and Page, Nicholas D., to Mobil Oil Corporation. Method for treating aggregate materials with wax and compositions thereof with bitumen for road surfaces. 4,714,629, Cl. 427-138.000.
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- De Antoniis, Mario; Fiorini, Mario; and Mazzamurro, Giuseppina, to Eniricerche S.p.A. Process for the synthesis of organofunctional silanes using isatoic anhydride or derivatives thereof. 4,714,769, Cl. 556-419.000.
- Dech, James A., to Atlantic Richfield Company. Drainhole well completion. 4,714,117, Cl. 166-380.000.
- Dechene, Ronald L.; and Newton, Robert E., to Auburn International, Inc. Flow measuring apparatus with analog, essentially linear output. 4,714,890, Cl. 324-454.000.
- Deegener, Elmar: See—
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- Deem, Jake O.; Kassik, Ronald W.; and Metteer, N. Bruce, to Motorola, Inc. Extremely accurate automatic frequency control circuit and method therefor. 4,715,001, Cl. 364-484.000.
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- Holm, David R.; and Peterson, Rudolph A., Jr., 4,714,227, Cl. 248-595.000.
- Lange, Ronald W.; Reynolds, David F.; Lolley, David R.; and Freeman, Gary L., 4,713,881, Cl. 29-724.000.
- Neumeyer, Lowell H., 4,714,033, Cl. 111-85.000.
- Rohwedder, Helmut, 4,714,398, Cl. 414-503.000.
- Zahn, Werner, 4,713,981, Cl. 74-479.000.
- Degussa Aktiengesellschaft: See—
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- DeHart, Marvin L.; and Johnson, Dale B., to Philips Industries Inc. Ceiling air diffuser. 4,714,009, Cl. 98-40.130.
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- Delbosse, Andre: See—
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- Delfs, Larry M.: See—
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- Delgoffe, Jean-Claude; Lobmann, Michele; and Zygraich, Nathan, to SmithKline-RIT. Temperature sensitive strain of bovine viral diarrhoea virus. 4,714,678, Cl. 435-235.000.

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- Denison, Samuel J. M.; and Bashford, David P., to Westland plc. Helicopter rotor. 4,714,409, Cl. 416-134.00A.
- Denizou, Jean-Pierre, to Fragma. Actuating device for linearly moving a cluster of control elements in a nuclear reactor. 4,714,582, Cl. 376-233.000.
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- Design Components Incorporated: See—
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- Desvard, Alain: See—
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- Desyllas, Peter L. L.; and Holt, Nicholas P., to International Computers Limited. Data storage apparatus. 4,714,990, Cl. 364-200.000.
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- Deuterium Corporation: See—
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- Deutsch, Ralph, to-Kawai Musical Instrument Mfg. Co., Ltd. Dual mode musical tone generator using stored musical waveforms. 4,713,997, Cl. 84-1.220.
- Deutsche Vortex GmbH: See—
Kuhl, Hans-Dieter; and Schmidt, Hans-Dieter, 4,714,484, Cl. 55-170.000.
- Deutscher, Anneliese, heir: See—
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- Deutscher, Klaus, deceased: See—
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- Dever, Gerald R.: See—
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- Devine, Thomas M., Jr., to General Electric Company. Composite rotary anode for X-ray tube and process for preparing the composite. 4,715,055, Cl. 378-144.000.
- DFC New Zealand Limited: See—
Buckle, Ian G.; and Michael, John P., 4,713,917, Cl. 52-167.000.
- Diamond Publishing: See—
Engel, James E.; and Diamond, Sidney, 4,714,275, Cl. 281-15.00R.
- Diamond, Sidney: See—
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- Dickinson, Norman L., to Dipac Associates. Pollution-free pressurized combustion utilizing a controlled concentration of water vapor. 4,714,032, Cl. 110-347.000.
- DiDomenico, Robert A., to Intermedics Infusaid, Inc. Positive pressure programmable infusion pump. 4,714,462, Cl. 604-67.000.
- Diel, Robert L.: See—
Skinner, Jerald P.; Zlotky, Richard A.; and Diel, Robert L., 4,714,225, Cl. 248-523.000.
- Diesel Kiki Co., Ltd.: See—
Kurihara, Kazumasa; and Arai, Kenji, 4,714,145, Cl. 192-0.052.
- Digital Equipment Corporation: See—
Oakes, Alan E., 4,715,036, Cl. 371-37.000.
- Dignan, Donald J., to Eastern Company, The. Clamping type cabinet lock. 4,714,283, Cl. 292-48.000.
- Di Leo, Vincenzo. Filtering case for separating a liquid from a solid, in particular for dehydrating slurries from industrial processes. 4,714,549, Cl. 210-224.000.
- Dillon, Joseph J.: See—
Bell, Robert L.; and Dillon, Joseph J., 4,714,135, Cl. 182-6.000.
- Di Mino, Alfonso; and Di Mino, Andre, to ADM Tronics Unlimited, Inc. Technique for treating manufactured thick film resistors. 4,714,911, Cl. 338-195.000.
- Di Mino, Andre: See—
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- DiMonte, Michael J.: See—
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- Dinizio, Stephen E.: See—
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- Dipac Associates: See—
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- Distaffen, Patsy S. Fishing lure of the spoon type. 4,713,906, Cl. 43-42.500.
- Dittert, Karen K., to Exxon Production Research Co. Method for filtering and combining seismic data having different spectral characteristics. 4,715,021, Cl. 367-41.000.
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Burgoyne, William F., Jr.; and Dixon, Dale D., 4,714,778, Cl. 564-305.000.
- Dixon, Joseph M.: See—
Davis, Benjamin L.; Dixon, Joseph M.; and Page, Nicholas D., 4,714,629, Cl. 427-138.000.
- Do-All Jewelry Mfg. Co., Inc.: See—
Geldwerth, Simon, 4,713,865, Cl. 24-616.000.
- Dobias, Bohuslav: See—
von Rybinski, Wolfgang; Tesmann, Holger; and Dobias, Bohuslav, 4,714,544, Cl. 209-167.000.
- Dr. Ing. h.c.F. Porsche Aktiengesellschaft: See—
Mueller, Robert, 4,714,129, Cl. 180-248.000.
- Szodfridt, Imre; and Knoblauch, Richard, 4,714,147, Cl. 192-87.150.
- Wichart, Klaus, 4,714,057, Cl. 123-90.150.
- Dr. Johannes Heidenhain GmbH: See—
Andernach, Dieterich; and Wurm, Manfred, 4,714,920, Cl. 340-747.000.
- Huber, Erich, 4,714,349, Cl. 356-374.000.
- Dr. Karl Thomae GmbH: See—
Roch, Josef; Heckel, Armin; Nickl, Josef; Muller, Erich; Narr, Berthold; Zimmermann, Rainer; and Weisenberger, Johannes, 4,714,698, Cl. 514-212.000.
- Dohzono, Masatake; Miyashita, Iwao; and Abe, Norihiro, to Kao Corporation. Absorbent member for tampon. 4,714,466, Cl. 604-378.000.
- Dolling, Rudolf: See—
Henklein, Peter; Becker, Manfred; Buttner, Werner; Loth, Fritz; Dautzenberg, Horts; Forner, Klaus; Dolling, Rudolf; Graul, Karl-Heinz; Halatsch, Wolf-Rainer; and Rupprich, Christian, 4,714,768, Cl. 548-435.000.
- Domeier, Wayne H.: See—
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- Domen, Jean-Paul. Globe maps and derived products. 4,714,351, Cl. 368-17.000.
- Domino Printing Sciences PLC.: See—
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- Domovs, Jean R.; and Rice, Willard H., to Domovs, Jean R. Hygienic wheelchair seat for extended use. 4,713,848, Cl. 4-480.000.
- Domtar Inc.: See—
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- Dona, Marinus J. J.: See—
Koster, Marinus P.; Soemers, Hermanus M. J. R.; and Dona, Marinus J. J., 4,713,977, Cl. 74-191.000.
- Dormehl, Erich, to Heyligenstaedt & Comp. Werkzeugmaschinenfabrik GmbH. Tool changer. 4,713,875, Cl. 29-568.000.
- Dorr-Oliver Incorporated: See—
McCoy, Daniel E.; Garver, Donald L.; and Hileman, George, 4,714,049, Cl. 122-4.00D.
- Dow Chemical Company, The: See—
Christy, Mark R.; and Ecker, Ernest L., 4,714,729, Cl. 524-281.000.
- Graham, Stephen L.; and Plunkett, David O., 4,714,728, Cl. 524-272.000.
- Juhl, Roger L.; Potter, James L.; and Polemenakos, Sotiros C., 4,714,736, Cl. 524-608.000.
- Liu, Ming-Biann, 4,714,771, Cl. 558-102.000.
- Najvar, Daniel J.; Pope, Brian G.; and Loeffler, Norman R., 4,714,722, Cl. 523-218.000.
- Olson, Robert S., 4,714,604, Cl. 423-488.000.
- Park, Chung P., 4,714,716, Cl. 521-80.000.
- Rubens, Louis C.; and Alexander, Willard E., 4,713,927, Cl. 53-472.000.
- Siegel, Sanford A.; and Noding, Stephen A., 4,714,665, Cl. 429-192.000.
- Tomalia, Donald A.; and Wilson, Larry R., 4,713,975, Cl. 73-865.800.
- van Eijl, Ahazuert T., 4,714,793, Cl. 585-4.000.
- Dow Corning Wright Corporation: See—
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- Fichera, Alfred J.; and Chiarizzio, Samuel J., 4,714,477, Cl. 623-22.000.
- Dowa Iron Powder Co., Ltd.: See—
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- Drake, Bick R.: See—
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- Dravo Corporation: See—
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Driscoll, Patrick R.; and Kremer, Ross A., to Mobil Oil Corporation. Process for production of phosphoric acid from dry matrix by SO₂ treatment and extraction. 4,714,600, Cl. 423-319.000.

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Drzyzga, Richard: See—
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Bajger, Teddy A.; Bunker, Neall H.; Cochran, James L.; Duane, Willis J.; and Mojica, Arturo, 4,714,946, Cl. 355-75.000.

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Duncan, Stuart S.: See—
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Du Pont de Nemours, E. I., and Company: See—
Buckmaster, Marlin D., 4,714,756, Cl. 528-481.000.

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Dupuy, Timothy C. Attachment for a firearm. 4,713,905, Cl. 42-85.000.

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Durkoppwerke GmbH: See—
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Goldstein, Irving S., 4,714,857, Cl. 313-112.000.

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Dysarz, Edward D. Device to relieve sucker rod torque below ground level in a petroleum well. 4,714,110, Cl. 166-68.000.

E&G Classics, Inc.: See—
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Feld, Thomas A.; Juri, Pedro N.; and Treher, Elizabeth N., 4,714,605, Cl. 424-1.100.

Gordon, Eric M.; Godfrey, Jollie D., Jr.; and Delaney, Norma G., 4,714,757, Cl. 530-329.000.

Misra, Raj N., 4,714,714, Cl. 514-572.000.

Eash, David D., to E&G Classics, Inc. Simulated padded car roof cover. 4,714,290, Cl. 296-210.000.

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Ahern, Douglas K.; Fowlkes, William Y.; and Rimai, Donald S., 4,714,939, Cl. 355-3.0TR.

Bischoff, Gene L.; and Elly, James E., 4,714,969, Cl. 360-66.000.

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McClure, Richard J.; and Jeffers, Frederick J., 4,714,324, Cl. 350-362.000.

Randall, Kent A., 4,714,241, Cl. 271-3.100.

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Speranza, Donald, 4,714,144, Cl. 192-0.084.

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Eberspaecher, Joerg, to Siemens Aktiengesellschaft. Circuit arrangement for a communications system for the transmission of message information from narrowband and broadband terminal equipment within a local network constructed as a loop. 4,715,026, Cl. 370-1.000.

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Christy, Mark R.; and Ecker, Ernest L., 4,714,729, Cl. 524-281.000.

Eckert, Charles E., to Aluminum Company of America. Trough shear diffuser apparatus for fluxing molten metal and method. 4,714,494, Cl. 75-66.000.

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Eckman, Harold J., to Cadet Manufacturing Company. Housing for wall mounted heating unit. 4,714,194, Cl. 237-70.000.

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Eder, Ernest J.; and Goodwin, Laverne D. Reverse bend attachment for a sheet metal brake. 4,713,957, Cl. 72-319.000.

Edgar, Reuben W., Jr.; Gilstad, Dennis W.; and Branstetter, Ronald L., to Nippon Colin Co., Ltd. Method and apparatus for noninvasive monitoring of arterial blood oxygen saturation. 4,714,080, Cl. 128-633.000.

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Mack, Theo; and Edlund, Roy, 4,714,259, Cl. 277-165.000.

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Cayton, Nancy M., 4,713,891, Cl. 33-494.000.

Edwards, Clarence C. Method of color photography of black and white object. 4,714,334, Cl. 354-76.000.

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Eichen, Elliot; Melman, Paul; and Cook, Kenneth, to GTE Laboratories Incorporated; and GTE Valeron Corporation. Frequency chirped interferometric displacement sensors and mechanical translation tips therefor. 4,714,346, Cl. 356-349.000.

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Eli Lilly and Company: See—
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Ellcon-National, Inc.: See—
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Elly, James E.: See—
Bischoff, Gene L.; and Elly, James E., 4,714,969, Cl. 360-66.000.

Eloy, Jean-Francois, to Commissariat a l'Energie Atomique. Process and apparatus for treating a material by a thermoionic effect with a view to modifying its physicochemical properties. 4,714,628, Cl. 427-53.100.

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Cooper-Hart, Michael A.; Emmons, Lawrence D.; Mackley, James S.; and Stokes, David H., 4,715,059, Cl. 379-53.000.

EMX International Limited: See—
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ETA Systems, Inc.: See—
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Fansteel Inc.: See—
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Fanti, Cristoforo; Travaglio, Gianclaudio; Ferrario, Luciano; and Moscatelli, Saverio, to Alfa Romeo Auto S.p.A. Control apparatus for a vehicle with disengageable four-wheel drive. 4,714,127, Cl. 180-233.000.

Fanuc Ltd.: See—
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Kumagai, Kazushi, 4,714,852, Cl. 310-156.000.

Kiya, Nobuyuki; and Yoshino, Motoaki, 4,714,999, Cl. 364-474.000.

Farley, Dennis C.: See—
Andrews, George E.; Davis, Paul C.; Farley, Dennis C.; Kravitz, Stanley H.; Meeker, Thrygve R.; Petersen, Owe G.; and Schelling, Arthur W., 4,715,049, Cl. 375-106.000.

Farr, Glyn P. R., to Lucas Industries Public Limited Company. Hydraulic anti-skid braking systems for vehicles. 4,714,301, Cl. 303-116.000.

Farrall, George A.: See—
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., 4,714,847, Cl. 310-332.000.

Farrel Corporation: See—
Meeker, Gregory W.; Bleck, Norris E.; Rizzi, Marc A.; and Irick, Carl M., 4,714,422, Cl. 425-204.000.

Nortey, Narku O., 4,714,350, Cl. 366-84.000.

Farrier, Ernest G.: See—
Banerjee, Chandra K.; Farrier, Ernest G.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,714,082, Cl. 131-359.000.

Fast, Jacob. Information display element for shelf and price channel use. 4,713,899, Cl. 40-10.00R.

Faugouin, Michel: See—
Poncelet, Andre; Getti, Hyacinthe; and Faugouin, Michel, 4,714,626, Cl. 427-49.000.

Federal-Mogul Corporation: See—
Damour, Philippe; Patoureaux, Alain; Somma, Jack J.; and Thompson, Ronald J., 4,714,356, Cl. 384-275.000.

Feichtlbauer, Werner, to Trak Incorporated. Ski running-surface plastic coating. 4,714,266, Cl. 280-604.000.

Feige, Manfred: See—
Bischofberger, Jurg; and Feige, Manfred, 4,714,153, Cl. 198-457.000.

Feissel, Henri: See—
Bacou, Claude; Baptiste, Rene; Feissel, Henri; Takats, Gilbert; and Cabrol, Christian, 4,714,828, Cl. 250-214.00C.

Feld, Thomas A.; Juri, Pedro N.; and Treher, Elizabeth N., to E. R. Squibb & Sons, Inc. Technetium-99m labeled dioxime complexes. 4,714,605, Cl. 424-1.100.

Felske, Arthur M.: See—
Harlow, Albert L., Jr.; and Felske, Arthur M., 4,714,192, Cl. 232-17.000.

Fernandes, Roosevelt A.; Smith-Vaniz, William R.; Burbank, John E., III; and Sieron, Richard L., to Niagara Mohawk Power Corporation. Apparatus for measuring the potential of a transmission line conductor. 4,714,893, Cl. 324-126.000.

Ferranti, plc: See—
McPherson, Hugh; and Stoker, Jeffrey, 4,714,873, Cl. 324-57.00N.

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Ferrario, Luciano: See—
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Ferris, Donald L.: See—
Byrnes, Francis E.; Ferris, Donald L.; Hibyan, Edward S.; Noehren, William L.; and Ogle, Peter C., 4,714,450, Cl. 464-90.000.

Fibercast Company: See—
Cagle, Larry L.; Andersen, Keith D.; and Lurvey, Victor E., 4,714,578, Cl. 264-255.000.

Fichera, Alfred J.; and Chiarizzio, Samuel J., to Dow Corning Wright Corporation. Ball-and-socket joint prosthesis with bearing insert. 4,714,477, Cl. 623-22.000.

Fidler, Fredrick H.; and Lowe, Thomas B., to Babcock & Wilcox Company, The. Mechanically attached two component ceramic fiber system. 4,714,072, Cl. 126-1.00F.

- Field, Anthony J.: See—
Cripps, Martin D.; and Field, Anthony J., 4,714,922, Cl. 340-825.000.
- Filiberti, Antonio. Ball valve, particularly for gases. 4,714,236, Cl. 251-315.000.
- Fine Foods Research Cooperative Union: See—
Matsuda, Eiichi, 4,714,618, Cl. 426-524.000.
- Finzenhagen, Manfred: See—
Hurnik, Helmut; Finzenhagen, Manfred; and Jeblick, Werner, 4,714,568, Cl. 252-350.000.
- Fiorini, Mario: See—
De Antonis, Mario; Fiorini, Mario; and Mazzamuro, Giuseppina, 4,714,769, Cl. 556-419.000.
- Fischer, William B. Prosthesis, method, and tool for installing same. 4,714,478, Cl. 623-23.000.
- Fisherwell Limited: See—
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- Flaherty, Patrick; and Bridgewater, Jon D., to Morton Metalcraft Company. Patient immersion vessel and system. 4,713,850, Cl. 4-585.000.
- Flecker, Peter: See—
Thies, Peter W.; David, Samuel; Kuehl, Ulrich; Buschmann, Gerd; and Flecker, Peter, 4,714,709, Cl. 514-414.000.
- Fletcher, David L.; and Graham, Arthur E., to International Business Machines Corporation. Electrophoretic insulation of metal circuit board core. 4,714,646, Cl. 428-204.000.
- Floreancig, Antoine, to Uranium Pechiney. Process for the recovery in the form of tetravalent fluoride of uranium extracted from phosphate-bearing solutions. 4,714,596, Cl. 423-10.000.
- Flow Cytometry Standards Corporation: See—
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- FlowMole Corporation: See—
Baker, Glen; Chau, Albert W.; and Mercer, John E., 4,714,118, Cl. 175-26.000.
- Fluegel, Theodore D.; and Ryan, Daniel M., to Sundstrand Corporation. Integral gear box and electrical generating system. 4,713,982, Cl. 74-686.000.
- Flugge, Jurgen: See—
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- Flusberg, Allen M.: See—
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- Flynn, Kenneth C. Method of making metal sculptures. 4,714,188, Cl. 228-120.000.
- FMC Corporation: See—
Brolin, Charles A., 4,714,808, Cl. 219-9.500.
- Focqueur, Herve; and Jumel, Bernard, to Valeo. Torsional damper device. 4,714,448, Cl. 464-68.000.
- Fonnesbeck, Dale D.: See—
Wilson, Bart A.; Jenkins, Vaughn J.; and Fonnesbeck, Dale D., 4,714,837, Cl. 307-289.000.
- Force, Christian; and Lescure, Alain, to Novatome. Anti-vibratory support device for a pipe whose thickness is small relative to the diameter. 4,714,229, Cl. 248-610.000.
- Ford Motor Company: See—
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- Crawford, Robert D.; Johnson, Wayne J.; Kimber, Theo, Jr.; Nollf, Douglas; Volk, Jack R.; and Franks, Donald C., 4,715,031, Cl. 370-85.000.
- Duffy, James J., 4,714,413, Cl. 417-293.000.
- Dyki, Joseph J., 4,714,437, Cl. 439-595.000.
- Novak, Robert F.; Schmatz, Duane J.; and Hunt, Thomas K., 4,714,798, Cl. 136-239.000.
- Otterstetter, Charles H.; Schowiak, Duane C.; and Stueckle, Paul, 4,714,179, Cl. 222-148.000.
- Rumpel, Manfred, 4,714,270, Cl. 280-690.000.
- Forest Grove Industries, Inc.: See—
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- Forner, Klaus: See—
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- Foster, Mark J., to Zenith Electronics Corporation. Video display with improved smooth scrolling. 4,714,919, Cl. 340-726.000.
- Foster, Walter M.: See—
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- Fotima International Ltd.: See—
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- Fournier, Jean-Paul; and Choay, Patrick, to Choay S.A. N-substituted 2,4-dialkoxy benzenesulfonamides and pharmaceutical compositions. 4,714,700, Cl. 514-229.000.
- Fournier, Yves: See—
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- Fowlkes, William Y.: See—
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- Fox, Dana G.: See—
Fox, Moroni, Sr.; and Fox, Dana G., 4,713,852, Cl. 5-451.000.
- Fox, Duke. Piston rings with a gap seal. 4,713,867, Cl. 29-156.600.
- Fox, Moroni, Sr.; and Fox, Dana G. Hybrid water bed mattress. 4,713,852, Cl. 5-451.000.
- Fragema: See—
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- Framatome: See—
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- Framtome & Cie: See—
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- France Bed Co., Ltd.: See—
Sasaki, Noboru; Iwata, Yasuji; and Mukai, Teruo, 4,713,956, Cl. 72-137.000.
- Franczyk, Thad S.: See—
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- Franek, Henning; Broemer, Heinz; Deutscher, Klaus, deceased (by Deutscher, Anneliese, heir); and Schaefer, Roland, to Ernst Leitz Wetzlar GmbH. Composite plastics-based material for prosthesis purposes. 4,714,721, Cl. 523-113.000.
- Frank, Andrew C.: See—
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- Franke, Heinrich; Joppin, Hartmut; and Franke, Helga, to Schering Aktiengesellschaft. Insecticidal and acaricidal oxetane and thietane derivatives, compositions, and method of use therefor. 4,714,710, Cl. 514-430.000.
- Franke, Helga: See—
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- Franklin, John N. Automatically aligned tow bar hitch. 4,714,265, Cl. 280-491.000.
- Franks, Donald C.: See—
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- Franzmann, Gunter: See—
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- Fraser, John S.; and Sheffield, Richard L., to United States of America, Energy. Optically pulsed electron accelerator. 4,715,038, Cl. 372-2.000.
- Freeburg, Thomas A.: See—
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- Freeman, Gary L.: See—
Lange, Ronald W.; Reynolds, David F.; Lolley, David R.; and Freeman, Gary L., 4,713,881, Cl. 29-724.000.
- Freeman, Kenneth F.; Garrett, Charles B.; Harra, David J.; and Lei, Lawrence C., to Varian Associates, Inc. Planar magnetron sputtering device with combined circumferential and radial movement of magnetic fields. 4,714,536, Cl. 204-298.000.
- Freitag, Dieter: See—
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- French, Hartley A.; and Richardson, Anthony C. Apparatus for observing the passage of a pig in a pipeline. 4,714,888, Cl. 324-326.000.
- Freundlich, David A.: See—
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- Frickel, Fritz-Frieder: See—
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- Froes, Francis H.: See—
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- Fuerhoff, Richard: See—
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- Fuji Photo Film Co., Ltd.: See—
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- Fujimoto, Toshitaka, to NEC Corporation. Piezo-electric actuator and stepping device using same. 4,714,855, Cl. 310-328.000.
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- Fujita, Toshio; and Hasegawa, Kouzi, to Kett Electric Laboratory. Instrument for measuring film thickness. 4,715,007, Cl. 364-563.000.
- Fujitsu Limited: See—
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- Miyazawa, Hideo; Andoh, Ikuhiro; Koyama, Hiromichi; and Kobayashi, Mitsuru, 4,714,306, Cl. 439-395.000.
- Nakanishi, Akio, 4,714,942, Cl. 355-14.000.
- Nakao, Kunimichi, 4,714,511, Cl. 156-285.000.
- Suzuki, Narumi; and Takagi, Hisamitsu, 4,714,303, Cl. 312-7.100.
- Fujiwara, Haruyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Twin wire former with an impermeable belt inside the top wire. 4,714,521, Cl. 162-300.000.
- Fujiwara, Katsuyoshi; and Anzai, Shunju, to Sharp Kabushiki Kaisha. Light exposure controller. 4,714,945, Cl. 355-69.000.
- Fujiwara, Katsuyoshi: See—
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- Fukuda, Takeshi: See—
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- Hayakawa, Yoichi; Kawai, Masao; Nishikawa, Seiichi; and Fukumura, Kagenori, 4,713,989, Cl. 74-869.000.
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- Garbrecht, William L.; Marzoni, Gifford P.; and Whitten, Kathleen R., to Eli Lilly and Company. Alkoxy cycloalkanol esters of dihydroxysergic acid useful as 5HT receptor antagonists. 4,714,704, Cl. 514-288.000.
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- Garrett, Charles B.: See—
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- Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,714,516, Cl. 156-628.000.
- Glover, Gary H., 4,714,884, Cl. 324-309.000.
- Guggenheim, Thomas L., 4,714,780, Cl. 564-430.000.
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- Heartz, Robert A., 4,715,005, Cl. 364-521.000.
- Howell, Edward K., 4,714,807, Cl. 200-144.00B.
- Koch, Steven R.; Stein, Charles R.; Hatfield, William T.; Shapiro, Neil R.; and Hughes, William C., 4,715,030, Cl. 370-85.000.
- Komanduri, Ranga, 4,714,385, Cl. 407-119.000.
- Kumpitsch, Robert C.; and Retersdorf, James P., 4,713,878, Cl. 29-599.000.
- McCready, Russell J.; and Tyrell, John A., 4,714,753, Cl. 528-288.000.
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- Morgan, Charles G., 4,714,640, Cl. 428-36.000.
- Premierani, William J., 4,715,000, Cl. 364-484.000.
- Quinn, Clayton B.; McClish, Richard R.; and Moore, James E., 4,714,657, Cl. 428-412.000.
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- Lambert, David K., 4,713,970, Cl. 73-861.050.
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- George C. Moore Co.: See—
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- Gerling, John E.; and Ren, Ji T., to Jova Enterprises, Inc. Microwave oven and method with controlled heating profile. 4,714,811, Cl. 219-10.55F.
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- Gifford, William E.: See—
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- Gilchrist, Robert T., Jr., to Shell Western E&P Inc. Pipelay in slurry trench. 4,714,379, Cl. 405-163.000.
- Gilfaut, Jean-Pierre; Peze, Andre; Ravillard, Jean-Paul; and Thevenet, Jean-Claude, to Barriquand. Industrial gas operated liquid heater. 4,714,052, Cl. 122-149.000.

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Gold, Raymond D.; and Riegel, Leo W., to Deere & Company. Weld fixture mounting method, 4,713,873, Cl. 29-559.000.

Golden, Mark A.: See—
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Goldstein, Irving S., to Duro-test Corporation. Infrared reflective lamp with envelope having straight sections, 4,714,857, Cl. 313-112.000.

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Solomon, Donald F.; Solomon, Romona L.; and Good, Charlie J., 4,714,546, Cl. 210-137.000.

Goodfellow, Anthony G.; and Wright, Anthony R., to W & A Bates Limited. Methods for handling sheet material, 4,714,505, Cl. 156-64.000.

Goodwin, Laverne D.: See—
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Colvin, Howard A.; Cottman, Kirkwood S.; and Parker, Dane K., 4,714,772, Cl. 558-240.000.

Hopper, Roger J.; and Parks, Carl R., 4,714,742, Cl. 525-346.000.

Gordini, Silvano: See—
Bruzzone, Mario; Gordini, Silvano; and Wyllie, Ken, 4,714,747, Cl. 526-64.000.

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Barlow, Gordon A., 4,714,249, Cl. 273-1.00G.

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Gordon, Robert B., to RCA Corporation. Cover for a semiconductor package, 4,714,981, Cl. 361-400.000.

Gosiewski, Donald E.: See—
Briggs, Paul C.; and Gosiewski, Donald E., 4,714,730, Cl. 524-321.000.

Gossman, Richard G.: See—
Heath, Allan B.; and Gossman, Richard G., 4,714,199, Cl. 239-412.000.

Gould Inc.: See—
Bennett, William R., 4,714,662, Cl. 429-27.000.

Jain, Babu L.; Jain, Pardeep K.; and Briner, Michael S., 4,714,901, Cl. 331-176.000.

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Hyner, Jacob; and Gradowski, Steven, 4,713,855, Cl. 10-10.00R.

Graebe, Robert H. Constant force cushion, 4,713,854, Cl. 5-481.000.

Graefe, Richard J.: See—
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Fletcher, David L.; and Graham, Arthur E., 4,714,646, Cl. 428-204.000.

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Granlund, Dan: See—
Svensson, Assar; and Granlund, Dan, 4,714,302, Cl. 305-35.0EB.

Granville-Phillips Company: See—
Morrison, Charles F., Jr., 4,714,891, Cl. 324-459.000.

Graul, Karl-Heinz: See—
Henklein, Peter; Becker, Manfred; Buttner, Werner; Loth, Fritz; Dautzenberg, Horst; Forner, Klaus; Dolling, Rudolf; Graul,

Karl-Heinz; Halatsch, Wolf-Rainer; and Rupprich, Christian, 4,714,768, Cl. 548-435.000.

Greatbatch Enterprises, Inc.: See—
Falk, Theodore J.; and Morris, Lawrence E., 4,714,234, Cl. 251-129.170.

Green, David T., to United States Surgical Corporation. Reloading unit for surgical fastening instruments, 4,714,187, Cl. 227-19.000.

Green, William F.: See—
Barnett, Joseph A.; Gomez, Joseph M.; Green, William F.; Lisica, Vincent M.; and Rosenthal, Arnold B., 4,714,400, Cl. 414-751.000.

Grehn, Martin: See—
Bayer, Oswald; Grehn, Martin; and Planek, Werner, 4,714,358, Cl. 384-470.000.

Greig, Walter G., to Moore Business Forms, Inc. Multiple-part form with one or more parts removably retained by temporary adhesion in stub area, 4,714,276, Cl. 283-63.00R.

Greskovics, Paul: See—
Chivens, Donald R.; and Greskovics, Paul, 4,714,508, Cl. 156-195.000.

GridComm, Inc.: See—
Lewis, Kenneth A.; Alpern, Alan N.; Frank, Andrew C.; and Ross, Stuart E., 4,715,045, Cl. 375-58.000.

Grigsby, Robert A., Jr.; and Speranza, George P., to Texaco Inc. Synthesis of products from polyoxyalkylene amines and 2,6-di-*t*-butylphenol for use as epoxy accelerators and curing agents, 4,714,750, Cl. 528-99.000.

Groth, Ronald W.; and Nowakowski, Robert J., to Orion Corporation. Segmental bearing shoe, 4,714,357, Cl. 384-312.000.

Gruber, Mark B., to Du Pont de Nemours, E. I., and Company. Method and apparatus for laying down tapes, 4,714,509, Cl. 156-272.200.

Gruftman, Fredrik A. Safety belts and the like, 4,714,134, Cl. 182-3.000.

Grundel, Hans, to S & G Implants GmbH. Femur prosthesis part of a knee joint endoprosthesis, 4,714,471, Cl. 623-20.000.

Grundel, Hans; and Aigner, Reinhard, to S & G Implants GmbH. Tibial member of a knee joint endoprosthesis, 4,714,475, Cl. 623-20.000.

Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig holland.Stiftung & Co. KG: See—
Ioannides, Gregor, 4,713,964, Cl. 73-116.000.

GT Development Corporation: See—
Morris, John M., 4,714,172, Cl. 220-86.00R.

GTE Laboratories Incorporated: See—
Eichen, Elliot; Melman, Paul; and Cook, Kenneth, 4,714,346, Cl. 356-349.000.

GTE Valeron Corporation: See—
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Guay, Normand D., to George C. Moore Co. Elastic fabric provided with a looped gripping surface, 4,714,096, Cl. 139-391.000.

Guggenheim, Thomas L., to General Electric Company. Method for making tetrahydroxydiphenylsulfide and product obtained therefrom, 4,714,780, Cl. 564-430.000.

Guglielmetti, Giorgio; Carossio, Guido; and Gilli, Luigi, to Saint-Gobain Vitrage (Les Miroirs). Cutting device for sheets made of plastic material, 4,713,994, Cl. 83-71.000.

Guigan, Jean. Conditioning strip for performing medical analyses on a sample of liquid and using dry reagents, 4,714,590, Cl. 422-102.000.

Guiho, Chantal H.; Maze, Etienne G.; and Trescol, Jean J., to Akzo NV. Process for coating an electrically conductive substrate and an aqueous coating composition based on cationic binder, 4,714,531, Cl. 204-181.700.

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Guiczynski, Zdzislaw. Operational amplifier, 4,714,894, Cl. 330-260.000.

Gullberg, Carl E., to Pharmacia AB. Coating method, 4,714,621, Cl. 427-2.000.

Gunther, Kim M.: See—
Miller, Mike F.; and Gunther, Kim M., 4,715,039, Cl. 372-37.000.

Gupta, Balaram B. G., to Hoechst Celanese Corporation. Process for producing 4-ring-substituted phenyl lower alkyl ketones, 4,714,781, Cl. 568-319.000.

Gustavson, Larry J.: See—
Wang, Kathy K.; Gustavson, Larry J.; and Dumbleton, John H., 4,714,468, Cl. 623-16.000.

Gwozd, Peter S., to Advanced Micro Devices, Inc. Method for filling a trench in an integrated circuit structure without producing voids, 4,714,520, Cl. 437-228.000.

Gyllstal, Lars-Goran L.: See—
Idegren, Gustav L.; Gyllstal, Lars-Goran L.; and Bartha, Istvan V., 4,714,029, Cl. 109-45.000.

H. B. Fuller Company: See—
Hume, Robert M., III, 4,714,727, Cl. 524-271.000.

H. Stoll GmbH & Co.: See—
Schmidt, Henning; Nedele, Walter; and Schmodde, Hermann, 4,713,948, Cl. 66-106.000.

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Bell, Weldon K.; and Haag, Werner O., 4,714,787, Cl. 568-697.000.

Haagensen, Duane B.; Moses, Darcy C.; and Smith, Leonard S., to Woodhead, John F., III. Apparatus and method for processing dielectric materials with microwave energy, 4,714,812, Cl. 219-10.55A.

Haddad, Kenneth R.; and Vilmer, Richard J., to Motorola, Inc. Speakerphone for radio and landline telephones, 4,715,063, Cl. 379-390.000.

Hahn, Alfred; Kamm, Bodo; Weiss, Karl; and Dummert, Johannes, to Siemens Aktiengesellschaft. X-ray apparatus with spring weight compensation, 4,715,057, Cl. 378-197.000.

Halatsch, Wolf-Rainer: See—
Henklein, Peter; Becker, Manfred; Buttner, Werner; Loth, Fritz; Dautzenberg, Horst; Forner, Klaus; Dolling, Rudolf; Graul, Karl-Heinz; Halatsch, Wolf-Rainer; and Rupprich, Christian, 4,714,768, Cl. 548-435.000.

Hale, Bryan M.: See—
Hale, Cecil H.; Tanner, Alan R.; and Hale, Bryan M., 4,714,530, Cl. 204-131.000.

Hale, Cecil H.; Tanner, Alan R.; and Hale, Bryan M., to Southwestern Analytical Chemicals, Inc. Method for producing high purity quaternary ammonium hydroxides, 4,714,530, Cl. 204-131.000.

Halpern, Howard J., to President and Fellows of Harvard College. Magnetic resonance analysis of substances in samples that include dissipative material, 4,714,886, Cl. 324-316.000.

Hamada, Akifumi: See—
Shimomura, Hiroshi; Izuka, Kazuo; Harano, Makoto; and Hamada, Akifumi, 4,714,383, Cl. 407-42.000.

Hamaguri, Kenji; and Sakai, Takao, to Minolta Camera Kabushiki Kaisha. Multi-wavelength oximeter having a means for disregarding a poor signal, 4,714,341, Cl. 356-41.000.

Hamajima, Shigemitsu: See—
Yasuda, Keiji; Oda, Yukihisa; Hamajima, Shigemitsu; Ishii, Masami; Nakanishi, Katsumi; Tsuzuki, Takayoshi; and Tsuda, Jyou, 4,714,804, Cl. 200-11.0DA.

Hamamatsu Photonics Kabushiki Kaisha: See—
Oda, Koichiro, 4,714,825, Cl. 250-213.0VT.

Hamanaka, Tadashi: See—
Miyashita, Yoshinobu; Hamanaka, Tadashi; and Iwata, Kenzi, 4,714,675, Cl. 435-32.000.

Hamar, Martin R. Laser apparatus for monitoring geometric errors, 4,714,344, Cl. 356-152.000.

Hamblett, Martin: See—
Cox, John C.; Morgan, Stephen E.; Hamblett, Martin; and Rubini, Alfred, 4,714,407, Cl. 415-192.000.

Hambley, Allan R., to Harris Corporation. Digital differential phase shift keyed demodulator, 4,715,047, Cl. 375-84.000.

Hamel, David O.: See—
Siellaff, Ulrich; and Hamel, David O., 4,713,923, Cl. 52-713.000.

Hammond, Michael R.; and Novorsky, Donald E., to Tocco, Inc. Method and apparatus for shaping the surfaces of cams on a camshaft, 4,714,809, Cl. 219-10.430.

Hancock, Bynum V., to Westinghouse Electric Corp. Trailing edge support for control stage steam turbine blade, 4,714,410, Cl. 416-193.00A.

Handte, Reinhardt: See—
Becherer, Johannes; Handte, Reinhardt; Nestler, Hans J.; and Kussmaul, Ulrich, 4,714,766, Cl. 548-217.000.

Hanford, Donald E.: See—
Cummings, Michael J.; Hanford, Donald E.; and Japp, Robert M., 4,714,504, Cl. 156-64.000.

Hann, William L.; and Fuller, Stanley E., to Commercial Aluminum Cookware Company. Supporting rack for cooking utensils, 4,714,166, Cl. 211-113.000.

Hansen, Charles: See—
Palmero, Albert; and Hansen, Charles, 4,714,853, Cl. 310-257.000.

Hansen, Kenneth A.: See—
Kurtzman, Gary; Heck, Joseph P.; Hansen, Kenneth A.; Enderby, Ralph; and Vidugiris, Bronis, 4,714,899, Cl. 331-1.00A.

Happy, Henry: See—
Sandt, Hartley; and Happy, Henry, 4,714,377, Cl. 405-154.000.

Hara, Kazuya, to Casio Computer Co., Ltd. Memory card, 4,714,980, Cl. 361-395.000.

Harada, Kunio: See—
Kato, Yasuo; Harada, Kunio; Kubota, Shigeo; Watanabe, Yoshio; and Murayama, Seiichi, 4,715,054, Cl. 378-122.000.

Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, to Toyota Jidosha Kabushiki Kaisha; and Aisin-Warner Kabushiki Kaisha. Transmission control device, 4,713,988, Cl. 74-868.000.

Harandi, Mohsen N., to Mobil Oil Corporation. Apparatus for minimizing recycling in an unsaturated gas plant, 4,714,524, Cl. 196-98.000.

Harano, Makoto: See—
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Tietze, Richard C., 4,714,288, Cl. 294-82.330.

Hardwood Lighting Designs Corp.: See—
Brooks, Raymond E., Jr., 4,713,916, Cl. 52-39.000.

Hardy, Frederick E.: See—
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Harestad, Roberta E.; and Stevens, John, to Minnesota Mining and Manufacturing Company. Second harmonic generation with N,N'-substituted barbituric acids, 4,714,838, Cl. 307-427.000.

Harhoff, Karl; and Melis, Egon, to Gewerkschaft Eisenhutte Westfalen GmbH. Material and transfer loading apparatus, 4,714,154, Cl. 198-514.000.

Harlow, Albert L., Jr.; and Felske, Arthur M., to EZ Mail Corporation. Slidable tray insert for mailboxes, 4,714,192, Cl. 232-17.000.

Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., to General Electric Company. Advanced piezoceramic power switching devices employing protective gastight enclosure and method of manufacture, 4,714,847, Cl. 310-332.000.

Harra, David J.: See—
Freeman, Kenneth F.; Garrett, Charles B.; Harra, David J.; and Lei, Lawrence C., 4,714,536, Cl. 204-298.000.

Harrington Arthritis Research Center: See—
Bloebaum, Roy D., 4,714,473, Cl. 623-20.000.

Harris Corporation: See—
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Harris, Steven: See—
Sterner, Rudolph J.; and Harris, Steven, 4,714,866, Cl. 318-636.000.

Harrison, Kim A. Fluorescent light bulb holder, 4,714,162, Cl. 206-419.000.

Hart, Cornelis M.; and Slob, Aric, to U.S. Philips Corporation. Integrated injection logic circuits, 4,714,842, Cl. 307-477.000.

Hart, Howard R., Jr.: See—
Dumoulin, Charles L.; and Hart, Howard R., Jr., 4,714,081, Cl. 128-653.000.

Hartl, Carroll P.; and Heitman, James M., to Oscar Mayer Foods Corporation. Automatic crimping mechanism for proteinaceous patties, 4,714,014, Cl. 99-450.200.

Hartmann & Braun AG: See—
Fabinski, Walter, 4,714,832, Cl. 250-343.000.

Hartmann, Ludwig; and Ruzek, Ivo, to Carl Freudenberg, Firma. Elastic roofing and sealing materials, 4,714,651, Cl. 428-286.000.

Hartog, Arthur H.; and Payne, David N., to National Research Development Corporation. Fibre optic sensing device and method, 4,714,829, Cl. 250-227.000.

Hascal, Marcel; Lopez, Sergio; Danielski, Andrew; and Mihai, Adrian. Portable electrostatic field safety monitor, 4,714,915, Cl. 340-657.000.

Hasegawa, Kouzi: See—
Fujita, Toshio; and Hasegawa, Kouzi, 4,715,007, Cl. 364-563.000.

Hasegawa, Takashi: See—
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Hashimoto, Takatsugu; Machara, Akihiro; Tomita, Seisuke; Funahashi, Yuichi; Watanabe, Junichiro; Sugiura, Kazuo; and Matsumoto, Hironori, to Bridgestone Corp.; Toshiba Silicone Co., Ltd.; and Japan Synthetic Rubber Co., Ltd. Rubber compounds, 4,714,734, Cl. 524-496.000.

Hata, Hideo: See—
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Hatakoshi, Makoto: See—
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Hatch, G. Brent; to Hatch, G. Brent; and Hatch, Susan W. Machine for laying conduit and methods for use thereof, 4,714,381, Cl. 405-178.000.

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Hattori, Isao; and Furukawa, Shigeru, to NGK Insulators, Ltd. Evacuating device for plunger molding apparatus, 4,714,423, Cl. 425-376.00R.

Hattori, Tadashi: See—
Ikeda, Hirotane; Hattori, Tadashi; Ohta, Minoru; and Mukainaka, Shinichi, 4,714,047, Cl. 118-724.000.

Hattori, Takemi; and Takeda, Nobuhiko, to Aisin Seiki Kabushiki Kaisha. Lumbar support, 4,714,291, Cl. 297-284.000.

Hattori, Tetsuo; and Seko, Shoichi, to Toyota Jidosha Kabushiki Kaisha. Suspension of vehicle, 4,714,132, Cl. 180-312.000.

Hattori, Yoshiyuki: See—
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; and Hattori, Yoshiyuki, 4,714,296, Cl. 303-6.00C.

Haubold, Heinz-Gunter; and Hiller, Peter, to Kernforschungsanlage Julich GmbH. Process and circuit arrangement for the remote pick up and reproduction of images of static or moving objects, 4,714,961, Cl. 358-209.000.

Hauptmann, Rudolf: See—
Siegel, Harald; and Hauptmann, Rudolf, 4,714,927, Cl. 342-160.000.

Hauschild, Gilbert: See—
Ehlscheid, Guenter; and Hauschild, Gilbert, 4,714,394, Cl. 414-41.000.

Hauschild, Werner: See—
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Hausen, Manfred Z.: See—
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Hawkins, Ronald G., to Aluminum Company of America. Overhead conductor damper with stamped and sand-cast parts, 4,714,799, Cl. 174-42.000.

Hayakawa, Yoichi; Kawai, Masao; Nishikawa, Seiichi; and Fukumura, Kagenori, to Aisin Warner Limited. Shift shock suppression in automatic transmission, 4,713,989, Cl. 74-869.000.

Hayakawa, Yoichi: See—
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,713,988, Cl. 74-868.000.

Hayashi, Kyojo; and Noda, Shigeru, to Sumitomo Electric Industries, Ltd. Connector for optical fibers with a gap, 4,714,318, Cl. 350-96.210.

- Hayashi, Shigeyuki: See—
Sakakibara, Kenji; Akao, Michitoshi; Hayashi, Shigeyuki; and Sakai, Jun, 4,714,943, Cl. 355-27.000.
- Hayashi, Toyooki: See—
Ohkuma, Kuniaki; Nakagawa, Reiji; Miyao, Hisao; Yoshimura, Shinichi; Suzuki, Toshio; Hayashi, Toyooki; Arakawa, Masayasu; and Koizumi, Hideharu, 4,714,397, Cl. 414-222.000.
- Hayter, Paul A.: See—
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- Healy, John T.; and Johnson, Joel W., to Westinghouse Electric Corp. Combustor feeding arrangement, 4,714,031, Cl. 110-109.000.
- Heartz, Robert A., to General Electric Company. Terrain/seascape image generator with math model data base, 4,715,005, Cl. 364-521.000.
- Heath, Alastair E. F.: See—
Bussey, Stephen; Cockburn, Barry; and Heath, Alastair E. F., 4,714,998, Cl. 364-431.010.
- Heath, Allan B.; and Gossman, Richard G. Liquid atomizing nozzle for spray apparatus, 4,714,199, Cl. 239-412.000.
- Hebert, Joel J.; and Chuang, Jo-Yu, to Schlumberger Technology Corporation. Apparatus for hard rock sidewall coring a borehole, 4,714,119, Cl. 175-20.000.
- Hecht, David. Method and apparatus for making bows, 4,714,182, Cl. 223-46.000.
- Heck, Joseph P.: See—
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- Heckel, Armin: See—
Roch, Josef; Heckel, Armin; Nickl, Josef; Muller, Erich; Narr, Berthold; Zimmermann, Rainer; and Weisenberger, Johannes, 4,714,698, Cl. 514-212.000.
- Hedberg, Sven-Erik; Lekholm, Anders; and Lindgren, Anders, to Siemens Aktiengesellschaft. Atrium-controlled heart pacemaker, 4,714,079, Cl. 128-419.0PG.
- Heekin, Theodore R., to Valco/Valley Tool & Die, Inc. Picture frame clamp, 4,714,373, Cl. 403-402.000.
- Heess, Gerhard; Karnopp, Dean; and van Zanten, Anton, to Robert Bosch GmbH. Pressure modulator for anti-skid brake systems, 4,714,300, Cl. 303-115.000.
- Heggart, Ronald G.; McClintock, Willard K.; and Engstrom, Randy J., to Union Carbide Corporation. Furnace cooling system and method, 4,715,042, Cl. 373-74.000.
- Heinlein, Werner: See—
Gassmann, Heiner; Beck, Siegfried; and Heinlein, Werner, 4,714,278, Cl. 285-169.000.
- Heinrich, Juergen; Krauth, Axel; Victor, Karl-Heinz; and Peeken, Heinz, to Hoechst Ceramtec Aktiengesellschaft; and Pacific Wietz GmbH & Co. KG. Annular sliding body for a sliding seal and process for use thereof, 4,714,257, Cl. 277-1.000.
- Heinrichs, Vern: See—
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- Heissler, Herbert: See—
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- Heitman, James M.: See—
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- Heitzmann, Hal: See—
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- Helinski, Richard R.; Lutz, Carl D.; Peer, Thomas R.; and Eno, Philip A., to Howtek, Inc. Ink jet printer, 4,714,936, Cl. 346-140.00R.
- Heller, Wilhelm; Flugge, Jurgen; and Ratz, Gerhard, to Krupp Stahl AG. Method for thermal treatment of pearlitic rail steels, 4,714,500, Cl. 148-12.00R.
- Helling, Gunter; and Himmelmann, Wolfgang, to Agfa Gevaert Aktiengesellschaft. Color photographic recording material containing a polymeric gelatine plasticizer, 4,714,671, Cl. 430-545.000.
- Hellstrom, Lars, to N.V. Optimed. Visual aid especially for weak-sighted persons, 4,714,329, Cl. 351-158.000.
- Hemphill, Charles W. Reversible digging teeth and holder therefor, 4,713,897, Cl. 37-83.000.
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- Hendy, Brian N.; and Smith, John W., to Imperial Chemical Industries PLC. Membranes, 4,714,725, Cl. 524-108.000.
- Henkel Kommanditgesellschaft auf Aktien: See—
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- von Rybinski, Wolfgang; Tesmann, Holger; and Dobias, Bohuslav, 4,714,544, Cl. 209-167.000.
- Wilsberg, Heinz-Manfred, 4,714,479, Cl. 8-137.000.
- Henklein, Peter; Becker, Manfred; Buttner, Werner; Loth, Fritz; Dautzenberg, Horts; Forner, Klaus; Dolling, Rudolf; Graul, Karl-Heinz; Halatsch, Wolf-Rainer; and Rupprich, Christian, to Akademie Der Wissenschaften Der DDR. N-(chlorocarbonyloxy)-5-norbornene-2,3-dicarboximide, process for its production and its use, 4,714,768, Cl. 548-435.000.
- Hennequin, Jean-Claude, to Essilor Internationale. Device for detecting and/or measuring visual deficiencies, 4,714,330, Cl. 351-239.000.
- Henning, Rainer: See—
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- Henry, Daniel P.; LaTorre, Fredrick E.; and Pope, Willard I. Educational board game, 4,714,255, Cl. 273-249.000.
- Henthorn, Clyde E. Golf ball and tee setter, 4,714,250, Cl. 273-32.500.
- Herion-Werke KG: See—
Maisch, Dieter, 4,714,007, Cl. 92-88.000.
- Herman, Alan C.: See—
Bente, H. Bryan; Herman, Alan C.; Myerson, Joel; Shaw, Benjamin G.; and Stefanski, Andrew, 4,714,545, Cl. 210-101.000.
- Hernandez, Irene H.: See—
Barker, Barbara A.; and Hernandez, Irene H., 4,714,918, Cl. 340-724.000.
- Hernandez, Rosalio A. Cooking vessel with an inner heat conductive jacket and the like, 4,714,012, Cl. 99-444.000.
- Heron Manufacturing, Inc.: See—
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- Herrington, Fox J., to Mobil Oil Corporation. Apparatus for producing machine-direction heat seals, 4,714,454, Cl. 493-193.000.
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- Hertsgaard, John P.; and Gallant, W. Keith, to Honeywell Inc. Enabling device for a gas generator of a forced dispersion munitions dispenser, 4,714,020, Cl. 102-351.000.
- Herve, Michel, to S.A. Fonderies du Lion. Heating apparatus operating with gaseous fuel and designed to be connected to a smoke pipe, 4,714,073, Cl. 126-91.00R.
- Hess, Herman A. Separable fastener with sliding sleeve, 4,713,864, Cl. 24-590.000.
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Thyren, Carl H.; and Hesthamar, Tore, 4,713,966, Cl. 73-149.000.
- Hewlett-Packard Company: See—
Bente, H. Bryan; Herman, Alan C.; Myerson, Joel; Shaw, Benjamin G.; and Stefanski, Andrew, 4,714,545, Cl. 210-101.000.
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- Kaplinsky, George T., 4,714,937, Cl. 346-140.00R.
- Heyligenstaedt & Comp. Werkzeugmaschinenfabrik GmbH: See—
Dormehl, Erich, 4,713,875, Cl. 29-568.000.
- Hibyan, Edward S.: See—
Byrnes, Francis E.; Ferris, Donald L.; Hibyan, Edward S.; Noehren, William L.; and Ogle, Peter C., 4,714,450, Cl. 464-90.000.
- Hickey, Charles P. Trick-or-treat carrier with false bottom, 4,714,985, Cl. 362-154.000.
- Higashigaki, Yoshiyuki; Yoshimoto, Yoshikazu; Suzuki, Tomonari; Nakajima, Shigeo; and Inoguchi, Toshio, to Sharp Kabushiki Kaisha. Methods and materials for thermoelectric and light-heat conversion, 4,714,639, Cl. 428-36.000.
- Hileman, George: See—
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- Hill, Bernhard, to U.S. Philips Corporation. Magneto-optical printing head and method of grey-scale image generation using such a printing head, 4,714,325, Cl. 350-376.000.
- Hiller, Peter: See—
Haubold, Heinz-Gunter; and Hiller, Peter, 4,714,961, Cl. 358-209.000.
- Hillstrom, David U.; and Cope, Dennis R., to Marketing Displays, Inc.; and B. F. Goodrich Company. Sign stand assembly, 4,714,220, Cl. 248-160.000.
- Hilti Aktiengesellschaft: See—
Bergner, Arndt, 4,714,391, Cl. 411-54.000.
- Himmelmann, Wolfgang: See—
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- Hiraoka & Co., Ltd.: See—
Obayashi, Tsutomu; Ito, Kazuhide; Hiraoka, Yoshiji; and Baba, Saburo, 4,714,650, Cl. 428-265.000.
- Hiraoka, Yoshiji: See—
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- Hirata, Sadao: See—
Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, 4,714,580, Cl. 264-516.000.
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- Hironaka, Yoshiaki, to Kioritz Corporation. Power train of mowing machine, 4,714,447, Cl. 464-52.000.
- Hirsch, Rolf-Burkhard: See—
Reinehr, Ulrich; Hirsch, Rolf-Burkhard; Dross, Joachim; and Jungverdorben, Hermann-Josef, 4,714,045, Cl. 118-420.000.
- Hiscock, Christopher J.: See—
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- Hitachi Cable, Ltd.: See—
Ouchi, Yutaka; Sugino, Akio; Sugaya, Kazuo; and Kimizima, Kazuo, 4,714,104, Cl. 164-504.000.
- Hitachi Kiden Kogyo Kabushiki Kaisha: See—
Watanabe, Seiji; Horimoto, Teiji; and Koizumi, Susumu, 4,714,155, Cl. 198-619.000.
- Hitachi, Ltd.: See—
Ikeda, Hiraku; and Kuwashima, Hidesumi, 4,714,401, Cl. 415-30.000.
- Kato, Yasuo; Harada, Kunio; Kubota, Shigeo; Watanabe, Yoshio; and Murayama, Seiichi, 4,715,054, Cl. 378-122.000.
- Matsubara, Katsumi; Uchida, Riichi; Muramatsu, Masatoshi; Naya, Kotaro; and Takagi, Tsuneharu, 4,714,418, Cl. 418-201.000.
- Mizuno, Takao; Uchikawa, Naohi; Murayama, Akira; Tamura, Takahiro; and Kuroshima, Ryoichi, 4,714,415, Cl. 418-14.000.
- Nishimura, Ryuji; Kato, Minoru; Noda, Masaru; and Imaide, Takuya, 4,714,955, Cl. 358-48.000.

- Hitachi Maxell, Ltd.: See—
Kato, Yoshitaka; Fujita, Minoru; and Maruyama, Hiroshi, 4,714,973, Cl. 360-133.000.
- Hitachi Metals, Ltd.: See—
Yamashita, Keitaro, 4,714,819, Cl. 219-216.000.
- Hiyamizu, Satoshi: See—
Mimura, Takashi; and Hiyamizu, Satoshi, 4,714,948, Cl. 357-22.000.
- Hoashi, Jyuzaemon; Fumoto, Syozo; and Oshita, Kiyoshi, to Daikin Kogyo Co., Ltd. Novel polytetrafluoroethylene fine powder, 4,714,748, Cl. 526-255.000.
- Hocken, Robert J.: See—
Lau, Kam C.; and Hocken, Robert J., 4,714,339, Cl. 356-4.500.
- Hodgson, William J. Jr.; and Middlesworth, Jeffrey A., to Exxon Chemical Patents Inc. Oriented elastomeric film and method of manufacture, 4,714,735, Cl. 524-514.000.
- Hodroski, Frank S., Jr. Foot rest for toilet, 4,713,846, Cl. 4-254.000.
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- Wiedemann, Wolfgang; Spietschka, Ernst; and Troester, Helmut, 4,714,666, Cl. 430-59.000.
- Hoechst Celanese Corporation: See—
Gupta, Balam B. G., 4,714,781, Cl. 568-319.000.
- Hoechst Ceramtec Aktiengesellschaft: See—
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- Hoeffle, Milton L.; Holmes, Ann; and Stratton, Charlotte D., to Warner-Lambert Company. Antiarteriosclerotic substituted benzimidazol-2-yl-and 3H-imidazol[4,5-b]pyridin-2-yl-phenoxy-alkanoic acids and salts and esters thereof, 4,714,762, Cl. 514-303.000.
- Hoeft, Herbert; and Strommer, Kurt, to L. Schuler GmbH. Transfer press, 4,713,961, Cl. 72-419.000.
- Hoelzer, John S.; Graefe, Richard J.; and Libert, James T., to Square D Company. Electronic delay timer, 4,714,977, Cl. 361-196.000.
- Hoerrens, Reiner. Ornamental chain, 4,713,946, Cl. 63-4.000.
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- Hofer, Gerald: See—
Bohringer, Wilfried; Eheim, Franz; Hofer, Gerald; Konrath, Karl; and Laufer, Helmut, 4,714,412, Cl. 417-289.000.
- Hofmann, Manfred: See—
Cremer, Heinz P.; Wolsiefer, Harald; Hoffmann, Manfred; Deegener, Elmar; and Franzmann, Gunter, 4,713,986, Cl. 74-805.000.
- Hoffmann, Wolfgang W., to Shibuya America Corporation. Straight line container labeling apparatus, 4,714,515, Cl. 156-450.000.
- Hofmann, Albert, to Kernforschungszentrum Karlsruhe GmbH. Method for cooling an object with the aid of superfluid helium (He II) and apparatus for implementing the method, 4,713,942, Cl. 62-62.000.
- Hofmann, Heinz: See—
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- Hofmann, Reiner: See—
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- Hofmeier, Gerhard; Petersen, Karl; and Schroeder, Wolfgang, to Eppendorf Geratebau Netheler & Hinz GmbH. Process for measuring the potential difference between a sample liquid and a reference electrolyte, 4,714,527, Cl. 204-1.00T.
- Hok, Bertil: See—
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- Hoke, Donald I., to Lubrizol Corporation. The acylated ether amine and lubricants and fuels containing the same, 4,714,561, Cl. 252-51.50A.
- Hoke, Engelbert; and Butterweck, Helgard, to Fried. Krupp Gesellschaft mit beschränkter Haftung. Device for purification of waste water, 4,714,548, Cl. 210-221.200.
- Holahan, J. Myles: See—
Holahan, Joseph M.; and Holahan, J. Myles, 4,714,208, Cl. 242-84.52B.
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- Holik, Herbert, to Sulzer-Escher Wyss GmbH. Device for decelerating fast-flow currents of white water, 4,714,522, Cl. 162-264.000.
- Holleran, Louis M.; and Martin, Francis W., to Corning Glass Works. Glass-ceramics suitable for dielectric substrates, 4,714,687, Cl. 501-9.000.
- Holm, David R.; and Peterson, Rudolph A., Jr., to Deere & Company. Seat suspension for an off-road vehicle, 4,714,227, Cl. 248-595.000.
- Holmes, Ann: See—
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- Holmes, Silas W.: See—
Goins, Dixie E.; Holmes, Silas W.; and Burt, Edward A., 4,714,691, Cl. 502-152.000.
- Holt, James F., to United States of America, Air Force. Method of bonding protective covers onto solar cells, 4,714,510, Cl. 437-2.000.
- Holt, Nicholas P.: See—
Desyllas, Peter L. L.; and Holt, Nicholas P., 4,714,990, Cl. 364-200.000.
- Holz, Gary L.; and Foster, Walter M., to BMP. Video processor, 4,714,958, Cl. 358-166.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—
Yamaguchi, Akio; and Yoshikawa, Kazushi, 4,714,026, Cl. 108-51.100.
- Honda Giken Kogyo Kabushiki Kaisha: See—
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- Kinugasa, Toshiyuki; Furuya, Tamio; Ishige, Yoshiki; Tsuchimoto, Yuichi; and Takahashi, Shoji, 4,714,424, Cl. 425-388.000.
- Muto, Osamu; Masumura, Masanori; and Hori, Yoshiaki, 4,713,979, Cl. 74-337.500.
- Ohkuma, Kuniaki; Nakagawa, Reiji; Miyao, Hisao; Yoshimura, Shinichi; Suzuki, Toshio; Hayashi, Toyooki; Arakawa, Masayasu; and Koizumi, Hideharu, 4,714,397, Cl. 414-222.000.
- Shinozaki, Takashi; and Kawaguchi, Takeshi, 4,714,126, Cl. 180-233.000.
- Takayanagi, Shinji, 4,714,453, Cl. 474-112.000.
- Tottori, Takumi; Oki, Kenji; Ooyama, Kazuo; and Mizushima, Toshio, 4,714,056, Cl. 123-65.0PE.
- Honda, Keiji: See—
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- Honeywell Inc.: See—
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- Honeywell Information Systems Italia: See—
Trotti, Bonifacio, 4,714,968, Cl. 360-51.000.
- Honkura, Yoshinobu; Murata, Kouji; Hayashi, Toyooki; Arakawa, Steel Works, Ltd. Soft magnetic stainless steel for cold forging, 4,714,502, Cl. 148-307.000.
- Honna, Takaji: See—
Ogawa, Kazuo; and Honna, Takaji, 4,714,765, Cl. 548-183.000.
- Hoopengardner, Merle R., to Orcon Corporation. Baseplate construction for an iron used to face seam carpet with hot melt adhesive tape, 4,714,514, Cl. 156-391.000.
- Hooven, Michael D., to Cordis Corporation. Three stage valve with flexible valve seat, 4,714,458, Cl. 604-9.000.
- Hooven, Michael D., to Cordis Corporation. Three stage intracranial pressure control valve, 4,714,459, Cl. 604-9.000.
- Hoper, Jens: See—
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- Hoppe, Lutz; and Reinhardt, Eugen, to Wolff Walsrode Aktiengesellschaft. Adhesive solutions, more especially for water-activatable adhesive coatings on wallpapers, 4,714,723, Cl. 524-42.000.
- Hopper, Roger J.; and Parks, Carl R., to Goodyear Tire & Rubber Company. The cyanamide derivatives as vulcanization rate modifiers, 4,714,742, Cl. 525-346.000.
- Hori, Roy Y.: See—
Webb, John D., Jr.; Hori, Roy Y.; and Simpson, George E., 4,714,470, Cl. 623-18.000.
- Hori, Yoshiaki: See—
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- Horiki, Seinosuke; Makino, Reiji; Ito, Kuninori; and Unno, Tetsuji, to Nagoya Oilchemical Co., Ltd. Expanding and shrinking member, 4,714,633, Cl. 427-282.000.
- Horimoto, Teiji: See—
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- Horn, Peter; Baumann, Edwin; and Marx, Matthias, to BASF Aktiengesellschaft. Nylon moldings and their production, 4,714,718, Cl. 521-134.000.
- Horn, William F.: See—
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- Horvath, Csaba: See—
Ambrus, Clara M.; and Horvath, Csaba, 4,714,556, Cl. 210-638.000.
- Hosaka, Masao: See—
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- Hoshino, Takashi, to Bridgestone Corporation. Rubber composition for tire inner liner, 4,714,732, Cl. 524-474.000.
- Hoshino, Yukio: See—
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- Hoss, Donald A.: See—
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- Hough, Geoffrey S., to Rolls-Royce plc. Turbines, 4,714,406, Cl. 415-170.00R.
- House, David W.; and Scott, Ray V., Jr., to UOP Inc. Polyurethane coatings and adhesives, 4,714,512, Cl. 156-306.600.
- Howell, Edward K., to General Electric Company. Low voltage vacuum circuit interrupter, 4,714,807, Cl. 200-144.00B.
- Howell, Gary W., to Du Pont de Nemours, E. I., and Company. Dispensing apparatus, 4,714,210, Cl. 242-55.300.
- Howtek, Inc.: See—
Helinski, Richard R.; Lutz, Carl D.; Peer, Thomas R.; and Eno, Philip A., 4,714,936, Cl. 346-140.00R.
- Hozn Auto & Soft Co., Ltd.: See—
Chen, Sun C., 4,714,805, Cl. 200-16.00A.
- Hsieh, Ming-Shiun: See—
Kabasawa, Satoshi; Hsieh, Ming-Shiun; Chang, Shih-Ming; and Lin, Chun-Hong, 4,715,004, Cl. 364-513.500.
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 Huber, Erich, to Dr. Johannes Heidenhain GmbH. Photoelectric length or angle measuring instrument. 4,714,349, Cl. 356-374.000.
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 Crookshanks, Rex J., 4,715,029, Cl. 370-70.000.
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 King, William W., 4,714,120, Cl. 175-329.000.
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 Huls Aktiengesellschaft: See—
 Moeller, Eckhard; Mueller, Wolfgang H. E.; and Hausen, Manfred Z., 4,714,784, Cl. 568-492.000.
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 Novak, Robert F.; Schmatz, Duane J.; and Hunt, Thomas K., 4,714,798, Cl. 136-239.000.
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 Hutchins, Erle M., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Universal adapter and methods of and apparatus for making same. 4,714,440, Cl. 439-676.000.
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 Hwang, Harrison. Packing film dispenser. 4,714,211, Cl. 242-96.000.
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 Trevino, Juan A. V., 4,714,597, Cl. 423-228.000.
 Hyner, Jacob; and Gradowski, Steven, to Whyco Chromium Company, Inc. Process for making self-drilling fasteners. 4,713,855, Cl. 10-10.00R.
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 Iida, Kazumi; Ohata, Yosuke; Hyodo, Keiichiro; Akiyama, Kazunori; Umeda, Tadashi; and Kishimoto, Keiichi, 4,714,338, Cl. 355-3.0FU.
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 Idegren, Gustav L.; Gyllstal, Lars-Goran L.; and Bartha, Istvan V., to Inter Innovation AB. Lockable cassette for valuable objects. 4,714,029, Cl. 109-45.000.
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 Ikeda, Hiraku; and Kuwashima, Hidesumi, to Hitachi, Ltd. Governing mode change-over apparatus. 4,714,401, Cl. 415-30.000.

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 Ikeda, Takashi. Piercing tool. 4,713,886, Cl. 30-366.000.
 Illinois Institute of Technology: See—
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 Illinois Tool Works Inc.: See—
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 Imaje S.A.: See—
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 Inada, Shoshichiro; Furukawa, Kurune; Masui, Takachika; Honda, Keiji; Ogasawara, Joji; and Tsubakimoto, Giichi, to Seitetsu Kagaku Co., Ltd.; Shinko Seito Co., Ltd.; and Shinko Sugar Production Co., Ltd. Process for recovering primary normal aliphatic higher alcohols. 4,714,791, Cl. 568-913.000.
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 Ros, Johannes F., 4,713,951, Cl. 70-456.00R.
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 Kergomard, Jean; and Meynial, Xavier, 4,714,001, Cl. 84-386.000.
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 Raisin, Jean-Pierre; and Canaud, Alain, 4,714,036, Cl. 112-147.000.
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 DiDomenico, Robert A., 4,714,462, Cl. 604-67.000.
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 Clark, Gregory J.; Chaudhari, Praveen; Cuomo, Jerome J.; Frisch, Margaret A.; and Speidell, James L., 4,714,831, Cl. 250-305.000.
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Barnett, Joseph A.; Gomez, Joseph M.; Green, William F.; Lisica, Vincent M.; and Rosenthal, Arnold B., 4,714,400, Cl. 414-751.000.
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 Cummings, Michael J.; Hanford, Donald E.; and Japp, Robert M., 4,714,504, Cl. 156-64.000.
 Fletcher, David L.; and Graham, Arthur E., 4,714,646, Cl. 428-204.000.
 Gladney, Henry M.; Lorch, Douglas J.; and Mattson, Richard L., 4,714,992, Cl. 364-200.000.
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 Livingston, David L.; Sucher, Daniel J.; and Walk, Bruce M., 4,714,993, Cl. 364-200.000.
 Makosch, Gunter, 4,714,348, Cl. 356-351.000.
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 Prasad, Chandrika; and Szweczyk, Andrew F., 4,714,982, Cl. 361-404.000.
 International Computers Limited: See—
 Desyllas, Peter L. L.; and Holt, Nicholas P., 4,714,990, Cl. 364-200.000.
 Eaton, John R., 4,714,991, Cl. 364-200.000.
 International Laser Systems, Inc.: See—
 Adsett, Anthony P., 4,714,107, Cl. 165-16.00A.
 International Paper Company: See—
 Richardson, Paul D., 4,714,191, Cl. 229-121.000.
 Intraspac, Inc.: See—
 Roth, Philip M.; Itskovitch, Nathan M.; and Sussman, Arthur, 4,713,894, Cl. 34-30.000.
 Inui, Shuji; and Sano, Yoshio, to Toyoda Gosei Co., Ltd. Steering wheel with tape switch assembly. 4,714,806, Cl. 200-61.550.
 Ioannides, Gregor, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig holland.Stiftung & Co. KG. Device for optical turbidity measuring of gases. 4,713,964, Cl. 73-116.000.
 Irick, Carl M.: See—
 Meeker, Gregory W.; Bleck, Norris E.; Rizzi, Marc A.; and Irick, Carl M., 4,714,422, Cl. 425-204.000.
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 Inoue, Ichizo; Oine, Toyonari; Yamada, Yoshihisa; Ishida, Ryuichi; and Ochiai, Takashi, 4,714,702, Cl. 514-259.000.
 Ishida, Toru: See—
 Nakatani, Seiichi; Yuhaku, Satoru; Okinaka, Hideyuki; Ishida, Toru; Makino, Osamu; and Kikuchi, Tatsuro, 4,714,570, Cl. 252-518.000.
 Ishige, Yoshiki: See—
 Kinugasa, Toshiyuki; Furuya, Tamio; Ishige, Yoshiki; Tsuchimoto, Yuichi; and Takahashi, Shoji, 4,714,424, Cl. 425-388.000.
 Ishii, Akira, to Kabushiki Kaisha Toshiba. Differential pressure transmission apparatus. 4,713,969, Cl. 73-706.000.
 Ishii, Masami: See—
 Yasuda, Keiji; Oda, Yukihisa; Hamajima, Shigemitsu; Ishii, Masami; Nakanishi, Katsumi; Tsuzuki, Takayoshi; and Tsuda, Jyous, 4,714,804, Cl. 200-11.0DA.
 Ishii, Toshihiko: See—
 Sato, Tadao; and Ishii, Toshihiko, 4,714,599, Cl. 423-290.000.
 Ishikawa Gasket Co. Ltd.: See—
 Udagawa, Tsunekazu, 4,714,260, Cl. 277-235.00B.
 Ishikawa Tekko Kabushiki Kaisha: See—
 Sawada, Kouji; Miura, Kiyokatsu; Suzuki, Keiichi; Idosako, Hidetaka; and Kazusa, Hideo, 4,714,368, Cl. 403-132.000.
 Ishizaki, Akira: See—
 Eguchi, Masaharu; Tosaka, Yoichi; Ohnuki, Ichiro; Aihara, Yoshihiko; and Ishizaki, Akira, 4,714,332, Cl. 354-21.000.
 Ishizuka, Keiji, to Canon Kabushiki Kaisha. Differential phase shift keying demodulator. 4,714,892, Cl. 329-50.000.
 Ito, Kojiro: See—
 Hiroi, Kazuo; and Ito, Kojiro, 4,714,988, Cl. 364-165.000.
 Ito, Kuninori: See—
 Horiki, Seinosuke; Makino, Reiji; Ito, Kuninori; and Unno, Tetsuji, 4,714,633, Cl. 427-282.000.
 Ito, Takeo; Takeuchi, Hajime; Hashimoto, Minoru; and Maeda, Tsumi, to Kabushiki Kaisha Toshiba. Magnetic recording medium. 4,714,654, Cl. 428-328.000.
 Ito, Yoichiro, to United States of America, Health and Human Services. Cross-axis synchronous flow-through coil planet centrifuge free of rotary seals: apparatus and method for performing countercurrent chromatography. 4,714,554, Cl. 210-635.000.
 Itoh, Kunio; Fukuda, Takeshi; and Yoshioka, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Rubber composition. 4,714,733, Cl. 524-493.000.
 Itoh, Satoshi: See—
 Tanaka, Koichi; and Itoh, Satoshi, 4,715,050, Cl. 375-111.000.
 Itou, Masami: See—
 Buma, Shuichi; Onuma, Toshio; Ohashi, Kaoru; and Itou, Masami, 4,714,271, Cl. 280-707.000.
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 Itskovitch, Nathan M.: See—
 Roth, Philip M.; Itskovitch, Nathan M.; and Sussman, Arthur, 4,713,894, Cl. 34-30.000.
 ITT Aerospace Optical: See—
 Willems, David A., 4,714,904, Cl. 333-148.000.
 Ivins, James M. Water saving float for a water tank. 4,714,088, Cl. 137-426.000.

Iwahashi, Hiroshi, to Kabushiki Kaisha Toshiba. Semiconductor memory device with plural latches for read out. 4,715,017, Cl. 365-239.000.
 Iwasaki, Tetsuji, to Kao Corporation. Concretion preventing agent for fertilizers. 4,714,490, Cl. 71-27.000.
 Iwasawa, Katsumasa: See—
 Mochizuki, Takeshi; Iwasawa, Katsumasa; Shiraiishi, Ikuya; and Terafuji, Kazuki, 4,714,635, Cl. 427-421.000.
 Iwata Air Compressor Mfg. Co., Ltd.: See—
 Mochizuki, Takeshi; Iwasawa, Katsumasa; Shiraiishi, Ikuya; and Terafuji, Kazuki, 4,714,635, Cl. 427-421.000.
 Iwata, Kenzi: See—
 Miyashita, Yoshinobu; Hamanaka, Tadashi; and Iwata, Kenzi, 4,714,675, Cl. 435-32.000.
 Iwata, Yasuji: See—
 Sasaki, Noboru; Iwata, Yasuji; and Mukai, Teruo, 4,713,956, Cl. 72-137.000.
 J. I. Case Company: See—
 Marek, Donald C., 4,714,263, Cl. 280-111.000.
 J. Kuhn GmbH Co.: See—
 John, Frank, 4,714,389, Cl. 409-233.000.
 Jabarin, Saleh A.: See—
 Balduff, Dennis C.; and Jabarin, Saleh A., 4,714,741, Cl. 525-185.000.
 Jackson, David A.; Corke, Michael; and Kersey, Alan D., to Kent Scientific and Industrial Projects Limited. Fiber optical interferometric temperature sensor with ramp modulation. 4,714,342, Cl. 356-44.000.
 Jacobson, David M., to John Fluke Mfg. Co., Inc. Method of and system for fast functional testing of random access memories. 4,715,034, Cl. 371-21.000.
 Jacquien, Paul: See—
 Bianchi, Claude; Fournier, Yves; and Jacquien, Paul, 4,713,882, Cl. 29-727.000.
 Jaffre, Robert; and Ropars, Yvon, to Etat Francais. Structure of surface effect ship with side walls. 4,714,041, Cl. 114-67.00A.
 Jain, Babu L.; Jain, Pardeep K.; and Briner, Michael S., to Gould Inc. Temperature compensated complementary metal-insulator-semiconductor oscillator. 4,714,901, Cl. 331-176.000.
 Jain, Pardeep K.: See—
 Jain, Babu L.; Jain, Pardeep K.; and Briner, Michael S., 4,714,901, Cl. 331-176.000.
 Jakobsson, Leif. Heat accumulator. 4,714,821, Cl. 219-326.000.
 Janome Sewing Machine Co., Ltd.: See—
 Kasuga, Noboru, 4,714,040, Cl. 112-323.000.
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 Wuesi, Hans-Heiner; Janssen, Bernd; Frickel, Fritz-Frieder; and Nuerrenbach, Axel, 4,714,786, Cl. 568-633.000.
 Januschowetz, Gerhard, to Schiedel GmbH & Co. Intermittently operating sorption apparatus with solid sorbent for heat and cold storage. 4,713,944, Cl. 62-480.000.
 Japan Synthetic Rubber Co., Ltd.: See—
 Hashimoto, Takatsugu; Maehara, Akihiro; Tomita, Seisuke; Funahashi, Yuichi; Watanabe, Junichiro; Sugiyama, Kazuo; and Matsumoto, Hironori, 4,714,734, Cl. 524-496.000.
 Japp, Robert M.: See—
 Cummings, Michael J.; Hanford, Donald E.; and Japp, Robert M., 4,714,504, Cl. 156-64.000.
 Jeblick, Werner: See—
 Humik, Helmut; Finzenhagen, Manfred; and Jeblick, Werner, 4,714,568, Cl. 252-350.000.
 Jefferies, Keith W.; and Long, Murray D., to Allflex International Limited. Liquid flow sensing device. 4,714,048, Cl. 119-14.080.
 Jeffers, Frederick J.: See—
 McClure, Richard J.; and Jeffers, Frederick J., 4,714,324, Cl. 350-362.000.
 Jenab, S. Abdollah. Hillslope landslide stability drain. 4,714,376, Cl. 405-45.000.
 Jenkins, Vaughn J.: See—
 Wilson, Bart A.; Jenkins, Vaughn J.; and Fonesbeck, Dale D., 4,714,837, Cl. 307-289.000.
 Jennens, Eric G. Inshore submersible amphibious machines. 4,713,896, Cl. 37-54.000.
 Jennings, Ralph N., to Triad Metal Products Company. Reuseable clamp with an outwardly projecting ear on each opposing end and having a hook shaped projection on one ear adapted for interlocking coaction with an opening in the other ear. 4,713,863, Cl. 24-20.00R.
 JEOL, Ltd.: See—
 Nagayama, Kuniaki, 4,714,882, Cl. 324-307.000.
 Jim Walter Resources, Inc.: See—
 Londrigan, Michael E.; and Skowronski, Michael J., 4,714,717, Cl. 521-131.000.
 Joader, Stefan: See—
 Schreurs, Emile; Joader, Stefan; and Valdemarsson, Stefan, 4,714,974, Cl. 361-12.000.
 Jodelet, Francois: See—
 Abondance, Roger; Corbet, Pierre; Jodelet, Francois; and Andre, Jean-Francois, 4,714,267, Cl. 280-615.000.
 Johannes, Wilhelmus. Device for determining the velocity in a flowing fluid by use of the acoustic Doppler-effect. 4,713,971, Cl. 73-861.250.
 Johansson, Lars A.: See—
 Wallin, Per Olov T.; Warel, Bengt H.; Svensson, Ake P.; Lundstrom, Kurt A.; and Johansson, Lars A., 4,714,025, Cl. 108-20.000.
 John Fluke Mfg. Co., Inc.: See—
 Jacobson, David M., 4,715,034, Cl. 371-21.000.
 Jones, Wayne R., 4,714,436, Cl. 439-497.000.

- John, Gunter; Kretschmer, Karl-Heinz; and Rollich, Jürgen, to VEB Kombinat Fortschritt Landmaschinen. Impeller-type cutter drum for a chopper. 4,714,204, Cl. 241-55.000.
- Johne, Frank, to J. Kuhn GmbH Co. Tool holder. 4,714,389, Cl. 409-233.000.
- Johns Hopkins University, The: See—
Civin, Curt I., 4,714,680, Cl. 435-240.250.
- Johnson, Dale B.: See—
DeHart, Marvin L.; and Johnson, Dale B., 4,714,009, Cl. 98-40.130.
- Johnson, Gilbert L., Jr.: See—
McMahon, Donald H.; and Johnson, Gilbert L., Jr., 4,715,028, Cl. 370-3.000.
- Johnson, Joel W.: See—
Healy, John T.; and Johnson, Joel W., 4,714,031, Cl. 110-109.000.
- Johnson, Ralph E.; and Rodda, Donald, to Singer Company, The. Needle looper assembly for non-threaded needle lockstitching. 4,714,037, Cl. 112-184.000.
- Johnson, Wayne J.: See—
Crawford, Robert D.; Johnson, Wayne J.; Kimber, Theo, Jr.; Nollf, Douglas; Volk, Jack R.; and Franks, Donald C., 4,715,031, Cl. 370-85.000.
- Johnson, William G.; and Romagnoli, Gary B. Container for disposable expended medical supplies. 4,714,168, Cl. 220-1.00T.
- Jones, Jamieson B. Fuel additive proportioning apparatus and method. 4,714,087, Cl. 137-3.000.
- Jones, Lloyd G., to Mobil Oil Corporation. Use of a proppant with controlled pulse fracturing. 4,714,114, Cl. 166-280.000.
- Jones, Robert L., to NDT Instruments, Inc. Hand-held digital thickness gage. 4,715,008, Cl. 364-563.000.
- Jones, Wayne R., to John Fluke Mfg. Co., Inc. Test clip with grounding adaptor for cable connector. 4,714,436, Cl. 439-497.000.
- Joppien, Hartmut: See—
Franke, Heinrich; Joppien, Hartmut; and Franke, Helga, 4,714,710, Cl. 514-430.000.
- Jordan, Robert D. Fuel injector system. 4,714,066, Cl. 123-447.000.
- Jordan, Willie W.: See—
McEachern, Richard D.; Jordan, Willie W.; Gebheim, Gerald C.; and Robinson, Joe M., 4,714,196, Cl. 239-62.000.
- Jorgensen, Diane V.; Kennedy, Clinton R.; and Wong, Stephen S., to Mobil Oil Corporation. Process for cyclic dewaxing/regeneration of hydrocarbon feedstocks. 4,714,537, Cl. 208-111.000.
- Joshua, Henry: See—
Miller, Douglas K.; and Joshua, Henry, 4,714,711, Cl. 514-464.000.
- Jova Enterprises, Inc.: See—
Gerling, John E.; and Ren, Ji T., 4,714,811, Cl. 219-10.55F.
- Juhl, Roger L.; Potter, James L.; and Polemenakos, Sotiros C., to Dow Chemical Company, The. Stable polyamide solutions. 4,714,736, Cl. 524-608.000.
- Jumel, Bernard: See—
Focqueur, Herve; and Jumel, Bernard, 4,714,448, Cl. 464-68.000.
- Jung, Alfred K.; Silberberg, Joseph; and Weil, Edward D., to Stauffer Chemical Company. Dibromoneopentyl phosphate melamine salt flame retardant. 4,714,724, Cl. 524-100.000.
- Junghans Uhren GmbH: See—
Ganter, Wolfgang, 4,714,352, Cl. 368-64.000.
- Jungverdorben, Hermann-Josef: See—
Reinehr, Ulrich; Hirsch, Rolf-Burkhard; Dross, Joachim; and Jungverdorben, Hermann-Josef, 4,714,045, Cl. 118-420.000.
- Jupp, Jeffrey A.; and Rees, Peter H., to British Aerospace PLC. Aircraft wing and winglet arrangement. 4,714,215, Cl. 244-199.000.
- Juri, Pedro N.: See—
Feld, Thomas A.; Juri, Pedro N.; and Treher, Elizabeth N., 4,714,605, Cl. 424-1.100.
- K & L Microwave: See—
Bernstein, Richard; Anthony, William H.; and Lupfer, David A., 4,714,905, Cl. 333-167.000.
- Kabasawa, Satoshi; Hsieh, Ming-Shiun; Chang, Shih-Ming; and Lin, Chun-Hong, to Matsushita Electric Industrial Co., Ltd. Pattern recognition system. 4,715,004, Cl. 364-513.500.
- Kabushiki Kaisha Daikin Seisakusho: See—
Ohkubo, Masahiro, 4,713,984, Cl. 74-732.000.
- Kabushiki Kaisha Kobe Seiko Sho: See—
Matsumura, Tetsuo; Ohzawa, Toshio; Kawashima, Akihiro; Ohkuma, Osamu; Sawada, Saburo; Yanai, Shun'ichi; Yoshimura, Hiroshi; and Sugino, Yasuo, 4,714,543, Cl. 208-412.000.
- Kabushiki Kaisha Toshiba: See—
Hiroi, Kazuo; and Ito, Kojiro, 4,714,988, Cl. 364-165.000.
- Ichikawa, Kentaro, 4,714,402, Cl. 415-35.000.
- Ishii, Akira, 4,713,969, Cl. 73-706.000.
- Ito, Takeo; Takeuchi, Hajime; Hashimoto, Minoru; and Maeda, Tatsumi, 4,714,654, Cl. 428-328.000.
- Iwahashi, Hiroshi, 4,715,017, Cl. 365-239.000.
- Onitsuka, Naganori, 4,714,869, Cl. 322-20.000.
- Rokugawa, Kyuji; and Tamayama, Yasuko, 4,714,672, Cl. 435-7.000.
- Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, 4,714,856, Cl. 313-2.100.
- Tanaka, Koichi; and Itoh, Satoshi, 4,715,050, Cl. 375-111.000.
- Kabushiki Kaisha Advance Kaihatsu Kenkyujo: See—
Ando, Shimon, 4,713,985, Cl. 74-804.000.
- Kabushikikaisha Kotobuki: See—
Kageyama, Hidehei; and Kuwabara, Yukimasa, 4,714,365, Cl. 401-65.000.
- Kadash, Marjory A.; and Schwab, Frederick C., to Mobil Oil Corporation. Method for treating polymer surfaces by corona discharge and

- then with reducing agent and resulting article. 4,714,658, Cl. 428-523.000.
- Kafkis, N. H. Method and apparatus for filling a plurality of flexible pipette type vessels. 4,713,925, Cl. 53-432.000.
- Kafko Manufacturing Limited: See—
Kindness, William, 4,713,849, Cl. 4-496.000.
- Kageyama, Akira: See—
Oda, Hiroyuki; and Kageyama, Akira, 4,714,058, Cl. 123-90.220.
- Kageyama, Hidehei; and Kuwabara, Yukimasa, to Kabushikikaisha Kotobuki. Mechanical pencil. 4,714,365, Cl. 401-65.000.
- Kajiyama, Kouji: See—
Ueda, Kazuhiro; Yamaguchi, Toshiaki; Kajiyama, Kouji; and Matsumoto, Osamu, 4,714,089, Cl. 137-614.180.
- Kajs, Theresa M.; and Berge, Cynthia A., to Procter & Gamble Company, The. Antimicrobial toilet bars. 4,714,563, Cl. 252-107.000.
- Kali-Chemie Pharma GmbH: See—
Thies, Peter W.; David, Samuel; Kuehl, Ulrich; Buschmann, Gerd; and Flecker, Peter, 4,714,709, Cl. 514-414.000.
- Kamata, Yutaka: See—
Uneno, Tsunehisa; Kamata, Yutaka; and Miyazaki, Sinji, 4,714,668, Cl. 430-316.000.
- Kamaya, Masashi, to PIAA Corporation. Mounting device for fog lamp. 4,714,223, Cl. 248-291.000.
- Kamio, Masaru: See—
Yokeno, Koujiro; Kamio, Masaru; and Ohkubo, Yukitoshi, 4,714,636, Cl. 428-1.000.
- Kamm, Bodo: See—
Hahn, Alfred; Kamm, Bodo; Weiss, Karl; and Dummert, Johannes, 4,715,057, Cl. 378-197.000.
- Kamohara, Eiji: See—
Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, 4,714,856, Cl. 313-2.100.
- Kanbe, Junichiro: See—
Katagiri, Kazuharu; Yoshinaga, Kazuo; Okada, Shinjiro; and Kanbe, Junichiro, 4,714,323, Cl. 350-350.00S.
- Kanemitsu, Shinji: See—
Nishino, Fumio; Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; and Toriumi, Mototada, 4,714,337, Cl. 355-3.0DR.
- Kanno, Hideo; Yamashita, Shinichi; Enari, Masahiko; Kuno, Mitsutoshi; and Mizutome, Atsushi, to Canon Kabushiki Kaisha. Display panel and method of driving the same. 4,714,921, Cl. 340-784.000.
- Kanojia, Ramesh M.; Falotico, Robert; Tobia, Alfonso J.; and Press, Jeffery B., to Ortho Pharmaceutical Corporation. 4-nitrogen substituted isoquinolinol compounds having cardiotonic, phosphodiesterase fraction III inhibiting properties and/or renal vasodilating properties. 4,714,705, Cl. 514-309.000.
- Kantrud, Steven G.; Ericson, Steven V.; and Seidel, Karl R., Jr., to Micro Component Technology, Inc. Drop shuttle. 4,714,150, Cl. 198-463.300.
- Kao, Anthony H. Preparing naturally sweet yogurt with *Saccharomycopsis* sp. and *Rhizopus* spp. 4,714,616, Cl. 426-42.000.
- Kao Corporation: See—
Dohzono, Masatake; Miyashita, Iwao; and Abe, Norihiro, 4,714,466, Cl. 604-378.000.
- Iwasaki, Tetsuji, 4,714,490, Cl. 71-27.000.
- Yamasaki, Harumasa; Morii, Masayoshi; Yokota, Yukinaga; Mamada, Akira; and Nabata, Yoshiyuki, 4,714,719, Cl. 521-163.000.
- Kapany, Narinder S.; and Unterleitner, Fred C., to Kaptron, Inc. Star coupler for optical fibers. 4,714,313, Cl. 350-96.160.
- Kaplinsky, George T., to Hewlett-Packard Company. Ink delivery system. 4,714,937, Cl. 346-140.00R.
- Kaptron, Inc.: See—
Kapany, Narinder S.; and Unterleitner, Fred C., 4,714,313, Cl. 350-96.160.
- Karnopp, Dean: See—
Heess, Gerhard; Karnopp, Dean; and van Zanten, Anton, 4,714,300, Cl. 303-115.000.
- Kasama, Nobuhiro: See—
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- Kassik, Ronald W.: See—
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- Kast, Steven J., to United States of America, Energy. Interlocking egg-crate type grid assembly. 4,714,585, Cl. 376-442.000.
- Kasuga, Noboru, to Janome Sewing Machine Co., Ltd. Sewing machine four motion speed. 4,714,040, Cl. 112-323.000.
- Katagiri, Kazuharu; Yoshinaga, Kazuo; Okada, Shinjiro; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal device having chiral smectic and nematic liquid crystal composition. 4,714,323, Cl. 350-350.00S.
- Kataoka, Yoshiharu: See—
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- Kato, Minoru: See—
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- Kato, Yoshitake; Fujita, Minoru; and Maruyama, Hiroshi, to Hitachi Maxell, Ltd. Shutter assembly for use in a disc cartridge. 4,714,973, Cl. 360-133.000.
- Kaufman, Christopher: See—
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- Kaun, Thomas D.; and Smith, James L., to United States of America, Energy. Molten carbonate fuel cell. 4,714,661, Cl. 429-14.000.
- Kawada, Kazuhiro: See—
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- Kawaguchi, Katsuji: See—
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- Kawaguchi, Takeshi: See—
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- Kawai, Masao: See—
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- Kawai Musical Instrument Mfg. Co., Ltd.: See—
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- Kawai, Takashi: See—
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- Kawajiri, Kazuhiro; Tamura, Hiroshi; Shinada, Haruji; Saito, Mitsuo; and Mizobuchi, Yuzo. Solid-state photo sensor device. 4,714,950, Cl. 357-30.000.
- Kawakita, Tetsuya: See—
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- Kawano, Hiroshige, to Nakamura Koki Co., Ltd. Bladder type fluid accumulator for hydraulic system. 4,714,093, Cl. 138-30.000.
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- Kawasumi Laboratories, Inc.: See—
Kawasumi, Shinroku, to Mitsubishi Mining & Cement Co., Ltd.; and Kawasumi Laboratories, Inc. Electronic parts and process for the manufacture of the same. 4,714,645, Cl. 428-209.000.
- Kay, D. Alan R.; and Wilson, William G. Methods of desulfurizing gases. 4,714,598, Cl. 423-230.000.
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- Kazusa, Hideo: See—
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- Kearns, John J.: See—
Tremblay, Paul A.; and Kearns, John J., 4,714,571, Cl. 260-403.000.
- Keenan, Daniel J.; and Hoss, Donald A., to Chrysler Motors Corporation. Collapsible/expandable shipping rack. 4,714,169, Cl. 220-8.000.
- Keene, Harold J.: See—
Dusel, Robert O.; Keene, Harold J.; Berres, James; and Blaha, Gerald, 4,713,880, Cl. 29-564.400.
- Keil, John P.: See—
Sisk, George W.; Lynn, Shelby A.; Keil, John P.; and Woods, John T., 4,714,304, Cl. 312-214.000.
- Keiper Recaro GmbH & Co.: See—
Cremer, Heinz P.; Wolsiefer, Harald; Hoffmann, Manfred; Deegen, Elmar; and Franzmann, Gunter, 4,713,986, Cl. 74-805.000.
- Keith, William C., to Texas Instruments Incorporated. Linear drive motor with symmetric magnetic fields for a cooling system. 4,713,939, Cl. 62-6.000.
- Kejr, Melvin P. Vehicle for transporting elongated objects. 4,714,273, Cl. 280-789.000.
- Keklak, Ronald; Couture, Michael V.; and Whitehouse, John C. Safe utility knife. 4,713,885, Cl. 30-162.000.
- Kelber, John D. Leaf collection apparatus for blower-vacuums. 4,713,858, Cl. 15-347.000.
- Keller AG fur Druckmesstechnik: See—
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- Kelly, George G.; McLaughlin, Henry; and Simon, James R., to CXA Ltd./CXA LTEE. Pyrotechnic variable delay connector. 4,714,017, Cl. 102-275.300.
- Kemeny, George A., to Westinghouse Electric Corp. Electromagnetic launcher with a passive inductive loop for rail energy retention or dissipation. 4,714,003, Cl. 89-8.000.
- Kemler, Craig G.: See—
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- Kenna, Robert V., to Pfizer Hospital Products Group, Inc. Spinal implant. 4,714,469, Cl. 623-17.000.
- Kennedy, Clinton R.: See—
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- Kent Scientific and Industrial Projects Limited: See—
Jackson, David A.; Corke, Michael; and Kersey, Alan D., 4,714,342, Cl. 356-44.000.
- Kerdraon, Alain: See—
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- Kergomard, Jean; and Meynial, Xavier, to Centre National de la Recherche Scientifique; and Institut de Recherche et de Coordination Acoustique Musique IRCAM. Device for obtaining quarter-tones and other micro-intervals on musical wind instruments with lateral holes. 4,714,001, Cl. 84-386.000.
- Kerivan, Leo J.: See—
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- Kernforschungsanlage Julich GmbH: See—
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- Kernforschungszentrum Karlsruhe GmbH: See—
Hofmann, Albert, 4,713,942, Cl. 62-62.000.
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- Kersten, Reinhard: See—
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- Kessler, Manfred; and Hoper, Jens. Method for measurement of concentration of substance. 4,714,673, Cl. 435-14.000.
- Kesteloot, Raymond P., to R K W Industries, Inc. Composite engine. 4,714,060, Cl. 123-195.00R.
- Ketley, Celia H., to W. R. Grace & Co. Low temperature single step curing polyimide adhesive. 4,714,726, Cl. 524-11.000.
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- Keyes, Melvin H., to Owens-Illinois Glass Container Inc. Protein modification to provide enzyme activity. 4,714,676, Cl. 435-176.000.
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- Khachaturian, Jon E. Method and apparatus for the offshore installation of multi-ton prefabricated deck packages on partially submerged offshore jacket foundations. 4,714,382, Cl. 405-204.000.
- Khare, Ashok K., to National Forge Company. Process for producing large section, large mass forged sleeves from large diameter ingots of alloy 625. 4,714,498, Cl. 148-11.50N.
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- Khowaylo, Alex: See—
Averill, Robert G.; Khowaylo, Alex; and Sidebotham, Christopher G., 4,714,472, Cl. 623-20.000.
- Kiesel, Helmut; and Stoeckl, Klaus, to Siemens Aktiengesellschaft. Bracket structure for dental purposes. 4,714,222, Cl. 248-282.000.
- Kikuchi, Seiji: See—
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- Kikuchi, Tatsuro: See—
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- Kikuchi, Uhee; and Takeo, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. Painting apparatus for vehicle body. 4,714,044, Cl. 118-314.000.
- Kimber, Theo, Jr.: See—
Crawford, Robert D.; Johnson, Wayne J.; Kimber, Theo, Jr.; Nollf, Douglas; Volk, Jack R.; and Franks, Donald C., 4,715,031, Cl. 370-85.000.
- Kimberly-Clark Corporation: See—
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- Kindness, William, to Kafko Manufacturing Limited. Pool liner retainer with closure clip. 4,713,849, Cl. 4-496.000.

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Hironaka, Yoshiaki, 4,714,447, Cl. 464-52.000.

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Kisida, Hiroshi; Nishida, Sumio; and Hatakoshi, Makoto, to Sumitomo Chemical Company, Limited. Pyridyloxy derivatives and their use as insecticides. 4,714,706, Cl. 514-345.000.

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Kumm, Emerson L.; and Kraver, Theodore C., 4,714,452, Cl. 474-49.000.

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Yonezawa, Toshio; Sasaguri, Nobuya; Kawaguchi, Katsuji; and Kusakabe, Takaya, 4,714,501, Cl. 148-13.000.

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Lechner, Fritz; Heissler, Herbert; Scheer, Wolfgang; Siebels, Wolfgang; and Ascherl, Rudolf, to M A N Technologie GmbH. Reinforced fiber bone replacement implant having treated surfaces and a method for its manufacture. 4,714,467, Cl. 623-16.000.

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Lee, Chun-Shen, to Amada Engineering & Service Co., Inc. Laser system. 4,715,040, Cl. 372-98.000.

Lee, Michael C.; and Golden, Mark A., to General Motors Corporation. Low coefficient of friction nylon blend. 4,714,740, Cl. 525-179.000.

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- Leslie Hartridge Limited: See—
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- L'Etat Francais represente par le Delege Ministeriel pour l'Armement: See—
Bocker, Jurgen; Klein, Klaus W.; Gersbach, Klaus; Sauvestre, Jean-Claude; and Montier, Patrick, 4,714,024, Cl. 102-521.000.
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- Levigator, Inc.: See—
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- Lewis, Kenneth A.; Alpern, Alan N.; Frank, Andrew C.; and Ross, Stuart E., to GridComm, Inc. System protocol for composite shift keying communication system, 4,715,045, Cl. 375-58.000.
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- Lipscher, Bernard N.; and Coleman, Kevin G. Door message apparatus with telephone answering device, 4,715,060, Cl. 379-70.000.
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- Lisle Corporation: See—
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- Liu, Ming-Biann, to Dow Chemical Company, The. Process for preparing halogenated trialkyl phosphate esters, 4,714,771, Cl. 558-102.000.
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- Londrigan, Michael E.; and Skowronski, Michael J., to Jim Walter Resources, Inc. Polyester polyols modified by low molecular weight glycols and cellular foams therefrom, 4,714,717, Cl. 521-131.000.
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- Looney, Ralph W.: See—
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- Lopez, Sergio: See—
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- Lorch, Douglas J.; and Mattson, Richard L., 4,714,996, Cl. 364-300.000.
- Lorenz, Joachim; and Gattinger, Martin, to MTU Motoren-und Turbinen Union Muenchen GmbH. Lubricating system for gas turbine engines and pump for such a system, 4,714,139, Cl. 184-6.110.
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- Loth, Fritz: See—
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- Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik; Stephen J., to Viskase Corporation. Irradiated multilayer film for primal meat packaging, 4,714,638, Cl. 428-35.000.
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- Mail, Jacob A., to Boeing Company, The. Aircraft wheel brake metering and despin valve, 4,714,298, Cl. 303-100.000.
- Mainland, Donald R., to Kolar Arms. Choke assemblies for shotguns, 4,713,903, Cl. 42-79.000.
- Maish, Dieter, to Herion-Werke KG. Shuttle piston cylinder, 4,714,007, Cl. 92-88.000.
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- MaKosch, Gunter, to International Business Machines Corporation. Method and arrangement for optically determining surface profiles, 4,714,348, Cl. 356-351.000.
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- Malloy Desormaux, Stephen G., to Eastman Kodak Company. Camera with door release and film rewind interlock, 4,714,335, Cl. 354-214.000.
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- Manning, Maurice; and Sawyer, Wilbur H., to Medical College of Ohio; and Columbia University, Trustees of, a part interest. Novel derivatives of arginine vasopressin antagonists, 4,714,696, Cl. 514-11.000.
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- Marek, Donald C., to J.I. Case Company. Axle oscillation adjustment means, 4,714,263, Cl. 280-111.000.
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- Mars, Inc.: See—
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- Marsden, Richard J.: See—
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- Marshall, Charles H., to Westinghouse Electric Corp. Oblique observation attachment for microscopes, 4,714,327, Cl. 350-504.000.
- Martin, Eugene J.: See—
Tootle, James N.; and Martin, Eugene J., 4,714,006, Cl. 92-5.00R.
- Martin, Francis W.: See—
Holleran, Louis M.; and Martin, Francis W., 4,714,687, Cl. 501-9.000.
- Martino, Germain: See—
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- Marty, Michel: See—
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- Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, to Toyo Seikan Kaisha, Ltd. Plastic vessel having oriented coating and process for preparation thereof, 4,714,580, Cl. 264-516.000.
- Maruishi Seiyaku Kabushiki Kaisha: See—
Sato, Nobukatsu; Kuraiyama, Haruo; and Agou, Masanobu, 4,714,764, Cl. 546-271.000.
- Maruyama, Hiroshi: See—
Kato, Yoshitake; Fujita, Minoru; and Maruyama, Hiroshi, 4,714,973, Cl. 360-133.000.
- Maruyama, Toshio; Shibuya, Noriaki; and Nakata, Yukihiko, to Sharp Kabushiki Kaisha. Charging and discharging control circuit for a storage battery, 4,714,868, Cl. 320-5.000.
- Marx, Matthias: See—
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- Marzoni, Gifford P.: See—
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- Masamura, Tatsuro, to Canadian Patents And Development Limited. Frequency offset diversity receiving system, 4,715,048, Cl. 375-100.000.
- Mascetti, Paolo, to Camoga S.p.A. Device adapted to move the sharpening grinding wheels in a leather splitting machine close to and away from a cutting blade, 4,713,950, Cl. 69-10.000.
- Mason, Brian R.: See—
Bailey, John W.; Hayter, Paul A.; Mason, Brian R.; and Turner, Graham N., 4,714,875, Cl. 324-73.0PC.
- Massey-Ferguson Services N.V.: See—
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- Masuda, Shuji; and Oda, Hiroyuki, to Mazda Motor Corporation. Single overhead camshaft engine, 4,714,059, Cl. 123-90.230.
- Masui, Takachika: See—
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- Masumura, Masanori: See—
Muto, Osamu; Masumura, Masanori; and Hori, Yoshiaki, 4,713,979, Cl. 74-337.500.
- Materna, Anthony T.; Vossler, Roger A.; and Stepczyk, Frank M., to TRW Inc. Computer integration system, 4,714,995, Cl. 364-200.000.
- Mather, Graham W.; Warwick, Graham R.; and Bazeley, Graham A., to Fisherwell Limited. Folding golf cart, 4,714,268, Cl. 280-646.000.
- Mathew, Ranjan: See—
Malladi, Devi P.; Mathew, Ranjan; and Shah, Divyesh P., 4,714,517, Cl. 156-629.000.
- Matsubara, Katsumi; Uchida, Riichi; Muramatsu, Masatoshi; Naya, Kotaro; and Takagi, Tsuneharu, to Hitachi, Ltd. Screw type vacuum pump, 4,714,418, Cl. 418-201.000.
- Matsuda, Eiichi, to Fine Foods Research Cooperative Union. Process for treating frozen block meat, 4,714,618, Cl. 426-524.000.
- Matsuishi, Tsutomu: See—
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- Matsuki, Taketo: See—
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- Matsumoto, Hironori: See—
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- Matsumoto, Osamu: See—
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- Matsumura, Tetsuo; Ohzawa, Toshio; Kawashima, Akihiro; Ohkuma, Osamu; Sawada, Saburo; Yanai, Shun'ichi; Yoshimura, Hiroshi; and Sugino, Yasuo, to Kabushiki Kaisha Kobe Seiko Sho; Idemitsukosan Kabushiki Kaisha; Mitsubishi Kasei Kogyo Kabushiki Kaisha; and Azisakiy Kabushiki Kaisha. Method of treating brown coal for liquefaction, 4,714,543, Cl. 208-412.000.
- Matsumura, Toshio, to Nissan Motor Co., Ltd. Reduction ratio control for continuously variable transmission, 4,713,987, Cl. 74-866.000.
- Matsuo, Noritada; Tushima, Kazunori; Nishida, Sumio; and Yano, Toshihiko, to Sumitomo Chemical Company, Limited. Carboxylic acid esters and insecticides containing them as the active ingredient, 4,714,712, Cl. 514-531.000.

Matsushita Electric Industrial Co., Ltd.: See—
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McAliley, J. Eugene; Daumit, Gene P.; Ethridge, Frederick A.; and Crozier, James R., Jr., to BASF Aktiengesellschaft. Carbon fiber multifilamentary tow which is particularly suited for weaving and/or resin impregnation. 4,714,642, Cl. 428-113.000.
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McClure, Richard J.; and Jeffers, Frederick J., to Eastman Kodak Company. Apparatus utilizing dispersion shear. 4,714,324, Cl. 350-362.000.
McCoy, Daniel E.; Garver, Donald L.; and Hileman, George, to Dorr-Oliver Incorporated. Apparatus to reduce or eliminate fluid bed tube erosion. 4,714,049, Cl. 424-00D.
McCready, Russell J.; and Tyrell, John A., to General Electric Company. Thermoplastic polyetherimide ester elastomers exhibiting improved hydrolytic stability. 4,714,753, Cl. 528-288.000.
McCready, Russell J.; and Tyrell, John A., to General Electric Company. Polyetherimide esters. 4,714,754, Cl. 528-288.000.
McCready, Russell J.; and Tyrell, John A., to General Electric Company. Thermoplastic polyetherimide ester elastomers exhibiting improved thermal properties. 4,714,755, Cl. 528-288.000.
McEachern, Richard D.; Jordan, Willie W.; Gebheim, Gerald C.; and Robinson, Joe M., to AgRobotics, Inc. Farm chemical delivery system. 4,714,196, Cl. 239-62.000.
McGlashen, James N., to Apsley Metals Limited. Vehicle and tire therefore. 4,714,099, Cl. 152-523.000.
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Medem, Harald: See—
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Meeker, Gregory W.; Bleck, Norris E.; Rizzi, Marc A.; and Irick, Carl M., to Farrel Corporation. Rotary plasticator screw injection machine. 4,714,422, Cl. 425-204.000.
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Miller, Bernard F., to Ingersoll-Rand Company. Plural-stage gas compressor. 4,714,414, Cl. 418-11.000.

Miller, Douglas K.; and Joshua, Henry, to Merck & Co., Inc. 6-hydroxy-2(2-hydroxy-4-methoxyphenyl)benzofuran derivatives to inhibit leukotriene biosynthesis. 4,714,711, Cl. 514-464.000.
Miller, Mike F.; and Gunther, Kim M., to Spectra-Physics, Inc. Internal resonator water cooled ion laser. 4,715,039, Cl. 372-37.000.
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Minai, Masayoshi; and Ueda, Yuji, to Sumitomo Chemical Co., Ltd. Process for preparing optically active 4-hydroxy-2-cyclopentenones. 4,714,782, Cl. 568-347.000.
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Minowa, Masahiro, to Seiko Epson Corporation. Print control device for a dot matrix printer. 4,714,363, Cl. 400-322.000.
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Medlin, William L.; and Zumwalt, Gary L., 4,715,019, Cl. 367-31.000.
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Uhri, Duane C., 4,714,115, Cl. 166-308.000.
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Mohnot, Shantilal M.; and Chakrabarti, Paritosh M., to PPG Industries, Inc. Alkaline water flooding with a precipitation inhibitor for enhanced oil recovery. 4,714,113, Cl. 166-270.000.
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Moore Business Forms, Inc.: See—
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Moore, George G. I.: See—
Bell, Randy L.; and Moore, George G. I., 4,714,776, Cl. 562-460.000.
Moore, James E.: See—
Quinn, Clayton B.; McClish, Richard R.; and Moore, James E., 4,714,657, Cl. 428-412.000.
Moore, Wayne E.; Quinn, Stephen R.; Tufts, Wesley M.; and Gasko, William F., to Aster Associates. Optical fiber unit having protective assembly. 4,714,316, Cl. 350-96.200.
Morgan, Charles G., to General Electric Co. (Alumina electrically conductive) guide article. 4,714,640, Cl. 428-36.000.
Morgan, Stephen E.: See—
Cox, John C.; Morgan, Stephen E.; Hamblett, Martin; and Rubini, Alfred, 4,714,407, Cl. 415-192.000.

- Mori, Masayoshi: See—
Yamasaki, Harumasa; Mori, Masayoshi; Yokota, Yukinaga; Mamada, Akira; and Nabata, Yoshiyuki, 4,714,719, Cl. 521-163.000.
- Morin, Fernand R., to Wolverine Aluminum Distributing Ltd. Ladder support for eavestrough or gutter, 4,714,136, Cl. 182-107.000.
- Morison, John: See—
Rouse, Michael W.; Thelen, Robert L.; and Morison, John, 4,714,201, Cl. 241-24.000.
- Moroto, Shuzo; Sumiya, Koji; Watanabe, Kazuaki; Kubo, Seitoku; Kobayashi, Koji; and Taga, Yutaka, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Friction coupling element of automatic transmission, 4,714,146, Cl. 192-85.0AA.
- Morris, David B.; Rollett, Andrew C.; and Roberts, Donald M., to Bayer Aktiengesellschaft. Device for the metering of a chemical, particularly for seed treatment, 4,714,177, Cl. 222-58.000.
- Morris, James R.; and White, James A., to Miles Inc. Test strip identification and instrument calibration, 4,714,874, Cl. 324-65.00R.
- Morris, John M., to GT Development Corporation. Vapor recovery systems, 4,714,172, Cl. 220-86.00R.
- Morris, Lawrence E.: See—
Falk, Theodore J.; and Morris, Lawrence E., 4,714,234, Cl. 251-129.170.
- Morrison, Charles F., Jr., to Granville-Phillips Company. Method and apparatus for improving the safety and extending the range of ionization gauge systems, 4,714,891, Cl. 324-459.000.
- Morrison, Elbert F.; Bradley, Danny R.; and Reece, D. C., to Burlington Industries, Inc. Apparatus for vacuum spinning, 4,713,931, Cl. 57-328.000.
- Morrison, Herbert M.; and Del Mar, Jorge, to Clairor Incorporated. Electrically heated curling wrapper, 4,714,820, Cl. 219-222.000.
- Morocco, Diane M. Fast food take out carton with cover, 4,714,190, Cl. 229-1.50B.
- Morrone, James V. Media storage apparatus, 4,714,157, Cl. 206-309.000.
- Morton Metalcraft Company: See—
Flaherty, Patrick; and Bridgwater, Jon D., 4,713,850, Cl. 4-585.000.
- Moscattelli, Saverio: See—
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- Moser, Franz: See—
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- Moser, Mark D.; and Lawson, Randy J., to UOP Inc. Trimetallic reforming catalyst, 4,714,538, Cl. 208-139.000.
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- Mosier, Benjamin. Method of forming fire retardant insulating material from plastic foam scrap and the resultant product, 4,714,715, Cl. 521-54.000.
- Mosser, Kenneth J. Automatic reset target assembly, 4,714,256, Cl. 273-392.000.
- Mothersole, David: See—
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- Motorola, Inc.: See—
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- Deem, Jake O.; Kassik, Ronald W.; and Metteer, N. Bruce, 4,715,001, Cl. 364-484.000.
- Haddad, Kenneth R.; and Vilmur, Richard J., 4,715,063, Cl. 379-390.000.
- Kurtzman, Gary; Heck, Joseph P.; Hansen, Kenneth A.; Enderby, Ralph; and Vidugiris, Bronis, 4,714,899, Cl. 331-1.00A.
- Lang, Warren R., 4,714,983, Cl. 362-27.000.
- MacGregor, Douglas B.; Zolnowsky, John; and Mothersole, David, 4,715,013, Cl. 364-900.000.
- Marabotto, Eduardo J.; Bresin, Mark S.; and Drake, Bick R., 4,714,439, Cl. 439-627.000.
- Pfister, James R., 4,714,519, Cl. 437-81.000.
- Tassle, C. R. V.; and Freeburg, Thomas A., 4,714,923, Cl. 340-825.060.
- Mrotzek, Dieter: See—
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- MTU Motoren und Turbinen Union Muenchen GmbH: See—
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- Mueller, Otto, Jr., to Massey-Ferguson Services N.V. Electronic tractor control, 4,715,012, Cl. 364-900.000.
- Mueller, Robert, to Dr. Ing. h.c.f. Porsche Aktiengesellschaft. Transmission system with intermediate differential for all-wheel drive vehicle, 4,714,129, Cl. 180-248.000.
- Mueller, Wolfgang H. E.: See—
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- Mukai, Teruo: See—
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- Mukainakano, Shinichi: See—
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- Muller, Dieter J.; and Wehmeyer, Heinrich, to Huels Aktiengesellschaft. Process for the production of 1,2,3-trichloropropane, 4,714,792, Cl. 570-261.000.
- Muller, Erich: See—
Roch, Josef; Heckel, Armin; Nickl, Josef; Muller, Erich; Narr, Berthold; Zimmermann, Rainer; and Weisenberger, Johannes, 4,714,698, Cl. 514-212.000.
- Muller, Hans; and Suerbaum, Hermann, to Muller, Hans. Method of salvaging a pipe conduit buried under ground, 4,714,095, Cl. 138-98.000.
- Muller, Klaus; Mutz, Bernd; and Daler, Helmo, to A. Raymond. Self-locking sheet-metal nut, 4,714,392, Cl. 411-175.000.
- Muller, Rudolph R. M., to Multifastener Corporation. Method of attaching fastening element to a panel, 4,713,872, Cl. 29-512.000.
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- Murai, Takashi: See—
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- Muramatsu, Masatoshi: See—
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- Murari, Bruno; Pasetti, Mauro; and Rossetti, Nazzareno, to SGS Microelettronica SpA. Monolithically integratable signal amplifier stage with high output dynamics, 4,714,897, Cl. 330-288.000.
- Murata, Kouji: See—
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- Murayama, Akira: See—
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- Murayama, Seiichi: See—
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- Musha, Tohru, to Olympus Optical Co., Ltd. Optical head with provision for tracking and focussing control, 4,715,024, Cl. 369-44.000.
- Muto, Kazuhiko, to Canon Kabushiki Kaisha. Logarithmic compression circuit, 4,714,844, Cl. 307-494.000.
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- Myerson, Joel: See—
Bente, H. Bryan; Herman, Alan C.; Myerson, Joel; Shaw, Benjamin G.; and Stefanski, Andrew, 4,714,545, Cl. 210-101.000.
- Nabata, Yoshiyuki: See—
Yamasaki, Harumasa; Mori, Masayoshi; Yokota, Yukinaga; Mamada, Akira; and Nabata, Yoshiyuki, 4,714,719, Cl. 521-163.000.
- Nabisco Brands, Inc.: See—
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- Nachman, Frank J.: See—
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- Nagai, Toki. Composite electromotive apparatus utilizing solar energy and the like, 4,714,797, Cl. 136-206.000.
- Nagamoto, Itsushi; Nakanishi, Tatsuo; and Tajima, Ryohei, to Nippon Gakki Seizo Kabushiki Kaisha. Method for producing a wood-type golf club head, 4,714,577, Cl. 264-46.600.
- Nagano, Hiroo: See—
Yamanaka, Kazuo; Nagano, Hiroo; Minami, Takao; Okada, Yautaka; Inoue, Mamoru; Susukida, Hiroshi; Onimura, Kichiro; Yonezawa, Toshio; Sasaguri, Nobuya; Kawaguchi, Katsuji; and Kusakabe, Takaya, 4,714,501, Cl. 148-13.000.
- Nagano, Shuji: See—
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- Nagao, Akihito: See—
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- Nagarwalla, Pheroze J.: See—
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- Nagase, Masaomi; Takemoto, Eiji; Ibuki, Noritaka; and Hasegawa, Takashi, to Toyota Jidosha Kabushiki Kaisha. Method and device for controlling fuel injection quantity of electronic control diesel engine, 4,714,068, Cl. 123-506.000.
- Nagashima, Hideyuki, to Nissan Motor Co., Ltd. Seat belt retractor, 4,714,274, Cl. 280-801.000.
- Nagata, Satoshi, to Canon Kabushiki Kaisha. Image forming apparatus, 4,715,006, Cl. 364-523.000.
- Nagata, Yasuhisa, to Toho Rayon Co., Ltd. Prepregs and method for production thereof, 4,714,648, Cl. 428-245.000.
- Nagayama, Kuniaki, to JEOL, Ltd. Two-dimensional nuclear magnetic resonance spectroscopy method, 4,714,882, Cl. 324-307.000.
- Nagoya Oilchemical Co., Ltd.: See—
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- Nahas, Randall E.: See—
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- Naik, Subhash K., to Textron/Avco Corp. High temperature oxidation/corrosion resistant coatings, 4,714,624, Cl. 427-34.000.
- Naito, Akio; Uozu, Hirohisa; and Numaguchi, Toru, to Toyo Engineering Corporation. Reforming apparatus, 4,714,593, Cl. 422-197.000.

- Najvar, Daniel J.; Pope, Brian G.; and Loeffler, Norman R., to Dow Chemical Company. The Fly ash reactive filler for dehydrating and bonding aqueous polymeric compositions, 4,714,722, Cl. 523-218.000.
- Nakagawa, Reiji: See—
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- Nakahara, Akihiro; and Matsuki, Taketo, to Sumitomo Rubber Industries, Ltd. Three-piece solid golf ball, 4,714,253, Cl. 273-228.000.
- Nakajima, Shigeo: See—
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- Nakajima, Yoichi: See—
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- Nakamura Koki Co., Ltd.: See—
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- Nakamura, Toshiyuki: See—
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- Nakamura, Tsuneaki; Kiyoshige, Tatsuo; and Sasaki, Shuji, to Lion Corporation. Composition for oral application, 4,714,612, Cl. 424-85.000.
- Nakanishi, Akio, to Fujitsu Limited. Reversal image development type electrophotographic printing system, 4,714,942, Cl. 355-14.00R.
- Nakanishi, Katsumi: See—
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- Nakanishi, Tatsuo: See—
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- Nakanishi, Yutaka; Yamada, Toshihiko; Sanada, Yuji; and Kawai, Takashi, to Toyotomi Kogyo Co., Ltd. Ignition system for oil burner, 4,714,426, Cl. 431-132.000.
- Nakao, Kunimichi, to Fujitsu Limited. Method and apparatus for adhering a tape or sheet to a semiconductor wafer, 4,714,511, Cl. 156-285.000.
- Nakata, Yukihiko: See—
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- Nakatani, Seiichi; Yuhaku, Satoru; Okinaka, Hideyuki; Ishida, Toru; Makino, Osamu; and Kikuchi, Tatsuro, to Matsushita Electric Industrial Co., Ltd. Conductor paste and method of manufacturing a multilayered ceramic body using the paste, 4,714,570, Cl. 252-518.000.
- Nakayama, Yoshiharu; and Ohnishi, Youichi, to Yamaha Hatsudoki Kabushiki Kaisha. Inline multiple cylinder engine for motorcycles, 4,714,061, Cl. 123-195.00R.
- Namba, Masato: See—
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- Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; and Miyata, Teruo, to Koken Co., Ltd. Surfactant composed of acylated collagen or acylated gelatine and a production process thereof, 4,714,758, Cl. 530-354.000.
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- National Forge Company: See—
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- Khare, Ashok K., 4,714,499, Cl. 148-11.50N.
- National Institute for Researches in Inorganic Materials: See—
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- National Research Development Corporation: See—
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- Hartog, Arthur H.; and Payne, David N., 4,714,829, Cl. 250-227.000.
- Perry, Forbes G. D. B., 4,713,978, Cl. 74-200.000.
- National Rolling Mills Inc.: See—
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- National Semiconductor Corporation: See—
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- National Tool & Manufacturing Co., Inc.: See—
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- Naya, Kotaro: See—
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- NCR Corporation: See—
Claessen, Albertus M. G., 4,715,064, Cl. 379-392.000.
- Gay, Richard B.; and Crafts, Harold S., 4,714,876, Cl. 324-73.00R.
- NDT Instruments, Inc.: See—
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- NEC Corporation: See—
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- Saburi, Akio, 4,715,033, Cl. 370-104.000.
- Sata, Hiroshi, 4,714,900, Cl. 331-8.000.
- Takekawa, Kouichi; and Bonkohara, Manabu, 4,714,952, Cl. 357-75.000.
- Usui, Takeshi, 4,714,830, Cl. 250-234.000.
- Yagi, Toshiharu, 4,715,037, Cl. 371-43.000.
- Nedele, Walter: See—
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- Nestler, Hans J.: See—
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- New York Society for the Relief of the Ruptured and Crippled: See—
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- Newton, Robert E.: See—
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- Nickl, Josef: See—
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- Nicolas, Jean-Marie C.: See—
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- Nicollini, Germano; and Senderowicz, Daniel, to SGS Microelettronica SpA. Internal all-differential operational amplifier for CMOS integrated circuits, 4,714,895, Cl. 330-258.000.
- Nidiffer, Charles A.; and Van Camp, Raymond E., to Bunn-O-Matic Corporation. Bag-receiving chute for coffee grinder, 4,714,206, Cl. 241-100.000.
- Nielsen, A. Lamont. Candy dispensing apparatus, 4,714,419, Cl. 425-126.00S.
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- Nightingale, Douglas J.: See—
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- Nigrini, Andrew; and Hsueh, Liming, to Chevron Research Company. Method for controlling rock dissolution and pipe corrosion during oil well steam injection, 4,714,112, Cl. 166-252.000.
- Nilsson, Alf B., to Aktiebolaget Electrolux. Arrangement for controlling an A.C. voltage, 4,714,870, Cl. 323-258.000.
- Nilsson, Olof E., to Telefonaktiebolaget LM Ericsson. Method and apparatus for the connection of a closed ring through a telephone exchange, 4,715,032, Cl. 370-86.000.
- Nimco Corporation: See—
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- Nippon Colin Co., Ltd.: See—
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- Nippon Denso Co., Ltd.: See—
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- Nippon Gakki Seizo Kabushiki Kaisha: See—
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- Nippon Oil Co., Ltd.: See—
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- Nippon Oil & Fats Co., Ltd.: See—
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- Nippon Paint Co., Ltd.: See—
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- Nippon Soken, Inc.: See—
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Nishimura, Tadashi: See—
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Gilfaut, Jean-Pierre; Peze, Andre; Ravillard, Jean-Paul; and Thevenet, Jean-Claude, 4,714,052, Cl. 122-149.000.

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Poloni, Alfredo; Drigani, Fausto; and Canzutti, Roberto, to Danieli & C. Officine Meccaniche SpA. Compensating device for rolling stands with rolls supported at only one end, 4,714,355, Cl. 384-193.000.

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Raidel, John E. Wide base type suspension assembly with parallelogram torque beams and four air springs, 4,714,269, Cl. 280-683.000.

Raisin, Jean-Pierre; and Canaud, Alain, to Institut Textile De France. Guiding device for the formation of a fold along the edge of a fabric, 4,714,036, Cl. 112-147.000.

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Randall, Kent A., to Eastman Kodak Company. Recirculating document feeder, 4,714,241, Cl. 271-3.100.

Ranke, Gerhard; and Siegert, Friedrich, to Linde Aktiengesellschaft. Process for obtaining C₂₊ or C₃₊ hydrocarbons from gaseous mixtures, 4,713,940, Cl. 62-17.000.

Rapoport, Morris, to Du Pont de Nemours, E. I., and Company. Hydrocyanation of butadiene, 4,714,773, Cl. 558-338.000.

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Reinehr, Ulrich; Hirsch, Rolf-Burkhard; Dross, Joachim; and Jungverdorben, Hermann-Josef, to Bayer Aktiengesellschaft. Device for wetting threads, films or thread bundles with liquids, 4,714,045, Cl. 118-420.000.

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- Rexnord Inc.: See—
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- Reynaud, Jean-Louis, to Imaje S.A. Ink jet angularly-adjustable nozzle printhead. 4,714,932, Cl. 346-75.000.
- Reynolds, David F.: See—
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- Reynolds, John H., IV: See—
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- Rheinmetall GmbH: See—
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- Lips, Hendrik; and Peters, Joerg, 4,714,019, Cl. 102-307.000.
- Weinfurth, Udo, 4,714,004, Cl. 89-37.090.
- Rhone-Poulenc Recherches: See—
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- Ribitsch, Gert: See—
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- Ricchio, Dominic A. Apparatus for improved water therapy. 4,713,853, Cl. 5-451.000.
- Riccio, Louis M.; and Bosna, Alexander A. Method and apparatus for applying metal cladding on surfaces and products formed thereby. 4,714,623, Cl. 427-27.000.
- Rice, Willard H.: See—
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- Richardson, Anthony C.: See—
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- Richardson, Paul D., to International Paper Company. Dispensing carton for plastic bags. 4,714,191, Cl. 229-121.000.
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- Takada, Hiromi, 4,714,364, Cl. 400-639.100.
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- Riegel, Leo W.: See—
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- Rieu, Jean-Pierre: See—
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- Riker Laboratories, Inc.: See—
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- Bohringer, Wilfried; Eheim, Franz; Hofer, Gerald; Konrath, Karl; and Laufer, Helmut, 4,714,412, Cl. 417-289.000.
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- Roberts, Charles G.: See—
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- Roberts Corporation: See—
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- Roberts, Donald M.: See—
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- Robinson, Kelly S.: See—
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- Roch, Josef; Heckel, Armin; Nickl, Josef; Muller, Erich; Narr, Berthold; Zimmermann, Rainer; and Weisenberger, Johannes, to Dr. Karl Thomae GmbH. 8-alkylthio-2-piperazino-pyrimido[5,4-d]-pyrimidines. 4,714,698, Cl. 514-212.000.
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- Rokni, Mordechai; and Flusberg, Allen M., to AVCO Everett Research Laboratory, Inc. Gaseous non linear dispersion laser beam control. 4,714,902, Cl. 332-7.510.
- Rokugawa, Kyuji; and Tamayama, Yasuko, to Kabushiki Kaisha Toshiba. Immunoassays involving complement lysing of chromophore containing microcapsules. 4,714,672, Cl. 435-7.000.
- Rolla, Gunnar. Aqueous dental preparation containing fluoride ions and the use thereof. 4,714,608, Cl. 424-52.000.
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- Willis, Jeffrey D., 4,713,938, Cl. 60-742.000.
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- Roper, Peter; and Spector, George. Indoor and outdoor cloth farm. 4,713,909, Cl. 47-17.000.
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- Ros, Johannes F., to Innovative Concepts Europe B.V. Separable key holder. 4,713,951, Cl. 70-456.00R.
- Rose, Harald; Zach, Joachim; and Lischke, Burkhard, to Siemens Aktiengesellschaft. Arrangement for detecting secondary and/or backscatter electrons in an electron beam apparatus. 4,714,833, Cl. 250-397.000.
- Roselle, Brian J.; and Weatherby, Dennis W., to Procter & Gamble Company. The. Automatic dishwasher detergent composition. 4,714,562, Cl. 252-94.000.
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- Roser, Walter: See—
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- Rosquist, Von D. Bed or bunk torsion spring suspension system. 4,713,851, Cl. 5-118.000.
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- Schemmann, Hugo: See—
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- Schmitt, Jerry C. Radar altimeter static accuracy circuit. 4,714,928, Cl. 342-174.000.
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- Schowiak, Duane C.: See—
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- Schubert, Peter J., to General Motors Corporation. Method of fabricating self-aligned silicon-on-insulator like devices. 4,714,685, Cl. 437-41.000.
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- Schwartz, Abraham, to Flow Cytometry Standards Corporation. Fluorescent calibration microbeads simulating stained cells. 4,714,682, Cl. 436-10.000.
- Schwartz, Frederic W., to Cable Electric Products, Inc. Telephone wire-and-jack attachment device and kit. 4,713,874, Cl. 29-566.400.
- Schweitzer, Edmund O., Jr. Voltage loss detector. 4,714,916, Cl. 340-664.000.
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- Scientific Drilling International: See—
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- Scott, Ray V., Jr.: See—
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- Searle, Robin H. J., to Normalair-Garrett (Holdings) Limited. Fluid pressure intensifier device. 4,714,411, Cl. 417-246.000.
- Seidel, Karl R., Jr.: See—
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- Seiko Epson Corporation: See—
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- Senkan, Selim M., to Illinois Institute of Technology. Production of higher molecular weight hydrocarbons from methane. 4,714,796, Cl. 585-328.000.
- Sensabaugh, Andrew J., Jr.: See—
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- Serizawa, Takashi: See—
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- SGS Microelettronica S.p.A.: See—
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- Shapiro, Neil R.: See—
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- Sharp Corporation: See—
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- Sharp, Daryl. Method and device for vacuum chromatography. 4,713,963, Cl. 73-23.100.
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- Inoue, Tomohiro; Tsugei, Shinji; and Iguchi, Shigeki, 4,715,010, Cl. 364-705.000.
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- Mimoto, Toshio; and Ota, Yoshiji, 4,715,015, Cl. 365-210.000.
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- Sharpe, John W.: See—
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- Shaw, Benjamin G.: See—
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- Shaw, Wilfrid G.: See—
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- Sheffield, Richard L.: See—
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- Shell Western E&P Inc.: See—
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- Shelton, Ronnie J. Guard for protecting a compound box. 4,714,070, Cl. 124-86.000.
- Shepherd, Robert W., to Elcon-National, Inc. Railway car hand brake with release governor. 4,714,142, Cl. 188-185.000.
- Sheppard, William L. Powered V-berth platform. 4,714,043, Cl. 114-343.000.
- Shibata, Tohru; and Okamoto, Ichiro, to Daicel Chemical Industries, Ltd. Agent for separation. 4,714,555, Cl. 210-635.000.
- Shibuya America Corporation: See—
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- Shibuya, Noriaki: See—
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- Shigeyuki, Akita, to Nippon Soken, Inc. Photo-electric conversion device with dark current compensation. 4,714,827, Cl. 250-214.00C.
- Shih, Kun M.: See—
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- Shimada, Masami, to Brother Kogyo Kabushiki Kaisha. Sewing machine driving system. 4,714,039, Cl. 112-275.000.
- Shimagaki, Makoto: See—
Zanma, Jun; Nishimura, Yoshinori; Shyoji, Kazuo; Shimagaki, Makoto; and Nakajima, Yoichi, 4,714,592, Cl. 422-192.000.
- Shimomura, Hiroshi; Izuka, Kazuo; Harano, Makoto; and Hamada, Akifumi, to Mitsubishi Kinzoku Kabushiki Kaisha; and Ryoco Seiki Co., Ltd. Insert rotary cutter. 4,714,383, Cl. 407-42.000.
- Shin-Etsu Chemical Co., Ltd.: See—
Itoh, Kunio; Fukuda, Takeshi; and Yoshioka, Hiroshi, 4,714,733, Cl. 524-493.000.
- Shinada, Haruji: See—
Kawajiri, Kazuhiro; Tamura, Hiroshi; Shinada, Haruji; Saito, Mitsuo; and Mizobuchi, Yuzo, 4,714,950, Cl. 357-30.000.
- Shinko Seito Co., Ltd.: See—
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- Shinko Sugar Production Co., Ltd.: See—
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- Shinozaki, Takashi; and Kawaguchi, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Four-wheel drive vehicle. 4,714,126, Cl. 180-233.000.
- Shipp, Peter W., Jr.; and Vogt, Clifford M., to Kimberly-Clark Corporation. Melt-blown material with depth fiber size gradient. 4,714,647, Cl. 428-212.000.
- Shiraishi, Daiichi: See—
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- Shiraishi, Ikuya: See—
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- Shlain, Vladimir: See—
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- Shoji, Norio; and Takeda, Masashi, to Sony Corporation. Double-sided logic input differential switch. 4,714,841, Cl. 307-455.000.
- Shouval, Daniel; Shafritz, David A.; and Wands, Jack R., to Albert Einstein College of Medicine of Yeshiva University, The; and General Hospital Corporation, The. Method of suppressing cell growth by immunotherapy. 4,714,613, Cl. 424-86.000.
- Shoyab, Mohammed; Marquardt, Hans; and Todaro, George J., to Oncogen. Polypeptide tumor inhibitors and antibodies thereto. 4,714,683, Cl. 436-547.000.
- Shrime, George, to Contitronix Inc. Typewriter daisy wheel. 4,714,362, Cl. 400-144.200.
- Shubaly, Murray R., to Atomic Energy of Canada, Limited. Method and apparatus for generating ion beams. 4,714,834, Cl. 250-427.000.
- Shulof, George F.; and DiMonte, Michael J., to Combustion Engineering, Inc. Pulverized solid control system. 4,714,202, Cl. 241-30.000.
- Shyoji, Kazuo: See—
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- Sidebotham, Christopher G.: See—
Averill, Robert G.; Khowaylo, Alex; and Sidebotham, Christopher G., 4,714,472, Cl. 623-20.000.
- Siebel, Wolfgang: See—
Lechner, Fritz; Heissler, Herbert; Scheer, Wolfgang; Siebels, Wolfgang; and Ascherl, Rudolf, 4,714,467, Cl. 623-16.000.
- Siecor Corporation: See—
Szentesi, Otto L., 4,714,317, Cl. 350-96.210.
- Siegel, Harald; and Hauptmann, Rudolf, to Siemens Aktiengesellschaft. Pulse doppler radar with variable pulse repetition rate. 4,714,927, Cl. 342-160.000.
- Siegel, Sanford A.; and Noding, Stephen A., to Dow Chemical Company, The. Secondary battery. 4,714,665, Cl. 429-192.000.
- Siebert, Friedrich: See—
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- Sielaff, Ulrich; and Hamel, David O., to United Steel Products Company. Method and means for building a pitched roof building using only square-end framing members. 4,713,923, Cl. 52-713.000.
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- Bachel, Ernst; and Giebel, Wolfgang, 4,714,277, Cl. 285-39.000.
- Biermeier, Johann; and Brand, Wilhelm, 4,714,972, Cl. 360-97.000.
- Boehner, Michael, 4,715,035, Cl. 371-23.000.
- Eberspaecher, Joerg, 4,715,026, Cl. 370-1.000.
- Goldmann, Horst; Einsle, Guenter; Brugger, Rudolf; and Wacker, Josef, 4,713,866, Cl. 29-33.00K.
- Hahn, Alfred; Kamm, Bodo; Weiss, Karl; and Dummert, Johannes, 4,715,057, Cl. 378-197.000.
- Hedberg, Sven-Erik; Lekholm, Anders; and Lindgren, Anders, 4,714,079, Cl. 128-419.00G.
- Kiesel, Helmut; and Stoeckl, Klaus, 4,714,222, Cl. 248-282.000.
- Krause, Bernd, 4,714,879, Cl. 324-158.00F.
- Krause, Dieter, 4,714,315, Cl. 350-96.200.
- Lechner, Robert; Rudolf, Hans-Werner; and Krimmer, Roland, 4,715,058, Cl. 379-27.000.
- Meissner, Ralph; and Popp, Walter, 4,714,887, Cl. 324-322.000.
- Rose, Harald; Zach, Joachim; and Lischke, Burkhard, 4,714,833, Cl. 250-397.000.
- Schwingschuh, Martin; Meschan, Franz; and Ribitsch, Gert, 4,714,910, Cl. 338-21.000.
- Siegel, Harald; and Hauptmann, Rudolf, 4,714,927, Cl. 342-160.000.
- Steinigeweg, Rolf-Jürgen, 4,714,878, Cl. 324-158.00MG.
- Wohlgemuth, Juergen, 4,713,962, Cl. 73-11.000.
- Sieron, Richard L.: See—
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- Sigiki, Hiraku; Yamada, Makoto; and Miyamori, Shinji, to Sony Corporation. Method and apparatus for reproducing signals having improved rotary head tracking control. 4,714,971, Cl. 360-77.000.
- Silberberg, Joseph: See—
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- Siler, G. Daniel, to Dayton Machine Tool Company. Dual pinion anti-backlash carriage drive for a machine tool. 4,714,388, Cl. 409-146.000.
- Sillitto, Hillary G., to Ferranti Plc. Optical viewing apparatus. 4,714,321, Cl. 350-174.000.
- Silverthorn, Gideon C., to Canada, Her Majesty the Queen in right of. Automated production of canisters. 4,714,486, Cl. 55-316.000.
- Simmons, Arturo; Walsh, Shawn T.; and Roberts, Charles G., to Texas Instruments Incorporated. Electrostatic discharge protection using thin nickel fuse. 4,714,949, Cl. 357-23.130.
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- Simpson, George E.: See—
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- Simpson Strong-Tie Company, Inc.: See—
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- Singer Company, The: See—
Johnson, Ralph E.; and Rodda, Donald, 4,714,037, Cl. 112-184.000.
- Sirkis, Murray D., to Arizona Board of Regents. Means and methods for heating semiconductor ribbons and wafers with microwaves. 4,714,810, Cl. 219-10.55M.
- Sisk, George W.; Lynn, Shelby A.; Keil, John P.; and Woods, John T., to Whirlpool Corporation. Built-in refrigerator cabinet. 4,714,304, Cl. 312-214.000.

- Skaggs, John E., Jr. Method and apparatus for augmentation of sound by enhanced resonance. 4,714,133, Cl. 181-160.000.
- Skega Aktiebolag: See—
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- SKF GmbH: See—
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- Skinner, Jerald P.; Zlotky, Richard A.; and Diel, Robert L. Foundation system for ground-mounted masts. 4,714,225, Cl. 248-523.000.
- Skis Rossignol S.A.: See—
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- Skowronski, Michael J.: See—
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- Slaker, Frank A.: See—
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- Slicer, Allan E.: See—
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- Smart, W. James, to CM & E/California, Inc. Industrial exhaust ventilation system. 4,714,010, Cl. 98-115.400.
- Smayling, Michael C.: See—
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- Smetanine, Alexandre: See—
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- Smith, Don A., Jr. Portable cleaning container. 4,713,859, Cl. 15-264.000.
- Smith, James L.: See—
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- Smith, John W.: See—
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- Smith, Leonard S.: See—
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- Smith, Michael D., to Thomson Components-Mostek Corporation. Semiconductor chip power supply monitor circuit arrangement. 4,714,843, Cl. 307-491.000.
- Smith, Robert W., to Colony Services Inc. Harvesting of aquatic vegetation by helicopters. 4,713,929, Cl. 56-8.000.
- Smith-Vaniz, William R.: See—
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- Snyder, Lynn K.: See—
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- Societe Anonyme Dite: Laboratoire L. Lafon: See—
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- S.A. Fonderies du Lion: See—
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- Societe d'Applications Generales d'Electricite et de Mecanique (SAGEM): See—
Lamiaux, Sylvie; and Kuhn, Alex, 4,715,016, Cl. 365-229.000.
- Societe Nationale d'Etudes et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.): See—
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- Societe pour d'Etude et la Fabrication de Circuits Integres Speciaux EFCIS: See—
Baudrant, Annie; and Marty, Michel, 4,714,951, Cl. 357-67.000.
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- Soemmers, Hermanus M. J. R.: See—
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- Sogabe, Masatoyo: See—
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- Sokalski, Stanley M., to Detrex Corporation. 2,2-bis (4 hydroxyphenyl) alkyl poly derivatives for use in after-treatment of conversion coated metals. 4,714,752, Cl. 528-153.000.
- Solomon, Donald F.; Solomon, Romona L.; and Good, Charlie J., to Newport Filters, Inc. Potable water filter. 4,714,546, Cl. 210-137.000.
- Solomon, Jack. Storage rack. 4,714,165, Cl. 211-11.000.
- Solomon, Romona L.: See—
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- Solvay & Cie (Societe Anonyme): See—
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- Somma, Jack J.: See—
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- Sony Corporation: See—
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- Sigiki, Hirako; Yamada, Makoto; and Miyamori, Shinji, 4,714,971, Cl. 360-77.000.
- Watanabe, Toshihiro; and Meguro, Hiroshi, 4,714,213, Cl. 242-198.000.
- Yoshinaka, Tadaaki; and Inoue, Takao, 4,714,954, Cl. 358-19.000.
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- Soref, Richard A.: See—
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- Southwestern Analytical Chemicals, Inc.: See—
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- Spector, George: See—
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- Calloway, Luther, Jr.; and Spector, George, 4,713,900, Cl. 40-324.000.
- Collins, William K.; and Spector, George, 4,713,947, Cl. 66-1.00A.
- Roper, Peter; and Spector, George, 4,713,909, Cl. 47-17.000.
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- Speidell, James L.: See—
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- Spence-Bate, Harry A. H., to Spence-Bate, Joyce Florence. Lamina retrieval apparatus. 4,714,240, Cl. 271-3.100.
- Spence-Bate, Joyce Florence: See—
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- Speranza, Donald, to Eaton Corporation. Method for controlling AMT system start from stop operation. 4,714,144, Cl. 192-0.084.
- Speranza, George P.: See—
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- Sperry Corporation: See—
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- Spevack, Jerome S., to Deuterium Corporation. Process for separating high purity water. 4,714,525, Cl. 203-10.000.
- Spider Staging, Inc.: See—
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- Spietschka, Ernst: See—
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- Spires, Walter P., Jr.: See—
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- Spradley, Willie D.; and Creswell, Paul J. Hydraulic jacking system for unseating wedge from rope sockets. 4,714,238, Cl. 254-93.00R.
- Spruck, Bernd; and Gerber, Siegfried, deceased (by Gerber, Hannelore, Silvia Gerber, Eberhard Gerber, Bernhard Gerber, legal representatives), to Carl-Zeiss-Stiftung. Attenuator for extraneous light fluctuations in a microscope with automatic brightness control. 4,714,823, Cl. 250-205.000.
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- Hoelzer, John S.; Graefe, Richard J.; and Libert, James T., 4,714,977, Cl. 361-196.000.
- McGoldrick, Gilbert A.; and Slicer, Allan E., 4,714,431, Cl. 439-212.000.
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- Stabler, Gerhard, to Santrade Ltd. Sealing arrangement for a medium-containing chamber of a dual belt press. 4,714,015, Cl. 100-154.000.
- Stacy, Jack C., Jr. Single laterally bendable track snowmobile. 4,714,125, Cl. 180-182.000.
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- Staerzl, Richard E., to Brunswick Corporation. Electronic fuel injection circuit with altitude compensation. 4,714,067, Cl. 123-494.000.
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- Stahlecker, Hans: See—
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- Stambaugh, Mark A., to Texas Instruments Incorporated. Frequency divide by N circuit. 4,715,052, Cl. 377-108.000.
- Stammann, Gunter; Kriesfalussy, Zoltan; Waldmann, Helmut; Schneider, Joachim; and Medem, Harald, to Bayer Aktiengesellschaft. Process for the regeneration of catalysts for the gas-phase reduction of aromatic nitro compounds. 4,714,689, Cl. 502-54.000.
- Standard Oil Company, The: See—
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- Staniszewski, Tadeusz, to Ziyad Incorporated. Paper tray for a printing device. 4,714,243, Cl. 271-171.000.
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- Kogan, Marcelo; Dinizio, Stephen E.; and Fancher, Llewellyn W., 4,714,493, Cl. 71-99.000.

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- Steer, Peter L., to Craig Medical Products Ltd. Urostomy appliance. 4,714,465, Cl. 604-340.000.
- Stefani, Fabrizio: See—
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- Stein, Charles R., to General Electric Company. Apparatus and method for determining the source direction of local area network transmissions. 4,714,802, Cl. 178-1.000.
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- Steiner, Karl-Heinz: See—
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- Steinigeweg, Rolf-Jurgen, to Siemens Aktiengesellschaft. Apparatus for forming the actual value of a torque in a three-phase synchronous machine with current-block feeding. 4,714,878, Cl. 324-158.0MG.
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- Steltenkamp, Robert J.; and Camara, Michael A., to Colgate-Palmolive Company. Antistatic agents which are diamines of trialkylacetic acids and diamines. 4,714,539, Cl. 252-8.800.
- Stepczyk, Frank M.: See—
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- Stern, Rudolph J.; and Harris, Steven, to Advanced Micro Devices, Inc. Rate-of-change signal generator using sampling techniques. 4,714,866, Cl. 318-636.000.
- Stevens, John: See—
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- Stevenson, Ernest W.; and Nahas, Randall E., to Levitator, Inc. Seaplane and dock lift. 4,714,375, Cl. 405-3.000.
- Stevenson, Hildreth W., to B. F. Goodrich Company, The. Radiant heat resistant stencillable inflatable and method. 4,714,637, Cl. 428-35.000.
- Stillwagon, W. C. Method and apparatus for inspecting high speed converted web. 4,714,340, Cl. 356-23.000.
- Stipanuk, John M.; and Yun, John M., to Molex Incorporated. Connection for flexible apparatus. 4,714,435, Cl. 439-496.000.
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- Stoker, Jeffrey: See—
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- Stone, Stanley A., to Varian Associates, Inc./Scientific Systems, Inc. Autosampler. 4,713,974, Cl. 73-864.230.
- Stone, Wayne B., Jr., to Wood Manufacturing. Injection molded, self sealing top assembly for open mouth coffee pots. 4,714,180, Cl. 422-456.000.
- Stormberg, Hans-Peter: See—
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- Strack, Hans; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Silicate-bound zeolite granulates, process for their production and use. 4,714,690, Cl. 502-64.000.
- Stratton, Charlotte D.: See—
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- Straub, Lee R.: See—
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- Strauss, Bernhard, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Apparatus for the protection of a movable elongate machine part. 4,713,892, Cl. 33-559.000.
- Strommer, Kurt: See—
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- Stuckel, Robert W. Ball inflation apparatus. 4,714,098, Cl. 141-85.000.
- Stuiecentrum voor Kernenergie, S.C.K.: See—
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- Stueckle, Paul: See—
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- Sucher, Daniel J.: See—
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- Suerbaum, Hermann: See—
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- Sugahara, Kazuyuki; Nishimura, Tadashi; Kusunoki, Shigeru; and Inoue, Yasuo, to Agency of Industrial Science and Technology. Method of forming single crystal layer on dielectric layer by controlled rapid heating. 4,714,684, Cl. 437-19.000.
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- Sugino, Yasuo: See—
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- Sugiura, Kazuo: See—
Hashimoto, Takatsugu; Maehara, Akihiro; Tomita, Seisuke; Funahashi, Yuichi; Watanabe, Junichiro; Sugiura, Kazuo; and Matsumoto, Hironori, 4,714,734, Cl. 524-496.000.
- Sulentic, Donald N.: See—
Oltman, John P.; Sulentic, Donald N.; and Purchase, Richard D., 4,714,158, Cl. 206-349.000.
- Sulzer-Escher Wyss GmbH: See—
Holik, Herbert, 4,714,522, Cl. 162-264.000.
- Sumitomo Chemical Company, Limited: See—
Kisida, Hiroshi; Nishida, Sumio; and Hatakoshi, Makoto, 4,714,706, Cl. 514-345.000.
- Sumitomo Electric Industries, Ltd.: See—
Hayashi, Kyozo; and Noda, Shigeru, 4,714,318, Cl. 350-96.210.
- Ide, Takashi, 4,714,343, Cl. 356-73.100.
- Takata, Koji; and Nishiyama, Yukinori, 4,714,299, Cl. 303-100.000.
- Sumitomo Metal Industries, Ltd.: See—
Yamanaka, Kazuo; Nagano, Hiroo; Minami, Takao; Okada, Yaotaka; Inoue, Mamoru; Susukida, Hiroshi; Onimura, Kichiro; Yonezawa, Toshio; Sasaguri, Nobuya; Kawaguchi, Katsuji; and Kusakabe, Takaya, 4,714,501, Cl. 148-13.000.
- Sumitomo Rubber Industries, Ltd.: See—
Nakahara, Akihiro; and Matsuki, Taketo, 4,714,253, Cl. 273-228.000.
- Sumiya, Koji: See—
Moroto, Shuzo; Sumiya, Koji; Watanabe, Kazuaki; Kubo, Seitoku; Kobayashi, Koji; and Taga, Yutaka, 4,714,146, Cl. 192-85.0AA.
- Sun Hydraulics, Inc.: See—
Watson, John H., 4,714,293, Cl. 299-12.000.
- Sundheimer, Patrick, to Framtome & Cie. Water and steam separating device for drying moist steam. 4,714,055, Cl. 122-488.000.
- Sundstrand Corporation: See—
Buford, John T., 4,714,051, Cl. 122-21.000.
- Fluegel, Theodore D.; and Ryan, Daniel M., 4,713,982, Cl. 74-686.000.
- Schaefer, John G.; Aarestad, Jerome K.; and Whitesel, Terry L., 4,714,405, Cl. 415-169.00R.
- Sussman, Arthur: See—
Roth, Philip M.; Itskovitch, Nathan M.; and Sussman, Arthur, 4,713,894, Cl. 34-30.000.
- Susukida, Hiroshi: See—
Yamanaka, Kazuo; Nagano, Hiroo; Minami, Takao; Okada, Yaotaka; Inoue, Mamoru; Susukida, Hiroshi; Onimura, Kichiro; Yonezawa, Toshio; Sasaguri, Nobuya; Kawaguchi, Katsuji; and Kusakabe, Takaya, 4,714,501, Cl. 148-13.000.
- Suzuki, Akira, to Copal Company Limited. Focal plane shutter for cameras. 4,714,336, Cl. 354-246.000.
- Suzuki, Akira, to Toshiba Machine Co., Ltd. Laser picture-drawing apparatus. 4,714,933, Cl. 346-108.000.
- Suzuki, Keiichiro: See—
Sawada, Kouji; Miura, Kiyokatsu; Suzuki, Keiichiro; Idosako, Hidetaka; and Kazusa, Hideo, 4,714,368, Cl. 403-132.000.
- Suzuki, Ko: See—
Yamashiro, Hiroshi; and Suzuki, Ko, 4,714,506, Cl. 156-80.000.
- Suzuki, Narumi; and Takagi, Hisamitsu, to Fujitsu Limited. Housing and securing structure for radio communication device. 4,714,303, Cl. 312-7.100.
- Suzuki, Tomonari: See—
Higashigaki, Yoshiyuki; Yoshimoto, Yoshikazu; Suzuki, Tomonari; Nakajima, Shigeo; and Inoguchi, Toshio, 4,714,639, Cl. 428-36.000.
- Suzuki, Toshio: See—
Ohkuma, Kuniaki; Nakagawa, Reiji; Miyao, Hisao; Yoshimura, Shinichi; Suzuki, Toshio; Hayashi, Toyooki; Arakawa, Masayasu; and Koizumi, Hideharu, 4,714,397, Cl. 414-222.000.
- Svensson, Ake P.: See—
Wallin, Per Olov T.; Warell, Bengt H.; Svensson, Ake P.; Lundstrom, Kurt A.; and Johansson, Lars A., 4,714,025, Cl. 108-20.000.
- Svensson, Assar; and Granlund, Dan, to Skega Aktiebolag. Vehicle track. 4,714,302, Cl. 305-35.0EB.
- Swaminathan, Balaji: See—
Sander, Craig S.; and Swaminathan, Balaji, 4,714,686, Cl. 437-195.000.
- Swan, Leo, to Equipment Development Company, Inc. Drum and cutter assembly for a planing machine. 4,714,294, Cl. 299-39.000.
- Swarr, Thomas E.; and Whnuck, Wayne G., to United States of America, Energy. Method of preparing a dimensionally stable electrode for use in a MCFC. 4,714,586, Cl. 419-2.000.

- Swartz, Richard E.; Moffatt, E. Marston; and Lopiccio, Mario T., to United Technologies Corporation. Dual laser beam brazing of fine wires. 4,714,815, Cl. 219-121.0LC.
- Swartz, Louis D.: See—
Kitamura, Koichi; Swartz, Louis D.; Catchpole, Clive; and Yaniv, Zvi, 4,714,836, Cl. 250-578.000.
- Sweers, Ronald L. Edge clip for an eaves trough mounting adapter. 4,713,915, Cl. 52-111.000.
- Synthes: See—
Comte, Pierre-Andre; Burri, Caius; Claes, Lutz; Gerngross, Heinz; and Meier, Remy, 4,714,076, Cl. 128-92.0ZW.
- Szalvay, Laszlo, to Raychem Corporation. Pipe repair sleeve apparatus and method of repairing a damaged pipe. 4,713,870, Cl. 29-402.090.
- Szentesi, Otto I., to Siercor Corporation. Biconic optical fiber connector/attenuator. 4,714,317, Cl. 350-96.210.
- Szewczyk, Andrew F.: See—
Prasad, Chandrika; and Szewczyk, Andrew F., 4,714,982, Cl. 361-404.000.
- Szodfridt, Imre; and Knoblauch, Richard, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Double clutch for a motor vehicle transmission. 4,714,147, Cl. 192-87.150.
- Szudy, James E.: See—
Koening, James P.; Knight, David J.; Szudy, James E.; Bartholomew, Roy E.; and Wurst, William R., 4,714,483, Cl. 55-163.000.
- Szuminski, Gary F.; and Nightingale, Douglas J., to Rolls-Royce Inc. Vectorable nozzles for aircraft. 4,713,935, Cl. 60-229.000.
- Tabor, Elhanan, to AR-KAL Plastics Products Beit Zera (1973). In-line fluid filtering devices and disc-filters useful in such devices. 4,714,552, Cl. 210-329.000.
- Taga, Yutaka: See—
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,713,988, Cl. 74-868.000.
- Moroto, Shuzo; Sumiya, Koji; Watanabe, Kazuaki; Kubo, Seitoku; Kobayashi, Koji; and Taga, Yutaka, 4,714,146, Cl. 192-85.0AA.
- Taiho Pharmaceutical Company, Limited: See—
Ogawa, Kazuo; and Honna, Takaji, 4,714,765, Cl. 548-183.000.
- Taisei Road Construction Co., Ltd.: See—
Mihara, Tohru, 4,714,374, Cl. 404-91.000.
- Tajima, Ryohei: See—
Nagamoto, Itsushi; Nakanishi, Tatsuo; and Tajima, Ryohei, 4,714,577, Cl. 264-46.600.
- Takada, Hiromi, to Ricoh Company, Ltd. Automatically returned paper ball assembly of a printer. 4,714,364, Cl. 400-639.100.
- Takagi, Hisamitsu: See—
Suzuki, Narumi; and Takagi, Hisamitsu, 4,714,303, Cl. 312-7.100.
- Takagi, Makoto: See—
Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; and Imura, Toru, 4,713,871, Cl. 29-421.00E.
- Takagi, Masayoshi; Hoshino, Yukio; and Yamauchi, Hiroki, to Toyoda Koki Kabushiki Kaisha. Machine tool with gang head interchange device. 4,713,876, Cl. 29-568.000.
- Takagi, Tsuneharu: See—
Matsubara, Katsumi; Uchida, Riichi; Muramatsu, Masatoshi; Naya, Kotaro; and Takagi, Tsuneharu, 4,714,418, Cl. 418-201.000.
- Takahashi, Mitsuru: See—
Tsuruoka, Ichiro; and Takahashi, Mitsuru, 4,714,427, Cl. 432-59.000.
- Takahashi, Naoyuki, to Olympus Optical Co., Ltd. Operating microscope apparatus. 4,714,328, Cl. 350-521.000.
- Takahashi, Seiichi: See—
Ujita, Tsugunobu; and Takahashi, Seiichi, 4,714,130, Cl. 180-262.000.
- Takahashi, Shoji: See—
Kinugasa, Toshiyuki; Furuya, Tamio; Ishige, Yoshiki; Tsuchimoto, Yuichi; and Takahashi, Shoji, 4,714,424, Cl. 425-388.000.
- Takahashi, Sumio: See—
Watabe, Seiji; Yokoyama, Isao; Sasaki, Masanori; Toyoshima, Yotaro; Takahashi, Sumio; and Maeda, Tsutomu, 4,714,908, Cl. 335-212.000.
- Takahashi, Takeshi: See—
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,714,566, Cl. 252-314.000.
- Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, to Meiji Milk Products Company Limited. Process for producing W/O/W type multiple emulsion. 4,714,566, Cl. 252-314.000.
- Takano, Hiroji, to Matsushita Electric Industrial Co., Ltd. Apparatus and method for making a stamp. 4,714,957, Cl. 358-93.000.
- Takata, Koji; and Nishiyama, Yukinori, to Sumitomo Electric Industries, Limited. Brake pressure control system. 4,714,299, Cl. 303-100.000.
- Takats, Gilbert: See—
Bacou, Claude; Baptiste, Rene; Feissel, Henri; Takats, Gilbert; and Cabrol, Christian, 4,714,828, Cl. 250-214.00C.
- Takayanagi, Shinji, to Honda Giken Kogyo Kabushiki Kaisha. Drive chain adjustment mechanism for vehicles having two rear wheels. 4,714,453, Cl. 474-112.000.
- Takeda Chemical Industries, Ltd.: See—
Nohara, Akira; and Maki, Yoshitaka, 4,714,774, Cl. 560-053.000.
- Yasaburo, Akagi; Yasumoto, Miura; and Tetsuo, Hoshino, 4,714,611, Cl. 424-85.000.
- Takeda, Masashi: See—
Shoji, Norio; and Takeda, Masashi, 4,714,841, Cl. 307-455.000.
- Takeda, Nobuhiko: See—
Hattori, Takemi; and Takeda, Nobuhiko, 4,714,291, Cl. 297-284.000.
- Takei, Toshihiro: See—
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; and Hattori, Yoshiyuki, 4,714,296, Cl. 303-6.00C.
- Takekawa, Kouichi; and Bonkohara, Manabu, to NEC Corporation. Capacitor built-in integrated circuit packaged unit and process of fabrication thereof. 4,714,952, Cl. 357-75.000.
- Takemoto, Eiji: See—
Nagase, Masaomi; Takemoto, Eiji; Ibuki, Noritaka; and Hasegawa, Takashi, 4,714,068, Cl. 123-506.000.
- Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, to Kabushiki Kaisha Toshiba. Color cathode ray tube with plural electron gun assemblies. 4,714,856, Cl. 313-2.100.
- Takeo, Tadashi: See—
Kikuchi, Uhee; and Takeo, Tadashi, 4,714,044, Cl. 118-314.000.
- Takeuchi, Hajime: See—
Ito, Takeo; Takeuchi, Hajime; Hashimoto, Minoru; and Maeda, Tsumi, 4,714,654, Cl. 428-328.000.
- Takeuchi, Makoto; Kitazumi, Etsuo; Sakaki, Hirokazu; and Okishi, Yoshio, to Fuji Photo Film Co., Ltd. Process for producing aluminum support for lithographic printing plate. 4,714,528, Cl. 204-33.000.
- Takeuchi, Masayoshi: See—
Kishida, Yoshifumi; and Takeuchi, Masayoshi, 4,714,086, Cl. 134-83.000.
- Takeuchi, Yukihisa: See—
Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; and Imura, Toru, 4,713,871, Cl. 29-421.00E.
- Tamai, Shigeru: See—
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,714,566, Cl. 252-314.000.
- Tamamura, Hideo; and Maeno, Hiroshi, to Canon Kabushiki Kaisha. Water-proof window structure of water-proof camera. 4,714,333, Cl. 354-64.000.
- Tamayama, Yasuko: See—
Rokugawa, Kyuji; and Tamayama, Yasuko, 4,714,672, Cl. 435-7.000.
- Tamburrino, Kenneth D.: See—
Polick, Raymond L.; Tamburrino, Kenneth D.; and Becker, Edmund H., 4,714,103, Cl. 164-486.000.
- Tamura, Hiroshi: See—
Kawajiri, Kazuhiro; Tamura, Hiroshi; Shinada, Haruji; Saito, Mitsuo; and Mizobuchi, Yuzo, 4,714,950, Cl. 357-30.000.
- Tamura, Takahiro: See—
Mizuno, Takao; Uchikawa, Naoshi; Murayama, Akira; Tamura, Takahiro; and Kuroshima, Ryoichi, 4,714,415, Cl. 418-14.000.
- Tanabe Seiyaku Co., Ltd.: See—
Inoue, Ichizo; Oine, Toyonari; Yamada, Yoshihisa; Ishida, Ryuichi; and Ochiai, Takashi, 4,714,702, Cl. 514-259.000.
- Tanaka, Kiyoshi; Saeki, Masaru; Matsui, Tsutomu; Koga, Yoshihiro; and Kawakita, Tetsuya, to Ajinomoto Co., Inc. Process for the separation of a basic amino acid from a fermentation broth using cation exchange resins. 4,714,767, Cl. 548-344.000.
- Tanaka, Koichi; and Itoh, Satoshi, to Kabushiki Kaisha Toshiba. Digital phase-locked loop circuit. 4,715,050, Cl. 375-111.000.
- Taniguchi, Yasushi: See—
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- Tanikawa, Isao: See—
Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, 4,714,580, Cl. 264-516.000.
- Tanioka, Hiroshi: See—
Inoue, Yutaka; Kurata, Mitsuru; Kasama, Nobuhiro; Hosaka, Masao; Yagasaki, Toshiaki; Tanioka, Hiroshi; and Yamakawa, Tadashi, 4,714,940, Cl. 355-3.00R.
- Tanner, Alan R.: See—
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- Targos, William M., to UOP Inc. Method of making a catalyst composition comprising uniform size metal components on carrier. 4,714,693, Cl. 502-261.000.
- Targos, William M.: See—
Abrevaya, Hayim; and Targos, William M., 4,714,692, Cl. 502-261.000.
- Tassle, C. R. V.; and Freeburg, Thomas A., to Motorola, Inc. Method and apparatus for shedding load in a communications controller of a data communications system. 4,714,923, Cl. 340-825.060.
- TDK Corporation: See—
Watabe, Seiji; Yokoyama, Isao; Sasaki, Masanori; Toyoshima, Yotaro; Takahashi, Sumio; and Maeda, Tsutomu, 4,714,908, Cl. 335-212.000.
- Tecnor: See—
Poncelet, Andre; Getti, Hyacinthe; and Faugouin, Michel, 4,714,626, Cl. 427-49.000.
- Teetz, Volker: See—
Urbach, Hansjorg; Henning, Rainer; Teetz, Volker; and Becker, Reinhard, 4,714,708, Cl. 514-412.000.
- Tektronix, Inc.: See—
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- Traa, Einar O., 4,714,872, Cl. 323-314.000.
- Telecredit, Inc.: See—
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- Telefonaktiebolaget LM Ericsson: See—
Nilsson, Olof E., 4,715,032, Cl. 370-86.000.
- Telefunken Robetechnica S.R.L.: See—
Bosco, Angelo; and Magnaghi, Edgardo, 4,714,212, Cl. 242-182.000.
- Telfer, Terrence D. Collapsible cooking unit. 4,714,013, Cl. 99-449.000.

- Temet, USA, Inc.: See—
Henderson, Dale K., 4,714,282, Cl. 292-36.000.
- Templeton, Charles B. Warmed animal toy. 4,714,445, Cl. 446-74.000.
- Tenhagen, Rudolf J., to BP Chemicals Limited. Process for making polyurethane foam. 4,714,574, Cl. 264-45.100.
- Terafuji, Kazuki: See—
Mochizuki, Takeshi; Iwasawa, Katsumasa; Shiraishi, Ikuya; and Terafuji, Kazuki, 4,714,635, Cl. 427-421.000.
- Terazono, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Photoelectric transducer with adjustable sensitivity to incident light wavelength. 4,714,824, Cl. 250-211.00R.
- Terkelsen, Bruce E., to United Technologies Corporation. Method and apparatus for epitaxial solidification. 4,714,101, Cl. 164-122.200.
- Tesmann, Holger: See—
von Rybinski, Wolfgang; Tesmann, Holger; and Dobias, Bohuslav, 4,714,544, Cl. 209-167.000.
- Tetsuo, Hoshino: See—
Yasaburo, Akagi; Yasumoto, Miura; and Tetsuo, Hoshino, 4,714,611, Cl. 424-85.000.
- Texaco Inc.: See—
Grigsby, Robert A., Jr.; and Speranza, George P., 4,714,750, Cl. 528-99.000.
- Texas Instruments Incorporated: See—
Keith, William C., 4,713,939, Cl. 62-6.000.
- Simmons, Arturo; Walsh, Shawn T.; and Roberts, Charles G., 4,714,949, Cl. 357-23.130.
- Stambaugh, Mark A., 4,715,052, Cl. 377-108.000.
- Tuvell, James A.; and Smayling, Michael C., 4,715,014, Cl. 365-185.000.
- Textron/Avco Corp.: See—
Naik, Subhash K., 4,714,624, Cl. 427-34.000.
- Textron Inc.: See—
Chaplin, John B.; and Whipple, Charles S., 4,714,443, Cl. 440-89.000.
- Thaniyavarn, Suwat, to TRW Inc. Electrostatically biased electrooptical devices. 4,714,312, Cl. 350-96.100.
- Thayer, Edward B.; and Ward, Eric J., to United Technologies Corporation. 2-D propulsive lift nozzle. 4,714,197, Cl. 239-265.290.
- Thelen, Robert L.: See—
Rouse, Michael W.; Thelen, Robert L.; and Morison, John, 4,714,201, Cl. 241-24.000.
- Theodoropoulos, Spyros, to Viomedics Inc. Novel oxazine-ureas and thiazine urea chromophores as fluorescent labels. 4,714,763, Cl. 544-31.000.
- Thevenet, Jean-Claude: See—
Gilfaut, Jean-Pierre; Peze, Andre; Ravillard, Jean-Paul; and Thevenet, Jean-Claude, 4,714,052, Cl. 122-149.000.
- Thies, Peter W.; David, Samuel; Kuehl, Ulrich; Buschmann, Gerd; and Flecker, Peter, to Kali-Chemie Pharma GmbH. N-(2,10-dioxo-tricyclo-[5,3,1,0^{3,8}]-undecane-5-yl)-tryptamine derivatives and medical compositions thereof. 4,714,709, Cl. 514-414.000.
- Thompson, Ronald J.: See—
Damour, Philippe; Patoureaux, Alain; Somma, Jack J.; and Thompson, Ronald J., 4,714,356, Cl. 384-275.000.
- Thomson Components - Mostek Corporation: See—
Proebsting, Robert J., 4,714,840, Cl. 307-443.000.
- Smith, Michael D., 4,714,843, Cl. 307-491.000.
- Thorud, Stanley R., to Liberty Diversified Industries. Security cassette holder. 4,714,161, Cl. 206-387.000.
- Thyren, Carl H.; and Hesthamar, Tore, to Enpece AB. Method and apparatus for volume measurement. 4,713,966, Cl. 73-149.000.
- TIE/communications, Inc.: See—
Korsky, Vincent V.; and Pajer, Raymond T., 4,715,062, Cl. 379-390.000.
- Tiede, Edward. Self propelled auger and separable vehicle therefor. 4,714,149, Cl. 198-312.000.
- Tietze, Richard C., to Harbor Branch Oceanographic Institution Inc. Remote release tow hooks. 4,714,288, Cl. 294-82.330.
- Tisma Machine Corporation: See—
Tisma, Steven, 4,713,928, Cl. 53-526.000.
- Tisma, Steven, to Tisma Machine Corporation. Automatic packaging machine for closing over filled boxes. 4,713,928, Cl. 53-526.000.
- Tobia, Alfonso J.: See—
Kanojia, Ramesh M.; Falotico, Robert; Tobia, Alfonso J.; and Press, Jeffery B., 4,714,705, Cl. 514-309.000.
- Tocco, Inc.: See—
Hammond, Michael R.; and Novorsky, Donald E., 4,714,809, Cl. 219-10.430.
- Todaro, George J.: See—
Shoyab, Mohammed; Marquardt, Hans; and Todaro, George J., 4,714,683, Cl. 436-547.000.
- Toeda, Shigetoshi, to Kyocera Corporation. Sub-combustion chamber of an internal combustion engine. 4,714,062, Cl. 123-273.000.
- Toho Rayon Co., Ltd.: See—
Nagata, Yasuhisa, 4,714,648, Cl. 428-245.000.
- Toi, Koji: See—
Fukushima, Koji; Seto, Yoshiko; Kawada, Kazuhiro; Toi, Koji; and Kumashiro, Izumi, 4,714,713, Cl. 514-563.000.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—
Uneno, Tsunehisa; Kamata, Yutaka; and Miyazaki, Sinji, 4,714,668, Cl. 430-316.000.
- Tomalia, Donald A.; and Wilson, Larry R., to Dow Chemical Company. The dense star polymers for calibrating/characterizing sub-micron apertures. 4,713,975, Cl. 73-865.800.
- Tomita, Kazuo: See—
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- Tomita, Seisuke: See—
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- Tontarelli, Sergio. Plastic hanger with a grooved circular cross-section. 4,714,183, Cl. 223-91.000.
- Tootle, James N.; and Martin, Eugene J., to Pneumo Corporation. Fluid actuator with feedback mechanism. 4,714,006, Cl. 92-5.00R.
- Top Shelf Company, Inc.: See—
Wilcox, John R., 4,713,949, Cl. 68-235.00R.
- Torelli, Guido: See—
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- Toriumi, Mototada: See—
Nishino, Fumio; Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; and Toriumi, Mototada, 4,714,337, Cl. 355-3.00R.
- Tosaka, Yoichi: See—
Eguchi, Masaharu; Tosaka, Yoichi; Ohnuki, Ichiro; Aihara, Yoshihiko; and Ishizaki, Akira, 4,714,332, Cl. 354-21.000.
- Toshiba Machine Co., Ltd.: See—
Koya, Hirokuni, 4,714,102, Cl. 164-457.000.
- Suzuki, Akira, 4,714,933, Cl. 346-108.000.
- Toshiba Silicone Co., Ltd.: See—
Hashimoto, Takatsugu; Machara, Akihiro; Tomita, Seisuke; Funahashi, Yuichi; Watanabe, Junichiro; Sugiura, Kazuo; and Matsumoto, Hironori, 4,714,734, Cl. 524-496.000.
- Toska Co., Ltd.: See—
Nishino, Hiroshi; and Okabe, Kazuo, 4,714,569, Cl. 252-511.000.
- Tosswill, Christopher H., to Galileo Electro-Optics Corp. Higher frequency microchannel plate. 4,714,861, Cl. 315-117.000.
- Toti, Andrew J. Structural beam and panel systems and methods and apparatus for making the same. 4,713,924, Cl. 52-731.000.
- Tottori, Takumi; Oki, Kenji; Ooyama, Kazuo; and Mizushima, Toshio, to Honda Giken Kogyo Kabushiki Kaisha. Two-cycle engine. 4,714,056, Cl. 123-65.0PE.
- Tovagliaro, Constantino, to Magnaghi Oleodinamica S.p.A. Gas-oil pressure accumulator. 4,714,094, Cl. 138-31.000.
- Tovey, Stuart J., to Schlumberger Electronics (U.K.) Limited. Brazing eutectic and method. 4,714,189, Cl. 228-122.000.
- Toyo Engineering Corporation: See—
Naito, Akio; Uozu, Hirohisa; and Numaguchi, Toru, 4,714,593, Cl. 422-197.000.
- Zanma, Jun; Nishimura, Yoshinori; Shyoji, Kazuo; Shimagaki, Makoto; and Nakajima, Yoichi, 4,714,592, Cl. 422-192.000.
- Toyo Seikan Kaisha, Ltd.: See—
Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, 4,714,580, Cl. 264-516.000.
- Toyoda Gosei Co., Ltd.: See—
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- Toyoda, Katsuyoshi; and Murai, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Cryogenic vessel. 4,713,941, Cl. 62-50.000.
- Toyoda Koki Kabushiki Kaisha: See—
Takagi, Masayoshi; Hoshino, Yukio; and Yamauchi, Hiroki, 4,713,876, Cl. 29-568.000.
- Toyoshima, Yotaro: See—
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- Ida, Shuichi; Yoshinaka, Toshio; and Nagano, Shuji, 4,713,980, Cl. 74-467.000.
- Kinaga, Eiichi; and Shiraishi, Daiichi, 4,713,862, Cl. 16-223.000.
- Kobayashi, Fumiaki, 4,713,965, Cl. 73-119.00A.
- Moroto, Shuzo; Sumiya, Koji; Watanabe, Kazuaki; Kubo, Seitoku; Kobayashi, Koji; and Taga, Yutaka, 4,714,146, Cl. 192-85.0AA.
- Nagase, Masaomi; Takemoto, Eiji; Ibuki, Noritaka; and Hasegawa, Takashi, 4,714,068, Cl. 123-506.000.
- Sawada, Kouji; Miura, Kiyokatsu; Suzuki, Keiichi; Idosako, Hidetaka; and Kazusa, Hideo, 4,714,368, Cl. 403-132.000.
- Yogo, Kenji, 4,714,193, Cl. 236-75.000.
- Yoshinaka, Toshio; and Nagano, Shuji, 4,714,128, Cl. 180-247.000.
- Toyotomi Kogyo Co., Ltd.: See—
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- Tracy, Stephen E., to Spider Staging, Inc. Method and apparatus for mounting a davit on a roof structure. 4,714,226, Cl. 240-544.000.
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- Tread Corporation: See—
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- Treher, Elizabeth N.: See—
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- Tremblay, Paul A.; and Kearns, John J., to Liposome Company, Inc., The. Process for purification of phospholipids. 4,714,571, Cl. 260-403.000.
- Trenchard, Paul M. Mixer for use with microwave oven. 4,714,813, Cl. 219-10.55F.
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- Triad Metal Products Company: See—
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- Troglio, Donald L.: See—
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- Troletti, Bonifacio, to Honeywell Information Systems Italia. Digital apparatus for data recovery system. 4,714,968, Cl. 360-51.000.
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- Wood, Ruey E., 4,714,262, Cl. 280-95.00R.
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- Tsuzuki, Takayoshi: See—
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- Turner, S. Richard; and Yanus, John F., to Xerox Corporation. Aromatic aryl amine polymers. 4,714,779, Cl. 564-330.000.
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- Udagawa, Tsunekazu, to Ishikawa Gasket Co. Ltd. Steel laminate gasket. 4,714,260, Cl. 277-235.00B.
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- Holt, James F., 4,714,510, Cl. 437-2.000.
- Lynch, Charles T.; Vahldiek, Fred W.; and Khobaib, Mohammad, 4,714,564, Cl. 252-110.000.
- Yang, Andrew C.; Payne, Richard; and Soref, Richard A., 4,714,314, Cl. 350-96.200.
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- Kast, Steven J., 4,714,585, Cl. 376-442.000.
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- U.S. Philips Corporation: See—
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- Bertram, Leo; and Schemmann, Hugo, 4,714,851, Cl. 310-156.000.
- Braun, Walter; Kersten, Reinhard; and Kuhl, Egbert, 4,714,822, Cl. 219-449.000.
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- Hart, Cornelis M.; and Slob, Arie, 4,714,842, Cl. 307-477.000.
- Hill, Bernhard, 4,714,325, Cl. 350-376.000.
- Koster, Marinus P.; Soemers, Hermanus M. J. R.; and Dona, Marinus J. J., 4,713,977, Cl. 74-191.000.
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- Sanders, Rudolf, 4,714,858, Cl. 313-318.000.
- Schleimann-Jensen, Lars J.; and Anderson, Fred H. E., 4,714,214, Cl. 244-3.160.
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- Vrijssen, Gerardus A. H. M., 4,713,879, Cl. 29-620.000.
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- U.S. Tool & Die, Inc.: See—
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- Swarts, Richard E.; Moffatt, E. Marston; and Lopiccolo, Mario T., 4,714,815, Cl. 219-121.0LC.
- Terkelsen, Bruce E., 4,714,101, Cl. 164-122.200.
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- House, David W.; and Scott, Ray V., Jr., 4,714,512, Cl. 156-306.600.
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- Targos, William M., 4,714,693, Cl. 502-261.000.
- Zinnen, Hermann A.; and Franczyk, Thad S., 4,714,783, Cl. 568-424.000.
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- Uredat-Neuhoff, Angela, to Inaba Seisakusho Ltd. Height adjustable table. 4,714,028, Cl. 108-144.000.
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- Usui, Takeshi, to NEC Corporation. Light beam positioner with scan distortion compensation. 4,714,830, Cl. 250-234.000.
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- Valco/Valley Tool & Die, Inc.: See—
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- Freeman, Kenneth F.; Garrett, Charles B.; Harra, David J.; and Lei, Lawrence C., 4,714,536, Cl. 204-298.000.
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- Varlet, Marc F. Latch assembly. 4,714,284, Cl. 292-91.000.
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- Vaughan, Lawrence E., to General Signal Corporation. Fluid pressure brake control portion. 4,714,297, Cl. 303-33.000.
- VEB Kombinat Fortschritt Landmaschinen: See—
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- Veeco Gray Inc.: See—
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- Vicik, Stephen J.: See—
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- Vickers, Incorporated: See—
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- Victor, Karl-Heinz: See—
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- Viskase Corporation: See—
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- Vogel, Richard M., to Eastman Kodak Company. Asynchronous still timing for a video camera producing movie or still images. 4,714,963, Cl. 358-213.260.
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- Volk, Jack R.: See—
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- Volkman, Robert A.: See—
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- Kubon, Achim; and Voss-Spinker, Peter, 4,714,106, Cl. 164-484.000.
- Vossler, Roger A.: See—
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- Vrijssen, Gerardus A. H. M., to U.S. Philips Corporation. Method of manufacturing a device having an electric resistance layer and the use of the method. 4,713,879, Cl. 29-620.000.
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- W. H. Brady Co.: See—
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Walkup, William B.: See—
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Wallin, Per Olov T.; Warell, Bengt H.; Svensson, Ake P.; Lundstrom, Kurt A.; and Johansson, Lars A.: See—
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Walters, LeRoy M.: See—
Counter, Louis F.; Born, Richard C.; Walters, LeRoy M.; Ziese, Lowell B.; and Searing, Lawrence G., 4,714,917, Cl. 340-679.000.

Wan, Chung-Zong; and Dettling, Joseph C.: See—
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Wands, Jack R.: See—
Shouval, Daniel; Shafritz, David A.; and Wands, Jack R., 4,714,613, Cl. 424-86.000.

Wang, Kathy K.; Gustavson, Larry J.; and Dumbleton, John H.: See—
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Wang, Su-Chue S.; and Tuang, Simon C.: See—
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Wankel, Felix: See—
Internal axis single-rotation machine with intermeshing internal and external rotors, 4,714,417, Cl. 418-159.000.

Wansink, Derk H. N.: See—
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Ward, Eric J.: See—
Thayer, Edward B.; and Ward, Eric J., 4,714,197, Cl. 239-265.290.

Ward, William C.: See—
Buller, Marvin L.; Lumbra, Douglas L.; Phelps, Douglas W.; Samuels, Sigvart J.; and Ward, William C., 4,714,953, Cl. 357-81.000.

Warell, Bengt H.: See—
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Warner-Lambert Company: See—
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Hoefle, Milton L.; Holmes, Ann; and Stratton, Charlotte D., 4,714,762, Cl. 514-303.000.

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Mather, Graham W.; Warwick, Graham R.; and Bazeley, Graham A., 4,714,268, Cl. 280-646.000.

Waste Recovery, Inc.: See—
Rouse, Michael W.; Thelen, Robert L.; and Morison, John, 4,714,201, Cl. 241-24.000.

Watabe, Seiji; Yokoyama, Isao; Sasaki, Masanori; Toyoshima, Yotaro; Takahashi, Sumio; and Maeda, Tsutomu, to TDK Corporation. Electromagnetic deflection-distortion corrector, 4,714,908, Cl. 335-212.000.

Watanabe, Harumichi: See—
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Watanabe, Junichiro: See—
Hashimoto, Takatsugu; Machara, Akihiro; Tomita, Seisuke; Funahashi, Yuichi; Watanabe, Junichiro; Sugiura, Kazuo; and Matsumoto, Hironori, 4,714,734, Cl. 524-496.000.

Watanabe, Kazuaki: See—
Moroto, Shuzo; Sumiya, Koji; Watanabe, Kazuaki; Kubo, Seitoku; Kobayashi, Koji; and Taga, Yutaka, 4,714,146, Cl. 192-85.0AA.

Watanabe, Masatsugu: See—
Omori, Shigeru; Watanabe, Masatsugu; and Oboshi, Fumio, 4,714,622, Cl. 427-11.000.

Watanabe, Sadao: See—
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Watanabe, Seiji; Horimoto, Teiji; and Koizumi, Susumu, to Hitachi Kiden Kogyo Kabushiki Kaisha. Runway for a conveyor means using linear motors, 4,714,155, Cl. 198-619.000.

Watanabe, Toshihiro; and Meguro, Hiroshi, to Sony Corporation. Magnetic tape cassette with magnetic tape protective closure and bias means therefor, 4,714,213, Cl. 242-198.000.

Watanabe, Yoshio: See—
Kato, Yasuo; Harada, Kunio; Kubota, Shigeo; Watanabe, Yoshio; and Murayama, Seiichi, 4,715,054, Cl. 378-122.000.

Watanabe, Yoshitaka: See—
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Waterloo Industries, Inc.: See—
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Weatherby, Dennis W.: See—
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Webb, Frederick A.: See—
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Webb, John D., Jr.; Hori, Roy Y.; and Simpson, George E.: See—
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Weil, Edward D.: See—
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Weinfruth, Udo; to Rheinmetall GmbH. Apparatus for horizontalization of revolvable weapon platform, 4,714,004, Cl. 89-37.090.

Weisenberger, Johannes: See—
Roch, Josef; Heckel, Armin; Nickl, Josef; Muller, Erich; Narr, Berthold; Zimmermann, Rainer; and Weisenberger, Johannes, 4,714,698, Cl. 514-212.000.

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Welch Allyn, Inc.: See—
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Wells, Virginia J.; and Klein, Gerald B.: See—
to Klein, Gerald B. System for retaining and displaying business cards, 4,713,901, Cl. 40-360.000.

Western Atlas International, Inc.: See—
Landrum, Ralph A., Jr., 4,715,020, Cl. 367-38.000.

Westgate, Charles A.: See—
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Westinghouse Electric Corporation: See—
Altman, Denis J., 4,714,584, Cl. 376-353.000.

Arzenti, Thomas E.; and Pirl, William E., 4,714,289, Cl. 294-119.300.

Comstock, Robert J.; and Sabol, George P., 4,715,053, Cl. 378-73.000.

Goutzoulis, Anastasios P., 4,714,826, Cl. 250-213.00A.

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Healy, John T.; and Johnson, Joel W., 4,714,031, Cl. 110-109.000.

Kemeny, George A., 4,714,003, Cl. 89-8.000.

Marshall, Charles H., 4,714,327, Cl. 350-504.000.

Minard, Paul G.; Alba, James; and Pacyna, David A., 4,714,054, Cl. 122-483.000.

Neuner, James A.; and Boomgaard, Dirk J., 4,714,926, Cl. 340-870.360.

Senger, Robert D.; Pirl, William E.; and Roth, Charles H., Jr., 4,713,952, Cl. 72-53.000.

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Wheeling Stamping Company: See—
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Whipple, Charles S.: See—
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Whirlpool Corporation: See—
Sisk, George W.; Lynn, Shelby A.; Keil, John P.; and Woods, John T., 4,714,304, Cl. 312-214.000.

Whitaker, Robert B., Jr.: See—
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White, James A.: See—
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Whitehouse, John C.: See—
Keklak, Ronald; Couture, Michael V.; and Whitehouse, John C., 4,713,885, Cl. 30-162.000.

Whitesel, Terry L.: See—
Schaefer, John G.; Aarestad, Jerome K.; and Whitesel, Terry L., 4,714,405, Cl. 415-169.00R.

Whitey Co.: See—
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Linderman, Ray D.; and Williams, Peter C., 4,714,237, Cl. 251-330.000.

Whiting, Peter E.: See—
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Whyco Chromium Company, Inc.: See—
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Wichart, Klaus; to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Variable valve control system for a piston internal-combustion engine, 4,714,057, Cl. 123-90.150.

Wiedemann, Wolfgang; Spietschka, Ernst; and Troester, Helmut; to Hoechst Aktiengesellschaft. Perylene tetracarboxylic acid imide pigments in an electrophotographic recording material, 4,714,666, Cl. 430-59.000.

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Ambidextrous or left-handed magazine catch for a pistol, 4,713,902, Cl. 42-7.000.

Wijnen, Peter J. A.: See—
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Wilcox, John R.: See—
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Wilkes, Donald F.: See—
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Willems, David A.: See—
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Williams, James A.: See—
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Williams, James E.: See—
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Williams, Peter C.: See—
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Linderman, Ray D.; and Williams, Peter C., 4,714,237, Cl. 251-330.000.

Williams, Ronald D.: See—
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Williamson, Reno S.: See—
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Willinger Bros., Inc.: See—
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Wilson, Larry R.: See—
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Wilson, William G.: See—
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Ehlscheid, Guenter; and Hauschild, Gilbert, 4,714,394, Cl. 414-41.000.

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Woerner, Guenter; Tschepiak, Ernst; and Moser, Franz; to Daimler-Benz Aktiengesellschaft. Apparatus for reducing vehicle drive train vibrations, 4,714,449, Cl. 464-68.000.

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Wuesi, Hans-Heiner; Janssen, Bernd; Frickel, Fritz-Frieder; and Nuerrenbach, Axel; to BASF Aktiengesellschaft. Vinylphenol derivatives, their preparation and their use, 4,714,786, Cl. 568-633.000.

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Yamada, Toshihiko: See—
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Yamagishi, Toshio; and Fujiwara, Katsuyoshi; to Sharp Kabushiki Kaisha. Copying apparatus having a controlled scanning speed according to a copying magnification, 4,714,941, Cl. 355-8.000.

Yamaguchi, Akio; and Yoshikawa, Kazushi; to Honda Giken Kogyo Kabushiki Kaisha. Pallet for material handling, 4,714,026, Cl. 108-51.100.

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Yamaha Hatsudoki Kabushiki Kaisha: See—
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Yamakawa, Kiyoshi; and Yoshimoto, Satoshi; to Brother Kogyo Kabushiki Kaisha. Stepper motor homing method and system, 4,714,361, Cl. 400-144.200.

Yamakawa, Tadashi: See—
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Yamamoto, Ken: See—
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Yamamoto, Mitsuru; Sakurada, Nobuaki; and Watanabe, Yoshitaka; to Canon Kabushiki Kaisha. Ink-jet head driving circuit, 4,714,935, Cl. 346-140.00R.

Yamamoto, Sakae; and Mizuno, Tsutomu; to Amada Company, Limited. Linear stepping motor, 4,714,849, Cl. 310-12.000.

Yamanaka, Kazuo; Nagano, Hiroo; Minami, Takao; Okada, Yaotaka; Inoue, Mamoru; Susukida, Hiroshi; Onimura, Kichiro; Yonezawa, Toshio; Sasaguri, Nobuya; Kawaguchi, Katsuji; and Kusakabe, Takaya; to Mitsubishi Jukogyo Kabushiki Kaisha; and Sumitomo Metal Industries, Ltd. Method for thermal treatment of alloy for heat transfer pipes, 4,714,501, Cl. 148-13.000.

Yamasaki, Harumasa; Morii, Masayoshi; Yokota, Yukinaga; Mamada, Akira; and Nabata, Yoshiyuki; to Kao Corporation. Catalyst for preparation of polyurethane and process for the preparation, 4,714,719, Cl. 521-163.000.

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- Yamashita, Keitaro, to Hitachi Metals, Ltd. Directly heating fixing apparatus having current collecting bearings. 4,714,819, Cl. 219-216.000.
- Yamashita, Shinichi: See—
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- Yamauchi, Hiroki: See—
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- Yanai, Shun'ichi: See—
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- Yang, Andrew C.; Payne, Richard; and Soref, Richard A., to United States of America, Air Force. Mode dependent, optical time delay system for electrical signals. 4,714,314, Cl. 350-96.200.
- Yaniv, Zvi: See—
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- Yano, Toshihiko: See—
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- Yanus, John F.: See—
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- Yasaburgo, Akagi; Yasumoto, Miura; and Tetsuo, Hoshino, to Takeda Chemical Industries, Ltd. Stable composition of gamma-interferon. 4,714,611, Cl. 424-85.000.
- Yasuda, Keiji; Oda, Yukihisa; Hamajima, Shigemitsu; Ishii, Masami; Nakanishi, Katsumi; Tsuzuki, Takayoshi; and Tsuda, Jyou, to Aisin Seiki Kabushikikaisha. Rotary switch having rotary contacts with an amorphous alloy coating. 4,714,804, Cl. 200-11.0DA.
- Yasumoto, Miura: See—
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- Yavari, Parviz, to Northrop Corporation. Superplastic forming process. 4,713,953, Cl. 72-60.000.
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- Yelnosky, John: See—
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- Yeo, David E., to Scientific Drilling International. Detection means for mud pulse telemetry system. 4,715,022, Cl. 367-83.000.
- Yin, Ronald L. Color display apparatus and method therefor. 4,714,956, Cl. 358-60.000.
- Yogo, Kazutoshi; and Wakata, Hideo, to Nippondenso Co., Ltd. Throttle control device for vehicles. 4,714,864, Cl. 318-52.000.
- Yogo, Kenji, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Selector valve device. 4,714,193, Cl. 236-75.000.
- Yokono, Koujiro; Kamio, Masaru; and Ohkubo, Yukitoshi, to Canon Kabushiki Kaisha. Liquid crystal device for color display. 4,714,636, Cl. 428-1.000.
- Yokota, Yukinaga: See—
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- Yokoyama, Toshinobu; Watanabe, Sadao; and Kurata, Takatsugu, to Matsushita Electric Industrial Co., Ltd. Vibration damping means for the line cathodes of an image display apparatus. 4,714,863, Cl. 315-366.000.
- Yonezawa, Toshio: See—
Yamanaka, Kazuo; Nagano, Hiroo; Minami, Takao; Okada, Yaataka; Inoue, Mamoru; Susukida, Hiroshi; Onimura, Kichiro; Yonezawa, Toshio; Sasaguri, Nobuya; Kawaguchi, Katsuji; and Kusakabe, Takaya, 4,714,501, Cl. 148-13.000.
- Yorkanis, Bernard J.: See—
Craft, Jack; Low, Michael L.; and Yorkanis, Bernard J., 4,714,871, Cl. 323-315.000.
- Yoshida, Hiroshi, to Yoshida Kogyo K. K. Method of manufacturing molded slide fastener coupling elements. 4,714,573, Cl. 264-37.000.
- Yoshida Kogyo K. K.: See—
Boser, Ronald J., 4,714,038, Cl. 112-265.200.
- Yoshida, Hiroshi, 4,714,573, Cl. 264-37.000.
- Yoshida, Ryo; and Aikawa, Hiroshi, to Daihatsu Motor Company Limited. V belt stepless variable transmission. 4,714,451, Cl. 474-28.000.
- Yoshida, Toshio; and Watanabe, Harumichi, to Nippon Oil Co., Ltd. Synthetic oils. 4,714,794, Cl. 585-26.000.
- Yoshida, Toshiro: See—
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,714,566, Cl. 252-314.000.
- Yoshikawa, Kazushi: See—
Yamaguchi, Akio; and Yoshikawa, Kazushi, 4,714,026, Cl. 108-51.100.
- Yoshimoto, Satoshi: See—
Yamakawa, Kiyoshi; and Yoshimoto, Satoshi, 4,714,361, Cl. 400-144.200.
- Yoshimoto, Yoshikazu: See—
Higashigaki, Yoshiyuki; Yoshimoto, Yoshikazu; Suzuki, Tomonari; Nakajima, Shigeo; and Inoguchi, Toshio, 4,714,639, Cl. 428-36.000.
- Yoshimura, Hiroshi: See—
Matsumura, Tetsuo; Ohzawa, Toshio; Kawashima, Akihiro; Ohkuma, Osamu; Sawada, Saburo; Yanai, Shun'ichi; Yoshimura, Hiroshi; and Sugino, Yasuo, 4,714,543, Cl. 208-412.000.
- Yoshimura, Shinichi: See—
Ohkuma, Kuniaki; Nakagawa, Reiji; Miyao, Hisao; Yoshimura, Shinichi; Suzuki, Toshio; Hayashi, Toyooki; Arakawa, Masayasu; and Koizumi, Hideharu, 4,714,397, Cl. 414-222.000.
- Yoshinaga, Kazuo: See—
Katagiri, Kazuharu; Yoshinaga, Kazuo; Okada, Shinjiro; and Kanbe, Junichiro, 4,714,323, Cl. 350-350.00S.
- Yoshinaka, Tadaaki; and Inoue, Takao, to Sony Corporation. Read start pulse generator for time base corrector. 4,714,954, Cl. 358-19.000.
- Yoshinaka, Tadaaki; Inoue, Takao; and Tomita, Kazuo, to Sony Corporation. Write clock pulse generator used for a time base corrector. 4,714,965, Cl. 358-320.000.
- Yoshinaka, Toshio; and Nagano, Shuji, to Toyota Jidosha Kabushiki Kaisha. Stop member mechanism for use in a four-wheel drive vehicle. 4,714,128, Cl. 180-247.000.
- Yoshinaka, Toshio: See—
Ida, Shuichiro; Yoshinaka, Toshio; and Nagano, Shuji, 4,713,980, Cl. 74-467.000.
- Yoshino, Motoaki: See—
Kiya, Nobuyuki; and Yoshino, Motoaki, 4,714,999, Cl. 364-474.000.
- Yoshioka, Hiroshi: See—
Itoh, Kunio; Fukuda, Takeshi; and Yoshioka, Hiroshi, 4,714,733, Cl. 524-493.000.
- Yoshiura, Syoichiro, to Sharp Kabushiki Kaisha. Variable-magnification copying machine with automatic magnification. 4,714,944, Cl. 355-55.000.
- Young, Leon; and Klassen, Edward J., deceased (by Klassen, Amelia K., legal representative), to Fotima International Ltd. Camera carrier. 4,714,184, Cl. 224-253.000.
- Young, Ping: See—
Polak, Anthony J.; and Young, Ping, 4,714,482, Cl. 55-158.000.
- Youssefeyh, Rina. Skin treatment compositions comprising unoxidized nerve tissue. 4,714,615, Cl. 424-95.000.
- Yuhaku, Satoru: See—
Nakatani, Seiichi; Yuhaku, Satoru; Okinaka, Hideyuki; Ishida, Toru; Makino, Osamu; and Kikuchi, Tatsuro, 4,714,570, Cl. 252-518.000.
- Yui, Yoshiaki: See—
Oda, Kazuyuki; Yui, Yoshiaki; Kataoka, Yoshiharu; and Hata, Hideo, 4,714,331, Cl. 353-122.000.
- Yun, John M.: See—
Stipanuk, John M.; and Yun, John M., 4,714,435, Cl. 439-496.000.
- Zaccane, Samuel G. Engine sump draining device. 4,714,138, Cl. 184-1.500.
- Zach, Joachim: See—
Rose, Harald; Zach, Joachim; and Lischke, Burkhard, 4,714,833, Cl. 250-397.000.
- Zahn, Werner, to Deere & Company. Remote actuating mechanism. 4,713,981, Cl. 74-479.000.
- Zanma, Jun; Nishimura, Yoshinori; Shyoji, Kazuo; Shimagaki, Makoto; and Nakajima, Yoichi, to Toyo Engineering Corporation. Radial flow catalytic reactor including heat exchange apparatus within the bed. 4,714,592, Cl. 422-192.000.
- Zeevi, Yehoshua Y.; and Medina, Antonio. Apparatus for relief illusion. 4,714,319, Cl. 350-144.000.
- Zeller, Gregor, to Petri A.G. Electric contact device for protective gas bag impact installations in automotive vehicles. 4,714,430, Cl. 439-15.000.
- Zenith Electronics Corporation: See—
Foster, Mark J., 4,714,919, Cl. 340-726.000.
- Zielinski, Larry E.: See—
Mennie, John; Troglio, Donald L.; and Zielinski, Larry E., 4,713,926, Cl. 53-443.000.
- Ziese, Lowell B.: See—
Counter, Louis F.; Born, Richard C.; Walters, LeRoy M.; Ziese, Lowell B.; and Searing, Lawrence G., 4,714,917, Cl. 340-679.000.
- Zimmer, Inc.: See—
Webb, John D., Jr.; Hori, Roy Y.; and Simpson, George E., 4,714,470, Cl. 623-18.000.
- Zimmermann, Rainer: See—
Roch, Josef; Heckel, Armin; Nickl, Josef; Muller, Erich; Narr, Berthold; Zimmermann, Rainer; and Weisenberger, Johannes, 4,714,698, Cl. 514-212.000.
- Zinnen, Hermann A.; and Franczyk, Thad S., to UOP Inc. Separation of nitrobenzaldehyde isomers. 4,714,783, Cl. 568-424.000.
- Ziyad Incorporated: See—
Staniszewski, Tadeusz, 4,714,243, Cl. 271-171.000.
- Zlotky, Richard A.: See—
Skinner, Jerald P.; Zlotky, Richard A.; and Diel, Robert L., 4,714,225, Cl. 248-523.000.
- Zolnowsky, John: See—
MacGregor, Douglas B.; Zolnowsky, John; and Mothersole, David, 4,715,013, Cl. 364-900.000.
- Zott, Werner, to Stahlecker, Fritz; and Stahlecker, Hans. Supporting disk for a supporting-disk bearing of an open-end spinning machine. 4,713,932, Cl. 57-406.000.
- Zoueki, Georges. Lens and pattern holder. 4,713,912, Cl. 51-101.0LG.
- Zumwalt, Gary L.: See—
Medlin, William L.; and Zumwalt, Gary L., 4,715,019, Cl. 367-31.000.
- Zygraich, Nathan: See—
Delgoffe, Jean-Claude; Lobmann, Michele; and Zygraich, Nathan, 4,714,678, Cl. 435-235.000.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF DECEMBER, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Hiraiwa, Kazuyoshi, to Nissan Motor Company, Limited. Four-wheel vehicle drive system. Re. 32,565, Cl. 180-249.000.

Nissan Motor Company, Limited: See—
Hiraiwa, Kazuyoshi, Re. 32,565, Cl. 180-249.000.

LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

Cetus Corporation: See—
Frankel, Arthur E.; Johnson, Larry J.; and Wennberg, Timothy J., B1 4,555,957, Cl. 73-864.140.

Davenport, John; and Russo, Michael A., to TI (Group Services) Limited. Controlling current density. B1 4,587,458, 12-22-87, Cl. 315-111.010.

Frankel, Arthur E.; Johnson, Larry J.; and Wennberg, Timothy J., to Cetus Corporation. Bi-directional liquid sample handling system. B1 4,555,957, 12-22-87, Cl. 73-864.140.

Johnson, Larry J.: See—
Frankel, Arthur E.; Johnson, Larry J.; and Wennberg, Timothy J., B1 4,555,957, Cl. 73-864.140.

Russo, Michael A.: See—
Davenport, John; and Russo, Michael A., B1 4,587,458, Cl. 315-111.010.

TI (Group Services) Limited: See—
Davenport, John; and Russo, Michael A., B1 4,587,458, Cl. 315-111.010.

Wennberg, Timothy J.: See—
Frankel, Arthur E.; Johnson, Larry J.; and Wennberg, Timothy J., B1 4,555,957, Cl. 73-864.140.

LIST OF DESIGN PATENTEEES

A-Dec, Inc.: See—
Nordstrom, Carl G.; and Parlier, Matthew H., 293,371, Cl. D24-5.000.

Abe, Takashi: See—
Hoshino, Naoko; Abe, Takashi; and Suzuki, Yosuke, 293,322, Cl. D14-71.000.

Abe, Takeshi: See—
Gotou, Atsuyuki; Shibayama, Masato; Abe, Takeshi; Hisatomi, Ryouichi; and Sasaki, Takeshi, 293,324, Cl. D15-199.000.

Abrams, Robert C.: See—
Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,304, Cl. D11-164.000.

Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,305, Cl. D11-164.000.

Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,306, Cl. D11-164.000.

Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,307, Cl. D11-164.000.

Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,308, Cl. D11-164.000.

Acoustiguide Corporation: See—
Demenus, Richard, 293,316, Cl. D14-6.000.

Alfer, Jaroslav G. Seat cushion. 293,286, 12-22-87, Cl. D6-596.000.

Alkire, Merrill D. Ear cleaner. 293,378, 12-22-87, Cl. D24-59.000.

American Telephone & Telegraph Company, AT&T Information Systems Inc.: See—
Kowalik, John; Longhitano, Ronald; Miggels, Stephen G.; Shakespeare, Walter J.; and Varadarajan, G., 293,321, Cl. D14-60.000.

Andersen, Ed S.: See—
Ryaa, Jan; and Andersen, Ed S., 293,341, Cl. D21-108.000.

Anderson, Lloyd E., Sr., to Pitt-Des Moines Inc. Elevated water tank. 293,360, 12-22-87, Cl. D23-202.000.

Arcair Company: See—
Chaney, David B., 293,296, Cl. D8-30.000.

Ashford, L. James. Portable seat. 293,282, 12-22-87, Cl. D6-368.000.

Attwood Corporation: See—
Whitley, Warwick M., II, 293,361, Cl. D23-231.000.

Bardsley, Harold B.: See—
Slattery, Ian; Bardsley, Harold B.; and Beverly, Ian, 293,323, Cl. D15-78.000.

Beck, Stephen C. Headset for use in applying electrical signals to the temples. 293,373, 12-22-87, Cl. D24-17.000.

Ben-Zeev, Avry: See—
Cauque, Michele; and Ben-Zeev, Avry, 293,287, Cl. D3-62.000.

Beverly, Ian: See—
Slattery, Ian; Bardsley, Harold B.; and Beverly, Ian, 293,323, Cl. D15-78.000.

Bienwald, Wolfgang F.: See—
Justiano, Joseph G.; and Bienwald, Wolfgang F., 293,313, Cl. D13-27.000.

Blackwell, James C. Water holding tub for sun tanning. 293,376, 12-22-87, Cl. D24-39.000.

Brookshire, Phillip L.: See—
O'Neil, William J., Jr.; Jones, David A.; and Brookshire, Phillip L., 293,366, Cl. D23-366.000.

Brule, Paul L., to Ventureprise, Inc. Conveyor. 293,384, 12-22-87, Cl. D34-29.000.

Bua, Jeffrey P., to Reebok International, Ltd. Shoe sole. 293,275, 12-22-87, Cl. D2-320.000.

Bulgari, Marina, to Marina B Creation S.A. Necklace. 293,303, 12-22-87, Cl. D11-3.000.

Burgdorf, Fred. Paper clip. 293,337, 12-22-87, Cl. D19-65.000.

Burlington Basket Company: See—
Thompson, Rick L., 293,383, Cl. D32-37.000.

Butt, Thomas E. Dental pick. 293,372, 12-22-87, Cl. D24-10.000.

Cal-Surgical, Inc.: See—
Sanderson, Ronald A.; Wilson, John L.; and Maples, Nolan M., 293,370, Cl. D24-3.000.

Calkin, Linda L. Doll. 293,351, 12-22-87, Cl. D21-166.000.

Calkin, Linda L. Doll. 293,352, 12-22-87, Cl. D21-166.000.

Casio Computer Co., Ltd.: See—
Nikaido, Takashi; Ono, Yoshio; and Wada, Masao, 293,300, Cl. D10-32.000.

Cauque, Michele; and Ben-Zeev, Avry, to Sparklight Corporation. Combined key ring, torch, photograph holder and LCD watch. 293,287, 12-22-87, Cl. D3-62.000.

Chadbourne, Gilbert R., to Keyes Fibre. Urine measuring jug. 293,377, 12-22-87, Cl. D24-56.000.

Chaney, David B., to Arcair Company. Torch for exothermic cutting electrodes. 293,296, 12-22-87, Cl. D8-30.000.

Charles, Harold E.: See—
Robertson, James R.; and Charles, Harold E., 293,309, Cl. D12-6.000.

Clark, Gary N.; Jones, Kirk H.; and Welburn, Edward T., Jr., to General Motors Corporation. Vehicle body. 293,310, 12-22-87, Cl. D12-90.000.

Clarks Limited: See—
Radford, Alfred D., 293,270, Cl. D2-313.000.

Combi Co., Ltd.: See—
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 293,329, Cl. D21-78.000.

Cron, Kenneth D.; and Sauvigne', Nannette, to STL, Enterprises. Toothbrush. 293,288, 12-22-87, Cl. D4-104.000.

Deering, Michael H. Bar scale template. 293,301, 12-22-87, Cl. D10-62.000.

de Meij, Seel. Boot sole. 293,272, 12-22-87, Cl. D2-320.000.

de Meij, Seel. Boot sole. 293,273, 12-22-87, Cl. D2-320.000.

Demenus, Richard, to Acoustiguide Corporation. Portable cassette player. 293,316, 12-22-87, Cl. D14-6.000.

Denny, Lee: See—
Hannah, Bruce P.; McClanahan, David D.; and Denny, Lee, 293,314, Cl. D13-40.000.

Denny, Thomas, to Johnson & Johnson Products Inc. Surgical laparotomy pad. 293,375, 12-22-87, Cl. D24-34.000.

Dexter-Portfolio Co., The: See—
Latta, Leigh C., III, 293,330, Cl. D21-159.000.

Latta, Leigh C., III, 293,343, Cl. D21-148.000.

Don Evans, Inc.: See—
Evans, Dale M., 293,279, Cl. D3-35.000.

Drackett Company, The: See—
O'Neil, William J., Jr.; Jones, David A.; and Brookshire, Phillip L., 293,366, Cl. D23-366.000.

Drag Specialties, Inc.: See—
Stahel, Alwin J., 293,312, Cl. D12-186.000.

Eastman Kodak Company: See—
Fricke, W. Patrick; and Harrison, Larry D., 293,327, Cl. D16-32.000.

Leonard, Bruce A., 293,326, Cl. D16-6.000.

Edwards, Peter; Steinhilber, Budd; and Gilliam, Ken, to Harmony Foods, Inc. Combination food container and scoop. 293,289, 12-22-87, Cl. D7-79.000.

Egley, Robert A. Case for magnetic media, programs and the like. 293,335, 12-22-87, Cl. D19-27.000.

Eldon Industries, Inc.: See—
Evenson, Mel, 293,338, Cl. D19-67.000.

Evenson, Mel, 293,339, Cl. D20-10.000.

El-Hag, Nabil: See—
Finsilver, Charles E.; Taylor, Terry L.; Worm, Roger E.; and El-Hag, Nabil, 293,292, Cl. D7-16.000.

Erlewine, Mark; and Squier, William. Guitar. 293,331, 12-22-87, Cl. D17-14.000.

Evans, Dale M., to Don Evans, Inc. Diskette file box. 293,279, 12-22-87, Cl. D3-35.000.

Evenson, Mel, to Eldon Industries, Inc. Stamp dispenser. 293,338, 12-22-87, Cl. D19-67.000.

Evenson, Mel, to Eldon Industries, Inc. Signboard. 293,339, 12-22-87, Cl. D20-10.000.

Everard, Lloyd. Inflatable bathtub. 293,363, 12-22-87, Cl. D23-277.000.

Everard, Lloyd. Inflatable sink. 293,364, 12-22-87, Cl. D23-289.000.

Excellente, Richard. Electric guitar body. 293,333, 12-22-87, Cl. D17-20.000.

Fabrique Ebel, Societe Anonyme: See—
Schoepfer, Eddy, 293,302, Cl. D11-3.000.

Fenner, Paul A. Cocktail composer guide. 293,336, 12-22-87, Cl. D19-64.000.

Fetterman, Douglas L., to Kenner Parker Toys Inc. Toy figure. 293,350, 12-22-87, Cl. D21-166.000.

Finsilver, Charles E.; Taylor, Terry L.; Worm, Roger E.; and El-Hag, Nabil, to General Foods Corporation. Covered entree plate. 293,292, 12-22-87, Cl. D7-16.000.

Fish, Falk: See—
Herzberg, Max; and Fish, Falk, 293,374, Cl. D24-17.000.

Formenti, Marco. Sofa. 293,283, 12-22-87, Cl. D6-381.000.

Fricke, W. Patrick; and Harrison, Larry D., to Eastman Kodak Company. Control panel for a copier or the like. 293,327, 12-22-87, Cl. D16-32.000.

Fujiyama, Mamoru, to Zojirushi Vacuum Bottle Co., Ltd. Vacuum bottle. 293,294, 12-22-87, Cl. D7-77.000.

General Foods Corporation: See—
Finsilver, Charles E.; Taylor, Terry L.; Worm, Roger E.; and El-Hag, Nabil, 293,292, Cl. D7-16.000.

General Motors Corporation: See—
Clark, Gary N.; Jones, Kirk H.; and Welburn, Edward T., Jr., 293,310, Cl. D12-90.000.

George, Ivan T. Wick bearing lighting device. 293,365, 12-22-87, Cl. D7-416.000.

Gilliam, Ken: See—
Edwards, Peter; Steinhilber, Budd; and Gilliam, Ken, 293,289, Cl. D7-79.000.

Gomez, Stephen D.: See—
Schmidt-Devlin, Ellen; and Gomez, Stephen D., 293,276, Cl. D2-321.000.

Gotou, Atsuyuki; Shibayama, Masato; Abe, Takeshi; Hisatomi, Ryouichi; and Sasaki, Takeshi, to Hitachi, Ltd. Industrial robot. 293,324, 12-22-87, Cl. D15-199.000.

Gust, James M.; and Yoder, Ronald L. Adjustable fishing rod support. 293,359, 12-22-87, Cl. D22-147.000.

Hanashima, Taira: See—
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 293,329, Cl. D21-78.000.

Hannah, Bruce P.; McClanahan, David D.; and Denny, Lee, to Knoll International, Inc. Work station spine assembly. 293,314, 12-22-87, Cl. D13-40.000.

Hansen, Erik L., to Rosti A/S. Punch cup. 293,291, 12-22-87, Cl. D7-9.000.

Harmony Foods, Inc.: See—
Edwards, Peter; Steinhilber, Budd; and Gilliam, Ken, 293,289, Cl. D7-79.000.

Harrison, Larry D.: See—
Fricke, W. Patrick; and Harrison, Larry D., 293,327, Cl. D16-32.000.

Hartzell, Robert H.: See—
Perusek, Allan J.; Jablonski, Ernest F.; and Hartzell, Robert H., 293,369, Cl. D24-2.000.

Hase, Mark A.: See—
Murphy, Marvin G.; and Hase, Mark A., 293,328, Cl. D14-102.000.

Hearn, David E. Fish carrier. 293,358, 12-22-87, Cl. D22-134.000.

Heilig, Mort, to Supercruiser, Inc. Scooter. 293,340, 12-22-87, Cl. D21-81.000.

Herzberg, Max; and Fish, Falk, to Orgenics, Ltd. Assay cards. 293,374, 12-22-87, Cl. D24-17.000.

Hestair Kiddicraft Limited: See—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 293,342, Cl. D21-139.000.

Highland Supply Corporation: See—
Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,304, Cl. D11-164.000.

Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,305, Cl. D11-164.000.

Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,306, Cl. D11-164.000.

Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,307, Cl. D11-164.000.

Weder, Donald E.; Weder, Erwin H.; and Abrams, Robert C., 293,308, Cl. D11-164.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet. 293,362, 12-22-87, Cl. D23-241.000.

Hisatomi, Ryouichi: See—
Gotou, Atsuyuki; Shibayama, Masato; Abe, Takeshi; Hisatomi, Ryouichi; and Sasaki, Takeshi, 293,324, Cl. D15-199.000.

Hitachi, Ltd.: See—
Gotou, Atsuyuki; Shibayama, Masato; Abe, Takeshi; Hisatomi, Ryouichi; and Sasaki, Takeshi, 293,324, Cl. D15-199.000.

Ho, Chin-Chou. Connector for attaching an infant seat to a table. 293,285, 12-22-87, Cl. D6-491.000.

Holden, Lawrence. Floatation aid. 293,356, 12-22-87, Cl. D21-238.000.

Horiuchi, Hiroshi, to Tomy Kogyo Co., Inc. Toy robot. 293,346, 12-22-87, Cl. D21-150.000.

Hoshino, Naoko; Abe, Takashi; and Suzuki, Yosuke, to Kabushiki Kaisha Toshiba. Audio tuner. 293,322, 12-22-87, Cl. D14-71.000.

Humbert, James R. Paper guide clip. 293,334, 12-22-87, Cl. D18-22.000.

Ichikawa, Kaname, to Modern Royal Co., Ltd. Lighter or the like. 293,382, 12-22-87, Cl. D27-41.000.

Igoe, Brian F., to Reebok International, Ltd. Shoe sole. 293,274, 12-22-87, Cl. D2-320.000.

Integral Design, Inc.: See—
Liptak, Richard M., 293,280, Cl. D6-314.000.

Interlego A.G.: See—
Ryaa, Jan; and Andersen, Edel S., 293,341, Cl. D21-108.000.

Ishii, Yoshiyasu: See—
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 293,329, Cl. D21-78.000.

Isles, Patricia J. Cup holder. 293,293, 12-22-87, Cl. D7-70.000.

Jablonski, Ernest F.: See—
Perusek, Allan J.; Jablonski, Ernest F.; and Hartzell, Robert H., 293,369, Cl. D24-2.000.

Johnson & Johnson Products Inc.: See—
Denny, Thomas, 293,375, Cl. D24-34.000.

Johnson, Stanley A., to Vollrath Company, The. Turner. 293,295, 12-22-87, Cl. D7-102.000.

Jones, David A.: See—
O'Neil, William J., Jr.; Jones, David A.; and Brookshire, Phillip L., 293,366, Cl. D23-366.000.

Jones, Kirk H.: See—
Clark, Gary N.; Jones, Kirk H.; and Welburn, Edward T., Jr., 293,310, Cl. D12-90.000.

Justiano, Joseph G.; and Bienwald, Wolfgang F., to Leviton Manufacturing Company, Inc. Electrical connector housing. 293,313, 12-22-87, Cl. D13-27.000.

Kabushiki Kaisha Toshiba: See—
Hoshino, Naoko; Abe, Takashi; and Suzuki, Yosuke, 293,322, Cl. D14-71.000.

Suzuki, Yosuke; and Sano, Takahide, 293,315, Cl. D14-84.000.

Karamian, Narbik A., to Raf-Tan Inc. Microwave distillation apparatus. 293,368, 12-22-87, Cl. D23-207.000.

Kato, Takaharu, to Ricoh Company, Ltd. Camera. 293,325, 12-22-87, Cl. D16-6.000.

Kenner Parker Toys Inc.: See—
Fetterman, Douglas L., 293,350, Cl. D21-166.000.

Keyes Fibre: See—
Chadbourne, Gilbert R., 293,377, Cl. D24-56.000.

Kikkawa, Hiroshi: See—
Umezumi, Mitsuhiro; Nakajima, Tooru; Kikkawa, Hiroshi; and Miyazaki, Mamoru, 293,317, Cl. D14-52.000.

Kim, Young O. Mug. 293,290, 12-22-87, Cl. D7-8.000.

Knoll International, Inc.: See—
Hannah, Bruce P.; McClanahan, David D.; and Denny, Lee, 293,314, Cl. D13-40.000.

Kowalik, John; Longhitano, Ronald; Miggels, Stephen G.; Shakespeare, Walter J.; and Varadarajan, G., to American Telephone & Telegraph Company, AT&T Information Systems Inc. Telephone stand. 293,321, 12-22-87, Cl. D14-60.000.

Larson, Lawrence L.: See—
Ruger, William B.; and Larson, Lawrence L., 293,357, Cl. D22-108.000.

Latino, Richard M.: See—
Wright, David; and Latino, Richard M., 293,284, Cl. D6-425.000.

Latta, Leigh C., III, to Dexter-Portfolio Co., The. Stuffed toy bear. 293,330, 12-22-87, Cl. D21-159.000.

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Denholm Seeds: See—
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Winner, Blair L., 6,065, Cl. 68.000.
Winner, Blair L., 6,066, Cl. 68.000.

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Winner, Blair L., to Denholm Seeds. Variety of geranium named Valerie.
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CLASSIFICATION OF PATENTS

ISSUED DECEMBER 22, 1987

NOTE.—First number, class; second number, subclass; third number, patent number.

104	CLASS 2	85	4,713,905	94	4,714,492	212	4,714,016	419 PG	4,714,079	321	4,714,116	
209	4,713,842			99	4,714,493			633	4,714,080	380	4,714,117	
411	4,713,843	42.39	4,713,907		CLASS 72	275.3	4,714,017	653	4,714,081		CLASS 174	
	4,713,844	42.5	4,713,906	53	4,713,952	275.7	4,714,018		CLASS 131	42	4,714,799	
	CLASS 4	43.4	4,713,908	60	4,713,953	307	4,714,019	94	4,714,083	73 R	4,714,800	
233	4,713,845			88	4,713,954	351	4,714,020	359	4,714,082	88 R	4,714,801	
254	4,713,846			137	4,713,956	401	4,714,021		CLASS 132		CLASS 175	
316	4,713,847	17	4,713,909	208	4,713,955	476	4,714,022					
480	4,713,848			319	4,713,957	516	4,714,023	88.7	4,714,084	20	4,714,119	
490	4,713,849	49	4,713,910	348	4,713,958	521	4,714,024		4,714,085	26	4,714,118	
585	4,713,850	394	4,713,911	410	4,713,959				CLASS 134	329	4,714,120	
	CLASS 5		CLASS 51	412	4,713,960		CLASS 106		4,714,086		CLASS 177	
118	4,713,851	101 LG	4,713,912	419	4,713,961	21	4,714,495	83				
451	4,713,852	165.9	4,713,913		CLASS 73	270	4,714,496		CLASS 136	134	4,714,121	
	4,713,853	281 P	4,713,914	11	4,713,962		CLASS 108	206	4,714,797	139	4,714,122	
481	4,713,854			23.1	4,713,963	20	4,714,025	239	4,714,798		CLASS 178	
	CLASS 8		CLASS 52	116	4,713,964	51.1	4,714,026		CLASS 137	1	4,714,802	
137	4,714,479	11	4,713,915	119 A	4,713,965	144	4,714,027				CLASS 180	
	CLASS 10	39	4,713,916	149	4,713,966	141	4,714,028	3	4,714,087			
10 R	4,713,855	167	4,713,917	170 A	4,713,967		CLASS 109	426	4,714,088	14.4	4,714,123	
	CLASS 15	221	4,713,918	594	4,713,968	45	4,714,029	614.18	4,714,089	20	4,714,140	
97 R	4,713,856	232	4,713,919	706	4,713,969	61	4,714,030	636	4,714,090	168	4,714,124	
	4,713,857	579	4,713,921	861.05	4,713,970		CLASS 110	884	4,714,091	182	4,714,125	
264	4,713,858	582	4,713,920	861.25	4,713,971			894	4,714,092	233	4,714,126	
347	4,713,858	656	4,713,922	861.76	4,713,972	109	4,714,031		CLASS 138	247	4,714,127	
	CLASS 16	713	4,713,923	862.67	4,713,973	347	4,714,032	30	4,714,093	248	4,714,128	
	4,713,859	731	4,713,924	864.14	B1 4,555,957		CLASS 111	31	4,714,094	248	Re.32,565	
	4,713,858			864.23	4,713,974			98	4,714,095	262	4,714,130	
			CLASS 53	865.8	4,713,975	85	4,714,033		CLASS 139	287	4,714,131	
111 R	4,713,860	432	4,713,925		CLASS 74		CLASS 112	391	4,714,096	312	4,714,132	
222	4,713,861	443	4,713,926	190	4,713,976				CLASS 141		CLASS 181	
223	4,713,862	472	4,713,927	191	4,713,977	113	4,714,034		5	4,714,097	160	4,714,133
	CLASS 24	526	4,713,928	200	4,713,978	114	4,714,035	85	4,714,098		CLASS 182	
20 R	4,713,863		CLASS 55	337.5	4,713,979	147	4,714,036		</td>			

298	4,714,536	CLASS 206	46.6	4,714,577	441	4,714,839	195	4,714,911	81	4,714,953
296	4,714,536	75	4,714,578	443	4,714,840	443	4,714,841	CLASS 340	CLASS 358	
309	4,714,537	CLASS 237	328.6	4,714,579	455	4,714,842	310 R	4,714,912	19	4,714,954
349	4,714,538	70	4,714,580	477	4,714,843	477	4,714,844	347 P	48	4,714,955
	4,714,539	CLASS 238	553	4,714,581	491	4,714,845	573	4,714,914	60	4,714,956
385	4,714,540	349	4,714,582	496	4,714,846	496	4,714,847	657	93	4,714,957
387	4,714,541	CLASS 239	3	4,714,583	664	4,714,848	664	4,714,916	166	4,714,958
419	4,714,542	62	4,714,584	12	4,714,849	679	4,714,849	4,714,917	184	4,714,959
518	4,714,543	265.29	4,714,585	49 R	4,714,850	724	4,714,850	4,714,918	206	4,714,960
	4,714,544	409	4,714,586	156	4,714,851	726	4,714,851	4,714,919	209	4,714,961
	4,714,545	412	4,714,587	257	4,714,852	747	4,714,852	4,714,920	213.26	4,714,962
	4,714,546	579	4,714,588	268	4,714,853	784	4,714,853	4,714,921	298	4,714,963
111	4,714,547	CLASS 208	100	4,714,589	317	4,714,854	825.06	4,714,922	320	4,714,964
139	4,714,548	409	4,714,590	328	4,714,855	825.210	4,714,855	4,714,923	335	4,714,965
	4,714,549	412	4,714,591	332	4,714,856	825.55	4,714,856	4,714,924		4,714,966
	4,714,550	579	4,714,592	359	4,714,857	870.36	4,714,857	4,714,925	CLASS 360	
161	4,714,551	CLASS 240	72	4,714,593	CLASS 312	160	4,714,927	48	4,714,967	
347	4,714,552	544	4,714,594	214	4,714,928	174	4,714,928	51	4,714,968	
412	4,714,553	CLASS 241	75	4,714,595	306	4,714,929	439	66	4,714,969	
	4,714,554	24	4,714,596	332	4,714,930	786	4,714,930	73	4,714,970	
	4,714,555	30	4,714,597	359	4,714,931	75	4,714,931	77	4,714,971	
CLASS 209	4,714,556	36	4,714,598	CLASS 313	112	4,714,932	108	97	4,714,972	
167	4,714,557	55	4,714,599	CLASS 314	111.01	4,714,933	140 R	133	4,714,973	
	4,714,558	95	4,714,600	CLASS 315	111.81	4,714,934		12	4,714,974	
CLASS 210	4,714,559	100	4,714,601	CLASS 316	111.81	4,714,935		44	4,714,975	
101	4,714,560	189 R	4,714,602	CLASS 317	111.81	4,714,936		114	4,714,976	
137	4,714,561	CLASS 242	4,714,603	CLASS 318	111.81	4,714,937		196	4,714,977	
169	4,714,562	25 R	4,714,604	CLASS 319	111.81	4,714,938		235	4,714,978	
221.2	4,714,563	55.3	4,714,605	CLASS 320	111.81	4,714,939		274	4,714,979	
224	4,714,564	84.52 B	4,714,606	CLASS 321	111.81	4,714,940		395	4,714,980	
244	4,714,565	96	4,714,607	CLASS 322	111.81	4,714,941		400	4,714,981	
278	4,714,566	182	4,714,608	CLASS 323	111.81	4,714,942		404	4,714,982	
329	4,714,567	198	4,714,609	CLASS 324	111.81	4,714,943		CLASS 362		
533	4,714,568	CLASS 244	4,714,610	CLASS 325	111.81	4,714,944		45	4,715,051	
635	4,714,569	3.16	4,714,611	CLASS 326	111.81	4,714,945		108	4,715,052	
638	4,714,570	3.29	4,714,612	CLASS 327	111.81	4,714,946		73	4,715,053	
769	4,714,571	155 R	4,714,613	CLASS 328	111.81	4,714,947		122	4,715,054	
776	4,714,572	199	4,714,614	CLASS 329	111.81	4,714,948		144	4,715,055	
	4,714,573	CLASS 211	4,714,615	CLASS 330	111.81	4,714,949		152	4,715,056	
	4,714,574	62	4,714,616	CLASS 331	111.81	4,714,950		197	4,715,057	
11	4,714,575	65	4,714,617	CLASS 332	111.81	4,714,951		CLASS 376		
113	4,714,576	160	4,714,618	CLASS 333	111.81	4,714,952		233	4,715,582	
CLASS 215	4,714,577	221.1	4,714,619	CLASS 334	111.81	4,714,953		261	4,715,583	
270	4,714,578	282	4,714,620	CLASS 335	111.81	4,714,954		353	4,715,584	
	4,714,579	291	4,714,621	CLASS 336	111.81	4,714,955		442	4,715,585	
CLASS 219	4,714,580	465	4,714,622	CLASS 337	111.81	4,714,956		CLASS 377		
9.5	4,714,808	523	4,714,623	CLASS 338	111.81	4,714,957		45	4,715,051	
10.43	4,714,809	595	4,714,624	CLASS 339	111.81	4,714,958		108	4,715,052	
10.55 A	4,714,810	608	4,714,625	CLASS 340	111.81	4,714,959		73	4,715,053	
10.55 F	4,714,811	610	4,714,626	CLASS 341	111.81	4,714,960		122	4,715,054	
	4,714,812	613	4,714,627	CLASS 342	111.81	4,714,961		144	4,715,055	
10.55 M	4,714,813	CLASS 249	4,714,628	CLASS 343	111.81	4,714,962		152	4,715,056	
79	4,714,814	14	4,714,629	CLASS 344	111.81	4,714,963		197	4,715,057	
109	4,714,815	90	4,714,630	CLASS 345	111.81	4,714,964		CLASS 378		
121 LC	4,714,816	205	4,714,631	CLASS 346	111.81	4,714,965		73	4,715,053	
121 LK	4,714,817	211 R	4,714,632	CLASS 347	111.81	4,714,966		122	4,715,054	
123	4,714,818	213 A	4,714,633	CLASS 348	111.81	4,714,967		144	4,715,055	
216	4,714,819	213 VT	4,714,634	CLASS 349	111.81	4,714,968		152	4,715,056	
222	4,714,820	214 C	4,714,635	CLASS 350	111.81	4,714,969		197	4,715,057	
326	4,714,821	CLASS 220	4,714,636	CLASS 351	111.81	4,714,970		CLASS 379		
449	4,714,822	1 T	4,714,637	CLASS 352	111.81	4,714,971		27	4,715,058	
	4,714,823	5 A	4,714,638	CLASS 353	111.81	4,714,972		53	4,715,059	
1	4,714,168	8	4,714,639	CLASS 354	111.81	4,714,973		70	4,715,060	
5 A	4,714,170	85 VR	4,714,640	CLASS 355	111.81	4,714,974		91	4,715,061	
8	4,714,169	86 R	4,714,641	CLASS 356	111.81	4,714,975		390	4,715,062	
85 VR	4,714,171	90.4	4,714,642	CLASS 357	111.81	4,714,976		392	4,715,064	
86 R	4,714,172		4,714,643	CLASS 358	111.81	4,714,977		CLASS 381		
90.4	4,714,173		4,714,644	CLASS 359	111.81	4,714,978		46	4,715,065	
	4,714,174		4,714,645	CLASS 360	111.81	4,714,979		CLASS 383		
216	4,714,175		4,714,646	CLASS 361	111.81	4,714,980		117	4,714,353	
	4,714,176		4,714,647	CLASS 362	111.81	4,714,981		CLASS 384		
51	4,714,177		4,714,648	CLASS 363	111.81	4,714,982		38	4,714,354	
58	4,714,178		4,714,649	CLASS 364	111.81	4,714,983		193	4,714,355	
107	4,714,179		4,714,650	CLASS 365	111.81	4,714,984		275	4,714,356	
148	4,714,180		4,714,651	CLASS 366	111.81	4,714,985		312	4,714,357	
456	4,714,181		4,714,652	CLASS 367	111.81	4,714,986		470	4,714,358	
480	4,714,182		4,714,653	CLASS 368	111.81	4,714,987		571	4,714,359	
	4,714,183		4,714,654	CLASS 369	111.81	4,714,988		620	4,714,360	
CLASS 223	4,714,184		4,714,655	CLASS 370	111.81	4,714,989		CLASS 400		
46	4,714,185		4,714,656	CLASS 371	111.81	4,714,990		144.2	4,714,361	
91	4,714,186		4,714,657	CLASS 372	111.81	4,714,991		322	4,714,362	
	4,714,187		4,714,658	CLASS 373	111.81	4,714,992		639.1	4,714,363	
CLASS 224	4,714,188		4,714,659	CLASS 374	111.81	4,714,993		CLASS 401		
253	4,714,189		4,714,660	CLASS 375	111.81	4,714,994		65	4,714,365	
	4,714,190		4,714,661	CLASS 376	111.81	4,714,995		CLASS 402		
CLASS 226	4,714,191		4,714,662	CLASS 377	111.81	4,714,996		13	4,714,366	
74	4,714,192		4,714,663	CLASS 378	111.81	4,714,997		CLASS 403		
	4,714,193		4,714,664	CLASS 379	111.81	4,714,998		104	4,714,367	
CLASS 227	4,714,194		4,714,665	CLASS 380	111.81	4,714,999		132	4,714,368	
19	4,714,195		4,714,666	CLASS 381	111.81	4,715,000		190	4,714,369	
146	4,714,196		4,714,667	CLASS 382	111.81	4,715,001		217	4,714,370	
	4,714,197		4,714,668	CLASS 383	111.81	4,715,002		355	4,714,371	
CLASS 228	4,714,198		4,714,669	CLASS 384	111.81	4,715,003		400	4,714,372	
120	4,714,199		4,714,670	CLASS 385	111.81	4,715,004				
122	4,714,200		4,714,671	CLASS 386	111.81	4,715,005				
	4,714,201		4,714,672	CLASS 387	111.81	4,715,006				
CLASS 229	4,714,202		4,714,673	CLASS 388	111.81	4,715,007				
1.5 B	4,714,203		4,714,674	CLASS 389	111.81	4,715,008				
121	4,714,204		4,714,675	CLASS 390	111.81	4,715,009				
	4,714,205		4,714,676	CLASS 391	111.81	4,715,010				
CLASS 232	4,714,206		4,714,677	CLASS 392	111.81	4,715,011				
17	4,714,207		4,714,678	CLASS 393	111.81	4,715,012				
	4,714,208		4,714,679	CLASS 394	111.81	4,715,013				
	4,714,209		4,714,680	CLASS 395	111.81	4,715,014				
	4,714,210		4,714,681	CLASS 396	111.81	4,715,015				
	4,714,211		4,714,682	CLASS 397	111.81	4,715,016				
	4,714,212		4,714,683	CLASS 398	111.81	4,715,017				
	4,714,213		4,714,684	CLASS 399	111.81	4,715,018				
	4,714,214		4,714,685	CLASS 400	111.81	4,715,019				
	4,714,215		4,714,686	CLASS 401	111.81	4,715,020				
	4,714,216		4,714,687	CLASS 402	111.81	4,715,021				
	4,714,217		4,714,688	CLASS 403	111.81	4,715,022				
	4,714,218		4,714,689	CLASS 404	111.81	4,715,023	</			

CLASSIFICATION OF DESIGNS

D2— 313 293,270	16 293,292	D12— 6 293,308	32 293,326	158 293,347	277 293,363
314.1 293,277	70 293,293	90 293,309	14 293,327	159 293,348	289 293,364
320 293,271	77 293,294	169 293,311	20 293,332	166 293,350	366 293,366
293,272	79 293,289	186 293,312	22 293,334	293,351	2 293,369
293,273	102 293,295	27 293,313	27 293,335	293,352	3 293,370
293,274	416 293,365	40 293,314	64 293,336	185 293,353	5 293,371
293,275	30 293,296	6 293,316	65 293,337	196 293,354	10 293,372
321 293,276	373 293,281	52 293,317	67 293,338	218 293,355	17 293,373
602 293,278	293,297	58 293,319	10 293,339	238 293,356	34 293,374
D3— 35 293,279	D8— 322 293,298	60 293,321	D20— 78 293,329	293,357	39 293,375
62 293,287	446 293,299	62 293,318	D21— 81 293,340	134 293,358	56 293,376
D4— 104 293,288	D10— 32 293,300	71 293,322	108 293,341	147 293,359	59 293,377
D6— 314 293,280	62 293,301	84 293,315	139 293,342	202 293,360	64 293,379
368 293,282	D11— 3 293,302	102 293,328	148 293,343	207 293,367	23 293,380
381 293,283	293,303	78 293,323	150 293,344	293,368	41 293,381
425 293,284	164 293,304	199 293,324	231 293,361	D26— 23 293,382	37 293,383
491 293,285	293,305	293,325	241 293,362	D34— 29 293,384	
596 293,286	293,306				
D7— 8 293,290	293,307				
9 293,291					

CLASSIFICATION OF PLANTS

P.— 68 6,063	6,064	6,065	6,066	74 6,067
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GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

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Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
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Delaware	10	Montana	30	Vermont	50
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Georgia	13	New Hampshire	33	Washington	53
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,714,035	4,714,604	4,714,586	4,714,078	20 : 4,714,975	4,714,861
02 : 4,713,867	4,714,655	4,714,624	4,714,098		4,714,865
04 : 4,713,943	4,714,674	4,714,761	4,714,138	4,714,221	4,714,867
4,714,060	4,714,686	4,714,807	4,714,164	4,714,225	4,714,890
4,714,452	4,714,770	4,714,815	4,714,175	4,714,265	4,714,894
4,714,473	4,714,811	4,714,820	4,714,206	4,714,273	4,715,027
4,714,513	4,714,839	4,714,853	4,714,242	4,714,928	4,715,028
4,714,810	4,714,860	4,714,934	4,714,244	4,714,496	4,715,036
4,714,903	4,714,866	4,715,045	4,714,249	4,714,558	4,713,858
4,714,983	4,714,877	4,715,062	4,714,263	4,714,646	4,713,877
4,715,001	4,714,889	4,714,210	4,714,275	4,713,905	4,713,902
06 : 4,713,870	4,714,901	4,714,509	4,714,405	4,713,937	4,713,915
4,713,924	4,714,929	4,714,537	4,714,435	4,714,116	4,713,927
4,713,953	4,714,937	4,714,478	4,714,478	4,714,174	4,713,970
4,713,956	4,714,956	4,714,334	4,714,482	4,714,224	4,713,975
4,713,960	4,714,958	4,713,861	4,714,512	4,714,233	4,714,005
4,713,997	4,714,967	4,713,899	4,714,538	4,714,382	4,714,006
4,713,998	4,714,992	4,713,908	4,714,539	4,714,523	4,714,043
4,714,008	4,714,995	4,713,911	4,714,540	4,714,665	4,714,046
4,714,010	4,714,996	4,713,916	4,714,576	4,714,691	4,714,100
4,714,012	4,715,008	4,713,929	4,714,595	4,714,722	4,714,144
4,714,027	4,715,022	4,714,011	4,714,638	4,714,749	4,714,169
4,714,031	4,715,029	4,714,042	4,714,660	4,714,759	4,714,179
4,714,032	4,715,039	4,714,054	4,714,661	4,714,842	4,714,199
4,714,066	4,715,040	4,714,107	4,714,692	4,713,990	4,714,220
4,714,111	4,715,059	4,714,173	4,714,693	4,713,991	4,714,262
4,714,112	4,555,957	4,714,197	4,714,783	4,714,088	4,714,270
4,714,133	08 : 4,713,860	4,714,255	4,714,796	4,714,180	4,714,413
4,714,140	4,713,901	4,714,288	4,714,886	4,714,247	4,714,437
4,714,170	4,714,178	4,714,377	4,714,916	4,714,290	4,714,529
4,714,184	4,714,248	4,714,428	4,714,923	4,714,294	4,714,550
4,714,217	4,714,614	4,714,439	4,714,979	4,714,339	4,714,557
4,714,219	4,714,876	4,714,458	4,715,063	4,714,440	4,714,697
4,714,305	4,714,891	4,714,459	4,714,163	4,714,443	4,714,703
4,714,310	4,714,946	4,714,469	4,714,251	4,714,554	4,714,729
4,714,312	09 : 4,713,843	4,714,717	4,714,304	4,714,680	4,714,743
4,714,313	4,713,855	4,715,005	4,714,470	4,714,905	4,714,744
4,714,324	4,713,885	4,715,061	4,714,657	4,714,962	4,714,745
4,714,371	4,714,084	4,713,935	4,714,685	4,715,030	4,714,752
4,714,372	4,714,087	4,714,072	4,714,704	4,713,930	4,714,752
4,714,375	4,714,101	4,714,340	4,714,737	4,714,122	4,714,762
4,714,386	4,714,160	4,714,647	4,714,753	4,714,152	4,714,771
4,714,446	4,714,187	4,714,658	4,714,754	4,714,157	4,714,798
4,714,491	4,714,190	4,714,369	4,714,755	4,714,314	4,714,809
4,714,508	4,714,192	4,714,616	4,714,874	4,714,316	4,714,817
4,714,514	4,714,202	4,713,854	4,714,904	4,714,366	4,714,836
4,714,515	4,714,203	4,713,925	4,713,869	4,713,869	4,714,919
4,714,517	4,714,218	4,713,926	4,713,873	4,713,873	4,715,011
4,714,520	4,714,252	4,713,928	4,713,881	4,713,881	4,715,012
4,714,535	4,714,344	4,713,982	4,713,936	4,713,936	4,715,031
4,714,536	4,714,350	4,714,033	4,714,033	4,714,641	4,715,047
4,714,545	4,714,493	4,714,051	4,714,158	4,714,726	4,713,889
4,714,546	4,714,534	4,714,053	4,714,808	4,714,730	4,713,898

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,713,907	4,714,779	4,714,526	4,714,561	4,714,584	4,714,840
4,714,020	4,714,781	4,714,556	4,714,562	4,714,603	4,714,843
4,714,069	4,714,787	4,714,585	4,714,563	4,714,623	4,714,881
4,714,121	4,714,788	4,714,615	4,714,564	4,714,632	4,714,899
4,714,130	4,714,857	4,714,687	4,714,567	4,714,707	4,714,918
4,714,161	4,714,871	4,714,712	4,714,587	4,714,731	4,714,949
4,714,256	4,714,911	4,714,724	4,714,606	4,714,738	4,714,953
4,714,463	4,714,984	4,714,760	4,714,630	4,714,739	4,715,013
4,714,644	4,715,044	4,714,763	4,714,637	4,714,777	4,715,014
4,714,656	4,715,051	4,714,780	4,714,662	4,714,778	4,715,018
4,714,727	4,713,976	4,714,799	4,714,676	4,714,801	4,715,019
4,714,776	4,714,125	4,714,802	4,714,677	4,714,826	4,715,020
4,714,812	4,714,663	4,714,831	4,714,695	4,714,926	4,715,021
4,714,838	4,714,848	4,714,847	4,714,696	4,714,981	4,715,023
4,714,924	4,715,038	4,714,893	4,714,716	4,715,049	4,715,052
29 : 4,714,269	4,713,845	4,714,912	4,714,741	4,715,053	4,713,851
4,714,989	4,713,865	4,714,913	4,714,742	4,714,185	4,713,852
31 : 4,714,071	4,713,878	4,714,939	4,714,772	4,713,874	4,714,151
32 : 4,714,092	4,713,900	4,714,959	4,714,785	4,714,096	4,714,376
33 : 4,714,575	4,713,906	4,714,963	4,714,803	4,714,679	4,714,381
4,714,909	4,713,909	4,714,969	4,715,042	4,713,973	4,714,419
4,714,936	4,713,913	4,714,978	4,713,859	4,714,208	4,714,837
34 : 4,713,846	4,713,967	4,714,982	4,714,070	4,714,353	4,713,920
4,713,848	4,713,993	4,714,987	4,714,322	4,714,581	4,713,931
4,713,868	4,713,999	4,714,993	4,714,578	4,714,640	4,714,030
4,713,890	4,714,016	4,714,994	4,714,013	4,714,642	4,714,234
4,713,894	4,714,038	4,715,000	4,714,124	4,713,884	4,714,282
4,713,918	4,714,075	4,715,055	4,714,194	4,714,474	4,715,046
4,713,947	4,714,081	4,713,888	4,714,201	4,714,477	4,713,856
4,713,995	4,713,963	4,714,143	4,713,999	4,713,897	4,713,957
4,714,037	4,714,165	4,714,082	4,714,872	4,713,939	4,714,118
4,714,091	4,714,167	4,714,186	4,714,896	4,713,968	4,714,172
4,714,109	4,714,182	4,714,317	4,713,844	4,714,009	4,714,226
4,714,135	4,714,198	4,714,410	4,713,893	4,714,080	4,714,436
4,714,142	4,714,234	4,714,444	4,713,919	4,714,110	4,714,683
4,714,156	4,714,239	4,714,464	4,713,949	4,714,114	4,714,914
4,714,243	4,714,241	4,714,619	4,713,952	4,714,115	4,714,960
4,714,421	4,714,276	4,714,682	4,713,974	4,714,117	4,715,034
4,714,461	4,714,297	4,714,701	4,714,003	4,714,119	4,713,891
4,714,472	4,714,335	4,713,863	4,714,049	4,714,120	4,714,188
4,714,476	4,714,385	4,713,954	4,714,077	4,714,131	4,714,293
4,714,524	4,714,400	4,713,958	4,714,097	4,714,162	4,714,756
4,714,542	4,714,414	4,713,983	4,714,103	4,714,196	4,715,060
4,714,547	4,714,422	4,714,113	4,714,108	4,714,238	4,713,853
4,714,559	4,714,547	4,714,166	4,714,228	4,714,362	4,713,880
4,714,571	4,714,432	4,714,181	4,714,281	4,714,379	4,713,903
4,714,600	4,714,434	4,714,191	4,714,289	4,714,460	4,713,922
4,714,601	4,714,450	4,714,235	4,714,360	4,714,519	4,713,923
4,714,605	4,714,454	4,714,237	4,714,441	4,714,530	4,714,014
4,714,610	4,714,455	4,714,250	4,714,487	4,714,609	4,714,067
4,714,620	4,714,457	4,714,283	4,714,489	4,714,681	4,714,227
4,714,670	4,714,468	4,714,373	4,714,492	4,714,715	4,714,357
4,714,694	4,714,485	4,714,388	4,714,494	4,714,728	4,714,631
4,714,705	4,714,488	4,714,431	4,714,498	4,714,735	4,714,884
4,714,711	4,714,504	4,714,433	4,714,499	4,714,736	4,714,917
4,714,714	4,714,516	4,714,483	4,714,541	4,714,750	4,714,977
4,714,757	4,714,525	4,714,510	4,714,583	4,714,773	4,714,985

DESIGN PATENTS

01 : 293,355	12 : 293,373	19 : 293,376	29 : 293,362	36 : 293,316	42 : 293,371
06 : 293,278	13 : 293,361	20 : 293,360	29 : 293,282	36 : 293,326	42 : 293,365
293,286	13 : 293,380	20 : 293,383	29 : 293,367	36 : 293,327	47 : 293,323
293,289	17 : 293,381	23 : 293,378	33 : 293,309	37 : 293,301	48 : 293,331
293,290	17 : 293,281	23 : 293,377	33 : 293,357	39 : 293,280	293,332
293,320	293,299	24 : 293,368	34 : 293,321	293,296	293,349
293,328	293,304	25 : 293,271	293,333	293,366	293,353
293,335	293,305	293,274	293,351	293,369	293,354
293,337	293,306	293,275	293,352	293,376	293,372
293,338	293,307	293,284	293,375	293,375	293,392
293,339	293,308	26 : 293,310	36 : 293,288	293,297	51 : 293,372
293,340	293,319	293,350	293,292	293,330	53 : 293,363
293,356	293,334	293,384	293,313	293,343	293,364
293,370	293,359	27 : 293,312	293,314	293,358	293,279
					293,295

PLANT PATENTS

06 : 6,063	6,064	6,065	6,066		
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December 29, 1987



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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987, and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date where Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching	

1085 OG 44

Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

Nov. 17, 1987.
DONALD J. QUIGG,
Assistant Secretary and
Commissioner of Patents
and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of Nov. 30, 1987.

Chemical Discipline	Jan. 22, 1987
Mechanical Discipline	June 13, 1985
Electrical Discipline	Mar. 27, 1986

DECEMBER 29, 1987

U.S. PATENT AND TRADEMARK OFFICE

1085 OG 45

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of Nov. 30, 1987.

Chemical	July 19, 1985
Electrical	May 2, 1985
Mechanical	June 2, 1985

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of Nov. 1987.

Affirmed	225
Affirmed-in-Part	36
Reversed	141
Total Decided	402

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on December 25, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,489,443 through 4,490,854
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . \$ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (\$1.9(f)) . . . \$ 225.00
By other than a small entity . . . \$ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . \$ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (\$1.9(f)) . . . \$ 55.00
By other than a small entity . . . \$ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . \$ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 12, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,408,362	06/394,705	10/11/83
4,408,363	06/255,458	10/11/83
4,408,364	06/359,942	10/11/83
4,408,368	06/282,968	10/11/83
4,408,371	06/295,731	10/11/83
4,408,378	06/265,813	10/11/83
4,408,381	06/284,967	10/11/83
4,408,391	06/233,983	10/11/83
4,408,403	06/289,171	10/11/83
4,408,405	06/250,471	10/11/83
4,408,406	06/303,919	10/11/83
4,408,408	06/282,095	10/11/83
4,408,411	06/265,727	10/11/83
4,408,412	06/284,608	10/11/83
4,408,414	06/369,633	10/11/83
4,408,421	06/259,483	10/11/83
4,408,425	06/291,792	10/11/83
4,408,426	06/289,277	10/11/83
4,408,429	06/310,434	10/11/83
4,408,434	06/223,061	10/11/83
4,408,436	06/266,511	10/11/83
4,408,441	06/343,212	10/11/83
4,408,486	06/349,378	10/11/83
4,408,469	06/328,152	10/11/83
4,408,473	06/319,684	10/11/83
4,408,475	06/230,335	10/11/83
4,408,477	06/406,529	10/11/83
4,408,488	06/365,845	10/11/83
4,408,501	06/265,746	10/11/83
4,408,506	06/253,706	10/11/83
4,408,509	06/325,390	10/11/83
4,408,513	06/360,181	10/11/83
4,408,515	06/282,545	10/11/83
4,408,533	06/286,820	10/11/83
4,408,537	06/283,333	10/11/83
4,408,546	06/224,488	10/11/83
4,408,549	06/267,883	10/11/83
4,408,550	06/328,202	10/11/83
4,408,555	06/274,365	10/11/83
4,408,556	06/230,993	10/11/83

Patent Number	Serial Number	Issue Date	4,408,992	06/381,319	10/11/83
			4,408,993	06/350,984	10/11/83
			4,408,996	06/310,416	10/11/83
4,408,567	06/231,059	10/11/83	4,408,997	06/316,704	10/11/83
4,408,571	06/388,839	10/11/83	4,409,001	06/338,197	10/11/83
4,408,573	06/310,208	10/11/83	4,409,021	06/375,492	10/11/83
4,408,575	06/278,511	10/11/83	4,409,036	06/219,574	10/11/83
4,408,586	06/274,188	10/11/83	4,409,052	06/257,407	10/11/83
4,408,587	06/236,384	10/11/83	4,409,075	06/283,374	10/11/83
4,408,601	06/251,872	10/11/83	4,409,081	06/346,263	10/11/83
4,408,615	06/239,469	10/11/83	4,409,096	06/273,521	10/11/83
4,408,623	06/277,966	10/11/83	4,409,104	06/249,164	10/11/83
4,408,633	06/249,501	10/11/83	4,409,105	06/323,338	10/11/83
4,408,635	06/317,185	10/11/83	4,409,112	06/333,968	10/11/83
4,408,639	06/220,235	10/11/83	4,409,121	06/392,869	10/11/83
4,408,646	06/317,559	10/11/83	4,409,137	06/247,446	10/11/83
4,408,653	06/319,515	10/11/83	4,409,161	06/321,152	10/11/83
4,408,656	06/299,296	10/11/83	4,409,166	06/250,233	10/11/83
4,408,666	06/315,744	10/11/83	4,409,174	06/334,099	10/11/83
4,408,670	06/257,366	10/11/83	4,409,184	06/348,746	10/11/83
4,408,679	06/306,190	10/11/83	4,409,198	06/405,009	10/11/83
4,408,680	06/241,250	10/11/83	4,409,207	06/262,119	10/11/83
4,408,682	06/272,182	10/11/83	4,409,211	06/356,531	10/11/83
4,408,688	06/320,686	10/11/83	4,409,220	06/297,024	10/11/83
4,408,693	06/306,504	10/11/83	4,409,224	06/282,575	10/11/83
4,408,696	06/261,492	10/11/83	4,409,225	06/243,762	10/11/83
4,408,716	06/353,407	10/11/83	4,409,234	06/384,861	10/11/83
4,408,719	06/274,411	10/11/83	4,409,247	06/269,945	10/11/83
4,408,737	06/280,280	10/11/83	4,409,269	06/357,384	10/11/83
4,408,738	06/303,788	10/11/83	4,409,306	06/355,018	10/11/83
4,408,757	06/343,686	10/11/83	4,409,372	06/340,914	10/11/83
4,408,761	06/298,733	10/11/83	4,409,375	06/347,965	10/11/83
4,408,762	06/273,246	10/11/83	4,409,400	06/370,393	10/11/83
4,408,763	06/350,617	10/11/83	4,409,419	06/290,655	10/11/83
4,408,764	06/236,257	10/11/83	4,409,421	06/385,225	10/11/83
4,408,768	06/327,608	10/11/83	4,409,428	06/382,596	10/11/83
4,408,774	06/264,060	10/11/83	4,409,429	06/389,683	10/11/83
4,408,779	06/237,087	10/11/83	4,404,439	06/257,362	10/11/83
4,408,785	06/277,041	10/11/83	4,409,468	06/317,147	10/11/83
4,408,792	06/245,397	10/11/83	4,409,482	06/251,863	10/11/83
4,408,799	06/277,416	10/11/83	4,409,485	06/308,740	10/11/83
4,408,805	06/268,006	10/11/83	4,409,487	06/267,562	10/11/83
4,408,829	06/229,823	10/11/83	4,409,490	06/288,766	10/11/83
4,408,830	06/239,717	10/11/83	4,409,491	06/453,619	10/11/83
4,408,846	06/230,905	10/11/83	4,409,510	06/434,355	10/11/83
4,408,849	06/443,431	10/11/83	4,409,513	06/308,841	10/11/83
4,408,886	06/349,491	10/11/83	4,409,516	06/227,224	10/11/83
4,408,899	06/285,799	10/11/83	4,409,544	06/256,782	10/11/83
4,408,906	06/329,833	10/11/83	4,409,545	06/233,426	10/11/83
4,408,912	06/219,904	10/11/83	4,409,549	06/226,638	10/11/83
4,408,923	06/241,928	10/11/83	4,409,550	06/264,100	10/11/83
4,408,928	06/245,900	10/11/83	4,409,587	06/343,031	10/11/83
4,408,940	06/300,011	10/11/83	4,409,588	06/242,347	10/11/83
4,408,949	06/407,125	10/11/83	4,409,590	06/305,867	10/11/83
4,408,950	06/379,168	10/11/83	4,409,591	06/265,371	10/11/83
4,408,956	06/325,545	10/11/83	4,409,608	06/258,345	10/11/83
4,408,958	06/219,467	10/11/83	4,409,612	06/303,308	10/11/83
4,408,967	06/238,287	10/11/83	4,409,637	06/441,765	10/11/83
4,408,973	06/378,070	10/11/83	4,409,641	06/262,914	10/11/83
4,408,974	06/340,865	10/11/83	4,409,644	06/272,987	10/11/83
4,408,987	06/340,977	10/11/83	4,409,646	06/224,798	10/11/83
4,408,988	06/416,484	10/11/83	4,409,647	06/243,125	10/11/83
4,408,990	06/372,080	10/11/83	4,409,684	06/289,102	10/11/83

Notification of Acceptance of Delayed Payment of Maintenance Fee
(35 U.S.C. 41(c); 37 CFR 1.378)

The patents listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 4 1(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,370,355	06/291,866	1/25/83	8/10/81	11/10/87
4,396,451	06/329,353	8/02/83	12/09/81	11/23/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,044,805, Re. S.N. 117,324, Filed Nov. 6, 1987, Cl. 144/134D, ROUTER GUIDE UNIT, Donald D. Gronholz, Owner of Record: *Marlene J. Gronholz, Bloomington, Minn.*, Attorney or Agent: Richard O. Bartz, Ex. Gp.: 321

4,223,396, Re. S.N. 116,260, Filed Nov. 3, 1987, Cl. 365/194, DELAYED LINE FOR SENSE AMPLIFIER PULSE, Hiroyuki Kinoshita, Owner of Record: *Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan*, Attorney or Agent: Donald W. Banner, et al., Ex. Gp.: 233

4,234,101, Re. S.N. 117,611, Filed Nov. 6, 1987, Cl. 221/241, CUP DISPENSER EMPLOYING UNIVERSAL ADJUSTMENT APPARATUS, Ronald Patore, Owner of Record: *James River Norwalk, Inc., Norwalk, Conn.*, Attorney or Agent: Douglas E. Henderson, et al., Ex. Gp.: 311

4,487,801, Re. S.N. 117,804, Filed Nov. 6, 1987, Cl. 428/313.5, FRAGRANCE-RELEASING PULL-APART SHEET, Everett M. Turnbull, et al., Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Donald M. Sell, et al., Ex. Gp.: 154

4,538,811, Re. S.N. 099,163, Filed Aug. 25, 1987, Cl. 273/31, ARBITRATION OF TENNIS BY CHANGE OF COLORS, Luis T. Wigoda, Owner of Record: *Inventor*, Attorney or Agent: Harry W. Barron, Ex. Gp.: 334

4,540,568, Re. S.N. 116,579, Filed Aug. 24, 1987, Cl. 424/81, INJECTIONABLE VISCOELASTIC OPTHALMIC GEL, Seymour F. Trager, et al., Owner of Record: *Inventor*, Attorney or Agent: Harold C. Wegner, et al., Ex. Gp.: 125

4,542,811, Re. S.N. 098,041, Filed Sept. 17, 1987, Cl. 188/322.17, SHOCK ABSORBER, Takeshi Miura, Owner of Record: *Nok Corp., Tokyo, Japan*, Attorney or Agent: Owen E. Perry, Ex. Gp.: 314

4,582,199, Re. S.N. 117,192, Filed Nov. 4, 1987, Cl. 206/428, CARTON AND BLANK THEREFOR, Richard L. Schuster, Owner of Record: *Manville Sales Corp., Ken-Caryl Ranch, Colo.*, Attorney or Agent: Ernie L. Brooks, et al., Ex. Gp.: 241

4,652,695, Re. S.N. 095,874, Filed Sept. 14, 1987, Cl. 174/035.0GC, MESH-COVERED CORE STRIP FOR HIGH FREQUENCY RFI/EMI RADIATION SHIELDING, Robert B. Busby, Owner of Record: *Pawling Corp., Pawling, N.Y.*, Attorney or Agent: Fritz Z. Schweitzer, Jr., Ex. Gp.: 215

4,663,719, Re. S.N. 117,053, Filed Nov. 5, 1987, Cl. 364/444, METHOD AND APPARATUS FOR DISPLAY OF DISTANCE AND DIRECTION TO DESTINATION, Muneaki Matsumoto, et al., Owner of Record: *Nippon Soken, Inc., Aichi-Ken, Japan*, Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 234

4,669,622, Re. S.N. 117,975, Filed Nov. 9, 1987, Cl. 215/237, PLASTIC ENCLOSURE FOR CONTAINER EMPLOYING THREE LIVING HINGES, Robert H. Bennett, Owner of Record: *Anchor Hocking Corp., Lancaster, Ohio*, Attorney or Agent: Alexander C. Wilkie, Jr., Ex. Gp.: 241

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for re-examination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,052,353 Reexam. No. 09/001,380, Requested: Nov. 18, 1987, Cl. 524/801, DISPERSIONS OF WATER SOLUBLE POLYMERS IN OIL, Clyde S. Scanley, Owner of Record: *Inventor, Morristown, N.J.*, Attorney or Agent: Unknown, Ex. Gp.: 150, Requester: Owner

4,194,650, Reexam. No. 90/001,377, Requested: Nov. 16, 1987, Cl. 222/57, LIQUID MIXING AND AERATING SYSTEM, James Nottke, et al., Owner of Record: *Lykes Pasco Packing Co., Dispenser Mfg Div., Clearwater, Fla.*, Attorney or Agent: Frijouf, Rust, et al., Ex. Gp.: 310, Requester: Lancer Corp., San Antonio, Tex.

4,338,199, Reexam. No. 90/001,378, Requested: Nov. 16, 1987, Cl. 210/721, PROCESSING METHODS FOR THE OXIDATION OF ORGANICS IN SUPERCRITICAL WATER, Michael Modell, Owner of Record: *Modar Inc., Houston, Tex.*, Attorney or Agent: Lester L. Hewitt, Ex. Gp.: 130, Requester: Owner

4,575,312, Reexam. No. 90/001,382, Requested: Nov. 20, 1987, Cl. 416/179, IMPELLER, Magnus Erikson, Owner of Record: *ITT Industries, Inc., New York, N.Y.*, Attorney or Agent: John T. O'Halloran, Ex. Gp.: 341, Requester: Unknown

4,601,783, Reexam. No. 90/001,381, Requested: Nov. 20, 1987, Cl. 156/655, HIGH CONCENTRATION SODIUM PERMANGANATE ETCH BATH AND ITS USE IN DESMEARING AND/OR ETCHING PRINTED CIRCUIT BOARD, Gerald Krulik, Owner of Record: *Morton Thiokol Inc., Chicago, Ill.*, Attorney or Agent: Richard Sheridan, Ex. Gp.: 130, Requester: Owner

4,603,149, Reexam. No. 90/001,376, Requested: Nov. 10, 1987, Cl. 521/57, ANTI-STATIC STYRENE POLYMER PARTICLES BY COATING, Haven S. Kesling, et al., Owner of Record: *Arco Chemical Co., Newtown Square, Pa.*, Attorney or Agent: John C. Martin, Ex. Gp.: 150, Requester: Owner

4,624,068, Reexam. No. 90/001,379, Requested: Nov. 18, 1987, Cl. 43/6, SPEARPOINT ASSEMBLY, Harland V. Howard, III, Owner of Record: *Panama Breakaway Inc., Bethel Park, Pa.*, Attorney or Agent: Warren E. Olsen, Ex. Gp.: 320, Requester: The A. B. Biller Co., Bloomington, Ill.

Department of the Treasury
United States Customs Service
(T.D. 87-138)

Recordation of Trade Name: "BROWNING"

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Recordation

Summary: On Aug. 3, 1987, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "BROWNING" was published in the Federal Register (52 FR 28773). The notice advised that before final action was taken on the application, consideration would

be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation and received not later than Oct. 2, 1987. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "BROWNING" is recorded as the trade name used by Browning, a corporation organized under the laws of the State of Utah, located at Rte. 1, Morgan, Utah 84050. The trade name is used in connection with the following merchandise manufactured in Belgium, France, England, Italy, West Germany, Portugal and Canada: hunting, camping and sporting goods equipment and accessories and sportswear including shotguns, rifles, black powder rifles, pistols, pistol cases, pistol holsters, flexible gun cases, fitted luggage cases, recoil pads, sight beads, chokes for shotguns, scope mount rings and bases, rifle slings and swivels, magazine plugs, gun oil, gun cleaners, gun safes, pocket knives, knife sharpeners, fishing and hunting knives, knife sheaths, knife honing oil, sleeping bags, coats, jackets, parkas, vests, insulated hunting suits, hoods, rain jackets, rain coats, rain pants, rain suits, rain parkas, underwear, hunting trousers, hunting vests, gloves, mittens, shooting gloves, hats, shirts, belts, belt buckles, insulated boots, waterproof boots, boot laces, boot dressings, socks, wool fleece bedding, archery bows, cross bows, archery gloves, shooting tabs, arm guards, quivers, nontelescopic bow sights and slings, bow cases, target faces, bow strings, fishing rods, rod blanks and cases, hand-pulled golf carts, golf clubs, golf bags and golf club head covers.

Date: Nov. 16, 1987.

For Further Information Contact: Beatrice E. Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5764).

JERRY C. LADERBERG,

Nov. 5, 1987.

Acting Chief, Entry,
Licensing and Restricted
Merchandise Branch.

Department of the Treasury
United States Customs Service
(T.D. 87-136)

Recordation of Trade Name : "TWO'S COMPANY"

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Recordation

Summary: On Aug. 3, 1987, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "TWO'S COMPANY" was published in the Federal Register (52 FR 28774). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation and received not later than Oct. 3, 1987. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "TWO'S COMPANY" is recorded as the trade name used by Two's Company, a corporation organized under the laws of the State of New York, located at 33 Bertel Ave., Mount Vernon, N.Y. 10550. The trade name is used in connection with the following merchandise manufactured in Japan, Hong Kong and Taiwan: acrylic and glass vases; stirrers; glass picture frames; glass products; floral accessories; commercial flowers containers; Christmas ornaments; silver and silver plated products; napkin rings and vinyl products.

Date: Nov. 9, 1987.

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301

Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

JERRY C. LADERBERG,

Nov. 3, 1987.

Acting Chief, Entry
Licensing and Restricted
Merchandise Branch.

Survey of Registered Practitioners in Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 20, 1987 from the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names begin with *E through J*. Enclosed with the letter is a data sheet which must be completed and returned to OED as soon as possible. All data sheets returned to OED will be acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with *E through J* and you have not received a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within (3) months after returning the data sheet to OED, please contact Patricia M. Jordan at (703) 557-1728.

CAMERON WEIFFENBACH,

Dec. 1, 1987.

Director, Office of
Enrollment & Discipline.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Patricia S. Abraham, Mandeville, La., Reg. No. 1,402,736, for the mark "ACAPULCO SOL RICH TANNING CREME and Design", Canc. No. 16,362.

ERMA S. BROWN,

Administrator

of the Trademark Trial
and Appeal Board.

For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

Advisory Committee for Patents and Trademarks

Notice of Open Meeting

In accordance with Section 10(a)(2) of the Federal Advisory Committee Act (Public Law 92-463), announcement is made of the following Committee Meeting:

The Advisory Committee for Patents and Trademarks will meet from 9:00 a.m. to 4:30 p.m. on Jan. 8, 1988, at the U.S. Patent and Trademark Office in Crystal City, Arlington, Va. The meeting will be held in the Commissioner's Conference Room.

The agenda for the meeting follows:

- (1) Orientation
- (2) Automation Activities

- (3) Quality Products
- (4) Innovation Promotion

The meeting will be open to public observation; approximately 12 seats will be available for the public on a first-come, first-served basis. If time permits, oral comments by the public of no more than three minutes on each topic within the above agenda will be allowed. Written comments and suggestions will be accepted before or after the meeting on any of the agenda matters.

For exact meeting location and other information, contact Donald G. Kelly, Executive Assistant to the Assistant Secretary, Patent and Trademark Office, Crystal Plaza 3, Room 11E10, Washington, D.C. 20231. Telephone: 703/557-3071.

Dec. 4, 1987.

DONALD J. QUIGG,
Assistant Secretary and

Commissioner of Patents
and Trademarks.

Status of PTO Services

The following is an update of the status of PTO services for November 1987:

Service Item	FY 1987 Goal (Calendar Days*)	Monthly Average (Calendar Days*)
Filing Receipts:		
Patents	22	25
Trademarks	30	45**
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	19 Hours
Window Coupons	5	3
Mail Coupons	12	8
Letter Orders	16	13
Certified Copies:		
Trademark Registrations	21	21
Applications-As-Filed	17	18***
File-Wrapper/Contents	N/A	28
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	34
Filing Reg. Certificates	Issue Date	Issue Date
Assignments:		
Recording Patent Assignments	20	40 ****
Receipt Date of Patent Documents Returned		Oct. 20, 1987
Recording Trademark Assignments	20	20
Receipt Date of Trademark Documents Returned		Nov. 6, 1987
Avg. Days from Issue Fee Payment to Issue Date	90-100	88
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	95% on Issue Date	92% on Issue Date*****
Trademark Copies Available	95% on Issue Date	99% on Issue Date

* Unless otherwise noted.

** Monthly average reduced by 19 days since last month.

*** The 5% of orders for which fiche are not on site are not included in calculations.

**** While reducing monthly average processing time by 6 days, continual staff recruiting problems have prevented us from getting back to goal levels.

***** Printer delivered copies late.

IMPROVEMENTS TO SERVICES

- *Special Mail Boxes* — As suggested by a patent attorney, special mail boxes are now being published regularly in each Official Gazette.
- *New Equipment* — The Office has upgraded two reader/printers located in the Trademark Archive Room (CP2-3 C24). The old 3M "500" reader/printers have been replaced with new plain paper Minolta "505" reader/printers. These new machines will provide quicker and higher quality copies for the public users.
- *Expanded Public Search Room Files* — As suggested by a public user, we have installed new steel cases in the north and south stack areas. These will provide us with space to store approximately 200,000 patents.

Dec. 4, 1987

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 29, 1987

4,515,149	4,652,354	4,676,753	4,686,408
4,522,905	4,652,572	4,677,246	4,686,525
4,549,978	4,653,297	4,677,262	4,686,577
4,566,876	4,653,386	4,677,609	4,686,642
4,574,366	4,654,449	4,678,766	4,686,759
4,581,165	4,658,322	4,678,782	4,686,834
4,582,915	4,659,844	4,679,268	4,686,912
4,585,198	4,660,610	4,680,696	4,686,913
4,603,330	4,661,431	4,680,978	4,687,015
4,605,001	4,661,879	4,681,560	4,687,685
4,612,238	4,662,312	4,681,580	4,688,023
4,615,978	4,663,103	4,682,393	4,688,099
4,616,423	4,663,405	4,682,475	4,688,100
4,616,760	4,663,869	4,682,839	4,688,129
4,618,456	4,667,995	4,683,439	4,688,364
4,629,287	4,669,123	4,683,854	4,688,543
4,635,913	4,669,280	4,684,018	4,688,999
4,636,387	4,671,662	4,684,202	4,689,078
4,637,464	4,672,265	4,684,321	4,689,097
4,638,631	4,672,287	4,684,487	4,689,358
4,638,803	4,673,275	4,684,678	4,689,935
4,642,649	4,674,334	4,684,935	4,690,656
4,644,085	4,674,967	4,685,181	4,693,309
4,645,538	4,675,078	4,685,270	4,693,594
4,645,904	4,675,188	4,685,499	4,693,671
4,647,308	4,675,243	4,685,598	4,693,814
4,647,319	4,675,330	4,685,708	4,694,075
4,647,498	4,675,609	4,685,777	4,694,650
4,649,518	4,675,755	4,685,779	
4,650,506	4,676,307	4,686,118	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box	
	Commissioner of Patents and Trademarks Washington, D.C. 20231
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks (e.g. amendments to applications and request for extensions of time to file an opposition). Mail directed to the Trademark Trial and Appeal Board should have "Attention TTAB" on the envelope in addition to "Box 5".
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and any subsequently filed papers for those applications.
Box 8	All papers for the Office of the Solicitor.
Box 9	Coupon orders for the U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box AF	Amendments or responses to final rejections in patent applications, submitted under the expedited processing program.
Box FWC	Mail related to File Wrapper and Continuations.
Box Interference	Communications relating to interferences and applications and patents involved in interferences.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination application.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
	Denver Public Library	(303) 571-2347
Colorado	New Haven: Science Park Library	(203) 786-5447
Connecticut	Newark: University of Delaware Library	(302) 451-2965
Delaware	Washington: Howard University Libraries	(202) 636-5060
Dist. of Columbia	Fort Lauderdale: Broward County Main Library	(305) 357-7444
Florida	Miami-Dade Public Library	(305) 375-2665
	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Georgia	Moscow: University of Idaho Library	(208) 885-6235
Idaho	Chicago Public Library	(312) 269-2865
Illinois	Springfield: Illinois State Library	(217) 782-5430
	Indianapolis-Marion County Public Library	(317) 269-1741
Indiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Louisiana	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Maryland	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
Michigan	Detroit Public Library	(313) 833-1450
	Minneapolis Public Library & Information Center	(612) 372-6570
Minnesota	Kansas City: Linda Hall Library	(816) 363-4600
Missouri	St. Louis Public Library	(314) 241-2288 Ext. 390
	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Montana	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nebraska	Reno: University of Nevada Library	(702) 784-6579
Nevada	Durham: University of New Hampshire Library	(603) 862-1777
New Hampshire	Newark Public Library	(201) 733-7815
New Jersey	Albuquerque: University of New Mexico Library	(505) 277-5441
New Mexico	Albany: New York State Library	(518) 474-7040
New York	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
North Carolina	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
Ohio	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
	Stillwater: Oklahoma State University Library	(405) 624-6546
Oklahoma	Salem: Oregon State Library	(503) 378-4239
Oregon	Philadelphia: Free Library	(215) 686-5330
Pennsylvania	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
	Providence Public Library	(401) 521-8726
Rhode Island	Charleston: Medical University of South Carolina Library	(803) 792-2371
South Carolina	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Tennessee	Nashville: Vanderbilt University Library	(615) 322-2775
	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
Texas	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Utah	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Virginia	Seattle: Engineering Library, University of Washington	(206) 543-0740
Washington	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
Wisconsin	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 5, 1987

PATENT EXAMINING GROUPS

Actual Filing Date of Oldest
New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	9-11-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-12-86
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	5-06-86
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-02-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-06-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during December 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents Numbers 3,543,308 to 3,551,900, inclusive
Plant Patents Numbers 3,008 to 3,010 inclusive

1085 OG 54

REEXAMINATIONS

DECEMBER 29, 1987

Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

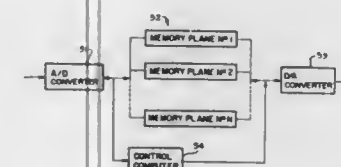
B1 4,415,980 (802nd)

AUTOMATED RADIOGRAPHIC INSPECTION SYSTEM
Robert A. Buchanan, Palo Alto, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Reexamination Request No. 90/000,968, Mar. 17, 1986.
Reexamination Certificate for Patent No. 4,415,980, issued Nov. 15, 1983, Ser. No. 239,611, Mar. 2, 1981.

Filed Mar. 17, 1986, Ser. No. 239,611
Int. Cl.⁴ G06F 15/46; H04N 5/32

U.S. Cl. 378—58



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 5-9 and 11 is confirmed.

Claims 1-4 and 10 are cancelled.

New claims 12-16 are added and determined to be patentable.

12. A system for detecting a substantial inhomogeneity in a test object, said system comprising:

- means for forming a first image of said test object by causing penetrating electromagnetic radiation from a radiation source to pass through said test object and impinge upon a detector, said detector thereby generating a first electronic signal, said first electronic signal then being digitized, said digitized first electronic signal being stored in a first memory plane as said first image;
- means for causing displacement of one relative to another of said radiation source, test object and detector after said first image has been formed;
- means for forming a second image of said test object by causing penetrating electromagnetic radiation from said radiation source to pass through said test object and impinge upon said detector after said displacement has occurred, said detector thereby generating a second electronic signal, said second electronic signal then being digitized, said digitized second electronic signal being stored in a second memory plane as said second image; and
- means for subtracting one of said first and second images from the other to produce a subtractive image in which any substantial inhomogeneity in said test object appears.

B1 4,434,157 (803rd)

METHOD OF RECOVERING CELL ANTIGEN AND PREPARATION OF FELINE LEUKEMIA VACCINE THEREFROM

Richard G. Olsen, London, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio
Reexamination Request No. 90/001,225, Apr. 20, 1987.
Reexamination Certificate for Patent No. 4,434,157, issued Feb. 28, 1984, Ser. No. 366,352, Apr. 7, 1982.

Continuation-in-part of Ser. No. 104,789, Dec. 18, 1979, Pat. No. 4,332,793. This application Apr. 20, 1987, Ser. No. 366,352

Int. Cl.⁴ A61K 39/12

U.S. Cl. 424—89

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-13 is confirmed.

1. A method for recovering virus-free, cell-free Feline leukemia associated neoantigen from cells infected with Feline Leukemia virus, which comprises:

- culturing said cells in a serum-containing growth medium;
- transferring and maintaining said cultured cells in a serum-free medium under conditions and for a time adequate to accumulate said neoantigen shed from said cells in said serum-free medium;
- separating said cultured cells from the associated serum-free medium, thereby producing a cell-free, serum-free medium;
- reducing the volume of said cell-free, serum-free medium without substantial loss of said neoantigen therefrom, thereby producing a neoantigen-rich medium; and
- inhibiting protease enzymes in said neoantigen-rich medium.

B1 4,519,853 (804th)

METHOD OF CARBURIZING WORKPIECE

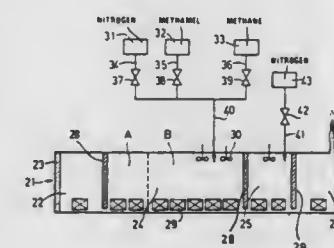
Michel Kostelitz, Versailles, and Philippe Queille, Viroflay, both of France, assignors to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procédes Georges Claude, Paris, France

Reexamination Request No. 90/000,974, Mar. 26, 1986.
Reexamination Certificate for Patent No. 4,519,853, issued May 28, 1985, Ser. No. 496,934, May 23, 1983.

Filed Mar. 26, 1986, Ser. No. 496,934

Claims priority, application France, May 28, 1982, 82 09328
Int. Cl.⁴ C23C 8/22

U.S. Cl. 148—16.5



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-13 and 15-19 is confirmed.

Claim 14 is determined to be patentable as amended.

1. A method of carburizing metal workpieces, comprising the steps of:

- loading workpieces to be carburized in a furnace;
- maintaining the workpieces in a carbon enriching atmosphere containing carbon monoxide, hydrogen and nitrogen;
- carrying out a first phase of the treatment at a first temperature from 850° to 1050° C.;
- carrying out a second phase of the treatment directly there-

after at a second temperature, lower than said first temperature, from 700° C. to 950° C.;

using an atmosphere for the first phase containing at least 1% nitrogen, from about 20% to about 50% carbon monoxide by volume and from about 40% to about 75% hydrogen by volume and having a carbon potential of from about 1.1% to about 1.6% by weight; and

increasing the amount of nitrogen in said atmosphere for carrying out the second phase from two to thirty times the amount of nitrogen in the atmosphere used for the first phase so that the carbon potential for the second phase remains significant, but is reduced at least 0.5% by weight below the carbon potential for the first phase, such that the length of the combined first and second phases is less than for a conventional carburizing treatment.

REISSUES

DECEMBER 29, 1987

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,566

BOWLER'S GLOVE AND WRIST SUPPORT

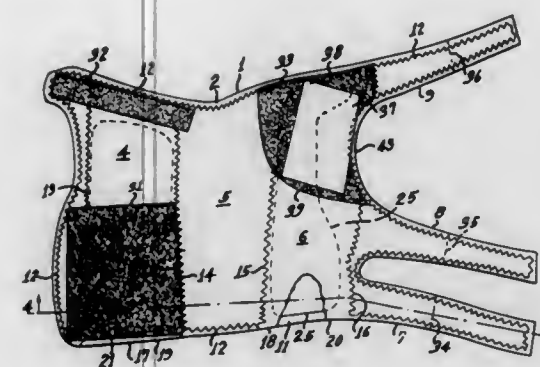
Edward E. Patton, Jr., 5080 Fremont St., Jacksonville, Fla. 32210

Original No. 4,190,906, dated Mar. 4, 1980, Ser. No. 883,223, Mar. 3, 1978. Application for reissue Aug. 2, 1984, Ser. No. 637,119

Int. Cl.⁴ A41D 19/00

U.S. Cl. 2-161 A

17 Claims



1. In a bowling glove and wrist support, a palm plate having a first end portion and a second end portion, hand-attachable means carrying said plate for disposing said plate with its said first end portion [in and bridging] *extending across the palmar arch of a wearer and terminating adjacently below the palm knuckle of the middle finger [and with its] between the head line and the heart line of the palm*, said second end portion of said plate *extending across the inner surface of the wrist spanning the wrist joint*, and a prop carried by said means in a position overlying said first end portion *for providing said prop with support by said plate*.

Re. 32,567

SKI BRAKE

Anton Emert, Oberau; Walter Knabel, Murnau, and Manfred Richert, Munich, all of Fed. Rep. of Germany, assignors to Marker International Company, Salt Lake City, Utah

Original No. 4,515,388, dated May 7, 1985, Ser. No. 407,098, Aug. 11, 1982. Application for reissue Aug. 15, 1985, Ser. No. 765,689

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131917

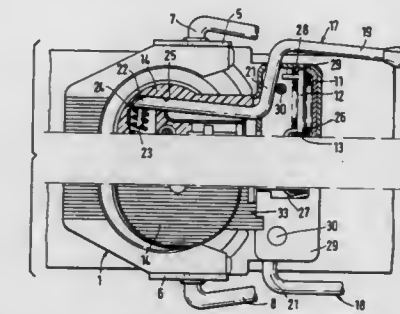
Int. Cl.⁴ A63C 7/10

U.S. Cl. 280-605

5 Claims

1. A brake for a ski, comprising:
a pair of laterally spaced wire levers, each wire lever being of predetermined diameter and comprising a pivot shaft intermediate a lower arm and an upper arm, said lever being rotatable between a braking position in which said lower arm extends below the ski and outboard from the

ski and a non-braking position in which said lower arm does not extend below the ski;
a coil spring disposed between said wire levers for biasing said lower arms outboard from the ski, said coil spring having a diameter no larger than the diameter of either of said levers;
actuating means for urging each lever into said braking position;
a generally circular pedal being rotatable about an axis perpendicular to said pedal and having a thickness about equal to the predetermined diameter of said wire levers, said pedal further having a downwardly facing recess



containing the coil spring and receiving the upper arms of each of said wire levers, said pedal receiving pressure from the sole of a ski boot, said pedal being movable by the pressure of the ski boot from a non-skiing position to a skiing position, said levers being rotated into said non-braking position when said pedal means is moved into said skiing position; and
positioning means for holding each of said lower arms in an inboard position against the bias of said coil spring when said levers are in said non-braking position, said positioning means comprising a guide surface on said pedal for engaging and urging inward said upper arms when said pedal is in said skiing position.

Re. 32,568

SCREW ROTOR MACHINE AND ROTOR PROFILE THEREFOR

Ake Astberg, Nacka, Sweden, assignor to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Original No. 4,435,139, dated Mar. 6, 1984, Ser. No. 345,230, Feb. 3, 1982. Application for reissue Feb. 25, 1986, Ser. No. 834,219

Claims priority, application United Kingdom, Feb. 6, 1981, 8103739

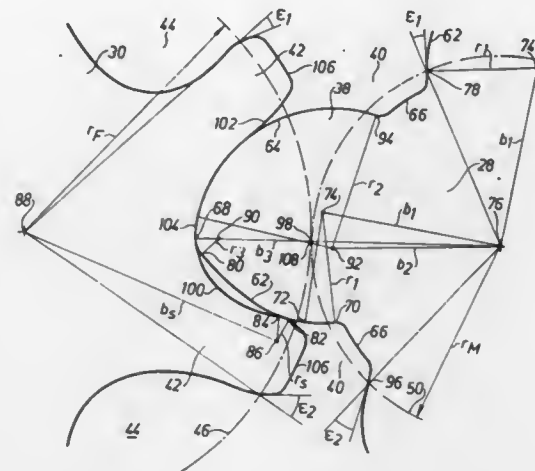
Int. Cl.⁴ F04C 18/16

U.S. Cl. 418-201

61 Claims

52. A pair of intermeshing rotors having helical lands and intervening grooves and adapted for rotation about parallel axes within a working space of a screw rotor machine, one rotor of each pair being of female rotor type formed such that at least the major portion of each land and groove is located inside the pitch circle of the rotor, the other rotor of the pair being of male rotor type formed such that at least the major portion of each land and groove is located outside the pitch circle of the rotor, the lands of one rotor following the envelopes developed by the grooves of the other rotor to form a continuous sealing line between the rotors, each rotor groove being provided with a primary flank forming the peripherally outer wall of the leg of said chamber comprised of a female rotor groove and the peripherally inner wall of the leg of said chamber comprised of a male rotor groove, respectively, and a secondary flank forming the other wall of the related leg of the

chamber, characterized in that in a plane perpendicular to the rotor axes the primary flank of each male rotor groove comprises



a first flank portion following a circular arc the radial extremes of which lie within the range 0.9 to 1.15 times the pitch radius.

PLANT PATENTS

GRANTED DECEMBER 29, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,068

ROSE PLANT INTERLADA

G. Peter IJsink, Leersum, Netherlands, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Jan. 13, 1986, Ser. No. 818,001

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—1

1 Claim

1. A new and distinct variety of rose plant of the shrub class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its unusually large, round flower clusters, low petal count, delicate pink color, long arching branches and good mildew resistance.

6,069

ROSE PLANT JACEL

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Jan. 10, 1986, Ser. No. 817,552

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—15

1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of heavy production of bright yellow buds and flowers fringed with long bearded sepals, round undulating petals and possessing very little fragrance.

6,070

ROSE PLANT JACLAM

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Jan. 10, 1986, Ser. No. 817,566

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—28

1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its very upright, vigorous growth habit, lustrous dark green foliage, attractive bright red flower color and its exceptional production of cut flower.

6,071

PLUM TREE (34EA305N)

Chris F. Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 30, 1985, Ser. No. 814,730

Int. Cl.⁴ A01H 5/03

U.S. Cl. Plt.—38

1 Claim

1. A new and distinct variety of plum tree of large size, vigorous upright growth and a regular and productive bearer of large, heart shaped, clingstone fruit; and further characterized by blooming approximately 7 days after Santa Rosa Plum

(non-patented) and bearing fruit ripening approximately 30 days after Red Beaut Plum (U.S. Plant Pat. No. 2,539) and the fruit having an attractive yellow skin color, firm yellow flesh, excellent eating quality, and the ability to ship to long distance markets.

6,072

GERANIUM PLANT NAMED LUCY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,672

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of geranium named Lucy, as described and illustrated, and particularly characterized by its pale lavender-pink flower color, variegated with dark red-purple on upper petals and lower petals having a white center; vigorous, compact growth habit; early flowering; good bud production at night temperatures up to 16° C.; thus providing a long and continuous flowering period; and ease of propagation and good rooting habit.

6,073

GERANIUM PLANT NAMED TUTTI-FRUTTI

Ingeborg Schumann, Bad Ems, Fed. Rep. of Germany, assignor to Fischer Geraniums, Inc., Curacao, Netherlands Antilles

Filed Jul. 31, 1985, Ser. No. 761,096

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of geranium named Tutti-Frutti, as described and illustrated, and particularly characterized by its light rose flower color; double flower form; early flowering and excellent flower production; good chlorophyll quality for transportation; fast rooting; excellent temperature tolerance; compact growth habit; and large flowerhead.

6,074

CHRYSANTHEMUM PLANT NAMED ATLANTIS

Leonard H. Shoesmith, deceased, late of Westfield, England (by May V. Shoesmith, executrix), assignor to Ball PanAm Plant Company, Parrish, Fla.

Filed Dec. 31, 1985, Ser. No. 815,002

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—77

1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Atlantis, as described and illustrated, and particularly characterized by its decorative capitulum type and flat capitulum form, pure white ray floret color, nine week flowering response, vigorous growth habit, medium plant height and upright branching pattern.

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PATENTS

GRANTED DEC. 29, 1987

ERRATA

For CLASS	See PATENT NO.
437-200	4,715,109
074-731	4,715,145
101-269	4,715,298
437-101	4,715,930
405-072	4,716,400
503-210	4,716,424

PATENTS

GRANTED DECEMBER 29, 1987

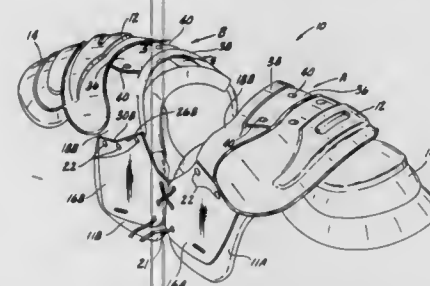
GENERAL AND MECHANICAL

4,715,066 SHOULDER PAD

Hal D. Mitchell, and Donald R. Walker, both of Rolla, Mo.,
assignors to Figgie International Inc., Willoughby, Ohio
Filed Oct. 24, 1986, Ser. No. 923,014
Int. Cl.⁴ A41D 13/00

U.S. Cl. 2-2

12 Claims



1. A shoulder pad for football players and the like comprising a left-hand member adapted to fit over the left shoulder and a right-hand member adapted to fit over the right shoulder, each of said members being of generally inverted U-shape as viewed from the side and comprising a chestplate member, a backplate member and an arch member, said arch member being relatively more rigid than said chestplate member and said backplate member, connecting means for fixedly interconnecting said chestplate member and said backplate member to said arch member, said arches being laterally spaced to provide an opening for the neck of a wearer with the spacing such that said arches lie adjacent and relatively close to the neck.

4,715,067 GOAL-KEEPER PAD

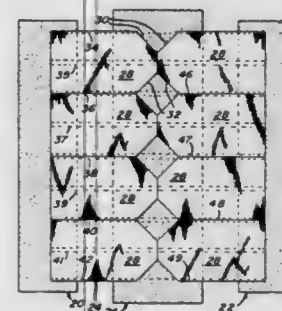
Robert Beauregard, St. Adolphe Dudswell, Canada, assignor to Roch Fortin, and Pierre Nizet, both of Quebec, Canada, part interest to each

Filed Apr. 16, 1987, Ser. No. 39,074

Int. Cl.⁴ A41D 13/00

U.S. Cl. 2-22

6 Claims



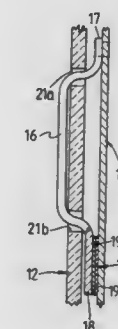
1. A goal keeper pad comprising:
(a) a heavily padded body, including:
(i) an upper thigh section;
(ii) an intermediate leg section; and
(iii) a lower foot section;
said sections having front, rear and side outer coverings; said coverings defining cut-out portions in a lower rear area of the leg section and the rear area of the foot section;
(b) an accordion-like joint sewn in covering arrangement to said cut-out portions, said joint being formed of:
(i) a pair of opposite outer bands of stretchable material;

(ii) an intermediate arrangement of pieces of resistant material disposed between said pair of bands; and
(iii) a third band of stretchable material centrally disposed on said intermediate arrangement; said bands and pieces being folded and sewn together to form said accordion-like joint.

4,715,068
GARMENT AND LINER COMBINATION
Milton D. Jacobson, 3300 Faring Rd., Birmingham, Ala. 35223
Filed Mar. 23, 1987, Ser. No. 29,185
Int. Cl.⁴ A41D 27/02

U.S. Cl. 2-272

8 Claims



1. A garment adaptable for use in various temperatures wherein the insulating qualities of the garment may be varied comprising:
(a) an outer portion wearable as a garment;
(b) a liner having insulating qualities determined in accordance with the temperature and wearable within said outer portion;
(c) a plurality of strap members affixed at one end thereof to the inside of said outer portion and having a free end;
(d) hook and pile fastening means affixed to said free end and the inside of said outer portion such that said free end may be secured to said outer portion; and
(e) means formed in said liner for allowing the passage of said strap members therethrough.

4,715,069
TOILET AIDS
David R. James, Tirley, England, assignor to James Industries Limited, Gloucester, England
Filed Jun. 3, 1986, Ser. No. 870,146
Claims priority, application United Kingdom, Jul. 5, 1985, 8517136

Int. Cl.⁴ E03D 11/00

U.S. Cl. 4-254

8 Claims



1. A toilet aid comprising a rear fixing bracket for mounting

on a WC pan using the normal seat attachment bolt holes of the latter, two side support arms each terminating in an turned outer end portion providing a handgrip for a user of the WC pan, and two side support legs, said arms and said legs being mounted on the bracket for separate pivotal movement about a common horizontal axis disposed adjacent the top surface of the WC pan in the region of said seat attachment bolt holes, said pivotal movement of said side support arms accommodating movement thereof between a lower operative position in which the arms are positioned to support the user of the WC pan and a raised inoperative position in which the arms do not obstruct normal use of the WC pan, and said support legs being adapted to contact the floor (when viewed from the side) forwardly of the base of the WC pan so that the legs support at least a major portion of any weight loading of the side support arms when the latter are operatively positioned.

4,715,070

FLOTATION POOL BLANKET

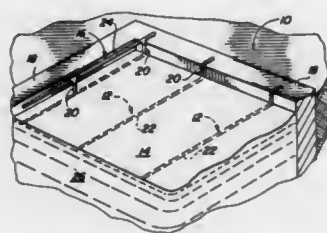
James K. Montijo, 2401 Pine St., Bakersfield, Calif. 93301

Filed Dec. 29, 1986, Ser. No. 947,264

Int. Cl.⁴ E04H 3/19

U.S. Cl. 4-498

17 Claims



1. A flotation pool blanket providing a barrier between the environment and the water surface of a swimming pool, and which is easily removable and replaceable, said swimming pool having a width, length, vertical sides and horizontal edges, the pool blanket comprising:

- a blanket adapted to cover at least a portion of the water surface of the pool;
- at least two elongated end ribs operably attached to said blanket, said end ribs having opposite ends and adapted to span the width of the pool; and
- ears operably attached to said end ribs to secure said end ribs proximate the water level, said ears defining right angle members, having two ends, one end attached to said end ribs and the other end adapted to engage the horizontal edge of the pool whereby said end ribs secure said blanket at the water surface within the pool as a barrier to the surrounding environment and provide means to remove said blanket by picking up and gathering said end ribs to one end of the pool for removal.

4,715,071

HYDROTHERAPY MASSAGE METHOD AND APPARATUS

Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and

Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001

Continuation-in-part of Ser. No. 796,987, Nov. 12, 1985. This application Apr. 15, 1987, Ser. No. 38,780

Int. Cl.⁴ A61H 33/02; E03C 1/02

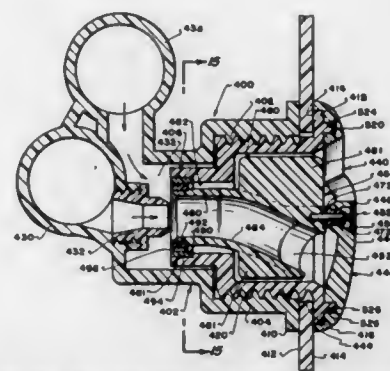
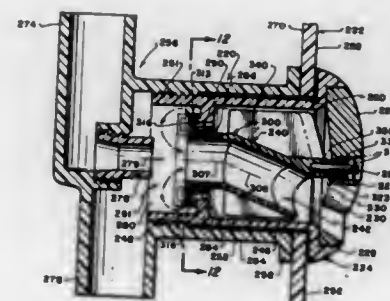
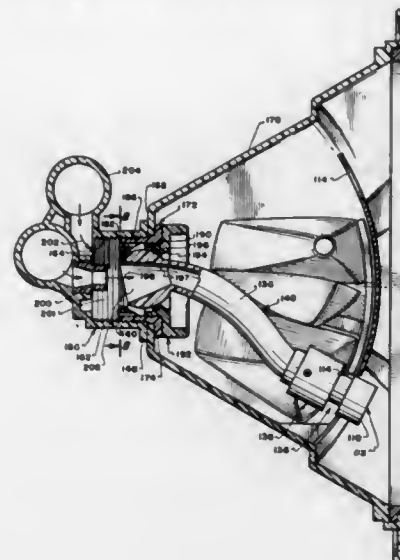
U.S. Cl. 4-542

42 Claims

1. Hydrotherapy apparatus for discharging a fluid stream useful for impacting against and massaging an area of a user's body, said apparatus comprising:

- supply means including a cavity and means for discharging a water jet along a defined axis into said cavity for creating a suction therein;
- an elongated rigid conduit including a tubular supply section having a supply orifice and a tubular discharge section

having a discharge orifice, said discharge section defining an axis misaligned with the axis of said supply section;



means mounting said conduit with said supply orifice opening to said cavity and with said supply section axis substantially aligned with the axis of said water jet whereby water supplied from said jet will flow through said conduit to said discharge orifice;

said mounting means including means supporting said conduit supply section for rotation about said supply section axis whereby said discharge orifice will translate along a nonlinear path describing a substantially planar area; and passageway means for drawing water from outside said conduit into said cavity to mitigate the effect of said suction on said conduit.

23. Hydrotherapy apparatus for discharging a fluid stream useful for impacting against and massaging an area of a user's body, said apparatus comprising:

supply means for discharging a water jet along a defined axis;

an elongated rigid conduit including a tubular supply section having a supply orifice and a tubular discharge section having a discharge orifice, said discharge section defining an axis misaligned with the axis of said supply section;

means mounting said conduit with said supply orifice substantially aligned with the axis of said water jet whereby water from said jet will flow through said conduit to said discharge orifice;

said mounting means including means supporting said conduit supply section for rotation about said supply section axis;

a pin supported substantially in alignment with said water jet axis; and

means coupling said conduit to said pin for rotation thereabout for translating said discharge orifice along a circular path and for supporting said conduit against lateral and axial thrust.

4,715,072

SHOWER BARRIER

Jurgen-Peter Sudmann, Dietrich-Bonhoeffer-Str. 18, 2902 Rastede 1, Fed. Rep. of Germany

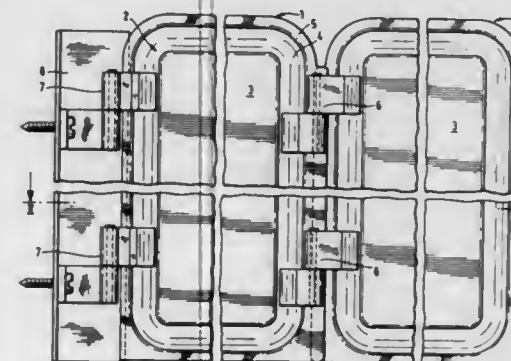
Filed Mar. 17, 1986, Ser. No. 840,517

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1985, 3509683

Int. Cl.⁴ A47K 3/22

U.S. Cl. 4-607

14 Claims



1. A shower barrier comprising at least two substantially rectangular wall sections hingedly attached to each other, each having top, bottom and side edges delimited by a rectangular frame and having a plastic board for splash water protection, the peripheral edges of said frame being formed by a one piece profiled tubular shaped member and said frame supporting said plastic board, said board including holding elements consisting of integral sleeve pieces extending around the periphery gripping around the profiled tubular shaped member, each holding element having at least along each side edge substantially laterally projecting outer flanges adapted to overlap adjacent flanges of adjacent wall sections.

4,715,073

TILTABLE BED FRAME ASSEMBLY

Wilbur T. Butler, 4039 Spyglass Rd., Oklahoma City, Okla. 73120

Filed Aug. 22, 1986, Ser. No. 899,488

Int. Cl.⁴ A61G 7/00; A47C 21/00

U.S. Cl. 5-62

16 Claims

1. An improved tiltable bed frame assembly comprising:

a main frame comprising:

a plurality of elongated members, rigidly interconnected at their adjoining ends to provide a substantially rectangularly shaped main frame having opposed, spatially disposed sides and opposed, spatially disposed ends; and

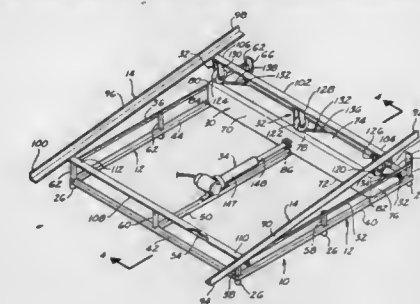
a substantially centrally disposed support member extend-

ing between and connected to the elongated members of the main frame ends;

a mattress frame supported by the main frame;

a first inclined ramp supported by the centrally disposed support member of the main frame so as to be disposed below the mattress frame and selectively moveable therealong;

first ramp engaging means connected to the mattress frame and supported on the first inclined ramp for elevationally moving a portion of the mattress frame relative to the



main frame as the first inclined ramp is moved along the main frame;

actuation means supported by the main frame and connected to the first inclined ramp for selectively moving the first inclined ramp along the main frame in a to and fro direction so that the angular disposition of the mattress frame relative to the main frame is adjusted in response to travel of the first inclined ramp; and

ram means connected to the first inclined ramp for selectively moving the first inclined ramp along the main frame.

4,715,074

CRIB

David R. Wallace, 112 Indiana Drive, Sault Ste. Marie, Ontario, Canada P6A 4Y5; George E. Rothschild, 1210 Prince of Wales Drive, Ottawa, Ontario, Canada K2C 1M9, and Robert W. Hamilton, 1133 Bayview Drive, Tsawwassen, British Columbia, Canada V4M 2R8

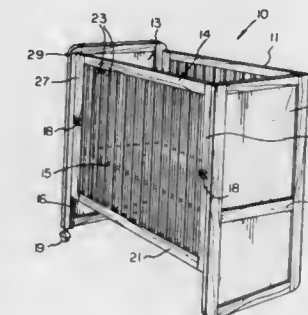
Filed Jul. 7, 1986, Ser. No. 882,787

Claims priority, application Canada, May 30, 1986, 510476

Int. Cl.⁴ A47D 7/00

U.S. Cl. 5-93 R

24 Claims



1. a crib comprising:

- (a) a generally rectangular, fixed-height back wall, said back wall including an upper horizontal face, a lower horizontal face, an inner face, an outer face and a pair of lateral faces, each said lateral face having an outwardly facing surface;
- (b) a pair of generally rectangular end gables, each said end gable including an upper horizontal face, a lower horizontal face and a pair of lateral end faces, said end gable

including an inwardly-facing surface and an outwardly-facing surface, each said end gable being hingedly connected to an associated lateral face of said fixed-height back wall;

- (c) at least two grooves within said inwardly facing surface of each of said end gables, each of said grooves on one said gable being on the same horizontal plane as an associated groove in the other said gable;
- (d) a mattress support having a specified rigidity selectively movably retained within selected grooves in the same horizontal plane in each of said end gables;
- (e) a generally rectangular, slidable dropside front wall disposed between said inwardly-facing surfaces of said end gables, said slidable dropside front wall being vertically slidable between a vertical upper limit and a vertical lower limit, said slidable dropside front wall including an upper horizontal face, a lower horizontal face, and a pair of lateral faces, each said lateral face having an outwardly facing surface; and
- (f) cooperating vertically-extending guide means between an inwardly facing surface of the lateral end faces of each end gable and the vicinal outwardly facing surface of the lateral faces of said slidable dropside front wall, to permit relative vertical movement of said slidable dropside front wall while preventing relative horizontal movement between said slidable dropside front wall and said end gables.

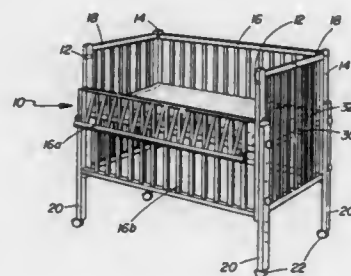
4,715,075

ADJUSTABLE LEGS FOR FOLDING CRIB

Louis Shamie, 972 Dean St., Brooklyn, N.Y. 11238
Filed Feb. 3, 1987, Ser. No. 10,220
Int. Cl.⁴ A47D 7/01, 7/03

U.S. Cl. 5—93 R

6 Claims



1. In a crib having a frame with four upright corner posts at the corners thereof, the improvement comprising, a leg for each post, each leg having a vertically extending guide channel therein, at least two vertically aligned and vertically spaced guide elements connected to each post, said guide elements of one post being slidable in the channel of one leg for vertical movement of said one leg with respect to its one post, each leg having a plurality of holes therethrough which are in greater number than the number of guide elements for one post, each hole communicating with said channel, said holes being spaced apart by an amount equal to the vertical spacing of said guide elements on one post, and bolt means engageable through two of said holes and into engagement with said at least two guide elements of one post for fixing a vertical position of each leg on its post.

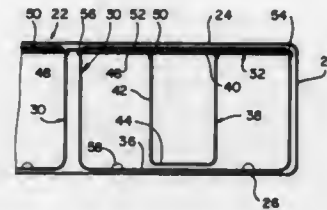
4,715,076

WATERBED MOTION REDUCTION AND HYDRAULIC ENHANCEMENT SYSTEM

Isaac Fogel, Potomac, and Donald W. Keefer, Pasadena, both of Md., assignors to Classic Corporation, Jessup, Md.
Filed Oct. 17, 1985, Ser. No. 788,412
Int. Cl.⁴ A47C 27/08

U.S. Cl. 5—450

17 Claims



1. A hydraulically enhanced waterbed comprising:
- a bladder for containing water, the bladder including a top wall, a bottom wall, and side walls connecting the top and bottom walls;
 - a plurality of outer hydraulic chambers positioned in an array within the bladder, each outer hydraulic chamber having a top surface generally oriented along the top wall of the bladder, a side surface extending from the top surface toward the bottom wall of the bladder, and a bottom surface extending from the side surface, the bottom surface and the side surface near the bottom surface constituting a bottom area of the outer hydraulic chamber, and at least one aperture in the bottom area of the outer hydraulic chamber; and
 - at least one inner hydraulic chamber positioned within at least one said outer hydraulic chamber, each inner hydraulic chamber having a top panel generally oriented along the top wall of the bladder and the top surface of the surrounding outer hydraulic chamber, a side panel extending from the top panel toward the bottom surface, and a bottom panel extending from the side panel, the bottom panel and the side panel near the bottom panel constituting a bottom area of the inner hydraulic chamber, and at least one aperture in the bottom area of the inner hydraulic chamber.

4,715,077

CONDUIT ON PASSENGER LOADING BRIDGE

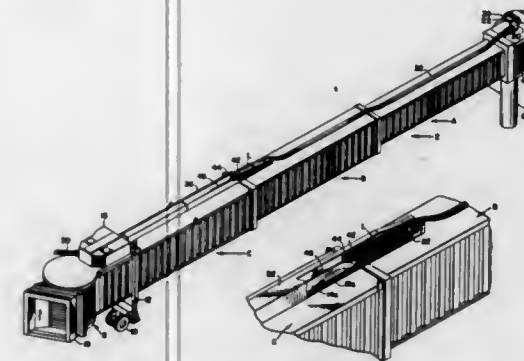
Thomas E. Shepherd, Norfolk, Va., assignor to Air-A-Plane Corporation, Norfolk, Va.
Continuation-in-part of Ser. No. 798,960, Nov. 18, 1985, Pat. No. 4,620,339. This application Aug. 27, 1986, Ser. No. 900,850
The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.
Int. Cl.⁴ E01D 1/00

U.S. Cl. 14—71.5

6 Claims

1. In combination with an extensible-retractable bridge having an inner end connected to an aircraft terminal and an outer end adapted to be connected to a parked aircraft, said bridge being comprised of a plurality of telescoping tunnel sections whose adjacent ends overlap to greater or lesser extents according to the extension or retraction of the bridge,
- a heat exchanger on the outermost tunnel section,
 - a fluid-temperature modifying means for supplying hot or cold liquid to the inner end of the bridge,
 - and fluid transmission means for supplying the temperature-modified liquid to the heat exchanger, said fluid transmission means including;
 - flexible hose means supported on said bridge and extending lengthwise thereof,
 - means for anchoring inner end portions of the hose means to the innermost tunnel section and means for anchoring

outer end portions of the hose means to the outermost tunnel section adjacent the inner end thereof, means for connecting the outer end portions of the hose means to the heat exchanger, the outer end portions of said hose means extending from the points of anchorage thereof towards the outer end of the bridge and thence looping back towards the inner end of



the bridge, the looped-back portion of the hose means providing and taking up slack in the hose means in accordance with decrease and increase in the length of the bridge, and tension means connected between one of the bridge sections and the hose means for maintaining the hose means under tension.

4,715,078

PAPERBOARD EDGE BUFFER AND CLEANER

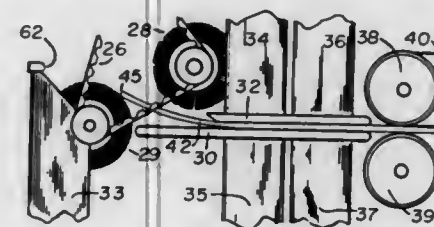
Paul C. Howard, Downey, Calif., and Ed Nowaczek, Boulder, Colo., assignors to Web Systems, Inc., Boulder, Colo.
PCT No. PCT/US83/00924, § 371 Date Mar. 11, 1985, § 102(e)
Date Mar. 11, 1985, PCT Pub. No. WO84/02067, PCT Pub. Date Jun. 7, 1984

PCT Filed Jan. 20, 1983, Ser. No. 708,946

Int. Cl.⁴ A46B 13/00

U.S. Cl. 15—4

10 Claims



1. A Paperboard Edge Buffer and Cleaner comprising:
- (a) a first buffing roller for buffing the leading edge of paperboard; said first buffing roller is disposed relative to the paperboard transport means so as to buff the upper surface of the paperboard in addition to the leading edge of the paperboard,
 - (b) a second buffing roller disposed near said first buffing roller for buffing the trailing edge of the paperboard, said second buffing roller is disposed relative to the paperboard transport means so as to buff the lower surface of the paperboard in addition to the trailing edge of the paperboard,
 - (c) a first vacuum means for removing particles remaining on the paperboard after the paperboard passes by said first and second buffing rollers,
 - (d) a pressure means for removing the particles to facilitate their transport by the vacuum means,
 - (e) a second vacuum means for removing particles from said first and second buffing rollers,

- (f) a transport means for moving the paperboard into contact with said first buffing roller and said second buffing roller,
- (g) a pair of interchangeable platforms, the first of said platforms being of such length as to cause the paperboard to pass over said second buffing roller without having said paperboard lower surface buffed, yet having the trailing edge buffed, and the second of said platforms being of such length as to cause the paperboard to pass over said second buffing roller and to have said paperboard lower surface buffed in addition to having the trailing edge buffed, and
- (h) a plate means for causing the buffing rollers to wear evenly across their surfaces.

4,715,079

WASHING APPARATUS

Douglas E. Kekewich, Islington, and Wendall Nelson, Brampton, both of Canada, assignors to Wash World Industries Limited, Canada

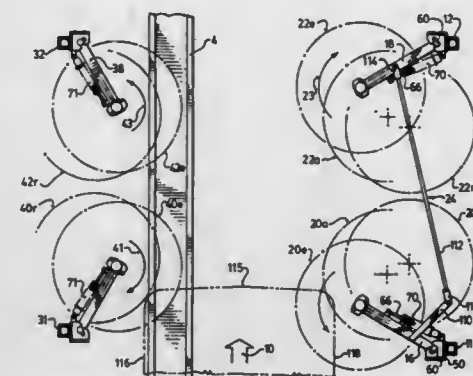
Filed Oct. 24, 1986, Ser. No. 922,611

Claims priority, application Canada, Oct. 23, 1986, 521239

Int. Cl.⁴ B60S 3/06

U.S. Cl. 15—97 B

21 Claims



1. A washing apparatus, for use in a vehicle washing installation in which a vehicle is moved forwardly along a vehicle path, the washing apparatus comprising a support means, first and second arms, which are longitudinally spaced relative to the vehicle path and each of which is pivotally mounted at one end thereof and at a respective pivot location to the support means and extends towards the vehicle path, with the first arm extending forwardly and the second arm extending rearwardly relative to the vehicle path, a first washing wheel rotatably mounted to the other end of the first arm, a second washing wheel rotatably mounted to the other end of the second arm, drive means for rotating the first washing wheel so that the vehicle engaging side thereof travels rearwardly and for rotating the second washing wheel so that the vehicle-engaging side thereof travels forwardly, and biasing means urging the first and second washing wheels towards the vehicle path.

4,715,080

BRUSH EXTENSION HANDLE

Gregory J. Rydzicki, 130 W. Wilson #5, Orange, Calif. 92667
Filed Mar. 27, 1985, Ser. No. 716,634

The portion of the term of this patent subsequent to Jun. 29, 2003, has been disclaimed.

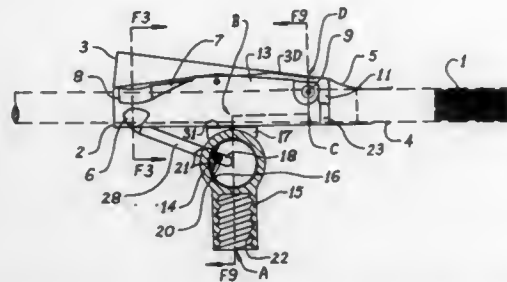
Int. Cl.⁴ A46B 5/02

U.S. Cl. 15—146

19 Claims

1. An adjustable attachment for holding a brush and substantially provided for use therewith, comprising a longitudinally extending lower plate, said lower plate having a rear portion located away from said brush and a front portion adjacent said brush, said lower plate having an adjustable groove at its rear portion, an upwardly bent arc at its front portion, and two side walls extending upwardly from said rear portion, each of said

two side walls having an outwardly extending bent portion in its front portion for supporting a brush in the longitudinal direction, a longitudinally extending upper plate having a front portion adjacent said brush, said upper plate having a downwardly bent arc at its front portion, and two side walls extend-



ing downwardly from its upper portion, said upper plate having an adjustable means for holding a brush, and pivot means on the front portions of each of said plates whereby said upper plate is rotationally mounted on said lower plate for clamping said brush between said plates.

4,715,081

DUST MOP WITH IMPROVED BACKING FOR SLIP-THROUGH FRAME

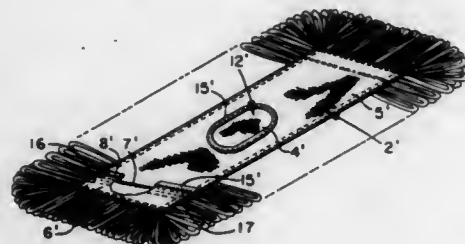
Deo Welch, P.O. Box 1251, Longview, Tex. 75606

Filed Nov. 18, 1981, Ser. No. 322,534

Int. Cl.³ A47L 13/24

U.S. Cl. 15-229.8

6 Claims



1. A dust mop comprising a backing having a plurality of yarns secured to one side thereof, the other side of said backing having a pair of oppositely facing pockets extending from the opposite ends of said backing, one of said pockets being substantially longer than the other pocket, said pockets being open at their innermost ends, the open end of the shorter of said pockets overlying the open end of said larger pocket.

4,715,082

WINDSHIELD WIPER BLADE ASSEMBLY

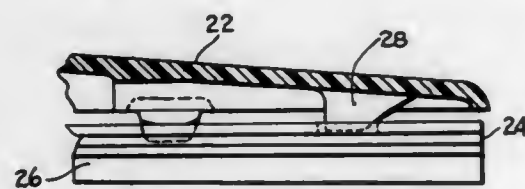
Neil A. Gowans, Buffalo, and William C. Riester, Williamsville, both of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,009

Int. Cl.⁴ B60S 1/04

U.S. Cl. 15-250.42

7 Claims



1. A windshield wiper blade assembly having an elongated

flexible pressure distributing superstructure and a wiper refill unit, means on said superstructure for slidably receiving said wiper refill unit, said wiper refill unit having an elastomeric wiping element supported by a stiff, resilient elongate backing strip and retention means for limiting longitudinal displacement of said refill unit relative to said superstructure, characterized in that said retention means comprises an integral fin-like projection depending from the undersurface of said superstructure on a medial longitudinal axis thereof and a slot penetrating said backing strip positioned to receive said depending projection when said refill unit and said superstructure are operatively assembled.

4,715,083

VACUUM CLEANER TOOL STORAGE

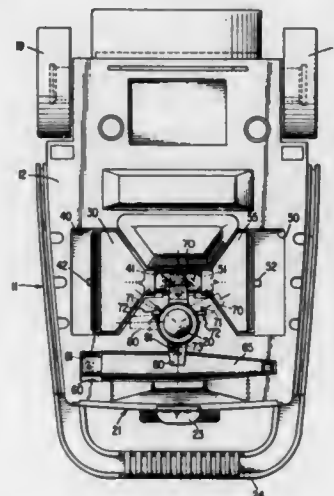
Frank R. Harris, and Gordon E. Laing, both of Anderson, S.C., assignors to The Slinger Company, Stamford, Conn.

Filed Sep. 29, 1986, Ser. No. 912,742

Int. Cl.⁴ A47L 9/00

U.S. Cl. 15-323

3 Claims



1. A vacuum cleaner having a housing enclosing a motor blower and dirt collecting means, and further having means thereon supporting said housing for movement across a floor or a like planar surface, said housing being formed with respect to said supporting means with a top, sides and a bottom surface, said vacuum cleaner being adapted for selective operation with a cleaner attachment chosen from among at least one cleaner attachment, and means for storing said at least one attachment during a period of non-use thereof, said storing means comprising:

at least one cleaner attachment accommodating recess formed in said housing extending upwardly into said bottom surface; and operator influenced latch means carried by said housing for selectively blocking movement of a cleaner attachment into or out of said attachment accommodating recess in said housing.

4,715,084

HAND VACUUM CLEANER

Gernot Jacob, Welsch-Flacht, and Leon Radom, Ellhofen, both of Fed. Rep. of Germany, assignors to Progress-Elektrogeraete Mauz & Pfeiffer GmbH & Co., Neurtingen, Fed. Rep. of Germany

PCT No. PCT/EP85/00475, § 371 Date May 8, 1986, § 102(e)

Date May 8, 1986, PCT Pub. No. WO86/01703, PCT Pub.

Date Mar. 27, 1986

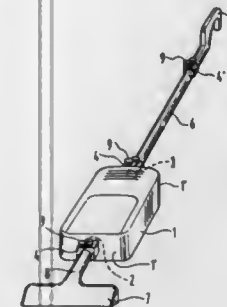
PCT Filed Sep. 16, 1985, Ser. No. 862,214

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1984, 8427360

Int. Cl.⁴ A47L 9/32

U.S. Cl. 15-328

7 Claims



1. A hand vacuum cleaner comprising: a housing receiving a suction fan and a dust collector; a handle detachably connected to said housing; a suction stub attached to said housing; an intermediate pipe detachably connected to said housing via said suction stub, said intermediate pipe being capable of being removed from said suction stub and being reattached to another portion of said housing between said housing and said handle, said intermediate pipe having a slot and a depression in one end thereof, said depression having a given depth; and at least one clamp for lockably attaching said intermediate pipe to said housing, said at least one clamp comprising a plug-in detent which cooperates with said slot of said intermediate pipe in order to actually align said intermediate pipe, said at least one clamp further comprising a rotatable cotter being eccentrically rotatable in order to move a portion of said cotter into said depression of said intermediate pipe, the movement of said cotter toward said depression being a distance which is substantially equivalent to the depth of said depression.

4,715,085

VACUUM CLEANER AND METHOD OF DISSIPATING ELECTROSTATIC CHARGE

Robert H. Johanson, Danville, Ky., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 19, 1986, Ser. No. 944,418

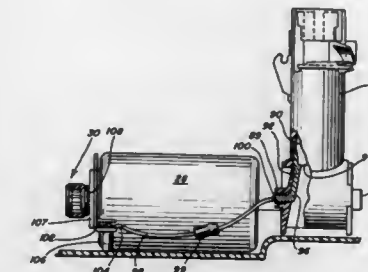
Int. Cl.⁴ A47L 9/28

U.S. Cl. 15-339

24 Claims

17. A canister vacuum cleaner comprising a floor cleaning unit having a rotatable brush and a brush motor for rotating said brush, a canister, physically separate from said floor cleaning unit, having disposed therein a suction means for providing a flow of air from said floor cleaning unit to said canister, and means for pneumatically interconnecting said canister and said floor cleaning unit, said pneumatically interconnecting means comprising a rigid wand and a wand handle and a flexible hose, said wand being adapted physically to engage and interconnect with said floor cleaning unit, said flexible hose being adapted physically to engage and interconnect with said canister, said wand handle being

adapted physically to engage and to interconnect both said wand and said flexible hose,



VACUUM CLEANER AND METHOD OF DISSIPATING ELECTROSTATIC CHARGE THROUGH CORONA DISCHARGE

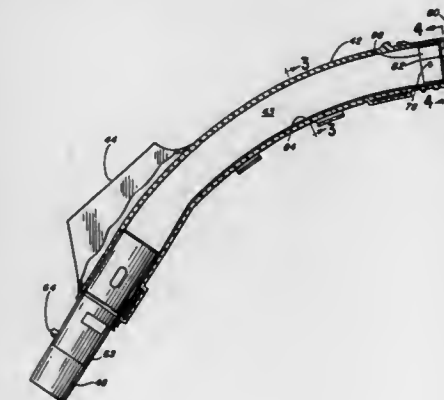
Robert H. Johanson, Danville; Raymond M. Montgomery, Boyle County; Michael T. Herndon, Burgin, all of Ky., and Edward C. Peterson, St. Joseph Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 19, 1986, Ser. No. 944,417

Int. Cl.⁴ A47L 9/28

U.S. Cl. 15-339

32 Claims



1. A vacuum cleaner comprising an elongate conductive tubular member and means for dissipating an electrostatic charge accumulated on said tubular member, said dissipating means comprising means for effecting a corona discharge into the air flowing within said vacuum cleaner.

4,715,087

HIGH SPEED FLOOR BURNISHER

Mike J. Todd, Eagan, Minn., and Gary E. Palmer, Roselle, Ill., assignors to Hako Minnteman, Inc., Addison, Ill.

Filed Dec. 11, 1985, Ser. No. 807,679

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

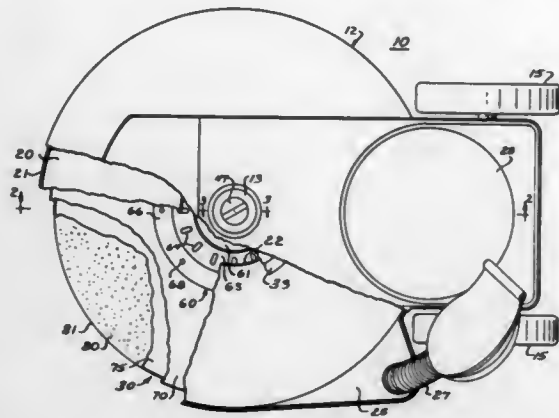
Int. Cl.⁴ B24B 29/00; A47L 11/14, 11/20

U.S. Cl. 15-385

22 Claims

1. A high speed floor burnisher comprising a housing adapted for movement along a floor; a vacuum shroud carried by said housing and defining a lower edge for sealing with said floor; means for resiliently mounting said shroud to said hous-

ing to maintain said seal with said floor during use; a motor carried by said housing; and a pad assembly beneath said shroud and driven at high rotary speed by said motor; said shroud forming a chamber above and about the sides of said pad assembly; said pad assembly including: a circular hub having an axis and having an outer surface; a burnishing pad; second mounting means fixedly securing said pad to said hub substantially coaxially therewith; means coupling the motor to drive said hub; collection means communicating with said



chamber; means connected to said pad assembly and forming a plurality of recesses extending from the location above said shroud, downwardly and outwardly beneath said shroud into said chamber for introducing make up air beneath said shroud and near the center thereof whereby high speed rotation of the pad assembly creates a flow of air into said chamber at a central part thereof, at least some air flowing outwardly in said chamber over said pad assembly to entrain particles therein and to deliver said entrained particles to said collection means.

4,715,088

VACUUM CLEANER ATTACHMENT

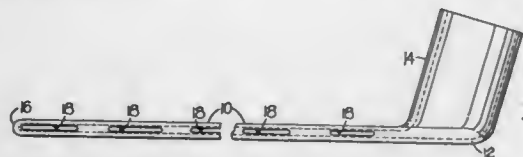
Gerald A. Haase, 1005 Country Club Rd., Lake Oswego, Oreg. 97034

Filed Aug. 29, 1986, Ser. No. 901,706

Int. Cl.⁴ A47L 9/02

U.S. Cl. 15—415 A

4 Claims



1. A vacuum cleaner attachment, comprising:
 - (a) a longitudinally elongated hollow body member having substantially flat, closed top and bottom walls, and a pair of opposite lateral side walls, the body member having a closed forward longitudinal end and an open opposite longitudinal end mounting a vacuum cleaner hose fitting, and
 - (b) suction openings through only at least one lateral side wall at spaced intervals along the body member,
 - (c) the body member configured with a slender profile for access to the limited vertical space under appliances and furniture, said flat bottom wall configured to be disposed adjacent a surface to be cleaned for movement of the attachment therealong, whereby said suction openings are disposed to permit air flow substantially only parallel to the surface to be cleaned.

4,715,089
TELESCOPING POLE CRANK ASSEMBLY

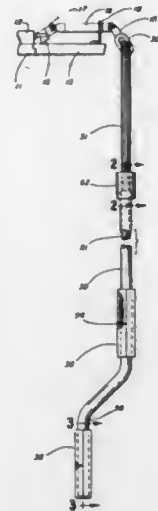
Anthony C. Schema, Faribault, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed Jun. 16, 1986, Ser. No. 874,401

Int. Cl.⁴ B25G 1/04

U.S. Cl. 16—115

9 Claims



1. A telescoping pole crank assembly comprising, a tubular pole crank, an extension pole slidably mounted in said pole crank for movement outwardly thereof to establish the overall length of the pole crank assembly, and means for locking said extension pole to said pole crank to maintain said overall length including a collar collet fixed to said pole crank and having a plurality of arcuately spaced clamping fingers extended beyond an end of the pole crank with a slot between each pair of clamping fingers, an outside collar with internal threads threadably mounted on the collar collet for movement longitudinally thereof in response to the relative rotation, and a pair of coaxing circular ramps on the exterior of the clamping fingers and the interior of said outside collar for compressing the clamping fingers by rotation of the outside collar and interfingering means on the collar collet and outside collar to prevent separation of one from the other comprising a throat opening to a counterbore in an end of the outside collar defining an annular abutment surface, and an effectively circular flange on the outer end of the clamping fingers having a diameter to abut against said abutment surface and being engageable by the outside collar for inward movement of the clamping fingers to a smaller diameter to pass through said throat upon assembly of the outside collar and collar collet and thereafter expand behind said abutment surface.

5. A telescoping pole crank assembly comprising, a tubular pole crank, an extension pole slidably mounted in said pole crank for movement lengthwise thereof to establish the overall length of the pole crank assembly, means for locking said extension pole to said pole crank to maintain said overall length including a collar collet fixed to said pole crank and having a plurality of arcuately spaced clamping fingers extended beyond an end of the pole crank with a slot between each pair of clamping fingers, an outside collar with internal threads threadably mounted on the collar collet for movement longitudinally thereof in response to the relative rotation, and a pair of coaxing circular ramps on the exterior of the clamping fingers and the interior of said outside collar for compressing the clamping fingers by rotation of the outside collar, and means for fastening the collar collet to the pole crank including aligned holes in said collar collet and pole crank, a pair of loose rivets one in each of said aligned holes, and said rivets being captured by said outside collar in surrounding relation to said collar collet.

6. A telescoping pole crank assembly comprising, a tubular pole crank with an offset end, a pair of pole handles rotatably

mounted on said pole crank with one handle positioned on said offset end, an extension pole slidably mounted in said pole crank for movement lengthwise thereof to establish the overall length of the pole crank assembly, and means for locking said extension pole to said pole crank to maintain said overall length including a collar collet fixed to said pole crank and having a plurality of arcuately spaced clamping fingers extended beyond an end of the pole crank with a slot between each pair of clamping fingers, an outside collar with internal threads threadably mounted on the collar collet for movement longitudinally thereof, in response to the relative rotation, and a pair of coaxing circular ramps on the exterior of the clamping fingers and the interior of said outside collar for compressing the clamping fingers by rotation of the outside collar, and at least one raised rib on the extension pole extending longitudinally thereof and positioned in one of said slots to prevent rotation of the extension pole relative to the pole crank, each of said handles being formed of two identical halves with each half having a peg and a hole for a snap fit connection to the other half, a pair of screws extending from the pole crank at the location of the handles, and a pair of internal ribs on each handle capturing one of the screws therebetween to enable handle rotation without movement lengthwise of the pole crank.

4,715,091

PROCESS FOR PREPARING CLAM CUTLET

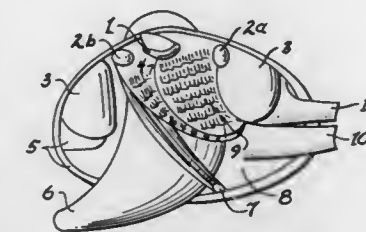
Howard M. Rome, 110 Dean St., Taunton, Mass. 02780

Filed Mar. 23, 1987, Ser. No. 29,448

Int. Cl.⁴ A22C 29/04

U.S. Cl. 17—48

11 Claims



1. A method for preparing a one-piece clam tongue for consumption, which comprises extracting the clam from its shell, removing the viscera from said tongue, separating the tongue from any remaining flesh, butterflyflying said tongue and passing it through a mechanical meat tenderizer to provide thereby a tender, edible one-piece clam cutlet.

4,715,092

APPARATUS AND METHOD FOR CUTTING SLAUGHTERED POULTRY INTO SEPARATE PIECES

Bernard Lerner, Peninsula; Dana Liebhart, Cuyahoga Falls, and Rick S. Wehrmann, Hudson, all of Ohio, assignors to Automatic Packaging Systems, Inc., Twinsburg, Ohio

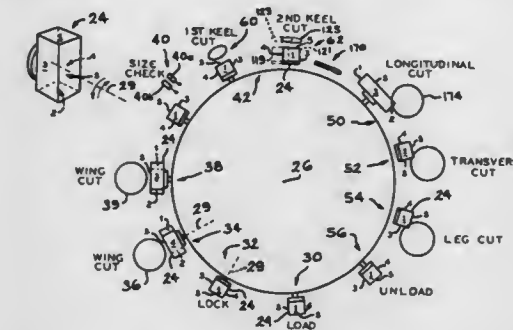
Continuation of Ser. No. 688,911, Jan. 4, 1985, Pat. No.

4,589,165. This application Jan. 17, 1986, Ser. No. 820,539

Int. Cl.⁴ A22C 21/00

U.S. Cl. 17—52

12 Claims



4,715,090
DEMOUNTABLE HINGES

Barry S. Morris, Walsall, England, assignor to The Bloxwich Lock and Stamping Company Limited, Walsall, England

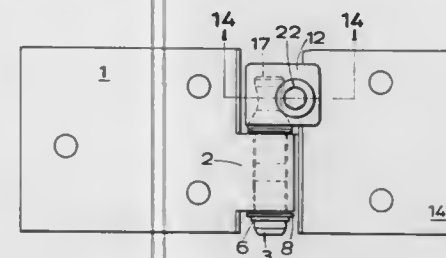
Filed Sep. 23, 1986, Ser. No. 910,647

Claims priority, application United Kingdom, Dec. 18, 1985, 8531168; Jul. 28, 1986, 8618369

Int. Cl.⁴ E05D 5/12

U.S. Cl. 16—261

6 Claims



1. A demountable hinge comprising first and second knuckles, a hinge pin journaled in said first knuckle, said second knuckle having an eye and a transverse bore which breaks into said eye, means holding captive said hinge pin to said first knuckle against axial displacement relative thereto, a part of said hinge pin which projects from said first knuckle being dimensioned to be received within said eye of said second knuckle, and a threaded locking member dimensioned to be received in said transverse bore in said second knuckle, said part comprising a portion of substantially frusto-conical shape, said portion having a smaller diameter end positioned towards said first knuckle, said threaded locking member having a substantially frusto-conical locking surface, whereby when said hinge pin part is within said eye of said second knuckle said locking member can be threadably tightened such that a locking engagement is provided between said frusto-conical locking surface of said locking member and said frusto-conical portion of said hinge pin.

3. A method for cutting slaughtered poultry into separate pieces, comprising the steps of:

- (a) mounting a bird carcass to be cut onto a bird support module;
- (b) conveying the carcass to a wing cutting station and severing wings from said carcass;
- (c) conveying the carcass through a breast cutting station and severing a central breast section from the carcass by:
 - (i) moving the carcass past a stationary cutter to effect an initial cut commencing at a rear portion of said central breast section, said cut extending towards a front portion of said central breast section at a predetermined angle;
 - (ii) while continuously moving said module, reciprocating a cutting means, in synchronized motion with the movement of said module, towards and away from said bird to effect a second cut commencing at the front portion of said central breast section, said second cut extending towards the rear portion of said breast section at a predetermined angle such that said second cut intersects

a cut made by the stationary cutter, thereby completely severing the central breast section from the carcass.

4,715,093

TRIMMING AND CUTTING APPARATUS FOR THE PREPARATION OF CRABS FOR MEAT EXTRACTION

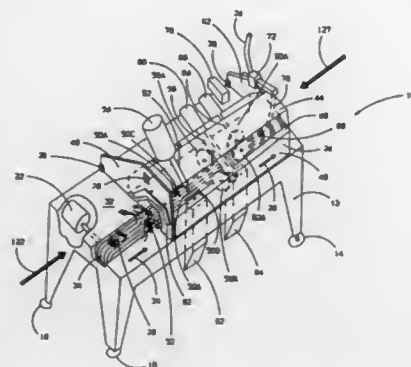
George C. Lapeyre, New Orleans; Christopher G. Greve, Covington, and Hendrik J. Ruys, New Orleans, all of La., assignors to The Laitram Corporation, Harahan, La.

Filed Sep. 16, 1985, Ser. No. 776,453

Int. Cl.⁴ A22C 29/02

U.S. Cl. 17—71

16 Claims



1. Apparatus for preparing cooked crabs for further processing to separate meat from shell by centrifugal action comprising:

- holding means for releasably securing a cooked crab body which has had the carapace shell removed in a selected orientation with respect to said holding means;
- conveying means for moving said holding means securing such a crab body along a predetermined path and proximate a cutting means; and
- a cutting means for making a "V" cross-sectional shaped cut extending between the front and rear of the crab, the open or top if said "V" shape located at the top or back of the crab and a "tip" of the "V" extending into the crab body substantially parallel to the center line of the crab body such that said "tip" of said "V" is proximate to but does not cut through the belly shell of such a crab thereby separating a "V" cross-sectional shaped portion containing the viscera from said crab body while maintaining the structural integrity of said belly shell such that such crab body is not divided into two pieces.

4,715,094

SHOE LACE KNOT RETAINER

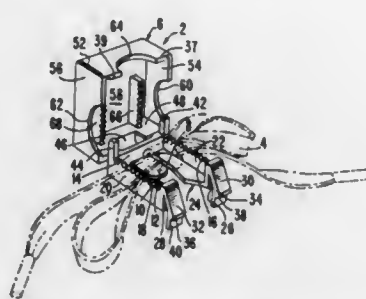
Charles W. Herdman, 1253 Stirling Rd., Dania, Fla. 33004

Filed Jun. 3, 1986, Ser. No. 869,990

Int. Cl.⁴ F16G 11/00

U.S. Cl. 24—119

19 Claims



1. A shoe lace knot retainer comprising a top portion and a bottom portion, said bottom portion comprising two spaced

side walls forming an enclosure for a shoe lace knot and having an opening between said side walls for receiving shoe laces, said top portion having two ribs, wherein said ribs lie laterally adjacent and parallel to but not engaged with said two side walls when said top portion is engaged over said bottom portion, to secure ends of said shoe lace.

4,715,095

PLATE FASTENER

Norio Takahashi, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

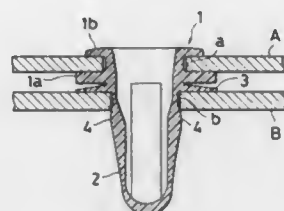
Filed Dec. 29, 1986, Ser. No. 946,977

Claims priority, application Japan, Jan. 22, 1986, 61-10252

Int. Cl.⁴ F16B 21/08

U.S. Cl. 24—453

7 Claims



1. A single piece plate fastener made of a synthetic resin for fastening together two plates in a face-to-face relation to each other, comprising a head portion to be locked in an engagement hole formed in one of said two plates, said head portion comprising upper and lower flange-like portions and a boss-like portion connecting the upper and lower flange-like portions, a cylindrical leg portion integral with and perpendicularly extending from the bottom of said head portion and to be locked in a mounting hole formed in the other one of said plates, and an umbrella-like elastic engagement portion extending from the outer periphery of a stem portion of said leg portion and to be in close area contact with said other plate, said leg portion having a projection formed on the outer periphery to engage with the edge of a mounting hole formed in said other plate in a face-to-face relation to said engagement portion and a reduced-thickness axial hinge portion formed in a wall portion other than said projection, the wall of said leg portion being flexed in folding fashion about said hinge portion.

4,715,096

THERMALLY ACTUATED SEAT BELT FASTENER

Joseph A. Fleming, 4201 E. Pinal, Catalina, Ariz. 85635, and

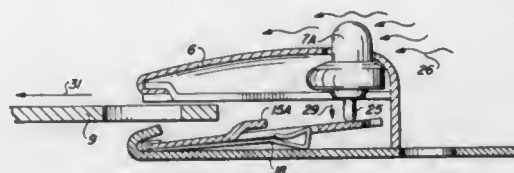
Stephen J. Haider, 1463 W. Chapala Dr., Tucson, Ariz. 85705

Filed Jul. 10, 1986, Ser. No. 883,960

Int. Cl.⁴ A41F 1/00

U.S. Cl. 24—602

5 Claims



1. A seat belt fastener comprising in combination:

- (a) a tongue member including a transverse retaining edge;
- (b) a latch mechanism including a movable retaining member for engaging the transverse retaining edge to prevent removal of the tongue member from the latch mechanism;
- (c) release button means in the latch mechanism for moving the movable retaining member away from the transverse

retaining edge as the release button means is depressed by a user to release the seat belt fastener; and

(d) temperature-sensitive means within the release button means for forcing a thrust member from the release button means against the movable retaining member to move it away from the transverse retaining edge if the temperature of the release button means exceeds a predetermined level, thereby automatically releasing the seat belt fastener without depressing of the release button means if the temperature of the release button means exceeds the predetermined level.

4,715,097

ARRANGEMENT FOR THE ENTANGLEMENT OF MULTI-FILAMENT THREADS

Bogdan Bogucki-Land, Offenbach, Fed. Rep. of Germany, assignor to Karl Mayer textilmaschinenfabrik GmbH, Fed. Rep. of Germany

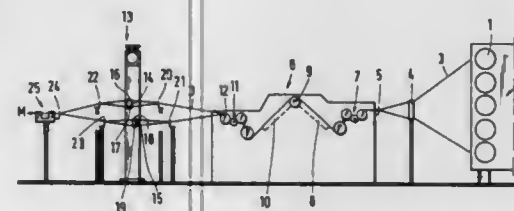
Filed Oct. 3, 1986, Ser. No. 914,945

Claims priority, application European Pat. Off., Oct. 4, 1985, 85112571.6

Int. Cl.⁴ D02H 5/02; D02J 1/08

U.S. Cl. 28—172

13 Claims



1. An arrangement for the entanglement of multi-filament thread, said arrangement being operable to entangle warp threads travelling from spools on a creel to a warping machine, said arrangement having a jet arm adapted to communicate with a source of compressed air, comprising:

- a plurality of adjacently placed plates, each adjacent pair of said plates having a separating element located between each, said plates being positioned to provide between them a plurality of parallel channels, each of said channels being shaped as an outwardly directed slot having side walls formed by a corresponding adjacent pair of said plates, said slot having a base formed by the separating element corresponding thereto, for each adjacent pair of said plates at least one of them including: (a) a reservoir adapted to communicate with said source of compressed air, (b) an airway between said reservoir and said source of compressed air, and (c) a bore in the side wall communicating with said reservoir for acting as a perpendicularly directed air jet, said plates having in said slot upstream and downstream of said air jets at least one thread support for keeping the threads out a predetermined distance from the base of said slot and in the influence of said air jet.

4,715,098

METHOD OF MAKING COAXIAL CABLE

Michael Booth, Swindon, and Richard J. Penneck, Lechlade, both of England, assignors to Raychem Limited, England

Division of Ser. No. 673,460, Nov. 20, 1984, Pat. No. 4,629,925.

This application Aug. 15, 1986, Ser. No. 897,470

Claims priority, application United Kingdom, Nov. 22, 1983, 8331156

Int. Cl.⁴ H04R 17/00

U.S. Cl. 29—25.35

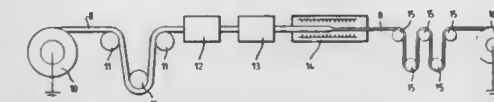
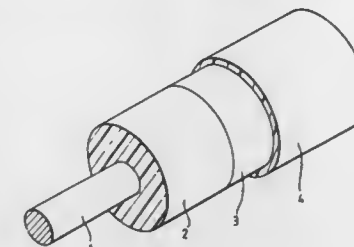
15 Claims

1. A method of forming a piezoelectric coaxial cable, which comprises the steps of:

- (a) co-extruding a central metallic electrical conductor, and surrounding the conductor with an insulating layer to form a wire, the insulating layer comprising a material

that is capable of being rendered piezoelectric by being oriented and polarized;

- (b) subjecting the wire to a continuous polarizing operation comprising:
 - (i) passing the wire through a heating zone in which the wire is heated to a predetermined elevated temperature to melt the electrical conductor, and



- (ii) passing the heated wire through a stretching zone and a polarizing zone so that the wire is stretched and, simultaneously or subsequently, the insulating layer is polarized, the insulating layer of the stretched wire having an internal radius that is not more than 0.5 times its external radius; and
- (c) providing the stretched wire with an outer electrical conductor.

4,715,099

TERMINAL CRIMPING MACHINE

Koji Yoshida, Kobe, Japan, assignor to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan

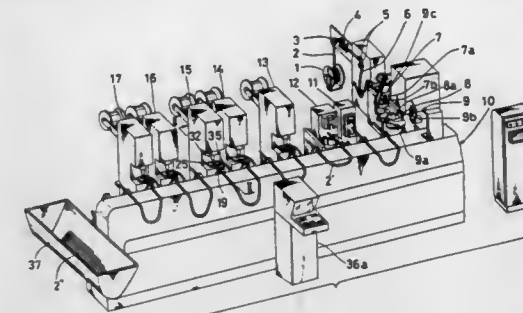
Filed Sep. 5, 1986, Ser. No. 904,340

Claims priority, application Japan, Jan. 16, 1986, 61-4966[U]; Jan. 24, 1986, 61-9505[U]

Int. Cl.⁴ H01R 43/04

U.S. Cl. 29—33 M

8 Claims



1. A terminal crimping machine comprising wire transfer conveyor means having a plurality of wire transfer units for gripping and holding insulated wires which are cut to predetermined lengths at a given reference elevational level, said wire transfer conveyor means travelling along a transfer path for intermittently advancing said wire transfer units through said transfer path, an insulation stripping unit disposed laterally of said transfer path for stripping insulation from ends of said insulated cut wires, at least one terminal crimping unit disposed laterally of said transfer path in a location downstream of said insulation stripping unit as viewed in a travel direction of an upper run of said transfer conveyor means, said terminal crimping unit comprising a terminal crimping bed adapted to vertically move from a position below said given reference

elevational level of the ends of wires being transferred to said given reference elevational level of the ends of said wires, a crimping die disposed above said crimping bed and adapted for vertical movement for crimping terminals, and position adjusting means connected to said terminal crimping bed for adjusting an elevational position of said terminal crimping bed to a desired elevational level relative to said given reference elevational level.

4,715,100

WIRE ROUTING TOOL FOR ROBOTIC WIRE HARNESS ASSEMBLY

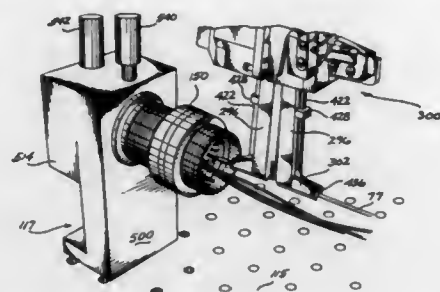
Dan A. Cross, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 741,318, Jun. 4, 1985, Pat. No. 4,677,734, which is a continuation-in-part of Ser. No. 539,768, Oct. 17, 1983, Pat. No. 4,520,966. This application Nov. 18, 1985, Ser. No. 798,827

Int. Cl.⁴ H01R 43/00

U.S. Cl. 29-33 M

18 Claims



1. A tool for use by a robot in assembling a wire harness on a form board, comprising:

- (a) connection means for releasably connecting the tool to the robot;
- (b) grasping means for grasping a wire, the grasping means allowing the wire to slide freely through the tool or restricting movement of the wire at predetermined intervals, the grasping means defining a longitudinal axis; and
- (c) insertion means for moving wire through the tool and for inserting one end of the wire into a connector on the form board by moving the grasping means substantially along the axis without moving the robot.

4,715,101

METHOD OF MAKING A PLASTIC BEARING

James A. Belanger, Northville, Mich., assignor to Belanger, Inc., Northville, Mich.

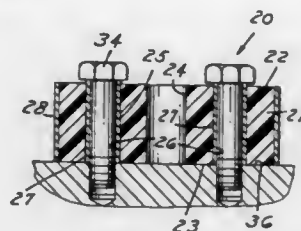
Division of Ser. No. 612,306, May 21, 1984, Pat. No. 4,586,831.

This application Dec. 23, 1985, Ser. No. 812,668

Int. Cl.⁴ B23P 11/00

U.S. Cl. 29-149.5 C

10 Claims



1. A method of making a bearing comprising the steps of: forming a block having at least a first substantially flat side and a second substantially flat side, said block being formed from a high molecular weight plastic; forming a cylindrical bearing bore in said block; and locating one or more rigid sleeves in the block, so that each

located rigid sleeve is spaced from the bearing bore, each located rigid sleeve extending from said first substantially flat side to said second substantially flat side, and each located rigid sleeve being capable of isolating a fastener inserted in said located rigid sleeve from contacting the sides when the fastener is tightened against said located rigid sleeve.

4,715,102

MACHINE TOOL

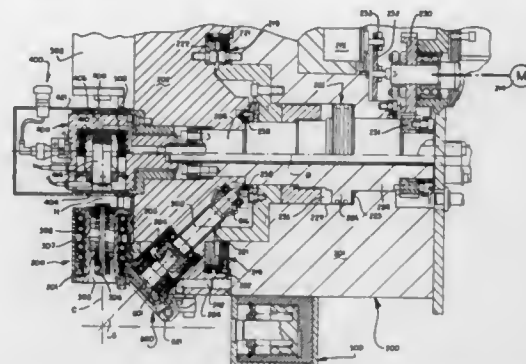
Heinz K. Wolf, Willoughby Hills, and Jyoti Mukherjee, North Royalton, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Oct. 31, 1986, Ser. No. 925,999

Int. Cl.⁴ B23C 1/12; B23P 23/02

U.S. Cl. 29-27 R

31 Claims



3. A machine tool (10) having a rotatable turret (200) with an end face (203) extending transversely to the axis of rotation (B) of said turret and a side face (204) extending transversely to said end face, said turret (200) including a base (201), a head portion (202) upon which said end and side faces (203, 204) of said turret are disposed, drive means (600) for transmitting drive forces through said turret to an output location between said end and side faces of said turret, said drive means (600) including a first drive gear (615) rotatably mounted on said base (201) of said turret and a second drive gear (616) rotatably mounted on the head portion of said turret, said machine tool being characterized by toolholder means (300) for rotating a cutting tool (T) about a first axis (C of FIG. 7) extending perpendicular to the axis (B) of rotation of said turret when said toolholder means is mounted on said end face (203) of said turret and for rotating a cutting tool (5) about a second axis (C of FIG. 10) extending parallel to the axis of rotation (B) of said turret when said toolholder means is mounted on said side face (204) of said turret, said head portion of said turret being rotatable relative to said base between a first operating position in which said toolholder means is operable to rotate a cutting tool and any one of a plurality of operating positions in which said toolholder means is ineffective to rotate a cutting tool, and retainer means (238) for holding said second drive gear (616) in a predetermined orientation in which teeth on said second drive gear are positioned for meshing engagement with teeth on said first drive gear (615), said retainer means (238) holding said second drive gear (616) in the predetermined orientation during rotation of said head portion of said turret relative to said base and movement of said second drive gear from said first operating position through said plurality of operating positions, said retainer means (238) releasing said second drive gear (616) for rotation relative to said head portion of said turret upon movement of said second drive gear from one of said plurality of operating positions to said first operating position to enable drive forces to be transmitted from said first drive gear to said second drive gear to rotate said toolholder means (300).

4,715,103

METHOD OF PRODUCING INTERFERENCE CONNECTION BETWEEN A FLUID LINE AND A FLUID INJECTOR

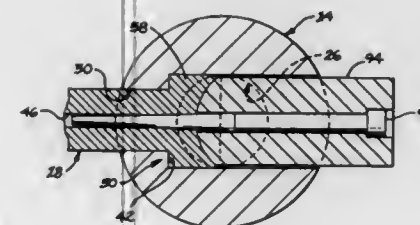
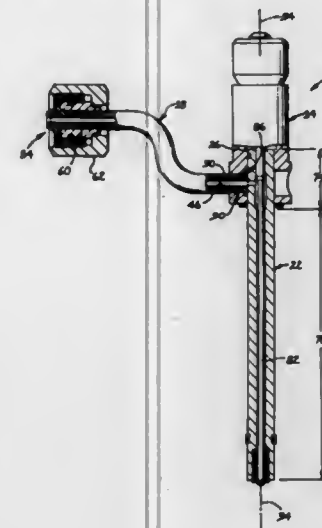
Tibor S. Jaksa, Pontiac; Richard F. Norton; Kenneth W. Hall, both of Peoria; Stephen J. Butler, Chillicothe; Craig C. Chicoine, and Wilford L. Blenz, both of Bloomington, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 4, 1986, Ser. No. 893,062

Int. Cl.⁴ B23P 15/00

U.S. Cl. 29-156.4 R

9 Claims



1. A method of manufacturing a fluid injector including a body having a sealing exterior portion of a predetermined outside diameter, a fluid line having an internal passage and an end portion, and a housing having first and second bores intersecting one another wherein the housing first bore has a sealing interior portion and the housing second bore includes an internal shoulder positioned adjacent to and facing the sealing interior portion of the housing first bore, said method comprising the steps of:

inserting the end portion of the fluid line into an end portion of the housing second bore so that the fluid line end portion inwardly extends a predetermined depth, greater than zero, inside the sealing interior portion of the housing first bore;

forming the fluid line end portion with respect to the internal shoulder so that the fluid line end portion forms a generally complementary flange portion seated against the internal shoulder;

removing any excess of the flange portion which inwardly extends inside the sealing interior portion of the housing first bore so that the remaining flange portion of the fluid line is substantially flush with a predetermined inside diameter of the housing first bore, said predetermined inside diameter of the housing first bore being less than the magnitude of the outside diameter of the body sealing exterior portion;

aligning the sealing exterior portion of the body with the housing first bore; and inserting the sealing exterior portion of the body into the sealing interior portion of the housing first bore so that a fluid-sealed interference fit is formed between the sealing exterior portion of the body and both the flange portion of the fluid line and the sealing interior portion of the housing first bore.

4,715,104

INSTALLATION TOOL

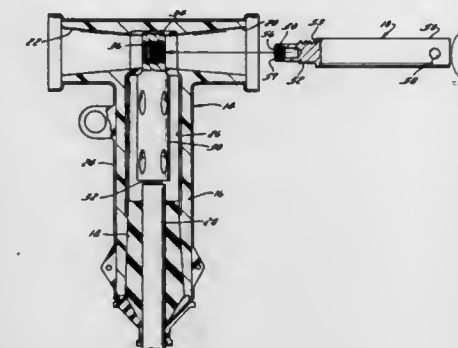
Randall R. Schoenewetter, Waukesha; John Makal, Menomonee Falls, and Edward L. Sankey, New Berlin, all of Wis., assignors to RTE Corporation, Waukesha, Wis.

Filed Sep. 18, 1986, Ser. No. 908,843

Int. Cl.⁴ B25B 27/14

U.S. Cl. 29-271

2 Claims



1. An installation tool for aligning the threaded end of a load break reducing tap plug with the threaded opening in a cable connector mounted in a visible break "T" connector assembly, the plug including a mounting bolt mounted in the threaded end of the plug, said tool comprising an elongated shaft having a threaded section on one end corresponding to the threaded opening in the cable connector, a non-threaded tubular extension on the threaded end of the shaft, the extension having a length greater than the width of the cable connector, and a threaded opening in the tubular extension and corresponding to the mounting bolt in the reducing tap plug.

4,715,105

METHOD OF PREPARATION OF PACKED FIBER GLASS REACTION VESSEL

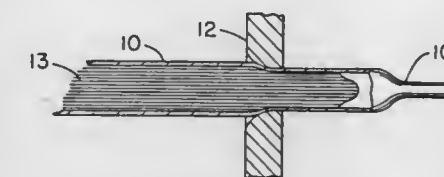
Richard P. Beaver, Library, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 750,445, Jul. 1, 1985, Pat. No. 4,657,742. This application Apr. 16, 1986, Ser. No. 852,866

Int. Cl.⁴ B32P 17/00

U.S. Cl. 29-419 G

3 Claims



1. In a process of packing leached, porous glass fibers in an elongated non-porous wall metal tube, the improvement comprising filling the tube with said leached, porous glass fibers oriented in parallel with respect to each other and with respect to the long axis of the tube, said tube being of a diameter in excess of the final desired diameter of the tube, passing the tube with the leached, porous glass fibers packed therein through a

die, reducing the internal diameter of the tube by pulling it through the die in a cold drawing process to reduce the tube to an internal diameter such that the packing density of the leached, porous glass fibers contained in the finished tube after it emerges from the die is between 70 and 100 percent of the theoretical maximum density based on the diameter of the leached, porous glass fibers employed and the final diameter of the tube using a triangular pitch pattern packing method.

3. In a process of packing hollow glass fibers in an elongated non-porous wall metal tube, the improvement comprising filling the tube with hollow glass fibers oriented in parallel with respect to each other and with respect to the long axis of the tube, said tube having a diameter in excess of the desired final diameter of the tube, passing the tube having the hollow glass fibers packed therein through a die, reducing the diameter of the tube by pulling it through the die in a cold drawing process to reduce the diameter of the tube to an internal diameter such that the packing density of the hollow glass fibers in the finished tube is between 70 and 100 percent of the theoretical maximum density based on the diameter of the hollow glass fibers the final diameter of the tube and a triangular pitch pattern of packing.

4,715,106

METHOD FOR BELT SPLICE PREPARATION

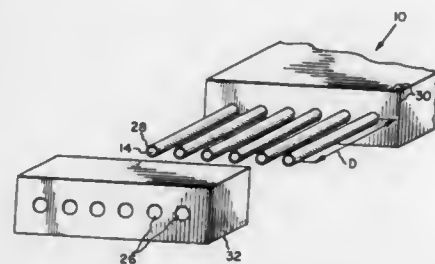
Paul J. Peterson, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 7, 1986, Ser. No. 837,114

Int. Cl.⁴ B23P 19/02

U.S. Cl. 29—426.4

4 Claims



1. A method for preparing an end of a cable belt for splicing, said cable belt including an elastomeric body having embedded therein a plurality of stranded cables aligned in a reinforcement plane extending transversely across substantially the entire width of said belt, said stranded cables extending longitudinally of the belt over its entire length, said method comprising the steps of:

- preparing a transverse cross section of said cable belt end exposing an axial cross sectional end of each of said plurality of stranded cables;
- positioning a tubular cutting tool against said cross section of said cable belt and around an end of one of said plurality of stranded cables, said cutting tool having an inside diameter greater than the cross section of said stranded cable and adapted to cut circumferentially around said stranded cable over a predetermined axial length of said cable;
- cutting a cylindrical core around said stranded cable, said cylindrical core extending for a predetermined distance through said elastomeric body along said stranded cable and co-axial therewith;
- repeating steps (b) and (c) for each of said plurality of stranded cables;
- cutting said elastomeric body in a cutting plane transverse of and perpendicular to said cable belt, said cutting plane intersecting each of said cylindrical cores around and between each of said plurality of stranded cables, said cutting plane extending through said elastomeric body at

said predetermined distance from said end of said cable belt to form a separated segment of said elastomeric body;

- exerting a force in a direction coincident with said plane of said stranded cables and directed away from said end of said cable belt to effect removal of said separated segment of said elastomeric body, thereby exposing said plurality of stranded cables over said predetermined distance.

4,715,107

METHOD OF FORMING AN AIRSPRING WITH PNEUMATIC FITTING

Henry D. Fresch, Silver Lake, and Steven E. Hurt, N. Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

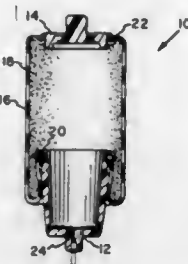
Division of Ser. No. 659,107, Oct. 9, 1984, Pat. No. 4,621,796.

This application Jun. 12, 1986, Ser. No. 873,645

Int. Cl.⁴ F16F 9/04; F16L 33/10

U.S. Cl. 29—436

4 Claims



1. A method of manufacturing an airspring having a first rigid retainer, a second rigid retainer, a flexible air impervious membrane sealably attached to the retainers to form a working cavity, said method comprising the steps of: (a) sealingly attaching an end of said membrane to each of said first and second retainers to form a working cavity therebetween; (b) forming an orifice through at least one of said first or second retainer, said orifice connecting with said working cavity; (c) inserting an unthreaded coupling assembly into said orifice, said coupling assembly including a ring adapted to be received in the orifice to provide an airtight seal with the retainer, an annular sleeve including a plurality of jaws adapted for receiving a fluid conduit positioned within said ring, an O-ring seal positioned in the orifice inwardly toward said cavity adapted to seal against the fluid conduit, said ring having a flared portion for forcing the plurality of jaws of the sleeve into engagement with the fluid conduit.

4,715,108

MACHINE TOOL CAPABLE OF CHANGING WORN CUTTING TOOLS, SUCH AS SMALL DIAMETER DRILLS, WITH NEW ONES

Kiyoshi Sugiyama, Susono, and Kotaro Nakamura, Nagazumi, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1986, Ser. No. 836,417

Claims priority, application Japan, Mar. 7, 1985, 60-45659; Feb. 6, 1986, 61-24767

Int. Cl.⁴ B23Q 3/157

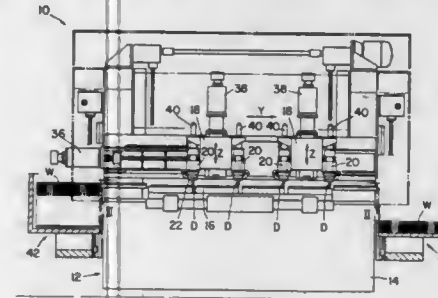
U.S. Cl. 29—568

19 Claims

1. A machine tool capable of changing old cutting tools, worn from use, with new ones, comprising:

- frame means;
- a table mounted to the frame means for reciprocating movement in a predetermined horizontal direction, toward and away from a preassigned tool change position;
- at least one toolhead disposed over the table and releasably holding a cutting tool;
- an old tool pot on the table for temporarily holding in an upstanding attitude an old tool released from the toolhead, the old tool pot including a discharge passageway, defined by a pot body for the discharge of the old tool;

- a new tool pot on the table for temporarily holding in an upstanding attitude a new tool to be held by the toolhead in substitution for the old tool released therefrom in the old tool pot;
- an elongate new tool cartridge for slidably holding a row of upstanding new tools and having a tool outlet adjacent one end thereof, the new tool cartridge being mounted to the frame means and so disposed thereon that the tool outlet thereof overlies and is aligned with the new tool pot on the table when the table is in the tool change position;



- tool pusher means having actuator means for concurrently pushing, when the table is in the tool change position, the old tool in the old tool pot down into the discharge passageway and one of the new tools in the new tool cartridge down through the tool outlet thereof into the new tool pot; and
- old tool recovery means for recovering the successive old tools discharged through the old tool pot.

4,715,109

METHOD OF FORMING A HIGH DENSITY VERTICAL STUD TITANIUM SILICIDE FOR REACHUP CONTACT APPLICATIONS

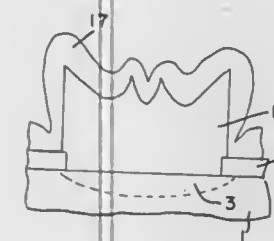
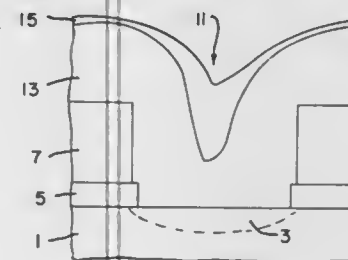
Jeffrey M. Bridges, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 12, 1985, Ser. No. 744,163

Int. Cl.⁴ H01L 21/28

U.S. Cl. 437—200

12 Claims



1. A method of forming a contact for a semiconductor device, comprising the steps of:

- providing a semiconductor substrate;

- forming an insulating layer on said substrate having an aperture therein extending to said substrate;
 - depositing a polycrystalline silicon layer in said aperture extending to said substrate and onto said insulating layer, said polycrystalline silicon layer having a depression therein extending into said aperture;
 - forming a first oxide layer on said polycrystalline silicon layer, said first oxide layer being thicker in said depression than elsewhere;
 - removing said first oxide layer and said polycrystalline silicon layer disposed over said insulating layer, retaining a portion of said first oxide layer in said depression;
 - removing said first oxide layer in said depression and a portion of said insulating layer;
 - depositing a layer of material taken from the class consisting of titanium, tantalum and molybdenum over said polycrystalline silicon layer; and
 - reacting said layer formed in step (g) with the polycrystalline silicon layer therebelow to form a reacted layer.
9. A method of forming a contact for a semiconductor device, comprising the steps of:

- providing a semiconductor substrate,
- forming an insulating layer on said substrate having an aperture therethrough extending to said substrate,
- depositing a conformal polycrystalline silicon layer in said aperture and over said insulating layer whereby the polycrystalline layer over said aperture is thicker than over said insulating layer, said polycrystalline silicon layer having a depression therein extending into said aperture;
- forming an etch retarding layer on said polycrystalline silicon layer only over said depression etchable at a rate substantially slower than said polycrystalline silicon layer,
- removing a substantially equal depth of polycrystalline silicon from over said aperture and said insulating layer except beneath said etch retarding layer to leave polycrystalline silicon only in said aperture and along the entire exposed substrate therein, and
- removing said insulating layer.

4,715,110

APPARATUS OF A ROBOT FOR INSTALLING WEATHER STRIPPING IN A DOOR OR LIKE OPENING

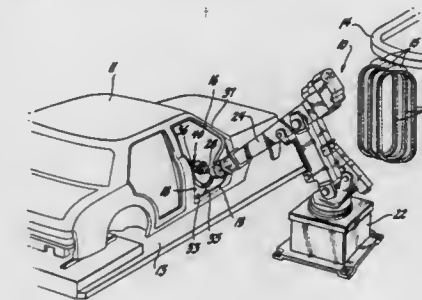
Stephen St. Angelo, Rochester Hills, Mich.; George C. Carver, Albany; David W. Patterson, Duluth, both of Ga., and Owen K. Fremont, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 18, 1986, Ser. No. 888,238

Int. Cl.⁴ B23P 21/00; B23Q 15/00

U.S. Cl. 29—701

11 Claims



1. A robot for installing a fixed length of weather stripping stored in a loading station into a body opening, said robot in combination comprising:

an arm supported on a pedestal movable in both horizontal and vertical planes;

means on the end of said arm to load said fixed length to said arm from said loading station; and

affixing means on the end of said arm and moved by said robot arm for interacting with the opening of said body

and guiding and applying said fixed length whereby said fixed length is affixed to the opening of said body.

11. A robot for installing a fixed length of weather stripping stored in a loading station into a body opening, said robot in combination comprising:

- a) an arm supported on a pedestal movable in both horizontal and vertical planes;
- a) a selectively operable gripper on the end of said arm to pull said fixed length from said loading station to load said arm;
- a) an idler roller on the end of said arm supporting said fixed length generally opposite said guide roller in said first position of said guide roller; and
- a) a powered pressure roller rotatably mounted on the end of said arm and moved by said robot arm having variable rotational velocity and compliance with respect to said arm in two axis, said pressure roller receiving said fixed length from said guide roller and guiding and applying said fixed length while tracing the opening of said body whereby said fixed length is affixed to the opening of said body.

4,715,111

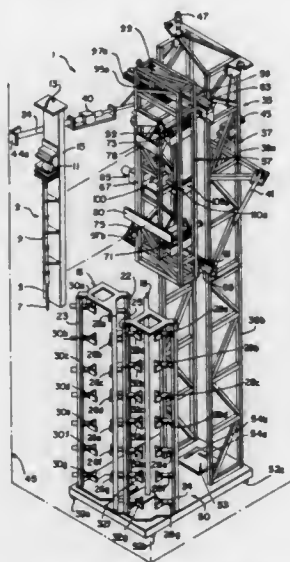
REMOTE REPAIR SYSTEM FOR NUCLEAR FUEL ROD ASSEMBLIES

Anoop Kapoor, Murrysville Boro; Edward J. Choby, Irwin, both of Pa.; Thomas J. Kramer, Cincinnati, Ohio; James E. Ranieri, Jeannette; Charles H. Roth, Jr., North Huntingdon; Donald E. Scheffer, Washington Township, Westmoreland County; John E. Spehar, Jr., Sewickley Township, Westmoreland County; Csaba Bessko, Pittsburgh, and Robert M. Blumstein, Greensburg, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 20, 1985, Ser. No. 746,897
Int. Cl.⁴ B23P 19/00, 21/00; B23Q 15/00

U.S. Cl. 29—723

30 Claims



1. A system for remotely reassembling and reconstituting nuclear fuel rod assemblies, wherein said rod assemblies each include an array of nuclear fuel rods mounted within a support skeleton having rod-guiding grids, comprising:

- (a) a rod handling means for gripping, lifting, lowering and ungripping a selected fuel rod;
- (b) a first work station for securing a support skeleton, and a second work station for securing an array of fuel rods;
- (c) positioning means for positioning the rod handling means

in selected positions over the first and second work stations in order to grip, lift, lower and ungrip selected fuel rods in selected positions, and

(d) control means operatively connected to the rod handling means and the positioning means for remotely controlling the positioning of the rod handling means, and the gripping, lifting, lowering and ungripping of the rod handling means.

4,715,112

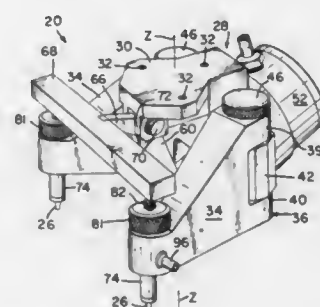
PICK-UP HEAD

Mark F. Jackson; Stephen P. Lawruk, both of Harrisburg; Dallas E. Schlegel, Mechanicsburg, and Richard V. Spong, Etters, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 10, 1986, Ser. No. 944,058
Int. Cl.⁴ H05K 13/04

U.S. Cl. 29—739

11 Claims



1. A pick-up head for use in picking up a workpiece having a pair of hollow rivets depending in spaced relationship from a lower surface thereof and opening into an upper surface thereof, and moving the workpiece towards a board to place said lower surface thereon thereby to insert said rivets into predetermined holes in the board, the pick-up head comprising:

- a) a body having a vertical central axis and an upper face;
- means on said upper face for attaching said body to a longitudinally movable shaft with said central axis coincident with the axis of the shaft;
- a) a pair of workpiece pick-up arms each pivotally attached at one end of said body, for movement towards and away from each other about pivotal axes extending alongside, and on opposite sides of, said central axis;
- means for releasably retaining said arms in desired relative angular positions about said pivotal axes;
- an elongate riveting tool mounted for axial movement in the other end of each pick-up arm in a direction parallel to said central axis;
- means for releasably securing each riveting tool to a rivet into which the tool has been inserted, to allow the pick-up head to pick up the workpiece; and
- drive means on said body for driving each riveting tool through a working stroke to secure said rivet in said predetermined hole in said board and through a return stroke to withdraw said riveting tool from said rivet.

4,715,113

MACHINE COMPONENT INSTALLATION DEVICE

John L. Wickham, Glenarm, Md., assignor to The J. L. Wickham Company, Inc., Baltimore, Md.

Filed Jul. 2, 1986, Ser. No. 881,234

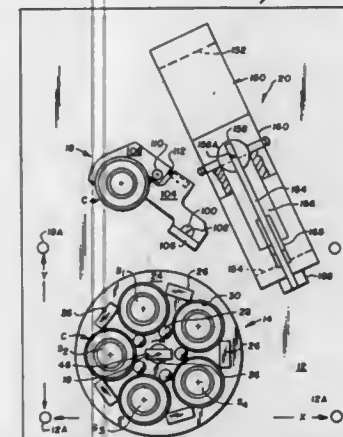
Int. Cl.⁴ B23P 19/00, 21/00; B65G 59/00

U.S. Cl. 29—792

6 Claims

1. A machine component installation device comprising:
a) a component feeder rotatably mounted on a base plate for controlled rotation about an axis, said component feeder

having at least two stacks of components to be installed, each stack selectively positionable at an active position;
a) a transfer arm mounted on said base plate for movement between first and second positions, said transfer arm including first and second pivotally connected members for grasping a component presented at said first position by



said component feeder and for pivoting motion to the second position; and
a) a component installation press having a ram operable along an installation axis substantially coincident with the second position, said ram operable to advance along the installation axis to carry a component grasped by said transfer arm.

4,715,114

TENSION SPRING TAKEOUT DEVICE IN AN AUTOMATIC TENSION SPRING MOUNTING APPARATUS

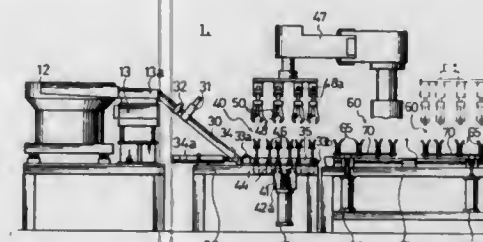
Yutaka Yajima, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 939,068

Int. Cl.⁴ B23Q 7/10; B23P 19/04

U.S. Cl. 29—809

11 Claims



1. A tension spring takeout device for use in an automatic tension spring mounting apparatus for automatically mounting a predetermined number of tension springs to frame members in a seat frame, said tension spring takeout device comprising:
a) a stock mechanism for sequentially separating a large number of tension springs from one another, arranging said tension springs in line, and stocking said tension springs therein;
a) a takeout mechanism including a predetermined number of takeout means located in said stock mechanism so as to correspond to the mounting intervals of said tension springs to said frame members, and operable such that a predetermined number of tension springs can be pushed out simultaneously; and,
a) a transfer device located so as to correspond to a direction in which said takeout mechanism pushes out said tension springs, and operable such that it can catch said tension

4,715,115

PACKAGE FOR WATER-SCALE SEMICONDUCTOR DEVICES

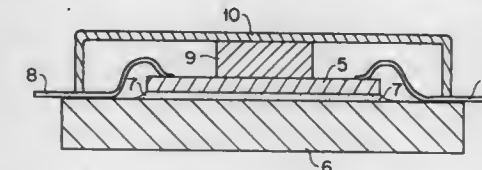
Michael O. King, Fremont, and Marvin S. Keshner, Mtn. View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 3, 1986, Ser. No. 847,410

Int. Cl.⁴ H01L 23/12, 23/14

U.S. Cl. 29—841

6 Claims



1. An apparatus for packaging a wafer comprising:
a) a substrate for supporting the wafer;
a) a viscous or semi-viscous fluid means for providing surface tension between the wafer and the substrate to restrict the wafer's motion in a direction perpendicular to the plane of the substrate;
a) a means mounted to the wafer for loosely clamping the wafer to the substrate for restricting the wafer's motion in a direction parallel to the plane of the substrate;
a) a cover attached to the substrate for shielding the wafer; and
an elastic means for restricting the wafer's motion in a direction perpendicular to the plane of the substrate wherein the elastic means is located between the wafer and the cover.

4,715,116

PRODUCTION OF DIELECTRIC BOARDS

John E. Thorpe, North Shields, and Gursharan S. Sarang, Ponteland, both of England, assignors to M&T Chemicals Inc., Woodbridge, N.J.

PCT No. PCT/GB84/00441, § 371 Date Oct. 21, 1985, § 102(e) Date Oct. 21, 1985, PCT Pub. No. WO85/02969, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 19, 1984, Ser. No. 770,290

Claims priority, application United Kingdom, Dec. 19, 1983, 8333753

Int. Cl.⁴ H05K 3/10

U.S. Cl. 29—846

12 Claims

1. A process for producing copper-clad dielectric boards, comprising the sequential steps of
(a) depositing a substantially uninterrupted layer of copper substantially free of micro-pores directly on a polished surface of a flat metallic press plate;
(b) providing the copper layer with a matte surface of copper of dendritic structure;
(c) bonding the matte surface to a dielectric material while applying heat and pressure to the press plate and the dielectric material in a laminating press and subsequently allowing the press to cool, the forces generated at the interface of the press plate and the copper layer, owing to the penetration of the dielectric material into the dendritic structure under pressure and the subsequent cooling of the dielectric material, being sufficient to overcome the adhesion of the copper layer to the polished surface of the press plate and thereby to cause the copper layer to be detached from the press plate;
(d) removing the resulting copper-clad dielectric board from the press and separating it from the press plate; and

- (e) returning the press plate to step (a) and repeating steps (a) to (d).

4,715,117

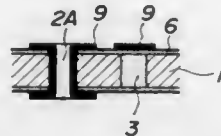
CERAMIC WIRING BOARD AND ITS PRODUCTION
Eyo Eomoto, Oogaki, Japan, assignor to Ilden Kabushiki Kaisha, Oogaki, Japan

Filed Mar. 14, 1986, Ser. No. 839,730

Claims priority, application Japan, Apr. 3, 1985, 60-69196
Int. Cl.⁴ H01K 3/22, 3/10

U.S. Cl. 29—851

12 Claims



1. A process for producing a ceramic wiring board, comprising the following steps (a) to (c):

- A step of making a sintered ceramic substrate having a plurality of holes, arranged regularly with a specified pitch
- A step of filling at least one of said plurality of through-holes with an electrical insulating material, and
- A step of forming by a plating process, simultaneously, a conductor circuit on the surface of said substrate and on the wall of at least one of the residual through-holes of said substrate.

4,715,118

CONNECTING STRIP FOR THE MANUFACTURE OF DIRECT TRANSFER ELECTRIC COMPONENTS AND MANUFACTURING METHOD FOR SUCH COMPONENTS

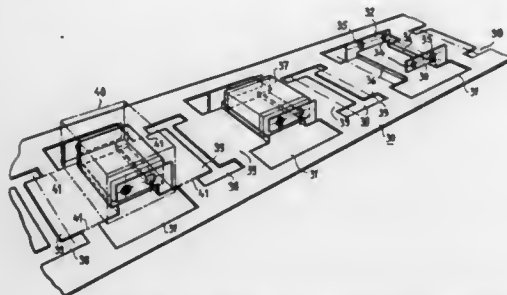
Gilles Bernard, Pourlans, and Francois Delalande, Seurre, both of France, assignors to Compagnie Europeenne de Composants Electroniques, Courbevoie, France

Filed May 2, 1986, Ser. No. 858,767

Claims priority, application France, May 10, 1985, 85 07148
Int. Cl.⁴ H05K 13/02; H01G 1/14

U.S. Cl. 29—856

10 Claims



1. A connecting strip useful in completion of manufacture of at least one direct transfer electric component presented as a solid body with a pair of body electrodes, said component, when completed having two electric terminations and a protective coating, each of said terminations including an electrical connection to one of the body electrodes, said strip comprising a metal foil with notches stamped out to provide:

- at least two attachment tag means to be folded over near the terminations to maintain said solid body in position relative to said strip to ensure an electrical connection between each said body electrode and one of said attachment tag means, at least one of said attachment tag means including a boss with head means to support said body and

provide an electrical connection to an adjacent body electrode, and

at least two strip electrode means to provide, after punching and folding, two exterior contacts to form said terminations, each of said terminations comprising a strip electrode means in contact with an attachment tag means which in turn is in contact with said body electrode.

10. A method of manufacturing an electric component from an intermediate form in which said electric component is presented as a solid body with a pair of body electrodes, said component, when completed having two electric terminations and a protective coating, each of said terminations including an electrical connection to one of the body electrodes, said method comprising the steps of:

- providing a strip comprising a metal foil with notches stamped out to provide at least two attachment tags to be folded over near the terminations to maintain said solid body in position relative to said strip to ensure an electrical connection between each said body electrode and one of said attachment tag means, and at least two strip electrodes to provide, after punching and folding, two exterior contacts to form said terminations, each of said terminations comprising a strip electrode in contact with an attachment tag which in turn is in contact with said body electrode,
- folding said attachment tags so as to receive said solid body,
- placing said solid body in position so that said attachment tags support said body while in electric contact with said body electrodes,
- soldering said body electrodes to the attachment tags,
- coating said body electrode with said strip acting as a support for the coating step,
- punching the strip to delimit each electric component and the strip electrodes, and
- folding and crimping the strip electrodes.

4,715,119

METHOD OF MANUFACTURING A PLUG

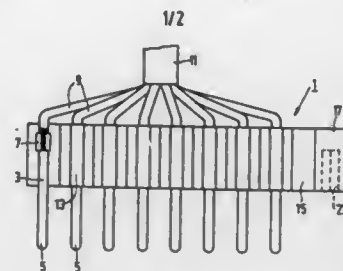
Henricus C. M. Joosten, Venlo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1986, Ser. No. 849,228

Claims priority, application Netherlands, Apr. 11, 1985, 8501064

Int. Cl.⁴ B29C 39/10, 53/02; H01R 43/02
U.S. Cl. 29—858

11 Claims



1. A method of manufacturing an electrical plug having at least three linear contact members arranged in a circle, a substantial portion of each contact member adjacent a first end thereof being an electrical contact and a remaining substantial portion of each contact member adjacent the opposite end thereof being a connection portion thereof which is electrically and mechanically connected to a conductor of a cable, the contact members being secured in a supporting body which is subsequently enclosed, together with the adjoining portion of the cable, by a plug body which leaves the contact portions of the contact members free; such method comprising forming said supporting body by the steps of:

- aligning the contact members so as to be adjacent and mutually parallel in a straight line;
- moulding the connection portions of the aligned contact

members in a ribbon-like, flexible plastic body so as to embed such connection portions in such plastic body; connecting the connection portions of the contact members to the conductors of the cable; rolling up the plastic body so as to form a cylinder which constitutes said supporting body; and mounting such cylinder in a bush of insulating material.

4,715,120

RAZORS, AND SHAVING UNITS FOR RAZORS

Angus J. McGready, Reading, England, assignor to Wilkinson Sword Limited, London, England

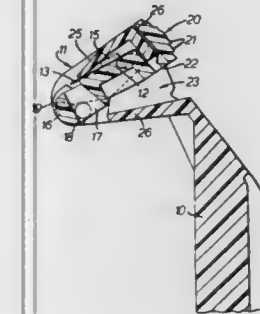
Continuation of Ser. No. 374,669, May 4, 1982, abandoned. This application Aug. 11, 1986, Ser. No. 895,546

Claims priority, application United Kingdom, May 19, 1981, 8115320

Int. Cl.⁴ B26B 21/14

U.S. Cl. 30—57

8 Claims



1. A razor blade assembly whose components comprise an elongate handle, a top cap rigidly secured to one end of the handle, a razor blade having a cutting edge and underlying the top cap, a guard bar disposed at the front of said assembly and spaced from the front edge of the top cap to form an opening therebetween, and means permanently supporting the blade beneath the top cap for solely pivotal movement relative thereto about an axis parallel to said cutting edge between a first position in which said cutting edge is exposed at said opening for shaving and said blade, top cap and guard bar cooperatively define the shaving geometry of the razor blade assembly, and a second position in which said cutting edge is retracted from said opening and underlies said cap in spaced relation thereto.

4,715,121
GRIP SCISSORS

Makoto Sugiyama; Hiroshi Sugimura; Naoyoshi Machida, and Yoshitichi Murai, all of Seki, Japan, assignors to Kai Cutlery Center Co., Ltd., Seki, Japan

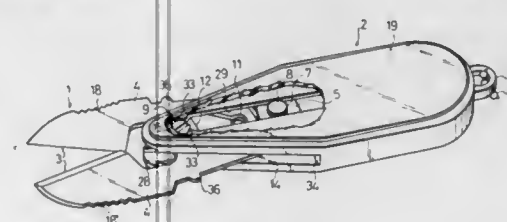
Filed Dec. 18, 1985, Ser. No. 810,919

Claims priority, application Japan, Sep. 19, 1985, 60-142968[U]

Int. Cl.⁴ B26B 13/00

U.S. Cl. 30—253

14 Claims



1. A pair of grip scissors comprising
(a) a grip scissor body having a pair of mutually open/closeable scissor segments, said scissor segments having respec-

tive stopper portions which, when said scissor segments are moved in mutually opening directions, come into contact with each other to restrict the degree of opening said scissor segments,

- a housing capable of housing completely therein said grip scissor body in a housed state and of extending said grip scissor body outward to a projected state, said grip scissor body being movable in the lengthwise direction of said housing case,
- at least one slide groove formed in said housing case and extending in the lengthwise direction thereof,
- a slide coupled to said grip scissor body and movable reciprocatingly along said slide groove of said housing case, and
- lock means for automatically locking said grip scissor body when said body is retracted to the housed state or extended to the projected state.

4,715,122

PLASTIC HANDLE SCISSORS

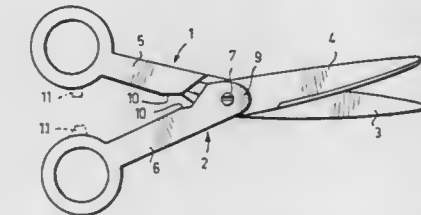
Olavi Lindén, Billnäs, Finland, assignor to Fiskars Oy AB, Helsinki, Finland

Filed Sep. 29, 1986, Ser. No. 912,317

Int. Cl.⁴ B26B 13/02

U.S. Cl. 30—254

4 Claims



1. A scissors comprising two scissors halves which have a hinged connection with one another that disposes each said scissors half with an inner surface thereof adjacent to the other and an opposite outer surface thereof remote from the other, each said scissors half comprising an elongated blade member of metal or the like and a plastic handle member fixed to the blade member, said blade member having a blade portion which extends along one part of its length to a tip at one of its ends and on which there is a cutting edge and having a connecting portion which extends along another part of its length to an opposite end thereof and in which there is a hole for said hinged connection, and said handle member being formed in one piece and having a tongue which embraces the connecting portion of the blade member around the outer surface thereof, said scissors being characterized by:

- the tongue of the handle member of one of said scissors halves having a male hinge element formed in one piece therewith that comprises
 - a base portion which fills said hole in said one scissors half and
 - a cylindrical pin portion
 - which is of substantially smaller diameter than said base portion,
 - which projects axially beyond the inner surface of said one scissors half and a substantial distance into said hole in the other scissors half, and
 - the axis of which is at predetermined distances from said tip and from said cutting edge of said one scissors half; and
- the tongue of the handle member of said other scissors half being formed to provide a female hinge element that cooperates with said cylindrical pin portion to provide said hinge connection, said tongue of said other scissors half having a bore therein that defines a cylindrical bearing surface

- (1) wherein said pin portion is received with a close but rotatable fit and
- (2) the axis of which is at predetermined distances from said tip and from said cutting edge of said other scissors half.

4,715,123

ROTARY TRIMMER WITH SELF-CONTAINED COLLECTION MEANS

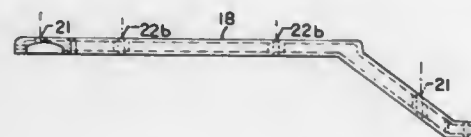
Ansel N. John, Centerville, Ohio, and Richard L. Jackson, 7193 N. Preble County Line Rd., Lewisburg, Ohio 45338, assignors to Richard L. Jackson, Lewisburg, Ohio

Continuation-in-part of Ser. No. 702,400, Feb. 15, 1985, Pat. No. 4,672,744. This application Jul. 14, 1986, Ser. No. 885,141

Int. Cl.⁴ B26B 7/00

U.S. Cl. 30—276

8 Claims



7. In a rotary device for cutting vegetation and the like, comprising:

- an angularly shaped housing, including a cylindrical housing having a defined channel extending from the forward portion thereof to the rearward portion thereof, said rearward portion of said angularly shaped housing providing collection space for said cut vegetation,
- a handle mounted on said angularly shaped housing, and motor means mounted in said cylindrical housing,
- said motor means including an extending power driving shaft, said shaft being perpendicular to the longitudinal axis of said handle, said handle including control means and energizing means for said motor means,
- a rotatable blade housing member adapted to be driven by said power driving shaft, including at least one cutting blade member, said combination of blade housing member and said cutting blade member describing a plane generally perpendicular to said power driving shaft, and
- a plurality of radially extending tines disposed forward of said angularly shaped housing and describing a radius exceeding a radius described by said cutting blade member, said tines describing a plane parallel to that described by said cutting blade member.

4,715,124

PROFILE GAUGE

Patrick W. Harrington, Hertfordshire, England, assignor to Florin Limited, London, England

Filed Apr. 16, 1986, Ser. No. 852,982

Claims priority, application United Kingdom, Apr. 26, 1985, 8510730

Int. Cl.⁴ G01B 5/20

U.S. Cl. 33—175

8 Claims

1. A profile gauge comprising a multitude of juxtaposed elongate blades which are independently biased into frictional contact with, and longitudinally slidable with respect to, a common supporting member in the form of a plate, each of said blades containing a longitudinal slot and said supporting member being engaged through all the slots of said blades, wherein the said blades are of plastics material and the bias is provided by resilience of the said plastics material, the slot in each blade containing a constriction at which the slot width is less than the thickness of the plate such that at least part of the slot in each

blade is narrower than the plate is thick, whereby said blades are individually sprung onto said supporting member, the



4,715,125

DOOR LOCK DRILLING TEMPLATE

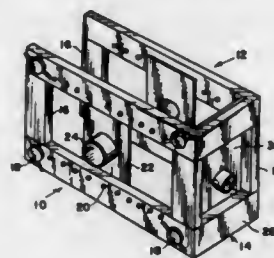
Lester R. Livick, 15106 Beatty St., San Leandro, Calif. 94579

Filed Dec. 8, 1986, Ser. No. 939,419

Int. Cl.⁴ B27G 17/08; B23B 47/28

U.S. Cl. 33—197

5 Claims



1. A template for the accurate cutting and drilling of latch and lock openings in a door stile, said template comprising:
- first and second elongated parallel frame members rigidly connected together at their first end;
 - a pair of tubular hole cutting guides each connected to and extending laterally outward from a plate, said guides for receiving a circular saw;
 - means for attaching said hole cutting guides and connected plates to selected positions along said first and second frame members;
 - a tubular drilling guide connected to and extending outward and perpendicular to an end plate member secured to said first and second frame members at their said first end, said drilling guide for receiving a latch hole boring drill;
 - at least one pointed member longitudinally adjustable in said end plate member, said pointed member positioned in said end plate member to pierce a point on the vertical centerline of a door stile edge; and
 - clamping means coupled to at least one of said parallel frame members for clamping the template to the edge of a door stile.

4,715,126

ARCHERY BOW SIGHT

Terry Holt, 2181 Broadmore Ave., San Pablo, Calif. 94806

Filed Jan. 7, 1987, Ser. No. 1,231

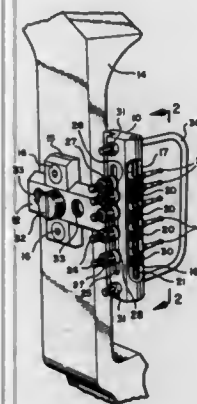
Int. Cl.⁴ F41G 1/46

U.S. Cl. 33—265

9 Claims

1. An archery bow sight, comprising a plurality of elongate sighting pins; a plurality of sighting pin receiving and holding means; a mounting block; a longitudinal groove in said mounting block that receives the plurality of sighting pin receiving and holding means for sliding movement therealong, said groove defining a path of travel for said plurality of sighting

pin receiving and holding means; a threaded shaft extending along the length of said groove; mating thumbwheel means mounted in respective sighting pin receiving and holding means whereby rotational movement of a thumbwheel by a user imparts longitudinal movement to the respective pin re-



ceiving and holding means for moving respective sighting pin receiving and holding means back-and-forth along said path of travel and for maintaining the position of said individual receiving and holding means at any position along said path when operation of the means for moving ceases; and means for mounting the sight on an archery bow.

4,715,127

RULER FOR MEASURING ANGLES BETWEEN AN ORIENTED AXIS AND A VECTOR

Eugenio P. Bernabeu, Tramontana 16, San Just Desvern, Barcelona, Spain

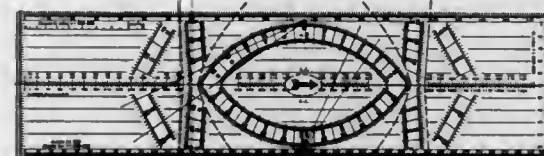
Filed Jan. 21, 1986, Ser. No. 820,096

Claims priority, application Spain, Jan. 19, 1985, 284,265

Int. Cl.⁴ G01B 3/02

U.S. Cl. 33—494

6 Claims



1. A ruler for measuring angles increasing in a clockwise direction between 0° and 360° between an oriented axis and a vector, comprising an essentially flat and transparent body including, in combination;
- a perimeter including two edges parallel with each other;
 - an arrow situated on a part of said body and parallel with said edges;
 - a surface on said ruler subdivided into eleven zones separated from each other by five lines, including a longitudinal line and four zonal lines, said longitudinal line being a straight line parallel with and equidistant from said edges, said longitudinal line being interrupted at its central part, where a closed curve is provided; said zonal lines each reaching from one of the said edges to the other without crossing each other, two of said zonal lines being on one side of said closed curve and the other two being on the other side of said closed curve.

4,715,128

CURVATURE PROBE AND METHOD

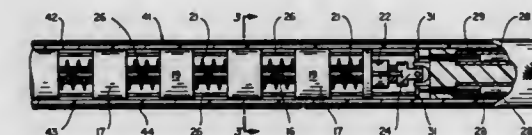
Richard E. Cummings, Camino; Charles S. Mackey, Bakersfield, both of Calif.; Robert W. Dickinson, 40 Maplewood Dr., San Rafael, Calif. 94901; Ben W. O. Dickinson, III, 2125 Broderick St., San Francisco, Calif. 94115, and Merle D. Larsen, Concord, Calif., assignors to Ben Wade Oakes Dickinson III and Robert Wayne Dickinson, both of San Francisco, Calif.

Filed Dec. 19, 1985, Ser. No. 811,531

Int. Cl.⁴ G01B 7/28

U.S. Cl. 33—544

16 Claims



1. In a curvature probe: an axially extending flexible shaft, a plurality of axially spaced guide members mounted on the flexible shaft and being movable axially of the shaft, means between adjacent ones of the guide members for maintaining the guide members in a spaced relationship, two pairs of axially extending sensing wires positioned in quadrature about the shaft with the two wires in each pair being positioned on opposite sides of the shaft, said wires passing freely through axially aligned openings in the guide members and being free to move relative to each other in an axial direction upon bending of the probe, and means responsive to the relative axial positions of the two wires in each pair for providing an output signal corresponding to the curvature to which the probe is bent.

4,715,129

SHELF STRUCTURE FOR DRYING SACKED MATTER

Shiichiro Uchida, Fujisawa, Japan, assignor to Shonetsugaku Kenkyusho Co., Ltd., Tokyo, Japan

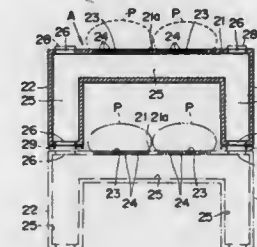
Filed Jan. 23, 1986, Ser. No. 824,573

Claims priority, application Japan, Jun. 24, 1985, 60-95468[U]

Int. Cl.⁴ F26B 9/00

U.S. Cl. 34—195

3 Claims



1. A shelf structure for drying sacks of particulate matter, said shelf structure comprising a plurality of hollow pallet-shaped shelves, each one of said plurality of hollow pallet-shaped shelves comprising:
- (a) a hollow top board having a hollow internal portion defined therein and a carrier section defined on the top thereof, said carrier section serving, in use, to support at least one sack of particulate matter, said carrier section having a plurality of through-holes therein providing communication between said hollow internal portion and the exterior of said hollow top board;
 - (b) a plurality of hollow legs extending downwardly from said hollow top board at horizontally spaced intervals, each one of said plurality of hollow legs having a hollow internal portion defined therein, each one of said hollow internal portions in said plurality of hollow legs being in communication with said hollow internal portion in said

hollow top board, said plurality of hollow legs being sized, shaped, and positioned so that said plurality of hollow pallet-shaped shelves can be stacked vertically on top of each other to form said shelf structure; and

(c) means for creating a pressure differential between said hollow internal portion and the exterior of said shelf structure, said means comprising:

(i) a first opening in the bottom of at least one of said plurality of hollow legs on each one of said plurality of said hollow pallet-shaped shelves and

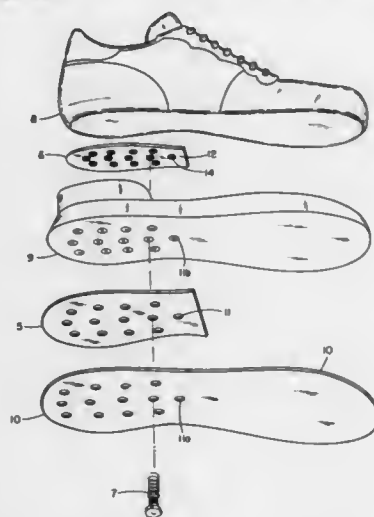
(ii) a second opening in said hollow top board on each one of said plurality of hollow pallet-shaped shelves sized, shaped, and positioned to communicate with said first opening in the next higher one of said plurality of hollow pallet-shaped shelves when said plurality of hollow pallet-shaped shelves are stacked to form said shelf structure.

4,715,130

CUSHION SYSTEM FOR SHOES

Alessandro Scatena, P.O. Box 11, 55060 Guamo, Lucca, Italy
Filed Jul. 2, 1986, Ser. No. 881,086
Claims priority, application Italy, Sep. 20, 1985, 87710 A/85
Int. Cl.⁴ A43B 21/30, 21/26
U.S. Cl. 36—27

6 Claims



1. A cushioning assembly for the rear part of a shoe comprising an outer sole (10), an upper sole (6), a first intersole (5) positioned adjacent said outer sole, at least one spring (3) positioned between said outer sole (10) and said upper sole (6), said spring having a top part and a lower part, said upper sole having at least one tooth (14), said tooth entering the top part of said spring and supporting said top part and holding the spring in place, said first intersole (5) having at least one threaded orifice (11), a pin (1) having a rigid base (2), an externally threaded portion (4), said threaded portion of said pin (4) being engageable with said threaded orifice (11) of said first intersole, said outer sole (10) having at least orifice (11a) in alignment with said threaded orifice of said intersole, said externally threaded portion of said pin passing through said orifice of said outer sole (10), said orifice of said outer sole being of size essentially equal to said base (2) of said pin, the bottom part of said spring resting on said pin.

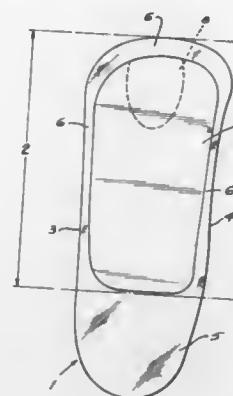
4,715,131

ORTHOPEDIC SUPPORTING MEMBER, PARTICULARLY ORTHOPEDIC SHOE INSERTS, AND METHOD OF ITS MANUFACTURE

Juergen Kremendahl, Remscheid, Fed. Rep. of Germany, assignor to Globus Fussstützenfabrik Karl Kremendahl, Remscheid, Fed. Rep. of Germany
Filed Feb. 18, 1986, Ser. No. 830,682
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 8509263[U]; European Pat. Off., Jul. 10, 1985, 85112695.3
U.S. Cl. 36—44

Int. Cl.⁴ A43B 13/38

15 Claims



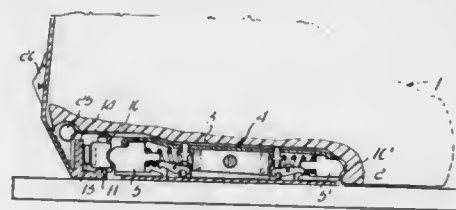
15. An orthopedic support member, comprising a body part composed of polyethylene terephthalate having zones of different stiffnesses, said body part being formed as an orthopedic shoe insert including a curved support zone for a central foot part and a heel zone for a heel of the foot with said zones formed of one-piece with one another, said support zone being stiff and bending-resistant and having a core composed of at least somewhat crystalline polyethylene terephthalate, said heel zone being elastic and composed of amorphous polyethylene terephthalate.

4,715,132

SKI BOOT FOR DISAPPEARING-TYPE BINDINGS

Alessandro Pozzobon, Paderno di Ponzano Veneto, Italy, assignor to Nordica S.p.A., Montebelluna, Italy
Filed Aug. 18, 1986, Ser. No. 897,562
Claims priority, application Italy, Sep. 4, 1985, 22066 A/85
Int. Cl.⁴ A43B 5/04; A63C 9/086
U.S. Cl. 36—117

4 Claims



1. In a ski boot and safety ski binding assembly, comprising a binding mechanism adapted to be fixed onto the ski and including opposite outwardly projecting spring biased latch members defining a longitudinal direction of the binding and wherein the ski boot includes a sole with a tread surface having a recess adapted to encircle said binding mechanism and movable catch members supported on said ski boot within said recess and having on one side thereof a shaped catch receptacle surface for mating engagement with said latch members and an abutment formation on an opposite side thereof, an actuating mechanism within said ski boot for at least one

of said movable catch members, said actuating mechanism comprising,

a movable abutment member selectively in abutment relationship with said abutment formation,

first force transmitting means for urging said abutment member in a position of abutment between said abutment member and said abutment formation of said catch member in which said catch member is locked in a first position in latching engagement relationship with one of said spring biased latch members,

second force transmitting means for withdrawing said abutment member from said first position thereof to allow said catch member to move away from said first position thereof out of latching engagement with said spring biased latch members,

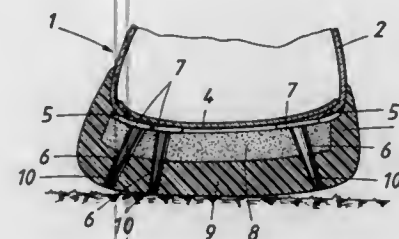
a control action element arranged on said ski boot in a position accessible from the outside and

transmission means for transmitting control action from said control action element to said actuating mechanism.

4,715,133
GOLF SHOE

Rudolf Hartjes, Neuhausen 12, A-4910 Ried/Innkreis, Austria, and Günter Gräber, Klosterstrasse 4, D-6732 Edenkoben, Fed. Rep. of Germany
Filed Jan. 13, 1986, Ser. No. 874,229
Claims priority, application Austria, Jun. 18, 1985, 1803/85
Int. Cl.⁴ A43B 5/00; A43C 15/00
U.S. Cl. 36—127

5 Claims



1. A golf shoe comprising

(a) an outsole defining a plurality of through holes,

(b) a resilient abutment disposed on top of the outsole and covering said through holes, the resilient abutment defining a like plurality of through holes in alignment with the through holes in the outsole,

(c) a like plurality of spikes, each of which comprises

(1) a pressure-applying plate bearing on said abutment from above and

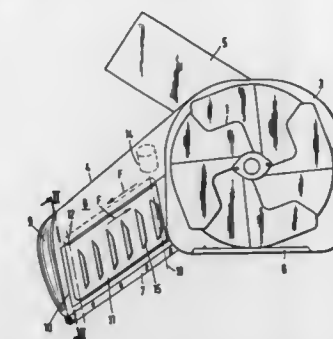
(2) a shank depending from said plate and extending through respective ones of said aligned through holes in the abutment and outsole, and

(d) an insole disposed on top said abutment, the pressure-applying plates of the spikes being disposed between the abutment and the insole, and the plates conforming to adjacent portions of the insole whereby said spikes are movable between a generally retracted position, in which said spikes do not substantially protrude below said outsole when a golfer is walking in said shoe, and an extended position, in which localized pressure upon respective ones of the adjacent insole portions causes respective ones of the pressure-applying plates to depress the resilient abutment and to move respective ones of the spikes axially through the aligned through holes so that at least certain of said spikes project below said outsole when the golfer performs a swinging motion.

4,715,134
ROTARY SNOW PLOUGH

Alfred Schmidt, Bernau, Fed. Rep. of Germany, assignor to Ing. Alfred Schmidt GmbH, St. Blasien, Fed. Rep. of Germany
Filed Jan. 24, 1985, Ser. No. 694,657
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404847
Int. Cl.⁴ E01H 5/09
U.S. Cl. 37—238

7 Claims



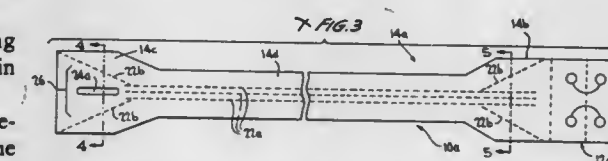
1. A rotary snow plow with at least one rotary element, a housing, a feed plough having a ploughshare attached to a side of the housing in order to increase the intake of snow with respect to a ground surface, the ploughshare of the feed plough including a belt conveyor element arranged laterally of the rotary plough, the plane of said belt conveyor element being parallel to the plane of the ploughshare and is set oblique to the ground surface so that the rear side of the ploughshare, in the direction of travel, forms an acute angle with the ground surface; and wherein the belt conveyor element is oriented with its conveying direction towards or above the rotational axis of the rotary element said ploughshare having an aperture said belt conveyor being installed in said aperture.

4,715,135
LONGITUDINALLY REINFORCED DISPLAY TAG FOR PRODUCT INFORMATION

Jacob Fast, 7561 NW, 9th St., Plantation, Fla. 33317
Filed Jan. 19, 1986, Ser. No. 876,167
Int. Cl.⁴ G09F 1/00

U.S. Cl. 40—10 R

9 Claims



1. An elongated product information and display tag blank of plastic sheet having a mounting portion for releasably securing the blank at a proximal end of a horizontally extending support hook or the like, a substantially flat elongate portion adjacent the mounting portion for extending over the hook to present product information at a distal end thereof and lengthwise strengthening means extending at least along the elongate portion of the blank for promoting transverse flexure of the elongate portion into a bowed configuration when the elongate portion is, squeezed laterally there by reinforcing the blank against longitudinal flexure.

4,715,136

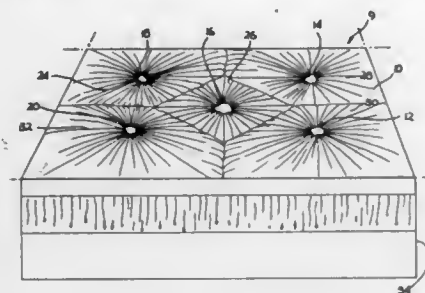
METHOD AND APPARATUS FOR CREATING A KINETIC WATER DISPLAY

Mark W. Fuller, Los Angeles, and Alan S. Robinson, El Monte, both of Calif., assignors to Wet Enterprises, Inc., Burbank, Calif.

Filed Sep. 9, 1986, Ser. No. 905,698
Int. Cl.⁴ G09F 19/00

U.S. Cl. 40-406

28 Claims



1. An apparatus for creating a kinetic water display effect, said apparatus comprising:
means for generating at least one stream of water in a first direction;
transparent plate means having inner and outer surfaces, said plate means being disposed at a substantial angle and in opposing relationship to said first direction of said at least one stream of water, said plate means being disposed across said means for generating said at least one stream of water such that said stream impinges upon the inner surface of said plate means thereby forming at least one kinetic shape comprised of ambient air and said water upon said inner surface of said plate means;
whereby an aesthetically pleasing kinetic water display viewable from a location above said outer surface of said transparent plate means is achieved.

4,715,137

ILLUMINATED DISPLAY WITH BEADED LIGHT-TRANSMITTING IMAGE

William J. Scheve, N5 W31797 Shagbark Glen, Delafield, Wis. 53018

Filed Jan. 31, 1986, Ser. No. 825,026
Int. Cl.⁴ G09F 13/18

U.S. Cl. 40-546

14 Claims



1. An illuminated display, comprising:
a light-transmitting member having at least one face;
a light source adjacent to the light-transmitting member;
an image applied to the face of the light-transmitting member comprising a layer of light-transmitting adhesive in the shape of the image adhered to the face and a plurality of light-transmitting particles adhered to the adhesive,

whereby, when the light source is lit, the image appears to be brighter than the rest of the member.

4,715,138

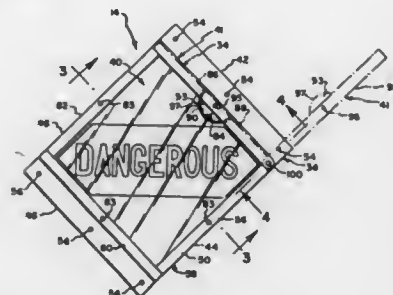
PLACARD HOLDER

John R. Cherico, Buffalo, N.Y., assignor to Johnny Stopper Inc., Cheektowaga, N.Y.

Continuation-in-part of Ser. No. 781,269, Sep. 30, 1985, abandoned. This application Nov. 1, 1985, Ser. No. 793,902
Int. Cl.⁴ G09F 21/04

U.S. Cl. 40-591

22 Claims



1. A placard holder comprising:
means defining a rigid base sheet;
means providing a rigid transparent panel arranged in spaced and parallel relationship with said base sheet; and
frame means connected between said panel and said base sheet for supporting said panel in spaced relationship with said base sheet, said base sheet, panel and said frame means collectively defining a relatively narrow, open-ended receptacle for holding a plurality of placards, said receptacle defining an opening at the open end thereof permitting the passing of placards into and out of said receptacle, said panel includes one edge extending along said receptacle opening and said one edge defining a notch facilitating the removal of placards from and the interchanging of placards within said receptacle, said frame means including at least one elongated member having a securement portion secured to said base sheet and a holding portion to which said transparent panel is secured, said holding portion being a first unitary structure and said securement portion being a second unitary structure including a thin strip portion and means defining a pair of parallel guide tracks, said thin strip portion extending along the length of said elongated member and defining two opposite edges and a planar surface engaging said base sheet, said parallel guide tracks joined to a corresponding edge of said thin strip portion and directed generally from the side of said thin strip portion opposite said planar surface, and said holding portion includes means interlocked with said pair of guide tracks so that said holding portion and said securement portion are cooperatively interlocked with one another.

4,715,139

CLOSED BREECH MUZZLE LOADER AND LOADING TOOL

Frederick W. Rodney, Jr., 134 Flagg Rd., Rochester, N.H. 03867

Filed Mar. 3, 1987, Ser. No. 21,174
Int. Cl.⁴ F41C 11/00

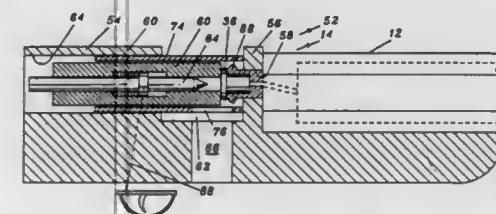
U.S. Cl. 42-51

8 Claims

1. In a muzzle loader having a barrel with a breech end, an improved breech assembly comprising:
(a) a breech block member adapted to be fitted into a gunstock and to receive the barrel in combination with the gunstock, said breech block member including a first bulkhead disposed over the breech end of the barrel, said first bulkhead having a first bore therein having an axis parallel to the axis of the barrel, said breech block member

further including a second bulkhead spaced from said first bulkhead to create a space therebetween, said second bulkhead having a second bore therein in axial alignment with said first bore, said breech block member additionally including a vertically disposed chimney bore communicating between the bottom of said space and the outside atmosphere;

- (b) a nipple member disposed in said first bore, said nipple member having a third bore therein having an axis parallel to the axis of the barrel and facing into said space, said third bore being sized to releasably receive a percussion cap therein, said nipple member further having a fourth bore therein communicating between the bottom of said third bore and the interior of the barrel at the breech end thereof whereby a percussion cap detonated in said third bore will in turn detonate gunpowder disposed in the barrel;
- (c) a cylindrical sliding sleeve disposed within said second bore, said sliding sleeve being slidable between a closed position against said first bulkhead to cover said space and



- said nipple member and a retracted position spaced from said first bulkhead to expose said space and said nipple member, said sliding sleeve having means in the sidewalls thereof for the passage of gases therethrough from said nipple member to said chimney bore when said sliding sleeve is in said closed position;
- (d) a cylindrical firing pin assembly disposed within said sliding sleeve, said firing pin assembly being slidable between a closed position close adjacent said nipple member and a retracted position spaced from said nipple member to expose said nipple member, said firing pin assembly having an axial fifth bore therethrough and including a firing pin slidably disposed within said fifth bore and spring bias means for urging said firing pin towards said nipple member; and,
- (e) trigger means disposed in said breech block member for holding said firing pin retracted from said nipple member against the bias force of said spring bias means and for releasing said firing pin to move towards said nipple member from the bias force of said spring bias means.

4,715,140

COMPENSATOR FOR HANDGUNS AND THE LIKE

Fred Rosenwald, 148 W. Julianna Dr., Churchville, Pa. 18966
Continuation-in-part of Ser. No. 787,157, Oct. 15, 1985, abandoned. This application Mar. 17, 1987, Ser. No. 26,733
Int. Cl.⁴ F41C 21/18; F41F 17/12

U.S. Cl. 42-97

8 Claims



1. A compensator assembly for a handgun comprising a barrel, a slide surrounding and reciprocally movable relative to said barrel, a spring return system including a spring whose forward end extends at least partially into a lower opening in said slide, said compensator assembly comprising:
a hollow bushing having a rearward portion extending into

and releasably coupled to said slide and surrounding and slidably receiving the forward portion of said barrel;
a spring guide rod for said spring return system extending through the lower opening in said slide and through said spring;
projection means on said bushing extending towards said spring guide rod;
said barrel having a projection;
means slidably mounted on said guide rod and engaging said bushing projection means and said spring for charging said spring to normally urge one end of the guide rod into engagement with said barrel projection;
a compensator weight having an upper bore slidably receiving the forward end of said bushing and having a lower bore receiving the forward end of said guide rod; and
fastening means for securing said compensator weight to said guide rod to prevent said guide rod and compensator weight from experiencing linear movement relative to one another, said projection means preventing rotational movement of said bushing and holding said slidably mounted means in a position to preload said spring.

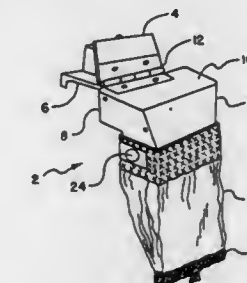
4,715,141

SPENT CARTRIDGE COLLECTOR

William M. Kohnke, 1170 Garraty Rd., San Antonio, Tex. 78209
Continuation of Ser. No. 816,653, Jan. 6, 1986, abandoned. This application Oct. 17, 1986, Ser. No. 919,600
Int. Cl.⁴ F41C 27/00

U.S. Cl. 42-98

1 Claim



1. A spent cartridge collector for receiving and collecting empty shell casings ejected through a cartridge ejection port in the wall of a firearm comprising:
a mounting unit for securing said spent cartridge collector to a firearm,
a deflector assembly affixed to said mounting unit and having an inlet port enveloping said cartridge ejection port of said firearm, an outlet port, a top surface, a front surface and a rear surface,
said inlet port being substantially larger than said cartridge ejection port and being asymmetrically positioned with respect to said mounting unit and said cartridge ejection port to extend beyond said ejection port in a direction towards the muzzle of said firearm and provide an internal volume in said deflector assembly forward of said ejection port,
said deflector assembly being hinged to said mounting unit above said cartridge ejection port to permit inspection of said cartridge ejection port of said firearm, and having said outlet port substantially orthogonal to said inlet port, said deflector assembly being formed of sheet metal and having a planar part of said top surface inclined downwardly to redirect shell casings entering said inlet port towards said output port,
said deflector assembly having a planar part of said front surface aligned substantially perpendicular to said cartridge ejection port and inclined rearwardly towards the butt end of said firearm to redirect shell casings impinging thereon towards said butt end of said firearm and permit

operation of said firearm by left-handed marksmen with said cartridge collector mounted thereon, and a cartridge collection bag affixed to said outlet port of said deflector assembly, said bag having a pair of Velcro strips affixed to the bottom thereof for opening said bag to remove collected shell casings from said bag.

4,715,142

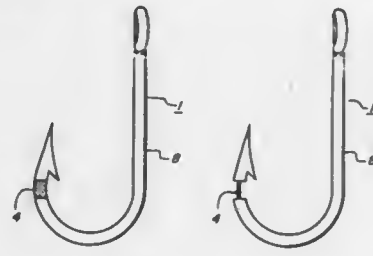
SELF-DESTRUCT FISH HOOK

Joseph D. Richard, 531 S. Navy Blvd., Pensacola, Fla. 32507
Filed May 7, 1987, Ser. No. 46,702

Int. Cl.⁴ A01K 97/02

U.S. Cl. 43—43.16

11 Claims



7. A self-destruct fish hook of the character described comprising:

- a fish hook having a predominantly steel body and conventional shape;
- a cathode covering a substantial portion of the surface of said fish hook, said cathode comprising a metal coating substantially noble galvanically with respect to the steel body of said hook;
- an anodic area including a relatively smaller portion of the surface of said fish hook separate from said cathode which is active galvanically with respect to said cathode; and means for delaying the onset of corrosion of the steel body of said hook beneath said anodic area after said hook is immersed in seawater; whereby said cathode and the steel body of said hook beneath said anodic area eventually form a galvanic couple after a period of immersion in seawater.

4,715,143

ARTIFICIAL SEED COAT FOR BOTANIC SEED ANALOGS

M. Keith Redenbaugh, Davis, and Zolla Reyes, Menlo Park, both of Calif., assignors to Plant Genetics, Inc., Davis, Calif.
Continuation of Ser. No. 570,611, Jan. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 545,678, Oct. 25, 1983, Pat. No. 4,583,320, which is a continuation-in-part of Ser. No. 433,688, Oct. 12, 1982, Pat. No. 4,562,663. This application Apr. 24, 1986, Ser. No. 794,626

The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.⁴ A01C 1/06; A01G 9/10

U.S. Cl. 47—57.6

14 Claims

1. A membrane coated hydrogel capsule encapsulating meristematic tissue and separating said tissue from its environment, which comprises:

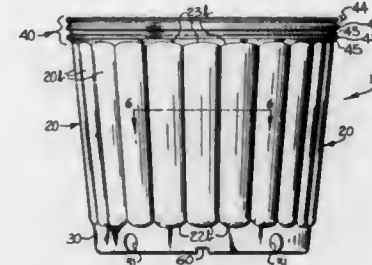
- a hydrogel capsule which contains encapsulated meristematic tissue substantially free of intact seed coat; and
- at least one membrane coating surrounding the capsule which reduces the flow of solvents and their included solutes between the capsule and its environment, thereby creating an analog to natural botanic seed having an artificial seed coat which provides the benefits of natural seed coat.

4,715,144
PLANT CONTAINER WITH CONCAVOCONVEX RIBS
Norman C. Lee, Greensboro, N.C., assignor to Zarn, Inc., Reidsville, N.C.

Filed Mar. 7, 1986, Ser. No. 837,501
Int. Cl.⁴ A01G 9/02

U.S. Cl. 47—66

7 Claims



1. A container for planting and growing plants in soil medium consisting of a unitary body forming a substantially frusto conical cylinder of thin, molded plastic material comprising:

- a sidewall portion comprising substantially vertically extending circumferentially arranged elongate concavoconvex ribs with the concave areas of said ribs facing inwardly toward the center axis of the plant container and the convex areas of said ribs facing outwardly away from the center axis of the plant container, said concavoconvex ribs decreasing in width as they extend from the top to the bottom of the container,
- a circumferentially extending rim portion comprising a circumferentially extending upper rib and lower rib, and a third intermediate rib, said upper and lower ribs both opening toward the inside of the plant container, and the intermediate rib opening toward the outside of the plant container, said rim portion also including a lip comprising an annular extension extending outwardly and upwardly and inwardly from said upper rib and forming a smooth uppermost edge,
- a circumferentially extending transition portion extending inwardly and downwardly from said lower rib and connecting the rim portion with the sidewall portion of said plant container,
- a circumferentially extending base portion contiguous with the lower end of said sidewall portion, said base portion having a plurality of drain openings, and
- a bottom wall portion integral with said base portion and comprising a substantially flat bottom wall for support of said plant container.

4,715,145

LOCK-UP CONTROL FOR SHOCKLESS GEAR SHIFTING

Hitoshi Takeda, and Sadao Takase, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed May 31, 1985, Ser. No. 739,854

Claims priority, application Japan, Jun. 1, 1984, 59-110676

Int. Cl.⁴ B60K 41/22

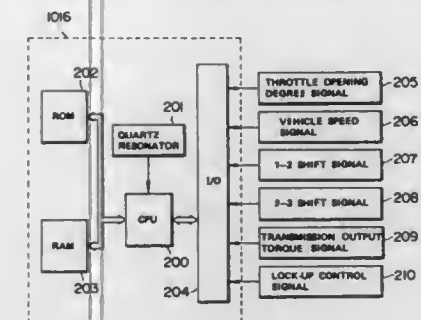
U.S. Cl. 74—731

6 Claims

1. A lock-up control system for a lock-up type automatic transmission including a torque converter with a lock-up clutch, comprising:

- means for detecting the occurrence of a command for shifting the transmission and generating a shifting command signal;
- means for detecting output torque of the transmission and generating a transmission output torque signal indicative of the output torque of the transmission; and
- means for determining and storing signals indicative of variations in said output torque signal and interrupting the lock-up action of the torque converter based on said trans-

mission output torque signal by releasing the engagement of the lock-up clutch after said transmission output torque



signal has demonstrated a predetermined trend in said variations after generation of said shifting command signal.

4,715,146

APPARATUS FOR CLOSING FIREPROOF DOORS

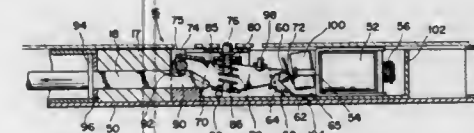
Haruyuki Atsumi, Kanagawa; Hisatogu Anzai, Tokyo, and Noboru Kasahara, Hiroshima, all of Japan, assignors to Ryobi Limited, Hiroshima and Hochiki Corporation, Shinagawa, both of Japan

Continuation of Ser. No. 645,921, Aug. 30, 1984. This application Aug. 1, 1986, Ser. No. 894,449

Claims priority, application Japan, Sep. 8, 1983, 58-139355[U]
Int. Cl.⁴ E05F 15/20

U.S. Cl. 49—1

8 Claims



1. A door hold-open apparatus comprising:
a support housing adapted for attachment to a door frame; a slider bar having a longitudinal axis and movably received in said support housing for movement therein along the slider bar longitudinal axis and adapted to be coupled to a door which is movable relative to said support housing between a door open and a door closed position, said slider bar having a first latching element;

an elongated actuator mechanism movably coupled to said support housing with its direction of elongation being substantially parallel to said longitudinal axis of the slider bar so to be tiltable about a tilt axis substantially perpendicular to the longitudinal axis of the slider bar, said actuator mechanism having a second latching element and being tiltable between a latching position in which the first and second latching elements are in releasable engagement with each other to prevent movement of the slider bar so that the door is kept in its open position and a release position in which the first and second latching elements are disengaged to release the slider bar for movement within the support housing so that the door can be closed, wherein the actuator mechanism comprises a body elongated along the longitudinal axis of said slider bar, the second latching element being disposed at one end of said body, and said member being connected to the other end of said body;

moving means secured in said support housing for moving said actuator mechanism between the latching position and the release position to disengage the first and second latching elements, said moving means comprising a solenoid and opposed, engaged surface means on said first and second latching elements angled for enabling sliding movement therebetween in a direction tangential to a locus of points defining a circle about said tilt axis of said actuator mechanism as the slider bar moves along its

longitudinal axis away from the actuator mechanism to force the actuator mechanism to its said release position, said moving means further comprising a member means connected to the actuator mechanism for tilting the actuator mechanism from the latch position to the release position upon said member means being struck by a plunger of said solenoid, said member means being positioned relative to said solenoid within striking distance of the plunger of said solenoid, wherein said member comprises two linked elements having a center portion in which the two elements are rotatably coupled and two remote ends one of which is connected to the other end of said body and the other of which is connected to the support housing, said linked elements being shiftable by said solenoid between an extended position in which said one remote end is spaced a first distance from the other remote end and a collapsed position in which said one remote end is spaced a second distance shorter than the first distance from the other remote end, one of said extended and collapsed positions corresponding to the latching position of said actuator mechanism and the other corresponding to the release position of said actuator mechanism;

mounting means for tiltably coupling the actuator mechanism to the support housing for movement between said latching position and said release position, and including resilient means having a spring, coupled to the actuator mechanism for adjustably applying a resilient force opposing tilting of the actuator mechanism from said latching position to said release position, and bias adjustment means for adjusting spring tension in said spring; and detecting means actuated by said member for sensing movement of the actuating member from said latching position to said release position and to indicate that the actuator mechanism has been displaced from the latching position.

4,715,147

IN-PROCESS GAGING EQUIPMENT FOR FLEXIBLE GRINDING CELLS

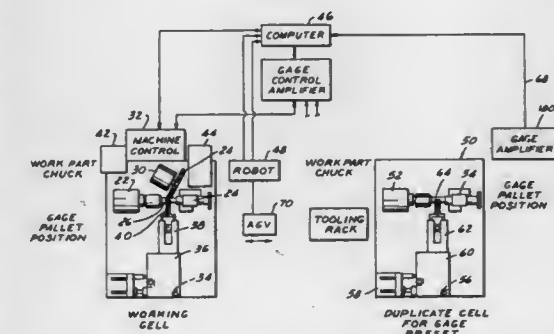
Lawrence I. Millay, Springfield, Vt., and Edward Bourgoine, Claremont, N.H., assignors to Ex-Cell-O Corporation, Walled Lake, Mich.

Filed Oct. 1, 1986, Ser. No. 914,034

Int. Cl.⁴ B24B 49/04

U.S. Cl. 51—165.71

5 Claims



3. A computer numerically control changeover apparatus of in-process gaging equipment for flexible grinding cells of the type controlled by a CNC controller and having a spindle with a chuck thereon for supporting a workpiece with respect to a tail stock comprising a bench fixture which is a replica of the grinding cell including a work driver and tail stock corresponding to those on the flexible grinding cell; a master workpiece removably supported on said work driver of the bench fixture and transferable to the spindle chuck of the grinding cell along with tooling for a subsequent computer controlled grinding operation; pallet mounted in-process gage means having support features thereon; identical coating support

features on said bench setup fixture and said grinding cell to receive said pallet mounted in process gage means for positioning feelers thereon with respect to the master workpiece in the bench setup fixture so as to preset the gage for subsequent use in the cell; means for receiving the preset gage on the pallet for subsequent transfer to the support features on the grinding cell means; and means for automatically transferring the preset pallet mounted in-process gage from the bench setup fixture to the cell in accordance with flexible manufacturing operations conducted at the grinding cell.

4,715,148

GEM FACETING MACHINE

Heinrich Landgraf, Waldherrstr. 17, D-8133 Feldafing, Fed. Rep. of Germany

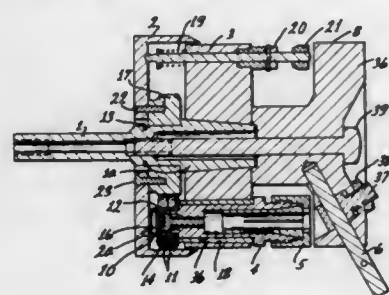
Filed Feb. 14, 1986, Ser. No. 830,377

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505444

Int. Cl.⁴ B24B 7/22

U.S. Cl. 51-229

11 Claims



1. In a gem faceting machine having a main working spindle which can be pivoted in a vertical plane to obtain various inclinations of its axes, further being amenable to height adjustment and being capable of being rotated about its own axis, there being means for latching the rotational position of the spindle in particular positions as well as in positions in-between the particular positions, a multiple gem mounting structure comprising:

- a multiple chuck mounting element provided for connection to said spindle for being turned therewith, the element having a plurality of receiving bores the bores being concentrically arranged on a common circle;
- a plurality of pin receiving spindles serving as chucks and respectively rotatably mounted in said bores of said multiple chuck element and being thereby radically equidistantly arranged therein;
- a rotatable and position arrestable actuating element including a drive element coupled for rotation to said pin receiving spindles;
- means on said actuating element for establishing a plurality of distinct latch and arresting positions;
- latch and arresting means cooperating with the means for establishing, for arresting the actuating element in any of its positions;
- an adaptor element for selective mounting to the chuck mounting element; and
- a plurality of gem mounting pins being directly without use of the adaptor element or through an adapter element indirectly mounted to the spindles of the plurality.

4,715,149

STEADY REST FOR VALVE GRINDING APPARATUS

John R. Kelsey, 8575 Louisiana Pl., Merrillville, Ind. 46410

Filed Aug. 25, 1986, Ser. No. 900,298

Int. Cl.⁴ B24B 19/00

U.S. Cl. 51-241 VS

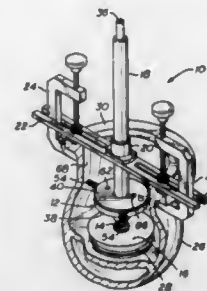
15 Claims

1. In flow valve seat grinding apparatus incorporating improved steady rest means, the combination comprising:

- (a) a tubular drive shaft housing means which houses and

supports a rotatable and longitudinally movable drive shaft means, said shaft means being connected through a flexible torque coupler means to drive a valve seat grinding head means, said grinding head means being adapted to grind a valve seat located within a valve body;

- (b) said valve body being formed with an elongated cavity having a sidewall;
- (c) said shaft housing means being laterally supported in movable relation within a lateral support journal means;
- (d) said support journal means being connected to support



bracket means to be adjustably fixed through clamping means to the upper portion of said valve body;

- (e) steady rest means including adjustable anchor means adjustably mounted within said cavity around said shaft housing means below said lateral support journal means and near said torque coupler means; and
- (f) said adjustable anchor means being operable to laterally extend at least three anchor members into fixed anchoring contact with said sidewall of said valve body and thereby to receive and to laterally support said shaft housing means in fixed position within said valve body.

4,715,150

NONWOVEN FIBER ABRASIVE DISK

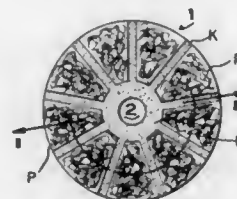
Masatoshi Takenchi, and Takayasu Hamagaki, both of Tokushima, Japan, assignors to Seiken Co., Ltd., Tokushima, Japan

Filed Apr. 29, 1986, Ser. No. 857,079

Int. Cl.⁴ B24D 11/00

U.S. Cl. 51-395

9 Claims



1. A nonwoven fiber abrasive disk comprising flexible fibers randomly oriented in all three dimensions and formed into a disk shape with a center hole, said disk having radial compressed regions and respective uncompressed regions between said compressed regions, said fibers being densely pressed in said compressed regions to a thickness less than in said uncompressed regions such that said compressed regions are recessed with respect to said uncompressed regions which thereby protrude out from the surface of said disk to form an abrasive surface, and wherein said compressed regions are solidified with bonding adhesive in gaps among said fibers in said compressed region.

4,715,151

PLASTERBOARD REPAIR KIT

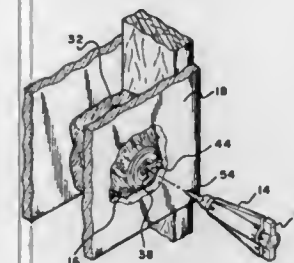
Alvin Garblik, 407 S. Almonesson Rd., Deptford, N.J. 08096

Filed Jan. 8, 1987, Ser. No. 1,612

Int. Cl.⁴ E04G 23/02

U.S. Cl. 52-2

6 Claims



1. A plasterboard repair kit for use in patching a hole in a plasterboard comprising:

- an inflatable member, said member being comprised of flexible but substantially inelastic plastic and including a front wall, a rear wall and peripheral side walls, an opening in said front wall for permitting gas to be introduced into the interior of said member for inflating the same and including valve means for preventing gas from exiting from said member;
- said inflatable member, when fully inflated and unrestricted by any outside structure, being substantially rectangular in shape;
- said opening being formed by a structural member which extends forwardly substantially no further than the exterior surface of said front wall;
- a gas cartridge, said cartridge containing only enough gas to substantially inflate said inflatable member at room temperature, and
- a holder for said cartridge, said holder including a nozzle means adapted to fit within said opening and further including means for releasing gas from said cartridge and directing the same through said nozzle so that it can enter said opening to inflate said inflatable member.

4,715,152

WATERTIGHT WINDOWSILL CONSTRUCTION

Shinji Tanikawa, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

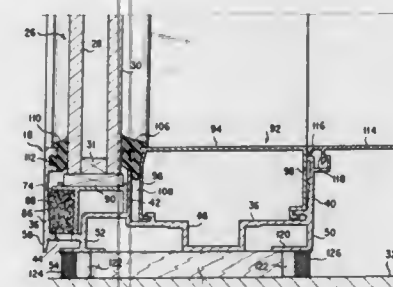
Filed Dec. 24, 1986, Ser. No. 946,523

Claims priority, application Japan, Dec. 25, 1985, 60-198440

Int. Cl.⁴ E06B 7/14

U.S. Cl. 52-209

5 Claims



1. A fixed sash window assembly for installation in an opening in an enclosing wall of a building, the opening being defined in part by a foundation of the building having a window base immovably mounted thereon, the fixed sash window assembly comprising:

- (a) panel means;
- (b) frame means of generally rectangular arrangement, to be installed in the opening in the enclosing wall of the building, for receiving and holding the panel means;

(c) a sill included in the frame means and integrally comprising:

- (1) a web generally disposed horizontally and having an exterior end and an interior end;
- (2) an exterior flange extending upwardly from the exterior end of the web;
- (3) there being a series of spaced apart drain holes defined in the web and disposed interiorly of, and along, the exterior flange;
- (4) a drain shield extending downwardly from the web and disposed exteriorly of the drain holes in the web for shielding the drain holes against the backflow of water therethrough; and
- (5) leg means depending from the web to be mounted directly on the window base and including an exterior leg having horizontal ledge extending exteriorly beyond the window base into underlying relation to the drain holes in the web at a distance therefrom, so that a space thus created between the horizontal ledge of the exterior leg of the leg means and the foundation of the building can be caulked by filling a sealing compound in the form of continuous strip without the possibility of blocking the drain holes in the web;
- (d) an attachment mounted on the web of the sill, and disposed interiorly of the exterior flange thereof, for supporting the panel means thereon, the attachment further coacting with the sill to define a water chamber over the drain holes in the web of the sill, the water chamber being in communication with a gap between the panel means and the exterior flange of the sill; and
- (e) an exterior sealing strip mounted between the panel means and the exterior flange of the sill for watertight sealing the gap therebetween.

4,715,153

PANEL MOUNTING BUILDING WALL CONSTRUCTION

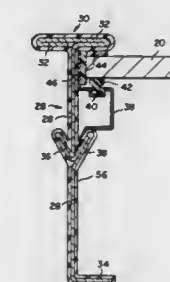
Henry Rohman, Rochester, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed May 8, 1986, Ser. No. 861,151

Int. Cl.⁴ E04B 2/88

U.S. Cl. 52-213

18 Claims



1. A panel mounting building wall construction comprising:

- a unitary elongate roll formed structural frame member of substantially J-shaped cross-section having a flat elongate intermediate plate member characterized by a first thickness, an elongate head, characterized by a first width, on one edge of said plate member transverse thereto and having lateral portions of said head extending outwardly in each direction away from said plate member, and an elongate laterally extending foot on the opposite edge of said plate member extending outwardly away from said plate, said foot having a width substantially equal to one half of said first width;
- a pair of elongate lips on said plate member, one of said lips laterally extending from one side of said plate member and the other of said lips laterally extending from the opposite side of said plate member;
- a seal assembly interposed between at least one of said lips and said head for releasably holding an edge of a wall

panel therebetween; and at least one transverse slot extending through the plate member and at least one flat end portion, insertable through said slot extending outwardly from said member a distance at least equal to the thickness of said member.

4,715,154

SPACE PARTITION MODULE

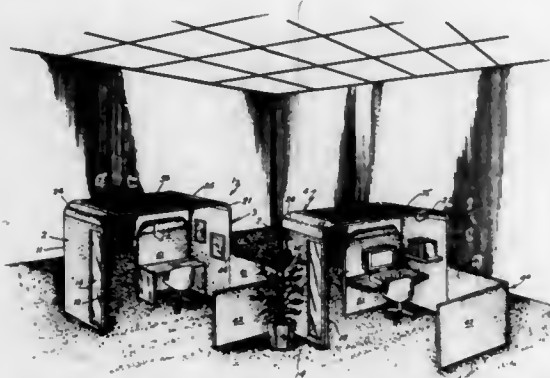
Mark A. Baloga, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Dec. 10, 1984, Ser. No. 680,282

Int. Cl.⁴ E04H 1/00

U.S. Cl. 52—239

41 Claims



1. A space partition module for subdividing an open office space in a building envelope, which is defined by a building ceiling, a building floor having a predetermined area and perimeter, and fixed building walls having a height; said space partition module comprising:

first and second sidewall panels positioned in a generally vertical, oppositely facing, spaced apart, generally parallel orientation; said first and second sidewall panels having upper edges, lower edges, and side edges, with said lower edges extending along the building floor;

a ceiling having opposite end edges connected with the upper edges of said first and second sidewall panels, and supporting said first and second sidewall panels in a free-standing condition; said ceiling panel spanning said first and second sidewall panels without any intermediate support at a height above the building floor that is less than the height of the building walls, and said first and second sidewall panels being spaced apart and arranged in a manner that defines an interior area and a perimeter which are substantially less than the area and the perimeter of the open office space in the building envelope, whereby said space partition module can be freely positioned on the building floor at any desired location;

said ceiling forming a canopy with sufficient headroom to accommodate average users, which canopy, in conjunction with said first and second sidewall panels, defines an unobstructed, three-dimensional workstation within and independent of the open office space, that has a degree of privacy for more efficient work performance, without evoking a sense of claustrophobia.

4,715,155

KEYABLE COMPOSITE JOIST

Neal E. Holtz, 11400 Rockville Pike, #750, Rockville, Md. 20852

Filed Dec. 29, 1986, Ser. No. 947,222

Int. Cl.⁴ E04C 3/08

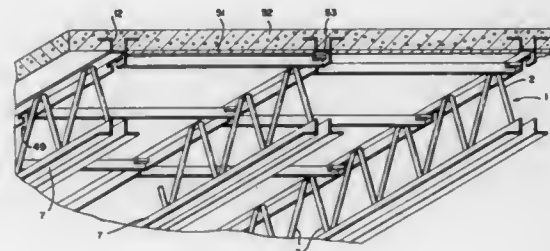
U.S. Cl. 52—333

14 Claims

1. A joist for composite slab construction, comprising:

- a. an open web of
 - i. zig-zag structure with
 - (1) slanted bracing members and

- (2) upper and lower knuckle and
- ii. open spaces between the bracing members, and
- b. at least one chord united to the web to form a joist, including
 - i. an upper chord comprising
 - (1) a sealing first bar which
 - (a) extends longitudinally in said joist (b) and which has
 - (i) a longitudinal, upright first leg having a first face which is
 - (1) upright and
 - (2) confronts one side of the web
 - (ii) a second leg comprising plural longitudinally-spaced leg segments extending
 - (1) longitudinally and laterally from the first leg,
 - (2) into and substantially throughout the length of, open spaces extending between the bracing members and located between adjacent upper knuckles of the web, and
 - (2) a second bar, which



- (a) extend longitudinally in said joist
- (b) and includes an upright third leg having
 - (i) a second face which
 - (1) is upright
 - (2) confronts the other side of the web
 - (3) is laterally spaced from the first leg and
 - (4) is in closely spaced or abutting relationship with the leg segments of the first bar,
- (3) said first, second and third legs and leg segments and their respective faces forming a concrete-receiving channel
 - (a) into which a plurality of the upper knuckles of the web extend to partition the channel into plural, longitudinally spaced pockets having open upper mouths for receiving concrete and
 - (b) in which the adjoining surfaces of said legs, leg segments, faces and knuckles abut with one another or are sufficiently closely spaced for forming keyed connections between said pockets and a concrete slab.

4,715,156

SUPPORT STRUCTURE FOR ROOF INSULATION IN METAL BUILDINGS

John J. Dozzo, Rio Rancho, N. Mex., assignor to Duke Insulation Company, Inc., Albuquerque, N. Mex.

Filed Sep. 2, 1986, Ser. No. 902,602

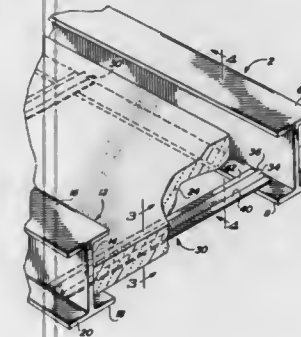
Int. Cl.⁴ E04B 1/74

U.S. Cl. 52—404

13 Claims

1. Support structure for supporting insulation between purlins in metal buildings, comprising, in combination:
- a plurality of cross brace extending between and disposed on flanges of the purlin, each cross brace including
 - a first end means secured to one purlin,
 - a second end means secured to another purlin, and
 - a center portion between the first and second end portions having
 - a first arm,
 - a first flange secured to the first arm and extending outwardly therefrom,

- a second arm secured to the first arm,
- a second flange secured to the second arm and extending outwardly therefrom and generally aligned with the first flange, and
- a juncture between the first arm and the second arm defining, in a cross section of the cross brace, an apex from which the first and second arms extend; and
- stringer means, including at least a single stringer secured to the plurality of cross braces between the purlins and defining with the cross braces a grid between the purlins for supporting insulation, and including



- a third arm,
- a third flange secured to the third arm and extending outwardly therefrom,
- a fourth arm secured to the third arm,
- a fourth flange secured to the fourth arm and extending outwardly therefrom and generally aligned with the third flange, and
- the plurality of cross braces and the stringer are secured together at the flanges,

4,715,157

ROOF STRUCTURE AND ROOF BOARD THEREFOR

Motokatsu Funaki, 430 Shimotsuchidana, Fujisawa-shi, Kanagawa-ken, Japan

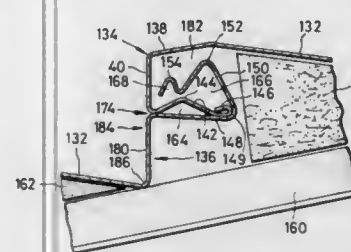
Filed Jul. 23, 1986, Ser. No. 888,603

Claims priority, application Japan, Jul. 24, 1985, 60-162133; Apr. 10, 1986, 61-81086

Int. Cl.⁴ E04D 1/00

U.S. Cl. 52—529

12 Claims



1. A roof board comprising:

- a flat surface section, an eaves side connection formed at one end of said flat surface section, and a ridge side connection formed at the other end of said flat surface section, a plurality of said roof boards being adapted to be connected through said eaves side and ridge side connections to one another in order with an upward incline in the direction of from an eaves side to a ridge side to form a roof structure;
- said eaves side connection being formed to have an upper front face section downwardly extending from said one end of said flat surface section, an inwardly extending section inwardly extending from a lower end of said upper

front face section, and an engagement section formed at a distal end of said inwardly extending section; said ridge side connection being formed to have a lower front face section upwardly extending from said the other end of said flat surface section, an outwardly extending section outwardly extending from an upper end of said lower front face section, and an envelope section formed at a distal end of said outwardly extending section; the connection between each adjacent two of said roof boards being carried out above said ridge section by holding the engagement section of the ridge side one of said adjacent two roof boards in the envelope section of the eaves side one of said adjacent two roof boards and abutting the upper end of the lower front face section of said eaves side roof board against the eaves side connection of said ridge side roof board to form a butt region therebetween which is positioned upwardly apart from the flat surface section of said eaves side roof board and exposed to an exterior of said roof structure.

4,715,158

MODULAR ELEMENT PARTICULARLY FOR FALSE CEILINGS, PARTITION SURFACES AND NON-STRUCTURAL WALLS

Giorgio Manzelli, Via S. Gallo 18, Lido Di Venezia (Province of Venezia), Italy

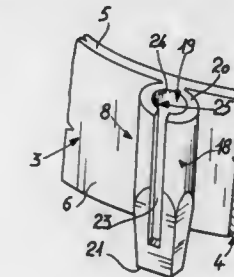
Filed Jun. 9, 1986, Ser. No. 872,331

Claims priority, application Italy, Jun. 14, 1985, 30725/85[U]

Int. Cl.⁴ E04C 2/42

U.S. Cl. 52—581

8 Claims



1. A modular element, particularly for equipping false ceilings, partition surfaces and non-structural walls, comprising a main body defining a first and a second main body bases, opposed to each other, and an outer side surface extending between said main body bases, a pair of male connection elements and a correspondent pair of female connection elements protruding from said outer side surface at mutually opposed locations thereof, each of said male connection elements comprising a ribbing extending from said outer side surface between said main body bases and having, on an edge thereof opposite to said outer side surface, an enlarged portion having an engagement end surface facing said first main body base, defining a transverse dimension and extending at a first distance from said second main body base, each of said female connection elements comprising a substantially tubular lug protruding from said outer side surface between said main body bases, said lug having an open end portion facing said first base and an internal cavity extending from said open end portion through said lug, said internal cavity being substantially countershaped to said enlarged portion, said lug further having a longitudinal slit extending at a lateral side of said lug opposed to said outer side surface and communicating with said cavity and stop projections extending in said internal cavity at a second distance from said second main body base which is greater than said first distance, said stop projections defining a mutual distance which is smaller than said transverse dimension, thereby, after insertion of said enlarged portion of said male connection element in an internal cavity of a female connection element of adjacent modular elements, the stop

projections of the female connection element of the adjacent modular elements cooperating with said engagement end surface of said enlarged portion and securely retaining said enlarged portion in the internal cavity.

4,715,159

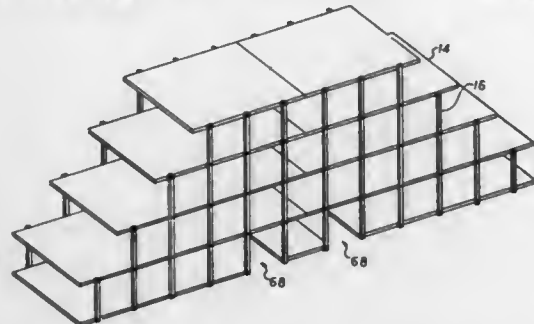
COLLAPSIBLE BUILDING CONSTRUCTION SYSTEM

Yousef Hijazi, P.O. Box 2, Makkah, Saudi Arabia
Filed Oct. 7, 1986, Ser. No. 916,380

Int. Cl.⁴ E04H 12/18

U.S. Cl. 52—646

23 Claims



1. A collapsible building construction system comprising: a plurality of horizontally disposed floor slabs which are adapted for stacking one on top of the other in a collapsed storage position and which are adapted to assume a spaced parallel relationship with each other when placed in an opened position, pivotal columns for connecting the horizontally disposed floor slabs to the adjacent floor slabs, the pivotal columns connected to the floor slabs at pivot points to provide for a scissor-like movement between the floor slabs and the pivotal columns, removable partitions that divide the space between floor slabs into rooms comprising foldable panels stored in compartments in the floor slabs which are removed from the compartments and locked in place, and means for bracing the floor slabs and the pivotal columns in the opened position.

4,715,160

SET OF STANDARDIZED STRUCTURAL ELEMENTS AND ACCESSORIES FOR THE ACCOMPLISHMENT OF SPATIAL AND/OR FLAT STRUCTURES WHICH CAN BE COMBINED TO DELIMIT HABITABLE SPACES IN AN INDUSTRIALIZED BUILDING SYSTEM

Luciano Romanelli, (Bari), Trani Strada Statale N. 16-Km. 762, Italy (70059)

Filed Apr. 18, 1986, Ser. No. 853,401

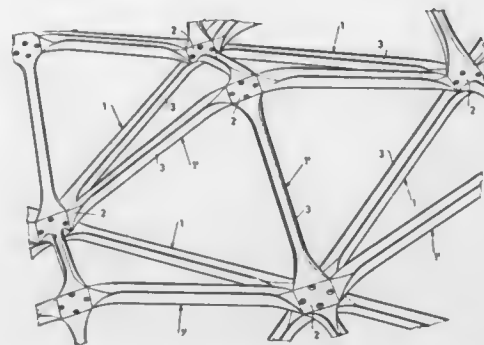
Claims priority, application Italy, Apr. 24, 1985, 20465 A/85
Int. Cl.⁴ E04H 12/00

U.S. Cl. 52—648

16 Claims

1. A set of standardized structural elements and accessories for the construction of building structures comprising: a first plurality of variable-section rod elements made up of aligned equally spaced flat pads and aligned pad connecting straight section lengths said straight section lengths having a non-planar cross-section, said variable-section rod elements being combinable with each other to form a planar reticular structure, each variable-section rod element having a longitudinal axis; a second plurality of discontinuous variable-section rod elements made up of parallel equally spaced flat pads and alternately inclined pad connecting straight section lengths said straight section lengths having a non-planar cross-section, said discontinuous, variable-section rod elements being combinable with each other and with said variable-section rod elements to form a spatial reticular

structure, each discontinuous variable-section rod element having a longitudinal axis; and a third plurality of panels, said panels being square with a side length equal to a multiple of the distance between



successive pads of said variable-section rod elements, said panels being combinable with and superimposable upon said variable-section rod elements to form a continuous surface for said spatial reticular structure.

4,715,161

SUSPENDED CEILING GRID CLIP

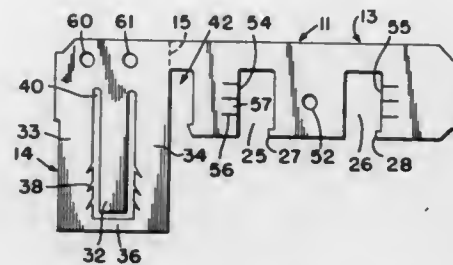
Eugene Carraro, Roslyn Heights, N.Y., and Raymond S. Laughlin, Cuyahoga Falls, Ohio, assignors to Erico International Corporation, Solon, Ohio

Filed May 19, 1986, Ser. No. 864,324

Int. Cl.⁴ E04B 5/52

U.S. Cl. 52—714

17 Claims



1. A spring steel fastener for suspended ceiling grids including tee bars, angles and the like, comprising a horizontal portion and a vertical portion connected to said horizontal portion at one end thereof, said vertical portion being offset at an angle to said horizontal portion, said horizontal portion including means for resiliently gripping and releasing the bulb of the stem of a tee bar, said vertical portion including means for gripping and releasing the upturned edge of an angle and means for gripping and releasing the bulb of a stem of a tee bar, said vertical portion being essentially planar and including a downwardly projecting spring tab in such plane, and a downwardly extending spring tab offset from such plane with the upturned edge of such angle adapted to be grasped therebetween, and a notch in said horizontal portion at its connection to said vertical portion adapted to accommodate the bulb portion of said second mentioned tee bar, the upper end of said offset tab partially blocking the opening of said notch and snapping beneath the shoulder of such bulb portion when inserted in such notch.

4,715,162

WOODEN JOIST WITH WEB MEMBERS HAVING CUT TAPERED EDGES AND VENT SLOTS

Lionel L. Brightwell, Boise, Id., assignor to Trus Joist Corporation, Boise, Id.

Filed Jan. 6, 1986, Ser. No. 816,568

Int. Cl.⁴ E04C 3/12

U.S. Cl. 52—729

9 Claims

4,715,163

APPARATUS FOR MORTARING LARGE-FORMAT BRICKS INTO A WALL

Lorenz Kesting, Holzheck 21, 4600 Dortmund-Eving, Fed. Rep. of Germany

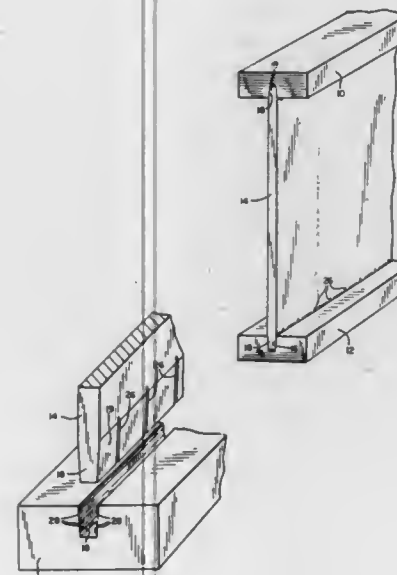
Filed May 28, 1985, Ser. No. 737,740

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1985, 3505841

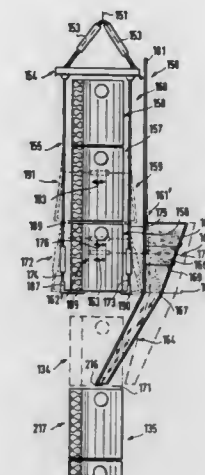
U.S. Cl. 52—749

Int. Cl.⁴ E04G 21/22

19 Claims



1. A wooden structural member, comprising: a pair of spaced wooden flanges each having a groove extending longitudinally thereof in alignment with and facing the groove of the other flange, said groove being tapered in width and of substantially uniform cross section along at least the majority of its length; adhesive bonding material provided in uncompressed wood within said grooves; a wooden web of oriented strand board having two opposite edges secured within the grooves of said flanges by the adhesive bonding material, said opposite edges each being cut with a tapered width which reduces with distance toward an outer end of the tapered edge and formed of substantially uncompressed wood which is not compressed beyond its elastic limit; and vent slots spaced longitudinally along the grooves and provided in uncompressed wood between the mating surfaces of the web edge and the flange groove, said vent slots extending to the top of the grooves to allow said bonding material to vent out of said grooves through said vent slots.



1. An apparatus for mortaring large format bricks into a wall, said apparatus including: a frame suitable for being lifting above the wall; a magazine (155) mounted on said frame for receiving a vertical stack of at least two bricks (156-158); lower and upper manipulator means (172, 191, 306, 317) in said magazine for releasably engaging the lowest brick of said stack within said magazine and the next lowest brick of said stack within said magazine, respectively, for retaining the bricks against vertical movement in the magazine when so engaged; and operating mean for said lower and upper manipulator means for cyclically operating said manipulator means to cause said lower manipulator means to engage said lowest brick in said stack, to cause said lower manipulator means to release said lowest brick to vertically, downwardly discharge said lowest brick from the bottom of the magazine onto said wall while said upper manipulator means engages said next lowest brick, to cause said upper manipulator means to release said next lowest brick to obtain downward movement of said next lowest brick in said magazine to become the lowest brick in said magazine, and to thereafter cause said lower manipulator means to engage the lowest brick to retain the lowest brick in said magazine.

4,715,164

HIGH SPEED ENVELOPE FLAP OPENER

Harry E. Luperti, Bethel; Eric N. Person, Danbury, and Thomas Simmel, Milford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 28, 1986, Ser. No. 835,000

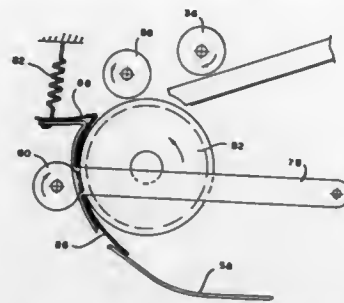
Int. Cl.⁴ B65B 43/26

U.S. Cl. 53—381 R

5 Claims

1. In a device for handling articles each of which has a bent-over flap, apparatus for conditioning the flap, comprising: a transfer roller rotatably driven mounted on a frame; a first rotatably mounted pressure roller abuttingly disposed against said transfer roller and providing between itself and said transfer roller a first nip for receiving an article having a bent-over flap; a second pressure roller abuttingly disposed against said

transfer roller, said second pressure roller being spaced from said first pressure roller about the periphery of said transfer roller and providing between itself and said transfer roller a second nip for receiving the article; and a pivotable flap-opening means for receiving the article from the first nip, said pivotable flap-opening means being arcuately shaped and having a flap-engaging lip thereon, said pivotable flap-opening means being dynamically pivotable between a first position for receiving the article between itself and the transfer roller and a second position for guiding the article about said transfer roller to the



second nip, wherein the first pressure roller is arranged with respect to said flap-opening means such that the article flexes in a direction opposite from the curvature of the transfer roller as the article exits the first nip and is guided to the second nip, and wherein the flap-engaging lip on said pivotable flap-opening means is arranged for engaging the flap of said article as said pivotable flap-opening means is guiding the article about said transfer roller whereby the flap is opened and bent back by the engagement of the flap with the lip as the article is guided past the lip through the second nip.

4,715,165

METHOD AND APPARATUS FOR REMOVAL OF ITEMS FROM A STERILE ENCLOSURE

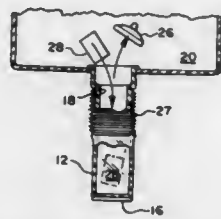
Douglas E. Thorogood, Tervuren, Belgium, assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 806,075, Dec. 5, 1985, abandoned. This application Apr. 1, 1987, Ser. No. 32,912

Int. Cl.⁴ B65B 5/00

U.S. Cl. 53-469

3 Claims



1. A method for maintaining sterility of a sterile item during the removal of the sterile item from a sterile enclosure having a port which leads from the interior of the sterile enclosure to the outside environment, the port having a proximal end adjacent to the interior of the enclosure and a distal end outside of the enclosure and the sterile enclosure including means for closing the port to provide a closed sterile environment, the method comprising the steps of:

- providing a length of flexible packaging having an open proximal end, a closed distal end and a sterile interior;
- attaching the proximal end of the packaging to the port of the enclosure on the outside of the enclosure and adjacent to the proximal end of the port;
- compressing the length of packaging and moving a sub-

stantial portion of the packaging including the distal end of the packaging adjacent to the distal end of the port;

- opening the means for closing the port to define a closed sterile environment comprising the sterile enclosure and sterile interior of the sterile length of packaging;
- passing the sterile item from the interior of the sterile enclosure through the port into the interior of the packaging adjacent to the distal end of the packaging;
- sealing a substantially transverse area of the packaging at a location between the position of the sterile item at the distal end of the packaging and the proximal end of the packaging, whereby the sterile item is sealed in a segment of the packaging at the distal end of the packaging;
- cutting the packaging substantially transversely along the sealed area whereby the sterile item in the sealed segment of the packaging is separated from the remaining length of packaging; and wherein
- the step of sealing a substantially transverse area of the packaging comprises making the sealed area wide enough whereby, when the packaging is cut substantially transversely along the sealed area, a portion of the sealed area lies on the separated segment of packaging and another portion of the sealed area lies on the remaining length of packaging, the sterile enclosure and sterile interior of the remaining length of packaging defining a closed sterile environment.

4,715,166

FILM PACKAGING APPARATUS

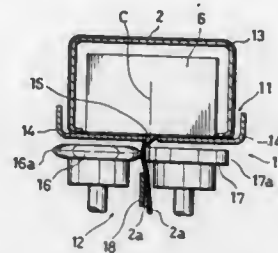
Hiroshi Kameda, Sakai, Japan, assignor to Tokiwa Kogyo Co., Ltd., Osaka, Japan

Filed Jan. 7, 1987, Ser. No. 1,194

Int. Cl.⁴ B65B 9/06, 51/14, 51/16, 51/26

U.S. Cl. 53-550

9 Claims



1. A film packaging apparatus comprising:

- a tube former to which is supplied a continuous length of a heat-meltable, heat-shrinkable film having a pair of longitudinal margins and to which is also supplied a plurality of articles to be packaged;
- said former including an inner former member on which said film is wrapped with said margins overlapping each other;
- said former further including an outer former member having a longitudinal outlet through which said overlapping margins project out;
- a longitudinal sealer disposed outside said tube former adjacent to said outlet for longitudinally heat-sealing and cutting said overlapping margins;
- said sealer including a cutter disc having a rounded circumferential edge, and a counter disc having a flat circumferential surface substantially in contact with said circumferential edge;
- said margins being nipped between said cutter disc and said counter disc at a position slightly deviating toward said cutter disc from a center line of said longitudinal outlet;
- a film guide for directing toward said center line portions of said margins located farther from said tube former than said position of nipping; and
- a transverse sealer disposed behind said longitudinal sealer for transversely heat-sealing and cutting a continuous tube of said film at a position between each adjacent two of said

articles to provide a bag of said film completely enclosing each of said articles.

4,715,167

BAGGER MACHINE

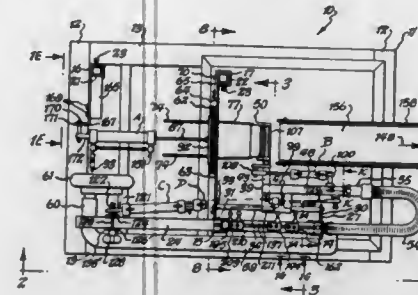
James G. Savigny, Lockport, N.Y., assignor to Ag-Pak, Inc., Gasport, N.Y.

Filed Aug. 8, 1986, Ser. No. 894,616

Int. Cl.⁴ B65B 43/28

U.S. Cl. 53-572

25 Claims



1. A bagger comprising a frame, a wicket bar having a front side and a rear side on said frame for mounting a ream of bags each having a front side and a rear side with said front sides of said bags facing said rear side of said wicket bar, said bags also having tabs at the upper ends of said rear sides, a rear clamp cylinder including a rear clamp piston rod, a rear clamp plate on said rear clamp piston rod for movement toward said wicket bar with said rear clamp piston rod to press against said tabs of said bags, a carriage, means mounting said carriage on said frame for movement toward and away from said wicket bar, a suction head on said carriage, means for creating a suction in said suction head, a bag opening cylinder mounted between said frame and said carriage for moving said carriage and said suction head thereon toward said ream on said wicket bar to engage the front side of the outermost bag on said ream and apply suction thereto and for moving said suction head away from said ream to pull the front side of said outermost bag away from the rear side thereof which is held on said wicket bar, a front clamp cylinder, means mounting said front clamp cylinder on said carriage, a front clamp piston rod on said front clamp cylinder, a clamp member on said carriage coupled to said front clamp piston rod, means mounting said clamp member for movement toward and away from said suction head to selectively clamp said upper edge portion of said front side of said bag after it has been moved away from said wicket bar and to selectively release said upper edge portion of said front side of said bag, and a bag push cylinder effectively mounted between said frame and said carriage for pushing said outermost bag away from said wicket bar while said front upper edge portion is effectively clamped between said suction head and said clamp member.

4,715,168

HEIGHT ADJUSTMENT FOR A FRONT MOUNT MOWER

Lonnie R. Oxley, West Bend, Wis., assignor to Deere & Company, Moline, Ill.

Filed May 13, 1986, Ser. No. 862,862

Int. Cl.⁴ A01D 34/04, 34/64

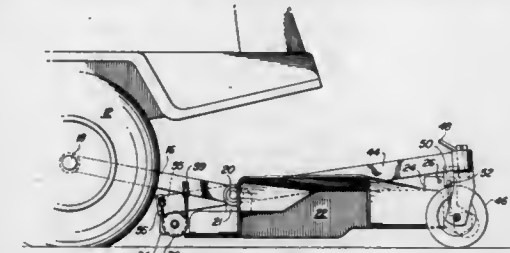
U.S. Cl. 56-15.8

4 Claims

1. In a height adjustment device for a front mounted mower, said mower including a mower deck having the rear portion thereof supported by a pair of push arms pivotally attached to and interconnecting said mower deck and a drive vehicle, the improvement comprising:

- a support frame pivotally attached to said mower deck at the point of pivotal attachment of said push arms to said mower deck, said support frame including ground engaging wheels disposed to support the forward end of said

support frame, an adjustment bracket interconnecting said support frame and said mower deck and disposed to selectively engage and support the forward end of said mower deck at one of a number of vertically spaced positions, whereby the forward end of said mower deck is selectively supported on said ground engaging wheels; and



means for automatically levelling the rear portion of said mower deck with the forward end of said mower deck, said leveling means being connected to said push arms and said support frame such that said rear portion is leveled relative to the forward end for each of the vertically spaced positions of the adjustment bracket.

4,715,169

EDGING ASSEMBLY

Maxwell K. Ould, 27 Severn Street, Epping, Victoria, Australia 3076

PCT No. PCT/AU85/00208, § 371 Date May 5, 1986, § 102(e) Date May 5, 1986, PCT Pub. No. WO86/01371, PCT Pub. Date Mar. 13, 1986

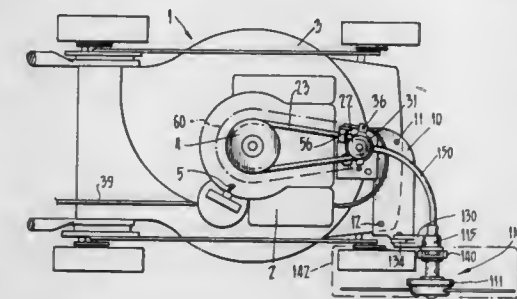
PCT Filed Aug. 30, 1985, Ser. No. 871,406

Claims priority, application Australia, Sep. 6, 1984, PG6973

Int. Cl.⁴ A01D 35/26

U.S. Cl. 56-16.9

17 Claims



1. An edging assembly for attachment to a rotary mower of the kind comprising a housing supporting a motor having a main shaft that drives a cutting blade below the housing to rotate about a substantially vertical axis, the assembly comprising a support plate arranged to be secured to the housing of the mower above the rotatable cutting blade, the support plate having mounted thereon an axially rotatable drive shaft, the drive shaft co-axially supporting an idler pulley and a drive pulley, a drive belt for connecting said pulleys to the main shaft of the mower, the drive shaft and pulleys being mounted on the support plate to be displaceable relative to the motor of the mower to vary the tension in the drive belt, the drive shaft being supported to be freely rotatable within a collar that is pivotally supported by the support plate, the drive belt extending past a pair of rollers positioned one on each side of the drive belt and supported on a slide which is displaceable relative to the collar to transfer the belt from one pulley to another, a cable control coupled to the slide to effect displacement of the slide, rotatable edging means supported by said plate, and a flexible spindle drive transferring drive from the drive shaft to the edging means.

4,715,170

APPARATUS FOR SELECTIVELY REMOVING TOBACCO PLANT LEAVES

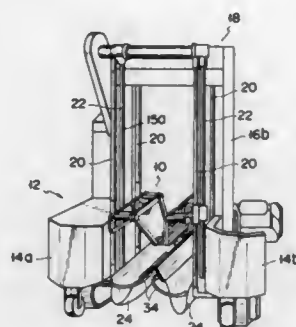
Hajime Miki, Oyama, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan

Filed Mar. 13, 1986, Ser. No. 839,267

Claims priority, application Japan, Mar. 18, 1985, 60-52344
Int. Cl.⁴ A01D 45/16

U.S. Cl. 56-27.5

10 Claims



1. An apparatus for plucking tobacco leaves, comprising: means movable along one row of tobacco plants extending in a predetermined direction said means having a pair of supporting members which can be positioned on both sides of the row of tobacco plants and extend parallel to the row of tobacco plants;
- a pair of first arms pivotally connected at the upper end to the supporting members;
- a pair of second arms pivotally connected at the upper end to the supporting members and spaced apart from said first arms by a predetermined distance in the direction of said row of tobacco plants;
- a pair of leaf-plucking arms, one being pivotally connected at both ends to the lower ends of the first and second arms which are connected to one of said supporting members, and the other being pivotally connected at both ends to the lower ends of the first and second arms which are connected to the other support member, said leaf-plucking arms extending parallel to each other and spaced apart, forming a gap wide enough to allow the passage of a tobacco stalk and to provide a gap between the stalk and either leaf-plucking arm;
- a plurality of wheels rotatably attached to each of said leaf-plucking arms and arranged at regular intervals in the lengthwise direction of the leaf-plucking arm, each wheel having a plurality of spokes long enough to extend into the gap between said leaf-plucking arms; and
- drive means for moving said first pair and said second pair of arms back and forth, to thereby move said leaf-plucking arms up and down.

4,715,171

REEL LIFT MECHANISM FOR MOWER-CONDITIONERS

Emmett F. Glass, Akron, and Edmund O. Howell, New Holland, both of Pa., assignors to New Holland Inc., New Holland, Pa.

Filed Apr. 7, 1986, Ser. No. 848,602

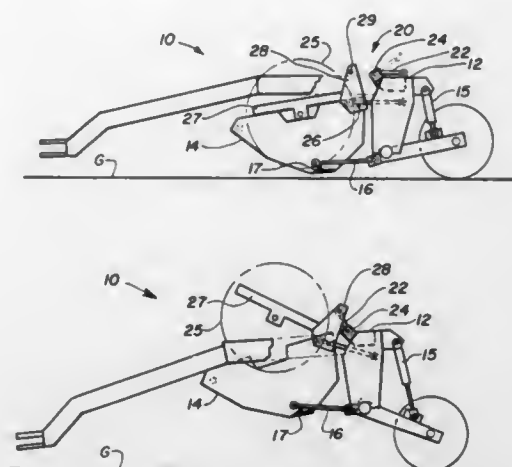
Int. Cl.⁴ A01D 47/00, 57/04

U.S. Cl. 56-192

7 Claims

1. In a mower-conditioner having a mobile frame adapted for movement over the ground; a header suspended forwardly of said frame for movement relative to said frame, said header including a cutterbar mounted thereon at a forward extremity of said header to sever standing crop material from the ground and crop conveying means for conveying crop material within said header including a rotatable reel, said crop conveying means being pivotally connected to said header to position said reel above said cutterbar for cooperative association therewith to harvest crop material from the ground; and header lift

means for raising said header relative to said frame, the improvement comprising:



linkage means selectively interconnectable between said frame and said crop conveying means for affecting a raising of said reel relative to said cutterbar when said header lift means raises said header relative to said frame.

4,715,172

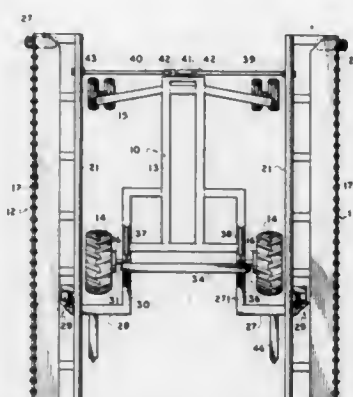
HARVESTING MACHINE WITH TWIN HEADERS

Ewen Mosby, Box 336, Hartney, Manitoba, Canada R0M 0X0
Filed Jul. 16, 1986, Ser. No. 886,176

Claims priority, application Canada, Jul. 24, 1985, 487410
Int. Cl.⁴ A01D 73/00; A01B 49/00

U.S. Cl. 56-228

16 Claims



1. A machine for harvesting a standing crop comprising a frame having a front end and a pair of sides, ground wheels for supporting the frame for driving movement across a field to be harvested, a pair of headers for cutting the standing crop each including means for cutting the crop and means thereon for transporting the cut crop transversely of the direction of motion, means mounting the headers on the frame at the front end thereof such that, in a working position thereof, the headers abut at the front end and extend outwardly therefrom to respective sides of the frame, and pivot coupling means mounting at least one of said headers on said frame such that it can pivot from said working position to a transport position in which it lies along a respective side of the frame generally parallel to the direction of movement and such that as it pivots the cutting means thereof is raised upwardly and inwardly toward the frame.

4,715,173

ROTARY LAWN MOWER ACCESSORIES

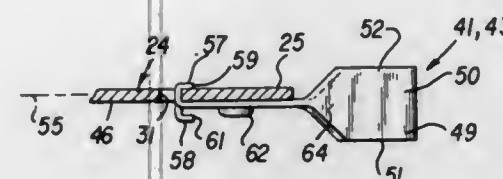
James Anderson, 5445-4A Avenue, Tsawwassen, British Columbia, Canada V4M 1H6

Filed Jun. 4, 1985, Ser. No. 741,111

Int. Cl.⁴ A01D 55/00

U.S. Cl. 56-295

8 Claims



1. An accessory assembly for use with a rotary lawn mower having a powered output shaft adapted to rotate about a generally vertical axis of rotation, the accessory assembly including:
 - (a) an elongated accessory bar adapted to be mounted on the output shaft to rotate therewith, the bar having opposite end portions, each end portion having a location opening and a positive fastener means, the fastener means and location opening of each end portion of the bar being spaced apart at a particular spacing and disposed along the bar so as to be located at different radii from the vertical axis;
 - (b) a pair of grass cutting elements mounted adjacent respective outer end portions of the bar, each grass cutting element having a downwardly inclined outer portion adapted to cooperate with the grass, and an inner portion having a first hook-shaped tang having an outwardly facing saddle means to engage the location opening, the tang also having a free end portion extending from the saddle means and away from the axis of rotation of the bar, each grass cutting element also having a positive fastener means spaced from the tang at the said particular spacing and cooperating with the positive fastener means of the bar to secure the cutting element positively to the accessory bar, and to provide lateral support for the cutting element relative to the bar under operating forces;
 - (c) the outer portion of each grass cutting element also having oppositely disposed first and second cutting portions provided with first and second cutting edges which extend downwardly and upwardly respectively from the bar so as to be spaced below and above a plane of the bar when the mower is positioned above the grass, so as to provide an active and an inactive cutting edge respectively dependent on the relative positions of the cutting element and the bar;
 - (d) the inner portion of each grass cutting element also having a second tang which is generally similar to the first tang, the tangs extending in opposite directions from a longitudinal plane of the inner portion, one particular tang engaging the location opening when the cutting edge associated with that tang is active.

4,715,174

SNOW TRAP ATTACHMENT FOR CROP HARVESTING MACHINE

Mervin R. Lloyd, Box 55, D'Arcy, Saskatchewan, Canada S0L 0N0, and Terrance A. Kon, Box 75, Brock, Saskatchewan, Canada S0L 0H0

Filed Feb. 24, 1986, Ser. No. 831,818

Claims priority, application Canada, Mar. 19, 1985, 476923

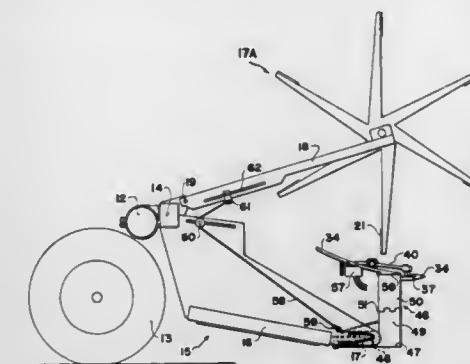
Int. Cl.⁴ A01D 34/04, 34/24

U.S. Cl. 56-297

20 Claims

1. An attachment for a crop harvesting machine of the type having a transverse machine blade arrangement across the front harvesting section for cutting the crop and collection means onto which the cut crop is deposited for condensing, the

attachment comprising an attachment blade arrangement for cutting the crop, means for driving the attachment blade arrangement, the attachment blade arrangement having a length which is a minor proportion of the length of the machine blade arrangement of the machine and means for mounting the attachment thereof at a position above and parallel to said machine blade arrangement whereby, with the machine blade arrangement arranged not to cut the crop at a position directly underlying the attachment, the attachment acts to cut the crop at a higher level than the machine blade arrangement to leave a strip of standing straw and to deposit the cut crop therefrom onto the collection means.



4,715,175

BINDER-TWINE GUIDE AND CUTTER MECHANISM FOR ROLL-BALER

Siegfried Schaible, Singen/Htwt.; Hans-Peter Wölfl; Eike Güsewell, both of Gottmadingen, and Bernhard Kohl, Winkelhaid, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

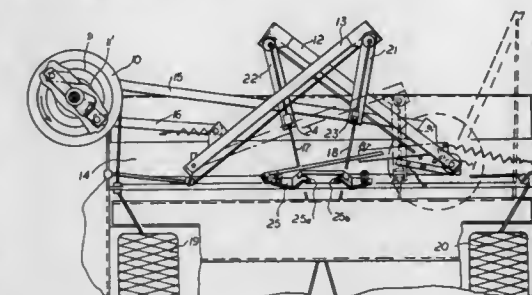
Filed Dec. 11, 1985, Ser. No. 808,348

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1984, 3445060

Int. Cl.⁴ A01D 39/00

U.S. Cl. 56-432

7 Claims



1. In a binding apparatus for tying up a round bale of agricultural harvested material formed in a baler, said binding apparatus being mounted on the housing of said baler, said binding apparatus comprising at least one cord supply spool, a cord guide mechanism for guiding at least one cord along the upper surface of said round bale to tie said bale up, and a cutting mechanism for said cord, said cutting mechanism being attached to said cord guide mechanism, wherein said cord guide mechanism comprises at least one cord guide arm and a cord disk having a gear unit, the improvement wherein said cutting mechanism is connected by a connecting rod to one end of a pulling strap, the other end of said pulling strap being attached by a pulling spring to a transverse truss provided for said binding apparatus, and on said cord guide mechanism an operating mechanism cooperating with said pulling strap is provided.

fluid wherein the working fluid is to be used to operate a work producing device, said apparatus comprising:

- a silo, said silo having a longitudinal center axis, said longitudinal center axis being located substantially vertical, said silo having an open top and a closed bottom, said silo being substantially filled with a liquid;
- track means mounted within said silo, said track means extending from said open top to said closed bottom;
- a carriage assembly, said carriage assembly having a carriage housing, said carriage housing having mounted thereon track engaging means, said track engaging means to connect with said track means and be movable thereon permitting movement of said carriage assembly between said open top and said closed bottom, said carriage housing having an internal chamber;
- a fluid cylinder mounted within said internal chamber, said fluid cylinder defining an inner compartment, a piston movably mounted within said inner compartment, said piston dividing said inner compartment into a gas containing section and a liquid containing section;
- a gas, said gas being located within said gas containing section;
- an orifice formed within said fluid cylinder, said orifice connecting with said liquid containing section; and
- a valve mounted in conjunction with said orifice, said valve permitting flow of liquid into said liquid containing section, said valve normally preventing flow of liquid from said liquid containing section, whereby as said carriage assembly submerges deeper into said silo some of said liquid passes said valve into said liquid containing section thereby moving said piston against said gas containing section compressing said gas contained therein, upon the maximum amount of said liquid being located within said liquid containing section at said closed bottom said carriage assembly is then moved to said open top and removed from said silo with the said liquid contained within said liquid containing section being removed therefrom and utilized to produce work.

4,715,183

DUAL SOURCE EXTERNAL HEATING SYSTEM FOR A HEAT PIPE

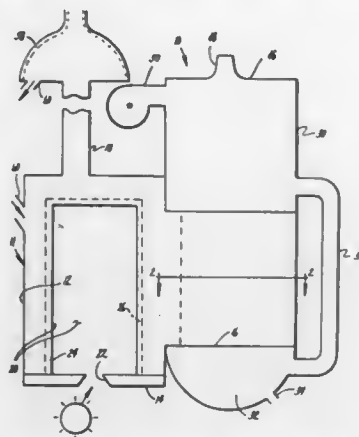
Roelf J. Meijer, and Benjamin Ziph, both of Ann Arbor, Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed Feb. 27, 1987, Ser. No. 19,590

Int. Cl.⁴ F02G 1/055; F03G 7/02

U.S. Cl. 60—524

3 Claims



1. An external heating system for supplying thermal energy to a heat engine which enables both solar energy and heated gases to be employed as heat sources comprising:

- a heat pipe evaporator cavity,
- a solar energy cavity,
- a heat exchanger section communicating with said solar energy cavity defining a plurality of hollow fins, and
- a gas combustor having a combustion chamber and a housing

ing for directing the heated gasses from said combustion chamber past said hollow fins.

4,715,184

KNOCK CONTROL SYSTEM FOR SUPERCHARGED INTERNAL COMBUSTION ENGINE

Kouichi Oosawa, and Yoshiaki Kinoshita, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

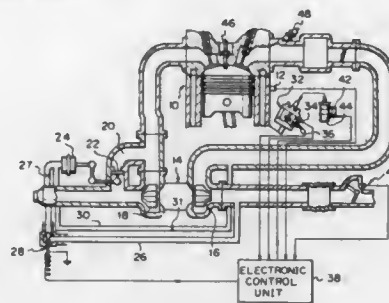
Filed Aug. 29, 1986, Ser. No. 901,819

Claims priority, application Japan, Sep. 10, 1985, 60-198589

Int. Cl.⁴ F02D 23/00

U.S. Cl. 60—602

4 Claims



1. A knock control system for a supercharged spark-ignition internal-combustion engine having a supercharger and an electronic ignition system, comprising:

- means for determining a basic spark advance in said ignition system in response to actual rotational speed and load of the engine;
- means for determining a retard correction value in response to an occurrence of detonation;
- means for correcting the basic spark advance by the retard correction value to determine an executive spark advance, by which the electronic ignition system causes an ignition spark to be generated;
- means for comparing the retard correction value with at least one predetermined reference value;
- boost pressure control means for reducing a supercharger boost pressure in response to the retard correction value being greater than the predetermined reference value, and for increasing the boost pressure in response to the retard value being smaller than the predetermined reference value;
- memory means for storing predetermined engine load threshold values for different rotational speeds of the engine;
- means for sensing an actual engine speed;
- means responsive to the actual engine speed for accessing the memory means and retrieving therefrom a predetermined engine load threshold value for the actual engine speed;
- means for sensing an actual engine load;
- means for comparing the actual engine load with said predetermined engine load threshold value for said actual engine speed; and
- means for cancelling the operation of said boost pressure control means when the actual engine load is smaller than the engine load threshold value.

4,715,185

METHOD AND MEANS FOR INCREASING ENERGY OUTPUT AND THERMAL EFFICIENCY OF AN ENERGY CYCLE SUCH AS THE RANKINE STEAM CYCLE

Eric A. Salo, 15898 Via Pinalte, San Lorenzo, Calif. 94578

Filed Oct. 3, 1986, Ser. No. 916,009

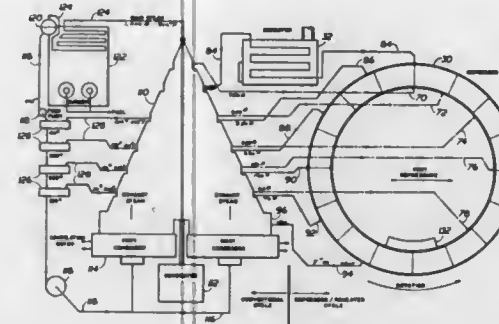
Int. Cl.⁴ F01K 17/00

U.S. Cl. 60—677

4 Claims

1. In the combination of an electrical generator and a steam

drive therefor, the improvement comprising first means for repressurizing partially expanded steam from the turbine, second means for reheating the repressurized steam, and third means for feeding the repressurized reheated steam into the turbine into driving relation therewith under higher pressure and temperature conditions than those for said partially expanded steam, said first means comprising a continuous closed-path housing, a conveyor rotor therein having spaced interconnected discs defining with the housing steamconveying compartments, a plurality of conduits interconnecting different steam extraction stations at the turbine with different steam



injection stations at the housing, whereby said compartments may receive steam under progressively higher pressure conditions, a conduit interconnecting the compartment under highest steam pressure with said second means while higher pressure extraction steam is being introduced into said compartment, whereby pressurized steam in said compartment is displaced into said second means and therethrough and through said through means to a high pressure injection station at said turbine, and one or more conduits adapted to thereafter interconnect said compartment with one or more other lower pressure injection stations at said turbine.

4,715,186

COOLANT PRESERVATION CONTAINER

Hajime Ishimaru, Ibaraki; Masao Miyamoto, and Shojiro Komaki, both of Tokyo, all of Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

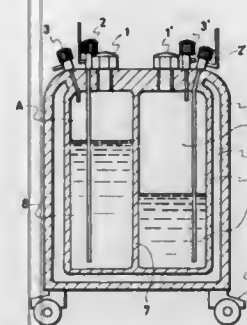
Filed Nov. 19, 1985, Ser. No. 799,414

Claims priority, application Japan, Nov. 19, 1984, 59-244301

Int. Cl.⁴ F17C 1/00

U.S. Cl. 62—45

18 Claims



1. A coolant preservation container comprising: an outerwall defining an enclosed space therein; an innerwall provided within said enclosed space and defining a container member therein; means defining at least one vacuum space formed between said outerwall and said innerwall for making said container member adiabatic; a partition comprised of a single, thermally conductive plate dividing said container member into a plurality of individual closed chambers; and at least one port provided on each individual closed chamber

for introducing a cryogenic liquid into each individual closed chamber and/or for discharging the cryogenic liquid from each individual closed chamber.

4,715,187

CONTROLLED CRYOGENIC LIQUID DELIVERY

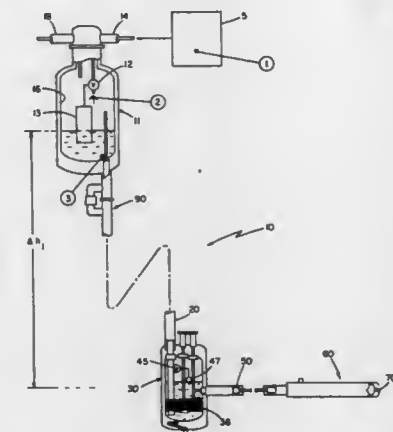
Thornton Stearns, Winchester, Mass., assignor to Vacuum Barrier Corporation, Woburn, Mass.

Filed Sep. 29, 1986, Ser. No. 912,923

Int. Cl.⁴ F17C 7/02

U.S. Cl. 62—55

20 Claims



1. System for delivering a controlled stream of liquid cryogen from an outlet, the system comprising:

- (a) a source of liquid cryogen at substantially constant pressure, remote from the outlet;
 - (b) a conduit connecting the source of liquid cryogen to the outlet;
 - (c) a flow-rate control restriction positioned in the conduit; and
 - (d) means to maintain cryogen substantially entirely in liquid phase as it flows through the conduit, and out of the outlet, and to maintain said flowing cryogen at a temperature substantially equal to or below the cryogen's boiling point at atmospheric pressure;
- whereby the cross-sectional area of the restriction controls the rate of liquid cryogen delivered at the outlet, and cryogen is reliably delivered at the outlet without severe flashing.

4,715,188

METHOD AND COOLER FOR COOLING GRANULAR MATERIAL

Torben Enkegaard, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Copenhagen, Denmark

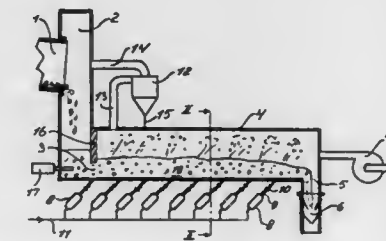
Filed Jun. 19, 1986, Ser. No. 876,243

Claims priority, application United Kingdom, Jun. 28, 1985, 8516474

Int. Cl.⁴ F25D 13/06

U.S. Cl. 62—63

5 Claims



1. A cooler for cooling granular material, said cooler comprising a horizontal or inclined non-rotatable cooler body

having a material inlet end and a material outlet end, a cooling air source for providing cooling air through said cooler in a direction from said material outlet end toward said material inlet end, at least one row of shock air blasters mounted along the bottom of said cooler body, said shock air blasters having air outlets projecting upwardly through said bottom of said cooler body so as, in use, to direct air blasts against said material and cause said material to be dispersed and suspended in said cooler.

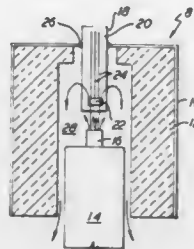
4,715,189

OPEN CYCLE COOLING OF ELECTRICAL CIRCUITS
Gert K. G. Hohenwarter, Tarrytown, N.Y., assignor to Hypres, Inc., Elmsford, N.Y.

Filed Nov. 12, 1985, Ser. No. 796,842
Int. Cl.⁴ F25D 17/02

U.S. Cl. 62—64

10 Claims



1. A method for localized cooling of a device containing a low temperature region, comprising the steps of:

- confining said low temperature region of said device in a housing which is open to the surrounding environment and which permits said low temperature region to be operably connected to a second device disposed outside the housing;
- carrying a cooling fluid from a cooling fluid source and directing a stream of the cooling fluid into the housing in the vicinity of said low temperature region so that the cooling fluid makes thermal contact with said low temperature region; and
- venting the cooling fluid away from the vicinity of said low temperature region of said device and into the surrounding environment.

4,715,190

CONTROL AND METHOD FOR MODULATING THE CAPACITY OF A TEMPERATURE CONDITIONING SYSTEM

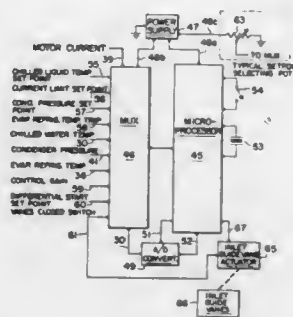
Doyoung Han, North Syracuse, N.Y., and Merle A. Renaud, Onalaska, Wis., assignors to American Standard Inc., New York, N.Y.

Division of Ser. No. 800,426, Nov. 21, 1985, Pat. No. 4,689,967.
This application Feb. 10, 1987, Ser. No. 13,110

Int. Cl.⁴ F25D 17/02; F25B 1/00

U.S. Cl. 62—201

20 Claims



1. In a temperature conditioning system for conditioning a

fluid to a setpoint temperature, a control for modulating the capacity of the system when an operating parameter is near a limit associated with protective shutdown of the system to avoid catastrophic failure, said control comprising

- means for sensing the condition of the operating parameter;
- means for selecting the limit for the operating parameter; and
- control means, responsive to the sensing means and the selecting means, for determining the deviation of the operating parameter from its limit and for modulating the capacity of the system according to a first predefined function of the deviation if the deviation is greater than a deadband and according to a second predefined function of the deviation if the deviation is less than the deadband.

4,715,191

AIR CONDITIONING METHOD

Hiroyuki Umemura; Kenji Matsuda; Tomofumi Tezuka; Kazuaki Isono; Hidenori Ishioka, all of Shizuoka; Sakuo Sugawara, and Masanori Hara, both of Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

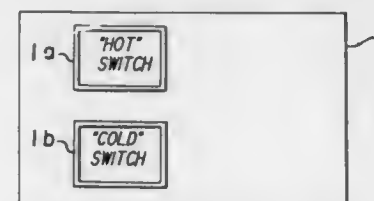
Filed Oct. 14, 1986, Ser. No. 918,725

Claims priority, application Japan, Oct. 15, 1985, 60-229075; Oct. 15, 1985, 60-229071; Oct. 15, 1985, 60-229072; Oct. 15, 1985, 60-229073; Aug. 1, 1986, 61-1544

Int. Cl.⁴ F25B 41/00

U.S. Cl. 62—208

10 Claims



1. An air conditioning method with use of an air conditioner which comprises a compressor placed in an air conditioner main body, a temperature detector for detecting temperature in a room, an A/D converter for converting an output from the temperature detector into a digital signal and a microcomputer which stores the output of said A/D converter and a set point value of temperature and compares the former with the latter thereby to produce an instruction signal to said compressor, characterized by comprising:

- a step of determining whether or not an input signal is produced from a plurality of switches for specifying a condition, said input signal being produced by a "hot" switch to be operated by a user when he feels hot and a "cold" switch to be operated when he feels cold,
- a step of determining a set point temperature on the basis of the signal from said switches, wherein when said "hot" switch is operated, the set point temperature is changed to a temperature equal to the room temperature minus a predetermined value and when said "cold" switch is operated, the set point temperature is changed to a temperature equal to the room temperature plus a predetermined value,
- a step of comparing data provided at said set point temperature determining step with the room temperature detected by said temperature detector to produce a signal, and,
- a step of controlling said compressor based on said signal as a result of the comparison.

4,715,192

ELECTRICAL OR THERMAL TRACKING COGENERATION SYSTEM UTILIZING OPEN CYCLE AIR-CONDITIONING

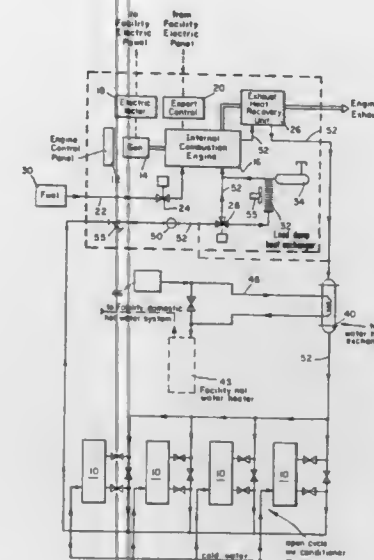
Yoram Katz, Los Angeles, Calif., assignor to Imperial Private Power, Santa Monica, Calif.

Filed Jun. 15, 1987, Ser. No. 61,455

Int. Cl.⁴ F25B 27/00

U.S. Cl. 62—323.1

9 Claims



1. A cogeneration system comprising:

- a generator;
 - an internal combustion engine for driving said generator;
 - a fuel source connected to said internal combustion engine;
 - valve means for regulating the amount of fuel supplied to the internal combustion engine;
 - an exhaust heat recovery unit connected to said engine;
 - a hot water heat exchanger connected to said exhaust heat recovery unit;
 - at least one open cycle air-conditioner connected to said hot water heat exchanger;
 - a pump for circulating fluid through the cogeneration system;
 - a load dump heat exchanger;
 - a fan means associated with said load dump heat exchanger; and
 - three way valve means regulating fluid flow between said pump means, said load dump heat exchanger, and said engine;
1. whereby fuel is supplied to said internal combustion engine through the interconnecting valve means, the internal combustion engine runs said generator which generates electricity to operate said hot water heat exchanger and said open cycle air-conditioner, and said pump circulates fluid which has been cooled by said at least one open cycle air-conditioner through said internal combustion engine to cool the internal combustion engine, from the internal combustion engine through said exhaust heat recovery unit, from the exhaust heat recovery unit through said hot water heat exchanger, from the hot water heat exchanger through said at least one open cycle air conditioner, to said three way valve means which regulates the water flow either directly to said internal combustion engine or through said load dump heat exchanger if the open cycle air-conditioner is not operating or only partially operating, and back through said internal combustion engine.

4,715,193

PLANT FOR THE PRODUCTION OF POPSICLES AND ICECREAMS INCORPORATING A HOLDING STICK
Carlo Curti, Milan, Italy, assignor to Saner S.p.A., Milan, Italy

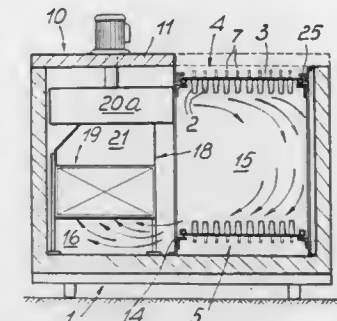
Filed Feb. 6, 1986, Ser. No. 826,882

Claims priority, application Italy, Feb. 6, 1985, 19405 A/85

Int. Cl.⁴ A23G 9/26

U.S. Cl. 62—345

8 Claims



3. A plant for the production of popsicles and ice creams incorporating a holding stick, comprising
a plurality of molds adapted to contain popsicles or ice creams being processed,
a guide means for moving said molds along a closed path having two superimposed main sections, including a forward one and a return one,
a thermally insulating casing, refrigerating members, and plural processing station all laid out along said path for said molds,
wherein

- predominant portions of both said main forward section and said main return section are accommodated within said thermally insulating casing,
- said refrigerating members include a plurality of cooling sets accommodated in said casing, each having at least one fan for circulating cool air along both said main path sections,
- rigid strips are provided to support arrays of said molds having confronting edges with a bent over recessed shape, and
- small flexible tubes are clamped between said edges, said small flexible tubes forming swivels between said strips and airtight seals, and
- said plant further comprising chains for entraining said rigid strips, further seal provided at the ends of said strips and at chains for entraining the strips, adapted to define a closure for said casing at openings formed in a top wall of the casing,
- cradle elements for supporting said chains, small sheets for covering said chains, and flexible lugs engaged with at least said cradle elements and carried slidably in contact with said strips.

4,715,194

ICE MAKING MACHINE WITH WATER DISTRIBUTOR
Yoshikazu Kito, Toyoake, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Oct. 23, 1986, Ser. No. 922,169

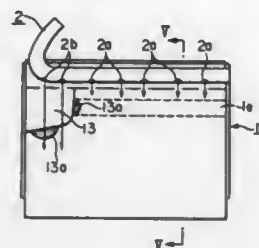
Int. Cl.⁴ F25C 1/12

U.S. Cl. 62—347

8 Claims

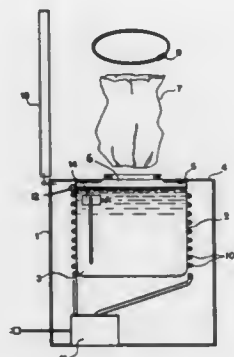
1. An ice making machine repeating an ice making cycle and a deicing cycle during operation thereof, comprising:
a freezing plate having one surface placed in contact with an evaporator and the other surface serving as a freezing surface;
a compressor in fluid communication with said evaporator for supplying a refrigerant thereto;
means disposed in the vicinity of one end of said freezing

plate for distributing water over said freezing surface of said freezing plate during the ice making cycle; and said water distributing means including means operative during the ice making cycle for leaving a predetermined region of said freezing surface a dry zone in which no water is distributed on said freezing surface, said predeter-



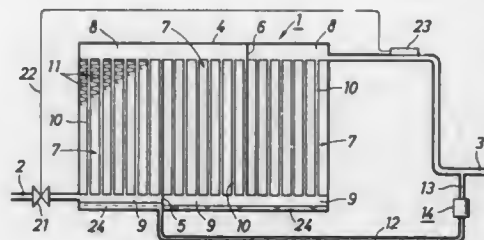
mined region corresponding in position to a portion of the region of said freezing plate where said evaporator is disposed, whereby the dry zone in which no water is distributed and which is in a region adjacent the evaporator is inherently somewhat colder than the region on which water is distributed, thereby ensuring the formation of a solid ice nucleus for propagation of ice to be made.

4,715,195
APPARATUS FOR RAPID COOLING OF CONTAINERS
Iosif Kucza, 160 Chalkfarm Drive, Apt. 818, Downsview, Ontario, M3L 2J1, Canada
Filed Jun. 2, 1987, Ser. No. 56,638
Int. Cl.⁴ F25D 17/02
U.S. Cl. 62-376



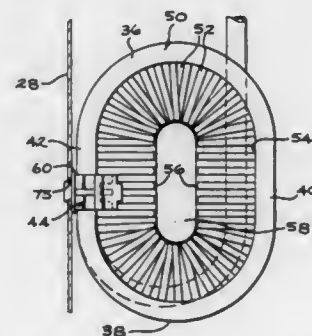
1. Apparatus for cooling articles comprising:
a top-opening cabinet;
a tub in the cabinet for holding liquid;
a plate across the tub, said plate having an opening;
refrigeration means connected for cooling the liquid; and
an open bag for holding the article, where the bag extends into the tub and the periphery of the bag is sealed across the opening in the plate thereby preventing direct access to the liquid from outside the cabinet, and where the bag is of a thin, flexible, liquid-impervious material;
whereby when sufficient liquid is placed in the tub so that a substantially part of the bag is in contact with the liquid and an article is placed in the bag, the bag will substantially conform to the shape of that part of the article lying below the surface of the liquid.

4,715,196
OIL RETURNING MECHANISM OF EVAPORATOR FOR AIR CONDITIONER
Hiroyuki Sugiura, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Apr. 3, 1987, Ser. No. 33,818
Claims priority, application Japan, Apr. 11, 1986, 61-82164; May 23, 1986, 61-118824
Int. Cl.⁴ F25B 43/02
U.S. Cl. 62-468



1. An air conditioner including a cooling medium compressor, a condenser, an expansion valve and an evaporator, these being connected one another by a cooling medium capillary tube to circulate a cooling medium, whereby an oil returning mechanism of an evaporator for the air conditioner is characterized in that there is provided an oil reservoir for reserving a lubricating oil after oil separation at a lower part of said evaporator, said oil reservoir and an outlet tube for guiding the cooling medium passed through said evaporator to said cooling medium compressor being connected by an oil returning tube, said oil returning tube being provided with a controlling valve, when a pressure differential between said oil returning tube and said outlet tube is a predetermined level or more, said controlling valve being closed to enhance a normal flow of the cooling medium from said evaporator to said cooling medium compressor, when said pressure differential is a predetermined level or less, the lubricating oil staying in the oil reservoir being fed to said cooling medium compressor via said oil returning tube and outlet tube.

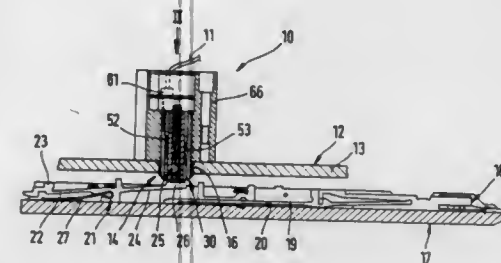
4,715,197
CLAMP ASSEMBLY
Mark D. Wattley, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Mar. 23, 1987, Ser. No. 28,878
Int. Cl.⁴ F25B 39/02
U.S. Cl. 62-515



1. A clamp assembly comprising:
a tubular elongated member having a portion of its circumference relatively smooth and a portion having a fin array comprising fins formed along a base line of the tubular elongated member, said fins extending radially outward from their attachment to the elongated member and bent alternately to diverge away from each other;

a clamp device having a base with securing means at one end from the base to fasten the clamp device to a structural panel member, two spaced apart legs at the other end from the base, said legs having a first portion spaced apart a distance sufficient to receive the tubular elongated member therebetween, a second portion diverging outwardly from the first portion, a third portion reversely bent relative to the second portion and forming inwardly directed resilient fingers converging toward the base and each other, said fingers having free ends and an inwardly directed projection located near the free end; and said tubular elongated member being received between the two spaced apart legs of the clamp device and retained therein by the fingers of the third portion with said projections positioned between the alternately bent fins in close proximity to the base line of the tubular elongated member.

4,715,198
CONTROL MAGNET ASSEMBLY FOR A PATTERN APPARATUS IN KNITTING MACHINES FOR ELECTRICALLY CONTROLLED NEEDLE SELECTION
Jürgen Ploppa, Pfullingen, and Franz Schmid, Bodelshausen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany
Filed Mar. 25, 1987, Ser. No. 30,014
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614220
Int. Cl.⁴ D04B 7/00
U.S. Cl. 66-75.2

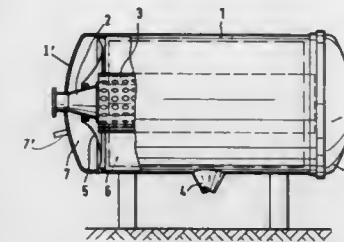


1. A control magnet assembly for a pattern apparatus in knitting machines for electrically controlled needle selection by controlling the armature element of selection jacks of the knitting machine operatively associated with the needles, comprising:
at least one selection magnet system having at least one permanent magnet retainer pole zone and at least one control pole zone, with said at least one control pole zone having a control coil associated therewith which is energized in accordance with the selection pattern;
a measuring head for detecting the magnitude of the magnetic field of the control pole zone; and
a circuit layout situated between the measuring head and the control coil for controlling the magnetic field of the control pole zone.

4,715,199
HIGH-TEMPERATURE DYEING APPARATUS
Guenther Kehlenbach, Wuerstelen, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany
Filed Apr. 10, 1986, Ser. No. 850,013
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513088
Int. Cl.⁴ D06B 5/18, 23/00
U.S. Cl. 68-198

1. An apparatus for dyeing materials at high temperatures, comprising a cylindrical pressure container having a horizontally extending axis, means mounted in said pressure container for holding material to be dyed, dyeing liquid inlet and outlet

means connected to said pressure container for circulating said dyeing liquid through said pressure container, flexible membrane means inside said pressure container for dividing said pressure container into a first chamber and into a second chamber smaller than said first chamber, means for mounting said



flexible membrane means inside said pressure container, and means for admitting a pressurized medium into said second smaller chamber for maintaining a required operating pressure in said first larger chamber through said flexible membrane means.

4,715,200
LOCKING DEVICE FOR A DOOR LOCK
James Katsaros, 616 S. Normandie Ave., Apt. 1303, Los Angeles, Calif. 90005
Filed Feb. 18, 1987, Ser. No. 16,676
Int. Cl.⁴ E05B 13/08
U.S. Cl. 70-211



1. In combination with a door, said door having a first locking mechanism for latching of said door, a doorknob connected to said first locking mechanism, said doorknob protruding from the surface of said door, a second locking mechanism mounted on said door, said second locking mechanism including a handle, said handle protruding from the surface of said door, said handle being manually movable from a locking position to an unlocking position, a locking device for said door comprising:

a bracket having an internal compartment, said handle to be located within said internal compartment, means mounted on said bracket movable to tightly engage with and be fixed to said handle;
an elongated bar having an inner end and an outer end, said bracket being attached by attaching means to said inner end, said doorknob abutting with said outer end, said bracket being movable relative to said elongated bar to assume various positions, said bracket being fixable to said elongated bar in each said position;
said bracket being pivotable about a pivot axis, said bracket having an apex portion, said elongated bar having an elongated center axis, said pivot axis being substantially perpendicular to said center axis of said elongated bar, during pivoting movement of said bracket relative to said

elongated bar said apex portion of said bracket remains in contact with said bar during the entire pivoting movement; and
 said bracket having a leg portion, said bracket being removable by disconnecting of said attaching means and moving said apex portion from said elongated bar and locating said leg portion against said elongated bar and re-engaging said attaching means.

4,715,201

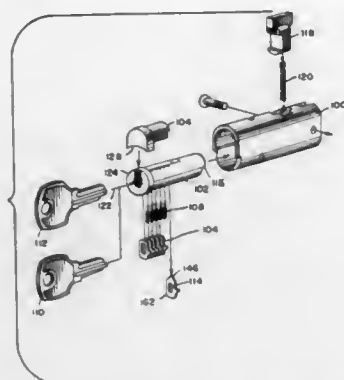
CYLINDER LOCK WITH REMOVABLE PLUG

Clark E. Craig, Simpsonville, S.C., assignor to Valbi, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 669,538, Nov. 8, 1984, Pat. No. 4,672,827. This application Jun. 5, 1986, Ser. No. 870,940
 Int. Cl.⁴ E05B 29/02

U.S. Cl. 70—369

4 Claims



1. An improved cylinder lock with a key operated removable plug comprising, in combination:
 - a first key means for operating the cylinder lock;
 - a second key means for allowing removal of the plug;
 - a cylinder having a longitudinal axis and defining a passage including a cylindrical portion of substantially constant diameter said cylinder also including tumbler recess means in a longitudinal direction along one side of the passage, and a longitudinal recess having an arcuately shaped cross section at the opposite side of the passage from the one side, said longitudinal recess having parallel sides extending parallel to the longitudinal axis;
 - an outwardly extending circumferential flange at one end of the passage, a groove in the inside surface of the passage through the flange to the longitudinal recess;
 - a plug rotatably mounted for rotation about the longitudinal axis in the cylindrical portion of the passage, said plug having an outside diameter substantially equal to the diameter of the cylindrical portion and rotatably mounted in the cylindrical portion, said plug including front face plate means of greater diameter than the plug to limit translation of the plug into the cylinder from the front of the passage, said plug including:
 - a plurality of tumbler passages generally transverse to the longitudinal axis;
 - an associated, longitudinal key slot mateable with the first and second key means and interconnecting the tumbler passages, and
 - a control tumbler passage mateable with the first and second key means, said control tumbler passage positioned at least in part longitudinally spaced from the front face plate means and beyond the circumferential cylinder flange when the plug is in the cylinder;
 - a plurality of combining tumblers in the tumbler passages configured to engage both the first and second key means, each tumbler defining a dimension transverse to the longitudinal axis greater than the plug diameter, biasing means for the combining tumblers in each tumbler passage, to bias the combined tumblers beyond the plug diameter to

engage the tumbler recess means on the one side of the passage in the cylinder and prevent plug rotation, said tumblers being translated against the force of the biasing means by either the first key means or the second key means to align the tumblers projecting beyond the diameter of the plug into the longitudinal recess on the opposite side of the passage whereby the plug may be rotated with the tumblers rotatable in the longitudinal recess;

an unbiased control disc tumbler in the control tumbler passage configured to engage both the first and second key means, said control disc tumbler defining a dimension transverse to the longitudinal axis greater than the plug diameter, said control disc tumbler defining means engaging the flange and preventing movement of the plug in a longitudinal direction out of the cylinder (1) when the first key means is placed in the key slot to engage the control tumbler and (2) when no key means is in the key slot; said control disc tumbler also defining means disengageable from the flange to release the plug when the second key means are engaged with the tumblers to align the combined tumblers within the longitudinal recess of the cylinder and the control tumbler disc is also translated to align one end with the groove through the flange, said one end shaped to slide in the groove, the opposite end of said control disc tumbler having a width greater than the width of the groove and tumbler recess means.

4,715,202

COIL-SPRING WINDING APPARATUS

Masaharu Shibata, Kamakura; Tsutomu Faruyama, and Kazuo Ohkoshi, both of Yokohama, all of Japan, assignors to NHK Spring Co. Ltd., Yokohama, Japan

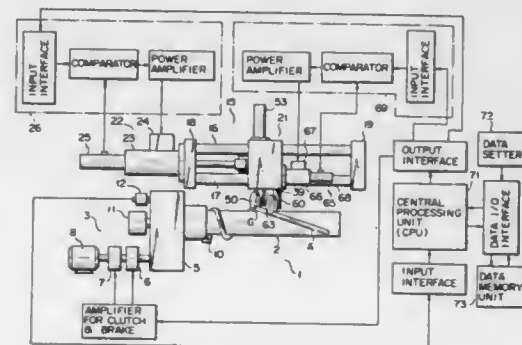
Filed Apr. 13, 1987, Ser. No. 37,865

Claims priority, application Japan, Apr. 22, 1986, 61-92816

Int. Cl.⁴ B21F 3/04

U.S. Cl. 72—21

5 Claims



1. A coil-spring winding apparatus for manufacturing a coil spring by forming a heated rod-shaped material into a spiral, comprising:

- a mandrel having one end and an outer peripheral surface on which the coil is to be wound;
- first drive means, for rotating the mandrel, said drive means including a motor;
- a chuck used for holding a leading end of the coil, said chuck being located at one end of the mandrel and adapted to rotate together therewith;
- a guide rail extending parallel to the mandrel;
- a carriage supported by the guide rail, for reciprocation along the rail;
- second drive means, for moving the carriage, said second drive means including a first actuator, for moving the carriage at a speed determined by the rotating speed of the mandrel;
- a first holder, attached to the carriage so as to be movable in the radial direction of the mandrel;
- a first guide roller mounted on the first holder, said guide

roller having an outer peripheral surface facing that of the mandrel, said peripheral surface having a groove thereon in which a part of the coil can be fitted;

a second actuator, for moving the first guide roller together with the first holder, in the radial direction of the mandrel;

a second guide roller, arranged at a radial distance from the first guide roller, and adapted to guide the coil toward the first guide roller;

supporting means attached to the carriage and supporting the second guide roller, said supporting means including a second holder for mounting the second guide roller, wherein the second guide roller is supported such that the second guide roller substantially faces a point of contact between the first guide roller and the coil, and is pivotable substantially around the contact point; and

a third actuator, for reorienting the second guide roller in accordance with the pitch angle of the coil spring.

4,715,203

COLD-WORKING TOOL

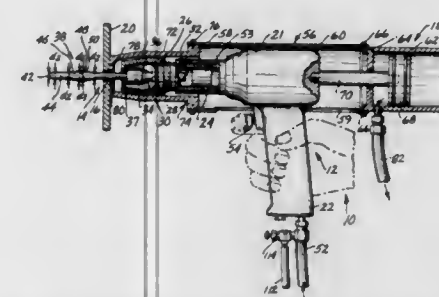
John H. Wiegstein, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 14, 1985, Ser. No. 798,001

Int. Cl.⁴ B30B 15/00

U.S. Cl. 72—30

10 Claims



1. A cold-working tool for thrusting an attached mandrel partially through a hole in a metal workpiece and extracting the mandrel from the hole, comprising:

- (a) a gun having a body, handle portion, and an elongate barrel, the barrel having an outer end located away from the body of the gun;
- (b) a boss having an inner end and an outer end, the inner end of the boss being retained within the outer end of the barrel, the inner end of the boss being slidable within the barrel, the outer end of the boss having the mandrel attached thereto;
- (c) pneumatic means associated with the gun and operable for delivering a succession of impulsive forces to the inner end of the boss and attached mandrel, a portion of the mandrel being forced through the hole by the impulsive forces;
- (d) a piston and cylinder assembly, the piston being slidable within the cylinder and having an attached rod extending from the cylinder with its outermost end attached to the gun, the piston and cylinder assembly and gun being configured and arranged so that when pressurized fluid is directed into the cylinder the piston is moved within the cylinder thereby creating a force tending to draw the gun and cylinder toward each other;
- (e) a housing having a first end and a second end, the first end connected to the piston and cylinder assembly, the housing configured so that its second end projects outwardly beyond the boss, the second end of the housing being positionable against the metal workpiece to brace the piston and cylinder assembly against the metal workpiece with the gun substantially between the piston and cylinder assembly and the metal workpiece for preventing movement of the cylinder toward the gun when pressurized fluid is directed into the cylinder, the housing being

further configured to substantially enclose the gun and permit movement of the gun within the housing; and,
 (f) operating means for selectively supplying pressurized fluid into the cylinder of the piston and cylinder assembly.

4,715,204

METHOD AND APPARATUS FOR ACCURATELY CENTERED ALIGNMENT OF A HOLLOW ROTATION SYMMETRICAL WORKPIECE

Norbert Ottlik, deceased, late of Augsburg, Fed. Rep. of Germany (by Klara Ottlik, Elisabeth Nowak, heirs), assignor to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

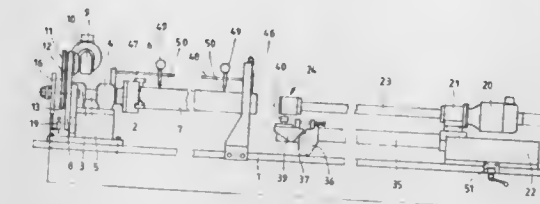
Filed Feb. 12, 1986, Ser. No. 828,829

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506450

Int. Cl.⁴ B21D 3/10; B21J 7/32, 7/46

U.S. Cl. 72—76

19 Claims



19. Method for accurately centering the alignment of a wall portion of a rotational symmetrical hollow workpiece (7) comprising the steps of

- measuring the outer wall of the workpiece (7) and determining the minimum distance of the wall portion from the longitudinal axis of the workpiece;
- introducing a hammering element (27,28) into the workpiece and hammering, from the inside of the workpiece, the wall portion which has the minimum distance from the axis of rotation, toward the outside;
- rotating said workpiece about the longitudinal axis relatively moving the hammering element with respect to said wall portion in at least one of the directions: axially; circumferentially, with respect to the axis of rotation of the rotation symmetrical workpiece;
- and changing the frequency of hammering operation as a function of the rotation position of the hammering element against the respective inner wall portion of the workpiece from the minimum distance of the wall portion with respect to said wall portion.

4,715,205

PLANETARY-TYPE ROLLING MILL FOR NON-FLAT PRODUCTS

Bernard Fazan, Metz, France, assignor to IRSID, Saint Germain-en-Laye, France

Continuation of Ser. No. 704,226, Feb. 22, 1985, abandoned.

This application Aug. 4, 1986, Ser. No. 892,457

Claims priority, application France, Feb. 22, 1984, 84 02803

Int. Cl.⁴ B21B 13/20

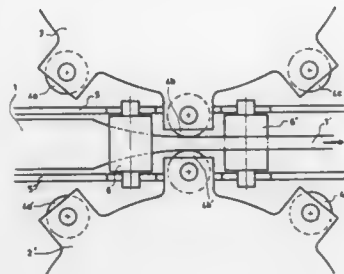
U.S. Cl. 72—198

2 Claims

1. A rolling mill of universal planetary type for rolling long products of circular cross section, in which a rolling action is performed by work rolls acting as opposing paired work rolls arranged equiangularly at the periphery of rotating rolling units distributed symmetrically about the product to be rolled, wherein:

- (a) the axes of said work rolls are parallel with the axis of the rotating rolling unit which bears them;
- (b) each work roll is a solid of revolution having two truncated cones with equal minor bases joined together axially forming a waist of circular shape extending over an arc of

a circle greater than 90° having its center equidistant from the two axes of said opposing paired work rolls when the latter are performing the rolling action on a said product, said waist having an axis of symmetry other than the plane containing the longitudinal axis of the rolled product and



perpendicular to the axis of said work rolls; and said waist spreads outwardly at both ends, thereby providing a continuous transition between the portion of the surface of the rolled product in contact with said work roll and the portion of said surface which is not in such contact.

4,715,206

ROLLING STAND OF THE TYPE WITH TIE-RODS WITH OSCILLATING SUPPORTS WITH INTERCHANGEABLE INTERMEDIATE HOLDER BASES

Luigi Forni, Castellanza, Italy, assignor to Pomini Farrel S.p.A., Castellanza, Italy

Continuation of Ser. No. 736,756, May 22, 1985, abandoned.

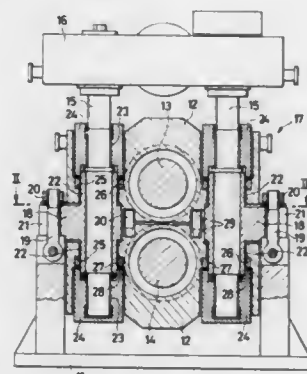
This application Apr. 29, 1987, Ser. No. 45,222

Claims priority, application Italy, May 28, 1984, 21129A/84

Int. Cl. B21B 31/04, 31/08, 13/08

U.S. Cl. 72-237

10 Claims



1. A convertible rolling stand comprising:

- a bed frame;
- intermediate holder bases having outwardly projecting portions, said outwardly projecting portions being configured and dimensioned to rest on and be removably secured to said bed frame;
- four vertical tie rods rotatably housed in said intermediate holder bases, each said tie rod having upper and lower threaded sections protruding out of said holder bases;
- upper and lower roll supports each rotatably supporting a horizontal roll, said upper roll support having nut seats securely housing threaded nuts corresponding to and engaging said upper threaded sections of said tie rods, said lower roll support having nut seats securely housing threaded nuts corresponding to and engaging said lower threaded sections of said tie rods, said threaded nuts being

non-rotating relative to said upper and lower roll supports;

drive means connected to said tie rods for rotating said tie rods relative to said roll supports, thereby causing said threaded nuts to be axially displaced on said tie rods such that said upper and lower roll supports are adjusted relative to each other; and

jack means engaging said upper and lower roll supports for urging said roll supports away from each other such that said roll supports are biased against said threaded nuts and tie rods.

4,715,207

APPARATUS FOR COVERING METALLIC BILLETS WITH ALUMINUM

Johann Rudolph, Hanau, Fed. Rep. of Germany, assignor to Vacuumschmelze GmbH, Fed. Rep. of Germany

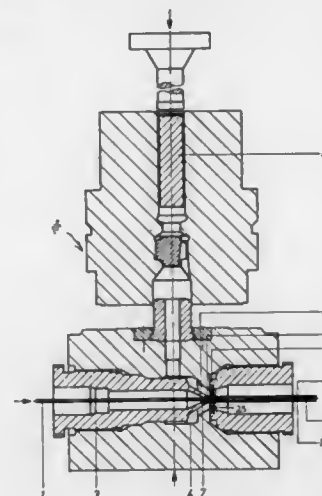
Filed Jun. 19, 1986, Ser. No. 875,957

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521850

Int. Cl. B21C 23/24

U.S. Cl. 72-268

2 Claims



1. In an apparatus for extruding a sheath onto a core, said core being selected from wires, cables, bands, pipes and the like, said sheath being composed of a material selected from a group consisting of aluminum and aluminum alloys, said apparatus having an extrusion chamber containing the material for the sheath, a nozzle projecting into the extrusion chamber and having a nozzle opening adapted to a cross section of the core and being aligned with a die opening in a die of the chamber with the die opening being adapted to the cross section of the finished extruded article, the improvements comprising means for producing friction between an inside surface of the nozzle opening and the surfaces of the core as the core passes through the nozzle opening, said means for forming friction comprising providing internal projections on a surface of the nozzle opening, said projections having a continual increasing height adjacent an end face of said nozzle.

4,715,208

METHOD AND APPARATUS FOR FORMING END PANELS FOR CONTAINERS

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Oct. 30, 1986, Ser. No. 924,981

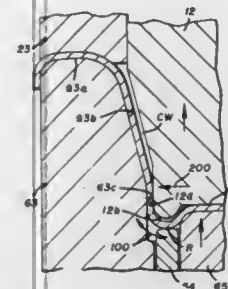
Int. Cl. B21D 51/44

U.S. Cl. 72-348

6 Claims

1. A method of forming a container end piece from a blank of material comprising the steps of:
- (A) initially forming an end piece having a central panel and

a peripheral flange interconnected by a countersink radius adjacent said central panel and a tapered chuckwall leading from said flange to said radiused area with said wall being tapered toward said central panel for a portion of its



- length and terminating in a vertical segment adjacent said radiused area; and
- (B) reforming the end piece initially formed to reduce the radius while maintaining at least a portion of said vertical segment in a vertical condition.

4,715,209

CROWN CONTROL COMPENSATION CONTROLLING METHOD IN MULTIPLE ROLL MILL

Hiroo Oshima, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

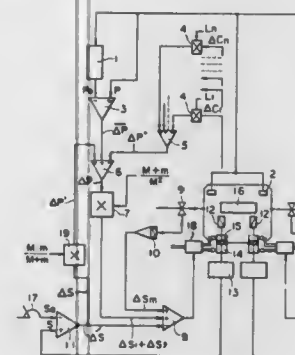
Filed Feb. 4, 1986, Ser. No. 825,981

Claims priority, application Japan, Jun. 6, 1985, 60-124000

Int. Cl. B21B 37/12

U.S. Cl. 72-366

1 Claim



1. A crown control compensation controlling method for controlling the position of at least one wedge in a multiple roll mill, said method comprising the steps of:

- (a) detecting and storing an initial value P_0 of a rolling load;
- (b) detecting the instantaneous value P of the rolling load;
- (c) calculating the instantaneous rolling load variation ΔP by subtracting the initial value P_0 of the rolling load from the instantaneous value P of the rolling;
- (d) multiplying the crown control quantities $\Delta C_1, \Delta C_2, \dots, \Delta C_n$ at preselected control points by the coefficients of influence on rolling load L_1, L_2, \dots, L_n and summing the products to obtain a rolling load variation $\Delta P''$;
- (e) multiplying the instantaneous rolling load variation ΔP by the value

$$\frac{M+m}{M^2}$$

wherein M is the mill modulus of the rolling mill and m is the plasticity modulus of the rolling stock, thereby obtaining a value $\Delta S_1 + \Delta S_2 = \Delta S$, wherein ΔS is the roll gap

control quantity and ΔS_1 and ΔS_2 are two portions into which the roll gap control quantity ΔS is divided;

(f) multiplying the roll gap control variation ΔS by an influence coefficient

$$\frac{Mm}{M+m}$$

wherein M and m are as defined previously to obtain the secondary rolling load variation $\Delta P'$;

(g) adding the instantaneous rolling load variation ΔP and a secondary rolling load variation $\Delta P'$ and subtracting the rolling load variation $\Delta P''$ to obtain the instantaneous rolling load variation caused by entry plate thickness variation ΔP ;

- (h) measuring the instantaneous plate thickness;
- (i) calculating the plate thickness variation ΔP ;
- (j) calculating a monitor component ΔS_m based on feedback of the plate thickness deviation;
- (k) subtracting the initial roll gap S_0 between the upper and lower work rolls from the shift position S of the work rolls to obtain the roll gap variation ΔS ;
- (l) adding the monitor component ΔS_m to the roll gap control quantity $\Delta S = \Delta S_1 + \Delta S_2$ and subtracting the roll gap variation ΔS ; and
- (m) controlling the position of at least one wedge in accordance with the value of the roll gap control quantity $\Delta S = \Delta S_1 + \Delta S_2$.

4,715,210

METHOD FOR MAKING STEERING RACK BARS

Arthur E. Bishop, 17 Burton St., Mosman, New South Wales, Australia (2088); Klaus J. Roeske, 54 Ponyara Rd., Beverley Hills, New South Wales, Australia, and David W. Scott, 7 Solitary Pl., Ruse, New South Wales, Australia (2560)

Division of Ser. No. 572,424, Jan. 4, 1984, Pat. No. 4,571,982.

This application Jan. 16, 1986, Ser. No. 819,291

Claims priority, application Australia, Jun. 4, 1982, PF4309;

PCT Int'l Appl., Jun. 2, 1983, PCT/AU83/00073

Int. Cl. B21J 7/18; B21K 1/76, 7/12

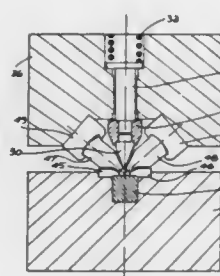
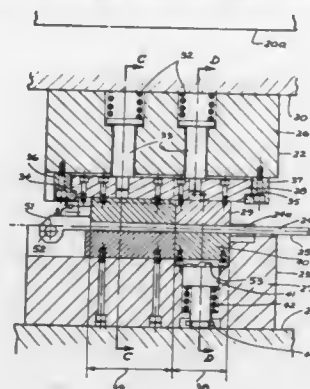
U.S. Cl. 72-400

4 Claims

1. A method of making a steering rack bar having a Y-form rack portion and a cylindrical portion from a blank by forging comprising the following steps:

- (a) producing an accurately shaped generally cylindrical blank the diameter of which is substantially equal to that of the cylindrical portion of the steering rack bar;
- (b) holding the cylindrical portion in the die of a press and subjecting a portion thereof to a forging operation to produce a Y-form rack portion, in a part of said die having a group of at least three relatively movable forming elements;
- (c) during said forging operation causing said elements to converge on the blank one of said elements acting to form teeth on a face thereof and at least two other of said elements acting to form two longitudinally extending guiding faces of the Y-form rack portion on an opposite face, the elements being moved in such a manner that as the die closes the said other elements effect a synchronized rolling motion while converging on the blank, the said other elements forcing material into cavities in the said one

element corresponding in shape to the teeth to be formed, from two directions simultaneously thereby focusing and



intensifying the forming pressure within said cavities, removing the finished rack bar from the die.

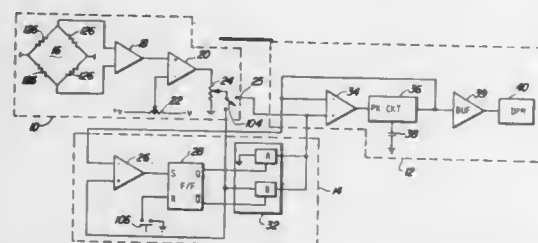
4,715,211 SINGLE PULSE PEAK CIRCUIT FOR TORQUE VERIFICATION

Ken Lehoczy, Livonia, Mich., assignor to GSE, Inc., Farmington Hills, Mich.

Filed Jun. 16, 1986, Ser. No. 874,533
Int. Cl. G01L 25/00

U.S. Cl. 73-1 C

5 Claims



1. A method of measuring the torque generated by a fastening device which produces multiple torque spikes comprising the steps of:

- monitoring the torque output of the fastening device as the torque increases and converting the torque output into a torque signal;
- displaying the value of the highest torque signal received; and
- when the torque output of the fastening device drops, preventing display of all subsequent increases in torque output of the fastening device.

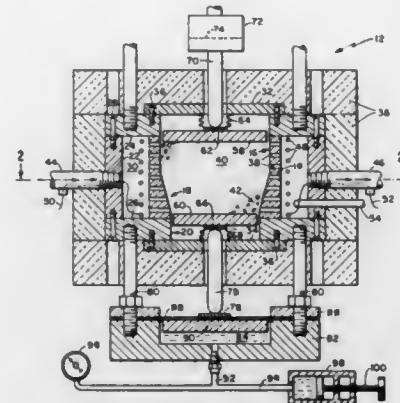
4,715,212 BULK SOLIDS PROPERTY TESTER

Jerry R. Johanson, San Luis Obispo, Calif., assignor to Jenike & Johanson, Inc., North Billerica, Mass.

Filed Apr. 24, 1986, Ser. No. 855,311
Int. Cl. G01M 3/00

U.S. Cl. 73-38

15 Claims



1. Testing apparatus for bulk solids comprising, in combination,

a test cell for containing the solids having a laterally enclosing wall converging from a first end toward a second end thereof, the cross sectional area of the first end exceeding the cross sectional area of the second end, means for applying pressure to the solids over said area of the first end including means to increase said pressure and a sensor for measuring said pressure, and means extending over said area of the second end, movable in the direction toward and away from the first end and adapted to confine the solids in the cell.

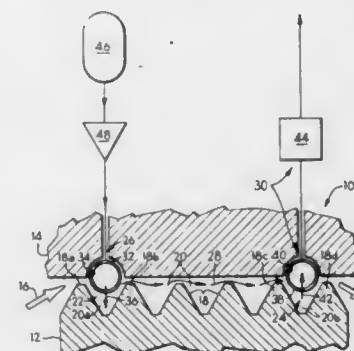
4,715,213 FLOW MEASUREMENT SYSTEM

William F. McGreehan, Fairfield, and Laurence T. Sherwood, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 13, 1986, Ser. No. 839,840
Int. Cl. G01M 3/20

U.S. Cl. 73-40.7

17 Claims



1. A method for measuring the leakage flow rate of a gas stream through a seal, said seal being positioned between an upstream and downstream region of said gas stream to continuously block gas flow therebetween, said method comprising the steps of:

- injecting a tracer gas at said upstream region;
- mixing said tracer gas with said gas stream to form a mixed flow stream; and
- detecting the concentration of said tracer gas in said mixed flow stream at said downstream region to determine said

leakage flow rate of said gas stream through said seal, said mixed flow stream at said upstream and downstream regions being substantially identical in its chemical composition.

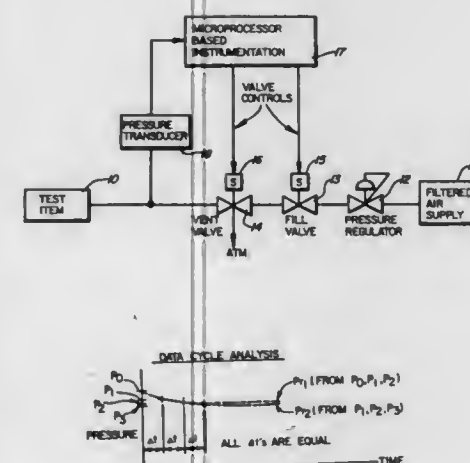
4,715,214 LEAK TESTER

Richard S. Tveter, Barrington, and Wayne A. Miller, Elgin, both of Ill., assignors to S. Himmelstein and Company, Hoffman Estates, Ill.

Filed Oct. 3, 1986, Ser. No. 914,925
Int. Cl. G01M 3/26

U.S. Cl. 73-49.2

16 Claims



9. The method of testing fluid receptors for leaking comprising the steps of:

- providing pressurized fluid into a chamber of the fluid receptor;
- isolating said chamber subsequent to provision of the fluid thereinto;
- sensing the pressure of the fluid in said isolated receptor;
- sequentially determining the sensed pressure at at least four different times during a stabilization period following the isolation of the chamber during which period the pressure in said isolated chamber changes exponentially due to a stabilization of the pressurized fluid therein toward a substantially constant value;
- calculating from a first group of at least three successive pressure determinations a first end pressure to which the fluid pressure should change after infinite time and calculating from a second, subsequent group of at least three successive pressure determinations a second end pressure to which the fluid pressure should attain after infinite time; comparing said first and second calculated end pressures and determining a differential therebetween;
- determining a characteristic of the exponential curve defining the rate of the pressure change due to the stabilization of the pressurized fluid; and
- calculating the leak rate from the value of the determined characteristic and the determined pressure differential.

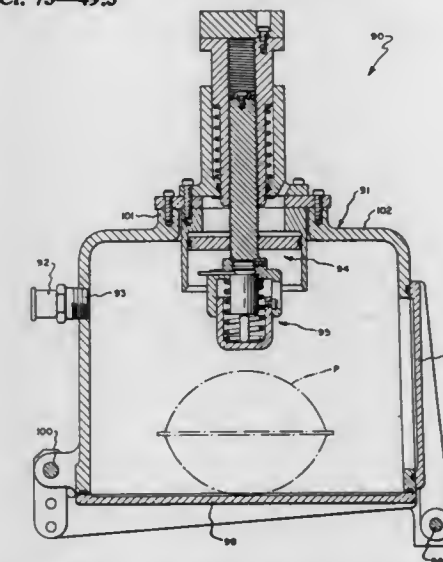
4,715,215 METHOD AND APPARATUS FOR TESTING THE FLUID-TIGHT SEALED INTEGRITY OF A HERMETICALLY-SEALED PACKAGE IN A RAPIDLY-STABILIZED ENVIRONMENT

John M. Perhach, Amherst; Charles E. Porter, Jr., Niagara Falls, and David C. Maloney, Alden, all of N.Y., assignors to The Aro Corporation, Bryan, Ohio

Continuation-in-part of Ser. No. 727,128, Apr. 25, 1985, abandoned. This application Oct. 2, 1986, Ser. No. 914,239
Int. Cl. G01M 3/02

U.S. Cl. 73-49.3

3 Claims



1. A leak detector for testing the fluid-tight sealed integrity of a hermetically-sealed package, comprising:

- an enclosure;
- a package-to-be-tested arranged within said enclosure, said package having a wall enclosing a chamber therewithin, a portion of said wall being movable in response to a pressure differential thereacross;
- a vacuum pump selectively operable to reduce the pressure within said enclosure for permitting the fluid within said chamber to expand and for permitting said wall portion to move;
- an actuator mounted on said enclosure, said actuator having a cylinder mounted on said enclosure and having a piston operatively arranged in said cylinder for sealed sliding movement therealong toward and away from said wall portion, said cylinder having a first stop arranged to limit further movement of said piston toward said package and having a second stop arranged to limit further movement of said piston away from said package, said piston having one face continuously exposed to the pressure within said enclosure and having its opposite face continuously exposed to atmospheric pressure, said actuator also including a spring acting between said piston and cylinder and urging said piston to move away from said package, said actuator being in a first position relative to said enclosure when the pressure within said enclosure is at atmospheric pressure and being in a second position relative to said enclosure when the pressure within said enclosure is at a predetermined negative pressure;
- a sensor mounted on said actuator and operatively arranged to sense displacement of said first wall portion when said actuator is in said second position and when the pressure within said enclosure is further reduced below said predetermined negative pressure, said sensor being operable to provide a signal as a function of such sensed displacement of said first wall portion; and
- a first comparator arranged to compare said sensor signal with a predetermined value, and operable to provide one signal if said sensor signal is greater than said predeter-

mined value and another signal if said sensor signal is less than said predetermined value.

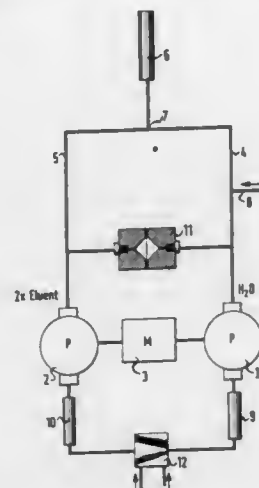
4,715,216 PROCESS AND APPARATUS FOR THE CHROMATOGRAPHIC DETERMINATION OF COMPONENTS IN SPECIMENS

Klaus P. Müller, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany
Filed Nov. 19, 1985, Ser. No. 799,491
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1984, 3442227

Int. Cl.⁴ G01N 31/08

U.S. Cl. 73—61.1 C

19 Claims



1. In a process for the determination of component concentrations down to the ppb (1 part per 10⁹ parts) range of a liquid specimen by chromatography separating said components in a separation column by means of an eluent stream of adapted special concentration, said specimen being at once introduced into the liquid stream to the separation column, the improvement comprising the steps of:

- providing a stream of said eluent with a concentration higher than said adapted special concentration for chromatographic separation; and
 - mixing said higher concentrated eluent stream with a necessary stream of extra-pure solvent to achieve said adapted special concentration when introducing the mixed streams into said separation column;
- said liquid specimen being added to said extra-pure solvent stream, just before mixing.

4,715,217 DETERMINING ORGANIC COMPOUNDS USING A MEMBRANE

Brenton S. Coyne; Andrew J. Strandjord; Mark W. Spence; Reid S. Willis; Robert A. Bredeweg, and Timothy S. Stevens, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 742,151, Jun. 6, 1985. This application Sep. 4, 1986, Ser. No. 903,535

Int. Cl.⁴ B01D 15/08

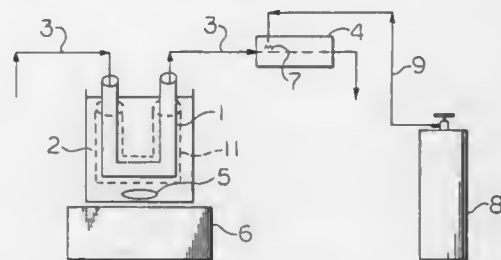
U.S. Cl. 73—61.1 C

14 Claims

1. In a membrane assisted analytical chemical method for the determination of the concentration of an organic compound in an aqueous matrix wherein said concentration is greater than the solubility limit of said compound in water, comprising the steps of:

- (a) adding an emulsifying agent to said matrix to essentially completely emulsify said organic compound;
- (b) partitioning said matrix from a receiving fluid with said

membrane, said membrane permeable to at least a detectable amount of said compound; and



(c) determining the concentration of said compound dispersed in said receiving fluid.

4,715,218 METHOD OF DETERMINING DEGREE OF EMBRITTELEMENT OF LOW ALLOY STEEL

Noriko Sato, Tokyo, and Masayuki Suzuki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

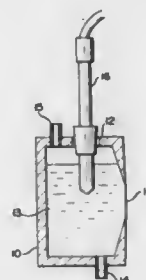
Filed Jul. 29, 1986, Ser. No. 890,281

Claims priority, application Japan, Mar. 25, 1986, 61-64707

Int. Cl.⁴ G01N 17/00, 27/00

U.S. Cl. 73—86

24 Claims



20. An apparatus for determining a degree of embrittlement which is caused by a thermal history of a low alloy steel, comprising an envelope containing therein an aqueous solution of an aromatic compound having a nitro group and at least one of a hydroxyl group and a carboxyl group, said envelope having an opening through which said aqueous solution contacts the low alloy steel, and a reference electrode which is brought into contact with said aqueous solution.

4,715,219 ACOUSTIC CALIBRATION DEVICE

Erling Frederiksen, Holte, Denmark, assignor to Aktieselskabet Bruel & Kjaer, Naerum, Denmark

Filed Jul. 28, 1986, Ser. No. 891,218

Claims priority, application Denmark, Sep. 23, 1985, 4310/85

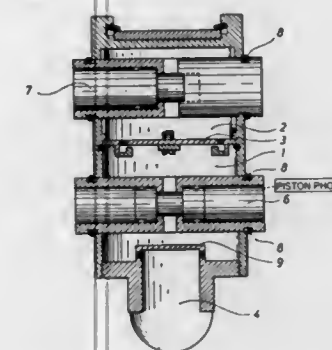
Int. Cl.⁴ G01H 17/00; G01M 19/00; G01D 21/00

U.S. Cl. 73—1 DV

11 Claims

1. An acoustic calibration device for intensity measuring systems comprising at least two pressure microphones (6,7) and at least two cavities, wherein the cavities are interconnected by means of at least one acoustic resistance element (3),

one of the pressure microphones (6) being insertable into one of the cavities (1) and the remaining pressure microphones (7)



being insertable into one of the remaining cavities (2), and a sound source being connected in the said one cavity.

4,715,220 THROTTLE VALVE OPENING SENSOR

Kenji Eitoku, and Kenji Hayashi, both of Obu, Japan, assignors to Aisan Kogyo KK, Obu, Japan

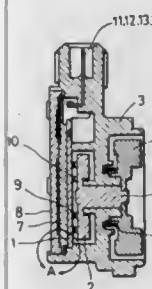
Filed Nov. 20, 1986, Ser. No. 932,590

Claims priority, application Japan, Dec. 5, 1985, 60-187907[U]

Int. Cl.⁴ G01D 11/24

U.S. Cl. 73—118.1

2 Claims



1. In a throttle valve opening sensor including a substrate provided with a throttle valve opening detecting portion, a rotor adapted to be rotated in association with rotation of a throttle valve, a housing for rotatably supporting said rotor and incorporating said substrate, a packing mounted in said housing for sealing said substrate, and a contact mounted on said rotor and adapted to slide on said opening detecting portion; the improvement comprising a substrate pressing portion formed at said packing for inwardly pressing said substrate, an O-ring projecting portion formed at said packing on the outer peripheral side of said substrate pressing portion and tightly contacting with said housing, and a cover provided outside said packing for inwardly pressing said substrate pressing portion and said projecting portion of said packing.

4,715,221 MOLD CAVITY VOLUME MEASURING APPARATUS

Conrad M. Grims, Golden, and Lawrence B. Eldridge, Littleton, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Aug. 5, 1986, Ser. No. 893,149

Int. Cl.⁴ G01F 17/00

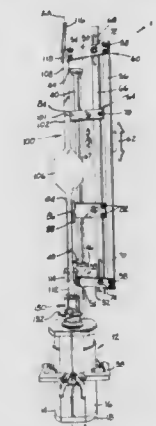
U.S. Cl. 73—149

4 Claims

4. An apparatus for measuring the volume of the cavity of a mold of the type used for blow molding having a plurality of relatively small dimension air passageways in fluid communication with the mold cavity for venting air from the cavity during molding and having a single opening into the mold

cavity for enabling the injection of air into the cavity during molding, the cavity opening being associated with an outer interfacing surface of the mold which is adapted to sealingly interface with an air blowing assembly, the apparatus comprising:

- (a) extensible membrane enclosure means, having a single enclosure opening therein and being insertable into said mold cavity through said mold cavity opening for expandably receiving a volume of liquid therein in totally filling relationship with said mold cavity and in nonfilling relationship with said air passageways;
- (b) liquid-holding means in selectively openable and closeable fluid communication with said extensible membrane enclosure means for receiving and holding a selected volume of liquid during a first holding state and for discharging a portion of said selected volume of liquid into said extensible membrane enclosure means and holding the remaining portion of said selected volume of liquid during a second holding state; wherein said liquid-holding means comprises a transparent column with a predetermined cross sectional configuration wherein the linear distance between the liquid level in said first holding state and the liquid level in said second holding state is indicative of the volume of liquid discharged from said liquid-holding means to said extensible membrane enclosure means;
- (c) said liquid-holding means comprising valve means for



enabling holding of said selected volume of liquid therein and for enabling discharge of a portion of said selected volume of liquid therefrom into said extensible membrane enclosure means;

- (d) connector means for sealingly connecting said extensible membrane enclosure means with said viewable liquid-holding means and having a fluid passage way therein extending between said valve means and said extensible membrane enclosure means;
- (e) liquid supply means for selectably supplying liquid to said liquid-holding means;
- (f) measuring means operatively associated with said liquid-holding means for measuring the difference in the volume of liquid in said liquid-holding means between said first holding state and said second holding state; wherein said measuring means is calibrated to account for said volume of said liquid in said fluid passageway between said valve means and said extensible membrane enclosure means and for said volume of the membrane of said extensible membrane enclosure means; wherein said measuring means comprises metered distance means having a first register indicia adapted to be aligned with the liquid level position of said liquid-holding means during said first liquid-holding state and having a second register indicia adapted to be positioned proximate the liquid level position of said liquid-holding means during said second liquid-holding state, said first register indicia and said second register indicia being spaced apart by a fixed preselected distance which is

representative of a preselected measuring volume approximately equal to the volume of the mold cavity being measured; whereby, when the actual volume of said mold cavity is equal to said preselected measuring volume, said lower register mark is positioned in exact alignment with said liquid level in said liquid-holding means in said second holding state; and whereby, when the actual volume of said mold cavity is different from said preselected measuring volume, said lower register mark is positioned in offset relationship with said liquid level in said second-holding state, the offset distance being proportional to the difference in volume between the actual volume of said mold cavity and said preselected measuring volume; further comprising scale indicia associated with said second register indicia for measuring the distance between the second register indicia and the liquid level of said liquid-holding means in said second holding state for determining the difference between the actual volume of the mold cavity and said preselected measuring volume; wherein said metered distance means is slidably moveable relative said liquid-holding means for enabling said first register indicia to be moved into alignment with said liquid level in said first holding state;

(g) membrane positioning and sealing means for positioning an upper portion of said extensible membrane enclosure means proximate the opening thereof in sealed relationship with interfacing surface of said mold whereby said extensible membrane is expandable into the entire volume of said mold cavity and only into said mold cavity by said liquid discharged into said extensible membrane from said liquid-holding means; wherein said membrane positioning means comprises:

slide means for enabling sliding movement of said connector means and said extensible membrane enclosure means attached thereto in a direction substantially in axial alignment with a central axis of said mold cavity opening;

interfacing surface means on said connector means adapted to abut with said interfacing surface of said mold whereby an annular portion of said extensible membrane enclosure means positioned proximate the opening of said extensible membrane enclosure means is sealingly engaged between said interfacing surfaces of said connector means and said mold cavity when said surfaces are urged into abutting relationship by sliding movement of said slide means;

(h) whereby the volume of said mold cavity is equal to the difference in the volume of liquid in said liquid-holding means between said first holding state and said second holding state plus the volume of the membrane of said extensible membrane enclosure means extending into said mold cavity less the volume of liquid positioned in said fluid passageway between said valve means and said extensible membrane enclosure means.

4,715,222

PRESSURE GAUGE

Tien-Tsai Huang, No. 4, Lane 30, Wu Chuan Street, Panchiao City, Taiwan

Filed Dec. 8, 1986, Ser. No. 938,886

Int. Cl.⁴ B60C 23/02; G01L 7/16

U.S. Cl. 73—146.8

5 Claims

1. A pressure gauge for measuring the pressure inside of a tire comprising:

a housing having an indicating board on one side thereof; an axle rotatably mounted in said housing; a pinion member fixedly mounted on said axle; an indicator for displaying the degree of rotation of said axle; a tube member including an inner end extending inwardly of said housing and in vertical position relative to the axis of said axle, and an outer end extending outwardly of said housing, adapted to communicate with the inside of the tire;

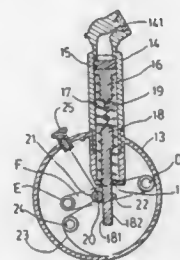
a movable member sealingly disposed in the outer end of

said tube member for being forced by the air pressure inside of the tire;

a compression spring disposed in said tube member, biasing said movable member against the pressure exerted on said movable member;

a rack member disposed movably in said tube member and having a lower end extending outwardly of said tube member so as to mesh with said pinion member;

a tension spring connecting said movable member with said rack member;



a blocking member normally brought into engagement with the surface of said axle to create a friction force therebetween when said axle is driven to rotate by said rack member as said movable member is forced downwardly by the air pressure, wherein the friction force is adjusted higher than tension force of said tension spring when said tension spring is at its most tensed state; thereby, only when said blocking member is released from said axle, will said rack member be pulled by the tension spring to its original position.

4,715,223

DEVICE FOR TESTING PROPERTIES OF COINS

Bernhard Kaiser, and Ortwin Wokoec, both of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

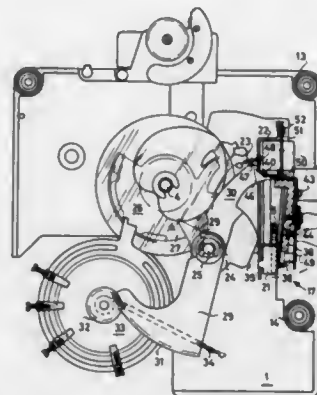
Filed Mar. 26, 1985, Ser. No. 716,033

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984, 3411347

Int. Cl.⁴ G01D 5/00

U.S. Cl. 73—163

7 Claims



1. Device for testing for magnetism and diameter coins in coin operated apparatus such as parking meters, comprising an upwardly extending coin guiding duct having an upwardly extending side wall and a lower end, a coin support means provided at said lower end of said coin guiding duct, a rocker lever having first and second arms, an adjustable set screw attaching said rocker lever to said side wall, a testing segment for carrying out a coin diameter testing step when a coin rests on said coin support means, a permanent magnet mounted on said first arm of said rocker lever, said magnet extending to the

range of a coin resting on said support means, so that the magnet is attracted by the coin if the coin is ferromagnetic, whereby said first arm of said rocker is moved toward the coin, said second arm comprising a locking bracket capable of engaging or being disengaged from said testing segment, depending on whether said first arm is moved toward the coin.

4,715,224

METHOD AND APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM

Ulrich Kuhn, Renningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

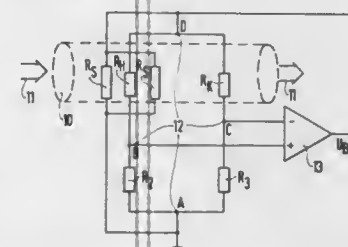
Filed Jan. 27, 1986, Ser. No. 822,519

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504082

Int. Cl.⁴ G01F 1/68

U.S. Cl. 73—204

7 Claims



1. A method for measuring the mass of a medium having an ambient temperature and flowing through a housing, in particular for measuring an air mass aspirated by an internal combustion engine, comprising the steps of:

applying a first film to a portion of a surface of a substantially rectangular substrate having a longitudinal extent to form at least one temperature-dependent resistor having sides,

disposing along said longitudinal extent of the substrate and on opposite sides of the at least one temperature-dependent resistor respective second films to form protective heating resistors having greater length than said at least one temperature-dependent resistor,

orienting said film on said surface so that said at least one temperature-dependent resistor is disposed substantially medially of terminal portions of the substrate, disposing at least one of said terminal portions in a metallic, thermally-conductive support means for thermal contact therewith,

further disposing said support means so that the at least one temperature-dependent resistor lays transversely to a flow direction of said medium and said terminal portions are exposed thereto,

connecting a resistance detection device having a regulating function to said at least one temperature-dependent resistor to form a closed loop for detecting a resistance value of the at least one temperature-dependent resistor, regulating the at least one temperature-dependent resistor to a predetermined resistance temperature by varying a supply of energy thereto, and maintaining said protective heating resistors at a temperature that approximates said predetermined resistance temperature of the at least one temperature-dependent resistor, whereby the at least one terminal portion of the substrate may be maintained at substantially the temperature of the medium.

4,715,225

FLOW METER FOR MEASURING THE FLOW RATE OF LIQUID

Yoshihiko Hasegawa, and Osamu Miyata, both of Hyogo, Japan, assignors to TLV Co., Ltd., Tokyo, Japan

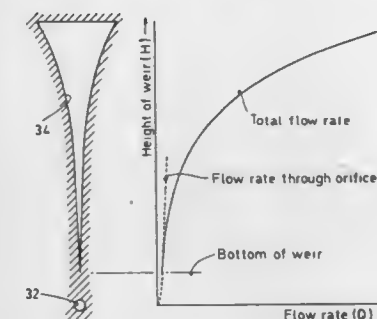
Filed Jul. 25, 1985, Ser. No. 759,077

Claims priority, application Japan, Aug. 9, 1984, 59-167410

Int. Cl.⁴ G01F 1/20

U.S. Cl. 73—215

6 Claims



1. A flow meter for measuring the flow rate of a liquid comprising a vertically elongated slit weir arranged to have said liquid flow therethrough and defining an upstream space on one side thereof, said flow meter being capable of detecting the liquid level in said upstream space with respect to said weir and determining the flow rate of the liquid on the basis of the relationship between said liquid level and the flow rate of the liquid that flows through the weir, wherein a width of said weir is designed so that a constant percentage variation in total flow rate causes a constant variation in liquid level at any liquid level.

4,715,226

ULTRASONIC APPARATUS FOR DETERMINING THE AMOUNT OF LIQUID IN A CONTAINER OF KNOWN VOLUME

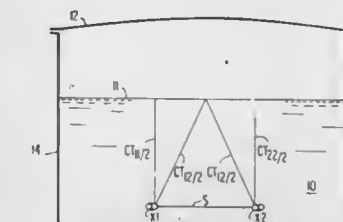
John A. Dorr, Crofton, Md., assignor to Xecutek Corporation, Annapolis, Md.

Filed Aug. 15, 1986, Ser. No. 896,972

Int. Cl.⁴ G01F 23/28

U.S. Cl. 73—290 V

2 Claims



1. In an ultrasonic apparatus for determining the volume of liquid in a container of known volume, comprising:

at least a pair of ultrasonic transducers, means mounting said pair of transducers a known distance apart relative to the liquid surface so that ultrasonic energy reflected from said liquid surface traverses the following paths:

(1) from a first of said transducers to the liquid surface, (2) from a first of said transducers immediately to said surface then and to said second of said transducers, means for measuring the time of travel T of ultrasonic energy from said one transducer to said surface, means for measuring the time of travel T of ultrasonic energy from said first of said transducers to the other of said transducers as reflected from said liquid surface,

means for computing the location of said surface of said liquid by solving:

$$H = \frac{ST}{2\sqrt{(T - \tau)(T + \tau)}}$$

where S equals the known distance between said pair of transducers, and means for computing the volume of liquid therefrom.

4,715,227

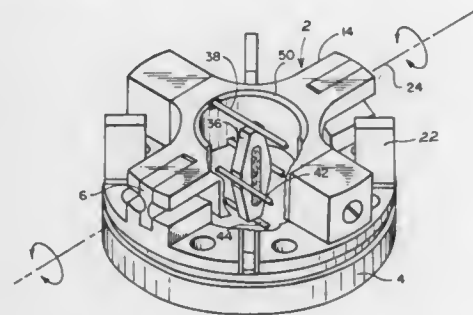
MULTISENSOR ASSEMBLY WITH ANGULAR RATE PIEZOELECTRIC CRYSTAL BEAM

Roland Pittman, Montclair, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 2, 1986, Ser. No. 902,695
Int. Cl.⁴ G01P 9/02

U.S. Cl. 73—504

13 Claims



1. In a navigation sensor having a gyroscopic element rotatable about an axis and at least one flexure hinge for resiliently mounting the gyroscopic element to a base, the gyroscopic element including an aperture concentric to the axis, the navigation sensor further having a torque sensing assembly comprising:

- a piezoelectric beam aligned in coaxial relationship with the axis;
- first restraining means for fixing orthogonal to the axis one edge portion of the beam to the gyroscopic element;
- second restraining means for fixing orthogonal to the axis an opposite edge portion of the beam to the base;
- third restraining means intermediate to the first and second restraining means for fixing to the gyroscopic element opposite midsection portions of the beam orthogonal to the axis;
- whereby the restrained beam converts an angular rate of the gyroscopic element to a corresponding electrical signal.

4,715,228

INSPECTION APPARATUS

Terry Livsey, and Graham T. Foulkes, both of Colne, England, assignors to Rolls-Royce plc, London, England

Filed Aug. 27, 1986, Ser. No. 900,694

Claims priority, application United Kingdom, Oct. 9, 1985, 8524854

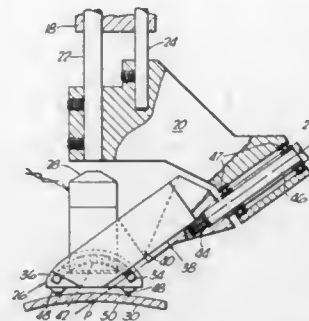
Int. Cl.⁴ G01N 29/04

U.S. Cl. 73—640

6 Claims

1. A device which in operation carries a probe and is moved over a workpiece surface so as to enable assessment of the workpiece by the probe and comprising a cradle and a cradle supporting head, wherein the cradle is adapted and arranged so as to enable adjustable positioning of said probe thereon and said cradle including a surface adapted in use to face said workpiece surface and including means for spacing said surface of said cradle a predetermined distance from said workpiece surface, and means for mounting said cradle for rotational movement about a first axis which passes through the sensing point of the probe and means for mounting said cradle

for movement about a second axis which intersects said first axis at a right angle and which passes through said sensing



4,715,229

APPARATUS FOR VIBRATION TESTING

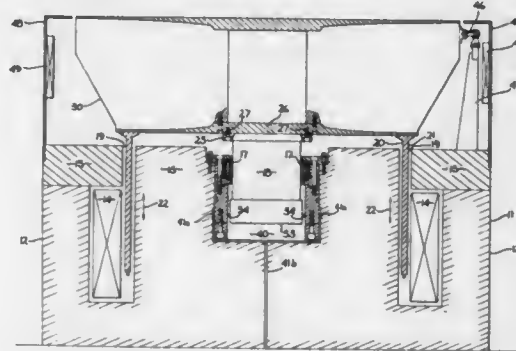
Gary Butts, Huntington Beach, Calif., assignor to Ling Electronics, Inc., Anaheim, Calif.

Filed May 5, 1986, Ser. No. 859,620

Int. Cl.⁴ G01M 7/00

U.S. Cl. 73—663

10 Claims



1. In a vibration testing device, including a reciprocative armature frame having means for mounting specimens thereon to be subjected to a spectrum of vibration test frequencies, said armature frame comprising:

- an upper plate comprised of a first material and formed with a central region which is thicker than the outer region thereof;
- a lower plate comprised of a second material;
- an intermediate member comprised of a third material disposed between and coupled to said upper and lower plates to form a unitary structure, said intermediate member including a hollow core and a plurality of ribs disposed substantially perpendicular to said plates;
- each of said first and second materials having a higher modulus of elasticity than said third material;
- said third material having a lower mass density than said first and second materials; and
- whereby undesirable resonant frequency ranges inherent within said device are shifted outside of the spectrum of vibration test frequencies.

4,715,230

PRESSURE REDUCING INSTRUMENT FOR PRESSURE GAUGES

Hisao Tatsuzawa, Odawara, Japan, assignor to Yamaya Sangyo Co., Ltd., Kanagawa, Japan

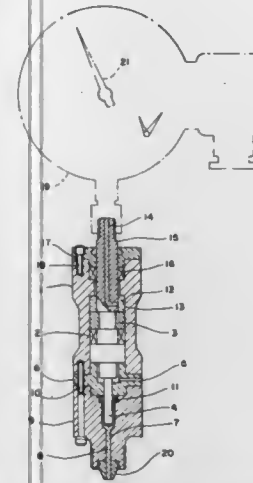
Filed Aug. 26, 1985, Ser. No. 769,243

Claims priority, application Japan, May 13, 1985, 60-070268[U]

Int. Cl.⁴ G01L 7/16

U.S. Cl. 73—706

1 Claim



1. A pressure reducing instrument for pressure gauges which comprises:
 - a cylinder;
 - a piston inside the cylinder, said piston having a pressure receiving face which is impinged by a pressure fluid to be measured and a pressurizing face for contacting a pressure transmitting fluid, the area of the pressurizing face being greater than the area of the pressure receiving face;
 - a bottom member secured to the bottom of the cylinder, the bottom member being provided with an introductory aperture, the introductory aperture beginning at one end of the exterior of the bottom member and terminating at its other end near the piston pressure receiving face whereby the pressure of the pressure fluid to be measured impinges the pressure receiving face;
 - an intermediate member interposed between the cylinder and the said bottom member;
 - the intermediate member comprising a central cavity, a portion of the piston being positioned within the central cavity;
 - the intermediate member being provided with an atmospheric conduit, the atmospheric conduit leading from the central cavity to the exterior periphery of the intermediate member;
 - the central cavity being positioned to introduce atmospheric pressure upon the piston intermediate its pressure receiving face and its pressurizing face;
 - whereby the said pressure transmitting fluid can be introduced into the pressure introductory portion of the pressure gauge at a pressure that is less than the pressure of the pressure fluid to be measured.

4,715,231

MAXIMUM PRESSURE INDICATOR

Leighton Lee, II, Guilford, and Robert J. Kolp, Ivoryton, both of Conn., assignors to The Lee Company, Westbrook, Conn.

Filed Nov. 20, 1986, Ser. No. 933,465

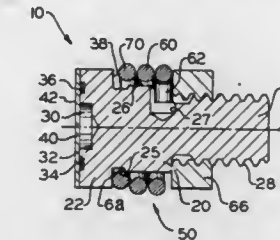
Int. Cl.⁴ G01L 7/08

U.S. Cl. 73—709

15 Claims

1. A maximum pressure indicator comprising: main body means adapted for insertion into a bore for form-

ing a rigid body comprising a head and a cavity opening through said head; bore securing means mounted to said main body means for engaging the surrounding wall of a bore to secure said main body means in fixed position in said bore; and irreversibly deformable means bonded to said head to sealingly enclose said cavity and having a pressure sensing



4,715,232

FLOW MEASURING SYSTEM WITH BACKFLOW PREVENTING MEANS

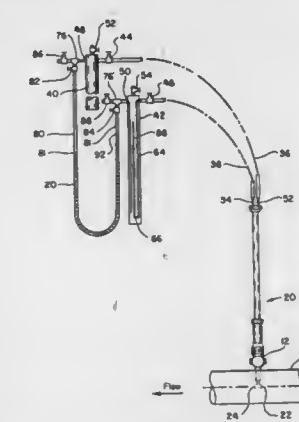
Carl F. Buettner, 9501 Pine Spray Ct., St. Louis, Mo. 63126

Filed Aug. 25, 1986, Ser. No. 900,186

Int. Cl.⁴ G01F 1/37

U.S. Cl. 73—861.49

19 Claims



1. Means for measuring the flow of fluid in a conduit filled with a fluid under pressure comprising a conduit with fluid under pressure to be measured, means for responding to differential pressure at some location in the conduit including a sensing head having a pair of oppositely facing open ended orifices and a separate tube connected respectively to each orifice and extending therefrom through and from the conduit, a pair of normally upwardly oriented closed tubular chambers external of the conduit, each of said chambers having an input passage located near the upper end thereof in communication with a respective one of said tubes and an outlet passage, a supply of a first fluid filling each of said chambers, a U-shaped conduit in each of said chambers, each U-shaped conduit having one end connected to communicate with the input passage thereof and an opposite open end, said U-shaped conduits extending from adjacent to the upper end of the respective chamber downwardly to near the bottom of the chamber and then upwardly therefrom to a location in the chamber adjacent the upper end of said chamber, the outlet passage to each of the

chambers including a tubular member having a first open end that extends downwardly to a position in the chamber adjacent the lower end of said chamber and an upper end communicating with the outlet passage, a differential indicating tube having a first end connected to communicate with the outlet passage of one of said chambers and a second end connected to communicate with the outlet passage of the other of said chambers, said differential indicating tube having a downwardly extending loop portion partially filled with an indicating fluid, the remaining portion being filled with the first fluid, the differential pressure sensed at the oppositely facing open ended orifices producing a height differential between the opposite ends of the indicating fluid in the differential indicating tube.

4,715,233

SENSOR FOR MAGNETIC-INDUCTIVE FLOWMETERS

Jozef H. M. Neven, Meerssen; Boedewijn J. Poortman, Dordrecht; Wouter T. Tromp, Sliedrecht, all of Netherlands, and Udo Stevens, Moers, Fed. Rep. of Germany, assignors to Rheometron AG, Basel, Switzerland

PCT No. PCT/EP86/00129, § 371 Date Oct. 14, 1986, § 102(e) Date Oct. 14, 1986, PCT Pub. No. WO86/05873, PCT Pub. Date Oct. 9, 1986

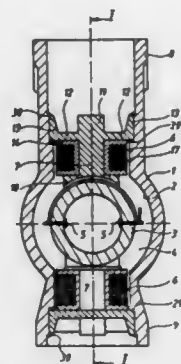
PCT Filed Mar. 10, 1986, Ser. No. 930,181

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 3511033

Int. Cl.⁴ G01F 1/58

U.S. Cl. 73—871.12

7 Claims



1. A flow sensor for magnetic-inductive flowmeters comprising a housing including a first bore extending therethrough, a sensing tube disposed within the housing and extending through the first bore, sensing electrodes mounted to the tube, first and second electromagnetic coils mounted to the housing, each having a core including first and second flanges proximate respective ends of the core, one of the core ends being affixed to the housing and the other one of the core ends being in contact with the sensing tube, a bobbin for each coil constructed of a dielectric material defined by first and second, generally semi-cylindrical bobbin segments shaped so that the segments can be placed about an intermediate portion of the core located between the flanges, and a conductor wire wrapped about the semi-cylindrical bobbin segments.

4,715,234

SELF-CLEANING AND SELF-LUBRICATING FLUID FLOWMETER

Charles R. Allen, Katy, and Jack D. Harshman, Missouri City, both of Tex., assignors to Daniel Industries, Inc., Houston, Tex.

Filed Jul. 18, 1986, Ser. No. 886,732

Int. Cl.⁴ G01F 1/10

U.S. Cl. 73—861.91

20 Claims

1. A self-cleaning and self-lubricating fluid flowmeter comprising:

(a) body means adapted for connection into a flow line and

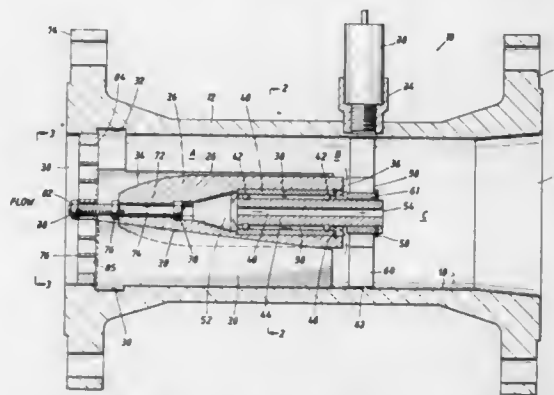
forming an internal flow passage for a fluid medium to flow therethrough;

(b) a bearing support hub being immovably positioned with said internal flow passage and forming a bearing receptacle;

(c) a turbine rotor;

(d) a rotor shaft extending into said bearing receptacle and supporting said turbine rotor in immovable assembly therewith;

(e) bearing means disposed within said bearing receptacle and establishing rotatable support for said rotor shaft and



rotor, said bearing means and said rotor shaft cooperatively defining a flow path extending upstream from the downstream extremity of said bearing support hub, passing through said bearing means, reversing direction and terminating at a location downstream of said downstream extremity of said bearing support hub;

(f) said bearing support hub being of a configuration for developing differential pressure responsive flow of said fluid medium through said flow path; and

(g) means developing signals responsive to fluid medium induced rotation of said turbine rotor.

4,715,235

DEFORMATION SENSITIVE ELECTROCONDUCTIVE KNITTED OR WOVEN FABRIC AND DEFORMATION SENSITIVE ELECTROCONDUCTIVE DEVICE COMPRISING THE SAME

Minoru Fukui, Toyomaka, and Naoki Kataoka, Kyoto, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Feb. 28, 1986, Ser. No. 834,785

Claims priority, application Japan, Mar. 4, 1985, 60-41024; May 14, 1985, 60-100482; Sep. 30, 1985, 60-214664; Sep. 30, 1985, 60-214665

Int. Cl.⁴ G01L 1/18; H01C 10/10

U.S. Cl. 73—862.68

48 Claims



1. A stretch sensitive electroconductive woven fabric comprising a plural number of longitudinal yarns and lateral yarns constituting a fabric strip having a shape which is substantially rectangular, in which conductive yarns are used for one of the longitudinal or lateral yarns constituting said fabric and insulating yarns for the other, and the longitudinal yarns and lateral yarns constituting said fabric strip are slanted relative to the longer direction of the fabric strip, and wherein the woven fabric is deformable and has an electrical resistance that varies with the degree of deformation.

4,715,236

POWER TRANSFORMER INSPECTION PROCEDURE

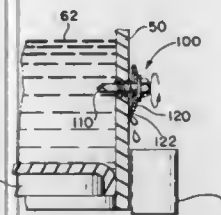
Thomas E. Willert, Bellingham, Wash., assignor to Puget Sound Power and Light Company, Bellevue, Wash.

Filed Oct. 3, 1986, Ser. No. 914,883

Int. Cl.⁴ G01N 1/00

U.S. Cl. 73—863.86

5 Claims



1. A method for obtaining a fluid sample from an electrical transformer of the type having a top and a bottom joined by a continuous wall so as to form a sealed vessel, the continuous wall having an inner wall surface enclosing primary and secondary windings positioned above the transformer bottom and a dielectric fluid, and an outer wall surface supporting secondary bushings, including a neutral secondary bushing, comprising the following steps:

locating a position on the outer wall surface between the neutral secondary bushing and the transformer bottom, and below the primary and secondary windings;

forming a bore at the located position partially through the continuous wall so that a reduced thickness wall portion remains adjacent to the inner wall surface;

placing a self-tapping screw, having a drilling end, a threaded midsection with a relatively constant diameter, a driving end, and a head for sealing the bore, into the bore;

rotating the driving end of the screw to advance the drilling end through the reduced thickness wall portion and to penetrate the inner wall surface until the sealing means seals the bore; and

counterrotating the driving end of the screw until the fluid exits the bore to obtain the sample.

4,715,237

PROCESS AND APPARATUS FOR QUANTITATIVE AND/OR QUALITATIVE ANALYSIS OF LIQUIDS

Karl Kaempff, Paul Zaehner, and Wolfgang Richter, all of Herisau, Switzerland, assignors to Metrohm AG

PCT No. PCT/CH85/00105, § 371 Date Feb. 12, 1987, § 102(e)

Date Feb. 12, 1987, PCT Pub. No. WO86/00703, PCT Pub. Date Jan. 30, 1986

PCT filed Jul. 1, 1985, Ser. No. 848,404

Claims priority, application Switzerland, Jul. 6, 1984, 3280/84; Mar. 18, 1985, 1188/85

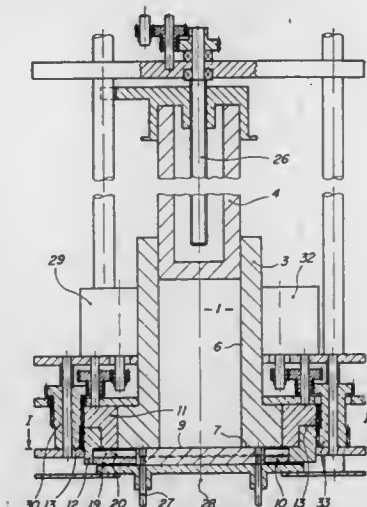
Int. Cl.⁴ G01N 1/14

U.S. Cl. 73—864.62

1 Claim

1. An apparatus for the qualitative and quantitative analysis of liquids, comprising means defining a chamber for receiving liquids, adjustable means for varying the volume of the chamber, the means defining the chamber including at least two ducts capable of opening into the chamber for feeding and discharging the liquids, the means defining the chamber comprising at least two wall portions, one of the wall portions being displaceable relative to the other wall portion independently of the adjustment of the means for varying the chamber volume, the at least two ducts arranged in one of the wall portions, shut-off means for closing and opening the ducts capable of opening into the chamber, the shut-off means being formed in one of the wall portions by a single surface area facing the ducts, the shut-off means and the one wall in which the at least two ducts are arranged being displaceable relative to each other between first and second positions, at least one of the at least two ducts being closed by the shut-off means in the first position with another of the at least two ducts opening into the chamber, while in the second position, the at least one of the ducts opens into the chamber with the another of the

ducts being closed by the shut-off means whereby the liquids in the chamber can be ejected fully through one of the at least two ducts while the another of the at least two ducts is not in communication with the chamber, one of the two wall portions being a cylinder having an end face, and the means for varying the volume of the chamber being a piston slidably received in the cylinder, wherein the displaceable wall portion is a cylinder end member facing the end face of the cylinder, the ducts capable of opening into the chamber being arranged in the displaceable wall portion at the end of the cylinder, the cylinder end member forming the displaceable wall portion bearing sealingly against the end face of the cylinder, the ducts in the displaceable wall portion defining openings in the surface area of the wall portion facing the interior of the chamber, and the openings being closeable by the end face of the cylinder, a plurality of separate ducts defining openings being arranged so



as to be located in a circle in the cylinder end member, such that all openings are closeable by the end face of the cylinder, and that at least one opening can be opened by displacing the cylinder end member relative to the longitudinal axis of the cylinder, wherein the cylinder end member is a circular disc comprising a control disc in which the circular disc is disposed in a plane-parallel relationship in such a way that the control disc is rotatable about the circular disc, a rotary ring to which the control disc is connected in such a way that the control disc is not rotatable relative to the rotary ring, but is displaceable in the plane of the circular disc, a wedge-action disc engaging the control disc for displacing the control disc together with the circular disc, the wedge-action disc being rotatable about the axis of the cylinder together with the rotary ring for positioning the control disc, and the wedge-action disc being rotatable about the axis of the cylinder while the rotary ring remains stationary for displacing the circular disc.

4,715,238

STARTER DEVICE FOR INTERNAL COMBUSTION ENGINES

Guido Bernardi, Milan, Italy, assignor to B.C.S. S.p.A., Milan, Italy

Filed Nov. 24, 1986, Ser. No. 934,018

Claims priority, application Italy, Nov. 25, 1985, 22979 A/85

Int. Cl.⁴ F02N 5/02; F03G 1/00

U.S. Cl. 74—6

13 Claims

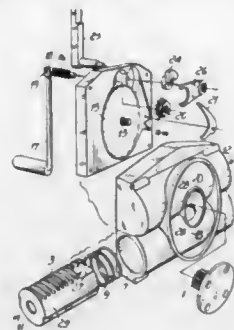
1. Starter device for an endothermal engine having a motor shaft, comprising:

a first pinion to be connected axially directly to the motor shaft of the endothermal engine;

a pair of slideable racks for engaging said first pinion on opposite sides thereof;

a pair of spring means, each engaging one of said two racks,

the direction of thrust of the first of said springs against its respective rack being opposite to the direction of thrust of the second of said springs against the respective rack;



manual start up means; and
a second pinion engaging said two racks and operated by the manual startup means.

4,715,239

ENGINE STARTER GEARING

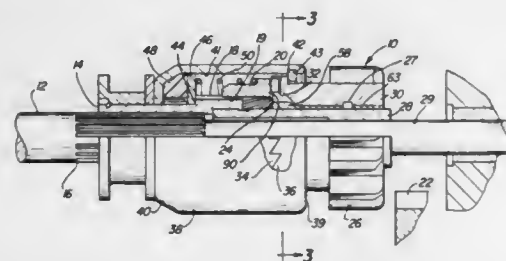
Paul F. Glometti, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 575,199, Jan. 30, 1984, Pat. No. 4,611,499. This application Sep. 15, 1986, Ser. No. 907,485

Int. Cl.⁴ F02N 11/00

U.S. Cl. 74—6

9 Claims



1. An engine starter gearing for selectively starting an engine having a starting gear, said engine starter gearing comprising:

- a power shaft;
- a sleeve slidably, but non-rotatably, secured to said power shaft, said sleeve having external helical splines formed on one extremity thereof;
- a pinion gear slidably journaled to said power shaft for axial movement relative thereto, said pinion gear being adapted for movement into and out of engagement with said starting gear of said engine to be started;
- a driven clutch member secured to said pinion gear for movement therewith, said driven clutch member having a conical surface and a circular recess formed radially outwardly of said surface;
- a driving clutch member slidably mounted on said helical splines of said sleeve, said driving and driven clutch members having complementary mutually engageable inclined teeth for transmitting torque therebetween in one direction of relative rotation;
- a barrel housing having an open end, said barrel housing being slidably supported on said sleeve and at least partially spatially encompassing said driving and driven clutch members;
- abutment means disposed within said barrel housing adjacent said open end thereof, said abutment means being adapted for engagement with said driven clutch member for confining said driving and driven clutch members within said housing;
- resilient means disposed within said barrel housing, said resilient means abutting said driving clutch member, said

resilient means further biasing said driving and driven clutch members into mutual engagement;

- a radially inwardly extending shoulder formed on said driving clutch member adjacent said circular recess of said driven clutch member;
- a plurality of centrifugal flyweight members annularly arranged within said circular recess, said plurality of centrifugal flyweight members each having an inclined surface abutting said conical surface of said driven clutch member, said plurality of centrifugal flyweight members being operative to displace said driving clutch member in said first axial direction in response to centrifugal force; and
- a plurality of cavities formed in said driven clutch member, said plurality of cavities each extending from said circular recess, each of said cavities of said plurality of cavities slidably receiving at least a portion of an associated centrifugal flyweight member of said plurality of centrifugal flyweight members to prevent circumferential movement of said plurality of centrifugal flyweight members while permitting radial movement thereof.

4,715,240

PUMPING DEVICE

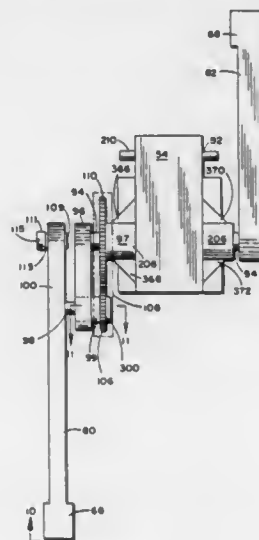
Richard R. Erich, Jackson, Calif., assignor to George F. Bethel and Patience K. Bethel, both of Newport Beach, Calif., a part interest

Continuation-in-part of Ser. No. 443,758, Feb. 7, 1983, abandoned. This application Aug. 29, 1985, Ser. No. 770,859

Int. Cl.⁴ F16H 21/36

U.S. Cl. 74—52

22 Claims



1. A pumping unit for pumping a rod type pumper wherein a rod is connected to a pump within a well comprising:

- a gear reducer having a high speed input shaft connected to reduction gears therein for turning a lower speed output shaft;
- a first member connected to said output shaft for rotation around the axis of said output shaft;
- a second member connected for rotation on said first member having rotatable means for connection to a rod pumper wherein said distance between the axis of rotation of said first member to the axis of rotation for the second member is substantially equal to the distance between the axis of rotation of said second member and said means for connection to said rod pumper;
- a fixed gear means surrounding the axis of rotation of said first member;
- a rotatable gear connected to said second member for rotational driven movement of said second member around its rotational axis of connection;
- gear means connected between said fixed gear means and

rotatable gear of a size related to said fixed gear means and said rotatable gear to provide timed movement of the rotation of said rotatable gear so as to cause the second member to which said rotatable gear is connected to rotate in reverse rotational movement from said first member but at the same rotational speed as said first member; counterbalance means connected to said second member to lessen forces seen by said fixed gear means and said rotatable gear; and, means substantially surrounding both of said gear means for housing said gear means.

4,715,241

MECHANICAL LINEAR DRIVE SYSTEM

Reinhard Lipinski, Plochingen, and Siegmund H. Kaiser, Nürtingen, both of Fed. Rep. of Germany, assignors to PROMA Produkt-und Marketing Gesellschaft mbH, Plochingen, Fed. Rep. of Germany

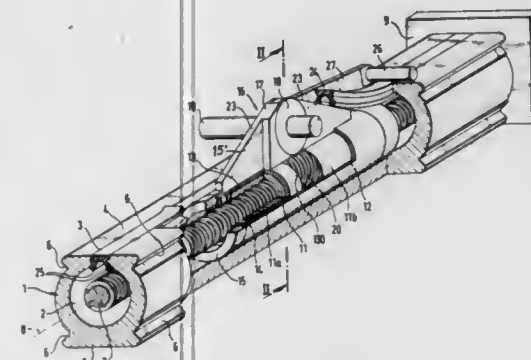
Filed Feb. 28, 1986, Ser. No. 834,896

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507497

Int. Cl.⁴ F16H 29/02

U.S. Cl. 74—89.15

14 Claims



1. Mechanical linear drive system comprising a threaded spindle (7) having at least two coaxial spindle portions (7a, 7b, 7c) each of which define end portions; spaced bearing means (9) mounting the end portions, at least one of the spaced bearing means being a rotatable bearing, at least one spindle portion (7a, 7b) is free to rotate in the bearing means to form a rotatable spindle portion; at least one spindle motor drive (10a, 10b, 10c) coupled to the at least one rotatable spindle portion;
- a tubular structure (1) having two ends, and formed with an axial linear slit (3), said tubular structure circumferentially surrounding the spindle (7), with clearance, the spaced bearing means being secured to the tubular structure ends means retaining the spaced bearing means in axially fixed position, said spaced bearing means closing off the ends of the tubular structure;
- at least one internally and externally threaded spindle nut (11) located on and coupled to each of said threaded spindle portions (7a, 7b) by the internal threading of said nut;
- a force transfer element (16) associated with and coupled to each one of said spindle nuts (11), the force transfer element (16) extending outwardly of the tubular structure through said slit (3);
- an individual drive means (21) associated with each force transfer element (16);
- a gearing mean (18, 20) on each force transfer element drivingly coupling the respective individual spindle motor drive means (21) to the external threading of said spindle nut (11), and having means to couple each spindle nut (11) and the associated force transfer element (16) together in a manner

permitting rotation of the spindle nut with respect to the associated force transfer element while inhibiting relative axial movement between the respective spindle nut (11) and the associated force transfer element (16).

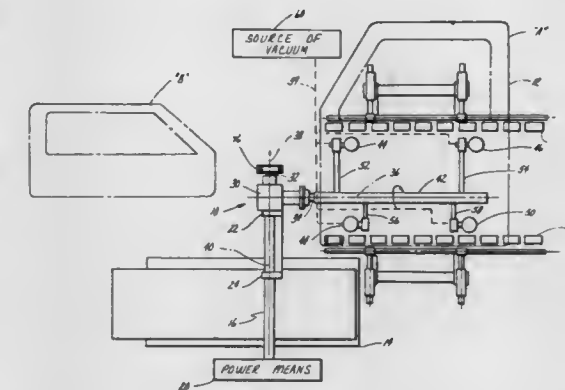
4,715,242

APPARATUS FOR TURNING A WORKPIECE OVER ALONG A TWISTING PATH OF MOTION

Irvin D. Bond, 5970 Wall St., Sterling Heights, Mich. 48077
Continuation-in-part of Ser. No. 714,844, Mar. 22, 1985, Pat. No. 4,676,113. This application Feb. 14, 1986, Ser. No. 829,165
Int. Cl.⁴ F16H 21/44

U.S. Cl. 74—102

13 Claims



1. Apparatus for turning a workpiece over along a twisting path of motion, comprising:

- a base;
- a turnover shaft mounted on the base, and power means for rotating the turnover shaft about a first axis of rotation between first and second rotated positions;
- workpiece support means mounted on the turn-over shaft so as to be rotated therewith about said first axis of rotation, the workpiece support means being so mounted on the turnover shaft as to be rotatable with respect to the turn-over shaft about a second axis that is non-parallel with respect to said first axis of rotation; and
- first means connecting the turnover shaft to the workpiece support means such that the workpiece support means is rotated about the second axis of rotation as the turnover shaft is being rotated about said first axis of rotation.

4,715,243

PLANETARY REDUCTION GEAR HAVING A MOLDED RING GEAR

Akira Morishita; Kyoithi Okamoto, both of Himeji; Toshihiko Gotoh, Ako; Yukio Kako, Himeji, and Takemi Arima, Kakogawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 30, 1985, Ser. No. 770,979

Claims priority, application Japan, Sep. 4, 1984, 59-134690[U]
Int. Cl.⁴ F16H 55/17

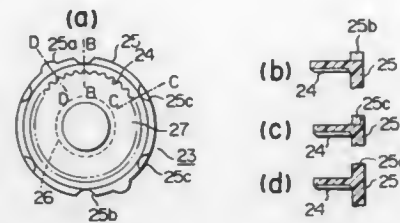
U.S. Cl. 74—434

4 Claims

1. A planetary reduction gear comprising:

- a sun gear;
- a planet gear which meshes with said sun gear; and
- an internally-toothed ring gear which surrounds said sun gear and said planet gear and meshes with said planet gear, said ring gear being formed of a molded synthetic resin and having a rim forced in its outer periphery and having a plurality of slots formed in said outer rim, said slots comprising through slots for bolts and non-piercing slots which extend only part way through the thickness of said rim, said slots being disposed at equal intervals around the

periphery of said rim to cause sink marks developing during molding of the resin to act uniformly on the ring



gear so that deformation of the ring gear during molding is prevented.

4,715,244 SELF-SCAVENGING GEAR BOX LUBRICATION SYSTEM

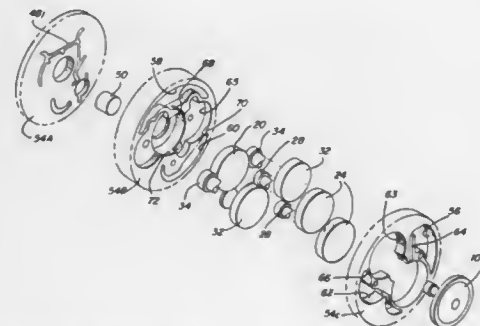
William A. Byrd, Rockford, and Anthony R. Smith, Roscoe, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 17, 1986, Ser. No. 886,346

Int. Cl.⁴ F01M 9/10; F16H 57/04

U.S. Cl. 74-467

17 Claims



1. A self-scavenging gear box lubrication system, comprising:

gear box housing means having at least one gear chamber therein providing close conformation with at least two meshing gears rotatably mounted in the chamber; means for delivering lubricating fluid to the chamber; at least one lubricating fluid collecting cavity in the housing means separate from, coplanar with and radially spaced from the gear chamber; and passage means between the gear chamber and the collecting cavity and oriented generally coplanar with and tangentially of at least one of the meshing gears for passing fluid from the chamber to the cavity under the influence of centrifugal action effected by rotation of the gear teeth whereby the fluid can be scavenged from the cavity by appropriate lubrication pump means, said passage means being of restricted dimensions to provide a positive inlet pressure to prevent backflow from the collecting cavity into the gear chamber at all attitudes.

4,715,245 DEVICE FOR METERING A POWDERED, GRANULAR OR LIQUID PRODUCT, AND APPARATUS INCLUDING A DEVICE OF THE KIND

Joanny Daloz, 4 Rue Général Charbonel, 21120 Is Sur Tille, France

Filed Mar. 25, 1986, Ser. No. 843,662

Claims priority, application France, Apr. 3, 1985, 8505085

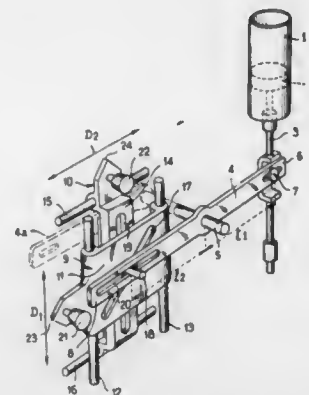
Int. Cl.⁴ G05G 1/04

U.S. Cl. 74-522

2 Claims

1. Device for metering a powdered, granular or liquid product, having a metering chamber (1) of variable volume, associ-

ated with means for changing the volume, the metering chamber (1) comprising a movable wall (2) within said chamber, said wall (2) being connected to an end of a lever (4), (26), (32) pivotally mounted about an axis (5), (27), (36), an end of the lever opposite the movable wall (2) being associated with first means (9), (25), (28), (33), (34) allowing the lever to be pivoted about said axis, and with second means (10), (27), (30), (31), (35) allowing the length of the lever (4), (26), (32) on one side of said pivotal axis (5), (27), (36) to be varied relative to the length of the lever on the other side of said axis, said first means (9) comprising a plate (11) mounted for sliding along a fixed straight line (D₁) which is transverse to the lever (4) and to said axis (5), said second means (10) comprising a plate (14) substantially parallel to the plate (11) of the first means and mounted



for sliding along a fixed straight line (D₂) substantially perpendicular to the straight line (D₁) of displacement of the first means, said plate (11) of the first means having an elongated opening (17) inclined with respect to the straight line (D₁) of displacement of said plate of the first means, a finger (18) mounted to slide in said elongated opening (17) and in an elongated opening (19) provided in the plate (14) of the second means, and extending substantially parallel to the straight line (D₁) of displacement of the plate (11) of the first means, said finger (18) being likewise engaged in an elongated opening (20) provided near said end (8) of the lever (4) opposite the metering chamber (1) and extending lengthwise along said lever, said pivotal axis (5) of the lever being fixed with respect to the lever.

4,715,246 THREE SPEED CHAINLESS PLANETARY TRANSMISSION FOR PEDAL-POWERED VEHICLES

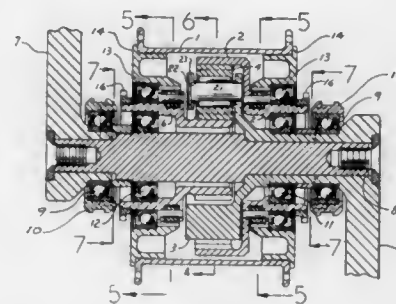
Dirck T. Hartmann, 4121 Morningstar Dr., Huntington Beach, Calif. 92649

Filed Apr. 4, 1986, Ser. No. 848,236

Int. Cl.⁴ B62M 1/08; F16H 3/44

U.S. Cl. 74-594.2

4 Claims



1. In a pedal-powered vehicle including a rotatable pedal

drive shaft, a frame, and a driving wheel having a hub concentric with the axis of rotation of said drive shaft, an improved three speed, chainless transmission mounted within said hub and in concentric relation with the axis of rotation of said hub and comprising:

planetary gear carrier means fixedly mounted to said drive shaft for rotation therewith;
a plurality of externally toothed planetary gears rotatably carried by said carrier means and constrained against axial movement;
internally toothed ring gear means mounted in a fixed axial position on said drive shaft for concentric rotation about said drive shaft, and meshed with said planetary gears;
externally toothed sun gear means meshed with said planetary gears and supported in a fixed axial position on said drive shaft for concentric rotation about said drive shaft;
first free-wheel ratchet means coupled between said hub and said ring gear means for driving said hub, second free wheel ratchet means coupled between said hub and said sun gear means for driving said hub, said hub being driven by one of said ring gear means or said sun gear means or by both, or free wheeling independently of said ring gear means and said sun gear means, depending upon the direction and speed of rotation of said ring gear means and said sun gear means relative to said hub;
a pair of external locking means each being selectively and alternatively operable to lock one of said ring gear means or said sun gear means against rotation or to leave both free to rotate, said hub being driven by the unlocked one of said ring gear means or said sun gear means or by both; said hub being driven at a selected rate of rotation depending upon whether the ring gear means or the sun gear means is free to rotate or both are free to rotate; and
an external shift means for selectively operating one of said ring gear locking means or said sun gear locking means.

4,715,247 TRANSMISSION APPARATUS WITH REDUCED FRICTIONAL FORCE

Toshio Honda; Toshio Ohhashi, and Yasuo Ohtsubo, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Harmonic Drive Systems Inc., Tokyo, both of Japan

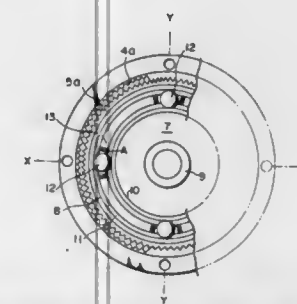
Filed Sep. 25, 1986, Ser. No. 911,450

Claims priority, application Japan, Sep. 26, 1985, 60-211024; Sep. 26, 1985, 60-211025

Int. Cl.⁴ F16H 33/00, 35/00, 37/00

U.S. Cl. 74-640

5 Claims



1. A transmission apparatus comprising a circular spline, a flexspline, and a wave generator and having an elliptic cam having major and minor axes and an input shaft connected to said wave generator, and a wave generator bearing which is arranged around said cam and in which a plurality of balls are interposed between inner and outer races, wherein said wave generator bearing comprises a ring-shaped retainer having a plurality of pockets for holding said balls which roll between said inner and outer races to be in contact with said inner and outer races and to be separated from each other in a circumferential direction; each of said pockets of said retainer has a pocket inner sur-

face forming a narrow opening portion at the inner race side and forming, at the outer race side, a wide opening portion having a larger size than said narrow opening portion at the inner race side; and
said pocket inner surface has a first contour line curved in a palne perpendicular to an axis of said wave generator, whereby the balls at minor axis positions of said cam are in contact with the narrow opening portion of said pocket, and the surface of the balls at major axis positions of said cam engage the pocket inner surface in an area containing a substantially central portion of said first contour line, said substantially central portion being substantially midway between said wide opening portion and said narrow opening portion.

4,715,248 MANUAL DIFFERENTIAL LOCK-UP

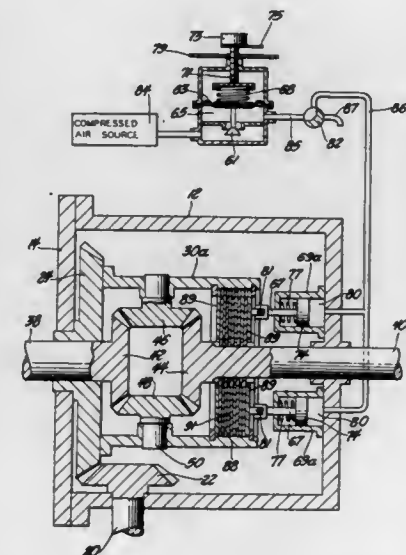
Lawrence A. Gant, 628 University Pl., Grosse Pointe City, Mich. 48230

Filed Jul. 11, 1986, Ser. No. 884,829

Int. Cl.⁴ F16H 1/44

U.S. Cl. 74-710.5

1 Claim



1. In a wheeled vehicle having a drive shaft, left and right wheel-tire assemblies, left and right axles connected to respective ones of the wheel-tire assemblies for delivering motive power thereto, and differential arranged to transmit power from the drive shaft to the axles; said differential comprising a carrier, an input gear carried by the drive shaft for rotation within the carrier, output side gears carried by individual axles for independent rotation within the carrier, a ring gear driven by the input gear for rotation within the carrier, a differential case secured to the ring gear for rotation therewith, and differential gears rotatably mounted on the differential case in meshed engagement with the output gears, whereby power is delivered to the output side gears from the case through the differential gears;

the improvement comprising releasable means for adjustably locking one of the side gears to the differential case or unlocking said one side gear for free rotation relative to the differential case; said releasable locking means comprising a first series of clutch plates keyed to the differential case, and a second series of clutch plates keyed to the axle associated with said one side gear; the first and second clutch plates being interspersed so that adjacent plates can be frictionally engaged to form a driving connection from the differential case to said one side gear; a plural number of air cylinder units mounted on the carrier; each air

cylinder unit comprising a piston, a piston rod, and a roller on the piston rod; said air cylinder units being arranged so that the rollers have pressure contact with an end one of the clutch plates to transmit an operating force thereto; an air pressure source; manually-operable valve means enabling pressurized air to flow from the source to the air cylinder units, or to flow from the air cylinder units to atmosphere; and a manually adjustable air pressure regulating means for varying the pressure of the air flowing from the source to the valve means, whereby the frictional forces existing between the clutch plates are varied to vary the amount of slippage between the plates when the air cylinder units are pressurized.

4,715,249

SPEED CHANGE DEVICE

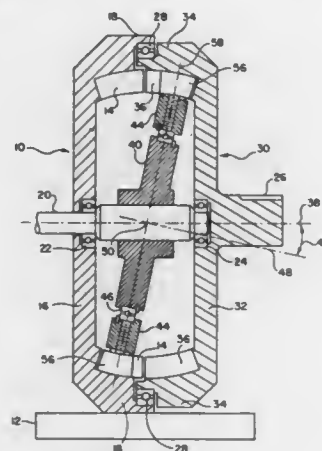
Edward C. Tibbals, Jr., 2216 Guilford College Rd., Jamestown, N.C. 27282

Filed Aug. 28, 1986, Ser. No. 901,183

Int. Cl.⁴ F16H 1/28, 13/06

U.S. Cl. 74—800

17 Claims



1. In speed change assembly, a rotatable drive shaft having a longitudinal axis, swash plate means disposed at a predetermined angle of inclination with respect to the longitudinal axis of said drive shaft and rotatable in conjunction therewith, an independently rotatable annular ring member journaled on the periphery of said swash plate means and having its axis of rotation intersecting the longitudinal axis of said drive shaft at a center of rotation, a plurality of equally spaced freely rotatable frusto-conical rollers mounted on the periphery of said annular ring member, said frusto-conical rollers having their axes of rotation intersecting said center of rotation and the extension apex of their exterior surfaces coincident with said center of rotation, fixed race means positioned to be engaged by the rollers on the periphery of said ring member having a race pattern including a predetermined number of equally spaced extending crests separated by selectively shaped recesses therebetween, said number of crests either equalling the number of rollers or differing from the number of rollers by one.

4,715,250 ROTARY CUTTING CYLINDER AND METHOD OF MAKING SAME

Thomas J. Rosemann, 993 Barbizon, Manchester, Mo. 63021

Filed Jun. 27, 1986, Ser. No. 879,617

Int. Cl.⁴ B21K 5/12; B26D 1/62

U.S. Cl. 76—101 A

22 Claims



1. A method of making a rotary cutting cylinder comprising the steps of: forming a generally cylindrical section having a plurality of longitudinally spaced grooves, with at least a portion of each longitudinally spaced groove being generally tangential to the cylindrical section; making a longitudinal slot in the cylindrical section crossing the grooves, the slot having opposing sidewalls; inserting a cutting rule in the slot; inserting a mounting bar in the slot, the mounting bar having a plurality of longitudinally spaced set screws therein, and aligning the set screws with the grooves in the cylindrical section; tightening the set screws to urge the cutting rule against one sidewall of the slot and for urging the mounting bar away from the cutting rule and against the opposite sidewall of the slot to secure the cutting rule and the mounting bar in the slot.

4,715,251

FIBER OPTIC CABLE PREPARATION TOOL AND METHOD OF PREPARING FIBER OPTIC CABLE FOR TERMINATION WITH A FIBER OPTIC CONNECTOR

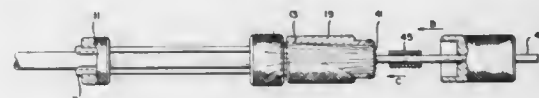
Mark Margolin; Igor Grois, both of Lincolnwood, and James E. Moore, Wheaton, all of Ill., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Aug. 4, 1986, Ser. No. 892,986

Int. Cl.⁴ H02G 1/12

U.S. Cl. 81—9.4

7 Claims



1. A tool for preparing a fiber optic cable for termination with a fiber optic connector, the fiber optic cable being of the type having, in a concentric arrangement, from the exterior to the center thereof, an outer protective cover, a layer of strength members and a buffer layer covered fiber, the tool comprising: an elongate first member having a longitudinal passage extending therethrough, said member having one end of clampable construction and another end whose exterior surface is of frusto-conical shape, and further comprising clamp means for clamping said one end onto a fiber optical cable to be received within said longitudinal passage and held by said first member; second clamp member having a longitudinal passage therethrough of a size such that said second clamp member can be received on the exterior of said other end of said first member in a manner for holding strength members of a fiber optic cable securely against the outer surface of said other end; and sleeve press means having a longitudinal passage extending therethrough of a size sufficient to permit a buffer covered

fiber of a fiber optic cable to pass therethrough, and a recess at one end of predetermined depth for receiving an inner crimp sleeve, which is mountable surrounding said buffer covered optical fiber, in a abutment against the one end of said sleeve press means a manner such that said inner crimp sleeve can be forced into said cable between said strength layer and said buffer layer to provide a support to an outer crimp sleeve of a connector with which the fiber optical cable is to be terminated.

4,715,252
VALVE WRENCH

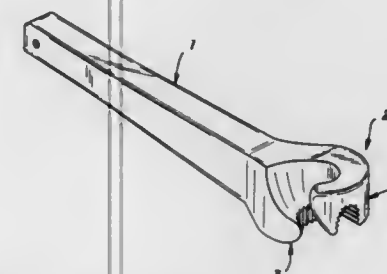
Amy Pella, Pascagoula, Miss., assignor to Chevron Research Co., San Francisco, Calif.

Filed Jul. 15, 1986, Ser. No. 885,900

Int. Cl.⁴ B25B 13/48

U.S. Cl. 81—176.1

4 Claims



1. A valve wrench comprising: (a) a handle; (b) a wheel grasping device comprising: (i) a rim grip at the end of said handle extending from said handle at a radius of curvature which approximates the radius of curvature of a rim of a valve wheel; and (ii) a spoke grip adjacent to said rim grip, said spoke grip extending in a direction opposite said rim grip, then extending at a radius of curvature greater than that of said rim, then extending at a radius of curvature which approximates the radius of curvature of a valve wheel spoke whereby the load applied to said valve wheel is distributed to both the spoke and rim.

4,715,253

LINE WRAP POWER TONGS

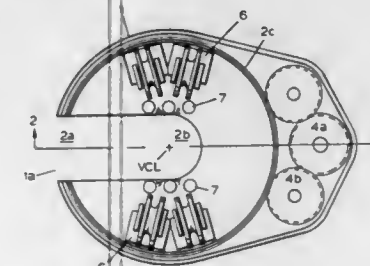
Thomas E. Falgout, Sr., and William N. Schoeffler, both of Lafayette, La., assignors to Team Engineering and Manufacturing, Inc., Youngsville, La.

Filed Mar. 11, 1986, Ser. No. 838,459

Int. Cl.⁴ B25B 17/00

U.S. Cl. 81—57.14

26 Claims



1. An open throat power tong assembly for rotating pipe to make up or break apart a threaded connection, comprising: (a) a tong body having a generally central opening therethrough, and a pipe-receiving throat opening at one side of the body into said central opening; (b) a partial drive ring rotatably mounted on said body and

defining an opening at one side thereof adapted for alignment with said throat in one rotational position; (c) a partial reel carrier ring rotatably mounted on said body and defining an opening at one side thereof adapted for alignment with said throat in one rotational position; (d) a plurality of spring biased rewind reels mounted on said partial reel carrier ring distributed about the rotational axis, situated such that flexible elements stored on said reels may be pulled from said reels in the general direction of said generally central opening, when pulling force on said flexible element exceeds a preselected amount, said reels capable of recovering said flexible element when said pulling force is reduced below said preselected amount; (e) first driving means mounted on said body and drivingly engaging said partial drive ring in rotation about said throat; (f) second driving means mounted on said body and drivingly engaging said partial reel carrier ring for independent rotation relative to said partial reel carrier about said throat; and (g) a plurality of elongated flexible elements, each having a driven end and a tailed end, said tailed end capable of retraction into one of said reels, said driven end attached to said driven ring such that relative rotation of said two partial rings will wrap said line around the periphery of pipe situated in said opening.

4,715,254

SAW GUIDE WITH COOLING AND LUBRICATING CAPABILITY

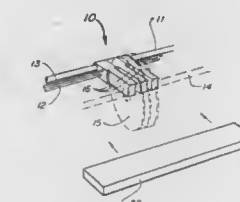
Allen D. DeGan, 655 Hilltop Dr. #69, Redding, Calif. 96003

Filed Jan. 14, 1987, Ser. No. 3,061

Int. Cl.⁴ B27B 5/29

U.S. Cl. 83—169

7 Claims



1. A saw guide for use with saw blades, comprising: a guide block having: a first hole therein; a second hole therein; mixing means for mixing substance in said first hole with substance in said second hole; a third hole communicating with said first hole and said mixing means whereby substance in said first hole is routed to said mixing means; a fourth hole communicating with said second hole and said mixing means whereby said substance in said second hole is routed to said mixing means, and orifice means communicating with said mixing means and positioned and oriented to deposit substances previously mixed by said mixing means on a saw blade, thereby lubricating and cooling said saw blade.

4,715,255

SAW CARRIAGE STABILIZER

Ronald W. Harriman, P.O. Box 258, Troutdale, Ore. 97060

Filed Oct. 24, 1985, Ser. No. 791,166

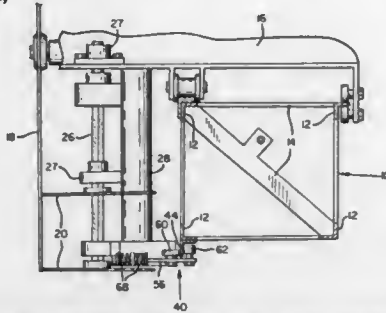
Int. Cl.⁴ B27B 7/02

U.S. Cl. 83—471.2

2 Claims

1. A portable saw mill comprising: an elongated supporting frame,

- a carriage movable longitudinally on said frame and having a vertical saw blade at one side thereof,
 a depending support on said carriage supporting at least one horizontal saw blade cooperating with the vertical saw blade in sawing boards from a log,
 a longitudinal depending guide flange secured to the elongated supporting frame,
 a laterally extending bracket secured to a lower portion of the said depending support,
 a slide plate slidably mounted on said bracket in a lateral direction,



- a pair of rollers mounted on said slide plate engageable on opposite sides of said flange and having guided following movement along said longitudinal guide flange for stabilizing the lower portion of said depending support and the horizontal saw blade thereon in a lateral direction,
 abutment means on at least one of said bracket and slide plate,
 and compression spring means on both sides of said abutment means engageable with at least one of said bracket and slide plate and providing resilient adjustment of at least one of said bracket and slide plate to adjust to lateral irregularities in said flange.

4,715,256

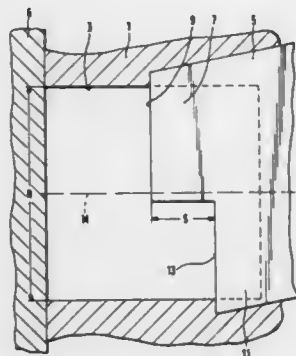
FUEL ELEMENT SHEARS HAVING A STEPPED BLADE
 Peter Kunze, Leimersheim, and Werner Kirsch, Bruchsal-Bückebau, both of Fed. Rep. of Germany, assignors to Wiederaufarbeitungsanlage Karlsruhe Betriebsgesellschaft mbH, Eggenstein-Leipoldshafen, Fed. Rep. of Germany
 Filed Nov. 10, 1986, Ser. No. 929,403

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3541000

Int. Cl. G21C 19/36; B26D 1/00

U.S. Cl. 83—694

2 Claims



1. A fuel element shearing apparatus for shearing a fuel element having a plurality of fuel rods having a predetermined precompact width and defining a longitudinal axis, the shearing apparatus comprising:

- a horizontal magazine adapted for receiving an undismantled nuclear reactor fuel element to be sheared and having a magazine opening through which the fuel element is incrementally pushed during the shearing operation;
 a stepped blade having only two shearing edges and being

movably mounted in front of said opening for movement thereacross in a direction perpendicular to said longitudinal axis for shearing first and second portions of said fuel element, respectively;

one of said shearing edges being an upper shearing edge and the other one of said shearing edges being a lower shearing edge, said lower shearing edge being disposed rearwardly of said upper shearing edge so as to cause said lower shearing edge to be disposed a step distance away from said upper shearing edge;

said step distance being adapted to correspond to at least said width of the precompact fuel element so as to cause said upper shearing edge and said lower shearing edge to shear said first and second portions sequentially; and,
 said upper shearing edge having a length longer than the length of said lower shearing edge.

4,715,257

WAVEFORM GENERATING DEVICE FOR ELECTRONIC MUSICAL INSTRUMENTS

Atsushi Hoshiai, and Hiroyuki Endo, both of Osaka, Japan, assignors to Roland Corp., Osaka, Japan

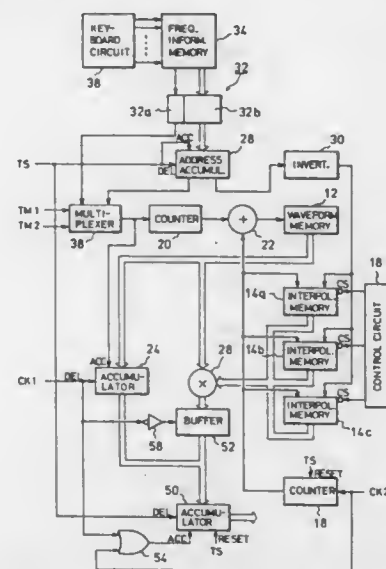
Filed Jul. 25, 1986, Ser. No. 889,472

Claims priority, application Japan, Nov. 14, 1985, 60-256142

Int. Cl. G10H 7/00

U.S. Cl. 84—1.01

2 Claims



1. A waveform generating device for electronic musical equipment, comprising:

- means for generating addresses consisting of an integral part and a fractional part each;
 waveform memory means for storing differences between adjoining samples of amplitude form a waveform for subsequent generation thereof;
 interpolation memory means for storing coefficients g_{i+m} which are given by an equation

$$g_{i+m} = \sum_{k=j}^{n-1} f_{i+mk}$$

where $i=0, 1, 2, \dots, m-1$, and $j=1, 2, \dots, n-1$, and where f_{i+mk} denotes specific ones of a series of amplitude values $f_L (L=0, 1, 2, \dots, mn-1)$ sampled from an impulse response characteristic of a low-pass interpolation filter at a frequency equal to "m" times a sampling frequency of said waveform, and "n" denotes the number of interpolation points;

means for effecting a convolution operation using said differences read out in correspondence to the integral parts of

said addresses and said coefficients read out in correspondence to the fractional parts of said addresses;
 means for accumulating said differences in the waveform; and
 means for summing a value resulting from said accumulating and a resultant of said convolution operation to obtain the amplitude of said waveform.

4,715,258

POWER TRANSMISSION FOR USE IN AUTOMOBILES HAVING CONTINUOUSLY VARIABLE TRANSMISSION
 Takashi Shigematsu; Tomoyuki Watanabe; Setsuo Tokoro, all of Susono, and Daisaka Sawada, Gotenba, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

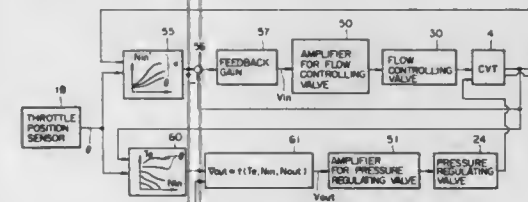
Filed Jan. 6, 1984, Ser. No. 568,810

Claims priority, application Japan, Aug. 29, 1983, 58-156464

Int. Cl. B60K 41/14

U.S. Cl. 74—866

12 Claims



12. A power apparatus for vehicles in which power of an internal combustion engine is transmitted to drive wheels through a belt system continuously variable transmission, comprising:

- a throttle valve of an intake system of said engine;
 means for detecting the position of said throttle valve;
 an accelerator pedal of said engine, said accelerator pedal being connected to said throttle valve so that the engine output horsepower requirement is a function of the position of the accelerator pedal;

memory means defining a desired engine speed as a function of throttle position and vehicle speed over the operational speed range of the engine, wherein a given throttle position and vehicle speed uniquely define a desired engine speed which will operate the engine at said horsepower requirement with minimum specific fuel consumption;

means for causing said engine to achieve said desired engine speed, comprising means for calculating a difference between actual engine speed and said desired engine speed and feedback control means controlling said continuously variable transmission on the basis of said calculated difference until said desired engine speed is achieved;

means for calculating an engine output torque as a function of said intake system throttle position and engine speed from an intake system throttle position and the actual engine speed; and

means for controlling belt pressing pressure on output side disks of the belt system continuously variable transmission as a function of calculated engine output torque and an approximation of an output disk side belt engaging radius of the belt system continuously variable transmission.

4,715,259

STRAP MOUNTING ASSEMBLY FOR ELECTRIC GUITARS PERMITTING MULTIPLE GUITAR ROTATIONS

Kenneth L. Wittman, 416 Vine St., Montoursville, Pa. 17754

Filed Apr. 6, 1987, Ser. No. 34,446

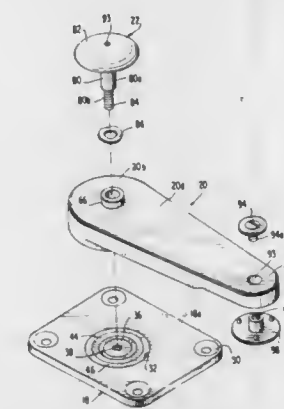
Int. Cl. G10G 5/00

U.S. Cl. 84—327

7 Claims

1. A strap mounting assembly for mounting opposite ends of a strap borne by a performer to the rear face of an electrical string musical instrument body at a balance point thereof to permit the instrument body to be rotated about the axis of the

balance point while maintaining electrical connections to said instrument body, said assembly comprising: a flat metal base plate having a tapped hole therein for placement coincident with said balance point and being screw mountable to said rear face, said flat base plate including a bottom surface mountable on the top surface of the rear face of said musical instrument body, and a top surface on the opposite side thereof, ring connector mounted to said base plate on said top surface and being electrically insulated from said base plate and having an integral "hot" terminal extending through said base plate and electrically insulated therefrom, an elongated arm formed of molded electrically insulative material having a longitudinal center line and having opposite inboard and outboard ends, a first hole within said inboard end of said arm at right angles to the longitudinal center line and intersecting said center line, a retainer button having a headed end and a threaded shank, said threaded shank projectable through one end of said strap and through said first hole within said inboard end of said arm and being threaded into said base plate tapped hole, said molded electrically insulative material arm having molded therein, radially spaced contacts about said first hole, an electrically shielded cable molded into said arm and having a shield element concentrically surrounding a core conductor and being electrically insulated therefrom, said shield element and said



core conductor being electrically connected respectively to said molded, radially spaced contacts and wherein said radially spaced contacts are positioned with respect to said first hole such that portions project outwardly of the bottom surface of said arm and in contact respectively with said ring connector and the face of said metal base plate proximate to said arm whereby electrical circuits are completed between the shield element and conductor core of the shield cable molded into the arm and the metal base plate and ring connector respectively on the instrument body via respective radially spaced contacts to facilitate the connection between the base plate and ring connector and an electrical output jack, a screw projecting through a second hole within the outboard end of said elongated arm, said assembly further comprises a retainer disk having a tapped hole within the center thereof, and wherein, the end of the screw passing through said second hole and through the other end of said strap is threaded into said retainer disk and wherein, said strap is of the length between the ends thereof coupled to respective ends of said arm such that, the guitar may be rapidly rotated through multiple rotations about a point defined by the retainer button with the instrument positioned comfortably at the waist of the performer, while maintaining the electrical connection between a pickup and the shielded cable.

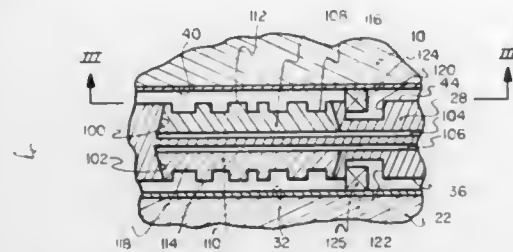
4,715,260
SEAL

Paul B. Pribis, Saratoga, N.Y., and Herbert J. West, Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 22, 1986, Ser. No. 945,152
Int. Cl.⁴ F41F 1/04

U.S. Cl. 89—7

2 Claims



1. A sealing mechanism for a pump comprising:
 - a housing having a cavity with an inner wall;
 - a central journal disposed in said housing cavity;
 - a piston having a piston head and a skirt defining a central cavity, said skirt having its distal region disposed on said central journal with one end of said journal projecting into said piston central cavity to define a pumping chamber between said projecting one end of said journal and said piston head and a clearance gap between said skirt and said housing cavity inner wall; and
 - a sealing mechanism for sealing said clearance gap; characterized in that said sealing mechanism comprises:
 - an additional pumping chamber defined by said housing cavity inner wall, said journal and the distal end face of said skirt;
 - a porous annular body disposed into the annular exterior surface of said skirt adjacent said housing cavity inner wall;
 - a plurality of annular grooves disposed in said body, each groove opening towards said housing cavity inner wall;
 - a passageway through said skirt coupling said porous body with said skirt distal end face; and
 - means for providing liquid into said additional pumping chamber; and
 - having a mode of operation wherein liquid flows from said additional pumping chamber through said passageway, through said porous body, through said annular grooves and into said clearance gap.

4,715,261

CARTRIDGE CONTAINING PLASMA SOURCE FOR ACCELERATING A PROJECTILE

Yeshayahu S. A. Goldstein, Gaithersburg; Derek A. Tildman, Silver Spring, both of Md.; Rodney L. Burton, Springfield; Dennis W. Massey, Manassas; and Niels K. Winsor, Alexandria, all of Va., assignors to GT-Devices, Alexandria, Va.

Filed Oct. 5, 1984, Ser. No. 657,888

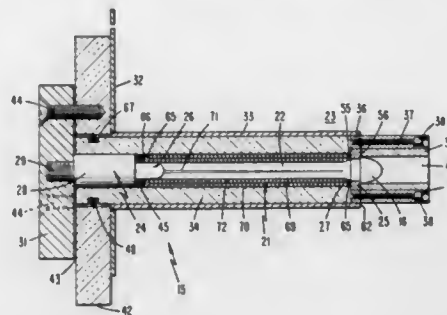
Int. Cl.⁴ F41F 1/00

U.S. Cl. 89—8

43 Claims

1. A cartridge for accelerating a projectile through a bore and muzzle of a gun, the bore being in a barrel of the gun, the gun having a breech having a bore aligned with the barrel bore, the cartridge having a geometry enabling it to be loaded into the breech bore through an end of the breech bore and comprising means for supplying a plasma jet behind a projectile in the barrel bore, the plasma jet supplying means including: a first tube having an interior wall surface forming a capillary passage, the first tube comprising a mass of a dielectric substance confined between the interior wall surface and an exterior wall surface of the tube, a second dielectric tube having an inner wall surface abutting against and confining the exterior wall surface, a metal sleeve having an inside wall

surface abutting against and confining an exterior wall surface of the second tube and an outside wall surface adapted to abut against and be confined by the breech bore, first and second electrodes located at opposite ends of the first tube for applying a discharge voltage between spaced region along the length of the interior wall surface while the dielectric ionizable substance is between the regions, the dielectric substance including at least one element that is ionized to form a plasma in response to the discharge voltage being applied between the spaced regions, the diametric length across the passage being short relative to the distance between the spaced regions, first and second ends of the passage being respectively open and



blocked to respectively enable and prevent the flow of plasma through them, the block ends closed the breech bore, the plasma forming an electric discharge channel between the spaced regions, ohmic dissipation occurring in the electric discharge channel to produce a pressure in the passage to cause the plasma in the passage to flow longitudinally in the passage and through the first end to form the plasma jet having sufficient pressure to accelerate the projectile from the vicinity of the breech through the barrel and muzzle, and means for establishing electric connections from a source of the discharge voltage to the first and second electrodes through the breech bore end, the electric connection to the second electrode being established via the metal sleeve.

4,715,262

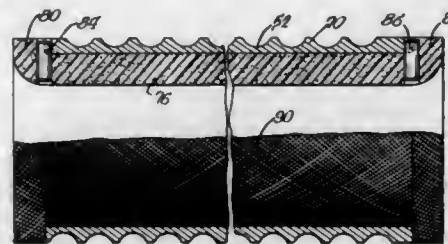
BALLISTIC TOLERANT DUAL LOAD PATH BALLSCREW AND BALLSCREW ACTUATOR

Jeffrey D. Nelson, Rockford, and John F. Scanlon, Roscoe, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 686,983, Dec. 27, 1984, This application Dec. 6, 1985, Ser. No. 805,627
Int. Cl.⁴ F41H 5/00; F16H 1/20; B64D 7/00

U.S. Cl. 89—36.02

15 Claims



1. A ballistic tolerant dual load path ballscrew actuator having an outer tubular member of metal subject to cracking when hit by a projectile and having an external helical groove for coaction with a ballnut and a second tubular member positioned within and having a length generally coextensive with said outer tubular member, said members being secured to each other adjacent their ends whereby the second member may react to loads applied to the ballscrew in the event the outer tubular member fails, the improvement wherein said second tubular member is formed of a rigid ballistic tolerant nonmetallic material which maintains its structural integrity without

cracking thereof when hit by a projectile whereby the second tubular member will provide a secondary load path after the outer tubular member has cracked and prevent lengthwise elongation of the outer tubular member and avoid increase in the size of the crack in the outer tubular member which could cause the ballnut to malfunction, and said second tubular member having a surrounding shell of ceramic material bonded thereto.

4,715,263

ROLL TURRET FOR A GUN MOUNT

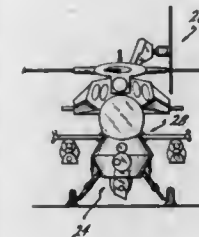
S. Bertram Kramer, Santa Monica, Calif., and Evan P. Sam-patagos, Mesa, Ariz., assignors to McDonnell Douglas Helicopter Co., Mesa, Ariz.

Filed Dec. 30, 1985, Ser. No. 814,886

Int. Cl.⁴ B64D 7/06

U.S. Cl. 89—37.21

5 Claims



1. An apparatus for mounting a gun in an aircraft comprising:
 - a gun;
 - a turret rotationally coupled to and disposed within said aircraft, said turret defining a turret axis, said gun being rotationally coupled to said turret about an elevation pivot axis, said gun rotating with said turret about said turret axis and said gun being selectively rotatable about said elevational pivot axis, said elevational pivot axis being approximately orthogonal to said turret axis, said gun and turret being arranged and configured about said elevation pivot axis and turret axis to assume a retracted orientation of said gun and turret within said aircraft, an orientation of said gun and turret about said elevation pivot and turret axis other than said retracted orientation disposing said gun outside of said aircraft for firing; and
 - means for enclosing said gun and turret within said aircraft when in said retracted orientation, wherein said means for enclosing comprises at least a pair of doors, each door coacting with said turret by contact between said turret and each door to selectively expose said gun and turret outside said aircraft and to selectively enclose said gun and turret within said aircraft, whereby positioning of said gun within and outside of said aircraft as well as aiming with said gun in an arbitrary direction is effectuated by selective rotation of said gun and turret only about said turret axis and said elevation pivot axis.

4,715,264

PISTON AND CYLINDER UNIT

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany
Filed Feb. 20, 1986, Ser. No. 832,475

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506180

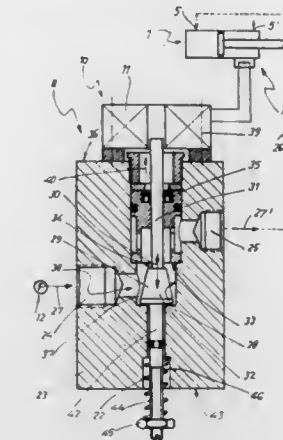
Int. Cl.⁴ F01B 25/02; F15B 13/04

U.S. Cl. 91—16

9 Claims

1. A piston and cylinder unit comprising a cylinder, a piston sliding in the cylinder, a piston rod attached to the piston, a regulating valve connected to said cylinder for controlling speed of motion of said piston in said cylinder, said regulating valve defining an open position to allow free passage through of fluid for driving said unit and a choking position to choke the passage of fluid to said unit for the purpose of slow-

ing down piston motion, at least one sensor designed to respond to a given position of said piston and to change the setting of said regulating valve following such response, said sensor being a contactless sensor and an electrically operated setting unit for operation of said regulating valve in response to a signal from said sensor for changing over said regulating



valve between its open and choked positions, said regulating valve comprising a housing defining a first fluid duct for conducting fluid to said cylinder, said regulating valve further comprising a valve plug capable of extending into said duct to a greater or lesser extent for choking fluid flow to said cylinder, and externally accessible means for adjusting such depth of extension into said duct.

4,715,265

PROCESS AND APPARATUS FOR VIBRATORY OPERATION OF A WORKING PISTON, IN PARTICULAR FOR ACTIVE WORKING TOOLS

Achim Graul, Wittelsbacherstrasse 42, 8070 Ingolstadt, and Elmar Niedermeyer, Neuburg/Do.-Ried, both of Fed. Rep. of Germany, assignors to Achim Graul, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/EP84/00227, § 371 Date Mar. 22, 1985, § 102(e) Date Mar. 22, 1985, PCT Pub. No. WO85/00762, PCT Pub. Date Feb. 28, 1985

PCT Filed Jul. 21, 1984, Ser. No. 717,230

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328426

Int. Cl.⁴ F01B 1/00; F16D 31/02

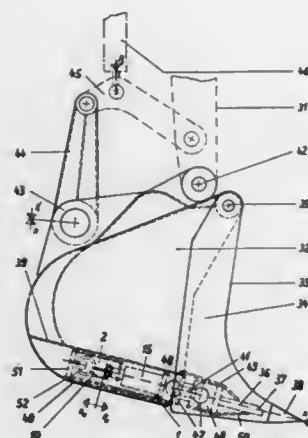
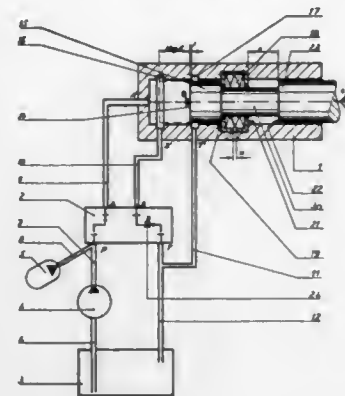
U.S. Cl. 91—170 R

15 Claims

1. In a process for vibratory operation of a working piston (15) for hydraulic tools and the like, which is displaceable with a reciprocating motion over a given working stroke movement in a cylinder (1), with a control device which allows pressure fluid into and out of the cylinder in rapid succession, the improvement characterized in that only one side of the working piston (15) is acted upon by pressure fluid and that the return movement of the piston is effected by reaction forces on the tool, wherein in the absence of reaction forces or when the maximum working stroke movement of the piston is reached pressure fluid is discharged from the cylinder (1), by-passing the control device (2).

3. In apparatus for producing a vibratory movement at a working piston (15) which is displaceable in a cylinder (1), with a pulse-generating control device (2) which lets pressure fluid into and out of the cylinder in rapid succession, the improvement characterized in that a feed conduit (9) leads from the control device (2) to the cylinder (1) for pressure fluid actuation of the piston (15) on only one side thereof, that a return conduit (10) leads from the cylinder to the control device (2), from the same side of the piston, wherein said conduits (9, 10) can be alternately opened and closed by the control device (2), and that arranged on the cylinder (1) is a

relief opening (17) which is exposed when the maximum piston stroke movement is reached and by way of which pressure



fluid can be drained from the cylinder (1) independently of the control position of the control device.

4,715,266

ROTARY FLUID ENERGY CONVERTER

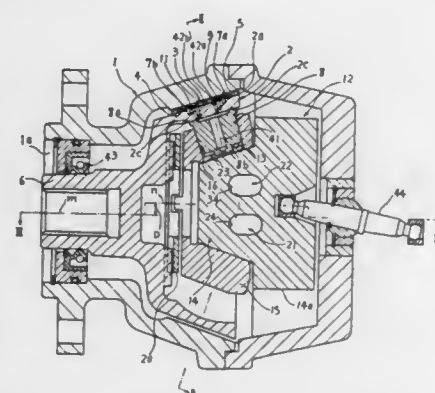
Yasuo Kita, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Oct. 21, 1986, Ser. No. 921,079

Int. Cl.⁴ F01B 13/04, 13/06

U.S. Cl. 91—488

2 Claims



1. A rotary fluid energy converter comprising:
a housing having a tapering surface in its inner surface;
a torque ring closely held against the tapering surface of the housing via first static pressure bearings that are circum-

ferentially spaced from one another, the ring having flat inner surfaces corresponding to the first bearings;
pistons disposed on the inner side of the torque ring and having their front ends attached to the flat inner surfaces of the ring via second static pressure bearings;
a cylinder barrel for slidably holding the base ends of the pistons;
a pintle which is disposed in an eccentric relation to the axis of the housing and which rotatably holds the cylinder barrel;
spaces formed between each piston and the cylinder barrel, the volumes of the spaces being increased or decreased as the torque ring is rotated relative to the housing;
two fluid communication lines which communicate with the spaces whose volumes are increasing and decreasing, respectively;
fluid passages for directing fluid from the spaces to the first and second static pressure bearings, whereby the static pressure of the fluid introduced in the first static pressure bearings and the static pressure of the fluid introduced in the second static pressure bearings produced coupled forces about the axis of rotation of the torque ring;
at least one pair of axially adjacent pressure pockets formed in each of the first static pressure bearings; and
restrictors through which fluid flowing out of the spaces is distributed to the corresponding pressure pockets, and wherein the pressurization of the pressure pockets of said first static pressure bearings is effected by sliding surfaces between the flat inner surfaces of the torque ring and the flat surfaces of the pistons.

4,715,267

BEARING SURFACE FOR INTERNAL COMBUSTION ENGINE PISTON SKIRT

John W. Richmond, Rugby, England, assignor to AE PLC, Warwickshire, England

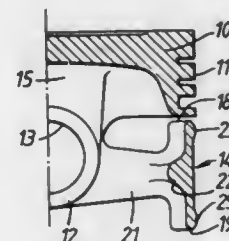
Filed Dec. 17, 1985, Ser. No. 809,712

Claims priority, application United Kingdom, Dec. 19, 1984, 8432015

Int. Cl.⁴ F16J 1/02, 1/04, 1/16

U.S. Cl. 92—232

7 Claims



1. A piston for an internal combustion engine or a compressor comprising:
a crown,
a ring band,
two gudgeon pin bosses defining a gudgeon pin bore,
two arcuate skirt members on opposite sides of the gudgeon pin bore and spaced from the ring band,
two pairs of struts, each pair extending from respective gudgeon pin bosses and supporting an associated skirt member,
a central portion of increased radial thickness included in each skirt member and extending circumferentially around each skirt member between points of connection of the associated struts with the skirt member,
a circumferentially extending bearing surface included in each skirt member for transmitting lateral loads and guiding the piston during reciprocation, the bearing surface being axially spaced from said central portion of increased radial thickness, a flexible flange included in each skirt

member and connected between the associated bearing surface and the central portion of increased radial thickness the flexible flange being continuous around the circumferential extent of the associated bearing surface so that the flexible flange allows flexure of the associated bearing surface relative to the associated central portion under lateral loads, to reduce piston noise.

4,715,268

VENTILATOR DEVICE

Robert A. Tanner, Pampisford, England, assignor to Dixon International Limited, England

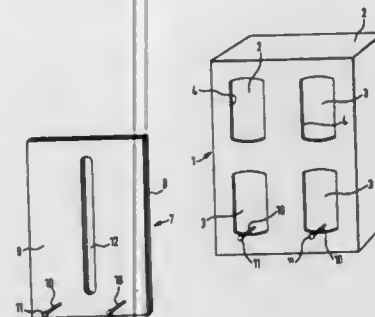
Continuation of Ser. No. 617,883, Jun. 6, 1984, abandoned. This application Jan. 10, 1986, Ser. No. 817,802

Claims priority, application United Kingdom, Jun. 7, 1983, 8315653

Int. Cl.⁴ F24F 7/00; G05D 23/13

U.S. Cl. 98—41.1

9 Claims



1. A ventilator device comprising a casing, said casing including a wall having one or more openings formed therein for passage of ventilation air therethrough, a shutter pivotally mounted within the casing for pivotal movement about a fixed axis between an open position and a closed position, the axis about which said shutter pivots being located such that in said closed position a surface of said shutter is closely juxtaposed to a mating surface of said wall, effectively blocking passage of air through said openings in said wall, and such that in said open position said shutter is substantially displaced from said wall, allowing passage of air through said openings in said wall, said shutter being normally held in said open position, first spring means for urging the shutter to said closed position to close the one or more openings, and second solenoid means actuation of which releases the shutter to cause it to be moved by said first means from the open position to the closed position to close said one or more openings, at least one aperture being formed in said shutter, said at least one aperture being located such that each said aperture is out of registration with the one or more openings in said wall when said shutter is moved to the closed position to close said one or more openings in said casing, and wherein each said aperture is out of registration with said one or more openings in said wall when said shutter is in the open position, such that air flow through said openings in said wall and said aperture in said casing follows a generally serpentine path.

4,715,269

COFFEE MAKER WITH PLASTIC DECANTER AND LOW TEMPERATURE WARMING PLATE

Arthur L. Stoner, Signal Hill, Calif., assignor to Wilbur Curtis Company, Inc., Los Angeles, Calif.

Filed Dec. 29, 1986, Ser. No. 946,862

Int. Cl.⁴ A47J 31/00

U.S. Cl. 99—279

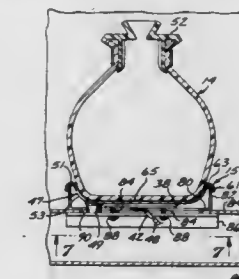
23 Claims

1. A coffee maker comprising:
a brewing and dispensing unit for brewing and discharging coffee;
a decanter constructed of heat resistant thermal insulative plastic for receiving coffee discharged from said brewing

and dispensing unit and formed with a bottom portion of a predetermined configuration;
a warming table for receiving the decanter and maintaining the brewed coffee warm therein;
a heat conductive warming plate mounted on said table and formed with a dished out well having a bottom wall and raised a peripheral wall with peripheral walls configured to complementarily receive said bottom portion of said predetermined configuration to enhance heat conduction thereto, and;
a heating element in thermal communication with said well whereby said decanter may be positioned with said bottom portion nested in said well in direct contact with said peripheral wall for direct heat conduction from said well to said bottom portion.

13. A coffee maker for use at room temperature of about 68° F. to brew coffee and maintain it at a warm temperature and comprising:

a brewing and dispensing unit for brewing and discharging the brewed coffee;
a decanter formed with thermally insulative plastic walls



defining a chamber for receipt of a predetermined volume of brewed coffee discharged from said brewing and dispensing unit and being formed with an open top and a bottom portion having a predetermined configuration, said decanter including a lid to cover said open top, said walls and lid providing sufficient thermal insulation to, when said cavity is substantially filled with said predetermined volume of coffee at substantially 180° F. at room temperature of about 68° F., limit the heat transfer from said coffee to a predetermined rate;

a warming plate for receiving said decanter and formed with a thermally conductive well configured to receive said bottom portion in close fitting heat exchange relationship, said warming unit including a heating element operative to maintain a selected temperature of about 200° F., said heating plate being constructed of a heat conductive material having a sufficiently high heat transfer coefficient to cooperate with said heating element, well, and decanter to form a heat path from said heating element into said decanter, having a sufficiently low resistance to heat transfer to, when said heating plate is at said 200° F., transfer said heat to said brewed coffee at said predetermined rate.

4,715,270

BEVERAGE BREWING APPARATUS FOR VENDING MACHINES

Tsutomu Harada, Takasaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Dec. 18, 1985, Ser. No. 810,171

Claims priority, application Japan, Dec. 28, 1984, 59-196715[U]

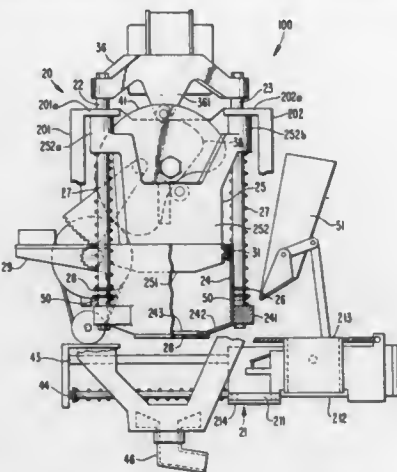
Int. Cl.⁴ A47J 31/00

U.S. Cl. 99—289 R

2 Claims

1. In a beverage brewing apparatus comprising a frame, a vertically movable cylinder member supported on said frame, said cylinder member having an open top and open bottom, a vertically movable piston member disposed in said cylinder

and supported by said frame, means for supplying hot water into said cylinder below the elevation of said piston, a base assembly including a brewing cavity disposed beneath said cylinder member, said brewing cavity being mounted to be movable horizontally between a brewing position and a discharge position and be sealed with said cylinder member in



said brewing position, a motor driven cam shaft, a plurality of cams on said cam shaft and cam followers to determine the movement of said cylinder and said piston, the improvement comprising biasing means disposed between said frame and said cylinder to normally push said cylinder downwardly to insure sealing between said cylinder and said brewing cavity when said brewing cavity is disposed at the brewing position.

4,715,271

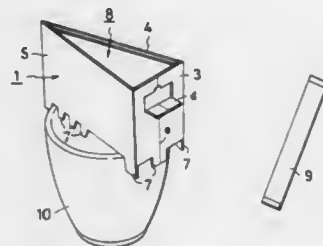
DISPOSABLE BEVERAGE BREWER

Keisuke Kitagawa, Chofu, Japan, assignor to Noazi Kasai, Japan
Filed Jul. 31, 1986, Ser. No. 890,934

Int. Cl.⁴ A47J 31/02, 31/06

U.S. Cl. 99—306

6 Claims



1. A filter brewer of triangular configuration comprising three planar side member defining an upper and a lower opening therein, a funnel-shaped filter in registry with the inner faces of the three side members, and

means forming a plurality of notches formed on lower edges of the three side members, said plurality of notches being adapted to engage the upper edge of a container with the lower edges of the three side members supported thereon.

4,715,272

SYSTEM FOR PREPARING TORTILLAS

Fausto C. Mendoza, Calzada San Esteban Num 57, Nancalpan de Juarez, Mexico

Filed Feb. 27, 1986, Ser. No. 834,399

Claims priority, application Mexico, Jul. 2, 1985, 205863

Int. Cl.⁴ A21B 1/42

U.S. Cl. 99—339

10 Claims

1. A system for preparing tortillas, comprising in combination:

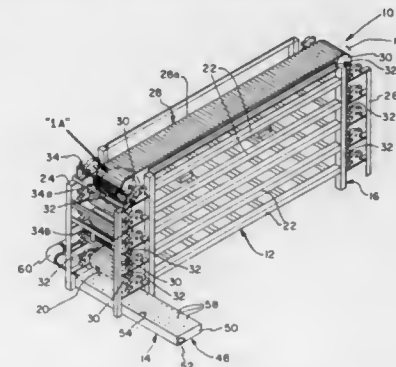
(a) a tortilla cooking oven including

(i) a support frame having an entrance at which uncooked tortillas are received and an exit from which cooked tortillas are discharged,

(ii) means mounted on said support frame defining a cooking path extending from said entrance toward said exit thereof and along which each tortilla travels through said oven and in which each of the opposite sides of the tortilla at separate portions of said path is subjected to cooking at the same temperature and over the same amount of time,

(iii) said cooking path defining means including a plurality of transporting members disposed on said support frame one above another with each member having an entry end and an exit end,

(iv) said plurality of transporting members including at



least one uppermost member for moving the tortillas resting on their one opposite sides along said cooking path and a lowermost member for moving the tortillas resting on their other opposite sides along said cooking path, and

(v) another transporting member being mounted on said support frame immediately below said lowermost member for receiving the cooked tortillas therefrom and moving them along a pre-cooling path to said exit of said oven; and

(b) a cooked tortilla cooling device associated with said tortilla cooking oven and being adapted to receive cooked tortillas from said pre-cooling path of said another transporting member at said exit of said oven so that said tortillas can be moved along a predetermined cooling path such that said tortillas are cooled by the time they reach an end of said cooling path.

4,715,273

COOKING APPARATUS

Gottfried Riesselmann, Achtern Diek 34, 2248 Vechta, Fed. Rep. of Germany

Filed Aug. 12, 1986, Ser. No. 895,657

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529424

Int. Cl.⁴ A22C 7/00

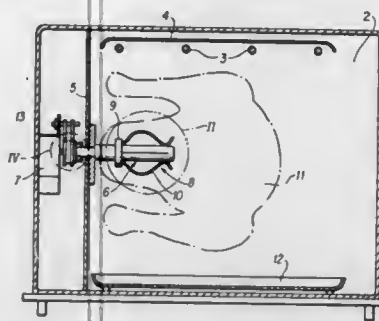
U.S. Cl. 99—442

21 Claims

1. In an apparatus for cooking food and preferably food having or capable of being formed with an accessible cavity, the cooking apparatus having at least one heating element adapted to be inserted into the cavity in order to heat the food internally from within the cavity, the improvement comprising:

means associated with the heating element for supporting at least portions of the food in fixed relation to the heating

element wherein said means is in a first position when said heating element is in a first position and are biased towards



the food in a second position when said heating element is in a second position vis-a-vis said means.

4,715,274

EMULSIFIER UNIT PARTICULARLY FOR EMULSIFYING STEAM AND MILK TO PREPARE CAPPUCCINO AND THE LIKE BEVERAGES

Luciano Paoletti, Florence, Italy, assignor to SPIDEM S.r.l., Pero Frazione Cerchiate, Italy

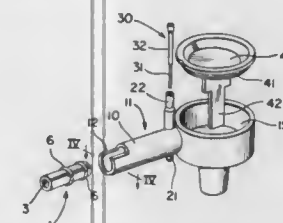
Filed Jan. 31, 1986, Ser. No. 824,853

Claims priority, application Italy, Jan. 31, 1985, 19311 A/85; Sep. 6, 1985, 22947/85[U]

Int. Cl.⁴ B01F 3/00

U.S. Cl. 99—454

10 Claims



1. An emulsifier unit particularly for emulsifying steam and milk to prepare cappuccino and the like, comprising an emulsifying chamber having an outward dispensing opening, nozzle means defining a steam delivery channel and terminating in a nozzle positioned spaced from said chamber to define a suction chamber, a milk intake conduit and an external air intake conduit communicating with said suction chamber which in turn communicates with said emulsifying chamber whereupon steam introduced into said steam delivery channel jets out of said nozzle creating a vacuum in said suction chamber drawing milk and air into same to mix and emulsify in said emulsifying chamber and to be discharged therefrom.

4,715,275

APPARATUS FOR PRODUCING FROZEN CONFECTIONS INCLUDING EDIBLE PARTICULATE MATERIAL

Harlan R. Getman, Toledo, Ohio, assignor to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 608,887, May 10, 1984, Pat. No. 4,643,905.

This application Oct. 30, 1986, Ser. No. 925,823

Int. Cl.⁴ A23G 9/00

U.S. Cl. 99—494

17 Claims

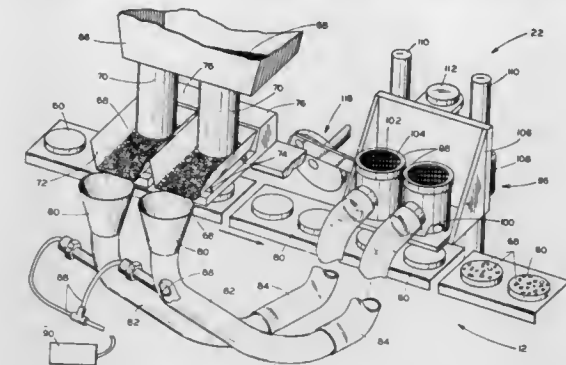
1. An apparatus for producing confections comprising, in combination:

means for providing a flow of confectionary material, means for severing such flow of material into individual bodies,

means for providing measured amounts of edible particulate matter,

means for receiving said measured amounts of edible partic-

ulate matter and applying said matter to said individual bodies, means for reciprocating said receiving means into and out of at least close proximity with said individual bodies, and



conduit means extending generally between said providing means and said receiving means for transporting such measured amounts of edible particulate matter from said providing means to said receiving means.

4,715,276

MECHANICAL CONTINUOUS DEWATERING PRESS

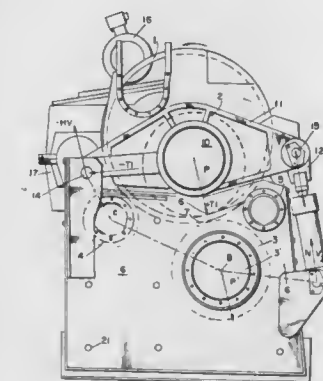
Vaio T. Saalasti, Arinatie 4, SF-00370 Helsinki 37, Finland
Continuation of Ser. No. 604,158, Apr. 26, 1984, abandoned.

This application Oct. 6, 1986, Ser. No. 915,852

Int. Cl.⁴ B30B 3/06, 9/20

U.S. Cl. 100—121

5 Claims



1. A dewatering press for expressing water from wet bark including a perforated, revolving drum disposed in an inclined operating position and through which material to be dewatered runs from an upper end to a lower end, more than one support roll for supporting said drum in said operating position, and a press roll in pressing contact with, and revolving inside, the drum, the material to be dewatered being compressed between the drum and the press roll several times, characterized in that: said drum revolves between a drum pressing counter roll and said press roll, and said press roll and said counter roll are disposed opposite one another, and during compression of said material to be dewatered, said press roll presses said drum against said counter roll and said more than one support roll, the counter roll countering the force of the press roll and the drum when the press roll is moved into compression with the bark pressed against the inside of the drum, so that most of the force acts upon the counter roll, thus reducing the force which would otherwise be applied to said support rollers, such that balancing of the machine may be achieved during compression of the wet bark, said support rolls and said counter roll being mounted between two end plates, at least one of said plates being easily removeable, said

support rolls being of smaller diameter than the counter roll and being disposed on opposite sides of said counter roll and a little higher than the location of the counter roll.

4,715,277

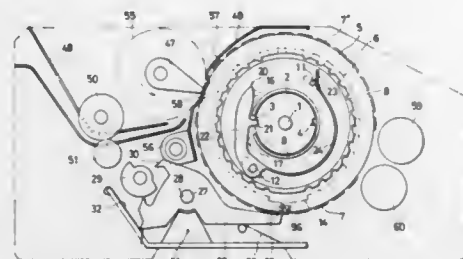
TYPE SELECTION MECHANISM FOR A PRINTER
Fumihisa Hori, Takizawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 3, 1986, Ser. No. 937,348

Claims priority, application Japan, Dec. 25, 1985, 60-198212(U); Dec. 27, 1985, 60-293089; Feb. 7, 1986, 61-24100; Feb. 7, 1986, 61-24101; Feb. 17, 1986, 61-30660
Int. Cl.⁴ B41J 1/48

U.S. Cl. 101—93.28

6 Claims



1. A printer comprising:
a drive shaft having axial grooves along the circumferential surface thereof;
printing wheels rotatably mounted on said drive shaft and each having a group of types along the circumferential surface thereof;
a drive claw of each said printing wheel and having a projection engageable with said grooves of said drive shaft;
a selection ratchet pivotally mounted on said printing wheel via said drive claw and having an engagement means engageable with said drive claw and a series of teeth formed along the circumferential margin thereof; and
a selection claw engageable with said teeth of said selection ratchet to selectively stop the rotation of said selection ratchet;
said printing wheel being linked to and rotated by said drive shaft when said projection of said drive claw engages said groove of said drive shaft;
said selection claw engaging said teeth of said selection ratchet during type selection to latch same, so that when said engagement means of said selection ratchet engages said drive claw, said projection of said drive claw disengages from said groove of said drive shaft and detaches said printing wheel from said drive shaft.

4,715,278

SQUEEGEE ARRANGEMENT FOR SILKSCREEN PRINTERS

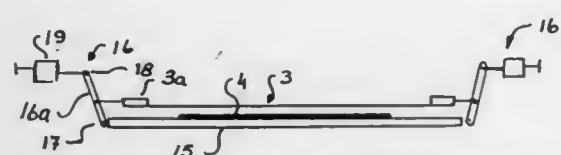
Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silk-screen Maskiner AB, Norsborg, Sweden

Filed Jun. 27, 1986, Ser. No. 879,604

Int. Cl.⁴ B05C 17/04

U.S. Cl. 101—123

8 Claims



1. A squeegee arrangement for silk-screen printing machines, comprising two squeegees arranged side-by-side and made from a somewhat flexible material, and respective squeegee holders, in which arrangement the squeegees are arranged to

move relative to a stencil having a printing pattern provided thereon and located above a material substrate to be printed upon and supported on a stencil frame, said squeegees being arranged to press print-forming substance through the stencil and onto the material substrate during said relative movement, and in which arrangement a plane extending centrally through respective squeegees forms an obtuse angle with the stencil and the material substrate in relation to the directional plane of squeegee movement, wherein the centrally located planes of respective squeegees subtend therebetween an angle of less than 120° and greater than 60°; and one of said squeegees is arranged to co-act with the stencil to effect printing in a first direction of squeegee movement, the other squeegee is arranged to co-act with the stencil to effect printing in a second direction opposite to said first direction; adjustment means for adjusting the angular range during a printing sequence; and means for displacing the stencil in a direction opposite to the direction of squeegees movement and compensate for discrepancies occurring in the print-pattern of the stencil on the substrate material as a result of stencil strength, said means for displacing the stencil connected to the stencil frame and displacing the frame in response to movement of said squeegees.

4,715,279

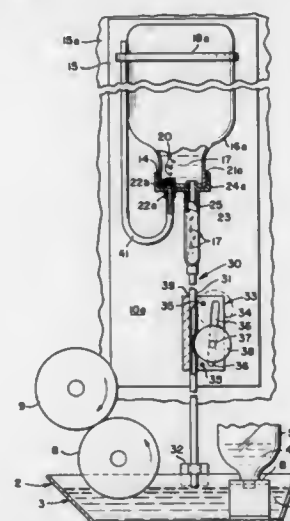
SUPPLEMENTARY LIQUID DISPENSING DEVICE
Rocco J. Albanese, 2296 Westside Dr., Rochester, N.Y. 14624

Filed Feb. 6, 1987, Ser. No. 12,052

Int. Cl.⁴ B41L 25/12

U.S. Cl. 101—148

9 Claims



1. A supplementary liquid dispensing device for continuously replacing alcohol lost from a fountain solution of a dampening system in a lithographic printing press, said dampening system having a fountain solution tray for containing said fountain solution therein, reservoir means for supplying said fountain solution to said tray at a given level therein, a rotatable fountain roller communicating with said fountain solution in said tray for wetting said fountain roller with said fountain solution, said supplementary liquid dispensing device comprising:

- (a) a frame,
- (b) bottle means for containing said alcohol therein,
(i) said bottle means includes a bottle mounted on said frame,
- (c) piping means connected to said bottle means for gravity flowing of said alcohol directly into said fountain solution in said fountain tray and disposed in co-operative relationship with said rotatable fountain roller for mixing said alcohol with said fountain solution, and
- (d) valving means connected to said piping means for controlling said flow of said alcohol directly into said tray and

said fountain solution at a rate substantially equal to the rate of loss of said alcohol from said fountain solution.

4,715,280

POLE BODY FOR AN ELECTRIC FUZE, METHOD OF MANUFACTURING AND METHOD OF USING THE POLE BODY

Alfred Wittwer, Niederglatt, Switzerland, assignor to EMS-Inventa AG, Zürich, Switzerland

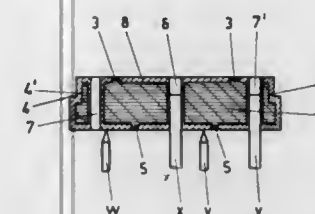
Filed Apr. 22, 1985, Ser. No. 725,959

Claims priority, application Switzerland, May 24, 1984, 2548/84

Int. Cl.⁴ F42B 3/14; B65D 5/12

U.S. Cl. 102—202.8

26 Claims



1. A pole body for an electric fuze, comprising:
an insulating carrier element;
a metal layer provided on said insulating carrier element and forming at least one detonating bridge;
said metal layer on said insulating carrier element defining a surface; and
said insulating carrier element partially protruding into said metal layer on said insulating carrier element and forming a common plane with said surface of said metal layer.

4,715,281

IMPACT SWITCH FOR FUSES

Horst Dinger, Tennenbronn, and Horst Moosmann, Schramberg, both of Fed. Rep. of Germany, assignors to Gebrüder Junghans GmbH, Schramberg, Fed. Rep. of Germany

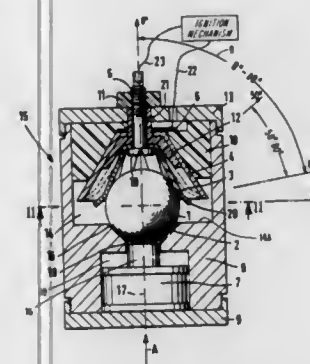
Filed Sep. 5, 1986, Ser. No. 903,714

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534309

Int. Cl.⁴ F42C 19/06

U.S. Cl. 102—216

4 Claims



1. An impact switch in a projectile of the type in which an electrical explosives-igniter is actuated in response to projectile impact, said switch comprising:
a housing comprising a rigid conical surface forming a conical recess centered along an axis extending in the fore-aft direction of the projectile,
first and second contacts, at least one of which being mov-

able into engagement with the other for completing an electrical circuit to actuate the explosives-igniter, and a spherical member movable in response to projectile impact for displacing said one contact into engagement with the other, said spherical member disposed in said recess so as to be movable along said rigid conical surface in directions angled relative to said axis to produce interengagement of said contacts in response to non-frontal impacts of the projectile, wherein said one contact comprises a contact spring having a plurality of flexible arms overlaying and contacting said spherical member so that at least one of said arms is flexed outwardly by said spherical member into engagement with said other contact, said other contact being hood-shaped and surrounding said arms.

4,715,282

CLUSTER BOMB GRENADE WITH MEANS FOR SPIN RATE ATTENUATION

Avraham Rosenberg, Holon, and Carol Ziner, Rishon Le-Zion, both of Israel, assignors to The State of Israel, Ministry of Defence, Israel Military Industries, Israel

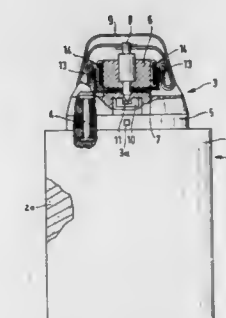
Filed Oct. 23, 1986, Ser. No. 922,343

Claims priority, application Israel, Dec. 18, 1985, 77377

Int. Cl.⁴ F42B 13/50, 25/22

U.S. Cl. 102—227

6 Claims



1. In a grenade adapted to be packed into a cargo projectile together with a plurality of its kind to form a cluster bomb, comprising a body housing a detonable charge; a rear portion housing a fuse and a striker pin adapted to advance towards the fuse along a predetermined path when the grenade hits a target thereby to ignite the fuse, movable blocking means for blocking the path of the striker pin towards the fuse when the grenade is in the unarmed state, which movable blocking means are movable towards a non-blocking position and are locked in the blocking position through engagement by the striker pin when said striker pin is in a locking position; a drag tape connected to the rear of the striker pin which is folded in the unarmed state of the grenade and is unfolded upon release of the grenade from the cargo projectile whereby the striker pin is retracted from engagement with said moveable blocking means to an unlocking position and the latter move into a non-blocking position whereupon the grenade is armed; the improvement by which said grenade comprises:

- (i) a plurality of telescoping wings swingably mounted on said rear portion in a centrosymmetrical arrangement and adapted to swing from a folded to an unfolded position;
- (ii) retainer means releasably coupled to said striker pin for retaining said wings in the folded position when said striker pin is in said locking position with said retainer means coupled thereto and for releasing said wings for swinging movement to the unfolded position when said striker pin is retracted to said unlocking position with said retainer means uncoupled therefrom, which retainer means are adapted to be jettisoned upon retraction of the striker pin to said unlocking position; and
- (iii) stop means for arresting the wings in a desired unfolded position.

4,715,283

GUIDED MISSILE

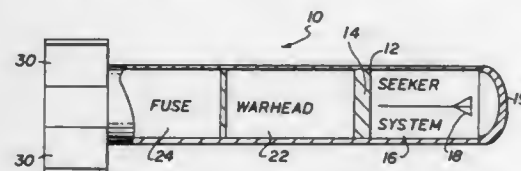
William C. Yengst, Solana Beach, Calif., assignor to Science Applications International Corporation, San Diego, Calif.

Filed Nov. 18, 1986, Ser. No. 932,227

Int. Cl.⁴ F42B 23/24, 25/20

U.S. Cl. 102-401

9 Claims



1. In combination in a guided missile for directing the guided missile to railroad tracks and for providing for the disposition of the missile under a railroad bed beneath the tracks to derail an approaching train,

- a housing made from a thick and strong metal, the housing having a blunt nose made from a compressible material, the housing having a relatively thick bulkhead at an intermediate position along the length of the housing,
- a seeker system in the housing between the bulkhead and the nose for homing the guided missile on the railroad tracks,
- a warhead in the housing at an intermediate position in the housing, and
- a fuse in the housing at a rearward position in the housing.

4,715,284

TELESCOPED AMMUNITION CONSTRUCTION FOR REDUCING BARREL EROSION

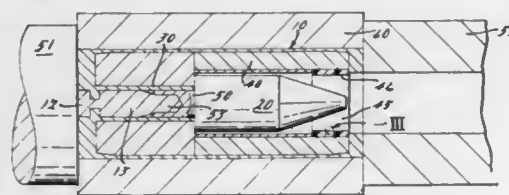
James D. Hendry, Huntington Beach, and Lee A. Tobias, Santa Ana, both of Calif., assignors to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Nov. 24, 1986, Ser. No. 934,527

Int. Cl.⁴ F42B 5/02

U.S. Cl. 102-434

3 Claims



1. A telescoped ammunition round comprising a propellant charge means having an axial cavity and supplying firing power for said ammunition round;

- a projectile means housed within said cavity for being fired from said ammunition round; and
- a wear reducing additive means coupled to the forward portion of said propellant charge means adjacent said axial cavity, said wear reducing additive means being integrally molded to said propellant charge means adjacent the forward portion of said axial cavity thereby strengthening said propellant charge means and accurately positioning said wear reducing additive means, being in the form of hard pellets pressed into said propellant charge means, and having extensions protruding into said propellant charge means to improve coupling between said wear reducing additive and said propellant charge means.

4,715,285

ADDITIVE SEALING SLEEVE FOR LARGE-CALIBERED CANNON AMMUNITION FOR THE PROTECTION OF THE WEAPON BARREL

Roland Höller, Nuremberg, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Dec. 9, 1986, Ser. No. 939,538

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3544907

Int. Cl.⁴ F42B 5/24

U.S. Cl. 102-435

3 Claims

1. Additive sealing sleeve for large-calibered artillery ammunition adapted for the protective treatment of a weapon barrel, said sleeve comprising a coated textile fabric which is assembled in a shell casing in the form of a lining, said fabric being covered as a support for a mixture constituted of wax and titanium dioxide; the improvement comprising in that the mixture contains a thickening medium which forms a stiffening three-dimensional meshwork, said thickening medium containing polybutylene and a combustion enhancing agent.

4,715,286

CONVEYER SYSTEM

Preston K. Parker, and Roy T. Toutant, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 27, 1985, Ser. No. 802,389

Int. Cl.⁴ B65G 17/40

U.S. Cl. 104-88

7 Claims

1. A conveyor system comprising:
a first horizontal trackway having a flat movable flexible chain extending between a plurality of work stations, said trackway having a loop section at one end thereof;
a plurality of pallets movable by frictional engagement with the flexible chain for carrying work pieces along the trackway between the work stations;
a second trackway adjacent the first trackway loop section and having a continuous flat flexible chain, said second trackway having an upper level section and a lower level section with the upper level section being in the same horizontal plane as the first trackway and having two legs connected by an intermediate section with both of the legs in pallet transfer communication with the first trackway, the lower level section of the second trackway being spaced below the upper level section and having two legs connected by an intermediate section, each leg of the lower level section being connected to a corresponding leg of the upper level section to form a continuous loop;
drive means for moving the continuous second trackway independent of the first trackway; and
switching means for diverting the pallets to either the first trackway loop section or the upper level of the second trackway.

4,715,287

VEHICLE CONVEYOR AND WHEEL ENGAGING DOLLY

Robert J. Wentworth, Northville, and Graham J. Astley, Novi, both of Mich., assignors to Belanger, Inc., Northville, Mich.

Filed Jan. 8, 1987, Ser. No. 1,595

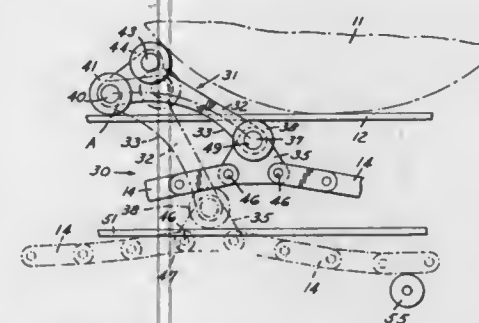
Int. Cl.⁴ B61B 10/04, 13/12; B65G 17/24, 19/26

U.S. Cl. 104-172.3

10 Claims

1. A tire engaging roller dolly adapted to be connected to a chain forming part of a conveyor for transporting a vehicle in one direction along a substantially horizontal track, comprising an arm having a surface on the side of the arm adapted to face the chain, said arm being hingedly connected on a first end to a connector link of the chain by a first pin which is adapted to extend through the link and the arm, a first pair of rollers being secured to the first pin, said arm having a second pin disposed at a second end space from the first and aligned with the first rollers, a second pair of rollers being secured to the second pin, a third pin disposed on the arm parallel to the first and

second pins at a point intermediate the first and second pins and spaced from said aligned first and second rollers, said third pin having a third pair of rollers secured thereon for engaging a tire of a vehicle adapted to be moved by the conveyor, whereby said second pair of rollers is adapted to ride upon the upper surface of the track with the third pair of rollers in a first



position and said first pair of rollers spaced below said track until the third pair of rollers engages the tire, and upon engaging the tire, the third pair of rollers is adapted to roll upwardly along the vehicle wheel until the first pair of rollers are pivoted about the second pair of rollers and into contact with the lower surface of the track.

4,715,288

APPARATUS FOR THE OVERHEAD TRANSPORTATION OF HEAVY LOADS ON A MONORAIL

Nicola Catena, Leumann, Italy, assignor to Fata European Group S.p.A., Turin, Italy

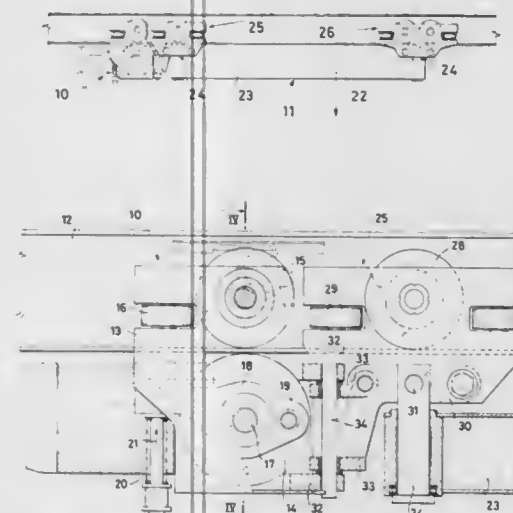
Filed Apr. 29, 1986, Ser. No. 857,181

Claims priority, application Italy, May 23, 1985, 21925/85[U]

Int. Cl.⁴ B61B 3/02

U.S. Cl. 105-154

7 Claims



1. An apparatus for the overhead transportation of loads on a monorail comprising, at least one truck (11), a tractive trolley (10), a vertically positioned pivot pin (34) articulately connecting said truck (11) and said tractive trolley (10), said truck (11) comprising first and second terminal trolleys (25, 26), bars (24) pivotally extending downwardly from said first and second terminal trolleys (25, 26), a girder (23) having ends mounted on said first and second terminal trolleys (25, 26), and a first and second pair of guide wheels mounted on said first terminal trolley (25), a first fork (32) having a bifurcated section with aligned holes therethrough, said pivot pin (34) being mounted

in said aligned holes, a second fork (33) having a bifurcated section with aligned holes therethrough, said pivot pin (34) passing through said aligned holes of said second fork (33), said first fork (32) being fixed to said tractive trolley (10), said second fork (33) being fixed to said first terminal trolley (25) and said pivot pin (34) and first pair of guide wheels having axes being positioned in the same vertical plane.

4,715,289

APPARATUS FOR CONTROLLING VIBRATION OF VEHICLE

Isao Okamoto, Musashino; Motomi Hiraishi, Kudamatsu; Hideo Takai, Hikari; Kenjiro Kasai, and Katsuyuki Terada, both of Kudamatsu, all of Japan, assignors to Japan National Railway and Hitachi, Ltd., both of Tokyo, Japan

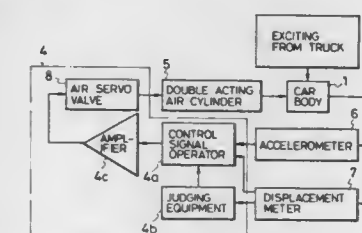
Filed May 29, 1986, Ser. No. 868,025

Claims priority, application Japan, May 31, 1985, 60-116420

Int. Cl.⁴ B61F 3/08, 5/24, 5/06

U.S. Cl. 105-199.2

6 Claims



1. An apparatus for controlling the vibration of a vehicle, comprising:
a truck;
a car body;
springs for supporting said car body on said truck;
a fluid pressure-acting mechanism arranged between said truck and said car body for controlling forces acting between said car body and said truck with a pressure fluid;
an acceleration detector for detecting acceleration of said car body;
means for determining displacement relatively generated between said car body and said truck due to a steady acceleration acting against said car body;
a fluid controller for controlling said pressure fluid supplied to said fluid pressure-acting mechanism; and
a controller for generating a vibration suppressing control signal based on an output from said acceleration detector, for calculating a displacement value, corresponding to said displacement relatively generated between said car body and said truck contained in said vibration suppressing control signal based on an output from said means for determining displacement generated relatively between said car body and said truck and for subtracting said displacement value from said vibration suppressing control signal to provide a control signal for controlling said fluid controller.

4,715,290

HUNTING CONTROL SIDE BEARING

Charles N. Hood, II, Deerfield, Ill., assignor to AMSTED Industries Incorporated, Del.

Filed May 19, 1986, Ser. No. 864,604

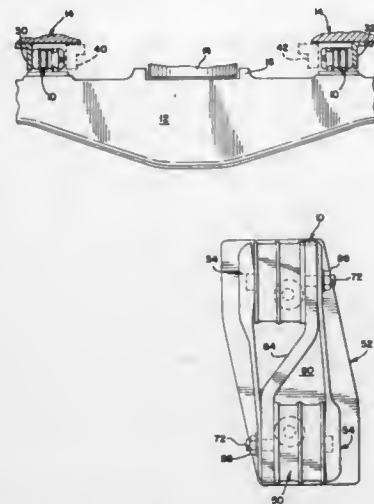
Int. Cl.⁴ B61F 5/14

U.S. Cl. 105-199.3

7 Claims

1. An improved side bearing for use in railway cars in which the frictional interface between said side bearing and a part secured to one of a carbody and truck bolster takes place in one or more substantially vertical planes, said side bearing comprising a resilient cartridge means having two opposite ends, mounting means to secure one end of said cartridge with respect to one of said carbody and truck bolster, and friction

means covering the other of said ends of said resilient cartridge, wherein said friction means is a fogged metal part



having a handle by which it is secured substantially normal to said mounting means and a body portion held against and covering said other end of said resilient cartridge.

4,715,291

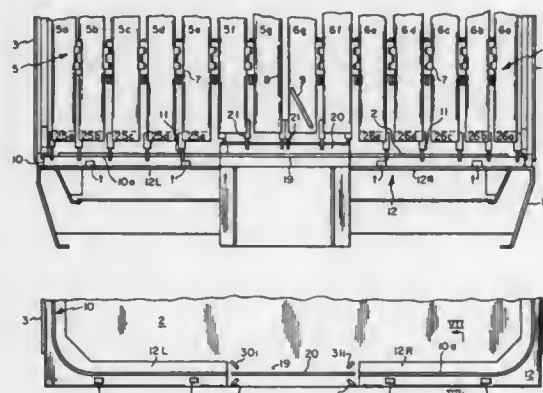
RAILROAD CAR DOOR BOTTOM GUIDE RAIL SYSTEM
James D. Hart, Grove City, Pa., assignor to Trinity Industries, Inc., Dallas, Tex.

Filed Jul. 2, 1986, Ser. No. 881,332

Int. Cl.⁴ B61D 3/18; B60J 5/14

U.S. Cl. 105—378

11 Claims



1. In a railroad car arranged to transport vehicles, a floor; a roof; a pair of spaced side walls; at least one door assembly; means for suspending said door assembly for movement from a closed position at an end of said railroad car to an open position adjacent a side wall for the loading and unloading of vehicles thereon; a rail for securing the bottom edges of said door assembly; and a plurality of spaced fingers attached to the bottom edges of said door assembly to straddle said rail and provide slidable movement of said door assembly relative to said rail, the improvement comprising:

a platform attached to said end of said railroad car extending along at least one side of said railroad car and positioned between a lower end of a side wall and an adjacent edge of said floor, said platform spaced a distance below and in parallel relation to said floor, a portion of said rail being positioned on said platform so that the upper edge of said portion of rail does not extend above the level of said floor at least in areas through which the tires of a vehicle pass during loading and unloading of said railroad car, whereby said door assembly may be moved along the rail

adjacent to and inside of said side walls to an open position for the loading and unloading of vehicles thereon.

4,715,292

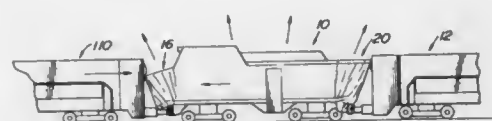
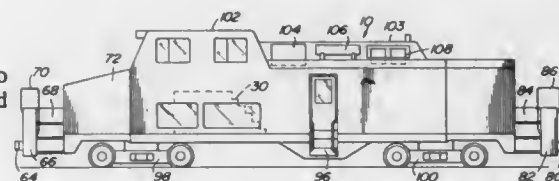
HEAD END VEHICLE WITH CREW ACCOMMODATIONS WITH LOCOMOTIVE AND OTHER CONTROLS

Michael J. Pavlick, 1538 Daws Cir., Norristown, Pa. 19403; James C. McQueston, 466 Hopwood Dr., Warminster, Pa. 18974; Walter S. Eggert, Jr., 26 Moredon Rd., and Lionel Sherrow, 737 Dale Rd., both of Huntingdon Valley, Pa. 19006
Filed Sep. 13, 1985, Ser. No. 776,068

Int. Cl.⁴ B61D 15/06, 17/00

U.S. Cl. 105—456

8 Claims



1. In combination:

- (a) a non-propulsion control rail vehicle providing a lead car in a train;
- (b) a self-propelled rail vehicle including propulsion means for directly pushing said lead vehicle;
- (c) said control vehicle including a main body having a plurality of floor levels therein and including a plurality of partitioned areas to provide working areas and accommodations for a crew;
- (d) one of said partitioned areas including a cab area having a highest floor level in said control vehicle to permit high visibility in forward and rear directions;
- (e) front and rear structures on the front and rear ends of said control vehicle disposed to collapse and absorb energy when subjected to impact forces;
- (f) a central frame structure including said cab area disposed between said front and rear structures, and
- (g) said central frame including protective members to limit the distance said front and rear structures will collapse when high impact forces are applied thereto to prevent the collapse of said central frame.

4,715,293

BODY-SUPPORTED HAND-OPERATED INSTRUMENT DESK

Richard W. Cobbs, P.O. Box 609, North Amherst, Mass. 01059
Filed Dec. 9, 1986, Ser. No. 939,536

Int. Cl.⁴ A47B 23/00

U.S. Cl. 108—43

10 Claims

1. A body-supported instrument desk retained over the shoulders of ones body for holding a hand operated portable instrument comprising:

- (a) a tubular frame member in generally a U-shape having a middle and ends, formed in such a manner as to conform to the back portion of ones body and over the shoulders with the middle joining contiguously and the ends spread apart, for resting on ones shoulders and providing structure therewith,
- (b) a pair of brackets having slots therein in crescent shape permanently affixed to the ends of said tubular frame member providing a vertical mounting base,
- (c) a rectangular shaped tubular table member having a slot in each end pivotally disposed upon the brackets in a horizontal direction defining an enclosed table area on three sides with the tubular frame member forming the fourth edge of the table member,
- (d) table member manual actuator adjusting means having



hand variable adjustment providing predetermined angular displacement of the table member relative to the brackets allowing adjustment of the angle of the table to fit the individuals body and accessibility requirements,

- (e) a table top engaging the table member and bottom vertical frame members providing a support for holding the portable instrument while the desk is retained portably on ones shoulders,
- (f) a pair of shoulder straps attached on one end to the vertical frame members and on the other to the back support member defining a cradle therebetween formably fitting ones shoulders for retaining the weight of the desk evenly thereupon, and
- (g) a resilient pad attached to the frame contiguous with the users back providing a comfortable surface for comfort and adaptability to different body contours.

4,715,294

PALLET CONSTRUCTION

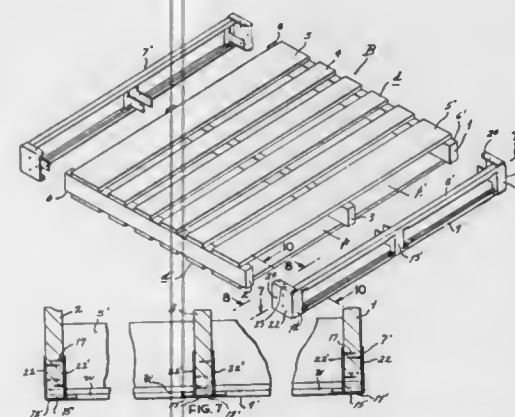
Thomas N. Depew, 10 Sunningdale Dr., St. Louis, Mo. 63124
PCT No. PCT/US86/02208, § 371 Date Oct. 20, 1986, § 102(e)
Date Oct. 20, 1986

PCT Filed Oct. 20, 1986, Ser. No. 938,169

Int. Cl.⁴ B65D 19/18

U.S. Cl. 108—51.1

25 Claims



1. A pallet comprising spaced-apart stringers, a plurality of deckboards secured to upper and lower edges of said stringers

in axial transverse relation thereto to define upper and lower decks, at least one end deckboard of each deck being spaced inwardly from the adjacent ends of the stringers to form end spacings, a protective device provided at said at least one end of said pallet comprising a plurality of stringer end caps for engagingly receiving the projecting end of the related stringer and being of general U-shape in cross-section, said end caps each having a pair of arms for disposition against the proximate side face portions of the related stringer and an interconnecting web for abutment on the inner face thereof against the confronting end face of such stringer, said arms being of such dimension lengthwise of the pallet as to project a substantial distance between the adjacent deckboards of the upper and lower decks, means for securing said arms to the proximate stringer in the zones thereof between said upper and lower decks, upper and lower rigid elongated members in axial parallel relation to said deckboards, the upper and lower elongated members each being of flat-sided tubular configuration and fixedly secured upon the upper edges of said stringer end caps for fitted reception within the end spacings for snug abutment of said elongated members against the proximate end face of the adjacent deckboard and against the adjacent edge of the stringers, said elongated members being of such transverse dimension as to be flush with the webs of the engaged stringers.

4,715,295

OVERBED TABLE

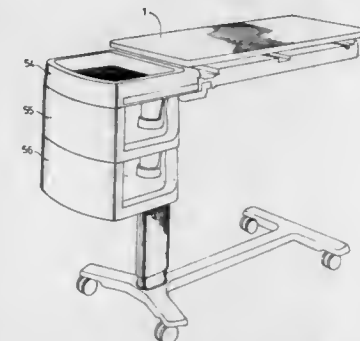
Daniel A. Hartman, Sunman, and L. Dale Foster, Brookville, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Jul. 26, 1985, Ser. No. 759,635

Int. Cl.⁴ A47B 57/00

U.S. Cl. 108—93

4 Claims



1. An improved table providing two usable horizontal surfaces, comprising:

- (a) an upper horizontal table surface;
- (b) a lower horizontal table surface positioned generally under said upper horizontal table surface, so that the lower horizontal table surface is not usable; said upper and lower table surfaces being mounted on slide members;
- (c) means for concurrently moving said upper and lower horizontal table surfaces in opposite directions to expose the lower horizontal table surface and to render said lower horizontal table surface available for use such that said upper table surface may be moved in either one of two directions relative to said lower table surface and movement of said upper table surface in one of said directions will cause movement of said lower table surface in the other of said two directions, said means for concurrently moving said table surfaces comprising a pivot means operably connected to the upper and lower table surfaces, said pivot means comprising an elongate pivot bar assembly having bearing means mounted on each end thereof and configured to cooperate with a generally V-shaped channel in the undersurface of said upper table surface and a generally elongate channel formed in the underside of said lower table surface and extending generally transverse to

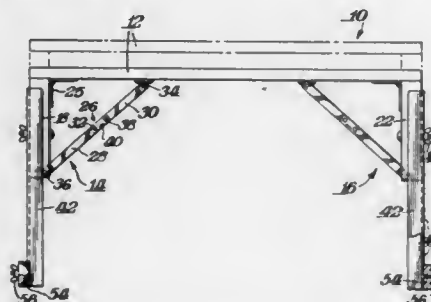
the direction of movement of said lower table surface, wherein movement of said upper table surface in one direction automatically results in movement of said lower table surface in the opposite direction; and
(d) latch means positioned to hold said table surfaces in a position where the upper surface is directly over the lower surface and means for releasing said latch means to permit said table surface to be concurrently moved in opposite directions.

4,715,296 UTILITY BENCH

William T. Wilkinson, c/o Connolly & Hutz, P.O. Box 2207,
1220 Market Bldg., Wilmington, Del. 19899-2207
Filed Apr. 3, 1986, Ser. No. 847,672
Int. Cl.⁴ A47B 3/02

U.S. Cl. 108—116

6 Claims



1. An adjustable utility bench for being disposed a vertical distance above a support surface comprising an elongated planar one-piece support platform having an underside and a pair of side edges and a pair of spaced ends, a mounting unit secured to each of said ends, each mounting unit comprising a pair of legs hingedly mounted to said platform by a hinging mechanism secured to the lower end of each of said legs and secured to said underside of said support platform at a location inwardly of said side edges for being folded against said underside of said platform during periods of storage, a brace interconnecting said legs whereby said legs are jointly movable between its use and storage conditions, said brace of each mounting unit being connected to its respective pair of legs at an angle thereto by said brace being connected at one end to the lower portion of one of said pair of legs and at its opposite end to the upper portion of the other of said pair of legs, said braces of both mounting units being at opposite angles to each other, an extension secured to each of said legs, adjustable securing means mounting each of said extensions to a respective leg whereby the vertical distance said extensions project away from said platform may be varied to control the height of said platform at one of at least three different fixed heights, and a support member spanning and extending laterally beyond and detachably connected to a respective pair of said extensions of each mounting unit to provide stability to said bench.

4,715,297

SAFE CONSTRUCTION AND REBAR COUPLING DEVICE FOR USE THEREWITH

Robert J. Lichter, 15571 Placid Cir., Huntington Beach, Calif.
92647

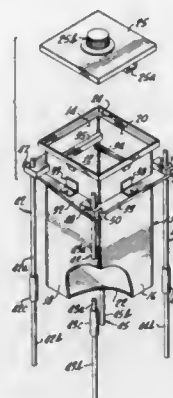
Filed Feb. 27, 1986, Ser. No. 834,205
Int. Cl.⁴ E05G 1/00

U.S. Cl. 109—50

17 Claims

1. A safe construction comprising:
safe-wall means forming a valuables receiving chamber and being configured for pouring of concrete thereabout;
connector means attached to said safe-wall means;
a plurality of rebar assemblies attached to said connector means, each of said rebar assemblies including at least one rebar section having one end thereof attached to said connector means and the other end thereof attached to a

coupler device, each of said coupler devices being formed of a non-rusting material, each of said coupler devices being positionable relative to the ground with said coupler device in a position for at least partial embedment in the



poured concrete along with said at least one rebar section of said rebar assemblies, said coupler device acting as a barrier to the formation of rust on said at least one rebar section.

4,715,298

ELECTRICALLY POWERED IMPRINTER

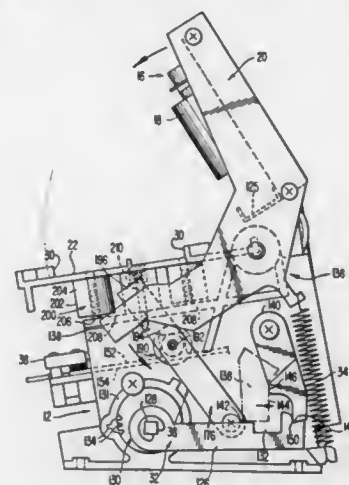
Walter R. Welckert, Petersburg, and Paul J. Foley, Kitchener,
both of Canada, assignors to National Business Systems, Inc.,
Ontario, Canada

Continuation of Ser. No. 780,989, Sep. 27, 1985, Pat. No.
4,655,132. This application Dec. 1, 1986, Ser. No. 936,605

The portion of the term of this patent subsequent to Apr. 7, 2004,
has been disclaimed.
Int. Cl.⁴ B41F 3/04

U.S. Cl. 101—269

28 Claims



1. In a motor operated imprinter of the type having a base having means for receiving a print bearing element having printing to be imprinted and a print receiving element to be imprinted with the printing by a motor powered rolling platen means as it moves from a first position to a second position, a head means pivotably connected to the base which is pivotable between an open position, providing access to the means for receiving, and a closed position positioning the head means for imprinting, a latching means, having latched and unlatched positions, for holding the head in its closed position when latched; and means for causing the head means to rotate to its open position upon the unlatching of the latching means, a

mechanism for braking the rotation of the head means from its closed position to its open position comprising:

- a head arrestor means having a first position which does not engage the head means and a second position which engages a part of the head means during rotation of the head means to the open position to brake the rate of pivoting of the head means to the open position; and
- means for moving the head arrestor means from the first position to the second position into engagement with the part of the head means in response to movement of the rolling platen means toward the second position which causes the head means to pivot at a braked rate of pivoting.

4,715,299

COMPOUND RESOURCE RECOVERY FURNACE

Steven L. Mann, P.O. Box 33, Cheshire, Conn. 06410

Filed Dec. 22, 1986, Ser. No. 945,013

Int. Cl.⁴ F23G 5/08

U.S. Cl. 110—235

15 Claims

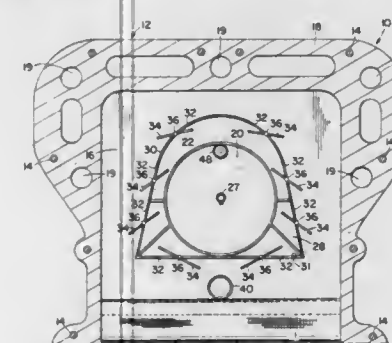


FIG. 4

1. A compound furnace comprising an elongated outer shell having a charging end and a discharging end, an inner chamber assembly disposed within and extending longitudinally of said shell and including first wall means for defining an inner chamber in communication with said charging end and said discharging end and second wall means surrounding at least a portion of said first wall means for cooperating with said first wall means to define an intermediate chamber, said outer shell cooperating with said inner chamber assembly to define an outer chamber, means for heating said inner chamber, regulating means associated with said second wall means for controlling communication between said intermediate chamber and said outer chamber, and controlling means responsive to temperature within said outer chamber for operating said regulating means to vary the degree of communication between said intermediate chamber and said outer chamber whereby to alter temperature within said outer chamber.

4,715,300

METHOD OF DISPOSING OF MATERIALS BY DISSOLVING IN ACID AND THEN INCINERATING

Rocky C. Costello, and Robert L. Dixon, both of Houston, Tex.,
assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 27, 1987, Ser. No. 43,052

Int. Cl.⁴ F23G 7/00

U.S. Cl. 110—346

8 Claims

1. A method of disposing of acid-dissolvable solid materials which comprises:
(a) dissolving the acid-dissolvable materials in a strong mineral acid to form an acid solution comprising the dissolved material; and
(b) feeding the acid solution from (a) to an incinerator for incineration.

4,715,301

LOW EXCESS AIR TANGENTIAL FIRING SYSTEM

Joseph D. Blanca, Feeding Hills, and David K. Anderson, East
Longmeadow, both of Mass., assignors to Combustion Engineering, Inc., Windsor, Conn.

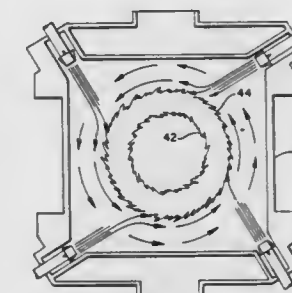
Continuation of Ser. No. 843,419, Mar. 24, 1986, abandoned.

This application Mar. 16, 1987, Ser. No. 26,223

Int. Cl.⁴ F23D 1/00

U.S. Cl. 110—347

11 Claims



1. A method of operating a tangentially fired pulverized coal furnace for purposes of achieving a better mixing of the coal and auxiliary air so that the excess air required for complete combustion of the coal is kept to a minimum and so that the quantity of coal, burnt or unburnt, impacting the upper furnace walls is lowered thus reducing plugging and fouling in the furnace comprising the steps of:

- discharging into the furnace at each of a plurality of first levels pulverized coal and primary air such that the pulverized coal and primary air being discharged at each of said plurality of first levels is directed in a first direction tangentially to a corresponding one of a plurality of first imaginary circles each located in the center of the furnace thereby causing a fireball to be formed within the furnace that rotates in said first direction while moving within the furnace;
- discharging into the furnace at each of said plurality of first levels secondary air such that the secondary air being discharged at each of said plurality of first levels is directed in said first direction tangentially to each of a corresponding one of said plurality of first imaginary circles each located in the center of the furnace;
- discharging into the furnace at each of a plurality of second levels that are each located directly above a corresponding one of each of said plurality of first levels auxiliary air in a mass more than two times that of the primary air such that the auxiliary air being discharged at each of said plurality of second levels unlike the pulverized coal and the primary air and the secondary air being discharged at each of said plurality of first levels is directed in a second direction that is opposite to said first direction tangentially to a corresponding one of a plurality of second imaginary circles each located in the center of the furnace thereby causing a fireball to be formed within the furnace that rotates in said second direction while moving upwardly within the furnace; and
- causing each fireball formed within the furnace to rotate in said second direction upon exiting from the furnace because of the influence exerted thereupon by virtue of the auxiliary air having a greater mass.

4,715,302

FOLDABLE DRILL IMPLEMENT WITH DIFFERENTIAL ASSEMBLY

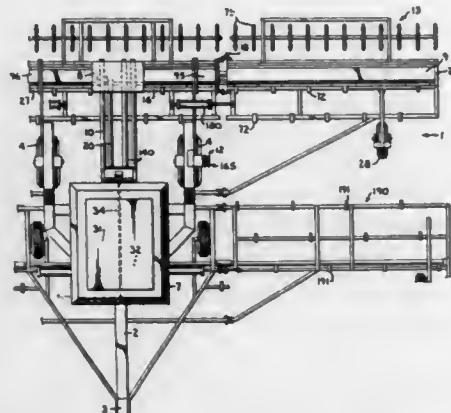
Stanley E. Briggs, Minneapolis, Kans., assignor to Briggs Manufacturing, Inc., Minneapolis, Kans.

Continuation-in-part of Ser. No. 816,556, Jan. 6, 1986, abandoned, which is a continuation of Ser. No. 574,264, Jan. 26, 1984, Pat. No. 4,562,779. This application Apr. 23, 1986, Ser. No. 855,124

Int. Cl.⁴ A01C 5/00, 7/16, 7/20

U.S. Cl. 111-1

6 Claims

**1. A foldable drill implement comprising:**

- (a) an implement frame having a tow bar for connection to a prime mover and a plurality of ground-engaging wheels for movable support over the ground in a first direction;
- (b) a supply hopper mounted to said frame;
- (c) a broadcast hopper mounted to said frame and spaced from said supply hopper, and extending generally transversely to said first direction;
- (d) said implement frame having a center frame section and a plurality of wing frame sections oppositely positioned adjacent said center frame section and having ground-engaging wheels for support, said center frame section including pivot means connecting said wing frame sections to opposite ends of said center frame section for folding;
- (e) said broadcast hopper including a central drill box mounted on said center frame section;
- (f) said broadcast hopper including a plurality of wing section drill boxes mounted on a respective said wing frame section and extending generally longitudinally of said central drill box and in flow communication therewith, each of said wing section drill boxes having outer ends;
- (g) a plurality of planter means supported by said frame and disposed along said broadcast hopper, said broadcast hopper being in flow communication with said planter means for broadcast of said material in the ground upon operational movement of said implement frame;
- (h) a first supply auger supported by said frame and extending generally in said first direction, said first supply auger being connected to said supply hopper and to said broadcast hopper and being in flow communication therebetween;
- (i) a first distribution auger supported by said frame and extending generally transversely to said first direction along said broadcast hopper, said first distribution auger being in flow communication with said first supply auger and adapted to transfer material from said supply auger to said central and wing drill boxes of said broadcast hopper; said first distribution auger having a right side auger shaft and a left side auger shaft;
- (j) motive means connected to and driving said first supply auger and said first distribution auger;
- (k) a differential assembly connected to said motive means for receiving power therefrom; said differential assembly connecting said right and left side auger shafts and differ-

entially supplying power thereto in response to torque differentials applied to said right and left side auger shafts; and

- (l) control means at said wing section drill box outer ends and sensitive to the presence of excess material delivered by respective said wing distribution augers, said control means being adapted to deactuate said first supply and distribution augers upon said presence of said excess material.

4,715,303

LUBRICATING DEVICE FOR SEWING AND EMBROIDERING MACHINES

Edgar Busch, Trippstadt; Lothar Schilling, and Klaus Ziegler, both of Kaiserslautern, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

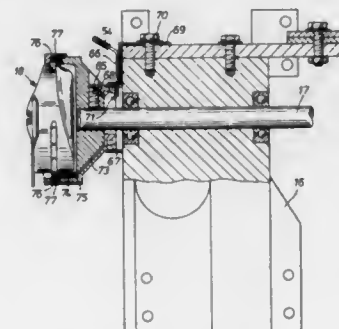
Filed Jun. 3, 1986, Ser. No. 870,076

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 8516167

Int. Cl.⁴ D05B 57/08, 71/02

U.S. Cl. 112-256

6 Claims



- 1. A lubricating device for the track of a rotating lock stitch loop taker of a sewing and embroidering machine, comprising a loop taker body having a hub portion, a rotatable loop taker arbor secured to said loop taker at the hub portion, a bearing block for rotatively mounting said loop taker arbor, said hub portion having a recess which comprises an oil chamber at its end facing said bearing block said arbor passing directly through said oil chamber before reaching the point at which it is secured to said hub portion, a fixed ring surrounding said loop taker hub portion enclosing a space between said hub portion and said bearing block a nozzle tube extending through the opening of said ring protruding into the recess of said loop taker hub portion for directing lubricating oil through an opening of said ring to the recess of said hub portion, a pump connected to said nozzle tube so as to supply lubricating oil to said recess portion, and a channel in said hub portion connecting said recess to the periphery of said loop taker so that the rotation of said loop taker produces a centrifugal force acting on the oil in the recess of said hub portion, to direct the oil, through said channel, to the periphery of said loop taker.

4,715,304

HYDROFOIL MARINE APPARATUS

Amiram Steinberg, Moshav Avichail, Israel

Continuation of Ser. No. 690,978, Jan. 11, 1985, abandoned. This application Apr. 22, 1986, Ser. No. 856,439

Int. Cl.⁴ B63B 1/28

U.S. Cl. 114-39.2

19 Claims

1. Hydrofoil marine apparatus comprising:

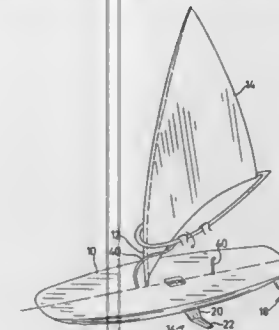
- a hull, including at least one recess formed in the underside thereof;
- hydrofoil means comprising a plurality of foil assemblies, each assembly including first and second generally planar surface portions, said section portion lying below said first

portion when disposed in an operative orientation in the water;

pivotal mounting means for mounting said hydrofoil onto the hull and defining a pivot axis perpendicular to at least one of said first and second generally planar surface portions; and

means for selectably and variably determining the dihedral angle between the first and second planar surface portions and comprising:

selectable displacement means associated with said hydrofoil means and operative to assume a first operative



orientation when said hydrofoil means is in a first pivotal orientation and to assume a second operative orientation when said hydrofoil means is in a second pivotal orientation;

hinge means joining said first and second generally planar surface portions and operative to determine the dihedral angle therebetween; and

means fixedly coupled to said displacement means and to said hinge means for transferring displacement of said displacement means to operation of said hinge means for desired orientation thereof.

4,715,305
SHIP'S HULL

Göran Wilkman, Espoo; Timo Kotilainen; Juha Pulliainen, both of Helsinki, and Gustav Lindqvist, Espoo, all of Finland, assignors to Oy Wärtsilä AB, Helsinki, Finland

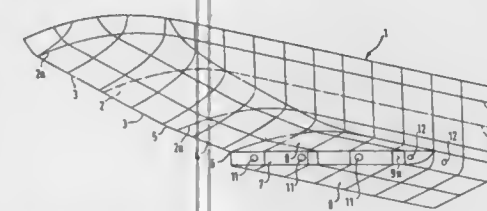
Filed Mar. 7, 1985, Ser. No. 708,970

Claims priority, application Finland, Mar. 12, 1984, 840995

Int. Cl.⁴ B63B 35/08

U.S. Cl. 114-40

19 Claims



- 1. A ship's hull that is adapted for operating an ice-filled waters and has a general frame form defining a substantially horizontal bottom surface and two opposite side surfaces, said hull having a rounded bow portion, the outline of which, in horizontal sections at and below the design waterline plane of the ship, and at least partially above the design waterline plane, is an at least substantially continuous curved arc from one side of the hull to the opposite side thereof, and said bow portion having a stem line that extends obliquely from said design waterline plane downwards in the rearward direction at an angle of at most 40 degrees to a horizontal plane, and said hull also having a wedge-shaped structure defined by two substantially vertical sides that converge in the direction from the stern of the hull towards the bow of the hull, said two sides

meeting in an edge that extends substantially vertically downwards from the region of the lower end of said stem line.

4,715,306

CATAMARAN WITH A STEERABLE CENTERBOARD APPARATUS AND AN IMPROVED DECK JOINT

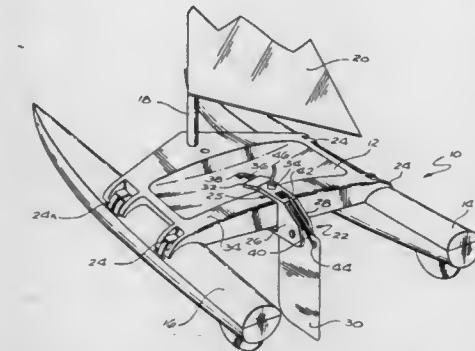
Alan W. Horais, 1603 Steinhart Ave., Redondo Beach, Calif. 90278

Filed Apr. 4, 1986, Ser. No. 848,305

Int. Cl.⁴ B63B 1/00

U.S. Cl. 114-61

11 Claims

**1. A steerable centerboard apparatus for a water going vessel having a deck with an opening extending therethrough, the deck being mounted to at least one hull, comprising:**

- a housing rotatably mounted to the deck of the vessel, said housing having a bore defined therethrough;
- a board pivotally attached to said housing;
- a tiller integral with said housing and extending into said deck, said tiller being movable by a user of said vessel for rotating said housing and said board about an axis substantially perpendicular to the direction of travel of said vessel, said board being pivotally attached to said housing about an axis perpendicular to this first-mentioned axis;
- means for maintaining said tiller in a pre-defined position until a user of said vessel is ready to move said tiller;
- a biasing element attached to an upper portion of said board and to said housing;
- a rope attached to said board, said rope extending through said opening in said deck and through said bore in said housing, wherein said board can be moved from an upper position to a lower position by moving said rope through said opening and said bore; and
- means for fixing said rope to said housing.

4,715,307

CONCRETE MARINE FLOAT AND METHOD OF FABRICATING SAME

Larry L. Thompson, Minneapolis, Minn., assignor to Rock Dock, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 439,752, Nov. 8, 1982, abandoned. This application Dec. 4, 1985, Ser. No. 805,198

Int. Cl.⁴ B63B 5/20

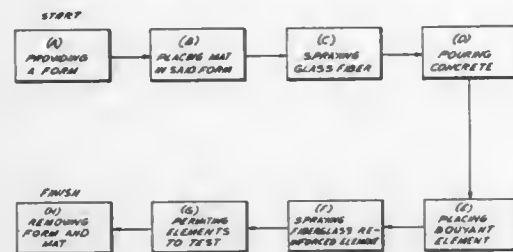
U.S. Cl. 114-65 A

3 Claims

1. A method of fabricating a marine float, comprising:

- (a) Providing a form having a generally rectangular configuration;
- (b) Placing a texturing mat in said form;
- (c) Spraying a layer of glass fiber reinforced concrete into said form over said mat to form a textured deck;
- (d) Pouring a layer of standard aggregate concrete over said textured deck;
- (e) Placing a buoyant element of expanded polystyrene foam on said layer of fiberglass reinforced cement;

- (f) Spraying a layer of fiberglass reinforced cement over the sides and bottom of said buoyant element;



- (g) Permitting the concrete elements to set; and
(h) Removing the form and textured mat.

4,715,308 GRID SYSTEM

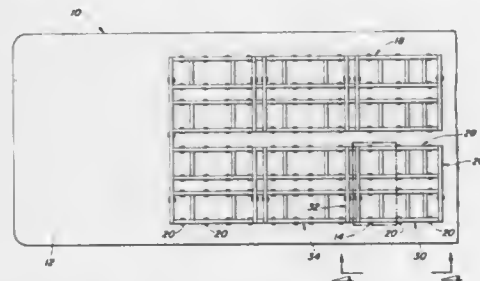
William J. Denison; Lancing G. Smith, and Lonnie R. Walker, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 756,884

Int. Cl.⁴ B63B 25/00

U.S. Cl. 114—72

20 Claims



1. A grid system for supporting a plurality of items of equipment from a deck of a floating vessel, comprising: a plurality of bracket means, welded to said deck; a support grid means for supporting said plurality of items of equipment above said deck, said support grid means including a plurality of interconnected substantially horizontally oriented beams; a plurality of detachable connecting means for detachably connecting said support grid means to said plurality of bracket means, so that said support grid means can be attached to said plurality of bracket means without the need for welding to said deck after said plurality of bracket means has previously been welded to said deck, at least one of said detachable connecting means being associated with each one of said bracket means; and equipment mounting means, operably associated with said support grid means, for mounting said plurality of items of equipment above said support grid means.

4,715,309

DEVICE FOR THE HANDLING OF LIQUIDS
Lars-Olof Liberg, Kungälv, Sweden, assignor to Götaverken Arendal AB, Göteborg, Sweden

Filed Dec. 30, 1985, Ser. No. 814,770

Claims priority, application Sweden, Jan. 21, 1985, 8500263
Int. Cl.⁴ B63B 43/06

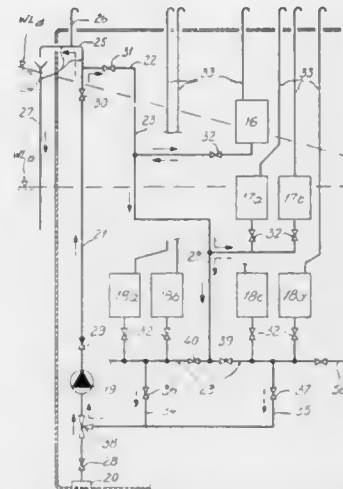
U.S. Cl. 114—125

8 Claims

1. A ballast handling system for a seaborne vessel, comprising a pump connected to at least one tank by conduit comprising:

(A) means for connecting the suction side of the pump with the water surrounding the vessel;

- (B) a riser conduit connected to the pressure side of said pump which extends to a first level above said tanks;
(C) a distribution conduit branched off from the riser conduit at said first level which leads to said at least one tank;
(D) an overflow pipe extending to a second level above the first level and having an outboard terminal above the maximum possible water level surrounding the vessel after serious damage to the vessel; and



- (E) a first shut-off valve in said riser conduit and a second shut-off valve in said distribution conduit which isolate, when closed, the overflow pipe from the remainder of the conduit;
(F) wherein the conduit is dimensioned so that the pressure required to raise liquid to said first level substantially corresponds to the pressure required, in normal use, to cover losses of flow in the distribution conduit.

4,715,310

MARINE SHOCK ABSORBING APPARATUS WITH STABILIZERS

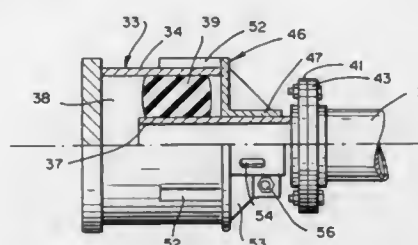
Walter B. Curtis, Thibadaux; Gregory L. Davis, and Mark C. Klimowicz, both of Morgan City, all of La., assignors to Texaco Inc., White Plains

Filed Jul. 19, 1985, Ser. No. 756,543

Int. Cl.⁴ B63B 59/02

U.S. Cl. 114—220

6 Claims



1. In a shock absorbing marine bumper for a structure positioned in a body of water, said structure including: a support member (13) which extends beneath the water's surface, a foundation member (21) depending outwardly from said support member, an elongated king post (26) having opposed upper and lower ends, and disposed substantially uprightly in the body of water to contact a vessel floating adjacent to the structure, said king post lower end being supportably engaged with said foundation member (21), a resiliently compressible shock absorber (33) including a casing (34) which depends outwardly from said support

member (13), having a retractably mounted pipe (37) which protrudes axially from the casing to engage the king post upper end, whereby displacement of said king post by a floating vessel will cause said pipe (37) to retract into said shock absorber casing (34) while resisting said king post movement, the improvement therein for provisionally obviating the shock absorbing action of said shock absorber (33) which comprises a stabilizer including a collar (47) which is removably fixed to the portion of said pipe (37) which protrudes axially from said casing (34), and at least one contact member (51) which extends outwardly from said collar (47) to engage said casing (34) thereby precluding further axial movement of said pipe (37) relative to said casing (34).

4,715,311

VARIABLE VOLUME KAYAK HULL

William E. Masters, P.O. Box 686, Liberty, S.C. 29657

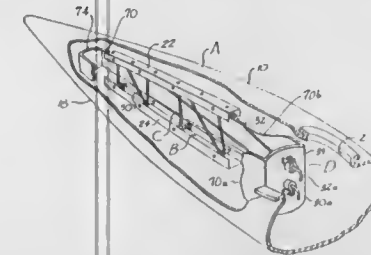
Continuation of Ser. No. 766,567, Aug. 19, 1985, abandoned.

This application Apr. 6, 1987, Ser. No. 33,850

Int. Cl.⁴ B63B 35/72

U.S. Cl. 114—347

21 Claims



1. A kayak having a hull constructed from a flexible material with a central seat section, enclosed bow and stern hull sections having prescribed enclosed volumes on respective sides of said central seat section, said kayak comprising: means connected to opposed generally horizontal interior surfaces of one of said hull sections for deforming the hull cross-sectional configuration inwardly along an appreciable length thereof to change the volume of said one hull section and adjust the volume of said one hull section to the weight of a boater so that said one hull section may be submerged by the weight of said boater under water about its entire circumference along a portion of its length for performing water acrobatics.

4,715,312

CONVERTIBLE CRAFT

Francois Bonvart, 2, avenue de Compiègne, 60300 Senlis, France

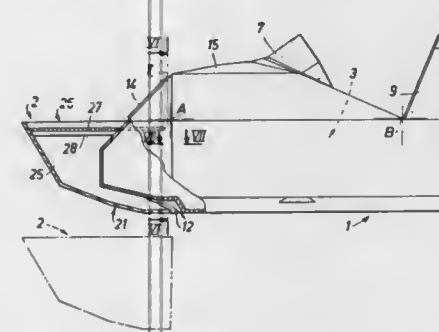
Filed Aug. 6, 1986, Ser. No. 893,691

Claims priority, application France, Aug. 9, 1985, 85 12254

Int. Cl.⁴ B63B 7/04

U.S. Cl. 114—352

12 Claims



1. A craft having an aft part and a forward end part comprising: a hull including said aft part and having a forward part, said

hull being capable of floating on water, said aft part including a first hollow space suitable as a navigation cabin; a stem, said stem being said forward end part of said craft when said stem is attached along a joint to said forward part of said hull, and being adapted for positioning above said first space to at least in part enclose said first space after complete detachment of said stem from said forward part of said hull, said stem when attached at said forward part of said hull enclosing a second hollow space between said hull and stem, and further comprising communication means between said second space and the exterior of said craft, said communication means being positioned such that water entering said hollow space naturally drains to the exterior of said craft whenever the level of water within said second hollow space exceeds the level of water surrounding said craft.

4,715,313

PUMP LINERS AND A METHOD OF CLADDING THE SAME

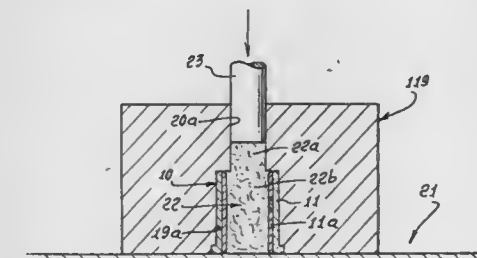
Gunes M. Ecer, Irvine, Calif., assignor to CDP, Ltd., Newport Beach, Calif.

Continuation of Ser. No. 769,313, Aug. 26, 1985, abandoned, which is a division of Ser. No. 689,312, Jan. 7, 1985, Pat. No. 4,603,062. This application Jun. 16, 1986, Ser. No. 874,607

Int. Cl.⁴ B05C 11/02

U.S. Cl. 118—105

6 Claims



1. Apparatus for cladding an internal cavity surface of a metal object, the cladding consisting essentially of a powder metal layer on said internal surface, the metal powder including metal oxide or oxides, borides and carbides, said apparatus comprising

- (a) a pressure transmitting and flowable grain filled into said cavity to contact said layer,
- (b) means for pressurizing said grain to cause sufficient pressure transmission to the powder metal layer to consolidate same, said means transmitting force to the grain along a primary axis, said layer extending about said axis and spaced therefrom, whereby force is transmitted by the grain away from said axis and against said layer,
- (c) and including a step die having a first chamber receiving said object, the die having a second chamber containing said grain communicating with said grain in the cavity which is in the first chamber, said pressurizing of the grain in the cavity being effected by grain pressurized in the second chamber,
- (d) and wherein the second chamber is in axial alignment with the first chamber, the second chamber having a cross section less than the cross section of the first chamber, and said powder metal layer to be pressurized being everywhere outside the projection into said cavity of a throat defined by the second chamber, whereby pressure is transmitted from the grain in the second chamber which is everywhere spaced from said layer,
- (e) the first chamber filled by the grain, radially inwardly of said layer.

4,715,314

ELECTROSTATIC POWDER COATING INSTALLATION
Hans-Ulrich Ramseier, and Fritz Brechbühler, both of Münsingen, Switzerland, assignors to H. U. Ramseier, Rubigen, Switzerland

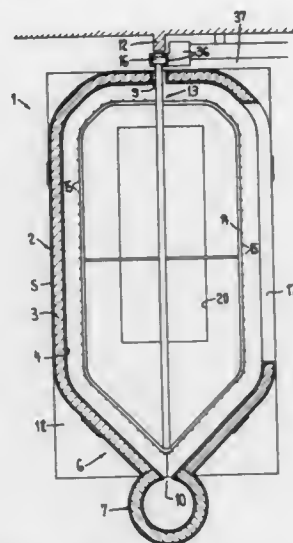
Filed Apr. 25, 1986, Ser. No. 855,726

Claims priority, application Switzerland, Apr. 30, 1985, 1834/85

Int. Cl.⁴ B05B 5/02

U.S. Cl. 118—631

19 Claims



1. An installation for applying an electrostatic powder coating of different colors to workpieces, comprising:
 - a cabin having longitudinally extending side walls, end walls and a bottom portion, each of said end walls having an opening for passage of workpieces into said cabin, an interior side of said walls and bottom portion being formed of a relatively non-stick, electrically non-conductive material and formed to be essentially free of any powder trapping discontinuities, said bottom portion comprising a smoothly varying generally V-shaped transition region extending longitudinally along the cabin;
 - a collecting channel having a variable width opening therein, said opening communicating with said transition region;
 - a suction device connected to said collecting channel, the width of said variable width opening being generally proportional to a distance of the opening from the suction device to obtain a generally uniform suction speed from the front to the back of the cabin whereby the amount of powder clinging to the walls of the cabin is reduced.

4,715,315

DISPENSER FOR PARTICULATE MATERIAL

Charles E. Burford, Dallas, Tex., assignor to Burford Corp., Maysville, Okla.

Continuation-in-part of Ser. No. 480,027, Mar. 27, 1983, Pat. No. 4,611,555. This application Nov. 7, 1985, Ser. No. 795,982

The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

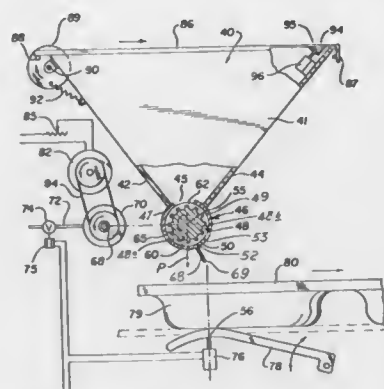
Int. Cl.⁴ B05C 11/00

U.S. Cl. 118—684

7 Claims

1. Apparatus to dispense either flaky or particulate material onto an article comprising: a container having an elongated opening formed therein; a dispensing tube having a hollow bore, said tube extending longitudinally of said opening, said tube having longitudinally extending inlet and outlet passages formed therein, said inlet passage communicating with the inside of the container and with the bore of the tube, said outlet passage communicating with the bore of the tube and the exterior of the container, wall segments on said dispensing tube extending between said inlet and outlet passages, one of said

wall segments being longer than the other of said wall segments and said outlet passage lying entirely on one side of a vertical plane extending through the center of said dispensing tube such that the lower edge of one of said wall segments is positioned at a lower elevation than the lower edge of the other wall segment; a mandrel rotatably disposed in said bore; conveyor means on the surface of the mandrel for conveying the material from the container to the outlet of the bore, said conveyor means having a major diameter which is less than the diameter of the bore to form an annular space between the major diameter of the conveyor means on the mandrel and the



diameter of the bore which is greater than the maximum dimension of individual particles of material being dispensed to prevent destruction of the particles being dispensed but being spaced sufficiently close together to prevent gravity flow of particles through the annular space when the mandrel is not rotating; drive means drivingly connected to said mandrel; and means associated with said drive means to intermittently energize said drive means when an article to receive particulate material is positioned in a predetermined relationship relative to said tube and to de-energize said drive means when the article is moved away from said predetermined position.

4,715,316

APPARATUS FOR PLATING AND COATING

Donald J. Broomfield, Elgin, Ill.; Paul C. Briggs, North Andover, Mass.; Eric G. Parker, Algonquin, and David P. Wagner, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 712,597, Mar. 18, 1985, Pat. No. 4,600,662.

This application Apr. 11, 1986, Ser. No. 850,517

Int. Cl.⁴ C23C 16/00

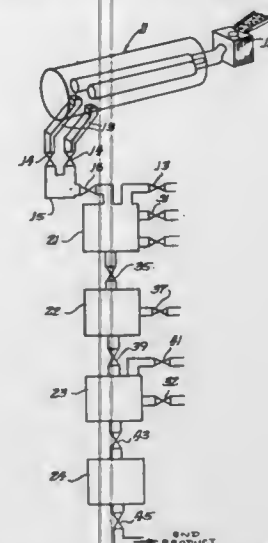
U.S. Cl. 118—716

5 Claims

1. An apparatus for producing a coated article comprising a first vacuum chamber for applying a layer of non-oxidized metal plating material to the article while maintaining the plated article in an atmosphere preventing oxidation of the plating material and a second vacuum chamber adjacent said first vacuum chamber for applying a layer of a coating material

in liquid form to said plating material while maintaining the plated articles in an inert atmosphere, and means for prevent-

difference of about 100° to 700° C. between said vessel wall and said substrate.



ing said coating material from entering said first vacuum chamber.

4,715,317

METHOD FOR PRODUCING OF POLYCRYSTALLINE SILICON AND APPARATUS THEREOF

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

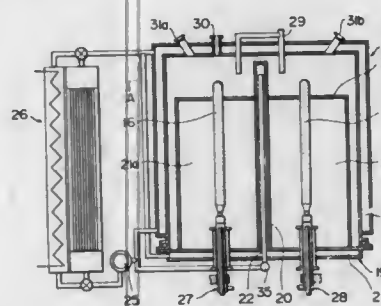
Filed Oct. 15, 1985, Ser. No. 767,079

Claims priority, application Japan, Oct. 24, 1984, 59-223177

Int. Cl.⁴ C23C 16/24

U.S. Cl. 118—719

1 Claim



1. An apparatus for production of polycrystalline silicon, comprising: a reaction vessel of metallic material closed with a detachable lid, a deposition substrate of electrically conductive material comprising a plurality of portions extending axially from the lid, an inlet for introducing reactant gas into said vessel, an outlet for removing reactant gas from said vessel, a jacket arranged over a substantial part of said vessel providing an interspace between the jacket and vessel, a hollow partition comprising several wings, said wings each having an inner cavity and being arranged to extend radially between and to separate two adjacent vertical portions of the deposition substrate, said cavity having inner tubes through which cooling medium is allowed to flow, a closed circuit for circulating a gas, said circuit being filled with gas and including said interspace and said partition cavities, and a two-way temperature controlling means in communication with said interspace and partition cavities, said temperature controlling means being capable of heating and cooling said gas and being capable of keeping the vessel wall in the temperature range of about 100° to 450° C., while simultaneously maintaining a temperature

4,715,318

PHOTOCHEMICAL REACTION APPARATUS
Masao Kameyama, and Koichi Matsumoto, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

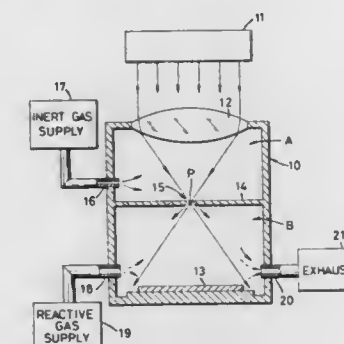
Filed Jan. 16, 1986, Ser. No. 819,801

Claims priority, application Japan, Jan. 17, 1985, 60-4991; Apr. 16, 1985, 60-79362; Jun. 7, 1985, 60-122791

Int. Cl.⁴ H01L 21/205, 21/263

U.S. Cl. 118—722

15 Claims



1. An apparatus for processing an element, such as a silicon wafer, by the use of photochemical reaction comprising:
 - light source means for supplying a light energy;
 - a housing forming therein a reaction chamber in which said element is arranged, said housing including wall means defining said reaction chamber, said wall means including at least one opening formed therethrough, said element being arranged spatially apart from said opening;
 - condensing means arranged between said light source means and said reaction chamber and spatially apart from said wall means whereby said light energy is condensed at around said opening and introduced into said reaction chamber; and
 - means for supplying a gas which is photochemically reactive to said light energy into said reaction chamber.

4,715,319

DEVICE FOR COATING A SUBSTRATE BY MEANS OF PLASMA-CVD OR CATHODE SPUTTERING

Udo Bringmann; Klaus Drews, and Detlef Schön, all of Halstenbek, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 694,725, Jan. 25, 1985, Pat. No. 4,673,588.

This application Feb. 27, 1987, Ser. No. 20,067

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3402971

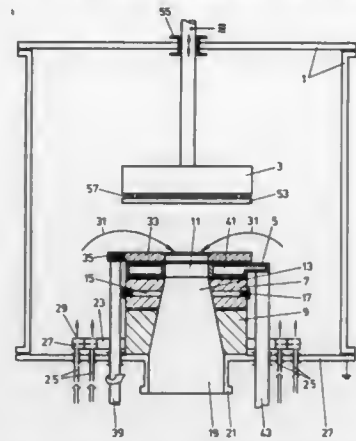
Int. Cl.⁴ C23C 16/00

U.S. Cl. 118—723

24 Claims

1. A device for providing a coating on a substrate by means of a plasma chemical vapor deposition or cathode sputtering, said device comprising a first angular electrode provided with an aperture extending along a central axis and axially fixed in an evacuable chamber provided with a second counter sheet electrode spaced from and opposing said first electrode, means for introducing gaseous substances into said chamber, means for applying a voltage to said electrodes to produce plasma in said chamber, and said chamber being further provided with a bipartite insulator block having an upper first portion adjoining said first electrode and provided with a central aperture corresponding to the central aperture of said first electrode and having a second portion immediately adjoining said first por-

tion bearing on the base of said evacuable chamber and positioned over a conduit means for conducting gaseous mate-



rial from said chamber to a vacuum pump means, said conduit means extending into the base of said evacuable chamber.

4,715,320

SANITARY DEVICE FOR ANIMALS

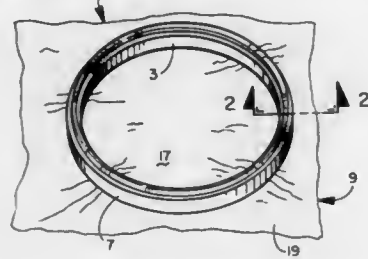
William D. Barnhart, 629 Ranson St., Ripon, Wis. 54971

Filed Jun. 9, 1986, Ser. No. 871,927

Int. Cl.⁴ A47K 11/02

U.S. Cl. 119—1

12 Claims



1. Apparatus for creating a sanitary receptacle comprising:
 - a. an inner member formed into a closed circular hoop having a generally rectangular cross section, a predetermined outer diameter, a predetermined wall thickness, and a predetermined length, the inner hoop being made of a sanitary plastic material;
 - b. a plastic center member formed into a closed circular hoop concentric with the inner member and having a predetermined inner diameter that is about 0.25 inches greater than the outer diameter of the inner hoop to create a generally uniform first annular space between the inner hoop outer diameter and the center hoop inner diameter, the center member having a generally rectangular cross section, predetermined outer diameter and a predetermined length; and
 - c. a plastic outer member formed into a closed circular hoop concentric with the inner and center members and having an inner diameter about 0.25 inches greater than the outer diameter of the center member to create a generally uniform second annular space between the center member outer diameter and the outer member inner diameter, the outer member having a generally rectangular cross section, predetermined length, and wall thickness, so that the three concentric members may cooperate to loosely retain a sheet of thin flexible material spanning the area of the outer member and folded into the first and second annular spaces between the respective inner, center, and outer members.

4,715,321
MILKING PARLOR STALL CONSTRUCTION WITH OVERHEAD GATES

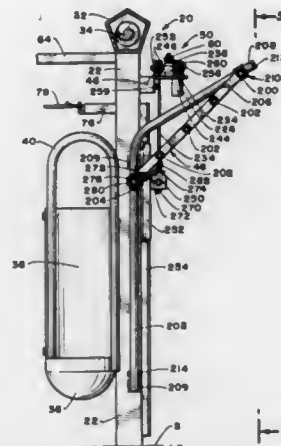
August Vandenberg, 1904 Trotter Trail, Norco, Calif. 91760; Ben W. Vandenberg, 17224 Gard Ave., Artesia, Calif. 90701; Andrew W. Vandenberg, 15751 Ryon St., and Ben E. Haws, 8828 Laurel St., both of Bellflower, Calif. 90706

Filed Jul. 25, 1986, Ser. No. 889,515

Int. Cl.⁴ A01K 1/12

U.S. Cl. 119—14.03

22 Claims



1. A milking parlor construction comprising in combination:
 - (a) a module comprising at least two spaced-apart, hollow vertical upright members adapted for rigid securement in a base or the like;
 - (b) a feed bowl means secured to each said hollow vertical upright member and defining a cattle feeding station;
 - (c) a feed conveyor means superpositioned in stationary position to said hollow vertical upright members and adapted to deliver feed to said hollow vertical upright members defining a feed passageway having communication to said feed bowl means;
 - (d) at least two pivoted gate members vertically upraisable and mounted on each said hollow vertical upright member and being adapted to move vertically and pivotally between an upper open and a lower closed position; and
 - (e) means to move at least pairs of said gate members into a selected one of the open and closed positions.

4,715,322

METHOD AND MEANS FOR KEEPING CATTLE IN A STALL BARN

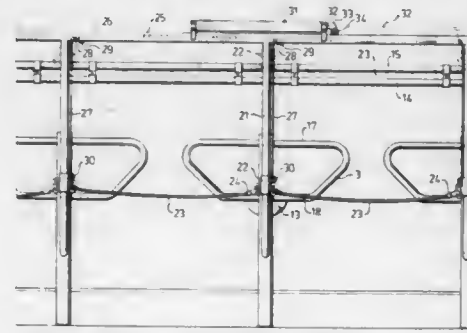
Kjell Johansson, Ökne Gård 1011, S-660 30 Värmlands Nysäter, Sweden

Filed Jul. 3, 1986, Ser. No. 881,932

Int. Cl.⁴ A01K 29/00

U.S. Cl. 119—27

12 Claims



1. An arrangement for keeping cattle in a stall barn having

feeding and resting places, wherein each animal is maintained, during feeding and resting, in a separate stall defined by at least vertical parallel side stall partitions, said animals being divided into a plurality of individual groups having a predetermined number of animals in each group, the groups being distributed along said feeding and resting places, the arrangement comprising closing means for confining the animals in individual stalls, a plurality of gates and power transmission means for said gates for establishing predetermined routes of a way system for the animals to and from a specific collecting place at a distance from said feeding and resting places, said closing means being at the rear of the stalls behind each animal within each group and being adapted to be raised and lowered simultaneously by an individual power transmission means, and a common control station having control means for automatically controlling the power transmission means for said gates and said closing means, said control means being effective to actuate the power transmission means for the closing means in a predetermined sequence, depending on the group of animals selected, and at the same time actuating the power transmission means for the gates to establish a predetermined route of said way system for the group selected, said closing means for each stall comprising a flexible barrier operatively connected at the rear of said stalls and having a length greater than the distance between connecting points of said barrier to the vertical side stall partitions, said barrier being connected at the rear of the stalls by having its opposed ends connected to sleeves slidable along guide means comprising vertical bars mounted at the rear end of said side stall partitions, said bars for a group of animals supporting a common horizontal groove element having a pull rod movably mounted therein, said pull rod being operatively connected to each sleeve and mounted for longitudinal movement in said grooved element for raising and lowering the barrier for each stall under control of said individual power transmission means, whereby said arrangement is free of pivotally journaled means for raising and lowering the barriers.

4,715,323

APPARATUS FOR SUPPLYING FOOD TO A PLURALITY OF CAGES

Teus Malestein, Stationsweg 49, 3771 VC Barneveld, Netherlands

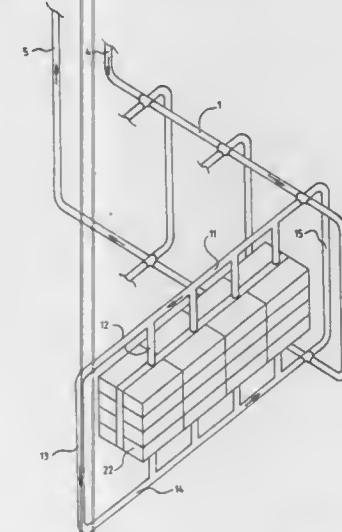
Filed Oct. 10, 1985, Ser. No. 786,083

Claims priority, application Netherlands, Oct. 16, 1984, 8403159; Oct. 16, 1984, 8403160

Int. Cl.⁴ A01K 5/02, 39/07

U.S. Cl. 119—52 AF

12 Claims



1. Apparatus for supplying food to a plurality of cages arranged in rows beside each other, said apparatus comprising a horizontally extending food gutter for each of said rows and

means for supplying food to the said gutters, said gutters being provided with horizontal food transport means for transporting food therealong and said food supplying means comprising a plurality of substantially vertical food supply pipes horizontally spaced along the length of each gutter which debouch into that gutter.

4,715,324

NUCLEAR STEAM GENERATOR SLUDGE LANCING METHOD AND APPARATUS

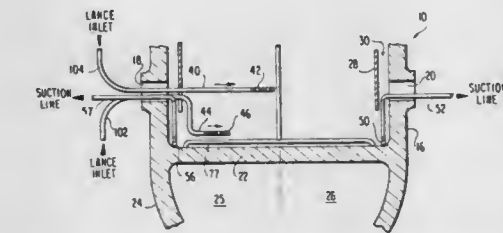
Gary R. Muller; Scott M. Theiss; James E. Brown, Jr., all of Palm Harbor, and Bobby R. Lawson, Tarpon Springs, all of Fla., assignors to Apex Technologies, Inc., Stuart, Fla.

Filed Nov. 26, 1985, Ser. No. 801,730

Int. Cl.⁴ F22B 37/52, 37/54

U.S. Cl. 122—381

16 Claims



1. A method of removing sludge from a steam generator of the type comprising an inner vertically oriented U-shaped bundle of heat transfer tubes having their open ends in fluid communication with holes in a tube sheet extending horizontally across the lower portion of a generally cylindrical outer shell of the generator, a central tube lane being defined between the legs of the U and extending between two diametrically opposite hand holes in the outer shell, and a peripheral lane being defined between the tube bundle and the outer shell of the generator, said method comprising the steps of:
 - inserting in a first of said hand holes a first movable fluid lance carrying on the inner end thereof a plurality of first nozzles which emit a plurality of high pressure high volume fluid jets when said lance is activated;
 - activating said lance and moving it inwardly along said tube lane to dislodge sludge deposited on said tube sheet and around said tubes;
 - inserting in said first hand hole a second movable fluid lance carrying on the inner end thereof a plurality of second nozzles which emit a plurality of low pressure high volume fluid jets upon activation of said second lance;
 - activating said second lance while said first lance is activated, after said first lance has moved inwardly a preselected distance, to dislodge sludge, to form a water barrier against redeposition of dislodged sludge and, together with the flow from said first lance, to suspend dislodged sludge particles in a volume of water flowing toward said peripheral lane; and removing, by suction, the fluid-entrained sludge flowing in said peripheral lane.

4,715,325

POLLUTION CONTROL THROUGH FUEL TREATMENT

Claud W. Walker, Rte. 2, Box 201, Portales, N. Mex. 88130

Filed Jun. 19, 1986, Ser. No. 876,226

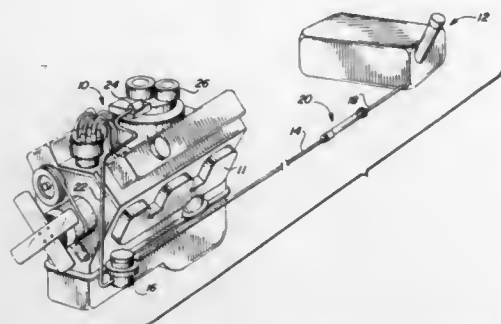
Int. Cl.⁴ F02B 75/12

U.S. Cl. 123—1 A

18 Claims

1. Method of operating an internal combustion engine comprising the steps of:
 - placing a housing in series relationship respective to fuel flow to said engine so that the fuel flows through the housing;
 - encapsulating at least one alloy member within said housing so that the fuel flowing through the housing is brought into contact with the surface of the alloy;

said alloy member consists of a mixture of the following metals: copper, zinc, nickel, lead, and tin; said mixture has the following range of composition:



copper 40-66%; zinc 2-28%; nickel 5-25%; lead 2-12%; and tin 1-5%.

4,715,326

MULTICYLINDER CATALYTIC ENGINE

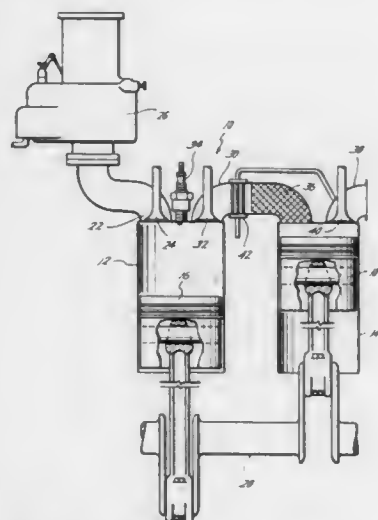
Robert H. Thring, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Sep. 8, 1986, Ser. No. 905,003

Int. Cl.⁴ F02B 43/08

U.S. Cl. 123-3

8 Claims



1. A multicylinder catalyst engine comprising, a first cylinder and a first piston reciprocating therein, a second cylinder and a second piston reciprocating therein, said first cylinder including an intake port, an intake valve in the intake port admitting all of the air and fuel for the engine, air/fuel mixing means connected to the intake port, said intake valve being opened as the first piston draws an air/fuel mixture into the first cylinder, and said intake valve being closed as the first piston moves to compress the mixture, a transfer passageway in communication between the first and second cylinders, a transfer valve in the passageway adjacent the first cylinder closing while the air/fuel mixture is drawn into the first cylinder and opening when the mixture in the first cylinder is compressed for transferring the compressed mixture from the first cylinder toward the second cylinder, a catalyst positioned in the passageway downstream of the transfer valve for igniting the compressed mixture when the transfer valve is closed thereby powering the second piston,

an exhaust port connected to the second cylinder, and an exhaust valve positioned in the exhaust port for exhausting gas from the second cylinder.

4,715,327

FLOW SYSTEM FOR ENGINE-PUMP ASSEMBLY

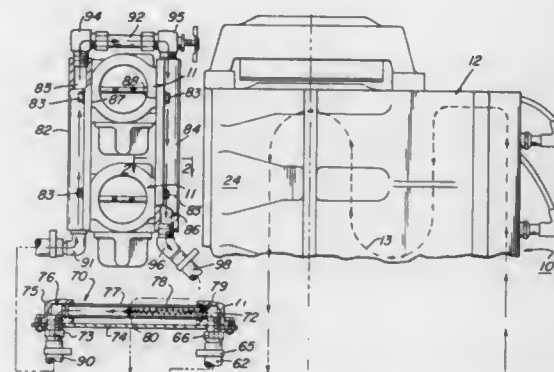
H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed May 23, 1986, Ser. No. 866,384

Int. Cl.⁴ F02P 5/14, 11/14

U.S. Cl. 123-41.15

12 Claims



1. A flow system for an engine-pump assembly having an engine including carburetor means and a cooling system including a cooling water flow path having an inlet and an outlet, and a pump mounted adjacent said engine and including a pump inlet having a water supplied thereto and a pump discharge passage delivering water at a high pressure comprising: first flow conduit means for delivering water at said high pump pressure from the discharge passage of said pump to the inlet of the cooling water flow path of the engine cooling system, second conduit means for delivering water from the outlet of the cooling water flow path of the engine cooling system to the inlet side of said pump, and a heat exchanger means contained in said second conduit means for applying the heat within said water discharged from said engine cooling system to the engine carburetor means, including a pair of heat exchanger blocks each of which is mounted on a side portion of said carburetor means in good heat conducting contact with said carburetor means, one of said conduit means including a flow indicator comprising a transparent flow tube through which said water flows in the direction from an inlet end to an outlet end thereof, a coil spring having one end secured at said tube inlet end and a free end contained within said flow tube, and an indicator member captured within said free end of said spring, said water flow through said flow tube applying the outlet end of said tube to a position indicative of the rate of cooling water flow.

4,715,328

MULTIPLE PISTON EXPANSION CHAMBER ENGINE

Francis W. Jackson, 409 Penwyn Rd., Wynnewood, Pa. 19096

Continuation-in-part of Ser. No. 727,338, Apr. 25, 1985,

abandoned, and Ser. No. 688,954, Dec. 31, 1984, Pat. No.

4,570,580, and Ser. No. 647,842, Sep. 6, 1984, Pat. No.

4,580,532, which is a division of Ser. No. 326,902, Dec. 2, 1981,

Pat. No. 4,489,681, said Ser. No. 688,954, Continuation-in-part

of Ser. No. 326,902, and Ser. No. 647,842, is a division of Ser.

No. 326,902, said Ser. No. 727,338, is a division of Ser. No.

647,842, which is a division of Ser. No. 326,902. This

application Oct. 15, 1985, Ser. No. 787,493

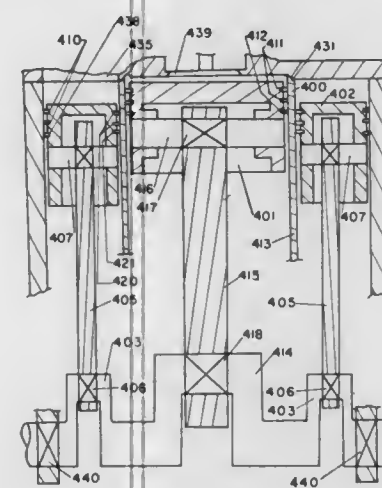
The portion of the term of this patent subsequent to Apr. 8, 2003,

has been disclaimed.

Int. Cl.⁴ F02B 75/18

U.S. Cl. 123-52 B

4 Claims



1. An internal combustion engine wherein combustion, expansion and exhaust functions are performed in a cylinder comprised of an auxiliary piston reciprocating in the cylinder, a sleeve valve reciprocating within said auxiliary piston, a working piston reciprocating within said sleeve valve and leading said auxiliary piston, an auxiliary chamber above said auxiliary piston and a combustion chamber above said working piston; said sleeve valve controlling communication of said auxiliary chamber with said combustion chamber to prevent communication of combusted products from the chamber above said working piston to the chamber above said auxiliary piston from when the working piston is at about TDC until a subsequent expansion stroke of said working piston is underway and at a point between 30 and 160 degrees past TDC and with said auxiliary piston being at about TDC at this same instant when said working piston is at said point and said communication then is commenced; and to permit communication only during said expansion stroke continuing past said point and a following exhaust stroke of said working piston so as to utilize energy of expansion from said auxiliary piston as it expands until said working piston has passed through BDC and returns to about TDC during said exhaust stroke of said working piston.

4,715,329

INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Makoto Yasuda; Shuichi Nishimura, both of Yokohama, and Syouzabu Ura, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 8, 1986, Ser. No. 849,401

Claims priority, application Japan, Apr. 9, 1985, 60-51649[U]

Int. Cl.⁴ F02B 75/18

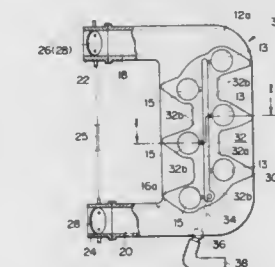
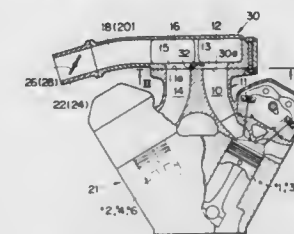
U.S. Cl. 123-52 MV

5 Claims

1. An induction system for an internal combustion engine having a plurality of cylinders, comprising: an intake manifold having a plurality of passages for supply-

ing air to the cylinders and an upstream planar joining end face;

a collector unit located upstream of said intake manifold for supplying air to said passages of said intake manifold and having a planar joining end face which is joined with said planar joining end face of said intake manifold; and



- a groove formed in at least one of said joining end faces to define therebetween a fluid recirculation passage and having a main groove section and a plurality of outlet groove sections branching off from said main groove section so that recirculation fluid is drawn in said main groove section and distributed from said outlet groove sections to said passages of said intake manifold, respectively.

4,715,330

ELECTROMAGNETICALLY-ACTUATED POSITIONING MECHANISM

Josef Buchl, Rehsteig 12, 8071 Lenting, Fed. Rep. of Germany

Filed Apr. 11, 1986, Ser. No. 850,935

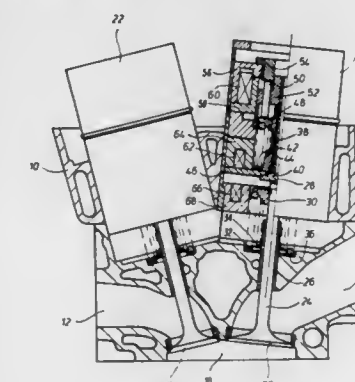
Claims priority, application Fed. Rep. of Germany, Apr. 12,

1985, 3513109

Int. Cl.⁴ F01L 9/04; H01F 7/08

U.S. Cl. 123-90.11

5 Claims



1. Electromagnetically-actuated positioning mechanism for valve-type reciprocating actuators in displacement machines comprising in operative combination:

- (a) means for reciprocatingly actuating a valve member, said reciprocating actuator means being movable between two discrete, mutually-opposite operating positions;
- (b) said reciprocating actuator means having an electromagnetically attractable member and being disposed to move

- said valve member from a first, closed operating position to a second, open operating position;
- (c) said valve member being biased to said first closed position by at least one spring member;
- (d) said reciprocating actuator means being biased toward said second open position by at least one spring member;
- (e) a pair of electromagnetics disposed to selectively attract said electromagnetically attractable member to said first or said second operating position when energized;
- (f) said spring members forming a spring system having a locus of equilibrium situated between said two operating positions;
- (g) means for adjusting the locus of equilibrium of said spring system to shift said locus to a position different from either of said operating positions;
- (h) said adjusting means comprises an electromagnetically-actuated member disposed to exert compressive force on at least one of said actuator spring members when energized to shift said spring system equilibrium locus as compared to the locus when said adjusting means electromagnetically-actuated member is de-energized; and
- (i) said valve member is at least partly open when said adjusting means is in its de-energized state.

4,715,331

ELECTROMAGNETICALLY-ACTUATED POSITIONING MECHANISMS

Peter Kreuter, Josef-Ponten Str. 38, Aachen 5100, Fed. Rep. of Germany

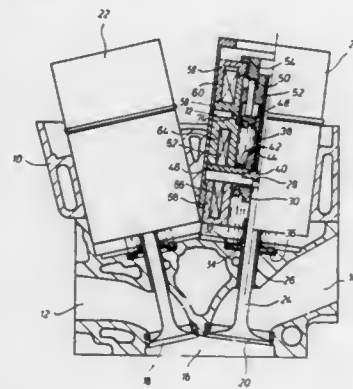
Filed Apr. 11, 1986, Ser. No. 850,936

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513106

Int. Cl.⁴ F01L 9/04; H01F 7/08

U.S. Cl. 123—90.11

20 Claims



1. A solenoid insulation system for an electromagnetically-actuated positioning mechanism for a valve-type reciprocating actuator assembly for actuating a valve member in a displacement machine, comprising in operative combination:

- (a) at least one adjustable spring disposed between and bearing on a first and a second spaced-apart seat member;
- (b) at least one actuating solenoid having a core disposed to selectively attract a single guided ferromagnetic valve actuator member to a first operating position;
- (c) said ferromagnetic valve actuator member being disposed across the face of said actuating solenoid and contactable with but disconnected from said valve member, and comprising said first spring seat member;
- (d) said spring being disposed coaxial to said actuating solenoid in a bore provided therein and disposed in contact with said ferromagnetic valve actuating member on one side thereof to urge it toward contact with said valve member;
- (e) at least one adjusting solenoid having a core disposed in association with said actuator assembly adapted to adjust the position of said second spring seat member; and
- (f) said actuating solenoid core and said adjusting solenoid

core are disposed with respect to each other to provide magnetic resistance therebetween to substantially decouple the respective cores of said solenoids.

4,715,332

ELECTROMAGNETICALLY-ACTUATED POSITIONING SYSTEM

Peter Kreuter, Josef-Ponten Str. 38, 5100 Aachen, Fed. Rep. of Germany

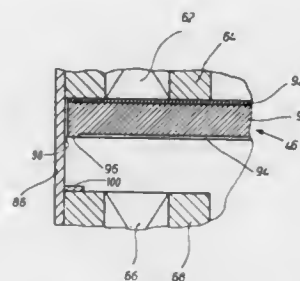
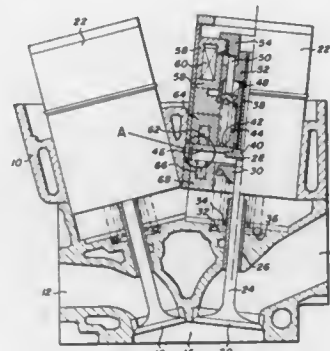
Filed Apr. 11, 1986, Ser. No. 850,939

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513103

Int. Cl.⁴ F01L 9/04; H01F 7/08

U.S. Cl. 123—90.11

20 Claims



1. Apparatus for improved control of release of an actuator anchor plate in an electromagnetically-actuated positioning mechanism for a valve-type reciprocating actuator assembly in a displacement machine, comprising in operative combination:

- (a) at least one actuating solenoid having a core with a contact face disposed to selectively attract a ferromagnetic valve actuator assembly anchor plate to a first operating position;
- (b) a ferromagnetic actuator assembly anchor plate having a contact face corresponding to and opposed from said solenoid contact face, and said anchor plate is disposed to be magnetically attractable to and releasable from said solenoid core, said anchor plate extending substantially entirely across said core face; and
- (c) said actuating solenoid core and said anchor plate are disposed with respect to each other to provide therebetween magnetic resistance in the magnetic circuit set up by the magnetic flux of said core, said magnetic resistance extending substantially across said contact faces and being sufficient to reduce generation and propagation of eddy currents in said anchor plate resulting in rapid magnetic field decay upon cut-off of current to said actuating solenoid coil, thereby reducing the release time of said anchor plate from said actuating solenoid.

4,715,333

VALVE TIMING CONTROL MEANS FOR ENGINE
Takeshi Oyaizu, Kakegawa, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Division of Ser. No. 783,005, Oct. 2, 1985, Pat. No. 4,685,429.

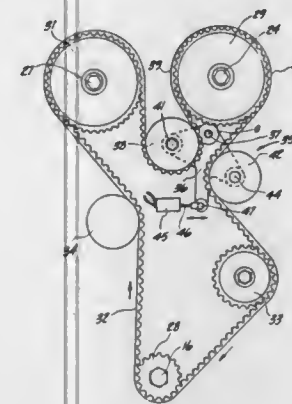
This application May 26, 1987, Ser. No. 54,236

Claims priority, application Japan, May 14, 1985, 60-100524

Int. Cl.⁴ F01L 1/26

U.S. Cl. 123—90.31

6 Claims



1. In a double overhead camshaft drive arrangement comprising a cylinder head, first and second camshafts journaled by said cylinder head, first and second driven pulleys each affixed for rotation about first and second parallel axes with a respective one of said camshafts, a drive pulley affixed for rotation with a drive shaft about a third axis parallel to said first and second axes to define with said first and second axes the apices of a triangle, flexible transmitter means trained around said pulleys for driving said camshafts from said drive shaft, the improvement comprising an idler pulley disposed between said driven pulleys and rotatable about a fourth axis lying without the triangle, said flexible transmitter means passing over one of said driven pulleys then across said idler pulley and finally over the other of said driven pulleys and engaging substantially more than 180 degrees of the circumference of each of said driven pulleys and of said idler pulley.

4,715,334

SELF CONTAINED HYDRAULIC BUCKET LIFTER
Stephen M. Buente, and George A. Hillebrand, both of Battle Creek, Mich., assignors to Eaton Corporation, Cleveland, Ohio

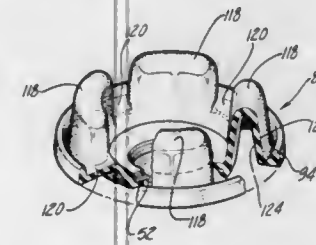
Continuation of Ser. No. 559,127, Dec. 7, 1983, abandoned. This application May 16, 1986, Ser. No. 864,561

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.⁴ F02L 1/24

U.S. Cl. 123—90.58

18 Claims



1. A self-contained hydraulic lash adjuster for use in the valve gear of an internal combustion engine, said tappet comprising:

- (a) body means including structure defining,

- (i) an outer annular wall having the outer periphery thereof forming a wear resistance surface;
- (ii) a transversely extending end wall substantially closing one end of said outer wall and defining an outwardly exposed cam face surface, and
- (iii) an annular hub disposed within said outer wall and spaced therefrom;
- (b) hydraulic lash adjusting means moveably received within said hub, said lash adjusting means including structure defining a reaction surface adapted for contacting associated components of the engine valve gear, said reaction surface extending generally parallel to said cam face surface and being moveable with respect thereto, said lash adjusting means including means defining a fluid pressure chamber and one-way valve means operable to admit fluid to said chamber for altering and hydraulically holding the position of said reaction surface with respect to said cam face surface for lash adjustment in said valve gear, said lash adjusting means further including means biasing said surface away from said cam face reaction surface; and
- (c) seal means extending generally transversely within said outer annular wall and operative to define in combination with said body means an expansible closed fluid reservoir for communication with said fluid pressure chamber, characterized in that said seal means includes:
- (i) a generally annular compliant diaphragm with an outer circumferential portion thereof carried within said body means and forming a fluid-tight seal therebetween; and,
- (ii) a rigid cap member having a plurality of spaced apertures therethrough with an inner circumferential portion of said diaphragm molded over the periphery of said cap member with said diaphragm material received in said apertures for providing positive engagement of said diaphragm with said cap member to provide a seal therebetween and to accommodate movement of said lash adjusting means upon installation of the tappet in the valve gear of an engine, said cap member operative to transmit forces in the valve train from said reaction surface.

4,715,335

INTERNAL COMBUSTION ENGINE WITH REDUCED NOISE AND HEAT EMISSIONS

Ludwig Elsbett, Günter Elsbett, and Klaus Elsbett, all of Industriestrasse 14, D-8543 Hilpoltstein, Fed. Rep. of Germany

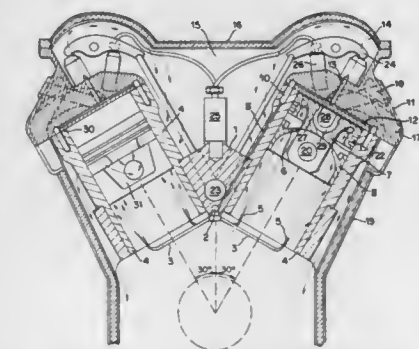
Filed Mar. 12, 1985, Ser. No. 710,864

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409101

Int. Cl.⁴ F01P 3/10, 3/20

U.S. Cl. 123—41.35

18 Claims



1. An oil cooled reciprocating internal combustion engine, comprising a crankshaft; a plurality of free standing cylinders extending upwardly from said crankshaft and each having an internal surface and an external surface; means for at least substantially uniformly cooling said internal and external surfaces at least substantially exclusively by oil, including means for supplying oil to said cylinders and means for directing such

oil against the major portions at least of the internal and external surfaces of said cylinders; and means defining a common chamber for said cylinders which contributes to uniformity of distribution of temperatures along the peripheries of the cylinders.

4,715,336

FOUR-STROKE INTERNAL COMBUSTION PISTON ENGINE

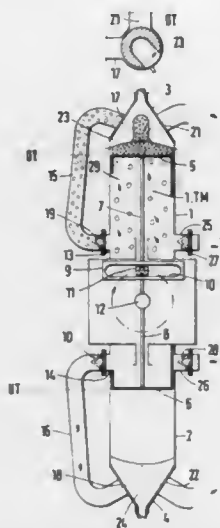
Manfred Schindler, Markt Schwaben, and Reinhold Ficht, Munich, both of Fed. Rep. of Germany, assignors to Ficht GmbH
Filed Feb. 26, 1986, Ser. No. 833,814

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1985, 3507108

Int. Cl.⁴ F02B 75/24

U.S. Cl. 123—56 BC

4 Claims



1. Four-stroke internal combustion piston engine comprising a crankshaft housing, a crankshaft located within said housing, at least two axially extending cylinders each located on an opposite side of said housing from one another and extending axially outwardly from said housing, each said cylinder having an inner end adjacent said housing and an outer end spaced axially outwardly from said housing, a piston located within each said cylinder and arranged to reciprocate in the axial direction of said cylinder between the inner and outer ends thereof, said pistons arranged to operate with a 180° phase shift, an axially extending piston rod for each said piston connected at one end to said piston and at the other end to said crankshaft, each said piston having a bottom dead center adjacent the inner end of said cylinder and a top dead center adjacent the outer end of said cylinder, each said cylinder having a variable volume inner cylinder space located between said piston and the inner end of said cylinder and a variable volume outer cylinder space located between said piston and the outer end of said cylinder, a suction system associated with said cylinders for supplying one of fresh air and a fuel-air mixture into said inner cylinder space, said suction system including means for transferring the one of fresh air and fuel-air mixture from said inner cylinder space to said outer cylinder space of said cylinder so that said piston moving toward said outer end draws the one of fresh air and fuel-air mixture into said inner cylinder space while the other said piston moves toward the inner end of the other said cylinder and displaces the one of fresh air and fuel-air mixture via said transfer means from said inner space for subsequent flow into said outer cylinder space forming a combustion chamber, wherein the improvement comprises that said suction system for supplying the one of fresh air and fuel-air mixture comprises a separate suction system section for supplying the one of fresh air and fuel-air mixture into each of said cylinders, said transfer means in each said supply system section comprises a transfer channel located

exteriorly of said cylinder and connected at one end adjacent the inner end of said cylinder and at an opposite end above the cylinder adjacent the outer end of said cylinder, a transfer check valve located in said transfer channel at the inner end of said cylinder, and a suction stub located at the inner end of said cylinder spaced from said transfer channel and including an inflow check valve, said outer end of each cylinder has an outlet therein spaced from an inlet from said transfer channel into the outer end of said cylinder, a rotary slide valve located within the outer end of each said cylinder for controlling inflow from said transfer channel and flow through said outlet.

4,715,337

ENGINE IGNITION SYSTEM WITH AN INSULATED AND EXTENDABLE EXTENDER

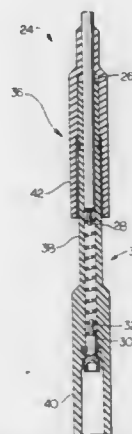
Phillip B. Bohl, Chillicothe; Rodney J. Gillette, Peoria, and James C. Smith, Washington, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jan. 31, 1985, Ser. No. 696,822

Int. Cl.⁴ F02P 15/00

U.S. Cl. 123—169 PA

21 Claims



1. An insulated igniter adapted for use in an engine to connect between an igniter and a source of high energy, comprising:

- a first electrically conducting core adapted to contact one of the igniter and the source of high energy;
- a second electrically conducting core adapted to contact the other of the igniter and the source of high energy;
- one of said cores being axially movable with respect to the other core to provide a variable length extender;
- means for axially biasing apart the first and second electrically conducting cores and for providing a connection between the first and second electrically conducting cores so that electrical energy passes therethrough; and
- a first outer tubular insulating member fixedly attached to and surrounding at least a portion of one of the first and second electrically conducting cores surrounding the biasing and providing means and slidably surrounding at least a portion of the other of the first and second electrically conducting cores.

4,715,338

ROTARY ENGINE

Raymond F. Pasquan, 131 Parker St., Sarnia, Ontario, N7T 6E9, Canada

Filed Dec. 30, 1986, Ser. No. 947,890

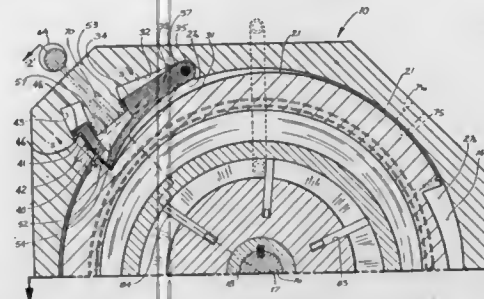
Int. Cl.⁴ F02B 53/00

U.S. Cl. 123—248

18 Claims

1. In a rotary internal combustion engine of the type including a housing having a generally continuous inner circumferential surface, and a pair of opposed inwardly extending side walls, a rotor rotatably mounted within said housing and having an external generally peripheral surface in close proximity

to the inner circumferential surface of said housing and side edge surfaces adjacent said side walls, at least one power producing pocket in the outer peripheral surface of the rotor and extending thereacross, the pocket being defined in the direction of rotation of the rotor by a steep shoulder extending inwardly from the outer peripheral surface and a gradual sloping section returning to the outer peripheral surface and merging therewith, the improvement comprising a oscillating means mounted in an opening in said inner circumferential surface of said housing, said oscillating means including a



movable member having the width of said rotor and having a rotor engaging inner surface, said movable member having an outwardly open cavity formed therein and receiving a stationary piston member, said movable member and piston member defining an expandable combustion chamber within said member, said combustion chamber having an inlet valve for the admission of a pressurized combustible gas, an ignition means, and outlet means for communicating combustion gases developed in said combustion chamber into said power pocket to thereby produce a force between said oscillating means and said shoulder for driving said rotor.

4,715,339

GOVERNOR FOR INTERNAL COMBUSTION ENGINE

Ryuichi Sagawa; Osamu Nagata, and Hajime Yamada, all of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

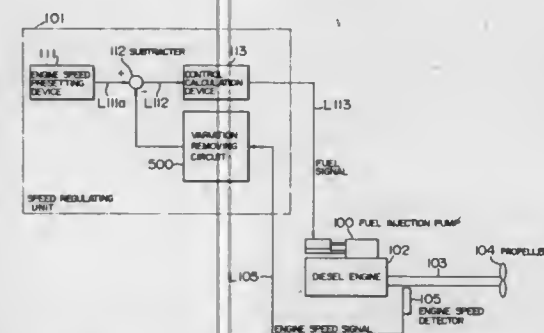
Filed Aug. 27, 1985, Ser. No. 769,891

Claims priority, application Japan, Sep. 1, 1984, 59-183521; Sep. 14, 1984, 59-193502

Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—357

10 Claims



1. A governor for an internal combustion engine having a fuel pump comprising:

- engine rotational speed detecting means for detecting a rotational speed of an engine and producing an engine rotational speed signal indicative of the engine rotational speed;
- a variation removing circuit connected to receive the engine rotational speed signal from said detecting means and having means for removing from the engine rotational speed signal a periodical variation component due to pulsation of output torque generated by the engine itself prior to producing an averaged rotational speed signal and

having a varying period corresponding to the variable rotational speed of the engine and a frequency

$$f_c = N_s Z / 60 \text{ Hz}$$

for a two stroke engine and

$$f_c = N_s Z / 120 \text{ Hz}$$

for a four stroke engine where

N_s = engine rpm

Z = number of cylinders;

engine rotational speed presetting means for generating an engine rotating speed setting signal indicative of a desired engine rotational speed; and

means for calculating an amount of injected fuel to be supplied to the engine on the basis of the averaged rotational speed signal and speed setting signal from said variation removing circuit and said engine rotational speed presetting means, respectively, and for supplying a fuel signal indicative of the calculated amount of injected fuel to the injection pump for the engine.

4,715,340

REDUCTION OF HC EMISSIONS FOR VAPOR RECOVERY PURGE SYSTEMS

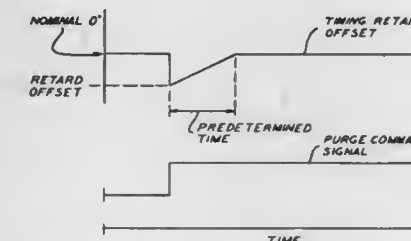
Jeffrey A. Cook, Dearborn, and Douglas R. Hamburg, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 4, 1987, Ser. No. 45,659

Int. Cl.⁴ F02P 5/04; F02M 25/08

U.S. Cl. 123—406

13 Claims



1. A method for controlling hydrocarbon emissions from an internal combustion engine having an air/fuel intake coupled to a fuel vapor recovery system, comprising the steps of: providing engine spark timing to said internal combustion engine; periodically purging fuel vapors from said fuel vapor recovery system into said air/fuel intake; retarding said engine spark timing whenever said step of purging is initiated; and advancing said engine spark timing back to its timing before said step of purging was initiated.

4,715,341

METHOD OF AND DEVICE FOR AUTOMATICALLY ADJUSTING THE IGNITION TIMING OF A CONTROLLED IGNITION ENGINE

Andre Douaud, Puteaux, and Joseph Rialan, Mondon, both of France, assignors to Institut Francais du Pétrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 241,159, Mar. 6, 1981, abandoned, which is a continuation of Ser. No. 61,125, Jul. 26, 1979. This application Oct. 6, 1981, Ser. No. 309,148

Claims priority, application France, Jul. 26, 1978, 78 22542 Int. Cl.⁴ F02P 5/04

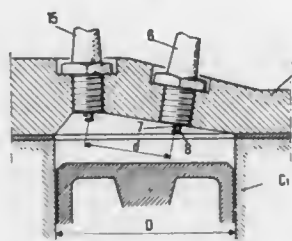
U.S. Cl. 123—425

16 Claims

1. A method of adjusting the ignition timing of a controlled ignition engine comprising at least two cylinders having knock detecting means associated therewith, and means for adjusting,

according to the spark timing in each cylinder, the angular position of the crankshaft to correspond to the time the flame front reaches in each cylinder a fixed reference position, the method comprising:

- adjusting the ignition timing when knocking occurs in at least the one cylinder wherein said knocking is detected, to eliminate said knocking;
- in the absence of knocking, and separately for each cylinder, detecting the passage of the flame front through said reference position, and when said detection is performed a predetermined number of times P for a number of cycles of operation of the engine at most equal to a predetermined number Q, generating an average value of the values of the angular position of the crankshaft corre-



sponding to the times when said flame front is detected, and producing a new value for the ignition timing based on said average value of the angular position with respect to which said average value is a predetermined value, the new value for the ignition timing for said one cylinder being used for controlling the ignition timing of the other cylinder if the number of times the flame front is detected in the other cylinder is less than the value P for said number of cycles Q; and

- in the absence of knocking and when the detecting of the number of flame fronts in each cylinder, being not less than P for the number of cycles Q, adjusting the ignition timing in each cylinder by a predetermined amount which is a function of at least one parameter characteristic of the operation of the engine.

4,715,342

SYSTEM FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Masaaki Nagai, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1985, Ser. No. 813,434

Claims priority, application Japan, Dec. 28, 1984, 59-280561
Int. Cl.⁴ F02P 5/04

U.S. Cl. 123-425

2 Claims

1. A system for controlling ignition timing of an internal combustion engine having a microprocessor and an ignition timing control device comprising:

- sensing means for sensing engine speed of the engine;
- a knock sensor for sensing engine knock and for producing a knock signal;
- a first maximum ignition timing table storing a plurality of degrees of ignition timing each producing a maximum engine torque dependent on engine speed with low-octane gasoline without the knock occurring;
- a second maximum ignition timing table storing a plurality of degrees of ignition timing each producing a maximum engine torque dependent on engine speed with high-octane gasoline without the knock occurring;
- first means for obtaining a first ignition timing from the first maximum ignition timing table in accordance with the engine speed;
- second means for obtaining a second ignition timing from the second maximum ignition timing table in accordance with the engine speed;

third means for obtaining a coefficient having a value between zero and one,
fourth means responsive to the knock signal for correcting the coefficient by a correcting quantity in a direction to prevent the engine knock;
fifth means for producing a corrected ignition timing based on either of said first ignition timing or said second ignition timing and an additional quantity dependent on the corrected coefficient; and
sixth means for storing the corrected ignition timing for operation of the engine;

the additional quantity comprises multiplying the corrected coefficient and the difference between the first and second ignition timings.

4,715,343

METHOD AND APPARATUS FOR CONTROLLING HEATER FOR HEATING AIR-FUEL RATIO SENSOR

Yoshiaki Kinoshita, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

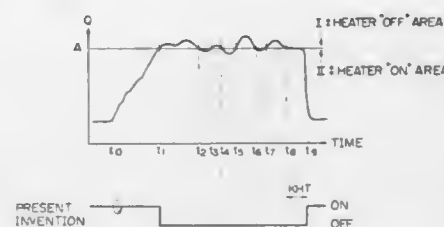
Filed Sep. 16, 1986, Ser. No. 907,819

Claims priority, application Japan, Sep. 17, 1985, 60-203407;
Sep. 17, 1985, 60-203408; Sep. 20, 1985, 60-206387

Int. Cl.⁴ F02D 41/14

U.S. Cl. 123-489

22 Claims



1. A method for controlling a heater for heating an air-fuel ratio sensor provided in an exhaust gas flow passage of an internal combustion engine comprising the steps of:
detecting a driving condition parameter of said engine;
determining whether or not said parameter is larger than a predetermined value;
turning ON said heater when said parameter is not larger than said predetermined value;
turning OFF said heater when said parameter is larger than said predetermined value; and
delaying the turning ON of said heater with a predetermined delay time when said parameter is not larger than said predetermined value.

4,715,344

LEARNING AND CONTROL APPARATUS FOR ELECTRONICALLY CONTROLLED INTERNAL COMBUSTION ENGINE

Naoki Tomisawa, Takasaki, Japan, assignor to Japan Electronic Control Systems, Co., Ltd., Japan

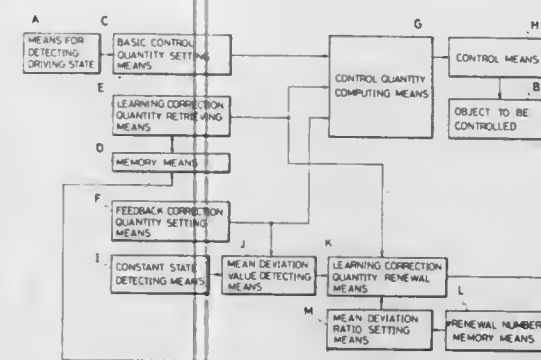
Filed Aug. 1, 1986, Ser. No. 891,967

Claims priority, application Japan, Aug. 5, 1985, 60-171223;
Sep. 24, 1985, 60-208913

Int. Cl.⁴ F02M 51/00

U.S. Cl. 123-489

12 Claims



1. A learning and control apparatus for an electronically controlled internal combustion engine, which comprises means for detecting driving states of the engine, an object to be controlled according to a control value, basic control quantity setting means for setting a basic control quantity corresponding to an aimed control value of the object to be controlled which is decided based on the detected engine driving state, reloadable memory means for storing a plurality of regions with parameters of the engine driving state and learning correction quantities for correcting said basic control quantity for the respective regions, learning correction quantity retrieving means for retrieving the learning correction quantity of the corresponding region from said memory means based on the detected actual engine driving state, feedback correction quantity setting means for comparing the aimed control value with the detected actual value of the object to be controlled and setting a feedback correction quantity for correcting said basic control value by increasing or decreasing the feedback correction quantity by a predetermined quantity so that the actual value is brought close to the aimed control value, control quantity computing means for computing a control quantity from the basic control quantity set by said basic control quantity setting means, the learning correction quantity retrieved by said learning correction quantity retrieving means and the feedback correction quantity set by said feedback correction quantity setting means, control means for controlling the object to be controlled according to said control quantity, constant state detecting means for detecting a constant driving state of the engine actually driven, mean deviation value detecting means for detecting and operating a mean value of deviations of the feedback correction quantities from a standard value when the engine is in the constant driving state, learning correction quantity renewal means for operating a new learning correction quantity by adding said mean value of deviations by a selected ratio to a present learning correction quantity retrieved by said learning correction retrieving means at every completion of said mean value deviations operation and for renewing the learning correction quantity stored in the memory means under the same driving regions by said new learning correction quantity, renewal number memory means for storing number of renewal of learning correction quantity in said memory means by receiving the output from said learning correction quantity renewal means under the same engine driving region, and mean deviation ratio setting means for setting said ratio of mean value of deviations of the feedback correction quantities in accordance with the number of learn-

ing correction quantity in such a manner as the ratio decreases when the number of renewal increases.

4,715,345

AUTOMATIC FUEL SHUT OFF SYSTEM FOR FUEL-INJECTED ENGINES

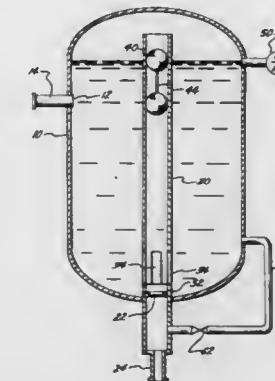
Carter Reames, Jr., 1845-B Starboard, Baton Rouge, La. 70820

Filed Jul. 18, 1985, Ser. No. 756,254

Int. Cl.⁴ F02M 39/00; F16K 31/18

U.S. Cl. 123-512

15 Claims



1. In a fuel-injected internal combustion engine comprising a fuel injection system fed by a main fuel supply, the improvement wherein there is interposed between the fuel supply and the injection system an automatic fuel shut off valve system which comprises:

- an air-tight reservoir having
 - a fuel inlet disposed at its upper portion and connectable to a fuel line leading from the fuel supply for the engine, and
 - a fuel outlet disposed at the bottom of the reservoir and connectable to a fuel line leading to a fuel injection system;
- said reservoir, fuel inlet, and fuel outlet being adapted to maintain a balanced flow of fuel through the reservoir and to maintain a substantially constant volume of liquid fuel within the reservoir so long as fuel continues to enter the reservoir via the fuel inlet;
- said reservoir together with said fuel inlet and said fuel outlet constituting the sole passageway by which the fuel line leading to the fuel injection system receives fuel from the fuel supply;
- a vertical conduit disposed within the reservoir and extending upwardly from the fuel outlet, the conduit having in its lower portion at least one fuel inlet vent providing communication from the interior of the reservoir outside the conduit to the fuel outlet;
- ball valve means including a ball valve and a ball valve seat for sealing off the flow of fuel from the reservoir when the volume of the fuel therein falls to a predetermined smaller quantity, said ball valve means being disposed within said conduit and said ball valve having a specific gravity less than but in proximity to the specific gravity of the fuel so that the ball valve remains afloat in the fuel except when brought into proximity to the ball valve seat as the volume of the fuel within the reservoir approaches said predetermined smaller quantity, and in which case the ball valve is drawn into the valve seat and seals off the flow of fuel into the fuel outlet;
- bleed valve means to provide, on actuation, open communication between the exterior of the reservoir and the interior of the upper portion of the reservoir; and
- pressure equalization means to enable, on actuation, equalization of pressure on both sides of the situs of the seal created by the ball valve means, without intake of air into the fuel injection system.

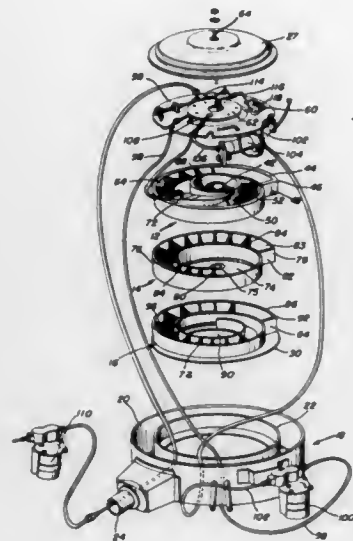
4,715,346

CARBURETOR FOR INTERNAL COMBUSTION ENGINE
Beth R. Dempsey, 8249 Standifer Gap Rd., Chattanooga, Tenn.
37421

Filed Apr. 14, 1986, Ser. No. 851,570
Int. Cl.⁴ F02M 15/02, 17/26

U.S. Cl. 123—524

15 Claims



1. A carburetor for an internal combustion engine comprising a plurality of mixing chambers arranged vertically in tandem, each chamber having a floor and spirally extending passageways defined by spaced apart wall means upstanding from the floor leading from a peripheral portion of the respective chamber to a central portion thereof, a first of said chambers having a substantially centrally disposed hollow tube communicating with the passageway of a second next adjacent chamber, said second chamber having an outlet in the passageway at the outer periphery thereof communicating with the passageway of a third chamber adjacent to and below the second chamber, and said third chamber having an outlet in the central portion thereof, a cyclonic funnel formed in the first chamber defined by an annular wall spaced about said hollow tube and an opening in said annular wall communicating with the passageway of the first chamber, means defining a reservoir in said first chamber between said hollow tube and said annular wall for collecting liquid fuel separated in said cyclonic funnel, a conduit communicating with said reservoir, a heater disposed outside said carburetor for receiving and heating liquid fuel so separated, means for communicating the heated liquid fuel with the upper end of said hollow tube for delivery of said heated fuel to the second chamber, cover means on said first chamber for closing the top thereof, said cover means having an aperture communicating with a peripheral portion of the passageway of said first chamber, means for spraying fuel into said aperture, and a housing for supporting said chambers with the lowermost chamber communicating with the intake manifold of said engine and for directing air into said aperture, whereby air and fuel may flow through the passageways of said first chamber and continue through the second and third chambers while unmixed heavy fuel components may collect in said reservoir, be heated and returned through said hollow tube into said second chamber.

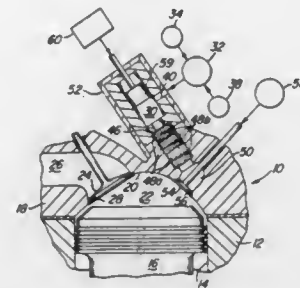
4,715,347

METHOD AND APPARATUS FOR PRETREATMENT OF FUEL BY PARTIAL COMBUSTION WITH A COMPOSITE CATALYST
Keith Hampton, and Johannes Schwank, both of Ann Arbor, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 25, 1986, Ser. No. 899,690
Int. Cl.⁴ F02M 31/16

U.S. Cl. 123—551

9 Claims



1. Apparatus for pretreatment of a fuel for combustion in an oxidizing atmosphere in the combustion chamber of a combustion device comprising:
a source of fuel;
a source of oxidizing fluid;
a mixing chamber for receiving oxidizer fluid from said source;
means for introducing fuel received from said fuel source into said oxidizer fluid in said mixing chamber to create a rich fuel-oxidizer fluid vapor mixture therein substantially above the stoichiometric ratio;
catalytic reactor means receiving said rich fuel-oxidizer fluid mixture from said mixture chamber and partially catalytically combusting said mixture to form a high temperature, hydrogen radical-rich product gas;
said catalytic reactor means comprising a composite catalytic bed formed by a composite of diverse catalytic materials acting to cause ignition of said fuel-oxidizer fluid mixture and formation of fuel molecule radicals;
compressor means for compressing said fuel-oxidizer mixture in said mixture chamber prior to passing over said catalytic bed to allow high pressure reaction of said fuel-oxidizer fluid mixture;
means for controllably directing said compressed high temperature product gas into said combustion chamber, whereby enabling enhanced combustion therein as a result of the high temperature condition of said product gas.

4,715,348

SELF-DIAGNOSIS SYSTEM FOR EXHAUST GAS RECIRCULATION SYSTEM OF INTERNAL COMBUSTION ENGINE

Kiyotaka Kobayashi, Aichi; Hideo Tsukasaki, and Takaaki Baba, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

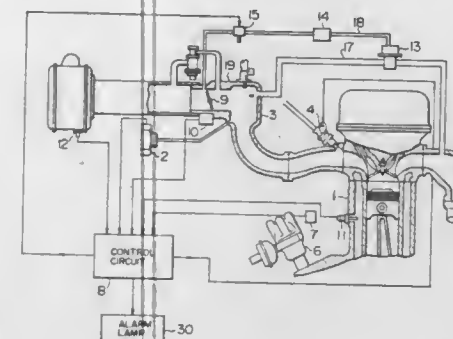
Filed Aug. 29, 1986, Ser. No. 902,964
Claims priority, application Japan, Aug. 31, 1985, 60-192844; Aug. 31, 1985, 60-192845; Oct. 22, 1985, 60-236783
Int. Cl.⁴ F02M 25/06

U.S. Cl. 123—571

9 Claims

1. A self-diagnosis system for an exhaust gas recirculation system mounted on an internal combustion engine which produces an exhaust gas, the engine having an intake passage, said system comprising:
recirculation passage means for selectively recirculating said exhaust gas from an exhaust passage of said engine to said intake passage of said engine;
valve means for opening and closing said recirculation passage means;
detector means for detecting a predetermined operating

parameter of said engine and generating values therefrom, said detector means being provided at a location other than said recirculation passage means, and said predetermined operating parameter being one which is influenced by said exhaust gas recirculated through said recirculation passage means;
storage means for storing values of said operating parameter detected by said detector means when said recirculation passage means is opened and closed, respectively;



means for calculating a difference between said detected values of said operating parameter stored in said storage means; and
means for comparing said calculated difference with a predetermined reference thereby to discriminate whether or not said exhaust gas recirculation system is in an abnormal state.

4,715,349

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH AN IMPROVED OPERATION UNDER A SMALL INTAKE AIR AMOUNT

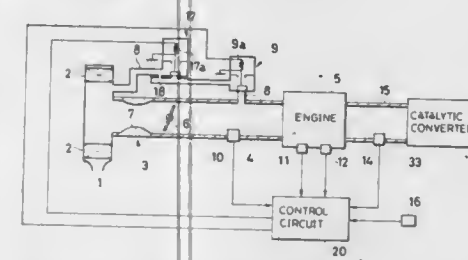
Yoshitaka Hibino, and Takeshi Fukuzawa, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1986, Ser. No. 915,471
Claims priority, application Japan, Oct. 5, 1985, 60-222171; Oct. 14, 1985, 60-228443

Int. Cl.⁴ F02M 23/08

U.S. Cl. 123—585

4 Claims



1. An air intake side secondary air supply system for an internal combustion engine having an intake air passage with a carburetor and an exhaust gas passage, comprising:
an air intake side secondary air supply passage leading to the intake air passage, at a position downstream of said carburetor;
a first open-close valve disposed in said air intake side secondary air supply passage;
an oxygen concentration sensor disposed in said exhaust passage and producing an output signal;
duty control unit responsive to said output signal of said oxygen concentration sensor and connected to said first open-close valve, operative to repeatedly calculate a valve open time period in a duty cycle in response to a result of determination of air/fuel ratio by using said

output signal of said oxygen concentration sensor, and opening said first open-close valve during said output valve open time period in each of said duty cycle;
means for detecting an amount of an intake air of said internal combustion engine; and
means for restricting an amount of said air intake side secondary air flowing through said air intake side secondary air supply passage when the amount of said intake air is smaller than a predetermined level.

4,715,350

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH A DUTY RATIO CONTROL OPERATION

Tomohiko Kawanabe, Utsunomiya; Noritaka Kushida, Tokyo; Masahiko Asakura, Tokorozawa, and Yasunari Seki, Utsunomiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

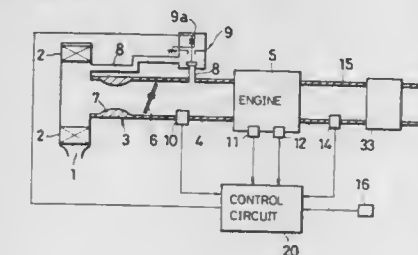
Filed Jan. 14, 1986, Ser. No. 818,637

Claims priority, application Japan, Feb. 16, 1985, 60-28759

Int. Cl.⁴ F02M 23/04

U.S. Cl. 123—587

3 Claims



1. An air intake side secondary air supply system for an internal combustion engine having an air intake passage with a carburetor and an exhaust passage, comprising:
an air intake side secondary air supply passage communicating with the air intake passage on the downstream side of the carburetor;
an open/close valve disposed in said air intake side secondary air supply passage;
an oxygen concentration sensor disposed in the exhaust passage and producing an output signal whose level is substantially proportional to an oxygen concentration of the exhaust gas;
means for setting a target air-fuel ratio in response to at least two parameters representing engine operation; and
comparing means for comparing the output signal of said oxygen concentration sensor and a level corresponding to said target air-fuel ratio;
control means for continuously controlling an opening ratio of said open/close valve, said control means calculating said opening ratio in response to a result of comparison between the output signal of the oxygen concentration sensor and said level corresponding to said target air-fuel ratio and supplying an opening ratio control signal at predetermined intervals, so that said open/close valve is opened or closed in response to said ratio control signal which is supplied at said predetermined intervals.

4,715,351

SUPPLEMENTAL AIR VALVE FOR INTERNAL COMBUSTION ENGINE

Chester W. Pankow, 1830 N. 37th St., Phoenix, Ariz. 85012

Filed Aug. 25, 1986, Ser. No. 900,088

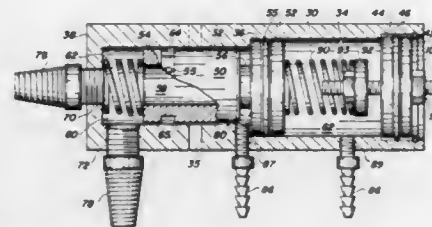
Int. Cl.⁴ F02M 123/04

U.S. Cl. 123—587

3 Claims

1. A valve for attachment in the PCV system of an internal combustion engine for regulating the admission of supplemental air to the crank case blow-by return, said valve comprising:
(a) a valve body defining a bore, said body having an inlet and

- an outlet connection defining a passageway through said valve for the blow-by return, said body further defining a port for air;
- (b) a valve member reciprocal within said bore having a piston member dividing at least a portion of said bore into two pressure chambers, said pressure chambers having means for connection of each to a source of engine vacuum;
- (c) said valve member being shiftable from and open position



permitting air to enter through said port to said passageway and having a closed position blocking admission of air through said port to said passageway; and

(d) resilient means normally urging said valve body to said closed position, said resilient means being selectively adjustable to provide a predetermined biasing force whereby said piston is shiftable to said open position in response to changes in engine vacuum to admit supplemental air to the engine.

4,715,352

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH A DUTY RATIO CONTROL OPERATION

Tomohiko Kawanabe; Masahiko Asakura; Noritaka Kushida, and Katsuhiko Kimura, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

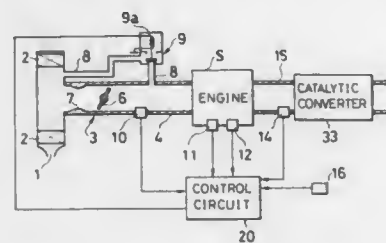
Filed Sep. 29, 1986, Ser. No. 912,038

Claims priority, application Japan, Sep. 30, 1985, 60-218503

Int. Cl.⁴ F02M 23/04

U.S. Cl. 123—589

1 Claim



1. An air intake side secondary air supply system for an internal combustion engine having an intake air passage with a carburetor and an exhaust gas passage, comprising:
 - an air intake side secondary air supply passage leading to the intake air passage, at a position downstream of said carburetor;
 - an open-close valve disposed in said air intake side secondary air supply passage;
 - an oxygen concentration sensor disposed in said exhaust passage and producing an output signal whose level is generally proportional to an oxygen concentration of an exhaust gas of the engine; and
 - duty control unit responsive to said output signal of said oxygen concentration sensor and operative to control said open-close valve, including means for determining a base valve open time period in a duty cycle of a predetermined time period using a plurality of predetermined operational parameters of said engine at an interval of said predetermined time period, means for detecting whether an air/fuel ratio of a mixture supplied to the engine is leaner or richer than a target air/fuel ratio at most an interval of

said predetermined time period, means for calculating an output valve open period by decreasing said base valve open time period by a first correction value when a result of the detection of said air/fuel ratio is "lean", and by increasing said base valve open time period by a second correction value when the result of the detection of said air/fuel ratio is "rich", and means for opening said open/close valve during said output valve open period in each of said duty cycle, wherein said duty control unit further includes means for increasing said first correction value only when the air/fuel ratio of the mixture has changed from rich to lean with respect to said target air/fuel ratio, and increasing said second correction value only when the air/fuel ratio of the mixture has changed from lean to rich with respect to said target air/fuel ratio.

4,715,353

ULTRASONIC WAVE TYPE FUEL ATOMIZING APPARATUS FOR INTERNAL COMBUSTION ENGINE

Hiroshi Koike, Katsuta; Hiroshi Katada, Mito, and Hiroshi Yoneda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuta, both of Japan

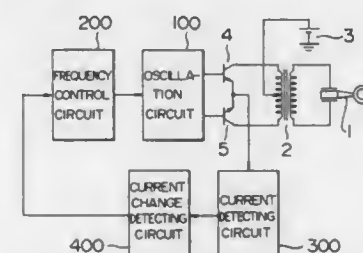
Filed Dec. 19, 1986, Ser. No. 943,748

Claims priority, application Japan, Dec. 25, 1985, 60-290652

Int. Cl.⁴ F02M 29/00

U.S. Cl. 123—590

6 Claims



1. An ultrasonic wave type fuel atomizing apparatus for an internal combustion engine for supplying atomized fuel to said internal combustion engine, comprising:
 - an ultrasonic wave vibrator provided in an intake passage of said internal combustion engine for atomizing fuel supplied thereto by vibrating at ultrasonic wave frequencies;
 - an oscillation circuit for producing ultrasonic waves used to drive said ultrasonic wave vibrator;
 - means for supplying an oscillation output of said oscillation circuit to said ultrasonic wave vibrator by increasing the oscillation output; and
 - a feedback circuit for controlling an oscillation frequency of said oscillation circuit in accordance with an output of said ultrasonic vibrator.

4,715,354

FUEL-ECONOMY AND EMISSION-CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINES

Roberto Longobardi, Viale Europa, 2/E, Castellammare di Stabia, 80053, Italy

PCT No. PCT/IT85/00023, § 371 Date Apr. 3, 1986, § 102(e) Date Apr. 3, 1986, PCT Pub. No. WO86/01258, PCT Pub. Date Feb. 27, 1986

PCT Filed Jul. 30, 1985, Ser. No. 862,224

Claims priority, application Italy, Aug. 3, 1984, 40426 A/84

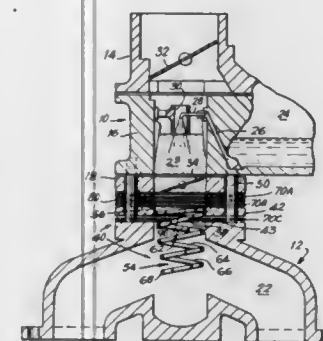
Int. Cl.⁴ F02M 29/00

U.S. Cl. 123—590

7 Claims

1. An improved fuel-economy and emission-control device for internal combustion engines, of a type having at least one spiral mixer element, and means for mounting said element downstream of a carburetor and upstream of an inlet manifold

internally of an coaxial with a passage through which a fuel-air mixture is directed, wherein the mixer element is a spiral element having a given number of turns which gradually decrease in diameter along the fuel-air mixture passage, and means for mounting the spiral mixer element, said means comprising a mounting flange having a tapered central opening which supports the mixer element, the improvement comprising: a radial bore coplanar with and passing through the mounting flange so as to communicate with the central opening,



through which a fluid supplied by an external intake means may be directed into the central opening and into the inlet manifold, wherein the intake means connected to the radial bore comprises, in turn, a solenoid-operated cleaner valve, a solenoid-operated metering valve, and a bypass valve connected to both an air cleaner and a blow-by system for adding vaporized oil to said fluid, said intake means components being connected and in fluid communication via small-bore hoses.

4,715,355

ARROW REST FOR ARCHERY BOW

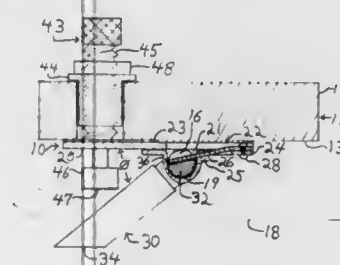
Krail N. Lattig, 2236 S. Pasfield, Springfield, Ill. 62704

Filed Mar. 26, 1986, Ser. No. 844,368

Int. Cl.⁴ F41D 10/00

U.S. Cl. 124—41 A

45 Claims



42. An arrow rest assembly for mounting to the side of a bow for supporting an arrow, the assembly comprising:
 - a base;
 - a generally L-shaped arrow support having a first leg journaled in the base about a vertical axis parallel to the longitudinal axis of the bow, and a second leg extending generally horizontally and pivotable in a generally horizontal plane;
 - a flat cam surface on the first leg of the arrow support;
 - means for engaging the flat cam surface on the first leg to resiliently bias the second arm generally laterally outwardly from the bow, said engaging means allowing the second arm to pivot forward and backward in a horizontal plane.

4,715,356

GAS BURNER WITH HEAT REFLECTIVE RADIANTS FOR CONTROLLED HEAT CONCENTRATION

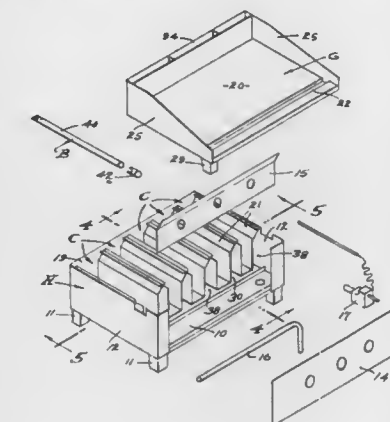
Howard S. Reynolds, 1192 Mitchell Ave. No. 50, Tustin, Calif. 92680

Continuation-in-part of Ser. No. 759,160, Jul. 26, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 4,669

Int. Cl.⁴ F24C 3/00

U.S. Cl. 126—39 H

18 Claims



1. In a gas stove, the combination of a plurality of adjacent burner-combustion chambers and each which directly heat isolated portions of a griddle plate, and each including:
 - a single straight elongated burner tube supplied by control means with gas and with primary combustion air from a primary air intake plenum, and having burner ports discharging therealong at a common plane spaced below the griddle plate,
 - a pair of straight and parallel baffles below the burner and extending upward to said plane and closely spaced from the opposite sides of the burner and forming a secondary air intake plenum supplying secondary combustion air to the burner,
 - a pair of radiants diverging upwardly from the pair of baffles at said plane and each extending to a seal at the underside of the griddle plate and forming an isolated combustion chamber therebetween,
 - the plurality of burner-combustion chambers being manifolded in parallel relation to each other and with the next adjacent radiants of each pair of burner-combustion chambers being convergent to meet at the underside of the griddle plate,
 - the secondary intake plenums and the combustion chambers of the plurality of burner-combustion chambers being in open communication at said common plane and all isolated by a wall from the primary air intake plenum, and the manifolded combustion chambers being open at one end to a flue.

4,715,357

APPARATUS FOR COOKING FOOD

Victor Sherman, 13-10 34 Ave., Long Island City, N.Y. 11106; Ilya Zborovsky, 3285 Wolfson Dr., Baldwin, N.Y. 11510, and William Sanchez, 35-69 169 St., Flushing, N.Y. 11358

Continuation-in-part of Ser. No. 801,781, Nov. 20, 1985, Pat. No. 4,627,335. This application May 20, 1986, Ser. No. 865,091

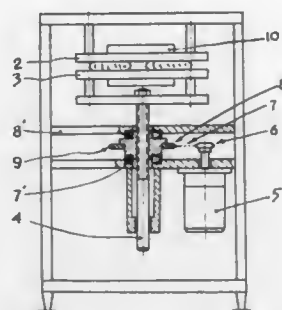
Int. Cl.⁴ F24C 3/00; A47J 27/62; A23B 4/04

U.S. Cl. 126—39 H

20 Claims

1. An apparatus for cooking food, comprising
 - two solid plates, said plates being heatable and one of said plates being movable relative to the other of said plates;
 - means for heating said plates; and
 - means for driving said one plate so as to move said one plate relative to said other plate so that when an initial food material is placed between said two plates and said plates

have been heated and said one plate has been moved toward said other plate, the initial food material is subjected to the action of heat and pressure of said plates and cooking is performed under the simultaneous action of



high temperature and high pressure, said driving means being formed so that said one plate is movable by said driving means toward said other plate in a stepped manner so that a risk of catching a part of the user's body between said plate is reduced.

4,715,358

AUTOMATIC CONTROL OF INCIDENT SOLAR FLUX
Helmut Köster, Karl-Bieber-Höhe, 6000 Frankfurt am Main, Fed. Rep. of Germany

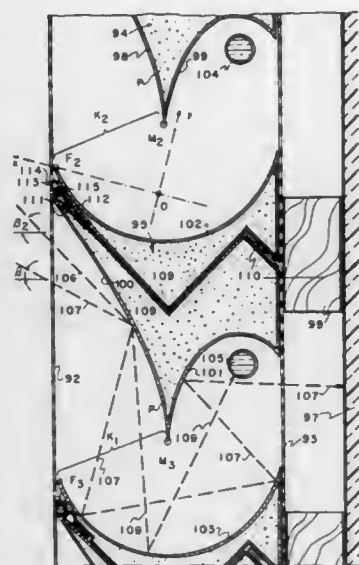
PCT No. PCT/DE80/00088, § 371 Date Feb. 2, 1981, § 102(e) Date Feb. 2, 1981, PCT Pub. No. WO80/02712, PCT Pub. Date Dec. 11, 1980

Continuation of Ser. No. 232,028, Feb. 2, 1981, abandoned. This PCT application Jun. 9, 1980, Ser. No. 814,513

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1979, 2923233; Jul. 25, 1979, 2930103; Oct. 29, 1979, 2942497 Int. Cl.⁴ F24J 2/18

U.S. Cl. 126—439

15 Claims



1. Apparatus for control of incident solar radiation, comprising essentially opaque elements (63, 64; 108, 109; 118, 119), which are arranged horizontally along their axis and are at intervals from each other along a vertical axis, each opaque element having a reflecting upper surface and reflecting lower surface wherein the reflective upper surface opaque element lies opposite the lower surface of the next adjacent element, and the lower surface of the next adjacent element lies opposite the upper surface of a second adjacent element, thus admitting radiation between the upper surface of said opaque element

and the lower of the adjacent element, characterized by the following characteristics:

each of the opaque elements is formed as a profile (63, 64; 108, 109; 118, 119) having mirror like surfaces; the upper and lower surfaces of each opaque element (63, 64; 108, 109; 118, 119) are different in shape; at least one portion of the lower surfaces (63, 69) of said mirror-profile is parabolic; the upper and lower surfaces of said mirror-profile established a radiation cross-section as well as a concentration cross-section (K, K₁, K₂); and the opaque elements (63, 64; 108, 109; 118, 119) are provided in between panel-like transparent elements (61, 62; 92, 93; 116, 117); whereby light reflected to an exterior of said apparatus is scattered by double reflection on the different contours of said upper and lower surfaces of said opaque elements.

4,715,359

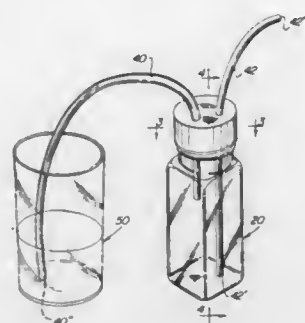
SAFETY BOTTLE AND CAP FOR THE ADMINISTRATION OF LIQUID RADIOACTIVE IODINE
U. Yun Ryo, 2716 Martinique La., Lexington, Ky. 40509

Filed Mar. 28, 1986, Ser. No. 845,259

Int. Cl.⁴ A61N 5/12

U.S. Cl. 128—1.1

7 Claims



1. A method of administering liquid solution contained in a bottle, or the like, which bottle is closed by a closure member through which extends a pair of straws; each of said pair of straws having an inner end in fluid communication with the interior of the container or the like, and an outer end exposed to the ambient air, wherein said method comprises:

- inserting the outer end of the first of the pair of straws into the patient's mouth for subsequent drawing thereon to drink the contents of the bottle, or the like;
- inserting the outer end of the second of the pair of straws into a container having a liquid therein, such that the outer end of the second of the pair of straws is immersed in the liquid;
- drawing on the outer end of the first of the pair of straws to draw liquid into the interior of the bottle, or the like, from the container having liquid therein via the outer end of the second of the pair of straws; and
- drawing out the liquid mixture in the interior of the bottle, or the like, provided through step (c), from the interior of the bottle to the outside thereof by drawing on the outer end of the first of the pair of straws.

4,715,360

ENDOSCOPE FORCEPS STOPCOCK

Nobuaki Akui, Yasuhiro Ueda, and Akira Suzuki, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Japan

Division of Ser. No. 773,122, Sep. 6, 1985, Pat. No. 4,653,477.

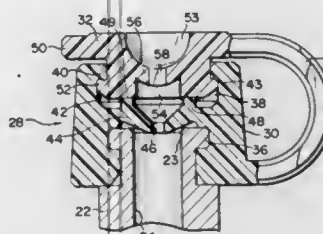
This application Jan. 7, 1987, Ser. No. 1,157

Claims priority, application Japan, Sep. 13, 1984, 59-139279; Oct. 5, 1984, 59-209455; May 22, 1985, 60-109573

Int. Cl.⁴ A61B 1/00

U.S. Cl. 128—4

12 Claims



1. An endoscope forceps stopcock fitted to an insertion mouthpiece provided at an insertion port of an insertion channel of an endoscope allowing for the insertion of medical instruments which comprises:

- a substantially cylindrical first member fitted to the insertion mouthpiece, said first member including an engagement section formed at one end opening thereof to be detachably engaged with the insertion mouthpiece, another engagement section formed at another end opening of the first member, and a valve section provided between both engagement sections in the first member to close the insertion port of the insertion channel;
- a second member removably fitted to the another engagement section of the first member and having a second valve section located to face the first valve section, said first and second valve sections having insertion sections allowing for the insertion of medical instruments, respectively, and at least one of the insertion sections being normally closed by the elasticity of the valve section; and a coupling member for connecting the first and second members.

4,715,361

PASSIVE MOBILIZER

Donald M. Mauldin, and Richard E. Jones, III, both of 3D Orthopedic, Inc., 11126 Shady Trail, Ste. #107, Dallas, Tex. 75229

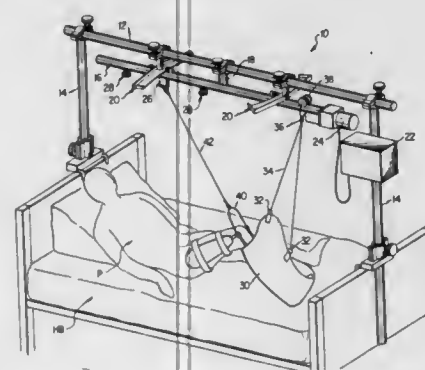
Continuation of Ser. No. 625,613, Jun. 28, 1984, abandoned.

This application Sep. 16, 1986, Ser. No. 908,941

Int. Cl.⁴ A61H 1/02

U.S. Cl. 128—52

27 Claims



1. Apparatus for exercising the human extremities about a joint which comprises:

- an elongate track;
- means for supporting the elongate track above the extremity to be exercised;
- a carriage supported by the elongate track;
- means for moving the carriage along the elongate track;
- means for reversing the direction of movement of the carriage along the elongate track;
- first support means for connecting the carriage to the extremity to be exercised whereby the extremity to be exercised is moved in response to the movement of the carriage along the elongate track and is allowed to rotate about an axis defined by the length of the extremity such that the joint rotates in an anatomically correct motion; and
- second support means connected to the extremity to be exercised and to the elongated track, said second support movable along the elongate track in response to movement of the extremity to be exercised.

4,715,362

AMBULATORY LUMBO-SACRAL TRACTION SYSTEMS AND METHODS

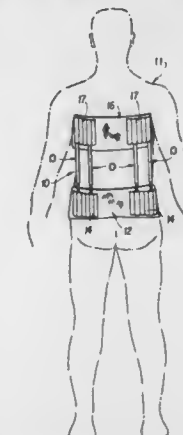
Henry Scott, 1109 Rock Creek Dr., Wyncote, Pa. 19095

Filed Feb. 27, 1986, Ser. No. 833,705

Int. Cl.⁴ A61H 1/02; A61F 5/04

U.S. Cl. 128—75

9 Claims



1. An ambulatory lumbo-sacral back brace for relieving upper body weight from the lower lumbo-sacral region of a patient's spine, the system comprising:

- a single upper support member for encircling the patient adjacent the patient's clavicle and beneath the patient's arms, the upper support member being in the form of a first flexible web having a back portion, a front portion and two free ends, with a first adjustable fastening means for connecting the free ends of the webs together to form a first closed loop;
- single lower support member for encircling the patient at a location adjacent the pelvis of the patient, the lower support member being in the form of a second flexible web having a back portion, a front portion, and two free ends adjacent the front portion with a second adjustable fastening means for connecting the ends of the web together to form a second closed loop;
- a plurality of substantially vertical and parallel longitudinally compressible struts having upper and lower ends, the struts each having individually adjustable internal biasing means for resisting longitudinal contraction;
- a plurality of individual strut securing pockets on each of said support members, each said support member having at least one pocket on each side of the spine, none of said pockets being aligned with the patient's spine, said pockets receiving individual struts and securing the struts between the upper and lower support members with the struts being selectively removable from the pockets, the strut

securing pockets being positioned at a plurality of longitudinally spaced locations on the upper and lower support members, the spaced locations being distributed over the back portions of the webs on both side of the spine when the system is placed on a patient, each of the strut securing pockets extending laterally with respect to its respective web for securing the strut to the web adjacent both the top and bottom edge thereof to prevent the strut from pivoting with respect to the webs, whereby the struts are selectively secured to the upper and lower support members at selected longitudinal locations on the belts and are individually adjustable in longitudinal force according to the needs of the patient using the system.

4,715,363

KNEE BRACE WITH EXTENSION ANGLE ESTABLISHING MEANS

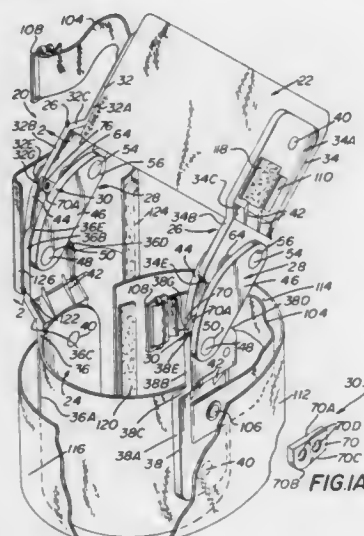
Garnett E. Detty, 13755 E. Camino Cartamo, Tucson, Ariz. 85749

Filed Sep. 26, 1986, Ser. No. 912,906

Int. Cl.⁴ A61F 3/00

U.S. Cl. 128—80 C

12 Claims



1. A brace for controlling the degree of motion of a bone joint comprising a first cuff member arranged to be releasably secured to a portion of the person's body on the side of said joint, a second cuff member arranged to be releasably secured to a portion of the person's body on the other side of said joint, a pair of elongated first brace members extending on opposite sides of said first cuff member, a pair of elongated second brace members extending on opposite sides of said second cuff member, each of said brace members having an end portion including an end face, and wherein the end face of one of said first brace members includes a recess therein and wherein the end face of one of said second brace members includes a recess therein, first hinge means including a link connected between the end portion of one of said first brace members and the end portion of one of said second brace members and second hinge means including a link connected between the end portion of the other of said first brace members and the end portion of the other of said second brace members, together forming a polycentric hinge, and a plural stop means each in the form of a respective insert having a peripheral stop surface and wherein anyone of said stop means being selected for releasable securement in one of said recesses whereupon its stop surface forms the end face of the brace member to which it is secured, and which stop surface is arranged to engage the end face of the brace member hingedly connected thereto, said selected stop means, hinge means and brace members cooperating with one another to enable the person's joint to be straightened up to a maximum angle and no further, said maximum angle being established by the stop surface of said selected stop means

engaging the end face of the brace member hingedly connected thereto, each of said plural stop means being arranged when secured to said brace member to establish a different maximum angle, whereupon said person can, by the selection of the appropriate stop means, fix the maximum angle that the brace will enable the joint to assume.

4,715,364

PELVIS LOCKING BELT

Katsumasa Noguchi, 42-13, Kabukicho 2 chome, Shinjuku-ku, Tokyo, Japan

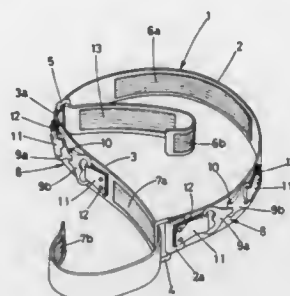
Filed Apr. 18, 1986, Ser. No. 853,488

Claims priority, application Japan, Jun. 19, 1985, 60-131946

Int. Cl.⁴ A61F 5/24

U.S. Cl. 128—96.1

7 Claims



1. An adjustable pelvis locking belt comprising a front belt section of non-expandable material and a back belt section of non-expandable material, a first annular connecting member connected to a first end portion of said front belt section, a second annular connecting member connected to a first end portion of said back belt section, said front belt section having a second end portion which passes through said second annular connecting member and which folds back on itself to a position superimposed on a first part of said front belt section, first adjustable fastening means adjustably fastening said folded back second end portion of said front belt section and said first part of said front belt section, said back belt section having a second end portion which passes through said first annular connecting member and which folds back on itself to a position superimposed on a first part of said back belt section, second adjustable fastening means adjustably fastening said folded back second end portion of said back belt section and said first part of said back belt section, pressing means on each of said front and back belt sections, mounting means on each of said front and back belt sections mounting said pressing means on the outer side of the respective front and back belt sections, each of said pressing means comprising two metal pressing members, each of said pressing means further comprising pivotal means pivotably connecting each two metal pressing members, each of said pressing members having a curved inner surface corresponding to the curvature of the loins of a human body, whereby said first and second adjustable means are adjustable to position said pressing means in a position between the front upper spines of the ilium in the pelvis and the femur trochanter major to press the hypodermic layer therebetween to thereby lock said spines and said femur trochanter.

4,715,365

INTRAUTERINE CONTRACEPTIVE DEVICE

Hugo Cimber, Neufeldstrasse 134, 3012 Bern, Switzerland

Filed Jul. 8, 1986, Ser. No. 883,183

Claims priority, application Switzerland, Jul. 11, 1985, 3015/85

Int. Cl.⁴ A61F 5/46

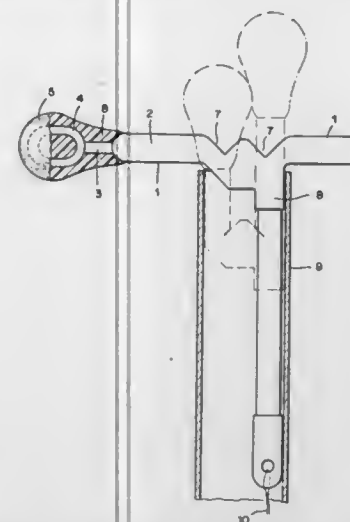
U.S. Cl. 128—130

8 Claims

1. An intrauterine contraceptive device of the type to be

introduced into and withdrawn from the uterus by a tube for closing the mouths of the Fallopian tubes, comprising:

- a support rod having an outer end;
- first and second branches extending laterally from the outer end of the support rod;
- the first and second branches including first and second pivots at which the respective branches pivot when entering and leaving the tube;



the first and second branches having enlarged terminal members at the terminal ends of the branches for engagement with the mouths of the Fallopian tube; and the first and second pivots positioned at first and second distances from the outer end of the support rod, the second distance being substantially greater than the first distance so that when the first and second branches are housed within the tube the enlarged terminal members are axially displaced with the terminal end of the second branch lying behind the terminal end of the first branch.

4,715,366

SURGICAL SHIELD

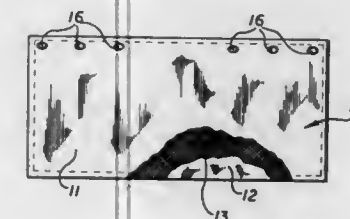
Edward Teeple, 641 Ridgefield Ave., Pittsburgh, Pa. 15216

Filed Apr. 21, 1986, Ser. No. 853,903

Int. Cl.⁴ A61F 13/00

U.S. Cl. 128—132 D

6 Claims U.S. Cl. 128—136



1. A malleable, lightweight surgical shield for use in an operating room and on a patient during laser procedures comprising:

- a. a non-woven fabric polymeric inner sheet,
- b. first and second aluminum foil sheets having a matte surface respectively positioned over each side of said fabric inner sheet to coextensively interpose said fabric sheet between said foil sheets; and
- c. means for attaching together the respective foil and fabric sheets.

4,715,367

MULTIFUNCTIONAL BEHAVIORAL MODIFICATION DEVICE FOR SNORING, BRUXISM, AND APNEA

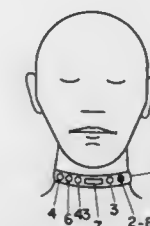
Robert B. Crossley, 6600 Elm Creek No. 152, Austin, Tex. 78744

Filed Sep. 15, 1986, Ser. No. 907,462

Int. Cl.⁴ A61B 5/10, 5/12

U.S. Cl. 128—136

21 Claims



1. A multifunctional behavioral modification device comprising:

- A. a means for detecting clenching and grinding of teeth
- B. a means for detecting snoring
- C. a means for detecting breathing
- D. a pair of electrodes suitable for skin contact for administering an adjustable electric shock
- E. battery power means
- F. battery powered circuitry suitable for impressing an adjustable electric shock across said electrodes when activated by one of the following:

1. said means for detecting clenching and grinding of teeth
2. said means for detecting snoring
3. said means for detecting breathing indicating that breathing has stopped

- G. an electronic counter means for counting the number of times in a given period a current is impressed across said pair of electrodes
- H. an enclosure means for said battery powered circuitry.

4,715,368

NOCTURNAL AIRWAY-PATENCY APPLIANCE

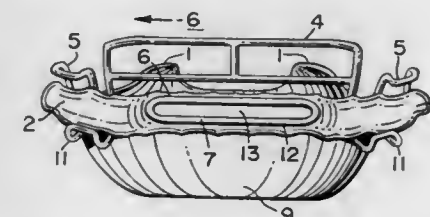
Peter T. George, Suite 520, 1441 Kapiolani Blvd., Honolulu, Hi. 96814

Filed Aug. 6, 1986, Ser. No. 893,584

Int. Cl.⁴ A62B 7/00

6 Claims U.S. Cl. 128—136

1 Claim



1. A preformed device consisting of a one-piece mouthpiece of orthodontal plastics said device having upper and lower negative impressions which are so configured so as to fit a patient's mouth's upper and lower teeth; said device having an inward and outward flange extending from said impressions; said device has embedded therein fitted labial arch wire guides along the front upper perimeter of the teeth; and molar wire clasps at the rear on each side of both upper and lower teeth of the outward flange body of the appliance; and with a lip-parting beak integrally molded at the front end of the appliance body with an air-way orifice passage through the same beak.

4,715,369

METHOD OF TREATING AN INJURED PART ON THE ORAL MUCOSA AND THE COVERING MATERIAL FOR USE THEREOF

Yoshiki Suzuki; Hiroshi Ikura, both of Hino; Gentaro Yamashita, Tachikawa, and Tsuneji Nagai, Taito, all of Japan, assignors to Teljin Limited, Osaka, Japan
Continuation of Ser. No. 741,064, Jun. 25, 1985, abandoned, which is a continuation of Ser. No. 594,951, Apr. 2, 1984, abandoned, which is a continuation of Ser. No. 335,418, Dec. 29, 1981, abandoned. This application Feb. 9, 1987, Ser. No. 13,175
Claims priority, application Japan, Dec. 29, 1980, 55-185294
Int. Cl.⁴ A61L 15/01; A61K 9/24

U.S. Cl. 128—156

3 Claims

1. A method for treating an injured part on the oral mucosa, which comprises covering the injured part with a covering material consisting of a medicament-free adhesive layer consisting essentially of cellulose lower alkyl ether and polyacrylic acid or its pharmaceutically acceptable salt and a medicament-free nonadhesive layer which has no adhesion to the wet surface of the oral mucosa.

4,715,370

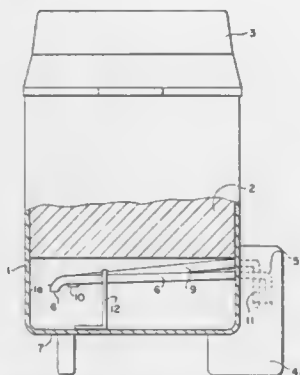
OVERFLOW TRAP FOR ANESTHETICS

Ulrich Altner, Bad Segeberg; Wolfgang Falb, Klein Wessenberg; Martin Ryschka, Stockelsdorf, and Carl-Friedrich Wallroth, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 11, 1986, Ser. No. 940,627
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544302

Int. Cl.⁴ A61M 15/00

U.S. Cl. 128—204.13

4 Claims



1. An overflow trap for a reservoir for having liquid anesthetics therein, comprising an anesthetic tank having a bottom and opposite side walls, an anesthetic inlet conduit extending into said tank and sloping downwardly toward the bottom of said tank, and an anesthetic overflow conduit extending into said tank and sloping downwardly to an inlet opening within the tank which is at a lower level from the remaining portion of said overflow conduit, said inlet conduit ending at an opening, said openings of said inlet and overflow conduits being spaced above the bottom of said tank, each of said inlet and overflow conduits extending from the same one of said opposite side walls almost to the other of said opposite side walls, the slant of each of said inlet and overflow conduits being slight between said opposite side walls.

4,715,371

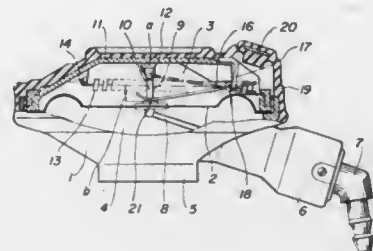
LUNG-CONTROLLED DIAPHRAGM VALVE

Hans Haas, Lubeck, Fed. Rep. of Germany, assignor to Drägerwerk A.G., Fed. Rep. of Germany
Filed Oct. 28, 1986, Ser. No. 924,358
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1985, 3539668

Int. Cl.⁴ A61M 16/00

U.S. Cl. 128—204.26

6 Claims



1. In a lung-controlled diaphragm valve having a valve housing defining a space with a valve diaphragm connected to said housing and extending across said space to divide space into an outer chamber and an inner chamber, the improvement comprising a tappet fixed to said diaphragm and extending into said outer chamber, said tappet having a ram which is spaced from said diaphragm, an inlet valve connected to said housing and communicating with said inner chamber for supplying breathing gas to said inner chamber, a valve lever connected to said inlet valve and engagable by said diaphragm to open said inlet valve, a connecting fitting connected to said housing and communicating with said inner chamber for connection to a respiratory mask for a user, a tilting lever pivotally mounted to said housing in said outer chamber, said tilting lever having a first arm portion engagable with said diaphragm and with said ram, and a second arm portion spaced from said first arm portion, an outer chamber housing engaged over said valve housing and including an actuating element moveable into said outer chamber and against said second arm portion of said tilting lever to move said first arm portion away from said diaphragm and toward engagement with said ram, and at least one spring connected between said housing in outer chamber and said tilting lever for biasing said first arm portion into engagement with said diaphragm when said tilting lever is in a pressure position engaged with said diaphragm, and for biasing said first arm portion away from said diaphragm and into disconnecting position, said ram of said tappet being spaced from an inner surface of said housing by a residual stroke distance when said tilting lever is in its pressure position with said valve lever closing said inlet valve, said tilting lever having a dead center position between its pressure position and its disconnecting position, under the influence of said spring, the distance between said pressure position and said dead center position for said first arm portion comprising a residual tilting distance, said residual tilting distance being greater than said residual stroke distance, said first arm portion of said tilting lever being moveable from said pressure position up to a position of engagement with said ram without moving said tappet, and said tilting lever being moveable into its disconnecting position with said first arm portion being engaged with said ram and pushing said ram under the influence of said spring into engagement with the inner surface of said housing in said outer chamber.

4,715,372

GAS INSUFFLATION APPARATUS FOR USE WITH AN ARTHROSCOPIC LASER SYSTEM

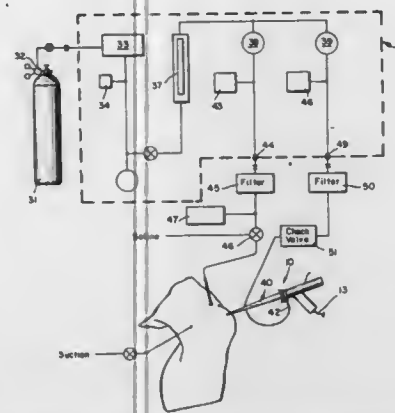
Jay E. Philippbar, 17931 Skypark Cir., Suite E, Irvine, Calif. 92714; Chadwick F. Smith, 1127 Wilshire Blvd., Los Angeles, Calif. 90017, and Leroy V. Sutter, Jr., 17931 Skypark Cir., Suite E, Irvine, Calif. 92714

Filed Jun. 12, 1985, Ser. No. 743,939

Int. Cl.⁴ A61B 17/36

U.S. Cl. 128—303.1

1 Claim



1. A combination of an arthroscopic attachment and a gas insufflation apparatus for use with a cylinder containing a gas at high pressure and a single stage regulator which is fluidly and mechanically coupled to the cylinder and which regulates the inlet pressure of the gas, said combination comprising:

- a filter which is fluidly coupled to the single stage regulator;
- an inlet relief valve which is fluidly coupled to said filter and which insures that the inlet pressure of the gas does not exceed a predetermined pressure;
- an inlet pressure gauge which is fluidly coupled to said filter and said inlet relief valve and which is used to read the inlet pressure;
- a control valve which is fluidly coupled to said filter and said inlet relief valve and which turns the flow of the gas through said gas insufflation apparatus on and off;
- a flow meter which is fluidly coupled to said control valve and which measures the flow of the gas through said gas insufflation apparatus; and
- a first regulator which has a first outlet relief valve and which is fluidly coupled to said flow meter;
- a hollow guide member which directs a beam of light energy from a laser system to a surgical target wherein said hollow guide member has an output tip;
- coupling means for optically coupling said beam of light to said guiding means, said coupling means being mechanically coupled to said hollow guide member;
- focusing means for focusing said beam of light energy so that the diameter of said focused beam of light energy is less than 0.8 millimeters at said output tip of said hollow guide member, said focusing means being optically and mechanically coupled to said coupling means;
- gas inletting means for letting a gas into said hollow guide member, said gas inletting means being mechanically coupled to said coupling means; and
- a second regulator which has a second outlet relief valve and which is fluidly coupled to said flow meter in order to insufflate the gas directly into said hollow guide member through said gas inletting means at a second preselected pressure which is slightly higher than said first preselected pressure in order to insufflate the gas directly into the knee joint at a first preselected pressure in order to distend the knee joint during arthroscopic surgery.

4,715,373

DEVICES FOR IMPLANTATION OF DEFORMABLE INTRAOCULAR LENS STRUCTURES

Thomas R. Mazzocco, 16534 Buchet Dr., Granada Hills, Calif. 91344, and Mary T. Frenchik, 22240 Schoenborn St., Canoga Park, Calif. 91304

Filed Sep. 27, 1985, Ser. No. 781,399

Int. Cl.⁴ A61B 17/36

U.S. Cl. 128—303 R

13 Claims



1. A surgical device for implantation of deformable intraocular lens in the eye through a relatively small incision made in the ocular tissue, said device comprising:

- A generally cylindrical disarticulating holding means at the distal end of the device for receiving an intraocular lens having a deformable optical zone portion therein; said holding means comprising two concentrically aligned cylindrical half sections;
- A concentrically aligned sleeve for exerting a prescribed compressive force upon the intraocular lens once contained within the lens holding means, said concentrically aligned sleeve being slidable between retracted positions in which no or little compressive force is exerted on said lens, and a forward position in which a prescribed compressive force is exerted upon at least a portion of said intraocular lens once contained within said lens holding means; and
- Tab means disposed at a proximate end of the surgical device for facilitating placement of the lens and for convenient effecting release of the deformed lens through a relatively small incision made in the ocular tissue.

4,715,374

DISPOSABLE AUTOMATIC LANCET

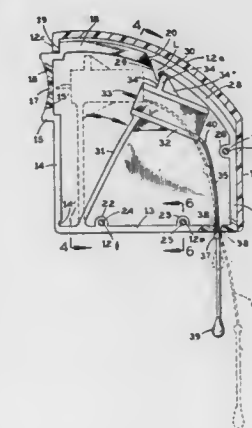
Joseph Maggio, Hialeah, Fla., assignor to Medcore, Inc., Hialeah, Fla.

Filed Nov. 14, 1986, Ser. No. 930,515

Int. Cl.⁴ A61B 17/32

U.S. Cl. 128—314

4 Claims



1. In an automatic surgical lancet comprising:
a housing having a seat for receiving the tip of a patient's finger and an opening in said seat for passing a lancet blade;
a spring arm inside said housing having a free end which is movable toward and away from said opening;
a holding element for holding said spring arm cocked in a stressed position in which its free end is held away from said opening;
a lancet blade holder on said free end of said spring arm;

and a lancet blade carried by said holder; the improvement which comprises:

- a pull line attached to said holder and extending outside said housing to be pulled to a position for cocking said spring arm in said stressed position, said pull line having a weakened region near its attachment to said holder which is readily broken by twisting the pull line, whereby to prevent another cocking of said spring arm after the pull line is broken;
- said housing having an outer wall segment providing said seat which is inwardly displaceable by a push of the patient's finger against said seat;
- and means acting between said displaceable wall segment and said holding element to cause said holding element to release the spring arm from said cocked position for movement of its free end toward said opening when said displaceable wall segment is pushed inward.

4,715,375

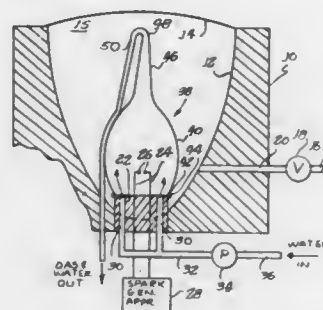
DEGASSIFICATION OF WATER IN HYDRAULIC SPARK GAP SHOCK WAVE GENERATOR

Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Kildeer, both of Ill., assignors to Trutek Research, Inc., Lake Zurich, Ill.

Filed Nov. 7, 1986, Ser. No. 928,524
Int. Cl.⁴ A61B 17/22

U.S. Cl. 128—328

4 Claims



1. Apparatus for generating a shock wave comprising an upwardly opening reflector having its vertex at the lowest portion and opposite the open end, a resilient diaphragm across the open end of the reflector, said reflector having a liquid such as water therein, means providing a spark gap in said reflector spaced up from said vertex, a spark across said gap causing a shock wave and producing gas in said liquid, and a flexible enclosure within said reflector upstanding from and adjacent the vertex thereof and substantially completely enclosing said spark gap means, said flexible enclosure being filled with a liquid such as water and isolating said spark gap means from most of the water in said reflector, said enclosure having a volume less than substantially one-half the volume of said reflector, and means for removing from said enclosure gas formed as an incident to discharging a spark across said gap, said diaphragm being adapted to be pressed against a living body, and the liquid in said flexible enclosure and in said reflector coupling said shock wave through said diaphragm to said living body, enclosure comprising an inverted bag supported by liquid therein, the bag tapering upwardly to an apex, the means for removing gas from the enclosure comprising exhaust means communicating with the interior of the bag adjacent said apex.

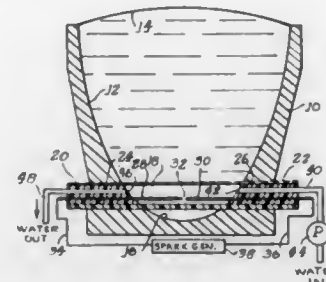
4,715,376 ISOLATION OF GAS IN HYDRAULIC SPARK GAP SHOCK WAVE GENERATOR

Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Kildeer, both of Ill., assignors to Trutek Research, Inc., Lake Zurich, Ill.

Filed Nov. 7, 1986, Ser. No. 928,805
Int. Cl.⁴ A61B 17/22

U.S. Cl. 128—328

2 Claims



1. Apparatus for generating shock waves comprising a reflector open at one end, a resilient diaphragm across the open end of the reflector, said reflector having a liquid such as water therein, means providing a spark gap in said reflector, a spark across said gap generating a shock wave and producing gas in said liquid, isolation means within said reflector closely adjacent to said spark gap means isolating said spark gap means from most of the liquid in said reflector and having a volume of not more than substantially 25% of the volume of said reflector, a liquid such as water being retained about said spark gap means by said isolation means, and means for removing from said isolation means gas formed as an incident to discharging a spark across said spark gap, said diaphragm being adapted to be pressed against a living body, and the liquid retained by said isolation means and in said reflector coupling said shock wave through said diaphragm to said living body, said reflector being upwardly opening and having a vertical axis of rotation, said isolation means comprising a substantially straight tube transverse of and intersecting said axis, said means for removing gas from said isolation means comprising means for flowing the liquid retained by said isolation means in one end of said tube and out the other.

4,715,377

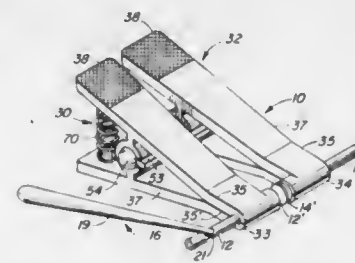
SURGICAL INSTRUMENTATION INCLUDING A CLAMP ASSEMBLY TO FACILITATE ATTACHMENT OF BLOOD VESSEL SECTIONS

Juan Arroyo, 12200 SW. 93 St., Miami, Fla. 33186
Continuation-in-part of Ser. No. 743,940, Jun. 12, 1985, Pat. No. 4,630,608. This application Oct. 25, 1985, Ser. No. 791,498

The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.⁴ A61B 17/08, 17/00

U.S. Cl. 128—335

13 Claims



1. A surgical instrumentation assembly of the type primarily designed for the positioning of open ends of blood vessel sections in aligned relation to one another for attachment thereof, said assembly comprising:

- (a) support means for aligned positioning of the vessel sections relative to one another and structured for interior, supporting engagement of both vessel sections,
- (b) said support means including an elongated portion disposable in coaxial relation concurrently within both vessel sections,
- (c) positioning means structured for exterior engagement with said vessel sections and aligned positioning and maintenance of the open ends into attachable position relative to one another,
- (d) said positioning means comprising a clamp assembly including two clamps disposable in interconnected, adjacently spaced relation to one another and each clamp comprising a sleeve element configured and dimensioned for surrounding and engaging relation to respective vessel sections,
- (e) said clamp further comprising two elongated lever arms each connected at one end thereof to said sleeve element and extending outwardly therefrom to respective free ends disposed in spaced relation to one another,
- (f) a fulcrum structure disposed between said lever arms of each clamp and pivotally interconnected to said lever arms and structured to allow pivotal movement of said lever arms relative to one another,
- (g) said lever arms, fulcrum structure and sleeve element of each clamp being of an integral, one piece construction,
- (h) securement means for positioning said sleeve elements relative to one another and structured for interconnecting said sleeve elements to one another for maintenance thereof into engageable relation to said respective vessel sections, and
- (i) said support means and said sleeve elements relatively structured and dimensioned to maintain the respective vessel sections in sandwiched relation therebetween and the open ends of the vessel sections in adjacent, aligned relation to one another.

4,715,378

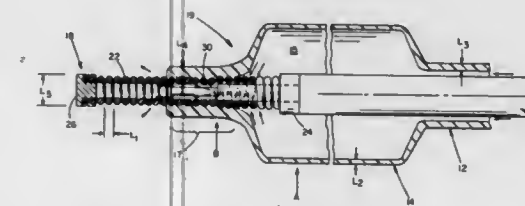
BALLOON CATHETER

J. Lee Pope, Jr., Attleboro, and Ronald E. Resden, Norton, both of Mass., assignors to Mansfield Scientific, Inc., Mansfield, Mass.

Filed Jul. 28, 1986, Ser. No. 890,819
Int. Cl.⁴ A61M 29/02

U.S. Cl. 128—344

4 Claims



1. A balloon catheter, comprising:
a distal balloon, and
a catheter extending from the proximal end of the balloon, out of the body, forming a conduit for balloon inflation liquid,
said balloon catheter sized and adapted, with said balloon deflated to a relatively small size, for introduction of said distal balloon into the body, and said balloon adapted to be inflated to a relatively larger size by introduction of inflation liquid into said balloon from outside the body, via the conduit formed by said catheter, and
said balloon catheter further comprising vent means disposed at the distal end of said balloon for selectively venting gas above a predetermined pressure from the interior of said balloon and restricting passage of inflation liquid from said balloon,

said vent means comprising a multi-winding coil extending distally from within said balloon, interstitial spaces generally between the windings of said coil being of a predetermined small size selected to permit passage therethrough of gaseous molecules above a predetermined pressure and to restrict throughpassage of larger molecules of inflation liquid at operating pressure.

4,715,379

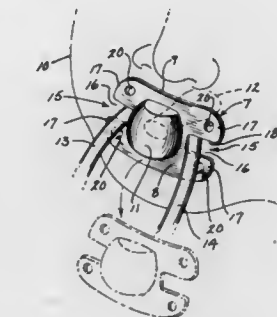
PACIFIER

Mary D. McCormick, 4415 N. 64 St., Milwaukee, Wis. 53218
Filed Aug. 28, 1986, Ser. No. 901,280

Int. Cl.⁴ A61J 17/00

U.S. Cl. 128—360

3 Claims



1. An infant pacifier (7) for use independent of but along side nonremovable tubes (13, 14) supplying air and food for insertion into an infant's body through its mouth, said pacifier comprising:

- (a) a base (8) having a generally peripheral edge (9), said base being adapted to symmetrically engage an infant's face in its mouth area,
- (b) a nipple (6) attached to said base,
- (c) and a pair of opposed slots (15) disposed in said base and extending into said base from said peripheral edge,
- (d) said slots comprising recesses (16) through which said tubes go into the mouth for unrestricted air and food supply, and with said slots being formed in a manner so that said pacifier is freely releasable from said tubes at all positions of the tubes within said slots and falls away from the tubes if said pacifier and/or tube means are disturbed.

4,715,380

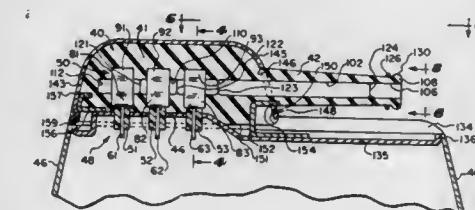
CAPPED PACER NECK CONTAINING A CONNECTOR ASSEMBLY

Donald L. Harris, Key Largo, Fla., assignor to Teletronics N.V., Curacao, Netherlands Antilles

Filed Apr. 3, 1986, Ser. No. 848,026
Int. Cl.⁴ A61N 1/00; H01R 11/00

U.S. Cl. 128—419 P

25 Claims



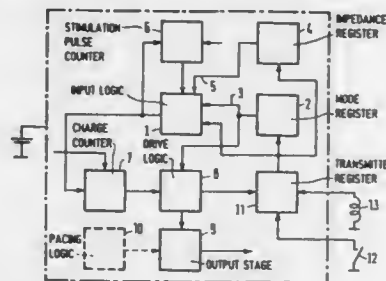
1. A cardiac pacing system comprising: a cardiac pacer; and a pacing lead having a distal end and a proximal end having at least one ring electrode thereon; said pacer comprising a metal case mounting electronic/electrical circuitry and a power supply therein and having a top side, a soft pliable elongate neck mounted to said top side of said case, connecting means inside said neck for connecting said cardiac pacer with said

proximal end of said pacing lead, said connecting means comprising at least one generally U-shaped electrical contact, insulated conductor means extending through said top side for coupling said at least one electrical contact to electrical circuitry in said case, said neck having at least one elongate lumen therein into which extends said at least one electrical contact and which has an open end for receiving the proximal end of said pacing lead, and a hard elongate cap which is sized to fit over at least a portion of said neck containing said at least one electrical contact, which is releasably fixed over said neck, and which has a smaller width than the width of said neck so that after said proximal end of said lead is inserted into said lumen, fixing of said cap over said neck will compress said at least one electrical contact against said at least one ring electrode.

4,715,381

BATTERY TEST CIRCUIT FOR A HEART PACEMAKER
Lennart Moberg, Spanga, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Sep. 17, 1986, Ser. No. 908,212
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535202

Int. Cl.⁴ A61N 1/00; H05G 0/00; A61B 5/04
U.S. Cl. 128—419 PT 5 Claims



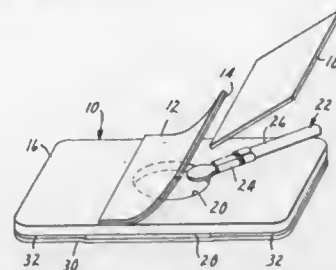
1. A battery test circuit for a heart pacemaker which consumes charge from a battery and thereby changes a charge status of said battery, said pacemaker generating successive stimulation pulses, said battery test circuit comprising:
a stimulation pulse counter for generating a signal corresponding to the number of said stimulation pulses;
means for generating signals corresponding to operating values of said pacemaker;
means for generating a time base signal indicative of elapsed time since a preceding battery test;
logic means connected to said stimulation pulse counter, to said means for generating signals corresponding to said operating values, and to said means for generating a time base signal, said logic means calculating a value based on all of said signals corresponding to the consumed charge of said battery; and
a charge counter memory connected to said logic means for storing values from said logic means generated since said preceding battery test, the content of said charge counter memory representing the present charge status of said battery.

4,715,382

FLAT BIOMEDICAL ELECTRODE WITH REUSEABLE LEAD WIRE
Jerome E. Strand, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 1, 1986, Ser. No. 892,506
Int. Cl.⁴ A61B 5/04; A61N 1/04

U.S. Cl. 128—640 19 Claims
1. A biomedical electrode adapted to be applied to a body, comprising:
a backing material having an aperture, having a top side

adapted to be oriented away from said body and having a bottom side adapted to be oriented toward said body;
a protective web at least partially secured to said top side of said backing material and covering said aperture;
a first removeable liner positioned between said protective web and said backing material, said first removeable liner covering at least a portion of the area of said backing material covered by said protective web and covering said aperture;
an electrically conductive adhesive positioned adjacent said backing material on said bottom side of said backing material covering said aperture;

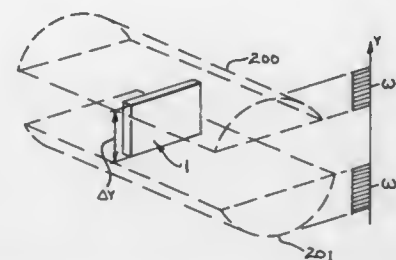


a second removeable liner positioned adjacent said electrically conductive adhesive opposite from said backing material; and
a lead wire having one end for being positioned within said aperture from said top side of said backing material so as to be adhered to said electrically conductive adhesive; whereby said second removeable liner may be removed and said biomedical electrode may be applied to said body with said electrically conductive adhesive and whereby said first removeable liner may be removed and said lead wire may be positioned with said one end within said aperture and secured by said protective web.

4,715,383

METHOD FOR REDUCING ARTIFACTS IN NMR IMAGES
Richard L. Ehman, and Joel P. Feinlee, both of Rochester, Minn., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 10, 1986, Ser. No. 928,504
Int. Cl.⁴ A61B 5/05
U.S. Cl. 128—653 5 Claims



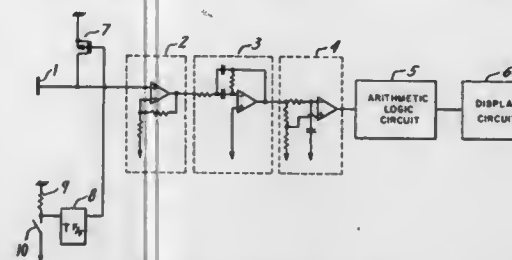
1. A method for eliminating artifacts in an NMR image of a volume of interest, the steps comprising:
acquiring NMR data for reconstructing the NMR image as a series of NMR measurements which each excite spins in the volume of interest;
executing a series of saturation pulse sequences which are interleaved with the NMR measurements, wherein each saturation pulse sequence includes the steps of:
(a) producing a magnetic field gradient which establishes Larmor resonant conditions in an adjacent region outside the volume of interest; and
(b) producing a transverse excitation field pulse which causes saturation of spins located in said adjacent region but not in the volume of interest; and

wherein the saturation pulse sequence is executed at a rate which maintains the net longitudinal magnetization of the spins in said adjacent region at a magnitude less than that of the spins in the volume of interest.

4,715,384

PULSIMETER
Junichi Tabata, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan
Filed Feb. 2, 1983, Ser. No. 463,160
Claims priority, application Japan, Feb. 3, 1982, 57-15660
The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.
Int. Cl.⁴ A61B 5/02

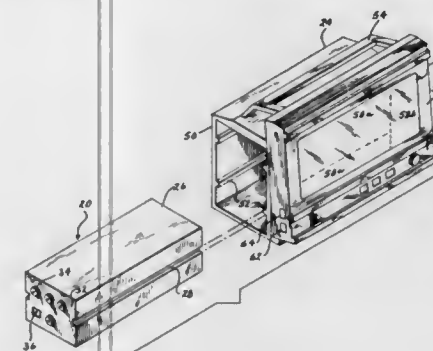
U.S. Cl. 128—706 14 Claims



1. In a pulsimeter having a detection electrode for receiving electrocardiac signals of a person and a pulse detection circuit for processing the electrocardiac signals, the improvement comprising: a switching element connected to the detection electrode and connected between an input terminal of the pulse detection circuit and a ground level; and switch means for controlling the conduction state and non-conduction state of the switching element.

4,715,385

PATIENT MONITORING SYSTEM HAVING TRANSPORTABLE DATA MODULE AND DISPLAY UNIT
Michael J. Cudaby, Delray Beach, Fla.; Carlos De La Hueraga, Shorewood, Wis.; Harold N. Arneson, Waukesha, Wis.; R. Thomas Divers, and Barry J. Altman, both of Mequon, Wis., assignors to Marquette Electronics, Inc., Milwaukee, Wis.
Filed Sep. 26, 1986, Ser. No. 912,359
Int. Cl.⁴ G06F 15/42; A61B 5/00
U.S. Cl. 128—710 16 Claims



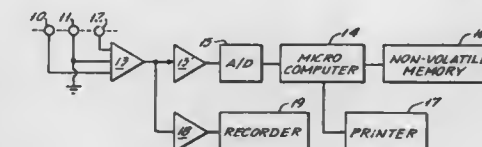
1. A monitoring system for providing continuous, uninterrupted, monitoring of one or more physiological conditions of a patient, including periods of transport of the patient from a location to a destination, said patient having physiological condition data sensors applied thereto, said system comprising:
a substantially non-transportable, first display unit positioned at said location, said first unit providing a data display for the physiological conditions being monitored;
a portable, second display unit capable of accompanying the

patient during transport for providing a data display for the physiological conditions being monitored;
a data acquisition and processing module for receiving data from the sensors; and
means for coupling said module to said first and second display units in a selected one of the following coupling modes: simultaneously to said first and second display units, individually to said first display unit and individually to said second display unit, so that said module may drive said display units to display data of the physiological conditions being monitored.

4,715,386

COMPUTER-AIDED DRUG-ABUSE DETECTION
Peter G. Martin, Mercer Island, Wash., assignor to National Patent Analytical Systems, Inc., New York, N.Y.
Filed Mar. 14, 1986, Ser. No. 839,614
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.⁴ A61B 5/04

U.S. Cl. 128—733 25 Claims

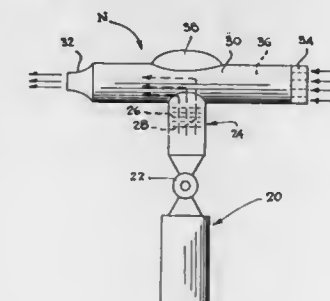


1. Apparatus for the non-invasive determination whether or not a subject has ingested a particular suspected single drug, said apparatus comprising:
(a) plural electrodes adapted for placement in the temple region of the subject's head, and ENG means connected to said electrodes for producing an electronystagmograph waveform for the subject;
(b) said ENG means including an amplifier and analog-to-digital converter means for converting said waveform into a digitally recorded waveform for digital processing;
(c) a digital computer with digital-storage means, wherein said storage means contains digitally stored reference data uniquely characterizing each of a plurality of waveform-component features for said single drug; and
(d) means coacting with said computer for comparing the subject's digitally recorded waveform for possible correlation with the digitally stored reference data for each of said component features.

4,715,387

AEROSOL FOR USE IN THE REDUCTION OF TOBACCO SMOKING
Jed E. Rose, Venice, Calif., assignor to The Regents of the Univ. of California, Berkeley, Calif.
Filed Aug. 23, 1985, Ser. No. 768,966
Int. Cl.⁴ A24F 47/00

U.S. Cl. 131—270 45 Claims



1. A method of aiding in the reduction of incidence of to-

bacco smoking by simulating respiratory tract sensations approximating those obtained by inhalation of normal tobacco smoke, said method comprising administering an aerosol to the oral cavity of an individual and which aerosol contains particles of a food acid which is present in non-toxic amounts and capable of being inhaled, the particles being of a proper size and having the food acid sufficient in content to migrate to the respiratory tract and simulate the sensations in the respiratory tract caused by tobacco smoke, the size of the particles being established so that at least a moderately substantial portion of the particles remain in the upper respiratory tract, whereby the oral and respiratory tract sensations simulate those created by tobacco smoke to reduce the need of an individual for tobacco smoke.

4,715,388

CIGARETTES HAVING MINIMIZED LOOSE ENDS AND A PROCESS FOR PREPARING SAME

Norman B. Rainer, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 20, 1985, Ser. No. 746,650

Int. Cl.⁴ A24B 15/28, 15/42; A24D 1/00

U.S. Cl. 131—309

10 Claims

1. A method for treating tobacco materials to reduce the loss of said materials at the uncovered end of a cigarette comprising:

- uniformly treating shredded tobacco materials with between about 1% and 6% by weight of a particulate hygroscopic adhesive powder,
- aging said treated shredded tobacco materials without compaction for a time sufficient to allow said powder to adhere to said tobacco materials.

4,715,389
CIGARETTE

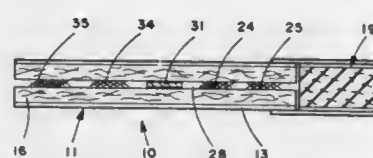
Dwo Lynn; Carl C. Morrison, both of Winston-Salem, and Ronald W. Hutcherson, Sr., King, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sep. 15, 1986, Ser. No. 907,175

Int. Cl.⁴ A24D 1/00

U.S. Cl. 131—335

9 Claims



1. An improved cigarette affording an enhanced delivery of nicotine and a reduced delivery of particulate matter in the smoke which comprises a column of cigarette tobacco wrapped with cigarette paper, a plurality of segments of aluminum screen material axially aligned within the column of tobacco and a section of carbonized flue-cured tobacco stem material impregnated with nicotine axially aligned with said segments within said column of tobacco.

4,715,390

MATRIX ENTRAPMENT OF FLAVORINGS FOR SMOKING ARTICLES

Walt Nichols; Reggie Newsome, both of Richmond; Rich Thesling, Glenn Allen, and Willie Houck, Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 19, 1985, Ser. No. 799,750

Int. Cl.⁴ A24B 3/12, 13/00

U.S. Cl. 131—335

30 Claims

1. A composition capable of progressively releasing flavor in smoking articles upon contact with moisture-containing smoke comprising an admixture of:

- a selected soluble flavoring material;

a solvent for said flavoring material;
a moisture releasing hydrophilic polymer; and
an amount of triacetin effective to retain the flavoring material in the composition.

4,715,391

APPARATUS FOR WASHING VEHICLES

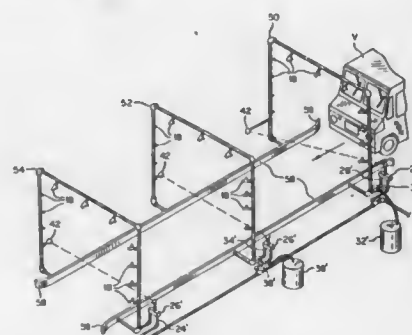
James I. Scheller, 16742 S. Annette, Oregon City, Ore. 97045

Continuation of Ser. No. 732,349, May 8, 1985, abandoned, which is a continuation of Ser. No. 523,373, Aug. 15, 1983, abandoned. This application Jul. 21, 1986, Ser. No. 888,736

Int. Cl.⁴ B08B 3/02

U.S. Cl. 134—57 R

1 Claim



1. Apparatus for washing vehicles in a streak-free process, consisting essentially of

first, second and third arch-like body members each having top and side portions of height and width dimensions allowing a vehicle to move therethrough, support and guide means secured to said arches to support them upright and also to guide a vehicle through the arches,

said three arches being spaced apart and in alignment with each other so that a vehicle can be driven therethrough, conduit means and inwardly directed nozzles on the top and side portions of each arch,

first detergent means associated with said conduit means and nozzles of said first arch supplying an acidic detergent to said nozzles of said first arch in a pH range of 2 to 5 for initial washing of a vehicle,

second detergent means associated with said conduit means and nozzles of said second arch supplying an alkaline detergent to said nozzles of said second arch in a pH range of 10 to 13 for further washing a vehicle and neutralizing said acidic detergent,

water rinse means associated with said conduit means of said third arch supplying pressured water in a final step to said nozzles of said third arch for rinsing the detergents from the vehicle,

containers for each of said first and second detergent means having communication with said conduit means and nozzles,

electrically operated valved control means in said conduit means arranged to be energized at selected positions of a vehicle for sequential operation of said first detergent means, said second detergent means, and said water rinse means,

pressure means associated with said conduit means for pressurizing said first and second detergent means and rinse means,

and actuating means for said electrically operated valved control means.

4,715,392

AUTOMATIC PHOTOMASK OR RETICLE WASHING AND CLEANING SYSTEM

Nobutoshi Abe, Kawasaki, and Kazunori Imamura, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

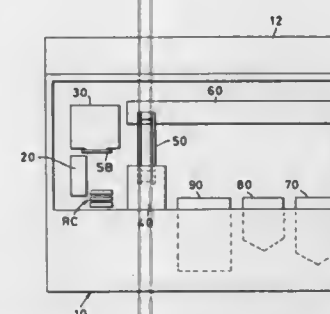
Continuation of Ser. No. 668,012, Nov. 5, 1984, abandoned. This application Feb. 4, 1987, Ser. No. 11,413

Claims priority, application Japan, Nov. 10, 1983, 58-211626; Nov. 18, 1983, 58-217434

Int. Cl.⁴ B08B 3/02

U.S. Cl. 134—62

9 Claims



1. A system for washing and cleaning the surfaces of a flat substrate horizontally encased in a case comprising:

means for inspecting foreign particles attached to the surface of said flat substrate, said inspecting means including first holder means for holding said flat substrate in a horizontal state;

means for washing the surface of said flat substrate so as to remove foreign particles attached to the surfaces of said flat substrate and including second holder means for holding said flat substrate in a vertical state and a washing unit for washing and cleaning the surface of said flat substrate held by said second holder means;

attitude change means for shifting the attitude of said flat substrate between the horizontal state and the vertical state;

first transfer means for withdrawing said flat substrate from said case and transferring said flat substrate to said second holder means through said attitude change means, the attitude of said flat substrate being changed from the horizontal state to the vertical state by said attitude change means;

second transfer means for transferring said flat substrate from said second holder means to said first holder means through said attitude change means, the attitude of said flat substrate being changed from the vertical state to the horizontal state by said attitude change means; and

third transfer means for transferring said flat substrate from said first holder means into said case.

4,715,393

FLUID DISPERSING CHECKVALVE

Gary D. Newton, 19473 County Rd. 35, Eckley, Colo. 80727

Filed Jul. 18, 1986, Ser. No. 887,886

Int. Cl.⁴ F16K 19/00

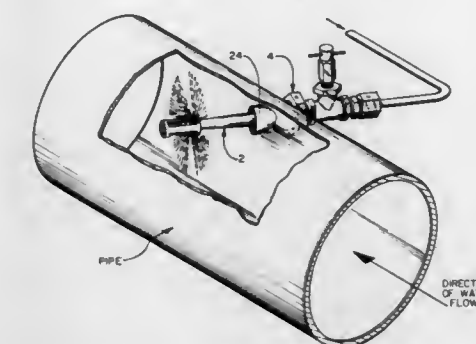
U.S. Cl. 137—7

10 Claims

8. A method for dispersing a fluid in a liquid stream which comprises:

- (a) flowing said fluid through a passage in a conduit;
- (b) exiting said fluid from said passage through an orifice;
- (c) displacing a valve from a valve seat circumscribing said orifice with said flow of fluid;
- (d) urging said valve against a valve retainer to move said valve retainer longitudinally in a slotted housing in oppo-

sition to a spring means compressing said spring means; and



(e) passing said fluid past said valve and through slots in said slotted housing and dispersing said fluid into said stream flowing past and through said slotted housing.

4,715,394

GAS SUPPLY SAFETY VALVE FOR EARTHQUAKE PROTECTION

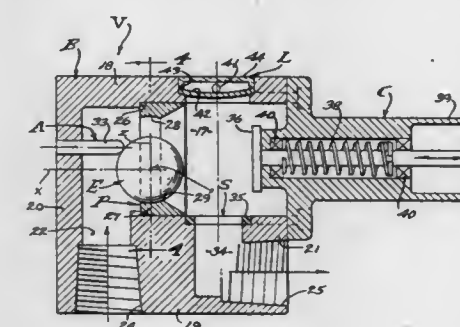
Michael S. O'Donnell, 10823 Whittle St., No. 9, North Hollywood, Calif. 91602, and Robert R. Graham, 1079 E. San Jose Ave., Burbank, Calif. 91501

Filed Sep. 19, 1986, Ser. No. 910,232

Int. Cl.⁴ F16K 17/36

U.S. Cl. 137—38

5 Claims



1. A normally open safety valve sensitive to close in response to longitudinal, transverse and vertical accelerations and including:

a body having a flow chamber therein with an inlet opening and an outlet opening,

a valve seat at the outlet opening,

a pedestal means within the chamber and comprised of an upwardly disposed transversely arcuate groove of concave cross sectional form having a rear edge and opposite side edges,

a ball valve normally set in a bottom dead center position of said groove and subject to accelerations of the body to roll by its inertia over any one of said edges,

the valve seat being lower than said edges to receive the ball valve,

and an abutment means comprised of a horizontally disposed pin at the front side of the pedestal means on an axis substantially above the center of and engaged with the periphery of the ball valve in its normally set bottom dead center position to prevent forward displacement thereof and to cause rearward rolling thereof subject to vertical as well as longitudinal accelerations of the body.

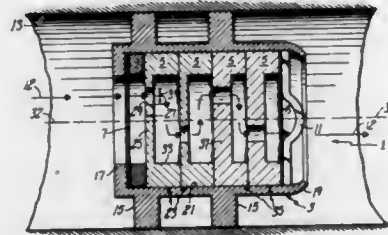
4,715,395 FLUID FLOW REGULATOR

Roy J. Mainelli, West Hartford, Conn., and Donald Preston, Agawam, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 30, 1986, Ser. No. 880,601
Int. Cl. F15D 1/02

U.S. Cl. 138—42

4 Claims



4. An apparatus having a series of spaced orifices for controlling a flow of fluid therethrough each orifice having a length L and a diameter D, said fluid having a specific gravity S which varies linearly and inversely over a temperature range, said series of spaced orifices being characterized by:

- a first set of orifices, each of said first set of orifices having a first L/D ratio and a first discharge coefficient corresponding to said first L/D ratio, said first discharge coefficient varying non-linearly over a temperature range;
- a second set of orifices, each of said second set of orifices having a second L/D ratio and a second discharge coefficient corresponding to said second L/D ratio, said second discharge coefficient varying non-linearly over a temperature range, said first L/D ratio and said second L/D ratio being dimensioned such that the first discharge coefficient relating to said first L/D ratio and said second discharge coefficient relating to said second L/D ratio coefficient offset changes to said specific gravity of said fuel over a temperature range thereby providing for a relatively constant flow of fuel over said temperature range.

4,715,396

PROPORTIONAL SOLENOID VALVE

Clarence D. Fox, Decatur, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

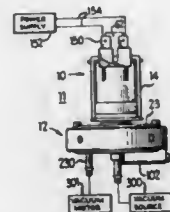
Continuation of Ser. No. 645,191, Aug. 29, 1984, Pat. No. 4,534,375, which is a continuation of Ser. No. 349,488, Feb. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 311,820, Oct. 16, 1981, abandoned. This application Aug. 2, 1985, Ser. No. 761,906

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl. F16K 31/06; F15C 3/00

U.S. Cl. 137—82

4 Claims



1. An electromechanical valve assembly, comprising an electrical winding;
- a magnetic flux circuit defining a flux path comprising a plurality of adjacent magnetic segments, including a generally cylindrical center segment which defines a fluid passage, an outer segment, and an end segment adjacent one end of said fluid passage, at least one of said segments being physically translatable within said valve assembly

along said flux path to adjust the portion of one of said segments that is in said flux path and the extent of an air gap adjacent the translatable segment;

- a non-magnetic seat member, having a central opening aligned with, and disposed near the other end of, the fluid passage;
- a magnetic closure member, positioned adjacent the non-magnetic seat and, with said magnetic segments, completing the flux path such that fluid flow urged by a predetermined pressure difference through the fluid passage and seat member central opening can be modulated by varying the energization level of the electrical winding, translation of the adjustable segment along said flux path being effective to vary the portion of one of said segments in said flux path and the air gap distance and thus vary the reluctance of the valve assembly for a given energization level of the electrical winding and given pressure difference.

4,715,397

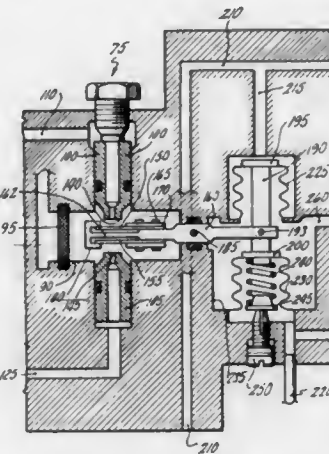
PRESSURE REGULATOR

Charles F. Stearns, Longmeadow, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 6, 1984, Ser. No. 638,338
Int. Cl. F15B 5/00

U.S. Cl. 137—84

4 Claims



1. A flow control system comprising a fluid operated control device, the operation of said flow control system being at least in part, determined by the setting of said control device in response to a difference in pressure thereacross of control fluid supplied thereto from a source of said fluid, said flow control system including a pressure regulator characterized by:

first and second orifices providing at least in part, fluid communication between said control device and said fluid source, modulation of fluid flow through said orifices determining said pressure difference across said control device;

first and second flappers disposed adjacent said first and second orifices, respectively, for varying the effective cross-sectional area of said orifices, thereby modulating flow therethrough for control of said pressure difference across said control device, said flappers and orifices being subject to fouling by contamination therebetween;

a lever having opposite sides on which said first and second flappers are mounted for the simultaneous positioning thereof with a single mechanical input to said lever;

first and second stiffening means connected to said first and second flappers, respectively, at outer surfaces thereon, each of said stiffening means unidirectionally stiffening a corresponding flapper in a direction parallel to the direction of flow through a corresponding orifice to prevent said flow from mispositioning said flapper while allowing flexure of said corresponding flapper in an opposite direc-

tion for minimizing any impediment to the normal operation of the other flapper due to the fouling of said corresponding flapper; and

said stiffening means further comprising stops engageable with outer portions of the ends of said flappers for limiting the travel thereof in directions parallel to said directions of flow through said orifices.

4,715,398

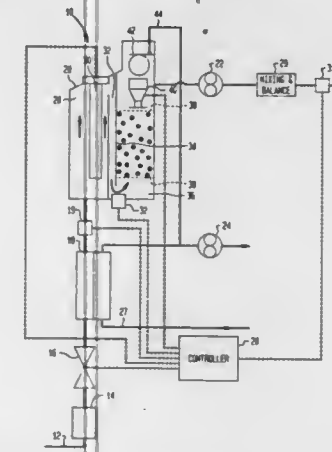
LIQUID LEVEL CONTROL

David R. Shouldice, Lakewood, and Dennis M. Treu, Morrison, both of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Oct. 30, 1986, Ser. No. 925,818
Int. Cl. B01D 19/00

U.S. Cl. 137—171

15 Claims



1. Fluid flow apparatus comprising
- a housing defining a deaeration chamber, a chamber inlet and a chamber outlet for the flow of liquid therethrough, said housing having a gas outlet at its top for the removal of gas volatilized from said liquid,
- a level sensor providing a control signal having a magnitude related to the level of liquid in said chamber,
- a valve hydraulically connected to said chamber inlet to control flow into said inlet,
- a pump connected to said chamber outlet,
- a source of negative pressure connected to said gas outlet, and
- a controller operably connected to alternately open and close said valve in a duty cycle responsive to the magnitude of said signal.

4,715,399

LIQUID-PROPELLANT MANAGEMENT SYSTEM FOR ROCKETS AND SPACE VEHICLES

Don E. Jaekle, Jr., 1042 Candlewood Ave., Sunnyvale, and R. K. Grove, 484 Panchita Way, Los Altos, both of Calif.

Filed Oct. 29, 1984, Ser. No. 665,657
Int. Cl. B64G 1/00

U.S. Cl. 137—209

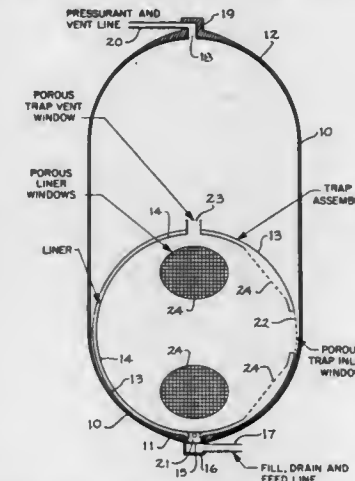
5 Claims

1. An apparatus for providing substantially gas-free liquid propellant to an engine, said apparatus comprising:

- (a) a hollow storage tank having a first opening and a second opening, said first opening being connectable to a first line through which said liquid propellant can be expelled from said tank to said engine, said second opening being connectable to a second line through which pressurized gas can be introduced into said tank to effect expulsion of said liquid propellant from said tank;
- (b) a hollow trap positioned within said tank, said trap having a porous inlet window for said liquid propellant and an exit port for said liquid propellant, said trap being secured to said tank so that said exit port of said trap communi-

cates with said first opening of said storage tank, said exit port of said trap being connectable to said first line; and

(c) a liner positioned within said trap, said liner being secured to said trap circumjacent said porous inlet window and circumjacent said exit port of said trap, said liner being spaced apart from said trap elsewhere within said trap to define a volume between said liner and said trap, said liner having a plurality of porous windows;



said porous inlet window of said trap and said porous windows of said liner having pores dimensioned to permit passage therethrough of said liquid propellant, said pores maintaining a barrier of said liquid propellant on said windows by surface tension when liquid propellant is not passing therethrough, said barrier precluding passage of said gas therethrough.

4,715,400

VALVE AND METHOD OF MAKING SAME

John F. Gardner, Loveland, and Thomas W. Showalter, Milford, both of Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

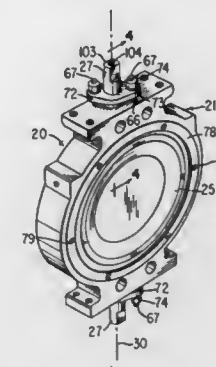
Division of Ser. No. 473,555, Mar. 9, 1983, Pat. No. 4,559,967. This application Dec. 23, 1985, Ser. No. 812,231

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

Int. Cl. F16K 49/00, 1/22

U.S. Cl. 137—341

9 Claims



1. In a fluid control butterfly valve comprising, a valve body structure having a fluid flow passage therethrough and first substantially annular sealing surface means around the periphery of said passage, and a rotatable closure structure for controlling fluid flow through said passage, said closure structure having second substantially annular sealing surface means around its periphery adapted to engage said first sealing surface means to shut off fluid flow through said valve, the im-

provement comprising substantially annular heat exchange means carried entirely by one of said structures and operating independently of the other of such structures, said annular heat exchange means corresponding in outline to and being disposed immediately adjacent yet in radially spaced relation with respect to an associated sealing surface means for controlling the temperature of at least its respective said associated sealing surface means, said substantially annular heat exchange means comprising electrical means, said substantially annular heat exchange means comprising substantially annular groove means in said one structure, said electrical means being disposed in said groove means, and further comprising an annular plate fastened over said annular groove means to hold said electrical means therein.

4,715,401

HOSE STORAGE ACCESS MEANS FOR SHIPMENT OF APPLIANCE

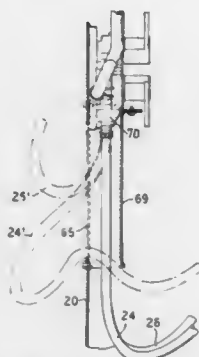
Paul R. Staun, St. Joseph Township, Berrien County; Robert M. Weir, St. Joseph, both of Mich., and Dean R. Sommerfeld, Green Springs, Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 30, 1986, Ser. No. 947,650

Int. Cl.⁴ A62C 35/00

U.S. Cl. 137—355.17

16 Claims



1. A cabinet for an appliance wherein the appliance has at least one hose with a free end to be attached to a conduit external of the cabinet, and the hose is stored internally of the cabinet during assembly and shipping of the appliance, comprising:

- an access port through said cabinet providing access to at least a portion of said hose;
- connecting means mounted onto an interior portion of said cabinet adjacent to said access port for attaching a fixed end of said hose to said appliance said fixed end of said hose attached to said connecting means, the free end of said hose being stored internally of said cabinet inaccessible from said port;

whereby selective removal of said free end of said hose from within said cabinet may be effected by grasping said accessible portion of said hose.

4,715,402

SHIPMENT HOSE STORAGE FOR APPLIANCES

Paul R. Staun, St. Joseph Township, Berrien County, and James R. Mulder, Berrien Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 30, 1986, Ser. No. 947,649

Int. Cl.⁴ A62C 35/00

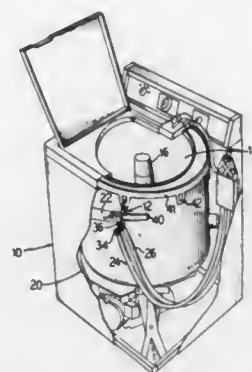
U.S. Cl. 137—355.17

15 Claims

1. A hose retainer for selectively removably securing free ends of a plurality of hoses to the interior of an appliance cabinet comprising:

- an elongated flexible sheet-form member sized and split to form a frangible hook for suspending the hose retainer to the interior of the appliance cabinet;

said member having a slit for removably receiving a free end of a first hose; and engagement means for securing a free end of at least one second hose;



4,715,403

FLOW CONTROL VALVE

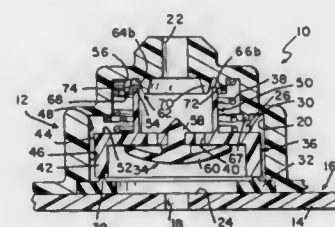
Emil Szlaga, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed Nov. 28, 1986, Ser. No. 935,814

Int. Cl.⁴ F16K 17/26, 24/00

U.S. Cl. 137—493.2

5 Claims



1. A flow-metering pressure-relief valve assembly for vehicle fuel tanks and the like, the assembly comprising a valve housing having an interior wall configured to define a chamber, inlet opening means for admitting fuel vapor into the chamber, and outlet opening means for exhausting fuel vapor from the chamber, the interior wall providing a first flow-metering surface situated in close proximity to the outlet opening means,
- a valve seat attached to the valve housing and situated in the chamber to surround the inlet opening means,
- a pressure-relief element in the chamber, the pressure-relief element including a valve member having an inner surface confronting the inlet means, and an upstanding skirt attached to the valve member and having a distal portion extending in an outward direction toward the outlet means in spaced relation to the interior wall of the valve housing, the distal portion providing a second flow-metering surface which cooperates with the first flow-metering surface to define a variable flow-metering orifice therebetween, and

biasing means for yieldably biasing the valve member against the valve seat normally to close the inlet opening means, the second flow-metering surface being moved in relation to the first flow-metering surface in response to relative movement of the valve member and the valve seat to vary the size of the variable flow-metering orifice, the first and second flow-metering surfaces having predetermined

shapes that are configured to meter the flow of pressurized fuel vapor through the variable flow-metering orifice in accordance with a predetermined specification matching the flow rate of fuel vapor exhausted through the outlet opening means to the magnitude of the pressure exposed to the inner surface of the valve member wherein the valve housing has a longitudinal axis and includes a first baffle depending from the interior wall and extending into the chamber in an axially-inward direction toward the valve member, the first baffle having a radially inwardly-facing surface, and a second baffle depending from the interior wall and extending into the chamber in an axially-inward direction toward the valve member, the first and second baffles being situated in radially spaced-apart relation to receive the distal portion of the upstanding skirt therebetween, the second baffle having a radially outwardly-facing surface which cooperates with the radially inwardly-facing surface of the first baffle to provide the first flow-metering surface.

4,715,404

ARRANGEMENT FOR DISASSEMBLING SEALING AND BEARING MEANS FROM ROTARY PIPE JOINTS

Joel Fusy, Barrault, France, assignor to FMC Corporation, Chicago, Ill.

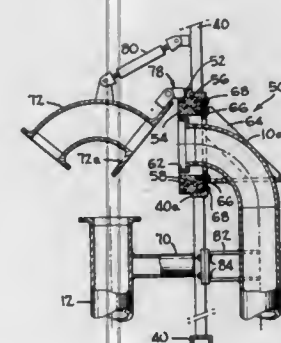
Filed Jan. 17, 1986, Ser. No. 820,476

Claims priority, application France, Jan. 17, 1985, 8500659

Int. Cl.⁴ F16L 27/00

U.S. Cl. 137—615

14 Claims



1. A loading arm, for transferring liquids, gases and particulate solids, comprising:
 - (a) a generally upstanding riser;
 - (b) an inner arm section pivotally mounted on the riser;
 - (c) an outer arm section;
 - (d) a rotary pipe joint pivotally interconnecting and removably attached to said inner and outer arm sections, said pipe joint comprising annular inner and outer elements interconnected for relative rotation by bearing means; and
 - (e) arm section support means attached to and extending from one of said arm sections and releasably attachable to the other arm section for rigidly interconnecting and supporting said arm sections in an arm-assembled position while the rotary pipe joint is removed from the arm.

4,715,405

SOLENOID VALVE, PARTICULARLY FOR APPARATUS FOR REMOVING A MILKING SET

Jan Kummer, Leeuwarden, Netherlands, assignor to Kummer Electronics B.V., Leeuwarden, Netherlands

Filed Mar. 20, 1987, Ser. No. 28,258

Claims priority, application Netherlands, Mar. 27, 1986, 8600802

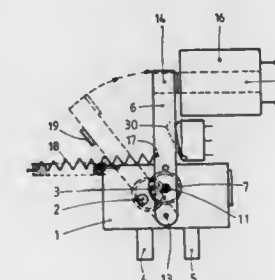
Int. Cl.⁴ F16K 11/074, 15/18, 31/02

U.S. Cl. 137—625.2

7 Claims

1. A valve for opening and closing respectively the communication between at least two fluid carrying conduits in which different pressures prevail, said valve having a valve body connected to a valve carrier and which is movable into two positions, the valve carrier being under the influence of a

spring and carrying a permanent magnet which in the one valve position is retained by the soft iron core of the solenoid, the coil of the solenoid being adapted to be supplied with a current pulse, so that the solenoid repulses the permanent magnet, so that under the influence of the spring the valve carrier is moved against an abutment in the other valve position, characterized in that the valve (7) is a three-way valve and the valve carrier (7) is adapted to be moved by hand (22) against the force of the spring (18) into the closed valve position, in which the permanent magnet (14) is retained under the



influence of the soft iron core (15) of the solenoid (15, 16), the fluid conduits (4, 5) opening into apertures (2, 3) in a planar surface of a connection block (1) and the valve body (7) being cup shaped of such dimensions and shape that it mutually communicates in the other valve position the outlet apertures (2, 3) while sealing with the planar surface, the valve carrier being a lever (6), which is rotatable around a pivot (13) provided in the connection block (1), the valve body (7) being secured to said lever adjacent to its pivot (13), the permanent magnet (14) being secured to the end of the lever (6) which is remote from the pivot (13).

4,715,406

CONTROL DISC VALVE

Hermann Kress, Filderstadt, Fed. Rep. of Germany, assignor to Hansa Metallwerke AG, Fed. Rep. of Germany

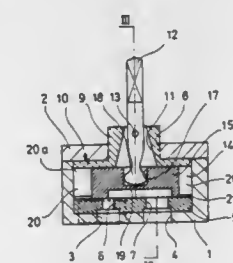
Filed Jun. 25, 1986, Ser. No. 878,243

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524149

Int. Cl.⁴ F16K 11/078, 31/72

U.S. Cl. 137—625.17

15 Claims



1. A control disc valve arrangement comprising in combination
 - (a) a housing,
 - (b) a stationary control disc fixedly positioned within said

housing and being in the form of a flat planar member having inlet ports located therein for the introduction of fluids from outside said housing, and at least one outlet port located therein which is adapted for the exit of fluids introduced through said inlet ports,

- (c) a movable control disc movably positioned within said housing and being in the form of a flat planar member having one surface adapted to slide back and forth relative to one flat surface of said stationary control disc,
- (d) a passageway in said movable control disc that is capable of controlling the flow of fluid between said inlet ports and said outlet port depending upon the position of said movable control disc with respect to said stationary control disc,
- (e) a closed chamber surrounding the perimeter of said movable control disc in such a manner that the movable control disc separates said closed chamber into two spaced apart smaller chambers in the manner of a piston,
- (f) a displacement path connecting said two smaller chambers, the cross-sectional area of said path being small in comparison to the cross-sectional area of either of said smaller chambers,
- (g) a fluid substance filling the space in said closed chamber that is not occupied by said movable control disc, and
- (h) means for moving said movable control disc from one position to another to thereby control the flow of fluid from said inlet ports to said outlet port whereby the movement of said movable control disc changes the relative volumes of said two spaced apart smaller chambers and such movement is slowed while said fluid substance in said closed chamber is forced from one smaller chamber to the other smaller chamber through said displacement path by virtue of the piston-like action of said movable control disc.

4,715,407

SPOOL VALVE ASSEMBLY

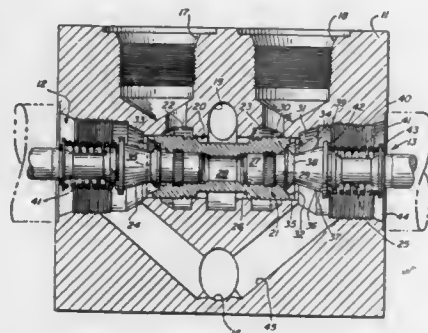
Felix Aranovich, Skokie, Ill., assignor to Clevite Industries Inc., Glenview, Ill.

Filed Oct. 14, 1986, Ser. No. 918,237

Int. Cl.⁴ F15B 13/044

U.S. Cl. 137—625.65

16 Claims



1. In a fluid flow control valve having a block defining a spool valve chamber, and ports communicating with said chamber, an improved spool valve assembly comprising:

- a tubular spool having an axial bore defining an end portion, and an annular end provided with at least one axially outwardly opening notch;
- a spool end having an inner end portion fixedly secured to said spool in said bore end portion, an intermediate portion defining a first, frustoconical axially outwardly narrowing radially outer surface concentrically within said annular end of the spool, and a second, frustoconical, axially outwardly widening radially outer surface extending axially outwardly from the axially outer end of said first frustoconical surface and axially outwardly of said

spool annular end, said outer surface facing substantially directly toward one of said block ports; and means for selectively positioning the spool in said chamber.

4,715,408

GAUZE OR LENO HARNESS FOR WEAVING MACHINES

Franz Eisenlohr, Im Bühl, Tettwil, Switzerland

PCT No. PCT/CH86/00116, § 371 Date Jan. 20, 1987, § 102(e)

Date Jan. 20, 1987, PCT Pub. No. WO87/01398, PCT Pub.

Date Mar. 12, 1987

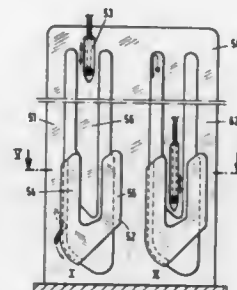
PCT Filed Aug. 11, 1986, Ser. No. 15,860

Claims priority, application European Pat. Off., Sep. 2, 1985, EP85111068.4

Int. Cl.⁴ D03D 47/40

U.S. Cl. 139—54

13 Claims



8. A leno harness for a weaving machine comprising a frame-like carrier having a central web, a pair of lanes on opposite sides of said web for guiding a crossing yarn therein and a passage having an inclined base connecting said lanes with each other for guiding the crossing yarn therebetween;
- a guide for a standing yarn mounted centrally of said lanes for reciprocating movement relative to said web during a shed change; and
- a guide element having a pair of arms extending about said web with a clearance at least equal to the thickness of the crossing yarn and with each arm disposed in a respective lane, and a yoke interconnecting said arms and resting on said base.

4,715,409

DEVICE FOR COUPLING A HEDDLE FRAME WITH A DRIVING ELEMENT

Martin Graf, Horgenberg, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

Filed Nov. 5, 1986, Ser. No. 927,165

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3541042

Int. Cl.⁴ D03C 13/00

U.S. Cl. 139—88

7 Claims



1. A device for coupling a heddle frame with an oscillatory drive element comprising, a pair of coupling elements which are engageable one into the other and which, in use, are respec-

tively disposed on a frame stave of said heddle frame and on said oscillatory drive element, a bolt latch comprising a pivotally mounted part of one of the coupling elements and being capable of pressing against the other coupling element when the coupling elements are engaged, the bolt latch having wedge surfaces extending transversely to the direction of drive and arranged to co-operate with matching surfaces on the other coupling element when the latch is pressed against it to produce a positive locking of the coupling elements in the engaged position, a toggle lever hinged to the bolt latch for operating the bolt latch and being pivotally mounted on said one coupling element, said toggle lever being pivotable against the action of a compression spring into an over dead center position in which the bolt latch is in the locking position, the toggle lever comprising an operating lever and a lever element interconnected by a joint, the lever element being hinged at one end to the bolt latch, and the compression spring abutting on said joint and on the end of the lever element which is connected to the bolt latch.

4,715,410

WEAVING LOOM

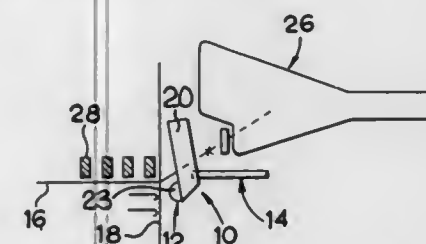
John D. Griffith, Cleaton, England, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 16, 1986, Ser. No. 908,044

Int. Cl.⁴ D03D 47/48

U.S. Cl. 139—434

5 Claims



1. Apparatus for turning a weft yarn into a warp shed for creating of a selvage, the apparatus including a movable guide which in a first position is located outside the warp sheet to receive the end of the weft yarn after weft insertion, said guide being movable to a second position located within the warp shed so that said guide serves to separate the upper and lower warp threads adjacent the fell of the warp shed prior to turning in of the weft yarn end and to thereby prevent snagging of the end of the weft yarn on the upper and lower warp threads, and a fluid jet nozzle associated with said guide, said jet nozzle being positioned to direct a flow of fluid along said guide for carrying the end of the weft yarn into the warp shed and through said guide after said guide has moved to said second position.

5. A method of turning the end of a weft yarn into a warp shed for creation of a selvage, the method including receiving the end of a weft yarn protruding from the warp sheet in a movable guide, after beat-up moving the guide into the newly formed warp shed to separate the upper and lower warp threads adjacent the fell of the warp shed prior to turning in of the weft yarn end and to thereby provide a passageway for the end of the weft yarn, directing a flow of fluid along the passageway to move the end of the weft yarn into the warp shed and through the passageway provided by the inwardly moved guide to prevent snagging of the end of the weft yarn on the upper and lower warp threads, removing the guide from the warp shed while maintaining said flow of fluid for maintaining the end of the weft yarn in position until beat-up of the subsequently inserted weft yarn.

4,715,411

SPEED CONTROL FOR WEFT FEED SPOOL IN WEAVING LOOMS

Philippe Van Bogaert, Brussels, and Filip Deconinck, Zwevegem, both of Belgium, assignors to Picanol N.V., Belgium

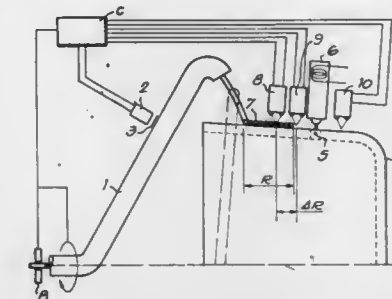
Filed Aug. 13, 1985, Ser. No. 765,221

Claims priority, application Belgium, Sep. 4, 1984, 2/60490

Int. Cl.⁴ D03D 47/36; B65H 51/20

U.S. Cl. 139—452

8 Claims



1. A method for controlling the speed of a weft feed spool in a weaving loom comprising: detecting at least two items of data related to weft delivery and supply, and loom operation; detecting by a weft reserve sensor the average minimum desired length of weft reserve on the spool; calculating from the detected data the variation from the average minimum desired reserve in terms of number of windings on the spool; calculating, as a function of the calculated variance in the number of windings from the average minimum reserve, any adjustment needed to the speed of the weft feed spool; controlling the weft feed spool speed as a function of said calculated adjustment.

4,715,412

METHOD AND APPARATUS FOR CHECK-WEIGHING CHARGES FOR CONTAINERS

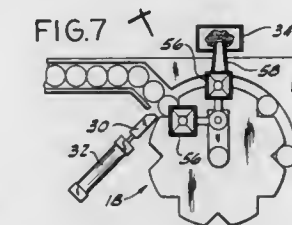
Nicholas J. Perazzo, Green Bay, Wis., assignor to Bemis Company, Inc., Minneapolis, Minn.

Filed Aug. 22, 1985, Ser. No. 768,205

Int. Cl.⁴ B65B 1/32, 1/28

U.S. Cl. 141—1

15 Claims



4. Apparatus for filling a sequential supply of containers with charges of product while intermittently checking the weight of selected charges, comprising: conveyor means for conveying a sequential supply of containers in at least one row and in predetermined spaced relation; container filling means disposed adjacent the conveyor means for delivering a measured charge of product to each container as the container is conveyed by said conveyor means past said container filling means; product weighing means disposed adjacent the filling means for receiving therefrom a charge of product which otherwise would have been delivered to a container;

means upstream of the filling means for creating a space on the conveyor means at a location for a container corresponding to the charge weighed by the weighing means; and
means for diverting to said weighing means the charge which otherwise would have been delivered to said space.

4,715,413

APPARATUS FOR MANIPULATING SMALL VOLUMES OF LIQUID

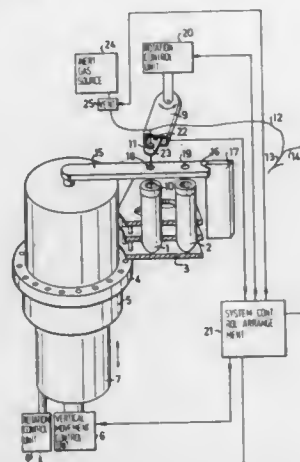
Ulf E. H. H. Backlund, Tolvmansvägen 27, S-191 71 Sollentuna, and Carl U. Ungerstedt, Mjölnerstigen 11, S-181 46 Lidingö, both of Sweden

Filed Oct. 8, 1986, Ser. No. 916,634

Claims priority, application Sweden, Oct. 18, 1985, 8504910
Int. Cl.⁴ B65B 3/04

U.S. Cl. 141-94

7 Claims



1. Apparatus for manipulating a small quantity of liquid, comprising at least one vessel for accommodating said quantity of liquid, a cannula suspension arrangement having a cannula capable of being inserted into said vessel, and a control arrangement which positions the cannula in the bottom of the vessel, the cannula suspension arrangement including a pressure sensor which is coupled to the control arrangement and which acts on the control arrangement when the tip of the cannula is subjected to a force acting axially to the cannula above a given level to stop further insertion of the cannula into the vessel.

4,715,414

CONCENTRIC WELL-TYPE EXTRACTOR TUBE FOR FILLING CONTAINERS WITH PRESSURIZED FLUID

David C. Harrison, Emmer Green, and Brian Glover, Camperley, both of England, assignors to Grundy Dispense Systems, Inc., Canoga Park, Calif.

Continuation-in-part of Ser. No. 700,085, Feb. 11, 1985, abandoned. This application Oct. 15, 1986, Ser. No. 919,314

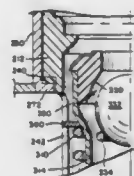
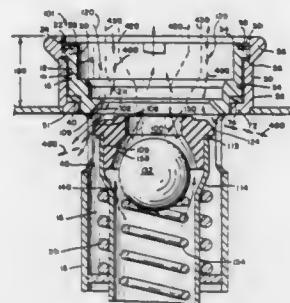
Int. Cl.⁴ F16L 37/12; B65B 3/18

U.S. Cl. 141-302

20 Claims

1. An extractor tube assembly for use with a container which includes sidewalls, comprising:
a. a valve neck for attaching said extractor tube assembly to the container, said valve neck comprising an upper and lower surface;
b. a valve body retained within said valve neck;
c. a valve housing member attached to said valve body adjacent to the lower surface of said valve neck, said valve housing member depending from said valve body and including a depending basket portion having at least one opening therein;
d. a first valve assembly including a first valve seat and a

movable first valve member, both seated within said valve body;
e. an elongated siphon tube attached to said moveable first valve member;
f. retaining means for retaining said moveable first valve member against said first valve seat to maintain said first valve assembly in a normally closed position;
g. a second valve assembly seated within said first valve assembly;
h. said elongated siphon tube further comprising an elongated cylindrical portion and a widened neck portion at the top of said elongated siphon tube; and



i. deflector means comprising a deflector plate retained between said widened neck portion of said elongated siphon tube and said retaining means;
j. whereby when said first valve assembly is in an opened position, a flow path for fluid is defined such that fluid enters the extractor tube assembly, travels in the flow path defined between said first valve seat and said first valve member, is deflected by said deflector means and then travels directly out said at least one opening in said depending basket portion of said valve housing member and against said sidewalls of the container and thereafter into the container.

4,715,415

MOULDING ROUTING APPARATUS

M. Bosley Wright, 2501 Greenspring Valley Rd., Owings Mills, Md. 21117

Continuation of Ser. No. 719,770, Apr. 4, 1985, Pat. No. 4,632,160. This application Dec. 22, 1986, Ser. No. 944,180
The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

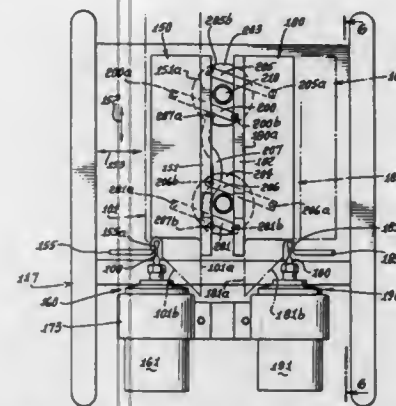
Int. Cl.⁴ B27C 5/00

U.S. Cl. 144-136 R

9 Claims

1. In apparatus for cutting an insert groove in a longitudinally elongated moulding having a backside and mitred end, the combination comprising:
(a) a first base, and a first guide surface on the base to engage the back side of the moulding thereby to position the moulding directionally laterally, and to extend directionally longitudinally;
(b) a first stop to engage and position the mitred end of the moulding, thereby to position the moulding longitudinally;
(c) clamp means movable to engage the positioned moulding and retain the moulding on the base;
(d) a first router and a rotary drive therefor, the router projecting into lapping relation with said mitred end of the moulding;
(e) and means to guide bodily displacement of the first rotat-

ing router relative to the base to directionally engage and penetrate the mitred end of the moulding, thereby to



produce said groove, the router thereafter being side-wardly removable from said groove.

4,715,416

SKI COVER

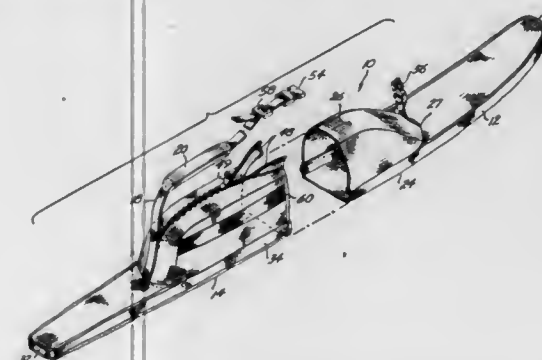
Kenneth A. Horne, Bainbridge Island, Wash., assignor to Connelly Skis, Inc., Lynnwood, Wash.

Continuation of Ser. No. 794,654, Nov. 4, 1985, abandoned. This application Mar. 3, 1987, Ser. No. 21,605

Int. Cl.⁴ A63C 11/00; B65D 37/00, 65/02

U.S. Cl. 150-52 R

6 Claims



1. A ski cover comprising:

(a) an elongate first sleeve having a closed end and an open end, the first sleeve being formed from flexible material and adapted to slide over a first end of a ski such that said closed end is adjacent said first end of said ski, the open end of the first sleeve being enlarged relative to the remaining portion of the first sleeve;
(b) an elongate second sleeve having a closed end and an open end, the second sleeve being formed from flexible material and adapted to slide over a second end of said ski such that said closed end of said second sleeve is adjacent the second end of said ski, the open end of the second sleeve being enlarged relative to the remaining portion of the second sleeve, the ski cover being configured so that when the first and second sleeves are slid over their associated ski ends the enlarged portion of one of the sleeves slidably overlaps the enlarged portion of the other sleeve thereby to adjust the length of the ski cover to the length of the ski being carried within the cover whereby the closed end of the first sleeve is positioned against the first end of the ski and the closed end of the second sleeve is positioned against the second end of the ski; and
(c) strap means interconnected between both sleeves for securing the overlapping first and second sleeves together such that when the ski cover, with the ski contained therein, is held by the strap means, the strap means applies

a load on each sleeve in a direction toward the other sleeve thereby tending to maintain the closed ends of the sleeves positioned against corresponding ends of the ski.

4,715,417

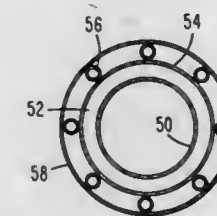
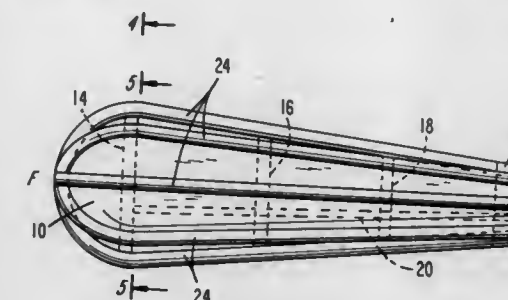
AIRCRAFT FUEL TANK

Wayne H. Coloney, P.O. Box 668, Tallahassee, Fla. 32302
Filed Aug. 20, 1986, Ser. No. 898,426

Int. Cl.⁴ B65D 90/12, 8/14; B64D 37/04

U.S. Cl. 150-55

5 Claims



1. A fuel tank adapted for mounting on the exterior of an aircraft comprising in combination

(a) a liquid fuel chamber constructed of a flexible liquid-impervious member and in the general shape of an elongated tear drop or other suitably aerodynamic shape,
(b) at least one passageway for the introduction or removal of liquid from said fuel chamber,
(c) a plurality of inflatable ribs attached to the outside walls of said liquid fuel chamber, said ribs
(1) being composed of tubes of flexible material that can be inflated with gas or liquid,
(2) being connected to means for inflating and deflating said tubular inflatable ribs,
(3) being attached to said flexible liquid-impervious membrane in a pattern at spaced apart intervals extending from the front portion to the rear portion of said fuel tank that, when said tubular ribs are inflated with a gas or liquid, will result in a strong supporting framework that establishes the maximum volumetric configuration and shape of said flexible liquid-impervious membrane and will cause it to be structurally strong enough to maintain its aerodynamic shape and qualities during flight at very high speeds, whether it is empty or filled with fuel, and configured in such a manner that when empty and demounted from the aircraft the ribs may be de-inflated, thus permitting the liquid fuel chamber to be collapsed to an essentially flattened condition that may be folded or rolled into a compact unit that occupies much less space than said maximum volumetric configuration, and
(d) an outer envelope of flexible material surrounding said plurality of inflatable ribs, said outer envelope being parallel to and spaced outwardly from said liquid fuel chamber.

4,715,418

PNEUMATIC TIRES HAVING HIGH UNIFORMITY
Shoji Miyoshi, Osaka, and Ryuichi Nomura, Hyogo, both of Japan, assignors to Toyo Rubber Industry Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 620,523, Jun. 12, 1984, abandoned, which is a continuation of Ser. No. 354,517, Mar. 3, 1982, abandoned. This application Jun. 17, 1985, Ser. No. 744,896

Claims priority, application Japan, Mar. 4, 1981, 56-30646
Int. Cl.⁴ D02G 3/48

U.S. Cl. 152—451

3 Claims

1. A pneumatic tire cord produced according to a method including the following steps:

- spinning polyester into a filament under tension at the solidifying point of melt polyester between 1.5×10^7 and 7.5×10^7 dyne/cm² and at a winding speed of 1,000 to 3,000 m/min;
- drawing the polyester into a filament at a draw ratio of 2.0 to 3.0;
- twisting a plurality of the polyester filaments into a strand and twisting a plurality of said strands into a cord; and
- heat treating the polyester cord, wherein the filament has an ethylene terephthalate component of at least 85 mol %, a high degree of polymerization such that the intrinsic viscosity is greater than 0.8 and a ratio of the birefringence of the surface portion to that of the central portion from 1.03/1 to 1.15/1, and the cord has a twist coefficient in the range of from 800 to 2,500, and a dimension unstabilizing factor 8.5 or less, wherein the twist coefficient is equal to $T \times \sqrt{D}$, T being the average value between the number of turns of a first twist of the plurality of filaments into the strand and the number of turns of a final twist of the plurality of strands into the cord, each being per 10 cm of cord, and D being the denier of the cord, and wherein the dimension unstabilizing factor is defined as the sum of the elongation (%) at a load of 2.3 g/d and the thermal shrinkage (%) when heated at 150° C. in dry air for 30 minutes.

4,715,419

LARGE-SIZE PNEUMATIC RADIAL TIRE FOR USE ON ROUGH ROAD WITH BELT HAVING SPECIFIED CORD
Kiyohito Kawasaki, Michitaka Sato, both of Akiyawa; Hiroyuki Koseki, Ohmiya, and Tamotsu Matsunuma, Urawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Nov. 28, 1984, Ser. No. 675,591

Claims priority, application Japan, Nov. 28, 1983, 58-222212
Int. Cl.⁴ B60C 9/00; D07B 1/06

U.S. Cl. 152—527

7 Claims



1. A large-size pneumatic radial tire for use on rough road comprising as a tire reinforcement; a carcass ply of cords arranged in a direction substantially perpendicular to the equatorial plane of the tire and a belt composed of at least three cord layers each containing steel cords embedded parallel to each other in rubber and arranged at a relatively small angle with respect to the equatorial plane of the tire, at least two adjacent cord layers of said cord layers of the belt being piled one upon the other to cross their cords with each other at an angle of 15°–30° with respect to the equatorial plane, an outermost cord layer for said belt comprising a cord layer formed by embedding a plurality of twisted steel cords, each having an elongation at break of 3.0–5.5% and a single layer construction of 1×3, 1×4, or 1×5 or a double layer construction with a core of 1 to 2 filaments obtained by twisting plural steel fila-

ments shaped prior to the formation of cord at a twisting angle of 10–20 without a wrap filament in rubber at a cord volume fraction of 5–40%, which is expressed by a percentage of the sum of sectional areas of cords included in an area of a region defined by a bisector between a line passing through centers of the cords in the outermost cord layer for the belt and a line passing through centers of the cords in an inner cord layer adjacent to the outermost cord layer and borderline between the tread and the outermost cord layer in section perpendicular to the circumferential direction of the belt, in such a manner that the form of penetrating rubber into the inside of the cord is a sealing type penetration from wherein a portion of the cord having an inner space completely filled with the penetrated rubber and a longitudinal length l_1 is alternately connected with a portion of the cord having an inner space incompletely filled with the penetrated rubber and a longitudinal length l_2 in the longitudinal direction of the cord so as to satisfy l_2 of not more than 10 mm and l_1/l_2 of not less than 0.14.

4,715,420

PNEUMATIC TIRE FOR PASSENGER CAR

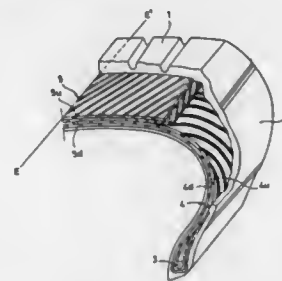
Kazuyuki Kabe, and Tuneso Morikawa, both of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 609,118, May 11, 1984. This application Jun. 4, 1986, Ser. No. 873,092

Claims priority, application Japan, Jun. 13, 1983, 58-104263
Int. Cl.⁴ B60C 9/06

U.S. Cl. 152—557

2 Claims



1. In a pneumatic tire of the type comprising a pair of right and left beads, a pair of right and left side walls containing said beads, respectively, a tread interposed between said side walls, a carcass cord layer spread between said beads, and at least two layers consisting of a belt reinforcing layer having reinforcing cords having a cord angle of from 15° to 30° with respect to the circumferential direction of the tire and a belt reinforcing layer having reinforcing cords having a cord angle of from 150° to 165° with respect to the circumferential direction of the tire, said belt reinforcing layers being laminated and disposed between said tread and said carcass cord layer, and said carcass cord layer having a two-layered laminate structure consisting of upper and lower carcass cord layers with each layer having reinforcing cords, the angle of said reinforcing cords of each of said carcass cord layers with respect to the circumferential direction of the tire, when measured from the side in which the angle of the reinforcing cords of said belt reinforcing layer on the contact side with said carcass cord layer describes an acute angle with respect to the circumferential direction of the tire, is such that the mean value $\frac{1}{2}(\alpha_1 + \alpha_2)$ of the angle α_2 of the reinforcing cords of said upper carcass cord adjacent said belt reinforcing layer and the angle α_1 of the reinforcing cords of said lower carcass cord layer is from 96° to 108° and their difference $(\alpha_2 - \alpha_1)$ is from 10° to 40°, and said upper carcass cord layer comprising reinforcing cords of nylon fibers and said lower carcass cord layer comprising reinforcing cords of polyester fibers with tension of said cords of both upper and lower carcass cord layers being substantially uniform.

4,715,421

ROLLER SHUTTER WITH JALOUSIE-TYPE LOUVERS
Günther Erber, Völkermarktstr. 355, A-9020 Klagenfurt, Austria

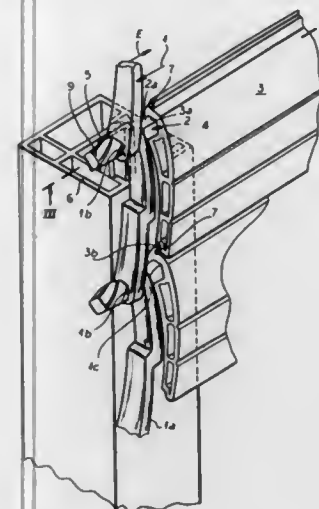
Filed May 15, 1985, Ser. No. 734,398

Claims priority, application European Pat. Off., Oct. 25, 1984, 84890199.7

Int. Cl.⁴ E06B 9/08

U.S. Cl. 160—133

16 Claims



1. A roller shutter comprising:
an array of louvers each formed with bearing-pin members projecting from opposite ends of each louver and defining a pivot axis for the respective louver in a longitudinal direction thereof;
respective chains flanking said louvers and having links receiving said bearing-pin members, each of said bearing-pin member cooperating with a respective journal member, each journal member and the respective bearing-pin member being provided with mating screw formations; and
means for shifting at least one of said chains in said direction linearly so as to cause relative movement of the respective journal member and the respective bearing-pin member so as to swing said louvers about the respective axes between open and closed louver positions.

4,715,422

REINFORCEMENT OF ARTICLES OF CAST METAL OR METAL ALLOY

Norman Tommis, Bradford, and James A. Cooper, Lutterworth, both of England, assignors to AE PLC, Warwickshire, England

Continuation-in-part of Ser. No. 653,219, filed as PCT GB84/00009 Jan. 16, 1984, published as WO84/02927 on Aug. 2, 1984, abandoned. This PCT application Jan. 16, 1984, Ser. No. 852,099

Claims priority, application United Kingdom, Jan. 18, 1983, 8301320

Int. Cl.⁴ B22D 19/14

U.S. Cl. 164—97

8 Claims

1. A method of manufacturing a reinforcement for incorporation in a cast article of metal or metal alloy, and comprising:
milling fibres or whiskers,
dispersing a mass of milled fibres or whiskers in a solution of colloidal silica,
adding starch to the dispersed milled fibres or whiskers in said colloidal silica solution to prevent settling,
adding latex to the dispersed milled fibres or whiskers in said colloidal silica solution,

precipitating said latex to bend the milled fibres or whiskers together,
forming a compact of said latex bound milled fibres or whiskers,
drying the compact, and
firing the compact to disperse the latex and to leave the milled fibres or whiskers of the compact bound together, by said silica.
8. A method of manufacturing a piston for an internal combustion engine comprising:
placing in a casting mould a reinforcement according to claim 1,
introducing into said mould under gravity a molten material selected from aluminium or an aluminium alloy,
closing said mould,
applying pressure to said molten material to force said molten material into said reinforcement,
solidifying said molten metal under said pressure to form said piston.

4,715,423

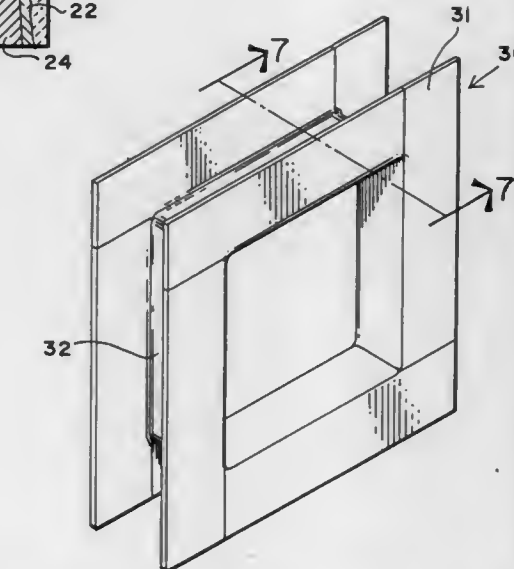
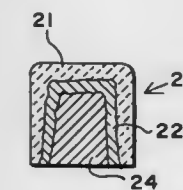
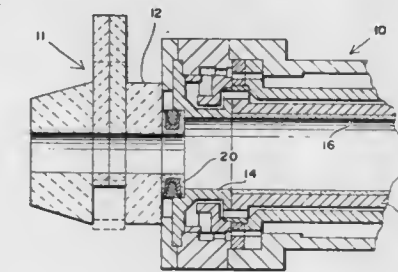
COMPOSITE BREAK RING METHOD

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Division of Ser. No. 795,837, Nov. 7, 1985. This application Jan. 27, 1987, Ser. No. 6,793
Int. Cl.⁴ B22D 19/00

U.S. Cl. 164—98

3 Claims



1. The method of forming a composite break ring comprising the steps of,
forming a ring shaped mold having a frame body portion with a U-shaped cross-section the interior portion of

which is the bottom of the U and a base defining the interior dimension of the intended break ring, temperature heating of a material to form the skin of the break ring and spraying the same interiorly of the mold, temperature heating of the substrate skin beneath the first skin and applying the same in intimate contact to the first skin to thereby form an interior shell of the break ring, and filling the balance of the body of the break ring with a third material.

4,715,424 BREAKER PAD

Alan P. B. Brown, 25 Karen Avenue, Lambton Gardens, Germiston, Transvaal, and Ian B. Reeves, Germiston, both of South Africa, assignors to Alan Paul Blakley Brown, Germiston, South Africa

Filed Jun. 16, 1986, Ser. No. 874,991
Claims priority, application South Africa, Jun. 20, 1985, 85/4642

Int. Cl.⁴ B22D 31/00
U.S. Cl. 164—264 13 Claims



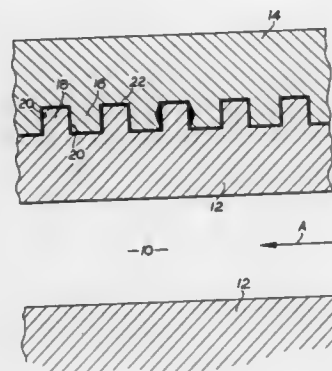
1. A breaker pad which is formed with an orifice through which, in use, material flows, the wall of the orifice, viewed in a first direction which is substantially in-line with the direction of material flow through the orifice, including a plurality of angular formations which extend generally towards a central region of the orifice, each respective pair of adjacent angular formations having between them an angular recess which extends generally away from the said central region of the orifice.

4,715,425 CASTING MOULD

Richard W. Brosch, Sutton Coldfield, United Kingdom, assignor to Lymore Limited, United Kingdom
Continuation of Ser. No. 319,255, Nov. 9, 1981. This application Mar. 26, 1987, Ser. No. 30,883

Claims priority, application United Kingdom, Nov. 22, 1980, 8037513

Int. Cl.⁴ B22D 11/00
U.S. Cl. 164—418 13 Claims



1. A mould assembly for continuous casting comprising a lining formed as a layer of a lubricious non-wetting material defining a solidification chamber into which molten metal is flowed in use, and a cooling jacket having a cooling system through which liquid coolant is passed in use including a layer of metal interposed between said lining layer and the coolant, wherein the improvement comprises said layers being cemented together by a bonding agent at the interface between

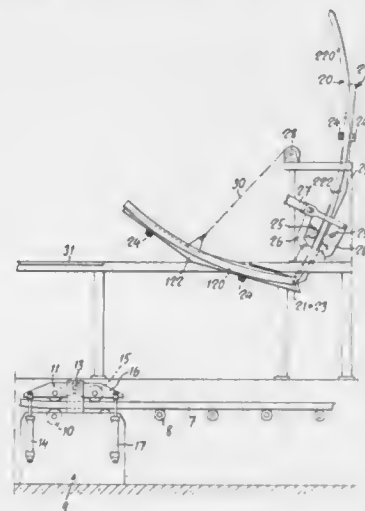
them; said layers having interfitting protruberances in the form of complementary close fitting rib and groove formations at said interface, at least some of said protruberances including re-entrant portions whose shaping allows the layers to be assembled together facewise-on and provides a mechanical key resisting subsequent separation of the layers due to the groove formations being filled with the bonding agent on assembly.

4,715,426 MACHINE FOR THE CURVED CONTINUOUS CASTING WITH RIGID STARTING BAR

Luciano Klauicic, Gorizia, Italy, assignor to Continua International Continuous Casting S.p.A., Italy

Filed Nov. 7, 1986, Ser. No. 928,808
Claims priority, application Italy, Nov. 27, 1985, 12611 A/85
Int. Cl.⁴ B22D 11/08

U.S. Cl. 164—426 9 Claims



1. A machine for the curved continuous casting of metals, particularly steel, including a mold for producing a cast strand, a curved casting path leading from said mold to a substantially horizontal cast strand path, a reversible extractor-straightener means for straightening and advancing said cast strand and a starting bar having a head and a tail end, said starting bar having substantially the same curvature as the curved casting path and being positionable between a starting position wherein the head end closes the mold and the tail end is engaged by said extractor-straightener means and a stowed position disengaged from said mold and said extractor-straightener means above said substantially horizontal cast strand path, the improvement comprising:

- a starting bar having a leading rigid segment, a trailing rigid segment, and means for pivotally connecting said segments together in succession; and
- a folding starting bar support-guide means including a displaceable portion and means for pivotally connecting said displaceable portion to said support-guide means; said folding starting bar support-guide means being specially adapted so that the pivotal connecting means of said starting bar and said support-guide means may be brought into register when said starting bar is in the stowed position and the displaceable portion folded with the leading segment of said starting bar so as to move the head end of the starting bar away from the cast strand path to a readily accessible position.

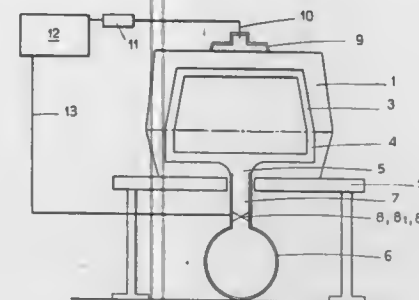
4,715,427 PROCESS AND APPARATUS FOR AUTOMATING A BAKING CYCLE UNDER HOT AIR OF SAND MOLDS

Pierre L. Merrien, Billere, and Pierre A. Merrien, Sceaux, both of France, assignors to Etude et Developpement en Metallurgie, Billere, France
Continuation of Ser. No. 631,521, Jul. 18, 1984, Pat. No. 4,573,522, which is a continuation of Ser. No. 210,623, Nov. 26, 1980, abandoned. This application Oct. 10, 1985, Ser. No. 786,065

Claims priority, application France, Nov. 28, 1979, 79 29227
The portion of the term of this patent subsequent to Mar. 4, 2003, has been disclaimed.

Int. Cl.⁴ B22C 9/12

U.S. Cl. 164—456 27 Claims



1. A method of ensuring the proper removal of volatile organic materials from an object, said method comprising the steps of:

- (a) determining an optimal concentration removal rate of volatile organic materials to be evaporated from an object as a function of time; and
- (b) heating said object in such a manner that the concentration of volatile organic materials evaporating from said object as a function of time substantially conforms to said optimal concentration removal rate.

16. An apparatus for ensuring the proper removal of volatile organic materials from an object, said apparatus comprising:

- (a) means for determining an optimal concentration removal rate of volatile organic materials evaporating from an object as a function of time; and
- (b) means for heating said object in such a manner that the concentration of volatile organic materials evaporating from said object as a function of time substantially conforms to said optimal concentration removal rate.

4,715,428

METHOD AND APPARATUS FOR DIRECT CASTING OF CRYSTALLINE STRIP BY RADIANT COOLING

Robert H. Johns, and John D. Nauman, both of Natrona Heights, Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 650,371, Sep. 13, 1984, abandoned. This application Jun. 18, 1986, Ser. No. 876,309

Int. Cl.⁴ B22D 11/06

U.S. Cl. 164—463 3 Claims

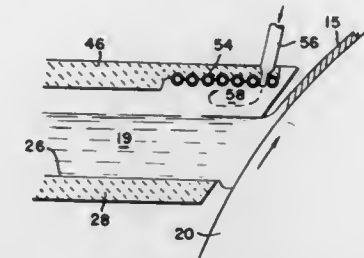
1. Method of directly casting molten metal to continuous strip of crystalline metal, comprising:

- flowing molten metal from a generally U-shaped structure of an exit end of a casting vessel onto an adjacent casting surface, the structure having edges substantially parallel to the casting surface and having a planar bottom wall and diverging inside sidewalls opening upwardly;
- moving the casting surface generally upwardly past the exit end of the casting vessel at a predetermined distance therefrom to solidify the molten metal into strip form; and
- additionally facilitating radiant cooling of the molten metal by a cooling means spaced from and in a zone defined above the molten metal top surface to extract heat therefrom, across the width of the U-shaped structure and

adjacent the casting surface to affect the as-cast strip surface quality and structure.

2. An apparatus for directly casting molten metal to continuous strip of crystalline metal, comprising:

- movable casting surface upon which molten metal solidifies into strip form;
- casting vessel having an exit end including a U-shaped structure for flowing molten metal onto the moving casting surface adjacent thereto at a predetermined distance, the



structure having edges substantially parallel to the casting surface and having a planar bottom wall and diverging inside sidewalls opening upwardly; and means for facilitating radiant cooling of the molten metal, said cooling means being spaced from and in a zone defined above the molten metal top surface to extract heat therefrom, across the width of the U-shaped opening and adjacent the casting surface to affect the as-cast strip surface quality and structure.

4,715,429

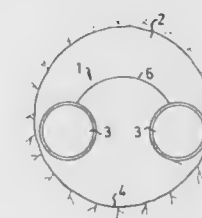
METHOD AND MEANS FOR APPLYING A HEAT EXCHANGER IN A DRILL HOLE FOR THE PURPOSE OF HEAT RECOVERY OR STORAGE

Palne Mogensen, Emblavägen 29, S-182 63 Djursholm, Sweden
Filed Jun. 16, 1986, Ser. No. 874,962

Claims priority, application Sweden, Jul. 2, 1985, 8503288

Int. Cl.⁴ F25D 23/12

U.S. Cl. 165—45 7 Claims



1. A method for applying a heat exchanger in a drill hole in rock, loose soils or the like for the purpose of heat recovery or storage, achieving a more efficient heat transfer between the defining surface of the drill hole and a heat transporting medium contained in the heat exchanger, the steps comprising: lowering substantially parallel heat-exchanging pipes into position in a drill hole and with said heat-exchanging pipes in said position, expanding said heat-exchanging pipes in a radial direction into at least partial contact with the defining surface of said drill hole by increasing the distance between said pipes.

4,715,430

ENVIRONMENTALLY SECURE AND THERMALLY EFFICIENT HEAT SINK ASSEMBLY

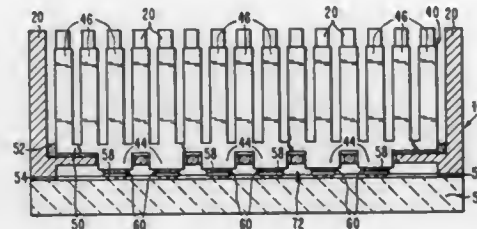
Allen J. Arnold, La Grangeville; Mark G. Courtney, Poughkeepsie; Diane N. Kirby, Poughkeepsie; Katherine H. Mis, Poughkeepsie, and Kerry L. Sutton, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1986, Ser. No. 923,456

Int. Cl.⁴ H01L 23/40

U.S. Cl. 165—80.3

16 Claims



1. A thermally efficient and environmentally secure heat sink for cooling a semiconductor module comprising, in combination:

a frame member having a base portion thereof, said base portion having a rim, formed around the perimeter of said base portion and extending from one side thereof, for contacting a surface of a module to be cooled thereby, said frame member having first heat radiating means for removing heat therefrom disposed around the perimeter of said base portion and disposed on the side opposite said rim and projecting in a direction opposite said rim, said frame member including a support surface disposed inward of said heat radiating means;

a high thermal conductivity member including a base region with a flange which, in use, rests on said support surface, said base region having a plurality of projections each of which extends beyond said support surface toward the surface of the module to be cooled but does not extend beyond the plane in which said rim lies, said high thermal conductivity member including second means to radiate heat extending in a direction opposite said projections a distance, in use, which is less than the extent of projection of said first heat radiating means;

said frame member being constructed of a material having a thermal coefficient of expansion substantially the same as the thermal coefficient of expansion of the module to which the heat sink is to be attached; and environmentally secure means to bond said high thermal conductivity member to said support surface of said frame member so that the bond therebetween is not permeable and remains not permeable after repeated thermal cycling of the heat sink.

4,715,431

REBOILER-CONDENSER WITH BOILING AND CONDENSING SURFACES ENHANCED BY EXTRUSION

Alexander Schwarz, Allentown, Pa.; Charles E. Kalb, East Northport, N.Y., and Charles C. Goebel, Westfield, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 9, 1986, Ser. No. 872,310

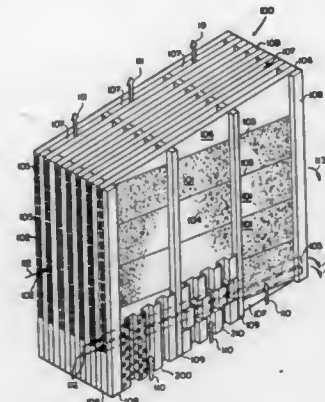
Int. Cl.⁴ F28F 3/04, 3/12; F28D 9/02

U.S. Cl. 105—110

10 Claims

1. A heat exchanger for reboiler-condenser service which comprises: a plurality of extruded passageways of a thermally conductive material comprising one or more internal longitudinal channels, means for condensate film thinning on all surfaces of said internal longitudinal channels, and means for promoting boiling on only two opposing exterior surfaces of the extruded passageway assembled in individual stacks, with said exterior without the means for promoting boiling of each of passageways juxtaposed to that of its neighbor, a plurality of stacks

assembled in side-by-side relationship with said enhanced exterior boiling surface of said stack facing the means for promoting boiling of its neighboring stack, the individual stack of passageways is so assembled so that the longitudinal axes of said passageways are inclined from the horizontal without being vertical, thereby defining downward sloping condensing



channels, with interposing support bars interposed between the exterior means for promoting boiling of neighboring stack of passageways; said support bars facing each other being vertical thereby defining vertical boiling channels; means for joining said support bars and passageways; and means for closing vertical edges between alternating pairs of passageways wherein the means for promoting boiling face each other.

4,715,432

AIR-COOLED TUBE CONDENSER

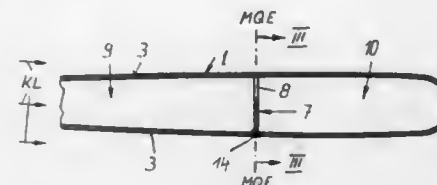
Paul Paikert, Witten, Fed. Rep. of Germany, assignor to GEA Luftkuehlergesellschaft Happel GmbH & Co., Bochum, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 738,024, May 24, 1985, abandoned. This application Aug. 5, 1986, Ser. No. 893,564 Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419734

Int. Cl.⁴ F28B 1/00

U.S. Cl. 165—110

4 Claims



1. An air-cooled surface condenser comprising a plurality of heat exchanger tubes provided with transverse fins and being elongated in the direction of cooling air flow and being all arranged in a single row extending transversely of the direction of air flow and each having a length many times greater than the width of the tube and being rounded at ends thereof, each finned heat exchanger tube having a changing cross-sectional area from one end to another end in said direction and including two continually changing portions which are symmetrical relative to a central plane of elongation of the tube, each tube having a front end portion and a rear end portion, as viewed in said direction, each tube having a cross-section which continually increases in the direction of elongation of the tube from said front end portion to said rear end portion and having opposite side walls each of which is slightly curved outwardly over the length of the tube from said front end portion to said rear end portion, each tube having an internal separating wall extended in a middle transverse plane of the tube and projecting over the entire depth of the tube, said

separating wall being formed with a plurality of spaced perforations provided in the region of one of said opposite side walls over the entire length of said separating wall whereby each tube is rigid and permitting a condensate collected in the tube to be drained in two separate streams while an excessive vapor in one of halves of the tubes separated by said separating wall can penetrate into another half of the tube through said perforations.

4,715,433

REBOILER-CONDENSER WITH DOUBLY-ENHANCED PLATES

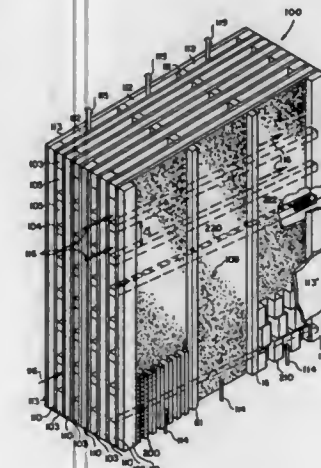
Alexander Schwarz, Allentown, Pa., and Charles E. Kalb, East Northport, N.Y., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 9, 1986, Ser. No. 872,299

Int. Cl.⁴ F28F 3/04, 3/12; F28D 9/02

U.S. Cl. 165—110

12 Claims



1. A heat exchanger for reboiler-condenser service which comprises: a plurality of plates of a thermally conductive material; with said plates having substantially horizontal and vertical edges and, on opposite sides of each plate, means for condensate film thinning and means for promoting boiling, respectively; said sheets assembled in a stack, with the means for condensate film thinning of each pair of plates facing each other and the means for promoting boiling of each pair of plates facing each other, with a plurality of interposing support bars, thereby defining between successive plates respective flow passages; said support bars between each pair of plates with the means for condensate film thinning facing each other extending between the vertical edges of each said pair of plates and being inclined from horizontal thereby defining downward sloping condensing channels and providing a primary means for drainage of condensate, and said support bars between each pair of plates with the means for promoting boiling facing each other being vertical thereby defining vertical boiling channels; means for joining said support bars and plates; first means for closing the horizontal edges between alternating pairs of plates with the means for condensate film thinning facing each other; and second means for closing vertical edges between alternating pairs of plates with the means for promoting boiling facing each other.

4,715,434

FLUID TREATMENT PRESSURE VESSEL WITH A DISPOSABLE CARTRIDGE AND VALVE THEREFOR

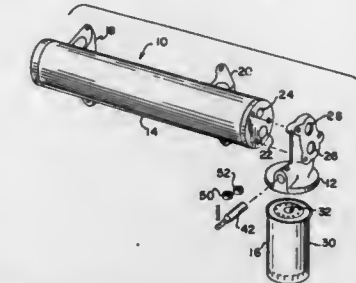
Gabriel J. Rudavicius, Lemont, Ill., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Dec. 19, 1985, Ser. No. 810,943

Int. Cl.⁴ F28F 13/12

U.S. Cl. 165—119

1 Claim



1. For an internal combustion engine, a cooling fluid treatment and lubricating oil heat exchanger pressure vessel arrangement with a removable fluid treatment cartridge comprising:

a header having primary cooling fluid high and low pressure communicative passages, a cartridge inlet fluidly connected with said high pressure passage, a cartridge outlet fluidly connected with said low pressure passage, and a linear passage intersecting said cartridge inlet and outlet; a lubricating-oil-to-coolant exchanger connected with said header having a high pressure coolant inlet connected with said primary high pressure passage of said header and a coolant outlet fluidly connected with said low pressure passage of said header, and said heat exchanger having a lubricating oil inlet and a lubricating oil outlet; a rotatable valve spool inserted within said linear bore of said header having a pair of axially separated traversing apertures positionally aligned with said cooling fluid inlet and outlet; deformable sleeves axially aligned with and inserted within said cooling fluid treatment inlet and outlet, said deformable sleeves being separated by said valve spool; and a cooling fluid treatment container sealably connected with said header surrounding said cartridge.

4,715,435

DUAL PUMP FOR TWO SEPARATE FLUIDS WITH MEANS FOR HEAT EXCHANGE BETWEEN THE FLUIDS

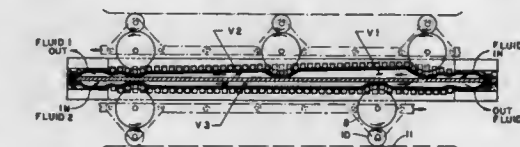
Claude H. Foret, 7122 Jordan Ave., Apt. 7, Canoga Park 91303

Filed Mar. 6, 1986, Ser. No. 836,759

Int. Cl.⁴ F04B 43/12; F28F 7/00

U.S. Cl. 165—120

15 Claims



12. A heat exchanging pump for two separate fluids, comprising a platen extending along a linear path, a bulged diaphragm secured at its edges to the edges of said platen to provide therewith a conduit, means to progressively compress a portion of said diaphragm against said platen along said path to constitute a peristaltic pump, and a second conduit including the opposite side of said platen, said platen being of a heat transmitting character, there being an inlet and an outlet for said first mentioned conduit connectable to a source and destination respectively, of the first of said fluids, and an inlet and outlet for said second conduit, connectable to a source and

destination, respectively, of the second of said fluids, separate from said first fluid.

4,715,436

CONSTRUCTION OF A HEAT TRANSFER WALL OF A HEAT TRANSFER PIPE

Kenji Takahashi, Abiko; Heikichi Kuwahara, Ibaraki; Takehiko Yanagida, Tsuchiura; Wataru Nakayama, Kashiwa; Kiyoshi Oizumi, Tsuchiura, and Shigeo Sugimoto, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

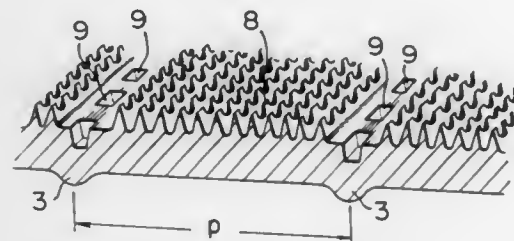
Filed Sep. 18, 1985, Ser. No. 777,362

Claims priority, application Japan, Oct. 5, 1984, 59-208290

Int. Cl.⁴ F28F 13/18, 19/02

U.S. Cl. 165—133

1 Claim



1. A heat transfer tube comprising:

- at least one row of projections provided on an inner surface of said heat transfer tube at regular intervals along a spiral curve thereof, said projections having smooth curved surfaces formed by plastic deformation of a part of said heat transfer tube which is effected by pressing a rolling disc provided with tooth means against an outer surface of said heat transfer tube, said projections having a height ranging from 0.45 mm to 0.6 mm, a pitch along the spiral curve ranging from 3.5 mm to 5 mm, and a pitch in an axial direction ranging from 5 mm to 9 mm;
- a plurality of parallel minute grooves formed at a minute pitch on the outer surface thereof;
- a plurality of minute fins provided between said grooves; and
- notches formed on said minute fins and having a depth smaller than said grooves; and
- wherein a forward end of each of said fins is sharply pointed.

4,715,437

HEAT EXCHANGER

Hiroyoshi Tanaka, Kyoto; Masaaki Adachi, Nara; Yoshiyuki Tsuda, Suita; Toshiaki Ando, Yawata; Humitoshi Nishiwaki, Nishinomiya, and Shigeo Aoyama, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Apr. 14, 1986, Ser. No. 851,507

Claims priority, application Japan, Apr. 19, 1985, 60-83833; May 24, 1985, 60-112445

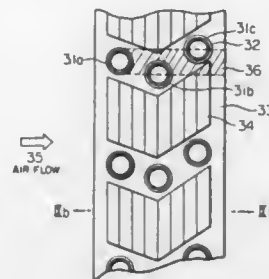
Int. Cl.⁴ F28D 1/04

U.S. Cl. 165—151

2 Claims

1. A heat exchanger, comprising: (a) a plurality of plate-shaped fins positioned in spaced parallel relationship with one another; and (b) a plurality of substantially parallel heat-transfer tubes intersecting said plurality of fins, said heat-transfer tubes being disposed in a plurality of non-linear rows oriented along a predetermined direction in a longitudinal dimension of said fins, said predetermined direction being adapted to correspond to a primary air flow direction of air passing between said fins, said fins including a plurality of cutouts opening toward said predetermined direction, said cutouts being provided between adjacent ones of said rows of heat-transfer tubes, a downstream-side projection area of each of said heat-transfer tubes located on an upstream side of said predetermined direction relative to said primary air flow direction

partially overlaps the position of at least one of said heat-transfer tubes disposed on the downstream side of said predetermined direction, each of said cutouts being substantially channel-shaped and comprising two sides of cutting lines facing the air flow and two legs connecting each cutout with its associated fin, said two legs being inclined relative to said predetermined



mined direction, a plurality of said channel-shaped cutouts being successively, discretely disposed and oriented in a slantwise direction relative to said predetermined direction in a repetitive pattern such that the legs of said respective cutouts are aligned along respective directions which extend generally parallel to a line connecting at least two adjacent heat transfer tubes in one of said rows of heat transfer tubes.

4,715,438

STAGGERED RADIAL-FIN HEAT SINK DEVICE FOR INTEGRATED CIRCUIT PACKAGE

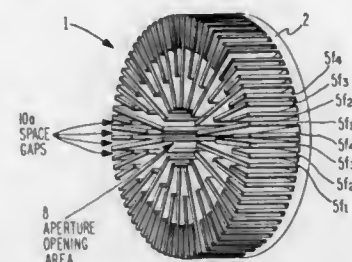
Paul G. Gabuzda, Laguna Beach, and Sanford V. Terrell, Laguna Hills, both of Calif., assignors to Unisys Corporation, Detroit, Mich.

Filed Jun. 30, 1986, Ser. No. 880,427

Int. Cl.⁴ F28F 7/00

U.S. Cl. 165—185

6 Claims



1. A heat sink device for attachment to an integrated circuit package and placed perpendicular to an impinging air flow, said device comprising:

- (a) a circular metallic base plate attachable to an integrated circuit package unit, and supporting a plurality of metallic fin elements wherein the said base plate includes:
 - (a1) a hemispheric dome at the center of said base plate for the purpose of receiving and dispersing said impinging air flow directed perpendicular to said base plate;
 - (b) said plurality of metallic fin elements equally spaced with air space interstices around the periphery of said base plate wherein said fin elements constitute a pattern of long, intermediate and short lengths oriented in the radial direction to form a repetitive sector pattern wherein said repetitive sector pattern includes:
 - (b1) a sequence of said radial fin element lengths which follow the pattern of long-short-intermediate-short, which pattern repeats through each sector of the circumference of said heat sink device; and wherein
 - (b2) the width of each of said plurality of fin elements is of the same dimension, and
 - (b3) the width of each of the said air space interstices

between adjacent fin elements is substantially the same as the width of each of said fin elements;

(c) a central cylindrical open space situated at the central area of said base plate to permit the perpendicular impingement of said air flow onto said base plate.

4,715,439

WELL CAP

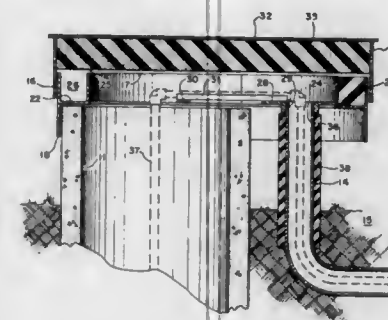
Roy E. Fleming, Rte. 1, Box 741, McKenney, Va. 23872

Filed Mar. 3, 1987, Ser. No. 21,215

Int. Cl.⁴ E21B 33/04

U.S. Cl. 166—68

5 Claims



1. A well cap adapted to be positioned atop the circular cylindrical casing of a well which accumulates potable subterranean water, said well cap comprising:

- (A) a lower member having (1) a continuous outer sidewall of uniform height between upper and lower extremities and configured to be vertically disposed in a perimeter comprised of a large circular arc and an outlying region extending radially and horizontally away from the large circular arc and terminating in an extremity shaped as an arc of a circle of smaller radius than the radius of said large arc, (2) a horizontally disposed shelf attached to said outer sidewall and extending a uniform distance inwardly with respect to said perimeter, (3) a floor panel disposed horizontally within said outlying region in substantially coplanar alignment with said shelf and having a circular aperture adjacent the circular arc extremity of said outlying region, (4) a first support beam extending diametrically through the center of said large circular arc and joined to opposed sides of said shelf, (5) a second support beam joined to the center of said first support beam and extending to the circular aperture of said outlying region while resting upon said floor panel, and (6) thermal insulation disposed upon said shelf about said perimeter to a height even with the upper extremity of said sidewall,
- (B) an upper member comprised of (1) a flat panel having a perimeter which matches the perimeter of the outer sidewall of said lower member, (2) a continuous boundary wall of uniform height perpendicularly disposed to said flat panel about its entire perimeter, and (3) self-supporting thermal insulation which covers said flat panel to a uniform height, and
- (C) a circular cylindrical tube having an upper extremity which joins the circular aperture of said outlying region and a continuous annular zone of self-supporting thermal insulation, said tube being oriented to extend vertically into the ground adjacent said well casing, whereby
- (D) when the upper member is seated upon the lower member, and the lower member is seated upon said well casing, a pump suspended within said well by said first support beam can pump water through a conduit which extends upwardly above said first support beam, runs horizontally toward the circular aperture in said outlying region, thence downwardly through said tube to a depth below the prevailing frost line and thence to a distributor line which extends to the point of ultimate water use, the

water in said conduit being protected from freezing during its transfer from the well to said distributor line.

4,715,440

DOWNHOLE TOOLS

Timothy G. Boxell, Haslemere; Frank B. Bardsley, Andover, and David E. Stoddart, Stroud, all of England, assignors to Gearhart Tesel Limited, Basingstoke, England

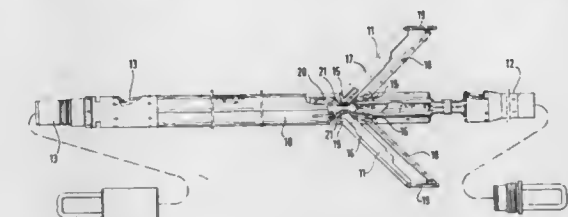
Filed Jul. 14, 1986, Ser. No. 885,241

Claims priority, application United Kingdom, Jul. 25, 1985, 8518823

U.S. Cl. 166—100

Int. Cl.⁴ E21B 47/00

36 Claims



1. A tool for use downhole comprising an elongate body, a plurality of arm means movably mounted on the body, and means for controlling movement of the arm means between an operational position in which the arm means extend outwardly with respect to the body and a retracted position, the arm means movement controlling means comprising a motor, presser means movable rectilinearly in response to operation of the motor and independent resilient means located between said presser means and each of said arm means for permitting independent movement of said arm means in response to force exerted on said arm means by surrounding material.

4,715,441

SIDE POCKET MANDREL

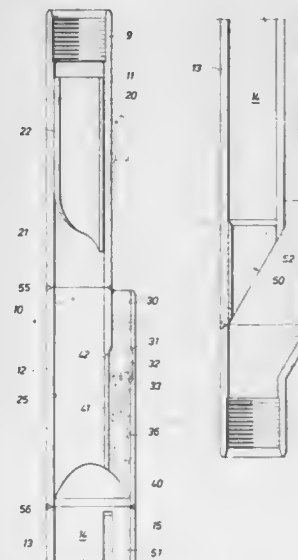
Douglass W. Crawford; William B. Crawford, both of P.O. Box 51, Atwood Akers, Crowley, La. 70526, and Mark S. Crawford, 501 Kaiser Dr., Lafayette, La. 70508

Filed Oct. 18, 1985, Ser. No. 789,313

Int. Cl.⁴ E21B 23/03

U.S. Cl. 166—117.5

20 Claims



1. A side pocket mandrel comprising: a tubular body section having a hollow interior that defines a main bore to one side thereof and another bore to the other side thereof; a short-length seating section welded to one end of said body section,

said seating section having a main bore formed to one side thereof aligned with said main bore in said body section, and a valve seating bore formed on the other side thereof generally aligned with said other bore, said seating bore having a polish section adjacent its outer end, said outer end opening through an exterior end surface of said mandrel, said seating bore having a recessed section adjacent said polish section, said recessed section providing an inwardly facing stop shoulder at one end thereof and a latch shoulder at the other end thereof facing said stop shoulder; and a tubular member welded to said seating section in axial alignment with said main bores, the axis of said polish section of said seating bore being inclined toward the axes of said main bores at a small angle.

4,715,442

APPARATUS FOR SERVICING TUBULAR STRINGS IN SUBTERRANEAN WELLS

John E. Kahl; Mark S. Jaynes, and Kirby R. Harrell, all of Houston, Tex., assignors to PA Incorporated, Houston, Tex. Continuation of Ser. No. 599,163, Apr. 11, 1984, abandoned.

This application Feb. 10, 1986, Ser. No. 808,936

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.⁴ G01N 27/82; G01R 33/12

U.S. Cl. 166—250

13 Claims



1. Apparatus for use in servicing a tubular string formed from a series of interconnected tubular sections used in subterranean oil or gas wells, the apparatus including a substantially horizontal floor and a structure positionable over the well head for sequentially hoisting and lowering individual tubular sections of the tubular string through the floor relative to the well head; the improvement comprising: an annular defect detecting housing fixedly positioned on the well head below the floor in surrounding relation to the path of the sequentially removed tubular sections; a plurality of insulating segments rotationally fixed with respect to the housing and mounted in said annular housing for radial movement between an inner detecting position and an outer position for clearing obstructions carried by the tubular sections; means for limiting radially inward movement of the insulating segments to the inner detecting position spaced outwardly from engagement with the tubular sections; means for detecting an approaching obstruction on any tubular section for concurrently shifting said insulating segments to said outer position; a plurality of detecting means mounted on said insulating segments in surrounding relation to the path travelled by the sequentially removed tubular sections; and said detecting means comprising means for determining the existence of a plurality of different defects in each tubular

section as each tubular section is passed through the annular defect detecting housing.

4,715,443

BAFFLE SYSTEM FOR CONDUCTING WELL TREATING OPERATIONS

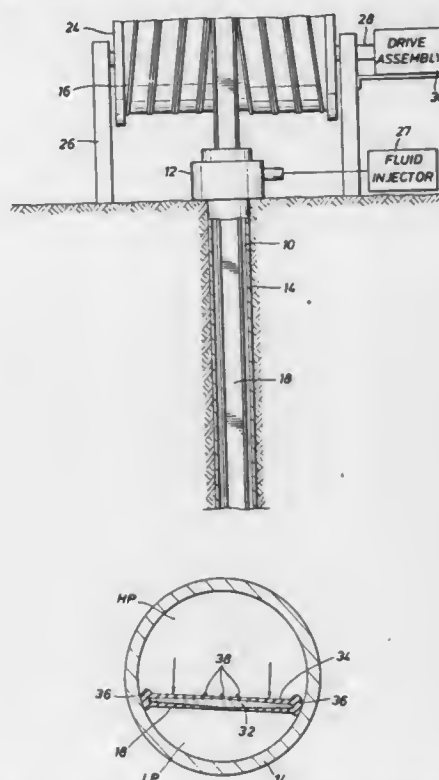
John L. Gidley, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Dec. 4, 1986, Ser. No. 937,779

Int. Cl.⁴ E21B 19/22, 33/10, 47/00

U.S. Cl. 166—250

36 Claims



1. A baffle system for segmenting a tubular member into a first conduit and a second conduit, said baffle system capable of withstanding a pressure differential between said first conduit and said second conduit, comprising:

- a core positionably insertable into said tubular member substantially coaxial with said tubular member to segment said tubular member into a first conduit and a second conduit;
- a sleeve surrounding said core; and
- sealing means extending from said sleeve to be engageable with the inner surface of said tubular member for forming a seal between said first conduit and said second conduit.

24. A method for segmenting tubing in a well bore, comprising the steps of:

- positionably inserting a baffle into said tubing so said baffle is substantially coaxial with said tubing to segment said tubing into a first conduit and a second conduit, said baffle comprising a core, a sleeve surrounding said core, and sealing means extending from said sleeve to be engageable with the inner surface of said tubing; and
- injecting a fluid into said first conduit at a sufficient pressure so that said sealing means of said baffle contacts the inner surface of said tubing to form a fluid seal between said first conduit and said second conduit.

4,715,444

METHOD FOR RECOVERY OF HYDROCARBONS

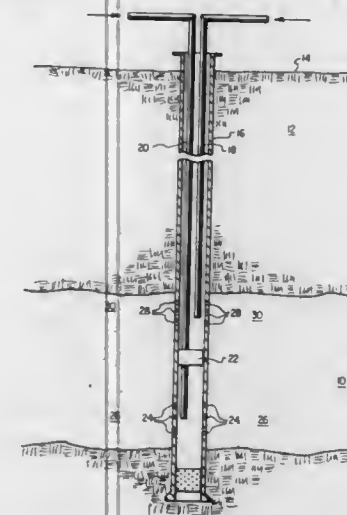
Donald J. MacAllister, Carrollton, and Virginia W. Pennington, Dallas, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 27, 1986, Ser. No. 923,241

Int. Cl.⁴ E21B 43/16, 43/20

U.S. Cl. 166—269

3 Claims



1. A method for recovering hydrocarbons from a subterranean hydrocarbon-containing formation penetrated by at least two wellbores, said method comprising:

- (a) Injecting a gaseous stream into said formation near the bottom of said formation through a first wellbore said gas being gaseous at the temperature and pressure in said formation and selected from the group consisting of carbon dioxide, nitrogen, light hydrocarbon gases and mixtures thereof;
- (b) Injecting a liquid aqueous stream into said formation near the top of said formation through said first wellbore; and
- (c) Recovering hydrocarbons from said formation through a second wellbore wherein said gaseous stream and said aqueous stream are injected substantially simultaneously and substantially continuously.

4,715,445

LATCH AND RETRIEVING ASSEMBLY

Sidney K. Smith, Jr., Huntsville, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 9, 1986, Ser. No. 939,652

Int. Cl.⁴ E21B 23/00, 31/20

U.S. Cl. 166—377

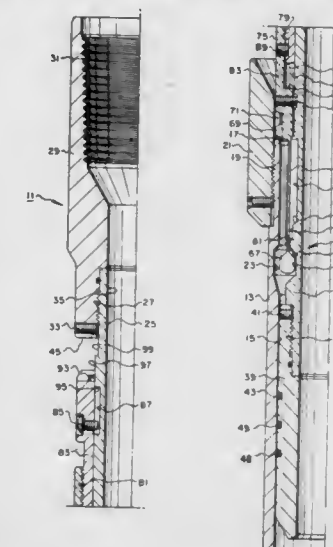
7 Claims

1. A latch and retrieving assembly for use with a well tool having an axial bore, the wall of the bore having an internal landing shoulder and an annular latch recess spaced below the landing shoulder, the assembly comprising:

- a mandrel insertable in the bore of the well tool, the mandrel having upper connecting means for connection in a well pipe string extending to the well surface;
- a lower abutment on the mandrel;
- a collet member slidably mounted about the mandrel, the collet member including a carrier ring seatable on the shoulder and a plurality of elongate, resilient fingers depending from the carrier ring and terminating in radially enlarged tips disposed in registration with the recess when the carrier ring is seated on the landing shoulder, the tips cooperating with the lower abutment to latch into and to be released from the recess respectively in response to downward movement of the mandrel;

the lower abutment including a carrying groove adjacent a lowermost extent of the mandrel, an upwardly slanting wall region which joins the carrying groove to a plateau region, and a downwardly slanting wall region which

joins the plateau region to a releasing groove, whereby downward movement of the mandrel moves the collet tips onto the plateau region and radially outward into latching engagement with the recess and whereby continued downward movement of the mandrel moves the releasing groove beneath the collet tips to allow inward radial movement of the collet tips for disengagement with the recess, the plateau region having a retaining shoulder for



engaging the collet tips which allows downward relative movement of the mandrel but thereafter restricts upward relative movement; and

wherein the collet carrier ring includes a plurality of radially extending torque lugs which are received within mating slots in the bore of the well tool whereby torque transmitted from the well surface through the pipe string is transmitted from the collet to the well tool.

4,715,446

DEVICE AND METHOD FOR THE TEMPORARY PROTECTION OF A WORKING TOOL OR MEASURING INSTRUMENT FIXED TO THE END OF A DRILL STRING

Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Pétrole, Rueil-Malmaison, France

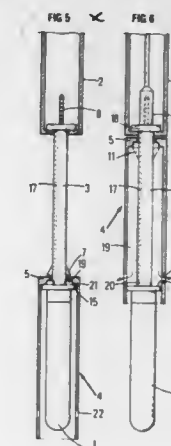
Filed Jun. 19, 1986, Ser. No. 875,975

Claims priority, application France, Jun. 19, 1985, 85 09434

Int. Cl.⁴ E21B 23/00

U.S. Cl. 166—381

16 Claims



1. A retractable protective device for a specialized tool for working in a well with said tool being fixed to the end of a drill

string, said device comprising a casing for protecting said tool, said drill string having substantially at its end and before said tool a first guide member and said casing having a second guide member, said first and second guide members being adapted for cooperating with each other so as to allow relative movement of said casing with respect to said tool and to said drill string.

7. A method for protecting a specialized tool for operating in a well with a casing and for using the tool within the well, said tool being fixed to the end of a drill string and said casing being mounted for sliding relative to an assembly formed by said tool and said drill string, which comprises positioning said tool in the well within the casing and effecting relative movement of the casing with respect to said tool and to said drill string to position the tool outside of said casing.

4,715,447

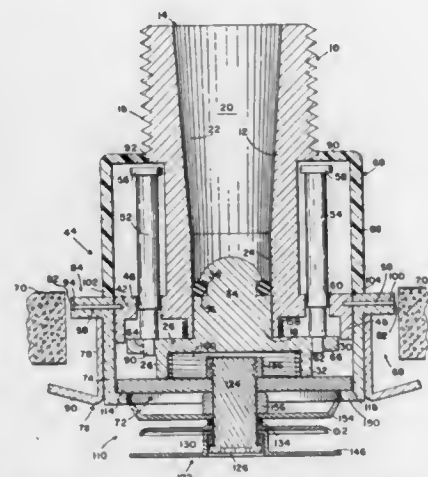
QUICK RESPONSE AUTOMATIC FIRE SPRINKLER HEAD

Kimball W. Johnson, 36 Rocky Hill Rd., Oxford, Mass. 05140
Continuation-in-part of Ser. No. 732,677, May 10, 1985, Pat. No. 4,596,289. This application May 29, 1986, Ser. No. 867,945
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.

Int. Cl.⁴ A62C 37/08

U.S. Cl. 169—37

31 Claims



19. Means for maintaining a valve assembly comprising a valve body member and deflector plate supporting said valve body member of a fire sprinkler head comprising a housing having an open bottom end, in the closed position until the attainment of a predetermined temperature with the onset of a fire comprising, in combination, a planar horizontally disposed member divided into two sections of equal size and of the same shape along a dividing line therefor, each of the said two sections having an upper planar surface and said surfaces being coplanar with one another and said two sections abutting one another at said dividing line, and means responsive to heat for maintaining said two sections together and in a horizontally disposed plane until the attainment of said predetermined temperature, said heat responsive means comprising means bridging said dividing line and being in direct engagement with each of said sections on opposite sides of said dividing line and a suitable eutectic composition.

4,715,448

FIRE EXTINGUISHER OUTLET HEAD

Alister L. McCulloch, 18 Berwick Brae Drive, Berwick, Victoria, Australia (3806)

PCT No. PCT/AU85/00153, § 371 Date Mar. 6, 1986, § 102(e)
Date Mar. 6, 1986, PCT Pub. No. WO86/00969, PCT Pub. Date Feb. 13, 1986

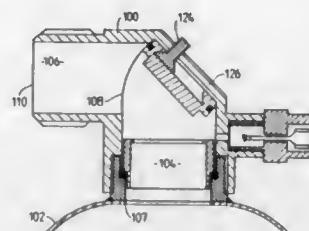
PCT Filed Jul. 15, 1985, Ser. No. 845,696

Claims priority, application Australia, Jul. 24, 1984, PG6189/85

Int. Cl.⁴ A62C 35/12

U.S. Cl. 169—62

5 Claims



1. An explosively actuated fire extinguisher outlet head comprising a housing having a passage adapted to communicate with extinguishant under pressure, said passage comprising a first passage portion having an inlet and outlet, a second passage portion being downstream of the first and extending transverse thereto, and means defining a junction between said first and second passage portions, a charge plug sealing the first passage portion, said plug having a head adapted to be sheared off upon actuating of an explosive charge whereby to permit discharge of the extinguishant through the passage, the interior of the passage being shaped to guide the sheared head for movement under the pressure of the released extinguishant along a curved path away from the junction between the first and second passage portions to be retained in a position in which flow of extinguishant from said first to said second passage portion is substantially unimpaired by the sheared head, wherein the passage comprises a wall inclined to the axes of the first and second passage portions so as to face the outlet from the first passage portion and the inlet to the second passage portion, said outlet head further comprising retaining means for retaining the plug head against said inclined wall after shearing, said retaining means comprising a pin projecting transversely from said wall into the passage and having a head part shaped to engage and retain the sheared plug head, said pin being mounted in a bore extending through said wall for axial movement upon engagement by the sheared plug head whereby displacement of an outer end of the pin externally of said wall upon engagement of the plug head with the pin provides indication of actuation of the fire extinguisher outlet head.

4,715,449

SELF-DUMPING CROP SHIELD

David C. Winter, Johnston, and William R. Wood, Ames, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 11, 1986, Ser. No. 884,458

Int. Cl.⁴ A01B 39/26

U.S. Cl. 172—513

14 Claims

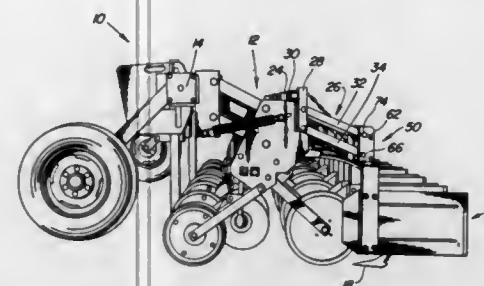
1. In a cultivating implement adapted for forward movement over the ground and having earthworking tools transversely spaced on a frame for cultivating soil containing trash between parallel rows of plants, shield structure for protecting the plants from soil throw, said structure comprising:

a fore-and-aft extending plant shield;

upright support structure connected to and extending upwardly from the shield;

linkage structure having a forward end connected to the implement frame and extending rearwardly from the

frame to a rear portion, said linkage structure comprising upper and lower fore-and-aft extending links; means pivotally connecting the upper end of the support structure to the rear portion of the linkage structure for rocking about a transversely extending axis located a substantial distance above the plant shield to thereby permit the shield to rock vertically about the axis between a lower crop shielding position and a raised trash-dumping position; and



wherein the support structure includes means for limiting the downward rocking of the shield to the lower crop-shielding position and permitting upward rocking of the shield toward the trash-dumping position, said means for limiting the downward rocking including pin means connected to the aft end of one of the links and wherein said means pivotally connecting the upper end is connected to the aft end of the other of the links for maintaining the shield in a preselected attitude when in the crop-shielding position.

4,715,450

GRADER BLADE WITH CASTING/INSERT ASSEMBLY ON LEADING EDGE

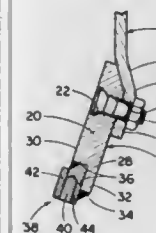
Robert P. Hallissy, Jeannette, Edmund Isakov, Earle W. Stephenson, both of Latrobe, and Don C. Rowlett, Bedford, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Feb. 20, 1987, Ser. No. 17,106

Int. Cl.⁴ E02F 3/815

U.S. Cl. 172—701.3

12 Claims



1. A grader blade comprising:

(a) a steel body having a bottom edge with a recess formed along a forward portion of said edge; and

(b) a casted assembly composed of a rear preformed cemented carbide insert and a front casted layer of carbide grit in combination with a substrate of casting material holding said insert and layer in a tiered contacting and attached relationship with one another, said casted assembly being disposed in said recess and said substrate welded to said body.

4,715,451

MEASURING DRILLSTEM LOADING AND BEHAVIOR

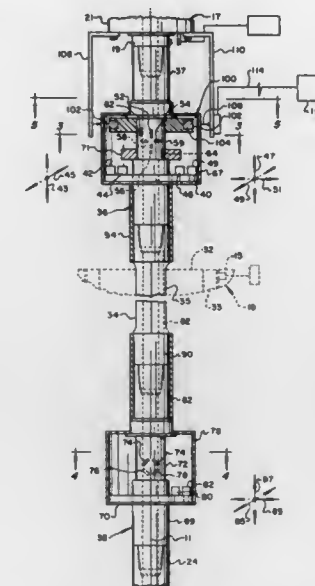
Amjad A. Bseisu, Dallas; Yih-Min Jan, and Frank J. Schuh, both of Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 17, 1986, Ser. No. 908,132

Int. Cl.⁴ E21B 47/00

U.S. Cl. 175—40

15 Claims



1. A system for measuring the behavior of an elongated drillstem while forming a drillhole, said drillstem being characterized by elongated tubular means having a drillbit disposed at the lower distal end thereof to form a drillhole below the earth's surface, and said drillstem being connected substantially at its upper or opposite end to means for rotating said drillstem, said system comprising:

at least a first sub connected to an upper region of said drillstem, said first sub including a generally tubular member; and

accelerometer means mounted on said first sub and adapted to produce electrical signals related to vibrations of said drillstem whereby the behavior of said drillstem at a point below said surface may be correlated with said vibration, said accelerometer means including at least two accelerometers disposed on said first sub in a common plane substantially opposite each other and on opposite sides of a longitudinal central axis of said first sub, said two accelerometers being capable of producing signals of variable amplitude indicating axial displacement of said drillstem in opposite directions and in such a way that in response to axial displacement of said first sub and bending displacement of said first sub, respectively, the signal amplitude of said two accelerometers may be compared to determine whether said drillstem is operating in an axial vibration mode or a bending vibration mode.

11. A method for determining the location of interaction between an elongated rotary drillstem and a downhole structure in a wellbore wherein said drillstem is characterized by an elongated tubular member having a drillbit or the like disposed at the lower distal end thereof to form a drillhole and said drillstem being connected substantially at its upper or opposite end to means for lifting or lowering said drillstem, said method comprising:

providing a sub disposed at an upper region of said drillstem, said sub comprising a generally tubular member; providing first means on said sub for measuring at least an axially directed surface deflection wave on the outer surface of said sub, said surface deflection wave being related to an axial deflection of said drillstem;

providing second means on said sub for measuring a torsional deflection wave propagated along the surface of said drillstem and related to interaction between said drillstem and a downhole structure; measuring axial and torsional strains on said drillstem related to signals produced by said first and second means, respectively; and comparing the time difference between an axial peak strain sensed by said first means and a torsionally induced peak strain sensed by said second means for determining the location of said interaction between said drillstem and said downhole structure,

4,715,452

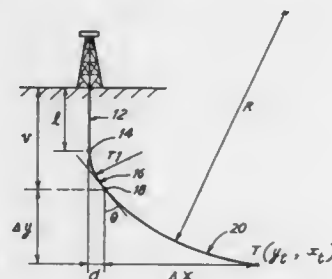
METHOD OF DRILLING A DIRECTIONAL WELL BORE
Michael Sheppard, Cambridge, England, assignor to Prad Research and Development NV, Curacao, Netherlands Antilles
Filed Jan. 7, 1986, Ser. No. 816,668

Claims priority, application United Kingdom, Jan. 8, 1985, 8500458

Int. Cl.⁴ F21B 7/04

U.S. Cl. 175-61

3 Claims



1. An improved method of drilling a directional well borehole with a drill string, along a predetermined trajectory extending between a starting location at the surface and an underground final depth point horizontally and vertically displaced from said starting location, said method comprising the steps of:

- (1) drilling a first, substantially vertical section of said borehole under said starting location;
- (2) drilling a second section of said borehole having a substantially constant build rate, said second section immediately preceding said final depth point; and
- (3) drilling a third section of said borehole having a substantially constant build rate, said third section being formed at the end of said first section between said first and second sections, and said third section having a build rate substantially greater than that of said second section, and a length substantially smaller than that of said second section.

4,715,453

DRILLING DEVIATION CONTROL TOOL

Thomas E. Falgout, Sr., Youngsville, and William N. Schoeffler, Lafayette, both of La., assignors to Team Construction and Fabrication, Inc., Youngsville, La.

Filed Oct. 30, 1986, Ser. No. 924,907

Int. Cl.⁴ E21B 17/10

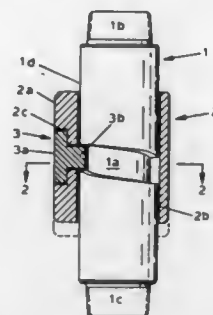
U.S. Cl. 175-73

17 Claims

1. A well drilling tool for use in a drill string assembly to aid in well bore control, the tool comprising:

- (a) a body comprising a drill string length;
- (b) at least one roller means situated on said body, arranged to engage a well bore wall and situated to rotate around said body;

(c) axial reciprocator means operatively associated with said body and said roller to urge said roller to reciprocate



axially relative to said body when said body rotates relative to said roller.

4,715,454

MECHANICAL DIRECTIONAL DRILLING JAR WITH SWIVEL MEANS

Chuan C. Teng, Lawrence Administrative Services Inc., P.O. Box 15250, Houston, Tex. 77220-5250; Rene A. Chapelle, Lawrence Administrative Services Inc., P.O. Box 2866, Conroe, Tex. 77305; John E. Blacklaws, Lawrence Administrative Services Inc., P.O. Box 15250, Houston, Tex. 77220-5250, and Lee E. McComsey, Dailey Petroleum Services Inc., 12860 Old Seward Hwy., Anchorage, Ak. 99511-0049

Filed Jun. 3, 1986, Ser. No. 870,087

Int. Cl.⁴ E21B 31/107

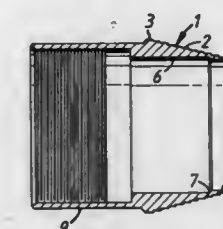
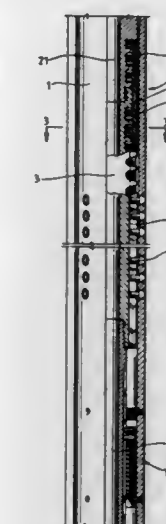
U.S. Cl. 175-299

12 Claims

1. A drilling jar comprising:

- a barrel;
- a polished stem, having upper and lower ends, said polished stem engaged to said barrel;
- a jay stem having upper and lower ends, said lower end connected to said barrel and including means for enabling the tripping of said drilling jar, said upper end connected to said lower end of said polished stem; means for engaging said polished stem to said barrel; means for engaging said jay stem to said barrel; and

a swivel for connecting said lower end of said polished stem to said upper end of said jay stem, enabling said jay stem



than the internal diameter d_i of the drill pipe and the internal diameter of the shoe is further reduced at the tip.

4,715,456

SLIPS FOR WELL PIPE

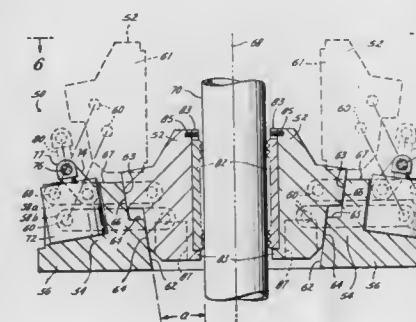
Frank E. Poe, Jr.; Dan R. Schwertner; Cooper L. Dunn, and Melvyn F. Whitby, all of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Filed Feb. 24, 1986, Ser. No. 832,315

Int. Cl.⁴ E21B 19/10

U.S. Cl. 175-423

18 Claims



1. A slip assembly adapted to engage pipe for movement of pipe into or out of a well bore comprising:

- a slip having a pipe engaging surface and a slip block contact surface;
- a slip block which engages the slip along a slip contact surface that is angled with respect to the pipe engaging surface;
- parallel vertically spaced links which pivotally connect the slip and slip block for movement of the slip into engagement with the slip block along said contact surfaces, each link having a first end pivotally connected to the slip and a second end pivotally connected to the slip block; and
- which, during both engagement and disengagement of the pipe engaging surface of the slip with the pipe, maintains said pipe engaging surface substantially parallel to the axis of the pipe; and

actuating means for pivoting the link to move the slip relative to the slip block, said actuating means being pivotally connected to said link between the second end of the link and the mid-point of the link between the pivotal connections on the first and second ends of the link.

4,715,455

DRILL SHOE

Martin A. Bolland; William C. Pike, both of Surrey; Prem S. Thukral, and Timothy P. Woolmington, both of Middlesex, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Oct. 14, 1986, Ser. No. 918,320

Claims priority, application United Kingdom, Oct. 18, 1985, 8525757

Int. Cl.⁴ E21B 10/02

U.S. Cl. 175-402

5 Claims

1. A drill shoe adapted to fit onto a drill pipe of external diameter d_e and internal diameter d_i , the shoe comprising an externally stepped cutting surface comprising a plurality of steps, the diameters of the steps increasing as they progress away from the tip of the shoe, the maximum external D_e diameter of the shoe being greater than the external diameter d_e of

4,715,457

METHOD FOR FAST WEIGHING

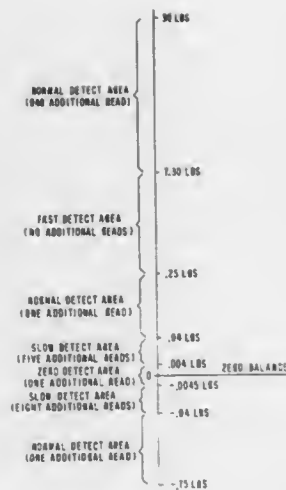
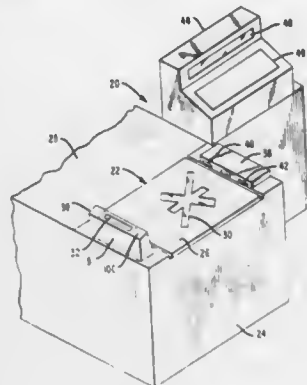
Gene L. Amacher, Cambridge; Gene R. Mathes, Zanesville; John F. Paugstat, Salesville, and Barry M. Mergenthaler, Cambridge, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed May 27, 1986, Ser. No. 867,650

Int. Cl.⁴ G01G 19/52, 23/14, 23/10

U.S. Cl. 177—1

16 Claims



1. A method for fast weighing using an electronic scale, comprising the following steps:

- providing an electrical signal representative of the weight of an object placed upon the scale;
- periodically sampling said electrical signal to obtain a plurality of instantaneous analog representations of the weight of said object;
- digitizing said instantaneous analog representations to provide a plurality of digital values representative of the weight of said object;
- storing said digital values;
- comparing each current digital value with the immediately preceding value to determine whether said values are similar, as defined by differing by less than a predetermined amount;
- comparing each compared current digital value which is similar to its previous value with a zero scale balance value to determine whether said compared current value is similar to said zero scale balance value as defined by differing by less than a predetermined count;
- maintaining a count of the number of values sampled;
- providing the most recent digital value which is not similar to a zero scale balance value as the desired weight when the weight is within a first range; and
- providing the most recent digital value as the desired weight

following a first number of similar samplings when the weight is within a second range.

4,715,458

BEAM BALANCE WITH UNEQUAL ARMS AND DIDDER DEVICE

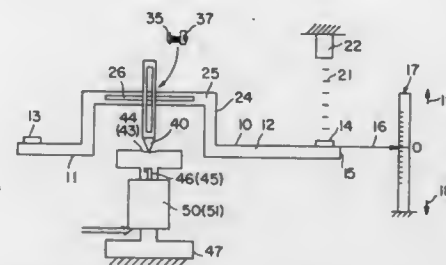
Pedro C. De Angelis, and Nedo D. L. Dragicevic, both of Cochabamba, Bolivia, assignors to Darko Jorge Lazaneo Dragicevic, Cochabamba, Bolivia

Filed Jul. 11, 1986, Ser. No. 884,810

Int. Cl.⁴ G01G 23/14, 3/14, 1/18

U.S. Cl. 177—172

7 Claims



1. Apparatus for measuring and detecting minute mechanical forces, such as those created by the energy of an energy beam, the apparatus comprising:

- (a) a balance beam, the balance beam having a U-shaped portion designating a fulcrum area, the U-shaped portion having a bite with a horizontal slot therein, the balance beam having unequal arms and first and second ends wherein the first end has an area thereon for mounting weights to adjust the attitude of the second end, a force measurement area at the second end, one of the ends having a pointer thereon for registering with the scale in order to designate a zero point and to indicate movement of the end in positive and negative directions; and
- (b) a pivot post having a vertical slot therein and a horizontally extending blade extending in a direction normal to the extent of the balance beam;
- (c) fastening means in registration with the horizontal slot in the bite portion and the vertical slot in the pivot post for fixing releasably the pivot post with respect to the bite of the U-shaped portion;
- (d) fulcrum means for supporting the balance beam, the fulcrum means having support areas engaged by the edge of the blade, and means for vibrating the fulcrum means so as to reduce friction between the blade and areas supporting the blade whereby the sensitivity of the balance is enhanced.

4,715,459

DRIVE FOR VEHICLES

Leo Stahl, Hub-Busswil, Switzerland, assignor to Leo Stahl AG, Busswil, Switzerland

Filed Jun. 23, 1986, Ser. No. 877,252

Claims priority, application Switzerland, Jun. 26, 1985, 2741/85

Int. Cl.⁴ B62D 11/04

U.S. Cl. 180—6.48

9 Claims

1. A drive for a vehicle with a travelling gear, in which the travelling gear is driven by a drive unit via a hydraulic gearing arrangement including at least one hydraulic gear with pump means for each side of the travelling gear, the multiplication factor for one side of the travelling gear, the multiplication factor for driving and steering independently of the other side of the travelling gear, the hydraulic pump means of the hydraulic gear comprising first and second hydraulic pump means coupled in series with one another said first hydraulic pump means being coupled by a first end of its shaft to the drive unit and by the second opposite end of its shaft to the first end of the shaft

4,715,461

ELECTRIC POWER STEERING SYSTEM FOR VEHICLES

Yasuo Shimizu, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

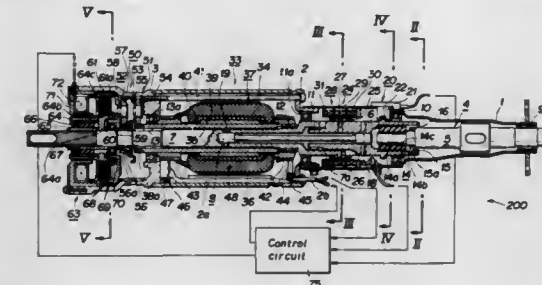
Filed Jan. 21, 1986, Ser. No. 820,347

Claims priority, application Japan, Jan. 22, 1985, 60-9545; Jan. 22, 1985, 60-9546

Int. Cl.⁴ B62D 5/04

U.S. Cl. 180—79.1

8 Claims



coupled to the first end of the shaft of the third hydraulic pump means, the last hydraulic pump means having the first end of its shaft engagable and disengagable from the second end of the shaft of the next-to-last hydraulic pump means by means of a clutch.

4,715,460

OMNIDIRECTIONAL VEHICLE BASE

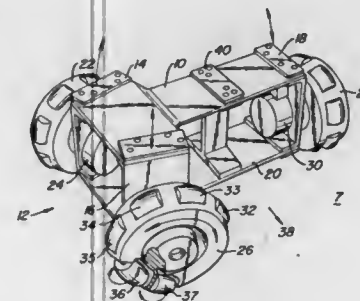
Robert E. Smith, Cupertino, Calif., assignor to International Texas Industries, Inc., San Antonio, Tex.

Filed Nov. 20, 1984, Ser. No. 673,965

Int. Cl.⁴ B62D 61/00

U.S. Cl. 180—7.1

24 Claims



1. An vehicle base comprising:

- an upper flexible base plate;
- a lower flexible base plate;
- a pair of front supports and a rear support disposed between and attached to the upper and the lower base plates to maintain the plates at a fixed separation;
- a pair of front wheels each mounted on one of the front supports and having an axis of rotation, the angle between the respective axes of rotations of each of the front wheels being less than 180°; and
- a rear wheel mounted on the rear support and having an axis of rotation, the angle between the axis of rotation of the rear wheel and the axis of rotation of either front wheel being less than 180°.

1. An electric power steering system for vehicles comprising:

- an input shaft operatively connected to a steering wheel;
- an output shaft operatively connected to a steered wheel;
- an electric motor for operatively supplying auxiliary torque to said output shaft;
- means for detecting steering torque acting on said input shaft;
- means for detecting a steering speed of said input shaft; and
- driving control means for feeding said electric motor with a drive signal based on output signals from said steering torque detecting means and said steering speed detecting means, said driving control means controlling said electric motor to produce said auxiliary torque and said driving control means controlling said electric motor to rotate at a speed in correspondence to said steering speed so that said rotational speed of said motor corresponds to said steering speed, said driving control means outputting a motor control signal and feeding said motor control signal to said electric motor, said driving control means including a motor driving means for receiving said motor control signal and for feeding said drive signal to said electric motor in accordance with said motor control signal, wherein

said driving control means determines an armature current necessary for the electric motor, depending on the output signal of the steering torque detecting means, and determines an armature voltage to be applied to the electric motor depending on a steering speed represented by the output signal from the steering speed detecting means and the armature current; and the drive signal to be fed from the driving control means to the electric motor includes an armature voltage signal.

4,715,462

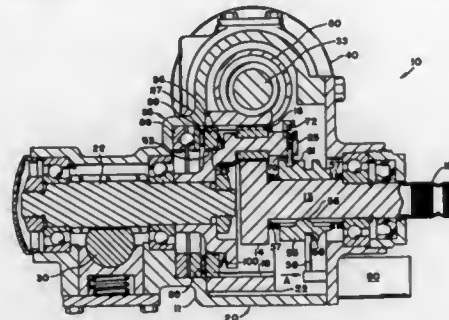
ELECTRIC POWER ASSISTANCE STEERING SYSTEM
Alistair G. Taig, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed May 29, 1986, Ser. No. 868,901

Int. Cl.⁴ B62D 5/04; G05D 17/00

U.S. Cl. 180—79.1

32 Claims



1. An electric power assistance actuating system, comprising a casing housing a force step-up transmission having a rotary output member intended to be connected to a driven system to be actuated and a rotary input member intended to be connected to a drive system, and an electric motor providing power assistance for said rotary output member, characterized in that said input and output members are connected via a planetary gear mechanism wherein the input member actuates a sun gear engaging planetary gears supported by a carrier connected with said output member, the planetary gears disposed between said sun gear and a ring gear of said planetary gear mechanism, means responsive to rotation of said input member relative to said output member providing actuation of means for controlling operation of said electric motor, the electric motor driving a motor gear, said motor gear engaging teeth disposed on the periphery of said ring gear, so that rotation of the input member relative to the output member effects actuation of said electric motor which displaces rotationally said ring gear as said input member is rotated.

4,715,463

ELECTRIC POWER STEERING SYSTEM FOR VEHICLES
Yasuo Shimizu, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

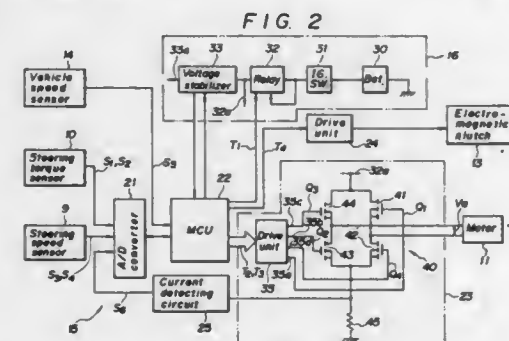
Filed Feb. 4, 1987, Ser. No. 10,665

Claims priority, application Japan, Feb. 6, 1986, 61-25165

Int. Cl.⁴ B62D 5/04

U.S. Cl. 180—79.1

2 Claims



1. An electric power steering system for vehicles comprising a steering shaft, means for detecting a steering state of said steering shaft, an electric motor for supplying auxiliary torque to said steering shaft, and drive control means which receives an output signal from said steering state detecting means and executes a motor drive process for feeding said electric motor with a drive signal in accordance with said output signal and further executes a trouble-diagnostic process of said system,

said drive control means including a micro-computer unit, wherein:

said system further comprises diagnostic proportion changing means which is operatively connected to said drive control means and changes the proportion of execution of said trouble-diagnostic process to said motor drive process in dependence on the vehicle speed.

4,715,464

POWER STEERING SYSTEM WITH HYDRAULIC REACTION

Keiichi Nakamura, Kariya, and Mikio Suzuki, Hekinan, both of Japan, assignors to Toyota Koki Kabushiki Kaisha, Kariya, Japan

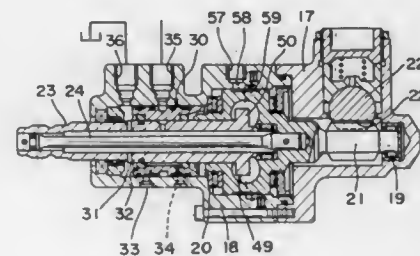
Filed Dec. 22, 1986, Ser. No. 944,507

Claims priority, application Japan, Dec. 27, 1985, 60-292792

Int. Cl.⁴ B62D 5/08

U.S. Cl. 180—142

15 Claims



1. A power steering system which utilizes fluid source means for supplying pressure fluid of a constant flow rate and fluid motor means for supplementing manual steering torque, comprising:

a valve housing;
a rotatable output shaft partially positioned within said valve housing and operatively connected with said fluid motor;
a rotatable input shaft partially positioned within said valve housing, aligned with said output shaft and adapted for manual actuation;

servo-valve means located in said valve housing for distributing fluid flow to said fluid motor in accordance with relative rotation between said input and output shaft;
reaction means located in said valve housing for providing resistance against relative rotation between said input and output shaft in accordance with fluid pressure supplied thereto;

magnetic control valve means having a solenoid and connected to said reaction means for varying fluid pressure applied thereto in a predetermined range of pressure according to excitation of said solenoid in accordance with a vehicle operating condition; and
means incorporated in said magnetic control valve means for controlling said fluid pressure at a predetermined pressure

in said predetermined range when the current supplied to said solenoid becomes abnormal.

4,715,465

BODY CONSTRUCTION FOR MOTOR SCOOTER VEHICLES

Shinji Takahashi, Tokyo, and Yoshinori Mita, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

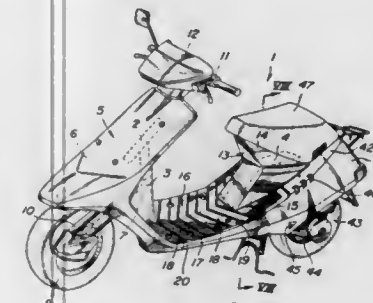
Filed Jan. 17, 1986, Ser. No. 820,433

Claims priority, application Japan, Jan. 17, 1985, 60-4342; Jan. 17, 1985, 60-4344; Mar. 22, 1985, 60-39766

Int. Cl.⁴ B62K 11/00

U.S. Cl. 180—225

11 Claims



1. A body construction in a motor scooter vehicle, comprising:

a vehicle frame assembly comprising a front frame having a head tube on a front end thereof and a rear frame;
a front cover covering said head tube and a front half portion of said front frame;
a central cover disposed around said rear frame, and comprising an upright portion surrounding said rear frame;
a floor panel having at least a portion formed as a unitary component with said central cover and disposed on a rear half portion of said front frame;
an engine positioned rearwardly of said rear frame and supported thereby, and an exhaust system extending from said engine; and
a pair of laterally spaced rear covers cooperating with said central cover in surrounding said engine and said exhaust system, said rear covers having portions extending forwardly and substantially covering sides of said floor panel and said portions being provided with a plurality of connecting means for connecting said rear covers to said floor panel.

4,715,466

FOUR WHEEL STEER CONTROL SYSTEM FOR FOUR WHEEL DRIVE VEHICLE, RESPONSIVE TO DRIVING TORQUE DISTRIBUTION

Katsumi Ishii, Sagami-hara; Kanae Hirayama, Yamato; Yoshio Matsuoka, Tokyo, and Kotel Takahashi, Sagami-hara, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Nov. 18, 1986, Ser. No. 931,846

Claims priority, application Japan, Nov. 20, 1985, 60-260948

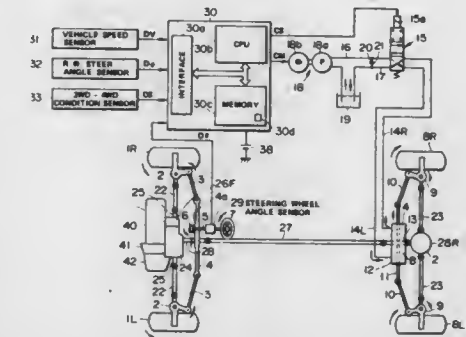
Int. Cl.⁴ B60K 23/08

U.S. Cl. 180—233

14 Claims

1. A vehicle comprising:
a four wheel drive system having a transfer for distributing a driving torque between a front wheel pair and a rear wheel pair, said transfer having means for varying a driving torque distribution between said front and rear wheel pairs,
a four wheel steer system for steering both of said front and rear wheel pairs, said four wheel steer system having means for steering said rear wheel pair in response to a control signal,

means for sensing said driving torque distribution, and
controlling means for varying a rear wheel steering ratio of a rear wheel steer angle to a steering wheel angle in accordance with said driving torque distribution sensed by said



driving torque distribution sensing means in such a manner as to maintain a steer characteristic of said vehicle substantially unchanged irrespective of change in said driving torque distribution, by manipulating said control signal.

4,715,467

CONTROL SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

Yasuhito Sakai, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

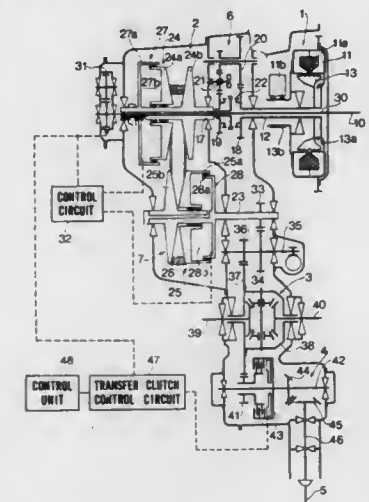
Filed Mar. 20, 1985, Ser. No. 713,935

Claims priority, application Japan, Mar. 27, 1984, 59-59934; Mar. 27, 1984, 59-59935

Int. Cl.⁴ B60K 17/34

U.S. Cl. 180—247

7 Claims



1. In a control system for a switchable two-wheel drive four-wheel drive vehicle powered by an engine, the vehicle having a hydraulically operated automatic transmission for transmitting power of the engine to main driving wheels of the vehicle, auxiliary driving wheels, a hydraulically operated transfer clutch for transmitting the power of the engine to the auxiliary driving wheels for the four-wheel drive, a hydraulic circuit for controlling the transmission, said hydraulic circuit having a line pressure, and a hydraulic control circuit means for operating the transfer clutch, the improvement wherein: said hydraulic control circuit means including a pressure regulator valve means for regulating the line pressure applied from the hydraulic circuit to the hydraulic control circuit means to a constant value, accumulator means for

accumulating oil from the line pressure of the hydraulic circuit for being supplied to the transfer clutch, control valve means having a spool for controlling said oil supplied to the transfer clutch providing clutch engaging pressure, said pressure regulator valve means for applying said constant value line pressure to one end of the spool of said control valve means, and solenoid operated valve means for controlling the spool of the control valve means by controlling the pressure of said constant value line pressure against the spool to control the clutch engaging pressure of the oil applied to the transfer clutch;

first means for detecting engine operating conditions and for producing a torque signal dependent on the engine operating conditions;

an electric circuit means for controlling said solenoid operated valve means, said electric circuit means including second means responsive to the torque signal for producing a clutch engage control signal, the magnitude of said control signal being dependent on engine torque; and

the clutch engage control signal being applied to the solenoid operated valve means to control the spool of the control valve means and being such that the clutch engaging pressure decreases with a decrease of the engine torque.

4,715,468

DEVICE FOR CONTROLLING A ROLL BAR SERVING AS A SAFETY DEVICE FOR THE OCCUPANTS OF A MOTOR VEHICLE

Karl-Heinz Baumann, Böblingen; Gerald Schick, Grafenau; Lothar Kassing, Nuffingen; Alban Bossenmaier, Stuttgart, and Luigi Brambilla, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

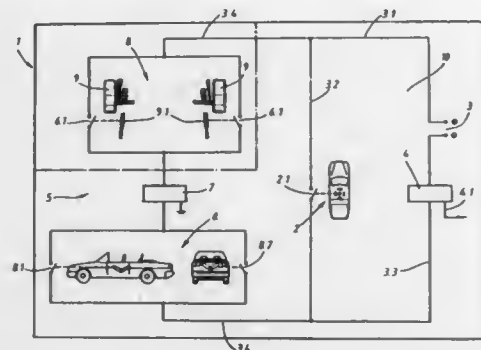
Filed Dec. 23, 1986, Ser. No. 945,522

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1985, 3545874

Int. Cl.⁴ B60R 21/00

U.S. Cl. 180—271

8 Claims



1. A device for actuating a safety device, in particular a roll bar, the device having first sensor means which output a first signal to cause the actuation of said safety device when a vehicle acceleration or deceleration exceeds a threshold value, said device comprising:

second sensor means for outputting a second signal upon sensing when at least one wheel suspension is fully extended;

third sensor means for outputting a third signal upon sensing tilting of said vehicle around at least one of a longitudinal axis and a transverse axis of said vehicle,

said safety device being actuated when both said second and third signals are outputted by said second and third sensor means.

4,715,469

BOREHOLE SEISMIC RECEIVER

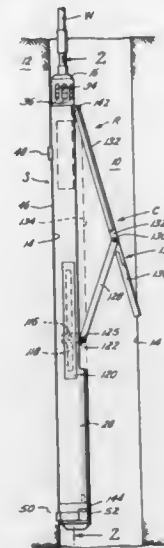
Arthur K. Yasuda, San Francisco; William S. Kennedy, Palo Alto, and Peter S. Aronstam, Cupertino, all of Calif., assignors to Petrophysical Services, Inc., Mountainview, Calif.

Filed Aug. 29, 1985, Ser. No. 770,796

Int. Cl.⁴ G01V 1/40

U.S. Cl. 181—102

2 Claims



1. A seismic receiver for use in a well borehole to sense the response of an earth formation adjacent the well borehole to seismic energy waves, comprising:

- (a) geophone means for sensing the response of the earth formations to the seismic energy waves;
- (b) sonde means for housing said geophone means, said sonde means having a substantially flat surface;
- (c) means for releasably urging said sonde means into contact with the borehole wall along said substantially flat surface, said means comprising:
 - (i) a contact arm pivotally mounted at one end to said sonde means on the side opposite said substantially flat surface and movable between a retracted position adjacent said sonde means for movement through the borehole to a selected depth and an engaged position in firm contact with the borehole wall at the selected depth,
 - (ii) motor means for driving said contact arm between the retracted position and the engaged position,
 - (iii) clutch means mounted between said motor means and said contact arm enabling retraction of said contact arm in the event of failure of said motor means;
- (d) said sonde means including rotatable means which allows the lower end portion of said sonde to rotate to firmly seat said sonde against the borehole wall despite wall irregularities.

4,715,470

DOWNHOLE ELECTROMAGNETIC SEISMIC SOURCE

Bjorn N. P. Paulsson, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 18, 1986, Ser. No. 841,073

Int. Cl.⁴ G01V 1/40

U.S. Cl. 181—106

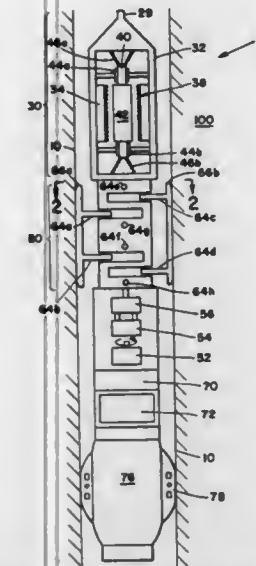
72 Claims

52. A downhole seismic source comprising:

a housing;

a reaction mass within said housing;

a clamping means for coupling said housing securely within a wellbore; and



an electromagnetic actuator means within said housing for moving said reaction mass to create substantially pressure waves and shear waves.

4,715,471

SELF-PROPELLED PERCUSSION UNIT AND METHOD OF USING SAME

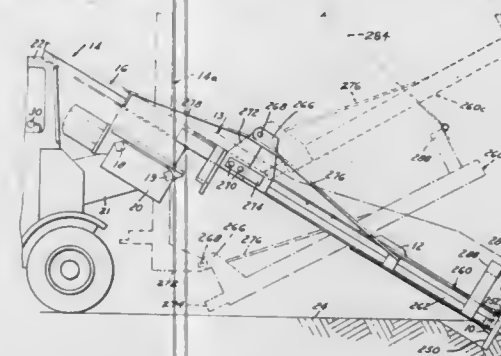
David W. Fulkerson, 8360 W. Six Mile Rd., Northville, Mich. 48167, and Lawrence W. Smith, 26950 Taft Rd., Novi, Mich. 48050

Continuation of Ser. No. 830,022, Sep. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 625,141, Oct. 23, 1975. This application Apr. 17, 1979, Ser. No. 30,764

Int. Cl.⁴ G01V 1/04, 1/10

U.S. Cl. 181—121

4 Claims



1. A method of generating seismic shear waves for subsurface geophysical exploration comprising the steps of locating a plate-like shock transmitting means on the earth surface such that a portion of said shock transmitting means having an impact face being exposed from above the earth surface, and said shock transmitting means having a second portion directed towards the earth and positioned on the earth surface at a preselected shear angle substantially less than 90° and greater than zero° with respect to horizontal, directing an impact hammer against said impact face of said shock-transmitting means with an impact force in a direction substantially equal to said preselected shear angle with respect to horizontal of said second portion of said shock transmitting means, said impact force substantially at right angles to said impact face of said shock-transmitting means and transmitting a shear wave and

compression wave in the earth in response to said impact hammer contacting said shock transmitting means.

4,715,472

ADJUSTABLE MOTORCYCLE MUFFLER

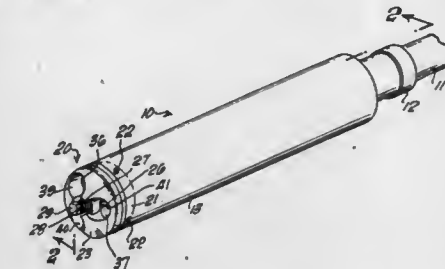
J. Ward McKee, 7021 E. Alondra Blvd. #7, Paramount, Calif. 90723

Filed Sep. 2, 1986, Ser. No. 902,748

Int. Cl.⁴ F01N 1/18

U.S. Cl. 181—241

17 Claims



1. An adjustable motorcycle muffler affixable to the exhaust pipe of a motorcycle, said muffler comprising:

- a generally cylindrical muffler body affixable to the exhaust pipe of a motorcycle;
- a perforated muffler pipe mounted in an axial manner within said muffler body, said perforated muffler pipe having a plurality of sound absorbing openings therethrough;
- a stationary ring affixed to the exit end of the muffler body, said stationary ring having a plurality of longitudinally aligned openings therethrough;
- an adjustable ring affixed to the stationary ring, said adjustable ring being movable to enlarge the gas flow path through the openings in the stationary ring, whereby the movement of the adjustable ring changes the exhaust gas flow resistance through the stationary ring so that the muffler may be tuned to provide an optimum amount of back flow resistance.

4,715,473

FOAM ACOUSTIC ABSORPTION MEMBER

Rolf Tschudin-Mahrer, Lausen, Switzerland, assignor to Irbt Research & Consulting AG, Fribourg, Switzerland

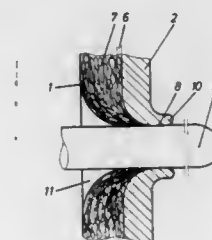
Filed Dec. 11, 1985, Ser. No. 807,614

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445656

Int. Cl.⁴ E04B 1/82

U.S. Cl. 181—286

1 Claim



1. In a foam, acoustic absorption member with area attachment between an air-pervious foam layer and a stabilizing layer provided with openings, the absorption member further comprising a support layer and the improvement wherein

the stabilizing layer with the support layer forms a hollow body having a front wall and a back wall defining a hollow space, said hollow space extending transversely along said front wall to allow conformance of said front wall, said foam layer and said support layer to an external surface, said front wall being pressed with thermal deformation against the foam layer, and

said openings comprise holes punched in said foam layer and in said stabilizing layer from the side of the foam layer, the hollow space between said front wall and said back wall being large enough to accommodate a collar which may be formed in said front wall about one of said openings.

4,715,474

SCAFFOLD SYSTEM

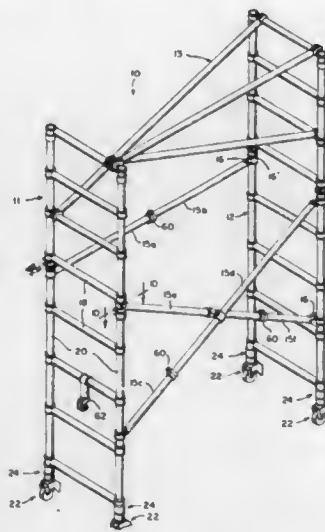
Donald T. Wehmeyer, 19026 - 171 Pl. NE., Woodinville, Wash. 98072

Filed Jul. 14, 1986, Ser. No. 885,945

Int. Cl.⁴ E06C 7/50

U.S. Cl. 182-194

30 Claims



1. An end fitting for a tubular member, comprising:
 - a one-piece body having a head and a neck projecting to an outer end from said head, circumferential portion of reduced circumference;
 - a porting ring sleeved on said neck and adjoining said head, said porting ring having exposed inlet and vent ports; inlet and vent passages connecting said inlet and vent ports with the exterior of said central portion;
 - said body being adapted to have a tubular member sleeved on said neck into engagement with the porting ring whereupon adhesive may be introduced through the inlet port for filling the space between said central portion and the tubular member for securing the tubular member to said neck.

4,715,475

TWO-SPEED DRIVE MECHANISM FOR TOYS

Ishida Minoru, 8-302, Ikenohata 4-Chome 8, Taito-ku, Tokyo, Japan

Filed Jul. 14, 1986, Ser. No. 884,901

Claims priority, application Japan, Nov. 30, 1985, 60-184659[U]

Int. Cl.⁴ F03G 1/08; A63H 29/04, 31/00

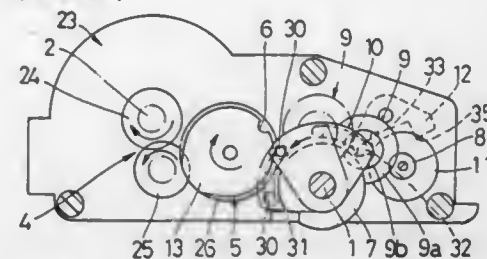
U.S. Cl. 185-39

2 Claims

1. In a two-speed drive mechanism for toys said mechanism being provided with a gear mechanism interconnecting an output shaft and a spiral spring shaft fixed with one end of a spiral spring, a cam having a recess part is provided so as to be engaged with said spiral spring shaft and rotated through a group of interconnecting gears, an intermediate member being

provided to interlock with said cam and engage therewith and change its position in the same direction as when the recess part of said cam moves upwardly from below through the winding up of said spiral spring, said intermediate member having an intermediate gear to interconnect the gear on said output shaft and a low-speed gear, an anchor being provided to swayingly engage with an gear coaxial with said low-speed gear and to rotate said gear tooth by tooth, said cam having a projection for contacting said intermediate member from

(WIND OFF)



below to keep the position of said intermediate member when it is on the low-speed side, and furthermore, in order to prevent said spiral spring winding up force from being transmitted further beyond said cam in that state a ratchet mechanism being incorporated in said group of interconnecting gears so that the rotational speed of said output shaft may be varied at the time before and after said cam changes its position reversely to its previous position when said cam moves downwardly from above by the release of said spiral spring and said recess part of said cam engages with said intermediate member.

4,715,476

RESET MECHANISM RESPONSIVE TO LOSS OF TORQUE

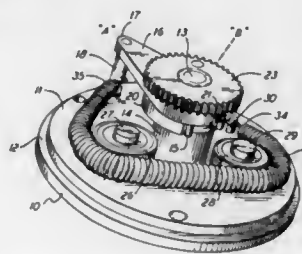
Howard G. France, Watertown, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Sep. 26, 1986, Ser. No. 913,174

Int. Cl.⁴ F03G 1/00

U.S. Cl. 185-40 R

7 Claims



1. A reset mechanism responsive to loss of torque comprising:
 - a base;
 - an arm rotatable about an arm axis through said base, said arm being rotatable through an arc from a first angular position to a second angular position, said arm extending radially from said axis to a distal end;
 - first bearing means on said base substantially opposite said arm axis from said second angular position;
 - an extension spring fixed at one end to a fixing point on said base and at its other end to a fixing point on said arm spaced from said arm axis, said spring extending around said first bearing means, said spring forming a first angle with said arm when said arm is in said first position, said spring forming a second angle with said arm when said arm is in said second position, said second angle being substantially smaller than said first angle.

4,715,477

DEVICE FOR FIXING SWING ARM USED FOR APPARATUS FOR LIFTING AUTOMOBILES FOR REPAIR

Koichi Suzuki, Aichi, Japan, assignor to Sugiyasu Industries Co., Ltd., Aichi, Japan

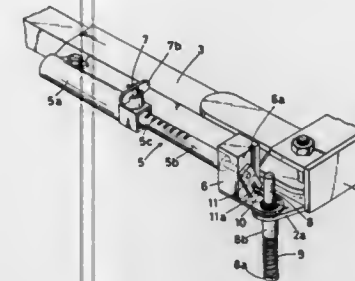
Filed Jul. 18, 1986, Ser. No. 887,246

Claims priority, application Japan, Aug. 23, 1985, 60-129429[U]

Int. Cl.⁴ B66F 7/28

U.S. Cl. 187-8.47

1 Claim



1. In an apparatus for lifting automobiles for repair thereof, comprising a pair of spaced posts, each post having a carriage which is connected thereto for vertical movement; a pair of horizontal swing arms pivotally connected to each carriage for swinging movement in a horizontal plane, each swing arm having a car body support means at its one end, and a device for temporarily fixing the swing arm in its desired horizontal position so as to temporarily fix the two swing arms with a desired angle therebetween, which device comprises (A) a horizontal hollow cylinder connected to one side of the swing arm at its one end portion and extending along a swing arm and (B) a horizontal cylindrical solid rod which is disposed along the swing arm in alignment with said hollow cylinder and is rotatably and slidably supported in the other end portion of said hollow cylinder at its one end portion, and which is connected, at its other end, to a horizontal bracket projecting from the carriage toward the same side as said solid rod and hollow cylinder in the vicinity of the section of the carriage pivotally connecting swing arm thereto, and which is provided with a plurality of transverse slots formed on a portion of the circumference of said solid rod substantially parallel to one another and along the lengthwise direction thereof, said hollow cylinder being provided with a lock means for engaging one of said slots for temporarily fixing the swing arm in a desired horizontal position, wherein the improvement comprises:

- a. a vertical rod means adapted for vertical movement and rotation about its vertical axis, said rod means being downwardly biased by a biasing means and extending vertically through said horizontal bracket, said rod means having a lower end disposed in a position lower than said carriage;
- b. a means for supporting said horizontal rod and for facilitating the rotation of said horizontal rod upon the vertical movement of said vertical rod means;
- c. means responsive to the movement of said vertical rod to its lowest position relative said carriage for rotating said horizontal rod to a position where one of said slots of said horizontal rod engages said lock means; and
- d. means for effecting the disengagement of said lock means and said slot on said horizontal rod upon the lowering of said carriage beyond a predetermined level.

4,715,478

HYDRAULIC ELEVATOR

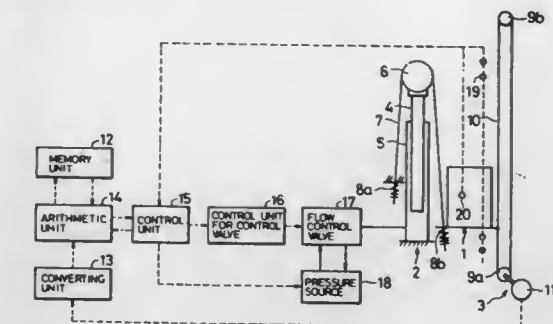
Ichiro Nakamura, Katsuta; Satoshi Kobayashi, Yokohama, and Eiichi Sasaki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 928,327

Claims priority, application Japan, Nov. 25, 1985, 60-262414 Int. Cl.⁴ B66B 1/26

U.S. Cl. 187-111

5 Claims



1. In a hydraulic elevator of the type which has a cage, a hydraulic jack, a hydraulic pressure source, a flow control valve and a control device, and in which a flow of a pressure fluid to be supplied to or discharged from the hydraulic jack is controlled thereby to raise or lower the cage directly or indirectly,

the hydraulic elevator comprising:

- detection means for obtaining an actual running velocity of the cage during acceleration,
- memory means for storing a predetermined reference running velocity,
- arithmetic means for calculating a command velocity during deceleration from said reference running velocity and the difference between said actual running velocity and a running velocity under a reference operating condition, and
- drive means driven in response to said command velocity so as to cause the cage to have a floor arrival running time close to a predetermined value.

4,715,479

RETRACTION TYPE SUPPORT ASSEMBLY FOR A FLOATING CALIPER DISC BRAKE

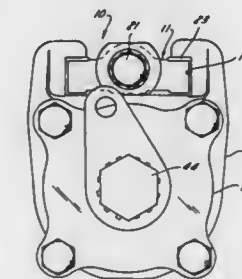
James A. V. Buckley, Whitefish Bay, Wis., assignor to Hayes Industrial Brake, Inc., Mequon, Wis.

Filed Jun. 17, 1986, Ser. No. 875,295

Int. Cl.⁴ F16D 55/02, 65/14

U.S. Cl. 188-71.8

15 Claims



1. A support assembly for mounting a floating caliper-disc brake on a frame, the brake being of the type including a caliper for bridging a disc, said caliper having a rectangular mounting slot, a first friction pad supported by said caliper on one side of the disc, a housing supported by said caliper on the other side of the disc and having a bore and a second friction pad mounted in said bore for movement into engagement with

the other side of the disc, said brake support assembly comprising a rectangular mounting block having a pair of stabilizing bosses at one end and an opening through the center, and a bolt positioned in said opening for securing said block to the frame with the bosses positioned in holes provided in the frame, said mounting block being adapted to be mounted in said rectangular mounting slot of said caliper whereby said caliper is free to float on said block when the second friction pad is moved into engagement with the disc to move the first friction pad into engagement with the opposite side of the disc, and spring means located between said block and said caliper for retracting said caliper to release said first friction pad from the disc when said second friction pad is moved away from the disc.

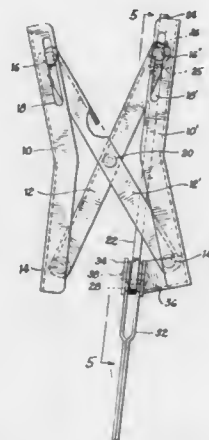
4,715,480

TANDEM WHEEL CHOCK

Milan B. Anderson, deceased, late of Chula Vista, Calif. (by Thelma Anderson, administratrix), assignor to Hewlett-Packard Products, Inc., San Diego, Calif.
Continuation of Ser. No. 778,228, Sep. 19, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 33,044
Int. Cl.⁴ B60T 3/00

U.S. Cl. 188-74

6 Claims



4. In combination with a pair of tandem wheels placed one behind the other on one side of a vehicle, a wheel chock assembly which comprises:

- expandable means horizontally bridging the shortest distance between said wheels, having:
 - a first shoe applied against one wheel;
 - a second shoe applied against the other wheel;
 - said shoes being generally bar-shaped and in a vertical, parallel, spaced-apart relationship, each shoe having a fixed pivot and a vertical slot distance from said pivot;
- horizontally contracting and expanding means including:
 - a pair of cross-braces pivotally connected at midpoint in a scissor-like configuration;
 - a fixed end on each of said braces being pivotally connected to the fixed pivot of one shoe, and a sliding other end of said brace being slidably engaged into the slot of the other shoe; and
 - means for adjusting the position of one of said sliding ends within its engaged slot.

4,715,481

HYDRODYNAMIC RETARDER

Klaus Brosius, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany
Filed Mar. 13, 1986, Ser. No. 839,335
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3511795

Int. Cl.⁴ F16D 57/02, 33/00; F16M 3/44

U.S. Cl. 188-291

13 Claims

1. A hydrodynamic retarder, having two independent operating circuits in a common housing comprising:

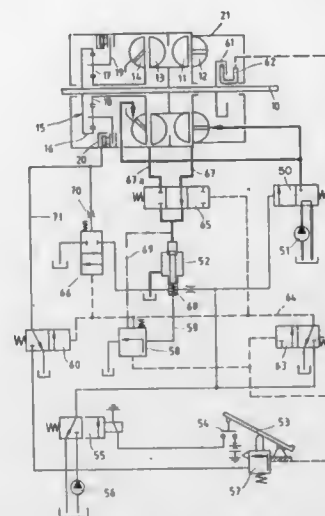
- (a) a first toroidal operating circuit formed from a first row

of rotor blades connected to a retarder shaft and from a stationary row of stator blades; and

- (b) a second toroidal operating circuit formed from a second rotor with a second row of rotor blades connected to the retarder shaft and a rotatable stator with a pivoted second row of stator blades

wherein the improvement comprises:

- (c) the rotatable stator of the second operating circuit is connected to the retarder shaft via a reversing gear unit which drives the rotatable stator in the opposite rotational direction to that of said first row of rotor blades;
- (d) the reversing gear has step-up gearing for the rotatable stator;



- (e) the reversing gear is provided with a coupling device mounted on said housing, said coupling device providing a releasable connection between the rotatable stator and the retarder shaft;

- (f) the rows of blades of the first operating circuit are inclined towards the axis of rotation of the second rotor, and the rows of blades of the second operating circuit are substantially symmetrical to the axis of rotation of the first rotor; and

- (g) a valve device to activate the second operating circuit, which valve device is provided to lower the pressure limit of an overflow valve with which the second operating circuit can be temporarily emptied throughout the duration of a switching on operation in the coupling device between the retarder shaft and the second stator.

4,715,482

METHOD AND APPARATUS FOR CONTROLLING AN ELECTROMAGNETIC CLUTCH FOR USE ON A VEHICLE

Tomoyuki Watanabe; Takashi Shigematsu; Setsuo Tokoro, and Takashi Hayashi, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 15, 1985, Ser. No. 754,949

Claims priority, application Japan, Nov. 20, 1984, 59-244900; Apr. 3, 1985, 60-70615

Int. Cl.⁴ F16D 37/02; B60K 41/02

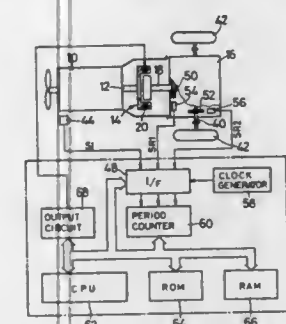
U.S. Cl. 192-0.032

11 Claims

1. A method of controlling an electromagnetic clutch incorporated in a power transmission system of a vehicle to transmit an output of an engine to drive wheels of the vehicle, so as to absorb a variation in output torque of the engine, said method comprising the steps of:

- detecting a variation in rotating speed or torque of an output shaft of said electromagnetic clutch; and controlling an engaging action of said electromagnetic clutch to adjust a

clutch torque transmitted by said clutch, based on whether the detected variation in rotating speed or torque



of said output shaft of said electromagnetic clutch is synchronized with an ignition period of said engine.

4,715,483

ANTI-ROLL BACK DEVICE

Keith J. Hobson, 23 Charnock Wood Rd., Sheffield S12 3HL, and Brian Hartley, 51 Hady Crescent, Hady Hill, Chesterfield, both of England

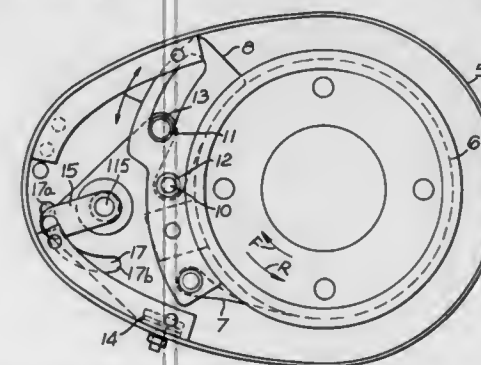
Filed Apr. 8, 1986, Ser. No. 849,545

Claims priority, application United Kingdom, Apr. 9, 1985, 8509022

Int. Cl.⁴ B60K 41/28, 41, 26

U.S. Cl. 192-4 A

14 Claims



1. A device for the selective prevention of the rotation of a rotatable member in one only of its two directions of rotation, comprising: an end fitting slidably mounted in close proximity to the rotatable member for movement between an upper position and a lower position and supporting first and second spaced pin means; elongate belt means attached by one end thereof to the end fitting and extending around the rotatable member, the other end of the belt means extending below said first pin means on the end fitting and over said second pin means on the end fitting and to an anchor point; crank means pivotally mounted in closely spaced relation to the rotatable member, around which the belt means passes on its passage from said second pin means on the end fitting to the anchor point; means for selectively pivoting said crank means between a first position where it acts on the belt means to put the belt means in a condition where rotation of the rotatable member in a first, forward, direction is permitted and rotation in a second, reverse direction is instantly prevented, and a second position where the belt means is in a condition where rotation of the rotatable member in said reverse direction is permitted, and means to hold said cranked means in said second position until said rotatable member has ceased its rotation in said second, reverse, direction.

4,715,484

AUTOMATIC INTERMEDIATE PLATE POSITIONER

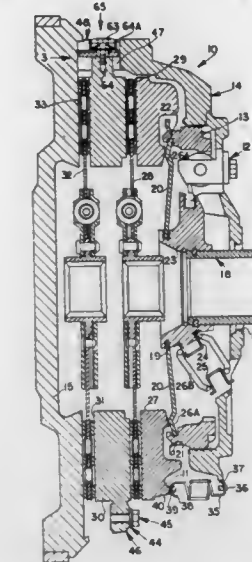
Richard A. Flotow, Butler, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 17, 1986, Ser. No. 942,782

Int. Cl.⁴ F16D 13/75

U.S. Cl. 192-70.25

6 Claims



1. A friction clutch having an axis of rotation and including in combination, a clutch cover assembly secured to a flywheel, said clutch cover surrounding a pair of axially spaced pressure members with the pressure member farthest from the flywheel being a pressure plate and the pressure member closest to the flywheel being an intermediate plate, a pair of driven discs with one disc being disposed between said pair of pressure members and the other disc disposed between the intermediate plate and said flywheel, clutch engaging spring means acting between said cover means and said pressure plate for biasing said pressure plate toward said flywheel and engaging said pressure members and said driven discs and said flywheel in driving relationship, a throwout bearing for withdrawing said clutch engaging spring load, a first spring return means for returning said pressure plate to its disengaged position with said first spring return means imposing a much lower load than said clutch engaging spring means, second spring return means for returning said intermediate plate to its disengaged position in a spaced relationship to said other driven disc and further removed from said flywheel than its position relative to said flywheel when in its engaged position, said second spring return means imposing a much lower load than said clutch engaging spring means on said intermediate plate, a plurality of drive lugs on said intermediate plate extending radially outwardly therefrom and having a bolt hole in the periphery thereof, a plurality of drive slots in said clutch cover with each receiving a drive lug in a driving relationship for imposing rotational loads thereon about said clutch axis, each of said slots being open in the direction facing said flywheel and each slot having a rear face opposed to and facing said flywheel and each slot having a pair of circumferentially opposed driving faces, a positioning means mounted on the radially outer surface of each of said drive lugs, said positioning means including a friction member which is longer in the axial direction than the lug mounting the same while being of the same circumferential size, said friction member having an axially elongated slot therein, the forward end of said friction member engaging said flywheel upon clutch engagement to position said friction means on said drive lug and being engageable with said rear face of said drive slot upon clutch disengagement for positioning said intermediate plate, said positioning means also including a lock strap which has a central hole therein overlying the slot in said friction member and has a pair of circumferentially

extending ends engageable with said driving faces of said drive slots, said lock strap having a pair of bendable axially extending tangs thereon, a positioning means spring disposed on said lock strap with an aperture therein aligned with the hole in the lock strap, and a bolt passing through said positioning means spring, said lock strap and said friction means and threaded into the bolt hole in the periphery of each of said drive lugs, said bolt being adjustable to adjust friction between said positioning means friction member and the drive lug carrying the same, said axially extending tangs on each of said lock straps being bendable radially outwardly to engage and prevent rotation of the bolt received in said positioning means, said bolts of all said positioning means adjusting the friction between said friction members and said lugs so that the total load on said lugs is greater than said second spring return means but less than the load on said pressure members imposed by said clutch engaging spring means.

4,715,485

CLUTCH DISC FOR A MOTOR VEHICLE FRICTION CLUTCH

Günther Rostin, Schweinfurt; Dagwin Tamm, Kaiserslautern, and Franz Hartig, Dittelbrunn, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

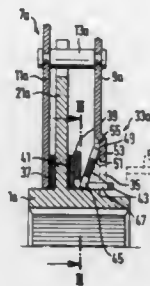
Filed Mar. 15, 1985, Ser. No. 712,354

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409829

Int. Cl.⁴ F16D 3/14, 3/66, 13/75

U.S. Cl. 192—106.2

4 Claims



1. Clutch disc for a motor vehicle friction clutch comprising:
 - (a) a hub (1);
 - (b) a friction lining carrier (7) supported on said hub, said friction lining carrier being rotatable relative to said hub through a limited angle of rotation about the rotational axis (5) of said hub;
 - (c) a torsional vibration spring damper arranged in a torque transmission path between said hub and said friction lining carrier, said friction lining carrier comprising an essentially radially extending first disc part means (9, 11), said first disc part means comprising a first disc (9) and a second disc (11) rigidly connected with each other and axially spaced from each other, a second disc part means (21) secured to and extending essentially radially outwardly from said hub and arranged axially between the first and second discs (9, 11), said spring damper comprising at least one damping spring (31) arranged in windows (25, 27, 29) of said first and second disc part means (9, 11, 21) which is stressable upon relative rotation of the first and second disc part means (9, 11, 21);
 - (d) a torsional vibration friction damper (33) with at least one axially acting preloaded spring (43) axially arranged between said second disc part means (21) and said first disc (9) of said first disc part means to be co-axial with same, and at least one friction ring (37, 41) arranged in an abutment force path of said preloaded spring (43) axially between one (9) of said first and second discs and said second disc part means and arranged co-axial therewith;
 - (e) an adjustment device (49, 53) arranged in the abutment force path of said preloaded spring, by means of which the

axial spacing between a radially outer edge region and a radially inner edge region of the preloaded spring is adjustable wherein the preloaded spring (43) is rotatable about the axis of rotation (5) relative to said first disc (9) of said first disc part means for the adjustment, said preloaded spring having several support tongues (49) spaced apart in circumferential direction, said first disc (9) having axial abutment steps (53) arranged in groups with each group corresponding to a respective one of the individual support tongues (49), so that the support tongues (49) rest on selected ones of said abutment steps, wherein said support tongues (49) are spaced from one another corresponding to the angular extent of each of said groups; and wherein snap-in shoulders (55) extending in a circumferential direction of said first disc (9) are provided between each of the abutment steps (53) in at least one of the groups of abutment steps (53), which lock the preloaded spring (43) through the support tongues (49) so that the preloaded spring does not rotate relative to said first disc (9) of said first disc part means.

4,715,486

LOW-WEAR FRICTIONALLY ENGAGING DEVICE

Jochen Burgdorf, Offenbach-Rumpenheim, and Helmut Weisbrod, Nauheim, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

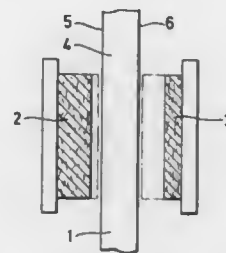
Filed Aug. 5, 1981, Ser. No. 290,117

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3033139

Int. Cl.⁴ F16D 13/60, 65/02, 69/02

U.S. Cl. 192—107 M

8 Claims



1. In a frictionally engaging device, especially a friction brake, friction clutch, and the like, a combination comprising at least one first and at least one second friction element engageable with one another for surface to surface engagement, said first element being of a relatively high-wear friction material containing an organic binder, said second element being of a relatively low-wear material containing iron and having at least one friction surface facing said first element for engagement therewith; and a wear-reducing coating uniformly applied to at least one friction surface of said second element, said coating comprising a substantial proportion of tungsten carbide.

4,715,487

CHUTE FOR OPTICAL SELECTOR

Nobuo Saika, Wakayama, Japan, assignor to Toyo Selmalki Selsakusho K. K., Wakayama, Japan

Continuation of Ser. No. 748,203, Jun. 24, 1985, abandoned.

This application Nov. 10, 1986, Ser. No. 928,589

Claims priority, application Japan, Dec. 28, 1984, 59-280043

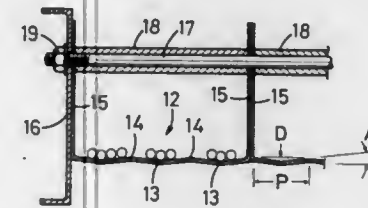
Int. Cl.⁴ B07C 5/342

U.S. Cl. 193—2 R

11 Claims

1. A chute for feeding falling articles of a size no greater than that of sliced almonds in a linear manner especially to an optical selector, comprising:
 - an upper infeed end and a lower discharge end, said lower

discharge end being inclined at an angle from the vertical from said upper infeed end, a bottom surface extending from said upper infeed end to said discharge end and providing a generally linear path for the falling articles, said bottom surface being gently corrugated along its width to provide a series of shallow valleys separated by low



ridges extending generally the length of said bottom surface from said upper infeed end to said lower discharge end, the inclination of said corrugations being in the range of 1°-20°,

the distance between said ridges ranging from 5 mm to 30 mm and the depth of said valleys from the top of said ridges ranging from 0.1 mm to 5 mm.

4,715,488

COLLAPSIBLE CONVEYOR

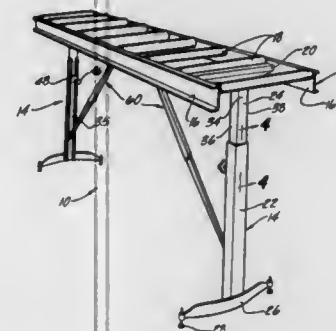
Timothy W. Hewitt, 18 Kensington, Pleasant Ridge, Mich. 48069, and William V. Hewitt, 1103 Park St., Royal Oak, Mich. 48067

Filed Jan. 24, 1986, Ser. No. 822,477

Int. Cl.⁴ B65G 13/00

U.S. Cl. 193—35 R

9 Claims



1. A collapsible conveyor for article handling comprising:
 - an elongated frame;
 - means secured to said frame for displaceably supporting articles;
 - a pair of substantially identical legs;
 - means for pivotally securing said legs to opposite ends of said frame so that said legs are pivotable between a first position in which said legs lie substantially parallel to and adjacent to said frame and a second position in which the legs extend substantially perpendicular away from said frame,
 - wherein each leg comprises an elongated first leg member and an elongated second leg member, said first leg member being hollow and having a rectangular cross sectional shape,
 - said second leg member being telescopically slidably received in one end of said first leg member, said second leg member having three sides which flatly abut against three internal sides of the first leg member and a fourth side which longitudinally tapers along said second leg member so that a space is formed between the fourth side of said second leg member and the fourth side of said first leg

member, said space decreasing in size as the insertion of the second leg member into the first leg member increases, and

means for locking said leg members together at an adjusted position comprising a plate, means for freely pivotally securing said plate to said first leg member about an axis transverse to the axis of said first leg member and so that said plate depends from said plate pivotal securing means, and means for adjustably locking the pivotal position of said plate so that an edge of said plate abuts against said fourth side of said second leg member and prevents the further insertion of said second leg member into said first leg member.

4,715,489

DISK OPERATED PLASTIC BAG DISPENSER

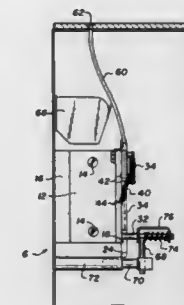
Loreto Verrelli, Burnaby, Canada, assignor to EBCO Industries Ltd., Canada

Filed Jun. 20, 1985, Ser. No. 747,087

Int. Cl.⁴ G07F 11/00, 5/02

U.S. Cl. 194—256

9 Claims



1. A disk operated mechanism comprising:
 - a first pivotable member;
 - a first lever formed on the first pivotable member;
 - a first stop to restrict pivoting of the first pivotable member, said first stop including means to permit its movement to allow pivoting of the first pivotable member past the first stop, said means to permit movement comprising a limb extending downwardly from the first stop, a second lever to contact the limb to move the stop out of contact with the first pivotable member and means urging the stop back into contact with the first pivotable member;
 - resilient means urging the first pivotable member against the first stop;
 - a second pivotable member, spaced from the first;
 - a second stop to restrict pivoting of the second pivotable member;
 - resilient means urging the second pivotable member against the second stop;
 - co-operable stops on the first and second members able to abut each other to prevent the first member pivoting by more than a predetermined amount when a force is applied to the first lever;
 - but the first and second members being spaced apart by an amount that allows a disk of predetermined size to be received between them, whereupon a force supplied to the first lever, and thus the first member, is transmitted by the disk to the second member to pivot the second member sufficiently to ensure the co-operable stops do not abut when the first member is pivoted and thus do not restrict further movement of the first lever.

4,715,490

AUTOMATIC PALLET CHANGER

Takao Date, Kannami; Masaru Okumura, and Koya Watanabe, both of Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Chuo, Japan

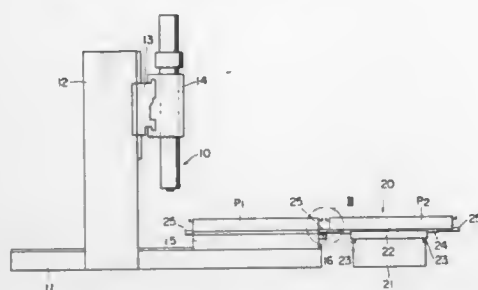
Filed Apr. 21, 1986, Ser. No. 853,917

Claims priority, application Japan, Apr. 26, 1985, 60-88965

Int. Cl.⁴ B65G 47/00

U.S. Cl. 198—346.1

3 Claims



1. An automatic pallet changer for replacement of pallets automatically between a pallet magazine storing a plurality of pallets and a pallet table of a machine tool, said pallet changer comprising:

- a rack fixed on the rear of each pallet parallelly to the direction in which the pallet is shifted for said replacement;
- a pallet driving pinion engaging with said rack disposed on a side end of said pallet table facing the pallet magazine; and
- pinion driving means for driving said pallet driving pinion.

4,715,491

HIGH INERTIA LOAD DRIVES AND CONTROLS THEREFOR

John Elderton, Hampton Hill, England, assignor to AE PLC, Rugby, England

PCT No. PCT/GB85/00177, § 371 Date Dec. 2, 1985, § 102(e) Date Dec. 2, 1985, PCT Pub. No. WO85/05088, PCT Pub. Date Nov. 21, 1985

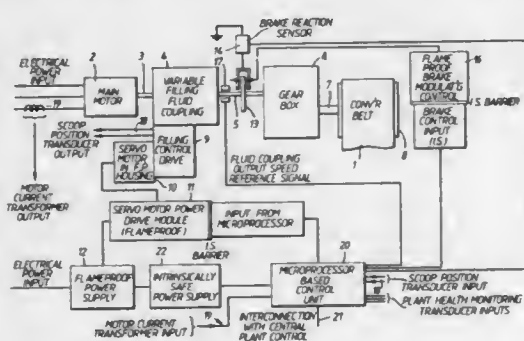
PCT Filed Apr. 25, 1985, Ser. No. 809,886

Claims priority, application United Kingdom, Apr. 30, 1984, 8411019

Int. Cl.⁴ F16D 67/06; B60K 41/28

U.S. Cl. 198—856

16 Claims



1. Apparatus for driving a high-inertia load from a prime mover, the apparatus comprising a brake for holding the load stationary, reaction sensing means for indicating the reaction exerted by the brake on the load, a variable filling fluid coupling having its input connected to the prime mover and its output connected to the brake and load, the coupling having filling control means responsive to external control signals for starting and stopping the load, the filling control means being responsive to the brake reaction sensor and to the speed of the load in such a manner as, on receipt of a start-up signal, to

release the brake under control such as to maintain a desired acceleration rate, and to start filling the fluid coupling such that the effect of such filling lags behind the restraining torque of the brake if the load is acting on it in the forward direction, but if the load is acting in the backward direction to maintain the brake engaged and cause the filling control means to increase the filling of the coupling until the driving torque exerted through the coupling reduces or eliminates the backward reaction sensed by the brake reaction sensor and thereafter to release the brake and progressively increase the coupling filling while monitoring the transmitted torque, until the working speed is attained, the control means being responsive to a stop signal to progressively reduce the coupling filling and to apply the brake while monitoring the torque exerted on the load to maintain it below a predetermined value.

4,715,492

HINGED COIN HOLDER

Gordon W. Holmes, Toronto, Canada, assignor to Professional Packaging Limited, Mississauga, Canada

Continuation-in-part of Ser. No. 600,985, Apr. 16, 1984, Pat. No. 4,541,528. This application Sep. 13, 1985, Ser. No. 775,794

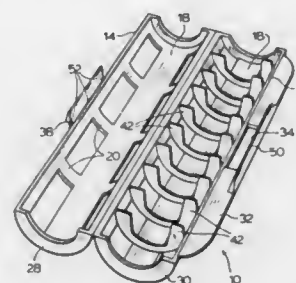
Claims priority, application Canada, May 4, 1983, 425138

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.⁴ B65D 85/62, 8/04

U.S. Cl. 206—0.83

26 Claims



19. In a holder for disc-like objects constructed of polymeric material and formed by molding as an integral element, comprising an elongate hollow cylindrical body having a generally circular cross-section of diameter substantially that of the disc-like objects to be packaged therein and formed of two semi-circularly cross-sectioned portions joined together at one common edge and releasably joined together by releasable locking means at the other common edge to enable opening of said body to occur at the other common edge to gain access to the interior of the body, the improvement wherein said releasable locking means comprises:

- at least one wedge-shaped upwardly-extending projection provided at and tapering towards the arcuate extremity of a resiliently-flexible tongue extending from adjacent the midpoint along the length of one curvilinear extremity of the body,
- a slot having a length slightly greater than the transverse dimension of the tongue and formed in an upright flange extending from the other curvilinear extremity of the body in a plane which substantially passes through the body hinge line, and
- a deflector bar extending perpendicularly to the flange towards said tongue at the upper extremity of said slot to deflect said wedge-shaped projection downwardly to guide the tongue into the slot until the projection clears the edge of the slot and said tongue springs up to establish engagement between the rear edge of the wedge-shaped projection and the adjacent surface of the flange to prevent withdrawal of the tongue through the slot and opening of the holder until the tongue is depressed so that the rear edge of the projection is free from the flange.

4,715,493

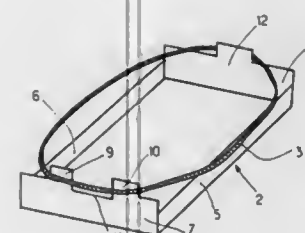
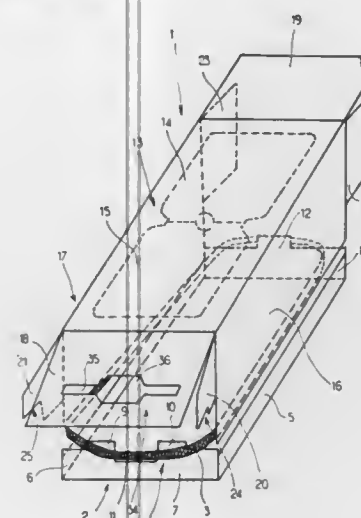
COMPOSITE PACKAGE FOR A GROUP OF CONTAINERS

Roger Dreyfus, Strasbourg, France, assignor to ICP S.A., Feger-sheim, France

Filed Oct. 27, 1986, Ser. No. 923,337

Int. Cl.⁴ B65D 5/46

U.S. Cl. 206—200



1. A composite package for a group of articles, comprising a substantially tray-shaped bottom portion having a bottom wall and a plurality of upstanding edge walls which include a front edge wall and a rear edge wall having respective upper edges and which confine the group of articles supported on the bottom wall;
- a cover portion connected to said bottom portion in an assembled condition of the package to cover said bottom portion and the group of articles and including including a front wall which includes a front panel having an opening and two lugs extending along said front panel in a closed position of said front panel;
- an elongated endless strap received in the package and loosely surrounding the group of articles in the assembled condition of the package; and
- means at said upper edges of said front and rear edge walls for holding said strap in position on said bottom portion, said holding means said front edge wall defining with said lugs, respective slots for the passage of said strap there-through and through said opening of said front panel between the interior and the exterior of the package in said assembled condition of the package and said closed position of said front panel for the strap to form a handle at the exterior of the package.

4,715,494

INTERNALLY PRESSURIZED PACKAGE WITH HEAT-SEALABLE CLOSURE MEMBER

Hans Heltzenröder, Langenselbold, and Eckhard Merz, Lich, both of Fed. Rep. of Germany, assignors to Dunlop Limited a British Company, United Kingdom

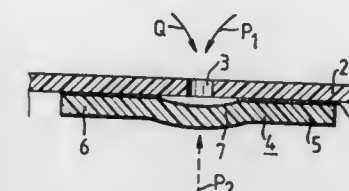
Filed Mar. 4, 1986, Ser. No. 836,124

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1985, 3509027

Int. Cl.⁴ B65D 81/20

U.S. Cl. 206—213.1

7 Claims



1. A pressure-tight packaging made of tubular flexible plastic material having sealed ends, with an initially heated gas contained therein and means to enable pressurizing and maintaining a gas pressure in said pressure-tight packaging without disturbing said sealed ends, said means comprising an opening in one packaging wall remote from the sealed ends of said pressure-tight packaging and a means for sealing said opening, said means comprising an elongated closure member for said opening said closure member comprising an imperforate material which is heat sealable at the temperature of the initially heated gas used to pressurize said container, said closure member being of planar configuration and being first attached by its opposed ends to the inner surface of said wall adjacent said opening to overlie said opening but defining a passage between said closure member and the wall immediately adjacent to the opening so as to permit gas entering said opening to enter said closed container, the positioning of the closure member in relation to the inner surface of the wall being such that when said container is internally pressurized with the gas at a temperature sufficient to activate said heat-sealable material and a pressure sufficient to urge said closure member against said opening, a permanent seal is formed.

4,715,495

DISPOSAL KIT

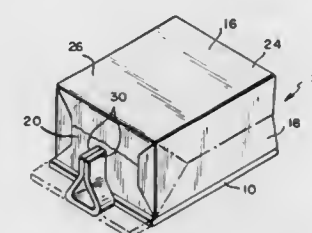
Herbert W. Henry, 4 West St., Cambridge, Mass. 02139

Filed Oct. 22, 1986, Ser. No. 921,430

Int. Cl.⁴ B65D 69/00

U.S. Cl. 206—223

1 Claim



1. A disposable kit for picking up animal litter and disposing of the same, comprising, in combination, a stiff cardboard panel of rectangular configuration, a foldable paper bag of the kind wherein the bottom is foldable relative to the sides into parallel relation therewith, said foldable paper bag being attached to one surface of the panel such as to be collapsible into parallelism with the panel prior to use and to be distensible for use with the open end adjacent one end of the panel, said panel being of a length such as to extend from the open end of the

bag to and beyond the closed end of the bag and defining at the closed end of the bag an extension of a width corresponding to the width of the bag, said extension containing slits parallel to the closed end of the bag extending from the opposite edges of the panel toward the center, but terminating short of the center such as to define a pair of tabs connected to the panel and foldable relative to the panel along lines parallel to the closed end of the bag to positions generally perpendicular to the panel and at right angles to the bottom of the bag, said tabs, when folded, providing a handle for holding the bag in a position to receive the litter, a flat cardboard panel corresponding to substantially the transverse width of the bag for scooping litter into the open end of the distended bag and a sanitary bag within which the collapsed bag and scoop can be stored prior to use and disposed of after use.

4,715,496

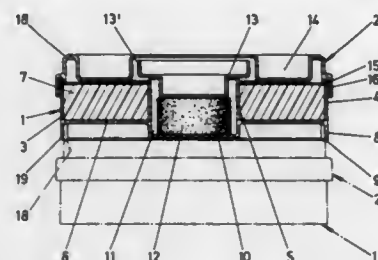
SHOE POLISH CAN

Ludger Hackmann, Lohne/Oldenburg, Fed. Rep. of Germany, assignor to Bramlage Gesellschaft mit beschränkter Haftung, Lohne/Oldenburg, Fed. Rep. of Germany
Filed Jan. 21, 1986, Ser. No. 820,867
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 8501716[U]

Int. Cl.⁴ B65D 81/22, 69/00

U.S. Cl. 206—229

15 Claims



1. A can for storage of shoe polish and similar paste materials, the can comprising
 - a housing having a bottom and a removable closure lid disposed opposite said bottom, and being configured for retention of an integrated applicator having an applicator handle,
 - an outer wall and an inner wall upstanding from said bottom and defining a paste containing space; and wherein said paste containing space is formed as an arcuate trough, said outer wall extends to meet said lid for closing off said paste containing space, said inner wall having an arcuate form to enclose a space for containing a head of the applicator, and said inner wall extends partway towards said lid to define a region for passage of said applicator handle from said head-containing space to said paste containing space and between said paste-containing space and said lid.

4,715,497

SHOULDER BOX FOR CIGARETTES OR THE LIKE
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Jul. 31, 1984, Ser. No. 637,237

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 3329456

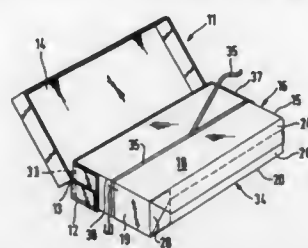
Int. Cl.⁴ B65D 85/10; A24F 15/00

U.S. Cl. 206—254

13 Claims

1. A shoulder box with a box portion (12) and a hinged lid (14) connected pivotally to said box part along an axis of articulation (13), said box portion for receiving a group of cigarettes (10) wrapped in an inner tin foil wrapping (15), said group of cigarettes to be aligned to lie flat in the box part parallel to the axis of articulation; said inner tin foil wrapping comprising a closed upper wall (18) with one of a tear-open

thread (35) and tear-open strip (36), and tearing lines located transverse to said thread (35) or strip (36) in the upper wall (18)



such that after the thread (35) or strip (36) has been removed the upper wall can be formed into two opening tabs (43, 44) by tearing said upper wall along said tearing lines.

4,715,498

SHARPS DISPOSAL SYSTEM

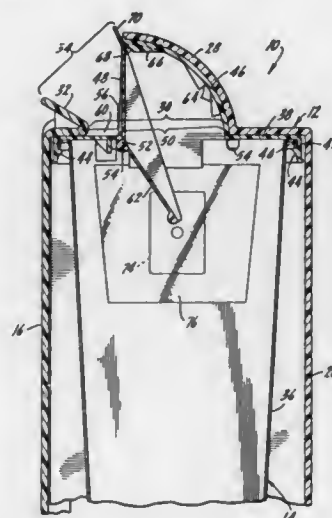
Paul H. Haniff, Barrington, Ill., assignor to Sage Products, Inc., Cary, Ill.

Filed Nov. 24, 1986, Ser. No. 934,413

Int. Cl.⁴ B65F 1/16

U.S. Cl. 206—366

21 Claims



1. A disposal system comprising
 - a hollow, outer enclosure,
 - an elongated slot for permitting access to the interior of the outer enclosure,
 - barrier means disposed adjacent said slot for restricting access to the interior of said outer enclosure, at least a portion of said barrier means comprising a constriction extending over said slot, and
 - a removable inner container disposed within said outer enclosure, said inner container including an inlet in registration with an inlet no larger in dimension than said slot, said inlet extending into said slot.

4,715,499

AUTOMOTIVE ROLL-UP TOOL KIT

Randall M. Franklin, Collinsville, Ill., assignor to RVF Corporation, Collinsville, Ill.

Filed Oct. 6, 1986, Ser. No. 915,628

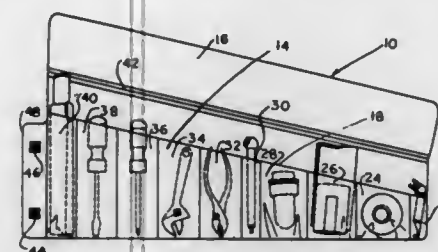
Int. Cl.⁴ B65D 30/22

U.S. Cl. 206—373

8 Claims

1. A roll-up automotive repair tool kit comprising a back sheet of flexible plastic, a plurality of vertically extending open top tool pockets receiving commonly used automotive repair tools formed by a flexible plastic pocket sheet member attached to said back sheet and extending sequentially from one

end of said cover sheet to an opposite end, a top roll over flap extending laterally from one end of said back sheet to an opposite end and forming a top extension of said back sheet and means for securing the tool kit in a rolled-up position comprising a Velcro-like pad means on the inside of said back sheet adjacent an end thereof and registering Velcro-like pad means on a back surface of the back sheet adapted to mate with said



first-mentioned Velcro-like pad means in the tool kit rolled-up position, said tool pockets increasing in height from one end of the kit to an opposite end and said flap being connected to said back sheet by a hinge means correspondingly increasing in height to said pockets to closely cover the open top of the tool pockets when closed and said flap being of substantially uniform height.

4,715,500

LIGHT-SENSITIVE PHOTOGRAPHIC FILM PACKAGING

Raymond A. Heylen, Grobbendonk, and Marc J. Boets, Edegem, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

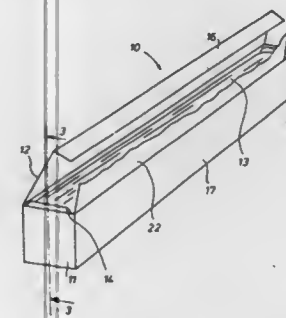
Filed Jul. 1, 1986, Ser. No. 881,003

Claims priority, application European Pat. Off., Jul. 12, 1985, EP 85201167.5

Int. Cl.⁴ B65D 27/10, 85/67

U.S. Cl. 206—397

5 Claims



1. Photographic film package for storing and dispensing undeveloped sheets of photographic sheets, comprising an elongated generally rectangular carton, a core that is rotatably journaled at its ends in said carton, and an openable light-tight cover on said box that gives in the opened position access to the interior of the box, an elongated retaining web wound in a multiplicity of windings on said core, and a plurality of separate sheets of photographic material that are sandwiched in closely spaced succession between the adjacent windings of said retaining web that is wound onto the core, whereby by opening said carton cover the free end of said sheet retaining web can be accessed and the web unwound to release said sheets one at a time.

4,715,501

IC TEST EQUIPMENT

Hiroshi Sato, and Yoshihito Kobayashi, both of Tokyo, Japan, assignors to Takeda Riken Co., Ltd., Tokyo, Japan

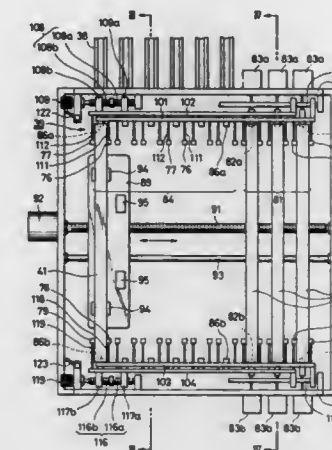
Filed Jun. 27, 1985, Ser. No. 749,274

Claims priority, application Japan, Jun. 29, 1984, 59-98843[U]; Jun. 29, 1984, 59-98847[U]; Jun. 29, 1984, 59-98848[U]

Int. Cl.⁴ B07C 5/342; B65G 57/30, 59/06

U.S. Cl. 209—573

8 Claims



4,715,502

TELEPHONE EQUIPMENT RACK

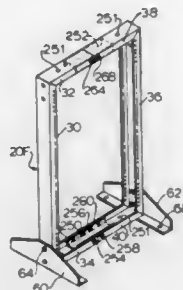
Garland R. Salmon, Durham, N.C., assignor to Newton Instrument Company, Butler, N.C.

Filed Feb. 20, 1986, Ser. No. 831,165

Int. Cl.⁴ A47F 5/00

U.S. Cl. 211-26

2 Claims



1. A rectangular, adjustable size telephone equipment rack comprising, in combination:

- a first U-shaped frame member formed of an integral strip of metal channel comprising a web and sides of U-shaped cross section and having a first vertical channel-formed side portion joined to horizontally-opposed channel-formed first top and first bottom portions oriented perpendicular to said first side portion and with the respective sides of the channel forming said side, top and bottom portions being inwardly directed;
- a second U-shaped frame member of shape and size mating that of said first frame member and formed of an integral strip of metal channel comprising a web and sides of U-shaped cross section and having a second vertical channel-formed side portion joined to horizontal opposed channel-formed second top and second bottom portions oriented perpendicular to said second side portion and with the respective sides of the channel forming said side, top and bottom portions being inwardly directed;
- first connector means adjustably securing said first and second top channel portions together; and
- second connector means adjustably securing said first and second bottom channel portions together, said first and second connector means each being formed of a U-shaped metal channel section with a web and sides nested within the web and sides of each of a pair of selected joined channel portions and adjustably bolt secured to both said joined channel portions and providing at least two positions in which said first and second top and bottom portions may be joined to provide frame width of corresponding different span.

4,715,503

INTERLOCKING JOINT WINE RACK

David W. Johnson, 1884 Sunset Blvd., San Diego, Calif. 92103

Filed Apr. 7, 1986, Ser. No. 848,573

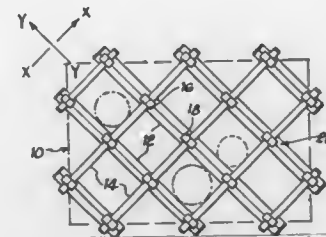
Int. Cl.⁴ A47B 73/00

U.S. Cl. 211-74

11 Claims

- A wine rack comprising:
 - a reticulated lattice defining orthogonal X, Y, and Z directions;
 - said lattice being comprised of a plurality of elongated structural members formed into an X-directional parallel array, a Y-directional parallel array, and a Z-directional parallel array;
 - said parallel arrays intersecting one another to define a plurality of six-member joints between said elongated structural members and each of said joints including two of said members from each of said X-, Y-, and Z-directional arrays to form said six-member joint, said six-member joint having three elongated structural members that are only full notched, said full notch being substantially equal to two times the cross-sectional area of each of the

three elongated members, two of said members having similar full notches and also having an additional half notch, said half notch being formed at ninety degrees to the full notch and substantially at mid-span of the full notch, the sixth elongated structural member having no notches at said joint and is the key post that holds the remaining five members together as a joint; and,



- each of said joints comprising an interlocking joint held together by the interlocking configurations of the elongated structural members themselves such that said lattice is rigid and completely integral without the use of blocks or sockets at the joints, or the use of fasteners or glue at any of the joints.

4,715,504

ORIENTED PLASTIC CONTAINER

Long F. Chang, Sylvania, and Scott W. Steele, Toledo, both of Ohio, assignors to Owen-Illinois Plastic Products Inc., Toledo, Ohio

Continuation of Ser. No. 783,061, Oct. 2, 1985, which is a continuation of Ser. No. 595,118, Mar. 30, 1985. This application

Sep. 25, 1986, Ser. No. 912,188

Int. Cl.⁴ B65D 23/00

U.S. Cl. 215-1 C

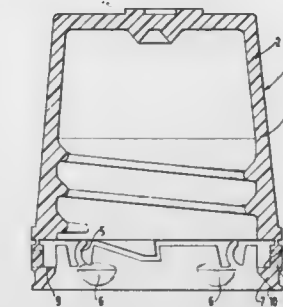
13 Claims



- A preform for making oriented plastic containers having a dimensionally stable finish comprising:
 - an injection molded finish part having an open upper end and an open lower end and made of a first plastic material, said finish part including an axially extending inner surface and an axially extending outer surface, said outer surface including a thread portion extending axially and defining an exterior thread on the neck of the final container,
 - an elongated main hollow body of orientable strain-hardenable thermoplastic material injection molded and bonded in situ on said previously molded open ended finish part, the material of said finish part having substantially greater thermal stability than the material of said hollow body, said hollow body including a main body container forming portion and a closed bottom container forming portion closing the open end of the main body forming portion,

said hollow body having an axially extending body portion of said body engaging the open lower end of the finish part and extending within the inner surface of said finish part, the body portion having a free end terminating within and in axially spaced relationship to the open upper end of the finish part such that the inner surface of said finish part is exposed to the atmosphere and said exterior thread portion is exposed to the atmosphere, and such that when the preform is blown at orientation temperatures, the hollow body forms the hollow body of a container with said inner surface of said finish part adjacent said open end of the finish part being exposed to the atmosphere and the outer surface of said open upper end of said finish part and the outer surface of said threaded portion of said finish part being exposed to the atmosphere in order that said exposed surfaces of greater thermal stability are subjected to the hot containers during filling of the container or when the contents are to be pasteurized.

ment being such that the inwardly projecting lugs cooperate with the projecting bead on the container body to prevent



initial removal of the cap part from the container body until the frangible means connecting the skirt of the cap part to the safety band has been broken.

4,715,505

GLASS HAVING MEANS FOR SWIZZLE STICK ATTACHMENT

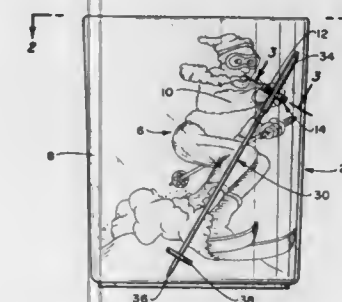
Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304

Filed May 13, 1986, Ser. No. 862,616

Int. Cl.⁴ A47G 19/22, 21/00; B65D 23/12

U.S. Cl. 215-100 R

7 Claims



1. A novelty glass, container, cup or the like comprising the combination:

- a container capable of being held by the human hand and having on the exterior sidewall thereof a protruding bracket member adapted to receive in releasable fashion a swizzle stick or the like, wherein said swizzle stick or the like simulates a sport or the like member and wherein a sport figure representation or indicia cooperates with said bracket member so as to simulate said sport figure representation or indicia actively utilizing said sport or the like member making up said swizzle stick.

4,715,506

TAMPER RESISTANT CLOSURES

Kevin W. McLaren, Erith, England, assignor to Johnsen & Jorgensen Plastics Limited, London, England

Filed Sep. 4, 1986, Ser. No. 903,556

Claims priority, application United Kingdom, Oct. 15, 1985, 8525351

Int. Cl.⁴ B65D 41/34

U.S. Cl. 215-252

9 Claims

- A container closure and container body assembly in which the container body has a mouth and an external annular or substantially annular projecting bead around the outside of the body below the mouth and in which the closure comprises a cap part with a depending skirt and a safety band connected to the skirt by frangible means characterized in that the safety band is provided with at least four relatively short spaced apart rounded lugs projecting inwardly from the band and with a plurality of relatively long spaced apart lugs of sharp profile, also projecting inwardly from the band and arranged so as to comprise at least one diametrically opposed pair, the arrange-

4,715,507

ELECTRICAL JUNCTION BOX WITH MANIPULATABLE ENDS

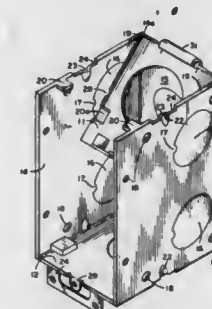
James C. Chamberlin, S. 3912 Bernard, Spokane, Wash. 99203

Filed May 5, 1987, Ser. No. 46,108

Int. Cl.⁴ H02G 3/08

U.S. Cl. 220-3.94

7 Claims



- An electrical junction box, formed with vertical side walls joined to a common rear wall and horizontal end walls pivotal thereto, wherein said electrical box comprises:
 - said side walls integrally joined to said rear wall forming a "U" shaped body,
 - said end walls each formed with a pivotal connection to said rear wall to enable pivoting of said end wall inwardly relative to said side and rear walls, and
 - fastening means carried by said side walls for releasably securing the end walls in a first position forming a box and permitting the pivotal motion of the end walls relative to the side walls to a second position with said "U" shaped body when said fastening means release said end walls.

4,715,508

COLLAPSIBLE CONTAINER

Richard C. Schurch, Livonia, Mich., assignor to BMC Manufacturing Inc., Plymouth, Mich.

Filed Aug. 11, 1986, Ser. No. 895,260

Int. Cl.⁴ B65D 7/24

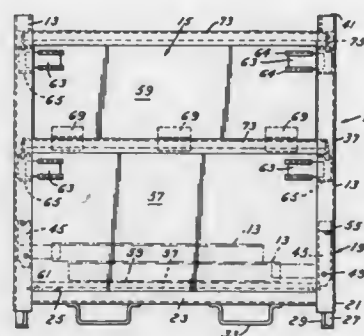
U.S. Cl. 220-7

13 Claims

- An improvement in a rigid collapsible container having a generally rectangularly-shaped base, the base including a plurality of lower corner posts, each lower corner post disposed at each corner of the base and each lower corner post disposed at each corner of the base and each lower corner post having a rivet securely fastened to and extending transversely from said each lower corner post, and the base including a plurality of

horizontally-oriented cross members, each cross member rigidly joining a respective two lower corner posts on each side of the base, the container further having a deck secured upon the base, and the container having a pair of end assemblies, each end assembly including a pair of upper corner posts, each upper corner post associated with a respective lower corner post, each end assembly further including a pair of corner post connectors, each corner post connector having an upper portion rigidly connected to a respective upper corner post and a lower end depending from said respective upper corner post, said lower end pivotally affixed to a respective rivet so that each end assembly is swingable between an upstanding position and a position overlying the deck, said position overlying the deck being inwardly of the lower corner posts, the improvement comprising in combination:

each corner post connector having a lock pin extending transversely from the upper portion thereof and each lower corner post having an upper end including a detent notch into which the lock pin is receivable into a detent



position, the detent notch having an edge cam surface inclined upwardly from the detent position and inwardly of the lower corner posts; and each corner post connector including a slot through which a respective rivet extends, the slot disposed in a lower portion of said each corner post connector and having an axis of elongation parallel to an axis along which each corner post connector extends, whereby, when an end assembly is swung from the upstanding position to the position overlying the deck, the lock pin is cammed out of the detent position as the lock pin is lifted by the edge cam surface, thus allowing collapsing of the end assembly without the necessity of manually disengaging the lock pin from the detent notch and without the necessity of manually lifting the end assembly, and, when an end assembly is swung from the position overlying the deck to the upstanding position, the lock pin reaches a position at which the lock pin is cammed into the detent position.

4,715,509

FUEL FILLER CONDUIT

Takaaki Ito; Eiji Mori; Koji Uranishi; Shinji Miyazaki, and Junichi Sugimoto, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Horie Metal Co., Ltd., both of Aichi, Japan

Filed Jul. 10, 1986, Ser. No. 884,154

Claims priority, application Japan, Jul. 31, 1985, 60-169613; Jul. 31, 1985, 60-169614; Jul. 31, 1985, 60-169615

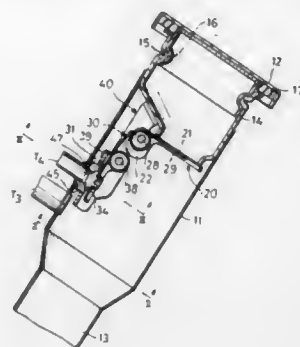
Int. Cl.⁴ B65B 31/06

U.S. Cl. 220—86 R

4 Claims

1. A fuel filler conduit connected with a fuel reservoir for the inner combustion engine at one end thereof and having the other open end normally closed by a cap, comprising a through hole formed in the circumferential wall of the conduit for outletting fuel vapour; first valve means normally urged by spring means to be in a position for closing a port leading to said other open end; and a second valve means normally urged

by other spring means to be in a position for closing said fuel vapour outlet and so engaged with said first valve means that when a fuel supply nozzle is inserted in the conduit from said other open end said first valve means is opened by the tip of



said nozzle against the force of said spring means, whereby said second spring means is opened against the force of said other spring means for allowing fuel vapour to pass through said outlet to be supplied to said engine for combustion.

4,715,510

SET UP PIECE FOR MOUNTING ON A CAN, CONTAINING A BEVERAGE

Leendert van der Meulen, 1804 Bayshore Road, SW., Calgary, Alberta, Canada T2V 3M1, and Adriaan Van Der Wouden, Ulvenhont, Netherlands, assignors to Leendert van der Meulen, Calgary, Canada

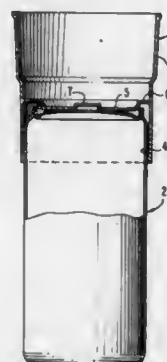
Filed Feb. 28, 1986, Ser. No. 834,771

Claims priority, application Netherlands, Mar. 1, 1985, 8500574

Int. Cl.⁴ B65D 25/48

U.S. Cl. 220—90.4

10 Claims



1. A beverage can drinking attachment comprising:

- a substantially cylindrical body having clamping means for obtaining a liquid tight connection between the beverage can attachment and a can top positioned at a lower end of said body;
- a disk extending substantially transverse across said body dividing said body into a drinking portion and clamping portion, said disk having means for engaging an upper rim of the can top;
- an aperture in said disk which when the can attachment is placed on the can top said aperture is alignable with a can lid opening;
- said clamping means comprising a straight, cylindrical skirt extending from a joint between said cylindrical body and said disk, said skirt having at a lower edge an inwardly extending rib which engages a cylindrical wall of the can substantially below an upper rim of the can, said skirt extending a substantial distance below the rim of the can

when the can attachment is placed on the can top whereby the can attachment provides a substantially liquid tight engagement, regardless of the shape or diameter of the upper part of the can or upper rim of the can.

4,715,511

PACK COMPRISING AN OUTER RIGID ENVELOPE AND AN INNER FLEXIBLE ENVELOPE

Dietrich Böhlen, Paldoux, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

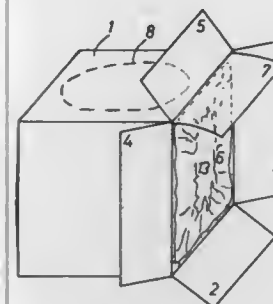
Filed Sep. 18, 1986, Ser. No. 909,143

Claims priority, application Switzerland, Oct. 3, 1985, 4279/85

Int. Cl.⁴ B65D 5/54

U.S. Cl. 220—403

14 Claims



1. A pack comprising
 - (a) a rigid outer envelope having at least one face and at least one flap associated with the face;
 - (b) a flexible inner envelope located within the outer envelope; and
 - (c) immobilization means between the inner and outer envelope and affixed to the inner envelope, the immobilization means abutting a face of the outer envelope and extending to each flap associated with the face, and having an opening positioned opposite and corresponding with an opening defined on the face.

4,715,512

INSULATED CABINET MANUFACTURE

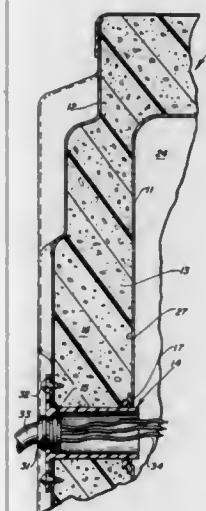
William J. Buchser, Marrs Township, Posey County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 3, 1981, Ser. No. 299,037

Int. Cl.⁴ F25D 23/08

U.S. Cl. 220—465

9 Claims



1. In a cabinet structure having an outer shell, and an inner

liner spaced inwardly from the shell to define the insulation space therebetween the improvement comprising:

- a wiring tunnel member extending successively through said outer shell, said insulation space, and said liner;
- a first foam stop member adjacent said liner in said insulation space, said wiring tunnel member extending through said first foam stop member;
- a second foam stop member extending about and bodily movable longitudinally along said wiring tunnel member in said insulation space; and
- foamed-in-place insulation in said insulation space urging said second foam stop member into engagement with said first foam stop member to cause said foam stop members to cooperatively stop the insulation foam at the extension of said wiring tunnel element through said liner.

4,715,513

TOXIC MATERIAL STORAGE VESSEL CONTAINMENT SYSTEM

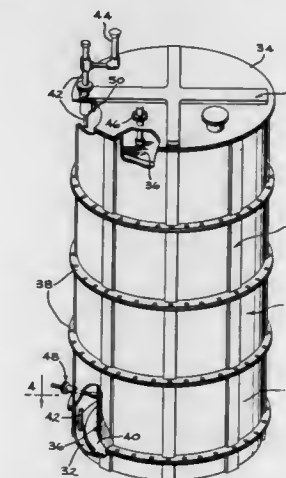
Amos H. Shelton, Jr., P.O. Box 327, Calvert City, Ky. 42029

Filed Dec. 9, 1985, Ser. No. 806,431

Int. Cl.⁴ B65D 6/38, 25/18

U.S. Cl. 220—469

3 Claims



1. A toxic material storage vessel containment system comprising
 - a cylindrically shaped hollow jacket having a flat circular bottom surface, a removable circular lid forming an upper surface for said jacket enclosing a conventional toxic material storage vessel therein,
 - a plurality of vertically extending ribs formed in and spaced around said jacket and defining channels therein which communicate with the interior of said jacket,
 - a raised disc shaped base eccentrically located relative to the vertical axis of said jacket and mounted on said bottom surface so as to be tangent to a single vertical line along the inside curved surface of said jacket, whereby a crescent shaped depression is formed between an arcuate portion of said jacket and a corresponding arcuate portion of said base for accumulating a liquid leaking from said vessel, and
 - leak detecting means mounted on said jacket and extending into said depression for detecting the presence of liquid which has leaked from said vessel.

4,715,514

AUTOMATIC UNITARY-PRODUCT DISPENSING DEVICE

Felix G. Vidondo, Peralta, Spain, assignor to Jofemar, S.A., Peralta, Spain

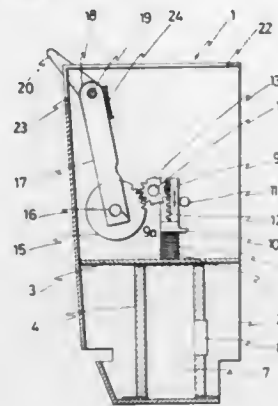
Filed Apr. 11, 1986, Ser. No. 851,141

Claims priority, application Spain, Apr. 15, 1985, 286032

Int. Cl.⁴ B65H 3/24; B65G 59/06; G07F 11/16

U.S. Cl. 221-258

1 Claim



1. An automatic unitary-product dispensing device, comprising:

- a frame having two grooves therethrough;
- a coil having a movable core, the coil being joined to the frame;
- one U-shaped flange joined at one end to one end of the core of the coil for movement therewith;
- a stud fixed relative to the frame and cooperative with the one U-shaped flange for guiding the movement thereof with the core;
- a projection at the one end of the one U-shaped flange joined to the one end of the core but butting against the stud, whereby to prevent further movement of the one U-shaped flange with the core;
- a rack in the one U-shaped flange for movement therewith;
- a pinion meshed with the rack for rotation upon the movement of the rack with the one U-shaped flange;
- a toothed wheel meshed with the pinion for rotation thereby;
- another U-shaped flange secured to the toothed wheel at one end for rotation therewith and extending into two lugs at the opposite end;
- rotatable means positioned between the lugs for rotation therebetween;
- two fingers connected to the rotatable means for rotation therewith and movement respectively along the grooves upon the rotation of the another U-shaped flange, whereby said fingers engage a product to dispense the product.

4,715,515

HOPPER AND METERING MECHANISM STRUCTURE FOR AN AGRICULTURAL IMPLEMENT

Ronald M. Stellen, Akeny, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 10, 1986, Ser. No. 884,148

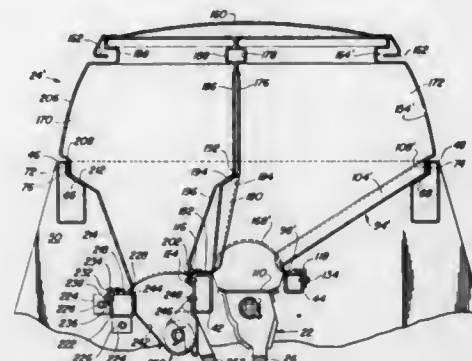
Int. Cl.⁴ B67D 5/60

U.S. Cl. 222-143

14 Claims

1. Hopper structure for a seeding and/or fertilizing implement having a frame, said hopper structure comprising:
- first and second support surfaces extending parallel and spaced with respect to each other to define an elongated opening therebetween;
 - meter support structure having outwardly directed support flanges for support on the respective support surfaces;

a flexible tank having lower sidewalls terminating in lower, outwardly extending tank flanges; and means releasably sandwiching the outwardly directed support flanges between the outwardly extending tank flanges and the support surfaces, said means releasably



sandwiching including an elongated flat portion and means securing the flat portion against the generally parallel to one of the tank flanges independently of fasteners passing through said one of the flanges and the corresponding support flange.

4,715,516

APPARATUS FOR DISPENSING CARBONATED BEVERAGE FROM CONTAINERS

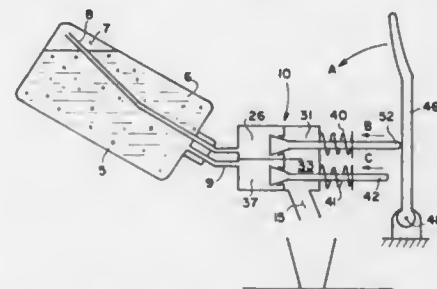
Napoleon P. Salvail, 6610 South Fork, Titusville, Fla. 32780

Filed Mar. 7, 1986, Ser. No. 837,211

Int. Cl.⁴ B67D 3/00

U.S. Cl. 222-153

7 Claims



1. A beverage dispensing assembly including a container with a threaded neck and means for dispensing a liquid from said container comprising:

- (a) a stand having supporting means for supporting said container such that said liquid can flow by gravity from said neck;
- (b) a dispensing valve sealingly attached to said neck and having
 - (i) a body portion;
 - (ii) a vent tube projecting from said body portion into the ullage volume of said container,
 - (iii) a spout,
 - (iv) a vent valve disposed in a passage in said body portion and having biasing means for biasing said vent valve in a normally closed position, said vent valve having an outlet communicating with said spout and an inlet,
 - (v) said vent tube disposed in said inlet and extending through said container into and communicating with the ullage volume of said container,
 - (vi) a fluid valve disposed in a passage communicating with the interior of said container and said spout, and having biasing means for biasing said fluid valve in a closed position, and

(vii) a lever attached to said body and operatively coupled to said vent valve and to said fluid valve such that movement of said lever sequentially opens first said vent valve and then said fluid valve thereby venting said ullage volume via said spout and dispensing said liquid via said spout.

4,715,517

DISPENSER HAVING A ROLLER FOR SQUEEZING MATERIAL FROM A TUBE

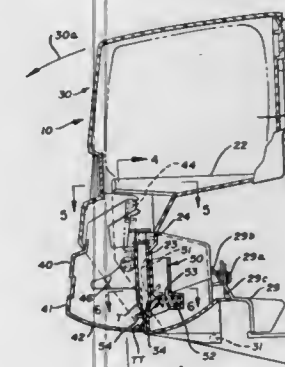
Charles Potter, Stow; Ronald F. Bell, Uniontown, and John M. Tosill, Barberton, all of Ohio, assignors to Go-Jo Industries, Inc., Cuyahoga Falls, Ohio

Filed Jun. 26, 1986, Ser. No. 878,643

Int. Cl.⁴ B65D 35/28

U.S. Cl. 222-181

8 Claims



1. A fluid dispenser for use with a source of fluid having a flexible valveless dispensing tube having an open end, comprising:

- (A) a base unit for reception of the source of fluid;
- (B) external closure means for normally engaging and closing off the open end of the tube;
- (C) said closure means including cam means pivotally carried by said base unit;
- (D) a roller assembly engagable with said cam means and being movable into and out of collapsing and dispensing engagement with the tube;
- (E) means for moving said roller assembly along said cam means and along the tube toward the open end thereof;
- (F) said roller assembly cooperating with said cam means for release of said closure means during at least a portion of the time said roller assembly moves along the tube; and
- (G) said roller assembly disengaging said cam means and permitting return of said closure means to its normal position prior to disengagement with the tube.

4,715,518

DISPENSER FOR STRIPED VISCOUS PRODUCTS

David G. Moore, Lee's Summit, Mo., assignor to Realex Corporation, Lee's Summit, Mo.

Continuation of Ser. No. 631,258, Jul. 16, 1984, abandoned. This application Oct. 3, 1986, Ser. No. 926,853

Int. Cl.⁴ G01F 11/00

U.S. Cl. 222-257

5 Claims

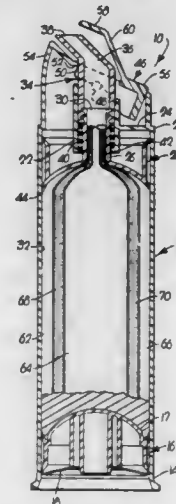
1. In a manually operated dispensing pump, the improvement comprising:
- a hollow cylindrical body defining an internal product chamber;
 - a pumping piston at one end of the body supported for reciprocal movement through repeated strokes of limited length toward and away from the opposite end of the body,
 - said piston having yieldable means associated therewith for returning the piston to its original position following each dispensing stroke and having a centrally disposed, axially

extending discharge passage in continuously open communication with said product chamber;

a discharge spout having an internal outlet passage of reduced diameter compared to the product chamber in continuously open communication with said discharge passage of the piston;

a take-up piston at the opposite end of the body from the pumping piston movable toward the pumping piston under the force of atmospheric pressure outside of the body and subatmospheric pressure inside of the body following each dispensing stroke of the pumping piston whereby to reduce the volume of the product chamber by an amount which corresponds to the volume of product dispensed during the immediately preceding dispensing stroke,

said take-up piston having means associated therewith for preventing retrograde movement of the take-up piston in a direction away from the pumping piston during the dispensing stroke of the pumping piston;



a viscous product mass within said product chamber containing a plurality of circumferentially spaced apart, axially extending product stripes of different colors,

said pumping piston having a smooth, concave, product-engaging face surrounding the discharge passage thereof and extending radially outwardly across the width of the product chamber for gently funneling the striped product mass laterally inwardly into and axially through said passages during movement of the pumping piston through its dispensing stroke, whereby to produce an axially striped, multi-colored bead of product emanating from the spout whose stripes are proportionately closer together and narrower than the stripes of the mass in the product chamber,

said passages of the pumping piston and the spout being devoid of internal obstructions to product flow throughout their full lengths whereby to preserve and maintain the integrity of the multi-colored stripes in the product passing through said passages; and

actuating means operably coupled with said pumping piston for operating the same.

4,715,519

ROLLED DISPENSER FOR CUTTING A CONTINUOUS ROLLED SHEET AND A BLANK THEREFOR

David Fischer, Downsview, Canada, assignor to Domtar Inc., W. Montreal, Canada

Filed Apr. 28, 1986, Ser. No. 856,833

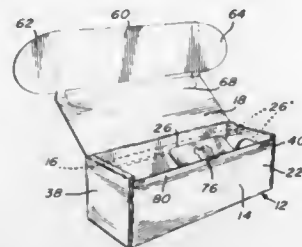
Int. Cl.⁴ B26F 3/02

U.S. Cl. 225-48

9 Claims

1. A roll dispenser for cutting a continuous rolled sheet of material comprising: a box having a bottom, a pair of opposite

longitudinal sides extending from said bottom, a pair of opposite ends extending from at least one of said longitudinal sides and said bottom, said ends being perpendicularly oriented with respect to said longitudinal sides, and defining said box for receiving a roll of continuous sheet material, a first of said longitudinal sides having a longitudinal free edge away from said bottom being provided with a cutting element, at least one tongue element inwardly and upwardly mounted on said first of said longitudinal sides and near said longitudinal free edge, a second of said longitudinal sides extends away from said bottom into a hingedly connected longitudinal panel defining a top for said box said at least one tongue element having an edge



away from said first of said longitudinal sides, said edge providing support in space relation between said cutting element on said first of said longitudinal sides and a roll of continuous sheet material to be received in said box, whereby, upon insertion of said roll of sheet material in said box said edge projects into, biases against and supports said sheet material between said top and said at least one tongue element to prevent the recoil of the free end of sheet material onto said roll, and whereby upon cutting said sheet material by said cutting element, the end portion of the roll of sheet material remains on said edge of said at least one tongue element and can be rapidly withdrawn to be further cut by said cutting element.

4,715,520

SURGICAL FASTENER APPLYING APPARATUS WITH TISSUE EDGE CONTROL

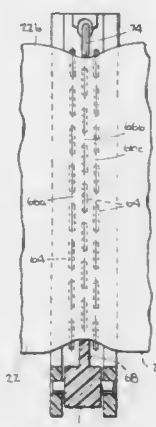
William H. Roehr, Jr., Ridgefield, Conn., and Richard L. Goodman, White Plains, N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 10, 1985, Ser. No. 785,992

Int. Cl.⁴ A61B 17/04

U.S. Cl. 227—19

13 Claims



1. An apparatus for applying a plurality of surgical fasteners to body tissue comprising:
a fastener holder cartridge containing an array of fastener in parallel rows;
an anvil opposite said cartridge for clamping of body tissue therebetween;
a pusher for expelling said array of fasteners from said car-

tridge towards said anvil part for applying the fasteners to the body tissue; and
a tissue edge control member at least at one side of said anvil in longitudinal alignment with at least one row of fasteners and extending within said array of fasteners to confine the clamped body tissue within said array of fasteners.

4,715,521

HAND-HELD TAG ATTACHER

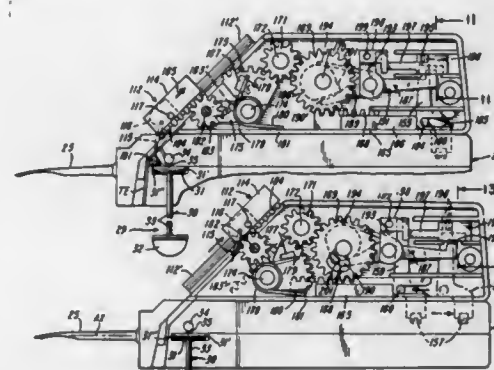
Larry D. Strausburg, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Division of Ser. No. 654,333, Sep. 25, 1984, Pat. No. 4,673,120.
This application Jan. 27, 1987, Ser. No. 6,858

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.⁴ A43D 69/00

U.S. Cl. 227—67

9 Claims



1. A hand-held tag attacher for attaching tags to merchandise using fasteners, each fasteners having a bar section and a button section joined by a filament section, the attacher being solely manually powered and comprising: an attacher body having a hopper adapted to receive a stack of tags and having a manually engageable handle, a needle mounted to the body and having an elongate needle bore and an elongate size opening communicating with the needle bore, means for advancing one bar section at a time into alignment with the needle bore, a push rod engageable with a bar section of a fastener for driving the bar section through the needle bore while its filament section extends through the side opening, a tag feeder engageable with an endmost tag in the hopper for feeding the endmost tag from its position in the stack along a path to an attaching position in alignment with the needle, means for moving the bar section advancing means, the push rod and the tag feeder through a cycle, wherein the moving means includes manually operable actuating means disposed at the handle, wherein the moving means further includes a cam and a lever driven by the cam, wherein the tag feeder includes a slide, a pin mounted for reciprocating movement on the slide, and means for coupling the lever to the slide.

4,715,522

NAIL RESERVE INDICATOR

Rodney B. Jordan, Box 39, Florian, La. 71429
Filed Dec. 5, 1986, Ser. No. 938,418

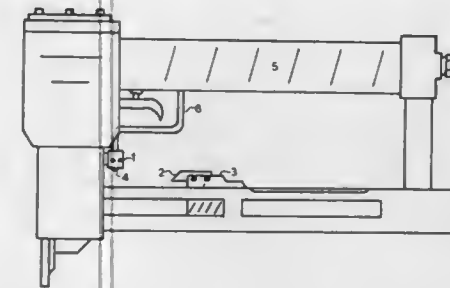
Int. Cl.⁴ B25C 7/00

U.S. Cl. 227—156

9 Claims

1. A pneumatic fastener driver device with an attached magazine and a device for indicating the depletion of fasteners within the magazine comprising:
(a) a pneumatic fastener driver housing;
(b) a fastener magazine attached to said housing;
(c) means attached to said housing for producing an audible signal; and

(d) trigger means attached to said magazine and connected to said signal producing means for detecting a low-fas-



tener condition in said magazine and for triggering said signal producing means so as to produce an audible signal.

4,715,523

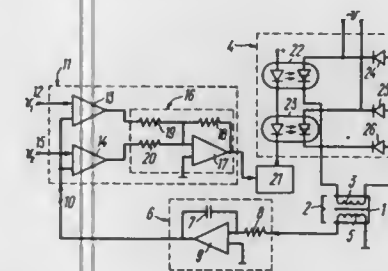
ELECTROMAGNETIC POWER DRIVE FOR A FRICTION WELDING MACHINE

Vladimir K. Lebedev, ulitsa Engelsa, 25, kv. 12; Ivan A. Chernenko, ulitsa Lomonosova, 24, kv. 125; Alexandr T. Dyshlenko, ulitsa Vasilkovskaya, 49, korpus 3, kv. 14; Leonid V. Litvin, ulitsa Vernadskogo, 87, kv. 46, and Vladimir I. Tishura, ulitsa Chigorina, 55, kv. 27, all of Kiev, U.S.S.R.
Filed Nov. 12, 1984, Ser. No. 930,664

Int. Cl.⁴ B23K 20/12, 27/00

U.S. Cl. 228—2

1 Claim



1. An electromagnetic power drive for a friction welding machine, comprising:

a first magnetic core which is stationary;
a second magnetic core adapted for axial motion and rotation in relation to said first magnetic core;
a power coil installed on said first magnetic core;
at least one pickup coil installed on said first magnetic core;
an integrator producing voltage proportional to the actual value of the magnetic flux during said friction welding, having an output and an input connected to each said pickup coil;
a comparison means having an input connected to said output of said integrator, a first driving input, a second driving input, and an output;
a first comparator having an input, an output, and a driving input which is said first driving input of said comparison means, to which voltage proportional to a first assigned value of the magnetic flux is applied;
a second comparator having an output, a driving input which is said second driving input of said comparison means, to which voltage proportional to a second assigned value of the magnetic flux is applied during said friction welding, and an input joined together with said input of said first comparator in order to form said input of said comparison means;
a control signal generator having a hysteresis output characteristic, an input connected to said outputs of said first and

second comparators, and an output which is said output of said comparison means; and
a voltage regulator made as a switch operated by control signals of said control signal generator, having a control input electrically connected to said output of said comparison means, and an output connected to said power coil.

4,715,524

ASSEMBLY OF PARTS TO BE FORMED INTO A T-JOINT WELD

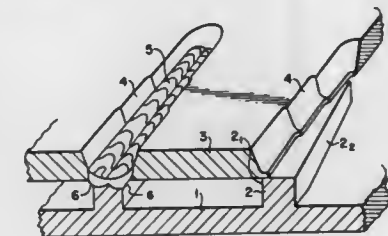
Yasuhiro Fukaya, and Nagio Minami, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,618

Claims priority, application Japan, Feb. 13, 1986, 61-27970
Int. Cl.⁴ B23K 9/02

U.S. Cl. 228—165

3 Claims



1. An assembly of parts for being welded into a T-joint weld, comprising:

a rib-like member having opposite faces and a thickness between said faces which increases from a thin end to a thick end, said faces being at an angle to the length of said rib-like member;
a pair of plate members with spaced opposed edges; beveled edge portions on the opposed edges of said plate member, said beveled edge portions having at least the lower edges with an elongated scalloped shape constituted by substantially straight elongated edge parts joined by curved edge parts;
said lower edges lying along the edges of the top surface of said rib-like member with said lower edges spaced from each other, and with the straight elongated edge parts at smaller angle to the length of the rib-like member than the faces of the rib-like member for forming gaps between the lower edges adjacent the curved edge parts and overlapping portions along the remainder of the edges;
whereby when the assembly is welded for welding the plate members to the rib member, even if the welding conditions are not changed precisely and continuously along the length of the rib member, the weld will have good quality along the entire length of the rib member.

4,715,525

METHOD OF BONDING COLUMBIUM TO TITANIUM AND TITANIUM BASED ALLOYS USING LOW BONDING PRESSURES AND TEMPERATURES

Brian Norris, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 10, 1986, Ser. No. 928,862

Int. Cl.⁴ B23K 20/00, 20/16, 20/22

U.S. Cl. 228—194

8 Claims

1. A method of bonding columbium to titanium and titanium based alloys, comprising the steps of:

(a) providing a first thin sheet of columbium,
(b) providing a second member having a composition taken from the class consisting of titanium and titanium based alloys,
(c) forming a layer of nickel and a layer of copper onto said second member, each of said layers having a thickness of less than about 0.0005 inches,

- (d) placing said first sheet and second member in intimate contact with each other with said layers therebetween,



- (e) heating the arrangement of (d) in a vacuum to a temperature below the beta-transus of the titanium material in (b) and above 1652° F., and
(f) cooling the arrangement of (e) to ambient temperature.

4,715,526

FLOATING SEAL AND METHOD OF ITS USE

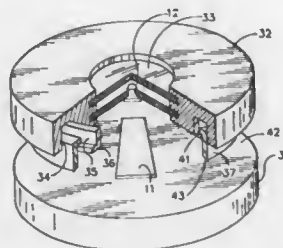
Douglas E. MacNeill, West Covina, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Nov. 20, 1986, Ser. No. 932,848

Int. Cl. B23K 37/04

U.S. Cl. 228—219

20 Claims



1. Apparatus for providing a floating seal for an inert gas reflow chamber, said apparatus comprising:

an upper chuck adapted to retain a first workpiece intended to be secured to another;

a lower chuck adapted to retain a second workpiece to which the first workpiece is intended to be secured, said upper and lower chucks being adapted to move said workpieces axially with respect to each other;

floating sealing means located between said upper and lower chucks; and

means for mounting said sealing means to said upper chuck for limited free axial movement with respect to said upper chuck, and for selectively free rotational and lateral movement with respect to said lower chuck;

whereby upon said sealing means being in sealing contact with both said upper and lower chucks, said upper and lower chucks and said sealing means form a sealed chamber, and selective rotational, lateral and axial adjustments may be made between the relative positions of said chucks while maintaining the integrity of said sealed chamber.

13. A method for reflow soldering in an inert gas chamber formed of an upper chuck, a lower chuck and a substantially non-deformable sealing member, said method comprising the steps of:

mounting said sealing member to said upper chuck for limited free axial movement with respect thereto;

separating said upper and lower chucks;

mounting a first workpiece to said upper chuck;

mounting a second workpiece to said lower chuck;

moving one of said chucks with respect to the other to a position where said lower chuck contacts a protruding surface of said sealing member and pushes said sealing member telescopically into said upper chuck for a portion of its possible axial movement, thereby forming the sealed chamber but with the first and second workpieces being still in spaced confronting relationship;

purging the sealed chamber with inert or reducing gas;

axially moving said lower chuck with respect to said upper chuck to establish a predetermined bonding pressure contact of said first workpiece with said second work-

piece, thereby moving said sealing member telescopically further into said upper chuck but still within the limits of its range of motion; and
directly measuring the bonding force between said first and second workpieces by means of a force transducer.

4,715,527

ULTRASONICALLY SEALED SIDE SEAM ON CUP

Kiyoshi Tsuzuki, Sigeto Tanaka, both of Sagami, and Yoshiaki Take, Fujisawa, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

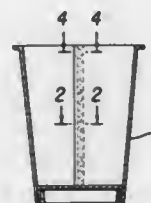
Continuation of Ser. No. 765,171, Aug. 12, 1985, abandoned, which is a continuation of Ser. No. 534,259, Sep. 20, 1983, abandoned, which is a continuation of Ser. No. 340,357, Jan. 18, 1982, abandoned, which is a division of Ser. No. 217,217, Dec. 17, 1980, Pat. No. 4,374,697. This application Sep. 11, 1986, Ser. No. 907,123

Claims priority, application Japan, Dec. 26, 1979, 54-169600; Dec. 26, 1979, 54-169601; Dec. 26, 1979, 54-169602; Dec. 26, 1979, 54-180535

Int. Cl. B65D 3/28

U.S. Cl. 229—1.5 B

3 Claims



1. A container comprising a tubular frustoconical side wall member having open ends, one of which is of smaller diameter than the other and a flat circular bottom member disposed at the open end of smaller diameter; said side wall member comprising a trapezoidal blank laminate of two coextensive plies, one ply comprising cardboard and the other ply comprising plastic, said trapezoidal blank having spaced, parallel top and bottom edges and symmetrically converging side edges and said blank being formed to assume said tubular frustoconical configuration with the cardboard ply at the outside and the plastic ply at the inside and with the side edges overlapping such that the plastic ply at the inner marginal edge of the outer one of the side edges is disposed in contact with the paper-board ply at the outer marginal edge of the inner one of the side edges, said side wall member having at its upper end a radially-disposed lip and at its lower end an inwardly-disposed upturned flange defining a groove peripherally of the lower end, the inner surface of which is constituted by the plastic ply and said bottom member corresponding in diameter to the open end of smaller diameter and being provided with a downturned peripheral flange turned downwardly from the plastic side such as to have contact with the inner plastic side of the side wall member at the lower end and wherein the cardboard ply at the marginal edge of the inner one of the side edges is skived and the plastic ply at said marginal edge folded to dispose the plastic ply about the end edge into contact with the plastic ply at the inner side of the outer one of the side edges and wherein the lapped ends are ultrasonically bonded using an ultrasonic horn throughout an area coextensive with the confronting overlapping surfaces thereof from the rim at the top downwardly along the overlapping surfaces at least several millimeters to reinforce the top and wherein the confronting overlapping surfaces of the lapped ends along the remainder of the distance toward the bottom are adhered to each other throughout an area corresponding in length to the remainder of the distance toward the bottom and in width from the edge of the outer one of the lapping ends toward the edge of the inner one of the lapping ends a distance less than the width of

the overlapping surface such that the remainder of the confronting surfaces are unattached.

behind at least a portion of said upstanding male latching member.

4,715,528

RECLOSABLE OPENING ARRANGEMENT ON A PACKING CONTAINER

Tom Kjelgaard, Löddeköping; Anders Hallberg, Lund, and Kenth Jacobsson, Södra Sandby, all of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

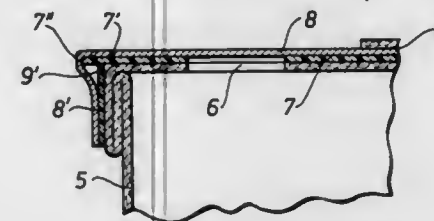
Filed Sep. 9, 1986, Ser. No. 905,157

Claims priority, application Sweden, Sep. 20, 1985, 8504351

Int. Cl. B65D 5/72

U.S. Cl. 229—123.1

13 Claims



1. In an opening arrangement on a packing container having a pouring opening formed in a container wall, the arrangement including a cover strip having an underside and being an openable closure of the pouring opening and a pouring edge strip arranged between the cover strip and the container wall, the improvement comprising the cover strip being provided with a gripping element in the form of a strip applied to the underside of the cover strip to provide detachable gripping of the pouring edge strip, said gripping element including means for reclosing said opening arrangement.

4,715,529

BEAK-TYPE CARTON LOCK

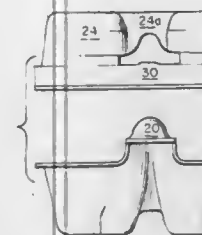
Kenneth D. Bixler, Huntington, N.Y., assignor to Packaging Corporation of America, Evanston, Ill.

Continuation of Ser. No. 530,840, Sep. 9, 1983, abandoned. This application Jul. 17, 1986, Ser. No. 870,148

Int. Cl. B65D 1/34

U.S. Cl. 229—2.5 R

9 Claims



1. In a molded container having a tray section and a cover section hingedly connected to a rear side of said tray section for movement between an open position and a closed position, said tray section having at least one fixedly positioned upstanding male latching member formed on a front side thereof, said cover section having a female latching formation formed in a front wall thereof, said container being further characterized in that the female latching formation includes a recessed upper marginal portion having a configuration which in part takes the shape of an inverted U having a closed end portion at a height at least as great as the height of said upstanding male latching member, and a width less than the width of said male latching member defining at least one flexible ear along said upper marginal portion which, in the locking position, lies

4,715,530

TWO-PART MAILER WITH RETURN ENVELOPE

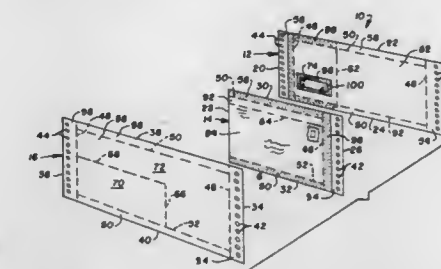
David J. Leese, Indianapolis, Ind., and Robert E. Ashby, Quakertown, Pa., assignors to Moore Business Forms, Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 834,765, Feb. 28, 1986, abandoned. This application Mar. 13, 1987, Ser. No. 25,724

Int. Cl. B65D 27/06

U.S. Cl. 229—73

44 Claims



1. A two-part mailer with a return envelope, comprising: a first part, including:

a top sheet having a front face and a rear face;

an intermediate sheet having a front face and a rear face; securement means joining said front face of said intermediate sheet to said rear face of said top sheet along a generally C-shaped band so that a first portion of the top sheet is disposed in facewise juxtaposition with a first portion of the intermediate sheet, with the C-shaped band of securement means defining on these sheets the internal perimeter of a return envelope, with potentially open mouth of such return envelope being defined between opposite limbs of said C-shaped band of securement means;

a second portion of said top sheet adjoining said first portion thereof outside said C-shaped band of securement and extending beyond a perimetrical edge of said intermediate sheet;

means defining a window aperture through said second portion of said top sheet beyond said perimetrical edge of said intermediate sheet;

two complementary C-shaped bands of deactivated, activatable adhesive disposed on said rear faces of said top and intermediate sheets, these two bands being arranged to form a hollow generally rectangular figure which collectively jointly perimetrical rings said return envelope and said window aperture;

at least one field of constant information printed on at least one of said top sheet and intermediate sheet; and

a second part, including:

a bottom sheet having a front face and a rear face; this bottom sheet being of sufficient size and shape as to permit facewise juxtaposition of said two complementary C-shaped bands of adhesive with said front face thereof substantially completely about the perimetrical extent of said generally rectangular figure;

this bottom sheet being adapted to be printed with information including at least one field of variable information located so as to be visible through said window aperture upon such juxtaposition of said two complementary C-shaped bands of adhesive with said front face of said bottom sheet.

4,715,531

REUSABLE REMAILABLE ENVELOPE

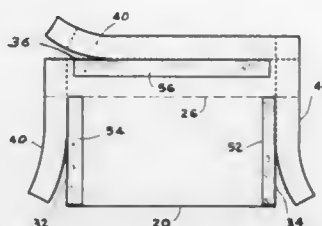
Russell M. Stewart, 1350 Ala Moana Blvd., Suite 1350, Honolulu, HI. 96814, and Rodney A. Gomes, 1760 Hookupa St., Pearl City, HI. 96782

Filed Sep. 10, 1985, Ser. No. 774,437

Int. Cl.⁴ B65D 27/06

U.S. Cl. 229—73

10 Claims



1. A reusable mailing envelope having a single sheet of paper with first and second surfaces and having a central fold thereby forming face and back portions, with the second surface on the face and back portions being juxtaposed and the first surface of the face and back portions being remote from one another, and the sheet having perforations spaced inward from peripheral edges thereof and extending parallel to the peripheral edges thereby forming detachable portions along the peripheral edges, first adhesive strips on the second surface in the detachable portions along lateral edges and a first activatable adhesive strip on the second surface of a detachable terminal edge portion along a terminal edge, and second activatable adhesive strips positioned inward from perforations on a back portion of the first surface, whereby the face portion of the first surface is an addressable and postage bearing area and wherein the face portion of the second surface is an addressable and postage bearing area.

4,715,532

ADJUSTABLY RESETTABLE, TEMPERATURE-RESPONSIVE AUTOMATIC VENTILATOR

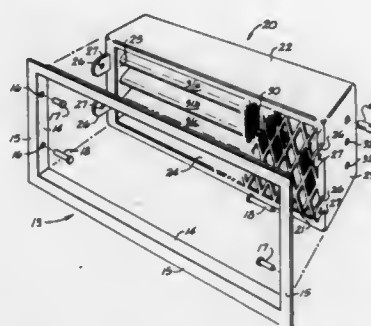
Paul M. Sarazen, Jr., 214 Fairview Dr., and Dennis A. Beam, 410 Westfield Rd., both of Shelby, N.C. 28150, assignors to Paul M. Sarazen and Dennis A. Beam, both of Shelby, N.C.

Filed Jul. 16, 1986, Ser. No. 886,531

Int. Cl.⁴ F24F 13/14

U.S. Cl. 236—49

13 Claims



1. An automatic ventilator comprising:
(a) a housing, said housing having peripheral side walls defining an air passageway therethrough;
(b) a setting opening defined in one of said side walls;
(c) at least one shutter element received in said air passageway and mounted to said housing for rotary movement between a closed position where the passageway is generally closed and an open position where the passageway is

generally open to the passage of ventilating air there-through;

- (d) temperature responsive drive means operatively associated with said shutter element for driving said shutter element between said open and closed positions;
(e) a setting plug receivable in said side wall setting opening, said plug having at one end two opposed members extending outwardly therefrom and defining a receiving slot therebetween, said receiving slot receiving one end of said drive means, said receiving slot being defined by opposing members having at least one gripping tooth engageable with said drive means, said plug having at an opposite end means for securing said plug against undesired rotation relative to said setting opening so that said plug when inserted into said setting opening non-rotatably secures said one end of said drive means relative to said side wall, and said means for securing said plug being selectively rotatable in infinitely varying increments relative to said setting opening and securable therein by deforming said setting opening for adjusting said plug relative to said setting opening; and
(f) whereby temperature variation effects on said drive means cause said shutter element to move toward an open or closed position.

4,715,533

RAIL FASTENER ASSEMBLY WITH HORIZONTAL FLANGES

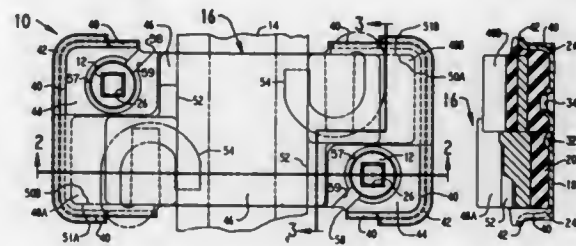
James H. Bucksbee, 5187 West Rd., McKean, Pa. 16426, and Casimir K. Slwek, 3427 Aberdeen Ave., Erie, Pa. 16506

Filed Apr. 1, 1986, Ser. No. 846,790

Int. Cl.⁴ E01B 9/62, 9/68

U.S. Cl. 238—283

10 Claims



1. In a rail fastener assembly for resiliently mounting a rail upon a support structure, said assembly including a lower plate having a pair of opposite peripheral edges extending generally in the rail direction, said edges having upstanding flanges integral therewith and extending generally vertically upwardly therefrom, a rail supporting upper plate disposed in vertically spaced overlying relationship to said lower plate and having opposite peripheral edge portions in laterally spaced confronting relationship to said flanges of said lower plate, and resilient elastomeric material interconnecting said plates for resilient vertical and lateral movement of said upper plate relative to said lower plate, the improvement comprising: generally horizontally extending flanges formed integrally with and projecting outwardly from said upstanding flanges adjacent the upper ends thereof, said horizontally extending flanges increasing the ability of said upstanding flanges to withstand without failure lateral forces imposed thereon during use of the assembly and said lower plate has a second pair of opposite peripheral edges generally perpendicular to said first mentioned pair; flange means upon at least one of said opposite peripheral edges for further increasing the failure resistance of said upstanding flanges upon said edges of said first pair, and for limiting movement of upper plate in the rail direction.

4,715,534

RAIL FASTENING ASSEMBLIES

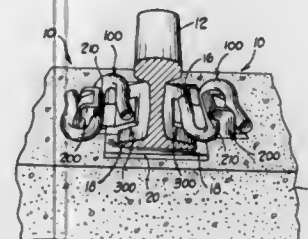
Graham M. Fee, Geneva, Ohio, assignor to Chemetron Railway Products, Inc., Chicago, Ill.

Continuation of Ser. No. 240,411, Mar. 4, 1981, abandoned, which is a continuation of Ser. No. 930,232, Aug. 2, 1978, abandoned. This application Apr. 30, 1986, Ser. No. 858,094

Int. Cl.⁴ E01B 9/30

U.S. Cl. 238—349

19 Claims



1. A drive-on rail fastening assembly for securing a railway rail, having laterally projecting base flanges, to a support therefor, said assembly comprising:

- (a) a generally S-shaped torsional spring rail clip including a singular generally linear central leg, a tie loop having an arcuate portion extending from a first end of said central leg to a terminal leg having a free distal end, and a rail loop having an arcuate portion extending from the second end of said central leg to a terminal leg having a free distal end, said central leg having a length which is less than the sum of the lengths of said tie loop terminal leg and said rail loop terminal leg, said tie loop terminal leg having a length which is less than the length of said rail loop terminal leg; and
(b) a chair positioned adjacent a railway rail, said chair having
(i) anchoring means for securing said chair to said support for said rail,
(ii) a front end and a back end (where said rail clip is driven onto said rail and chair from said front end toward said back end) with a tie side and a rail side extending between said ends,
(iii) a head means extending from said front end of said chair toward said back end, said head means having a jaw means facing toward one of said sides of said chair for receiving at least a portion of said central leg when said rail loop terminal leg engages said rail base flange and said tie loop terminal leg engages said chair,
(iv) a ramp means disposed on said tie side of said head means for engaging said tie loop terminal leg when said clip is placed on said rail and said chair and then driven into position, said ramp means rising from said front end of said chair to a point disposed behind the front-most end of said head means, at which point said ramp first exerts an upwardly directed force on said tie loop terminal leg urging said central leg against said jaw means whereby said head means is disposed between said central leg and the distal end of one of said terminal legs of said rail clip before said central leg is urged against said jaw means.

4,715,535

POWDER SPRAY GUN

Douglas C. Mulder, Wellington, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Apr. 28, 1986, Ser. No. 856,758

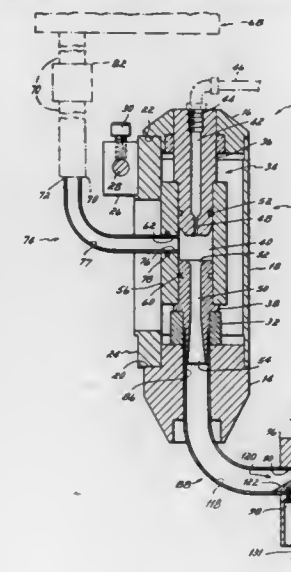
Int. Cl.⁴ B05B 7/14

U.S. Cl. 239—1

17 Claims

1. A powder spray gun for spraying air-entrained particulate powder material comprising:
a gun body having a powder inlet and a powder outlet;

means for connecting said powder inlet of said gun body to a source of air-entrained particulate powder material;
a conduit having an inlet end connected to said powder outlet of said gun body for receiving particulate powder material and an outlet end, said conduit having a bend between said inlet end and said outlet end, said bend having an outer wall on one side of said conduit, the particulate powder material in the course of flow through said conduit being concentrated in a powder flow stream along said outer wall of said bend in said conduit;



a spray head mounted to said outlet end of said conduit, said spray head being formed with a powder discharge slot terminating in a powder spray orifice;
deflector means mounted within said conduit for contacting and directing said concentrated stream of particulate powder material into a predetermined portion of said powder discharge slot of said spray head and out said powder spray orifice for dispersion onto a substrate.

4,715,536

DISPENSER FOR THE SLOW RELEASE OF VOLATILE PRODUCTS

Amedeo Capizzi, Pia Spinelli, both of Milan, and Emilio Arsura, San Donato Milanese, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 751,854, Jul. 5, 1985, abandoned. This application Aug. 26, 1986, Ser. No. 900,262

Claims priority, application Italy, Jul. 6, 1984, 21783 A/84 Int. Cl.⁴ A61L 9/04

U.S. Cl. 239—54

1 Claim

1. A multilayer dispenser, provided with openings, having a size of 2 cm on a side and a thickness ranging between 0.4 and 2 mm, for the slow release of volatile pheromones comprising an adsorbing substrate consisting of polyethylene fibrils alone or combined with cellulose fibers containing the active ingredient adsorbed or dispersed therein and coated on the two faces with a multi-layer polyester-aluminum-polyethylene film which is impermeable to pheromones and in which the polyethylene layer is hot-welded to the substrate.

4,715,537 SPRAY TIP

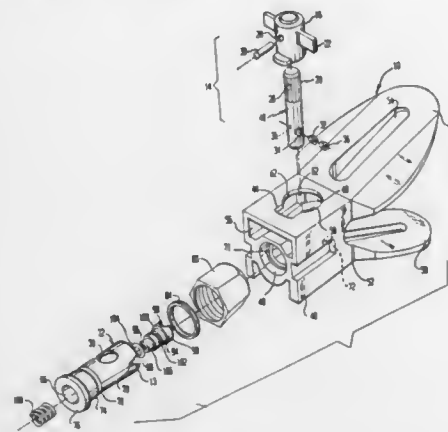
Oliver J. Calder, Orange, Calif., assignor to Phyllis Graham, Orange, Calif.

Continuation-in-part of Ser. No. 662,615, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 575,153, Jan. 30, 1984, Pat. No. 4,537,355, which is a continuation of Ser. No. 457,919, Jan. 14, 1983, Pat. No. 4,484,707, which is a continuation-in-part of Ser. No. 442,525, Nov. 18, 1982, Pat. No. 4,483,481, which is a continuation of Ser. No. 165,247, Jul. 2, 1980, abandoned. This application Aug. 16, 1985, Ser. No. 766,190

The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.
Int. Cl.⁴ B05B 15/02

U.S. Cl. 239—119

14 Claims



13. A spray tip comprising:

- (a) a housing subassembly of:
 - (i) a housing having a longitudinal through passageway and an intersecting cylindrical orthogonal bore; and
 - (ii) a plastic spray guard having a pair of outwardly diverging winds dependent from a spray guard body having a longitudinal through cavity received over said housing, a through transverse bore in said spray guard body aligned with said orthogonal bore of said housing;
- (b) a cylindrical turret member having a transverse through bore, and rotatably seated in the aligned orthogonal and transverse bores of said housing and spray guard body;
- (c) a handle member permanently secured to said turret member with a lip member radially projecting therefrom; and
- (d) a lip receiving cavity in the upper portion of said spray guard body having a slotted aperture opening thereto in alignment with said transverse bore to receive said lip member with one interior wall of said lip receiving cavity having internal shoulders at 180 degree spacing for abutment stops when the transverse through bore of said turret member is in alignment with said through passageway of said housing.

4,715,538

SWIRL JET NOZZLE AS A HYDRAULIC WORK TOOL
Horst Lingnau, Duisburg, Fed. Rep. of Germany, assignor to Woma-Apparatebau Wolfgang Maasberg & Co., GmbH, Duisburg, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,419
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412319

Int. Cl.⁴ B05B 3/06

U.S. Cl. 239—248

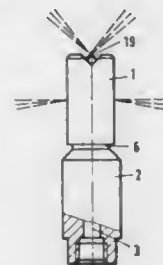
9 Claims

1. Apparatus for producing a swirling jet of pressurized liquid for use in the removal of solid material from an adjacent surface comprising:

- a stator including a body with a first portion having a first cross-sectional area at a first end thereof, said body also

including a neck portion extending from said first end of said first portion, said neck portion having a longitudinal axis and an average cross-sectional area which is smaller than said first cross-sectional area, at least a part of the first end of said first portion of said body which is contiguous to said neck portion defining a reaction surface, said stator being adapted for coupling at a second end of said body first portion which is disposed oppositely with respect to said first end to a source of pressurized liquid, said body in part defining a supply conduit for said liquid which extends through said first portion and into said neck portion, said supply conduit terminating at a discharge port in said neck portion oriented transversely to said axis, said stator neck portion further having a circumferential groove in the exterior thereof;

a rotor having an elongated internal cavity sized and shaped to receive said stator neck portion, said rotor being coaxial with said stator neck portion and having oppositely disposed first and second ends, said rotor having at least a first jet defining discharge port in the first end thereof, said discharge port having an axis which is angularly oriented with respect to said stator neck portion axis, said



rotor having at least a first flow passage for the pressurized liquid which extends between an inner surface thereof which faces the stator neck portion and said first jet defining discharge port whereby pressurized fluid discharged through said discharge port in said stator neck portion will be delivered to said rotor first jet defining discharge port, said rotor further defining a second flow passage for said pressurized liquid between said inner surface thereof and the second end thereof, said rotor second end having a surface which is disposed oppositely to and in facing relationship to said stator reaction surface, said rotor first end including a face portion which defines a plane oriented substantially transversely with respect to the stator neck portion axis, and said face portion having a generally V-shaped groove formed therein, said first jet defining discharge port being located in a side wall of said generally V-shaped groove; and

a retainer captured in said rotor, said retainer including a pin which extends linearly across a portion of the internal cavity in said rotor, said pin intercepting said circumferential groove in said stator neck portion to capture said rotor on said stator while permitting relative rotation therebetween.

4,715,539

HIGH-PRESSURE WATER JET TOOL AND SEAL
Curtis C. Steele, P.O. Box 44, Trenton, Ohio 45067
Filed Dec. 11, 1986, Ser. No. 940,299
Int. Cl.⁴ B05B 3/02

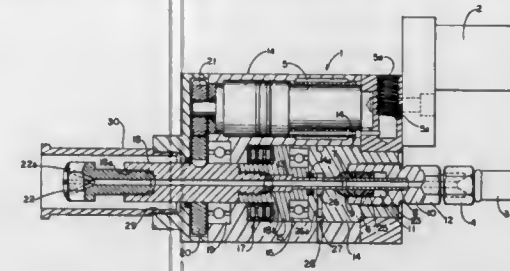
U.S. Cl. 239—263

9 Claims

1. Means for providing a seal between the end of a non-rotating section and the end of a rotating section of a high-pressure hydraulic supply line which comprises:

- an axially aligned cavity holding a seal member, said cavity having a centrally positioned opening at its forward wall to receive said rotating section of said supply line,

said forward wall converging toward said central opening,
a plug member which forms the rear wall of said cavity, said plug member having a centrally positioned opening to receive said non-rotating section of said supply line, said seal member having a centrally positioned bore, said end of said rotating section and said end of said non-



rotating section of said supply line being held in abutting alignment in said bore of said seal member, and means for introducing high-pressure hydraulic fluid between the rear face of said seal member and the face of said plug member in said cavity to thereby force said seal member forward in said cavity against said converging wall of said cavity to thereby compress said seal member around said two ends of said supply line.

4,715,540

FUEL-INJECTION NOZZLE

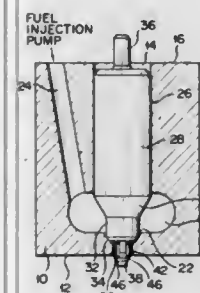
Hiroshi Miyake, Osaka, Japan, assignor to Daihatsu Motor Company Limited, Osaka, Japan

Continuation of Ser. No. 567,010, Dec. 30, 1983, abandoned.
This application Mar. 26, 1986, Ser. No. 843,830

Claims priority, application Japan, Jan. 17, 1983, 58-6254
Int. Cl.⁴ F02M 47/00

U.S. Cl. 239—533.3

6 Claims



1. A fuel-injection nozzle for injecting pressurized fuel into the combustion chamber of an internal combustion engine, comprising:

- a nozzle body having a guide hole, a fuel accumulation chamber to receive pressurized fuel, an injection hole communicating with the fuel accumulation chamber and opening to the combustion chamber, and a body seat provided between the fuel accumulation chamber and the injection hole, wherein the guide hole, fuel accumulation chamber, body seat and injection hole are coaxially arranged;
- a nozzle needle which is slidably fitted within the guide hole and which extends into the accumulation chamber, and which further has a needle seat at one end and is urged to make the needle seat contact the body seat to close the injection hole, and
- a needle pin coaxially projected from said end of the nozzle needle into the injection hole so that an annular gap is defined between the outer periphery of the needle pin and the inner periphery of the injection hole, the needle pin having a tapered portion progressively slenderized

toward the combustion chamber for varying the rate of fuel injection through the annular gap when pressurized fuel in the fuel accumulation chamber urges the needle away from the body seat, and at least two flat surfaces on the outer periphery, the flat surfaces each at constant distance from a plane that is both parallel to the flat surface and contains the longitudinal axis of the needle pin; said flat surfaces extending from the needle seat of the nozzle needle along a portion of the needle pin for defining a series of wide and narrow sections around the annular gap; the maximum gap between at least one of the flat surfaces and the inner periphery of the injection hole being smaller than those between the other flat surfaces and the inner periphery of the injection hole; the wide sections formed by the flat surfaces and inner periphery of the injection hole being of such shape whereby injected fuel passing therethrough is caused to be made up of particles of diverse sizes.

4,715,541

FUEL INJECTION NOZZLE FOR COMBUSTION ENGINES

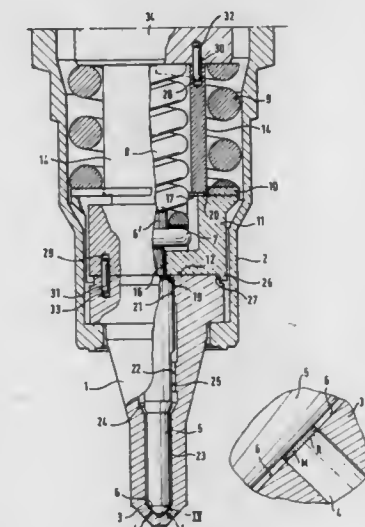
Otto Freudenschuss, Vienna; Günther Herdin, Steyr; Harald Schmidt, Vienna, and Emerich Schreiner, Steyr, all of Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria
Filed Feb. 25, 1986, Ser. No. 833,218

Claims priority, application Austria, Feb. 26, 1985, 566/85; Nov. 8, 1985, 3231/85

Int. Cl.⁴ F02M 45/00

U.S. Cl. 239—533.4

5 Claims



1. A fuel injection nozzle for internal combustion engines, comprising

- a nozzle body having a longitudinal axis,
- a nozzle cap at one end of said nozzle body, said nozzle cap having a fuel ejection bore therein for delivery of fuel to a combustion chamber, said nozzle cap including a valve seat,
- a nozzle needles guided within said nozzle body along said axis,
- first and second spring means acting in series to bias said nozzle needle towards said valve seat to close said fuel ejection bores, said nozzle needle being displaceable away from said valve seat in a first displacement phase against the force of said first spring means and a second displacement phase against the force of said second spring means, the outer surface area of an imaginary cylinder formed as a projection from said fuel ejection bores against said nozzle needle when said nozzle needle is displaced away from said valve seat being smaller than the cross-sectional

area of said fuel ejection bore throughout said first displacement phase.

4,715,542
FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Josef Morell, Otto Freudenthuss, and Harald Schmidt, all of Vienna, Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

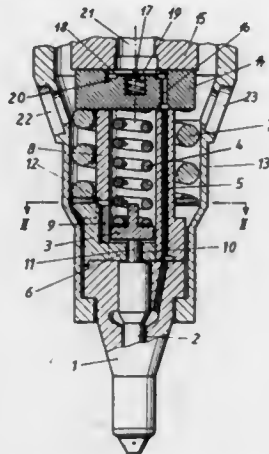
Filed Feb. 25, 1986, Ser. No. 833,217

Claims priority, application Austria, Mar. 4, 1985, 628/85

Int. Cl.⁴ F02M 61/20

U.S. Cl. 239—533.9

8 Claims



1. A fuel injection nozzle for internal combustion engines, comprising:
 - a body having an axis,
 - a nozzle needle guided within said body along said axis, said nozzle needle being movable between an open and a closed position,
 - a first helical pressure spring biasing said nozzle needle into its closed position, said first helical pressure spring being disposed along said axis,
 - a second helical pressure spring disposed along said axis and surrounding said first helical pressure spring, said second helical pressure spring being stronger than said first helical pressure spring, said first and second helical pressure springs being arranged eccentrically relative to each other,
 - a bush disposed eccentrically about said axis between said first and second helical pressure springs, said bush having a wall of non-uniform thickness and including a bore in the region of greatest thickness of the bush wall, said bore being parallel to said axis and delivering fuel under pressure to said nozzle needle to move said nozzle needle away from its closed position, and
 - a movable stop associated with said nozzle needle for limiting movement of said nozzle needle, said second helical pressure spring acting to limit the movement of said stop.

4,715,543
FLOW RESTRICTOR DEVICE PARTICULARLY USEFUL FOR DRIP IRRIGATION

Isaac Rinkewich, 12 Fishman Maimon St., Tel Aviv, Israel

Filed Jan. 27, 1986, Ser. No. 822,876

Int. Cl.⁴ B05B 15/00

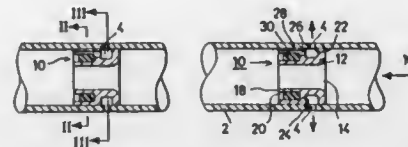
U.S. Cl. 239—542

20 Claims

1. A flow restrictor device particularly useful for drip irrigation, comprising:
 - a disc-shaped member attachable to a pipe containing a pressurized fluid such that one face of the disc-shaped member is subject to the inlet pressure of the pressurized fluid, and an other face is exposed to the atmosphere;
 - said disc-shaped member being formed with an annular

recess in said one face to be exposed to said pressurized fluid, and with a metering passageway leading from said annular recess to said other face to be exposed to the atmosphere;

and a flow restrictor annular member of uniform inner and outer dimensions received within said annular recess to partially cover said metering passageway, said flow restrictor member being deformable in a radial direction under the pressure of the pressurized fluid to restrict said metering passageway under high inlet pressure, and to enlarge said metering passageway under low inlet pressure, and thereby to control the flow of the fluid there-through, according to the pressure of the fluid at said one face of the disc-shaped member.



strictor member being deformable in a radial direction under the pressure of the pressurized fluid to restrict said metering passageway under high inlet pressure, and to enlarge said metering passageway under low inlet pressure, and thereby to control the flow of the fluid there-through, according to the pressure of the fluid at said one face of the disc-shaped member.

4,715,544
VERTICAL ROLLER MILL

Jan Folsberg, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Copenhagen, Denmark

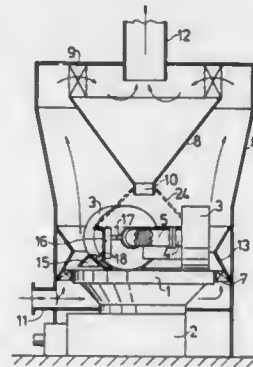
Filed Oct. 29, 1986, Ser. No. 924,619

Claims priority, application United Kingdom, Oct. 29, 1985, 8526626

Int. Cl.⁴ B02C 15/00

U.S. Cl. 241—57

4 Claims



1. In a vertical roller mill comprising a grinding table which is rotatable about a vertical axis; at least two grinding rollers which are rotatable about substantially horizontal, stationary axes and are urged against an annular grinding path of said grinding table; and a nozzle ring encircling said table for blowing separating and conveying gas into a mill housing above said grinding table; the improvement wherein a screen is mounted above said grinding path in each circular arc between adjacent ones of said rollers, said screen being formed with an obliquely upwardly and radially inwardly directed outer wall above a radially outer zone of said grinding path and an obliquely downwardly and radially inwardly directed inner wall above a radially inner zone of said grinding path; and wherein a guide wall is mounted above each said screen, said guide wall being formed and placed to collect a portion of material being blown, in use, by the gas from said nozzle ring over and along said outer screen wall and to return at least a coarser fraction of said material down towards said inner screen wall and hence back onto said grinding table adjacent to the radially inner edge of said grinding path, said screen and guide wall being further placed and formed such that there is an annular space between said guide wall and said mill housing and such that, in

use, said separating and conveying gas suspends at least a finer fraction of said material being blown and conveys said at least finer fraction upwardly through said annular space and past said guide wall.

4,715,545
TISSUE GRINDING AND TRANSPORT SYSTEM AND METHOD

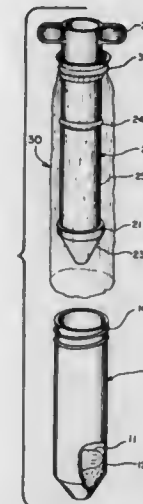
Paul H. Haniff, Barrington, and John J. Newton, Jr., Palatine, both of Ill., assignors to Sage Products, Inc., Cary, Ill.

Filed Feb. 13, 1986, Ser. No. 828,788

Int. Cl.⁴ B02C 23/36

U.S. Cl. 241—169.1

15 Claims



1. A system for collecting and grinding tissue specimens or other biological samples comprise:
 - an elongate container having an open top portion and rigid side walls defining a hollow interior for receiving the specimen and including a first grinding surface adjacent a bottom wall of the container;
 - a grinder adapted for fitting into the open top portion of the container and including a second grinding surface engageable with the first grinding surface and further including operating means extending beyond the open top portion of the container when said grinding surface are engaged; and
 - a protective sheath attached to the grinder and adapted to envelop and seal the opening between the container and the grinder with grinder emplaced within the container; whereby tissue specimens or other biological samples can be collected in said container and ground between said first and second grinding surfaces when said grinder is rotated within said container by the application of a rotating force to said operating means and said protective sheath thereby prevents the contamination of the specimen or the surrounding atmosphere during the grinding operation.

4,715,546
GRINDING MEDIA CHARGING DEVICE
Robert Holming, Brookfield; Robert S. Nelson, Mequon, and Thomas R. Daley, Nashotah, all of Wis., assignors to Armo Inc., Middletown, Ohio and The Holming Company, Milwaukee, Wis.

Filed Feb. 11, 1987, Ser. No. 17,295

Int. Cl.⁴ B02C 17/18

U.S. Cl. 241—171

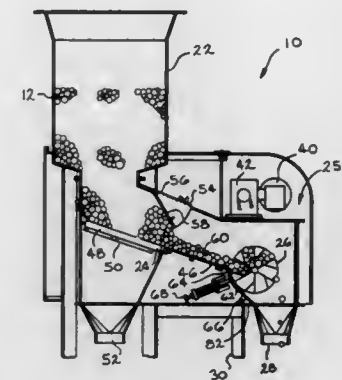
15 Claims

1. An apparatus for feeding grinding balls into a ball mill comprising:
 - a ball storage hopper for new grinding balls,
 - a regulator,
 - a chute for conveying said balls to said regulator,
 - said chute having first and second ends,

said first end including a baffle for controlling the depth of said balls on said chute,

said regulator including a discharge drum, means for continuously rotating said drum and a means for retaining said balls in said drum,

said drum being disposed adjacent said second end and including a plurality of compartments adapted to receive said balls,



said retaining means being disposed adjacent to a portion of said drum for retaining said balls in one of said compartments,

whereby said drum is rotated at a predetermined speed to uniformly feed said balls into said mill at a rate that can correspond to the ball attrition rate of said mill.

4,715,547
BALL MILL
Gerhard Bühler, Rheinfelden, Switzerland, assignor to Fryma Maschinen A.G. Rheinfelden, Rheinfelden, Switzerland

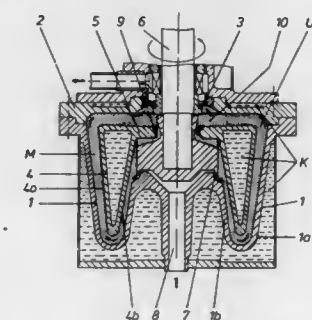
Filed Dec. 3, 1985, Ser. No. 804,264

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1984, 3444575

Int. Cl.⁴ B02C 17/04, 17/18

U.S. Cl. 241—176

5 Claims



1. A ball mill apparatus for the continuous crushing and dispersing of a solid grinding stock which is conveyed along in a fluid, comprising an annular-gap-shaped grinding chamber which is rotationally symmetric with respect to a vertical centre axis, formed between a stator and a rotor coupled to a drive, which chamber has an at least approximately V-shaped cross-section on both sides of the vertical centre axis and is provided with an inlet and an outlet for the circulating grinding stock, with the grinding chamber being partially filled with grinding balls which circulate continuously, together with the grinding stock, under the effect of the rotor rotation during operation of the ball mill, wherein the V-shaped cross-section of the grinding chamber increases in the conveying direction of the grinding stock from the grinding stock inlet to a confluence in an upper, radially inward-leading return-flow chamber.

4,715,548

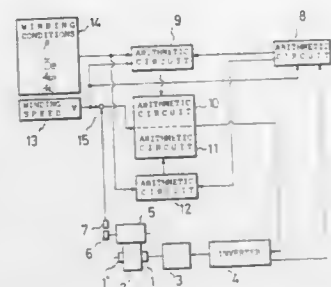
SPINDLE DRIVE TYPE YARN WINDING APPARATUS
Yuzuru Miyake; Isao Nohara; Takami Sugioke; Susumu Onishi,
and Toshiyuki Ueno, all of Matsuyama, Japan, assignors to
Teijin Seiki Co., Ltd., Osaka, Japan

Filed May 16, 1986, Ser. No. 864,434
Claims priority, application Japan, May 17, 1985, 60-105292;
Jun. 24, 1985, 60-138399

Int. Cl.⁴ B65H 54/02, 59/00

U.S. Cl. 242-18 R

4 Claims



1. A spindle drive type yarn winding apparatus comprising:
motor means for driving a bobbin holder;
inverter means for supplying electric power to said motor;
contact roller means for contacting with and driven by a
bobbin inserted on said bobbin holder or a package wound
on said bobbin;

controller means for performing at least integral control
action to said motor so as to control the rotating speed of
said contact roller means at a predetermined value,
setter means for setting a winding speed, density of the
wound package, stroke of the wound package and denier
of the wound package;

first arithmetic circuit means for calculating a diameter of
the wound package;

second arithmetic circuit means for calculating a gain of said
controller means based on winding conditions set in said
setter means and said diameter calculated in said first
arithmetic circuit means; and

altering means for altering the gain of said controller means
based on at least one factor set in said setter means and said
diameter of said wound package calculated in said first
arithmetic circuit means

4,715,549

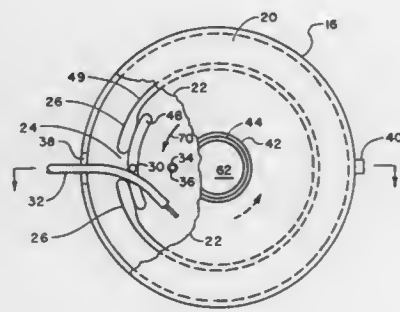
WIRE CARRIER AND LOADING APPARATUS
Constantine M. Travlos, Baltimore, Md., assignor to The United
States of America as represented by the Secretary of the Air
Force, Washington, D.C.

Filed Apr. 7, 1987, Ser. No. 35,333

Int. Cl.⁴ B65H 54/00

U.S. Cl. 242-25 R

5 Claims



1. Apparatus comprising:

a wire carrier assembly having a wire-carrying spool, a
shroud and a shroud retainer;

said spool comprising a hollow cylinder having a first end
and a second end and a longitudinal opening extending
throughout the wall thereof, a disk-shaped base plate
concentrically disposed at said first end of said cylinder
and having a tubular hub extending coaxially through and
beyond said second end of said cylinder, said base plate
further having an arcuate slot therethrough adjacent the
interior surface of said wall of said hollow cylinder and
spanning said opening in said cylinder, said base plate
further having a drive pin hole therethrough and located
within the radius of said arcuate slot;

said shroud comprising a circular cover having a mounting
hole at the center thereof and a rim extending from a side
thereof, said rim having a wire insertion and dispensing
port therethrough, said hub on said base plate of said spool
extending through said mounting hole in said shroud;

said shroud retainer comprising a ring positioned over the
distal end of said tubular hub of said base plate.

4,715,550

**METHOD AND APPARATUS FOR CONTROLLING THE
EFFECTIVE LENGTH OF THREAD PACKAGES**

Markus Erni, Winterthur, and Kurt Salvisberg, Gächlingen,
both of Switzerland, assignors to Maschinen Abrik Rieter AG,
Winterthur, Switzerland

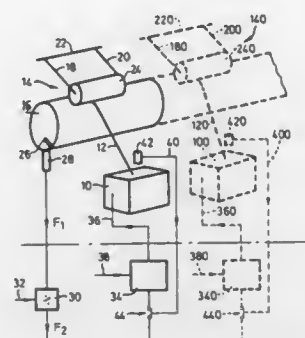
Continuation of Ser. No. 893,562, Aug. 5, 1986, abandoned,
which is a continuation of Ser. No. 715,645, Mar. 21, 1985,
abandoned. This application Mar. 16, 1987, Ser. No. 26,472

Claims priority, application United Kingdom, Mar. 22, 1984,
8407465

Int. Cl.⁴ B65H 63/08

U.S. Cl. 242-39

6 Claims



1. A yarn winding apparatus comprising means for rotating a
yarn package during a winding operation; means for produc-
ing an output signal which is a function of the rotary motion of
a predetermined part of said rotating means during the winding
operation; adjustably settable means for receiving said output
signal and for providing a winding termination signal when the
cumulative rotary motion of said predetermined part of said
rotating means during the respective winding operation as
indicated by said output signal has reached a predetermined
level; and means separate from said adjustably settable means
and operative for controllably adjusting said output signal
prior to reaching said adjustably settable means to correct any
deviation between the actual and the desired effective length of
the yarn wound into the package.

4,715,551

**SELF-LOCKING DEVICE FOR TRANSMITTING
TORQUE TO BOBBIN CORES**

Alfred Besemann, Hamburg, Fed. Rep. of Germany, assignor to
E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Ger-
many

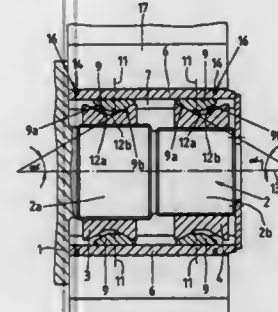
Filed Apr. 21, 1987, Ser. No. 40,867

Claims priority, application Fed. Rep. of Germany, Apr. 26,
1986, 3614286

Int. Cl.⁴ B65H 54/54, 75/24

U.S. Cl. 242-46.4

11 Claims



1. A self-locking device for transmitting torque to the inter-
nal surface of a tubular component, such as the hollow core of
a bobbin, comprising a rotor having external threads; first and
second nuts having internal threads mating with said external
threads, said threads being such that joint rotation of said nuts
with reference to said rotor in a selected direction entails an
axial movement of said nuts relative to each other; torque
transmitting means including at least two torque transmitting
members outwardly adjacent said nuts and having external
surfaces engageable with the internal surface of the tubular
component and inner sides facing said nuts, said nuts having
outer sides adjacent said inner sides and said inner and outer
sides having cooperating cam faces arranged to move said
members substantially radially outwardly and away from said
rotor in response to rotation of said nuts in said selected direction
so that the external surfaces of said members bear against
the internal surface of the tubular component; and means for
biasing said members substantially radially inwardly toward
said rotor.

4,715,552

MULTI-SPINDLE WINDER

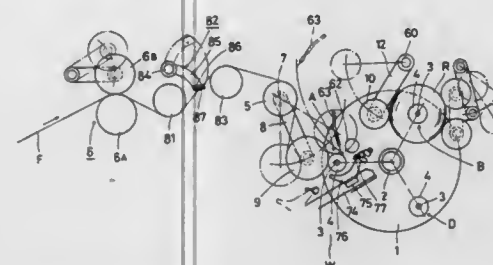
Yukimichi Matsumoto, Hirakata, Japan, assignor to Kabushiki
Kaisha Fuji Tekkocho, Osaka, Japan

Filed Apr. 23, 1986, Ser. No. 856,071

Int. Cl.⁴ B65H 19/20, 19/16, 19/28

U.S. Cl. 242-56 A

2 Claims



1. A multi-spindle winder of a surface winding-center wind-
ing system, comprising:
multi-spindle turrets each having a plurality of winding
spindles fitted thereon with winding cores located be-
tween a first winding station and a second winding station
thereon;
a first contact roller on arms oscillatably mounted to make

press contact with at least one of said winding cores to
wrap a leading end of a given length of a transparent
stretch film fed from a feed roller onto said one winding
core in order to initiate winding at said first winding
station, said first contact roller being rotatably driven
while being in contact with said one winding core from
said first winding station to an intermediate station be-
tween said first and second winding stations;

a second contact roller oscillatably mounted to make press
contact with a wound roll transferred by the turning
motion of said multi-spindle turrets thereby to wind up the
given length of the film into a transparent roll product at
said second winding station, said second contact roller
being driven to rotate by a drive means and being in
contact with the wound roll from said intermediate station
to said second winding station and changed over from said
first contact roller at said intermediate station;

a cam for contacting said arms which supports said first
contact roller for facilitating a receding of said first
contact roller from said intermediate station;

means for forcing said first contact roller to return from said
intermediate station to said first winding station;

speed control means for controlling the rotation of said drive
means of said second contact roller;

film cutting means for severing the fully wound roll, said
film cutting means being located rearwardly of said one
winding core at said first winding station; and

automatic wrapping means for wrapping the leading cut end
of the film around an empty winding core, including a film
guiding member having an arcuate guide face and air
nozzles capable of injecting air rearwardly of the moving
area of the film cutting means toward the space between
said film guiding member and said empty core;

said cam being actuated interlocking with the turning mo-
tion of said multi-spindle turrets and having a guide profile
which limits a displacement magnitude of said first contact
roller so as to increase the variation magnitude in path
length of the film stretching from said feed roller via said
first contact roller to said one winding core being wound
in proportion to the turning angle of said multi-spindle
turrets,

said speed control means serving to control said drive means
so as to impart, immediately before press contact, a pe-
ripheral speed slightly faster than said first contact roller
to said second contact roller and, after press contact, a
peripheral speed gradually increasing at an increment
proportional to the turning angle of multi-spindle turrets
during movement from said intermediate station to said
second winding station, whereby winding is accomplished
under a constant tension without air being entrapped in
the roll products.

4,715,553

ROLL CORE HOLDING DEVICE

Tetsuo Hatakeyama, Tama; Yoshinori Uera, Matsudo, and
Nobuaki Nagao, Kawasaki, all of Japan, assignors to Kabu-
shiki Kaisha Tokyo Kikai Selsakusho, Tokyo, Japan

Filed Aug. 22, 1986, Ser. No. 899,995

Claims priority, application Japan, Sep. 2, 1985, 60-134164

Int. Cl.⁴ B65H 75/24; B23B 31/40

U.S. Cl. 242-68.4

5 Claims

1. A roll core holding device for each end of a roll core
comprising:

a shifting means;

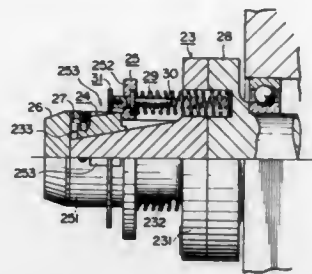
a center member capable of shifting in response to the shift-
ing means and comprising a base section, a shaft section
protruding from the base section and a plurality of
grooves formed in the shaft section from the top to the
base;

a plurality of pawls capable of shifting along the shaft sec-
tion of the center member for widening the space between
the adjacent pawls as they are shifted toward the base
section, each pawl being slidably engaged within each

groove of the center member so that the space between the adjacent pawls becomes wide as the pawls slide toward the base section of the center member and each pawl becomes completely embedded in each groove as the pawls slide toward the top of the shaft section;

an external member slidably mounted on the shaft section of the center member and comprising a cylindrical section and a flange section, the cylindrical section being formed with a plurality of openings through which a head portion of the pawls can appear;

a retaining member which contacts a side end of the roll core in order to retain the core;



a pressing means which is penetratingly arranged through the flange section of the external member from the base section of the center member so as to support the retaining member and to press the flange section toward the top of the center member from the base section thereof to urge the pawls toward the top of the shaft section;

an urging means for urging the pressing means toward a top side thereof; and

a stopper secured at the top of the shaft section of the center member.

4,715,554

FISHING LINE SPOOL AND METHOD OF USE
Rupert Kuntze, Kudowastrasse 9, D-1000 Berlin 33, Fed. Rep. of Germany

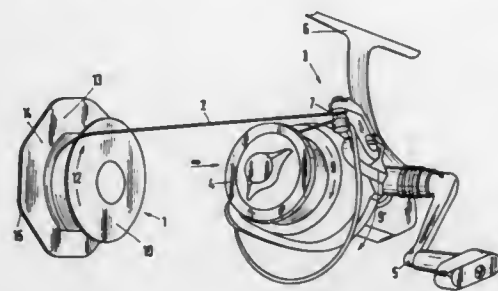
Filed Apr. 10, 1986, Ser. No. 850,177

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528616

Int. Cl.⁴ A01K 89/00; B65H 54/00

U.S. Cl. 242—84.2 R

12 Claims



1. An antitwist system for transferring fishing line from a supply spool to a fishing reel comprising:

- a fishing reel having winding means rotatable about an axis in a first direction of rotation when viewed from an operator's position behind the fishing reel;
- a supply spool comprising: (i) a generally cylindrical portion having first and second edges; (ii) a first flange extending radially outwardly from and fixedly attached to the first edge, the first flange having a first lateral dimension and a substantially circular periphery; and, (iii) a second flange extending radially outwardly from and fixedly attached to the second edges, the second flange having a non-circular periphery and at least one lateral

dimension greater than the first lateral dimension, the supply spool adapted to be non-rotatably oriented such that the first flange faces the fishing reel;

- a supply of fishing line wound onto the cylindrical portion of the supply spool in a second direction opposite to the first direction of rotation when viewed from the operator's position, the supply having a free end; and,
- means to attach the free end of the fishing line to the fishing reel such that, as the winding means are rotated about the axis in the first direction of rotation, the fishing line is wound onto the fishing reel in the first direction and unwound from the non-rotating supply spool in contact with the periphery of the first flange in the first direction as viewed from the operator's position whereby the twist in the line caused by the winding on the fishing reel is opposite to the twist caused by unwinding from the supply spool so as to minimize the twist imparted to the fishing line.

4,715,555

DUAL MODE FISHING REEL ASSEMBLY

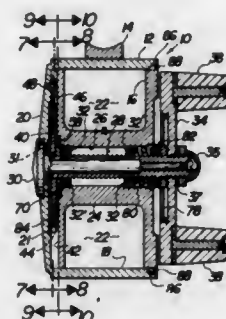
Robert L. McChristian, Jr., 10896 SW. 188 St., Miami, Fla. 33157

Filed Nov. 24, 1986, Ser. No. 933,981

Int. Cl.⁴ A01K 89/02

U.S. Cl. 242—84.5 R

5 Claims



1. A fishing reel assembly having a direct drive and automatic anti-reversing capabilities, said assembly comprising:

- a reel frame including mounting means for securing said reel frame to a fishing rod,
- a spool including an inner face and a centrally disposed bore extending therethrough and structured to contain fishing line thereon,
- a crankshaft having an innermost and an outermost end, said crankshaft positionable through said bore in coaxial relation to said spool and rotatably connected to said reel frame at said innermost end thereof, said spool rotatably supported on said crankshaft,
- a crank arm secured to said outermost end of said crankshaft in adjacent and spaced relation to said reel frame and rotatable with said crankshaft relative to said reel frame,
- automatic anti-reversing means, including a disc element secured to said crankshaft, for preventing reverse rotation of said crankshaft and comprising a first structure secured to said reel frame and a second structure comprising a plurality of teeth formed on the periphery of said disc element for rotation therewith, said first and second structures cooperatively disposed and constructed for instant abutting engagement with one another upon reverse rotation of said spool,
- direct drive means for accomplishing forward rotation of said spool upon forward rotation of said crankshaft by said crankarm,
- said direct drive means comprising a plurality of lugs fixedly formed on said spool and a plurality of drive arms pivotally mounted a substantially one end thereof so as to rotate with said crankshaft, an opposite end of each drive

- arm configured and pivotally disposable into abutting, direct driving engagement with said plurality of lugs,
- said plurality of drive arms disposable between an operative position, during forward rotation of said crankshaft and an inoperative position during reverse rotation of said crankshaft, said operative position defined by direct driving engagement of said plurality of drive arms with a corresponding number of said plurality of lugs and said inoperative position defined by disengagement of said plurality of drive arms from said plurality of lugs.
- said direct drive means further comprising a cam member secured to said crankshaft structure so as to rotate therewith, said cam member disposed in adjacent and engageable relation to said plurality of drive arms and configured for concurrent movable engagement with said plurality of drive arms between said operative position and said inoperative position,
- said plurality of lugs formed on said inner face of said spool in surrounding relation along the periphery of a recessed cutout portion on said inner face, said plurality of lugs disposed in spaced relation to one another and extending radially inward therefrom towards said plurality of drive arms,
- said plurality of drive arms disposed at least partially within said cutout portion and in surrounded relation by said plurality of lugs, said lugs spaced sufficiently close to allow immediate driving engagement of said drive arms with said respective lugs, said spool being forced into forward rotation by said direct drive means upon forward rotation of said crankshaft and said drive means being instantly disengaged from said lugs upon reverse rotation of said crankshaft,
- said spool rotating freely within said reel frame upon said drive arms being instantly disengaged from said lugs wherein said drive means is in said inoperative position, and
- said plurality of drive arms pivotally mounted in abutting, driving engagement with said cam member for limited outward disposition into abutting engagement with said plurality of lugs and out of engagement with said periphery of said cutout portion, whereby jamming engagement between said spool and said plurality of drive arms is prevented.

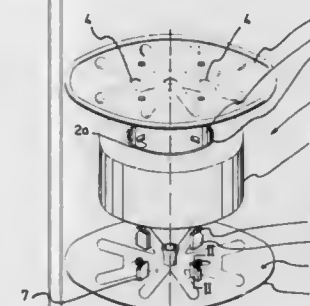
4,715,556
SPOOL

Rufin Tack, Deerlijk, and Marc Eggermont, Aalter, both of Belgium, assignors to N.V. Bekaert S.A., Zvevegem, Belgium
Filed Mar. 19, 1986, Ser. No. 841,221

Claims priority, application Belgium, Apr. 1, 1985, 1/011224
Int. Cl.⁴ B65H 75/18; B25G 3/20

U.S. Cl. 242—118.6

8 Claims



1. A spool comprising:

- a central portion, and
- two flanges attachable thereto by fastening means, each flange having an inside and an outside and being provided with said fastening means located on the inner-

side of at least one of the flanges and being attachable to an inside of the central portion, the fastening means comprising supports provided with a spring and a clamp (10), said clamp coacting with said spring.

4,715,557

WIRE CONTAINER

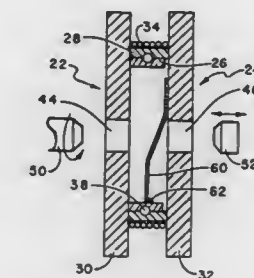
Frank C. Rushing, Columbia, and Mark Weixel, Ellicott City, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 11, 1987, Ser. No. 13,819

Int. Cl.⁴ B65H 49/00, 75/14, 75/28

U.S. Cl. 242—129

6 Claims



1. Wire containing apparatus comprising:

- first and second members each having a cylindrical drum and a flange of circular cross section concentric with said drum and disposed on one end thereof;
- said drum of said first member having an outer diameter substantially equal to the inner diameter of said drum of said second member and being positioned within said drum of said second member;
- retainer means disposed between said drums of said first and second members to retain the drum of said first member within the drum of said second member while permitting rotational motion therebetween;
- container registration means situated at the axis of said flanges of said first and second members respectively, anti-rotation means disposed between the inner side of said flange of said second member and the inner wall of said drum of said first member; and
- wire clamping means disposed on the side wall flange of said first and second members.

4,715,558

SINGLE PIECE TAPE REEL AND ASSEMBLY

Kenneth E. Fair, and Charles M. Campbell, both of Opelika, Ala., assignors to Ampex Corporation, Redwood City, Calif.

Filed Feb. 24, 1986, Ser. No. 832,927

Int. Cl.⁴ G03B 1/04; B65H 75/18

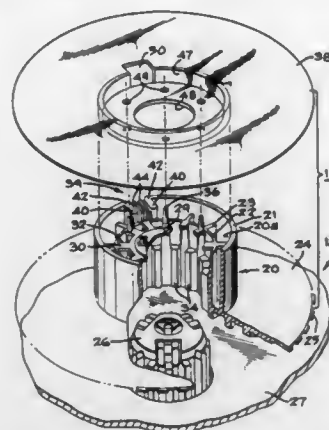
U.S. Cl. 242—199

12 Claims

1. A reel for storage of magnetic tape adapted to be mounted on a rotatable splined spindle of a magnetic tape recording apparatus comprising:

- a one piece hub member including a hub having a central hub portion, an attached flange, and an integral top cover portion, the hub portion having a central opening;
- a plurality of splines circumferentially disposed about and extending axially along the interior of the central opening of the hub portion in spaced relation for engaging the spindle;
- the top cover portion overlying the central opening, and having access opening therein overlying the splines; and
- said splines being truncated at respective upper ends thereof

adjacent the top cover portion, to define a series of recesses between the top cover portion and respective upper



surfaces of the splines, concentric with the central opening for receiving an engaging member of the spindle.

4,715,559

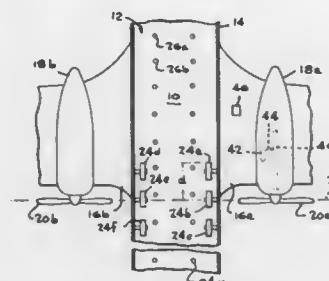
APPARATUS AND METHOD FOR GLOBAL NOISE REDUCTION

Christopher R. Fuller, 312 Reynolds St. Apt. 3, Blacksburg, Va. 24060

Filed May 15, 1986, Ser. No. 863,937
Int. Cl.⁴ A61F 11/02

U.S. Cl. 244-1 N

24 Claims



1. Apparatus for attenuating sound radiated from a vibrating surface into a control volume surrounded by the vibrating surface, said apparatus comprising:

- means for providing a control signal indicative of the frequency and amplitude of the sound radiated from said vibrating surface into said control volume;
- vibrating means directly connected to said vibrating surface for further vibrating said vibrating surface to induce a cancelling sound into said control volume for combining with an attenuating said radiated sound;
- detecting means disposed within said control volume for detecting the combination of said cancelling and said radiated sound to provide an error signal indicative thereof; and
- control means responsive to said error signal for adaptively modifying said control signal as to phase and amplitude and for applying said modified control signal to drive said vibrating means, whereby said error signal is driven to a minimum level.

4,715,560

COMPOSITE CRUCIFORM STRUCTURE FOR JOINING INTERSECTING STRUCTURAL MEMBERS OF AN AIRFRAME AND THE LIKE

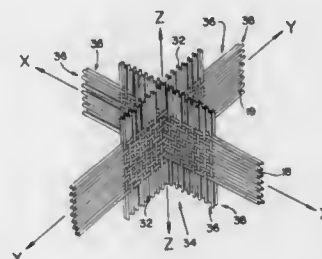
Ernie F. Loyek, Sparks, Nev., assignor to Lear Fan Limited, Reno, Nev.

Continuation of Ser. No. 475,140, Mar. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 142,118, Apr. 21, 1981, abandoned. This application Dec. 13, 1984, Ser. No. 681,712

Int. Cl.⁴ B64C 1/06

U.S. Cl. 244-177 R

17 Claims



1. An aircraft structure comprising non-intersecting structural elements and intersecting structural elements, the intersecting structural elements being of a composite cruciform structure having intersecting structural members, and the non-intersecting structural elements being elongated planar elements extending between and overlapping adjacent structural members of adjacent intersecting structural elements of the cruciform structure, said cruciform structure comprising a first bundle of fibers interwoven with a second bundle of fibers and additional fibers interwoven with each of said first and second bundles of fibers in a direction substantially perpendicular to the fibers of said first and second bundles, to form said cruciform structure, said fibers having a reinforcing resin on the surface thereof to provide a strong substantially rigid structure jointer of said structural members without a substantial break in the continuity of the fibers and to provide substantially even load bearing and force transmitting capability in a plurality of directions with respect to said intersection of said structural members.

4,715,561

DRAIN ASSEMBLY FOR AIRCRAFT

Dominic J. Spinosa, Wantagh, N.Y., and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Hauppauge, N.Y.

Filed Nov. 3, 1986, Ser. No. 926,466

Int. Cl.⁴ B64C 1/00; F16K 31/122

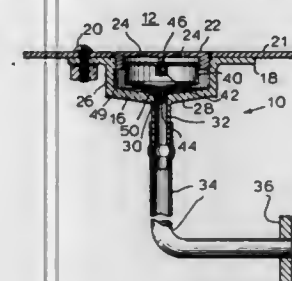
U.S. Cl. 244-129.1

24 Claims

1. Drain assembly for use in a pressurized compartment environment, said drain assembly being normally operable at first compartment pressure which is any pressure below a certain predetermined value to provide fluid communication between the interior of said compartment and the extra compartment environment, and said drain assembly further operable to seal against said fluid communication at a second compartment pressure which is any pressure above said certain value, said drain assembly comprising:

a housing defining a well space open to the compartment and

having an outlet communicating with a point outside said compartment, a flotation device, said well space having volume sufficient to hold said flotation device along with an amount of liquid which floats the device at first compartment pressure, said flotation device having size, shape and weight to fit in said well and when floated provides a fluid drain course



between said compartment and outside point at first compartment pressure whereby liquid entering said housing from said compartment passes through said outlet to said outside point, and sealing means provided to cooperate with said housing and said flotation device to permit passage of liquid through said fluid drain course at first compartment pressure and to seal said fluid drain course at second compartment pressure.

4,715,562

MECHANISM FOR AUTOMATICALLY ACTUATING A RESCUE DEVICE UPON OPENING OF AN EXIT DOOR

Jean Bokalot, Toulouse, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

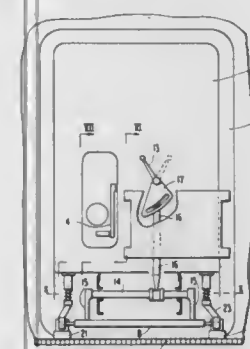
Filed Jan. 22, 1986, Ser. No. 821,259

Claims priority, application France, Jan. 24, 1985, 85 01012

Int. Cl.⁴ B64C 1/34

U.S. Cl. 244-137.2

6 Claims



1. Mechanism for automatically actuating a rescue device upon opening of a panel obturating an exit and bearing said rescue device and said mechanism, said panel undergoing a movement of lifting, or of rotation or of lifting combined with a rotation at the moment of opening, said mechanism comprising:

- a voluntary actuating member having a first and a second position;
- a control bar connected to said rescue device and substantially parallel to said panel;
- a movable assembly actuated by said actuating member, said movable assembly being releasably connected to said control bar and adapted to push or draw said control bar, so that said control bar can occupy a first end position remote to said panel when said actuating member is in its

first position and a second and position near said panel when said actuating member is in its second position; fork elements freely supporting said control bar in its first end position; said mechanism being associated with hook elements fixed to the periphery of said opening and adapted to receive said control bar in its second end position, said control bar being transferred by said movable assembly from said fork elements to said hook elements when said voluntary actuating member moves from its first position to its second position.

4,715,563

REEFING LINE PRESSURE REDUCER

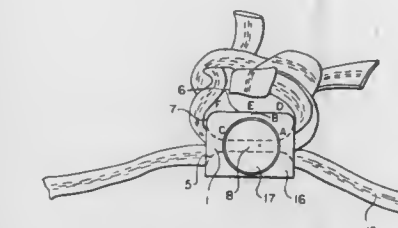
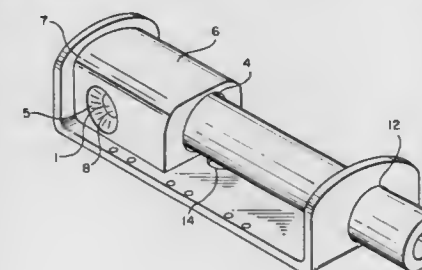
Ronny A. Quamen, Yuma, Ariz., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 25, 1986, Ser. No. 900,062

Int. Cl.⁴ B64D 17/00

U.S. Cl. 244-152

4 Claims



1. In a reefing line cutter assembly having a cutter bracket;

- a reefing line cutter held in place by said cutter bracket with a first channel for receiving a reefing line, means for cutting said reefing line, a second channel for receiving said cutting means, and means in said second channel for actuating said cutting means; the improvement characterized by a reefing line pressure reducer comprising: an element of substantially rectangular cross section; a reefing line channel within said element for receiving the ends of said reefing line which loop through said reefing line channel and terminate in a knot juxtaposed against said element; and a cutter channel within said element, perpendicular to and intersecting with said reefing line channel, for receiving means for cutting said reefing line; wherein said cutter channel engages said reefing line cutting means, and said reefing line channel and said first channel align for receiving the reefing line; and wherein said pressure reducer element has smooth rounded edges and has the cross-sectional shape of a pillow to cause the reefing line adjacent to the tie-off area circumscribed by the knot to be subjected to less stress than said elements containing edges with shorter radii.

4,715,564

CHEMILUMINESCENT KITE

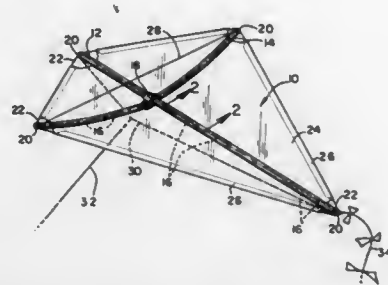
John J. Kinn, and Donna A. Kinn, 17 Peregrine Dr., Voorhees, N.J. 08043

Filed Jan. 24, 1986, Ser. No. 822,362

Int. Cl.⁴ B64C 31/06

U.S. Cl. 244—153 R

15 Claims



1. A chemiluminescent kite comprising a cover sheet for providing aerodynamic lift, a frame comprising a plurality of support members, said support members providing support for said cover sheet, and attachment means for connecting said cover sheet to said support members, wherein at least one of said support members is a light transmitting container adapted to hold therein a source of chemiluminescent light.

4,715,565

CLAMPING CONNECTION ASSEMBLY FOR SPACECRAFT

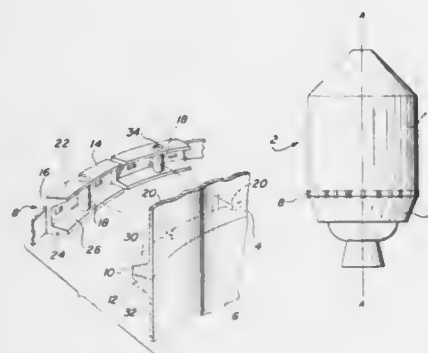
Alois Wittmann, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 27, 1986, Ser. No. 866,812

Int. Cl.⁴ B64G 1/64

U.S. Cl. 244—158 R

10 Claims



1. In a spacecraft having first and second separable components joined by a tension strap V-clamp assembly so as to be held together along an axial direction while subject to both

axial loads and bending moments, the improvement of a connection assembly comprising:

- a first flange member having a first detent on the first spacecraft component; flange members to hold them together; and
- a second flange member having a second detent on the second spacecraft component;
- a retainer member for transmitting the radial force of the tension strap to the first and second flange members to hold them together; and
- a shear pin mounted on the retainer member for engaging the complimentary first and second detents, the shear pin and detents cooperatively preventing relative rotational movement between flange members, the shear pin being capable of transmitting shear and torsional forces without increasing the axial load created by the tension strap or locking the connection assembly to prohibit a predetermined release.

4,715,566

INTERCONNECTABLE SPACE STATION MODULE AND SPACE STATION FORMED THEREWITH

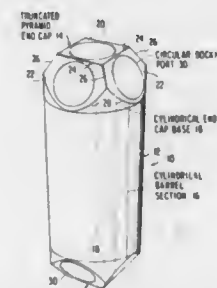
William O. Nobles, Littleton, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Oct. 29, 1985, Ser. No. 792,387

Int. Cl.⁴ B64G 1/10

U.S. Cl. 244—159

10 Claims



1. An interconnectable manned space station module for interconnection into a variety of space station configurations without need for dedicated interconnect modules, which is lightweight, strong and stiff and which provides readily available access ports for both inplane connection and offplane docking of service modules and the like thereto, said module comprising:

an elongated module body, end caps mounted to respective ends of said body, said end caps being in the form of a four sided truncated pyramid having a truncated side forming a flat, square central end face remote from said body and at right angles to the longitudinal axis of said body, and four flat oblique side faces integral with and about the four sides of the central end face.

4,715,567

SYSTEM FOR COUPLING TWO FLAPS OF AN AIRCRAFT WING, AND AN AIRCRAFT WING EQUIPPED WITH SUCH A SYSTEM

Jacques Pocard, Levignac, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 8, 1986, Ser. No. 939,140

Claims priority, application France, Dec. 13, 1985, 85 18515

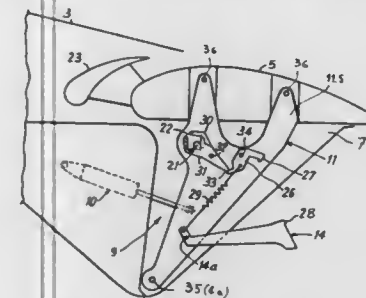
Int. Cl.⁴ B64C 9/02

U.S. Cl. 244—213

7 Claims

1. A system for coupling together two flaps of an aircraft wing, adjacent and at least substantially aligned along said wing, each flap having its own pivoting and drive means, said system comprising:

- first mechanical coupling means (12, 15) intended to ensure the synchronized operation of said two flaps;
- second mechanical emergency coupling means (13, 21, 22) able to take over the function of said first mechanical coupling means in case of failure thereof, said second mechanical emergency coupling means being disposed between said adjacent flaps and including at least one finger (21) integral with one of said flaps and engaged, with a predetermined play, in a recess (22) provided in the other flap;
- at least one mechanical device (14) intended for signaling the transfer of function between said first and second mechanical coupling means, said mechanical device having at



- least one lever able to move between two positions, the first of which corresponds to normal operation of said first mechanical coupling means, in which position the lever is not visible, and the second of which corresponds to a failure of said first mechanical coupling means, in which position the lever is visible;
- a controllable bolt (26) for locking said lever in its first non-visible position; and
- sensor means (30, 31) for detecting the position of said finger (21), said sensor means causing release of the locking between said bolt and said lever when said first mechanical coupling means fails, thus allowing said lever to take its second visible position.

4,715,568

EXPANSIBLE PITON

Donald D. Best, Jr., Escalon, Calif., assignor to David A. Hornbeck, Reno, Nev., a part interest

Division of Ser. No. 778,571, Sep. 20, 1985, abandoned. This application Aug. 5, 1986, Ser. No. 893,214

Int. Cl.⁴ A62B 29/08

U.S. Cl. 248—1

2 Claims



1. An expansible piton for use in a rock crevice comprising:
 - a. a primary plate having a first rock-contacting surface;
 - b. positioning means extending along a longitudinal axis and attached to said primary plate for moving said primary plate from a distant location with said first rock-contacting surface against one side of the crevice, said positioning means including a hand loop, a cable extending along said longitudinal axis, said cable being attached at one end to said primary plate and at the other end to said hand loop, and a sleeve on said axis of said cable intermediate said primary plate and said hand loop;
 - c. a secondary body having a second rock-contacting surface, said primary plate and said secondary body being further defined therebetween by a wedge surface and an abutting surface disposed slidably to contact said wedge surface, said wedge surface and said abutting surface

being disposed between said first and second rock-contacting surfaces;

- d. moving means attached to said secondary body for selectively moving said secondary body in a direction parallel to said longitudinal axis and in a direction transverse thereto, said moving means including a rocker slidable on said cable between said sleeve and said hand loop, said rocker being initially oriented transversely relative to said longitudinal axis, and a pair of operating cables translatablely extending through said sleeve from said rocker to said secondary body in a direction initially parallel to said longitudinal axis, said cables being spaced apart to provide a moment arm capable of rotating said secondary body in response to rotation of said rocker.

4,715,569

FASTENING MECHANISM FOR MOUNTING OPERATING EQUIPMENT AND THE LIKE

Willi Essig, Boeblingen; Robert Kicherer, Oberderdingen, and Hans Mayer, Kuerbach, all of Fed. Rep. of Germany, assignors to EGO Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

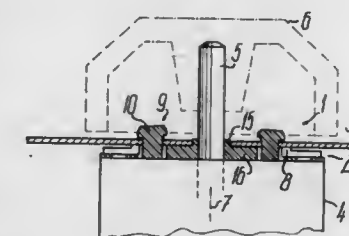
Filed Jun. 10, 1986, Ser. No. 872,513

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521634; Apr. 19, 1986, 3613295

Int. Cl.⁴ G12B 9/00

U.S. Cl. 248—27.1

24 Claims



1. A fastening mechanism for mounting an equipment body of a piece of operating equipment, such as control equipment, electrical power control switching means and the like in the vicinity of at least one opening on a panel, the opening being defined by a boundary, said fastening mechanism comprising: holding members associated with the equipment body and supported against opposite associated sides of the panel in a fastening position, said holding members having supporting surfaces for support purposes, at least one holding member being provided as a tension member engaging the associated side of the panel with pretension due to a supporting force occurring in the fastening position, at least one tension member being arranged in an at least slightly movable manner on the equipment body with respect to the boundary of the opening, wherein at least one of the tension members has a head portion provided on a shank portion passing through the opening, said head portion forming at least one of the supporting surfaces, the tension member in the fastening position being resiliently movable of itself by means of at least one articulation zone provided in the tension member, thereby compensating in the fastening position the position of the supporting surface with respect to the panel under the supporting force occurring.

4,715,570

FOLDABLE DRAIN HOSE SUPPORT

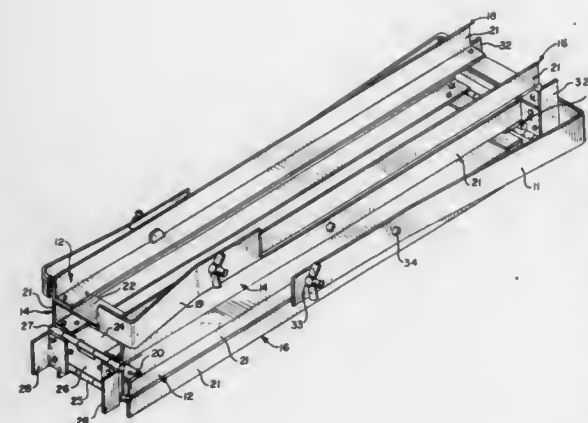
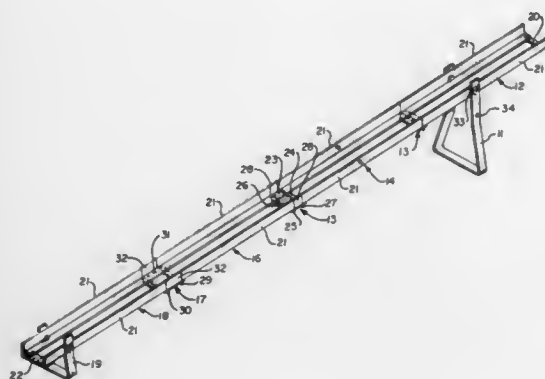
David Mashuda, 130 Wisconsin Ave., Evans City, Pa. 16033

Filed Jul. 7, 1986, Ser. No. 882,306

Int. Cl.⁴ F16L 3/00

U.S. Cl. 248—49

5 Claims



1. A foldable support trestle for flexible fluid conduit comprising a series of at least four stretcher sections connected end-to-end by first, second and third hinge sections respectively, the first stretcher section being connected to the second stretcher section by the first hinge section so that the first and second stretcher sections can be folded against each other, the second stretcher section being connected to the third stretcher section by the second hinge section, said second hinge section being a double pin hinge section with an additional stretcher section between said pins so that the second and third stretcher sections can be folded parallel to each other but separated sufficiently to admit the first stretcher section between them, the third stretcher section being connected to the fourth stretcher section by the third hinge section, said third hinge section being a double pin hinge section with an additional stretcher section between said pins so that the third and fourth stretcher sections can be folded parallel to each other but separated sufficiently to admit the folded first and second stretcher sections between them.

4,715,571

DEVICE FOR SECURING A PLURALITY OF ELECTRICAL CONDUCTORS OR CABLES

Uwe Soltow, Hamburg; Hans-Peter Guthke, Steinkirchen; Hans-Georg Plate, Roseburg; Johann Lechner, Hamburg, and Safa Kirma, Wedel, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

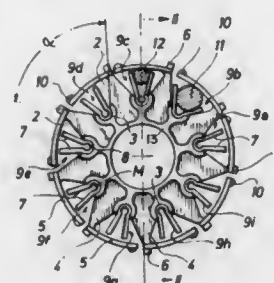
Filed Dec. 6, 1985, Ser. No. 806,284

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445489

Int. Cl.⁴ F16L 3/22

U.S. Cl. 248—68.1

7 Claims



1. A device for securing a plurality of electrical conductor in a predetermined position to form a conductor bunch prior to final installation of the conductor bunch, comprising a single piece disk made of elastically yielding synthetic material and having a central opening and a ring zone around said central opening, a first plurality of recesses in said ring zone of said single piece disk for receiving said conductors, a further plurality of leaf spring type rim sections made of elastically yielding material, elastic hinge means securing said leaf spring type rim sections to said single piece disk, said leaf spring type rim sections extending around said ring zone for closing said first plurality of recesses and holding said conductors in said first plurality of recesses with an elastically yielding radially effective biasing force at least until final installation, said single piece disk including means for attaching said single piece disk to a mounting member.

4,715,572

TRASH BAG RETAINER AND AIR VENTING DEVICE

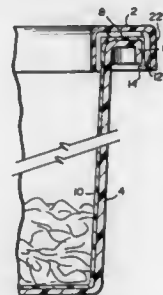
Edward S. Robbins, III, 459 N. Court St., Florence, Ala. 35630, and Gary T. Schwertner, St. Joseph, Tenn., assignors to Edward S. Robbins, III, Florence, Ala.

Filed Mar. 30, 1987, Ser. No. 31,659

Int. Cl.⁴ B65B 67/04

U.S. Cl. 248—101

42 Claims



1. A device for securing a flexible liner within a trash receptacle for the type having a side wall and an open top, said device comprising:

a rim having an inner surface defining an interior cavity which is sized and configured to receive the top of said

receptacle and an upper region of the flexible liner draped thereover; said rim including retaining means having at least one pair of ribs spaced apart from one another along said rim and projecting into said interior cavity thereof, each for removably securing said rim to the top of said receptacle and for holding a localized portion of said flexible liner against the top of said receptacle, such that another portion of said liner between said localized portions thereof is substantially unsecured against the top of said receptacle, wherein said retaining means establishes a space between said another portion of the liner and said inner surface of said rim, and wherein said retaining means allows said substantially unsecured another portion to flex into said established space thereby forming a vent between said unsecured another portion and the receptacle top to permit air trapped between the liner and the side wall of the receptacle to escape therethrough.

4,715,573

CONVERTIBLE TOOL TRAY AND SUPPORT STAND FOR MECHANICS TOOL

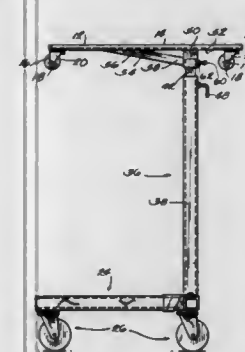
Reinald D. Liegel, Waukesha, Wis., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Nov. 26, 1986, Ser. No. 934,997

Int. Cl.⁴ A47G 29/00

U.S. Cl. 248—129

7 Claims



1. A tool tray assembly for use in supporting tools used by a mechanic beneath a vehicle, the tool tray assembly comprising: a tool tray having an upper surface adapted for use in supporting a plurality of mechanics tools, and said tool tray including a bottom surface, means for supporting the tool tray for movement along the ground, the means for supporting including a plurality of wheels attached to said bottom surface of said tool tray and adapted to independently support said tool tray for movement along the ground.

a base, means for supporting said base for movement along the ground, a vertically extending member supported by said base and extending upwardly from said base, said vertically extending member including an upper end, and means for removably mounting said tool tray on said upper end of said vertical member with said tool tray and said plurality of wheels supported above the ground, said means for removably mounting said tool tray on said upper end of said vertical member including a mounting member fixed to the bottom surface of said tool tray, said mounting member being releasably engageable with said upper end of said vertically extending member so as to removably support said tool tray on said upper end.

4,715,574

SAFETY LOCK FOR MATERIALS HANDLING SYSTEM

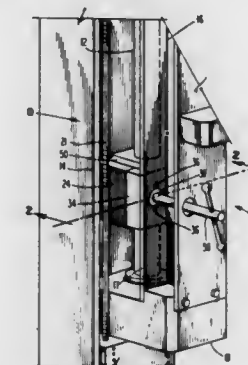
Alysa R. Holt, and Robert E. Matthiessen, both of Cherry Hill, N.J., assignors to InTest Corporation, Cherry Hill, N.J.

Filed Nov. 12, 1985, Ser. No. 796,911

Int. Cl.⁴ B25J 1/12

U.S. Cl. 248—297.1

16 Claims



10. A safety lock system for preventing unlocking of a balanced loaded unit mounted on and locked to a vertical shaft when said loaded unit becomes unbalanced, said safety lock system comprising:

a lock block having a bore adapted for mounting said lock block on said shaft for movement of said lock block along said shaft; locking means projecting through the wall of said bore for engaging said shaft to lock said lock block against vertical movement along said shaft; a rotatable handle coupled to said locking means for engaging said shaft with said locking means upon rotation of said handle in one direction and for disengaging said locking means from said shaft upon rotation of said handle in an opposite direction; and safety locking means adapted to be secured to said loaded unit and movable with said loaded unit for preventing rotation of said handle upon a preselected movement of said loaded unit relative to said lock block.

4,715,575

EYEGGLASS HOLDER

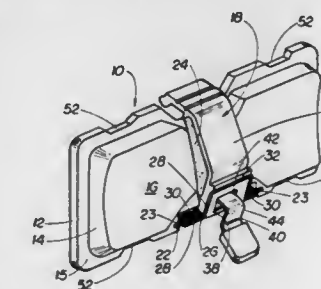
Larry Kamerer, 1413 Old Ford Rd., New Albany, Ind. 47150

Filed Dec. 10, 1986, Ser. No. 940,441

Int. Cl.⁴ A47F 5/00

U.S. Cl. 248—309.1

4 Claims



1. An eyeglass holder comprising:

a backing plate; resilient means on one planar surface of the backing plate; clamping finger means pivotally attached to the backing plate for movement between a first position transversely overlaying the one planar surface of the backing plate having the resilient means and a second position away from the one planar surface of the backing plate having the resilient means;

biasing means for biasing the clamping finger toward the first position;
a resilient latch arm; and
means on the clamping finger for engagement with the resilient latch arm for releasably holding the clamping finger in the second position.

4,715,576

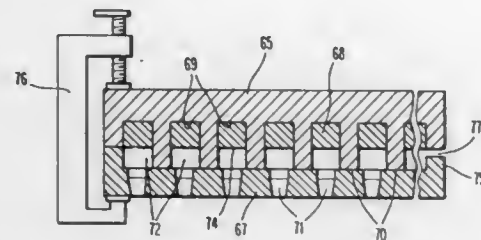
APPARATUS FOR FORMING A FLEXIBLE MASK

Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 533,604, Sep. 19, 1983, which is a division of Ser. No. 283,734, Jul. 15, 1981, Pat. No. 4,411,856. This application May 2, 1985, Ser. No. 729,755
Int. Cl.⁴ B29C 39/02

U.S. Cl. 249-60

7 Claims



1. A die for forming a flexible mask comprising a body having a pair of opposing outer surfaces, a plurality of openings extending through and between said pair of opposing outer surfaces and a plurality of protrusions extending from one of the opposing outer surfaces, said die comprising:

- first die means for forming said plurality of openings;
- second die means positioned against said first die means for forming said plurality of protrusions, said first and second die means forming a cavity to define said mask, and
- stripping means positioned within said cavity for removing said flexible mask after being formed.

4,715,577

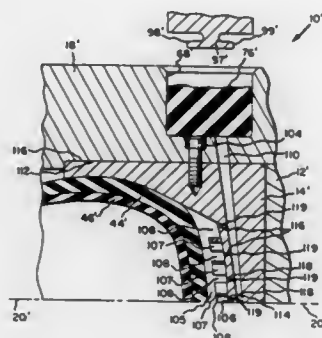
APPARATUS FOR INJECTION MOLDING TIRE TREADS

Alan Greenwood, Kent, and Norbert Majerus, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 760,937, Jul. 31, 1985, Pat. No. 4,604,256. This application Apr. 21, 1986, Ser. No. 853,975
Int. Cl.⁴ B29C 45/14

U.S. Cl. 249-107

5 Claims



1. Apparatus for injection molding a tread portion of a tire, said apparatus comprising a heated mold having a tread molding ring member, said mold containing an annular tread molding space having a molding surface on said tread molding ring member, axially extending tread molding ring runner passages disposed in said tread molding ring member at circumferen-

tially spaced positions separated from said molding surface, said runner passages extending from at least one edge of said ring member to a centerplane of said mold and being tapered from a larger diameter at said edge of said ring member to a smaller diameter at a centerplane of said mold, said runner passages being in communication with a source of fluid molding compound, and a plurality of axially spaced gate orifices located along each of said runner passages and in communication with said tread molding space.

4,715,578

DIAPHRAGM VALVE

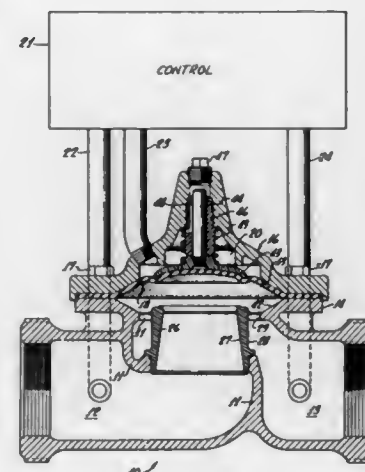
Clyde W. Seltzer, Newport Beach, Calif., assignor to Cla-Val Company, Costa Mesa, Calif.

Filed Dec. 22, 1986, Ser. No. 944,976

Int. Cl.⁴ F16K 31/128

U.S. Cl. 251-25

18 Claims



1. A pilot-operated diaphragm valve, which comprises:

- (a) a valve body having an inlet and an outlet,
- (b) a valve cover,
- (c) a diaphragm mounted, at its periphery, between said body and cover, the central regions of said diaphragm being adapted to move transversely of the peripheral regions thereof,
- (d) a combination diaphragm seat and diaphragm support sealingly mounted in said valve body at the opening between said inlet and outlet thereof, on the opposite side of said diaphragm from said cover, said valve body, and said combination diaphragm seat and diaphragm support, defining between them a substantially unobstructed flow annulus, said combination diaphragm seat and diaphragm support including a circumferentially continuous sealing lip adapted to be sealingly engaged by said diaphragm,
- (e) means on said combination diaphragm seat and diaphragm support to support said diaphragm at regions thereof radially-inwardly of, and adjacent, said flow annulus when said diaphragm is seated on said combination seat and support, said support means (e) being spaced from said lip sufficiently that said diaphragm will seal against said lip without touching said combination seat and support at regions outwardly adjacent said sealing lip, when said diaphragm is seated on said lip and on said support means (e),
- (f) means on said valve body to support said diaphragm, at regions radially-outwardly of, and adjacent, said flow annulus when said diaphragm is seated on said combination seat and support, said support means on said valve body being sufficiently low that, when there is a high pressure differential across said diaphragm and said diaphragm is fully

seated on said combination diaphragm seat and diaphragm support, said diaphragm will bend downwardly around the outer portion of said support means (e) and into said substantially unobstructed flow annulus, and (g) means to vary the fluid pressure in the chamber defined by said cover and said diaphragm, to cause opening and closing of said valve.

4,715,579

RADIATOR VALVE INCORPORATING PRESETTING MEANS

Curt Hammarstedt, Alstermo, Sweden, assignor to Tour & Andersson AB, Johanneshov, Sweden

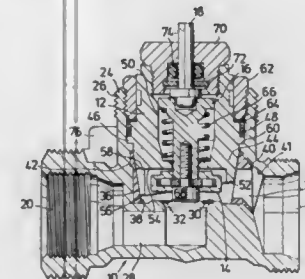
Filed Feb. 13, 1987, Ser. No. 14,667

Claims priority, application Sweden, Feb. 17, 1986, 8600679

Int. Cl.⁴ F16K 47/08

U.S. Cl. 251-121

10 Claims



1. A radiator valve incorporating presetting means for the quantity of a fluid flowing through said valve, comprising a valve body (10) with a presetting spindle (12) having a shield member (52), the height of the shield member varies circumferentially whereby the shield member can be adjusted to close a larger or smaller part of a flow opening (34) of said valve to achieve a desired preset, and incorporating a valve cone (14) being moveable via a spindle (16) and a piston (18) to control the distance of the valve cone to an adjacent valve seat (30), wherein said valve has a conical seat (38) for receiving a cooperating conical portion (44) of said presetting spindle (12), said conical portion incorporating said shield member (52) and said conical seat incorporating said flow opening (34).

4,715,580

SWINGING DEVICE

Fritz Mueller, Neuer Wasen 6, 7118 Ingelfingen-Criesbach, Fed. Rep. of Germany

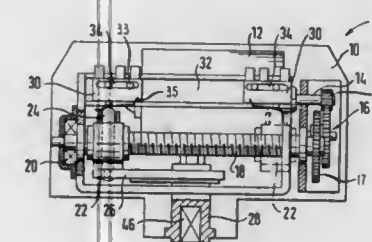
Filed Feb. 17, 1987, Ser. No. 15,222

Claims priority, application Fed. Rep. of Germany, May 6, 1986, 3615368

Int. Cl.⁴ F16K 31/04, 31/53

U.S. Cl. 251-229

13 Claims



1. A swinging device for transmitting swinging motion to an element of a shut-off valve or the like for opening and closing the latter, comprising:
a casing,
a rotatable spindle member extending within said casing; and
oscillating means adapted to cooperate with the element and

operatively connected with said spindle member for swinging between two end positions in such a manner that a maximum torque is exerted on the element when said oscillating means is in said end positions, said oscillating means including a nut adapted to move along said spindle member between said end positions, an oscillating crank having one end and another end, said one end being pivotally connected directly to said nut and moving along a straight line without being shifted toward said casing when said crank is moved between said end positions, and a coupling member operatively connected to said element and cooperating with said other end of said crank in such a manner that said coupling member is slidably received in said crank in a non-rotational manner so as to achieve said straight line movement for preventing said shifting.

4,715,581

DAMPER CONSTRUCTION

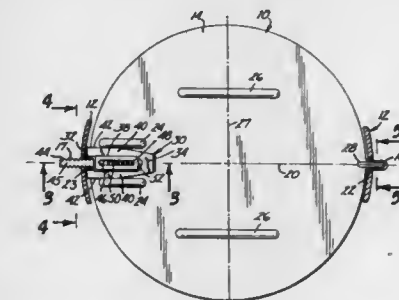
Jerome J. Myers, Maple Grove, Minn., assignor to Sheet Metal Connectors, Inc., Minneapolis, Minn.

Filed Mar. 23, 1987, Ser. No. 28,879

Int. Cl.⁴ F16K 1/22

U.S. Cl. 251-308

13 Claims



1. A damper for pivotally mounting in a pair of diametrically opposite aligned pivot openings provided in opposite sides of an air duct, said damper including:

- A. a generally flat damper blade having an outer periphery generally congruent with the inner periphery of the air duct on a plane normal to the longitudinal axis of the duct and passing through said pivot openings;
- B. a first pivot pin integral with and extending outwardly from the blade in direction so that it passes through one of the pivot openings as the damper is being installed in the duct;
- C. the damper blade being provided with integrally formed positioning bead means lying in aligned relation to the axis of the first pivot pin at a side portion of the damper blade opposite the first pivot pin, said bead means extending out of the plane of the damper blade;
- D. a damper clip adapted to be mounted on the damper blade and including a second pivot pin, said damper clip being provided with second pivot pin alignment means cooperative with the bead means for aligning the second pivot pin with the first pivot pin to provide a pivot axis for the damper blade; and
- E. means for permanently attaching the damper clip to the damper blade when positioned by the damper blade positioning bead means.

4,715,582

METHOD OF WINDING OPTICAL CABLE ON AERIAL WIRE

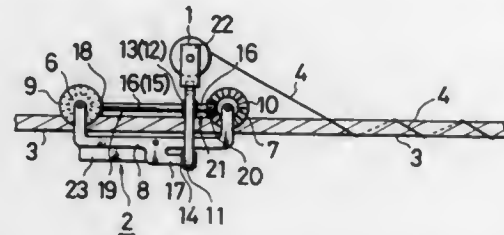
Akitoshi Ikeda, Tokorozawa; Chitoshi Nishimura, Kawasaki; Norio Katsuoka, Tokyo, and Masami Obara, Nikko, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1986, Ser. No. 847,271

Claims priority, application Japan, Apr. 3, 1985, 60-69171
Int. Cl.⁴ B65H 59/00

U.S. Cl. 254-134.3 Cl

7 Claims



1. A method of winding an optical cable on an aerial wire, comprising the steps of:

- providing an optical cable wound on a spool, the optical cable having a preset twist in one direction;
- providing a means for winding the optical cable on the aerial wire; and
- winding the optical cable on the aerial wire in a direction opposite to the direction of the preset twist of the optical cable, whereby the preset twist opposes the twist induced by the winding of the optical cable on the aerial wire so that twisting stress on the optical cable is minimized.

4,715,583

TENSION FIXTURE FOR A CURTAIN

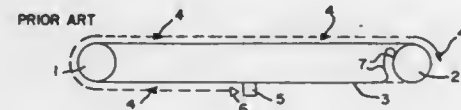
Hans Grütznier, Kehrsatz, Switzerland, assignor to K. Bratschi, Silen Gliss, Muri near Berne, Switzerland

Filed Feb. 8, 1985, Ser. No. 699,663

Claims priority, application Switzerland, Feb. 9, 1984, 623/84
Int. Cl.⁴ A47H 5/02; B66D 1/395

U.S. Cl. 254-283

12 Claims



1. A tensioning device for use with a curtain having an endless traverse which is longitudinally movable in both directions responsive to a rotational drive means and which is subject to elongation resulting from strain:

- wherein said rotational drive means includes at least two driving gears which are operatively coupled with a common drive shaft by a freewheeling coupling such that when either one of said driving gears is operated, the other of said driving gears rotates freely; and
- wherein said elongation is caused to extend from between said driving gears.

4,715,584

FURNACE FOR MELTING METALS

Andrianus J. Hengelmolen, Dreumel, Netherlands, assignor to Hengelmolen Engineering B.V., Dreumel, Netherlands

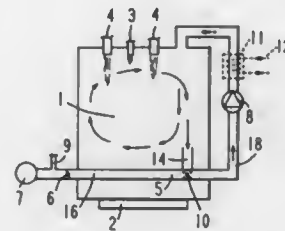
Filed Jan. 25, 1984, Ser. No. 573,570

Claims priority, application Netherlands, Jan. 26, 1983, 8300288

Int. Cl.⁴ C21C 5/38

U.S. Cl. 266-155

4 Claims



1. A furnace for sequentially pre-heating and melting a charge of metal, comprising

- a furnace chamber having at least one closable supply opening for introducing a contaminated charge of metal into the furnace chamber wherein the furnace chamber is adapted for sequential pre-heating and melting cycles for the metal charge,
- means for discharging gas from the furnace chamber,
- a recycle conduit connected directly between the gas discharging means and the furnace chamber,
- a fan incorporated in the recycle conduit for producing a recycle stream of the discharged gas in the recycle conduit directly to the furnace chamber and to the charge therein at a rate sufficient to ensure substantially optimum convection transfer of heat to the metal,
- heat source means for heating the gas of the recycle stream to a first temperature sufficient to gasify metal contaminants, but insufficient to melt the metal during the pre-heating cycle and to a second temperature sufficient to melt the metal during the melting cycle,
- a stack,
- a stack conduit connected between the gas discharging means and the stack,
- a controllable valve incorporated in the stack conduit, and
- pressure gauge means responsive to the pressure in the furnace chamber for operating the controllable valve to keep the furnace chamber pressure at a predetermined value.

4,715,585

METHOD AND APPARATUS FOR FORMING LADLE WELL BLOCKS

Joseph Simko, 6303 New Jersey, Hammond, Ind. 46323

Continuation-in-part of Ser. No. 774,090, Sep. 9, 1985,

abandoned. This application Sep. 19, 1986, Ser. No. 909,822

Int. Cl.⁴ C21C 5/44

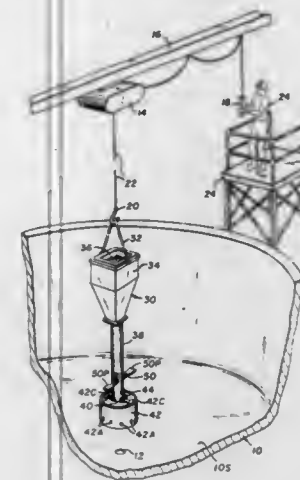
U.S. Cl. 266-273

11 Claims

1. Improved apparatus for forming a well block in a well in a vessel for holding molten metal, comprising:

- a hopper sized to receive a charge of sand sufficient to at least fill the well;
- a chute connected to the hopper for allowing the discharge by gravity of sand held therein and for delivering it out of a chute opening;
- a valve unit for closing and opening communication between the hopper and the chute;
- a movable unit mounted below and about the chute opening such that the movable unit is the lowest most projection of the apparatus, said movable unit being mounted so that it may rise up relative to the chute when the apparatus is

lowered onto a surface, and being sized to fit about the well;



means responsive to the rising movement of said movable unit for operating said valve unit to open communication between the hopper and the chute.

4,715,586

CONTINUOUS CASTER TUNDISH HAVING WALL DAMS

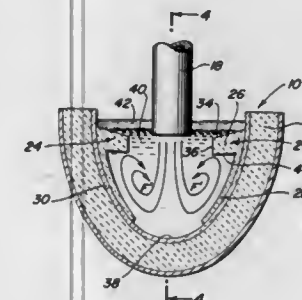
Manfred Schmidt, Bethlehem, Pa., and Theodore W. Fenicle, Chesterton, Ind., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 18, 1987, Ser. No. 16,913

Int. Cl.⁴ B22D 11/10, 41/02, 41/08

U.S. Cl. 266-275

2 Claims



1. In a tundish for use in the continuous casting of a molten metal and comprising a curved bottom portion having one or more nozzles for transferring said molten metal into a mold, upstanding curved sidewalls and flat end walls to define an elongated trough containing a quantity of molten metal, the improvement comprising in combination therewith the provision of a refractory lining, each sidewall being provided with a refractory dam member, said dam member comprising a curved vertical portion positioned against said refractory lining and a flange portion projecting substantially horizontally inwardly and having a downwardly sloping upper surface, where said flanges are positioned below the operating surface level of said molten metal but above the midpoint of the depth of said molten metal in said tundish.

4,715,587

SINUOUS BAND AND SEAT SPRING ASSEMBLY

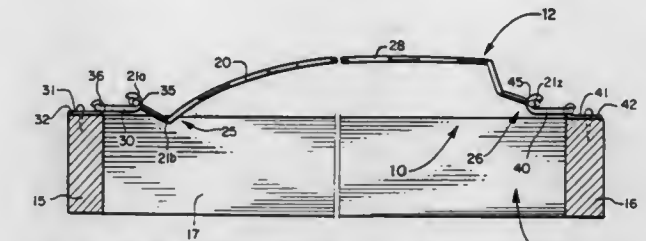
Lawton H. Grosby, Lake Bluff, Ill., assignor to Morley Furniture Spring Corporation, Lake Bluff, Ill.

Filed Apr. 7, 1986, Ser. No. 848,787

Int. Cl.⁴ A47C 23/16

U.S. Cl. 267-103

10 Claims



1. A sinuous spring band assembly mounted between the front rail and the back rail of a furniture seat frame, comprising:

- (a) a normally arced sinuous spring band stretched out between the front rail and the back rail;
- (b) said band being a regular loop sinuous band including a series of generally linear wire segments spaced about seven-eighths of an inch apart and interconnected by a series of generally semi-circular wire segments;
- (c) said interconnected wire segments defining a front bend complex in said band, a back bend complex in said band, and a body in said band extending between said bend complexes;
- (d) said back bend complex including a downwardly and rearwardly inclined inner leg having an upper end and a lower end, and an outer leg having an inner end joined to said lower end and an outer end spaced from said inner end, said upper end of said inner leg joining the body of said band;
- (e) back rail connecting means including a horizontally elongated member pivotably connected to said outer end of said outer leg and to said back rail;
- (f) said front bend complex including an upwardly and forwardly inclined leg having a lower end joining the body of said band an upper end; and
- (g) front rail connecting means including a horizontally elongated member pivotably connected to said upper end of said front bend complex leg and to said front rail.

4,715,588

ROLLING-TYPE BELLOWS FOR VEHICULAR PNEUMATIC CUSHIONING

Gunter Drescher; Gerhard Fankhänel, both of Hanover, and Wolfgang Gnirk, Lehrte, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed May 2, 1986, Ser. No. 859,051

Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3515942

Int. Cl.⁴ F16F 9/04

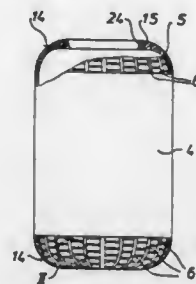
U.S. Cl. 267-122

1 Claim

1. A rolling-type bellows for vehicular pneumatic cushioning in a direction of movement for a roll fold between support means; said bellows having walls with an outer surface and being in the form of an essentially cylindrical hose body that is made of rubber or rubber-like synthetic material in which reinforcing members are disposed; said bellows in combination further comprises:

- two oppositely disposed end beads, at least one of which is drawn-in somewhat to provide an opening of reduced diameter, with an annular support surface being provided adjacent to each of said end beads; in the installed state of said bellows, said annular support surfaces, the width of which can vary, being movable relative to one another; and

raised ribs spaced from one another by a distance that corresponds to a multiple of the width of one of said ribs that are integrally provided on the outer surface of said bellows particularly in the region of both said annular support surfaces thereof; said ribs extending at least essentially in the axial direction of said bellows as well as raised surface portions provided as crosspieces extending parallel to one another and at substantially right angles to said ribs in a transverse direction relative to said ribs, said crosspieces projecting beyond the outer wall of the bellows to a lesser extent than do said ribs in the region of both said annular support surfaces; rather than making support surface contact over the entire surface, the walls of the bellows roll directly, as upon rails, on said support means only via said raised ribs that extend in the direction of movement and, as a result, on one hand, there is en-



hanced kink-free continuous movement of the roll fold, which is curved about a radius, and on the other hand any unavoidable wear is also kept at a minimum and, moreover, any increase of mechanically or otherwise caused surface tears is effectively prevented and for a self-cleaning effect said raised ribs also counteract any clogging of foreign bodies such as grains of sand and little stones between said ribs with avoidance of accompanying danger of excessive wear and localized destruction of the wall of the bellows; each of said ribs having a rectangular cross-sectional shape and each of said ribs projects beyond the outer surface of said bellows to a height that corresponds to a small fraction of the thickness of said hose body that forms said bellows, said surface portions being successively disposed, equidistantly from one another, in a uniform distribution.

4,715,589

CONNECTING DEVICE COMPRISING A BOLT AND A LOOP AROUND THE BOLT

Rudolf Woerndle, Brunnthal, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 656,546, Oct. 1, 1984, abandoned. This application Feb. 2, 1987, Ser. No. 14,081

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1983, 3339654

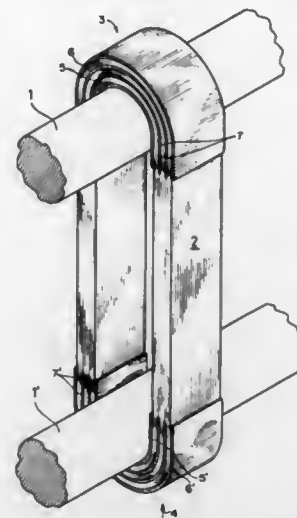
Int. Cl.⁴ F16F 1/42

U.S. Cl. 267-148

6 Claims

1. A connecting device, comprising bolt means and a loop having two loop legs and at least one looping bight connected to said loop legs, said bight looping around the bolts means, said loop legs and loop bight forming a laterally open space, said loop including a matrix of synthetic material and unidirectional fibers embedded in said matrix of synthetic material, said looping bight further including reinforcing fiber layer means directly embedded in said matrix of synthetic material, said reinforcing fiber layer means being located exclusively in a looping range formed by said looping bight around said bolt means so that said loop legs are free of said reinforcing fiber layer means, said unidirectional fibers of said loop having a fiber orientation extending substantially tangentially relative to and around said bolt means in said loop bight, said reinforcing fiber layer means having at least one main fiber orientation

extending at least approximately in a longitudinal direction of said bolt means in said loop bight so that the fibers in said reinforcing fiber layer means extend mainly about coaxially with the respective bolt means for increasing the resistance of



said matrix of synthetic material against contractions in said looping range around said bolt means and for preventing a squeeze-out of matrix material out of said loop bight when said loop legs are pulled so as to press said bight against said bolt means.

4,715,590

POSITIONING DEVICE FOR THE INSTALLATION OF DGOR FRAMES, WINDOW FRAMES OR THE LIKE

Juan B. M. Segarra, Les Casetes 78, Masamagrell (Valencia), Spain

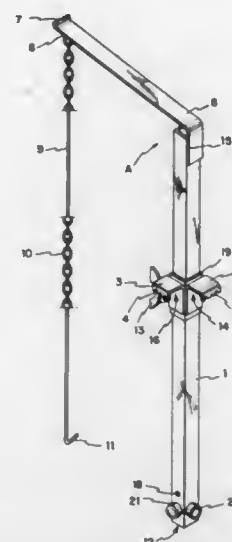
Filed Jul. 10, 1986, Ser. No. 884,242

Claims priority, application Spain, Nov. 25, 1985, 290,517

Int. Cl.⁴ B25B 1/02

U.S. Cl. 269-76

14 Claims



1. Apparatus for pre-positioning frames for doors, windows or the like with respect to a fixed surface remote from the frame to be positioned, said apparatus comprising:

an elongate, first member positionable along a first axis parallel to an axis of the frame;

a second member, carried on said first member, said first and second members being movable with respect to each other

along said first axis, said second member having a first claw adapted to engage over the frame, said first claw extending outwardly from said second member along a second axis orthogonal to said first axis, and means for releasably fastening said second member to said first member along said first axis; and cantilevered biasing means connected to one end of said first member with the free end of said cantilevered biasing means engageable with the fixed surface, whereby said biasing means is adapted to hold said apparatus and the frame in a predetermined position with respect to the fixed surface.

4,715,591

PATIENT SUPPORT FOR RADIATION IMAGING

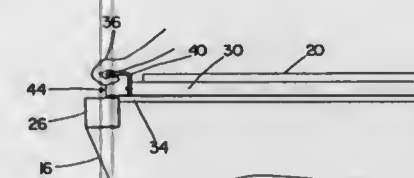
Kenneth J. Dragmen, Sr., South Euclid, Ohio, assignor to Picker International, Inc., Cleveland, Ohio

Filed Apr. 10, 1986, Ser. No. 850,021

Int. Cl.⁴ A61G 13/00

U.S. Cl. 269-322

5 Claims



1. A table assembly for use in medical diagnostic examinations of patients, said table assembly comprising:

a. a main support structure;

b. a patient support member defining a planar examining surface having a longitudinal dimension;

c. means for movably mounting the patient support member to the main support structure for movement along a path substantially parallel to the longitudinal dimension of the patient support member and maintaining a clearance space between said main support structure and said patient support member; and

d. means for discouraging inadvertent placement of patient fingers in said clearance space, said means comprising a shroud defining a finger placement space remote from said clearance space fixedly attached to said support member, said shroud extending above said clearance space but not substantially above said planar examining surface and further extending beyond the end of said support member.

4,715,592

ACCOUCHEMENT APPARATUS

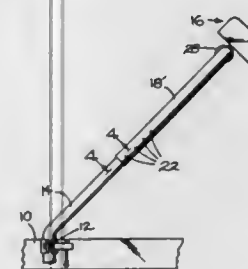
Julie M. Lewis, 1760 Oak St., Lake Oswego, Oreg. 97034

Continuation of Ser. No. 806,124, Dec. 6, 1985, abandoned, which is a continuation of Ser. No. 612,321, May 21, 1984, abandoned. This application Sep. 22, 1986, Ser. No. 910,802

Int. Cl.⁴ A61G 13/00

U.S. Cl. 269-328

5 Claims



1. Accouchement apparatus for disposition on an underlying horizontal support, the accouchement apparatus configured to

engage and support the woman in an upright position on the underlying horizontal support during labor and delivery, the accouchement apparatus comprising:

(a) a U-shaped frame having an intermediate horizontal upper body support portion and laterally spaced vertically extending legs of sufficient length to position said horizontal upper body support portion above an underlying horizontal support a distance sufficient to support the vertical extending upper body of a woman kneeling or squatting on the underlying horizontal support with the arms of the woman hanging over said horizontal upper body support portion, the legs comprising two telescoping sections arranged for longitudinal adjustment for varying the elevation of the horizontal upper body support portion above an underlying horizontal support to accommodate use by women of different heights,

(b) a resilient pad secured to the intermediate upper body support portion of the frame for engagement by the vertically extending upper body of a woman kneeling or squatting on the underlying horizontal support and leaning against the padded upper body support portion for support in an upright position during labor and delivery,

(c) said intermediate portion of the frame comprising two separate lateral sections, an outer hollow sleeve member slidably and rotatably receives said two separate sections telescopically therein for varying the spacing between the legs, securing means on the outer sleeve member releasably engages the two separate sections and secures them releasably to the sleeve member, whereby the sleeve member may be secured to the two separate sections in selected positions of rotation of the sleeve member, and the pad is rigidly secured to the sleeve member for rotation therewith, and

(d) means on the legs for engaging an underlying horizontal support to support the frame in vertically extending position with the resilient upper body support pad disposed substantially horizontally a spaced distance above the underlying horizontal support sufficient to engage and support the vertically extending upper body of a woman kneeling or squatting on the underlying horizontal support for the woman in upright position leaning against the padded upper body support portion during labor and delivery.

4,715,593

STACK-SUPPORTING BOTTOM FEED CONVEYOR

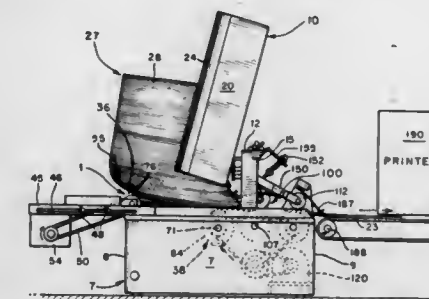
Edward S. Godlewski, 129 S. Spruce St., Wooddale, Ill. 60691

Continuation of Ser. No. 803,249, Dec. 2, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 7,577

Int. Cl.⁴ B65H 3/32

U.S. Cl. 271-10

20 Claims



1. In a conveyor for feeding stock items to associated mechanism,

means for storing said stock items in a stack,

means for feeding said items to the associated mechanism from said storing means including means for sequentially delivering to said mechanism said items one by one off the bottom of the stack during predetermined intervals, and

means intervening said intervals for lifting the entire stack off said feeding means and comprising means for thereupon facilitating pullout of the bottom item by said mechanism,

said means for feeding said items comprising rotatable means disposing beneath the stack and having slick areas and high frictional areas circumferentially offset from each other, said slick areas projecting farther from the axis of rotation of said rotatable means than said frictional areas and being operative to engage and lift the stack and provide a slide surface for the bottom item during said interval and said frictional areas operative to advance the succeeding bottom article a predetermined distance from under the stack into said mechanism after the previous bottom item has been completely withdrawn by said mechanism from under the stack by engaging such succeeding article attendant to the stack being lowered upon the respective frictional area.

4,715,594

FACE AND BACK REVERSING MECHANISM

Minoru Isobe, Yoshinori Koshida, and Katunori Yuasa, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

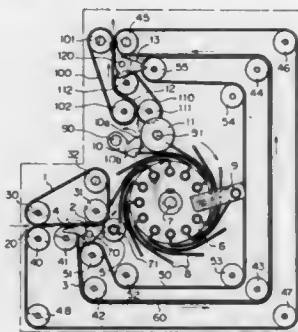
Filed Feb. 7, 1986, Ser. No. 827,352

Claims priority, application Japan, Feb. 13, 1985, 60-26073

Int. Cl.⁴ B65H 29/58

U.S. Cl. 271—65

8 Claims



1. A document front face and back face reversing mechanism, comprising:

moving means for continuously moving a succession of documents having front faces and back faces inserted at an entry position, forward end first, thereinto in succession, along a first conveyance path, all of the documents inserted into the moving means having a same one of the front face and the back face facing in a same direction at said entry position, said moving means including a plurality of continuously moving document holder parts for holding respective ones of the succession documents from said entry position to an extraction position;

stopper means at said extraction position, for successively receiving and stopping only the successive documents at said extraction position;

extracting and conveying means for successively extracting the successive documents from said holder parts, rearward ends first, and conveying the successive documents rearward ends first toward a merge position with the other one of the front faces and back faces of the successive documents facing in a given direction; and

bypassing and conveying means for conveying other documents having the other of the front faces and back faces thereof facing in said same direction upstream of said entry position, along a second conveyance path bypassing said entry position and said moving means, to said merge position with the other one of the front faces and back faces thereof facing in said given direction.

4,715,595

APPARATUS FOR FEEDING PAPER SHEETS FROM A PAPER STOCK TO A PRINTER OR READER

Toshinori Ishigaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

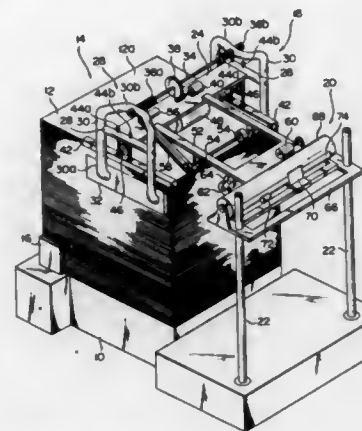
Filed Dec. 30, 1985, Ser. No. 814,759

Claims priority, application Japan, Dec. 28, 1984, 59-276221

Int. Cl.⁴ B65H 7/14, 3/06

U.S. Cl. 271—110

12 Claims



10. A printer comprising:

a base on which a rectangular, parallelepiped stack of a number of sheets is placed;

a printer main body; and

a paper feeder for sequentially feeding the sheets from the uppermost sheet to said printer main body, said paper feeder including:

a paper feeder main body arranged above the sheet stack;

a feed roller, supported by said paper feeder main body and in contact with the uppermost sheet, for feeding the uppermost sheet in a predetermined direction;

drive means for driving said feed roller to advance the uppermost sheet in the predetermined direction;

regulating means, arranged at a predetermined position with respect to the uppermost sheet, for allowing movement of the uppermost sheet and preventing movement of the other sheets; and

support means, movable in accordance with a change in the height of the sheet stack upon sheet feed, for supporting said paper feeder main body and said regulating means spaced above the uppermost sheet at times when the feed roller feeds the uppermost sheet, said printer main body being interconnected with said paper feeder for vertical movement therewith, wherein said printer main body and said paper feeder move vertically downward together as sheets are fed from the top of the sheet stack by said paper feeder.

4,715,596

PAPERBOARD SHEET FEEDER

Larry K. Cantrell, Spartanburg, and Edwin J. Smith, Duncan, both of S.C., assignors to Grant Machinery Inc., Inman, S.C.

Filed Apr. 23, 1986, Ser. No. 855,117

Int. Cl.⁴ B65H 3/06

U.S. Cl. 271—116

20 Claims

1. A paperboard sheet feeder, comprising:

a support for a stack of paperboard sheets;

a roller on said support;

bearing means engaging said roller for rotatably supporting said roller on said support;

drive means for rotating said roller, said drive means including:

a drive gear;

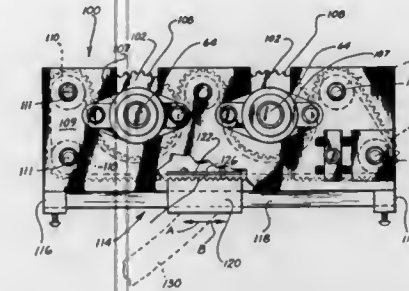
clutch means connecting said drive gear to said roller for rotating said roller when said drive gear is rotated in one

direction and for allowing said roller to freewheel when said drive gear is rotated in an opposite direction;

a drive belt having a surface engaging said drive gear;

a guide; and

a slide block slidably mounted on said guide, said drive belt being connected to said block so that said drive gear is



driven in said one direction and then in said opposite direction as said slide block reciprocates on said guide and said roller is driven in a positive manner when said drive gear is rotated in said one direction and said roller free-wheels when said drive gear is driven in said opposite direction.

4,715,597

AUTOMATIC DOCUMENT FEEDER

Yasuo Sakurai, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

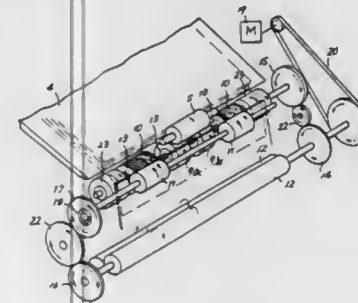
Filed Mar. 19, 1986, Ser. No. 841,182

Claims priority, application Japan, Mar. 19, 1985, 60-53303; Apr. 1, 1985, 60-66587

Int. Cl.⁴ B65H 3/52

U.S. Cl. 271—122

8 Claims



1. An automatic document feeder comprising:

a separating roller rotatably supported at one end of a table for placing thereon a stack of sheets of documents to be fed;

a friction roller rotatably supported and pressed against said separating roller;

a feed roller rotatably supported and coaxial with said separating roller;

a transport roller rotatably supported and pressed against said feed roller;

driving means for driving to rotate said separating, feed and transport rollers selectively depending on a direction of rotation; and

wherein said separating roller is comprised of a material different from that of said feed roller.

4,715,598

BASKETBALL GAME AND COURT

John K. Knight, Doncaster, Australia, assignor to R.F.D. Consultants Pty. Ltd., Melbourne, Australia

PCT No. PCT/AU84/00267, § 371 Date Sep. 3, 1985, § 102(e)

Date Sep. 3, 1985, PCT Pub. No. WO85/03009, PCT Pub. Date Jul. 18, 1985

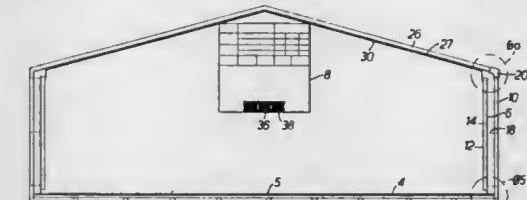
PCT Filed Dec. 21, 1984, Ser. No. 776,117

Claims priority, application Australia, Jan. 13, 1984, PG3181

Int. Cl.⁴ A63B 71/02, 63/08; A63C 19/00; E04H 3/14

U.S. Cl. 272—3

18 Claims



1. A court for a ball game comprising a substantially planar floor surface, a wall portion which at least in part comprises a barrier and a goal arranged so that the barrier forms at least part of the boundary of the area of playing the game and when struck allows for rebounding of the ball into play, and a goal structure located generally centrally of said floor surface and above the floor surface to enable unimpeded access beneath the goal structure, and wherein the goal structure includes a fixed rigid back board rebound and first and second goal targets located on opposite sides of the barrier.

4,715,599

BASKETBALL BACKBOARD FOR A DIVING BOARD

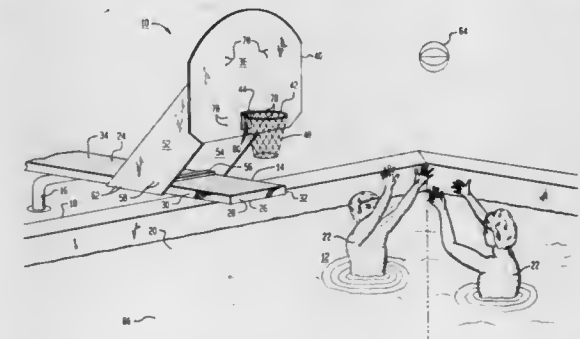
Dean Raymond, 124 Manlove Ave., Hightstown, N.J. 08520, and John J. Metrosky, R.D. 1, Box 111, Allentown, N.J. 08501

Filed Jun. 13, 1986, Ser. No. 873,997

Int. Cl.⁴ A63B 63/08

U.S. Cl. 273—15 R

4 Claims



1. A method for connecting a game apparatus to a diving board, said game apparatus including a basketball-like backboard, a first and second panel connected to said backboard, and an upper and a lower horizontal member connected to said first and second panels respectively, said method comprising the steps of:

placing the end of said diving board between said first and second horizontal members;

resting the weight of said apparatus on said first horizontal member on said diving board; and,

rotating said apparatus so that said second horizontal member contacts the underside of said diving board, wherein said apparatus is held in place by the downward action of the force of gravity tending to cause said apparatus to tilt forward and said second horizontal member to

stay in contact with the bottom surface of said diving board.

4. A water game apparatus for use in a swimming pool having a diving board, said diving board having a top surface, a bottom surface, a first vertical edge and a second vertical edge, said water game apparatus comprising:

a target including a relatively flat basketball-like backboard and a hoop means attached to said basketball-like backboard;

first horizontal means locatable on the top surface of said diving board for supporting the bulk of the weight of said apparatus;

second horizontal means for keeping said apparatus from tipping over, said second horizontal means being locatable up against the bottom surface of said diving board;

first vertical means attached to said first horizontal means, said second horizontal means and said basketball-like backboard and locatable along said first vertical edge of said diving board; and,

second vertical means also attached to said first horizontal means, said second horizontal means and said basketball-like backboard and locatable along said second vertical edge of said diving board opposite from said first vertical edge of said diving board,

wherein the center of gravity of said apparatus is located forward of said first horizontal means in the direction of said basketball-like backboard when said apparatus is properly attached to said diving board.

4,715,600

DOOR MOUNTED, HEIGHT ADJUSTABLE BASKETBALL BACKBOARD AND RIM

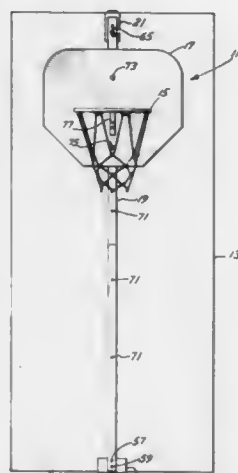
James C. Offutt, Peoria, Ill., assignor to Rimball, Inc., Peoria, Ill.

Filed Mar. 27, 1986, Ser. No. 844,986

Int. Cl.⁴ A63B 63/08

U.S. Cl. 273-1.5 R

3 Claims



1. A basketball game apparatus comprising:
 - a first U-shaped bracket member having a U-shaped channel of a size for receiving the upper edge of a conventional door;
 - a second U-shaped bracket having a channel of a size for receiving the lower edge of the door;
 - a vertical pole of length shorter than the height of the door and having a first end and a second end, said first end being secured to said first bracket and said second end being secured to said second bracket for securing said pole in a substantially vertical relationship with respect to the outer face of the door;
 - tightening means for pulling said first and second bracket toward one another for clamping the door tightly therebetween in order to rigidly dispose said pole relative to the door; and

tween in order to rigidly dispose said pole relative to the door; and

a backboard and basketball rim assembly adjustably mountable to various vertical positions along said pole;

said first U-shaped member including a relatively thin L-shaped metal member and a relatively thick front member, said L-shaped member having a first leg for seating against the backside of the door and a second leg for seating against the top edge of the door, said thick front member having a first face for seating against the front face of the door and a second top face for abutting a portion of said second leg of said L-shaped member; and securement means for securing said second leg to said second top face of said front member.

4,715,601

SET OF GOLF CLUBS AND METHOD OF MATCHING SAME

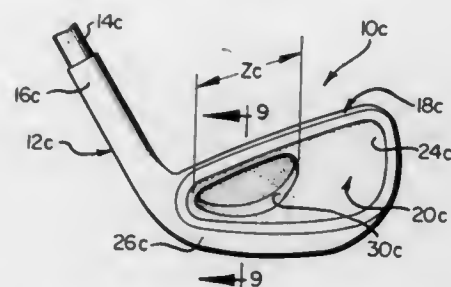
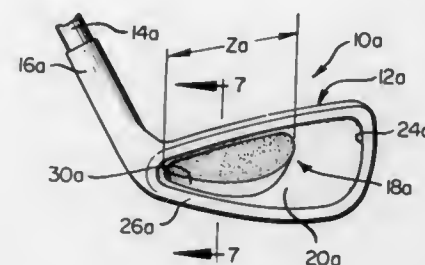
Anthony Lamanna, 24 N. 38 Valley Rd., Lake Zurich, Ill. 60047

Filed Feb. 25, 1986, Ser. No. 833,101

Int. Cl.⁴ A63B 53/04

U.S. Cl. 273-77 A

12 Claims



1. A set of golf clubs including at least a first and a second club, each club comprising a club head and a shaft, each club head including a hosel portion to which the shaft is attached and a blade portion, said blade portion including, a substantially planar face for striking a golf ball and a back portion opposite said planar face, the substantially planar faces on the respective club heads of the set being disposed at varying angles with respect to a vertical datum line to provide progressive degrees of loft, such that the planar face on the first of said club heads is disposed at a lesser angle to said datum line than is the planar face on the second one of said club heads in said set, the back portions of each said first and second club heads including a cavity formed therein, and the cavity in said first club head being of a larger volume than the cavity in said second club head, with the volume of the cavities in said clubs decreasing from the lower lofted clubs of said set to the higher lofted clubs, and the length of the hosel portion on said first club being shorter than the hosel portion on said second club with the hosel length on said clubs increasing from the lower lofted clubs to the higher lofted clubs of said set, such that the hosel length may be selected to provide a relatively uniformly located center of mass for each club head in the set.

4,715,602

RACING GAME APPARATUS

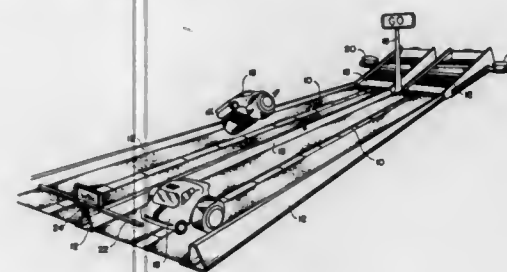
Richard L. May, 326 S. Pacific Coast Hwy., Redondo Beach, Calif. 90277; Jay Smith, Los Angeles, and Harley Wolf, Studio City, both of Calif., assignors to Richard L. May and Kenneth Curran, both of Redondo Beach, Calif.

Filed May 9, 1986, Ser. No. 861,356

Int. Cl.⁴ A63F 9/14

U.S. Cl. 273-86 R

6 Claims



1. Racing game apparatus including: a track comprising a running surface and a pair of upright side members extending along the respective edges thereof; an inertia type motor vehicle to be propelled along the running surface of the track between the side members after its wheels are first set in a spinning condition; a ramp attached to one end of said track including a trap door for receiving the spinning wheels of the vehicle; a manually operated mechanism attached to said trap door for closing said trap door to release the vehicle from the ramp; a starting flag assembly attached to said ramp including a pivoted arm, a latch for holding the arm in an essentially horizontal position, resilient means coupled to the arm for biasing the arm to an upright position when released by the latch; and a manually operated release mechanism coupled to the latch, said release mechanism including a dual operated button assembly which responds only to the simultaneous operation by two persons to operate said release mechanism.

4,715,603

MINIATURE SIMULATED BASEBALL

Lawrence C. Gleason, 2036 Canyon #34A, Boulder, Colo. 80302

Continuation of Ser. No. 740,954, Jun. 3, 1985, abandoned. This application Sep. 11, 1986, Ser. No. 906,229

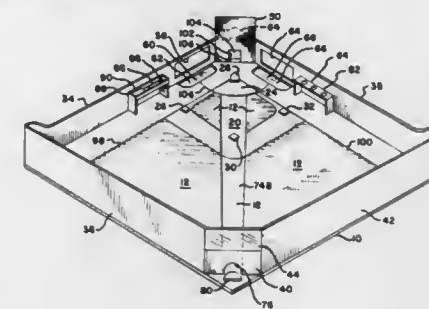
Int. Cl.⁴ A63F 7/20

U.S. Cl. 273-90

19 Claims

1. The baseball game with a lighting system to simulate an actual night baseball game said lighting system comprising:
 - (1) a slotted base member with said slot having a width wide enough to fit snugly on top of a boarder wall;
 - (2) a shaft whereby said base member is connected to a backplate; and
 - (3) a plurality of miniature lamps set in said backplate; and
 - (4) a screen connected to said backplate encasing said lamps whereby said lamps are protected from damage by a ball batted.
2. A miniature simulated baseball game using a miniature simulated baseball, a plurality of simulated baserunners, and a plurality of simulated miniature defensive fielders which comprises:
 - (A) a component playing surface simulating quite closely an actual baseball playing field, including a home plate, an infield diamond, and an outfield;
 - (B) an adjustable simulated strike zone comprising:
 - (1) a backstop located behind home plate, said backstop having an adjustable opening; and
 - (2) a barrier means for adjusting the size of said adjustable opening to thereby define said strike zone;
 - (C) a means to pitch a simulated miniature baseball, said baseball pitching means spaced from said simulated home

plate and including a soft flexible material of a thickness easily depressed by a finger tip; and



other relatively shifted lengthwise of the rows by a half of said spacing; and
means for paying out a predetermined number of coins when a prize-winning combination of said displayed complete symbols is displayed on at least one predetermined prize-winning line extending diagonally to said lengthwise arrangement of symbols.

4,715,605

TWO AND THREE-DIMENSIONAL NUMBER GAME OR PUZZLE

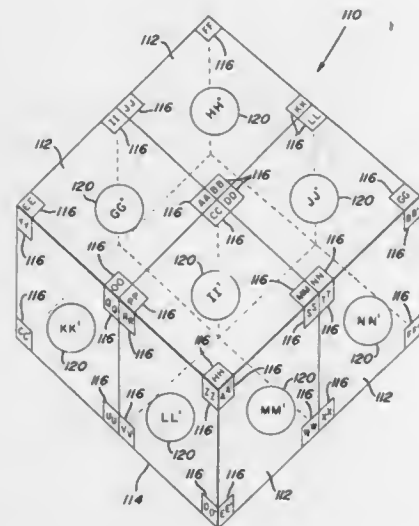
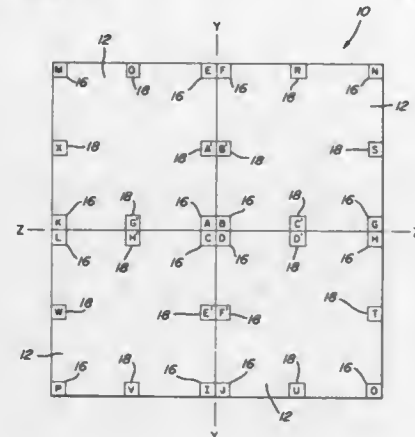
Steven F. Fritzman, 38 Mourning Dove Dr., Stafford, Va. 22554

Filed Feb. 12, 1986, Ser. No. 828,478

Int. Cl.⁴ A63F 9/06, 9/20

U.S. Cl. 273—156

14 Claims



1. A game or puzzle, comprising
at least four, two-dimensional card game pieces, wherein each one of said two-dimensional card game pieces has the configuration of a square, interchangeably disposable at predetermined locations with respect to each other, and orientable in any one of a plurality of different orientations at each one of said predetermined locations, so as to form at least an interrelated two-by-two array of said card game pieces which also has the configuration of a square;
dissimilar indicia disposed at each corner of each of said square-shaped card game pieces, as well as about the peripheral edge portions of each of said square-shaped card game pieces substantially centrally between said corners of each of said square-shaped card game pieces, so as to define a pattern of indicia upon each one of said card game pieces which is identical upon each one of said card

game pieces whereby said orientations and interchangeability of said card game pieces is facilitated;

a first set of said indicia upon all of said card game pieces located at the center of said two-by-two array of said card game pieces as defined by the mating corners of each of said at least four square-shaped card game pieces;

a second set of said indicia upon all of said card game pieces located at the center of each peripheral edge portion of said two-by-two array of said card game pieces as defined by adjacent mating corners of adjacent pairs of said square-shaped card game pieces; and

a third set of said indicia upon all of said card game pieces located between said first and second sets of said indicia along the mating edges of said adjacent pairs of said card game pieces as defined by said indicia located at said central peripheral edge portions of each one of said square-shaped card game pieces,

said first, second, and third sets of indicia being related to each other when said card game pieces are disposed at correct ones of said locations, and in correct ones of said orientations, within said two-by-two array of said card game pieces so as to satisfy at least one of the relationships wherein: (1) all of said indicia of at least one of said second and third sets of said indicia is the same as or equal to all of said indicia of the same set of indicia of said second and third sets of indicia disposed respectively along each of said mating edges of said adjacent pairs of said card game pieces, or (2) all of said indicia of one of said second and third sets of indicia is the same as or equal to all of said indicia of the other one of said second and third sets of indicia disposed respectively along each of said mating edges of said adjacent pairs of said card game pieces, or (3) at least one of said entire sets of indicia is the same as or equal to at least one other one of said entire sets of indicia.

2. A game or puzzle, comprising:

at least four, three-dimensional game pieces, wherein each one of said three-dimensional game pieces has the configuration of a cube, interchangeably disposable at predetermined locations with respect to each other, and orientable in any one of a plurality of different orientations at each one of said predetermined locations, so as to form at least an interrelated two-by-two-by-one array of said cubical game pieces which has the configuration of a parallelepiped as defined by upper and lower horizontal planar surfaces which are at least two cube game pieces wide and two cube game pieces long, and vertical side planar surfaces which are one cube game piece deep;

dissimilar indicia disposed at each corner of each planar surface of each one of said cubical game pieces, as well as at the center of each of said planar surfaces of said each one of said cubical game pieces, so as to define a pattern of indicia upon said each one of said planar surfaces which is identical upon each one of said planar surfaces of said cubical game pieces whereby said orientations and interchangeability of said cubical game pieces is facilitated;

a first set of said indicia upon all of said planar surfaces of all of said cubical game pieces located at the center of each one of said planar surfaces of said each one of said cubical game pieces;

a second set of said indicia upon all of said planar surfaces of all of said cubical game pieces located at the center of each peripheral edge portion of said upper and lower horizontal planar surfaces of said array of said cubical game pieces as defined by adjacent mating corners of adjacent mating pairs of said cubical game pieces;

a third set of said indicia upon all of said planar surfaces of all of said cubical game pieces located at the center of each upper edge portion of each vertical side planar surface of said array of said cubical game pieces as defined by adjacent mating corners of adjacent mating pairs of said cubical game pieces; and

a fourth set of said indicia upon all of said planar surfaces of all of said cubical game pieces located at the center of each lower edge portion of each vertical side planar surface of

said array of cubical game pieces as defined by adjacent mating corners of adjacent mating pairs of said cubical game pieces,

said first, second, third, and fourth sets of said indicia being related to each other when said cubical game pieces are disposed at correct ones of said locations, and in correct ones of said orientations, within said two-by-two-by-one array of said cubical game pieces so as to satisfy at least one of the relationships wherein: (1) all of said indicia of said first set of said indicia, and located upon any one vertical side planar surface of said array of cubical game pieces, is the same as or equal to all of said indicia of said first set of said indicia located upon all of the remaining vertical side planar surfaces of said array of cubical game pieces, or (2) the indicia of said first set of said indicia, and located upon each planar surface of each of said cubical game pieces disposed within each of said vertical side planar surfaces of said array of cubical game pieces, is the same as or equal to the indicia of said first set of said indicia located upon the same vertical side planar surface of said array of cubical game pieces, or (3) all of the indicia of any one of said second, third and fourth, sets of indicia, respectively located at any one of said edge locations upon said upper and lower horizontal planar surfaces, and said vertical side surfaces, of said array of cubical game pieces, is the same as or equal to all of the indicia of the same set of indicia located at the remaining ones of said edge locations upon said upper and lower horizontal planar surfaces, and said vertical side surfaces, of said array of cubical game pieces, or (4) the indicia of any one of said second, third and fourth, sets of indicia, respectively located at any one of said edge locations upon said upper and lower horizontal planar surfaces, and said vertical side surfaces, of said array of said cubical game pieces, is the same as or equal to the indicia of the same set of indicia located at the same edge location, as defined by the adjacent indicia of adjacent mating corners of adjacent mating pairs of said cubical game pieces, while the remaining indicia of said other ones of said second, third and fourth, sets of indicia, respectively located at the remaining ones of said edge locations upon said upper and lower horizontal planar surfaces, and said vertical side planar surfaces, of said array of said cubical game pieces, are the same as or equal to the indicia of the same sets of indicia, respectively located at the same edge locations corresponding to said remaining indicia respectively located at said remaining ones of said edge locations upon said upper and lower horizontal planar surfaces, and said vertical side planar surfaces, of said array of cubical game pieces.

4,715,606

GOLF CLUB WITH HEAD WEIGHT CONTROL DEVICE

Alan Varley, Kowitzberg 41, 2407 Lübeck-Travemünde, Fed. Rep. of Germany

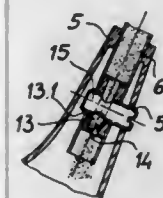
Filed Nov. 29, 1985, Ser. No. 803,121

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1984, 3444072

Int. Cl.⁴ A63B 69/36

U.S. Cl. 273—194 B

5 Claims



1. A golf club comprising:

a head;
a hollow space within said head;
a shaft holder having a bore therein communicating with said hollow space;
a hollow shaft having an inner end affixed to said shaft holder;
means for permitting addition of a flowable filling material into said shaft; and
control means adjacent said inner end of said shaft, adjustable from outside said golf club for controlling a free flow of said flowable filling material between said hollow shaft and said hollow space, whereby a weight distribution of said golf club is adjusted.

4,715,607

GOLF BALL COMPOSITION

Francisco M. Llort, Dighton; Paul M. Gendreau, Swansea, both of Mass., and Raymond A. Berard, Portsmouth, R.I., assignors to Acushnet Company, New Bedford, Mass.

Filed Feb. 18, 1986, Ser. No. 830,695

Int. Cl.⁴ A63B 37/00, 37/02, 37/06

U.S. Cl. 273—218

16 Claims

6. A golf ball product formed from a mixture comprising polybutadiene having a cis-1,4-polybutadiene content of above about 40% and, per 100 parts polybutadiene, from about 30 to about 40 parts zinc diacrylate, and from about 0.1 to about 1.0 parts free radical initiator, and further comprising from about 0.01% to 2.0% zinc dimethacrylate by weight of the combined weight of the zinc diacrylate and zinc dimethacrylate.

4,715,608

EDUCATIONAL GAME APPARATUS

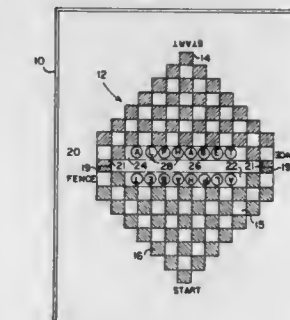
Johanna Burt, 2125 Palm Vista Dr., Apopka, Fla. 32703

Filed Nov. 24, 1986, Ser. No. 934,499

Int. Cl.⁴ A63F 3/00

U.S. Cl. 273—248

6 Claims



32—propagate
(prop' a-gd r)
30—

1. Educational board game apparatus comprising:

(a) a board having a playing field, said field having
(i) a first essentially pyramidal design formed by a first checkerboard pattern having alternating first dark and light squares, a vertex thereof adjacent a first playing end of said board and a first base toward a second playing end of said board;
(ii) a second essentially pyramidal design formed by a second checkerboard pattern having alternating second dark and light squares, said second dark squares differing distinguishably from said first dark squares, a vertex thereof adjacent said second playing end of said board and a second base contiguous with said first base;
(iii) a first word ALPHABET having each letter of a size to fit into a square of said designs, said word disposed in a line within said first design, parallel to said first base,

- and oriented to be read from said second playing end, said word including means for associating the letters thereof with said second dark squares;
- (iv) a second word ALPHABET having each letter of a size to fit into a square of said designs, said word disposed in a line within said second design, parallel with said second base, and oriented to be read from said first playing end, said word including means for associating the letters thereof with said first dark squares;
- (b) a set of game word cards having a word printed on one side thereof and a definition of such word printed on the other side thereof, one of said cards being drawn by a player prior to each play of said game for providing a word to such player for spelling or definition prior to such play;
- (c) a set of movable playing pieces including
- (i) a plurality of blank playing tiles having a size to fit within said squares for moving in increments over said playing field,
- (ii) a plurality of indicator tiles having the letter M on one face thereof and the letter S on an opposite face thereof for a player during play of said game to place on said board to indicate "spelling" or "meaning"
- (iii) a plurality of alphabet tiles each alphabet tile having a letter thereon and being of a size to cover a letter of said word ALPHABET, said alphabet tiles having collectively at least twice the number of letters required to spell the word ALPHABET, said alphabet tiles serving to cover a corresponding letter of the word ALPHABET when a player's playing tile is moved thereon during play of said game; and
- (d) chance means for operation by a player to determine the number of increments of movement of a playing tile over said playing field when such player successfully spells or defines a word on one of said word cards drawn from said set.

4,715,609

SEAL ELEMENT FOR SEALING DUCTS OF AN AIR CONDITIONER SYSTEM

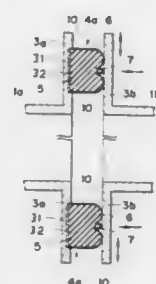
Kaoru Mino, Koji Fukushima, and Takashi Kasai, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Dec. 3, 1985, Ser. No. 804,256

Claims priority, application Japan, Dec. 7, 1984, 59-185758(U); Dec. 10, 1984, 59-259267

Int. Cl.⁴ F16J 15/10

U.S. Cl. 277—207 R

3 Claims



1. A seal element for providing a seal by being squeezed between opposed surfaces of a pair of joint members comprising:

an elongate elastic body of an elastic material and having a pair of side surfaces sealingly engageable respectively with the surface of the joining members, one of said side surfaces having an outwardly bowed configuration, said elastic body having along its entire length an elongated sealing fin projecting integrally from said bowed one side surface;

said sealing fin having less elasticity than said body;

said body having a semi-elliptical cross-sectional shape defined by said one and other side surfaces, said other side

surface including the minor axis of an ellipse containing said semi-elliptical cross-sectional shape, said sealing fin extending perpendicular to said other surface; and

whereby when said seal element is squeezed between the opposed surfaces of the joint members, said elastic body being elastically deformable in such a manner that said one bowed side surface is urged by said sealing fin to flex inwardly toward the other side surface and is held in sealing engagement with one of the opposed surfaces of the joint members.

4,715,610

HITCH FOR A VEHICLE HAVING A SINGLE REAR WHEEL

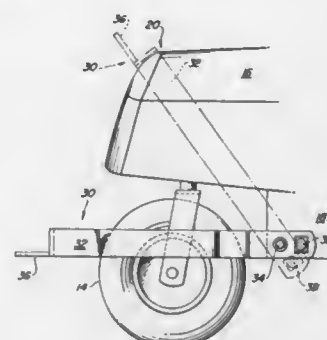
James N. Wisdom, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed May 13, 1986, Ser. No. 862,857

Int. Cl.⁴ B60D 1/00

U.S. Cl. 280—490 R

4 Claims



1. In a hitch on a vehicle having a single rear wheel, said vehicle including a frame extending outwardly from both sides of said rear wheel and a rear body section having side portions, a rear portion, and a top portion including a contoured upper rear section; said rear body section being supported on said frame and extending vertically above said rear wheel, the improvement comprising:

a generally C-shaped support having opposite ends pivotally attached to said frame on opposite sides of said rear wheel, said support being attached forwardly of said rear wheel and being selectively movable between a lowered towing position and a raised stored position wherein said support encircles said side portions and said rear portion adjacent said contoured upper rear section of said rear body section above said rear wheel;

a hitch plate attached to and extending out from the central portion of said support; and

means for selectively locking said support against pivotal movement in said towing and stored positions.

4,715,611

MOUNTING OF THE COUPLING BODY OF A TRAILER COUPLING IN THE CROSS-PIECE

Johann Brey, Munich, Fed. Rep. of Germany, assignor to Rockinger Spezialfabrik für Anhängerkupplungen GmbH & Co., Munich, Fed. Rep. of Germany

Filed Aug. 14, 1986, Ser. No. 896,889

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1985, 3530565

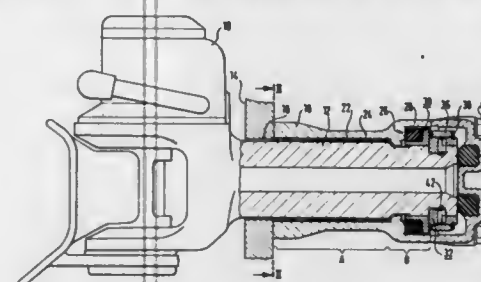
Int. Cl.⁴ B60D 1/00

U.S. Cl. 280—504

15 Claims

1. A trailer coupling for a towing vehicle having a coupling body, a draw rod issuing from the coupling body, a cross-piece for attachment to the towing vehicle, a bearing tube secured to the cross-piece and having a passage therein concentric with the bore of the cross-piece, said draw rod passing through a

bore in the cross-piece and being guided in said passage, said draw rod being axially supported on the bearing tube against traction force and thrust force transmission, the cross-section of the draw rod occupying substantially the full cross-section



of the cross-piece bore, and the bearing tube, commencing on the side of the cross-piece remote from the coupling body, extending exclusively in the direction of the coupling body, wherein the draw rod is supported in both force directions on an end section of the bearing tube remote from the cross-piece.

4,715,612

ALPINE SKI

Christopher Fels, 32-655 Richmond Road, Ottawa, Ontario K2A 3Y3, Canada, and David Fels, 317 Chapel Street, Ottawa, Ontario K1N 7Z2, Canada

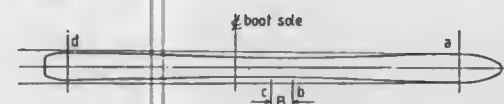
Filed Dec. 4, 1985, Ser. No. 804,836

Claims priority, application Canada, Jun. 28, 1985, 485027

Int. Cl.⁴ A63C 5/04

U.S. Cl. 280—609

8 Claims



1. A snow ski having a bottom camber, a side camber, and a single waist, said waist defined as that portion of the ski at which the side camber defines the minimum width of the ski, said ski comprising an overall length of 140 cm. to 230 cm., and wherein the maximum height of the bottom camber is in the rearward portion of the ski behind the centerline of the boot placement and the waist of the ski is wholly ahead of the centerline of boot placement such that the ski width is increasing in the rearward direction of the ski at this centerline position.

4,715,613

Patent Not Issued For This Number

4,715,614

VEHICLE REAR-SUSPENSION SYSTEM

Takao Kijima, and Fumitaka Ando, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Jul. 17, 1984, Ser. No. 631,791

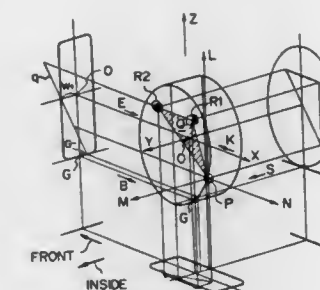
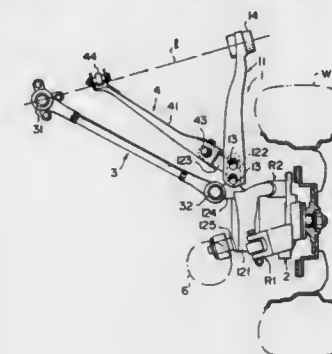
Claims priority, application Japan, Jul. 27, 1983, 58-138530

Int. Cl.⁴ B60G 3/26, 7/02

U.S. Cl. 280—701

12 Claims

1. A wheel suspension of a rear wheel of a vehicle, comprising a wheel supporting member having a trailing arm and a first control link, wherein said trailing arm at its end directed to a vehicle body is vertically pivotable about a pivotal axis, the trailing arm being connected to the vehicle body by means of a resilient bushing, and wherein the first control link at its end directed to the vehicle body is pivotally connected to one end of a second control link, said second control link, at its other end, being pivoted to the vehicle body at a body side pivotal center whereby the body side pivotal center of the second control link is downwardly offset from the pivotal axis of the trailing arm, a ball joint connecting the wheel supporting member to the trailing arm so as to permit pivotable movement



arm, the ball joint and the first and second resilient bushings being arranged to cause the rear wheel to toe in against a force acting thereon.

4,715,615

VEHICLE REAR-SUSPENSION SYSTEM

Takao Kijima, and Fumitaka Ando, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

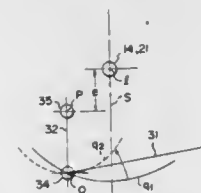
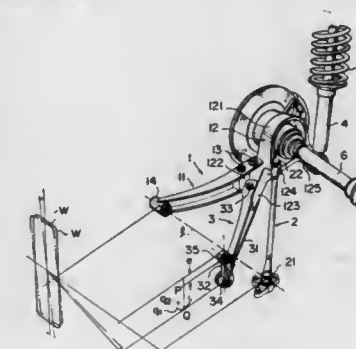
Filed Jul. 20, 1984, Ser. No. 632,648

Claims priority, application Japan, Jul. 27, 1983, 58-138528; Jul. 27, 1983, 58-138533

Int. Cl.⁴ B60G 3/26, 7/02

U.S. Cl. 280—701

11 Claims



1. A wheel-suspension of a rear wheel of a vehicle comprising a wheel supporting member having a trailing arm and a first control link, wherein said trailing arm at its end directed to the vehicle body is vertically pivotable, being connected to the

vehicle body at a body side mounting point by means of a resilient bushing and wherein said first control link at its end directed to said vehicle body is pivotably connected with one end of a second control link, said second control link, at its other end, being pivoted to said vehicle body at a body side pivot center (P), a lateral link, one end of which is pivotably connected to the wheel supporting member and the other end of which is pivotably connected to said vehicle body at a body side mounting point, respectively, whereby the body side pivot center (P) of said second control link is downwardly offset from the line (l) adjoining the body side mounting point of said trailing arm and the body side mounting point of said lateral link by a predetermined amount (e), said lateral link being connected by means of ball joints to said wheel supporting member and said vehicle body.

4,715,616

REAR SUSPENSION CONTROLLER

Ken Asami, Nagoya; Kaoru Ohashi, Okazaki; Toshio Onuma, Susono, and Shuichi Buma, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

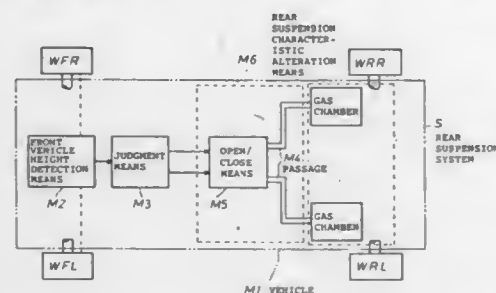
Filed Dec. 23, 1985, Ser. No. 812,351

Claims priority, application Japan, Dec. 25, 1984, 59-276513; Dec. 27, 1984, 59-275824

Int. Cl.⁴ B60G 11/26

U.S. Cl. 280—707

9 Claims



1. A rear suspension controller for a vehicle including suspensions having gas chambers for gas springs and provided for the right and left rear wheels of the vehicle, comprising:

- a front vehicle height detection means for detecting a distance between a front wheel and the body of the vehicle and for generating a front vehicle height signal corresponding to a substantially instantaneous value of said distance;
- a judgment means for comparing a absolute value of said front vehicle height signal with a predetermined reference signal and for generating a judgment result signal when the absolute value of the front vehicle height signal is greater than the predetermined reference signal;
- passages for connecting the gas chambers of the right and the left rear gas suspensions to each other;
- and open/close means for opening or closing said passages;
- and
- a rear suspension characteristic alteration means for performing control to open the open/close means for the passages substantially simultaneous with the generating of the judgment result signal.

4,715,617

PASSENGER COMPARTMENT SENSOR WITH LOW BIAS

David Breed, Boonton Township, Morris County, N.J., assignor to Breed Corporation

Continuation of Ser. No. 580,338, Feb. 15, 1984, abandoned.

This application Apr. 24, 1987, Ser. No. 48,515

Int. Cl.⁴ B60R 21/08

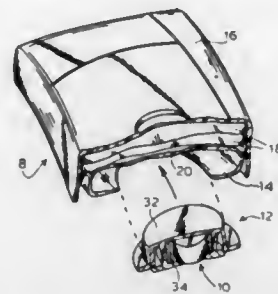
U.S. Cl. 280—731

16 Claims

1. A sensor with a low-bias for mounting outside of the

vehicle crush zone and operable without electrical power for actuating a pyrotechnic device, said sensor comprising:

- a movable sensing mass, a rotatable shaft, a sensing train which includes means for translating movement of the sensing mass rotation of the shaft, a primer, a spring biased



4,715,618

VEHICLE SAFETY HARNESS FOR PETS

Garry L. Harris, 5250 S. Hardy Dr., Tempe, Ariz. 85283

Filed Dec. 4, 1986, Ser. No. 937,700

Int. Cl.⁴ B60R 22/00

U.S. Cl. 280—801

15 Claims



1. A safety harness for restraining a pet in a predetermined location in an automotive vehicle having a rigid frame, said safety harness comprising:

- a jacket configured as an inverted vest having an essentially closed bottom portion for substantially enclosing the chest and forequarters of said pet, and an essentially open top portion;
- belt means extending across said essentially open top portion of said jacket for securing said jacket about said pet; and
- strap means for securing said jacket to the rigid frame of said vehicle, said strap means including a first strap having a first end and a second end, first latch means for releasably attaching said first end of said first strap to the left side of said jacket, first anchoring means for releasably connecting said second end of said first strap to a portion of the rigid frame of said vehicle to the left of said predetermined location, a second strap having a first end and a second end, second latch means for releasably attaching said first end of said second strap to the right side of said jacket, and second anchoring means for releasably connecting the second end of said second strap to a portion of the rigid frame of said vehicle to the right of said predetermined location.

4,715,619

BOOK JACKET

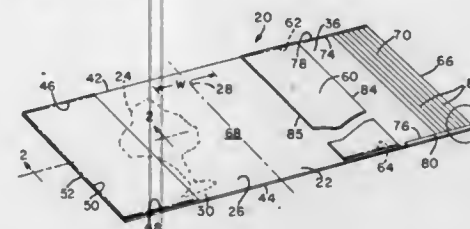
Alexander Sloat, Stamford, Conn., assignor to Printmark, Inc., Stamford, Conn.

Filed Jan. 13, 1986, Ser. No. 818,553

Int. Cl.⁴ B42D 3/04

U.S. Cl. 281—19 R

4 Claims



1. A jacket for a book having front and back outer covers of known dimensions and that are attached to each other along a spine whose thickness may vary depending upon the number of pages in the book, comprising:

- an outer, thin, flexible, foldable continuous plastic sheet having first and second book-covering segments and further having top and bottom edges that are separated from each other by a distance that is generally commensurate with the height of a book to be covered, the length of said outer flexible sheet being sufficient so that said first and second outer book-covering segments are separated from each other by a floating uninterrupted flexible spine region whose width is sufficient to wrap around spines of different thicknesses within a range, the width of the floating spine region being greater than about two percent and generally less than about 20 percent of the overall length of the book jacket;

- an inner, thin, flexible foldable plastic sheet affixed to the outer sheet and having at least first and second book cover engaging segments, said latter sheet segments being affixed to the outer sheet opposite the book-covering segments thereof to enable the front and back book covers to fit between the outer sheet and said first and second book cover engaging segments of said inner sheet, said latter segments further being affixed to the outer sheet at locations that are so spaced from each other so as to enable engagement with and retention of the front and back book covers regardless of the thickness, within a thickness range, of the spine of the book to be covered;

- the inner sheet being further formed of separate individual first and second sheets, the first of said latter sheets being affixed to the outer sheet at one end thereof as well as near said top and bottom edges to form a pocket shaped to snugly receive the front outer cover of the book and enable predetermined alignment of a display thereon with respect to said outer sheet, the second of said separate individual sheets being affixed to the outer sheet at a location selected to maintain said engagement with and retention by the back outer cover of the book substantially independent of the thickness of the spine of the book to be covered.

4,715,620

MANIFOLD FORM ASSEMBLY

Gary J. Thompson, 2610 Brookdale, Green Bay, Wis. 54305

Filed Oct. 22, 1986, Ser. No. 921,964

Int. Cl.⁴ B41L 1/00, 1/20; B41M 5/10

U.S. Cl. 282—9 R

14 Claims

1. An integral manifold form assembly for providing a plurality of completed two-page documents, comprising:

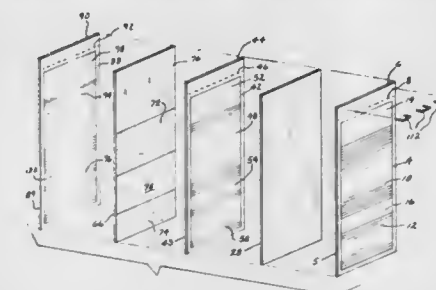
- an original front page having at least one image-receiving area disposed thereon;
- an original back page having at least one image-receiving area disposed thereon, said back page image-receiving

area being non-overlapping with said front page image-receiving area when said front and back pages are aligned; pressure sensitive image-transferring means integral with the form assembly for transferring pressure-created images formed on said image-receiving areas of said original front page and said original back page;

a duplicate of said front page integral with the form assembly and having at least one image-receiving area disposed thereon corresponding substantially to said original front page image-receiving area

a duplicate of said back page integral with the form assembly and having at least one image-receiving area disposed thereon corresponding substantially to said original back page image-receiving area; and

binder means for binding said original front and back pages, said image-transferring means, and said duplicate front



and back pages into an integral form assembly, said assembly being adapted for movement between a first position in which said original front page is exposed for completion, and a second position in which said original back page is exposed for completion, so that pressure-created images formed on said original front page image-receiving area when said assembly is in said first position are transferred to said duplicate front page image-receiving area by said image-transferring means, and pressure-created images formed on said original back page image-receiving area when said assembly is in said second position are transferred to said duplicate back page image-receiving area by said image transferring means, for providing a completed original front page and a completed original back page, and for providing a copy of said original front page on said duplicate front page and a copy of said original back page on said duplicate back page.

4,715,621

NUMERIC COLOR CODED FILING SYSTEM

William Colavito, R.D. 2, Box 450, Woodbine, N.J. 08270, and

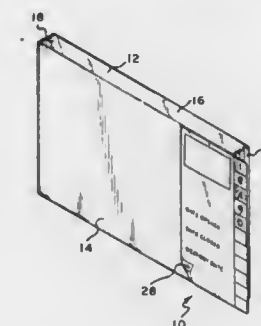
Christa Riggins, 242 E. Ridgewood Ave., Absecon, N.J. 08201

Filed Jun. 10, 1986, Ser. No. 872,547

Int. Cl.⁴ B42F 21/04, 21/12

U.S. Cl. 283—36

6 Claims



1. A numeric color coded filing system for use with expandable files of known height and width comprising:

a substantially rectangularly shaped base member, said base member having a height which is substantially equal to the height of the face of the expandable files with which it is to be used and having a width which is less than the front length of said file but large enough to carry visually perceivable written indicia thereon, said base member being comprised of a substantially flexible sheet-like material and having an adhesive on the reverse side thereof;

the face of said base member along one vertical edge thereof having means dividing the same into a plurality of vertically arranged and substantially equal parts; when said base member is affixed to the front face of a file, said vertical edge is adapted to extend outwardly beyond the face of said file and to remain substantially vertical, the width of said vertical edge being substantially smaller than the width of the remaining portion of said base member; said remaining portion of said base member having a surface which is adapted to be written upon and including a plurality of predesignated areas for the entry of data, some of said predesignated areas having preprinted indicia thereon and others of said areas being adapted to carry user entered indicia;

a plurality of labels, each of said labels being comprised of a sheet-like material and being substantially equal in size to each of said plurality of parts, each label having a numeric digit thereon and having a background color uniquely associated with said digit, each of the ten digits 0-9 being associated with a different background color, said labels having an adhesive on their reverse sides and being adapted to be affixed to said base member along said vertical edge.

4,715,622

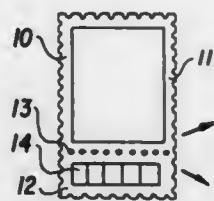
POSTAL STAMP WITH PROVISIONS FOR ENTERING MACHINE READABLE DESTINATION IDENTIFIER

Ameer G. Mikhail, 2103 Windom Ct., Bel Air, Md. 21014
Filed Jan. 16, 1986, Ser. No. 819,298

Int. Cl.⁴ B42D 15/00

U.S. Cl. 283-71

2 Claims



1. A postal stamp, comprising, a sheet of thin material having two surfaces, one of said surfaces being coated with a bonding material, a perforation formed along at least one direction within the outer boundaries of said stamp across said surfaces so that said stamp may be separated into at least two pieces, one of said pieces having designated spaces and indicia positioned thereon for entering a destination identifier code which may be written in numerals, alphabets, or their combinations thereof, with said destination identifier code being readable by a scanning device.

4,715,623 DOCUMENTS HAVING A REVEALABLE CONCEALED IDENTIFIER AND THE METHOD OF MAKING SUCH DOCUMENTS

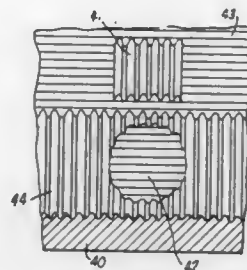
Richard L. Roule, Westport, Conn., and Joshua C. Cantor, Westfield, N.J., assignors to American Bank Note Company, New York, N.Y.

Filed Sep. 28, 1984, Ser. No. 655,713

Int. Cl.⁴ G09F 3/00, 19/16

U.S. Cl. 283-91

8 Claims



1. Stock material for printing documents, said material having a revealable, at times concealed identifier, comprising:

- a paper substrate having a nonspecular printable surface;
- an intaglio identifier pattern impressed in said substrate surface without ink and defined by foreground areas surrounded by background areas having no color contrast with the foreground areas, said foreground areas having distinctive intaglio forms of ridges and grooves, said background areas having intaglio forms of ridges and grooves distinctively different from those of the adjacent foreground areas, said intaglio identifier pattern being visible only as a contrast in reflectivity of the foreground and background areas and only when observed along a line of sight that: (1) has an angle with the substrate surface which lies within a first limited range of angles; and (2) has an angle of orientation with respect to the ridges of the foreground areas which lies within a second limited range of angles.

4. The method of producing a revealable, at times concealed identifier pattern of variable appearance in a printable substrate, comprising the step of impressing an uninked intaglio plate against a nonspecular surface of the substrate, said plate carrying an intaglio identifier pattern including foreground areas surrounded by background areas, said foreground areas having distinctive intaglio forms of grooves in the surface of the plate, said background areas having intaglio forms of grooves distinctively different from those of the foreground areas, thereby producing in said substrate an identifier pattern of ridges and grooves, said pattern being invisible when observed along a line of sight normal to the substrate surface, but visible only as a contrast in reflectivity when observed along a different line of sight making a small acute angle with the substrate surface.

4,715,624

PLASTIC TO METAL TRANSITION FITTING

Henry A. Frye, 16112 Tortola Cir., Huntington Beach, Calif. 92649

Division of Ser. No. 747,839, Jun. 24, 1985, which is a continuation-in-part of Ser. No. 318,219, May 24, 1982, abandoned. This application Jul. 11, 1986, Ser. No. 884,789

Int. Cl.⁴ F16L 21/02

U.S. Cl. 285-55

3 Claims

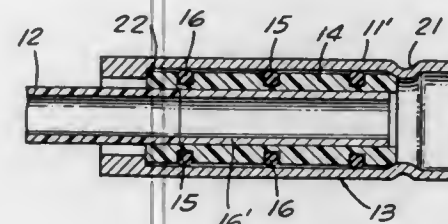
1. A transition fitting for interconnecting synthetic plastic pipe with a larger metal pipe which automatically compensates for thermal expansion and force related differentials between the plastic pipe and metal pipe, comprising:

- a metal pipe section of outer diameter substantially equal to that of the metal pipe, one end portion of the pipe section

formed to permit welded abutment with an end of the metal pipe, and a shoulder formed on an inner wall surface adjacent the pipe section other end;

- a cylindrical plastic member slidably received within the pipe section having a first end abutting against the metal pipe section shoulder, said member having an axial opening extending completely therethrough, one end portion of said member opening having a diameter substantially identical to the plastic outer pipe diameter and adapted to be sealingly secured thereto;

O-ring means on the circumferential surface of the cylindrical plastic member contacting the pipe section internal wall for establishing a movable seal therebetween;



a metal sleeve affixed within the cylindrical plastic member axial opening and continuously engaging the plastic member walls defining said axial opening and underlying the O-ring means, an end of the metal sleeve forming a shoulder in the plastic member axial opening against which the plastic pipe abuts; and

an inwardly directed ridge rolled into the metal pipe section engaging the second end of the plastic member for securing the cylindrical plastic member against longitudinal movement while allowing rotational movement between the metal pipe section and plastic member.

4,715,625

LAYERED PIPE SLIPS

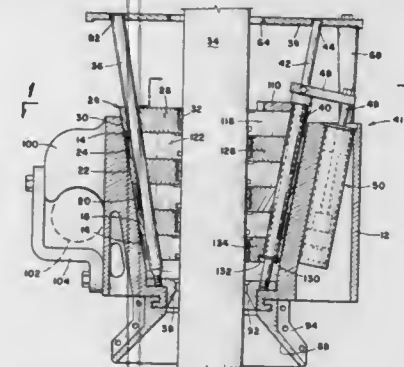
Jess W. Shows, Jr., Maurice, and Asadollah Hayatdavoudi, Lafayette, both of La., assignors to Premiere Casing Services, Inc., Lafayette, La.

Filed Oct. 10, 1985, Ser. No. 786,950

Int. Cl.⁴ B65H 59/10

U.S. Cl. 285-145

27 Claims



1. Apparatus for supporting a pipe in a vertical position comprising:

- a support member having an upper surface and a lower surface and a passage formed therethrough between said upper and lower surfaces, said passage having an inwardly tapered surface between said upper and lower surfaces;
- a first pair of substantially arcuate slip segments receivable in said passage, said slip segments having inwardly tapered edges which ride on said tapered surface when said segments are so received for clamping a pipe in said passage as said segments are lowered therein; and

a second pair of substantially arcuate slip segments receivable in said passage above said first pair, said second pair of segments having inwardly tapered edges which ride on said tapered surface when said second segments are so received for clamping a pipe in said passage as said second segments are lowered therein; wherein when said first and second segment pairs are so received, said first pair of segments are opposite one another, said second pair of segments are opposite one another and said first pair is staggered relative to said second pair.

4,715,626

CLAMPING SLEEVE WITH A CLAMPING SCREW

Manfred Gehring, Freudenstadt, Fed. Rep. of Germany, and Heinz Pliiss, Courtaman, Switzerland, assignors to Mage AG, Switzerland

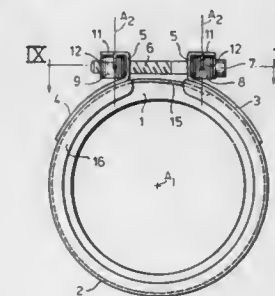
Filed Sep. 12, 1985, Ser. No. 775,483

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435368; Jul. 3, 1985, 85108205

Int. Cl.⁴ F16L 49/00

U.S. Cl. 285-230

17 Claims



1. In a clamping sleeve for joining pipes which may be of differing diameters and having a rubber-elastic sealing ring which has at least one beading projecting radially inward at each of its ends, a clamping ring which encircles the sealing ring and is in the form of a sheet-metal strip bent in a circular shape about a central axis and on the ends of which are attached opposing clamping plates which extend generally radially outward, and clamping means for drawing the clamping plates toward each other to secure the clamping sleeve in clamping engagement with pipes to be joined and including a clamping screw extending through the clamping plates, the improvement wherein said clamping means includes a pair of intermediate pieces, each of said intermediate pieces being received on said clamping screw outward of an associated one of the clamping plates, each of said intermediate pieces being at least partially cylindrical and defining a partially cylindrical bearing surface engaging an associated one of said clamping plates, each of said intermediate pieces being arranged with the axis of its partially cylindrical bearing surface being parallel to a plane that is perpendicular to said central axis.

4,715,627

Patent Not Issued For This Number

4,715,628

CHILD RESISTANT CABINET LOCK COMBINATION FINGER LOCK

Satya S. Brink, R.R. 1, Box 836, Chelsea, Quebec, Canada J0X 1N0; John H. Bailes, and Suzanne C. M. Poulin, both of 16 Beckwith Rd., Ottawa, Ontario, Canada K1S 0K7

Filed Nov. 21, 1985, Ser. No. 800,549

Int. Cl.⁴ E05C 19/06

U.S. Cl. 292-19

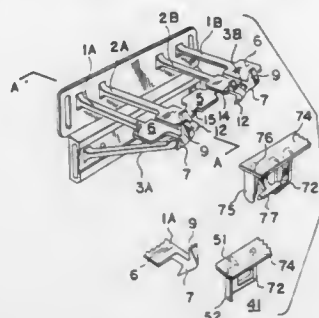
11 Claims

1. A lock for a door or drawer or the like, movable with respect to a frame, to restrict children from gaining entry, the lock comprising:

- a base to be attached to the door or drawer,
- a pair of locking protrusions, secured to the base, with

ends normally to interlock with catches to be attached to the cabinet frame, the locking protrusions positioned to be pushed downwards with the index and 3rd finger of an adult so as to clear the catches,

- (c) blocking protrusions secured to the base, an interconnecting-bar means joining the blocking protrusions, movement of the interconnecting-bar means causing corresponding movement of the blocking protrusions, the interconnecting-bar means positioned to be pushed downwards with the middle finger of an adult, the blocking protrusions to engage with the locking protrusions and



prevent their depression and thereby prevent opening of the door or drawer when: (i) the interconnecting-bar means is in undepressed position or (ii) when the interconnecting-bar means and locking protrusions are depressed before the blocking protrusions so that the locking protrusions remain interlocked with the catches on the cabinet frame, and when the interconnecting-bar means and blocking protrusions are depressed before the locking protrusions, the blocking protrusions to disengage from the locking protrusions to allow the locking protrusions to move away from the catches on the cabinet frame upon being pushed downwards with the index and 3rd finger.

4,715,629

CHILD PROOF CLOSURE DEVICE FOR DOORS

Alan J. Robinson, 202 Westminster St., Christchurch, New Zealand

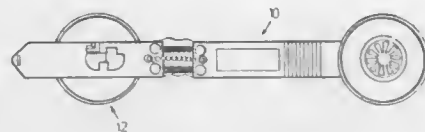
Filed Dec. 12, 1985, Ser. No. 808,116

Claims priority, application New Zealand, Oct. 30, 1985, 209380

Int. Cl.⁴ E05B 65/06

U.S. Cl. 292—256

15 Claims



1. A child proof locking system having a first part with a first lock means, a second part with a second lock means, means for expanding the first part with one hand to engage the first lock means with the second lock means, and interengaging means on the first and second parts for moving one of the lock means to a locking position upon release of the first part by the one hand, whereby only the one hand is required to lock the system, and from which locking position a first hand is required to expand the first part and a second hand is required to manipulate said one of the lock means to unlock the system.

4,715,630

ENERGY ABSORBING VEHICLE BUMPER

Donald L. Manning, Orchard Lake, Mich., assignor to Transpec Inc., Troy, Mich.

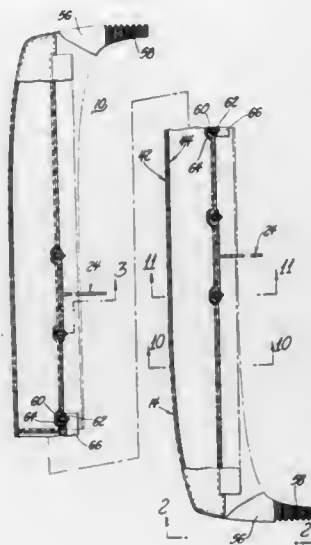
Filed Apr. 28, 1986, Ser. No. 856,658

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.⁴ B60R 19/08

U.S. Cl. 293—120

4 Claims



1. An energy absorbing vehicle bumper system of the type including a pair of identical beam members (16) adapted to be joined by a common plate member (66) at their horizontally inner ends to provide a bumper support structure for spanning the front end of a vehicle, bracket means (24) for mounting said beams to the vehicle, and energy absorbing means supported upon said beam on the side thereof opposite from the bracket means, said energy absorbing means including a deflectable member (44) enclosed by an elastomeric outer cover means (42), the improvement comprising:

A. each beam (16) having

- (1) a generally U-shaped cross-section with a vertical wall portion (18);
- (2) a pair of horizontal leg portions (20 and 22) projecting rearwardly from the upper and lower edges of the vertical wall portion and away from said energy absorbing means;
- (3) said vertical wall portion (18) including a front face (48) proximate said energy absorbing means;

B. the energy absorbing means comprising a hollow, rigidified and deflectable structural member (44) having a rear wall (46) secured to the front face (48) of the vertical wall portion (18) of said beam member;

C. the abuttingly adjacent front face (48) of beam (16) and rearwall (46) of hollow member (44) being formed to provide coacting recesses and projections (50 and 52) to resist relative sliding movement between beam (16) and member (44);

D. fastening means (36) for securing said beam members to said bracket means; and

E. said elastomeric cover means (42) enclosing the energy absorbing means and at least a portion of the cooperating beam member.

4,715,631

LIFTING MAGNET UNIT WITH A GRIPPING MECHANISM

Shigemi Nakajima, Osaka, Japan, assignor to Kabushiki Kaisha Nakajima Tekkoshu, Osaka, Japan

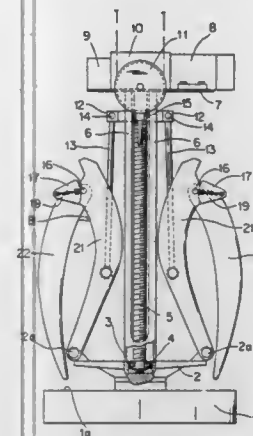
Filed Sep. 24, 1986, Ser. No. 911,079

Claims priority, application Japan, Nov. 29, 1985, 60-267479; Apr. 17, 1986, 61-87018; Apr. 17, 1986, 61-87019; Apr. 22, 1986, 61-91209

Int. Cl.⁴ B66C 3/16

U.S. Cl. 294—2

14 Claims



1. A lifting magnet unit with a gripping mechanism, which comprises: a lifting magnet; a bracket attached to the upper surface of the lifting magnet opposite the attracting surface of the same; a screw rod supported upright and rotatably at one end on the bracket; a base plate disposed at the other end of the screw rod; a motor for rotating the screw rod, disposed on the base plate; a frame fixed at the lower end to the bracket and at the upper end to the base plate; a spider block having an internally threaded center hole engaging the screw rod; and a plurality of gripping arm assemblies each comprising a first arm pivotally joined at one end thereof to the extremity of one of the arms of the bracket with a pin, a second arm pivotally joined at one end thereof to the other end of the first arm with a pin, a rod pivotally joined at one end thereof to the spider block with a pin and at the other end thereof to the middle part of the first arm with a pin, and a locking mechanism for locking the second arm to the first arm by inserting a pin into a hole formed in the second arm.

4,715,632

RECEIVING AND LIFTING DEVICE FOR GROUND OR FLOOR OBJECTS

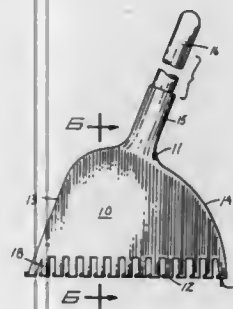
Kenneth McVey, Paulsen Medical/Dental Building, Spokane, Wash. 99201

Filed Sep. 22, 1986, Ser. No. 909,948

Int. Cl.⁴ A63B 47/02

U.S. Cl. 294—19.1

2 Claims



1. A manually useable device for receiving and lifting three-

dimensional objects freely resting on a ground or floor surface in an individual manner, comprising:

a pair of transversely spaced upright walls having upper and lower ends extending between upright, unobstructed front and back edges, the walls being arranged in non-parallel, converging side-by-side positions and being joined to one another across their respective upper ends;

handle means extending upwardly from the joined upper ends of the walls for facilitating manual positioning of the walls relative to a ground or floor surface without bending or stooping movement by a user;

the respective lower ends of the walls being provided with a row of inwardly protruding resilient fingers projecting partially across the space separating the walls, the inner ends of the fingers in one row being normally transversely spaced apart from the inner ends of the fingers in the remaining row and being adapted to engage beneath an object on a ground or floor surface when the walls are moved apart and together as the fingers slide over exterior surfaces of the object while the device is moved downwardly over it;

the pair of walls being spaced apart a greater distance at their front edges than at their back edges to free an object lifted within the device to fall gravitationally between the front edges of the walls and into a waiting receptacle when the device is tilted forwardly.

4,715,633

CUP HOLDER

Douglas F. Brink, and John MacConnell, both of Ft. Collins, Colo., assignors to Benchmark Ventures, Ft. Collins, Colo.

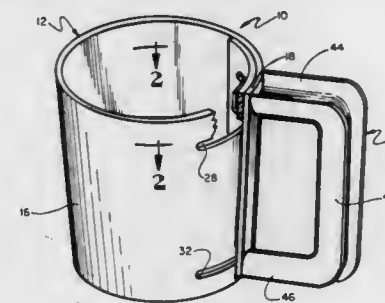
Continuation-in-part of Ser. No. 727,873, Apr. 26, 1985,

abandoned. This application Apr. 25, 1986, Ser. No. 856,053

Int. Cl.⁴ A47J 45/10; B65D 23/10

U.S. Cl. 294—31.2

16 Claims



1. A device for holding a disposable cup or the like, comprising:

a coiled member having two end portions overlapping each other to define a central opening for receiving a cup, one of said end portions being the outer end portion and the other said end portion being the inner end portion with the outer end portion overlapping the inner end portion, the extent of overlap of said end portions being variable for adjustment of the size of said central opening for receiving and gripping various sized cups, said coiled member also having an elongated slot in said inner end portion and an opening in said outer end portion aligned with the slot in the inner end portion;

handle means associated with said coiled member for providing a convenient handle member to hold said coiled member; and

combination connecting and attachment means positioned in said slot and in said opening for maintaining said inner and outer end portions in abutting, interconnected relationship while permitting relative sliding movement therebetween throughout the length of said slot to enable expansion and contraction of said coiled member and for attaching said handle means to said coiled member.

4,715,634

WEED EXTRACTING TOOL

Teresa L. Mueller, and Michael W. Mueller, both of 1329 W. Laguna Azul, Mesa, Ariz. 85202

Filed Mar. 3, 1987, Ser. No. 21,205

Int. Cl.⁴ A01B 1/16

U.S. Cl. 294—50.5

12 Claims



1. A tool for extracting weeds and soil from the ground, the tool comprising:

- (a) a T-shaped handle having a lower end and an upper end;
- (b) a cutting head, said cutting head including,
 - (i) a tubular housing secured to the lower end of said handle,
 - (ii) a blade depending from said housing; and
- (c) ejector means mounted for reciprocation within said tubular housing for dislodging trapped soil and weeds from said cutting head, said ejector means including,
 - (i) shaft means coaxially disposed within said housing,
 - (ii) a plunger member depending from a lower end of said shaft means,
 - (iii) biasing means for biasing said shaft means and said plunger member downwardly to an extended position, and
 - (iv) latching means for holding said shaft means and said plunger member in a retracted position against the bias of said biasing means, said latching means comprising elements of a releasable interconnection on said shaft means and on said tubular housing for releasably securing said shaft means to said housing, said elements of a releasable interconnection including,
 - (1) a keyhole shaped slot formed in said tubular housing, said slot including an elongated relatively narrow portion depending from an upper circular portion
 - (2) elongated knob means movably connected to said shaft means, said knob means being disposed to extend through said keyhole shaped slot of said tubular housing and including a reduced diameter portion and a larger diameter portion and being movable from a first position in which said larger diameter portion extends through said circular portion of said keyhole shaped slot to a secured position in which said reduced diameter portion is slidable in said elongated relatively narrow portion of said keyhole shaped slot and
 - (3) means for biasing said knob means to said first position.

4,715,635

FLEXIBLE CONTAINER FOR TRANSPORTING AND STORING BULK GOODS

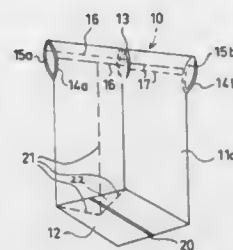
Erkki Koskinen, Porri, Finland, assignor to Oy W. Rosenlew Ab, Finland

Filed Aug. 12, 1981, Ser. No. 292,149

Claims priority, application Finland, Aug. 14, 1980, 802555 Int. Cl.⁴ B65D 29/00, 88/56

U.S. Cl. 294—68.1

5 Claims



1. A flexible container for transporting and storing bulk goods, said container being constructed from a tubular blank having an open free lower margin and formed so as to include a shell, a bottom and a filling aperture, said container being liftable by its upper end, comprising:

- said free open lower margin of the tubular blank being closed by a bottom seam extending substantially over the central region of said container bottom; and
- substantially longitudinal pleats being formed in said shell, each pleat having a lower part proximate to said container bottom folded in a manner so as to be coplanar with said container bottom, said lower pleat part including an upper plane and a lower plane, and wherein said upper plane of each pleat part is folded down into the plane of said container bottom and affixed to said lower plane of said pleat part by a connecting seam.

4,715,636

GRIPPER INCLUDING AN EXCHANGEABLE GRIPPING JAW

Franz Wiesner, Owen/Teck, and Horst Etzel, Hochdorf, both of Fed. Rep. of Germany, assignors to Traub AG, Fed. Rep. of Germany

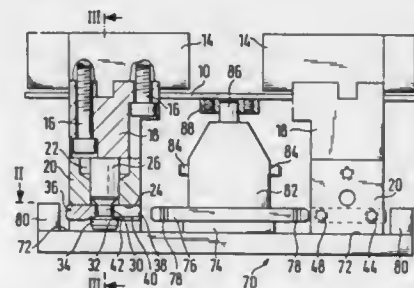
Filed Mar. 14, 1986, Ser. No. 839,683

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1985, 3513453

Int. Cl.⁴ B25J 15/04

U.S. Cl. 294—86.4

10 Claims



1. A gripper, especially for automatic handling machines with which at least one male coupling member is adapted to be coupled to a female coupling member by means of a coupling comprising

- a coupling opening and a locking member opening disposed transversely thereof in said at least one female coupling member,
- a coupling plug extending away from said at least one male coupling member and being insertable in the coupling opening and having a lateral recess,

a locking member engaging in the locking member opening and in the recess at the same time when in a locking position, thereby locking the coupling plug in the coupling opening,

the at least one female coupling member, coupling plug, and locking member being clamped together by a spring assembly in the locking position,

and the locking member having a surface for application of an external force by which it is movable into a release position at which the coupling plug can be pulled out of the coupling opening,

wherein

the spring assembly is adapted to be tensioned in longitudinal direction of the coupling plug,

the locking member has a second surface opposite the surface mentioned for application of an external force by which it is movable into the locking position,

the locking member further has a wedge surface which cooperates with a limiting surface of the recess formed at the coupling plug to clamp the spring assembly when the locking member is moved into the locking position, and

a jaw deposit is arranged within the operating range of the gripping jaw against which deposit the locking member is adapted to be pressed selectively by its first or second surface for application of a force.

4,715,637

GRIP DEVICE FOR SHEET-LIKE OBJECTS

Yuji Hosoda, Chiyoda; Kazuo Honma, Aml, and Masakatsu Fujie, Ushiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

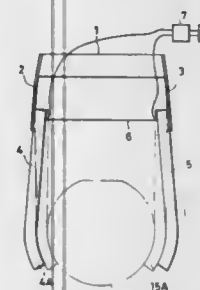
Filed Apr. 17, 1986, Ser. No. 853,450

Claims priority, application Japan, Apr. 17, 1985, 60-80110; Apr. 17, 1985, 60-80111; Apr. 19, 1985, 60-82309

Int. Cl.⁴ B25J 15/04; B66C 1/10

U.S. Cl. 294—86.4

24 Claims



1. A gripping means for gripping an outer peripheral edge of a sheet-like object, the gripping means comprising a base means, grip members mounted on said base means for gripping the object, elastic means disposed on respective sides of the base means for respectively connecting said grip members to said base means so as to urge the respective grip members in one of an opening and closing direction, at least one shape memory means for coupling said grip members to each other, and a power source connected to said shape memory means through a switch means.

4,715,638

ROBOTIC HAND WITH SLIP COUPLINGS

Francis T. Chambers, Rock House, Ballycroy, Westport, County Mayo, Ireland

Filed May 14, 1986, Ser. No. 862,946

Claims priority, application Ireland, May 14, 1985, 1190/85 Int. Cl.⁴ B66C 3/16

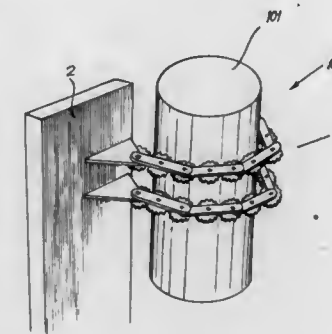
U.S. Cl. 294—88

21 Claims

1. A robotic hand for gripping regularly shaped and irregularly shaped objects, comprising:

- (a) a base support;

- (b) a jointed finger, mounted on the base support and formed by a plurality of link elements;
- (c) a pivot joint between each link element;
- (d) a drive means for each link element for pivoting a link element about another link element in which each drive means is interconnected to form a sequential drive from an innermost link element adjacent the base to an outermost link element; and



- (e) a slip coupling between each link element and an associated drive means to prevent further pivoting of the link element and to transfer drive from an inner link element to a next outermost link element, said coupling operating when the pressure exerted by said inner link element on an object being gripped exceeds a pre-set pressure to cause the coupling to slip.

4,715,639

GRASPING UTENSIL

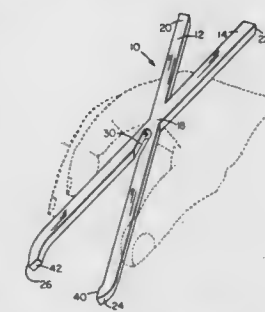
Roger A. Nicoletta, and Emil Downey, both of 34 Connecticut Blvd., E. Hartford, Conn. 06018

Filed Dec. 4, 1986, Ser. No. 938,008

Int. Cl.⁴ A47G 21/10; B25B 9/02

U.S. Cl. 294—99.2

8 Claims



1. A hand-operated utensil for grasping and picking up food or other articles comprising: a pair of elongated handling and grasping elements, each having corresponding upper and lower ends, the elements being arranged in intersecting and integrally interconnected relationship at a position of intersection intermediate the upper and lower ends, the lower portions of the elements between the intersection and the lower ends being made flexible toward and away from each other for grasping articles with the lower ends by stress-relieving recess means including at least one recess extending into the lower portion of one element adjacent the intersection to reduce the transverse cross section of said one element at the recess and form a flex hinge permitting flexing movement of said one element toward the other element, and the upper portions of the elements between the intersection and the upper ends being rigid relative to one another and diverging away from one another for a distance between the intersection and the upper ends to thereby provide above the intersection a stationary, non-flexing and broad based support in contact with the

knuckle area of the hand, and below the intersection, a flexible tweezers for grasping articles when the utensil is held with the lower portions and intersection between the thumb and forefinger.

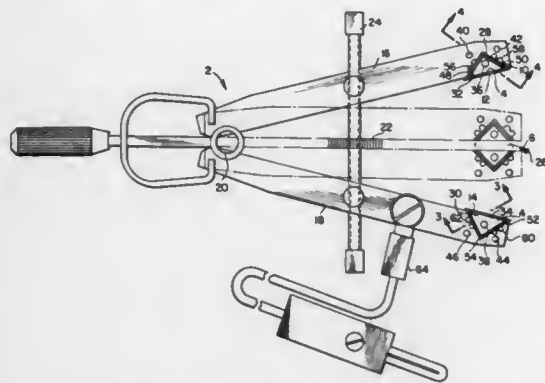
4,715,640 LOCATOR

Vincent P. Barkley, Arlington, Va., assignor to Pace Incorporated, Laurel, Md.

Filed Aug. 6, 1985, Ser. No. 762,868
Int. Cl.⁴ H05K 13/04

U.S. Cl. 294—106

11 Claims



1. A locator device for locating modular electronic components centrally with respect to a nozzle of an apparatus for attaching said components to a substrate, said locator device comprising:

- component support means for supporting a component to be located centrally with respect to the nozzle of a component attachment apparatus;
- component centralizing means associated with said component support means and engageable with said nozzle for centralizing said component with respect to said nozzle.

4,715,641

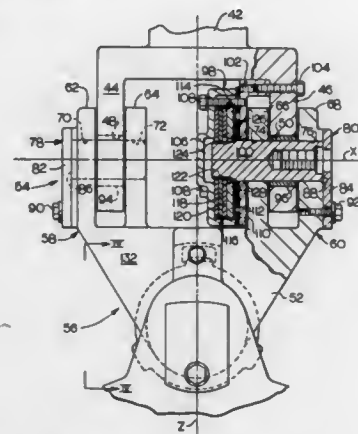
MOUNTING APPARATUS FOR A GRAPPLE HEAD ASSEMBLY

Marvin K. Palmer, Oswego, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 11, 1986, Ser. No. 906,066
Int. Cl.⁴ F16F 7/08

U.S. Cl. 294—119.4

19 Claims



1. A mounting apparatus, comprising:
a first member having first and second spaced-apart mounting flanges;
a second member having first and second spaced-apart mounting flanges and being positioned in inwardly adjacent relation to the respective first and second mounting

flanges of the first member and being secured thereto for relative rotation about a first axis; and
means for resisting relative rotation about said first axis; said means being positioned between and substantially encompassed within the profile of the mounting flanges of the second member.

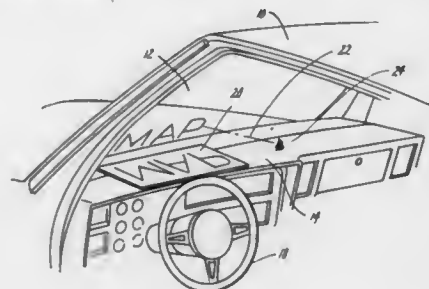
4,715,642 MAP DISPLAY

Paul T. Dobbs, 16083 Southampton, Livonia, Mich. 48154

Filed Oct. 2, 1986, Ser. No. 914,676
Int. Cl.⁴ B60R 27/00

U.S. Cl. 296—1 R

1 Claim



1. In a vehicle having a driver's compartment, a dashboard having a top surface, and a windshield mounted above the dashboard for a driver in the driver's compartment to view oncoming traffic conditions along a line of sight, the combination comprising:

- a sheet element having a reverse image of a map thereon, the sheet element being removably mounted on the top surface of the dashboard in such a position that a mirror image thereof is reflected on the windshield in the path of said line of sight so as to be viewable along said line of sight of the driver whereby he need not change his line of sight for viewing oncoming traffic conditions to view said mirror image but only refocus his eyes to read the mirror image of the map on the windshield, and
- a film mounted on the inside surface of that portion of the windshield on which the mirror image of the map is being reflected so as to eliminate any double image thereof at such time as the line of sight is focused on said mirror image.

4,715,643

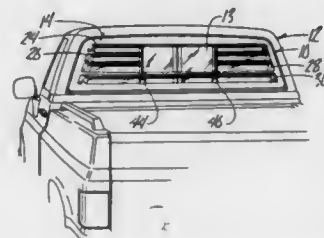
REAR WINDOW LOUVER FOR PICKUP TRUCKS AND METHOD FOR MAKING SAME

Diego Butler L., Richardson, Tex., assignor to Deflecta-Shield Corp., West Des Moines, Iowa

Filed Mar. 2, 1987, Ser. No. 20,472
Int. Cl.⁴ B60J 3/00

U.S. Cl. 296—97 A

11 Claims



1. A universal rear window louvered unit for pickups, comprising:
a louvered window frame of generally conforming shape to a pickup truck rear window;

said frame having a perimeter edge portion of general conforming configuration to a pickup rear window; and
a series of spaced apart louvers extending across said frame; said louvers each having a flush mount bottom portion therebetween adapted for easing planer cutting removal.

4,715,644

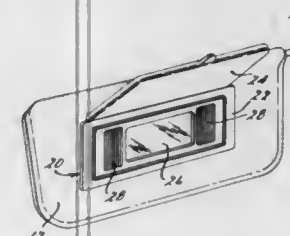
SPRING-LOADED HINGE ASSEMBLY FOR VEHICLE ACCESSORIES

Mark Lobanoff, Troy, and James A. Gavagan, Centerline, both of Mich., assignors to Irvin Industries, Inc., Rochester Hills, Mich.

Filed Sep. 22, 1986, Ser. No. 910,129
Int. Cl.⁴ B60J 3/02

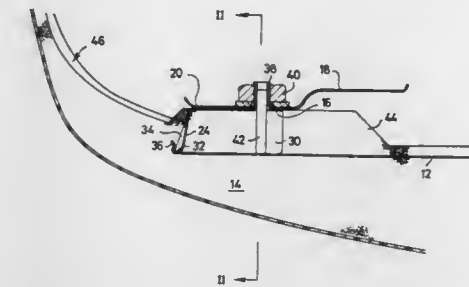
U.S. Cl. 296—97 H

16 Claims



1. A spring-loaded hinge assembly for interconnecting an accessory door with an accessory housing structure for a vehicle, said hinge assembly comprising: pivot means pivotally interconnecting the door with the housing structure for rotational movement of the door relative to the housing structure about a longitudinally-extending axis; a cam member protruding in a generally lateral direction from the door for rotational movement therewith; said cam member having at least one dwell portion thereon; leaf spring means on the housing structure and slidably and resiliently deflectably engageable by said cam member for exerting a resilient biasing force on said cam member; and support means interconnected with the housing structure for supporting said leaf spring means in a direction generally opposite the direction of said engagement of said leaf spring means by said cam member, said support means supporting said leaf spring means at least at two spaced-apart support locations thereon, said cam member deflectably engaging said leaf spring means at a medial location thereon between said spaced-apart support locations, said leaf spring means tending to maintain the door in a predetermined rotational orientation relative to the housing structure when engaged by said dwell portion of said cam member.

vehicle, a strap extending across the bumper laterally with respect to the vehicle, inside the skin, and supported at its ends



by the brackets, and a plastic foam filling molded in situ within the skin and encapsulating the strap.

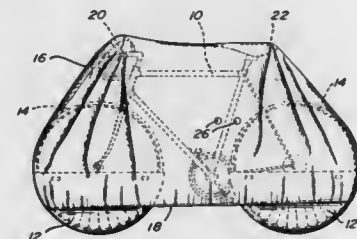
4,715,646 PROTECTIVE COVERING FOR LIGHTWEIGHT VEHICLE

Carlo P. Goffi, and Deborah E. Clark-Goffi, both of 4972 Suzanne, Pierrefonds, Quebec, Canada H8X 1Z9

Filed Mar. 2, 1987, Ser. No. 20,910
Int. Cl.⁴ B60R 9/10

U.S. Cl. 296—136

5 Claims



1. Protective covering for a lightweight vehicle having at least two spoked wheels, the covering comprising:
semi circular sheath wheel covers for each wheel having an opening slit to fit over the wheel, each of the wheel covers formed of flexible waterproof sheet material, each of the wheel covers having wheel cover attachment means located across the opening slit to attach each of the wheel covers to the wheel at the opening slit and hold each of the wheel covers to the wheel, and
an overall cover having a bag like shape with an opening, the overall cover shaped to fit over the vehicle extending down to overlap the wheel covers on the wheels, the overall cover formed of flexible waterproof sheet material, and having overall cover attachment means to the vehicle.

4,715,647

FRAMELESS TURN-UP REAR WINDOW FOR VEHICLES

Ralph Mynott, Nuenen, and Johan Verbeek, Eindhoven, both of Netherlands, assignors to 501 Volvo Car B.V., Helmond, Netherlands

Filed Oct. 9, 1986, Ser. No. 916,912
Claims priority, application Netherlands, Oct. 10, 1985, 8502761

Int. Cl.⁴ B60J 1/18

U.S. Cl. 296—152

9 Claims

1. A frameless turn-up rear window for vehicles, characterized in that at some distance from its outer edge a U-shaped metallic profile strip has been fixed all round by cementing

4,715,645

BUMPER BAR FOR A MOTOR VEHICLE

Idris Lewis, Chelmsford, and John Churchill, Southend on Sea, both of United Kingdom, assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 3, 1987, Ser. No. 21,101

Claims priority, application United Kingdom, Mar. 12, 1986, 8606163

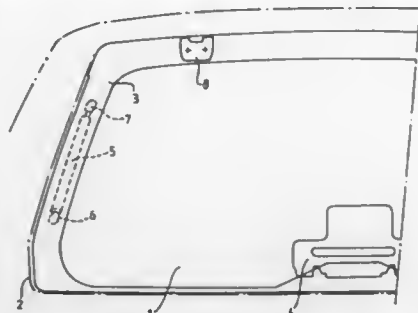
Int. Cl.⁴ B60R 19/08

U.S. Cl. 296—120 R

16 Claims

1. A bumper comprising a plastic skin, brackets molded integrally with the skin adapted for mounting the bumper on a

onto the inside of the window, which strip has an open side facing the interior of the vehicle and is provided with means of



attachment for one or more of those ancillary parts which are commonly used for the proper functioning of the rear window.

4,715,648

ARRANGEMENT FOR INCREASING THE BODY WIDTH AT WHEEL HOUSINGS OF A VEHICLE

Werner Hensel, Trollhättan, Sweden, assignor to Saab-Scania Aktiebolag, Södertälje, Sweden

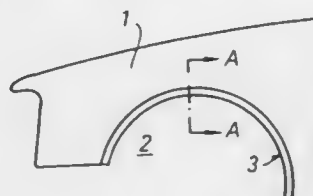
Filed Oct. 6, 1986, Ser. No. 915,517

Claims priority, application Sweden, Oct. 4, 1985, 8504603

Int. Cl.⁴ B62D 25/00

U.S. Cl. 296—198

8 Claims



1. Arrangement for increasing the body width at wheel housings of a vehicle body provided with a trim detail gripping round an edge at a wheel housing opening, characterized in that the trim detail is of substantially U-shaped cross section, said trim detail being at least partially surrounded by a body member which is also of substantially U-shaped cross section and which in the transverse direction of the body extends beyond the trim detail and which is formed with abutments on the inner surface thereof on either side of the edge, said abutments gripping round and coacting with abutments or the like on the trim detail for locating and fixing the body member to the trim detail.

4,715,649

LOCATOR AND HOLD-DOWN LATCH FOR REMOVABLE VEHICLE ROOF PANELS

Leonard F. Bores, Dearborn, and Mark J. Zdziarski, Taylor, both of Mich., assignors to ASC Incorporated, Southgate, Mich.

Filed Dec. 29, 1986, Ser. No. 947,031

Int. Cl.⁴ B60J 7/10

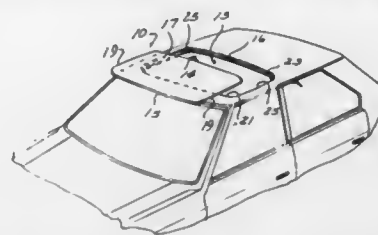
U.S. Cl. 296—218

8 Claims

1. A locator and hold-down latch for a removable sunroof panel having front and rear edges and designed to fit in a roof opening of a vehicle, said latch comprising:

- a tapering finger connector mounted on the center of the rear edge of the panel and extending outwardly and rearwardly therefrom;
- a detent formed on a bottom face of the finger connector and extending through the width thereof;
- a tapering slot connector adapted to receive the finger con-

ector, said slot connector being formed in the center of a rear edge of the opening; and
a cylinder fixedly mounted on a bottom face of the slot connector and extending laterally therethrough adapted



to engage the detent when the finger connector is inserted into the slot connector thereby serving to align and latch the connectors to each other and the panel to the vehicle and to prevent axial displacement therebetween.

4,715,650

FULLY COLLAPSIBLE PORTABLE CHAIR

Cary Berman, 450 Merion Rd., Merion, Pa. 19066, and Steven Kiss, 10616 Lockart Rd., Philadelphia, Pa. 19116

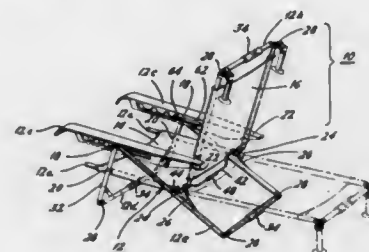
Continuation of Ser. No. 831,218, Feb. 20, 1986, abandoned.

This application Apr. 6, 1987, Ser. No. 33,866

Int. Cl.⁴ A47C 4/00

U.S. Cl. 297—28

10 Claims



1. In a collapsible chair having a frame of joined vertical and horizontal members defining a seat, a back, and a plurality of ground supports, said frame capable of being compacted by folding the seat, back, and ground supports together into a flattened unit, containing an improvement comprising providing a set of first vertical members and a set of second vertical members, the vertical members of each set positioned parallel to and in a plane with each other; said set of first vertical members being hingedly connected by at least one horizontal member, said horizontal member being provided with a hinged joint intermediate its ends permitting said horizontal member to be folded into two sections assuming a position approaching substantially parallel to, and within the plane of, said first vertical members;

said set of second vertical members being hingedly connected by at least one horizontal member, said horizontal member being provided with a hinged joint intermediate its ends permitting said horizontal member to be folded into two sections assuming a position approaching substantially parallel to, and within the plane of, said second vertical members;

wherein the planes of said set of first vertical members and said set of second vertical members approach a position of parallel to each other when said chair is folded into a flattened unit;

said hinged joint comprising a flexible ligament affixed to two end plugs, and a sleeve;

said ligament being of sufficient width and being affixed to said end plugs off center so to create a directional bias, allowing said hinged joint to fold fully in only one direction;

said end plugs being adapted to join to and connect the sections of said horizontal members and maintain said members a fixed linear distance apart when said members are coaxially aligned; and
said sleeve being positioned around said horizontal member and adapted to slide to surround and to traverse said ligament and hold said sections of the horizontal member in linear relationship to each other.

4,715,651

DEVICE FOR INSTALLING SKIN ON AUTOMOTIVE SEAT

Fumio Wakamatsu, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

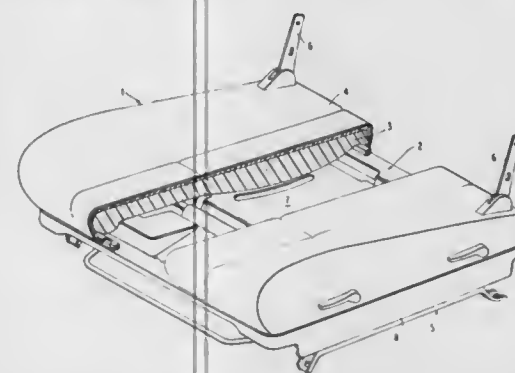
Filed Sep. 30, 1986, Ser. No. 913,296

Claims priority, application Japan, Sep. 30, 1985, 60-216986

Int. Cl.⁴ A47C 31/00

U.S. Cl. 297—219

2 Claims



1. A device for installing a skin on a seat pad of an automobile seat having a frame comprising:

L-shaped projection portions (10) disposed on the frame of the seat and having flanges (11) extending at right angles to the direction in which the skin is stretched on a top portion of the seat pad;

a notched portion (18) formed on said frame adjacent each said projection portion wherein said flange of each projection portion and said notched portion each have a step-engaging face portion with a plane parallel to the direction of the extended flange; and

retaining means (13) secured on an outer edge of the skin and engaging said projection portion, said retaining means having step portions engaging said step-engaging face portions of at least said flanges, wherein said retaining means comprises;

a fringe member (14) having a cylindrical portion contiguous with an end portion, said end portion being secured to the outer edge of said skin;

a retaining member (13') having a generally U-shaped cross section and having first and second step portions disposed on ends thereof, wherein

said retaining member is forcibly fit over said cylindrical portion of the fringe member and slideable thereon, and first and second step portions engage said step engaging face portions of said flange and notch, respectively.

4,715,652

PORTABLE STADIUM SEAT WITH TRAY

James F. Ward, 3412 Chatsworth La., Orlando, Fla. 32806

Filed Dec. 27, 1985, Ser. No. 813,773

Int. Cl.⁴ A47C 7/62

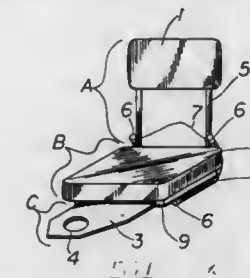
U.S. Cl. 297—252

4 Claims

1. A portable stadium seat comprised of:

a seat bottom portion consisting of a covered seat cushion mounted on two support pieces running from front to back on each side of said cushion, each support piece containing a groove on the inner side thereof, a flat en-

casement piece connecting both support pieces, said encasement having attached at the front middle thereof a spring-loaded hook-like fastener member which, when in the downward "OPEN" position attaches to the underside of a stadium seat and two tubular elements or rails attached to each side of the encasement piece running from front to back of the encasement piece; and



a back rest portion consisting of a curved cushion which is mounted to the two upper ends of a U-shaped support rail or tubular element, said back portion being attached to the seat bottom portion by means of connecting elements such as rods or rivets; and

a tray which fits into the grooves between the two support pieces of the seat bottom portion, which can be slidably extended from the front of the seat portion to hold food and drink.

4,715,653

LUMBAR SUPPORT APPARATUS

Takemi Hattori, Kariya, and Nobuhiko Takeda, Ohbu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

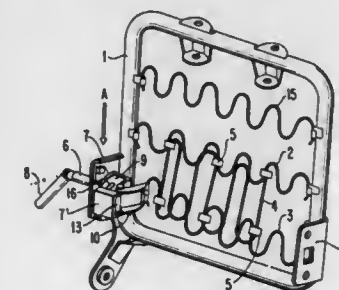
Filed Sep. 19, 1986, Ser. No. 909,129

Claims priority, application Japan, Sep. 19, 1985, 60-207262

Int. Cl.⁴ A47C 3/00

U.S. Cl. 297—284

1 Claim



1. A lumbar support apparatus comprising:

a seat frame;

a first support member fixed to said frame, said first support member being made of wire formed in an S-spring;

a second support member attached to said frame, said second support member being made of wire formed in an S-spring and being movable from substantially within a plane defined by said frame to a position forward of said plane;

a third support member interposed between said first and second support members for interconnecting the same and movable with said second support member, said third support member being made of wire formed in an S-spring and connected to said first fixed support member and said second movable support member at a plurality of points; and

a cam mounted for rotation on said frame, said cam having a groove formed thereon;

a movable arm connected to said second support member; and

a cam pin connected to said movable arm and engaging said groove so as to cause movement of said arm upon rotation

of said cam, thereby moving said second support member and the interconnected first and third support members.

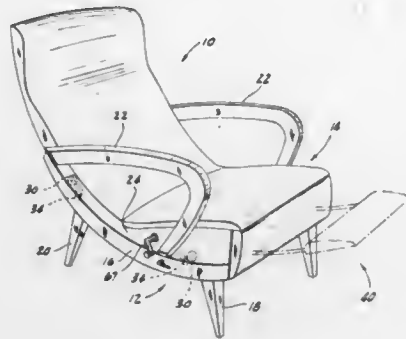
4,715,654

RECLINING CHAIR WITH RETRACTABLE FOOTREST
Joseph F. Laskowitz, 1552 Estrada, Apt. 5, St. Louis, Mo. 63138
Continuation of Ser. No. 837,491, Mar. 7, 1986, abandoned. This application Mar. 17, 1987, Ser. No. 24,921

Int. Cl.⁴ A47C 1/02

U.S. Cl. 297-329

12 Claims



1. A chair comprising:
 - (a) a lower base portion including opposed sides,
 - (b) an upper seating portion including opposed sides, said seating portion being mounted to said base portion for longitudinal arcuate movement of said seating portion relative to said base portion,
 - (c) retractable footrest assembly including:
 1. guide means operatively carried between said seating portion sides including opposed elongate substantially tubular arcuately formed guide members,
 2. a movable footrest including arm means including opposed arcuately formed arm members each received within one of the tubular members of said guide members and a transverse footrest member mounted between said arm members,
 3. drive means for moving said arm members in said guide members, said drive means including a pair of longitudinally spaced transverse shafts each having at least one sprocket mounted thereon, an endless chain extending between said sprockets, connection means including a transverse traveller member attached at each end to said arm members and an adaptor member connecting said transverse member to said chain in direct drive relation, and means for moving said chain and said connected traveller member whereby said footrest moves fore and aft relative to said seating portion, and
 4. said arcuate arm members extending outwardly of said arcuate guide members along the same generally arcuate line.

4,715,655

RECLINING ANGLE ADJUSTMENT DEVICE

Naoaki Katsumoto, Fujisawa, and Toshihito Miyagawa, Toyota, both of Japan, assignors to Shiroki Kinzoku Kogyo Kabushiki Kaisha, Fujisawa and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Nov. 26, 1985, Ser. No. 801,961

Claims priority, application Japan, Nov. 26, 1984, 59-179597
Int. Cl.⁴ E05D 11/10; B60N 1/02

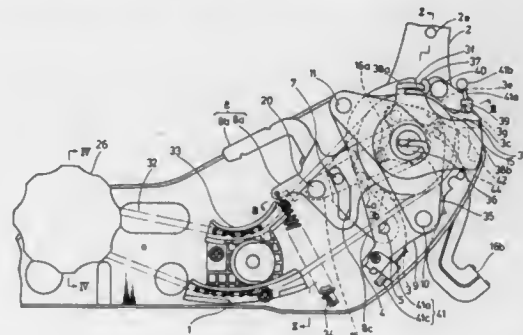
U.S. Cl. 297-362

4 Claims

1. A reclining angle adjustment device comprising:
 - an intermediate gear plate having an outer gear with a rack on an outer edge thereof;
 - an upper arm having an inner gear meshing with said outer gear of the intermediate gear plate;
 - an angularly movable shaft on which said intermediate gear

plate and said upper arm are angularly movably mounted concentrically and eccentrically thereon, respectively;

- a lower arm fixed to a subplate to hold said intermediate gear plate and upper arm between said lower arm and said subplate and in supporting relation to said angularly movable shaft;
- a pawl pivotally mounted on said lower arm and having teeth for selective engagement with said rack of said intermediate gear plate;
- a release lever rotatable mounted on said angularly movable shaft for releasing said rack of said intermediate gear plate from said pawl for rough reclining angle adjustment;
- a handle shaft rotatably mounted on said lower arm;
- a transmission mechanism having driver and driven members, said driver member being mounted on said handle shaft with said driven member being mounted on said angularly movable shaft;
- a control handle mounted on said handle shaft for turning said angularly movable shaft through said transmission mechanism to effect fine reclining angle adjustment;



- a stopper arm rotatively mounted on said angularly movable shaft and angularly movable by said driven member of the transmission mechanism over a limited path;
- a brake mechanism mounted on said handle shaft for selectively preventing said handle shaft and said driver member from rotating to in turn prevent rotation of said driven member;
- a first stopper provided in a pin bracket fixed to said lower arm for engaging said stopper arm to limit rotation thereof;
- a second stopper provided on said driven member for rotation with said driven member, with said second stopper engaging said stopper arm during movement thereof by said driven member along said limited path; and
- said first stopper establishing a range of fine reclining angle adjustment defined by movement of said stopper arm between positions abutting said first stopper in opposite directions.

4,715,656

HINGE JOINT FOR THE SEATS OF MOTOR VEHICLES AND THE LIKE

Hansjörg Walk, Reutlingen, and Heinz-Jürgen Wägener, Remscheid, both of Fed. Rep. of Germany, assignors to Kelper Recaro GmbH & Co., Remscheid, Fed. Rep. of Germany
Filed Jul. 2, 1986, Ser. No. 881,195

Claims priority, application European Pat. Off., Jul. 2, 1985, 85108181

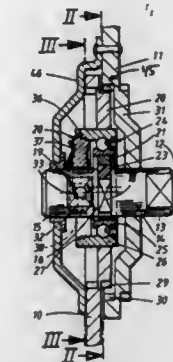
Int. Cl.⁴ A47C 1/025; F16H 55/18

U.S. Cl. 297-362

18 Claims

1. A hinge joint, particularly for changing the mutual positions of two parts of a seat in a motor vehicle or the like, comprising a first component; a second component; means for selectively changing the position of said second component relative to said first component including a shaft rotatably journaled in one of said components, a first gear on said second component, a second gear provided on said first compo-

nent, mating with said first gear and surrounding said shaft, an eccentric interposed between said shaft and said second gear and movable radially of said shaft, and means for yieldably biasing said eccentric radially of said shaft so as to increase the eccentricity of said first and second gears with reference to each other, said second gear having a rotary hub which sur-



rounds said eccentric; and means for moving one of said first and second gears radially of said shaft relative to the other of said first and second gears, comprising a portion which is movable substantially axially of said shaft and means for urging said portion of said moving means substantially axially of said shaft and against said hub.

4,715,657

DOUBLE RANGING DRUM CUTTER HAVING BEDROCK SENSOR BASED ON VIDEO IMAGE PROCESSING SYSTEM

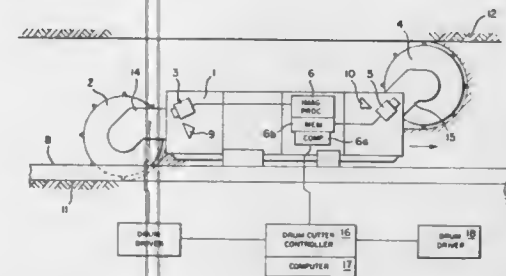
Koji Sato, Chiba; Hiroshi Kuroda, Omata; Ryuj Yamada, Omata, and Mamoru Serino, Omata, all of Japan, assignors to Zaidan Hojin Sekitan Gijutsu Kenkyusho; Mitsui Sekitan Kogyo Kabushiki Kaisha and Kabushiki Kaisha Mitsui Miike Seisakusho, all of Tokyo, Japan

Continuation-in-part of Ser. No. 703,267, Feb. 20, 1985, abandoned. This application Aug. 26, 1986, Ser. No. 900,419
Claims priority, application Japan, Feb. 23, 1984, 59-31470

Int. Cl.⁴ E21C 35/08

U.S. Cl. 299-1

1 Claim



1. A double ranging drum cutter of the long wall type machine for the extraction of coal which is designed to move longitudinally on a face conveyor set on a bed of rock and coal, the front of the face conveyor also extending along the coal layer, in combination:

- (a) an elongated carrier body (1) with a defined front and rear, said front being in the direction of movement of said carrier body when in a cutting mode of operation, said carrier body being adapted and designed to move along the face conveyor;
- (b) a rear cutter drum assembly including a rear support arm (14) attached to the carrier body, said rear assembly including a first drum driver on said support arm, also a rear

vertically rotating cutter drum (2) supported by said rear support arm;

- (c) a front cutter drum assembly including a forward support arm (15) with a transversal shaft disposed on the front side of the carrier body (1), said front assembly including a second drum driver located on said support arm, also, a forward vertically rotating cutter drum (4), supported by said forward support arm;
- (d) front and rear infrared television cameras (3,5) and assemblies for picking up an image of a portion of the lower and upper bed of rock and coal being cut by the front and rear cutter drums, each assembly including an infrared ray projector (9, 10) for projecting infrared rays onto the surface being cut so that said surface in turn can be viewed by said cameras (3,5), and,
- (e) a video image processing unit (6) mounted on the carrier body (1) and electrically connected to the front and rear television cameras (3, 5) including a first microcomputer (6a) to transform the received video signals into a binary code unit, a memory (6b) to store the signals, a drum cutter control (16) mounted on the carriage body, coupled to each cutter drum driver (18), a second microcomputer (17) for counting said binary code units and causes the controller (16) to control the action of the cutter drums.

4,715,658

PLANING MACHINE FOR THE MINING OF MINERALS
Gert Braun, and Ernst Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun Industrieanlagen, Fed. Rep. of Germany

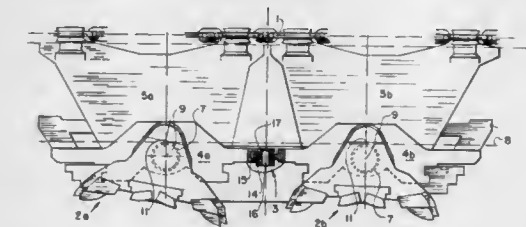
Continuation of Ser. No. 778,556, Sep. 20, 1985, abandoned. This application Feb. 26, 1987, Ser. No. 20,131

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1984, 3434518

Int. Cl.⁴ E21C 25/42

U.S. Cl. 299-34

4 Claims



1. A planing machine for the mining of minerals, particularly the underground mining of coal using a planing chain guided on the filling side of a conveyor chute having a side wall on a side opposite to the filling side, comprising two individual planes (2a, 2b) lying side-by-side along the conveyor chain, an articulated connection interconnecting said planes and permit relative pivoting between said planes in vertical and horizontal directions, each plane comprising a plane body (4a, 4b) and a sword plate (5a, 5b) connected to said plane body and having a portion extending under the conveyor chute and connected to the planing chain, a horizontally extending roller centrally carried by each of said planes, each horizontal roller being mounted for rotation about a vertical axis to one of said plane bodies, each roller being at least partly exposed for rolling against the side wall of the chute for permitting movement of each plane body along the side wall of the chute while also permitting rotation of each plane body about the vertical axis of its horizontal roller, said sword plates of said planes being individually connected to the planing chain and being unconnected from each other from one plane to the other for permitting horizontal and vertical pivoting between said planes only through said articulated connection.

4,715,659

MINERAL MINING INSTALLATIONS

Christoph Rassmann, Lünen; Gerhard Nickel, Selm; Bernd Steinkuhl; Gerhard Merten, both of Lünen, and Egon Pfefferle, Hamm, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen GmbH, Lünen, Fed. Rep. of Germany

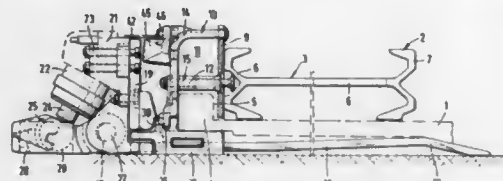
Filed Sep. 16, 1986, Ser. No. 907,940

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533107; May 27, 1986, 3617737

Int. Cl.⁴ E21C 35/20

U.S. Cl. 299—43

18 Claims



1. A mineral mining installation comprising a scraper-chain conveyor composed of individual channel sections arranged end-to-end; means defining upper and lower chain guide passages at one side of the conveyor remote from a mineral face being worked; said passage-defining means including detachable covers fitted to the channel sections of the conveyor; at least some of the covers having lugs provided on the lower regions thereof; a floor sub-frame structure disposed beneath the conveyor; a mineral winning machine having a drive plate projecting between the conveyor and the sub-frame structure and slidable along the sub-frame structure; guide means in the lower guide passage connecting the drive plate to a drive chain running through the upper and lower passages; and connection means between said at least some of the covers and the sub-frame structure to permit both raising and tilting movements of the passage-defining means and adjacent sides of the channel sections of the conveyor to a limited extent in relation to the sub-frame structure in response to the passage of the drive plate; wherein the connection means takes the form of tongue-and-groove connections and locking bars are provided to maintain the tongues within the grooves, the locking bars being detachably connected to the sub-frame structure and having portions which overlap with the lugs on the lower regions of the covers.

4,715,660

VEHICLE DISC WHEEL WITH MULTIPLE TIRES ON ONE RIM

Jaroslav V. M. Juhán, Geneva, Switzerland, assignor to JJD S.A., Geneva, Switzerland

Continuation of Ser. No. 709,131, Mar. 7, 1985, abandoned. This application Feb. 2, 1987, Ser. No. 6,335

Claims priority, application Switzerland, Mar. 8, 1984, 1157/84

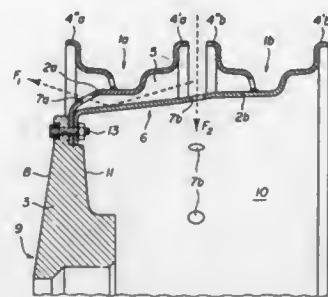
Int. Cl.⁴ B60B 11/04, 11/06

U.S. Cl. 301—13 R

3 Claims

1. Vehicle wheel comprising a lateral disc and a rim provided for mounting of at least two pneumatic tires, said rim comprising at least two distinct elements of different width, which are solidly connected on one side thereof to said lateral disc and the respective other sides of which are incurvated to form lateral walls of tire fitting rings and further incurvated lateral walls of tire fitting rings are solidly connected on the central parts of the rim elements, an annular passage opening between the incurvated lateral walls which are arranged to

face each other, wherein said rim elements are coaxially arranged on one side of said lateral disc, the element having the



smaller width being placed in outer diametral position with respect to the element having the larger width.

4,715,661

HYDRAULIC BRAKE BOOSTER

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

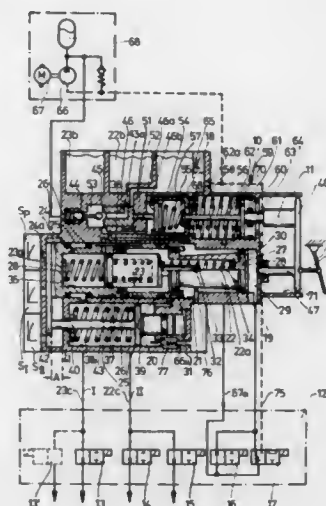
Filed Jan. 13, 1986, Ser. No. 818,522

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507186

Int. Cl.⁴ B60T 13/14

U.S. Cl. 303—10

22 Claims



1. A hydraulic brake booster for a vehicle brake system, comprising a pressure medium supply system including a motor, a pump and a reservoir, a housing, a brake pedal, a brake pedal-actuated brake valve in said housing for connecting the pressure medium supply system with at least one master brake cylinder piston for at least one brake circuit, at least two master brake cylinder pistons disposed axially in line with one another with a portion of one piston disposed inside the other and disposed in said housing and a brake pedal locking piston beside said master brake cylinder pistons in said housing with its longitudinal axis in parallel relationship with said two master brake cylinder pistons and activated by said brake pedal via a brake pressure plate (48) connected to said brake pedal which actuates said brake pedal locking piston via tappet (63) and widened portion (64).

4,715,662

METHOD FOR DETERMINING AN OPTIMAL SLIP VALUE

Anton van Zanten, Ditzingen, and Gerhard Heess, Tamm, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP84/00402, § 371 Date Aug. 16, 1985, § 102(e) Date Aug. 16, 1985, PCT Pub. No. WO85/02592, PCT Pub. Date Jun. 20, 1985

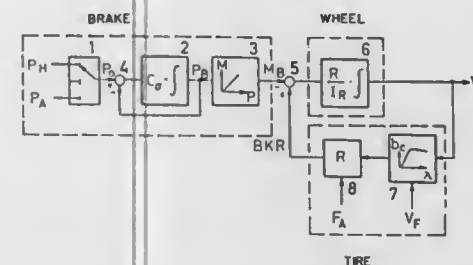
PCT Filed Dec. 15, 1984, Ser. No. 768,097

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345546

U.S. Cl. 303—109

Int. Cl.⁴ B60T 8/32

13 Claims



1. A method for determining an optimal slip value λ at least one wheel of a vehicle for regulating braking force, using signals (V_R ; V_F) at least approximated to the wheel speed V_R and the vehicle speed V_F , characterized in that the method comprises during driving, varying the slip value λ by varying the braking pressure P_B and at individual measuring instants (K , $K+1$. . .) and ascertaining signal value combinations $V_R^*(K)$, $V_F^*(K)$, $P_B^*(K)$ and $F_A^*(K)$, that after inserting a plurality of these ascertained signal value combinations for various values of slip value λ into a function $V_R(K+1)=f$ with unknown estimated coefficients a_n , solving the resultant equation system and ascertaining the coefficients a_n , ascertaining coefficients a_n which are coefficients of a generalized description of a μ slip curve $\mu=f(V_R, V_F)$ from the coefficients a_n , and ascertaining a location of the optimal slip value λ_{opt} by use of the ascertained instantaneous course of the μ slip curve, where $p_B(K)$ is the braking pressure, $F_A(K)$ is the tire/road contact force and K is an increment counter, which defines the measurement and calculation instances which are located at intervals of ΔT from one another, and obtaining function $V_R(K+1)$ by the following two expressions:

$$V_R(K+1) = a_1 V_R(K) + a_2 \cdot F_A(K) \cdot \frac{V_R(K) - V_R(K)}{V_R(K)} \cdot \Delta T +$$

$$a_3 p_B(K) \frac{R \cdot \Delta T}{IR} \bar{s} < 0.5$$

$$V_R(K+1) = a_1 \cdot V_R(K) + [a_2 + a_3 (V_F(K) - V_R(K))] \cdot$$

$$F_A(K) \Delta T + a_4 \frac{V_R(K) \cdot F_A(K) \cdot \Delta T}{V_R(K) - V_R(K)} + a_5 p_B(K) \frac{R \Delta T}{IR}$$

for $\bar{s} > 0.5$, where a_1 and a_2 and a_3 are the coefficients a_n that are to be ascertained, R is the radius of the wheel, IR is its moment of inertia,

$$\bar{s} = \frac{\epsilon \lambda}{\mu(1-\lambda)}$$

ϵ is a tire constant, $\mu = \mu_0(1 + A\lambda \cdot v\lambda)$, μ_0 is the coefficient of friction between the tire and the road, $A\lambda$ is a rubber constant and $v\lambda = \lambda \cdot V_F$.

4,715,663

BRAKE OIL PRESSURE CONTROL DEVICE

Yoshiyuki Hattori, Toyooka; Kazuma Matsui, Toyohashi; Yui-chi Imani, Hamamatsu; Akira Kano, Obu; Tetsuya Nagata, Konan; Koji Nakane, Anjo, and Ken Nomura, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

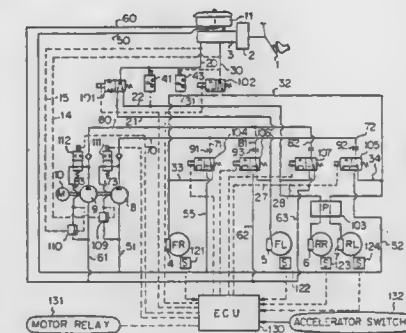
Continuation-in-part of Ser. No. 792,007, Oct. 28, 1985, Pat. No. 4,627,671, and Ser. No. 793,760, Nov. 1, 1985, Pat. No. 4,687,260. This application Sep. 17, 1986, Ser. No. 908,234

Claims priority, application Japan, Sep. 23, 1985, 60-210846; May 7, 1986, 61-104457

Int. Cl.⁴ B60T 8/86

U.S. Cl. 303—110

9 Claims



1. A brake oil pressure control device of a brake system for reducing a speed of wheels of a vehicle, said brake system including a brake pedal, a master cylinder connected to said brake pedal, a reservoir holding brake oil, and wheel cylinders, said device comprising:

a main line system having a main line connecting said master cylinder to said wheel cylinders, and a first valve provided between said master cylinder and said wheel cylinders to open and close said main line,

a subline system having a pressure source, a subline connecting said pressure source to said wheel cylinders, and a second valve provided between said pressure source and said wheel cylinders to open and close said subline,

a means for controlling an oil pressure at said pressure source, said controlling means having a relief pipe connecting a discharge port of said pressure source to said reservoir, a relief valve provided in said relief pipe, said relief valve opening said relief pipe in accordance with an oil pressure at said master cylinder so that the oil pressure at said pressure source is restricted to be not higher than the oil pressure at said master cylinder, and a third valve provided in said relief pipe to open and close said relief pipe,

a means for sensing a locking and slipping condition of said wheels, and

a valve control mechanism controlling said first, second and third valves in accordance with a locking and slipping condition of said wheels.

4,715,664

HYDRAULIC ANTI-SKID BRAKE SYSTEM WITH DEVICE FOR IMPROVEMENT IN STRAIGHT-LINE RUNNING STABILITY OF VEHICLE

Nobuyasu Nakanishi; Masakazu Ishikawa, both of Toyota; Akira Shirai, Toyooka, and Noboru Noguchi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 20, 1986, Ser. No. 841,783

Claims priority, application Japan, Mar. 23, 1985, 60-59074

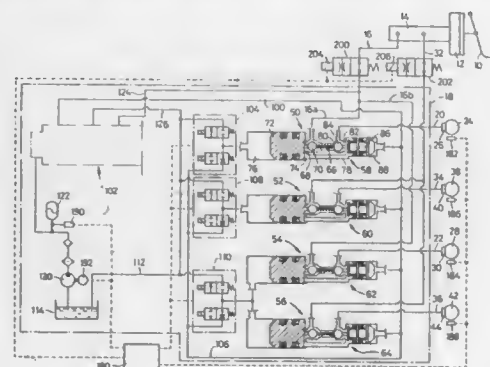
Int. Cl.⁴ B60T 8/42

U.S. Cl. 303—111

9 Claims

1. A hydraulic brake system wherein braking pressures in respective right and left brake cylinders for a right wheel and a left wheel of a motor vehicle are regulated to prevent skidding, comprising:

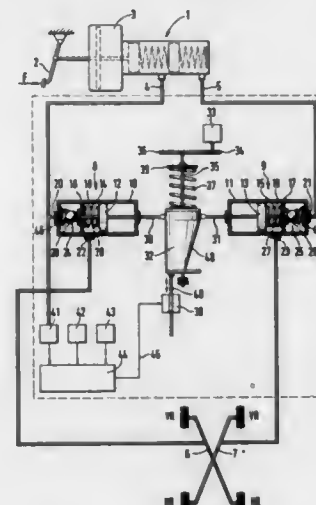
- a master cylinder operable for generating a master cylinder pressure;
- a first passage and a second passage, said first and second passages connecting said master cylinder to said right and left brake cylinders, respectively;
- a first pressure control device and a second pressure control device, said first and second pressure control devices being of a closed-circuit type, each of said first and second pressure control devices comprising:
- (a) a cut-off valve disposed in a part of each of said first and second passages, said cut-off valve being operable between an open position and a closed position;
 - (b) a variable-volume chamber communicating with a respective one of said first and second passages, at a point between said cut-off valve and a respective one of said first and second brake cylinders;
 - (c) an actuator partially defining said variable-volume chamber, said actuator being movable so as to selectively open and close said cut-off valve and so as to change the volume of said variable-volume chamber thereby changing the braking pressure in said one of said right and left brake cylinders while said cut-off valve is placed in said closed position;
 - (d) a pressure chamber partially defined by said actuator such that pressure in said pressure chamber acts on said actuator so as to reduce the volume of said variable-volume chamber;
 - (e) a solenoid-operated valve connected to said pressure



- chamber, said solenoid operated valve being operable between a first position wherein the pressure in said pressure chamber may be reduced, and a second position wherein the pressure in said pressure chamber may increase; and
- (f) a power source independent of said master cylinder to activate said actuator through said solenoid-operated valve;
- a first flow restrictor device provided in said first passage, a second flow restrictor device provided in said second passage, said first and second flow restrictor devices being electrically controlled independently of each other, so as to restrict the flow of a brake fluid from said master cylinder to said right and left brake cylinders through said first and second passages, respectively, and
- control means electrically connected to said solenoid-operated valves of said first and second pressure control devices and to said first and second flow restrictor devices, said control means being operable to activate one of said first and second flow restrictor devices which corresponds to one of said right and left brake cylinders, after the pressure control device for the other brake cylinder is activated to start an anti-skid control of the braking pressure in the other one of said right and left brake cylinder upon skidding of the corresponding wheel, said control means controlling said one flow restrictor device to thereby reduce the rate of increase in the braking pressure

in said one brake cylinder after said anti-skid control of the braking pressure in said other brake cylinder is started.

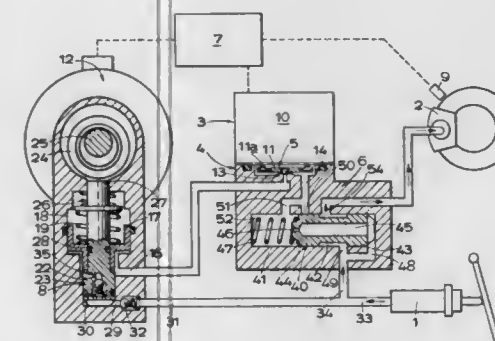
4,715,665
BRAKE SLIP CONTROLLED BRAKE FOR AUTOMOTIVE VEHICLES
 Fritz Ostwald, Dreieich, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.
 Continuation of Ser. No. 640,684, Aug. 13, 1984, abandoned.
 This application Aug. 4, 1986, Ser. No. 894,450
 Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330483
 Int. Cl.⁴ B60T 15/58, 8/64, 8/42
 U.S. Cl. 303—111 6 Claims



1. A brake-slip-controlled brake system for an automotive vehicle including a master cylinder acted upon by a pedal force of the vehicle brake and said master cylinder being connected to a plurality of wheel brake cylinders respectively by way of a plurality of brake circuits, said system comprising, in combination:

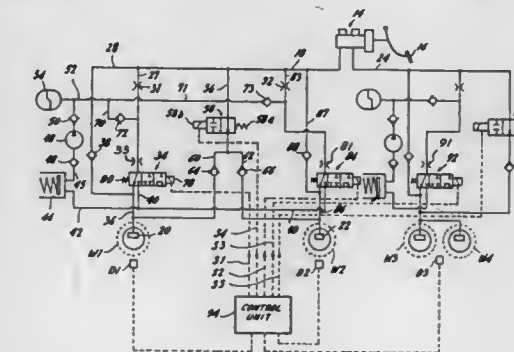
- a plurality of sensors respectively coupled to said vehicle for providing electrical signals indicative of vehicle braking behavior;
- means coupled to said sensors for providing an output signal indicative of said braking behavior;
- an axially displaceable rotating cam being rotatable about a given axis and longitudinally displaceable from a normal position of rest to a plurality of positions along said axis in response to said output signal, said cam being longitudinally tapered along said axis and having an eccentric cross section which varies in shape along said axis;
- said cam including one axially extending portion throughout the entire length of said cam and which has a constant predetermined radial distance from said axis to thereby provide a high lobe substantially parallel to said axis;
- means responsive to said output signal for translating said cam along said axis; and
- at least two braking pressure modulators each being respectively coupled to one of said brake circuits between said master cylinder and one of said brake cylinders, each of said modulators comprising a cylinder having a movable piston slidably mounted therein and each of said pistons having a tappet extending outwardly away from its cylinder for engaging said cam, and valve opening means extending in the opposite direction from said piston.

4,715,666
HYDRAULIC ANTI-SKID BRAKING SYSTEMS FOR VEHICLES
 Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries public limited Company, Great Britain
 Filed May 14, 1986, Ser. No. 863,137
 Claims priority, application United Kingdom, May 18, 1985, 8512610
 Int. Cl.⁴ B60T 8/40
 U.S. Cl. 303—116 14 Claims



1. An hydraulic anti-skid braking system for a vehicle having a wheel, and comprising a brake for braking said wheel, a source of operating fluid for applying said brake, pressure-responsive means, sensing means for sensing the speed of rotation of said wheel and for emitting a signal when said speed or rotation exceeds a predetermined value, a modulator assembly for modulating the supply of operating fluid to said brake from said source in accordance with said signals from said sensing means, said modulator assembly incorporating means responsive to one of said signals to isolate said source from said brake and relieve the pressure of said operating fluid applied to said brake and, at the termination of said signal, to control re-application of said brake at a controlled rate, wherein said modulator assembly incorporates at least one flow-control regulator valve, and at least one exhaust valve, said flow-control regulator valve comprising a wall defining a bore, a metering spool which works in said bore and incorporates a fixed orifice, a spring biasing said spool, said spool being movable between a first position in which it is biased by said spring to provide unrestricted direct communication of hydraulic fluid to said pressure-responsive means and a second position in opposition to the force in said spring and in which direct communication to said pressure-responsive means is cut-off and a variable orifice defined between said spool and said bore provides an indirect restricted communication of hydraulic fluid to said pressure-responsive means through said fixed orifice in said spool, a pressure drop across said fixed orifice determining the said second position, said exhaust valve being responsive to said signals and being movable between a closed position, when no signal is operative and said spool is biased by said spring into the said first position, and an open position, when a signal is operative, to establish the said pressure drop whereby to cause said spool to move into the said second position.

4,715,667
HYDRAULIC PRESSURE CONTROL DEVICE FOR USE IN VEHICLE ANTI-SKID BRAKING SYSTEM
 Hiromi Otsuki, Anjo; Kenichi Numata, Chiryu; Ryoichi Matsuura, Anjo; Yoshihisa Nomura; Nobuyasu Nakanishi, both of Toyota, and Hiroyuki Oka, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan
 Continuation-in-part of Ser. No. 760,982, Jul. 31, 1985, abandoned. This application Jun. 6, 1986, Ser. No. 873,272
 Claims priority, application Japan, Aug. 9, 1984, 59-167628
 Int. Cl.⁴ B60T 8/00/8/36, 13/68, 15/02
 U.S. Cl. 303—119 6 Claims



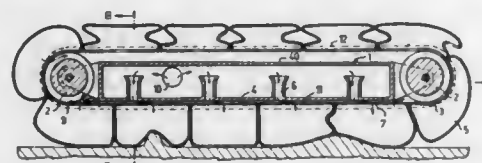
1. A hydraulic pressure control device in a vehicle anti-skid braking system, comprising:

- (a) a brake master cylinder;
- (b) a wheel brake actuating cylinder;
- (c) a fluid pressure supply passage connected between said master cylinder and said wheel brake actuating cylinder for supplying a braking fluid under pressure from said master cylinder to said wheel brake actuating cylinder;
- (d) control means responsive to a wheel condition, for generating a control signal;
- (e) a directional control valve disposed in said fluid pressure supply passage and having at least first and second selective positions, said directional control valve being normally shifted to said first position to open said fluid pressure supply passage;
- (f) a fluid pressure return passage connected between said directional control valve and said fluid pressure supply passage in bypassing relation to said directional control valve, said directional control valve being actuatable in response to said control signal for connecting said wheel brake actuating cylinder to said fluid pressure return passage to return a braking fluid under pressure from said wheel brake actuating cylinder to said fluid pressure supply passage in bypassing relation to said directional control valve;
- (g) a reservoir disposed in said fluid pressure return passage for storing the braking fluid;
- (h) a hydraulic pressure pump disposed in said fluid pressure return passage for pumping the braking fluid from said reservoir;
- (i) an accumulator disposed in said fluid pressure return passage for storing part of the braking fluid from said hydraulic pump;
- (j) a first restriction disposed in said fluid pressure supply passage between said master cylinder and the junction between said fluid pressure supply and return passages;
- (k) a second restriction disposed in said fluid pressure supply passage between said directional control valve and the junction between said fluid pressure supply and return passages, said first restriction having a diameter smaller than the diameter of said second restriction; and
- (l) a check valve disposed in said fluid pressure return passage for allowing the braking fluid to flow in one direction

only, said direction being from said accumulator into said fluid pressure supply passage.

4,715,668 PNEUMATIC MATTRESS TRACK SYSTEM FOR VEHICLES

Fredrik K. Burmeister, Lansantorppa 3, SF-02630 Espoo 63, Finland
PCT No. PCT/FI84/00075, § 371 Date Apr. 17, 1985, § 102(e)
Date Apr. 17, 1985, PCT Pub. No. WO85/01710, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 15, 1984, Ser. No. 725,791
Claims priority, application Finland, Oct. 19, 1983, 833810
Int. Cl. B62D 55/26
U.S. Cl. 305-34 8 Claims



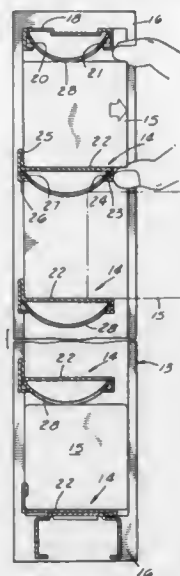
1. A pneumatic mattress track system used as a construction element of a vehicle, comprising a hull, front and rear roller means, endless, hollow mattress means running around said roller means, said mattress means having a plurality of discrete bag arrangements, each bag arrangement having a band surface facing the hull during entire operation of the system, the band surface having at least one opening for feeding a pressurized gas into the bag arrangement, a gas cushion space being defined between the hull and the band surfaces of the plurality of bag arrangements, the gas cushion space having a substantially thin configuration to enable to use a bottom of the hull and the band surfaces as the only sealing means for the gas cushion space, the gas being fed into the gas cushion space through a plurality of orifices in the bottom of the hull, a number of the orifices being at least equal to a number of the bag arrangements upon which the system rests during the operation.

4,715,669 CARTRIDGE CABINET DRAWER

William R. Baillie, Corona; Jorge Macias, West Covina, and Michael Dressendorfer, San Dimas, all of Calif., assignors to Russ Bassett Company, Whittier, Calif.
Filed Jun. 27, 1986, Ser. No. 879,416
Int. Cl. A47B 81/06
U.S. Cl. 312-12 3 Claims

1. A cabinet drawer for releasably storing a plurality of items of substantially identical height, comprising:
a front panel;
a back panel spaced apart from said front panel;
a top wall having one end secured to front panel and the opposite end secured to the back panel, said wall including a pair of inwardly facing spaced apart recesses on a lower surface;
a shelf panel having first and second opposite ends affixed to the respective front and back panels below the top wall a distance greater than the height of the items, said shelf panel having a width less than that of the items;
said shelf panel having an upstanding wall along one edge forming a partially enclosed back wall for the shelf panel the opposite side being open forming an access opening through which items are added to and removed from the drawer; and
a flat sheet of deformable spring-like material having a width greater than the distance between the top wall recesses, said flat sheet having opposite edges received within the respective recesses effecting bowing of the sheet down-

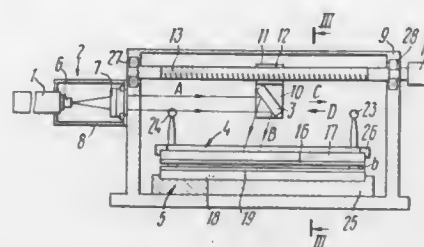
wardly toward the shelf panel a sufficient amount to resiliently engage the top of an item located therein;



said flat sheet having a plurality of parallel transverse spaced apart slots therein forming between each adjacent pair of slots an individual resiliently deformable member.

4,715,670 APPARATUS FOR COPYING HOLOGRAPHIC DIFFRACTION GRATINGS

Boris G. Turukhano, ulitsa K. Podryadchikova, 16, kv. 37, Lenin-gradskaya oblast, Gatchina, U.S.S.R.
Filed Jul. 14, 1986, Ser. No. 885,099
Int. Cl. G03H 1/20
U.S. Cl. 350-3.69 2 Claims

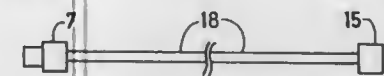


1. An apparatus for copying holographic diffraction gratings, comprising:
a source of coherent radiation, which emits coherent radiation;
a collimating system placed directly after said coherent radiation source in the direction of said radiation;
a mirror placed directly after said collimating system in the direction of said coherent radiation and adapted for reciprocal travel;
a master holographic diffraction grating placed directly after said mirror in the direction of said coherent radiation and comprising a substrate having a first extended surface along which said travel of said mirror is performed so that said coherent radiation reflected by said mirror falls on said first extended surface and a second extended surface, and a recording layer applied on the second extended surface;
a copy holographic grating placed directly after said master holographic grating in the direction of said coherent radiation, rigidly secured to said master holographic grating and comprising a substrate having a first extended surface

facing said recording layer of said master holographic grating, a second extended surface, and a recording layer applied on the first extended surface.

4,715,671 OPTICAL TRANSMISSION LINK FOR MUSICAL PRODUCTION

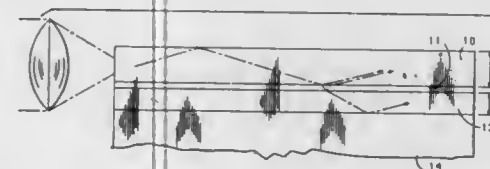
Edward J. Miesak, #2A 2508 W. Hickory, Denton, Tex. 76201
Filed Jun. 10, 1985, Ser. No. 743,008
Int. Cl. G02B 6/00; G10H 1/00
U.S. Cl. 350-96.10 15 Claims



1. A shock eliminating audio signal transmission link for use by performing musicians, comprising
a musical instrument,
a first standard audio connector for connection to said musical instrument, said connector having a first electrical contact,
source electro-optical transducing means in electrical communication with said first contact at a source location for transducing a sound electrical signal received at said contact into a corresponding light signal,
a second standard audio connector having a second electrical contact,
receiving electro-optical transducing means in electrical communication with said contact at a receiving location remote from said source location for converting said light signal into a corresponding received sound electrical signal and delivering the same to said second contact, and means for transmitting said light signal between said source and receiving electro-optical transducing means.

4,715,672
OPTICAL WAVEGUIDE UTILIZING AN ANTIRESONANT LAYERED STRUCTURE
Michel A. Duguay, Fair Haven; Thomas L. Koch, Middletown, both of N.J.; Yasuo Kokubun, Yokohama, Japan, and Loren N. Pfeiffer, Morristown, N.J., assignors to American Telephone and Telegraph Company, Murray Hill, N.J.
Filed Jan. 6, 1986, Ser. No. 816,199
Int. Cl. G02B 6/10 7 Claims

U.S. Cl. 350-96.12



1. An optical waveguide comprising first optical material structured with boundaries to guide light of a selected wavelength in a predetermined direction, and means juxtaposed with said boundaries for establishing an antiresonant reflection for a component of light propagating in a direction perpendicular to said predetermined direction including a second optical material of predetermined thickness adjacent to said first optical material and having an index of refraction greater than that of said first optical material, and a third optical material adjacent to said second optical material and having an index of refraction less than that of said second optical material, said predetermined thickness of said second optical material is approximately equal to an odd multiple of one-quarter wavelength of light in said second optical material, characterized in that,

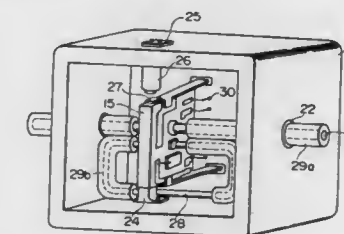
said first optical material is fabricated as a planar waveguide having a thickness d_1 , and said third optical material is fabricated as a layer having a thickness d_2 which is ap-

proximately equal to an odd multiple times one-half of the thickness d_1 .

4,715,673 OPTICAL SWITCH

Takanobu Noro, Yokohama; Yasumasa Koakutsu, Fujisawa; Tamio Takeuchi; Masao Yano, both of Yokohama; Selichi Onoda, Tokorozawa; Hideo Arima, Yokohama; Hitoshi Yokono, Fujisawa, and Hirayoshi Tanei, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 1, 1986, Ser. No. 857,957
Int. Cl. G02B 6/36 12 Claims

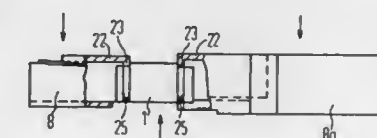
U.S. Cl. 350-96.20



1. An optical switch comprising:
first and second light path members disposed to confront each other;
a substrate located between said first and second light path members;
an optical waveguide fitted in said substrate substantially in parallel to a line connecting said first and second light path members;
a light emitting element fixed in proximity to said optical waveguide on one side of said substrate, said light emitting element being in optical coupling with said first light path member;
a photosensitive element fixed oppositely to said light emitting element on another side of said substrate, said photosensitive element being in optical coupling with said second light path member;
a drive means for moving said substrate at least between two positions so that said optical waveguide or said elements are positioned between said first and second light path members; and
a looping light path member for coupling said light emitting element with said photosensitive element optically when said optical waveguide is positioned between said first and second light path members.

4,715,674
LIGHT-WAVE GUIDE-PLUG CONNECTION
Dietmar Schulz, Munich; Peter Pohl, Stockdorf, both of Fed. Rep. of Germany, and Alfred H. Johnson, Poughkeepsie, N.Y., assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany and IBM, Armonk, N.Y.
Filed Jan. 20, 1987, Ser. No. 5,053
Int. Cl. G02B 6/38 3 Claims

U.S. Cl. 350-96.21



1. A light wave guide-plug connection with plug connector halves in which the forward ends have at least a pin, or sleeve shaped plug element, comprising:
a plug connector half with a sleeve shaped plug element

formed for connection with a pin shaped plug element joinable with a first of two supporting bodies the first body including an entrance channel for inserting said plug-connector half with at least one pin shaped plug element such that a joined position of the plug connector half with the sleeve shaped plug element and the first supporting body is obtained through tenon-groove-interlock contours of the plug connector half with the sleeve shaped plug element and the first supporting body lying crosswise to a plug axis, and a motion of the plug connector half with the sleeve shaped plug element and the first supporting body crosswise to the plug axis;

a second supporting body having a guiding tube for the insertion of pin shaped plug elements from both sides, and having at said both sides interlock contours of like configuration as the interlock contours of the plug connector half with said sleeve shaped plug element.

4,715,675 FIBER OPTIC FERRULE

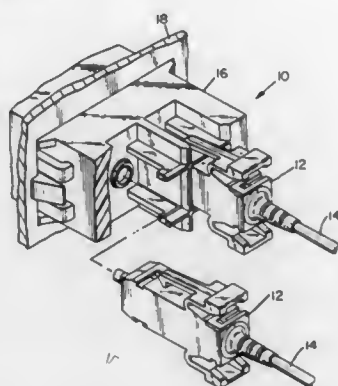
James D. Keven, Wellsville; William J. Stape, Lewisberry, and Robert N. Weber, Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 631,413, Jul. 16, 1984, abandoned. This application Jan. 21, 1987, Ser. No. 6,344

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.20

4 Claims



1. A ferrule for permanent connection to an optical fiber cable and for assembly into an optical connector assembly, the ferrule comprising,

opposing first and second identical ferrule halves constructed to engage and mate with each other, a mating surface on each corresponding ferrule half, a portion of a mating face at one end of said mating surface, a mating face constructed by said portions of a mating face for encircling an end of an optical fiber portion of an optical fiber cable,

an optical fiber receiving groove extending along said mating surface and communicating with said portion of said mating face,

a jacket portion receiving recess extending along said mating surface and communicating with said groove and with a rear end of a corresponding ferrule half,

interengaging alignment means extending transversely of said mating surface for aligning and interengaging the opposing ferrule half,

means for securing said ferrule halves together with the ferrule halves opposed along their mating surfaces with the recited grooves opposed and aligning an optical fiber portion of an optical fiber cable axially of the ferrule and with an end of the optical fiber at the mating face, and with the recesses opposed and receiving a jacket portion of an optical fiber cable,

the ferrule having an exterior mounting means defined by

the opposed first and second ferrule halves for mounting the ferrule within a connector assembly,

on each ferrule half a projecting portion of the mounting means projects above the mating surface, on each ferrule half another portion of the mounting means is recessed below the mating surface,

a recess in the mating surface aligned with said another portion of the mounting means and aligned with the projecting portion of the mounting means across the mating surface from the projecting portion of the mounting means and receives therein the corresponding projecting portion of the opposed ferrule half, and

projection means projecting in said recess of each ferrule half for engaging and gripping a jacket portion of an optical fiber cable received in said recess.

4,715,676

OPTICAL FIBER CABLE

Ralph Sutehall, and Robert S. F. Clarke, both of Harlow, England, assignors to STC plc, London, England

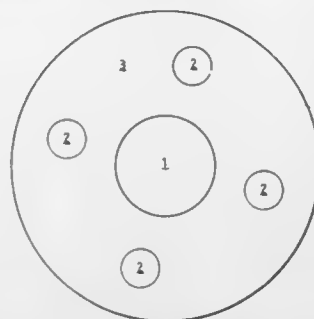
Filed Nov. 5, 1985, Ser. No. 795,182

Claims priority, application United Kingdom, Nov. 10, 1984, 8428480

Int. Cl.⁴ G02B 6/44

U.S. Cl. 350—96.23

6 Claims



1. A gas blocked optical fiber cable having an extruded sheath in which is embedded a central strength member that is longitudinally impermeable to gas, and also embedded in the extruded sheath, around the strength member, a set of plastics packaged glass optical fibers spaced apart from each other and from the strength member;

wherein each member of the set of packaged fibers consists of a glass optical fiber possessing an optical waveguiding structure within the glass, which glass is provided with primary and secondary plastics coatings respectively of lower tensile modulus material that is not degraded at the extrusion temperature of the sheath material, and of higher modulus material that has a Vicat softening temperature higher than the extrusion temperature of the sheath material;

and wherein the extruded sheath is a pressure extruded sheath annealed to produce shrinkage, and is made of material having a tensile modulus of at least 700 MPa.

4,715,677

RUGGEDIZED OPTICAL FIBER CABLE

Yasunori Saito, Cary, and John DeAngelo, Durham, both of N.C., assignors to Sumitomo Electric Research Triangle, Inc., Research Triangle Park, N.C.

Filed Dec. 24, 1985, Ser. No. 812,973

Int. Cl.⁴ G02B 6/44

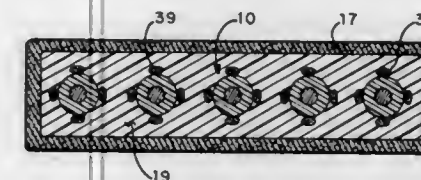
U.S. Cl. 350—96.23

22 Claims

1. A high strength flat optical fiber cable comprising: a plurality of plastic coated optical fibers in parallel relationship; and

an outer jacket surrounding said plurality of optical fibers, said outer jacket comprising a set resin having a plurality

of fiber reinforcement elements positioned throughout the set resin and extending generally parallel to said optical fibers with a high strength fiber reinforced resin jacket



wherein said fiber reinforcement elements comprise a plurality of monofilament yarns selected from the group comprising glass, Kevlar, carbon and graphite yarns.

4,715,678

OPTICAL FIBRE CABLE

Oliver S. Johnson, Kent, and Robert J. W. Powell, Middlesex, both of England, assignors to Telephone Cables Limited, England

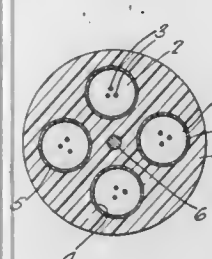
Filed Nov. 8, 1984, Ser. No. 669,580

Claims priority, application United Kingdom, Nov. 16, 1983, 8330621

Int. Cl.⁴ G02B 6/44

U.S. Cl. 350—96.23

10 Claims



1. An optical fibre cable comprising: a sheath having at least one channel extending along the sheath, at least one optical fibre contained within said at least one channel and, means located within and distributed along the sheath, for catalyzing the oxidation of hydrogen within the cable to water, said means including a quantity of hydrogen trapping material together with at least one of a waterblocking and a water-absorbing substance.

4,715,679

LOW DISPERSION, LOW-LOSS SINGLE-MODE OPTICAL WAVEGUIDE

Venkata A. Bhagavatula, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 496,560, May 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 328,369, Dec. 7, 1981, abandoned. This application Feb. 2, 1987, Ser. No. 9,820

Int. Cl.⁴ G02B 6/22

U.S. Cl. 350—96.33

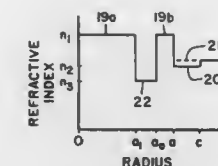
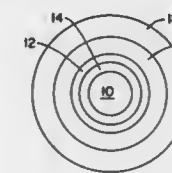
30 Claims

15. A single-mode optical waveguide fiber comprising a core of transparent material having a maximum refractive index n_1 and a radius a , and a layer of transparent cladding material on the outer surface of said core, the refractive index n_2 of said cladding being less than n_1 ,

said waveguide being characterized in that said core includes at least one annular region of depressed refractive index, the inner radius a_1 of the innermost of said regions being greater than zero and the maximum radius a_0 of the outermost of said regions of depressed refractive index being less than a , the

refractive index profile of said single-mode fiber being such that:

(a) said fiber is relatively free from microbending loss, and
(b) said fiber exhibits a waveguide dispersion characteristic which is such that:



(1) waveguide dispersion is relatively uniform with respect to wavelength so that the fiber is insensitive to manufacturing tolerances and

(2) waveguide dispersion is relatively large at wavelengths greater than 1400 nm so that large values of material dispersion can be completely cancelled.

4,715,680

OPTICAL SWITCH

Takao Kawaguchi, Moriguchi; Hideaki Adachi, Hirakata; Kentaro Setsune, Sakai; Kenzo Ohji, Ikoma, and Kiyotaka Wase, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

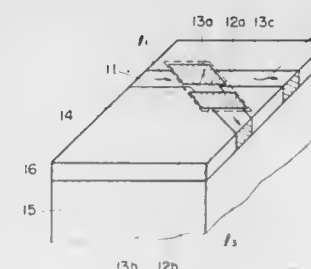
PCT No. PCT/JP84/00039, § 371 Date Oct. 5, 1984, § 102(e) Date Oct. 5, 1984, PCT Pub. No. WO84/03155, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 10, 1984, Ser. No. 667,480

Int. Cl.⁴ G02B 6/00

U.S. Cl. 350—96.34

18 Claims



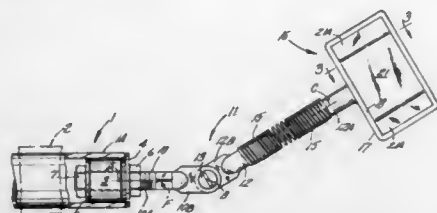
1. An optical switch of the type including at least an input optical wave guide; two branch optical wave guides; a pair of transmission control electrodes and a branch portion at which said input optical wave guide is branched into said branch optical wave guides, said input optical wave guide and said branch optical wave guides being made of electro-optical material and said transmission control electrodes being arranged in a spaced relation with a gap having a predetermined width therebetween, said gap being located at any one of the input optical wave guides and the branch optical wave guides in the vicinity of said branch portion so that transmission of light beams through the input optical wave guide and the branch optical wave guide is controlled by applying a predetermined voltage to the transmission control electrodes

thereby changing the refractive index of the optical wave guide at the position located below said gap, wherein the input optical wave guide and the branch optical wave guide are constituted by a layer of a PLZT ((Pb, La) (Zr, Ti) O₃) based thin film which is formed by epitaxial growth on the base plate located on a C-plane of sapphire (α -alumina).

4,715,681
BICYCLE REFLECTOR FOR HANDLEBAR ATTACHMENT

William M. Johnson, P.O. Box 70404, Eugene, Oreg. 97401
Filed Mar. 3, 1986, Ser. No. 835,371
Int. Cl.⁴ G02B 5/08, 7/18
U.S. Cl. 350—99

5 Claims



1. A reflector assembly for inserted attachment to a tubular structure of a vehicle, said assembly comprising, expandable mounting means including a plug of elastomeric material, adjustable means acting on said plug to radially expand same when positioned within the tubular structure to secure same therein, articulated arm means including a threaded arm segment extending through said plug and on which said adjustable means are carried for acting on said plug, and a reflector carried by said arm means and offset from said plug.

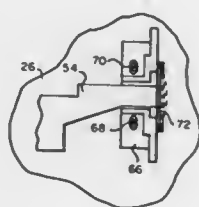
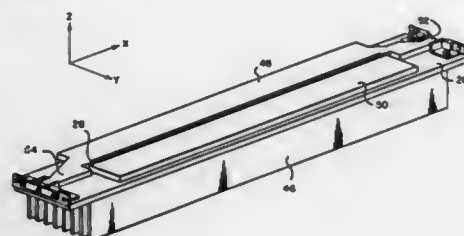
4,715,682
MOUNT FOR IMAGING LENS ARRAY ON OPTICAL PRINT HEAD

Kevin C. Koek; William T. Matthias, both of Rochester, and James T. Barton, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 11, 1986, Ser. No. 884,943
Int. Cl.⁴ G02B 7/02, 6/04

U.S. Cl. 350—253

5 Claims



1. Apparatus for mounting an imaging lens array formed of a plurality of gradient index optical fibers onto a print head having a linear array of light sources, such that the optical

fibers are accurately spaced from the light sources in a first direction along their optical axes and are accurately positioned in a second direction lateral to the length of the light source array so as to align with the light sources; said apparatus comprising:

first attachment means for totally constraining one end of the imaging lens array relative to the print head; and second attachment means for constraining the other end of the imaging lens array to inhibit movement of the lens array in the first and second directions while permitting at least limited relative movement between said other end of the imaging lens array and the print head in a third direction along the length of the light source array to accommodate different rates of thermal expansion of the imaging lens array and of the print head.

4,715,683
MODIFIED LIQUID CRYSTAL TELEVISION AS A SPATIAL LIGHT MODULATOR

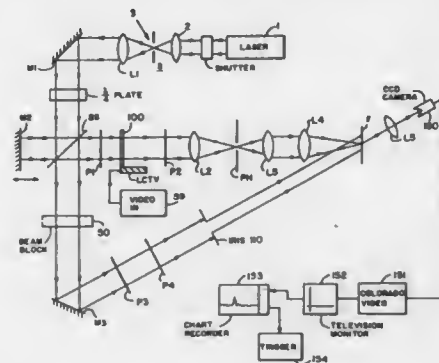
Don A. Gregory, Huntsville, Ala., and Bob D. Guenther, Cary, N.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 10, 1986, Ser. No. 928,492

Int. Cl.⁴ G02F 1/13; G03H 1/08; G02B 5/32

U.S. Cl. 350—331 R

4 Claims



1. A system comprising a laser producing a laser beam, first means for splitting said laser beam into first and second parts, a liquid crystal television having a screen, a lens, input means connected to said television so as to cause a scene to be depicted on said screen, said screen positioned such that the first part of said laser beam will pass through said screen and be modulated by the scene thereon, and be transformed by said lens, film means being positioned so as to receive said first part of said laser beam after it passes through said screen; and said second part of said laser beam being directed towards said film means by a path which does not pass through said TV screen so as to act as a reference beam, whereby said film means will produce a holograph of said scene on said TV screen.

4,715,684
OPTICAL SYSTEM FOR THREE COLOR LIQUID CRYSTAL LIGHT VALVE IMAGE PROJECTION SYSTEM

Ralph J. Gagnon, Chico, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 20, 1984, Ser. No. 622,528

Int. Cl.⁴ G02F 1/13; G02B 27/14, 27/28, 21/00

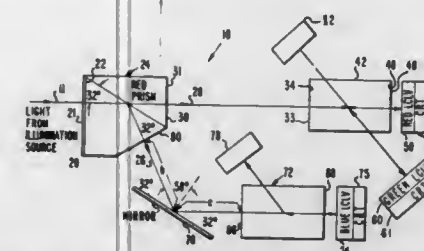
U.S. Cl. 350—331 R

20 Claims

1. In a multi color projection system, having first means for providing a source of light energy, first, second and third liquid crystal light valves; first, second and third means for providing an optical signal for use in combination with said first, second and third liquid crystal light valves; and first and second projection lenses, the improvement comprising:

a first beam splitter for splitting light incident thereon into first and second beams, said first beam including first and second color components having said first polarization state and a first color component having a second polarization state; said second beam including said second color component and a third color component, both of said second and third color components having said second polarization state;

a second beam splitter mounted in the optical path of said first beam and oriented with respect to said first beam splitter, to reverse the polarization states of the light incident thereon and to direct the first color component of said first polarization state to said first light valve and



polarization modulated light from said first light valve to said first projection lens; said second beam splitter also directing the second color component of said second polarization state to said second light valve and polarization modulated light from said second light valve to said first projection lens; and

a third beam splitter responsive to said third color component and oriented with respect to said second beam for reversing the polarization state of said third color component and for directing said third color component having a first polarization state to said third light valve and polarization modulated light from said third light valve to said second projection lens.

4,715,685
LIQUID CRYSTAL DISPLAY HAVING POTENTIAL SOURCE IN A DIODE RING

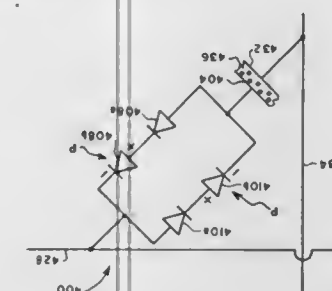
Zvi Yaniv, Southfield; Vincent D. Canella, Birmingham; Walter E. Chapelle, Southfield, and Roger W. Pryor, Bloomfield Hills, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 4, 1985, Ser. No. 708,355

Int. Cl.⁴ G02F 1/133

U.S. Cl. 350—332

18 Claims



1. A light influencing display comprising: a plurality of pixels, at least one pixel including a pair of electrodes, at least one of said electrodes being light transmissive; isolation means coupled to one of said electrodes to enable the selective application of driving potentials across said electrodes; and light influencing material disposed between said electrodes; said isolation means including bidirectional threshold means for establishing first and second threshold voltages of opposite polarity and including a first threshold device having a first threshold voltage, and a second threshold device having a

second threshold voltage, said first and second threshold devices being coupled together in a ring to establish first and second threshold voltages of opposite polarity; and first and second photovoltaic potential sources coupled in series with said first and second threshold devices respectively, said first threshold device being in series with said first photovoltaic potential source in the ring and said second second threshold device being in series with said second photovoltaic potential source in the ring for back biasing said first and second threshold devices and increasing the absolute magnitude of said first and second threshold voltages.

4,715,686
LIGHT-PASSIVE DISPLAY DEVICE AND METHOD OF MANUFACTURING SAME

Yukihiko Iwashita, and Hideaki Okumura, both of Shiojiri, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

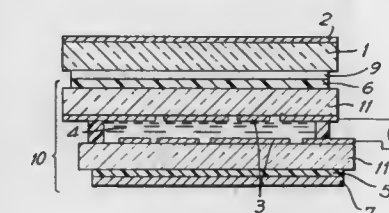
Filed Nov. 14, 1985, Ser. No. 798,094

Claims priority, application Japan, Nov. 16, 1984, 59-241937; Nov. 28, 1984, 59-252575; Dec. 17, 1984, 59-265649

Int. Cl.⁴ G02F 1/133

U.S. Cl. 350—339 R

29 Claims



1. A liquid crystal display device having at least one transparent substrate and improved optical properties due to a reduction in light reflected from the exterior surface of the at least one transparent substrate, comprising:

a polarizing plate disposed on the exterior surface of the at least one transparent substrate;

a transparent glass plate having an anti-reflection surface on the polarizing plate;

an adhesive layer provided on at least a portion of the interface between the polarizing plate and the glass plate on the side opposite the anti-reflection surface for causing the glass plate to adhere to the polarizing plate; and

wherein at least the at least one transparent substrate, the polarizing plate and the glass plate have substantially the same refractive index.

13. A method of producing a liquid crystal display assembly including a liquid crystal element having at least one transparent substrate, a polarizing plate provided on the exterior surface of the at least one transparent substrate and a transparent glass anti-reflection plate which adheres with optical uniformity on the polarizing plate, comprising:

adhering a polarizing plate to the exterior surface of the at least one transparent substrate;

placing a transparent adhesive film on at least a portion of the polarizing plate;

placing a transparent glass anti-reflection plate on the adhesive film to form an assembly;

heating the assembly; and

applying pressure to the assembly while it is heated.

4,715,687

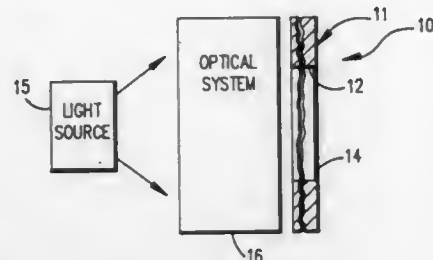
COLOR VARIATION IN A PASSIVELY ILLUMINATED DISPLAY USING FLUORESCENT LIGHT SOURCES

David W. Glass, Georgetown, and Wilson M. Routt, Jr., Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1986, Ser. No. 945,630

Int. Cl.⁴ G02F 1/13; F21K 2/00; H01J 1/62; H05B 37/00
U.S. Cl. 350—345

19 Claims



1. A passively illuminated display including: a plurality of switch means disposed in a desired arrangement; light source means disposed to illuminate each of said switch means to enable each of said switch means to display light from said light source means when said switch means is in its selected state; activating means to activate said light source means at rapid time intervals; said light source means producing light of a first color during a first time period when said light source means is activated by said activating means and at least light of a second color during a second time period when said light source means is not activated by said activating means; and means to selectively control each of said switch means to cause each of said switch means to be in the selected state for displaying light from said light source means during the first time period, the second time period, or to not be in the selected state during either of the time periods, each of said switch means displaying light of the first color if in the selected state during the first time period and displaying light of the second color if in the selected state during the second time period.

4,715,688

FERROELECTRIC LIQUID CRYSTAL DISPLAY DEVICE HAVING AN A.C. HOLDING VOLTAGE

Takamasa Harada; Masaaki Taguchi, and Koji Iwasa, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

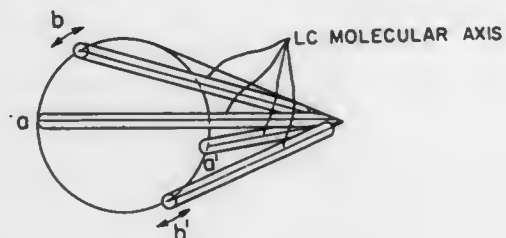
Filed Dec. 10, 1984, Ser. No. 679,760

Claims priority, application Japan, Jul. 4, 1984, 59-138832; Oct. 15, 1984, 59-215363

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—350 S

41 Claims



1. A liquid crystal display device driven in a time-sharing mode, comprising: a pair of electrodes spaced apart from each other; a ferro-electric liquid crystal layer disposed between the

pair of electrodes such that the layer loses a spiral molecular alignment thereof to establish two-bistable molecular alignments thereof; drive means connected between the pair of electrodes for applying an electric signal to the layer sufficient to change one of the two bi-stable molecular alignments to the other bi-stable molecular alignment and for applying an A.C. electric signal to the layer effective to hold the other bi-stable molecular alignment, the A.C. electric signal having an amplitude and a pulse width insufficient to change the bi-stable molecular alignments; and converting means for converting the two bi-stable molecular alignments to corresponding optical ON and OFF display states, respectively.

23. A smectic liquid crystal display device comprising in combination: a liquid crystal panel including a pair of opposed base plates, electrodes disposed on the respective inner surfaces of the opposed base plates, alignment membranes shaped on the respective inner surfaces of the opposed base plates, and a smectic liquid crystal compound inserted between the opposed base plates at an interval less than a spiral pitch of the liquid crystal compound so that the liquid crystal compound is aligned by the alignment membranes to establish two bi-stable optical states; means for applying a liquid crystal operating voltage of one polarity in a first half of an electrode selecting operation to the electrodes so as to select one of the two bi-stable optical states and for applying another liquid crystal operating voltage of another polarity in a second half of the electrode selecting operation to the electrodes so as to select the other bi-stable optical state, and means for applying to the electrodes an alternating voltage which is less than the liquid crystal operating voltage in a non-electrode selecting operation so as to hold the selected bi-stable optical state.

4,715,689

APPARATUS AND METHOD FOR SPATIAL INTENSITY THRESHOLD DETECTION

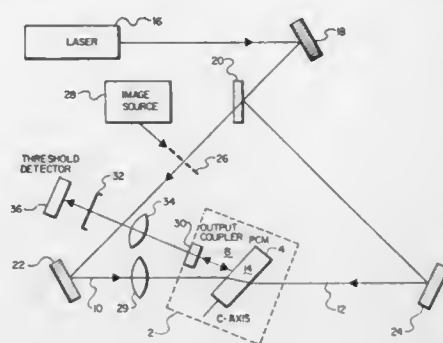
Thomas R. O'Meara, Malibu, and Richard C. Lind, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 20, 1986, Ser. No. 864,937

Int. Cl.⁴ G02B 5/23; G02F 1/01

U.S. Cl. 350—354

25 Claims



1. A spatial optical intensity threshold detector, comprising: a phase conjugate resonator (PCR) comprised of a phase conjugate mirror (PCM), a mirror means optically opposed to the PCM and an oscillation cavity between the PCM and mirror means, the PCR having a greater than unity gain, means for applying an optical input beam having a spatial intensity pattern to the PCR, the beam cooperating with the PCR to produce a high intensity spatial PCR oscillation output at locations corresponding to the beam having optical intensities on one side of a threshold intensity level, and an optical detector means positioned to sense the PCR oscillation pattern.

4,715,690

PHOTOGRAPHIC SCREEN

Kaoru Onodera; Satoru Hohnishi; Kazuyuki Kobayashi, and Kazuo Shiozawa, all of Hino, Japan, assignors to Konishiroku Photo Ind. Co., Ltd., Tokyo, Japan

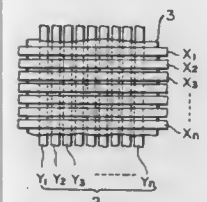
Continuation of Ser. No. 836,223, Feb. 28, 1986, abandoned, which is a continuation of Ser. No. 525,254, Aug. 19, 1983, abandoned, which is a continuation of Ser. No. 234,329, Feb. 13, 1981, abandoned. This application Dec. 31, 1986, Ser. No. 948,430

Claims priority, application Japan, Feb. 13, 1980, 55-15509

Int. Cl.⁴ G02F 1/17

U.S. Cl. 350—357

15 Claims



1. A light transmitting electrochromic optical screen for photographic use, said screen being arranged to pass light prior to the light exposing a photosensitive material, comprising: an optically heterogeneous pattern consisting of regions of relatively higher light transmission density and regions of relatively lower light transmission density, and means for variably defining predetermined areas on said screen as said regions of higher and lower light transmission density by varying at least one of: (i) the area of both said higher and lower light transmission density regions, and (ii) the transmission density of said region of relatively higher light transmission density, to thereby vary the pattern of said relatively higher and lower light transmission density regions of said screen and thereby varying the light transmission characteristics of said screen.

4,715,691

ELECTROCHROMIC DISPLAY USING BIPOLAR ION-EXCHANGE MEMBRANE

Toshikatsu Sata, Tokuyama; Teruaki Katsube, Tokyo, and Yoshiya Iida, Yokohama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

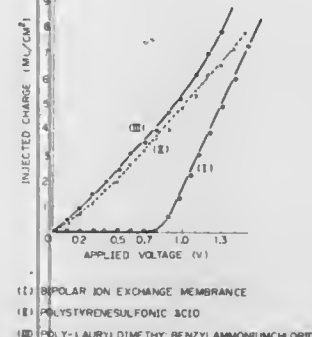
Filed Dec. 10, 1985, Ser. No. 807,250

Claims priority, application Japan, Dec. 12, 1984, 59-260858

Int. Cl.⁴ G02F 1/23

U.S. Cl. 350—357

8 Claims



(1) BIPOLAR ION-EXCHANGE MEMBRANE
(2) POLYSTYRENE-SULFONIC ACID
(3) POLY-L-LAURYL-DIMETHYL-BENZYL-AMMONIUM-CHLORIDE

1. An electrochromic display comprising a transparent electroconductive substrate as an electrode, an electrochromic layer, an ion-exchange membrane and a counter electrode in a

laminated structure, said ion-exchange membrane being a bipolar ion-exchange membrane comprising at least one cation-exchange membrane layer having cation-exchange groups and at least one anion-exchange membrane layer having anion-exchange groups in a laminated structure.

4,715,692

VARIFOCAL TYPE FINDER

Yasuyuki Yamada, Tokyo; Kazuo Fujibayashi, Kanagawa; Yasuhisa Sato, Kanagawa, and Hideo Yokota, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

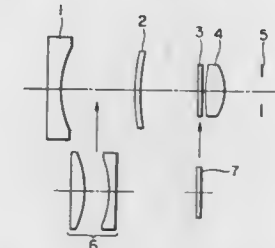
Filed Sep. 24, 1984, Ser. No. 653,966

Claims priority, application Japan, Sep. 28, 1983, 58-149729[U]

Int. Cl.⁴ G02B 15/02; G03B 13/10

U.S. Cl. 350—422

6 Claims



1. A finder of the variable magnification type comprising: an objective lens; an eyepiece arranged in a spaced relation to said objective lens; an auxiliary lens for magnification change arranged to be inserted into and retracted from a space between the objective lens and the eyepiece; and means arranged in between the objective lens and the eyepiece to provide viewfield frames of different sizes when the auxiliary lens is inserted and retracted.

4,715,693

VARI-FOCAL PHOTOGRAPHIC LENS SYSTEM OF REAR LENS GROUP EXCHANGE TYPE

Hiroshi Takase; Masaki Imaizumi, and Toru Fujii, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

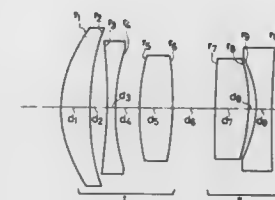
Filed Feb. 12, 1985, Ser. No. 701,040

Claims priority, application Japan, Feb. 16, 1984, 59-26073

Int. Cl.⁴ G02B 15/02, 9/34, 9/60

U.S. Cl. 350—422

4 Claims



1. A vari-focal photographic lens system of rear lens group exchanging type comprising, in the order from the object side, a front lens group and a rear lens group, said front lens group consisting of a positive lens, a negative lens and a positive lens, having a positive refracting power as a whole, and being located more toward the object side position in the tele-position than the position in the wide position, said rear lens group

being arranged to be exchangeable in the tele-position and in the wide-position, and consisting of a positive lens and a negative lens in the wide position and consisting of a negative lens in the tele-position, said vari-focal photographic lens system being arranged to vary the focal length of the lens system as a whole by exchanging said rear lens group.

4,715,694

BEAM STEERING MIRROR CONSTRUCTION

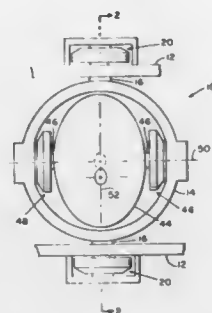
Frederick G. Eitel, Palm Beach, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 28, 1986, Ser. No. 856,263

Int. Cl.⁴ G02B 26/10

U.S. Cl. 350—486

3 Claims



1. A beam steering mirror construction comprising a beam steering mirror with trunnion mounting shafts projecting from opposite sides thereof for rotation of the beam steering mirror about a primary axis through a centroid of the mirror, a ring structure surrounding said beam steering mirror and trunnion mounting said shafts of said beam steering mirror relative to said ring structure, said ring structure having trunnion mounting shafts projecting therefrom on a secondary axis that is 90° from the trunnion primary axis of said beam steering mirror and said secondary axis being located in the same plane as said primary axis, a set of trunnion bearings mounting said ring structure at said shafts relative to a stationary support structure, electric torque motor actuator means mounted relative to said beam steering mirror shafts and said ring structure for adjusting said beam steering mirror about said primary axis, an electric torque motor actuator means mounted between said trunnion mounting shafts of said ring structure and said stationary support structure for adjusting said ring structure about said secondary axis, and said trunnion mounting shafts of said ring structure and said trunnion mounting shafts of said beam steering mirror each having torsion spring means which spring bias these trunnion mounting shafts for rotary constraints by the torsion spring means.

4,715,695

FIBER FOR OPTICAL TRANSMISSION

Masayuki Nishimura, Shuzo Suzuki, and Hiroshi Yokoto, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

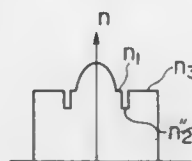
Filed Apr. 11, 1984, Ser. No. 599,023

Claims priority, application Japan, Jun. 15, 1983, 58-107354

Int. Cl.⁴ G02B 6/16

U.S. Cl. 350—96.31

3 Claims



1. A fiber having only a single core for optical transmission,

said core having a substantially parabolic distribution of refractive index for propagating light in a plurality of modes, said fiber further comprising: a first cladding layer formed around said core having a refractive index equal to that at a peripheral portion of said core, wherein the thickness of said first cladding layer is between $D/100$ and $d/20$, where D is the diameter of said core; a second cladding layer formed around said first cladding layer having a refractive index smaller than that of said first cladding layer; and a third cladding layer formed around said second cladding layer having a refractive index greater than that of said second cladding layer, wherein said core propagates all of said plurality of modes and said cladding layers affect retardation times of said plurality of modes propagating in said core.

4,715,696

FLEX COUPLINGS ISOLATE STABILIZING MIRRORS

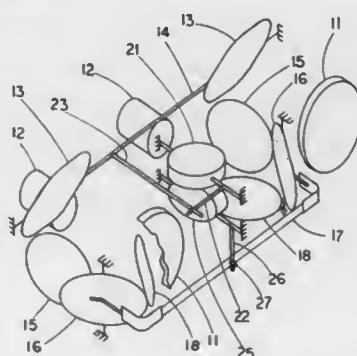
Orville T. Greene, Jr., 1 Marla Ct., Stafford, Va. 22554, and John A. Mead, 506 Tree Top Dr., Apt. 102, Virginia Beach, Va. 23451

Filed Jul. 1, 1986, Ser. No. 881,113

Int. Cl.⁴ G02B 27/64, 23/00

U.S. Cl. 350—500

7 Claims



1. In an image stabilizing binocular with two pitch mirrors carried in line on a common bar whose outboard extremities are attached to the frame through pivot wires defining a pitch axis about which said mirrors compensate the line-of-sight for frame oscillation with rotation through a linkage by a relatively small single-degree-of-freedom gyroscope, the inclusion of spring ribbon couplings to connect said mirrors to said common bar; each said coupling, with its width parallel to pitch, being fastened to said common bar along its length near its middle and to the back side of one mirror near both its ends, leaving curled portions of its length free to isolate said mirrors from visible vibration.

4,715,697

MICROSCOPE BODY SYSTEM

Puthenpurackal K. John, Pittsford, and Arthur H. Shoemaker, Orchard Park, both of N.Y., assignors to Cambridge Instruments Inc., Buffalo, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,878

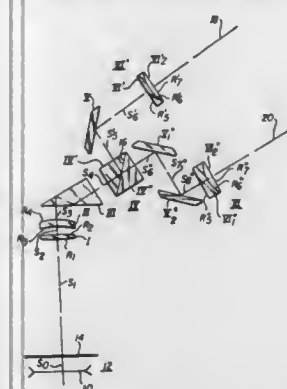
Int. Cl.⁴ G02B 21/20, 21/36

U.S. Cl. 350—502

17 Claims

1. A microscope body having an optical system comprising: telescope objective means for imaging light from an infinity corrected objective having a predetermined amount of residual lateral color; a beam divider receiving light from said telescope objective means; means for providing a pair of eyepiece focal planes including light transmitting elements; and deflectors to direct light from said telescope objective means to said eyepiece focal planes, said telescope objective means, beam divider and light transmitting elements hav-

ing individual glass properties selected to compensate, in combination, for said predetermined amount of residual



lateral color of the objective without the introduction of axial color aberration.

4,715,699

SCANNING OPTICAL SYSTEM FOR LASER BEAM PRINTERS

Akira Morimoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

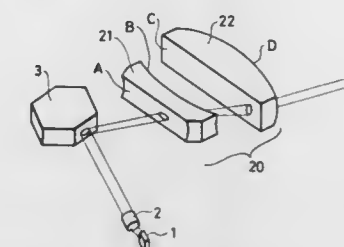
Filed Jan. 28, 1986, Ser. No. 823,236

Claims priority, application Japan, Jan. 28, 1985, 60-13989; Apr. 22, 1985, 60-86705

Int. Cl.⁴ G02B 26/08

U.S. Cl. 350—6.8

9 Claims



1. In a scanning optical system composed of a semiconductor laser, a collimator lens that produces substantially parallel rays of light from the beam emitted from the semiconductor laser, a deflector for deflecting said parallel rays of light, and a scanning lens system that focuses the deflected rays to form a spot on a scanning surface, the improvement wherein the normal direction in which light emitting from the semiconductor laser has a wide angle spread is in alignment with a scanning direction of said scanning optical system, said scanning lens system having an anamorphic configuration and being so designed that the point of an image formed in an auxiliary scanning direction upon receiving parallel rays of light containing no astigmatism is offset from the point of an image formed in the scanning direction.

4,715,698

HEATER-EQUIPPED OUTER REARVIEW MIRROR

Shinji Haba, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

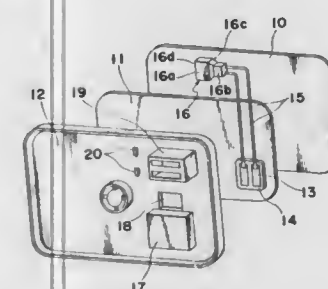
Filed Dec. 9, 1986, Ser. No. 939,718

Claims priority, application Japan, Dec. 9, 1985, 60-190046[U]

Int. Cl.⁴ B60R 1/06

U.S. Cl. 350—588

3 Claims



1. A heater-equipped outer rearview mirror comprising: a mirror; a mirror holder for holding said mirror; a flat heater interposed between said mirror and said mirror holder; a connector; and lead wires connecting said heater to said connector, said flat heater having a terminal fixing portion which protrudes from a back face thereof and is connected to terminals of said lead wires, said mirror holder including a box, which is provided at the back face thereof so as to accommodate said terminal fixing portion, a hole, which penetrates therethrough to permit said lead wires and said connector to pass therethrough from the front face of said mirror holder toward the back face thereof, and a connector holding portion which protrudes from the back face of said mirror holder so as to hold said connector therein.

4,715,700

LIGHT EMITTING OPTICAL FIBER ASSEMBLIES INCLUDING LIGHT CONTROLLING

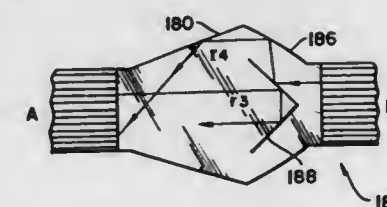
Maurice Daniel, 550 Jaycox Rd., Avon Lake, Ohio 44012 Division of Ser. No. 427,155, Sep. 29, 1982, Pat. No. 4,519,017.

This application May 7, 1985, Ser. No. 731,511

Int. Cl.⁴ G02B 6/36, 7/00, 17/00, 6/26

U.S. Cl. 350—618

7 Claims



1. A light controlling diode assembly including a transmitting optical unit having a light input end and a light output end and optical diode means mounted in said optical unit between the input and output ends thereof, said optical diode means including a first surface means positioned to face said light output end and operative to reflect light passing from said output end toward said input end back to said output end and second surface means positioned to deflect light from said input end toward said output end.

4,715,701

MIRROR AND BRACKET ASSEMBLY

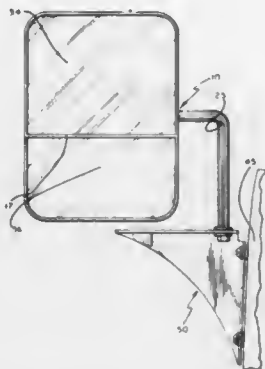
Milfred W. Urban, 1337 N. Meridian, Wichita, Kans. 67203

Filed Jul. 23, 1986, Ser. No. 888,413

Int. Cl.⁴ G02B 5/10, 7/18

U.S. Cl. 350—625

13 Claims



1. A break-away rearview mirror comprising a mirror housing having a lower housing recess and an upper housing recess separated from said lower housing recess by a partition; at least one lower central support means secured generally to the approximate center of the bottom of said lower housing recess and a plurality of lower peripheral support means attached to the bottom of said lower housing recess and generally circumscribing said lower central support means; at least one upper central support means attached generally to the approximate center of the bottom of said upper housing recess and a plurality of upper peripheral support means secured to the bottom of said upper housing recess and generally circumscribing said upper central support means; a first bonding means with a predetermined setting time positioned on top of said upper and lower central support means; a second bonding means with a predetermined setting time that is longer than said predetermined setting time of said first bonding means and positioned on top of said plurality of upper and lower peripheral support means whereby when said second bonding means sets, it sets into an elastic, rubbery solid; a flat mirror of unity magnification disposed on said upper central support means and said plurality of upper peripheral support means, and bonded thereto by said first and second bonding means after the same have solidified; a convex mirror optically pre-aligned disposed on said lower central support means and said plurality of lower peripheral support means and bonded thereto by said first and second bonding means after the same have solidified; said second bonding means adapted upon solidification to provide a cushion effect for the flat mirror and the convex mirror against the upper and lower peripheral support means, respectively, to prevent the mirrors from breaking or becoming misaligned in the event the mirror housing is dropped or jarred; a mirror bracket means attached to said mirror housing; a molded synthetic resin bracket means comprising a generally hollow structure having a bracket recess for receiving therethrough said bracket means and a pair of generally rectangular mating box-like members, each including a pair of end walls and a pair of side walls, an end wall of each pair of boxlike members including a semi-cylindrical recess defining a portion of said bracket recess such that when said box-like members mate, the semi-cylindrical recess on each portion of said box-like members are aligned when the bracket recess is formed; a means for attaching said mirror bracket means to said molded bracket means to hold said mirror housing in an upright position; and a mounting bracket means connecting to said molded bracket means to mount said combined mirror housing-mirror bracket means-molded bracket means on an automobile and, said mounting bracket means having a structural portion of same being encased within said synthetic resin bracket means, said combined mirror housing-mirror bracket means breaking-

away from said molded synthetic resin bracket means upon impact.

4,715,702

DECORATIVE LENS

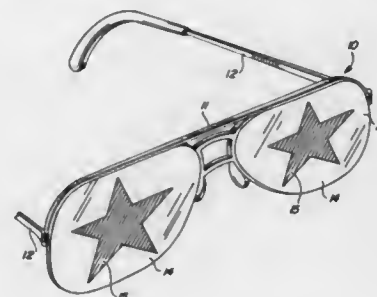
Stephen M. Dillon, 7442 E. Butherus Dr., Scottsdale, Ariz. 85260

Filed Oct. 20, 1986, Ser. No. 920,762

Int. Cl.⁴ G02C 7/10; G02B 5/30

U.S. Cl. 351—44

9 Claims



1. A multiple element construction comprising:
a first transparent element having a first pattern formed thereon,
said first pattern having a first color and a field surrounding said first pattern having a second color,
a second transparent element coated with a relatively thin layer of reflective material,
said thin layer of reflective material being so thin and sparsely applied so that only a fraction of light impinging thereon is reflected and the remainder passes there-through, and
a third transparent element having a second pattern identical to said first pattern formed thereon in axial alignment with said first pattern,
said second pattern having a color identical with said second color of said first element and the field surrounding said second pattern having a color identical with said first color of said first pattern.

4,715,703

OCULAR-FUNDUS ANALYZER

Tom N. Cornsweet, and Samuel Hersh, both of Mission Viejo, Calif., assignors to Rodenstock Instrument Corporation, Los Angeles, Calif.

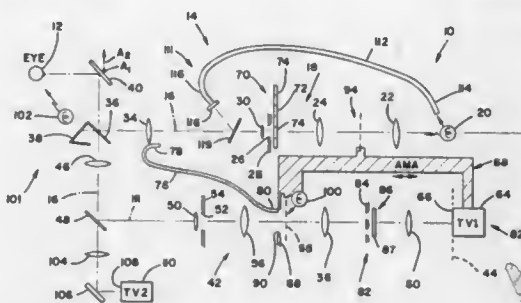
Continuation of Ser. No. 433,813, Oct. 12, 1982, abandoned.

This application Jan. 14, 1986, Ser. No. 818,913

Int. Cl.⁴ A61B 3/10, 3/14

U.S. Cl. 351—205

24 Claims



1. Apparatus for examining the ocular fundus of an eye comprising:
(a) illuminating means for illuminating the ocular fundus, said illuminating means including aperture means having

the form of non-overlapping apertures positioned substantially side by side and image forming means for forming an image of said aperture means on a part of the ocular fundus;

(b) imaging means, responsive to reflections from said illuminated ocular fundus, for forming an image of the ocular fundus at a detecting plane, said imaging means including stereo means for providing a stereo pair of images of the ocular fundus at said detecting plane;
(c) detecting means for detecting an image of the ocular fundus appearing at said detecting plane; and
(d) electronic data processing means connected to said connecting means for electronically processing and digitally analyzing said image thereby to display information about the ocular fundus under examination.

4,715,704

LIGHT TRAP FOR SURGICAL OPERATION MICROSCOPES

Klaus Biber, Aalen, and Gerhard Unold, Essingen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Continuation of Ser. No. 660,896, Oct. 15, 1984, abandoned.

This application Oct. 21, 1986, Ser. No. 921,596

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339172

Int. Cl.⁴ A61B 3/10, 3/08

U.S. Cl. 351—207

1 Claim



1. The method of illuminating an eye of a patient during surgery thereon, which comprises:

(a) providing a surgical operation microscope having a microscope optical system which may be focused on an eye to be operated upon;
(b) providing said microscope with an illumination system for projecting an illuminating beam of light onto said eye to be operated upon;
(c) providing a shiftable blocking member shiftable between a blocking position and a non-blocking position with respect to said beam of light;
(d) said blocking member when in its effective blocking position serving to intercept and block a central core portion of said beam of light to prevent the central core from reaching the eye to be operated upon while allowing a ring of light around said blocked central core to reach said eye, said blocked central core at the location where said beam impinges on the eye being substantially concentric with and of approximately the same size as the pupil of the eye, so that direct light of said beam will not enter the eye through the pupil and reach the retina and fundus portions of the eye;
(e) said method further comprising keeping said blocking member in its said effective position during at least a substantial part of an operation on the eye, to relieve the patient of discomfort which would be caused by impinge-

ment of said illuminating beam onto the retina of the eye; and

(f) moving said blocking member to its ineffective position only for brief intervals during the operation, only when additional illumination of the retina and fundus portions of the eye is temporarily needed.

4,715,705

METHOD FOR PRESENTATION OF INFORMATION OF A PLURALITY OF SHEETSHAPED INFORMATION CARRIERS AND A DEVICE FOR THE ACCOMPLISHMENT OF THE METHOD

Bert Nord, Västra Frölunda, Sweden, assignor to Ingenjorsfirma B Nord AB, Sweden

PCT No. PCT/SE85/00284, § 371 Date Mar. 20, 1986, § 102(e)

Date Mar. 20, 1986, PCT Pub. No. WO86/01008, PCT Pub.

Date Feb. 13, 1986

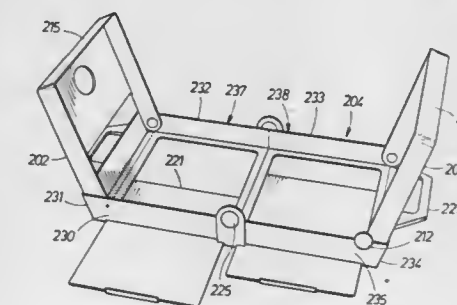
PCT Filed Jul. 18, 1985, Ser. No. 849,452

Claims priority, application Sweden, Jul. 23, 1984, 8403821

Int. Cl.⁴ G03B 21/54

U.S. Cl. 353—120

8 Claims



1. A device for presentation of information including a plurality of sheetshaped information carriers which are connected to each other in continuous series of said sheets, which sheets along opposite edge portions are connected with each other along folding lines so that the series of sheets extends zig-zag like and in a stored position form a pack of said sheets, in which pack the sheets are close to each other and from which the sheets can be folded out for presentation of information on the sheets, said device further including two side support means arranged on the sides of a presentation means, said presentation means being pivotable along a central line around a pivot, said side support means being positioned with an interspace relative to each other, said interspace being approximately twice the width of each sheet between said folding lines so that two of said sheets can be held extended on said presentation means, one of said side supports being arranged to support said pack of sheets, whereas the other side support means is arranged to receive sheets which consecutively are folded over to said second side support means.

4,715,706

LASER DOPPLER DISPLACEMENT MEASURING SYSTEM AND APPARATUS

Charles P. Wang, 1180 Mahalo Pl., Compton, Calif. 90220

Filed Oct. 20, 1986, Ser. No. 920,660

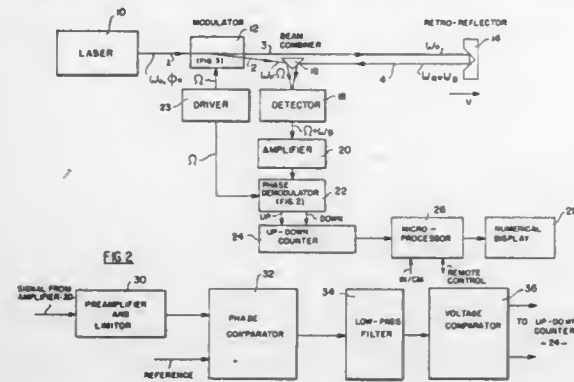
Int. Cl.⁴ G01C 3/08

U.S. Cl. 356—5

4 Claims

1. Apparatus for measuring the displacement of a moving retro-reflective target from a reference position comprising: a laser for producing a laser beam of a particular frequency ω_0 ; oscillator means for producing an electrical heterodyning reference signal of a particular frequency Ω ; an optical modulator interposed between the laser and the target for passing the laser beam ω_0 from the laser to the target to be reflected thereby as a reflected laser beam $\omega_0 + \omega_D$ parallel to and displaced from the laser beam ω_0 and having a frequency shift ω_D

proportional to the velocity of the target and connected to said oscillator means for producing a refracted laser beam $\omega_0 \pm \Omega$ having a frequency shifted by a predetermined amount Ω ; beam combining means positioned in the paths of the refracted beam $\omega_0 \pm \Omega$ from the modulator and the reflected beam $\omega_0 + \omega_D$ from the target for combining the two beams and for producing a combined output beam $\Omega \pm \omega_D$ in response thereto; a photodetector positioned in the path of the combined



output beam $\Omega + \omega_D$ from the beam combining means for producing an electrical beat output signal $\Omega + \omega_D$ in response thereto; means including a phase-demodulator coupled to said detector and to said oscillator means and responsive to the beat output signal $\Omega + \omega_D$ from said detector for comparing the phases of said beat output signal $\Omega + \omega_D$ and said reference signal Ω to produce an output signal $\Delta\phi$ having a phase displacement from said reference signal Ω proportional to the displacement ΔZ of the target from the reference position,

$$\Delta Z = \frac{C}{2\omega_0} \left(N + \frac{\phi}{2\pi} \right),$$

where C is the speed of light, N is the number of half wavelengths, and ϕ is the phase angle less than 2π ; and for applying the heterodyning signal to the optical modulator and to the phase demodulator; and utilization means coupled to said phase demodulator and responsive to the output signal therefrom for providing a measurement of the displacement of the target from the reference position.

4,715,707

LASER DOPPLER VELOCIMETER WITH LASER BACKSCATTER DISCRIMINATOR

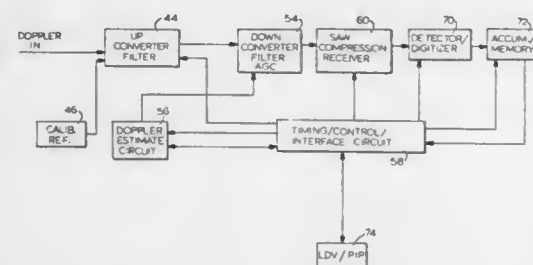
Albert H. Reynolds, III, St. Louis County; Ernie C. McDaniel, St. Charles County, and Roland E. Juhala, St. Charles, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 3, 1986, Ser. No. 847,723

Int. Cl.⁴ G01P 3/36; G01S 7/48

U.S. Cl. 356—28.5

9 Claims



1. A laser doppler velocimeter with laser backscatter dis-

crimination for determining the relative velocity between an optical platform and another target, comprising:

means for generating a laser beam and directing said beam toward said target;

detector means for producing a doppler signal in response to the detection of said laser beam;

means for rejecting selected noise and backscatter signals from the doppler signal with band widths and amplitudes outside selected thresholds; and

means for enhancing the legitimate doppler signal from the target further comprising means for taking a selected number of spectra of the detected doppler signal, means for averaging said spectra to produce data from which a velocity sample is determined, means for determining the minimum and maximum derivatives of the average spectrum, and means for rejecting the velocity sample if the width difference between the frequencies of minimum and maximum derivatives exceeds a predetermined threshold.

4,715,708

PARTICLE ANALYZING APPARATUS WITH INDEX PROJECTING OPTICAL SYSTEM FOR DETECTING A FOCUSING STATE OF THE MEASURING SYSTEM

Yuji Ito, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

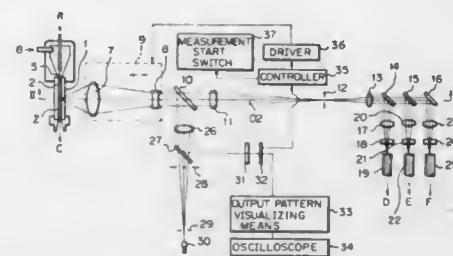
Filed May 28, 1986, Ser. No. 867,496

Claims priority, application Japan, Jun. 5, 1985, 60-121885

Int. Cl.⁴ G01N 21/01; G03B 3/10

U.S. Cl. 356—72

11 Claims



1. A particle analyzing apparatus comprising: an irradiating optical system for emitting a particle analyzing beam onto a particle to be examined, the particle flowing in a flow section of a flow cell; a measuring optical system for measuring light obtained by scattering of the particle analyzing beam by the particle to be examined, and/or fluorescent light obtained therefrom; an index projecting optical system for projecting at least two non-parallel index beams for detecting a focusing state of said measuring optical system with respect to said flow section of said flow cell; and a focusing state detection system for detecting the focusing state in accordance with an output pattern obtained by receiving the focusing detection beams reflected by first and second walls of said flow cell.

4,715,709

SURFACE FLAW DETECTING METHOD AND APPARATUS

Yoshitada Sekine, Yoya; Fumiki Yokota, Yamato, and Hisashi Kubota, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 26, 1985, Ser. No. 727,874

Claims priority, application Japan, Apr. 27, 1984, 59-83888; Apr. 27, 1984, 59-83889; Apr. 27, 1984, 59-83890

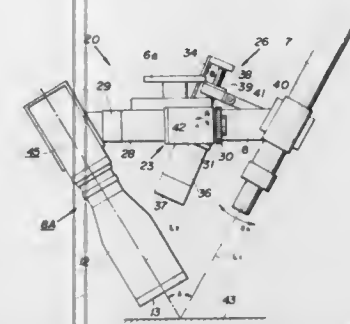
Int. Cl.⁴ G01N 21/88

U.S. Cl. 356—237

11 Claims

1. A method for detecting flaws in the surface of an object to be inspected, comprising the steps of:

transmitting a laser beam in a slit configuration onto a surface of the object; projecting the laser beam reflected by the surface of the object onto a part of a light-scattering plane screen; forming an image of the surface of the object on the part of the screen, the image having a first configuration in the form of a continuous slit when the surface of the object



has no flaw and having a second configuration in the form of a slit with a corresponding discontinuity when the surface of the object has a flaw; detecting both the first and second configurations of the image of the surface on said part of said screen; and producing a train of pulses in response to said first and second configurations of the image in which a possible surface flaw is indicated by a particular output level.

4,715,710

PUMP COLORIMETRIC ANALYZER

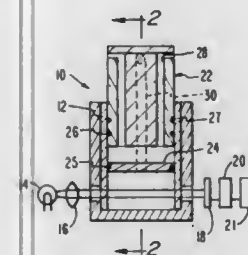
Marinus L. Andersen, Loveland, Colo., assignor to Hach Company, Loveland, Colo.

Filed Feb. 19, 1986, Ser. No. 830,969

Int. Cl.⁴ G01N 1/10, 21/85

U.S. Cl. 356—246

20 Claims



1. A pump colorimetric analyzer comprising: (a) a sample cell adapted to permit a light beam to be transmitted therethrough; (b) a light source adapted to transmit a light beam through said sample cell; (c) a photodetector adapted to detect light transmittance through said sample cell from said light source; (d) a piston adapted to reciprocate between first and second positions within said sample cell, said piston having a sample chamber therein which is adapted to permit said light beam from said light source to be transmitted through said chamber in said piston to said photodetector when said piston is in said second position, said piston further including means for introducing a liquid sample into said chamber and expelling said liquid sample from said chamber;

wherein said analyzer is adapted to measure light transmittance through a first liquid sample present in said sample cell when said piston is in said first position and is adapted to measure light transmittance through a second liquid sample present in

said sample chamber when said piston is in said second position.

4,715,711

MINIATURE SAPPHIRE ANVIL CELL FOR RESERVOIR FLUID PROPERTY STUDIES

Keh-Jim Dunn, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

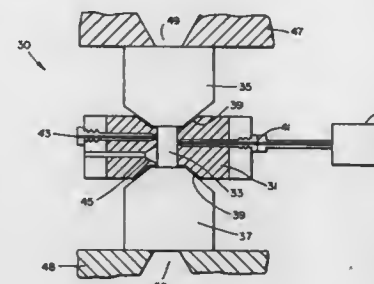
Continuation-in-part of Ser. No. 789,058, Oct. 18, 1985,

abandoned. This application Feb. 4, 1987, Ser. No. 10,601

Int. Cl.⁴ G01N 1/10

U.S. Cl. 356—246

3 Claims



1. A high-pressure cell for measuring the properties of a petroleum reservoir fluid sample, comprising: two truncated, essentially conical, transparent sapphire anvils having opposing flat surfaces, said anvils being aligned on the same lengthwise axis; a pressure vessel for containing a sample under high pressure having an inner chamber with an opening at each end of said pressure vessel, said pressure vessel being located between said sapphire anvils such that the opposing surfaces of said sapphire anvils are placed over said openings to form a high-pressure fluid-tight seal; gaskets located between said anvils and said pressure cell to ensure a pressure and fluid tight seal, wherein said gaskets are made of a material selected from the group consisting of soft metals and strong polymeric materials, said seals being formed by the yield point of said gaskets being exceeded by the compressive forces that the sapphire anvils exert on said pressure cell; a high-pressure inlet connected to said pressure vessel to admit a sample under high pressure; a high-pressure pump operably connected to said high-pressure inlet; a high-pressure outlet connected to said pressure vessel to remove said pressurized sample; and a pushing block located at the base of at least one sapphire anvil, said block having an aperture in the area adjacent to the sapphire anvil such that light may pass through the aperture in the block, the sapphire anvil, and the pressure vessel.

4,715,712

MULTIWAVELENGTH SPECTROPHOTOMETER

Taro Nogami, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1985, Ser. No. 710,389

Claims priority, application Japan, Mar. 14, 1984, 59-47048

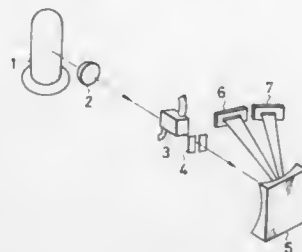
Int. Cl.⁴ G01J 3/42, 3/36

U.S. Cl. 356—328

8 Claims

8. A multiwavelength spectrophotometer, particularly for liquid chromatography comprising a light source, a sample cell, a grating for dispersing a light beam from said light source, a first multichannel light detector means for detecting light dispersed by said grating in a first wavelength range, a second multichannel light detector means for detecting light dispersed by said grating in a second wavelength range overlapping at least partly said first wavelength range, said light

detected by said second multichannel light detector means having a different order of interference in comparison to the order of interference of said light detected by said first multichannel light detector means, and a processor means for averaging output signals of each of said first and second light detector means so as to provide output signals with an improved S/N ratio at least in the second wavelength range, the first and second light detector means being identical first and second photodiode arrays and the averaging of the output signals of the first and second photodiode arrays following the formula



whereby,
A is the output signal of a photodiode of the first array covering a predetermined wavelength range, B(1) and B(2) are the output signals of two neighboring photodiodes of the second array covering together the same predetermined range and k_1 , k_2 are weight factors for the output signals A and

$$\frac{k_1 A + k_2 \frac{B(1) + B(2)}{2}}{k_1 + k_2}$$

$$\frac{B(1) + B(2)}{2}$$

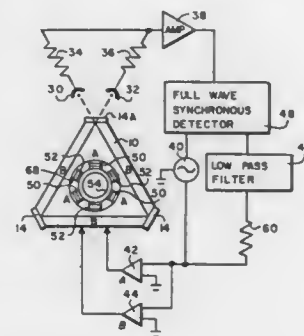
4,715,713
PATH LENGTH ADJUSTER FOR RING LASER GYRO
Thomas J. Hinchings, Canoga Park, Calif., assignor to Litton Systems Inc., Beverly Hills, Calif.

Filed Jan. 28, 1985, Ser. No. 750,425

Int. Cl. G01C 19/64

U.S. Cl. 356—350

26 Claims



1. A ring laser comprising;
a substantially rigid laser body block, including openings formed therein containing lasing material defining at least three substantially straight intersecting path branches, said intersections defining corners of a ring laser path;
at least three corner-mirrors, equal in number to said intersections, each rigidly supported by said body block at separate said corners, said mirrors being positioned and angled to reflect laser radiation in said ring laser path;

means for delivering energy to said lasing material;
a first plurality of forcer means, one for each of said corners, each positioned to apply a force between the other said forcer means of that said first plurality of forcer means, and said rigid laser body block along lines of action intersecting said mirrors and bisecting the angles between the respective adjacent laser path branches;
a second plurality of forcer means, one for each of said branches, each positioned to apply a force between the other said forcer means, of said second plurality of forcer means, and said rigid laser body block along lines of action intercepting said branches;
the forces of said first and second plurality of forcer means being adjusted to compensate for changes in length of said total laser path.

4,715,714
MEASURING DEVICE FOR DETERMINING RELATIVE POSITION BETWEEN TWO ITEMS

Bernhard Gaechter, Balgach; Bernhard Braunecker, Widnau, and Fritz Muller, Balgach, all of Switzerland, assignors to Wild Heerbrugg AG, Heerbrugg, Switzerland

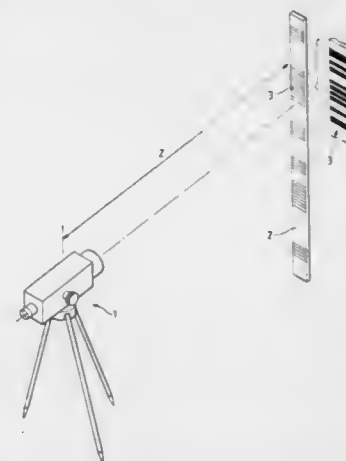
Filed Dec. 27, 1984, Ser. No. 686,889

Claims priority, application Switzerland, Dec. 30, 1983, 6994/83

Int. Cl. G01B 11/14

U.S. Cl. 356—375

28 Claims



1. A measuring device for determining the relative position between a first item and a second item, said first and second items being movable with respect to each other, said first item comprising a code carrier, a single passive dimensional code pattern arranged on said code carrier; said second item including optical means to remotely read said passive code pattern, code reader means to sample the image of said code pattern and to produce a digital signal corresponding thereto, computer means to receive said signal, said computer means comprising means to store information corresponding to said passive code pattern, said code pattern being able to retain the quasi-stochastic characteristics required for decoding, and said computer means comprising means to integrate and compare at least a part of said sampled signal to a corresponding part of said store information to thereby determine said relative position.

4,715,715
SYSTEM FOR MEASURING THE COLOR OF A MATERIAL

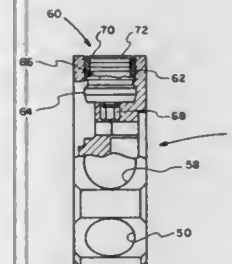
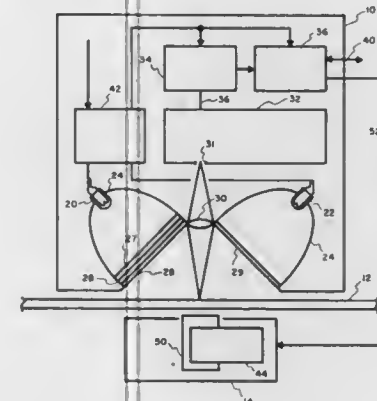
John Howarth, Monte Sereno, and Mark Alguard, Palo Alto, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 668,761, Nov. 6, 1984, abandoned. This application Mar. 20, 1987, Ser. No. 29,350

Int. Cl. G01N 21/86; G01J 3/46

U.S. Cl. 356—402

7 Claims



1. A system for measuring the color of a moving sheet of material which is being produced, the system comprising:
(a) means for causing the sheet to move;
(b) means for illumination the sheet;
(c) sensor means located to a first side of the sheet for receiving light from the sample material;
(d) means for measuring the intensities of predetermined frequencies of light received by the sensor; and
(e) backing means for reflecting light from the sheet back toward the sheet, said backing means being constructed so that the sheet moves relative to said backing means and said backing means including backing material which is substantially the same as the sheet, said backing material being spaced apart from the sheet.

4,715,716
RHOMBIC-SHAPED SCALE DEVICE FOR USE IN JUDGING DISCOLORATION, FADING OR STAINING
Nagaichi Suga, 2-8, 1-chome, Toyama, Shinjuku-ku, Tokyo, and Kiyoshi Chaki, c/o Suga Test Instruments Co., Ltd., 4-14, Shinjuku 5-chome, Shinjuku-ku, Tokyo, both of Japan

Filed Mar. 28, 1986, Ser. No. 845,686

Claims priority, application Japan, Mar. 29, 1985, 60-66235

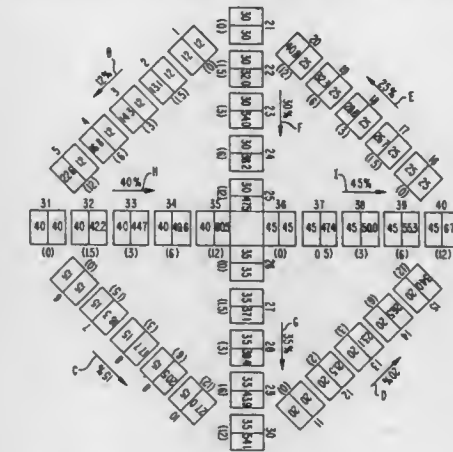
Int. Cl. G01J 3/52

U.S. Cl. 356—421

5 Claims

1. A scale device for use in judging the amount of discoloration or fading, or for judging the amount of staining, of a sample after a test of the sample for light fastness of dyeing or resistance to staining, said scale device comprising:
a plurality of scales of the same color, each scale having a plurality of patches with first and second portions, the first

portion of each patch having the same luminous reflectance and the second portion of the respective patches having successively varied luminous reflectances so as to give to the patches progressive values of color differences, the luminous reflectance of the first portion of the patches



of each scale being different from the luminous reflectances of the first portion of the patches of the other scales, four of said scales being arranged in a rhombic arrangement and the remainder of said scales being in a cross shaped within said rhombic arrangement.

4,715,717
METHOD FOR MONITORING SURFACE TEXTURE AND QUALITY FOR MOVING TRANSPARENT FILM BODIES

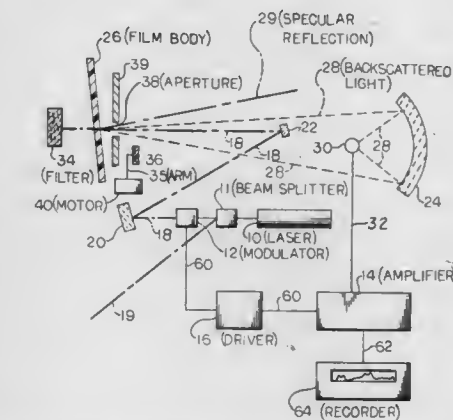
John C. Evans, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 5, 1985, Ser. No. 804,958

Int. Cl. G01N 21/84

U.S. Cl. 356—429

11 Claims



1. A method for online detection of surface texture of a moving transparent film body, comprising the steps of:
extruding from a die, a material suitable for forming the moving transparent film body;
injecting a fluid into the extruded material to form a bubble of the moving transparent film body;
slightly deflating the bubble with conventional deflating means;
prior to complete deflation of the bubble, irradiating the moving transparent film body with a beam of collimated electromagnetic radiation at an angle of incidence sufficient to produce detectable backscattered electromagnetic radiation and specularly reflected electromagnetic radiation from said moving transparent film body;

avoiding the specularly reflected electromagnetic radiation and collecting the backscattered electromagnetic radiation;
directing the collected backscattered electromagnetic radiation to a detector to produce a signal proportional to the intensity of the collected backscattered electromagnetic radiation directed to the detector; and
evaluating the signal so that the surface texture can be detected.

4,715,718

METHOD AND APPARATUS FOR ON-LINE MONITORING OF LAMINATE BOND STRENGTH

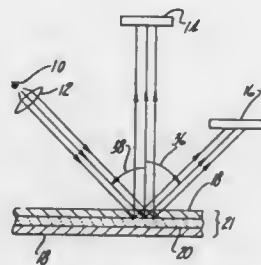
John C. Evans, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 24, 1985, Ser. No. 748,363

Int. Cl.⁴ G01N 21/47

U.S. Cl. 356—446

15 Claims



1. A method for the on-line determination of the bonding strength of a plural layer laminate having at least one inner and one outer layer, said outer layer being transparent to electromagnetic radiation, said method comprising:

- directing a collimated beam of electromagnetic radiation transmitted onto a surface of said inner layer through said transparent outer layer at an incident angle substantially greater than a normal to the surface of said laminate;
- measuring the scattered and diffusely reflected intensity value of said electromagnetic radiation reflected from said inner layer at two substantially different diffuse reflectance angles;
- converting said reflected intensity value to a diffuse intensity ratio derived value which is proportional to the adhesion of the laminate based upon a predetermined relationship of the bonding strength of said laminate and said derived value.

4,715,719

METHOD OF PREPARING MORTAR OR CONCRETE
Yasuro Ito; Yoshiro Higuchi, both of Tokyo; Takeshi Shiki, Funabashi; Yukikazu Tsuji, Ashikaga; Masanori Tsuji, Osaka, and Mitsutaka Hayakawa, Kamakura, all of Japan, assignors to Yasuro Ito and Taisei Corporation, Tokyo, Japan
PCT No. PCT/JP84/00008, § 371 Date Sep. 13, 1984, § 102(e) Date Sep. 13, 1984, PCT Pub. No. WO84/02872, PCT Pub. Date Aug. 2, 1984

Continuation of Ser. No. 654,003, Sep. 13, 1984, abandoned. This PCT application Jan. 18, 1984, Ser. No. 882,034

Claims priority, application Japan, Jan. 18, 1983, 58-5216; Apr. 5, 1983, 58-58639

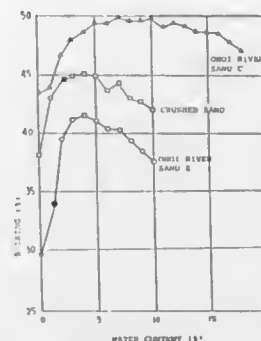
Int. Cl.⁴ B28C 5/00

U.S. Cl. 366—2

5 Claims

1. A method of preparing mortar or concrete, which comprises the steps of:
determining respectively a percentage of water contained in or adhered to a fine aggregate equivalent to a JIS surface-dry water percentage, minimum and maximum adhesion water percentages of the fine aggregate, and a percentage of water of the fine aggregate in which interstice thereof is saturated with water while a surface thereof is dry;
determining a quantity of water necessary to be added for

preparation of the mortar or concrete in accordance with a multiple of a given value with respect to said minimum adhesion water percentage; and



mixing a powder of hydraulic compound with a fine aggregate and the calculated amount of water.

4,715,720

DRUM MIX ASPHALT PLANT WITH KNOCK-OUT BOX AND SEPARATE PUGMILL COATER

J. Donald Brock, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

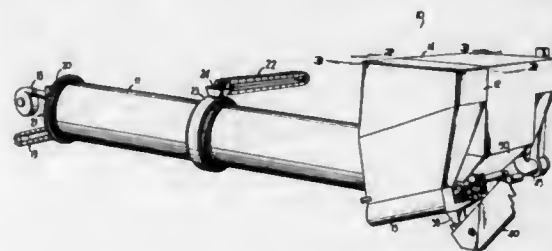
Continuation of Ser. No. 668,290, Nov. 5, 1984, Pat. No. 4,616,934. This application Aug. 18, 1986, Ser. No. 882,294

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.⁴ B28C 5/46

U.S. Cl. 366—25

3 Claims



1. An apparatus for manufacturing asphalt paving composition, comprising:

- a rotary drum having upper and lower ends;
- means for introducing aggregate into the upper end of said rotary drum;
- means for heating the interior of said rotary drum, whereby said aggregate introduced into the upper end of said rotary drum is dried and heated as it travels through said rotary drum;
- mixing means;
- means for introducing said heated aggregate from the lower end of said rotary drum into said mixing means;
- exhaust means for creating an exhaust airflow through and out of said rotary drum, whereby airborne particulate matter generated by the drying and heating of said aggregate is extracted from the interior of said rotary drum in said exhaust airflow;
- collection means for causing a portion of said particulate matter suspended in said exhaust airflow to drop out of said exhaust airflow into said mixing means, whereby said portion of said particulate matter is recovered from said exhaust airflow; and
- means for introducing liquid asphalt into said mixing means, whereby said aggregate is dried and heated in said rotary drum and mixed with said recovered particulate matter and said liquid asphalt in said mixing means to form an asphalt paving composition.

4,715,721

TRANSPORTABLE INTEGRATED BLENDING SYSTEM

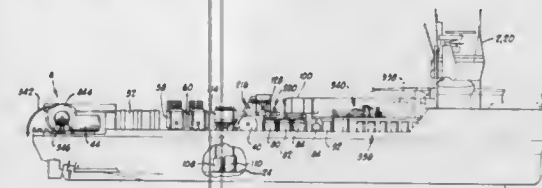
Lonnie R. Walker; Leslie N. Berryman; Larry E. Guffee, all of Duncan; David E. Ripley, Marlow, and David A. Prucha, Duncan, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 757,112

Int. Cl.⁴ B01F 15/00

U.S. Cl. 366—132

16 Claims



1. A transportable integrated system of components commonly and simultaneously transportable from one location to another, at each of which locations a respective blend of produced from a plurality of substances contained within and transported by the system, said system comprising:

- a blend producing facility;
- floatable means for transporting said blend producing facility on water to a respective one of the locations; and
- wherein said blend producing facility includes:
- blender means, mounted on said floatable means, for blending a plurality of substances into a respective blend needed at the respective one of the locations;
- storage means, mounted on said floatable means, for storing a particulate material defining one of the plurality of substances;
- surge bin means, mounted on said floatable means, for receiving at least a portion of the particulate material;
- means, mounted on said floatable means, for conveying particulate material from said storage bin means to said surge bin means; and
- means, mounted on said floatable means, for transferring a controllable quantity of the particulate material from said surge bin means to said blender means.

4,715,722

PROCESS AND APPARATUS FOR FEEDING FIBER MATERIAL

Adolph Hergeth, Dülmen; Günter Lucassen, Haltern, both of Fed. Rep. of Germany, and Akiva Pinto, Gastonia, N.C., assignors to Hergeth Hollingsworth, GmbH, Dülmen, Fed. Rep. of Germany

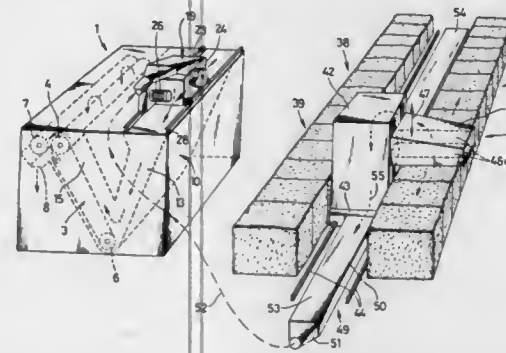
Filed Feb. 24, 1986, Ser. No. 832,905

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506476; Feb. 8, 1986, 3603997

Int. Cl.⁴ B01F 15/02

U.S. Cl. 366—132

24 Claims



1. In a textile process for feeding fiber material, such as cotton and the like, from an opening device which opens

pressed bales of fiber material set up in a row to a hopper feeder, said process being of the type which comprises delivery of the opened fiber material successively removed layerwise from the bales by pneumatic means to the hopper feeder into a receiving chamber ahead of an inclined upwardly extending spiked feed lattice for the transmittal to a processing machine, wherein the improvement comprises delivering the fiber material removed continuously from the row of bales to the receiving chamber of the hopper feeder transversely to the hopper feeder and parallel to the spiked feed lattice in a manner that said fibers are deposited layerwise across and parallel to the spiked feed lattice.

4,715,723

ARRANGEMENT FOR CONTROLLABLY MIXING VOLATILE MATERIALS

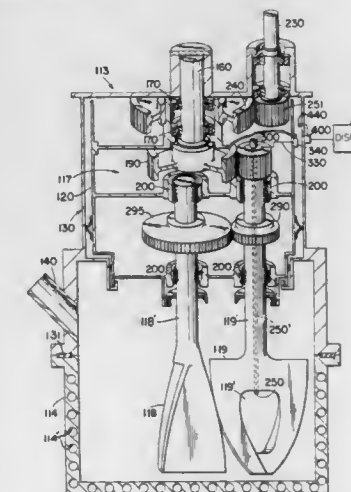
Roy W. Anderson, San Jose; Stephen J. Ross, Morgan Hill, and Larry D. Henderson, San Jose, all of Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 28, 1986, Ser. No. 936,049

Int. Cl.⁴ B01F 15/00

U.S. Cl. 366—142

5 Claims



1. A mixing arrangement for mixing volatile materials comprising containment means for holding the materials to be mixed, said containment means defining holes for circulation of cooling fluid, first blade means for mixing said materials and drive means for turning said blade means to conduct mixing operation with respect to said materials, said mixing apparatus characterized in that said first blade means includes temperature detection means for monitoring bulk temperature levels within the materials being mixed and an external display arrangement for temperature levels detected by said temperature detection means and radio communication with said drive means.

4,715,724

HEAD ATTACHMENT FOR A HYDRAULIC SYNTHETIC-RESIN WORKING MACHINE FOR COLORED SYNTHETIC RESIN

Gerrit J. Ter Beek, No. 61a Binnenhavenstraat, 7553 GH Hengelo, and Albertus Ter Beek, No. 5, Palfijnstraat, 7555 MP Hengelo, both of Netherlands

Filed Sep. 21, 1981, Ser. No. 303,928

Claims priority, application Netherlands, Sep. 22, 1980, 8005275

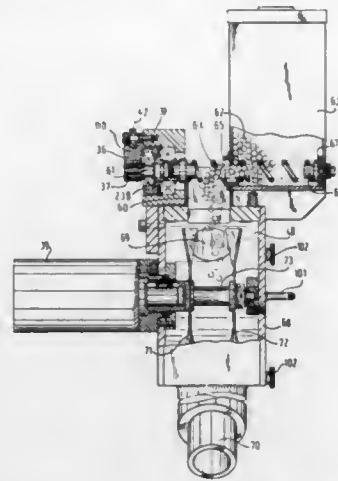
Int. Cl.⁴ B01F 15/02

U.S. Cl. 366—157

20 Claims

1. A head attachment for a hydraulic, synthetic resin processing machine for colored synthetic resin, said attachment comprising a mixer, a synthetic resin supply vessel directly connected to said mixer, a coloring mass supply vessel con-

nected to said mixer through a dosing device, and a reciprocating hydraulic motor and coupling for intermittently driving



the dosing device upon stroking of the motor in one direction only.

4,715,725 STEP MOTOR CONTROL MECHANISM FOR ELECTRONIC TIMEPIECE

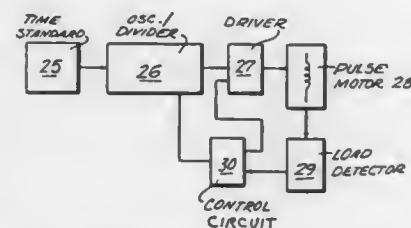
Yoshikazu Kawamura; Minoru Hosokawa; Sakiho Okazaki, and Hiroshi Ishii, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Continuation of Ser. No. 742,832, Jun. 10, 1985, Pat. No. 4,599,005, which is a continuation of Ser. No. 430,292, Mar. 10, 1985, Pat. No. 4,522,507, which is a continuation of Ser. No. 133,046, Mar. 24, 1980, Pat. No. 4,370,065, which is a continuation of Ser. No. 839,867, Oct. 6, 1977, Pat. No. 4,212,156. This application Jun. 25, 1986, Ser. No. 860,404
Claims priority, application Japan, Oct. 6, 1976, 51-120146
The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.

Int. Cl.⁴ G04F 5/00

U.S. Cl. 368—157

2 Claims



1. An electronic timepiece having a step motor and comprising a quartz crystal vibrator producing a high frequency time standard signal, divider circuit means for producing low-frequency time signals in response to said high frequency time standard signals; a gear train driven by said step motor and adapted to place the step motor in one of a first normally loaded condition and a second loaded condition; load detection means for producing a load detection signal in response to detecting said second loaded condition of said step motor; driving and control means intermediate said divider circuit means and said step motor for receiving the low frequency signal from the dividing circuit means, said driving and control means being adapted to apply a first drive signal having a first pulse shape to said step motor during a predetermined unit of time defining the period of the first pulse to said step motor in response to said low frequency signal, said driving and control means, in response to said load detection signal being applied thereto, being adapted to apply a second drive signal having a second pulse shape of larger energy than said first pulse shape

to said step motor, said step motor including drive coil means for receiving said first drive signal produced by said driving and control means, said load detecting means being adapted to detect induced current in said coil means after said first drive signal is applied thereto, said driving and control means, in response to said load detection signal being applied thereto, being adapted to apply the second drive signal having a second pulse shape of the same polarity as said first pulse shape to said drive coil means, said second pulse being applied during said predetermined unit of time.

4,715,726 METHOD OF MEASURING THE STRENGTH OF CONCRETE FOR SLIP FORM PROCESS

Kenji Tsuruta, Nagareyama, Japan, assignor to Ohbayashi-Gumi, Ltd., Osaka, Japan

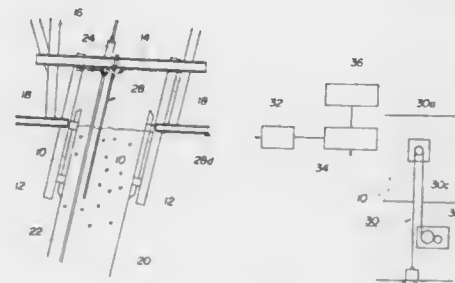
Filed Jun. 23, 1986, Ser. No. 877,972

Claims priority, application Japan, Nov. 1, 1985, 60-244086; May 19, 1986, 61-112734

Int. Cl.⁴ G01N 3/00

U.S. Cl. 374—102

11 Claims



1. In a slip form process in which a slide form is moved upward after concrete poured therein has set to a degree to provide a sufficient strength, a method of measuring the strength of said concrete comprising the steps of: measuring a position of said slide form by an altimeter measuring a temperature of said concrete by a temperature sensor movable with said slide form and inserted into said concrete, said temperature sensor having arranged in an axial direction thereof a plurality of spaced-apart measuring elements separated from each other by a predetermined distance and adapted to operate when said slide form is moved upward by said predetermined distance, whereby the temperature of a particular point of said concrete is measured in sequence by said plurality of measuring elements; calculating an integral of the temperature over time of said concrete within said slide form, by an arithmetic unit on the basis of data given by said temperature sensor and said altimeter; and determining strength of said concrete based on said integral.

4,715,727 NON-INVASIVE TEMPERATURE MONITOR

Kenneth L. Carr, Harvard, Mass., assignor to M/A-Com, Inc., Burlington, Mass.

Filed Jul. 5, 1984, Ser. No. 627,761

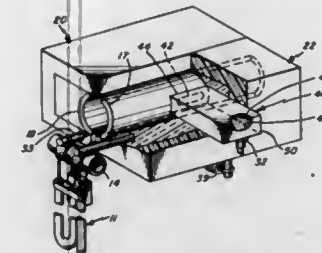
Int. Cl.⁴ A61N 5/02; G01J 5/00

U.S. Cl. 374—122

12 Claims

1. A temperature apparatus used in association with a guided wave means that is adapted for microwave heating, from a microwave heating source, of a substance that is absorptive at microwave frequencies and that is held in retaining means that is transparent at microwave frequencies, both said substance and said retaining means therefor being enclosed by said guided wave means, said apparatus comprising; a length of waveguide, means defining a coupling aperture in said guided

wave means, means supporting said length of waveguide with one end thereof about said coupling aperture, a microwave radiometer detection circuit, means coupling from the length of waveguide to the detection circuit, wherein said microwave heating is at one frequency and the detection is at another frequency, and wherein said microwave heating and micro-



wave detection are at different frequencies, said coupling aperture having a cross-sectional area less than the waveguide cross-sectional area, the coupling aperture being sufficiently small in comparison to the waveguide cross-section so as to leave the heating characteristics of the guides wave means substantially undisturbed.

4,715,728 TAMPER EVIDENT MULTI-PURPOSE ENVELOPE

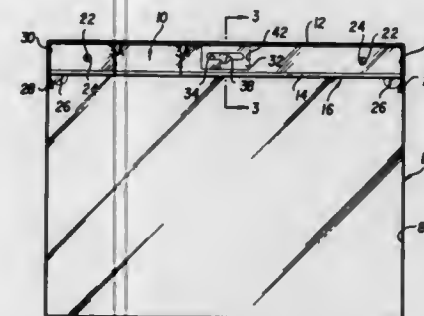
Nicholas Sfikas, 29 Widewaters La., Pittsford, N.Y. 14534

Filed Jan. 24, 1987, Ser. No. 65,855

Int. Cl.⁴ B65D 33/10, 33/14

U.S. Cl. 383—9

27 Claims



1. A substantially planar multipurpose envelope for use in a multi-ringed notebook binder comprising:

- a first substantially planar hinged flap normally positioned in the place of said envelope and hingedly movable out of the plane of said envelope;
- said first flap having first ring binder mounting means for supporting said envelope in a multi-ringed binder when said first flap is positioned out of the plane of said envelope;
- said first flap having a second hinged flap integral therewith and contained therein and normally positioned in the plane of said first flap and hingedly movable out of the plane of said first flap;
- said second flap including hanger mounting means for hanging said envelope up when said second flap is positioned outside of the plane of said first flap; and
- said second flap being independently pivotable of said first flap.

4,715,729 ROLLER BEARING FOR INFINITE RECTILINEAR MOTION

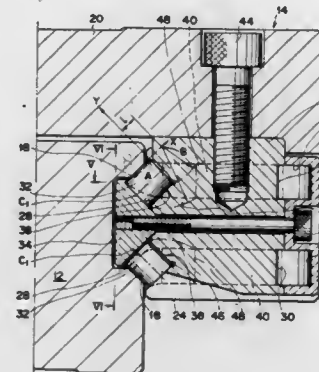
Kazuhiko Tanaka, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1987, Ser. No. 13,563

Claims priority, application Japan, Aug. 19, 1986, 61-191969
Int. Cl.⁴ F16C 29/06

U.S. Cl. 384—44

6 Claims



1. A roller bearing for an infinite rectilinear motion comprising:
 - a long truck rail (12) in which an inclined surface formed in a part of an outside wall surface is used as a truck surface (18);
 - a slide unit (14) which rides over said truck rail (12) and in which a truck surface (28) is formed at a location which faces said truck surface (18);
 - a number of cylindrical rollers (32) arranged between the truck surface (18) of said truck rail (12) and the truck surface (28) of said slide unit (14) on the basis of a parallel roller type;
 - a truck groove (38) including said truck surface (28); an infinite circulating passage for said cylindrical rollers (32) including said truck groove (38); and
 - said truck groove (38) and said infinite circulating passage being formed in said slide unit (14); characterized in that side plates (24) are attached to both end portions of the slide unit (14), within each of which plates (24) a direction change passage (40) being communicated with the truck groove (38) and being located in the same horizontal plane as the truck groove (38) is formed;
 - a twisting passage (46) is formed between said direction change passage (40) and said truck groove (38), in which twisting passage (46) each of the cylindrical rollers (32) moves so as to be gradually twisted until a central axis (C₁) of the cylindrical roller (32) is located in a vertical direction, and at the same time, the cylindrical roller (32) moves from the truck groove (38) into an unloaded region so as to be shifted;
 - and in a cross section which is perpendicular to a slide direction of the bearing, a center of curvature (B) of said twisting passage (46) is located in a region which is contained by an extension line (X) of the truck surface (18) of the truck rail (12) and an extension line (Y) of an end surface of the roller in the outside of the truck rail (12).

4,715,730 LINEAR MOTION PILLOW BLOCKS INCLUDING SELF-ALIGNING FEATURES

Robert E. Magnuson, Greenbrook, N.J., assignor to Lee Controls, Inc., Piscataway, N.J.

Filed Mar. 26, 1986, Ser. No. 844,366

Int. Cl.⁴ F16C 29/04, 29/12

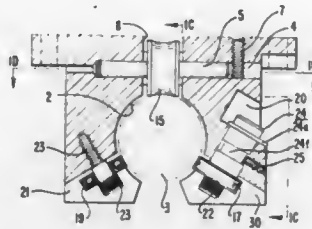
U.S. Cl. 384—52

15 Claims

1. A pillow block having an outer surface and comprising in

combination a primary bore having an elongated principal axis constructed to be slideably accommodated on a cylindrical primary shaft, and means for self-adjusting the position of said pillow block on said shaft, wherein said self-adjusting means comprises in combination:

- at least one slot which passes through said pillow block between an outer surface thereof and said primary bore;
- an axle supported in said slot and extending in a plane normal to the principal axis of said primary bore;



at least one roller, mounted in said slot in rotatable relation to said axle, said roller disposed to make tangential contact with said cylindrical primary shaft and constructed for at least slight rotation about said axle in response to slideable movement of said pillow block on said primary shaft; wherein said roller is a ball bearing roller annular in form and having a concave sectional shape which conforms to said cylindrical primary shaft.

4,715,731 GAS BEARING

Gabriel Tittzer, Rösra-Hoffnungstal, Fed. Rep. of Germany, assignor to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

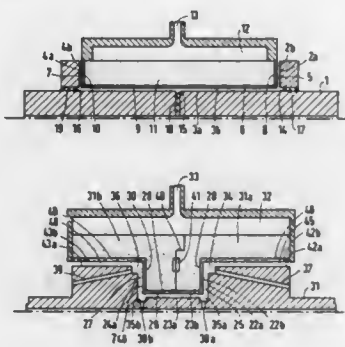
Filed Jun. 6, 1986, Ser. No. 871,703

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1985, 3520717; Aug. 26, 1985, 3530437

Int. Cl.⁴ F16C 32/06, 33/06

U.S. Cl. 384-100

18 Claims



1. Gas bearing and shaft assembly, comprising means for supporting the shaft in radial and axial directions in the form of complementary sets of guiding surfaces formed on the gas bearing and the shaft being mutually spaced apart defining bearing gaps therebetween, at least one guiding surface of each of said sets being a porous gas passage surface, a thin-porous layer adjoining said gas passage surface, a component having a given region disposed upstream of said gas passage surface in flow direction of gas fed under pressure through said component to said gas passage surface and said component having other porous gas-permeable regions, said gas passage surface and said thin porous layer together being denser than said other gas-permeable regions of said component and producing a pressure drop at said thin porous layer substantially greater than at said other gas-permeable regions, and gas outlet paths in communication with said bearing gaps within the bearing.

4,715,732 BEARING ASSEMBLIES FOR MOTORS

Anthony J. Sanders, Darlington, England, assignor to Black & Decker Inc., Newark, Del.

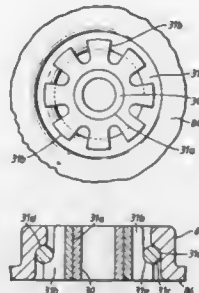
Filed Oct. 29, 1986, Ser. No. 924,635

Claims priority, application United Kingdom, Oct. 31, 1985, 8526837

Int. Cl.⁴ F16C 37/00, 27/06, 33/02; H02K 5/16

U.S. Cl. 384-320

16 Claims



1. A bearing assembly for a shaft, comprising: a mounting sleeve having a longitudinal bore; a series of spaced, external, axial, outwardly extending fins on said sleeve; a bearing mounted in said bore; each of said fins being of a smaller height over one part of its axial length and being of a greater height over another part of its axial length; an annular mounting member; and a seating for said annular mounting member formed at a junction between said one part and said another part of the axial length of each of said fins
6. An electric motor assembly, comprising: a stator defining a central longitudinal axis; an armature having a shaft extending along said axis, said shaft being rotatable on said axis; a bearing in which said shaft is journaled; a heat sink having a bore therein, said bearing being disposed in said bore; said heat sink comprising a sleeve having a plurality of external fins extending outwards with respect to said axis; and an armature mounting member in which said heat sink is supported via a ring, said ring encircling and seating against said fins and spacing said heat sink from said armature mounting member.

4,715,733 ANTIFRICTION THRUST BEARING FOR ORBITAL MOTION

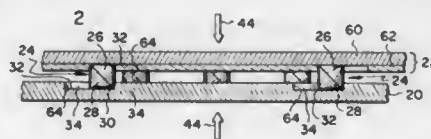
Jerry A. Rood, Onalaska, Wis., assignor to American Standard Inc., New York, N.Y.

Filed May 21, 1986, Ser. No. 865,494

Int. Cl.⁴ F16C 19/00; F01C 1/02; F16H 37/00

U.S. Cl. 384-445

14 Claims



1. An antifriction thrust bearing for use between two generally facing surfaces undergoing relative orbital motion, said bearing comprising a plurality of rollers each having two opposing, generally conical shaped surfaces defined by two coaxially aligned cones, joined at their base, and each having an apex at opposite ends of each of said rollers with each apex having a vertex angle that is less than or generally equal to a

right angle of 90 degrees, and with each conical surface lying in rolling line contact with one of the facing surfaces, so that said rolling line contact sweeps a circular area on each of said facing surfaces as they orbit relative to each other.

4,715,734 PLATEN ADJUSTING MECHANISM

Gerhard Pamler, Nuremberg, Fed. Rep. of Germany, assignor to Ta Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

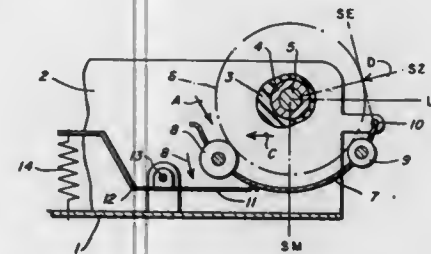
Continuation of Ser. No. 667,578, Nov. 2, 1984. This application Oct. 6, 1986, Ser. No. 915,997

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340046

Int. Cl.⁴ B41J 11/20

U.S. Cl. 400-56

3 Claims



1. Automatic platen adjusting mechanism for a typewriter or like machine comprising a platen having a shaft a frame having side plates, elastic bearings supported in said side plates for supporting said platen shaft and configured to yield in a straight line direction perpendicular to a typing plane which includes a line against which types impact against said platen, a paper guide trough rotatably supporting front and rear pressure rolls on axes parallel to the axis of said platen shaft and forward and rearward respectively of a vertical line through said platen shaft axis, means biasing said paper guide trough to urge said pressure rolls into engagement with said platen, and means secured to said side plates and positioned relative to said platen to cause paper introduced into said guide trough between said platen and pressure rolls to exert pressure against said platen resulting in the yielding of said elastic bearings in said straight direction a distance equal to the thickness of the paper, said last named means comprising means on said side plate for pivotally mounting said paper guide trough on an axis parallel to the axis of said platen shaft, said paper guide trough pivot axis lying in said typing plane forward and above the axis of said front pressure rolls.

4,715,735 DUAL MODE PRINTING APPARATUS WITH MULTIPLE PRINT RIBBON CASSETTES

Susumu Kuzuya, and Mamoru Imaizumi, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 24, 1984, Ser. No. 664,339

Claims priority, application Japan, Oct. 31, 1983, 58-204357; Oct. 31, 1983, 58-204358; Oct. 31, 1983, 58-204359; Oct. 31, 1983, 58-204360

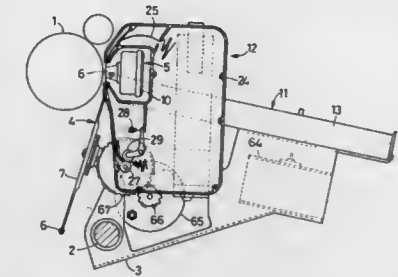
Int. Cl.⁴ B41J 3/54, 35/28

U.S. Cl. 400-82

5 Claims

1. A printing apparatus comprising: first printing means for type-printing characters including a daisy-type wheel having type elements which are disposed at the free ends of multiple spokes and abutable on a platen, and a hammer located at the back of said daisy-type wheel and opposite to said platen so that said type elements are selectively located between said hammer and

said platen for striking said type elements against said platen; second printing means including a plurality of print elements which are selectively activated for printing characters by a dot matrix; a single common carrier which reciprocates along a print line defined on said platen, said first and second printing means being supported on said single common carrier and said second printing means having a second print point which is spaced away from a first print point of said daisy-type wheel of said first printing means in a direction along the surface of said platen parallel to said print line;



a first ribbon cassette accommodating a first ribbon for use by said first printing means, said first ribbon cassette being disposed in a plane substantially parallel to said print line; a second ribbon cassette accommodating a second ribbon for use by said second printing means, said second ribbon cassette being disposed in a plane substantially perpendicular to said print line; and means for controlling said first and second printing means, said single common carrier, and said first and second ribbon cassettes to effect a mixed type and dot matrix printing in the same line of printing.

4,715,736 PROCESS FOR DETERMINING OPTIMUM KEYBOARD FORMATS FOR A GIVEN LANGUAGE

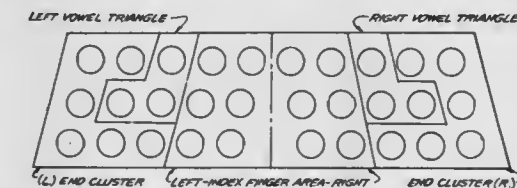
Roger J. McGunnigle, New York, N.Y., assignor to FWM Enterprises, Inc., Somers, N.Y., a part interest

Division of Ser. No. 676,610, Dec. 3, 1984, Pat. No. 4,613,247, which is a continuation of Ser. No. 401,913, Jul. 26, 1982, abandoned. This application Apr. 9, 1986, Ser. No. 833,811

Int. Cl.⁴ B41J 5/10

U.S. Cl. 400-484

16 Claims



1. A process for determining optimum keyboard formats for a given language, comprising:

- (a) establishing a fixed array of an upper row, a middle row and a lower row of key members with ten key members in each row, thereby defining a keyboard having a left-hand side and a right-hand side;
- (b) defining sets of key members whereby each key member in a set is to be actuated by a certain finger of a keyboard operator after placing the operator's first to fourth fingers of each hand at a rest position on the first to fourth and the seventh to tenth key members of the middle row, counting from left to right;
- (c) consecutively ordering each of the key members of said keyboard according to the relative ease of finger actuation

- by the operator when the operator's fingers start at said rest position, alternating between each hand for each of the first to fourth fingers, thereby establishing a different finger priority number for each of the key members;
- (d) determining the frequency of use of characters including letters and punctuation marks, in words and sentences of said language;
- (e) assigning a first frequency number corresponding to the character most frequently used in said language;
- (f) continuing to assign consecutive frequency numbers to said characters from the character second most frequently used to the least frequently used character in said language;
- (g) selecting one of a plurality of keyboard formats, said formats including a scientific keyboard format defined by
- (h) matching each of the priority numbered key members with a corresponding frequency numbered character, thereby establishing a primary format whereby the ten most frequently used letter characters in said language are matched to the key members of the middle row;
- (i) assigning only consonant letter characters to the middle row key members actuable by the index fingers of the operator, by exchanging placement of a vowel letter character matched to the index finger key members with a consonant letter character matched to another middle row key member and having a frequency of use close to that of the vowel letter character which it replaces;
- (j) assigning the four most frequently used vowel letter characters in said language to the key member group including the second, third, eighth and ninth key members of the middle row, counting from left to right, by exchanging placement of another kind of character matched to said key member group with a vowel letter character matched to a key member outside said key member group and having a frequency of use close to that of the other kind of character which it replaces;
- (k) assigning vowel letter characters other than said four most frequently used ones to the third and eighth key members of said upper row, counting from left to right; and
- (l) exchanging the placement of consonant letter characters with one another along the middle row and exchanging the placement of vowel letter characters with one another along said middle row to create a word-like sound of at least four letter characters for association with each hand thereby facilitating easy memorization of the letter character layout in said scientific keyboard format.

4,715,737

PRINTER WITH PAPER FEED ROLLER DISENGAGEMENT MECHANISM

Fumihara Hori, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Japan

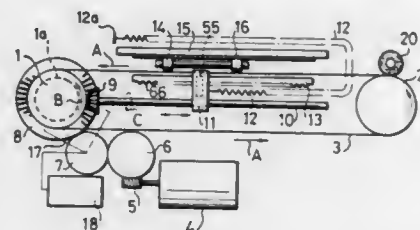
Filed Jul. 6, 1983, Ser. No. 511,512

Claims priority, application Japan, Jul. 7, 1982, 57-117027; Jul. 7, 1982, 57-117028

Int. Cl.⁴ B41J 19/76

U.S. Cl. 400-569

2 Claims



1. A printer comprising a paper feed roller, an intermediate gear coupled with said paper feed roller and having a spur gear section on an outer circumferential surface thereof, and a paper feed cam having an axis extending perpendicularly to a plane

including an axis of said intermediate gear and having on its outer circumferential surface a helical tooth for meshing engagement with said spur gear section of the intermediate gear, said paper feed roller being angularly movable in a paper feed mode for a predetermined angular interval through said intermediate gear in response to angular movement of said paper feed cam, said paper feed cam having in the outer circumferential surface thereof a gap for disengagement of said tooth with said intermediate gear in a non-feed mode.

4,715,738

CARBURETOR THROTTLE LEVER/SPEED CONTROL CONNECTOR

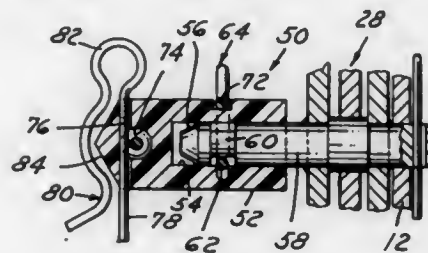
Raymond Stocker, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1986, Ser. No. 945,147

Int. Cl.⁴ F16B 21/18

U.S. Cl. 403-24

4 Claims



1. A universal connector for interconnecting a pair of relatively movable members for actuation of one in response to actuation of the other, the connector including an elongated body having an axial passage open at one end, a pin type pivot shaft fixed for rotation with one of the members and having an end projectable into the passage with an annular groove formed thereon, a flexible essentially U-shaped spring retaining clip having a pair of laterally spreadable legs, the body having an opening extending therethrough essentially at right angles to its longitudinal axis for receiving one leg of the retaining clip therethrough, the other leg surrounding an outer peripheral portion of the body in a hook-like manner to springedly retain the clip to the body, the axis of the opening being aligned with and intersecting the shaft groove upon assembly of the shaft of the body, the opening being oblong in cross-section with an inner diameter less than and an outer diameter greater than that of the groove whereby the one leg is received in and passes through the groove upon insertion through the opening to lock the shaft of the body against axial relative movement while permitting rotational movement therebetween, a camming movement of the one leg laterally outwardly in the opening to the outer diameter of the opening moving the one leg laterally out of the groove permitting axial separation between the shaft and connector body, and means connecting the opposite end of the body to the other moving member to permit the body to rotate freely upon the shaft to translate a linear movement of one member into an arcuate and linear movement of the other.

4,715,739

CONNECTION BETWEEN A PLASTICS QUILL SHAFT AND A METAL ELEMENT

Christoph Rüegg, Basel; Peter Voirol, Binningen; Willi Fuchs, Basel, and Hans U. Meister, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 10, 1982, Ser. No. 347,403

Claims priority, application Switzerland, Feb. 18, 1981, 1070/81

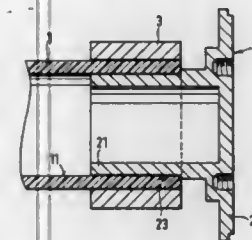
Int. Cl.⁴ F16B 4/00

U.S. Cl. 403-30

7 Claims

1. A connection between a fiber reinforced plastic torque transmission shaft and a torque input fitting wherein said trans-

mission shaft is reinforced with high rigidity fibers oriented in an angular range of from 0° to ±30° to the shaft axis, said connection comprising a first metal ring forming part of the input fitting which extends into an end zone of the transmission shaft and a second metal ring which extends over said end zone of the transmission shaft, said first and second metal rings frictionally clamping the wall of the transmission shaft in its



end zone therebetween, the clamping stresses in said first and second metal rings being so matched that the mean diameter of the transmission shaft in the clamped end zone is substantially equal to that in the adjacent area, and the said first and second metal rings consisting of a material whose coefficient of thermal expansion circumferentially differs by not more than about 20% from that of the transmission shaft.

4,715,740

CLOSURE SYSTEM FOR A LONGITUDINALLY DIVIDED CABLE SLEEVE

Klaus Pichler, Otterfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

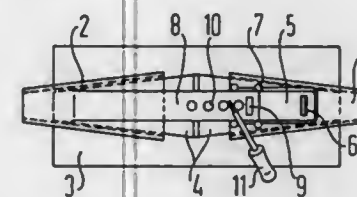
Filed Oct. 30, 1986, Ser. No. 924,978

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1985, 3542153

Int. Cl.⁴ F16G 11/02

U.S. Cl. 403-313

14 Claims



1. In a closure system for longitudinally closing a divided cable sleeve of plastic, said cable sleeve having two undercut beads extending along a parting line, said beads being expanded wedge-like from the sleeve ends towards the middle of the sleeve and said system including a pair of clamping rails having a wedge-shape and engaged with said beads to hold the beads in tight engagement with means for fixing the clamping rails in a final closed position, the improvements comprising said means for fixing including a resilient strip extending from a broad end of one of the wedge-shaped rails in a longitudinal direction, said strip having a first part for a latch mechanism at its end and having a draw on aid in the form of a plurality of free standing pegs lying at intervals following one another, a second opposed rail having a longitudinally extending guide channel for receiving the resilient strip of said first rail, said guide channel having a second part of the latch mechanism arranged at an end opposite to the wide end.

4,715,741

CLIP FOR COUPLING SHELF ASSEMBLIES

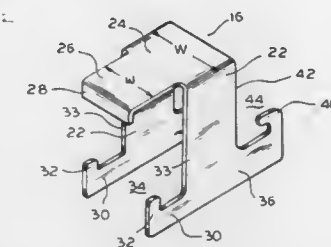
Irwin Kulbersh, Skokie, Ill., assignor to Amco Corporation, Chicago, Ill.

Filed Jul. 21, 1986, Ser. No. 887,250

Int. Cl.⁴ A47B 9/00

U.S. Cl. 403-389

13 Claims



1. A device for coupling together shelves located at the same level in adjacent shelf assemblies comprising two parallel spaced-apart sidewalls; a top wall connected to said sidewalls and disposed in a plane perpendicular to said sidewalls; a tongue extending outwardly from said top wall in a plane parallel to the plane of the top wall; a first pair of projections extending from said sidewalls below and parallel to the direction of extension of said tongue to form with said tongue and said sidewalls a first shelf receiving space, said first shelf receiving space being shaped and proportioned to enable said device to be pivoted into and out of coupling engagement with one of said shelves; and a second pair of projections extending from said sidewalls in a direction opposite to that of said first pair of projections to form with said sidewalls a second shelf receiving space.

4,715,742

MANUALLY DEPRESSIBLE AUTOMATICALLY DEPLOYABLE SPRING BALANCED BOLLARD

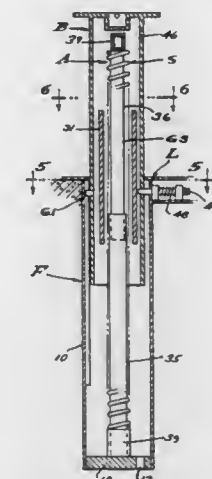
Harry D. Dickinson, 1681 Larco Way, Glendale, Calif. 91302

Filed Mar. 17, 1986, Ser. No. 840,389

Int. Cl.⁴ E01F 13/00

U.S. Cl. 404-6

18 Claims



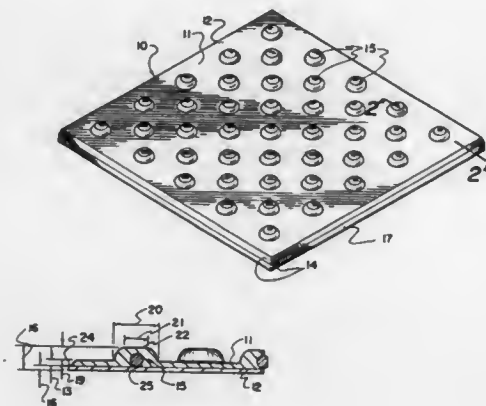
1. A manually depressible spring balanced bollard type trafficway barrier for arresting vehicles, and including; a below grade level foundation of substantial depth, having a grade level opening at its upper end and having a bottom support, a spring lift means centered upon the bottom support and supporting a bollard in a position of balanced equilibrium between a depressed position and an extended position, the bollard being of tube form entered through the founda-

tion grade level opening and centered over and carried by the spring lift means in said balanced condition extending upward from the grade level, and releasable lock means carried by the foundation and engaged with spaced stops on the bollard, one stop engageable to hold when the bollard is depressed to grade level and the other stop engageable to hold the bollard when extended by the lift means, whereby the spring lift means stores potential energy by depression of the bollard to grade level and subsequently released for transfer into kinetic energy and assisted by inertia to lift the bollard above the position of balanced equilibrium and to the other stop.

4,715,743
MOBILITY GUIDE TILE FOR VISUALLY HANDICAPPED

Donald W. Schmanski, 400 W. King St., Carson City, Nev. 89701

Filed Jun. 13, 1986, Ser. No. 873,954
Int. Cl.⁴ E01F 9/00; E01C 5/20, 5/22; G09B 21/00
U.S. Cl. 404—9 21 Claims



1. A tile for positioning on walkways, crosswalks and other areas of pedestrian traffic for providing direction and warning to visually handicapped persons, said tile comprising:
a flat plate comprised of a single layer of flexible, polymer composition with a top and bottom surface and including a chamfered edge around the periphery of the plate tapering to a lesser thickness at the extreme edge thereof;
raised bumps coupled and formed integrally with the top surface of the plate and of the same flexible, polymer composition, and projecting upward therefrom and being configured as truncated structure having a larger base attached at the top surface of the plate and tapering to a narrower top which includes a substantially flat, contacting surface adapted to withstand repeated contact with footwear without significant wear;
said tile including a uniform adhesive layer applied at the bottom surface.

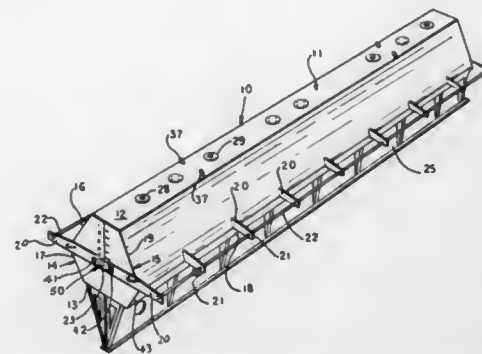
4,715,744
FLOATING BREAKWATER

Alvin Richey, 2044 N. Manor Dr., Erie, Pa. 16505

Filed Dec. 12, 1986, Ser. No. 941,045
Int. Cl.⁴ E02B 3/06
U.S. Cl. 405—26 11 Claims

1. A floating breakwater comprising an elongated hollow

body having a top, bottom, first side, second side, first end and a second end attached together forming a water tight body, a plate-like keel fixed to said bottom of said body and extending downwardly and extending from one end of said body to the other,
first outrigger means attached to said first side and extending outwardly therefrom,
second outrigger means attached to said second side of said body and extending outwardly therefrom,
first swivel means is pivotally attached to said first end of said breakwater,
second swivel means pivotally attached to said second end of said breakwater,
said swivel means having means thereon to attach said swivel means to an anchor line whereby said breakwater



can be anchored in place along a shoreline for decelerating waves,
said hollow body having bulkheads therein attached to said first side of said body, to said second side of said body, to said bottom of said body dividing said body into a plurality of compartments, whereby a water ballast in said breakwater is prevented from flowing from one end thereof to the other to change the weight thereof,
said bulkheads having laterally spaced openings through them allowing water in said breakwater to redistribute itself in said body at a controlled rate to restrain the movement of said breakwater,
said top of said body has spaced openings therein and covers for said spaced openings whereby ballasts can be introduced into and removed from said breakwater body.

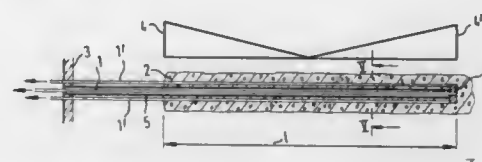
4,715,745
GROUND ANCHOR SYSTEM

Ernst Reichert, Pörling, and Karl Schütt, Langenfeld, both of Fed. Rep. of Germany, assignors to Stump Bohr GmbH, Ismaning, Fed. Rep. of Germany

PCT No. PCT/DE85/00241, § 371 Date May 5, 1986, § 102(e) Date May 5, 1986, PCT Pub. No. WO86/00655, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 12, 1985, Ser. No. 858,185
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425941

Int. Cl.⁴ E02D 5/76
U.S. Cl. 405—262 11 Claims



1. A ground anchor system comprising:
an abutment at a side of a ground surface opposite the ground;

an elongated main tension member having a subterranean portion of its length extending into and adapted to be anchored in the ground below said surface, said elongated main tension member having a free portion of its length between said surface and said abutment and being tensioned against said abutment;
an anchor body in the ground at a foot of said main tension member in the ground remote from said abutment, said main tension member being fixed to said anchor body;
a sleeve spacedly surrounding said main tension member over at least said subterranean portion and fixed to said anchor body;
a compression mass surrounding said sleeve, said subterranean portion and said anchor body in direct contact with said anchor body and said sleeve and with the surrounding ground over the length of said subterranean portion, said sleeve separating said subterranean portion of said tension member from direct contact with said mass; and
at least one auxiliary tension member extending to said anchor body, passing through said mass outwardly of said sleeve and tensioned against said abutment.

4,715,746
METHOD OF STRENGTHENING GEOLOGICAL FORMATIONS

Max Mann, Odenthal, and Manfred Kapps, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Continuation of Ser. No. 819,075, Jan. 15, 1986, abandoned. This application Apr. 15, 1987, Ser. No. 38,375

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3502997

Int. Cl.⁴ E02D 3/12
U.S. Cl. 405—264 8 Claims

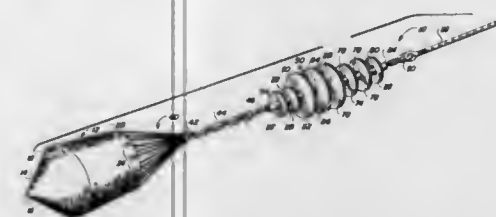
1. A process for strengthening a geological formation in an underground working or mine by introducing a reaction mixture which contains only organic foam-forming components and optionally water comprising
(a) a polyisocyanate component and
(b) a polyol component which comprises a mixture of
(i) an organic polyhydroxyl compound with a hydroxyl number of about 100 to 800 and
(ii) a monovalent alcohol having a molecular weight of about 32 to 600 wherein component (ii) is present in an amount of about 0.01 to 20% by weight, based on the total quantity of component (b)
into at least one bore-hole located in said formation and allowing components (a) and (b) to react to form a polyurethane.

4,715,747
AIR MOTIVATED CONDUIT PROVER APPARATUS

Robert N. Behrens, 4802 W. Laurel Ln., Glendale, Ariz. 85304

Filed Jun. 20, 1986, Ser. No. 876,413
Int. Cl.⁴ F16L 1/00

U.S. Cl. 405—303 11 Claims



1. Air driven apparatus for proving and cleaning a conduit, comprising, in combination:
flexible piston means movable in the conduit;
flexible mandrel means secured to and movable with the piston means in the conduit including

cable means secured to the piston means,
a plurality of spacers secured to and movable with the cable means,
a plurality of plates alternating with the plurality of spacers and secured to and movable with the cable means;
rope means secured to the cable means of the mandrel means and movable with the piston means and the mandrel means through the conduit; and
air means for moving the piston means, the mandrel means, and the rope means through the conduit to prove the integrity of the conduit.

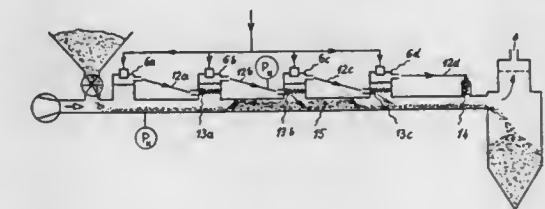
4,715,748
PROCESS AND EQUIPMENT FOR PNEUMATIC AND HYDRAULIC TRANSPORT OF BULK MATERIALS THROUGH PIPES

Wolfgang Krambrock, Vogt, Fed. Rep. of Germany, assignor to AVT Anlagen- und Verfahrenstechnik GmbH, Vogt, Fed. Rep. of Germany

Continuation of Ser. No. 781,135, Sep. 27, 1985, abandoned. This application Apr. 6, 1987, Ser. No. 35,264

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435907

Int. Cl.⁴ B65G 53/66
U.S. Cl. 406—11 6 Claims



1. Process for pneumatic or hydraulic transport of bulk material in a conveying direction through a pipeline by means of over or underpressure, with a normal pressure drop existing in the pipeline when no plug of bulk material exists in the pipeline, comprising: monitoring the pressure prevailing at a plurality of successive selected points along the pipeline; continuously providing a plurality of sources of a pure gas or liquid each at a pressure corresponding to the pressure prevailing at an associated one of the selected points along the pipeline; and supplying the pure gas or liquid from each source to the selected point along the pipeline which next succeeds, in the conveying direction, the associated selected point for that source, only when the pressure drop in the pipeline between the selected point associated with that source and the succeeding selected point exceeds the normal pressure drop.

4,715,749
PNEUMATIC TRANSPORT CONVEYOR

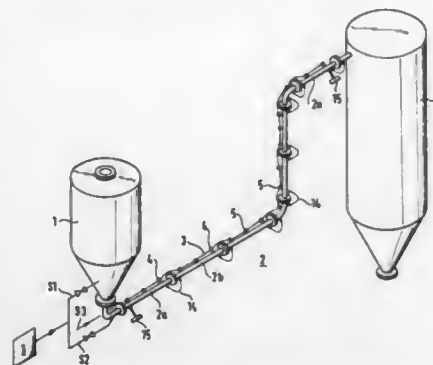
Hans Hoppe, Vogt; Dieter Heep, Bergatreute; Norbert Eberhard, Ertingen, and Werner Miller, Ravensburg, all of Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Oct. 9, 1985, Ser. No. 785,844
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 3437560

Int. Cl.⁴ B65G 53/66
U.S. Cl. 406—14 7 Claims

1. A pneumatic conveying system for bulk material comprising a transport conduit through which said bulk material is pneumatically transported, said transport conduit comprising a plurality of tubular sections connected end to end, each section comprising a rigid outer tube and an elastoc tube having an outer diameter smaller than the inner diameter of said outer tube, and a secondary gas line paralleling said transport conduit, check and relief valves connecting said secondary gas line to the interior of the inner tube at selected intervals, said check

and relief valve communicate through the walls of said outer and inner tube to be responsive to a different in pressure between that within the inner tube and that within said secondary gas line to divert gas to or from the interior of said inner tube to enhance the transport of said bulk material therethrough, said elastic inner tube being hermetically sealed at each end to said outer tube and to each of said check and relief valves to form an enclosed chamber between said inner and outer tubes,



hermetically separated from the interior of said inner tube and from said secondary gas line, a bridging tube connecting the chambers of each one said conduit sections serially with the chamber of each of the next adjacent conduit sections, the chambers of at least the terminal conduit sections in said transport conduit being opened to atmosphere to permit air at atmospheric pressure to move serially through said chambers from one end of said transport conveyor to the other.

4,715,750

LARGE CAPACITY SINGLE OVERHEAD PNEUMATIC TUBE SYSTEM

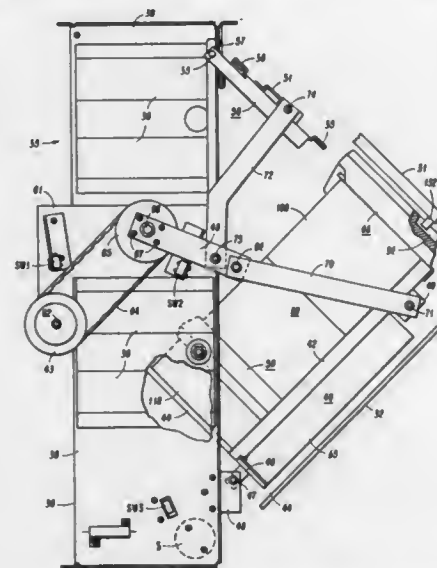
Michael J. Podoll, Marion, and Peter J. Jensen, Center Point, both of Iowa, assignors to LeFebure Corporation, Cedar Rapids, Iowa

Filed Jan. 19, 1986, Ser. No. 875,923

Int. Cl.⁴ B65G 51/26

U.S. Cl. 406—111

9 Claims



1. In a pneumatic tube system having a pair of terminals interconnected by an overhead rectangular tube, a captive, generally rectangular carrier having upper and lower ends for passage between the terminals, one of the terminals including a front wall and an upright rectangular carrier receiver normally enclosed within said one terminal for receiving the carrier from and dispatching the carrier into the tube, the receiver

having an upper opening and an inner carrier platform supporting the lower end of the carrier when in the receiver, the receiver constituting a drawer including said front terminal wall and slidable in one direction relative to said one terminal from its closed to its open position in order to expose the upper end of the carrier when supported on the carrier platform and in an opposite direction relative to said one terminal from its open to its closed position in order to return the carrier to within said one terminal, the carrier lower and upper ends constituting covers slidable with respect to the carrier in said directions of movement of the receiver, means for retaining the cover of the upper end of the carrier in said one terminal upon movement of the receiver between its closed and its open positions, whereupon the carrier is opened and closed upon movement of the receiver between its closed and open positions.

4,715,751

DEVICE FOR THE INTERNAL MACHINING OF A TUBE

Claude Rigoulot, 71100 Chalon Sur Saone, France, assignor to Commissariat a l'Energie Atomique, Paris, France

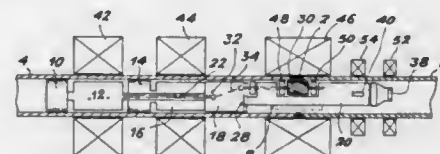
Filed Sep. 19, 1986, Ser. No. 909,466

Claims priority, application France, Sep. 27, 1985, 85 14351

Int. Cl.⁴ B23C 3/02

U.S. Cl. 409—139

11 Claims



1. A device for the internal machining of a tube, wherein the device comprises a mobile assembly which can be positioned in the tube and has a first part with at least two bearings to provide a centering support of the mobile assembly in the tube and provided with two rotors which freely rotate along a longitudinal axis of said mobile assembly, and a second part having a machining tool mounted so as to rotate freely along a longitudinal axis so that it can machine the interior of the tube, means for linking the second part to the first part in radial sliding relationship to enable said second part to translate radially along a radial axis of said tube relative to said first part, one of the said rotors driving the machining tool via a transmission shaft and the other of the said rotors rotating the second part and a fixed assembly arranged around the tube and comprising first and second magnetic devices, each magnetic device being centered respectively substantially about the median transverse plane of each rotor and each magnetic device establishing a rotary magnetic field which rotates a respective one of said two rotors on the longitudinal axis of the mobile assembly and a third magnetic device centered substantially about the median transverse plane of the cutting tool and establishing a rotary magnetic field able to displace the second part radially with respect to the first part, whilst rotating in phase with the second part.

4,715,752

CUTTER HEAD IN A MACHINE TOOL

Masayuki Oura, Kyoto, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,345

Claims priority, application Japan, Mar. 11, 1986, 61-33868[U]

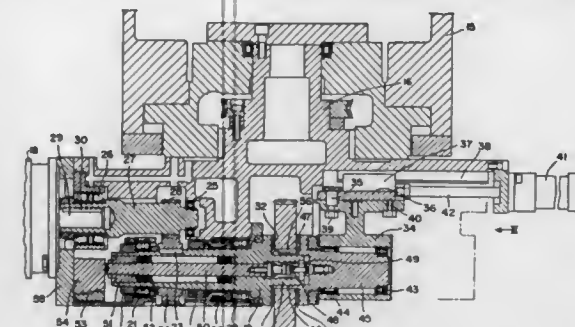
Int. Cl.⁴ B23Q 5/04

U.S. Cl. 409—232

1 Claim

1. A cutter head in a machine tool comprising a cutter head main body, a cutter spindle that is rotatably supported by said cutter head main body and adapted to be rotatably driven, a cutter support carried by said cutter head main body so as to be

rotatable about an axis orthogonal to the cutter spindle axis and movable along the axial direction of said cutter spindle, a support shaft that is rotatably supported by said cutter support so as to be coaxial with said cutter spindle, a collet section having an expansible and contractible diameter so that the tip end of said cutter spindle can be fitted in the inner circumference of the collet section resulting in expansion of the diameter



and a cutter can be fitted around the outer circumference of the collet section, said collet section being formed at the tip end of said support shaft, and clamp means for clamping the cutter fitted around the outer circumference of said collet section by bringing said cutter spindle and said support shaft close to each other under the state where the tip end of said cutter spindle is fitted in the collet section of said support shaft.

4,715,753

TOOL-HEAD/TOOL-HOLDER COUPLING

Hans Tack, Velbert, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

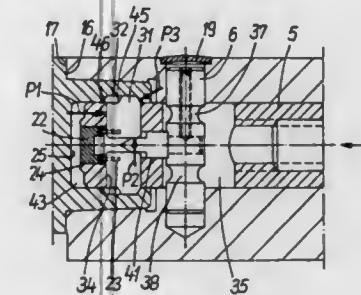
Filed Jan. 23, 1987, Ser. No. 6,707

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602247

Int. Cl.⁴ B23B 29/04, 29/34

U.S. Cl. 409—234

21 Claims



1. Coupling for the connection of a tool head having a planar face and defining therewith a blind bore with a groove and a contact collar external to said bore and a tool holder having a counterface opposing said collar in a machine tool having an interchangeable tool head provided with an at least partially conical receiving pin and an annular contact collar, both cooperating with a corresponding receiving bore and an annular counterface of the tool holder, with tool holder and tool head being actuated by means of clamping elements which are themselves actuated by way of a clamping device and being locked in such a manner that the contact collar of the tool head rests against the counterface of the tool holder, the coupling comprising a clamping slide in the tool holder and arranged movably therein in longitudinal direction of the tool holder, the clamping slide having a frontal face cooperating with the planar face of the tool head in said blind bore in the tool head, radially movable clamping jaws in the front portion of said tool head, a pin fixed to the tool holder and cooperating with said clamping jaws and responsive to the clamping jaws being

pushed over said pin to grip behind said groove in the receiving bore of the tool head and lock said tool head in its end position in such a manner that its contact collar rests firmly against the counterface of the tool holder.

4,715,754

TIEDOWN ASSEMBLY

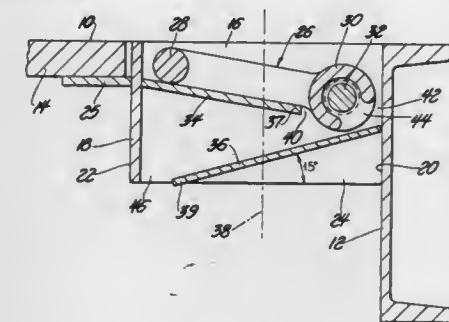
Andrew J. Scully, Macomb, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 18, 1986, Ser. No. 875,899

Int. Cl.⁴ B61D 45/00

U.S. Cl. 410—107

3 Claims



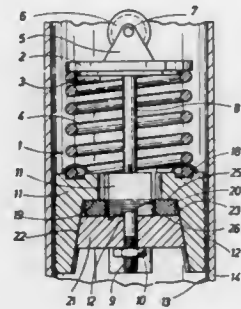
1. In a flat bed cargo vehicle having a series of upward-opening pockets spaced therealong, and a cargo tie-down anchor member pivotably disposed within each pocket for swinging motion between a retracted position located entirely within the pocket and a use position extending partly out of the pocket:

the improvement wherein each pocket is defined by side walls and a bottom wall; said pocket side walls including first and second parallel flat side walls spaced from one another to define the length dimension of the pocket, and third and fourth parallel flat side walls spaced from one another to define the width dimension of the pocket; said bottom wall comprising an upper plate (34) and a lower plate (36); said upper plate angling downwardly from the first pocket side wall to a point beyond the vertical mid plane (38) of the pocket; said lower plate angling downwardly from the second pocket side wall to a point beyond the vertical mid plane of the pocket, said plates having free edge areas spaced from respective ones of the second and first side walls; the plates being dimensioned so that the free edge areas of the plates overlap one another in the vertical direction; the pocket side walls having lower edges thereof no higher than the general plane of the lower plate whereby the space between the free edge of the lower plate and the first side wall forms a restriction to upwardly-moving flames that might otherwise reach the space above the cargo bed; each cargo tie-down member comprising a hub section (30) located above the lower plate in the space between the second side wall and the free edge of the upper plate, and a loop section (28) extending from the hub section; and a pivot shaft (32) extending through the hub section from the third side wall to the fourth side wall to form a pivot axis paralleling the first and second side walls; each cargo tie down member being swingable around the defined pivot axis between a retracted position wherein the loop section rests against the upper plate and a use position wherein the loop section extends upwardly relative to the pivot axis; each hub section having a curvilinear cross section sized to form a first water drainage clearance space (42) between the hub section and the associated second side wall, and a second water drainage clearance space (40) between the hub section and the free edge of the associated upper

plate when the tie down member is in its use position or in its retracted position.

4,715,755

SECURING DEVICE FOR SECURING IN CAVITIES
Karl G. Hesselmar, Lerum, Sweden, assignor to AB Holmgrens Armaturfabrik, Gnosjö, Sweden
PCT No. PCT/SE85/00280, § 371 Date Mar. 18, 1986, § 102(e)
Date Mar. 18, 1986, PCT Pub. No. WO86/00964, PCT Pub. Date Feb. 13, 1986
PCT Filed Jul. 15, 1985, Ser. No. 852,457
Claims priority, application Sweden, Jul. 18, 1984, 8403763
Int. Cl.⁴ F16B 13/04; E21B 23/00
U.S. Cl. 411—39 6 Claims



1. A securing device for use in a cavity, comprising: a plurality of clamping jaws, a changeable tension body adapted to expand said clamping jaws against opposite wall portions in said cavity, said clamping jaws having engagement surfaces to be forced outwardly, and also having tension surfaces for cooperation with a tension surface of the tension body which by a displacement motion of the clamping jaws relative to the tension body is brought to adjust the clamping jaws between an inner, releasing position and an outer, expanded securing position, a spring mechanism for pressing the clamping jaws against the tension body, and a distance element positioned between the clamping jaws and the tension body, said distance element maintaining in said releasing position a predetermined distance between support surfaces of the clamping jaws and a surface of said distance element, said distance element being made of a material soluble in water such that the material is contacted with a source of water and after a certain time interval the distance element is dissolved and said distance will be reduced, so as to result in said displacement motion of the clamping jaws relative to the tension body, whereby the expanded securing position will be automatically taken with a time delay from the time, when said environmental influence begins.

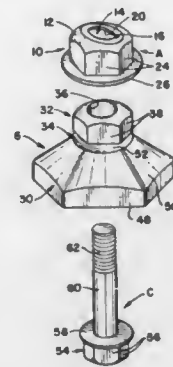
4,715,756

NUT AND WASHER ASSEMBLY

Henry F. Danico, Stoneham, and Frederick A. Hammerle, Topsfield, both of Mass., assignors to TRW Inc., Cleveland, Ohio
Continuation of Ser. No. 635,978, Jul. 30, 1984, This application Oct. 6, 1986, Ser. No. 917,231
Int. Cl.⁴ F16B 33/00, 37/08
U.S. Cl. 411—369 8 Claims

1. A fastener assembly comprising:
a washer member molded from plastic and including a skirt portion having a sealing face and a reduced diameter end portion integrally joined to said skirt portion by a collar section interposed between said skirt and end portions, a fastener receiving aperture for receiving the threaded shank of an elongated threaded fastener, said aperture extending generally centrally through said skirt portion, said end portion and said collar portion, at least the portion of said aperture associated with said skirt portion being devoid of threads;
a generally cup-shaped metal nut means having an internal

open configuration generally corresponding to said end portion positioned over and enclosing said end portion and press fitted thereto for driving rotation therewith, said nut means having side walls terminating above said skirt portion and further including a threaded opening aligned with said aperture and adapted to threadedly receive the shank of an elongated threaded fastener extending through said aperture; and,

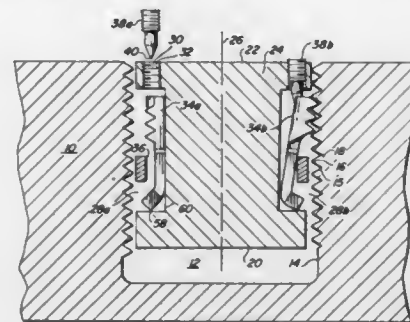


said collar section having a width substantially less than said end portion and a conformation to facilitate fracture thereof when a predetermined torque load is applied between said skirt portion and end portion for allowing said skirt portion and end portions to be rotated relative to each other.

4,715,757

ATTACHMENT APPARATUS AND METHOD FOR ATTACHING

Robert E. Edminster, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 1, 1984, Ser. No. 656,800
Int. Cl.⁴ F16B 35/01
U.S. Cl. 411—411 18 Claims



1. An attachment apparatus comprising:
a device having an outward facing surface and a body formed around a common axis;
an anchor surrounding the body of said device;
a pin having a pin axis; and
a keeper positioned on the outward side of the body of said device, said keeper having
a tooth protruding outwardly from the body of said device, and
means, integral with said keeper, for receiving said pin so that upon engagement of said pin with said receiving means said pin transmits force to said keeper in a direction which causes said keeper tooth to move outwardly from the body of said device.

4,715,758

METHOD AND APPARATUS FOR ATTACHING SHEETS TOGETHER

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.
Filed Jul. 18, 1986, Ser. No. 886,606
Int. Cl.⁴ B42C 9/00
U.S. Cl. 412—8 12 Claims

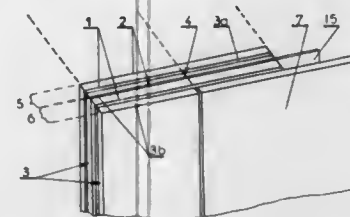


1. A method of binding sheets of paper together by stitching on the center-line of the sheets to form signatures, comprising the steps of continuously collecting the sheets in spaced-apart stacks on a support, moving said support with said stack in a path of movement and at a selected speed, positioning groups of hollow needles in radially extending positions along only one straight line on the circumference of a circular rotatable support and rotating said support to have said needles rotate at said selected speed and into piercing contact with the sheets for forming holes therein on the center-line thereof, the spacing of said groups of said needles on the circular path of rotation being in circumferential spaced-apart groups which are related to said center-lines of said stacks of sheets by a whole number to have said needles pierce said sheets only on the center-lines and at a uniformly spaced-apart positions along said center-lines of successive ones of said stacks, forcing a hardenable liquid through said hollow needles only while said needles are piercing, depositing said hardenable liquid into said holes and into contact with the sheets for binding the sheets together when the liquid hardens, and withdrawing said needles from said holes.

4,715,759

COUNTERFOIL BINDING

Hubert Larque, Route de Lys, Bruges 64800 Nay, France
Filed Dec. 17, 1984, Ser. No. 682,752
Claims priority, application France, Dec. 23, 1983, 83 20800
Int. Cl.⁴ B42F 1/00; B42D 1/10, 5/00
U.S. Cl. 412—33 5 Claims



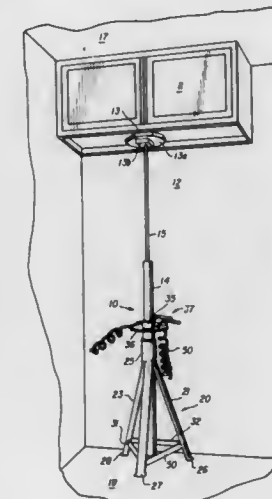
1. A counterfoil binding for classifying documents in loose-leaf form, comprising:
a plurality of thin superimposed strips bound together at a lateral edge in pad-like form and covered on at least one entire side with an adhesive layer;
a removable film covering the entire adhesive layer, said film having at least one line of least resistance for facilitating partial removal of the film from the surface of said strip, said film having a thickness which is at least as great as the thickness of the documents to be classified and said at least one line of least resistance being parallel to the bound edge of said strip; and
wherein each strip and associated film is configured so that removal of a portion of the film along said line of least resistance permits substitution of a loose-leaf sheet for the removed portion of film thereby forming a prolongation

of the non-removed portion of the film and the non-removed portion maintains appropriate spacing between said plurality of strips.

4,715,760

HOIST FOR INSTALLING CABINETS, CEILING FRAMES AND THE LIKE

Ervin R. Browning, P.O. Box 430, Carlsbad, Calif. 92008
Filed Oct. 22, 1986, Ser. No. 921,306
Int. Cl.⁴ E04G 1/00, 21/14
U.S. Cl. 414—10 13 Claims



1. A lifting device for hoisting wall mounted cabinets, ceiling frames and the like, the lifting device comprising:
a tripod support having three legs each having an upper end and a lower end, feet positioned at the lower ends of each of the legs to provide three spaced supports for the device and annular means for connecting the legs to one another adjacent the upper ends thereof;
a single tube fixed in the annular means and extending a substantial distance down between the legs of the tripod support;
a fluid cylinder telescopically received within the single tube;
a plurality of stations defined in the single tube for receiving stop means to longitudinally position the fluid cylinder in the single tube at a selected one of the stations;
means connected to the fluid cylinder for pressurizing the cylinder;
piston means within the fluid cylinder for extending longitudinally upon pressurizing the fluid cylinder;
extension means extending from the piston means for longitudinal movement therewith, the extension means having a distal end; and
a supporting platform mounted on the distal end of said extension means for supporting the object to be lifted.

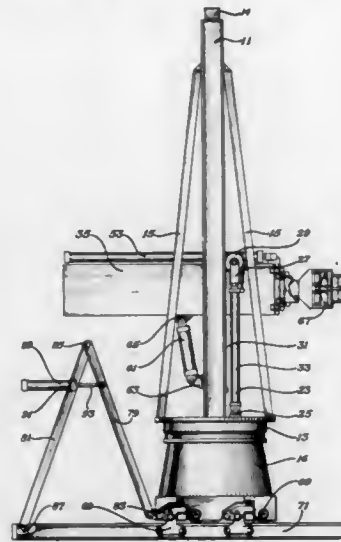
4,715,761

UNIVERSAL FLOOR MOUNTED PIPE HANDLING MACHINE

Joe R. Berry, Round Rock; Faustyn C. Langowski, Georgetown; James G. Renfro, Austin, and Roger Smith, Jr., Georgetown, all of Tex., assignors to Hughes Tool Company, Houston, Tex.
Continuation of Ser. No. 760,388, Jul. 30, 1985, abandoned. This application Mar. 3, 1987, Ser. No. 21,618
Int. Cl.⁴ E21B 19/14
U.S. Cl. 414—22 3 Claims

1. A pipe handling machine, comprising:
a first set of tracks extending across a rig floor, toward and away from the well center, the rig floor having an upper surface which defines a horizontal plane, the tracks being

flush with the upper surface of the rig floor so that the tracks do not protrude past the horizontal plane;
a second set of tracks extending across the rig floor, transverse to the first set, the second set of tracks also being flush with the upper surface of the rig floor;
a trolley, engaging one set of tracks;
a turntable for transferring the trolley from one set of tracks to the other set of tracks;
means for moving the trolley along the tracks;
a base, mounted on the trolley;



means for rotating the base about a vertical axis; two parallel vertical tracks, extending upward from the base for movement with the base;
a carriage, mounted on the vertical tracks, for vertical movement along the tracks;
means for moving the carriage along the vertical tracks;
a multisection telescoping boom, connected to the carriage for movement therewith;
means for telescopically extending and retracting the boom;
means for luffing the boom about a horizontal axis; and a pipe-engaging head, mounted on the boom.

4,715,762

GRAPPLER SYSTEM FOR LIFTING APPARATUS

John J. Lanigan, Sr., Tinley Park; Myron Glickman, Morton Grove; Thazhuthkudiyil V. George, Chicago, and Bernard A. Ermel, Clarendon Hills, all of Ill., assignors to Mi-Jack Products, Inc., Hazel Crest, Ill.

Continuation of Ser. No. 761,620, Aug. 1, 1985, abandoned, which is a division of Ser. No. 683,970, Dec. 12, 1984, Pat. No. 4,546,891, which is a continuation of Ser. No. 583,119, Feb. 24, 1983, abandoned, which is a continuation of Ser. No. 346,513, Feb. 8, 1982, abandoned. This application Jan. 9, 1987, Ser. No. 4,807

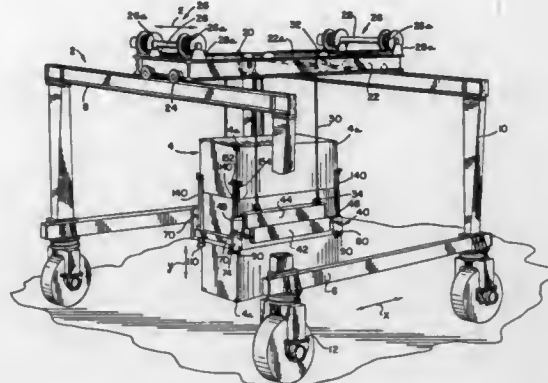
Int. Cl.⁴ B66C 17/20; B65G 59/06

U.S. Cl. 414—126

11 Claims

1. An apparatus for lifting containers of the type having lifting apertures at the corners thereof, which comprises:
an interconnected open center frame;
an open center bridge supported by said frame;
lift means carried by said open center bridge;
single grapple means connected to said lift means for engaging one or more of a plurality of stacked containers;
means operatively connecting said lift means to said grapple means to position said grapple means adjacent a stack of containers for lifting one or more of the containers;
said open center bridge being disposed above said grapple means with the open center permitting containers to be elevated to a vertical position above the bridge;
said grapple means including first latching means mounted for engaging apertures of a first container and second

latching means mounted for engaging apertures of a second container carried on the first container;



said grapple means further including means for permitting withdrawal of said first latching means from said first container while permitting said second latching means to remain in engagement with the second container.

4,715,763

DRY ASH REMOVAL SYSTEM

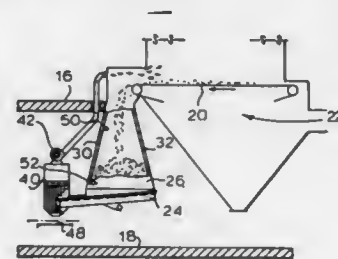
Russell J. Galgana, Clarksville; Patrick F. Mahoney, Rensselaer, both of N.Y., and Gordon L. Sutin, Dundas, Canada, assignors to Smith & Mahoney, P.C., Albany, N.Y.

Filed Jul. 25, 1986, Ser. No. 890,762

Int. Cl.⁴ B65D 88/28; B65G 65/42; F23J 3/00

U.S. Cl. 414—216

8 Claims



1. An apparatus for removal of ash from the furnace of a solid fuel fired heat generator unit having a relatively elongated furnace front including
means for collecting ash from beneath the furnace and advancing it to the furnace front,
a conveyor located remote from the furnace front a distance therebelow, and
a hopper connecting the furnace front with the conveyor to communicate ash from the furnace front to the conveyor, the conveyor being operable to convey ash forwardly relatively of the hopper, the hopper being characterized by
a front elevational profile thereof of converging course from a widest lateral expanse thereof at entry thereto at the furnace front to a narrowest lateral expanse at outlet therefrom at said conveyor, and a side elevational profile of diverging course from a narrowest transverse expanse at the entry thereto to a maximum transverse expanse at the outlet thereof, the respective front and side elevational

profiles following courses such that the cross-sectional area of said hopper from top to bottom is of substantially uniform measure.

4,715,764

GATE VALVE FOR WAFER PROCESSING SYSTEM

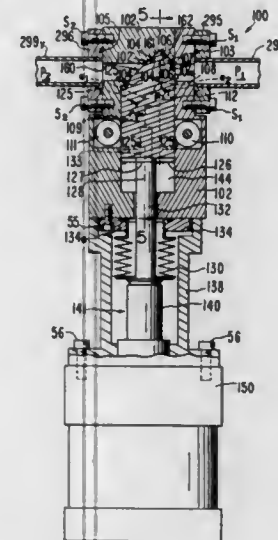
Martin A. Hutchinson, Santa Clara, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 28, 1986, Ser. No. 856,876

Int. Cl.⁴ B65G 51/02

U.S. Cl. 414—217

11 Claims



1. A valve comprising:
a valve body having a passage therethrough;
a valve gate having a first position in which said passage is open and a second position in which a first portion and a second portion of the surface of said valve gate each extend across said passage thereby dividing said passage into a first region and a second region;
sealing means, between said valve body and said first portion of said surface of said valve gate when said valve gate is in said second position, for providing a vacuum seal between said first region and said second region, a rotational moment being generated on said valve body by said sealing means being pressed between said first portion of said surface and said valve body when said valve gate is in said second position;
means between said second portion of said surface and said valve body when said valve gate is in said second position, for providing a rotational moment opposed to said rotational moment generated on said valve gate by said sealing means being pressed between said first portion of said surface and said valve body when said valve gate is in said second position, said means for providing a rotational moment not providing a vacuum seal between said first region and said second region; and
means connected to said valve gate for translating said valve gate from said first position to said second position and from said second position to said first position.

4,715,765

GRAVITY FLOW STORAGE SYSTEM

Charles Agnoff, 8 Split Rock Ct., Melville, N.Y. 11747

Filed Apr. 10, 1986, Ser. No. 850,227

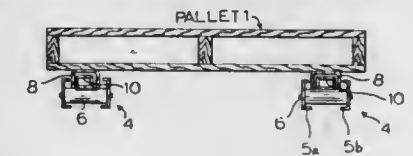
Int. Cl.⁴ A47F 5/00

U.S. Cl. 414—276

8 Claims

1. A gravity flow storage system for storing pallets comprising:
at least two parallel and laterally spaced-apart conveyors having a plurality of rotatably mounted, parallel longitudinally spaced-apart rollers, said conveyors being disposed

at an inclined angle to define a storage lane having a front lower end and a rear upper end; and
at least two independent pallet carrier sets, each of said sets disposed respectively on an associated conveyor, said sets comprising at least two nested telescoping pallet carriers including an innermost and an outermost pallet carrier, with said nested pallet carriers normally resting upon said conveyor rollers and being longitudinally displaceable on said associated conveyor via said rollers thereof, wherein



corresponding pallet carriers of said carrier sets cooperate to support a pallet thereon such that said system is loadable by successively placing pallets onto corresponding carriers at said front lower end and moving the pallets on said corresponding carriers rolling on said rollers towards said rear upper end, beginning with said outermost carriers, and said system being conversely unloadable by successively removing pallets at said front lower end, thereby allowing any previously loaded pallets to move under the force of gravity towards said front lower end.

4,715,766

COMBINED DISTRIBUTION APPARATUS FOR PIECE GOODS

Guenter Gebhardt, Sinsheim, Fed. Rep. of Germany, assignor to Gebhardt Fordertechnik GmbH, Sinsheim, Fed. Rep. of Germany

Continuation of Ser. No. 562,740, Dec. 19, 1983, abandoned.

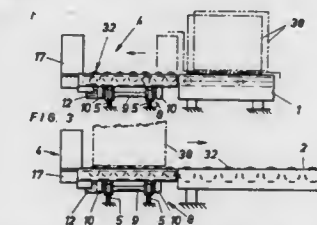
This application Apr. 30, 1986, Ser. No. 858,845

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247126

Int. Cl.⁴ B65G 67/00

U.S. Cl. 414—392

6 Claims



1. A distribution apparatus for piece goods, comprising a transporting system for picking up and delivering a piece good, the transporting system including plural conveyor means and plural loading fork means, said plural loading fork means being disposed in a manner such that they can be raised and lowered relative to the plural conveyor means and being operable in the transporting direction, drive motor means for selectively driving both the plural conveyor means and the plural loading fork means in the transporting direction for loading and unloading, and means for supporting said plural conveyor means and said plural loading fork means on a displaceable frame means operably shiftable transversely of the transporting direction, the plural loading fork means being supported on a displaceable chassis means operable to travel in the transporting direction, said displaceable chassis means including plural lever means each having one end thereof pivotally attached to the plural fork means near the ends thereof, roller means at another end of the plural lever means and supported in U-shaped bearer profile means on the displaceable frame means, plural actuating means extending below the plural fork means, each lever means on a fork means being pivotally attached to one of the plural actuating means, the plural conveyor means being sup-

ported in part by one side of the U-shaped bearer profile means, said drive motor means including drive means for each of the plural conveyor means and connected to the plural conveyor means and to the drive motor means, the drive motor means having a motor means fixedly mounted on the displaceable frame means and also drivingly connected to the plural actuating means to laterally shift the plural actuating means in the transporting direction to thereby pivot the plural lever means to cause the plural loading fork means to be raised in height above the plural conveyor means, said drive motor means also connected to plural fork shifting means mounted to an underside of the plural fork means to provide for shifting of the shiftable carriage means attached to the plural fork means in the transporting direction, and said fixedly mounted motor means being located at an edge of the displaceable frame means at a point away from the transporting direction.

4,715,767

MOTOR-DRIVEN GARBAGE TRUCK COMPRISING A DETACHABLE CONTAINER

Gustav D. Edelhoff, Iserlohn, Fed. Rep. of Germany, and Fred I. Smith, Palos Verdes Pen, Calif., assignors to Edelhoff Polytchnik GmbH & Co., Iserlohn, Fed. Rep. of Germany

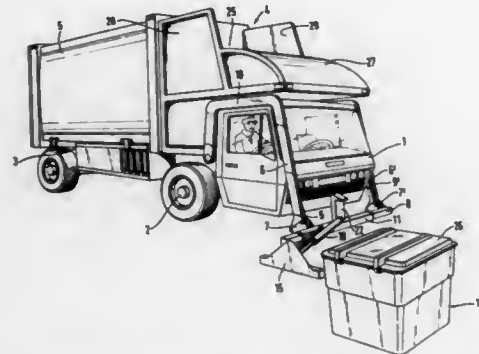
Filed May 14, 1985, Ser. No. 733,865

Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3420058

Int. Cl.⁴ B65F 3/04

U.S. Cl. 414—408

12 Claims



1. A motor-driven garbage truck having a chassis frame including front and rear axles and a driver's cab including a front windscreen mounted on said chassis frame and comprising a garbage container provided with a receiving opening and a closure member therefor and separable coupling elements, a pouring unit permanently mounted on said truck in a forward portion thereof and a pouring chute leading to a receiving space, lifting and tipping apparatus for picking up a garbage can and discharging the contents thereof into said chute, and a conveying and compacting apparatus for transferring garbage from said receiving space into said container through said receiving opening, said pouring unit being disposed in part above said driver's cab and in part between said driver's cab and said container, said chute being disposed in a region extending behind and above said driver's cab, said lifting and tipping apparatus comprising at least one lifting arm pivotally movable about a transverse pivot carried by said pouring unit or said chassis frame, said lifting arm carrying at its free end a carrying rail disposed parallel to said transverse pivot and which is pivotally movable between a pick-up position, in which said rail is disposed below and in front of said driver's cab, and a pouring position, in which said rail is disposed above and behind said driver's cab, said rail being provided with displaceable or pivotally movable extensible means for coupling to and gripping a garbage can, said displaceable or pivotally movable extensible means for coupling and gripping a garbage can including a link in the form of an arm, said link being eccentrically mounted on a profiled member slidably mounted on said

carrying rail and extensible beyond at least one end of said carrying rail for pivotal movement about a vertical axis, the link at its free end carrying a triangular shaped self-centering claw member having beveled edges which cooperate with a similar shaped member on said garbage can for picking up said garbage can and means for pivotally moving said claw member between an outer position, in which said carrying rail or said profiled member picks up said garbage can and an inner position in which said lifting and tipping apparatus transports said garbage can to said pouring opening.

12. A tipping device for motor-driven garbage-collecting trucks comprising a holding claw adapted to cooperate with edge portions of garbage cans provided with open ends and upper sides and with a receiving pocket on the open ends thereof, and a gripping arm, said tipping device characterized by the fact that said holding claw is a plate having the shape of an isosceles triangle having an upwardly directed vertex and the upper sides of which form inwardly tapering, beveled gripping edges which cooperate with said receiving pocket on said garbage cans, said receiving pocket having a complementary undercut surface and being formed by a section member located on and reinforcing the edge portion of said garbage cans at an open end, said holding claw being attached to a free end of said gripping arm.

4,715,768

BOAT TRAILER GUIDE

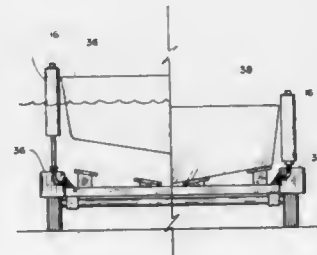
Lloyd O. Capps, Rte. 5, Box 445, Claremore, Okla. 74017

Filed Jul. 21, 1986, Ser. No. 887,745

Int. Cl.⁴ B60P 3/10

U.S. Cl. 414—535

3 Claims



1. A boat trailer guide comprising:
(a) a bracket means for attaching to a boat trailer and adapted to hold a shaft means substantially vertical and adjacent to the side of a boat support on a trailer;
(b) a shaft means for supporting a floatable roller wherein said shaft means is attachable to said bracket means and adapted to be held substantially vertical and adjacent to the side of a boat supported on a trailer when said bracket means is attached to a boat trailer; and
(c) a floatable roller attached to said shaft means and adapted to rotate about said shaft means as well as to float upwardly and extend telescopically on said shaft means, thus extending the boat guide vertically, when a boat trailer to which said bracket means is attached such as to hold said shaft means substantially vertical is lowered below water.

4,715,769

RAIL SUPPORTED ARTICULATED CLIMBING DOLLY

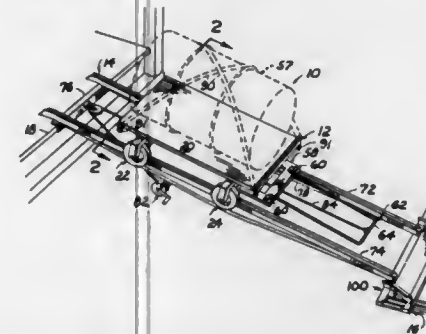
Robert E. Kirtley, 30 N.E. 65, Oklahoma City, Okla. 73105

Filed Apr. 17, 1986, Ser. No. 853,110

Int. Cl.⁴ B65G 11/02

U.S. Cl. 414—571

2 Claims



1. A climbing dolly system, comprising:
a normally horizontal platform having forward and rearward ends;
frame means including an axle underlying and depending upon respective end portions of said platforms;
at least one of said frame means being pivotally connected with the platform for horizontal pivoting movement about a vertical axis;
each said frame means including at least one transverse frame member having at least one wheel strut depending from its respective ends;
tongue and handle means connected with said one frame means for manual steering movement of said dolly on a horizontal surface;
wheels journaled by said axles for supporting respective end portions of said platform in a mobile manner when on a horizontal surface;
track means including a pair of box channel tracks disposed in spaced parallel relation extending in a fixed position between vertically spaced horizontal support surfaces for supporting the dolly during movement from one elevation to another;
roller means moveable on said track means including two pairs of rollers connected with the depending end portion of each said wheel strut in forward to rearward aligned spaced relation adjacent the respective wheel and spaced upwardly with respect to a horizontal surface supporting the wheels,
the rollers of each pair of said pair of rollers being juxtaposed transversely of the dolly platform;
a pulley block secured to one end portion of the track means; and
which means mounted on the track means and having a flexible element entrained through the pulley block for moving the dolly along the track means.

4,715,770

POWER LIFT FOR A LIFTING DEVICE

Robert Kryscyk, Ketsch, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 786,924, Oct. 11, 1985, abandoned.

This application Feb. 5, 1987, Ser. No. 13,214

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3439048

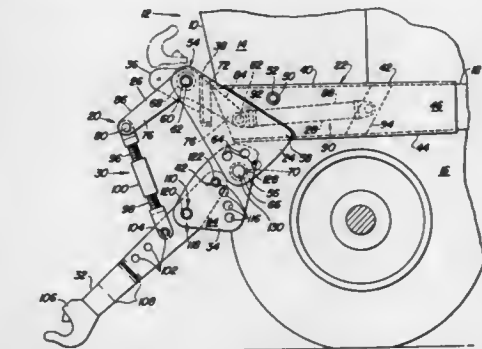
Int. Cl.⁴ B66C 1/00

U.S. Cl. 414—680

6 Claims

1. A front-mounted power lift assembly for an agricultural tractor comprising a frame member fixed to the tractor, at least one vertically movable lower link having means for engaging an implement, and at least one arm, one end of the arm being coupled to the lower link, characterized by means for pivotally coupling the link to the one end of the arm at a pivot axis and by means for selectively rotatably and non-rotatably connect-

ing the other end of the arm to the frame member, the means for connecting the arm to the frame member comprising at least one opening in the arm, a plurality of openings in the



frame member and a pin for insertion through the at least one opening in the arm and through a selected one of the frame member openings, the power lift assembly further comprising a lifting means for vertical moving of the lower link.

4,715,771

VARIABLE GEOMETRY MOUNTING ARRANGEMENT FOR BACKHOE ASSEMBLY

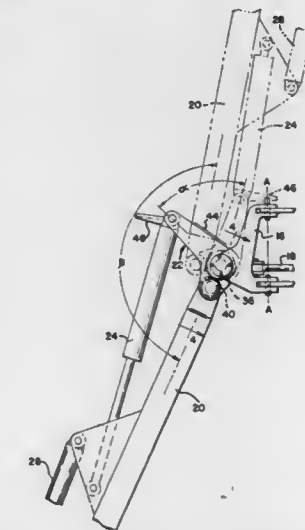
Charles B. Hanson, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Nov. 10, 1986, Ser. No. 928,873

Int. Cl.⁴ B66C 23/42

U.S. Cl. 414—688

4 Claims



1. An arrangement for mounting a hydraulically positionable backhoe having a boom on a material-handling implement, comprising:

swing tower means mounted on the material handling implement for supporting the backhoe;
pivotal coupler means pivotally joined to the swing tower means for relative pivotal movement about a first horizontal axis;
means pivotally coupling the boom of the backhoe to the coupler means for relative pivotal movement about a second horizontal axis spaced from the first horizontal axis;
first gear means joined to the swing tower means and fixed against rotation with respect thereto;
second gear means joined to the boom of the backhoe and fixed against rotation with respect thereto, said second

gear means being in operative meshing engagement with the first gear means; and
selectively extensible hydraulic fluid actuator means extending between said coupler means and the boom of said backhoe, whereby extension of the actuator means causes the second gear means to move about the first gear means to thereby alter the vertical disposition of the second horizontal axis relative to the first horizontal axis, and to thereby pivot the coupler means about the first horizontal axis while the boom of said backhoe pivots about the second horizontal axis.

4,715,772

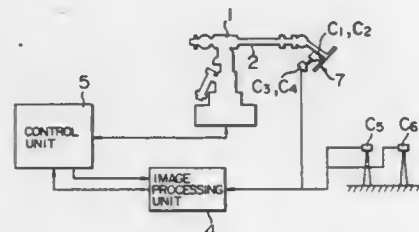
APPARATUS FOR AUTOMATIC GLAZING OF CARS
Hideaki Kanayama, Toyama, Japan, assignor to Kabushiki Kaisha Fujikoshi, Toyama and Mazda Motor Corporation, Hiroshima, both of Japan

Filed Apr. 21, 1986, Ser. No. 853,912

Claims priority, application Japan, May 30, 1985, 60-115375
Int. Cl.⁴ B25J 11/00

U.S. Cl. 414-730

1 Claim



1. An apparatus for automatic glazing of cars comprising:
 - a robot having a robot arm;
 - a gripping tool mounted on said robot arm for gripping a window glass;
 - a first set of two T.V. cameras fixed along a conveyor line for respectively taking images of front and rear pillars of a body shell stopped at a predetermined position;
 - a second set of T.V. cameras mounted on said gripping tool for taking images of a window frame for position compensation of said window glass, said second set of T.V. cameras mounted on said gripping tool comprising two cameras mounted on the lower side of said gripping tool and two cameras mounted on transverse sides of said gripping tool, said lower side cameras respectively taking images of reference members mounted on the lower portion of said window frame for supporting the lower end of said window glass and said transverse side cameras respectively taking images of transverse ends of said window glass and frame;
 - an image processing unit for distinguishing between different kinds of body shells and for calculating position variations of the stopped body shell with respect to predetermined positions thereof from images of said first set of two T.V. cameras fixed along the conveyor line and said second set of T.V. cameras mounted on said gripping tool; and
 - a control unit for receiving a signal representing a distinguished kind of body shell from said image processing unit to move said robot arm to select a window glass of said distinguished kind of body shell and for receiving signals corresponding to the position variations from said image processing unit to move the robot arm so as to compensate for said position variations.

4,715,773

METHOD AND APPARATUS FOR REPOSITIONING A MISLOCATED OBJECT WITH A ROBOT HAND

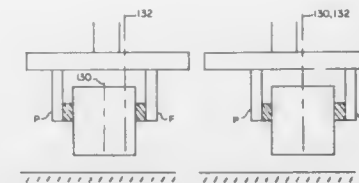
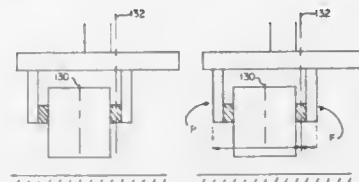
Joey K. Parker, Tuscaloosa, Ala., and Frank W. Paul, Seneca, S.C., assignors to Clemson University, Clemson, S.C.

Continuation-in-part of Ser. No. 741,277, Jun. 4, 1985. This application Jun. 9, 1986, Ser. No. 872,219

Int. Cl.⁴ B25J 9/16

U.S. Cl. 414-730

10 Claims



1. A method for translating an object held by at least two fingers of a robot hand at a predetermined gripping force to a predetermined position relative to a fixed point of the robot hand, the method comprising:
 - sensing the position of each finger relative to the fixed point of the robot hand;
 - for each finger, determining whether said finger is at the greater distance from the predetermined position;
 - selecting the finger at the greater distance as the finger to be position-controlled and selecting the other finger as the finger to be force-controlled;
 - moving said position-controlled finger toward the predetermined position;
 - controlling movement of said position-controlled finger according to the position of said position-controlled finger relative to the fixed point of the robot hand;
 - sensing the gripping force between said force-controlled finger and the object;
 - controlling movement of said force-controlled finger according to said gripping force sensed between said force-controlled finger and the object;
 - stopping movement of said position-controlled finger when the object reaches the predetermined position relative to the fixed point of the robot hand; and
 - when said position-controlled finger is stopped and the predetermined gripping force is applied to the object, then stopping said force-controlled finger.
5. An apparatus for translating an object held by at least two fingers of a robot hand, to a predetermined position relative to a fixed point of the robot hand, the apparatus comprising:
 - means for sensing the position of each finger relative to the fixed point of the robot hand;
 - finger differentiation means for identifying the finger at the greater distance from the predetermined position as the position-controlled finger and for identifying the other finger as the force-controlled finger;
 - means for moving each finger;
 - means for controlling movement of said position-controlled finger according to the position of said position-controlled finger relative to the fixed point of the robot hand;
 - means for sensing the force between said force-controlled finger and the object; and
 - means for controlling movement of said force-controlled finger according to the force sensed between the force-controlled finger and the object.

4,715,774

WORKPIECE ADVANCING APPARATUS

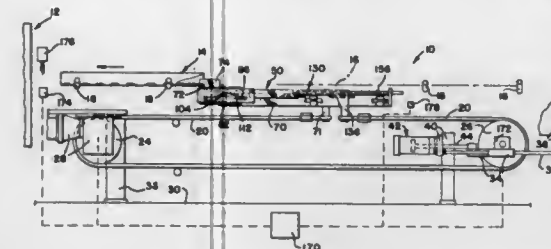
James M. Magnuson, Kankakee, Ill., assignor to Peddinghaus Corporation, Bradley, Ill.

Filed Dec. 23, 1985, Ser. No. 812,739

Int. Cl.⁴ B65G 25/00

U.S. Cl. 414-751

17 Claims



1. Apparatus for gripping and advancing a workpiece for processing, said apparatus including:
 - (a) a flexible tension member;
 - (b) guide means for supporting said tension member, said tension member being trained about said guide means for movement on said guide means in a workpiece advancing direction and in a direction opposite thereto;
 - (c) gripping means including a pair of cooperating jaw means for gripping said workpiece, said jaw means of said gripping means being operatively connected to said tension member for operation of said jaw means between an open position wherein said jaw means are spaced apart, and a closed position by relative movement of said jaw means toward each other, said flexible tension member including two ends, with one of said ends operatively connected with one of said jaw means, and with the other of said ends operatively connected with the other of said jaw means;
 - (d) tensioning means for selectively tensioning and untensioning said tension member for operating said jaw means of said gripping means from between one of said open and closed positions and the other of said positions; and
 - (e) drive means for selectively moving said tension member on said guide means to move said pair of cooperating jaw means of said gripping means selectively in said advancing and opposite directions.

4,715,775

180 DEGREE INVERTING MACHINE

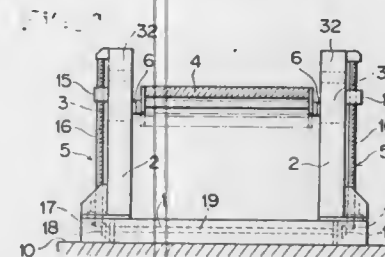
Hiroyuki Amino, Shizuoka, Japan, assignor to Amino Iron Works Co., Ltd., Shizuoka, Japan

Filed Apr. 26, 1985, Ser. No. 727,902

Claims priority, application Japan, Oct. 17, 1984, 155810[U]
Int. Cl.⁴ B25B 11/00

U.S. Cl. 414-758

22 Claims



15. An inverting machine for inverting metal molds 180° for finishing, assembling, dismantling, checking, repairing, and cleaning thereof, the inverting machine comprising:
 - a base;
 - a stationary table positioned on said base and having two lateral sides;

a pair of portal uprights mounted on said table and extending upwardly from each of said sides;
two slide frames each slidably movable along said uprights; means for vertically moving said slide frames relatively to a respective pair of said uprights;
an inverting table having a T-groove for holding a metal mold to be inverted and extending between said slide frames, said inverting table being arranged in opposition to said stationary table and having two opposite sides each with a width;
a central shaft having ends and being pivotally supported by said slide frames at said ends and extending from a center of said width of each side of said inverting table, said central shaft having an outer circumference;
clutch means located between said central shaft and said inverting table for selectively making and breaking connection between said central shaft and said inverting table; first gears provided on said outer circumference of said central shaft;
second gears provided on said slide frames and being formed and arranged to mesh with said first gears; and means for driving said second gears including a reversible power source, said stationary table being arranged so as to provide for a path for transporting the metal mold in front of at least said stationary table.

4,715,776

WIND TURBINE SYSTEM USING A SAVONIUS TYPE ROTOR

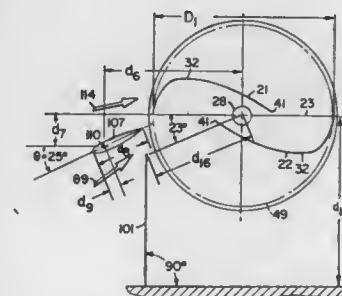
Alvin H. Benesh, 120 S. Adams Ave., Pierre, S. Dak. 57501

Filed Nov. 22, 1985, Ser. No. 801,069

Int. Cl.⁴ F03D 3/04

U.S. Cl. 415-2 R

21 Claims



1. A Savonius rotor assembly for interacting with a moving fluid, comprising:
 - (a) a support framework;
 - (b) a rotor mounted on the support framework for rotation about a central horizontally extending axis, the rotor having two blades disposed symmetrically about the central horizontally extending axis, each of the blades having an outer edge and an inner edge with respect to the central, horizontally extending axis, the outer edges of the blades lying on a circle defining a diameter of the rotor, the blades further having a first curved portion and a second curved portion, the first curved portion beginning at the outer edge and terminating at the second curved portion with the first curved portion defining a surface generally concave with respect to the central, horizontally extending axis, the first curved portion having a radius of curvature which becomes progressively less from the outer edge to the second curved portion, the second curved portion coming progressively closer to a plane containing the central, horizontally extending axis and the outer edge of the blade as the second curved portion extends from the first curved portion to the inner edge of the blade, the maximum displacement of the blades from the plane being less than one-quarter of the diameter of the rotor; and
 - (c) a deflector member extending along the length of the rotor and beyond the ends of the rotor and positioned on

a side of the rotor facing the direction from which the fluid is flowing, a top edge of the deflector member being positioned below a substantially horizontal plane extending through the central, horizontally extending axis of the rotor.

4,715,777

LATERAL CHANNEL SUPPLY PUMP

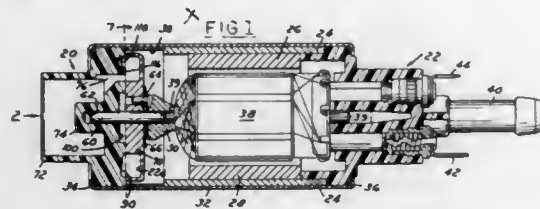
Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Sep. 18, 1985, Ser. No. 777,332

Int. Cl.⁴ F04D 5/00

U.S. Cl. 415—53 T

8 Claims



1. In a lateral channel pump having an inlet housing with a pumping face in a first plane normal to the axis of rotation and a rotor having a multi-pocketed pumping face to rotate adjacent said housing pumping face, that improvement which comprises:

- means forming an arcuate intake passage in said pumping face having a leading and a trailing end extending essentially concentric to the axis of rotation and circumferentially a first predetermined angle of the 360° rotation,
- a radially extending outlet port in said pumping face spaced circumferentially away from said intake passage a second predetermined angle, and
- a circumferential sweep channel in said pumping face between the trailing end of said arcuate intake passage and said outlet port having a cross-section enlarging radially from the inner circumference of said channel to the outer circumference of said channel said sweep channel further enlarging in cross-sectional area from said inlet to said outlet.

4,715,778

CENTRIFUGAL COMPRESSOR

Kazuo Katayama, Taku Ichiryu, Tsuneyoshi Mitsuhashi, Yasushi Mori, and Masanori Kobayashi, all of Takasago, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

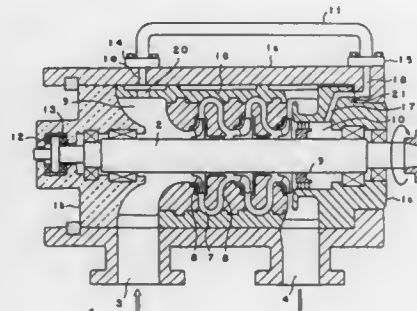
Filed Apr. 30, 1986, Ser. No. 857,490

Claims priority, application Japan, Apr. 1, 1986, 61-47097[U]

Int. Cl.⁴ F01D 3/04

U.S. Cl. 415—104

9 Claims



1. A centrifugal compressor of the type in which disassembly and assembly of said compressor is effected by taking out and inserting internal component parts including end walls for closing ends of a cylindrical rotor chamber in the axial direction thereof; characterized in that an intake chamber side communication hole communicating with an intake chamber

formed within said cylindrical rotor chamber and a propelling force balance chamber side communication hole communication with a propelling force balance chamber formed within said cylindrical rotor chamber, are provided in said internal component parts and in said cylindrical rotor chamber wall, and the intake chamber side communication hole and the propelling force balance chamber side communication hole provided in said cylindrical rotor chamber wall are communicated with each other through a balance pipe mounted on an outer surface of said cylindrical rotor chamber wall, the propelling force balance chamber side communication hole in the cylindrical rotor chamber wall being formed in an inner axial end surface of the cylindrical rotor chamber wall, the inner axial end surface extending perpendicularly to the axial direction.

4,715,779

BLEED VALVE FOR AXIAL FLOW COMPRESSOR

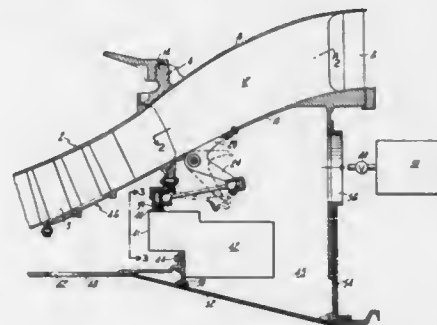
Gabriel L. Suciu, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1984, Ser. No. 681,331

Int. Cl.⁴ F01B 25/00

U.S. Cl. 415—144

7 Claims



1. A bleed valve construction for a multistage compressor including:

- a support case having spaced inner and outer walls defining an air duct for the compressor between them and struts extending between the walls across the air duct, said struts and the case being located between adjacent stages of the compressor,
- bleed doors mounted in openings in the outer wall of the case between adjacent struts and being movable into open or closed position, each door having a projecting arm thereon,
- an actuating ring mounted on said outer case in spaced relation to said door and means constraining said ring to move circumferentially without axial movement,
- a plurality of links connecting the ring to the doors, one link for each door for moving the doors in unison into open or closed position in response to circumferential movement of said ring, and
- actuating means for causing circumferential movement of the ring for actuation the doors in unison.

4,715,780

WATER PUMP

Yoshiro Kan, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,119

Claims priority, application Japan, Sep. 10, 1984, 59-136138[U]

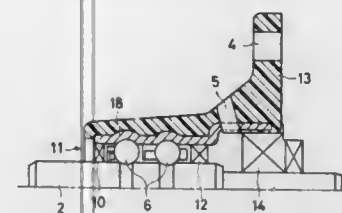
Int. Cl.⁴ F04D 29/08

U.S. Cl. 415—170 A

14 Claims

1. A water pump for an engine of an automotive vehicle, comprising: a rotary pump shaft to which are fixed a drive pulley and a liquid circulating impeller for circulating engine

cooling fluid on rotation of said pump shaft through said drive pulley, bearing means rotatably supporting said pump shaft and including an inner race, an outer race, and a plurality of rolling members rollingly disposed between said inner and outer races, and a separate pump housing formed of resin and molded to said outer race of said bearing means so as to be integrally



attached to said outer race, whereby said pump shaft is rotatably supported within said pump housing, said outer race having a reinforcing member connected thereto which extends into and reinforces said pump housing, said pump housing having a mounting portion including means for mounting the housing to an engine with the impeller disposed to circulate cooling fluid within the engine.

4,715,781

COVER FOR TURBINES AND PUMPS

Helmut Bronowski, and Christian Dahlke, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

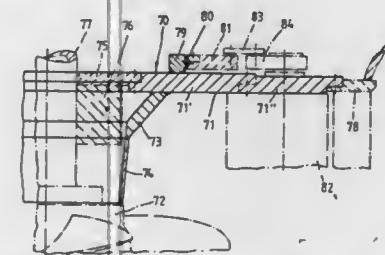
Division of Ser. No. 820,691, Jan. 16, 1986. This application Sep. 18, 1986, Ser. No. 908,796

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501883

Int. Cl.⁴ F01D 25/24

U.S. Cl. 415—219 C

9 Claims



1. In a machine of the type of a propeller-type turbine, Kaplan-type turbine, or similarly-shaped pump, or the like, the machine comprising

- a rotatable shaft; a rotatable runner on the shaft, such that rotation of the shaft and the runner applies an axial force on the shaft; bearings on the shaft for supporting the shaft for rotation; and an outer covering around the shaft and the runner;
 - the improvement comprising a cover for said machine, the cover consists essentially of
 - (a) a flat ring which is supported at an exterior edge thereof on the outer covering;
 - (b) a first shell which is conically shaped, and is welded to the side of the flat ring toward the runner; the first shell concentrically surrounding the shaft and tapering narrower toward the runner; and
 - (c) on the side of the conical first shell toward the runner, a second shell also conically shaped for directing radially inward water flow axially toward said runner and defining a lesser conical angle than the first conical shell, and extending from an exterior region of the first conical shell and toward the runner;
- the flat ring, the first shell, and the second shell comprising

sheet metal material and having welded joints therebetween; and at least one said bearing being mounted between the flat ring and the shaft.

4,715,782

HYDRAULIC CONTROL DEVICE FOR WIND TURBINE

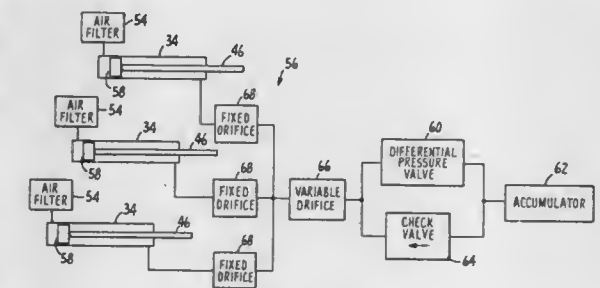
David M. Shimmel, Tracy, Calif., assignor to Fayette Manufacturing Corp., Tracy, Calif.

Filed Dec. 24, 1985, Ser. No. 812,975

Int. Cl.⁴ F03D 7/04

U.S. Cl. 416—32

7 Claims



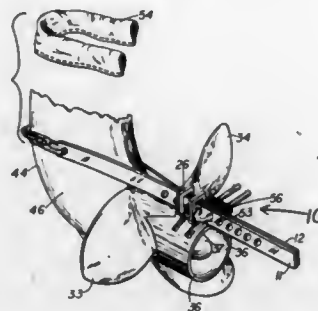
1. A wind turbine apparatus comprising:
a wind turbine rotor having one or more blades;
one or more rotor braking devices each coupled to one of said blades, wherein each rotor braking device is movable between an aligned position for normal operation of said rotor and a braking position for slowing said rotor, and wherein the centrifugal force acting on said rotor braking devices during rotation of said rotor tends to move said rotor braking devices from said aligned positions to said braking positions;
one or more fluid cylinders each mechanically coupled to a blade and its associated rotor braking device, wherein the fluidic pressure within said fluid cylinders opposes the movement of the said rotor braking devices from said aligned positions to said braking positions;
a variable orifice connected to said fluid cylinders for regulating the flow of fluid from the fluid cylinders and the deployment time of the rotor braking devices;
pressure difference valve means fluidically coupled between said variable orifice and an accumulator for opening when the pressure within said fluid cylinders exceeds the pressure in the accumulator by a predetermined amount;
accumulator means for receiving pressure from said fluid cylinders by way of said variable orifice when said pressure difference valve means is open so that the stored fluid is at a pressure which is intermediate between the pressure in said fluid cylinders and the pressure in said accumulator at the time the relief valve opens; and
check valve means fluidically coupled in parallel with said pressure difference valve means between said accumulator means and said variable orifice for permitting pressurized fluid at said intermediate pressure to flow there-through only in the direction from said accumulator means towards said fluid cylinders to return said braking devices to said aligned positions when the pressure in said accumulator means exceeds the pressure in said fluid cylinders, wherein said fluid cylinders pressure difference valve means, accumulator means, and check valve means form a pressurized, closed, fluidic system.

4,715,783

THEFT-PROOFING DEVICE FOR OUTBOARD MOTOR PROPELLERSMark W. Wade, 3667 Quentia Ave., Boynton Beach, Fla. 33436
Filed Dec. 12, 1986, Ser. No. 941,152Int. Cl.⁴ F16B 41/00

U.S. Cl. 416-146 R

8 Claims



1. A theft-proofing device for a propeller of an outboard motor of the type having a substantially upright drive shaft and a substantially horizontal propeller shaft and housings therefor comprising:

- (A) a pair of elongated bar means,
- (B) hinge means connecting together said pair of bar means,
- (C) tubular blocking means for blocking linear movement of said propeller,
- (D) forward projections of said blocking means, said projections fitting between and against said blades of said propeller,
- (E) support means for said tubular means, said support means being slidably positionable on said pair of bar means, and
- (F) means locking said support means in a fixed position relative to said pair of bar means

whereby, said hinge means being positioned against a forward portion of said upright shaft housing with said pair of bar means projecting aft on either side thereof between said blades and above said horizontal shaft housing, said propeller shall be protected from theft or rotation when said projections of said blocking means are inserted against said blades and said locking means is locked in position on said bar means.

4,715,784

BLADE SUPPORT HUB FOR AN AXIAL FAN

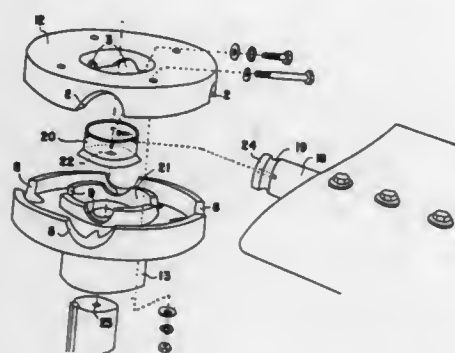
Antonio Mosiewicz, Milan, Italy, assignor to Cofimco S.p.A., Milan, Italy

Filed Feb. 14, 1984, Ser. No. 580,061

Claims priority, application Italy, Mar. 9, 1983, 19975 A/83
Int. Cl.⁴ F04D 29/34

U.S. Cl. 416-208

7 Claims



1. A blade support hub of hollow circular ring structure for an axial fan with at least two blades, comprising two facing opposite parts each having an inwardly facing inner rim and an

inwardly facing outer rim corresponding respectively to the minor diameter and to the major diameter of said circular ring structure spaced-apart; radially extending blade shank housing seats formed by bored cavities in said circular ring structure which extend through both the outer rim and the inner rim; the diameter of the cavity bore through the inner rim being of smaller diameter than the diameter of the cavity bore through the outer rim, which has the same diameter as the blade shank, the blade shank having an annular groove in a position corresponding to said inner ring for radially locking the blade; bolts for holding the opposite parts together in facing relationship, the blades being positioned so as to be fixed in their cavities all simultaneously upon tightening of the two opposite parts together by means of said bolts.

3. A method for manufacturing a blade support hub of hollow circular ring structure having two facing opposite parts, each with an inwardly facing inner rim and an inwardly facing outer rim, comprising the steps of

- casting the two opposite parts to a standard dimension;
- securing the two opposite parts together in facing relationship; and
- then machining spaced-apart radial extending blade shank opening into the assembled opposite parts in the number and dimensions required.

4,715,785

OIL DETECTION APPARATUS FOR SUBMERSIBLE PUMPS

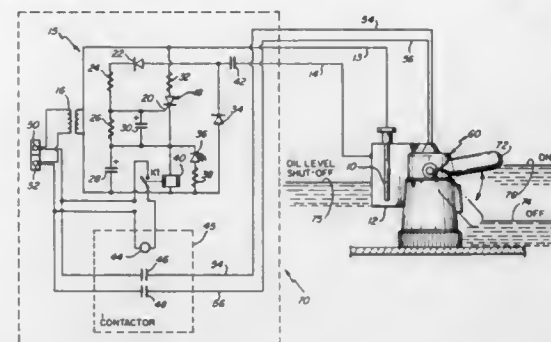
Richard R. Gurega, Easton, Conn., assignor to Richal Corporation, Bridgeport, Conn.

Filed Mar. 14, 1986, Ser. No. 840,315

Int. Cl.⁴ F04B 49/00

U.S. Cl. 417-1

2 Claims



1. Apparatus for detecting the presence of oil in the vicinity of a water immiscible pump having a conductive housing including an extending wall member and a drive motor, comprising:

- a probe adapted to be immersed in a liquid mixture of oil and water, said probe being mounted on the pump housing; and
- electrical circuit means connected between said probe and said wall member for operating the motor driving said pump in response to sensing water between said wall member and probe and for rendering said motor inoperable in response to sensing oil between said wall member and probe.

4,715,786

CONTROL METHOD AND APPARATUS FOR PERISTALTIC FLUID PUMP

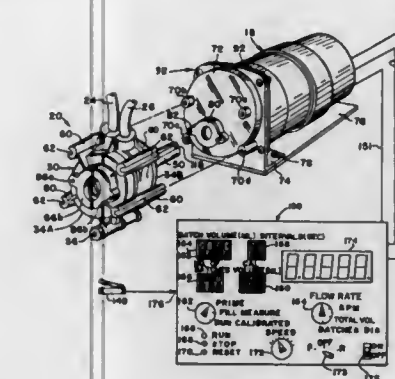
Donald L. Wolff, Barrington; Porter T. McCauley, Northfield; Paul Stiefel, Skokie; Gyorgy J. Takacs, Wheeling, and Roman A. Adams, Lincolnshire, all of Ill., assignors to Cole-Parmer Instrument Company, Chicago, Ill.

Filed Dec. 14, 1984, Ser. No. 682,031

Int. Cl.⁴ F04B 49/06

U.S. Cl. 417-22

20 Claims



1. A control apparatus for a peristaltic pump having a housing with an internal chamber and a pair of openings communicating with the chamber, a length of tube extending through one opening and out the other and having a portion looped internally in the chamber so as to form a continuous flow passage through the tube, displacement means supported within the chamber and operatively associated with the tube to perform a peristaltic pumping action within the tube by deforming the tube, and a motor to rotate the displacement means and cause the deformation; said control apparatus comprising:

means for sensing the actual angular velocity of the motor and for generating a motor speed signal indicative of said actual velocity;

means for generating a desired velocity signal;

means for comparing said actual velocity signal and said desired velocity signal and for generating an error signal of one logic level if said actual velocity is greater than said desired velocity and for generating said error signal as another logic level if said desired velocity is greater than said actual velocity;

means for controlling the velocity of said motor in a direction tending to null the difference between said actual velocity and said desired velocity;

programmed microprocessor means for alternatively setting said desired velocity signal to zero or said desired value; said microprocessor means being responsive to a stored set of instructions and a plurality of switch inputs producing mode commands; and

said switch input including a run switch to turn the motor on, a stop switch to turn the motor off, and a mode switch to determine the operational function of the apparatus; wherein said operational functions include using the apparatus as an uncalibrated flowmeter, a calibrated flowmeter, or a calibrated dispenser.

4,715,787

COAXIAL, TWO-CYLINDERED AIR COMPRESSOR

Michael Hung, Taipei, Taiwan, assignor to Utility Electronics Industries Co. Ltd., Taipei, Taiwan

Filed Mar. 28, 1986, Ser. No. 845,854

Int. Cl.⁴ F04B 39/00, 35/04

U.S. Cl. 417-63

1 Claim

1. Two-cylindered air compressor sharing a common axial line, comprising:

an outer casing;

a main frame disposed inside the outer casing an penetrating, in association with, strutting supports;

a gas cylinder proper composed of two cylinder members sharing a common axis positioned on either side down the main frame with each cylinder member having an intake port and an outlet port;

a motor as the source of transmission of the cylinder members positioned up the main frame;

a transmission gear, fitted to the shaft core of the motor for the purpose of transmission engagements;

a reduction gear, fitted by articulation over the top of the main frame, for interactive engagement with the transmission gear;

a backside shaft bushing, positioned over the main frame and the reduction gear, serving to fit by articulation the shaft member of the reduction gear;

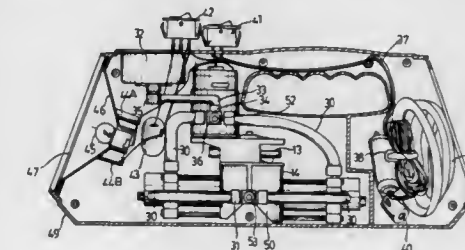
a front side shaft bushing, positioned inside the main frame and beneath the reduction gear, serving to fit by articulation the shaft member of the reduction gear;

a pressure gage, mounted over the shell casing, with which the reading of the output gas pressure is taken;

a two-pass joint bolted to the bottom side of the pressure gage;

a three-pass joint, established on the underside of the interior of the shell casing, of which one end is thread-coated and extending beyond the outside to serve as an air intake passage;

a four-pass joint, established over the interior of the shell casing of which one end is extended beyond the casing, duly thread-coated, to serve as a discharging path;



a small rubber tube, interconnecting the two-pass joint with the four-pass joint;

means to fasten the small rubber tube in position;

a plurality of rubber tubes, used to interconnect the two outlet ports of the cylinder members and the four-pass joint, and to interconnect the two intake ports of the cylinder members with the three-pass joint;

a plurality of tubing guides to fix the fitting of the rubber tubes;

a motor pushkey, as a control of the motor and fitted to the upper side of the shell casing;

a light-bulb, fitted ahead of the shell casing, and having a bulb circuit to provide electricity thereto;

a reflection board, fitted in front of the shell casing;

a flicker, in series connection with the bulb circuit inside the shell casing, serving as the command of the bulb, flashing or otherwise;

a case lid to close access at the rear side of the shell casing, said case lid being a transparent lid applied with a color coating, which, once fixed to the shell casing, will keep attachments and accessories tightly secured in the casing, and which, when attached to the frontal end of the shell casing, will achieve alerting, warning effects in conjunction with the flickering of the bulb;

the four-pass joint, by means of the rubber tube, bringing the outlet port of each cylinder member, in conflux into the joint, so that as the motor on top of the main frame drives the cylinder members to activation, one such cylinder member will perform suction of atmospheric pressure whilst the other will discharge at all the same time,

one of said working chambers when it is in its final stage of the compression stroke;

said unloading mechanism further including a first valve member movable to vary the opening area of said unloading port;

means for controlling the suction of fluid into the compressor and including a second passage and a second valve member movable therein to vary the opening area of said suction port;

said second passage having first and second portions communicated, respectively, with said suction port and said cylinder at a point which leads said suction port as viewed in the direction of rotation of said rotor;

said first and second valve members having pressure receiving faces, respectively, and being movable by a pressure applied to said pressure receiving faces;

means for exerting the same pressure signal to said pressure receiving faces of said first and second valve members;

said second valve member being formed therein with a third communication passage which, when said second valve member is in a position in which the opening area of said suction port is decreased most, communicates said suction port through said first and second portions of said second passage with said point of said cylinder.

4,715,793

FLOW REGULATING ROTARY VANE PUMP

Merz Johann, Schwäbisch Gmünd, and Seidl Günther, Heubach, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany
PCT No. PCT/EP85/00384, § 371 Date Apr. 3, 1986, § 102(e)
Date Apr. 3, 1986, PCT Pub. No. WO86/01261, PCT Pub. Date Feb. 27, 1986

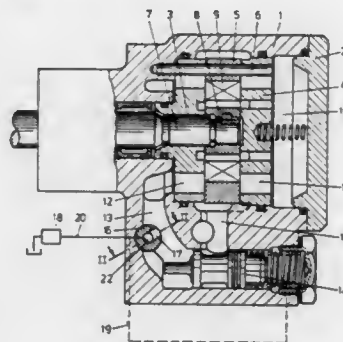
PCT Filed Jul. 30, 1985, Ser. No. 857,756

Claims priority, application Luxembourg, Apr. 11, 1984, 00246

Int. Cl.⁴ F04B 49/00

U.S. Cl. 417—300

11 Claims



1. In a rotary vane pump having a pump pressure outlet and a pump suction inlet and having regulation of pressure agent flow to a consumer (18) by means of a bypass valve (14) operable by pump output pressure flow in a pump pressure outlet passage (13) whereby said bypass valve is shifted by differential pressure between said output pressure and consumer pressure for opening flow to a bypass passage (15) to bypass pump outlet flow to the suction inlet flow of said pump for circulatory flow between said pump pressure outlet and pump suction inlet including a combining flow from a tank to the bypass passage;

the improvement which comprises a metering throttle member (21) disposed to receive pump outlet flow from said pressure outlet passage (13) to a throttle passage (17) in said throttle member and said throttle member having a metering throttle passage (22) connecting to said throttle passage

for passage of pressure agent flow to a consumer and effecting a reduced flow rate thereto by reason of high viscosity

of cold pressure agent wherein initially cold pressure agent effects said reduced flow rate to increase circulatory flow and thus reduce the flow needed from a tank for maintaining full circulatory flow,

wherein said metering throttle passage (22) has an area cross section for flow which is small enough as compared to the wetted area of passage therethrough for a pressure agent so as to produce increased flow friction expediting pump regulation for a cold pressure agent during pump start up by effecting initial decrease of flow to a consumer to maintain said circulatory flow by operation of said bypass valve without increasing the flow of initially cold pressure agent from the tank to said bypass passage, thereby reducing noise at start up.

4,715,794

BOTTOM-HOLE PUMP FLUID FLOW CONTROLLER

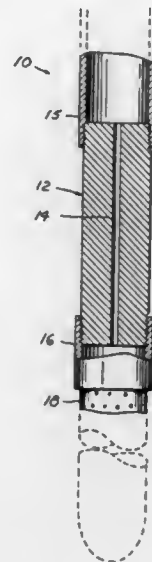
Neal E. VanHooser, Rte. 3, Box 140-A, Pauls Valley, Okla. 73075

Filed Sep. 29, 1986, Ser. No. 912,873

Int. Cl.⁴ F04B 21/02

U.S. Cl. 417—313

2 Claims



1. In an oil well bottom hole pump having a depending threaded tubular fluid inlet end portion for communicating with a fluid passageway through the pump, the improvement comprising:

fluid controller means including a cylindrical member having an 8/64 inch (6.35 mm) axial bore axially connected with said inlet end portion,

the length of said member being not less than 2½ times its diameter and not greater than 7½ times its diameter.

4,715,795

METERING PUMP

Reiner Habrich, Kirchheim; Manfred Bauer, and Alois Reiter, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 825,143

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 8505108

Int. Cl.⁴ F04B 21/02

U.S. Cl. 417—568

11 Claims

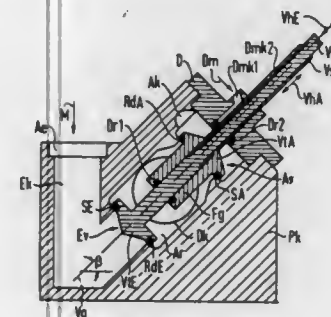
1. As metering pump including a pump head, particularly for metering liquid components of reaction resin compounds comprising:

a reciprocating displacement member;

an intake valve designed as a dish valve;

a discharge valve designed as a dish valve,

actuation elements arranged outside of said pump head to control said intake valve and said discharge valve, said valves having valve stems coaxially seated in the pump head which are actuated by said actuation elements,



said valve stem of said intake valve being coaxially seated in a valve disk and said valve stem of said discharge valve, and

an additional guide member for said valve stem of said intake valve being attached to said valve disk of said discharge valve.

4,715,796

SCROLL-TYPE FLUID TRANSFERRING MACHINE

WITH LOOSE DRIVE FIT IN CRANK SHAFT RECESS
Tsutomu Inaba; Tadashi Kimura; Norihide Kobayashi; Masahiro Sugihara, and Tetsuzo Matsugi, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

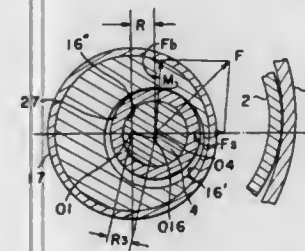
Filed Mar. 21, 1986, Ser. No. 842,235

Claims priority, application Japan, May 16, 1985, 60-106318; May 16, 1985, 60-106307; Nov. 27, 1985, 60-268436

Int. Cl.⁴ F01C 1/04, 17/06, 21/02

U.S. Cl. 418—55

6 Claims



1. A scroll-type fluid transferring machine which comprises:

(a) a stationary scroll member and an oscillatable scroll member each of which has a spiral wrap of an involute curve or other curves projecting from a base plate, said stationary scroll member and said oscillatable scroll member cooperating to form a compression chamber between the spiral wraps and the base plates by mutually fitting one into the other;

(b) an oscillatable scroll shaft provided on the surface of the base plate of said oscillatable scroll member at the position opposite the spiral wrap of said oscillatable scroll member;

(c) a crank shaft having an axis and having an eccentric recess, said eccentric recess having an axis which is shifted by a predetermined distance from the axis of said crank shaft, said eccentric recess receiving said oscillatable scroll shaft to cause an oscillating movement of said oscillatable member;

(d) at least one main bearing for rotatably supporting said crank shaft;

(e) a bearing supporter for supporting said main bearing;

(f) means for preventing the rotation of said oscillatable scroll member around the axis of said oscillatable scroll

shaft and for causing the oscillating movement of said oscillatable scroll member with respect to and inside of said at least one main bearing; and

(g) a cylindrical bush having coaxial outer and inner circumferences loosely fitted in said eccentric recess in said crank shaft with a gap between the outer circumference of said cylindrical bush and the inner wall of said eccentric recess, said oscillatable scroll shaft being fitted in the inner circumference of said cylindrical bush in a freely rotatable manner.

4,715,797

ROTARY-PISTON DISPLACEMENT MACHINE

Heinrich Güttinger, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

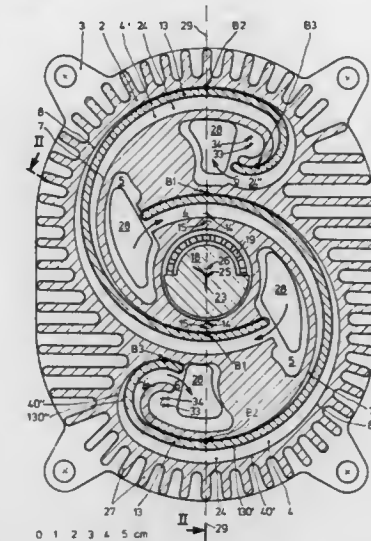
Filed Apr. 22, 1986, Ser. No. 854,619

Claims priority, application Switzerland, Apr. 26, 1985, 1780/85

Int. Cl.⁴ F04C 18/04, 23/00, 29/04

U.S. Cl. 418—55

6 Claims



1. In a rotary-piston displacement machine for compressible media of the type having

two stationary delivery chambers which form a spiral in a stationary housing, encompass more than 360° and in each case lead from an inlet to an outlet, and having

a spiral displacer allocated to each delivery chamber and engaged into the latter, each displacer forms a spiral and encompasses more than 360°, is arranged as a band-shaped strip on a disk-shaped rotor eccentrically driven relative to the housing, and is mounted and guided with respect to the delivery chambers in order to execute a circulating, torsion-free movement, and

wherein the spiral shaped delivery chambers and displacers in each case consist of two portions, with a second portion continuously adjoining the outlet-side end of an initial portion which encompasses less than 360°, the radius of curvature of which second portion is substantially smaller than the minimum radius of curvature of the initial portion, so that the second portion is located between the outlet-side end and the center of the initial portion, the improvement wherein:

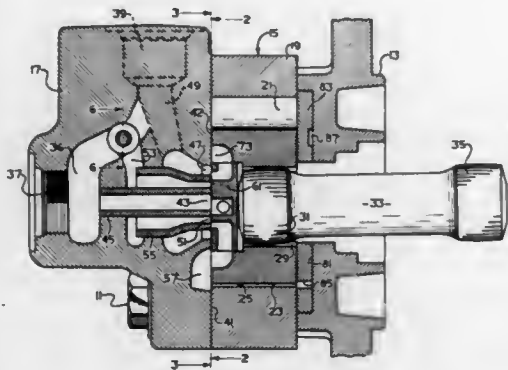
the spiral-like delivery chambers are arranged centrosymmetrically to one another in the absence of a common instantaneous center, and

the inlet-side ends of the delivery chambers are arranged around a drive mounting for the rotor, the drive mounting being located radially inwardly of the delivery chambers.

4,715,798

TWO-SPEED VALVE-IN STAR MOTOR

Marvin L. Bernstrom, Eden Prairie, Minn., assignor to Eaton Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 858,151, May 1, 1986. This application Jan. 28, 1986, Ser. No. 7,882
Int. Cl.⁴ F01C 1/10, 21/14; F03C 2/08
U.S. Cl. 418—57 15 Claims



1. A rotary fluid pressure device of the type comprising housing means including an endcap member defining a fluid inlet port and a fluid outlet port; a gerotor gear set associated with said housing means and including an internally-toothed ring member, and an externally-toothed star member eccentrically disposed within said ring member; one of said ring member and said star member having orbital movement relative to the other of said members, and said star member having rotational movement relative to said ring member and said housing means; the internal teeth of said ring member and the external teeth of said star member interengaging to define a plurality of expanding and contracting fluid volume chambers during said relative orbital and rotational movements; shaft means and means operable to transmit said rotational movement of said star member to said shaft means: said endcap member defining a first fluid pressure chamber in continuous fluid communication with said one of said fluid inlet port and said fluid outlet port, and a second fluid pressure chamber in continuous fluid communication with the other of said fluid inlet port and said fluid outlet port; said star member defining a first manifold zone in continuous fluid communication with said first fluid pressure chamber, and a second manifold zone in continuous fluid communication with said second fluid pressure chamber; said star member including an end surface disposed toward said endcap member and defining first and second sets of fluid ports, said first set of fluid ports being in continuous fluid communication with said first manifold zone, and said second set of fluid ports being in continuous fluid communication with said second manifold zone, characterized by:

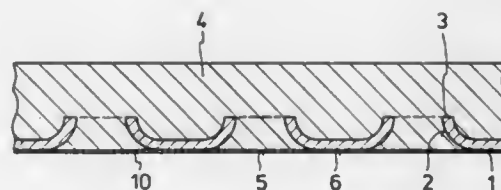
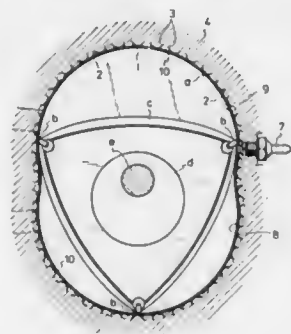
- said end surface of said star member being in sliding, sealing engagement with an adjacent surface of said endcap member;
- said endcap member defining a third fluid pressure chamber and a control fluid passage in communication with said third fluid pressure chamber;
- said star member defining a third manifold zone in continuous fluid communication with said third fluid pressure chamber;
- said end surface of said star member defining a third set of fluid ports in continuous fluid communication with said third manifold zone;
- said adjacent surface of said endcap member defining a plurality $N+1$ of valve passages, each of said valve passages being in continuous fluid communication with one of said expanding and contracting fluid volume chambers;
- said first, second, and third sets of fluid ports being in commutating fluid communication with said plurality $N+1$ of valve passages, defined by said endcap member,

in response to said relative rotational movement of said star member; and
(g) valve means selectively operable between a first condition communicating said control fluid passage to said first fluid pressure chamber, and a second condition communicating said control fluid passage to said second fluid pressure chamber.

4,715,799

COMPOSITE CONSTRUCTION OF CASING FOR ROTARY PISTON ENGINE

Dankwart Eiermann, Weissensberg, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany
Filed Apr. 25, 1986, Ser. No. 856,688
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514913
Int. Cl.⁴ F01C 1/22, 21/10; B22D 19/00
U.S. Cl. 418—61 A 7 Claims



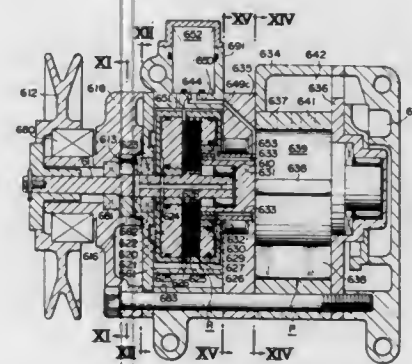
1. A housing mantle made in a composite construction for a rotary piston engine with a trochoidal-shaped two-arc mantle runway and a triangular piston having sealing strips arranged in corners thereof gliding along this mantle runway, such triangular piston rotating upon an eccentric of an eccentric shaft, comprising:

- a layer of steel forming the mantle runway;
- an outer layer of an aluminum alloy cast around this layer, said layer of steel forming the mantle runway having openings therein including radially outwardly bent-open edges therewith; and
- a cast metal forming said outer layer and cast to be filled-out as far as to a plane which coincides with a base plane of said layer forming said mantle runway so as to establish considerably improved direct heat-conducting contact between the mantle runway and aluminum of said housing mantle via the edges of the openings.

4,715,800

ROTARY COMPRESSOR WITH CLUTCH ACTUATED BY HYDRAULIC FLUID AND COMPRESSED FLUID

Kazutoshi Nishizawa, Toyooka; Masashi Takagi, Kariya; Akio Matsuoka, Obu, and Fuzio Nomura, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Continuation of Ser. No. 788,218, Oct. 16, 1985, abandoned.
This application Mar. 26, 1987, Ser. No. 31,179
Claims priority, application Japan, Oct. 17, 1984, 59-219236; Jul. 2, 1985, 60-145496
Int. Cl.⁴ F04C 29/00; F04B 35/00, 49/02; F16D 25/063
U.S. Cl. 418—69 10 Claims



1. A rotary compressor, comprising:
an input shaft;

a compressor component including a housing and a rotor member rotatably disposed in said housing and connectable to said input shaft, said housing defining at least one compression chamber having a volume varying with the rotation of said rotor member, a first pressurized working fluid being discharged from the compression chamber when said rotor member is connected to said input shaft and rotated thereby;

a clutch component including a first clutch cylinder, a first piston member disposed in said first clutch cylinder so as to be movable axially of said input shaft and cooperating with said first clutch cylinder to define therein a first pressure chamber, a second clutch cylinder connected to said rotor member for rotation therewith, a second piston member disposed in said second clutch cylinder so as to face to said first piston member but spaced therefrom axially of said input shaft and cooperating with said second clutch cylinder to define therein a second pressure chamber, a plurality of first clutch members disposed between said first and second piston members and mounted on said input shaft for rotation therewith, a plurality of second clutch members with one disposed between each pair of adjacent first clutch members and mounted on said second clutch cylinder for rotation therewith, said first and second clutch members being movable axially of said input shaft between an engaged position where said first and second clutch members engage with each other to allow a torque to be transmitted from said input shaft to said rotor member and a disengaged position where said first and second clutch members are disengaged from each other to prevent the torque from being transmitted from said input shaft to said rotor member, and biasing means for biasing said first and second clutch members toward said disengaged position;

a hydraulic pump drivably connected to said input shaft for discharging a second pressurized working fluid upon the rotation of said input shaft;

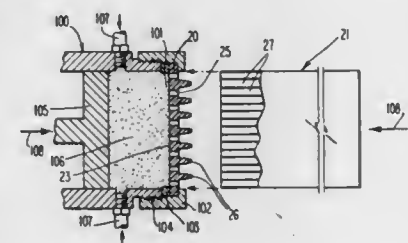
first valve means movable between a first position where said second pressurized working fluid from said hydraulic pump is allowed to be applied to said first pressure chamber to cause said first piston member to move said first and second clutch members to said engaged position against the action of said biasing means and a second position where said second pressurized working fluid from said hydraulic pump is prevented from being applied to said first pressure chamber to cause said first and second clutch members to said disengaged position; and

second valve means movable between a first position where said first pressurized working fluid from said compressor component is allowed to be applied to said second pressure chamber to cause said second piston member to move said first and second clutch members to said engaged position against the action of said biasing means and a second position where said first pressurized working fluid from said compressor component is prevented from being applied to said second pressure chamber to cause said first and second clutch members to said disengaged position.

4,715,801

APPARATUS FOR HIGH SPEED MANIFOLDING OF HONEYCOMB STRUCTURES

Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Division of Ser. No. 533,604, Sep. 19, 1983, which is a division of Ser. No. 283,734, Jul. 15, 1981, Pat. No. 4,411,856. This application May 2, 1985, Ser. No. 729,736
Int. Cl.⁴ B29C 45/14
U.S. Cl. 425—110 5 Claims



1. An apparatus for charging a flowable material into open ends of selected cells at an open end face of a honeycomb structure having an outer peripheral surface extending between said open end face and an opposite end face, said apparatus comprising:

- a feed head having an exit orifice through which the flowable material is passed; and
- a mask having a pair of opposing outer surfaces, a plurality of openings extending through said mask between and through said surfaces, and a plurality of protrusions extending from a first of said outer surfaces, said mask secured across said exit orifice with the second of said outer surfaces facing toward said exit orifice and said protrusions facing outward from said exit orifice and from said feed head, and said first surface and said protrusions are exposed so as to be able to be fitted against said open end face of aid honeycomb structure.

4,715,802

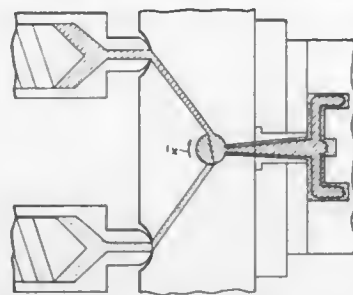
INJECTION MOLDING MACHINE

Takashi Arai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 19, 1986, Ser. No. 876,079
Claims priority, application Japan, Jun. 27, 1985, 60-140742
Int. Cl.⁴ B29C 45/16 2 Claims

U.S. Cl. 425—130

1. An injection molding machine, comprising:
a valve holding member provided with a first passageway for introducing a first resin material from a first injection cylinder and a second passageway for introducing a second resin material from a second injection cylinder;
a valve rotatably held in a mating hole provided in said valve holding member, said valve assuming a substantially cylindrical position where said second pressurized working fluid from said hydraulic pump is prevented from being applied to said first pressure chamber to cause said first and second clutch members to said disengaged position; and

drical shape and provided with a cut-away portion at the axially central position thereof;
a mold having a space for molding an article into which said resin materials are poured; and
a member having a pouring gate for pouring said first and second resin materials into said space;
said valve being constructed such that it is stopped at a first position and a second position by the rotational movement thereof, that in said first position, it pours the first resin material from said first injection cylinder into said space of



said mold through said first passageway, said cut-away portion and said pouring gate, and that in said second position, it pours the second resin material from said second injection cylinder into said space of said mold through said second passageway, said cut-away portion and said pouring gate, wherein the central portion of said valve is of a cylindrical shape, the opposite ends of said cylindrical shape assume a frusto-conical shape, and gaps for shearing leaked resin are provided between the frusto-conical portions of said valve and the inner surface of said mating hole of said valve holding member.

4,715,803

TRIPLE CO-EXTRUDER

Daniel A. Koppa, Bloomfield, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

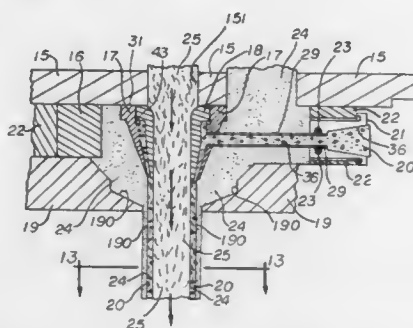
Continuation of Ser. No. 724,206, Apr. 17, 1985, abandoned.

This application Apr. 30, 1987, Ser. No. 45,229

Int. Cl.⁴ A21C 3/04, 11/16

U.S. Cl. 425—133.1

1 Claim



1. An extrusion apparatus for co-extruding three streams simultaneously and having three generally concentric flow passages defined by a die, said die comprising: three plates in face abutting relationship, a first of said plates being a block attached to means for extruding two materials, said block defining two side-by-side apertures, each being in communication with said means for extruding, an extrusion nozzle defining a generally cylindrical internal axial passage and a second annular orifice concentric with said passage, said nozzle having an internal sleeve member inserted within and radially spaced from a conical member to form both the internal passage and said annular passage with said conical member having a conduit fixed thereto and radially extending from the exterior of said conical member and in communication with said annu-

lar passage, a second plate abutting with said first of said plates, said conical member abutting said first of said plates such that a flow passage is defined by said internal axial passage communicating with a first of said apertures, a second of said apertures communicating with an aperture defined by said second plate and surrounding said nozzle, a third of said plates defining an extrusion orifice for the three streams, the second of said plates defining an opening extending generally parallel to a face of said plates through which said radially extending conduit projects for communication with a third extrusion means.

4,715,804

METAL MOLD FOR RESIN MOLDING

Mitsuo Takahashi, Matsudo, Japan, assignor to Seikoh Giken Co., Ltd., Chiba and Sumitomo Heavy Industries, Ltd., Tokyo, both of Japan

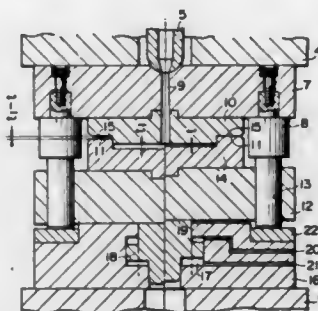
Filed Apr. 15, 1986, Ser. No. 852,339

Claims priority, application Japan, Apr. 19, 1985, 60-84056

Int. Cl.⁴ B29C 45/08, 45/67

U.S. Cl. 425—141

2 Claims



1. A metal mold for resin molding, said mold having a substantially longitudinal axis, comprising
 - a fixed side metal mold assembly including
 - a fixed side metal mold plate having a lower surface extending transverse to said longitudinal axis; and
 - a fixed side upper cavity plate having an upper surface secured to the lower surface of said fixed side metal mold plate and a lower surface which includes a peripheral stepped flat portion;
 - a plurality of guide post rods attached to and projecting, in the direction of said longitudinal axis, from the lower surface of said fixed side metal mold plate, said guide post rods having ends located at a predetermined distance from the lower surface of said fixed side metal mold plate;
 - a movable side metal mold assembly including
 - a pressure receiving plate having an upper surface extending transverse to said longitudinal axis, the upper surface of said pressure receiving plate being in contact with the ends of said guide post rods;
 - a movable side metal mold plate having lower and upper surfaces, the lower surface thereof being supportable by the upper surface of said pressure receiving plate, said movable side metal mold plate being guided for movement in the direction of said longitudinal axis by said guide post rods; and
 - a movable side lower cavity plate having a lower surface secured to the upper surface of said movable side metal mold plate and an upper surface which includes a peripheral stepped flat portion, the peripheral stepped flat portion of the upper surface of said lower cavity plate being complementary to and cooperating with the peripheral stepped flat portion of the lower surface of said upper cavity plate, an injection cavity being defined between the lower and upper surfaces of said upper and lower cavity plates respectively;
- means for injecting resin material into said injection cavity;

a hydraulic device secured to the lower surface of said movable side metal mold plate; and
means for applying pressure to said hydraulic device during injection of resin material into said cavity to bring the lower surface of said movable side metal mold plate into contact with the upper surface of said pressure receiving plate thereby making the thickness of the gap in said injection cavity equal to a first thickness, said means further applying pressure to said hydraulic device after resin material has been injected into said cavity to bring the complementary peripheral stepped flat surfaces of said upper and lower cavities into contact with each other thereby making the thickness of the gap in said injection cavity equal to a second thickness, wherein said first thickness is greater than said second thickness, the first thickness of said gap of said injection cavity being determined by the length of said guide post rods.

4,715,806

APPARATUS FOR THE PUNCHING AND REMOVING OF THE SPRUE IN AN INJECTION MOLDING TOOL

Ernst Ehrler, Munich; Martin Eichlseder, Tettensweis, and Edmund Theiss, Freising, all of Fed. Rep. of Germany, assignors to Krauss-Maffei A.G., Fed. Rep. of Germany

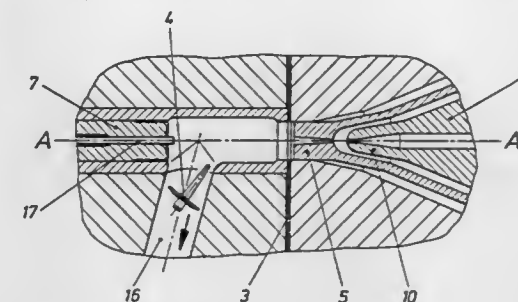
Filed Nov. 18, 1985, Ser. No. 799,337

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1984, 3442023

Int. Cl.⁴ B29C 45/38, 45/44

U.S. Cl. 425—553

9 Claims



1. An injection molding tool comprising:
 - a first part of said injection molding tool partially defining a molded part cavity, said first part including an axially arranged and axially displaceable punch exhibiting a first internal bore, and
 - an injection nozzle arranged axially to and positioned behind said punch wherein said first internal bore is in communication with said injection nozzle;
 - a second part of said injection molding tool partially defining a molded part cavity, said second part including:
 - an axially arranged and displaceable ejector;
 - an axially mobile ejector pin guided within said ejector;
 - an axially arranged sleeve around the ejector for guiding said ejector;
 - an orifice means in the sleeve for allowing removal of a punched sprue;
 - the ejector having a frontal side means facing the molded part cavity and aligned with the punch for acting as a die for said punch.

4,715,807

PULSE COMBUSTION DEVICE

Nobuyoshi Yokoyama, and Tsuneyasu Hayakawa, both of Nagoya, Japan, assignors to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 27, 1987, Ser. No. 7,204

Claims priority, application Japan, Jan. 28, 1986, 61-10627[U]

Int. Cl.⁴ F23C 11/04

U.S. Cl. 431—1

5 Claims

1. An apparatus for vacuum compressing a laminate consisting of a number of air-permeable sheets of a material, comprising:
 - a table having a supporting surface for supporting the laminate;
 - vacuum producing means for evacuating air from within a space defined by an air-impermeable sheet covering a major portion of the periphery of the laminate, inclusive of a lower surface thereof, supported on said supporting surface;
 - a suction pipe arranged on said supporting surface along at least one side surface of the laminate and connected to said vacuum producing means, said suction pipe having a suction port facing the one side surface of the laminate; and
 - support means for supporting said suction pipe in such a manner that said suction pipe is capable of being moved in parallel relation to said supporting surface.

wherein said air inlet valve assembly includes an annular valve plate formed with a plurality of circumferentially

equi-spaced air ports and being secured to annular end surfaces of said flange member and said cylindrical member, and a plurality of circumferentially equi-spaced air inlet valve units mounted on said valve plate on a common circular path concentric with the gas passage, said air inlet valve units each including a circular perforated backer

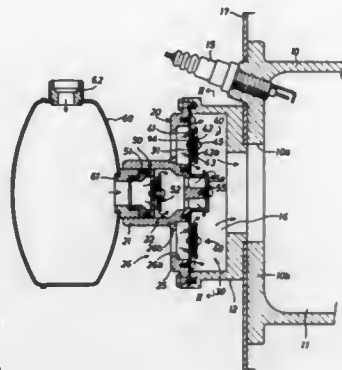


plate arranged within the mixing chamber to oppose each of said air ports and fixed to said valve plate through a spacer, and a circular air flapper movable between said valve plate and said backer plate to be lifted off said air port when applied with negative pressure in the mixing chamber and to be seated over said air port when applied with positive pressure in the mixing chamber.

4,715,808

THERMOSTATIC CONTROL SYSTEM

Rodney T. Heath, 4901 E. Main, Farmington, N. Mex. 87401, and Charles R. Gerlach, 639 W. Rhapsody, San Antonio, Tex. 78216

Continuation of Ser. No. 625,023, Jun. 27, 1984, Pat. No. 4,615,673, and a continuation of Ser. No. 359,246, Mar. 18, 1982, Pat. No. 4,474,550. This application May 27, 1986, Ser. No. 866,765

Int. Cl. F23N 1/00

U.S. Cl. 431-18

2 Claims

1. A system for controlling the amount of natural supply gas delivered from a natural gas supply source to a natural gas burner adapted to continuously heat a process fluid or the like in a vessel or the like so as to continuously automatically maintain the temperature of the process fluid within a predetermined minimum range of temperatures above and below a pre-set nominal temperature during normal operating conditions comprising:

means for controlling the operation of the gas burner by varying the pressure of supply gas delivered to the gas burner by use of a control gas pressure operated flow regulator device in a natural gas supply line connecting the gas burner to the natural gas supply source;

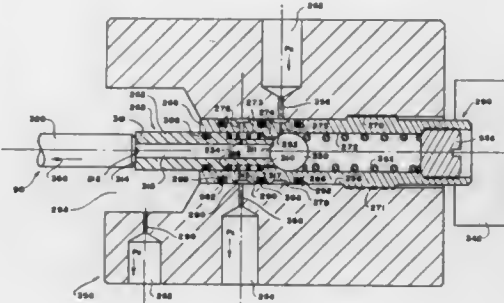
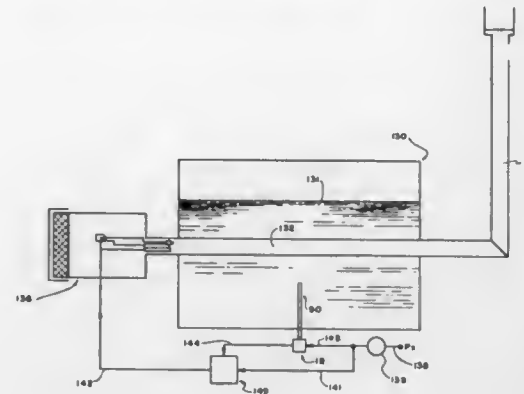
means for controlling the operation of said control gas pressure operated flow regulator device by varying the pressure of control gas delivered thereto from the gas supply source in accordance with variations in the temperature of the process fluid in the vessel;

a bore having a supply gas orifice means through which supply gas is fed into said bore and a control gas orifice means through which said control gas is fed to said control gas pressure operated flow regulator device;

means for controlling the pressure of the control gas delivered to said gas operated flow regulator device by using a relatively substantially large variable orifice means as compared to said control supply gas orifice means;

means for controlling said relatively substantially large variable orifice means by changes in temperature so that a small change in temperature results in a relatively large

change in the pressure of the control gas delivered to said control gas pressure operated flow regulator device; said relatively substantially large variable orifice means being located between said supply gas orifice means and said control gas orifice means; and



means for attenuating changes in the pressure of the control gas delivered to said control gas pressure operated flow regulator device by bleeding gas through a relatively small fixed sized orifice leading from said bore to atmospheric pressure.

4,715,809

FLUIDIZED BED HAVING MODIFIED SURFACES IN THE HEAT EXTRACTOR

Josef Langhoff, Dinslaken; Hermann Kruschke; Horst Geldmacher, both of Essen; Manfred Golomb, Bottrop; Karl-Heinz Kamp, Duisburg; Peter Masuch, Recklinghausen, and Rolf Chalupnik, Essen, all of Fed. Rep. of Germany, assignors to Ruhrkohle AG, Essen, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,920

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447186

Int. Cl. F23D 21/00; F28D 13/00; F28F 19/00

U.S. Cl. 431-170

7 Claims

1. A fluidized combustion bed having immersion heat exchanger tubular means, said tubular means having an inner surface and an outer surface;

said tubular means comprising a plurality of tubes spaced away from one another;

said bed having inlet means and outlet means for the flow of fluid therebetween;

said tubes being disposed substantially transverse to the flow in said bed;

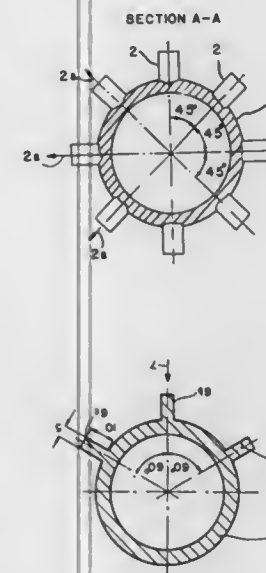
said inner surface of said tubular means defining means for conducting a heat transferring medium through said tubular means;

said outer surface of said tubular means having protrusions extending therefrom;

said protrusions being disposed to deflect, at least partially,

a flow of products of combustion in said fluidized bed from said outer surface; and said protrusions being pins disposed on and protruding from said outer surface and distributed thereover, whereby erosion of said outer surface of said tubular means is minimized, said pins being disposed on said outer surface of said tubular means in encircling, circumferential rows of spaced pins, adjacent circumferential rows being angularly displaced from one another about the longitudinal axis of said tubular means.

4. A fluidized combustion bed having immersion heat exchanger tubular means, said tubular means having an inner surface, an outer surface, a top and a bottom; said tubular means comprising a plurality of tubes spaced away from one another; said bed having inlet means and outlet means for the flow of fluid therebetween;



said tubes being disposed substantially transverse to the flow in said bed; said inner surface of said tubular means defining means for conducting a heat transferring medium through said tubular means; said outer surface of said tubular means having protrusions extending therefrom; said protrusions being disposed to deflect, at least partially, a flow of products of combustion in said fluidized bed from said outer surface; said protrusions comprising fins disposed on and protruding from said outer surface and said fins being disposed solely on the upstream surface, with respect to the flow, of said tubular means; said tubular means having a longitudinal axis; and said fins being disposed to extend along said longitudinal axis of said tubular means.

4,715,810

PROCESS AND APPARATUS FOR REMOVING VOLATILES FROM METAL

Everett M. Ramsey, Richland; Bruce A. Gray, and Donald C. Evans, both of Newburgh, all of Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 750,336, Jun. 28, 1985, abandoned. This application Jun. 26, 1986, Ser. No. 879,066

Int. Cl. F26B 5/00; F26G 13/00

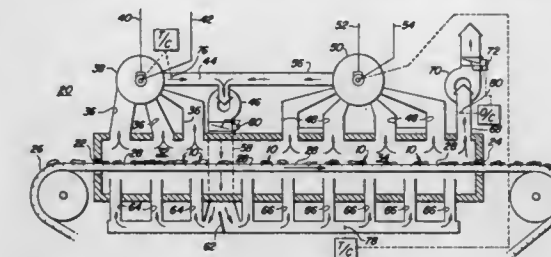
U.S. Cl. 432-8

11 Claims

1. A process for removing volatilizable contaminants from the surface of aluminum, comprising the steps of:

(a) shredding said aluminum into small pieces;

(b) transporting said small pieces through a furnace; (c) heating said small pieces in a first zone of said furnace to vaporize said volatiles, said vaporizing producing fumes containing unburned hydrocarbons; (d) burning said fumes containing unburned hydrocarbons to produce hot gas having a temperature of between 1000° and 1500° F.; (e) mixing said hot gas with a cooler gas to produce a recirculating gas having a temperature of between 900° and 1100° F.; (f) routing a portion of said recirculating gas to said first



zone of said furnace and introducing sufficient air to heat incoming aluminum and vaporize volatiles contained on the surface thereof and routing the remaining portion of said recirculating gas to a second zone of said furnace where said gas contacts said aluminum leaving said first zone and pyrolyzes said aluminum to remove any carbon present on the surface thereof; and

(g) positioning a temperature sensing device in said furnace for measuring the temperature of said recirculating gas and controlling the amount of air and fuel supply to a burner such that the temperature of said hot gas leaving said burner is maintained between 1000° and 1500° F.

4,715,811

PROCESS AND APPARATUS FOR MANUFACTURING LOW SULFUR CEMENT CLINKER

Thomas R. Lawall, Emmaus, Pa., assignor to Fuller Company, Bethlehem, Pa.

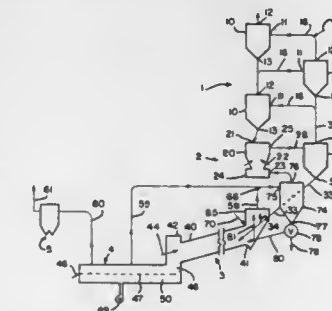
Division of Ser. No. 750,437, Jul. 1, 1985, Pat. No. 4,662,945.

This application Jul. 3, 1986, Ser. No. 882,125

Int. Cl. F27B 15/00

U.S. Cl. 432-58

4 Claims



1. Apparatus for producing low sulfur cement clinker comprising:

a rotary kiln having a feed end and a discharge end with an inlet for fuel at the discharge end for establishing a burning zone near the discharge end;

a clinker cooler flow connected to the discharge end of the kiln;

a stationary calcining furnace having an inlet for cement raw meal to be calcined, an inlet for fuel, an inlet for air for combustion and an outlet for spend combustion air and calcined cement raw meal;

- a first gas solids separator having an inlet for spent combustion air and calcined cement raw meal, an outlet for separated gas, and an outlet for separated calcined cement raw meal;
- a first duct flow connecting the outlet for spent combustion air and calcined cement raw meal of the calcining furnace to the inlet for spent combustion air and calcined cement raw meal of the first gas solids separator;
- a second duct flow connecting the outlet for separated calcined cement raw meal of the first gas solids separator to the feed end of the rotary kiln;
- a riser duct flow connecting the feed end of the kiln to the inlet for air for combustion of the calcining furnace for discharging combustion gas from the kiln;
- means for supplying fuel to the riser duct for producing in the riser duct reducing conditions and a temperature for decomposing sulfur compounds which may be contained in the cement raw meal and the fuel;
- means for supplying fresh air to the riser duct;
- means for diverting a portion of the calcined cement raw meal from said second duct to the riser duct for absorbing decomposed sulfur oxides discharged from the feed end of the kiln with combustion gas; and
- separator means for separating the absorbed sulfur compounds from spent combustion gas and fresh air and having an inlet connected to the riser duct and an outlet for spent combustion gas and fresh air connected to the calcining furnace, and an outlet for absorbed sulfur compounds.

4,715,812

KILN FURNITURE

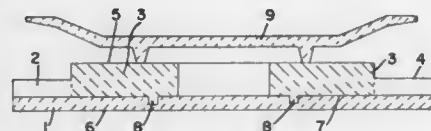
Alfred G. von Matuschka, Sauerlach-Altkirchen; Klaus Liethschmidt, Frechen-Grefrath; Hubertus Webert, Kerpem-Horrem, and Emil K. Köhler, Berchtesgaden-Oberau, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany
Filed Apr. 21, 1986, Ser. No. 854,046

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516490

Int. Cl.⁴ F27B 21/00

U.S. Cl. 432—258

8 Claims



1. Kiln furniture for supporting ceramic products to be baked in a high-speed baking kiln, comprising:
- a laminar support including a needled blanket impregnated with an inorganic binder or a binder-free needled blanket, said blanket having a lower stack-up surface in contact with a conveyor surface of said kiln and an upper surface with a plurality of depressions in the form of preformed slots and/or grooves therein; and
- a plurality of separate segment-like basic bodies made of a ceramic material and fitted in said depressions on said blanket, said basic bodies being relatively small, having simple shapes and having cross-sections resistant to thermoshock, said basic bodies together forming an emplacement surface for supporting said ceramic products to be baked in said high-speed baking kiln.

4,715,813

METHOD OF DETERMINING MATERIALS OF SUITABLE COLOURS FOR A TOOTH REPAIR LAYER OF PROSTHESIS FACET, AND A SAMPLE SET FOR APPLYING THIS METHOD

Ernst Mühlbauer, Fangdieckstrasse 61, 2000 Hamburg 53, Fed. Rep. of Germany

Filed Jul. 1, 1986, Ser. No. 880,733

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523982

Int. Cl.⁴ A01C 19/00

U.S. Cl. 433—26

10 Claims

1. An assembled sample for determining materials of suitable colors for the base and top layer of a tooth repair component, comprising:

a base layer color sample;

a top layer color sample;

wherein one of the base or top layer color samples is in the form of a liquid optically connected without bonding to the other layer.

4,715,814

ARTICULATOR

Koide Kaoru, Niigata, and Nagai Sadao, Urawa, both of Japan, assignors to Takamiya Dental Manufacturing Company Limited, Tokyo, Japan

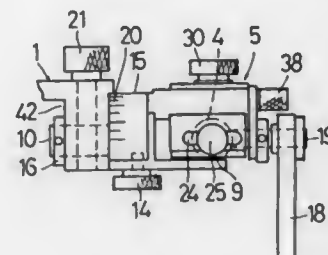
Filed Mar. 3, 1986, Ser. No. 835,262

Claims priority, application Japan, Jun. 12, 1985, 60-127709

Int. Cl.⁴ A01C 11/00

U.S. Cl. 433—59

4 Claims



1. An articulator convertible between an archon box type and an archon slot type, comprising:
- an upper jaw arciform and a lower jaw arciform for mounting a gypsum model;
- a pair of right and left condylar spheres provided at the rear of the lower jaw arciform;
- condyle path plates provided at the rear of the upper jaw arciform for supporting the condylar spheres;
- the condyle path plates including a rear wall contacting the rears of the condyle spheres, side walls contacting the sides of the condyle spheres and a lower wall contacting the lower portion for preventing the condyle path plate from floating; said lower wall being detachable;
- whereby attachment and removal of said lower wall permits conversion, respectively, between an archon slot type and an archon box type.

4,715,815

DENTAL ARTICULATOR

Hans Rossner, Ulmerstr. 11, D-8940 Memmingen, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,926

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1985, 3511928

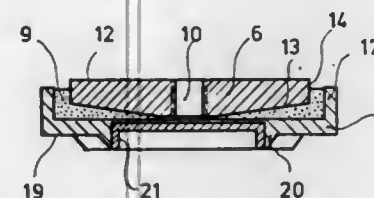
Int. Cl.⁴ A61C 11/00

U.S. Cl. 433—60

17 Claims

1. A dental articulator comprising an arm; a first support on said arm; a second support arranged to carry a dental model; and means for adjustably coupling said second support to said

first support, comprising a mass of plastic material which is rigid a first temperature range and is ductile within a second temperature range so that the mutual positions of said supports can be repeatedly altered by rendering the plastic material



ductile, said second support including a receptacle having a bottom wall and a sidewall defining with the bottom wall a compartment containing the mass of plastic material, at least a portion of said first support being at least partially embedded in said mass within said compartment.

4,715,816

ADJUSTABLE DENTAL WEDGING SYSTEM

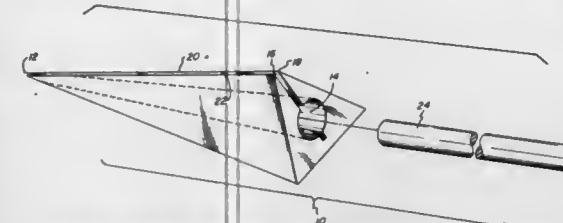
Andrew Mogelof, 298B South Trail, Stratford, Conn. 06497

Filed Aug. 25, 1986, Ser. No. 900,302

Int. Cl.⁴ A61C 7/00

U.S. Cl. 433—149

7 Claims



1. An adjustable dental wedge, comprising:
- a wedge of resilient material having a central bore positioned parallel to an axis, said wedge being essentially a trihedron, said wedge further having two opposed leaves formed along said axis separating from said bore to one apex of said wedge.

4,715,817

DENTURE ATTACHMENT STRUCTURE AND METHOD

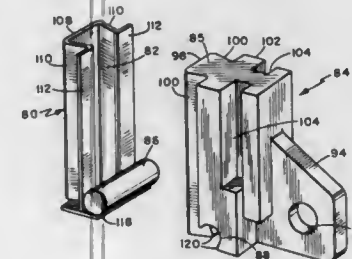
Max Zuest, 595 San Fernando, San Diego, Calif. 92106, and Paul Zuest, 13531 Orange Blossom Ln., Poway, Calif. 92064

Continuation-in-part of Ser. No. 765,811, Aug. 15, 1985, abandoned. This application Jun. 19, 1986, Ser. No. 876,265

Int. Cl.⁴ A61C 13/22

U.S. Cl. 433—181

19 Claims



1. An attachment structure for securing a denture to an existing tooth or tooth substitute, comprising:
- an insert member for securing to a denture;
- a retainer member for securing in a cut-out in an existing tooth or tooth substitute;
- one of the members having an elongate, open faced channel and the other member having a corresponding elongate

tongue which is a frictional sliding fit in the channel in the direction of insertion of a denture in an oral cavity; the channel and tongue having cooperating interengageable snap fit formation at their lower ends for snap fit engagement when the tongue is fully inserted in the channel, one of the formations comprising a socket and the other formation comprising a head of corresponding shape to the socket; and

the head and socket being elongated in a direction transverse to the longitudinal axes of the tongue and channel and each being of length greater than the transverse width of the tongue and channel so that they project outwardly on opposite sides of the tongue and channel.

4,715,818

COMPUTER TRAINING SYSTEM

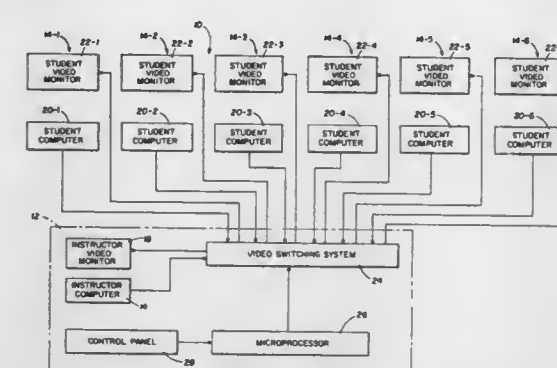
Ronald L. Shapiro, 11219 Empire Ln., Rockville, Md. 20852, and Raymond M. Thompson, Jr., Washington, D.C., assignors to Ronald Lewis Shapiro, Rockville, Md.

Filed Dec. 4, 1984, Ser. No. 677,998

Int. Cl.⁴ G09B 19/00

U.S. Cl. 434—118

13 Claims



1. A computer training system adapted for instruction of a student individually, or a plurality of students simultaneously, particularly in a classroom environment, which comprises:

an instructor work station which includes a computer having an associated video monitor upon which an instructor can produce displays using the instructor work station computer;

at least one student work station which includes a computer having an associated video monitor upon which a student can produce displays using the student work station computer;

first switching means operable by the instructor at the instructor work station for selectively connecting the student work station computer and video monitor to the instructor work station video monitor so that displays being produced on the student work station video monitor by the student are displayed on the instructor work station video monitor to enable the instructor to monitor the work of the student; and

second switching means operable by the instructor at the instructor work station for selectively connecting the instructor work station computer and video monitor to the student work station video monitor, and disconnecting the student work station video monitor from the student work station computer while connecting the instructor work station computer and video monitor to the student work station video monitor, so that displays produced by the instructor on the instructor work station video monitor using the instructor work station computer, also are displayed on the student work station video monitor for instruction of the student by the instructor without disturbing work which has been inputted into the student work station computer.

4,715,819

CONNECTOR FOR PRINTED BOARD CONNECTION
Yoshihiro Iwasa; Toru Masuda, and Yasuji Shibano, all of Osaka, Japan, assignors to Hosiden Electronics Co., Ltd., Japan

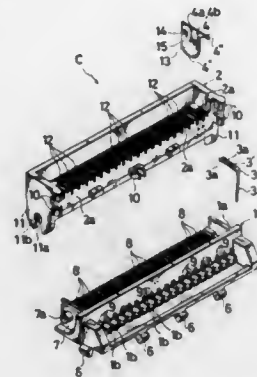
Continuation of Ser. No. 721,511, Apr. 9, 1985, abandoned. This application Aug. 19, 1986, Ser. No. 898,780

Claims priority, application Japan, Apr. 12, 1984, 59-54614[U]

Int. Cl.⁴ H01R 39/00

U.S. Cl. 439—31

13 Claims



1. A connector for connecting printed circuit boards, comprising:

- a first body having a plurality of first contacts to be connected with a printed wiring of a first circuit board and means of the first body for mounting a first circuit board thereto, each of said plurality of first contacts comprises a fork-shaped contact member including projecting contact portions facing each other with a contact area defined on each contact portion, said contact areas being spaced apart in the projecting direction of the contact portions;
- a second body facing the first contacts of said first body, said second body having a plurality of second contacts to be connected with the printed wiring of a second circuit board and means on the second body for mounting a second circuit board thereto; and
- means associated with each body according to which said first body and said second body are turnably and detachably connected with each other, each of said first contacts and of said second contacts being brought into contact with each other within a turning range of the two bodies.

4,715,820

CONNECTION SYSTEM FOR PRINTED CIRCUIT BOARDS

Howard W. Andrews, Jr., Hershey; Charles S. Pickles, Hummelstown, and Attalee S. Taylor, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 29, 1986, Ser. No. 913,183

Int. Cl.⁴ H01R 9/09; H05K 1/10

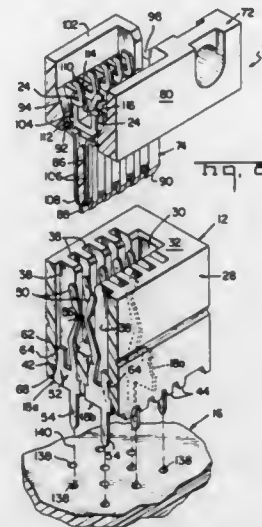
U.S. Cl. 439—59

8 Claims

1. A connection system for electrically interconnecting circuits on a printed circuit mother board and on a printed circuit daughter board, said system comprising:

- first connector having an elongated slot opening outwardly and a plurality of electrical contact means with spring means disposed on both sides of said slot and pin means extending outwardly therefrom for electrical engagement with circuits on the mother board; and
- a second connector comprising housing means and electrical contact means, said housing means including an elongated, outwardly extending blade means on one side, slot means in an opposite side for receiving the daughter board, cavities on each side of said slot with said cavities on one side being longitudinally offset relative to the facing cavities and further said cavities communicating

with said slot through notches with the notches on one side of said slot facing the notches on the other side, said contact means having finger means disposed on said blade means for electrically engaging said spring means upon inserting said blade means in said slot in said first connector, said contact means further having contact are means disposed in said cavities and projecting into said slot



through said notches for electrically engaging circuits on the daughter board which may be inserted in said slot means and further having spring section means intermediate said finger means and contact arm means, said section means having a concave-convex shape to provide an elongated spring section over a short linear distance, said contact arm means being formed normal to the plane of said finger means and spring section means.

4,715,821

COAXIAL PLUG FOR USE IN A JUNCTION BETWEEN A COAXIAL CONDUCTOR AND A STRIPLINE

Claes E. S. Axell, Askim, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

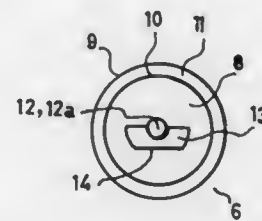
Filed Aug. 28, 1986, Ser. No. 901,126

Claims priority, application Sweden, Oct. 3, 1985, 8504588

Int. Cl.⁴ H05K 1/00

U.S. Cl. 439—59

9 Claims



- 1. A coaxial plug for use between a coaxial conductor located externally of an apparatus box and a stripline with a conductive ground plane located within the box, comprising: an insulating plate, the stripline and ground plane each being located on a respective side of said plate; an end wall on said coaxial plug; means for connection with the stripline, said means being a centre pin in said coaxial plug; means for connection with said ground plane, said means being a conductive outer casing of said coaxial plug; a projecting part of said coaxial plug projecting outwardly from said end wall and in contact with said conductive outer casing, said centre pin and said projecting part terminating substantially edge-to-edge at substantially equal

distances from said end wall and adjacent said insulating plate; and planar surface means included on said projecting part at a location remote from said centre pin for bonded connections between said centre pin and the stripline and between said planar surface means and the ground plane, respectively.

4,715,822

ELECTRICAL CONNECTION DEVICE FOR A MOTOR VEHICLE

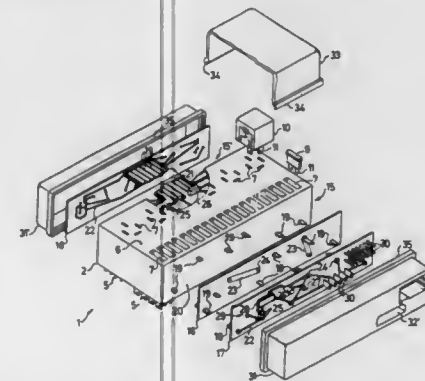
Hans P. Stribel, Nürtingen, Fed. Rep. of Germany, assignor to Stribel GmbH, Frickenhausen, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 885,167

Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—74

16 Claims



- 1. A device for centralized interconnection of electric components of a motor vehicle, such as safety fuses, plug-in connectors, wiring harnesses, switching apparatuses for electric consuming circuits and electronic control devices for the electric consuming circuits, comprising a pack of vertically superposed flat conductors separated from each other in horizontal and vertical directions by insulating means, said flat conductors being made of sheet metal to withstand high currents flowing through the electric consuming circuits, and the insulating means delimiting opposite lateral sides of the pack; a plurality of connector sockets arranged above the uppermost flat conductors to receive the plug-in connectors; at least a part of the uppermost flat conductors being connected to said connector sockets; a plurality of connector pins projecting from at least one lateral side of said pack at different levels of said flat conductors, the connector pins at the uppermost level being connected to said part of the uppermost flat conductors and the remaining connector pins to assigned intermediate flat conductors; a first conductor plate supporting components of at least one electronic control device for a consuming circuit of the motor vehicle, said first conductor plate being fixedly arranged at said one lateral side opposite said projecting connector pins and further supporting bridging conductors for interconnecting selected connector pins at the uppermost and intermediate levels to provide a desired interconnection of said connection sockets; and at least one separate switching apparatus having a plug-in connector detachably inserted in assigned ones of said connector sockets to switch a consuming circuit in the motor vehicle.

4,715,823

PLUG-IN SOCKET ASSEMBLY FOR INTEGRATED CIRCUIT PACKAGE

Toyokazu Ezura; Fujio Katsumata, and Kiyokazu Ikeya, all of Shizuoka, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

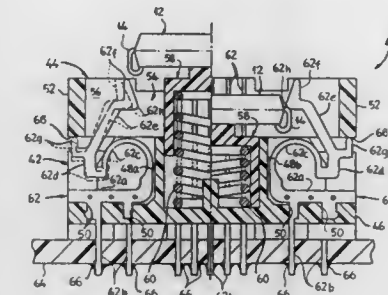
Filed Nov. 21, 1986, Ser. No. 934,063

Claims priority, application Japan, Dec. 31, 1985, 60-299100

Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—267

20 Claims



1. A plug-in socket assembly for use with a semiconductor integrated circuit package unit having a plurality of contact pins arranged along at least one side of the integrated circuit package unit, the socket assembly having a first direction in which the integrated circuit package unit is to be placed into the socket assembly and a second direction opposite to the first direction, comprising

- (a) a support member,
- (b) a housing member movable toward the support member in said first direction and away from the support member in said second direction, the housing member defining an open space adapted to have said integrated circuit package unit accommodated therein,
- (c) a carrier member for having said integrated circuit package unit detachably supported thereon, the carrier member being mounted on said support member and being movable with respect to each of said support member and said housing member in said first direction into and in said second direction out of a position in which the integrated circuit package unit supported thereon assumes a predetermined position within said open space with respect to said support member.
- (d) a plurality of contact elements supported on said support member and each extending in part in said support member, each of the contact elements having (i) a seat portion disposed on said support member, (ii) a spring portion leading from said seat portion and arcuately curved at least in part away from said open space laterally of the socket assembly, (iii) an elongated arm portion merging out of said spring portion toward said open space laterally of the socket assembly, (iv) an inner lug portion leading from said arm portion and engageable with one of said contact pins of said integrated circuit package unit when the integrated circuit package unit is in said predetermined position within said open space, and (v) an outer lug portion merging out of said arm portion and located outwardly of said inner lug portion laterally of the socket assembly, said housing being formed with a surface portion which is received on said outer lug portions of said contact elements.

4,715,824

CONNECTOR FOR INTERCONNECTING CABLE TO A PRINTED CIRCUIT BOARD

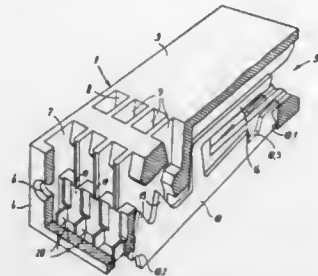
Laurentius M. Verhoeven, Rv Veghel, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 3, 1986, Ser. No. 937,500

Claims priority, application Netherlands, Dec. 4, 1985, 8503347

Int. Cl.⁴ H01R 4/24

U.S. Cl. 439—391

6 Claims



1. A connector for interconnecting a multiconductor cable having a plurality of conductors, each surrounded by insulation material, with a printed circuit board comprising:
 - a block-shaped insulation housing having a first section for receiving the conductors of the cable at one end, and a second section terminating in the form of a U-shape at the other end of the housing capable of being connected to the printed circuit board,
 - a plurality of partitions aligned longitudinally along said connector housing, said partitions defining in said one section a plurality of conductor receiving channels and in said second section a plurality of parallel grooves,
 - a plurality of openings at said one end of the housing and aligned with said channels so that the conductors are individually inserted and received within the channels of said first housing section,
 - a plurality of long, flat contact springs adapted for insertion in each of the parallel grooves, each said contact spring having at the end to be inserted in the first housing section at least one tooth capable of piercing through the insulation material of and making electrical contact with the conductor received in the channel which is aligned with the groove in which said contact spring is inserted, the other end of each said contact spring being adjacent said other end of the housing and terminating in a U-shaped spring part with a first and second leg, said first leg designed for electrically contacting a corresponding contact strip on the printed circuit board, said first and second legs and said one tooth being disposed in approximately the same plane as the rest of the contact spring.

4,715,825

CONNECTOR WITH PIERCE CONTACT ELEMENT HAVING REDUCED WEAR CROWN

Bob Mouissie, Ek Berlicum, and Hubertus B. Libregts, Xr Vlijmen, both of Netherlands, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 793,131, Oct. 30, 1985, abandoned.

This application Mar. 25, 1987, Ser. No. 31,148

Claims priority, application Netherlands, Nov. 9, 1984, 8403432

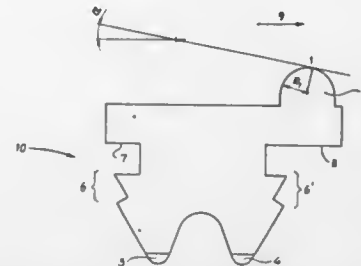
Int. Cl.⁴ H01R 4/24

U.S. Cl. 439—391

6 Claims

1. A connector for a cable having at least one insulated conductor wherein electrical connection with said conductor is made within the housing by axially piercing the end face of the conductor, said connector comprising:
 - a insulation housing with said insulated conductor inserted through an aperture in a sidewall of the housing,
 - a pierce contact element inserted through an opposite side-

wall of housing, said contact element including a base from which projects a pointed tang and two arms, one arm on either side of the pointed tang, both arms being provided with teeth along their inside edges, said inside edges running parallel to from the center line of the pointed tang and at a distance therefrom which is adjusted to the dimensions of the housing whereby when the pierce contact



element is inserted into the housing, the pointed tang pierces axially into the end face of the conductor and the teeth of the arms penetrate into and grip portions of the connector housing surrounding the conductor which has been pierced axially by the tang, said contact element further including a contact crown projecting from said base, said contact crown adapted to electrically contact a contact strip or contacting wire in a matching connector.

4,715,826

CIRCUIT BOARD CONNECTOR

John C. Collier, Skelmersdale, and Keith Davies, St. Helens, both of England, assignors to BICC Public Limited Company, London, England

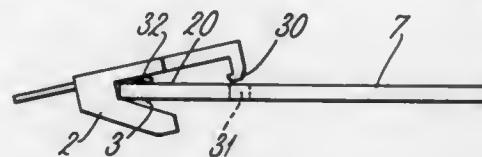
Filed Sep. 3, 1986, Ser. No. 903,384

Claims priority, application United Kingdom, Sep. 3, 1985, 8521843

Int. Cl.⁴ H01R 4/24

U.S. Cl. 439—438

7 Claims



1. An electrical edge connector for a circuit board having an edge with at least one contact pad present on or adjacent the edge; the connector comprising an insulating housing, the housing defining an aperture for receiving an edge of a circuit board; at least one metallic connector pin extending from the housing, the connector pin having a sharp-edged male contact region plated with a ductile metallic material, said sharp-edged region being capable of penetrating and deforming a similarly plated contact pad to establish a low resistance electrical connection therebetween; wherein the connector is such that a circuit board and the housing are pivotable with respect to one another between a first position in which there is clearance between the connector pin and the contact pad present on the circuit board, and a second position in which the connector pin penetrates and deforms said contact pad such that the connector pin and the contact pad are in low resistance electrical contact one with the other; and there is provided securing means for holding a circuit board with respect to the housing in the second position.

4,715,827

MODULAR CONNECTOR SYSTEM

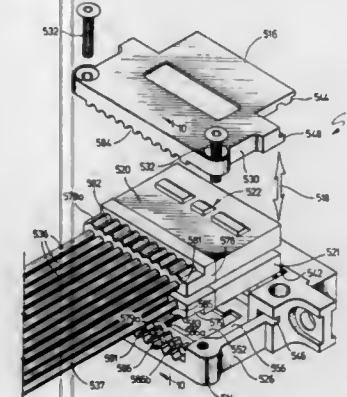
Lev B. Furman, York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 729,102, Apr. 30, 1985, Pat. No. 4,632,495, Ser. No. 729,103, Apr. 30, 1985, abandoned, and Ser. No. 729,104, Apr. 30, 1985, abandoned. This application Apr. 17, 1986, Ser. No. 853,306

Int. Cl.⁴ H01R 13/502

U.S. Cl. 439—465

44 Claims



1. A connector comprising a housing, at least one module adapted to be received within said housing, said module including means for receiving a plurality of electrical conductors therein, and positioning means for positioning said module within said housing, characterized in that,
 - said housing includes a receiving portion and a cover portion,
 - said cover portion being releasably mountable to said receiving portion for releasably enclosing said module within said housing,
 - said positioning means includes locking means on said housing and said module for locking said module laterally and longitudinally within said housing,
 - said locking means including an interengaging ribbed structure and channel structure on said housing and said module,
 - said module includes means for receiving a plurality of rows of conductor wires,
 - said cover portion includes first and second portions releasably mountable to opposite sides of said receiving portion.

4,715,828

ELECTRICAL CONNECTION FOR ELECTRONIC CIRCUITS

Jacques Landrevie, La Chambre, France, assignor to Societe Nouvelle Rockall France S.A., Vitre, France

Filed Nov. 27, 1985, Ser. No. 802,774

Claims priority, application New Zealand, Dec. 4, 1984, 210422

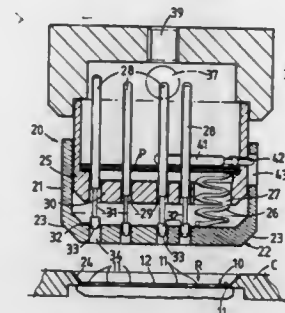
Int. Cl.⁴ H01R 13/04

U.S. Cl. 439—660

7 Claims

1. A connecting device for the connection of first and second electrical of electronic circuits, said device comprising
 - a planar contact surface formed by a plurality of annular conductive zones disposed concentrically about an axis vertical to said planar surface, each conductive zone being isolated from the others and connected to said first circuit;
 - a contactor device having a plurality of separate spaced apart contacts each connected to said second circuit and each being for conductive engagement with a particular annular conductive zone said contactor device having a housing and a plunger slidably located therein, said contacts being carried by said plunger and being project-

able from said housing responsive to sliding movement of said plunger; and
locating means for automatically positioning, when a leading portion of said contactor device is positioned over said planar contact surface, each contact for engagement with



its said particular annular conductive zone irrespective of the angular positioning of the leading portion of the contactor device relative to the contact surface such that with all contacts engaged with the contact surface said first and second circuits are electrically coupled.

4,715,829

HIGH DENSITY ELECTRICAL CONNECTOR SYSTEM

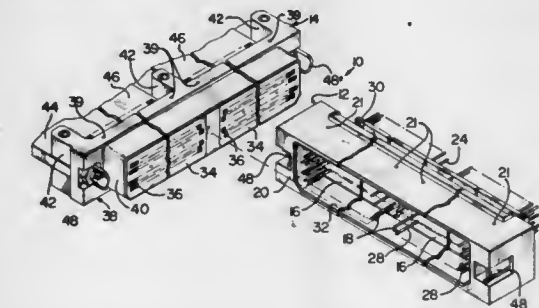
George Preputnick, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 13, 1986, Ser. No. 930,587

Int. Cl.⁴ H01R 13/04

U.S. Cl. 439—660

8 Claims



1. A high density electrical connector system for electrically interconnecting circuits on printed circuit devices such as backplane, mother boards, daughter cards and the like, said system comprising:

first connector means having dielectric module means housed in shell means and a plurality of conductive pin members contained in said module means with first and second ends thereof extending outwardly from opposite sides of said module means with said first ends adapted to engage circuits on a printed circuit device;

second connector means having dielectric module means with a plurality conductive contact elements contained therein, said elements having receptacle means at one end for receiving said second ends of said pin members and outwardly extending cantilever beam means at another end for electrically engaging circuits on another printed circuit device so that the two devices may be electrically interconnected;

shell means housing said module means of said second connector means, said shell means having a pair of spaced apart ears for receiving a heat sink; and

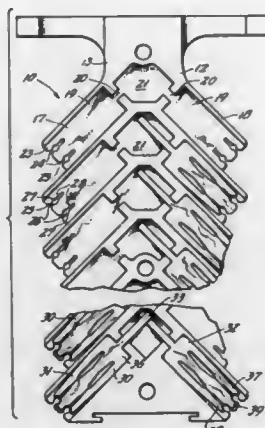
pins, received in each of said pairs of ears, extending through and supporting the heat sink.

4,715,830

**WIRE STRAIN RELIEF AND CONDUCTOR RETAINER
CONSTRUCTION FOR TELEPHONE BLOCKS**Paul V. De Luca, Plandome Manor, N.Y., assignor to Porta
Systems Corp., Syosset, N.Y.Filed Oct. 27, 1986, Ser. No. 923,178
Int. Cl.⁴ H01R 9/24

U.S. Cl. 439—709

1 Claim



1. In a telephone connector block for interconnecting individual subscriber pairs to central office equipment, including at least one generally planar contact holding element, a plurality of contact elements supported upon said contact holding element, said contact holding element having a longitudinal axis and first and second surfaces, one of said surfaces having a plurality of laterally extending recesses, said contact elements each being positioned within a corresponding recess, each of said contact elements having a conductor retaining slot extending from an edge thereof which defines a quick clip type of connector, the improvement comprising: said contact holding elements enclosing substantially the entire length of said contact elements, and having openings therein corresponding to the conductor retaining slots in said quick clip terminals, said openings including a first end portion of width corresponding to an insulated conductor, a second portion of relatively narrower width, a third portion of generally arcuate configuration and of diameter corresponding to the width of said first portion, and a fourth portion of narrower width corresponding to the width of said second portion, said contact elements being positioned in said recesses such that said edge is positioned adjacent the junction of said third and fourth portions of said openings and said retaining slot overlies and extends along the length of said fourth portion, said third portion forming a recess for resiliently retaining the end of a conductor in abutted relation relative to the open end of said conductor retaining slot of said quick clip connector; whereby upon assembly of plural subscriber pair conductors within said block, and prior to engagement with a given clip connector, the ends of said conductor may be positioned and resiliently maintained at the end of a corresponding slot for engagement by a tool serving to engage said conductor within said slot.

4,715,831

WIRING FOR REFRIGERATION APPARATUSStephen W. Paddock, Knight Township, Vanderburg County,
Ind., assignor to Whirlpool Corporation, Benton Harbor,
Mich.Filed Oct. 22, 1982, Ser. No. 435,895
Int. Cl.⁴ H01R 9/24

U.S. Cl. 439—709

4 Claims

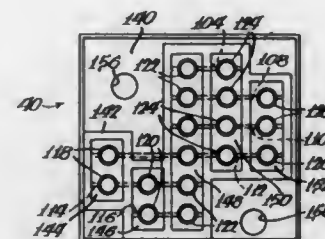
1. In a refrigeration apparatus arranged for operation from an electrical power source and having a plurality of electrical components including a compressor, a fan, a thermostat, and a light, and wherein one or more electrical leads are connected to each of said components, the combination of:

a plurality of electrical connectors, each of said connectors

receiving at least two of selected ones of said leads and being elongated, receiving the associated leads in a single straight row;

a terminal block defining a plurality of side-by-side, connector-receiving connection stations, each of said stations being elongated and configured to receive a corresponding connector;

means disposed at each connection station and carried by each connector for establishing an electrical connection when a connector is received by the associated station; and



a plurality of electrically separated busses carried by said terminal block and extending linearly between the connecting stations to effect electrical interconnection between preselected leads associated with different ones of said connectors;

said busses being generally parallel to each other and extending generally transversely to the direction of elongation of said connection stations;

the bus effecting the greatest number of electrical connections being located centrally of the remaining busses.

4,715,832

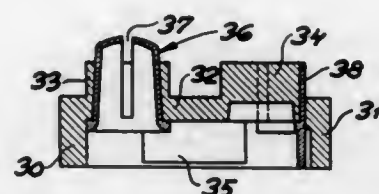
CURRENT-CARRYING ELEMENTErik Bach, Billund, Denmark, assignor to Interlego A.G., Baar,
SwitzerlandPCT No. PCT/DK85/00074, § 371 Date May 1, 1986, § 102(e)
Date May 1, 1986, PCT Pub. No. WO86/01343, PCT Pub.
Date Feb. 27, 1986

PCT Filed Aug. 2, 1985, Ser. No. 852,664

Claims priority, application Denmark, Aug. 3, 1984, 3768/84
Int. Cl.⁴ H01R 11/09

U.S. Cl. 439—723

11 Claims



1. A building element for a building set, said element being mechanically interconnectable with other similar elements in a number of different positions, each element comprising a plurality of contiguous, square module units having a common module measure, at least some of said units have a coupling stud protruding co-axially with a central axis of the module unit, so that the mutual centre-to-centre distance of the coupling studs is equal to a multiple of the module measure, said element moreover comprising complementary coupling means for cooperation with coupling studs on an adjacent element for mechanical intercoupling of the elements, and having at least two mutually electrically insulated current paths arranged so that when interconnected with an adjacent element a first current path is connected to first contact areas in the element to establish electrical connection with a corresponding first current path in the adjacent element, and a second current path

being connected to second contact areas in the element to establish electrical connection with a corresponding second current path in the adjacent element, characterized in that the portions of the first current path contact areas designed to cooperate with an adjacent element are positioned within a plurality of areas co-axial with respective central axes and of a predetermined extent which is smaller than the cross section of the coupling studs, and that the second current path contact areas are positioned co-axially around the respective central axes, but outside the first current path contact areas.

4,715,833

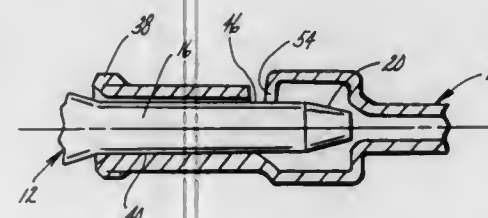
PIN AND SOCKET ELECTRICAL TERMINALDewey F. Mobley, Lake Orion, and Janice M. Warren, New
Hudson, both of Mich., assignors to Interlock Corporation,
Westland, Mich.

Filed Jul. 2, 1986, Ser. No. 881,413

Int. Cl.⁴ H01R 13/11

U.S. Cl. 439—834

9 Claims



1. A pin and socket assembly for establishing electrical contact comprising a pin member and a hollow socket member of a size and shape to enable insertion of said pin member into said socket member, one of said members having integral radially projecting and circumferentially spaced ribs and the other one of said members having a generally cylindrical surface engageable with said ribs, said ribbed member having a single longitudinal seam and an annular wall cross section continuous on either side of said longitudinal seam, said ribs terminating in edges located substantially on an imaginary circular path having a diameter such that when said pin member is inserted into said socket member said edges of said ribs firmly engage said cylindrical surface so as to establish electrical contact between said members.

4,715,834

CONNECTOR FOR A TELESCOPIC ISOLATING SWITCH
Edmond Thurles, Meyzieu; Jean-Paul Masson, Villeurbanne,
and Louis Malik, Caluire, all of France, assignors to Alsthom-
Atlantique, Paris, France

Filed May 30, 1985, Ser. No. 739,587

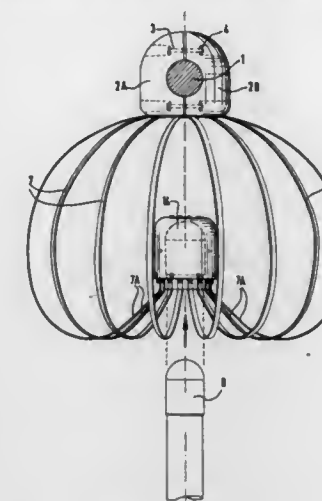
The portion of the term of this patent subsequent to Sep. 29,
2003, has been disclaimed.Int. Cl.⁴ H01R 13/11

U.S. Cl. 439—842

6 Claims

1. In a connector for electrical and mechanical connection to an overhead conductor and for constituting the female connector portion of a telescopic isolating switch suitable for co-operating electrical engagement with a male connector portion of said switch, the improvement whereby said female connector portion comprises a plurality of metal conductors which are curved and regularly circumferentially spaced in such a manner as to define meridians of a substantially spherical member, means for fixing the top ends of said conductors to a metal block, said block being electrically connected and mechanically fixed to said overhead conductor, the bottom ends of said curved metal conductors each including a rectilinear portion which is inclined relative to the vertical and extending inwardly and upwardly in such a manner as to define an inlet

cone for said male connector portion, followed by a hairpin bend portion having two arms, including a radially inward one



which serves as a contact finger for making electrical contact with the male connector portion.

4,715,835

IC PACKAGE CARRIERNoriyuki Matsuoka, Tokyo, Japan, assignor to Yamaichi Elec-
tric Mfg. Co., Ltd., Tokyo, Japan

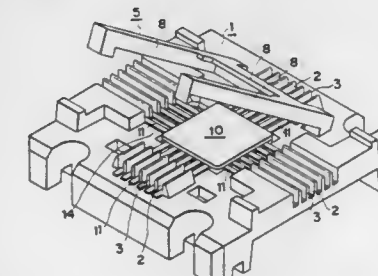
Filed Jun. 2, 1986, Ser. No. 869,605

Claims priority, application Japan, Jun. 3, 1985, 60-120000

Int. Cl.⁴ H01R 9/09; B65D 85/42

U.S. Cl. 439—893

2 Claims



1. A carrier of an IC package having a plurality of IC leads projecting in parallel sidewise from at least two lateral side surfaces thereof, which comprises:

a carrier substrate including a section for accommodating the IC package therein and a plurality of grooves formed in at least two lateral side portions of the upper surface of said carrier substrate for accommodating therein the plurality of IC leads and supporting the lower surfaces of the plurality of IC leads on the bottoms thereof when the IC package has been accommodated in said section;

IC package supporting means hingedly mounted for rotation at a position on said carrier substrate, disengageably engaged at another position with said carrier substrate and comprising at least two IC lead retaining bars which extend along said two lateral side portions and engage the upper surfaces of the plurality of IC leads for retaining against the lower surfaces of the bars the upper surfaces of the plurality of IC leads when said IC package supporting means has been engaged with said carrier substrate having the IC package accommodated in said section thereof; said at least two IC lead retaining bars having free outer ends, said free outer ends of said bars having engaging pawls, and said free outer ends being elastically shiftable toward and away from each other; and

said upper surface of said carrier substrate has engaging means for engaging said pawls and for shifting said free outer ends of said bars toward each other when said bars are rotated against the upper surface of said carrier substrate, whereby said pawls of said free outer ends are engageable and disengageable with said carrier substrate for retaining the IC package.

4,715,836

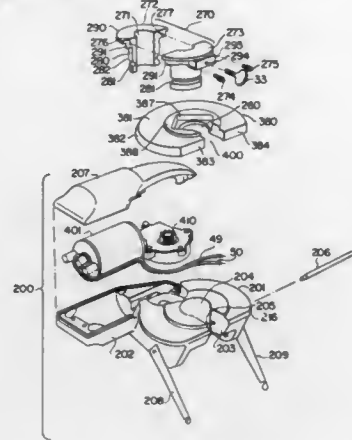
REMOTE STEERING ASSEMBLY KIT FOR OUTBOARD TROLLING MOTORS

Richard R. Schulte, 16424 S. Mayleon, Plainfield, Ill. 60544
Continuation-in-part of Ser. No. 852,275, Apr. 15, 1986, Pat. No. 4,669,987, which is a continuation of Ser. No. 775,284, Sep. 12, 1985, abandoned, which is a continuation of Ser. No. 607,539, May 7, 1984, abandoned. This application Nov. 24, 1986, Ser. No. 934,286

Int. Cl.⁴ B63H 21/17

U.S. Cl. 440-6

5 Claims



1. A remote steering assembly kit for an already existing outboard trolling motor assembly of the type having a boat mounting frame member including a clamp member to clamp to a side of the boat, a sleeve member connected to said frame member, an upwardly extending cylindrical drive shaft housing extending from a drive motor at the upper end to a propeller at the bottom end received through said sleeve member and being rotatable to steer the boat on which it is mounted, said kit comprising detachable rotatable steering gear means for mounting on said cylindrical drive shaft housing of said existing outboard trolling motor assembly while it remains assembled and co-axial with said cylindrical drive shaft to rotate it in both opposite directions of rotation to thereby steer the boat, power drive gear means positioned to rotate said steering gear means in both opposite directions of rotation on command, and control means to direct said power drive gear means to rotate said steering gear means as desired in each opposite direction of rotation to steer the said boat to the right when rotated in one direction and to left when rotated in the opposite direction of rotation, said control means being movable to a location in said boat remote from said trolling motor for remote steering control of said boat, wherein said detachable rotatable steering gear means includes a steering gear member having an arcuate peripheral configuration, an arcuately extending top wall, an arcuately extending side wall having an outwardly facing surface and an inwardly facing surface, gear teeth projecting inwardly from said inwardly facing surface of said arcuately extending side wall for driving engagement with said power drive gear means, a radially extending slot in said top wall of said steering gear member opening to said side wall to receive said cylindrical drive shaft housing, a central aperture through said top wall of said steering gear member, said radially extending slot extending from said opening to said side wall to said central aperture whereby said steering gear member is mountable on said cylindrical drive shaft housing co-axially therewith while said trolling motor assembly remains assembled,

rotary drive means detachably affixed to said cylindrical drive shaft housing having first engagement means for driving engagement with said steering gear member, said top wall of said steering gear member including second engagement means for engagement with said first engagement means of said rotary drive means.

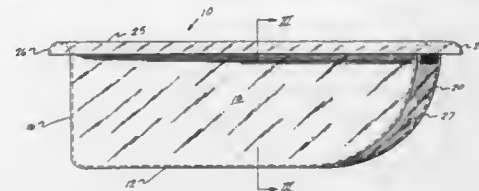
4,715,837

UNDERWATER VIEWING DEVICE

John F. Floyd, 858 Glenalyn Ave., Spartanburg, S.C. 29302
Continuation of Ser. No. 690,869, Jan. 14, 1985, abandoned. This application Aug. 1, 1986, Ser. No. 891,418
Int. Cl.⁴ G02B 5/00

U.S. Cl. 441-135

4 Claims



1. An underwater viewing device comprising:
a body, said body comprising a flat transparent bottom having a generally elongated rectangular shape with a pointed end, walls of unitary construction with said bottom and extending upwardly therefrom for a distance adequate to preclude substantial water splash thereover during normal use, said walls having means for reducing passage of light therethrough, said walls at said pointed end of said bottom defining a bow shape thereat, and an outwardly turned flange of unitary construction with said walls, said flange extending around at least a major portion of the periphery of said body near the top of said walls and permitting said device to be held by one in a moving boat and suspended in the water whereby one may view beneath the surface of the water through the transparent bottom; said bow shape defining a center line extending from an inward portion of said outwardly turned flange to said pointed end of said bottom, said center line being the most forwardly extending portion of said bow shape, said walls defining said bow shape defining a pair of surfaces to each side of said center line and extending continuously from said inner portion of said outwardly turned flange to said bottom;
said flange defining support receiving openings therein, so that said device may be secured to a boat mounted support device;
a generally C-shaped rigid support device having one end secured to one of said receiving openings in said flange; and
a bracket mounted on a side of a boat and securing said other end of said support device thereto.

4,715,838

APPARATUS FOR RECOVERING FLUORESCENT MATERIAL FROM MERCURY VAPOR DISCHARGE LAMPS

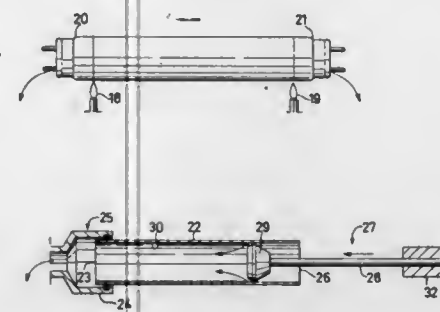
Hans Kulander, Oskarshamn, Sweden, assignor to MRT System Aktiebolag, Oskarshamn, Sweden
Filed Apr. 17, 1986, Ser. No. 853,127
Claims priority, application Sweden, Apr. 30, 1985, 8502103
Int. Cl.⁴ H01J 9/00; A47L 7/00

U.S. Cl. 445-61

11 Claims

1. Apparatus for removing and collecting luminescent material from mercury vapour electrical discharge lamps and like lamps, comprising:
a stripping device (27) for loosening luminescent material

(30) from inner wall surfaces of a bulb part (22) in conjunction with a suction force; and
a suction device (25) including means connectable to one end of the bulb part (22) for generating said suction force in the bulb part and for collecting loosened luminescent material;
said stripping device (25) including:
a supporting rod (28) arranged for reciprocatory movement in the bulb part (22);
a stripping head (29) mounted on one end of said rod (28) and arranged for reciprocatory movement in the bulb part (22) along with said rod (28);



said stripping head (29) being supported and guided by said rod (28) in the bulb part (22), and being dimensional so as to define an annular air gap (36) between the outer periphery of said stripping head (29) and an opposing wall section of the bulb part (22), the size of said gap being such as to provide said suction force; and
said stripping head (29) having a double-cone configuration presenting two conical surfaces (33, 34) each departing in opposite directions from a mutually common waist section (35), said conical surfaces having given cone angles so as to center said stripping head (29) in the bulb part (22) under the influence of said suction force.

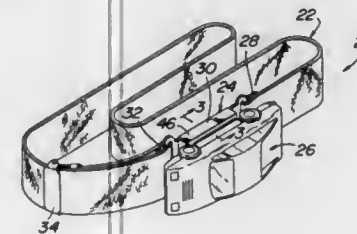
4,715,839

NOVELTY BELT

Allan L. Ford, Philadelphia, and Jay H. Baronoff, Yardley, both of Pa., assignors to Reborn Products Co., Inc., Bensalem, Pa.
Continuation of Ser. No. 757,593, Jul. 22, 1985, abandoned. This application Oct. 1, 1986, Ser. No. 915,912
Int. Cl.⁴ A63H 33/00

U.S. Cl. 446-28

8 Claims



1. A novelty item in the form of a combination belt and toy, said novelty item comprising a toy and band of material having a pair of ends and adapted to encircle the waist of a wearer to form said belt for supporting a garment thereon, buckle means secured to said band for releasably securing the ends of said band together, said buckle means including a first portion attached to one of said pair of ends of the band of material and a second portion for mating with said first portion attached to the other of said pair of ends of the band of material, said first portion overlying said second portion when said first and second portions are mated, said first portion having an outer surface and peripheral sidewalls, said toy including a lower surface and wheel means adjacent the periphery of said lower

surface and extending below said lower surface, said toy having means on its lower surface for releasably securing it onto said outer surface of said first portion against accidental disconnection therefrom, said toy completely covering the buckle means with the wheel means of said toy being outside the periphery of the sidewalls of said first portion of said buckle means when the toy is releasably secured to said buckle means, whereupon once the toy is so secured, it forms decorative ornamentation covering said buckle means, whereas said toy is removed from said surface, it can function as a toy or amusement device while leaving the belt still useful to support said garment.

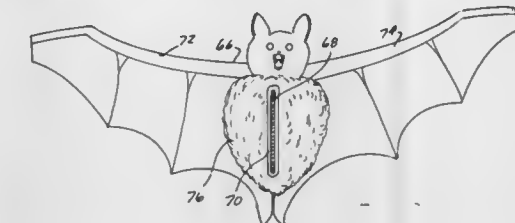
4,715,840

EXPANSIBLE OBJECT

Jeffery G. Swift, 5418 Nicole, Milford, Mich. 48082
Filed Aug. 1, 1986, Ser. No. 892,031
Int. Cl.⁴ A63H 3/00

U.S. Cl. 446-74

15 Claims



1. An expansible object comprising:
a body, simulating an animate object, the body having an access port communicating with an internal pouch, the internal pouch extending substantially over the width and length of the inside of the body;
a plurality of small objects, each simulating a smaller form of the body, storable within the internal pouch of the body; and
means for closing the access port to retain the plurality of small objects within the internal pouch.

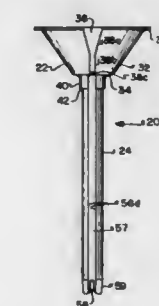
4,715,841

BALLOON HOLDER

David C. Nelson; Michael J. Fresh, both of Copley, Ohio, and Herbert Mueller, Herznach, Switzerland, assignors to Ballon-Mueller AG, Herznach, Switzerland
Filed Mar. 11, 1986, Ser. No. 838,516
Int. Cl.⁴ A63H 3/06

U.S. Cl. 446-222

13 Claims



1. A one-piece balloon holding device comprising a cup having a rim and a sidewall, and a longitudinally extending stem joined at one end to the outside of said cup at a locating remote from said rim;
said cup also having a longitudinally extending slit for insertion of the neck of the balloon;
said stem being adapted to be inserted into one end of a hollow balloon stick and being shaped so as to provide space for concealing said neck of said balloon inside said

balloon stick when the stem is so inserted, said stem having means near the end remote from said cup for engaging said neck.

4,715,842

DOLL CONSTRUCTION

Edward C. Noble, 700 Hicks Ave., Jackson, Ala. 36545

Filed Aug. 21, 1986, Ser. No. 898,516

Int. Cl.⁴ A63H 33/32; G09B 19/00

U.S. Cl. 446—268

3 Claims



1. A doll construction which comprises: an inanimate article in the form of a small figure in the general shape of a human with two arms, each arm having a hand with a plurality of fingers and a thumb joined thereto; and a fingerprint on each of the fingers and thumbs of said doll, each of said fingerprints being located in the fingerprint position at the outer end of said finger or thumb on the palm side of the hand, and with each fingerprint being in the form of a symbol such as a letter or numeral which serves to identify said doll; and a record keeping sheet having marked spaces for entering fingerprint information for each finger and thumb of the doll, thus identifying and distinguishing the doll from other similar dolls.

4,715,843

TOY VEHICLE PLAYSET

Eric C. Ostendorff, Torrance, and James I. Tucker, Jr., Manhattan Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 20, 1985, Ser. No. 778,573

Int. Cl.⁴ A63H 18/00

U.S. Cl. 446—429

3 Claims



1. A toy vehicle playset comprising a roadway; a booster for impelling a vehicle along the roadway; a ramp positioned in the roadway; means for normally arranging the ramp to direct a vehicle upward therefrom, the ramp being positioned above the roadway; pivot means supporting one end of the ramp above the roadway so that the ramp is movable in response to pressure on its underside to allow passage of a vehicle along the roadway; a catcher positioned in the roadway to catch a vehicle leaving the ramp; and a return portion of the roadway slanted to stop the vehicle and return it to the end of the roadway at which the booster is situated.

4,715,844

ALTERNATOR AND GENERATOR BELT TENSIONING DEVICE

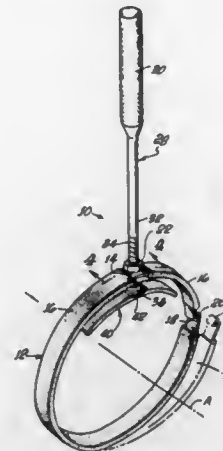
David G. Fambrough, 13205 South Hills Dr., Reno, Nev. 89511

Filed May 1, 1986, Ser. No. 858,112

Int. Cl.⁴ F16H 7/12

U.S. Cl. 474—130

2 Claims



1. An apparatus for applying tension to an alternator/generator driven pulley or sprocket which includes: a flexible strip of material attachable at its ends to itself; such attachment effected by interlocking of inwardly bent first end of said strip of material with an outwardly bent second end of said strip of material, said interlocking being accomplished by bending said flexible strip ends apart from one another until said first and second bent ends are substantially aligned with one another and then said strip ends are interlocked with one another; an elongated handle threadedly affixed to said flexible strip at a point away from said first and second inwardly and outwardly bent ends of approximately 90° from said connected ends, said threaded portion of said handle being threadedly passing through a correspondingly threaded projection on said flexible strip; a swivably connected arcuate clamping member affixed to the end of said threaded handle at its extremity within a circle formed by said flexible strip after being connected to itself at its ends and capable of gripping an alternator/generator housing when said handle is rotated to move said arcuate clamping member against said housing thereby forcing said housing against said arcuate strip at a point opposite said threaded handle.

4,715,845

SPROCKET WHEEL FOR DRIVING SAW CHAIN OF CHAIN SAW

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Jul. 21, 1986, Ser. No. 888,451

Claims priority, application Japan, Aug. 9, 1985, 60-122504[U]

Int. Cl.⁴ F16H 55/30

U.S. Cl. 474—152

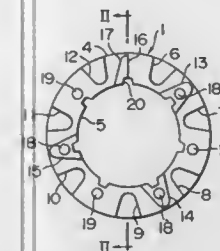
3 Claims

1. A sprocket wheel for driving a saw chain of a chain saw comprising

a pair of annular sprocket wheel members of the same shape and configuration each formed on one side surface thereof with elevated surface portions of a number which is one half the desired number of the teeth of the sprocket wheel produced as an end product by joining the sprocket wheel members together in such a manner that the one side surfaces thereof having the elevated surface portions face each other, wherein each said elevated surface portion provides a respective tooth of the sprocket wheel, said desired number of teeth is an odd number,

each said pair of sprocket wheel members is formed with a plurality of projections on first respective parts of said one side surface thereof and with a plurality of recesses on second respective parts of said one side surface thereof,

said projections of each said sprocket wheel member are received in the respective recesses of the other when the two sprocket wheel members are joined together, and



one of said elevated surface portions on each said sprocket wheel member is a half-size elevated surface portion, and the half-size elevated surface portions of the two sprocket wheel members are joined to each other back to back when the two sprocket wheel members are joined together to provide a completed respective one of said elevated surface portions.

4,715,846

TRAILING PANEL FOLDER

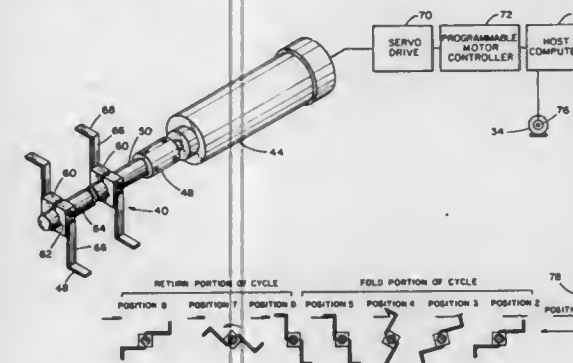
Chet Zak, West Newbury, Mass., assignor to Post Machinery, Inc., Portsmouth, N.H.

Filed Jun. 11, 1986, Ser. No. 872,797

Int. Cl.⁴ B31B 1/00

U.S. Cl. 493—10

11 Claims



1. A trailing panel folding system for use in a blank folding machine including conveyor means driven by a drive means for continuously advancing blanks with trailing panels in a predetermined direction in untimed relationship to one another along a generally horizontal path, said trailing panel folding system comprising:

- a rotatable shaft mounted below said path and transverse thereto;
- a motor, which is not part of said drive means, connected to drive said shaft;
- arm means mounted on said shaft and extending generally radially therefrom, said arm means having at least one arm extending away from said shaft and a folding head for folding a trailing panel of a blank at the distal end of said arm and projecting therefrom substantially normal to the axis of said shaft;
- an encoder interconnected with said drive means providing a pulsed output related to the velocity at which said blanks are moving along said path;
- a blank sensor responsive to the presence of a blank at a predetermined location along said path upstream of said

shaft for providing a trailing edge signal when the trailing edge of the sensed blank leaves said location;

- a programmable motor controller for operating said motor through a cycle of operation, said controller including means for moving said arm means to a predetermined start position wherein said folding head is disposed upstream of said shaft, means for causing said folding head to move to an up position wherein said folding head overlies the folded trailing panel at a speed sufficiently fast to overtake and fold the panel, means to cause said folding head to dwell in said up position, and means for causing said arm means to move to a start position after the folded panel has moved from under said folding head; and
- a microprocessor interconnected with said encoder, said blank sensor and said controller for receiving input signals based upon the operation of said sensor and said encoder, and providing output signals to said controller to start said cycle and to cause said head to move from said up position, wherein said means for causing said folding head to move to an up position causes said motor to operate in accordance with a first acceleration/velocity profile, and wherein said means for causing said arm means to move to a start position causes said motor to operate in accordance with a second acceleration/velocity profile, said first and second profiles being different.

4,715,847

PROCESS AND APPARATUS FOR PRODUCING BLANKS FOR PACKS

Heinz Focke, and Jürgen Focke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

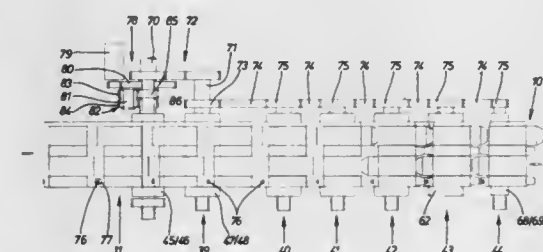
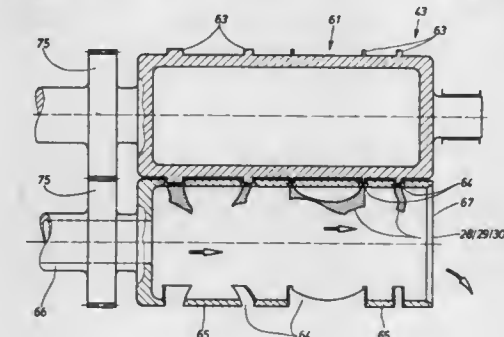
Filed Jan. 3, 1986, Ser. No. 816,018

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1985, 3500547

Int. Cl.⁴ B31B 1/00

U.S. Cl. 493—11

16 Claims



1. Process for producing blanks for packs, made of paper, cardboard or like packaging material, by severing them from a longitudinal sheet of packaging material, wherein the blanks are severed from the sheet during conveying of the latter, wherein the sheet is normally conveyed at a constant speed, and wherein each pack has two rectangular main wall panels,

(12, 13), two rectangular side wall panels (14, 15), and two rectangular end closures (20), said process characterized by: severing each blank (10) from the sheet (11) in a plurality of partial cuts which form, from laterally aligned portions of the sheet (11), a pair of closing tabs (19) respectively provided on parts of the sheet (11) forming main wall panels (13, 12) at the trailing and leading edges of successive blanks (10), and each of which comprises one of said end closures and a closing tongue (21), two side tabs (17), respectively provided on parts of the sheet (11) forming side wall panels (14) at the trailing and leading edges of successive blanks (10), between said pair of closing tabs (19), and two side tabs (18), respectively provided on parts of the sheet (11) forming side wall panels (15) at the trailing and leading edges of successive blanks (10), laterally adjacent one of said pair of closing tabs (19), such that the side tabs (17, 18) are laterally narrower than said parts of the sheet (11) forming the side wall panels (14 and 15) on which said side tabs (17, 18) are provided, at least at parts of the side tabs (17, 18) spaced from said parts of the sheet (11) forming the side wall portions (14, 15) on which the side tabs (17, 18) are provided, and gaps are formed between each of the pair of closing tabs (19) and each laterally adjacent side tab (17, 18); and executing said partial cuts in at least two work cycles in which partial cuts are made respectively along opposite sides of said gaps.

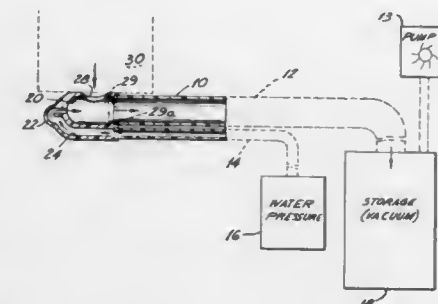
4,715,848

GASTRO-INTESTINAL LAVAGE SYSTEM AND METHOD

Gregory A. Beroza, 16 Dikeman St., Hempstead, N.Y. 11550
Continuation of Ser. No. 723,557, Apr. 15, 1985, abandoned.
This application Dec. 16, 1986, Ser. No. 942,258
Int. Cl.⁴ A61M 1/00

U.S. Cl. 604—35

5 Claims



1. A gastric lavage device comprising:

- a nozzle;
- an aspirating chamber in said nozzle;
- a window in a side of said aspirating chamber, effective for communicating with a body cavity;
- an exit port in a rear portion of said nozzle;
- an opening in a forward end of said aspirating chamber, said opening being directed toward said exit port from front to rear across said aspirating chamber;
- means for connecting a source of pressurized liquid to said opening;
- said opening and said source of pressurized liquid being effective in combination to direct a hard stream of said liquid through said aspirating chamber toward said exit port, whereby debris in said aspirating chamber is broken up and urged toward said exit port;
- means for creating a reduced pressure at said exit port, whereby debris in said body cavity may be drawn through said window into said aspiration chamber, therein to be broken up by said hard stream of liquid and removed through said exit port.

4,715,849

METHOD FOR EASILY DRAWING BLOOD FROM ARM OR LEG

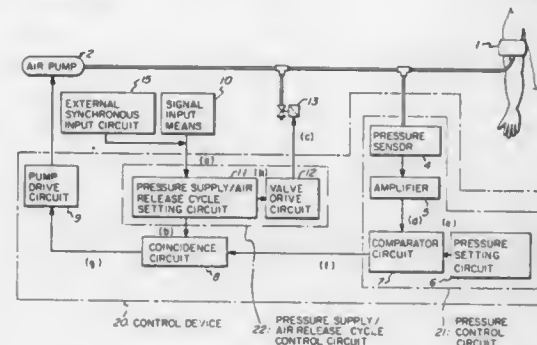
Hideori Gion; Takumi Yoda, both of Okayama; Yasuzo Kirita, Toyonaka; Kazuhito Zaima, Saijo, and Noriyuki Kurata, Takamatsu, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Feb. 21, 1986, Ser. No. 832,524

Claims priority, application Japan, Feb. 26, 1985, 60-38563
Int. Cl.⁴ A61B 17/12

U.S. Cl. 604—52

3 Claims



1. A method from drawing blood from an arm or leg of a patient which comprises:

- inserting a blood-drawing needle into a vein in the arm or leg of a patient,
- winding a bag-like band around the patient's arm or leg, at a site downstream of the point of insertion of the blood-drawing needle, so as to increase the amount of blood drawn by said blood-drawing needle,
- inflating said bag-like band with air from a pneumatic pump so that said bag-like band presses tightly against the patient's arm or leg, and
- controlling the inflation of said bag-like band by:
 - generating a periodic signal of 3-10 second duration which activates the closing of valve means concurrently with generating a first drive signal, followed by a 1-3 second period when neither signal is generated,
 - monitoring the pressure in said bag-like band, such that a second drive signal is generated whenever the pressure is less than a reference value which is equal to 30-150 mm Hg, and
 - monitoring said first and second drive signals such that a pump driving signal is generated activating said pneumatic pump only when said first and second drive signals are generated.

4,715,850

THERAPEUTIC AGENT DELIVERY SYSTEM AND METHOD

Lol H. Tran, Wheaton, Ill., assignor to Controlled Release Technologies, Inc., Batavia, Ill.

Filed Dec. 6, 1984, Ser. No. 679,128

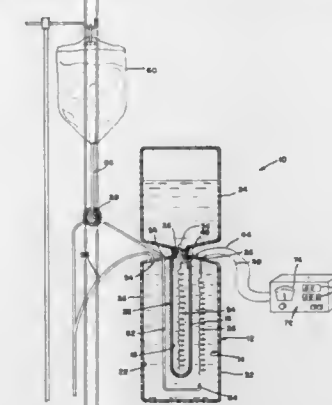
Int. Cl.⁴ A61M 31/00

U.S. Cl. 604—82

27 Claims

1. A therapeutic agent delivery system comprising:
- housing means defining a cavity divided by a semipermeable membrane into a donor chamber of substantially constant volume adapted to hold the therapeutic agent and a receiving chamber adapted to receive the therapeutic agent from the donor chamber through the membrane;
 - an anode and a cathode in communication with the cavity with at least one of the anode and cathode being in communication with the donor chamber such that the therapeutic agent remains in the donor chamber until an electromotive force of a sufficient amount is applied between the anode and cathode whereby at least a portion of the

therapeutic agent passes from the donor chamber to the receiving chamber; and



delivery means for delivering the therapeutic agent from the receiving chamber to a patient.

4,715,851

MEANS FOR HANDLING TWO SOLUTIONS WHICH ARE TO BE MIXED TOGETHER

Peter Geisser, St. Gallen; Hans P. Kaiser, Zurich, and Franz Berger, Gossan, all of Switzerland, assignors to Laboratorien Hausmann AG, St. Gallen, Switzerland

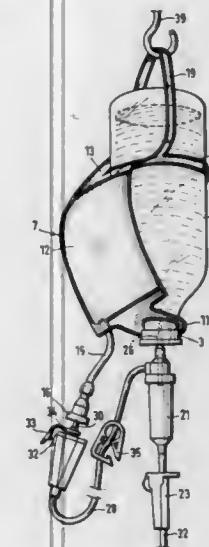
Filed Jun. 11, 1986, Ser. No. 872,863

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522645

Int. Cl.⁴ A61M 37/00, 5/14

U.S. Cl. 604—82

13 Claims



1. An apparatus for handling and mixing together two liquids in a sterile manner comprising:

- a rigid container for housing a first fluid including a first closure disposed at one end of said rigid container;
- a flexible bag mounted to said rigid container for housing a second fluid, including a tube with a second closure mounted at one end of said tube;
- a first needle inserted into said first closure;
- a drop chamber fluidly connected to said first needle;
- an infusion tube fluidly connected to said drop chamber;
- a first flow regulation means disposed along said infusion tube for controlling the rate of fluid flow through said infusion tube;
- a second needle inserted into said second closure;
- an air inlet filter fluidly connected to said second needle;

a connecting tube fluidly connecting said air inlet filter with said drop chamber;

a second flow regulation means for controlling the flow of said second fluid into said drop chamber,

whereby insertion of said first and second needles in said first and second closures permits flow of the said first and second fluids to said drop chamber for mixing therein.

4,715,852

IMPLANTED MEDICATION INFUSION DEVICE

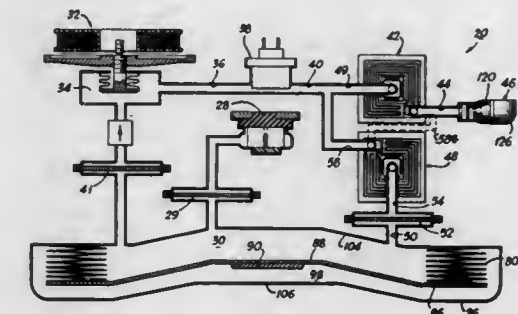
Robert H. Reinicke, Mission Viejo, and Lance M. Yamato, Rancho Palos Verdes, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 21, 1986, Ser. No. 888,585

Int. Cl.⁴ A61M 7/00

U.S. Cl. 604—131

20 Claims



1. In an implantable medication infusion device, the combination of, a medication reservoir having a movable wall portion, a pressure stabilizing chamber in communication with said movable wall portion and filled with a fluid having a pressure which is greater than the pressure of the body in which said device is implanted, a solenoid operated pulsatile pumping unit having an inlet communicating with said reservoir through an inlet valve; and a flow restrictor positioned between said pumping unit and a catheter outlet, said flow restrictor permitting; and continuous flow of medication to said catheter outlet at a safe value rate in the event said inlet valve remains open.

4,715,853

BACK-FILL SYRINGE

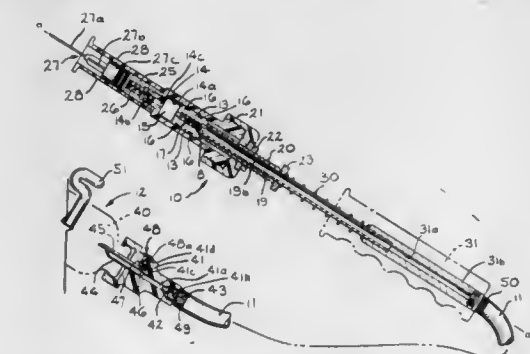
Gordon E. Prindle, Schaumburg, Ill., assignor to Ideal Instruments, Inc., Chicago, Ill.

Filed Sep. 19, 1986, Ser. No. 909,481

Int. Cl.⁴ A61M 5/18

U.S. Cl. 604—184

16 Claims



1. A syringe assembly and dispensing bottle means which reloads a liquid to be dispensed by the syringe assembly after injecting a dose of the liquid into an animal which comprises:

(a) a piston means movable along a longitudinal axis for

- dispensing the liquid from the syringe assembly and which has an opening along the axis;
- (b) a sleeve means confining the piston means for movement along the longitudinal axis and defining a chamber with the piston means for holding the liquid prior to dispensing, the sleeve means having a dispensing end with an opening for discharging the liquid through a needle means mounted on the dispensing end and a charging end for receiving the liquid;
- (c) tubular means connected at one end to the piston means along the longitudinal axis and extending from the charging end of the sleeve means to provide movement of the piston means in the sleeve means and to provide a fluid connection from the dispensing bottle means to the opening in the piston means;
- (d) handle means grippable by one hand mounted on the tubular means away from the charging end of the sleeve means such that the tubular means can be moved to push the piston means in the sleeve means along the longitudinal axis by the hand on the handle means;
- (e) hose means connected to the tubular means at an end opposite the one end of the tubular means;
- (f) bottle means connected to the hose means;
- (g) one-way valve means in the dispensing end of the sleeve means, the opening in the piston means or in the tubular means and in the bottle means, whereby the liquid can be dispensed from the chamber through the dispensing end of the sleeve means and needle means by the piston means with the valve means in the dispensing end open and with the valve means in the tubular means or piston means and the bottle means closed when the needle means is inserted into the animal and the fluid injected by pushing the handle means along the longitudinal axis and whereby the chamber is refilled from the bottle means by closing the valve means in the dispensing end and by opening the valve means in the piston means and in the bottle;
- (h) return means mounted on the assembly so as to move the piston means in the sleeve means back to the position for holding the liquid prior to dispensing and thus to refill the chamber; and
- (i) additional one-way valve means for air inlet into the bottle means which allows air to enter the bottle means as the chamber in the sleeve means is refilled by movement of the piston means in the sleeve means back to the position for holding the liquid prior to dispensing.

4,715,854

MULTIDOSE DISPOSABLE SYRINGE AND METHOD OF FILLING SAME

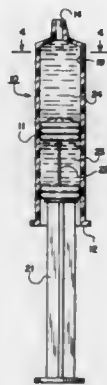
Vincent L. Vaillancourt, 30A Ridgedale Ave., East Hanover, N.Y. 07936

Filed Jul. 17, 1986, Ser. No. 887,078

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—191

9 Claims



1. A multidose syringe comprising

- a one piece cylindrical barrel having an open end and a tip defining a closed end with a duct extending therefrom;
- a first piston mounted in said barrel in friction-fit relation to move from a first position abutting said closed end to a second position spaced therefrom to define a first chamber therebetween for receiving a first fluid;
- a second piston slidably mounted in said barrel in friction-fit relation to move between a first position adjacent said first piston and a second position spaced therefrom to define a second chamber therebetween for receiving a second fluid;
- a piston rod connected to said second piston and extending from said barrel;
- collapsible means connecting said pistons to move said first piston with said second piston after predetermined movement of said second piston from said first piston after filling of said second chamber with a fluid;
- a passageway disposed between said first piston and said barrel defining a communicating path between said duct and a point between said pistons with said first piston in said first position thereof; and
- means in said passageway to create turbulence in a flow of fluid drawn into said second chamber to preclude an air flow into said second chamber.

4,715,855

DRY BOTTLE DRAINAGE SYSTEM

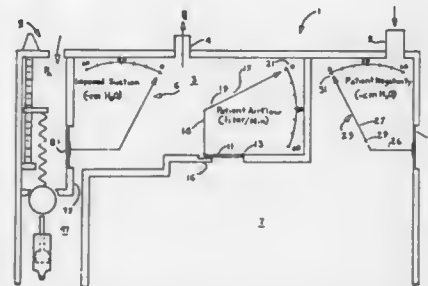
Nicholas F. D'Antonio, and Nicholas J. D'Antonio, both of Liverpool, N.Y., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,564

Int. Cl.⁴ A61M 1/00

U.S. Cl. 604—320

10 Claims



4. A system for draining fluids from a portion of the body, said system comprising:
- collection means for receiving fluids from the body, said collection means including an inlet port for admitting fluids from the body to said collection means;
- a suction chamber communicatable with said collection means, said suction chamber being connectable to a suction source;
- a suction regulator for controlling the pressure in said suction chamber, said suction regulator including
- a first compartment having a first chamber communicating with the atmosphere;
- a second compartment having a second chamber communicating with said suction chamber;
- first dividing means dividing said first chamber from said second chamber, said first dividing means including an opening for putting said second chamber in communication with said first chamber;
- first closing means movable between an opening position for opening said opening and a closing position for closing said opening; and
- biasing means for biasing said closing means towards the closed position with a force which establishes a force equilibrium across said closing means when the force resulting from the application of the desired pressure to said closing means occurs;

venturi means for admitting gases from said collection chamber into said suction chamber rate a flow rate according to the pressure differential between said collection chamber and said suction chamber; and

gas flow measuring means for measuring the gas flow rate through said venturi means.

4,715,856

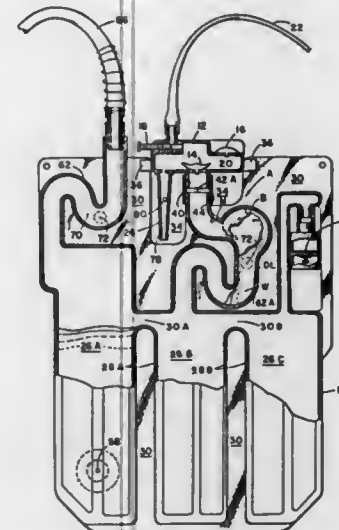
AIR LEAK DETECTION SYSTEM FOR CHEST FLUID COLLECTION BOTTLES AND BLOW-OUT PREVENTION BAFFLE THEREFOR

Donald P. Elliott, Denver, and William L. Halseth, Parker, both of Colo., assignors to C. R. Bard, Inc., Murray Hill, N.J. Continuation of Ser. No. 381,161, May 24, 1982, Pat. No. 4,544,370. This application Aug. 13, 1985, Ser. No. 765,315

Int. Cl.⁴ A61M 1/00

U.S. Cl. 604—321

5 Claims



1. An apparatus for draining a patient's chest cavity comprising a body including a closed collection chamber having an inlet at the upper end thereof for connection to a patient drainage tube permitting chest cavity fluid and air to drain directly through said inlet to provide direct unobstructed flow of air and fluid into said collection chamber, an air space above the collection chamber, an outlet from the collection chamber in communication with the air space, said body further including a combination negative pressure indicator and air leak detector assembly in turn including a reservoir positioned downstream of said collection chamber and having a liquid trap portion for receipt of an indicator fluid, said reservoir connected to said collection chamber by an upright column positioned intermediate said collection chamber and said reservoir and in turn connected to said outlet at the upper end thereof and to said liquid trap portion at the lower end thereof, and one-way valve seal downstream of the negative pressure indicator and air leak detector assembly acting as a seal to prevent air from entering back into the air leak detector but permitting air from the air leak detector to flow out the valve seal.

4,715,857

WOUND DRESSINGS

Laszlo Juhasz, London, and Angus I. McLeod, Bucks, both of England, assignors to Charcoal Cloth Ltd., Berkshire, England

PCT No. PCT/GB86/00217, § 371 Date Nov. 12, 1986, § 102(e) Date Nov. 12, 1986, PCT Pub. No. WO86/05970, PCT Pub. Date Oct. 23, 1986

PCT Filed Apr. 18, 1986, Ser. No. 882,915

Claims priority, application United Kingdom, Apr. 18, 1985, 8509977

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—359

18 Claims



1. An anti-bacterial wound dressing comprising:
- a first layer of permeable material,
- a layer of semi-permeable adhesive material,
- a layer of charcoal fabric,
- a second layer of permeable material,
- said first and second permeable layers and said semi-permeable layer being coextensive and surrounding said charcoal fabric, said first permeable layer being bound to said charcoal fabric layer and to said second permeable layer adjacent the periphery of said charcoal fabric layer.

4,715,858

EPICORNEAL LENS

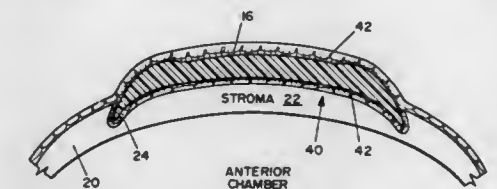
Richard L. Lindstrom, 1065 W. Ferndale Rd., Wayzata, Minn. 55391

Filed Jul. 25, 1986, Ser. No. 889,174

Int. Cl.⁴ A61F 2/14

U.S. Cl. 623—5

13 Claims



10. Epicorneal lens comprising:
- a. lens optic means having upper and lower surfaces for implant in an eye between a stroma and epithelium of the eye;
- b. said lens optic means of a synthetic biocompatible material; and,
- c. a basement membrane material completely coating at least one of said surfaces of said lens optic means with a material for enhancing epithelium growth.

4,715,859

HIP CUP FOR A HIP JOINT ACETABULAR PROSTHESIS

Klaus-Dieter Schelhas, Bremen, and Gerd Blehl, Cologne, both of Fed. Rep. of Germany, assignors to Orthoplast Endoprothetik GmbH, Bremen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 937,877

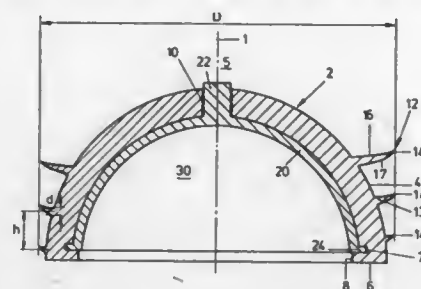
Int. Cl.⁴ A61F 2/34

U.S. Cl. 623—22

10 Claims

1. Hip joint acetabular prosthesis cup comprising an outer cup having a truncated cone external form having a crown at one end and an annular cup edge at the other end, with an inner cup capable of being inserted to the outer cup, and with a self-cutting thread running about externally on the outer shell

for cementless anchoring of the cup in the bony tissue, and wherein the external diameter (D) of the thread is approximately constant over the entire cup and wherein the thread has a decreasing depth as it approaches said annular cup edge.



4,715,860

POROUS ACETABULAR HIP RESURFACING

Harlan C. Amstutz, Pacific Palisades, and J. Michael Kabo, Los Angeles, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 23, 1985, Ser. No. 768,871

Int. Cl.⁴ A61F 2/34

U.S. Cl. 623-22

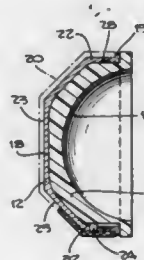
17 Claims

1. An acetabular component for an artificial hip joint comprising:

a continuous metal cup having a rim, said cup having a diameter of between about four and seven centimeters, said cup having an outer coating of a porous metallic material having an affinity for bone ingrowth, the outer periphery of said cup extending from the rim thereof having a right cylindrical configuration extending from the rim thereof having a right cylindrical configuration

extending for at least one-half centimeter away from the rim thereof;

a hollow plastic insert including means for firmly securing said insert into said metal cup after said cup is in place in the patient, said plastic insert having a central opening having a substantially spherical surface for receiving the ball of the femoral component of the artificial hip joint; said cylindrical surface of said cup extending for the greater portion of the periphery of said cup, said cylindrical surface extending for in the order of one-half or less of the total depth of said prostheses, and then being directed



inwardly toward the bottom of said plastic insert and generally following the configuration of said spherical surface to minimize the necessary bone removal and to avoid penetration of the acetabulum; and

said cup being free of outwardly directed elements which might otherwise interfere with full press-fit seating of said cup;

whereby a force fit of the right cylindrical surface of the acetabular component encourages early bone growth into the porous outer coating thereof, and increased permanency of the artificial joint.

CHEMICAL

4,715,861

ECONOMY CHROME TANNING PROCESS WITH ALDEHYDE-ACIDS AND KETO-ACIDS

Werner Lotz, Niederrhausen; Karlheinz Fuchs, Hünfelden, and Siegmund Haller, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,100

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516842

Int. Cl.⁴ C14C 1/00

U.S. Cl. 8-94.18

5 Claims

1. An economy chrome tanning process, which comprises pretreating the pelts before tanning with 0.1 to 2% of an aldehyde-acid or keto-acid and subsequently tanning the pretreated pelts.

4,715,862

WASH CYCLE FABRIC CONDITIONING COMPOSITION, PROCESS FOR MANUFACTURE OF SUCH COMPOSITION, AND METHOD OF USE THEREOF

Robert J. Steltenkamp, Somerset, and Michael A. Camara, Jackson, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 716,871, Mar. 27, 1985, Pat. No. 4,682,982. This application Dec. 8, 1986, Ser. No. 939,653

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.⁴ D06M 13/40

U.S. Cl. 8-137

12 Claims

1. A wash cycle fabric conditioning composition which comprises an antistatic proportion, sufficient to impart antistatic characteristics to laundry during washing when the fabric conditioning composition is charged to wash water during the wash cycle at a concentration of 0.2 to 2 g./l., of antistatic N-higher alkyl neoalkanamide or antistatic N-higher alkenyl neoalkanamide or a mixture thereof, wherein the higher alkyl or higher alkenyl is of a number of carbon atoms in the range of 8 to 20 and the neoalkanoic acid moiety is of 5 to 16 carbon atoms, and a particulate carrier or liquid medium for the amide which is a builder or filler suitable for building a detergent or filling it, or is an aqueous medium containing a nonionic surface active agent.

4,715,863

PROCESS FOR DYEING HYDROPHOBIC FIBRE MATERIAL FROM AQUEOUS BATH CONTAINING UNTREATED DISPERSE DYE AND TO ADJUST THE EXHAUSTED DYE BATH FOR FURTHER USE

Josef Navratil, Basel, and Heinz Abel, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 9, 1986, Ser. No. 861,676

Claims priority, application Switzerland, May 14, 1985, 2049/85

Int. Cl.⁴ D06P 3/54, 5/20

U.S. Cl. 8-440

23 Claims

1. A process for dyeing hydrophobic fibre material with unformulated disperse dyes from an aqueous liquor containing a solubilizingly or dispersingly effective amount of surfactant or surfactant mixture having a hydrotropic action on disperse dyes, which process comprises dissolving one or more such dyes in water at a temperature of 50° to 150° C. by means of said surfactant or surfactant mixture, bringing the dye solution together with the substrate in a dyeing apparatus, then heating the dyeing liquor to the dyeing temperature, completing the dyeing at that temperature, then removing the substrate, restoring the exhausted dyeing liquor to the composition required for the next dyeing by adding water and surfactant in amounts corresponding to the amounts used in the previous dyeing and the same or different dye, and dyeing further substrate.

4,715,864

LIGNOSULFONATE SALTS FOR USE AS DYESTUFF ADDITIVES

Peter Dilling, Isle of Palms, and Susan L. Schlegel, Goose Creek, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed May 5, 1986, Ser. No. 859,384

Int. Cl.⁴ C09B 67/00

U.S. Cl. 8-557

17 Claims

1. A method of producing a sulfonated lignin salt for use as a dispersant in azo dyestuff-containing dye systems comprising the step of modifying a sulfonated lignin salt by addition of an amine compound having a pKa value lower than the pKa value of the cation component of the sulfonated lignin salt, and combining the amine compound and sulfonated lignin salt to produce an ion exchange reaction and equilibrium therebetween.

11. A dyestuff composition containing an azo dyestuff and as a dispersant therein the ion-exchange reaction product of a sulfonated lignin salt having a relatively high pKa value and an amine compound having a pKa value lower than the pKa value of the cation component of the sulfonated lignin salt.

4,715,865

METHOD FOR CONTROLLING VISCOSITY OF ORGANIC LIQUIDS AND COMPOSITIONS

Kissho Kitano, Ohi, Japan; Ilan Duvdevani, Leonia, and Donald N. Schulz, Annandale, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

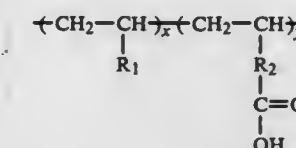
Continuation-in-part of Ser. No. 625,974, Jun. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 565,106, Dec. 23, 1983, abandoned. This application Dec. 9, 1985, Ser. No. 806,416

Int. Cl.⁴ C10L 7/00

U.S. Cl. 44-7.3

5 Claims

1. A method of viscosifying an organic liquid from about 10 to about 10,000 cps for polymer concentrations of less than about 1.0 wt. % which method comprises adding a sufficient quantity of an ester containing copolymer of an alpha-olefin and a vinyl alkylencarboxylic acid copolymerized in the presence of a Ziegler-Natta catalyst having an acid content of from about 0.01 to 10 mole percent and a molecular weight of about 100,000 to about 10,000,000, wherein said copolymer of said alpha-olefin and said vinyl alkyl-enecarboxylic acid has the formula:



wherein R₁ is an alkyl group having 6 carbon atoms, R₂ is an alkylene group having 17 carbon atoms, x is about 95.0 to about 99.95 mole % and y is about 0.05 to about 5.0 mole %.

4,715,866

DERIVATIVES OF POLYETHER GLYCOL ESTERS OF POLYCARBOXYLIC ACIDS AS RHEOLOGICAL ADDITIVES FOR COAL-WATER SLURRIES

Donald D. Staker, and William S. Kain, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 819,088, Jan. 15, 1986, abandoned. This application Apr. 30, 1987, Ser. No. 45,728

Int. Cl.⁴ C10L 1/32

U.S. Cl. 44-51

32 Claims

1. A coal-water slurry comprising coal, water and a rheological additive comprising the reaction product of a polycarboxylic organic acid having from about 16 to about 60 carbon atoms and from 2 up to 4 carboxyl groups, said polycarboxylic

organic acid selected from the group consisting of dimer acids, trimer acids, adducts of unsaturated monocarboxylic acids or dimer acids with maleic anhydride in a molar ratio of about 1:1, adducts of linoleic acid or similar unsaturated monocarboxylic acids with acrylic-type acids in a molar ratio of about 1:1 and adducts of olefins having from about 12 to about 40 carbon atoms with maleic acid or maleic anhydride in a molar ratio of about 1:1; with (a) a polyether glycol having recurring oxalkylene groups containing up to 4 carbon atoms and a molecular weight of from about 1,000 to about 20,000; and (b) an organic hydroxylic compound having a molecular weight of less than, 1,000 and containing one hydroxyl group; said molar ratio of (a) said polyether glycol to (b) said organic hydroxylic compound ranging from about 4:1 to about 1:4; said polycarboxylic acid having at least 55% up to essentially 100% of the available carboxylic groups reacted.

4,715,867

AUXILIARY BED PRESSURE SWING ADSORPTION MOLECULAR SIEVE

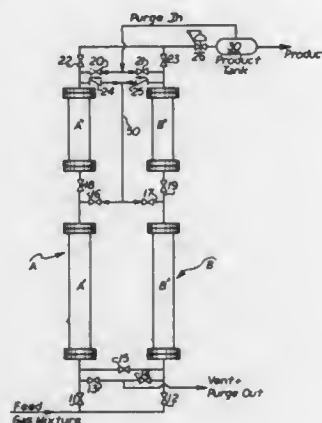
Toan P. Vo, Pittsburgh, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1986, Ser. No. 848,309

Int. Cl.⁴ B01D 53/04

U.S. Cl. 55—26

14 Claims



1. A process for producing an enriched gas stream substantially continuously in a system consisting of at least first and second adsorption zones each of which comprises a primary column and an auxiliary column connected in series and contains an adsorbent capable of selective adsorbing at least one component of a gaseous mixture; said process comprising the complementary steps of

- serially passing co-currently said gaseous mixture containing the gas to be enriched through a first adsorption zone having a primary adsorption column and an auxiliary adsorption column connected in series at an adsorption pressure of from about 1.01 to 200 bars to produce an enriched gas stream;
- discontinuing the flow of gaseous mixture prior to breakthrough from said first adsorption zone and immediately thereafter equalizing the pressure in said first adsorption zone with the pressure in the primary column of said second adsorption zone by substantially simultaneously
 - equalizing the auxiliary column of said first adsorption zone from its outlet to the outlet of the primary column of said second adsorption zone, and simultaneously equalizing from the inlet of the primary column of the first adsorption zone to the inlet of the primary column of the second adsorption zone; and
 - pressurizing the auxiliary column of the second adsorption zone substantially to the same pressure of the primary column of said second adsorption zone with said enriched gas;

- venting the first adsorption zone counter-currently to atmospheric pressure;
 - regenerating said first adsorption zone in the direction opposite to that of the gaseous mixture in step (a);
 - pressurizing the second adsorption zone with said gaseous mixture to the adsorption pressure and producing enriched product gas from the outlet of said second adsorption zone while continuing said venting and regeneration in said first adsorption zone;
 - discontinuing the flow of gaseous mixture prior to breakthrough from the second adsorption zone and immediately thereafter equalizing the pressure in said second adsorption zone with the pressure in the primary column of said first adsorption zone by substantially simultaneously
 - equalizing the auxiliary column of said second adsorption zone between said outlet of said column and said outlet of the primary column of said first adsorption zone, and simultaneously equalizing from the inlet of the primary column of the second adsorption zone to the inlet of said primary column of the first adsorption zone; and
 - pressurizing said auxiliary column of said first adsorption zone substantially to the same pressure of the primary column of said first adsorption zone with said enriched gas;
 - venting said second adsorption zone counter-currently to atmospheric pressure;
 - regenerating said second adsorption zone in the direction opposite to that of the gaseous mixture in step (e);
 - while continuing the venting and regeneration in the second adsorption zone pressurizing the first adsorption zone with said gaseous mixture to the adsorption pressure; and
 - repeating the sequence of steps (a) through (i).
11. An auxiliary bed pressure swing gas adsorption means comprising:
- at least first and second adsorption means consisting of
 - a primary adsorption column having a sorbent bed and inlet and outlet means; and
 - an associated auxiliary adsorption column in series with said primary adsorption column, said auxiliary column having a sorbent bed and controllable inlet and outlet means;
 - means for selectively controlling feed gas to be separated installed at said primary column inlets;
 - gas storage means for storing separated product gas selectively connected to said auxiliary column outlets and having first and second outlet means;
 - first gas transfer means selectively connected to said outlets of said auxiliary column and one of said storage means outlets;
 - second gas transfer means selectively connected to said outlets of said auxiliary columns and adapted for connection with said outlet of a primary column, said second gas transfer means including equalization means for equalizing said auxiliary column of said first adsorption means from its outlet to said outlet of said primary column of said second adsorption means simultaneously with equalizing the inlets of the primary columns of said first and second means;
 - means for pressurizing the auxiliary column of said second adsorption means substantially simultaneously to the same pressure as the primary column of said second adsorption zone with said gas from storage means;
 - means for equalizing the auxiliary column of said second adsorption means and the outlet of said primary column of said first adsorption means simultaneously with equalizing the inlet of said primary column of said second adsorption means to the inlet of said primary column of said first adsorption means;
 - means for pressurizing said auxiliary column of said first adsorption means substantially simultaneously to the pres-

sure of said primary column of said first adsorption means; and
(i) means for selectively venting said first and second adsorption means.

4,715,868

VAPOR RECOVERY SYSTEM

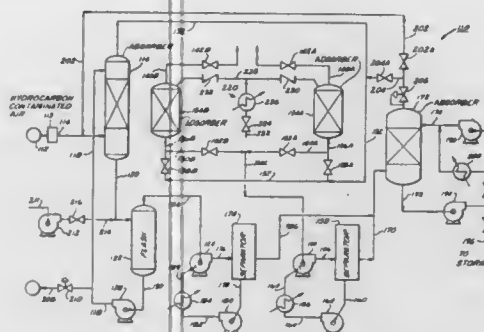
Paul E. Kennedy, Tulsa, Okla., assignor to McGill Incorporated, Tulsa, Okla.

Continuation-in-part of Ser. No. 751,329, Jul. 1, 1985, Pat. No. 4,670,028. This application Sep. 22, 1986, Ser. No. 909,969

Int. Cl.⁴ B01D 53/14

U.S. Cl. 55—48

23 Claims



1. In a process in which hydrocarbon components are removed from an inlet air-hydrocarbon mixture by passing the inlet air-hydrocarbon mixture through solid adsorbent beds capable of selectively adsorbing hydrocarbon components from the inlet air-hydrocarbon mixture, and in which the adsorbent beds are vacuum regenerated to produce a rich air-hydrocarbon mixture which is passed to an absorber in which a substantial portion of the hydrocarbon components are absorbed from the rich air-hydrocarbon mixture by a liquid hydrocarbon absorbent to produce an absorber overhead gas containing nonabsorbed hydrocarbon components, the improvement comprising:

- passing the inlet air-hydrocarbon mixture through a first absorber vessel to produce an absorber overhead gas stream and an absorber bottom liquid stream;
- passing the absorber bottom liquid stream to a flash vessel to flash the absorber bottom liquid stream to produce an overhead flash vapor stream and a flashed liquid stream having an affinity to absorb hydrocarbons from the inlet air-hydrocarbon mixture;
- passing the flashed liquid stream from the flash vessel to the absorber vessel such that the inlet air-hydrocarbon stream is directed through the absorber vessel in direct countercurrent contact with the flashed liquid stream;
- passing the overhead flash vapor stream from the flash vessel to another absorber vessel such that the overhead flash vapor stream is directed through the other absorber vessel in direct countercurrent contact with a liquid absorbent stream to produce another absorber overhead stream and another absorber bottom liquid stream; and
- passing the combined absorber overhead gas streams from the absorbers to a selected one of the solid adsorbent beds for adsorbing substantially all of the hydrocarbon components in the absorber overhead gas stream.

4,715,869

DEGASSING OF LIQUIDS

Colin Ramshaw, Warrington, England, assignor to Imperial Chemical Industries PLC, London, United Kingdom

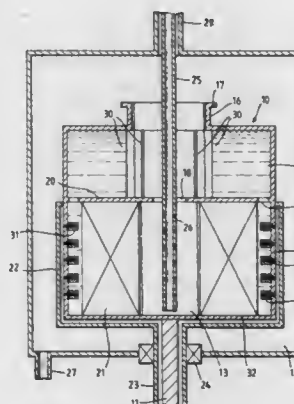
Filed Mar. 24, 1986, Ser. No. 843,371

Claims priority, application United Kingdom, Apr. 3, 1985, 8508690

Int. Cl.⁴ B01D 19/00

U.S. Cl. 55—53

15 Claims



1. A process for the removal of a gas from a liquid in which it is sparingly soluble which comprises:

providing a rotor which includes a first annular chamber and a second superposed annular chamber, both having radially inner and outer regions, the first chamber including a permeable element having radially inner and outer regions;

feeding liquid to be processed into the radially inner region of said first chamber and rotating said rotor so that the liquid in said first chamber is subjected to an acceleration, expressed in a radial direction with respect to the axis of rotation, which is greater than the acceleration due to gravity whereby the liquid flows outwardly from the inner region of said element through the pores of said element to the outer region thereof;

feeding a displacing gas from the radially outer region of said element through the element while preventing liquid from leaving the radially outer region so that the displacing gas and liquid are in counter-current contact in the pores of said permeable element whereby gas in the liquid is removed by said displacing gas;

maintaining the liquid as the continuous phase and bubbles of the displacing gas in the dispersed phase;

collecting the liquid as it is discharged from the radially outer region of the permeable element;

passing the thus processed liquid into the second chamber through port means communicating between the radially outer regions of said first and second chambers;

discharging the liquid from said second chamber at a radially inner region thereof; and

collecting the displacing gas and the removed gas inwardly from treated liquid.

4,715,870

ELECTROSTATIC FILTER DUST COLLECTOR

Senichi Masuda, No. 415, 2-1 Nishigahara 3-chome, Kita-ku, Tokyo 114, and Naoki Sugita, Kawaguchi, both of Japan, assignors to Senichi Masuda, Tokyo, Japan

Continuation of Ser. No. 700,113, Feb. 11, 1985, abandoned.

This application Oct. 6, 1986, Ser. No. 915,929

Claims priority, application Japan, Feb. 18, 1984, 59-29993

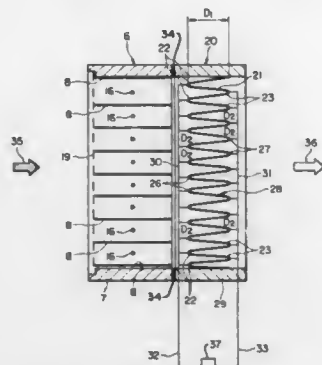
Int. Cl.⁴ B03C 3/12, 3/45

U.S. Cl. 55—132

1 Claim

1. An electrostatic filter dust collector having a charging section through which a dust-containing gas is passed to sub-

ject the floating dust particles therein to preliminary electric charging, and a dust-containing section provided with an insulating filter member which is used to collect under the actions of an electric field the charged particles in the dust containing air passed through said charging section, characterized in that: said charging section and said collecting section are independently framed and the charging section frame and the collecting section frame are joined together by packing; said insulating filter member is folded so as to form ridges at the upstream and downstream sides thereof alternatively, the distance between said upstream ridges and said downstream ridges being not more than 100 mm; a plurality of discrete insulating spacers bonded to said filter member at a respective plurality of predetermined, spaced apart levels inside the frame for retaining a distance of not more than 5 mm between the surfaces of the adjacent folded parts of said filter member, each of said spacers



extending transversely to the ridges on the upstream and the downstream sides of said filter member and including portions covering said ridges; said ridges and the portions of the spacers which cover said ridges being coated with a conductive material to form a distinct, continuous electrode spanning each ridge; a first electrical conducting bar extending transversely in contact with an end portion of each of said electrodes on said upstream ridges and a second electrical conducting bar extending transversely in contact with an end portion of each of said electrodes on said downstream ridges; means for applying one of either an AC or DC high voltage between said first and second conducting bars, whereby the voltage of each upstream and downstream electrode is established only by said contact with the first and second bars, respectively.

4,715,871

DEHUMIDIFIER FOR A COMPRESSED GAS

Eiichi Uratani, No. 1-9 Mukojima 3-chome, Sumida-ku, Tokyo, Japan

Continuation of Ser. No. 910,260, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 719,212, Apr. 2, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 40,752 Claims priority, application Japan, Jul. 26, 1984, 59-156403 Int. Cl.⁴ B01D 46/12

U.S. Cl. 55-222

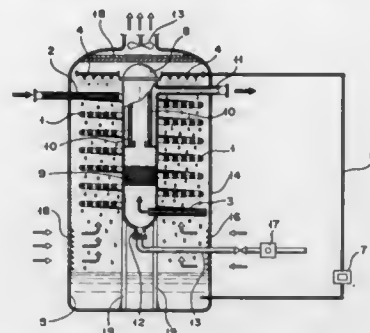
5 Claims

1. A dehumidifier for a compressed gas, said dehumidifier comprising:

- a coiled heat exchanger pipe, said pipe having a plurality of substantially parallel spiral windings, said coiled pipe being substantially horizontal and comprising a plurality of uppermost coils and a plurality of lowermost coils;
- a sprinkler positioned above the uppermost coils of said pipe, said sprinkler comprising means for sprinkling water over said heat exchanger pipe;
- a sump positioned below the lowermost coils of said pipe,

said sump comprising means for receiving said sprinkled water;

- a water supply pipe for conducting said sprinkled water from said sump to said sprinkler;
- a housing, wherein said coiled pipe, said sprinkler and said sump are all positioned within said housing, and wherein said water supply pipe is positioned substantially exteriorly of said housing;
- a plurality of air-intake openings positioned along a wall of said housing, said air-intake openings being positioned below the lowermost coils of said pipe and above said sump;
- a forced air exhaust system comprising means for forcing air within said housing upwardly past said coiled pipe, said forced air exhaust system including a rotating fan positioned in an upper portion of said housing;



- a gas-liquid separator comprising means for removing moisture, oil and other floating material from compressed gas being conducted through the interior of said coiled pipe, said separator being located within the pipe winding having the smallest diameter;
- a compressed gas inlet tube for introducing gas from the exterior of said housing to said coiled pipe, the inlet tube being positioned along an upper portion of said housing; and
- an outlet pipe connected to an upper portion of said gas-liquid separator for conducting compressed gas from said separator to the exterior of said housing, wherein said gas-liquid separator includes a demister and at least one liquid removing element, wherein said demister is located within said separator and above an outlet header through which cooled gas enters said separator, said liquid removing element being positioned above said demister within said separator.

4,715,872

PORTABLE DUST COLLECTOR

Steven A. Snyder, Spring Valley, Ohio, assignor to Shopsmith, Inc., Dayton, Ohio

Filed Sep. 19, 1986, Ser. No. 909,739

Int. Cl.⁴ B01D 46/02

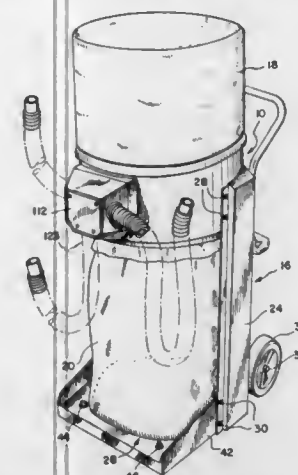
U.S. Cl. 55-315

22 Claims

1. A portable dust collector comprising:

- a housing having an outer side wall, a substantially open top, a substantially open bottom, and a dustproof chamber within an interior thereof;
- a motor enclosed within said chamber;
- blower means driven by said motor for drawing air into said housing, said blower means being enclosed with said interior and having an inlet extending through said housing and communicating with an exterior thereof, and an outlet discharging within said housing;
- said chamber and blower means being shaped to form a passageway within said chamber between said open top and bottom;
- filter bag means attached to and enclosing said top for retain-

ing particulates discharged into said interior by said blower while allowing air to pass therethrough; collection bag means attached to and enclosing said bottom for collecting particulates retained in said interior of said housing, whereby particulate-laden discharged from said



outlet circulates in the vicinity of said collection bag means and flows through said passageway to said filter bag means; and support means attached to and extending downwardly from said housing side wall for providing clearance below said housing sufficient for said collection bag.

4,715,873

LIQUEFIED GASES USING AN AIR RECYCLE LIQUEFIER

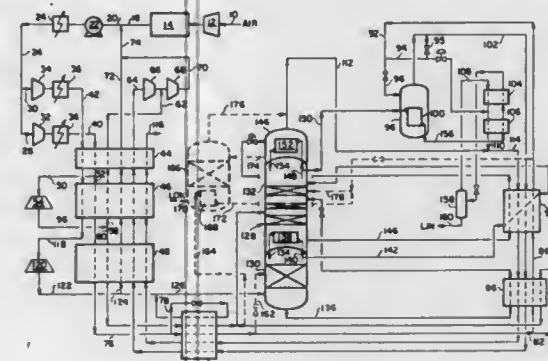
Steven R. Auvil, Macungie, and Rakesh Agrawal, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 24, 1986, Ser. No. 855,859

Int. Cl.⁴ F25J 5/00

U.S. Cl. 62-13

26 Claims



5. A process for the cryogenic distillative separation of air to produce at least a liquid nitrogen product, comprising the steps of:

- compressing feed air to an elevated pressure and removing water, carbon dioxide and condensibles from the feed air;
- splitting the feed air into a first split feed stream and a second split feed stream;
- cooling each split feed stream to a lower temperature by indirect heat exchange against process streams;
- expanding a first portion of the first split feed stream through a warm expander and recycling at least a first part

- of the expanded stream to the feed air while providing refrigeration to the feed air by indirect heat exchange;
- expanding the second split feed stream through a cold expander and using at least a first portion of the expanded stream for a distillation step;
- recycling a second portion of the expanded second split stream to the feed air while providing refrigeration to the feed air by indirect heat exchange;
- removing an oxygen-enriched stream from the base of the distillation column;
- removing a gaseous nitrogen stream from the distillation column and condensing a first portion of the gaseous nitrogen stream against a process stream;
- condensing a second portion of the gaseous nitrogen stream from the distillation column against at least a part of the second portion of the first split stream by indirect heat exchange to produce a liquid nitrogen product, and
- recycling at least a part of the second portion of the first split stream to the feed air.

4,715,874

RETROFITTABLE ARGON RECOVERY IMPROVEMENT TO AIR SEPARATION

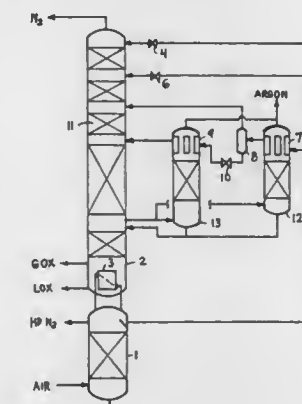
Donald C. Erickson, 1704 S. Harbor Ln., Annapolis, Md. 21401

Filed Sep. 8, 1986, Ser. No. 904,901

Int. Cl.⁴ F25J 3/04

U.S. Cl. 62-22

20 Claims



1. A process for distilling air to produce argon and oxygen of at least 98% purity comprising:

- rectifying at least part of the pressurized supply air to kettle liquid and liquid N₂;
- partially evaporating at least part of the kettle liquid at reduced pressure by exchanging latent heat with crude argon vapor;
- separately at least partially evaporating at least part of the liquid remnant from said first partial evaporation step by exchanging latent heat with crude argon vapor;
- separately feeding two vapor streams produced from steps (b) and (c) to separate heights of a nitrogen removing distillation column; and
- rectifying an oxygen-argon mixture from said distillation column to produce quality crude argon by refluxing said rectification step with both of the liquid crude argon streams produced by steps (b) and (c).

4,715,875

MANUFACTURE OF OPTICAL FIBRE PREFORMS

Amnon Jacobson, Tel-Aviv, Israel, assignor to Ispra Fibroptics Industries Herzlia Ltd., Israel
Division of Ser. No. 670,169, Nov. 13, 1984, Pat. No. 4,597,787.
This application Mar. 26, 1986, Ser. No. 844,131
The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.⁴ C03B 37/023

U.S. Cl. 65—3.11

18 Claims



1. A process for the production of a glass preform useful for drawing optical fibres, which comprises:

filling the inside of a glass tube with vapors of silicon or a metal which under specific pressure and temperature conditions has a liquid phase which does not react with said glass tube, the oxide of said silicon or metal having light guiding properties, said vapors in said tube being under pressure and temperature conditions such that said tube is not substantially deformed,

subjecting said tube containing said vapors to cooling under temperature and pressure conditions such that the vapors under temperature and pressure conditions such that the vapors liquefy and coat the inside of said glass tube without reacting chemically therewith, thereby forming a coating on the inner walls of said tube with said silicon or metal in liquid condition, and

passing oxygen through the liquid silicon or metal-coated glass tube under temperature and pressure conditions such that said silicon or metal is oxidized, whereby the inner walls of said glass tube become uniformly coated with the formed silicon or metal oxide.

4,715,876

METHOD OF AND APPARATUS FOR COUPLING MULTICORE COATED OPTICAL FIBERS

Keiji Osaka, Yuichi Usui, and Tooru Yanagi, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 26, 1986, Ser. No. 878,777

Claims priority, application Japan, Jun. 28, 1985, 60-142770
Int. Cl.⁴ C03B 37/16, 37/023; G02B 6/38

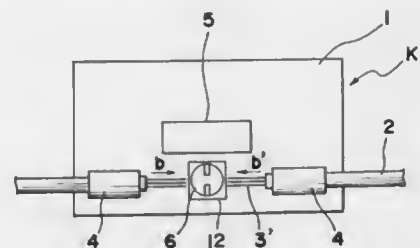
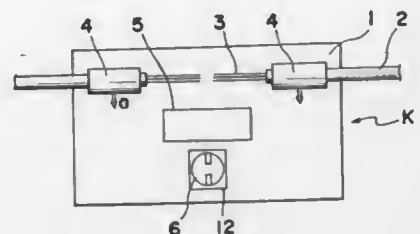
U.S. Cl. 65—4.21

12 Claims

1. A method of coupling a first end of a first multi-core coated optical fiber and a second end of a second multi-core coated optical fiber, with the first and second multi-core coated optical fibers each having multiple optical fibers integrally covered with a reinforcement coating, said method comprising:

clamping the coated portions of the first and second multi-core coated optical fibers in first and second clamp members, respectively, said clamp members being movable with said fibers to keep said first and second fibers aligned; removing the reinforcement coating from the first end of the first multi-core coated optical fiber; removing the reinforcement coating from the second end of the second multi-core coated optical fiber; cutting off the first and second exposed fiber ends such that the optical fibers of the first multi-core coated optical fiber and the optical fibers of the second multi-core coated optical fiber have first cut end faces at the first exposed fiber ends and second cut end faces at the second exposed fiber ends, respectively; and coupling the first and second cut end faces;

the cutting step and the coupling step being performed without detaching the first and second multi-core coated



optical fibers from the first and second clamp members, respectively

4,715,877

APPARATUSES IN THE MANUFACTURE OF MINERAL WOOL

Tapio Moisala, Pargas, and Jukka Gustafsson, Espoo, both of Finland, assignors to AGA Aktiebolag, Lidings, Sweden and Oy Partek AB, Pargas, Finland

Filed Sep. 2, 1986, Ser. No. 902,557

Claims priority, application Sweden, Sep. 2, 1985, 8504074
Int. Cl.⁴ C03B 37/05

U.S. Cl. 65—15

1 Claim

1. An apparatus for use in a mineral wool manufacturing comprising:

a furnace having an output for supply of coke and mineral material to be melted;
a first tapping spout housing an input section for receiving said molten material and a discharge section for discharging said material to an input section of a second tapping spout;
a spinning machine for receiving a tapping jet from said second spout discharge section; and
at least one oxy-fuel burner located at said discharge section of said second spout for heating with said burner's flame, said discharge section and first portion of said jet, the impulse size of said flame being predetermined to maintain unaffected the configuration and position of said tapping jet.

4,715,878

PROCESS FOR PRODUCING FINELY DIVIDED SPHERICAL GLASS POWDERS

Nelson E. Kopatz, and Lori S. Pruyne, both of Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 12, 1987, Ser. No. 24,952

Int. Cl.⁴ C03B 19/10; C03C 25/02

U.S. Cl. 65—21.1

7 Claims

1. A process comprising:

(a) forming a coating of a surface active agent selected from the group consisting of nonionic surface active agents and anionic surface active agents on the surfaces of the particles of a glass powder, the average particle size of said particles being less than about 25 micrometers in diameter; and
(b) feeding the resulting coated particles and a carrier gas

into a high temperature zone and maintaining said particles in said zone for a sufficient time to melt at least about 50% by weight of said particles, and to form droplets therefrom; and

(c) cooling said droplets to form glass particles having essentially a spherical shape with the majority of said glass particles having a size which is essentially the same as the size of the starting glass powder particles.

4,715,879

METHOD FOR THE MANUFACTURE OF A TEMPERED AND/OR CURVED GLASS PANE WITH REDUCED TRANSMISSION

Franz-Josef Schmitte, Rudolfstr. 1; Dieter Müller, Auf der Reihe 3, both of D-4650 Gelsenkirchen, and Rolf Groth, Holzstr. 218, D-4630 Bochum 6, all of Fed. Rep. of Germany
Filed Nov. 5, 1986, Ser. No. 927,174

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1985, 3539130; Nov. 28, 1985, 3542036; Dec. 18, 1985, 3544840
Int. Cl.⁴ C03C 17/00

U.S. Cl. 65—60.2

12 Claims



1. Method for the manufacture of a prestressed and/or curved glass pane of soda-lime-silica glass having reduced transmission in a prescribable spectral range (in prescribable spectral ranges), in particular a sunshade pane, whereby at least one metal layer having a majority content of a metal or of a metal alloy from the elements having the atomic numbers 22 through 28 of the periodic table is applied to at least one side of a glass carrier and a protective layer of at least one metal oxide or mixed metal oxide is applied to that side thereof facing away from the glass carrier, and whereby a thermal prestressing and/or bending process is carried out in air at a temperature of 580° C. through 680° C., preferably 600° C. through 650° C., characterized in that both the metal layer as well as the protective layer are applied to the essentially planar glass carrier before the thermal prestressing and/or bending process; and in that the protective layer is applied with an oxygen deficit x , referred to a metal atom of the metal oxide or, respectively, metal oxides, of $0.05 \leq x \leq 0.4$ and in a thickness from 10 nm through 100 nm, being applied in such a composition that no noteworthy oxygen diffusion into the metal layer occurs during the prestressing and/or bending process.

4,715,880

TAKE OUT MECHANISM FOR GLASSWARE FORMING MACHINES

Miguel Humberto-Calderon-Quintero, San Nicolas de los Garza, Mexico, assignor to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Dec. 11, 1985, Ser. No. 808,355

Claims priority, application Mexico, Dec. 14, 1984, 203757

Int. Cl.⁴ C03B 9/40

U.S. Cl. 65—260

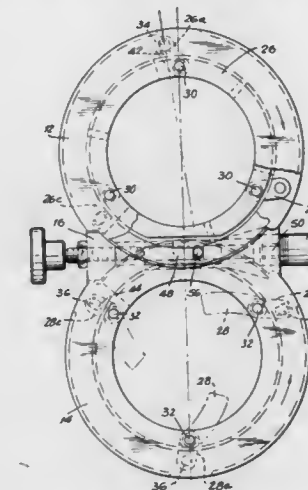
4 Claims

1. A take-out mechanism of particular utility in a glassware forming machine, comprising:

a ring-shaped member having an inner periphery of sufficient diameter to accommodate a formed glassware article; means supporting said ring-shaped member in axially fixed relationship to said formed article; gripping fingers pivotally mounted in horizontal position on said ring-shaped member and moveable between a retracted position in which they are positioned outwardly of

said inner periphery of said ring-shaped member, and a gripping position in which they extend radially inwardly of said inner periphery of said ring-shaped member and into gripping relationship with a said article;

a crown ring rotatable on said ring-shaped member for moving said gripping fingers between said retracted and extended positions, said crown ring having surfaces coop-



erating with pins carried by the respective said gripping members; and, an actuator connected to said crown ring and operative to rotate said crown ring through a determined angle to adjust the position of said gripping fingers radially inwardly and radially outwardly of the inner periphery of said ring-shaped member.

4,715,881

CONTROL OF EASTERN BLACK NIGHTSHADE WITH A FUNGAL PATHOGEN

Robert N. Andersen, St. Paul, Minn., and Harrell L. Walker, Ruston, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 29, 1985, Ser. No. 738,707

Int. Cl.⁴ C12N 1/14; C12R 1/645; A01N 63/00; A01H 1/00
U.S. Cl. 71—79

10 Claims

1. A method for controlling plants of the genus Solanum comprising inoculating a susceptible plant of the genus Solanum with an effective amount of a strain of the fungus *Colletotrichum coccoides* having all the identifying characteristics of NRRL 15547.

4,715,882

SUBSTITUTED PHENOXYPROPIONALDEHYDE DERIVATES AND THEIR USE AS HERBICIDAL AGENTS

Muppala S. Raju, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 797,310, Nov. 12, 1986, Pat. No. 4,661,149.

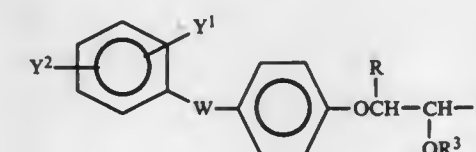
This application Oct. 15, 1986, Ser. No. 918,955

Int. Cl.⁴ C07C 69/612, 43/205; A01N 57/06, 31/04, 37/34, 37/10

U.S. Cl. 71—86

4 Claims

1. A compound of the Formula:



wherein

Y^1 and Y^2 are independently hydrogen, halogen, nitro, cyano, or lower alkyl, haloalkyl or alkoxy;

W is oxygen or sulfur;

R is hydrogen or lower alkyl or alkoxy;

R^1 is cyano, vinyl, acetynyl, lower dialkylphosphinyl or dialkylphosphonyl;

R^3 is hydrogen, or up to C_{10} alkyl, cycloalkyl, haloalkyl, hydroxyalkyl, oxoalkyl, alkoxyalkyl, alkenyl, alkynyl or $-COR^6$ or $-CSR^6$ wherein R^6 is up to C_{10} alkyl, cycloalkyl, haloalkyl, alkoxy, alkenyl, alkynyl, amino, $-COOR^7$ or $-COSR^7$ wherein R^7 is hydrogen, alkali metal, up to C_{10} alkyl, cycloalkyl, haloalkyl, alkenyl or alkynyl.

3. A herbicidal composition containing an agronomically acceptable carrier and a herbicidally effective amount of a compound or mixture of compounds defined in claim 1.

4,715,883

THIAZOLYL-GLYOXYLONITRILE-2-OXIME ETHER DERIVATIVES FOR PROTECTING PLANT CROPS

Alfons Lukaszczyk, Basel; Henry Martin, Allschwil; Peter J. Diel, Muttentz; Werner Föry; Karl Götzl, both of Basel; Hans Kristinsson, Bottmingen; Beat Müller, Reinach; René Muntwyler, Hofstetten; Johannes P. Pachlatko, Rheinfelden; Hermann Rempfler, Ettingen; Rolf Schurter, Binningen, and Henry Szczepanski, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

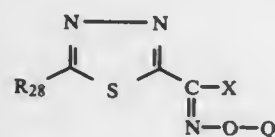
Division of Ser. No. 232,752, Feb. 9, 1981, Pat. No. 4,388,464, which is a division of Ser. No. 70,288, Aug. 28, 1979, Pat. No. 4,347,372. This application Sep. 24, 1982, Ser. No. 423,354. Claims priority, application Switzerland, Sep. 1, 1978, 9255/78

Int. Cl. A01N 43/82

U.S. Cl. 71-90

12 Claims

1. A composition for reducing the phytotoxic effects of herbicides on cultivated plants which comprises (1), as an antidote, an effective amount of a compound of the formula



wherein

R_{28} is lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl or phenyl,

Q is hydrogen, lower alkyl which can be interrupted by oxygen or sulfur, or substituted by halogen or cyano, or an carboxylic acyl radical, and

X is hydrogen, cyano, halogen, C_1 - C_{10} alkyl, lower alkanoyl, $-COOH$, $-COO$ -lower alkyl, $-COS$ -lower alkyl, $-CON(R)_2$ in which R is hydrogen or lower alkyl and (2) a suitable carrier therefor.

4,715,884

HERBICIDAL CYCLOHEXANE-1,3-DIONE DERIVATIVES

Keith G. Watson, Box Hill North, Australia, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 604,967, Apr. 27, 1984, Pat. No. 4,604,132.

This application Jul. 11, 1986, Ser. No. 884,365

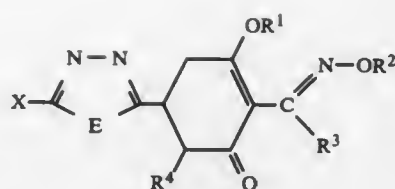
Claims priority, application Australia, May 6, 1983, PF9198

Int. Cl. C07D 271/06, 285/08; A01N 43/82

U.S. Cl. 71-90

8 Claims

1. A compound of formula



wherein:

E is selected from oxygen and sulfur;

X is selected from the group consisting of C_1 to C_3 alkyl, C_1 to C_3 alkoxy and C_1 to C_3 alkylthio;

R^1 is selected from the group consisting of hydrogen and the alkali metals;

R^2 is selected from the group consisting of C_1 to C_3 alkyl, allyl and propargyl;

R^3 is selected from the group consisting of C_1 to C_3 alkyl; and

R^4 is hydrogen.

4,715,885

HERBICIDAL PYRAZOLE SULFONYLUREAS

Barry A. Wexler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

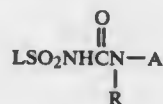
Continuation-in-part of Ser. No. 678,409, Dec. 10, 1984, Pat. No. 4,622,062, which is a continuation-in-part of Ser. No. 578,344, Feb. 9, 1984, abandoned. This application Sep. 10, 1986, Ser. No. 890,711

Int. Cl. C07D 403/12, 405/12, 417/12; A01N 43/66

U.S. Cl. 71-91

45 Claims

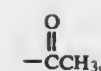
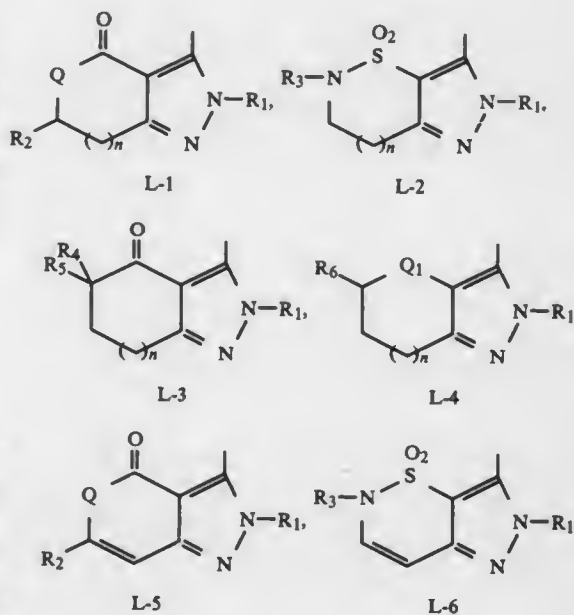
1. A compound selected from



wherein

R is H or CH_3 ;

L is



SO_2CH_3 , $SO_2N(CH_3)_2$ or CO_2CH_3 ;

R_2 is H or C_1 - C_3 alkyl;

R_3 is H, C_1 - C_3 alkyl or CHF_2 ;

R_4 is H, Cl or CH_3 ;

R_5 is H, Cl or CH_3 ;

R_6 is H or C_1 - C_3 alkyl;

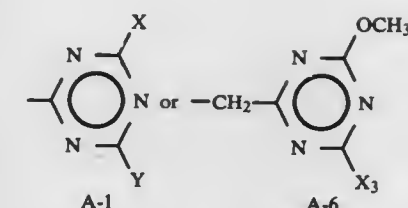
R_7 is H or CH_3 ;

n is 0 or 1;

Q is O, S or NCH_3 ;

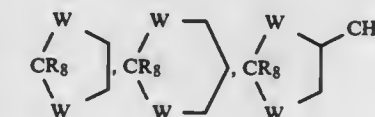
Q1 is O, S or SO_2 ;

A is



X is CH_3 , OCH_3 , OC_2H_5 , CF_3 , or CFH_2 ;

Y is H, C_1 - C_3 alkyl, OCH_3 , OCH_2CH_3 , CH_2OCH_3 , $SeCH_3$, $CH_2OCH_2CH_3$, NH_2 , $NHCH_3$, $N(CH_3)_2$, CF_3 , SCH_3 , $OCH_2CH=CH_2$, $OCH_2C=CH$, OCH_2CF_3 , $OCH_2C-H_2OCH_3$, CH_2SCH_3 , SCF_2H , cyclopropyl, $CR_8(WCH_3)_2$.



or $CR_8(WCH_2CH_3)_2$;

R_8 is H or CH_3 ;

W is O or S;

Z is N; X_3 is CH_3 or OCH_3 ;

provided that when Y is $SeCH_3$, then X is CH_3 , OCH_3 , OCH_2CH_3 , or CF_3 .

16. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,715,886

HERBICIDAL PYRAZOLE SULFONAMIDES

Barry A. Wexler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 726,386, Apr. 23, 1985, Pat. No. 4,671,817.

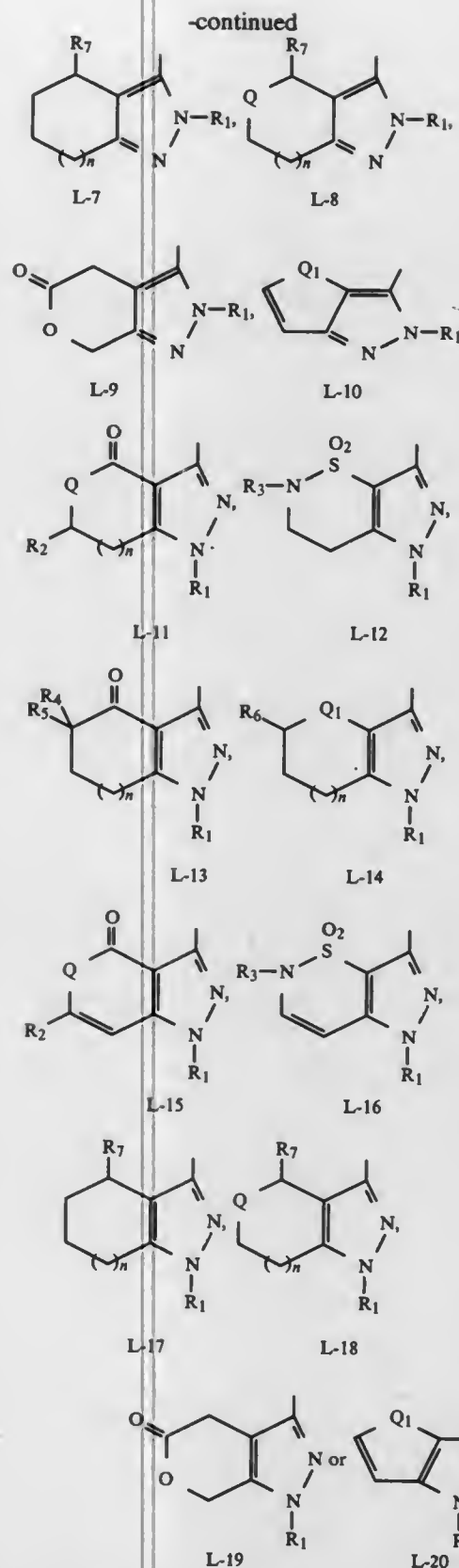
This application Mar. 16, 1987, Ser. No. 26,416

Int. Cl. C07D 513/04; A01N 47/36

U.S. Cl. 71-91

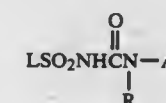
24 Claims

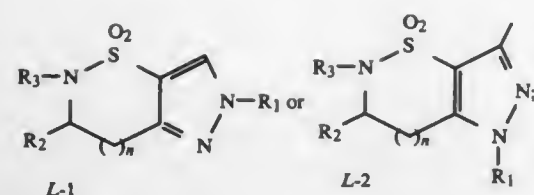
1. A compound selected from



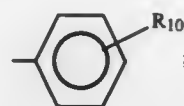
R_1 is H, C_1 - C_3 alkyl, $CH_2CH=CH_2$, $CH_2C=CH$, CH_2CF_3 , CHF_2 , phenyl, phenyl substituted with NO_2 , CH_3 , OCH_3 , Cl, Br or F,

wherein
L is

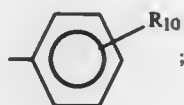




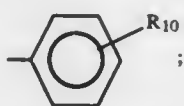
R is H or CH₃;
 R₁ is H, C₁-C₃ alkyl, CH₂CH=CH₂, CH₂C=CH₂, CH₂CF₃, CHF₂, C(O)CH₃, SO₂CH₃, SO₂N(CH₃)₂, CO₂CH₃, phenyl or phenyl substituted with NO₂, CH₃, OCH₃, Cl, Br or F;
 n is 0 or 1;
 R₂ is H or CH₃;
 R₃ is R₄, SR₄, SO₂R₄, OR₄, C(O)R₄, C(O)OR₄, (C(O))₂OR₄, (CO)₂R₄, C(O)NR₅R₆, C(O)NRA, C(S)SR₄, NR₅R₆, OH, CN, P(O)R₇R₈, P(S)R₇R₈, Si(CH₃)₂R₉, J or C(O)J;
 R₄ is C₁-C₁₀ alkyl, C₂-C₁₀ alkoxyalkyl, C₂-C₁₀ alkenyl, C₂-C₁₀ epoxyalkyl, C₂-C₁₀ alkynyl, C₃-C₆ cycloalkyl, C₄-C₇ cycloalkylalkyl or



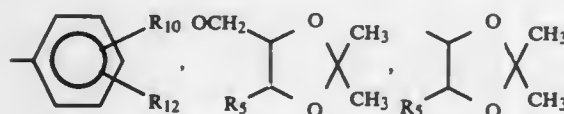
when R₄ is C₃-C₆ cycloalkyl or C₄-C₇ cycloalkylalkyl it may optionally be substituted by C₁-C₄ alkyl, 1 to 3 atoms of Cl or F or 1 Br; when R₄ is C₁-C₁₀ alkyl, C₂-C₁₀ alkenyl or C₂-C₁₀ alkynyl it may optionally be substituted by one or more halogens and/or by (R₁₁)_p, provided that when p is 2, the values of R₁₁ may be identical or different; p is 1 or 2;
 R₅ is H or C₁-C₄ alkyl;
 R₆ is H, C₁-C₁₀ alkyl, C₁-C₁₀ haloalkyl, C₂-C₁₀ alkenyl, C₂-C₁₀ alkynyl, C₃-C₆ cycloalkyl or



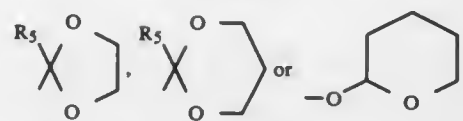
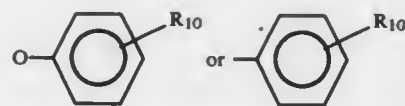
R₇ and R₈ are independently C₁-C₄ alkyl, C₁-C₄ alkoxy or C₁-C₄ alkylthio;
 R₉ is C₁-C₁₀ alkyl, benzyl or



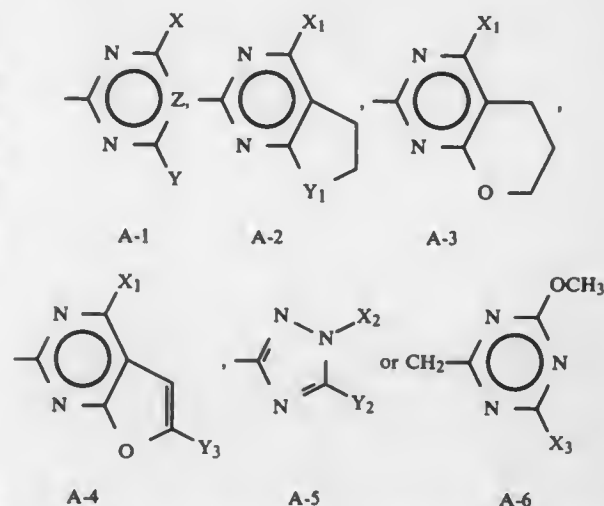
R₁₀ is H, F, Cl, Br, CH₃, OCH₃, NO₂, CN, SCH₃, SO₂CH₃ or CF₃;
 R₁₁ is OR₆, OC(O)R₆, P+R₉R₁₃R₁₄, P+(C₆H₅)₃, OC(O)NR₅R₆, OSO₂R₆, OP(O)R₇R₈, P(O)R₇R₈, OP(S)R₇R₈, P(S)R₇R₈, OSi(CH₃)₂R₉, Si(CH₃)₂R₉, SR₆, SO₂R₆, SCN, CN, SP(O)R₇R₈, SP(S)R₇R₈, N+R₅R₆R₉, NR₅R₆, NR₅C(O)R₆, NR₅C(O)OR₆, NR₅C(O)NR₅R₆, NR₅SO₂R₆, NR₅P(O)R₇R₈, NR₅P(S)R₇R₈, NO₂, C(O)R₆, C(O)OR₆, C(O)NR₅R₆, SeR₆, naphthyl, J,



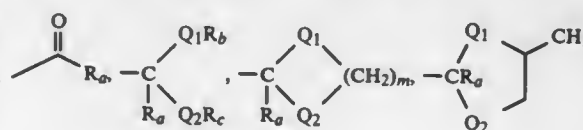
-continued

R₁₂ is H, F, Cl, Br, CH₃,

R₁₃ and R₁₄ are independently C₁-C₃ alkyl;
 J is a 5- or 6-membered aromatic heterocycle, a 5- or 6-membered dihydroaromatic heterocycle or a 5- or 6-membered tetrahydroaromatic heterocycle which contains 1-4 heteroatoms selected from 0-1 oxygen atoms, 0-1 sulfur atoms and/or 0-4 nitrogen atoms and these heterocycles may optionally be substituted by 1-4 CH₃, 1-2 OCH₃, SCH₃, Cl, N(CH₃)₂ or CN groups or J is a 5- or 6-membered lactone, lactam or cycloalkanone which may optionally be substituted by 1-4 CH₃ groups;
 A is



X is H, C₁-C₄ alkyl, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ haloalkyl, C₁-C₄ haloalkylthio, C₁-C₄ alkylthio, C₂-C₅ alkoxyalkyl, C₂-C₅ alkoxyalkoxy, amino, C₁-C₃ alkylamino, di(C₁-C₃ alkyl)amino or C₃-C₅ cycloalkyl;
 Y is H, C₁-C₄ alkyl, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ haloalkylthio, C₁-C₄ alkylthio, C₂-C₅ alkoxyalkyl, C₂-C₅ alkoxyalkoxy, amino, C₁-C₃ alkylamino, di(C₁-C₃ alkyl)amino, C₃-C₄ alkenyloxy, C₃-C₄ alkynyloxy, C₂-C₅ alkylthioalkyl, C₂-C₅ alkylsulfinylalkyl, C₂-C₅ alkylsulfonylalkyl, C₁-C₄ haloalkyl, C₂-C₄ alkynyl, azido, cyano,

or N(OCH₃)CH₃;

m is 2 or 3;

Q₁ and Q₂ are independently O or S;R₆ is H or C₁-C₃ alkyl;R₇ and R₈ are independently C₁-C₃ alkyl;Z is N, CCH₃, CC₂H₅, CCl or CBr;

Y₁ is O or CH₂;
 X₁ is CH₃, OCH₃, OC₂H₅ or OCF₂H;
 X₂ is CH₃, C₂H₅ or CH₂CF₃;
 Y₂ is OCH₃, OC₂H₅, SCH₃, SC₂H₅, CH₃ or CH₂CH₃;
 X₃ is CH₃ or OCH₃; and
 Y₃ is H or CH₃;

provided that

1. when R₃ is R₄, then R₄ is other than C₁-C₃ alkyl or CF₂H;
2. the total number of carbon atoms in R₃ does not exceed 13;
3. when R₆ is H, then R₁₁ is other than SO₂R₆, SO₂R₆, OSO₂R₆ or NR₅CO₂R₆; and
4. X and/or Y are other than OCF₂H.

4,715,887

SUBSTITUTED TRIAZOLYL-METHYL-TERT-BUTYL CARBINOL COMPOUNDS AND PLANT PROTECTION AGENTS

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Paul-Ernst Froberg, Leverkusen; Wilhelm Brandes, Leichlingen, and Klaus Lürsen, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 321,290, Nov. 13, 1981, abandoned, which is a continuation of Ser. No. 213,705, Dec. 5, 1980, abandoned. This application Dec. 21, 1984, Ser. No. 684,178 Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951163

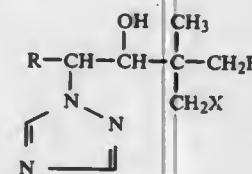
The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.⁴ C07D 249/08; A01N 43/63; A61K 31/41

U.S. Cl. 71-92

22 Claims

1. A substituted triazolylmethyl-tert-butyl carbinol of the formula



wherein

R is cyclohexylmethyl, 4-chlorobenzyl or 2,4-dichlorobenzyl, and

X is hydrogen, or fluoro,

and a hydrochloric acid addition salt thereof.

10. Method of protecting plants, against fungus growth which method comprises applying to the plants or their habitat an effective amount of a substituted triazolylmethyl tert-butyl carbinol compound as claimed in claim 1.

18. Method of plant growth regulation comprising applying to the plants or their habitat an effective amount of a substituted triazolylmethyl tert-butyl carbinol compound as claimed in claim 1.

4,715,888

HERBICIDAL AGENTS CONTAINING PHOTOSYNTHESIS-INHIBITING HERBICIDES IN COMBINATION WITH PYRIDINECARBOXAMIDES

Gerhard Marzolph, Cologne; Winfried Lunkenheimer, Wuppertal, and Carl Fedtke, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 21, 1984, Ser. No. 642,976

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332272

Int. Cl.⁴ A01N 43/64, 43/60

U.S. Cl. 71-93

9 Claims

1. A herbicidal composition consisting essentially of a herbicidally effective and selective amount of

- (a) a photosynthesis-inhibiting active compound (herbicide) plus
 (b) 0.25 to 100 times its weight of pyridine-2-carboxylic acid N-tert-butylamide.

4,715,889

QUINOLINE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Helmut Hagen, Frankenthal; Rolf-Dieter Kohler, Edingen-Neckarhausen; Jürgen Markert, Mutterstadt, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 7, 1983, Ser. No. 530,084

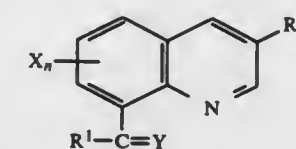
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233089

Int. Cl.⁴ A01N 43/42; C07D 215/48

U.S. Cl. 71-94

15 Claims

1. A quinoline derivative of the formula



(I)

wherein

X is chlorine in position 5 or 7 and n is 1 or 2, Y is oxygen, R¹ is —NR³R⁴, where R³ and R⁴ are identical or different and are each hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₁-C₆-hydroxyalkyl, formyl, cyclohexyl, phenyl or pyridyl, or N(CH₃), or R¹ is OM, where M is one equivalent of an alkali metal or alkaline earth metal ion, hydrogen, or is H₂NR³R⁴, where R³ and R⁴ have the above meanings, and R² is hydrogen, or C₁-C₄-alkyl which is unsubstituted or substituted in the ω-position by halogen, amino, monoalkylamino, dialkylamino or trialkylammonium where alkyl is of 1 to 4 carbon atoms, C₁-C₄-alkoxy, or is formyl, cyano, carboxy or C₂-C₆-alkenyl, with the proviso that R² is not hydrogen when



is carboxyl.

6. A herbicidal composition containing inert additives and an effective amount of a quinoline derivative of the formula I as defined in claim 1.

7. A process for combating the growth of unwanted plants, wherein the unwanted plants and/or their location are treated with a herbicidally effective amount of a composition as defined in claim 6.

4,715,890

METHOD OF PREPARING A MAGNETIC MATERIAL

Stanford R. Ovshinsky, Bloomfield Hills; Stephen J. Hodgins, Southfield; David D. Allred, Troy, and Gregory Demaggio, Bloomfield Hills, all of Mich., assignors to Ovonic Synthetic Materials Company, Inc., Troy, Mich.

Filed Oct. 17, 1986, Ser. No. 919,934

Int. Cl.⁴ C22C 1/04

U.S. Cl. 75-0.5 AA

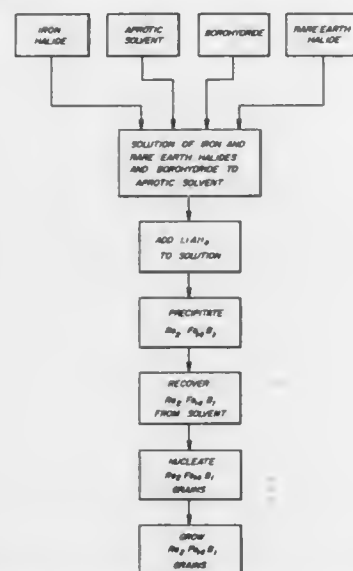
13 Claims

1. A method of forming a magnetic material of the transition metal-rare earth metal-boron type comprising a solid mass of grains, which method comprising the steps of:

- (a) forming a solution of a reducible iron halide, a reducible rare earth halide, and lithium borohydride in an aprotic solvent;
 (b) reducing the compounds and precipitating a tetragonal,

RE₂Tm₁₄B-type composition having a morphology characterized by one or more of

- (i) amorphous;
 - (ii) microcrystalline; and
 - (iii) polycrystalline; wherein the grains thereof have an average grain characteristic dimension less than that of the optimal enhanced remanence magnetic material; and
- (c) heat treating the precipitate to form a solid material characterized in that the grains meet adjacent grains at grain boundaries therebetween, the grains and grain boundaries therebetween being characterized by:
- (i) the grains having an average grain characteristic dimension;



- (ii) individual grains having an easy axis of the magnetization and an individual grain characteristic dimension within a distribution about the average grain characteristic dimension; and
 - (iii) the grain boundaries having a characteristic dimension small enough to allow interaction between surface atoms of adjacent grains across the grain boundaries, thereby forming a permanent magnetic material such that the grain-grain interaction in the heat treated material substantially equals the magnetic anisotropy field of the individual grains;
- the magnetic material being characterized by:
- (1) a maximum magnetic energy product, (BH)_{max}, greater than 15 megagauss-oersteds; and
 - (2) a remanence greater than 8 kilogauss.

4,715,891

METHOD OF PREPARING A MAGNETIC MATERIAL
Stanford R. Ovshinsky, Bloomfield Hills; Stephen J. Hudgens, Southfield; David D. Allred, Troy, and Gregory DeMaggio, Bloomfield Hills, all of Mich., assignors to Ovonc Synthetic Materials Company, Inc., Troy, Mich.

Filed Oct. 17, 1986, Ser. No. 919,935

Int. Cl.⁴ H01F 1/02

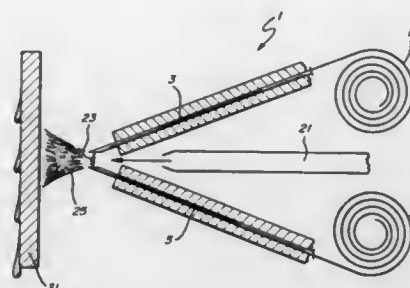
U.S. Cl. 75—0.5 BA

13 Claims

1. A method of forming an enhanced isotropic remanence magnetic material comprising a solid mass of grains of an alloy of the rare earth-transition metal-boron type having P4₂/mm tetragonal crystallography, which method comprises the steps of:

- (a) vaporizing precursors of the magnetic material;
- (b) condensing the precursors of the magnetic material whereby to form a condensate solid alloy having a fine grain morphology characterized by one or more of:

- (ii) microcrystalline, and
 - (iii) polycrystalline; wherein the grains thereof have an average grain characteristic dimension less than that of the enhanced remanence magnetic material; and
- (c) heat treating the fine grain solid to form a magnetic material comprised of grains having a characteristic dimension, R₀, of about 200 Angstroms such that the grain-grain interaction between adjacent grains substantially



equals the magnetic anisotropy field of the individual grains, and magnetically aligns grains away from their easy axis of magnetization, the grains meeting at grain boundaries having a characteristic dimension small enough to allow the grain-grain interaction between adjacent grains, so as to form an enhanced remanence magnetic material having an isotropic maximum magnetic energy product, (BH)_{max}, greater than 15 megaGauss-Oersteds and an isotropic remanence greater than 9 kiloGauss.

4,715,892

CERMET SUBSTRATE WITH GLASS ADHESION COMPONENT

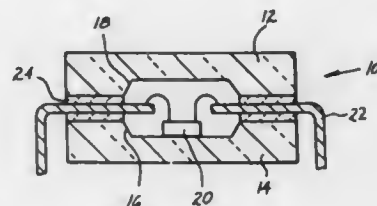
Deepak Mahulikar, Meriden, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 838,866, Mar. 12, 1986. This application Oct. 30, 1986, Ser. No. 922,271

Int. Cl.⁴ C22C 29/12

U.S. Cl. 75—233

29 Claims



1. The process of forming a composite material, comprising the steps of:
- providing a mixture of from about 25 to about 80 volume % of metallic material in the form of particles, from an effective amount up to about 10 volume % of binder in the form of particles of glass, and the balance essentially ceramic particles;
 - mixing said glass particles with said ceramic particles whereby said ceramic particles are coated with said glass particles;
 - mixing the glass coated ceramic particles with said metallic particles;
 - compacting said mixture; and heat treating the compacted mixture to form a matrix comprising the metallic material with said glass coated ceramic particles distributed within said matrix.

4,715,893

ALUMINUM-IRON-VANADIUM ALLOYS HAVING HIGH STRENGTH AT ELEVATED TEMPERATURES
David J. Skinner, Flinders; Richard L. Bye, Jr., Morristown; Kenji Okazaki, Basking Ridge, and Colin M. Adam, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 4, 1984, Ser. No. 596,741

Int. Cl.⁴ C22C 21/00, 21/10, 21/12; B22F 9/06

U.S. Cl. 75—249

11 Claims

1. An aluminum-base alloy consisting essentially of the formula Al₁₀₀Fe_aV_bX_c, wherein X is at least one element selected from the group consisting of Zn, Co, Ni, Cr, Mo, Zr, Ti, Hf, Y and Ce, "a" ranges from about 7-15 wt %, "b" ranges from about 2-10 wt %, "c" ranges from about 0-5 wt % and the balance is aluminum, said alloy having been uniformly quenched at a cooling rate of at least about 10⁷° C./sec by being forced under pressure through a slotted nozzle and into contact with a casting surface in close proximity thereto and moving at a speed of at least about 4000 ft/min, and having a microstructure which is at least about 50% composed of a generally spherical, intermetallic O-phase.

4,715,894

USE OF IMMERSION TIN AND TIN ALLOYS AS A BONDING MEDIUM FOR MULTILAYER CIRCUITS
Abraham M. Holtzman, Bat Yam, and Joseph Relis, Ramat Gan, both of Israel, assignors to Techno Instruments Investments 1983 Ltd., Bat-Yam, Israel

Filed Aug. 29, 1985, Ser. No. 770,842

Int. Cl.⁴ C23C 18/46

U.S. Cl. 106—1.22

16 Claims

1. An immersion metal composition comprising:
- (a) a thiourea compound
 - (b) a urea compound
 - (c) a metal salt
- said metal salt being selected from the group of salts based on the Group IVA metals including tin, Group VIII metals, Group IB metals, Group IIB metals and Group IIIA metals, said urea compound and thiourea compound each being present in an amount sufficient to enable said composition to function as an immersion composition.

4,715,895

METHOD OF PRODUCING MOLDS FOR THE CASTING OF METAL

Friedhelm Schnippering, Siegburg, and Karl-Martin Rödder, Troisdorf-Splch, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf Bez Koeln, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 768,914, Sep. 15, 1984, abandoned, which is a continuation of Ser. No. 593,176, Mar. 26, 1984, abandoned, which is a continuation of Ser. No. 430,093, Sep. 30, 1982, abandoned. This application Sep. 15, 1986, Ser. No. 908,879

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143036

Int. Cl.⁴ B28B 7/28

U.S. Cl. 106—38.3

10 Claims

1. A method of making a mold for casting metal, comprising:
- (a) providing a permanent model of the mold;
 - (b) spraying a layer of an anhydrous fluid ceramic slip which cures without the addition of water onto the surface of the model, the fluid ceramic slip comprising granular refractory substances, a binding agent of a partially-condensed and partially-hydrolyzed alkyl silicate containing hydroxyl groups and between 18 and 25%, by weight, SiO₂, and no hardener;

- (c) thereafter sanding the slip layer by throwing a sanding material thereinto, the sanding material comprising a granular refractory substance having a grain size between 0.07 and 0.25 mm and a hardener, the hardener comprising means comprising at least one amine for hardening the slip by chemical action;
- (d) allowing the hardener to so harden the slip; and
- (e) removing the hardened slip from the model for use as the mold.

4,715,896

CEMENTITIOUS BINDER FOR CONSOLIDATED FILL
William A. Berry, Burlington, Canada, assignor to Standard Slag Cement, Toronto, Canada

Filed Aug. 4, 1986, Ser. No. 892,445

Int. Cl.⁴ C04B 7/14, 7/02, 2/02

U.S. Cl. 106—117

8 Claims

1. A water-hardenable cementitious material for consolidated fill comprising in admixture an aggregate suitable for use in consolidated fill and a binder the binder, consisting essentially of:

- (a) about 55 to 97 parts by weight of finely divided, water-hardenable, vitrified, cementitious, iron blast furnace slag;
- (b) about 3 to about 45 parts by weight of Class C fly ash; and
- (c) an alkaline activator elevating the pH of the composition above about 11 in the presence of water, the activator being calcium hydroxide in an amount of about 2 to about 15% by weight based on the total weight of said slag plus said fly ash.

4,715,897

ESTERS AS PITCH PLASTICIZERS

James A. Tallon, Grafton, and Richard T. Lewis, Parma Heights, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 596,365, Apr. 3, 1984, abandoned. This application May 13, 1986, Ser. No. 862,695

Int. Cl.⁴ C08L 95/00

U.S. Cl. 106—284

24 Claims

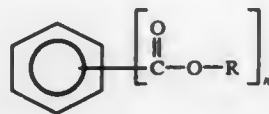
1. A process for making a carbon body which comprises: (a) providing a mixture comprising carbonaceous particles, pitch binder, and a plasticizing agent in an amount between about 1 and about 6 wt.%, based on the weight of the pitch binder; (b) extruding the mixture to prepare extruded composite, and (c) baking the composite to form the carbon body, wherein the plasticizing agent is benzenepolycarboxylic acid ester soluble in the pitch binder and having the structure;



wherein n is between 2 and 6, and wherein each R is the same or different from the other R groups, and each R is a substituted or unsubstituted alkyl, alkenyl, or aryl group having 1 to 10 carbon atoms, wherein the permissible substituents on the R groups are selected from the groups of amino, hydroxy, halo, cyano, nitro, oximino, alkoxy, alkylthio, alkylsulfinyl and alkylsulfonyl.

11. A mixture used for extruding carbon bodies comprising carbonaceous particles, a coal tar or petroleum pitch binder and between about 1 wt.% and about 6 wt.%, based on the weight of the pitch, of a plasticizing agent soluble in the pitch

binder, said plasticizing agent comprising a benzenepolycarboxylic acid ester having the structure;



wherein n is between 2 and 6, and wherein each R is the same or different from the other R groups, and each R is a substituted or unsubstituted alkyl, alkenyl, or aryl group having 1 to 10 carbon atoms, wherein the permissible substituents on the R groups are selected from the group of amino, hydroxy, halo, cyano, nitro, oximino, alkoxy, alkylthio, alkylsulfinyl and alkylsulfonyl.

4,715,898

SULFONIUM RESINS USEFUL AS PIGMENT GRINDING VEHICLES IN CATIONIC ELECTRODEPOSITION

Mark W. Johnson, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1986, Ser. No. 880,379

Int. Cl.⁴ C04B 14/00; C08G 59/14, 59/40

U.S. Cl. 106—308 Q

16 Claims

1. A cationic resin suitable for use as a pigment grinding vehicle capable of producing smooth films while maintaining high rupture voltages which is derived from an epoxy resin and which contains ternary sulfonium groups and alkyl phenoxide groups in which the alkyl group contains at least 4 carbon atoms; said cationic resin containing from 0.25 to 1.4 milliequivalents of ternary sulfonium group per gram of resin and containing from 1.9 to 25 percent by weight of alkyl phenoxide groups based on weight of cationic resin; said alkyl phenoxide groups being present in the cationic resin by reaction of the corresponding alkyl phenol with epoxide functionality of the epoxy resin.

4,715,899

LIQUID CLEANER CONTAINING INACTIVATED PROTEASE FOR PROTEIN SOILED CONTACT LENSES

Sabir Chanda, 17 Arlington Dr., Pittsford, N.Y. 14534; Thomas M. Riedhammer, 52 Applan Dr., Rochester, N.Y. 14606, and Andrew M. Tometsko, 105 Brooklawn Dr., Rochester, N.Y. 14618

Division of Ser. No. 435,851, Oct. 21, 1982, abandoned. This application Apr. 11, 1984, Ser. No. 599,123

Int. Cl.⁴ B08B 3/08

U.S. Cl. 134—26

8 Claims

1. A process for removing proteinaceous deposits on contact lenses comprising the steps of:

- contacting said contact lens with an aqueous solution of a mild thiol reducing agent wherein the aqueous solution is isotonic to the human eye and said thiol reducing agent is selected from group consisting of: cysteine, mercaptoethanol, sodium thiosulfate, ascorbic acid, glutathione and mixtures thereof;
- admixing with said solution containing said lens an effective amount of an allosterically inactivated sulphydryl protease, to remove said proteinaceous deposit from said lens, said protease having been inactivated by reaction with sodium tetrathionate; and
- allowing said lens to remain in the admixture until said proteinaceous deposit is removed.

4,715,900

AZEOTROPIC COMPOSITIONS OF TRICHLOROTRIFLUOROETHANE, DICHLORODIFLUOROETHANE AND METHANOL/ETHANOL

Helen A. Cannon, Wilmington; Robert A. Gorski, Newark; William G. Kenyon, Wilmington, and Akimichi Yokozeki, Greenville, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 8, 1987, Ser. No. 1,454

Int. Cl.⁴ B08B 3/08; C11D 7/50

U.S. Cl. 134—31

10 Claims

1. An azeotrope or azeotrope-like composition comprising about 67–81 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane and 15–26 weight percent 1,2-dichloro-1,1-difluoroethane and about 3–7 weight percent methanol.

2. An azeotrope or azeotrope-like composition comprising about 59–66 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane and 31–39 weight percent 1,2-dichloro-1,1-difluoroethane and about 2–4 weight percent ethanol.

4,715,901

ARCHITECTURAL PRODUCT

Douglas A. Granger, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 533,348, Sep. 19, 1983, abandoned. This application Sep. 17, 1985, Ser. No. 776,934

Int. Cl.⁴ C22F 1/04

U.S. Cl. 148—2

32 Claims

1. The method of producing an improved aluminum sheet product having substantial freedom from structural streaking in an electrochemically or chemically treated condition, said method comprising:

- formulating an aluminum base alloy consisting essentially of:
 - at least 98.5% aluminum, 0.25 to 1% Fe, 0.05 to 0.4% Si, not more than 0.3% of any other element except aluminum; or
 - 0.3 to 2.5% Mg, 0.25 to 1% Fe, 0.05 to 0.5% Si
 said formulating including the step of adding one or more metal additives from the group consisting of Cr, Mn, Ni, Zr, V, Co, Mo and the rare earth elements so as to include in said alloy 0.01 to 0.08% each for one or more of such elements so added but not more than 0.2% combined total for all such elements, the balance of said alloy being aluminum and incidental elements and impurities;
- casting an ingot of said alloy; and
- producing said sheet from said ingot.

4,715,902

PROCESS FOR APPLYING THERMAL BARRIER COATINGS TO METALS AND RESULTING PRODUCT

Ibrahim M. Allam, Menlo Park, and David J. Rowcliffe, Los Altos, both of Calif., assignors to S R I International, Menlo Park, Calif.

Continuation of Ser. No. 487,745, Apr. 22, 1984, abandoned, and a continuation-in-part of Ser. No. 662,252, Oct. 17, 1984, abandoned, and a continuation-in-part of Ser. No. 325,504, Nov. 27, 1981, Pat. No. 4,483,720. This application Apr. 4, 1985, Ser. No. 719,685

The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.

Int. Cl.⁴ C23C 8/10

U.S. Cl. 148—6.3

7 Claims

1. A method of coating a metal substrate with a protective coating which comprises:

- providing a substrate metal to be coated,
- providing an alloy or mixture of (1) zirconium and/or hafnium, and (2) at least one other metal M_2 which does not form a stable oxide at an elevated temperature in an atmosphere having a very small partial pressure of oxy-

gen, and which forms an alloy with at least one component of the substrate on heat treatment of the coated material, the zirconium and/or hafnium constituting not less than 50% by weight of the alloy or mixture, M_2 being present in substantial amount but not exceeding 50% by weight of the alloy or mixture,

- applying such alloy or mixture to a surface of the substrate (1) by dipping the substrate in a molten alloy or mixture of zirconium and/or hafnium and M_2 or (2) by applying a slurry in a volatile liquid of zirconium and/or hafnium and M_2 in finely divided form either as the separate metals or as an alloy of the metals, then vaporizing the solvent and fusing the metals;
- effecting selective oxidation of the zirconium and/or hafnium at an elevated temperature in the coating without substantial oxidation of M_2 ;
- said method resulting in a coating which is bonded to the substrate, said coating having an outermost dense layer of zirconium and/or hafnium oxide substantially free from M_2 , an intermediate layer containing zirconium and/or hafnium oxide and M_2 and an innermost layer of M_2 alloyed with one or more metals from the substrate.

4,715,903

ALUMINUM OFFSET COIL, AND METHOD FOR ITS PRODUCTION

Wolfgang V. Asten, Fulheim; Karl H. Dörner, Grevenbroich; Hartmut Scheel, Grevenbroich, and Volker Wurste, Grevenbroich, all of Fed. Rep. of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,559

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507402

Int. Cl.⁴ C22F 1/04

U.S. Cl. 148—11.5 A

7 Claims

5. A method of making an offset coil comprising: hot-rolling an aluminum billet having a thickness between about 400 and about 600 mm at a temperature within the range between about 550° and about 480° C., thereby forming a coil having a recrystallized surface zone and an unrecrystallized core zone such that the coil after hot-rolling has a temperature above about 320° C. and has a hot-rolled thickness less than about 3.5 mm; cooling said coil to room temperature; cold rolling said coil without intermediate annealing to achieve a thickness reduction of about 80 to about 90% compared to the thickness of the hot rolled coil, such that said core zone has a grain aspect ratio S of at least 16 and said surface zone has a grain aspect ratio S of less than 8.

4,715,904

METHOD FOR PRODUCING A MAGNET WITH RADIAL MAGNETIC ANISOTROPY

Kenzaburo Iijima, and Yoshinori Hayashi, both of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Feb. 24, 1984, Ser. No. 583,125

Claims priority, application Japan, Feb. 28, 1983, 58-033425

Int. Cl.⁴ H01F 1/02

U.S. Cl. 148—102

16 Claims



1. A method for producing a magnet having radial magnetic anisotropy comprising the steps of forming a thin, elongated strap from a Cu—Ni—Fe spinodal

decomposition type alloy which can be provided with magnetic anisotropy, subjecting said strap to age-hardening under concurrent magnetization in its thickness direction, and taking up said strap, after age-hardening, into a light, hollow roll of a prescribed shape.

2. A method for producing a magnet having radial magnetic anisotropy comprising the steps of forming a thin, elongated strap from a Fe—Cr—Co spinodal decomposition type alloy which can be provided with magnetic anisotropy, subjecting said strap to age-hardening under concurrent magnetization in its thickness direction, and taking up said strap, after age-hardening, into a tight, hollow roll of a prescribed shape, subjecting said roll of said strap to additional age-hardening.

4,715,905

METHOD OF PRODUCING THIN SHEET OF HIGH SI-FE ALLOY

Kazuhide Nakaoka, Yokohama; Yoshikazu Takada, Kawasaki; Junichi Inagaki, and Akira Hiura, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP85/00534, § 371 Date Feb. 10, 1986, § 102(e) Date Feb. 10, 1986, PCT Pub. No. WO86/02102, PCT Pub. Date Apr. 10, 1986

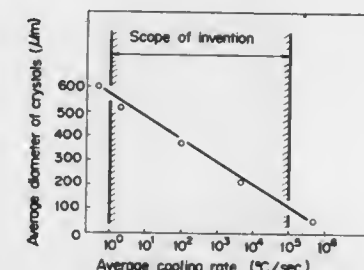
PCT Filed Sep. 26, 1985, Ser. No. 833,394

Claims priority, application Japan, Sep. 28, 1984, 59-201594

Int. Cl.⁴ H01F 1/04

U.S. Cl. 148—111

10 Claims



1. A method of producing thin sheets of Si-Fe alloy, comprising the steps of preparing molten Si-Fe alloy composition containing more than 4.0 weight percent Silicon; casting the molten Si-Fe alloy to form plates of thickness ranging from 0.1 mm to 30 mm and cooling at a cooling rate of 1° C./sec to less than 10⁵° C./sec, said casting being by thin plate casting; subsequently hot rolling the cast plates at a reduction rate of more than 30 percent and at a temperature of between 600° C. and 800° C.; and subsequently pickling, cold rolling and annealing.

4,715,906

ISOTHERMAL HOLD METHOD OF HOT WORKING OF AMORPHOUS ALLOYS

Alan I. Taub, Schenectady, and Peter G. Frischmann, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 13, 1986, Ser. No. 839,317

The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.

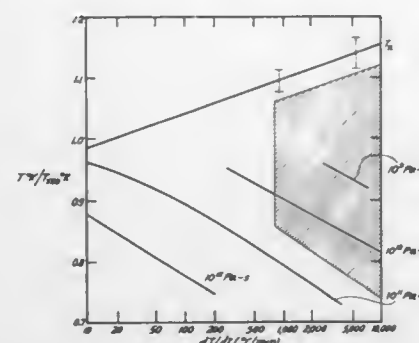
Int. Cl.⁴ H01F 1/00

U.S. Cl. 148—120

10 Claims

1. A method of deforming an amorphous alloy without destroying its magnetic properties which comprises providing an amorphous alloy specimen,

ramping the temperature of the specimen at a rate at or above 1000° C./min which preserves its viscosity at a low value of less than 4×10^{11} Pa-S, heating the specimen to above its softening temperature and below its recrystallization temperature,



stressing the specimen to deform the specimen at or below its yield strength after the temperature has been ramped to above its softening temperature.

4,715,907

METHOD FOR HEAT TREATING FERROUS PARTS
George D. Pfaffmann, Farmington, Mich., assignor to Tocco, Inc., Boaz, Ala.

Division of Ser. No. 752,550, Jul. 8, 1985, Pat. No. 4,637,844.

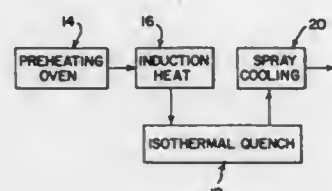
This application Aug. 22, 1986, Ser. No. 899,323

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl. C21D 11/20

U.S. Cl. 148—144

3 Claims



1. A method of heat treating ferrous workpieces comprising: inductively heating a peripheral surface portion of the workpiece to the austenizing temperature thereof to a substantial depth while leaving the remaining core portion of the workpiece substantially below said austenizing temperature;

rapidly cooling the inductively heated peripheral surface portions of the workpiece in a bath to a predetermined transformation temperature which is above the M_s temperature of the workpiece at a rate at least equal to the critical cooling rate and sufficiently rapid to prevent transformation of the austenite of the austenized peripheral surface portions to intermediate matrix phases during the said rapid cooling thereof;

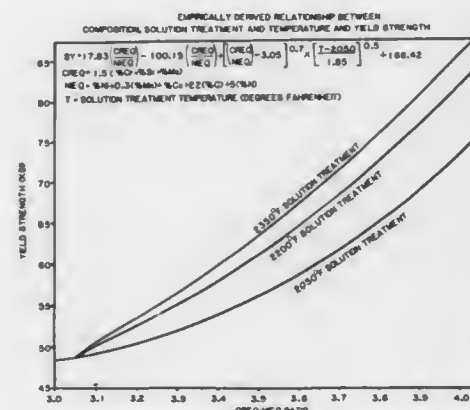
maintaining the said workpiece at the said predetermined transformation temperature for a preselected time sufficient to substantially homogenize only said surface portion of said workpiece at said transformation temperature and independently of the temperature of said core portion; and

then cooling the workpiece to ambient temperature.

4,715,908
DUPLEX STAINLESS STEEL PRODUCT WITH IMPROVED MECHANICAL PROPERTIES
Robin K. Churchill, Aloha, Oreg., assignor to ESCO Corporation, Portland, Oreg.
Continuation-in-part of Ser. No. 801,746, Nov. 26, 1985, abandoned. This application May 19, 1986, Ser. No. 864,333
Int. Cl. C22C 38/44

U.S. Cl. 148—327

1 Claim



1. A duplex stainless steel having austenite pools in a ferrite matrix resulting from heating to a temperature in the range of 2050° F.—2350° F. and cooling rapidly thereafter, said steel consisting essentially of except for residual elements:

Carbon	0.001	to	0.08	Wt. %
Manganese	0.001	to	2.00	Wt. %
Silicon	0.001	to	1.50	Wt. %
Chromium	20.00	to	27.50	Wt. %
Nickel	8.00	to	11.00	Wt. %
Molybdenum	3.00	to	4.50	Wt. %
Sulfur	0.0001	to	0.050	Wt. %
Phosphorus	0.0001	to	0.050	Wt. %
Nitrogen	0.10	to	0.30	Wt. %
Iron	Balance			

such that:

$$3.50 \leq \left(\frac{C_{req}}{N_{ieq}} \right) \leq 4.00$$

where:

$$C_{req} = 1.5(\% \text{ Cr} + \% \text{ Si} + \% \text{ Mo})$$

$$N_{ieq} = \% \text{ Ni} + 0.3(\% \text{ Mn}) + \% \text{ Cu} + 22(\% \text{ C}) + 5\% \text{ N}$$

and having greater impact toughness values in the cast form than Ferralium Alloy 255 and SAF 2205, the impact toughness in Charpy V-notch testing at -100° F. being above about 75 ft-lbs. when tested from keel blocks per ASTM E23-82, the HAZ impact toughness at -100° F. being above about 50 ft-lbs. and having a yield strength of at least 65 KSI.

4,715,909
NICKEL-CHROMIUM ALLOY IN STRESS CORROSION CRACKING RESISTANCE
Takao Minami, Amagasaki-shi; Hiroo Nagano, Kobeshi; Kazuo Yamanaka, Minoo-shi; Yasutaka Okada, Narashi; Hiroshi Susukida, Takasago; Kichiro Onimura, Takasago; Toshio Yonezawa, Takasago; and Nobuya Sasaguri, Takasago, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of Japan

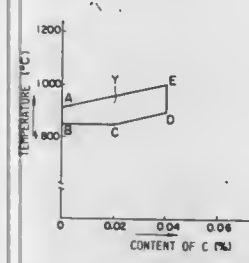
Continuation of Ser. No. 550,023, Nov. 8, 1983, abandoned. This application Jun. 19, 1986, Ser. No. 878,398

Claims priority, application Japan, Jun. 13, 1983, 56-104094; Jun. 13, 1983, 58-104095

U.S. Cl. 148—410

Int. Cl. C22C 19/05

2 Claims



1. A nickel-chromium alloy heat treated product excellent in a stress corrosion cracking resistance which is obtained by carrying out an annealing treatment under conditions defined by points A, B, C, D and E of FIG. 1, said alloy consisting essentially of the following composition:

in terms of % by weight,	
not more than 0.04% C;	not more than 1.0% Si;
not more than 1.0% Mn;	not more than 0.030% P;
not more than 0.02% S;	40 to 70% Ni;
25 to 35% Cr;	0.1 to 0.5% Al;
0.05 to 1.0% of Ti;	

0.5 to 5.0% of a metal selected from the group consisting of Mo, W, V and mixtures thereof; and balance Fe.

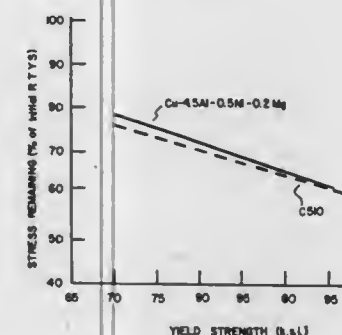
4,715,910
LOW COST CONNECTOR ALLOY
Frank N. Mandigo, Northford, and Eugene Shapiro, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 7, 1986, Ser. No. 882,878

Int. Cl. C22C 9/01

U.S. Cl. 148—414

17 Claims

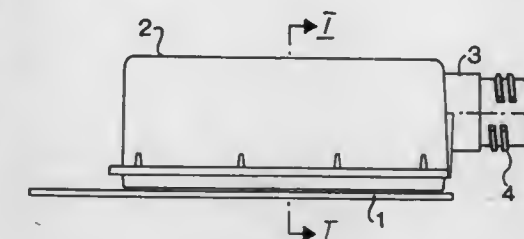


15. An electrical connector formed from a copper base alloy consisting essentially of from about 3.5% to about 6.0% aluminum, from about 0.1% to about 3.0% nickel, from about 0.03% to about 1.0% magnesium and the balance essentially copper.

4,715,911
METHOD FOR THE PRODUCTION OF A PLASTIC CONTAINER
Arne Johansson, Roskilde, and Erland Namensen, Lejre, both of Denmark, assignors to A/S Nunc, Roskilde, Denmark
Filed Mar. 25, 1986, Ser. No. 843,685
Claims priority, application Denmark, Mar. 25, 1985, 1345/85
Int. Cl. B32B 31/20

U.S. Cl. 156—69

6 Claims



1. A method of producing a plastic container which includes a base part and an integral top part, the base part and the integral top part being easily separated, said method comprising the steps of

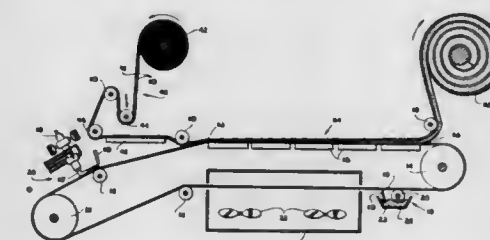
- providing a plastic and essentially planar base part,
- providing a plastic top part which defines at least one compartment therein and an open end, said top part having an essentially planar end face at said open end and a thin flange which projects outwardly from around the entire periphery of said end face,
- positioning said top part and said base part together so that said thin flange of said top part contacts said base,
- vibrating one of said top part and said base part relative to the other part to partially melt said thin flange,
- discontinuing said vibrating before said thin flange becomes completely molten, and
- allowing said flange to cool, such that said top and base parts become attached, thereby producing said plastic container.

4,715,912
METHOD FOR FORMING A LAYER OF BLOWN CELLULAR URETHANE ON A CARPET BACKING
John G. Tillotson, Tiarco Dr., Dalton, Ga. 30720
Continuation of Ser. No. 718,899, Apr. 2, 1985, abandoned, which is a continuation of Ser. No. 531,282, Sep. 12, 1983, Pat. No. 4,512,831, which is a continuation of Ser. No. 000,478, Jan. 2, 1979, Pat. No. 4,405,393, which is a continuation of Ser. No. 872,341, Jan. 25, 1978, Pat. No. 4,132,817, which is a continuation-in-part of Ser. No. 782,636, Mar. 30, 1977, Pat. No. 4,171,395. This application May 21, 1986, Ser. No. 870,283
The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.

Int. Cl. B32B 31/00, 5/20

U.S. Cl. 156—79

10 Claims



1. Method of producing a continuous layer of chemically blown foam cushion having a density of between approximately one and ten pounds per cubic foot on the back of a carpet product comprising the steps of:

- (a) preparing a mixture of reactive urethane forming agents, including isocyanate, polyol and water such that said mixture will undergo chemical blowing when heated sufficiently, and controlling the temperature of said mixture to a temperature of between approximately 60° and 100° F.;
- (b) providing a conveyor path;
- (c) depositing said mixture onto an elastomeric film moving along said conveyor path;
- (d) forming said mixture on said film into a uniform layer by means of an air knife;
- (e) preheating the lower surface of an uncoated carpet material to a temperature of approximately 100° to 300° F.;
- (f) bringing the lower surface of said preheated carpet into flush contact with said layer of said mixture on said film;
- (g) heating said mixture to cause chemical blowing thereof;
- (h) applying pressure to said layer of said mixture disposed between said carpet and said film; and
- (i) removing the coated carpet material from said conveyor path.

4,715,913

DECORATING SUBSTRATE MATERIALS

Nicholas J. Middleton, Highworth, England, assignor to Metal Box p.l.c., Reading, England

Continuation of Ser. No. 619,175, Jun. 11, 1984, abandoned.

This application Apr. 24, 1986, Ser. No. 858,556

Claims priority, application United Kingdom, Jun. 13, 1984, 8316092

Int. Cl.⁴ B32B 31/00; B44C 1/17; D06P 1/02

U.S. Cl. 156—85

26 Claims

1. A method of decorating a side wall of a container body comprising the steps of

- (a) providing a container body having a side wall including an exterior surface,
- (b) providing a base coating laminate including a layer of polyester film and a layer of heat-sensitive adhesive,
- (c) providing a flexible paper carrier printed with indicia in a sublinable dye,
- (d) first applying the base coating laminate to the container body side wall exterior surface with the adhesive thereof in contact with the container body exterior surface,
- (e) heating the heat-sensitive adhesive to activate the heat-sensitive adhesive and bond the polyester film of the base coating laminate to the container body,
- (f) following step (e) applying the flexible paper carrier with the sublinable dye against the layer of the polyester film in such a position as to effect the migration of the dye from the carrier directly to the layer of polyester film,
- (g) heating the paper carrier in order (1) to effect shrinkage of the paper carrier to tighten it into intimate contact with the polyester, and (2) to effect the migration of the sublinable dye and indicia from the paper carrier to the layer of polyester film, and then
- (h) removing the paper carrier from the layer of polyester film.

4,715,914

FABRIC REPAIR IMPLEMENT AND METHOD OF MENDING HOLES IN FABRICS

Lorraine Viner, 1066 S. Ogden Dr., Los Angeles, Calif. 90019

Filed Mar. 23, 1987, Ser. No. 28,725

Int. Cl.⁴ B32B 35/00

U.S. Cl. 156—94

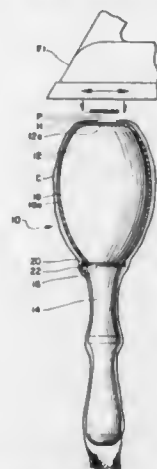
13 Claims

13. A method for the repair of wear holes and tears in fabric apparel items comprising:

- (a) turning the fabric apparel item requiring hole repair inside-out to expose the inner side of said apparel item;
- (b) positioning the fabric apparel item in the area of the hole requiring repair over a hand-held mandrel having a flattened anvil surface area at its upper head end, said mandrel having a fabric heat-resistant cover bearing on its

outer surface a Teflon coating for interface with said apparel item;

- (c) positioning a hole patch pre-form of fabric material bearing a heat activated adhesive coating on one side thereof over the apparel item in the area of the hole requiring repair, the adhesive coating of said patch pre-form interfacing with said apparel item and exposed portions of the fabric heat-resistant cover of said mandrel;
- (d) heating the hole patch pre-form of fabric material and



interfacing apparel item with a hand-held, heated ironing device applying pressure to said patch pre-form and apparel item in opposition to the hand-held mandrel and the upper flattened anvil surface area thereof to join said patch pre-form to said apparel item in the area thereof requiring hole repair; and

- (e) removing said hand-held, heated ironing device and allowing the fabric material of said patch pre-form and said apparel item to cool to set said heat activated adhesive and thereby repair said apparel item.

4,715,915

LONGITUDINAL SEAM AND METHOD OF FORMING

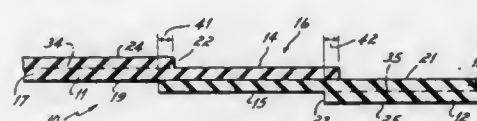
Robert S. Vanderzee, Carlisle, Pa., assignor to Carlisle Corporation, Cincinnati, Ohio

Filed Jun. 19, 1986, Ser. No. 875,943

Int. Cl.⁴ B32B 31/00

U.S. Cl. 156—182

13 Claims



1. A method of forming an enlarged sheet of material comprising:

forming a first sheet by bonding together a first and a second lamina with said first lamina extending beyond said second lamina along a longitudinal first edge to form an edge portion, a body portion, a first planar side and a first stepped side said body portion having a thickness greater than a thickness of said edge portion;

forming a second sheet by bonding together a first and a second lamina with said first lamina extending beyond said second lamina along a longitudinal second edge of said second lamina to form an edge portion, a body portion, a second planar side, and a second stepped side;

bonding said first edge portion of said first sheet to said second edge portion of said second sheet with said first planar surface positioned and bonded to said second planar surface thereby forming a seam;

said first and second edge portions overlapped to a con-

trolled degree to provide a seam having a greatest thickness 1½ times the thickness of said body portion of said first sheet.

4,715,916

METHOD FOR ASSEMBLING A SEAT BACK

Makoto Shimada, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

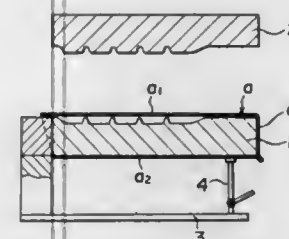
Filed Sep. 20, 1985, Ser. No. 778,259

Claims priority, application Japan, Sep. 25, 1984, 59-200893

Int. Cl.⁴ B29B 43/04

U.S. Cl. 156—245

3 Claims



1. A method of assembling a seat back, comprising the steps of:

forming a bag-like trim cover assembly by sewing at least a cover portion defining front and lateral side portions of the seat back to a cover portion defining a back portion of the seat back;

mounting said bag-like trim cover assembly, inside out, onto a cantileverwise supported lower mold in an inserted manner, said lower mold being provided on the upper surface thereof with an uneven configuration corresponding to a desired front surface of the seat back;

pressing an upper mold having on the engagement surface thereof an uneven configuration corresponding to said uneven configuration of said lower mold onto said trim cover assembly so as to form an uneven surface on said trim cover assembly;

applying an adhesive agent to said uneven surface of said trim cover assembly;

pressing a foam cushion member with a frame embedded therein against said trim cover assembly while said trim cover assembly is mounted on said lower mold, to thereby bond said cushion member to said trim cover assembly; and

turning over the portions of said trim cover assembly which are disposed on the lower surface side of said lower mold so that said portions cover said cushion member.

4,715,917

PROCESS FOR THE PRODUCTION OF A MULTIDETECTOR WITH IONIZATION CHAMBERS

Marco Tirelli, Palaiseau; René Lecolant, Etampes, and Raoul Hecquet, Boulogne, all of France, assignors to Thomson-CGR, Paris, France

Filed Dec. 11, 1985, Ser. No. 807,732

Claims priority, application France, Dec. 14, 1984, 84 19188

Int. Cl.⁴ B32B 31/18

U.S. Cl. 156—250

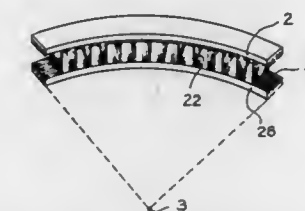
10 Claims

1. A process for the production of a multidetector having ionization chambers and metallized partitions wherein each of said metallized partitions has a plurality of flanges, comprising the steps of:

cutting, in a resin monoblock, a base having the same shape as the multidetector to be produced;

arranging said partitions in a tool shaped so that said flanges of said partitions extend from said tool;

spreading onto said base a resin which is to be polymerized; moving said tool close to said base;



polymerizing said resin while maintaining said tool close to said base so that said partitions which are immersed in said resin are welded to said base.

4,715,918

METHOD FOR FORMING DISCRETE PARTICULATE AREAS IN A COMPOSITE ARTICLE

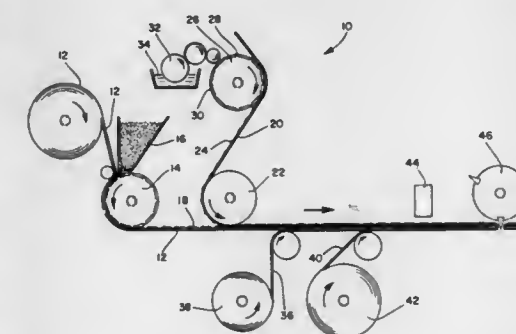
Theodore B. Lang, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 26, 1985, Ser. No. 749,158

Int. Cl.⁴ B32B 31/06, 31/08, 31/12

U.S. Cl. 156—273.1

14 Claims



1. A method of forming a composite structure comprising laying down discrete areas of particulate material on a receiving web, applying adhesive to areas of a covering web, bringing the two webs together, in such a manner that the adhesive areas do not overlay the discrete areas of said particulate material, thereby creating discrete pockets of particulate material wherein said particulate material is laid down in discrete areas by being applied to depressions in a forming roll that is then rotated into contact with the receiving web and wherein said discrete areas of particulate material are in a pattern having a greater number of said depressions in the areas of the roll where more particulate material is desired and wherein said laying down on said receiving web is by electrical attraction.

4,715,919

INTERFACIAL BONDING OF POLYMERIC LAMINAE IN THE SOLID STATE

Stoyko C. Fakirov, Sofia, Bulgaria, and Jerold M. Schultz, Newark, Del., assignors to University of Delaware, Newark, Del.

Continuation of Ser. No. 553,106, Nov. 18, 1983, abandoned.

This application Sep. 20, 1985, Ser. No. 777,991

Int. Cl.⁴ C09J 5/02, 1/00, 3/00

U.S. Cl. 156—307.3

9 Claims

1. A process for production of a bonded laminar structure of crystalline, oriented linear polyester laminae, the laminae being of a composition which loses its crystallinity and orientation upon melting, the bonds being chemical bonds formed by solid state reaction between molecules of each lamina across the

interface of contacting surfaces of laminae by the steps in sequence comprising:

- application to at least one of two adjacent surfaces to be bonded of an agent effective in the absence of externally applied radiation to cause chemical reaction between molecules of polymers of adjacent laminae;
- bringing the surfaces having said agent on at least one surface to be bonded together to form a laminate;
- urging the surfaces to be bonded into intimate contact with pressure; and
- heating the laminate while being urged into contact to a temperature from 10° to 100° C. below the melting point of the polyester of the laminate to form chemical bonds.

4,715,920

APPARATUS AND METHOD FOR RECYCLING PLASTIC BEVERAGE CONTAINERS

Kurt H. Ruppman, Dallas, and Charles A. Prano, Richardson, both of Tex., assignors to Plastic Recycling Inc., Tex.

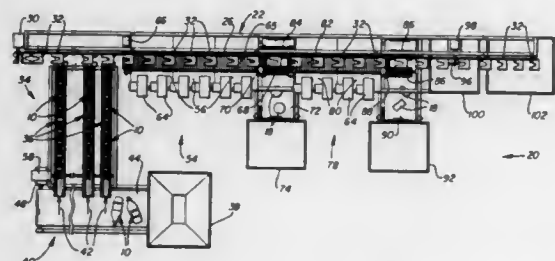
Continuation of Ser. No. 161,883, Jun. 23, 1980, abandoned.

This application Apr. 2, 1982, Ser. No. 364,636

Int. Cl.⁴ B32B 31/18

U.S. Cl. 156—344

44 Claims



1. Apparatus for separating labels adhesively secured to plastic bottles, comprising:
 - an endless belt mounted for rotation around a course;
 - means for effecting rotation of said belt;
 - a plurality of carriers secured to said belt for movement therewith, each of said carriers comprising a single piece flat plate with a notch therein oriented toward the travel direction of said belt, the notch being configured to engage the neck of a bottle;
 - means located along the course for heating said bottles to soften the adhesive securing the labels thereto;
 - means located along the course beyond said heating means for separating the labels from said bottles and collecting the labels; and
 - a portion of the course followed by said belt being angled so that each bottle slides out of the notch of its corresponding carrier under gravity.
22. A method of separating labels and base cups adhesively secured to plastic bottles, comprising the steps of:
 - (a) advancing the bottles along a predetermined course;
 - (b) heating the bottles to soften the adhesive securing the labels and base cups thereto;
 - (c) contacting the heated bottles with a pair of rotating brushes positioned to engage opposite sides of each bottle to remove the base cups therefrom;
 - (d) collecting the removed base cups;
 - (e) contacting the heated bottle with a pair of rotating brushes positioned to engage opposite sides of each bottle to remove the labels therefrom;
 - (f) collecting the removed labels; and
 - (g) collecting the bottles.

4,715,921

QUAD PROCESSOR

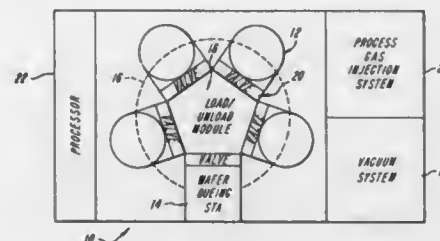
Joseph A. Maher, South Hamilton, Mass.; E. John Vowles, Goffstown; Joseph D. Napoli, Winham, both of N.H.; Arthur W. Zafropoulos, Manchester, and Mark W. Miller, Burlington, both of Mass., assignors to General Signal Corporation, Stamford, Conn.

Filed Oct. 24, 1986, Ser. No. 923,125

Int. Cl.⁴ H01L 21/306; B44C 1/22

U.S. Cl. 156—345

25 Claims



1. A multiple-processing and contamination-free plasma etching system, comprising:
 - plural, single-wafer plasma etching vessels each having an ingress and egress defining port that are arrayed about a predetermined spacial locus in such a way that the several ports thereof are accessible from a single location spaced from the several ports;
 - a wafer queuing station spaced with the plural vessels along the same predetermined spacial locus defining a wafer access port accessible from said single location;
 - plural valve means individually coupled to corresponding ones of said plural, single-wafer plasma etching vessel ingress and egress ports and to said wafer queuing station wafer access port;
 - single-wafer transfer means disposed at said single location and cooperative with corresponding ones of said plural valve means for moving wafers from and to said wafer access port of said queuing station from and to selected ones of said single-wafer plasma etching vessels through the associated one of said ingress and egress ports thereof; and
 - processor means for controlling said vessels, said transfer means and said valve means to provide selectable single or multistep processing of wafers in said queuing station in one or more of said etching vessels.

4,715,922

AUTOMATIC PAPER ROLL PASTING APPARATUS FOR ROTARY PRESSES

Mamoru Hayashi, Kawasaki, and Hideo Kawamori, Yokohama, both of Japan, assignors to Tokyo Kikai Seisakusho, Ltd., Japan

Filed Mar. 31, 1986, Ser. No. 846,601

Claims priority, application Japan, Mar. 30, 1985, 60-66742

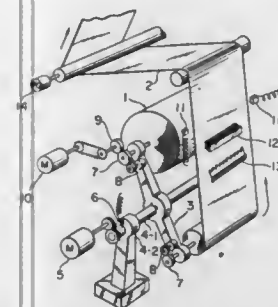
Int. Cl.⁴ B65H 19/16, 19/18, 19/20

U.S. Cl. 156—361

4 Claims

1. An automatic paper roll pasting apparatus for rotary presses for sequentially and continually feeding a continuous strip of paper, or a paper web, to a rotary press from a plurality of paper rolls, and characterized in that a paper roll support capable of accommodating at least two or more paper rolls, a paper roll measuring means for measuring a value relating to the diameter of a new paper roll mounted on said paper roll support, and a paper roll revolution control means for calculating a signal in the form of a revolution signal by correlating said value relating to the diameter of said new paper roll measured by said paper roll measuring means with the speed of a running paper web being fed to said rotary press from another paper roll mounted on said paper roll support to control the revolution of said new paper roll by comparing said calculated

revolution signal with said revolution signal of said new paper roll are provided; and that said paper roll revolution control means is adapted to coincide the revolution of said new paper



roll with desired revolution of said new paper roll calculated from the speed of said running paper web, and said new paper roll is pasted, by pasting with adhesive, for example, with said paper web.

4,715,923

APPARATUS FOR CONSOLIDATING COMPOSITE MATERIALS

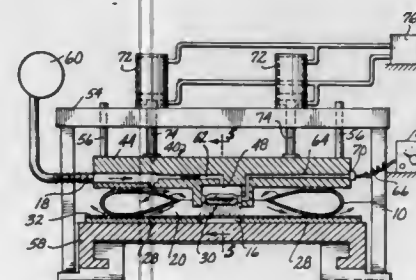
Frederick L. Knoll, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 26, 1985, Ser. No. 813,645

Int. Cl.⁴ B32B 31/26

U.S. Cl. 156—380.9

19 Claims



1. Apparatus for consolidating materials on a work surface, comprising:
 - a fluid bearing having a flexible, inflatable cushion, said cushion forming a plenum chamber when inflated;
 - means for inflating said cushion and pressurizing said plenum chamber with fluid to float said fluid bearing in proximate relationship to a work surface and material to be consolidated thereon;
 - means for applying a load to said fluid bearing so as to develop a predetermined pressure in said plenum chamber;
 - positioning means for positioning said fluid bearing so that said inflatable cushion is spaced from said material and said plenum chamber is superposed relative to said material and said work surface to apply the pressure in said plenum chamber to said material; and
 - heating means for heating said material while the pressure in said plenum chamber is applied thereto.

4,715,924

APPARATUS FOR FORMING A WEB

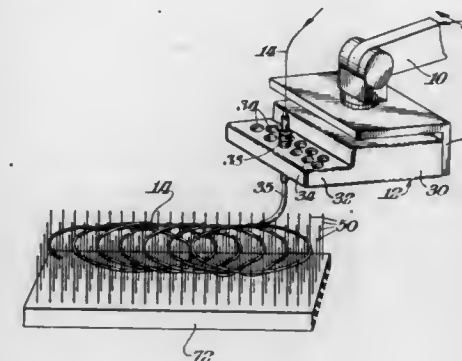
Ronald F. McConnell, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 29, 1982, Ser. No. 445,166

Int. Cl.⁴ D04H 3/02

U.S. Cl. 156—433

7 Claims



1. An apparatus comprising a bed of resiliently mounted, deflectable pins and a movable head for depositing a continuous strand in said bed according to a desired pattern, said head including a freely rotatable, strand-guiding tube projecting therefrom and terminating in a horn, said horn being a curved length projecting into said bed sufficiently to dispense the strand beneath the tops of the pins.

4,715,925

APPARATUS FOR FORMING CONNECTION BRIDGES BETWEEN STACKS OF CORRUGATED CARDBOARD SHEETS IN A CORRUGATOR

Walter Hofmeister, Henstedt-Ulzburg, and Günter Demmin, Hamburg, both of Fed. Rep. of Germany, assignors to Peters Maschinenfabrik GmbH, Fed. Rep. of Germany

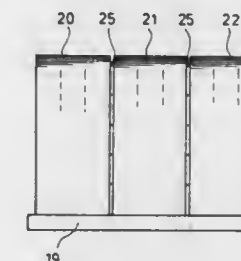
Filed Feb. 13, 1987, Ser. No. 14,349

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604870

Int. Cl.⁴ B31F 1/00

U.S. Cl. 156—470

3 Claims



1. Apparatus for stacking of corrugated cardboard sheets on at least two stacks disposed adjacent each other in a stacker included in a corrugator, wherein a slitter scorer, first conveying means, cut-off means, second conveying means and a stacker are located each behind the other in conveying direction, characterized in that at least one applying means is located above the first conveying means, said applying means being supported for movement transverse to the conveying direction and said applying means being adapted to apply adhesive strips, self-adhering paper strips or the like to adjacent webs to form connection bridges between the stacks by which adjacent stacks are stabilized against each other.

4,715,926

APPARATUS FOR SEVERING AND JOINING JOINT
PIECERyuichi Murasaki, Toyama, Japan, assignor to Yoshida Kogyo
K. K., Tokyo, Japan

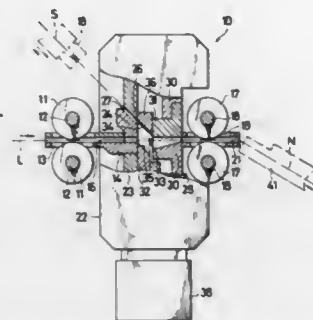
Filed Oct. 24, 1986, Ser. No. 922,724

Claims priority, application Japan, Oct. 26, 1985, 60-240217

Int. Cl.⁴ B32B 31/18, 31/20

U.S. Cl. 156—511

7 Claims



1. An apparatus for severing and joining a joint piece, comprising:

- first feed means for feeding a first elongate product for a predetermined interval along a substantially horizontal path;
- second feed means for feeding a second elongate product for a predetermined interval along an inclined path extending obliquely to said horizontal path;
- a first fixed cutter disposed adjacent to said horizontal path;
- a second fixed cutter disposed adjacent to said inclined path;
- a movable cutter movable for transversely cutting off the first elongate product on said first fixed cutter into a product length and then for obliquely cutting off the second elongate product on said second fixed cutter into a joint piece, said movable cutter having a slanted surface for carrying a trailing end of the product length thereon with the joint piece partly overlapping said trailing end; and
- joining means for joining overlapping portions of the joint piece and the product length to each other, thereby to produce a product with the joint piece having a free end exposed beyond said trailing end.

4,715,927

IMPROVED METHOD OF MAKING A
PHOTOCONDUCTIVE MEMBERAnnette G. Johncock, Walled Lake, and Stephen J. Hudgens,
Southfield, both of Mich., assignors to Energy Conversion
Devices, Inc., Troy, Mich.

Continuation of Ser. No. 580,081, Feb. 14, 1984, abandoned.

This application Nov. 21, 1986, Ser. No. 941,244

The portion of the term of this patent subsequent to May 14,
2002, has been disclaimed.Int. Cl.⁴ C30B 25/02

U.S. Cl. 156—606

48 Claims

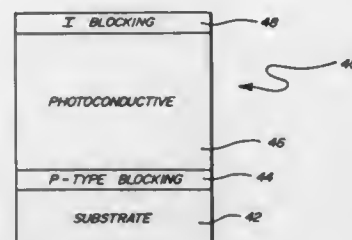
1. An improved method of forming a photoconductive member, comprising:

- providing a substrate;
- providing a source of microwave energy;
- providing an enclosed reaction vessel;
- operatively disposing said substrate in said vessel;
- coupling microwave energy from said source into the interior of said vessel;
- introducing into said vessel at least one reaction gas, said reaction gas including at least one semiconductor element to be deposited;
- energizing said source of microwave energy to generate a

plasma in said vessel and to deposit semiconductor alloy material from said reaction gas onto said substrate; evacuating said vessel to an operating pressure about an order of magnitude below conventional RF deposition pressure;

depositing a bottom blocking layer onto said substrate by adding at least one dopant to said reaction gas;

depositing a substantially intrinsic, amorphous photoconductive layer onto said blocking layer said photoconduc-



tive layer having a first density of defect states; changing at least one deposition parameter so as to deposit an enhancement layer atop said photoconductive layer, said enhancement layer having a second density of defect states less than said first density of defect states; and depositing a hard top stabilizing layer atop said enhancement layer, said hard top stabilizing layer formed from a reaction gas which includes at least one of carbon, nitrogen or oxygen.

4,715,928

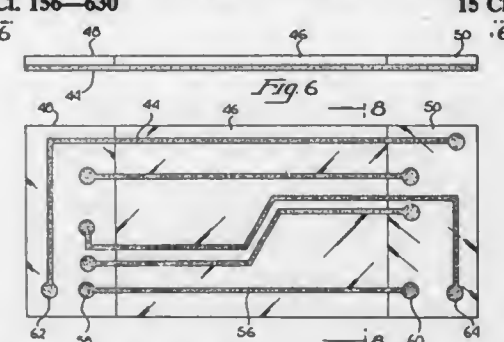
FLEXIBLE PRINTED CIRCUITS AND METHODS OF
FABRICATING AND FORMING PLATED THRU-HOLES
THEREINBill L. Hamby, 1198 Navigator Dr., Ventura, Calif. 93003
Division of Ser. No. 780,806, Sep. 27, 1985, Pat. No. 4,687,695.

This application Sep. 19, 1986, Ser. No. 909,315

Int. Cl.⁴ C23F 1/02; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—630

15 Claims



1. A method of making flexible printed circuits comprising the steps of

- providing a sheet of metal,
- covering at least a first area of the metal sheet with a sheet of flexible material,
- covering a second area of the metal sheet at least in part coterminous with the first area with a rigid printed circuit board material,
- bonding the flexible material and the rigid material to the metal sheet,
- etching the metal sheet to form a circuit pattern and
- bonding additional flexible material and rigid printed circuit board material to the flexible material and rigid printed circuit board material, respectively, of steps (b) and (c) to sandwich the circuit pattern formed in step (e) therebetween.

4,715,929

PATTERN FORMING METHOD

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita
Electric Industrial Co., Ltd., Osaka, Japan

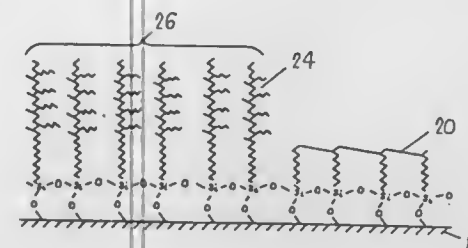
Filed Jul. 15, 1986, Ser. No. 885,824

Claims priority, application Japan, Jul. 19, 1985, 60-160507

Int. Cl.⁴ B44C 1/22; B05D 3/06

U.S. Cl. 156—643

10 Claims



1. A pattern forming method comprising the steps of: forming on a substrate a monomolecular film having responsive groups which undergo chemical vapor reactions under irradiation of an energy beam; irradiating an energy beam in a pattern on said monomolecular film, thereby forming bonds between said responsive groups at the irradiated portion to selectively deactivate the responsive groups in the irradiated portion; transferring said substrate into a polymerizing monomer atmosphere; and irradiating the entire surface of said monomolecular film in said monomer atmosphere to activate the responsive groups in a pattern not deactivated and additionally polymerize said monomer onto the monomolecular film except in the previously deactivated portion, whereby a polymerized film is formed in a pattern.

4,715,930

PROCESS FOR PRODUCING BY SLOPING ETCHING A
THIN FILM TRANSISTOR WITH A SELF-ALIGNED
GATE WITH RESPECT TO THE DRAIN AND SOURCE
THEREOFBernard Diem, Meylan, France, assignor to Commissariat a
l'Energie Atomique, Paris, France

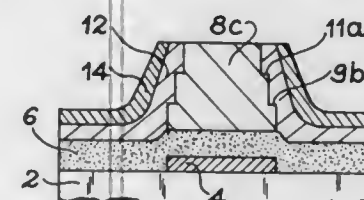
Filed Nov. 13, 1986, Ser. No. 929,908

Claims priority, application France, Nov. 15, 1985, 85 16922

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 437—101

2 Claims



1. A process for producing a thin film transistor with a self-aligned gate with respect to its drain and source comprising the following successive steps:

- producing the transistor gate on a glass substrate;
- depositing an insulating layer on the substrate and the gate;
- depositing a thick hydrogenated amorphous silicon layer on the insulating layer;
- depositing a positive photosensitive resin layer on the silicon layer;
- irradiating the resin layer through the substrate, the gate serving as an irradiation mask;

- developing the resin layer leading to the elimination of the irradiated zones of said resin layer;
- etching the silicon layer until the insulating layer is exposed, the remaining resin serving as a mask for said etching;
- producing electric contacts and source and drain electrodes of the transistor; and
- eliminating the remaining resin and forming a plurality of staircase steps on the edges of the silicon layer by an equal number of successive and partial etching operations of said silicon layer, the remaining resin being used on each occasion as a mask and itself being etched isotropically over a limited thickness following each etching of the silicon layer.

4,715,931

PROCESS FOR INHIBITING ALUMINUM HYDROXIDE
DEPOSITION IN PAPERMAKING FELTSAlan J. Schellhamer, Daniel J. Barnett, and Abdul Q. Khan, all
of Jacksonville, Fla., assignors to Betz Laboratories, Inc.,
Trevose, Pa.

Filed Mar. 24, 1987, Ser. No. 29,827

Int. Cl.⁴ D21F 1/32

U.S. Cl. 162—199

18 Claims

16. In a process for conditioning of press felt in a papermaking system producing paper or paperboard from pulp suspensions containing alum wherein aluminum hydroxide is deposited in said felt and a surfactant is added to the shower water to inhibit felt filling and compaction, the improvement comprising adding to said water a carboxylic acid selected from the group consisting of tartaric acid, malic acid, citric acid, mesoxalic acid, tartronic acid and tetrahydroxy succinic acid, said carboxylic acid being added in an amount from 10 parts to 1,000 parts per million parts of water.

4,715,932

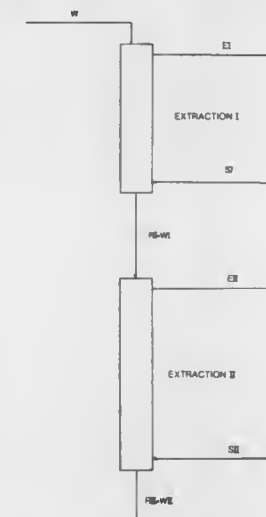
METHOD TO SEPARATE POLAR ORGANIC
COMPOUNDS, IN PARTICULAR ALIPHATIC
ALCOHOLS, FROM FERMENTATION FLUIDSKlaus Misselhorn, Ascheberger Weg 41, 1000 Berlin 27, and
Uwe Tegtmeyer, Triftstrasse 46, 1000 Berlin 65, both of Fed.
Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 361,069

Claims priority, application Fed. Rep. of Germany, Mar. 30,
1981, 3112603Int. Cl.⁴ B01D 3/34; C07C 29/86

U.S. Cl. 203—43

12 Claims



1. Method for the separation of polar organic compounds from aqueous fermentation fluids which comprises:
 - (a) extracting at least part of said fermentation fluid from a

fermentation process with a first solvent (SI) which is a selective extractant for said polar organic compounds to form a first extract phase (EI) comprising first solvent (SI) and extracted polar organic compounds and a first raffinate phase (RI) comprising the remaining aqueous fermentation fluid and some solvent (SI);

- (b) separating said first extract phase (EI) from said first raffinate phase (RI);
- (c) recovering said polar organic compounds from the said first extract phase (EI);
- (d) extracting said first raffinate phase (RI) with a second solvent (SII) which is a selective solvent for the first solvent (SI) and which has a different polarity than solvent (SI) to form a second extract phase (EII) comprising first solvent (SI) and second solvent (SII), a second raffinate phase (RII) substantially free from said solvent (SI), solvent (SII) and said polar organic compounds.
- (e) separating said second extract phase (EII) from said second raffinate phase (RII).

4,715,933

SEPARATION OF N-PROPANOL FROM 2-BUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and Mark G. Vosburgh, both of 1314 S. Third Ave., both of Bozeman, Mont. 59715

Filed Sep. 16, 1985, Ser. No. 776,450

Int. Cl.⁴ B01D 3/40; C07C 29/84

U.S. Cl. 203-51

3 Claims

1. A method for recovering n-propanol from a mixture of n-propanol and 2-butanol which comprises distilling a mixture of n-propanol and 2-butanol in a rectification column in the presence of about one to two parts of extractive agent per part of n-propanol-2-butanol mixture, recovering n-propanol as overhead product, obtaining the 2-butanol and the extractive agent from the stillpot, separating the 2-butanol from the extractive agent by conventional distillation in another rectification column, wherein said extractive agent

- (1) is an organic compound or a mixture of organic compounds composed solely of carbon, hydrogen and oxygen and contain a six carbon atom aromatic ring
- (2) boils at least 100 Centigrade degrees above n-propanol
- (3) does not form binary azeotropes with either n-propanol or 2-butanol
- (4) does not form a ternary azeotrope with n-propanol and 2-butanol
- (5) is miscible in boiling n-propanol-2-butanol mixtures
- (6) in combination with n-propanol and 2-butanol, results in a relative volatility of n-propanol to 2-butanol in the range of 1.09 to 1.27.

4,715,934

PROCESS AND APPARATUS FOR SEPARATING METALS FROM SOLUTIONS

Pentti Tamminen, Espoo, Finland, assignor to LTH Associates, Helsinki, Finland

Filed Nov. 18, 1985, Ser. No. 799,009

Int. Cl.⁴ C25C 5/02, 7/00

U.S. Cl. 204-10

39 Claims

1. A process for depositing a metal from a solution containing said metal onto a metal-collecting face of a cathode electrode, said cathode electrode and an anode electrode, mounted with a face substantially parallel to said metal-collecting face, forming part of an electrochemical cell, comprising the steps of:

- providing said solution to said cell at least in the area thereof between said electrodes;
- applying a substantial centrifugal force to said electrodes and said solution, said force having a substantial component in a direction perpendicular to and outward from the metal collecting face; and
- applying an electric current to said electrodes.

4,715,935

PALLADIUM AND PALLADIUM ALLOY PLATING

John R. Lovie, New Providence, N.J.; Gerardus A. Somers, Schayk, and Jan J. M. Hendriks, Sint Oedenrode, both of Netherlands, assignors to OMI International Corporation, Warren, Mich.

Filed Jan. 21, 1986, Ser. No. 819,968

Claims priority, application United Kingdom, Jan. 25, 1985, 8501856

Int. Cl.⁴ C25D 3/52, 3/56

U.S. Cl. 204-44.6

15 Claims

1. A method of electroplating palladium metal or palladium alloy on a substrate which comprises contacting the substrate to be plated with an aqueous electroplating composition comprising a source of palladium metal, a source of oxalate ions and, optionally, a source of alloying metal ions wherein, the source of the palladium metal and the source of oxalate ions are added together to the composition in the form of a complex selected from the group consisting of palladium oxalate complexes and palladium complexes which yield oxalate ions in the aqueous electroplating composition, passing an electric current through the aqueous electroplating composition between an anode and the substrate to be plated as the cathode to cathodically electrify said substrate and cause the electrodeposition of a palladium containing layer thereon.

4,715,936

PROCESS FOR ANODIZING ALUMINUM FOR AN ALUMINUM ELECTROLYTIC CAPACITOR

Steven M. Florio, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Apr. 2, 1984, Ser. No. 595,883

Int. Cl.⁴ C25D 11/08

U.S. Cl. 204-58

2 Claims

1. A process for anodizing aluminum for an aluminum electrolytic capacitor, said process comprising applying an anodization voltage while passing aluminum capacitor foil through a bath wherein the only anodizing ion is present as 0.05 to 5 wt% of a dicarboxylic acid selected from aspartic acid and glutamic acid dissolved in an aqueous solvent at a temperature of 25° to 100° C. and neutralized to a pH of 5.5 to 8 by a basic reagent selected from sodium hydroxide, potassium hydroxide, ammonia, ethylamine, diethylamine, and triethylamine, thereby forming a partially crystalline barrier layer dielectric oxide on said aluminum capacitor foil.

4,715,937

LOW-TEMPERATURE DIRECT NITRIDATION OF SILICON IN NITROGEN PLASMA GENERATED BY MICROWAVE DISCHARGE

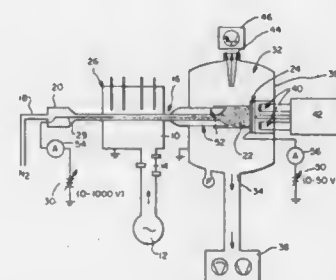
Mehrdad M. Moslehi, Palo Alto; Chi Y. Fu, San Francisco County, and Krishna Saraswat, Santa Clara County, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed May 5, 1986, Ser. No. 859,943

Int. Cl.⁴ C23C 8/24

U.S. Cl. 204-177

7 Claims



- 1. A low-temperature process for forming an ultra-thin

silicon nitride film on a silicon substrate by direct plasma nitridation of silicon comprising the steps of

- supporting a wafer comprising said silicon substrate on a wafer support in a stainless steel nitridation chamber, leading a quartz tube from a nitrogen gas source into said plasma nitridation chamber through a resonant cavity, establishing a fluorine and hydrogen-free nitrogen atmosphere in said quartz tube,
- generating nitrogen plasma inside the resonant cavity of said quartz tube, said plasma extending through the quartz tube into said nitridation chamber to the surface of said wafer, inserting a silicon rod into an end of said quartz tube distant from said wafer support, and
- providing an electrical connection between said silicon rod and a first voltage source to produce an anodization current and an electrical connection between said wafer and a second voltage source to equalize the plasma currents at the wafer and the silicon rod to minimize contamination of said silicon nitride film.

4,715,938

METHOD AND APPARATUS FOR ELECTROLYZING WATER

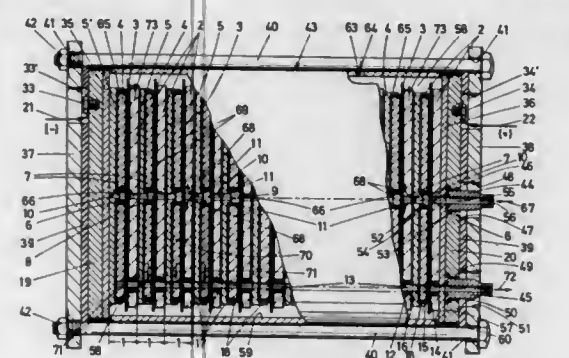
Roger E. Billings, 3420 Pink Hill Circle, Blue Springs, Mo. 64015

Continuation of Ser. No. 844,694, Mar. 27, 1986, This application Nov. 4, 1986, Ser. No. 926,721

Int. Cl.⁴ C28B 1/02

U.S. Cl. 204-129

18 Claims



15. A method for electrolysis of water to produce hydrogen and oxygen therefrom; said method comprising the steps of:

- (a) providing at least one electrolysis cell including a solid electrolyte membrane positioned between an open porous anode plate and an open porous cathode plate;
- (i) said anode plate and said cathode plate contacting mutually opposite sides of said membrane;
- (b) wetting, with water, surfaces of said anode and cathode plates which abut said membrane;
- (i) said wetting being by providing conveyance of water into and substantially radially through said anode plate from a central portion of said anode plate toward an outer perimeter thereof; and
- (c) passing a current through said electrolysis cell to generate hydrogen gas at said cathode plate and oxygen gas at said anode plate.

4,715,939

METHOD FOR REMOVAL OF MONOVALENT IONS FROM ZNSO₄ ELECTROLYTE BY ELECTRODIALYSIS

Donald L. Ball, Castlegar, and Daniel A. D. Boateng, Montrose, both of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Apr. 21, 1987, Ser. No. 41,026

Claims priority, application Canada, Apr. 22, 1986, 507254

Int. Cl.⁴ B01D 13/02

U.S. Cl. 204-182.4

25 Claims

- 1. A method for the purification of zinc sulfate electrolyte

containing concentrations of monovalent cations including at least one cation chosen from the group consisting of thallium, sodium and potassium and monovalent anions including at least one anion chosen from the group consisting of chloride and fluoride by electrodialysis, which method comprises the steps of feeding zinc sulfate electrolyte to diluate cells of an electrodialysis unit comprising a multiplicity of alternating monovalent cation permselective exchange membranes and monovalent anion permselective exchange membranes, said membranes defining alternating diluate and concentrate cells, an anode compartment and a cathode compartment, an anode positioned in the anode compartment and a cathode positioned in the cathode compartment; rinsing said anode compartment and said cathode compartment with circulating rinse solutions; applying an electrical current between the anode and the cathode at a value such that the value of the corresponding current density is in the range of about 10 to 500 A/m²; maintaining the temperature in the unit in the range of about 0° to 60° C.; feeding electrolyte at a pH having a value of less than about 5.5; passing flows of solutions through the diluate and concentrate cells at a linear velocity sufficient to maintain turbulent flow in said cells; withdrawing a diluate from said diluate cells; and recovering purified zinc sulfate electrolyte with reduced concentrations of monovalent cations and monovalent anions.

4,715,940

MASK FOR PATTERNING ELECTRODE STRUCTURES IN THIN FILM EL DEVICES

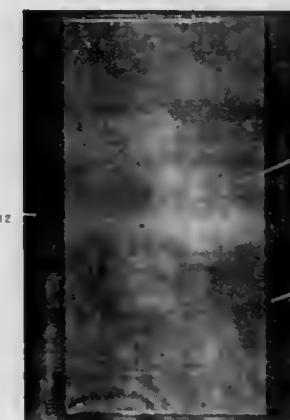
Robert A. Boudreau, Hampton, N.H., assignor to GTE Products Corporation, Danvers, Mass.

Filed Oct. 23, 1985, Ser. No. 790,590

Int. Cl.⁴ C23C 14/00

U.S. Cl. 204-192.1

30 Claims



- 1. A mask for the patterning of electrode structures for a thin film device having at least a substrate, said mask comprising a plurality of metallic strips which extend across said mask are substantially parallel to each other, each strip having an equal thickness, T_S, and a first major surface and an opposed second major surface, the second surface being adapted for disposition upon solid substrate;
- a series of metallic interconnecting bridges which extend across said mask and are perpendicular to said strips and said bridges defining a predetermined pattern of elongated apertures having rounded profiles, each of said bridges having an equal thickness, T_B, and a first surface and an opposed second surface, the first surface of each bridge and the first major surface of each strip being coplanar, and the thickness, T_S, of each strip being greater than the thickness, T_B, of each bridge, whereby an opening is provided between the bridge and the substrate when the mask is disposed against the substrate.

4,715,941

SURFACE MODIFICATION OF ORGANIC MATERIALS TO IMPROVE ADHESION

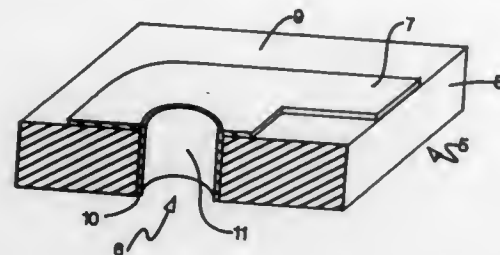
Carol R. Jones, Binghamton, and Robin A. Susko, Owego, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 14, 1986, Ser. No. 851,856

Int. Cl.⁴ C23C 14/00

U.S. Cl. 204—192.36

18 Claims



1. A method of roughening an organic surface previously modified by a silicon containing fluid, said method comprising subjecting said surface to an oxygen containing plasma whereby all portions of said organic surface subjected to said oxygen containing plasma are uniformly roughened to promote adhesion between said surface and material subsequently applied thereto.

4,715,942

ELECTROPHORESIS APPARATUS

Sigeru Tezuka, Sholchi Yamamoto, and Masayoshi Yamamoto, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

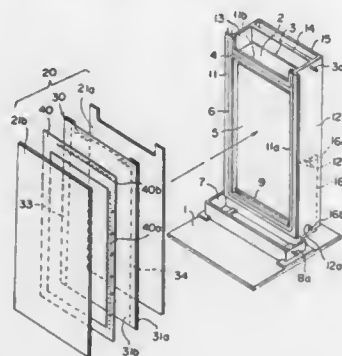
Filed Feb. 9, 1987, Ser. No. 12,402

Claims priority, application Japan, Feb. 7, 1986, 61-25587

Int. Cl.⁴ G01N 27/28

U.S. Cl. 204—299 R

6 Claims



1. An electrophoresis apparatus for conducting electrophoresis by use of an electrophoresis sheet composed of two sheet members formed of a non-conductive organic polymer film and disposed to stand facing each other, spacers having predetermined thicknesses disposed at right and left edge portions between the two sheet members, and an electrophoresis gel membrane of uniform thickness grasped between the two sheet members,

wherein the improvement comprises the provision of:

- a pair of flat plate-like supporting members for supporting said electrophoresis sheet by sandwiching it therebetween, and
- a spacer disposed between said electrophoresis sheet and at least one of said flat plate-like supporting members, and contacting edge portions of said electrophoresis sheet.

4,715,943

APPARATUS FOR SEPARATING A MIXTURE OF COMPONENTS BY THIN LAYER ELECTROPHORESIS

John Place, Geneva, and André Bregnard, Le Lignon, both of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Continuation of Ser. No. 702,721, Feb. 19, 1985, abandoned.

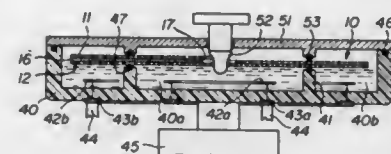
This application Nov. 26, 1986, Ser. No. 935,591

Claims priority, application Switzerland, Feb. 22, 1984, 853/84

Int. Cl.⁴ G01N 21/22

U.S. Cl. 204—299 R

13 Claims



1. Apparatus for separating by thin layer electrophoresis a mixture of components capable of being selectively displaced in an electrically conducting medium under the influence of an electric potential applied to the medium, comprising

- means for incorporating said mixture in said medium, the latter consisting of a gel contained in the moulding cavity of a mould for thin layers of polymer;
- means for connecting two distinct portions of this gel to the poles of a current source, characterized by the fact that it additionally comprises
- means for detecting and measuring, during the electrophoresis or, the relative positions of the separated components of the mixture and their separation velocity in the gel.

4,715,944

GAS SENSOR

Hiroaki Yanagida, Kashiwa, and Tadashi Ogata, Fuchu, both of Japan, assignors to Kabushiki Kaisha Advance Kaihatsu Kenkyujo, Tokyo, Japan

PCT No. PCT/JP85/00304, § 371 Date Jan. 31, 1986, § 102(e) Date Jan. 31, 1986, PCT Pub. No. WO85/05681, PCT Pub. Date Dec. 19, 1985

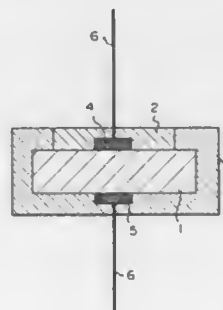
PCT Filed May 31, 1985, Ser. No. 833,400

Claims priority, application Japan, Jun. 1, 1984, 59-110856

Int. Cl.⁴ G01N 27/58

U.S. Cl. 204—426

9 Claims



1. A gas sensor for measuring the concentration of CO₂, Cl₂, SO_x or NO_x in an ambient atmosphere comprising

- a shaped solid electrolyte;
- a measurement electrode attached to a part of the surface of said solid electrolyte;
- a layer of a metal salt capable of forming a dissociative equilibrium with a gas component to be measured and which covers the exposed surfaces of both said measure-

ment electrode and said solid electrolyte adjacent said measurement electrode;

- a reference electrode attached to a part of the surface of said solid electrolyte other than that covered with said metal salt layer;
- a gas-intercepting layer covering the exposed surface of said reference electrode and substantially all of the remaining surface, not covered with said metal salt layer, of said solid electrolyte, said gas intercepting layer being substantially gas impermeable, and sealing said reference electrode from the ambient atmosphere, and
- lead lines for taking out potentials from said measurement electrode and said reference electrode.

4,715,945

AROMATIC PITCH

Ghazi Dickakian, Scotch Plains, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 241,431, Mar. 6, 1981, abandoned. This application May 9, 1983, Ser. No. 492,593

Int. Cl.⁴ C01C 1/16

U.S. Cl. 208—40

5 Claims

1. A process for the preparation of an aromatic pitch suitable for manufacturing a carbon product with an anisotropic structure comprising:

- providing a cat cracker bottom;
- distilling said cat cracker bottom to obtain a distillate fraction, said distillate fraction having a boiling point in the range of from about 500° F. to about 1000° F.;
- treating said fraction at a temperature within the range of about 400° C. to about 450° C. and 10–200 mm Hg for a period of time ranging from about 30 to about 600 minutes to produce an aromatic pitch containing a toluene insoluble content of 50 to 90 weight percent and a quinoline insoluble content of 10 to 60 weight percent; and
- stripping said treated fraction to remove a portion of the distillable oil from the treated mixture.

4,715,946

PROCESS FOR DEASPHALTING A HYDROCARBON CHARGE CONTAINING ASPHALTENES

Jean-Francois Le Page, Rueil Malmaison; Alain Billon, Orlienas; Frédéric Morel, Sainte Foy Les Lyon; Pierre Renard, Saint Nom la Breteche; Jean-Michel Bledermann, Montvilliers; Michel Laborde, Sainte Foy les Lyon, and Jacques Bousquet, Irigny, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 4, 1986, Ser. No. 848,083

Claims priority, application France, Apr. 5, 1985, 85 05350

Int. Cl.⁴ C10C 3/00

U.S. Cl. 208—45

12 Claims

1. A process for deasphalting an asphaltene-containing hydrocarbon charge, comprising the steps of:

- heating to 100°–220° C. a mixture of hydrocarbon charge with a first solvent charge comprising at least one paraffinic, olefinic or cycloparaffinic hydrocarbon having 3 to 7 carbon atoms, and feeding said heated mixture to a settling zone, the volume ratio of the solvent charge to the hydrocarbon charge being from 2.5/1 to 6/1,
- settling the mixture in a settling zone, at a temperature from 100°–220° C., to form a light phase containing deasphalted oil and solvent and a heavy asphalt phase, wherein said light phase flows upward at an upflow velocity of less than 1 cm/second, and separating the light phase from the heavy asphalt phase,
- subjecting the heavy asphalt phase to washing, by downward flow in a substantially vertical washing zone, counter-currently with an upward flow of a second solvent charge, said second solvent charge having substantially the same composition as the first solvent charge and being introduced at a temperature from 5° to 50° C. lower than the temperature of introduction of the heavy asphalt phase in the washing zone, the solvent/asphalt phase volume

ratio in said washing zone ranging from 0.5/1 to 8/1, and recovering an oil-solvent upper phase of low asphaltene content and a lower asphalt-solvent phase of high asphaltene content,

- directly recycling the oil-solvent upper phase of step (c) to the settling zone of step (a),
- separating the solvent from the lower phase of step (c) and recovering an asphalt phase, and
- separating the solvent from the light phase of step (b) and recovering the deasphalted oil phase.

4,715,947

COMBINATION PROCESS FOR THE CONVERSION OF A RESIDUAL ASPHALTENE-CONTAINING HYDROCARBONACEOUS STREAM TO MAXIMIZE MIDDLE DISTILLATE PRODUCTION

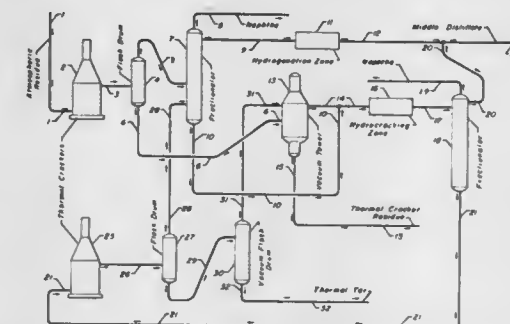
Darrell W. Staggs, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 24, 1986, Ser. No. 934,511

Int. Cl.⁴ C10G 65/14, 69/06

U.S. Cl. 208—68

14 Claims



1. A process for the conversion of a residual asphaltene-containing hydrocarbonaceous charge stock to selectively produce large quantities of high quality middle distillate while minimizing hydrogen consumption which process comprises the steps of:

- reacting said residual asphaltene-containing hydrocarbonaceous charge stock in a first non-catalytic thermal reaction zone at thermal cracking conditions including an elevated temperature from about 700° F. (371° C.) to about 950° F. (510° C.) a pressure from about 15 psig (103 kPa gauge) to about 100 psig (689 kPa gauge) and an equivalent residence time at 900° F. (482° C.) from about 2 to about 30 seconds to provide a first non-catalytic thermal reaction zone effluent;
- passing said first non-catalytic thermal reaction zone effluent into a first separation zone operated at conditions which result in the separation of entering hydrocarbonaceous compounds to provide a first middle distillate stream having olefinic hydrocarbonaceous compounds, a first distillate hydrocarbonaceous stream boiling at a temperature greater than about 700° F. (371° C.) and a first non-distillable hydrocarbonaceous stream;
- hydrotreating said first middle distillate stream having olefinic hydrocarbonaceous compounds recovered in step (b) in a catalytic hydrotreating reaction zone at hydrotreating conditions to saturate at least a portion of said olefinic hydrocarbonaceous compounds to provide a first high quality middle distillate product stream;
- reacting said first distillate hydrocarbonaceous stream boiling at a temperature greater than about 700° F. (371° C.) with hydrogen, in a catalytic hydrocracking reaction zone, at hydrocracking conditions including a maximum catalyst bed temperature in the range of about 600° F. (315° C.) to about 850° F. (454° C.) selected to convert at least a portion of said first distillate hydrocarbonaceous stream to lower-boiling hydrocarbonaceous products including a second high quality middle distillate stream;

- (e) separating the hydrocarbonaceous effluent stream produced in said catalytic hydrocracking zone of step (d) to provide a second high quality middle distillate product stream and a second distillate hydrocarbonaceous stream boiling at a temperature greater than about 700° F. (371.20 C.);
- (f) reacting said second distillate hydrocarbonaceous stream boiling at a temperature greater than about 700° F. (371° C.) in a second non-catalytic thermal reaction zone at thermal cracking conditions including an elevated temperature from about 700° F. (371° C.) to about 950° F. (510° C.), a pressure from about 50 psig (345 kPa gauge) to about 400 psig (2756 kPa gauge) and an equivalent residence time at 900° F. (482° C.) from about 5 to about 90 seconds to provide a second non-catalytic thermal reaction zone effluent;
- (g) passing said second non-catalytic thermal reaction zone effluent into a second separation zone operated at conditions to provide a thermal tar stream, a second middle distillate stream having olefinic hydrocarbonaceous compounds, and a third distillate hydrocarbon stream boiling at a temperature greater than about 700° F. (371° C.);
- (h) passing at least a portion of said second middle distillate stream having olefinic hydrocarbonaceous compounds into said first separation zone; and
- (i) passing at least a portion of said third distillate hydrocarbon stream boiling at a temperature greater than about 700° F. (371° C.) into said first separation zone.

4,715,948

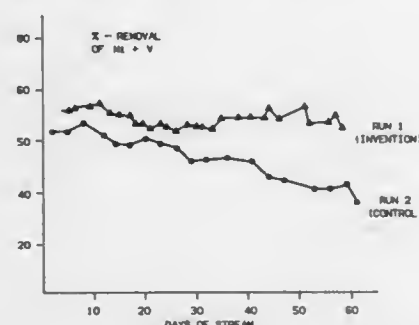
IMPROVING THE LIFE OF A CATALYST USED TO PROCESS HYDROCARBON CONTAINING FEED STREAMS

Edward L. Sughrue, II; Simon G. Kukes, and Robert J. Hogan, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 511,078, Jul. 6, 1983, abandoned. This application Feb. 17, 1984, Ser. No. 581,458 Int. Cl. C10G 45/00; C03C 6/08

U.S. Cl. 208—251 H

11 Claims



1. In a hydrofining process in which a hydrocarbon-containing feed stream is contacted under hydrofining conditions with hydrogen and a catalyst composition comprising a support selected from the group consisting of alumina, silica and silica-alumina and a promoter comprising at least one metal from Group VIB, Group VIIB, and Group VIII of the periodic table and in which said catalyst composition has been partially deactivated by use in said hydrofining process, a method for improving the activity of said catalyst composition for said hydrofining process comprising the step of adding a decomposable compound of molybdenum to said hydrocarbon-containing feed stream prior to contacting said hydrocarbon-containing feed stream with said catalyst composition, wherein the molybdenum in said decomposable compound is in a valence state of zero, wherein a sufficient quantity of said decomposable compound of molybdenum is added to said hydrocarbon-containing feed stream to result in a concentration of molybdenum in said hydrocarbon-containing feed stream in the range of about 1 to about 60 ppm and wherein said added decompos-

able compound was not added to said hydrocarbon-containing feed stream during the period of time that said catalyst composition was partially deactivated by said use in said hydrofining process.

4,715,949

HEAVY METAL SEPARATOR

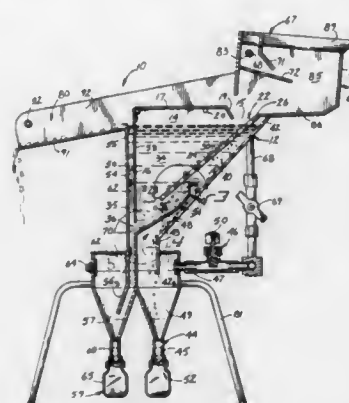
David L. Watts, 1114 - 11th, Benton City, Wash. 99320

Continuation-in-part of Ser. No. 885,835, Jul. 14, 1986. This application Nov. 5, 1986, Ser. No. 927,314

Int. Cl. B03B 5/68, 7/00

U.S. Cl. 209—17

22 Claims



1. A heavy metal separator for separating ore consisting of fine and coarse material into heavy metal particles and waste particles in which the heavy metal particles include fine heavy metal flakes having an elongated major dimension, comprising: means defining a separation chamber having an upper and a lower end; screen means mounted in the chamber, having a feed end adjacent the upper end of the chamber, extending downwardly at an inclined angle to a discharge end, the screen means dividing the chamber into a first section above the screen means and a second section below the screen means with the screen means positioned to receive the ore and adapted to allow the ore to gravitationally move downward over the screen means with the fine material passing therethrough and descending into the second section; an inclined wall, forming part of the second section and situated below the screen means, positioned to receive the fine material and to direct it on a downward path; a first water inlet means connected to the second section for providing an ascending stream of water into the second section; and baffle means mounted in the separation chamber having one end located in said second section for directing the stream of water in a direction opposite the fine material moving on said downward path for washing waste particles from the fine material and directing the waste particles from the second section into the first section; the inclined wall in conjunction with the baffle means defines a flow passage which is adapted to orient the fine heavy metal flakes with their elongated major dimension substantially parallel with the inclined wall to minimize the cross sectional area of the flakes perpendicular with the inclined wall.

4,715,950

VIBRATORY SEPARATION APPARATUS

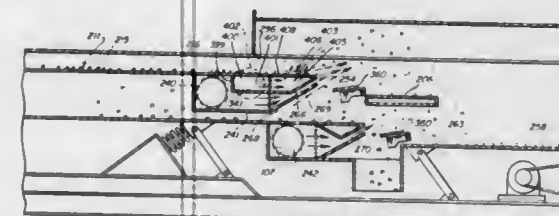
Gary A. Danner, and Raymond W. Sherman, both of Barrington, Ill., assignors to General Kinematics Corporation, Barrington, Ill.

Continuation of Ser. No. 710,606, Mar. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 589,651, Mar. 14, 1984, Pat. No. 4,624,370. This application Oct. 1, 1986, Ser. No. 914,537

Int. Cl. B07B 9/02; B07C 5/38

U.S. Cl. 209—20

10 Claims



1. An improved vibratory separating apparatus of the type having a conveying surface for moving a composite mixture in a first direction between an inlet end and a discharge end and having a first conveying plateau and a second conveying plateau spaced from the first plateau toward the discharge end and a drop-out opening between the first and second plateaus, said first plateau directing the composite mixture substantially along a plane adjacent the drop-out opening and having an edge at the drop-out opening, said second plateau having a landing area including at least a portion spaced beneath the edge of the first plateau, and means for vibrating said conveying surface to effect vibrating movement of the composite mixture, the improvement comprising:

a foraminous section in said first conveying plateau adjacent said plateau edge; said foraminous section extending from side to side and in the first direction on the first conveying plateau; first means for forcibly delivering air upwardly through the foraminous section to fluidize the composite material and to break up clumped composite material; and second means for forcibly delivering air into the drop-out opening angularly upwardly and in said first direction from underneath the composite mixture moving over the first plateau edge so that forced air from the second means cooperates with forced air delivered upwardly through the foraminous section to thereby cause air delivered through the foraminous section to be drawn in the first direction so that the air both delivered upwardly through the foraminous section and directed angularly upwardly by the second means through the drop-out opening propels materials of a predetermined size and density over the drop-out opening and onto the landing area on the second plateau for conveyance to a first area, said materials other than those intercepted by the landing area falling through the drop-out opening for separate collection in a second area.

4,715,951

APPARATUS FOR SEPARATING GRANULATE MATERIAL

Wolfgang Krambrock, and Hans Hoppe, both of Aichwiesen, Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Continuation of Ser. No. 711,472, Mar. 13, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 921,887

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409814

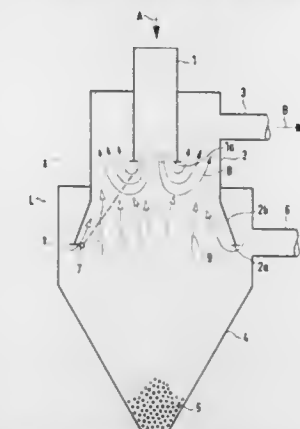
Int. Cl. B07B 7/02

U.S. Cl. 209—138

3 Claims

1. Apparatus for pneumatically separating mixed granulate material, comprising a vertically disposed housing closed at its top and open at its bottom defining an interior chamber, a

collecting hopper concentrically surrounding said housing having a cylindrical wall extending at least in part below the bottom of said housing and having an upper end wall mounted on said housing and a conical bottom wall below said housing for collecting material therein, pneumatic feed means for delivering mixed granulate material to said housing said pneumatic feed means comprising a feed pipe extending concentrically through the top of said housing terminating in a mouth in said chamber below said top and above said bottom, said housing having a side wall section below the mouth of said feed pipe widened conically outward in the direction of said collecting hopper defining a widening space within said housing, an air discharge conduit radially passing through said housing in communication with said chamber above said mouth and an



inlet conduit means radially passing through the cylindrical wall of said collecting hopper for introducing air radially into said housing in part impinging on the outer surface of said side wall section and in part being deflected upwardly into the mouth of the conically widened side wall section of said housing, the widening space within said housing between the mouth of said feed pipe and the edge of the conically widened side wall section of said housing preventing said granulate material from being radially impinged thereon and defining a braking stretch in which the downwardly moving particles are contacted by the radial and upward counter moving air to effect classification of said granulate material therein whereby the coarser material falls into said hopper and the finer material is discharged through said discharge conduit.

4,715,952

REVERSE OSMOSIS WATER PURIFICATION ELEMENT AND CARTRIDGE

Walter P. Casey, Jr., 5226 S. Topaz Rd., Las Vegas, Nev. 89120

Continuation of Ser. No. 357,213, Mar. 11, 1982, abandoned.

This application Dec. 30, 1983, Ser. No. 567,184

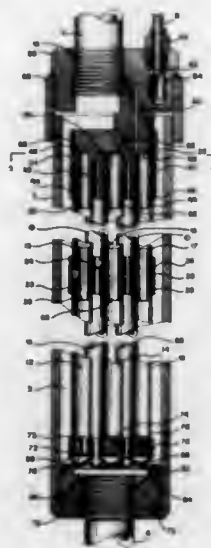
Int. Cl. B01D 13/00

U.S. Cl. 210—136

1 Claim

1. A reverse osmosis water purification unit comprising a hollow cylindrical housing, closure means at each end of the housing, said housing and closure means forming a chamber, an aqueous fluid inlet communicating with the chamber comprising a radially offset bore through one of said closure means, a brine outlet, a purified water outlet, a plurality of hollow tubular reverse osmosis separating elements mounted in the chamber, each element comprising an elongate, straight, rigid, plastic tubular member having a semipermeable membrane disposed around an exterior surface of said member, a plurality of grooves extending along the entire length of said member adapted to carry purified water passing through the membrane, conduit means for conducting said purified water to an interior portion of the element, a manifold having a plurality of mounting members comprising lugs adapted to slideably fit into end portions of the elements, thereby connecting the tubular elements to the manifold, a purified water collection

chamber, and second conduit means extending through the mounting member connecting the interior of each tubular element to the purified water collection chamber, and check valve means to preclude flow of purified water from the purified water outlet into the chamber, said check valve means



comprising an exit chamber defined by walls having a circular cross-section and having an open end, a flexible sleeve removably mounted in said exit chamber, and an exit bore for conducting purified water from the collection chamber through a wall of the exit chamber radially with said chamber and adjacent said flexible sleeve.

4,715,953

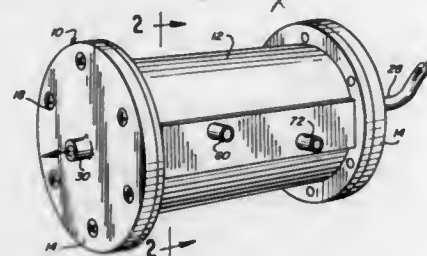
HOLLOW FIBER SEPARATION DEVICE MANIFOLD
Ronald J. Leonard, Harvard, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 1, 1983, Ser. No. 481,439

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—321.8

11 Claims



1. In a hollow fiber separation device which comprises a core, a bundle of hollow tubular fibers for separation of materials, said fibers being circumferentially wrapped about the longitudinal axis of said core, a housing enclosing said bundle, a first manifold system for permitting fluid flow through said bundle in a first flow path in contact with the exterior surfaces of said hollow fibers, and a second manifold system for permitting fluid flow through the bores of said hollow fibers in a second flow path separated from the first flow path, said second manifold system including a space extending longitudinally through said circumferentially wrapped bundle exposing open ends of said fibers at opposed sides of said space, regions of said bundle adjacent to said space being potted to prevent leakage around said fibers, the improvement comprising, in combination:

said second manifold system including an inlet conduit and an outlet conduit, each being in flow communication with said space, and partition means in said space to isolate fluid flow between the inlet conduit and one of said opposed

sides from fluid flow between the outlet conduit and the other of said opposed sides.

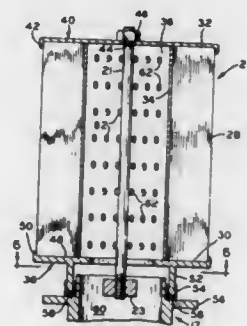
4,715,954

TRIANGULAR FILTER CARTRIDGE AND APPARATUS
Howard T. DeGraffenreid, P.O. Box 261, Inola, Okla. 74036
Continuation-in-part of Ser. No. 632,451, Jul. 19, 1984, Pat. No. 4,613,438. This application Sep. 22, 1986, Ser. No. 910,693
The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.

Int. Cl.⁴ B01D 29/32

U.S. Cl. 210—323.1

4 Claims



1. A fluid filter apparatus comprising:

a vessel having a generally cylindrical inner surface and a longitudinal axis,
a filter cartridge assembly for filtering a fluid and comprising a plurality of individually replaceable filter cartridges disposed in said filter vessel,

each said replaceable filter cartridge comprising an elongate permeable filter medium including means defining a passage therein, said filter medium remaining in an essentially constant configuration throughout the filtering process, a porous support member being in supporting relationship with said elongate permeable medium, and upper and lower end caps secured to respective opposite ends of said elongate permeable filter medium, said elongate permeable filter medium having a generally triangularly shaped outer peripheral surface having three substantially flat elongate sides, adjacent ones of the elongate sides being joined by an arcuate portion so that each triangularly shaped filter cartridge has rounded corners,

at least some of said filter cartridges being arranged in a generally circular pattern around the inner cylindrical surface of the vessel such that a flat side of each of said cartridges in the circular pattern is in direct facing relationship with said vessel inner surface and an opposite rounded corner of the cartridge faces radially inward toward the longitudinal axis of said vessel, adjacent flat sides of adjacent cartridges in the circular pattern generally facing each other, whereby the filter cartridges are closely spaced within said vessel thereby increasing filtration capacity; and

a plurality of mounting stools within a lower portion of said vessel,

said lower end cap comprising a generally cylindrical skirt depending downwardly and being sealingly supported against a respective said mounting stool, said skirt encircling and being concentric with an upwardly extending skirt portion of said mounting stool.

4,715,955

ULTRAFILTRATION APPARATUS

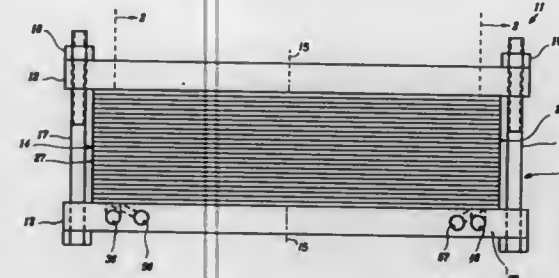
Denis R. Friedman, Acton, Mass., assignor to Filtron Technology Corp., Clinton, Mass.

Filed Dec. 22, 1986, Ser. No. 944,060

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—346

21 Claims



1. A filtration apparatus comprising:

a filtration module comprising an axially stacked plurality of filter membrane sheets, said module defining a stack of fluid flow chambers having multi-edged perimeters and disposed on opposite sides of and substantially coextensive with each said membrane sheet, the perimeters of said membrane sheets and said chambers being sealed such that fluid flow between adjacent chambers must pass through a said membrane sheet straddled thereby; said module defining a plurality of feed passages communicating with alternating ones of said chambers adjacent first axially aligned edges thereof, a plurality of retentate passages communicating with said alternating chambers adjacent to second axially aligned edges thereof opposite to said first edges, and a plurality of filtrate passage means communicating with other ones of said chambers between said alternating ones thereof, said filtrate passage means entering said other chambers adjacent to either said first or second aligned edges;

a base frame means; and

a pair of parallel plates supported by said frame means and movable thereon relative to each other in directions normal thereto, said module being retained between said parallel plates with said direction of movement thereof aligned with the axis of said membrane sheets; and wherein one of said plates defines a first channel substantially parallel to and axially aligned with said first edges, a second channel substantially parallel to and axially aligned with said second edges, and a third channel means including one portion substantially parallel to either of said first and second edges and another portion transverse thereto and extending a distance therebetween.

4,715,956

VIBRATING SCREEN CENTRIFUGE

Wolfgang Heckmann, Bergisch Gladbach, and Wolfgang Epper, Bergheim, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 885,230

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524878

Int. Cl.⁴ B01D 17/038

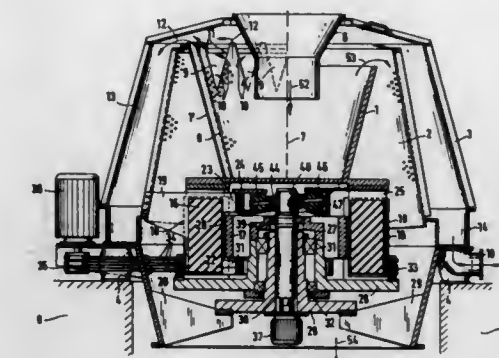
U.S. Cl. 210—363

20 Claims

1. A vibrating screen centrifuge for dewatering fine-grained material comprising in combination:

a first container for receiving material providing a first mass;
a second container for receiving material from the first for separating material from liquid providing a second mass;
means enabling mutual cancellation of mass forces sufficient to preclude transmission of mass forces on to the bearings of said centrifuge, including resilient connections between

said masses permitting relative movement between containers limited by said connections;
means driving said masses in simultaneous rotation;



and means inducing vibration in said masses with a phase shift of 180° in an axial direction with said resilient connections accommodating vibrations of each mass relatively independent of the other.

4,715,957

CORN-WATER SLURRY SEPARATOR DEVICE

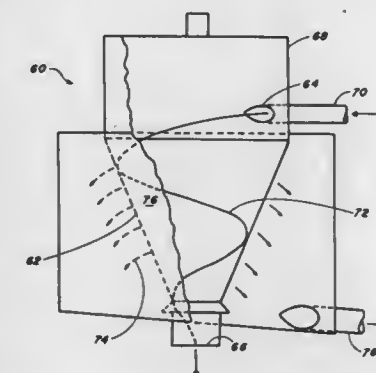
Kevin C. Cogan, Carrollton; Edward L. Ouellette, Corinth, and Martin Morua, Irving, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Continuation of Ser. No. 608,380, May 9, 1984, abandoned. This application May 1, 1986, Ser. No. 858,867

Int. Cl.⁴ B04C 5/10; B01D 53/24

U.S. Cl. 210—497.3

4 Claims



1. A stationary, non-moving dewatering device for separating corn from a corn and water slurry comprising:

- a. an upper cylindrical portion of said device oriented about a vertical axis having walls defining an upper inlet port;
- b. an inverted conical portion adjacent the upper cylindrical portion, the inverted conical portion tapering from top to bottom and defining a lower exit port;
- c. the walls of said inverted conical portion being of a non-protruding surface and defining apertures evenly spaced throughout said non-protruding surface, said apertures being sized to permit the passage therethrough of the water in the corn and water slurry, while preventing the passage therethrough of the corn in the corn and water slurry; and
- d. the upper cylindrical portion defining an inlet port therein, said inlet port being aligned with a corn and water slurry inlet pipe such that said slurry is introduced tangentially into said inverted conical portion; whereby the slurry is decelerated as it traverses said inverted conical portion, thus minimizing damage to the corn.

4,715,958

PROCESS AND MEANS FOR CONDUCTING THE DENITRIFICATION OF WATER

Uwe Fuchs, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany
Continuation of Ser. No. 525,360, Aug. 22, 1983, abandoned.
This application Oct. 21, 1985, Ser. No. 788,705

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232095

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.⁴ C02F 3/08, 3/10

U.S. Cl. 210—605

15 Claims

1. In a process for the biological denitrification of water which is at least substantially free of carbon, and wherein the water is denitrified in a reactor in the presence of a carrier material supporting denitrifying microorganisms thereon, the improvement comprising conducting denitrification in a reactor in the presence of a carrier material which is not a carbon source for denitrifying microorganisms carried thereon and which is impregnated with organic substances separate from the carrier material in a manner such that the organic substances do not effectively enter into solution with the water being treated, with no substantial increase in BOD₅, said organic substances being biodegradable and at least partially insoluble in water and being employed as a carbon source by the denitrifying microorganisms, and the carrier material having been impregnated with said organic substances prior to being placed in the reactor for conducting the denitrification process whereby the requirement of providing a separate carbon source for the denitrifying microorganisms to effect denitrification is avoided, said carrier material being non-surface active and comprising at least one of sand, gravel, plastic filler bodies, porous mineral material, urea-formaldehyde resins, polyethylene, polypropylene, polyurethane, silicone polymers and natural sponges, and is in at least one of open-celled, foam and sintered lump form, and wherein influent water introduced into the reactor has a COD-content of about 1-200 mg/l.

4,715,959

APPARATUS AND METHOD FOR CONTROLLING ULTRAFILTRATION DURING HEMODIALYSIS

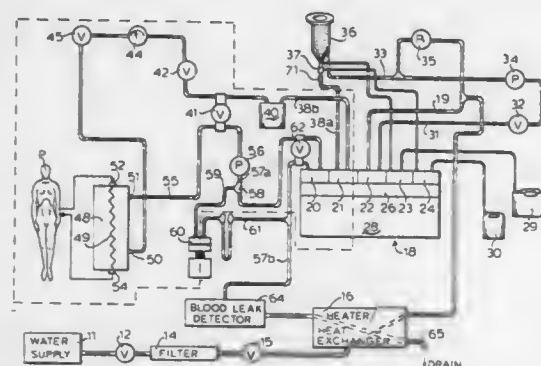
Jonathan M. Allan, Portland; Richard J. Burton, Tigard, both of Oreg., and Volker Jurock, Rodgau, Fed. Rep. of Germany, assignors to CD Medical Inc., Miami Lakes, Fla.

Continuation of Ser. No. 413,287, Aug. 31, 1982, Pat. No. 4,477,342. This application May 3, 1984, Ser. No. 606,505

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—637

3 Claims



3. A method of hemodialytic ultrafiltration using a semipermeable membrane device having a blood chamber and a dialy-

sate chamber that minimizes pressure transients in the dialysate chamber of the semipermeable membrane device and thereby reduces ultrafiltration error caused by system compliance comprising the steps:

- providing fresh dialysate fluid;
- reducing and regulating the pressure of said fresh dialysate fluid to substantially match the pressure in the dialysate chamber of the semipermeable membrane device;
- introducing said reduced pressure fluid to an input of a first positive displacement device;
- conveying said reduced pressure fluid from an output of the positive displacement device to the input of the semipermeable membrane device;
- withdrawing said reduced pressure fluid from an output of the semipermeable membrane device;
- increasing the pressure of said withdrawn fluid; and
- introducing said increased pressure withdrawn fluid to an input of a second positive displacement device and to an input of an ultrafiltrate withdrawal device.

4,715,960

METHOD FOR THE MODIFICATION OF POLYCARBONATE MEMBRANES, THE MEMBRANES PRODUCED BY SUCH METHOD AND THEIR USE

John A. Thompson, Wyoming, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 10, 1983, Ser. No. 474,008

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—651

10 Claims

5. A method for selectively separating organic liquids by the use of polycarbonate membrane prepared by the treatment method comprising contacting said membrane with a solvent having a solubility parameter in the range 8.9-10 (cal/cm³)^{0.5}, said contacting being conducted for a time sufficient to result in shrinkage of the membrane but insufficient to result in dissolution of the membrane, wherein the organic liquids are separated by selective permeation through said polycarbonate membrane under conditions of temperature and pressure sufficient to effect said separation.

4,715,961

UREA ADSORBENT

Masayuki Mishima, Machida, Japan, assignor to Research Dev. Corp. of Japan and Kao Corporation, both of Tokyo, Japan
Division of Ser. No. 890,558, Jul. 30, 1986, Pat. No. 4,677,135.

This application Mar. 10, 1987, Ser. No. 24,020

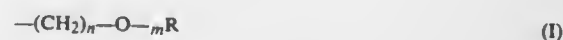
Claims priority, application Japan, Aug. 6, 1985, 60-171760

Int. Cl.⁴ B01D 15/04

U.S. Cl. 210—692

8 Claims

1. A urea adsorbent comprising hollow microspheres each including an outer layer formed of a urea-permeable polymer, and an inner layer formed of a polymer containing, as its component, a polyoxyalkylene glycol derivative expressed by the following formula (I):



wherein n is an integer of 2-5, m is an integer of at least 3 and R stands for hydrogen or a methyl group.

4,715,962

AMPHOLYTIC DIALLYLDIMETHYL AMMONIUM CHLORIDE (DADMAC) COPOLYMERS AND TERPOLYMERS FOR WATER CLARIFICATION

Bhupati R. Bhattacharyya, Downers Grove; Sanjay R. Srivatsa, Naperville, and Michael L. Dwyer, Crest Hill, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 15, 1986, Ser. No. 896,791

Int. Cl.⁴ C02F 1/56

U.S. Cl. 210—708

6 Claims

1. A method of removing emulsified impurities from a waste oil emulsion selected from the group consisting of a petroleum refinery waste water and an automotive oily effluent water which comprises treating these impurity-containing waters with an effective amount of a water-soluble polymer consisting essentially of Diallyldimethyl Ammonium Chloride and either,

- A. from 5 to 25 mole percent of either acrylic acid or methacrylic acid, or
 - B. from 5 to 25 mole percent of either acrylic acid or methacrylic acid and from 1-10 percent of a hydroxy C₂-C₆ alkyl acrylate or methacrylate;
- which polymer has an intrinsic viscosity of at least 0.5, and then separating the polymer and emulsified impurities from the impurity-containing waters.

4,715,963

METHOD OF DEWATERING FOOD ITEMS

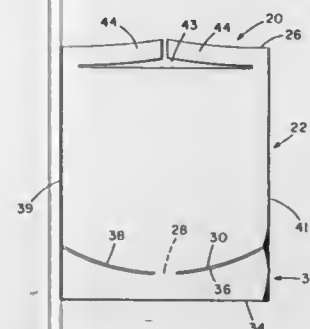
Darlene N. Jones, 842 William, River Forest, Ill. 60305

Division of Ser. No. 798,925, Nov. 18, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 32,177

Int. Cl.⁴ B01D 17/038

U.S. Cl. 210—781

2 Claims



1. A method for dewatering food items comprising the steps of:

- placing the food items in a compartment formed from flexible thinwall sheet material, said compartment having an open top and an opening opposite the open top sized to permit passage of liquid but substantially to prevent passage of the food items therethrough; and
- twirling the compartment nearby its open top to cause water from the food items to be expelled through the opening by centrifugal force.

4,715,964

METHOD FOR FILTERING CONTAMINATED LIQUIDS

Eugene H. Harms, Perrysburg, Ohio, assignor to Henry Filters, Inc., Bowling Green, Ohio

Filed Nov. 19, 1986, Ser. No. 932,317

Int. Cl.⁴ B01D 27/04, 33/04

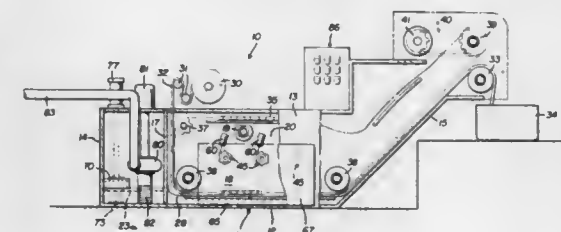
U.S. Cl. 210—783

6 Claims

1. A method of supplying machining coolant of a predetermined clarity to a plurality of machines and supplying to other machines a lesser volume of coolant of enhanced clarity containing less than about 5 PPM particles of a size less than about 5 microns, the method comprising the steps of:

- (1) dumping used coolant from all of the machines into a common pool;
- (2) pumping and filtering used coolant from the pool simulta-

neously through (a) a perforate filter drum to obtain a large volume of coolant of the requisite clarity for said plurality of machines, and (b) a paper filter medium located at the bottom of the pool to obtain a limited volume of clean coolant of enhanced clarity containing less than



about 5 PPM particles of a size less than about 5 microns for said other machines; and
(3) circulating clean coolant of the requisite clarity from step (2)(a) to the plurality of machines and the clean coolant of enhanced clarity from step (2)(b) to those machines requiring same.

4,715,965

METHOD FOR SEPARATING AND RECOVERING VOLATILIZABLE CONTAMINANTS FROM SOIL

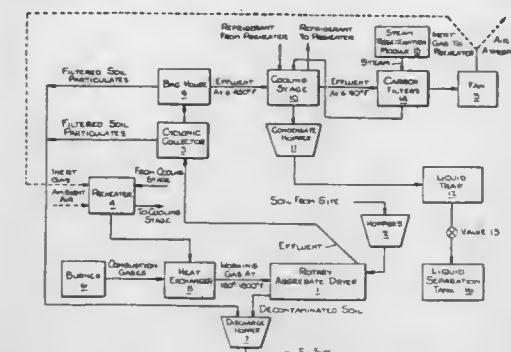
Adam L. Sigerson, Box 9083 - R.D. 7, Sussex, N.J. 07461, and James E. Shirk, 402 Fairmount Ave., Jersey City, N.J. 07306

Filed May 19, 1986, Ser. No. 864,720

Int. Cl.⁴ F26B 3/04

U.S. Cl. 210—800

11 Claims



4,715,966

SEPTIC TANK SLUDGE LEVEL INDICATOR

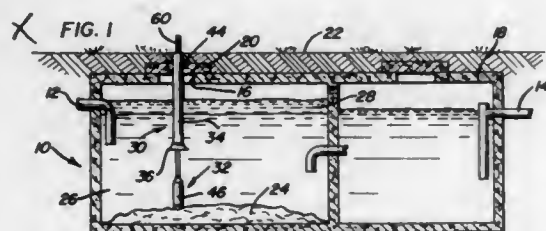
Gary K. Bowman, Springfield, Ohio, assignor to Ingenuity Unlimited, Inc., Springfield, Ohio

Filed Nov. 26, 1985, Ser. No. 802,584

Int. Cl.⁴ B01D 21/34

U.S. Cl. 210-800

9 Claims



1. A septic tank sludge level indicator comprising an elongated hollow member adapted to extend through the top wall of a septic tank with the lower end thereof oriented in liquid material in the tank and the upper end thereof oriented substantially at ground level and a float assembly inserted through the hollow member from the upper end thereof and adapted to be inserted into the interior of the septic tank and into engagement with the upper surface of sludge collected in the bottom of the septic tank, said float assembly including a float member and an elongated indicator member extending above the upper end of the hollow member with the float assembly being of sufficient weight not to be buoyant in the liquid but adapted to be supported by and stopped by the upper surface of the sludge to enable the depth of sludge in the septic tank to be determined.

9. The method of determining the vertical depth of accumulated sludge in the bottom portion of a septic tank in order to enable accumulation of the sludge to a maximum safe vertical depth before removing the sludge from the tank by providing a visual indication of the depth of sludge in the tank at a point above ground level to enable determination of the sludge depth from a point above ground level, said method consisting of the steps of providing a tubular guide through the top wall of the septic tank with the upper end of the guide being substantially at ground level and the lower end of the guide being above the upper surface of the sludge when at its maximum safe depth, inserting an elongated indicator member downwardly into the guide with the indicator member including indicia thereon associated with the upper end of the guide to indicate the depth of insertion of the indicator member into the guide and providing the lower end of the indicator member with means thereon engaged with the upper surface of the sludge with the weight of the indicator member and said means on the lower end thereof and the configuration of the means on the lower end thereof enabling the indicator member and means on the lower end thereof to be supported from the upper surface of the sludge when the means on the lower end of the indicator member comes into contact with the upper surface of the sludge with the indicator member and means thereon not capable of being supported by liquid in the septic tank when the indicator member and means on the lower end thereof comes into contact with the liquid thereby enabling the indicator member to be observed at ground level for determining the vertical depth of the accumulated sludge in the bottom of the septic tank.

4,715,967

COMPOSITION AND METHOD FOR TEMPORARILY REDUCING PERMEABILITY OF SUBTERRANEAN FORMATIONS

Harold E. Bellis, and Edward F. McBride, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1985, Ser. No. 822,589

Int. Cl.⁴ E21B 43/27, 43/26

U.S. Cl. 252-8.551

17 Claims

1. A wellbore fluid for reducing the permeability of a subterranean formation penetrated by a wellbore comprising a fluid having dispersed therein a sufficient amount of a treatment agent for successful fluid control, said treatment agent comprising discrete solid structures of a condensation product of hydroxyacetic acid with up to 15 wt. % cocondensing compounds containing other hydroxy-, carboxylic-acid-, or hydroxycarboxylic acid moieties, said condensation product having a number average molecular weight of about 200 to 4000, being substantially crystalline at both ambient and wellbore temperatures and having a melting point of about 160° or higher and sufficiently high to avoid softening or melting during use and being substantially insoluble in said wellbore fluid and degradable in the presence of water at elevated temperature to monomers and dimers which are at least partially soluble in oil or water.

4,715,968

NON-BLOOMING ANTISTATIC AGENTS

Gerald Sugerman, Allendale, N.J., and Salvatore J. Monte, Staten Island, N.Y., assignors to Kenrich Petrochemicals Inc., Bayonne, N.J.

Filed May 8, 1986, Ser. No. 861,094

Int. Cl.⁴ D06M 13/26

U.S. Cl. 252-8.6

12 Claims

1. An antistatic composition comprising a polymeric material selected from polyolefins, polystyrenic and polyester polymers having admixed therewith from 100 to 10,000 ppm of an antistatic agent which is an amino or sulfonyl titanate or zirconate.

4,715,969

CONTROLLING VISCOSITY OF FABRIC SOFTENING HEAVY DUTY LIQUID DETERGENT CONTAINING BENTONITE

Adam A. Rothanavibhata, East Brunswick, and Richard K. Payne, Sayreville, both of N.J., assignors to Colgate Palmolive Co., New York, N.Y.

Continuation of Ser. No. 685,346, Dec. 24, 1984, abandoned.

This application Jul. 23, 1986, Ser. No. 889,147

Int. Cl.⁴ D06M 11/00

U.S. Cl. 252-8.7

7 Claims

1. A fabric softening heavy duty liquid detergent composition of a density in the range of 1.15 to 1.35 g./ml. at room temperature, a pH in the range of 9.5 to 11, and a viscosity in the range of 1,000 to 5,000 centipoises, which does not increase to more than 5,000 centipoises on thirty days quiescent storage at room temperature, which comprises 6 to 12% of sodium linear higher alkylbenzene sulfonate wherein the higher alkyl is of 12 to 15 carbon atoms, 1.5 to 3% of sodium alkyl polyethoxy sulfate wherein the alkyl is of 12 to 16 carbon atoms and the polyethoxy is of 2 to 7 ethylene oxide groups, 7 to 15% of sodium tripolyphosphate, 2 to 7% of sodium carbonate, 8 to 15% of finely divided swelling bentonite, 0.12 to 0.18% of sodium polyacrylate of molecular weight in the range of 1,000 to 3,000, and 50 to 70% of water.

4,715,970

WASH CYCLE ADDITIVE ANTISTATIC COMPOSITION FOR TREATMENT OF LAUNDRY, PROCESS FOR MANUFACTURE OF SUCH COMPOSITION AND METHOD OF USE THEREOF

Robert J. Steltenkamp, Somerset, and Michael A. Camara, Jackson, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 883,193, Jul. 8, 1986, which is a continuation of Ser. No. 734,508, May 16, 1985, Pat. No. 4,619,775. This application Dec. 8, 1986, Ser. No. 939,313

The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.

Int. Cl.⁴ C11D 3/32

U.S. Cl. 252-8.8

20 Claims

1. A wash cycle additive antistatic composition for treatment of laundry in wash water to make it antistatic after washing and automatic machine drying, which comprises an antistatic proportion, sufficient to impart antistatic characteristics to the laundry during washing when the wash cycle additive composition is charged to the wash water during the wash cycle at a concentration in the range of 0.1 to 2 g./l., of antistatic polyamide of trialkylacetic acid and polyamine, wherein the alkyls of the trialkylacetic acid moiety are of 1 to 10 carbon atoms each and the polyamine moiety contains from 2 to 5 amino groups, and a particulate carrier or liquid medium for building or filling a detergent, or is an aqueous medium containing a nonionic surface active agent.

4,715,971

WELL DRILLING AND COMPLETION COMPOSITION

Boyton T. Blair, Slidell, La., assignor to Engineering & Colloid, Ltd., Slidell, La.

Filed Dec. 9, 1985, Ser. No. 806,437

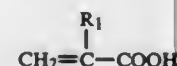
Int. Cl.⁴ C09K 7/02

U.S. Cl. 252-8.51

10 Claims

1. A water base well drilling and completion composition comprising per each barrel of water base well drilling and completion composition:

(a) from about 0.10 lbs to about 6.0 lbs of a potassium salt of a copolymer of a first compound having the formula



wherein R₁ is selected from the group consisting of H and an alkyl having 1 to 4 carbon atoms, and a second compound having the formula CH₂=CH-COO-R₂ wherein R₂ is selected from the group consisting of an alkyl radical and a hydroxyalkyl wherein said alkyl and hydroxyalkyl each have 1 to 4 carbon atoms, said first compound and said second compound are combined in a molar ratio of from about 1:1 to about 3:1 of the first compound to the second compound, and said copolymer has a weight average molecular weight of less than about 20,000; and

(b) from about 0.10 quarts to about 10.0 quarts of an accelerator catalyst having water, from about 10 lbs to about 80 lbs of KOH per each bbl. of water, from about 25 lbs to about 50 lbs of lignite per each bbl. of water, and from about 1.0 lbs to about 10 lbs of sulfonated polystyrene per each bbl. of water and wherein said sulfonated polystyrene has an average molecular weight of from about 1 to about 12 million, and said accelerator catalyst having been prepared by heating the mixture of water, lignite, KOH and sulfonated polystyrene to a temperature of at least 120° F. while simultaneously stirring for at least 30 minutes.

4,715,972

SOLID LUBRICANT ADDITIVE FOR GEAR OILS

Paula J. Pacholke, 3420 Shenandoah Ave., Port Huron, Mich. 48060

Filed Apr. 16, 1986, Ser. No. 852,420

Int. Cl.⁴ C10M 103/00, 125/00

U.S. Cl. 252-25

1 Claim

1. A method for demulsifying contaminant water out of gear oil as determined by ASTM test D-2711 by adding to said gear oil a composition consisting essentially of:

about 0.01 percent to about 65 percent by weight of the additive composition of solid lubricant particles selected from the group consisting of molybdenum disulfide, graphite, cerium fluoride, zinc oxide, tungsten disulfide, mica, boron nitrate, boron nitride, borax, silver sulfate, cadmium iodide, lead iodide, barium fluoride, tin sulfide, fluorinated carbon, PTFE, intercalated graphite, zinc phosphide, zinc phosphate, and mixtures thereof;

about 0.01 to about 25 percent by weight of the additive composition, of a stabilizing agent consisting essentially of an ethylene-propylene copolymer consisting of approximately equivalent proportions of ethylene and propylene monomers;

and a suitable fluid carrier, and demulsifying said contaminant water.

4,715,973

LUBRICATING OIL COMPOSITIONS

Feike de Jong, and Jacob Vermeule, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 30, 1986, Ser. No. 835,580

Claims priority, application Netherlands, Mar. 15, 1985, 8500753

Int. Cl.⁴ C10M 141/02

U.S. Cl. 252-40.5

28 Claims

1. A composition of matter stable above 140° C. prepared by the process steps of: stirring a lubricating oil mixture comprising at least one hydrocarbon lubricating oil with at least one basic polyvalent metal salt of a naphthenic acid having a basicity of between about 100 and about 1000%, and admixing at least one compound selected from the group consisting of a first polyester, a salt of said first polyester, and mixtures thereof, said first polyester being derived from at least one hydroxycarboxylic acid of the general formula HO-X-COOH, wherein X represents a bivalent saturated or unsaturated aliphatic radical containing at least 8 carbon atoms with at least 4 carbon atoms situated between the hydroxyl group and the carboxyl group, and a second polyester, a salt of said second polyester, and mixtures thereof, said second polyester being derived from a mixture of at least one hydroxycarboxylic acid of the general formula HO-X-COOH and at least one carboxylic acid containing no hydroxyl groups to form said stable composition of matter.

4,715,974

COPPER SALTS OF SULFURIZED FATTY ACIDS AS ANTIOXIDANTS

Liehpao O. Farn, and Andrew G. Horodysky, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

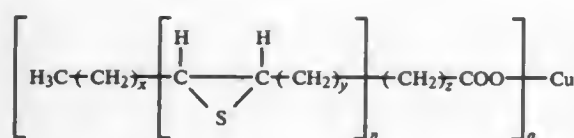
Filed Apr. 14, 1987, Ser. No. 38,080

Int. Cl.⁴ C10M 135/34, 153/02

U.S. Cl. 252-46.4

22 Claims

1. A composition comprising a major proportion of an oil of lubricating viscosity or grease or other solid lubricant prepared therefrom and a minor multifunctional amount, sufficient to impart antioxidant and/or anticorrosion, antiwear and EP properties thereto, of a mixture of sulfurized fatty acid copper salts containing at least one copper salt having the following generalized structure:



where x and z are from 0 to about 18, n is from 1 to about 4, y is from 0 to about 3 and q is 1 or 2.

4,715,975 OIL CONTAINING DISPERSANT VII OLEFIN COPOLYMER

Maria M. Kapuscinski, Carmel; Benjamin J. Kaufman, Wappingers Falls, and Christopher S. Liu, Poughkeepsie, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,314

Int. Cl.⁴ C10M 149/04; C08F 26/02

U.S. Cl. 252—50

12 Claims

1. A graft polymer comprising an oil-soluble, substantially linear, carbon-carbon backbone polymer having graft polymerized thereon units derived from allyl amine.

4,715,976 ELECTROLYTE SOLUTION FOR ELECTROLYTIC CAPACITOR

Shoichiro Mori, and Makoto Ue, both of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

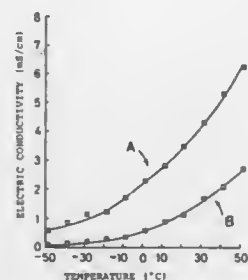
Filed Dec. 19, 1986, Ser. No. 943,728

Claims priority, application Japan, Dec. 20, 1985, 60-286980; Dec. 20, 1985, 60-286982; Apr. 28, 1986, 61-98673

Int. Cl.⁴ H01G 9/02

U.S. Cl. 252—62.2

9 Claims



1. An electrolyte solution for use in an electrolytic capacitor, said solution comprising as a solute at least one quaternary ammonium salt of a carboxylic acid selected from the group consisting of

- quaternary ammonium salts of at least one of maleic acid and citraconic acid wherein the mole ratio of acid to ammonium is substantially 1/1,
- quaternary ammonium salts of aromatic carboxylic acids, wherein the mole ratio of acid to ammonium is 1/1 to 4/1 for monocarboxylic acids, substantially 1/1 for dicarboxylic acids, 0.33/1 to 1.33/1 for tricarboxylic acids and 0.25/1 to 1/1 for tetracarboxylic acids, and
- quaternary ammonium salts of branched-chain aliphatic dicarboxylic acids having 11 to 30 carbon atoms in total.

4,715,977 MAGNETIC COATING COMPOSITIONS FROM CARBOXYLIC ACID-GRAFTED PHENOXY RESINS

George A. Salensky, Hunterdon County, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 725,535, Apr. 22, 1985, Pat. No. 4,638,038.

This application Oct. 2, 1986, Ser. No. 914,794

Int. Cl.⁴ C04B 35/04; H01F 1/00

U.S. Cl. 252—62.54

11 Claims

1. A magnetic coating composition for magnetic recording media comprising:

- a phenoxy resin having pendant secondary hydroxyl groups of which about 3 to about 50% of such hydroxyl groups have been reacted to produce moieties having pendant carboxyl groups,
- a magnetic powder, and
- an organic solvent.

4,715,978 HEAT STORAGE COMPOSITION, LATENT HEAT STORAGE CAPSULES CONTAINING SAID HEAT-STORAGE COMPOSITION AND TEMPERATURE CONTROL APPARATUS USING SAID CAPSULES

Naomichi Yano, Takarazuka; Tadatsugu Ueno, Osaka, and Shigeru Tsuboi, Amagasaki, all of Japan, assignors to Kubota Tekko Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1986, Ser. No. 850,100

Int. Cl.⁴ C09K 5/06

U.S. Cl. 252—70

5 Claims

1. A heat storage composition containing calcium chloride hexahydrate as the main component, which contains, as nucleating agents for preventing supercooling, 0-5 percent by weight (on the whole heat storage composition basis) of barium sulfide, 0.001-5 percent by weight (on the same basis) of barium chloride dihydrate and 0.001-0.1 percent by weight (on the same basis) of strontium chloride hexahydrate.

4,715,979 GRANULAR DETERGENT COMPOSITIONS HAVING IMPROVED SOLUBILITY

Jeffrey E. Moore; Brett A. Evans, and Richard Hansen, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 785,933, Oct. 9, 1985, abandoned. This application Oct. 9, 1986, Ser. No. 916,985

Int. Cl.⁴ C11D 1/12, 1/755

U.S. Cl. 252—91

24 Claims

1. A granular rapidly dissolving detergent composition prepared by:

- forming base granules comprising, by weight:
 - from about 30% to about 85% of a mixture of a C₁₁-C₁₃ alkylbenzene sulfonate surfactant and a C₁₂-C₁₆ alkyl sulfate surfactant in a weight ratio of sulfonate surfactant to sulfate surfactant of from about 4:1 to about 1:4;
 - an alkali metal silicate having a molar ratio of SiO₂ to alkali metal oxide of from about 1.0 to about 3.2; the weight ratio of (a) to (b) being from about 1.5:1 to about 6:1;
 - from about 10% to about 60% of sodium sulfate; and
 - from 0% to about 20% of a pyrophosphate or anhydrous Form I tripolyphosphate detergent builder material, or mixtures thereof; said base granules prepared by drying an aqueous slurry comprising the above components;
- admixing said base granules with from 0% to about 300%, by weight of the base granules, of a detergent builder material;
- compacting said admix at a pressure of from about 20 to about 200 psi;
- granulating the resulting compacted admix; and
- admixing an additional 0% to about 300%, by weight of

the base granules, of a detergent builder material; said composition having a bulk density of from about 0.55 to about 1.2 g/cc and an average particle size of from about 20 to about 1500 microns.

24. A laminated laundry product comprising two plies of water insoluble tissue in which:

- at least one ply is water permeable;
- at least one ply defines more than one cup, each cup being surrounded by a rim of that ply;
- the second ply is sealed to the first ply at least at the rims of the cups to physically separate the cups so that the contents of the cups remain in place; and more than one cup contains the product of claim 1.

4,715,980 ANTIMICROBIAL SANITIZING COMPOSITION CONTAINING N-ALKYL AND N-ALKENYL SUCCINIC ACID AND METHODS FOR USE

John A. Lopes, and James H. Stanton, both of Grosse Ile, Mich., assignors to Diversey Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 17, 1986, Ser. No. 840,336

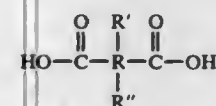
Int. Cl.⁴ C11D 3/48

U.S. Cl. 252—106

26 Claims

1. An antimicrobial concentrate composition capable of being diluted with a major amount of water to form an antimicrobial solution, the concentrate composition comprising:

- a dicarboxylic acid having the general formula:



wherein R is a saturated or unsaturated hydrocarbon moiety having two carbons; R' is a substituted or unsubstituted n-alkyl or n-alkenyl moiety having between about 6 and about 12 carbon atoms; and R'' is a substituent selected from the group consisting of hydrogen and alcohol, the dicarboxylic acid being present in an amount between about 0.25 and about 25 percent by weight based on the total weight of the concentrate;

- a solubilizer present in an amount between about 0.25 and about 20 percent by weight based on the total weight of the concentrate;
- an acid present in an amount capable of yielding a solution pH below about 5.0 upon dilution of the concentrate to a use solution; and
- an anionic diluent, the diluent selected from the group consisting of alcohols, water and mixtures thereof, the diluent being present in an amount between about 10.0 and about 95 percent by weight based on the total weight of the concentrate.

4,715,981 PROCESS FOR AUGMENTING OR ENHANCING THE AROMA OF DETERGENTS USING MIXTURES OF HYDROXYBORNYLOXYBUTANES

Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 837,348, Mar. 7, 1986, Pat. No. 4,668,431, which is a continuation-in-part of Ser. No. 784,618, Oct. 4, 1985, Pat. No. 4,620,041, which is a division of Ser. No. 644,054, Aug. 24, 1984, Pat. No. 4,619,780, which is a division of Ser. No. 574,150, Jan. 26, 1984, Pat. No. 4,521,634, which is a continuation-in-part of Ser. No. 533,915, Sep. 19, 1983, Pat. No. 4,532,364, which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Jan. 9, 1987, Ser. No. 2,021

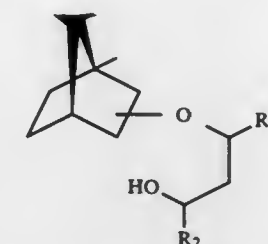
Int. Cl.⁴ C11D 3/50

U.S. Cl. 252—174.11

3 Claims

1. A process for augmenting or enhancing the aroma of a

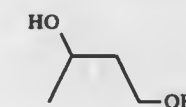
solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to said solid or liquid anionic, cationic, nonionic or zwitterionic detergent, an aroma augmenting or enhancing quantity of a mixture of compounds defined according to the generic structure:



wherein in the mixture in each of the compounds one of R₁ or R₂ is methyl and the other of R₁ and R₂ is hydrogen produced according to the process of reacting camphene having the structure:



with 1,3-butanediol having the structure:



in the presence of an acid catalyst.

4,715,982 COSMETIC COMPOSITION FOR GENTLE CLEANSING, ESPECIALLY FOR REMOVING EYE MAKEUP

Ariette Zabotto, Paris, and Jean-Claude Contamin, Morangis, both of France, assignors to L'Oréal, Paris, France

Filed Oct. 28, 1986, Ser. No. 925,135

Claims priority, application France, Oct. 31, 1985, 85 16193

Int. Cl.⁴ C11D 3/32

U.S. Cl. 252—174.17

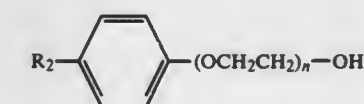
11 Claims

1. A cosmetic composition suitable for gentle cleansing which comprises:

- from 0.2 to 3% by weight of at least one active substance which is a nonionic surface-active agent which is a compound of formula (I):



wherein R₁ is a fatty chain containing from 8 to 18 carbon atoms and n is from 8 to 25, or a compound of formula (II):



wherein R₂ is a C₈-C₁₆ alkyl residue and n is from 10 to 40;

- from 0.02 to 10% by weight of at least one nonionic

polymer which is a poly-β alanine, a C₁-C₃ alkyl cellulose, a hydroxy C₁-C₃ alkyl cellulose or a hydroxy-propylated derivative of guar gum; and a cosmetically acceptable adjuvant, the above percentages being based on the total weight of the composition.

4,715,983

METHOD OF STORING A SOLID CHLORINATING AGENT

Masanori Ota, Chiba, and Hitoshi Sasahara, Tokyo, both of Japan, assignors to Nissan Chemical Industries, Ltd., Japan
Filed Dec. 16, 1985, Ser. No. 809,005

Claims priority, application Japan, Dec. 18, 1984, 59-266737
Int. Cl.⁴ C11D 7/54, 3/48; B65D 81/24; B01D 53/04

U.S. Cl. 252-186.35 8 Claims

1. A method of storing a solid chlorinating agent or a composition containing a solid chlorinating agent, comprising storing a solid chlorinating agent or a composition thereof under the ambient atmosphere together with a storage stabilizer consisting of aluminosilica gel obtained from allophane and active carbon, said stabilizer being prepared from the two components via such steps as kneading, granulation and drying.

4,715,984

LIQUID-CRYSTALLINE DIHYDROAZINES

Joachim Krause, Dieburg; Wächter, Griesheim, and Bernhard Schenble, Alsbach, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 821,195

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501849

Int. Cl.⁴ C09K 19/34; G02F 1/13; C07D 265/06, 279/06, 319/06, 339/08, 413/12, 417/12

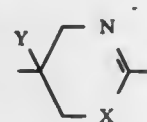
U.S. Cl. 252-299.61 18 Claims

1. A liquid crystalline phase comprising at least two liquid crystalline components at least one of which is a 5,6-dihydroazine derivative of the formula



wherein

each of R¹ and R² independently is alkyl of 1-15 C atoms, or alkyl of 1-15 C atoms in which one or two nonadjacent CH₂ groups are replaced by —O—, —CO—, —O—CO—, —CO—O— or —CH=CH—, and one of R¹ and R² can also be H, F, Cl, Br, CN, or R³—A³—Z², A¹ is —A—, —A⁴—A—, or —A—A⁴—, A is



X is O or S,

Y is H, C₁-C₄-alkyl, F, Cl, Br, or CN,

each of A², A³ and A⁴ independently is a 1,4-cyclohexylene, 1,3-dioxane-2,5-diyl or a 1,3-dithiane-2,5-diyl group; is one of said three groups substituted, respectively, in the 1- or 4, 2- or 5-, or 2- or 5-position, by C₁-C₄-alkyl, F, Cl, Br, CF₃, or CN; is a piperidine-1,4-diyl, 1,4-bicyclo[2.2.2]octylene A or 1,4-phenylene group; or is a 1,4-phenylene group substituted by one or two F, Cl, CH₃ or CN groups, or one of said phenylene groups in which one or two CH groups may also be replaced by N;

each of Z¹ and Z² independently is —CO—O—, —O—CO—, —CH₂CH₂—, —CHCN—CH₂—, —CH₂—CHCN—, —CH=CH—, —OCH₂—, —CH₂O—, —CH=N—, —N=CH—, —NO=N—, —N=NO— or a single bond and R³ is alkyl of 1-15 C atoms, alkyl of 1-15 C atoms in which

one or two nonadjacent CH₂ groups are replaced by —O—, —CO—, —O—CO—, —CO—O— or —CH=CH—, or H, F, Cl, Br, or CN,

and wherein all substituted and unsubstituted rings are selected from Cy: a 1,4-cyclohexylene group, Oaz: a 5,6-dihydro-1,3(4H)-oxazine-2,5-diyl group, Taz: a 5,6-dihydro-1,3(4H)-thiazine-2,5-diyl group, Dio: a 1,3-dioxane-2,5-diyl group, Diti: a 1,3-dithiane-2,5-diyl group, Bi: a bicyclo[2.2.2]octylene group, Pip: a piperidine-1,4-diyl group, Phe: a 1,4-phenylene group, Pyr: a pyrimidine-2,5-diyl group or Pyn: a pyridazine-3,6-diyl group.

4,715,985

COMPOSITION FOR CHECKING THE FUNCTIONING OF FIRE DETECTION INSTALLATIONS AND APPLICATION TO VARIOUS TYPES OF DETECTORS

Jean-Louis Pean, Montlhéry; Catherine Desvard, Maurepas, both of France, and Jean-Paul Barbier, Chicago, Ill., assignors to L'Air Liquide, Société Anonyme pour l'Étude et l'Exploitation des Procédés George Claude, Paris, France

Filed Oct. 30, 1985, Ser. No. 793,085

Claims priority, application France, Oct. 30, 1984, 84 16562
Int. Cl.⁴ C09K 3/30

U.S. Cl. 252-305 10 Claims

1. A composition for checking the functioning of fire detection installations comprising trifluorotrichloroethane, nitrous oxide, ethyl ether, and an alkyl phthalate selected from the group consisting of ethyl phthalate and butyl phthalate.

4,715,986

PARTICLES, MODIFIED AT THEIR SURFACE BY HYDROPHILIC AND HYDROPHOBIC GROUPS

Burghard Grüning, Ulrich Holtschmidt; Goetz Koerner, all of Essen, and Gerd Rossmay, Haltern-Lavesum, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,031

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411759

Int. Cl.⁴ B01J 13/00; C09C 3/00

U.S. Cl. 252-315.2 10 Claims

1. Particles comprising fragments having a size of less than 100 μm, said fragments being insoluble in organic solvents and water and having on one side thereof hydrophilic groups and on the other side thereof hydrophobic groups, said hydrophilic and hydrophobic groups being distributed anisotropically in a non-statistical manner, in separate hydrophilic and hydrophobic domains on the surface of said fragments.

4,715,987

METHOD OF TREATING PHYLLOSILICATES

Hermann L. Rittler, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

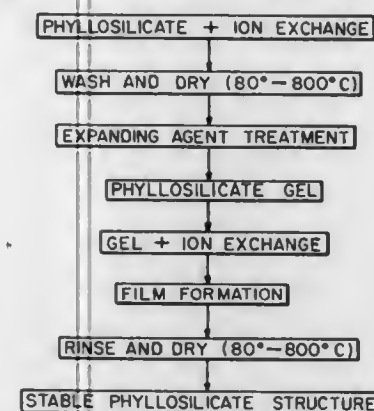
Filed May 12, 1986, Ser. No. 861,939

Int. Cl.⁴ B01J 13/00

U.S. Cl. 252-315.5 13 Claims

1. A method of forming a product from a naturally-occurring phyllosilicate which comprises exposing the phyllosilicate to a source of exchangeable ions to effect a change in the chemical makeup of the phyllosilicate interlayer by ion transfer, exposing the ion-exchanged phyllosilicate to an expanding agent selected from the group consisting of a primary amino-

carboxy acid, lysine orotate, and glycylglycine to expand the cell structure and cause gel formation, flocculating the gel,



forming gel-floc interface, and withdrawing flocculated gel from the gel-floc interface.

4,715,988

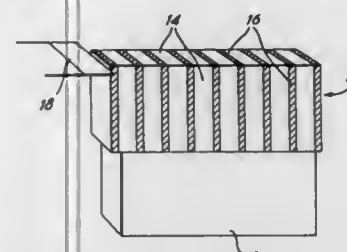
STANDARD FOR ANALYSIS

David Colin, South Glamorgan, Wales, assignor to Amersham International plc., Buckinghamshire, England
Filed Feb. 7, 1985, Ser. No. 699,395

Claims priority, application United Kingdom, Feb. 7, 1984, 8403128

Int. Cl.⁴ C09F 7/00; G01N 31/00

U.S. Cl. 252-408.1 14 Claims



1. A block of polymeric material for the preparation of standards for analysis, the block including at least two label layers, each label layer being of uniform thickness and containing a known concentration of a label material uniformly distributed therein and different layers containing different concentrations of the label material.

4,715,989

COATING FOR EMI SHIELDING

F. Ryan Sullivan, Cleveland Heights, and David M. Aleksa, Parma, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Jan. 22, 1986, Ser. No. 821,310

Int. Cl.⁴ H01B 1/06

U.S. Cl. 252-512 23 Claims

1. An electrically conductive water based, air dried, paint having a cured surface resistivity of less than about 10 Ω/square comprising: metallic flake selected from a group consisting of copper, silver, iron phosphide, gold, nickel, mixtures thereof, and substrates coated therewith, the flakes having a thickness of not more than about 3 microns and a long dimension of at least about 10 microns but not intended for applying the paint;

polymeric latex, the polymer having a molecular weight of at least about 90,000, a backbone, and pendant acidic functional moieties in the backbone in sufficient quantity to provide the polymer with an acid number of at least about 7 but not more than about 195, the latex being

present in the paint in a ratio of about 15% by weight to about 100% by weight (Polymer basis) of the metallic flake present in the paint;

an air drying, co-solvent having a boiling point greater than water and being capable of agglomerating particles of the latex polymer to form a coherent coating upon a surface being painted in a quantity of at least 2% by weight and 20% by weight of polymer in the latex;

a pH adjusting compound in a quantity sufficient to adjust the pH of the paint to between about 5 and 11; and

at least one non-silicone, non-silicate based film forming enhancer in a quantity of between about 1% by weight and 5% by weight of the metallic flake present in the paint.

4,715,990

STABLE SOIL RELEASE PROMOTING LIQUID DETERGENT CONTAINING STABILIZED ENZYMES

Michael C. Crossin, Kendall Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 539,080, Oct. 5, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 821,572

Int. Cl.⁴ C11D 3/37, 3/386, 17/08; D06M 15/507

U.S. Cl. 252-551 6 Claims

1. A stable soil release promoting enzyme-containing liquid detergent comprising a detergent proportion, in the range of 25% to 40%, of a nonionic detergent, a detergent supplementing and fluorescent brightener substantivity increasing proportion, in the range of 1 to 8%, of sodium higher fatty alcohol polyethoxylate sulfate detergent, a soil release promoting proportion, in the range of 0.5 to 5%, of a soil release promoting polymer of polyethylene terephthalate and polyoxyethylene terephthalate of a molecular weight in the range of about 15,000 to 50,000, wherein the polyoxyethylene of the polyoxyethylene terephthalate is of a molecular weight in the range of about 1,000 to 10,000, and with the molar ratio of ethylene terephthalate to polyoxyethylene terephthalate units being within the range of 2:1 to 6:1, an enzymatically hydrolyzing proportion, within the range of 0.005 to 0.1% (active basis) of enzyme, which enzymatically hydrolyzes proteinaceous soil or proteinaceous and amylaceous soils on fabrics during washing thereof with an aqueous washing solution of the liquid detergent, a stabilizing proportion, within the range of 0.2 to 2%, of a stabilizer for the enzyme(s), and an aqueous medium, in which the pH is in the range of about 6 to 9 and in which there is present no more than 2% of water soluble ionizable material other than the higher fatty alcohol polyethoxylate sulfate detergent.

4,715,991

AQUEOUS HIGH CONCENTRATION SURFACTANT SLURRY CONTAINING AN OLEFIN SULFONATE

Yoshie Hirakouchi; Osamu Toisawa, both of Chiba, and Masatoshi Takahashi, Fujisawa, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,051

Claims priority, application Japan, Apr. 26, 1985, 60-90471

Int. Cl.⁴ C11D 1/14; B01F 17/02

U.S. Cl. 252-555 2 Claims

1. An aqueous high concentration surfactant slurry having a viscosity of 150 poise or less at room temperature comprising: (A) 50% to 75% by weight of C₁₂-C₂₀ olefin sulfonates substantially composed of 8 to 60 parts by weight of at least one vinylidene olefin sulfonate and 92 to 40 parts by weight of at least one linear olefin sulfonate; (B) 1% to 5% by weight of sodium chloride, potassium chloride, or a mixture thereof; (C) 0.3% to 5% by weight of at least one nonionic substance selected from the group consisting of (C-1) polyoxypropylene glycols having an average molecular weight of 170 to 300, (C-2) ethylene oxide addition products of secondary higher alcohols having a C₇-C₁₈ alkyl group and an

average addition mole number of ethylene oxide of 7 to 12, and (C-3) addition products of ethylene oxide having an average addition mole number of 3 to 10 and propylene oxide having an average addition mole number of 1 to 9 of secondary higher alcohols having a C₇-C₁₈ alkyl group provided that the total addition mole number of the ethylene oxide and the propylene oxide is 6 to 12.

4,715,992

FILTER ELEMENT REDUCTION METHOD

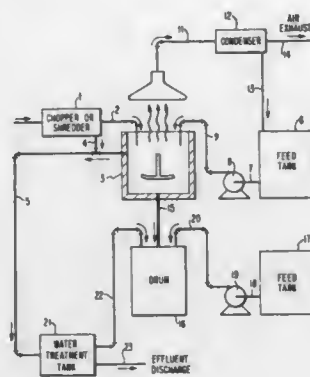
Thomas S. Snyder, Oakmont; Herbert A. Burgman, Murrysville, and Edward Mitchell, Wilkensburg, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1985, Ser. No. 793,040

Int. Cl.⁴ G21F 9/16, 9/04

U.S. Cl. 252-628

16 Claims



1. A method of reducing the bulk volume of material which comprises a phenolic resin and which contains addition polymerizable groups, comprising:

- (A) contacting said material, including said phenolic resin, with sufficient butyrolactone to dissolve soluble organic material therein, including said phenolic resin and form a mixture;
- (B) adding about 0.1 to 2% by weight, based on said mixture weight, of an addition polymerization catalyst, whereby said addition polymerizable groups are polymerized and said mixture is solidified.

4,715,993

PROCESS FOR PREPARING CERTAIN 1,4-DI[ω-(2-HYDROXYETHYLAMINO)ALKYLAMINO]ANTHRAQUINONE FREE BASES

Keith C. Murdock, Pearl River, N.Y., and Richard L. Webb, Darien, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 476,901, Mar. 18, 1983, Pat. No. 4,526,788.

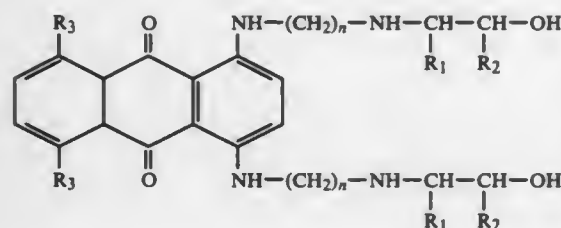
This application Jun. 14, 1985, Ser. No. 744,701

Int. Cl.⁴ C07C 97/24, 97/26

U.S. Cl. 260-380

3 Claims

1. The process of preparing a free base of the formula:



wherein n is 2 or 3, R₁ is hydrogen or methyl, R₂ is hydrogen or methyl, and R₃ is hydrogen or hydroxy which comprises introducing gaseous ammonia or methylamine into a suspension of an acid-addition salt of said base in anhydrous methanol

or ethanol or a mixture thereof at 0° C.-20° C. for a period of time sufficient to substantially convert the acid-addition salt to the free base.

4,715,994

NOVEL ANTIBACTERIAL AGENTS AND POTENTIATORS OF CARBAPENEM ANTIBIOTICS

William H. Parsons, Rahway; William R. Schoen, Edison; Arthur A. Patchett, Westfield, all of N.J., and Masao Taniguchi, Machida, Japan, assignors to Merck & Co., Inc., Rahway, N.J.

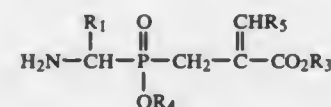
Filed Nov. 5, 1986, Ser. No. 927,028

Int. Cl.⁴ C07F 9/30, 9/32; A01N 31/02, 57/12

U.S. Cl. 260-502.5 E

8 Claims

1. A compound of the formula:



wherein:

R₁ is H, CH₃;

R₅ is

- (a) hydrogen,
- (b) C₁-C₁₂ linear or branched alkyl;
- (c) C₂-C₁₂ linear or branched monoalkenyl;
- (d) C₇-C₂₀ aralkyl, wherein the alkyl chain is linear or branched C₁-C₈;
- (e) heterocyclylalkyl, wherein the alkyl chain is linear or branched C₁-C₈ and the heterocyclyl ring is 5-6 membered, optionally fused with a benzene ring, fully aromatic, containing 1-2 O, N or S heteroatoms;

wherein said above values for R₅ can be substituted by one or more: halo, hydroxy, carboxy, C₁-C₄ alkoxy, C₇-C₁₆ arylalkoxy, C₃-C₇ cycloalkyl, C₁-C₄ alkoxy, C₆-C₁₂ aryloxy, amino, mono- or di-C₁-C₈ alkyl-amino, thio, C₁-C₄ alkylthio, C₆-C₁₂ arylthio, C₇-C₁₆ aralkylthio, or the radical -S-(CH₂)_n-CH(NH₂)-COOH, where n=1-2; with the proviso that R₅ is at least C₂ alkyl if substituted by one of the above-defined thio groups, and wherein the aryl or aromatic heterocyclyl rings can be further substituted by C₁-C₄ linear or branched alkyl, trihalomethyl, nitro, cyano, halo, or sulfonamido;

R₃ and R₄ are hydrogen, C₁-C₄ alkyl, C₆-C₁₂ aryl or C₇-C₁₆ aralkyl;

and including stereoisomers and racemates thereof.

4,715,995

PROCESS FOR THE PREPARATION OF ALKALI METAL AND ALKALINE EARTH SALTS OF BENZALDEHYDE-2,4-DISULFONIC ACID

Hans J. Metz, Heppenheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,744

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1984, 3434038

Int. Cl.⁴ C07C 143/38

U.S. Cl. 260-511

15 Claims

1. A process for the preparation of an alkali metal or alkaline earth metal salt of benzaldehyde-2,4-disulfonic acid from 2,4-dichlorobenzal chloride, which comprises reacting 2,4-dichlorobenzal chloride with an alkali metal or alkaline earth metal sulfite or an alkali metal or alkaline earth metal hydrogensulfite, or a mixture of any of these salts, in the presence of water and an acid-bonding substance at a temperature of 140° C. to below 180° C.

4,715,996

BUBBLE CAP ASSEMBLY

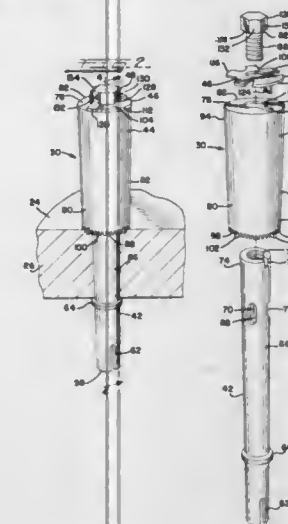
George G. Lambousy, Texas City; Benjamin H. Reeves, West Texas City, and William E. Nelson, Dickinson, all of Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 31, 1986, Ser. No. 925,325

Int. Cl.⁴ B01F 3/04

U.S. Cl. 261-114.2

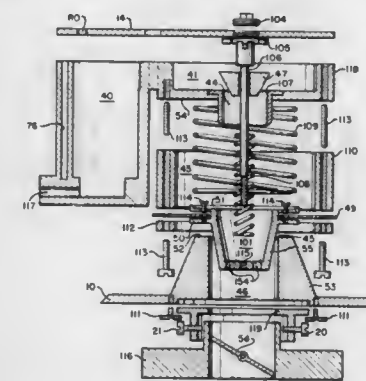
14 Claims



1. A bubble cap assembly for use in a reactor in a hydrocarbon processing plant, comprising:

- a tubular riser for injecting hydrocarbons generally upwardly in a reactor, said riser defining a notch providing a riser keyway;
- a bubble cap seated upon said riser in an umbrellalike manner for radially distributing the flow of hydrocarbons in a reactor, said bubble cap defining a slot providing a bubble cap keyway;
- a keeper comprising a lock washer having at least one bendable locking tab and a key for lockably engaging said bubble cap keyway and said riser keyway; and
- a fastener positioned upon said keeper and connected to said riser; and
- said locking tab being of a size and shape and having sufficient mechanical strength for securely engaging and locking said fastener to substantially prevent rotation and removal of said fastener during operation of said reactor.

ber and for driving heated, vaporized fuel mixed with air toward and into means for holding the heated, vaporized fuel



adjacent to means for drawing the heated, vaporized fuel into admixture with air.

4,715,998

INHALATION APPARATUS

Derek Clow, Keighley, England, assignor to The BOC Group plc, Windlesham, England

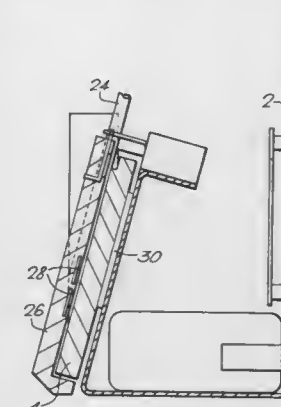
Filed Mar. 31, 1986, Ser. No. 845,917

Claims priority, application United Kingdom, Apr. 4, 1985, 8508920

Int. Cl.⁴ B01F 3/04; A61M 15/00

U.S. Cl. 261-142

2 Claims



1. An apparatus for delivering humidified gas to a patient comprising a humidifying module including a reservoir and releasably attached to a heater unit and when so attached occupying a plane at an angle with the vertical, the module including a substantially flat back plate and a front plate spaced therefrom, means for clamping the back plate and the front plate together to define a gas tight humidifying chamber, a substantially flat wick accommodated within the humidifying chamber, the wick being made from material that absorbs water without any significant change in its surface area, an inlet for dry gas and an outlet for humidified gas both formed in the front plate for communication with the interior of the humidifying chamber.

4,715,997

CARBURETION SYSTEM AND METHOD FOR VAPORIZING FUEL AND FOR MIXING VAPORIZED HEATED FUEL WITH AIR TO POWER AN INTERNAL COMBUSTION ENGINE

Terry Boone, 164 N. Blackstone Ave., Fresno, Calif. 93701

Filed Apr. 23, 1986, Ser. No. 855,123

Int. Cl.⁴ F02M 15/04

U.S. Cl. 261-142

5 Claims

1. A carburetion system comprising means for heating and vaporizing fuel for an internal combustion engine including a chamber having fuel inlet means linked to fuel-atomizing means and heating means for vaporizing atomized fuel by direct contact with the fuel; means for holding the heated vaporized fuel formed in said chamber; passage means linking said holding means to said chamber adjacent to said holding means; means for drawing heated vaporized fuel into admixture with air to form a combustible air/fuel mixture; and, atop said chamber, adjustable means for admitting air to said cham-

4,715,999

PROCESS OF MAKING OPTICAL BLANKS

Helmut Djalich, Budenheim; Nanning J. Arfsten, Bischofsheim; Helmut Schmidt, Hoechst; Gottfried Philipp, Kist, and Gerhard Tuenker, Wuerzburg, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Munich, Fed. Rep. of Germany
Filed Nov. 8, 1985, Ser. No. 796,460

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1984, 3440652

Int. Cl.⁴ B29D 11/00

U.S. Cl. 264—1.1

14 Claims

1. A method of producing an essentially nonswelling optical blank from a granulate or powder of polyorganoheterosiloxane, comprising subjecting said polyorganoheterosiloxane to hot-blank pressing to form said optical blank wherein during said hotblank processing step, the polymer is further polymerized and the resultant optical blank is essentially non-swelling in water and does not require a grinding step, said polyorganoheterosiloxane having been produced in a solvent reaction medium by hydrolytic preliminary condensation of

(a) at least one compound, soluble in the reaction medium, of formula I

MR₄

(I)

in which M represents titanium, zirconium or tin and R represents halogen, carbonate, hydroxy, alkoxy, acyloxy or a chelate liquid; and

(b) at least one organofunctional silane of formula II

R'_m(R''Y)_nSiX_{4-m-n}

(II)

in which R' is a radical representing alkyl, alkenyl, aryl, arylalkyl, alkylaryl, arylalkenyl or alkenylaryl, R'' represents alkylene, arylene, alkylenearylene, alkenylene or alkenylenearylene, and wherein said radical is optionally substituted by oxygen or sulphur atoms or by —NH— groups, X represents hydrogen, halogen, hydroxy, alkoxy, acyloxy or the group —NR''₂ wherein R'' represents hydrogen and/or alkyl, Y represents methacryloxy-, epoxy- or vinyl-group, with m and n having the value 0, 1, 2 or 3 and m+n having the value 1, 2, or 3;

without addition of water or with the addition of a quantity of water which is less than the stoichiometric quantity required for the complete hydrolysis of the existing hydrolyzable groups, and subsequent further condensation by addition of at least the quantity of water which is needed for the hydrolysis of the remaining hydrolyzable groups, in which process, related to the total molar number of the initial components, 20–80 molar % of component (a), 80±20 molar % of component (b) and 0–50 molar % of component (c) are employed; and removing said solvent to form said granulate or powder.

4,716,000

PROCESS AND APPARATUS FOR THE PRODUCTION OF A CROSS-LINKED, EXTRUDED OR SPRAYED PRODUCT

Kurt Kerschbaum, Klosterneuburg, and Alfred Konicka, Vienna, both of Austria, assignors to Rosendahl Maschinen Gesellschaft m.b.H., Maria Easersdorf, Austria

Filed Oct. 22, 1985, Ser. No. 790,255

Claims priority, application Austria, Oct. 22, 1984, 3364/84

Int. Cl.⁴ B29C 47/62

U.S. Cl. 264—83

4 Claims

1. A process for producing a cross-linked, extruded or sprayed product, comprising:

(a) feeding components consisting essentially of a cross-linked polymer in the presence of hydrolyzable, unsaturated silane, a free radical which admits an initiator, and a silanol condensation catalyst to a heatable cylinder having first and second ends, said first end receiving said compo-

nents from a feeding means and said second end delivering said product to a molding means,

said components being admixed by a mechanical worm being rotatably disposed inside said cylinder, said worm being of a two-thread type with a channel formed adjacent to said worm, leading to said molding means, said two-thread worm having,

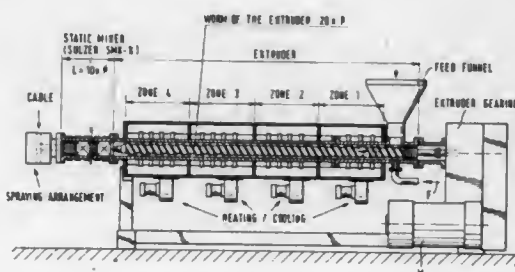
a first spiral groove defined by said threads with a cross-section over the length of said worm decreasing to approximately zero,

a second spiral groove defined by said threads having a cross-section over the length of said worm increasing from approximately zero in the opposite direction of said first spiral groove, and the sum of said cross-sections of said first and second spiral grooves decreasing toward said channel with both spiral grooves having substantially equal gradients, and

said admixed components forming a strand being conveyed in said channel to static mixing means disposed in said channel toward said second end of said cylinder, said static mixing means separating said strand into a plurality of strands with subsequent uniting of said plurality of strands, producing a mixed mass,

(b) raising the temperature during step (a) to enable grafting of said admixed components,

(c) transferring the grafted mixture of steps (a) and (b) to a



mold in the presence of water to cause cross-linking of said grafted mixture, and to form a product.

2. An apparatus for producing a cross-linked, extruded or sprayed product comprising:

means for feeding chemical components of said product;

means for molding said product;

a heatable cylinder having first and second ends, said first end receiving said components from said feeding means and said second end delivering said product to said molding means, said cylinder including,

a mechanical worm being rotatably disposed inside said cylinder to mix said components, said worm being of a two-thread type with a channel formed adjacent to said worm leading to said molding means, said two-thread worm having,

a first spiral groove defined by said threads with a cross-section over the length of said worm decreasing to approximately zero,

a second spiral groove defined by said threads having a cross-section over the length of said worm increasing from approximately zero in the opposite direction of said first spiral groove, and the sum of said cross-sections of said first and second spiral grooves decreasing toward said channel both spiral grooves having substantially equal gradients,

means for static mixing of said components, being disposed in said channel toward said second end of said cylinder.

4,716,001

METHOD OF MAKING A FLEXIBLE CABLE ASSEMBLY

Louis E. Kottke, Adrian, Mich., assignor to Acco Babcock Inc., Fairfield, Conn.

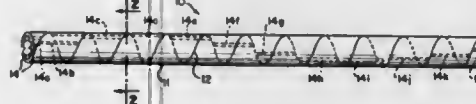
Division of Ser. No. 625,601, Jun. 28, 1984, Pat. No. 4,655,729.

This application Sep. 26, 1985, Ser. No. 780,487

Int. Cl.⁴ B28B 11/16; B29C 61/06, 71/00

U.S. Cl. 264—145

4 Claims



1. A method of forming a liner for a flexible cable assembly, comprising

(a) forming a flexible generally cylindrical tube with at least one generally longitudinally extending rib on the interior surface of the tube;

(b) cutting the tube to form a helical tubular strip with at least one segment of said rib on each turn thereof; and

(c) circumferentially offsetting the rib segments on adjacent turns of the strip.

4,716,002

METHOD OF PRODUCING A FLAME-RETARDANT ACRYLIC COPOLYMER

Masaaki Fujimatsu, and Toshiyuki Kobashi, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Division of Ser. No. 568,922, Jan. 6, 1984, Pat. No. 4,604,428.

This application Jan. 28, 1986, Ser. No. 823,296

Claims priority, application Japan, Jan. 10, 1983, 58-2596

Int. Cl.⁴ D01F 6/18

U.S. Cl. 264—182

6 Claims

1. In a method of producing flame-retardant acrylic fibers, which comprises producing an acrylic polymer, dissolving said acrylic polymer in an inorganic solvent to form a spinning solution, spinning said acrylic polymer in said solution into fibers and after-treating said fibers, the improvement wherein said acrylic polymer is produced by polymerizing, at a temperature of 30° to 60° C., a vinyl monomer containing more than 75 weight % of acrylonitrile, in an aqueous medium containing a radical initiator and a halogen-containing polymer latex substantially free from an emulsifier, said latex containing polymer particles of less than 0.5μ stably dispersed therein, wherein the quantity of said latex is such that the quantity of halogen-containing polymer in said latex is 1.5 to 150 weight % based on the weight of said vinyl monomer.

4,716,003

APPARATUS AND METHOD FOR REDUCING NECK WASTE IN A CAST VINYL SHELL

Laurent R. Gandreau, So. Berwick, Me., assignor to Ex-Cell-O Corporation, Walled Lake, Mich.

Filed May 22, 1986, Ser. No. 865,991

Int. Cl.⁴ B29C 41/04, 41/46

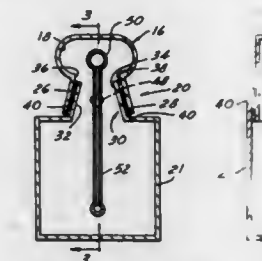
U.S. Cl. 264—302

6 Claims

1. In a method for molding an article by depositing heat gellable material from a powder box joined to a preheated mold through a pour spout on the powder box and through a waste inlet neck on the preheated mold and wherein the joined powder box and mold are rotated as a unit to deposit the heat gellable material on a mold surface the improvement comprising:

maintaining the pour spout on the powder box at a non-gelling temperature below that required to gel any appreciable thickness of material thereon to prevent the deposition of gelled material thereon as it passes thereacross during rotation of the joined powder box and the preheated mold; shielding the waste inlet neck from powder flow into the

heated mold by inserting the pour spout through the waste inlet neck and in overlying relationship thereto whereby the gellable material is bypassed around the waste inlet



neck as the gellable material is deposited on the mold surface during rotation of the joined powder box and preheated mold.

4,716,004

THIMBLE GUIDE EXTENDER

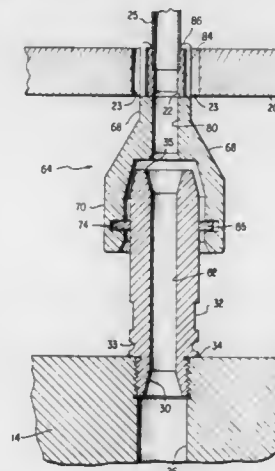
Daniel Merkovsky, Monroeville, and Michael R. Gasparro, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 6, 1986, Ser. No. 826,522

Int. Cl.⁴ G21C 17/00

U.S. Cl. 376—203

12 Claims



1. In a nuclear reactor having a reactor lower core plate with a bore therein and having a thimble guide with a bottom end that is mounted on the reactor lower core plate, a top end that is spaced apart from an aperture in the bottom nozzle of a fuel assembly supported by the core plate, and sides defining an elongated guide channel between the top and bottom ends to accommodate an elongated hollow thimble which is longitudinally movable through the bore and into the aperture, the bottom nozzle having legs which rest on the core plate around the bore and having flow openings adjacent the aperture, and the guide channel having an axis which extends through the bore and the aperture, a thimble guide extender comprising:

a hollow element having a thimble passage with an axis, said hollow element having an upper portion which contacts said bottom nozzle of said fuel assembly and a lower portion which extends around said sides of said thimble guide so that said upper end of said guide is disposed within said hollow element; and

means for mounting said hollow element so that said thimble passage axis is coaxial with respect to said axis of said guide channel, said means for mounting including locking fingers on said upper portion of said hollow element to extend into said flow openings and secure said hollow element to said bottom nozzle.

4,716,005

FORMING A SEAL BETWEEN PLANAR SEALING SURFACES

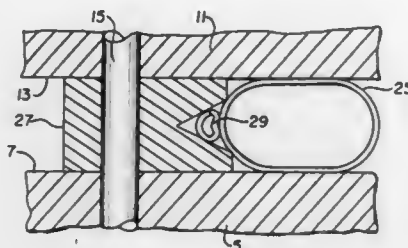
L. Ike Ezekoye, Wilkinsburg; Edward J. Rusnica, Greensburg, and Henry A. Sepp, Jr., Monroeville Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 21, 1986, Ser. No. 820,356

Int. Cl.⁴ G21C 13/00

U.S. Cl. 376-205

12 Claims U.S. Cl. 376-209



1. A method of forming a seal between the confronting planar sealing surfaces on two annular structural members which are drawn together by axially extending bolts comprising the steps of:

forming a seal assembly by locking a toroidal, crushable seal member within a substantially flat annular spacer member against an annular shoulder formed on the inner diameter thereof with an annular resilient member seated in a radially extending groove in the inner surface of said substantially flat annular member, said flat annular member being axially thinner than said toroidal, crushable seal member; placing said sealing assembly between said planar sealing surfaces and positively aligning said assembly relative to said axially extending bolts; and

tightening said bolts to draw said planar sealing surfaces toward each other and into contact with the flat annular member while crushing said toroidal, crushable seal member to form a seal between said planar sealing surfaces.

11. In a nuclear reactor, the combination of a generally, cylindrical pressure vessel having a flange extending radially around its upper end which defines an axially facing planar sealing surface and axially extending bores passing through said sealing surface, a substantially hemispherical head having a radially extending flange around its lower end which defines an axially facing planar sealing surface complementary to the sealing surface on the pressure vessel flange and which also defines axially extending bores aligned with the bores in the pressure vessel flange, bolts passing through the bores in the pressure vessel and head flanges to draw said flanges toward each other, and a sealing assembly comprising:

- a toroidal, crushable metallic, tubular seal member;
- a flat, annular spacer member defining a radially extending V-shaped annular recess in its inner surface and axially extending bores aligned with the bores in said pressure vessel and head flanges through which said bolts pass to position the spacer member relative to said flanges; and
- a toroidal coil spring seated in said V-shaped groove and sized to grip and position said toroidal, crushable metallic tubular seal member inside said flat annular spacer, said flat annular spacer being substantially rigid and axially thinner than said seal member such that as said bolts are tightened to draw said flanges toward each other and down against said spacer member, the seal member is crushed between said planar sealing surfaces to form a seal therebetween.

4,716,006

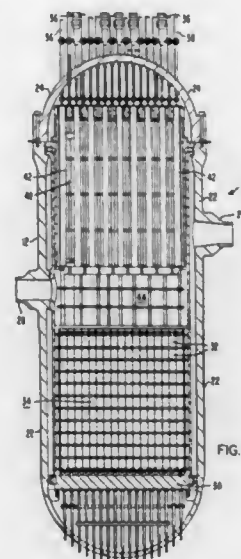
SPECTRAL SHIFT REACTOR CONTROL METHOD

Albert J. Impink, Jr., Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 520,087, Aug. 4, 1983, which is a division of Ser. No. 217,054, Dec. 16, 1980, Pat. No. 4,432,930. This application Apr. 23, 1986, Ser. No. 855,239

Int. Cl.⁴ G21C 7/26

6 Claims



1. The method of operating a pressurized-water fissile-material-fueled spectral-shift nuclear reactor in such manner that short-term reactivity requirement variations can be satisfied without making control rod or chemical shim changes, said reactor including a pressure vessel enclosing a reactor core and having an inlet and an outlet for circulating a water coolant moderator in heat transfer relationship with said core, said core comprising a plurality of fuel assemblies disposed therein for generating heat by nuclear fission, said reactor provided with a plurality of neutron-absorbing control rods which are vertically movable into and out of said core so that movement of said control rods into said core will substantially decrease reactivity and withdrawal of said control rods from said core will substantially increase reactivity, said control rods when inserted into said core displacing an equivalent volume of said water coolant moderator, said reactor also provided with a plurality of neutron-spectral-shift rods which have a lower absorptivity for neutrons than said control rods, said neutron-spectral-shift rods when inserted into said core displacing an equivalent volume of said water coolant moderator, said neutron-spectral-shift rods comprising two different types of rods, a first of said different types of said neutron-spectral-shift rods comprising displacer rods which have a low absorptivity for neutrons, the remainder of said neutron-spectral-shift rods comprising gray rods which have an absorption for neutrons which is intermediate the neutron absorption of said control rods and the low neutron absorption of said displacer rods, each said neutron-spectral-shift displacer rod comprising a hollow thin-walled Zircaloy member containing a filling of solid or annular zirconium- or aluminum-containing material for providing internal support and mass for said thin-walled tubular member, each said displacer rod having overall neutron-absorbing and -moderating characteristics essentially not exceeding those of hollow tubular Zircaloy members with or without a filling of zirconium oxide pellets or aluminum oxide pellets, said neutron-spectral-shift rods being arranged in clusters comprising adjacent neutron-spectral-shift rods, said neutron-spectral-shift rods being vertically movable as individual clusters into and out of said reactor core with the cluster movement being independent of the movement of said control rods, the volume of said water coolant moderator which is

displaced by said displacer rods when fully inserted into said core substantially exceeding the volume of said water coolant moderator which is displaced by said gray rods when fully inserted into said core, the volume of said water coolant moderator which is displaced by said displacer rods when fully inserted into said core substantially exceeding the volume of said water coolant moderator which is displaced by said control rods if fully inserted into said core, and the volume of said water coolant moderator which is displaced by said control rods if fully inserted into said core exceeding the volume of said water coolant moderator which is displaced by said gray rods when fully inserted into said core, said method comprising:

when said reactor is operating with a portion of said clusters of said neutron-spectral-shift rods fully inserted in said core and the remainder of said clusters of said neutron-spectral-shift rods fully withdrawn from said core, compensating for increased short-term reactivity requirements by completely withdrawing previously inserted clusters of said neutron-spectral-shift rods from said core, and compensating for decreased short-term reactivity requirements by completely inserting previously withdrawn clusters of said neutron-spectral-shift rods into said core.

4,716,007

SPECTRAL SHIFT REACTOR

William R. Carlson, Pittsburgh, and Eugene J. Piplica, Levelgreen, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

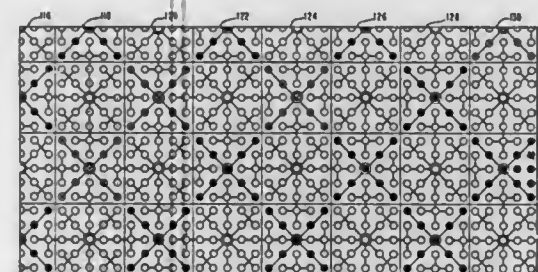
Continuation of Ser. No. 217,061, Dec. 16, 1980, abandoned.

This application Dec. 9, 1983, Ser. No. 559,848

Int. Cl.⁴ G21C 7/26

U.S. Cl. 376-209

6 Claims



1. A spectral shift pressurized-water reactor comprising: a pressure vessel enclosing a reactor core which includes fissile material fuel, said pressure vessel having an inlet and an outlet for circulating water coolant moderator in heat transfer relationship with said core, said core comprising a plurality of square-shaped adjacent fuel assemblies vertically disposed therein for generating heat by nuclear fission, and said fuel assemblies having a fuel enrichment which provides a measure of excess reactivity at the beginning of core life which is later drawn upon to lengthen core life;

a plurality of spaced vertical guide tubes disposed in each of said fuel assemblies and adapted to have rod members vertically moved therein and therefrom during reactor operation, and a portion of said guide tubes in each said fuel assembly disposed in a cross-like configuration along the two diagonals which connect the corners of said square-shaped fuel assemblies;

three separate types of rods adapted to be moved into and out of said guide tubes, a first type of said rods comprising neutron-absorbing control rods which are movable into and out of said core so that movement of said control rods into said core will substantially decrease reactivity and withdrawal of said control rods from said core will substantially increase reactivity, a second type of said rods comprising neutron-spectral-shift displacer rods which have a substantially lower absorptivity for neutrons than said control rods, each said neutron-spectral-shift dis-

placer rod comprising a hollow thin-walled Zircaloy member containing a filling of solid or annular zirconium- or aluminum-containing material for providing internal support and mass for said thin-walled tubular member, each said displacer rod having overall neutron-absorbing and -moderating characteristics essentially not exceeding those of hollow tubular Zircaloy members with or without a filling of zirconium oxide pellets or aluminum oxide pellets, the third type of said rods comprising thick walled gray rods each of which have an absorptivity for neutrons intermediate that of each of said control rods and each of said neutron-spectral-shift displacer rods, and said rods all having substantially the same cross-sectional dimension;

said gray rods and said control rods operable to be moved into and out of said core in a portion of said guide tubes which are positioned in said cross-like configuration, and said neutron-spectral-shift displacer rods operable to be moved into and out of substantially all of the remainder of said guide tubes, approximately half of said fuel assemblies operable to have only said neutron-spectral-shift displacer rods moved therein and therefrom, those of said fuel assemblies into which only said neutron-spectral-shift displacer rods are to be moved being alternated in position in said core with those of said fuel assemblies into which said control rods and said gray rods are to be moved, the total number of said neutron-spectral-shift displacer rods very substantially exceeding the total number of said control rods and said gray rods, and the total number of said control rods substantially exceeding the total number of said gray rods;

spider members and associated shafts and drive members therefor positioned above said core, a separate spider member provided for substantially all of each of said fuel assemblies, each of said spider members being separately controllable and having only one type of said rods connected thereto in the form of a rod cluster, said control rods and said gray rods being connected to said spider members in the form of control-rod and gray-rod cross-like clusters to move into said guide tubes which are similarly disposed, and said neutron-spectral-shift displacer rods connected to said spider members as composite clusters which interfit into substantially all said guide tubes in a single fuel assembly in addition to those proximate guide tubes of adjacently positioned fuel assemblies so that those spiders which have said displacer rod clusters connected thereto serve one fuel assembly in addition to proximate portions of those fuel assemblies which are positioned adjacent thereto; and

each said neutron-spectral-shift displacer rod cluster having a total reactivity worth when fully inserted into said core, each said gray rod cluster having a total reactivity worth when fully inserted into said core, and the total reactivity worth of each said neutron-spectral-shift displacer rod cluster substantially exceeding the total reactivity worth of each said gray rod cross-like cluster so that during reactor operation predetermined reactivity worths can be obtained by movement of said displacer rod clusters and said gray rod clusters.

4,716,008

DEVICE FOR CONTROL OF THE CORE OF A NUCLEAR REACTOR

Claude Leroy, Lardy; Jean-Paul Millot, Elancourt, and Guy Desfontaines, Puteaux, all of France, assignors to Framatome & Cie, Courbevoie, France

Filed Jan. 30, 1985, Ser. No. 696,369

Claims priority, application France, Jan. 30, 1984, 84 01360

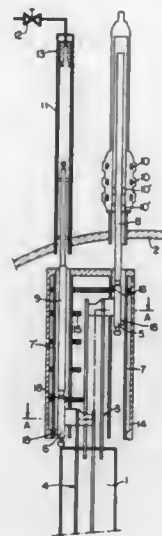
Int. Cl.⁴ G21C 7/12

U.S. Cl. 376-237

8 Claims

1. In a pressurized water nuclear reactor having a pressure vessel and a core comprising a plurality of vertically arranged adjacent fuel assemblies arranged in a regular array, a control device including a plurality of clusters arranged for insertion

into and removal from the core and each having a plurality of rods connected to a common carrier vertically slidable in a stationary guide structure and connectable to a drive shaft, said clusters comprising first clusters containing neutron absorbing material and each individually associated with electromagnetic actuation means for adjusting the amount of insertion of the associated one of said first clusters and comprising second clusters containing a different material and each individually associated with hydraulic actuation means independent from said electromagnetic actuation means and controllable to cause upward and downward movement of the associated one of said second clusters, means being provided for optionally locking



and unlocking one of said second clusters in a fixed position fully removed from said core, a set of one first cluster and one second cluster being associated with some only of said fuel assemblies, with the drive shafts of the two clusters in each set being non-coaxial and being arranged symmetrically with respect to the axis of a single stationary structure located above the associated fuel assembly and arranged for authorizing mutually independent vertical movement of the first and second clusters, said guide structure including two vertical guide tubes located symmetrically with respect to and at a distance from a vertical axis of the associated fuel assembly, each constructed to guide the carrier of one of the first cluster and second cluster associated with the fuel assembly.

4,716,009

DROPPED ROD PROTECTION INSENSITIVE TO LARGE LOAD LOSS

Francis R. Thaulez, Saint Paul, Belgium, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1985, Ser. No. 809,709

Int. Cl.⁴ G21C 7/36

U.S. Cl. 376—242

9 Claims

1. A method of operating the reactor of a nuclear power plant comprising the steps of:

monitoring the rate of change of reactor neutron flux; shutting down the reactor when the rate of change of neutron flux becomes more negative than a preselected negative value corresponding to that caused by a dropped reactor control rod;

monitoring operation of the nuclear power plant to detect a loss of load of a magnitude which generates a rate of change in neutron flux more negative than said preselected negative value within a predicted period of time after detection of said loss of load; and

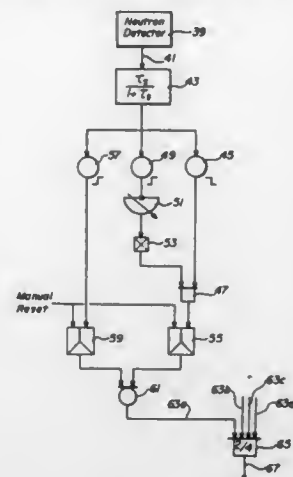
inhibiting shutdown of the reactor in response to the rate of change of neutron flux becoming more negative than said preselected value for a predetermined time period after detection of said loss of load, said predetermined time

period being longer in duration than said predicted time period.

3. A protection system for the reactor in a nuclear power plant comprising:

means for monitoring the rate of change of reactor neutron flux;

means responsive to a negative rate of change in the neutron flux which is more negative than a preselected negative value for shutting down the reactor; and



means responsive to a positive rate of change in the neutron flux which exceeds a preselected positive value thereof for inhibiting subsequent operation of said means to shutdown the reactor, whereby the reactor is not shutdown even though a rate of change of the neutron flux becomes more negative than said preselected negative value when the rate of change of said neutron flux has already exceeded said preselected positive value.

4,716,010

TOOLING APPARATUS FOR MODIFYING NUCLEAR REACTORS

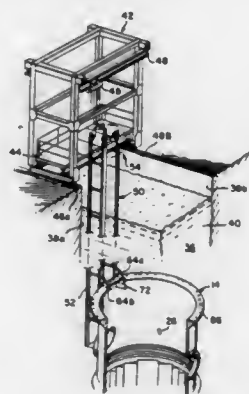
Frank G. Gallo, Latrobe; Clark E. Swenson, Monroeville; William A. Bencloski, Hermine; Angelo J. Cassette, Greensburg; John L. Manno, White Oak, and Edward A. Parlak, N. Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 13, 1983, Ser. No. 561,018

Int. Cl.⁴ G21C 19/02

U.S. Cl. 376—260

22 Claims



1. Support apparatus for supporting and selectively locating a tool with respect to its work piece, and the work piece having first and second dimensions, said support apparatus comprising:

- (a) a tool carriage for receiving the tool;
- (b) a support structure for supporting and guiding said tool carriage with respect to the workpiece;
- (c) first drive means mounted on said support structure and coupled to said tool carriage for selectively driving said tool carriage along said first dimension;
- (d) rail means mounted on said tool carriage along said second dimension;
- (e) a support table mounted for movement along said rail means;
- (f) second drive means mounted on said tool carriage selectively driving the tool along said second dimension, said second drive means mounted on said support table and engaging said rail means, whereby the tool may be accurately positioned with respect to the work piece; and
- (g) clamp means affixed to said support structure for engaging the work piece for suspending said support structure, whereby said support structure extends along said first dimension of said work piece.

13. In a nuclear reactor having a core barrel of a substantially cylindrical configuration with an axis and a plurality of flow holes disposed therethrough, a remotely controlled apparatus for supporting and selectively disposing a tool with respect to the core barrel, said remotely controlled apparatus comprising:

- (a) a tool carriage for receiving the tool;
- (b) a strongback assembly for supporting and guiding said tool carriage with respect to the core barrel;
- (c) clamp means affixed to said strongback assembly for engaging the core barrel for suspending said strongback assembly along a first dimension substantially parallel to the axis of the core barrel;
- (d) first drive means mounted on said strongback assembly and coupled to said tool carriage for selectively driving said tool carriage along said first dimension;
- (e) a support table;
- (f) means mounted on said tool carriage for supporting said support table for movement along an arcuate path corresponding to said cylindrical configuration; and
- (g) second drive means on said tool carriage and coupled to said support table for selectively driving said support table along said arcuate path, whereby the tool is accurately positioned with respect to the core barrel.

4,716,011

BWR FUEL ASSEMBLY BOTTOM NOZZLE WITH ONE-WAY COOLANT FLOW VALVE

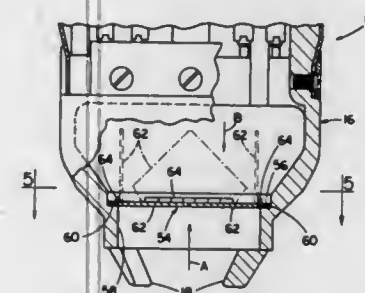
Rust P. Taleyarkhan, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 9, 1985, Ser. No. 785,816

Int. Cl.⁴ G21C 3/32, 15/00

U.S. Cl. 376—281

1 Claim



1. In a nuclear reactor having a flow of coolant/moderator fluid therein, at least one fuel assembly installed in the fluid flow, said fuel assembly comprising in combination:

- a bundle of elongated fuel rods disposed in side-by-side relationship so as to form an array of spaced fuel rods;
- an outer tubular flow channel surrounding said fuel rods so

as to direct the flow of coolant/moderator fluid along said fuel rods;

bottom and top nozzles mounted at opposite ends of said flow channel and having an inlet and outlet respectively for allowing entry and exit of the flow of coolant/moderator fluid into and from said flow channel and along said fuel rods therein, said bottom nozzle having an annular surface defined therein so as to surround said inlet thereof, said annular surface having circumferentially spaced sectors and circumferentially spaced segments which alternate with said spaced sectors; and

a coolant flow direction control device operatively disposed in said bottom nozzle so as to open said inlet thereof to the flow of coolant/moderator fluid in an inflow direction into said flow channel through said bottom nozzle inlet but close said inlet to the flow of coolant/moderator fluid from said flow channel through said bottom nozzle inlet upon reversal of coolant/moderator fluid flow from the inflow direction;

said coolant flow direction control device being a unidirectional flow check valve positioned across said inlet of said bottom nozzle for sensing the direction of coolant/moderator fluid flow and automatically opening when the flow direction sensed is into said bottom nozzle and closing when the flow direction sensed is out of said bottom nozzle;

said flow check valve including a plurality of outer portions mounted to said respective circumferentially spaced sectors of said bottom nozzle annular surface surrounding said inlet thereof, and a plurality of inner portions being pivotally connected to said respective outer portions for pivotal movement toward and away from one another between lowered and closed and raised open positions;

said inner valve portions, when in their raised positions, extending toward said bottom nozzle in the direction of coolant flow into said bottom nozzle, said inner valve portions being configured to extend in close fitting relationship adjacent to one another and coplanarly across said inlet so as to close said inlet when disposed in their respective lowered positions and to extend in generally parallel relationship to the direction of coolant flow and be located remote from one another so as to open said inlet when disposed in their respective raised positions;

each of said inner valve portions, when in its lowered position, has opposite lateral edge portions that seat on respective surface portions of the two segments located on opposite ends of said sector to which the respective outer portion of said valve is mounted, said inner valve portions in seating on said spaced segments of said bottom nozzle annular surface being stopped by said surface from pivoting past their lowered positions in which they would extend away from said bottom nozzle and allow reverse flow of coolant therefrom;

said inner valve portions being arranged in first and second pairs which are angularly displaced about ninety degrees from one another wherein said inner valve portions of each pair are placed in opposing relation to one another such that one is a mirror image of the other, said inner valve portions located directly opposite to one another in said respective pairs thereof extending generally parallel to one another when in said raised positions.

4,716,012

REACTOR INTERNALS LOOSE PARTS STRAINER

Michael R. Gasparro, Penn Hills, and Richard E. Tome, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1985, Ser. No. 785,307

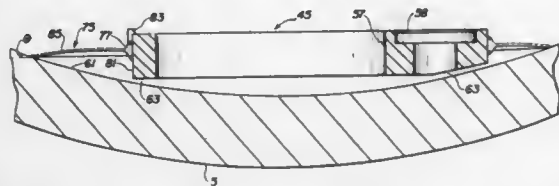
Int. Cl.⁴ G21C 9/00, 15/00

U.S. Cl. 376—352

5 Claims

1. In combination, an upright cylindrical nuclear reactor pressure vessel having a hemispherical lower head section with a curved inner surface and defining an annular flange extend-

ing radially inward near its upper end, reactor internals suspended within said pressure vessel from said flange, said internals extending downward into said hemispherical lower head section but with the lower end thereof terminating short of contacting the curved inner surface hemispherical lower head section to form a radially extending, annular gap therebetween which varies in size in response to variations in the temperature of reactor coolant circulated through the pressure vessel and



internals due to a difference in the coefficients of thermal expansion thereof, and strainer means comprising an annular member with apertures therethrough smaller than the smallest size of said gap secured to the lower end of said reactor internals and extending radially outward therefrom, over the gap with an outer peripheral edge in contact with the curved inner surface of the hemispherical lower head section for all sizes of said gap to prevent debris from entering and lodging in said gap from above while allowing fluid to pass therethrough.

4,716,013

NUCLEAR REACTOR

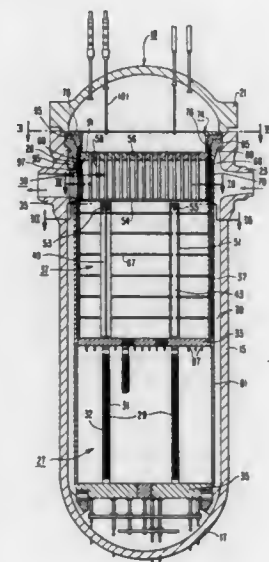
Luciano Veronesi, O'Hara Twp., Allegheny Co., and Daniel C. Garner, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 490,099, Apr. 29, 1983, abandoned.
This application Feb. 7, 1986, Ser. No. 828,553

Int. Cl.⁴ G21C 1/04

U.S. Cl. 376—353

19 Claims



1. A nuclear reactor including a vessel, a nuclear core within said vessel, control-rod assemblies within said vessel, said control-rod assemblies including vertical control-rod guide means in a plenum vertically above said core, said control-rod assemblies also including control-rod clusters, each said cluster including a plurality of control rods suspended from a spider, said cluster being movable to move its said control rods between said guide means and said core, and a drive rod connected to each said cluster for so moving said each cluster, said vessel having at least an inlet nozzle for supplying a coolant through said core, the inflowing coolant after passing through said core flowing predominantly through said guide means generally vertically, a calandria in the path of said outflowing

coolant, from said guide means, said calandria including a plurality of hollow members, an upper support for said members perforate to the opening within said members and a lower support, said calandria being mounted with its lower support above and on said guide means and with said drive rods only and not said control rods passing through said hollow members, said lower support being perforate to the coolant flowing out of said guide means, said vessel having at least an outlet nozzle with a generally horizontal coolant outflow channel, said outflow channel being substantially at the level of said calandria so that the coolant flowing into said calandria flows generally transversely over the outer surfaces of said hollow members and out through said outflow channel.

4,716,014

MOISTURE SEPARATOR FOR STEAM GENERATOR LEVEL MEASUREMENT SYSTEM

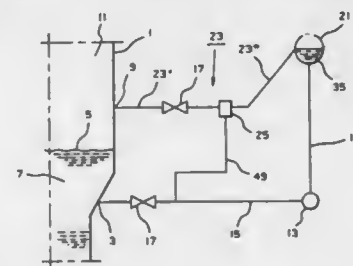
Bertrand J. Cantineau, Braine l'Alleud, Belgium, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 11, 1986, Ser. No. 872,986

Int. Cl.⁴ G21C 17/00

U.S. Cl. 376—371

10 Claims



1. In a system for measuring the level of liquid in a steam generator comprising:

- a lower tap connected to the steam generator at a point below the lowest liquid level to be measured;
- an upper tap connected to the steam generator at a point above the highest liquid level to be measured;
- a reference leg external to the steam generator extending substantially from the level of the lower tap to a point above the upper tap;
- a condensation pot at the upper end of said reference leg in which steam condenses to keep the reference leg filled with water;
- a connecting line extending between the condensate pot and the upper tap through which steam passes to the condensate pot and excess liquid from the condensate pot returns; and

pressure responsive means connected to the lower tap and the lower end of the reference leg for generating a signal proportional to the level of liquid in the steam generator; the improvement comprising:

- a separator pot in said connecting line defining an expansion chamber which reduces the velocity of steam and liquid flowing from the steam generator toward the condensate pot to effect separation of liquid from the steam, said chamber having a low point below the connecting line at which the liquid separated from the steam and the excess liquid from the condensate pot accumulate; and
- a drain line between the low point in said separator pot and said lower tap through which the liquid separated from the steam and the excess liquid from the condensate pot are returned to said steam generator.

4,716,015

MODULAR NUCLEAR FUEL ASSEMBLY DESIGN

William R. Carlson, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1985, Ser. No. 734,372

Int. Cl.⁴ G21C 3/32

U.S. Cl. 376—445

21 Claims



1. A fuel assembly for a nuclear reactor core comprising at least two sub-assembly fuel modules, each of said sub-assembly modules containing a plurality of axially extending fuel rods and comprising:

- a bottom nozzle module having an associated bottom plate module;
- a top nozzle module having an associated top plate module;
- at least one guide tube extending between said top and bottom modules;
- at least one fuel rod spacer grid module fixed to said guide tube for laterally supporting said fuel rods;
- a joining means including an interlocking means for removably securing the top and bottom nozzle modules respectively of adjacent sub-assembly fuel modules together to form an integral assembly from said sub-assembly modules, said joining means being operable to facilitate rapid assembly and disassembly of said fuel assembly into its component sub-assemblies.

4,716,016

UNIVERSAL FUEL ASSEMBLY CONSTRUCTION FOR A NUCLEAR REACTOR

Edmund E. Demario, Penn Hills Twp.; Denis L. Burman, Monroeville; Carl A. Olson, Monroeville, and Jeffrey R. Secker, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 4, 1985, Ser. No. 708,190

Int. Cl.⁴ G21C 3/32

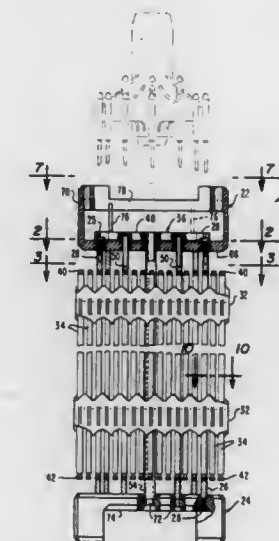
U.S. Cl. 376—446

17 Claims

1. A fuel assembly, comprising in combination:

- (a) a rigid fuel assembly skeleton defined by
 - (i) an upper end structure having a plurality of openings defined therein;
 - (ii) a lower end structure;
 - (iii) a plurality of elongated nonfuel, nonguide thimble, structural members extending longitudinally between and rigidly interconnecting said upper and lower end structures;
- (b) a plurality of transverse grids being supported on said elongated structural members of said fuel assembly skeleton at axially spaced locations therealong between said upper and lower end structures thereof;
- (c) a plurality of fuel rods extending through and being supported by said grids between said upper and lower end

structures of said fuel assembly skeleton so as to extend in generally side-by-side spaced relation to one another and to said elongated nonfuel, structural members of said fuel assembly skeleton, certain groups of said fuel rods in said plurality thereof being spaced apart laterally from one another by a greater distance than the rest of said fuel rods so as to define a plurality of elongated channels extending through said grids and between said upper and lower end structures of said fuel assembly skeleton, said elongated channels thereby being in the form of open spaces extending laterally between said fuel rods of said certain groups thereof and longitudinally between said upper and lower end structures of said fuel assembly skeleton wherein said open spaces are not defined by any physical structure



other than said end structures of said fuel assembly skeleton, said grids and said fuel rods of said certain groups thereof, said plurality of elongated channels being in a pattern which matches that of said plurality of openings in said upper end structure of said fuel assembly skeleton; and

- (d) a cluster assembly removably supportable on said fuel assembly skeleton and having a plurality of elongated hollow guide thimbles, said guide thimbles of said cluster assembly extending from said upper end structure of said fuel assembly skeleton through said openings therein and through said elongated channels toward said lower end structure of said fuel assembly skeleton when said cluster assembly is removably supported by said upper end structure of said fuel assembly skeleton.

4,716,017

APPARATUS FOR SECURING STRUCTURAL TUBES IN NUCLEAR REACTOR FUEL ASSEMBLIES

John S. Kerrey, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 637,374, Aug. 3, 1984. This application Oct. 23, 1985, Ser. No. 790,682

Int. Cl.⁴ G21C 3/32; B21D 39/00

U.S. Cl. 376—446

11 Claims

1. In a nuclear reactor fuel assembly having a structural tube with a predetermined inside diameter, a generally cylindrical insert of an axial length substantially smaller than the axial length of said structural tube and having a generally cylindrical passageway of a predetermined diameter smaller than said predetermined inside diameter for providing an effectively reduced inside diameter for said structural tube, said insert comprising:

means, having an outside diameter approximately equal to

said predetermined inside diameter, for coaxially centering said insert within said structural tube;



forming lobes, operable when expanded to locally deform against said structural tube thereby locking said insert within said structural tube.

4,716,018

END PLUG WITH TRUNCATED TAPERED LEADING END CONFIGURATION

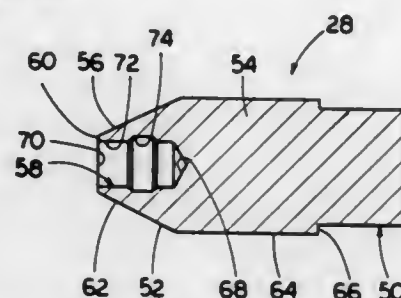
David A. Boatwright, Columbia, and Wade H. Widener, Cayce, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 12, 1985, Ser. No. 797,331

Int. Cl.⁴ G21C 3/10

U.S. Cl. 376-451

4 Claims



1. An improved end plug for attachment on an end of a cladding tube of a nuclear fuel rod which facilitates using a gripper tool for loading the fuel rod into a nuclear fuel assembly, comprising:

- (a) an inner portion adapted to be inserted into said end of said tube; and
- (b) an outer portion adapted to extend from said end of said tube when said inner portion is inserted therein, said outer portion including a body part disposed adjacent said tube end and a leading part disposed remote from said tube end;
- (c) said leading part having a hollow interior cavity defined therein, a continuous exterior annular truncated surface defined on a terminal end of said leading part and a continuous exterior annular tapered surface defined on a lateral side of said leading part;
- (d) said exterior tapered surface extending between and merging with said body part and said exterior truncated surface and providing sufficient angular inclination so as to facilitate insertion of the end plug when mounted on the fuel rod tube end into the fuel assembly;
- (e) said interior cavity in said leading part having an inner end, an outer opening defined at and surrounded by said exterior annular truncated surface and a continuous interior annular wall surface interconnecting said inner end and said outer opening, said interior wall surface being of the same constant diameter from said inner end to said outer opening;
- (f) said interior wall surface of said cavity having a continuous undercut annular groove defined therein having a larger diametrical size than that of inner and outer annular portions of said interior wall surface on opposite sides of

said groove, said groove being axially spaced from said cavity opening and engageable by the gripper tool fitted through said cavity opening for loading the fuel rod into the nuclear fuel assembly;

- (g) said leading part having a thickness between said exterior tapered surface thereon and said interior cavity undercut groove therein which is less than the radius of said groove and greater than the width of said exterior truncated surface, said interior wall surface of said cavity within said leading part having an axial length between said exterior truncated surface and said undercut groove which is greater than the axial width of said groove such that said leading part is provided with sufficient wall structure laterally surrounding said interior cavity to react the forces created by engagement of the gripper tool within the cavity groove.

4,716,019

PROCESS FOR PRODUCING COMPOSITE AGGLOMERATES OF MOLYBDENUM AND MOLYBDENUM CARBIDE

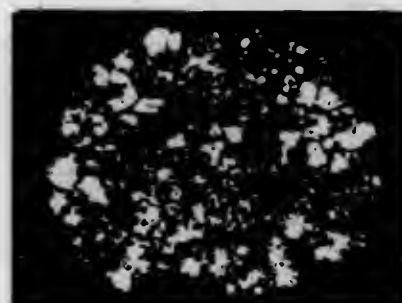
David L. Houck, Towanda; David J. Port, and Jen S. Lee, both of Sayre, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 4, 1987, Ser. No. 58,213

Int. Cl.⁴ B22F 1/00

U.S. Cl. 419-17

5 Claims



1. A process for producing composite agglomerates of molybdenum and molybdenum carbide (Mo_2C), said process comprising:

- (a) forming a relatively uniform mixture of non-agglomerated molybdenum powder and carbon powder, said carbon powder having a particle size no greater than the size of said molybdenum powder, with the amount of said carbon powder being proportional to the amount of molybdenum carbide desired in said composite agglomerates;
- (b) forming a slurry of said mixture, an organic binder, and water with the amount of said binder being no greater than about 2% by weight of said mixture;
- (c) agglomerating the powders in said mixture from said slurry;
- (d) classifying the resulting agglomerates to remove the major portion of the agglomerates having a size greater than about 170 mesh and less than about 325 mesh from the balance of said agglomerates; and
- (e) reacting said balance, the major portion of which has a size in the range of from about -170 mesh to about +325 mesh at a temperature of no greater than about 1400° C. for a sufficient time in a non-carbonaceous vessel in a non-oxidizing atmosphere to form said composite agglomerates.

4,716,020

TITANIUM ALUMINUM ALLOYS CONTAINING NIOBIUM, VANADIUM AND MOLYBDENUM

Martin J. Blackburn, Kensington, and Michael P. Smith, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 27, 1982, Ser. No. 424,668

Int. Cl.⁴ C22C 14/00

U.S. Cl. 420-418

11 Claims

1. A titanium aluminum alloy consisting essentially of, by atomic percent, 25-27 aluminum, 0.5-4 molybdenum, 7-15.5 niobium, with the balance titanium, wherein the (niobium+molybdenum) content is between 11 and 16 atomic percent.

4,716,021

HEAT TREATMENT APPARATUS FOR POLYOLEFIN RESIN PARTICLES

Hiroyuki Akiyama, Hiratsuka; Susumu Izawa, Utsunomiya; Shigeru Okabe, Imaichi, and Toru Yamaguchi, Utsunomiya, all of Japan, assignors to Japan Styrene Paper Corp., Tokyo, Japan

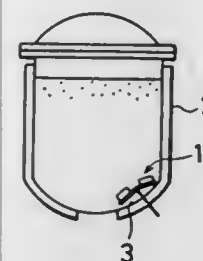
Filed Jul. 9, 1986, Ser. No. 883,655

Claims priority, application Japan, Jul. 17, 1985, 60-157493

Int. Cl.⁴ B01F 7/06

U.S. Cl. 422-135

6 Claims



1. An apparatus for the heat treatment of polyolefin resin particles comprising an autoclave having a tilted bottom wall portion and a turbine-type impeller provided over said tilted bottom wall portion such that the rotation of the impeller has an axis of rotation which is inclined with respect to the vertical of the autoclave, said impeller comprising a dome or umbrella-shaped disk and vanes arranged radially on the face or convex side of said disk.

4,716,022

PARTICLE TREATMENT APPARATUS

Joseph B. Priestley, Jr., 13200 N. 103rd Ave., #35, Sun City, Ariz. 85351

Filed Nov. 4, 1985, Ser. No. 794,475

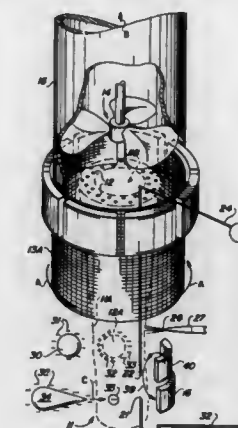
Int. Cl.⁴ F27B 17/10

U.S. Cl. 422-140

2 Claims

1. Particle treatment apparatus including
 - (a) means for forming in a volume of gas a free standing funnel extending downwardly from said means and having a core region and a vortex region of gas circulating around said core region, said means including
 - (i) a hollow cylindrical member having first and second open ends and a vertical axis, and,
 - (ii) means for rotating said cylindrical member about said vertical axis to cause gas to circulate around said axis;
 - (b) means for introducing particles into said vortex region, said vortex region causing said particles to circulate around said vertical axis in confined circular paths of travel generally lying in said vortex region and in a horizontal plane; and,

(c) particle treatment means generally adjacent said funnel for introducing a fluid into said vortex region, said fluid



being carried in said circulating gas in said vortex region and coating said particles.

4,716,023

COMPOSITE PARTIAL OXIDIZER AND REFORMER

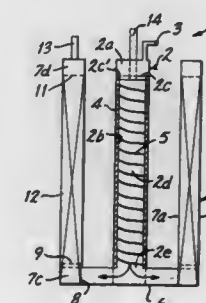
Larry G. Christner, Newtown, and Steven A. Koehler, Bethel, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Nov. 13, 1986, Ser. No. 930,299

Int. Cl.⁴ B01J 8/04

U.S. Cl. 422-149

7 Claims



1. Apparatus comprising: means for partially oxidizing a hydrocarbon containing fuel comprising: a tubular member having an inner wall; a wick extending along the length of said tubular member adjacent said inner wall; a spiral metallic member including a catalyst disposed thereon, said spiral member being situated adjacent said wick and extending along the length of said tubular member; a means for receiving said partially oxidized fuel for reforming said partially oxidized fuel and for shift converting said reformed fuel.

4,716,024

MAGNETIZING HYDROCARBON FUELS AND OTHER FLUIDS

Ivo Pera, Pembroke Pines, Fla., assignor to Goliarda Mugnai Trust, Miami Lakes, Fla.

Filed Jun. 25, 1986, Ser. No. 878,208

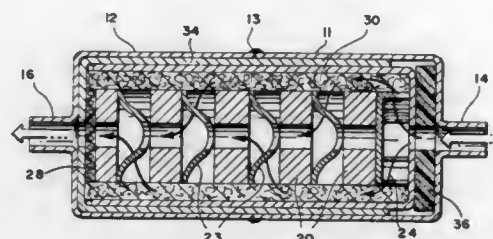
Int. Cl.⁴ B01J 19/08; B03C 1/30; C02F 1/48

U.S. Cl. 422-186.01

5 Claims

1. Apparatus for magnetically treating fluid comprising hydrocarbon fuels or water comprising a housing having an inlet port and an outlet port attached thereto in substantially coaxial relationship with each other, a plurality of flat circular magnets with an opening at the center thereof positioned

within said housing, said magnets being arranged with surfaces of like polarity adjacent each other, said magnets being separated from each other by a wave washer positioned between adjacent magnets whereby flow of the fluid passed said magnets maximize the exposure of said fluid to the magnetic fields surrounding said magnets, and a circular plate positioned upstream of the first circular magnet, said circular plate having a



flange extending axially therefrom with a plurality of flow openings provided through said flange around the circumference thereof whereby inlet flow within said housing flows radially past said flow openings and into a space surrounding the outer periphery of said circular magnets and between said housing whereby said fluid flow is radially inward past the flat surfaces of said magnets and then axially through said opening at the center of said magnets to said outlet port of said housing.

4,716,025

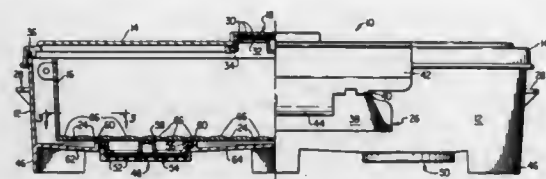
MEDICAL STERILIZATION CONTAINER WITH INSTRUMENT TRAY

Robert L. Nichols, 808 Fort Worth, Jacksonville, Tex. 75766
Division of Ser. No. 668,090, Nov. 5, 1984, Pat. No. 4,617,178.
This application Jan. 22, 1986, Ser. No. 821,137

Int. Cl.⁴ A61L 3/02

U.S. Cl. 422—310

3 Claims



1. A medical instrument sterilization container, comprising: a housing for receiving medical instruments for sterilization; a removable lid sealingly fitted to said housing; a tray removably disposed within said housing for supporting the medical instruments; a plurality of apertures defined in a grid pattern in the bottom of said tray to drain condensate therefrom; said tray having a plurality of raised domed portions, each said raised domed portion having a lowered peripheral area with at least two of said apertures, and wherein each of said domed portions slopes toward said lowered peripheral area in order to facilitate drainage of condensate through said apertures and to provide an irregular surface to minimize surface contact of the instruments with said tray and thus prevent condensate from being trapped under the instruments.

4,716,026

DEFLUORINATION KILN RESTRICTION CONTROL AGENT AND METHOD

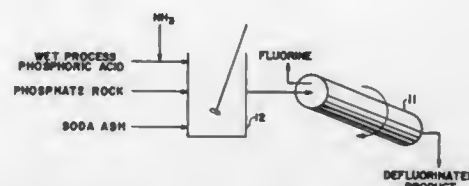
James R. Gruber, Lakeland; Ernest A. Gudath, Brandon; Dennis H. Michalski, Lakeland; Robert R. Riddle, Lakeland, and Regis R. Stana, Lakeland, all of Fla., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jan. 22, 1986, Ser. No. 820,503

Int. Cl.⁴ C01B 25/16

U.S. Cl. 423—167

7 Claims



1. In a process for thermal defluorination of a mixture of phosphate rock, wet process phosphoric acid and an alkali-containing fluxing agent by feeding said mixture to a thermal defluorination kiln adapted to receive said mixture, the method of preventing the formation of fused ring and ball materials comprising the steps of (1) ammoniating the wet process acid to provide a mole ratio of $\text{NH}_3:\text{PO}_4$ of from about 0.05 to 0.5 and (2) mixing the ammoniated acid with the rock and the fluxing agent prior to feeding the mixture to the kiln.

4,716,027

METHOD FOR SIMULTANEOUSLY SCRUBBING CEMENT KILN EXHAUST GAS AND PRODUCING USEFUL BY-PRODUCTS THEREFROM

Garrett L. Morrison, Unity, Me., assignor to Passamaquoddy Tribe, A Sovereign Indian tribe recognized by the Government of the United States of America, Thomaston, Me.

Continuation-in-part of Ser. No. 890,991, Jul. 25, 1986, which is a continuation-in-part of Ser. No. 796,075, Nov. 7, 1985, abandoned. This application Sep. 5, 1986, Ser. No. 904,719

Int. Cl.⁴ C01B 17/16, 21/00, 17/00

U.S. Cl. 423—225

11 Claims

1. A method of simultaneously scrubbing acidic oxides of sulfur, nitrogen and carbon from the hot exhaust stream from a cement kiln and utilizing acids derived therefrom to produce useful products from the carbonates and oxides of alkali and alkaline earth metals contained as solids in cement kiln dust comprising said carbonates and oxides and insoluble silicates, aluminates and iron compounds, which comprises

- (a) mixing said dust with water to form a slurry comprising undissolved solids and a solution of the soluble compounds in said dust, and
- (b) passing said gas stream into said slurry whereby said acidic oxides contained therein will react with water to produce acids, the latter will react with said carbonates and oxides of alkali and alkaline earth metals to yield a solution of alkali and alkaline earth metal salts comprising principally the cationic components, calcium, potassium, magnesium and sodium, and anionic components, carbonate, sulfate and nitrate, and a precipitate of alkali and alkaline earth metal salts with insoluble silicates, aluminates and iron compounds, and the gas of said gas stream after passing through said slurry emerges as scrubbed exhaust.

4,716,028

PROCESS FOR PREPARATION OF HIGH-TYPE SILICON NITRIDE POWDER

Kiyoshi Kasai, Atsugi; Takaaki Tsukidate, Hino, and Toshihiko Arakawa, Machida, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shiananyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,171

Claims priority, application Japan, Feb. 18, 1985, 60-28467

Int. Cl.⁴ C01B 21/063, 33/06

U.S. Cl. 423—344

5 Claims

1. A process of preparing crystalline silicon nitride by the thermal decomposition of a nitrogen-containing silane compound, said process comprising the steps of: forming a powder or molded body having a powder bulk density of at least 0.1 g/cm^3 expressed in terms of silicon, from a mixture of a crystalline silicon nitride powder having an oxygen content of at least 1.0% by weight and a nitrogen-containing silane compound, and thermally decomposing said mixture while said mixture is heated at a temperature-elevating rate of at least $15^\circ \text{C. per minute}$ in a temperature range of from $1,350^\circ \text{C.}$ to $1,550^\circ \text{C.}$, to obtain thereby an α -type silicon nitride powder.

4,716,029

BOEHMITE

Yasuo Oguri, Tokyo; Junji Saito, Yokohama, and Naoto Kijima, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

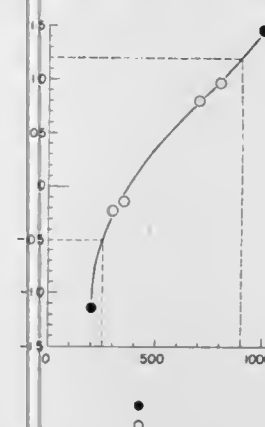
Continuation-in-part of Ser. No. 641,722, Aug. 17, 1984, abandoned. This application Dec. 16, 1985, Ser. No. 809,049
Claims priority, application Japan, Feb. 23, 1982, 57-28008; Oct. 29, 1982, 57-190074; Aug. 23, 1983, 58-153466

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.⁴ C01F 7/02

U.S. Cl. 423—625

1 Claim



1. A boehmite having an orthorhombic crystal form in which the ratio of the maximum length in the direction of the a-axis of the crystal to the distance between the opposing crystal faces perpendicular to the c-axis of said crystal is at least 10, said maximum length in the direction of the a-axis of the crystal is at least 2500 \AA and said distance between the opposing faces perpendicular to the c-axis of said crystal is $250\text{--}900 \text{ \AA}$.

4,716,030

METHOD FOR DETECTION OF EXOGENOUS OR ACTH STIMULATED GLUCOCORTICOIDS IN DOMESTIC ANIMALS

Dennis W. Macy, Ft. Collins, Colo., assignor to Colorado State University Research Foundation, Ft. Collins, Colo.

Filed Apr. 25, 1985, Ser. No. 727,288

Int. Cl.⁴ A61K 49/00

U.S. Cl. 424—9

9 Claims

1. A method for detecting supraphysiological levels of glucocorticoids in an animal, comprising the steps of: (a) administering a pharmacological dose of glucagon to an animal suspected of having supraphysiological glucocorticoid levels; (b) taking a blood sample from the animal between about 15 and about 60 minutes after the glucagon administration; and (c) comparing the blood glucose level of the sample with a blood glucose level of 300 mg/dl to indicate glucocorticoid use.

4,716,031

DRUG DISPENSER COMPRISING A MULTIPLICITY OF MEMBERS ACTING TOGETHER FOR SUCCESSFULLY DISPENSING DRUG

James B. Eckenhoff, Felix Theeuwes, both of Los Altos, and Joseph C. Deters, Mountain View, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 591,824, Mar. 21, 1984, abandoned. This application Feb. 12, 1986, Ser. No. 828,810

Int. Cl.⁴ A61K 9/48, 9/52

U.S. Cl. 424—453

3 Claims

1. A dispenser for delivering a beneficial drug at a controlled rate to a fluid biological environment of use having a temperature greater than 32°C. , the dispenser comprising:

- (a) a wall comprising a semipermeable polymeric composition that is permeable to the passage of a fluid present in the environment of use and substantially impermeable to the passage of a beneficial drug, the semipermeable wall surrounding in at least a part:
 - (i) an internal container, which container is a member selected from the group consisting of a one-piece capsule and a two-piece capsule comprising an internal compartment, said capsule member formed of a non-toxic composition adapted to be admitted into the biological environment of use comprising the gastrointestinal tract;
 - (ii) first means in the compartment for changing from a storable composition to a dispensable composition in response to the temperature of the biological environment, said first means a member selected from the group consisting of a glycerol ester of a fatty acid, polyethylene glycol, a block polymer of butylene oxide and ethylene oxide, a block polymer of propylene oxide and ethylene oxide, and a block polymer of polyoxyalkylene and propylene glycol;
 - (iii) a beneficial gastrointestinal administrable drug in the means responsive to temperature;
 - (iii) a second means in the compartment for imbibing fluid through the semipermeable wall and for expanding in the compartment, said second means a member selected from the group consisting of a polysaccharide, and acidic carboxy polymer, a polyethylene oxide, and a starch composition, said second means in contacting arrangement with the first means; and
- (b) at least one passageway through the wall and through the container connecting the exterior of the dispenser with the first means for dispensing the beneficial drug from the dispenser.

4,716,032
AEROSOL SPRAY COMPOSITION FOR MASTITIS PREVENTION

Geoffrey J. Westfall, P.O. Box 285, Rte. 6, Brooklyn, Conn. 06234, and Franklin D. Haase, Ridge Farm, Ill., assignors to Geoffrey J. Westfall, Brooklyn, Conn.
Division of Ser. No. 519,909, Aug. 3, 1983, Pat. No. 4,548,807.
This application Aug. 12, 1985, Ser. No. 764,751
Int. Cl.⁴ A61K 9/12

U.S. Cl. 424-45

15 Claims

1. A containerized product for use in preventing mastitis in dairy cattle and other animals, comprising: a container capable of being pressurized, said container having a valve means including an orifice nozzle discharge device capable of directing a disinfectant composition outwardly from said container; and a water based disinfectant composition contained within said container and being useful in the treatment of mastitis, said composition consisting essentially of a homogeneous mixture of: about 0.1 to 5.0 weight % of a disinfectant; about 5 to 75 weight % of a water and alcohol soluble aerosol propellant carrier having the characteristic of low temperature production upon volatilization; about 0 to 75 weight % of a lower alkanol; about 0 to 75 weight % of a water soluble emollient, either one or a combination of the alkanol and emollient being present in an amount of not less than 5 weight %; up to 1.0 weight % of a water soluble dye; and water in an amount sufficient to provide a total composition of 100 weight %; said mixture being uniformly homogeneous throughout the use thereof.

8. The product of claim 1, wherein said container is elongate and cylindrical and said valve means includes orifice nozzle means for directing an aerosol spray axially outwardly from one end of said container in a fan-shaped pattern.

4,716,033
MEDICAMENT ADSORBATES WITH SURFACTANT AND THEIR PREPARATION

John Denick, Jr., Newton, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Mar. 27, 1986, Ser. No. 845,209
Int. Cl.⁴ A61K 9/18, 9/16, 9/14

U.S. Cl. 424-48

18 Claims

1. A medicament adsorbate which comprises:
a complex magnesium aluminum silicate having sorbed therein a solution of medicament drug and a surfactant.

4,716,034
PACKAGED DENTAL CREAM

Sandra L. Schelm, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 27, 1985, Ser. No. 803,040
Int. Cl.⁴ A61K 7/16

U.S. Cl. 424-49

12 Claims

1. A packaged dental cream herein said dental cream is in direct contact with a low or medium density polyethylene or polypropylene surface, wherein syneresis occurs in said dental cream due to said direct contact when said dental cream comprises as ingredients an aqueous vehicle comprising a liquid vehicle comprising about 10-50% by weight of water and glycerine and sorbitol together in amount of about 15-50% by weight, the weight ratio of glycerine to sorbitol being from about 0.25:1 to about 3:1, a dental cream solid vehicle comprising about 0.05-10% by weight of a dental cream gelling agent and about 20-75% by weight of a dentally acceptable water-insoluble polishing material at least 50% by weight of which is alpha-alumina trihydrate, and a water-soluble inorganic phosphate compound in amount which reduces the pH of the dental cream to about 6-8; said dental cream comprising said ingredients and as an additive which prevents syneresis in said dental cream upon said direct contact about 0.5-2% by weight of polyethylene glycol of average molecular weight of about 200-1000, the weight ratio of the total amount of glycerine and

sorbitol to said polyethylene glycol being from about 60:1 to about 6:1.

4,716,035
ORAL COMPOSITIONS AND METHODS FOR TREATING GINGIVITIS

Padmini Sampathkumar, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 738,103, May 24, 1985, Pat. No. 4,670,252, and a continuation-in-part of Ser. No. 811,148, Dec. 19, 1985, Division of Ser. No. 811,149, Dec. 19, 1985. This application Sep. 26, 1986, Ser. No. 912,728
Int. Cl.⁴ A61K 7/16, 7/18, 9/68

U.S. Cl. 424-52

20 Claims

1. A pharmaceutical composition suitable for treating or preventing dental plaque, or gingival, or periodontal diseases of the oral cavity with reduced staining of teeth or dentures, which composition comprises:

- from about 0.001% to about 99.9% of an organic monoperphthalic peroxy acid-based antigingivitis agent selected from 1,12-dodecanedioic peroxy acid and its derivatives, monoperphthalic acid and its derivatives, and the pharmaceutically-acceptable salts and esters thereof;
- from about 0.001% to about 10% of a source of F⁻ fluoride ions, which source essentially completely dissociates in aqueous solution to provide free F⁻ fluoride ions in solution; and
- a pharmaceutically-acceptable carrier suitable for delivering said antigingivitis agent and said fluoride ion source to the oral cavity.

4,716,036
STABILIZED DENTAL CREAM CONTAINING VEGETABLE OIL

Sandra L. Schelm, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 22, 1986, Ser. No. 821,566
Int. Cl.⁴ A61K 7/16, 7/26

U.S. Cl. 424-57

9 Claims

1. A dental cream in direct contact with a low or medium density polyethylene or polypropylene surface, wherein syneresis occurs in said dental cream due to said direct contact when said dental cream comprises as ingredients a liquid vehicle comprising about 10-50% by weight of the dental cream of water, glycerine and sorbitol, the amount of glycerine and sorbitol together being about 15-50% by weight of the dental cream, the weight ratio of glycerine to sorbitol being from about 0.25:1 about 3:1 about 0.05-10% by weight of the dental cream of gelling agent selected from the group consisting of Irish Moss, gum tragacanth, sodium carboxymethyl cellulose, hydroxyethyl cellulose, polyvinyl pyrrolidone, sodium alginate, guar gum, starch and xanthan, about 20-75% by weight of the dental cream of a dentally acceptable water-insoluble polishing material consisting essentially of at least 50% by weight of alpha-alumina trihydrate, and a water-soluble inorganic ortho-phosphate compound in amount which reduces the pH of the dental cream to about 6-8, and as an additive which prevents syneresis in said dental cream upon said direct contact, about 0.1-5% by weight of the dental cream of a vegetable oil being selected from the group consisting of coconut oil, palm oil, peanut oil and safflower oil.

4,716,037
METHOD OF ELIMINATING THE CORROSIVITY OF HAIR CONDITIONING COMPOSITIONS

Constance E. Erdman, and Timothy J. Padden, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Feb. 24, 1986, Ser. No. 832,565

Int. Cl.⁴ A61K 7/06, 7/08

U.S. Cl. 424-70

18 Claims

1. A method of eliminating the corrosion to stainless steel by

a corrosive hair conditioning composition which contains chloride ions or sulfate ions and is corrosive to stainless steel which comprises adding to the corrosive hair conditioning composition an effective corrosion inhibiting amount of a quaternary ammonium phosphate compound.

4,716,038
METHODS FOR THE ALLEVIATION OR TREATMENT OF ARTHRITIC DISEASE

John L. Stanford, Mill House, Claygate, Marden, Kent, England; Iron R. Cohen, 11, Hankin Street, Rehovot, Israel; Ayala Frenkel, 5, Hanasi Harishon Street, Rehovot, Israel; Joseph Holoshitz, 24, Hiber Street, Petach Tikva, Israel; Willem van Eden, Hooglandse Kerksteeg, 3, N-2312 HR Leiden, Netherlands, and Graham A. W. Rook, 27, Glenloch Road, London NW3 4DJ, England

PCT No. PCT/GB85/00183, § 371 Date Feb. 25, 1986, § 102(e) Date Feb. 25, 1986, PCT Pub. No. WO85/05034, PCT Pub. Date Nov. 21, 1985

PCT Filed Apr. 29, 1985, Ser. No. 817,742

Claims priority, application Israel, Apr. 27, 1984, 71683

Int. Cl.⁴ A61K 39/02, 35/74

U.S. Cl. 424-92

6 Claims

1. A method for the alleviation or treatment of arthritic disease which comprises administering to a patient suffering therefrom an effective amount of a composition comprising, as the active ingredient, a mycobacterium or a fraction thereof.

4,716,039
VIRUS INSECTICIDE COMPOSITIONS

Martin H. Rogoff, Potomac, Md., and Tsueng R. Shieh, Miami, Fla., assignors to Sandoz Pharm. Corp., E. Hanover, N.J.
Continuation of Ser. No. 638,014, Aug. 6, 1984, abandoned, which is a continuation of Ser. No. 139,845, Apr. 14, 1980, abandoned, which is a continuation of Ser. No. 4,276, Jan. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 751,725, Dec. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 596,986, Jul. 18, 1975, abandoned. This application May 16, 1985, Ser. No. 734,889
Int. Cl.⁴ A01N 63/00

U.S. Cl. 424-93

40 Claims

1. A particulate insecticidal composition comprising a free-flowing particle mass containing 0.1 to 35 percent by weight of a finely divided virus insecticide in which virions are in inclusion body form secured in from 65 to 99.9 percent by weight of a matrix comprising a material selected from the group consisting of a normally solid defatted vegetable proteinaceous material and mixtures of normally solid defatted vegetable proteinaceous material and clay in a weight ratio of 0.1 to 10 parts of said proteinaceous material per part of clay, such particles having a size in the range of from 3 to 150 microns, said virus insecticide being free of viruses which are not in inclusion body form.

4,716,040
CONTROLLED ABSORPTION METHYLDOPA PHARMACEUTICAL FORMULATION

Donald E. Panoz, Whale Bay, Bermuda, assignor to Elan Corporation P.L.C., Ireland

Filed Dec. 20, 1984, Ser. No. 685,324

Claims priority, application Ireland, Dec. 21, 1983, 3026/83

Int. Cl.⁴ A61K 9/50, 9/58

U.S. Cl. 424-459

11 Claims

1. A controlled absorption methyldopa formulation for oral administration, comprising a pellet having a core of methyldopa or a pharmaceutically acceptable salt thereof in association with an organic acid, and a multi-layer membrane surrounding said core and containing a major proportion of a pharmaceutically acceptable film forming, water-insoluble polymer and a minor proportion of a pharmaceutically acceptable film forming, water-soluble polymer, the number of layers in said membrane and the ratio of said water-soluble polymer to said water-insoluble polymer being effective to permit re-

lease of said methyldopa from said pellet at a rate allowing controlled absorption thereof over a twenty four hour period following oral administration said rate being measured in vitro as a dissolution rate which is substantially pH independent and which when measured in a Basket Assembly according to U.S. Pharmacopoeia XX at 37° C. and 75 r.p.m., substantially corresponds to the following dissolution pattern:

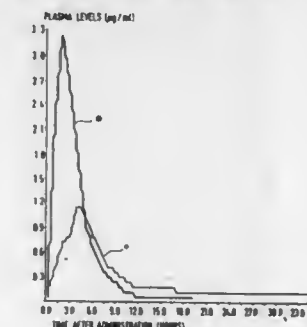


FIG. 1

- from 25 to 50% of the total methyldopa is released after 1 hour of measurement in said assembly;
- from 50 to 80% of the total methyldopa is released after 3 hours of measurement in said assembly;
- from 80 to 100% of the total methyldopa is released after 5 hours of measurement in said assembly; and
- from 90 to 100% of the total methyldopa is released after 7 hours of measurement in said assembly.

4,716,041
DIFFUSION COATED MULTIPLE-UNITS DOSAGE FORM

Kim Kjærnaes, Valby; Finn N. Christensen, Hørsholm, and Jens R. Jensen, Stenløse, all of Denmark, assignors to A/S Alfred Benzon, Copenhagen, Denmark
PCT No. PCT/DK85/00005, § 371 Date Oct. 28, 1985, § 102(e) Date Oct. 28, 1985, PCT Pub. No. WO85/03436, PCT Pub. Date Aug. 15, 1985

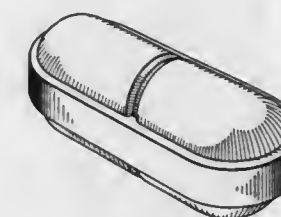
PCT Filed Feb. 8, 1985, Ser. No. 795,497

Claims priority, application Denmark, Feb. 10, 1984, 620/84; Feb. 10, 1984, 621/84

Int. Cl.⁴ A61K 9/14, 9/22

U.S. Cl. 424-468

25 Claims



1. An oral pharmaceutical controlled release multiple-units formulation in which individual units containing an active substance are coated with a substantially water-insoluble, but water-diffusible controlled release coating comprising

- an inner film layer which causes adhesion between the units at elevated temperatures comprising a water-dispersible film-forming agent, and
- an outer film layer comprising a water-based film-forming agent which prevents adhesion between the units at elevated temperatures and imparts flowability to the units, the coated units having been subjected to heating at a temperature at which the formation of a continuous phase of the film-forming agent of the inner film layer is accelerated to form a coating which does not substantially change its diffusion characteristics in the course of time.

4,716,042

STABILIZED COATED ASPIRIN TABLETS

Robert G. Blank, Vineland, N.J., and Ronald W. Miller, Huntingdon Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 16, 1986, Ser. No. 874,956

Int. Cl.⁴ A61K 9/28

U.S. Cl. 424—474

4 Claims

1. A film coated aspirin tablet/caplet containing as the active ingredient a material selected from the group consisting of aspirin and aspirin with caffeine wherein acetylsalicylic acid decomposition is inhibited by incorporation therein prior to coating of a small decomposition inhibiting amount of an acid selected from the group consisting of citric acid, alginic acid, glutamic acid and admixtures thereof, the coated tablet/caplet having been film or enteric coated from an aqueous solution of a film or enteric coating material.

4,716,043

PROCESS FOR MAKING PORTIONED CHEESE

Jens Peter S. Hansen, Risskov, Denmark, assignor to Jens Peter Hansen, Aarhus A/S, Denmark

PCT No. PCT/DK84/00071, § 371 Date Mar. 20, 1985, § 102(e) Date Mar. 20, 1985, PCT Pub. No. WO85/00501, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 26, 1984, Ser. No. 718,021

Claims priority, application Denmark, Jul. 28, 1983, 3460/83

Int. Cl.⁴ A23C 9/137, 19/02

U.S. Cl. 426—35

4 Claims

1. A process for producing portioned cheese, consisting essentially of:

mixing a milk concentrate having a solids content of 35–40% and a temperature of between 0° to 60° C. with glucono-delta-lactone and additives selected from the group consisting of rennet, lipase, organic acids, calcium chloride, stabilizers, emulsifiers, phosphates, citrates and salts, thereby forming a liquid mixture to be coagulated, said milk concentrate obtained by ultrafiltration or diafiltration of whole milk or skim milk;

dispensing said liquid mixture, before coagulation takes place, into individual packages; and

closing hermetically and storing said individual packages to permit coagulation and ripening of said liquid mixture without any contamination;

wherein the amount of glucono-delta-lactone and said temperature are selected to ensure that coagulation of said liquid mixture occurs after said liquid mixture has been dispensed into said individual containers.

4,716,044

PROCESS FOR OBTAINING JUICES FROM FRUITS CONTAINING SAME

Ronald L. Thomas, Clemson; Terry C. Titus, Seneca, and Craig A. Brandon, Clemson, all of S.C., assignors to Clemson University, Clemson, S.C.

Filed Jan. 31, 1986, Ser. No. 825,083

Int. Cl.⁴ A23L 2/06; B01D 13/00

U.S. Cl. 426—51

18 Claims

1. An improved process for obtaining fruit juice from fruit containing same consisting essentially of the steps of:

(a) processing fruit from which said juice is to be obtained to produce a pumpable fluid puree of fruit and juice;

(b) providing an elongated tubular rigid porous housing of predetermined size and length, said housing having a food grade ultrafiltration membrane secured along inside surfaces of same, said membrane having an initial permeability (P) to water of from about 1 to about 15 as determined by the formula

$$P = \frac{\text{permeate flux}}{\text{pressure}}$$

where permeate flux is the number of gallons of water

passing through a square foot of membrane per day and pressure is measured in pounds per square inch;

(c) simultaneously extracting said juice from said puree and clarifying and sterilizing said juice by pumping said puree in a single pass through said tubular housing at an inlet pressure of from about 100 to about 1000 pounds per square inch during which said puree makes tangential contact with said membrane and said juice passes through said membrane and is extracted, clarified and sterilized thereby.

4,716,045

PROCESS FOR THE MANUFACTURE OF A DAIRY PRODUCT

Giovanni Prella, Vercelli, Italy, assignor to Nestec S.A., Vevey, Switzerland

Filed Dec. 11, 1985, Ser. No. 807,550

Claims priority, application European Pat. Off., Dec. 24, 1984, 84116296.9

Int. Cl.⁴ A23C 19/00

U.S. Cl. 426—63

17 Claims

1. A method for manufacturing a non-fermented dairy product of the soft-curd fresh cheese type comprising preparing a starting mixture by homogeneously mixing casein in the native state, fats and whey proteins, sterilizing the starting mixture at a pH and at a temperature and for a time which maintains the casein in the native state and reactive to rennet, introducing the sterilized starting mixture and sterile rennet into a sterile container under hygienic conditions and hermetically sealing the sterilized mixture and sterile rennet product within the container and then subjecting the hermetically sealed product to temperature and time conditions sufficient for the sterile rennet to set the product.

4,716,046

PULVERULENT WATER-SOLUBLE NONHYGROSCOPIC COMPOSITION FOR PREPARING BEVERAGES WITH A LASTING EFFERVESCENCE AND METHOD FOR PREPARING THE SAME

Louis F. Lavie, Lausanne, Switzerland, assignor to Dridrinks N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 599,695, Apr. 12, 1984, Pat. No. 4,579,742. This application Jan. 7, 1985, Ser. No. 689,440

Claims priority, application European Pat. Off., Dec. 19, 1984, 84810641.5

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.⁴ A23L 2/40; A61K 9/36, 9/62

U.S. Cl. 426—96

18 Claims

1. A pulverulent effervescent, water-soluble, non-hygroscopic composition for use as the basis for diet or soft drinks, said composition comprising a mixture of components in particulate form capable of reacting mutually in the presence of water to evolve gas, characterized in that each of the particulate components is impregnated with the dry residue of a heat-treated saccharose or saccharose derivative ethanolic liquor containing gum arabic.

4,716,047

FAT BLENDS CONTAINING MILK FAT OR A MILK FAT FRACTION AND NON-MILK FAT, AND SPREADS CONTAINING SAID FAT BLENDS

Gerhard Biernoth, Quickborn; Hans-Udo Menz, Schenefeld; Klaus H. Todt, and Theophil Wieske, both of Hamburg, all of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 21, 1986, Ser. No. 821,105

Claims priority, application United Kingdom, Jan. 24, 1985, 8501778

Int. Cl.⁴ A23D 3/00

U.S. Cl. 426—603

22 Claims

1. A fat blend comprising 10–90 wt. % of milk fat or a milk fat portion and 90–10 wt. % of a non-milk fat wherein

(i) the non-milk fat comprises 15–50 wt. % glycerides selected from the group consisting of S₂X, SYZ, SZY, SYY, SZZ glycerides and mixtures thereof;

(ii) the total amount of SYZ, SZY, SY₂ and SZ₂ glycerides is at least 12 wt. % when the amount of S₂X glycerides is less than 7 wt. %, based on the non-milk fat;

(iii) the total amount of SYZ, SZY, SY₂ and SZ₂ glycerides is at least 3 wt. % when the amount of S₂X glycerides is at least 7 wt. %, based on the non-milk fat, and 50–85% wt. % of triglycerides having a composition such that the fat solids profile of the non-milk fat corresponds to the following percentages of crystallized fat measured by NMR: N₁₀: C=15–65; N₂₀: C=10–30; N₃₅: C=0–3 S being a saturated fatty acid residue containing 16 or more carbon atoms,

X is a saturated fatty acid residue containing 2–8 carbon atoms, a cis-unsaturated fatty acid containing 16 or more carbon atoms, or a hydroxy group,

Y is a trans-unsaturated fatty acid residue containing 16 or more carbon atoms,

Z is a saturated fatty acid residue containing 12 or 14 carbon atoms.

4,716,048

PROCESS FOR FORMING DEPOSITED FILM

Shunichi Ishihara, Ebina; Shigeru Ohno, Yokohama; Masahiro Kanai; Shunri Oda, both of Tokyo, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

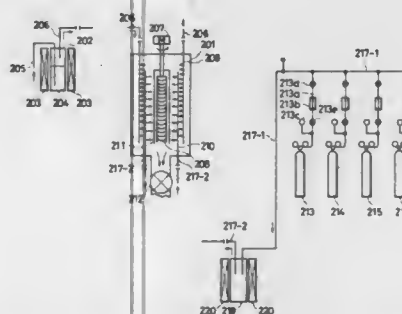
Filed Feb. 11, 1986, Ser. No. 828,256

Claims priority, application Japan, Feb. 12, 1985, 60-025896; Feb. 18, 1985, 60-029809; Feb. 19, 1985, 60-031053; Feb. 20, 1985, 60-031871; Feb. 21, 1985, 60-033276; Feb. 22, 1985, 60-034778

Int. Cl.⁴ H01L 21/469

U.S. Cl. 427—39

21 Claims



1. A process for forming a deposited film, which comprises introducing into a film forming space housing a substrate therein an active species (A) formed by decomposition of a compound containing germanium and a halogen and an active species (B) formed by decomposition of a chemical substance for film formation which is reactive with said active species (A) separately from each other, and then allowing both the

species to react with each other thereby to form a deposited film on the substrate.

4,716,049

COMPRESSIVE PEDESTAL FOR MICROMINIATURE CONNECTIONS

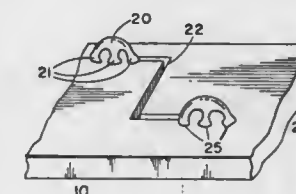
Nils E. Patraw, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 811,560, Dec. 20, 1985. This application Jan. 30, 1986, Ser. No. 880,478

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—96

2 Claims



1. A method for making a resilient microelectronic connective member including the steps of:

providing a substrate for forming said resilient microelectronic connective member;

covering said substrate with a substrate mask having an aperture;

filling said aperture with a filling material which will form a positive meniscus at the top boundary of said substrate mask in order to form a rounded pillar on said substrate within said aperture;

dissolving said substrate mask with a dissolving substance that will remove said substrate mask from said substrate but that will leave said pillar intact on said substrate;

impressing a pedestal design mask over said pillar;

depositing a layer of metal over said pedestal design mask in order to form a resilient microelectronic connective member; and

dissolving said pillar with a dissolving substance that will remove said pillar but that will leave said resilient microelectronic connective member on said substrate.

4,716,050

CHEMICAL VAPOR DEPOSITION OF ALUMINUM ON AN ACTIVATED SURFACE

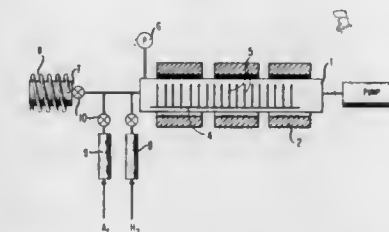
Martin L. Green, New Providence; Roland A. Levy, Berkeley Heights, and Ralph G. Nuzzo, Summit, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 861,119, May 7, 1986, abandoned, which is a continuation of Ser. No. 730,674, May 3, 1985, abandoned. This application Nov. 10, 1986, Ser. No. 928,744

Int. Cl.⁴ B05D 5/12; C23C 16/20

U.S. Cl. 427—99

9 Claims



1. In the manufacture of semiconductor integrated devices, a method for depositing an aluminum layer on a surface,

said depositing being by chemical vapor deposition while said substrate is heated at a desired temperature, and said method comprising treating said surface, prior to said depositing, with an activating agent so as to produce on said surface a surface layer comprising hydroxyl groups, derivatizing said surface layer, and decomposing the derivatized layer.

4,716,051

IMPREGNATION OF CONCRETE IN DEPTH

Karl-Martin Rödder, Troisdorf-Spich, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Troisdorf Bez Koeln, Fed. Rep. of Germany
Continuation of Ser. No. 689,034, Jan. 7, 1985, abandoned, which is a continuation of Ser. No. 514,186, Jul. 15, 1983, abandoned. This application Nov. 26, 1985, Ser. No. 801,792
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228660

Int. Cl.⁴ B05C 1/16; B05D 5/10

U.S. Cl. 427—136

7 Claims

1. A method for hydrophobizing depth-impregnation of a set heavy concrete comprising treating at least one surface of the set heavy concrete with a solvent free alkyl trialkoxysilane wherein the alkyl group has 3 to 8 carbon atoms and the alkoxy group has 1 or 2 carbon atoms.

4,716,052

METHOD OF MAKING PRESSURE SENSITIVE ADHESIVE TAG OR LABEL STOCK

Robert E. Waugh, Sun City Center, Fla.; Urban R. Nannig, North Kingstown, R.I., and Clyde R. Rockwood, Columbus, Ohio, assignors to The D. L. Auld Company, Columbus, Ohio
Filed Jan. 21, 1986, Ser. No. 820,270

Int. Cl.⁴ B41M 3/12

U.S. Cl. 427—147

7 Claims

1. A method of making stock for a tag, label, or the like comprising the steps of:

- providing a layer of pressure sensitive adhesive,
- treating a first surface of said pressure sensitive adhesive by the application of an inert particulate material to render said first surface substantially tack free and suitable for printing directly thereon, and
- printing indicia directly on said substantially tack free first surface of said pressure sensitive adhesive.

4,716,053

TUBING COATING DEVICE AND METHOD

Luther Eekjian, 2223 Midlothian Dr., Altadena, Calif. 91001
Filed Feb. 26, 1986, Ser. No. 833,341

Int. Cl.⁴ B05D 7/22

U.S. Cl. 427—230

20 Claims



1. The method of applying a coating of viscous material to bores of an outer tube and of an insert tube, and proximate the inserted end of the insert tube, the steps including:

- inserting a sealing element forwardly within the bore of the outer tube and to a position proximate said inserted end of the insert tube, and also locating a plunger within said insert tube, with said viscous material on the surface of the plunger, and the sealing element carried on the plunger,
- advancing a pusher forwardly on the plunger to push said viscous material toward and proximate said sealing element and proximate said end of the insert tube,
- distorting said sealing element to engage the bore of the outer tube, and also squeezing said viscous material

against the bores of the tubes proximate said end of the insert tubing,

- and causing said element to move away from the bore of the outer tube and withdrawing the element and pusher rearwardly from the tubes.

12. In apparatus for applying coating of viscous material to bores of an outer tube and of an insert tube, and proximate the inserted end of the insert tube, the combination including:

- a plunger means and a distortable sealing element carried thereon to be inserted forwardly within the bore of the outer tube and to carry said element to a position proximate said inserted end of the insert tube, whereby viscous material may be located on the surface of the plunger,
- a pusher carried to be advanced forwardly on the plunger to push said viscous material toward and proximate said element and proximate said end of the insert tube,
- means for distorting said element to engage the bore of the outer tube, enabling confinement of said viscous material against the bores of the tubes proximate said end of the insert tubing, and for allowing contracting of said element away from the bore of the outer tube and withdrawal the contracted element and pusher rearwardly from the tubes.

4,716,054

ACCELERATED FIXING OF CHROMATE-CONTAINING WOOD PRESERVATIVE SALTS

Richard Stanek, Mainz-Finthen; Hans-Norbert Marx, Buehl-Weitenung; Wendelin Hettler, Sinzheim-Muellhofen, and Claus Wagner, Neumarkt, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 12, 1986, Ser. No. 838,782

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510364

Int. Cl.⁴ B05D 3/12

U.S. Cl. 427—297

3 Claims

1. A process for the accelerated fixing of chromate-containing wood preservative salts, in which freshly impregnated timbers are subjected to fixing with superheated steam, wherein the freshly impregnated timbers are subjected first to a dry heat treatment in which both the wood surface and the internal walls of the heating chamber are heated to 60°–100° C. and the timbers are then treated with superheated steam in a conventional manner.

4,716,055

CONDUCTIVE FIBER AND METHOD OF MAKING SAME

John H. Sanders, Newport News, Va.; Louis D. Hoblit, Lake Jackson, Tex., and Joe A. Mann, Greensboro, N.C., assignors to BASF Corporation, Williamsburg, Va.

Filed Aug. 5, 1985, Ser. No. 762,360

Int. Cl.⁴ C23C 18/30

U.S. Cl. 427—304

15 Claims

1. A process of making an electrically conductive polymeric filament comprising:

- mixing a catalyst with a polymer wherein said polymer is catalyzed for electroless deposition of a metal;
- extruding the mixture of step (a) to form a catalyzed filamentary polymeric material; and
- electrolessly depositing a metal coincident with said catalyzed filamentary polymeric material to form said conductive polymeric filament; wherein said conductive polymeric filament has a metallic zone occupying at least 1% of the cross-sectional area of said conductive polymeric filament.

4,716,056

SYSTEM FOR TREATING A SURFACE

Frank Fox, 52A Robins Ave., Newington, Conn. 06111, and Cassius W. Leys, 80 E. Hartsdale Ave., Hartsdale, N.Y. 10530
Filed Dec. 24, 1986, Ser. No. 945,887

Int. Cl.⁴ B05D 3/02

U.S. Cl. 427—407.1

18 Claims

1. A method for treating a surface to facilitate subsequent removal of any markings placed thereon, said method comprising the steps of:

- preparing by scraping, degreasing, brushing, sanding and/or washing said surface;
- applying a water-based epoxy to said surface and permitting said water-based epoxy to dry for a period sufficient to allow the release of any moisture contained therein; and
- applying a top coat which includes an aliphatic urethane color component to said surface and permitting said top coat to dry thereon.

4,716,057

PROCESS FOR THE PREPARATION OF PUTTY FOR USE IN COATING, INCLUDING AUTOMATIC COATING OF SLABS OF MARBLE OR STONE AND THE LIKE UNDER VACUO IN TWO SEPARATE CONTAINERS

Marcello Toncelli, Via Giovanni XXIII, 2 Bassano Del Grappa, Vicenza, Italy

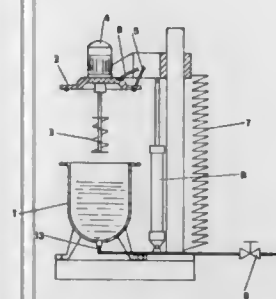
Filed Sep. 25, 1986, Ser. No. 911,484

Claims priority, application Italy, Sep. 30, 1985, 85601 A/85

Int. Cl.⁴ B05D 3/02

U.S. Cl. 427—393.6

1 Claim



1. A method of coating a slab of marble, stone which consists of mixing in a first container the ingredients of the first component of a putty, said first component comprising polyester resins, calcium carbonate, silica gel and a catalyst, evacuating the container and mixing said ingredients under vacuo to obtain an homogeneous mixture, introducing into a second container the ingredients of the second component of the putty which contains the accelerator, said ingredients comprising a polyester resin, calcium carbonate and silica gel, evacuating the second container and mixing said ingredients therein under vacuum, introducing compressed air into the containers, removing only the desired quantities of each of said components at the time of use and causing said desired quantities to be spread directly onto the slab being coated whereby the premature hardening of the putty and the incorporation of air are avoided.

4,716,058

METHOD OF CURTAIN COATING TO MAKE THIN DIELECTRIC CERAMIC LAYERS

Thomas M. Morin, Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 25, 1986, Ser. No. 899,832

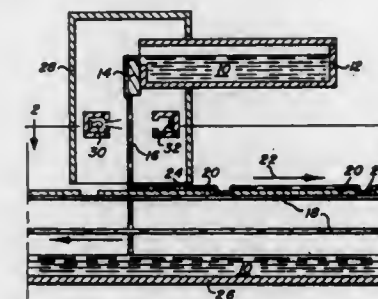
Int. Cl.⁴ B05D 1/30

U.S. Cl. 427—420

9 Claims

1. A method for making a ceramic capacitor having at least one buried electrode including depositing at least one foundation ceramic-paint coating on a substrate, depositing one patterned electroding ink film on said foundation coating, deposit-

ing a dielectric-ceramic-paint coating over said film and depositing another patterned electroding ink film on said dielectric-ceramic-paint coating, wherein the improvement comprises: continuously pumping a dielectric-ceramic paint into a reservoir of the kind that discharges said paint as a falling paint curtain; directing a source of electromagnetic radiation through said curtain equally near the left edge and near the right edge of said curtain; sensing the radiation transmitted through said curtain;



passing said substrate through said falling paint curtain to accomplish said depositing of said dielectric-ceramic-paint; and

adjusting the symmetry of paint discharge from said reservoir to cause the radiation through said curtain near said left edge of said curtain to equal the transmitted radiation near said right edge so that the falling curtain is equally thick near both said edges and said dielectric-ceramic-paint coating is rendered uniformly thick between opposite edges on said substrate.

4,716,059

COMPOSITES OF METAL WITH CARBON FLUORIDE AND METHOD OF PREPARATION

Jung T. Kim, Williamsville, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 26, 1987, Ser. No. 18,892

Int. Cl.⁴ B05D 1/18

U.S. Cl. 427—443.1

14 Claims

1. A process for the simultaneous electroless deposition of particulate carbon fluoride and metals comprising:

- suspending up to 20 wt. % carbon fluoride particles having an average particle size of 0.2 to 8 μ m in an aqueous solution comprising,
- about 0.5 to 2.0 % by volume of a non-ionic surfactant having an HLB number of 10 to 20, and optionally
- up to about 20% by volume of a cationic surfactant relative to said non-ionic surfactant of (a) (1),
- adding the suspension of carbon fluoride particles of (a) to an electroless metal plating bath;
- suspending a solid in the electroless metal plating bath containing suspended carbon fluoride particles for a period of time sufficient to co-deposit the desired amount of carbon fluoride and metal.

4,716,060

WATER PROOFING AND PRESERVATIVE METHODS

Vithal J. Rajadhyaksha, and Nelly M. Rajadhyaksha, both at 27436 Esquina, Mission Viejo, Calif. 92691

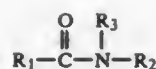
Filed May 2, 1986, Ser. No. 859,059

Int. Cl.⁴ A01N 3/00; B27K 3/00; B32B 9/04

U.S. Cl. 428—15

25 Claims

1. The method of treating the surface of wood, concrete, stone, leather, rubber, paint, or metal, comprising coating the surface with a solvent comprising from about ten percent to one hundred percent of the total solvent a compound having the formula:



wherein R₁, R₂ and R₃ are saturated alkyls having from 2 to 20 carbon atoms, and wherein at least one of R₁, R₂ and R₃ is a saturated alkyl having at least 12 carbon atoms and wherein either R₁ and R₂, R₁ and R₃, or R₂ and R₃ is in the form of a cyclic structure, thus forming a nitrogen heterocyclic compound.

4,716,061

POLYPROPYLENE/POLYESTER NONORIENTED HEAT SEALABLE MOISTURE BARRIER FILM AND BAG

John P. Winter, Appleton, Wis., assignor to Presto Products, Incorporated, Appleton, Wis.

Filed Dec. 17, 1985, Ser. No. 810,110

Int. Cl.⁴ B65B 25/06; B32B 27/08

U.S. Cl. 428—35

40 Claims



1. A nonoriented, heat sealable, coextruded, moisture barrier film comprising:

- a base layer selected from the group consisting of a polypropylene homopolymer, a polypropylene copolymer and combinations thereof;
- a heat sealant layer selected from the group consisting of a polyester, a copolyester and combinations thereof; and
- a tie layer between the base layer and the heat sealant layer selected from the group consisting of a modified polyolefin blend, an unmodified polyethylene copolymer and combinations thereof.

4,716,062

COMPOSITE MATERIALS, THEIR PREPARATION AND ARTICLES MADE THEREFROM

Max Klein, P.O. Box 3, Dalton, Mass. 01226

Filed Nov. 8, 1985, Ser. No. 796,929

Int. Cl.⁴ C08J 5/02; B32B 5/06

U.S. Cl. 428—36

26 Claims

1. An aqueous dispersion for the production of composite material in the form of a sheet or web comprising a continuous matrix phase which surrounds a reinforcement phase composed of discrete reinforcing elements, the disperse phase of said aqueous dispersion including (i) polymer micro-bits produced from an expanded, hydrophobic, thermoplastic polymer which is non-brittle in expanded form, said polymer micro-bits being substantially completely free of intact cells of the expanded polymer from which they are produced, (ii) at least one finely divided, hydrophobic, heat fusible resin, and (iii) said reinforcing elements.

4,716,063

INFORMATION RECORDING DISK

Haruo Uehara, Yokohama, and Hiroshi Omata, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,837

Claims priority, application Japan, Oct. 23, 1984, 59-223714

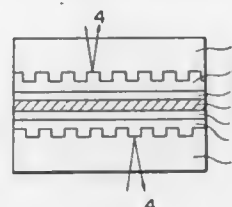
Int. Cl.⁴ C08G 75/04; G11B 7/24

U.S. Cl. 428—65

6 Claims

1. An information recording disk prepared by a method wherein a liquid precursor is held between an information recording disk mold and a transparent support substrate and is

cured to form a resin transfer layer integrally with the transparent support substrate, and the information pattern on the mold is transferred to the resin transfer layer, characterized in that the resin precursor used in the resin transfer layer com-



4,716,064

COMPOSITE STIFF LIGHTWEIGHT STRUCTURE AND METHOD FOR MAKING SAME

Robert A. Holzl, LaCanada, and Robert E. Benander, Sylmar, both of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 31, 1985, Ser. No. 793,828

Int. Cl.⁴ B32B 3/12

U.S. Cl. 428—73

5 Claims



1. A lightweight structure having a high stiffness to weight ratio comprising, at least a pair of outer surface defining elements extending spaced from each other to define a volume therebetween and comprising substantially planar and substantially parallel members, and at least one stiffening element extending between said outer surface defining elements within the volume defined thereby, said stiffening element defining a volume and being substantially cylindrical and the axis of which intersects said parallel members at substantially a right angle and having at least one wall intersecting each of said outer surface defining elements, said stiffening element and said outer surface defining elements comprising a chemically vapor deposited material selected from the group consisting of the carbides, nitrides, and borides of silicon and titanium, and carbides and nitrides of boron as a monolithic structure having a thickness of at least about 1 millimeter.

4,716,065

UNDERLYING PAD FOR ATTACHING REMOVABLE AUTOMOBILE CARPET

John J. McLaughlin, 729 Shore Rd., Somers Point, N.J. 08244

Continuation-in-part of Ser. No. 752,806, Jul. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 649,909, Sep. 4, 1984, Pat. No. 4,671,981. This application Nov. 10, 1986,

Ser. No. 929,261

Int. Cl.⁴ B32B 3/06

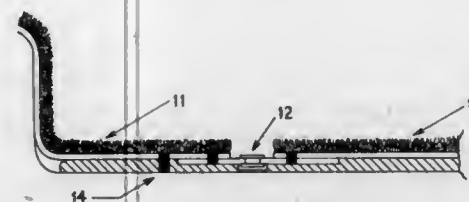
U.S. Cl. 428—95

10 Claims

3. A means to construct removable automobile carpets positioned in the openings cut out of the main floor carpet in the well areas of an automobile, with such removable carpets being in the same plane as the main automobile floor carpet, comprising in combination:

- a. Underlying pads that rest on the car floor,

b. a main automobile floor carpet with the well areas having corresponding openings.



c. removable carpets that insert into the openings in the main automobile floor carpet, rest on the top of the underlying pad or pads and having one side of a border fastener adhered to the pad (or pads).

4,716,066

FILLING BODY OF ACID-RESISTANT SYNTHETIC PLASTICS MATERIAL

Paul Wymann, Basel, and Volker Fetting, Arlesheim, both of Switzerland, assignors to Wam-Plast AG, Basel, Switzerland

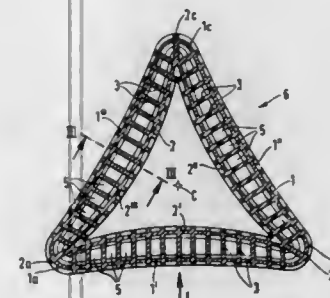
Filed Apr. 4, 1986, Ser. No. 848,052

Claims priority, application Switzerland, Apr. 16, 1985, 1608/85

Int. Cl.⁴ B32B 3/12

U.S. Cl. 428—116

30 Claims



1. A triangular filling body including three wall sections having inner and outer walls of acid-resistant synthetic plastic material, a plurality of which bodies, heaped-up in an irregular manner, have, per cubic meter of bulk volume, a total source area of more than 250 m², said filling body having a central axis, and more than 80% of the surface of said filling body being present on walls, the thickness of which corresponds to the thickness of sheets of the synthetic plastic material from which they are made, said outer walls defining an outside of said body, said inner and outer walls being concavely curved relative to said outside of said body, said outer walls forming an enclosure and being destined to be subject to pressure from superimposed filling bodies in a heaped-up bulk, said three wall sections being constituted by a row of cells having parallel walls and are open to the passage of gas therethrough along the axes of said cells, the number of cells in each of said wall sections being greater than three.

4,716,067

HONEYCOMB CORE STRUCTURE WITH EMBEDDED FASTENER

Yukimori Moji, Seattle, and Richard Q. Taylor, Tukwila, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 12, 1986, Ser. No. 906,209

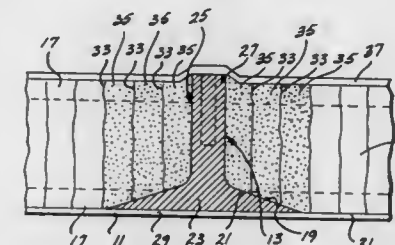
Int. Cl.⁴ B32B 3/12

U.S. Cl. 428—117

42 Claims

22. A synthetic skin/honeycomb core sandwich structure with an embedded fastener comprising:

a honeycomb core layer;
at least one fastener embedded in said honeycomb core layer, said at least one fastener having a shank and an enlarged head with a flat exterior surface, said fastener embedded in said honeycomb core layer such that the flat exterior surface of said head lies co-planar with one surface of said honeycomb core and the shank of said fastener lie transverse to the plane of said honeycomb core layer; potting material located in the cells of said honeycomb core layer that surrounds said at least one fastener;



a first nonmetallic synthetic layer bonded to both the surface of said honeycomb core layer that is coplanar with the flat exterior surface of the head of said at least one fastener and the flat exterior surface of the head of said at least one fastener; and,
a second nonmetallic synthetic layer bonded to the surface of said honeycomb core layer remote from the surface to which said first nonmetallic synthetic layer is bonded.

4,716,068

POLYPROPYLENE ADHESIVE TAPE

Walter Seifried, Weisbaden, and Guenther Crass, Taunusstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 17, 1986, Ser. No. 819,631

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501726

Int. Cl.⁴ B32B 3/00; C09J 7/02

U.S. Cl. 428—141

18 Claims

1. An adhesive tape, comprising:

- a co-extruded polypropylene base film having molecular chains oriented by three-stage biaxial stretching, consisting essentially of:
- a base layer comprising polypropylene,
- a first covering layer comprising polypropylene and a diorganopolysiloxane as a modifier, and
- a corona-treated, second covering layer comprising polypropylene and a natural or synthetic resin modifier having a softening point of from about 70° to about 170° C. wherein said second covering layer is corona-treated on its surface facing away from said base layer; and
- an adhesive layer applied directly to the corona-treated surface of said second covering layer.

4,716,069

PROCESS FOR PRODUCING A PLASTIC LAMINATE OF LOW DENSITY POLYMERIC MATERIAL AND HIGH DENSITY POLYMERIC MATERIAL AND LAMINATE MADE THEREOF

Paul Burke, 45 Springhill Park, Killiney, Co. Dublin, Ireland

Filed Dec. 16, 1985, Ser. No. 809,475

Claims priority, application Ireland, Dec. 17, 1984, 3229/84

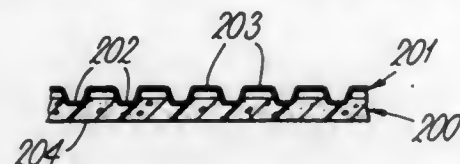
Int. Cl.⁴ B32B 3/28

U.S. Cl. 428—167

15 Claims

12. A plastic laminate comprising
a first lamina of foamed low density polymeric material;

a second corrugated lamina of non-foamed high density polymeric material bonded directly to said first lamina;



said first lamina having a thickness at least fifty times greater than the thickness of said second laminae.

4,716,070

SEALANT COMPOSITIONS AND SEALED DOUBLE GLAZING UNITS

Edward W. Duck, Guangelloch, and Ingolf Scheffler, Wiesloch, both of Fed. Rep. of Germany, assignors to Teroson G.m.b.H., Fed. Rep. of Germany

Filed Mar. 28, 1986, Ser. No. 845,281

Claims priority, application United Kingdom, Mar. 28, 1985, 8508114

Int. Cl.⁴ C08G 18/62

U.S. Cl. 428—192

8 Claims

1. A double glazing unit comprising two spaced apart glass panes sealed together around their edges by a seal obtained by reacting (a) an isocyanate component and (b) a reactive component comprising a polymer having terminal functional groups that can react with the isocyanate component to form a polyurethane, wherein the polymer having functional groups is an isoprene polymer.

4,716,071

METHOD OF ENSURING ADHESION OF CHEMICALLY VAPOR DEPOSITED OXIDE TO GOLD INTEGRATED CIRCUIT INTERCONNECT LINES

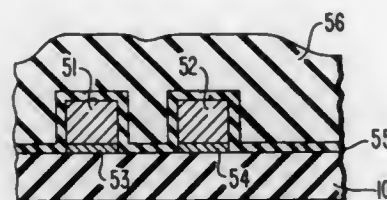
Bruce E. Roberts; Jimmy C. Black, both of Palm Bay, and Dyer A. Matlock, Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Aug. 22, 1985, Ser. No. 768,326

Int. Cl.⁴ B32B 9/00, 27/06

U.S. Cl. 428—209

9 Claims



1. A gold interconnect/oxide of silicon insulator structure for providing relatively insulated conductor paths overlying an integrated circuit-containing semiconductor body comprising:

- a plurality of gold interconnected lines distributed over said semiconductor body;
- a thin gold-to-oxide of silicon adhesion film formed on each of said gold interconnect lines, said film containing a first gold-titanium region contiguous with the gold of said gold interconnect lines and a second region of an oxide of titanium contiguous with said gold-titanium region; and
- a layer of an oxide of silicon formed on said thin gold-to-oxide of silicon adhesion film so as to be contiguous with second contiguous with the second region of an oxide of titanium thereof.

4,716,072

MULTILAYER COMPOSITE STRUCTURE FOR SMOOTH SURFACES

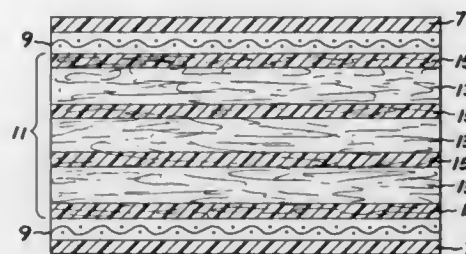
Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,152

Int. Cl.⁴ B32B 3/26

U.S. Cl. 428—212

14 Claims



5. A composite sheet comprising fiber mat and a fiber free outer layer of thermoplastic material; a bulk layer comprising fiber mat and thermoplastic resin; barrier means situated between said fiber free layer and said bulk layer, said fiber free layer, bulk layer and barrier means laminated together, said barrier means limiting movement of fibers from said bulk layer to the fiber free layer.

4,716,073

THIN WALL HIGH PERFORMANCE INSULATION ON WIRE

Stuart K. Randa, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 2, 1986, Ser. No. 869,778

Int. Cl.⁴ B32B 7/02

U.S. Cl. 428—215

3 Claims

1. An electrical wire covered with an extruded fluoropolymer foam layer comprising ethylene/chlorotrifluoroethylene copolymer or ethylene/tetrafluoroethylene copolymer and an extruded fluoropolymer unfoamed skin layer around the foam comprising ethylene/chlorotrifluoroethylene copolymer or ethylene/tetrafluoroethylene copolymer; wherein the foam layer is between 0.05–0.76 mm thick and the skin layer is between 0.013–0.076 mm thick and wherein the foam layer and the skin layer are each formed by separate extrusions, which extrusions can be either simultaneous or in sequence.

4,716,074

POROUS FIBROUS FLUOROCARBON STRUCTURES

John L. Hurley, Mahwah, N.J.; Joseph D. Puzo, Cortland, and Rosa F. Tingey, Ithaca, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Feb. 10, 1986, Ser. No. 827,537

Int. Cl.⁴ B32B 27/00; D04H 1/64

U.S. Cl. 428—220

24 Claims

1. A porous, fibrous fluorocarbon structure comprising (1) polytetrafluoroethylene fibers having lengths in the range of from about 4,500 to about 8,500 micrometers, diameters in the range of from about 15 to about 35 micrometers, and aspect ratios of at least about 100, and (2) a fluorinated ethylene-propylene copolymer binder, said structure having a void volume in the range of from about 50 to about 95 percent, a strength of from about 500 to about 2,500 grams per inch of width, a thickness in the range of from about 5 to about 20 mils, a weight of from about 3 to about 25 grams per square foot, an air pressure drop of from about 0.0025 to about 0.1 inch of water at a flow rate of 28 standard cubic feet per minute per square foot of the fibrous structure, and wherein said binder is present in said structure in an amount of from about 10 to about 35 percent by weight of based on the weight of said fibers.

4,716,075

PROTECTED METAL ARTICLE AND METHOD OF MAKING

Christy Christ, Trenton; Herbert F. Campbell, Franklin, both of Ohio; Gayle P. Fields, Ashland, and James L. Burris, Russell, both of Ky., assignors to Armco Inc., Middletown, Ohio

Filed Apr. 10, 1986, Ser. No. 849,986

Int. Cl.⁴ D21F 11/00; D21H 5/12; B32B 15/00, 17/00

U.S. Cl. 428—285

5 Claims



1. An article of manufacture including a ferrous base strip having a hot dip metallic coating on at least one side thereof, the improvement comprising:

- a heat resistant fibrous layer embedded in said metallic coating,
- fibers of said fibrous layer projecting from said metallic coating,
- said fibrous layer including a continuous nonwoven, permeable, fusion bonded, composite paper of synthetic polymer staple fiber and fibril binding agent,
- said paper having a tensile strength of at least 10 lbs/in. (18/Ncm) in both the machine and cross directions, an elongation of at least about 5% and having a thickness of at least about 3 mils (0.1 mm),
- said polymer having a degradation temperature above the melting point of said metallic coating.

4,716,076

MAGNETIC RECORDING MEDIUM

Akira Morioka; Takeshi Matsuura, both of Kyoto, and Yoshiyuki Takahira, Suita, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jan. 11, 1985, Ser. No. 743,679

Claims priority, application Japan, Jun. 13, 1984, 59-120948

Int. Cl.⁴ G11B 5/706, 5/708

U.S. Cl. 428—323

7 Claims

1. A magnetic recording medium comprising a magnetic layer, including a magnetic powder, and carbon black, said magnetic powder being comprised of:

- iron oxide magnetic powder with more than 30 m²/g specific surface area measured by BET method, and
- chromium dioxide (CrO₂) magnetic powder with more than 30 m²/g specific surface area measured by BET method and in an amount being within a range of more than 3% to less than 20% by weight in the total amount of the iron oxide powder and the chromium dioxide powder,
- said carbon black having a volatile constituent of more than 3% by weight.

4,716,077

MAGNETIC RECORDING MEDIUM

Tsutomu Okita; Hiroshi Hashimoto, and Masashi Aonuma, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1986, Ser. No. 884,450

Claims priority, application Japan, Jul. 12, 1985, 60-152503

Int. Cl.⁴ G11B 5/702

U.S. Cl. 428—328

17 Claims

1. A magnetic recording medium comprising a non-magnetic support and a magnetic layer, said magnetic layer containing as a binder at least one compound selected from each of the compound groups (A) and (B) that has been exposed to radiation, wherein

- (A) is polyvinyl chloride type compounds having a molecular weight of 5,000 to 50,000 containing at least on CO₂H

group and at least one carbon-carbon unsaturated bond per molecule and having an acid value of from 1 to 30; and (B) is polyurethane type compounds having a molecular weight of 1,000 to 100,000 containing at least one —CO₂H group and at least one carbon-carbon unsaturated bond per molecule and having an acid value of from 1 to 30, wherein the mixing ratio of compound(s) (A) and compound(s) (B) is from 20/80 to 90/10 parts by weight.

4,716,078

SUBSTRATE FOR A MAGNETIC DISC AND METHOD MANUFACTURING SAME

Nobuyuki Kishine; Tetsuya Imamura, both of Tochigi, and Michihide Yamachi, Wakayama, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,770

Claims priority, application Japan, Aug. 8, 1983, 58-144576

Int. Cl.⁴ G11B 7/04

U.S. Cl. 428—336

11 Claims

1. A thermal-resistant magnetic memory storage disc comprising:

- a disc of a non-magnetic, molded, glass-like carbon substrate having a flat, smooth, mirror-like surface, and
- a continuous, thin film of magnetic material deposited on the smooth surface of said substrate.

4,716,079

EXCELLENT WINDABILITY MAGNET WIRE

Fumikazu Sano, Hiratsuka, and Masakazu Mezaki, Yokohama, both of Japan, assignors to The Furukawa Electric Co. Ltd., Tokyo, Japan

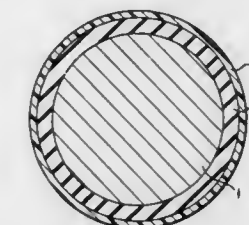
Filed Feb. 20, 1987, Ser. No. 16,873

Claims priority, application Japan, Feb. 27, 1986, 61-40429

Int. Cl.⁴ B32B 27/00; D02G 3/00

U.S. Cl. 428—383

10 Claims



1. An excellent windability magnet wire wherein an insulating layer of a synthetic resin film is formed on a conductor directly or with another insulation in between and a lubricant layer is formed on the insulating layer, the improvement wherein the lubricant layer is made of an intimate mixture of natural wax as a major constituent and thermosetting and fluorocarbon resins compounded therewith.

4,716,080

SIZE COMPOSITION

David F. Lewin, Amarillo, Tex., assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Division of Ser. No. 868,382, May 29, 1986. This application

Apr. 9, 1987, Ser. No. 36,412

Int. Cl.⁴ B32B 9/00, 15/00

U.S. Cl. 428—389

3 Claims

1. A glass fiber coated with the in situ dried residue of a substantially chrome-free aqueous sizing composition for glass fiber gun roving which comprises (A) a mixture of emulsified film-forming polymers comprising a polymer of vinyl acetate and ethylene, a polymer of vinyl acetate and an epoxy-functional vinyl monomer, and an unsaturated polyester resin; (B) titanium acetyl acetate; (C) quaternary salt of ammonium

ethosulfate; (D) a cationic lubricant; and (E) 3-methacryloxypropyltrimethoxysilane or hydrolysate thereof.

4,716,081

CONDUCTIVE COMPOSITIONS AND CONDUCTIVE POWDERS FOR USE THEREIN

John E. Ehrreich, Acton, Mass., assignor to Ercon, Inc., Waltham, Mass.

Filed Jul. 19, 1985, Ser. No. 757,061

Int. Cl.⁴ B32B 5/16; B05D 7/00; H01B 1/02

U.S. Cl. 428—403

33 Claims

1. A process of making an electrically conductive metal powder of average particle dimension of less than 0.025 inch comprising cleaning copper powder in a metal-complexing cleaning bath to form a clean powder, thereupon plating the surface of the resultant clean powder with a silver coating in a plating solution, while maintaining continuous agitation of said plating solution, rinsing, drying, and then heat treating said powder at a temperature of at least about 130° C. for a period of time effective to enhance its heat-aging stability when loaded into an organic polymer resin matrix.

22. An electrically conductive metal powder formed of a copper core with a continuous, thin, adherent silver coating thereover said powder being characterized by a heat-aging stability which is manifested by the characteristic of the Standard Test, whereby said powder in particle-to-particle contact, within test composition provides means to maintain a volume resistivity of less than 2 ohm-cm in said Test matrix after being subjected to an age test at 195° C. for 500 hours.

4,716,082

DUPLEX GLASS PREFORMS FOR HERMETIC GLASS-TO-METAL SEALING

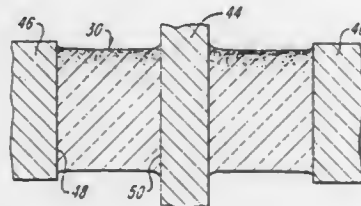
John E. Ahearn, Middleboro; Raymond A. Frates, Fairhaven; Dennis Girard; Richard A. Koepke, both of New Bedford, all of Mass.; James K. Schmidt, Mt. Pleasant, and C. Dodd Manon, Ligonier, both of Pa., assignors to Isotronics, Inc., New Bedford, Mass.

Filed Oct. 28, 1986, Ser. No. 924,057

Int. Cl.⁴ B32B 17/06

U.S. Cl. 428—428

20 Claims



1. A duplex glass preform for forming hermetic glass-to-metal seals, comprising:

- a glass matrix, said glass matrix having a peripheral interfacing surface for glass-to-metal sealing;
- a dispersion zone in at least one end of said glass matrix, said dispersion zone extending inwardly from a surface of said at least one end into said glass matrix for a predetermined depth;
- a substantially ceramic-free zone intermediate said dispersion zone and said peripheral interfacing surface; and
- a plurality of ceramic particles selectively distributed in said dispersion zone of said glass matrix to form a ceramic particle density gradient therein, and wherein said ceramic particle density gradient has a maximum value at said surface and gradually decreases to a near zero value at said predetermined depth.

12. A hermetic glass-to-metal sealed package for microcircuit chips, comprising:

- a duplex glass preform, said duplex glass preform further comprising
- a glass matrix having a peripheral interfacing surface and at

least one terminal bore therethrough substantially parallel to said peripheral interfacing surface, said terminal bore having an interfacing surface,

a dispersion zone in at least one end of said glass matrix, said dispersion zone extending inwardly from a surface of said at least one end into said glass matrix for a predetermined depth,

a first substantially ceramic-free zone intermediate said dispersion zone and said peripheral interfacing surface,

a second substantially ceramic-free zone intermediate said dispersion zone and said terminal bore interfacing surface, and

a plurality of ceramic particles selectively distributed in said dispersion zone of said glass matrix to form a ceramic particle density gradient therein, and wherein said ceramic particle density gradient has a maximum value at said surface and gradually decreases to a zero value at said predetermined depth;

a terminal pin correspondingly disposed in said at least one terminal bore and hermetically sealed thereto; and

a body having at least one aperture therein adapted to receive said duplex glass preform, and wherein said duplex glass preform is hermetically sealed in said body.

4,716,083

DISORDERED COATING

Erwin Eichen, West Bloomfield, and James D. Flasek, Rochester, both of Mich., assignors to Ovonic Synthetic Materials Company, Troy, Mich.

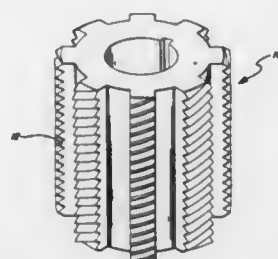
Filed Sep. 23, 1983, Ser. No. 535,352

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.⁴ B32B 9/00, 15/18; C23C 14/00

U.S. Cl. 428—457

14 Claims



1. An article comprising:

- a substrate; and
- a coating applied to at least a portion of the substrate, the coating comprising a layer adherent to the substrate and consisting of disordered boron and carbon, said layer of disordered boron and carbon formed by sputtering under sputtering conditions to provide said disorder and said adherence.

4,716,084

OIL-IMPREGNATED CAPACITOR

Atsushi Sato, Tokyo; Shigenobu Kawakami, Ichikawa; Keiji Endo, Yokosuka, and Hideyuki Dohi, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Japan

Filed Apr. 18, 1986, Ser. No. 853,546

Claims priority, application Japan, Apr. 19, 1985, 60-82178; Apr. 19, 1985, 60-82179

Int. Cl.⁴ B32B 15/08

U.S. Cl. 428—458

9 Claims

1. An oil-impregnated capacitor having at least one wound plastic film which is impregnated with an electric insulating oil, said insulating oil comprising 1-phenyl-1-methylphenylethane wherein said 1-phenyl-1-methylphenylethane is present in 1-phenyl-1-(4-methylphenyl)ethane, 1-phenyl-1-(3-methylphenyl)ethane and 1-phenyl-1-(2-methylphenyl)ethane isomeric forms, said 1-phenyl-1-(4-methylphenyl)ethane form

being present in an amount not less than 70 percent based upon the total weight of the 1-phenyl-1-methylphenylethane and said 1-phenyl-1-(2-methylphenyl)ethane form being present in an amount not more than 15 percent based upon the total weight of the 1-phenyl-1-methylphenylethane.

4,716,085

MULTI-LAYERED IONOMER-VINYLDENE CHLORIDE CONTACT LAMINATED STRUCTURES

John Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 714,561, Mar. 21, 1985, abandoned, which is a division of Ser. No. 540,442, Oct. 11, 1983, Pat. No. 4,544,699. This application Jun. 13, 1986, Ser. No. 874,782

Int. Cl.⁴ B32B 27/08

U.S. Cl. 428—476.9

34 Claims

1. A multilayered structure useful as a packaging material comprising a first layer being an ionomer polyethylene carboxylate-containing film secured at a temperature between about 130° and 250° F. to a second layer through a vinylidene chloride copolymer adhesive, said adhesive forming a third layer and comprising:

- (a) from about 45 to about 90 percent vinylidene chloride
- (b) from about 5 to about 25 percent of a polar comonomer having one or more hydroxyl groups
- (c) from about 0 to about 30 percent of a plasticizing comonomer for vinylidene chloride, and
- (d) a cross-linking agent for hydroxyl groups selected from the group consisting of dialdehydes containing between 2 and about 10 carbon atoms, boric acid, and water soluble metal salts of boric acid.

4,716,086

PROTECTIVE OVERCOAT FOR LOW EMISSIVITY COATED ARTICLE

F. Howard Gillery, Allison Park; Russell C. Criss, and James J. Finley, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 683,458, Dec. 19, 1984, abandoned. This application Dec. 23, 1985, Ser. No. 812,680

Int. Cl.⁴ B32B 17/06

U.S. Cl. 428—630

10 Claims

- 1. A high transmittance, low emissivity article comprising:
- a. a transparent nonmetallic substrate;
- b. a first transparent antireflective film comprising a metal oxide deposited on a surface of said substrate;
- c. a transparent infrared reflective metallic film deposited after said first antireflective metal oxide film;
- d. a second transparent antireflective film comprising a metal oxide deposited after said infrared reflective metallic film; and
- e. a protective overcoat about 10 to 50 Angstroms thick deposited after said second antireflective metal oxide film comprising a metal oxide having greater durability than said antireflective metal oxide at the same thickness.

4,716,087

PLATINUM-COPPER ALLOY ELECTROCATALYST AND ACID-ELECTROLYTE FUEL CELL ELECTRODE USING THE SAME

Takashi Ito, Ichikawa; Shigemitsu Matsuzawa, Edogawa, and Katsuaki Kato, Ichikawa, all of Japan, assignors to Nippon Engelhard Ltd., Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,246

Claims priority, application Japan, May 16, 1986, 61-110911

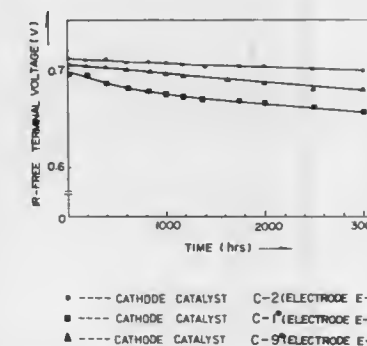
Int. Cl.⁴ H01M 4/92

U.S. Cl. 429—40

22 Claims

1. A platinum-copper electrocatalyst comprising a carrier

and a platinum-copper alloy supported in a well dispersed manner in said carrier, said platinum-copper alloy containing



15 to 50 atomic percent of copper and 85 to 50 atomic percent of platinum.

4,716,088

ACTIVATED RECHARGEABLE HYDROGEN STORAGE ELECTRODE AND METHOD

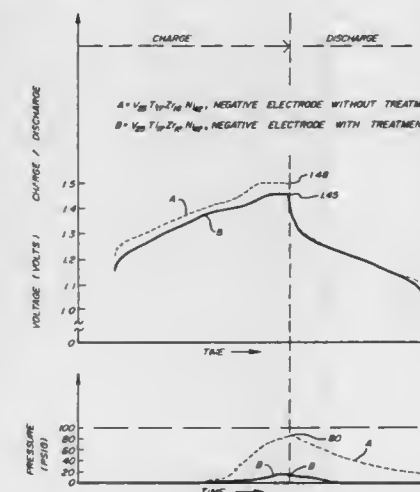
Benjamin Reichman, Birmingham; Srin Venkatesan, Southfield; Michael A. Fetcenko, Royal Oak; Kenneth Jeffries, Pontiac; Sharon Stahl, Mt. Clemens, and Clifford Bennett, Clarkston, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Dec. 29, 1986, Ser. No. 947,148

Int. Cl.⁴ H01M 4/36, 10/44

U.S. Cl. 429—101

141 Claims



1. A method of activating a rechargeable hydrogen storage negative electrode containing active electrode material, comprising the steps of

prior to sealing the electrode in a hydrogen storage electrochemical cell:

- (a) electrochemically charging said negative electrode to provide a charge; and thereafter
- (b) discharging at least a portion of said charge, whereby surface roughness of said negative electrode increases and the gas pressure that develops in a sealed hydrogen storage rechargeable electrochemical cell resulting from said negative electrode is reduced.

4,716,089

PHOTOCONDUCTIVE MEMBER FOR EXHIBITING PHOTOCONDUCTIVITY UPON ILLUMINATION BY ELECTROMAGNETIC LIGHT IN THE VISIBLE TO ULTRAVIOLET RANGE

Mutsuki Yamazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 800,972, Nov. 22, 1985, abandoned. This application Sep. 30, 1986, Ser. No. 913,368

Claims priority, application Japan, Nov. 26, 1984, 59-248088; Nov. 26, 1984, 59-248089; Dec. 12, 1984, 59-262212; Dec. 12, 1984, 59-262215; Feb. 4, 1985, 60-19412; Feb. 4, 1985, 60-19415 Int. Cl.⁴ G03G 5/085

U.S. Cl. 430—57

5 Claims

1. A photoconductive member comprising:
 - a conductive substrate;
 - a blocking layer disposed on said conductive substrate, said blocking layer comprising amorphous silicon carbide or amorphous silicon nitride and containing 1×10^{-3} to 1.0 atomic % of an element of Group III or V of the Periodic Table;
 - a first photoconductive layer disposed on said blocking layer, said first photoconductive layer comprising amorphous silicon carbide or amorphous silicon nitride, containing 1×10^{-6} to 1×10^{-3} atomic % of an element of Group III of the Periodic Table, and the product of the mobility ($\text{cm}^2/\text{sec V}$) and the lifetime (sec) of the holes in electron-hole pairs generated in light absorption being $1 \times 10^{-7} \text{ cm}^2/\text{V}$ or higher;
 - a second photoconductive layer disposed on said first photoconductive layer, said second photoconductive layer comprising amorphous silicon, having a thickness of 0.1 μm to 5 μm , and containing 1×10^{-6} to 1×10^{-3} atomic % of an element of Group III of the Periodic Table; and
 - a surface layer disposed on said second photoconductive layer, said surface layer having a thickness of 0.05 to 5 μm and a resistivity of $10^{13} \Omega\text{-cm}$.

4,716,090

PHOTOCONDUCTIVE MEMBER FOR EXHIBITING PHOTOCONDUCTIVITY UPON ILLUMINATION BY ELECTROMAGNETIC LIGHT IN THE VISIBLE TO ULTRAVIOLET RANGE

Mutsuki Yamazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 800,972, Nov. 22, 1985, Pat. No. 4,666,803. This application Sep. 30, 1986, Ser. No. 913,369

Claims priority, application Japan, Nov. 26, 1984, 59-248088; Nov. 26, 1984, 59-248089; Dec. 12, 1984, 59-262212; Dec. 12, 1984, 59-262215; Feb. 4, 1985, 60-19412; Feb. 4, 1985, 60-19415 Int. Cl.⁴ G03G 5/14

U.S. Cl. 430—65

4 Claims

1. A photoconductive member comprising:
 - a conductive substrate;
 - a first blocking layer which comprises amorphous silicon carbide and is disposed on said conductive substrate, and contains 1×10^{-4} to 1.0 atomic % of an element belonging to Group III or V of the Periodic Table;
 - a photoconductive layer comprising amorphous silicon and having a thickness of 0.5 to 5 μm ; and
 - a second blocking layer which comprises amorphous silicon nitride, is disposed between said first blocking layer and the photoconductive layer and has a thickness of 5 to 40 μm , contains 1×10^{-8} to 1×10^{-4} atomic % of an element belonging to Group III or V of the Periodic Table, and has a larger optical band gap than those of the first blocking layer and photoconductive layer.

4,716,091

ELECTROPHOTOGRAPHIC MEMBER WITH SILICONE GRAFT COPOLYMER IN SURFACE LAYER

Toshiyuki Yoshihara, Mitaka; Masaaki Hiro, Kanagawa, and Katsunori Watanabe, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1986, Ser. No. 829,935

Claims priority, application Japan, Feb. 19, 1985, 60-29424; Sep. 27, 1985, 60-215494; Sep. 27, 1985, 60-215495; Sep. 27, 1985, 60-215497

Int. Cl.⁴ G03G 5/14

U.S. Cl. 430—66

12 Claims

1. An electrophotographic image holding member which comprises a surface layer containing a silicone type comb shaped graft polymer having a silicone portion at the side chain.

4,716,092

TRANSPARENCY FILM ASSEMBLY AND ROLLER ASSEMBLY FOR USE THEREWITH

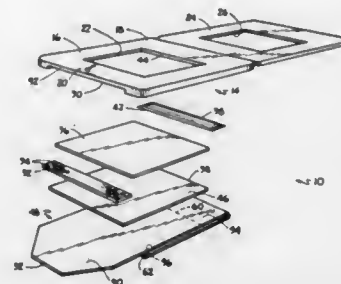
Paul B. Mason, Magnolia, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1986, Ser. No. 902,774

Int. Cl.⁴ G03C 5/54, 3/00; G03D 5/02

U.S. Cl. 430—209

4 Claims



1. A transparency film assembly comprising:
 - a mount for a film frame, said mount including a first section having first and second opposite ends separated by means for defining a first aperture, and a second section having means for defining a second aperture, said first and second sections being adapted to be located in face-to-face relation with said first and second apertures located in alignment with each other;
 - a container of processing liquid attached to said first end and located between said first and second sections, said container having a rupturable section located adjacent one side of said first aperture;
 - means for receiving residual processing liquid, said receiving means being supported by said second end adjacent said first aperture and located between said first and second sections;
 - an unexposed transparency film frame of the instant type secured to said first section in superposition to and intermediate said first and second apertures, said film frame including a strippable emulsion layer;
 - a first sheet of material located between said first and second sections in covering relation to said strippable emulsion layer, said first sheet being constructed to assist in the spreading of the processing liquid across said film frame, subsequent to its photographic exposure, so as to initiate the formation of a visible image in said film frame, said first sheet being adapted to strip said emulsion layer from said film frame during the removal of said first sheet from between said first and second sections; and
 - a second sheet of material having first and second portions separated by an intermediate portion, said intermediate portion being fixedly secured to an end of said first sheet at a location adjacent said rupturable section of said container of processing liquid, said first portion having a free

end and said second portion being of an area at least coextensive to that of said first sheet, whereby pulling on said free end in a direction so as to withdraw it from between said first and second sections of said mount is effective to strip said first sheet and said emulsion layer from said film frame while simultaneously moving said second portion of said second sheet into covering relation with said emulsion layer being carried by said first sheet prior to said first sheet and said second portion of said second sheet being moved from between said first and second sections of said frame.

2. A transparency film assemblage as defined in claim 1 wherein said receiving means comprises a strip of absorbent material.

4,716,093

SOLVENT DEVELOPABLE PHOTORESIST COMPOSITION AND PROCESS OF USE

Richard J. Kempf, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 17, 1986, Ser. No. 839,973

Int. Cl.⁴ G03C 1/495, 1/68

U.S. Cl. 430—277

14 Claims

1. A solvent developable photopolymerizable composition present as a film with a creep viscosity of at least 20 megapoise comprising
 - (a) at least one nongaseous ethylenically unsaturated compound having a boiling point above 100° C. at normal atmospheric pressure and being capable of forming a high polymer by photoinitiated addition polymerization,
 - (b) an initiating system activated by actinic radiation, and
 - (c) a preformed macromolecular binder soluble in methyl chloroform at a temperature of 22° C. and a time not greater than 24 hours, said binder formed from monomers comprising methylmethacrylate, and C₂ to C₄ alkyl methacrylate, wherein said composition as a film of 0.002 inch thickness laminated to a copper substrate and imagewise exposed to actinic radiation will meet both of the following conditions:
 - (i) a time to clear of not greater than 26 seconds when the imagewise exposed film is passed at a transport speed of 4.5 feet per minute through a spray of methyl chloroform at a temperature of 65° C. and spray pressure of 20 psi (gauge) whereby all unexposed composition is removed from the substrate and
 - (ii) a time to strip of the exposed composition of not greater than 9.5 seconds when the exposed composition is passed at a transport speed of 10 feet per minute through a spray of a solution containing by weight 93 parts methylene chloride and 6 parts methanol at a temperature of 65° C. and a spray pressure of 21 psi (gauge) whereby all exposed composition is removed from the substrate.
11. An article present as a wound roll comprising a support film and a cover film which contains between these two films a solvent developable photopolymerizable composition present as a film with a creep viscosity of at least 20 megapoise comprising
 - (a) at least one nongaseous ethylenically unsaturated compound having a boiling point above 100° C. at normal atmospheric pressure and being capable of forming a high polymer by photoinitiated addition polymerization,
 - (b) an initiating system activated by actinic radiation, and
 - (c) a preformed macromolecular binder soluble in methyl chloroform at a temperature of 22° C. and a time not greater than 24 hours, said binder formed from monomers comprising methylmethacrylate and C₂ to C₄ alkyl methacrylate, wherein said composition as a film of 0.002 inch thickness laminated to a copper substrate and imagewise exposed to actinic radiation will meet both of the following conditions:
 - (i) a time to clear of not greater than 26 seconds when the imagewise exposed film is passed at a transport speed of 4.5 feet per minute through a spray of methyl chloro-

form at a temperature of 65° C. and spray pressure of 20 psi (gauge) whereby all unexposed composition is removed from the substrate and

- (ii) a time to strip of the exposed composition of not greater than 9.5 seconds when the exposed composition is passed at a transport speed of 10 feet per minute through a spray of a solution containing by weight 93 parts methylene chloride and 6 parts methanol at a temperature of 65° C. and a spray pressure of 21 psi (gauge) whereby all exposed composition is removed from the substrate

4,716,094

PHOTOSENSITIVE RESIN COMPOSITION WHICH IS IMPROVED WITH RESPECT TO SURFACE TACK-FREE CHARACTERISTIC AFTER CURING, AND A METHOD

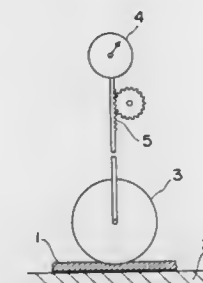
Kuniaki Minonishi, and Reijiro Sato, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1985, Ser. No. 709,186

Claims priority, application Japan, Mar. 13, 1984, 59-46472 Int. Cl.⁴ G03C 1/68, 1/70

U.S. Cl. 430—284

7 Claims



1. A photosensitive resin composition for use in preparing a printing plate for flexography which is improved with respect to surface tack-free characteristics after curing by exposure to actinic radiation, comprising:
 - (a) an ethylenically unsaturated prepolymer having a number average molecular weight of 5000 or more per double bond and at least one urethane bond;
 - (b) an ethylenically unsaturated monomer;
 - (c) a photoinitiator; and
 - (d) at least one compound represented by the general formula (I)
$$R^1-X \quad (I)$$

wherein R¹ represents a monovalent hydrocarbon residue represented by C_nH_{2n+1} or C_nH_{2n-1} in which n is an integer of from 11 to 21; and X represents —COOH, —CONH₂ or —CH₂OR² in which R² represents H or —CO—R³—S—R³—COOCH₂—R⁴ in which R³ is a divalent hydrocarbon residue having 1 to 6 carbon atoms and R⁴ has the same meaning as R¹, the weight ratio of said at least one compound to the total weight of said ethylenically unsaturated prepolymer, said ethylenically unsaturated monomer and said photoinitiator being 0.1/100 to 6/100.
3. A photosensitive resin composition according to claim 1, wherein said ethylenically unsaturated prepolymer is an unsaturated polyurethane (meth)acrylate.

4,716,095

METHOD FOR REDUCING COLOR CROSS-CONTAMINATION DURING RE-IMAGING OF PHOTOTACKIFIABLE MATERIALS

Mario Grossa, Dreieich, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1986, Ser. No. 930,102

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540804

Int. Cl.⁴ G03C 5/00

U.S. Cl. 430—291

10 Claims

1. Process for improving the reproduction quality of a negative-working, multiple exposure and toning process for preparing powder images on a substrate bearing a layer of a light-sensitive composition comprising at least one 4-(2'-nitrophenyl)-1,4-dihydropyridine compound, and/or a light-sensitive system comprising at least one 1,4-dihydropyridine compound and at least one hexaarylbiimidazole compound, comprising the steps of:

- exposing said layer imagewise to actinic radiation to produce tacky image areas,
- toning the tacky areas with finely-divided powders, and
- repeating the imagewise exposing and toning steps several times using different images for exposure and different toners, wherein the improvement comprises: treating the light-sensitive layer before the first imagewise exposure and/or between each toning step and the subsequent exposure with a strong inorganic or organic acid having a pKa value of ≤ 2.0 .

2. Process according to claim 1, wherein the light-sensitive layer is treated with a strong volatile acid.

3. Process according to claim 2, wherein the light-sensitive layer is treated with hydrochloric acid.

4. Process according to claim 2, wherein the light-sensitive layer is treated with the vapor of the strong volatile acid.

6. Process according to claim 1, wherein the light-sensitive layer is treated with a finely-divided carrier material charged with the strong acid.

4,716,096

METHOD AND APPARATUS FOR PRODUCING CHARACTERS ON A GRIT-ERODIBLE BODY

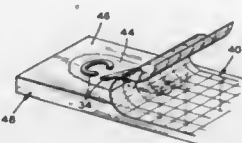
Larry L. Cooper, Bowling Green, and Philip G. Saunders, Maumee, both of Ohio, assignors to Container Graphics Corporation, Maumee, Ohio

Continuation-in-part of Ser. No. 458,839, Jan. 18, 1983. This application Nov. 7, 1983, Ser. No. 549,078

Int. Cl.⁴ G03C 5/00

U.S. Cl. 430—323

13 Claims



1. A font of type for grit-blasting masks comprising a thin backing sheet, a multiplicity of characters including letters and numerals of one style, releasably affixed in lines to said sheet in orderly, spaced fashion, each of said characters being made of a material which is flexible and resistant to blasting grit.

4,716,097

INCREASED PHOTOPOLYMER PHOTOSPEED EMPLOYING YELLOW LIGHT PREEXPOSURE

Gregory C. Weed, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 3, 1986, Ser. No. 830,509

Int. Cl.⁴ G03C 5/00, 5/04

U.S. Cl. 430—327

27 Claims

1. A process of increasing the photospeed of a layer of a photopolymerizable composition with subsequent exposure to actinic radiation, said photopolymerizable composition containing

- an addition polymerizable ethylenically unsaturated monomer
- an initiating system activated by actinic radiation, and
- a triarylmethane or xanthene dye wherein the process comprises the steps of:
 - exposing the layer of the photopolymerizable composition to radiation at a wavelength longer than 400 nm and at an intensity of at least 1500 lumen per square meter for a time sufficient to increase photospeed and
 - imagewise exposing the photopolymerizable composition with increased photospeed from step (1) to actinic radiation, with the proviso that the dye in (c) is chosen from a triarylmethane or xanthene dye capable of imparting an increase in photospeed of at least two steps as measured on a sixth root of two step wedge exposed film and with the proviso that such increase in photospeed is obtained in step (1).

4,716,098

DEVELOPER FOR PREPARING PRINTING FORMS AND PROCESS THEREFOR

Gerhard Mack; Birgit Mueller, both of Wiesbaden; Guenter Jung, Taunusstein, and Werner Frass, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 23, 1985, Ser. No. 790,153

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1984, 3439597

Int. Cl.⁴ G03F 7/00

U.S. Cl. 430—331

18 Claims

1. A developer mixture for developing a negative-working exposed reproduction layer provided on a base, said mixture comprising water; from about 0.5 to about 13.0% by weight of at least one organic solvent; at least one alkaline agent; about 0.5 to about 9.0% by weight of at least one complexing agent; from about 0.2 to about 12.0% by weight of at least one surface-active agent; from about 0.5 to about 10.0% by weight of at least one emulsifier; about 1.0 to about 7.0% by weight of at least one n-alkanoic compound; and from about 0.5 to about 20.0% by weight of at least one buffer substance, said percentages by weight being based on the total weight of said developer mixture, wherein (A) said surface-active agent has an anionic structure and (B) said n-alkanoic compound is selected from an n-alkanoic acid, an n-alkanoic acid salt, and mixture thereof.

4,716,099

DISPERSIONS OF WATER-INSOLUBLE PHOTOGRAPHIC ADDENDA USING PETROLEUM SULFONATE

Michael J. Simons, Ruislip, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 800,199, Nov. 21, 1985, Pat. No. 4,624,903. This application Jun. 2, 1986, Ser. No. 869,535

Claims priority, application United Kingdom, Nov. 23, 1984, 8429678

Int. Cl.⁴ G03C 1/40, 1/38, 1/42, 7/32

U.S. Cl. 430—493

4 Claims

1. A dispersion of a water-insoluble photographic addendum selected from the group consisting of couplers, ultraviolet

absorbers, dyes, redox dye releasers, developing agents, electron transfer agents, oxidized developer scavengers and image stabilizers, in a hydrophilic colloid composition which dispersion contains an oil-soluble petroleum sulfonate which is liquid at 20° C.

4,716,100

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Yoshiharu Yabuki; Kozo Sato; Ken Kawata, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fujii Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 26, 1985, Ser. No. 769,273

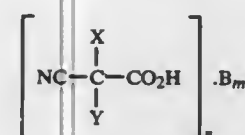
Claims priority, application Japan, Aug. 25, 1984, 59-176998

Int. Cl.⁴ G03C 1/02

U.S. Cl. 430—570

21 Claims

1. A heat-developable light-sensitive material comprising a silver halide emulsion and containing therein a reducing agent and a base precursor represented by the following general formula (I):



wherein X and Y, which may be the same or different, each represents a substituent selected from the group consisting of a hydrogen atom, an alkyl group, an alkenyl group, a halogen atom, an alkynyl group, a cycloalkyl group, an aryl group, an aralkyl group, a heterocyclic group, an alkoxy group, and aryloxy group, an alkylthio group, an arylthio group, an amino group, an acylamino group, a nitro group, a cyano group, an alkylsulfinyl group, an arylsulfinyl group, an acyl group, a sulfamoyl group, a substituted sulfamoyl group, a carbamoyl group, a substituted carbamoyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, an aryloxysulfonyl group, a nitroso group, a group of the formula $-\text{CO}_2\text{H}\cdot\text{B}$ wherein B is as defined below, a group of the formula $\text{R}^1\text{N}=\text{CR}^2$ — wherein R^1 and R^2 each represents a hydrogen atom, an alkyl group or an aryl group, and a hydroxy group, provided that both X and Y are not simultaneously both hydrogen atoms, simultaneously both halogen atoms or one of X and Y is hydrogen and the other is halogen at the same time, and wherein the alkyl moiety or aryl moiety included in the substituent represented by X and Y may further be substituted with a substituent, or X and Y may combine and form a ring; B represents a monoacid or diacid base which has a pKa of 7 or more and contains 12 or less carbon atoms; n and m each represent 1 or 2 and maintains the relationship that the number of positive charges and the number of negative charges are equal.

4,716,101

RAPID ENZYME ASSAY BY PRODUCT SELECTIVE BLOT

Gregory A. Thompson, and Huw M. Davies, both of Davis, Calif., assignors to Calgene, Inc., Davis, Calif.

Filed Dec. 18, 1984, Ser. No. 683,550

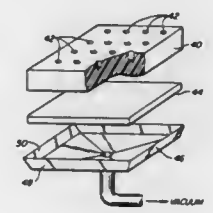
Int. Cl.⁴ G01N 27/26, 33/52, 33/561

U.S. Cl. 435—4

18 Claims

1. A method for detecting an enzyme in a sample, said method comprising: reacting the sample with substrate for the enzyme in an aqueous reaction mixture so that a product is produced if enzyme is present in the sample; passing the reaction mixture transversely through an image gel having an immobilized phase capable of selectively binding said product but not substrate; washing the image gel to remove the substrate and other non-bound materials; and detecting the presence of said product in the image gel.

18. An assay kit for detecting an enzyme, said kit comprising: an application gel having a plurality of wells for receiving a plurality of samples suspected of containing the enzyme;



an image gel laminated to the application gel and having an immobilized phase dispersed therein for selectively binding a product resulting from reaction of a substrate with said enzyme but not said enzyme substrate; and means for packaging the application gel and image gel.

4,716,102

PURIFIED AIDS-ASSOCIATED VIRUS ARV-2

Jay A. Levy, San Francisco, Calif., assignor to Regents of the University of California, Berkeley, Calif.

Filed Aug. 15, 1984, Ser. No. 641,167

Int. Cl.⁴ G01N 33/543; C12N 7/00, 5/00

U.S. Cl. 435—5

9 Claims

1. Biologically pure AIDS-associated retrovirus, ARV-2, said retrovirus having all the identifying characteristics of the ARV-2 retrovirus that has infected the human T-cell line, ATCC CRL 8597.

4,716,103

CHEMICALLY ACTIVE TRIAZINE SUPPORT COMPOSITION

Hans-Dieter Hunger, Zepernick, and Charles Coutelle, Berlin, both of German Democratic Rep., assignors to Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.

Filed Aug. 8, 1984, Ser. No. 638,882

Claims priority, application German Democratic Rep., Aug. 9, 1983, 253821; Apr. 24, 1984, 262260; Apr. 24, 1984, 262265; Apr. 24, 1984, 262264; Apr. 24, 1984, 262263; Apr. 24, 1984, 262261

Int. Cl.⁴ C12Q 1/68; C12N 11/12; G01N 33/544; C07D 251/00

U.S. Cl. 435—5

46 Claims

1. A composition with chemically active filler components comprising

- a polymer compound having no triazine groups in a concentration of 5–80% by volume;
- a polymer compound with 4,6-dihalogen-1,3,5-triazine groups in a concentration of 1–80% by volume;
- a 2,4,6-trihalogen-1,3,5-triazine filler component in a concentration of 0.5–50% by volume; and
- an alkali metal halogenide filler component in a concentration of 0.1–20% by volume.

37. Method for the fixation of cells to a support material comprising:

- contacting the cells with a support having chemically active filler components composed of:
 - cellulose and/or cellulose derivative having no triazine groups in a concentration of 5–80% by volume;
 - cellulose and/or cellulose derivative with 4,6-dihalogen-1,3,5-triazine groups in a concentration of 1–80% by volume;
 - a 2,4,6-trihalogen-1,3,5-triazine filler component in a concentration of 0.5–50% by volume; and
 - an alkali metal halogenide filler component in a concentration of 0.1–20% by volume to form a conjugate of support and cells; and

(b) washing said conjugate of support and cells.

4,716,104

DETECTING PRESENCE OF HCMV-SPECIFIC IGM
William J. Harris, Carnoustie, near Dundee, and Helena F. Hart, Edinburgh, both of Scotland, assignors to Cogent Limited, London, England

Filed Feb. 20, 1985, Ser. No. 703,535

Claims priority, application United Kingdom, Feb. 20, 1984, 8404368

Int. Cl.⁴ G01N 33/569, 33/577

U.S. Cl. 435—5 2 Claims

1. A method for detecting the presence of HCMV-specific IgM in a clinical sample, which comprises: capturing IgM in a clinical sample with anti-human IgM immobilized on a support, reacting captured IgM with HCMV antigens, and detecting the resulting bound HCMV antigens with labelled HCMV-specific monoclonal antibody.

4,716,105

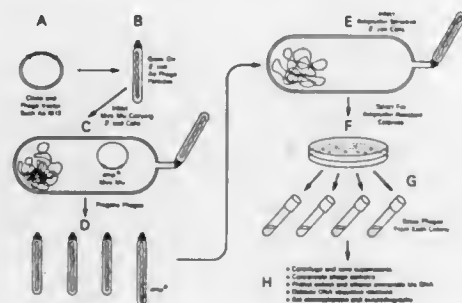
MINI MU CONTAINING PLASMID AND A METHOD FOR RAPID DNA SEQUENCING

Kiyoshi Mizunuchi, Michiyo Mizunuchi, and Toshiro Adachi, all of Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Dec. 13, 1984, Ser. No. 680,992

Int. Cl.⁴ C12Q 1/70, 1/68; C12N 15/00

U.S. Cl. 435—5 12 Claims



3. A method of determining base sequence in a DNA segment comprising:

- cloning said DNA segment by incorporation thereof in a cloning vector selected from the group consisting of ColE1 plasmids and M13 DNA phages;
- randomly inserting a mini Mu marker transposon of less than 2 kilobases in cloned DNA of step (a);
- isolating transposon-containing DNA obtained through step (b);
- separating radiolabelled chain terminator reaction products obtained by using radiolabelled nucleotides as precursors and the DNA of step (c) as a template together with universal primer oligonucleotide having sequence complementary to one of the transposon ends or two oligonucleotides each complementary to each of the two ends of the transposon; and
- identifying the sequence of said bases from said radiolabelled products through suitable gel electrophoretic means.

4,716,106

DETECTING POLYNUCLEOTIDE SEQUENCES
David J. Chiswell, Aylesbury, England, assignor to Amersham International plc, Buckinghamshire, England

Filed Feb. 28, 1985, Ser. No. 706,747

Claims priority, application United Kingdom, Mar. 1, 1984, 8405437

Int. Cl.⁴ C12Q 1/70, 1/68; G01N 33/566

U.S. Cl. 435—6 10 Claims

1. A method of detecting a specific target polynucleotide sequence in a sample, comprising the use of
(a) a labelled polynucleotide secondary probe having a complex single-stranded polynucleotide sequence, and
(b) a polynucleotide primary probe having a single-stranded sequence complementary to the target sequence and a complex single-stranded sequence complementary to the complex sequence of the secondary probe, which method comprises the steps of
(i) contacting the sample under hybridisation conditions with the primary probe,
(ii) before, during or after said contact hybridising the labelled secondary probe to the primary probe, and
(iii) observing the presence or absence of the label in association with the sample as indicating the presence or absence of the target sequence.

4,716,107

METHOD FOR DIAGNOSIS OF A.I.D.S.

Robert L. Gross, 15 Vasquez Ave., San Francisco, Calif. 94127

Continuation of Ser. No. 584,658, Feb. 29, 1984, abandoned.

This application Dec. 10, 1986, Ser. No. 941,531

Int. Cl.⁴ G01N 33/567, 33/555, 33/564; C12Q 1/02

U.S. Cl. 435—7 12 Claims

3. A method for the diagnosis of acquired immune deficiency syndrome in a human subject, comprising:

- isolating plasma from a sample of said human subject's blood;
- suspending in said plasma a predetermined amount of lymphocytes from a healthy donor;
- incubating said suspension with antiserum which specifically binds to T-lymphocytes at a dilution and in an amount selected to inhibit binding of T-lymphocytes in the suspension to sheep red blood cells;
- combining said treated suspension with a predetermined quantity of erythrocytes capable of rosette formation with said lymphocytes;
- comparing the level of rosette formation in said suspension with a non-inhibiting control level obtained by combining the T-lymphocytes of the healthy donor with an inert suspending medium and said antiserum, further combining said T-lymphocytes, inert suspending medium, and antiserum with erythrocytes capable of rosette formation, and determining the level of rosette formation, to obtain a value representing the percent inhibition of rosette formation attributable to said antiserum; and
- comparing the value obtained in step (e) with a control value representing the percent inhibition of rosette formation resulting from the addition of anti-T-lymphocyte antiserum to a T-lymphocyte sample from a healthy donor combined with said erythrocytes, to detect any variation occurring in said value which is attributable to said plasma, as an indication of the presence of acquired immune deficiency syndrome in said subject.

4,716,108

ASSAYING ANTI-TP ANTIBODIES FOR SYPHILIS DIAGNOSIS

Takashi Sato, Saitama; Emiko Kubo, and Takako Kayashima, both of Tokyo, all of Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 513,411, Jul. 14, 1983, abandoned. This application Feb. 24, 1986, Ser. No. 833,666

Claims priority, application Japan, Jul. 14, 1982, 57-121244

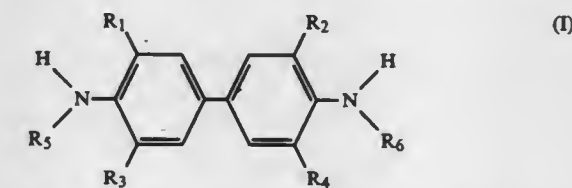
Int. Cl.⁴ G01N 33/53, 33/555, 33/569, 33/571

U.S. Cl. 435—7 4 Claims

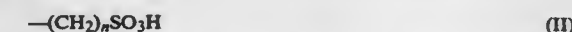
1. A method of measuring anti TP IgM antibodies in a sample comprising the steps of:

- adding animal erythrocytes having anti IgM antibodies immobilized thereon, to a liquid sample containing IgM antibodies which have been produced by TP antigens, to allow said anti IgM antibodies to react with said IgM antibodies;
- separating from the liquid the animal erythrocytes having anti IgM antibodies immobilized thereon, and which have reacted with said IgM antibodies in step (1);
- adding animal erythrocytes having TP antigens immobilized thereon, to a liquid containing said animal erythrocytes separated in step (2) to react TP antigens with IgM antibodies which are specifically reactive to TP antigens, said IgM antibodies being anti TP IgM antibodies, and
- correlating the agglutination due to the reaction in step (3) with the amount of anti TP IgM antibodies in the sample.

ing an enzyme, a buffer and a chromogen, wherein said chromogen comprises a sulfoalkyl derivative of a 3,3',5,5'-tetraalkylbenzidine or a water-soluble salt thereof represented by the following general formula I:



wherein R₁, R₂, R₃ and R₄ are straight-chain alkyl groups having 1 to 6 carbon atoms, selected from the group consisting of a methyl, ethyl, n-propyl, n-butyl, n-amyl and n-hexyl group, and one of R₅ and R₆ represents a sulfoalkyl group of the following formula II:



wherein n represents an integer of 1 to 6 and wherein the sulfoalkyl group is substituted with at least one hydroxyl group, the other one of R₅ and R₆ representing a member selected from the group consisting of a hydrogen atom and said sulfoalkyl group.

4,716,111

PROCESS FOR PRODUCING HUMAN ANTIBODIES

Michal E. Osband, Brookline, and Joy A. Cavnano, Boston, both of Mass., assignors to Trustees of Boston University, Boston, Mass.

Continuation of Ser. No. 407,236, Aug. 11, 1982, abandoned.

This application Jan. 30, 1985, Ser. No. 696,546

Int. Cl.⁴ C12P 21/00; C12N 15/00, 5/00

U.S. Cl. 435—68 6 Claims

1. A process for producing a human antibody which comprises collecting mononuclear cells depleted of suppressor cells from the autologous blood of a human patient not previously exposed to an antigen which elicits and human antibody, adding to said mononuclear cells an antigen capable of initiating the production of said human antibody, adding to said mononuclear cells autologous serum from said patient and incubating said mononuclear cells, antigen and autologous serum in the presence of a non-specific lymphocyte activator for a period of time sufficient to effect the production of a human antibody.

4,716,112

VECTORS FOR INCREASED EXPRESSION OF CLONED GENES

Nikos Panayotatos, Geneva, Switzerland, assignor to Biogen N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 531,235, Sep. 12, 1983, abandoned. This application Feb. 11, 1986, Ser. No. 829,456

Claims priority, application United Kingdom, Sep. 16, 1982, 8226409

Int. Cl.⁴ C12P 21/00; C12N 15/00, 1/20, 1/00

U.S. Cl. 435—68 8 Claims

1. An improved expression vector comprising an expression control sequence, said sequence comprising at least one promoter selected from the group consisting of a promoter of RNA I and a promoter of primer RNA for initiation of DNA replication; a DNA sequence within the replicon of the vector encoding RNA I and the primer RNA for initiation of DNA replication and their regulatory regions, said DNA sequence having an AT to GC mutation at position 3029 in the two strands of pBR322, said mutation increasing the copy number of the vector in a host as compared to a vector without such mutation and further amplifying the expression of genes and DNA sequences under the control of said expression control sequence of said vector beyond the amplification expected by

4,716,110

COMPOSITION FOR ASSAYING HYDROGEN PEROXIDE

Hiroshi Wada, Chigasaki, and Yuzo Kosaka, Adachi, both of Japan, assignors to Eiken Kagaku Kabushiki Kaisha, Japan

Filed Oct. 24, 1984, Ser. No. 664,309

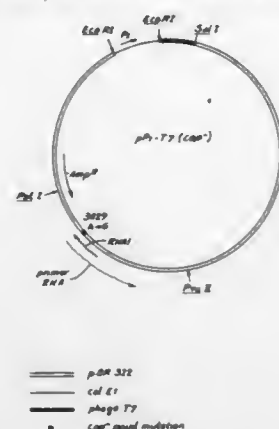
Claims priority, application Japan, Aug. 22, 1984, 59-174630

Int. Cl.⁴ C12Q 1/26, 1/28, 1/54

U.S. Cl. 435—25 18 Claims

1. A composition for assaying hydrogen peroxide compris-

the copy number increase; and at least one restriction site for insertion of a DNA sequence encoding a desired polypeptide



into said vector and operatively linking the DNA sequence to said expression control sequence.

4,716,113

PROCESS FOR THE PRODUCTION OF AN (S)-METHYL OR (S)-ETHYL

4-AMINO-6-FLUOROCHROMAN-4-CARBOXYLATE
Frank J. Urban, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 642,008, Aug. 20, 1984, abandoned. This application Mar. 31, 1986, Ser. No. 846,383

Int. Cl.⁴ C12P 17/06; C07P 41/00; C07D 311/04

U.S. Cl. 435-125

1 Claim

1. A process for preparing an (S)-methyl or (S)-ethyl 4-amino-6-fluoro-chroman-4-carboxylate by subjecting 4-amino-6-fluoro-chroman-4-carboxylic acid or (2R)-4-amino-6-fluoro-2-methylchroman-4-carboxylic acid in the form of a hydrohalide acid addition salt to the sequence of steps comprising:

- esterification with thionyl chloride and the appropriate lower alkanol, followed by basification to form an intermediate racemic methyl or ethyl ester; and
- resolution of said intermediate racemic ester by treatment with α -chymotrypsin to afford the desired (S)-methyl or (S)-ethyl ester in pure form.

4,716,114

PROCEDURE FOR THE ENHANCEMENT OF THE RESISTANCE TO ARSENITE AND ARSENATE OF THIOBACILLUS FERROOXIDANS AND BACILLUS SUBTILIS

Claude Nicolau, La Chapelle Saint Mesmin, and Jacques Raymond, ST Jean la Ruelle, both of France, assignors to Inverko Industrie Vertriebs Kontor GmbH & Co., KG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 496,390, May 20, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 719,337

Claims priority, application Fed. Rep. of Germany, May 24, 1982, 3219440

Int. Cl.⁴ C12N 15/00

U.S. Cl. 435-172.3

6 Claims

1. A process for increasing the resistance of a bacterial strain to As(III) and As(V), comprising transforming a first bacterial strain selected from a group of transformable bacterial strains, said group consisting of *Thiobacillus ferrooxidans* and *Bacillus subtilis* by a plasmid carrying resistance to As(III) and As(V) which is capable of expression of said resistance in said first strain.

4,716,115

DERIVED NISIN PRODUCING MICROORGANISMS, METHOD OF PRODUCTION AND USE AND PRODUCTS OBTAINED THEREBY

Carlos F. Gonzalez, and Alfred J. Gryczka, both of Sarasota, Fla., assignors to MicroLife Technics, Inc., Sarasota, Fla.

Continuation of Ser. No. 529,614, Sep. 6, 1983, abandoned. This application Jul. 11, 1986, Ser. No. 884,890

Int. Cl.⁴ C12N 15/00; 1/20; C12P 21/00; 21/04

U.S. Cl. 435-172.3

18 Claims

1. A nisin producing engineered bacterium of the genus *Streptococcus* which contains foreign DNA which encodes for nisin production, which foreign DNA was obtained from a nisin producing donor bacterium and which foreign DNA was transferred to a recipient bacterium resulting in the nisin producing engineered bacterium, wherein the donor bacterium is a naturally occurring *Streptococcus* species containing plasmid DNA from a 29 Mdal plasmid encoding for sucrose utilization and nisin production and nisin resistance and wherein the recipient bacterium is a *Streptococcus* species which is sensitive to nisin and which does not naturally produce nisin.

4,716,116

PROTEIN MODIFICATION TO PROVIDE ENZYME ACTIVITY

Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois Glass Container Inc., Toledo, Ohio

Filed Dec. 4, 1980, Ser. No. 212,782

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.⁴ C12N 9/00; 9/14

U.S. Cl. 435-183

9 Claims

1. A process to produce a modified protein from a negative protein comprising the steps of:

- selecting one enzyme to be molded, said enzyme having an enzymatic activity different from said native protein;
- selecting a native protein to be modified to model said enzyme;
- admixing said native protein with a denaturing agent for a time at a temperature sufficient to partially denature said native protein so as to perturb the shape or conformation of said native protein without causing an irreversible, gross denaturation;
- admixing the resulting partially denatured native protein with a competitive inhibitor of said model enzyme; and
- admixing said partially denatured native protein and said inhibitor with a cross-linking agent for a time and at a temperature sufficient to cross-link said partially denatured native protein by forming covalent bonds between reactive sites on said partially denatured native protein in the presence of said inhibitor and produce a modified protein having the biological activity of said model enzyme.

4,716,117

MONOCLONAL ANTIBODIES TO FACTOR VIII

George Kuo; Frank R. Masiaz, both of San Francisco; Martha Truett, Oakland; Pablo Valenzuela, San Francisco, all of Calif.; Mirella E. Rasmussen, Copenhagen, Denmark, and Jennifer Favaloro, Victoria, Australia, assignors to Chiron Corporation, Emeryville, Calif. and Nordisk Gentofte, Gentofte, Denmark

Continuation-in-part of Ser. No. 664,919, Oct. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 570,062, Jan. 12, 1984. This application Jan. 7, 1985, Ser. No. 689,274

Int. Cl.⁴ A61K 39/395; G01N 33/597

U.S. Cl. 435-240.27

4 Claims

1. A hybridoma cell line selected from the group consisting of cell line 42, cell line 47, cell line 56, cell line 1-28, cell line 4E5, cell line 5B1, and, cell line 2B6.

4,716,118

METHOD FOR DETERMINING IONIC STRENGTH OF A SAMPLE

Otto S. Wolfels, and Helmut Offenbacher, both of Graz, Austria, assignors to AVL AG, Schaffhausen, Switzerland

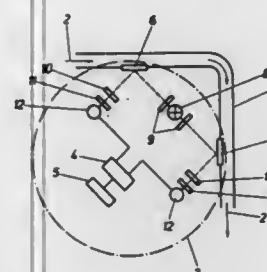
Continuation of Ser. No. 640,881, Aug. 15, 1984, abandoned.

This application Aug. 21, 1986, Ser. No. 898,804

Claims priority, application Austria, Aug. 26, 1983, 3061/83
Int. Cl.⁴ G01N 21/77; 33/52

U.S. Cl. 436-2

2 Claims



1. A method for determining an ionic strength value of an electrolytic solution having a certain ionic concentration, said method comprising the steps of

- providing two identical carrier materials, each of said two carrier materials comprising glass and having a carrier surface,
- treating said carrier surface of each of said two carrier materials with aminopropyl triethoxysilane and dichlorodimethylsilane to obtain high concentrations of ammonium groups on each of said carrier surfaces and block any silicate anions remaining on each of said carrier surfaces,
- providing a pH indicator substance,
- chemically coupling said indicator substance to said treated carrier surface of each of said two carrier materials,
- chemically modifying the carrier surface of at least one of said two carrier materials to which said indicator substance has been chemically coupled in step (d) by treatment with an acid chloride so as to provide the carrier surface of one of said two carrier materials with a different microenvironment than the carrier surface of the other of said two carrier materials, thus providing two optical sensors which will respond differently to the ionic strength value of said electrolytic solution,
- measuring the pH of said electrolytic solution using said two optical sensors, thus obtaining two differing pH measurement values,
- calculating a difference between said two differing pH measurement values obtained in step (f), and
- empirically inferring the ionic strength value of said electrolytic solution from said difference calculated in step (g).

4,716,119

CONTROL SERUM AND PROCESS THEREFOR

Helmut Rehner, Weilheim, and Peter Roeschla, Seeshaupt, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 663,832, Oct. 23, 1984, abandoned, which is a continuation of Ser. No. 350,867, Feb. 22, 1982, abandoned.

This application Oct. 7, 1986, Ser. No. 917,240

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1981, 3107060

Int. Cl.⁴ G01N 31/00

U.S. Cl. 436-16

1 Claim

1. Process for preparation of a calibration/control serum containing a desired component, comprising preparing an aqueous solution of said component, lyophilizing said solution to form a lyophilizate, reconstituting said lyophilizate with an

aqueous medium wherein prior to lyophilization there is added to said solution 0.5 to 10% by weight of the reconstituted solution of a compound selected from the group consisting of sodium acetate, triethanolammonium acetate, tetramethylethylenediammonium diacetate, tetramethylethylenediammonium diacetate, tetramethylammonium acetate and combinations thereof, and adding said reconstituted solution to a serum sample.

4,716,120

STABLE ALLERGENIC EXTRACTS AND METHODS
Yuh-Geng Tsay, San Jose; Myron A. Beigler, Los Altos Hills; Emanuel Calenoff, Burlingame; Gerald L. Friesen, Vacaville, and James L. Nichols, Los Altos, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 476,187, Mar. 17, 1983, abandoned. This application Nov. 25, 1985, Ser. No. 801,649

Int. Cl.⁴ A61K 39/00; G01N 33/53

U.S. Cl. 436-513

23 Claims

1. A substantially dried, purified allergenic extract substantially free from extracted components with molecular weights outside the range of 1000 to 100,000 daltons, having an allergen composition substantially the same as the original extract, and which upon aqueous reconstitution yields a transparent, colorless solution which has an increase in absorbance in the range of 400 to 700 nm of less than 0.01 O.D. after storage for 18 days at 22° C.

12. A process for increasing stability of an allergenic extract comprising

- passing an aqueous solution of an allergenic extract through 100,000 and 1000 dalton ultrafilters and retaining substantially all of the fraction having a molecular weight of from 1000 to 100,000 to yield an allergenic extract;
- contacting the allergenic extract obtained in Step (a) with a quantity of a carbon absorbent and with a gel polymer absorbent which forms a cage structure in aqueous media which is sufficient to clarify the extract, to yield a retained fraction; and
- substantially drying the retained fraction obtained in Step (b) to yield an allergenic product which upon aqueous reconstitution yields a transparent, colorless solution which has an increase in absorbance in the range of 400 to 700 nm of less than 0.01 O.D. after storage for 18 days at 22° C.

4,716,121

FLUORESCENT ASSAYS, INCLUDING IMMUNOASSAYS, WITH FEATURE OF FLOWING SAMPLE

Myron J. Block, North Salem, N.H., and Tomas B. Hirschfeld, Livermore, Calif., assignors to Ord, Inc., Nahant, Mass.

Filed Sep. 9, 1985, Ser. No. 773,940

Int. Cl.⁴ G01N 33/533; 33/552; 21/64; 35/00

U.S. Cl. 436-514

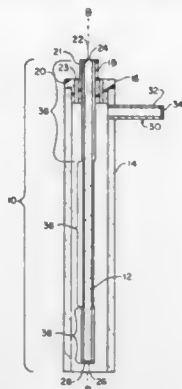
11 Claims

1. In a method for performing assays involving measurement of fluorescence excited in a fluid sample by an evanescent wave at a surface region of a totally internally reflecting substrate, the improvement comprising:

exciting said fluorescence while flowing through an enclosure of fixed dimensions bounded in part by said region, a sufficient volume of said sample to maintain said enclosure filled with flowing sample.

4. In apparatus for assaying a fluid sample, said apparatus including a totally internally reflecting substrate transmissive to radiation capable of exciting fluorescence in fluorescent material disposed at least on a portion of the surface of said substrate, said substrate also being transmissive to said fluorescence, and means spaced from at least said portion of said surface of said substrate so as to define an enclosure bounded in part by said portion, the improvement comprising:

means for flowing substantially continuously said sample over at least said portion of said surface and in sufficient



volume to fill said enclosure, while exciting said fluorescence.

4,716,122

CARRIER MATERIAL FOR USE IN IMMUNE DETERMINATIONS

Hans Scheefers, Giessen, Fed. Rep. of Germany, assignor to Organogen Medizinisch-Molekularbiologische Forschungsgesellschaft m.b.H., Heidelberg, Fed. Rep. of Germany
Filed Sep. 26, 1985, Ser. No. 780,378

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1984, 3435744

Int. Cl.⁴ G01N 33/543, 33/544, 33/545, 33/549

U.S. Cl. 436—532

9 Claims

1. A carrier having a covalently bound reaction component of an immunological reaction, for use in immune determinations comprising the reaction component covalently bound to a heterobifunctional photoactivatable compound, one group of which is formed by an aryl azide group linked to an inert polyethylene carrier.

4,716,123

SOLID PHASE BIOLOGICAL DIAGNOSTIC ASSAY VIA VISUAL OBSERVATION AS ENHANCED BY MIE SCATTERING

David E. Wood, Chelsea, Mich., assignor to Covalent Technology Corporation, Ann Arbor, Mich.

Continuation of Ser. No. 501,268, Jun. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 469,939, Feb. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 224,984, Jan. 14, 1981, abandoned. This application Aug. 20, 1986, Ser. No. 898,874

Int. Cl.⁴ G01N 33/546

U.S. Cl. 436—533

45 Claims

1. In a method of assaying an aqueous sample containing a specifically binding biomaterial having a binding site which is a specific binding partner to a biological substance by observation in light including a selected wavelength in the visual range, said specifically binding biomaterial being in association with other biomaterials, comprising:

- (1) contacting a solid support having a water insoluble macroextensive surface capable of associating with said specifically binding biomaterial with said aqueous sample for a time sufficient for said specifically binding biomaterial to associate with said macroextensive surface;
- (2) separating said support from contact with said aqueous sample;
- (3) contacting said macroextensive surface with an aqueous solution containing a plurality of particles having particle surfaces bearing said biological substance associated therewith for a time sufficient for said binding site to bind

to said biological substance and to thereby bind said particles to said macroextensive surface;

- (4) separating said support from said aqueous solution;
- (5) rinsing said support to remove any non-bound particles; and
- (6) observing the degree of adherence of said particles to said macroextensive surface to thereby perform said assay; the improvement comprising attaining increased speed, ease of assaying, specificity and selectivity, wherein said particles are synthetic polymeric particles and said plurality of synthetic particles are substantially spherical having an average diameter which falls within a range of from about 0.2 micron to about 11.1 microns, are of the substantially the same size within said range and have substantially the same selected refractive index, all as calculated by Mie scattering for clear visual observation of said particles when said particles are adhered to said macroextensive surface and are viewed in light including said wavelength.

4,716,124

TAPE AUTOMATED MANUFACTURE OF POWER SEMICONDUCTOR DEVICES

Alexander J. Yerman, and James A. Loughran, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

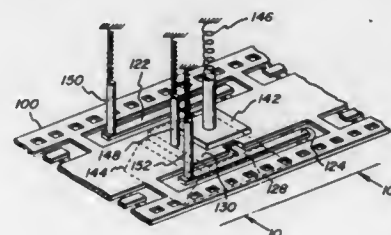
Division of Ser. No. 616,756, Jun. 4, 1984, Pat. No. 4,635,092.

This application Aug. 20, 1986, Ser. No. 898,082

Int. Cl.⁴ H01L 23/26

U.S. Cl. 437—8

13 Claims



1. A process for manufacturing a power semiconductor device comprising the steps of:

- (a) providing a metal tape carrier including a series of sprocket holes adapted to be engaged by a drive mechanism for automated movement of said tape carrier;
- (b) providing a plate-shaped power chip having a first main current electrode on a first major chip surface and a second main current electrode and at least one control electrode on a second major chip surface, respectively;
- (c) bonding said second main current electrode to a major surface of said metal tape carrier; and
- (d) forming a control lead for contact with said control electrode, said control lead being formed from said tape carrier by severing and electrically isolating an elongated portion of said carrier from the remainder of said carrier.

4,716,125

METHOD OF PRODUCING SEMICONDUCTOR LASER

Masao Makiuchi, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1986, Ser. No. 935,323

Claims priority, application Japan, Nov. 30, 1985, 60-270509

Int. Cl.⁴ H01L 21/203, 21/223, 21/225, 21/265

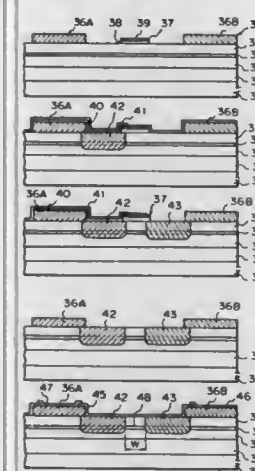
U.S. Cl. 437—22

12 Claims

1. A method of producing a semiconductor laser comprising the steps of:

- forming a first high resistance clad layer, having a first band gap, on a semi-insulating semiconductor substrate;
- forming an active layer of a multi-quantum well structure, in

which quantum wells have a second band gap narrower than said first band gap, on said first clad layer; forming a second high resistance clad layer on said active layer, said second clad layer having a property of reducing the diffusion coefficient of impurities toward the upper surface thereof, from the active layer side, the lower portion of said second clad layer having a third band gap wider than said second band gap; selectively thermally diffusing first impurity atoms into said first clad layer through a first portion of said second clad layer and a first portion of said active layer, so that said



first portion of said active layer is disordered and the diffused portions form a first conduction region of a first conductivity type; and

selectively thermally diffusing second impurity atoms into said clad layer through a second portion of said second clad layer and a second portion of said active layer at a desired distance from said first portion of said active layer, so that said second portion of said active layer is disordered and the diffused portions form a second conduction region of a second conductivity type opposite to that of said first conductivity type.

4,716,126

FABRICATION OF DOUBLE DIFFUSED METAL OXIDE SEMICONDUCTOR TRANSISTOR

Adrian I. Cogan, San Jose, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Filed Jun. 5, 1986, Ser. No. 871,006

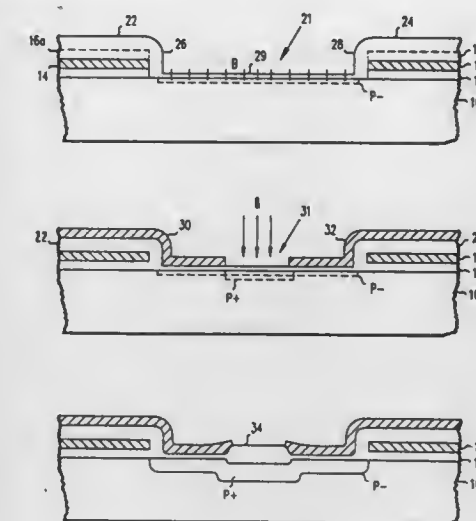
Int. Cl.⁴ H01L 21/265, 21/316

U.S. Cl. 437—24

4 Claims

1. A process for fabricating a double diffused metal oxide semiconductor transistor structure comprising the steps of: sequentially forming on a silicon substrate a thin film of gate oxide, a layer of polysilicon, and a first layer of thermally grown oxide; etching a window through said layers and said thin film whereby said polysilicon layer is configured into gate regions having side walls and a window between said gate regions; implanting nitrogen in said semiconductor substrate window region for forming an oxidation inhibitor to silicon; thermally growing a second layer of silicon oxide over said side walls of said gate regions and over said window forming thereby a thin oxide pad over said window; implanting P-type impurity material below said window; forming silicon nitride over said second layer of thermally grown silicon oxide and patterning by masking and etching said silicon nitride to form spaced regions that define a narrow window therebetween; implanting P+ type impurity material through said narrow window between said gate regions;

growing a localized oxide plug over said implanted P+ region by a drive-in diffusion and oxidation cycle; implanting N-type material to form a junction adjacent to said gate region; and



opening access to said gate regions for defining metal contact regions.

4,716,127

METHOD OF IMPLANTING SPATIALLY CONTROLLED P-N JUNCTIONS BY FOCUSED ION BEAMS CONTAINING AT LEAST TWO SPECIES

Shoji Shukuri, Koganei; Masao Tamura, Tokorozawa; Yasuo Wada, and Yoshihisa Fujisaki, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

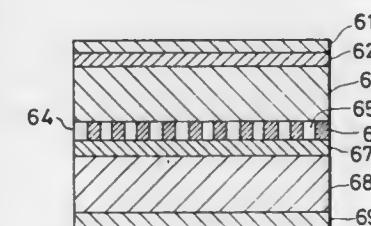
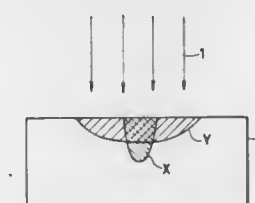
Filed Apr. 15, 1986, Ser. No. 852,317

Claims priority, application Japan, Apr. 15, 1985, 60-78347

Int. Cl.⁴ H01L 21/265; G01N 23/00

U.S. Cl. 437—27

15 Claims



1. A method of manufacturing a semiconductor device comprising the step of irradiating a desired part of a workpiece with a focused ion beam which contains at least two species of

impurity ions to be simultaneously implanted, thereby to simultaneously implant said at least two species of impurity ions into said desired part, the at least two species having spatial distributions of ion current density within the focused ion beam that are different from each other.

4,716,128

METHOD OF FABRICATING SILICON-ON-INSULATOR LIKE DEVICES

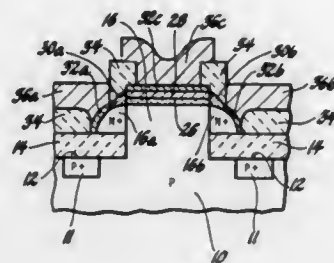
Peter J. Schnabert, and Nadeem S. Alvi, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 10, 1986, Ser. No. 940,255

Int. Cl.⁴ H01L 21/365, 41/425

U.S. Cl. 437-41

9 Claims



9. A process for forming a semiconductor device comprising the steps of:

- forming an insulating layer over a surface of a semiconductor body;
- forming a hole in the insulator layer for exposing a portion of the surface of the semiconductor body;
- growing epitaxially semiconductor material from the exposed portion of the surface of the semiconductor body vertically upward in the hole;
- removing portions of the insulator layer to expose an opposed pair of vertical sidewall portions of the vertically grown semiconductor material; and
- growing epitaxially semiconductor material laterally from said opposed pair of exposed sidewall portions of the vertically grown semiconductor material to form first and second regions which are separated by portions of vertically grown semiconductor material which serve as a third region of the device.

4,716,129

METHOD FOR THE PRODUCTION OF SEMICONDUCTOR DEVICES

Mototaka Taneya; Sadayoshi Matsui, and Mitsuhiro Matsumoto, all of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

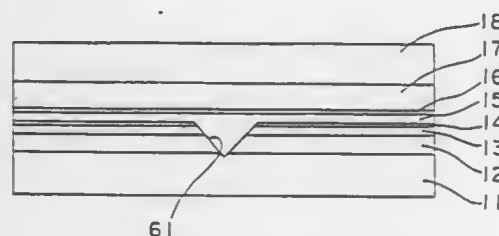
Filed Jan. 6, 1986, Ser. No. 816,569

Claims priority, application Japan, Jan. 14, 1985, 60-4760

Int. Cl.⁴ H01L 21/208

U.S. Cl. 437-96

11 Claims



1. A method for the production of semiconductor devices which comprises:

- forming a non-Te-doped layer on a Te-doped layer, said

non-Te-doped layer having the same polarity as said Te-doped layer, and forming an upper layer on said non-Te-doped layer, said upper layer having a polarity different from that of said Te-doped layer, wherein said layers comprise semiconductors of Groups III to V of the periodic table and wherein said layers are formed by liquid phase epitaxy.

4,716,130

MOCVD OF SEMI-INSULATING INDIUM PHOSPHIDE BASED COMPOSITIONS

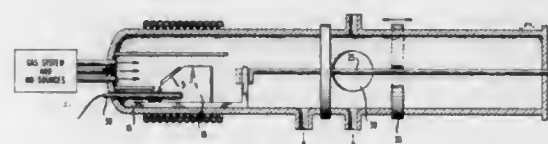
Wilbur B. Johnston, Jr., Mendham, and Judith A. Long, Millburn, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 604,370, Apr. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 544,215, Oct. 21, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 831,113

Int. Cl.⁴ H01L 7/36, 21/205, 21/84

U.S. Cl. 437-104

24 Claims



1. A process for producing a device comprising the steps of (1) forming a region of a semi-insulating indium phosphide-based material by contacting a substrate with a deposition gas stream and (2) forming the active region of said device CHARACTERIZED IN THAT said semi-insulating region is formed by introducing a dopant precursor comprising a composition chosen from the group consisting of ferrocene based compositions and iron pentacarbonyl based compositions into said deposition gas stream, wherein said deposition gas stream is produced by combining entities including an organo-indium compound and a source of phosphorus wherein the mole ratio of iron to indium in said gas stream is less than 1.2×10^{-4} , and whereby said semi-insulating indium phosphide has a resistivity of at least 10^6 ohm-cm.

4,716,131

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE HAVING POLYCRYSTALLINE SILICON LAYER WITH METAL SILICIDE FILM

Takeshi Okazawa, and Yoshiyuki Hirano, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

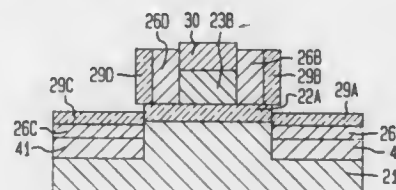
Filed Nov. 28, 1984, Ser. No. 675,768

Claims priority, application Japan, Nov. 28, 1983, 58-223717; Nov. 30, 1983, 58-225814

Int. Cl.⁴ H01L 21/283

U.S. Cl. 437-200

2 Claims



1. A method of manufacturing a semiconductor device comprising steps of forming a first silicon oxide film on the major surface of a single crystal silicon substrate, forming a polycrystalline silicon layer on said first silicon oxide film, forming an

4,716,132

METHOD FOR PRODUCTION OF SILICON NITRIDE SINTERED BODY

Akito Horiuchi, Kokubu; Kiyoshi Yokoyama, Kagoshima, and Makoto Yoshida, Kokubu, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Mar. 31, 1986, Ser. No. 846,701

Int. Cl.⁴ C04B 35/58

U.S. Cl. 501-97

18 Claims

1. A method for the production of a silicon nitride sintered body, which comprises molding a fine powder of an alloy comprising metallic silicon and a metal of the group IIIa of the Periodic Table, subjecting the molded body to a nitriding treatment by calcination in a nitrogen-containing atmosphere and sintering the nitrided molded body at a temperature higher than the nitriding treatment temperature.

1. A method for the production of a silicon nitride sintered body, which comprises molding a fine powder of an alloy comprising metallic silicon and a metal of the group IIIa of the Periodic Table, subjecting the molded body to a nitriding treatment by calcination in a nitrogen-containing atmosphere and sintering the nitrided molded body at a temperature higher than the nitriding treatment temperature.

4,716,134

DIELECTRIC CERAMIC COMPOSITION

Takashi Yamaguchi; Isao Ishiguchi, both of Chichibu, and Takeshi Inoue, Sakura, all of Japan, assignors to Mitsubishi Mining and Cement Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1986, Ser. No. 930,581

Claims priority, application Japan, Dec. 10, 1985, 60-277610

Int. Cl.⁴ C04B 35/46

U.S. Cl. 501-136

8 Claims

1. A dielectric ceramic composition which comprises $(\text{Pb}, \text{La})(\text{Zr}, \text{Ti})\text{O}_3$ and $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ in the ratio defined by the formula below,

$$x(\text{Pb}_{1-u}\text{La}_u)(\text{Zr}_{1-v}\text{Ti}_v)\text{O}_3 \cdot (1-x)\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$$

wherein

$$1.0 \geq u \geq 0.28$$

$$0.25 \leq v \leq 1.00$$

$$0.03 \leq x \leq 0.50.$$

4,716,132

METHOD OF MANUFACTURING A DISTRIBUTED FEEDBACK TYPE SEMICONDUCTOR DEVICE

Shoji Hirata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

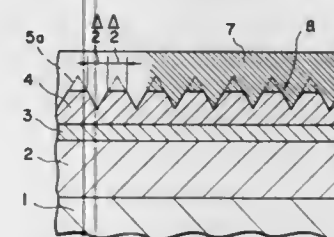
Filed Jan. 13, 1987, Ser. No. 2,972

Claims priority, application Japan, Jan. 14, 1986, 61-5725

Int. Cl.⁴ H01L 21/208

U.S. Cl. 437-228

2 Claims



1. A method of manufacturing a distributed feedback type semiconductor laser comprising a first cladding layer 2, an active layer 3 disposed on said first cladding layer, a guiding layer 4 disposed on said active layer and a second cladding layer 7 disposed on said guiding layer respectively, in which a grating 8 is disposed to said guide layer, wherein the method comprises the steps of:

- forming a predetermined material layer on said guide layer, selectively etching said material layer and said guide layer until said guide layer is at least partially exposed thereby forming undulation substantially in a trigonal waveform to the surface of said material layer and said guiding layer, and
- forming said second cladding layer so as to cover said unevenness.

4,716,135

ORGANOPHOSPHORUS-MODIFIED ZEOLITES AND METHOD OF PREPARATION

Catherine S. H. Chen, Berkeley Heights, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 808,973, Dec. 16, 1985, Pat. No. 4,658,079, which is a continuation-in-part of Ser. No. 709,143, Mar. 7, 1985, Pat. No. 4,568,786, which is a continuation-in-part of Ser. No. 598,139, Apr. 9, 1984, Pat. No. 4,520,221. This application Nov. 18, 1986, Ser. No. 932,051

Int. Cl.⁴ B01J 29/04, 27/14

U.S. Cl. 502-62

13 Claims

1. A surface-inactivated catalyst composition comprising a medium or large pore shape-selective siliceous zeolite material having active internal Bronsted acid sites and containing a surface-inactivating amount of an organophosphorus base or cation, the base or cation having an effective cross section larger than the zeolite pore.

2. The catalyst composition of claim 1 wherein said zeolite material comprises aluminosilicate having a silica-to-alumina mole ratio of at least 12 and a constraint index of about 0.5 to 12 prior to phosphorus compound surface treatment.

8. A surface-inactivated catalyst composition comprising a zeolite having the structure of ZSM-5 and having active internal Bronsted acid sites and containing no metals other than periodic group IIIB or IVB elements and having an acid cracking value of greater than 50 and containing a surface-inactivating amount of an organophosphorus base or cation, said base or cation having an effective cross-section larger than a zeolite pore.

4,716,136

MACROSTRUCTURAL UNIT HAVING A CATALYTICALLY-ACTIVE ZEOLITE SURFACE
 Paul B. Weisz, Yardley, and Tsoung Y. Yan, Philadelphia, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.
 Filed Dec. 20, 1985, Ser. No. 811,199
 Int. Cl. B01J 29/06

U.S. Cl. 502-64

9 Claims

1. A process for preparing a macrostructural unit having a catalytically-active zeolite surface as an integral part of the macrostructural unit, which comprises:

- mixing a slurry containing one or more of finely divided silica, silica gel, alumina, aluminum hydroxide and kaolin, said slurry having a ratio of silicon atoms to aluminum atoms corresponding to that of the zeolite to be formed, with plasticizer to form a plastic mass;
- shaping the plastic mass to a desired configuration;
- calcining the shaped plastic mass at 500° to 800° C. for 1 to 10 hours to form a rigid macrostructural unit having the same configuration as the shaped plastic mass;
- crystallizing 5 to 80% of the rigid macrostructural unit obtained by calcination to crystalline aluminosilicate zeolite; and
- activating the crystalline aluminosilicate zeolite to catalytically-active zeolite.

4,716,137

PROCESS OF PREPARING A CATALYST CONTAINING ACTIVATED ISOMERIZATION SITES

Paul H. Lewis, Groves, Tex., assignor to Texaco Inc., White Plains, N.Y.
 Division of Ser. No. 342,546, Jan. 25, 1982, Pat. No. 4,489,216.
 This application Sep. 19, 1984, Ser. No. 652,022
 Int. Cl. C07C 5/24

U.S. Cl. 502-74

12 Claims

- The method which comprises loading a hydrogen mordenite having a silica-to-alumina mole ratio of 10-20:1, with a metal of the platinum-palladium group thereby forming a loaded hydrogen mordenite; calcining said loaded hydrogen mordenite at 1200° F.-1500° F. thereby forming a loaded calcined hydrogen mordenite containing activated isomerization sites; and recovering said loaded calcined hydrogen mordenite containing activated isomerization sites.

4,716,138

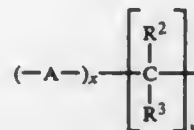
OLIGOMERIZATION TO ALPHA-OLEFINS
 Rex E. Murray, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.
 Division of Ser. No. 887,183, Jul. 21, 1986, Pat. No. 4,689,437.
 This application Dec. 12, 1986, Ser. No. 940,982
 Int. Cl. B01J 31/14, 31/02

U.S. Cl. 502-117

34 Claims

- An oligomerization catalyst precursor comprising (i) a transition metal compound wherein the transition metal is selected from the group consisting of nickel, chromium, cobalt, iron, and copper, and mixtures thereof and (ii) at least one organophosphorus sulfonate ligand containing (a) at least one benzene ring having a trivalent phosphorus atom located at one position on the benzene ring and an SO₃M group located at a position on the benzene ring ortho thereto, or at least one benzene ring having a trivalent phosphorus atom connected through a methylene group to a first position on the benzene ring and an SO₃M group connected through a methylene group to a second position on the benzene ring ortho to the first position, or at least one bridging or fused aromatic ring system having a trivalent phosphorus atom and an SO₃M group, each located on the same or different aromatic ring in the system at substituent positions adjacent to one another, or at least one aromatic ring, other than a benzene ring, or heteroaromatic ring, each ring having a trivalent phosphorus atom and an SO₃M group located at substituent positions

adjacent to one another, wherein M is selected from the group consisting of hydrogen, alkali metals, alkaline earth metals, and NR₄ and PR₄ wherein R is a hydrogen atom or a substituted or unsubstituted hydrocarbyl radical having 1 to 15 carbon atoms and each R can be alike or different or (b) a trivalent phosphorus atom connected through a group having the formula



to an SO₃M group wherein A is an oxygen atom, an NH radical, or an NR radical; R² and R³ are hydrogen atoms or a substituted or unsubstituted hydrocarbyl radical having 1 to 6 carbon atoms and can be alike or different; x is an integer 0 or 1; y is an integer from 1 to 3; and R and M are as defined above.

4,716,139

AMORPHOUS SULFIDE CATALYSTS OF TRIVALENT CHROMIUM AND PROMOTER METALS AND METHOD OF MAKING SAME

Allan J. Jacobson, Princeton; Teh C. Ho, Bridgewater; Russell R. Chianelli, Somerville; John J. Steger, Pittstown, and Angelo A. Montagna, Summit, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
 Continuation of Ser. No. 656,144, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 567,882, Jan. 3, 1984, abandoned, which is a continuation of Ser. No. 454,384, Dec. 29, 1982, abandoned. This application Mar. 31, 1986, Ser. No. 846,219
 Int. Cl. B01J 31/00, 27/047, 27/049, 27/051

U.S. Cl. 502-167

13 Claims

- A process for preparing a catalyst composition comprising an amorphous metal sulfide of trivalent chromium, (i) a metal selected from the group consisting of Mo, W and mixture thereof and (ii) at least one promoter metal selected from the group consisting of Fe, Ni, Co, Mn, Zn, Cu and mixtures thereof said process comprising heating one or more precursors at a temperature of at least about 200° C., under oxygen-free conditions and in the presence of sulfur for a time sufficient to form said catalyst, wherein said precursor is selected from the group consisting of [Cr_{1-x}M_xLX₃]_n[MoS₄]_n, [Cr_{1-x}M_xLX₃]_n[WS₄]_n and mixture thereof, wherein n=(3-z-y)/2, wherein M is one or more divalent promoter metals selected from the group consisting of Mn, Fe, Co, Ni, Cu, Zn and mixtures thereof, wherein 1>z≥0 and 1-z≥y≥0, wherein L is one or more neutral nitrogen-containing ligands, at least one of which is a chelating polydentate ligand, and wherein X is a singly charged anionic ligand.

4,716,140

HYDROTREATING CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1986, Ser. No. 924,092

Int. Cl. B01J 27/19, 27/188, 27/18; C01F 7/02

U.S. Cl. 502-211

39 Claims

- A process for preparing highly active hydrotreating catalysts having surface areas above about 300 m²/g and at least about 80% of the pore volume in pores having diameters less than about 70 Å, which process comprises: (a) precipitating an aqueous solution of one or more aluminum salt(s) in the presence of a phosphorus-containing compound by adjusting the pH of said solution to a range between about 5.5 and about 10.0 at a temperature in the range between about 20° C. and about 90° C., (b) aging the precipitate at a temperature ranging from about

20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

- washing the precipitate,
- mixing the precipitate with a solution containing solubilized salts of nickel and a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, and a phosphorus-containing compound in an amount of from about 0.2 to about 1.5 moles of phosphorus per mole of heavy metal at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the metal salts onto the gel is sufficient to yield a final catalyst having from about 1% w to about 5% w nickel and from about 8% w to about 32% w heavy metal,
- extruding the product of step (d), and
- drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,716,141

HYDROTREATING CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1986, Ser. No. 924,225

Int. Cl. B01J 27/19, 27/188, 27/185; C10G 45/08

U.S. Cl. 502-211

75 Claims

- A process for preparing highly active hydrotreating catalysts having surface areas above about 300 m²/g and at least about 80% of the pore volume in pores having diameters less than about 70 Å, which process comprises:

- precipitating an aqueous solution of one or more aluminum salt(s) in the presence of a phosphorus-containing compound by adjusting the pH of said solution to a range between about 5.5 and about 10.0 at a temperature in the range between about 20° C. and about 90° C.,
- aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,
- washing the precipitate,
- mixing the precipitate with dry, water-soluble salts of nickel and a heavy metal selected from the group consisting of molybdenum, tungsten, and mixtures thereof and a phosphorus-containing compound in an amount of from about 0.2 to about 1.5 moles of phosphorus per mole of heavy metal, at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 25° C. and about 100° C. to yield a final catalyst having from about 1% w to about 5% w nickel and from about 8% w to about 32% w heavy metal,
- extruding the product of step (d), and
- drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,716,142

CATALYSTS FOR THE HYDRODENITROGENATION OF ORGANIC MATERIALS AND PROCESS FOR THE PREPARATION OF THE CATALYSTS

Richard M. Laine, Palo Alto; Albert S. Hirschon, Menlo Park, and Robert B. Wilson, Jr., Mountain View, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Aug. 26, 1986, Ser. No. 900,447

Int. Cl. B01J 21/04, 27/049, 27/051

U.S. Cl. 502-220

47 Claims

- A process for the preparation of a multimetallic catalyst for the hydrodenitrogenation of an organic feedstock, which process comprises:

- forming a pre-catalyst itself comprising: (i) a first metal compound selected from compounds of nickel, cobalt or mixtures thereof; (ii) a second metal compound selected from compounds of chromium, molybdenum, tungsten, or mixtures thereof; and (iii) an inorganic support;
- heating the pre-catalyst of step (a) with a source of sulfide

in a first non-oxidizing gas at a temperature and for a time effective to presulfide the pre-catalyst;

- adding in a second non-oxidizing gas to the sulfided pre-catalyst of step (b) an organometallic transition metal moiety selected from compounds of iridium, rhodium, iron, ruthenium, tungsten or mixtures thereof for a time and at a temperature effective to chemically combine the metal components; and
- optionally heating the chemically combined catalyst of step (b) in vacuum at a temperature and for a time effective to remove residual volatile organic materials.

4,716,143

DEHYDROGENATION CATALYST COMPOSITION
 Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 871,356, Jun. 6, 1986,

abandoned. This application Feb. 25, 1987, Ser. No. 18,541

Int. Cl. G01J 21/04, 23/58, 23/62

U.S. Cl. 502-326

10 Claims

- A catalytic composite comprising a platinum group metal component, a modifier metal component selected from the group consisting of a tin component, germanium component, rhenium component, and mixtures thereof on a refractory oxide support having a nominal diameter of at least about 850 microns wherein the platinum group component and the modified metal component are surface-impregnated such that the average concentration of the surface-impregnated platinum group component and modifier metal component on the outside 100 micron layer of the catalyst particle are each at least 2 times the concentration of the respective platinum group component and modifier metal component in the 200 micron diameter center core of the catalyst.

4,716,144

DYE-BARRIER AND SUBBING LAYER FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Noel R. Vanier, Rochester; Kin K. Lum, Webster, and Wayne A. Bowman, Walworth, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 813,294, Dec. 24, 1985,

abandoned. This application Nov. 25, 1986, Ser. No. 934,969

Int. Cl. B41M 5/26

U.S. Cl. 503-227

20 Claims

- In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having on one side thereof a dye layer and on the opposite side thereof a slipping layer comprising a lubricating material and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein a hydrophilic dye-barrier layer is located between said dye layer and said support, and a subbing layer is located between said dye-barrier layer and said support.

4,716,145

NON-IMAGEWISE REHEATING OF TRANSFERRED DYES IN THERMAL DYE TRANSFER ELEMENTS

Noel R. Vanier, Rochester; Gary W. Byers, and Helmut Weber, both of Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,690

Int. Cl. B41M 5/26

U.S. Cl. 503-227

17 Claims

- In a process of forming a stable dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon at least one continuous area comprising a layer of an image dye dispersed in a binder, and transferring a dye image to a dye-receiving element to form said dye transfer image, said imagewise-heating being done by a thermal print head, the improvement comprising heating said dye-receiving element containing said transferred dye image

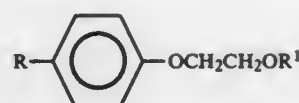
with said thermal print head while a continuous area of said dye-donor element that does not contain any image dye is located between said thermal print head and said dye-receiving element containing said transferred image dye, so that stratification of said transferred image dye in said dye-receiving element is reduced.

4,716,146

4-ALKYLPHENYL-2-ALKOXYETHYL ETHERS AND FRAGRANCE COMPOSITIONS CONTAINING SAME
Eugene G. Harris, West Chester, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 636,772, Aug. 1, 1984, abandoned. This application Dec. 19, 1986, Ser. No. 944,143
Int. Cl.⁴ A61K 7/46; C11B 9/00; C07C 43/20
U.S. Cl. 512-21

6 Claims

1. A compound having the structural formula:



wherein R and R¹ are lower alkyl having from 1 to 2 carbon atoms.

4,716,147

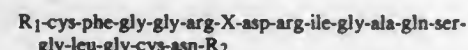
SYNTHETIC AIRIAL PEPTIDES

Foe S. Tjoeng, Manchester; Kam F. Fok, St. Louis, and Steven P. Adams, St. Charles, all of Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Mar. 27, 1986, Ser. No. 844,906
Int. Cl.⁴ A61K 37/02; C07K 7/10, 7/08

U.S. Cl. 514-11

16 Claims

1. A synthetic peptide having potent natriuretic activity comprising the following amino acid sequence:



wherein

R₁=arg, arg-arg, leu-arg-arg, ser-leu-arg-arg, D-arg, D-arg-D-arg,

R₂=ser-phe, ser-phe-arg, ser-phe-arg-tyr,

X=met, ile,

or the physiologically acceptable salts, esters or amides thereof.

4,716,148

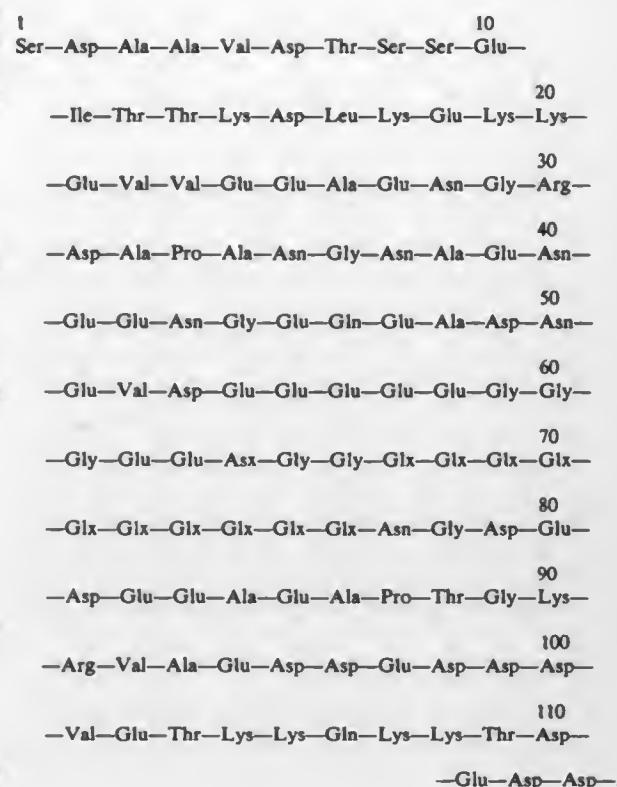
PROTHYMOSIN ALPHA

Bernard L. Horecker, New York, N.Y., assignor to Hoffman-La Roche Inc., Nutley, N.J.
Division of Ser. No. 639,757, Aug. 13, 1984, Pat. No. 4,659,694, which is a continuation-in-part of Ser. No. 546,211, Oct. 27, 1983, abandoned. This application Nov. 18, 1986, Ser. No. 932,074
Int. Cl.⁴ A61K 37/02

U.S. Cl. 514-12

4 Claims

1. A method for reconstituting immune functions in thymic deprived or immunodeprived warm-blooded mammals which method comprises administering to such mammal an immunopotentiating effective amount of a substantially homogeneous peptide and the pharmaceutically acceptable acid and base addition salts thereof, wherein said peptide comprises about 113 amino acid residues; wherein the isoelectric focusing point of said peptide is about 3.55; wherein about one half of the amino acid residues in said peptide consist of glutamic acid and aspartic acid; wherein said peptide does not contain methionine, cysteine or aromatic amino acids; wherein said peptide has the amino acid sequence starting from the amino terminal end:



4,716,149

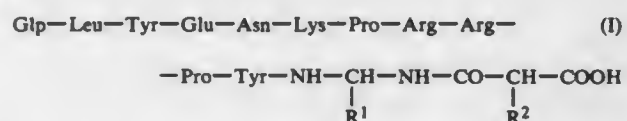
PARTIALLY MODIFIED, RETRO-INVERSO NEUROTENSIN ANALOGS

Fabio Bonelli, Antonello Pessi, both of Rome, and Antonio S. Verdini, Monterotondo, all of Italy, assignors to Enichem S.p.A. and Eniricerche S.p.A., both of Milan, Italy
Filed Dec. 13, 1985, Ser. No. 808,617
Claims priority, application Italy, Dec. 21, 1984, 24197 A/84
Int. Cl.⁴ A61K 37/02; C07K 7/08

U.S. Cl. 514-13

7 Claims

1. A neurotensin-like peptide, partially retro-inverted at the Ile-Leu bond, of the general formula (I):



wherein R¹ and R² are straight or branched alkyl radicals of from 1 to 7 carbon atoms.

4,716,150

SYNTHETIC PEPTIDES AND USE THEREOF IN PREPARING CALMODULIN ANTISERA

Linda J. Van Eldik, and D. Martin Watterson, both of Nashville, Tenn., assignors to Vanderbilt University, Nashville, Tenn. and The Rockefeller University, New York, N.Y.
Continuation of Ser. No. 597,243, Apr. 5, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 770,227
Int. Cl.⁴ H61K 37/02; C07K 7/08, 7/06

U.S. Cl. 514-14

50 Claims

1. A synthetic peptide immunogen for use in developing antisera against vertebrate calmodulin, the peptides having a chain length of from 8 to 15 amino acids arranged in a linear N-terminal to C-terminal sequence which includes the immunogenic heptapeptide segment asparagine-tyrosine-glutamic acid-glutamic acid-phenylalanine-valine-glutamine, said pep-

tide immunogen being selected from the class of peptides consisting of:

- Gly-Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr-Ala-Lys;
- Gly-Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val Gln-Met-Met-Thr-Ala;
- Gly-Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr;
- Gly-Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met;
- Gly-Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met;
- Gly-Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln;
- Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr-Ala-Lys;

- Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr-Ala;
- Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr;
- Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Glu-Met-Met;
- Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met;
- Gln-Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln;
- Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr-Ala-Lys;
- Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr-Ala;
- Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr;
- Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met;
- Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met;
- Val-Asn-Tyr-Glu-Glu-Phe-Val-Gln;
- Asn-Tyr-Glu-Glu-Phe-Val-Gal-Met-Met-Thr-Ala-Lys;
- Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr-Ala;
- Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met-Thr;
- Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met-Met;
- Asn-Tyr-Glu-Glu-Phe-Val-Gln-Met;

wherein, optionally, cysteine may also be present at either the N-terminal or C-terminal ends of said compounds (a) to (w), and wherein the abbreviations Gly, Gln, Val Asn, Tyr, Glu, Phe, Met, Thr, Ala, and Lys represent respectively glycine, glutamine, valine, asparagine, tyrosine, glutamic acid, phenylalanine, methionine, threonine, alanine, and lysine.

4,716,151

TRIPEPTIDES AND THEIR USE

Pierre Jolles, Paris; Daniele Migliore-Samour, Le Kremlin-Bicetre, and Fabienne Parker, St Maur-des-Fosses, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France
Filed Aug. 14, 1985, Ser. No. 765,536
Claims priority, application France, Aug. 16, 1984, 84 12853
Int. Cl.⁴ A61K 37/02; C07K 5/08

U.S. Cl. 514-18

4 Claims

1. A pharmaceutical composition having immunostimulant activity comprising an effective amount of a tripeptide selected from the group consisting of Gly-Leu-Phe, Gly-Leu-Tyr and Gly-Phe-Leu in combination with one or more diluents or adjuvants which are compatible and pharmaceutically acceptable.

4,716,152

PHARMACEUTICAL USE OF SUBSTITUTED O-ACYLGLYCOSIDES

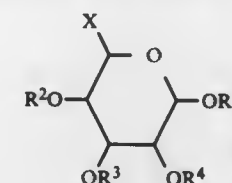
Bernd-Wieland Krüger, Wuppertal; Oswald Lockhoff, Cologne; Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany; Hans-Georg Opitz, Emeryville, Calif.; Klaus Schaller; Klaus G. Stünkel, both of Wuppertal, Fed. Rep. of Germany, and Hans-Joachim Zeller, Velbert, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Nov. 28, 1984, Ser. No. 675,808
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344256
Int. Cl.⁴ A61K 31/70

U.S. Cl. 514-25

13 Claims

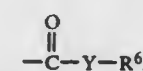
1. A method of activating the immune system of a patient

which comprises administering to a patient an amount effective thereof of a compound of the formula



in which

X is hydrogen or the radical CH₂OR⁵,
R², R³, R⁴ and R⁵ each independently is hydrogen or the radical



Y is oxygen, sulphur, NH or CH₂, and
R¹ and R⁶ each independently is a hydrocarbon radical having up to 50 carbon atoms, or a hydrocarbon radical having up to 50 carbon atoms wherein up to 5 methylene or methine groups are replaced by O, S, NH, N-C₁₋₂₀-alkyl or N-CO-C₁₋₂₀-alkyl, with the proviso that at least one of the radicals R¹ and R⁶ contains between 9 to 50 carbon atoms.

4,716,153

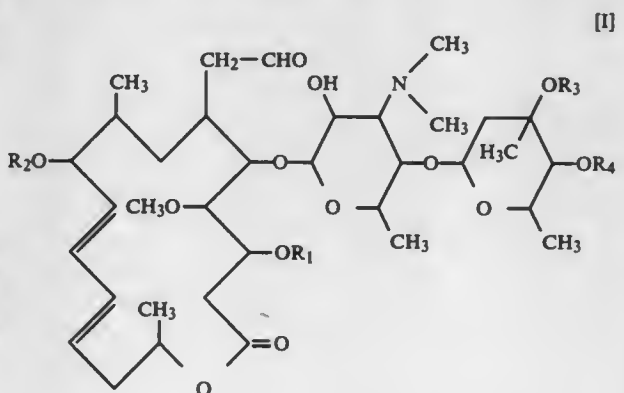
STABLE ORAL PREPARATION OF MACROLIDE ANTIBIOTICS AND METHOD FOR STABILIZING THE SAME

Masataka Morishita; Masaru Ono, and Yukio Sumita, all of Shizuoka, Japan, assignors to Toyo Jozo Company, Ltd., Shizuoka, Japan
Continuation of Ser. No. 555,378, Nov. 28, 1983, abandoned.
This application Aug. 25, 1986, Ser. No. 900,231
Claims priority, application Japan, Dec. 4, 1982, 57-212942
Int. Cl.⁴ A61K 31/70, 31/19, 37/44, 35/00

U.S. Cl. 514-30

18 Claims

1. A stable oral preparation of a 16-membered ring macrolide antibiotic with increased resistance to dissolution by gastric juices and adequate bioavailability which comprises a 9-hydroxy or 9-acyloxy 16-membered ring macrolide and an effective amount of a stabilizer therefor, said stabilizer exhibiting a pH of 3-6.5 in aqueous solution and being present in an amount of at least 10 mg per 100 mg potency of said antibiotic, said antibiotic having the formula



wherein each of R₁, R₂ and R₃ independent of the other is hydrogen or lower alkanoyl, and R₄ is lower alkanoyl, and said stabilizer being selected from the group consisting of neutral amino acids monosodium or monopotassium salt of acidic amino acids, basic amino acids, sodium or potassium salts of

mono-basic and polybasic organic carboxylic acids, calcium phosphate, aluminum glycinate and mixtures thereof.

4,716,154

GEL OF CROSSLINKED HYALURONIC ACID FOR USE AS A VITREOUS HUMOR SUBSTITUTE

Tomas Milson, and Bengt L. Lindqvist, both of Uppsala, Sweden, assignors to Pharmacia AB, Uppsala, Sweden
PCT No. PCT/SE85/00239, § 371 Date Dec. 3, 1985, § 102(e) Date Dec. 3, 1985, PCT Pub. No. WO86/00079, PCT Pub. Date Jan. 3, 1986

PCT Filed Jun. 7, 1985, Ser. No. 844,388

Claims priority, application Sweden, Jun. 8, 1984, 8403090

Int. Cl.⁴ A61K 31/70

U.S. Cl. 514—54

16 Claims

1. In the retinal surgery method in which a viscous fluid is introduced into an intraocular space enclosed between a rear boundary formed by the retina and a frontal boundary normally formed by the lens and the ciliary body, so that the pressure applied on the receptor layer by the viscous fluid, conjointly with any remaining portions of natural humor, will cause the receptor layer to lie in contact with the pigment epithelial layer for a period of time sufficient for healing, the improvement comprising that said viscous fluid contains a sterile and pyrogen-free gel of cross-linked hyaluronic acid.

4,716,155

PHOSPHORUS CONTAINING COMPOUNDS AND HYPOTENSIVE USE THEREOF

Donald S. Karanewsky, Princeton Junction, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 334,271, Dec. 24, 1981, Pat. No. 4,555,506.

This application Jan. 25, 1985, Ser. No. 695,136

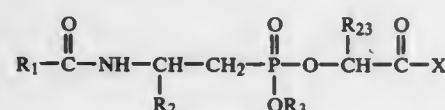
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.

Int. Cl.⁴ C07F 9/58, 9/56; A61K 31/40, 31/44

U.S. Cl. 514—89

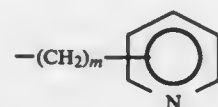
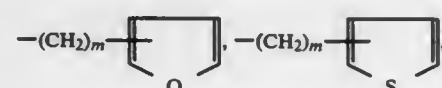
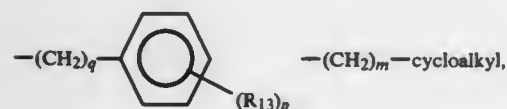
9 Claims

1. A compound of the formula



and a pharmaceutically acceptable salt thereof wherein:

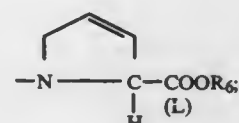
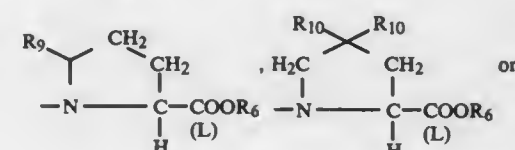
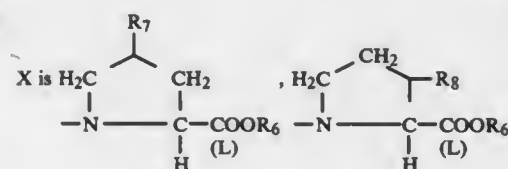
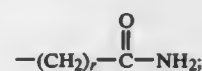
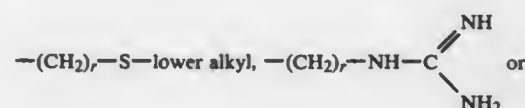
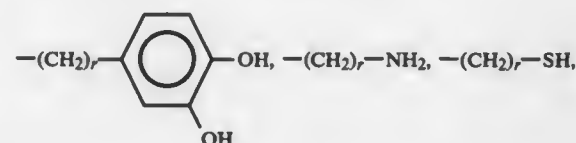
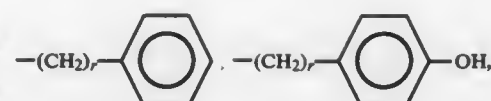
R₁ and R₂ are independently selected from the group consisting of hydrogen, lower alkyl, halo substituted lower alkyl,



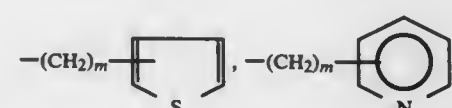
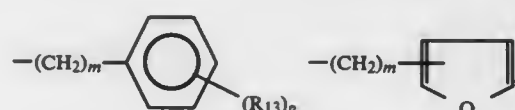
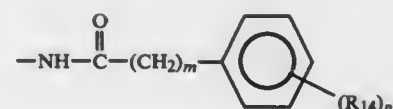
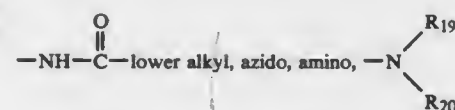
and amino substituted lower alkyl;

q is zero or an integer from 1 to 7;

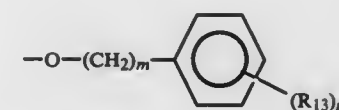
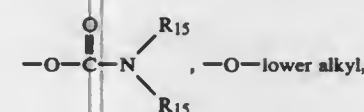
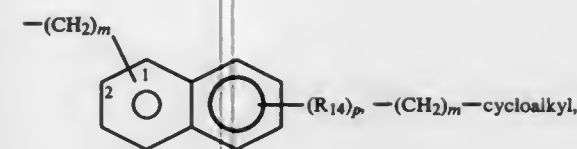
R₂₃ is hydrogen, lower alkyl, halo substituted lower alkyl,



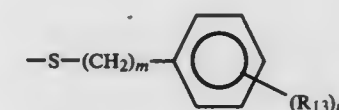
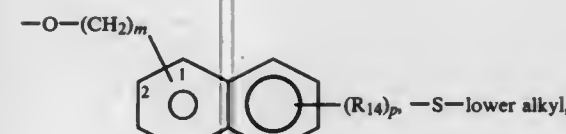
R₇ is hydrogen, lower alkyl, halogen, keto, hydroxy,



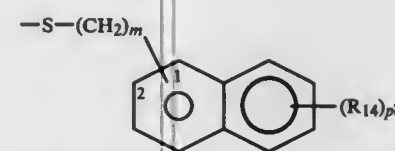
a 1- or 2-naphthyl of the formula



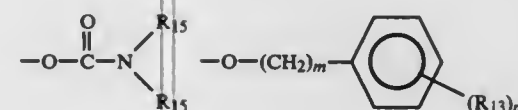
a 1- or 2-naphthoxy of the formula



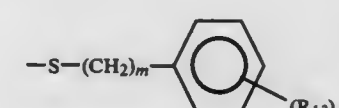
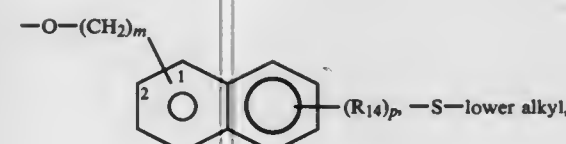
or a 1- or 2-naphthylthio of the formula



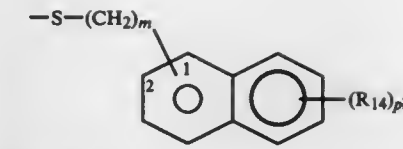
R₈ is keto, halogen,



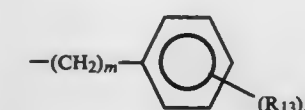
—O—lower alkyl, a 1- or 2-naphthoxy of the formula



or a 1- or 2-naphthylthio of the formula



R₉ is keto or



R₁₀ is halogen or —Y—R₁₆;

R₁₃ is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxo, phenylthio, or phenylmethyl;

R₁₄ is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

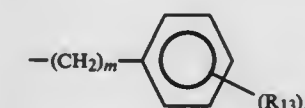
m is zero, one, two or three;

p is one, two or three provided that p is more than one only if R₁₃ or R₁₄ is hydrogen, methyl, methoxy, chloro or fluoro;

R₁₅ is hydrogen or lower alkyl of 1 to 4 carbons;

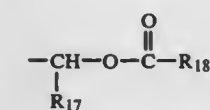
Y is oxygen or sulfur;

R₁₆ is lower alkyl of 1 to 4 carbons or

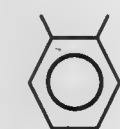


r is an integer from 1 to 4;

R₃ and R₆ are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, benzhydryl, and



wherein R₁₇ is hydrogen, lower alkyl, or phenyl, and R₁₈ is hydrogen, lower alkyl, lower alkoxy, phenyl, or R₁₇ and R₁₈ taken together are —(CH₂)₂—, —(CH₂)₃—, —CH=CH—, or



R₁₉ is lower alkyl, benzyl, or phenethyl; and

R₂₀ is hydrogen, lower alkyl, benzyl or phenethyl.

8. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and a hypotensive agent or pharmaceutically acceptable salt thereof of the formula

benzyl or phenyl optionally substituted as described above; or

R₂ is hydrogen, C₁₋₆ alkyl, or phenyl optionally substituted by halogen, CF₃, C₁₋₄ alkoxy or C₁₋₄ alkyl; and R₁ is CN, CR₅R₆Y or COR₁₀ as defined for R₂ above; or

R₁ and R₂ together form C₃₋₆ polymethylene optionally substituted by C₁₋₄ alkyl;

R₃ is selected from furyl, thienyl, pyrrolyl, benzofuranyl, benzothienyl, and indolyl optionally substituted by one or two substituents selected from halogen, CF₃, C₁₋₄ alkoxy, C₁₋₄ alkyl, hydroxy, nitro, cyano, C₂₋₁₀ acyloxy, NR₁₁R₁₂ wherein R₁₁ and R₁₂ are independently selected from hydrogen, C₁₋₆ alkyl, C₂₋₇ alkanoyl or C₁₋₆ alkylsulfonyl; or COR₁₃ wherein R₁₃ is hydroxy, C₁₋₆ alkoxy or NR₁₄R₁₅ wherein R₁₅ and R₁₄ are independently selected from hydrogen or C₁₋₆ alkyl; and

R₄ is hydrogen, or C₁₋₄ alkyl, or benzyl optionally substituted in the phenyl ring by one or more of halogen, CF₃, C₁₋₄ alkyl, and is attached at nitrogen atom 1 or 2.

7. A method of treatment or prophylaxis of inflammatory and/or allergic conditions in mammals including man which comprises the administration of an effective amount of a compound of formula (I) as claimed in claim 1 or a pharmaceutically acceptable salt or solvate thereof to the sufferer.

4,716,161

PHENYLPIPERAZINE DERIVATIVES AND THEIR ACID ADDITION SALTS

Harukazu Fukami, Kyoto; Ryoji Kikumoto, Machida; Kenichiro Nakao, Tokyo; Issei Nitta, Machida, and Shinya Inoue, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,456

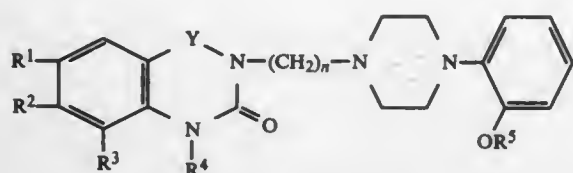
Claims priority, application Japan, Apr. 17, 1984, 59-77006; Sep. 28, 1984, 59-203743; Oct. 5, 1984, 59-209133; Jan. 8, 1985, 60-1246

Int. Cl.⁴ A61K 31/54; C07D 417/06

U.S. Cl. 514-222

16 Claims

7. A pharmaceutical composition for treating hypertension comprising an effective amount of a phenylpiperazine compound of the formula:



wherein R¹ and R² are each independently an alkoxy group of 1 to 3 carbon atoms, or R¹ and R² together with carbon atoms to which they are attached form —O(CH₂)_mO— wherein m is an integer of 1 to 3; R³ and R⁴ are each hydrogen; Y is —CO—; R⁵ is hydrogen or an alkyl group of 1 to 3 carbon atoms; and n is an integer of 2 to 4; or an acid addition salt thereof.

4,716,162

FUSED 5 RING HETEROCYCLIC COMPOUNDS, THEIR PREPARATION, AND THEIR ANTI-ARRHYTHMIC AND DIURETIC USE

Kuniyuki Tomita; Yasuo Shimoji; Seiji Kumakura; Hiroyuki Koike; Nobuyoshi Iwata, and Yasuhiro Morisawa, all of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,474

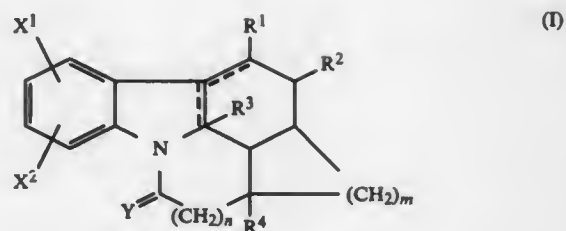
Claims priority, application Japan, Jul. 18, 1984, 59-148766

Int. Cl.⁴ A61K 27/00, 31/495; C07D 401/14, 471/04

U.S. Cl. 514-234

30 Claims

1. A compound of formula (I):



in which:

the dotted lines represent one single carbon-carbon bond and one double carbon-carbon bond or two single carbon-carbon bonds;

m is an integer from 2 to 7;

n is an integer from 1 to 3;

Y represents 2 hydrogen atoms or an oxo group;

R¹ represents a hydrogen atom or a C₁₋₆ alkyl group;

R² represents a hydrogen atom, a carboxy group, a group of formula —NHCOOR^b in which R^b represents a C₁₋₆ alkyl group, a substituted C₁₋₆ alkyl group, an aralkyl group wherein the aryl part is C₆₋₁₀ carbocyclic aryl and the alkyl part is C₁₋₆ alkyl, a substituted aralkyl group wherein the aryl part is C₆₋₁₀ carbocyclic aryl and the alkyl part is C₁₋₆ alkyl, a C₃₋₆ alkenyl group, a C₃₋₆ haloalkenyl group, a C₃₋₁₀ cycloalkyl group or a substituted C₃₋₁₀ cycloalkyl group, a group of formula —NR₂, a quaternary ammonium group of formula —N⁺(R')₃, a group of formula —CONR₂, a group of formula —NHR₂, a group of formula —NHCONR₂, an aminoalkanoilamino group wherein the alkanoyl part is C₂₋₇ alkanoyl, a group of formula —CO.NH.NR₂ or a group of formula —CO.NH.N=CHR'';

the two atoms or groups represented by R are independently selected from the group consisting of hydrogen atoms, C₁₋₆ alkyl groups, substituted C₁₋₆ alkyl groups, aralkyl groups where the aryl part is C₆₋₁₀ carbocyclic aryl and the alkyl part is C₁₋₆ alkyl, substituted aralkyl groups where the aryl part is C₆₋₁₀ carbocyclic aryl and the alkyl part is C₁₋₆ alkyl, heterocyclic groups and substituted heterocyclic groups; or the two symbols R, together with the nitrogen atom to which they are attached, represent a nitrogenous heterocyclic group;

the three groups represented by R' are independently selected from the group consisting of C₁₋₆ alkyl groups, substituted C₁₋₆ alkyl groups, aralkyl groups where the aryl part is C₆₋₁₀ carbocyclic aryl and the alkyl part is C₁₋₆ alkyl and substituted aralkyl groups where the aryl part is C₆₋₁₀ carbocyclic aryl and the alkyl part is C₁₋₆ alkyl;

R'' represents a C₁₋₅ alkyl group or a phenyl group;

R³ represents a hydrogen atom, a C₁₋₃ alkyl group or a substituted C₁₋₃ alkyl group;

R⁴ represents a hydrogen atom, a C₁₋₆ alkyl group, a C₃₋₆ alkenyl group, a C₃₋₆ alkynyl group, an aralkyl group wherein the aryl part is a C₆₋₁₀ carbocyclic aryl group and the alkyl part is C₁₋₆ alkyl, or the phenyl group;

X¹ and X² are independently selected from the group consisting of hydrogen atoms, C₁₋₆ alkyl groups, substituted C₁₋₆ alkyl groups, C₁₋₆ alkoxy groups, aralkyloxy groups wherein the aryl part is a C₆₋₁₀ carbocyclic aryl group and the alkyl part is a C₁₋₆ alkyl group, hydroxy groups, halogen atoms, trifluoromethyl groups, nitro groups, amino groups, aminoalkanoilamino groups wherein the alkanoyl part is C₂₋₇ alkanoyl, mono- and di-alkylaminoalkanoilamino groups wherein the alkanoyl part is C₂₋₇ alkanoyl and the or each alkyl part is C₁₋₆ alkyl and is substituted or unsubstituted, C₂₋₇ alkanoyloxy groups, carboxy groups, carbamoyl groups, mono- and di-alkylcarbamoyl groups where the or each alkyl part is C₁₋₆ alkyl and cyano groups;

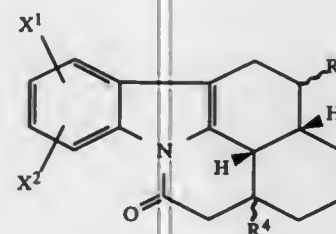
the substituents on said alkyl, cycloalkyl, alkoxy, aralkyl and heterocyclic groups are from 1 to 2 substituents selected from the group consisting of halogen atoms, cyano groups, nitro groups, hydroxy groups, C₁₋₄ alkoxy groups, mercapto groups, C₁₋₄ alkylthio groups, C₁₋₆ alkanoyl groups, carboxy groups, alkoxy carbonyl groups where the alkoxy part is C₁₋₄ alkoxy, amino groups, C₁₋₄ alkylamino groups, dialkylamino groups where each alkyl part is C₁₋₄ alkyl, carbamoyl groups, alkyl-carbamoyl groups where the alkyl part is C₁₋₄ alkyl, dialkylcarbamoyl groups where each alkyl part is C₁₋₄ alkyl, and, only as substituents on substituted alkyl and alkoxy groups, C₃₋₁₀ cycloalkyl groups, substituted C₃₋₁₀ cycloalkyl groups, heterocyclic groups and substituted heterocyclic groups, and, only as substituents on cycloalkyl groups and substituted aryl parts of aralkyl groups, C₁₋₄ alkyl groups and substituted C₁₋₄ alkyl groups, and, only as substituents on substituted heterocyclic groups, C₁₋₄ alkyl groups, substituted C₁₋₄ alkyl groups, C₆₋₁₀ carbocyclic aryl groups, substituted C₆₋₁₀ carbocyclic aryl groups, arylalkenyl groups wherein the aryl part is C₆₋₁₀ carbocyclic aryl and the alkenyl part is C₃₋₆ alkenyl and substituted arylalkenyl wherein the aryl part is substituted C₆₋₆ carbocyclic aryl and the alkenyl part is C₃₋₆ alkenyl;

said heterocyclic groups being selected from the group consisting of pyrrolidinyl, morpholinyl, piperidinyl and piperazinyl;

said nitrogenous heterocyclic group being selected from the group consisting of: N-(2-cyclohexylethyl)carbamoyl, N-[2-(1-pyrrolidinyl)ethyl]carbamoyl, N-(2-piperidinocarbonyl)carbamoyl, N-(2-morpholinoethyl)carbamoyl, N-(3-morpholinopropyl)carbamoyl, N-(4-morpholinobutyl)carbamoyl, N-[2-(4-methyl-1-piperazinyl)ethyl]carbamoyl, N-[2-(4-ethoxycarbonyl-1-piperazinyl)ethyl]carbamoyl, N-benzylcarbamoyl, N-4-methylbenzylcarbamoyl, N-2-chlorobenzylcarbamoyl, N-4-chlorobenzylcarbamoyl, N-2-methoxybenzylcarbamoyl, N-4-methoxybenzylcarbamoyl, N-3,4-dimethoxybenzylcarbamoyl, N-phenethylcarbamoyl, N-4-methylphenethylcarbamoyl, N-4-chlorophenethylcarbamoyl, N-4-methoxyphenethylcarbamoyl, N-3,4-dimethoxyphenethylcarbamoyl, N-3-phenylpropylcarbamoyl, N-4-phenylbutylcarbamoyl, N-furfurylcarbamoyl, N-(2-pyridylmethyl)carbamoyl, N-(4-pyridylmethyl)carbamoyl, N-(2-pyrid-2-ylethyl)carbamoyl, N-cyclopentylcarbamoyl, N-cyclohexylcarbamoyl, N-phenylcarbamoyl, N-4-tolylcarbamoyl, N-4-chlorophenylcarbamoyl, N-4-methoxyphenylcarbamoyl, N-2-pyridylcarbamoyl, N-2-furylcarbamoyl, N-morpholinocarbonyl, N-piperidinocarbonyl and N-piperazinylcarbamoyl groups; and heterocyclic-carbonyl groups, selected from the group consisting of 1-pyrrolidinylcarbonyl, piperidinocarbonyl, 4-methyl-1-piperazinylcarbonyl and 4-phenyl-1-piperazinylcarbonyl groups,

or a pharmaceutically acceptable salt or ester thereof.

19. A compound of formula (I-5):



wherein

X¹ is 6—OH or 7—OH;

X² is H;

R² is NH₂ and

R⁴ is H or C₁₋₆ alkyl.

4,716,163

HYPOGLYCEMIC METHOD USING 5-SUBSTITUTED PYRROLIDINYLIDENE COMPOUNDS

Joyce E. Epps, Jeffersonville; Kung-Tat Ng, Telford; Robert W. Tuman, Chalfont, and Wu-Nan Wu, Landsdale, all of Pa., assignors to McNeillab, Inc., Spring House, Pa.

Division of Ser. No. 902,348, Aug. 29, 1986, Pat. No. 4,670,436.

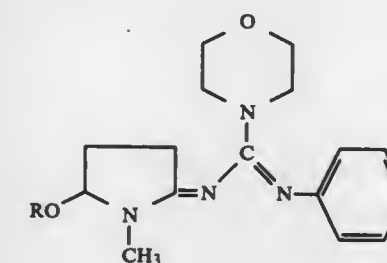
This application Apr. 3, 1987, Ser. No. 33,948

Int. Cl.⁴ A61K 31/535

U.S. Cl. 514-237

2 Claims

1. A method for the treatment of diabetes which comprises administering to a mammal in need thereof, a pharmaceutical composition which comprises a pyrrolidinylidene of the following formula (I)



wherein

R is hydrogen, and the pharmaceutically acceptable acid addition salts thereof in combination with a pharmaceutically acceptable diluent or carrier.

4,716,164

AS-TRIAZINONES

Rodney B. Hargreaves, Poynton; Bernard J. McLoughlin, and Stuart D. Mills, both of Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 660,102, Oct. 12, 1984, Pat. No. 4,558,045, which is a division of Ser. No. 438,728, Nov. 3, 1982, Pat. No. 4,489,073. This application Oct. 31, 1985, Ser. No. 793,264

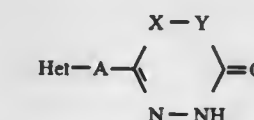
Claims priority, application United Kingdom, Nov. 12, 1981, 8134174

Int. Cl.⁴ C07D 253/06, 401/04, 401/06; A61K 31/53

U.S. Cl. 514-242

8 Claims

1. A heterocyclic compound of the formula:



wherein A is a direct link, or is alkylene of 1 to 4 carbon atoms or alkenylene of 2 to 4 carbon atoms; wherein X is —CR¹R²— and Y is —NR³—, wherein R¹ and R² are hydrogen and R³ is hydrogen or alkyl of up to 4 carbon atoms; and wherein Het is 2-, 3- or 4-pyridyl which is unsubstituted or bears a chloro, bromo, cyano, carbamoyl or methyl substituent; or Het is 2- or 3- thienyl which is unsubstituted or which bears one or two chloro or methyl substituents; or Het is unsubstituted benzo[b]thienyl, benzo[b]furyl, indolyl or quinolyl; or Het is 3-methyl-2-quinolalinal.

8. A method for the treatment of acute or chronic heart failure, or of hypertension, in a warm-blooded animal in need of such treatment, which comprises administering to said animal an effective amount of a heterocyclic compound claimed in claim 1.

4,716,165

HISTAMINE H₁ ANTAGONISTS

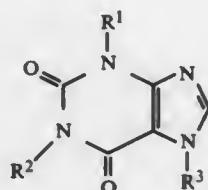
Magid A. Abou-Gharbia, Brandywood, and Susan T. Nielsen, Wilmington, both of Del., assignors to American Home Products Corporation, New York, N.Y.

Filed Sep. 24, 1986, Ser. No. 910,906

Int. Cl.⁴ C07D 473/08; A61K 31/52

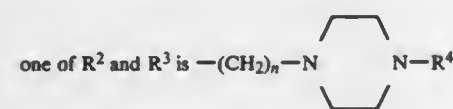
U.S. Cl. 514—265

1. A compound of the formula:

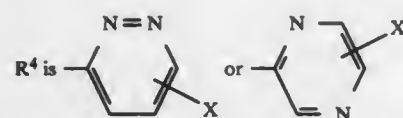


in which

R¹ is hydrogen or alkyl of 1 to 6 carbon atoms;



and the other is hydrogen or alkyl of 1 to 6 carbon atoms, where



in which X is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, cyano or a nitro substituent on one of the available carbon atoms; and n is one of the integers 2, 3 or 4; or a pharmaceutically acceptable salt thereof.

4,716,166

HISTAMINE H₁ ANTAGONISTS

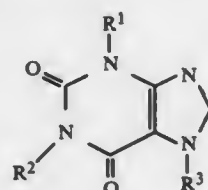
Magid A. Abou-Gharbia; Susan T. Nielsen, both of Wilmington, Del., and Michael B. Webb, King of Prussia, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 21, 1986, Ser. No. 921,553

Int. Cl.⁴ C07D 473/08; A61K 31/52

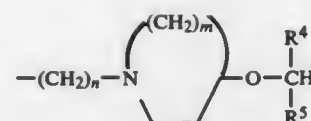
U.S. Cl. 514—265

1. A compound of the formula:



in which

R¹ is hydrogen or alkyl of 1 to 6 carbon atoms; one of R² and R³ is alkyl of 1 to 6 carbon atoms and the other is



9 Claims

where

R⁴ is pyridin-2-yl, pyridin-4-yl, thienyl, or phenyl, any of which is optionally substituted by a halo, alkyl of 1 to 6 carbon atoms, nitro, trifluoromethyl, hydroxy or alkoxy of 1 to 6 carbon atoms substituent;

R⁵ is pyridin-2-yl, pyridin-4-yl or phenyl, any of which is optionally substituted by a halo, alkyl of 1 to 6 carbon atoms, hydroxy, alkoxy of 1 to 6 carbon atoms, nitro or trifluoromethyl substituent;

n is one of the integers from 2 to 10;

and m is one of the integers 1, 2 or 3,

or a pharmaceutically acceptable salt thereof.

4,716,167

2-AMINO-5-OXO-5H-[1]BENZOPYRANO[2,3-B]PYRIDINE-3-CARBOXYLIC ACID DERIVATIVES

Akira Nohara, Kyoto, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

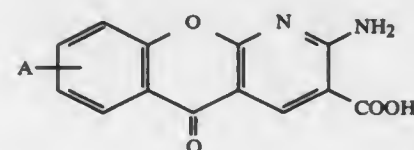
Filed Jan. 28, 1986, Ser. No. 823,479

Claims priority, application Japan, Jan. 28, 1985, 60-15109; Mar. 20, 1985, 60-56909

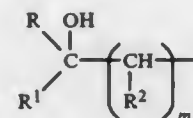
Int. Cl.⁴ C07D 491/052

U.S. Cl. 514—291

1. A compound of the formula:



wherein A is



(R, R¹ and R² are independently hydrogen or lower alkyl and m is 0 or 1, with the proviso that when m is 1, R¹ is hydrogen) or R—CO— (R has the same meaning as defined above), or a physiologically acceptable salt thereof.

8 Claims

4,716,168

IMIDAZO[4,5-f]QUINOLINES USEFUL AS IMMUNOMODULATING AGENTS

Robert J. Alaimo, and Jon A. Andersen, both of Norwich, N.Y., assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

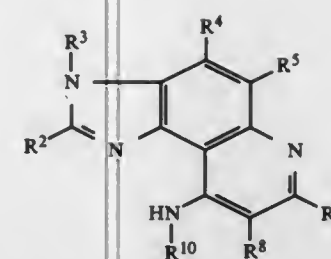
Continuation of Ser. No. 689,628, Jan. 8, 1985, abandoned. This application Apr. 29, 1986, Ser. No. 858,093

Int. Cl.⁴ A61K 31/415; C07D 471/04

U.S. Cl. 514—293

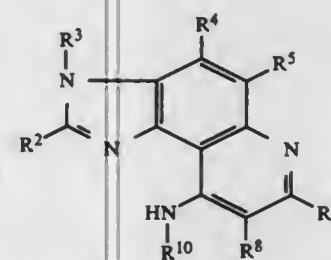
21 Claims

1. A compound of the class of imidazo[4,5-f]quinolines which conform to the chemical structure or tautomeric structures thereof:



wherein R² is H, straight or branched chain lower alkyl, phenyl, substituted phenyl, furyl, thienyl, thiazoyl, or trihalomethyl; R³ is H or straight or branched chain lower alkyl; R⁴ and R⁵ are H or straight or branched chain lower alkyl, or R⁴ and R⁵ are connected lower alkylene derivatives; R⁷ is H, straight or branched chain lower alkyl, phenyl, substituted phenyl, furyl, thienyl, thiazoyl, (lower)alkoxycarbonyl, or trihalomethyl; R⁸ is H, lower alkyl, or (lower)alkoxycarbonyl, or R⁷ and R⁸ may join together to form a six-membered ring; and R¹⁰ is H, straight or branched chain alkyl, cyclohexyl, methylene cyclohexyl, or unsubstituted or substituted phenyl, naphthyl, pyridyl, piperidyl, or phenylalkyl; and wherein further said substituted phenyl groups are substituted, independently, with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C₁-C₂₀ straight or branched chain alkyl, cyclohexyl, C₁-C₂₀ straight or branched chain alkoxy, phenyl, trifluoromethyl, phenyloxy, benzyloxy, methylene-cyclohexyloxy, cyclopentyloxy, phenylazo, piperidyl, morpholinyl, pyrrolidyl, N-methyl piperazinyl, N-benzyl piperazinyl, carboxylic acid, carboxylic acid ethyl ester, methylthio, benzoyl, acetyl, propionyl, 2-diethylamino-ethoxy, and mono- or disubstituted amines substituted with H, lower alkyl, hydroxyalkyl, and alkanoyl; except said compounds wherein R² is H or methyl or unsubstituted phenyl and R³=R⁴=R⁵=R⁸=H and R⁷ is H or methyl or ethyl or unsubstituted phenyl and R¹⁰ is unsubstituted or substituted phenyl or 2-(4-methyl-1-piperazinyl)-5-pyridyl or 2-methoxy-5-pyridyl or 2-piperidino-5-pyridyl or 4-methoxybenzyl or cyclohexyl or α- or β-naphthyl; and salts and hydrates thereof.

13. A method for enhancing the immune response system of a mammal which comprises systematically administering to a mammal having a depressed immune function a pharmaceutical composition comprising a compound conforming to the following chemical structure or tautomeric structures thereof:



wherein R² is H, straight or branched chain lower alkyl, phenyl, substituted phenyl, furyl, thienyl, thiazoyl, or trihalomethyl; R³ is H or straight or branched chain lower alkyl; R⁴ and R⁵ are H or straight or branched chain lower alkyl, or R⁴ and R⁵ are connected lower alkylene derivatives; R⁷ is H, straight or branched chain lower alkyl, phenyl, substituted phenyl, furyl, thienyl, thiazoyl, (lower)alkoxycarbonyl, or trihalomethyl; R⁸ is H, lower alkyl, or (lower)alkoxycarbonyl, or R⁷ and R⁸ may join together to form a six-membered ring; and R¹⁰ is H, straight or branched chain alkyl, cyclohexyl, methylene cyclohexyl, or unsubstituted or substituted phenyl, naphthyl, pyridyl, piperidyl, or phenylalkyl; and salts and hydrates thereof; and wherein further said substituted phenyl groups are substituted, independently, with one or more

groups selected from the groups consisting of halo, nitro, cyano, hydroxy, C₁-C₂₀ straight or branched chain alkyl, cyclohexyl, C₁-C₂₀ straight or branched chain alkoxy, phenyl, trifluoromethyl, phenyloxy, benzyloxy, methylene-cyclohexyloxy, cyclopentyloxy, phenylazo, piperidyl, morpholinyl, pyrrolidyl, N-methyl piperazinyl, N-benzyl piperazinyl, carboxylic acid, carboxylic acid ethyl ester, methylthio, benzoyl, acetyl, propionyl, 2-diethylamino-ethoxy, and mono- or disubstituted amines substituted with H, lower alkyl, hydroxyalkyl, and alkanoyl; said pharmaceutical composition being administered to said mammal in an amount which is non-toxic but which is effective to enhance the function of the immune response system of said mammal.

4,716,169

IMIDAZO[1,2-a]PYRIDINES AND THEIR USE AS CARDIOTONIC AGENTS

Joachim Heider, Warthausen; Norbert Haeel; Volkhard Austel, both of Biberach; Klaus Noll, Warthausen; Andreas Bomhard, Biberach; Jacques van Meel, Biberach, and Willi Diederer, Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Dec. 17, 1985, Ser. No. 810,008

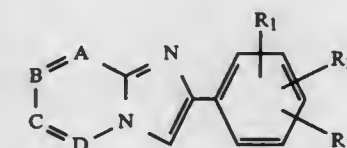
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446778

Int. Cl.⁴ A61K 31/41; C07D 471/04

U.S. Cl. 514—299

8 Claims

1. An imidazo[1,2-a]pyridine of the formula



wherein

one of the groups A, B, C or D is a —CH= group optionally substituted by a halogen atom or by an alkylmercapto, alkylsulphonyloxy, amino, alkylamino, dialkylamino or acetamido group;

another of the groups A, B, C or D is a —CH= group optionally substituted by an alkylmercapto group; and, the other groups A, B, C or D are —CH= groups;

R₁ and R₂ together with two carbon atoms of the phenyl ring between them form a phenyl ring optionally substituted by an alkoxy group; and, when R₁ and R₂ do form such a phenyl ring,

R₃ is a hydrogen atom, a hydroxy, alkoxy or alkylsulphonyloxy group; or,

R₁ a phenylalkoxy, alkylsulphonyloxy, alkylsulphonamido, N-alkyl-alkylsulphonamido, aminosulphonyl, alkylaminosulphonyl or dialkylaminosulphonyl group or in the 4 position an acetamido, aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl group, it being provided that if one or two of the groups A, B, C or D are one of the above-mentioned substituted —CH= groups, then R₁ may also represent an amino, hydroxy, methoxy or cyano group in the 4 position;

R₂ is a hydrogen atom, a hydroxy or alkoxy group; and, R₃ is a hydrogen atom or an alkoxy group;

wherein in all the above-mentioned groups the alkyl part may contain one or two carbon atoms;

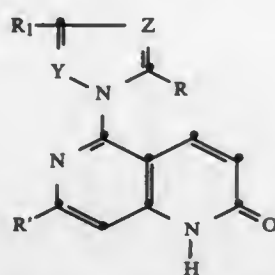
or, a pharmaceutically acceptable acid addition salt thereof.

7. A pharmaceutical composition for treating heart failure characterized by reduced cardiac output containing an effective positive inotropic amount of a compound of claim 1 together with a pharmaceutically acceptable carrier.

4,716,170
5-[1H-(5-MEMBERED-N-AROMATIC
HETERYL)-1-YL]-1,6-NAPHTHYRIDIN-2(1H)-ONES AND
THEIR CARDIOTONIC USE

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y. Division of Ser. No. 816,591, Jan. 16, 1986, Pat. No. 4,634,772, which is a continuation-in-part of Ser. No. 811,040, Dec. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 765,900, Aug. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 695,603, Jan. 28, 1985, abandoned. This application Oct. 1, 1986, Ser. No. 913,910 Int. Cl.⁴ A61K 31/44; C07D 471/04

U.S. Cl. 514—300 14 Claims
1. 5-[1H-(5-membered-N-aromatic heteryl)-1-yl]-7-R'-1,6-naphthyridin-2(1H)-one having the formula I



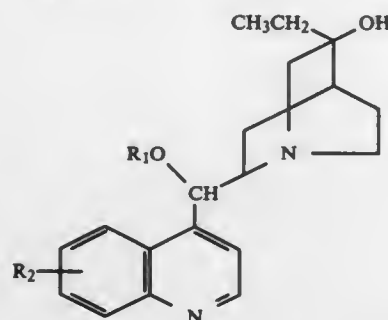
or pharmaceutically acceptable acid-addition or pharmaceutically acceptable cationic salt thereof, where R is hydrogen, halo or lower-alkyl, R' is hydrogen or methyl, R₁ is hydrogen, lower-alkyl, hydroxymethyl, halo, trifluoromethyl, nitro or phenyl, Z is N, C-H, C-(lower-alkyl), C-halo, C-hydroxymethyl or C-phenyl, and Y is N, C-H, C-halo, C-(lower-alkyl) or C-NO₂, at least one of Y or Z being N.

13. A method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotionically effective amount of 5-[1H-(5-membered-N-heteryl)-1-yl]-7-R'-1,6-naphthyridin-2(1H)-one of claim 1 or pharmaceutically acceptable acid-addition or cationic salt thereof.

4,716,171
ANTIARRHYTHMIC QUINIDINE DERIVATIVES

Francois-Xavier Jarreau, Versailles, and Jean-Jacques Koenig, Vernou la Celle s/Seine, both of France, assignors to Etablissements Nativelle S.A., France
Continuation of Ser. No. 380,316, May 20, 1982, abandoned.
This application Apr. 9, 1984, Ser. No. 597,219
Claims priority, application France, May 20, 1981, 81 10024
Int. Cl.⁴ A61K 31/49; C07D 453/04

U.S. Cl. 514—305 13 Claims
1. A quinidine derivative of formula (I):



wherein R₁ represents a hydrogen atom, an alkyl group with 1 to 4 carbon atoms or an acyl group with 1 to 4 carbon atoms, and R₂ represents a hydrogen atom, a hydroxy group, an alkoxy group with 1 to 4 carbon atoms, an acetoxy group, a

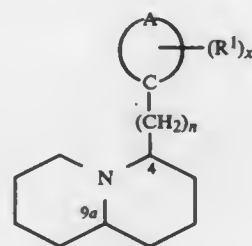
formyloxy group or a benzyloxy group or an acid addition salt thereof.

5. A pharmaceutical composition for the treatment of cardiac arrhythmias comprising a therapeutically effective amount of a derivative of claim 1, 2 or 3, or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier or diluent.

4,716,172
4-SUBSTITUTED OCTAHYDROQUINOLIZINE
ANALGESIC COMPOUNDS AND
OCTAHYDROQUINOLIZINIUM INTERMEDIATES

Richard J. Carmosin, Quakertown, and John R. Carson, Norristown, both of Pa., assignors to McNeilab, Inc., Spring House, Pa.

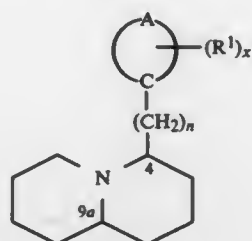
Filed Apr. 10, 1986, Ser. No. 850,631
Int. Cl.⁴ A61K 31/345; C07D 455/02
U.S. Cl. 514—306 20 Claims
1. An octahydroquinolizine of the following formula (I)



wherein

A represents the atoms necessary to form a phenyl, naphthyl, cycloalkyl, or cycloalkenyl ring system as the A-C cycle shown in formula (I);
R¹ is independently cyano; halogen; alkyl; phenoxy; alkylthio; phenylthio; phenylthio substituted by acetamido, halo, or alkyl; haloalkyl; alkenyl; alkynyl or cycloalkenyl; n is the integer 0; and
x is the integer 0, 1, 2, or 3, provided that when A is phenyl, x is 1, 2, or 3; and, when A is phenyl, x is 1, and R¹ is methoxy, R¹ is in the 2- or 3-position of the phenyl ring; wherein said cycloalkyl and cycloalkenyl are of C₃-C₇ atoms and the alkyl portion of all the alkyl alkenyl and alkynyl containing groups are lower alkenyl alkenyl or alkyl; and the pharmaceutically-acceptable acid-addition salts thereof.

11. A pharmaceutical composition effective in the treatment of pain which comprises a pharmaceutically-acceptable carrier and a pain-reducing amount of an octahydroquinolizine of the following formula (I):



wherein

A represents the atoms necessary to form a phenyl, naphthyl, cycloalkyl, or cycloalkenyl ring system as the A-C cycle shown in formula (I);
R¹ is independently cyano; halogen; alkyl; phenoxy; alkylthio; phenylthio; phenylthio substituted by acetamido, halo, or alkyl; haloalkyl; alkenyl; alkynyl or cycloalkenyl; n is the integer 0; and
x is the integer 0, 1, 2, or 3,

and the pharmaceutically-acceptable acid-addition salts thereof.

4,716,173
METHOD OF TREATMENT OF MALARIA BY ONE
TIME INTERFERENCE

Aida Salatinjants, 1333 N. Hobart, Los Angeles, Calif. 90027
Filed Feb. 6, 1985, Ser. No. 698,837

Int. Cl.⁴ A61K 31/47, 31/715, 31/525, 31/34
U.S. Cl. 514—314 4 Claims

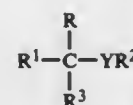
1. A composition adapted to prolong the residence time of drugs in the circulating plasma of mammals including humans comprising about 48 parts by weight potassium hydrogen tartrate, about 8 parts by weight tannic acid, about 94 parts by weight pectin, about 21 parts by weight L-tyrosine, about 6 parts by weight hexanoic acid, and about 200 parts by weight 10% riboflavin.

4,716,174
ARYL(ARYLOXY OR ARYLTHIO)AZOLOMETHANES
AND THEIR USE AS PESTICIDES

Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

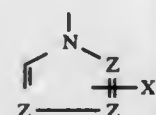
Continuation of Ser. No. 653,399, Sep. 24, 1984, Pat. No. 4,636,514, which is a continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 898,061

Int. Cl.⁴ C07D 409/14; A61K 31/38
U.S. Cl. 514—340 4 Claims
1. A compound corresponding to the formula



wherein

R represents hydrogen, phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C₁-C₄ alkyl, C₁-C₄ alkoxy, NO₂, CN or CF₃ groups;
R¹ represents thienyl or thienyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C₁-C₄ alkyl, C₁-C₄ alkoxy, NO₂, CN or CF₃ groups;
R² represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C₁-C₄ alkyl, C₁-C₄ alkoxy, NO₂, CN or CF₃ groups;
R³ represents a 5-membered N-heterocyclic ring of the formula



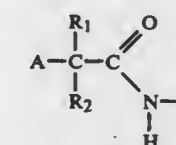
wherein

each Z independently represents —CH or N and at least one of Z is N;
X is C₁-C₄ alkyl, Br, Cl, F or I and
n represents an integer of from 0 to 3 and
Y is oxygen or sulfur.

4,716,175
SATURATED FATTY ACID AMIDES AS INHIBITORS OF
ACYL-COA:CHOLESTEROL ACYLTRANSFERASE

Milton L. Hoeffle, Ann Arbor; Ann Holmes, Dexter, and Bruce D. Roth, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Feb. 24, 1987, Ser. No. 17,960
Int. Cl.⁴ A61K 31/44, 31/16, 31/165; C07D 213/36; C07C 103/19

U.S. Cl. 514—357 7 Claims
1. A compound having the formula:



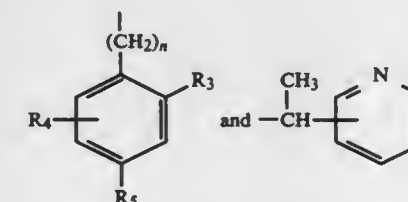
wherein A is an unbranched hydrocarbon group containing from one to twenty carbon atoms and which may contain from one to three carbon-carbon double bonds;

R₁ is hydrogen, alkyl of from one to four carbon atoms or phenylmethyl;

R₂ is alkyl of from one to four carbon atoms or phenylmethyl; or

R₁ and R₂ when taken together with the carbon atom to which they are attached form a saturated carbocyclic ring of from three to seven carbon atoms;

B is selected from



where n is zero or one,

R₃, R₄, and R₅ are independently selected from hydrogen, fluorine, chlorine, bromine, trifluoromethyl, alkyl of from one to four carbon atoms, and alkoxy of from one to four carbon atoms;

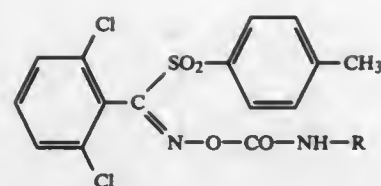
6. A pharmaceutical composition useful for inhibiting the intestinal absorption of cholesterol comprising an ACAT-inhibitory effective amount of a compound as defined by claim 1 in combination with a pharmaceutically acceptable carrier.

4,716,176
BENZALDOXIME CARBAMATE DERIVATIVES, THEIR
COMPOSITIONS AND METHOD OF USE

Christa Fest, Wuppertal; Wilhelm Brandes, Leichlingen; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 23, 1986, Ser. No. 867,101
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1985, 3520943

Int. Cl.⁴ A01N 47/12; C07C 147/06, 131/00
U.S. Cl. 514—477 14 Claims
1. A benzaldoxime carbamate of the formula



in which

R is alkyl having 1 to 6 carbon atoms, halogenoalkyl having 1 to 8 carbon atoms and 1 to 5 halogen atoms, cyanoalkyl having 1 to 6 carbon atoms in the alkyl part, tosyl, benzyl, cycloalkyl which has 5 to 7 carbon atoms and is optionally substituted by alkyl having 1 to 4 carbon atoms, or phenyl which is optionally substituted by substituents independently selected from the group consisting of alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen, and halogenoalkoxy and halogenoalkyl each having 1 to 4 carbon atoms and 1 to 5 halogen atoms.

12. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim 1 and a diluent.

4,716,177

TOLRESTAT FOR INHIBITION OF WEIGHT GAIN
Steven W. Ryder, St. James; David G. Shand, New York, and John F. Mullane, Pelham, all of N.Y., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 17, 1986, Ser. No. 853,066

Int. Cl.⁴ A61K 31/275

U.S. Cl. 514—524

5 Claims

1. A method for inhibiting weight gain in a diabetic human in need of treatment for weight stabilization which comprises administering to the diabetic human an effective amount of tolrestat or a therapeutically acceptable salt thereof.

4,716,178

SUBSTITUTED DI-T-BUTYLPHENOLS

Robert A. Scherrer, White Bear, and Mark A. Rustad, Afton, both of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

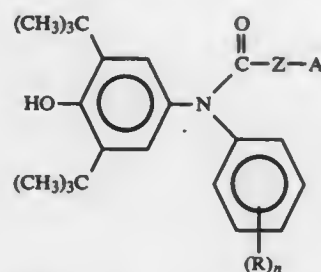
Continuation-in-part of Ser. No. 876,287, Jun. 17, 1986, abandoned, which is a continuation of Ser. No. 757,454, Jul. 22, 1985, abandoned. This application Aug. 27, 1986, Ser. No. 879,472

Int. Cl.⁴ A61K 31/195; C07C 101/34

U.S. Cl. 514—563

9 Claims

1. A compound of the formula



wherein each R independently represents hydrogen, lower alkyl, lower alkoxy, halogen, amino, lower alkylamino, di(lower)alkylamino, hydroxy, lower acylamido, trifluoromethyl, benzoyloxy, carboxy, or a derivative of a compound wherein R is carboxy selected from a lower alkyl carboxylate ester, a (lower)alkylamino(lower)alkyl carboxylate ester, a pharmaceutically acceptable (lower)alkylamino(lower)alkyl ester acid-addition salt, and a pharmaceutically acceptable carboxylate salt; and n is 0, 1, 2 or 3, with the proviso that if n is 2 or 3, only one R substituent, at the most, is selected from carboxy,

and further with the proviso that if n is 2 or 3, all R substituents combined contain no more than 6 carbon atoms; Z is a carbon-carbon bond, divalent alkyl of 1 to about 8 carbon atoms or divalent alkylene of 2 to about 8 carbon atoms, and when alkyl or alkylene, Z may optionally be substituted by methyl or phenyl and may contain an ether, thioether or phenylene linkage; A is selected from carboxyl, tetrazolyl, and N-methyl tetrazolyl, with the proviso that if Z is a carbon-carbon bond, A is carboxyl; or a derivative of the foregoing selected from a lower alkyl carboxylate ester, a (lower)alkylamino(lower)alkyl carboxylate ester, a pharmaceutically acceptable (lower)alkylamino(lower)alkyl carboxylate ester acid-addition salt and a pharmaceutically acceptable carboxylate salt of the carboxy moiety when A is carboxyl, and selected from a pharmaceutically acceptable alkali metal and an alkaline earth salt of the tetrazolyl moiety when A is tetrazolyl.

4,716,179

USE OF NON-IRRITATING OR SLIGHTLY IRRITATING AND/OR PROMOTING DITERPENE ALCOHOL AND OF DERIVATIVES THEREOF AS ANTINEOPLASTIC PREPARATIONS

Erich Hecker, Heidelberg-Handschuhsheim; Hans Osswald, and Rainer Schmidt, both of Heidelberg, all of Fed. Rep. of Germany, assignors to Stiftung Deutsches Krebsforschungszentrum, Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 113,760, Jan. 21, 1980, abandoned. This application Feb. 29, 1984, Ser. No. 584,738 Claims priority, application Fed. Rep. of Germany, Jan. 23, 1979, 2902506

Int. Cl.⁴ A61K 31/12

U.S. Cl. 514—691

8 Claims

1. The method of treating transplanted tumor-afflicted animal subjects which comprises administering to said subjects an anti-transplanted tumor effective amount of phorbol, said phorbol being incorporated in a carrier material.

4,716,180

COMPOSITION AND METHOD FOR THE PRESERVATION OF MASTITIS

Walter Fetty, Lincoln, Nebr., and Joseph R. Killian, Akron, Ohio, assignors to Killian Latex, Inc., Akron, Ohio

Filed Nov. 16, 1984, Ser. No. 672,486

Int. Cl.⁴ A01N 25/00

U.S. Cl. 514—782

6 Claims

1. A liquid film-forming composition for the preventative treatment of mastitis in dairy animals by application thereof onto a teat, comprising in substantially the following weight ratios:

4162.50 wt.	natural rubber latex
500.00 wt.	propylene glycol
10.40 wt.	sulfur
4.20 wt.	sodium isopropyl xanthate
12.40 wt.	mercaptobenzothiazole
83.20 wt.	clay
30.00 wt.	tetrasodium salt of ethylenediamine
29.27 wt.	tetraacetic acid
16.50 wt.	potassium hydroxide
6.00 wt.	sulfonated fatty acid
8.04 wt.	casein
6.79 wt.	wax
6.53 wt.	gum Arabic
.81 wt.	ammonia
11.64 wt.	oleic acid
1.68 wt.	parachloro meta-xylene
.61 wt.	sodium salt of alkyl sulfonic acid
.61 wt.	shellac
.32 wt.	alcohol
.32 wt.	triethanolamine
.32 wt.	sodium alkyl arylether sulfate
.21 wt.	caustic soda
.21 wt.	sodium o-phenylphenate tetrahydrate, and,

-continued

3119.89 wt. water.

4,716,181

SCAVENGERS FOR THE REMOVAL OF IMPURITIES FROM ARSINE AND PHOSPHINE

Glean M. Tom, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

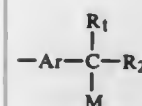
Division of Ser. No. 938,701, Dec. 5, 1986, which is a division of Ser. No. 888,180, Jul. 21, 1986, Pat. No. 4,659,552. This application May 7, 1987, Ser. No. 46,759

Int. Cl.⁴ C08F 14/00

U.S. Cl. 521—53

3 Claims

1. A process for preparing a macroreticulate polymer scavenger comprising reacting (1) a hydride selected from the group consisting of arsine and phosphine and (2) a metallated macroreticulate polymer having a plurality of pendant functional groups or mixtures of functional groups having the general formula:



where Ar is an aromatic hydrocarbon radical containing from one to three rings, R₁ and R₂ are the same or different and are selected from the group consisting of hydrogen and alkyl hydrocarbon radicals containing from 1 to 12 carbon atoms, and M is a metal selected from the group consisting of sodium, potassium and lithium, said metallated macroreticulate polymer having within its pores a compound selected from the group consisting of a 1-12 carbon alkyl compound of M and a hydride of M, or mixtures thereof.

4,716,182

COLD SETTING COMPOSITIONS, A PROCESS FOR THE PRODUCTION THEREOF AND THE USE THEREOF FOR POLYURETHANE PRODUCTION

Heinrich Hess; Gerhard Grögler, both of Leverkusen, and Richard Kopp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 891,725

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529251

Int. Cl.⁴ C08G 18/14

U.S. Cl. 521—163

16 Claims

1. A cold setting two-component composition comprising (A) a suspension of (i) a surface-modified, finely-divided polyisocyanate, wherein from 0.1 to 25 equivalent percent of the isocyanate groups of the unmodified polyisocyanate have been deactivated, with (ii) an aliphatic polyamine having a molecular weight of from 400 to 8000, said suspension being storage stable up to 85° C., and (B) member from the group consisting of (i) polyhydroxyl compounds having molecular weights of from 62 to 8000, (ii) water, and (iii) mixtures thereof.

4,716,183

STYRENE-DIENE BLOCK COPOLYMER COMPOSITIONS

Jose P. Gamarra, Union City, and C. John Swinburn, Los Altos, both of Calif., assignors to Raychem Corp., Menlo Park, Calif. Filed Nov. 22, 1985, Ser. No. 801,018

Int. Cl.⁴ C08K 5/01

U.S. Cl. 522—80

10 Claims

1. A crosslinked composition comprising: about 2 to about 30 parts by weight of a styrene-diene block copolymer; about 70 to about 98 parts by weight hydrocarbon oil; and about 0.5 to about 25% by weight based on the weight of the copolymer and oil of a multifunctional coupling agent; and wherein the copolymer-oil-coupling agent composition is cross-linked with electron beam radiation or with UV radiation in the presence of a photoinitiator.

4,716,184

EPOXY RESIN ENCAPSULATING COMPOSITION WITH ENHANCED MOISTURE RESISTANCE AND METHOD FOR PRODUCING THE SAME

Hirohiko Kagawa; Yasuhiro Kyotani, and Munetomo Torii, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Dec. 3, 1986, Ser. No. 937,331

Int. Cl.⁴ C08F 6/28

U.S. Cl. 523—310

10 Claims

1. An epoxy resin encapsulating composition with enhanced moisture resistance for semiconductor packages consisting essentially of the admixture of an epoxy resin adduct of epichlorohydrin and an aromatic hydroxyl-containing compound, and an inorganic ion-exchange solid material, said ion-exchange solid material being in the form of particles dispersed in the epoxy resin adduct and capable of exchanging its mobile anions with the chlorine ions which originate from the epichlorohydrin and occur in the epoxy resin adduct as a result of possible hydrolysis of the corresponding chlorides, said ion-exchange solid material being represented by the general formula:



in which x represents 0.2 to 2.0, y represents 1.0 to 5.0, z represents 0.1 to 3.0, w represents 0.1 to 3.0 and n represents 0.5 to 3.0 and forming an ion-exchange network which carries said mobile anions to be substituted with said chlorine ions.

4,716,185

CURABLE MIXTURES BASED ON DIGLYCIDYL COMPOUNDS AND METAL COMPLEX COMPOUNDS

Claus W. Rabener, Oettingen; Hans-Peter Hörner, Wehr, both of Fed. Rep. of Germany, and Dieter Baumann, Möhlin, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. Filed Jan. 16, 1987, Ser. No. 3,969

Claims priority, application Switzerland, Jan. 17, 1986, 191/86-3; Nov. 19, 1986, 4616/86-7

Int. Cl.⁴ C08G 59/68

U.S. Cl. 523—456

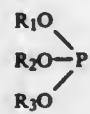
17 Claims

1. A curable mixture, containing (a) at least one bisphenol diglycidyl ether based on bisphenol A, hydrogenated bisphenol A or bisphenol F, (b) as a curing catalyst, a colorless or slightly yellow solution of a metal complex compound of the formula I



and the ether compound having a boiling point of at least 60° C., and

- A is an anion of the formula BF_4^- , PF_6^- , AsF_6^- or SbF_6^- , x is the number 4, 5 or 6 and y is zero or the number 1 or 2, the sum of x and y always being 6, the complex being dissolved in an excess of the corresponding ether or the corresponding ether compound,
- (c) a sterically hindered mononuclear or polynuclear phenol, a phosphite of the formula II or III



or



- in which R_1 , R_2 and R_3 independently of one another are each phenyl, alkyl-substituted phenyl having 1-12 carbon atoms in the alkyl radical or alkyl having 1 to 20 carbon atoms, or a mixture of a sterically hindered mononuclear or polynuclear phenol and a phosphite of the formula II or III and, optionally,
- (d) as a reactive diluent, up to 25 parts by weight, relative to 100 parts by weight of (a), of at least one diglycidyl ether of 1,4-butanediol, 1,6-hexanediol or neopentyl glycol or a cresol glycidyl ether and, optionally,
- (e) as an adhesion promoter, an organic silane, titanate or zirconate.

4,716,186

STARCH DERIVATIVES AND METHODS OF MAKING USING SAME

Norman A. Portnoy, Decatur, and Larry P. Avery, Oreana, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Apr. 9, 1986, Ser. No. 849,930
Int. Cl.⁴ C08B 31/08, 33/04, 35/04

- U.S. Cl. 524—50 13 Claims
1. A cold water soluble carboxymethylated granular starch material having an average degree of carboxymethyl substitution in the range of from about 0.15 to about 1.0 of such substituent per anhydroglucose unit in the starch molecule and having a ratio of inorganic anion content, in weight percent on a starch material dry solids weight basis, to carboxymethyl degree of substitution of about 14 or less.

4,716,187

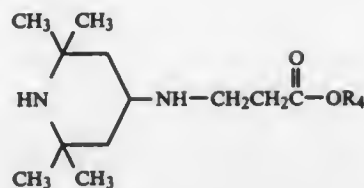
STABILIZING POLYMERS

Lajos Ávár, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 590,506, Mar. 16, 1984, abandoned. This application Mar. 15, 1985, Ser. No. 712,345
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310100

Int. Cl.⁴ C08K 5/34

- U.S. Cl. 524—99 2 Claims
1. A mixture of compounds of the formula



wherein R_4 is an isomer of the formula $-\text{C}_{12}\text{H}_{25}$.

(II)

4,716,188

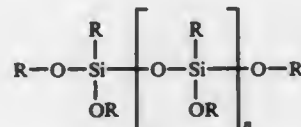
WATER-REPELLENT AND VAPOR-PERMEABLE PAINT

Oskar Mariusson, Lindarflot 3, IS-210 Gardabae 3, and Jon Bjarnason, Safamyri 21, IS-108 Reykjavik, both of Iceland
Filed Jun. 6, 1986, Ser. No. 871,278

Claims priority, application Denmark, Jun. 11, 1985, 2596/85
Int. Cl.⁴ C08K 5/54, 3/34

U.S. Cl. 524—268 5 Claims

1. A water-repellent and vapor-permeable paint, suitable for outdoor surfaces, concrete surfaces and surfaces in "wet" rooms indoors, said paint comprising one or more fillers selected from the group consisting of pigments and particulate extenders, a continuous phase consisting of at least one volatile organic solvent, at least one organic binder selected from the group consisting of acrylic and methacrylic resins, said binder also comprising at least one non-crosslinked oligomeric alkyl-substituted organosiloxane, wherein
- (a) the paint has a pigment-volume concentration (PVC) within the range of 47 to 65%;
- (b) the paint, as part of said filler, contains diatom shells in an amount of 3 to 10% of the paint including volatile solvents;
- (c) one or more non-crosslinked oligomeric alkyl-alkoxy organosiloxanes are present as part of said continuous phase and having the general formula



wherein the group R, which may be identical or different, each denotes a C_{1-8} alkyl group and n is a number from 3 to 8, said oligomeric organosiloxane being present in an amount of 10 to 30% of the weight of binder excluding the oligomeric organosiloxane, said diatom shells having inner surfaces which have been rendered hydrophobic by said one or more non-crosslinked oligomeric alkyl-alkoxy organosiloxane.

4,716,189

COMPOSITION

Hans J. Gollub, Bühl; Dieter A. Hechenberger, Sinsheim, and Renate Moermann, Bühl, all of Fed. Rep. of Germany, assignors to Lingner & Fischer GmbH, Fed. Rep. of Germany
Filed Jan. 8, 1987, Ser. No. 1,378

Claims priority, application United Kingdom, Jan. 10, 1986, 8600599

Int. Cl.⁴ C08F 110/02

- U.S. Cl. 524—284 9 Claims
1. A stick for the application of adhesive material to a substrate, comprising an adhesive dissolved or dispersed in a liquid medium containing an alkali metal or ammonium salt of an aliphatic carboxylic acid having from 8 to 36 carbon atoms, characterised in that the adhesive comprises a mixture of (i) an aqueous dispersion of an optionally carboxylated (C_4 to C_{10})-alkyl ester of acrylic acid and (ii) an aqueous dispersion of polyethylene.

4,716,190 METHOD FOR EQUILIBRATING POLYAMIDE MAGNET WIRE COATINGS AND ENAMEL COMPOSITIONS

Francois A. Lavalley, Fort Wayne, Ind., assignor to Essex Group, Inc., Ft. Wayne, Ind.

Filed Dec. 22, 1986, Ser. No. 945,159
Int. Cl.⁴ C08T 5/05

- U.S. Cl. 524—386 8 Claims
1. A method for equilibrating a high molecular weight polyamide for use as a magnet wire enamel comprising:
- forming a solution of a polyamide resin in an organic solvent;
- adding an organic titanate titanium catalyst and a solvolytic agent containing at least one reactive hydrogen to said solution;
- heating said solution to a sufficiently high temperature to cause a solvolytic reaction between the polyamide and solvolytic agent thereby resulting in the reduction of the polyamide to a lower average molecular weight and a lower viscosity.

4,716,191

CABLE FLOODING COMPOUND

Thomas D. Hindman; Thomas J. Roessing, both of Parker, and Joseph D. Burkhard, Petrolia, all of Pa., assignors to Witco Corp., New York, N.Y.

Filed May 16, 1985, Ser. No. 734,676
Int. Cl.⁴ C08K 5/01; H02G 15/00

- U.S. Cl. 524—488 4 Claims
1. A cable flooding compound comprising; 92-94 weight percent of a microcrystalline wax having a melting point of 170°-180° F. (ASTM D-127) and a penetration of 25-35 (ASTM D-1321), and an elastomeric polymer comprising, 3-5 weight percent of polyethylene and 2-4 weight percent of a rubber, and wherein the compound is a cable flooding compound exhibiting the jacket slip characteristics of atactic polypropylene.

4,716,192

STABLE EMULSIONS OF WATER RESISTANT POLYVINYL ALCOHOL-STABILIZED VINYL CHLORIDE-ETHYLENE COPOLYMERS

John G. Iacoviello, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 747,133, Jun. 20, 1985, Pat. No. 4,673,702, which is a continuation-in-part of Ser. No. 572,726, Jan. 20, 1984, abandoned. This application Mar. 13, 1987, Ser. No. 25,901

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.⁴ C08F 2/16; C08K 3/20

- U.S. Cl. 524—549 35 Claims
1. A method for preparing a stable vinyl chloride based resin emulsion which comprises a copolymer colloiddally dispersed in an aqueous medium, the copolymer having a Tg from 0° to 50° C., about 65 to 90 wt % vinyl chloride, about 5 to 35 wt % ethylene, about 1 to less than about 5 wt % olefinically unsaturated copolymerizable monomer, provided that when the copolymerizable monomer is acrylamide about 1 wt % is present, and prepared by emulsion polymerization of vinyl chloride monomer, ethylene and the olefinically unsaturated comonomer in the presence an emulsifying system consisting essentially of about 3 to 15 wt % polyvinyl alcohol which is 70 to 91 mole % hydrolyzed, which method comprises
- (a) forming an aqueous emulsion reaction mixture containing substantially all the polyvinyl alcohol and a portion of the total vinyl chloride monomer,
- (b) pressurizing the reaction mixture with an ethylene pressure sufficient to provide the copolymer with a 5 to 35 wt % ethylene content,
- (c) initiating the reaction mixture by the addition of a free

- radical generating source and continuing polymerization until the rate of polymerization begins to decrease,
- (d) adding the remaining vinyl chloride over a period of time while continuing polymerization until the reaction is no longer self-sustaining, and
- (e) removing the unreacted ethylene and reducing the vinyl chloride free monomer content of the emulsion.

4,716,193

REACTIVE GLASS COMPONENT IN RIM

Robert A. Grigsby, Jr., Georgetown, Tex., assignor to Texaco, Inc., White Plains, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,237
Int. Cl.⁴ C08G 18/00

- U.S. Cl. 524—730 4 Claims
1. A reaction injection molded elastomer made by reacting in a closed mold ingredients comprising amine terminated polyethers of greater than 1500 average molecular weight, having greater than 50% of their active hydrogens in the form of amine hydrogens, a chain extender and an aromatic polyisocyanate having also present an additive comprising a filler and the silane compound octadecyltriethoxysilane.

4,716,194

REMOVABLE PRESSURE SENSITIVE ADHESIVE

James L. Walker, Whitehouse Station, and Paul B. Foreman, Somerville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Nov. 25, 1985, Ser. No. 801,251
Int. Cl.⁴ C08L 33/06, 43/04

- U.S. Cl. 524—806 19 Claims
1. In an acrylate based pressure sensitive emulsion adhesive having a Tg of about -60° to about -20° C. the improvement which comprises polymerizing therein an effective amount of an organofunctional silane monomer thereby improving the removability of the adhesive.

4,716,195

PROCESS FOR THE PREPARATION IN MICROSUSPENSION OF A VINYL CHLORIDE POLYMER LATEX AND RESULTANT PRODUCTS

Daniel Brulet, Saint-Auban, France, assignor to Societe d'Extrusion et de Transformation, France

Filed Sep. 2, 1986, Ser. No. 903,023

Claims priority, application France, Sep. 6, 1985, 85 13267
Int. Cl.⁴ C08L 27/06

- U.S. Cl. 524—851 7 Claims
1. A process for the preparation of a vinyl chloride polymer latex having particles with a mean diameter between about 0.2 and 0.8 μm and containing at least one organosoluble polymerization initiator comprising:
- a. dispersing in an aqueous reaction medium also containing parabenzquinone, vinyl chloride or vinyl chloride and at least one monomer copolymerizable therewith, at least one anionic emulsifier, and from about 0.004 to 0.16% by weight, with respect to said monomers, of said initiator expressed in terms of active oxygen,
- b. polymerizing at one at a desired polymerization temperature, θ_1 , and
- c. continuously adding parabenzquinone to said aqueous reaction medium during the polymerization when the temperature θ_2 of the reaction medium is such that the difference $\theta_2 - \theta_1$ exceeds a value from 0° to +5° C.

4,716,196

FLAME RETARDED THERMOPLASTIC STYRENIC COMPOSITIONS

Glenn B. Hilton, Enfield, Conn., and Wayne W. Robertson, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 1, 1984, Ser. No. 656,195
Int. Cl.⁴ C08L 51/04, 71/04

- U.S. Cl. 525—72 2 Claims
1. A flame retarded thermoplastic composition consisting essentially of, in intimate admixture:
- a copolymer of styrene and acrylonitrile grafted on a rubber substrate which is dispersed in a matrix copolymer of styrene and acrylonitrile;
 - a flame retardant additive or mixture of such additives in an amount sufficient to impart flame retardant properties to said grafted and ungrafted copolymers; and
 - polytetrafluoroethylene resin having a particle size within the range of about 70 to about 700 microns in an amount of between 0.05 and 0.15 weight percent based on the weight of (a), (b) and (c).

4,716,197

POLYETHYLENE/EPDM-GRAFT POLYSTYRENE BLENDS

Randolph H. Seiss, and Edward H. Yonkers, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 21, 1986, Ser. No. 854,281
Int. Cl.⁴ C08L 23/06, 23/18, 25/04, 51/04

- U.S. Cl. 525—75 21 Claims
1. A polymer blend comprising:
- from about 20 to about 90% of a blend of high density polyethylene and a linear low density polyethylene, of which from about 15 to about 85% comprises said linear low density polyethylene;
 - from about 6 to about 60% of a vinyl aromatic polymer; and
 - from about 4 to about 20% of a vinyl aromatic grafted alpha-olefin copolymer compatibilizer for said vinyl aromatic polymer and said polyethylenes.

4,716,198

RESIN COMPOSITION

Katuyoshi Murabayashi, Sakai, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 11, 1985, Ser. No. 743,536

Claims priority, application Japan, Jun. 19, 1984, 59-124493
Int. Cl.⁴ C08L 53/00

- U.S. Cl. 525—92 13 Claims
1. A resin composition suitable for injection molding, comprising:
- 100 parts by weight of a thermoplastic injection moldable resin component consisting of
 - a first thermoplastic injection moldable resin selected from the group consisting of polystyrene, copolymer of styrene and acrylonitrile and copolymer of acrylonitrile, butadiene and styrene and
 - up to 50 percent by weight of a second thermoplastic injection moldable resin different from said first resin
 - 0.01 to 50 parts by weight of a polyamide block copolymer consisting essentially of
 - 10 to 90 percent by weight of polyamide blocks prepared by polymerizing amino carboxylic acids having 6 to 12 carbon atoms, lactams having 6 to 12 carbon atoms, nylon salts prepared from diamines having from 6 to 12 carbon atoms and dicarboxylic acids having from 6 to 12 carbon atoms, and the balance is
 - polyester blocks or polyol blocks linked to said polyamide blocks by ester bonds wherein said second thermoplastic injection moldable resin is different from said polyamide block copolymer.

4,716,199

RESIN COMPOSITION AND ARTICLES FORMED THEREFROM

Roelof van der Meer, Bergen op Zoom, Netherlands, assignor to General Electric Company, Selkirk, N.Y.

Continuation of Ser. No. 586,916, Mar. 7, 1984, abandoned. This application May 23, 1986, Ser. No. 847,388

Claims priority, application Netherlands, Mar. 17, 1983, 8300956

- Int. Cl.⁴ C08L 53/00 3 Claims
- U.S. Cl. 525—92 3 Claims
1. A thermoplastic resin composition having improved multiaxial impact strength comprising:
- 100 parts by weight of a resin composition comprising:
- a polyphenylene ether resin or copolymers thereof; and
 - a styrene resin or copolymers thereof, the ratio of polyphenylene ether to polystyrene being between 1:20 and 4:1; and 1 to 35 parts by weight per 100 parts (a), (b), and (c) of
 - an unsaturated diblock copolymer consisting essentially of 20 to 40 percent by weight of an alkenyl aromatic block and 60 to 80 percent by weight of a diene block, the alkenyl aromatic block having a molecular weight of about 10,000 to 100,000 and the diene block having a molecular weight of about 50,000 to 500,000.

4,716,200

ACRYLIC POLYESTER HIGH SOLIDS COATINGS

Wellington F. Berghoff, Beachwood, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Filed Mar. 6, 1986, Ser. No. 836,744

- Int. Cl.⁴ C08L 63/00 19 Claims
- U.S. Cl. 525—111 19 Claims
1. A high solids coating composition comprising on a polymer solids weight basis:
- between 1.5% and 40% low molecular weight acrylic copolymer of copolymerized ethylenically unsaturated monomers comprising a hydroxylated monomer, a monocarboxylic acid monomer, an acrylic monomer, and other ethylenic monomer, said acrylic copolymer having a number average molecular weight between 500 and 2000, a hydroxyl number between 50 and 300, and an Acid No. less than about 30;
 - between 1.5% and 78.5% low molecular weight polyester polymer having a number average molecular weight between 250 and 2000, a hydroxyl number between 115 and 285, and an Acid No. less than about 15, said polyester produced by esterifying one mole of a non-ether aliphatic glycol with at least 0.1 mole of an aromatic dicarboxylic acid and at least 0.1 mole of an aliphatic saturated dicarboxylic acid having 1 to 8 carbon atoms where said glycol is at least 20% molar excess of the moles of said aromatic and moles of said aliphatic dicarboxylic acids;
 - between 10% and 58.5% of an amine derivative cross-linking resin selected from an aminoplast, a glycoluril, or a phenoplast resin; and
 - said composition containing a reinforcing low molecular weight polymer selected from a styrene-maleate half ester, an epoxy resin, a mixture of styrene-maleate half ester and epoxy resin, or an alkylene oxide adduct of bisphenol.

4,716,201

FILMS OF BLENDS OF LINEAR ETHYLENE POLYMERS AND AROMATIC POLYMERS

Peter J. Canterino, Towaco, N.J.; David V. Dobreski, Fairport, N.Y., and Richard G. Shaw, Piscataway, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,656

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

- Int. Cl.⁴ C08L 23/18, 23/20, 25/04, 25/16 12 Claims
- U.S. Cl. 525—240 12 Claims
1. A method for reducing extruder torque in the extrusion of films of a linear ethylene copolymer of ethylene and a higher olefin having 4-8 carbon atoms and a density of less than 0.94 by blending therein a thermoplastic polymer of an aromatic hydrocarbon which is up to about 10 weight percent of said blend in an amount effective to reduce extruder torque compared to the torque of the linear ethylene copolymer alone, said film having greater stiffness and reduced splittiness compared to films without said thermoplastic polymer of an aromatic hydrocarbon.

4,716,202

PREPARATION OF ALUMINUM IONOMERS OF CARBOXYLIC ACID COPOLYMERS

Howard W. Strauss, Groves, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 22, 1986, Ser. No. 899,027

- Int. Cl.⁴ C08F 8/42 7 Claims
- U.S. Cl. 525—370 7 Claims
1. A process for neutralizing with aluminum ion the carboxylic acid groups of a copolymer containing 30 to 95 weight percent units derived from an alpha-olefin containing 2 to 10 carbon atoms, at least 25 weight percent of which is ethylene, 1 to 25 weight percent units derived from an ethylenically unsaturated carboxylic acid containing from 3 to 8 carbon atoms, and from 0 to 60 weight percent derived from a softening comonomer which is a vinyl ester of a carboxylic acid containing 2 to 10 carbon atoms, an alkyl vinyl ether wherein the alkyl group contains from 1 to 10 carbon atoms or alkyl acrylates or methacrylates wherein the alkyl group contains from 1 to 10 carbon atoms, comprising melting the copolymer and mixing therewith an aluminum compound of the formula



where m is 0-2 and n is 1-3, adding a volatile organic acid substantially in the absence of water to the mixture whereby the aluminum compound reacts with the carboxylic acid groups of the copolymer, and removing the volatile organic acid by volatilization.

4,716,203

DIBLOCK AND TRIBLOCK COPOLYMERS

Donald J. Casey, Ridgefield; Peter K. Jarrett, Trumbull, and Louis Rosati, Norwalk, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 5, 1986, Ser. No. 903,797

- Int. Cl.⁴ C08L 71/02; C08G 63/06 16 Claims
- U.S. Cl. 525—408 16 Claims
1. A diblock copolymer having a first block comprising a polyalkylene oxide and a second block consisting essentially of glycolic acid ester and trimethylene carbonate linkages.

4,716,204

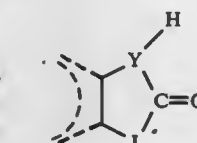
USE, AS LATENT CROSS-LINKERS FOR EPOXY RESINS, OF COMPOUNDS WHICH CAN BE REARRANGED IN SITU TO DIFUNCTIONAL PHENOLS

Theodore L. Parker, Lafayette, Calif., assignor to The Dow Chemical Company, Midland, Mich.

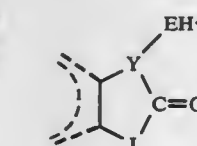
Division of Ser. No. 763,866, Aug. 9, 1985, Pat. No. 4,631,331. This application Oct. 3, 1986, Ser. No. 914,849

Int. Cl.⁴ C08G 59/14, 59/62; C07D 263/38 27 Claims

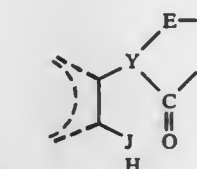
- U.S. Cl. 525—504 27 Claims
1. A latent mono- or polyphenol of one of the formulas
- $$\begin{array}{ccc} [\text{TE}]_m\text{Q} & \text{T+EQ} & [\text{TE}]_y\text{Q+D} \\ | & | & | \\ \text{H} & \text{H} & \text{H} \end{array} \quad \text{(A)} \quad \text{(B)} \quad \text{(C)}$$
- wherein:
- m is an integer of 1 to 7, n is 1 or 2 and y is an integer of value less than m,
 - Q is an organic radical,
 - EH is derivable as follows from D,
 - D is a group which can react with the Y—H group in a first moiety,



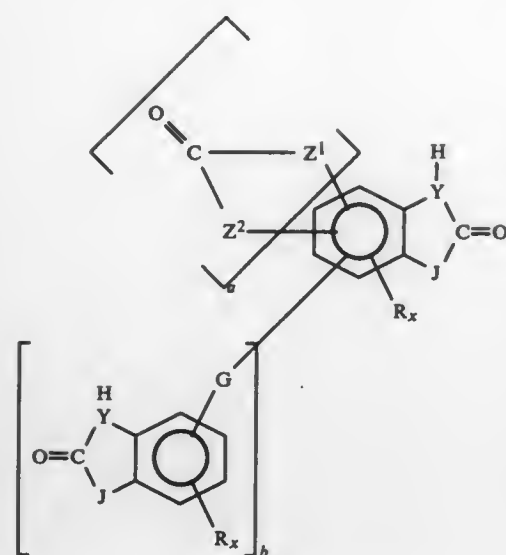
in which Y and J are as defined below, and J is a portion of a benzene ring, to convert moiety (a) to a second moiety



in which —E— is a group of such a nature that EH is an active hydrogen group and moiety (b) can be caused to rearrange to a third moiety

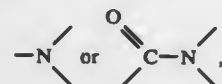


in which JH is an oxirane-reactive —OH or —SH group, and the carbonyl carbon, Y and E together provide the atoms constituting a stable ring; and T, independently the same or different in each occurrence, is the residue of a compound of the following formula (L), containing one or two of said moieties of formula (a):



wherein

one of a and b is zero and the other is zero or 1;
one of Z¹ and Z² is YH and the other is J and, when a = 1, Z¹ and Z² are attached to adjacent ring carbons;
x, independently in each occurrence is zero, 1, or 2;
R is a non-interfering substituent, independently the same or different in each occurrence;
G is a valence bond, an alkylene or alkenylene group—optionally halosubstituted, CO, O, S, SO, SO₂, SiO;
Y is



independently in each occurrence;
J is O or S, independently in each occurrence;
and the number of Y-H groups in the molecule is 1 or 2.

4,716,205

NICKEL-CATALYZED POLYMERIZATION OF ETHYLENE

Ulrich Klabunde, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 15, 1985, Ser. No. 787,149

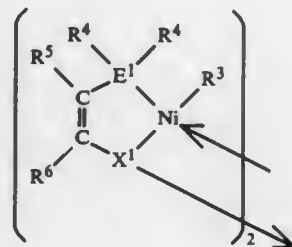
Int. Cl.⁴ C08F 4/80, 10/02

U.S. Cl. 526—115

7 Claims

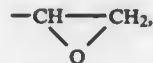
1. Polymerization process for producing substantially linear and crystalline polyethylene having a molecular weight of at least 1000, said process comprising contacting and reacting ethylene, in an oxygen-free atmosphere, at a temperature in the range of about 0° C. to about 200° C., in the presence of a nickel-containing catalyst selected from:

1(a) The dinickel compound of the formula



wherein:

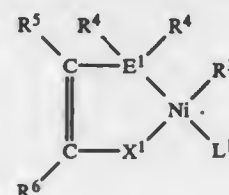
- (L) R³ and each R⁴, independently, is H or C₁₋₂₀ hydrocarbyl;
X¹ is O or S;
E¹ is P, As or Sb; and each of R⁵ and R⁶, independently, is H, C₁₋₂₀ hydrocarbyl or a functional group selected from —OR², —Cl, —CO₂R², —CO₂M, —C(O)N(R¹)₂, —C(O)R², —SR², —SO₂R², —OSO₂R², —SOR², —P(O)(OR²)₂—(R¹)_y, —CN, —NHR², —N(R²)₂,



—Si(OR¹)_{3-x}(R¹)_x, —OSi(OR¹)_{3-x}(R¹)_x, —NO₂, —SO₃M, —PO₃M₂ and —P(O)(OR²)₂M

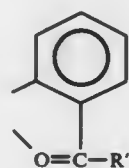
wherein M is alkali or alkaline earth metal, ammonium, quaternary ammonium, phosphonium or arsonium, y is 0, 1 or 2, each R¹, independently, is H or C₁₋₂₀ hydrocarbyl, each R², independently, is C₁₋₂₀ hydrocarbyl, and x is 0 or an integer of 1 to 3, or R⁵ and R⁶, taken together, is a substituted or unsubstituted C₅₋₈ alicyclic, C₅₋₈ heterocyclic or C₆₋₁₄ aromatic ring, the heteroatom of the heterocyclic ring being selected from O, N and S;

1(B) the nickel compound of the formula



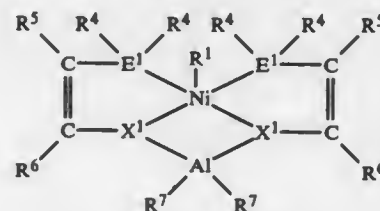
wherein:

R³, R⁴, R⁵, R⁶, X¹ and E¹ are defined as above and L¹ is a weakly coordinating ligand, or R³ and L¹ taken together is



wherein R'' is H, C₁₋₂₀ hydrocarbyl or oxyhydrocarbyl or n(R²)₂ wherein R² is defined as above:

1(c) the nickel-containing compound of the formula



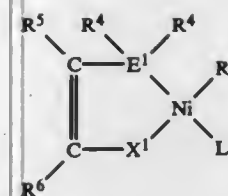
wherein:

R¹, R⁴, R⁵, R⁶, X¹ and E¹ are defined as above;
each R⁷, independently, is H, —OSi(R'')₃, C₁₋₂₀ alkyl or oxyalkyl, C₆₋₂₀ aryl, alkaryl, aralkyl or oxyaryl, N(R²)₂ wherein R² is as defined above, or halogen, or both R⁷ groups, taken together, is a 5 to 8-membered heterocyclic ring wherein the heteroatom is selected from O, N and S; and

each R'', independently, is C₁₋₂₀ alkyl or oxyalkyl, C₆₋₂₀ aryl, alkaryl, aralkyl or oxyaryl;

(2) the mixture comprising:

(i) the nickel compound of the formula



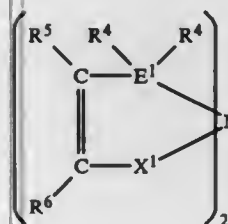
wherein:

R³, R⁴, R⁵, R⁶, X¹ and E¹ are defined as above and L² is a strongly coordinating ligand; and

(ii) an acceptor compound which can react irreversibly with L²; and

(3) the mixture comprising:

(i) the nickel compound of the formula



wherein:

R⁴, R⁵, R⁶, X¹ and E¹ are defined as above; and
(ii) a suitable alkylating or arylating compound.

4,716,206

PROCESS FOR POLYMERIZATION OF OLEFINS

Masahito Fujita; Masami Kizaki; Makoto Miyazaki, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 811,556, Dec. 19, 1985, Pat. No. 4,634,687, which is a continuation of Ser. No. 647,766, Sep. 6, 1984, abandoned. This application Nov. 5, 1986, Ser. No. 927,551

Claims priority, application Japan, Sep. 22, 1983, 58-174299

Int. Cl.⁴ C08F 4/64

U.S. Cl. 526—139

6 Claims

1. A process for the polymerization of an olefin or copolymerization of an olefin with another olefin in the presence of a catalyst system comprising

A. a titanium containing catalyst component, and

B. a cocatalyst system comprising

(a) an organoaluminum compound represented by the formula R¹R²R³Al wherein R¹, R² and R³, which may be the same or different, each denotes a C₁₋₂₀ alkyl, alkenyl, cycloalkyl, aryl, aralkyl, or alkoxy group, or a hydrogen atom,

(b) an organoaluminum halide represented by the formula R_{3-n}AlX_n wherein R⁴ denotes a C₁₋₂₀ alkyl, alkenyl, cycloalkyl, aryl, aralkyl or alkoxy group, X denotes a halogen atom and n is equal to or greater than 1,

(c) an electron donor compound containing a nitrogen atom, sulfur atom, oxygen atom or phosphorous atom, and

(d) an aromatic carboxylic acid ester, wherein the molar ratio of component a. to b. is in the range of 90:10 to 30:70, the molar ratio of component c. to d. is in the range of 5:95 to 70:30 and the molar ratio of component a. + b. to component c. + d. is in the range of 50:50 to 85:15.

4,716,207

NODULAR COPOLYMERS COMPRISING NARROW MWD ALPHA-OLEFIN COPOLYMERS COUPLED BY NON-CONJUGATED DIENES

Charles Cozewith, Westfield; Shlaw Ju, Edison, and Gary W. Verstrate, Matawan, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 681,950, Dec. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 504,582, Jun. 15, 1983, Pat. No. 4,540,753. This application Sep. 4, 1986, Ser. No. 903,637

Int. Cl.⁴ C08F 4/68

U.S. Cl. 526—169.2

32 Claims

1. In a polymerization process for producing a copolymer in the form of polymer chains from a reaction mixture comprising a catalyst, ethylene, and at least one alpha-olefin monomer, the improvement which comprises conducting the polymerization:

- in at least one mix-free reactor;
- with essentially one active catalyst species;
- using at least one reaction mixture which is essentially transfer agent-free;
- permitting the polymerization to continue until the copolymer is at least 50% completed;
- introducing into the reaction mixture a coupling agent; and
- permitting the reaction to continue; thereby incorporating the coupling agent into the polymer so as to form a nodular polymer wherein the polymer chains are linked to the coupling agent.

4,716,208

FLUORINE-CONTAINING COPOLYMERS

Stephen H. Korzeniowski, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

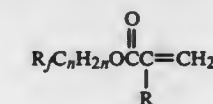
Continuation of Ser. No. 578,009, Feb. 13, 1984, abandoned, which is a continuation of Ser. No. 479,738, Mar. 28, 1983, abandoned. This application Aug. 14, 1985, Ser. No. 766,069

Int. Cl.⁴ C08F 20/22

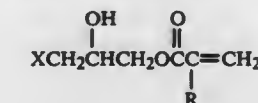
U.S. Cl. 526—245

14 Claims

1. Polymers of (i) from about 50 to about 85 parts by weight of a fluorinated monomer or mixture of fluorinated monomers having the formula



and (ii) from about 50 to about 15 parts by weight of one or more monomers having the formula



wherein

R_f is straight or branched-chain perfluoroalkyl containing 4-20 carbons;
R is H or CH₃;
n is an integer from 1-15; and
X is Cl or Br.

4,716,209

STRONG AND ELASTIC POLYURETHANE POLYUREA POLYACRYLATES AND ELECTRON BEAM-CURED COATINGS CONTAINING THE SAME

Steven R. Schmid, Des Plaines; Robert E. Ansel, and Kevin P. Murray, both of Hoffman Estates, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 23, 1986, Ser. No. 824,547

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.⁴ C08F 2/54, 26/02, 226/02

U.S. Cl. 526—261

24 Claims

1. An essentially isocyanate-free radiation-curable polyurethane polyurea polyethylenic oligomer comprising the reaction product of: (1) organic diisocyanate; (2) a stoichiometric deficiency, based on said diisocyanate, of difunctional materials reactive with isocyanate functionality and consisting essentially of: (A) diol component selected from polycarbonate diol and polyoxyalkylene glycol in which the alkylene group contains from 2-4 carbon atoms, said diol component having a molecular weight of from 200 to 1000; (B) dihydric bisphenol-based alkylene oxide adduct in which the alkylene group contains from 2-4 carbon atoms and containing from 2-10 alkylene groups per molecule; and (C) a diprimary diamine component selected from alkylene diamine and polyoxyalkylene diamine in which the alkylene groups contain from 2-4 carbon atoms, said diamine component having a molecular weight of from about 70 to 800, said components (A) and (B) being present in a weight ratio of from 1:4 to 9:1 and said component (C) being present in an amount of from 30 equivalent percent to 60 equivalent percent of the total equivalents of component (2), the polyurethane polyurea of components (1) and (2) being capped by (3) a monohydric ethylenically unsaturated compound, and the deficiency of difunctional materials reactive with isocyanate functionality and the proportion of said monohydric ethylenically unsaturated compound providing a polyethylenically unsaturated oligomer having a molecular weight in the range of about 5,000 to about 30,000.

4,716,210

USE OF LIQUID, COLD-HARDENING POLYURETHANE-UREA-FORMING COMPONENTS FOR CORROSION-INHIBITING, WEAR-RESISTANT COATINGS ON METAL AND PLASTICS SURFACES AND MOLDINGS AND ON STONE AND CONCRETE

Gerhard Trümmelmeyer, Leichlingen, and Hans-Dieter Rupprecht, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 446,082

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3148838

Int. Cl.⁴ C08G 18/10, 18/67

U.S. Cl. 528—75

12 Claims

1. A hydrolysis-resistant, low temperature-resistant, elastic polyurethane-urea possessing high strength and abrasion resistance prepared from coldhardening, quick-gelling, solvent-free, liquid components comprising

(A) a liquid mixture having a viscosity below about 6,000 mPa.s/25° C. and an average functionality of the hydroxyl group and amino group compounds of about 2.0 to 2.75 comprising

- (1) a polyether polyol component having an average molecular weight of about 500 to 8,000 and a viscosity below about 6,000 mPa.s/25° C. which is
 - (a) graft modified with about 5 to 40% by weight of polymers and/or copolymers of unsaturated monomers and/or
 - (b) contains from about 5 to 40% by weight of high molecular weight polyadducts, polycondensates or polymers in dissolved or finely dispersed form;
- (2) liquid or low melting aromatic polyamines soluble in (1) and having a molecular weight below about 500

wherein the OH/NH₂ equivalent ratio of (1) to (2) is from about 1:1 to 1:10; and

(3) aliphatic tertiary amine catalysts in quantities from about 0.01 to 5% by weight; and

(B) liquid aromatic polyisocyanates having an average isocyanate functionality of from about 2.0 to 2.55 comprising

(1) phosgenation products of the condensation reaction of aniline and/or C₁-C₄-mono- or -di-substituted anilines with formaldehyde or the conversion products of said phosgenation products which are liquid at room temperature and are obtained by the introduction of carbodiimide, allophanate or biuret groups, by trimerization or by modification with low molecular weight polyols, said phosgenation products or said conversion products having a viscosity below about 1000 mPa.s/25° C. and/or

(2) reaction products of (B) (1) with a polyether polyol having a molecular weight from about 400 to 7000 at an NCO/OH equivalent ratio of about 2:1 to 10:1, said reaction products having a viscosity below about 5000 mPa.s/25° C.,

wherein the equivalent ratio of the isocyanate groups of (B) to the isocyanate-reactive groups of (A) is about 0.95:1 to 1.10:1.

4,716,211

SLURRY PROCESS FOR PRODUCING HIGH MOLECULAR WEIGHT CRYSTALLINE POLYARYLETHETERKETONES

Robert A. Clendinning, New Providence, and Louis M. Maresca, Belle Mead, both of N.J., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 710,119, Mar. 11, 1985, abandoned.

This application May 15, 1986, Ser. No. 867,420

Int. Cl.⁴ C08G 8/02, 63/60, 63/62

U.S. Cl. 528—126

8 Claims

1. An improved process for preparing a poly(aryl ether ketone) by reacting nucleophilic coreactants with electrophilic coreactants under Friedel-Crafts polymerization conditions, wherein the improvement comprises carrying out the process in a solvent comprising 1,2-dichloroethane.

4,716,212

PREPARATION OF A HIGH MOLECULAR WEIGHT POLY(ARYLENE SULFIDE KETONE)

Roger G. Gaughan, Piscataway, N.J., assignor to Phillips Petroleum Company

Filed Sep. 5, 1986, Ser. No. 905,615

Int. Cl.⁴ C08G 65/38

U.S. Cl. 528—226

12 Claims

1. A method for preparing a poly(arylene sulfide ketone) comprising:

contacting in a reaction mixture (a) at least one polyhalobenzophenone, employing about 1.004:1 to about 1.038:1 molar ratios of alkali metal hydrosulfide relative to said polyhalobenzophenone, and at least one of (b) or (c), wherein (b) is at least one alkali metal sulfide and at least one alkali metal hydrosulfide, and (c) is at least one alkali metal hydroxide and at least one alkali metal hydrosulfide, under polymerization conditions effective for producing the poly(arylene sulfide ketone);

4,716,213

POLYESTERS POLYOLS PREPARED FROM GLUTARIC ACID, SUCCINIC ACID AND ADIPIC ACID, AND POLYURETHANES PREPARED THEREFROM

George N. Altounian, Cap Rouge, and Daniel Grenier, Ste-Foy, both of Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Continuation of Ser. No. 747,929, Jun. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 517,397, Jul. 26, 1983, Pat. No. 4,525,574. This application May 27, 1986, Ser. No. 867,617

The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.

Int. Cl.⁴ C08G 18/42

U.S. Cl. 528—283

6 Claims

1. Process for preparing polyols which comprises
 - (a) introducing in a reactor a mixture of acids comprising about 35 to 80% by weight of glutaric acid, about 15 to 35% by weight of succinic acid and about 8 to 35% by weight of adipic acid, or esters or anhydrides thereof, with at least one polyhydroxy alcohol selected from the group consisting of secondary alcohols, tertiary alcohols, and highly cluttered alcohols, with a catalyst selected from the group consisting of stannous chloride, stannic chloride and alkyl-tin compounds;
 - (b) flushing the reaction mixture with an inert gas;
 - (c) heating the reaction mixture while stirring at a temperature not exceeding about 225° C.;
 - (d) removing 90 to 95% of the water or methanol formed during step (c);
 - (e) introducing into the reactor at least one primary alcohol which is not cluttered;
 - (f) heating to about 225° C. and removing by distillation the maximum of water or methanol;
 - (g) ending the reaction by placing the reactor under vacuum in order to remove all traces of water or methanol in the reaction mixture and continuing this operation until the polyol obtained has an acid value lower than 3, a hydroxyl functionality at least equal to 2.0 and a hydroxyl number lower than 600.

4,716,214

PROCESS FOR THE PREPARATION OF POLYTETRAMETHYLENE ADIPAMIDE

Reinoud J. Gaymans, Keizerweg 25, 7548 PX Boekelo, and Antonius J. P. Bongers, Julianalaan 37, 6124 AG Papenhoven-Born, both of Netherlands

Continuation of Ser. No. 724,734, Apr. 18, 1985, abandoned.

This application Sep. 30, 1986, Ser. No. 913,313

Claims priority, application Netherlands, Apr. 19, 1984, 8401271

Int. Cl.⁴ C08G 69/28

U.S. Cl. 528—335

13 Claims

1. A continuous process for the preparation of white, high molecular weight nylon 4,6 comprising the steps of:
 - heating in a first reaction zone a reaction mixture comprising the salt of 1,4-diaminobutane and adipic acid, with up to 25 wt. % of at least one other polyamide-forming compound, at a temperature above the solidification point of the reaction mixture and at a pressure between 2 and 100 bars to form a prepolymer-containing liquid reaction mixture, passing the liquid prepolymer mixture to a second reaction zone, wherein the mixture is maintained in a liquid state while the pressure therein is simultaneously reduced to form a second liquid prepolymer having at most 0.20 mg/g pyrrolidine groups per gram of prepolymer; and thereafter
 - subjecting said second prepolymer liquid to at least one subsequent reaction zone, wherein the liquid prepolymer mixture is maintained in a liquid state.

4,716,215

COMPRESSION MOLDABLE AROMATIC POLYAMIDE POWDER

Hideo Matsui; Hiroshi Fujie, and Takashi Noma, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 10, 1986, Ser. No. 828,237

Claims priority, application Japan, Feb. 15, 1985, 60-26429; Aug. 27, 1985, 60-186596; Aug. 28, 1985, 60-187324

Int. Cl.⁴ C08G 69/32

U.S. Cl. 528—348

10 Claims

1. An aromatic polyamide compression molding powder, produced by an interfacial polymerization process, comprising porous agglomerates having an average particle size of from 10 to 400 μ m and a surface area of from 1 to 20 m²/g, said agglomerates comprising a plurality of fine coalescible particles which have an average size of from 0.1 to 10 μ m, which comprise at least one aromatic amide polymer comprising 40 to 100 molar % of recurring m-phenylene isophthalamide units and 0 to 60 molar % of at least one additional recurring aromatic amide unit.

4,716,216

CRYSTALLINE POLYIMIDES CONTAINING CUMULATIVE PHENYLENE SULFIDE UNITS

Tohru Takekoshi, Scotia, and Patricia P. Anderson, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

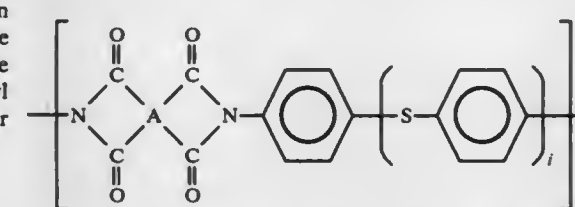
Continuation-in-part of Ser. No. 771,096, Aug. 30, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 932,802

Int. Cl.⁴ C08G 69/42, 75/00, 79/02

U.S. Cl. 528—352

6 Claims

1. A crystalline polyimide consisting essentially of structural units of the formula



wherein A is the tetravalent aromatic nucleus of a dianhydride selected from the group consisting of pyromellitic dianhydride; biphenyl-3,3',4,4'-tetracarboxylic dianhydride; 1,4-bis(3,4-dicarboxyphenoxy)benzene dianhydride; and benzophenone-3,3',4,4'-tetracarboxylic dianhydride; i is a whole number of from 2 to 6 and n is a whole number of at least 5.

4,716,217

HYBRID LYMPHOBLASTOID-LEUKOCYTE HUMAN INTERFERONS

Marvin H. Caruthers, Boulder, Colo.; Michael Leineweber, Frankfurt am Main, Fed. Rep. of Germany; Moshe Lelner, Rehovot, Israel, and Yitzhak Stabinsky, Boulder, Colo., assignors to University Patents, Inc., Westport, Conn.

Filed Aug. 31, 1984, Ser. No. 646,866

Int. Cl.⁴ C07K 13/00, 15/26; A61K 45/02

U.S. Cl. 530—351

8 Claims

1. An antiviral and antiproliferative composition of matter comprising a polypeptide of 166 amino acids and optionally having an additional methionine attached to the ordinary first amino acid at the N-terminus, the amino acid sequence of said polypeptide compound having the formula



wherein X consists essentially of amino acids 2 to 46 of human lymphoblastoid interferon (LbIF); Y consists essentially of amino acids 60 to 85 of said LbIF; Z consists essentially of amino acids 112 to 166 of said LbIF; P consists essentially of

amino acids 47 to 59 of human α C, α F-, or α I-type leukocyte interferon (LeIF) and is $\text{gln}^{47}\text{-phe-gln-lys}^{50}\text{-ala-gln-ala-leu-ser}^{55}\text{-val-leu-his-glu}^{59}$, or $\text{gln}^{47}\text{-phe-gln-lys}^{50}\text{-thr-gln-ala-leu-ser}^{55}\text{-val-leu-his-glu}^{59}$; and B consists essentially of amino acids 86 to 111 of human α C-, α F-, or α I-type leukocyte interferon (LeIF) and is $\text{ser}^{86}\text{-thr-glu-leu-tyr}^{90}\text{-gln-gln-leu-asn-asn}^{95}\text{-leu-glu-ala-cys-val}^{100}\text{-ileu-gln-glu-val-gly}^{105}\text{-val-glu-glu-thr-pro}^{110}\text{-leu}$, or $\text{ser}^{86}\text{-thr-glu-leu-tyr}^{90}\text{-gln-gln-leu-asn-asn}^{95}\text{-leu-glu-ala-cys-val}^{100}\text{-ileu-gln-glu-val-gly}^{105}\text{-met-glu-glu-thr-pro}^{110}\text{-leu}$, or $\text{ser}^{86}\text{-thr-glu-leu-tyr}^{90}\text{-gln-gln-leu-asn-asn}^{95}\text{-leu-glu-ala-cys-val}^{100}\text{-ileu-gln-glu-val-gly}^{105}\text{-met-glu-glu-thr-pro}^{110}\text{-leu}$ having biological or antiviral activity of human interferon.

4,716,218

GRAIN EXTRACTION MILLING

Li-Fu Chen, and Johan E. Hoff, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Jan. 15, 1986, Ser. No. 819,413

Int. Cl.⁴ C07K 3/02, 3/28

U.S. Cl. 530—372

30 Claims

1. A process for the production of grain oil and dehydrated alcohol comprising the steps of:
cracking the grain;
drying the grain to a moisture content sufficiently low to enable the grain to dehydrate an ethanol solution of greater than 90% ethanol, while simultaneously extracting grain oil from the dried grain with an ethanol solution of greater than 90% ethanol, and recovering the grain oil and dehydrated alcohol from the extractant.

4,716,219

ADSORBENT FOR PROTEIN PURIFICATION

Bernhard Eggmann, Basel; Erich Hochuli, Arisdorf, and Alfred Schacher, Riehen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 23, 1986, Ser. No. 821,728

Claims priority, application Switzerland, Feb. 4, 1985, 490/85

Int. Cl.⁴ C07K 3/20

U.S. Cl. 530—413

13 Claims

1. An adsorbent comprising an electroneutral carrier matrix, $-\text{O}-\text{CH}_2-\text{CH}(\text{OH})-\text{CH}_2-\text{NH}-$ groups as a spacer and a triazine coloring substance bonded to the spacer, which adsorbent is characterized by providing high flow rates and a large loading capacity.

4,716,220

DISAZO COMPOUNDS WITH XANTHONE NUCLEUS FOR ELECTROPHOTOGRAPHY

Kyoji Tsutsui, Mishima, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 597,991, Apr. 9, 1984, Pat. No. 4,540,643.

This application Jul. 9, 1985, Ser. No. 753,281

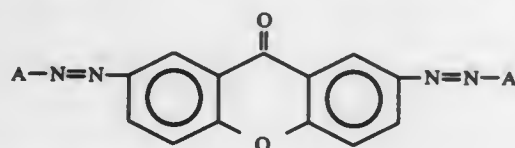
Claims priority, application Japan, Apr. 26, 1983, 58-73177; Apr. 28, 1983, 58-75586

Int. Cl.⁴ C09B 35/03; G03G 5/06, 5/14

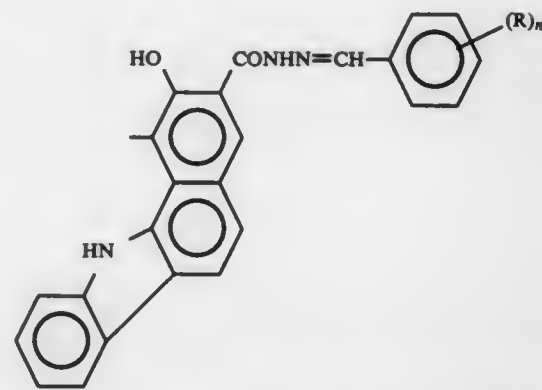
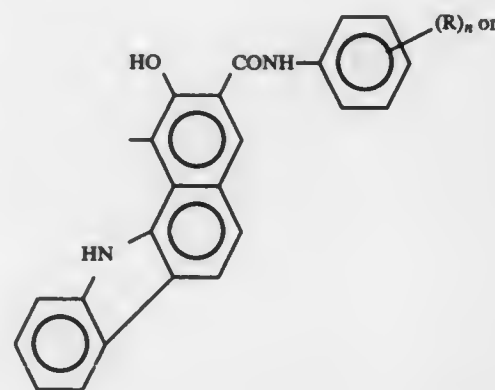
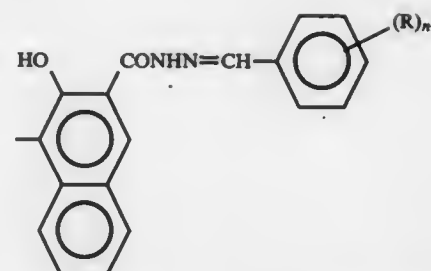
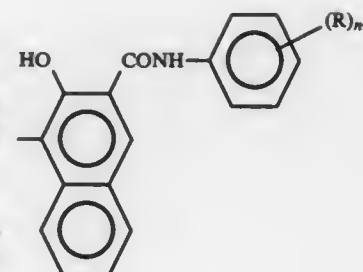
U.S. Cl. 534—738

15 Claims

1. A disazo compound represented by the formula



wherein, A stands for



wherein, R stands for alkyl, alkoxy, nitro, halogen, cyano or halomethyl; n stands for an integer of 0, 1, 2 or 3; and in case n is an integer of 2 or 3, each R is the same or different.

4,716,221

4'-DEMETHYL-4-EPIPODOPHYLLOTOXIN DERIVATIVE

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Shinichi Kondo, Yokohama; Wataru Tanaka, Hoya; Tomohisa Takita, Asaka; Yoshio Nishimura, Yokohama, and Hiroshi Yoshikawa, Fujitaka, all of Japan, assignors to Zaidan Hojin Biseibatsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Mar. 21, 1986, Ser. No. 842,286

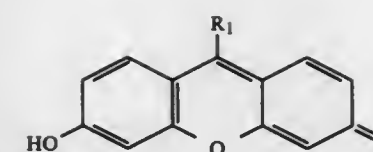
Claims priority, application Japan, Apr. 2, 1985, 60-68424

Int. Cl.⁴ C07H 15/24

U.S. Cl. 536—17.2

1 Claim

1. 4-O-(2-deoxy-2-dimethylamino-4,6-O-ethylidene- β -D-glucopyranosyl)-4'-demethyl-4-epipodophyllotoxin and salt thereof.



in which R₁ can be aryl, and B—OH is a sugar or sugar derivative.

4,716,222

SUBSTRATES FOR HYDROLASES

Kurt Wallenfels, Freiburg, Fed. Rep. of Germany, and Ahmed M. Fathy, Heliopolis, Egypt, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 5, 1985, Ser. No. 720,347

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3412939

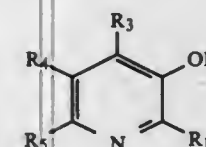
Int. Cl.⁴ C07H 17/02

U.S. Cl. 536—18.7

12 Claims

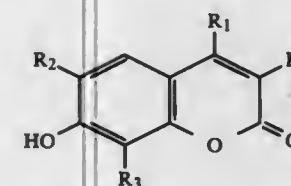
1. A compound of the formula A—O—B, in which A represents the radical in the ion A—O⁻ of a heterocyclic compound A—OH with an acid pK_a, whose absorbance is measured photometrically after hydrolysis of A—O—B, while B is the radical in a compound B—OH which makes the compound specific for the reaction with a given enzyme, and where A—OH is selected from the group consisting of:

a. a compound of the formula I



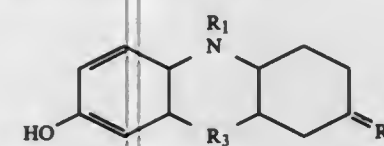
in which R₁ can be OH, NO₂ or halogen, and R₃, R₄ and R₅ can be H or NO₂, at the most two NO₂ being present,

b. a compound of the formula II



in which R₁ can be H or alkyl with 1-12 carbon atoms, and R₂, R₃ or R₄ can be H or NO₂, one or two NO₂ being present,

c. a compound of the formula III



in which R₁ can be O or an electron pair, R₂ can be O, S or N(CH₃)₂, and R₃ can be O or S and

d. a compound of the formula IV

4,716,223

METHOD FOR PREPARING GANGLIOSIDE DERIVATIVES AND USE THEREOF IN PHARMACEUTICAL COMPOSITIONS

Francesco della Valle, Padua, and Aurelio Romeo, Rome, both of Italy, assignors to FIDIA, S.p.A., Abano Terme, Italy

Continuation of Ser. No. 425,462, Sep. 28, 1982, Pat. No. 4,593,091, which is a continuation-in-part of Ser. No. 290,106, Aug. 4, 1981, Pat. No. 4,476,119. This application Mar. 10, 1986, Ser. No. 837,201

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.⁴ C08B 37/00; C07H 5/04

U.S. Cl. 536—53

11 Claims

1. A method for preparing inner ester ganglioside derivatives which comprises:

- subjecting a ganglioside or mixture of gangliosides to ion exchange to convert the carboxylate groups in said gangliosides to a salt thereof;
- dissolving the thus prepared salt of a ganglioside or mixture of gangliosides in a non-aqueous organic solvent; and
- reacting said salt of a ganglioside or mixture of gangliosides with a lactonization reagent to form at least one lactonic bond in said inner ester ganglioside derivatives.

4,716,224

CROSSLINKED HYALURONIC ACID AND ITS USE

Katukiyo Sakurai; Yoshio Ueno, and Takashi Okuyama, all of Higashiyama, Japan, assignors to Seikagaku Kogyo Co. Ltd., Tokyo, Japan

Filed May 2, 1985, Ser. No. 729,558

Claims priority, application Japan, May 4, 1984, 59-88440; Jan. 17, 1985, 60-4908; Jan. 22, 1985, 60-8512; Jan. 29, 1985, 60-13595; Mar. 15, 1985, 60-50357

Int. Cl.⁴ A61K 7/00, 31/725

U.S. Cl. 536—55.1

11 Claims

1. A crosslinked hyaluronic acid or a pharmaceutically acceptable salt thereof produced by crosslinking hyaluronic acid or a pharmaceutically acceptable salt thereof with a polyfunctional epoxy compound selected from the group consisting of halomethyloxirane compounds and a bisepoxy compound selected from the group consisting of 1,2-bis(2,3-epoxypropoxy) ethane, 1,4-bis(2,3-epoxypropoxy) butane, 1,6-bis(2,3-epoxypropoxy) hexane and a diglycidyl ether of bisphenol A or bisphenol F, which has a crosslinking index of 5 to 20 per 1000 repeating disaccharide units composed of glucuronic acid and N-acetylglucosamine in hyaluronic acid, said crosslinked hyaluronic acid or pharmaceutically acceptable salt thereof being water soluble and stringy.

4,716,225
RADIOOPAQUE SUGAR DERIVATIVES AND A METHOD OF METABOLIC MAPPING USING THE SAME

Robert S. Ledley, Silver Spring, Md., and Douglas M. Gersten, Washington, D.C., assignors to Georgetown University, Washington, D.C.

Continuation-in-part of Ser. No. 685,227, Dec. 27, 1984, which is a continuation of Ser. No. 385,730, Jun. 7, 1982, abandoned. This application Sep. 30, 1985, Ser. No. 781,494
 Int. Cl.⁴ A61K 31/70, 49/04

U.S. Cl. 536—122 19 Claims

1. A method of metabolically mapping one or more central nervous system components of a mammalian body by computerized axial tomography scanning which comprises:

- injecting an effective amount of a 2-, 5-, or 6-iodo-substituted hexose, as a contrast medium, into said mammalian body, and
- scanning the mammalian body by computerized axial tomography, thereby visualizing the concentration flux of said hexose in the central nervous system component or components.

4,716,226
OPTICALLY ACTIVE 4-CARBALKOXY-2-AZETIDINONES

Stéphane Gero, Les Ulis; Jeanine Cleophas, Palaiseau, and Alice Gateau-Olesker, Gif-Sur-Yvette, all of France, assignors to Roussel Uclaf, Paris, France

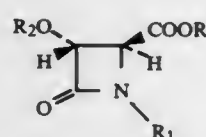
Filed Oct. 28, 1985, Ser. No. 791,774

Claims priority, application France, Nov. 2, 1984, 84 16759

Int. Cl.⁴ C07D 205/08; C07B 41/04, 41/02, 53/00

U.S. Cl. 540—200 3 Claims

1. A 2-azetidinone of the formula



wherein R is alkyl of 1 to 4 carbon atoms, R₁ is selected from the group consisting of hydrogen, —OH, protected hydroxy and —OCH₂—COOR', R' is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and R₂ is a hydroxyl protective group.

4,716,227
PROCESS FOR MANUFACTURING CEPHALOSPORIN ESTERS

André Furlenmeier, Basle, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

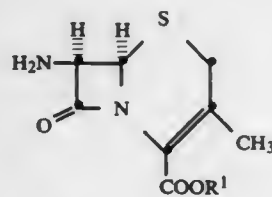
Filed Nov. 7, 1985, Ser. No. 795,948

Claims priority, application Switzerland, Nov. 15, 1984, 5470/84

Int. Cl.⁴ C07D 501/18; A61K 31/545

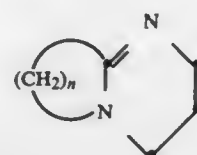
U.S. Cl. 540—230 15 Claims

1. A process for producing a cephalosporin ester of the formula



wherein R¹ is a group which is readily removable by hydrolysis, which process comprises reacting 7-amino-3-methyl-3-ceph-

em-4-carboxylic acid in a partially chlorinated lower alkane selected from the group consisting of methylene chloride or chloroform with a bicyclic amidine of the formula



wherein n is the integer 3, 4 or 5, and a halide of the formula



wherein X is halogen and R¹ has the above significance, thereby producing compound Ia.

4,716,228
CONDENSED 2-SUBSTITUTED THIAZOLE DERIVATIVES

Ugo Scarponi, Arese; Anna M. Lazzarini, Seregno; Daniela Toti, Bettola, and Roberto de Castiglione, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

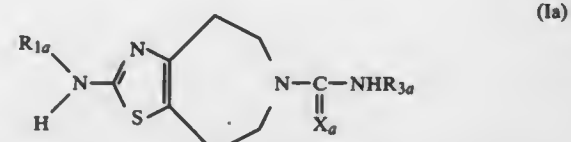
Filed Mar. 17, 1986, Ser. No. 839,935

Claims priority, application United Kingdom, Mar. 23, 1985, 8507595

Int. Cl.⁴ C07D 484/04, 417/04; A61K 31/55

U.S. Cl. 540—578 4 Claims

1. A compound of the general formula Ia



wherein R_{1a} represents a hydrogen atom or an amidino group, R_{3a} represents a hydrogen atom, a saturated or unsaturated, linear or branched acyclic hydrocarbon group having from 1 to 6 carbon atoms, a cycloalkyl group having from 3 to 7 carbon atoms, a phenyl group, a mono- or di-substituted phenyl group (the substituent(s) being selected from alkyl groups having from 1 to 4 carbon atoms, methylthio, methoxy, amino, acetylamino or methylenedioxy groups or fluorine, bromine or chlorine atoms), a benzyl group, a mono- or di-substituted benzyl group (the substituent(s) being as above defined) and X_a represents an oxygen or sulphur atom, an imino, cyanoimino or nitromethylene group or a group of the formula CHSO₂R_{3a} or NCOR_{3a} wherein R_{3a} is as above defined, or a pharmaceutically acceptable salt thereof.

4,716,229
NEW PYRIMIDINES AND A PROCESS FOR THE PREPARATION OF PYRIMIDINES

Erich Klauke, Odenthal; Bernd Baasner, and Karl H. Schün-dehütte, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

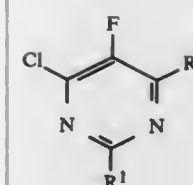
Continuation of Ser. No. 636,458, Jul. 31, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,041

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328154

Int. Cl.⁴ C07D 239/30

U.S. Cl. 544—334 12 Claims

1. A pyrimidine of the formula



wherein

R¹ denotes fluorine or trifluoromethyl, and
 R² denotes fluorine, chlorine or trifluoromethyl.

in a homogeneous aqueous solvent system at a temperature that is in the range of from about 10° C. up to about 30° C. until said chlorination reaction is substantially complete.

4,716,232
1-(VINYL PHOSPHONATE ADDUCT) PYRAZOLIDINONES

Robert J. Ternansky, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

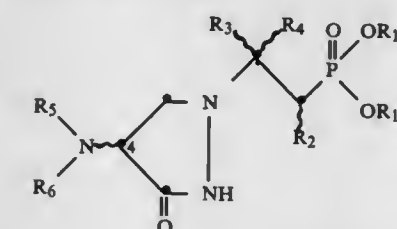
Filed May 14, 1986, Ser. No. 862,913

Claims priority, application European Pat. Off., Apr. 28, 1986, 86303174.6

Int. Cl.⁴ C07F 9/58, 9/65

U.S. Cl. 548—112 18 Claims

1. A compound of the formula:



4,716,230
CERTAIN BISDI-2 OR 4-PYRIDYL-PHOSPHINO) ALKANES #10 HAVING ANTI-TUMOR PROPERTIES

David T. Hill, North Wales, Pa., assignor to Smithkline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 723,778, Apr. 16, 1985, abandoned. This application Mar. 25, 1986, Ser. No. 843,886

Int. Cl.⁴ C07F 9/58; A61K 33/42

U.S. Cl. 546—21 4 Claims

1. A compound of the formula



wherein:

R is the same and is 2-pyridyl or 4-pyridyl, and
 A is a straight or branched alkanediyl chain of from one to six carbon atoms.

wherein:

R_{1a} and R_{1b} are the same or different and are C₁ to C₆ alkyl or phenyl;

R₂ is hydrogen, halo, C₁ to C₆ alkyl, C₁ to C₆ alkyl substituted by one or two halogen, hydroxy, protected hydroxy, amino, protected amino, C₁ to C₇ acyloxy, nitro, carboxy, protected carboxy, carbamoyl, carbamoyloxy, cyano, methylsulfonylamino or C₁ to C₄ alkoxy groups, perfluoro C₂ to C₄ alkyl, C₇ to C₁₂ arylalkyl group substituted on the C₁ to C₆ alkyl portion with one or two groups chosen from halogen, hydroxy, protected hydroxy, amino, protected amino, C₁ to C₇ acyloxy, nitro, carboxy, protected carboxy, carbamoyl, carbamoyloxy, cyano, N-(methylsulfonylamino) or C₁ to C₄ alkoxy; and/or the phenyl group may be substituted with 1 or 2 groups chosen from halogen, hydroxy, protected hydroxy, nitro, C₁ to C₆ alkyl, C₁ to C₄ alkoxy, carboxy, protected carboxy, carboxymethyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, protected aminomethyl, or an N-(methylsulfonylamino) group, phenyl, a phenyl group substituted with one or two moieties chosen from the group consisting of halogen, hydroxy, protected hydroxy, cyano, nitro, C₁ to C₆ alkyl, C₁ to C₄ alkoxy, carboxy, protected carboxy, carboxymethyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, protected aminomethyl, trifluoromethyl or N-(methylsulfonylamino), 1,3-thiazol-2-yl, 4-(protected carboxymethyl)-5-methyl-1,3-thiazol-2-yl, 1,2,4-thiadiazol-5-yl, 3-methyl-1,2,4-thiadiazol-5-yl, 1,3,4-thiazol-5-yl, 2-methyl-1,3,4-thiazol-5-yl, 2-hydroxy-1,3,4-thiazol-5-yl, 2-(protected carboxy)-4-methyl-1,3,4-thiazol-5-yl, 1,3-oxazol-2-yl, 1,3,4-oxadiazol-5-yl, 2-methyl-1,3,4-oxadiazol-5-yl, 2-(hydroxymethyl)-1,3,4-oxadiazol-5-yl, 1,2,4-oxadiazol-5-yl, 1,3,4-thiadiazol-5-yl, 2-methyl-1,3,4-thiadiazol-5-yl, 2-thiol-

4,716,231
CHLORINATION OF 2-METHOXYNICOTINIC ACID

Carl J. Goddard, Croton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 27, 1987, Ser. No. 43,056

Int. Cl.⁴ C07D 213/80, 213/803

U.S. Cl. 546—298 6 Claims

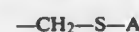
1. A process for chlorinating 2-methoxynicotinic acid at the 5-position of the molecule, which comprises subjecting said acid to the chlorinating activity of an alkali metal hypochlorite

1,3,4-thiadiazol-5-yl, 2-(methylthio)-1,3,4-thiadiazol-5-yl, 2-amino-1,3,4-thiadiazol-5-yl, 1H-tetrazol-5-yl, 1-methyl-1H-tetrazol-5-yl, 1-(1-(dimethylamino)eth-2-yl)-1H-tetrazol-5-yl, 1-(protected carboxymethyl)-1H-tetrazol-5-yl, 1-(carboxymethyl)-1H-tetrazol-5-yl sodium salt, 1-(methylsulfonic acid)-1H-tetrazol-5-yl sodium salt, 2-methyl-1H-tetrazol-5-yl, 1,2,3-triazol-5-yl, 1-methyl-1,2,3-triazol-5-yl, 2-methyl-1,2,3-triazol-5-yl, 4-methyl-1,2,3-triazol-5-yl, pyrid-2-yl N-oxide, 6-methoxy-2-(N-oxide)-pyridaz-3-yl, 6-hydroxypyridaz-3-yl, 1-methylpyrid-2-yl, 1-methylpyrid-4-yl, 2-hydroxypyrimid-4-yl, 1,4,5,6-tetrahydro-5,6-dioxo-4-methyl-as-triazin-3-yl, 1,4,5,6-tetrahydro-4-(formylmethyl)-5,6-dioxo-as-triazin-3-yl, 2,5-dihydro-5-oxo-6-hydroxy-as-triazin-3-yl, 2,5-dihydro-5-oxo-6-hydroxy-as-triazin-3-yl sodium salt, 2,5-dihydro-5-oxo-6-hydroxy-2-methyl-as-triazin-3-yl sodium salt, 2,5-dihydro-5-oxo-6-hydroxy-2-methyl-as-triazin-3-yl, 2,5-dihydro-5-oxo-6-methoxy-2-methyl-as-triazin-3-yl, 2,5-dihydro-5-oxo-6-methoxy-2-methyl-as-triazin-3-yl sodium salt, 2,5-dihydro-5-oxo-2-methyl-as-triazin-3-yl, 2,5-dihydro-5-oxo-2,6-dimethyl-as-triazin-3-yl, tetrazolo[1,5-b]pyridazin-6-yl, 4-(protected carboxymethyl)-5-methyl-1,3-thiazol-2-yl, 1,3,4-triazol-5-yl, 2-methyl-1,3,4-triazol-5-yl, 1H-tetrazol-5-yl, 1-methyl-1H-tetrazol-5-yl, 1-(1-(dimethylamino)eth-2-yl)-1H-tetrazol-5-yl, 1-(protected carboxymethyl)-1H-tetrazol-5-yl, 1-(methylsulfonic acid)-1H-tetrazol-5-yl, 1-(methylsulfonic acid)-1H-tetrazol-5-yl sodium salt, 1,2,3-triazol-5-yl, 1,4,5,6-tetrahydro-5,6-dioxo-4-methyl-as-triazin-3-yl, 1,4,5,6-tetrahydro-4-(2-formylmethyl)-5,6-dioxo-as-triazin-3-yl, 2,5-dihydro-5-oxo-6-hydroxy-2-methyl-as-triazin-3-yl sodium salt, 2,5-dihydro-5-oxo-6-hydroxy-2-methyl-as-triazin-3-yl, tetrazolo[1,5-b]pyridazin-6-yl, and 8-aminotetrazolo[1,5-b]pyridazin-6-yl, nitro or cyano; a group of the formula



wherein R_8 is hydrogen, C_1 to C_6 alkyl, C_1 to C_6 alkyl substituted by one or two halogen, hydroxy, protected hydroxy, amino, protected amino, C_1 to C_7 acyloxy, nitro, carboxy, protected carboxy, carbamoyl, carbamoyloxy, cyano, methylsulfonamino or C_1 to C_4 alkoxy groups, perfluoro C_2 to C_4 alkyl, C_7 to C_{12} arylalkyl group substituted on the C_1 to C_6 alkyl portion with one or two groups chosen from halogen, hydroxy, protected hydroxy, amino, protected amino, C_1 to C_7 acyloxy, nitro, carboxy, protected carboxy, carbamoyl, carbamoyloxy, cyano, N-(methylsulfonamino) or C_1 to C_4 alkoxy; and/or the phenyl group may be substituted with 1 or 2 groups chosen from halogen, hydroxy, protected hydroxy, nitro, C_1 to C_6 alkyl, C_1 to C_4 alkoxy, carboxy, protected carboxy, carboxy methyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, protected aminomethyl, or a N-(methylsulfonamino) group, phenyl, a phenyl group substituted with one or two moieties chosen from the group consisting of halogen, hydroxy, protected hydroxy, cyano, nitro, C_1 to C_6 alkyl, C_1 to C_4 alkoxy, carboxy, protected carboxy, carboxymethyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, trifluoromethyl or N-(methylsulfonamino), amino, an amino group with one substituent chosen from the group consisting of phenyl, a phenyl group substituted with one or two moieties chosen from the group consisting of halogen, hydroxy, protected hydroxy, cyano, nitro, C_1 to C_6 alkyl, C_1 to C_4 alkoxy, carboxy, protected carboxy, carboxymethyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, protected aminomethyl, trifluoromethyl or N-(methylsulfonamino), C_1 to C_6 alkyl, and C_7 to C_{12} arylalkyl, or an amino group with two substituents chosen from the group consisting of phenyl, a phenyl group substituted with one or two moieties chosen from the group consisting of halo-

gen, hydroxy, protected hydroxy, cyano, nitro, C_1 to C_6 alkyl, C_1 to C_4 from the group consisting of halogen, hydroxy, protected hydroxy, cyano, nitro, C_1 to C_6 alkyl, C_1 to C_4 alkoxy, carboxy, protected carboxy, carboxymethyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, protected aminomethyl, trifluoromethyl or N-(methylsulfonamino); or a group of the formula



wherein A is 1,3-thiazol-2-yl, 4-(protected carboxymethyl)-5-methyl-1,3-thiazol-2-yl, 1,2,4-thiadiazol-5-yl, 3-methyl-1,2,4-thiadiazol-5-yl, 1,3,4-triazol-5-yl, 2-methyl-1,3,4-triazol-5-yl, 2-hydroxy-1,3,4-triazol-5-yl, 2-(protected carboxy)-4-methyl-1,3,4-triazol-5-yl, 1,3-oxazol-2-yl, 1,3,4-oxadiazol-5-yl, 2-methyl-1,3,4-oxadiazol-5-yl, 1,3,4-thiadiazol-5-yl, 2-methyl-1,3,4-thiadiazol-5-yl, 2-thiol-1,3,4-thiadiazol-5-yl, 2-(methylthio)-1,3,4-thiadiazol-5-yl, 2-amino-1,3,4-thiadiazol-5-yl, 1H-tetrazol-5-yl, 1-methyl-1H-tetrazol-5-yl, 1-(1-(dimethylamino)eth-2-yl)-1H-tetrazol-5-yl, 1-(protected carboxymethyl)-1H-tetrazol-5-yl, 1-(carboxymethyl)-1H-tetrazol-5-yl sodium salt, 1-(methylsulfonic acid)-1H-tetrazol-5-yl sodium salt, 2-methyl-1H-tetrazol-5-yl, 1,2,3-triazol-5-yl, 1-methyl-1,2,3-triazol-5-yl, 2-methyl-1,2,3-triazol-5-yl, 4-methyl-1,2,3-triazol-5-yl, pyrid-2-yl N-oxide, 6-methoxy-2-(N-oxide)-pyridaz-3-yl, 6-hydroxypyridaz-3-yl, 1-methylpyrid-2-yl, 1-methylpyrid-4-yl, 2-hydroxypyrimid-4-yl, 1,4,5,6-tetrahydro-5,6-dioxo-4-methyl-as-triazin-3-yl, 1,4,5,6-tetrahydro-4-(formylmethyl)-5,6-dioxo-as-triazin-3-yl, 2,5-dihydro-5-oxo-6-hydroxy-as-triazin-3-yl, 2,5-dihydro-5-oxo-6-hydroxy-as-triazin-3-yl sodium salt, 2,5-dihydro-5-oxo-6-hydroxy-2-methyl-as-triazin-3-yl sodium salt, 2,5-dihydro-5-oxo-6-hydroxy-2-methyl-as-triazin-3-yl, 2,5-dihydro-5-oxo-6-methoxy-2-methyl-as-triazin-3-yl, 2,5-dihydro-5-oxo-2-methyl-as-triazin-3-yl, 2,5-dihydro-5-oxo-2,6-dimethyl-as-triazin-3-yl, tetrazolo[1,5-b]pyridazin-6-yl, 4-(protected carboxymethyl)-5-methyl-1,3-thiazol-2-yl, 1,3,4-triazol-5-yl, 2-methyl-1,3,4-triazol-5-yl, 1H-tetrazol-5-yl, 1-methyl-1H-tetrazol-5-yl, 1-(1-(dimethylamino)eth-2-yl)-1H-tetrazol-5-yl, 1-(protected carboxymethyl)-1H-tetrazol-5-yl, 1-(methylsulfonic acid)-1H-tetrazol-5-yl sodium salt, 1,2,3-triazol-5-yl, 1,4,5,6-tetrahydro-5,6-dioxo-4-methyl-as-triazin-3-yl, 1,4,5,6-tetrahydro-4-(2-formylmethyl)-5,6-dioxo-as-triazin-3-yl, 2,5-dihydro-5-oxo-6-hydroxy-2-methyl-as-triazin-3-yl sodium salt, 2,5-dihydro-5-oxo-6-hydroxy-2-methyl-as-triazin-3-yl, tetrazolo[1,5-b]pyridazin-6-yl, and 8-aminotetrazolo[1,5-b]pyridazin-6-yl;

R_3 and R_4 are the same or different and are hydrogen, C_1 to C_6 alkyl, C_1 to C_6 alkyl substituted by one or two halogen, hydroxy, protected hydroxy, amino, protected amino, C_1 to C_7 acyloxy, nitro, carboxy, protected carboxy, carbamoyl, carbamoyloxy, cyano, methylsulfonamino or C_1 to C_4 alkoxy groups, C_7 to C_{12} arylalkyl, C_7 to C_{12} arylalkyl group substituted on the C_1 to C_6 alkyl portion with one or two groups chosen from halogen, hydroxy, protected hydroxy, amino, protected amino, C_1 to C_7 acyloxy, nitro, carboxy, protected carboxy, carbamoyl, carbamoyloxy, cyano, N-(methylsulfonamino) or C_1 to C_4 alkoxy; and/or the phenyl group may be substituted with 1 or 2 groups chosen from halogen, hydroxy, protected hydroxy, nitro, C_1 to C_6 alkyl, C_1 to C_4 alkoxy, carboxy, protected carboxy, carboxymethyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, protected aminomethyl, or a N-(methylsulfonamino) group, or R_3 and R_4 are the same or different and are phenyl, a phenyl group substituted with one or two moieties chosen from the group consisting of halogen, hy-

droxy protected hydroxy, cyano, nitro, C_1 to C_6 alkyl, C_1 to C_4 alkoxy, carboxy, protected carboxy, carboxymethyl, protected carboxymethyl, hydroxymethyl, protected hydroxymethyl, aminomethyl, protected aminomethyl, trifluoromethyl or N-(methylsulfonamino), or a group of the formula



wherein R_{11} has the same definition as R_9 ;

R_5 and R_6 are:

- (1) each hydrogen;
- (2) taken together and form a phthalimido group; or
- (3) different and are either hydrogen or an amino-protecting group;

or a pharmaceutically-acceptable salt thereof.

4,716,233

PROCESS FOR PREPARING PHTHALIMIDO ISOXAZOLES

Jing-Jong Lu, and Herbert L. Wehrmeister, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 765,964, Aug. 15, 1985, Pat. No. 4,593,024.

This application Feb. 28, 1986, Ser. No. 834,686

Int. Cl. C07D 261/04

U.S. Cl. 548—245

1 Claim

1. The process of making 3-chloro-4-phthalimido-4,5-dihydroisoxazole, which comprises reacting a phthaloyl-containing compound with D-cycloserine to form a phthalimide with the 4-amino group of the D-cycloserine and reacting said phthalimide compound with a phosphorous chloride to form the imidoyl chloride, 3-chloro-4-phthalimido-4,5-dihydroisoxazole.

4,716,234

ULTRAVIOLET ABSORBING POLYMERS COMPRISING 2-(2'-HYDROXY-5'-ACRYLOYLOXYALKOXYPHENYL)-2H-BENZOTRIAZOLE

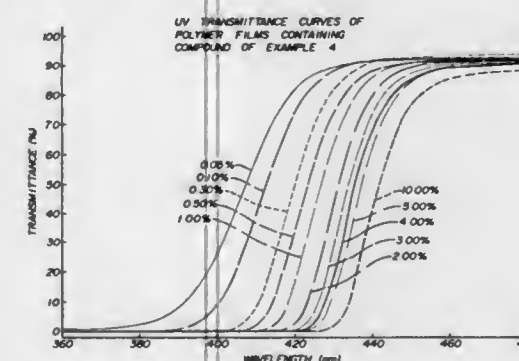
Gary B. Dunka, Upland; Akira Yamada, Claremont, both of Calif.; Charles D. Beard, Montclair, Del., and Namassivaya Doddi, Upland, Calif., assignors to Iolab Corporation, Covina, Calif.

Filed Dec. 1, 1986, Ser. No. 937,171

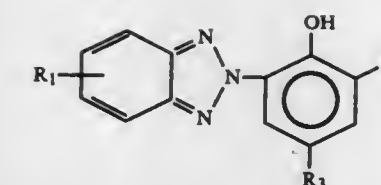
Int. Cl. C07D 249/16; C08F 232/08, 120/36

U.S. Cl. 548—259

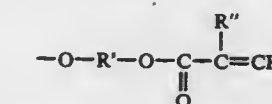
9 Claims



1. A compound of the formula



wherein R_1 is H, halogen or alkoxy of 1 to 3 carbon atoms, R_2 is selected from the group consisting of H, CH_3 , and t-alkyl of 4 to 6 carbon atoms, and R_3 is



wherein R' is C_{2-10} alkylene which may be straight chain or branched, and R'' is H, CH_3 or CH_2X where X is halogen.

4,716,235

PROCESS FOR PREPARING

N-[1(S)-ETHOXYCARBONYL-3-PHENYLPROPYL]-L-ALANYL-L-PROLINE

Satomi Takahashi, Kobe; Kenji Inoue; Yoshifumi Yanagida, both of Takasago; Takehisa Ohashi, Kobe, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanagafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 25, 1986, Ser. No. 900,051

Claims priority, application Japan, Aug. 27, 1985, 60-188243

Int. Cl. C07D 207/09

U.S. Cl. 548—533

6 Claims

1. A process for preparing N-[1(S)-ethoxycarbonyl-3-phenylpropyl]-L-alanyl-L-proline, which comprises reacting an N-carboxyanhydride of N-[1(S)-ethoxycarbonyl-3-phenylpropyl]-L-alanine with L-proline in an amount of 1 to 1.5 moles of L-proline per mole of the N-carboxyanhydride in the presence of at least one base selected from the group consisting of an hydroxide of an alkali metal, a carbonate of alkali metal, an hydrogencarbonate of an alkali metal, a secondary amine, a tertiary amine and a quaternary ammonium hydroxide, in a mixture of water and an organic solvent, at a temperature of from -20°C . to room temperature and with pH of the reaction system maintained within an alkaline range.

4,716,236

METHOD FOR SYNTHESIZING ESTERS

Frederick E. Ward, and Kin F. Yip, both of Elkhardt, Ind., assignors to Miles Laboratories, Inc., Elkhardt, Ind.

Continuation of Ser. No. 597,337, Apr. 6, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 805,254

Int. Cl. C07D 207/36

U.S. Cl. 548—556

6 Claims

1. The method of preparing the compound 3-(N-tosyl-L-alanyloxy)-5-phenylpyrrole which consists essentially of reacting 3-hydroxy-5-phenylpyrrole and N-tosyl-L-alaninyl-chloride in the presence of a solvent used for esterification, said solvent being selected from the group consisting of tetrahydrofuran, methylene chloride, chloroform, acetone, diethylether and benzene; a weak organic base selected from the group consisting of pyridine and 2,6-lutidine; and about 2.4 equivalents of trifluoroacetic acid based on about 1.2 equivalent of N-tosyl-L-alaninylchloride.

4,716,237

PROCESS FOR THE PRODUCTION OF 3-OXONITRILES
Karlheinz Drauz, Freigericht; Axel Kleemann, Hanau, and Elisabeth Wolf-Heuss, Mosbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 15, 1983, Ser. No. 475,395

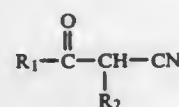
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209472

Int. Cl.⁴ C07D 333/24; C07C 121/34, 121/76

U.S. Cl. 549-72

17 Claims

1. A process for the production of a 3-oxonitrile of the formula



in which R₁ is a tertiary alkyl group, cycloalkyl group, aromatic hydrocarbon group or heteroaromatic group which is a pyridine group, piperidine group, thiazole group, furan group, thiophene group, pyrane group, morpholine group, benzothiazole group, pyrrole group, benzopyrrole group, quinoline group or oxazole group, or such a group containing a substituent non-reactive with sodium hydride and R₂ is hydrogen, an alkyl group having 1 to 4 carbon atoms or such an alkyl group substituted by an aryl group, an aryl group containing a substituent non-reactive with sodium hydride, a heteroaromatic group, which is a pyridine group, piperidine group, thiazole group, furan group, thiophene group, pyrane group, morpholine group, benzothiazole group, pyrrole group, benzopyrrole group, quinoline group or oxazole group or a heteroaromatic group containing a substituent non-reactive with sodium hydride, comprising reacting a carboxylic acid ester of the formula



(II)

in which R₃ is methyl or ethyl, with a carboxylic acid nitrile of the formula



(III)

in an inert solvent with sodium hydride, the sodium hydride being added as a 70-80% suspension in white oil.

4,716,238

CHROMENE DERIVATIVES USEFUL AS INSECTICIDES
Tibor Timár; Kálmán Zeupán; János Répási; Irén Borsos née Safranek, all of Tiszavasvári; István Kiss, Szeged; Ambrás Fodor, Szeged, and Péter Maróy, Szeged, all of Hungary, assignors to Alkaloida Vegyeszeti Gyar, Tiszavasvári, Hungary

Filed Feb. 14, 1984, Ser. No. 580,097

Claims priority, application Hungary, Feb. 15, 1983, 504

Int. Cl.⁴ C07D 311/58

U.S. Cl. 549-408

1 Claim

1. 5-methyl-7-cyclopentyl-2,2-dimethyl-2H-chromene.

4,716,239

NICKEL COMPOSITION SOLUBLE IN HYDROCARBONS

Gérard Provin, Ezanville; Alain Forestiere, Vernaison, and Dominique Commercene, Meudon, all of France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France

Filed Nov. 28, 1984, Ser. No. 675,594

Claims priority, application France, Nov. 29, 1983, 83 19183

Int. Cl.⁴ C07F 15/04

U.S. Cl. 556-147

16 Claims

1. A nickel liquid reaction product composition, soluble in hydrocarbons, obtained by the process comprising reacting:

a divalent nickel inorganic compound;
a halogenoacetic acid;
and an ester of the general formula R₁COOR₂, wherein R₁ is hydrogen or C₁₋₄-alkyl and R₂ is a hydrocarbyl radical.

4,716,240

1,2-DICHLORO-1,2,2-TRIMETHYL-1-PHENYLDISILANE AND METHOD FOR PRODUCING THE SAME

Yoichiro Nagai, Yamato; Hamao Watanabe, and Yoshinori Akutsu, both of Kiryu, all of Japan, assignors to Yuki Gosei Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1987, Ser. No. 11,964

Claims priority, application Japan, Feb. 19, 1986, 61-32808; Feb. 19, 1986, 61-32809

(I) Int. Cl.⁴ C07F 7/08, 7/12

U.S. Cl. 556-430

11 Claims

1. 1,2-dichloro-1,2,2-trimethyl-1-phenyldisilane expressed by the chemical formula (II),



4,716,241

CYCLOPENTANE DERIVATIVES

Takayoshi Yamauchi; Kaneaki Hattori; Shunichi Ikeda, and Kentaro Tamaki, all of Sakai, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,945

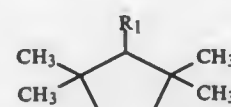
Claims priority, application Japan, Mar. 1, 1985, 60-40946; Jul. 5, 1985, 60-147821

Int. Cl.⁴ C07C 121/46

U.S. Cl. 558-44

1 Claim

1. A compound represented by the formula



wherein R₁ is cyano, formyl, or alkanesulfonyloxy.

4,716,242

SALTS OF OXAZAPHOSPHORINE DERIVATIVES

Jürgen Engel, Alzenau; Axel Kleemann, Mühlheim; Ulf Niemeyer; Peter Hilgard, both of Bielefeld, and Joerg Pohl, Halle, all of Fed. Rep. of Germany, assignors to Asta-Werke Aktiengesellschaft Chemische Fabrik, Bielefeld, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,465

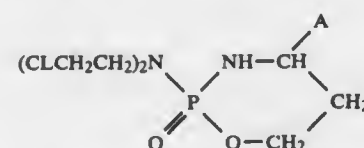
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407585

Int. Cl.⁴ C07F 9/40

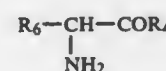
U.S. Cl. 558-81

7 Claims

1. A salt of oxazaphosphorine derivatives of the formula



where A is the group —S—alk—SO₃H and alk represents a C₂-C₄-alkylene residue with a basic compound of the formula:



II

wherein R₄ is a hydroxy group or an amino group R₆ is hydrogen or a C₁-C₆-alkyl group or a C₁-C₆-alkyl group which is substituted by an amino group or a guanido group.

4,716,243

α-(O-CHLOROPHENYL)-AMINOMETHYLENE-β-FORMYLAMINOPROPIONITRILE

Hansgeorg Ernst, Ludwigshafen; Wolfgang Littmann, Mannheim, and Joachim Paust, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 765,505

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431270

Int. Cl.⁴ C07C 87/24, 121/16; C07D 239/42

U.S. Cl. 558-395

1 Claim

1. α-(o-Chlorophenyl)-aminomethylene-β-formylaminopropionitrile.

4,716,244

PROCESS FOR THE PREPARATION OF STERICALLY HINDERED HYDROXYPHENYLCARBOXYLIC ACID ESTERS

Ivan Orban, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 21, 1986, Ser. No. 853,839

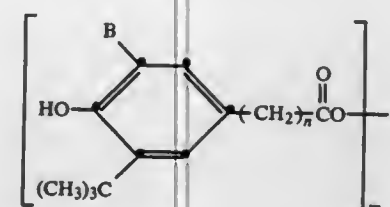
Claims priority, application Switzerland, May 2, 1985, 1870/85

Int. Cl.⁴ C07C 67/03

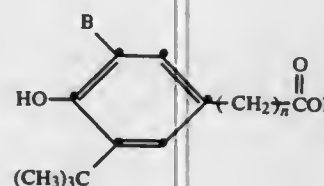
U.S. Cl. 560-75

6 Claims

1. A process for the preparation of a compound of formula I



wherein n is a number from 0 to 2, m is 1 or 2, A is a radical derived from an m-valent aliphatic alcohol, which radical contains 2 to 18 carbon atoms, and B is methyl or tert-butyl, by transesterification of about m moles of an ester of formula II at a temperature of 110° to 220° C. and under a pressure of 1000 to 2 mbar,



wherein R is methyl or ethyl, with an alcohol of formula III
A-(OH)_m

(III)

which process comprises

- carrying out the transesterification in the presence of an organic or inorganic zinc salt in an amount of 0.05 to 2.0 mol%, based on the ester of formula II, and
- distilling the resultant melt in a short-time distillation apparatus under a pressure in the range from 0.5 to 6 mbar and at a temperature in the range from 230° to 270° C., and granulating the melt obtained.

4,716,245

PROCESS FOR PRODUCING

2,6-NAPHTHALENEDICARBOXYLIC ACID

Isao Hirose, Matsuyama, Japan, assignor to Teijin Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 18, 1986, Ser. No. 853,693

Claims priority, application Japan, Apr. 24, 1985, 60-86563; Nov. 19, 1985, 60-257800

Int. Cl.⁴ C07C 51/265

U.S. Cl. 562-416

17 Claims

1. A process for producing 2,6-naphthalenedicarboxylic acid which comprises oxidizing 2,6-diisopropyl-naphthalene or its oxidation derivative with molecular oxygen in a reaction medium containing at least 70% by weight of an aliphatic monocarboxylic acid selected from the group consisting of acetic acid, propionic acid and a mixture of these in the presence of an oxidation catalyst comprising (A) at least one compound of a heavy metal selected from propionic acid and a mixture of these in the presence of an oxidation catalyst comprising (A) at least one compound of a heavy metal selected from the group consisting of compounds of cobalt, compounds of manganese, and mixtures thereof and (B) bromine or a bromine compound; characterized in that said oxidation is carried out in the presence of 1.1 to 15 gram-atoms, per gram-atom of bromine, of an alkali metal.

4,716,246

PROCESS FOR L-DOPA

Donald F. Reinhold, Morganville; Torleif Utne, Warren, and Newton L. Abramson, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 22, 1986, Ser. No. 899,283

Int. Cl.⁴ C07C 99/08

U.S. Cl. 562-446

3 Claims

1. A process for producing (S)-3-(3,4-dihydroxyphenyl)alanine which comprises:
- (1) hydrolyzing 5-vanillylhydantoin with alkali to obtain 3-(4-hydroxy-3-methoxyphenyl)alanine;
- (2) acetylating 3-(4-hydroxy-3-methoxyphenyl)alanine in aqueous alkali to obtain (R,S)-N-acetyl-3-(4-acetoxy-3-methoxyphenyl)alanine;
- (3) selectively and independently crystallizing the enantiomorphs, (S)-N-acetyl-3-(4-acetoxy-3-methoxyphenyl)alanine and (R)-N-acetyl-3-(4-acetoxy-3-methoxyphenyl)alanine in a parallel or a series operation;
- (4) hydrolyzing (S)-N-acetyl-3-(4-acetoxy-3-methoxyphenyl)alanine to obtain (S)-3-(3,4-dihydroxyphenyl)alanine; and
- (5) racemizing (R)-N-acetyl-3-(4-acetoxy-3-methoxyphenyl)alanine by warming an acetic acid dispersion thereof with acetic anhydride to obtain (R,S)-N-acetyl-3-(4-acetoxy-3-methoxyphenyl)alanine; and recycling the (R,S)-N-acetyl-3-(4-acetoxy-3-methoxyphenyl)alanine to Step 3.

4,716,247

PROCESS FOR THE PRODUCTION OF THIOSEMICARBAZIDE

Axel Kleemann; Herbert Klenk, and Wolfgang Schulz, all of Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,973

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204149

Int. Cl.⁴ C07C 159/00; C01B 21/093; C01C 3/20

U.S. Cl. 564-18

13 Claims

1. A process for forming hydrazine thiocyanate comprising reacting hydrazine with hydrogen cyanide and sulfur.
3. A process of preparing thiosemicarbazide comprising reacting hydrazine with hydrogen cyanide and sulfur to form hydrazine thiocyanate and heating the hydrazine thiocyanate to form thiosemicarbazide.

4,716,248

AMINOCYCLOHEXYL-SUBSTITUTED, BRANCH
ALKYLAMINESFrederick H. Howell, Atherton, England, and Josef Pfeifer,
Therwil, Switzerland, assignors to Ciba-Geigy Corporation,
Ardsley, N.Y.

Continuation of Ser. No. 388,360, Jun. 14, 1982, abandoned.

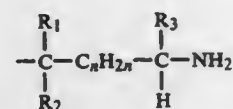
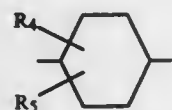
This application Oct. 12, 1984, Ser. No. 660,196

Claims priority, application United Kingdom, Jun. 19, 1981,
8119009Int. Cl.⁴ C07C 101/72

U.S. Cl. 564-454

12 Claims

1. A compound having the formula I

wherein p is 1 or 2 and the residues QNH₂ are the same or
different and each is a residue of formula:wherein n is an integer from 1 to 15; R₁ is C₁-C₈ alkyl; R₂ is
C₁-C₄ alkyl; or R₁ and R₂, together with the carbon atom to
which they are attached, form a C₅-C₈ cycloalkylene residue;
R₃ is H or C₁-C₆ alkyl, C₃-C₈ cycloalkyl or C₆-C₁₀ aryl; and
Y is a divalent cyclohexylene residue of formula:wherein R₄ and R₅ are H or C₁-C₄ alkyl or, when p is 1, the
group R₄, together with the group X, can form a tetramethyl-
ene chain substituted by the group QNH₂, X is NH₂ or QNH₂
or X may be combined with R₄ as hereinbefore defined; and,
when p is 2, X is a direct bond or a -CH₂- or -O- residue;
as well as salts with organic or inorganic acids; and stereoisomers
of formula I.

4,716,249

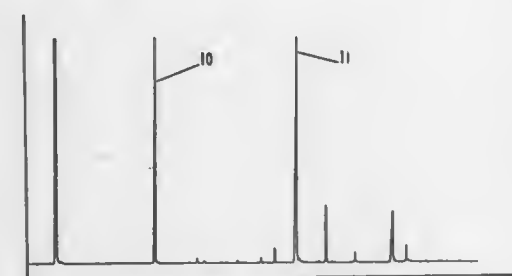
PROCESS FOR PREPARING NATURAL
BENZALDEHYDE AND ACETALDEHYDEAlan O. Pittet, Atlantic Highlands, N.J., assignor to Interna-
tional Flavors & Fragrances Inc., New York, N.Y.Continuation of Ser. No. 872,913, Jun. 11, 1986, which is a
division of Ser. No. 780,298, Sep. 26, 1985, Pat. No. 4,617,419.

This application Oct. 31, 1986, Ser. No. 925,788

The portion of the term of this patent subsequent to Oct. 14,
2003, has been disclaimed.Int. Cl.⁴ C07C 45/51

U.S. Cl. 568-433

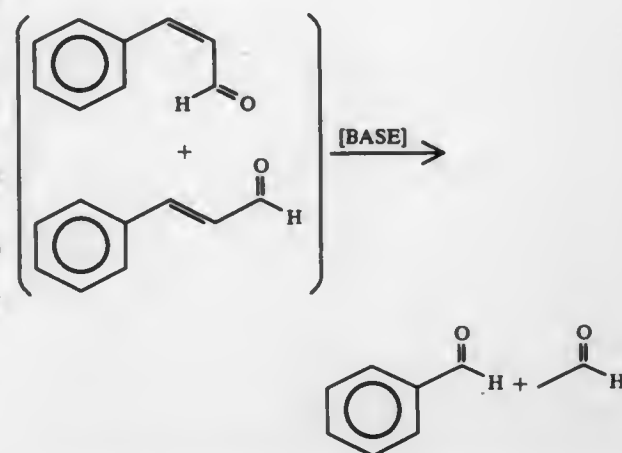
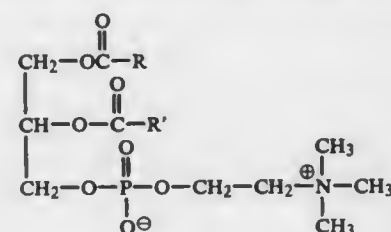
1 Claim



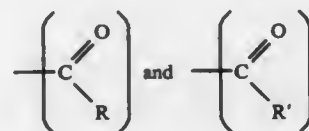
GC-IR SPECTRUM FOR EXAMPLE I

1. A method of making benzaldehyde comprising:

- (i) dispersing cinnamaldehyde in water;
- (ii) converting the cinnamaldehyde to benzaldehyde accord-
ing to the reaction:

under the action of heat at reflux conditions in the pres-
ence of a mixture of natural base and in the presence of an
ionic surfactant which is lecithin having the structure:

wherein the residues:

represent palmitoyl, stearoyl, oleyl, linoleyl, linolenyl and
C₂₀-C₂₂ acid residues, the temperature range of the reac-
tion being between 40° C. and 150° C.; the pressure range
of the reaction being between 0.2 and 10 atmospheres; the
time of reaction being between 5 and 80 hours; the mole
ratio of base:cinnamaldehyde being from 0.1:1 up to 4:1;

- (iii) distilling benzaldehyde and acetaldehyde from the cin-
namaldehyde; and
- (iv) recovering benzaldehyde from the distillate.

4,716,250

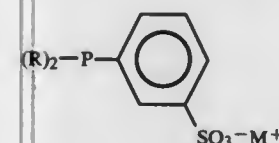
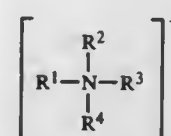
HYDROFORMYLATION USING LOW
VOLATILE/ORGANIC SOLUBLE PHOSPHINE
LIGANDSAnthony G. Abatjoglou, Charleston, and David R. Bryant, South
Charleston, both of W. Va., assignors to Union Carbide Corpo-
ration, Danbury, Conn.

Filed Jul. 10, 1986, Ser. No. 884,197

Int. Cl.⁴ C07C 45/50

U.S. Cl. 568-454

19 Claims

1. In a non-aqueous hydroformylation process for producing
aldehydes which comprises reacting an olefinically unsatu-
rated organic compound with carbon monoxide and hydrogen,
in a non-aqueous hydroformylation reaction medium contain-
ing an organic solubilized Group VIII transition metal-phos-phorus ligand complex catalyst and free phosphorus ligand,
wherein the hydroformylation reaction conditions comprise a
reaction temperature of from about 45° C. to about 200° C., a
total gas pressure of hydrogen, carbon monoxide and olefini-
cally unsaturated compound of less than about 1500 psia;
wherein the H₂:CO molar ratio of gaseous hydrogen to carbon
monoxide is in the range of from about 1:10 to 100:1; and
wherein said reaction medium contains at least about 4 moles
of total free phosphorus ligand per mole of Group VIII transi-
tion metal in said medium, the improvement comprising em-
ploying as the phosphorus ligand of said complex catalyst and
as said free phosphorus ligand, a low volatile, organic soluble
monosulfonated tertiary phosphine salt the general formulawherein each R group individually represents a radical con-
taining from 1 to 30 carbon atoms selected from the class
consisting of alkyl, aryl, alkaryl, aralkyl and cycloalkyl radi-
cals and M represents an amine cation having the general
formulawherein R¹ represents hydrogen or a radical containing from 1
to 30 carbon atoms selected from the class consisting of alkyl,
aryl, alkaryl, aralkyl, and cycloalkyl radicals, and each R², R³
and R⁴ group individually represents a radical selected from
the class consisting of alkyl, aryl, alkaryl, aralkyl and cyclo-
hexyl radicals, and wherein any two or three of said R¹, R², R³
and R⁴ groups can be bonded together to form a mono-, bi-, or
poly-cyclic ring along with the nitrogen atom of said amine
cation; with the proviso that in any given monosulfonated
tertiary phosphine salt employed at least one of said R¹, R², R³
and R⁴ groups of the amine cation, M, represents an alkyl or
aralkyl radical containing from 8 to 30 carbon atoms.

4,716,251

DIARYLOXYALKANE BROMINATION PROCESS

Gerald L. Scymanski, Trenton; Amgad S. Mossaad, South River,
and Saadat Hussain, East Brunswick, all of N.J., assignors to
Ethyl Corporation, Richmond, Va.

Filed Feb. 7, 1986, Ser. No. 826,994

Int. Cl.⁴ C07C 41/18, 43/225

U.S. Cl. 568-645

19 Claims

1. A process for brominating a diaryloxyalkane to produce a
product containing an average of about 5-7 bromine atoms per
molecule, said process comprising:

- (a) commingling a solution of said diaryloxyalkane in a
haloalkane solvent with an excess of liquid bromine in the
absence of a bromination catalyst at a temperature from
about 0° C. up to the reflux temperature of the mixture;
- (b) allowing the resultant mixture to react to form the de-
sired brominated diaryloxyalkane; and
- (c) recovering said brominated diaryloxyalkane.

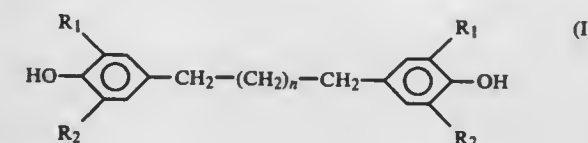
4,716,252
PROCESS FOR THE PREPARATION OF
BIS-HYDROXYPHENYL-N-ALKANES, NEW
BIS-HYDROXYPHENYL-N-ALKANES AND NEW
ALKANEDIONESRudolf Wagner, Cologne; Kurt Halcour, Leverkusen; Hans-
Rudolf Dicke, and Volker Eckhardt, both of Krefeld, all of
Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft,
Leverkusen, Fed. Rep. of Germany

Filed Jul. 28, 1986, Ser. No. 891,491

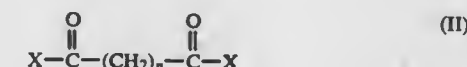
Claims priority, application Fed. Rep. of Germany, Aug. 2,
1985, 3527862Int. Cl.⁴ C07C 39/16, 37/00

U.S. Cl. 568-729

5 Claims

1. A process for the preparation of a bis-hydroxyphenyl-n-
alkane of the formula (I)

in which

n represents an integer in the range from 0 to 10, and
R₁ and R₂, independently of one another, represent hydro-
gen, C₁- to C₁₂-alkyl, C₁- to C₄-alkoxy and/or halogen,
wherein 1 mol of a dicarboxylic acid or dicarboxylic acid
derivative of the formula (II)

in which

n has the abovementioned meaning, and

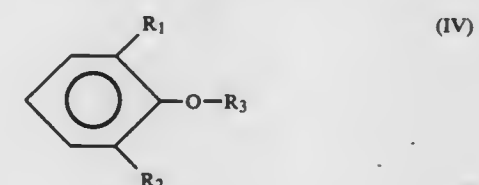
X represents

(a) OH or halogen, or both X's form, together with the
molecular moiety -CO-(CH₂)_n-CO-, the corre-
sponding cyclic or polymeric dicarboxylic anhydride, or
represents

(b) the radical (III)



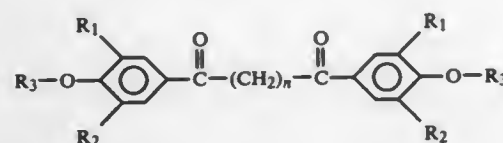
in which

R₁ and R₂ have the abovementioned meaning, is contacted
with 1 to 10 mols of a fluorine-containing organic sul-
phonic acids, with the addition, in the case where X=(a),
of a phenolic compound of the formula (IV)

in which

R₁ and R₂ have the abovementioned meaning, and
R₃ represents hydrogen or C₁- to C₁₂-alkyl, at temperatures
in the range from 20° to 120° C., pressures in the range
from 0.5 to 5 bar and holdup times in the range from 1

minute to 2 hours to form an alkanedione of the formula (V)



in which
n, R₁, R₂ and R₃ have the abovementioned meaning, which is converted by hydrogenation, and in the case where R₃=C₁- to C₁₂-alkyl by an additional ether cleavage, into a bis-hydroxyphenyl-n-alkanes.

4,716,253

METHOD FOR PRODUCING CYCLOALKANOLS

Tamio Shirafuji, Kiyomi Sakai, both of Niihama, and Ken-ichi Hirose, Settsu, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 12, 1986, Ser. No. 929,510

Claims priority, application Japan, Nov. 19, 1985, 60-259479; Nov. 25, 1985, 60-265904

Int. Cl.⁴ C07C 29/04, 35/18

U.S. Cl. 568—895

11 Claims

1. A method for producing a cycloalkanol having from 5 to 8 carbon atoms by the hydration of a cycloalkene having from 5 to 8 carbon atoms with water using a solid acid as a catalyst which comprises carrying out said hydration at a temperature in the range from about 50° C. to about 200° C. in the presence of a phenol having one or more hydroxyl groups directly bonded to a benzene ring.

4,716,254

PREPARATION OF AROMATIC IODINE COMPOUNDS

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 7, 1986, Ser. No. 882,575

Int. Cl.⁴ C07C 17/12

U.S. Cl. 570—147

14 Claims

1. An iodination process comprising the step of contacting
(a) a feed stream comprising at least one monohalobenzene compound with
(b) an iodination reagent selected from the group consisting of (i) iodine monochloride (ii) mixtures of free iodine and free chloride having an I₂:Cl₂ mol ratio in the range of from about 1:3 to about 3:1, and
(c) a catalyst composition comprising at least one material selected from the group consisting of lanthanide chlorides, mixtures of iron(III) chloride with cerium chloride and mixtures of iron(III) chloride with samarium chloride; under such iodination conditions as to obtain a product comprising at least one para-iodohalobenzene compound; wherein the weight ratio of iron(III) chloride to cerium chloride in said mixtures of iron(III) chloride with cerium chloride is in the range of from about 1:10 to about 20:1, and the weight ratio of iron(III) chloride to samarium chloride in said mixtures of iron(III) chloride with samarium chloride is in the range of from about 1:10 to about 20:1.

4,716,255

PROCESS FOR THE PRODUCTION OF 3,3-DICHLORO-2-METHYLPROPENE

Dieter J. Müller, Marl, Fed. Rep. of Germany, assignor to Hoes Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,418

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3330610; Apr. 25, 1984, 3415337

Int. Cl.⁴ C07C 17/06

U.S. Cl. 570—216

17 Claims

1. A process for the production of 3,3-dichloro-2-methylpropene as predominant product, comprising reacting 1-chloro-2-methylpropene with sulfuryl chloride in the presence of an effective amount of a compatible and nitrogen-containing organic base having a catalytically effective free pair of electrons or phosphine.

4,716,256

HYDROGENATION OF DIENES

Marvin M. Johnson, and Gerhard P. Nowack, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 31, 1985, Ser. No. 696,971

Int. Cl.⁴ C07C 5/02

U.S. Cl. 585—274

9 Claims

1. A process for the selective hydrogenation of 4-vinylcyclohexene to 4-ethylcyclohexene which comprises contacting said 4-vinylcyclohexene under hydrogenation conditions in the presence of hydrogen, a catalyst consisting essentially of elemental nickel on an inorganic support, and at least one nitrogen-containing compound; wherein said at least one nitrogen-containing compound is selected from the group consisting of: pyridine, 2-methylpyridine, 4-methylpyridine, quinoline, isoquinoline, hydrazine, ethylene diamine, hexamethylene diamine, NR₃, wherein each R is independently H, a C₁ up to about C₁₀ alkyl or a C₅ up to about C₁₀ cycloalkyl or aromatic radical; and mixtures of any two or more thereof; and within the amount of said at least one nitrogen-containing compound ranges from about 0.01 up to 5 mole percent based on the moles of said 4-vinylcyclohexene.

4,716,257

ORGANOLANTHANIDE CATALYSTS

Tobin J. Marks, and Heiko Mauermann, both of Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

Division of Ser. No. 715,927, Mar. 25, 1985, Pat. No. 4,668,773. This application May 14, 1987, Ser. No. 29,186

Int. Cl.⁴ C07C 5/03

U.S. Cl. 585—275

6 Claims

1. A method for hydrogenating olefins comprising the steps of
(a) filling an evacuated reaction vessel with a measured volume of solvent;
(b) preparing a substantially pure hydrogen atmosphere in said reaction vessel and over said solvent;
(c) adding measured amounts of a catalyst and an olefin, said catalyst including a lanthanide complex of the formula (Cp₂MH)₂, where Cp'=(η⁵(CH₃)₅C₅) and M is selected from the group consisting of the Lanthanide Series elements; and
(d) mixing; whereby said olefin is hydrogenated.

ELECTRICAL

4,716,258

STAMPED CONCENTRATORS SUPPORTING PHOTOVOLTAIC ASSEMBLIES

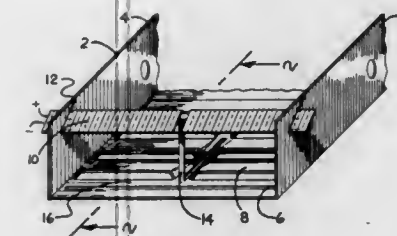
R. Michael Murtha, 1010 Janetwood Dr., Oxnard, Calif. 93030

Filed Jan. 23, 1987, Ser. No. 6,373

Int. Cl.⁴ H02N 6/00

U.S. Cl. 136—246

4 Claims



1. A radiant energy concentrating collector comprising: reflective sheet material formed as a module and having stamped louvers therein with open spaces therebetween and connected by common-border-areas, said common-border-areas including rib means, said rib means supporting a photovoltaic cell assembly, the louvers being positioned to reflect sunlight falling on the module to said photovoltaic cell assembly.

4,716,259

BOTH-SIDE FLEXIBLE PRINTED CIRCUIT BOARD

Go Tokura, Kanagawa; Kazuhiko Arakawa, Tokyo, and Jun Terashima, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

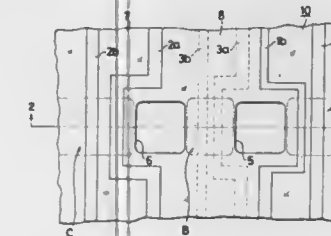
Filed Jan. 23, 1986, Ser. No. 821,606

Claims priority, application Japan, Feb. 1, 1985, 60-013096[U]

Int. Cl.⁴ H05K 1/00

U.S. Cl. 174—68.5

6 Claims



1. A two-sided flexible printed circuit board, including a substrate having electrically conducting patterns and cover layers formed on both sides, comprising: apertures formed in a curved portion of said printed circuit board, surface portions of said curved portion having said conducting patterns formed only on the front surface or back surface so that the conducting patterns are not superimposed one over the other in said curved portion, and said cover layers being formed only on the conducting pattern side at the surface portion of said curved portion of said board in said curved portion.

4,716,260

PUSHING AND PULLING CABLE

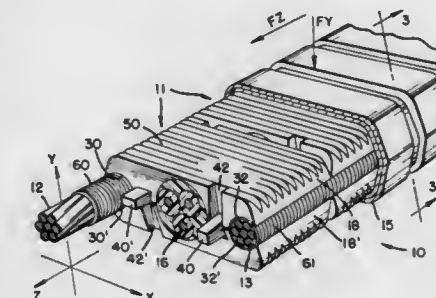
Ernest G. Hoffman, Middlefield, and David H. Neuroth, Hamden, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Aug. 13, 1986, Ser. No. 896,011

Int. Cl.⁴ H01B 7/18

U.S. Cl. 174—102 R

25 Claims



1. An elongated cable structure having a longitudinal axis and comprising:
an outer layer extending substantially parallel to the longitudinal axis of the cable structure and defining an elongated internal cavity, said outer layer being substantially rigid in longitudinal and transverse directions for receiving longitudinal and transverse components of driving forces when applied to the cable structure and being bendable about said longitudinal axis;
at least one elongated tensile element in said cavity having its longitudinal axis extending substantially parallel to said longitudinal axis of said cable structure and being bendable about said longitudinal axis of said cable structure for pulling and pushing the cable substantially longitudinally;
a plurality of longitudinally disposed gripping members positioned in said cavity between said outer layer and said tensile element; and
means coupling said gripping members to said outer layer in a region where said transverse components of driving forces are to be applied to said layer, whereby said members are drive-coupled to said layer, said members substantially enclosing and transversely compressing longitudinal segments of said tensile element to grip and to increase the longitudinal rigidity of such segments, whereby transfer of the driving forces from said outer layer to said tensile element pushing and pulling forces is effected.

4,716,261

SECTION INSULATOR FOR ELECTRIC RAILWAY CONTACT CONDUCTORS

Helmuth Wehrberger, Roettenbach, and Ulrich Summa, Bubendorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

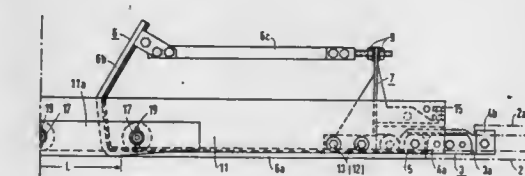
Filed May 23, 1986, Ser. No. 867,103

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 8516717[U]

Int. Cl.⁴ B60M 1/18

U.S. Cl. 191—39

6 Claims



1. A section insulator for electric railway contact conductors having the ends of two contact conductors each secured to

a first upright insulation strip and a second upright insulation strip by means of a respective contact conductor terminal clamp and a respective support member; the insulation strips are constructed of fiber-reinforced plastic; two arc horns with an approximate U-shape attached between the two insulation strips to the support members, one leg of each arc horn forming a runner which is contacted by an electric railway current collector, and the other leg of each arc horn forming an adjustment bracket connected back to its respective support member; and a contact runner portion of each arc horn connecting the two legs forming an approximately V-shaped arc guide, the improvement comprising:

- a first upright contact bar and a second upright contact bar for providing a contact surface for the current collector at the space between the runners of the arc horns, wherein the first upright contact bar is connected to the first upright insulation strip and the second upright contact bar is connected to the second upright insulation strip; and
- a plurality of spacers for separating the upright contact bars from the upright insulator strips;
- the bottom side of each upright insulation strip located above the contact surface for the current collector.

4,716,262

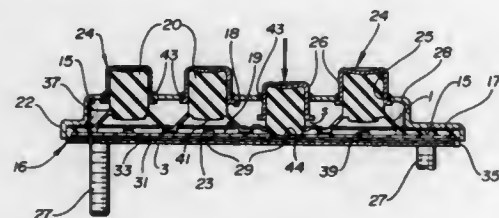
VANDAL-RESISTANT TELEPHONE KEYPAD SWITCH
Milton Morse, Fort Lee, N.J., assignor to Nena Morse, Fort Lee, N.J.

Continuation-in-part of Ser. No. 544,391, Oct. 21, 1983, Pat. No. 4,555,600, and a continuation-in-part of Ser. No. 381,905, May 25, 1982, Pat. No. 4,501,936, and a continuation-in-part of Ser. No. 299,509, Sep. 4, 1981, Pat. No. 4,436,965, and a continuation-in-part of Ser. No. 286,063, Jul. 23, 1981, abandoned, and a continuation-in-part of Ser. No. 261,647, May 7, 1981, abandoned, and a continuation-in-part of Ser. No. 236,757, Feb. 23, 1981, Pat. No. 4,438,300. This application Nov. 22, 1985, Ser. No. 801,136

Int. Cl.⁴ H01H 13/70

U.S. Cl. 200—5 A

15 Claims



1. A switch assembly comprising:
 - a pressure-actuated switch including a rigid support plate; a base layer of flexible material having a front face formed with an array of electrically-conductive paths thereon connected to said support plate;
 - an intermediate layer formed on said base layer having apertures therethrough overlying portions of said electrically-conductive paths of said base layer;
 - a top layer formed on said intermediate layer having electrically-conductive paths thereon a portion of said paths overlying said apertures in said intermediate layer;
 - a continuous flexible membrane overlying said top layer and sealing said top layer and said plate and formed with a relatively thick projecting portion at each aperture in said intermediate layer;
 - each of said projecting portions being connected to said membrane via a conical support surface;
 - a rigid shield connected to said switch and formed with an array of throughgoing apertures aligned with and generally identical to those of the intermediate layer and having a rear face confronting the sealing portion of said membrane, the thick projecting portions of the membrane

projecting forward through the apertures of the shield plate past the front face thereof;

means for securing the shield plate to the membrane with the apertures aligned; and respective rigid caps fitted over the thickened portions, projecting forward through the shield plate apertures.

4,716,263

RECIPROCALLY ACTUATED SWITCH WITH ROTATABLE CONTACT SELECTOR

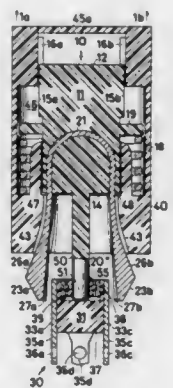
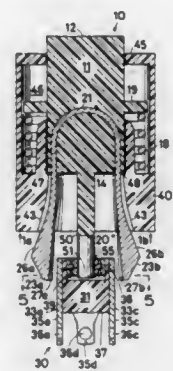
Karel Havel, P.O. Box 66, Station M, Toronto, Ontario, Canada M6S 4T2

Continuation-in-part of Ser. No. 901,878, Aug. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 852,768, Apr. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 844,690, Mar. 27, 1986, abandoned. This application Jun. 24, 1987, Ser. No. 65,901

Int. Cl.⁴ H01H 19/00, 21/00, 25/06

U.S. Cl. 200—11 R

6 Claims



1. A rotary switch comprising:
 - a stationary member including an insulating body having a plurality of stationary contact pairs angularly arranged thereon;
 - a rotary member including a rotary body and a flexible conducting bridging element secured thereto;
 - said rotary body being coupled to said stationary member for rotating about an axis to bring said bridging element to one of a plurality of angular rotary positions aligned with a selective one of said contact pairs; and
 - a slider member arranged on said rotary member for reciprocating movement along said axis to an engaging position, for deflecting said bridging element into electrical engagement with the aligned contact pair on said stationary member, and to a disengaging position, for releasing said bridging element from said aligned contact pair.

4,716,264

VACUUM SWITCH

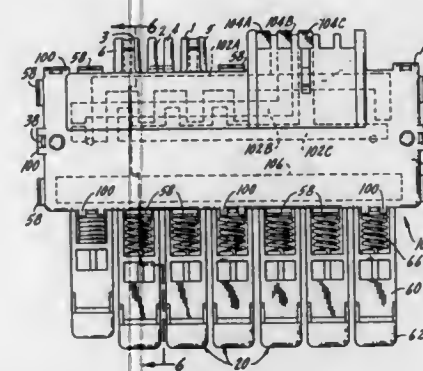
Charles P. Toulouse, Winona, Minn., assignor to Lake Center Industries, Winona, Minn.

Filed Mar. 11, 1987, Ser. No. 24,628

Int. Cl.⁴ H01H 9/06

U.S. Cl. 200—61.86

27 Claims



1. A vacuum switch for connecting a plurality of vacuum lines in variable combinations, comprising:
 - a vacuum housing including a plurality of ports connectable to the vacuum lines, and a plate member having on one side a plurality of separate channels, at least two of the channels being in fluid communication with separate ports, each channel having at least one passage therein extending through the plate member;
 - seal means for sealing the channels sufficiently to maintain a vacuum in them;
 - a plurality of valves slidably engaging, in sealing relation, the surface of the other side of the plate member, each valve having a cavity in its central portion adjacent the surface of the plate to provide fluid communication between two channels when the valve is placed such that the cavity spans a pair of passages.

4,716,265

CIRCUIT BREAKER WITH ARC SHIELDED CONTACT ARM

Hiroshi Fujii; Tsukasa Iio; Yasuji Genba; Hideaki Moriwaki, and Yoshinori Mochizuki, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

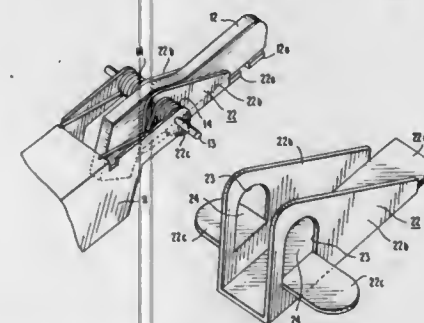
Filed Jun. 15, 1987, Ser. No. 61,522

Claims priority, application Japan, Sep. 9, 1986, 61-138778[U]

Int. Cl.⁴ H01H 33/08, 9/30

U.S. Cl. 200—144 R

4 Claims



1. A circuit breaker, comprising:
 - (a) a stationary contact arm (2) having a stationary contact (2a);
 - (b) a movable contact arm (12) having a movable contact (12a) for engaging with and separating from the stationary contact to close and open a current flow path;

- (c) a contact mounting arm (11) for rotatably supporting the movable contact arm about a shaft (13);
- (d) contact-pressure spring means (14) disposed on the shaft for biasing the movable contact arm toward the stationary contact arm; and
- (e) an electrically insulating shield (22) disposed on the shaft, underlying a bottom face of the movable contact arm, overlying opposite side faces thereof, and underlying the contact-pressure spring means to prevent a contact separation arc from migrating along the movable contact arm and/or welding any turns of the spring means together.

4,716,266

ELECTRICAL ARC QUENCHING CHAMBER, IN PARTICULAR FOR FLUID-QUENCHED CIRCUIT BREAKERS

Giuseppe Muscaglione, Pontirolo Nuovo, and Gianpiero Talpo, Bergamo, both of Italy, assignors to SACE S.p.A. Costruzioni Elettromeccaniche, Milan, Italy

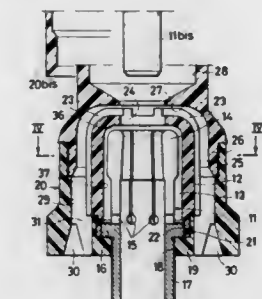
Filed Oct. 15, 1986, Ser. No. 918,879

Claims priority, application Italy, Dec. 3, 1985, 23074 A/85

Int. Cl.⁴ H01H 33/70

U.S. Cl. 200—148 R

20 Claims



1. An electric arc interruption chamber particularly adapted for use with fluid-quenched circuit breakers having an arc-quenching gas within a sealed electrically insulated casing comprising a movable main contact and a stationary main contact each having a respective arc contact, said movable arc contact being a tulip contact defined by a plurality of spaced fingers, a generally bell-shaped member constructed of electrically insulating material, said bell-shaped member being defined by a peripheral wall and an end wall, said end wall having an opening in alignment with and through which relatively moves said stationary arc contact, an exterior of said fingers and an interior of said bell-shaped member defining a first chamber, said movable main contact having a housing constructed of electrically insulating material; said housing being defined by a peripheral wall and an end wall in external space relationship to said bell-shaped member peripheral wall and end wall, respectively, and defining therewith a second chamber; said housing end wall having an opening in alignment with and through which relatively moves said stationary arc contact; means cooperatively defined by an exterior of said bell-shaped member and an interior of said housing for forming arc-quenching gas flow zones in said second chamber for directing arc-quenching gas along said second chamber toward said opening, into said first chamber and into said tulip contact; and said arc-quenching gas flow zones include both low speed/low pressure zones and high speed/high pressure zones.

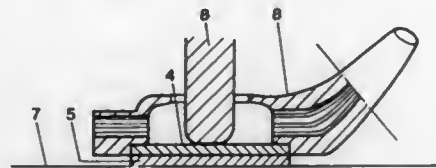
4,716,272
METHOD OF ATTACHING A CONNECTION PIECE TO A METAL SURFACE BY BRAZING

Per A. Blad, Stockholm, and Rolf Johansson, Åkersberga, both of Sweden, assignors to AGA Aktiebolag, Lidingö, Sweden
Filed Jul. 19, 1985, Ser. No. 756,631

Claims priority, application Sweden, Aug. 10, 1984, 8404050
Int. Cl.⁴ B23K 1/10

U.S. Cl. 219—129

10 Claims



1. A method of connecting a connection piece of metal to a base metal surface by brazing, comprising the steps of: providing heat generated by an electric arc from a consumable electrode; conducting said heat through at least a portion of said connection piece, causing melting of a brazing metal provided between said connection piece and said base metal surface, applying a mechanical force to said portion of said connection piece after current to the electric arc has been disconnected, pressing said connection piece against said base metal surface, and wherein said portion of said connection piece prevents the electric arc from direct contact with said base metal surface and said brazing metal, thereby preventing disadvantageous thermal actuation of said base metal surface.

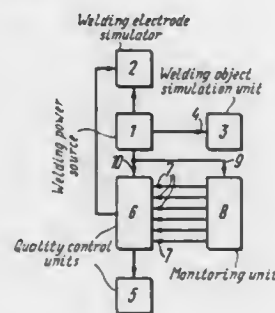
4,716,273
ELECTRIC-ARC TRAINER FOR WELDERS
Boris E. Paton; Vsevolod V. Vasiliev; Valentin A. Bogdanovsky; Sergei N. Danilyak; Viktor M. Gavva; Jury P. Roiko, and Valery A. Nushko, all of Kiev, U.S.S.R., assignors to Institute Problem Modelirovaniya V Energetike Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.
Filed Dec. 30, 1986, Ser. No. 947,886

Claims priority, application U.S.S.R., Dec. 30, 1985, 400057[I]

Int. Cl.⁴ B23K 9/10

U.S. Cl. 219—130.01

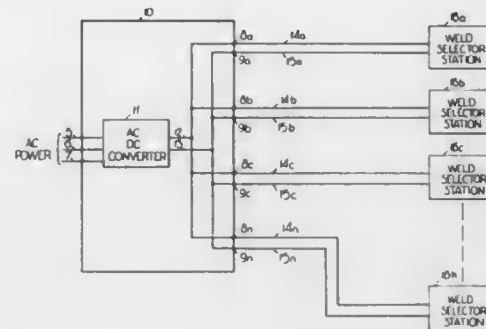
10 Claims



1. An electric-arc trainer for welders, said electric-arc trainer comprising:
a welding electrode simulator having a first input to which a supply voltage is applied, and a second input to which a signal is applied to control a simulated electrode-melting rate depending on a running length of an arc gap;
a welding power source having a first output connected to said first input of said simulator for applying the supply voltage to said simulator, a second output for ensuring together with said first output that welding current is

running, and a third output at which a signal is produced to indicate the current arc gap length;
a welding object simulation unit having an input connected to said second output of said welding power source;
said welding electrode simulator interacting with said welding object simulation unit to produce a welding arc;
a control unit having a first input, a second input, a first output, and a second output;
said control unit producing sound signals received by the trainee to indicate if the simulated welding process is being run normally and counting the factors selected from a group including the number of errors made by the trainee, the operating time of the simulated welding process, the total time of the simulated welding process, the time of the simulated welding process without errors, and the weld-on time of the welding electrode simulator, and indicating at least one of said factors;
said first input of said control unit being connected to said third output of said welding power source;
said first output of said control unit being connected to said second input of said welding electrode simulator, and at which the signal is formed to control the simulated electrode-melting rate, depending on the running length of the arc gap;
a unit monitoring parameters of the welding process, having an input to which the signal of the current arc gap length is applied, said input being connected to said third output of said welding power source and an output connected to said second input of said control unit, at which output the signals are formed to correspond to the values of respective parameters of the simulated welding process;
a helmet connected to said second output of said control unit at which signals are formed to provide feedback sound signals to inform the trainee if the welding process is correct.

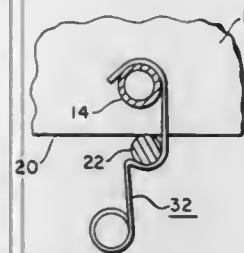
4,716,274
DISTRIBUTED STATION WELDING SYSTEM
Malcolm T. Gilliland, 310 Pine Valley Rd., Marietta, Ga. 30067
Filed Oct. 25, 1985, Ser. No. 791,224
Int. Cl.⁴ B23K 9/10
U.S. Cl. 219—130.21 22 Claims



2. An improved welding power supply, comprising:
power supply means for providing a source of DC power; and
weld parameter selection means for providing welding power with electrical parameters desirable for a predetermined welding operation, said weld parameter selection means comprising:
a power input terminal;
input voltage sensing means responsive to an input voltage present at said power input terminal for providing an input voltage signal;
current limiting means;
first switching means responsive to a first drive signal for providing said welding power through said current limit-

ing means to an output terminal, said welding power comprising an output voltage and an output current;
arc sustaining means connected in parallel with said first switching means for providing a predetermined minimum welding power, said predetermined minimum welding power being capable of sustaining an arc;
driving means responsive to a second drive signal and a shutdown signal for selectively providing said first drive signal having a first set of electrical parameters to said first switching means;
feedback current sensing means for providing a current feedback signal responsive to said output current;
first oscillation means for providing said second drive signal, said second drive signal having a second set of electrical parameters, at least one of said second set of electrical parameters being responsive to said input voltage signal and a selected one of the following signals; said current feedback signal, a first manually adjustable signal, and both said current feedback signal and said first manually adjustable signal;
average current sensing means for providing said shutdown signal in response to the average value of said output current exceeding a predetermined maximum average output current value;
peak current sensing means for providing said shutdown signal in response to the peak value of said output current exceeding a predetermined maximum peak output current value; and
first output voltage sensing means for providing said shutdown signal in response to said output voltage being below a predetermined minimum voltage, said predetermined minimum voltage being less than an arc sustaining voltage required to sustain an arc.

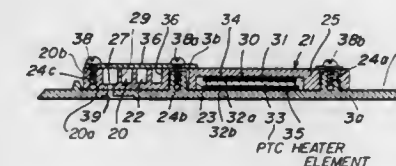
4,716,275
EVAPORATOR COIL HEAT EXCHANGER ASSEMBLY
William L. Waldschmidt, Farmington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.
Filed Nov. 13, 1986, Ser. No. 930,198
Int. Cl.⁴ H05B 1/00
U.S. Cl. 219—201 6 Claims



1. An elevator coil heat exchanger assembly comprising:
a plurality of refrigerant carrying tubes,
a plurality of cooling fins disposed in heat conducting relation with said tubes,
said cooling fins being disposed in spaced relation with a predetermined spacing,
a heating element for defrosting the evaporator coil section, and a plurality of spring retainer clips disposed to hold said heating element against the cooling fins,
each of said spring retainer clips being a single piece of wire having first and second ends, and at least first, second, and third curved sections which proceed in the recited order from the first end towards the second end,
said first, second and third curved sections each having a concave side, with the concave sides of the first and second curved sections facing one another, and with the concave side of the third curved section facing the second end of the wire,
said first, second, and third curved sections being disposed in a common plane, to enable the associated portions of the

spring retainer clip to fit in the predetermined spacing between adjacent cooling fins,
said first and second curved sections being respectively disposed about a tube of said evaporator section and about said heating element,
said first and second curved sections being spaced by a predetermined dimension selected to cause a spring retainer clip to exert a force against the heating element, to hold the heating element against the cooling fins.

4,716,276
ELECTRIC STEAM IRON HAVING A DETACHABLE HANDLE
Akio Motegi, and Takao Saito, both of Saitama, Japan, assignors to Sanyo Corp., Japan
Continuation of Ser. No. 637,771, Aug. 3, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,214
Claims priority, application Japan, Sep. 5, 1983, 58-137683
Int. Cl.⁴ H05B 1/02; F22B 1/28; D06F 75/14, 75/34
U.S. Cl. 219—253 13 Claims



1. A portable steam iron, comprising:
a hollow housing; a sole plate at the base of the housing; a steam vent in the sole plate communicating with said hollow housing for outlet of steam from the housing;
a water inlet to the housing and a water supply on said housing in communication with the inlet to the hollow of the housing for delivery of water to the housing;
a generally serpentine passage defined in and through the hollow of the housing and placed and shaped for transmitting water from the vicinity of the inlet toward the steam vent and for transmitting steam to the steam vent;
heat generating means in the hollow of the housing for heating water in the passage for generating steam in the passage from water in the passage, said passage having elements therein for defining a heating surface for water, and also for heating the sole plate to an ironing temperature, the heat generating means being provided with means for establishing different levels of heating of the sole plate; the iron also comprising temperature control means having a selector knob in the housing and operatively connected to the heat generating means for selecting a heat setting for the heating means; and
a handle detachably attachable to the housing for supporting the housing in use; the handle also having means defining a storage case for the iron replaceable with respect to the periphery of the housing and with respect to the periphery of the sole plate; the selector knob being shaped and positioned with respect to the periphery of said housing and the sole plate to interfere with the emplacement and removal of the handle into the storage position;
the knob having a cut away portion which provides clearance for allowing the handle to be moved past the knob to the storage position; the cut away portion being located on the knob so that when the knob is rotated to the position for the heating means to be off, the cut away portion is positioned relative to the periphery of the housing and the sole plate to permit the handle to be moved past the knob through the cut away portion to the storage position.

4,716,277

ELECTRIC HOTPLATE

Felix Schreder, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc und Fischer, Fed. Rep. of Germany

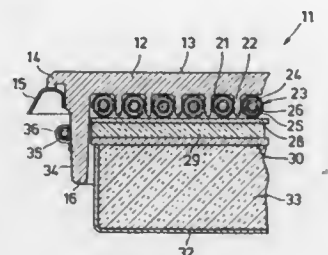
Filed Nov. 21, 1985, Ser. No. 800,516

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443529

Int. Cl.⁴ H05B 3/70

U.S. Cl. 219—449

8 Claims



1. An electric hotplate, comprising:

a hotplate body of cast material, the hotplate body having cast-in-slots defined on a lower side thereof, the slots being defined between narrow ribs in the hotplate body and the slots being arranged substantially parallel to one another;

tubular heaters including electrical heating resistors embedded in an electrical heating insulating material within a tubular metal casing, the tubular heaters being arranged in the slots, the slots engaging the heaters by at least two thirds of a circumference of the tubular heaters, whereby metallic contact is provided between the metal casing and inner surfaces of the slots;

the hotplate body having a downwardly directed rim, surrounding the hotplate body;

a temperature regulator including a thermal expansion system having at least two temperature sensors, the two temperature sensors being filled with an expansion fluid and connected to an outside of the rim at two substantially facing portions of the rim and being interconnected with the thermal expansion system and with one another by capillary tubes; and,

a double-contact switch responsive to the thermal expansion system and having two switch contacts operated at two temperatures by the expansion system and switching two separately-energized portions of said tubular heaters.

4,716,278

APPARATUS FOR WARMING UP AND STERILIZING BABIES BOTTLES

Alain Cappe, Quiberon, and Claude Nabet, Montrouge, both of France, assignors to Thermababy, S.A., Auray, France

Filed Jun. 10, 1986, Ser. No. 872,578

Claims priority, application France, Jun. 10, 1985, 85 08745

Int. Cl.⁴ H05B 3/58

U.S. Cl. 219—521

7 Claims

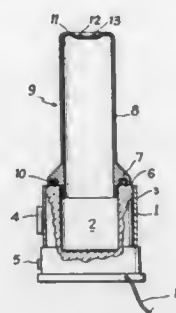
1. An electrical apparatus for warming and sterilizing a baby's bottle, comprising:

a base portion forming an open well provided with a first electrical heating device controlled by a thermostat and adapted to warm up the bottle,

a lid adapted to be hermetically fixed on said base portion forming together with said well a tightly closed compartment, said compartment adapted to contain a bottle and to hold water, and having at least one valve communicating between the compartment and the exterior of said apparatus,

a second electrical heating device for heating the water held

in said closed compartment to a temperature higher than 100° C., and for sterilizing said bottle, means for controlling said second electrical heating device,



means for disconnecting said second electrical heating device after sterilization has been accomplished.

4,716,279

SELF-TEMPERATURE CONTROLLING TYPE HEATING DEVICE

Makoto Hori, Ohgaki; Toshiatsu Nagaya, Kariya; Hirokatsu Mukai; Hitoshi Niwa, both of Okazaki, and Naoto Miwa, Tsushima, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

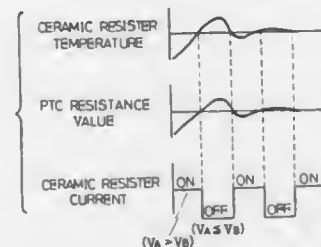
Filed Aug. 30, 1985, Ser. No. 771,053

Claims priority, application Japan, Sep. 7, 1984, 59-188672

Int. Cl.⁴ H05B 1/02

U.S. Cl. 219—541

6 Claims



1. A self-temperature controlling type heating device comprising:

a ceramic resistor having:

a first domain which has a substantially low resistance and hardly or never exhibits a positive temperature coefficient, said first domain being designed to have a thickness in which a logarithm of a ratio of resistance value at 200° C. to that of 20° C. is not more than 2; and

a second domain which has a higher resistance than said first domain and remarkably exhibits a positive temperature coefficient, said second domain having a characteristic in which a logarithm of a ratio of resistance value at 200° C. to that of 20° C. is more than 2.

first and second electrodes provided on said first domain to flow an electric current through said first domain and allow said first domain to generate heat,

a third electrode provided on said second domain to flow an electric current through said second domain in cooperation with said first electrode, and

an electric control circuit for controlling the electric current flow in said first domain in accordance with electric resistance variation of said second domain which is caused by the heating effect of the heat generation of said first domain.

4,716,280

PARTICLE COUNTING DEVICE

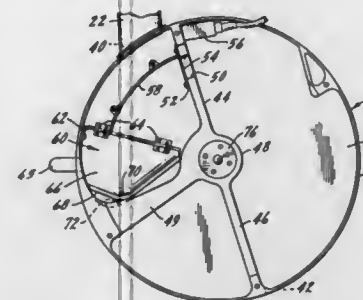
Ray Eberle, Champaign, Ill., assignor to Illinois Foundation Seeds, Inc., Champaign, Ill.

Filed Jan. 12, 1987, Ser. No. 2,191

Int. Cl.⁴ G06M 9/02

U.S. Cl. 235—98 C

16 Claims



1. A counting device for counting particles of granular material, comprising:

a housing having at least one surface defining at least a partial enclosure;

particle supply means associated with the housing for introducing uncounted particles into the housing;

counting means mounted on the housing surface for counting individual particles;

a well having at least one wall pivotally mounted to the housing surface for rotation between a first normal position wherein the well receives and holds uncounted particles from the supply means and a second cleanout position wherein uncounted particles are purged from the housing;

transferring means mounted in the housing enclosure for carrying individual particles from the well to the counting means where they are counted and then released; and

discharge means associated with the housing for directing counted particles out of the counting device.

4,716,281

METHOD FOR CONTROLLING TERMINAL DISPLAY INDICATION

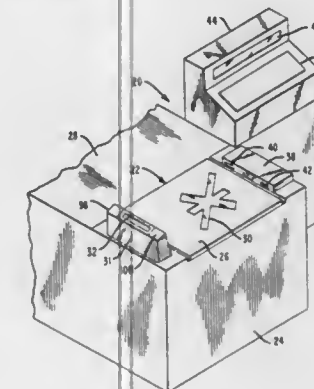
Gene L. Amacher, Cambridge; Gene R. Mathes, Zanesville; John F. Paugstat, Salesville, and Barry M. Mergenthaler, Cambridge, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed May 27, 1986, Ser. No. 867,658

Int. Cl.⁴ G06K 15/00

U.S. Cl. 235—383

9 Claims



1. A method for utilizing a single display of a system having a terminal and both merchandise item scanning capability including a scanner and merchandise item weighing capability including a scale to display both information derived from scanning a merchandise item and information derived from

weighing a merchandise item, and to provide similar indications of the correctness of a scanning operation and the correctness of a weighing operation to a terminal operator, said display having associated therewith a first indicator for indicating a satisfactory scan or a satisfactory weigh and a second indicator for indicating that a satisfactory scan or a satisfactory weigh has not been completed, comprising the following steps: maintaining both of said first and second indicators in an unactivated condition during the time that a scanning operation is in progress; activating the first or the second indicator to indicate a successful or an unsuccessful scanner operation; and initiating a weighing operation only when either said first indicator or said second indicator is activated, and when an item to be weighed is placed on the scale and a steady representation of its weight is generated.

4,716,282

FOCUS STATE DETECTION METHOD AND APPARATUS WITH SELECTIVE STATISTICAL PROCESSING

Akira Akashi, Yokohama; Hiroshi Ohmura, Wako; Akira Ishizaki, Yokohama; Keiji Ohtaka, Tokyo, and Yasuo Suda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

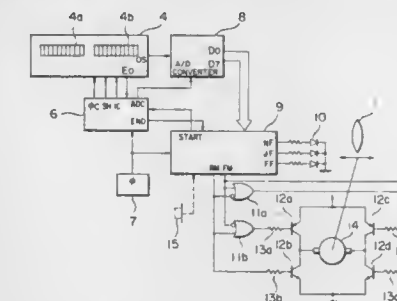
Filed Aug. 9, 1985, Ser. No. 764,002

Claims priority, application Japan, Aug. 17, 1984, 59-171038

Int. Cl.⁴ G01N 1/20

U.S. Cl. 250—201

13 Claims



1. A focus state detection method comprising: a first step of photoelectrically detecting an image pattern of an object to produce a detection signal; a second step of sampling the detection signal a plurality of times, statistically processing the detection signals and detecting focus state in accordance with a result of the statistical processing; a third step of detecting focus state in accordance with the detection signal without the statistical processing; and a fourth step of selecting one of said second step and said third step.

4,716,283

OPTICAL HEAD FOR FOCUSING A LIGHT BEAM ON AN OPTICAL DISK

Hideo Ando, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 7, 1985, Ser. No. 742,396

Claims priority, application Japan, Jun. 12, 1984, 59-120373

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

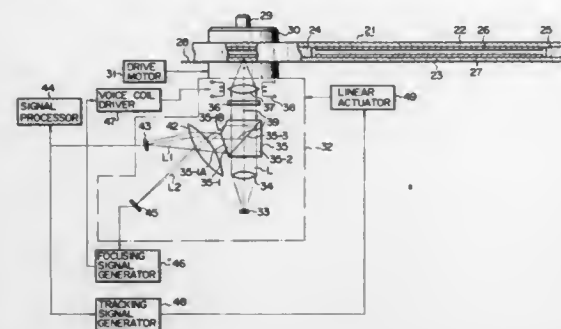
Int. Cl.⁴ G01J 1/20

U.S. Cl. 250—201

20 Claims

1. An optical head for focusing a light beam on an information recording layer, comprising: light source means for emitting a light beam; objective lens means for converging the light beam emitting from the light source, applying the light beam to the

information recording layer and transferring the light beam reflected from the information recording layer, said objective lens means forming a focused beam spot corresponding to a beam waist of said light beam on the information recording layer when said light beam is accurately focused on the information recording layer, and for forming a beam spot larger than said focused beam spot on the information recording layer when said light beam is inaccurately focused on the information recording layer; means for reducing, in a predetermined direction, the size of the light beam transferred from the objective lens means;



first photodetecting means with first and second photosensitive regions on which the transferred light beam is applied; and means for shielding a portion of the light beam reduced in said predetermined direction in accordance with the distance between the objective lens means and information recording layer, thereby applying the light beam to the first and second photosensitive regions when it is accurately focused on the information recording layer and to only one of the first and second photosensitive regions when it is inaccurately focused on the information recording layer.

4,716,284

PHOTOGRAPHIC OPTICAL SYSTEM HAVING ENHANCED SPECTRAL TRANSMITTANCE CHARACTERISTICS

Tsunefumi Tanaka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

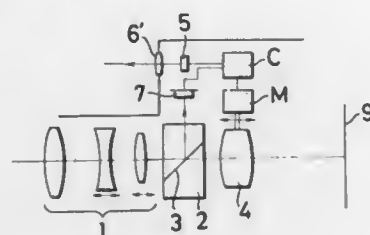
Filed Mar. 8, 1985, Ser. No. 709,447

Claims priority, application Japan, Mar. 12, 1984, 59-46853

Int. Cl.⁴ G03B 3/10

U.S. Cl. 250—201

10 Claims



6. A photographic optical system comprising:
(a) objective optical means having an optical path;
(b) optical path splitting means arranged on the image side of said objective optical means for splitting said optical path;
(c) image receiving means arranged on one of the split parts of the optical path to receive an image of an object;
(d) a light source for emitting a light beam of invisible wavelength region and a light detector for receiving said light beam reflected from said object for detecting whether or not the image of the object is focussed on the image re-

ceiving means, at least one of said light source and light detector being located on another of the split parts of said optical path; and

(e) rear optical means arranged between said optical path splitting means and said image receiving means, wherein the superimposed characteristic of the spectral transmittance characteristic of said objective optical means and the spectral transmittance characteristic of said rear optical means matches the sensitivity characteristic of said image receiving means, and in said invisible wavelength region the spectral transmittance of said objective optical means is larger than the spectral transmittance of said rear optical means.

4,716,285

LIGHT AMOUNT CORRECTION METHOD AND APPARATUS FOR IMAGE OUTPUT SYSTEM

Masahiro Konishi, Kaisel, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

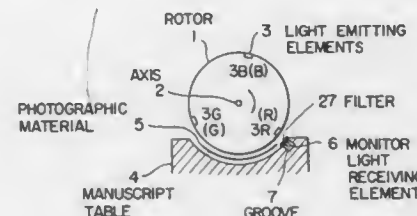
Filed Aug. 21, 1985, Ser. No. 767,911

Claims priority, application Japan, Aug. 23, 1984, 59-175763; Sep. 5, 1984, 59-185897

Int. Cl.⁴ G01J 1/32

U.S. Cl. 250—205

10 Claims



1. A light amount correction apparatus for an image recording system wherein a photographic material is exposed with light from semiconductor light sources of three colors to record images, which comprises:

a driving circuit which controls said semiconductor light sources electrically with image signals so as to emit light; a monitor circuit which sequentially measures the amount of light emitted from said semiconductor light sources with a photosensor and respectively outputs voltage signals corresponding thereto;

setting circuits for respectively setting reference signals for the three colors;

a correction circuit which adds deviations to said image signals, said deviations being obtained by respectively comparing voltage signals from said monitor circuit with said reference signals; and

a filter disposed between said semiconductor light sources and said photosensor for equalizing a spectral sensitive characteristic of said photosensor with a spectral sensitive characteristic of said photographic material; wherein each exposure amount of light from said semiconductor light sources pass through said filter so as to always expose said photographic material with light having a constant amount and temperature.

4,716,286

ELECTRO-OPTICAL PAPER DISPENSER CONTROLLER HAVING A VARIABLE GAIN AMPLIFIER WITH DIGITAL INPUT CONTROL MEANS

Lawrence D. Taylor, Lansdale, Pa., assignor to Brandt, Inc., Bensalem, Pa.

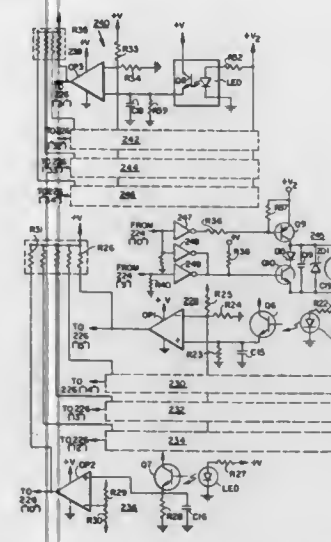
Division of Ser. No. 699,055, Feb. 7, 1985, Pat. No. 4,660,822.

This application Mar. 27, 1986, Ser. No. 844,891

Int. Cl.⁴ H01J 40/14

U.S. Cl. 250—214 R

6 Claims



1. A gain control circuit for automatically adjusting the output of a liquid sensing element comprising:

a light source;
said light sensing element being positioned to receive light from said light source;
a variable gain amplifier including digital input control means for amplifying the output signal of said sensing element wherein the gain is adjusted in accordance with a digital input applied to said input control means;
converter means for converting the amplified signal to a digital output;
means for comparing the digital output against a selectable reference value;
said comparison means including means for applying a digital signal to the input control means of said variable gain amplifier to adjust the gain of the variable gain amplifier to bring the digital output of said converter means into comparison with said reference value.

4,716,287

LIGHT PIPE FOR AN OPTICAL MOUSE

Eric Nestler, Cambridge, Mass., assignor to Symbolics Inc., Cambridge, Mass.

Filed Sep. 6, 1985, Ser. No. 773,403

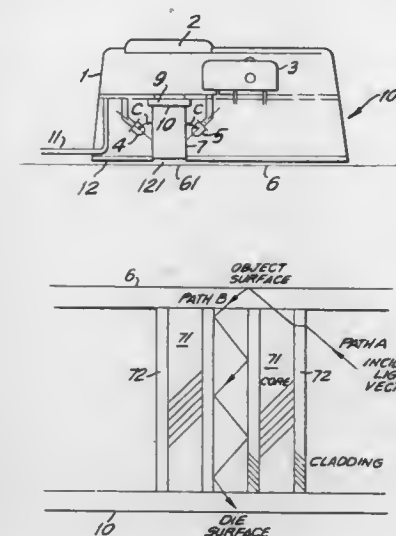
Int. Cl.⁴ G09G 1/00; H01J 5/16

U.S. Cl. 250—227

7 Claims

1. In a device for optically sensing an image on a planar object surface, wherein the device has a planar base with an aperture therein framing a particular portion of the image on the object surface to be sensed and shielding said portion from ambient light, optical sensing means having a surface disposed substantially in a single plane and light transmission means for transmitting light from the object surface at the aperture to the sensing surface, the improvement wherein: the sensing surface is disposed parallel to the planar base and vertically aligned with the aperture; the light transmission means comprises a block of light transmitting fibers disposed between the sensing surface and the aperture, at least one light source disposed above the base and directing light of a given wavelength solely on the sides of the block at an acute angle; wherein the block comprises a plurality of parallel light transmissive regular

polygonal fiber cores each surrounded by light transmissive cladding having a lower index of refraction than the core, wherein the thickness of the cladding is greater than the given



wavelength of the light from the light source and the ratio of the width of the core to the thickness of the cladding ranges from 4 to 24.

4,716,288

SECURITY DEVICE FOR DETECTING DEFECTS IN TRANSMITTING FIBER

Yuzuru Dol, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 316,385, Oct. 29, 1981, abandoned.

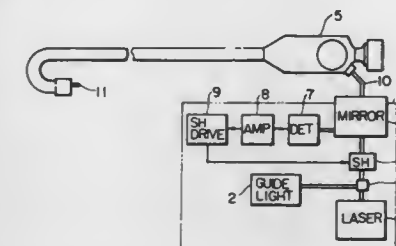
This application Apr. 2, 1986, Ser. No. 847,137

Claims priority, application Japan, Nov. 1, 1980, 55-154328

Int. Cl.⁴ G01N 21/88

U.S. Cl. 250—227

16 Claims



1. In a laser machining or medical instrument wherein a laser irradiating light beam and a guide light beam are introduced into an optical fiber through an entrance end face thereof, are transmitted along said optical fiber and exit said optical fiber from an exit end face thereof, fault detecting means comprising:

light detecting means for detecting the amount of light reflected back toward said entrance end face by interior surfaces of said optical fiber, laser cutoff means, and drive means for actuating said laser cutoff means when the amount of light detected by said light detecting means varies from a predetermined value determined accordance with the amount of reflection normally caused at said fiber exit end face.

4,716,289

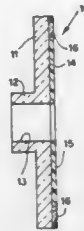
OBTURATOR DISC FOR AN OPTICAL TRANSDUCER
Giampaolo Guerrini, Ivrea, and Emilio Caligaris Cappio, Biella, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Apr. 30, 1985, Ser. No. 728,865

Claims priority, application Italy, May 2, 1984, 67437 A/84
Int. Cl.⁴ G01D 5/34

U.S. Cl. 250—231 SE

8 Claims



1. An obturator disc for an optical transducer comprising: a cylindrical element of transparent plastic material having a front surface, and a central hub projecting from a rear surface opposite to said front surface and provided with a through hole for fitting the cylindrical element to a rotating member, wherein the central hub and the cylindrical element with its front surface are obtained as a single moulding; and
- a layer of opaque material fixed on the front surface of said cylindrical element to define said obturator disc; wherein said layer of opaque material comprises a deposit of photosensitive material provided with a plurality of transparent radial windows disposed along an annular zone of said front surface coaxial with an axis of the through hole of said central hub; and
- wherein said radial windows are obtained by exposition of said photosensitive material to light and through a pattern mask coaxial with the axis of the through hole of said central hub and in which have been preformed said radial windows.

4,716,290

ROTARY ENCODER WITH INTERMITTENT FEED MEANS

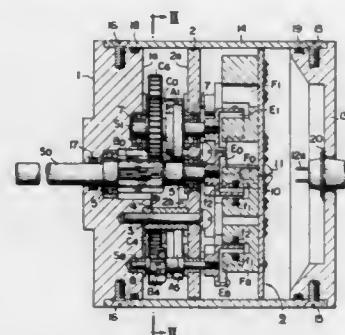
Yoshiaki Ogawa, Kamakura, Japan, assignor to Nippon Gear Co., Ltd., Fujisawa, Japan

Filed Nov. 6, 1984, Ser. No. 668,751

Claims priority, application Japan, Nov. 29, 1983, 58-223128
Int. Cl.⁴ G01D 5/38

U.S. Cl. 250—231 SE

9 Claims



1. A compact rotary encoder including encoders, gear shafts and a train of gears, each having teeth meshed together in a multi-stage arrangement, each stage comprising a driving wheel, a driven wheel, and a second driven wheel so as to successively reduce rotation of later stages, the encoders are provided with the gear shafts at desired stages in order to

count revolutions of a power input shaft, said driving and driven wheels being spur gears, wherein the driving spur gear and its corresponding driven spur gear, between each desired stages of the train of gears, form an intermittent feed means permitting idling of said driving spur gear and reducing rotation between desired stages, characterized in that:

the number of teeth of said driving spur gear is 16 and the number of teeth of said driven spur gear is 8, the teeth of said driving spur gear are removed except for two teeth adjacent each other and another two mutually-adjacent teeth which are diametrically opposite the two adjacent teeth, wherein said intermittent feed means has a gear ratio of 4:8 so as to achieve a revolution reduction ratio of $\frac{1}{2}$ and said encoders are one-bit encoders mounted on end portions of each of said gear shafts of the respective stages of the train of gears.

4,716,291

COPYING MACHINE

Hiroshi Sakamoto, Fukuoka; Toshihiro Torigoe, Kasuya, and Tadashi Yamaguchi, Fukuoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

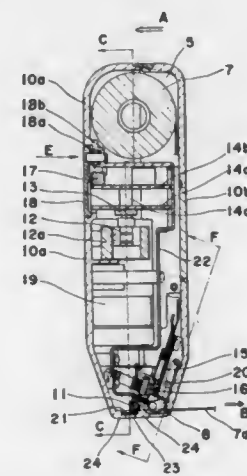
Filed May 14, 1985, Ser. No. 733,806

Claims priority, application Japan, May 16, 1984, 59-97984; May 16, 1984, 59-97983; Jan. 18, 1985, 60-6960

Int. Cl.⁴ G03C 5/16

U.S. Cl. 250—318

20 Claims



1. A copying machine comprising: an image sensor of train type having a plurality of sensing cells arranged in a line for detecting image information of a manuscript to be copied; an illumination means for illuminating the manuscript to be copied with a beam of light; an optical means for introducing the beam of light so as to be focused with the image of the manuscript to be copied on the image sensor; a print means for printing image information onto a copy paper in accordance with an output of the image sensor; an electric power source for supplying electric power to the image sensor and the print means; a housing for accommodating therein the image sensor, the illumination means, the optical means, the print means, the electrical power source, and copy paper; and paper guiding means in the housing for guiding the copy paper in contact with the print means and then out of the housing in overlapping relationship with the manuscript to be copied during a copying operation, the paper guiding means comprising an opening adjacent a portion of the housing which confronts the manuscript during the copying operation so that the copy paper can be withdrawn from the housing by fixing a portion of the copy paper in contact with the manuscript with one hand of a user of the

copying machine and moving the housing relative to the manuscript with the other hand of the user to thereby apply image information to the copy paper with the print means as the copy paper is withdrawn from the housing.

4,716,292

LINEAR INCREMENTAL MEASURING SYSTEM FOR MEASURING SPEED AND DISPLACEMENT

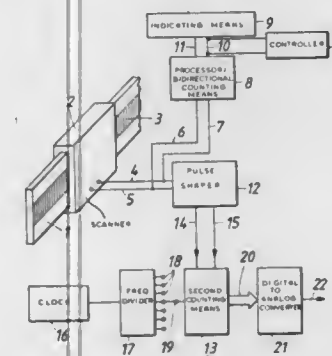
Heinz Rieder, St. Pantaleon, and Max Schwaiger, Ostermieding, both of Austria, assignors to RSF-Elektronik Gesellschaft m.b.H., Tarsdorf, Austria

Filed Jul. 1, 1985, Ser. No. 750,859

Claims priority, application Austria, Jul. 6, 1984, 2174/84
Int. Cl.⁴ G01D 5/34

U.S. Cl. 250—237 G

3 Claims



1. A linear measuring system, comprising: a linear incremental scale; a scanning unit displaceable in a scanning movement along said scale for generating two phase-displaced analog signals in response to said scanning movement, a direction of phase displacement of said analog signals representing direction of said scanning movement; a processor connected to said scanning unit and receiving said analog signals therefrom for generating digital signals representing said analog signals and for simultaneously generating direction-indicating signals; bidirectional counting means connected to said processor and receiving said digital signals therefrom for counting said digital signals and generating a count related to the extent of said scanning movement and receiving direction-indicating signals from said processor so that the direction of counting by said counter represents the direction of said scanning movement; indicating means connected to said counting means for providing a display of said extent of said scanning movement; a digital-to-analog conversion circuit connected to said processor and receiving said digital signals therefrom for converting said digital signals to an analog output proportional to the velocity of said scanning movement and with a polarity which depends upon the direction of said scanning movement; said digital-to-analog conversion circuit comprising: second counting means for receiving digital signals from said processor and for counting said digital signals, a digital-to-analog converter for sampling the count of said second counting means and for deriving from the count thus sampled an analog voltage having under the control of said direction-indicating signals a polarity depending on the instantaneous direction of said scanning movement, and means comprising a clock effecting a sampling of the count of said second counting means by said digital-to-analog converter and a resetting of said second counting means during alternate periods defined by said clock wherein said second counting means being bidirectional counting means for counting said digital signals from said processor

in a sense depending on the concurrently generated direction-indicating signals.

4,716,293

ACCESSORY FOR INFRARED EMISSION SPECTROSCOPY SPECTROSCOPY

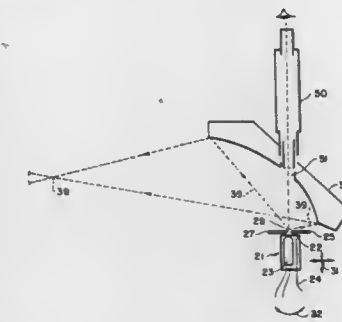
Nicolas J. Harriek, Croton Dam Rd., Ossining, N.Y. 10562

Filed May 16, 1986, Ser. No. 863,732

Int. Cl.⁴ G01N 21/62; G01J 3/443

U.S. Cl. 250—340

15 Claims



1. An accessory for infrared emission spectroscopy comprising: a. a base member; b. a member having a sample-supporting surface portion mounted on the base member; c. a masking member mounted closely adjacent and over the sample-supporting surface portion and having a highly-reflecting upper surface and a small aperture therein; d. a curved first mirror subtending a large solid angle and having a first focus and mounted on the base member; e. said masking member being mounted so as to extend completely between the curved first mirror and the sample-supporting surface portion and such that the first focus of the first mirror is located substantially at the said aperture.

4,716,294

PYRODETECTOR FOR THE DETECTION OF A BODY ENTERING INTO ITS DETECTION AREA

Felix Fettke, Herzehrock; Hans Siwon, Obing, and Hans Meixner, Haar, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

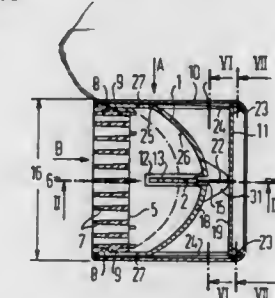
Filed Aug. 18, 1986, Ser. No. 897,300

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532476

Int. Cl.⁴ G08B 13/18; G01J 5/12

U.S. Cl. 250—353

13 Claims



1. A pyrodetector for detection of a body entering into a detection area of the pyrodetector, said body having a temperature deviating from its environment, comprising: a concave mirror shaped to focus heat radiation emanating from the body; a first sensor element positioned at a focus of the concave

mirror and at least one further sensor element positioned for compensation of environmental influences;
 a film of uniform electrically non-conductive material having an iso-directional, permanent orientation polarization and electrodes situated thereon which are employed to form the first and further sensor elements;
 the film and sensors forming an arrangement which is secured in a mounting;
 a covering positioned to cover a cavity of the mirror and which is permeable to incident radiation;
 an electronic evaluation means;
 the film and sensor elements being arranged in the concave mirror such that radiation reflected by the concave mirror is incident on both surface sides of the film;
 the concave mirror being a parabolic mirror dimensioned such that its focus lies in an inner half thereof;
 the film with the sensor elements lying at an optical axis of the concave mirror so that the first sensor element is essentially impinged only by a radiation of the body which has been reflected in the concave mirror when the body is situated at a large distance relative to a size of the mirror;
 the covering comprising a thin film of polyethylene which is stretched over a honeycomb lattice acting as a support and which is arranged in front of the cavity of the mirror;
 said concave mirror being formed of a body having side walls perpendicular to one another and having a rectangular cross-section with a major axis and a minor axis, and a reflector portion extending inwardly from said side walls and curved in two planes forming a continuous arced surface as said concave mirror;
 said film with said sensor elements being positioned in said mounting parallel to said minor axis, and an opening in said reflector portion of said concave mirror which is dimensioned to permit insertion of said film together with a retaining frame carrying said film and said mounting;
 said mounting comprising two spaced apart U-shaped parts dimensioned for mounting said retaining frame, said U-shaped parts being parallel to one another from said opening into the cavity of the concave mirror;
 said electronic evaluation means comprising a circuit board with printed interconnects and active and passive electrical components, said circuit board being arranged outside of said concave mirror and behind the reflector portion thereof, and said sensor elements being connected to said evaluation means via plug pins extending from said retaining frame;
 said electronic evaluation means being held by resilient clamps provided with barbs, said clamps being secured to said body rearwardly of said concave mirror; and
 said concave mirror, retaining frame with the film and sensor elements, the electronic evaluation means, and the honeycomb lattice provided with the cover being accommodated in a housing means for shielding against disturbing influences.

4,716,295

ION BEAM GENERATOR

Yoshihiro Ueda; Kouichi Ono; Tatsuo Oomori, and Shigeto Fujita, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

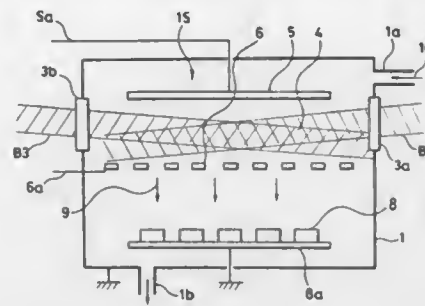
Filed Oct. 1, 1985, Ser. No. 782,725
 Int. Cl.⁴ H01J 37/00

U.S. Cl. 250-423 P

36 Claims

1. An ion beam generator, which comprises:
 an ion generating section for generating ions where a material to be ionized is introduced;
 a light source for introducing a light into said ion generating section which light has a wavelength such that it excites the material to be ionized to a Rydberg state from a ground state of said material by a resonance excitation;
 a pair of electrodes for generating an electric field for ionizing said material by Stark effect which has been excited to the Rydberg state; and
 a material support for supporting a material to which ionized

ions are irradiated, which support also functions as an electrode for generating an ion drawing out electric field



in cooperation with one of said pair of electrodes such that ions pass through said one of said pair of electrodes to irradiate said material.

4,716,296

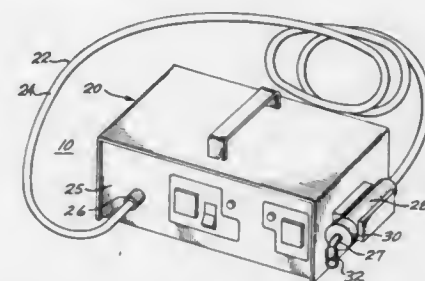
APPARATUS FOR CURING DENTAL RESTORATIVE COMPOSITES

Ronald L. Bussière, Edmonds, and Robert J. Smith, Lynnwood, both of Wash., assignors to Surgicorp, Lynnwood, Wash.

Filed Apr. 26, 1982, Ser. No. 371,610
 Int. Cl.⁴ H01J 61/40

U.S. Cl. 250-504 H

6 Claims



1. An apparatus for applying light in selective frequency ranges to organic composite materials used in restorative dentistry for optimum curing of the composite materials, comprising:

light bulb means;
 means for energizing said light bulb means;
 and filter means selected with reference to the composition of the composite material to be cured and used to attenuate substantially all frequencies of light produced by said light bulb means except the frequency range which produces uniform curing of the composite material without causing radical cross-linking of the composite material; and

further comprising a flexible, light transmitting cord means having a first end in light transmission communication with said light means and means for detachably mounting said filter means on the end portion of said light cord means distal from said light means.

4,716,297

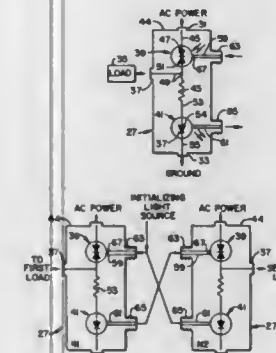
METHOD AND APPARATUS FOR OPTICALLY SWITCHING CURRENT

Harry D. Wills, Mentor, Ohio, and Joseph L. Betthausen, San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jun. 10, 1985, Ser. No. 743,001
 Int. Cl.⁴ G02B 27/00

U.S. Cl. 250-551

17 Claims



1. A relay, comprising:

a photoelectric element having first and second electrodes and photosensitive means responsive to optical stimulation for electrically coupling said first and second electrodes so as to permit transmission of electrical current therebetween;

a first electrical terminal electrically coupled to said first electrode of said photoelectric element for connecting said relay to a source of electrical power;
 an optically opaque housing encasing at least said photosensitive means of said photoelectric element;
 an optical input port optically coupled to said photosensitive means defined through said optically opaque housing;
 a light source having first and second electrodes, responsive to electrical current therebetween for emitting light;
 an optical output port optically coupled to said light source;
 said second electrode of said photoelectric element electrically coupled to a second electrical terminal and to said first electrode of said light source; and
 a third electrical terminal electrically coupled to said second electrode of said light source for permitting some of the current through said photoelectric element to energize said light source.

2. Electrical switching apparatus comprising:

first and second relays each having a first electrical terminal for connection to a source of electrical power and a second electrical terminal for connection to an electrical load;

said first relay comprising first means for electrically coupling its first and second terminals in response to a first signal, and means to emitting light in response to the electrical coupling of its first and second electrical terminals;

said second relay comprising second means for electrically coupling its first and second electrical terminals in response to an optical signal from said light emitting means of said first relay, comprises means for emitting light in response to the electrical coupling of its first and second electrical terminals, and further comprising means for optically coupling said light emitting means of said second relay to said first electrical coupling means; and
 means for optically coupling said light emitting means of said first relay to said second electrical coupling means.

4,716,298

SYSTEM FOR AUTOMATICALLY DETECTING PRESENCE OR ABSENCE OF A PRECEDING VEHICLE AND METHOD THEREFOR

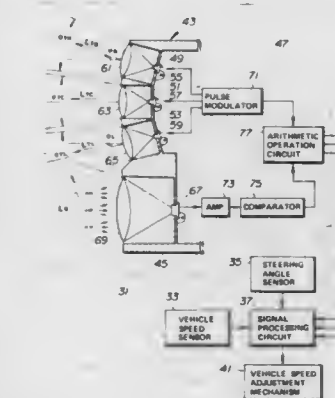
Yoshiyuki Etoh, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 30, 1985, Ser. No. 739,152

Claims priority, application Japan, Jun. 1, 1984, 59-110692
 Int. Cl.⁴ G01N 21/86

U.S. Cl. 250-561

8 Claims



1. A system for detecting the presence or absence of a vehicle present in a detection area of a subject vehicle on which the system is mounted, comprising:

(a) first means for transmitting measuring media over the detection area toward which the measuring media are simultaneously transmitted in mutually different directions and through respectively predetermined angles with respect to a longitudinal axis of the subject vehicle;
 (b) second means for outputting a first signal upon receipt of any one of the measuring media from the first means reflected by an object which is present in the detection area the subject vehicle, said first signal indicating the direction of propagation of the reflected measuring media toward the object, for calculating a distance between the subject vehicle and the object on the basis of the propagation delay between transmission of the measuring media from the first means and reception of the reflected wave from the object and outputting a second signal indicating the calculated distance between the subject vehicle and the object; and
 (c) third means for recognizing whether the object is a vehicle present in the detection area on the basis of the first and second signals outputted from said second means.

4,716,299

APPARATUS FOR CONVEYING AND INSPECTING A SUBSTRATE

Hiroshi Tanaka; Hiromitsu Iwata, and Yukio Kakizaki, all of Yokohama, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 23, 1986, Ser. No. 821,743

Claims priority, application Japan, Jan. 31, 1985, 60-17318
 Int. Cl.⁴ G01N 21/86

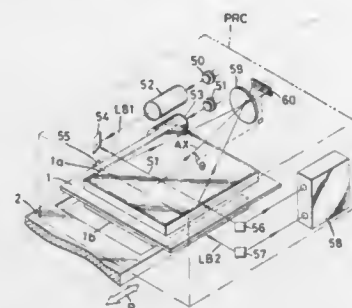
U.S. Cl. 250-571

11 Claims

1. An arrangement in an apparatus for handling a substrate such as a photomask or a reticle used in a process of manufacturing a semiconductor device, comprising:

a container unit for containing therein said substrate in a substantially horizontal posture;
 an inspection unit having means for inspecting a surface of said substrate, said inspecting means including radiation means for supplying a directional beam to said surface, and means for detecting scattering of said directional beam from the surface of said substrate;

a holding member for holding said substrate substantially horizontally;
 a support member having a guide member for supporting said holding member movably in a horizontal direction;
 first drive means for moving said support member between a first position wherein said guide member is opposed to said container unit and a second position wherein said guide member is opposed to said inspection unit;
 second drive means for moving said holding member relative to said guide member;
 third drive means operable to fix said substrate to said holding member and to separate said substrate from said holding member; and



operation means for controlling said first, second and third drive means so that, when said support member is moved in said first position, said substrate is fixed to said holding member and said holding member is moved by said second drive means to remove said substrate from said container unit, and when said support member is in said second position, said holding member is moved by said second drive means together with said substrate to cause a relative displacement between said substrate and said directional beam for inspecting said substrate by said inspecting means.

4,716,300

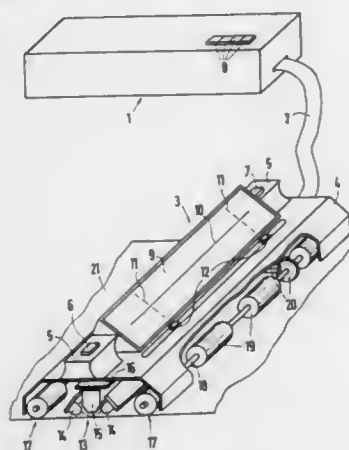
APPARATUS FOR SCANNING DOCUMENTS IN A RASTER LINE MODE USING MARGIN STOPS
 Wolfgang Andrich, and Helmut W. Schilling, both of Pforzheim, Fed. Rep. of Germany, assignors to Alcatel NV, Amsterdam
 Filed Jul. 3, 1986, Ser. No. 881,763

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1985, 3525450

Int. Cl.⁴ H04N 1/10

U.S. Cl. 250—578

2 Claims



1. Optical scanner apparatus for raster line scanning of a document which has text on its upper side and which is supported on a flat surface, said apparatus comprising:

a hand device comprising:
 a optical scanner comprising a linear array of optical to electric transducing elements,
 a position encoder for generating signals synchronized to the scanning of said document,
 a display panel for displaying data indicative of that line area of said document above which said optical scanner is located,
 two margin stops whose positions are indicated by respective displayed vertical lines on said display panel; and
 a control logic device for operating said hand device and for selectively storing only that portion of the scanned data presented on said display panel between said two vertical lines.

4,716,301

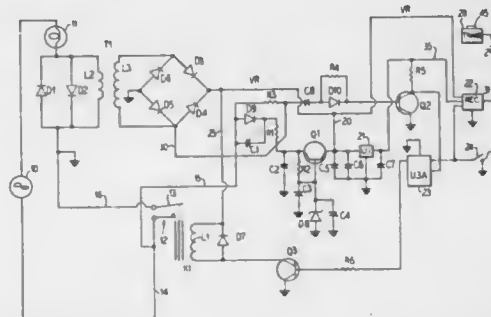
DIGITAL LIGHT CONTROL

Colin B. Willmott, Buffalo Grove; Carl T. Heltschel, Oak Brook, and Bernard J. Wojciak, Jr., Woodridge, all of Ill., assignors to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Apr. 8, 1986, Ser. No. 849,276
 Int. Cl.⁴ G08B 1/00

U.S. Cl. 307—115

11 Claims



1. A power circuit for remotely or locally energizing a load, comprising, an A.C. power source, a first power supply comprising a first switching means which can be either in the opened or closed position, said A.C. power source connected to one side of said first switching means, said load with one side connected to the second side of said A.C. power source, a pair of back to back diodes connected to said A.C. power source and a transformer with its primary winding in parallel with said back to back diodes and with one side connected to the second side of said load, the second side of said first switching means and the second side of said transformer connected to ground, a transmitter, a receiver energized by said transmitter and connected to a trigger circuit, said trigger circuit connected to said first switching means to move it from an opened to a closed position, a diode rectifier connected to said receiver, a secondary winding of said transformer connected to said diode rectifier, a clock circuit connected between said trigger circuit and said first side of said A.C. power source and an amplifier circuit connected between said first side of said A.C. power source and said receiver.

4,716,302

IDENTITY CIRCUIT FOR AN INTEGRATED CIRCUIT USING A FUSE AND TRANSISTOR ENABLED BY A POWER-ON RESET SIGNAL

Stephen T. Flanagan, Austin; Lawrence J. Day, Manchaca, both of Tex., and Barry A. Simon, San Jose, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1986, Ser. No. 945,253

Int. Cl.⁴ H03K 17/18

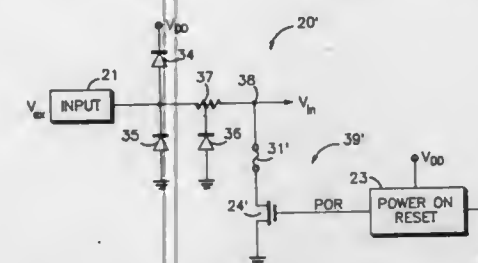
U.S. Cl. 307—200 B

20 Claims

1. In an integrated circuit having an input with ESD protection having a first diode coupled between the input and a first

power supply terminal, and a second diode coupled between the input and a second power terminal, an identifying circuit comprising:

power on reset means for providing a power on reset pulse



in response to application of a voltage between the first and second power supply terminals; and
 control means, coupled to the power on reset means, for coupling the input to the first power supply terminal in response to receiving the power on reset pulse.

4,716,303

MOS IC PULL-UP CIRCUIT

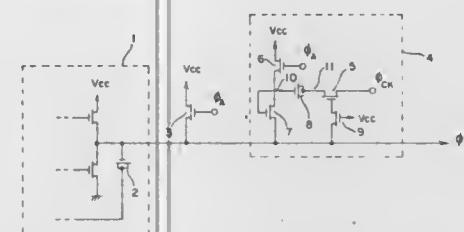
Toshio Mimoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 1, 1985, Ser. No. 729,190

Int. Cl.⁴ H03K 19/096

U.S. Cl. 307—264

1 Claim



1. A MOS IC pull-up circuit for statically holding a signal outputted during an active stage of a dynamic memory element, which signal has been boosted to a level at least equal to a power source voltage, comprising:

a first MOSFET having a drain terminal connected to said power source and a gate terminal connected to a node of an active signal representative of said active stage;

a second MOSFET having a drain terminal and a gate terminal both connected to a source terminal of said first MOSFET, and a source terminal connected to said boosted signal;

a third MOSFET;

a fourth MOSFET;

a MOS capacitance;

said MOS capacitance being connected between a source terminal of said third MOSFET and said source terminal of said first MOSFET, a gate terminal of said third MOSFET being connected to said boosted signal through a source-drain channel of said fourth MOSFET, a gate terminal of said fourth MOSFET being connected to said power source, and a periodic signal being connected to a drain terminal of said third MOSFET,

said boosted signal being held at a level at least equal to said power source voltage during said active stage, through a boosting operation of said first through fourth MOSFETS and said MOS capacitance.

4,716,304

DRIVER CIRCUIT FOR HIGH-VOLTAGE POWER TRANSISTORS PROVIDING PROTECTION TO THE DRIVER TRANSISTORS

Arnim Fiebig, Leinfelden, and Rupert Weber, Schneeberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

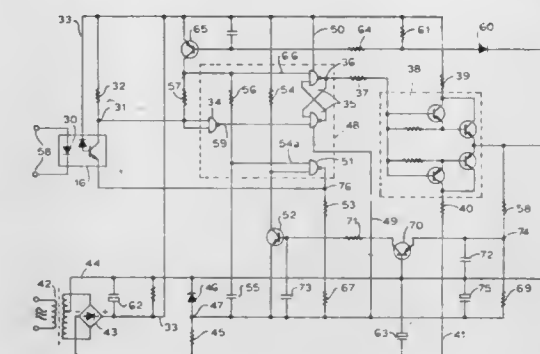
Filed Jun. 20, 1986, Ser. No. 876,699

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1985, 3522429

Int. Cl.⁴ H03K 17/60, 3/26, 19/24

U.S. Cl. 307—270

13 Claims



1. Driver circuit means for an even plurality of high voltage power switching transistors each having a switchable path between collector and emitter thereof and a base electrode for switching control of said path and each having a free wheeling diode connected antiparallel to said switchable path of said power switching transistor, said even plurality of power switching transistors having their respective switchable paths connected in cascade between positive and negative poles of a d.c. voltage source, and a load for said power switching transistors being connected between a midpoint of said cascade connection of power switching transistors and a conductor maintained at a potential midway between the respective potentials of said positive and negative poles of said source of d.c. voltage, comprising:

an individual driver circuit and an individual driver power supply unit for each said power transistor, each said driver circuit comprising a final driver stage (18, 38) a control logic stage (17, 48) and a first galvanic isolation input device (16), which is interposed between a source (4, 5) of switching control signals and an input of said control logic stage;

each driver power supply unit having a rectifier and a second galvanic isolation input device (15) interposed between said rectifier and a source of alternating current, said rectifier providing a reference potential output connection and at least one output connection providing a d.c. supply voltage with respect to said reference potential output connection,

said reference potential output connection being connected galvanically to the emitter of the power switching transistor for which the power supply unit containing the rectifier providing said reference potential output is individual; each said final driver stage being powered by a said power supply unit individual to the same power switching transistor and having an output galvanically connected to the base electrode of said same power switching transistor for which the driver circuit containing the final driver stage is individual;

each said driver circuit further comprising:

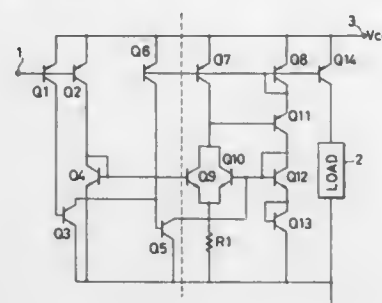
a first settable and resettable bistable circuit (35) in said control logic stage of each said driver circuit, connected so as to store said switching control signals and to determine and time switched-on and switched-off conditions of the power transistor for which the driver

circuit is individual in accordance respectively with set and reset conditions of said first bistable circuit; a second settable and resettable bistable circuit (51, 52) for registering error conditions and circuits associated therewith for setting said second bistable circuit in response to at least one of two voltage differences which are, namely, a first voltage difference between the emitter and collector of said power transistor exceeding a first predetermined value and a second voltage difference between base and emitter of said power switching transistor exceeding a second predetermined value while said first bistable circuit is set, and a blocking circuit including a diode connected to the collector of the said power switching transistor for which the driver circuit is individual for preventing the setting of said first bistable circuit so long as said free wheeling diode connected antiparallel to the said power switching transistor conducts current.

4,716,305

SWITCHING DEVICE HAVING A FEEDBACK MEANS FOR RENDERING A CONTROL CIRCUIT INOPERATIVE IN RESPONSE TO A CURRENT SUPPLY CIRCUIT BEING INOPERATIVE

Takamasa Sakuragi, Hiratsuka, and Ikuo Fushimi, Ebina, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 27, 1986, Ser. No. 833,616
Claims priority, application Japan, Mar. 1, 1985, 60-38899
Int. Cl.⁴ H03K 3/01, 17/60; H03F 3/04; G05F 3/16
U.S. Cl. 307-296 R 1 Claim



1. A switching device comprising:
a current supply circuit for supplying a current to a load having operating and non-operating states;
a control circuit for controlling said operating and non-operating states of said current supply circuit; and
feedback means connected between said current supply circuit and said control circuit for rendering said control circuit inoperative in response to said current supply circuit being inoperative.

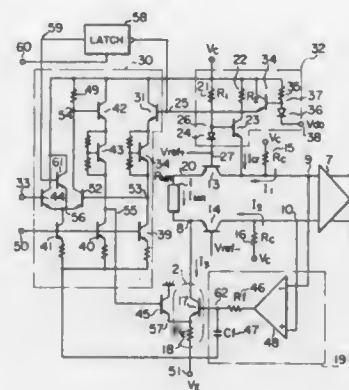
4,716,306

CIRCUIT FOR DETECTING VARIATION OF RESISTANCE OF A VARIABLE-RESISTANCE ELEMENT

Naoki Sato, Hachioji; Yoshihisa Kamo, Kokubunji; Yasuhiro Katoh, Tokyo; Minoru Kosuge, and Shinichi Arai, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 9, 1984, Ser. No. 639,093
Claims priority, application Japan, Aug. 15, 1983, 58-148082; Dec. 14, 1983, 58-234249
Int. Cl.⁴ H03K 3/01, 17/90, 5/22
U.S. Cl. 307-296 R 18 Claims

1. A circuit for detecting variation of resistance of a variable-resistance element which is supplied with a bias current and varies the resistance thereof in response to an external factor, said circuit comprising:

first means for applying a constant d.c. voltage across said variable-resistance element;
a current source connected to one of two terminals of said variable-resistance element to supply said bias current;
second means for detecting the variation of said bias current which flows in said variable-resistance element depending on said external factor; and

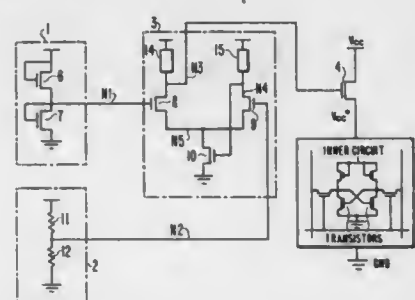


a feedback circuit for controlling said first means in accordance with the input signal or output signal of said second means, wherein said first means comprises a pair of grounded-base transistors with their base electrodes being provided with different base voltages, with their emitter electrodes being respectively connected to said two terminals of said variable-resistance element, and with their collector electrodes being connected to the inputs of said second means.

4,716,307

REGULATED POWER SUPPLY FOR SEMICONDUCTOR CHIPS WITH COMPENSATION FOR CHANGES IN ELECTRICAL CHARACTERISTICS OR CHIPS AND IN EXTERNAL POWER SUPPLY

Keizo Aoyama, Yamato, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Aug. 12, 1986, Ser. No. 895,730
Claims priority, application Japan, Aug. 16, 1985, 60-179444
Int. Cl.⁴ G05F 1/56, 5/08
U.S. Cl. 307-297 14 Claims



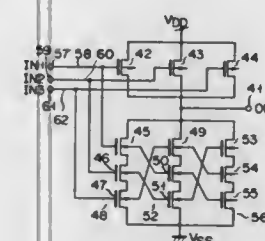
1. A semiconductor device having an external power supply line operatively connected to receive an external power supply voltage, comprising:
a semiconductor substrate;
an inner circuit, formed on said semiconductor substrate, containing a plurality of transistors;
voltage regulating means, formed on said substrate, operatively connected to receive the external power supply voltage and operatively connected to said inner circuit, for regulating the external power supply voltage and converting the external power supply voltage to an inter-

nal power supply voltage to be applied to said inner circuit; and
controlling means, formed on said semiconductor substrate and operatively connected to said voltage regulating means, for controlling said voltage regulating means in accordance with the characteristics of said transistors in said inner circuit so that variations in the electrical characteristics of said transistors are compensated in dependence upon the external power supply voltage, said controlling means comprising:
means for providing a representative signal which represents electrical characteristics of said transistors in said inner circuit;
means for generating a reference voltage in accordance with the external power supply voltage; and
means, operatively connected to said means for providing a representative signal and said means for generating a reference voltage, for generating a regulating signal in accordance with said representative signal and said reference voltage.

4,716,308

MOS PULL-UP OR PULL-DOWN LOGIC CIRCUIT HAVING EQUALIZED DISCHARGE TIME DELAYS AND LAYOUT AVOIDING CROSSOVERS

Kenji Matsuo, Yokohama; Itsuo Sasaki, Kawasaki; Hiroaki Suzuki, Yokohama, and Mitsuyuki Kunieda, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jul. 29, 1983, Ser. No. 518,751
Claims priority, application Japan, Jul. 30, 1982, 57-133541; Jul. 30, 1982, 57-133576
Int. Cl.⁴ H03K 19/017; H01L 27/04, 29/78
U.S. Cl. 307-303 3 Claims



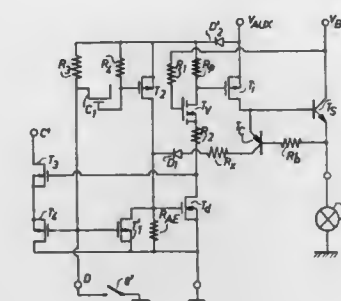
1. A MOS logic circuit comprising:
a semiconductor substrate of a first conductivity type;
first to tenth semiconductor regions of a second conductivity type, arranged on said substrate aligned parallel to one another with a specific interval therebetween;
first to ninth gate layers, respectively formed between said first and second semiconductor regions, said second and third semiconductor regions, said third and fourth semiconductor regions, said fourth and fifth semiconductor regions, said fifth and sixth semiconductor regions, said sixth and seventh semiconductor regions, said seventh and eighth semiconductor regions, said eighth and ninth semi-

conductor regions, and said ninth and tenth semiconductor regions;
a first conductive layer, connected to said first and seventh semiconductor regions, for supplying a power source voltage to said first and seventh semiconductor regions;
a second conductive layer, connected to said fourth and tenth semiconductor regions, for outputting logic output signals from said fourth and tenth semiconductor regions;
a third conductive layer, connected to said third, sixth and eighth gate layers, for supplying a first logic input signal to said third, sixth and eighth gate layers;
a fourth conductive layer, connected to said second, fourth, and seventh gate layers, for supplying a second logic input signal to said second, fourth and seventh gate layers; and
a fifth conductive layer, connected to said first, fifth and ninth gate layers, for supplying a third logic input signal to said first, fifth and ninth gate layers.

4,716,309

STATIC RELAY FOR LOW DC VOLTAGES

Robert J. Stroppiana, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 8, 1985, Ser. No. 731,814
Claims priority, application France, May 11, 1984, 8407308
Int. Cl.⁴ H03K 17/08, 17/04
U.S. Cl. 307-442 22 Claims



10. A static relay for supplying low DC voltages to a load comprising:
a bipolar output transistor of a first conductivity type having an emitter connected to an output terminal to which the load is to be connected, the load to be further connected to a common supply terminal, means for connecting a collector of the output transistor to a main supply terminal, a base of the output transistor being supplied by means of a main current path of a current injection transistor having a control electrode, a bipolar detection transistor of a second (opposite) conductivity type having an emitter-base path including a base resistor, said emitter-base path being connected parallel to the base-emitter path of the bipolar output transistor, a control transistor having a source connected to the common supply terminal, a drain coupled to the control electrode of the current injection transistor and a gate controlled via a control terminal which receives a control signal that causes said current injection transistor and the bipolar output transistor to become conductive, and means connecting the gate of the control transistor to the common supply terminal via a self-maintenance resistor and to a collector of the detection transistor via a diode connected in the normally forward direction for a current originating from the collector of the detection transistor whereby a self-maintenance

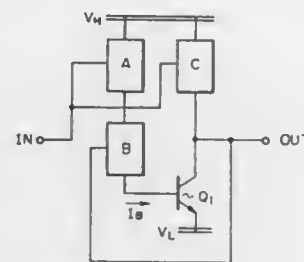
voltage is applied to the gate of the control transistor in the normal state of the load, and wherein the collector of the detection transistor produces a signal representative of the state of the load.

4,716,310

LOGICAL BIMOS GATE CIRCUIT HAVING LOW POWER DISSIPATION

Tetsu Tanizawa, Kawasaki, and Osam Ohba, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Sep. 30, 1985, Ser. No. 781,742

Claims priority, application Japan, Oct. 2, 1984, 59-205511
Int. Cl.⁴ H03K 17/16, 19/02, 5/08, 17/60
U.S. Cl. 307-446 10 Claims

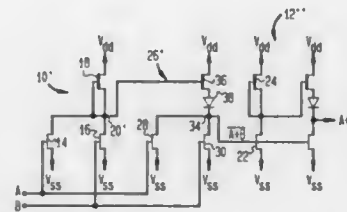


1. A logical gate circuit comprising: first and second power sources for supplying first and second levels, respectively; an input terminal for receiving an input signal having one of the first and second levels; an output terminal for providing an output signal having one of the first and second levels; a switching transistor, having an emitter operatively connected to said second power source, having a collector operatively connected to said output terminal and having a base, said output terminal outputting the output signal with the second level in response to said switching transistor having an ON state; an active load circuit, operatively connected between said first power source and the collector of said switching transistor and to said input terminal, said active load circuit being turned OFF in response to the input signal having the first level and being turned ON in response to the input signal having the second level, the output signal having the first level when said active load circuit is ON; control transistor means, operatively connected to the base of said switching transistor having a control terminal connected (and) to said output terminal, for controlling said switching transistor in response to the output signal, said control transistor means turning ON and OFF in response to the output signal having the first level and the second level, respectively; and input transistor means, operatively connected between said first power source and said control transistor means and operatively connected to said input terminal, for controlling said switching transistor in response to the input signal, said input transistor means turning ON and OFF in response to the input signal having the first level and the second level, respectively, said switching transistor being turned ON only when said control and input transistor means are ON and provide a base current thereto.

4,716,311 DIRECT COUPLED FET LOGIC WITH SUPER BUFFER OUTPUT STAGE

William H. Davenport, Hillsboro; Gary D. McCormack, and George S. LaRue, both of Beaverton, all of Oreg., assignors to TriQuint, Beaverton, Oreg.

Filed Apr. 25, 1985, Ser. No. 726,864
Int. Cl.⁴ H03K 19/017, 17/16, 19/094, 19/12
U.S. Cl. 307-448 4 Claims



1. An integrated logic circuit comprising a direct coupled, FET logic input stage having:
 - (a) a depletion-mode FET structure having a gate, a source and a drain, the drain being connected to a first reference potential level and the gate and source being connected together, and
 - (b) a first enhancement mode FET structure having at least one gate, a source and a drain, the drain being connected to the source of the depletion-mode FET structure, the source being connected to a second, lower reference potential level and the gate being connected to receive an input logical signal, and a super buffer logic output stage having:
 - (c) a second enhancement mode FET structure that is essentially identical to the first enhancement mode FET structure, the source of the second enhancement mode FET structure being connected to said second, lower reference potential level and the gate of the second enhancement mode FET structure being connected to the gate of the first enhancement mode FET structure, and
 - (d) a controllable current source connected to the source of the depletion-mode FET structure and to the drain of the second enhancement mode FET structure, for providing drain current to the second enhancement mode FET structure when the drain of the first enhancement mode FET structure exceeds a predetermined potential level and depriving the second enhancement mode FET structure of drain current when the drain of the first enhancement mode FET structure is below said predetermined potential level and wherein the controllable current source comprises a diode and a second depletion-mode FET structure, the gate of the second depletion-mode FET structure being connected to the source of the first-mentioned depletion-mode FET structure, the drain of the second depletion-mode FET structure being connected to the first reference potential level and the source of the second depletion-mode FET structure being connected through said diode to the drain of the second enhancement mode FET structure.

4,716,312 CMOS LOGIC CIRCUIT

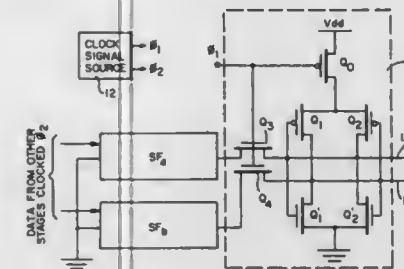
Carver A. Mead, and John C. Wawrzyniec, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 731,849, May 7, 1985, abandoned. This application Apr. 27, 1987, Ser. No. 47,492
Int. Cl.⁴ H03K 19/096, 17/284, 17/693
U.S. Cl. 307-475 7 Claims

1. An integrated circuit comprised of two set-reset circuits, a first set-reset circuit and a second set-reset circuit, each comprised of two CMOS inverters connected in parallel to a

source of power by at least one power-down MOS transistor of a type chosen from a group consisting of n-channel and p-channel MOS transistors, each of said CMOS inverters comprising a first MOS transistor of the same n- or p-channel type as said power-down transistor connected directly to said power-down transistor and a second MOS transistor of the n- or p-channel type not chosen for said power-down transistor connected in series with said first MOS transistor, an output terminal at a junction between the first and second series transistors, an input terminal connected to the gate of each of said first and second series transistors, and

two signal-pass MOS transistors of the same type as said second MOS transistor of each MOS inverter, one signal-pass transistor connected as a series switch in a first signal line for receiving a data bit SF_a connected to the input terminal of one CMOS inverter and the output terminal of



the other CMOS inverter, and the other signal-pass transistor connected as a series switch in a second signal line for receiving a data bit SF_b connected to the input terminal of the other CMOS inverter and the output terminal of the one CMOS inverter, whereby said two CMOS inverters are directly cross-coupled, input to output, and the input to each is gated by a separate one of said pass transistors, a source of first and second nonoverlapping phase clock signals, said first phase clock signals being connected to the gates of said power-down and signal-pass transistors of said first set-reset circuit, and said second phase clock signals being connected to the gates of said power-down and signal-pass transistors of said second set-reset circuit, Boolean logic means for independently producing said data bits SF_a and SF_b, whereby monodirectional transfer of data bits SF_a and SF_b into said second set-reset circuit in response to one of said clock signals is effected according to the following table

SF _a	SF _b	q ⁿ⁺¹
0	0	q ⁿ
0	1	0
1	0	1
1	1	x

where x indicates the new state qⁿ⁺¹ is uncertain, wherein output terminals of said first set-reset circuit are coupled to pass transistors of said second set-reset circuit by two separate switching functions comprised of MOS transistors of the same type as said pass transistors, said MOS transistors of said switching functions having their gates connected to receive data bits, a separate one of said switching functions being connected to each pass transistor to provide current paths between circuit ground and said pass transistors under control of data signals, and wherein at least one of said switching functions is comprised of at least three transistors, one transistor connected in series with a second transistor, and a third transistor connected in parallel with one of said transistors to provide a series-parallel network of transistors between circuit ground and said pass transistors.

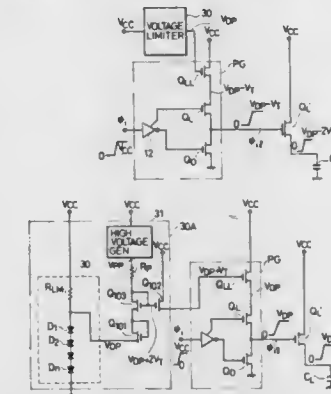
4,716,313

PULSE DRIVE CIRCUIT

Ryoichi Hori, Nishitama; Kiyoo Itoh, Higashikurume, and Jun Etoh, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 620,894, Jun. 15, 1984, abandoned.

This application Jun. 3, 1987, Ser. No. 58,617
Claims priority, application Japan, Jun. 15, 1983, 58-105710
Int. Cl.⁴ H03K 5/02, 17/08, 17/28, 17/284
U.S. Cl. 307-475 9 Claims



1. A semiconductor circuit comprising: a voltage limiter means for limiting a supply voltage to a predetermined primary voltage, wherein the voltage level of said primary voltage is equal to the voltage level of said supply voltage when said voltage level of the supply voltage is below a predetermined voltage level, and further wherein the voltage level of said primary voltage varies in accordance with said voltage level of said supply voltage with a gradient of change less than 1.0 when said supply voltage is above said predetermined voltage level; a pulse generating means for generating output pulses according to an input signal, wherein said pulse generating means is supplied with said primary voltage from the voltage limiter means and is also supplied with the supply voltage, and further wherein the output pulses have a voltage level which is limited by said predetermined primary voltage supplied from said voltage limiter means; and driver means coupled to receive said supply voltage and said output pulses for driving a capacitance load from a first voltage level to a second voltage level according to said output pulses of the pulse generating means, wherein the capacitance load is supplied with the second voltage from the supply voltage limited by the driver means according to the output pulses.

4,716,314

INTEGRATED CIRCUIT

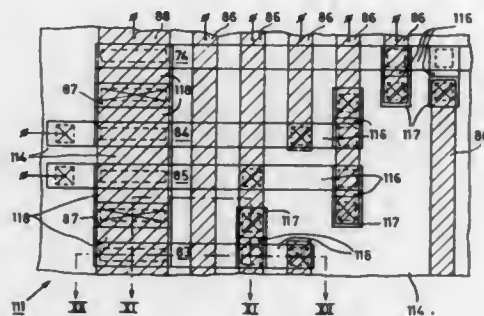
Cornelis Mulder, Eindhoven, and Henricus E. J. Wulms, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,473
Claims priority, application Netherlands, Oct. 9, 1974, 7413264

Int. Cl.⁴ H01L 27/04; H03K 19/091
U.S. Cl. 307-477 26 Claims

22. An integrated circuit comprising a common semiconductor body portion, said body portion comprising plural gate circuits each comprising at least one inverter transistor having emitter and base zones and at least one collector, and a complementary transistor connected to the inverter transistor for biasing same and having emitter, base and collector zones with the complementary transistor having its collector zone connected to the inverter transistor base zone, and each gate circuit having means connecting the complementary transistor base zone and the inverter transistor emitter zone in a d.c. path, said inverter transistors being arranged along substantially

parallel rows with all the inverter transistor collectors of the same gate circuit being located along the same row and wherein at least some of the gate circuits occupy different lengths in the row direction, means for interconnecting inverter transistor collectors and base zones of different gate circuits located in different rows to form desired logic, said inverter transistor collector and base zone interconnecting means comprising a group of elongated signal tracks substantially all of which extend substantially their entire length in mutually parallel straight lines and over the body substantially transversely to the row directions, said signal-track-interconnected collectors in different rows being located under the interconnecting signal track, at least plural tracks in the group of signal tracks interconnecting gate circuits in non-adjacent rows and crossing over at least one gate circuit in an interven-



ing row, a plurality of said gate circuits each having connections to said signal tracks that are spaced apart in the row direction by distances that are different from the spacings of signal track connections to other gate circuits, the biasing complementary transistor emitter zones being located along a column extending parallel to and located alongside the said group of signal tracks, and means for isolating adjacent rows of inverter transistors, wherein the body comprises a surface layer of a first type conductivity and of given conductivity on a substrate having at least one region of first type conductivity but of higher conductivity than the given conductivity, the inverter transistor base zones being second type locally over-doped zones located above and adjoining said higher conductivity one region and the second type doping profile in the inverter transistor base zones decreases from the said one region towards the surface of the surface layer.

4,716,315

TEMPERATURE COMPENSATION APPARATUS FOR AN ELECTRICAL CIRCUIT

Isaac M. Bell, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 29, 1986, Ser. No. 924,316

Int. Cl.⁴ G01K 7/24; H03K 17/14

U.S. Cl. 307-491

11 Claims

1. Apparatus for compensating a temperature dependent characteristic of a semiconductor device having a thermal time constant, said apparatus including:

- a source of operating potential coupled to said semiconductor device;
- a compensation circuit coupled to said source of operating potential and exhibiting an electrical time constant approximating said thermal time constant of said semiconductor device;
- means for deriving from said compensation circuit a control signal exhibiting said electrical time constant; and
- means for coupling said control signal to said semiconductor device to alter said characteristic of said semiconductor device in a direction opposite to a direction produced by temperature variations.

4,716,316 FULL WAVE, SELF-DETECTING DIFFERENTIAL LOGARITHMIC RF AMPLIFIER

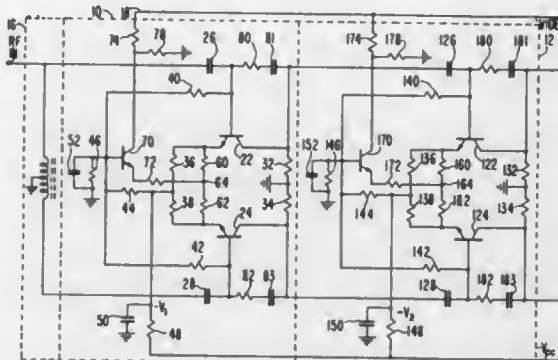
Dennis P. Collin, Beverly, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 698,204, Feb. 4, 1985, abandoned. This application May 20, 1987, Ser. No. 53,604

Int. Cl.⁴ G06G 7/24

U.S. Cl. 307-492

4 Claims



1. A logarithmic rf amplifier comprising:
 - means for receiving a first rf signal;
 - means for generating a second rf signal from said first rf signal, said second rf signal being said first rf signal shifted in phase by 180°;
 - a first amplifier stage comprising
 - means, coupled to said means for receiving and to said means for generating, for deriving a first output signal, a second output signal and a third signal from said first rf signal and said second rf signal, said first output signal being an amplified representative of said first rf signal, said second output signal being an amplified representative of said second rf signal and said third signal being a full wave rectification of said first rf signal, and
 - means, responsive to said third signal, for providing a first video signal representative of said third signal;
 - a second amplifier stage comprising
 - means, responsive to said first output signal and said second output signal, for providing a fourth signal, said fourth signal being a full wave rectification of said first output signal, and
 - means, responsive to said fourth signal, for providing a second video signal representative of said fourth signal; and
 - means for summing said first video signal and said second video signal.

4,716,317

CONTROL METHOD FOR AN INTEGRATED CIRCUIT USING A THREE-LEVEL CLOCK PULSE SIGNAL

Alphons F. E. B. Splerings, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1986, Ser. No. 910,104

Claims priority, application Netherlands, Oct. 21, 1985, 8502860

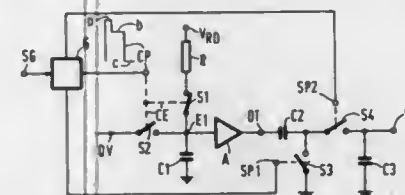
Int. Cl.⁴ H04N 5/21

U.S. Cl. 307-520

2 Claims

1. A control method for an integrated circuit having a common switching electrode for controlling at least two oppositely-switchable transistors, which are operative in the integrated circuit for transferring an information charge or for performing a resetting operation, respectively, a connection of the switching transistors being coupled to a capacitance for receiving the information charge and for performing the resetting operation under the control of a clock pulse signal occurring at the switching electrode, comprising the step of providing the

clock pulse signal with three signal levels, a first clock pulse signal level at which the reset transistor is conducting and the charge transfer transistor is non-conducting, a subsequent



second clock-pulse signal level at which the two transistors are non-conducting and a subsequent third clock pulse signal level at which the charge transfer transistor is conducting and the reset transistor is non-conducting.

4,716,318

LOW PASS FILTER FORMED IN AN INTEGRATED CIRCUIT

Hideharu Koike, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

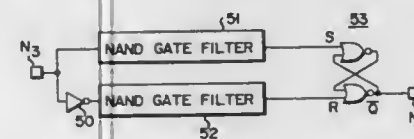
Filed Mar. 12, 1986, Ser. No. 838,708

Claims priority, application Japan, Mar. 13, 1985, 60-49974

Int. Cl.⁴ H03K 17/28

U.S. Cl. 307-520

2 Claims



1. A low pass filter apparatus formed in an integrated circuit comprising:
 - an input terminal of said apparatus;
 - an output terminal of said apparatus;
 - a first low pass filter circuit including
 - a first low pass filter circuit input terminal connected to said input terminal of said apparatus,
 - a first low pass filter circuit output terminal,
 - a plurality of series connected NAND gates connected between said first low pass filter circuit input terminal and said first low pass filter circuit output terminal, the first input terminal of each of said NAND gates being directly connected to said first low pass filter circuit input terminal,
 - an even number of inverters connected in series between said first low pass filter circuit input terminal and the second input terminal of the first of said series connected NAND gates,
 - an odd number of inverters connected between the output terminal of each of said series connected NAND gates and the second input terminal of the following NAND gate of said series connected NAND gates, and
 - an odd number of inverters connected between the output terminal of the last NAND gate of said series connected NAND gates and said first low pass filter circuit output terminal;
 - a second low pass filter circuit including
 - a second low pass filter circuit input terminal connected to said input terminal of said apparatus,
 - a second low pass filter circuit output terminal,
 - a plurality of series connected NAND gates connected between said second low pass filter circuit input terminal and said second low pass filter circuit output terminal, the first input terminal of each of said NAND gates being directly connected to said second low pass filter circuit input terminal,
 - an even number of inverters connected in series between

said second low pass filter circuit input terminal and the second input terminal of the first of said series connected NAND gates, an odd number of inverters connected between the output terminal of each of said series connected NAND gates and the second input terminal of the following NAND gate of said series connected NAND gates, and an odd number of inverters connected between the output terminal of the last NAND gate of said series connected NAND gates and said second low pass filter circuit output terminal;

an inverter inserted between said input terminal of said apparatus and said second low pass filter circuit input terminal; and

a set/reset type flip-flop circuit having a set input terminal connected to said first low pass filter circuit output terminal, a reset input terminal connected to said second low pass filter circuit output terminal, and an output terminal connected to said output terminal of said apparatus.

4,716,319

SWITCHED CAPACITOR FILTER FOR LOW VOLTAGE APPLICATIONS

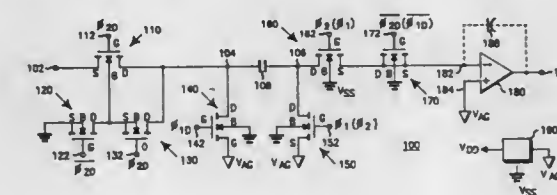
Michael E. Rebeschini, Hanover Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 4, 1986, Ser. No. 892,534

Int. Cl.⁴ H03K 5/00; H03F 1/02

U.S. Cl. 307-520

9 Claims



1. A switched capacitor circuit having an input node, an output node, and a reference node, said circuit comprising in combination:
 - a capacitor having first and second plates;
 - a gain device having an input port and an output port, said output port coupled to said circuit output node;
 - first switch means responsive to a first control signal for coupling said input node to said capacitor first plate, said first switch means being a switched-tub MOS transistor;
 - second switch means responsive to a second control signal for coupling said capacitor first plate to said reference node;
 - third switch means responsive to a third control signal for coupling said capacitor second plate to said reference node;
 - fourth switch means responsive to a fourth control signal for coupling said capacitor second plate to said gain device input port, said third and fourth switch means being single MOS transistors of the same conductivity type; and
 - clock means for providing said control signals to each of said switch means, said first and second control signals being delayed in time with respect to said third and fourth control signals such that the opening of each of said switch means coupled to said capacitor second plate occurs before the opening of each corresponding switch means not coupled thereto,
- whereby switching said first switch means does not produce charge injection into said gain device input port.

4,716,320

CMOS SENSE AMPLIFIER WITH ISOLATED SENSING NODES

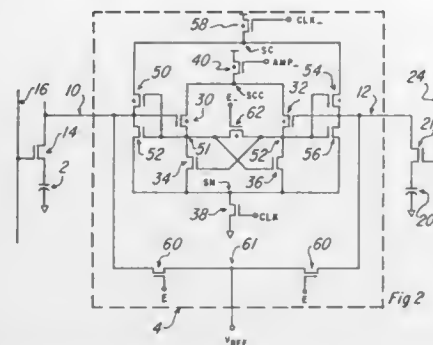
Hugh P. McAdams, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 20, 1986, Ser. No. 876,624

Int. Cl.⁴ H03K 3/356, 17/04

U.S. Cl. 307—530

16 Claims



1. A sense amplifier circuit for sensing the differential voltage between a first bit line and a second bit line, said first and second bit lines each having a capacitance, comprising:

a first coupling means for coupling said first bit line to a first sensing node in such a manner that the voltage of said first sensing node is responsive to the voltage of said first bit line and in such a manner that the capacitance of said first bit line is isolated from said first sensing node;

a second coupling means for coupling said second bit line to a second sensing node in such a manner that the voltage of said second sensing node is responsive to the voltage of said second bit line and in such a manner that the capacitance of said first bit line is isolated from said first sensing node;

amplifying means for amplifying the differential voltage between said first sensing node and said second sensing node, responsive to said first bit line and said second bit line being at different voltages;

a first driving means for driving said first bit line to a voltage responsive to said amplifying means, said driving means coupled between said first bit line and said amplifying means in such a manner that the capacitance of said first bit line is isolated from said amplifying means for either polarity of differential voltage; and

a second driving means for driving said second bit line to a voltage responsive to said amplifying means, said driving means coupled between said second bit line and said amplifying means in such a manner that the capacitance of said second bit line is isolated from said amplifying means for either polarity of differential voltage.

4,716,321

LOW NOISE, HIGH THERMAL STABILITY ATTENUATOR OF THE INTEGRABLE TYPE

Pietro Erratico, Milan, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy

Filed Feb. 10, 1986, Ser. No. 827,921

Claims priority, application Italy, Feb. 20, 1985, 19570 A/85

Int. Cl.⁴ H03K 5/08, 17/62; H03H 7/24

U.S. Cl. 307—540

6 Claims

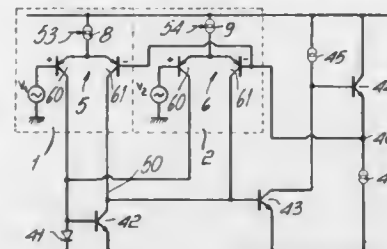
1. A low noise, high thermal stability attenuator of the integrable type, comprising:

a ladder-type attenuating network having an attenuating network input receiving a signal to be attenuated and a plurality of intermediate taps defining each an attenuating network output providing a different predetermined attenuation level output signal and a controlled switching element including a plurality of amplifying means, a corre-

spondent plurality of biasing means and an amplifying output stage.

each said amplifying means having at least one first attenuated signal input, one second bias input and an amplifying means output,

each said first attenuated signal input of said amplifying means being connected to a respective one of said attenuating network outputs, each said second bias input of said amplifying means being connected to a respective one of said biasing means and said amplifying means outputs of



said amplifying means being connected together and defining a summing knot,

each said biasing means having a switching input, said switching inputs of said biasing means receiving a control signal to operatively switch on only one of said biasing means and thereby only a respective one of said amplifying means of said plurality,

said amplifying output stage having an output stage input connected to said summing knot and an output stage output defining an attenuator output.

4,716,322

POWER-UP CONTROL CIRCUIT INCLUDING A COMPARATOR, SCHMITT TRIGGER, AND LATCH

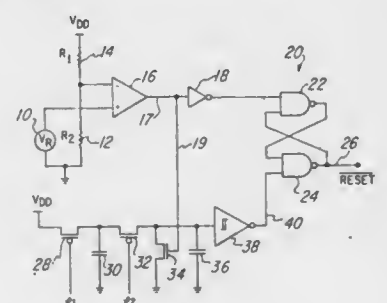
Sebastiano D'Arrigo, Houston, Tex.; Giuliano Imondi, Rieti, and Sossio Vergara, Frattamaggiore, both of Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 25, 1986, Ser. No. 843,532

Int. Cl.⁴ H03K 17/22, 17/30

U.S. Cl. 307—592

5 Claims



1. A circuit for generating an enable signal responsive to the voltage of a power supply during power-up, comprising:

a reference voltage generator, connected to said power supply, for generating a reference voltage;

a comparator, coupled to said reference voltage generator and to said power supply, for generating a voltage at its output corresponding to the difference between said power supply voltage and the reference voltage;

capacitor means coupled to said power supply and to said output of said comparator such that in response to the voltage of said output of said comparator indicating that said power supply voltage exceeds a predetermined value, said capacitor means is enabled to charge up from said power supply;

a trigger circuit having an input coupled to said capacitor means and responsive to the voltage on the latter to reversibly change its output voltage;

a latch having a set input coupled to said output of said comparator, and having a reset input coupled to the output of said trigger circuit so that, responsive to said power supply voltage exceeding said predetermined value during power-up, the output of said latch generates an enable signal, and so that, responsive to said power supply voltage thereafter falling below said predetermined value, the output of said latch generates a disable signal.

4,716,323

POWER VOLTAGE DROP DETECTING CIRCUIT

Tetsuro Wada, Yokohama, and Yasuo Ohkubo, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

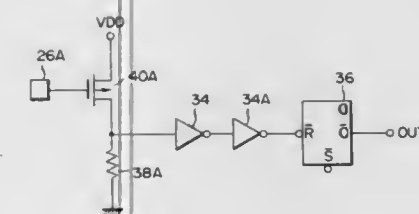
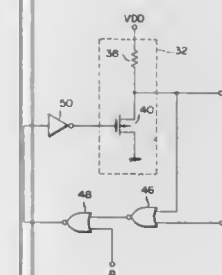
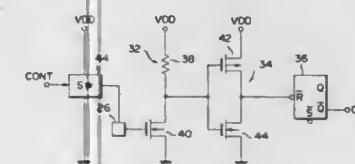
Filed Apr. 25, 1986, Ser. No. 855,595

Claims priority, application Japan, Apr. 27, 1985, 60-91419; Jan. 13, 1986, 61-4788

Int. Cl.⁴ H03K 17/284, 17/22, 17/20, 17/30

U.S. Cl. 307—594

7 Claims



1. A power voltage drop detecting circuit formed on an LSI chip accommodated in a package having pins, said circuit comprising:

first and second power source terminals supplied with power voltage and set at a positive potential and a ground potential, respectively;

a voltage dividing circuit, having a resistive means and a MOS transistor, for dividing the power voltage, said resistive means being connected at one end to said first power source terminal directly and at the other end to said second power source terminal via the current path of said MOS transistor;

a CMOS inverter for producing an output voltage according to the output voltage of said voltage dividing circuit;

a control pad connected to a pin of said LSI chip package and to a gate of said MOS transistor and set at different potentials in test and detection modes, respectively; and

a CMOS RS flip-flop having a reset terminal responsive to an inverted output signal of said CMOS inverter.

4,716,324

MAGNETOHYDRODYNAMIC ELECTRICAL POWER GENERATION

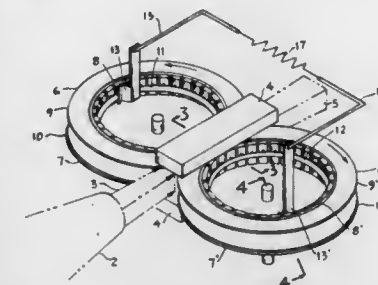
Nicholas Selufer, 725 Dodds La., Gladwyne, Pa. 19035

Filed Nov. 5, 1986, Ser. No. 932,079

Int. Cl.⁴ H02K 44/00

U.S. Cl. 310—11

6 Claims



1. A magnetohydrodynamic electrical energy generating unit comprising a source of high temperature gaseous fluid flowing in a stream, means maintaining a magnetic field comprising lines of force penetrating said stream and extending normal to the direction of flow of said stream, and movable means defining a portion of a confining structure restricting the flow of said stream through said magnetic field and adapted for progressive movement of successive portions thereof into and out of said field substantially in parallelism with a plane of the direction of flow of said stream.

4,716,325

DISENGAGEABLE ONE-WAY MECHANISM FOR SYNCHRONOUS MOTORS

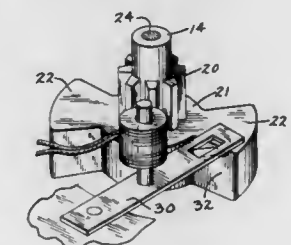
William N. Roos, Colgate, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.

Filed Nov. 6, 1986, Ser. No. 927,573

Int. Cl.⁴ H02K 7/10

U.S. Cl. 310—41

5 Claims



1. In combination with a bidirectional a.c. synchronous motor having a casing and a motor shaft disposed in an opening in the casing, a disengageable one-way mechanism comprising: an abutment mounted to the motor shaft for rotation therewith;

a flexible arm mounted to the casing and including a finger normally disposed in the path of said abutment and adapted to block said abutment when the motor shaft rotates in one direction and to ride over said abutment when the motor shaft rotates in the opposite direction; and means responsive to the energization of said motor and including a time delay to move said arm to remove the finger from the path of the abutment after the motor shaft has begun to rotate in said opposite direction and for as long as the motor is energized.

4,716,326

ELECTRIC MOTOR WITH ADJUSTABLE SWITCH LOCATION

Lynn E. Fisher, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

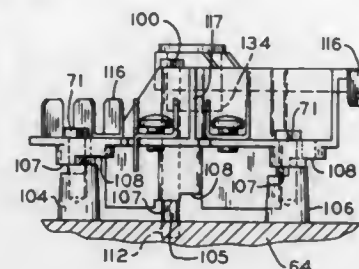
Division of Ser. No. 522,620, Aug. 12, 1983, Pat. No. 4,593,163.

This application May 16, 1986, Ser. No. 864,048

Int. Cl.⁴ H02K 5/26

U.S. Cl. 310—89

29 Claims



1. An electric motor comprising a rotatable shaft, a centrally disposed, shaft mounted, axially movable switch operating mechanism conjointly rotatable with said shaft, and a winding energization controlling switch assembly actuated in response to the axial movement of said switch operating mechanism and including a switch actuator, a switch arm support, at least two elongate switch arms supported on said support, and at least one contact carried by each of said switch arms, wherein said support is fastened to a motor mounting surface, and said switch actuator and switch arms are positioned so that a line passing through said switch arms and switch actuator is essentially collinear with the axis of said shaft and thus overlies said operating mechanism whereby maximum utilization of mechanism travel may be utilized in effecting movement of said switch actuator.

4,716,327

ELECTRIC MOTOR BEARING

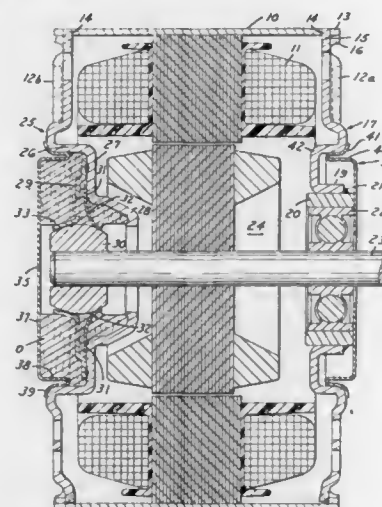
Thomas W. Stone, Owosso, Mich., assignor to Universal Electric Company, Owosso, Mich.

Filed Nov. 5, 1986, Ser. No. 927,521

Int. Cl.⁴ H02K 5/16

U.S. Cl. 310—90

5 Claims



1. An electric motor comprising a sheet metal shell having an axis, a stator supported by said shell, a shaft, a rotor mounted on said shaft, longitudinally spaced end members, said end members being fastened to the shell in a manner

such that the end members are accurately positioned longitudinally of the shell and the center of the end members is accurately positioned relative to the axis of the shell,

one of said end members rotatably supporting a portion of said shaft,

the other of said end members comprising a sheet metal member having an axially inwardly extending portion, an unpainted radial portion connected to the axial portion and a generally axially inwardly extending portion,

a bearing on said shaft,

a spring retainer engaging said radial portion of said other end member and having a plurality of radial fingers yieldingly engaging said bearing,

a bearing retainer welded to said unpainted radial portion of said end member, and defining a seat engaging said bearing,

an external oil catcher cover frictionally engaging the annular wall of said other end member and extending radially inwardly into overlying relation with said bearing member, and

oil retaining material positioned between said oil catcher cover and said bearing retainer and between said bearing retainer and said spring retainer and between said spring retainer and said generally axially inwardly extending portion of said end member.

4,716,328

MAGNETIC FIELD COMPENSATED LIQUID METAL CURRENT COLLECTOR FOR ACYCLIC GENERATOR

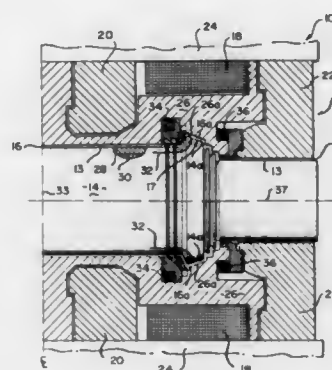
Manoj R. Shah, Latham; Henry G. Lenz, and William L. Bird, both of Scotia, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Jan. 2, 1986, Ser. No. 815,611

Int. Cl.⁴ H02K 31/00

U.S. Cl. 310—178

2 Claims



1. An acyclic dynamoelectric machine comprising, in combination:

A. a stator having a bore;

B. a rotor mounted for rotation about its axis within said bore and separated from said stator by an annular air gap;

C. a pair of axially spaced, solenoidal-shaped field windings for developing an excitation magnetic field;

D. a pair of current collectors, each said current collector being in radially underlying relation with a different one of said field windings and including opposed, conforming annular collector surfaces of said rotor and said stator separated by a segment of said air gap and liquid metal disposed within said air gap segment to conduct current between said stator and said rotor collector surfaces, said rotor and stator collector surfaces being disposed at a predetermined angle relative to said axis; and

E. solenoidal-shaped compensation means incorporated in said stator for shaping said excitation magnetic field in the regions of said current collectors such as to minimize field

components thereof normal to said stator and rotor collector surfaces, said compensation means including a separate pair of axially spaced trim coils associated with each said current collector, said trim coils of each said trim coil pair disposed in opposed, continuous flanking relation with said stator collector surface of the associated one of said current collectors and respectively energized with equal and opposite direct currents, whereby the net magnetic field contribution of said trim coils to said excitation field is practically zero.

4,716,329

ARMATURE CONSTRUCTION FOR ELIMINATING ARMATURE REACTION IN ELECTRIC ROTATING MACHINES

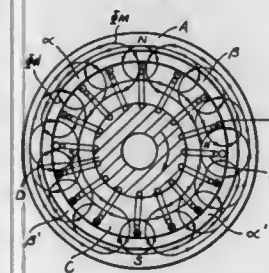
Sang S. Oh, Seoul, Rep. of Korea, assignor to Jang Kyun Oh, Seoul, Rep. of Korea, a part interest

Continuation of Ser. No. 874,664, Feb. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 321,554, Jan. 5, 1973, abandoned. This application Jun. 24, 1980, Ser. No. 162,571

Int. Cl.⁴ H02K 1/10

U.S. Cl. 310—183

7 Claims



1. Apparatus comprising rotor and stator means one of which is rotatable relative to the other, one of said means being a magnetized member and therefore having North and South poles, the other of said means comprising an armature, a first winding associated with at least one of said means and effecting a magnetic interaction between said rotor and stator means, a second winding at right angles to said first winding, said second winding being of closed loop configuration, and a non-magnetic means operatively positioned with respect to said second winding for cooperating therewith for the generating and positioning of counter flux for compensating armature reaction flux and thereby increasing efficiency, said rotor and stator means being concentric cylinders, the outer of which is a magnet and the inner of which is said armature, said first winding being a main coil wound on said armature, said non-magnetic means being associated with said armature, said first winding being of drum type, said armature being slotted to receive said main coil.

4,716,330

DC MOTOR WITH COMMUTATOR ROTOR

Marc Heyraud, La Chaux-de-Fonds, Switzerland, assignor to Asgallium S.A., Switzerland

Filed Nov. 5, 1985, Ser. No. 795,082

Claims priority, application European Pat. Off., Nov. 19, 1984, 84810559.9

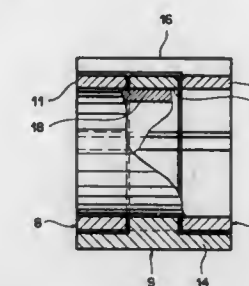
Int. Cl.⁴ H02K 13/10

U.S. Cl. 310—233

8 Claims

1. A DC motor comprising:
a stator which includes a first number of pairs of poles regularly distributed around an axis; and
a rotor which includes a commutator and a plurality of coils, the number of said coils being a second number equal to the product of an integer higher than one and said first number;
said commutator comprising a plurality of integral rigid parts of a conducting metal, each of said integral rigid parts including an annular supporting portion and a group of elongated elements regularly distributed around said

annular supporting portion, the number of elongated elements in said group being equal to said first number of pairs of poles of said stator, and the number of integral rigid parts being equal to said second number of coils per pair of poles;



said annular supporting portions of said plurality of integral rigid parts being coaxial with the axis of said stator so that said elongated elements of said plurality of integral rigid parts are regularly distributed around said axis, said annular supporting portions being held in a fixed relationship with, spaced apart from and insulated from one another by insulating means.

4,716,331

ELECTRICALLY VARIABLE PIEZOELECTRIC HYBRID CAPACITOR

Robert J. Higgins, Jr., Sunrise, Fla., assignor to Motorola Inc., Schaumburg, Ill.

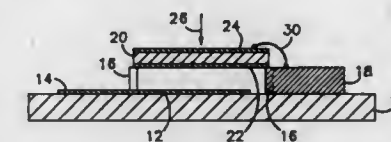
Division of Ser. No. 814,868, Dec. 30, 1985, Pat. No. 4,675,960.

This application Mar. 13, 1987, Ser. No. 25,430

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—330

9 Claims



1. An electrically variable piezoelectric hybrid microelectronic circuit capacitor, comprising in combination:

a substrate;

a first capacitor plate formed on a surface of said substrate; a ridge formed by a hybrid microelectronic circuit manufacturing process on said surface of said substrate, said ridge having an upper surface positioned a predetermined distance above said first capacitor plate;

an arch or dome shaped piezoelectric wafer connected to said upper surface of said ridge;

a second capacitor plate formed on a first surface of said piezoelectric wafer;

a first control plate formed on a second surface of said piezoelectric wafer.

4,716,332

PIEZOELECTRIC VIBRATOR

Hitoaki Hayashi, Tokyo, Japan, assignor to Asahi Dempa Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,014

Claims priority, application Japan, Mar. 31, 1986, 61-70953

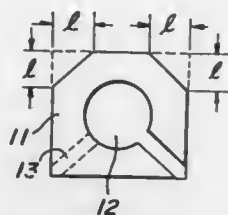
Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—368

5 Claims

1. In a piezoelectric vibrator vibrating at a third overtone frequency comprising a vibrating plate made of piezoelectric material and having opposite major surfaces, and a pair of electrodes applied on said major surfaces in opposition to each

other, the improvement wherein said vibrating plate comprises a substantially square plate having at least two adjacent corners cut off along oblique planes substantially perpendicular to said plate and spaced from an axis passing through a center of said plate, said plate has a center of gravity eccentric with



respect to a center of gravity of each of said pairs of electrodes, and an impedance of the vibrator for said third overtone frequency is smaller than one-third of an impedance of a vibrator for a fundamental frequency, so that a fundamental vibration is suppressed and a third overtone vibration is enhanced.

4,716,333

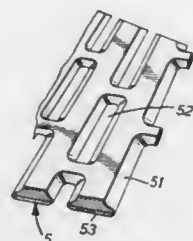
SHADOW MASK FOR A COLOR CATHODE RAY TUBE
Tokita Kiyoshi, and Kondou Masayoshi, both of Saitama, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Aug. 13, 1984, Ser. No. 640,390

Claims priority, application Japan, Aug. 16, 1983, 58-148843
Int. Cl.⁴ H01J 29/80

U.S. Cl. 313—402

21 Claims



1. A color cathode ray tube comprising:
an envelope having a neck portion and a panel portion;
electron gun means within said neck portion for emitting an electron beam directed toward said panel portion;
a plurality of colored phosphor stripes on a surface of said panel portion to emit colored light when struck by the electron beam; and
a shadow mask between said panel portion and said electron gun means to permit the electron beam to strike the correct color phosphor stripe while preventing the electron beam from striking another color phosphor stripe, said shadow mask comprising:
a. a major face containing a plurality of apertures,
b. a skirt portion extending from the periphery of said major face; and
c. a layer consisting essentially of a ceramic material bonded to said major face by heat treatment so that said shadow mask includes residual tensile stress.

4,716,334

FACEPLATE ASSEMBLY FOR SECURING A TENSION MASK SUPPORT STRUCTURE TO A FACEPLATE
James R. Fendley, Arlington Heights, and Siegfried M. Greiner, Crystal Lake, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 31, 1986, Ser. No. 925,424

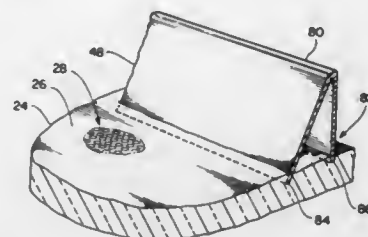
Int. Cl.⁴ H01J 29/07

U.S. Cl. 313—407

11 Claims

1. A faceplate assembly for a color cathode ray tube comprising a glass faceplate having on its inner surface a centrally disposed phosphor screen, and a foil shadow mask mounted in

tension on a mask support structure located on opposed sides of the screen, said mask support structure physically penetrating said faceplate for permanent, cementless anchoring of said



structure to said faceplate, with the embedment of said mask support structure being of such depth as to cause said structure to resist tensile forces created by said mask.

4,716,335

LUMINESCENT SCREEN AND LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP PROVIDED WITH SUCH A SCREEN

Evert D. Schutten, Roosendaal, and Johannes G. Verlijdsdonk, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1986, Ser. No. 869,750

Claims priority, application Netherlands, Jun. 4, 1985, 8501599

Int. Cl.⁴ C09K 11/475

U.S. Cl. 313—486

4 Claims

1. A luminescent screen provided with a luminescent layer which is applied to a carrier and which comprises a luminescent terbium-activated silicate having a cuspidine crystal structure, characterized in that the silicate corresponds to the formula $Y_{4-x-z-p}Ca_xM_z^{II}Tb_pSi_{2-y}Al_yO_{7+x+z+y}N_{2-x-z-y}$ where M^{II} represents at least one of the elements Mg, Sr and Ba, where the yttrium is replaceable up to at most 50 mol. % by at least one of the elements Gd and La and
 $0 \leq x \leq 1.9$
 $0 \leq z \leq 1.0$
 $0 \leq y \leq 1.9$
 $x+z+y \leq 1.9$
 $0.05 \leq p \leq 1.5$.

4,716,336

LUMINESCENT SCREEN AND LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP PROVIDED WITH SUCH A SCREEN

Evert D. Schutten, Roosendaal, and Johannes G. Verlijdsdonk, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1986, Ser. No. 869,749

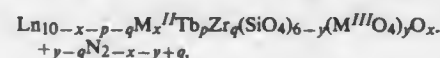
Claims priority, application Netherlands, Jun. 4, 1985, 8501600

Int. Cl.⁴ C09K 11/475

U.S. Cl. 313—486

8 Claims

1. A luminescent screen provided with a luminescent layer which is formed on a carrier and which comprises a luminescent silicate having an apatite crystal structure, characterized in that the silicate corresponds to the formula:



where Ln represents at least one of the elements Y, La and Gd, M^{II} represents at least one of the elements Mg, Ca and Sr and M^{III} represents at least one of the elements Al and B and where

$$0 \leq x \leq 1.9$$

$$0 \leq y \leq 1.9$$

$$x+y \leq 1.9$$

$$0 \leq p \leq 3$$

$$0 \leq q \leq x+y$$

$$0.1 \leq p+q$$

4,716,337

FLUORESCENT LAMP

Cornelis Huisjes, and Evert D. Schutten, both of Roosendaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 6, 1987, Ser. No. 720

Claims priority, application Netherlands, Jan. 8, 1986, 8600023

Int. Cl.⁴ H01J 61/44, 61/48

U.S. Cl. 313—487

8 Claims



1. A low-pressure mercury vapour discharge lamp having a very satisfactory colour rendition, a colour temperature of emitted white light in the range from 2300 to 3300 K. and a colour point on or near the Planckian locus, said lamp having a gas-tight radiation emitting envelope containing mercury and a rare gas, and a luminescent layer comprising:

- a. at least one luminescent alkaline earth metal halophosphate activated by trivalent antimony and by bivalent manganese with a colour temperature of the emitted radiation from 2900 to 5000 K.;
- b. at least one luminescent material activated by bivalent europium having an emission maximum in the range from 470 to 500 nm and a half-value width of the emission band of not more than 90 nm;
- c. a luminescent rare earth metal metaborate activated by trivalent cerium and by bivalent manganese and having a monoclinic crystal structure whose fundamental lattice is defined by the formula $Ln(Mg,Zn,Cd)B_3O_{10}$, in which Ln represents at least one of the elements yttrium, lanthanum and gadolinium, and in which up to 20 mol. % of the B may be replaced by Al and/or Ga, which metaborate has a red Mn^{2+} emission; and
- d. a luminescent aluminate activated by trivalent cerium and having a garnet crystal structure at least partly absorbing blue radiation at wavelengths below 480 nm, characterized in that the luminescent layer also comprises:
- e. a green luminescing material activated by bivalent manganese having an emission maximum in the range from 510 to 535 nm.

4,716,338

ELECTRODE STRUCTURE FOR A CATHODE GLOW DISCHARGE SYSTEM

Yung Rungz, Room No. 503, 1st door, Beijing Huel Min Hospital Dormitory, Beijing, China

Filed Sep. 3, 1985, Ser. No. 771,799

Claims priority, application China, May 15, 1985, 85103601
Int. Cl.⁴ H01J 17/38, 1/90

U.S. Cl. 313—619

10 Claims

1. An electrode structure in a glow discharge system used for nitride hardening of a workpiece, comprising:
an anode plate;

a cathode plate mounted opposite said anode plate and adapted to support said workpiece;
a conducting bar which passes through said anode plate and is connected to said cathode plate;
an insulating dielectric shroud extending between said anode

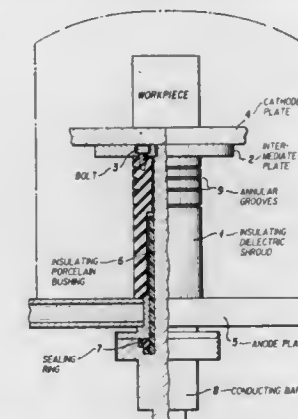


plate and said cathode plate and surrounding said conducting bar;
said shroud being in contact with said cathode plate and said anode plate so as to leave no gap therebetween and so that there are no exposed portions of said conducting bar between said cathode and anode plates.

4,716,339

SPLIT DRIFT RING FOR FOCUS DEFLECTION IN LIGHT VALVES

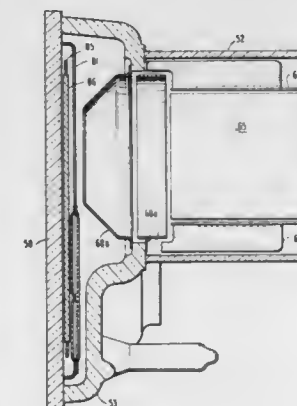
Alfred G. Roussin, Syracuse, N.Y., assignor to General Electric Company, Princeton, N.J.

Filed Jul. 8, 1986, Ser. No. 883,214

Int. Cl.⁴ H01J 29/46

U.S. Cl. 315—15

12 Claims



1. An improved electrostatic electron optical system for generating an electron beam and imaging an electron object formed by an aperture having a rectangular cross-section and sweeping said beam over a scanned raster area while maintaining the magnification of the horizontal and vertical image dimensions, and focus surface over the entire scanned area comprising:

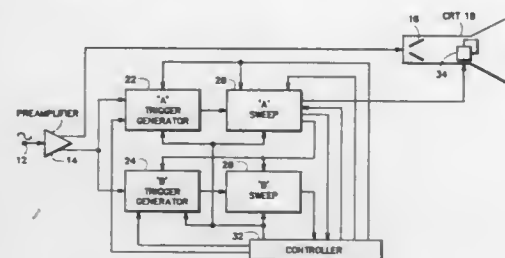
a focus deflection electrode assembly of rectangular cross-section having two pairs of parallel plates;
at least two substantially symmetrical, cylindrical electrodes in spaced apart relation along the axis of said focus and deflection electrode assembly; and
a beam landing electrode, said at least two cylindrical electrodes being operated at different voltages to produce a plurality of electrostatic lens which provide off-axis

4,716,345

AUTOMATIC PULSE DISPLAY

Gordon W. Shank, Portland, Oreg., and Earl P. Eason, Livermore, Calif., assignors to Tektronix, Inc., Beaverton, Oreg.
 Filed Sep. 19, 1986, Ser. No. 909,343
 Int. Cl.⁴ G01R 13/28; H04N 3/223
 U.S. Cl. 315—392

7 Claims



1. In an oscilloscope having dual time sweeps and trigger generators, a method of automatically expanding the display of a repetitive input signal having a pulse portion of less than a specified duty factor, comprising:

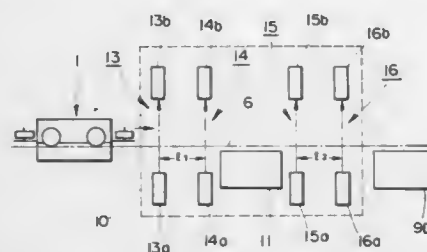
setting the speed of the time sweep for the sweep signal to contain a predetermined number of input signal cycles; increasing the speed of the time sweep to expand the signal cycles, the speed increased by a factor sufficient to place less than a single signal cycle within the sweep signal and an expanded pulse portion of greater than the specified duty factor outside the sweep signal; detecting whether an expanded pulse is contained within the faster sweep signal; and displaying the expanded pulse if so contained.

4,716,346

CONVEYING APPARATUS

Yukito Matsuo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan
 Filed Dec. 12, 1985, Ser. No. 808,114
 Claims priority, application Japan, Dec. 13, 1984, 59-263516
 Int. Cl.⁴ H02K 41/00
 U.S. Cl. 318—38

18 Claims



1. A conveying apparatus for moving a carriage loaded with an article in a conveying direction along a curve of a track under the influence of inertia, comprising:

a plurality of driving means disposed along said track in a spaced relation to impart forward or reverse propulsive force to said carriage, one speed detecting means for detecting the speed of the carriage before the carriage enters a preselected one of the driving means, said preselected driving means being located upstream of the curve with respect to the conveying direction, mass detecting means for detecting the mass of the carriage, memory means for storing information on radius of curvature of said curve, and speed control means responsive to said one speed detecting means, said mass detecting means, and said memory means for determining a maximum desired speed as a function of

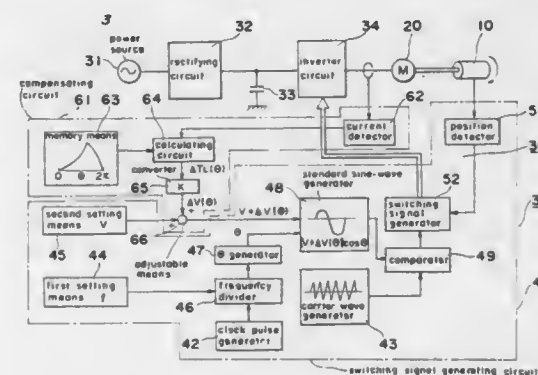
the mass of the carriage and the radius of the curve for limiting the centrifugal force exerted on the carriage when it moves along the curve to a predetermined maximum value, said speed control means including means for controlling said preselected driving means to change the speed of the carriage to the maximum desired speed before the carriage enters the curve.

4,716,347

OSCILLATION REDUCING APPARATUS FOR ROTARY COMPRESSOR

Satoru Fujimoto, Sakai, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan
 Filed Mar. 14, 1986, Ser. No. 839,735
 Claims priority, application Japan, Mar. 15, 1985, 60-52947
 Int. Cl.⁴ G05B 5/01
 U.S. Cl. 318—460

9 Claims



1. A vibration reducing device for a rotary compressor to be driven by a motor, comprising:

an inverter for actuating the motor upon receiving an electric power from a power source; means for synchronizing the actuation of the inverter with the rotation of the compressor; means for detecting the driving condition of the motor; means for controlling the output of the inverter in response to the output of the means for detecting; and means for adjusting the output of the means for controlling on the basis of a factor relating to a load torque of the compressor, thereby controlling the generating torque of the motor in accordance with the load torque fluctuation of the compressor.

4,716,348

DC MOTOR ADAPTIVE CONTROLLER

Dennis C. Nolan, West Allis, and David A. Bluma, Milwaukee, both of Wis., assignors to MagneTek, Inc., Los Angeles, Calif.
 Filed Aug. 26, 1986, Ser. No. 900,451
 Int. Cl.⁴ H02P 5/06, 7/14

U.S. Cl. 318—479

17 Claims

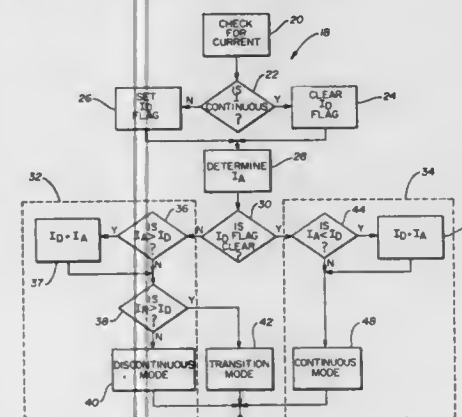
1. In a method of regulating DC motors of the type providing armature current through phase control of power semiconductors, the improvement comprising the steps of:

(a) repetitively sensing and storing the highest value of armature current while in discontinuous conduction as a transition value between discontinuous and continuous armature current conduction; and
 (b) regulating said armature current to a presently commanded value by operating at a first gain while said armature current is below said transition value, and at a second gain while said armature current is above said transition value.

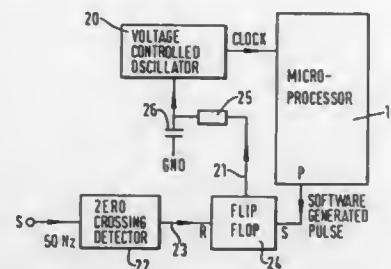
12. A method of operating a DC motor phase-control regulator comprising:

(a) determining whether motor armature current is continuous from phase to phase by sampling said armature cur-

rent a predetermined number of degrees ahead of the firing command in each phase;
 (b) computing an average value of said armature current;
 (c) comparing said average value of armature current to a stored value representative of the highest previously sensed discontinuous armature current;
 (d) retaining the higher of said average value of armature current and said stored value of the highest previously sensed discontinuous armature current when said armature current is discontinuous and retaining the lower of said average value and said stored value of the highest previously sensed discontinuous armature current when said armature current is continuous;



ing signal after a fixed number of clock pulses, said synchronising means comprising means for detecting a fixed phase of said periodic external signal and means for controlling the fre-



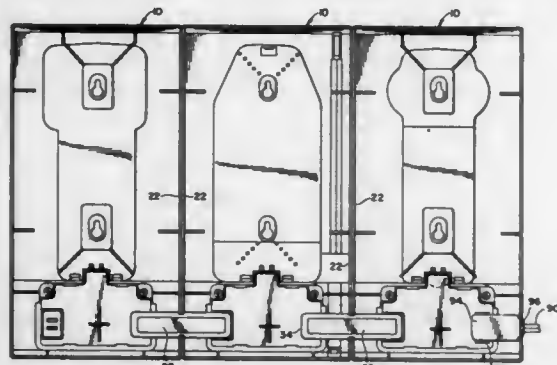
quency of said clock source in dependence on the time difference between the occurrence of said timing signal and detection of said fixed phase of said periodic external signal.

4,716,352 CHARGING BASE FOR A BATTERY-POWERED APPLIANCE

Richard L. Hurn, Ridgely, and Michael R. Sell, Denton, both of Md., assignors to Black & Decker, Inc., Newark, Del.
Filed Dec. 26, 1984, Ser. No. 686,590
Int. Cl.⁴ H01M 45/04

U.S. Cl. 320-2

7 Claims



1. An electrical charging base for a battery-powered appliance having an electrical charging contact, said base comprising:

- a frame defining a shaped cavity for receiving said appliance in only one orientation;
- a rectifying circuit disposed in said frame for converting source alternating current to charging direct current, said source alternating current originating from a source outside of said charging base, said rectifying circuit including a source input contact and a charging output contact, said charging output contact being disposed for electrical connection with said charging contact when said appliance is disposed in said cavity;
- a source output contact disposed in said frame;
- a bypass circuit disposed in said frame for electrically connecting said source input contact to said source output contact, said bypass circuit transmitting source unaltered AC current from said source input contact to said source output contact; and
- jumper means for electrically connecting said source output contact to a source input contact of a second charging base for another appliance.

4,716,353

BATTERY CHARGER

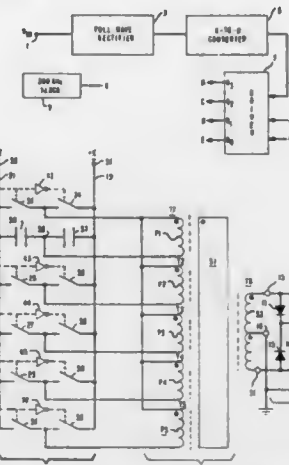
Rudolph H. Engelmann, Ann Arbor, Mich., assignor to Electro-Voice Inc., Buchanan, Mich.

Filed Sep. 2, 1986, Ser. No. 903,254

Int. Cl.⁴ H02J 7/00; G05F 5/00

U.S. Cl. 320-21

14 Claims



1. In a battery charging system including a source of DC voltage, transformer means having a primary winding, a plurality of first secondary windings, a plurality of second secondary windings, a current sensing secondary winding, and a plurality of tertiary windings associated with individual ones of said first plurality of secondary windings, respectively, and positive and negative voltage output terminals, the method comprising the steps of:

- alternately and successively applying said DC voltage across said primary winding, first in one polarity, and next in opposite polarity, thereby causing oppositely directed pulses of current to flow through said primary winding over successive half-cycles of operation, respectively;
- rectifying the AC pulses induced through said first secondary windings;
- connecting the rectified AC pulses to said positive and negative current output terminals, for delivering charging current to a battery connected to said output terminals; and
- shorting selected ones of said tertiary windings over each half-cycle of operation, for preventing the induction of voltage across and flow of current from the ones of said first secondary windings associated with shorted ones of said first tertiary windings, respectively, for controlling the magnitude of charging current to be delivered to a battery.

4,716,354

AUTOMATIC VOLTAGE REGULATOR MEANS PROVIDING A DUAL LOW POWER RESPONSIVE AND OUTPUT-VOLTAGE-CONTROLLING REGULATOR SIGNAL PARTICULARLY FOR A PLURAL SOURCE BATTERY POWERED SYSTEM

David C. Hacker, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Nov. 12, 1985, Ser. No. 797,235

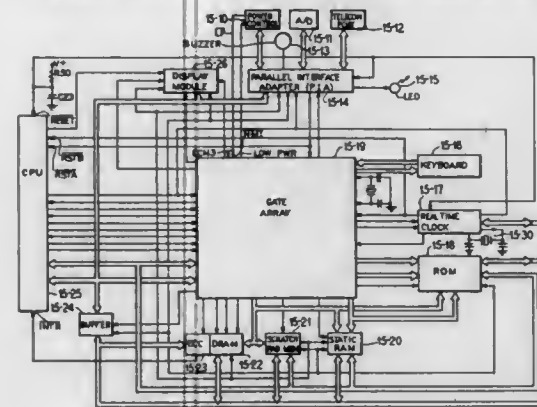
Int. Cl.⁴ H02J 7/04

U.S. Cl. 320-39

44 Claims

1. In a system including power supply means for supplying a regulator input voltage, automatic voltage regulator means having power input means coupled with said power supply means for receiving the regulator input voltage, having power output means for supplying a regulator output voltage, and being automatically operable to maintain a selected value of said regulator output voltage at said power output means for a normal range of values of said regulator input voltage,

said automatic voltage regulator means comprising operational amplifier means providing a regulator signal controlling regulator output voltage so as to maintain the selected value of said regulator output voltage for the normal range of values of said regulator input voltage, said operational amplifier means causing said regulator signal to progressively change in amplitude to maintain said regulator output voltage at the selected value as the value



of said regulator input voltage is progressively decreased within said normal range, and causing said regulator signal to reach a distinctive limit range as the regulator input voltage falls below a given minimum value, and signalling means coupled with said operational amplifier means and responsive to said regulator signal for supplying a low power signal to an external circuit when the regulator signal reaches said distinctive limit range.

4,716,355 DEVICE FOR CONTROLLING A CHARGING GENERATOR

Mitsuharu Morishita, and Shinichi Kouge, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

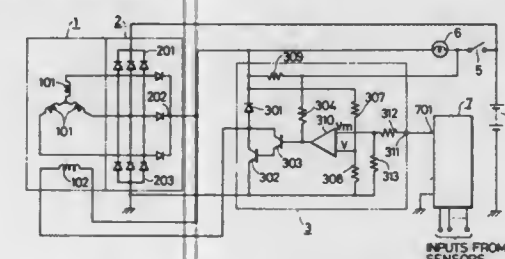
Continuation of Ser. No. 472,465, Mar. 7, 1983, abandoned. This application Apr. 24, 1986, Ser. No. 856,538

Claims priority, application Japan, Mar. 9, 1982, 57-38915; Mar. 9, 1982, 57-38916

U.S. Cl. 320-64

Int. Cl.⁴ H02J 7/14

6 Claims



1. An apparatus for controlling a charging generator on a vehicle, said generator having armature coils and a field coil for charging a storage battery, comprising:

- a rectifier for rectifying an a.c. output induced in the armature coils into a d.c. output for charging the storage battery;
- a voltage regulator for turning a current flowing through the field coils of the charging generator on and off to control and output voltage of the charging generator so as to be maintained at a reference voltage, said voltage regulator comprising a transistor for controlling the conduction of the field coil of the charging generator, and a comparator comparing the output of the rectifier with the reference voltage to produce an output for turning said transistor on and off; and
- reference voltage output means for setting a desired reference voltage for said voltage regulator; sensor means

responsive to engine speed of said vehicle and charging of said storage battery and providing inputs to reference voltage output means for setting said reference voltage for said voltage regulator, and said voltage regulator including means for providing a plurality of modes of control are determined by whether said set reference voltage as a function of said inputs is inside or outside a preset voltage range.

4,716,356 JFET PINCH OFF VOLTAGE PROPORTIONAL REFERENCE CURRENT GENERATING CIRCUIT

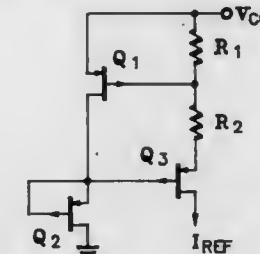
Robert L. Vyne, Tempe, and David M. Susak, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1986, Ser. No. 943,341

Int. Cl.⁴ G05F 3/08

U.S. Cl. 323-312

4 Claims



1. A circuit for generating a reference current proportional over temperature to the ratio of the pinch off voltage V_p of a JFET to some resistance, comprising:

- a first JFET having a source coupled to a first source of supply voltage, a gate, and a drain;
- first means coupled to the drain of said first JFET for imparting a negative gate-to-source voltage on said first JFET;
- first resistive means coupled between the gate and source of said first JFET for producing said reference current; and
- second means coupled to the gate and drain of said first JFET for setting the voltage at the drain of said first JFET.

4,716,357 AC VOLTAGE REGULATOR WITH SPLIT PRIMARY SWITCHING

Edward Cooper, 2612 Penrose St., San Diego, Calif. 92101
Continuation-in-part of Ser. No. 805,829, Dec. 6, 1985. This application Oct. 23, 1986, Ser. No. 922,196

Int. Cl.⁴ G05F 1/30

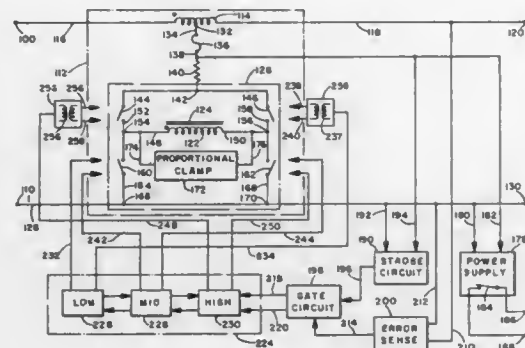
U.S. Cl. 323-263

21 Claims

1. An apparatus for regulating an AC line voltage, comprising:

- an input port for connection to a source of input AC voltage;
- an output port for delivering a regulated voltage to a load;
- transformer means for regulating the output voltage, comprising a buck/boost winding connected between the input and output port, a primary winding split into two oppositely wound portions each having a greater number of turns than the buck/boost winding, each primary winding portion being split into at least two winding parts and a common transformer core about which both windings are wound;
- switch means for controlling the connection of the primary winding in circuit with the buck/boost winding, including means for selectively connecting the primary winding in different configurations in the circuit the switch means comprising first switch means for controlling connection of the two parts of one of the primary winding portions in series in the circuit in a first, boost configuration, and second switch means for controlling connection of the two parts of the other winding portion in series in the circuit in a second, buck configuration;
- voltage sensing means for detecting the magnitude of the line voltage and for producing corresponding control

signals when the line voltage varies outside predetermined limits; and
switch controlling means responsive to the voltage sensing means control signals for closing said first switch means if the voltage is below the predetermined limits and closing said second switch means if the voltage is above the prede-



termined limits, the transformer means comprising a step up transformer in the first configuration and a step down transformer in the second configuration; and
energy proportional current and voltage limiting means for limiting the current and voltage across the primary winding.

4,716,358

CONSTANT CURRENT CIRCUITS

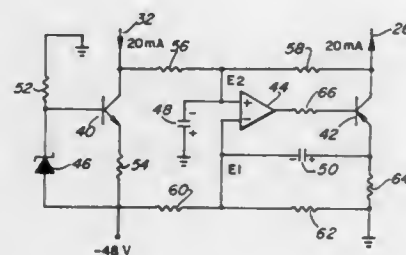
Dermot T. Fucito, Norcross, Ga., assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 12, 1986, Ser. No. 929,715

Int. Cl.⁴ G05F 3/28

U.S. Cl. 323-316

10 Claims



1. A constant current circuit comprising:
first means for passing a constant current, said first means having first and second terminals;
second means for passing a current, the second means having first and second terminals and including control means for controlling the current passed by the second means;

a first potential divider connected between the first terminals of the first and second means and having a tapping point;
a second potential divider connected between the second terminals of the first and second means and having a tapping point;
and
amplifier means responsive to potential difference between the tapping points of the first and second potential dividers for controlling the control means, whereby the current passed by the second means has a predetermined relationship to the constant current passed by the first means.

4,716,359

OUTPUT STAGE CONTROL CIRCUIT

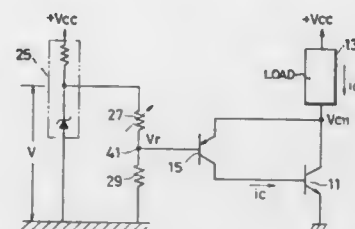
Hidetaka Numata, and Toshihiko Kawata, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Nov. 13, 1986, Ser. No. 930,794

Claims priority, application Japan, Nov. 15, 1985, 60-257475
Int. Cl.⁴ G05F 1/445

U.S. Cl. 323-349

3 Claims



1. An output stage control circuit for stably controlling a current through a varying load having one terminal connected to a power supply source, comprising:
output driving means constituted by an output stage transistor having its collector and emitter terminals connected in series between the other terminal of said load and ground for adjusting the current through said load;
control means constituted by a control transistor having its collector and emitter terminals connected between said other terminal of said load and a base terminal of said output stage transistor for supplying an analog control signal to said base terminal of said output stage transistor; and
a reference voltage supply source for providing a reference voltage signal to a base terminal of said control transistor, whereby the current through the load is stably controlled by said output driving means in response to the analog control signal provided by said control means which is determined in response to the reference voltage signal.

4,716,360

MOISTURE DETECTOR APPARATUS AND METHOD

Ivars E. Pakulis, Arlington Heights, Ill., assignor to Advanced Moisture Technology, Inc., Wauconda, Ill.

Filed Aug. 16, 1985, Ser. No. 766,426

The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.

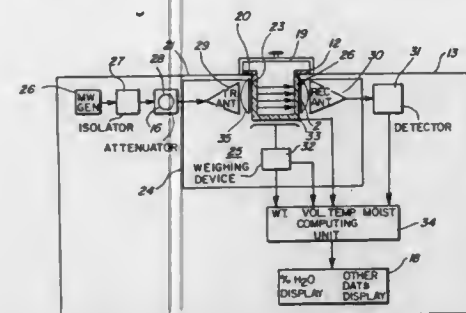
Int. Cl.⁴ G01R 27/26

U.S. Cl. 324-58.5 A

28 Claims

1. An apparatus for analyzing a sample of moisture containing material comprising:
first means for forming a chamber effectively preventing reflection of microwave energy;
second means defining a sample cell space for retaining a moisture containing sample material, said second means being arranged to be disposed in said chamber;
third means for transmitting microwave energy in the form of a parallel beam, planar wavefront through said second means in said chamber;
fourth means for receiving radiation transmitted through

said space and providing a first output signal representative of water weight in a sample material therein;
fifth means coupled to said first and second means for providing a second output signal representing the weight of a sample material including the water weight retained in said space;



sixth means for receiving said first and second output signals and providing a third output signal representing the percent by weight moisture content of material retained in said space; and
seventh means for measuring the temperature of the sample material retained in said space during a weight sensing operation and providing a fourth output signal.

4,716,361

CAPACITANCE MEASURING METHOD AND APPARATUS

Tzafir Sheffer, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

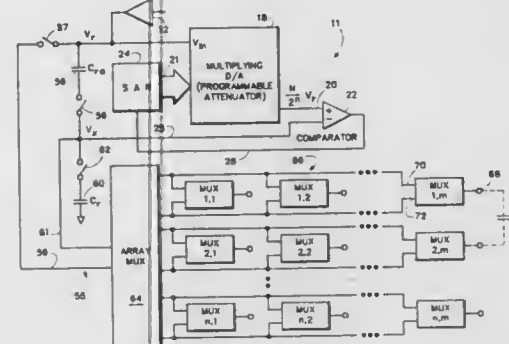
Continuation-in-part of Ser. No. 668,622, Nov. 5, 1984,

abandoned. This application Jun. 11, 1985, Ser. No. 743,622

Int. Cl.⁴ G01R 27/00

U.S. Cl. 324-60 R

10 Claims



1. A method for measuring the magnitude of an unknown capacitance utilizing a ratiometric capacitance measurement apparatus adapted to measure the magnitude of a capacitor relative to a known capacitance coupled to said capacitor, the method comprising the steps of:
coupling said apparatus to said unknown capacitance; and
utilizing said apparatus to measure the magnitude of said unknown capacitance relative to said known capacitance wherein said known capacitance is the inherent capacitance coupling said capacitance measurement device to a point of common reference potential.

4,716,362

SURFACE WAVE DISPERSIVE FILTER SPECTRUM ANALYZER

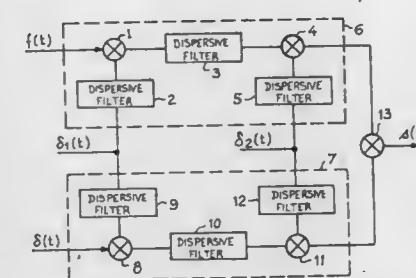
René Ambos, Morangis; Gilles Quagliaro, Chatillon, and Alain Fertil, Voisin le Bretonneux, all of France, assignors to Thomson CSF, Paris, France

Filed Oct. 21, 1985, Ser. No. 789,952

Claims priority, application France, Oct. 30, 1984, 84 16600
Int. Cl.⁴ G01R 23/16

U.S. Cl. 324-77 B

4 Claims



1. A surface wave dispersive filter spectrum analyzer, comprising:
a first M-C-M analyzer including:
first dispersive filter means for receiving a first driving signal, and for delivering a first linearly frequency modulated ramp signal;
first mixer means for receiving an input signal $f(t)$, and for premultiplying said signal $f(t)$ by said first ramp signal to provide a first multiplied signal;
second dispersive filter means for convoluting said first multiplied signal with a second linearly frequency modulated ramp signal to provide a first convoluted signal;
third dispersive filter means for receiving a second driving signal, and for delivering a second linearly frequency modulated ramp signal; and second mixer means for postmultiplying said first convoluted signal by said second ramp signal to provide a first analyzed signal;
a second M-C-M analyzer including:
fourth dispersive filter means for receiving said first driving signal, and for delivering a fourth linearly frequency modulated ramp signal;
third mixer means for receiving a reference signal, and for premultiplying said reference signal by said fourth ramp signal to provide a second multiplied signal;
fifth dispersive filter means for convoluting said second multiplied signal with a fifth linearly frequency modulated ramp signal to provide a second convoluted signal;
sixth dispersive filter means for receiving said second driving signal, and for providing a sixth linearly frequency modulated ramp signal; and
fourth mixer means for postmultiplying said second convoluted signal by said sixth ramp signal to provide a second analyzed signal; and fifth mixer means for mixing said first and second analyzed signals to provide an output signal.

4,716,363

EXPONENTIAL DECAY TIME CONSTANT MEASUREMENT USING FREQUENCY OF OFFSET PHASE-LOCKED LOOP: SYSTEM AND METHOD

John N. Dukes, Los Altos Hills; William F. Carlsen, Jr., Mountain View, and Richard J. Pittaro, San Carlos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 8, 1987, Ser. No. 47,818

Int. Cl.⁴ G01R 23/16

U.S. Cl. 324-77 R

18 Claims

1. A system for measuring a value functionally related to an exponential decay time constant, said system comprising:
stimulus/response means including stimulus means for stim-

- (e) rotating the received resonance signal by a phase offset;
 (f) transforming the phase offset rotated received signal;
 (g) determining a phase angle corresponding to the reference from the transformed signal;
 (h) comparing the determined phase angle with a selected phase angle;
 (i) adjusting the phase offset in accordance with the determined and selected phase angle comparisons and repeating steps (e) and (f);
 (j) repeating steps (b) through (i) with each of a plurality of different phase encode gradients and creating an image representation from the transformed signals.

4,716,369

HIGH SPEED IMAGING METHOD WITH THREE-DIMENSIONAL NMR

Kensuke Sekihara, Hachioji; Shigeru Matsui, Koganei; Hideki Kohno, Suginami; Etsuji Yamamoto, and Hidemi Shiono, both of Aikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

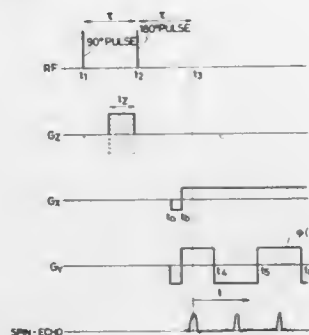
Filed Jun. 20, 1985, Ser. No. 746,663

Claims priority, application Japan, Jun. 20, 1984, 59-126843; Jul. 6, 1984, 59-139001

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324-309

9 Claims



1. A high speed imaging method using three-dimensional NMR comprising the steps of:

- (a) exciting nuclear spins of an object placed under a homogeneous static magnetic field;
 (b) applying a 180° radio frequency pulse to said object a predetermined time after said excitation;
 (c) applying a first gradient magnetic field with a predetermined amplitude for providing said static magnetic field with a spatial gradient along a first direction within a certain time during the period from said excitation until the generation of an echo signal by the application of said 180° radio frequency pulse;
 (d) applying second and third gradient magnetic fields for providing said static magnetic field with respective spatial gradients along a second and a third direction perpendicular to said first direction, wherein one of said second and third gradient magnetic fields is constant and the other is periodically inverted so as to form an echo train of;
 (e) repeating said steps (a)-(d) a plurality of times to obtain a measured signal by each repetition, the amplitude of said first gradient magnetic field being sequentially varied in each repetition; and
 (f) Fourier-converting the measured signal obtained by each said repetition so as to obtain a three-dimensional distribution of nuclear spins in said object.

4,716,370

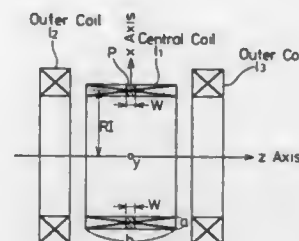
COIL ARRANGEMENT FOR PRODUCING STATIC MAGNETIC FIELD

Yuji Inoue, Hideto Iwaoka, and Tadashi Sugiyama, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation and Yokogawa Medical Systems, Limited, both of Tokyo, Japan
 Filed Sep. 20, 1985, Ser. No. 778,368

Claims priority, application Japan, Sep. 27, 1984, 59-202450
 Int. Cl.⁴ G01R 33/20

U.S. Cl. 324-319

2 Claims



2. A coil arrangement for use in an NMR tomograph for producing a static magnetic field, said coil arrangement consisting of a central coil and two outer coils disposed on opposite sides of said central coil; wherein said central coil has a rectangular cross section comprising a first dimension (a) in the X-axis direction, a second dimension (b) in the Z-axis direction, and a center portion (P) having a length dimension (W) in the Z-axis direction; wherein said length dimension (W) is substantially smaller than the second dimension (b), and other portions of said central coil equals said second dimension (b) less said length dimension (W); wherein said center portion (P) has a greater number of windings per unit dimension in the X-axis direction and in the Z-axis direction than for the other portions of said central coil; wherein said center portion (P) has a current density of about twice the current density of said other portions of said central coil; and wherein further are provided means for applying current to said center portion (P) of said central coil greater than current applied to said other portions of said central coil.

4,716,371

NON-CONTACT AUTORANGING ELECTROSTATIC FIELDMETER WITH AUTOMATIC DISTANCE INDICATOR

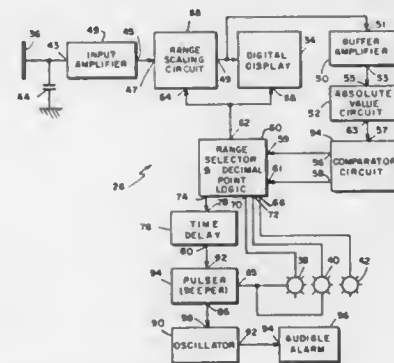
Mark Blitshteyn, Edison, N.J., and William S. Wright, Green Lane, Pa., assignors to The Simco Company, Inc., Hatfield, Pa.

Filed Jul. 22, 1985, Ser. No. 757,652

Int. Cl.⁴ G01R 29/12

U.S. Cl. 324-457

5 Claims



1. An apparatus for measuring electrostatic fields and related parameters such as electrostatic potential, voltage and charge

density of objects in a non-contact manner, the apparatus comprising a sensor for sensing the electrostatic field produced by a charged object and for producing an electrical signal in response thereto, display means responsive to the electrical signal for providing a visual indication of the charge on the object, means for coupling the display means to the sensor, the display means having a first range for use in measurement by the sensor at a first distance from the object and a second range for use in measurement by the sensor at a second distance from the object, the means for coupling the display means to the sensor including means for scaling the electrical signal, first indicating means for providing an indication that the sensor is to be placed at the first distance from the charged object, second indicating means for providing an indication that the sensor is to be placed at the second distance from the charged object, a comparator, logic, means for coupling the comparator to the sensor, means for coupling the logic to the comparator, and means for coupling the means for scaling the electrical signal, the first indicating means and the second indicating means to the logic.

4,716,372

CIRCUIT ARRANGEMENT FOR MONITORING THE CURRENT SUPPLY OF AN ELECTRIC CONSUMER

Edwin Fauser, Ditzingen, and Hans List, Pforzheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE85/00430, § 371 Date Aug. 18, 1986, § 102(e) Date Aug. 18, 1986, PCT Pub. No. WO86/03860, PCT Pub. Date Jul. 3, 1986

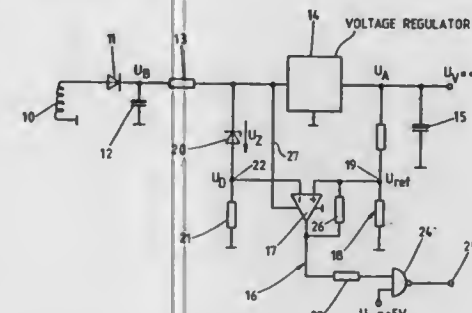
PCT Filed Oct. 30, 1985, Ser. No. 908,812

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446129

Int. Cl.⁴ H03K 5/24; G01R 19/165

U.S. Cl. 328-146

8 Claims



1. A circuit arrangement for monitoring the current supply of an electric consumer such as a microcomputer on a mobile data carrier wherein energy is transferred inductively, the circuit arrangement comprising:

inductive means for receiving the energy transferred inductively to provide an operating voltage which changes with time to rise above a predetermined minimum value and to then fall below this minimum value;
 voltage regulator means receiving said operating voltage and generating a regulator output voltage which defines an approximately constant supply voltage so long as said operating voltage is above said minimum value; and,
 voltage monitor means for providing a switch-on signal switching the consumer on and a switch-off signal for switching off the consumer after said regulator output voltage rises to said supply voltage and before said regulator output falls below said supply voltage, said voltage monitor means including:
 reference voltage circuit means for supplying a reference voltage proportional to said regulator output voltage;
 difference voltage circuit means for supplying a difference voltage exceeding a predetermined threshold value, said threshold value being selected so that said difference voltage first exceeds and then drops beneath said refer-

ence voltage when said regulator output voltage has reached and not yet dropped below said supply voltage;
 a comparator having a first input for receiving said reference voltage and a second input for receiving said difference voltage, said comparator further having an output for providing said switch-on signal and said switch-off signal.

4,716,373

METHOD AND CIRCUIT ARRANGEMENT FOR INCREASING THE SIGNAL-TO-NOISE RATIO OF A PERIODICAL ELECTRICAL SIGNAL

Michael Schulze, Much, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

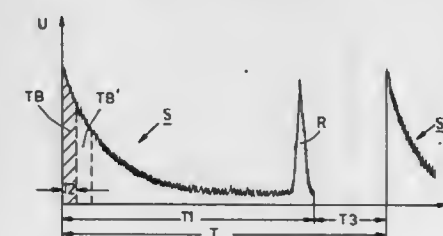
Filed Oct. 29, 1984, Ser. No. 665,836

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339146

Int. Cl.⁴ H04B 1/10

U.S. Cl. 328-165

18 Claims



1. A method of increasing the signal-to-noise ratio of a portion of a periodical electrical signal, said method comprising:
 integrating the amplitude of said signal during a base time period corresponding to the portion of said periodical signal for which the signal-to-noise ratio is to be increased, so as to provide a first signal representative of an overall processed value;
 dividing said time period into a plurality of consecutive signal suppression subperiods and, for each such subperiod, integrating the amplitude of the periodical signal during a signal transmission period which is equal to said base time period less said subperiod, so as to provide a plurality of integrated second signals, each associated with one suppression subperiod;
 subtracting each subperiod-associated second signal from said first signal so as to provide a plurality of difference signals, each associated with a signal suppression subperiod; and
 arranging said difference signals in the same sequence as their associated suppression subperiods so as to produce an output signal having the same general waveform as the periodical signal and an improved signal-to-noise ratio.

4,716,374

ADAPTIVE ANALOG VARIABLE LIMITER

Peter E. Tilly, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 13, 1986, Ser. No. 874,244

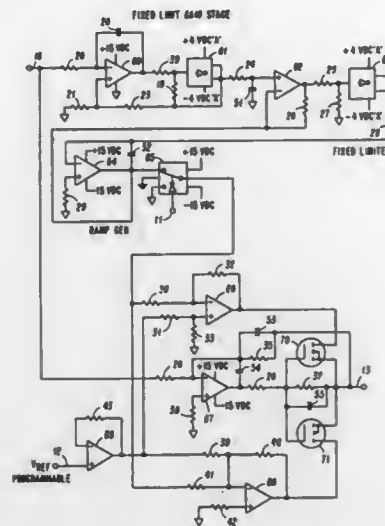
Int. Cl.⁴ H03K 5/08

U.S. Cl. 328-169

3 Claims

1. An analog variable output limiter for an amplifier, comprising:
 means for limiting an output value of said amplifier to a select range of possible values, said range having upper and lower limits; and
 means for varying said limits, while maintaining said range substantially constant, and following said output value as a time function slower than potential amplifier output fluctuations, thereby precluding sudden errant outputs

outside said range limits and permitting said range to follow slower varying amplifier outputs,



4,716,375

SWITCHED-CAPACITOR MULTIPLIER CIRCUIT
Arthur H. M. van Roermund, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 26, 1986, Ser. No. 878,940

Claims priority, application Netherlands, Jul. 18, 1985, 8502071

Int. Cl.⁴ H03D 3/18; H03K 5/00, 17/00

U.S. Cl. 329-50

4 Claims

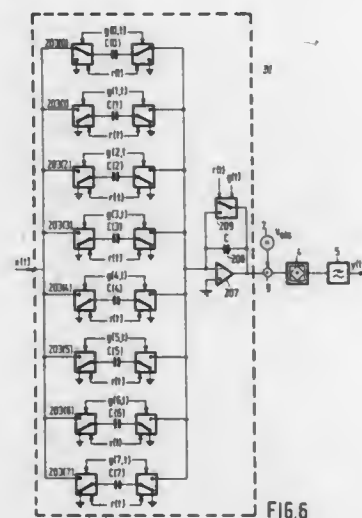


FIG. 6

1. A switched-capacitor distributed multiplier circuit for multiplying an information signal $x(t)$ by a multiplier signal constituted by a periodical bipolar carrier signal $d(t)$, comprising:

- means for rectifying said bipolar carrier signal, thereby creating a rectified carrier signal;
- means for applying said rectified carrier signal to said multiplier circuit to constitute said multiplier signal; and
- auxiliary multiplier circuit means connected exclusively to the output of said multiplier circuit for multiplying the output signal of said distributed multiplier circuit by a

binary signal having a value indicative of the instantaneous polarity of said bipolar carrier signal.

4,716,376

ADAPTIVE FSK DEMODULATOR AND THRESHOLD DETECTOR

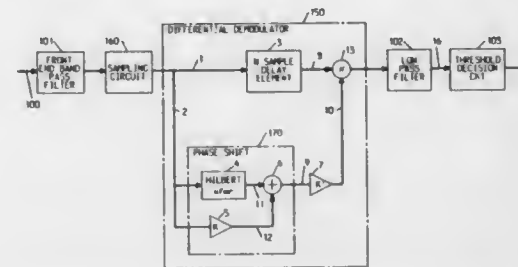
Douglas S. Daudelin, Howell, N.J., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Jan. 31, 1985, Ser. No. 697,001

Int. Cl.⁴ H03K 9/06

U.S. Cl. 329-107

22 Claims



1. Apparatus for demodulating a frequency shift keyed (FSK) signal having upper and lower frequency components, said apparatus including

- first means for providing a delayed version of said FSK signal, each frequency component in said delayed version being phase shifted in an amount which is linearly related to the frequency of said component,
- second means for shifting the phase of said FSK signal by a preselected constant value such that a center frequency which is halfway between said upper and lower frequency components is 90 degrees out of phase with the phase of the center frequency of said delayed version, and
- third means responsive to said delayed version and the output of said second means for providing an output indicative of the relative phase difference therebetween.

4,716,377

PIEZOELECTRIC RESONANCE COMPONENT HAVING AN IMPROVED GROUP DELAY TIME CHARACTERISTIC

Jiro Inoue, Ishikawa, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Continuation of Ser. No. 711,210, Mar. 13, 1985, Pat. No. 4,651,109. This application Jul. 22, 1986, Ser. No. 887,925

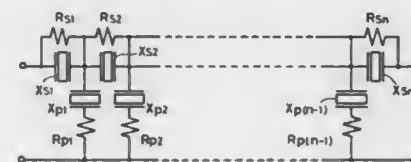
Claims priority, application Japan, Jun. 12, 1984, 59-121023; Nov. 26, 1984, 59-179179

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.⁴ H03H 9/13

U.S. Cl. 329-117

7 Claims



1. A piezoelectric resonance component having an improved group delay time characteristic comprising:

- an input terminal and an output terminal and a common terminal;
- a plurality of first circuits connected in series between said input and output terminals, at least one of said first circuits comprising a piezoelectric resonator connected in parallel with a damping resistor;

a plurality of second circuits, at least one of said second circuits comprising a piezoelectric resonator connected in series with a damping resistor; wherein said plurality of second circuits are each respectively connected between said common terminal and a node formed between two of said plurality of first circuits.

4,716,378

AMPLIFIER CIRCUIT

Hideyasu Jiko, Neyagawa, and Tomoyuki Hayashi, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

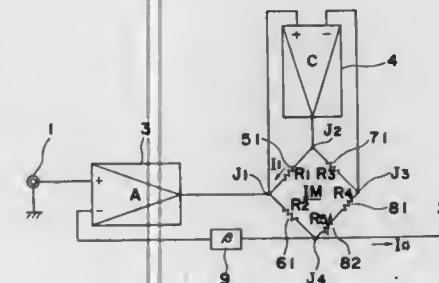
Filed Apr. 14, 1986, Ser. No. 851,527

Claims priority, application Japan, Apr. 15, 1985, 60-79602

Int. Cl.⁴ H03F 1/34

U.S. Cl. 330-108

6 Claims



1. An amplifier circuit comprising:

- an input terminal;
- a first amplifier having an inverting input and a non-inverting input, said non-inverting input being connected to said input terminal;
- a second amplifier having an inverting input and a non-inverting input, said non-inverting input of said second amplifier being connected to an output of said first amplifier;
- an impedance circuit defined by first, second, third and fourth impedance elements connected in a bridge circuit, a first junction between said first impedance element and second impedance element being connected to an output of said first amplifier;
- a second junction between said first impedance element and said third impedance element being connected to an output of said second amplifier;
- a third junction between said third impedance element and said fourth impedance element being connected to said inverting input of said second amplifier;
- a fourth junction between said second impedance element and said fourth impedance element;
- a negative feedback circuit connected between said fourth junction and said inverting input of said first amplifier;
- an output terminal connected to said fourth junction; and
- a load connected between said output terminal and ground.

4,716,379

DIFFERENTIAL AMPLIFIER INCLUDING BALANCED TWO TERMINAL SERIES RC NETWORK

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1986, Ser. No. 880,472

Int. Cl.⁴ H03F 3/45, 3/14

U.S. Cl. 330-252

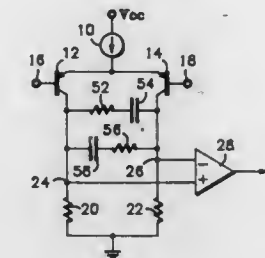
6 Claims

1. An RC circuit integrable in a semiconductor substrate, comprising:

- a first resistor diffused in said substrate and having first and second terminals;
- a second resistor diffused in said substrate and having first and second terminals;
- a first capacitor having a first diffused plate formed in said

substrate and connected to the first terminal of said second resistor;

- a second capacitor having a first diffused plate formed in said substrate and connected to the second terminal of said first resistor;
- said first capacitor having a second plate comprised of a



4,716,380

FET DIFFERENTIAL AMPLIFIER

Robert J. Proebsting, Dallas, Tex., assignor to Thomson Components-Mostek Corporation, Carrollton, Tex.

Continuation of Ser. No. 430,226, Sep. 30, 1982, abandoned,

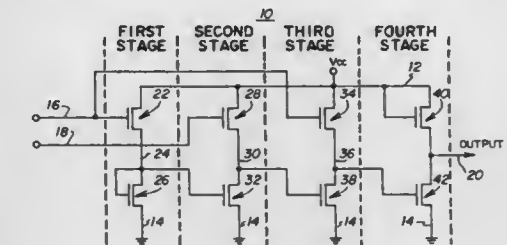
which is a continuation of Ser. No. 119,873, Feb. 8, 1980,

abandoned. This application Jul. 23, 1984, Ser. No. 633,375

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330-253

22 Claims



8. A field effect transistor differential amplifier which receives input signals through first and second input terminals, produces an output signal at an output terminal, and is powered through first and second power terminals, comprising:

- a first stage comprising a first transistor, the gate terminal thereof connected to said first input terminal, the drain terminal thereof connected to said first power terminal and the source terminal thereof connected to a first node, said first stage including a second transistor having the gate and drain terminals thereof connected to said first node and the source terminal thereof connected to said second power terminal, the gain of said second transistor greater than the gain of said first transistor;
- a second stage comprising a third transistor, the gate terminal thereof connected to said second input terminal, the drain terminal thereof connected to said first power terminal and the source terminal thereof connected to said output terminal, said second stage including a fourth transistor, the gate terminal thereof connected to said first node, the drain terminal thereof connected to said output terminal and the source terminal thereof connected to said second power terminal, the gain of said fourth transistor greater than the gain of said third transistor; and
- said first stage has greater gain than said second stage

whereby said output signal is driven to a first state when the voltage of the input signal at said first input terminal is greater than the sum of the voltage of the input signal at said second input terminal and a predetermined voltage differential and said output signal is driven to a second state when the voltage of the input signal at said first input terminal is less than the sum of the voltages of the input signal at said second input terminal and said predetermined voltage differential.

4,716,381

HIGH-CURRENT OPERATIONAL AMPLIFIER

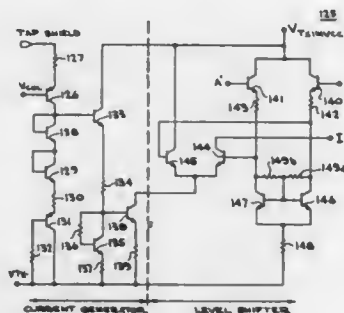
David L. Campbell, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 3, 1986, Ser. No. 847,804

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—256

4 Claims



1. In an integrated circuit transceiver, including a differential operational amplifier generating signals to be transmitted over a node meeting IEEE 802.3 standards, a circuit which translates a reference voltage from positive ground to negative ground and generates a current-gain (h_{FE}) and temperature-compensated output current received by said operational amplifier constant within an operating voltage range and proportional to said reference voltage, comprising a current generator circuit and a level-shifter circuit, said current generator circuit comprising:

- a first transistor having a base terminal connected to said reference voltage, an emitter terminal connected through a first resistance element to a tap shield terminal, and a collector terminal; and
- compensation means comprising:
 - a second transistor having an emitter terminal, a collector terminal connected to a first voltage supply, and a base terminal coupled to said first voltage supply through a second resistance element;
 - a third transistor having a collector terminal, a base terminal coupled to said third transistor collector terminal through a third resistance element, and an emitter terminal coupled to said first voltage supply through a fourth resistance element;
 - a fourth transistor having a base terminal connected to said third transistor collector terminal, an emitter terminal coupled to said first voltage supply through a fifth resistance element, and a collector terminal;
 - a series of two diode-connected transistors, a first of said series having its anode terminal connected to said first transistor collector terminal and a second of said series having a cathode coupled to said second transistor emitter terminal through a sixth resistance element; and
 - a fifth transistor having a base terminal connected to said first transistor collector terminal, an emitter terminal coupled to said third transistor collector through a seventh resistance element, and a collector

whereby an intermediate current is conducted by, and an h_{FE} -compensated base voltage generated at, said fourth transistor collector terminal and a negative-ground trans-

lated reference voltage generated at said fifth transistor collector terminal, said level-shifter comprising means responsive to differential input signals, said negative-ground translated reference voltage and said h_{FE} -compensated base voltage and intermediate current, for generating said output current.

4,716,382

MICROWAVE AMPLIFYING APPARATUS

Wasuke Yanagisawa, and Kenichi Muramatsu, both of Tokyo, Japan, assignors to Yokowo Mfg. Co., Ltd., Tokyo, Japan

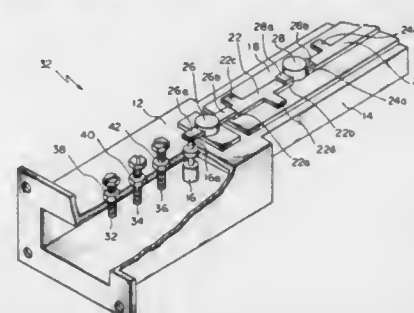
Filed Oct. 24, 1986, Ser. No. 922,602

Claims priority, application Japan, Nov. 25, 1985, 60-264590

Int. Cl.⁴ H03F 3/60

U.S. Cl. 330—286

6 Claims



1. A device for converting a transmission mode of a microwave signal applied to said device and amplifying said signal so as to output said amplified signal, comprising:

- a hollow conductive waveguide having a predetermined cross-section and shorted at one end of said waveguide;
- a pickup probe mounted on said waveguide adjacent to said one end for converting the transmission mode of said microwave signal which is applied to said waveguide;
- matching means disposed between said one end and the other end of said waveguide for adjusting an impedance of said waveguide;
- an amplifier element having an input terminal which is directly interconnected to an output terminal of said pickup probe; and
- a microstrip line having an input terminal interconnected to an output terminal of said amplifier element and an output terminal interconnected to a subsequent circuit element which is located outside said device.

4,716,383

PRECISE PHASE START-UP VOLTAGE CONTROLLED OSCILLATOR WITH ACCURATE DUTY CYCLE

Karl M. J. Lofgren, Long Beach; Gerald W. Shearer, Orange, and Kenneth W. Ouyang, Huntington Beach, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Jun. 23, 1986, Ser. No. 877,367

Int. Cl.⁴ H03K 3/02

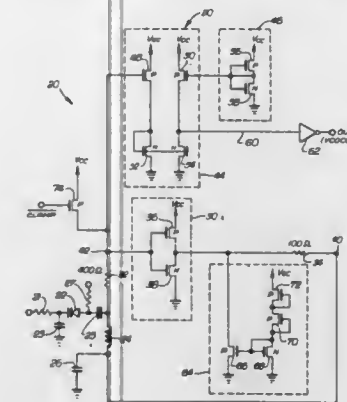
U.S. Cl. 331—117 FE

14 Claims

1. A voltage controlled oscillator for producing a square wave with a precise duty cycle, comprising:
- oscillating means for generating a periodic signal substantially symmetrical about a central voltage level at a first node;
 - means for supplying at a reference node a reference voltage substantially equal to the central voltage level; and
 - a two-input comparator with a first input coupled to the first node and a second input coupled to the reference node,

the comparator providing a first logic level at a comparator output when the voltage at the first node is greater

ing steps are implemented during a compensation stage preceding said exposing stage.



than the voltage at the second node and otherwise providing a second logic level.

4,716,384
MODULATORS

Malcolm D. M. Roe, London, and Michael E. Hicks, Tring, both of England, assignors to Crosfield Electronics Limited, London, England

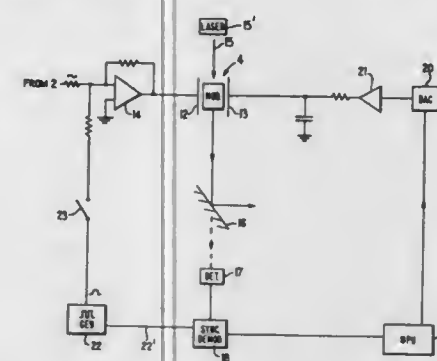
Filed Apr. 25, 1985, Ser. No. 727,325

Claims priority, application United Kingdom, May 1, 1984, 8411079; Nov. 5, 1984, 8427912

Int. Cl.⁴ H01S 3/10; H04N 5/76; G01D 15/14

U.S. Cl. 332—7.51

10 Claims



1. In the exposing of a record medium to radiation in which, during an exposing stage, said radiation passes through a modulator which comprises a device for controlling the transmission of radiation passing through the modulator in accordance with an applied control function, the response characteristic of the modulator to the control function exhibiting a maximum or minimum such that the exposure of said record medium to said radiation is controlled by applying a first control function to said modulator, a method of compensating for changes in the response characteristic of the modulator, comprising the steps of: applying a test control function having a DC component and a cyclically varying component to said modulator; monitoring radiation transmitted through said modulator; detecting the phase relationship between the cyclical component of said transmitted radiation and said cyclically varying component of said test control function to determine the position of said DC component of said test control function along said response characteristic of said modulator; and determine a correction function for application to said modulator to compensate for any change in said response characteristic, where said test control function applying, transmitted radiation monitoring, phase relationship detecting, and correction function determin-

4,716,385
MULTILEVEL MODULATOR COMPRISING A COMPACT ERROR CORRECTING CODE PRODUCING UNIT

Selichi Noda, and Makoto Yoshimoto, both of Tokyo, Japan, assignors to NEC Corporation, Japan

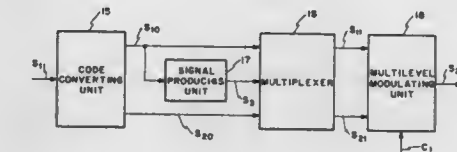
Filed Jul. 23, 1986, Ser. No. 889,804

Claims priority, application Japan, Jul. 24, 1985, 60-164695; Aug. 23, 1985, 60-184015

Int. Cl.⁴ H03K 7/00, 9/00

U.S. Cl. 332—9 R

9 Claims



1. A multilevel modulator responsive to an input digital signal having a plurality of levels for modulating a carrier signal into a multilevel modulated signal, wherein the improvement comprises:

- code converting means for converting said input digital signal into a major converted signal and a minor converted signal, said major converted signal having rearranged groups, each group consisting of a first predetermined number of levels, said minor converted signal having a second predetermined number of levels related to the respective groups;
- signal producing means responsive to said major converted signal for producing a Lee-error correcting code sequence;
- multiplexing means for multiplexing said error correcting code sequence and said major converted signal into a major multiplexed signal and said error correcting code sequence and said minor converted signal into a minor multiplexed signal; and
- modulating means for modulating said carrier signal by said major and said minor multiplexed signals into said multilevel modulated signal.

4,716,386

WAVEGUIDE TO STRIPLINE TRANSITION

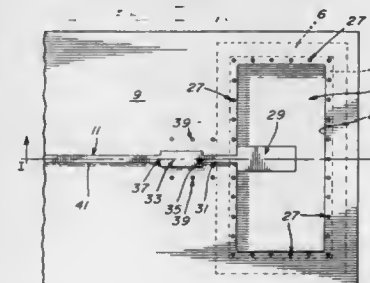
Andrew J. Lait, Kanata, Canada, assignor to Canadian Marconi Company, Montreal, Canada

Filed Jun. 10, 1986, Ser. No. 872,676

Int. Cl.⁴ H01P 5/107

U.S. Cl. 333—26

8 Claims



1. An arrangement for effecting a waveguide to stripline transition, wherein: said waveguide comprises an input waveguide section and a separate short circuit waveguide section; said input waveguide section and separate short waveguide

circuit section each section comprising a hollow interior of substantially the same size and shape enclosed by a surrounding wall;

said stripline comprising a copper track sandwiched between a first dielectric plate and a second dielectric plate;

a first ground plane on the surface of the first dielectric plate removed from said copper track, and a second ground plane on the surface of said second dielectric plate removed from said copper track;

said input waveguide section and said short circuit waveguide section being disposed in spaced alignment such that the surrounding walls and hollow interiors thereof are in alignment;

a portion of the stripline being disposed in the space between the input waveguide section and the short circuit waveguide section such that the first ground plane is in contact with the cross-sectional surface of the input waveguide section and the second ground plane is in contact with the cross-sectional surface of the short circuit waveguide section;

a first aperture in said first ground plane of substantially the same size and shape as said hollow interior and a second aperture in the second ground plane of substantially the same size and shape as said hollow interior, the first and second apertures being in alignment with each other and being located in said portion of said stripline and in alignment with the hollow interiors of said input section and said short circuit section;

means disposed between the surrounding wall of said input section and the surrounding wall of said short circuit section to simulate a continuation of said waveguide walls, said means extending only between the outer surfaces of said first and second ground planes;

whereby to improve the match in the transition and to thereby reduce losses at the transition.

4,716,387

WAVEGUIDE-MICROSTRIP LINE CONVERTER

Sadao Igarashi, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

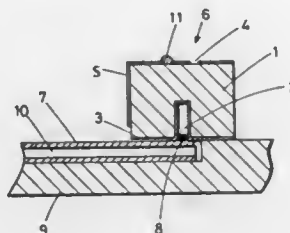
Filed Sep. 25, 1986, Ser. No. 911,400

Claims priority, application Japan, Sep. 30, 1985, 60-150551

Int. Cl.⁴ H01P 5/107

U.S. Cl. 333-26

10 Claims



1. A waveguide-microstrip line converter to be connected to a waveguide for mode conversion in transmitting a signal from the waveguide to a microstrip line, which comprises: a cuboidal dielectric body having a hole formed in one surface thereof; a probe formed by forming a conductive layer over the inner surface of the hole formed in the cuboidal dielectric body so as to be connected to a microstrip line; and a conductive layer formed over the surface of the cuboidal body excluding at least one surface of the cuboidal dielectric body to be brought into contact with the waveguide, an area surrounding the probe, and an area to be disposed opposite the microstrip line.

4,716,388
MULTIPLE OUTPUT ALLPASS SWITCHED CAPACITOR FILTERS

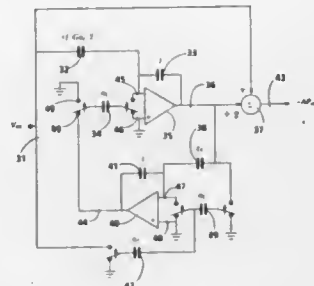
Gordon M. Jacobs, 6622 Chabot Rd., Oakland, Calif. 94618

Filed Dec. 24, 1984, Ser. No. 685,319

Int. Cl.⁴ H03H 19/00, 11/12, 11/34

U.S. Cl. 333-173

7 Claims



1. A multiple output allpass biquadratic filter comprising:
 - a biquadratic filter section having an input port and an output port and exhibiting either a bandpass or bandstop frequency response characteristic at said output port when a signal is applied to said input port;
 - a two input summation circuit whose output port produces the sum of the signals present at its two input ports according to the equation

$$V_{out} = aV_1 + bV_2$$

where V_{out} is the signal at the summation circuit output port, V_1 is the signal at the summation circuit first input port, V_2 is the signal at the summation circuit second input port, and both the constants a and b can be positive or negative but not equal to zero;

- a signal input terminal connected to both the input port of said biquadratic filter section and the first input port of said summation circuit;
- a connection between the output port of the biquadratic filter section and the second input port of said summation circuit;
- a primary output terminal having an allpass frequency response characteristic that is the output port of the addition circuit;
- a secondary output terminal that is the output port of the biquadratic filter section.

4,716,389

MILLIMETER WAVE MICROSTRIP SURFACE MOUNTED ATTENUATOR

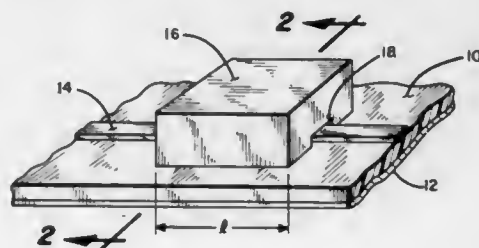
Michael J. Gawronski, Minneapolis, and John R. Lamberg, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 20, 1986, Ser. No. 920,964

Int. Cl.⁴ H01P 1/22, 1/23

U.S. Cl. 333-81 A

4 Claims



1. An attenuator for a microstrip transmission line assembly

of the type having an elongated conductive microstrip spaced from a conductive ground plane by a layer of solid dielectric material, comprising:

a substantially rigid, non-deformable block of electromagnetic energy absorbing material, said block having at least one planar surface, save for a groove formed inwardly of said planar surface into said block, said block resting on said layer of solid dielectric material with said conductive microstrip aligned with said groove so as to straddle only said conductive microstrip in a non-contact relationship and only over a predetermined length of said conductive microstrip.

4,716,390

MAGNETOSTATIC WAVE CHANNELIZER

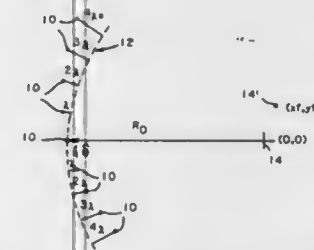
Jeffrey H. Elliott, Santa Monica; Robert B. Stokes, Torrance; David Penunuri, Placentia, and Kuo-Hsiung Yen, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 15, 1986, Ser. No. 907,546

Int. Cl.⁴ H01P 1/20, 1/213

U.S. Cl. 333-202

10 Claims



1. A magnetostatic wave (MSW) device for processing of multifrequency input signals, the device comprising:
 - an MSW propagating medium;
 - means for applying a magnetic bias field to the propagating medium;
 - input transducer array means responsive to the input signals and providing a spatially modulated transduction coupling strength along an arcuate path on the propagating medium, wherein the arcuate path is selected to provide multiple sources of magnetostatic waves that combine constructively at frequency-dependent points in a focal region of the propagation medium; and
 - a plurality of output transducers positioned on the propagating medium at frequency-dependent points in the focal region, to provide output signals indicative of the various frequency components of the input signal.

4,716,391

MULTIPLE RESONATOR COMPONENT-MOUNTABLE FILTER

Michael F. Moutrie, Buffalo Grove; Raymond L. Sokola, Lake Zurich, both of Ill., and Phillip J. Gordon, Carmel, Ind., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 25, 1986, Ser. No. 890,682

Int. Cl.⁴ H01P 1/205

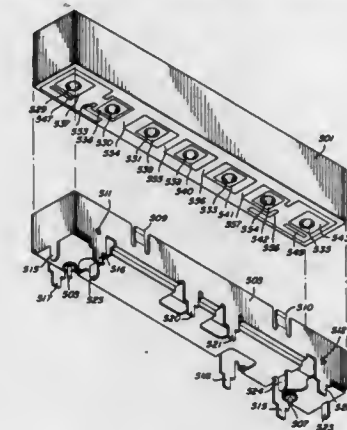
U.S. Cl. 333-206

12 Claims

1. A substrate mountable filter comprising:
 - a dielectric filter means comprised of a dielectric material and having first, second, and side surfaces, said second and side surfaces of said dielectric material being substantially covered with a conductive material; a plurality of holes having surfaces substantially covered by a conductive material which extends from the first surface of the dielectric material toward the second surface thereof and which has openings on the first surface of the dielectric material that are disposed at predetermined distances relative to one another; first and second electrode means disposed on said first surface and each coupled to said conductive material covered surface of a separate one of said plurality

of holes; and first and second coupling means disposed on said first surface and coupled respectively to said first and second electrode means and the respective conductive hole surface coupled thereto; and

(b) a mounting means comprised of a conductive material having a recessed area for accepting and holding said dielectric filter means and an interior surface within said recessed area disposed essentially parallel to said first



surface of said dielectric material; first and second terminal means extending through said interior surface, disposed opposite said first and second coupling means, and providing electrical contact respectively thereto; and a plurality of mounting tabs disposed at predetermined positions opposite said recessed area whereby said dielectric filter means and mounting means may be mounted on a substrate.

4,716,392

POWER SUPPLY SWITCH

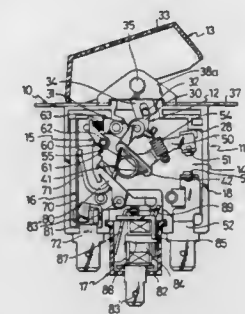
Kunimitsu Nakano, and Hiroyuki Onishi, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Feb. 7, 1986, Ser. No. 827,144

Int. Cl.⁴ H01H 3/00

U.S. Cl. 335-189

12 Claims



1. A power supply switch comprising a housing, an operating member pivotally supported substantially at the middle of said housing, a movable contactor provided at one end with a movable contact engageable with and disengageable from a fixed contact and at the other end with a latch part, resilient means for linking between one end of said operating member and substantially the central part of said movable contactor, a tension spring engaged at one end of the movable contactor to the other end of the operating member and at the other end to the movable contactor at a position between the linking point of said link means and said one end having said movable contact of said movable contactor for biasing the movable contactor in a direction of disengaging from said fixed contact, means engageable with said latch part of the movable contact-

tor for latching the contactor into a contact closing position of engaging the movable contact with said fixed contact as the contactor is moved with a rotation of the operating member, with the linking point of the operating member to the link means shifted beyond an imaginary line connecting between the pivoting axis of the operating member and said linking point of the link means to the movable contactor said resilient linking means being slightly compressed in said contact closing position of the movable contactor for providing thereto a contact pressure to the fixed contact, means engaged with said latch means for biasing it in a direction of engaging with said latch part of the movable contactor, and means engaged with the latch means for tripping the latch means out of engaging position with the latch part against the force of said biasing means to forcibly break the contacts.

4,716,393

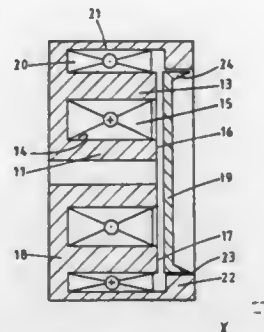
ELECTROMAGNETIC ACTUATOR

Frank M. Logie, London, England, assignor to Lucas Industries public limited company, Birmingham, England
Filed May 22, 1986, Ser. No. 886,564
Claims priority, application United Kingdom, Jun. 8, 1985, 8514544

Int. Cl.⁴ H01F 7/08

U.S. Cl. 335-261

2 Claims



1. An electromagnetic actuator comprising a core structure having a central pole piece defining a pole face, at least one annular pole piece surrounding the central pole piece in spaced relationship and defining an annular pole face, said spaced relationship between said central pole piece and said annular pole piece defining an annular recess, said winding, when energized, causing adjacent pole faces to assume opposite magnetic polarity, an armature formed from magnetic material, said armature, when said winding is energized, being attracted towards said pole faces, an annular core component extending alongside but spaced from the outer pole piece by a recess containing at least one further winding, said core component extending beyond said pole faces and defining a radial air gap with the armature.

4,716,394

BOBBIN DEVICE

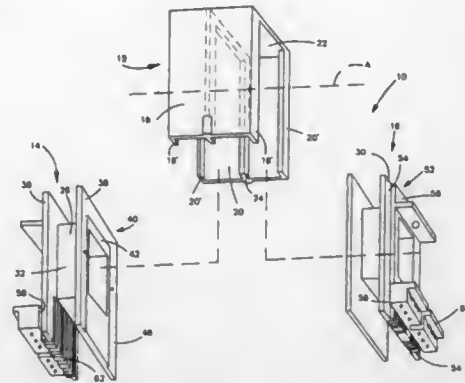
Albert Gordon, Beachwood, Ohio, assignor to Cosmo Plastics Company, Cleveland, Ohio
Filed Mar. 12, 1987, Ser. No. 25,067
Int. Cl.⁴ H01F 27/30

U.S. Cl. 336-192

11 Claims

1. A transformer coil assembly comprising a shroud member having a pair of bobbin members removably mounted therein; each of said bobbin members comprising a central core adapted to extend along an axis of the assembly between an end flange and a mating flange, said flanges extending transversely of said core and providing a winding area therebetween, said mating flanges of said bobbin members including mating faces adapted to be disposed in adjacent relationship when said bobbin members are mounted in said shroud member to provide said assembly, said mating faces including first mounting

surfaces which engage upon assembly of the bobbin members, second mounting surfaces which cooperate to provide a mounting channel, and interengaging means for indicating axial and angular alignment of the bobbin members in a subassembly position with engagement of said first mounting surfaces and provision of the mounting channel, said end flanges having axially outboard faces including spaced slide mounting surfaces for engagement with said shroud member, said shroud member having a U-shaped configuration including a bight adapted to extend along the top of the assembly between a pair of legs spaced from said assembly axis, said shroud member including a transversely inwardly extending rib located at an intermediate location along its axial length for engagement within said mounting channel, each of said shroud legs includ-



ing axially spaced transversely inwardly projecting leg guides for engaging one of the slide mounting surfaces on each of said end flanges, said leg guides of each leg being axially spaced by a distance equal to the axial spacing of said end flanges of said bobbin members when said first mounting surfaces are engaged, said shroud member being adapted to receive said bobbin members in said proper subassembly position between the shroud legs in a sliding frictional fit with engagement of said rib within said mounting channel and intermediate rib engagement whereby said bobbin members are reliably assembled upon transverse relative movement within said shroud member with said leg guides engaging said slide mounting surfaces and axially confining said bobbin members within said shroud member.

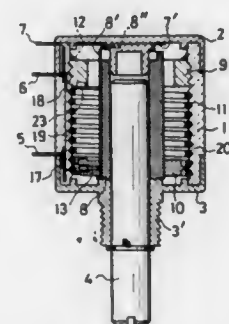
4,716,395

MULTI-ROTATION TYPE POTENTIOMETER

Eitaro Shimoda, Kawasaki, Japan, assignor to Sakae Tsushin Kogyo Co., Ltd., Kanagawa, Japan
Filed Feb. 9, 1987, Ser. No. 12,352
Int. Cl.⁴ H01C 10/24

U.S. Cl. 338-149

9 Claims



1. A multi-rotation type potentiometer comprising:
(a) a cylindrical shaped housing member having a spiral-shaped screw groove formed on its inner surface;

- (b) a spiral-shaped resistance element having a predetermined number of turns and received by said screw groove of said housing member;
- (c) two end terminals respectively attached to said housing member one ends of which are respectively connected to both ends of said resistance element through connection leads;
- (d) a rotatory shaft attached with a cylindrical rotor, said rotary shaft rotatably assembled to said housing member such that said cylindrical rotor is located within said housing member along its center axis;
- (e) a slipping lever fixed to an outer surface of said cylindrical rotor along its axis direction;
- (f) a ring-shaped sliding member having inner and outer contacts and a guide member and engaged with said rotor such that when said rotary shaft and hence said rotor are rotated, said sliding member is rotated together with said rotor and also slid in an up and down direction on said rotor by an engagement of said guide member with said resistance element, while its inner and outer contacts respectively contact with said slipping lever and said resistance element;
- (g) an output terminal having a slip-ring and attached to said housing member such that said slip-ring contacts with one end of said slipping lever; and
- (h) a stopper member screwed into said housing member to prevent said sliding member from being rotated at a revolution number exceeding a predetermined revolution number.

4,716,396

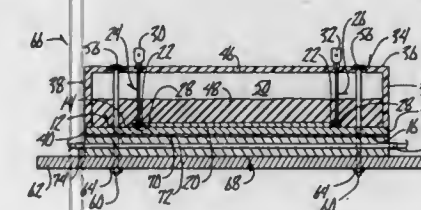
HIGH POWER DENSITY, LOW CORONA RESISTOR
Jerome J. Kneffel, Bellwood, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed Jul. 10, 1986, Ser. No. 884,201

Int. Cl.⁴ H01C 1/02

U.S. Cl. 338-226

13 Claims



- 1. A high power density, low corona resistor adapted to be mounted on a heat sink surface, said resistor comprising:
a housing member having a top wall and a plurality of side walls forming a cavity within said housing, said side walls having bottom edges defining a bottom opening in said housing;
- a dielectric thermally conductive substrate having an upper surface and a lower surface, at least a portion of said upper surface being positioned in covering relation over said bottom opening of said housing, said lower surface being substantially planar and having a plurality of microscopic indentations therein;
- a resistance element mounted upon said upper surface of said substrate, said resistance element comprising a single thin film of electrically conductive material in intimate contact with said upper surface of said substrate;
- a first lead means and a second lead means each having first and second ends, both of said first ends being above said upper surface of said substrate and being electrically connected to said resistance element;
- an electrically insulative material covering said resistance element and said first ends of said pair of leads to provide physical, environmental and structural protection to said resistance element and said first ends of said pair of lead means, said second ends of said leads protruding outside

said insulative material and upwardly therefrom and extending through and outside said housing member;
an electrically conductive sheet operatively secured to said lower surface of said substrate and being in intimate contact with said lower surface of said substrate so as to substantially fill said microscopic indentations therein and substantially eliminate voids capable of causing corona phenomena between said lower surface and said conductive sheet; and
said substrate being the only dielectric material between said resistance element and said electrically conductive sheet so as to eliminate dielectric materials of more than one dielectric constant therebetween and thereby minimizing corona phenomena between said resistance element and said conductive sheet;
securing means securing said housing member to said substrate and being adapted to attach said housing member and said substrate to said heat sink surface with said conductive sheet in heat conducting contact with said heat sink surface.

4,716,397

METHOD AND APPARATUS FOR VERY HIGH SPEED ANALOG-TO-DIGITAL CONVERSION

Hans Werba, Theresienstrasse 11, D-8390 Passau, Fed. Rep. of Germany, and Rudolf Schlögl jun., Im Tal 9, A-6060 Absam (Tirol), Austria

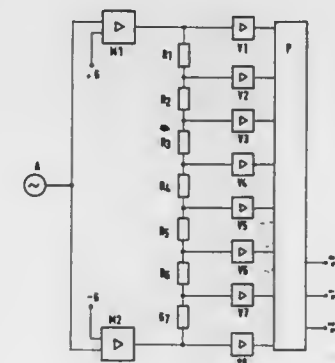
Filed Mar. 21, 1985, Ser. No. 714,387

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410796; Jul. 10, 1984, 3425399

Int. Cl.⁴ H03M 1/36

U.S. Cl. 340-347 AD

8 Claims



- 1. A method for analog/digital conversion, comprising the steps of:
amplitude modulating a first d.c. voltage signal with an analog signal to be digitized;
amplitude modulating a second d.c. voltage signal with the analog signal to be digitized, said first and second voltage signals having the same voltage value but opposite polarity;
- feeding said amplitude modulated first d.c. voltage signal into a first end of a chain of resistors and the amplitude modulated second d.c. voltage signal into a second end of the chain of resistors;
- detecting a voltage divider point in the chain of resistors at which cancellation of the amplitude modulated d.c. voltage signals fed into the first and second ends of the chain of resistors occurs; and
- assigning the voltage divider point a first binary value and all

other resistor voltages a second binary value to produce a binary value pattern characterizing the converted analog signal value.

4,716,398

LINEARITY CONTROL CIRCUIT FOR DIGITAL TO ANALOG CONVERTER

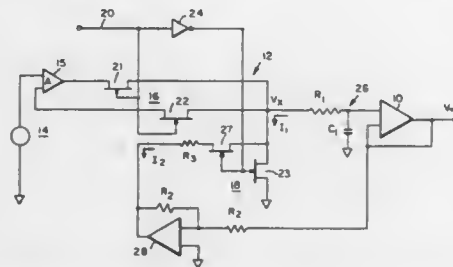
Larry E. Eccleston, Edmonds, and John C. Emery, Everett, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Feb. 26, 1987, Ser. No. 19,427

Int. Cl.⁴ H03M 1/66

U.S. Cl. 340—347 DA

16 Claims



4. In a digital to analog converter having an input amplifier receiving a pulse width modulated signal and first and second controlled switching devices for transmitting first and second voltages to an input of said input amplifier in a modulated manner, said first and second controlled switching devices connected to said input of said input amplifier, wherein said first controlled switching device is connected to a first voltage level and said second controlled switching device is connected to a second voltage level, the improvement comprising:

resistance eliminating means for eliminating resistance of at least one of said switching devices from affecting an output voltage produced by said input amplifier, said resistance eliminating means including withdrawing means for withdrawing from said at least one switching device an amount of current substantially equal to the current provided to said at least one switching device from said input of said input amplifier,

said withdrawing means including: amplifier means connected between an output of said input amplifier and said at least one switching device, gain control means for controlling gain of said amplifier means thereby to provide an output voltage of said amplifier means as a predetermined function of an output voltage at said output of said input amplifier, current control means for providing a current value as a predetermined function of said output voltage of said amplifier means,

said current control means connected to obtain said current value from said at least one switching device, whereby all current provided to said at least one switching device from said input terminal of said input amplifier is withdrawn by said withdrawing means.

thereby substantially eliminating any effects of internal resistance of said at least one switching device from affecting output voltage or current of said input amplifier.

4,716,399

OPTOMECHANICAL CONTROL APPARATUS

Lester H. Nordlund, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 14, 1985, Ser. No. 691,167

Int. Cl.⁴ G08C 9/00

U.S. Cl. 340—365 P

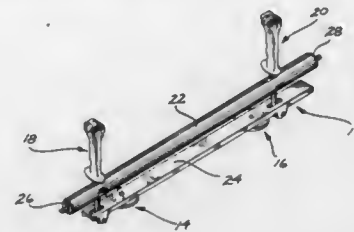
13 Claims

1. A control apparatus, comprising:

A support structure;

a joystick assembly mounted to the supported structure, the joystick assembly including at least two joysticks, and

mounting means for mounting the joysticks such that the joysticks can rotate in unison about common first and second axes that are not parallel to one another, the mounting means including a coupling member coupled to the joysticks such that rotation of the joysticks about the first axis causes a first characteristic movement of the coupling member, and rotation of the joysticks about the second axis causes a second characteristic movement of the coupling member; and



position measuring means, including a two-axis photodetector and illumination means for directing a beam of radiation to a point on the photodetector, the position measuring means cooperating with the coupling member to vary the position of the point along a first axis of the photodetector as the coupling member undergoes its first characteristic movement and to vary the position of the point along a second axis of the photodetector as the coupling member undergoes its second characteristic movement.

4,716,400

KEY SENSING SYSTEM

Yukio Karibayashi, Soka, Japan, assignor to Aica Kogyo Co., Ltd., Nagoya, Japan

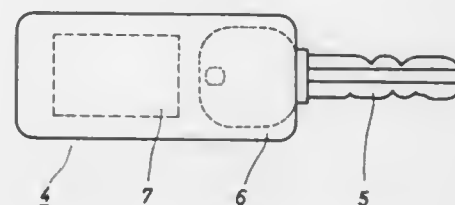
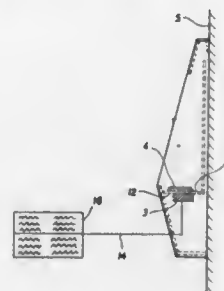
Filed Feb. 7, 1986, Ser. No. 827,063

Claims priority, application Japan, Jun. 7, 1985, 60-86176

Int. Cl.⁴ G08B 13/14

U.S. Cl. 340—572

4 Claims



1. A key sensing system, said system including a keyholder having a non-magnetic portion with a magnet disposed therein and a key fixedly attached thereto, comprising:

a keysensor housing having a front surface and a rear surface, said front surface having a cavity therein and said cavity having a plate-like portion positioned substantially perpendicularly with respect to said rear surface, said plate-like portion being configured to receive said non-

magnetic portion of said keyholder in a plurality of orientations relative to said rear surface; and
at least one magnetic sensor positioned in said keysensor housing immediately below said plate-like portion for sensing said magnet disposed in said non-magnetic portion of said keyholder when said non-magnetic portion is positioned on said base in one of said plurality of orientations.

4,716,401

TAMPER-RESISTANT SUPERVISORY SYSTEM

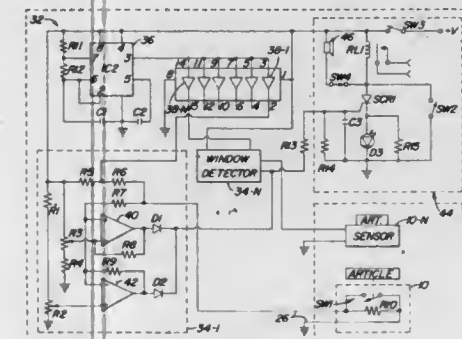
William P. Wohlford, Bettendorf, and LaVern B. Hovenga, Davenport, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 19, 1985, Ser. No. 777,647

Int. Cl.⁴ G08B 13/14

U.S. Cl. 340—568

11 Claims



1. A supervisory system comprising:

a sensor unit including an electrical parameter which varies as a function of presence and absence of an article to be supervised;

a conducting cable;

a monitoring unit connected to the sensor unit via the cable, the monitoring unit comprising:

a first source of potential having a first characteristic;

a second source of potential having a second characteristic which is different from the first characteristic, at least one of the sources producing a periodically varying potential; an impedance network connected to the first and second potential sources and to the cable, the impedance network producing a status signal having a component with the first characteristic and having a component with the second characteristic, the status signal varying as a function of the electrical parameter of the sensor unit and as a function of the condition of the cable; and means for generating an alarm signal in response to changes in the status signal, the alarm signal generating means comprising a comparator having a first input connected to the impedance network to receive the status signal, having a second input connected to receive a reference signal and having an output, the comparator producing a signal at its output which depends upon signals applied to its inputs.

4,716,402

MODULAR PERSONAL SECURITY DEVICE

Paul S. Francis, 4603 Homestead Dr., Prairie Village, Kans. 66208

Filed Nov. 12, 1985, Ser. No. 796,991

Int. Cl.⁴ G08B 19/00

U.S. Cl. 340—693

19 Claims

1. A security device for carrying on the person, said device comprising:

a housing having a size to be held in the hand;

a flashlight bulb in said housing for emitting light when energized to provide illumination of the area into which the light from the bulb is directed;

a buzzer in said housing for emitting an audible alarm signal when energized;

a battery in said housing for supplying power to said bulb and buzzer to energize same;

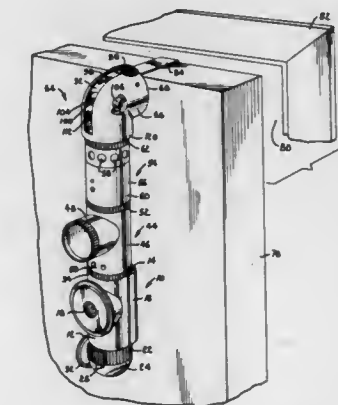
a switch on said housing having an off condition wherein said bulb is deenergized and an on condition wherein said bulb is energized steadily;

a socket in said housing;

a pin in said socket, said pin being removable from said socket and being accessible to be pulled out of the socket and detached from the housing;

means for successively energizing and deenergizing said bulb to emit a flashing alarm light in a response to removal of said pin from said socket;

means for successively energizing and deenergizing said buzzer to emit a series of said audible alarm signals in



succession in response to removal of said pin from said socket;

a mounting unit for said housing having first and second ends, said first end of the mounting unit having means for securing same to a supporting surface and said second end being adapted for detachable physical and electrical connection to said housing in a manner to receive power from said battery;

intrusion detecting means associated with said mounting unit and powered by said battery for detecting an intrusion and applying an electrical intrusion signal to said second end when an intrusion is detected; and means for steadily energizing said bulb and successively energizing and deenergizing said buzzer when said electrical intrusion signal is applied to said housing through said second end of the mounting unit.

4,716,403

LIQUID CRYSTAL DISPLAY DEVICE

Shinji Morozumi, Suwa, Japan, assignor to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 472,358, Mar. 4, 1983, Pat. No. 4,600,274. This application May 21, 1985, Ser. No. 736,612

Claims priority, application Japan, Oct. 1, 1982, 57-173513

Int. Cl.⁴ G09G 3/36

U.S. Cl. 340—702

24 Claims

1. A liquid crystal display having a plurality of color picture elements of three primary colors arranged in a matrix of rows and columns, the display having two opposed substrates, a matrix of color filters and a common electrode on one substrate and each picture element having a driving electrode and an associated single color filter on the opposed substrate, comprising:

driving circuit means for receiving three primary color signals;

color selection means for selecting sequentially for input to said driving circuit means each one of said three primary color signals said color selection means including a

switching means, said switching means having three color inputs, each one of the three color inputs being for receiving an input signal of one of said primary colors, said switching means having three color outputs, each one of the color outputs being connected to said driving means; and a control means for causing said switch means to sequentially connect each one of said color outputs to each one of said color inputs, in a sequence of color signal



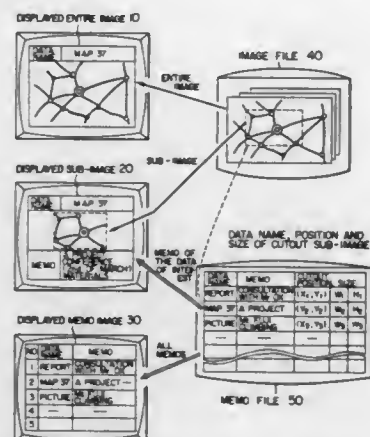
selection corresponding to a physical arrangement of colors of said picture elements; and element selecting means for selecting said picture elements in sequence, said driving circuit means applying selected color signals from said color selection means to driving electrodes of a corresponding color in said selected picture element, said element selecting means having timing signal inputs for receiving timing signals to time said selection of picture elements in sequence for driving.

4,716,404

IMAGE RETRIEVAL METHOD AND APPARATUS USING ANNOTATIONS AS GUIDANCE INFORMATION
Kuniaki Tabata, Tokyo, and Susumu Tsubura, Sagami, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 29, 1984, Ser. No. 594,690
Claims priority, application Japan, Apr. 1, 1983, 58-55073
Int. Cl. G09G 1/00

U.S. Cl. 340—723

8 Claims



1. An image retrieval method, using a display system comprising the steps of:

- storing a plurality of images in first memory means;
- designating a partial area defining a sub-image for each image stored in said first memory means;
- storing extracting information representing the position of the designated partial area in a corresponding image, reference data associated with said image and image designating information in a second memory;
- displaying a plurality of pairs of image designating information and reference data read out of said second memory means for image retrieval;

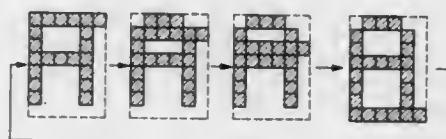
- selecting one of the image designating information by referring to the displayed reference data;
- reading out an image corresponding to the selected image designating information from said first memory means and extracting a sub-image from said read-out image on the basis of said extracting information corresponding to said image designating information;
- displaying the extracted sub-image together with said reference data associated therewith; and
- displaying an entire image corresponding to the selected image designating information.

4,716,405

FLAT PANEL DISPLAY CONTROL APPARATUS
Noboru Yamaguchi, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 30, 1985, Ser. No. 792,844
Claims priority, application Japan, Oct. 31, 1984, 59-229221
Int. Cl. G09G 1/16

U.S. Cl. 340—723

12 Claims



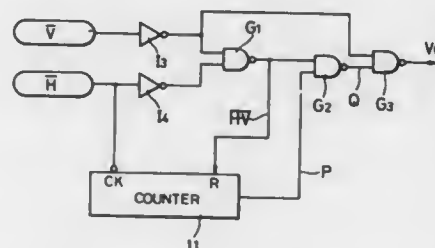
1. A flat panel display control apparatus comprising: a flat panel display device for displaying each character by a plurality of dots in a matrix form; pattern storing means for storing a character pattern of a character to be displayed; means for storing attribute data of each character stored in said pattern storing means; and attribute control means for reading out the character pattern and the attribute data thereof, and for supplying the character pattern to said flat panel display device by superimposing a cyclically moving dot or dots on the character pattern when the attribute data indicates a high-light intensity display.

4,716,406

SEQUENTIAL SELECTION CIRCUIT
Toshio Shionoya, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 22, 1985, Ser. No. 725,816
Claims priority, application Japan, Apr. 25, 1984, 59-83330
Int. Cl. G09B 3/28

U.S. Cl. 340—814

5 Claims



1. A sequential selection circuit which selects series of circuits, elements and, electrodes over a long period to activate them sequentially one by one for a short period, comprising a shift register which has a number of shift stages corresponding to the total number that is to be selected, for sequentially shifting a single input pulse in response to clock pulses corresponding to the short period; a counter for counting the clock pulses so as to generate an output voltage level which is low

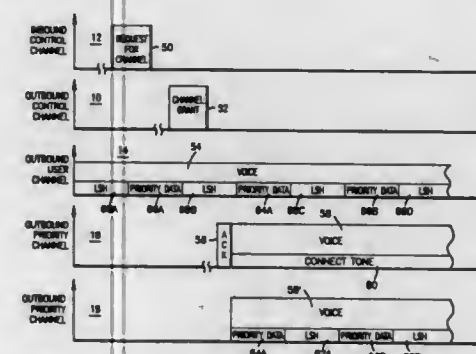
when the count reaches the total number to be selected; an input circuit for generating an input pulse for said shift register depending on the voltage level from the counter and a pulse corresponding to the long period; and a reset circuit for resetting said counter in accordance with the clock pulse and the pulse corresponding to the long period.

4,716,407

TRUNKED COMMUNICATION SYSTEM TRUE PRIORITY CHANNEL SCAN

Jaime Andres Borrás, Hialeah, Fla.; Michael D. Sasuta, Palatine, Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation-in-part of Ser. No. 785,173, Oct. 7, 1985, abandoned. This application Dec. 19, 1986, Ser. No. 945,210
Int. Cl. H01H 67/00; H04B 11/32, 7/00
U.S. Cl. 340—825.04

35 Claims



1. In a trunked communication for communicating messages of varying priority levels having at least one central station for allocating a limited number of communication channels among a plurality of subscribers units each having an identification (ID) code stored therein and constructed and arranged to communicate information on any of the communication channels, a method for any of the plurality of subscribers receiving a current message on a current communication channel to respond to a priority message on another communication channel comprising the steps of:

- (a) receiving priority data from the central station on the current communication channel;
- (b) determining the priority level of the priority message from said priority data;
- (c) comparing the priority level of the priority message to the priority level of the current message;
- (d) abandoning the current message and responding to the priority message if said priority level of the priority message at least exceeds that of the current message.

4,716,408

DATA TRANSMISSION SYSTEM OF THE STAR TYPE WITH ENABLEMENT PASSING

Stuart O'Connor, Glossop; Donald Bell, Stockport; Trevor R. Fox, Warrington, and Paul Townsend, Middleton, all of United Kingdom, assignors to International Computers Limited, London, England
Filed Apr. 16, 1984, Ser. No. 600,416
Claims priority, application United Kingdom, Apr. 21, 1983, 8310821

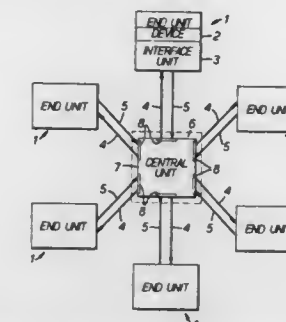
Int. Cl. H04Q 1/00

U.S. Cl. 340—825.5

11 Claims

1. A data communication system comprising a plurality of stations between which communication is to take place and coupling means, each station being connected to the coupling means by an inward channel for the transmission of data from the station to the coupling means and an outward channel for the transmission of data from the coupling means to the

station, the channels of each station being distinct from those of every other station, each station having means for detecting an entitlement indication received over its inward channel, which indication confers an entitlement on the station to transmit user data, user data being transmitted in frames, the stations being in a predetermined cyclic sequence in which each station has a successor station, and the coupling means comprising:



means responsive to receipt of a frame over the inward channel from any station for retransmitting that frame on to the outward channels of the other stations, whereby the frame is broadcast to those other stations, and means responsive to receipt of an indication from any station, indicating that the station is relinquishing its entitlement to transmit user data, for transmitting an entitlement indication solely on to the outward channel of that station's successor station.

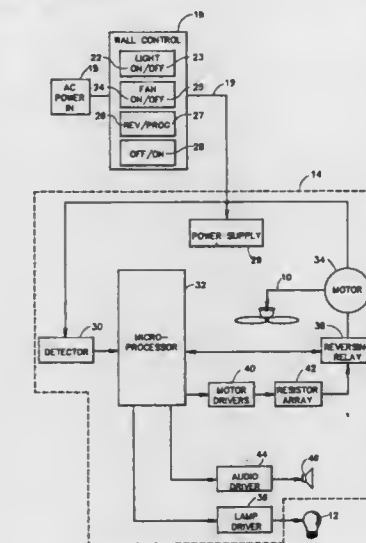
4,716,409

ELECTRICAL APPLIANCE CONTROL SYSTEM
Edward F. Hart, Yorba Linda, and William McDonough, El Toro, both of Calif., assignors to Homestead Products, Inc., Ramona, Calif.

Filed Jul. 16, 1986, Ser. No. 886,249
Int. Cl. G05B 19/02; H04M 11/04

U.S. Cl. 340—825.22

30 Claims



1. A system for remotely controlling at least two electrical appliances powered by an AC power source, comprising: a series of manually operable switches; control signal generating means responsive to actuation of the switches for providing a firing delay in the AC sine wave after a zero crossing; each switch corresponding to a delay signal of predetermined length in a predetermined

polarity half of the AC signal distinct from all the other switch signals;
 delay signal detecting means connected to said generating means for detecting said delay signals and producing control pulses in response to said delay signals; said detecting means comprising first control means for detecting the polarity of the delayed half of an input AC signal and producing an output polarity control signal, and second control means for producing a control signal pulse of length dependent on the half cycle length of the input AC signal, each control signal pulse produced by said delay signals having a predetermined length shorter than the standard AC half cycle pulse length; and
 programmable control means for controlling operation of said electrical appliances in response to stored program instructions and detection of said polarity control signals and control signal pulse length; said program instructions including means for associating each shortened control signal pulse length of each polarity with a predetermined control function, said control functions including means for switching each appliance on and off, and means for initiating a series of pre-programmed sequences of operations of said appliances.

4,716,410

CATV DATA TRANSMISSION METHOD

Takashi Nozaki, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 681,748, Dec. 14, 1984, abandoned.

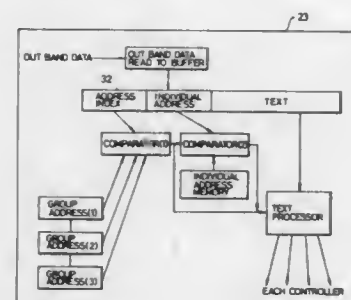
This application May 27, 1987, Ser. No. 56,351

Claims priority, application Japan, Dec. 16, 1983, 58-238360

Int. Cl.⁴ H04Q 9/14; H04N 7/00

U.S. Cl. 340—825,520

1 Claim



1. A CATV data transmission method, in which data is transmitted from a transmitting side to a receiving side having a first plurality of individual terminal units, each of said units having assigned an individual address, comprising:

assigning said terminal units to a second plurality of groups, each of said groups containing one or more of the terminal units, that receive collectively data transmitted from said transmitting side and are intended for each terminal in said group;

assigning a unique group address to each of said groups, thereby defining a second plurality of group addresses; storing at each terminal unit a reference signal and at least two addresses, comprising an individual address and any applicable unique group addresses, said stored applicable unique group addresses comprising all of the unique group addresses for those of said groups to which said terminal unit is assigned;

transmitting from said transmitting side to all terminal units in common at said receiving side, a transmitted signal comprising at least (i) data intended for an individual terminal unit together with an individual address and a group address pattern, comprising at least one of said unique group addresses, or (ii) data intended collectively for one of said second plurality of groups together with a

group address pattern, comprising at least one of said unique group addresses;
 at each terminal unit, receiving at least said transmitted data and said group address pattern;
 in each terminal unit:

initially comparing a portion of said received group address pattern with said reference signal and generating a first signal if said portion and said reference signal are identical and generating a second signal if said portion and said reference signal are not identical;
 comparing a stored individual address with said transmitted signal in response to the generation of said first signal;
 comparing all of said stored unique group addresses with said transmitted signal in response to the generation of said second signal; and,
 if coincidence is obtained in either of said address comparisons, processing at said terminal unit said data.

4,716,411

THERMOELECTRIC THERMOMETER OF RADIO TRANSMISSION TYPE

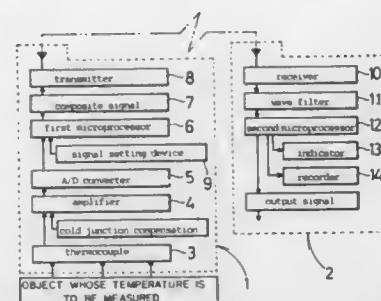
Tokio Nakamura, 6-50, Kurakuen Yonban-cho, Nishinomiya-shi, Hyogo-ken, Japan

Filed May 5, 1986, Ser. No. 859,498

Int. Cl.⁴ G08C 19/12, 19/16

U.S. Cl. 340—870.17

1 Claim



1. A thermoelectric thermometer for measuring the temperature of a hot environment in the range of about 300° C. to about 1300° C., comprising, in combination:

- an elongated housing with a defined front, midportion and rear, a pointed nose section at the front;
- an elongated thermocouple (15) with a rear part extending from said nose section into said housing midportion;
- a transmitter (17) in said midportion coupled to said thermocouple rear part to receive a signal therefrom;
- a sinker (16) disposed between said thermocouple (15) and the transmitter (17), the weight of the sinker being such that it can sink the thermometer in an environment to be measured as to its temperature;
- an electric cell power supply (18) coupled to the transmitter to supply power thereto;
- a sharp-pointed protective cover (22) covering at least the front of the thermocouple, an insulator (24) disposed around the elongated thermocouple, a flange (20) disposed around the midportion to prevent the thermocouple's transmitter (17) from sinking into the environment to be measured;
- amplifier means (4), analog-to-digital converter means (5) in the transmitter, to amplify the signal received from the thermocouple, with a first microprocessor (6) to convert the digital signal to a data signal; and,
- receiver means located some distance away from the transmitter (17), said receiver means being adapted and disposed to receive a transmitted signal from the transmitter and said receiver means including a wave filter (11) to filter the transmitted signal, a second microprocessor (12) to decode the transmitted signal, with a recorder (14) and an indicator (13) to utilize the transmitted signal.

4,716,412

PLANE-STRUCTURE QUANTIFIED ANALOG DISPLAY UNIT AND ANALOG MEASURING DEVICE COMPRISING SUCH A DISPLAY UNIT

Daniel Arnoux, Claude Genter, Christian Anton, and Jacques Forme, all of Paris, France, assignors to Bleris, Paris, France

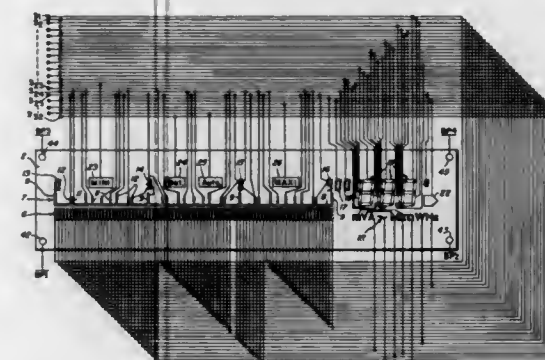
Filed Jan. 22, 1985, Ser. No. 693,094

Claims priority, application France, Jan. 26, 1984, 84 01177

Int. Cl.⁴ G09G 3/18

U.S. Cl. 340—753

5 Claims



1. A quantified analog display device which displays a selected measured quantity in analog form, comprising:

- a flat substrate;
- a plurality of selectively excitable bar electrodes arranged side by side on one face of the substrate;
- a first set of scale electrodes on the one face of the substrate;
- a second set of scale electrodes on the one face of the substrate;
- a third set of scale electrodes on the one face of the substrate; and

means for interconnecting said first, second and third sets of scale electrodes to first, second and third terminals, respectively, so as to define a first scale having a first range when said first and second terminals are energized and to define a second scale having a second range when said first and third terminals are energized, said first and second scales each including graduations and associated digits to indicate the range of values being displayed, the digits of the first and second scales having common electrodes and being commonly located adjacent said bar electrodes, whereby said display device can display measured quantities in at least two different ranges of values.

4,716,413

DRUNK DRIVER DETECTION SYSTEM

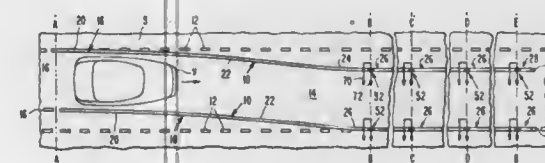
Ernest Haile, 30 Cadwalder Ter., Trenton, N.J. 08618

Filed Feb. 5, 1986, Ser. No. 826,440

Int. Cl.⁴ G08G 1/01

U.S. Cl. 340—933

3 Claims



1. A readily portable apparatus adapted to be laid out upon a road surface as an aid in checking motorists for possible driver impairment, comprising:

- a pair of parallel, identically formed inspection lane boundary strips, each strip having a portion formed with a distinct curvature in the direction of the length of the strip and a fluid pressure chamber having closures at both

ends thereof sealing the chamber against leakage, said chamber having a resiliently flexible top wall adapted to be depressed by a vehicle wheel so as to temporarily reduce the volumetric capacity of the chamber and thereby transmit an increased fluid pressure longitudinally of said curved portion to the ends of the chamber, the closure at one end of the chamber being of a material unyielding in the presence of said increased pressure, the closure at the other end of the chamber being formed as a resiliently flexible diaphragm stretched across said other end and adapted to deflect under said increased pressure longitudinally outwardly of the chamber;

(b) means for temporarily locating said strips upon a road surface in a transversely spaced relation selected to form therebetween a traffic lane that has a distinctly curved area defined by the curved portions of the strips whereby when a vehicle rides up upon at least one of the boundary strips the curved traffic lane has not been successfully negotiated, and the presence of an impaired driver is indicated;

(c) first electrical contact means mounted on the diaphragm exteriorly of said chamber so as to shift therewith longitudinally outwardly of the chamber;

(d) second contact means mounted in the strip exteriorly of said chamber in the path of deflection of the first contact means and engageable by the first contact means on deflection of the diaphragm; and

(e) an alarm circuit actuable responsive to said engagement of the contact means, to generate a signal indicating the failure of the vehicle to negotiate the traffic lane successfully.

4,716,414

SUPER RESOLUTION IMAGING SYSTEM

Stephen P. Luttrell, Malvern Wells, and Christopher J. Oliver, Malvern, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

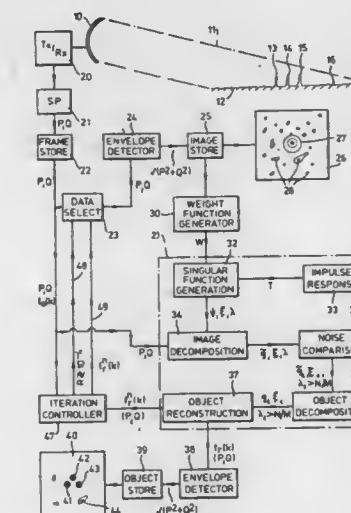
Filed Apr. 30, 1985, Ser. No. 784,665

Claims priority, application United Kingdom, May 10, 1984, 8411916

Int. Cl.⁴ G01S 13/89

U.S. Cl. 342—179

8 Claims



1. An imaging system having a given impulse response and including:

- an imaging device employing coherent radiation and arranged to provide complex amplitude image data,
- means for generating from image data a weight function appropriate to distinguish weak and strong image features,

- (3) means for reconstructing object data from a singular function decomposition of image data on the basis of singular functions derived from the weight function and system impulse response, and
- (4) means for generating an image from reconstructed object data.

4,716,415

DUAL POLARIZATION FLAT PLATE ANTENNA

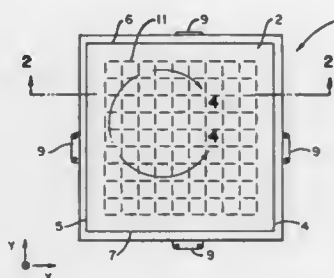
Kenneth C. Kelly, 9360 Shoshone Ave., Northridge, Calif. 91325

Filed Dec. 6, 1984, Ser. No. 678,891

Int. Cl.⁴ H01Q 13/10

U.S. Cl. 343-771

17 Claims



1. A linearly polarized antenna for producing two coincident broadside beams with said beams having their polarizations orthogonal, comprising:

a top plate;

a bottom plate delimiting with said top plate a cavity in which a first higher order rectangular waveguide mode having a mode number P propagates in a first direction in the cavity, and a second and independent higher order rectangular waveguide mode having a mode number Q propagates in a second direction in the cavity, said first direction being orthogonal to said second direction, said top plate having a first set of radiating slots through it, all slots of said first set being parallel to a Y-axis of a cartesian coordinate system and arranged in P-1 rows of alternately staggered parallel radiating slots and Q columns of colinear radiating slots, and a second set of radiating slots, all slots of said second set being parallel to an X-axis of a cartesian coordinate system and arranged in P rows of colinear radiating slots and Q-1 columns of alternately staggered parallel radiating slots, the slots of said first and second sets having respective first and second longitudinal axes, the longitudinal axes of said first and second sets being perpendicular to one another.

4,716,416

ANTENNA DISH REFLECTOR WITH INTEGRAL DECLINATION ADJUSTMENT

Edward W. Smith, Los Angeles, and Gene Garfinkle, Newport Beach, both of Calif., assignors to Satellite Technology Services, Inc., St. Louis, Mo.

Filed Mar. 28, 1985, Ser. No. 717,506

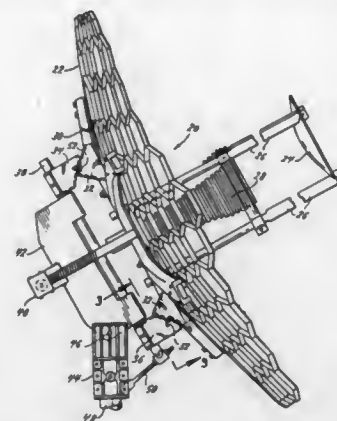
Int. Cl.⁴ H01Q 15/16, 3/02

U.S. Cl. 343-915

14 Claims

1. An antenna for receiving satellite broadcast data, the antenna comprising a main reflector dish, means to rotatably mount said main reflector dish from a support, said support comprising a rod means defining an axis of rotation of said dish to adjust the azimuth thereof, said rotatable mounting means including integral means to adjust the declination of the dish with respect to the support, the declination adjust means com-

prising an upper and lower pad means rotatably secured to the rod means, an upper and lower surface secured to the dish, and



means to mount said upper and lower surfaces to said upper and lower pads.

4,716,417

AIRCRAFT SKIN ANTENNA

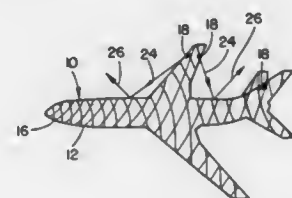
Alex Grumet, Whitestone, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 13, 1985, Ser. No. 701,141

Int. Cl.⁴ H01Q 1/28

U.S. Cl. 343-708

50 Claims



1. A holographic aircraft antenna comprising a thin layer of strip elements contoured to and secured to the skin of the aircraft, the spacing and width of said thin layer of strip elements are determined by an interference pattern of first and second radio frequency beams recorded on a holographic recording medium thereby forming a hologram to yield the desired radio frequency radiation pattern, said hologram being fabricated such that excitation of said hologram from a radio frequency source mounted to said aircraft will result in the transmission of a radio frequency signal reflected out of said hologram.

4,716,418

APPARATUS AND METHOD FOR EJECTING INK DROPLETS

Joachim Heinzl, Munich, and Guenter Rosenstock, Ottobrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 488,440, Apr. 25, 1983, abandoned. This application Nov. 19, 1984, Ser. No. 673,207

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217248

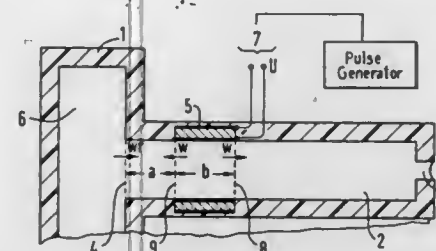
Int. Cl.⁴ G01D 15/16

U.S. Cl. 346-1.1

20 Claims

1. Apparatus for ejecting droplets from a fluid-filled channel having a discharge opening comprising, a tubular piezo electric transducer surrounding a part of the length of the said channel, said transducer being adapted to change its internal diameter by expansion and contraction in response to applied

drive pulses, and including means for applying to said transducer a pulse poled opposite to the polarization direction of the transducer in order to cause expansion of the interior diameter of the transducer, said channel having a cross-sectional expansion at its end opposite the discharge opening, said transducer surrounding said channel in the proximity of said cross-sectional expansion, whereby the pressure wave generated by said transducer expansion is reflected at said cross-sectional expansion with the reversal of its polarity, said transducer being



spaced from said cross-sectional expansion by the distance required for a pressure wave to travel from said transducer to said cross-sectional expansion and for a corresponding reflected pressure wave to travel from said cross-sectional expansion to said transducer in approximately the period of said drive pulse, whereby said reflected pressure wave is summed between said transducer and said discharge opening with the generated pressure wave due to the contraction of the transducer, to provide a composite pressure wave for ejecting a single droplet from said fluid-filled channel.

4,716,419

THERMAL TRANSFER PRINTER

Yoji Okazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

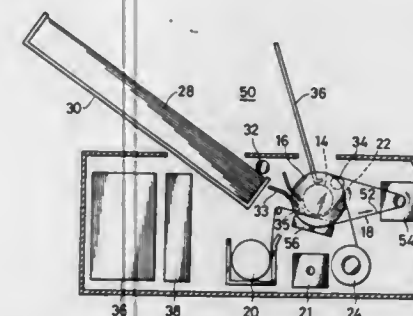
Continuation of Ser. No. 756,702, Jnl. 19, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 31,208

Claims priority, application Japan, Nov. 12, 1984, 59-238078

Int. Cl.⁴ G01D 15/16

U.S. Cl. 346-76 PH

5 Claims



1. A thermal transfer printer for thermally recording, with an ink ribbon, information on recording paper wound on a platen, comprising:

a step motor for intermittently turning the plate by means of a timing belt and a timing pulley; and

a thermal head for thermally recording information on the recording paper via the ink ribbon, said thermal head having a face positioned adjacent said platen at a location defined by an angle formed by (a) a line originating from an axial center of the platen and extending to a starting point of a tension side of said timing belt on said timing pulley, and (b) a line originating from said axial center and extending to a center of said thermal head face, said angle being between 0° and about 60°.

4,716,420

PEN TURRET ROTATION FOR PLOTTERS

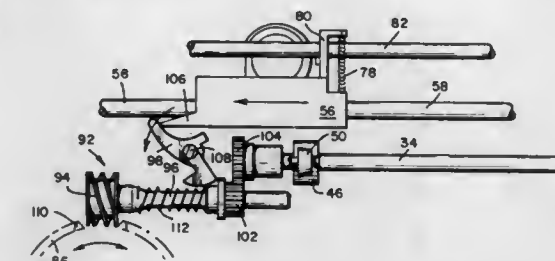
Kevin L. Glassett, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 27, 1986, Ser. No. 923,353

Int. Cl.⁴ G01D 9/30, 9/00; F16H 21/44, 1/16

U.S. Cl. 346-139 R

7 Claims



1. In an improved plotter printer for making plots requiring the use of a plurality of pens maintained in a rotatable turret and including (a) means for accepting and moving a printing medium bidirectionally and (b) means for printing information on said medium, said printing means including a carriage assembly comprising means for removing a pen from and replacing a pen on a preselected position on said turret, means for moving said pen bidirectionally orthogonal to the movement of said paper and means for selectively engaging said pen and said medium for printing thereon, the improvement which comprises means for linking rotation of said turret for selecting said pen to said means for moving said medium.

4,716,421

RECORDING APPARATUS

Kunitaka Ozawa, Isehara; Takashi Nakamura, Hiratsuka; Akira Katayama; Katsunori Hatanaka, both of Yokohama; Tetsuzo Mori, Hiratsuka, and Makoto Takaoka, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

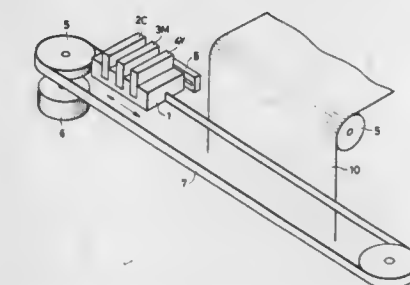
Filed Oct. 14, 1986, Ser. No. 918,715

Claims priority, application Japan, Oct. 18, 1985, 60-230963

Int. Cl.⁴ G01D 15/18

U.S. Cl. 346-140 R

15 Claims



1. A recording apparatus comprising:

plural recording heads;

a carriage on which said plural recording heads are mounted;

moving means for moving said carriage relative to a recording medium;

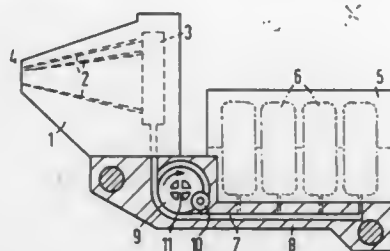
detecting means for detecting marks indicating the mounting positions of said recording heads; and

means for generating a value corresponding to the position of each of said recording heads according to the detection output of said detecting means.

4,716,422

MECHANISM FOR RINSING AN INK PRINTING HEAD
 Ernst Goepel, Germering, and Hans Kusmierz, Gilching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
 Filed Jul. 9, 1986, Ser. No. 883,659
 Claims priority, application Fed. Rep. of Germany, Aug. 12, 1985, 3528896

Int. Cl.⁴ G01D 15/16; B41J 3/04
 U.S. Cl. 346—140 R 11 Claims



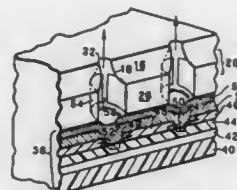
1. A mechanism for rinsing the ink channels and nozzles of a print head in printer devices upon employment of a hose pump which is firmly connected to the print head and in which the connecting hoses guided over the hose pumps are grasped and pinched by a puck, with the connecting hoses arranged between the ink reservoir and the ink distributing system of the print head, comprising the improvement wherein the connecting hoses are guided over a revolute member having on its outer surface at least one annular groove, the connecting hoses projecting into a sector of the annular groove, whereby at least one section of the pinchable connecting hose lies against a bearing surface of a carrier in the rolling region of the puck, the puck connected to the revolute member being seated rotatable around its longitudinal axes, whereby said puck is situated within the annular groove and a drive element being provided, by means of which the revolute member can be turned.

4,716,423

BARRIER LAYER AND ORIFICE PLATE FOR THERMAL INK JET PRINT HEAD ASSEMBLY AND METHOD OF MANUFACTURE

C. S. Chan, and Robert R. Hay, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.
 Division of Ser. No. 801,169, Nov. 22, 1985, abandoned. This application Oct. 3, 1986, Ser. No. 915,290

Int. Cl.⁴ G01D 15/18; C25D 1/02; G03C 5/00
 U.S. Cl. 346—140 R 7 Claims



1. An integrated orifice plate and barrier layer of discontinuous and scalloped wall portions structure for an ink jet print-head manufactured by the process of:

(a) forming a first mask portion having a convergently con-

toured external surface and a second mask portion having straight vertical walls, and

(b) electroforming a first metal layer around said first mask portion to define an orifice plate layer having one or more convergent orifices, and electroforming a second metal layer around said second mask portion to define a barrier layer of discontinuous and scalloped wall portions having one or more ink reservoir cavities aligned respectively with one or more of said convergent orifices in said orifice plate layer.

4,716,424

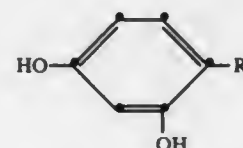
PRESSURE-SENSITIVE OR HEAT-SENSITIVE RECORDING MATERIAL

Jean C. Petitpierre, Riehen; Hermann Nachbur, Reinach, and Albert Würmli, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 13, 1983, Ser. No. 494,467
 Claims priority, application Switzerland, May 17, 1982, 3052/82

Int. Cl.⁴ B41M 5/16, 5/18, 5/22
 U.S. Cl. 503—210 12 Claims

1. A pressure- or heat-sensitive recording material, which, in its color reactant system, contains as a color developer for the color former, a substituted resorcinol compound of the formula



or its corresponding zinc or aluminium salt, in which R is selected from the group consisting of nitro, hydroxyamide, trifluoromethyl, formyl, lower alkanoyl, lower alkenoyl, lower alkanoyloxy, lower-alkoxycarbonyl, benzoyloxy, phenoxycarbonyl, benzyloxycarbonyl, lower-alkylsulfonyl, lower-alkylsulfonyloxy, phenylsulfonyl, phenylsulfonyloxy, lower-alkylphenoxysulfonyl, halogenophenoxysulfonyl, carbamoyl, sulfamoyl, N-(lower)alkylcarbamoyl, N-(lower)alkylsulfamoyl, N-phenylcarbamoyl, N-phenylsulfamoyl, N-hydroxy(lower)alkylcarbamoyl, N-hydroxy(lower)alkylsulfamoyl, phenylazo and phenylazomethine.

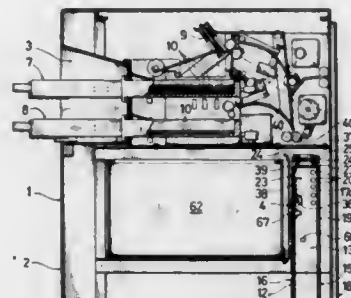
4,716,425

THERAPEUTIC TOMOGRAPHIC SYSTEM

Atsumi Kashiwagi, Nara, Japan, assignor to Fujimoto Photo Industrial Co., Ltd., Osaka, Japan
 Filed Dec. 11, 1986, Ser. No. 940,461

Claims priority, application Japan, May 29, 1986, 61-124945; May 29, 1986, 61-124946

Int. Cl.⁴ G03B 29/00, 27/60
 U.S. Cl. 354—76 5 Claims



1. A therapeutic tomographic system for projecting on a film an image appearing on a monitor television, comprising,

a low pressure box whose interior is held at a negative pressure and which is provided with a vertical receiving surface having a large number of vent holes, and a feed belt interposed between said film and said receiving surface, which directly receives said film owing to adhesive power of said low pressure box, to be integrated therewith, and which in that state, reciprocally moves in vertical direction.

4,716,426

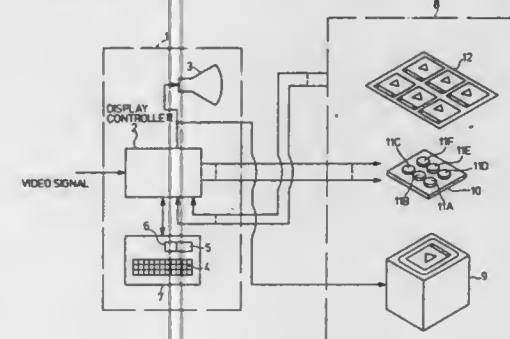
METHOD OF AND APPARATUS FOR PHOTOGRAPHING MEDICAL IMAGE

Hisashi Endo, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP86/00277, § 371 Date Jan. 9, 1987, § 102(e) Date Jan. 9, 1987, PCT Pub. No. WO86/07168, PCT Pub. Date Dec. 4, 1986

PCT Filed May 29, 1986, Ser. No. 10,276
 Claims priority, application Japan, May 30, 1985, 60-116975
 Int. Cl.⁴ G03B 29/00 2 Claims

U.S. Cl. 354—76



1. A method of photographing a medical image comprising the steps of:

displaying on a display a registration frame for registering information for specifying a plurality of images to be successively photographed;

registering said information for specifying said plurality of images through said registration frame on said display;

supplying video signals of said plurality of images to a multi-format camera successively with reference to the registered information; and

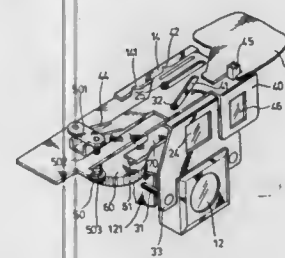
photographing the plurality of images in succession which correspond to the supplied video signals by said multi-format camera.

4,716,427

CAMERA MEANS FOR REGULATING THE EXPOSURE AREA OF A FRAME OF FILM

Shiow-Feng Shyu, P.O. Box 10780, Taipei, Taiwan
 Filed Mar. 17, 1986, Ser. No. 840,492

Int. Cl.⁴ G03B 1/00, 13/02, 17/38
 U.S. Cl. 354—159 13 Claims



1. A camera which can regulate the exposure area of a frame of film comprising:

(a) a body;
 (b) a film advance wheel for turning the film take-up spool around and for returning a shutter striking plate to its original position;

(c) a regulating plate;

(d) a view shield device arranged to be actuated by the regulating plate and movable between a first position in which it is substantially clear of the viewfinder and a second position in which it is effective to shield the viewfinder to reduce the viewing area to approximately half the total width thereof;

(e) means for guiding movement of the regulating plate;

(f) at least two opaque movable blades arranged to be driven by the regulating plate to shield an exposure window of the camera from the sides of the window such that the width of the exposure window is reduced to approximately one half of the total width;

(g) a clutch device actuable by the regulating plate to control the film advance wheel to rotate through one cycle or one half on each operation of the shutter mechanism of the camera;

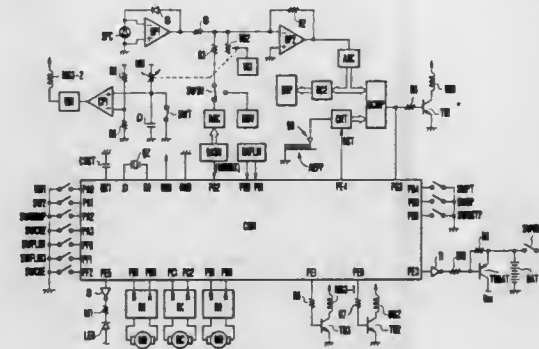
(h) an operating member accessible from outside the camera, said operating member being arranged to move the regulating member between two positions and the regulating member being arranged, when being moved from a first to a second position, to move the view shield device to the second position, to move the opaque movable blades to shield half of the width of the exposure window and to move control means for the film advance wheel so that said wheel can rotate through only one half cycle after each shutter operation such that the length of the film advanced is reduced to one half of the normal length advanced; when being moved from the second position back to the first position, to move the view shield device to the first position, to move the opaque movable blades to a position in which they no longer obstruct the exposure window and to move said control means for the film advance wheel so that said wheel can rotate through one full cycle after each shutter operation so that the length of film advanced corresponds to a full frame of the exposure window.

4,716,428

AUTOMATIC FILM LOADING DEVICE FOR CAMERA
 Masaharu Kawamura, Kawasaki; Yoshihito Harada, Yokohama; Ryuichi Kobayashi, Kawasaki; Masayuki Suzuki, Yokohama; Tsunemasa Ohara, and Yoichi Tosaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,387
 Int. Cl.⁴ G03B 1/12 6 Claims

U.S. Cl. 354—173.11



1. A camera having an automatic loading device which includes a first film winding detection means for generating a one-frame detection signal by detecting a film winding time interval for every frame portion of the film and is arranged to continuously blank feed a plurality of frame portions of the

film on the basis of said one-frame detection signal when the camera is loaded with said film, comprising:

- (a) second film winding detection means arranged to detect a film winding extent shorter than one frame and to generate a plurality of film movement detection signals every time one frame portion of said film is wound up;
- (b) third film winding detection means for detecting from the number of said film movement detection signals of said second detection means the amount of film blank fed during a period of time between the start of blank film feeding and generation of the one-frame detection signal by said first film winding detection means; and
- (c) control means for variably controlling the number of blank fed frame portions of said film on the basis of the result of detection made by said third film winding detection means.

4,716,429

DISPLAY APPARATUS FOR SINGLE-LENS REFLEX CAMERA

Isao Misawa, 6-Go, Wakame-son, 1-31-12 Higashi-nogawa, Komae-Shi, Tokyo, Japan

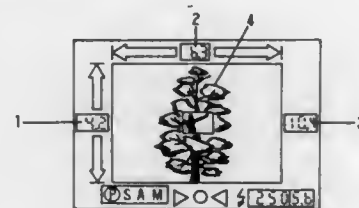
Filed Dec. 22, 1986, Ser. No. 945,370

Claims priority, application Japan, Dec. 23, 1985, 60-196563[U]

Int. Cl.⁴ G03B 3/10, 17/20

U.S. Cl. 354-409

10 Claims



1. In a single lens reflex camera of the type having a camera body removably mountable to an interchangeable lens and comprising means for effecting autofocus of said mounted lens, said camera body comprising a viewfinder picture display means for displaying an in-focus picture of a subject to be photographed; the improvement comprising means for detecting and displaying the distance to said subject from said camera in said viewfinder picture display means adjacent said in-focus picture, and means for detecting a focal distance of said interchangeable lens removably mounted to said camera body and for displaying corresponding vertical and horizontal dimensions of said subject based on said detected lens focal distance, said subject vertical and horizontal dimension display further being provided in said viewfinder picture display means adjacent said in-focus picture, said subject vertical and horizontal dimension display providing means comprising means for obtaining a field angle based on said detected lens focal distance and for calculating a relationship in size between the camera picture size and said subject; whereby the vertical and horizontal dimensions of an in-focus subject and the distance to said subject may be displayed in the camera viewfinder along with the in-focus picture of the subject in an improved single lens reflex camera display apparatus.

4,716,430

PULSE PROXIMITY DETECTION

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 4, 1986, Ser. No. 926,756

Int. Cl.⁴ G03B 3/00; G01C 3/08

U.S. Cl. 354-403

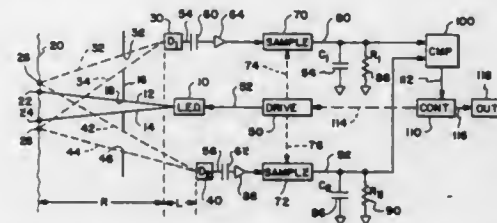
27 Claims

1. Range determining apparatus comprising:

energy producing means for directing a pulse of energy to a remote surface to form a spot of energy thereon;

first energy responsive means positioned an unknown distance from the surface to receive energy reflected from at least the entire spot and to produce a first output which increases to a first value indicative of the energy received by the first energy responsive means during a first time period;

second energy responsive means positioned a predetermined optical distance further from the surface than the first energy responsive means to receive energy reflected from at least the entire spot and to produce a second output



which increases to a second value indicative of the energy received by the second energy responsive means during the first time period;

first decay means connected to the first energy responsive means to receive the first output;

second decay means connected to the second energy responsive means to receive the second output; and

comparing means connected to the first and second decay means and operable to produce a third output indicative of a second time period which is a function of the relative time needed for the first and second outputs to decay to an equal value, the second time period being a function of the unknown distance.

4,716,431

OPTICAL SYSTEM FOR USE IN FOCUS DETECTING APPARATUS

Osamu Shindo, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

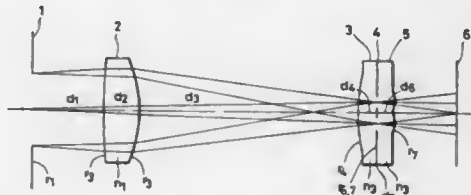
Filed Jul. 25, 1986, Ser. No. 889,535

Claims priority, application Japan, Jul. 26, 1986, 60-166580

Int. Cl.⁴ G03B 3/00

U.S. Cl. 354-407

1 Claim



1. In an optical system for use in a focus detecting apparatus which comprises a condenser lens disposed at a film equivalent surface or in the vicinity thereof and a pair of splitting optical elements which are disposed behind said condenser lens in a manner symmetrical with respect to the meridional plane of said condenser lens, the focus position being detected by sensing a relative positional mismatch between the images of the object refocused by the respective splitting optical elements, the improvement wherein the rear surface of said condenser lens is an ellipsoidal surface which satisfies the relation $-1 < k < 0$ when it is expressed by the formula for a quadratic surface:

$$x = \frac{ch^2}{1 + \sqrt{1 - (k+1)c^2h^2}}$$

and wherein an auxiliary lens which is coaxial with said condenser lens is disposed just in front of said splitting optical elements.

4,716,432

EXPOSURE CONTROL APPARATUS

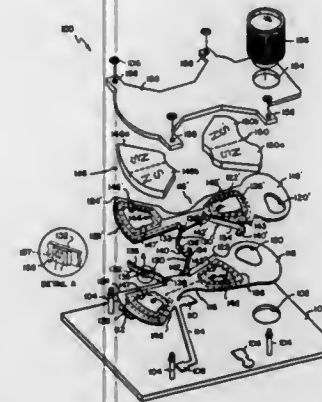
Thomas M. Stephany, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 24, 1986, Ser. No. 855,289

Int. Cl.⁴ G03B 9/08, 9/14

U.S. Cl. 354-446

7 Claims



1. Exposure control apparatus for regulating the amount of light admitted to a selected area, said apparatus comprising:

light limiting means movable from a rest position to admit light to said area;

means for moving said light limiting means;

means for urging said light limiting means toward said rest position;

means for providing a first output indicative of ambient light;

means for sensing a change in said urging means which is indicative of an instantaneous position of said light limiting means and for producing a second output proportional to said change; and

means for actuating said moving means to admit a predetermined amount of light to said area in response to said first and second outputs.

4,716,433

BATTERY CHECKING CIRCUIT

Kiyoshi Aiyfuku, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha

Filed Apr. 26, 1985, Ser. No. 727,587

Claims priority, application Japan, Apr. 28, 1984, 59-86884; Apr. 28, 1984, 59-86885; Sep. 10, 1984, 59-189054; Mar. 6, 1985, 60-44001

Int. Cl.⁴ G03B 17/18

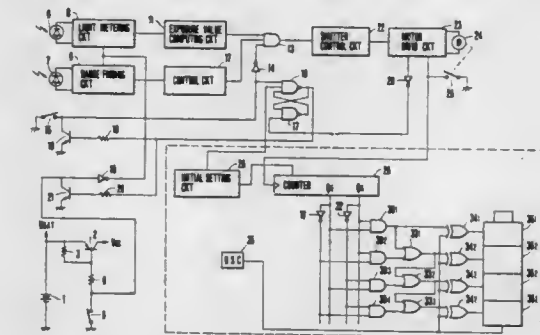
U.S. Cl. 354-468

38 Claims

1. A battery checking circuit for a camera comprising:
 - (a) a first pulse generating circuit for producing a number of pulses for each camera operation;
 - (b) a circuit for an accessory operation associated with the camera;
 - (c) a second pulse generating circuit for producing a number of pulses for each accessory operation;
 - (d) a counter for counting and providing an output of the sum of the pulses produced from said first and said second pulse generating circuits;
 - (e) display means for displaying the remaining amount of

energy of a battery, said display means having a plurality of display areas arranged side by side; and

(f) control means for controlling the operation of a plurality of display elements for said areas in accordance with the



output sum of said counter, said control means causing said plurality of display areas to change their appearance from one side to another successively depending on the number of pulses counted so that the remaining amount of energy of the battery is made recognizable.

4,716,434

FOCUS CONDITION DETECTING DEVICE

Nobuyuki Taniguchi, Nishinomiya; Tokuji Ishida, Daito; Masataka Hamada, Minamikawachi; Toshihiko Karasaki, and Toshio Norita, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1986, Ser. No. 945,879

Claims priority, application Japan, Dec. 23, 1985, 60-291149

Int. Cl.⁴ G03B 3/00

U.S. Cl. 354-408

2 Claims

1. A focus condition detecting device, comprising:

an objective lens;

first and second light intensity distribution signal generating means including first and second sensor arrays for receiving light having passed through different areas of the exit pupil of said objective lens and generating first and second light intensity distribution signals which represent light intensity respectively;

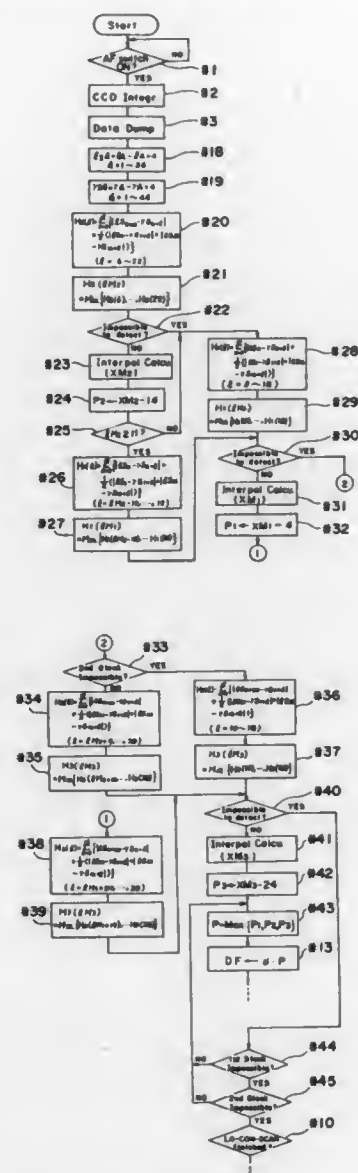
signal dividing means for dividing said first light intensity distribution signal into a plurality of blocks;

calculation means for shifting each of the portions of said first light intensity distribution signal belonging to said respective blocks relative to said second light intensity distribution signal by sequentially changing the amount of shift to calculate correlations therebetween and thereby to find the amount of shift providing the highest correlation with respect to each of said blocks;

focus condition signal generating means for generating a focus condition signal representing the focus condition of said objective lens in accordance with the amount of shift found to provide the highest correlation through each correlation calculation; and

control means for controlling said calculation means in accordance with the amount of shift found through the correlation calculation with use of the portion of said first light intensity distribution signal belonging to one of said

blocks, so as to restrict the shift range for the succeeding correlation calculation with use of the portion of said first



light intensity distribution signal belonging to another one of said blocks.

4,716,435 HEAT AND PRESSURE ROLL FUSER AND ROLL ENGAGING MECHANISM THEREFOR

Jack O. Wilson, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 29, 1985, Ser. No. 802,890

Int. Cl.⁴ G03G 15/20

U.S. Cl. 355—3 FU

9 Claims

1. Latch mechanism for a heat and pressure roll fuser, said apparatus comprising:

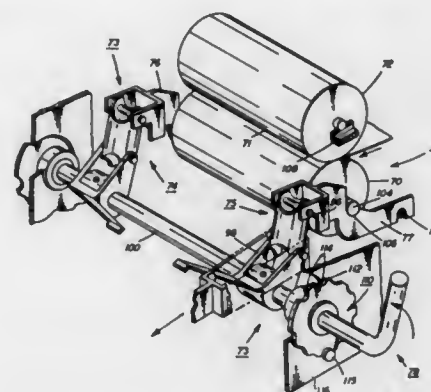
- a pair of pivotally supported support arms for supporting one of a pair of rolls forming said fuser, said one of a pair of rolls including shaft members;
- means for supporting another roll of said fuser so that it is disposed substantially above said one of a pair of rolls;
- an actuator member operably supported for cooperation with said pair of support arms;
- means interconnecting said support arms to said actuator member and operative in at least one position to apply a force sufficient to force said one roll into pressure engage-

ment with said another roll upon actuation of said actuator member;

said pair of support arms, interconnecting means and said actuator member comprising the sole means for operatively supporting said one of a pair of rolls;

said support arms each being provided with a recess for receiving and captivating said shaft members for movement with said support arms;

said interconnecting means comprising a pair of over-center toggle structures wherein each of said toggle structures



comprises a first toggle link fixedly secured to said actuator member and a second toggle link pivotally secure to one of said support arms;

a compression spring in said second toggle link for effecting pressure engagement of said rolls when said latch mechanism is actuated; and

a pair of washers for retaining said compression spring and a pair of shafts for retaining said washers in said second toggle link, said shafts being provide with a notched area for receiving at least a part of said washer whereby said shafts are captivated in said second toggle link.

4,716,436 CHARGE ERASE DEVICE WITH FLARE LIGHT CONTROL

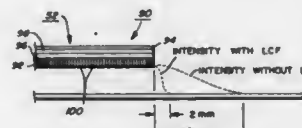
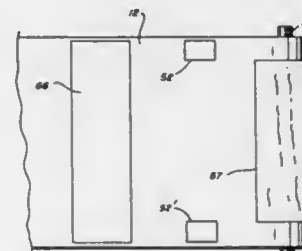
Joseph H. Lang, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 26, 1986, Ser. No. 833,313

Int. Cl.⁴ G03G 15/052, 21/00

U.S. Cl. 355—3 CH

3 Claims



1. An electrophotographic reproduction machine wherein a photoconductive surface is uniformly charged by a corona generating means and a latent image of an original document is subsequently formed on said photoconductive surface by an optical exposure system, said machine including at least one

charge erase device for dissipating the charge on selected areas of the photoconductive surface exclusive of the area of said latent image, said charge erase device comprising, in combination,

an electroluminescent display panel adapted to provide a light output from at least one surface thereof, and

a light control film optically coupled to said display panel, said film adapted to direct said light output onto said photoconductive surface preferentially whereby flare light intrusion into the latent image area is minimized.

4,716,437 DEVELOPMENT STATION HAVING APERTURED THIN FILM FOR CONTROLLING THE FLOW OF DEVELOPER MATERIAL

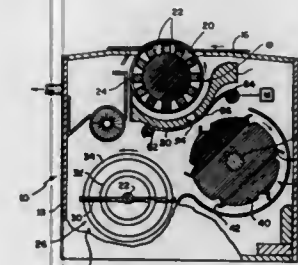
Bruce D. MacLellan, Ontario, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 19, 1986, Ser. No. 932,415

Int. Cl.⁴ G03G 15/00, 15/09

U.S. Cl. 355—3 DD

5 Claims



1. In electrophotographic apparatus having a development station with a magnetic brush for applying developer material to a photoconductor, means for feeding developer material to the magnetic brush, and means defining an opening between the magnetic brush and the feeding means through which developer material passes as it is fed to the brush, the improvement comprising:

means for controlling the flow of developer material from the feeding means to the magnetic brush through the opening, the controlling means comprising a thin, flexible member positioned between the feeding means and the opening, the member having a plurality of apertures through which developer material can flow, and means for moving member between (1) a first position wherein the apertures are aligned with the opening so that developer material from the feeding means can pass through the apertures and be delivered to the magnetic brush and (2) a second position wherein the apertures are displaced from the opening to block the flow of developer material from the feeding means through the opening.

4,716,438 HIGH SPEED ELECTRONIC REPROGRAPHIC/PRINTING MACHINE

Barbara L. Farrell, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 17, 1986, Ser. No. 931,600

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—6

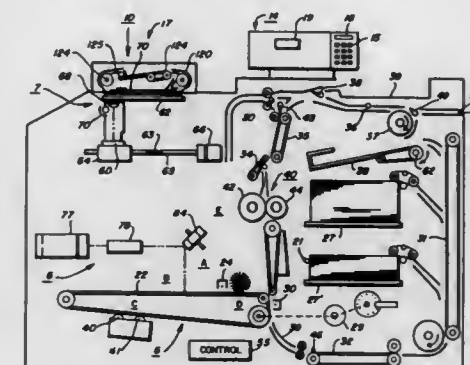
5 Claims

1. A method of operating an electronic reprographic/printing machine having a scanner for scanning documents at least one of which contains control instructions for operating the machine in the form of a coded image, the remainder of the documents bearing images to be converted into image signals for processing by said machine in accordance with said control instructions, comprising the steps of:

- (a) scanning each of said documents in succession;

(b) tolling a preset time interval when scanning each of said documents while looking for said coded image;

(c) concluding no coded image is present on failure to detect said coded image within said time interval but continuing scanning of said document to convert the image thereon to image signals for processing by said machine;



(d) where a coded image is detected, decoding said coded image to provide control instructions for operating said machine; and

(e) terminating scanning of the document bearing said coded image prematurely on detection of the end of said coded image whereby to enhance scanner throughput rate.

4,716,439 HALF-MODE COPYING MACHINE

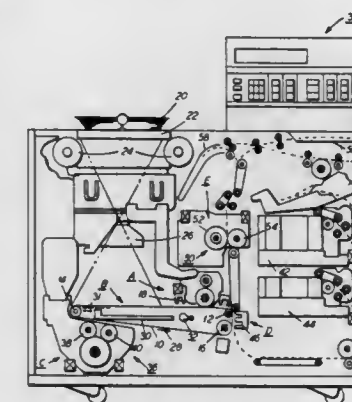
Thomas Acquaviva, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 21, 1986, Ser. No. 854,214

Int. Cl.⁴ G03G 15/04

U.S. Cl. 355—7

7 Claims



1. An electrophotographic printing machine, including: means for supporting a first document and a second document;

a photoconductive member;

means for charging at least a portion of said photoconductive member;

means for flash illuminating the first document and the second document supported by said supporting means;

optical means associated with said flash illuminating means for projecting a first light image of the first document and the second document onto the charged portion of said photoconductive member to record a first electrostatic latent image of the first document and the second document on said photoconductive member; and

means for erasing a portion of the first electrostatic latent image recorded on said photoconductive member corresponding to the first document.

4,716,440

POSITIONING DEVICE FOR SHEET ON EXPOSURE PLATEN OF A COPYING MACHINE

Franciscus A. C. M. Couwenberg, Veldhoven; Cornelis J. Groenenberg, and Antonius C. S. Wetjens, both of Venlo, all of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

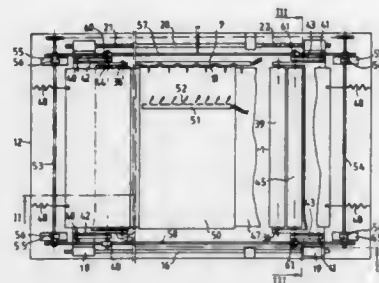
Filed Nov. 5, 1986, Ser. No. 927,645

Claims priority, application Netherlands, Nov. 6, 1985, 8503038

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—14 SH

6 Claims



1. A device for positioning an original in sheet form on the exposure platen of a copying machine, comprising:
 - a. a frame having at least one abutment means adaptable for movement into an operative position in contact with said exposure platen;
 - b. means for feeding said original sheet onto said platen and against the abutment means;
 - c. a first pair of first and second rollers disposed with their axes parallel and adjacent to said abutment means, said rollers being displaceable with said abutment means along said platen;
 - d. means for displacing said first roller towards the platen; and
 - e. a pressure member consisting of a flexible belt having opposite ends which are secured to said frame and being entrained between said first roller and said platen and about said first roller and in the opposite direction being entrained about said second roller and over the abutment towards the frame whereby displacement of first roller towards the platen presses said pressure member against said sheet.

4,716,441

LIGHT EXPOSURE APPARATUS

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 16, 1986, Ser. No. 886,662

Claims priority, application Japan, Jul. 19, 1985, 60-160508

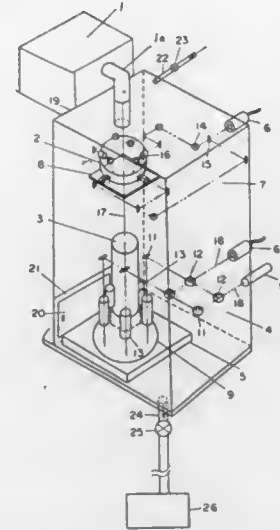
Int. Cl.⁴ G03B 27/52

U.S. Cl. 355—30

5 Claims

1. A light exposure apparatus comprising:
 - a. an exposure light source for generating light of a wavelength in the far ultraviolet wavelength region;
 - b. a light exposure optical system for receiving and passing light from said light source therethrough along an exposure light path;
 - c. an alignment optical system operatively associated with said light exposure optical system for aligning said light exposure optical system and including means for directing light along an alignment light path;
 - d. a box in which said exposure light path and said alignment light path are at least in part disposed;
 - e. an air inlet means in said box for introducing air into the inside of said box;
 - f. first means for opening and shutting said air inlet means;
 - g. an air outlet means in said box for exhausting air from the inside of said box;

second means for opening and shutting said air outlet means; and
exhaust means coupled to said air outlet means through said second means for exhausting the interior of said box to a subatmospheric pressure;



whereby said air inlet means can be closed and said air outlet means opened and said exhaust means can be operated to exhaust air from the interior of said box so that the inside of said box is at a subatmospheric pressure.

4,716,442

EXPOSURE DEVICE AND EXPOSURE CONTROL METHOD

Yoshio Yazaki, Chofu, Japan, assignor to ORC Manufacturing Co., Ltd., Tokyo, Japan

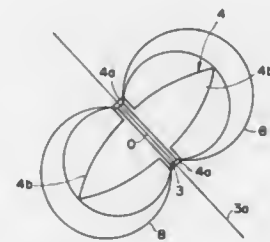
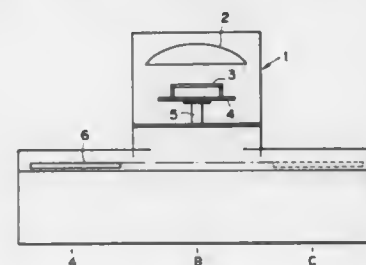
Filed Feb. 24, 1986, Ser. No. 832,436

Claims priority, application Japan, Feb. 22, 1985, 60-34162

Int. Cl.⁴ G03B 27/72

U.S. Cl. 355—67

4 Claims



1. An exposure device comprising
 - a. an exposure stand upon which is mounted an object to be exposed and which is reciprocally movable across an illuminated surface defined by an exposure light source;
 - b. said exposure light source comprising a reflecting mirror such as a parabolic reflecting mirror or a deformed elliptical

4,716,444

OPTICAL RADAR TRANSCIEVER CONTROL APPARATUS

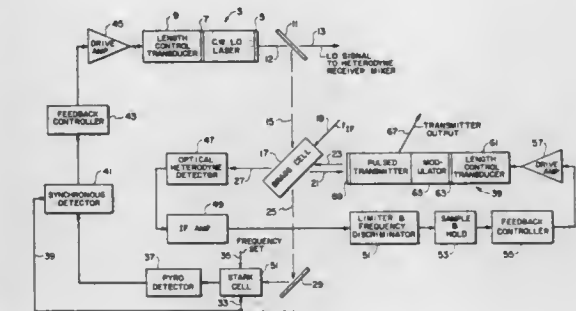
Robert J. Mongeon, S. Windsor; Robert J. Wayne, Manchester, and Robert W. Henschke, E. Hampton, all of Conn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1985, Ser. No. 761,257

Int. Cl.⁴ G01C 3/08

U.S. Cl. 356—05

2 Claims

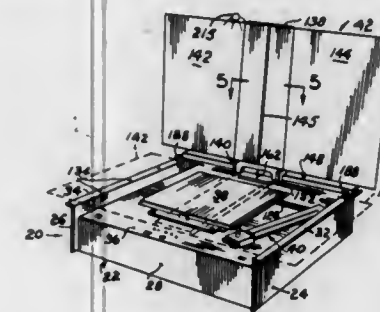


PHOTOGRAPHIC IMAGE PRECISION REPROPORTIONING SYSTEM

Thomas L. Byers, P.O. Box 26624, Oklahoma City, Okla. 73126
Continuation-in-part of Ser. No. 676,336, Nov. 29, 1984, Pat. No. 4,607,952. This application Aug. 14, 1986, Ser. No. 896,556
Int. Cl.⁴ G03B 27/10, 27/68

U.S. Cl. 355—84

12 Claims



1. A photographic image reproportioning apparatus, comprising:
 - a. a base having opposing ends, opposing sides and a planar top;
 - b. transparent carriage means overlying said top for supporting a photographic film having an image thereon;
 - c. platen means interposed between said top and said carriage means for supporting a photosensitive sheet in printing contact with the photographic film;
 - d. means mounting said platen means on said top for rectilinear movement between the base ends when in a first position and between the base sides in a second position and normally biasing said platen means in one direction;
 - e. manually adjustable calibration bar means contacting and moving said platen means a predetermined distance opposite said one direction when in said second position;
 - f. light impervious mask means including an opaque sheet overlying said carriage means and having a photo-light passing slit extending transversely or in the direction of platen means travel for the passing of film exposure light therethrough;
 - g. motor driven means for simultaneously or separately moving said mask means and said calibration bar means in the same or opposite directions along the platen means travel path; and,
 - h. template means interposed between the platen means and the motor driven means for predetermined movement of the platen means against or with its bias in said one direction when in said first position.

1. Optical radar transceiver control apparatus of the heterodyne type comprising
 - a. a pulsed transmitted laser, said transmitter laser having an intracavity modulator for pulse modulation thereof;
 - b. a continuous wave local oscillator laser, said local oscillator laser having a lower power output than said transmitter laser and operating on substantially the same power curve as said transmitter laser;
 - c. an acousto-optic Bragg cell having a Bragg angle input, a non-Bragg angle input, a transducer input, a first output at which a zero order output signal appears which has the same frequency as the signal applied to said Bragg angle input, a second output at which a first order output signal appears which has a frequency equal to the sum of the frequencies of signals applied to said Bragg angle input and said transducer input, and a third output at which a signal appears which has zero and first order components of a signal applied to said non-Bragg angle input;
 - d. means for coupling said Bragg cell Bragg angle input to receive at least a portion of the output beam from said local oscillator laser;
 - e. means for coupling said Bragg cell non-Bragg angle input to receive at least a portion of the output beam from said transmitter laser;
 - f. means for coupling said Bragg cell transducer input to a RF signal having a frequency equal to the desired intermediate frequency at which the heterodyne apparatus is to operate;
 - g. means for coupling said Bragg cell first output to first frequency control means for stabilizing the optical output frequency of said local oscillator laser at a frequency which differs from the line center frequency of said laser power curve by an amount equal to said desired intermediate frequency;
 - h. means for coupling said Bragg cell second output to said transmitter laser for injection control of said transmitter laser by said Bragg cell first order output signal; and
 - i. means for coupling said Bragg cell third output to second frequency control means for controlling the length of the cavity of said transmitter laser to cause said transmitter laser to operate at the line center frequency of said laser power curve.

4,716,445

HETEROJUNCTION BIPOLAR TRANSISTOR HAVING A BASE REGION OF GERMANIUM

Jun'ichi Sone, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

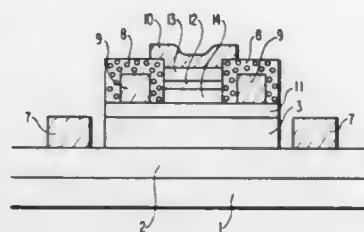
Filed Jan. 20, 1987, Ser. No. 4,931

Claims priority, application Japan, Jan. 17, 1986, 61-8587

Int. Cl.⁴ H01L 29/161, 29/72, 29/20

U.S. Cl. 357-16

13 Claims



1. A heterojunction transistor comprising:
 - a collector region having a GaAs layer of one conductivity type;
 - a base region having a germanium layer of the other conductivity type formed on said GaAs layer; and
 - an emitter region having a mixed crystal layer of silicon and germanium, said mixed crystal layer having said one conductivity type and being formed on said germanium layer.

4,716,446

INSULATED DUAL GATE FIELD EFFECT TRANSISTOR
Leonard J. M. Esser; Petrus J. A. M. Van de Wiel; Leonardus A. Daverveld, and Johannes A. A. Van Gils, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

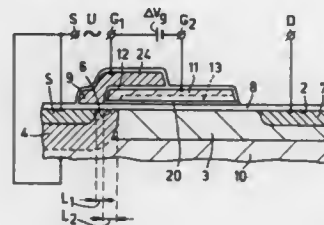
Continuation of Ser. No. 558,229, Dec. 5, 1983, abandoned. This application Jun. 9, 1986, Ser. No. 872,630

Claims priority, application Netherlands, Dec. 16, 1982, 8204855

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357-23.14

8 Claims



1. A semiconductor device having a semiconductor body comprising at least an insulated gate field effect transistor having a surface-adjacent first region, a surface-adjacent channel region of a first conductivity type surrounded at least laterally by the first region, said first region being of a selected conductivity type, a source zone of the second opposite conductivity type adjoining the surface and surrounded within the semiconductor body at least in part by the channel region, a surface-adjacent channel zone between the source zone and the first region and forming part of the channel region, a drain zone of the second conductivity type which is separated by a part of the first region, referred to as the drift region, from the channel region and has a higher doping concentration than that of the first region, an electrically insulating layer located at least on the channel zone and a gate electrode located on the insulating layer above the channel zone, characterized in that a second gate electrode located on the drain side of the channel zone and separated from the first gate electrode is present on the insulating layer above the channel zone adjacent the first gate electrode located on the source side of the channel zone,

whereby in the direction from the source zone to the drain zone, the length L_2 of the part of the second gate electrode located above the channel zone and separated therefrom only by said insulating layer is larger than the length L_1 of the part of the first gate electrode located above the channel zone and separated therefrom only by said insulating layer, said device further comprising means for applying a potential difference between said first and second gate electrodes during operation.

4,716,447

INTERRUPTING CHARGE INTEGRATION IN SEMICONDUCTOR IMAGERS EXPOSED TO RADIANT ENERGY

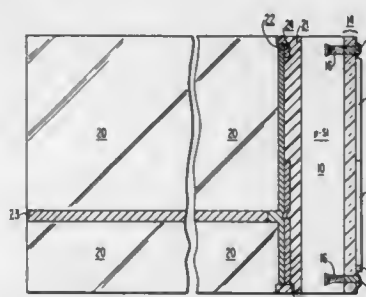
Eugene D. Savoye, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 778,758, Sep. 20, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,805

Int. Cl.⁴ H01L 29/78, 27/14, 31/00, 27/12

U.S. Cl. 357-24

12 Claims



1. In combination:
 - a semiconductor substrate uniformly thin in its entirety and having opposed first and second surfaces;
 - means for generating charge carriers in the bulk of said substrate;
 - means for inducing an array of depletion regions in a portion of the first surface of said substrate, said depletion regions having a tendency to collect said charge carriers;
 - a backing plate of glass which is relatively thick as compared to said uniformly thin semiconductor substrate so as to provide structural support to said thin semiconductor substrate and including a vapor-deposited and photolithographically-shaped electrode structure in direct contact with a first surface thereof without any layer of cement in contact with said electrode structure on the side of said electrode structure facing said backing plate;
 - a layer of insulating cement of a material different than glass for cementing said first surface of the thick backing plate with electrode structure already in place thereon to the second surface of said semiconductor substrate, with an alignment such that said electrode structure opposes said array of depletion regions; and
 - means for applying potentials between said semiconductor substrate and said electrode structure for selectively suppressing said tendency.

4,716,448

CHEMFET OPERATION WITHOUT A REFERENCE ELECTRODE

Kevin A. Kelly, 858 Kinnear Rd., Apt. #213, Columbus, Ohio 43212

Filed Sep. 3, 1985, Ser. No. 771,974

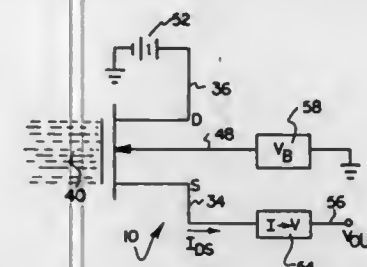
Int. Cl.⁴ H01L 29/66

U.S. Cl. 357-25

24 Claims

1. In combination, a chemically sensitive field effect transistor having a gate region adapted to interface with a substance so as to generate an electrochemical interfacial potential in response to a chemical property of the substance and further

having source, drain, and substrate regions, at least a portion of said substrate region being between the source and the drain,



first means for applying a potential between the source and drain, and second means for applying a time-variant potential to the substrate.

4,716,449

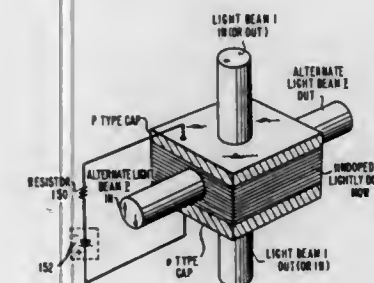
NONLINEAR AND BISTABLE OPTICAL DEVICE
David A. B. Miller, Fairhaven, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 785,546, Oct. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 589,556, Mar. 14, 1984, Pat. No. 4,546,244. This application Jan. 14, 1987, Ser. No. 6,327

Int. Cl.⁴ H01L 27/14

U.S. Cl. 357-30

7 Claims



1. An optical device, comprising:
 - first means, including a first surface, capable of absorbing electromagnetic radiation incident on said first surface, the absorption and/or refractive index of said first means being alterable by applying a voltage across said first means and/or through alterations in said applied voltage; and
 - second means for producing a voltage across said first means, said voltage being alterable in response to electromagnetic radiation incident on, and absorbed by, said second means, characterized in that
- said first means further includes a quantum well region, and said second means includes at least a first component integral with said first means and at least a second component overlying a portion, but less than all, of said first surface.

4,716,450

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING COMPLEMENTARY FIELD EFFECT TRANSISTORS
Ryuichi Hashishita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 26, 1985, Ser. No. 748,840

Claims priority, application Japan, Jun. 26, 1984, 59-131474

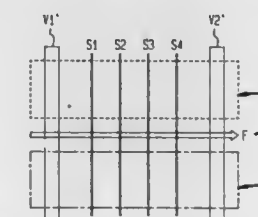
Int. Cl.⁴ H01L 27/02

U.S. Cl. 357-42

9 Claims

1. A semiconductor integrated circuit comprising a semiconductor substrate;

- a first transistor forming region of a first conductivity type elongated in a first direction;
- a second transistor forming region of a second conductivity type elongated in said first direction, said first and second transistor forming regions provided being adjacent and parallel to each other;
- a plurality of first field effect transistors formed on said first transistor forming region and distributed in said first direction over substantially an entire area of said first transistor forming region;
- a plurality of second field effect transistors formed on said second transistor forming region and distributed in said first direction over substantially an entire area of said second transistor forming region;
- a plurality of first wirings formed on said first and second transistor forming regions, at least a portion of said first wirings extending in said first direction on said first and



- second transistor forming regions, gates of said first and second transistors being formed with said first wirings;
- first and second power supply wirings extending in a second direction perpendicular to said first direction, each of said first and second power supply wirings passing over each of said first and second transistor forming regions;
- a plurality of signal wirings extending in said second direction and passing over each of said first and second transistor forming regions, said first and second power supply wirings and said signal wirings being nonsuperposed and formed on the same wiring layer level;
- means for electrically connecting said first and second field effect transistors to said signal wirings;
- means for electrically connecting said first power supply wiring to a part of said first transistor forming region; and
- means for electrically connecting said second power supply wiring to a part of said second transistor forming region.

4,716,451

SEMICONDUCTOR DEVICE WITH INTERNAL GETTERING REGION

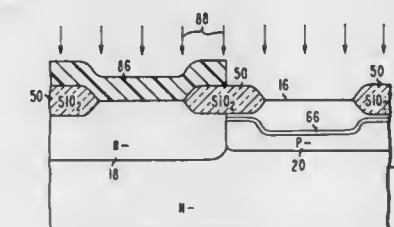
Sheng T. Hsu, Lawrenceville, and Doris W. Flatley, Belle Mead, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 10, 1982, Ser. No. 448,724

Int. Cl.⁴ H01L 27/04

U.S. Cl. 357-42

7 Claims



1. A semiconductor device comprising:
 - a substrate of single crystalline silicon having opposed surfaces,
 - the active region of at least one semiconductor element on said substrate adjacent one of said surfaces, and
 - means for gettering including a thin gettering region of a

substantially unannealed gettering material in said substrate spaced from both said surfaces and extending adjacent but spaced from the active regions of at least one of said semiconductor elements.

4,716,452

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE CONSTRUCTED BY POLYCELL TECHNIQUE

Hitoshi Kondoh, and Akihiro Sneda, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

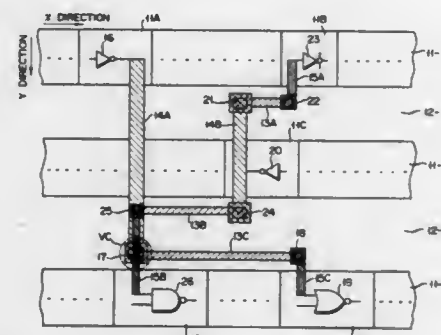
Filed Nov. 8, 1985, Ser. No. 796,422

Claims priority, application Japan, Nov. 9, 1984, 59-235192

Int. Cl.⁴ H01L 23/48, 27/10, 27/02

U.S. Cl. 357-68

24 Claims



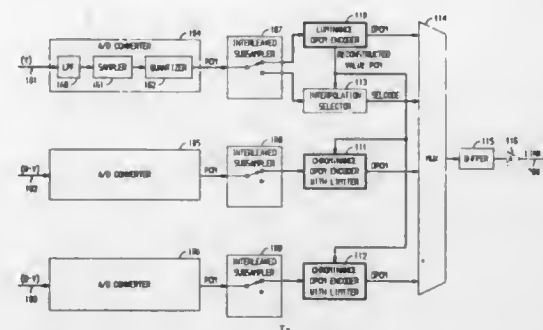
1. A semiconductor IC device made by the polycell technique, comprising:

- a semiconductor substrate;
- various functional circuits formed in one major surface of said semiconductor substrate;
- a plurality of cell arrays each constituted by unit cells having said functional circuits;
- a wiring region formed between any two adjacent cell arrays;
- a first insulating layer formed on said semiconductor substrate;
- a polysilicon wiring layer formed on said first insulating layer, embedded in the corresponding unit cell, positioned in said wiring region, extending at right angles to said cell arrays and connected at one end to one of the input terminals of the corresponding unit cell;
- a second insulating layer formed on said first insulating layer and said polysilicon wiring layers;
- a first metal wiring layer formed on that portion of said second insulating layer which is positioned in said wiring region;
- a third insulating layer formed on said first metal wiring layer and said second insulating layer;
- a second metal wiring layer formed on that portion of said third insulating layer which is positioned in said wiring region, and extending at right angles to said first metal wiring layer, part of said second metal wiring layer being selectively connected to one of the output terminals of said unit cell;
- a via contact hole formed in said third insulating layer and positioned above said polysilicon wiring layer, for connecting said second metal wiring layer to said first metal wiring layer, said via contact hole having an axis aligned with that of said polysilicon wiring layer; and
- a contact hole formed in said second insulating layer, for connecting said first metal wiring layer to said polysilicon wiring layer.

4,716,453
DIGITAL VIDEO TRANSMISSION SYSTEM
Robert L. Pawelski, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jun. 20, 1985, Ser. No. 746,840
Int. Cl.⁴ H04N 11/06

U.S. Cl. 358-13

48 Claims



6. An arrangement for transmitting component video signals in digital form, comprising for each video component signal:
- first operational means, for predicting a value of a first sample of the component video signal;
 - a plurality of sets of representative values of quantization levels of signal prediction errors;
 - second operational means, coupled to the first means and to the plurality of sets, for selecting a set of the signal error-representative values on the basis of the predicted value of only the first sample of the signal;
 - third operational means, coupled to the first means and to the selected set, for selecting a signal error-representative value from the selected set of signal error-representative values on the basis of difference between the predicted value and an actual value of the first sample of the signal; and
 - fourth operational means, responsive to the selected value, for generating a code indicating the selected signal error-representative value; and the arrangement further comprising:
 - fifth operational means, coupled to each fourth means, for transmitting on a communication medium the generated codes.

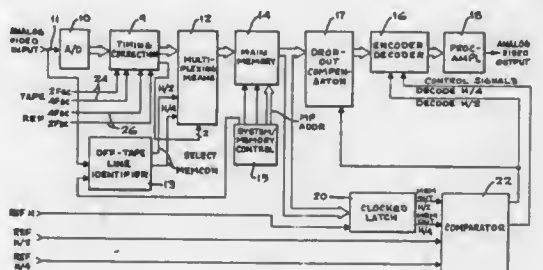
4,716,454
CHROMA PHASE WORD ENCODE/DECODE IN A VIDEO PROCESSING SYSTEM
Reginald W. Oldershaw, Redwood City, and Steven D. Wagner, San Jose, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Oct. 17, 1985, Ser. No. 788,597

Int. Cl.⁴ H04N 9/47, 9/89, 5/78

U.S. Cl. 358-18

18 Claims



1. A circuit for processing video data signals having horizontal sync pulses and chroma burst signals, wherein successive

horizontal lines of the video data have different chroma phase information, comprising:

- means for providing a reference line type identification signal;
- means for inserting data in the video data signals which identifies the chroma line type of a horizontal line;
- main memory means for storing the line type information of selectable lines along with the associated video data signals to enable correcting timing errors in both the data signals and the line type information;
- means for comparing the stored line type information with the corresponding reference line type identification signal to develop a line type control signal for the respective line; and
- means for shifting the phase of the respective chroma signal in response to its line type control signal.

4,716,455
CHROMINANCE SIGNAL INTERPOLATION DEVICE
FOR A COLOR CAMERA

Naoki Ozawa, Kokubunji; Toshiyuki Akiyama, Kodaira; Kazuhiro Satoh, Setagaya; Syusaku Nagahara, Hachioji, and Itaru Mimura, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

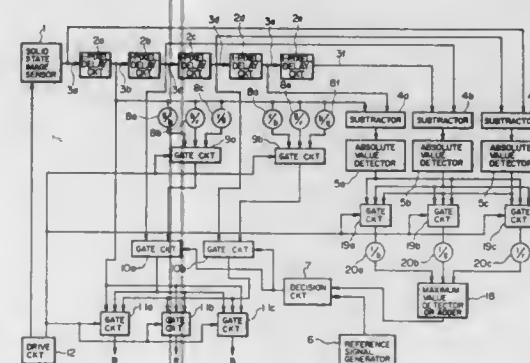
Filed Mar. 18, 1986, Ser. No. 840,654

Claims priority, application Japan, Mar. 25, 1985, 60-58398

Int. Cl.⁴ H04N 9/077, 9/04

U.S. Cl. 358-44

14 Claims



1. A solid-state imaging device including a solid-state image sensor having a plurality of picture elements which are arrayed in, at least one horizontal row, and a plurality of color filters each having one of a plurality of different color transmission characteristics which are disposed in an array in correspondence with said picture elements of said solid-state image sensor, said device comprising: first output means for providing an output signal of a first picture element one of said at least one horizontal row; second output means for providing an output signal of a second picture element which is disposed at a position preceding said first picture element in said one horizontal row and which corresponds to a color filter having a different color transmission characteristic than a color filter corresponding to said first picture element; first amplification means for amplifying said output signal provided by said first output means with a gain equal to the ratio of an output signal provided by said second output means when said second picture element images an achromatic subject having a given arbitrary luminance to an output signal provided by said first output means when said first picture element images an achromatic subject having said given arbitrary luminance; decision signal generation means for generating decision signal on the basis of a difference signal representing the difference between said output signal provided by said first output means and an output signal of a third picture element which is disposed in said one horizontal row; interpolation signal generation means for generating an interpolation signal from said output signal of said second output means and an output signal of said first

amplification means as a function of the magnitude of said decision signal generated by said decision signal generation means; and first gate means for selecting signals corresponding at least one of said plurality of different color transmission characteristics from said signal provided by said first output means and said interpolation signal

4,716,456
CCD COLOR IMAGE SENSOR WITH A LIGHT SOURCE
HAVING A SPECTRUM DISTRIBUTION
CHARACTERISTIC HAVING PEAKS AT 470 NM AND 590
NM AND HAVING NO WAVELENGTHS ABOVE 700 NM
Yasuo Hosaka, Tokyo, Japan, assignor to Tokai Shikibu
Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 565,158, Oct. 25, 1983, abandoned.

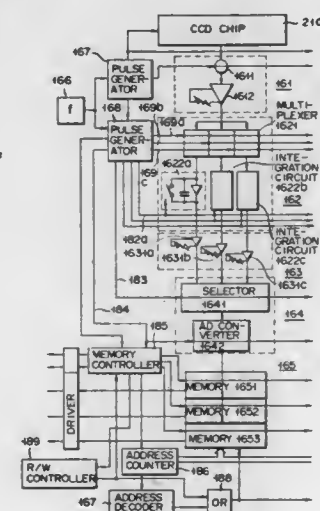
This application Sep. 22, 1986, Ser. No. 910,303

Claims priority, application Japan, Oct. 28, 1982, 57-188159

Int. Cl.⁴ G03F 3/08; H04N 1/028, 1/46

U.S. Cl. 358-75

23 Claims



1. A color image sensor in combination with a light source for sensing the color image of a color document, comprising:
- a light source having a spectrum distribution characteristic with a peak substantially at a wavelength of 470 nm for emitting light rays to illuminate the color document;
 - charge-coupled photosensitive converting means having a plurality of picture elements, each of the picture elements being constituted by three photosensitive sections having substantially the same specific spectrum distribution characteristic, for sensing light rays from the document to generate electric signals; and
 - a plurality of sets of three different color filters, said three different color filters having different specific spectrum distribution characteristics, one set of color filters being provided for each of said plurality of picture elements, the color filters of each set being positioned in the path of light rays directed to corresponding photosensitive sections of a corresponding picture element, said light source and one of said three different color filters providing a composite spectrum distribution characteristic not covering wavelengths above 700 nm.

4,716,457

ELECTRONIC ENDOSCOPIC SYSTEM

Satoshi Matsuo, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

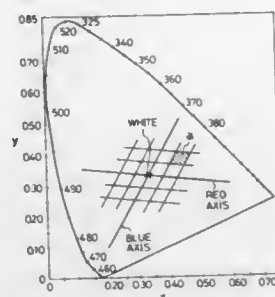
Filed Feb. 24, 1987, Ser. No. 17,602

Claims priority, application Japan, Feb. 27, 1986, 61-42290

Int. Cl.⁴ H04N 7/18, 9/73; A61B 1/04, 1/06

U.S. Cl. 358—98

5 Claims



1. An electronic endoscopic system comprising: an endoscope means having an imaging element assembled to an end thereof;
- a memory means for storing color correction data with respect to a reference color, of respective sections obtained by dividing a chromaticity diagram plotted based on the imaging element; and
- means for selectively addressing the color correction data stored in said memory means.

4,716,458

DRIVER-VEHICLE BEHAVIOR DISPLAY APPARATUS

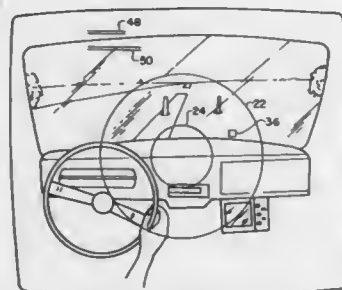
Edward F. Heitzman, and Edward J. Heitzman, both of 6 Moores Mill Rd., Pennington, N.J. 08534

Filed Mar. 6, 1987, Ser. No. 22,754

Int. Cl.⁴ H04N 7/18

U.S. Cl. 358—103

26 Claims



1. Driver-vehicle behavior display apparatus comprising: means for receiving video signals corresponding to a driver's view of a course to be traversed;
- means for generating first video information signals corresponding to a graphical representation of a vehicle's capabilities;
- means for generating second video information signals corresponding to a vector representation of g forces imposed upon a vehicle by a driver; and
- means for combining in real time said received video signals, said first video information signals and said second video information signals to form a real time composite video signal displayable as a g—g diagram superimposed upon said driver's view of said course to be traversed.

4,716,459

FATIGUE CRACK POSITION DETECTION APPARATUS

Eiichi Makabe; Mitsuaki Uesugi; Masaichi Inomata; Kyusuke Maruyama; Kenji Iwai, all of Yokohama, and Kazuo Sano, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP86/00028, § 371 Date Sep. 16, 1986, § 102(c)

Date Sep. 16, 1986, PCT Pub. No. WO86/04410, PCT Pub.

Date Jul. 31, 1986

PCT Filed Jan. 24, 1986, Ser. No. 912,582

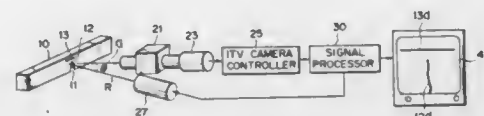
Claims priority, application Japan, Jan. 25, 1985, 60-12098;

Oct. 25, 1985, 60-239025; Oct. 25, 1985, 60-239026

Int. Cl.⁴ H04N 7/18; G01N 19/08

U.S. Cl. 358—106

6 Claims



1. A method of detecting a fatigue crack position on a fatigue test piece on which a reference line is scribed, which comprises: integrating luminance levels in the same direction as that of the reference line from an image signal, obtaining the image signal by scanning said reference line and a crack formed in the fatigue test piece, obtaining a reference line position from a maximum luminance level in the image signal, converting the image signal into a binary signal, detecting a crack distal end position by discriminating a state in which a high-level value of the binary signal is continuously detected, and calculating a distance between the reference line position and the crack distal end position.

4,716,460

DISPLAY REFRESH MEMORY APPARATUS UTILIZING ONE HALF FRAME UPDATING

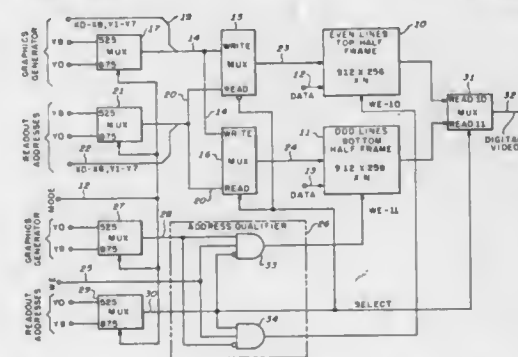
David J. Benson, Pijeras, N. Mex.; Carl H. Brown, Portland, Oreg., and William R. Hancock, Cedar Crest, N. Mex., assignors to Sperry Corporation, Great Neck, N.Y.

Filed Oct. 8, 1986, Ser. No. 916,580

Int. Cl.⁴ H04N 7/01

U.S. Cl. 358—140

8 Claims



1. Refresh memory apparatus for use in a display system having means for generating a raster and means for providing digital signals synchronous with respect to said raster, said apparatus comprising: first memory means for storing a first portion of a frame of image signals, second memory means for storing a second portion of a frame of image signals, said first and second portions comprising an entire frame of image signals, and

switching means responsive to said digital signals for alternately: (A) controlling said first memory means for writing updated image signals into said first memory means with respect to said first portion while controlling said second memory means for reading out said second portion stored therein to said display system and (B) controlling said second memory means for writing updated image signals into said second memory means with respect to said second portion while controlling said first memory means for reading out said second portion stored there in to said display system.

4,716,461

VIDEO SIGNAL BLANKING INTERVAL SIGNAL CONDITIONING CIRCUIT

Werner Hinn, Zollikoberg, assignor to RCA Corporation, Princeton, N.J.

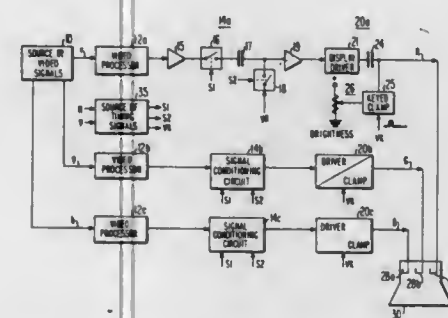
Filed Apr. 29, 1986, Ser. No. 857,047

Claims priority, application United Kingdom, Oct. 1, 1985, 8524200

Int. Cl.⁴ H04N 3/24, 5/18

U.S. Cl. 358—165

10 Claims



1. In a system for processing a wideband video signal including an image interval and a blanking interval, apparatus for conditioning said video signal to exhibit a reference level during said blanking interval, said apparatus comprising: a video signal path having an input and an output;

a capacitor for coupling a video signal from said input to said output of said video path;

first switching means coupled in series with said capacitor in said signal path, said first switching means having a control input for receiving a timing signal for causing said first switching means to (a) exhibit a conductive state during said image interval and during a prescribed reference portion of said blanking interval for enabling said video signal to be conveyed from said input to said output of said video path via said capacitor, and (b) exhibit a nonconductive state during remaining portions of said blanking interval to prevent said video signal from being conveyed to said output of said video path via said capacitor during said remaining portions of said blanking interval; and

second switching means coupled to said capacitor and to a reference potential, said second switching means having a control input for receiving a timing signal for causing said second switching means to (a) exhibit a conductive state for the duration of said blanking interval whereby said reference potential is coupled to said capacitor, and (b) exhibit a nonconductive state at other times.

4,716,462

MOTION ADAPTIVE TELEVISION SIGNAL PROCESSING SYSTEM

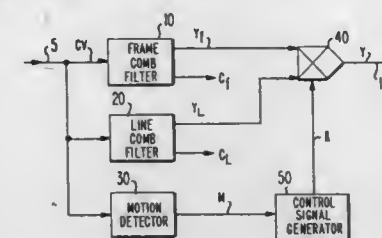
Robert A. Wargo, Ringoes; Leopold A. Harwood, Bridgewater, Dalton H. Pritchard, Princeton, and Michael S. Chartier, Sayerville, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 25, 1986, Ser. No. 934,923

Int. Cl.⁴ H04N 5/21

U.S. Cl. 358—166

18 Claims



1. A television signal processing system, comprising: a source of a television signal; means, coupled to said source, for estimating image changes over at least one image scan time interval; means, coupled to said source, for adaptively processing said television signal in response to a control signal; and means, coupled between said estimator and said adaptive processor, for generating said control signal exhibiting a function substantially described by:

$$K = Ae^{-b/x}$$

where K is the value of said control signal, A is the maximum value said control signal can attain, x is said estimated change, and b is a constant.

4,716,463

POWER DOWN SENSE CIRCUIT

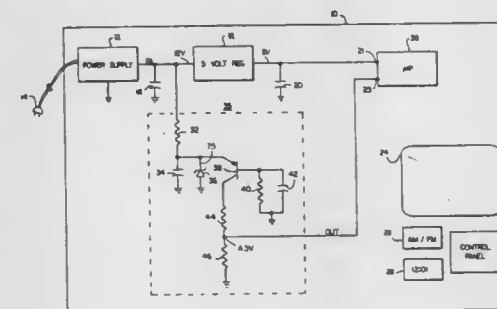
Carl W. Stacy, Elmwood Park, and William Chamberlain, Lombard, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 24, 1986, Ser. No. 922,640

Int. Cl.⁴ H04N 5/63

U.S. Cl. 358—190

6 Claims



1. A television receiver including a microprocessor having memory and timekeeping functions, said microprocessor having a sleep mode activated by a trigger voltage applied to a sleep terminal for operating said microprocessor with minimal power consumption to maintain said memory and timekeeping functions during a power failure comprising: a power supply including a voltage regulator; a filter capacitor coupled to the output of said voltage regulator and supplying a power input for said microprocessor; and sense means coupled between the input of said regulator and

the sleep terminal of said microprocessor for developing said trigger voltage for said microprocessor in the event said input voltage to the regulator falls below a predetermined level.

4,716,464

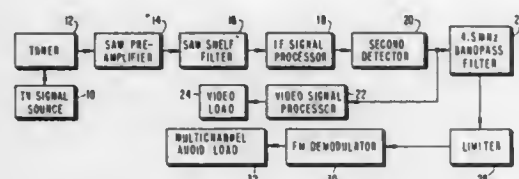
SINGLE CHANNEL IF FOR VIDEO AND AUDIO
Robert P. Parker, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1986, Ser. No. 858,457

Int. Cl.⁴ H04N 5/62, 5/44, 7/04

U.S. Cl. 358—197

17 Claims



1. A television receiver for a TV signal comprising picture and sound carrier signals, including radio frequency (RF) tuner means having a first nonzero amplitude versus frequency response over a predetermined frequency range intermediate upper and lower adjoining frequency ranges, and an intermediate frequency (IF) section coupled thereto for processing said signals, said RF tuner and IF section having an overall transmission characteristic exhibiting a Nyquist attenuation slope over said upper and lower frequency ranges respectively adjoining said predetermined frequency range intermediate said upper and lower frequency ranges, wherein to compensate for said first response said IF section exhibits a second nonzero amplitude versus frequency response, different from said first response, over said predetermined frequency range such that said overall transmission characteristic exhibits substantially no variation of attenuation with frequency in said predetermined frequency range.

4,716,465

DEVICE FOR WIRELESS VIDEO MONITORING AND CONTROL OF A STILL CAMERA

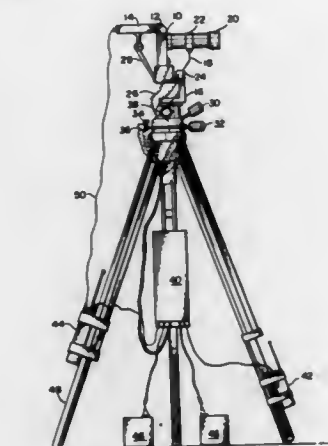
Peter Meyer, 1213 Talley Rd., Wilmington, Del. 19809

Filed Aug. 20, 1986, Ser. No. 898,367

Int. Cl.⁴ H04N 5/232

U.S. Cl. 358—210

13 Claims



1. A method for video monitoring and control of a still camera comprising the steps of:

(a) mounting a still camera, that has a viewfinder and a lens, a shutter means and is on a support means that permits vertical and horizontal movement;

- (b) connecting the lens of said still camera to a servo motor device;
- (c) connecting servo motors to the support means that permits vertical and horizontal movement and to the lens;
- (d) connecting a control means to said servo motors;
- (e) further connecting said control means to a receiver means for receiving transmitted control signals;
- (f) mounting a television camera to the viewfinder of said camera;
- (g) connecting said television camera to a transmitting device for transmitting an electronic signal to a video receiving device;
- (h) transmitting control signals to said receiver means by means of a remotely located short wave transmitting device at the same time that the person transmitting the signals is able to view the image seen on the video receiving device;
- (i) using a power generating means for supplying power to the control means;
- (j) connecting said television transmitter and receiving means to said control means; and
- (k) controlling the shutter means electronically and by remote control.

4,716,466

IMAGE SENSOR

Takashi Miida, Tokyo; Akira Takei, Yokohama, and Kiyoshi Tashiro, Chiba, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

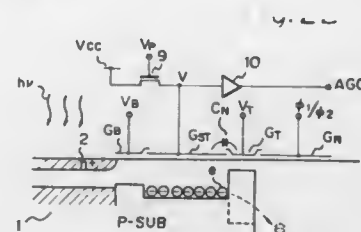
Filed May 28, 1985, Ser. No. 738,331

Claims priority, application Japan, May 31, 1984, 59-111221

Int. Cl.⁴ H04N 3/14; H01L 29/78

U.S. Cl. 358—213.26

13 Claims



1. An image sensor comprising:
- charge storage means having MIS capacitors for storing charges corresponding to the amount of light received, each of said MIS capacitors having an electrode;
 - charge transfer means having a plurality of stages for storing charges transferred from said charge storage means, said charges stored in said stages being transferred sequentially;
 - transfer gate means for transferring charges from said charge storage means to said stages of said charge transfer means in response to a timing control signal;
 - changing means for changing an electric potential of said electrode of each of said MIS capacitors in accordance with the amount of said charge stored in said MIS capacitors; and
 - detecting means for detecting said electric potential of said electrode and for outputting the detected electric potential for generating said timing control signal.

4,716,467

SPEED-UP METHOD AND APPARATUS FOR TWO-DIMENSIONAL FACSIMILE CODING AND DECODING

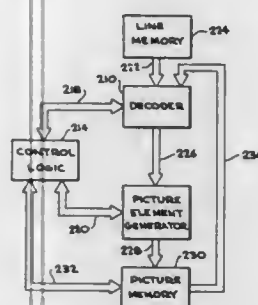
Vinod Menon, Sunnyvale, and Shinkyu Kaku, Los Gatos, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 27, 1985, Ser. No. 706,201

Int. Cl.⁴ H04N 1/41

U.S. Cl. 358—260

10 Claims



1. In a facsimile system for digitized picture elements of units of alternating color employing a method for encoding/decoding a scan line of said digitized picture elements with respect to a reference line of said digitized picture elements, a method for improving said encoding/decoding speed comprising the steps of:

- (a) detecting a uni-color scan line during said encoding/decoding of said scan line and recording the color of said picture elements in said uni-color scan line; and
- (b) encoding or decoding a line next-following said uni-color line detected in step (a) with respect to a reference line comprising a uni-color line having all its digitized picture elements of said color recorded in step (a), and without reference to said uni-color line detected in step (a).

4,716,468

APPARATUS FOR CONTROLLING THE ELECTRON BEAM IN A TELEVISION CAMERA TUBE

Masanori Maruyama, Kokubunji; Kenji Takahashi, Kanagawa; Koji Kudo, Hachioji; Masanori Hombach, Mitaka, and Shusaku Nagahara, Hachioji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

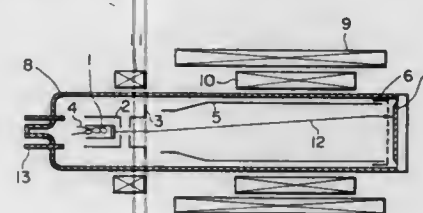
Filed Apr. 23, 1986, Ser. No. 854,865

Claims priority, application Japan, Apr. 24, 1985, 60-86400

Int. Cl.⁴ H04N 5/235

U.S. Cl. 358—219

8 Claims



1. A television camera tube device comprising:
- a target disposed adjacent to one end of a camera tube to produce a charge pattern corresponding to the luminous intensity of an object;
 - an electron gun disposed adjacent to the other end of the camera tube to generate an electron beam for scanning said target, said electron gun including a cathode emitting electrons, a first grid disposed between said cathode and said target to be applied with a first predetermined voltage and having a first aperture, and a second grid disposed

between said first grid and said target to be applied with a second predetermined voltage and having a second aperture smaller than said first aperture; and means for controlling the voltages applied to said first and second grids for providing the electron beam quantity corresponding to the luminous intensity of the object forming the charge pattern on said target; wherein the voltages applied to said first and second grids are both positive relative to said cathode, and said voltage control means decreases the voltage applied to said first grid and increases the voltage applied to said second grid, so that a drive curve changes substantially rectilinearly relative to an increase in the luminous intensity of said object.

4,716,469

CIRCUIT FOR EYESIGHT PROTECTION IN A TELEVISION SET

Eul D. Kim, and Hyun J. Choi, both of Kumi, Rep. of Korea, assignors to Gold Star Co., Ltd., Seoul, Rep. of Korea

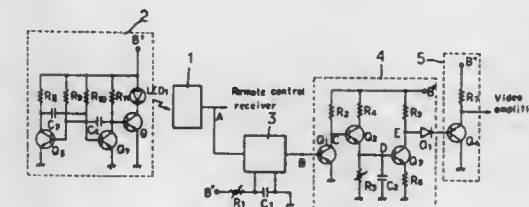
Filed May 29, 1986, Ser. No. 868,246

Claims priority, application Rep. of Korea, Oct. 25, 1985, 14051/1985

Int. Cl.⁴ H04N 5/65

U.S. Cl. 358—245

5 Claims



1. An eyesight protection circuit for a television set having a remote control infrared signal receiving-amplifying portion 1, characterized by an infrared transmitter 2 installed in a front side of said television set so that the infrared pulse signals emitted from said infrared transmitter 2 are received on said remote control receiving-amplifying portion 1 after reflecting upon a viewer within a predetermined distance of the screen of said television set, said remote control receiving-amplifying portion 1 having an output interconnected to the input of a monostable multivibrator 3 to apply there to output signals from said remote control receiving-amplifying portion 1 in response to the signals reflected from the viewer, a delay circuit portion 4 having an input adapted to interconnected to the output of said monostable multivibrator 3 outputting higher level signals when higher level signals are applied on the input thereof over a predetermined time and otherwise outputting lower level signals, and a video amplifier driving circuit portion 5 for controlling the "ON" and "OFF" of a video amplifier in response to said lower and higher level signals respectively, having an input interconnected to the output of said delay circuit portion and an output adapted to be connected to a said video amplifier associated with said television set.

4,716,470

METHOD FOR PREVIEWING UNDEVELOPED FILM
Alfred B. Levine, 2924 Terrence Dr., Chevy Chase, Md. 20815

Division of Ser. No. 834,923, Feb. 28, 1986, which is a continuation-in-part of Ser. No. 617,344, Jun. 4, 1984, Pat. No. 4,588,282. This application Feb. 25, 1987, Ser. No. 18,577

Int. Cl.⁴ H04M 1/00

U.S. Cl. 358—256

20 Claims

1. A method of previewing exposed but undeveloped still image frames in a photographic film prior to development of the film, comprising the steps of:

- obtaining and recording a series of corresponding electronic

- heads mounted on a rotary body of said tape guide drum at the same height but 180 degrees apart from each other relative to the rotational direction of said rotary body so as to form a plurality of skewed tracks on said tape;
- (b) tape drive means for running said tape in both forward and reverse directions on command;
- (c) first erase head means secured on said rotary body at a position lower than said recording transducer means for erasing a pair of said skewed tracks simultaneously when said tape is driven in the forward direction by said tape drive means; and
- (d) second erase head means secured on said rotary body at a position higher than said recording transducer means for erasing a pair of said skewed tracks simultaneously when said tape is driven in the reverse direction of said rotary body.

4,716,477

MECHANISM FOR AUTOMATICALLY LOADING A CASSETTE IN RECORDING AND/OR REPRODUCING APPARATUS INCLUDING PINCHING MEANS FOR APPLYING VARYING PINCHING ACTION

Tsukasa Uehara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

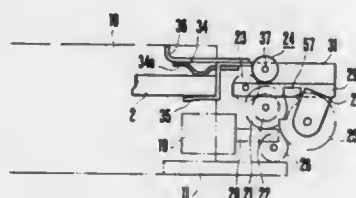
Filed Nov. 13, 1984, Ser. No. 670,749

Claims priority, application Japan, Nov. 15, 1983, 58-213238; Nov. 15, 1983, 58-213239; Nov. 15, 1983, 58-213240; Nov. 15, 1983, 58-213241; Nov. 15, 1983, 58-213242

Int. Cl.⁴ G11B 17/04, 15/68

U.S. Cl. 360-97

8 Claims



1. In an apparatus using a record bearing medium container, a record bearing medium container loading device comprising: container holding means having an elastic member and a container receiving member, said holding means pinching said container elastically between the elastic member and the container receiving member; control means for controlling the pinch force of said elastic member of said holding means against the container pinched thereby; and driving means for automatically carrying said container holding means into the apparatus in a predetermined inserting direction; wherein the control means increases said pinching force of said elastic member against the container pinched between said elastic member and said container receiving member as said driving means moves the container holding means into the apparatus.

4,716,478

TWO POINT ATTACHMENT WITH SINGLE POINT CLAMPING FOR CONNECTING THE ARM STACK TO THE ACTUATOR MEMBER IN A DISC MEMORY DRIVE

Edward Walsh, and David W. Wolto, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 14, 1986, Ser. No. 829,688

Int. Cl.⁴ G11B 21/08, 21/24, 21/16

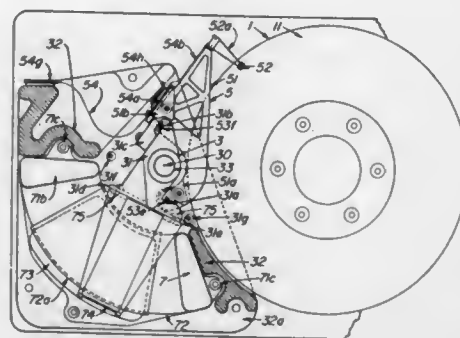
U.S. Cl. 360-104

13 Claims

1. In a disc drive assembly having rotatable memory discs and transducer heads for deriving information from said discs,

means for supporting and moving said transducer heads over said discs, comprising:

- a. an actuator structure having a pivotally mounted actuator member, said transducer member having two spaced attachment supports;
- b. an armstack unit comprising individual arms mounting at least one transducer head thereon at one end and having center-to-center arm spacings corresponding to the center-to-center axial spacings of said discs;
- c. two attachment members on said armstack unit adjacent the end thereof opposite said transducer heads and space to engage said attachment supports on said actuator member;



- d. one of said attachment supports comprising a notch and the other of said attachment supports having a face portion disposed at an acute angle to a line from said notch which intersects said face portion, one of said attachment members engaging said notch and the other of said attachment members engaging said face portion; and
- e. means engaging and applying a force to said other of said attachment members acting in a direction substantially paralleling said face portion to securely engage said one attachment member in said notch and to securely engage said other of attachment members with said face portion.

4,716,479

MAGNETIC DISK HEAD OPENING MECHANISM WITH AN EXPANDED OPENING RANGE

Yuzo Sakamoto, and Kazuo Koike, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 674,324, Nov. 23, 1984, abandoned.

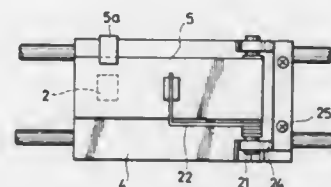
This application Mar. 19, 1987, Ser. No. 28,059

Claims priority, application Japan, Nov. 24, 1983, 58-221141

Int. Cl.⁴ G11B 21/22

U.S. Cl. 360-105

9 Claims



1. A magnetic disk head opening apparatus, for a flexible magnetic disk having magnetic recording layers on both sides, allowing opening to a vertical position from a normal horizontal position, said apparatus comprising:

- a carriage;
- a first magnetic head provided on said carriage;
- an arm;
- a second magnetic head provided on said arm which is

- rotatable with respect to said carriage, said first and second magnetic heads arranged to confront each other through the flexible disk; and
- a rotation mechanism comprising:
- a supporting member having a pair of V-shaped grooves arranged spaced apart from each other in a line forming a rotation space;
 - a pair of rotation fulcrum pins arranged in correspondence to said pair of V-shaped grooves, rotatably supported by said pair of V-shaped grooves and coupled to said arm, the rotation space allowing said arm to rotate from the normal horizontal position to substantially the vertical position exposing the second magnetic head for examination without decoupling said arm from said carriage;
 - a closure spring coupled between said arm and said carriage, and urging said arm to rotate about said fulcrum pins; and
 - a pair of elastic urging members which urge said rotation fulcrum pins into contact with said V-shaped grooves at all times.

4,716,480

CARRIAGE LATCH FOR A DISC DRIVE

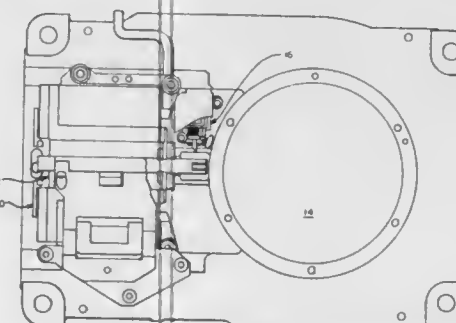
John P. Wiens, Santa Clara, and Clifford T. Jue, Santa Cruz, both of Calif., assignors to Seagate Technology, Scotts Valley, Calif.

Filed Aug. 29, 1986, Ser. No. 901,678

Int. Cl.⁴ G11B 5/55, 21/08

U.S. Cl. 360-105

9 Claims



1. In an actuator having a frame and a transducer carriage for positioning a transducer with respect to a recording media, a dynamic lock mechanism for holding said carriage in a fixed position relative to said frame comprising

- a plunger guided by a solenoid and a further frame for movement between a first position wherein said plunger engages an extension on said carriage to lock said carriage in said fixed position and a second position wherein said plunger is withdrawn from said carriage to allow said carriage to position said transducer with respect to a recording media,
- spring means surrounding said plunger for normally biasing said plunger into said first position,
- said solenoid being responsive to a signal to withdraw said plunger from said first position to said second position, and shock absorbing means comprising a counterweight pivotally linked to said plunger for absorbing a shock applied to said frame and preventing movement of said plunger away from said first position in the absence of actuation of said solenoid.

4,716,481

RECORDING AND/OR REPRODUCING APPARATUS HAVING AN IMPOSED HEAD SHIFTING FEATURE

Nobuo Tezuka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 495,424, May 17, 1983, abandoned.

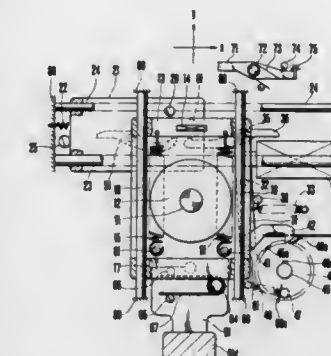
This application Aug. 21, 1986, Ser. No. 899,750

Claims priority, application Japan, May 26, 1982, 57-89099; May 26, 1982, 57-89100; Jun. 2, 1982, 57-94365

Int. Cl.⁴ G11B 5/54, 5/58, 5/82

U.S. Cl. 360-106

10 Claims



1. A recording and/or reproducing apparatus comprising: (A) a head for signal recording and/or reproducing against a recording medium in a predetermined loaded position; (B) a movable carriage member for carrying said head along a surface of said medium between a first and a second position; (C) a spring member for urging said carriage member in a direction from said first to said second position along said surface of said medium; (D) control means including a cam member for controlling the movement of said carriage member in said direction by an urging force of said spring member; (E) reset means for shifting said carriage member to said first position and for charging said spring member; and (F) eject means responsive to said shifting operation of said reset means for ejecting said medium from said loaded position.

4,716,482

HEAD ACTUATOR LIMIT STOP ASSEMBLY FOR A DISK MEMORY DRIVE

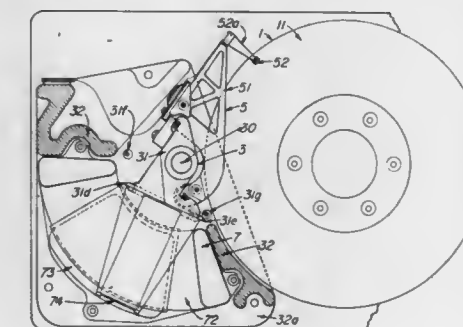
Edward Walsh, Boise, Iowa, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 14, 1986, Ser. No. 829,686

Int. Cl.⁴ G11B 21/08

U.S. Cl. 360-106

6 Claims



1. In a disc memory drive having a housing, a rotatable memory disc, a transducer head for deriving information from said memory disc, and a movably mounted actuator structure

for supporting and bidirectionally moving said transducer head between radial limits in a transducer head path adjacent the surface of said memory disc, the improvement comprising:

- a pair of impact members on said movably mounted actuator structure, each impact member moving with said actuator in a predetermined impact member path;
- a pair of rod shaped limit stops, one for each impact member;
- axially spaced bearings on each rod shaped limit stop;
- journals in said housing journaling said bearings and supporting each rod shaped limit stop in a respective impact member path to be engaged by the respective one of said pair of impact members at a location on each rod shaped limit stop intermediate said axially spaced bearings; and
- a radially eccentric portion on each rod shaped limit stop at said location so that rotation of said rod shaped limit stop adjusts the limit of movement of the associated impact member in said predetermined impact member path for controlling the radial limits of movement of said transducer head in said transducer head path.

4,716,483

THREE PIECE HEAD ACTUATOR ARM ASSEMBLY FOR DISC DRIVE

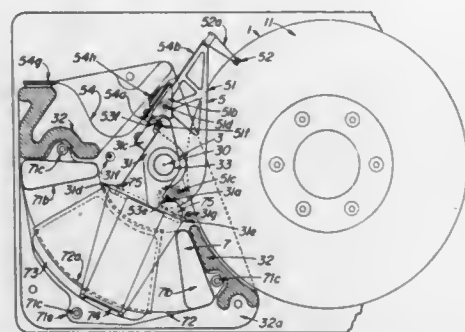
Edward Walsh, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 14, 1986, Ser. No. 829,687

Int. Cl.⁴ G11B 21/08, 21/16

U.S. Cl. 360—106

4 Claims



1. In a disc drive assembly having a rotatable memory disc and a transducer head for deriving information from said memory disc, means for supporting and moving said transducer head over said memory disc comprising:

- an actuator structure having side sections and upper and lower section providing a front and a rear opening;
- an actuator member having front and rear sections;
- bearing means in said upper and lower sections of said actuator structure mounting said actuator member for angular movement and positioning said front and rear sections of said actuator member in locations accessible at said front opening of said actuator structure;
- a unitized transducer head support structure;
- fastening means detachably mounting said support structure on said front section of said actuator member in a position projecting from said front opening of said actuator structure, said fastening means being accessible and actuatable at the front of said actuator structure without removing said actuator member from said support structure;
- a magnetic driver having a housing and a movable member;
- means detachable securing said housing to said actuator structure with said movable member adjacent said rear face of said actuator member; and
- fastening means accessible and actuatable at said front opening, for detachably securing said movable member to said actuator member at said rear face.

4,716,484

MAGNETIC HEAD COMPRISING A CORE FORMED OF SMALL AND LARGE THIN FILM PATTERNS

Nobuyuki Kaminaka, Neyagawa, and Yasuo Yoshida, Kumamoto, both of Japan, assignors to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

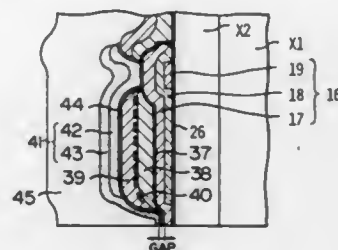
Filed Jun. 12, 1984, Ser. No. 619,917

Claims priority, application Japan, Jun. 13, 1983, 58-105200

Int. Cl.⁴ G11B 5/127, 5/147

U.S. Cl. 360—125

1 Claim



1. A thin film magnetic head comprising a substrate;

a first magnetic core including

a first magnetic film deposited on said substrate;

a second magnetic film deposited over said first magnetic film and said substrate, said second magnetic film having a larger surface area than said first magnetic film; and

a third magnetic film deposited over and completely covering said second magnetic film, said third magnetic film having a larger surface area than said second magnetic film;

a second magnetic core comprising at least two magnetic films deposited on said first magnetic core; and
a coil interposed between said first and second magnetic cores, said first and second magnetic cores being separated by a magnetic gap layer thereby defining a magnetic transducer gap.

4,716,485

CARTRIDGE-SHAPED CLEANING DEVICE WITH A ROTABLE CLEANING ASSEMBLY

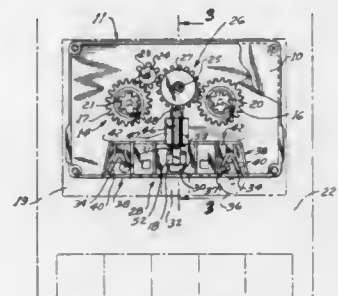
Choi K. Yeung, Woodland Heights, Hong Kong, assignor to Recoton Corporation, Long Island City, N.Y.

Filed Mar. 29, 1985, Ser. No. 717,450

Int. Cl.⁴ G11B 5/41

U.S. Cl. 360—128

8 Claims



1. A cartridge-shaped cleaning device adapted to clean a head and tape drive assembly of a cassette player and/or recorder unit of the type having a head provided with a face having a portion that lies in a plane, a recess capable of receiving a tape cassette, and tape transport means including a pair of spaced spindles to drive the tape of said cassette and a pinch roller and capstan, said device comprising a cassette housing configured to fit within the recess; a drive system having first

and second hub gears rotatably mounted in said housing and adapted to engage respective spindles of the player/recorder unit when the device is within said recess; transmission means operatively engaging said first and second hub gears for transferring a driving force from one hub gear to the other; a head cleaning assembly mounted in said housing having a cleaning element positionable against the head of the player/recorder unit when the device is within said recess; and rotary drive means driven by said tape transport means and coupled to the head cleaning assembly and adapted to impart rotary movement to the cleaning element about an axis substantially perpendicular to the plane of the face of the head of the player/recorder unit such that said cleaning element remains in contact with the face of said head substantially throughout the rotary movement of said cleaning element.

4,716,486

ELECTRIC MOTOR COMPRISING A THERMISTOR-TYPE OVERCURRENT PROTECTION DEVICE

Janusz Soblepanek, Gif/Yvette, and Simon Aboukrat, Garges Lès Gonesse, both of France, assignors to Etudes Techniques et Représentations Industrielles E.T.R.I., Neuilly-sur-Seine, France

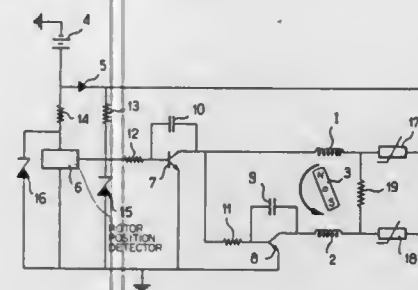
Filed Mar. 3, 1986, Ser. No. 835,303

Claims priority, application France, Mar. 15, 1985, 85 03858

Int. Cl.⁴ H02H 5/04, 7/08

U.S. Cl. 361—24

3 Claims



1. An electronically switched direct-current motor comprising at least two motor windings (1, 2), and a device used in protection against overcurrent in the motor windings (1, 2) and in aid of motor restart after a stoppage of the motor, wherein said device comprises at least two positive temperature coefficient thermistors (17, 18), one (17) of said thermistors being series-connected with a first motor winding (1) whilst the other thermistor (18) is series-connected with a second winding (2), each thermistor being thermally independent from the other, wherein said first winding and said one of said thermistors, and said second winding and said other thermistor, when energized, have electrically parallel current paths between a source of direct current and the ground.

4,716,487

APPARATUS FOR MONITORING MOTOR WINDING LEAKAGE

Joseph G. Horvath, Astatula, and James C. Miller, Tavares, both of Fla., assignors to Automeg, Inc., Astatula, Fla.

Filed May 5, 1986, Ser. No. 859,365

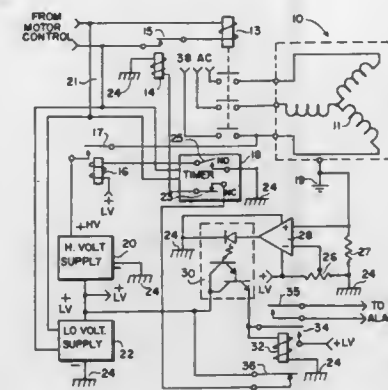
Int. Cl.⁴ H02H 3/16

U.S. Cl. 361—42

7 Claims

1. In an electric motor having an electrical winding, controlled by a contactor and having a source of control voltage for operating said contactor, a system for automatically monitoring the insulation leakage resistance of said electric motor winding prior to each operation of said motor comprising: power supply means for supplying a source of high-voltage direct current and having a system ground; timing means connected to said power supply means and to said source of control voltage, said timing means being

responsive to said control voltage to connect said high voltage to the electrical winding for a short period of time and to thereafter apply said control voltage to said contactor; a sense resistor connected from a frame of said motor to said system ground; and



comparator means connected across said sense resistor for producing an indication when a voltage across said resistor due to flow of leakage current exceeds a preselected value.

4,716,488

PRIMARY SWITCHED-MODE POWER SUPPLY UNIT

Bernd Segger, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

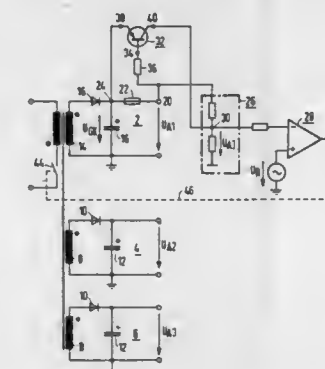
Filed Apr. 23, 1986, Ser. No. 855,535

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518621

Int. Cl.⁴ H02H 9/04

U.S. Cl. 361—88

4 Claims



1. A primary switched-mode power supply unit with a plurality of electrically isolated secondary circuits, each of said secondary circuits having a secondary winding connected to a respective series circuit of a rectifier and a filter capacitor, one of said series circuits having a fuse connected between the connection point of said rectifier and said filter capacitor and an output of the respective-secondary circuit, said output is connected to an actual-value sensor, and said actual-value sensor is connected to a controller, comprising: a switch connected from the connection point of the filter capacitor and the fuse to an output terminal of the actual-value sensor.

4,716,489

BREAKDOWN PROTECTED PLANAR TRANSISTOR DEVICE

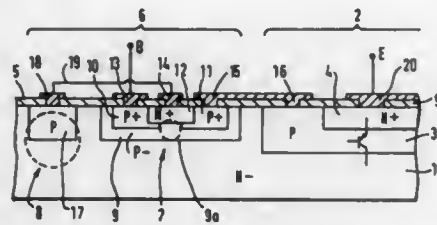
Kaoru Imamura, and Kenichi Muramoto, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1985, Ser. No. 813,841

Claims priority, application Japan, Dec. 28, 1984, 59-279937
Int. Cl.⁴ H02H 3/20

U.S. Cl. 361-91

9 Claims



1. A transistor device which will not break down in the event of an accident such as load short circuiting but will continue to operate, said transistor device comprising:

- a bipolar transistor; and
- protection means for protecting said bipolar transistor from being damaged due to the accidental application of a high voltage to the collector of said transistor wherein said protection means consists essentially of a single junction type field effect transistor which is responsive to said high voltage to reduce the base current of said transistor without eliminating said base current thereby maintaining the operation of said transistor while protecting said transistor from breaking down.

4,716,490

POWER SAVING MODULE

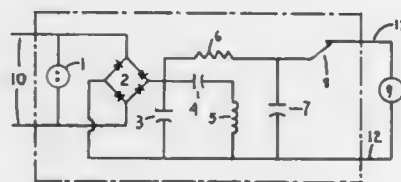
George Alexanian, 6138 N. Brooks Cir., Fresno, Calif. 93711

Filed Apr. 3, 1987, Ser. No. 33,622

Int. Cl.⁴ H01H 47/04, 47/22

U.S. Cl. 361-155

5 Claims



1. A device for energizing a solenoid comprising:

- a DC power source means,
- normally closed switch means and means for connecting said switch means in series with a solenoid,
- a first capacitor connected in parallel with said switch means and said solenoid when said solenoid is connected to said switch means,
- resistance means connected to a terminal of said DC power source means and to a junction of said first capacitor and said switch means,
- time delay means comprising a second capacitor connected in series with a relay coil across said DC power source means, said relay coil controlling said switch means,
- wherein, upon application of power from said DC power source means, current flows through said second capacitor and said relay coil and thereby opens said switch means and current flows through said resistance means to charge said first capacitor, and
- whereby upon charging of said second capacitor, and relay becomes de-energized and said switch means closes to permit, when said solenoid is connected to said switch means, an initial high current to flow from said first capacitor through said solenoid and thereafter permit a low-level holding current to flow from said DC power source means to said solenoid through said resistance means.

itor through said solenoid and thereafter permit a low-level holding current to flow from said DC power source means to said solenoid through said resistance means.

4,716,491

HIGH FREQUENCY PLASMA GENERATION APPARATUS

Yasunori Ohno; Tomoe Kurosawa, both of Hitachi; Tadashi Sato, Mito, and Youichi Ohshita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

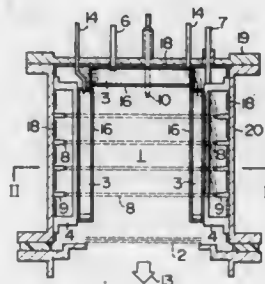
Filed Dec. 9, 1985, Ser. No. 806,341

Claims priority, application Japan, Dec. 11, 1984, 59-259884

Int. Cl.⁴ H05H 1/16

U.S. Cl. 361-230

6 Claims



1. A high frequency plasma generation apparatus comprising:

- cylindrical wall means;
- means for hermetically sealing two ends of said cylindrical wall means, so as to form a high frequency plasma production chamber within said cylindrical wall means;
- means for introducing a gas into said high frequency plasma production chamber;
- a high frequency coil, disposed in said high frequency plasma production chamber in the neighborhood of said cylindrical wall means, for providing high frequency electric power to said gas so as to produce a plasma; and
- magnetic field generation means for generating a multi-cusp magnetic field for producing a plasma confinement domain inside of said high frequency coil, wherein said plasma is confined within said plasma confinement domain so as to prevent contact between said plasma and said high frequency coil.

4,716,492

PRESSURE SENSOR WITH IMPROVED CAPACITIVE PRESSURE TRANSDUCER

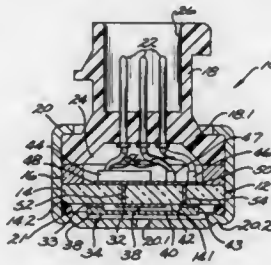
Thomas J. Charboneau, Plainville, and Keith W. Kawate, Attleboro Falls, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 5, 1986, Ser. No. 859,566

Int. Cl.⁴ H01G 7/00; G01L 9/12

U.S. Cl. 361-283

24 Claims



1. A transducer comprising a substantially flat ceramic substrate having a flat surface on one side and having an opposite side, a first electrically conductive capacitor plate mounted on

a central part of the flat surface on said one side of the flat, ceramic substrate, movable means mounted on said substrate surface at a location spaced to leave a peripheral portion of the flat ceramic substrate free to be engaged from each of two opposite sides of the flat ceramic substrate and having an electrically conductive surface portion of the movable means forming a second capacitor plate disposed over the first capacitor plate in selected spaced relation to the first capacitor plate to form a capacitor, and means for electrically connecting the first and second capacitor plates in an electrical circuit, the movable means being selectively movable relative to the first capacitor plate for varying the capacitance of the capacitor in accordance with a selected change in condition being monitored while leaving the peripheral portion of said substrate accessible to be gripped at said two opposite sides of said peripheral portion of the flat ceramic substrate for mounting the transducer while leaving the movable means substantially free of stresses associated with such mounting.

4,716,493

ELECTRONIC INSTRUMENT HOUSING

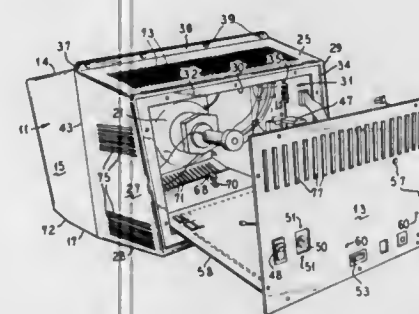
Philip Zelkowitz, 6518 N. Kilpatrick, Lincolnwood, Ill. 60646

Filed May 21, 1985, Ser. No. 736,236

Int. Cl.⁴ H05K 7/20

U.S. Cl. 361-383

10 Claims



1. A computer monitor console housing:

- a cast aluminum casing having top, side and bottom walls defining a chamber receiving console apparatus and having a front end and a back end;
- means mounting the console apparatus within said chamber;
- said front end having an opening mounting a console apparatus CRT on said casing front end in a visibly exposed relation to said opening;
- said back end having an access port through which said console apparatus within said chamber is accessible;
- a replaceably removable closure for said access port;
- means replaceably securing said closure in radiation leak-proof joinder to said back end in closing relation to said access port;
- said closure having means thereon supporting some console apparatus to be inserted and removed from said chamber on said closure serving as a carrier;
- and said casing comprising a pair of shells, means securing said shells together, one of said shells having said front end opening, and the other of said shells having said back end access port, said other shell having a seat about said port receiving said closure.

4,716,494

RETENTION SYSTEM FOR REMOVABLE HEAT SINK
Edward J. Bright, Elizabethtown, and David B. Sinisi, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 7, 1986, Ser. No. 928,239

Int. Cl.⁴ H05K 7/20

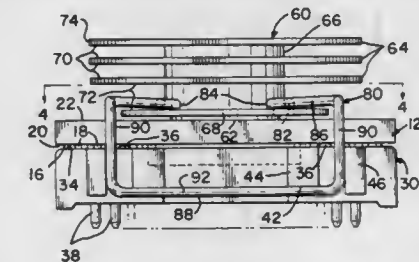
U.S. Cl. 361-386

14 Claims

1. A retention system for securing a heat sink to an active device-containing means including a thermally conductive

substrate having a substantially planar top surface and opposing side edges and further including a housing means having sidewalls, said system comprising:

- a heat sink including a substrate-proximate surface engageable with the substrate upon assembly to said active device containing means to form a thermal connection, and further including a central shaft extending upwardly from said substrate-proximate surface and a retention fin extending radially outwardly from said central shaft proximate said substrate-proximate surface;
- an integral formed wire spring clip having opposing horizontal inner sections arcuately shaped to conform to said central shaft and spaced apart to engage and hold said central shaft therebetween when said heat sink is inserted therebetween with said retention fin thereunder, said arcuate inner sections each having a reverse bend at each end thereof which bends are in opposed pairs from which intermediate sections extend outwardly in related pairs and are angled slightly upwardly, and outer sections joining outer ends of each said pair of intermediate sections and each having portions depending from said outer ends



joined by a horizontal latch member integral with said depending portions and disposed a selected distance lower than said arcuate inner sections, each said outer section cooperating with a respective opposing side wall of the housing means of the active device-containing means, said outer sections being spaced apart to be received along the opposing substrate side edges and the opposing side walls of the housing means; and

- latching projections disposed on the respective opposing side walls of the housing means having downwardly facing latch surfaces latchingly engageable by respective said horizontal latch members upon assembly of said spring clip to the housing means, said latch surfaces located at a selected distance lower than the top surface of the substrate engageable by said heat sink, such that upon assembly when said heat sink engages the top substrate surface, said intermediate sections are resiliently deflected downwardly for said horizontal latch members to latch under said latch surfaces, thus generating downward spring force on said heat sink retention fin and creating an assured thermal connection between the top substrate surface and said substrate-proximate surface of said heat sink.

4,716,495

PRINTER CIRCUIT BOARD CHASSIS WITH POWER INTERLOCK

Robert Craker, Painesville, Ohio, assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 22, 1986, Ser. No. 909,710

Int. Cl.⁴ H05K 7/14

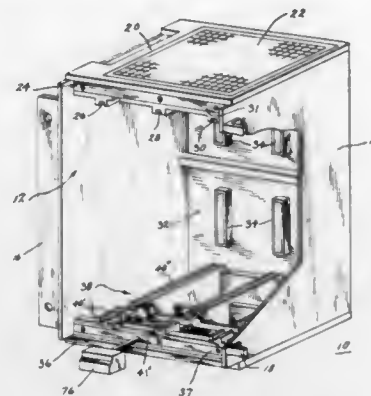
U.S. Cl. 361-391

9 Claims

1. A chassis having a plurality of locations for printed circuit boards, each location having at least one track for receiving an edge of a printed circuit board, said chassis including electrical connectors providing electrical interconnection of printed circuit boards inserted in said locations, the improvement comprising:

- a printed circuit board retaining means for releasably hold-

ing a printed circuit board in each location, said retaining means having a held state and a released state; a power supply including a printed circuit board inserted in one of said locations and coupled to one of the electrical connectors to supply electrical power to other electrical connectors of said chassis, and further including an electri-



cal switch mounted on the printed circuit board, said switch having first and second states; and means coupled to said retaining means for placing the switch in the first state when said retaining means is in the released state and for placing the switch in the second state when the retaining means is in the held state.

4,716,496

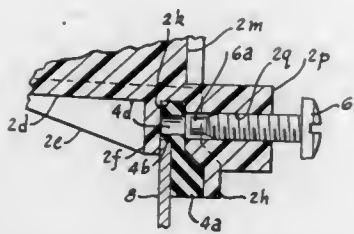
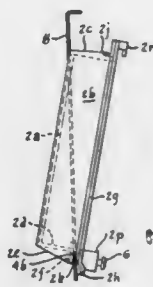
PANEL-MOUNTED CONTROL STATION HOUSING
Ronald J. Fritsch, Sussex, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 9, 1986, Ser. No. 861,168

Int. Cl.⁴ H05K 7/00

U.S. Cl. 361-391

14 Claims



1. In a control station housing adapted for having electrical control apparatus mounted thereto comprising:
a substantially vertically oriented panel having an opening therein;
said housing having upper and lower transverse grooves open outwardly of said housing for receiving respective upper and lower edges of said panel opening, a vertical dimension between an outer edge of said upper groove and a corresponding edge of said lower groove being

greater than a vertical dimension of said opening and a vertical dimension between bottoms of said respective grooves being less than said vertical dimension of said opening, said housing being insertable into said opening to engage said lower groove over said lower edge permitting rotation of an upper surface of said housing through said opening to align said upper groove with said upper edge; resilient means in said lower groove biasing said housing upwardly to effect engagement of said upper groove with said upper edge; and means carried by said housing extendable into said lower groove within said panel opening preventing downward movement of said housing within said opening sufficient to permit disengagement between said upper groove and said upper edge.

4,716,497

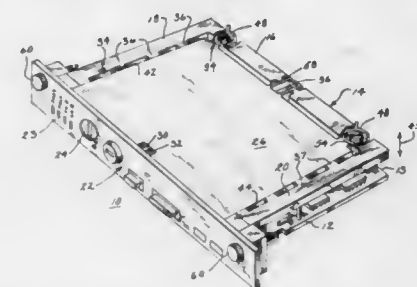
PRINTED CIRCUIT BOARD MODULE
Robert Craker, Painesville, Ohio, assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 22, 1986, Ser. No. 909,714

Int. Cl.⁴ H05K 1/14

U.S. Cl. 361-395

16 Claims



1. A printed circuit board module comprising:
a first printed circuit board;
a frame substantially parallel to and spaced from said first printed circuit board, said frame having two opposed legs extending from a connecting member forming a central opening therebetween, each of said legs having an interior edge facing the other leg;
a frame insert removably held within the central opening of said frame; and
a second printed circuit board attached to said frame insert.

4,716,498

RACK MOUNTED CIRCUIT MODULE
Stafford M. Ellis, East Preston, England, assignor to GEC Avionics Limited, England

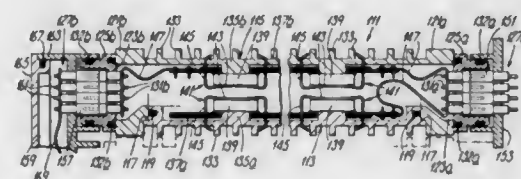
Filed Nov. 12, 1985, Ser. No. 797,245

Claims priority, application United Kingdom, Nov. 23, 1984, 8429685; Mar. 29, 1985, 8508278

Int. Cl.⁴ H05K 7/20

U.S. Cl. 361-386

12 Claims



1. A heat-dissipating electric circuit module, comprising:
(a) rectangular box including two parts of a material of a high thermal conductivity, each of said two box parts including a respective one of opposite external major

walls of the box and having an interior major surface and external surface portions;
(b) a first plurality of electrical components secured to, and mounted in good thermal contact with the interior major surface of, one of the box parts;
(c) a second plurality of electrical components secured to, and mounted in good thermal contact with the interior major surface of, the other of the box parts;
(d) each of said two box parts providing for the electrical components secured to its interior major surface a high thermal conductivity heat path extending to its external surface portions, whereby a major portion of heat generated in the electrical components during operation is conducted away from said components;
(e) each of at least some of said electrical components being mounted in surface contact with an inward facing surface of a respective pad portion of the said interior major surface of the said box part to which that component is secured; and
(f) a printed circuit board having a distribution of apertures corresponding to the distribution of pad portions located with a said box part with the pad portions received by said apertures of the board and the electrical components in contact with the pad portions electrically connected to tracks of the board.

4,716,499

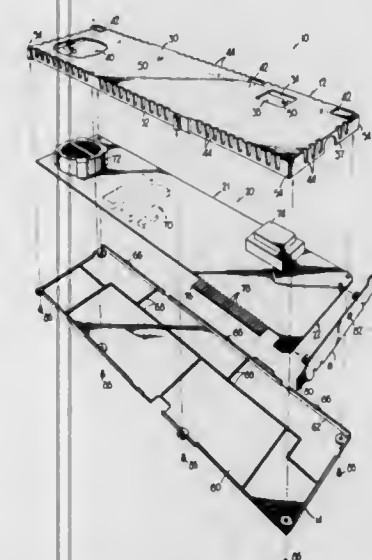
ENCLOSED CIRCUIT BOARD ASSEMBLY
Vikram Bhargava, Alpharetta, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Jul. 28, 1986, Ser. No. 889,739

Int. Cl.⁴ H05K 7/12

U.S. Cl. 361-395

9 Claims



1. An improved protective enclosure enclosing an electrical circuit board having a first and a second side, comprising:
a first cover at least partially concealing the first side and including a first engagement means extending over an edge of said circuit board, and engaging said second side;
a second cover at least partially concealing said second side and including a second engagement means extending over an edge of said circuit board and engaging said first side, such that said first cover and said second cover means combine to at least partially enclose said circuit board.

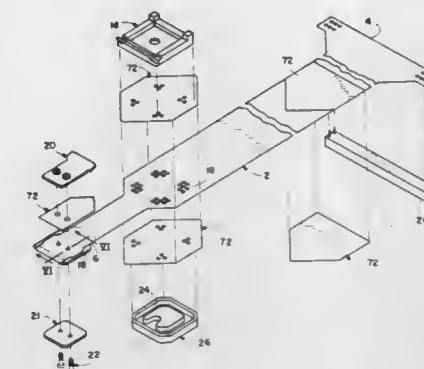
4,716,500
PROBE CABLE ASSEMBLY
David G. Payne, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 18, 1985, Ser. No. 789,278

Int. Cl.⁴ H05K 1/00

U.S. Cl. 361-398

8 Claims



1. A probe cable assembly for use in connecting a monitoring instrument to an electronic system under test, which system has a receptacle for receiving a multiple terminal electronic component, to analyze the interaction between the system and the component, said cable assembly comprising:

a flexible circuit cable having an instrument end for connection to the monitoring instrument and a probe end for connection to the receptacle of the electronic system under test, the cable having a plurality of conductors supported by a base sheet of dielectric material in mutually electrically insulated relationship with signal conductors and ground conductors being in interlaced relationship to form a plurality of transmission lines having a substantially uniform characteristic impedance over the length of the conductors, and having a cover sheet of dielectric material laminated to the base sheet with the conductors interposed between the cover sheet and the base sheet, at least one group of conductors terminating at the probe end in respective termination areas that lie in a predetermined array, the termination areas being exposed at one side of the cable and forming respective terminals for the conductors of said group;
a stiffening element attached to the cable at the probe end on the opposite side of the cable from said one side, said stiffening element being capable of fitting into the receptacle of the system under test; and
an auxiliary receptacle for receiving the multiple terminal electronic component, said auxiliary receptacle being secured to the cable and having a plurality of contact elements in a predetermined array, and also having terminal pins connected to the contact elements and extending through the base sheet and being connected to conductors to said one group.

4,716,501

INDICATOR LIGHT ASSEMBLY WITH FLUORESCENT LENS

John M. McKee, 3307 NW. 108 Dr., #15, and Joseph V. Ranalletta, 3893 NW. 73 Terr., both of Coral Springs, Fla. 33065

Filed Oct. 21, 1986, Ser. No. 921,295

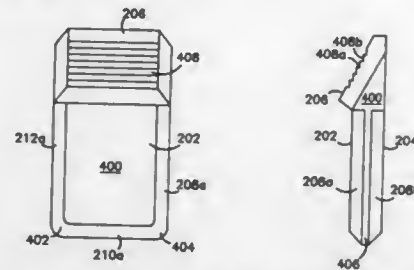
Int. Cl.⁴ F21V 7/04

U.S. Cl. 362-31

5 Claims

1. An indicator light assembly, comprising in combination:
a translucent block having an index of refraction greater than that of the environment and including a fluorescent material, said block having two opposed and substantially parallel surfaces connected by a plurality of sides; wherein one of said sides includes an indicating surface

positioned at an angle relative to said opposed surfaces whereby internal light traveling substantially parallel to said opposed surfaces is transmitted through said indicating surface; wherein another of said sides includes first and second reflecting surfaces positioned at angles relative to said opposed surfaces whereby internal light traveling substantially parallel to said opposed surfaces is reflected back into said block;



- a printed circuit board having a first surface positioned adjacent one of said opposed surfaces of said translucent block, a second surface opposing said first surface, and a hole positioned over said block; and
a light source located on said second surface of said printed circuit board and positioned over said hole.

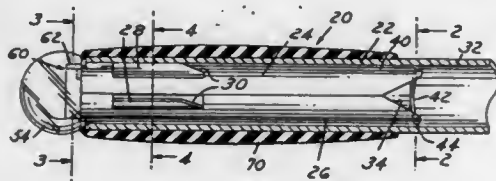
4,716,502

HANDLEBAR SAFETY LIGHT

Roger A. Schott, and Lawrence A. Schott, both of Redford, Mich., assignors to Freedom Industries, Inc., Redford, Mich.
Filed Nov. 7, 1986, Ser. No. 928,092
Int. Cl.⁴ B62J 6/00

U.S. Cl. 362-72

13 Claims



1. A signal light for bicycle and like applications having a handlebar with open tubular ends, said signal light comprising a cylindrical battery shell having axially spaced ends, a circular opening at one end, and a circumferential array of spaced axially extending resilient ribs integrally projecting outwardly of said shell at angles thereto between said ends,
battery means captured within said shell so as to position battery contacts adjacent to said spaced ends of said shell, a lamp having a base received in said circular shell opening and a bulb carried by said base externally of said shell, and a lens having a hollow contoured head affixed to said shell at said one end enclosing and capturing said bulb, said ribs being of identical construction and having axial edges spaced from said one shell end which slope rearwardly toward said shell so as to facilitate press-fit insertion of said shell into a handlebar end,
said ribs being of radially inwardly concave arcuate cross section of uniform thickness axially of said shell and having radii of curvature equal to that of said shell, said ribs having an outer diameter for resilient press-fit insertion of said shell into a handlebar end such that said ribs function both to retain said shell in the handlebar end, to center in said shell therein, and to adapt to various size openings in the handlebars.

4,716,503

FLUORESCENT DISPLAY BASE

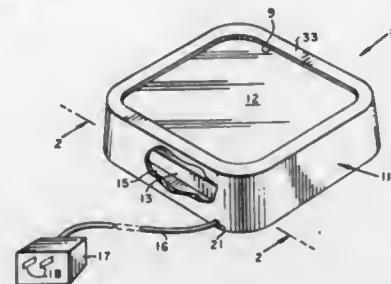
Richard L. Chappell, and Alice M. Chappell, both of New York, N.Y., assignors to Fine Lines International Ltd., New York, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,202

Int. Cl.⁴ F21S 3/00; G09G 13/04

U.S. Cl. 362-97

12 Claims



1. A low-intensity fluorescent light display stand for supporting and illuminating sculptures and art objects comprising a case, said case having side walls, said case having an open bottom and an open top, said open top including an inward flange, a translucent plastic top portion for supporting and illuminating sculptures and art objects, said translucent top portion integrally attached to said open top portion of said case at said flange, a bottom portion, said bottom portion adapted to be engageably held in said open bottom of said case, said bottom portion adapted to mount at least one fluorescent tube, a fluorescent starter disposed in said case and connected in series to a 120 volt AC-DC step-down transformer having means adapted to connect to a standard 120 volt outlet remote from said case, a low voltage DC-AC step-up transformer disposed inside said case and connected to said starter and to said AC-DC step-down transformer, said DC-AC step-up transformer connected in parallel to said fluorescent tube.

4,716,504

LIGHT FIXTURE BRACKET FOR SUSPENDED CEILING

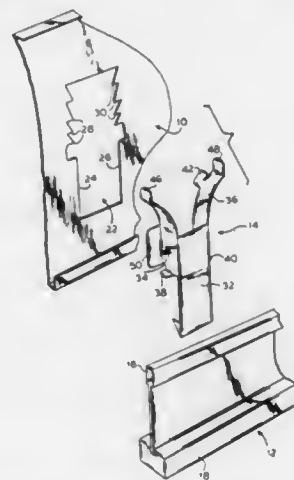
Scott Pahl, North Andover, and Luigi De Simone, Chelsea, both of Mass., assignors to Keene Corporation, Union, N.J.

Filed Mar. 13, 1987, Ser. No. 25,496

Int. Cl.⁴ F21S 1/02

U.S. Cl. 362-150

8 Claims



1. In combination, a light fixture having a sidewall with a bracket engaging opening therein, said opening being defined with a plurality of vertically spaced bracket engaging means arranged in pairs therein, and a bracket for securing said fixture to a ceiling grid member; said bracket including:
a vertical plate;
a pair of spaced legs extending from said plate disposed

transverse to said plate along opposite sides thereof, said legs being biased away from each other;
fixture engaging means on each of said legs adapted to interengage with said bracket engaging opening, said fixture engaging means becoming disengaged when said legs are urged towards one another; and,
feet members on each of said legs spaced downwardly of said fixture engaging means and adapted to rest on a top surface of said grid member, the vertical position of said fixture with respect to said grid member being determined by which of said pairs of bracket engaging means interengages with said fixture engaging means.

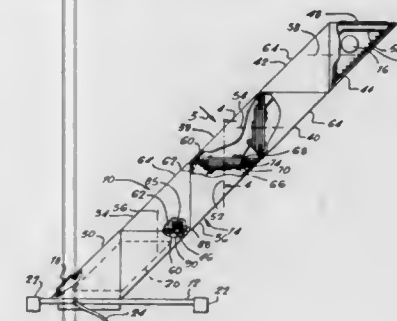
4,716,505

TABLE LAMPS

Shui L. D. Chan, Kowloon, Hong Kong, assignor to New Horizons Product Development Company Limited, Hong Kong
Filed Feb. 13, 1987, Ser. No. 14,632
Int. Cl.⁴ F21S 1/02

U.S. Cl. 362-287

9 Claims



1. A table lamp comprising:

a base,
an arm upstanding from said base and having an inner end joined to said base and an outer end, said arm being constituted by a number of hollow box-like segments,
bearing means rotatably joining adjacent segments to one another so that adjacent segments are capable of rotation one relative to the other, a lamp supported in the segment at said outer end of said arm, said lamp being arranged to provide illumination when energised,
an electrical supply cord leading to said base, commutator means aligned with said bearing means between each adjacent pair of segments for passing electrical current from one segment to an adjacent segment,
conductor means in each segment for passing electrical current from commutator means to commutator means, said lamp being connected to said commutator means from said segment at said outer end of said arm and said supply cord being connected to commutator means for a segment at said inner end of said arm.

4,716,506

IRIS-PRODUCING LAMP DEVICE

Hui C. Shang, Room No. 330, Gate No. 2, Building No. 6 Zao-LinXil4, XuanWu District, Beijing, China

Filed Sep. 15, 1986, Ser. No. 907,242

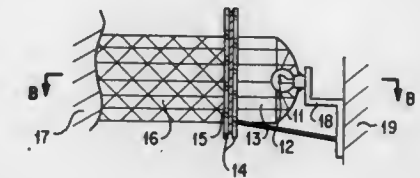
Claims priority, application China, Sep. 16, 1985, 85203803
Int. Cl.⁴ F21V 9/00

U.S. Cl. 362-293

7 Claims

1. An iris-producing lamp device comprising one or more non-monochromatic light sources with its socket or their sockets on a bracket wherein a lamp shade also mounted on said bracket is made of a grating-film iris-producing glass, and wherein the grating-film iris-producing glass is made of a

2-dimensional grating-film or two 1-dimensional grating-films with one superimposed on the other crossedly and they are all



clamped firmly between two sheets of transparent material or affixed on one sheet of the transparent material.

4,716,507

OPTICAL COLLIMATOR TARGET ILLUMINATION

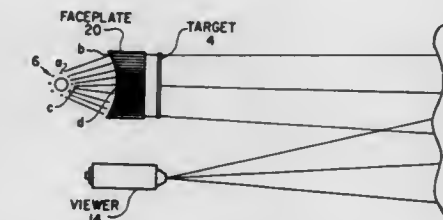
Alan J. Ames, Casselberry, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 12, 1986, Ser. No. 862,903

Int. Cl.⁴ F21V 8/00

U.S. Cl. 362-311

2 Claims



1. In a collimator including a target illuminated by a light source positioned adjacent thereto with its axis through the centerpoint of the target, the off-axis illumination of the target being lower than illumination at the light axis by an amount proportional to the fourth power of cosine of the angle at which light strikes the periphery, means for obtaining uniform illumination across the target with increased illumination at its periphery comprising a fiber optic faceplate positioned between the light source and the target, the faceplate being a coherent fiber optic bundle, the bundle being disposed with its longitudinal axis lying on the target axis, the bundle having a concave end so that a curved surface is adjacent the light source, the curvature of the curved surface being such that the distance from the light source to off-axis fibers in the bundle is equal to the distance from the light source to a fiber on the light axis, overcoming the cosine fourth power illumination lowering effect.

4,716,508

OUTDOOR LIGHTING PEDESTAL

John F. Kramer, deceased, late of Palm Desert, Calif.; by Barbara B. Van Oosting, executrix, P.O. Box 2857, Palm Desert, Calif. 92261, and by Karen S. Wessberg, executrix, 2469 Porthmoor, Corona, Calif. 91720

Filed Oct. 28, 1985, Ser. No. 791,928

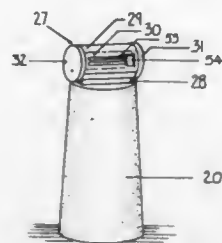
Int. Cl.⁴ F21S 1/10

U.S. Cl. 362-431

6 Claims

1. A pedestal for supporting an electric lighting fixture which comprises an upright member formed of a dense composition having a central base for accommodation of electrical wiring extending centrally therethrough, said pedestal being in the form of a frustum of a cone with a wide base adapted to rest upon the ground and an uppermost narrow surface adapted to receive said lighting fixture wherein a vertically slidable sup-

porting collar is positioned around said pedestal at a level at which its base is supported upon the ground, a central opening



in said collar conforming closely to an outer diameter of the pedestal at said level.

4,716,509

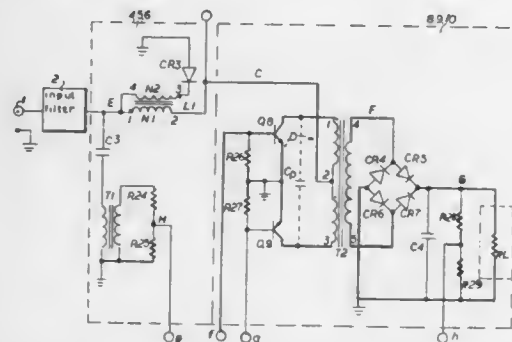
PWM INVERTER WITH TRAPEZOIDAL OUTPUT
Silvio Rocucci, Rome, Italy, assignor to Selenia Spazio, L'Aquila, Italy

Filed Feb. 27, 1986, Ser. No. 834,306

Claims priority, application Italy, Feb. 28, 1985, 47752 A/85
Int. Cl.⁴ H02M 3/337

U.S. Cl. 363—26

3 Claims



1. A pulse-width-modulated inverter-converter for generating a output from a direct-current supply voltage, comprising: a source of said direct-current supply voltage; a power inverter connected to said source and provided with a power transformer; a pair of transistors each having a respective emitter-collector network connected between a respective end of a primary winding of said transformer and ground, said power transformer having a secondary winding, a signal applied to said primary winding being controlled so that a smoothed trapezoidal waveform is outputted by said transformer; a full-wave rectifier connected across said secondary winding and receiving said smoothed trapezoidal waveform therefrom for applying said output to said load; a main oscillator connected to said source and generating from said direct-current supply voltage a substantially square wave signal adapted to determine the frequency of said power output; means connecting said main oscillator to said power inverter for generating said power output therein; and means including a nonlinear inductive element responsive to current drawn therethrough and interposed between said source and said power inverter for sending constant current energy to said power transformer and the load, wherein said nonlinear inductive element includes: a reactor having one winding connected in series between an input filter connected to said source and a centertap of said primary winding of said transformer, and said reactor having another winding, said other winding is of opposite

polarity from said one winding and is connected in series with an output of said filter, a nonlinear diode having an anode connected to ground and a cathode connected to said other winding, and a filter and recovery capacitor connected upstream of said reactor, said nonlinear diode acting as an energy recovery element toward said filter and recovery capacitor.

4,716,510

AUTOMATIC RESTART CIRCUIT FOR A SWITCHING POWER SUPPLY

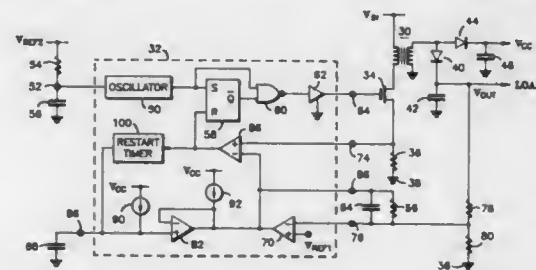
W. David Pace, Tempe, and Wei C. Wang, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 5, 1986, Ser. No. 859,690

Int. Cl.⁴ H02M 7/517

U.S. Cl. 363—49

2 Claims



1. In a pulse width modulation controller including modulator circuitry for providing output pulses at an output thereof to utilization means, the modulator circuitry including a comparator and an error amplifier operating in conjunction to provide output pulse width modulation by causing the output of the comparator to periodically switch from a first level state to a second level state and soft start circuitry coupled with the comparator for providing slow start up of the controller, the soft start circuitry including a first capacitor, the improvement comprising circuit means coupled between the output of the comparator and the soft start circuitry for activating the soft start circuitry to initiate a restart of the controller whenever the output of the comparator does not switch to the second level state within a preset time interval wherein said circuit means includes:

- a second capacitor;
- means for charging said second capacitor;
- first semiconductor switch means responsive to the output of the comparator output being switched to said second level state for discharging said second capacitor; and
- second semiconductor switch means responsive to said second capacitor being charged to a predetermined level when the output of the comparator does not switch within said preset time interval for discharging the first capacitor whereby the restart of the controller is initiated.

4,716,511

SURGE CURRENT-LIMITING CIRCUIT

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Jun. 12, 1986, Ser. No. 874,017

Claims priority, application Japan, Jun. 28, 1985, 60-140156

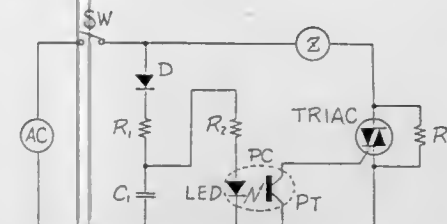
Int. Cl.⁴ H02H 9/00; H05B 41/36

U.S. Cl. 363—49

6 Claims

1. A circuit for limiting surge current, consisting essentially of:
 - (a) an AC power source connected in series with a switch;
 - (b) a current-limiting means connected in series with a load and said AC power source and switch;
 - (c) a control rectifier connected in parallel with the current-limiting means, said rectifier having a gate for its control;
 - (d) a photocoupler connected with said gate of said controlled rectifier; and

- (e) a delay circuit having a time constant, connected in parallel with said AC power source and said switch, said delay circuit also being connected in parallel with said series circuit of said load and current-limiting means and further connected through the photocoupler with said gate of the controlled rectifier; wherein said current-limiting means is effectively short-circuited by said controlled rectifier being turned from the



non-conducting state to the conducting state by said delay circuit via said photocoupler, after a period of time corresponding to said delay time after the closing of said switch, said photocoupler transmitting an amount of light which increases over said period corresponding to said time constant, for providing a respective gate signal to said gate of said controlled rectifier for said change of state thereof.

4,716,512

MULTIPLE STEP-UP RECTIFIER CIRCUIT

Yoshio Takamura, and Akira Nakajima, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

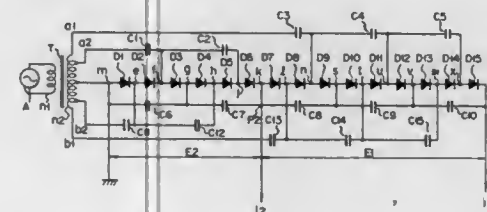
Filed Sep. 4, 1986, Ser. No. 903,425

Claims priority, application Japan, Sep. 10, 1985, 60-198507

Int. Cl.⁴ H02M 7/25

U.S. Cl. 363—61

9 Claims



1. A multiple step-up rectifier circuit, comprising: first input terminals (A1, B1) between which a first voltage is applied; second input terminals (A2, B2) between which a second voltage different from said first voltage is applied; a reference potential point provided between said first input terminals and between said second input terminals, the polarity of said first voltage applied to one (A1) of said first input terminals being opposite to that of said first voltage applied to the other first input terminal (B1) with respect to said reference potential point, and the polarity of said second voltage applied to one (A2) of said second input terminals being opposite to that of said second voltage applied to the other second input terminal (B2) with respect to said reference potential point; a plurality of rectifier elements connected in series to provide a rectifier series circuit and have the same rectifying direction, one end of said rectifier series circuit being connected to said reference potential point; a plurality of first capacitors connected in series to provide a capacitor series circuit having two ends connected to the respective ends of said rectifier series circuit, each first capacitor being connected in parallel to two or more of said first rectifier elements; a first output terminal provided at that end of said capacitor

series circuit which is connected to the other end of said rectifier series circuit; a second output terminal provided at a connection point between arbitrary, adjacent two of said first capacitors; second capacitors grouped into first and second second capacitor groups, said first second capacitor group including at least one of said second capacitors, and having two ends, one of which is connected to said one (A1) of said first input terminals while the other end of said first second capacitor group is connected to a connection point between arbitrary, adjacent two of said rectifier elements, which is located between said first and second output terminals, said second second capacitor group including at least one of said second capacitors, and having two ends, one of which is connected to said other first input terminal (B1) while the other end of said second second capacitor group is connected to a connection point between arbitrary, adjacent two of said rectifier elements, which is located between said first and second output terminals and is different from said connection point where said other end of said first second capacitor group is connected; third capacitors grouped into first and second third capacitor groups, said first third capacitor group including at least one of said third capacitors, and having two ends, one of which is connected to said one (A2) of said second input terminals while the other end of said first third capacitor group is connected to a connection point between arbitrary, adjacent two of said rectifier elements, which is located between said second output terminal and said reference potential point or connected to a connection point between arbitrary, adjacent two of said rectifier elements, which is located between said second output terminal and a third output terminal located closer to said reference potential point than said second output terminal, said second third capacitor group including at least one of said third capacitors, and having two ends, one of which is connected to said other second input terminal (B2) while the other end of said second third capacitor group is connected to a connection point between arbitrary, adjacent two of said rectifier elements, which is located between said second output terminal and said reference potential point or a connection point between arbitrary, adjacent two of said rectifier elements, which is different from said connection point where said other end of said first third capacitor group is connected; said second and third capacitors having the following relationship:

$$\frac{C_1}{C_2} = \frac{\frac{1}{2}n_1^2 + n_1 + \frac{1}{2}}{\frac{1}{2}n_2^2 + n_2 + \frac{1}{2}} \times \frac{I_1}{I_2} \times \frac{E_2}{E_1}$$

where

C₁: capacitance of each of said second capacitors,
C₂: capacitance of each of said third capacitors,
n₁: half the number of said second capacitors,
n₂: half the number of said third capacitors,
I₁: output current of said first output terminal,
I₂: output current of said second output terminal,
E₁: first voltage applied between said first input terminals, and
E₂: second voltage applied between said second input terminals.

4,716,513

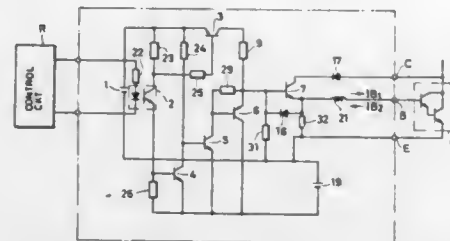
BASE DRIVE CIRCUIT IN A TRANSISTOR INVERTER
Tomotaka Ito, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1986, Ser. No. 890,047

Claims priority, application Japan, Jul. 30, 1985, 60-168111
Int. Cl.⁴ H02M 7/44

U.S. Cl. 363—97

2 Claims



1. A base drive circuit in a transistor inverter in which a transistor on-off operation is utilized to convert a DC voltage into an AC voltage, comprising:

- a main circuit transistor having a base;
- a control circuit for controlling a direction of current through said main circuit transistor;
- a photocoupler having a rear stage and being rendered on and off by a pulse signal outputted by said control circuit;
- first transistor means (7), coupled to said photocoupler, for supplying base current to said main circuit transistor when said photocoupler is on;
- an amplifying transistor (5) at the rear stage of said photocoupler;
- second transistor means (6), directly driven by an output of said amplifying transistor when said photocoupler is off, for applying a reverse bias current to the base of said main circuit transistor; and
- conductor means, directly connected between said amplifying transistor and said second transistor means, for directly applying said output to said second transistor means.

4,716,514

SYNCHRONOUS POWER RECTIFIER

Raoji Patel, Framingham, Mass., assignor to Unitrode Corporation, Lexington, Mass.

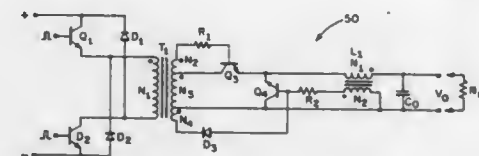
Continuation of Ser. No. 681,016, Dec. 13, 1984, abandoned.

This application Sep. 22, 1986, Ser. No. 910,313

Int. Cl.⁴ H02M 7/217

U.S. Cl. 363—127

6 Claims



1. A synchronous power rectifier comprising:
- a source providing a flow of current at periodic intervals;
 - a first semiconductor device comprising a bipolar transistor connected to receive said flow of current from said source and being synchronously controlled by said source to pass said flow of current of one polarity during said period intervals;
 - a capacitor;
 - an inductor connected to said source and said capacitor to receive said flow of current and provide a charging current for said capacitor;
 - a second semiconductor device connected to provide a second flow of current of said polarity from said inductor into said capacitor during time intervals wherein said first

semiconductor device is not providing flow of current from said source wherein,
said conductor includes a secondary winding connected to cause said second semiconductor device to provide said second flow of current, and
said source provides a turn-off signal at periodic intervals, said synchronous power rectifier further comprising means to apply said turn-off signal to said second semiconductor element to cause it to turn off.

4,716,515

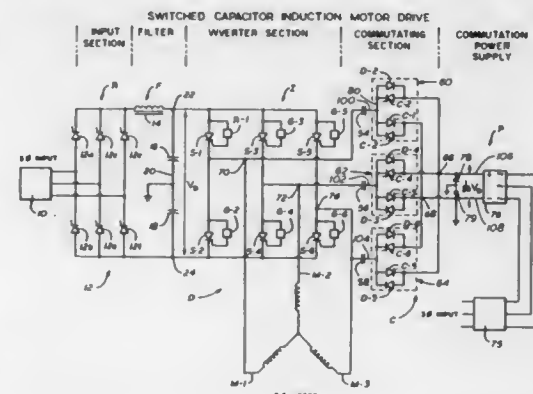
SWITCHED CAPACITOR INDUCTION MOTOR DRIVE
William C. Alexander, Austin, Tex., assignor to Solar Refining, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 616,832, Jun. 4, 1984, Pat. No. 4,597,039, which is a continuation-in-part of Ser. No. 534,567, Sep. 22, 1983, abandoned. This application Jun. 18, 1986, Ser. No. 875,636

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.⁴ H02M 7/515

U.S. Cl. 363—138

10 Claims



1. An alternating current, induction motor drive, for providing alternating drive current from a direct current voltage source, comprising:

- a plurality of gate control motor drive switching elements forming a three-phase motor drive inverter circuit, said inverter circuit being connected between the voltage source and the motor;
 - switch control means for controlling said motor drive switching elements in timed relation so as to provide the three-phase drive current to the motor, said switch control means including voltage sensing means for preventing said switching elements from being actuated unless the voltage across said switching elements is less than a prescribed minimum value or an increasing value, said switch control means comprising:
 - means for selectively applying reverse bias voltage to said gate control switching elements to force-commutate said switching elements in timed relation so as to provide three-phase drive current to the motor; and
 - gate control means for selectively enabling said gate controlled switching elements in a timed relation so as to provide three-phase drive current to the motor; and
 - a plurality of capacitive buffering means having a first terminal and a second terminal, said first terminal being connected between said switching elements in each phase of said inverter circuit and said second terminal being connected to said force-commutation means, said capacitive buffering means being selected to have an energy storage capacity slightly less than the energy storage capacity of the motor,
- wherein said reverse bias means for selectively applying reverse bias voltage comprises saturable reactor means for

selectively applying reverse bias voltage to said gate control switching element.

4,716,516

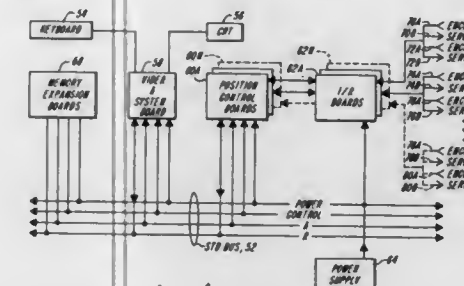
MODULAR MACHINE TOOL CONTROLLER
Ronald X. DuLong, Sandown, N.H., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Sep. 26, 1984, Ser. No. 654,778

Int. Cl.⁴ G06F 15/00

U.S. Cl. 364—132

3 Claims



1. A modular machine tool controller, comprising:
- means for receiving and storing user commands and providing control instructions;
 - position control means for receiving said control instructions and providing position signals to said machine tool and having an instruction cycle; and
 - data transfer means for selectively providing block control instruction transfer between said means for receiving and said position control means, wherein
- said position control means is operable according to a predetermined address to temporarily inhibit said means for receiving until said position control instruction cycle is complete and thereafter permitting operation of said data transfer means,
- additional position control means are operable at a corresponding address, said additional position control means also receiving control instructions on said data transfer means and having a different corresponding address,
- said additional position control means includes:
- a processor;
 - processor interrupt means; and
 - control instruction input means, and wherein
- upon completion of the position control cycles, said processor interrupt means is operative to inhibit operation of said processor and to cause new control instructions to be received by said control instruction input means, whereupon said processor is released to provide position signals according to said control instructions in said control instruction input means.

4,716,517

APPARATUS FOR CONTROLLING AN ELEVATOR
Shigemi Iwata, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 11, 1985, Ser. No. 774,886

Int. Cl.⁴ B66B 3/02

U.S. Cl. 364—148

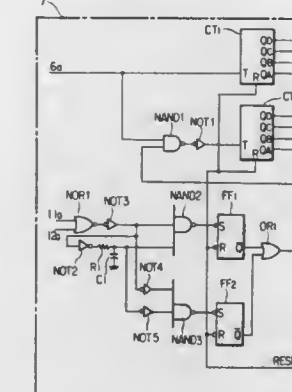
7 Claims

1. In an apparatus for controlling an elevator cage moving in a hoistway between a plurality of floors, the combination comprising:
- a pulse generating means for generating signal pulses responsive to vertical movement of the cage in the hoistway,
 - a plurality of plates provided in the hoistway, each plate corresponding to one of the floors,
 - position detector means including detectors provided on the cage and movable upon movement of the cage into positions opposite to said plates for detecting the positions of the floors corresponding to said plates based on the posi-

tions of the cage and for generating position signals representing a predetermined point located a predetermined distance above each actual floor level and a predetermined point located a predetermined distance below each actual floor level,

memory means for storing data representing the positions of the cage and the floors,

first means for calculating the positions of the predetermined points on the basis of number of pulses generated from



said pulse generating means and accumulated when a signal representing a predetermined point above a floor and a predetermined point below a floor is generated, and for storing data in said memory means representing the calculated positions of the predetermined points, and

second means for calculating data as to the actual levels of the respective floors on the basis of the calculated positions of the predetermined points and storing the data as to calculated actual floor levels in said memory means.

4,716,518

INCREMENTAL CONTROL

Nicholas J. Hawkins, Cambridgeshire, and Robert Saltarelli, Suffolk, both of England, assignors to W. Vinten Limited, Suffolk, England

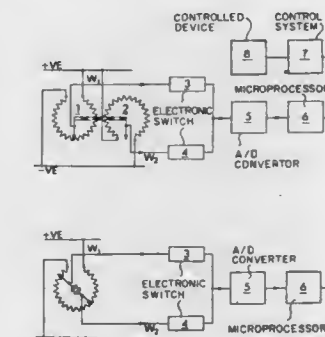
Filed Nov. 14, 1985, Ser. No. 798,065

Claims priority, application United Kingdom, Nov. 14, 1984, 8428806

Int. Cl.⁴ G05D 3/00

U.S. Cl. 364—184

16 Claims



1. An endstopless incremental control arrangement comprising:
- at least two variable output devices connected in parallel across a voltage supply, said variable output devices each including an output member which is variable in position to vary the output of the associated device;
 - means for ganging said output members together so that there is a predetermined relationship between the posi-

tions of the output members relative to the corresponding variable output devices;
 a selector switching means connected in series with the output member of each of said variable output devices;
 conversion means connected to the outputs of said switching means for providing a digital output in accordance with the outputs for said switching means; and
 processing means, connected to said conversion means, for processing said digital output so as to determine which of the variable output devices is producing the most valid output and for producing an output signal corresponding to the said most valid output for use in a control system.

4,716,519

METHOD OF CHECKING CHANNEL CONNECTIONS AND DETECTING HEATER CIRCUIT AND TEMPERATURE SENSOR MALFUNCTIONS IN MULTI-CHANNEL CLOSED LOOP HOT MELT HEATING SYSTEMS

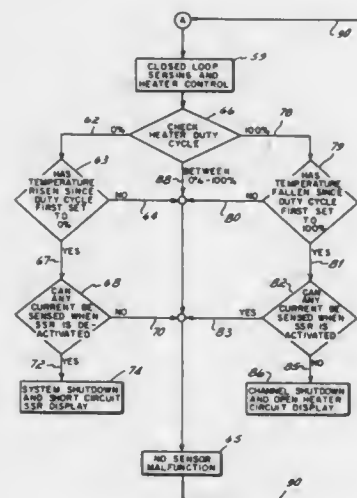
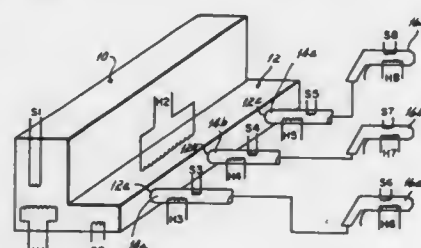
Philip F. Locke, Jr., Mentor, and Mark J. Ignatius, Lakewood, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jan. 22, 1986, Ser. No. 821,005

Int. Cl.⁴ F25B 13/00; G10M 19/00; G05D 23/00

U.S. Cl. 364-186

10 Claims



1. For use in connection with a multi-component hot melt heating system wherein each component has an electric heater energized through a signal-controlled switch having a control electrode and an associated temperature sensor, and wherein the components are each connected to a different channel of a multi-channel microprocessor for individual closed loop temperature control of each component, a method of checking each channel to determine the component status thereof, comprising the steps of:

(a) checking the control signals to the control electrodes of the signal-controlled switches of all channels to determine if all are at switch-deactivation levels designed to render nonconductive their associated signal-controlled

switches, reflecting all sensor temperatures being above their respective set point temperatures;
 (b) when all control signals are at switch deactivation levels, determining for a sensor associated with a single channel, to be checked if the temperature thereof has risen since the time the control signal level input to its associated signal-controlled switch most recently switched to its present switch-deactivation level; and
 (c) in response to detecting a nonincreasing sensor temperature in step (b), providing a normal sensor indication.

4,716,520

METHOD OF CHECKING CHANNEL CONNECTIONS AND DETECTING HEATER CIRCUIT AND TEMPERATURE SENSOR MALFUNCTIONS IN MULTI-CHANNEL CLOSED LOOP HOT MELT HEATING SYSTEMS

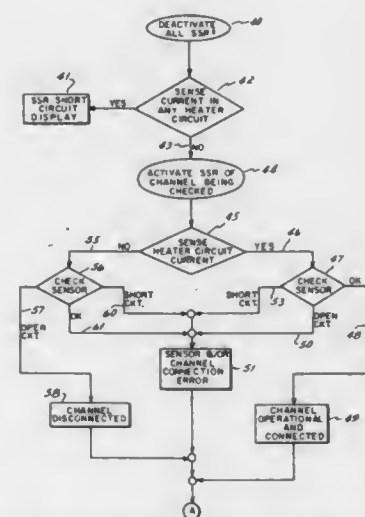
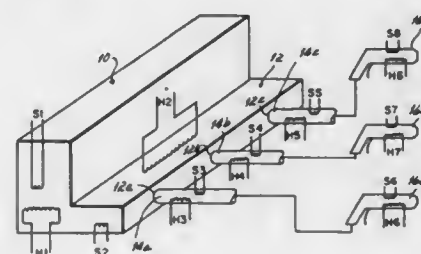
Philip F. Locke, Jr., Mentor, and Mark J. Ignatius, Lakewood, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 821,005, Jan. 22, 1986. This application Mar. 16, 1987, Ser. No. 26,014

Int. Cl.⁴ F25B 13/00; G10M 19/00; G05D 23/00

U.S. Cl. 364-186

8 Claims



1. For use in connection with a multi-component hot melt heating system wherein each component has an electric heater energized through a signal-controlled switch having a control electrode and an associated temperature sensor, and wherein the components are each connected to a different channel of a multi-channel microprocessor for individual closed loop temperature control of each component, a method of checking each channel to determine the component status thereof, comprising the steps of:

(a) providing control signals to the control electrode output lines of each microcomputer channel to render nonconductive any signal-controlled switches having their respective control electrode connected to the input of a channel;

(b) sensing the current flow through the heaters with a

current sensor common to all heater energization circuits and providing a short circuited switch indication if significant current flow exists;
 (c) providing control signals to the control electrode output line of a specific individual channel to be checked to render conductive the signal-controlled switch having its control electrode connected thereto;
 (d) sensing heater current flow with a current sensor common to all heater energization circuits; and
 (e) in response to significant sensed heater current flow in step (d), checking the temperature sensor connected to the specific individual channel being checked, and if it is neither open circuited nor short circuited, providing an indication that a fully operational component is connected to the specific channel being checked.

4,716,522

MICROCOMPUTER SYSTEM WITH BUFFER IN PERIPHERAL STORAGE CONTROL

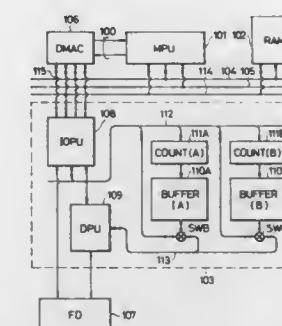
Tsuneo Funabashi, Hachioji; Kazuhiko Iwasaki, Kokubunji, and Hideo Nakamura, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 473,861

Claims priority, application Japan, Mar. 10, 1982, 57-36408 Int. Cl.⁴ G06F 3/06

U.S. Cl. 364-200

5 Claims



4,716,521

MICROCOMPUTER

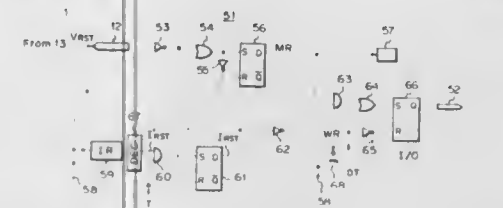
Yasutaka Nagae, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1984, Ser. No. 630,239

Claims priority, application Japan, Jul. 13, 1983, 58-126241 Int. Cl.⁴ G06F 1/00

U.S. Cl. 364-200

7 Claims



1. A microcomputer which executes instructions to produce output data, operatively connected to a first external pin for receiving an external reset signal to initialize said microcomputer and a second external pin for providing a power-on signal to hold said microcomputer in a power-on state, said microcomputer comprising:

an instruction decoder, operatively connected to receive instructions, capable of decoding a reset instruction and outputting a control signal in response to the reset instruction; and

internal reset signal means, operatively connected to said instruction decoder, for generating an internal reset signal in response to the control signal, said microcomputer being initialized by the internal reset signal, said internal reset signal means comprising:

a first flip-flop, operatively connected to said instruction decoder, for maintaining the internal reset signal as an output; and
 a first OR gate operatively connected to said first flip-flop and the first external pin to receive the external reset signal;

microcomputer elements operatively connected to said internal reset signal means; and

a master reset flip-flop, operatively connected to said first OR gate and said microcomputer elements, for producing a master reset signal for initializing said microcomputer elements.

1. In a microcomputer system including a data processor; a random access memory; a common bus interconnecting said data processor and said random access memory; and a peripheral disc storage unit in which data is stored on a disc in sectors having a predetermined number of data blocks; a peripheral storage control for controlling data transfer between said peripheral disc storage unit and said random access memory under control of said data processor, comprising:

an internal data bus;

counter means connected to said internal data bus for storing memory addresses;

buffer means connected to said counter means for storing a sector of data read out from said peripheral disc storage unit into, and for feeding a number of data blocks which may be less than that of a sector of data to said internal data bus from, a storage location thereof having an address corresponding to that stored in said counter means; switching means selectively connecting said buffer means to said internal data bus or said peripheral storage;

data transfer means connected between said internal data bus and said common bus and connected to receive a transfer acknowledge signal from said data processor for controlling the direction of data transfer between said internal data bus and said common bus in response to both a read/write instruction signal received on said common bus and said transfer acknowledge signal from said data processor; and

control means connected to said internal data bus and responsive to a predetermined command transferred to said internal data bus by said data transfer means for controlling said switching means, said counter means and said buffer means to effect connection between said buffer means and said peripheral disc storage unit to cause data transfer therebetween and to effect connection between said buffer means and said internal data bus to cause data transfer with said random access memory via said data transfer means and said common bus, including storing means for storing an indication of a number of blocks to be transferred and a read start address received from said data processor via said common bus and said data transfer means, means for setting said counter means with said read start address associated with said predetermined command and means for controlling said buffer means to read out a number of blocks of data, beginning at said read start address according to the data stored in said storing means.

tially coupling said high data bus portion to said m byte output data bus, followed by said low bus portion during a read operation; and means in said timing and control logic responsive to said selection signal and effective when said nm byte wide external devices are communicating with said data processor for disabling said timing and control logic means whereby said bus converter device is bypassed.

4,716,528

METHOD FOR MANAGING LOCK ESCALATION IN A MULTIPROCESSING, MULTIPROGRAMMING ENVIRONMENT

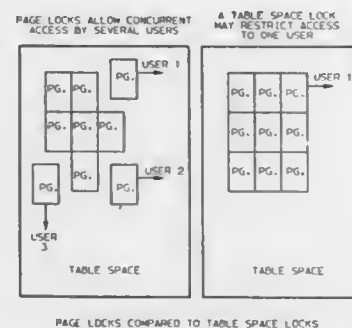
Richard A. Crus, San Jose; Donald J. Haderle, Los Gatos, and Howard W. Herron, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1986, Ser. No. 825,508

Int. Cl.⁴ G06F 9/46

U.S. Cl. 364—300

5 Claims



1. A computer method for managing granularity of lockable resources and concurrency of access among a plurality of asynchronous processes making references to said resources in a multiprocessing environment,

said environment including a facility for selectively imposing a predetermined number of locks on resources of small granularity (page locks) and large granularity (table locks),

the facility (1) granting a lock responsive to a request from a referencing process or system condition, (2) assigning said granted lock to the requesting process and the referenced lockable resource, and (3) maintaining a current count of the number and type of locks and their distribution by process and resource, comprising the steps of:

- establishing a first limit on the number of small granularity locks (page locks) which may be granted by the facility for each lockable resource, said first limit having a magnitude set consistent with an expectation of resource use among the processes making reference thereto, and establishing a second limit on the number of locks assignable per process;
- granting locks by the facility to requesting processes in an order determined by availability and request;
- upon a requesting process being granted a small granularity lock by the facility on a resource referenced by said process which would result in the number of said locks reaching the first limit for that resource, (c1) withdrawing the small granularity locks assigned to the referenced resource, and (c2) granting a large granularity lock (tablespace) on the resource to a predetermined one of the referencing processes; and
- upon a process requesting a lock, the grant of which would result in reaching the second limit, refusing the grant of the lock by the facility to said requesting process.

4,716,529

ELECTRONIC GAME APPARATUS

Jin Nakayama, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

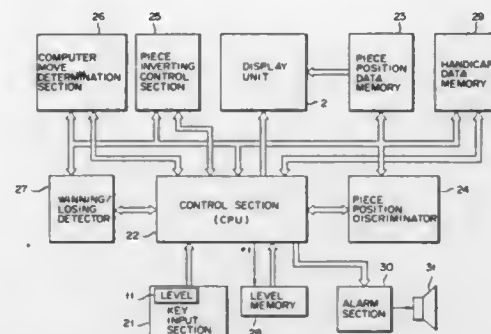
Continuation of Ser. No. 632,531, Jul. 19, 1984, abandoned. This application Nov. 12, 1986, Ser. No. 930,955

Claims priority, application Japan, Jul. 29, 1983, 58-137475

Int. Cl.⁴ A63F 3/02

U.S. Cl. 364—410

10 Claims



1. An electronic game apparatus, comprising:

display means for displaying a game board, a plurality of pieces identified with a challenger player, and a plurality of pieces identified with a computer player, said game board having piece positions in the form of a matrix comprised of a plurality of rows and a plurality of columns; piece position data memory means for storing piece identification data which includes identities and positions of the pieces identified with the challenger and computer players as displayed on said display means;

handicap data storage means for storing handicap data including patterns of pieces identified with the challenger and computer players which patterns are unfavorable to the challenger player;

handicap data designation means for designating handicap data stored in said handicap data storage means;

controlling means for reading the handicap data designated by said handicap data designation means, and for writing the readout data in said piece position data memory means;

piece position input means for enabling the challenger player to designate a position of a row and column of a challenger player's piece which is to be displayed on the game board and stored in said piece position data memory means;

piece identification data altering means coupled to said piece position input means for altering, after the designated position of the challenger player's piece is stored in said piece position data memory means, piece identification data identified with the computer players stored in said piece position data memory means in accordance with relative positions between the pieces identified with the challenger and computer players stored in said piece position data memory means; and

determination means coupled to said piece position input means, said piece position data memory means and said piece identification data altering means, for determining, by the use of a determination program, piece position data of the computer player's piece on the basis of piece position data of a challenger player's piece newly input through said piece position input means, and the piece identification data of said piece position data memory means that has been altered by said piece identification data altering means, storing the thus-determined data in said piece position data memory means, and for subsequently causing said piece identification data altering means to operate.

4,716,530

SYSTEM FOR AUTOMATICALLY CONTROLLING MOVEMENT OF UNMANNED VEHICLE AND METHOD THEREFOR

Hiroshi Ogawa; Yasuyuki Miyazaki, both of Aichi; Susumu Yoshida, Kakamigahara, and Shinichi Sasaki, Nagoya, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

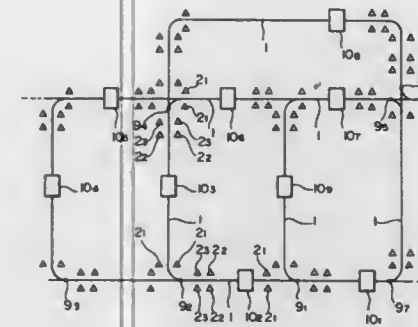
Filed Feb. 22, 1985, Ser. No. 704,522

Claims priority, application Japan, May 21, 1984, 59-74140; May 21, 1984, 59-74145; Jul. 9, 1984, 59-142037

Int. Cl.⁴ G06F 15/50

U.S. Cl. 364—424

18 Claims



1. A system for automatically controlling movement of an unmanned vehicle, comprising:

- first means having at least one curved corner defining at least one predetermined route from a starting point to a final destination of the vehicle so as to guide the vehicle to move therealong, the first means including (a) a guide wire extended on the ground along the predetermined route of movement, (b) a generator for generating an alternating current magnetic field around the guide wire, and (c) a detector installed on the vehicle for detecting the magnetic field around the guide wire and outputting a signal indicating the intensity of the magnetic field;
- second means, disposed near the first means along the predetermined route, for indicating one of various movement control modes to be carried out by the vehicle, the second means including a plurality of markers, each marker located on at least one side of said guide wire adjacent to the curved corner and each marker generating a signal;
- third means, installed on the vehicle, for detecting the presence of said second means as the vehicle moves; and
- fourth means, installed on the vehicle and having predetermined data on the various control modes of movement of the vehicle to be carried out sequentially during movement of the vehicle along the predetermined route when said second means is detected by said third means for controlling the movement of the vehicle along the predetermined route, the fourth means controlling the movement of the vehicle in any one of the various control modes and controlling the movement direction of the vehicle according to the total detected number of said markers so as to move the vehicle along the guide wire in accordance with the signal from the detector.

4,716,531

TWO LANE ENGINE CONTROL SYSTEM

Arthur F. Saunders, Gloucester, England, and Edward S. Eccles, Bishops Cleeve, Near Cheltenham, United Kingdom, assignors to Dowty and Smiths Industries Controls Limited, Cheltenham and Smiths Industries Public Limited Company, London, both of, England

Continuation of Ser. No. 603,871, Apr. 25, 1984, abandoned.

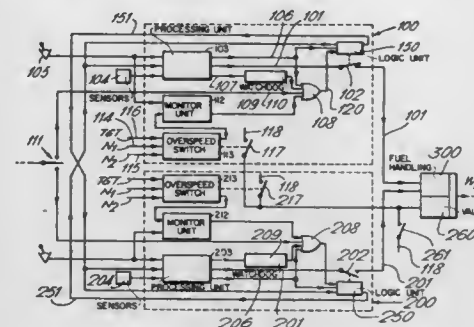
This application Jun. 2, 1986, Ser. No. 871,134

Claims priority, application United Kingdom, May 10, 1983, 8312822

Int. Cl.⁴ G06F 11/00

U.S. Cl. 364—431.02

13 Claims



1. An engine control system comprising: first and second control means; means for supplying input signals to said first and second control means; means for supplying output signals from one of said first and second control means to control operation of an engine in response to said input signals; relay means connected intermediate said first and second control means and said engine, said relay means being operable to supply output signals to the engine from either said first control means or said second control means; limiter means; means for supplying signals representative of the actual performance of the engine to said limiter means independently of said first or second control means, the limiter means being operable to override control of said engine by said first or second control means, and said limiter means itself controlling operation of said engine not to exceed predetermined operational parameters, when the one of said control means then controlling the engine causes said engine to exceed said predetermined operational parameters; monitor means having timer means therein, said monitor means providing an output response signal when the engine has been operated at said predetermined operational parameters for more than a predetermined period of time; and means supplying said output response signal from said monitor means to said relay means to disconnect the one of said control means which is producing the limited control of said engine and to connect instead the other of said control means to said engine.

4,716,532

CLINKER MANUFACTURE CONTROL USING FALLING CLINKER COLORIFIC ENERGY MEASUREMENT

Philippe Benoit, Lambersart; Alain Chielens, Mouvaux, and Jean-Paul Voisin, Helemmes, all of France, assignors to Fives-Cail Babcock, Paris, France

Filed Mar. 10, 1986, Ser. No. 838,146

Claims priority, application France, Mar. 13, 1985, 85 03660

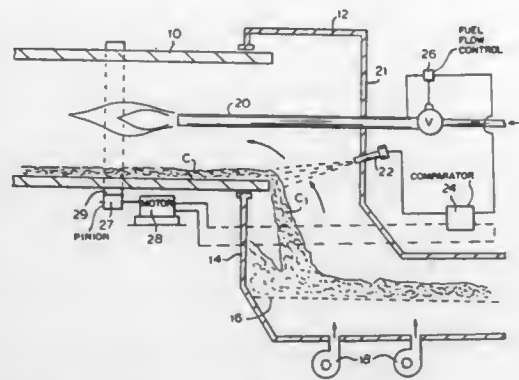
Int. Cl.⁴ F27B 7/42; C04B 7/44; G01J 5/52

U.S. Cl. 364—477

3 Claims

1. In a method of operating an installation for the manufacture of clinker, which installation comprises a rotary tubular kiln having an open discharge end for the clinker produced in the kiln, a cooler for the clinker connected to the discharge end, a hood covering the open discharge end and the cooler, the hood enclosing an atmosphere, hot clinker falling from the open discharge end into the cooler in a downward direction and cooling air passing in the cooler through the hot clinker

and heated by the hot clinker, the heated cooling air flowing through the atmosphere of the hood towards the open discharge end countercurrently to the falling hot clinker, and a burner mounted in the hood and extending into the open discharge end of the rotary tubular kiln, the improvement comprising the steps of measuring the calorific energy radiated by



the falling hot clinker across the atmosphere of the hood to establish a measured value, comparing the measured value with a predetermined reference value for said radiated calorific energy, and controlling at least one operating parameter of said installation in response to the difference between the measured and reference values to maintain the content of free lime in the clinker within predetermined limits.

4,716,533

IMAGE TRANSLATION SYSTEM

Keiji Ohmori, Yokohama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

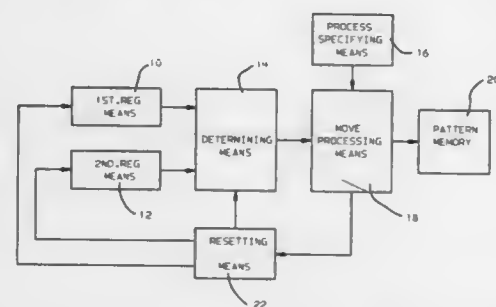
Filed Apr. 23, 1985, Ser. No. 726,263

Claims priority, application Japan, Apr. 27, 1984, 59-84166

Int. Cl. G06F 3/14

U.S. Cl. 364-518

5 Claims



1. For execution by an image processing system for rotating by $n \times 90^\circ$ ($n=1, 2, 3$) an image of a rectangular source area in a memory and moving the image to a rectangular destination area partly overlapping the source area, the method which comprises:

- scanning the source and destination areas for each of four sides (upper, lower, left and right) in a predetermined order to find whether the destination area includes a non-overlapping sub-area which is positioned along the side and not included in the source area,
- if such a destination sub-area is found for a side, rotating and moving data from the corresponding source sub-area to the destination sub-area, and
- redefining the source and destination areas exclusive of the processed sub-areas as new source and destination areas.

4,716,534

MICROPROCESSOR BASED LEVEL AND ANGLE FINDER

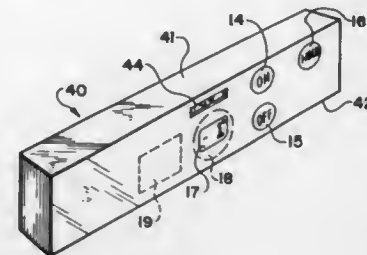
D. Michael Baucom, 9100 Sandburg Ave., Charlotte, N.C. 28213, and Sergio V. Gomez, 1713 Lyndhurst Ave., Charlotte, N.C. 28203

Filed Oct. 31, 1984, Ser. No. 666,806

Int. Cl. G01C 1/00, 9/00

U.S. Cl. 364-559

13 Claims



- An angle sensor comprising:
 - a housing having a reference point thereon;
 - gravity responsive means mounted in said housing and including an eccentrically weighted disc mounted for rotation on an axis in said housing, and radially extending discrete markings thereon around the disc concentric with said axis, each of which markings defines a positional relationship relative to a gravitational vector wherein said discrete markings on said disc comprise spaced-apart lines, each line representing two degrees of arc and each space representing two degrees of arc, said sensing means comprising first and second phototransistors spaced an odd number of degrees of arc apart to sense said spaces and said markings, and a third phototransistor positioned at a predetermined angular position from said first and second phototransistors for sensing gravitational alignment of the disc with reference to a zero degree reference marking on said disc;
 - sensing means stationarily mounted in said housing for sensing the passage of the markings on the disc as the housing moves in relation to said disc and the disc maintains a position corresponding to the gravitational vector;
 - means for determining the number of and direction of movement of the markings as the markings move past said sensing means, and computing the angular position of the reference point relative to the gravitational vector; and
 - display means for indicating the angular position of the reference point.

4,716,535

SPEED DETECTION APPARATUS

Koichi Yoshida, Kobe, and Joji Kawai, Akashi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 26, 1985, Ser. No. 727,799

Claims priority, application Japan, May 29, 1984, 59-111779

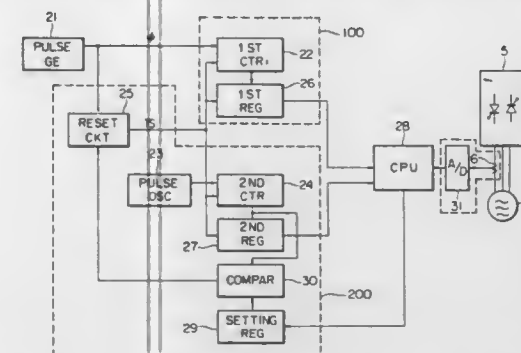
Int. Cl. G05B 5/00; G01P 3/48

U.S. Cl. 364-565

2 Claims

2. In a variable speed system for electric equipment, a speed detection apparatus for detecting speed of the electric equipment on the basis of a sampling interval so as to stably operate the control system, said speed detection apparatus comprising a pulse generator for generating signal pulses proportional to speed of the electric equipment, an electrical quantity-detecting unit for detecting an electrical quantity to be applied to the electric equipment, a sampling interval setting unit for changing a sampling interval responsive to variations in the electrical quantity, a counting unit connected to the sampling interval setting unit for counting signal pulses generated by said pulse generator in accordance with the sampling interval, and a calculating unit for determining speed of the electric equipment required for smooth operation on the basis of said

counted signal pulses and said set sampling interval, said electric quantity-detecting unit including a current detector for detecting an input current to the electric equipment, said counting unit including a first counter for counting said signal pulses and a first register for storing therein said counted signal pulses in response to an external reset signal, said sampling interval-setting unit including a reset circuit for generating said



external reset signal, a setting register for setting a set value in response to the input current detected by said current detector, a pulse oscillator for generating clock pulses at a predetermined frequency, a second counter for counting clock pulses from said pulse oscillator, a second register for storing therein said counted clock pulses in response to said external reset signal, a comparator for comparing said set value and said counted clock pulse, and said calculating unit including a CPU.

4,716,536

MEASUREMENT CALIBRATION

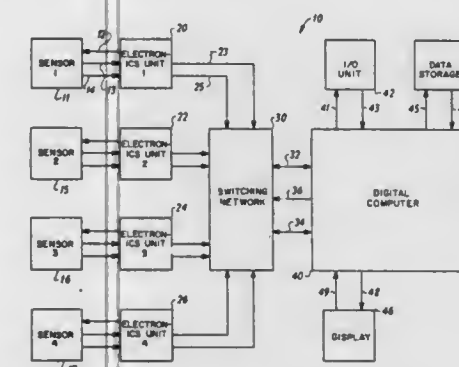
Robert L. Blanchard, Lexington, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Apr. 16, 1985, Ser. No. 723,763

Int. Cl. G01F 23/26

U.S. Cl. 364-571

44 Claims



17. Multiple unit fluid level sensor system for use in measuring fluid levels in a plurality of fluid-containing tanks, comprising:

- a plurality of fluid level sensor modules, each of which includes
 - a bottom sensor segment and at least one upper sensor segment,
 - means for fixedly mounting one end of said sensor module within a fluid containing tank, and
 - at least one fluid sensor calibrator, wherein each sensor segment includes a respective calibrator channel cable and each calibrator includes an associated calibrator channel cable, and each sensor module includes at least one sensor drive cable;
- a plurality of source means for supplying an alternating-current drive voltage to each sensor module, and a plurality of signal processing channel means for producing a

signal level related to the proportion of fluid within each respective segment, and for producing a signal level related to the proportion of fluid within each respective calibrator included with the sensor module;

- switching network means for selectively making connection to the sensor segment and calibrator channels; and
- computer means including input/output means, data storage means, display means, arithmetic and logic unit means, and central control unit means, all capable of cooperating under programmed control;

wherein said source means supplies a voltage to the fluid level sensor module and to the calibrator via an input cable, said processing means receives a signal related to the sensed fluid level via an output cable for each measurement channel and each calibrator channel, and such signals are processed and stored by the computer to provide corrected output displays and corrected segment and total measurements related to specific sensor channels and tank fluid levels.

4,716,537

CIRCUIT ARRANGEMENT FOR SIMULATING A RESISTIVE ELEMENTARY TWO PORT DEVICE FOR USE IN A WAVE DIGITAL FILTER

Helmut Scheuermann, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

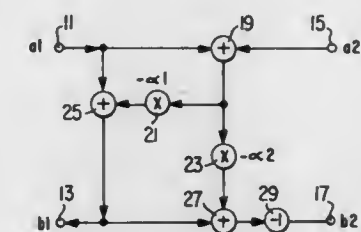
Filed Mar. 23, 1984, Ser. No. 592,799

Claims priority, application European Pat. Off., Mar. 25, 1983, EP 83 102 9681

Int. Cl. G06F 7/38

U.S. Cl. 364-724

11 Claims



1. A wave two port circuit arrangement for simulating a resistive elementary two port device for use in a wave digital filter, comprising:

- first and second ports each for receiving and transmitting input and output signals, respectively;
- first summing means connected to said first and second ports and producing a first sum signal which represents the sum of the input signals present at said first and second ports;
- first multiplier means connected to said first summing means for producing a first negatively scaled first sum signal and feeding it to one of said first and second ports as part of the output signal present at said one port;
- second multiplier means connected to said first summing means for producing a second negatively scaled first sum signal and feeding it to the other of said first and second ports as part of the output signal present at said other port;
- second summing means connected to said one port and to said second multiplier means for producing a second sum signal which represents the sum of the output signal present at said one port and the second negatively scaled first sum signal; and
- an inverter connected to said second summing means and said other port for inverting the second sum signal and feeding it to said other port to form the output signal at that port.

4,716,538

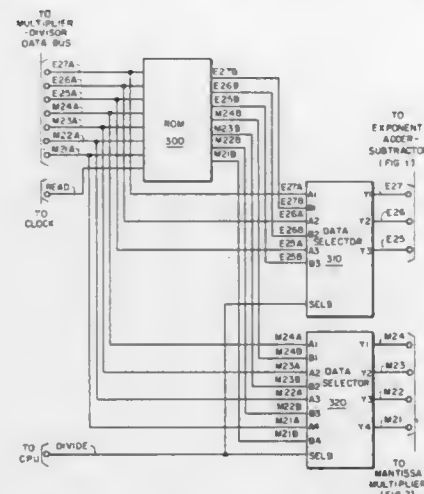
MULTIPLY/DIVIDE CIRCUIT FOR ENCODER PCM SAMPLES

Jeffrey P. Mills, Oak Park, and Max S. Macrander, Warrenville, both of Ill., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 31, 1984, Ser. No. 687,892

Int. Cl.⁴ G06F 7/52

U.S. Cl. 364-754



1. A multiplier/divider circuit for use in a digital signal processing system which includes a processing unit operated to provide multiply and divide control signals, a source of pulse code modulation (PCM) samples and a source of multiplier/divisor numbers, each sample and number having a sign bit, a plurality of exponent bits and a plurality of mantissa bits, said multiplier/divider circuit comprising:

- a read-only-memory (ROM) connected to said source of multiplier/divisor numbers and operated in response to each of said numbers to provide the reciprocal thereof;
 - a data selection circuit connected to said processing unit, to said ROM and to said source of multiplier/divisor numbers;
 - an adder circuit connected to said source of PCM samples and said data selection circuit; and
 - a multiplication circuit connected to said source of PCM samples and said data selection circuit;
- said data selection circuit being operated in response to said multiply control signal to gate said multiplier/divisor exponent bits to said adder circuit and said multiplier/divisor mantissa bits to said multiplication circuit, whereby said gated multiplier/divisor represents a multiplier,
- said data selection circuit being further operated in response to said divide control signal to gate said exponent bits of said reciprocal to said adder circuit and said mantissa bits of said reciprocal to said multiplication circuit, whereby said gated reciprocal represents the reciprocal of a divisor;
- said adder circuit being operated to add said multiplier exponent bits to said PCM sample exponent bits and provide a plurality of first summation signals representative of the results of said addition;
- said multiplication circuit being operated to multiply said multiplier mantissa bits by said PCM sample mantissa bits and provide a plurality of first multiplication signals representative of the results of said multiplication;
- whereby said adder circuit and multiplication circuit effectuate multiplication of said PCM sample and said multiplier;
- said adder circuit being further operated to add said exponent bits of said divisor reciprocal to said PCM sample exponent bits and provide a plurality of second summation signals representative of the results of said addition;
- said multiplication circuit being further operated to multiply said mantissa bits of said divisor reciprocal by said PCM sample mantissa bits and provide a plurality of second

multiplication signals representative of the results of said multiplication;

whereby said adder circuit and said multiplication circuit effectuate division of said PCM sample by said divisor.

4,716,539

MULTIPLIER CIRCUIT FOR ENCODER PCM SAMPLES

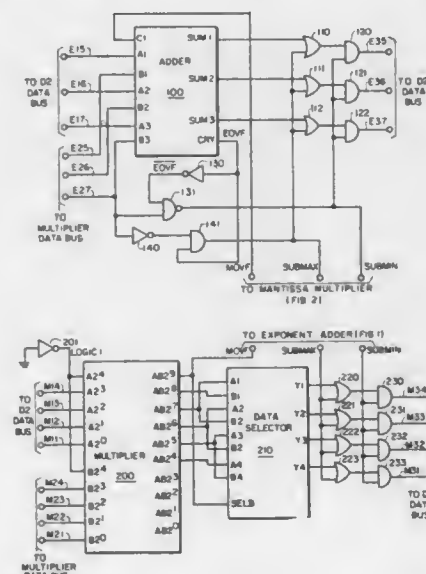
Jeffrey P. Mills, Oak Park, and Max S. Macrander, Warrenville, both of Ill., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 31, 1984, Ser. No. 687,875

Int. Cl.⁴ G06F 7/52, 7/38

U.S. Cl. 364-754

14 Claims



1. A multiplier circuit for use in a digital signal processing system which includes a source of pulse code modulation (PCM) samples and a source of multiplier numbers, each sample and number having a sign bit, a plurality of exponent bits and a plurality of mantissa bits, said multiplier circuit comprising:

- an adder circuit connected to said source of PCM samples and said source of multiplier numbers; and
 - a multiplication circuit connected to said source of PCM samples and said source of multiplier numbers;
- said adder circuit being operated to add said multiplier exponent bits to said PCM sample exponent bits and provide a plurality of summation signals representative of the results of said addition;
- said multiplication circuit being operated to multiply said multiplier mantissa bits by said PCM sample mantissa bits and provide a plurality of multiplication signals representative of the results of said multiplication;
- whereby said adder circuit and multiplication circuit effectuate multiplication of said PCM sample and said multiplier;
- said adder circuit further operated in response to said summation signals having a value in excess of a predetermined threshold to provide an exponent overflow signal; and
- a minimax gating circuit connected to said adder circuit and said source of multiplier numbers, and operated in response to the most significant exponent bit of said multiplier numbers having a first characteristic and said exponent overflow signal of a second characteristic, to provide a first substitution signal;
- and further operated in response to the most significant exponent bit of said multiplier numbers having a second characteristic and said exponent overflow signal of a second characteristic to provide a second substitution signal.

4,716,540

MULTI-FUNCTIONAL FUZZY LOGIC CIRCUIT

Takeshi Yamakawa, Nishigoshi, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

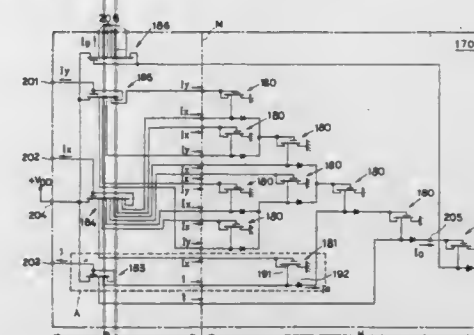
Filed Jul. 3, 1985, Ser. No. 751,447

Claims priority, application Japan, Jul. 6, 1984, 59-141250; Jul. 6, 1984, 59-141251; Jul. 6, 1984, 59-141252

Int. Cl.⁴ H03K 19/00

U.S. Cl. 364-807

7 Claims



1. A multi-functional fuzzy logic circuit comprising:
 - at least one input circuit, to which at least one input current is fed, for producing at least one output current of the same value in the same direction as the input current and at least one output current of the same value in the reverse direction, and
 - a plurality of fuzzy logic circuits for executing different fuzzy logic operations, each of said fuzzy logic circuits having as its input at least one of said output currents produced by said at least one input circuit.

4,716,541

BOOLEAN PROCESSOR FOR A PROGRAMMABLE CONTROLLER

Jesse T. Quatse, 2 Fifer Ave. #250, Corte Madera, Calif. 94925

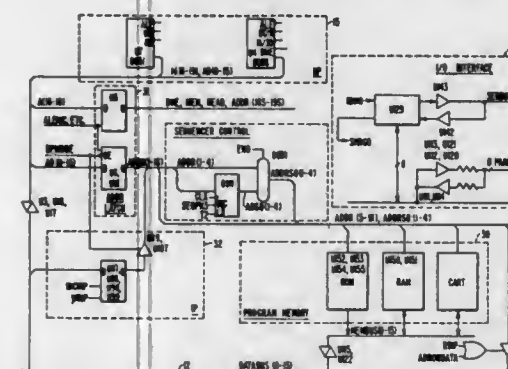
Filed Aug. 2, 1984, Ser. No. 637,772

Int. Cl.⁴ G06F 9/22, 9/00; G05B 19/18

U.S. Cl. 364-900

24 Claims

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 23 Pages)



1. A Boolean processor for manipulating a plurality of Boolean variables stored in an associated I/O image memory by executing programs stored in an associated program memory, comprising:

- a node memory having a plurality of individually addressable locations; AT- register; a destination register; and
 - means for interpreting instructions fetched from the associated program memory and directing corresponding operations including
- means, activated on the occurrence of at least one of a first class of instructions (structure instructions), for specifying selected first and second node memory locations in said node memory, storing the address of said second node memory location in said address destination register, performing a binary logical operation on the logical

values stored in said first and second node memory locations, and storing the result of said binary logical operation in said second node memory location, and means, activated on the occurrence of a second class of instructions (input instructions), for specifying a selected location in the associated I/O image memory, reading an input variable from said selected location in the associated I/O image memory and performing a logical AND between said input variable and the content of said T-register.

4,716,542

METHOD AND APPARATUS FOR SINGLE SOURCE ENTRY OF ANALOG AND DIGITAL DATA INTO A COMPUTER

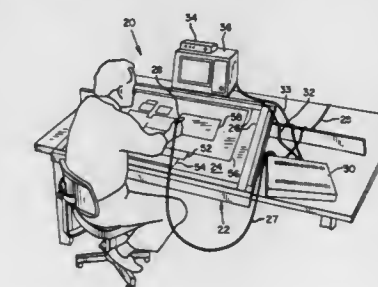
Curtis L. Peltz, Lake Oswego, Oreg.; George F. Martin, Ivoryton, Conn., and Peter H. Blake, Portland, Oreg., assignors to Timberline Software Corporation, Portland, Oreg.

Filed Sep. 26, 1985, Ser. No. 781,268

Int. Cl.⁴ G06F 15/64, 15/60, 3/033

U.S. Cl. 364-900

10 Claims



1. A method for inputting two-dimensional graphical data from a first, construction drawing and processing instructions from a second drawing into a computer system through a digitizer means for sensing location coordinates of a user-designated point on a drawing and outputting a corresponding digitizer output signal; the computer system including a computer having logic and memory circuitry, a keyboard and a display terminal connected to the computer via data input and output means, and a prestored construction cost estimation program; the keyboard including keys defining a set of alphanumeric keyboard symbols and electrical circuitry for transmitting to the computer different signals uniquely defining each of said keyboard symbols; and the second drawing containing image of a keyboard comprising a first set of visible symbols corresponding to the set of keyboard symbols and a second set of symbols corresponding to preselected formulae; the method comprising:

- storing in the computer memory circuitry a coordinates map defining the coordinates of the first and second keyboard image, a first set of formulae in the logic and memory circuitry for making dimensional computations and a second set of unique signals corresponding to the keyboard symbols and which mimic the electrical signals generated by the keyboard circuitry;
- digitizing the coordinates of user-designated points on each of said drawings and outputting corresponding digitizer output signals;
- processing each digitizer output signal in accordance with the stored coordinates map to determine upon which drawing said point was designated and the coordinates of the location of the point thereon;
- for a digitizer output signal corresponding to a location of a point on the first drawing, formatting said coordinates as graphic data point coordinates;
- for a digitizer output signal corresponding to a location of a point on the second drawing, generating from the logic and memory circuitry a selected one of said set of unique symbols;
- processing a first digitizer output signal corresponding to a

first location on the keyboard image through said coordinates map to select one of said formulae;
processing a second digitizer output signal corresponding to graphic data coordinates of at least two points on the construction drawing including utilizing said coordinates within the selected formula to produce a resultant answer; and
transmitting said resultant answer to the keyboard data input means for further processing by said estimation program.

7. A system for detecting and processing analog graphic data shown on a drawing in a computer operable from an electrical alphanumeric keyboard through digital keyboard data input means for inputting electrical symbols to the computer and programmed with an applications program, the system comprising:

a digitizer means disposable on a flat work surface for digitizing coordinates of a designated point on a predetermined area of said surface and outputting digital signals uniquely identifying the coordinates of each designated point;

means defining an image of a computer keyboard for displaying visible symbols including a first set of alphanumeric characters and a second set of predetermined function symbols; and

digitizer interface program means for preprocessing the digital signals output from the digitizer means to generate and transmit a modified set of digital output signals to the applications program via the digital data input means, the interface program means including:

first prestored keyboard character means for generating first digital symbols in a form which mimic the electrical alphanumeric keyboard characters;

second prestored function means including a set of formulae for making dimensional computations and generating second digital symbols defining results of the computations in the form of said keyboard characters;

means for discriminating between digitized coordinates of points of said image and said drawing positioned in common within said predetermined area; and

addressing means responsive to each of a predetermined subset of the digital signals from the digitizer means for accessing one of the first and second prestored means, the addressing means comprising:

logic means for comparing the digital signals from the digitizer to said predetermined subset and, for a digital signal within said subset, selecting one the first and second prestored means,

means including a prestored coordinates map defining relative coordinates of the first and second set of visible symbols for selectively accessing one of a first unique symbol stored in the first prestored keyboard character means, or a unique formula stored in the second prestored function means to generate a second unique symbol;

means for outputting the selected unique symbol to the digital data input means; and

locating means operable by a user after positioning the image means in said predetermined area for inputting digital signals identifying the location of the first and second sets of symbols as image coordinates within said area and linking said image coordinates to the relative coordinates of the coordinates map of the first and second drawings.

4,716,543 TERMINAL DEVICE FOR EDITING DOCUMENT AND COMMUNICATING DATA

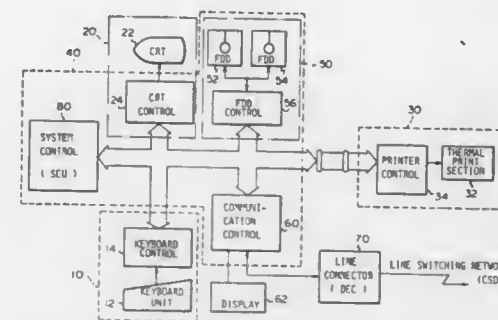
Toshiya Ogawa, Kawasaki; Hiroaki Ueno, Tsuchiura; Toshiaki Yamada, Kawasaki, and Tomoyuki Haganuma, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Dec. 27, 1982, Ser. No. 453,024

Claims priority, application Japan, Dec. 29, 1981, 56-212194; Feb. 24, 1982, 57-27504

Int. Cl.⁴ G06F 3/00

U.S. Cl. 364-900

18 Claims



1. A terminal device for preparing a document and communicating data, comprising:

input means for inputting prepared document data, format data and control data which are necessary for document preparation, document transmission and system control;

display means for displaying data which are necessary for document preparation;

print means for printing prepared document data and received document data;

external storage means for storing prepared document data and received document data;

communication control means for receiving document data and controlling transmission and reception of document data, the communication control means having a memory for storing prepared document data for transmission and received document data; and
system control means having a supervisor program for alternately executing an operating system program for outputting the received document data from said memory to the print means and to the external storage means and a communications control program for storing the prepared document data and the received document data in the memory, the supervisor program controlling the operating system program and the communications control program in such a manner that received document data can be alternately output from said memory to the print means and to the external storage means simultaneously with document preparation using the input means and the display means; and stored in said memory simultaneously with document preparation using the input means and the display means.

4,716,544 VARIABLE DIMENSION AND VARIABLE ORIENTATION GRAPHICS BIT-MAP COMPUTER MEMORY

George S. Bartley, Waltham, Mass., assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1983, Ser. No. 486,733

Int. Cl.⁴ G06F 7/00, 15/22; G06K 9/32

U.S. Cl. 364-900

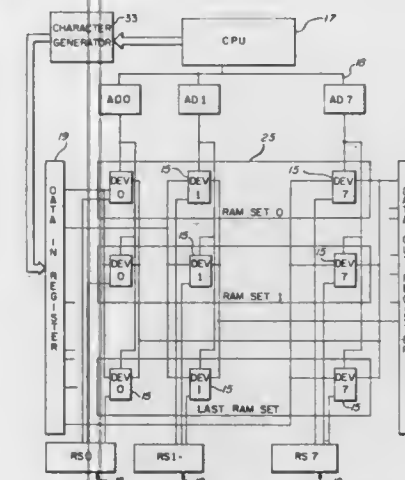
18 Claims

1. Apparatus for providing character data bits to an output device comprising:

means for storing and outputting data bits comprising a plurality of characters;

a memory means having a plurality of address lines and a plurality of input lines, the input lines being connected to

receive a character from said storing means, said address lines being connectable for receiving a plurality of first address groups each defining a selected character orientation, said memory means being responsive to each address group to store a character in said said memory means in the orientation defined by said address group, said memory means further having a plurality of output lines for outputting a stored character upon receipt of a plurality of second addresses; and



means connected to said address lines for addressing said memory means with one of said address groups to cause storage of a character in a selected orientation and for addressing said memory means with said second addresses for supplying character data bits to said output device; wherein the orientations are selected according to the following addresses:

$$\text{AREG}_i^r = \text{AREG}_{i-1}^{r-1} + K, \text{ for } i > 0 \quad (a)$$

$$\text{AREG}_i^r = \text{AREG}_{NB-1}^{r-1} + 1 + K, \text{ for } i = 0$$

or

$$\text{AREG}_0^r = \text{AREG}_i^{r-1} + 1 + K$$

where r =row number, i =device number and AREG equals the address for changing to row r from row $r-1$;

$$\text{AREG}_i^c = \text{AREG}_{i-1}^{c-1}, \text{ for } i > 0 \quad (b)$$

$$\text{AREG}_i^c = \text{AREG}_{NB-1}^{c-1} + 1, \text{ for } i = 0$$

or

$$\text{AREG}_0^c = \text{AREG}_i^{c-1} + 1$$

where AREG is the address and c is the column changed-to, give device i ;

$$\text{AREG}_i^r = \text{AREG}_{i+1}^{r-1} - K, \text{ for } i < NB - 1 \text{ (or } i < T); \quad (c)$$

$$\text{AREG}_{NB-1}^r = \text{AREG}_0^{r-1} - K - 1, \text{ for } i = T$$

or

$$\text{AREG}_T^r = \text{AREG}_0^{r-1} - K - 1$$

where AREG is the address and r is the row changed-to for device i ;

$$\text{AREG}_i^c = \text{AREG}_{i+1}^{c-1}, \text{ for } i < NB - 1 \text{ (or } i < T); \quad (d)$$

$$\text{AREG}_{NB-1}^c = \text{AREG}_0^{c-1} - 1, \text{ for } i = NB - 1$$

or

$$\text{AREG}_T^c = \text{AREG}_0^{c-1} - 1$$

where AREG is the address, c is the column changed-to for device i , and wherein NB is the number of bits passed in parallel to said matrix and K is an integer.

4,716,545 MEMORY MEANS WITH MULTIPLE WORD READ AND SINGLE WORD WRITE

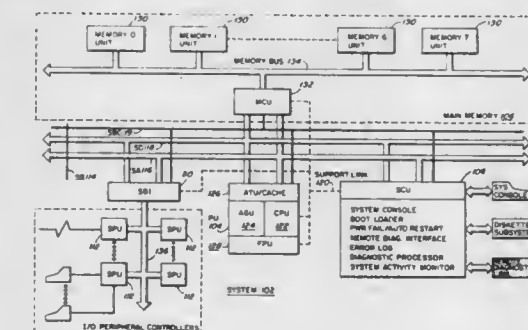
David L. Whipple, Braintree, and Edward D. Mann, Methuen, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Mar. 19, 1985, Ser. No. 713,365

Int. Cl.⁴ G06F 13/00

U.S. Cl. 364-900

17 Claims



1. A memory unit for storing information units which is interconnected during operation with a main memory control unit, the memory unit comprising, in combination:

a bus coupling the memory unit to the memory control unit for transferring in the alternative no more than a single information unit at one time and no more than a single memory address specifying an information unit in the memory unit at another time, the information unit being transferred either to or from the memory unit and the address being transferred only thereto;

memory request receiving means coupling the memory unit to the memory control unit for receiving a read request which specifies a variable number of information units; memory storage means coupled to the bus for storing the information units and outputting information units in response to internal addresses; and

internal control means coupled to the bus and to the memory request receiving means and responsive to the read request and a memory address received on the bus for providing a sequence of internal addresses which specifies a sequence of the information units, the sequence of information units always beginning with the information unit specified by the memory address, always having the information units ordered by increasing memory address, and always containing the number of information units specified by the read request, the number being independent of the memory address,

whereby the memory unit outputs the sequence of information units specified by the memory address and the memory read request to the bus.

4,716,546

MEMORY ORGANIZATION FOR VERTICAL AND HORIZONTAL VECTORS IN A RASTER SCAN DISPLAY SYSTEM

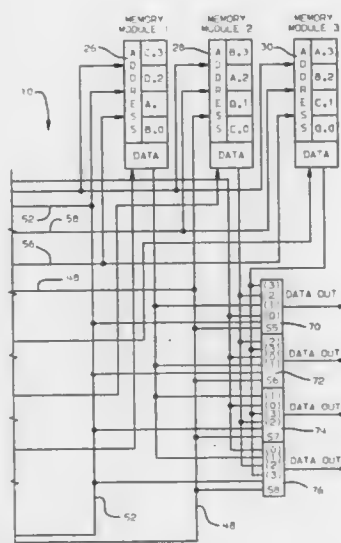
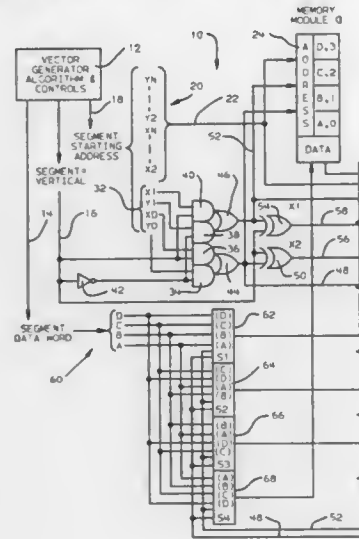
William F. Beausoleil, Hopewell Junction, and David F. McManigal, Stormville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1986, Ser. No. 890,662

Int. Cl.⁴ G06F 9/00

U.S. Cl. 364—900

5 Claims



1. A memory organization for a raster-scan display refresh memory organized in square pixel groups organized in memory segments consisting of physically separate memory modules for separate portions of pixel groups where high order address bits select modules and low order address bits select within modules, comprising:

a memory segment for an $N \times N$ pixel display area where N is a power of two and wherein the memory segment contains N physically separate addressable memory modules, memory address generating means for addressing each of said memory modules with data, said memory address means having the highest order address bits thereof connected directly to the address inputs of each of said memory modules, vector generating means for producing display vectors connected to said memory address generating means and for producing an output control signal when a vertical vector

is generated and sent to said memory address generating means,

input data selector means (62,64,66,68) for receiving input data and said low order address bits for said data and for providing said data to said memory modules in a rotated form representative of a wrap-around rearrangement of raster-scan lines,

memory address transforming means connected to said memory address generating means and said vector generating means for receiving said low order bits of said memory address and said vertical vector control signal and consisting of a logic tree having Exclusive OR gate means as outputs for providing unchanged rotated addresses to said memory modules in the absence of said vertical vector control signal and for providing tilted memory addresses for vertical vectors by changing address bit values in the presence of said vertical vector control signal to write vertical vectors into said memory modules orthogonally to horizontal vectors, and

memory output data selector means (70,72,74,76) connected to receive data from said memory modules for derotating memory data as it is read out of memory to a display refresh cycle by restoring the data to a raster-scan display arrangement from the arrangement in which it was stored in memory.

4,716,547

CURRENT SWITCH FOR PROGRAMMING VERTICAL FUSES OF A READ ONLY MEMORY

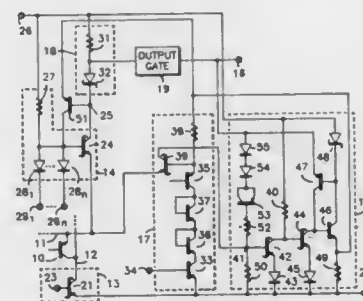
Ira E. Baskett, Tempe, Ariz., and Gene T. Sluss, Chippewa Falls, Wis., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 7, 1986, Ser. No. 849,089

Int. Cl.⁴ G11C 11/40

U.S. Cl. 365—96

24 Claims



1. A current switch for programming a plurality of vertical fuses of a read only memory, said current switch and said read only memory both monolithically integrated on the same chip, each of said fuses uniquely coupled between one of a plurality of word lines and one of a plurality of bit lines, said read only memory including a row decode, a sense amplifier, an output gate, and an output terminal, said sense amplifier coupled to one of said word lines by said row decode and to said output terminal by said output gate, said current switch comprising:

first means coupled between said output terminal and said row decode for switchably transmitting a programming voltage to said row decode from said output terminal, said programming voltage then being applied to said one of said word lines and one of said fuses, wherein said voltage will program said fuse as the voltage thereacross to change; and second means coupled between said row decode and said first means for switching said first means to prohibit said programming voltage from passing therethrough when said voltage change has been sensed.

4,716,548

SEMICONDUCTOR MEMORY CELL

Tohru Mochizuki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

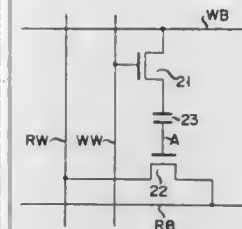
Filed Feb. 12, 1986, Ser. No. 828,863

Claims priority, application Japan, Feb. 13, 1985, 60-25689; Mar. 28, 1985, 60-64434; Mar. 30, 1985, 60-66809; Mar. 30, 1985, 60-67055

Int. Cl.⁴ G11C 11/00, 11/24, 11/34; H01L 29/78

U.S. Cl. 365—149

18 Claims



1. A semiconductor memory cell comprising:

- a bit line for writing data;
- a word line for writing data;
- a bit line for reading out data;
- a word line for reading out data;
- a MOS transistor for writing data, one terminal of the drain-source path of the MOS transistor being connected to said bit line for writing data, and the gate electrode of the MOS transistor being connected to said word line for writing data;
- a capacitor for storing charges, one electrode of the capacitor being connected to the other terminal of the drain-source path of the MOS transistor; and
- a MOS transistor for reading out data, one terminal of the drain-source path of the MOS transistor being connected to said bit line for reading out data, the other terminal of the drain-source path of the MOS transistor being connected to said word line for reading out data, and the gate electrode of the MOS transistor being connected to the other electrode of said capacitor.

4,716,549

SEMICONDUCTOR MEMORY DEVICE HAVING A CIRCUIT FOR COMPENSATING FOR DISCRIMINATING VOLTAGE OF MEMORY CELLS

Masao Nakano, Kawasaki; Yoshihiro Takemae, Tokyo; Tomio Nakano, Kawasaki; Shigeki Nozaki, Kuwana; Kimiaki Sato, Tokyo, and Nobumi Kodama, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 29, 1986, Ser. No. 901,680

Claims priority, application Japan, Oct. 8, 1985, 60-222757

Int. Cl.⁴ G11C 7/02, 11/24

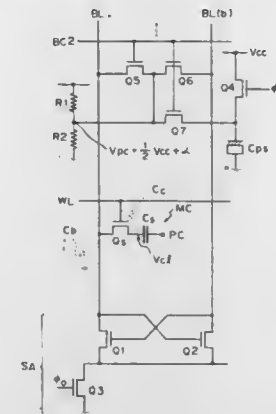
U.S. Cl. 365—203

7 Claims

1. A semiconductor memory device having a circuit for compensating for a discriminating voltage of a memory cell, comprising:

- a bit line pair consisting of first and second bit lines;
- a memory cell comprising a memory capacitor for storing data and a gate circuit capable of coupling the memory capacitor to the first bit line of the bit line pair;
- a word line, connected to the gate circuit, for energizing and deenergizing the gate circuit to control coupling and decoupling of the memory cell to and from the first bit line;
- a sense amplifier connected to the bit line pair, which sense amplifier being adapted to sense and amplify a voltage at the first bit line by using a precharge voltage of the second bit line as a reference voltage in an active state of the semiconductor memory device; and
- a precharge circuit for precharging the bit line pair to a

predetermined resultant precharge voltage in a reset state of the semiconductor memory device, wherein the precharge circuit precharges the bit line pair with the resultant precharge voltage obtained by adding a compensating voltage to a precharge voltage in the reset state, the compensating voltage being adapted to compen-



sate for variation in a memory cell discriminating voltage based on variation in a memory cell voltage caused by capacitive coupling of the word line to the memory capacitor due to a parasitic capacitance of the gate circuit in the active state, and the precharge voltage being adapted to optimize the memory cell discriminating voltage when it is assumed that the parasitic capacitance is not present.

4,716,550

HIGH PERFORMANCE OUTPUT DRIVER

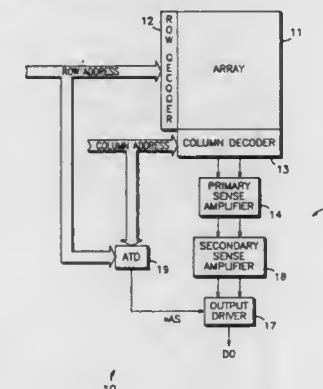
Stephen T. Flannagan, and Paul A. Reed, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 7, 1986, Ser. No. 882,569

Int. Cl.⁴ G11C 13/00

U.S. Cl. 365—207

8 Claims



4. In a memory having an array of memory cells, each memory cell for containing data therein in the form of a first pair of differential signals; decoder means for selecting a memory cell in response to an address; and a sense amplifier for receiving data from the selected memory cell and for providing a pair of differential signals representative of the data received from the selected memory cell; an output driver comprising:

- a first input line for receiving a first signal of the pair of differential signals;
- a second input line for receiving a second signal of the pair of differential signals;
- a first transistor having a first current electrode coupled to a first power supply terminal, a second current electrode for providing an output signal of the memory, and a control electrode;
- first logic means, having a first input coupled to the first input line, an output coupled to the control electrode of

the first transistor, and a second input for receiving a disable signal, for providing said output at a logic state which causes the first transistor to be non-conductive when the disable signal is present and for providing said output at a logic state responsive to a logic state present on the first input line when the disable signal is not present;

a second transistor having a first current electrode coupled to a second power supply terminal, a second current electrode coupled to the second current electrode of the first transistor, and a control electrode; and

second logic means, having a first input coupled to the second input line, an output coupled to the control electrode of the second transistor, and a second input for receiving the disable signal, for providing said output at a logic state which causes the second transistor to be non-conductive when the disable signal is present and for providing said output at a logic state responsive to a logic state present on the second input line when the disable signal is not present;

a first inverter having an input coupled to the first input line, and an output;

a third transistor having a first current electrode coupled to the first input line, a control electrode coupled to the output of the first inverter, and a second current electrode;

a fourth transistor having a first current electrode coupled to the second current electrode of the third transistor, a control electrode for receiving the latch enable signal, and a second current electrode coupled to the first power supply terminal;

a second inverter having an input coupled to the second input line, and an output;

a fifth transistor having a first current electrode coupled to the second input line, a control electrode coupled to the output of the first inverter, and a second current electrode;

a sixth transistor having a first current electrode coupled to the second current electrode of the fifth transistor, a control electrode for receiving the latch enable signal, and a second current electrode coupled to the first power supply terminal.

4,716,551

SEMICONDUCTOR MEMORY DEVICE WITH VARIABLE SELF-REFRESH CYCLE

Yasaburo Inagaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

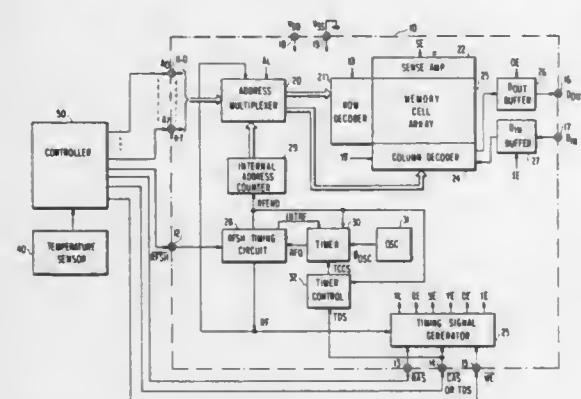
Filed Sep. 13, 1984, Ser. No. 650,153

Claims priority, application Japan, Sep. 14, 1983, 58-169773

Int. Cl.⁴ G11C 7/00

U.S. Cl. 365-222

10 Claims



1. A semiconductor memory comprising:
a plurality of address terminals;
a row address strobe terminal;
a column address strobe terminal;
a read/write control terminal;

a refresh terminal;
a memory cell array;
a first circuit coupled to said address terminals, said row address strobe terminal, said column address strobe terminal, said read/write control terminal and said memory cell array and activated during a data-read or data-write period in accordance with a level at said read/write control terminal to read data stored in a selected memory cell in said memory cell array or to write data in the selected memory cell; and
a second circuit coupled to said refresh terminal, said memory cell array and one terminal selected from said address terminals, said column address strobe terminal and said read/write control terminal and activated during a self-refresh period to refresh at least one memory cell in said memory cell array, said second circuit including an oscillator generating an oscillation signal, means for receiving a temperature detection signal supplied to said one terminal during said self-refresh period, said temperature detection signal taking a first level when an ambient temperature is equal to or higher than a predetermined value and a second level when the ambient temperature is lower than said predetermined value, and a timer circuit receiving said oscillation signal and an output of said receiving means and generating a refresh request signal in a first cycle when said temperature detection signal takes said first level and in a second cycle when said temperature detection signal takes said second level, said second circuit refreshing the memory cell in said memory cell array in response to said refresh request signal.

4,716,552

METHOD AND APPARATUS FOR NON-DESTRUCTIVE ACCESS OF VOLATILE AND NON-VOLATILE DATA IN A SHADOW MEMORY ARRAY

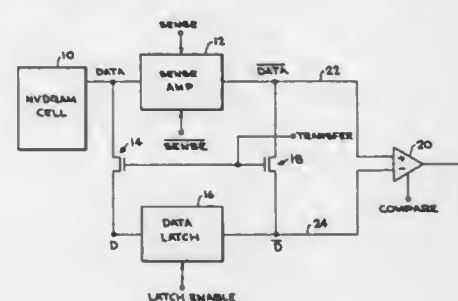
Ron Maltiel, Mountain View, and Robert L. Yan, Cupertino, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 29, 1985, Ser. No. 717,348

Int. Cl.⁴ G11C 13/00, 11/40

U.S. Cl. 365-222

18 Claims



13. Apparatus providing non-destructive access to at least two digital data elements comprising:
control means for generating a plurality of control and timing signals, said control signals including access control signals;
memory cell means responsive to said access control signals for storing at least a non-volatile digital data element and a volatile digital data element, and for generating at a terminal signals representative of said data stored within said data elements, said memory cell means further receiving at said terminal a signal and writing data corresponding to said signal to said non-volatile data element;
bidirectional sensing means responsive to said signals generated by said memory cell means for sampling said signals and for generating amplified signals therefrom;
latch means responsive to said signals generated by said memory cell means for temporarily storing said signals

and for generating a signal from said temporarily-stored signal;
transfer means responsive to one of said control signals, connected to said sensing means for selectively conducting said signals between said sensing means and said latch means upon receipt of said one of said control signals; and
comparator means having a first input responsive to said signal generated by said sensing means and a second input responsive to said signal generated by said latch means for generating a first signal when said signals at said first and said second input are equal and a second signal otherwise; whereby said digital data element stored in said volatile portion of said memory cell means is read therefrom and stored in said latch means in response to said one of said control signals and said non-volatile digital data element is sampled and a signal generated therefrom by said sensing means; and
whereby said temporarily-stored signal may be conducted to said bidirectional sensing means, said amplified signal generated therefrom applied to said memory cell means terminal and rewritten to said volatile data element therein.

4,716,553

FLOAT FOR USE IN SEISMIC SURVEYS OF THE SEA BED

Inge Dragsund, Ulsteinvik, and Einar Gjestrum, Oslo, both of Norway, assignors to Geophysical Company of Norway A.S., Horvik, Norway

Filed Dec. 24, 1984, Ser. No. 685,449

Claims priority, application Norway, Dec. 23, 1983, 834803

Int. Cl.⁴ G01V 1/38; B63B 21/16

U.S. Cl. 367-15

13 Claims



1. In a float for use in seismic surveys of the sea bed wherein an elongated float connected to a towing cable from a vessel for towing the float has at least one shaft rotatably mounted thereon, at least one seismic pulse transmitter suspension and hoisting drum on said shaft, a suspension line member on said at least one suspension and hoisting drum, a seismic pulse transmitter suspended on said suspension line, and drive means for rotating said at least one shaft and suspension and hoisting drum for raising and lowering said at least one seismic pulse transmitter with respect to said float, the improvement comprising:

an attachment means for the towing cable on said float;
at least one utility line extending from the vessel to the float for conducting power means for controlling operation of said at least one seismic pulse transmitter and drive means, the power means being operatively connected to said at least one seismic pulse transmitter and drive means;
said at least one seismic pulse transmitter being pneumatically driven;
said drive means being at least one pneumatically driven motor;
a steering control line engaging near one end thereof with the float at a position spaced from said towing cable attachment means and having the other end connected to said towing cable at a position spaced from said towing cable attachment means; and
pneumatically driven motor means mounted on said float and connected to said one end of said steering control line for adjusting the length of said steering control line to guide and control the position of the float so that varying the length of said steering control line varies the lateral

deviation of the course of the float as it is towed from the longitudinal course of the vessel;
said power means of said at least one utility line being operatively connected to said length adjustment means for operating said length adjustment means.

4,716,554

TAPERED WIRING HARNESS

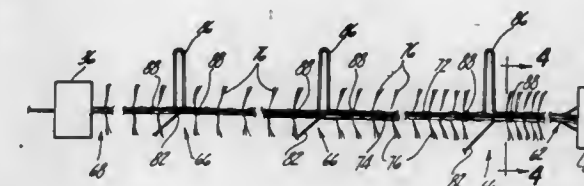
Donald R. Depew, Jackson; Robert A. Houghton, East Lansing, and David C. Sparks, Lansing, all of Mich., assignors to Spartron Corporation, Jackson, Mich.

Filed May 2, 1985, Ser. No. 729,812

Int. Cl.⁴ G01V 1/38

U.S. Cl. 367-20

10 Claims



1. A wiring harness for an array of electrical transducers comprising:

a plurality of signal wires of different lengths and being disposed in a bundle with the starting ends being approximately even and the terminal ends being staggered,
a common wire in said bundle,
a lacing of thread encircling said bundle for holding said wires together,
the end of each signal wire being outside said lacing for connection with a transducer at a take-out point,
a loop of said common wire being outside said lacing at each take-out point for connection with said transducer,
and haring on said harness comprising multiple haring members retained on said bundle by said lacing at a predetermined intervals.

4,716,555

SONIC METHOD FOR FACILITATING THE FRACTURING OF EARTHEN FORMATIONS IN WELL BORE HOLES

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Jun. 24, 1985, Ser. No. 748,161

The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.

Int. Cl.⁴ G01V 1/00

U.S. Cl. 367-35

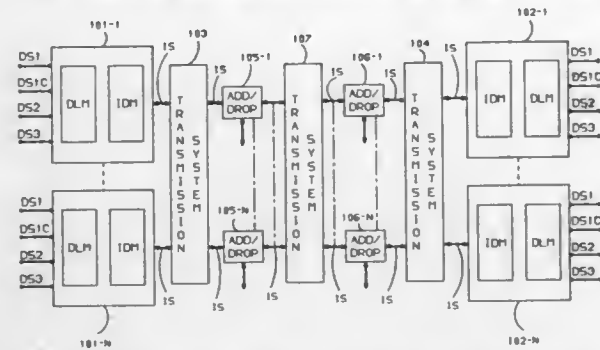
4 Claims

1. A method for providing sonic downward pressure for fracturing an earthen formation surrounding the borehole of a well comprising the steps of:

installing an elongated elastic column member down said well, said elastic column member having a plurality of sonic impeller elements spaced therealong and oriented for downward pumping action,
feeding pressurized fluid to said well at the upper end thereof, and
applying sonic energy to said elastic column member at a frequency such as to cause resonant standing wave vibration thereof, thereby effecting pulsating downward pumping action of the fluid against the earthen structure at the bottom of said well, the spacing between adjacent impeller

one or more digital transmission bit rates, the apparatus comprising:

at least one means for formatting said at least one digital signal being added into channel frames having a predetermined number of digital words, said at least one formatting means including means for generating a number of said channel frames for said at least one digital signal being added during a first predetermined interval, said number of channel frames being dependent on a predetermined relationship of the digital transmission bit rate of said at least one digital signal being formatted and a transmission bit rate of one of a predetermined set of digital signals; means for supplying a predetermined number of digital words from said channel frames for said at least one digital



signal being added during a predetermined frame interval of said transmission signal and for inserting said number of supplied digital words for said at least one digital signal being added into a group of data word positions of a repetitive transmission signal frame during said predetermined transmission signal frame interval, said number of digital words in said group for said at least one digital signal being added being dependent on the number of channel frames that have been generated therefore during said first predetermined interval; and means for combining data words from said at least one digital signal group of data word positions with data words in a repetitive frame of said transmission signal, wherein said at least one digital signal is added to said transmission signal.

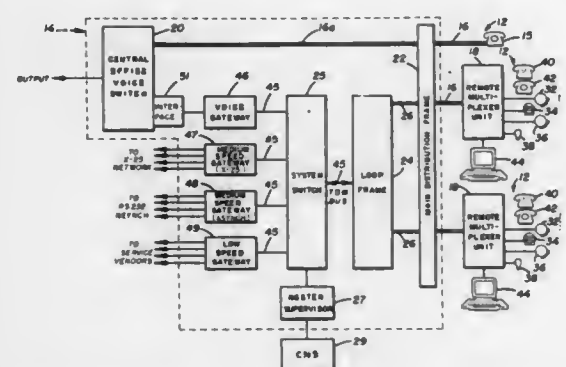
4,716,562 TELEPHONE SYSTEM

Gregg D. Carse, Mountain View, and Bernard N. Daines, Union City, both of Calif., assignors to Pacific Bell, San Francisco, Calif.

Continuation-in-part of Ser. No. 711,083, Mar. 12, 1985, abandoned. This application Mar. 11, 1986, Ser. No. 838,571
Int. Cl.⁴ H04J 3/12

U.S. Cl. 370—110.1

21 Claims



1. An information transfer system for use in a telephone system wherein full duplex digital signal bursts each containing

a plurality of different types of information are transmitted between a central office and each of a plurality of subscriber locations, and wherein signals respectively containing the different types of information in a predetermined format are transmitted between the central office and each of a plurality of selected locations outside said information transfer system which may or may not be subscriber locations, said information transfer system comprising:

signal processing means for receiving and disassembling the digital signal bursts into digital information words, each digital information word being comprised of only of the types of information in the digital signal bursts, said signal processing means also being for assembling digital information words of different types of information into digital signal bursts for transmission to respective subscriber locations,

gateway means for each type of information for converting digital information words into a predetermined signal format, said gateway means including means for transmitting formatted signals for transmission to respective selected locations corresponding to respective time slots in which digital information words are received, said gateway means further including means and for receiving signals in a predetermined format from selected locations and converting same into digital information words in predetermined destination related time slots containing the respective type of information received,

switch means coupling said signal processing means to said gateway means for routing the digital information words from said signal processing means to a respective one of said gateway means corresponding to the type of information in the digital information word being routed and in a time slot corresponding to a predetermined destination for said respective digital information word, and for routing the digital information words from each of said gateway means to said signal processing means in a predetermined time slot corresponding to a respective one of said selected locations for assembly into digital signal bursts for a particular subscriber location,

and control means coupled to said signal processing means, said gateway means, and said switch means for synchronously operating same and for placing each of said digital information words in a preallocated time slot corresponding to the source and destination of the information contained in the digital information word.

4,716,563 DEMODULATION OF AUXILIARY LOW FREQUENCY CHANNELS IN DIGITAL TRANSMISSION SYSTEMS

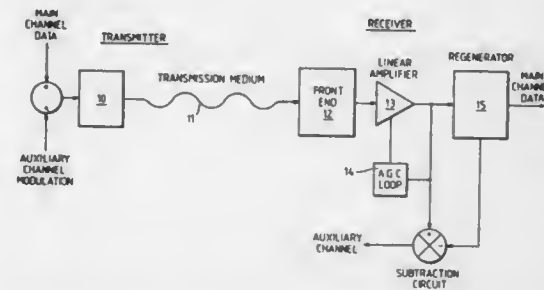
Robert C. Roust, Basildon, Great Britain, assignor to STC PLC, London, England

Filed May 19, 1986, Ser. No. 865,213

Claims priority, application United Kingdom, May 21, 1985, 8512876

Int. Cl.⁴ H04J 3/12; H04B 1/16
U.S. Cl. 370—110.4

6 Claims



1. An arrangement for the demodulation of auxiliary low frequency channels in digital transmission systems comprising

means for receiving the transmitted signals, linear amplification means with automatic gain control (AGC) to which the output of the receiving means is applied, non-linear discrimination means to which the output of the amplification means is applied for discriminating between logic levels in the amplified digital signals at the main channel bit rate, and subtraction means to one input of which the output of the amplification means is applied and to a second input of which the output of the discrimination means is applied for subtracting the output of the discrimination means from the amplified signals to obtain the auxiliary low frequency channel signals.

4,716,564

METHOD FOR TEST GENERATION

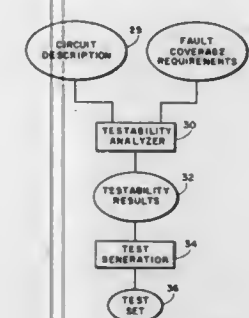
Angelo C. J. Hung, and Francis C. Wang, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 15, 1985, Ser. No. 798,649

Int. Cl.⁴ G01R 31/28

U.S. Cl. 371—27

5 Claims



1. A method for determining a group of test vectors for testing an integrated circuit network including a plurality of gates interconnected at nodes including input reveal a predetermined category of faults in said network, and output terminals of said integrated circuit network to reveal a predetermined category of faults in said network, comprising the steps of:

measuring the testability of said integrated circuit network according to a test counting procedure including propagation of sensitivity test counts forwardly from input terminals to a principal output terminal and rearwardly back to said input terminals through gates between said input and output terminals of said network to provides test count matrices for the nodes of said network including said input and output terminals, enumerating the test counts from said matrices by driving individual sensitivity values from test count matrices at said input terminals forwardly to a said output terminal and rearwardly back to said input terminals in a number of successive passes in order to accumulate the test counts described by said matrices at said nodes, and separately storing a set of sensitivity values to which said input terminals are driven for each such pass, each set comprising a test vector for said network.

4,716,565

ERROR CONCEALING SYSTEM FOR DIGITAL DATA

Tetsuro Soma, Shinagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP85/00238, § 371 Date Dec. 27, 1985, § 102(e)

Date Dec. 27, 1985, PCT Pub. No. WO85/05211, PCT Pub. Date Nov. 21, 1985

PCT Filed Apr. 26, 1985, Ser. No. 826,497

Claims priority, application Japan, Apr. 27, 1984, 59-86755

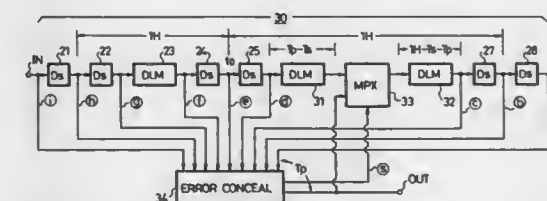
Int. Cl.⁴ H04N 5/21; G06F 11/00

U.S. Cl. 371—31

12 Claims

1. Error concealing method for digital data in which a reproduced data signal comprised of a plurality of data elements arranged in a matrix is supplied to an error concealing circuit

and an erroneous data element in said reproduced data signal is error-concealed by interpolation based on data nearby said erroneous data element in said matrix, characterized by the steps of determining when said nearby data is erroneous, con-



cealing the errors in said erroneous nearby data and then feeding back said error-concealed nearby data to said error concealing circuit to thereby carry out error-concealment of said erroneous data element using said error-concealed nearby data.

4,716,566

ERROR CORRECTING SYSTEM

Hiromu Masuhara, and Tsunekazu Kimura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

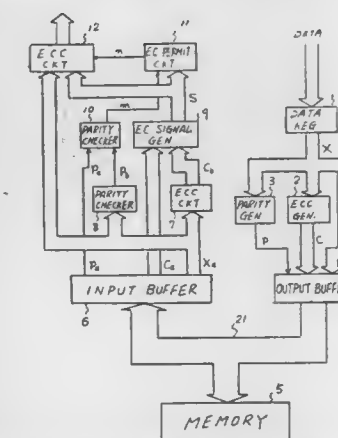
Filed Aug. 20, 1985, Ser. No. 767,596

Claims priority, application Japan, Aug. 20, 1984, 59-172670

Int. Cl.⁴ G06F 11/10

U.S. Cl. 371—37

9 Claims



1. An error correcting system comprising:
a first error correcting code generator means responsive to a data word for generating a first error correcting code to be added to the data word to be transmitted;
a first parity bit generator means responsive to said data word for generating a first parity bit associated with said data word;
a transmitting means for transmitting said data word, said first error correcting code and said first parity bit to an external circuit;
a receiving means for receiving through said external circuit a received data word, a received first error correcting code, and a received first parity bit;
a second error correcting code generator means responsive to said received data word for generating a second error correcting code to be added to the received data word;
a second parity bit generator means responsive to said received data word for generating a second parity bit associated with said received data word;
an error correction signal generator means for comparing said received first error correcting code and said second error correcting code and generating an error correction signal when a difference between said received first error correcting code and said second error correcting code is found;
a parity check means for comparing said received first parity

bit and said second parity bit and outputting a parity error signal when said received first parity bit and said second parity bit are different;

an error correction permitting means for outputting an error correction permitting signal only when both said error correction signal and said parity error signal are generated; and

an error correction circuit means for correcting an error of said received data word in accordance with said error correction signal only when said error correction permitting signal is output, said error correction circuit outputting said received data word without error correction when said error correction permitting signal is not output.

4,716,567

METHOD OF TRANSMITTING DIGITAL DATA IN WHICH ERROR DETECTION CODES ARE DISPERSED USING ALTERNATE DELAY TIMES

Masahiro Ito; Masaharu Kobayashi, and Takao Arai, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

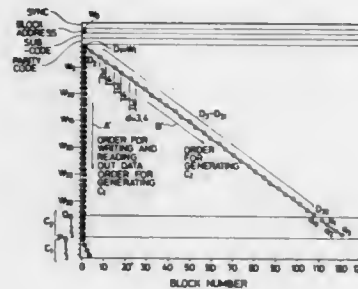
Filed Feb. 10, 1986, Ser. No. 827,606

Claims priority, application Japan, Feb. 8, 1985, 60-21651

Int. Cl.⁴ G06F 11/10

U.S. Cl. 371-40

2 Claims



1. A method of transmitting data blocks each consisting of thirty-two digital data elements as frames of one hundred and twenty-eight blocks, in which each frame also includes first and second check codes capable of detecting and correcting errors from different combinations of digital data in the blocks of the frame, said method comprising the steps of:

storing, in a memory having a plurality of block storage areas, thirty-two digital data elements in each block storage area of said memory in the order of generation of said digital data elements;

generating a plurality of sets of second check codes from the digital data stored in the memory in such a manner that each set of the second check codes is generated from thirty-two digital data elements existing alternately at delay block distances between successive elements of three and four blocks in the memory, and storing the second check codes in the memory at positions such that a delay block distance between adjacent second check codes included in each set is alternately three and four blocks;

generating a plurality of sets of first check codes in such a manner that each set of said first check codes is generated from said digital data elements and the second check codes of a respective block storage area in the memory, and storing the second check codes in the memory;

reading out from the memory and transmitting the digital data elements and the first and second check codes in the order of the block storage areas in the memory.

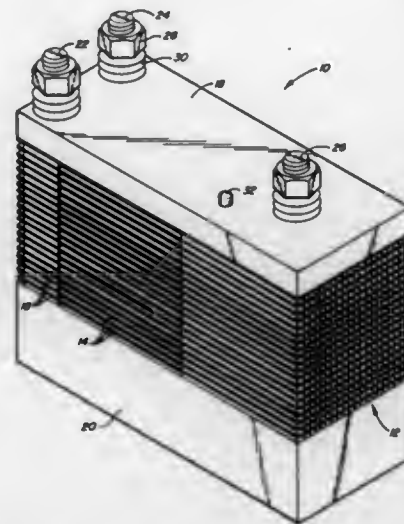
4,716,568 STACKED DIODE LASER ARRAY ASSEMBLY

Donald R. Scifres, San Jose; Peter Cross, Palo Alto, and Gary L. Harnagel, San Jose, all of Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 731,651, May 7, 1985, abandoned. This application May 1, 1986, Ser. No. 859,058
Int. Cl.⁴ H01S 3/04

U.S. Cl. 372-36

20 Claims



1. A diode laser array assembly comprising, a plurality of linear diode laser array subassemblies stacked one above another in parallel relation, each of said subassemblies having a support plate with first and second opposed major surfaces, a linear array of diode lasers mounted to a first of said major surfaces at a front edge of said support plate, and an electrically conductive path from said first major surface in parallel via a plurality of wires through said linear array to said second major surface, each of said subassemblies being electrically connected in series to at least one adjacent subassembly, the stacked subassemblies providing clearance between the linear arrays and adjacent subassemblies, and heat conducting path means for removing excess heat from said linear arrays.

4,716,569

POWER SUPPLY FOR NEGATIVE IMPEDANCE GAS DISCHARGE LASERS

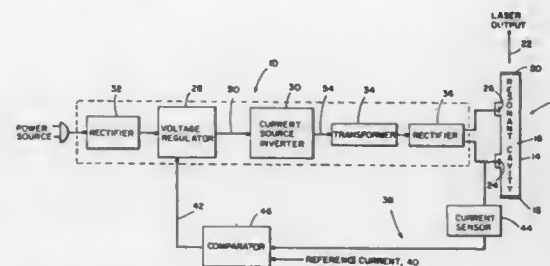
George L. Bees, Ashland, Mass., assignor to A.L.E. Systems, Inc., Ashland, Mass.

Filed Apr. 9, 1986, Ser. No. 849,843

Int. Cl.⁴ H01S 3/04

U.S. Cl. 372-38

20 Claims



1. An adjustable constant current power supply for a negative impedance gas discharge laser, comprising: means for providing constant output of current, means connected between said constant current providing means and said gas discharge laser for matching the current

output of said constant current providing means with lasing requirements of said gas discharge laser, said constant current providing means providing electrical energy to pump the gas discharge laser; and means electrically connected to said constant current providing means for feeding a variable controlled voltage to said constant current providing means said variable voltage altering said constant output of current over a preselected range feedback circuit means for providing a control signal to said variably controlled voltage feeding means; such that output power of the gas discharge laser varies with said output of current from said current providing means.

4,716,570

DISTRIBUTED FEEDBACK SEMICONDUCTOR LASER DEVICE

Toshihiko Yoshida, Tenri; Haruhisa Takiguchi; Shinji Kaneiwa, both of Nara, and Sadayoshi Matsui, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

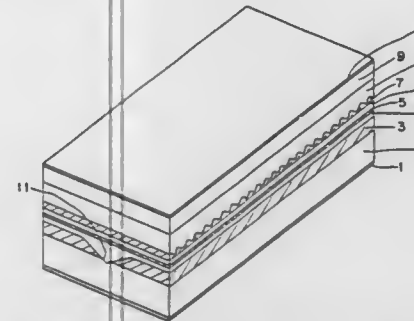
Filed Jan. 6, 1986, Ser. No. 816,259

Claims priority, application Japan, Jan. 10, 1985, 60-3099; Feb. 7, 1985, 60-23169

Int. Cl.⁴ H01S 3/19, 3/08; H01L 29/161, 29/205

U.S. Cl. 372-45

12 Claims



1. A distributed feedback semiconductor laser device comprising: an active layer positioned between a first cladding layer and a second cladding layer, wherein an absorption layer is positioned between said active layer and one of said cladding layers, said absorption layer having grooves to form a diffraction grating with a given periodicity in the direction of the propagation of laser light.

4,716,571

A HIGH-OUTPUT SEMICONDUCTOR LASER OF DOVE TAIL GROOVE TYPE

Ken Hamada, Toyonaka; Masaru Wada, Takatsuki, and Kunio Itoh, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

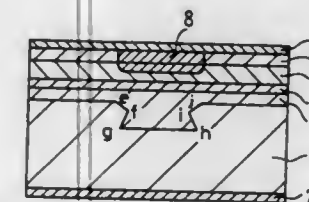
Continuation of Ser. No. 549,758, Nov. 8, 1983, abandoned. This application Jul. 16, 1986, Ser. No. 886,763

Claims priority, application Japan, Nov. 11, 1982, 57-198713

Int. Cl.⁴ H01S 3/19

U.S. Cl. 372-48

5 Claims



1. A high-output semiconductor laser comprising: a semiconductor substrate having a substantially flat principal surface, and a channel formed as a groove within said

principal surface and below said flat surface, said groove having a dove-tail shaped cross-section for defining an active lasing region;

a first electrode positioned on a second surface of said substrate opposite said channel;

a first clad layer formed on said principal surface of said substrate;

a flat active layer having a thickness sufficient to spread a laser light generated therein,

at least another clad layer formed on the side of said active layer opposite said first clad layer;

a second electrode positioned with respect to said active layer opposite said first electrode; and

a current injection region formed above said groove and said active layer,

said dove-tail shaped cross section having upper and lower parts which are wider than a middle part of the cross section.

4,716,572

METHOD FOR COATING CARBON AND GRAPHITE BODIES

Heinrich Kühn, Brechen; Olaf Stütz, Frankfurt, and Karl Wimmer, Nordendorf, all of Fed. Rep. of Germany, assignors to Sigmund GmbH, Augsburg, Fed. Rep. of Germany

Filed Dec. 17, 1985, Ser. No. 810,313

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446286

Int. Cl.⁴ H05B 7/094; B05D 1/02, 5/12

U.S. Cl. 373-88

12 Claims

1. Method for applying a sole, silicon-containing protective layer to the surface of a carbon or graphite body, which layer is substantially impervious to fluids, adheres well to carbon or graphite bodies and protects the bodies against attack of corrosive substances, which comprises, plasma spraying a powder consisting essentially of a silicon powder having a grain size under 0.05 mm with an inert gas/hydrogen mixture as a plasma gas at an atmospheric pressure of at most 200 h Pa to generate a protective layer 0.1 to 0.5 mm thick on the surface of the body, with the generated protective layer having a density which is at least 95% of the theoretical density.

12. A graphite electrode section for an arc furnace, the surface of which section is coated solely with a silicon-containing protective layer which is substantially impervious to fluids, adheres well to graphite bodies and protects the bodies against attack of corrosive substances, said layer obtained by plasma spraying a powder consisting essentially of a silicon powder having a grain size under 0.05 mm with an inert gas/hydrogen mixture as a plasma gas at an atmospheric pressure of at most 200 h Pa to generate a protective layer 0.1 to 0.5 mm thick on the surface of the body, with the generated protective layer having a density which is at least 95% of the theoretical density.

4,716,573

METHOD OF REDUCING THE EFFECT OF NARROWBAND JAMMERS IN RADIO COMMUNICATION BETWEEN TWO STATIONS

Bo C. Bergström, Täby, and Knut O. M. Herolf, Österskär, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Nov. 8, 1985, Ser. No. 796,297

Claims priority, application Sweden, Nov. 19, 1984, 8405818

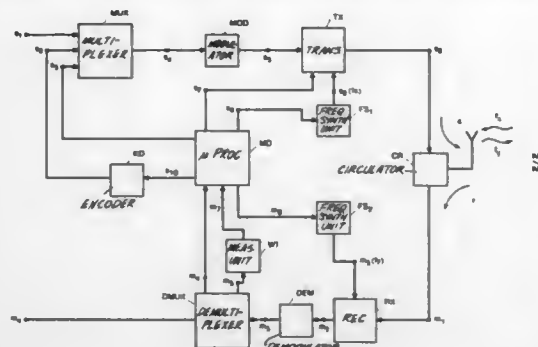
Int. Cl.⁴ H04K 1/00

U.S. Cl. 375-1

4 Claims

1. A method for reducing the effect of narrowband jammers in communication between a first station (A) and a second station (B) across a radio channel having a varying transmission quality in dependence on said jammers by using frequency hopping which includes periodically changing a transmitting frequency (fx) from the first station (A) to the second station (B) and a transmitting frequency (fy) from the second station

(B) to the first station (A) with a given period (T_h), there being randomly generated a plurality of fixed frequencies (F_1, \dots, F_n) available for the frequency hopping, each of said frequencies having mutually different or equal status values indicative of giving disturbance free or acceptable communication across said radio channel, a characteristic signal being sent from said first station (A) to said second station (B) on one of said fixed frequencies (f_1, \dots, f_n) to test the channel quality for that frequency with respect to said jammers when communicating between said stations (A,B), measuring the result of the test of



said quality in said second station (B), transmitting said result from said second station (B) and receiving the same in the first station (A) in a form such that the result is not affected by said jammers, entering the result as a status value for said frequency (f_x), and deciding in dependence on said status value whether said frequency should be used as a transmitting frequency (f_x) or if a second frequency should be chosen as a communicating frequency, said second frequency representing a mapping frequency obtained from a previous measurement giving disturbance free communication.

4,716,574

WIRELESSLY FUNCTIONING SIGNAL TRANSMISSION SYSTEM

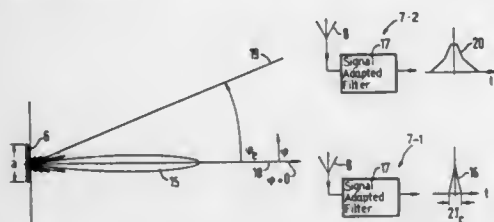
Paul W. Baier, Kaiserslautern, and Peter Rausch, Pforzheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Feb. 15, 1985, Ser. No. 702,322

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1984, 3406083

Int. Cl.⁴ H04L 7/00

U.S. Cl. 375-1

21 Claims



21. A spread-spectrum-system comprising a transmitter having a binary message source, a driving selection circuit receiving the output of said binary message source, a pair of signal generators connected to the output of the drive selection circuit and producing respectively spread-spectrum-signals of the form

$$s_L(t) = A \text{ rect}(t/T) p(t) \cos(2\pi f_c t + \phi_L) \quad (1)$$

and

$$s_H(t) = A \text{ rect}(t/T) p_H(t) \cos(2\pi f_c t + \phi_H) \quad (2)$$

where A is the amplitude of PN-PSK signal waveforms $\text{rect}(t/T)$ representing the waveform as a function of the time of

the carrier envelope which may be essentially rectangular and for a time duration T where T is equal to the product of the number L of "chips" or clock intervals respectively of said first and second generators, $p_L(t)$ is the pseudo-random sequence allocated to the logical value L and $p_H(t)$ is the pseudo-random sequence allocated to the logical value H, a directional antenna connected to the outputs of said first and second generators, a receiver located at a remote location, from said transmitter and having a receiving transducer, first and second filter correlation circuits connected to the output of said receiving transducer and said first filter correlation circuits matched to pass as output of received signal segments produced by the transmitted waveform $s_L(t)$ and said second filter correlation circuit matched to pass signal segments produced by the transmitted waveform $s_H(t)$, an envelope detector receiving the outputs of said first and second filter correlation circuits, a synchronizing means supplying synchronizing signals to said envelope detector, a first threshold circuit connected to the output of the said envelope detector, a threshold transgression duration measurement circuit connected to the output of said first threshold circuit and a second threshold circuit receiving the output of said threshold transgression duration measurement circuit and producing signal outputs.

4,716,575

ADAPTIVELY SYNCHRONIZED RING NETWORK FOR DATA COMMUNICATION

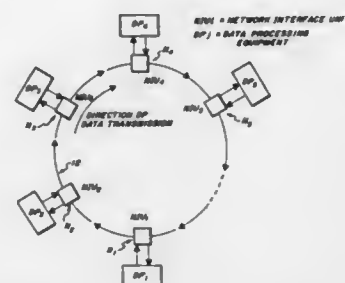
Bryan P. Douros, Natick, and Andrew Marcovitz, Cambridge, both of Mass., assignors to Apollo Computer, Inc., Chelmsford, Mass.

Continuation of Ser. No. 804,329, Dec. 4, 1985, abandoned, which is a continuation of Ser. No. 361,565, Mar. 25, 1982, abandoned. This application Oct. 14, 1986, Ser. No. 918,629

Int. Cl.⁴ H04B 3/36

U.S. Cl. 375-3

12 Claims



1. A ring communications system for a plurality of data processing units coupled to a network comprising:

a plurality of substantially similar network interface units connected in series along a closed signal path ring for receiving, storing and retransmitting data bits along the closed signal path,

each including a feedback loop for continuously controlling the data retransmitting bit rate of that network interface unit in response to a comparison between the phase of the transmitted data of that unit and the phase of the received data of that unit, and for varying the data residence delay between receipt and retransmission of data in the network interface unit, such that the steady state magnitude of the phase correction of the transmitted data for a given change in the phase of the received data bits is less than or equal to unity (1) for all network interface units, and less than unity (1) for at least one network interface unit, wherein

the transmitting bit rate approaches the receiving bit rate, and,

by cumulative action of the varying of the retransmitting bit rates and attendant delays of the plurality of network

interface units, data transmission throughout the signal path ring is stabilized at a substantially common bit rate.

4,716,576

APPARATUS FOR CONTROLLING TRANSMITTER-RECEIVER

Shigeru Sakai, and Kazunori Kado, both of Tokyo, Japan, assignors to Kabushiki Kaisha Kenwood, Japan

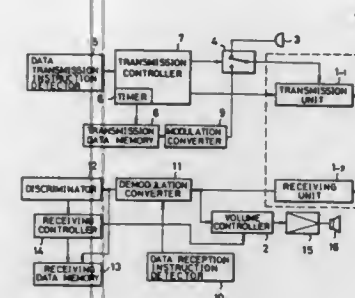
Filed Jul. 16, 1984, Ser. No. 631,074

Claims priority, application Japan, Jul. 20, 1983, 58-111555[U]

Int. Cl.⁴ H04B 1/40

U.S. Cl. 375-5

5 Claims



1. A transmitter-receiver which transmits or receives an aural signal or a data signal, comprising:

a transmitting unit (e.g. 1-1);

a receiving unit (e.g. 1-2);

a speaker (e.g. 16) for transducing an electrical signal received in said receiving unit into an acoustic sound;

a discriminator (e.g. 12) for discriminating whether an aural signal or a data signal is present in the electrical signal received in said receiving unit;

a volume controller (e.g. 2) in response to said discriminator detecting a data signal in the received signal for reducing the electrical signal applied to said speaker and thus reduce the volume of the data signal generated from the speaker, and

wherein said volume controller reduces the electrical signal to a level at which an operator can hear the acoustic sound from said speaker in response to said discriminator detecting said data signal so that the received data signal can be monitored as the acoustic sound from the speaker.

4,716,577

AUTOEQUALIZER

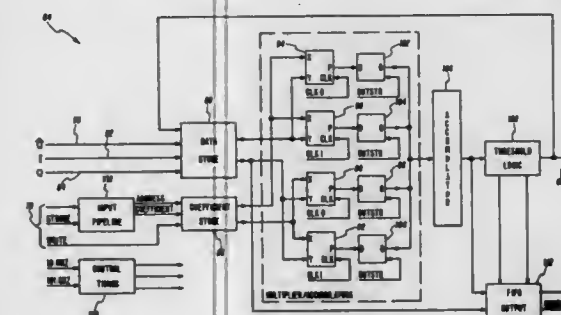
Henry E. R. Oexmann, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 7, 1986, Ser. No. 882,648

Int. Cl.⁴ H04B 3/04

U.S. Cl. 375-15

12 Claims



1. An autoequalizer for receiving continuous data streams from a first data channel and a second data channel, wherein the two data streams had originally been mixed with carriers

for transmission over a single channel with a carrier of one data stream orthogonal to the carrier of the other data stream, comprising in combination:

first means for storing consecutive data samples forming a time window from a continuous data stream, responsively connected to the first data channel;

second means for storing consecutive data samples forming a time window from a continuous data stream, responsively connected to the second data channel;

first means for providing a plurality of constants, the constants corresponding to the data samples of the first means for storing;

second means for providing a plurality of constants, the constants corresponding to the data samples of the second means for storing;

first means for mathematically operating, wherein each data sample stored in the first means for storing is mathematically operated on with the corresponding constant from the first means for providing a plurality of constants;

second means for mathematically operating, wherein each data sample stored in the second means for storing is mathematically operated on with the corresponding constant from the second means for providing a plurality of constants;

first means for summing the results of the first means for mathematically operating;

second means for summing the results of the second means for mathematically operating;

means responsive to the first and second means for summing for generating a number corresponding to an expected value for each data sample as it existed before being originally mixed; and

means for accumulating the results of the first means for summing, the second means for summing and the means for generating a number corresponding to an expected value.

4,716,578

CIRCUIT AND METHOD FOR THE RECOVERY OF DATA FROM A DIGITAL DATA STREAM

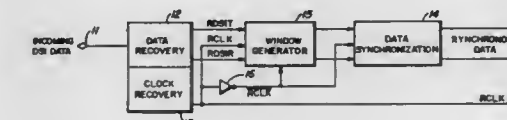
Mark S. Wight, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 29, 1986, Ser. No. 912,481

Int. Cl.⁴ H04L 7/02

U.S. Cl. 375-20

10 Claims



4. A method of recovering data from a data stream received at an input data port, the receiving circuitry comprising a clock recovery circuit for deriving clock and inverted clock signals from a data stream appearing at the input port, and a data synchronization circuit responsive to the recovered inverted clock signals and individual pulses from the data stream for providing output pulses each having a width corresponding to that of a recovered clock cycle, the method comprising the step of, at the input of the synchronization circuit, generating in response to each input data pulse and one of the clock signals a recognition window having a maximum width approximately corresponding to that of a clock cycle.

4,716,579

PHASE CORRECTOR

John Masterton, Bishop's Stortford, Great Britain, assignor to STC PLC, London, England

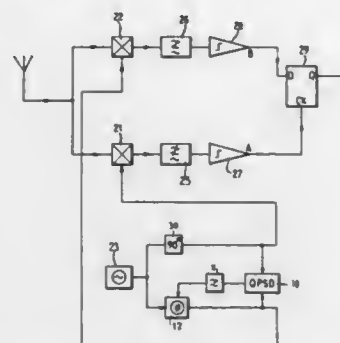
Filed Mar. 6, 1986, Ser. No. 836,797

Claims priority, application United Kingdom, Mar. 7, 1985, 8505923

Int. Cl.⁴ H03D 3/00, 3/24

U.S. Cl. 375—81

1 Claim



1. A radio receiver for frequency shift keyed signals on an RF carrier, which comprises first and second paths to which the received radio signals are applied, each said signal path including a mixer circuit followed by a low-pass filter and a limiting amplifier stage, a local oscillator running at the carrier frequency, a first connection from the local oscillator via which the output thereof is applied directly to the mixer circuits of the first of said paths, a second connection from the local oscillator to a quadrature phase shifter the output of which is applied to the mixer circuit of the second of said paths, so that the second mixer circuit receives the local oscillator output with a quadrature phase shift with respect to the first path, a quadrature phase sensitive detector to whose inputs are applied the signal on the first connection from the local oscillator and the output of the quadrature phase shifter, the output from the detector being an error signal if the phase relation is incorrect, which error signal represents the magnitude and sign of the error in phase relation, phase adjusting means responsive to the error signal to adjust the phase of one or both of the locally generated inputs to the mixers in a manner appropriate to the restoration of the correct phase relation, and a D-type clocked flip-flop to the D input of which is applied the output of one of the limiting amplifier stages while the output of the other limiting amplifiers is applied to the clock input of the flip-flop, the output of the flip-flop being the signal modulator in frequency shift keyed manner on to the carrier.

4,716,580

CHARGE TRANSFER ANALOG COMPARATOR AND DEVICES USING SUCH A COMPARATOR

Jean L. Berger, Grenoble, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 18, 1985, Ser. No. 745,883

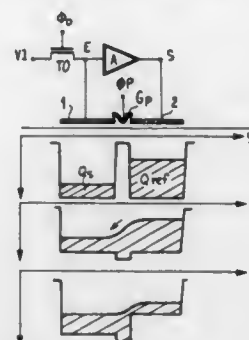
Claims priority, application France, Jun. 26, 1984, 84 10047 Int. Cl.⁴ G11C 19/28; H01L 29/78; H03M 1/00; H03K 5/153 U.S. Cl. 377—62

15 Claims

1. A charge transfer analog comparator comprising a pair of metal-insulator semiconductor (MIS) capacitors formed by two portions of a common substrate separated by a passage channel portion, an insulating layer over the substrate and a pair of electrodes over respective ones of said two portions, and a passage gate electrode overlying the passage channel portion for controllably interconnecting the pair of MIS capacitors,

an amplifier having an input and an output, the input being connected to one of the pair of electrodes, the output to the other of the pair of electrodes, and means for introduc-

ing into one of the pair of capacitors a signal charge and into the other of the pair of capacitors a reference charge for comparison with the signal charge, and



means for initiating the comparison connected to the input of the amplifier.

4,716,581

X-RAY EXAMINATION APPARATUS

Sigvard Barud, Jaerfaella, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

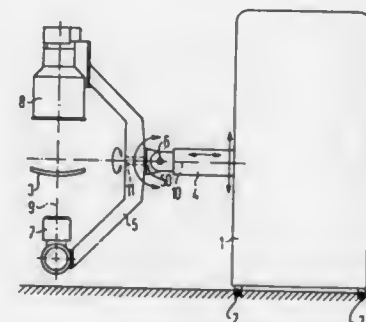
Filed Apr. 9, 1985, Ser. No. 721,853

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1984, 3413348

Int. Cl.⁴ H05G 1/02

U.S. Cl. 378—198

11 Claims



1. An x-ray examination apparatus, comprising:

a vertically extending stand;
a curved support having a radiation source mounted at one terminating end and an image layer carrier mounted at an opposite terminating end, the radiation source and image layer carrier being aligned to one another so that a central ray from the radiation source will strike the image layer carrier;

support mounting means for connecting the support to the stand for translational and rotational movement of the support relative to the stand; and

said support mounting means comprising, at its distal end opposite the stand, an end part having a first shaft projecting from one end thereof to which the support is directly mounted and about which the support rotates, a supporting shaft connecting to said stand, and a horizontal second shaft connecting the supporting shaft to the end part and which engages an opposite end of the end part, said second shaft being perpendicular to said first shaft and perpendicular to a direction of said central ray, the end part and the attached support pivoting about said second shaft so that the support pivots in a vertical plane.

4,716,582

DIGITAL AND SYNTHESIZED SPEECH ALARM SYSTEM

Kenneth E. Blanchard, Media, and Stephen V. Sanislo, Jr., Springfield, both of Pa., assignors to Phonetics, Inc., Media, Pa. and Wisconsin Bell, Inc., Milwaukee, Wis.

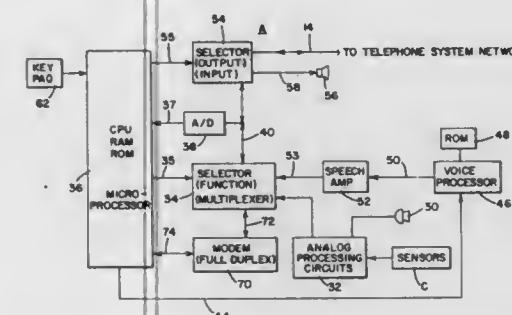
Continuation-in-part of Ser. No. 792,325, Oct. 28, 1985, which is a division of Ser. No. 488,999, Apr. 27, 1983, Pat. No. 4,558,181.

This application Sep. 16, 1986, Ser. No. 907,997

Int. Cl.⁴ H04M 1/24, 11/04

U.S. Cl. 379—28

4 Claims



1. A portable, self-contained device for monitoring a selected local area, having a standard telephone terminal for connection to a standard external telephone line, said device adapted to report occurrence of any of a plurality of preselected conditions adjacent said local area, said device comprising:

- means for setting in said device a first identification number corresponding to a telephone number for the external telephone line into said selected local area;
- means for selectively connecting said device onto said external telephone line installed at said selected local area;
- means for creating in said device a first distinct signal upon occurrence of one of said plurality of preselected conditions;
- synthetic speech generator means for generating in said device a first synthetic voice message in response to said distinct signal;
- means for amplifying and playing said first synthetic voice message at said local area upon its creation;
- means causing said synthetic speech generator to create a first telephone format dialing signal corresponding to a second identification number of a first, remote preselected telephone in response to said distinct signal;
- means applying said dialing signal to said external telephone line and thereby initiating a telephone call;
- means for creating an answer and handshake present signal upon recognizing the occurrence of an answer and handshake at said first remote telephone;
- a modem for creating a telephone compatible digital information signal in response to said answer and handshake present signal, said digital signal including a representation of said first identification number;
- switch means directing said digital signal onto said telephone line;
- means terminating said telephone call;
- means for reobtaining a dial tone when an answer and handshake present signal is not generated and cycling means for repeatedly creating said first dialing signal and seeking an answer and handshake at said first remote telephone for a preselected period of time;
- means responsive to the absence of said answer and handshake present signal for said preselected period of time causing said synthetic speech generator to create a second telephone format dialing signal corresponding to the identification number of a second, remote preselected telephone;

- means applying said second dialing signal to said external telephone line and thereby initiating a telephone call;
- means creating an answer signal upon recognizing the occurrence of an answer at said second remote telephone;
- preprogrammed means creating a digital compatible indicator signal if said second preselected telephone is capable of the receipt of digital information;
- means creating a handshake present signal if a digital handshake is received from said second remote telephone;
- means activating said switch means for directing said digital signal to said telephone line if said handshake present signal is present; and
- means causing said synthetic speech generator to create a second synthetic voice signal in response to the absence of said digital compatible indicator signal, said second synthetic voice signal includes a representation of said first identification number and means applying said second synthetic voice signal to said telephone line.

3. A method for monitoring a selected local area with a device having a standard telephone terminal connected to standard external telephone lines of a standard commercial telephone network for occurrence of any of a plurality of preselected conditions adjacent said local area, said method comprising:

- setting a first identification code in said device corresponding to a telephone number for said standard external telephone lines into said selected local area;
- automatically answering a telephone call directed to said device on said standard external telephone lines;
- determining if a digital communications format handshake is present on said external telephone lines and creating a handshake present signal in response thereto;
- in the absence of a handshake present signal, creating a synthetic speech message including information corresponding to an identification code for said local area external telephone lines and information on the status of said preselected conditions, applying said synthetic speech message to said external telephone lines as intelligence and terminating said telephone call;
- in the presence of a handshake present signal, determining if a data command is present on said external telephone lines and generating a data command present signal in the presence of such command;
- in the absence of a data command present signal, creating a digitally encoded telephone system acceptable message including an identification code for said local area external telephone lines and the status of said preselected conditions, masking references to alarm conditions reported and terminating said telephone call;
- in the presence of a data command present signal, terminating said telephone call, initiating a second telephone call by creating and applying to said external telephone lines a telephone format dialing signal corresponding to an identification code of a remote preselected telephone connected to said commercial telephone network, determining whether an answer and digital handshake is present on said external telephone lines and creating an answer and handshake present signal in the presence thereof; in the presence of said answer and handshake present signal, applying said digitally encoded telephone system acceptable message to said external telephone lines, masking references to alarm conditions reported and disconnecting said second telephone call; in the absence of said answer and handshake present signal, terminating said second telephone call and reapplying said telephone format dialing signals to said external telephone line seeking an answer and handshake present signal.

- a first scrambler coupled to said output of first serial-to-parallel converter;
- a second frequency divider coupled to said first frequency divider and forming a third clock signal;
- a first converting means comprising at least one serial-to-parallel converter for each output of said first serial-to-parallel converter, coupled to said first frequency divider, said first scrambler and said second frequency divider, wherein said third clock signal controls reading of said converting means;
- a second scrambler receiving said audio signals;
- a first memory coupled to said second scrambler, wherein said audio frequency controls loading of said first memory and said third clock signal controls reading of said first memory;
- an encoding means coupled to said first memory and said converting means for channel encoding said video and said audio signals;
- a register coupled to said encoding means, said first memory and said third clock signal for storing an output of said encoding means;
- a multiplexer coupled to said register for combining said output of said register into parallel flow and a frame alignment word;
- a parallel-to-serial converter coupled to said multiplexer forming a digital TV signal, under serial form with channel encoding; and
- a switching matrix coupled to said parallel-to-serial converter for selection of television channels by said subscribers.

4,716,588

ADDRESSABLE SUBSCRIPTION TELEVISION SYSTEM HAVING MULTIPLE SCRAMBLING MODES

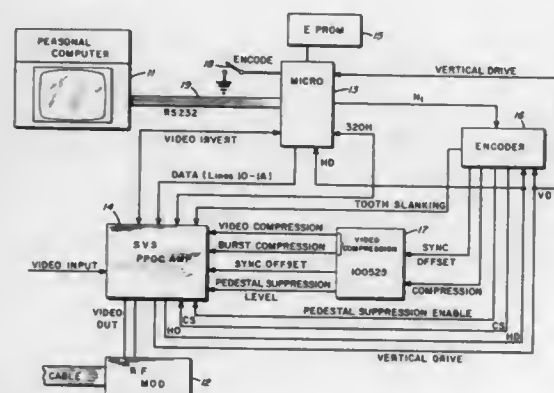
John R. Thompson, La Quinta; Curtis J. Hunting, Altadena; Ronald K. Masson, Topanga, and Craig E. Trivelpiece, Irvine, all of Calif., assignors to Payview Limited, Hong Kong

Filed Oct. 29, 1985, Ser. No. 792,704

Int. Cl.⁴ H04N 7/167

U.S. Cl. 380—20

22 Claims



1. A method for scrambling a video signal, said video signal including a plurality of sequential fields, each field having a plurality of active line portions preceded by a horizontal synchronization period comprising:

- removing horizontal synchronization pulses from said synchronization period;
- compressing the amplitude of said active line portions;
- adding a pseudo synchronization pulse having an amplitude greater than said removed synchronization pulse to said synchronization period from which said horizontal synchronization pulses were removed, said pseudo synchronization pulse leading edge occurring at a time different than that of said removed synchronization pulse;
- changing the position of said pseudo synchronization pulses leading edge in subsequent fields; and;

adding an offset voltage to said video signal during the active line period of said video signal.

4,716,589

MULTIVOICE SIGNAL SWITCHING CIRCUIT

Tochiya Matsui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

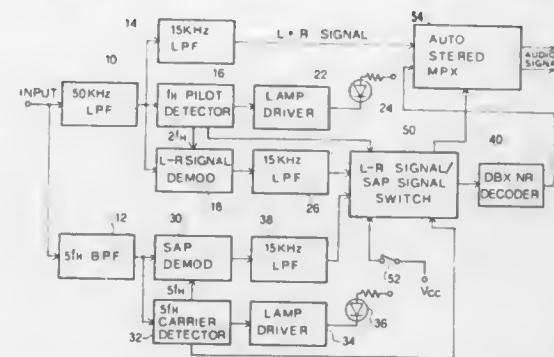
Filed Nov. 26, 1985, Ser. No. 801,714

Claims priority, application Japan, Nov. 26, 1984, 59-179101[U]

Int. Cl.⁴ H04H 5/00

U.S. Cl. 381—3

24 Claims



1. A multivoice signal switching circuit for treating a multivoice signal including a main channel and first and second subchannels, the first subchannel being assigned to stereophonic information and the second subchannel being assigned to second language information, comprising means receiving a control signal for selectively outputting one of the first and second subchannel signals extracted from said multivoice signal, means for sensing the second subchannel signal, and means connected to the sensing means and for controlling the selectively outputting means so as to force said selectively outputting means to a condition of outputting the first subchannel signal irrespective of the control signal, when the second subchannel signal cannot be sensed.

4,716,590

AM STEREO TRANSMISSION METHOD AND APPARATUS

Susumu Takahashi, and Hiroshi Iida, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

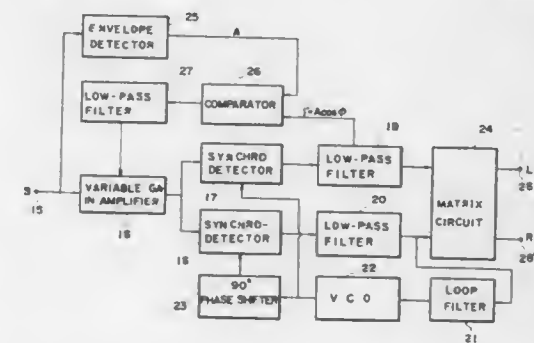
Filed Jan. 16, 1985, Ser. No. 691,793

Claims priority, application Japan, Jan. 17, 1984, 59-6174; Nov. 19, 1984, 59-176123[U]; Nov. 19, 1984, 59-176124[U]; Nov. 19, 1984, 59-176125[U]

Int. Cl.⁴ H04H 5/00

U.S. Cl. 381—15

9 Claims



1. A demodulator for AM stereo signals, comprising: an amplitude controller for receiving an AM signal $S=A \cos$

$(\omega t + \phi)$, wherein A represents an amplitude, ω a carrier angular frequency, and $\phi = \tan^{-1} (L-R)/(1+L+R)$ a phase angle;

- an orthogonal demodulator for orthogonally demodulating the output of the amplitude controller;
- a matrix circuit for deriving left and right audio signals L and R from sum and difference signals $(L+R)$ and $(L-R)$ obtained by the orthogonal demodulator;
- an amplitude control signal generator circuit for producing a control signal to control the amplitude controller, and a low-pass filter for passing said control signal to said amplitude controller, wherein when the received AM stereo signal S is equal to $(1+L+R) \cos(t+\phi)$, the amplitude of the AM stereo signal S is changed by said amplitude controller in response to said control signal to

$$\sqrt{(1+L+R)^2 + (L-R)^2} \cos(\omega t + \phi).$$

4,716,591

SPEECH SYNTHESIS METHOD AND DEVICE

Sigeaki Masuzawa, Nara; Shinya Shibata, Yamatokoriyama; Hiroshi Miyazaki, and Tetsuo Iwase, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

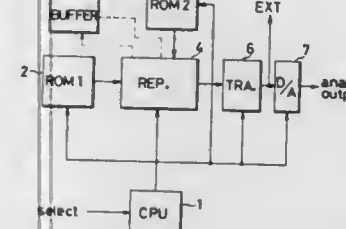
Continuation of Ser. No. 577,482, Apr. 6, 1984, abandoned, which is a continuation of Ser. No. 398,906, Jul. 16, 1982, abandoned, which is a continuation of Ser. No. 123,065, Feb. 20, 1980, abandoned. This application Nov. 8, 1985, Ser. No. 795,760

Claims priority, application Japan, Feb. 20, 1979, 54-19309

Int. Cl.⁴ G10L 5/00

U.S. Cl. 381—51

2 Claims



1. A method for synthesizing speech waveforms comprising the steps of:

- (a) storing digital speech information designating speech phonemes in a first addressable memory;
- (b) storing in a second addressable memory digital compression command information in a normalized form, said compression command information being capable of modifying the phonemes at least with respect to pitch cycle and amplitude and reading said phonemes out of said first memory means either selectively or sequentially;
- (c) reading out the compression command information in the normalized form from said second memory;
- (d) decoding the normalized form of said compression command information into the actual digital form;
- (e) modifying said phonemes using the actual digital form of said compression command information to form continuously digitalized synthetic speech waveforms;
- (f) converting the digitalized synthetic speech waveforms into analog waveforms; and
- (g) quantizing said continuously digitalized synthetic waveform at predetermined spaced sampling times, computing the average value of the waveform between adjacent spaced sampling times, interleaving said average values into said waveform between said adjacent spaced sampling times to generate a composite quantized digital

waveform and converting said composite quantized digital waveform into an analog waveform.

4,716,592

METHOD AND APPARATUS FOR ENCODING VOICE SIGNALS

Kazunori Ozawa, and Takashi Araseki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

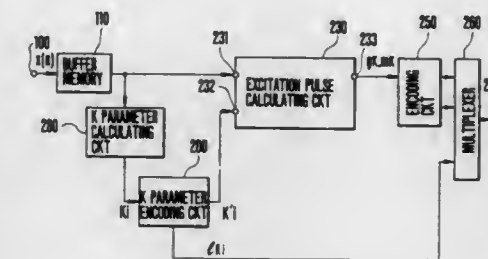
Filed Dec. 27, 1983, Ser. No. 565,804

Claims priority, application Japan, Dec. 24, 1982, 57-231603; Dec. 24, 1982, 57-231605; Dec. 24, 1982, 57-231606

Int. Cl.⁴ G10L 5/00

U.S. Cl. 381—40

5 Claims



1. An apparatus for encoding voice signals comprising: means inputted with a discrete voice signal series for dividing said voice signal series at each time interval to obtain a time interval voice signal series;
- means for extracting a parameter representative of a spectrum envelope from said time interval voice signal series and encoding the parameter;
- means for calculating an impulse response series based on said parameter representative of said spectrum envelope;
- means for calculating an autocorrelation function sequence of said impulse response series;
- means for calculating a cross-correlation function sequence between said impulse response series and said time interval voice signal series;
- means for calculating and encoding an excitation signal series of said time interval voice signal series by using said autocorrelation function sequence and said cross-correlation function sequence; and
- means for combining and outputting a code of said parameter representative of said spectrum envelope and a code representative of said excitation signal series.

4,716,593

IDENTITY VERIFICATION SYSTEM

Shoichi Hirai, Yokohama, and Sadakazu Watanabe, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

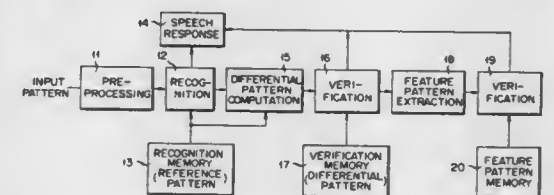
Filed Jun. 17, 1983, Ser. No. 505,496

Claims priority, application Japan, Jun. 25, 1982, 57-109527

Int. Cl.⁴ G10L 5/00

U.S. Cl. 381—42

2 Claims



1. An identity verification system comprising: speech input means for providing input speech pattern data from utterances of a speaker;
- first memory means for storing speech reference pattern data

for each of categories prepared from speech pattern data obtained by utterances of a plurality of speakers;
 similarity computing means responsive to said speech input means and said first memory means for computing similarities between said input speech pattern data and said reference pattern data for each of categories and recognizing the category of utterance of the speaker from the computed similarities;
 second memory means for storing speech reference differential pattern data and reference vector pattern data of each of specific speakers for categories, said speech reference differential pattern data of a speaker being prepared by a difference between an input speech pattern of the speaker for a category and speech reference pattern data of the same speaker for the same category as the input speech pattern the speech reference feature vector pattern data being extracted from the speech reference differential pattern data for each of the specific speakers;
 speech differential pattern computing means responsive to said speech input means and said first memory for computing differential pattern data indicative of a difference between speech input pattern data obtained through said speech input means by a speaker claiming identity verification and speech reference pattern data of the same cate-

gory as the input speech pattern whose category has been recognized by said similarity computing means;
 identity verification means responsive to said second memory means and said speech differential pattern computing means for comparing the speech differential pattern data provided by said speech differential pattern computing means with the speech reference differential pattern data of the recognized category stored in said second memory means to verify the speaker claiming identity verification; and
 feature vector pattern extracting means responsive to said speech differential pattern computing means for extracting feature vector pattern data from the speech differential pattern data of the speaker claiming identity verification computed by said speech differential pattern computing means; and wherein
 said identity verification means is arranged to perform speaker identity verification, in a first stage, on the basis of the speech differential pattern data, and, in a second stage, on the basis of the feature vector pattern data when the first stage identity verification is difficult.

DESIGNS

DECEMBER 29, 1987

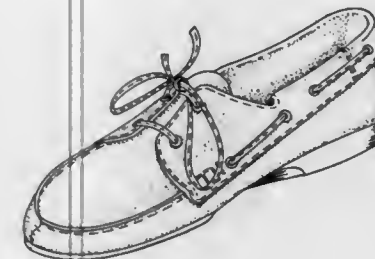
293,385
SHOE

Leo H. Famolare, Kennebunkport, Me., assignor to Wolverine World Wide, Inc., Rockford, Mich.

Filed Mar. 18, 1985, Ser. No. 713,043

Term of patent 14 years

U.S. Cl. D2—287



293,386

SHOE UPPER

Brenda C. Kelley, Beaverton, Oreg., assignor to Pensa, Inc., Portland, Oreg.

Filed Apr. 4, 1986, Ser. No. 847,882

Term of patent 14 years

U.S. Cl. D2—314



293,387

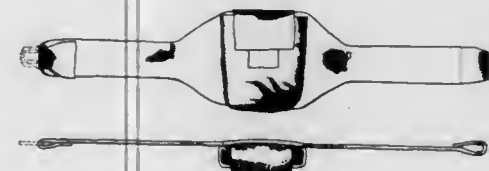
KNAPSACK BELT

Richard S. Wagner, II, Cincinnati, Ohio, assignor to Tune Belt, Inc., Cincinnati, Ohio

Filed May 17, 1985, Ser. No. 735,051

Term of patent 14 years

U.S. Cl. D2—630



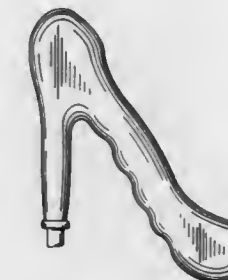
293,388

UMBRELLA HANDLE

John L. Susan, 1819-9th St., Rockford, Ill. 61108
Filed Feb. 18, 1985, Ser. No. 700,114

Term of patent 14 years

U.S. Cl. D3—12



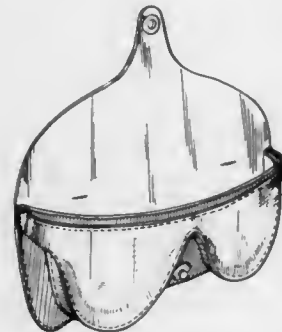
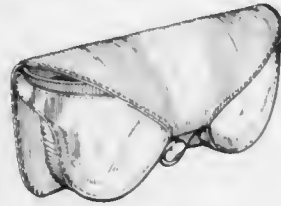
293,389

SPECTACLES CASE WITH EXTERNAL POCKETS FOR SPARE GLASSES

Alberto Vitaloni, Turin, Italy, assignor to Vitaloni S.p.A., Belnasco, Italy

Filed May 7, 1985, Ser. No. 731,305
Term of patent 14 years

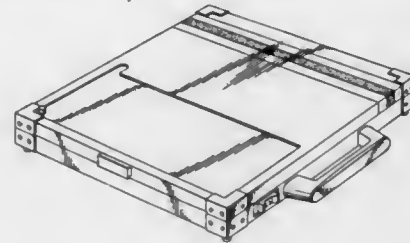
U.S. Cl. D3—34



293,390

MAGAZINE FOR SUPPLYING FILM FOR A PRINTER
Masatoki Sutou, Okazaki; Yutaka Maeda, Machida, both of Japan; Walter F. Anderson, Jr., Minneapolis, and James W. Kochevar, Shoreview, both of Minn., assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan and Minnesota Mining and Manufacturing Company (3M), St. Paul, Minn.Filed May 22, 1985, Ser. No. 736,714
Claims priority, application Japan, Nov. 22, 1984, 59-48258
Term of patent 14 years

U.S. Cl. D3—35



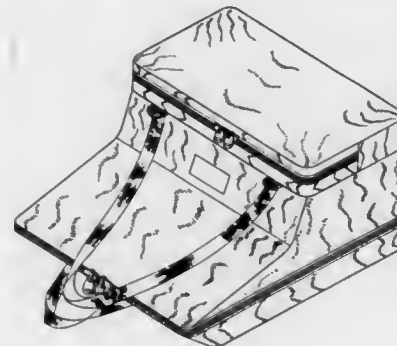
293,391

COMPUTER TOTE BAG

Robert H. Preston, 6909 Quail Pl., Unit F, La Costa, Calif. 92009

Filed Sep. 6, 1984, Ser. No. 647,657
Term of patent 14 years

U.S. Cl. D3—71



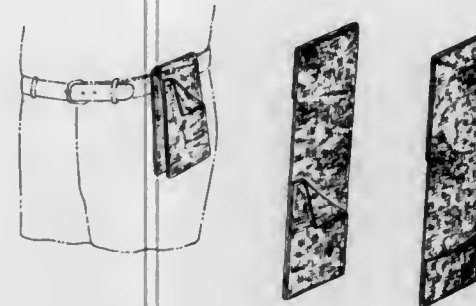
293,392

PURSE ATTACHMENT FOR BELT

Marilyn R. Lindon, Los Angeles, Calif., assignor to La Cle, Jochen Hoffmann, Memmertweg 28, 4800 Bielefeld 16, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,978
Term of patent 14 years

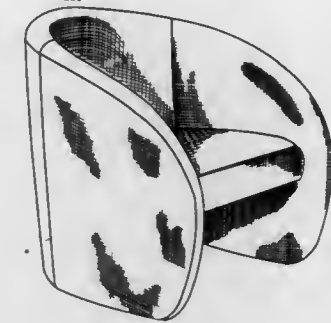
U.S. Cl. D3—106

293,395
SEAT

Jochen Hoffmann, Memmertweg 28, 4800 Bielefeld 16, Fed. Rep. of Germany

Filed Jun. 6, 1985, Ser. No. 741,908
Term of patent 14 years

U.S. Cl. D6—375



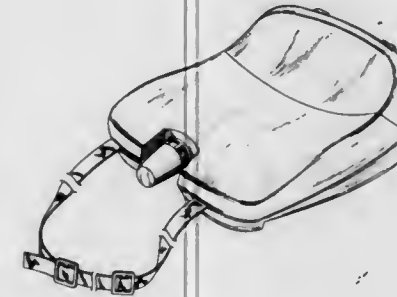
293,393

COMBINED SEAT AND CONTAINER

Eugene L. Bothun, Loveland, and Michael C. McGuire, Littleton, both of Colo., assignors to Sit-N-Sip, Inc., Huntington Beach, Calif.

Filed May 14, 1985, Ser. No. 733,937
Term of patent 14 years

U.S. Cl. D6—335



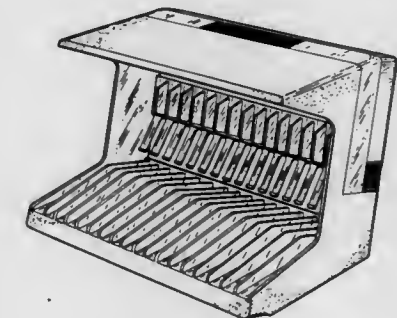
293,396

COMPACT DISK STORAGE UNIT

James A. Womack, Fremont, and Peter J. Palmer, San Jose, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.

Filed May 17, 1985, Ser. No. 735,827
Term of patent 14 years

U.S. Cl. D6—407



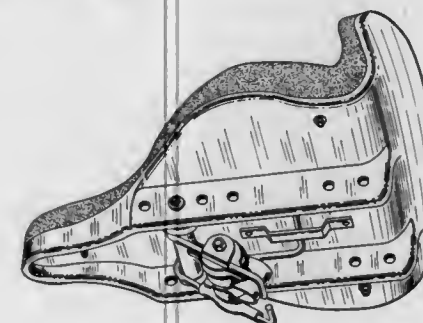
293,394

ANATOMIC CYCLE SEAT FOR RELIEVING PELVIC PRESSURE

Stephen A. Holcomb, P.O. Box 1389, Santa Maria, Calif. 93455

Filed Oct. 24, 1985, Ser. No. 791,135
Term of patent 14 years

U.S. Cl. D6—354



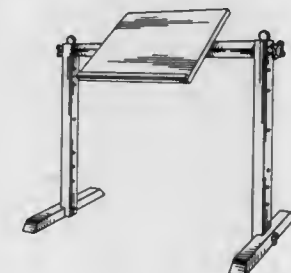
293,397

ADJUSTABLE TABLE

William G. Hunt, 1210 E. Main St., Sunset Beach, N.C. 28459

Filed Jun. 17, 1985, Ser. No. 745,505
Term of patent 14 years

U.S. Cl. D6—429



293,398

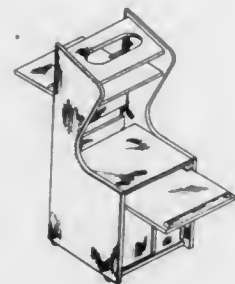
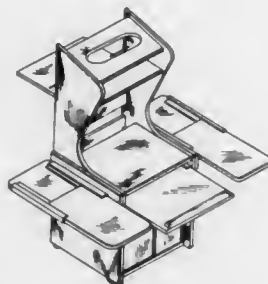
MOBILE PERSONAL COMPUTER WORKSTATION

Gordon F. Kwiecinski, Cincinnati, Ohio, assignor to Hamilton Sorter Co., Inc., Fairfield, Ohio

Filed May 3, 1985, Ser. No. 730,469

Term of patent 14 years

U.S. Cl. D6-430



293,399

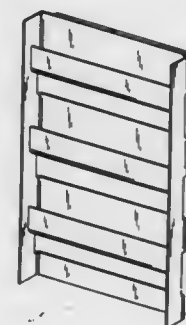
DISPLAY CASE FOR GREETING CARDS

John P. Persitz, 1400 E. Bellevue Pl., Milwaukee, Wis. 53211

Filed Apr. 25, 1985, Ser. No. 726,994

Term of patent 14 years

U.S. Cl. D6-468



293,400

TABLE

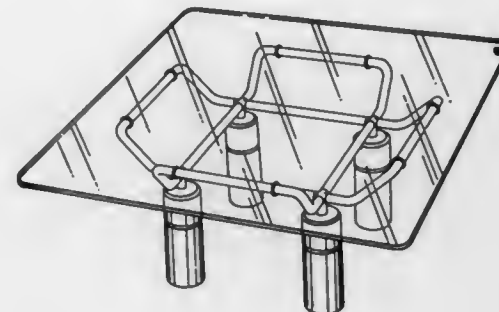
Michael M. Stewart, Toronto, Canada, assignor to Ambient Systems Limited, Toronto, Canada

Filed Apr. 22, 1985, Ser. No. 725,442

Claims priority, application Canada, Mar. 19, 1985, 19-03-85-1

Term of patent 14 years

U.S. Cl. D6-487



293,401

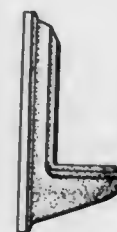
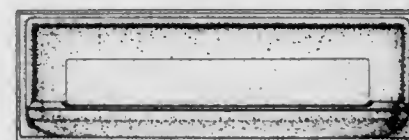
SHOWER STALL SOAP DISH

John W. Moore, St. Louis County, Mo., assignor to The Swan Corporation, St. Louis, Mo.

Filed Jul. 12, 1985, Ser. No. 754,167

Term of patent 14 years

U.S. Cl. D6-540



293,402

DISPENSER HOUSING FOR LIQUIDS

Tor Petterson, Palos Verdes, Calif., assignor to James River Corporation of Nevada, San Francisco, Calif.

Filed Apr. 25, 1986, Ser. No. 857,773

Term of patent 14 years

U.S. Cl. D6-545



293,403

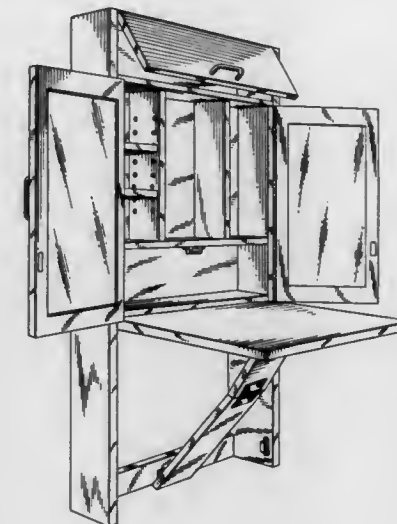
WALL MOUNTED VANITY

Martin Umanoff, 26 Windsor Rd., Great Neck, N.Y. 11021, and Chris W. Boehl, 7 Pine Dr., Port Washington, N.Y. 11050

Filed Dec. 23, 1986, Ser. No. 946,285

Term of patent 14 years

U.S. Cl. D6-555



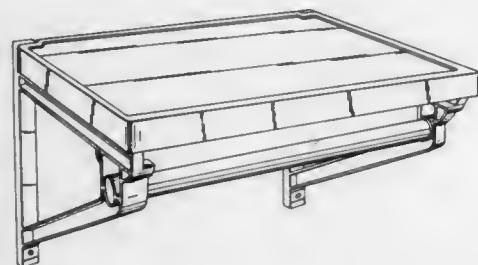
293,404

WALL-MOUNTED SHELF AND ROD COMBINATION
Kent W. Murphy, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Nov. 29, 1985, Ser. No. 807,048

Term of patent 14 years

U.S. Cl. D6—574



293,406

DECALCOMANIA OR THE LIKE FOR CHINA DINNERWARE

Jeanette Mattson, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,076

Term of patent 14 years

U.S. Cl. D7—39



293,405

DECALCOMANIA OR THE LIKE FOR CHINA DINNERWARE

Helea Zaghailb, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,075

Term of patent 14 years

U.S. Cl. D7—39



293,407

COMBINATION FOOD CONTAINER AND SCOOP

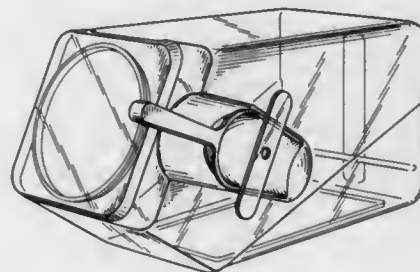
Peter Edwards, Hayward; Bodd Steinhilber, Stinson Beach, and Ken Gilliam, San Francisco, all of Calif., assignors to Harmony Foods, Inc., Santa Cruz, Calif.

Filed Jan. 30, 1986, Ser. No. 824,077

The portion of the term of this patent subsequent to Dec. 22, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—79



293,408

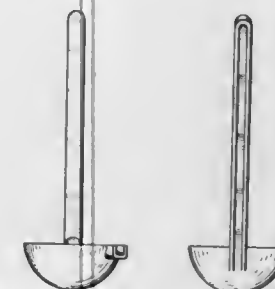
PUNCH LADLE

Erik L. Hansen, Roskilde, Denmark, assignor to Rosti A/S, Denmark

Filed May 8, 1985, Ser. No. 731,798

Term of patent 14 years

U.S. Cl. D7—104



293,410

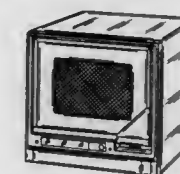
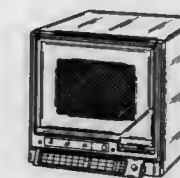
MICROWAVE OVEN

Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan

Filed Feb. 19, 1985, Ser. No. 703,107

Term of patent 14 years

U.S. Cl. D7—351



293,409

ELECTRIC INSULATED BEVERAGE DISPENSER OR THE LIKE

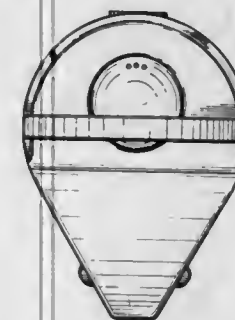
Seishin Seike, Osaka, Japan, and Mario Bellini, Rotterdam, Netherlands, assignors to Zojurushi Vacuum Bottle Co., Ltd., Osaka, Japan

Filed Nov. 1, 1984, Ser. No. 667,311

Claims priority, application Japan, May 1, 1984, 59-017976

Term of patent 14 years

U.S. Cl. D7—313



293,411

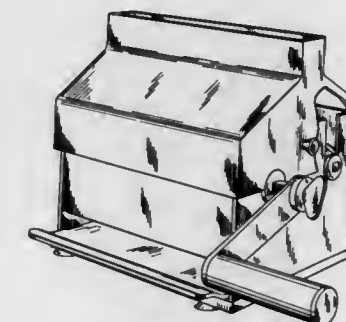
MEAT TENDERIZER

Rosalie J. Dickey, 7814 Old Harford Rd., Baltimore, Md. 21234

Filed Jul. 20, 1984, Ser. No. 632,647

Term of patent 14 years

U.S. Cl. D7—382



293,412

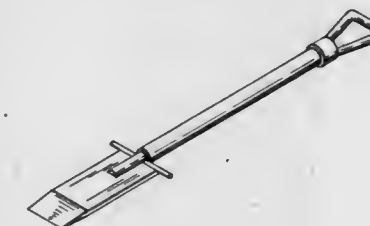
SPADE

Celso S. Gonzales, 245 Bennett Ave., Apt. 3-E, New York, N.Y. 10040

Filed Jan. 4, 1985, Ser. No. 688,823

Term of patent 14 years

U.S. Cl. D8—10



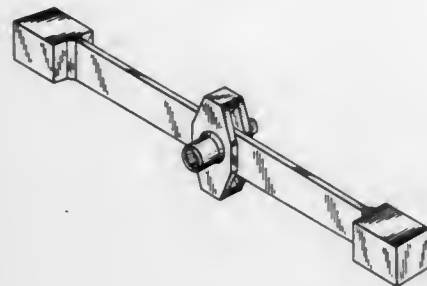
293,413

IMPACT LUG WRENCH

Melverton R. Witbeck, 3867 Meadowlawn Loop SE, No. 4, Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.

Filed Feb. 19, 1987, Ser. No. 703,186
Term of patent 14 years

U.S. Cl. D8—27



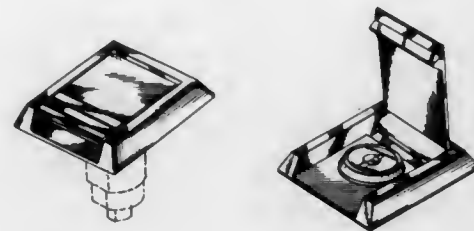
293,415

COMBINED LATCH LOCK AND COVER

Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.

Filed Sep. 30, 1985, Ser. No. 781,779
Term of patent 14 years

U.S. Cl. D8—346



293,416

TRUSS SPACER OR SIMILAR ARTICLE

Leo J. Krueger, 1045 Alpine Ct., Oshkosh, Wis. 54901

Filed Dec. 9, 1985, Ser. No. 806,373
Term of patent 14 years

U.S. Cl. D8—373



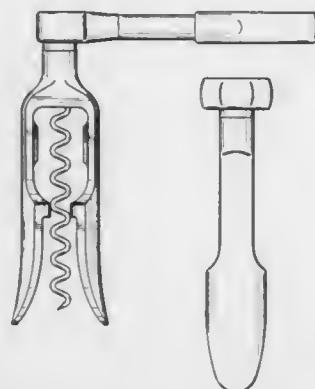
293,414

CORKSCREW

Herbert Allen, Houston, Tex., assignor to Hallen Company, Houston, Tex.

Filed Apr. 23, 1985, Ser. No. 726,114
Term of patent 14 years

U.S. Cl. D8—43



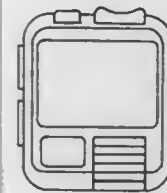
293,417

WATCH CASE

Yasuyuki Sakamaki, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,808
Term of patent 14 years

U.S. Cl. D10—30



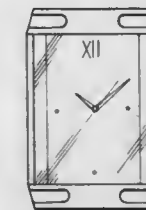
293,420

WATCH CASE

Toshiaki Tanaka, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1985, Ser. No. 762,923
Claims priority, application Japan, Apr. 16, 1985, 60-15397

U.S. Cl. D10—39



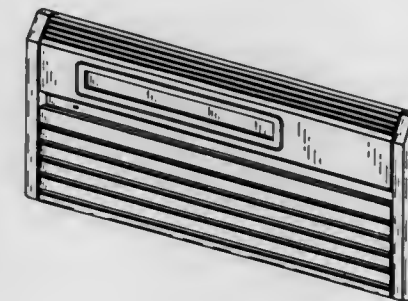
293,421

CONTROLLER FOR AN ENERGY MANAGEMENT SYSTEM

Robert W. Bounema, Mound; Robert C. Knutson, Minnetonka, and Ralph E. Pasquarette, Jordan, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 10, 1985, Ser. No. 786,015
Term of patent 14 years

U.S. Cl. D10—50



293,418

WRIST WATCH

Yutaka Fukumura, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,803
Term of patent 14 years

U.S. Cl. D10—32



293,419

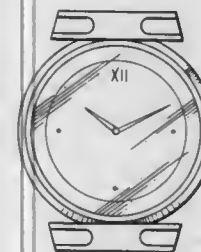
WATCH CASE

Toshiaki Tanaka, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,913

Claims priority, application Japan, Apr. 16, 1985, 60-15400
Term of patent 14 years

U.S. Cl. D10—39



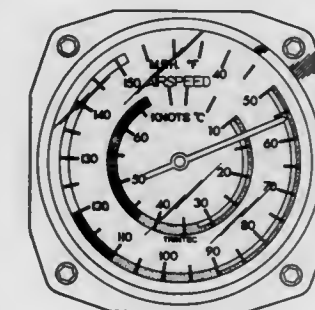
293,422

THERMOMETER

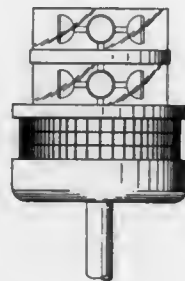
Brendon G. Nunes, 1035 Toy Avenue, Unit 6, Pickering, Ontario, Canada L1W 3N9

Filed Apr. 23, 1987, Ser. No. 41,358
Term of patent 14 years

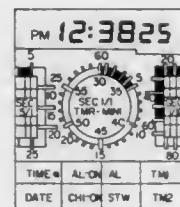
U.S. Cl. D10—57



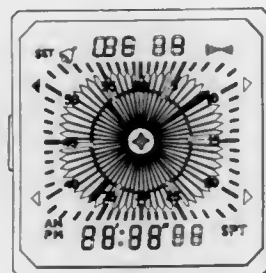
293,423
COMBINED SIGNAL LIGHT AND AUDIBLE ALARM OR SIMILAR ARTICLE
 Leonard R. Portillo, 101 Arlington St., Las Vegas, Nev. 89110
 Filed Jul. 8, 1985, Ser. No. 752,536
 Term of patent 14 years
 U.S. Cl. D10—114



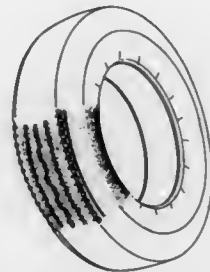
293,424
LIQUID CRYSTAL TIME DISPLAY APPARATUS
 Shigeki Yoshikawa, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
 Filed May 17, 1985, Ser. No. 735,810
 Term of patent 14 years
 U.S. Cl. D10—125



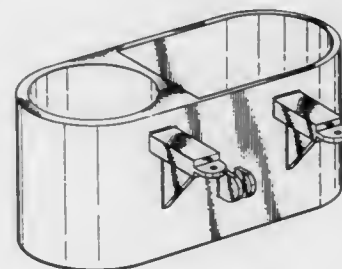
293,425
ELECTROOPTIC DISPLAY FOR A TIMEPIECE
 Shinpei Ichikawa, Newbury Park, Calif., assignor to Timex Corporation, Waterbury, Conn.
 Filed Aug. 29, 1985, Ser. No. 770,454
 Term of patent 14 years
 U.S. Cl. D10—125



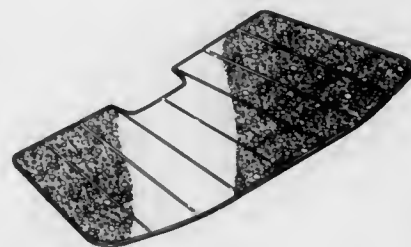
293,426
TIRE FOR AUTOMOBILES
 Masahiko Kanamaru, Zushi, and Osamu Takahashi, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
 Filed Jan. 24, 1985, Ser. No. 694,312
 Claims priority, application Japan, Jul. 31, 1984, 57-32396
 Term of patent 14 years
 U.S. Cl. D12—143



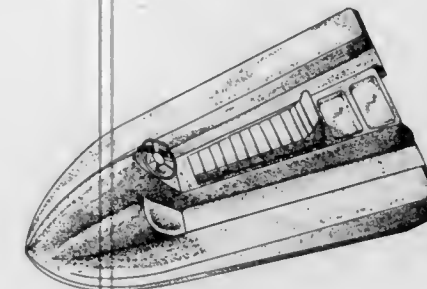
293,427
BICYCLE CARRIER
 Malcolm A. Gibbs, Parkhill, Canada, assignor to Twin Star Manufacturing Ltd., Parkhill, Canada
 Filed Jun. 27, 1985, Ser. No. 749,521
 Term of patent 14 years
 U.S. Cl. D12—158



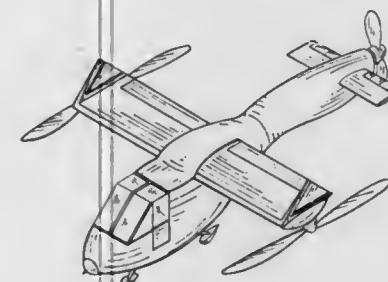
293,428
VEHICLE SUN SHIELD
 G. Mitchell Watts, San Luis Obispo, Calif., assignor to New World Products Corporation, San Luis Obispo, Calif.
 Filed Apr. 26, 1985, Ser. No. 727,787
 Term of patent 14 years
 U.S. Cl. D12—191



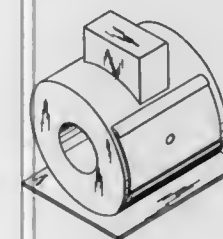
293,429
BOAT
 Eugene Franyutti, and Juan Franyutti, both of 7814 Fortune Dr., San Antonio, Tex. 78280
 Filed Oct. 20, 1986, Ser. No. 920,890
 Term of patent 14 years
 U.S. Cl. D12—307



293,430
PERISTROPHIC-WING AIR CRAFT
 Theodore Koutsouplidis, Kecropos 39, Glyfada, Athens 166-75, Greece
 Filed May 16, 1986, Ser. No. 864,112
 Term of patent 14 years
 U.S. Cl. D12—338



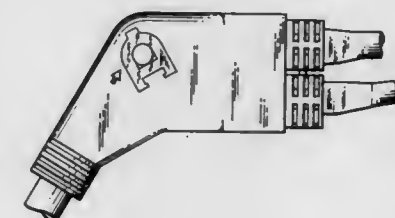
293,431
CURRENT TRANSFORMER
 David N. Makinson, Franklin, N.C., and Karl W. Struck, Clayton, Ga., assignors to Sangamo Weston, Inc., Norcross, Ga. Division of Ser. No. 595,178, Mar. 30, 1984, Pat. No. Des. 288,314. This application Nov. 10, 1986, Ser. No. 928,375
 Term of patent 14 years
 U.S. Cl. D13—4



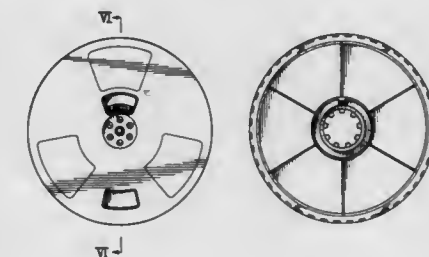
293,432
ELECTRICAL CONNECTING PLUG
 Toru Masuda, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Japan
 Filed Apr. 2, 1985, Ser. No. 719,393
 Claims priority, application Japan, Oct. 3, 1984, 59-41345
 Term of patent 14 years
 U.S. Cl. D13—24



293,433
VEHICLE WIRING HARNESS CONNECTOR
 Gary W. Brooks, North Vernon, Ind., and Victor Mastis, Hinsdale, Ill., assignors to The Grote Manufacturing Company, Inc., Madison, Ind.
 Filed Jul. 27, 1984, Ser. No. 635,208
 Term of patent 14 years
 U.S. Cl. D13—24



293,434
REEL FOR VIDEO TAPE
 Koji Maeda, Osaka, Japan, assignor to Video Eico IPD Co., Ltd., Osaka, Japan
 Filed Jan. 3, 1985, Ser. No. 688,655
 Claims priority, application Japan, Sep. 19, 1984, 59-39398
 Term of patent 14 years
 U.S. Cl. D14—11



293,435

REEL FOR VIDEO TAPE

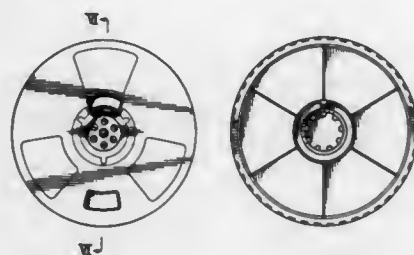
Koji Maeda, Osaka, Japan, assignor to Video Eico IPD Co., Ltd., Osaka, Japan

Filed Jan. 3, 1985, Ser. No. 688,498

Claims priority, application Japan, Sep. 19, 1984, 59-39397

Term of patent 14 years

U.S. Cl. D14—11



293,436

REEL FOR VIDEO TAPE

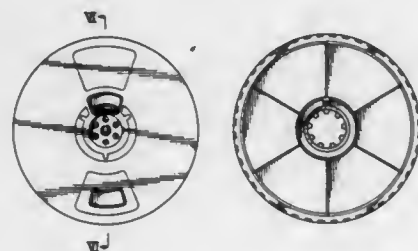
Koji Maeda, Osaka, Japan, assignor to Video Eico IPD Co., Ltd., Osaka, Japan

Filed Jan. 3, 1985, Ser. No. 688,499

Claims priority, application Japan, Sep. 19, 1984, 59-39399

Term of patent 14 years

U.S. Cl. D14—11



293,437

OPERATION MACHINE CONSOLE FOR TELEPHONE INFORMATION

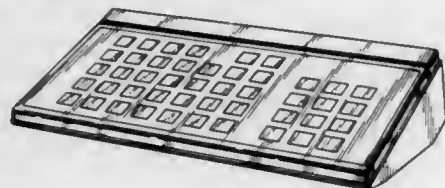
Naoko Hoshino, Chiba, and Yosuke Suzuki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 7, 1985, Ser. No. 742,235

Claims priority, application Japan, Dec. 24, 1984, 59-52700

Term of patent 14 years

U.S. Cl. D14—52



293,438

TELEPHONE

Makoto Ishimaru, Tokyo, Japan, assignor to Kanda Tsushin Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,385

Claims priority, application Japan, Apr. 10, 1985, 60-14548

Term of patent 14 years

U.S. Cl. D14—58



293,439

TELEPHONE SET

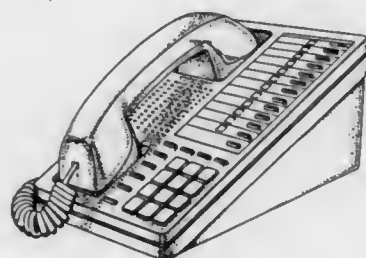
David A. Nogas, Ottawa, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Mar. 14, 1986, Ser. No. 844,738

Claims priority, application Canada, Jan. 31, 1986, 31-01-86-6

Term of patent 14 years

U.S. Cl. D14—58



293,440

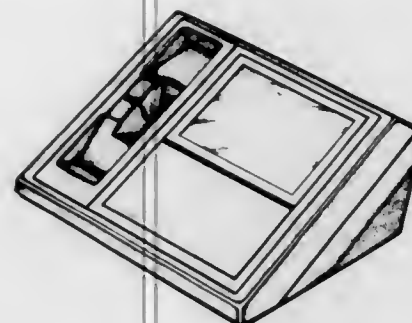
HOUSING FOR HANDSET BASE OF TRANSACTION TELEPHONE OR SIMILAR ARTICLE

David M. Britz, Rumson, N.J., assignor to American Telephone and Telegraph Company, AT&T Information Systems Inc., both of Murray Hill, N.J.

Filed Feb. 13, 1987, Ser. No. 14,392

Term of patent 14 years

U.S. Cl. D14—60



293,441

TELEPHONE STAND

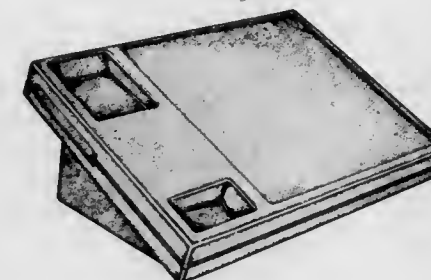
John Kowalik, Freehold; Ronald Longhitano, Oldbridge Township, Middlesex County; Stephen G. Miggels, Wyckoff, and Walter J. Shakespeare, Middletown, all of N.J., assignors to American Telephone and Telegraph Company and AT&T Information Systems Inc., both of Murray Hill, N.J.

Filed Jun. 19, 1986, Ser. No. 876,384

The portion of the term of this patent subsequent to Dec. 22, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—60



293,442

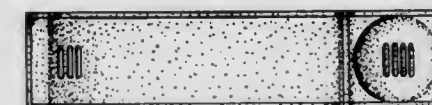
TELEPHONE HANDSET

Deane Richardson, Worthington; Gregg Davis, Columbus; Fran Blackman, Dublin, and Peter Koloski, Columbus, all of Ohio, assignors to Trillium Telephone Systems, Inc., Kanata, Canada

Filed Mar. 19, 1986, Ser. No. 845,355

Term of patent 14 years

U.S. Cl. D14—63



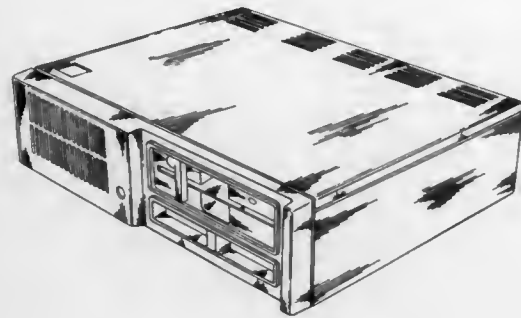
293,443

PERSONAL COMPUTER WITH DISKETTE DRIVE

Myron F. Davis; Willis Y. Jordan, III, both of Boca Raton, Fla.; Walter F. Kraus, La Grangeville, N.Y., and Robert L. Syler, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 7, 1983, Ser. No. 529,904
Term of patent 14 years

U.S. Cl. D14-100



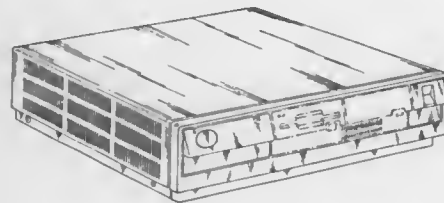
293,444

PERSONAL COMPUTER HOUSING

Vincent S. Garmon, West Palm Beach, Fla., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 20, 1987, Ser. No. 12,854
Term of patent 14 years

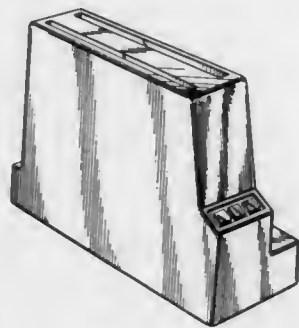
U.S. Cl. D14-100

293,445
PRINTER

Frank Pensavecchia, Lake Orion, Mich., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Jul. 11, 1985, Ser. No. 754,030
Term of patent 14 years

U.S. Cl. D14-111



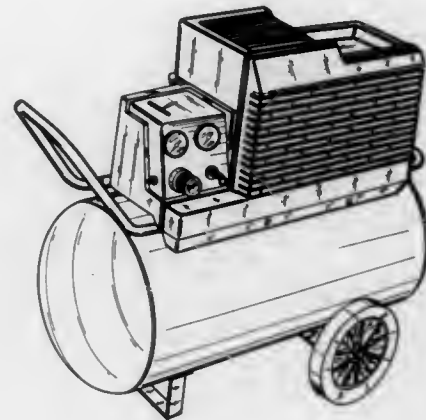
293,446

AIR COMPRESSOR

Frederick M. Morgan, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Oct. 22, 1986, Ser. No. 922,448
Term of patent 14 years

U.S. Cl. D15-9



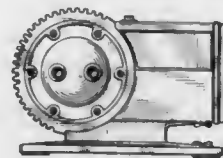
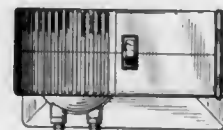
293,447

AIR COMPRESSOR

Dennis V. Hefling, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Nov. 5, 1986, Ser. No. 927,429
Term of patent 14 years

U.S. Cl. D15-9



293,448

ICE CREAM MAKER

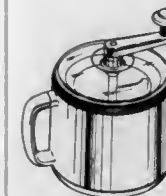
Susumu Uesaka, Tokyo, Japan, assignor to Nippon Light Metal Company Limited, Japan

Filed May 24, 1984, Ser. No. 613,735

Claims priority, application Japan, Dec. 12, 1983, 58-53326
The portion of the term of this patent subsequent to Oct. 2, 2000,

has been disclaimed.
Term of patent 14 years

U.S. Cl. D15-82



293,449

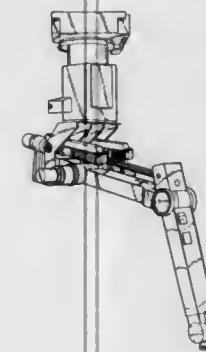
INDUSTRIAL ROBOT

Herbert Kaufmann, and Torbjörn Forss, both of Västerås, Sweden, assignors to Asea AB, Västerås, Sweden

Filed Mar. 6, 1985, Ser. No. 709,347

Claims priority, application Sweden, Sep. 24, 1984, 84-2532
Term of patent 14 years

U.S. Cl. D15-199



293,450

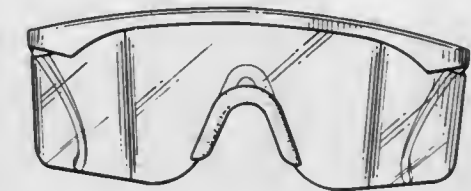
SUNGLASSES

James H. Jannard, Laguna Niguel, Calif., assignor to Oakley, Inc., Irvine, Calif.

Filed Aug. 15, 1986, Ser. No. 896,736

Term of patent 14 years

U.S. Cl. D16-102



293,451

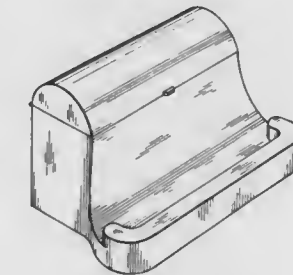
COMBINED SERVICE EQUIPMENT RECEPTACLE AND HOLDER FOR SPECTACLES

James J. Snell, Beeches, Pitt Lane, Gringley-on-the-Hill, Doncaster, South Yorkshire, and Peter Tillery, 1A Main Street, Ulley, Sheffield, South Yorkshire, both of England

Filed Jul. 17, 1985, Ser. No. 755,926

Term of patent 14 years

U.S. Cl. D16-129



293,452

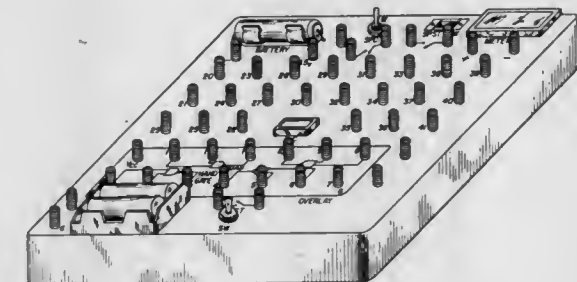
EDUCATIONAL ELECTRONIC EXPERIMENTATION LAB-KIT

Edwin Z. Gabriel, 91 Mount Tabor Way, Ocean Grove, N.J. 07756

Filed Nov. 13, 1984, Ser. No. 671,089

Term of patent 14 years

U.S. Cl. D17-62



293,453

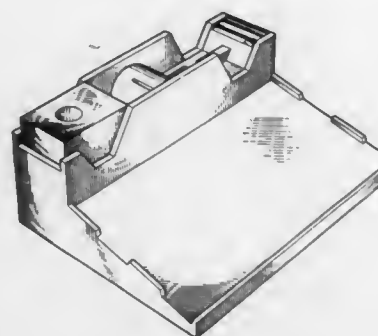
COMBINED DISPENSER FOR TAPE AND HOLDER FOR NOTE PADS

Lars-Gunnar Johanson, Paris, France, assignor to Watch Out Ltd. AB, Farsta, Sweden

Filed Feb. 20, 1985, Ser. No. 703,348

Term of patent 14 years

U.S. Cl. D19—77



293,454

REGULATOR OF COIN SELECTOR FOR AUTOMATIC VENDOR

Osamu Kobayashi; Masanori Tanaka; Masaki Akagawa, all of Sakado, and Rynji Yamagishi, Kawagoe, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,974

Claims priority, application Japan, Mar. 14, 1984, 59-9567

Term of patent 14 years

U.S. Cl. D20—8



293,455

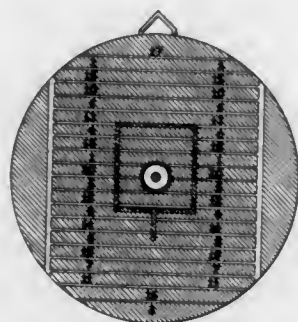
FOOTBALL GAME DART BOARD

Eric Castro; Manuel Castro, both of P.O. Box 193, Banta, Calif. 95304, and Frank T. Silva, 3181 W. Berry Rd., Tracy, Calif. 95376

Filed May 13, 1985, Ser. No. 733,073

Term of patent 14 years

U.S. Cl. D21—6



293,456

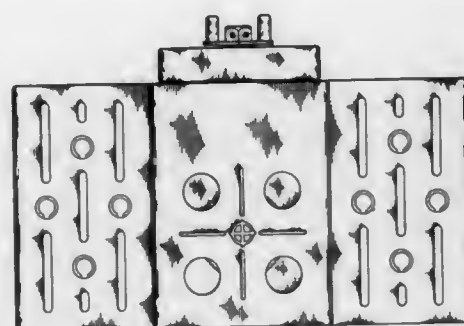
TOY BENCH WITH VISE

M. Allyson Smith, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Nov. 1, 1985, Ser. No. 794,065

Term of patent 14 years

U.S. Cl. D21—121



293,457

DOLL

Nancy E. Atkins, 5610 S. Pirates Cove, Tempe, Ariz. 85283

Filed May 20, 1985, Ser. No. 735,661

Term of patent 14 years

U.S. Cl. D21—173



293,458

SPORTS DOLL

Bryan K. Williams, Rte. 4, Box 311, Coushatta, La. 71019

Filed Jun. 26, 1985, Ser. No. 748,762

Term of patent 14 years

U.S. Cl. D21—177



293,459

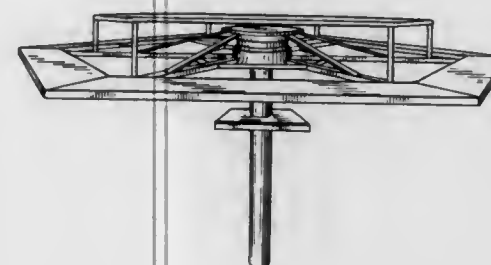
MERRY-GO-ROUND

Seth H. McCombs, West Grant St., Rushville, Ill. 62681

Filed Jan. 16, 1985, Ser. No. 691,927

Term of patent 14 years

U.S. Cl. D21—249



293,460

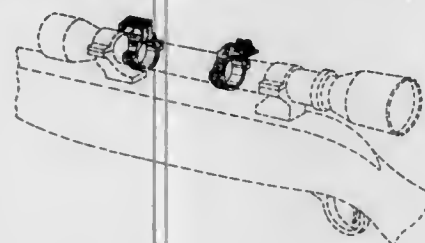
SIGHT OVER SCOPE GUN SIGHT

Paul D. Williams, 9241 Davison, Davison, Mich. 48423

Filed May 6, 1985, Ser. No. 731,153

Term of patent 14 years

U.S. Cl. D22—109



293,461

AIR SEPARATOR FOR AN AIR COMPRESSOR UNIT

Ying-Chung Chang, No. 37, Lane 359, Ta Ya Rd., Tai Chung City, Taiwan

Filed May 14, 1984, Ser. No. 609,824

Term of patent 14 years

U.S. Cl. D23—207



293,462

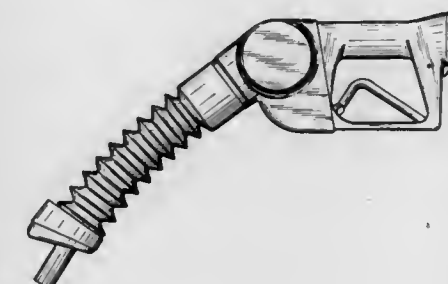
FUEL DISPENSING NOZZLE

Allen M. Bower, Erie; Eric J. Butterfield, Fairview, both of Pa., and Robert D. Roberts, Jefferson, Ohio, assignors to Emco Wheaton, Inc., Conneaut, Ohio

Filed Oct. 18, 1985, Ser. No. 789,077

Term of patent 14 years

U.S. Cl. D23—226



293,463

HEATER

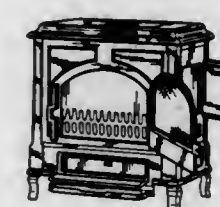
Henri Bastien, Couvin, Belgium, assignor to Fonderies du Lion S.A., Frasnes lez Couvin, Belgium

Filed Dec. 26, 1984, Ser. No. 686,323

Claims priority, application Benelux, Jun. 25, 1984, 59105 01/02/03

Term of patent 14 years

U.S. Cl. D23—346

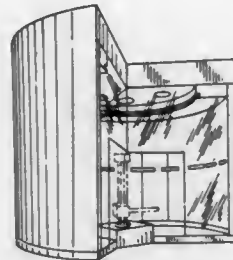


293,464
FUME HOOD

G. Thomas Saunders, Geneva, Ill., and William E. Baitinger, West Lafayette, Ind., assignors to St. Charles Manufacturing Co., St. Charles, Ill.

Filed Jan. 16, 1986, Ser. No. 819,545
Term of patent 14 years

U.S. Cl. D23—371



293,466
DENTAL CLEANING JET

Ambrogio Catracchia, 219 - 14th Avenue, Saint-Eustache, Canada (J7P 4B4)

Filed Dec. 3, 1985, Ser. No. 777,285
Term of patent 14 years

U.S. Cl. D24—15



293,465

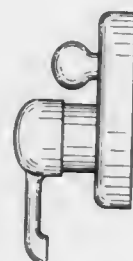
COMBINED WATER CONTROL VALVE AND SPOUT
Herta A. Bengtsson, Molle, Sweden, assignor to American Standard Inc., New York, N.Y.

Division of Ser. No. 777,477, Sep. 18, 1985. This application Apr. 6, 1987, Ser. No. 35,316

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 20 MR 2048

Term of patent 14 years

U.S. Cl. D23—257



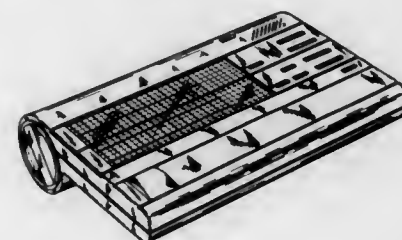
293,467
PHYSIOLOGICAL UNIT FOR MONITORING BODY FUNCTIONS

Marten F. Elkerbont, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1985, Ser. No. 725,185

Claims priority, application Benelux, Oct. 31, 1984, 59504-00
Term of patent 14 years

U.S. Cl. D24—17

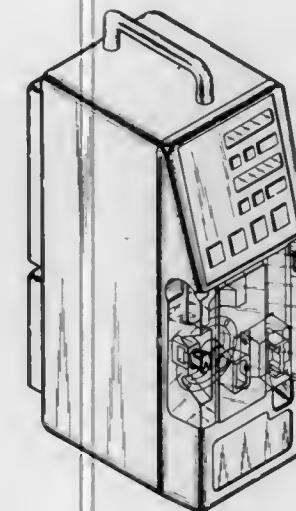


293,468
I.V. INFUSION PUMP

David C. Hill, Poway, and Donald Stanley, San Diego, both of Calif., assignors to Fisher Scientific Group, San Diego, Calif.

Filed Sep. 10, 1985, Ser. No. 774,623
Term of patent 14 years

U.S. Cl. D24—17

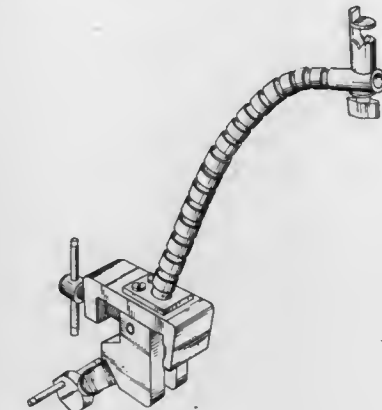


293,470
COMBINED ADJUSTABLE POSITIONER AND HOLDER FOR SURGICAL INSTRUMENTS

David T. Adler, 110 Dumbarton Dr., Hantington, N.Y. 11743

Filed Mar. 14, 1985, Ser. No. 711,618
Term of patent 14 years

U.S. Cl. D24—27



293,471

MASSAGER OR SIMILAR ARTICLE

Atuhiko Sato, 10-20, Matsubara 5-chome, Soka-shi, Saitama, Japan

Filed Apr. 23, 1985, Ser. No. 726,207
Term of patent 14 years

U.S. Cl. D24—36



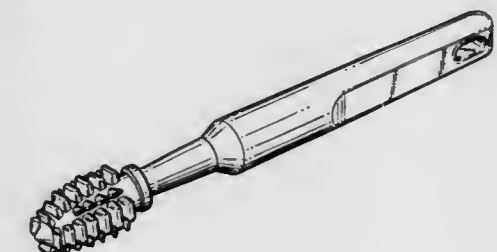
293,472

GUM MASSAGER

Anthony Chrones, Warwick, and Charles C. Richardson, North Kingstown, both of R.I., assignors to Gerber Products Company, Fremont, Mich.

Filed Jul. 3, 1985, Ser. No. 752,217
Term of patent 14 years

U.S. Cl. D24—36



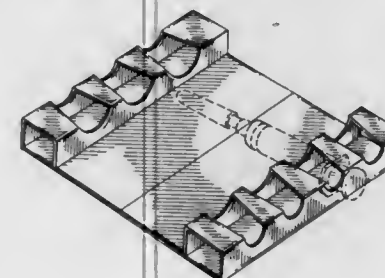
293,469

COLLAPSIBLE SYRINGE HOLDER

Gordon M. Greenblatt, 5533 N. 3rd St., Phoenix, Ariz. 85012

Filed Aug. 23, 1985, Ser. No. 768,703
Term of patent 14 years

U.S. Cl. D24—25



293,473

MALE ERECTION SUSTAINER

John L. Chaney, 156 Broad St., Box 592, Lake Geneva, Wis. 53147

Filed Jan. 14, 1985, Ser. No. 691,078
Term of patent 14 years

U.S. Cl. D24—64



293,475

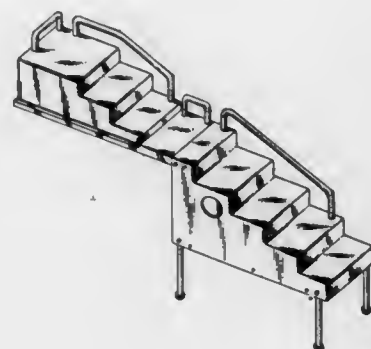
POOL ACCESS APPARATUS FOR THE DISABLED

Lewis J. Daly, 5890 Pierson Rd., Fayetteville, N.Y. 13066

Filed May 28, 1985, Ser. No. 737,948

Term of patent 14 years

U.S. Cl. D25—62



293,474

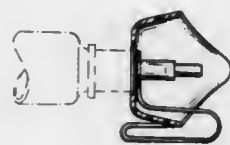
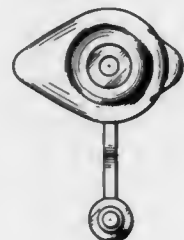
COMBINED EYE CUP AND EYE DROP DISPENSER CAP

Arthur C. Jermyn, 15914 Overview Rd., Poway, Calif. 92064

Filed Jun. 20, 1985, Ser. No. 746,868

Term of patent 14 years

U.S. Cl. D24—66



293,476

FIRE ESCAPE POLE

Anthony E. Morales, 5261 Hollywood Blvd., Hollywood, Calif. 90027

Filed Mar. 19, 1985, Ser. No. 713,421

Term of patent 14 years

U.S. Cl. D25—64



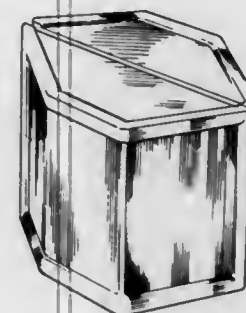
293,477

TRANSLUCENT BUILDING BLOCK OR THE LIKE
Thomas J. Pirosko, McMurray, and Francis J. Zavada, Aliquippa, both of Pa., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Feb. 24, 1984, Ser. No. 583,417

Term of patent 14 years

U.S. Cl. D25—108



293,478

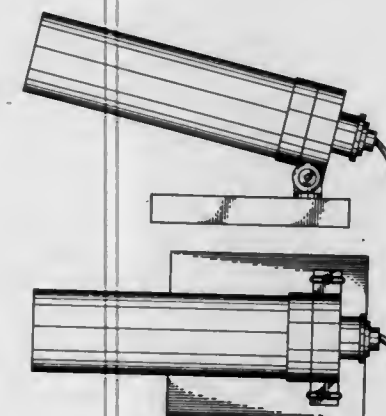
LAMP FOR EMITTING DECORATIVE LIGHTING EFFECTS

Clint G. Palone, 3001 Jaudon, Kansas City, Mo. 64117

Filed Apr. 22, 1985, Ser. No. 725,779

Term of patent 14 years

U.S. Cl. D26—24



293,479

AUXILIARY VEHICLE BRAKE LIGHT

Roger E. Hugnet, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 26, 1985, Ser. No. 748,980

Term of patent 14 years

U.S. Cl. D26—28



293,480

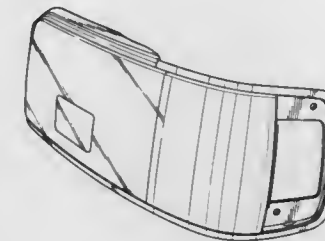
COMBINED REAR COMBINATION LAMP AND BEZEL FOR SIDE MARKER LAMP FOR A VEHICLE

Katsuyuki Oki, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 31, 1985, Ser. No. 760,969

Term of patent 14 years

U.S. Cl. D26—35



293,481

COMBINED PORTABLE LIGHT AND RADIO
Keiichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co., Ltd., Shizuoka, Japan

Filed May 7, 1985, Ser. No. 731,406

Term of patent 14 years

U.S. Cl. D26—38



293,482

FLASHLIGHT

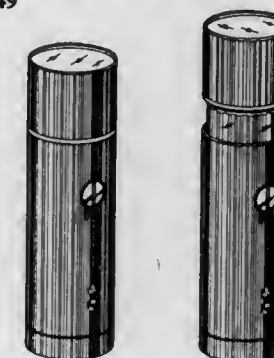
Udo M. Geissler, Munich, Fed. Rep. of Germany, assignor to OSRAM Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 710,142

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, MR 14 031

Term of patent 14 years

U.S. Cl. D26—49



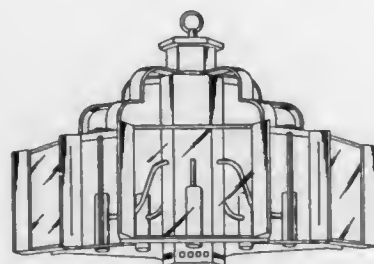
293,483

LIGHT FIXTURE

Fredrick R. Glassman, 9170 La Alba Dr., Whittier, Calif. 90603
Filed Sep. 20, 1985, Ser. No. 778,531

Term of patent 14 years

U.S. Cl. D26—81



293,485

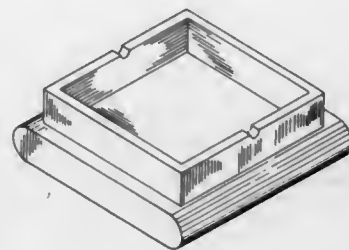
ASH TRAY

Arlan D. Lothe, Sun Prairie, Wis., assignor to Don Evans, Inc.,
DeForest, Wis.

Filed Aug. 19, 1985, Ser. No. 766,718

Term of patent 14 years

U.S. Cl. D27—29



293,486

LIGHTER

Ricardo Aguirre Gili, Barcelona, Spain, assignor to Flamagas,
S.A., Barcelona, Spain

Filed Dec. 11, 1985, Ser. No. 807,507

Claims priority, application Spain, Jun. 27, 1985, 108,567

Term of patent 14 years

U.S. Cl. D27—42



293,484

LIGHTING FIXTURE

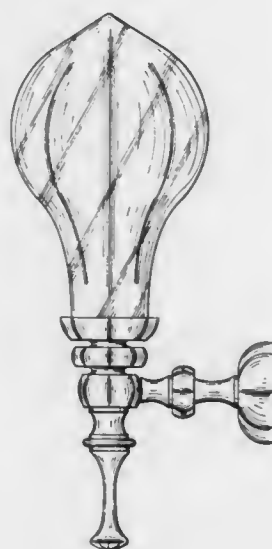
Gerhard E. Joerger, Hans-Thoma-Strasse 89-99, 6800 Mann-
heim 25, Fed. Rep. of Germany

Filed Oct. 16, 1985, Ser. No. 787,888

Claims priority, application Fed. Rep. of Germany, Apr. 26,
1985, MR V/1301

Term of patent 14 years

U.S. Cl. D26—87



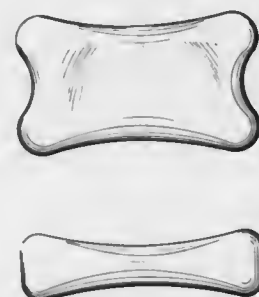
293,487

BAR OF SOAP

Walter F. Swanson, 11147 Fogelson Ct., Indianapolis, Ind. 46229
Filed May 10, 1985, Ser. No. 732,647

Term of patent 14 years

U.S. Cl. D28—8.1



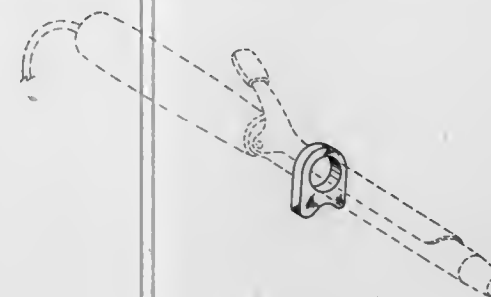
293,488

CURLING IRON RETAINER

Jeffery E. Emmons, 12220 Field Farm Ct., Granger, Ind. 46530
Filed Apr. 5, 1985, Ser. No. 720,395

Term of patent 14 years

U.S. Cl. D28—38



293,489

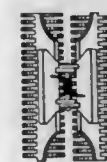
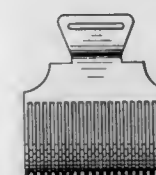
SPRING LOADED CLIP FOR A HAIR ROLLER OR THE LIKE

Peter L. Franzino, Jacksonville, Fla., assignor to Zip Clip, Inc.,
Jacksonville, Fla.

Filed Sep. 30, 1985, Ser. No. 782,034

Term of patent 14 years

U.S. Cl. D28—40



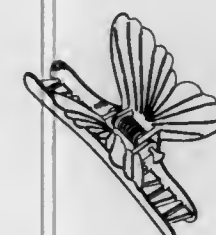
293,490

HAIR CLIP

John Cabiddu, 5701 Hansen Rd., Minneapolis, Minn. 55436
Filed Apr. 10, 1985, Ser. No. 721,647

Term of patent 14 years

U.S. Cl. D28—40



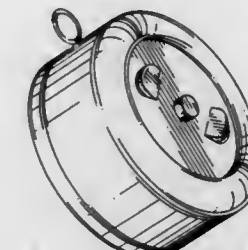
293,491

COMBINATION FLOSS HOLDER AND KEY CHAIN FOB OR SIMILAR ARTICLE

Robert D. Fronske, 1433 E. Wesleyan Dr., Tempe, Ariz. 85282
Filed Aug. 16, 1985, Ser. No. 766,353

Term of patent 14 years

U.S. Cl. D28—64



293,492

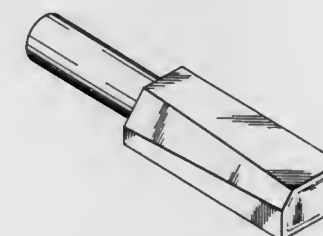
PRISMATIC COSMETIC CONTAINER

Walter W. Kemmerer, Peekskill, N.Y., assignor to Guild Mold-
ers, Inc., Middletown, N.Y.

Filed Sep. 27, 1985, Ser. No. 781,005

Term of patent 14 years

U.S. Cl. D28—76



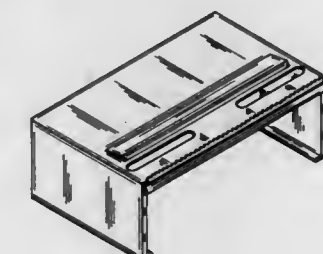
293,493

WRAPPING TABLE

Ernest J. Garr, 3587 Powell Dr., Lafayette, Calif. 94549
Filed Feb. 25, 1985, Ser. No. 705,231

Term of patent 14 years

U.S. Cl. D6—449



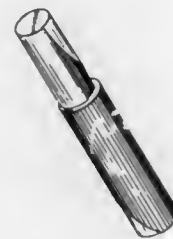
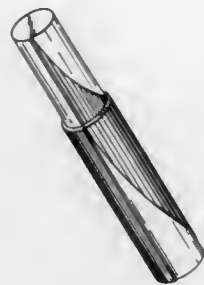
293,494

COSMETIC CONTAINER WITH MULTIPOSITIONAL CAP

Walter K. Kemmerer, Peekskill, N.Y., assignor to Guild Molders, Inc., Middletown, N.Y.

Filed Sep. 27, 1985, Ser. No. 781,044
Term of patent 14 years

U.S. Cl. D28—82



293,495

PROTECTIVE BODY SUIT

Albert Berryman, and Dwight A. Dorm, both of York, Pa., assignors to Dornco, Inc., Wilmington, Del.

Filed May 23, 1985, Ser. No. 736,685
Term of patent 14 years

U.S. Cl. D29—10



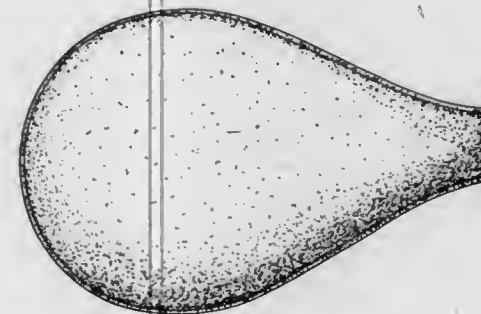
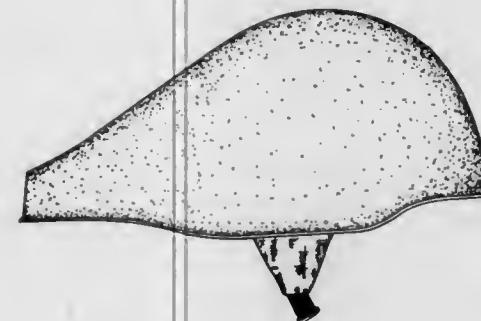
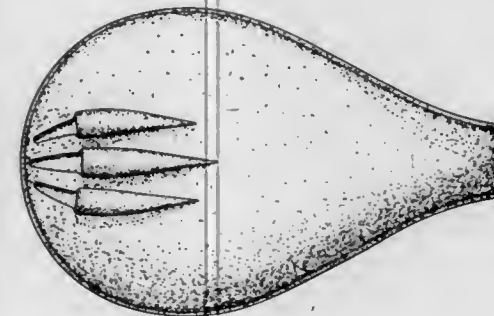
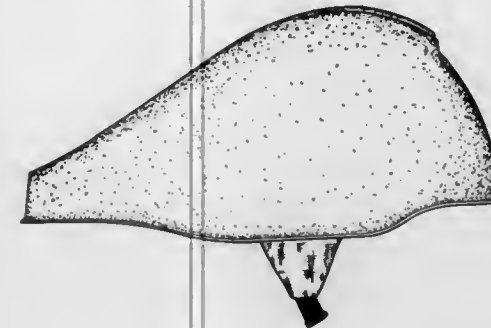
293,496

BICYCLE RACING HELMET

James J. Gentes, 1940-4 Southwest Expressway, San Jose, Calif. 95126

Filed Jun. 14, 1985, Ser. No. 744,810
Term of patent 14 years

U.S. Cl. D29—12



293,497

BUCKLE AND STRAP ASSEMBLY FOR A GIRTH STRAP

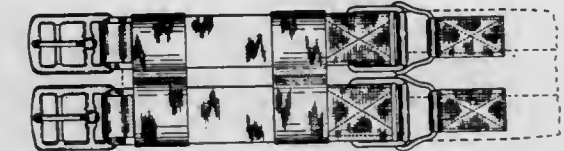
Elizabeth A. Bird, Droitwich, United Kingdom, assignor to Cottage Industries (Equestrian) Limited, Worcestershire, England

Filed Nov. 19, 1984, Ser. No. 672,684

Claims priority, application United Kingdom, May 19, 1984, 1019776

Term of patent 14 years

U.S. Cl. D30—134



293,498

VACUUM CLEANER HOSE HANDLE

William C. Traylor, Jr., Birmingham, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 9, 1984, Ser. No. 658,893

Term of patent 14 years

U.S. Cl. D32—31



293,499

SCRAPER

Marc J. Senecal, 1451 Maravilla Ave., and Kevin K. Knapp, 1745 Jefferson Ave., both of, Ft. Myers, Fla. 33901-6860

Filed Nov. 19, 1986, Ser. No. 932,389

Term of patent 14 years

U.S. Cl. D32—49



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF DECEMBER, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. E. Staley Manufacturing Company: See—
Portnoy, Norman A.; and Avery, Larry P., 4,716,186, Cl. 524-50.000.
- A.L.E. Systems, Inc.: See—
Bees, George L., 4,716,569, Cl. 372-38.000.
- A/S Alfred Benzon: See—
Kjornaes, Kim; Christensen, Finn N.; and Jensen, Jens R., 4,716,041, Cl. 424-468.000.
- A/S Nunc: See—
Johansson, Arne; and Namensen, Erlend, 4,715,911, Cl. 156-69.000.
- AB Holmgrens Armaturfabrik: See—
Hesselmar, Karl G., 4,715,755, Cl. 411-39.000.
- Abatjoglou, Anthony G.; and Bryant, David R., to Union Carbide Corporation. Hydroformylation using low volatile/organic soluble phosphine ligands. 4,716,250, Cl. 568-454.000.
- Abe, Nobutoshi; and Imamura, Kazunori, to Nippon Kogaku K. K. Automatic photomask or reticle washing and cleaning system. 4,715,392, Cl. 134-62.000.
- Abel, Heinz: See—
Navratil, Josef; and Abel, Heinz, 4,715,863, Cl. 8-440.000.
- Abex Corporation: See—
Kouns, Herbert H.; and Gardner, Loren D., 4,715,788, Cl. 417-218.000.
- Abou-Gharbia, Magid A.; and Nielsen, Susan T., to American Home Products Corporation. Histamine H₁ antagonists. 4,716,165, Cl. 514-265.000.
- Abou-Gharbia, Magid A.; Nielsen, Susan T.; and Webb, Michael B., to American Home Products Corporation. Histamine H₁ antagonists. 4,716,166, Cl. 514-265.000.
- Aboukrat, Simon: See—
Sobiepanek, Janusz; and Aboukrat, Simon, 4,716,486, Cl. 361-24.000.
- Abramson, Newton L.: See—
Reinhold, Donald F.; Utne, Torleif; and Abramson, Newton L., 4,716,246, Cl. 562-446.000.
- Acco Babcock Inc.: See—
Kottke, Louis E., 4,716,001, Cl. 264-145.000.
- Acquaviva, Thomas, to Xerox Corporation. Half-mode copying machine. 4,716,439, Cl. 355-7.000.
- Acushnet Company: See—
Llort, Francisco M.; Gendreau, Paul M.; and Berard, Raymond A., 4,715,607, Cl. 273-218.000.
- Adachi, Hideaki: See—
Kawaguchi, Takao; Adachi, Hideaki; Setsune, Kentaro; Ohji, Kenzo; and Waga, Kiyotaka, 4,715,680, Cl. 350-96.340.
- Adachi, Masaaki: See—
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Ando, Toshiaki; Nishiwaki, Humitoshi; and Aoyama, Shigeo, 4,715,437, Cl. 165-151.000.
- Adachi, Toshiro: See—
Mizuuchi, Kiyoshi; Mizuuchi, Michiyo; and Adachi, Toshiro, 4,716,105, Cl. 435-5.000.
- Adam, Colin M.: See—
Skinner, David J.; Bye, Richard L., Jr.; Okazaki, Kenji; and Adam, Colin M., 4,715,893, Cl. 75-249.000.
- Adams, Carl F. Energy producing apparatus. 4,715,182, Cl. 60-495.000.
- Adams, Roman A.: See—
Wolff, Donald L.; McCauley, Porter T.; Stiefel, Paul; Takacs, Gyorgy J.; and Adams, Roman A., 4,715,786, Cl. 417-22.000.
- Adams, Steven P.: See—
Tjoeng, Foe S.; Fok, Kam F.; and Adams, Steven P., 4,716,147, Cl. 514-11.000.
- Adolph Coors Company: See—
Grims, Conrad M.; and Eldridge, Lawrence B., 4,715,221, Cl. 73-149.000.
- Advanced Micro Devices, Inc.: See—
Campbell, David L., 4,716,381, Cl. 330-256.000.
Maltiel, Ron; and Yau, Robert L., 4,716,552, Cl. 365-222.000.
Menon, Vinod; and Kaku, Shinkyo, 4,716,467, Cl. 358-260.000.
- Advanced Moisture Technology, Inc.: See—
Pakulis, Ivars E., 4,716,360, Cl. 324-58.50A.
- AE PLC: See—
Elderton, John, 4,715,491, Cl. 198-856.000.
Richmond, John W., 4,715,267, Cl. 92-232.000.
Tomms, Norman; and Cooper, James A., 4,715,422, Cl. 164-97.000.
- Aerospatiale Societe Nationale Industrielle: See—
Poccard, Jacques, 4,715,567, Cl. 244-213.000.
- Ag-Pak, Inc.: See—
Savigny, James G., 4,715,167, Cl. 53-572.000.
- AGA Aktiebolag: See—
Blad, Per A.; and Johansson, Rolf, 4,716,272, Cl. 219-129.000.
Moisala, Tapio; and Gustafsson, Jukka, 4,715,877, Cl. 65-15.000.
- Agfa-Gevaert N.V.: See—
Heylen, Raymond A.; and Boets, Marc J., 4,715,500, Cl. 206-397.000.
- Agnoff, Charles. Gravity flow storage system. 4,715,765, Cl. 414-276.000.
- Agrawal, Rakesh: See—
Auvil, Steven R.; and Agrawal, Rakesh, 4,715,873, Cl. 62-13.000.
- Ahearn, John E.; Frates, Raymond A.; Girard, Dennis; Koepke, Richard A.; Schmidt, James K.; and Manon, C. Dodd, to Isotronics, Inc. Duplex glass preforms for hermetic glass-to-metal sealing. 4,716,082, Cl. 428-428.000.
- Aica Kogyo Co., Ltd.: See—
Kuribayashi, Yukio, 4,716,400, Cl. 340-572.000.
- Air-A-Plane Corporation: See—
Shepherd, Thomas E., 4,715,077, Cl. 14-71.500.
- Air Products and Chemicals, Inc.: See—
Auvil, Steven R.; and Agrawal, Rakesh, 4,715,873, Cl. 62-13.000.
Holzl, Robert A.; and Benander, Robert E., 4,716,064, Cl. 428-73.000.
Iacoviello, John G., 4,716,192, Cl. 524-549.000.
Schwarz, Alexander; Kalb, Charles E.; and Goebel, Charles C., 4,715,431, Cl. 105-110.000.
Schwarz, Alexander; and Kalb, Charles E., 4,715,433, Cl. 165-110.000.
- Aisan Kogyo KK: See—
Eitoku, Kenji; and Hayashi, Kenji, 4,715,220, Cl. 73-118.100.
- Aisin Seiki Kabushiki Kaisha: See—
Hattori, Takemi; and Takeda, Nobuhiko, 4,715,653, Cl. 297-284.000.
- Wakamatsu, Fumio, 4,715,651, Cl. 297-219.000.
- Akademie der Wissenschaften der DDR: See—
Hunger, Hans-Dieter; and Coutelle, Charles, 4,716,103, Cl. 435-5.000.
- Akashi, Akira; Ohmura, Hiroshi; Ishizaki, Akira; Ohtaka, Keiji; and Suda, Yasuo, to Canon Kabushiki Kaisha. Focus state detection method and apparatus with selective statistical processing. 4,716,282, Cl. 250-201.000.
- Akiyama, Hiroyuki; Izawa, Susumu; Okabe, Shigeru; and Yamaguchi, Toru, to Japan Styrene Paper Corp. Heat treatment apparatus for polyolefin resin particles. 4,716,021, Cl. 422-135.000.
- Akiyama, Toshiyuki: See—
Ozawa, Naoki; Akiyama, Toshiyuki; Satoh, Kazuhiro; Nagahara, Syusaku; and Mimura, Itaru, 4,716,455, Cl. 358-44.000.
- Aktieselskabet Bruel & Kjaer: See—
Frederiksen, Erling, 4,715,219, Cl. 73-1.0DV.
- Akui, Nobuaki; Ueda, Yasuhiro; and Suzuki, Akira, to Olympus Optical Co., Ltd. Endoscope forceps stopcock. 4,715,360, Cl. 128-4.000.
- Akutsu, Yoshinori: See—
Nagai, Yoichiro; Watanabe, Hamao; and Akutsu, Yoshinori, 4,716,240, Cl. 556-430.000.
- Alaimo, Robert J.; and Andersen, Jon A., to Norwich Eaton Pharmaceuticals, Inc. Imidazo(4,5-f)quinolines useful as immunomodulating agents. 4,716,168, Cl. 514-293.000.
- Albanese, Rocco J. Supplementary liquid dispensing device. 4,715,279, Cl. 101-148.000.
- Alcatel NV: See—
Andrich, Wolfgang; and Schilling Helmut W., 4,716,300, Cl. 250-578.000.
- Aleksa, David M.: See—
Sullivan, F. Ryan; and Aleksa, David M., 4,715,989, Cl. 252-512.000.
- Alexander, William C., to Solar Refining, Inc. Switched capacitor induction motor drive. 4,716,515, Cl. 363-138.000.
- Alexanian, George. Power saving module. 4,716,490, Cl. 361-155.000.
- Alguard, Mark: See—
Howarth, John; and Alguard, Mark, 4,715,715, Cl. 356-402.000.
- Alkaloida Vegyeszeti Gyar: See—
Timar, Tibor; Zsupan, Kalman; Repasi, Janos; Borsos nec Safranek, Iren; Kiss, Istvan; Fodor, Andras; and Maroy, Peter, 4,716,238, Cl. 549-408.000.
- Allam, Ibrahim M.; and Rowcliffe, David J., to S R I International. Process for applying thermal barrier coatings to metals and resulting product. 4,715,902, Cl. 148-6.300.
- Allan, Jonathan M.; Burton, Richard J.; and Jurock, Volker, to CD Medical Inc. Apparatus and method for controlling ultrafiltration during hemodialysis. 4,715,959, Cl. 210-637.000.
- Allegheny Ludlum Corporation: See—
Johns, Robert H.; and Nauman, John D., 4,715,428, Cl. 164-463.000.
- Allen-Bradley Company, Inc.: See—
Craker, Robert, 4,716,495, Cl. 361-391.000.
Craker, Robert, 4,716,497, Cl. 361-395.000.

Allen, Charles R.; and Harshman, Jack D., to Daniel Industries, Inc. Self-cleaning and self-lubricating fluid flowmeter. 4,715,234, Cl. 73-861.910.

Allied Corporation: See—
Kim, Jung T., 4,716,059, Cl. 427-443.100.
Skinner, David J.; Bye, Richard L., Jr.; Okazaki, Kenji; and Adam, Colin M., 4,715,893, Cl. 75-249.000.
Taig, Alistair G., 4,715,462, Cl. 180-79.100.

Allied-Signal Inc.: See—
Raskin, Donald; Kearney, James E.; and Haznedar, Errol A., 4,716,556, Cl. 367-168.000.

Allred, David D.: See—
Ovshinsky, Stanford R.; Hudgens, Stephen J.; Allred, David D.; and Demaggio, Gregory, 4,715,890, Cl. 75-0.5AA.
Ovshinsky, Stanford R.; Hudgens, Stephen J.; Allred, David D.; and Demaggio, Gregory, 4,715,891, Cl. 75-0.5BA.

Alps Electric Co., Ltd.: See—
Hori, Fumihisa, 4,715,737, Cl. 400-569.000.
Hori, Fumihisa, 4,715,277, Cl. 101-93.280.
Igarashi, Sadao, 4,716,387, Cl. 333-26.000.
Numata, Hidetaka; and Kawata, Toshihiko, 4,716,359, Cl. 323-349.000.

Alsthom-Atlantique: See—
Thurles, Edmond; Masson, Jean-Paul; and Malik, Louis, 4,715,834, Cl. 439-842.000.

Altman, Barry J.: See—
Cudahy, Michael J.; De La Huerca, Carlos; Arneson, Harold N.; Divers, R. Thomas; and Altman, Barry J., 4,715,385, Cl. 128-710.000.

Altner, Ulrich; Falb, Wolfgang; Ryschka, Martin; and Wallroth, Carl-Friedrich, to Drägerwerk Aktiengesellschaft. Overflow trap for anesthetics. 4,715,370, Cl. 128-204.130.

Altounian, George N.; and Grenier, Daniel, to Centre de Recherche Industrielle du Québec. Polyesters polyols prepared from glutaric acid, succinic acid and adipic acid, and polyurethanes prepared therefrom. 4,716,213, Cl. 528-283.000.

Aluminum Company of America: See—
Granger, Douglas A., 4,715,901, Cl. 148-2.000.
Ramsey, Everett M.; Gray, Bruce A.; and Evans, Donald C., 4,715,810, Cl. 432-8.000.

Alvi, Nadeem S.: See—
Schubert, Peter J.; and Alvi, Nadeem S., 4,716,128, Cl. 437-41.000.

Alyfuku, Kiyoshi, to Canon Kabushiki Kaisha. Battery checking circuit. 4,716,433, Cl. 354-468.000.

ALZA Corporation: See—
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,716,031, Cl. 424-453.000.

Amacher, Gene L.; Mathes, Gene R.; Paugstat, John F.; and Mergenthaler, Barry M., to NCR Corporation. Method for fast weighing. 4,715,457, Cl. 177-1.000.

Amacher, Gene L.; Mathes, Gene R.; Paugstat, John F.; and Mergenthaler, Barry M., to NCR Corporation. Method for controlling terminal display indication. 4,716,281, Cl. 235-383.000.

Ambos, Rene; Quagliaro, Gilles; and Fertel, Alain, to Thomson CSF. Surface wave dispersive filter spectrum analyzer. 4,716,362, Cl. 324-77.00B.

Amco Corporation: See—
Kulbersh, Irwin, 4,715,741, Cl. 403-389.000.

American Bank Note Company: See—
Roule, Richard L.; and Cantor, Joshua C., 4,715,623, Cl. 283-91.000.

American Cyanamid Company: See—
Bitha, Panayota; Child, Ralph G.; Hlavka, Joseph J.; and Lin, Yang-I, 4,716,157, Cl. 514-184.000.
Casey, Donald J.; Jarrett, Peter K.; and Rosati, Louis, 4,716,203, Cl. 525-408.000.
Murdock, Keith C.; and Webb, Richard L., 4,715,993, Cl. 260-380.000.

American Home Products Corporation: See—
Abou-Gharbia, Magid A.; and Nielsen, Susan T., 4,716,165, Cl. 514-265.000.
Abou-Gharbia, Magid A.; Nielsen, Susan T.; and Webb, Michael B., 4,716,166, Cl. 514-265.000.
Blank, Robert G.; and Miller, Ronald W., 4,716,042, Cl. 424-474.000.
Ryder, Steven W.; Shand, David G.; and Mullane, John F., 4,716,177, Cl. 514-524.000.

American Microsystems, Inc.: See—
Bauer, Jerry R., 4,716,586, Cl. 380-3.000.

American Standard Inc.: See—
Han, Doyoung; and Renaud, Merle A., 4,715,190, Cl. 62-201.000.
Rood, Jerry A., 4,715,733, Cl. 384-445.000.

American Telephone and Telegraph Company: See—
Duguay, Michel A.; Koch, Thomas L.; Kokubun, Yasuo; and Pfeiffer, Loren N., 4,715,672, Cl. 350-96.120.

American Telephone and Telegraph Company, AT&T Bell Laboratories: See—
Angell, Eric H.; Aprille, Thomas J.; Azaret, Juan O.; Fang, Rong-Chin; Lee, Byeong G.; Longwell, Brian C.; Sharper, Craig A.; and Spalink, Jan-Dieter, 4,716,561, Cl. 370-55.000.
Green, Martin L.; Levy, Roland A.; and Nuzzo, Ralph G., 4,716,050, Cl. 427-99.000.
Johnston, Wilbur D., Jr.; and Long, Judith A., 4,716,130, Cl. 437-104.000.
Miller, David A. B., 4,716,449, Cl. 357-30.000.

Amersham International plc: See—
Chiswell, David J., 4,716,106, Cl. 435-6.000.
Colin, David, 4,715,988, Cl. 252-408.100.

Ames, Alan J., to United States of America. Optical collimator target illumination. 4,716,507, Cl. 362-311.000.

Amino, Hiroyuki, to Amino Iron Works Co., Ltd. 180 degree inverting machine. 4,715,775, Cl. 414-758.000.

Amino Iron Works Co., Ltd.: See—
Amino, Hiroyuki, 4,715,775, Cl. 414-758.000.

Amoco Corporation: See—
Clendinning, Robert A.; and Maresca, Louis M., 4,716,211, Cl. 528-126.000.
Lambousy, George G.; Reaves, Benjamin H.; and Nelson, William E., 4,715,996, Cl. 261-114.200.

AMP Incorporated: See—
Andrews, Howard W., Jr.; Pickles, Charles S.; and Taylor, Attalee S., 4,715,820, Cl. 439-59.000.
Bright, Edward J.; and Sinisi, David B., 4,716,494, Cl. 361-386.000.
Furman, Lev B., 4,715,827, Cl. 439-465.000.
Jackson, Mark F.; Lawruk, Stephen P.; Schlegel, Dallas E.; and Spong, Richard V., 4,715,112, Cl. 29-739.000.
Kevern, James D.; Stape, William J.; and Weber, Robert N., 4,715,675, Cl. 350-96.200.
Preputnick, George, 4,715,829, Cl. 439-660.000.

Ampex Corporation: See—
Fair, Kenneth E.; and Campbell, Charles M., 4,715,558, Cl. 242-199.000.
Oldershaw, Reginald W.; and Wagner, Steven D., 4,716,454, Cl. 358-18.000.

Amphenol Corporation: See—
Margolin, Mark; Grois, Igor; and Moore, James E., 4,715,251, Cl. 81-9.400.

AMSTED Industries Incorporated: See—
Hood, Charles N., II, 4,715,290, Cl. 105-199.300.

Amstutz, Harlan C.; and Kabo, J. Michael, to University of California, The Regents of the. Porous acetabular hip resurfacing. 4,715,860, Cl. 623-22.000.

Andersen, Jon A.: See—
Alaimo, Robert J.; and Andersen, Jon A., 4,716,168, Cl. 514-293.000.

Andersen, Marinus L., to Hach Company. Pump colorimetric analyzer. 4,715,710, Cl. 356-246.000.

Andersen, Robert N.; and Walker, Harrell L., to United States of America, Agriculture. Control of eastern black nightshade with a fungal pathogen. 4,715,881, Cl. 71-79.000.

Anderson, David K.: See—
Bianca, Joseph D.; and Anderson, David K., 4,715,301, Cl. 110-347.000.

Anderson, James. Rotary lawn mower accessories. 4,715,173, Cl. 56-295.000.

Anderson, Milan B., deceased (by Anderson, Thelma, administratrix), to Hewitt Tubular Products, Inc. Tandem wheel chock. 4,715,480, Cl. 188-74.000.

Anderson, Patricia P.: See—
Takekoshi, Tohru; and Anderson, Patricia P., 4,716,216, Cl. 528-352.000.

Anderson, Roy W.; Ross, Stephen J.; and Henderson, Larry D., to United Technologies Corporation. Arrangement for controllably mixing volatile materials. 4,715,723, Cl. 366-142.000.

Anderson, Thelma, administratrix: See—
Anderson, Milan B., deceased, 4,715,480, Cl. 188-74.000.

Ando, Fumitaka: See—
Kijima, Takao; and Ando, Fumitaka, 4,715,614, Cl. 280-701.000.
Kijima, Takao; and Ando, Fumitaka, 4,715,615, Cl. 280-701.000.

Ando, Hideo, to Kabushiki Kaisha Toshiba. Optical head for focusing a light beam on an optical disk. 4,716,283, Cl. 250-201.000.

Ando, Seigo: See—
Hosoe, Toshiaki; Ando, Seigo; and Kawase, Yoshihiro, 4,716,366, Cl. 324-207.000.

Ando, Toshiaki: See—
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Ando, Toshiaki; Nishiwaki, Humitoshi; and Aoyama, Shigeo, 4,715,437, Cl. 165-151.000.

Andrews, Howard W., Jr.; Pickles, Charles S.; and Taylor, Attalee S., to AMP Incorporated. Connection system for printed circuit boards. 4,715,820, Cl. 439-59.000.

Andrich, Wolfgang; and Schilling Helmut W., to Alcatel NV. Apparatus for scanning documents in a raster line mode using margin stops. 4,716,300, Cl. 250-578.000.

Angell, Eric H.; Aprille, Thomas J.; Azaret, Juan O.; Fang, Rong-Chin; Lee, Byeong G.; Longwell, Brian C.; Sharper, Craig A.; and Spalink, Jan-Dieter, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Digital transmission including add/drop module. 4,716,561, Cl. 370-55.000.

Ansel, Robert E.: See—
Schmid, Steven R.; Ansel, Robert E.; and Murray, Kevin P., 4,716,209, Cl. 526-261.000.

ANT Nachrichtentechnik GmbH: See—
Scheuermann, Helmut, 4,716,537, Cl. 364-724.000.

Anton, Christian: See—
Arnoux, Daniel; Genter, Claude; Anton, Christian; and Forme, Jacques, 4,716,412, Cl. 340-753.000.

Anzai, Hisatugu: See—
Atsumi, Haruyuki; Anzai, Hisatugu; and Kasahara, Noboru, 4,715,146, Cl. 49-1.000.

Aoki, Satoshi: See—
Mori, Shosuke; Sakurai, Atsushi; Aoki, Satoshi; and Suzuki, Tatsuya, 4,716,526, Cl. 364-200.000.

Aonuma, Masashi: See—
Okita, Tsutomu; Hashimoto, Hiroshi; and Aonuma, Masashi, 4,716,077, Cl. 428-328.000.

Aoyama, Keizo, to Fujitsu Limited. Regulated power supply for semiconductor chips with compensation for changes in electrical characteristics or chips and in external power supply. 4,716,307, Cl. 307-297.000.

Aoyama, Shigeo: See—
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Ando, Toshiaki; Nishiwaki, Humitoshi; and Aoyama, Shigeo, 4,715,437, Cl. 165-151.000.

Apex Technologies, Inc.: See—
Muller, Gary R.; Theiss, Scott M.; Brown, James E., Jr.; and Lawson, Bobby R., 4,715,324, Cl. 122-381.000.

Apollo Computer, Inc.: See—
Douras, Bryan P.; and Marcuvitz, Andrew, 4,716,575, Cl. 375-3.000.

Aprille, Thomas J.: See—
Angell, Eric H.; Aprille, Thomas J.; Azaret, Juan O.; Fang, Rong-Chin; Lee, Byeong G.; Longwell, Brian C.; Sharper, Craig A.; and Spalink, Jan-Dieter, 4,716,561, Cl. 370-55.000.

Arai, Shinichi: See—
Sato, Naoki; Kamo, Yoshihisa; Katoh, Yasuhiro; Kosuge, Minoru; and Arai, Shinichi, 4,716,306, Cl. 307-296.00R.

Arai, Takao: See—
Ito, Masahiro; Kobayashi, Masaharu; and Arai, Takao, 4,716,567, Cl. 371-40.000.

Arai, Takashi, to Canon Kabushiki Kaisha. Injection molding machine. 4,715,802, Cl. 425-130.000.

Arakawa, Kazuhiko: See—
Tokura, Go; Arakawa, Kazuhiko; and Terashima, Jun, 4,716,259, Cl. 174-68.500.

Arakawa, Toshihiko: See—
Kasai, Kiyoshi; Tsukidate, Takaaki; and Arakawa, Toshihiko, 4,716,028, Cl. 423-344.000.

Aranovich, Felix, to Cleve Industries Inc. Spool valve assembly. 4,715,407, Cl. 137-625.650.

Araseki, Takashi: See—
Ozawa, Kazunori; and Araseki, Takashi, 4,716,592, Cl. 381-40.000.

Arfsten, Nanning J.: See—
Dislich, Helmut; Arfsten, Nanning J.; Schmidt, Helmut; Philipp, Gottfried; and Tuenker, Gerhard, 4,715,999, Cl. 264-1.100.

Arima, Hideo: See—
Noro, Takano; Koakutsu, Yasumasa; Takeuchi, Tamio; Yano, Masao; Onoda, Seiichi; Arima, Hideo; Yokono, Hitoshi; and Tanei, Hirayoshi, 4,715,673, Cl. 350-96.200.

Arima, Takemi: See—
Morishita, Akira; Okamoto, Kyoichi; Gotoh, Toshihiko; Kato, Yukio; and Arima, Takemi, 4,715,243, Cl. 74-434.000.

Armo Inc.: See—
Christ, Christy; Campbell, Herbert F.; Fields, Gayle P.; and Burris, James L., 4,716,075, Cl. 428-285.000.
Holming, Robert; Nelson, Robert S.; and Daley, Thomas R., 4,715,546, Cl. 241-171.000.

Arneson, Harold N.: See—
Cudahy, Michael J.; De La Huerca, Carlos; Arneson, Harold N.; Divers, R. Thomas; and Altman, Barry J., 4,715,385, Cl. 128-710.000.

Arnold, Allen J.; Courtney, Mark G.; Kirby, Diane N.; Mis, Katherine H.; and Sutton, Kerry L., to International Business Machines Corporation. Environmentally secure and thermally efficient heat sink assembly. 4,715,430, Cl. 165-80.300.

Arnoux, Daniel; Genter, Claude; Anton, Christian; and Forme, Jacques, to Bleris. Plane-structure quantified analog display unit and analog measuring device comprising such a display unit. 4,716,412, Cl. 340-753.000.

Aro Corporation, The: See—
Perbach, John M.; Porter, Charles E., Jr.; and Maloney, David C., 4,715,215, Cl. 73-49.300.

Aronstam, Peter S.: See—
Yasuda, Arthur K.; Kennedy, William S.; and Aronstam, Peter S., 4,715,469, Cl. 181-102.000.

Arroyo, Juan. Surgical instrumentation including a clamp assembly to facilitate attachment of blood vessel sections. 4,715,377, Cl. 128-335.000.

Arsura, Emilio: See—
Capizzi, Amedeo; Spinelli, Pia; and Arsura, Emilio, 4,715,536, Cl. 239-54.000.

Asahi Dempa Co., Ltd.: See—
Hayashi, Hitoaki, 4,716,332, Cl. 310-368.000.

Asahi Kasei Kogyo Kabushiki Kaisha: See—
Fukui, Minoru; and Kataoka, Naoki, 4,715,235, Cl. 73-862.680.
Minonishi, Kuniaki; and Sato, Reijiro, 4,716,094, Cl. 430-284.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: See—
Doi, Yuzuru, 4,716,288, Cl. 250-227.000.
Morimoto, Akira, 4,715,699, Cl. 350-6.800.
Shindo, Osamu, 4,716,431, Cl. 354-407.000.

Asakura, Masahiko: See—
Kawanabe, Tomohiko; Kushida, Noritaka; Asakura, Masahiko; and Seki, Yasunari, 4,715,350, Cl. 123-587.000.
Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; and Kimura, Katsuhiko, 4,715,352, Cl. 123-589.000.

Asami, Ken; Ohashi, Kaoru; Onuma, Toshio; and Buma, Shuichi, to Toyota Jidosha Kabushiki Kaisha. Rear suspension controller. 4,715,616, Cl. 280-707.000.

ASC Incorporated: See—
Bores, Leonard F.; and Zdziarski, Mark J., 4,715,649, Cl. 296-218.000.

Asgalum S.A.: See—
Heyraud, Marc, 4,716,330, Cl. 310-233.000.

Ashby, Robert E.: See—
Leese, David J.; and Ashby, Robert E., 4,715,530, Cl. 229-73.000.

Asta-Werke Aktiengesellschaft Chemische Fabrik: See—
Engel, Jürgen; Kleemann, Axel; Niemeyer, Ulf; Hilgard, Peter; and Pohl, Joerg, 4,716,242, Cl. 558-81.000.

Astec Industries, Inc.: See—
Brock, J. Donald, 4,715,720, Cl. 366-25.000.

Asten, Wolfgang V.; Dörner, Karl H.; Scheel, Hartmut; and Wurste, Volker, to Vereinigte Aluminium-Werke Aktiengesellschaft. Aluminum offset coil, and method for its production. 4,715,903, Cl. 148-11.50A.

Astley, Graham J.: See—
Wentworth, Robert J.; and Astley, Graham J., 4,715,287, Cl. 104-172.300.

AT&T Bell Laboratories: See—
Pawelski, Robert L., 4,716,453, Cl. 358-13.000.

AT&T Information Systems Inc.: See—
Daudelin, Douglas S., 4,716,376, Cl. 329-107.000.

Atlantic Richfield Company: See—
Bseisu, Amjad A.; Jan, Yih-Min; and Schuh, Frank J., 4,715,451, Cl. 175-40.000.
MacAllister, Donald J.; and Pennington, Virginia W., 4,715,444, Cl. 166-269.000.

Atsumi, Haruyuki; Anzai, Hisatugu; and Kasahara, Noboru, to Ryobi Limited; and Hochiki Corporation. Apparatus for closing fireproof doors. 4,715,146, Cl. 49-1.000.

Austel, Volkhard: See—
Heider, Joachim; Haul, Norbert; Austel, Volkhard; Noll, Klaus; Bomhard, Andreas; van Meel, Jacques; and Diederer, Willi, 4,716,169, Cl. 514-299.000.

Automatic Packaging Systems, Inc.: See—
Lerner, Bernard; Liebhart, Dana; and Wehrmann, Rick S., 4,715,092, Cl. 17-52.000.

Automeg, Inc.: See—
Horvath, Joseph G.; and Miller, James C., 4,716,487, Cl. 361-42.000.

Autotrol Corporation: See—
Roos, William N., 4,716,325, Cl. 310-41.000.

Auvil, Steven R.; and Agrawal, Rakesh, to Air Products and Chemicals, Inc. Liquefied gases using an air recycle liquefier. 4,715,873, Cl. 62-13.000.

Avar, Lajos, to Sandoz Ltd. Stabilizing polymers. 4,716,187, Cl. 524-99.000.

Avery, Larry P.: See—
Portnoy, Norman A.; and Avery, Larry P., 4,716,186, Cl. 524-50.000.

AVL AG: See—
Wolfbeis, Otto S.; and Offenbacher, Helmut, 4,716,118, Cl. 436-2.000.

AVT Anlagen- und Verfahrenstechnik GmbH: See—
Krambrock, Wolfgang, 4,715,748, Cl. 406-11.000.

Axell, Claes E. S., to Telefonaktiebolaget L M Ericsson. Coaxial plug for use in a junction between a coaxial conductor and a stripline. 4,715,821, Cl. 439-59.000.

Azaret, Juan O.: See—
Angell, Eric H.; Aprille, Thomas J.; Azaret, Juan O.; Fang, Rong-Chin; Lee, Byeong G.; Longwell, Brian C.; Sharper, Craig A.; and Spalink, Jan-Dieter, 4,716,561, Cl. 370-55.000.

B.C.S. S.p.A.: See—
Bernardi, Guido, 4,715,238, Cl. 74-6.000.

B.F. Goodrich Company, The: See—
Sullivan, F. Ryan; and Aleksa, David M., 4,715,989, Cl. 252-512.000.

Baasner, Bernd: See—
Klaue, Erich; Baasner, Bernd; and Schundehutte, Karl H., 4,716,229, Cl. 544-334.000.

Baba, Takaaki: See—
Kobayashi, Kiyotaka; Tsukasaki, Hidaka; and Baba, Takaaki, 4,715,348, Cl. 123-571.000.

Bach, Erik, to Interlego A.G. Current-carrying element. 4,715,832, Cl. 439-723.000.

Backlund, Ulf E. H. H.; and Ungerstedt, Carl U. Apparatus for manipulating small volumes of liquid. 4,715,413, Cl. 141-94.000.

Baier, Paul W.; and Rausch, Peter, to Siemens Aktiengesellschaft. Wirelessly functioning signal transmission system. 4,716,574, Cl. 375-1.000.

Baillie, William R.; Macias, Jorge; and Dressendorfer, Michael, to Russ Bassett Company. Cartridge cabinet drawer. 4,715,669, Cl. 312-12.000.

Baines, John H.: See—
Brine, Satya S.; Baines, John H.; and Poulin, Suzanne C. M., 4,715,628, Cl. 292-19.000.

Baker, Terence S.; Powell, Michael J.; and Titmas, Richard C., to Boots-Celltech Diagnostics Limited. Immunoassay. 4,716,109, Cl. 435-7.000.

Bail, Donald L.; and Boateng, Daniel A. D., to Cominco Ltd. Method for removal of monovalent ions from ZnSO₄ electrolyte by electrodiagnosis. 4,715,939, Cl. 204-182.400.

- Ballard, James G.: See—
Liegel, Reinald D.; and Ballard, James G., 4,715,789, Cl. 417-253.000.
- Ballon-Mueller AG: See—
Nelson, David C.; Fresh, Michael J.; and Mueller, Herbert, 4,715,841, Cl. 446-222.000.
- Baloga, Mark A., to Steelcase Inc. Space partition module. 4,715,154, Cl. 52-239.000.
- Barbier, Jean-Paul: See—
Peau, Jean-Louis; Desvard, Catherine; and Barbier, Jean-Paul, 4,715,985, Cl. 252-305.000.
- Bardsley, Frank B.: See—
Boxell, Timothy G.; Bardsley, Frank B.; and Stoddart, David E., 4,715,440, Cl. 166-100.000.
- Barkley, Vincent P., to Pace Incorporated. Locator. 4,715,640, Cl. 294-106.000.
- Barnett, Daniel J.: See—
Schellhamer, Alan J.; Barnett, Daniel J.; and Khan, Abdul Q., 4,715,931, Cl. 162-199.000.
- Barnhart, William D. Sanitary device for animals. 4,715,320, Cl. 119-1.000.
- Baronoff, Jay H.: See—
Ford, Allan L.; and Baronoff, Jay H., 4,715,839, Cl. 446-28.000.
- Bartholmae, Jack N.: See—
Tompkins, E. Neil; and Bartholmae, Jack N., 4,716,585, Cl. 379-202.000.
- Bartley, David H.: See—
Oxley, Donald W.; Bartley, David H.; and McEntee, Timothy J., 4,716,524, Cl. 364-200.000.
- Bartley, George S., to Minolta Camera Kabushiki Kaisha. Variable dimension and variable orientation graphics bit-map computer memory. 4,716,544, Cl. 364-900.000.
- Barton, James T.: See—
Koek, Kevin C.; Matthias, William T.; and Barton, James T., 4,715,682, Cl. 350-253.000.
- Barud, Sigvard, to Siemens Aktiengesellschaft. X-ray examination apparatus. 4,716,581, Cl. 378-198.000.
- BASF Aktiengesellschaft: See—
Ernst, Hansgeorg; Littmann, Wolfgang; and Paust, Joachim, 4,716,243, Cl. 558-395.000.
Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Jurgen; and Wuerzler, Bruno, 4,715,889, Cl. 71-94.000.
Stanek, Richard; Marx, Hans-Norbert; Hettler, Wendelin; and Wagner, Claus, 4,716,054, Cl. 427-297.000.
- BASF Corporation: See—
Sanders, John H.; Hoblit, Louis D.; and Mann, Joe A., 4,716,055, Cl. 427-304.000.
- Baskett, Ira E.; and Sluss, Gene T., to Motorola, Inc. Current switch for programming vertical fuses of a read only memory. 4,716,547, Cl. 365-96.000.
- Battelle Memorial Institute: See—
Place, John; and Bregnard, Andre, 4,715,943, Cl. 204-299.000.
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- Bauer, Jerry R., to American Microsystems, Inc. State sequence dependent read only memory. 4,716,586, Cl. 380-3.000.
- Bauer, Manfred: See—
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- Baxter Travenol Laboratories, Inc.: See—
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- Thorogood, Douglas E., 4,715,165, Cl. 53-469.000.
- Bayer Aktiengesellschaft: See—
Fest, Christa; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,716,176, Cl. 514-477.000.
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- Klauke, Erich; Baasner, Bernd; and Schundehutte, Karl H., 4,716,229, Cl. 544-334.000.
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- Mann, Max; and Kapps, Manfred, 4,715,746, Cl. 405-264.000.
- Marzolph, Gerhard; Lunkenheimer, Winfried; and Fedtke, Carl, 4,715,888, Cl. 71-93.000.
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- BBC Brown, Boveri & Company, Ltd.: See—
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- Beam, Dennis A.: See—
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- Beard, Charles D.: See—
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- Beaver, Richard P., to PPG Industries, Inc. Method of preparation of packed fiber glass reaction vessel. 4,715,105, Cl. 29-419.000.
- Beckmann, Rudolf: See—
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- Beecham Group p.l.c.: See—
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- Bees, George L., to A.L.E. Systems, Inc. Power supply for negative impedance gas discharge lasers. 4,716,569, Cl. 372-38.000.
- Behrens, Robert N. Air motivated conduit prover apparatus. 4,715,747, Cl. 405-303.000.
- Beigler, Myron A.: See—
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- Belanger, Inc.: See—
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- Bell, Isaac M., to RCA Corporation. Temperature compensation apparatus for an electrical circuit. 4,716,315, Cl. 307-491.000.
- Bell, Ronald F.: See—
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- Bellis, Harold E.; and McBride, Edward F., to Du Pont de Nemours, E. I., and Company. Composition and method for temporarily reducing permeability of subterranean formations. 4,715,967, Cl. 252-8.551.
- Bemis Company, Inc.: See—
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- Benchmark Ventures: See—
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- Bencloski, William A.: See—
Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Casette, Angelo J.; Manno, John L.; and Parlak, Edward A., 4,716,010, Cl. 376-260.000.
- Benesh, Alvin H. Wind turbine system using a savonius type rotor. 4,715,776, Cl. 415-2.000.
- Bennett, Clifford: See—
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- Benoit, Philippe; Chielens, Alain; and Voisin, Jean-Paul, to Fives-Cail Babcock. Clinker manufacture control using falling clinker colorific energy measurement. 4,716,532, Cl. 364-477.000.
- Benson, David J.; Brown, Carl H.; and Hancock, William R., to Sperry Corporation. Display refresh memory apparatus utilizing one half frame updating. 4,716,460, Cl. 358-140.000.
- Berard, Raymond A.: See—
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- Berg, Lloyd; and Vosburgh, Mark G. Separation of n-propanol from 2-butanol by extractive distillation. 4,715,933, Cl. 203-51.000.
- Berger, Franz: See—
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- Berger, Jean L., to Thomson-CSF. Charge transfer analog comparator and devices using such a comparator. 4,716,580, Cl. 377-62.000.
- Berghoff, Wellington F., to Glidden Company. The Acrylic polyester high solids coatings. 4,716,200, Cl. 525-111.000.
- Bergstrom, Bo C.; and Herolf, Knut O. M., to Telefonaktiebolaget LM Ericsson. Method of reducing the effect of narrowband jammers in radio communication between two stations. 4,716,573, Cl. 375-1.000.
- Bergwerksverband GmbH: See—
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- Berlin, Bo; and Nedstedt, Gert, to Tetra Pak International AB. Metering pump. 4,715,791, Cl. 417-274.000.
- Berman, Cary; and Kiss, Steven. Fully collapsible portable chair. 4,715,650, Cl. 297-28.000.
- Bernabeu, Eugenio P. Ruler for measuring angles between an oriented axis and a vector. 4,715,127, Cl. 33-494.000.
- Bernard, Gilles; and Delalande, Francois, to Compagnie Europeenne de Composants Electroniques. Connecting strip for the manufacture of direct transfer electric components and manufacturing method for such components. 4,715,118, Cl. 29-856.000.
- Bernardi, Guido, to B.C.S. S.p.A. Starter device for internal combustion engines. 4,715,238, Cl. 74-6.000.
- Bernstrom, Marvin L., to Eaton Corporation. Two-speed valve-in star motor. 4,715,798, Cl. 418-57.000.
- Beroza, Gregory A. Gastro-intestinal lavage system and method. 4,715,848, Cl. 604-35.000.

- Berry, Joe R.; Langowski, Faustyn C.; Renfro, James G.; and Smith, Roger, Jr., to Hughes Tool Company. Universal floor mounted pipe handling machine. 4,715,761, Cl. 414-22.000.
- Berry, William A., to Standard Slag Cement. Cementitious binder for consolidated fill. 4,715,896, Cl. 106-117.000.
- Berryman, Leslie N.: See—
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- Besemann, Alfred, to E. C. H. Will (GmbH & Co.). Self-locking device for transmitting torque to bobbin cores. 4,715,551, Cl. 242-46.400.
- Bessko, Csaba: See—
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- Best, Donald D., Jr., to Hornbeck, David A., a part interest. Expandable piston. 4,715,568, Cl. 248-1.000.
- Bethel, George F.: See—
Erich, Richard R., 4,715,240, Cl. 74-52.000.
- Bethel, Patience K.: See—
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- Bethlehem Steel Corporation: See—
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- Bethhauser, Joseph L.: See—
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- Bhagavatula, Venkata A., to Corning Glass Works. Low dispersion, low-loss single-mode optical waveguide. 4,715,679, Cl. 350-96.330.
- Bhargava, Vikram, to Hayes Microcomputer Products, Inc. Enclosed circuit board assembly. 4,716,499, Cl. 361-395.000.
- Bhattacharyya, Bhupati R.; Srivatsa, Sanjay R.; and Dwyer, Michael L., to Nalco Chemical Company. Ampholytic diallyldimethyl ammonium chloride (DADMAC) copolymers and terpolymers for water clarification. 4,715,962, Cl. 210-708.000.
- Biale, John, to Union Oil Company of California. Multi-layered ionomer-vinylidene chloride contact laminated structures. 4,716,085, Cl. 428-476.900.
- Bianca, Joseph D.; and Anderson, David K., to Combustion Engineering, Inc. Low excess air tangential firing system. 4,715,301, Cl. 110-347.000.
- Biber, Klaus; and Unold, Gerhard, to Carl-Zeiss-Stiftung. Light trap for surgical operation microscopes. 4,715,704, Cl. 351-207.000.
- BICC Public Limited Company: See—
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- Bienz, Wilford L.: See—
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- Biernoth, Gerhard; Menz, Hans-Udo; Todt, Klaus H.; and Wiese, Theophil, to Lever Brothers Company. Fat blends containing milk fat or a milk fat fraction and non-milk fat, and spreads containing said fat blends. 4,716,047, Cl. 426-603.000.
- Billings, Roger E. Method and apparatus for electrolyzing water. 4,715,938, Cl. 204-129.000.
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- Biogen N.V.: See—
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- Bishop, Arthur E.; Roeske, Klaus J.; and Scott, David W. Method for making steering rack bars. 4,715,210, Cl. 72-400.000.
- Bitha, Panayota; Child, Ralph G.; Hlavka, Joseph J.; and Lin, Yang-I, to American Cyanamid Company. Heterocyclic-1,2-diamine platinum complexes. 4,716,157, Cl. 514-184.000.
- Bixler, Kenneth D., to Packaging Corporation of America. Beak-type carton lock. 4,715,529, Cl. 229-2.500.
- Bjarnason, Jon: See—
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- Black & Decker, Inc.: See—
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- Black, Jimmy C.: See—
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- Blackburn, Martin J.; and Smith, Michael P., to United Technologies Corporation. Titanium aluminum alloys containing niobium, vanadium and molybdenum. 4,716,020, Cl. 420-418.000.
- Blacklaws, John E.: See—
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- Blad, Per A.; and Johansson, Rolf, to AGA Aktiebolag. Method of attaching a connection piece to a metal surface by brazing. 4,716,272, Cl. 219-129.000.
- Blair, Boyton T., to Engineering & Colloid, Ltd. Well drilling and completion composition. 4,715,971, Cl. 252-8.510.
- Blake, Peter H.: See—
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- Blanchard, Kenneth E.; and Sanislo, Stephen V., Jr., to Phonetics, Inc.; and Wisconsin Bell, Inc. Digital and synthesized speech alarm system. 4,716,582, Cl. 379-28.000.
- Blanchard, Robert L., to Foxboro Company, The. Measurement calibration. 4,716,536, Cl. 364-571.000.
- Blank, Robert G.; and Miller, Ronald W., to American Home Products Corporation. Stabilized coated aspirin tablets. 4,716,042, Cl. 424-474.000.
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- Blishteyn, Mark; and Wright, William S., to Simco Company, Inc., The. Non-contact autoranging electrostatic fieldmeter with automatic distance indicator. 4,716,371, Cl. 324-457.000.
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- Blumstein, Robert M.: See—
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- BMC Manufacturing Inc.: See—
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- Boatwright, David A.; and Widener, Wade H., to Westinghouse Electric Corp. End plug with truncated tapered leading end configuration. 4,716,018, Cl. 376-451.000.
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- Boden, Richard M.: See—
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- Bodine, Albert G. Sonic method for facilitating the fracturing of earthen formations in well bore holes. 4,716,555, Cl. 367-35.000.
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- Moji, Yukimori; and Taylor, Richard Q., 4,716,067, Cl. 428-117.000.
- Nordlund, Lester H., 4,716,399, Cl. 340-365.000.
- Wiegenstein, John H., 4,715,203, Cl. 72-30.000.
- Boets, Marc J.: See—
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- Bogdanovsky, Valentin A.: See—
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- Bogucki-Land, Bogdan, to Karl Mayer textilmaschinenfabrik. Arrangement for the entanglement of multi-filament threads. 4,715,097, Cl. 28-172.000.
- Bohl, Phillip B.; Gillette, Rodney J.; and Smith, James C., to Caterpillar Inc. Engine ignition system with an insulated and extendable extender. 4,715,337, Cl. 123-169.000.
- Bohlen, Dietrich, to Nestec S.A. Pack comprising an outer rigid envelope and an inner flexible envelope. 4,715,511, Cl. 220-403.000.
- Bokalt, Jean, to Societe Nationale Industrielle Aerospatiale. Mechanism for automatically actuating a rescue device upon opening of an exit door. 4,715,562, Cl. 244-137.200.
- Bollands, Martin A.; Pike, William C.; Thukral, Prem S.; and Woolmington, Timothy P., to British Petroleum Company p.l.c., The. Drill shoe. 4,715,455, Cl. 175-402.000.
- Bomhard, Andreas: See—
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- Bond, Irvin D. Apparatus for turning a workpiece over along a twisting path of motion. 4,715,242, Cl. 74-102.000.
- Bonelli, Fabio; Pessi, Antonello; and Verdini, Antonio S., to Enichem S.p.A.; and Eniricerche S.p.A. Partially modified, retro-inverso neurotensin analogs. 4,716,149, Cl. 514-13.000.
- Bongers, Antonius J. P.: See—
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- Boone, Terry. Carburetion system and method for vaporizing fuel and for mixing vaporized heated fuel with air to power an internal combustion engine. 4,715,997, Cl. 261-142.000.
- Booth, Michael; and Penneke, Richard J., to Raychem Limited. Method of making coaxial cable. 4,715,098, Cl. 29-25.350.

- Boots-Celltech Diagnostics Limited: See—
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- Bores, Leonard F.; and Zdzarski, Mark J., to ASC Incorporated. Locator and hold-down latch for removable vehicle roof panels. 4,715,649, Cl. 296-218.000.
- Borg-Warner Corporation: See—
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- Borras, Jaime Andres, to Motorola, Inc. Trunked communication system true priority channel scan. 4,716,407, Cl. 340-825.040.
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- Boston University, Trustees of: See—
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- Boudreau, Robert A., to GTE Products Corporation. Mask for patterning electrode structures in thin film EL devices. 4,715,940, Cl. 204-192.100.
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- Bowman, Gary K., to Ingenuity Unlimited, Inc. Septic tank sludge level indicator. 4,715,966, Cl. 210-800.000.
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- Boxell, Timothy G.; Bardsley, Frank B.; and Stoddart, David E., to Gearhart Tesel Limited. Downhole tools. 4,715,440, Cl. 166-100.000.
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- Brandon, Craig A.: See—
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- Brandt, Inc.: See—
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- Braun, Ernst: See—
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- Braun, Gert; and Braun, Ernst, to Halbach & Braun Industrieanlagen. Planing machine for the mining of minerals. 4,715,658, Cl. 299-34.000.
- Braunecker, Bernhard: See—
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- Brechbuhler, Fritz: See—
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- Breed Corporation: See—
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- Breed, David, to Breed Corporation. Passenger compartment sensor with low bias. 4,715,617, Cl. 280-731.000.
- Bregnard, Andre: See—
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- Breu, Johann, to Rockinger Spezialfabrik für Anhängerkupplungen GmbH & Co. Mounting of the coupling body of a trailer coupling in the cross-piece. 4,715,611, Cl. 280-504.000.
- Bridges, Jeffrey M., to Texas Instruments Incorporated. Method of forming a high density vertical stud titanium silicide for reachup contact applications. 4,715,109, Cl. 437-200.000.
- Bridgestone Corporation: See—
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- Briggs Manufacturing, Inc.: See—
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- Briggs, Paul C.: See—
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- Briggs, Stanley E., to Briggs Manufacturing, Inc. Foldable drill implement with differential assembly. 4,715,302, Cl. 111-1.000.
- Brigham & Women's Hospital: See—
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- Bright, Edward J.; and Sinisi, David B., to AMP Incorporated. Retention system for removable heat sink. 4,716,494, Cl. 361-386.000.
- Brightwell, Lionel L., to Trus Joist Corporation. Wooden joist with web members having cut tapered edges and vent slots. 4,715,162, Cl. 52-729.000.
- Brine, Satya S.; Baines, John H.; and Poulin, Suzanne C. M. Child resistant cabinet lock combination finger lock. 4,715,628, Cl. 292-19.000.
- Bringmann, Udo; Drews, Klaus; and Schon, Detlef, to U.S. Philips Corporation. Device for coating a substrate by means of plasma-CVD or cathode sputtering. 4,715,319, Cl. 118-723.000.
- Brink, Douglas F.; and MacConnell, John, to Benchmark Ventures. Cup holder. 4,715,633, Cl. 294-31.200.
- Brisson, Alfred G.: See—
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- Nowacki, Christopher; and Brisson, Alfred G., 4,715,376, Cl. 128-328.000.
- British Petroleum Company p.l.c., The: See—
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- Brock, J. Donald, to Astec Industries, Inc. Drum mix asphalt plant with knock-out box and separate pugmill coater. 4,715,720, Cl. 366-25.000.
- Bronowski, Helmut; and Dahlke, Christian, to J. M. Voith GmbH. Cover for turbines and pumps. 4,715,781, Cl. 415-219.00C.
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- Combustion Engineering, Inc.: See—
Bianca, Joseph D.; and Anderson, David K., 4,715,301, Cl. 110-347.000.
- Cominco Ltd.: See—
Ball, Donald L.; and Boateng, Daniel A. D., 4,715,939, Cl. 204-182.400.
- Commereuc, Dominique: See—
Provin, Gerard; Forestiere, Alain; and Commereuc, Dominique, 4,716,239, Cl. 556-147.000.
- Commissariat a l'Energie Atomique: See—
Diem, Bernard, 4,715,930, Cl. 437-101.000.
- Rigoulot, Claude, 4,715,751, Cl. 409-139.000.
- Compagnie Europeenne de Composants Electroniques: See—
Bernard, Gilles; and Delalande, Francois, 4,715,118, Cl. 29-856.000.
- Concurrent Computer Corporation: See—
Gilanyi, Robert A.; and Schmitt, Ralph H., 4,716,525, Cl. 364-200.000.
- Connelly Skis, Inc.: See—
Horne, Kenneth A., 4,715,416, Cl. 150-52.00R.
- Connon, Helen A.; Gorski, Robert A.; Kenyon, William G.; and Yokozeki, Akimichi, to Du Pont de Nemours, E. I., and Company: Azeotropic compositions of trichlorotrifluoroethane, dichlorodifluoroethane and methanol/ethanol. 4,715,900, Cl. 134-31.000.
- Container Graphics Corporation: See—
Cooper, Larry L.; and Saunders, Philip G., 4,716,096, Cl. 430-323.000.
- Contamin, Jean-Claude: See—
Zabotto, Arlette; and Contamin, Jean-Claude, 4,715,982, Cl. 252-174.170.
- Continental Gummi-Werke Aktiengesellschaft: See—
Drescher, Gunter; Fankhanel, Gerhard; and Gnirk, Wolfgang, 4,715,588, Cl. 267-122.000.
- Continua International Continuous Casting S.p.A.: See—
Klaucic, Luciano, 4,715,426, Cl. 164-426.000.
- Controlled Release Technologies, Inc.: See—
Tran, Loi H., 4,715,850, Cl. 604-82.000.
- Conway, Richard J.; Watson, Keith G.; and Farquharson, Graeme J., to Imperial Chemical Industries PLC: Herbicidal cyclohexane-1,3-dione derivatives. 4,715,884, Cl. 71-90.000.
- Cook, Jeffrey A.; and Hamburg, Douglas R., to Ford Motor Company: Reduction of HC emissions for vapor recovery purge systems. 4,715,340, Cl. 123-406.000.
- Cooper, Edward: AC voltage regulator with split primary switching. 4,716,357, Cl. 323-263.000.
- Cooper, James A.: See—
Tommis, Norman; and Cooper, James A., 4,715,422, Cl. 164-97.000.
- Cooper, Larry L.; and Saunders, Philip G., to Container Graphics Corporation: Method and apparatus for producing characters on a grit-erodible body. 4,716,096, Cl. 430-323.000.
- Cooper, Ronald J.: See—
Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Pescatore, John C.; and Marsico, Mario A., 4,716,523, Cl. 364-200.000.
- Corning Glass Works: See—
Bhagavatula, Venkata A., 4,715,679, Cl. 350-96.330.
- Montieth, Max R., 4,715,576, Cl. 249-60.000.
- Montieth, Max R., 4,715,801, Cl. 425-110.000.
- Rittler, Hermann L., 4,715,987, Cl. 252-315.500.
- Cornsweet, Tom N.; and Hersh, Samuel, to Rodenstock Instrument Corporation: Ocular-fundus analyzer. 4,715,703, Cl. 351-205.000.
- Cosmo Plastics Company: See—
Gordon, Albert, 4,716,394, Cl. 336-192.000.
- Costello, Rocky C.; and Dixon, Robert L., to Stauffer Chemical Company: Method of disposing of materials by dissolving in acid and then incinerating. 4,715,303, Cl. 110-346.000.
- Courtney, Mark G.: See—
Arnold, Allen J.; Courtney, Mark G.; Kirby, Diane N.; Mis, Katherine H.; and Sutton, Kerry L., 4,715,430, Cl. 165-80.300.
- Coutelle, Charles: See—
Hunger, Hans-Dieter; and Coutelle, Charles, 4,716,103, Cl. 435-5.000.
- Couwenberg, Franciscus A. C. M.; Groenenberg, Cornelis J.; and Wetjens, Antonius C. S., to Océ-Nederland B.V.: Positioning device for sheet on exposure platen of a copying machine. 4,716,440, Cl. 355-14.05H.
- Covalent Technology Corporation: See—
Wood, David E., 4,716,123, Cl. 436-533.000.
- Coyne, Brenton S.; Strandjord, Andrew J.; Spence, Mark W.; Willis, Reid S.; Bredeweg, Robert A.; and Stevens, Timothy S., to Dow Chemical Company: The Determining organic compounds using a membrane. 4,715,217, Cl. 73-61.10C.
- Cozewith, Charles; Ju, Shiao; and Verstrate, Gary W., to Exxon Research & Engineering Co.: Modular copolymers comprising narrow MWD alpha-olefin copolymers coupled by non-conjugated dienes. 4,716,207, Cl. 526-169.200.
- Craig, Clark E., to Valhi, Inc.: Cylinder lock with removable plug. 4,715,201, Cl. 70-369.000.
- Craker, Robert, to Allen-Bradley Company, Inc.: Printer circuit board chassis with power interlock. 4,716,495, Cl. 361-391.000.
- Craker, Robert, to Allen-Bradley Company, Inc.: Printed circuit board module. 4,716,497, Cl. 361-395.000.
- Crass, Guenther: See—
Seifried, Walter; and Crass, Guenther, 4,716,068, Cl. 428-141.000.
- Crawford, Douglass W.; Crawford, William B.; and Crawford, Mark S.: Side pocket mandrel. 4,715,441, Cl. 166-117.500.
- Crawford, Mark S.: See—
Crawford, Douglass W.; Crawford, William B.; and Crawford, Mark S., 4,715,441, Cl. 166-117.500.
- Crawford, William B.: See—
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- Criss, Russell C.: See—
Gillery, F. Howard; Criss, Russell C.; and Finley, James J., 4,716,086, Cl. 428-630.000.
- Crosfield Electronics Limited: See—
Roe, Malcolm D. M.; and Hicks, Michael E., 4,716,384, Cl. 332-7.510.
- Cross, Dan A., to Boeing Company: The Wire routing tool for robotic wire harness assembly. 4,715,100, Cl. 29-33.00M.
- Cross, Peter: See—
Scifres, Donald R.; Cross, Peter; and Hamagel, Gary L., 4,716,568, Cl. 372-36.000.
- Crossin, Michael C., to Colgate-Palmolive Company: Stable soil release promoting liquid detergent containing stabilized enzymes. 4,715,990, Cl. 252-551.000.
- Crossley, Robert B.: Multifunctional behavioral modification device for snoring, bruxism, and apnea. 4,715,367, Cl. 128-136.000.
- Crus, Richard A.; Haderle, Donald J.; and Herron, Howard W., to International Business Machines Corporation: Method for managing lock escalation in a multiprocessing, multiprogramming environment. 4,716,528, Cl. 364-300.000.
- Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A.: See—
Fausone, Alfredo; and Moncalvo, Agostino, 4,716,587, Cl. 380-10.000.
- Cudahy, Michael J.; De La Huerca, Carlos; Arneson, Harold N.; Divers, R. Thomas; and Altman, Barry J., to Marquette Electronics, Inc.: Patient monitoring system having transportable data module and display unit. 4,715,385, Cl. 128-710.000.
- Cummings, Richard E.; Mackey, Charles S.; Dickinson, Robert W.; Dickinson, Ben W. O., III; and Larsen, Merle D., to Dickinson III, Ben Wade Oakes; and Dickinson, Robert Wayne: Curvature probe and method. 4,715,128, Cl. 33-544.000.
- Curran, Kenneth: See—
May, Richard L.; Smith, Jay; and Wolf, Harley, 4,715,602, Cl. 273-86.00R.
- Curti, Carlo, to Sauer S.p.A.: Plant for the production of popsicles and icecreams incorporating a holding stick. 4,715,193, Cl. 62-345.000.
- Curtis, Walter B.; Davis, Gregory L.; and Klimowicz, Mark C., to Texaco Inc.: Marine shock absorbing apparatus with stabilizers. 4,715,310, Cl. 114-220.000.
- D. L. Auld Company, The: See—
Wagh, Robert E.; Nannig, Urban R.; and Rockwood, Clyde R., 4,716,052, Cl. 427-147.000.
- Dahl, John H.: See—
Hulsizer, Philip N.; and Dahl, John H., 4,716,271, Cl. 219-125.110.
- Dahlke, Christian: See—
Bronowski, Helmut; and Dahlke, Christian, 4,715,781, Cl. 415-219.00C.
- Daiel Chemical Industries, Ltd.: See—
Murabayashi, Katuyoshi, 4,716,198, Cl. 525-92.000.
- Daihatsu Motor Company Limited: See—
Miyake, Hiroshi, 4,715,540, Cl. 239-533.300.
- Daikin Industries, Ltd.: See—
Fujimoto, Satoru, 4,716,347, Cl. 318-460.000.
- Daimler-Benz Aktiengesellschaft: See—
Baumann, Karl-Heinz; Schick, Gerald; Kassing, Lothar; Bossenmaier, Alban; and Brambilla, Luigi, 4,715,468, Cl. 180-271.000.
- Daines, Bernard N.: See—
Carse, Gregg D.; and Daines, Bernard N., 4,716,562, Cl. 370-110.100.
- Dale Electronics, Inc.: See—
Kneifel, Jerome J., 4,716,396, Cl. 338-226.000.
- Daley, Thomas R.: See—
Holming, Robert; Nelson, Robert S.; and Daley, Thomas R., 4,715,546, Cl. 241-171.000.
- Daloz, Joanny: Device for metering a powdered, granular or liquid product, and apparatus including a device of the kind. 4,715,245, Cl. 74-522.000.
- Dana Corporation: See—
Flotow, Richard A., 4,715,484, Cl. 192-70.250.
- Danico, Henry F.; and Hammerle, Frederick A., to TRW Inc.: Nut and washer assembly. 4,715,756, Cl. 411-369.000.
- Daniel Industries, Inc.: See—
Allen, Charles R.; and Harshman, Jack D., 4,715,234, Cl. 73-861.910.
- Daniel, Maurice: Light emitting optical fiber assemblies including light controlling. 4,715,700, Cl. 350-618.000.
- Danilyak, Sergei N.: See—
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Danilyak, Sergei N.; Gavva, Viktor M.; Roiko, Jury P.; and Nushko, Valery A., 4,716,273, Cl. 219-130.010.
- Danner, Gary A.; and Sherman, Raymond W., to General Kinematics Corporation: Vibratory separation apparatus. 4,715,950, Cl. 209-20.000.
- D'Antonio, Nicholas F.; and D'Antonio, Nicholas J., to Pfizer Hospital Products Group, Inc.: Dry bottle drainage system. 4,715,855, Cl. 604-320.000.

D'Antonio, Nicholas J.: See—
D'Antonio, Nicholas F.; and D'Antonio, Nicholas J., 4,715,855, Cl. 604-320.000.

Darko Jorge Lazaneo Dragicevic: See—
De Angelis, Pedro C.; and Dragicevic, Nedo D. L., 4,715,458, Cl. 177-172.000.

D'Arrigo, Sebastiano; Imondi, Giuliano; and Vergara, Sossio, to Texas Instruments Incorporated. Power-up control circuit including a comparator, Schmitt trigger, and latch. 4,716,322, Cl. 307-592.000.

Datapoint Corporation: See—
Tompkins, E. Neil; and Bartholmae, Jack N., 4,716,585, Cl. 379-202.000.

Date, Takao; Okumura, Masaru; and Watanabe, Koya, to Toshiba Kikai Kabushiki Kaisha. Automatic pallet changer. 4,715,490, Cl. 198-346.100.

Daudelin, Douglas S., to AT&T Information Systems Inc. Adaptive FSK demodulator and threshold detector. 4,716,376, Cl. 329-107.000.

Davenport, William H.; McCormack, Gary D.; and LaRue, George S., to TriQuint. Direct coupled FET logic with super buffer output stage. 4,716,311, Cl. 307-448.000.

Daverveld, Leonardus A.: See—
Esser, Leonard J. M.; Van de Wiel, Petrus J. A. M.; Daverveld, Leonardus A.; and Van Gils, Johannes A. A., 4,716,446, Cl. 357-23.140.

Davies, Huw M.: See—
Thompson, Gregory A.; and Davies, Huw M., 4,716,101, Cl. 435-4.000.

Davies, Keith: See—
Collier, John C.; and Davies, Keith, 4,715,826, Cl. 439-438.000.

Davis, Gregory L.: See—
Curtis, Walter B.; Davis, Gregory L.; and Klimowicz, Mark C., 4,715,310, Cl. 114-220.000.

Davis, William F., to Motorola, Inc. Differential amplifier including balanced two terminal series RC network. 4,716,379, Cl. 330-252.000.

Day, Lawrence J.: See—
Flannagan, Stephen T.; Day, Lawrence J.; and Simon, Barry A., 4,716,302, Cl. 307-200.00B.

De La Huerca, Carlos: See—
Cudahy, Michael J.; De La Huerca, Carlos; Arneson, Harold N.; Divers, R. Thomas; and Altman, Barry J., 4,715,385, Cl. 128-710.000.

DeAngelis, John: See—
Saito, Yasunori; and DeAngelis, John, 4,715,677, Cl. 350-96.230.

De Angelis, Pedro C.; and Dragicevic, Nedo D. L., to Darko Jorge Lazaneo Dragicevic. Beam balance with unequal arms and didder device. 4,715,458, Cl. 177-172.000.

de Castiglione, Roberto: See—
Scarpioni, Ugo; Lazzarini, Anna M.; Toti, Daniela; and de Castiglione, Roberto, 4,716,228, Cl. 540-578.000.

Deconinck, Filip: See—
Van Bogaert, Philippe; and Deconinck, Filip, 4,715,411, Cl. 139-452.000.

Deere & Company: See—
Kryszek, Robert, 4,715,770, Cl. 414-680.000.

Oxley, Lonnie R., 4,715,168, Cl. 56-15.800.

Steilen, Ronald M., 4,715,515, Cl. 222-143.000.

Winter, David C.; and Wood, William R., 4,715,449, Cl. 172-513.000.

Wisdom, James N., 4,715,610, Cl. 280-490.00R.

Wohlford, William P.; and Hovenga, LaVern B., 4,716,401, Cl. 340-568.000.

Deflecta-Shield Corp.: See—
Butler L., Diego, 4,715,643, Cl. 296-97.00A.

DeGan, Allen D. Saw guide with cooling and lubricating capability. 4,715,254, Cl. 83-169.000.

DeGraffenreid, Howard T. Triangular filter cartridge and apparatus. 4,715,954, Cl. 210-323.100.

Degussa Aktiengesellschaft: See—
Drauz, Karlheinz; Kleemann, Axel; and Wolf-Heuss, Elisabeth, 4,716,237, Cl. 549-72.000.

Kleemann, Axel; Klenk, Herbert; and Schulz, Wolfgang, 4,716,247, Cl. 564-18.000.

de Jong, Feike; and Vermeule, Jacob, to Shell Oil Company. Lubricating oil compositions. 4,715,973, Cl. 252-40.500.

Delalande, Francois: See—
Bernard, Gilles; and Delalande, Francois, 4,715,118, Cl. 29-856.000.

della Valle, Francesco; and Romeo, Aurelio, to FIDIA, S.p.A. Method for preparing ganglioside derivatives and use thereof in pharmaceutical compositions. 4,716,223, Cl. 536-53.000.

De Luca, Paul V., to Porta Systems Corp. Wire strain relief and conductor retainer construction for telephone blocks. 4,715,830, Cl. 439-709.000.

Demaggio, Gregory: See—
Ovshinsky, Stanford R.; Hudgens, Stephen J.; Allred, David D.; and Demaggio, Gregory, 4,715,890, Cl. 75-0.5AA.

Ovshinsky, Stanford R.; Hudgens, Stephen J.; Allred, David D.; and Demaggio, Gregory, 4,715,891, Cl. 75-0.5BA.

Demario, Edmund E.; Burman, Denis L.; Olson, Carl A.; and Secker, Jeffrey R., to Westinghouse Electric Corp. Universal fuel assembly construction for a nuclear reactor. 4,716,016, Cl. 376-446.000.

DeMars, Robert A. Glass having means for swizzle stick attachment. 4,715,505, Cl. 215-100.00R.

de Mello, Carol R.: See—
Markwell, Roger E.; Ward, Robert W.; and de Mello, Carol R., 4,716,160, Cl. 514-212.000.

Demmin, Gunter: See—
Hofmeister, Walter; and Demmin, Gunter, 4,715,925, Cl. 156-470.000.

Dempsey, Beth R. Carburetor for internal combustion engine. 4,715,346, Cl. 123-524.000.

Denick, John, Jr., to Warner-Lambert Company. Medicament adsorbates with surfactant and their preparation. 4,716,033, Cl. 424-48.000.

Denison, William J.; Smith, Lancing G.; and Walker, Lonnie R., to Halliburton Company. Grid system. 4,715,308, Cl. 114-72.000.

Denton Vacuum Inc.: See—
Lee, Kon J.; and Musset, Anthony, 4,716,340, Cl. 315-111.410.

Depew, Donald R.; Houghton, Robert A.; and Sparks, David C., to Spartan Corporation. Tapered wiring harness. 4,716,554, Cl. 367-20.000.

Depew, Thomas N. Pallet construction. 4,715,294, Cl. 108-51.100.

Desfontaines, Guy: See—
Leroy, Claude; Millot, Jean-Paul; and Desfontaines, Guy, 4,716,008, Cl. 376-237.000.

De Simone, Luigi: See—
Pahl, Scott; and De Simone, Luigi, 4,716,504, Cl. 362-150.000.

DeSoto, Inc.: See—
Schmid, Steven R.; Ansel, Robert E.; and Murray, Kevin P., 4,716,209, Cl. 526-261.000.

Desvard, Catherine: See—
Peau, Jean-Louis; Desvard, Catherine; and Barbier, Jean-Paul, 4,715,985, Cl. 252-305.000.

Deters, Joseph C.: See—
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,716,031, Cl. 424-453.000.

Detty, Garnett E. Knee brace with extension angle establishing means. 4,715,363, Cl. 128-80.00C.

Dickakian, Ghazi, to Du Pont de Nemours, E. I., and Company. Aromatic pitch. 4,715,945, Cl. 208-40.000.

Dicke, Hans-Rudolf: See—
Wagner, Rudolf; Halcour, Kurt; Dicke, Hans-Rudolf; and Eckhardt, Volker, 4,716,252, Cl. 568-729.000.

Dickinson, Ben W. O., III: See—
Cummings, Richard E.; Mackey, Charles S.; Dickinson, Robert W.; Dickinson, Ben W. O., III; and Larsen, Merle D., 4,715,128, Cl. 33-544.000.

Dickinson, Harry D. Manually depressible automatically deployable spring balanced bollard. 4,715,742, Cl. 404-6.000.

Dickinson III, Ben Wade Oakes: See—
Cummings, Richard E.; Mackey, Charles S.; Dickinson, Robert W.; Dickinson, Ben W. O., III; and Larsen, Merle D., 4,715,128, Cl. 33-544.000.

Dickinson, Robert W.: See—
Cummings, Richard E.; Mackey, Charles S.; Dickinson, Robert W.; Dickinson, Ben W. O., III; and Larsen, Merle D., 4,715,128, Cl. 33-544.000.

Dickinson, Robert Wayne: See—
Cummings, Richard E.; Mackey, Charles S.; Dickinson, Robert W.; Dickinson, Ben W. O., III; and Larsen, Merle D., 4,715,128, Cl. 33-544.000.

Diederer, Willi: See—
Heider, Joachim; Huel, Norbert; Austel, Volkhard; Noll, Klaus; Bomhard, Andreas; van Meel, Jacques; and Diederer, Willi, 4,716,169, Cl. 514-299.000.

Diehl GmbH & Co.: See—
Holler, Roland, 4,715,285, Cl. 102-435.000.

Diel, Peter J.: See—
Lukaszyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gotzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,715,883, Cl. 71-90.000.

Diem, Bernard, to Commissariat a l'Energie Atomique. Process for producing by sloping etching a thin film transistor with a self-aligned gate with respect to the drain and source thereof. 4,715,930, Cl. 437-101.000.

Diesel Kiki Co., Ltd.: See—
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, 4,715,790, Cl. 417-269.000.

Mino, Kaoru; Fukushima, Koji; and Kasai, Takashi, 4,715,609, Cl. 277-207.00R.

Sugiura, Hiroyuki, 4,715,196, Cl. 62-468.000.

Dilling, Peter; and Schlegel, Susan L., to Westvaco Corporation. Lignosulfonate salts for use as dyestuff additives. 4,715,864, Cl. 8-557.000.

Dillon, Stephen M. Decorative lens. 4,715,702, Cl. 351-44.000.

Dinger, Horst; and Moosmann, Horst, to Gebruder Junghans GmbH. Impact switch for fuses. 4,715,281, Cl. 102-216.000.

Dislich, Helmut; Arfsten, Nanning J.; Schmidt, Helmut; Philipp, Gottfried; and Tuenker, Gerhard, to Schott Glaswerke. Process of making optical blanks. 4,715,999, Cl. 264-1.100.

Divers, R. Thomas: See—
Cudahy, Michael J.; De La Huerca, Carlos; Arneson, Harold N.; Divers, R. Thomas; and Altman, Barry J., 4,715,385, Cl. 128-710.000.

Diversey Wyandotte Corporation: See—
Lopes, John A.; and Stanton, James H., 4,715,980, Cl. 252-106.000.

Dixon International Limited: See—
Tanner, Robert A., 4,715,268, Cl. 98-41.100.

Dixon, Robert L.: See—
Costello, Rocky C.; and Dixon, Robert L., 4,715,300, Cl. 110-346.000.

Dobbs, Paul T. Map display. 4,715,642, Cl. 296-1.00R.

Dobreski, David V.: See—
Canterino, Peter J.; Dobreski, David V.; and Shaw, Richard G., 4,716,201, Cl. 525-240.000.

Dr. Karl Thomae GmbH: See—
Heider, Joachim; Huel, Norbert; Austel, Volkhard; Noll, Klaus; Bomhard, Andreas; van Meel, Jacques; and Diederer, Willi, 4,716,169, Cl. 514-299.000.

Doddi, Namassivaya: See—
Dunks, Gary B.; Yamada, Akira; Beard, Charles D.; and Doddi, Namassivaya, 4,716,234, Cl. 548-259.000.

Dohi, Hideyuki: See—
Sato, Atsushi; Kawakami, Shigenobu; Endo, Keiji; and Dohi, Hideyuki, 4,716,084, Cl. 428-458.000.

Doi, Yuzuru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Security device for detecting defects in transmitting fiber. 4,716,288, Cl. 250-227.000.

Domtar Inc.: See—
Fischer, David, 4,715,519, Cl. 225-48.000.

Dorner, Karl H.: See—
Asten, Wolfgang V.; Dorner, Karl H.; Scheel, Hartmut; and Wurstle, Volker, 4,715,903, Cl. 148-11.50A.

Dorr, John A., to Xecutek Corporation. Ultrasonic apparatus for determining the amount of liquid in a container of known volume. 4,715,226, Cl. 73-290.00V.

Dorsey, Eric A.: See—
Groner, Gabriel F.; Dorsey, Eric A.; Williams, Keith M.; and Vyas, Harihar J., 4,716,583, Cl. 379-88.000.

Douaud, Andre; and Rialan, Joseph, to Institut Francais du Petrole. Method of and device for automatically adjusting the ignition timing of a controlled ignition engine. 4,715,341, Cl. 123-425.000.

Douros, Bryan P.; and Marcuvitz, Andrew, to Apollo Computer, Inc. Adaptively synchronized ring network for data communication. 4,716,575, Cl. 375-3.000.

Dow Chemical Company, The: See—
Coyne, Brenton S.; Strandjord, Andrew J.; Spence, Mark W.; Willis, Reid S.; Bredeweg, Robert A.; and Stevens, Timothy S., 4,715,217, Cl. 73-61.10C.

Evans, John C., 4,715,717, Cl. 356-429.000.

Evans, John C., 4,715,718, Cl. 356-446.000.

Parker, Theodore L., 4,716,204, Cl. 525-504.000.

Rogers, Richard B.; and Herrero, Maria P., 4,716,174, Cl. 514-340.000.

Seiss, Randolph H.; and Yonkers, Edward H., 4,716,197, Cl. 525-75.000.

Downey, Emil: See—
Nicoletta, Roger A.; and Downey, Emil, 4,715,639, Cl. 294-99.200.

Dowty and Smiths Industries Controls Limited: See—
Saunders, Arthur F.; and Eccles, Edward S., 4,716,531, Cl. 364-431.020.

Dozzo, John J., to Duke Insulation Company, Inc. Support structure for roof insulation in metal buildings. 4,715,156, Cl. 52-404.000.

Dragerwerk Aktiengesellschaft: See—
Altner, Ulrich; Falb, Wolfgang; Ryschka, Martin; and Wallroth, Carl-Friedrich, 4,715,370, Cl. 128-204.130.

Haas, Hans, 4,715,371, Cl. 128-204.260.

Dragicevic, Nedo D. L.: See—
De Angelis, Pedro C.; and Dragicevic, Nedo D. L., 4,715,458, Cl. 177-172.000.

Drägmen, Kenneth J., Jr., to Picker International, Inc. Patient support for radiation imaging. 4,715,591, Cl. 269-322.000.

Dragsund, Inge; and Gjestrum, Einar, to Geophysical Company of Norway A.S. Float for use in seismic surveys of the sea bed. 4,716,553, Cl. 367-15.000.

Drauz, Karlheinz; Kleemann, Axel; and Wolf-Heuss, Elisabeth, to Degussa Aktiengesellschaft. Process for the production of 3-oxonitriles. 4,716,237, Cl. 549-72.000.

Drescher, Gunter; Fankhanel, Gerhard; and Gnirk, Wolfgang, to Continental Gummi-Werke Aktiengesellschaft. Rolling-type bellows for vehicular pneumatic cushioning. 4,715,588, Cl. 267-122.000.

Dressendorfer, Michael: See—
Baillie, William R.; Macias, Jorge; and Dressendorfer, Michael, 4,715,669, Cl. 312-12.000.

Drews, Klaus: See—
Bringmann, Udo; Drews, Klaus; and Schon, Detlef, 4,715,319, Cl. 118-723.000.

Dreyfus, Roger, to ICP S.A. Composite package for a group of containers. 4,715,493, Cl. 206-200.000.

Dridrinks N.V.: See—
Lavie, Louis F., 4,716,046, Cl. 426-96.000.

Duck, Edward W.; and Scheffler, Ingolf, to Teroson G.m.b.H. Sealant compositions and sealed double glazing units. 4,716,070, Cl. 428-192.000.

Duguay, Michel A.; Koch, Thomas L.; Kokubun, Yasuo; and Pfeiffer, Loren N., to American Telephone and Telegraph Company. Optical waveguide utilizing an antiresonant layered structure. 4,715,672, Cl. 350-96.120.

Duke Insulation Company, Inc.: See—
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- Ecer, Gunes M., to CDP, Ltd. Pump liners and a method of cladding the same. 4,715,313, Cl. 118-105.000.
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- Eitel, Frederick G., to United States of America, Army. Beam steering mirror construction. 4,715,694, Cl. 350-486.000.
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- Exxon Research & Engineering Co.: See—
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- Fives-Cail Babcock: See—
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- Flannagan, Stephen T.; and Reed, Paul A., to Motorola, Inc. High performance output driver. 4,716,550, Cl. 365-207.000.
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- Fleming, Roy E. Well cap. 4,715,439, Cl. 166-68.000.
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- Florin Limited: See—
Harrington, Patrick W., 4,715,124, Cl. 33-175.000.
- Florio, Steven M., to Sprague Electric Company. Process for anodizing aluminum for an aluminum electrolytic capacitor. 4,715,936, Cl. 204-58.000.
- Flotow, Richard A., to Dana Corporation. Automatic intermediate plate positioner. 4,715,484, Cl. 192-70.250.
- Floyd, John F. Underwater viewing device. 4,715,837, Cl. 441-135.000.

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Electric Corp. Tooling apparatus for modifying nuclear reactors, 4,716,010, Cl. 376-260.000.
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- Gidley, John L., to Exxon Production Research Company. Baffle system for conducting well treating operations, 4,715,443, Cl. 166-250.000.
- Gilanyi, Robert A.; and Schmitt, Ralph H., to Concurrent Computer Corporation. Peripheral controller for coupling data buses having different protocol and transfer rates, 4,716,525, Cl. 364-200.000.
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- Gilliland, Malcolm T. Distributed station welding system, 4,716,274, Cl. 219-130.210.
- Giometti, Paul F., to Facet Enterprises, Inc. Engine starter gearing, 4,715,239, Cl. 74-6.000.
- Gion, Hidenori; Yoda, Takumi; Kirita, Yasuzo; Zaima, Kazuhito; and Kurata, Noriyuki, to Kuraray Co., Ltd. Method for easily drawing blood from arm or leg, 4,715,849, Cl. 604-52.000.
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- Gjestrum, Einar: See—
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- Glass, Emmett F.; and Howell, Edmund O., to New Holland Inc. Reel lift mechanism for mower-conditioners, 4,715,171, Cl. 56-192.000.
- Glassett, Kevin L., to Hewlett-Packard Company. Pen turret rotation for plotters, 4,716,420, Cl. 346-139.00R.
- Gleason, Lawrence C. Miniature simulated baseball, 4,715,603, Cl. 273-90.000.
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- Glidden Company, The: See—
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- Globus Fussstutzenfabrik Karl Kremendahl: See—
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- Goddard, Carl J., to Pfizer Inc. Chlorination of 2-methoxynicotinic acid, 4,716,231, Cl. 346-298.000.
- Godlewski, Edward S. Stack-supporting bottom feed conveyor, 4,715,593, Cl. 271-10.000.
- Goebel, Charles C.: See—
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- Goepel, Ernst; and Kusmierz, Hans, to Siemens Aktiengesellschaft. Mechanism for rinsing an ink printing head, 4,716,422, Cl. 346-140.00R.
- Goffi, Carlo P.; and Clark-Goffi, Deborah E. Protective covering for lightweight vehicle, 4,715,646, Cl. 296-136.000.
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- Gollub, Hans J.; Hechenberger, Dieter A.; and Moermann, Renate, to Lingner & Fischer GmbH. Composition, 4,716,189, Cl. 524-284.000.
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- Gomes, Rodney A.: See—
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- Gonzalez, Carlos F.; and Gryczka, Alfred J., to Microlife Technics, Inc. Derived nisin producing microorganisms, method of production and use and products obtained thereby, 4,716,115, Cl. 435-172.300.
- Goodman, Richard L.: See—
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- Greenwood, Alan; and Majerus, Norbert, 4,715,577, Cl. 249-107.000.
- Peterson, Paul J., 4,715,106, Cl. 29-426.400.
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- Gordon, Phillip J.: See—
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- Graciotti, Alessandro, to Ing. C. Olivetti. Bus converter, 4,716,527, Cl. 364-200.000.
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- Grant Machinery Inc.: See—
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- Gray, Bruce A.: See—
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- Greene, Orville T., Jr.; and Mead, John A. Flex couplings isolate stabilizing mirrors, 4,715,696, Cl. 350-500.000.
- Greenwood, Alan; and Majerus, Norbert, to Goodyear Tire & Rubber Company, The. Apparatus for injection molding tire treads, 4,715,577, Cl. 249-107.000.

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- Griffith, John D., to Sulzer Brothers Limited. Weaving loom, 4,715,410, Cl. 139-434.000.
- Grigsby, Robert A., Jr., to Texaco, Inc. Reactive glass component in rim, 4,716,193, Cl. 524-730.000.
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- Grois, Igor: See—
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- Grosby, Lawton H., to Morley Furniture Spring Corporation. Sinuous band and seat spring assembly, 4,715,587, Cl. 267-103.000.
- Gross, Robert L. Method for diagnosis of A.I.D.S., 4,716,107, Cl. 435-7.000.
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- Grundy Dispense Systems, Inc.: See—
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- Gruning, Burghard; Holtschmidt, Ulrich; Koerner, Goetz; and Rossmly, Gerd, to Th. Goldschmidt AG. Particles, modified at their surface by hydrophilic and hydrophobic groups, 4,715,986, Cl. 252-315.200.
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- GTE Communication Systems Corporation: See—
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- Mills, Jeffrey P.; and Macrander, Max S., 4,716,539, Cl. 364-754.000.
- GTE Products Corporation: See—
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- Guilford, Richard P.; and Rosborough, John R., to United States of America, Energy. Monitoring transients in low inductance circuits, 4,716,364, Cl. 324-127.000.
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- Haacke, E. Mark, to Picker International, Inc. Magnetic resonance reconstruction and scanning techniques using known information, constraints, and symmetry relations, 4,716,368, Cl. 324-309.000.
- Haas, Hans, to Dragerwerk A.G. Lung-controlled diaphragm valve, 4,715,371, Cl. 128-204.260.
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- Haase, Gerald A. Vacuum cleaner attachment, 4,715,088, Cl. 15-415.00A.
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- Hackmann, Ludger, to Bramlage Gesellschaft mit beschränkter Haftung. Shoe polish can, 4,715,496, Cl. 206-229.000.
- Haderle, Donald J.: See—
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- Haganuma, Tomoyuki: See—
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- Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Jurgen; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Quinoline derivatives and their use for controlling undesirable plant growth, 4,715,889, Cl. 71-94.000.
- Haider, Stephen J.: See—
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- Hale Fire Pump Company: See—
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- Halliburton Company: See—
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- Walker, Lonnie R.; Berryman, Leslie N.; Guffee, Larry E.; Ripley, David E.; and Prucha, David A., 4,715,721, Cl. 366-132.000.
- Hallissy, Robert P.; Isakov, Edmund; Stephenson, Earle W.; and Rowlett, Don C., to Kennametal Inc. Grader blade with casting/insert assembly on leading edge, 4,715,450, Cl. 172-701.300.
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- Hamada, Masataka: See—
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Harada, Tsutomu, to Sanden Corporation. Beverage brewing apparatus for vending machines. 4,715,270, Cl. 99-289.00R.

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Hasegawa, Yoshihiko; and Miyata, Osamu, to TLV Co., Ltd. Flow meter for measuring the flow rate of liquid. 4,715,225, Cl. 73-215.000.

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Hashishita, Ryuichi, to NEC Corporation. Semiconductor integrated circuit having complementary field effect transistors. 4,716,450, Cl. 357-42.000.

Hatakeyama, Tetsuo; Uera, Yoshinori; and Nagao, Nobuaki, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Roll core holding device. 4,715,553, Cl. 242-68.400.

Hatanaka, Katsunori: See—
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Hattori, Kaneaki: See—
Yamauchi, Takayoshi; Hattori, Kaneaki; Ikeda, Shunichi; and Tamaki, Kentaro, 4,716,241, Cl. 558-44.000.

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Hauel, Norbert: See—
Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Noll, Klaus; Bomhard, Andreas; van Meel, Jacques; and Diederer, Willi, 4,716,169, Cl. 514-299.000.

Havel, Karel. Reciprocally actuated switch with rotatable contact selector. 4,716,263, Cl. 200-11.00R.

Hawkins, Nicholas J.; and Saltarelli, Robert, to W. Vinten Limited. Incremental control. 4,716,518, Cl. 364-184.000.

Haws, Ben E.: See—
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Ito, Yasuro; Higuchi, Yoshiro; Shiki, Takeshi; Tsuji, Yukikazu; Tsuji, Masanori; and Hayakawa, Mitsutaka, 4,715,719, Cl. 366-2.000.

Hayakawa, Tsuneyasu: See—
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Eitoku, Kenji; and Hayashi, Kenji, 4,715,220, Cl. 73-118.100.

Hayashi, Mamoru; and Kawamori, Hideo, to Tokyo Kikai Seisakusho, Ltd. Automatic paper roll pasting apparatus for rotary presses. 4,715,922, Cl. 156-361.000.

Hayashi, Takashi: See—
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Hayes Microcomputer Products, Inc.: See—
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Haznedar, Errol A.: See—
Raskin, Donald; Kearney, James E.; and Haznedar, Errol A., 4,716,556, Cl. 367-168.000.

Heath, Rodney T.; and Gerlach, Charles R. Thermostatic control system. 4,715,808, Cl. 431-18.000.

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Hecker, Erich; Osswald, Hans; and Schmidt, Rainer, to Stiftung Deutsches Krebsforschungszentrum. Use of non-irritating or slightly irritating and/or promoting diterpene alcohol and of derivatives thereof as antineoplastic preparations. 4,716,179, Cl. 514-691.000.

Heckmann, Wolfgang; and Epper, Wolfgang, to Klockner-Humboldt-Deutz Aktiengesellschaft. Vibrating screen centrifuge. 4,715,956, Cl. 210-363.000.

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Heep, Dieter: See—
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Heess, Gerhard: See—
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Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Noll, Klaus; Bomhard, Andreas; van Meel, Jacques; and Diederer, Willi, to Dr. Karl Thomae GmbH. Imidazo[1,2-a]pyridines and their use as cardiotonic agents. 4,716,169, Cl. 514-299.000.

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Hein-Werner, Inc.: See—
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Heitzman, Edward F.; and Heitzman, Edward J. Driver-vehicle behavior display apparatus. 4,716,458, Cl. 358-103.000.

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Heitzman, Edward F.; and Heitzman, Edward J., 4,716,458, Cl. 358-103.000.

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Hendriks, Jan J. M.: See—
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Henkin, Melvyn L.; and Laby, Jordan M. Hydrotherapy massage method and apparatus. 4,715,071, Cl. 4-542.000.

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Henry, Herbert W. Disposal kit. 4,715,495, Cl. 206-223.000.

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Herdman, Charles W. Shoe lace knot retainer. 4,715,094, Cl. 24-119.000.

Hergeth, Adolph; Lucassen, Gunter; and Pinto, Akiva, to Hergeth Hollingsworth, GmbH. Process and apparatus for feeding fiber material. 4,715,722, Cl. 366-132.000.

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Herndon, Michael T.: See—
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King, Michael O.; and Keshner, Marvin S., 4,715,115, Cl. 29-841.000.

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- Hitachi Cable, Ltd.: See—
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- Hlavka, Joseph J.: See—
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- Hoeffle, Milton L.; Holmes, Ann; and Roth, Bruce D., to Warner-Lambert Company. Saturated fatty acid amides as inhibitors of acyl-CoA:cholesterol acyltransferase, 4,716,175, Cl. 514-357.000.
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- Hoffman, Ernest G.; and Neuroth, David H., to Hubbell Incorporated. Pushing and pulling cable, 4,716,260, Cl. 174-102.00R.
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- Hoffmann-La Roche Inc.: See—
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- Hohenwarter, Gert K. G., to Hypres, Inc. Open cycle cooling of electrical circuits, 4,715,189, Cl. 62-64.000.
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- Holming, Robert; Nelson, Robert S.; and Daley, Thomas R., to Armco Inc.; and Holming Company, The. Grinding media charging device, 4,715,546, Cl. 241-171.000.
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- Holt, Terry. Archery bow sight, 4,715,126, Cl. 33-265.000.
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- Holtzman, Abraham M.; and Relis, Joseph, to Techno Instruments Investments 1983 Ltd. Use of immersion tin and tin alloys as a bonding medium for multilayer circuits, 4,715,894, Cl. 106-1.220.
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- Kawanabe, Tomohiko; Kushida, Noritaka; Asakura, Masahiko; and Seki, Yasunari, 4,715,350, Cl. 123-587.000.
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- Shimizu, Yasuo, 4,715,461, Cl. 180-79.100.
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- Stauffer, Norman L., 4,716,430, Cl. 354-403.000.
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- Horecker, Bernard L., to Hoffman-La Roche Inc. Prothymosin alpha, 4,716,148, Cl. 514-12.000.
- Hori, Fumihisa, to Alps Electric Co., Ltd. Printer with paper feed roller disengagement mechanism, 4,715,737, Cl. 400-569.000.
- Hori, Fumihisa, to Alps Electric Co., Ltd. Type selection mechanism for a printer, 4,715,277, Cl. 101-93.280.
- Hori, Makoto; Nagaya, Toshiatsu; Mukai, Hirokatsu; Niwa, Hitoshi; and Miwa, Naoto, to Nippondenso Co., Ltd. Self-temperature controlling type heating device, 4,716,279, Cl. 219-541.000.
- Hori, Ryoichi; Itoh, Kiyoo; and Etoh, Jun, to Hitachi, Ltd. Pulse drive circuit, 4,716,313, Cl. 307-475.000.
- Horie Metal Co., Ltd.: See—
Ito, Takaaki; Mori, Eiji; Uranishi, Koji; Miyazaki, Shinji; and Sugimoto, Junichi, 4,715,509, Cl. 220-86.00R.
- Horiuchi, Akito; Yokoyama, Kiyoshi; and Yoshida, Makoto, to Kyocera Corporation. Method for production of silicon nitride sintered body, 4,716,133, Cl. 501-97.000.
- Hornbeck, David A.: See—
Best, Donald D., Jr., 4,715,568, Cl. 248-1.000.
- Horne, Kenneth A., to Connelly Skis, Inc. Ski cover, 4,715,416, Cl. 150-52.00R.
- Horner, Hans-Peter: See—
Rabener, Claus W.; Horner, Hans-Peter; and Baumann, Dieter, 4,716,185, Cl. 523-456.000.

- Horodysky, Andrew G.: See—
Fang, Lieh-pao O.; and Horodysky, Andrew G., 4,715,974, Cl. 252-46.400.
- Horvath, Joseph G.; and Miller, James C., to Automeg, Inc. Apparatus for monitoring motor winding leakage, 4,716,487, Cl. 361-42.000.
- Hosaka, Yasuo, to Tokya Shibaura Denki Kabushiki Kaisha. CCD Color image sensor with a light source having a spectrum distribution characteristic having peaks at 470 nm and 590 nm and having no wavelengths above 700 nm, 4,716,456, Cl. 358-75.000.
- Hoshiai, Atsushi; and Endo, Hiroyuki, to Roland Corp. Waveform generating device for electronic musical instruments, 4,715,257, Cl. 84-1.010.
- Hoshizaki Electric Co., Ltd.: See—
Kito, Yoshikazu, 4,715,194, Cl. 62-347.000.
- Hosiden Electronics Co., Ltd.: See—
Iwasa, Yoshihiro; Masuda, Toru; and Shibano, Yasuji, 4,715,819, Cl. 439-31.000.
- Hosoda, Yuji; Honma, Kazuo; and Fujie, Masakatsu, to Hitachi, Ltd. Grip device for sheet-like objects, 4,715,637, Cl. 294-86.400.
- Hosoe, Toshiaki; Ando, Seigo; and Kawase, Yoshihiro, to Nippon Kokan K.K. Eddy current distance signal apparatus with temperature change compensation means, 4,716,366, Cl. 324-207.000.
- Hosokawa, Minoru: See—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,715,725, Cl. 368-157.000.
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- Houck, Willie: See—
Nichols, Walt; Newsome, Reggie; Thesing, Rich; and Houck, Willie, 4,715,390, Cl. 131-335.000.
- Houghton, Robert A.: See—
Depew, Donald R.; Houghton, Robert A.; and Sparks, David C., 4,716,554, Cl. 367-20.000.
- Hovenga, LaVern B.: See—
Wohlford, William P.; and Hovenga, LaVern B., 4,716,401, Cl. 340-568.000.
- Howard, Paul C.; and Nowaczek, Ed, to Web Systems, Inc. Paperboard edge buffer and cleaner, 4,715,078, Cl. 15-4.000.
- Howarth, John; and Alguard, Mark, to Measurex Corporation. System for measuring the color of a material, 4,715,715, Cl. 356-402.000.
- Howell, Edmund O.: See—
Glass, Emmett F.; and Howell, Edmund O., 4,715,171, Cl. 56-192.000.
- Howell, Frederick H.; and Pfeifer, Josef, to Ciba-Geigy Corporation. Aminocyclohexyl-substituted, branch alkylamines, 4,716,248, Cl. 564-454.000.
- Hsu, Sheng T.; and Flatley, Doris W., to RCA Corporation. Semiconductor device with internal gettering region, 4,716,451, Cl. 357-42.000.
- Huang, Bernard; and Milenkovic, Veljko, to Ford Motor Company. Method to avoid singularity in a robot mechanism, 4,716,350, Cl. 318-568.000.
- Huang, Tien-Tsai. Pressure gauge, 4,715,222, Cl. 73-146.800.
- Hubbell Incorporated: See—
Hoffman, Ernest G.; and Neuroth, David H., 4,716,260, Cl. 174-102.00R.
- Hudgens, Stephen J.: See—
Johncock, Annette G.; and Hudgens, Stephen J., 4,715,927, Cl. 156-606.000.
- Ovshinsky, Stanford R.; Hudgens, Stephen J.; Allred, David D.; and Demaggio, Gregory, 4,715,890, Cl. 75-0.5AA.
- Ovshinsky, Stanford R.; Hudgens, Stephen J.; Allred, David D.; and DeMaggio, Gregory, 4,715,891, Cl. 75-0.5BA.
- Huels Aktiengesellschaft: See—
Muller, Dieter J., 4,716,255, Cl. 570-216.000.
- Hughes Aircraft Company: See—
Gagnon, Ralph J., 4,715,684, Cl. 350-331.00R.
- O'Meara, Thomas R.; and Lind, Richard C., 4,715,689, Cl. 350-354.000.
- Patraw, Nils E., 4,716,049, Cl. 427-96.000.
- Wittmann, Alois, 4,715,565, Cl. 244-158.00R.
- Hughes Tool Company: See—
Berry, Joe R.; Langowski, Faustyn C.; Renfro, James G.; and Smith, Roger, Jr., 4,715,761, Cl. 414-22.000.
- Smith, Sidney K., Jr., 4,715,445, Cl. 166-377.000.
- Huiskes, Cornelis; and Schutten, Evert D., to U.S. Philips Corporation. Fluorescent lamp, 4,716,337, Cl. 313-487.000.
- Hulsizer, Philip N.; and Dahl, John H., to Welding Services, Inc. Apparatus for positioning a tool with respect to a cylindrical work piece, 4,716,271, Cl. 219-125.110.
- Humberto-Calderon-Quintero, Miguel, to Vitro Tec Fideicomiso. Take out mechanism for glassware forming machines, 4,715,880, Cl. 65-260.000.
- Hung, Angelo C. J.; and Wang, Francis C., to Tektronix, Inc. Method for test generation, 4,716,564, Cl. 371-27.000.
- Hung, Michael, to Utility Electronics Industries Co. Ltd. Coaxial, two-cylindrical air compressor, 4,715,787, Cl. 417-63.000.
- Hunger, Hans-Dieter; and Couette, Charles, to Akademie der Wissenschaften der DDR. Chemically active triazine support composition, 4,716,103, Cl. 435-5.000.
- Hunting, Curtis J.: See—
Thompson, John R.; Hunting, Curtis J.; Masson, Ronald K.; and Trivelpiece, Craig E., 4,716,588, Cl. 380-20.000.
- Hurley, John L.; Puzo, Joseph D.; and Tingey, Rosa F., to Pall Corporation. Porous fibrous fluorocarbon structures, 4,716,074, Cl. 428-220.000.
- Hurn, Richard L.; and Sell, Michael R., to Black & Decker, Inc. Charging base for a battery-powered appliance, 4,716,352, Cl. 320-2.000.
- Hurt, Steven E.: See—
Fresch, Henry D.; and Hurt, Steven E., 4,715,107, Cl. 29-436.000.
- Hussain, Saadat: See—
Scymanski, Gerald L.; Mossaad, Amgad S.; and Hussain, Saadat, 4,716,251, Cl. 568-645.000.
- Hutcherson, Ronald W., Sr.: See—
Lynn, Dwo; Morrison, Carl C.; and Hutcherson, Ronald W., Sr., 4,715,389, Cl. 131-335.000.
- Hutchings, Thomas J., to Littton Systems Inc. Path length adjuster for ring laser gyro, 4,715,713, Cl. 356-350.000.
- Hutchinson, Martin A., to Varian Associates, Inc. Gate valve for wafer processing system, 4,715,764, Cl. 414-217.000.
- Hypres, Inc.: See—
Hohenwarter, Gert K. G., 4,715,189, Cl. 62-64.000.
- Iacoviello, John G., to Air Products and Chemicals, Inc. Stable emulsions of water resistant polyvinyl alcohol-stabilized vinyl chloride-ethylene copolymers, 4,716,192, Cl. 524-549.000.
- Ibiden Kabushiki Kaisha: See—
Enomoto, Eyo, 4,715,117, Cl. 29-851.000.
- IBM: See—
Schulz, Dietmar; Pohl, Peter; and Johnson, Alfred H., 4,715,674, Cl. 350-96.210.
- Ichiryu, Taku: See—
Katayama, Kazuo; Ichiryu, Taku; Mitsuhashi, Tsuneyoshi; Mori, Yasushi; and Kobayashi, Masanori, 4,715,778, Cl. 415-104.000.
- ICP S.A.: See—
Dreyfus, Roger, 4,715,493, Cl. 206-200.000.
- Ideal Instruments, Inc.: See—
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- Igarashi, Isamu: See—
Nakao, Hideo; Fujimoto, Koichi; Ishihara, Sadao; Sugawara, Shinichi; and Igarashi, Isamu, 4,716,158, Cl. 514-202.000.
- Igarashi, Sadao, to Alps Electric Co., Ltd. Waveguide-microstrip line converter, 4,716,387, Cl. 333-26.000.
- Ignatius, Mark J.: See—
Locke, Philip F., Jr.; and Ignatius, Mark J., 4,716,519, Cl. 364-186.000.
- Locke, Philip F., Jr.; and Ignatius, Mark J., 4,716,520, Cl. 364-186.000.
- Iida, Hiroshi: See—
Takahashi, Susumu; and Iida, Hiroshi, 4,716,590, Cl. 381-15.000.
- Iida, Yoshiya: See—
Sata, Toshikatsu; Katsube, Teruaki; and Iida, Yoshiya, 4,715,691, Cl. 350-357.000.
- Iijima, Kenzaburo; and Hayashi, Yoshinori, to Nippon Gakki Seizo Kabushiki Kaisha. Method for producing a magnet with radial magnetic anisotropy, 4,715,904, Cl. 148-102.000.
- Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, to Diesel Kiki Co., Ltd. Compressor having pulsating reducing mechanism, 4,715,790, Cl. 417-269.000.
- Iio, Tsukasa: See—
Fujii, Hiroshi; Iio, Tsukasa; Genba, Yasusi; Moriwaki, Hideaki; and Mochizuki, Yoshinori, 4,716,265, Cl. 200-144.00R.
- Iizuka, Yasuo: See—
Tsukuda, Yasuo; Hara, Hisao; Harada, Hideki; and Iizuka, Yasuo, 4,715,178, Cl. 60-272.000.
- Ikedo, Akitoshi; Nishimura, Chitoshi; Katsuo, Norio; and Obara, Masami, to Furukawa Electric Co., Ltd. The. Method of winding optical cable on aerial wire, 4,715,582, Cl. 254-134.3CL.
- Ikedo, Shunichi: See—
Yamauchi, Takayoshi; Hattori, Kaneaki; Ikeda, Shunichi; and Tamaki, Kentaro, 4,716,241, Cl. 558-44.000.
- Ikeya, Kiyokazu: See—
Ezura, Toyokazu; Katsumata, Fujio; and Ikeya, Kiyokazu, 4,715,823, Cl. 439-267.000.
- Ikura, Hiroshi: See—
Suzuki, Yoshiki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, 4,715,369, Cl. 128-156.000.
- Illinois Foundation Seeds, Inc.: See—
Eberle, Ray, 4,716,280, Cl. 235-98.00C.
- Illinois Tool Works Inc.: See—
Broomfield, Donald J.; Briggs, Paul C.; Parker, Eric G.; and Wagner, David P., 4,715,316, Cl. 118-716.000.
- Imai, Tamotsu, to UOP Inc. Dehydrogenation catalyst composition, 4,716,143, Cl. 502-326.000.
- Imaizumi, Mamoru: See—
Kuzuya, Susumu; and Imaizumi, Mamoru, 4,715,735, Cl. 400-82.000.
- Imaizumi, Masaki: See—
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- Imamura, Kaoru; and Muramoto, Kenichi, to Kabushiki Kaisha Toshiba. Breakdown protected planar transistor device, 4,716,489, Cl. 361-91.000.
- Imamura, Kazunori: See—
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- Imamura, Tetsuya: See—
Kishine, Nobuyuki; Imamura, Tetsuya; and Yamauchi, Michihide, 4,716,078, Cl. 428-336.000.

- Imani, Yuichi: See—
Hattori, Yoshiyuki; Matsui, Kazuma; Imani, Yuichi; Kuno, Akira; Nagata, Tetsuya; Nakane, Koji; and Nomura, Ken, 4,715,663, Cl. 303-110.000.
- Imondi, Giuliano: See—
D'Arrigo, Sebastiano; Imondi, Giuliano; and Vergara, Sossio, 4,716,322, Cl. 307-592.000.
- Imperial Chemical Industries PLC: See—
Conway, Richard J.; Watson, Keith G.; and Farquharson, Graeme J., 4,715,884, Cl. 71-90.000.
Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,716,164, Cl. 514-242.000.
Ramshaw, Colin, 4,715,869, Cl. 515-53.000.
- Imperial Private Power: See—
Katz, Yoram, 4,715,192, Cl. 62-323.100.
- Impink, Albert J., Jr., to Westinghouse Electric Corp. Spectral shift reactor control method, 4,716,006, Cl. 376-209.000.
- Inaba, Naomi: See—
Fujita, Masahito; Kizaki, Masami; Miyazaki, Makoto; and Inaba, Naomi, 4,716,206, Cl. 526-139.000.
- Inaba, Tsutomu; Kimura, Tadashi; Kobayashi, Norihide; Sugihara, Masahiro; and Matsugi, Tetsuzo, to Mitsubishi Denki Kabushiki Kaisha. Scroll-type fluid transferring machine with loose drive fit in crank shaft recess, 4,715,796, Cl. 418-55.000.
- Inagaki, Junichi: See—
Nakaoka, Kazuhide; Takada, Yoshikazu; Inagaki, Junichi; and Hiura, Akira, 4,715,905, Cl. 148-111.000.
- Inagaki, Yasuhiro, to NEC Corporation. Semiconductor memory device with variable self-refresh cycle, 4,716,551, Cl. 365-222.000.
- Ing. Alfred Schmidt GmbH: See—
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- Ing. C. Olivetti: See—
Graciotti, Alessandro, 4,716,527, Cl. 364-200.000.
- Ing. C. Olivetti & C., S.p.A.: See—
Guerrini, Giampaolo; and Caligaris Cappio, Emilio, 4,716,289, Cl. 250-231.05E.
- Ingenjorsfirma B Nord AB: See—
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- Ingenuty Unlimited, Inc.: See—
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- Inomata, Masachi: See—
Makabe, Eiichi; Uesugi, Mitsuaki; Inomata, Masaichi; Maruyama, Kyusuke; Iwai, Kenji; and Sano, Kazuo, 4,716,459, Cl. 358-106.000.
- Inoue, Hajime: See—
Okada, Hiroshi; Takahashi, Takao; and Inoue, Hajime, 4,716,476, Cl. 360-66.000.
- Inoue, Jiro, to Murata Manufacturing Co., Ltd. Piezoelectric resonance component having an improved group delay time characteristic, 4,716,377, Cl. 329-117.000.
- Inoue, Kenji: See—
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- Inoue, Shinya: See—
Fukami, Harukazu; Kikumoto, Ryoji; Nakao, Kenichiro; Nitta, Issei; and Inoue, Shinya, 4,716,161, Cl. 514-222.000.
- Inoue, Takeshi: See—
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- Inoue, Yuji; Iwaoka, Hideto; and Sugiyama, Tadashi, to Yokogawa Electric Corporation; and Yokogawa Medical Systems, Limited. Coil arrangement for producing static magnetic field, 4,716,370, Cl. 324-319.000.
- Institut Francais du Pétrole: See—
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Le Page, Jean-Francois; Billon, Alain; Morel, Frederic; Renard, Pierre; Biedermann, Jean-Michel; Laborde, Michel; and Bousquet, Jacques, 4,715,946, Cl. 208-45.000.
Provin, Gerard; Forestiere, Alain; and Commereuc, Dominique, 4,716,239, Cl. 556-147.000.
Wittrisch, Christian, 4,715,446, Cl. 166-381.000.
- Institute Problem Modelirovani V Energetike Akademii Nauk Ukrainskoi SSR: See—
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Danilyak, Sergei N.; Gavva, Viktor M.; Roiko, Yuri P.; and Nushko, Valery A., 4,716,273, Cl. 219-130.010.
- Interatom GmbH: See—
Tittizer, Gabriel, 4,715,731, Cl. 384-100.000.
- Interlego A.G.: See—
Bach, Erik, 4,715,832, Cl. 439-723.000.
- Interlock Corporation: See—
Mobley, Dewey F.; and Warren, Janice M., 4,715,833, Cl. 439-834.000.
- International Business Machines Corporation: See—
Arnold, Allen J.; Courtney, Mark G.; Kirby, Diane N.; Mis, Katherine H.; and Sutton, Kerry L., 4,715,430, Cl. 165-80.300.
Beausoleil, William F.; and McManigal, David F., 4,716,546, Cl. 364-900.000.
Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Pescatore, John C.; and Marsico, Mario A., 4,716,523, Cl. 364-200.000.
Crus, Richard A.; Haderle, Donald J.; and Herron, Howard W., 4,716,528, Cl. 364-300.000.
Glass, David W.; and Routt, Wilson M., Jr., 4,715,687, Cl. 350-345.000.
Jones, Carol R.; and Susko, Robin A., 4,715,941, Cl. 204-192.360.
- Ohmori, Keiji, 4,716,533, Cl. 364-518.000.
- International Computers Limited: See—
O'Connor, Stuart; Bell, Donald; Fox, Trevor R.; and Townsend, Paul, 4,716,408, Cl. 340-825.500.
- International Flavors & Fragrances Inc.: See—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,715,981, Cl. 252-174.110.
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- International Minerals & Chemical Corp.: See—
Gruber, James R.; Gudath, Ernest A.; Michalski, Dennis H.; Riddle, Robert R.; and Stana, Regis R., 4,716,026, Cl. 423-167.000.
Lu, Jing-Jong; and Wehrmeister, Herbert L., 4,716,233, Cl. 548-245.000.
- International Standard Electric Corporation: See—
Burgdorf, Jochen; and Weisbrod, Helmut, 4,715,486, Cl. 192-107.00M.
- International Texas Industries, Inc.: See—
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- inTest Corporation: See—
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- Inverko Industrie Vertriebs Kontor GmbH & Co., KG: See—
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- Iolab Corporation: See—
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- Irbis Research & Consulting AG: See—
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- IRSID: See—
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- Irvin Industries, Inc.: See—
Lobanoff, Mark; and Gavagan, James A., 4,715,644, Cl. 296-97.00H.
- Isakov, Edmund: See—
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- Ishida, Tokuji: See—
Taniguchi, Nobuyuki; Ishida, Tokuji; Hamada, Masataka; Karasaki, Toshihiko; and Norita, Toshio, 4,716,434, Cl. 354-408.000.
- Ishigaki, Toshinori, to Kabushiki Kaisha Toshiba. Apparatus for feeding paper sheets from a paper stock to a printer or reader, 4,715,595, Cl. 271-110.000.
- Ishiguchi, Isao: See—
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- Ishihara, Sadao: See—
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- Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Process for forming deposited film, 4,716,048, Cl. 427-39.000.
- Ishii, Hiroshi: See—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,715,725, Cl. 368-157.000.
- Ishii, Katsumi; Hirayama, Kanae; Matsuoka, Yoshio; and Takahashi, Kotei, to Nissan Motor Co., Ltd. Four wheel steer control system for four wheel drive vehicle, responsive to driving torque distribution, 4,715,466, Cl. 180-233.000.
- Ishikawa, Masakazu: See—
Nakanishi, Nobuyasu; Ishikawa, Masakazu; Shirai, Akira; and Noguchi, Noboru, 4,715,664, Cl. 303-111.000.
- Ishimaru, Hajime; Miyamoto, Masao; and Kemaki, Shojiro, to Seiko Instruments & Electronics Ltd. Coolant preservation container, 4,715,186, Cl. 62-45.000.
- Ishioka, Hidenori: See—
Umemura, Hiroyuki; Matsuda, Kenji; Tezuda, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Sugawara, Sakuo; and Hara, Masanori, 4,715,191, Cl. 62-208.000.
- Ishizaki, Akira: See—
Akashi, Akira; Ohmura, Hiroshi; Ishizaki, Akira; Ohtaka, Keiji; and Suda, Yasuo, 4,716,282, Cl. 250-201.000.
- Ishizuka, Hiroshi. Method for producing of polycrystalline silicon and apparatus thereof, 4,715,317, Cl. 118-719.000.
- Isobe, Minoru; Koshida, Yoshinori; and Yuasa, Katunori, to Oki Electric Industry Co., Ltd. Face and back reversing mechanism, 4,715,594, Cl. 271-65.000.
- Isono, Kazuaki: See—
Umemura, Hiroyuki; Matsuda, Kenji; Tezuda, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Sugawara, Sakuo; and Hara, Masanori, 4,715,191, Cl. 62-208.000.
- Isotronics, Inc.: See—
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- Ispra Fiberoptics Industries Herzlia Ltd.: See—
Jacobson, Amnon, 4,715,875, Cl. 65-3.110.
- Ito, Masahiro; Kobayashi, Masaharu; and Arai, Takao, to Hitachi, Ltd. Method of transmitting digital data in which error detection codes are dispersed using alternate delay times, 4,716,567, Cl. 371-40.000.
- Ito, Takaaki; Mori, Eiji; Uranishi, Koji; Miyazaki, Shinji; and Sugimoto, Junichi, to Toyota Jidosha Kabushiki Kaisha; and Horie Metal Co., Ltd. Fuel filler conduit, 4,715,509, Cl. 220-86.00R.
- Ito, Takashi; Matsuzawa, Shigemitsu; and Kato, Katsuaki, to Nippon Engelhard Ltd. Platinum-copper alloy electrocatalyst and acid-electrolyte fuel cell electrode using the same, 4,716,087, Cl. 429-40.000.

- Ito, Tomotaka, to Mitsubishi Denki Kabushiki Kaisha. Base drive circuit in a transistor inverter, 4,716,513, Cl. 363-97.000.
- Ito, Yasuro; Higuchi, Yoshiro; Shiki, Takeshi; Tsuji, Yukikazu; Tsuji, Masanori; and Hayakawa, Mitsutaka, to Yasuro Ito and Taisei Corporation. Method of preparing mortar or concrete, 4,715,719, Cl. 366-2.000.
- Ito, Yuji, to Canon Kabushiki Kaisha. Particle analyzing apparatus with index projecting optical system for detecting a focusing state of the measuring system, 4,715,708, Cl. 356-72.000.
- Itoh, Kiyoo: See—
Hori, Ryoichi; Itoh, Kiyoo; and Etoh, Jun, 4,716,313, Cl. 307-475.000.
- Itoh, Kunio: See—
Hamada, Ken; Wada, Masaru; and Itoh, Kunio, 4,716,571, Cl. 372-48.000.
- Itonaga, Makoto, to Victor Company of Japan, Ltd. Recording disc and method for fabricating same, 4,716,560, Cl. 369-275.000.
- ITT Industries, Inc.: See—
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- Iwai, Kenji: See—
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- Iwakawa, Tsunekiyo: See—
Oida, Osamu; and Iwakawa, Tsunekiyo, 4,716,341, Cl. 315-169.400.
- Iwaoka, Hideto: See—
Inoue, Yuji; Iwaoka, Hideto; and Sugiyama, Tadashi, 4,716,370, Cl. 324-319.000.
- Iwasa, Koji: See—
Harada, Takamasa; Taguchi, Masaaki; and Iwasa, Koji, 4,715,688, Cl. 350-350.00S.
- Iwasa, Yoshihiro; Masuda, Toru; and Shibano, Yasuji, to Hosiden Electronics Co., Ltd. Connector for printed board connection, 4,715,819, Cl. 439-31.000.
- Iwasaki, Kazuhiko: See—
Funabashi, Tsuneco; Iwasaki, Kazuhiko; and Nakamura, Hideo, 4,716,522, Cl. 364-200.000.
- Iwase, Tetsuo: See—
Masuzawa, Sigeaki; Shibata, Shinya; Miyazaki, Hiroshi; and Iwase, Tetsuo, 4,716,591, Cl. 381-51.000.
- Iwashita, Yukihiko; and Okumura, Hideaki, to Seiko Epson Corporation. Light-passive display device and method of manufacturing same, 4,715,686, Cl. 350-339.00R.
- Iwata, Hiromitsu: See—
Tanaka, Hiroshi; Iwata, Hiromitsu; and Kakizaki, Yukio, 4,716,299, Cl. 250-571.000.
- Iwata, Nobuyoshi: See—
Tomita, Kuniyuki; Shimoji, Yasuo; Kumakura, Seiji; Koike, Hiroyuki; Iwata, Nobuyoshi; and Morisawa, Yasuhiro, 4,716,162, Cl. 514-234.000.
- Iwata, Shigemi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling an elevator, 4,716,517, Cl. 364-148.000.
- Izawa, Susumu: See—
Akiyama, Hiroyuki; Izawa, Susumu; Okabe, Shigeru; and Yamaguchi, Toru, 4,716,021, Cl. 422-135.000.
- J. I. Case Company: See—
Hanson, Charles B., 4,715,771, Cl. 414-688.000.
- J. L. Wickham Company, Inc.: See—
Wickham, John L., 4,715,113, Cl. 29-792.000.
- J. M. Voith GmbH: See—
Bronowski, Helmut; and Dahlke, Christian, 4,715,781, Cl. 415-219.00C.
- Brosius, Klaus, 4,715,481, Cl. 188-291.000.
- Jackson, Francis W. Multiple piston expansion chamber engine, 4,715,328, Cl. 123-52.00B.
- Jackson, Mark F.; Lawruk, Stephen P.; Schlegel, Dallas E.; and Spong, Richard V., to AMP Incorporated. Pick-up head, 4,715,112, Cl. 29-739.000.
- Jackson, Richard L.: See—
John, Ansel N.; and Jackson, Richard L., 4,715,123, Cl. 30-276.000.
- Jacob, Gernot; and Radom, Leon, to Progress-Elektrogerate Mauz & Pfeiffer GmbH & Co. Hand vacuum cleaner, 4,715,084, Cl. 15-328.000.
- Jacobs, Gordon M. Multiple output allpass switched capacitor filters, 4,716,388, Cl. 333-173.000.
- Jacobson, Allan J.; Ho, Teh C.; Chianelli, Russell R.; Steger, John J.; and Montagna, Angelo A., to Exxon Research and Engineering Company. Amorphous sulfide catalysts of trivalent chromium and promoter metals and method of making same, 4,716,139, Cl. 502-167.000.
- Jacobson, Amnon, to Ispra Fiberoptics Industries Herzlia Ltd. Manufacture of optical fibre preforms, 4,715,875, Cl. 65-3.110.
- Jacobson, Milton D. Garment and liner combination, 4,715,068, Cl. 2-272.000.
- Jacobson, Kent: See—
Kjelgaard, Tom; Hallberg, Anders; and Jacobsson, Kent, 4,715,528, Cl. 229-123.100.
- Jaekle, Don E., Jr.; and Grove, R. K. Liquid-propellant management system for rockets and space vehicles, 4,715,399, Cl. 137-209.000.
- Jaksa, Tibor S.; Norton, Richard F.; Hall, Kenneth W.; Butler, Stephen J.; Chicoine, Craig C.; and Bienz, Willford L., to Caterpillar Inc. Method of producing interference connection between a fluid line and a fluid injector, 4,715,103, Cl. 29-156.40R.
- James, David R., to James Industries Limited. Toilet aids, 4,715,069, Cl. 4-254.000.
- James Industries Limited: See—
James, David R., 4,715,069, Cl. 4-254.000.
- Jan, Yih-Min: See—
Bseisu, Amjad A.; Jan, Yih-Min; and Schuh, Frank J., 4,715,451, Cl. 175-40.000.
- Japan Electronic Control Systems, Co., Ltd.: See—
Tomisawa, Naoki, 4,715,344, Cl. 123-489.000.
- Japan Exlan Company Limited: See—
Fujimatsu, Masaaki; and Kobashi, Toshiyuki, 4,716,002, Cl. 264-182.000.
- Japan National Railway: See—
Okamoto, Isao; Hiraishi, Motomi; Takai, Hideo; Kasai, Kenjiro; and Terada, Katsuyuki, 4,715,289, Cl. 105-199.200.
- Japan Styrene Paper Corp.: See—
Akiyama, Hiroyuki; Izawa, Susumu; Okabe, Shigeru; and Yamaguchi, Toru, 4,716,021, Cl. 422-135.000.
- Japan Tobacco Inc.: See—
Miki, Hajime, 4,715,170, Cl. 56-27.500.
- Jarreau, Francois-Xavier; and Koenig, Jean-Jacques, to Etablissements Nativelle S.A. Antiarrhythmic quinidine derivatives, 4,716,171, Cl. 514-305.000.
- Jarrett, Peter K.: See—
Casey, Donald J.; Jarrett, Peter K.; and Rosati, Louis, 4,716,203, Cl. 525-408.000.
- Jaynes, Mark S.: See—
Kahl, John E.; Jaynes, Mark S.; and Harrell, Kirby R., 4,715,442, Cl. 166-250.000.
- Jeffries, Kenneth: See—
Reichman, Benjamin; Venkatesan, Srin; Fetchenko, Michael A.; Jeffries, Kenneth; Stahl, Sharon; and Bennett, Clifford, 4,716,088, Cl. 429-101.000.
- Jenike & Johanson, Inc.: See—
Johanson, Jerry R., 4,715,212, Cl. 73-38.000.
- Jens Peter Hansen, Aarhus A/S: See—
Hansen, Jens Peter S., 4,716,043, Cl. 426-35.000.
- Jensen, Jens R.: See—
Kjornaes, Kim; Christensen, Finn N.; and Jensen, Jens R., 4,716,041, Cl. 424-468.000.
- Jensen, Peter J.: See—
Podoll, Michael J.; and Jensen, Peter J., 4,715,750, Cl. 406-111.000.
- Jiko, Hideyasu; and Hayashi, Tomoyuki, to Matsushita Electric Industrial Co., Ltd. Amplifier circuit, 4,716,378, Cl. 330-108.000.
- JJD S.A.: See—
Juhán, Jaroslav V. M., 4,715,660, Cl. 301-13.00R.
- Jofemar, S.A.: See—
Vidondo, Felix G., 4,715,514, Cl. 221-258.000.
- Johann, Merz; and Gunther, Seidl, to Zahnradfabrik Friedrichshafen, AG. Flow regulating rotary vane pump, 4,715,793, Cl. 417-300.000.
- Johansson, Jerry R., to Jenike & Johanson, Inc. Bulk solids property tester, 4,715,212, Cl. 73-38.000.
- Johanson, Robert H., to Whirlpool Corporation. Vacuum cleaner and method of dissipating electrostatic charge, 4,715,085, Cl. 15-339.000.
- Johanson, Robert H.; Montgomery, Raymond M.; Herndon, Michael T.; and Peterson, Edward C., to Whirlpool Corporation. Vacuum cleaner and method of dissipating electrostatic charge through corona discharge, 4,715,086, Cl. 15-339.000.
- Johansson, Arne; and Namensen, Erlend, to A/S Nunc. Method for the production of a plastic container, 4,715,911, Cl. 156-69.000.
- Johansson, Kjell. Method and means for keeping cattle in a stall barn, 4,715,322, Cl. 119-27.000.
- Johansson, Rolf: See—
Blad, Per A.; and Johansson, Rolf, 4,716,272, Cl. 219-129.000.
- John, Ansel N.; and Jackson, Richard L., to Jackson, Richard L. Rotary trimmer with self-contained collection means, 4,715,123, Cl. 30-276.000.
- John Fluke Mfg. Co., Inc.: See—
Eccleston, Larry E.; and Emery, John C., 4,716,398, Cl. 340-347.00A.
- Sheffer, Tzafir, 4,716,361, Cl. 324-60.00R.
- John, Puthenpurackal K.; and Shoemaker, Arthur H., to Cambridge Instruments Inc. Microscope body system, 4,715,697, Cl. 350-502.000.
- Johncock, Annette G.; and Hudgens, Stephen J., to Energy Conversion Devices, Inc. Improved method of making a photoconductive member, 4,715,927, Cl. 156-606.000.
- Johnny Stopper Inc.: See—
Cherico, John R., 4,715,138, Cl. 40-591.000.
- Johns, Robert H.; and Nauman, John D., to Allegheny Ludlum Corporation. Method and apparatus for direct casting of crystalline strip by radiant cooling, 4,715,428, Cl. 164-463.000.
- Johnsen & Jorgensen Plastics Limited: See—
McLaren, Kevin W., 4,715,506, Cl. 215-252.000.
- Johnson, Alfred H.: See—
Schulz, Dietmar; Pohl, Peter; and Johnson, Alfred H., 4,715,674, Cl. 350-96.210.
- Johnson, David W. Interlocking joint wine rack, 4,715,503, Cl. 211-74.000.
- Johnson, Kimball W. Quick response automatic fire sprinkler head, 4,715,447, Cl. 169-37.000.
- Johnson, Mark W., to PPG Industries, Inc. Sulfonium resins useful as pigment grinding vehicles in cationic electrodeposition, 4,715,898, Cl. 106-308.00Q.
- Johnson, Marvin M.; and Nowack, Gerhard P., to Phillips Petroleum Company. Hydrogenation of dienes, 4,716,256, Cl. 585-274.000.
- Johnson, Oliver S.; and Powell, Robert J. W., to Telephone Cables Limited. Optical fibre cable, 4,715,678, Cl. 350-96.230.

Johnson, William M. Bicycle reflector for handlebar attachment. 4,715,681, Cl. 350-99.000.

Johnston, Wilbur D., Jr.; and Long, Judith A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. MOCVD of semi-insulating indium phosphide based compositions. 4,716,130, Cl. 437-104.000.

Jolles, Pierre; Migliore-Samouir, Daniele; and Parker, Fabienne, to Rhone-Poulenc Sante. Tripeptides and their use. 4,716,151, Cl. 514-18.000.

Jones, Carol R.; and Susko, Robin A., to International Business Machines Corporation. Surface modification of organic materials to improve adhesion. 4,715,941, Cl. 204-192.360.

Jones, Darlene N. Method of dewatering food items. 4,715,963, Cl. 210-781.000.

Jones, Richard E., III: See—
Mauldin, Donald M.; and Jones, Richard E., III, 4,715,361, Cl. 128-52.000.

Joosten, Henricus C. M., to U.S. Philips Corporation. Method of manufacturing a plug. 4,715,119, Cl. 29-858.000.

Jordan, Rodney B. Nail reserve indicator. 4,715,522, Cl. 227-156.000.

Ju, Shiao: See—
Cozewith, Charles; Ju, Shiao; and Verstrate, Gary W., 4,716,207, Cl. 526-169.200.

Jue, Clifford T.: See—
Wiens, John P.; and Jue, Clifford T., 4,716,480, Cl. 360-105.000.

Juhala, Roland E.: See—
Reynolds, Albert H., III; McDaniel, Ernie C.; and Juhala, Roland E., 4,715,707, Cl. 356-28.500.

Juhan, Jaroslav V. M., to JJD S.A. Vehicle disc wheel with multiple tires on one rim. 4,715,660, Cl. 301-13.000.

Juhász, Laszlo; and McLeod, Angus I., to Charcoal Cloth Ltd. Wound dressings. 4,715,857, Cl. 604-359.000.

Jung, Guenter: See—
Mack, Gerhard; Mueller, Birgit; Jung, Guenter; and Frass, Werner, 4,716,098, Cl. 430-331.000.

Jurock, Volker: See—
Allan, Jonathan M.; Burton, Richard J.; and Jurock, Volker, 4,715,959, Cl. 210-637.000.

K. Bratschi, Silent Gliss: See—
Grutzner, Hans, 4,715,583, Cl. 254-283.000.

Kabe, Kazuyuki; and Morikawa, Tuneso, to Yokohama Rubber Co., Ltd., The. Pneumatic tire for passenger car. 4,715,420, Cl. 152-557.000.

Kabo, J. Michael: See—
Amstutz, Harlan C.; and Kabo, J. Michael, 4,715,860, Cl. 623-22.000.

Kabushiki Kaisha Advance Kaihatsu Kenkyujo: See—
Yanagida, Hiroaki; and Ogata, Tadashi, 4,715,944, Cl. 204-426.000.

Kabushiki Kaisha Daini Seikosha: See—
Tabata, Junichi, 4,715,384, Cl. 128-706.000.

Kabushiki Kaisha Fuji Tekkoshu: See—
Matsumoto, Yukimichi, 4,715,552, Cl. 242-56.00A.

Kabushiki Kaisha Fujikoshi: See—
Kanayama, Hideaki, 4,715,772, Cl. 414-730.000.

Kabushiki Kaisha Kawakami Seisakusho: See—
Nasu, Nobuo, 4,715,805, Cl. 425-504.000.

Kabushiki Kaisha Kenwood: See—
Sakai, Shigeru; and Kudo, Kazunori, 4,716,576, Cl. 375-5.000.

Kabushiki Kaisha Kobe Seiko Sho: See—
Oshima, Hiroo, 4,715,209, Cl. 72-366.000.

Kabushiki Kaisha Meidensha: See—
Ogawa, Hiroshi; Miyazaki, Yasuyuki; Yoshida, Susumu; and Sasaki, Shinichi, 4,716,530, Cl. 364-424.000.

Kabushiki Kaisha Mitsui Miike Seisakusho: See—
Sato, Koji; Kuroda, Hiroshi; Yamada, Ryuji; and Serino, Mamoru, 4,715,657, Cl. 299-1.000.

Kabushiki Kaisha Nakajima Tekkoshu: See—
Nakajima, Shigemi, 4,715,631, Cl. 294-2.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: See—
Haba, Shinji, 4,715,698, Cl. 350-588.000.

Kabushiki Kaisha Toshiba: See—
Ando, Hideo, 4,716,283, Cl. 250-201.000.

Honda, Toshio; Ohhashi, Toshiro; and Ohtsubo, Yasuo, 4,715,247, Cl. 74-640.000.

Imamura, Kaoru; and Muramoto, Kenichi, 4,716,489, Cl. 361-91.000.

Ishigaki, Toshinori, 4,715,595, Cl. 271-110.000.

Koike, Hideharu, 4,716,318, Cl. 307-520.000.

Kondoh, Hitoshi; and Sueda, Akihiro, 4,716,452, Cl. 357-68.000.

Matsuo, Satoshi, 4,716,457, Cl. 358-98.000.

Matsuo, Yukito, 4,716,346, Cl. 318-38.000.

Mochizuki, Tohru, 4,716,548, Cl. 365-149.000.

Okazaki, Joji, 4,716,419, Cl. 346-76.0PH.

Sato, Noriko; and Suzuki, Masayuki, 4,715,218, Cl. 73-86.000.

Takamura, Yoshio; and Nakajima, Akira, 4,716,512, Cl. 363-61.000.

Tokita, Kiyoshi; and Kondou, Masayoshi, 4,716,333, Cl. 313-402.000.

Wada, Tetsuro; and Ohkubo, Yasuo, 4,716,323, Cl. 307-594.000.

Yamaguchi, Noboru, 4,716,405, Cl. 340-723.000.

Yamazaki, Mutsuki, 4,716,089, Cl. 430-57.000.

Yamazaki, Mutsuki, 4,716,090, Cl. 430-65.000.

Kabushiki Kaisha Universal: See—
Okada, Kazuo, 4,715,604, Cl. 273-143.000.

Kabushikigaisha Tokyo Kikai Seisakusho: See—
Hatakeyama, Tetsuo; Uera, Yoshinori; and Nagao, Nobuaki, 4,715,553, Cl. 242-68.400.

Kaempfer, Karl; Zaehner, Paul; and Richter, Wolfgang, to Metrohm AG. Process and apparatus for quantitative and/or qualitative analysis of liquids. 4,715,237, Cl. 73-864.620.

Kagawa, Hirohiko; Kyotani, Yasuhiro; and Torii, Munetomo, to Matsushita Electric Works, Ltd. Epoxy resin encapsulating composition with enhanced moisture resistance and method for producing the same. 4,716,184, Cl. 523-310.000.

Kahil, John E.; Jaynes, Mark S.; and Harrell, Kirby R., to PA Incorporated. Apparatus for servicing tubular strings in subterranean wells. 4,715,442, Cl. 166-250.000.

Kai Cutlery Center Co., Ltd.: See—
Sugiyama, Makoto; Sugimura, Hiroshi; Machida, Naoyoshi; and Murai, Yoshiichi, 4,715,121, Cl. 30-253.000.

Kain, William S.: See—
Staker, Donald D.; and Kain, William S., 4,715,866, Cl. 44-51.000.

Kaiser, Bernhard; and Wokocek, Ortwin, to Kienzle Apparate GmbH. Device for testing properties of coins. 4,715,223, Cl. 73-163.000.

Kaiser, Hans P.: See—
Geisser, Peter; Kaiser, Hans P.; and Berger, Franz, 4,715,851, Cl. 604-82.000.

Kaiser, Siegmund H.: See—
Lipinski, Reinhard; and Kaiser, Siegmund H., 4,715,241, Cl. 74-89.150.

Kakizaki, Yukio: See—
Tanaka, Hiroshi; Iwata, Hiromitsu; and Kakizaki, Yukio, 4,716,299, Cl. 250-571.000.

Kako, Yukio: See—
Morishita, Akira; Okamoto, Kyoichi; Gotoh, Toshihiko; Kako, Yukio; and Arima, Takemi, 4,715,243, Cl. 74-434.000.

Kaku, Shinkyu: See—
Menon, Vinod; and Kaku, Shinkyu, 4,716,467, Cl. 358-260.000.

Kalb, Charles E.: See—
Schwarz, Alexander; Kalb, Charles E.; and Goebel, Charles C., 4,715,431, Cl. 105-110.000.

Schwarz, Alexander; and Kalb, Charles E., 4,715,433, Cl. 165-110.000.

Kameda, Hiroshi, to Tokiwa Kogyo Co., Ltd. Film packaging apparatus. 4,715,166, Cl. 53-550.000.

Kamerer, Larry. Eyeglass holder. 4,715,575, Cl. 248-309.100.

Kameyama, Masaomi; and Matsumoto, Koichi, to Nippon Kogaku K.K. Photochemical reaction apparatus. 4,715,318, Cl. 118-722.000.

Kaminaka, Nobuyuki; and Yoshida, Yasuo, to Matsushita Electrical Industrial Co., Ltd. Magnetic head comprising a core formed of small and large thin film patterns. 4,716,484, Cl. 360-125.000.

Kamo, Yoshihisa: See—
Sato, Naoki; Kamo, Yoshihisa; Katoh, Yasuhiro; Kosuge, Minoru; and Arai, Shinichi, 4,716,306, Cl. 307-296.000.

Kamp, Karl-Heinz: See—
Langhoff, Josef; Kirschke, Hermann; Geldmacher, Horst; Golomb, Manfred; Kamp, Karl-Heinz; Masuch, Peter; and Chalupnik, Rolf, 4,715,809, Cl. 431-170.000.

Kan, Yoshio, to Nippon Seiko Kabushiki Kaisha. Water pump. 4,715,780, Cl. 415-170.00A.

Kanai, Masahiro: See—
Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,716,048, Cl. 427-39.000.

Kanayama, Hideaki, to Kabushiki Kaisha Fujikoshi; and Mazda Motor Corporation. Apparatus for automatic glazing of cars. 4,715,772, Cl. 414-730.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—
Takahashi, Satomi; Inoue, Kenji; Yanagida, Yoshifumi; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,716,235, Cl. 548-533.000.

Kaneishi, Shinji: See—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneishi, Shinji; and Matsui, Sadayoshi, 4,716,570, Cl. 372-45.000.

KAO Corporation: See—
Kishine, Nobuyuki; Imamura, Tetsuya; and Yamauchi, Michihide, 4,716,078, Cl. 428-336.000.

Mishima, Masayuki, 4,715,961, Cl. 210-692.000.

Kaoru, Koide; and Sadao, Nagai, to Takamiya Dental Manufacturing Company Limited. Articulator. 4,715,814, Cl. 433-59.000.

Kapoor, Anoop; Choby, Edward J.; Kramer, Thomas J.; Ranieri, James E.; Roth, Charles H., Jr.; Scheffer, Donald E.; Spehar, John E., Jr.; Bessko, Csaba; and Blumstein, Robert M., to Westinghouse Electric Corp. Remote repair system for nuclear fuel rod assemblies. 4,715,111, Cl. 29-723.000.

Kapps, Manfred: See—
Mann, Max; and Kapps, Manfred, 4,715,746, Cl. 405-264.000.

Kapuscinski, Maria M.; Kaufman, Benjamin J.; and Liu, Christopher S., to Texaco Inc. Oil containing dispersant VII olefin copolymer. 4,715,975, Cl. 252-50.000.

Karantewsky, Donald S.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Phosphorus containing compounds and hypotensive use thereof. 4,716,155, Cl. 514-89.000.

Karasaki, Toshihiko: See—
Taniguchi, Nobuyuki; Ishida, Tokuji; Hamada, Masataka; Karasaki, Toshihiko; and Norita, Toshio, 4,716,434, Cl. 354-408.000.

Karl Mayer textilmashinenfabrik: See—
Bogucki-Land, Bogdan, 4,715,097, Cl. 28-172.000.

Kasahara, Noboru: See—
Atsumi, Haruyuki; Anzai, Hisatugu; and Kasahara, Noboru, 4,715,146, Cl. 49-1.000.

Kasai, Kenjiro: See—
Okamoto, Isao; Hiraishi, Motomi; Takai, Hideo; Kasai, Kenjiro; and Terada, Katsuyuki, 4,715,289, Cl. 105-199.200.

Kasai, Kiyoshi; Tsukidate, Takaaki; and Arakawa, Toshihiko, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of high-type silicon nitride powder. 4,716,028, Cl. 423-344.000.

Kasai, Takashi: See—
Mino, Kaoru; Fukushima, Koji; and Kasai, Takashi, 4,715,609, Cl. 277-207.000.

Kashiwagi, Atsumi, to Fujimoto Photo Industrial Co., Ltd. Therapeutic tomographic system. 4,716,425, Cl. 354-76.000.

Kassing, Lothar: See—
Baumann, Karl-Heinz; Schick, Gerald; Kassing, Lothar; Bossenmaier, Alban; and Brambilla, Luigi, 4,715,468, Cl. 180-271.000.

Katada, Hiroshi: See—
Koike, Hiroshi; Katada, Hiroshi; and Yoneda, Hiroshi, 4,715,353, Cl. 123-590.000.

Kataoka, Naoki: See—
Fukui, Minoru; and Kataoka, Naoki, 4,715,235, Cl. 73-862.680.

Katayama, Akira: See—
Ozawa, Kunitaka; Nakamura, Takashi; Katayama, Akira; Hatanaka, Katsunori; Mori, Tetsuzo; and Takaoka, Makoto, 4,716,421, Cl. 346-140.000.

Katayama, Kazuo; Ichiryu, Taku; Mitsuhashi, Tsuneyoshi; Mori, Yasushi; and Kobayashi, Masanori, to Mitsubishi Jukogyo Kabushiki Kaisha. Centrifugal compressor. 4,715,778, Cl. 415-104.000.

Katayama, Yoshitaka; Nabeshima, Daiki; and Nakamura, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Record disc addressing apparatus. 4,716,558, Cl. 369-33.000.

Kato, Katsuaki: See—
Ito, Takashi; Matsuzawa, Shigemitsu; and Kato, Katsuaki, 4,716,087, Cl. 429-40.000.

Katoh, Yasuhiro: See—
Sato, Naoki; Kamo, Yoshihisa; Katoh, Yasuhiro; Kosuge, Minoru; and Arai, Shinichi, 4,716,306, Cl. 307-296.000.

Katsaros, James. Locking device for a door lock. 4,715,200, Cl. 70-211.000.

Katsube, Teruaki: See—
Sato, Toshiakatsu; Katsube, Teruaki; and Iida, Yoshiya, 4,715,691, Cl. 350-357.000.

Katsumata, Fujio: See—
Ezura, Toyokazu; Katsumata, Fujio; and Ikeya, Kiyokazu, 4,715,823, Cl. 439-267.000.

Katsumoto, Naoki; and Miyagawa, Toshihiko, to Shiroki Kinzoku Kogyo Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Reclining angle adjustment device. 4,715,655, Cl. 297-362.000.

Katsuoka, Norio: See—
Ikeda, Akitoshi; Nishimura, Chitoshi; Katsuoka, Norio; and Obara, Masami, 4,715,582, Cl. 254-134.3CL.

Katz, Yoram, to Imperial Private Power. Electrical or thermal tracking cogeneration system utilizing open cycle air-conditioning. 4,715,192, Cl. 62-323.100.

Kaufman, Benjamin J.: See—
Kapuscinski, Maria M.; Kaufman, Benjamin J.; and Liu, Christopher S., 4,715,975, Cl. 252-50.000.

Kawaguchi, Takao; Adachi, Hideaki; Setsune, Kentaro; Ohji, Kenzo; and Wasa, Kiyotaka, to Matsushita Electric Industrial Co., Ltd. Optical switch. 4,715,680, Cl. 350-96.340.

Kawai, Joji: See—
Yoshida, Koichi; and Kawai, Joji, 4,716,535, Cl. 364-565.000.

Kawakami, Shigenobu: See—
Sato, Atsushi; Kawakami, Shigenobu; Endo, Keiji; and Dohi, Hideyuki, 4,716,084, Cl. 428-458.000.

Kawamori, Hideo: See—
Hayashi, Mamoru; and Kawamori, Hideo, 4,715,922, Cl. 156-361.000.

Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuchi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Automatic film loading device for camera. 4,716,428, Cl. 354-173.110.

Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, to Seiko Epson Corporation. Step motor control mechanism for electronic timepiece. 4,715,725, Cl. 368-157.000.

Kawanabe, Tomohiko; Kushida, Noritaka; Asakura, Masahiko; and Seki, Yasunari, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine with a duty ratio control operation. 4,715,350, Cl. 123-587.000.

Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; and Kimura, Katsuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine with a duty ratio control operation. 4,715,352, Cl. 123-589.000.

Kawasaki Jukogyo Kabushiki Kaisha: See—
Sagawa, Ryuichi; Nagata, Osamu; and Yamada, Hajime, 4,715,339, Cl. 123-357.000.

Kawasaki, Kiyobito; Sato, Michitaka; Koseki, Hiroyuki; and Matsumura, Tamotsu, to Bridgestone Corporation. Large-size pneumatic radial tire for use on rough road with belt having specified cord. 4,715,419, Cl. 152-527.000.

Kawase, Yoshihiro: See—
Hosoe, Toshiaki; Ando, Seigo; and Kawase, Yoshihiro, 4,716,366, Cl. 324-207.000.

Kawata, Ken: See—
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Kawate, Keith W.: See—
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Kelly, Kevin A. CHEMFET operation without a reference electrode. 4,716,448, Cl. 357-25.000.

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Keshner, Marvin S.: See—
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Kesting, Lorenz. Apparatus for mortaring large-format bricks into a wall. 4,715,163, Cl. 52-749.000.

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Keyes, Melvin H., to Owens-Illinois Glass Container Inc. Protein modification to provide enzyme activity. 4,716,116, Cl. 435-183.000.

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Kicherer, Robert: See—
Essig, Willi; Kicherer, Robert; and Mayer, Hans, 4,715,569, Cl. 248-27.100.

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Killian, Joseph R.: See—
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- Kimura, Katsuhiko: See—
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- King, Patrick D., to Flo-Con Systems, Inc. Composite break ring method. 4,715,423, Cl. 164-98.000.
- Kinn, Donna A.: See—
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- Kioritz Corporation: See—
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- Kirby, Diane N.: See—
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- Kirma, Safa: See—
Soltow, Uwe; Guthke, Hans-Peter; Plate, Hans-Georg; Lechner, Johann; and Kirma, Safa, 4,715,571, Cl. 248-68.100.
- Kirsch, Werner: See—
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- Kirtley, Robert E. Rail supported articulated climbing dolly. 4,715,769, Cl. 414-571.000.
- Kishine, Nobuyuki; Imamura, Tetsuya; and Yamauchi, Michihide, to KAO Corporation. Substrate for a magnetic disc and method manufacturing same. 4,716,078, Cl. 428-336.000.
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Timar, Tibor; Zsupan, Kalman; Repasi, Janos; Borsos nee Safranek, Iren; Kiss, Istvan; Fodor, Andras; and Maroy, Peter, 4,716,238, Cl. 549-408.000.
- Kiss, Steven: See—
Berman, Cary; and Kiss, Steven, 4,715,650, Cl. 297-28.000.
- Kita, Yasuo, to Shimadzu Corporation. Rotary fluid energy converter. 4,715,266, Cl. 91-488.000.
- Kitagawa, Keisuke, to Noazi Kasai. Disposable beverage brewer. 4,715,271, Cl. 99-306.000.
- Kitano, Kishio; Duvdevani, Ilan; and Schulz, Donald N., to Exxon Research and Engineering Company. Method for controlling viscosity of organic liquids and compositions. 4,715,865, Cl. 44-7.300.
- Kito, Yoshikazu, to Hoshizaki Electric Co., Ltd. Ice making machine with water distributor. 4,715,194, Cl. 62-347.000.
- Kiuchi, Takao, to Fuji Photo Film Co., Ltd. Camera-combined magnetic recording-reproducing system. 4,716,474, Cl. 360-33.100.
- Kizaki, Masami: See—
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- Kjelgaard, Tom; Hallberg, Anders; and Jacobsson, Kenth, to Tetra Pak International AB. Reclosable opening arrangement on a packing container. 4,715,528, Cl. 229-123.100.
- Kjornaes, Kim; Christensen, Finn N.; and Jensen, Jens R., to A/S Alfred Benzon. Diffusion coated multiple-units dosage form. 4,716,041, Cl. 424-468.000.
- Klabunde, Ulrich, to Du Pont de Nemours, E. I., and Company. Nickel-catalyzed polymerization of ethylene. 4,716,205, Cl. 526-115.000.
- Klaucic, Luciano, to Continua International Continuous Casting S.p.A. Machine for the curved continuous casting with rigid starting bar. 4,715,426, Cl. 164-426.000.
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- Kleemann, Axel; Klenk, Herbert; and Schulz, Wolfgang, to Degussa Aktiengesellschaft. Process for the production of thiosemicarbazide. 4,716,247, Cl. 564-18.000.
- Kleemann, Axel: See—
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- Engel, Jurgin; Kleemann, Axel; Niemeyer, Ulf; Hilgard, Peter; and Pohl, Joerg, 4,716,242, Cl. 558-81.000.
- Klein, Max. Composite materials, their preparation and articles made therefrom. 4,716,062, Cl. 428-36.000.
- Klenk, Herbert: See—
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- Klimowicz, Mark C.: See—
Curtis, Walter B.; Davis, Gregory L.; and Klimowicz, Mark C., 4,715,310, Cl. 114-220.000.
- Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr: See—
Schaible, Siegfried; Wolffe, Hans-Peter; Gusewell, Eike; and Kohl, Bernhard, 4,715,175, Cl. 56-432.000.
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- Kneifel, Jerome J., to Dale Electronics, Inc. High power density, low corona resistor. 4,716,396, Cl. 358-226.000.
- Knight, John K., to R.F.D. Consultants Pty. Ltd. Basketball game and court. 4,715,598, Cl. 272-3.000.
- Knoll, Frank: See—
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- Knoll, Frederick L., to Boeing Company, The. Apparatus for consolidating composite materials. 4,715,923, Cl. 156-380.900.
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- Kobashi, Toshiyuki: See—
Fujimatsu, Masaaki; and Kobashi, Toshiyuki, 4,716,002, Cl. 264-182.000.
- Kobayashi, Kazuyuki: See—
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- Kobayashi, Kiyotaka; Tsukasaki, Hidaka; and Baba, Takaaki, to Nippondenso Co., Ltd. Self-diagnosis system for exhaust gas recirculation system of internal combustion engine. 4,715,348, Cl. 123-571.000.
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- Kobayashi, Ryuichi: See—
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- Kobayashi, Satoshi: See—
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- Kobayashi, Yoshihito: See—
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- Koch, Thomas L.: See—
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- Kodama, Nobumi: See—
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- Koehler, Steven A.: See—
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- Koenig, Jean-Jacques: See—
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- Koepke, Richard A.: See—
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- Koerner, Goetz: See—
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- Kohl, Bernhard: See—
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- Kohler, Emil K.: See—
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- Kohler, Rolf-Dieter: See—
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- Kohnke, William M. Spent cartridge collector. 4,715,141, Cl. 42-98.000.
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- Koike, Hideharu, to Kabushiki Kaisha Toshiba. Low pass filter formed in an integrated circuit. 4,716,318, Cl. 307-520.000.
- Koike, Hiroshi; Katada, Hiroshi; and Yoneda, Hiroshi, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Ultrasonic wave type fuel atomizing apparatus for internal combustion engine. 4,715,353, Cl. 123-590.000.
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- Kolp, Robert J.: See—
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- Kon, Terrance A.: See—
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- Kondo, Shigeyuki, to NEC Corporation. Device for modifying program duration on a tape player. 4,716,473, Cl. 360-9.100.
- Kondo, Shinichi: See—
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- Kondoh, Hitoshi; and Sueda, Akihiro, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit device constructed by polycell technique. 4,716,452, Cl. 357-68.000.
- Kondou, Masayoshi: See—
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- Konicka, Alfred: See—
Kerschbaum, Kurt; and Konicka, Alfred, 4,716,000, Cl. 264-83.000.
- Konishi, Masahiro, to Fuji Photo Film Co., Ltd. Light amount correction method and apparatus for image output system. 4,716,285, Cl. 250-205.000.
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- Kopatz, Nelson E.; and Pruyn, Lori S., to GTE Products Corporation. Process for producing finely divided spherical glass powders. 4,715,878, Cl. 65-21.100.
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- Koppa, Daniel A., to Nabisco Brands, Inc. Triple co-extruder. 4,715,803, Cl. 425-133.100.
- Korzeniewski, Stephen H., to Du Pont de Nemours, E. I., and Company. Fluorine-containing copolymers. 4,716,208, Cl. 526-245.000.
- Kosaka, Yuzo: See—
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- Koseki, Hiroyuki: See—
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- Koshida, Yoshinori: See—
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- Koskinen, Erkki, to Oy W. Rosenlew Ab. Flexible container for transporting and storing bulk goods. 4,715,635, Cl. 294-68.100.
- Koster, Helmut. Automatic control of incident solar flux. 4,715,358, Cl. 126-439.000.
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- Kottke, Louis E., to Acco Babcock Inc. Method of making a flexible cable assembly. 4,716,001, Cl. 264-145.000.
- Kouge, Shinichi: See—
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- Kouns, Herbert H.; and Gardner, Loren D., to Abex Corporation. Servo control variable displacement pressure compensated pump. 4,715,788, Cl. 417-218.000.
- Koyokawa, Morio; and Fujimoto, Akihiko, to Mitsubishi Denki Kabushiki Kaisha. Numerical control apparatus. 4,716,349, Cl. 318-562.000.
- Krambrock, Wolfgang, to AVT Anlagen- und Verfahrenstechnik GmbH. Process and equipment for pneumatic and hydraulic transport of bulk materials through pipes. 4,715,748, Cl. 406-11.000.
- Krambrock, Wolfgang; and Hoppe, Hans, to Waeschle Maschinenfabrik GmbH. Apparatus for separating granulate material. 4,715,951, Cl. 209-138.000.
- Kramer, John F., deceased; by Van Oosting, Barbara B., executrix; and by Wessberg, Karen S., executrix. Outdoor lighting pedestal. 4,716,508, Cl. 362-431.000.
- Kramer, S. Bertram; and Sampatacos, Evan P., to McDonnell Douglas Helicopter Co. Roll turret for a gun mount. 4,715,263, Cl. 89-37.210.
- Kramer, Thomas J.: See—
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- Kramer, Wolfgang; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lursen, Klaus, to Bayer Aktiengesellschaft. Substituted triazolyl-methyl-tert-butyl carbinol compounds and plant protection agents. 4,715,887, Cl. 71-92.000.
- Krause, Joachim; Wachter, and Scheuble, Bernhard, to Merck Patent Gesellschaft mit beschränkter Haftung. Liquid-crystalline dihydroazines. 4,715,984, Cl. 252-299.610.
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- Kremendahl, Juergen, to Globus Fussstutzenfabrik Karl Kremendahl. Orthopedic supporting member, particularly orthopedic shoe inserts, and method of its manufacture. 4,715,131, Cl. 36-44.000.
- Kress, Hermann, to Hansa Metallwerke AG. Control disc valve. 4,715,406, Cl. 137-625.170.
- Kreuter, Peter. Electromagnetically-actuated positioning mechanisms. 4,715,331, Cl. 123-90.110.
- Kreuter, Peter. Electromagnetically-actuated positioning system. 4,715,332, Cl. 123-90.110.
- Krischke, Hermann: See—
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- Kristinsson, Haukur: See—
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- Kruger, Bernd-Wieland; Lockhoff, Oswald; Metzger, Karl G.; Opitz, Hans-Georg; Schaller, Klaus; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Pharmaceutical use of substituted O-acetylglucosides. 4,716,152, Cl. 514-25.000.
- Kryszyk, Robert, to Deere & Company. Power lift for a lifting device. 4,715,770, Cl. 414-680.000.
- Kubo, Emiko: See—
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- Kubota Tekko Kabushiki Kaisha: See—
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- Kucza, Isosif. Apparatus for rapid cooling of containers. 4,715,195, Cl. 62-376.000.
- Kudo, Kazunori: See—
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- Kudo, Koji: See—
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- Kuhn, Ulrich, to Robert Bosch GmbH. Method and apparatus for measuring the mass of a flowing medium. 4,715,224, Cl. 73-204.000.
- Kukes, Simon G.: See—
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- Kulbersh, Irwin, to Amco Corporation. Clip for coupling shelf assemblies. 4,715,741, Cl. 403-389.000.
- Kumakura, Seiji: See—
Tomita, Kuniyuki; Shimoji, Yasuo; Kumakura, Seiji; Koike, Hiroyuki; Iwata, Nobuyoshi; and Morisawa, Yasuhiro, 4,716,162, Cl. 514-234.000.
- Kummer Electronics B.V.: See—
Kummer, Jan, 4,715,405, Cl. 137-625.200.
- Kummer, Jan, to Kummer Electronics B.V. Solenoid valve, particularly for apparatus for removing a milking set. 4,715,405, Cl. 137-625.200.
- Kunieda, Mitsuyuki: See—
Matsuo, Kenji; Sasaki, Itsuo; Suzuki, Hiroaki; and Kunieda, Mitsuyuki, 4,716,308, Cl. 307-303.000.
- Kuno, Akira: See—
Hattori, Yoshiyuki; Matsui, Kazuma; Imani, Yuichi; Kuno, Akira; Nagata, Tetsuya; Nakane, Koji; and Nomura, Ken, 4,715,663, Cl. 303-110.000.
- Kuntze, Rupert. Fishing line supply spool and method of use. 4,715,554, Cl. 242-84.20R.
- Kunze, Peter; and Kirsch, Werner, to Wiederaufarbeitungsanlage Karlsruhe Betriebsgesellschaft mbH. Fuel element shears having a stepped blade. 4,715,256, Cl. 83-694.000.
- Kuo, George; Masiaz, Frank R.; Truett, Martha; Valenzuela, Pablo; Rasmussen, Mirella E.; and Favaloro, Jennifer, to Chiron Corporation; and Nordisk Gentofte. Monoclonal antibodies to factor VIIIc. 4,716,117, Cl. 435-240.270.
- Kuraray Co., Ltd.: See—
Gion, Hidenori; Yoda, Takumi; Kirita, Yasuzo; Zaima, Kazuhito; and Kurata, Noriyuki, 4,715,849, Cl. 604-52.000.
- Kurata, Noriyuki: See—
Gion, Hidenori; Yoda, Takumi; Kirita, Yasuzo; Zaima, Kazuhito; and Kurata, Noriyuki, 4,715,849, Cl. 604-52.000.
- Kuribayashi, Yukio, to Aica Kogyo Co., Ltd. Key sensing system. 4,716,400, Cl. 340-572.000.
- Kuroda, Hiroshi: See—
Sato, Koji; Kuroda, Hiroshi; Yamada, Ryuji; and Serino, Mamoru, 4,715,657, Cl. 299-1.000.
- Kurosawa, Tomoe: See—
Ohno, Yasunori; Kurosawa, Tomoe; Sato, Tadashi; and Ohshita, Youichi, 4,716,491, Cl. 361-230.000.
- Kushida, Noritaka: See—
Kawanabe, Tomohiko; Kushida, Noritaka; Asakura, Masahiko; and Seki, Yasunari, 4,715,350, Cl. 123-587.000.
- Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; and Kimura, Katsuhiko, 4,715,352, Cl. 123-589.000.
- Kusmierz, Hans: See—
Goepel, Ernst; and Kusmierz, Hans, 4,716,422, Cl. 346-140.00R.

Kuwahara, Heikichi: See—
Takahashi, Kenji; Kuwahara, Heikichi; Yanagida, Takehiko; Nakayama, Wataru; Ozumi, Kiyoshi; and Sugimoto, Shigeo, 4,715,436, Cl. 165-133.000.

Kuzuya, Susumu; and Imaizumi, Mamoru, to Brother Kogyo Kabushiki Kaisha. Dual mode printing apparatus with multiple print ribbon cassettes. 4,715,735, Cl. 400-82.000.

Kyocera Corporation: See—
Horiuchi, Akito; Yokoyama, Kiyoshi; and Yoshida, Makoto, 4,716,133, Cl. 501-97.000.

Kyotani, Yasuhiro: See—
Kagawa, Hirohiko; Kyotani, Yasuhiro; and Torii, Munetomo, 4,716,184, Cl. 523-310.000.

Kyowa Hakko Kogyo Co., Ltd.: See—
Yamauchi, Takayoshi; Hattori, Kaneaki; Ikeda, Shunichi; and Tamaki, Kentaro, 4,716,241, Cl. 558-44.000.

L-TEC Company: See—
Carkhuff, Donald W., 4,716,269, Cl. 219-121.0PQ.

Laboratorien Hausmann AG: See—
Geisser, Peter; Kaiser, Hans P.; and Berger, Franz, 4,715,851, Cl. 604-82.000.

Laborde, Michel: See—
Le Page, Jean-Francois; Billon, Alain; Morel, Frederic; Renard, Pierre; Biedermann, Jean-Michel; Laborde, Michel; and Bousquet, Jacques, 4,715,946, Cl. 208-45.000.

Laby, Jordan M.: See—
Henkin, Melvyn L.; and Laby, Jordan M., 4,715,071, Cl. 4-542.000.

Laine, Richard M.; Hirschon, Albert S.; and Wilson, Robert B., Jr., to SRI International. Catalysts for the hydrodenitrogenation of organic materials and process for the preparation of the catalysts. 4,716,142, Cl. 502-220.000.

Laing, Gordon E.: See—
Harris, Frank R.; and Laing, Gordon E., 4,715,083, Cl. 15-323.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes George Claude: See—
Pean, Jean-Louis; Desvard, Catherine; and Barbier, Jean-Paul, 4,715,985, Cl. 252-305.000.

Lait, Andrew J., to Canadian Marconi Company. Waveguide to strip-line transition. 4,716,386, Cl. 333-26.000.

Laitram Corporation, The: See—
Lapeyre, George C.; Greve, Christopher G.; and Ruys, Hendrik J., 4,715,093, Cl. 17-1.000.

Lake Center Industries: See—
Toulouse, Charles P., 4,716,264, Cl. 200-61.860.

Lamanna, Anthony. Set of golf clubs and method of matching same. 4,715,601, Cl. 273-77.00A.

Lamberg, John R.: See—
Gawronski, Michael J.; and Lamberg, John R., 4,716,389, Cl. 333-81.00A.

Lambousy, George G.; Reaves, Benjamin H.; and Nelson, William E., to Amoco Corporation. Bubble cap assembly. 4,715,996, Cl. 261-114.200.

Landgraf, Heinrich. Gem faceting machine. 4,715,148, Cl. 51-229.000.

Landrevie, Jacques, to Societe Nouvelle Rockall France S.A. Electrical connection for electronic circuits. 4,715,828, Cl. 439-660.000.

Lang, Joseph H., to Xerox Corporation. Charge erase device with flare light control. 4,716,436, Cl. 355-3.0CH.

Lang, Theodore B., to Kimberly-Clark Corporation. Method for forming discrete particulate areas in a composite article. 4,715,918, Cl. 156-273.100.

Langhoff, Josef; Kriskke, Hermann; Geldmacher, Horst; Golomb, Manfred; Kamp, Karl-Heinz; Masuch, Peter; and Chalupnik, Rolf, to Ruhrkohle AG. Fluidized bed having modified surfaces in the heat exchanger. 4,715,809, Cl. 431-170.000.

Langowski, Faustyn C.: See—
Berry, Joe R.; Langowski, Faustyn C.; Renfro, James G.; and Smith, Roger, Jr., 4,715,761, Cl. 414-22.000.

Lanigan, John J., Sr.; Glickman, Myron; George, Thazhuthukudiyil V.; and Ermel, Bernard A., to Mi-Jack Products, Inc. Grapppler system for lifting apparatus. 4,715,762, Cl. 414-126.000.

Lapeyre, George C.; Greve, Christopher G.; and Ruys, Hendrik J., to Laitram Corporation, The. Trimming and cutting apparatus for the preparation of crabs for meat extraction. 4,715,093, Cl. 17-1.000.

Larque, Hubert. Counterfoil binding. 4,715,759, Cl. 412-33.000.

Larsen, Merle D.: See—
Cummings, Richard E.; Mackey, Charles S.; Dickinson, Robert W.; Dickinson, Ben W. O., III; and Larsen, Merle D., 4,715,128, Cl. 33-544.000.

LaRue, George S.: See—
Davenport, William H.; McCormack, Gary D.; and LaRue, George S., 4,716,311, Cl. 307-448.000.

Laskowitz, Joseph F. Reclining chair with retractable footrest. 4,715,654, Cl. 297-329.000.

Lattig, Krail N. Arrow rest for archery bow. 4,715,355, Cl. 124-41.00A.

Laughlin, Raymond S.: See—
Carraro, Eugene; and Laughlin, Raymond S., 4,715,161, Cl. 52-714.000.

Lavallee, Francois A., to Essex Group, Inc. Method for equilibrating polyamide magnet wire coatings and enamel compositions. 4,716,190, Cl. 524-386.000.

Lavie, Louis F., to Dridrinks N.V. Pulverulent water-soluble nonhydroscopic composition for preparing beverages with a lasting effervescence and method for preparing the same. 4,716,046, Cl. 426-96.000.

Lawall, Thomas R., to Fuller Company. Process and apparatus for manufacturing low sulfur cement clinker. 4,715,811, Cl. 432-58.000.

Lawruk, Stephen P.: See—
Jackson, Mark F.; Lawruk, Stephen P.; Schlegel, Dallas E.; and Spong, Richard V., 4,715,112, Cl. 29-739.000.

Lawson, Bobby R.: See—
Muller, Gary R.; Theiss, Scott M.; Brown, James E., Jr.; and Lawson, Bobby R., 4,715,324, Cl. 122-381.000.

Lazzarini, Anna M.: See—
Scarponi, Ugo; Lazzarini, Anna M.; Toti, Daniela; and de Castiglione, Roberto, 4,716,228, Cl. 540-578.000.

Lear Fan Limited: See—
Loyek, Ernie F., 4,715,560, Cl. 244-177.00R.

Lebedev, Vladimir K.; Chernenko, Ivan A.; Dyshlenko, Alexandr T.; Litvin, Leonid V.; and Tishura, Vladimir I. Electromagnetic power drive for a friction welding machine. 4,715,523, Cl. 228-2.000.

Lechner, Johann: See—
Soltow, Uwe; Guthke, Hans-Peter; Plate, Hans-Georg; Lechner, Johann; and Kirma, Safa, 4,715,571, Cl. 248-68.100.

Lecolant, Rene: See—
Tirelli, Marco; Lecolant, Rene; and Hecquet, Raoul, 4,715,917, Cl. 136-250.000.

Ledley, Robert S.; and Gersten, Douglas M., to Georgetown University. Radioopaque sugar derivatives and a method of metabolic mapping using the same. 4,716,225, Cl. 536-122.000.

Lee, Byoung G.: See—
Angell, Eric H.; Aprille, Thomas J.; Azaret, Juan O.; Fang, Rong-Chin; Lee, Byoung G.; Longwell, Brian C.; Sharper, Craig A.; and Spalink, Jan-Dieter, 4,716,561, Cl. 370-55.000.

Lee Company, The: See—
Lee, Leighton, II; and Kolp, Robert J., 4,715,231, Cl. 73-709.000.

Lee Controls, Inc.: See—
Magnuson, Robert E., 4,715,730, Cl. 384-52.000.

Lee, Jen S.: See—
Houck, David L.; Port, David J.; and Lee, Jen S., 4,716,019, Cl. 419-17.000.

Lee, Kon J.; and Musset, Anthony, to Denton Vacuum Inc. Pre-ionization aided sputter gun. 4,716,340, Cl. 315-111.410.

Lee, Leighton, II; and Kolp, Robert J., to Lee Company, The. Maximum pressure indicator. 4,715,231, Cl. 73-709.000.

Lee, Norman C., to Zarn, Inc. Plant container with concavoconvex ribs. 4,715,144, Cl. 47-66.000.

Leese, David J.; and Ashby, Robert E., to Moore Business Forms, Inc. Two-part mailer with return envelope. 4,715,530, Cl. 229-73.000.

LeFebvre Corporation: See—
Podoll, Michael J.; and Jensen, Peter J., 4,715,750, Cl. 406-111.000.

Lehoczy, Ken, to GSE, Inc. Single pulse peak circuit for torque verification. 4,715,211, Cl. 73-1.00C.

Leiber, Heinz, to Robert Bosch GmbH. Hydraulic brake booster. 4,715,661, Cl. 303-10.000.

Leineweber, Michael: See—
Caruthers, Marvin H.; Leineweber, Michael; Leitner, Moshe; and Stabinsky, Yitzhak, 4,716,217, Cl. 530-351.000.

Leitner, Moshe: See—
Caruthers, Marvin H.; Leineweber, Michael; Leitner, Moshe; and Stabinsky, Yitzhak, 4,716,217, Cl. 530-351.000.

Leland Stanford Junior University, The Board of Trustees of the: See—
Moslehi, Mehrdad M.; Fu, Chi Y.; and Saraswat, Krishna, 4,715,937, Cl. 204-177.000.

Lenz, Henry G.: See—
Shah, Manoj R.; and Lenz, Henry G., 4,716,328, Cl. 310-178.000.

Leo Stahl AG: See—
Stahl, Leo, 4,715,459, Cl. 180-6.480.

Leonard, Ronald J., to Baxter Travenol Laboratories, Inc. Hollow fiber separation device manifold. 4,715,953, Cl. 210-321.800.

Le Page, Jean-Francois; Billon, Alain; Morel, Frederic; Renard, Pierre; Biedermann, Jean-Michel; Laborde, Michel; and Bousquet, Jacques, to Institut Francais du Petrole. Process for deasphalting a hydrocarbon charge containing asphaltene. 4,715,946, Cl. 208-45.000.

Lerner, Bernard; Liebhart, Dana; and Wehrmann, Rick S., to Automatic Packaging Systems, Inc. Apparatus and method for cutting slaughtered poultry into separate pieces. 4,715,092, Cl. 17-52.000.

Leroy, Claude; Millot, Jean-Paul; and Desfontaines, Guy, to Framatome & Cie. Device for control of the core of a nuclear reactor. 4,716,008, Cl. 376-237.000.

Leshner, George Y.; and Singh, Baldev, to Sterling Drug Inc. 5-[IH-(5-membered-N-aromatic hetero)-1-yl]-1,6-naphthyridin-2(1H)-ones and their cardiotonic use. 4,716,170, Cl. 514-300.000.

Lever Brothers Company: See—
Biernoth, Gerhard; Menz, Hans-Udo; Todt, Klaus H.; and Wieske, Theophil, 4,716,047, Cl. 426-603.000.

Levine, Alfred B. Method for previewing undeveloped film. 4,716,470, Cl. 358-256.000.

Levy, Jay A., to University of California, Regents of the. Purified AIDS-associated virus ARV-2. 4,716,102, Cl. 435-5.000.

Levy, Roland A.: See—
Green, Martin L.; Levy, Roland A.; and Nuzzo, Ralph G., 4,716,050, Cl. 427-99.000.

Lewin, David F., to Owens-Corning Fiberglass Corporation. Size composition. 4,716,080, Cl. 428-389.000.

Lewis, Idris; and Churchill, John, to Ford Motor Company. Bumper bar for a motor vehicle. 4,715,645, Cl. 296-120.00R.

Lewis, Julie M. Accouchement apparatus. 4,715,592, Cl. 269-328.000.

Lewis, Paul H., to Texaco Inc. Process of preparing a catalyst containing activated isomerization sites. 4,716,137, Cl. 502-74.000.

Lewis, Richard T.: See—
Tallon, James A.; and Lewis, Richard T., 4,715,897, Cl. 106-284.000.

Leys, Cassius W.: See—
Fox, Frank; and Leys, Cassius W., 4,716,056, Cl. 427-407.100.

Liberg, Lars-Olof, to Götaverken Arendal AB. Device for the handling of liquids. 4,715,309, Cl. 114-125.000.

Libregts, Hubertus B.: See—
Moussie, Bob; and Libregts, Hubertus B., 4,715,825, Cl. 439-391.000.

Lichter, Robert J. Safe construction and rebar coupling device for use therewith. 4,715,297, Cl. 109-50.000.

Liebhart, Dana: See—
Lerner, Bernard; Liebhart, Dana; and Wehrmann, Rick S., 4,715,092, Cl. 17-52.000.

Liedtke, Kurt: See—
Focke, Heinz; and Liedtke, Kurt, 4,715,497, Cl. 206-254.000.

Liegel, Reinold D., to Hein-Werner Corporation. Convertible tool tray and support stand for mechanics tool. 4,715,573, Cl. 248-129.000.

Liegel, Reinold D.; and Ballard, James G., to Hein-Werner, Inc. High speed hydraulic fluid venting valve in a hydraulic fluid pump. 4,715,789, Cl. 417-253.000.

Liethschmidt, Klaus: See—
von Matschka, Alfred G.; Liethschmidt, Klaus; Weber, Hubertus; and Kohler, Emil K., 4,715,812, Cl. 432-258.000.

Lin, Yang-I: See—
Bitha, Panayota; Child, Ralph G.; Hlavka, Joseph J.; and Lin, Yang-I, 4,716,157, Cl. 514-184.000.

Lind, Richard C.: See—
O'Meara, Thomas R.; and Lind, Richard C., 4,715,689, Cl. 350-354.000.

Linde Aktiengesellschaft: See—
Fuchs, Uwe, 4,715,958, Cl. 210-605.000.

Linden, Olavi, to Fiskars Oy AB. Plastic handle scissors. 4,715,122, Cl. 30-254.000.

Lindquist, John, to Universal Manufacturing Corporation. Constant illumination, remotely dimmable electronic ballast. 4,716,343, Cl. 315-307.000.

Lindqvist, Bengt L.: See—
Malson, Tomas; and Lindqvist, Bengt L., 4,716,154, Cl. 514-54.000.

Lindqvist, Gustav: See—
Wilkman, Goran; Kotilainen, Timo; Pulliainen, Juha; and Lindqvist, Gustav, 4,715,305, Cl. 114-40.000.

Lindstrom, Richard L. Epiconal lens. 4,715,858, Cl. 623-5.000.

Ling Electronics, Inc.: See—
Butts, Gary, 4,715,229, Cl. 73-663.000.

Lingnau, Horst, to Woma-Apparatebau Wolfgang Maasberg & Co., GmbH. Swirl jet nozzle as a hydraulic work tool. 4,715,538, Cl. 239-248.000.

Lingner & Fischer GmbH: See—
Gollub, Hans J.; Hechenberger, Dieter A.; and Moermann, Renate, 4,716,189, Cl. 524-284.000.

Lion Corporation: See—
Hirakouchi, Yoshie; Toisawa, Osamu; and Takahashi, Masatoshi, 4,715,991, Cl. 252-555.000.

Lipinski, Reinhard; and Kaiser, Siegmund H., to PROMA Produkt-und Marketing Gesellschaft mbH. Mechanical linear drive system. 4,715,241, Cl. 74-89.150.

Lisle Corporation: See—
Pool, James L., 4,716,365, Cl. 324-158.00P.

List, Hans: See—
Fausser, Edwin; and List, Hans, 4,716,372, Cl. 328-146.000.

Littmann, Wolfgang: See—
Ernst, Hansgeorg; Littmann, Wolfgang; and Paust, Joachim, 4,716,243, Cl. 558-395.000.

Litton Systems Inc.: See—
Hutchings, Thomas J., 4,715,713, Cl. 356-350.000.

Litvin, Leonid V.: See—
Lebedev, Vladimir K.; Chernenko, Ivan A.; Dyshlenko, Alexandr T.; Litvin, Leonid V.; and Tishura, Vladimir I., 4,715,523, Cl. 228-2.000.

Liu, Christopher S.: See—
Kapusciniski, Maria M.; Kaufman, Benjamin J.; and Liu, Christopher S., 4,715,975, Cl. 252-50.000.

Livick, Lester R. Door lock drilling template. 4,715,125, Cl. 33-197.000.

Livsey, Terry; and Foulkes, Graham T., to Rolls-Royce plc. Inspection apparatus. 4,715,228, Cl. 73-640.000.

Llort, Francisco M.; Gendreau, Paul M.; and Berard, Raymond A., to Acushnet Company. Golf ball composition. 4,715,607, Cl. 273-218.000.

Lloyd, Mervin R.; and Kon, Terrance A. Snow trap attachment for crop harvesting machine. 4,715,174, Cl. 56-297.000.

Lobanoff, Mark; and Gavagan, James A., to Irvin Industries, Inc. Spring-loaded hinge assembly for vehicle accessories. 4,715,644, Cl. 296-97.00H.

Locke, Philip F., Jr.; and Ignatius, Mark J., to Nordson Corporation. Method of checking channel connections and detecting heater circuit and temperature sensor malfunctions in multi-channel closed loop hot melt heating systems. 4,716,519, Cl. 364-186.000.

Locke, Philip F., Jr.; and Ignatius, Mark J., to Nordson Corporation. Method of checking channel connections and detecting heater circuit and temperature sensor malfunctions in multi-channel closed loop hot melt heating systems. 4,716,520, Cl. 364-186.000.

Lockhoff, Oswald: See—
Kruger, Bernd-Wieland; Lockhoff, Oswald; Metzger, Karl G.; Opitz, Hans-Georg; Schaller, Klaus; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,716,152, Cl. 514-25.000.

Lofgren, Karl M. J.; Shearer, Gerald W.; and Ouyang, Kenneth W., to Western Digital Corporation. Precise phase start-up voltage con-

trolled oscillator with accurate duty cycle. 4,716,383, Cl. 331-117.0FE.

Logie, Frank M., to Lucas Industries public limited company. Electromagnetic actuator. 4,716,393, Cl. 335-261.000.

Long, Judith A.: See—
Johnston, Wilbur D., Jr.; and Long, Judith A., 4,716,130, Cl. 437-104.000.

Longobardi, Roberto. Fuel-economy and emission-control device for internal combustion engines. 4,715,354, Cl. 123-590.000.

Longwell, Brian C.: See—
Angell, Eric H.; Aprille, Thomas J.; Azaret, Juan O.; Fang, Rong-Chin; Lee, Byoung G.; Longwell, Brian C.; Sharper, Craig A.; and Spalink, Jan-Dieter, 4,716,561, Cl. 370-55.000.

Lopes, John A.; and Stanton, James H., to Diversey Wyandotte Corporation. Antimicrobial sanitizing composition containing n-alkyl and n-alkenyl succinic acid and methods for use. 4,715,980, Cl. 252-106.000.

L'Oreal: See—
Zabotto, Arlette; and Contamin, Jean-Claude, 4,715,982, Cl. 252-174.170.

Lotz, Werner; Fuchs, Karlheinz; and Haller, Siegmund, to Hoechst Aktiengesellschaft. Economy chrome tanning process with aldehyde-acids and keto-acids. 4,715,861, Cl. 8-94.180.

Loughran, James A.: See—
Yerman, Alexander J.; and Loughran, James A., 4,716,124, Cl. 437-8.000.

Lovie, John R.; Somers, Gerardus A.; and Hendriks, Jan J. M., to OMI International Corporation. Palladium and palladium alloy plating. 4,715,935, Cl. 204-44.600.

Loyek, Ernie F., to Lear Fan Limited. Composite cruciform structure for joining intersecting structural members of an airframe and the like. 4,715,560, Cl. 244-177.00R.

LTH Associates: See—
Tamminen, Pentti, 4,715,934, Cl. 204-10.000.

Lu, Jing-Jong; and Wehrmeister, Herbert L., to International Minerals & Chemical Corp. Process for preparing phthalimido isoxazoles. 4,716,233, Cl. 548-245.000.

Lucas Industries public limited Company: See—
Farr, Glyn P. R., 4,715,666, Cl. 303-116.000.

Logie, Frank M., 4,716,393, Cl. 335-261.000.

Lucassen, Gunter: See—
Hergeth, Adolph; Lucassen, Gunter; and Pinto, Akiva, 4,715,722, Cl. 366-132.000.

Lukaszyk, Alfons; Martin, Henry; Diel, Peter J.; Forzy, Werner; Gotzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfer, Hermann; Schurter, Rolf; and Szczepanski, Henry, to Ciba-Geigy Corporation. Thiadiazolyl-glyoxylonitrile-2-oxime ether derivatives for protecting plant crops. 4,715,883, Cl. 71-90.000.

Lum, Kin K.: See—
Vanier, Noel R.; Lum, Kin K.; and Bowman, Wayne A., 4,716,144, Cl. 503-227.000.

Lunkenheimer, Winfried: See—
Marzolph, Gerhard; Lunkenheimer, Winfried; and Fedtke, Carl, 4,715,888, Cl. 71-93.000.

Luperti, Harry E.; Person, Eric N.; and Simmel, Thomas, to Pitney Bowes Inc. High speed envelope flap opener. 4,715,164, Cl. 53-381.00R.

Lurssen, Klaus: See—
Kramer, Wolfgang; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,715,887, Cl. 71-92.000.

Luttrell, Stephen P.; and Oliver, Christopher J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Super resolution imaging system. 4,716,414, Cl. 342-179.000.

Lymore Limited: See—
Brosch, Richard W., 4,715,425, Cl. 164-418.000.

Lynn, Dwo; Morrison, Carl C.; and Hutcherson, Ronald W., Sr., to R. J. Reynolds Tobacco Company. Cigarette. 4,715,389, Cl. 131-335.000.

M/A-Com, Inc.: See—
Carr, Kenneth L., 4,715,727, Cl. 374-122.000.

M.A.N. Roland Druckmaschinen Aktiengesellschaft: See—
Ottlik, Norbert, deceased, 4,715,204, Cl. 72-76.000.

M&T Chemicals Inc.: See—
Thorpe, John E.; and Sarang, Gursharan S., 4,715,116, Cl. 29-846.000.

MacAllister, Donald J.; and Pennington, Virginia W., to Atlantic Richfield Company. Method for recovery of hydrocarbons. 4,715,444, Cl. 166-269.000.

MacConnell, John: See—
Brink, Douglas F.; and MacConnell, John, 4,715,633, Cl. 294-31.200.

Machida, Naoyoshi: See—
Sugiyama, Makoto; Sugimura, Hiroshi; Machida, Naoyoshi; and Murai, Yoshiichi, 4,715,121, Cl. 30-253.000.

Macias, Jorge: See—
Baillie, William R.; Macias, Jorge; and Dressendorfer, Michael, 4,715,669, Cl. 312-12.000.

Mack, Gerhard; Mueller, Birgit; Jung, Guenter; and Frass, Werner, to Hoechst Aktiengesellschaft. Developer for preparing printing forms and process therefor. 4,716,098, Cl. 430-331.000.

Mackey, Charles S.: See—
Cummings, Richard E.; Mackey, Charles S.; Dickinson, Robert W.; Dickinson, Ben W. O., III; and Larsen, Merle D., 4,715,128, Cl. 33-544.000.

MacLellan, Bruce D., to Eastman Kodak Company. Development station having apertured thin film for controlling the flow of developer material. 4,716,437, Cl. 355-3.0DD.

MacNeil, Douglas E., to General Dynamics, Pomona Division. Floating seal and method of its use. 4,715,526, Cl. 228-219.000.

Macrander, Max S.: See—
Mills, Jeffrey P.; and Macrander, Max S., 4,716,538, Cl. 364-754.000.
Mills, Jeffrey P.; and Macrander, Max S., 4,716,539, Cl. 364-754.000.

Macy, Dennis W., to Colorado State University Research Foundation. Method for detection of exogenous or ACTH stimulated glucocorticoids in domestic animals. 4,716,030, Cl. 424-9.000.

Mage AG: See—
Gehring, Manfred; and Pluss, Heinz, 4,715,626, Cl. 285-230.000.

Maggio, Joseph, to Medcore, Inc. Disposable automatic lancet. 4,715,374, Cl. 128-314.000.

MagneTek, Inc.: See—
Nolan, Dennis C.; and Bluma, David A., 4,716,348, Cl. 318-479.000.

Magnuson, James M., to Peddinghaus Corporation. Workpiece advancing apparatus. 4,715,774, Cl. 414-751.000.

Magnuson, Robert E., to Lee Controls, Inc. Linear motion pillow blocks including self-aligning features. 4,715,730, Cl. 384-52.000.

Maher, Joseph A.; Vowles, E. John; Napoli, Joseph D.; Zafiropoulos, Arthur W.; and Miller, Mark W., to General Signal Corporation. Quad processor. 4,715,921, Cl. 156-345.000.

Mahoney, Patrick F.: See—
Galgana, Russell J.; Mahoney, Patrick F.; and Sutin, Gordon L., 4,715,763, Cl. 414-216.000.

Mahulikar, Deepak, to Olin Corporation. Cermet substrate with glass adhesion component. 4,715,892, Cl. 75-233.000.

Mainelli, Roy J.; and Preston, Donald, to United Technologies Corporation. Fluid flow regulator. 4,715,395, Cl. 138-42.000.

Majerus, Norbert: See—
Greenwood, Alan; and Majerus, Norbert, 4,715,577, Cl. 249-107.000.

Makabe, Eiichi; Uesugi, Mitsuaki; Inomata, Masaichi; Maruyama, Kyusuke; Iwai, Kenji; and Sano, Kazuo, to Nippon Kokan Kabushiki Kaisha. Fatigue crack position detection apparatus. 4,716,459, Cl. 358-106.000.

Makal, John: See—
Schoenwetter, Randall R.; Makal, John; and Sankey, Edward L., 4,715,104, Cl. 29-271.000.

Makiuchi, Masao, to Fujitsu Limited. Method of producing semiconductor laser. 4,716,125, Cl. 437-22.000.

Malestein, Teus. Apparatus for supplying food to a plurality of cages. 4,715,323, Cl. 119-52.0AF.

Malik, Louis: See—
Thurles, Edmond; Masson, Jean-Paul; and Malik, Louis, 4,715,834, Cl. 439-842.000.

Maloney, David C.: See—
Perhach, John M.; Porter, Charles E., Jr.; and Maloney, David C., 4,715,215, Cl. 73-49.300.

Malson, Tomas; and Lindqvist, Bengt L., to Pharmacia AB. Gel of crosslinked hyaluronic acid for use as a vitreous humor substitute. 4,716,154, Cl. 514-54.000.

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Mandigo, Frank N.; and Shapiro, Eugene, to Olin Corporation. Low cost connector alloy. 4,715,910, Cl. 148-414.000.

Mann, Edward D.: See—
Whipple, David L.; and Mann, Edward D., 4,716,545, Cl. 364-900.000.

Mann, Joe A.: See—
Sanders, John H.; Hoblit, Louis D.; and Mann, Joe A., 4,716,055, Cl. 427-304.000.

Mann, Max; and Kapps, Manfred, to Bergwerksverband GmbH; and Bayer Aktiengesellschaft. Method of strengthening geological formations. 4,715,746, Cl. 405-264.000.

Mann, Steven L. Compound resource recovery furnace. 4,715,299, Cl. 110-235.000.

Manning, Donald L., to Transpec Inc. Energy absorbing vehicle bumper. 4,715,630, Cl. 293-120.000.

Manno, John L.: See—
Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Casette, Angelo J.; Manno, John L.; and Parlak, Edward A., 4,716,010, Cl. 376-260.000.

Manon, C. Dodd: See—
Ahearn, John E.; Frates, Raymond A.; Girard, Dennis; Koepke, Richard A.; Schmidt, James K.; and Manon, C. Dodd, 4,716,082, Cl. 428-428.000.

Mansfield Scientific, Inc.: See—
Pope, J. Lee, Jr.; and Resden, Ronald E., 4,715,378, Cl. 128-344.000.

Manzelli, Giorgio. Modular element particularly for false ceilings, partition surfaces and non-structural walls. 4,715,158, Cl. 52-581.000.

Marcuvitz, Andrew: See—
Douras, Bryan P.; and Marcuvitz, Andrew, 4,716,575, Cl. 375-3.000.

Maresca, Louis M.: See—
Clendinning, Robert A.; and Maresca, Louis M., 4,716,211, Cl. 528-126.000.

Margolin, Mark; Grois, Igor; and Moore, James E., to Amphenol Corporation. Fiber optic cable preparation tool and method of pre-

paring fiber optic cable for termination with a fiber optic connector. 4,715,251, Cl. 81-9.400.

Mariussen, Oskar; and Bjarnason, Jon. Water-repellent and vapor-permeable paint. 4,716,188, Cl. 524-268.000.

Markert, Jurgen: See—
Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Jurgen; and Wuerzler, Bruno, 4,715,889, Cl. 71-94.000.

Marks, Tobin J.; and Mauermann, Heiko, to Northwestern University. Organolanthanide catalysts. 4,716,257, Cl. 585-275.000.

Markwell, Roger E.; Ward, Robert W.; and de Mello, Carol R., to Beecham Group p.l.c. Certain 7-amino-pyrazolo[4,3-b]pyridines useful in treating inflammatory and allergic disorders. 4,716,160, Cl. 514-212.000.

Maroy, Peter: See—
Timar, Tibor; Zsupan, Kalman; Repasi, Janos; Borsos nee Safranek, Iren; Kiss, Istvan; Fodor, Ambras; and Maroy, Peter, 4,716,238, Cl. 549-408.000.

Marquette Electronics, Inc.: See—
Cudahy, Michael J.; De La Huerca, Carlos; Arneson, Harold N.; Divers, R. Thomas; and Altman, Barry J., 4,715,385, Cl. 128-710.000.

Marr, Michael R.: See—
Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Pescatore, John C.; and Marsico, Mario A., 4,716,523, Cl. 364-200.000.

Marsico, Mario A.: See—
Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Pescatore, John C.; and Marsico, Mario A., 4,716,523, Cl. 364-200.000.

Martin, George F.: See—
Peltz, Curtis L.; Martin, George F.; and Blake, Peter H., 4,716,542, Cl. 364-900.000.

Martin, Henry: See—
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gotzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,715,883, Cl. 71-90.000.

Martin Marietta Corporation: See—
Nobles, William O., 4,715,566, Cl. 244-159.000.

Martin, Peter G., to National Patent Analytical Systems, Inc. Computer-aided drug-abuse detection. 4,715,386, Cl. 128-733.000.

Maruyama, Kyusuke: See—
Makabe, Eiichi; Uesugi, Mitsuaki; Inomata, Masaichi; Maruyama, Kyusuke; Iwai, Kenji; and Sano, Kazuo, 4,716,459, Cl. 358-106.000.

Maruyama, Masanori; Takahashi, Kenji; Kudo, Koji; Hombaugh, Masanori; and Nagahara, Shusaku, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Apparatus for controlling the electron beam in a television camera tube. 4,716,468, Cl. 358-219.000.

Marx, Hans-Norbert: See—
Stanek, Richard; Marx, Hans-Norbert; Hettler, Wendelin; and Wagner, Claus, 4,716,054, Cl. 427-297.000.

Marzolph, Gerhard; Lunkenheimer, Winfried; and Fedtke, Carl, to Bayer Aktiengesellschaft. Herbicidal agents containing photosynthesis-inhibiting herbicides in combination with pyridinecarboxamides. 4,715,888, Cl. 71-93.000.

Masaki, Kazumi, to Hayashibara, Ken. Surge current-limiting circuit. 4,716,511, Cl. 363-49.000.

Maschinen Abrik Rieter AG: See—
Erni, Markus; and Salvisberg, Kurt, 4,715,550, Cl. 242-39.000.

Mashimo, Satoshi; Fujita, Kunihiro; Tanaka, Masayuki; Yamaguchi, Yoshio; and Takeda, Kazuhiro, to Mitsubishi Belting Ltd. Power transmission tensile cord and belt manufacture. 4,715,176, Cl. 57-251.000.

Mashuda, David. Foldable drain hose support. 4,715,570, Cl. 248-49.000.

Masiarz, Frank R.: See—
Kuo, George; Masiarz, Frank R.; Truett, Martha; Valenzuela, Pablo; Rasmussen, Mirella E.; and Favaloro, Jennifer, 4,716,117, Cl. 435-240.270.

Mason, Paul B., to Polaroid Corporation. Transparency film assemblage and roller assembly for use therewith. 4,716,092, Cl. 430-209.000.

Massey, Dennis W.: See—
Goldstein, Yeshayahu S. A.; Tidman, Derek A.; Burton, Rodney L.; Massey, Dennis W.; and Winsor, Niels K., 4,715,261, Cl. 89-8.000.

Masson, Jean-Paul: See—
Thurles, Edmond; Masson, Jean-Paul; and Malik, Louis, 4,715,834, Cl. 439-842.000.

Masson, Ronald K.: See—
Thompson, John R.; Hunting, Curtis J.; Masson, Ronald K.; and Trivelpiece, Craig E., 4,716,588, Cl. 380-20.000.

Masters, William E. Variable volume kayak hull. 4,715,311, Cl. 114-347.000.

Masterion, John, to STC PLC. Phase corrector. 4,716,579, Cl. 375-81.000.

Masuch, Peter: See—
Langhoff, Josef; Krichke, Hermann; Geldmacher, Horst; Golomb, Manfred; Kamp, Karl-Heinz; Masuch, Peter; and Chalupnik, Rolf, 4,715,809, Cl. 431-170.000.

Masuda, Senichi; and Sugita, Naoki, to Masuda, Senichi. Electrostatic filter dust collector. 4,715,870, Cl. 55-132.000.

Masuda, Toru: See—
Iwasa, Yoshihiro; Masuda, Toru; and Shibano, Yasuji, 4,715,819, Cl. 439-31.000.

Masuhara, Hiromu; and Kimura, Tsunekazu, to NEC Corporation. Error correcting system. 4,716,566, Cl. 371-37.000.

Masuzawa, Sigeki; Shibata, Shinya; Miyazaki, Hiroshi; and Iwase, Tetsuo, to Sharp Kabushiki Kaisha. Speech synthesis method and device. 4,716,591, Cl. 381-51.000.

Mathes, Gene R.: See—
Amacher, Gene L.; Mathes, Gene R.; Paugstat, John F.; and Mergenthaler, Barry M., 4,715,457, Cl. 177-1.000.
Amacher, Gene L.; Mathes, Gene R.; Paugstat, John F.; and Mergenthaler, Barry M., 4,716,281, Cl. 235-383.000.

Matlock, Dyer A.: See—
Roberts, Bruce E.; Black, Jimmy C.; and Matlock, Dyer A., 4,716,071, Cl. 428-209.000.

Matsuda, Kenji: See—
Umamura, Hiroyuki; Matsuda, Kenji; Tezuda, Tomofumi; Isono, Kazuaki; Ishioka, Hidekazu; Sugawara, Sakuo; and Hara, Masanori, 4,715,191, Cl. 62-208.000.

Matsugi, Tetsuzo: See—
Inaba, Tsutomu; Kimura, Tadashi; Kobayashi, Norihide; Sugihara, Masahiro; and Matsugi, Tetsuzo, 4,715,796, Cl. 418-55.000.

Matsui, Hideo; Fujie, Hiroshi; and Noma, Takashi, to Teijin Limited. Compression moldable aromatic polyamide powder. 4,716,215, Cl. 528-348.000.

Matsui, Kazuma: See—
Hattori, Yoshiyuki; Matsui, Kazuma; Imani, Yuichi; Kuno, Akira; Nagata, Tetsuya; Nakane, Koji; and Nomura, Ken, 4,715,663, Cl. 303-110.000.

Matsui, Sadayoshi: See—
Taneya, Mototaka; Matsui, Sadayoshi; and Matsumoto, Mitsuhiro, 4,716,129, Cl. 437-96.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Matsui, Sadayoshi, 4,716,570, Cl. 372-45.000.

Matsui, Shigeru: See—
Sekihara, Kensuke; Matsui, Shigeru; Kohno, Hideki; Yamamoto, Etsuji; and Shiono, Hidemi, 4,716,369, Cl. 324-309.000.

Matsui, Toshiya, to NEC Corporation. Multivoice signal switching circuit. 4,716,589, Cl. 381-3.000.

Matsumoto, Koichi: See—
Kameyama, Masao; and Matsumoto, Koichi, 4,715,318, Cl. 118-722.000.

Matsumoto, Mitsuhiro: See—
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Matsumoto, Yukimichi, to Kabushiki Kaisha Fuji Tekkoshu. Multi-spindle winder. 4,715,552, Cl. 242-56.00A.

Matsunuma, Tamotsu: See—
Kawasaki, Kiyohito; Sato, Michitaka; Koseki, Hiroyuki; and Matsunuma, Tamotsu, 4,715,419, Cl. 152-527.000.

Matsuoka, Kenji; Sasaki, Itsuo; Suzuki, Hiroaki; and Kunieda, Mitsuyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. MOS pull-up or pull-down logic circuit having equalized discharge time delays and layout avoiding crossovers. 4,716,308, Cl. 307-303.000.

Matsuo, Satoshi, to Kabushiki Kaisha Toshiba. Electronic endoscopic system. 4,716,457, Cl. 358-98.000.

Matsuo, Yukito, to Kabushiki Kaisha Toshiba. Conveying apparatus. 4,716,346, Cl. 318-38.000.

Matsuoka, Akio: See—
Nishizawa, Kazutoshi; Takagi, Masashi; and Matsuoka, Akio, 4,715,792, Cl. 417-295.000.
Nishizawa, Kazutoshi; Takagi, Masashi; Matsuoka, Akio; and Nomura, Fuzio, 4,715,800, Cl. 418-69.000.

Matsuoka, Noriyuki, to Yamaichi Electric Mfg. Co., Ltd. IC package carrier. 4,715,835, Cl. 439-893.000.

Matsuoka, Yoshio: See—
Ishii, Katsumi; Hirayama, Kanae; Matsuoka, Yoshio; and Takahashi, Kotei, 4,715,466, Cl. 180-233.000.

Matsushita Electric Industrial Co., Ltd.: See—
Hamada, Ken; Wada, Masaru; and Itoh, Kunio, 4,716,571, Cl. 372-48.000.
Jiko, Hideyasu; and Hayashi, Tomoyuki, 4,716,378, Cl. 330-108.000.
Kawaguchi, Takao; Adachi, Hideaki; Setsune, Kentaro; Ohji, Kenzo; and Wada, Kiyotaka, 4,715,680, Cl. 350-96.340.
Ogawa, Kazufumi, 4,715,929, Cl. 156-643.000.
Ogawa, Kazufumi, 4,716,441, Cl. 355-30.000.
Sakamoto, Hiroshi; Torigoe, Toshihiro; and Yamaguchi, Tadashi, 4,716,291, Cl. 250-318.000.
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Ando, Toshiaki; Nishiwaki, Humitoshi; and Aoyama, Shigeo, 4,715,437, Cl. 165-151.000.

Matsushita Electric Works, Ltd.: See—
Kagawa, Hirohiko; Kyotani, Yasuhiro; and Torii, Munetomo, 4,716,184, Cl. 523-310.000.
Nakano, Kunimitsu; and Onishi, Hiroyuki, 4,716,392, Cl. 335-189.000.

Matsushita Electrical Industrial Co., Ltd.: See—
Kaminaka, Nobuyuki; and Yoshida, Yasuo, 4,716,484, Cl. 360-125.000.

Matsuura, Ryoichi: See—
Otsuki, Hiromi; Numata, Kenichi; Matsuura, Ryoichi; Nomura, Yoshihisa; Nakanishi, Nobuyasu; and Oka, Hiroyuki, 4,715,667, Cl. 303-119.000.

Matsuura, Takeshi: See—
Morioka, Akira; Matsuura, Takeshi; and Takahira, Yoshiyuki, 4,716,076, Cl. 428-323.000.

Matsuzawa, Shigemitsu: See—
Ito, Takashi; Matsuzawa, Shigemitsu; and Kato, Katsuaki, 4,716,087, Cl. 429-40.000.

Mattel, Inc.: See—
Ostendorff, Eric C.; and Tucker, James I., Jr., 4,715,843, Cl. 446-429.000.

Matthias, William T.: See—
Koek, Kevin C.; Matthias, William T.; and Barton, James T., 4,715,682, Cl. 350-253.000.

Matthiessen, Robert E.: See—
Holt, Alyn R.; and Matthiessen, Robert E., 4,715,574, Cl. 248-297.100.

Mauermann, Heiko: See—
Marks, Tobin J.; and Mauermann, Heiko, 4,716,257, Cl. 585-275.000.

Mauldin, Donald M.; and Jones, Richard E., III. Passive mobilizer. 4,715,361, Cl. 128-52.000.

May, Richard L.; Smith, Jay; and Wolf, Harley, to May, Richard L.; and Curran, Kenneth. Racing game apparatus. 4,715,602, Cl. 273-86.00R.

Mayer, Hans: See—
Essig, Willi; Kicherer, Robert; and Mayer, Hans, 4,715,569, Cl. 248-27.100.

Mazda Motor Corporation: See—
Kanayama, Hideaki, 4,715,772, Cl. 414-730.000.
Kijima, Takao; and Ando, Fumitaka, 4,715,614, Cl. 280-701.000.
Kijima, Takao; and Ando, Fumitaka, 4,715,615, Cl. 280-701.000.

Mazzocco, Thomas R.; and Frenchik, Mary T. Devices for implantation of deformable intraocular lens structures. 4,715,373, Cl. 128-303.00R.

McAdams, Hugh P., to Texas Instruments Incorporated. CMOS sense amplifier with isolated sensing nodes. 4,716,320, Cl. 307-530.000.

McBride, Edward F.: See—
Bellis, Harold E.; and McBride, Edward F., 4,715,967, Cl. 252-8.551.

McCaffrey, John T., to Perkin-Elmer Corporation. The Power circuit for spectral analysis gaseous discharge lamps. 4,716,342, Cl. 315-219.000.

McCanley, Porter T.: See—
Wolff, Donald L.; McCauley, Porter T.; Stiefel, Paul; Takacs, Gyorgy J.; and Adams, Roman A., 4,715,786, Cl. 417-22.000.

McChristian, Robert L., Jr. Dual mode fishing reel assembly. 4,715,555, Cl. 242-84.50R.

McClung, James A.: See—
Bulso, Joseph D., Jr.; and McClung, James A., 4,715,208, Cl. 72-348.000.

McComsey, Lee E.: See—
Teng, Chuan C.; Chapelle, Rene A.; Blacklaws, John E.; and McComsey, Lee E., 4,715,454, Cl. 175-299.000.

McConnell, Ronald F., to Du Pont de Nemours, E. I., and Company. Apparatus for forming a web. 4,715,924, Cl. 156-433.000.

McCormack, Gary D.: See—
Davenport, William H.; McCormack, Gary D.; and LaRue, George S., 4,716,311, Cl. 307-448.000.

McCormick, Mary D. Pacifier. 4,715,379, Cl. 128-360.000.

McCulloch, Alister L. Fire extinguisher outlet head. 4,715,448, Cl. 169-62.000.

McDaniel, Ernie C.: See—
Reynolds, Albert H., III; McDaniel, Ernie C.; and Juhala, Roland E., 4,715,707, Cl. 356-28.500.

McDonnell Douglas Corporation: See—
Reynolds, Albert H., III; McDaniel, Ernie C.; and Juhala, Roland E., 4,715,707, Cl. 356-28.500.

McDonnell Douglas Helicopter Co.: See—
Kramer, S. Bertram; and Sampatatos, Evan P., 4,715,263, Cl. 89-37.210.

McDonough, William: See—
Hart, Edward F.; and McDonough, William, 4,716,409, Cl. 340-825.220.

McEntee, Timothy J.: See—
Oxley, Donald W.; Bartley, David H.; and McEntee, Timothy J., 4,716,524, Cl. 364-200.000.

McGill Incorporated: See—
Kennedy, Paul E., 4,715,868, Cl. 55-48.000.

McGready, Angus J., to Wilkinson Sword Limited. Razors, and shaving units for razors. 4,715,120, Cl. 30-57.000.

McGreehan, William F.; and Sherwood, Laurence T., to General Electric Company. Flow measurement system. 4,715,213, Cl. 73-40.700.

McGunnigle, Roger J., to FWM Enterprises, Inc., a part interest. Process for determining optimum keyboard formats for a given language. 4,715,736, Cl. 400-484.000.

McKee, J. Ward. Adjustable motorcycle muffler. 4,715,472, Cl. 181-241.000.

McKee, John M.; and Ranalletta, Joseph V. Indicator light assembly with fluorescent lens. 4,716,501, Cl. 362-31.000.

McLaren, Kevin W., to Johnson & Jorgensen Plastics Limited. Tamper resistant closures. 4,715,506, Cl. 215-252.000.

McLaughlin, John J. Underlying pad for attaching removable automobile carpet. 4,716,065, Cl. 428-95.000.

McLeod, Angus I.: See—
Juhasz, Laszlo; and McLeod, Angus I., 4,715,857, Cl. 604-359.000.

McLoughlin, Bernard J.: See—
Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,716,164, Cl. 514-242.000.

- McManigal, David F.: See—
Beausoleil, William F.; and McManigal, David F., 4,716,546, Cl. 364-900.000.
- McNally, Guy W. W. Variable speed replay of digital audio with constant output sampling rate. 4,716,472, Cl. 360-8.000.
- McNeilab, Inc.: See—
Carmosin, Richard J.; and Carson, John R., 4,716,172, Cl. 514-306.000.
- Eppe, Joyce E.; Ng, Kung-Tat; Tuman, Robert W.; and Wu, Wu-Nan, 4,716,163, Cl. 514-237.000.
- McQueston, James C.: See—
Pavlick, Michael J.; McQueston, James C.; Eggert, Walter S., Jr.; and Sherrow, Lionel, 4,715,292, Cl. 105-456.000.
- McVey, Kenneth. Receiving and lifting device for ground or floor objects. 4,715,632, Cl. 294-19.100.
- Mead, Carver A.; and Wawrzyniec, John C., to California Institute of Technology. CMOS logic circuit. 4,716,312, Cl. 307-475.000.
- Mead, John A.: See—
Greene, Orville T., Jr.; and Mead, John A., 4,715,696, Cl. 350-500.000.
- Measures Corporation: See—
Howarth, John; and Alguard, Mark, 4,715,715, Cl. 356-402.000.
- Medicore, Inc.: See—
Maggio, Joseph, 4,715,374, Cl. 128-314.000.
- Meijer, Roelf J.; and Ziph, Benjamin, to Stirling Thermal Motors, Inc. Dual source external heating system for a heat pipe. 4,715,183, Cl. 60-524.000.
- Meister, Hans U.: See—
Ruegg, Christoph; Voirol, Peter; Fuchs, Willi; and Meister, Hans U., 4,715,739, Cl. 403-30.000.
- Meixner, Hans: See—
Pettke, Felix; Siwon, Hans; and Meixner, Hans, 4,716,294, Cl. 250-353.000.
- Mendoza, Fausto C. System for preparing tortillas. 4,715,272, Cl. 99-339.000.
- Menon, Vinod; and Kaku, Shinkyo, to Advanced Micro Devices, Inc. Speed-up method and apparatus for two-dimensional facsimile coding and decoding. 4,716,467, Cl. 358-260.000.
- Menz, Hans-Udo: See—
Bieroth, Gerhard; Menz, Hans-Udo; Todt, Klaus H.; and Wieske, Theophil, 4,716,047, Cl. 426-603.000.
- Merck & Co., Inc.: See—
Parsons, William H.; Schoen, William R.; Patchett, Arthur A.; and Taniguchi, Masao, 4,715,994, Cl. 260-502.50E.
- Reinhold, Donald F.; Utne, Torleif; and Abramson, Newton L., 4,716,246, Cl. 562-446.000.
- Merck Patent Gesellschaft mit beschränkter Haftung: See—
Krause, Joachim; Wachtler; and Scheuble, Bernhard, 4,715,984, Cl. 252-299.610.
- Mergenthaler, Barry M.: See—
Amacher, Gene L.; Mathes, Gene R.; Paugstat, John F.; and Mergenthaler, Barry M., 4,715,457, Cl. 177-1.000.
- Amacher, Gene L.; Mathes, Gene R.; Paugstat, John F.; and Mergenthaler, Barry M., 4,716,281, Cl. 235-383.000.
- Merkovsky, Daniel; and Gasparro, Michael R., to Westinghouse Electric Corp. Thimble guide extender. 4,716,004, Cl. 376-203.000.
- Merrien, Pierre A.: See—
Merrien, Pierre L.; and Merrien, Pierre A., 4,715,427, Cl. 164-456.000.
- Merrien, Pierre L.; and Merrien, Pierre A., to Etude et Développement en Métallurgie. Process and apparatus for automating a baking cycle under hot air of sand molds. 4,715,427, Cl. 164-456.000.
- Merten, Gerhard: See—
Rassmann, Christoph; Nickel, Gerhard; Steinkuhl, Bernd; Merten, Gerhard; and Pfefferle, Egon, 4,715,659, Cl. 299-43.000.
- Merz, Eckhard: See—
Heitzenroder, Hans; and Merz, Eckhard, 4,715,494, Cl. 206-213.100.
- Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung: See—
Soltow, Uwe; Guthke, Hans-Peter; Plate, Hans-Georg; Lechner, Johann; and Kirma, Saffa, 4,715,571, Cl. 248-68.100.
- Woernle, Rudolf, 4,715,589, Cl. 267-148.000.
- Metal Box p.l.c.: See—
Middleton, Nicholas J., 4,715,913, Cl. 156-85.000.
- Metrohm AG: See—
Kaempf, Karl; Zaehner, Paul; and Richter, Wolfgang, 4,715,237, Cl. 73-864.620.
- Metrosky, John J.: See—
Raymond, Dean; and Metrosky, John J., 4,715,599, Cl. 273-15.00R.
- Metz, Hans J., to Hoechst Aktiengesellschaft. Process for the preparation of alkali metal and alkaline earth salts of benzaldehyde-2,4-disulfonic acid. 4,715,995, Cl. 260-511.000.
- Metzger, Karl G.: See—
Kruger, Bernd-Wieland; Lockhoff, Oswald; Metzger, Karl G.; Opitz, Hans-Georg; Schaller, Klaus; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,716,152, Cl. 514-25.000.
- Meyer, Peter. Device for wireless video monitoring and control of a still camera. 4,716,465, Cl. 358-210.000.
- Mezaki, Masakazu: See—
Sano, Fumikazu; and Mezaki, Masakazu, 4,716,079, Cl. 428-383.000.
- Mi-Jack Products, Inc.: See—
Lanigan, John J., Sr.; Glickman, Myron; George, Thazhuthakudiyil V.; and Ermel, Bernard A., 4,715,762, Cl. 414-126.000.
- Michalski, Dennis H.: See—
Gruber, James R.; Gudath, Ernest A.; Michalski, Dennis H.; Riddle, Robert R.; and Stana, Regis R., 4,716,026, Cl. 423-167.000.
- Micro Research, Inc.: See—
Newell, Darrel E.; and O'Brien, Mary C., 4,716,344, Cl. 315-312.000.
- MicroLife Technics, Inc.: See—
Gonzalez, Carlos F.; and Gryczka, Alfred J., 4,716,115, Cl. 435-172.300.
- Middleton, Nicholas J., to Metal Box p.l.c. Decorating substrate materials. 4,715,913, Cl. 156-85.000.
- Miesak, Edward J. Optical transmission link for musical production. 4,715,671, Cl. 350-96.100.
- Migliore-Samour, Daniele: See—
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- Miida, Takashi; Takei, Akira; and Tashiro, Kiyoshi, to Fujitsu Limited. Image sensor. 4,716,466, Cl. 358-213.260.
- Mikhail, Ameer G. Postal stamp with provisions for entering machine readable destination identifier. 4,715,622, Cl. 283-71.000.
- Miki, Hajime, to Japan Tobacco Inc. Apparatus for selectively removing tobacco plant leaves. 4,715,170, Cl. 56-27.500.
- Milenkovic, Veljko: See—
Huang, Bernard; and Milenkovic, Veljko, 4,716,350, Cl. 318-568.000.
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- Millay, Lawrence I.; and Bourgoine, Edward, to Ex-Cell-O Corporation. In-process gaging equipment for flexible grinding cells. 4,715,147, Cl. 51-165.710.
- Miller, David A. B., to American Telephone and Telegraph Company AT&T Bell Laboratories. Nonlinear and bistable optical device. 4,716,449, Cl. 357-30.000.
- Miller, James C.: See—
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- Miller, Mark W.: See—
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- Miller, Ronald W.: See—
Blank, Robert G.; and Miller, Ronald W., 4,716,042, Cl. 424-474.000.
- Miller, Wayne A.: See—
Tveter, Richard S.; and Miller, Wayne A., 4,715,214, Cl. 73-49.200.
- Miller, Werner: See—
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- Millot, Jean-Paul: See—
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- Mimoto, Toshio, to Sharp Kabushiki Kaisha. MOS IC pull-up circuit. 4,716,303, Cl. 307-264.000.
- Mimura, Itaru: See—
Ozawa, Naoki; Akiyama, Toshiyuki; Satoh, Kazuhiro; Nagahara, Syusaku; and Mimura, Itaru, 4,716,455, Cl. 358-44.000.
- Minami, Nagio: See—
Fukaya, Yasuhiro; and Minami, Nagio, 4,715,524, Cl. 228-165.000.
- Minami, Takao; Nagano, Hiroo; Yamanaka, Kazuo; Okada, Yasutaka; Susukida, Hiroshi; Onimura, Kichiro; Yonezawa, Toshio; and Sasaguri, Nobuya, to Mitsubishi Jukogyo Kabushiki Kaisha; and Sumitomo Metal Industries, Ltd. Nickel-chromium alloy in stress corrosion cracking resistance. 4,715,909, Cl. 148-410.000.
- Minnesota Mining and Manufacturing Company: See—
Strand, Jerome E., 4,715,382, Cl. 128-640.000.
- Tsay, Yuh-Geng; Beigler, Myron A.; Calenoff, Emanuel; Friesen, Gerald L.; and Nichols, James L., 4,716,120, Cl. 436-513.000.
- Mino, Kaoru; Fukushima, Koji; and Kasai, Takashi, to Diesel Kiki Co., Ltd. Seal element for sealing ducts of an air conditioner system. 4,715,609, Cl. 277-207.00R.
- Minolta Camera Kabushiki Kaisha: See—
Bartley, George S., 4,716,544, Cl. 364-900.000.
- Taniguchi, Nobuyuki; Ishida, Tokuji; Hamada, Masataka; Karasaki, Toshihiko; and Norita, Toshio, 4,716,434, Cl. 354-408.000.
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- Minoru, Ishida. Two-speed drive mechanism for toys. 4,715,475, Cl. 185-39.000.
- Mis, Katherine H.: See—
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- Misawa, Isao. Display apparatus for single-lens reflex camera. 4,716,429, Cl. 354-409.000.
- Mishima, Masayuki, to Research Dev. Corp. of Japan; and Kao Corporation. Urea adsorbent. 4,715,961, Cl. 210-692.000.

- Misselhorn, Klaus; and Tegtmeyer, Uwe. Method to separate polar organic compounds, in particular aliphatic alcohols, from fermentation fluids. 4,715,932, Cl. 203-43.000.
- Mita, Yoshinori: See—
Takahashi, Shinji; and Mita, Yoshinori, 4,715,465, Cl. 180-225.000.
- Mitchell, Edward: See—
Snyder, Thomas S.; Burgman, Herbert A.; and Mitchell, Edward, 4,715,992, Cl. 252-628.000.
- Mitchell, Hal D.; and Walker, Donald R., to Figgie International Inc. Shoulder pad. 4,715,066, Cl. 2-2.000.
- Mitsubishi Chemical Industries Limited: See—
Fukami, Harukazu; Kikumoto, Ryoji; Nakao, Kenichiro; Nitta, Issei; and Inoue, Shinya, 4,716,161, Cl. 514-222.000.
- Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, 4,716,029, Cl. 423-625.000.
- Mitsubishi Denki Kabushiki Kaisha: See—
Fujii, Hiroshi; Iio, Tsukasa; Genba, Yasuji; Moriaki, Hideaki; and Mochizuki, Yoshinori, 4,716,265, Cl. 200-144.00R.
- Hine, Shiro, 4,716,559, Cl. 369-112.000.
- Inaba, Tsutomu; Kimura, Tadashi; Kobayashi, Norihide; Sugimura, Masahiro; and Matsugi, Tetsuzo, 4,715,796, Cl. 418-55.000.
- Ito, Tomotaka, 4,716,513, Cl. 363-97.000.
- Iwata, Shigemi, 4,716,517, Cl. 364-148.000.
- Koyokawa, Morio; and Fujimoto, Akihiko, 4,716,349, Cl. 318-562.000.
- Morishita, Akira; Okamoto, Kyoichi; Gotoh, Toshihiko; Kako, Yukio; and Arima, Takemi, 4,715,243, Cl. 74-434.000.
- Morishita, Mitsuharu; and Kouge, Shinichi, 4,716,355, Cl. 320-64.000.
- Sakamoto, Yuzo; and Koike, Kazuo, 4,716,479, Cl. 360-105.000.
- Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, 4,716,295, Cl. 250-423.00P.
- Umemura, Hiroyuki; Matsuda, Kenji; Tezuda, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Sugawara, Sakuo; and Hara, Masanori, 4,715,191, Cl. 62-208.000.
- Yoshida, Koichi; and Kawai, Joji, 4,716,535, Cl. 364-565.000.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—
Fukaya, Yasuhiro; and Minami, Nagio, 4,715,524, Cl. 228-165.000.
- Katayama, Kazuo; Ichiryu, Taku; Mitsuhashi, Tsuneyoshi; Mori, Yasushi; and Kobayashi, Masanori, 4,715,778, Cl. 415-104.000.
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- Oura, Masayuki, 4,715,752, Cl. 409-232.000.
- Mitsubishi Mining and Cement Co., Ltd.: See—
Yamaguchi, Takashi; Ishiguchi, Isao; and Inoue, Takeshi, 4,716,134, Cl. 501-136.000.
- Mitsubishi Petrochemical Co., Ltd.: See—
Mori, Shoichiro; and Ue, Makoto, 4,715,976, Cl. 252-62.200.
- Mitsuboshi Belting Ltd.: See—
Masuboshi, Satoshi; Fujita, Kunihiro; Tanaka, Masayuki; Yamaguchi, Yoshio; and Takeda, Kazuhiro, 4,715,176, Cl. 57-251.000.
- Mitsuhashi, Tsuneyoshi: See—
Katayama, Kazuo; Ichiryu, Taku; Mitsuhashi, Tsuneyoshi; Mori, Yasushi; and Kobayashi, Masanori, 4,715,778, Cl. 415-104.000.
- Mitsui Sekitani Kogyo Kabushiki Kaisha: See—
Sato, Koji; Kuroda, Hiroshi; Yamada, Ryuji; and Serino, Mamoru, 4,715,657, Cl. 299-1.000.
- Miwa, Naoto: See—
Hori, Makoto; Nagaya, Toshiatsu; Mukai, Hirokatsu; Niwa, Hitoshi; and Miwa, Naoto, 4,716,279, Cl. 219-541.000.
- Miyagawa, Toshihito: See—
Katsumoto, Naoki; and Miyagawa, Toshihito, 4,715,655, Cl. 297-362.000.
- Miyake, Hiroshi, to Daihatsu Motor Company Limited. Fuel-injection nozzle. 4,715,540, Cl. 239-533.300.
- Miyake, Yuzuru; Nohara, Isao; Sugioka, Takami; Onishi, Susumu; and Ueno, Toshiyuki, to Teijin Seiki Co., Ltd. Spindle drive type yarn winding apparatus. 4,715,548, Cl. 242-18.00R.
- Miyamoto, Masao: See—
Ishimaru, Hajime; Miyamoto, Masao; and Komaki, Shojiro, 4,715,186, Cl. 62-45.000.
- Miyata, Osamu: See—
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- Miyazaki, Hiroshi: See—
Masuzawa, Sigeaki; Shibata, Shinya; Miyazaki, Hiroshi; and Iwase, Tetsuo, 4,716,591, Cl. 381-51.000.
- Miyazaki, Makoto: See—
Fujita, Masahito; Kizaki, Masami; Miyazaki, Makoto; and Inaba, Naomi, 4,716,206, Cl. 526-139.000.
- Miyazaki, Shinji: See—
Ito, Takaaki; Mori, Eiji; Uranishi, Koji; Miyazaki, Shinji; and Sugimoto, Junichi, 4,715,509, Cl. 220-86.00R.
- Miyazaki, Yasuyuki: See—
Ogawa, Hiroshi; Miyazaki, Yasuyuki; Yoshida, Susumu; and Sasaki, Shinichi, 4,716,530, Cl. 364-424.000.
- Miyoshi, Shoji; and Nomura, Ryuichi, to Toyo Rubber Industry Co., Ltd. Pneumatic tires having high uniformity. 4,715,418, Cl. 152-451.000.
- Mizuuchi, Kiyoshi; Mizuuchi, Michio; and Adachi, Toshiro, to United States of America, Health and Human Services. Mini Mu containing plasmid and a method for rapid DNA sequencing. 4,716,105, Cl. 435-5.000.
- Mizuuchi, Michio: See—
Mizuuchi, Kiyoshi; Mizuuchi, Michio; and Adachi, Toshiro, 4,716,105, Cl. 435-5.000.
- Moberg, Lennart, to Siemens Aktiengesellschaft. Battery test circuit for a heart pacemaker. 4,715,381, Cl. 128-419.0PT.
- Mobil Oil Corporation: See—
Canterino, Peter J.; Dobreski, David V.; and Shaw, Richard G., 4,716,201, Cl. 525-240.000.
- Chen, Catherine S. H., 4,716,135, Cl. 502-62.000.
- Farn, Liehpao O.; and Horodysky, Andrew G., 4,715,974, Cl. 252-46.400.
- Weisz, Paul B.; and Yan, Tsoung Y., 4,716,136, Cl. 502-64.000.
- Mobley, Dewey F.; and Warren, Janice M., to Interlock Corporation. Pin and socket electrical terminal. 4,715,833, Cl. 439-834.000.
- Mochizuki, Tohru, to Kabushiki Kaisha Toshiba. Semiconductor memory cell. 4,716,548, Cl. 365-149.000.
- Mochizuki, Yoshinori: See—
Fujii, Hiroshi; Iio, Tsukasa; Genba, Yasuji; Moriaki, Hideaki; and Mochizuki, Yoshinori, 4,716,265, Cl. 200-144.00R.
- Moermann, Renate: See—
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- Mogelof, Andrew. Adjustable dental wedging system. 4,715,816, Cl. 433-149.000.
- Mogensen, Palne. Method and means for applying a heat exchanger in a drill hole for the purpose of heat recovery or storage. 4,715,429, Cl. 165-45.000.
- Moisala, Tapio; and Gustafsson, Jukka, to AGA Aktiebolag; and Oy Partek AB. Apparatuses in the manufacture of mineral wool. 4,715,877, Cl. 65-15.000.
- Moji, Yukimori; and Taylor, Richard Q., to Boeing Company, The. Honeycomb core structure with embedded fastener. 4,716,067, Cl. 428-117.000.
- Monarch Marking Systems, Inc.: See—
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- Moncalvo, Agostino: See—
Fausone, Alfredo; and Moncalvo, Agostino, 4,716,587, Cl. 380-10.000.
- Mongeon, Robert J.; Wayne, Robert J.; and Henschke, Robert W., to United States of America, Army. Optical radar transceiver control apparatus. 4,716,444, Cl. 356-05.000.
- Monsanto Company: See—
Hilton, Glenn B.; and Robertson, Wayne W., 4,716,196, Cl. 525-72.000.
- Tjoeng, Foe S.; Fok, Kam F.; and Adams, Steven P., 4,716,147, Cl. 514-11.000.
- Montagna, Angelo A.: See—
Jacobson, Allan J.; Ho, Teh C.; Chianelli, Russell R.; Steger, John J.; and Montagna, Angelo A., 4,716,139, Cl. 502-167.000.
- Monte, Salvatore J.: See—
Sugerman, Gerald; and Monte, Salvatore J., 4,715,968, Cl. 252-8.600.
- Montedison S.p.A.: See—
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- Montgomery, Raymond M.: See—
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- Montierth, Max R., to Corning Glass Works. Apparatus for forming a flexible mask. 4,715,576, Cl. 249-60.000.
- Montierth, Max R., to Corning Glass Works. Apparatus for high speed manufacturing of honeycomb structures. 4,715,801, Cl. 425-110.000.
- Montijo, James K. Flotation pool blanket. 4,715,070, Cl. 4-498.000.
- Moore Business Forms, Inc.: See—
Leese, David J.; and Ashby, Robert E., 4,715,530, Cl. 229-73.000.
- Moore, David G., to Realex Corporation. Dispenser for striped viscous products. 4,715,518, Cl. 222-257.000.
- Moore, James E.: See—
Margolin, Mark; Grois, Igor; and Moore, James E., 4,715,251, Cl. 81-9.400.
- Moore, Jeffrey E.; Evans, Brett A.; and Hansen, Richard, to Procter & Gamble Company. The Granular detergent compositions having improved solubility. 4,715,979, Cl. 252-91.000.
- Moore, Ralph J.: See—
Gnanamuthu, Daniel S.; Moores, Ralph J.; Paton, Neil E.; and Vyhna, Richard F., 4,716,270, Cl. 219-121.0LM.
- Moosmann, Horst: See—
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- Morel, Frederic: See—
Le Page, Jean-Francois; Billon, Alain; Morel, Frederic; Renard, Pierre; Biedermann, Jean-Michel; Laborde, Michel; and Bousquet, Jacques, 4,715,946, Cl. 208-45.000.
- Morell, Josef; Freudenschuss, Otto; and Schmidt, Harald, to Steyr-Daimler-Puch AG. Fuel injection nozzle for internal combustion engines. 4,715,542, Cl. 239-533.900.
- Mori, Eiji: See—
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- Mori, Shoichiro; and Ue, Makoto, to Mitsubishi Petrochemical Co., Ltd. Electrolyte solution for electrolytic capacitor. 4,715,976, Cl. 252-62.200.
- Mori, Shosuke; Sakurai, Atsushi; Aoki, Satoshi; and Suzuki, Tatsuya, to Fujitsu Limited. Multiprocessor system. 4,716,526, Cl. 364-200.000.

- Mori, Tetsuzo: See—
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- Mori, Yasushi: See—
Katayama, Kazuo; Ichiryu, Taku; Mitsuhashi, Tsuneyoshi; Mori, Yasushi; and Kobayashi, Masanori, 4,715,778, Cl. 415-104.000.
- Morikawa, Tuneso: See—
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- Morimoto, Akira, to Asahi Kogaku Kogyo Kabushiki Kaisha. Scanning optical system for laser beam printers. 4,715,699, Cl. 350-6.800.
- Morin, Thomas M., to Sprague Electric Company. Method of curtain coating to make thin dielectric ceramic layers. 4,716,058, Cl. 427-420.000.
- Morioka, Akira; Matsuura, Takeshi; and Takahira, Yoshiyuki, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,716,076, Cl. 428-323.000.
- Morisawa, Yasuhiro: See—
Tomita, Kuniyuki; Shimoji, Yasuo; Kumakura, Seiji; Koike, Hiroyuki; Iwata, Nobuyoshi; and Morisawa, Yasuhiro, 4,716,162, Cl. 514-234.000.
- Morishita, Akira; Okamoto, Kyoichi; Gotoh, Toshihiko; Kako, Yukio; and Arima, Takemi, to Mitsubishi Denki Kabushiki Kaisha. Planetary reduction gear having a molded ring gear. 4,715,243, Cl. 74-434.000.
- Morishita, Masataka; Ono, Masaru; and Sumita, Yukio, to Toyo Jozo Company, Ltd. Stable oral preparation of macrolide antibiotics and method for stabilizing the same. 4,716,153, Cl. 514-30.000.
- Morishita, Mitsuharu; and Kouge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Device for controlling a charging generator. 4,716,355, Cl. 320-64.000.
- Moriwaki, Hideaki: See—
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- Morley Furniture Spring Corporation: See—
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- Morozumi, Shinji, to Seiko Epson Kabushiki Kaisha. Liquid crystal display device. 4,716,403, Cl. 340-702.000.
- Morris, Barry S., to Bloxwich Lock and Stamping Company Limited, The. Demountable hinges. 4,715,090, Cl. 16-261.000.
- Morrison, Carl C.: See—
Lynn, Dwo; Morrison, Carl C.; and Hutcherson, Ronald W., Sr., 4,715,389, Cl. 131-335.000.
- Morrison, Garrett L., to United States of America, America. Method for simultaneously scrubbing cement kiln exhaust gas and producing useful by-products therefrom. 4,716,027, Cl. 423-225.000.
- Morse, Milton, to Morse, Nena. Vandal-resistant telephone keypad switch. 4,716,262, Cl. 200-5.00A.
- Morse, Nena: See—
Morse, Milton, 4,716,262, Cl. 200-5.00A.
- Morua, Martin: See—
Cogan, Kevin C.; Ouellette, Edward L.; and Morua, Martin, 4,715,957, Cl. 210-497.300.
- Mosby, Ewen. Harvesting machine with twin headers. 4,715,172, Cl. 56-228.000.
- Mosiewicz, Antonio, to Cofimco S.p.A. Blade support hub for an axial fan. 4,715,784, Cl. 416-208.000.
- Mosleh, Mehrdad M.; Fu, Chi Y.; and Saraswat, Krishna, to Leland Stanford Junior University, The Board of Trustees of the. Low-temperature direct nitridation of silicon in nitrogen plasma generated by microwave discharge. 4,715,937, Cl. 204-177.000.
- Mossaad, Amgad S.: See—
Scymanski, Gerald L.; Mossaad, Amgad S.; and Hussain, Saadat, 4,716,251, Cl. 568-645.000.
- Motegi, Akio; and Saito, Takao, to Sanyei Corp. Electric steam iron having a detachable handle. 4,716,276, Cl. 219-253.000.
- Motorola, Inc.: See—
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- Borras, Jaime Andres, 4,716,407, Cl. 340-825.040.
- Davis, William F., 4,716,379, Cl. 330-252.000.
- Edminster, Robert E., 4,715,757, Cl. 411-411.000.
- Flannagan, Stephen T.; Day, Lawrence J.; and Simon, Barry A., 4,716,302, Cl. 307-200.00B.
- Flannagan, Stephen T.; and Reed, Paul A., 4,716,550, Cl. 365-207.000.
- Higgins, Robert J., Jr., 4,716,331, Cl. 310-330.000.
- Moutrie, Michael F.; Sokola, Raymond L.; and Gordon, Phillip J., 4,716,391, Cl. 333-206.000.
- Pace, W. David; and Wang, Wei C., 4,716,510, Cl. 363-49.000.
- Rebeschini, Michael E., 4,716,319, Cl. 307-520.000.
- Vyne, Robert L.; and Susak, David M., 4,716,356, Cl. 323-312.000.
- Moussie, Bob; and Libregts, Hubertus B., to Du Pont de Nemours, E. I., and Company. Connector with pierce contact element having reduced wear crown. 4,715,825, Cl. 439-391.000.
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- MRT System Aktiebolag: See—
Kulander, Hans, 4,715,838, Cl. 445-61.000.
- Mueller, Birgit: See—
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- Mueller, Fritz. Swinging device. 4,715,580, Cl. 251-229.000.
- Mueller, Herbert: See—
Nelson, David C.; Fresh, Michael J.; and Mueller, Herbert, 4,715,841, Cl. 446-222.000.
- Mueller, Michael W.: See—
Mueller, Teresa L.; and Mueller, Michael W., 4,715,634, Cl. 294-50.500.
- Mueller, Teresa L.; and Mueller, Michael W. Weed extracting tool. 4,715,634, Cl. 294-50.500.
- Muhlbauser, Ernst. Method of determining materials of suitable colours for a tooth repair layer of prosthesis facet, and a sample set for applying this method. 4,715,813, Cl. 433-26.000.
- Mukai, Hirokatsu: See—
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- Mukherjee, Jyoti: See—
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- Mulder, Cornelis; and Wulms, Henricus E. J., to U.S. Philips Corporation. Integrated circuit. 4,716,314, Cl. 307-477.000.
- Mulder, Douglas C., to Nordson Corporation. Powder spray gun. 4,715,535, Cl. 239-1.000.
- Mulder, James R.: See—
Staun, Paul R.; and Mulder, James R., 4,715,402, Cl. 137-355.170.
- Mullane, John F.: See—
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- Muller, Beat: See—
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gotzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,715,883, Cl. 71-90.000.
- Muller, Dieter: See—
Schmitte, Franz-Josef; Muller, Dieter; and Groth, Rolf, 4,715,879, Cl. 65-60.200.
- Muller, Dieter J., to Huels Aktiengesellschaft. Process for the production of 3,3-dichloro-2-methylpropene. 4,716,255, Cl. 570-216.000.
- Muller, Eckart; and Beckmann, Rudolf, to Volkswagen AG. Method and device for the removal of solid components contained in the exhaust gases of internal combustion engines. 4,715,179, Cl. 60-274.000.
- Muller, Fritz: See—
Gaechter, Bernhard; Braunecker, Bernhard; and Muller, Fritz, 4,715,714, Cl. 356-375.000.
- Muller, Gary R.; Theiss, Scott M.; Brown, James E., Jr.; and Lawson, Bobby R., to Apex Technologies, Inc. Nuclear steam generator sludge lancing method and apparatus. 4,715,324, Cl. 122-381.000.
- Muller, Klaus P., to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung. Process and apparatus for the chromatographic determination of components in specimens. 4,715,216, Cl. 73-61.10C.
- Muntwyler, Rene: See—
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- Murabayashi, Katuyoshi, to Daicel Chemical Industries, Ltd. Resin composition. 4,716,198, Cl. 525-92.000.
- Murai, Yoshiichi: See—
Sugiyama, Makoto; Sugimura, Hiroshi; Machida, Naoyoshi; and Murai, Yoshiichi, 4,715,121, Cl. 30-253.000.
- Muramatsu, Kenichi: See—
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- Muramoto, Kenichi: See—
Imamura, Kaoru; and Muramoto, Kenichi, 4,716,489, Cl. 361-91.000.
- Murasaki, Ryuichi, to Yoshida Kogyo K. K. Apparatus for severing and joining joint piece. 4,715,926, Cl. 156-511.000.
- Murata Manufacturing Co., Ltd.: See—
Inoue, Jiro, 4,716,377, Cl. 329-117.000.
- Murdock, Keith C.; and Webb, Richard L., to American Cyanamid Company. Process for preparing certain 1,4-di(ω-(2-hydroxyethylamino)alkylamino)anilinequinone free bases. 4,715,993, Cl. 260-380.000.
- Murray, Kevin P.: See—
Schmid, Steven R.; Ansel, Robert E.; and Murray, Kevin P., 4,716,209, Cl. 526-261.000.
- Murray, Rex E., to Union Carbide Corporation. Oligomerization to alpha-olefins. 4,716,138, Cl. 502-117.000.
- Murtha, R. Michael. Stamped concentrators supporting photovoltaic assemblies. 4,716,258, Cl. 136-246.000.
- Muscaglione, Giuseppe; and Talpo, Gianpietro, to SACE S.p.A. Costruzioni Elettromeccaniche. Electrical arc quenching chamber, in particular for fluid-quenched circuit breakers. 4,716,266, Cl. 200-148.00R.
- Musset, Anthony: See—
Lee, Kon J.; and Musset, Anthony, 4,716,340, Cl. 315-111.410.
- Myers, Jerome J., to Sheet Metal Connectors, Inc. Damper construction. 4,715,581, Cl. 251-308.000.
- Mynott, Ralph; and Verbeek, Johan, to 501 Volvo Car B.V. Frameless turn-up rear window for vehicles. 4,715,647, Cl. 296-152.000.
- Nabeshima, Daiki: See—
Katayama, Yoshitaka; Nabeshima, Daiki; and Nakamura, Shinichi, 4,716,558, Cl. 369-33.000.
- Nabet, Claude: See—
Cappe, Alain; and Nabet, Claude, 4,716,278, Cl. 219-521.000.
- Nabisco Brands, Inc.: See—
Koppa, Daniel A., 4,715,803, Cl. 425-133.100.

- Nachbur, Hermann: See—
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- Nagae, Yasutaka, to Fujitsu Limited. Microcomputer. 4,716,521, Cl. 364-200.000.
- Nagahara, Shusaku: See—
Maruyama, Masanori; Takahashi, Kenji; Kudo, Koji; Hombaug, Masanori; and Nagahara, Shusaku, 4,716,468, Cl. 358-219.000.
- Nagahara, Syusaku: See—
Ozawa, Naoki; Akiyama, Toshiyuki; Satoh, Kazuhiro; Nagahara, Syusaku; and Mimura, Itaru, 4,716,455, Cl. 358-44.000.
- Nagai, Masaaki, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the ignition timing of an internal combustion engine. 4,715,342, Cl. 123-425.000.
- Nagai, Tsuneji: See—
Suzuki, Yoshiki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, 4,715,369, Cl. 128-156.000.
- Nagai, Yoichiro; Watanabe, Hamao; and Akutsu, Yoshinori, to Yuki Gosei Kogyo Co., Ltd. 1,2-dichloro-1,2,2-trimethyl-1-phenyldisilane and method for producing the same. 4,716,240, Cl. 556-430.000.
- Nagano, Hiroo: See—
Minami, Takao; Nagano, Hiroo; Yamanaka, Kazuo; Okada, Yasutaka; Susukida, Hiroshi; Onimura, Kichiro; Yonezawa, Toshio; and Sasaguri, Nobuya, 4,715,909, Cl. 148-410.000.
- Nagao, Nobuaki: See—
Hatakeyama, Tetsuo; Uera, Yoshinori; and Nagao, Nobuaki, 4,715,553, Cl. 242-68.400.
- Nagashima, Akira, to Kioritz Corporation. Sprocket wheel for driving saw chain of chain saw. 4,715,845, Cl. 474-152.000.
- Nagata, Osamu: See—
Sagawa, Ryuichi; Nagata, Osamu; and Yamada, Hajime, 4,715,339, Cl. 123-357.000.
- Nagata, Tetsuya: See—
Hattori, Yoshiyuki; Matsui, Kazuma; Imani, Yuichi; Kuno, Akira; Nagata, Tetsuya; Nakane, Koji; and Nomura, Ken, 4,715,663, Cl. 303-110.000.
- Nagaya, Toshiatsu: See—
Hori, Makoto; Nagaya, Toshiatsu; Mukai, Hirokatsu; Niwa, Hitoshi; and Miwa, Naoto, 4,716,279, Cl. 219-541.000.
- Nakajima, Akira: See—
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- Nakajima, Shigemichi, to Kabushiki Kaisha Nakajima Tekkosho. Lifting magnet unit with a gripping mechanism. 4,715,631, Cl. 294-2.000.
- Nakamura, Hideo: See—
Funabashi, Tsuneo; Iwasaki, Kazuhiko; and Nakamura, Hideo, 4,716,522, Cl. 364-200.000.
- Nakamura, Ichiro; Kobayashi, Satoshi; and Sasaki, Eiichi, to Hitachi, Ltd. Hydraulic elevator. 4,715,478, Cl. 187-111.000.
- Nakamura, Eiichi; and Suzuki, Mikio, to Toyoda Koki Kabushiki Kaisha. Power steering system with hydraulic reaction. 4,715,464, Cl. 180-142.000.
- Nakamura, Kotaro: See—
Sugiyama, Kiyoshi; and Nakamura, Kotaro, 4,715,108, Cl. 29-568.000.
- Nakamura, Shinichi: See—
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- Nakamura, Takashi: See—
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- Nakamura, Tokio. Thermoelectric thermometer of radio transmission type. 4,716,411, Cl. 340-870.170.
- Nakane, Koji: See—
Hattori, Yoshiyuki; Matsui, Kazuma; Imani, Yuichi; Kuno, Akira; Nagata, Tetsuya; Nakane, Koji; and Nomura, Ken, 4,715,663, Cl. 303-110.000.
- Nakanishi, Nobuyasu; Ishikawa, Masakazu; Shirai, Akira; and Noguchi, Noboru, to Toyota Jidosha Kabushiki Kaisha. Hydraulic anti-skid brake system with device for improvement in straight-line running stability of vehicle. 4,715,664, Cl. 303-111.000.
- Nakanishi, Nobuyasu: See—
Otsuki, Hiromi; Numata, Kenichi; Matsuura, Ryoichi; Nomura, Yoshihisa; Nakanishi, Nobuyasu; and Oka, Hiroyuki, 4,715,667, Cl. 303-119.000.
- Nakano, Kunimitsu; and Onishi, Hiroyuki, to Matsushita Electric Works, Ltd. Power supply switch. 4,716,392, Cl. 335-189.000.
- Nakano, Masao; Takemae, Yoshihiro; Nakano, Tomio; Nozaki, Shigeki; Sato, Kimiaki; and Kodama, Nobumi, to Fujitsu Limited. Semiconductor memory device having a circuit for compensating for discriminating voltage of memory cells. 4,716,549, Cl. 365-203.000.
- Nakano, Tomio: See—
Nakano, Masao; Takemae, Yoshihiro; Nakano, Tomio; Nozaki, Shigeki; Sato, Kimiaki; and Kodama, Nobumi, 4,716,549, Cl. 365-203.000.
- Nakao, Hideo; Fujimoto, Koichi; Ishihara, Sadao; Sugawara, Shinichi; and Igarashi, Isamu, to Sankyo Company Limited. 7-(2-aminothiazol-4-yl)-2-(syn)-methoxyiminooacetamido-3-methoxymethyl-3-cepham-4-carboxylates. 4,716,158, Cl. 514-202.000.
- Nakao, Kenichiro: See—
Fukami, Harukazu; Kikumoto, Ryoji; Nakao, Kenichiro; Nitta, Issei; and Inoue, Shinya, 4,716,161, Cl. 514-222.000.
- Nakaoka, Kazuhide; Takada, Yoshikazu; Inagaki, Junichi; and Hiura, Akira, to Nippon Kokan Kabushiki Kaisha. Method of producing thin sheet of high Si-Fe alloy. 4,715,905, Cl. 148-111.000.
- Nakayama, Jin, to Casio Computer Co., Ltd. Electronic game apparatus. 4,716,529, Cl. 364-410.000.
- Nakayama, Wataru: See—
Takahashi, Kenji; Kuwahara, Heikichi; Yanagida, Takehiko; Nakayama, Wataru; Oizumi, Kiyoshi; and Sugimoto, Shigeo, 4,715,436, Cl. 165-133.000.
- Nalco Chemical Company: See—
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- Namensen, Erlend: See—
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- Nannig, Urban R.: See—
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- Napoli, Joseph D.: See—
Maher, Joseph A.; Vowles, E. John; Napoli, Joseph D.; Zafropoulos, Arthur W.; and Miller, Mark W., 4,715,921, Cl. 156-345.000.
- Nasu, Nobuo, to Kabushiki Kaisha Kawakami Seisakusho. Apparatus for vacuum compression of laminated sheet material. 4,715,805, Cl. 425-504.000.
- National Business Systems, Inc.: See—
Weickert, Walter R.; and Foley, Paul J., 4,715,298, Cl. 101-269.000.
- National Distillers and Chemical Corporation: See—
Harris, Eugene G., 4,716,146, Cl. 512-21.000.
- Staker, Donald D.; and Kain, William S., 4,715,866, Cl. 44-51.000.
- National Patent Analytical Systems, Inc.: See—
Martin, Peter G., 4,715,386, Cl. 128-733.000.
- National Starch and Chemical Corporation: See—
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- Nauman, John D.: See—
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- Navistar International Transportation Corp.: See—
Rudavicius, Gabriel J., 4,715,434, Cl. 165-119.000.
- Navratil, Josef; and Abel, Heinz, to Ciba-Geigy Corporation. Process for dyeing hydrophobic fibre material from aqueous bath containing untreated disperse dye and to adjust the exhausted dye bath for further use. 4,715,863, Cl. 8-440.000.
- NCR Corporation: See—
Amacher, Gene L.; Mathes, Gene R.; Paugstat, John F.; and Mergenthaler, Barry M., 4,715,457, Cl. 177-1.000.
- Amacher, Gene L.; Mathes, Gene R.; Paugstat, John F.; and Mergenthaler, Barry M., 4,716,281, Cl. 235-383.000.
- NEC Corporation: See—
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- Hashishita, Ryuichi, 4,716,450, Cl. 357-42.000.
- Inagaki, Yasaburo, 4,716,551, Cl. 365-222.000.
- Kondo, Shigeyuki, 4,716,473, Cl. 360-9.100.
- Masuhara, Hiromu; and Kimura, Tsunekazu, 4,716,566, Cl. 371-37.000.
- Matsui, Toshiya, 4,716,589, Cl. 381-3.000.
- Noda, Seiichi; and Yoshimoto, Makoto, 4,716,385, Cl. 332-9.00R.
- Oida, Osamu; and Iwakawa, Tsunekyo, 4,716,341, Cl. 315-169.400.
- Okazawa, Takeshi; and Hirano, Yoshiyuki, 4,716,131, Cl. 437-200.000.
- Ozawa, Kazunori; and Araseki, Takashi, 4,716,592, Cl. 381-40.000.
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- Nedstedt, Gert: See—
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- Nelson, David C.; Fresh, Michael J.; and Mueller, Herbert, to Ballon-Mueller AG. Balloon holder. 4,715,841, Cl. 446-222.000.
- Nelson, Jeffrey D.; and Scanlon, John F., to Sundstrand Corporation. Ballistic tolerant dual load path ballscrew and ballscrew actuator. 4,715,262, Cl. 89-36.020.
- Nelson, Robert S.: See—
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- Nelson, Wendall: See—
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- Nelson, William E.: See—
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- Nestec S.A.: See—
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- Prella, Giovanni, 4,716,045, Cl. 426-63.000.
- Nestler, Eric, to Symbolics Inc. Light pipe for an optical mouse. 4,716,287, Cl. 250-227.000.
- Neuroth, David H.: See—
Hoffman, Ernest G.; and Neuroth, David H., 4,716,260, Cl. 174-102.00R.
- Neven, Jozef H. M.; Poortman, Boedewijn J.; Tromp, Wouter T.; and Stevens, Udo, to Rheometron AG. Sensor for magnetic-inductive flowmeters. 4,715,233, Cl. 73-871.120.
- New Holland Inc.: See—
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- New Horizons Product Development Company Limited: See—
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- Newell, Darrel E.; and O'Brien, Mary C., to Micro Research, Inc. Microprocessor controlled lighting system. 4,716,344, Cl. 315-312.000.
- Newsome, Reggie: See—
Nichols, Walt; Newsome, Reggie; Thesing, Rich; and Houck, Willie, 4,715,390, Cl. 131-335.000.

- Newton, Gary D. Fluid dispersing check valve. 4,715,393, Cl. 137-7.000.
 Newton Instrument Company: See—
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 Newton, John J., Jr.: See—
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 Nichols, Robert L. Medical sterilization container with instrument tray. 4,716,025, Cl. 422-31.000.
 Nichols, Walt; Newsome, Reggie; Thesing, Rich; and Houck, Willie, to Philip Morris Incorporated. Matrix entrapment of flavorings for smoking articles. 4,715,390, Cl. 131-335.000.
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 Rassmann, Christoph; Nickel, Gerhard; Steinkuhl, Bernd; Merten, Gerhard; and Pfefferle, Egon, 4,715,659, Cl. 299-43.000.
 Nicolau, Claude; and Raimond, Jacques, to Inverko Industrie Vertriebs Kontor GmbH & Co., KG. Procedure for the enhancement of the resistance to arsenite and arsenate of *Thiobacillus ferrooxidans* and *Bacillus subtilis*. 4,716,114, Cl. 435-172.300.
 Nicoletta, Roger A.; and Downey, Emil. Grasping utensil. 4,715,639, Cl. 294-99.200.
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 Nippon Gakki Seizo Kabushiki Kaisha: See—
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 Nippon Gear Co., Ltd.: See—
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 Nippon Kogaku K. K.: See—
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 Nishimura, Masayuki; Suzuki, Shuzo; and Yokoto, Hiroshi, to Sumitomo Electric Industries, Ltd. Fiber for optical transmission. 4,715,695, Cl. 350-96.310.
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- Nishimura, Yoshio: See—
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 Noble, Edward C. Doll construction. 4,715,842, Cl. 446-268.000.
 Nobles, William O., to Martin Marietta Corporation. Interconnectable space station module and space station formed therewith. 4,715,566, Cl. 244-159.000.
 Noda, Seiichi; and Yoshimoto, Makoto, to NEC Corporation. Multi-level modulator comprising a compact error correcting code producing unit. 4,716,385, Cl. 332-9.00R.
 Nogami, Taro, to Hitachi, Ltd. Multiwavelength spectrophotometer. 4,715,712, Cl. 356-328.000.
 Noguchi, Katsumasa. Pelvis locking belt. 4,715,364, Cl. 128-96.100.
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- Nordson Corporation: See—
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 Locke, Philip F., Jr.; and Ignatius, Mark J., 4,716,520, Cl. 364-186.000.
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 Wight, Mark S., 4,716,578, Cl. 375-20.000.
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 Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, to Mitsubishi Chemical Industries Ltd. Boehmite. 4,716,029, Cl. 423-625.000.
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- Okita, Tsutomu; Hashimoto, Hiroshi; and Aonuma, Masashi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,716,077, Cl. 428-328.000.
- Okumura, Hideaki: See—
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- Oldershaw, Reginald W.; and Wagner, Steven D., to Ampex Corporation. Chroma phase word encode/decode in a video processing system. 4,716,454, Cl. 358-18.000.
- Olin Corporation: See—
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- Oliver, Christopher J.: See—
Luttrell, Stephen P.; and Oliver, Christopher J., 4,716,414, Cl. 342-179.000.
- Olson, Carl A.: See—
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- Olympus Optical Co., Ltd.: See—
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- Omata, Hiroshi: See—
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- O'Meara, Thomas R.; and Lind, Richard C., to Hughes Aircraft Company. Apparatus and method for spatial intensity threshold detection. 4,715,689, Cl. 350-354.000.
- OMI International Corporation: See—
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- Omron Tateisi Electronics Co.: See—
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- Onimura, Kichiro: See—
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- Ono, Masaru: See—
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- Onoda, Seiichi: See—
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- Onodera, Kaoru; Hohnishi, Satoru; Kobayashi, Kazuyuki; and Shiozawa, Kazuo, to Konishiroku Photo Ind. Co., Ltd. Photographic screen. 4,715,690, Cl. 350-357.000.
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- Oosawa, Kouichi; and Kinoshita, Yoshiaki, to Toyota Jidosha Kabushiki Kaisha. Knock control system for supercharged internal combustion engine. 4,715,184, Cl. 60-602.000.
- Opitz, Hans-Georg: See—
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- Orban, Ivan, to Ciba-Geigy Corporation. Process for the preparation of sterically hindered hydroxyphenylcarboxylic acid esters. 4,716,244, Cl. 560-75.000.
- ORC Manufacturing Co., Ltd.: See—
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- Ord, Inc.: See—
Block, Myron J.; and Hirschfeld, Tomas B., 4,716,121, Cl. 436-514.000.
- Organogen Medizinisch-Molekularbiologische Forschungsgesellschaft m.b.H.: See—
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- Orthoplast Endoprothetik GmbH: See—
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- Osaka, Keiji; Usui, Yuichi; and Yanagi, Tooru, to Sumitomo Electric Industries, Ltd. Method of and apparatus for coupling multicore coated optical fibers. 4,715,876, Cl. 65-4.210.
- Osband, Michal E.; and Cavagnaro, Joy A., to Boston University, Trustees of. Process for producing human antibodies. 4,716,111, Cl. 435-68.000.
- Oshima, Hiroo, to Kabushiki Kaisha Kobe Seiko Sho. Crown control compensation controlling method in multiple roll mill. 4,715,209, Cl. 72-366.000.
- Osswald, Hans: See—
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- Ostendorff, Eric C.; and Tucker, James I., Jr., to Mattel, Inc. Toy vehicle playset. 4,715,843, Cl. 446-429.000.
- Ostwald, Fritz, to ITT Industries, Inc. Brake slip controlled brake for automotive vehicles. 4,715,665, Cl. 303-111.000.
- Ota, Masanori; and Sasahara, Hitoshi, to Nissan Chemical Industries, Ltd. Method of storing a solid chlorinating agent. 4,715,983, Cl. 252-186.350.
- Otani, Kiyoshi, to Sanyo Electric Co., Ltd. Apparatus for information retrieval from an optically readable storage disc. 4,716,557, Cl. 369-32.000.
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- Ottlik, Klara, Elisabeth Nowak, heirs: See—
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- Ouellette, Edward L.: See—
Cogan, Kevin C.; Ouellette, Edward L.; and Morua, Martin, 4,715,957, Cl. 210-497.300.
- Ould, Maxwell K. Edging assembly. 4,715,169, Cl. 56-16.900.
- Oura, Masayuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Cutter head in a machine tool. 4,715,752, Cl. 409-232.000.
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Ovshinsky, Stanford R.; Hudgens, Stephen J.; Allred, David D.; and Demaggio, Gregory, 4,715,890, Cl. 75-0.5AA.
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- Owen-Illinois Plastic Products Inc.: See—
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- Owens-Corning Fiberglass Corporation: See—
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- Owens-Illinois Glass Container Inc.: See—
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- Oxley, Donald W.; Bartley, David H.; and McEntee, Timothy J., to Texas Instruments Incorporated. Apparatus and method removing increment/decrement pairs to decimate a block reference stream. 4,716,524, Cl. 364-200.000.
- Oxley, Lonnie R., to Deere & Company. Height adjustment for a front mount mower. 4,715,168, Cl. 56-15.800.
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Moisala, Tapio; and Gustafsson, Jukka, 4,715,877, Cl. 65-15.000.
- Oy W. Rosenlew AB: See—
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Wilkman, Goran; Kotilainen, Timo; Pulliainen, Juha; and Lindqvist, Gustav, 4,715,305, Cl. 114-40.000.
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- Ozawa, Naoki; Akiyama, Toshiyuki; Satoh, Kazuhiro; Nagahara, Syusaku; and Mimura, Itaru, to Hitachi, Ltd. Chrominance signal interpolation device for a color camera. 4,716,455, Cl. 358-44.000.
- PA Incorporated: See—
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- Pace Incorporated: See—
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- Pace, W. David; and Wang, Wei C., to Motorola, Inc. Automatic restart circuit for a switching power supply. 4,716,510, Cl. 363-49.000.
- Pachlatko, Johannes P.: See—
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- Pacholke, Paula J. Solid lubricant additive for gear oils. 4,715,972, Cl. 252-25.000.

- Pacific Bell: See—
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- Packaging Corporation of America: See—
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- Padden, Timothy J.: See—
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- Paddock, Stephen W., to Whirlpool Corporation. Wiring for refrigeration apparatus. 4,715,831, Cl. 439-709.000.
- Pahl, Scott; and De Simone, Luigi, to Keene Corporation. Light fixture bracket for suspended ceiling. 4,716,504, Cl. 362-150.000.
- Paikert, Paul, to GEA Luftkuehlergesellschaft Happel GmbH & Co. Air-cooled tube condenser. 4,715,432, Cl. 165-110.000.
- Pakulis, Ivars E., to Advanced Moisture Technology, Inc. Moisture detector apparatus and method. 4,716,360, Cl. 324-58.50A.
- Pall Corporation: See—
Hurley, John L.; Puzo, Joseph D.; and Tingey, Rosa F., 4,716,074, Cl. 428-220.000.
- Palmer, Gary E.: See—
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- Palmer, Marvin K., to Caterpillar Inc. Mounting apparatus for a grapple head assembly. 4,715,641, Cl. 294-119.400.
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- Pamler, Gerhard, to Ta Triumph-Adler Aktiengesellschaft. Platen adjusting mechanism. 4,715,734, Cl. 400-56.000.
- Panayotatos, Nikos, to Biogen N.V. Vectors for increased expression of cloned genes. 4,716,112, Cl. 435-68.000.
- Pankow, Chester W. Supplemental air valve for internal combustion engine. 4,715,351, Cl. 123-587.000.
- Panoz, Donald E., to Elian Corporation P.L.C. Controlled absorption methylodex pharmaceutical formulation. 4,716,040, Cl. 424-459.000.
- Paoletti, Luciano, to SPIDEM S.r.l. Emulsifier unit particularly for emulsifying steam and milk to prepare cappuccinos and the like beverages. 4,715,274, Cl. 99-454.000.
- Parker, Eric G.: See—
Broomfield, Donald J.; Briggs, Paul C.; Parker, Eric G.; and Wagner, David P., 4,715,316, Cl. 118-716.000.
- Parker, Fabienne: See—
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- Parker, Joey K.; and Paul, Frank W., to Clemson University. Method and apparatus for repositioning a mislocated object with a robot hand. 4,715,773, Cl. 414-730.000.
- Parker, Preston K.; and Tountant, Roy T., to General Electric Company. Conveyor system. 4,715,286, Cl. 104-88.000.
- Parker, Robert P., to RCA Corporation. Single channel if for video and audio. 4,716,464, Cl. 358-197.000.
- Parker, Theodore L., to Dow Chemical Company, The. Use, as latent cross-linkers for epoxy resins, of compounds which can be rearranged in situ to difunctional phenols. 4,716,204, Cl. 525-504.000.
- Parlak, Edward A.: See—
Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Casette, Angelo J.; Manno, John L.; and Parlak, Edward A., 4,716,010, Cl. 376-260.000.
- Parsons, William H.; Schoen, William R.; Patchett, Arthur A.; and Taniguchi, Masao, to Merck & Co., Inc. Novel antibacterial agents and potentiators of carbapenem antibiotics. 4,715,994, Cl. 260-502.50E.
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- Patchett, Arthur A.: See—
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- Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Danilyak, Sergei N.; Gavva, Viktor M.; Roiko, Jury P.; and Nushko, Valery A., to Institute Problem Modelirovaniya V Energetike Akademii Nauk Ukrainskoi SSR. Electric-arc trainer for welders. 4,716,273, Cl. 219-130.010.
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- Rosman, Alan H., to Dynamic Hydraulic Systems, Inc. Hydraulic lift mechanism. 4,715,180, Cl. 60-372.000.
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- Roussin, Alfred G., to General Electric Company. Split drift ring for focus deflection in light valves. 4,716,339, Cl. 315-15.000.
- Roust, Robert C., to STC PLC. Demodulation of auxiliary low frequency channels in digital transmission systems. 4,716,563, Cl. 370-110.400.
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- Rowlett, Don C.: See—
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- Rudolph, Johann, to Vacuumschmelze GmbH. Apparatus for covering metallic billets with aluminum. 4,715,207, Cl. 72-268.000.
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- Sumitomo Electric Research Triangle, Inc.: See—
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- Sumitomo Metal Industries, Ltd.: See—
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- Summa, Ulrich: See—
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- Sundstrand Corporation: See—
Byrd, William A.; and Smith, Anthony R., 4,715,244, Cl. 74-467.000.
- Nelson, Jeffrey D.; and Scanlon, John F., 4,715,262, Cl. 89-36.020.
- Surgicorp: See—
Bussiere, Ronald L.; and Smith, Robert J., 4,716,296, Cl. 250-504.00H.
- Susak, David M.: See—
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- Susko, Robin A.: See—
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- Susukida, Hiroshi: See—
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- Sutehall, Ralph; and Clarke, Robert S. F., to STC plc. Optical fiber cable. 4,715,676, Cl. 350-96.230.
- Sutin, Gordon L.: See—
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- Sutter, Leroy V., Jr.: See—
Philippbar, Jay E.; Smith, Chadwick F.; and Sutter, Leroy V., Jr., 4,715,372, Cl. 128-303.100.
- Sutton, Kerry L.: See—
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- Suzuki, Akira: See—
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- Suzuki, Hiroaki: See—
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- Suzuki, Koichi, to Sugiyasu Industries Co., Ltd. Device for fixing swing arm used for apparatus for lifting automobiles for repair. 4,715,477, Cl. 187-8.470.
- Suzuki, Masayuki: See—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,716,428, Cl. 354-173.110.
- Sato, Noriko; and Suzuki, Masayuki, 4,715,218, Cl. 73-86.000.
- Suzuki, Mikio: See—
Nakamura, Keiichi; and Suzuki, Mikio, 4,715,464, Cl. 180-142.000.
- Suzuki, Shuzo: See—
Nishimura, Masayuki; Suzuki, Shuzo; and Yokoto, Hiroshi, 4,715,695, Cl. 350-96.310.
- Suzuki, Tatsuya: See—
Mori, Shosuke; Sakurai, Atsushi; Aoki, Satoshi; and Suzuki, Tatsuya, 4,716,526, Cl. 364-200.000.
- Suzuki, Yoshiaki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, to Teijin Limited. Method of treating an injured part on the oral mucosa and the covering material for use thereof. 4,715,369, Cl. 128-156.000.
- Svecia Silkscreen Maskiner AB: See—
Ericsson, Sylve J. D., 4,715,278, Cl. 101-123.000.
- Swenson, Clark E.: See—
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- Swift, Jeffery G. Expandable object. 4,715,840, Cl. 446-74.000.
- Swinmurn, C. John: See—
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- Symbolics Inc.: See—
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- Szczepanski, Henry: See—
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- Szlag, Emil, to Stant Inc. Flow control valve. 4,715,403, Cl. 137-493.200.
- Ta Triumph-Adler Aktiengesellschaft: See—
Pamler, Gerhard, 4,715,734, Cl. 400-56.000.
- Tabata, Junichi, to Kabushiki Kaisha Daini Seikosha. Pulsimeter. 4,715,384, Cl. 128-706.000.
- Tabata, Kuniaki; and Tshura, Susumu, to Hitachi, Ltd. Image retrieval method and apparatus using annotations as guidance information. 4,716,404, Cl. 340-723.000.
- Tachi-S Co., Ltd.: See—
Yajima, Yutaka, 4,715,114, Cl. 29-809.000.
- Tachikawa Spring Co., Ltd.: See—
Shimada, Makoto, 4,715,916, Cl. 156-245.000.
- Tack, Hans, to Fried. Krupp Gesellschaft mit beschränkter Haftung. Tool-head/tool-holder coupling. 4,715,753, Cl. 409-234.000.
- Tack, Rufin; and Eggemont, Marc, to N.V. Bekaert S.A. Spool. 4,715,556, Cl. 242-118.600.
- Tagushi, Masaaki: See—
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- Taig, Alistair G., to Allied Corporation. Electric power assistance steering system. 4,715,462, Cl. 180-79.100.
- Takacs, Gyorgy J.: See—
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- Takada, Yoshikazu: See—
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- Takagi, Masashi: See—
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- Nishizawa, Kazutoshi; Takagi, Masashi; Matsuoka, Akio; and Nomura, Fuzio, 4,715,800, Cl. 418-69.000.
- Takahashi, Kenji; Kuwahara, Heikichi; Yanagida, Takehiko; Nakayama, Wataru; Oizumi, Kiyoshi; and Sugimoto, Shigeo, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Construction of a heat transfer wall of a heat transfer pipe. 4,715,436, Cl. 165-133.000.
- Takahashi, Kenji: See—
Maruyama, Masanori; Takahashi, Kenji; Kudo, Koji; Hombach, Masanori; and Nagahara, Shusaku, 4,716,468, Cl. 358-219.000.
- Takahashi, Kotei: See—
Ishii, Katsumi; Hirayama, Kanae; Matsuoka, Yoshio; and Takahashi, Kotei, 4,715,466, Cl. 180-233.000.
- Takahashi, Masatoshi: See—
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- Takahashi, Mitsuo, to Seikoh Giken Co., Ltd.; and Sumitomo Heavy Industries, Ltd. Metal mold for resin molding. 4,715,804, Cl. 425-141.000.
- Takahashi, Norio, to Nifco Inc. Plate fastener. 4,715,095, Cl. 24-453.000.
- Takahashi, Satomi; Inoue, Kenji; Yanagida, Yoshifumi; Ohashi, Takehisa; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing N-[1(S)-ethoxycarbonyl-3-phenylpropyl]-L-alanyl-L-proline. 4,716,235, Cl. 548-533.000.
- Takahashi, Shinji; and Mita, Yoshinori, to Honda Giken Kogyo Kabushiki Kaisha. Body construction for motor scooter vehicles. 4,715,465, Cl. 180-225.000.
- Takahashi, Susumu; and Iida, Hiroshi, to Sansui Electric Co., Ltd. AM stereo transmission method and apparatus. 4,716,590, Cl. 381-15.000.
- Takahashi, Takao: See—
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- Takahira, Yoshiyuki: See—
Morioka, Akira; Matsuura, Takeshi; and Takahira, Yoshiyuki, 4,716,076, Cl. 428-323.000.
- Takai, Hideo: See—
Okamoto, Isao; Hiraishi, Motomi; Takai, Hideo; Kasai, Kenjiro; and Terada, Katsuyuki, 4,715,289, Cl. 105-199.200.
- Takamiya Dental Manufacturing Company Limited: See—
Kaoru, Koide; and Sadao, Nagai, 4,715,814, Cl. 433-59.000.
- Takamura, Yoshio; and Nakajima, Akira, to Kabushiki Kaisha Toshiba. Multiple step-up rectifier circuit. 4,716,512, Cl. 363-61.000.
- Takaoka, Makoto: See—
Ozawa, Kunikida; Nakamura, Takashi; Katayama, Akira; Hatanaka, Katsunori; Mori, Tetsuzo; and Takaoka, Makoto, 4,716,421, Cl. 346-140.00R.
- Takase, Hiroshi; Imaizumi, Masaki; and Fujii, Toru, to Olympus Optical Co., Ltd. Vari-focal photographic lens system of rear lens group exchange type. 4,715,693, Cl. 350-422.000.
- Takase, Sadao: See—
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- Take, Yoshiaki: See—
Tsuzuki, Kiyoshi; Tanaka, Sigeto; and Take, Yoshiaki, 4,715,527, Cl. 229-1.50B.
- Takeda Chemical Industries, Ltd.: See—
Nohara, Akira, 4,716,167, Cl. 514-291.000.
- Takeda, Hitoshi; and Takase, Sadao, to Nissan Motor Co., Ltd. Lock-up control for shockless gear shifting. 4,715,145, Cl. 74-731.000.
- Takeda, Kazuhiro: See—
Mashimo, Satoshi; Fujita, Kunihiko; Tanaka, Masayuki; Yamaguchi, Yoshio; and Takeda, Kazuhiro, 4,715,176, Cl. 57-251.000.
- Takeda, Nobuhiko: See—
Hattori, Takemi; and Takeda, Nobuhiko, 4,715,653, Cl. 297-284.000.
- Takeda Riken Co., Ltd.: See—
Sato, Hiroshi; and Kobayashi, Yoshihito, 4,715,501, Cl. 209-573.000.
- Takei, Akira: See—
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- Takekoshi, Tohru; and Anderson, Patricia P., to General Electric Company. Crystalline polyimides containing cumulative phenylene sulfide units. 4,716,216, Cl. 528-352.000.
- Takemae, Yoshihiro: See—
Nakano, Masao; Takemae, Yoshihiro; Nakano, Tomio; Nozaki, Shigeki; Sato, Kimiaki; and Kodama, Nobumi, 4,716,549, Cl. 365-203.000.
- Takeuchi, Masatoshi; and Hamagaki, Takayasu, to Seiken Co., Ltd. Nonwoven fiber abrasive disk. 4,715,150, Cl. 51-395.000.
- Takeuchi, Tamio: See—
Noro, Takanobu; Koakutsu, Yasumasa; Takeuchi, Tamio; Yano, Masao; Onoda, Seiichi; Arima, Hideo; Yokono, Hitoshi; and Tanei, Hirayoshi, 4,715,673, Cl. 350-96.200.
- Takeuchi, Tomio: See—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,716,221, Cl. 536-17.200.
- Takiguchi, Haruhisa: See—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Matsui, Sadayoshi, 4,716,570, Cl. 372-45.000.
- Takita, Tomohisa: See—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,716,221, Cl. 536-17.200.
- Taleyarkhan, Rusi P., to Westinghouse Electric Corp. BWR fuel assembly bottom nozzle with one-way coolant flow valve. 4,716,011, Cl. 376-281.000.
- Tallon, James A.; and Lewis, Richard T., to Union Carbide Corporation. Esters as pitch plasticizers. 4,715,897, Cl. 106-284.000.
- Talpo, Gianpietro: See—
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- Tamaki, Kentaro: See—
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- Tamminen, Pentti, to LTH Associates. Process and apparatus for separating metals from solutions. 4,715,934, Cl. 204-10.000.
- Tamura, Masao: See—
Shukuri, Shoji; Tamura, Masao; Wada, Yasuo; and Fujisaki, Yoshihisa, 4,716,127, Cl. 437-27.000.
- Tanaka, Hiroshi; Iwata, Hiromitsu; and Kakizaki, Yukio, to Nippon Kogaku K. K. Apparatus for conveying and inspecting a substrate. 4,716,299, Cl. 250-571.000.
- Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Ando, Toshiaki; Nishiwaki, Humitoshi; and Aoyama, Shigeo, to Matsushita Electric Industrial Co. Ltd. Heat exchanger. 4,715,437, Cl. 165-151.000.
- Tanaka, Kazuhiko, to Nippon Thompson Co., Ltd. Roller bearing for infinite rectilinear motion. 4,715,729, Cl. 384-44.000.
- Tanaka, Masayuki: See—
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- Tanaka, Sigeto: See—
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- Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. Photographic optical system having enhanced spectral transmittance characteristics. 4,716,284, Cl. 250-201.000.
- Tanaka, Wataru: See—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,716,221, Cl. 536-17.000.
- Tane, Hirayoshi: See—
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- Taney, Mototaka; Matsui, Sadao; and Matsumoto, Mitsuhiro, to Sharp Kabushiki Kaisha. Method for the production of semiconductor devices. 4,716,129, Cl. 437-96.000.
- Taniguchi, Masao: See—
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- Taniguchi, Nobuyuki; Ishida, Tokuji; Hamada, Masataka; Karasaki, Toshihiko; and Norita, Toshio, to Minolta Camera Kabushiki Kaisha. Focus condition detecting device. 4,716,434, Cl. 354-408.000.
- Tanikawa, Shinji, to Yoshida Kogyo K. K. Watertight window sill construction. 4,715,152, Cl. 52-209.000.
- Tanizawa, Tetsu; and Ohba, Osamu, to Fujitsu Limited. Logical BiMOS gate circuit having low power dissipation. 4,716,310, Cl. 307-446.000.
- Tanner, Robert A., to Dixon International Limited. Ventilator device. 4,715,268, Cl. 98-41.100.
- Tashiro, Kiyoshi: See—
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- Tatsuzawa, Hisao, to Yamaya Sangyo Co., Ltd. Pressure reducing instrument for pressure gauges. 4,715,230, Cl. 73-706.000.
- Taub, Alan I.; and Frischmann, Peter G., to General Electric Company. Isothermal hold method of hot working of amorphous alloys. 4,715,906, Cl. 148-120.000.
- Taylor, Attalee S.: See—
Andrews, Howard W., Jr.; Pickles, Charles S.; and Taylor, Attalee S., 4,715,820, Cl. 439-59.000.
- Taylor, Lawrence D., to Brandt, Inc. Electro-optical paper dispenser controller having a variable gain amplifier with digital input control means. 4,716,286, Cl. 250-214.00R.
- Taylor, Richard Q.: See—
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- Team Construction and Fabrication, Inc.: See—
Falgout, Thomas E., Sr.; and Schoeffler, William N., 4,715,453, Cl. 175-73.000.
- Team Engineering and Manufacturing, Inc.: See—
Falgout, Thomas E., Sr.; and Schoeffler, William N., 4,715,253, Cl. 81-57.140.
- Techno Instruments Investments 1983 Ltd.: See—
Holtzman, Abraham M.; and Relis, Joseph, 4,715,894, Cl. 106-1.220.
- Teepie, Edward. Surgical shield. 4,715,366, Cl. 128-132.00D.
- Tegtmeyer, Uwe: See—
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- Teijin Limited: See—
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- Suzuki, Yoshiki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, 4,715,369, Cl. 128-156.000.
- Teijin Petrochemical Industries, Ltd.: See—
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- Teijin Seiki Co., Ltd.: See—
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- Tektronix, Inc.: See—
Hung, Angelo C. J.; and Wang, Francis C., 4,716,564, Cl. 371-27.000.
- Payne, David G., 4,716,500, Cl. 361-398.000.
- Shank, Gordon W.; and Eason, Earl P., 4,716,345, Cl. 315-392.000.
- Teletronics N.V.: See—
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- Telefonaktiebolaget L M Ericsson: See—
Axell, Claes E. S., 4,715,821, Cl. 439-59.000.
- Telefonaktiebolaget L M Ericsson: See—
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- Telephone Cables Limited: See—
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- Teng, Chuan C.; Chapelle, Rene A.; Blacklaws, John E.; and McCormsey, Lee E. Mechanical directional drilling jar with swivel means. 4,715,454, Cl. 175-299.000.
- Terada, Katsuyuki: See—
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- Terashima, Jun: See—
Tokura, Go; Arakawa, Kazuhiko; and Terashima, Jun, 4,716,259, Cl. 174-68.500.
- Ter Beek, Albertus: See—
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- Ter Beek, Gerrit J.; and Ter Beek, Albertus. Head attachment for a hydraulic synthetic-resin working machine for colored synthetic resin. 4,715,724, Cl. 366-157.000.
- Termansky, Robert J., to Eli Lilly and Company. 1-(vinyl phosphonate adduct) pyrazolidinones. 4,716,232, Cl. 548-112.000.
- Teroson G.m.b.H.: See—
Duck, Edward W.; and Scheffler, Ingolf, 4,716,070, Cl. 428-192.000.
- Terrell, Sanford V.: See—
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- Texaco Inc.: See—
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- Grigsby, Robert A., Jr., 4,716,193, Cl. 524-730.000.
- Kapuscinski, Maria M.; Kaufman, Benjamin J.; and Liu, Christopher S., 4,715,975, Cl. 252-50.000.
- Lewis, Paul H., 4,716,137, Cl. 502-74.000.
- Texas Instruments Incorporated: See—
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- Charboneau, Thomas J.; and Kawate, Keith W., 4,716,492, Cl. 361-283.000.
- D'Arrigo, Sebastiano; Imondi, Giuliano; and Vergara, Sossio, 4,716,322, Cl. 307-592.000.
- Ezura, Toyokazu; Katsumata, Fujio; and Ikeya, Kiyokazu, 4,715,823, Cl. 439-267.000.
- McAdams, Hugh P., 4,716,320, Cl. 307-530.000.
- Oxley, Donald W.; Bartley, David H.; and McEntee, Timothy J., 4,716,524, Cl. 364-200.000.
- Tezuda, Tomofumi: See—
Umemura, Hiroyuki; Matsuda, Kenji; Tezuda, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Sugawara, Sakuo; and Hara, Masanori, 4,715,191, Cl. 62-208.000.
- Tezuka, Nobuo, to Canon Kabushiki Kaisha. Recording and/or reproducing apparatus having an imposed head shifting feature. 4,716,481, Cl. 360-106.000.
- Tezuka, Sigeru; Yamamoto, Shoichi; and Yamamoto, Masayoshi, to Fuji Photo Film Co., Ltd. Electrophoresis apparatus. 4,715,942, Cl. 204-299.00R.
- Th. Goldschmidt AG: See—
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- Thauler, Francis R., to Westinghouse Electric Corp. Dropped rod protection insensitive to large load loss. 4,716,009, Cl. 376-242.000.
- Theeuwes, Felix: See—
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- Theiss, Edmund: See—
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- Theiss, Scott M.: See—
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- Thermababy, S.A.: See—
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- Thermo King Corporation: See—
Waldschmidt, William L., 4,716,275, Cl. 219-201.000.
- Thesing, Rich: See—
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- Thomas, Ronald L.; Titus, Terry C.; and Brandon, Craig A., to Clemson University. Process for obtaining juices from fruits containing same. 4,716,044, Cl. 426-51.000.
- Thompson, Gary J. Manifold form assembly. 4,715,620, Cl. 282-9.00R.
- Thompson, Gregory A.; and Davies, Huw M., to Calgene, Inc. Rapid enzyme assay by product selective blot. 4,716,101, Cl. 435-4.000.
- Thompson, John A., to Exxon Research and Engineering Company. Method for the modification of polycarbonate membranes, the membranes produced by such method and their use. 4,715,960, Cl. 210-651.000.
- Thompson, John R.; Hunting, Curtis J.; Masson, Ronald K.; and Trivel-piece, Craig E., to Payview Limited. Addressable subscription television system having multiple scrambling modes. 4,716,588, Cl. 380-20.000.

- Thompson, Larry L., to Rock Dock, Inc. Concrete marine float and method of fabricating same. 4,715,307, Cl. 114-65.00A.
- Thompson, Raymond M., Jr.: See—
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- Thomson-CGR: See—
Tirelli, Marco; Lecolant, Rene; and Hecquet, Raoul, 4,715,917, Cl. 156-250.000.
- Thomson Components-Mostek Corporation: See—
Proebsting, Robert J., 4,716,380, Cl. 330-253.000.
- Thomson CSF: See—
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- Berger, Jean L., 4,716,580, Cl. 377-62.000.
- Thorogood, Douglas E., to Batten Travenol Laboratories, Inc. Method and apparatus for removal of items from a sterile enclosure. 4,715,165, Cl. 53-469.000.
- Thorpe, John E.; and Sarang, Gursharan S., to M&T Chemicals Inc. Production of dielectric boards. 4,715,116, Cl. 29-846.000.
- Thring, Robert H., to Southwest Research Institute. Multicylinder catalytic engine. 4,715,326, Cl. 123-3.000.
- Thukral, Prem S.: See—
Bollands, Martin A.; Pike, William C.; Thukral, Prem S.; and Woolmington, Timothy P., 4,715,455, Cl. 175-402.000.
- Thurmes, Edmond; Masson, Jean-Paul; and Malik, Louis, to Alsihom-Atlantique. Connector for a telescopic isolating switch. 4,715,834, Cl. 439-842.000.
- Tibbals, Edward C., Jr. Speed change device. 4,715,249, Cl. 74-800.000.
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- Tillotson, John G. Method for forming a layer of blown cellular urethane on a carpet backing. 4,715,912, Cl. 156-79.000.
- Tilly, Peter E., to Rockwell International Corporation. Adaptive analog variable limiter. 4,716,374, Cl. 328-169.000.
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- Timberline Software Corporation: See—
Peltz, Curtis L.; Martin, George F.; and Blake, Peter H., 4,716,542, Cl. 364-900.000.
- Tingey, Rosa F.: See—
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- Tishura, Vladimir I.: See—
Lebedev, Vladimir K.; Chernenko, Ivan A.; Dyshlenko, Alexandr T.; Litvin, Leonid V.; and Tishura, Vladimir I., 4,715,523, Cl. 228-2.000.
- Titmas, Richard C.: See—
Baker, Terence S.; Powell, Michael J.; and Titmas, Richard C., 4,716,109, Cl. 435-7.000.
- Tittizer, Gabriel, to Interatom GmbH. Gas bearing. 4,715,731, Cl. 384-100.000.
- Titus, Terry C.: See—
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- Tjoeng, Foe S.; Fok, Kam F.; and Adams, Steven P., to Monsanto Company. Synthetic aerial peptides. 4,716,147, Cl. 514-11.000.
- TLV Co., Ltd.: See—
Hasegawa, Yoshihiko; and Miyata, Osamu, 4,715,225, Cl. 73-215.000.
- Toa Nenryo Kogyo Kabushiki Kaisha: See—
Fujita, Masahito; Kizaki, Masami; Miyazaki, Makoto; and Inaba, Naomi, 4,716,206, Cl. 526-139.000.
- Tobias, Lee A.: See—
Hendry, James D.; and Tobias, Lee A., 4,715,284, Cl. 102-434.000.
- Tocco, Inc.: See—
Pfaffmann, George D., 4,715,907, Cl. 148-144.000.
- Todd, Mike J.; and Palmer, Gary E., to Hako Minuteman, Inc. High speed floor burnisher. 4,715,087, Cl. 15-385.000.
- Todt, Klaus H.: See—
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- Toisawa, Osamu: See—
Hirakouchi, Yoshie; Toisawa, Osamu; and Takahashi, Masatoshi, 4,715,991, Cl. 252-555.000.
- Toja, Emilio, to Gruppo Lepetit, S.p.A. Pyridazino[4,3-c]-isoquinolines having anti-anxiety activity. 4,716,159, Cl. 514-210.000.
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- Tokiwa Kogyo Co., Ltd.: See—
Kameda, Hiroshi, 4,715,166, Cl. 53-550.000.
- Tokoro, Setsuo: See—
Shigematsu, Takashi; Watanabe, Tomoyuki; Tokoro, Setsuo; and Sawada, Daisaku, 4,715,258, Cl. 74-866.000.
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- Tokura, Go; Arakawa, Kazuhiko; and Terashima, Jun, to Canon Kabushiki Kaisha. Both-side flexible printed circuit board. 4,716,259, Cl. 174-68.500.
- Tokuyama Soda Kabushiki Kaisha: See—
Sata, Toshikatsu; Katsube, Teruaki; and Iida, Yoshiya, 4,715,691, Cl. 350-357.000.
- Tokya Shibaura Denki Kabushiki Kaisha: See—
Hosaka, Yasuo, 4,716,456, Cl. 358-75.000.
- Tokyo Kikai Seisakusho, Ltd.: See—
Hayashi, Mamoru; and Kawamori, Hideo, 4,715,922, Cl. 156-361.000.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—
Hirai, Shoichi; and Watanabe, Sedakazu, 4,716,593, Cl. 381-42.000.
- Katayama, Yoshitaka; Nabeshima, Daiki; and Nakamura, Shinichi, 4,716,558, Cl. 369-33.000.
- Matsuo, Kenji; Sasaki, Itsuo; Suzuki, Hiroaki; and Kunieda, Mitsuyuki, 4,716,308, Cl. 307-303.000.
- Tom, Glenn M., to Hercules Incorporated. Scavengers for the removal of impurities from arsine and phosphine. 4,716,181, Cl. 521-53.000.
- Tome, Richard E.: See—
Gasparro, Michael R.; and Tome, Richard E., 4,716,012, Cl. 376-352.000.
- Tometsko, Andrew M.: See—
Chanda, Subir; Riedhammer, Thomas M.; and Tometsko, Andrew M., 4,715,899, Cl. 134-26.000.
- Tomisawa, Naoki, to Japan Electronic Control Systems, Co., Ltd. Learning and control apparatus for electronically controlled internal combustion engine. 4,715,344, Cl. 123-489.000.
- Tomita, Kuniyuki; Shimoji, Yasuo; Kumakura, Seiji; Koike, Hiroyuki; Iwata, Nobuyoshi; and Morisawa, Yasuhiro, to Sankyo Company, Limited. Fused 5 ring heterocyclic compounds, their preparation, and their anti-arrhythmic and diuretic use. 4,716,162, Cl. 514-234.000.
- Tomm, Dagwin: See—
Rostin, Gunther; Tomm, Dagwin; and Hartig, Franz, 4,715,485, Cl. 192-106.200.
- Tommis, Norman; and Cooper, James A., to AE PLC. Reinforcement of articles of cast metal or metal alloy. 4,715,422, Cl. 164-97.000.
- Tompkins, E. Neil; and Bartholmae, Jack N., to Datapoint Corporation. Gain switched audio conferencing network. 4,716,585, Cl. 379-202.000.
- Toncelli, Marcello. Process for the preparation of putty for use in coating, including automatic coating of slabs of marble or stone and the like under vacuo in two separate containers. 4,716,057, Cl. 427-393.600.
- Toppan Printing Co., Ltd.: See—
Tsuzuki, Kiyoshi; Tanaka, Sigeto; and Take, Yoshiaki, 4,715,527, Cl. 229-1.50B.
- Torigoe, Toshihiro: See—
Sakamoto, Hiroshi; Torigoe, Toshihiro; and Yamaguchi, Tadashi, 4,716,291, Cl. 250-318.000.
- Torii, Munetomo: See—
Kagawa, Hirohiko; Kyotani, Yasuhiro; and Torii, Munetomo, 4,716,184, Cl. 523-310.000.
- Tosaka, Yoichi: See—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,716,428, Cl. 354-173.110.
- Toshiba Kikai Kabushiki Kaisha: See—
Date, Takao; Okumura, Masaru; and Watanabe, Koya, 4,715,490, Cl. 198-346.100.
- Sugiyama, Kiyoshi; and Nakamura, Kotaro, 4,715,108, Cl. 29-568.000.
- Tosill, John M.: See—
Potter, Charles; Bell, Ronald F.; and Tosill, John M., 4,715,517, Cl. 222-181.000.
- Toti, Daniela: See—
Scarponi, Ugo; Lazzarini, Anna M.; Toti, Daniela; and de Castiglione, Roberto, 4,716,228, Cl. 540-578.000.
- Toulouse, Charles P., to Lake Center Industries. Vacuum switch. 4,716,264, Cl. 200-61.860.
- Tour & Andersson AB: See—
Hammarstedt, Curt, 4,715,579, Cl. 251-121.000.
- Toutant, Roy T.: See—
Parker, Preston K.; and Toutant, Roy T., 4,715,286, Cl. 104-88.000.
- Townsend, Paul: See—
O'Connor, Stuart; Bell, Donald; Fox, Trevor R.; and Townsend, Paul, 4,716,408, Cl. 340-825.500.
- Toyo Jozo Company, Ltd.: See—
Morishita, Masataka; Ono, Masaru; and Sumita, Yukio, 4,716,153, Cl. 514-30.000.
- Toyo Rubber Industry Co., Ltd.: See—
Miyoshi, Shoji; and Nomura, Ryuichi, 4,715,418, Cl. 152-451.000.
- Toyo Seimaiki Seisakusho K. K.: See—
Saika, Nobuo, 4,715,487, Cl. 193-2.00R.
- Toyo Soda Manufacturing Co., Ltd.: See—
Kasai, Kiyoshi; Tsukidate, Takaaki; and Arakawa, Toshihiko, 4,716,028, Cl. 423-344.000.
- Toyoda Koki Kabushiki Kaisha: See—
Nakamura, Keiichi; and Suzuki, Mikio, 4,715,464, Cl. 180-142.000.
- Toyota Jidosha Kabushiki Kaisha: See—
Asami, Ken; Ohashi, Kaoru; Onuma, Toshio; and Buma, Shuuichi, 4,715,616, Cl. 280-707.000.
- Ito, Takaaki; Mori, Eiji; Uranishi, Koji; Miyazaki, Shinji; and Sugimoto, Junichi, 4,715,509, Cl. 220-86.00R.
- Katsumoto, Naoki; and Miyagawa, Toshihito, 4,715,655, Cl. 297-362.000.
- Kinoshita, Yoshiaki, 4,715,343, Cl. 123-489.000.
- Nakanishi, Nobuyasu; Ishikawa, Masakazu; Shirai, Akira; and Noguchi, Noboru, 4,715,664, Cl. 303-111.000.

- Oosawa, Kouichi; and Kinoshita, Yoshiaki, 4,715,184, Cl. 60-602.000.
- Otsuki, Hiromi; Numata, Kenichi; Matsuura, Ryoichi; Nomura, Yoshihisa; Nakanishi, Nobuyasu; and Oka, Hiroyuki, 4,715,667, Cl. 303-119.000.
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- Tran, Loi H., to Controlled Release Technologies, Inc. Therapeutic agent delivery system and method. 4,715,850, Cl. 604-82.000.
- Transpec Inc.: See—
- Manning, Donald L., 4,715,630, Cl. 293-120.000.
- Traub AG: See—
- Wiesner, Franz; and Etzel, Horst, 4,715,636, Cl. 294-86.400.
- Travlos, Constantine M., to United States of America, Air Force. Wire carrier and loading apparatus. 4,715,549, Cl. 242-25.00R.
- Treu, Dennis M.: See—
- Shouldice, David R.; and Treu, Dennis M., 4,715,398, Cl. 137-171.000.
- Trico Products Corporation: See—
- Gowans, Neil A.; and Riester, William C., 4,715,082, Cl. 15-250.420.
- Trinity Industries, Inc.: See—
- Hart, James D., 4,715,291, Cl. 105-378.000.
- TriQuint: See—
- Davenport, William H.; McCormack, Gary D.; and LaRue, George S., 4,716,311, Cl. 307-448.000.
- Trivelpiece, Craig E.: See—
- Thompson, John R.; Hunting, Curtis J.; Masson, Ronald K.; and Trivelpiece, Craig E., 4,716,588, Cl. 380-20.000.
- Tromp, Wouter T.: See—
- Neven, Jozef H. M.; Poortman, Boudewijn J.; Tromp, Wouter T.; and Stevens, Udo, 4,715,233, Cl. 73-871.120.
- Truett, Martha: See—
- Kuo, George; Masiaz, Frank R.; Truett, Martha; Valenzuela, Pablo; Rasmussen, Mirella E.; and Favaloro, Jennifer, 4,716,117, Cl. 435-240.270.
- Trummelmeyer, Gerhard; and Ruprecht, Hans-Dieter, to Bayer Aktiengesellschaft. Use of liquid, cold-hardening polyurethane-urea-forming components for corrosion-inhibiting, wear-resistant coatings on metal and plastics surfaces and moldings and on stone and concrete. 4,716,210, Cl. 528-75.000.
- Trus Joist Corporation: See—
- Brightwell, Lionel L., 4,715,162, Cl. 52-729.000.
- Trutek Research, Inc.: See—
- Nowacki, Christopher; and Brisson, Alfred G., 4,715,375, Cl. 128-328.000.
- Nowacki, Christopher; and Brisson, Alfred G., 4,715,376, Cl. 128-328.000.
- Truth Incorporated: See—
- Schema, Anthony C., 4,715,089, Cl. 16-115.000.
- TRW Inc.: See—
- Danico, Henry F.; and Hammerle, Frederick A., 4,715,756, Cl. 411-369.000.
- Elliott, Jeffrey H.; Stokes, Robert B.; Penunuri, David; and Yen, Kuo-Hsiung, 4,716,390, Cl. 333-202.000.
- Tsay, Yuh-Geng; Beigler, Myron A.; Calenoff, Emanuel; Friesen, Gerald L.; and Nichols, James L., to Minnesota Mining and Manufacturing Company. Stable allergenic extracts and methods. 4,716,120, Cl. 436-513.000.
- Tschudin-Mahrer, Rolf, to Irbt Research & Consulting AG. Foam acoustic absorption member. 4,715,473, Cl. 181-286.000.
- Tsuboi, Shigeru: See—
- Yano, Naomichi; Ueno, Tadatsugu; and Tsuboi, Shigeru, 4,715,978, Cl. 252-70.000.
- Tsuda, Yoshiyuki: See—
- Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Ando, Toshiaki; Nishiwaki, Humitoshi; and Aoyama, Shigeo, 4,715,437, Cl. 165-151.000.
- Tsuhara, Susumu: See—
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- Tsuji, Masanori: See—
- Ito, Yasuro; Higuchi, Yoshiro; Shiki, Takeshi; Tsuji, Yukikazu; Tsuji, Masanori; and Hayakawa, Mitsutaka, 4,715,719, Cl. 366-2.000.
- Tsuji, Yukikazu: See—
- Ito, Yasuro; Higuchi, Yoshiro; Shiki, Takeshi; Tsuji, Yukikazu; Tsuji, Masanori; and Hayakawa, Mitsutaka, 4,715,719, Cl. 366-2.000.
- Tsukasaki, Hidaka: See—
- Kobayashi, Kiyotaka; Tsukasaki, Hidaka; and Baba, Takaaki, 4,715,348, Cl. 123-571.000.
- Tsukidate, Takaaki: See—
- Kasai, Kiyoshi; Tsukidate, Takaaki; and Arakawa, Toshihiko, 4,716,028, Cl. 423-344.000.
- Tsukuda, Yasuo; Hara, Hisao; Harada, Hideki; and Iizuka, Yasuo, to Hitachi Metals, Ltd. Exhaust port assembly. 4,715,178, Cl. 60-272.000.
- Tsuruta, Kenji, to Ohbayashi-Gumi, Ltd. Method of measuring the strength of concrete for slip form process. 4,715,726, Cl. 374-102.000.
- Tsutsui, Kyoji, to Ricoh Co., Ltd. Disazo compounds with xanthone nucleus for electrophotography. 4,716,220, Cl. 534-738.000.
- Tsuzuki, Kiyoshi; Tanaka, Sigeto; and Take, Yoshiaki, to Toppan Printing Co., Ltd. Ultrasonically sealed side seam on cup. 4,715,527, Cl. 229-1.50B.
- Tucker, James I., Jr.: See—
- Ostendorf, Eric C.; and Tucker, James I., Jr., 4,715,843, Cl. 446-429.000.
- Tuckey, Charles H., to Walbro Corporation. Lateral channel supply pump. 4,715,777, Cl. 415-53.00T.
- Tuenker, Gerhard: See—
- Dislich, Helmut; Arfsten, Nanning J.; Schmidt, Helmut; Philipp, Gottfried; and Tuenker, Gerhard, 4,715,999, Cl. 264-1.100.
- Tuman, Robert W.: See—
- Epps, Joyce E.; Ng, Kung-Tat; Tuman, Robert W.; and Wu, Wu-Nan, 4,716,163, Cl. 514-237.000.
- Turukhano, Boris G. Apparatus for copying holographic diffraction gratings. 4,715,670, Cl. 350-3.690.
- Tveter, Richard S.; and Miller, Wayne A., to S. Himmelstein and Company. Leak tester. 4,715,214, Cl. 73-49.200.
- Uchida, Shichiro, to Shonetsugaku Kenkyusho Co., Ltd. Shelf structure for drying sacked matter. 4,715,129, Cl. 34-195.000.
- Ue, Makoto: See—
- Mori, Shoichiro; and Ue, Makoto, 4,715,976, Cl. 252-62.200.
- Ueda, Yasuhiro: See—
- Akui, Nobuaki; Ueda, Yasuhiro; and Suzuki, Akira, 4,715,360, Cl. 128-4.000.
- Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, to Mitsubishi Denki Kabushiki Kaisha. Ion beam generator. 4,716,295, Cl. 250-423.00P.
- Uehara, Haruo; and Omata, Hiroshi, to Canon Kabushiki Kaisha. Information recording disk. 4,716,063, Cl. 428-65.000.
- Uehara, Tsukasa, to Canon Kabushiki Kaisha. Mechanism for automatically loading a cassette in recording and/or reproducing apparatus including pinching means for applying varying pinching action. 4,716,477, Cl. 360-97.000.
- Ueno, Hiroaki: See—
- Ogawa, Toshiya; Ueno, Hiroaki; Yamada, Toshiaki; and Haganuma, Tomoyuki, 4,716,543, Cl. 364-900.000.
- Ueno, Tadatsugu: See—
- Yano, Naomichi; Ueno, Tadatsugu; and Tsuboi, Shigeru, 4,715,978, Cl. 252-70.000.
- Ueno, Toshiyuki: See—
- Miyake, Yuzuru; Nohara, Isao; Sugioka, Takami; Onishi, Susumu; and Ueno, Toshiyuki, 4,715,548, Cl. 242-18.00R.
- Ueno, Yoshio: See—
- Sakurai, Katukiyo; Ueno, Yoshio; and Okuyama, Takashi, 4,716,224, Cl. 536-55.100.
- Uera, Yoshinori: See—
- Hatakeyama, Tetsuo; Uera, Yoshinori; and Nagao, Nobuaki, 4,715,553, Cl. 242-68.400.
- Uesugi, Mitsuaki: See—
- Makabe, Eiichi; Uesugi, Mitsuaki; Inomata, Masaichi; Maruyama, Kyusuke; Iwai, Kenji; and Sano, Kazuo, 4,716,459, Cl. 358-106.000.
- Umemura, Hiroyuki; Matsuda, Kenji; Tezuda, Tomofumi; Isono, Kazuaki; Ishioka, Hidenori; Sugawara, Sakuo; and Hara, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Air conditioning method. 4,715,191, Cl. 62-208.000.
- Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 4'-demethyl-4-epipodophyllotoxin derivative. 4,716,221, Cl. 536-17.200.
- Ungerstedt, Carl U.: See—
- Backlund, Ulf E. H. H.; and Ungerstedt, Carl U., 4,715,413, Cl. 141-94.000.
- Union Carbide Corporation: See—
- Abatjoglou, Anthony G.; and Bryant, David R., 4,716,250, Cl. 568-454.000.
- Murray, Rex E., 4,716,138, Cl. 502-117.000.
- Salensky, George A., 4,715,977, Cl. 252-62.540.
- Tallon, James A.; and Lewis, Richard T., 4,715,897, Cl. 106-284.000.
- Union Oil Company of California: See—
- Biale, John, 4,716,085, Cl. 428-476.900.
- Unisys Corporation: See—
- Gabuzda, Paul G.; and Terrell, Sanford V., 4,715,438, Cl. 165-185.000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: See—
- Luttrell, Stephen P.; and Oliver, Christopher J., 4,716,414, Cl. 342-179.000.
- United States of America
- Agriculture: See—
- Andersen, Robert N.; and Walker, Harrell L., 4,715,881, Cl. 71-79.000.
- Air Force: See—
- Rushing, Frank C.; and Weixel, Mark, 4,715,557, Cl. 242-129.000.
- Travlos, Constantine M., 4,715,549, Cl. 242-25.00R.
- America: See—
- Morrison, Garrett L., 4,716,027, Cl. 423-225.000.
- Army: See—
- Ames, Alan J., 4,716,507, Cl. 362-311.000.
- Eitel, Frederick G., 4,715,694, Cl. 350-486.000.
- Gregory, Don A.; and Guenther, Bob D., 4,715,683, Cl. 350-331.00R.
- Mongeon, Robert J.; Wayne, Robert J.; and Henschke, Robert W., 4,716,444, Cl. 356-05.000.
- Quamen, Ronny A., 4,715,563, Cl. 244-152.000.
- Scully, Andrew J., 4,715,754, Cl. 410-107.000.

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- Health and Human Services: See—
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- Bringmann, Udo; Drews, Klaus; and Schon, Detlef, 4,715,319, Cl. 118-723.000.
- Esser, Leonard J. M.; Van de Wiel, Petrus J. A. M.; Daverveld, Leonardus A.; and Van Gils, Johannes A. A., 4,716,446, Cl. 357-23.140.
- Huiskes, Cornelis; and Schutten, Evert D., 4,716,337, Cl. 313-487.000.
- Joosten, Henricus C. M., 4,715,119, Cl. 29-858.000.
- Mulder, Cornelis; and Wulms, Henricus E. J., 4,716,314, Cl. 307-477.000.
- Schulze, Michael, 4,716,373, Cl. 328-165.000.
- Schutten, Evert D.; and Verlijdsdonk, Johannes G., 4,716,335, Cl. 313-486.000.
- Schutten, Evert D.; and Verlijdsdonk, Johannes G., 4,716,336, Cl. 313-486.000.
- Spierings, Alphons F. E. B., 4,716,317, Cl. 307-520.000.
- Stroppiana, Robert J., 4,716,309, Cl. 307-442.000.
- van Roermund, Arthur H. M., 4,716,375, Cl. 329-50.000.
- United States Surgical Corporation: See—
- Roehr, William H., Jr.; and Goodman, Richard L., 4,715,520, Cl. 227-19.000.
- United Technologies Corporation: See—
- Anderson, Roy W.; Ross, Stephen J.; and Henderson, Larry D., 4,715,723, Cl. 366-142.000.
- Blackburn, Martin J.; and Smith, Michael P., 4,716,020, Cl. 420-418.000.
- Mainelli, Roy J.; and Preston, Donald, 4,715,395, Cl. 138-42.000.
- Stearns, Charles F., 4,715,397, Cl. 137-84.000.
- Suciu, Gabriel L., 4,715,779, Cl. 415-144.000.
- Unitrode Corporation: See—
- Patel, Raoji, 4,716,514, Cl. 363-127.000.
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- Rose, Jed E., 4,715,387, Cl. 131-270.000.
- Universal Electric Company: See—
- Stone, Thomas W., 4,716,327, Cl. 310-90.000.
- Universal Manufacturing Corporation: See—
- Lindquist, John, 4,716,343, Cl. 315-307.000.
- University of California, The Regents of the: See—
- Amstutz, Harlan C.; and Kabo, J. Michael, 4,715,860, Cl. 623-22.000.
- Levy, Jay A., 4,716,102, Cl. 435-5.000.
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- Fakirov, Stoyko C.; and Schultz, Jerold M., 4,715,919, Cl. 156-307.300.
- University Patents, Inc.: See—
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- Biber, Klaus; and Unold, Gerhard, 4,715,704, Cl. 351-207.000.
- UOP Inc.: See—
- Imai, Tamotsu, 4,716,143, Cl. 502-326.000.
- Staggs, Darrell W., 4,715,947, Cl. 208-68.000.
- Ura, Syouzabu: See—
- Yasuda, Makoto; Nishimura, Shuichi; and Ura, Syouzabu, 4,715,329, Cl. 123-52.0MV.
- Uranishi, Koji: See—
- Ito, Takaaki; Mori, Eiji; Uranishi, Koji; Miyazaki, Shinji; and Sugimoto, Junichi, 4,715,303, Cl. 220-86.00R.
- Urutani, Eiichi. Dehumidifier for a compressed gas. 4,715,871, Cl. 55-222.000.
- Urban, Frank J., to Pfizer Inc. Process for the production of an (S)-methyl or (S)-ethyl 4-amino-6-fluorochroman-4-carboxylate. 4,716,113, Cl. 435-125.000.
- Urban, Milfred W. Mirror and bracket assembly. 4,715,701, Cl. 350-625.000.
- Usui, Yuichi: See—
- Osaka, Keiji; Usui, Yuichi; and Yanagi, Tooru, 4,715,876, Cl. 65-4.210.
- Utility Electronics Industries Co. Ltd.: See—
- Hung, Michael, 4,715,787, Cl. 417-63.000.
- Utne, Torleif: See—
- Reinhold, Donald F.; Utne, Torleif; and Abramson, Newton L., 4,716,246, Cl. 562-446.000.
- Vacuum Barrier Corporation: See—
- Stearns, Thornton, 4,715,187, Cl. 62-55.000.
- Vacuumschmelze GmbH: See—
- Rudolph, Johann, 4,715,207, Cl. 72-268.000.
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Biernoth, Gerhard; Menz, Hans-Udo; Todt, Klaus H.; and Wieske, Theophil, 4,716,047, Cl. 426-603.000.
- Wiesner, Franz; and Etzel, Horst, to Traub AG. Gripper including an exchangeable gripping jaw. 4,715,636, Cl. 294-86.400.
- Wight, Mark S., to Northern Telecom Limited. Circuit and method for the recovery of data from a digital data stream. 4,716,578, Cl. 375-20.000.
- Wilbur Curtis Company, Inc.: See—
Stoner, Arthur L., 4,715,269, Cl. 99-279.000.
- Wild Heerbrugg AG: See—
Gaechter, Bernhard; Braunecker, Bernhard; and Muller, Fritz, 4,715,714, Cl. 356-375.000.
- Wilkinson Sword Limited: See—
McGready, Angus J., 4,715,120, Cl. 30-57.000.
- Wilkinson, William T. Utility bench. 4,715,296, Cl. 108-116.000.
- Wilkman, Goran; Kotilainen, Timo; Pulliainen, Juha; and Lindqvist, Gustav, to Oy Wartsila AB. Ship's hull. 4,715,305, Cl. 114-40.000.
- Willert, Thomas E., to Puget Sound Power and Light Company. Power transformer inspection procedure. 4,715,236, Cl. 73-863.860.
- Williams, Keith M.: See—
Groner, Gabriel F.; Dorsey, Eric A.; Williams, Keith M.; and Vyas, Harihar J., 4,716,583, Cl. 379-88.000.
- Willis, Reid S.: See—
Coyne, Brenton S.; Strandjord, Andrew J.; Spence, Mark W.; Willis, Reid S.; Bredeweg, Robert A.; and Stevens, Timothy S., 4,715,217, Cl. 73-61.10C.
- Willmott, Colin B.; Heitschel, Carl T.; and Wojciak, Bernard J., Jr., to Chamberlain Manufacturing Corporation. Digital light control. 4,716,301, Cl. 307-115.000.
- Wills, Harry D.; and Bethausen, Joseph L., to General Electric Company. Method and apparatus for optically switching current. 4,716,297, Cl. 250-551.000.
- Wilson, Jack O., to Xerox Corporation. Heat and pressure roll fuser and roll engaging mechanism therefor. 4,716,435, Cl. 355-3.0FU.
- Wilson, Robert B., Jr.: See—
Laine, Richard M.; Hirschon, Albert S.; and Wilson, Robert B., Jr., 4,716,142, Cl. 502-220.000.
- Wimmer, Karl: See—
Kuhn, Heinrich; Stitz, Olaf; and Wimmer, Karl, 4,716,572, Cl. 373-88.000.
- Winsor, Niels K.: See—
Goldstein, Yeshayahu S. A.; Tidman, Derek A.; Burton, Rodney L.; Massey, Dennis W.; and Winsor, Niels K., 4,715,261, Cl. 89-8.000.
- Winter, David C.; and Wood, William R., to Deere & Company. Self-dumping crop shield. 4,715,449, Cl. 172-513.000.

Winter, John P., to Presto Products, Incorporated. Polypropylene/polyester nonoriented heat sealable moisture barrier film and bag. 4,716,061, Cl. 428-35.000.

Wisconsin Bell, Inc.: See—
Blanchard, Kenneth E.; and Sanislo, Stephen V., Jr., 4,716,582, Cl. 379-28.000.

Wisdom, James N., to Deere & Company. Hitch for a vehicle having a single rear wheel. 4,715,610, Cl. 280-490.00R.

Witco Corp.: See—
Hindman, Thomas D.; Roessing, Thomas J.; and Burkhard, Joseph D., 4,716,191, Cl. 524-488.000.

Wittman, Kenneth L. Strap mounting assembly for electric guitars permitting multiple guitar rotations. 4,715,259, Cl. 84-327.000.

Wittmann, Alois, to Hughes Aircraft Company. Clamping connection assembly for spacecraft. 4,715,565, Cl. 244-158.00R.

Wittsch, Christian, to Institut Français du Pétrole. Device and method for the temporary protection of a working tool or measuring instrument fixed to the end of a drill string. 4,715,446, Cl. 166-381.000.

Wittwer, Alfred, to EMS-Inventa AG. Pole body for an electric fuse, method of manufacturing and method of using the pole body. 4,715,280, Cl. 102-202.800.

Woerndle, Rudolf, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschränkter Haftung. Connecting device comprising a bolt and a loop around the bolt. 4,715,589, Cl. 267-148.000.

Wohlford, William P., and Hovenga, LaVern B., to Deere & Company. Tamper-resistant supervisory system. 4,716,401, Cl. 340-568.000.

Woito, David W.: See—
Walsh, Edward; and Woito, David W., 4,716,478, Cl. 360-104.000.

Wojciak, Bernard J., Jr.: See—
Willmott, Colin B.; Heitschel, Carl T.; and Wojciak, Bernard J., Jr., 4,716,301, Cl. 307-115.000.

Wokocek, Ortwin: See—
Kaiser, Bernhard; and Wokocek, Ortwin, 4,715,223, Cl. 73-163.000.

Wolf, Harley: See—
May, Richard L.; Smith, Jay; and Wolf, Harley, 4,715,602, Cl. 273-86.00R.

Wolf, Heinz K., and Mukherjee, Jyoti, to Warner & Swasey Company, The. Machine tool. 4,715,102, Cl. 29-27.00R.

Wolf-Heuss, Elisabeth: See—
Drauz, Karlheinz; Kleemann, Axel; and Wolf-Heuss, Elisabeth, 4,716,237, Cl. 549-72.000.

Wolfbeis, Otto S., and Offenbacher, Helmut, to AVL AG. Method for determining ionic strength of a sample. 4,716,118, Cl. 436-2.000.

Wolff, Donald L.; McCauley, Porter T.; Stiefel, Paul; Takacs, Gyorgy J.; and Adams, Roman A., to Cole-Parmer Instrument Company. Control method and apparatus for peristaltic fluid pump. 4,715,786, Cl. 417-22.000.

Wolfe, Hans-Peter: See—
Schable, Siegfried; Wolfe, Hans-Peter; Gusewell, Eike; and Kohl, Bernhard, 4,715,175, Cl. 56-432.000.

Woma-Apparatebau Wolfgang Maasberg & Co., GmbH: See—
Lingnau, Horst, 4,715,538, Cl. 239-248.000.

Wood, David E., to Covalent Technology Corporation. Solid phase biological diagnostic assay via visual observation as enhanced by Mie scattering. 4,716,123, Cl. 436-533.000.

Wood, William R.: See—
Winter, David C.; and Wood, William R., 4,715,449, Cl. 172-513.000.

Woolmington, Timothy P.: See—
Bollands, Martin A.; Pike, William C.; Thukral, Prem S.; and Woolmington, Timothy P., 4,715,455, Cl. 175-402.000.

Wright, M. Bosley. Moulding routing apparatus. 4,715,415, Cl. 144-136.00R.

Wright, William S.: See—
Blitshteyn, Mark; and Wright, William S., 4,716,371, Cl. 324-457.000.

Wu, Wu-Nan: See—
Epps, Joyce E.; Ng, Kung-Tat; Tuman, Robert W.; and Wu, Wu-Nan, 4,716,163, Cl. 514-237.000.

Wuerzer, Bruno: See—
Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Jurgen; and Wuerzer, Bruno, 4,715,889, Cl. 71-94.000.

Wulms, Henricus E. J.: See—
Mulder, Cornelis; and Wulms, Henricus E. J., 4,716,314, Cl. 307-477.000.

Wurmli, Albert: See—
Petitpierre, Jean C.; Nachbur, Hermann; and Wurmli, Albert, 4,716,424, Cl. 503-210.000.

Wurstle, Volker: See—
Asten, Wolfgang V.; Dorner, Karl H.; Scheel, Hartmut; and Wurstle, Volker, 4,715,903, Cl. 148-11.50A.

Wymann, Paul; and Fattinger, Volker, to Wam-Plast AG. Filling body of acid-resistant synthetic plastics material. 4,716,066, Cl. 428-116.000.

Xecutek Corporation: See—
Dorr, John A., 4,715,226, Cl. 73-290.00V.

Xerox Corporation: See—
Acquaviva, Thomas, 4,716,439, Cl. 355-7.000.

Farrell, Barbara L., 4,716,438, Cl. 355-6.000.

Lang, Joseph H., 4,716,436, Cl. 355-3.0CH.

Wilson, Jack O., 4,716,435, Cl. 355-3.0FU.

Xomox Corporation: See—
Gardner, John F.; and Showalter, Thomas W., 4,715,400, Cl. 137-341.000.

Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,716,100, Cl. 430-570.000.

Yajima, Yutaka, to Tachi-S Co., Ltd. Tension spring takeout device in an automatic tension spring mounting apparatus. 4,715,114, Cl. 29-809.000.

Yamada, Akira: See—
Dunks, Gary B.; Yamada, Akira; Beard, Charles D.; and Dodd, Namassivaya, 4,716,234, Cl. 548-259.000.

Yamada, Hajime: See—
Sagawa, Ryuichi; Nagata, Osamu; and Yamada, Hajime, 4,715,339, Cl. 123-357.000.

Yamada, Ryuji: See—
Sato, Koji; Kuroda, Hiroshi; Yamada, Ryuji; and Serino, Mamoru, 4,715,657, Cl. 299-1.000.

Yamada, Toshiaki: See—
Ogawa, Toshiya; Ueno, Hiroaki; Yamada, Toshiaki; and Haganuma, Tomoyuki, 4,716,543, Cl. 364-900.000.

Yamada, Yasuyuki; Fujibayashi, Kazuo; Sato, Yasuhisa; and Yokota, Hideo, to Canon Kabushiki Kaisha. Varifocal type finder. 4,715,692, Cl. 350-422.000.

Yamaguchi, Noboru, to Kabushiki Kaisha Toshiba. Flat panel display control apparatus. 4,716,405, Cl. 340-723.000.

Yamaguchi, Tadashi: See—
Sakamoto, Hiroshi; Torigoe, Toshihiro; and Yamaguchi, Tadashi, 4,716,291, Cl. 250-318.000.

Yamaguchi, Takashi; Ishiguchi, Isao; and Inoue, Takeshi, to Mitsubishi Mining and Cement Co., Ltd. Dielectric ceramic composition. 4,716,134, Cl. 501-136.000.

Yamaguchi, Toru: See—
Akiyama, Hiroyuki; Izawa, Susumu; Okabe, Shigeru; and Yamaguchi, Toru, 4,716,021, Cl. 422-135.000.

Yamaguchi, Yoshio: See—
Mashimo, Satoshi; Fujita, Kunihiko; Tanaka, Masayuki; Yamaguchi, Yoshio; and Takeda, Kazuhiro, 4,715,176, Cl. 57-251.000.

Yamaha Hatsudoki Kabushiki Kaisha: See—
Oyaizu, Takeshi, 4,715,333, Cl. 123-90.310.

Yamaichi Electric Mfg. Co., Ltd.: See—
Matsuoka, Noriyuki, 4,715,835, Cl. 439-893.000.

Yamakawa, Takeshi, to Omron Tateisi Electronics Co. Multi-functional fuzzy logic circuit. 4,716,540, Cl. 364-807.000.

Yamamoto, Etsuji: See—
Sekihara, Kensuke; Matsui, Shigeru; Kohno, Hideki; Yamamoto, Etsuji; and Shiono, Hidemi, 4,716,369, Cl. 324-309.000.

Yamamoto, Masayoshi: See—
Tezuka, Sigeru; Yamamoto, Shoichi; and Yamamoto, Masayoshi, 4,715,942, Cl. 204-299.00R.

Yamamoto, Shoichi: See—
Tezuka, Sigeru; Yamamoto, Shoichi; and Yamamoto, Masayoshi, 4,715,942, Cl. 204-299.00R.

Yamanaka, Kazuo: See—
Minami, Takao; Nagano, Hiroo; Yamanaka, Kazuo; Okada, Yasutaka; Susukida, Hiroshi; Onimura, Kichiro; Yonezawa, Toshio; and Sasaguri, Nobuya, 4,715,909, Cl. 148-410.000.

Yamashita, Gentaro: See—
Suzuki, Yoshiki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, 4,715,369, Cl. 128-156.000.

Yamato, Lance M.: See—
Reinicke, Robert H.; and Yamato, Lance M., 4,715,852, Cl. 604-131.000.

Yamauchi, Michihide: See—
Kishine, Nobuyuki; Imamura, Tetsuya; and Yamauchi, Michihide, 4,716,078, Cl. 428-336.000.

Yamauchi, Takayoshi; Hattori, Kaneaki; Ikeda, Shunichi; and Tamaki, Kentaro, to Kyowa Hakko Kogyo Co., Ltd. Cyclopentane derivatives. 4,716,241, Cl. 558-44.000.

Yamaya Sangyo Co., Ltd.: See—
Tatsuzawa, Hisao, 4,715,230, Cl. 73-706.000.

Yamazaki, Mutsuki, to Kabushiki Kaisha Toshiba. Photoconductive member for exhibiting photoconductivity upon illumination by electromagnetic light in the visible to ultraviolet range. 4,716,089, Cl. 430-57.000.

Yamazaki, Mutsuki, to Kabushiki Kaisha Toshiba. Photoconductive member for exhibiting photoconductivity upon illumination by electromagnetic light in the visible to ultraviolet range. 4,716,090, Cl. 430-65.000.

Yan, Tsoung Y.: See—
Weisz, Paul B.; and Yan, Tsoung Y., 4,716,136, Cl. 502-64.000.

Yanagi, Tooru: See—
Osaka, Keiji; Usui, Yuichi; and Yanagi, Tooru, 4,715,876, Cl. 65-4.210.

Yanagida, Hiroaki; and Ogata, Tadashi, to Kabushiki Kaisha Advance Kaihatsu Kenkyujo. Gas sensor. 4,715,944, Cl. 204-426.000.

Yanagida, Takehiko: See—
Takahashi, Kenji; Kuwahara, Heikichi; Yanagida, Takehiko; Nakayama, Wataru; Oizumi, Kiyoshi; and Sugimoto, Shigeo, 4,715,436, Cl. 165-133.000.

Yanagida, Yoshifumi: See—
Takahashi, Satomi; Inoue, Kenji; Yanagida, Yoshifumi; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,716,235, Cl. 548-533.000.

Yanagisawa, Wasuke; and Muramatsu, Kenichi, to Yokowo Mfg. Co., Ltd. Microwave amplifying apparatus. 4,716,382, Cl. 330-286.000.

Yaniv, Zvi; Canella, Vincent D.; Chapelle, Walter E.; and Pryor, Roger W., to Energy Conversion Devices, Inc. Liquid crystal display having potential source in a diode ring. 4,715,685, Cl. 350-332.000.

Yano, Masao: See—
Noro, Takanobu; Koakutsu, Yasumasa; Takeuchi, Tamio; Yano, Masao; Onoda, Seiichi; Arima, Hideo; Yokono, Hitoshi; and Tanei, Hirayoshi, 4,715,673, Cl. 350-96.200.

Yano, Naomichi; Ueno, Tadatsugu; and Tsuboi, Shigeru, to Kubota Tekko Kabushiki Kaisha. Heat storage composition, latent heat storage capsules containing said heat-storage composition and temperature control apparatus using said capsules. 4,715,978, Cl. 252-70.000.

Yasuda, Arthur K.; Kennedy, William S.; and Aronstam, Peter S., to Petrophysical Services, Inc. Borehole seismic receiver. 4,715,469, Cl. 181-102.000.

Yasuda, Makoto; Nishimura, Shuichi; and Ura, Syouzabu, to Nissan Motor Co., Ltd. Induction system for internal combustion engine. 4,715,329, Cl. 123-52.0MV.

Yasuro Ito and Taisei Corporation: See—
Ito, Yasuro; Higuchi, Yoshiro; Shiki, Takeshi; Tsuji, Yukikazu; Tsuji, Masanori; and Hayakawa, Mitsutaka, 4,715,719, Cl. 366-2.000.

Yau, Robert L.: See—
Maltiel, Ron; and Yau, Robert L., 4,716,552, Cl. 365-222.000.

Yazaki, Yoshio, to ORC Manufacturing Co., Ltd. Exposure device and exposure control method. 4,716,442, Cl. 355-67.000.

Yen, Kuo-Hsiung: See—
Elliott, Jeffrey H.; Stokes, Robert B.; Penunuri, David; and Yen, Kuo-Hsiung, 4,716,390, Cl. 333-202.000.

Yengst, William C., to Science Applications International Corporation. Guided missile. 4,715,283, Cl. 102-401.000.

Yerman, Alexander J.; and Loughran, James A., to General Electric Company. Tape automated manufacture of power semiconductor devices. 4,716,124, Cl. 437-8.000.

Yeung, Choi K., to Recotcon Corporation. Cartridge-shaped cleaning device with a rotatable cleaning assembly. 4,716,485, Cl. 360-128.000.

Yip, Kin F.: See—
Ward, Frederick E.; and Yip, Kin F., 4,716,236, Cl. 548-556.000.

Yoda, Takumi: See—
Gion, Hidenori; Yoda, Takumi; Kirita, Yasuzo; Zaima, Kazuhito; and Kurata, Noriyuki, 4,715,849, Cl. 604-52.000.

Yokogawa Electric Corporation: See—
Inoue, Yuji; Iwaoka, Hideto; and Sugiyama, Tadashi, 4,716,370, Cl. 324-319.000.

Yokogawa Medical Systems, Limited: See—
Endo, Hisashi, 4,716,426, Cl. 354-76.000.

Inoue, Yuji; Iwaoka, Hideto; and Sugiyama, Tadashi, 4,716,370, Cl. 324-319.000.

Yokohama Rubber Co., Ltd., The: See—
Kabe, Kazuyuki; and Morikawa, Tuncu, 4,715,420, Cl. 152-557.000.

Yokomizo, Yoshikazu, to Canon Kabushiki Kaisha. Data decoding apparatus. 4,716,471, Cl. 358-296.000.

Yokono, Hitoshi: See—
Noro, Takanobu; Koakutsu, Yasumasa; Takeuchi, Tamio; Yano, Masao; Onoda, Seiichi; Arima, Hideo; Yokono, Hitoshi; and Tanei, Hirayoshi, 4,715,673, Cl. 350-96.200.

Yokota, Fumiki: See—
Sekine, Yoshitada; Yokota, Fumiki; and Kubota, Hisashi, 4,715,709, Cl. 356-237.000.

Yokota, Hideo: See—
Yamada, Yasuyuki; Fujibayashi, Kazuo; Sato, Yasuhisa; and Yokota, Hideo, 4,715,692, Cl. 350-422.000.

Yokoto, Hiroshi: See—
Nishimura, Masayuki; Suzuki, Shuzo; and Yokoto, Hiroshi, 4,715,695, Cl. 350-96.310.

Yokowo Mfg. Co., Ltd.: See—
Yanagisawa, Wasuke; and Muramatsu, Kenichi, 4,716,382, Cl. 330-286.000.

Yokoyama, Kiyoshi: See—
Horiuchi, Akito; Yokoyama, Kiyoshi; and Yoshida, Makoto, 4,716,133, Cl. 501-97.000.

Yokoyama, Nobuyoshi; and Hayakawa, Tsuneyasu, to Paloma Kogyo Kabushiki Kaisha. Pulse combustion device. 4,715,807, Cl. 431-1.000.

Yokozeki, Akimichi: See—
Connon, Helen A.; Gorski, Robert A.; Kenyon, William G.; and Yokozeki, Akimichi, 4,715,900, Cl. 134-31.000.

Yoneda, Hiroshi: See—
Koike, Hiroshi; Katada, Hiroshi; and Yoneda, Hiroshi, 4,715,353, Cl. 123-590.000.

Yonezawa, Toshio: See—
Minami, Takao; Nagano, Hiroo; Yamanaka, Kazuo; Okada, Yasutaka; Susukida, Hiroshi; Onimura, Kichiro; Yonezawa, Toshio; and Sasaguri, Nobuya, 4,715,909, Cl. 148-410.000.

Yonkers, Edward H.: See—
Seiss, Randolph H.; and Yonkers, Edward H., 4,716,197, Cl. 525-75.000.

Yoshida Kogyo K. K.: See—
Murasaki, Ryuichi, 4,715,926, Cl. 156-511.000.

Tanikawa, Shinji, 4,715,152, Cl. 52-209.000.

Yoshida, Koichi; and Kawai, Joji, to Mitsubishi Denki Kabushiki Kaisha. Speed detection apparatus. 4,716,535, Cl. 364-565.000.

Yoshida, Koji, to Shin Meiwa Industry Co., Ltd. Terminal crimping machine. 4,715,099, Cl. 29-33.00M.

Yoshida, Makoto: See—
Horiuchi, Akito; Yokoyama, Kiyoshi; and Yoshida, Makoto, 4,716,133, Cl. 501-97.000.

Yoshida, Susumu: See—
Ogawa, Hiroshi; Miyazaki, Yasuyuki; Yoshida, Susumu; and Sasaki, Shinichi, 4,716,530, Cl. 364-424.000.

Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Distributed feedback semiconductor laser device. 4,716,570, Cl. 372-45.000.

Yoshida, Yasuo: See—
Kaminaka, Nobuyuki; and Yoshida, Yasuo, 4,716,484, Cl. 360-125.000.

Yoshihara, Toshiyuki; Hiro, Masaaki; and Watanabe, Katsunori, to Canon Kabushiki Kaisha. Electrophotographic member with silicone graft copolymer in surface layer. 4,716,091, Cl. 430-66.000.

Yoshikawa, Hiroshi: See—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,716,221, Cl. 536-17.200.

Yoshimoto, Makoto: See—
Noda, Seiichi; and Yoshimoto, Makoto, 4,716,385, Cl. 332-9.00R.

Yuasa, Katunori: See—
Isobe, Minoru; Koshida, Yoshinori; and Yuasa, Katunori, 4,715,594, Cl. 271-65.000.

Yuki Gosei Kogyo Co., Ltd.: See—
Nagai, Yoichiro; Watanabe, Hamao; and Akutsu, Yoshinori, 4,716,240, Cl. 556-430.000.

Zabotto, Arlette; and Contamin, Jean-Claude, to L'Oreal. Cosmetic composition for gentle cleansing, especially for removing eye makeup. 4,715,982, Cl. 252-174.170.

Zaehner, Paul: See—
Kaempf, Karl; Zaehner, Paul; and Richter, Wolfgang, 4,715,237, Cl. 73-864.620.

Zafirovopoulos, Arthur W.: See—
Maher, Joseph A.; Vowles, E. John; Napoli, Joseph D.; Zafirovopoulos, Arthur W.; and Miller, Mark W., 4,715,921, Cl. 156-345.000.

Zahnradfabrik Friedrichshafen, AG.: See—
Johann, Merz; and Gunther, Seidl, 4,715,793, Cl. 417-300.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: See—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,716,221, Cl. 536-17.200.

Zaidan Hojin Sekitan Gijutsu Kenkyusho: See—
Sato, Koji; Kuroda, Hiroshi; Yamada, Ryuji; and Serino, Mamoru, 4,715,657, Cl. 299-1.000.

Zaima, Kazuhito: See—
Gion, Hidenori; Yoda, Takumi; Kirita, Yasuzo; Zaima, Kazuhito; and Kurata, Noriyuki, 4,715,849, Cl. 604-52.000.

Zak, Chet, to Post Machinery, Inc. Trailing panel folder. 4,715,846, Cl. 493-10.000.

Zarn, Inc.: See—
Lee, Norman C., 4,715,144, Cl. 47-66.000.

Zborovsky, Ilya: See—
Sherman, Victor; Zborovsky, Ilya; and Sanchez, William, 4,715,357, Cl. 126-39.00H.

Zdziarski, Mark J.: See—
Bores, Leonard F.; and Zdziarski, Mark J., 4,715,649, Cl. 296-218.000.

Zeiler, Hans-Joachim: See—
Kruger, Bernd-Wieland; Lockhoff, Oswald; Metzger, Karl G.; Opitz, Hans-Georg; Schaller, Klaus; Stunkel, Klaus G.; and Zeiler, Hans-Joachim, 4,716,152, Cl. 514-25.000.

Zelkowitz, Philip. Electronic instrument housing. 4,716,493, Cl. 361-383.000.

Zenith Electronics Corporation: See—
Fendley, James R.; and Greiner, Siegfried M., 4,716,334, Cl. 313-407.000.

Stacy, Carl W.; and Chamberlain, William, 4,716,463, Cl. 358-190.000.

Ziegler, Klaus: See—
Busch, Edgar; Schilling, Lothar; and Ziegler, Klaus, 4,715,303, Cl. 112-256.000.

Ziner, Carol: See—
Rosenberg, Avraham; and Ziner, Carol, 4,715,282, Cl. 102-227.000.

Zipf, Benjamin: See—
Meijer, Roelf J.; and Zipf, Benjamin, 4,715,183, Cl. 60-524.000.

Zsupan, Kalman: See—
Timar, Tibor; Zsupan, Kalman; Repasi, Janos; Borsos nee Safranek, Iren; Kiss, Istvan; Fodor, Amdras; and Maroy, Peter, 4,716,238, Cl. 549-408.000.

Zuest, Max; and Zuest, Paul. Denture attachment structure and method. 4,715,817, Cl. 433-181.000.

Zuest, Paul: See—
Zuest, Max; and Zuest, Paul, 4,715,817, Cl. 433-181.000.

501 Volvo Car B.V.: See—
Mynott, Ralph; and Verbeek, Johan, 4,715,647, Cl. 296-152.000.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF DECEMBER, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Astberg, Ake, to Svenska Rotor Maskiner Aktiebolag. Screw rotor machine and rotor profile therefor. Re. 32,568, Cl. 418-201.000.
- Emert, Anton; Knabel, Walter; and Richert, Manfred, to Marker International Company. Ski brake. Re. 32,567, Cl. 280-605.000.
- Knabel, Walter: See—
- Emert, Anton; Knabel, Walter; and Richert, Manfred, Re. 32,567, Cl. 280-605.000.
- Marker International Company: See—
- Emert, Anton; Knabel, Walter; and Richert, Manfred, Re. 32,567, Cl. 280-605.000.
- Patton, Edward E., Jr. Bowler's glove and wrist support. Re. 32,566, Cl. 2-161.00A.
- Richert, Manfred: See—
- Emert, Anton; Knabel, Walter; and Richert, Manfred, Re. 32,567, Cl. 280-605.000.
- Svenska Rotor Maskiner Aktiebolag: See—
- Astberg, Ake, Re. 32,568, Cl. 418-201.000.

LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Buchanan, Robert A., to Lockheed Missiles & Space Co., Inc. Automated radiographic inspection system. B1 4,415,980, 12-29-87, Cl. 378-58.000.
- Kostelitz, Michel; and Queille, Philippe, to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procédes Georges Claude. Method of carburizing workpiece. B1 4,519,853, 12-29-87, Cl. 148-16.500.
- L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procédes Georges Claude: See—
- Kostelitz, Michel; and Queille, Philippe, B1 4,519,853, Cl. 148-16.500.
- Lockheed Missiles & Space Co., Inc.: See—
- Buchanan, Robert A., B1 4,415,980, Cl. 378-58.000.
- Ohio State University Research Foundation, The: See—
- Olsen, Richard G., B1 4,434,157, Cl. 424-89.000.
- Olsen, Richard G., to Ohio State University Research Foundation, The. Method of recovering cell antigen and preparation of feline leukemia vaccine therefrom. B1 4,434,157, 12-29-87, Cl. 424-89.000.
- Queille, Philippe: See—
- Kostelitz, Michel; and Queille, Philippe, B1 4,519,853, Cl. 148-16.500.

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- American Telephone and Telegraph Company: See—
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- Dickey, Rosalie J. Meat tenderizer. 293,411, 12-29-87, Cl. D7-382.000.
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- Edwards, Peter; Steinhilber, Budd; and Gilliam, Ken, to Harmony Foods, Inc. Combination food container and scoop. 293,407, 12-29-87, Cl. D7-79.000.
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- Fronske, Robert D. Combination floss holder and key chain fob or similar article. 293,491, 12-29-87, Cl. D28-64.000.
- Fukumura, Yutaka, to Citizen Watch Co., Ltd. Wrist watch. 293,418, 12-29-87, Cl. D10-32.000.
- Gabriel, Edwin Z. Educational electronic experimentation lab-kit. 293,452, 12-29-87, Cl. D17-62.000.
- Garmon, Vincent S., to International Business Machines Corp. Personal computer housing. 293,444, 12-29-87, Cl. D14-100.000.
- Garr, Ernest J. Wrapping table. 293,493, 12-29-87, Cl. D6-449.000.
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- Syler, Robert L.: See—
Davis, Myron F.; Jordan, Willis Y., III; Kraus, Walter F.; and Syler, Robert L., 293,443, Cl. D14-100.000.
- Syracuse China Corporation: See—
Mattson, Jeanette, 293,406, Cl. D7-39.000.
- Zughaib, Helen, 293,405, Cl. D7-39.000.
- Takahashi, Osamu: See—
Kanamaru, Masahiko; and Takahashi, Osamu, 293,426, Cl. D12-143.000.
- Tanaka, Masanori: See—
Kobayashi, Osamu; Tanaka, Masanori; Akagawa, Masaki; and Yamagishi, Ryoji, 293,454, Cl. D20-8.000.
- Tanaka, Toshiaki, to Citizen Watch Co., Ltd. Watch case. 293,419, 12-29-87, Cl. D10-39.000.
- Tanaka, Toshiaki, to Citizen Watch Co., Ltd. Watch case. 293,420, 12-29-87, Cl. D10-39.000.
- Tillery, Peter: See—
Snell, James J.; and Tillery, Peter, 293,451, Cl. D16-129.000.
- Timex Corporation: See—
Ichikawa, Shinpei, 293,425, Cl. D10-125.000.
- Toyota Jidosha Kabushiki Kaisha: See—
Oki, Katsuyuki, 293,480, Cl. D26-35.000.
- Traylor, William C., Jr., to Whirlpool Corporation. Vacuum cleaner hose handle. 293,498, 12-29-87, Cl. D32-31.000.

- Trillium Telephone Systems, Inc.: See—
Richardson, Deane; Davis, Gregg; Blackman, Fran; and Koloski, Peter, 293,442, Cl. D14-63.000.
- Tune Belt, Inc.: See—
Wagner, Richard S., II, 293,387, Cl. D2-630.000.
- Twin Star Manufacturing Ltd.: See—
Gibbs, Malcolm A., 293,427, Cl. D12-158.000.
- Uesaka, Susumu, to Nippon Light Metal Company Limited. Icecream maker. 293,448, 12-29-87, Cl. D15-82.000.
- Umanoff, Martin; and Buehl, Chris W. Wall mounted vanity. 293,403, 12-29-87, Cl. D6-553.000.
- U.S. Philips Corporation: See—
Elkerbout, Marten F., 293,467, Cl. D24-17.000.
- Video Eico IPD Co., Ltd.: See—
Maeda, Koji, 293,434, Cl. D14-11.000.
- Maeda, Koji, 293,435, Cl. D14-11.000.
- Maeda, Koji, 293,436, Cl. D14-11.000.
- Vitaloni, Alberto, to Vitaloni S.p.A. Spectacles case with external pockets for spare glasses. 293,389, 12-29-87, Cl. D3-34.000.
- Vitaloni S.p.A.: See—
Vitaloni, Alberto, 293,389, Cl. D3-34.000.
- Wagner, Richard S., II, to Tune Belt, Inc. Knapsack belt. 293,387, 12-29-87, Cl. D2-630.000.
- Watch Out Ltd. AB: See—
Johanson, Lars-Gunnar, 293,453, Cl. D19-77.000.
- Watts, G. Mitchell, to New World Products Corporation. Vehicle sun shield. 293,428, 12-29-87, Cl. D12-191.000.
- Whirlpool Corporation: See—
Traylor, William C., Jr., 293,498, Cl. D32-31.000.
- Whitley, Warwick M., II, to Attwood Corporation. Combined latch lock and cover. 293,415, 12-29-87, Cl. D8-346.000.
- Williams, Bryan K. Sports doll. 293,458, 12-29-87, Cl. D21-177.000.
- Williams, Paul D. Sight over scope gun sight. 293,460, 12-29-87, Cl. D22-109.000.
- Witbeck, Melverson R. Impact lug wrench. 293,413, 12-29-87, Cl. D8-27.000.
- Wolverine World Wide, Inc.: See—
Famolare, Leo H., 293,385, Cl. D2-287.000.
- Womack, James A.; and Palmer, Peter J., to Innovative Concepts, Inc. Compact disk storage unit. 293,396, 12-29-87, Cl. D6-407.000.
- Yamagishi, Ryoji: See—
Kobayashi, Osamu; Tanaka, Masanori; Akagawa, Masaki; and Yamagishi, Ryoji, 293,454, Cl. D20-8.000.
- Yokohama Rubber Co., Ltd., The: See—
Kanamaru, Masahiko; and Takahashi, Osamu, 293,426, Cl. D12-143.000.
- Yoshikawa, Shigeki, to Citizen Watch Co., Ltd. Liquid crystal time display apparatus. 293,424, 12-29-87, Cl. D10-125.000.
- Zavada, Francis J.: See—
Pirosko, Thomas J.; and Zavada, Francis J., 293,477, Cl. D25-108.000.
- Zip Clip, Inc.: See—
Franzino, Peter L., 293,489, Cl. D28-40.000.
- Zojirushi Vacuum Bottle Co., Ltd.: See—
Seike, Seishin; and Bellini, Mario, 293,409, Cl. D7-313.000.
- Zughaib, Helen, to Syracuse China Corporation. Decalcomania or the like for china dinnerware. 293,405, 12-29-87, Cl. D7-39.000.

LIST OF PLANT PATENTEES

- Ball PanAm Plant Company: See—
Shoesmith, Leonard H., deceased, 6,074, Cl. 77.000.
- Fischer Geraniums, Inc.: See—
Schumann, Ingeborg, 6,073, Cl. 68.000.
- IlSink, G. Peter, to Jackson & Perkins Company. Rose plant Interlada. 6,068, 12-29-87, Cl. 1.000.
- Jackson & Perkins Company: See—
IlSink, G. Peter, 6,068, Cl. 1.000.
- Warriner, William A., 6,069, Cl. 15.000.
- Warriner, William A., 6,070, Cl. 28.000.
- Kirmann, Wolfgang, to Vavra, Mirko. Geranium plant named Lucy. 6,072, 12-29-87, Cl. 68.000.
- Schumann, Ingeborg, to Fischer Geraniums, Inc. Geranium plant named Tutti-Frutti. 6,073, 12-29-87, Cl. 68.000.
- Shoesmith, Leonard H., deceased (by Shoesmith, May V., executrix), to Ball PanAm Plant Company. Chrysanthemum plant named Atlantis. 6,074, 12-29-87, Cl. 77.000.
- Shoesmith, May V., executrix: See—
Shoesmith, Leonard H., deceased, 6,074, Cl. 77.000.
- Vavra, Mirko: See—
Kirmann, Wolfgang, 6,072, Cl. 68.000.
- Warriner, William A., to Jackson & Perkins Company. Rose plant Jacel. 6,069, 12-29-87, Cl. 15.000.
- Warriner, William A., to Jackson & Perkins Company. Rose plant Jaclam. 6,070, 12-29-87, Cl. 28.000.
- Zaiger, Chris F. Plum tree (34EA305N). 6,071, 12-29-87, Cl. 38.000.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 29, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	CLASS 34	677	4,715,185	522	4,715,245	51.1	4,715,294	132 D	4,715,366
2	4,715,066	195	4,715,129	594.2	4,715,246	93	4,715,295	136	4,715,367
22	4,715,067	CLASS 36	CLASS 62	640	4,715,247	116	4,715,296	156	4,715,368
161 A	Re.32,566	27	4,715,130	710.5	4,715,248	50	4,715,297	204.13	4,715,369
272	4,715,068	44	4,715,131	731	4,715,145	CLASS 109	4,715,297	204.26	4,715,370
CLASS 4	CLASS 4	117	4,715,132	800	4,715,249	CLASS 110	4,715,297	303 R	4,715,371
234	4,715,069	127	4,715,133	866	4,715,258	CLASS 110	4,715,299	303.1	4,715,372
498	4,715,070	CLASS 37	CLASS 37	CLASS 75	CLASS 75	235	4,715,299	314	4,715,373
542	4,715,071	238	4,715,134	0.5 AA	4,715,890	346	4,715,300	328	4,715,374
607	4,715,072	CLASS 40	CLASS 40	0.5 BA	4,715,891	347	4,715,301	335	4,715,375
CLASS 5	CLASS 5	10 R	4,715,135	233	4,715,892	CLASS 111	4,715,302	344	4,715,376
62	4,715,073	406	4,715,136	249	4,715,893	CLASS 112	4,715,303	360	4,715,377
93 R	4,715,074	591	4,715,137	CLASS 76	CLASS 76	256	4,715,303	419 P	4,715,378
450	4,715,076	CLASS 42	CLASS 42	CLASS 81	CLASS 81	CLASS 114	4,715,304	419 PT	4,715,381
CLASS 8	CLASS 8	51	4,715,139	9.4	4,715,251	39.2	4,715,304	640	4,715,382
94.18	4,715,861	97	4,715,140	57.14	4,715,253	40	4,715,305	653	4,715,383
137	4,715,862	98	4,715,141	176.1	4,715,252	61	4,715,306	706	4,715,384
440	4,715,863	CLASS 43	CLASS 43	CLASS 83	CLASS 83	65 A	4,715,307	710	4,715,385
557	4,715,864	43.16	4,715,142	169	4,715,254	72	4,715,308	733	4,715,386
CLASS 14	CLASS 14	7.3	4,715,865	471.2	4,715,255	125	4,715,309	CLASS 131	4,715,387
71.5	4,715,077	51	4,715,866	694	4,715,256	220	4,715,310	270	4,715,387
CLASS 15	CLASS 15	CLASS 44	CLASS 44	CLASS 84	CLASS 84	347	4,715,311	309	4,715,388
4	4,715,078	75.2	4,715,198	1.01	4,715,257	352	4,715,312	335	4,715,389
97 B	4,715,079	CLASS 66	CLASS 66	327	4,715,259	CLASS 118	4,715,313	26	4,715,899
146	4,715,080	CLASS 68	CLASS 68	CLASS 89	CLASS 89	105	4,715,313	31	4,715,900
229.8	4,715,081	198	4,715,199	7	4,715,260	631	4,715,314	57 R	4,715,901
250.42	4,715,082	211	4,715,200	8	4,715,261	684	4,715,315	62	4,715,902
323	4,715,083	369	4,715,201	36.02	4,715,262	716	4,715,316	CLASS 136	4,715,903
328	4,715,084	CLASS 71	CLASS 71	37.21	4,715,263	719	4,715,317	246	4,716,258
339	4,715,085	79	4,715,881	CLASS 91	CLASS 91	723	4,715,319	CLASS 137	4,716,258
385	4,715,086	86	4,715,882	16	4,715,264	1	4,715,320	7	4,715,393
415 A	4,715,087	90	4,715,883	170 R	4,715,265	14.03	4,715,321	38	4,715,394
CLASS 16	4,715,088	91	4,715,884	488	4,715,266	27	4,715,322	82	4,715,396
115	4,715,089	92	4,715,885	CLASS 92	CLASS 92	52 AF	4,715,323	84	4,715,397
261	4,715,090	94	4,715,886	232	4,715,267	CLASS 122	4,715,324	171	4,715,398
CLASS 17	CLASS 17	CLASS 98	CLASS 98	41.1	4,715,268	381	4,715,324	209	4,715,399
48	4,715,091	CLASS 99	CLASS 99	CLASS 99	CLASS 99	341	4,715,325	341	4,715,400
52	4,715,092	1	4,715,269	1 A	4,715,325	355.17	4,715,325	493.2	4,715,401
71	4,715,093	3	4,715,270	3	4,715,326	493.2	4,715,326	615	4,715,402
CLASS 24	CLASS 24	41.15	4,715,327	41.15	4,715,327	615	4,715,327	615	4,715,403
119	4,715,094	41.35	4,715,328	41.35	4,715,328	625.17	4,715,328	625.17	4,715,404
453	4,715,095	52 B	4,715,329	52 B	4,715,329	625.2	4,715,329	625.2	4,715,405
602	4,715,096	52 MV	4,715,330	52 MV	4,715,330	625.65	4,715,330	625.65	4,715,406
CLASS 28	CLASS 28	56 BC	4,715,331	56 BC	4,715,331	CLASS 138	4,715,331	42	4,715,395
172	4,715,097	90.11	4,715,332	90.11	4,715,332	CLASS 139	4,715,332	88	4,715,409
CLASS 29	CLASS 29	90.31	4,715,333	90.31	4,715,333	434	4,715,410	452	4,715,411
25.35	4,715,098	90.58	4,715,334	90.58	4,715,334	CLASS 141	4,715,412	94	4,715,413
27 R	4,715,102	169 PA	4,715,335	169 PA	4,715,335	302	4,715,414	CLASS 144	4,715,415
33 M	4,715,103	248	4,715,336	248	4,715,336	136 R	4,715,415	CLASS 148	4,715,901
149.5 C	4,715,104	357	4,715,337	357	4,715,337	2	4,715,902	6.3	4,715,903
156.4 R	4,715,105	406	4,715,338	406	4,715,338	11.5 A	4,715,903	16.5	4,715,904
271	4,715,106	425	4,715,339	425	4,715,339	102	4,715,904	111	4,715,905
419 G	4,715,107	489	4,715,340	489	4,715,340	120	4,715,906	144	4,715,907
426.4	4,715,108	512	4,715,341	512	4,715,341	327	4,715,908	410	4,715,909
436	4,715,109	524	4,715,342	524	4,715,342	414	4,715,910	CLASS 150	4,715,416
568	4,715,110	551	4,715,343	551	4,715,343	52 R	4,715,417	55	4,715,417
701	4,715,111	571	4,715,344	571	4,715,344	CLASS 152	4,715,418	451	4,715,418
723	4,715,112	585	4,715,345	585	4,715,345	527	4,715,419	557	4,715,420
739	4,715,113	587	4,715,346	587	4,715,346	CLASS 156	4,715,911	69	4,715,911
792	4,715,114	589	4,715,347	589	4,715,347	CLASS 158	4,715,911	69	4,715,911
809	4,715,115	590	4,715,348	590	4,715,348	CLASS 160	4,715,911	69	4,715,911
841	4,715,116	591	4,715,349	591	4,715,349	CLASS 162	4,715,911	69	4,715,911
846	4,715,117	592	4,715,350	592	4,715,350	CLASS 164	4,715,911	69	4,715,911
851	4,715,118	593	4,715,351	593	4,715,351	CLASS 166	4,715,911	69	4,715,911
856	4,715,119	594	4,715,352	594	4,715,352	CLASS 168	4,715,911	69	4,715,911
858	4,715,120	595	4,715,353	595	4,715,353	CLASS 170	4,715,911	69	4,715,911
CLASS 30	CLASS 30	596	4,715,354	596	4,715,354	CLASS 172	4,715,911	69	4,715,911
57	4,715,121	597	4,715,355	597	4,715,355	CLASS 174	4,715,911	69	4,715,911
233	4,715,122	598	4,715,356	598	4,715,356	CLASS 176	4,715,911	69	4,715,911
234	4,715,123	599	4,715,357	599	4,715,357	CLASS 178	4,715,911	69	4,715,911
276	4,715,124	600	4,715,358	600	4,715,358	CLASS 180	4,715,911	69	4,715,911
CLASS 33	CLASS 33	601	4,715,359	601	4,715,359	CLASS 182	4,715,911	69	4,715,911
175	4,715,125	602	4,715,360	602	4,715,360	CLASS 184	4,715,911	69	4,715,911
197	4,715,126	603	4,715,361	603	4,715,361	CLASS 186	4,715,911	69	4,715,911
265	4,715,127	604	4,715,362	604	4,715,362	CLASS 188	4,715,911	69	4,715,911
494	4,715,128	605	4,715,363	605	4,715,363	CLASS 190	4,715,911	69	4,715,911
544	4,715,129	606	4,715,364	606	4,715,364	CLASS 192	4,715,911	69	4,715,911
CLASS 34	CLASS 34	607	4,715,365	607	4,715,365	CLASS 194	4,715,911	69	4,715,911
195	4,715,130	608	4,715,366	608	4,715,366	CLASS 196	4,715,911	69	4,715,911
CLASS 36	CLASS 36	609	4,715,367	609	4,715,367	CLASS 198	4,715,911	69	4,715,911
27	4,715,131	610	4,715,368	610	4,715,368	CLASS 200	4,715,911	69	4,715,911
44	4,715,132	611	4,715,369	611	4,715,369	CLASS 202	4,715,911	69	4,715,911
117	4,715,133	612	4,715,370	612	4,715,370	CLASS 204	4,715,911	69	4,715,911
127	4,715,134	613	4,715,371	613	4,715,371	CLASS 206	4,715,911	69	4,715,911
CLASS 37	CLASS 37	614	4,715,372	614	4,715,372	CLASS 208	4,715,911	69	4,715,911
238	4,715,135	615	4,715,373	615	4,715,373	CLASS 210	4,715,911	69	4,715,911
CLASS 40	CLASS 40	616	4,715,374	616	4,715,374	CLASS 212	4,715,911	69	4,715,911
10 R	4,715,136	617	4,715,375	617	4,715,375	CLASS 214	4,715,911	69	4,715,911
406	4,715,137	618	4,715,376	618	4,715,376	CLASS 216	4,715,911	69	4,715,911
591	4,715,138	619	4,715,377	619	4,715,377	CLASS 218	4,715,911	69	4,715,911
CLASS 42	CLASS 42	620	4,715,378	620	4,715,378	CLASS 220	4,715,911	69	4,715,911
51	4,715,139	621	4,715,379	621	4,715,379	CLASS 222	4,715,911	69	4,715,911
97	4,715,140	622	4,715,380	622	4,715,380	CLASS 224	4,715,911	69	4,715,911
98	4,715,141	623	4,715,381	623	4,715,381	CLASS 226	4,715,911	69	4,715,911
CLASS 43	CLASS 43	624	4,715,382	624	4,715,382	CLASS 228	4,715,911	69	4,715,911
43.16	4,715,142	625	4,715,383	625	4,715,383	CLASS 230	4,715,911	69	4,715,911
CLASS 44	CLASS 44	626	4,715,384	626	4,715,384	CLASS 232	4,715,911	69	4,715,911
7.3	4,715,865	627	4,715,385	627	4,715,385	CLASS 234	4,715,911	69	4,715,911
51	4,715,866	628	4,715,386	628	4,715,386	CLASS 236	4,715,911	69	4,715,911
CLASS 47	CLASS 47	629	4,715,387	629	4,715,387	CLASS 238	4,715,911	69	4,715,911
57.6	4,715,143	630	4,715,388	630	4,715,388	CLASS 240	4,715,911	69	4,715,911
66	4,715,144	631	4,715,389	631	4,715,389	CLASS 242	4,715,911	69	4,715,911
CLASS 49	CLASS 49	632	4,715,390	632	4,715,390	CLASS 244	4,715,911	69	4,715,911
!	4,715,146	633	4,715,391	633	4,715,391	CLASS 246	4,715,911	69	4,715,911
CLASS 51	CLASS 51	634	4,715,392	634	4,715,392	CLASS 248	4,715,911	69	4,715,911
165.71	4,715,147	635	4,715,393	635	4,715,393</				

CLASSIFICATION OF PATENTS

79	4,715,912			201	4,716,275	107	4,715,577	90	4,715,603		4,716,311	
85	4,715,913		CLASS 188	253	4,716,276			143 R	4,715,604		4,716,314	
94	4,715,914			449	4,716,277		CLASS 250	156	4,715,605		4,716,315	
182	4,715,915	71.8	4,715,479	521	4,716,278	201	4,716,282	194 B	4,715,606		4,716,316	
245	4,715,916	74	4,715,480	541	4,716,279		4,716,283	218	4,715,607		4,716,317	
250	4,715,917	291	4,715,481				4,716,284	248	4,715,608		4,716,318	
273.1	4,715,918		CLASS 191		CLASS 220	205	4,716,285				4,716,319	
307.3	4,715,919	39	4,716,261	3.94	4,715,507	214 R	4,716,286		CLASS 277	530	4,716,320	
344	4,715,920		CLASS 192	7	4,715,508	227	4,716,287	207 R	4,715,609	540	4,716,321	
345	4,715,921	0.032	4,715,482	86 R	4,715,509		4,716,288		CLASS 280	592	4,716,322	
361	4,715,922	4 A	4,715,483	90.4	4,715,510	231 SE	4,716,289	490 R	4,715,610	594	4,716,323	
380.9	4,715,923	70.25	4,715,484	403	4,715,511	237 G	4,716,290	504	4,715,611		CLASS 310	
433	4,715,924	106.2	4,715,485	465	4,715,512	318	4,716,291	605	Re.32,567	11	4,716,324	
470	4,715,925	107 M	4,715,486	469	4,715,513	340	4,716,293	609	4,715,612	41	4,716,325	
511	4,715,926		CLASS 193		CLASS 221	353	4,716,294	701	4,715,614	89	4,716,326	
606	4,715,927			258	4,715,514	423 P	4,716,295		4,715,615	90	4,716,327	
630	4,715,928	2 R	4,715,487		CLASS 222	504 H	4,716,296	707	4,715,616	178	4,716,328	
643	4,715,929	35 R	4,715,488	143	4,715,515		4,716,297	731	4,715,617	183	4,716,329	
			CLASS 194	153	4,715,516	561	4,716,298	801	4,715,618	233	4,716,330	
			CLASS 196	181	4,715,517	571	4,716,299		CLASS 281	330	4,716,331	
				257	4,715,518	578	4,716,300	19 R	4,715,619	368	4,716,332	
133	4,715,421	256	4,715,489		CLASS 225		CLASS 281		CLASS 282		CLASS 312	
	CLASS 162	346.1	4,715,490	48	4,715,519	25	4,715,578	9 R	4,715,620	12	4,715,665	
199	4,715,931	856	4,715,491		CLASS 227	121	4,715,579		CLASS 283		CLASS 313	
	CLASS 164		CLASS 200	19	4,715,520	229	4,715,580					
97	4,715,422			308	4,715,521		4,715,581	36	4,715,621	402	4,716,333	
98	4,715,423	5 A	4,716,262		4,715,522		CLASS 252	71	4,715,622	407	4,716,334	
264	4,715,424	11 R	4,716,263					91	4,715,623	486	4,716,335	
418	4,715,425	61.86	4,716,264		CLASS 228	8.51	4,715,971		CLASS 285		4,716,336	
426	4,715,426	144 R	4,716,265			8.551	4,715,972				4,716,337	
456	4,715,427	148 R	4,716,266		CLASS 229	8.6	4,715,973	55	4,715,624	487	4,716,338	
463	4,715,428		CLASS 203			8.7	4,715,974	145	4,715,625	619	4,716,339	
	CLASS 165	43	4,715,932		CLASS 230	8.8	4,715,975	230	4,715,626		CLASS 315	
45	4,715,429	51	4,715,933			25	4,715,976		CLASS 292	15	4,716,339	
80.3	4,715,430		CLASS 204		CLASS 235	40.5	4,715,977			111.41	4,716,340	
110	4,715,432			1.5 B	4,715,527	46.4	4,715,974	19	4,715,628	169.4	4,716,341	
	4,715,433	10	4,715,934	2.5 R	4,715,529	50	4,715,975	256	4,715,629	219	4,716,342	
119	4,715,434	44.6	4,715,935	73	4,715,530	62.2	4,715,976		CLASS 293	307	4,716,343	
120	4,715,435	58	4,715,936	123.1	4,715,531	62.54	4,715,977	120	4,715,630	312	4,716,344	
133	4,715,436	129	4,715,938		4,715,532	70	4,715,978		CLASS 294	392	4,716,345	
133	4,715,436	177	4,715,937			91	4,715,979					
151	4,715,437	182.4	4,715,939		CLASS 235	106	4,715,980	2	4,715,631		CLASS 318	
185	4,715,438	192.1	4,715,940			174.11	4,715,981	19.1	4,715,632	38	4,716,346	
	CLASS 166	192.36	4,715,941		98 C	174.17	4,715,982	31.2	4,715,633	460	4,716,347	
68	4,715,439	299 R	4,715,942		383	186.35	4,715,983	50.5	4,715,634	479	4,716,348	
100	4,715,440		4,715,943			299.61	4,715,984	68.1	4,715,635	562	4,716,349	
117.5	4,715,441		4,715,944		CLASS 236	305	4,715,985	86.4	4,715,636	568	4,716,350	
250	4,715,442		CLASS 206			315.2	4,715,986		4,715,637		4,716,351	
	4,715,443	0.83	4,715,492		CLASS 238	315.5	4,715,987	88	4,715,638		CLASS 320	
269	4,715,444	200	4,715,493			408.1	4,715,988	99.2	4,715,639	2	4,716,352	
377	4,715,445	213.1	4,715,494		283	512	4,715,989	106	4,715,640	21	4,716,353	
381	4,715,446	223	4,715,495		349	551	4,715,990	119.4	4,715,641	39	4,716,354	
	CLASS 169	229	4,715,496		CLASS 239	555	4,715,991		CLASS 296	64	4,716,355	
37	4,715,447	254	4,715,497			628	4,715,992					
62	4,715,448	259	4,715,498		1		CLASS 254	1 R	4,715,642		CLASS 323	
	CLASS 172	366	4,715,499		54			97 A	4,715,643			
		373	4,715,500		119		CLASS 254	97 H	4,715,644	263	4,716,356	
		397	4,715,500		248			120 R	4,715,645	312	4,716,357	
			CLASS 208		263		CLASS 260	136	4,715,646	316	4,716,358	
513	4,715,449				533.3			152	4,715,647	349	4,716,359	
701.3	4,715,450	40	4,715,945		533.4		380	4,715,993			CLASS 324	
	CLASS 174	45	4,715,946		533.9		502.5 E	4,715,994	198	4,715,648		
		68	4,715,947		534.2		511	4,715,995	218	4,715,649		
68.5	4,716,259	251 H	4,715,948		CLASS 241				CLASS 297			
102 R	4,716,260									58.5 A	4,716,360	
	CLASS 175		CLASS 209		37		CLASS 261			60 R	4,716,361	
		17	4,715,949		169.1			28	4,715,650	77 B	4,716,362	
40	4,715,451	20	4,715,950		171		114.2	219	4,715,651	77 R	4,716,363	
61	4,715,452	138	4,715,951		176		142	252	4,715,652	127	4,716,364	
73	4,715,453	573	4,715,501		CLASS 242			284	4,715,653	158 P	4,716,365	
299	4,715,454						CLASS 264	329	4,715,654	207	4,716,366	
402	4,715,455		CLASS 210		18 R			362	4,715,655	307	4,716,367	
423	4,715,456	136	4,715,952		25 R		1.1		4,715,656		4,716,368	
	CLASS 177	321.8	4,715,953		39				CLASS 299		4,716,369	
		323.1	4,715,954		75		4,715,999				4,716,370	
1	4,715,457	346	4,715,955		83		4,716,000	1	4,715,657	457	4,716,371	
172	4,715,458	363	4,715,956		182		4,716,001	34	4,715,658		CLASS 328	
	CLASS 180	497.3	4,715,957		302		4,716,003	43	4,715,659			
			4,715,958									
6.48	4,715,459		4,715,958		155		4,715,584		CLASS 301		4,716,372	
7.1	4,715,460	605	4,715,959		173		4,715,585			165	4,716,373	
79.1	4,715,461	637	4,715,959		275		4,715,586	13 R	4,715,660	169	4,716,374	
	4,715,461	651	4,715,960		129				CLASS 303		CLASS 329	
	4,715,462	692	4,715,961		199		CLASS 267					
	4,715,463	708	4,715,962									
	4,715,463	781	4,715,963		CLASS 244							
	4,715,464	783	4,715,964				103	4,715,587	10	4,715,661	50	4,716,375
225	4,715,465		4,715,965		129.1		122	4,715,588	109	4,715,662	107	4,716,376
233	4,715,466	800	4,715,966		137.2			110	4,715,589	110	4,716,377	
247	4,715,467				152		CLASS 269				CLASS 330	
271	4,715,468		CLASS 211		153 R							
					158 R							
	CLASS 181	26	4,715,502		159		76	4,715,590	116	4,715,666	108	4,716,378
		74	4,715,503		177 R		322	4,715,591	119	4,715,667	252	4,716,379
	CLASS 215				213		328	4,715,592		4,715,667	253	4,716,380
			CLASS 219						CLASS 305		4,716,381	
										34	4,715,668	
	CLASS 182										CLASS 307	
	CLASS 185											
39	4,715,475											
40 R	4,715,476											
	CLASS 187											
8.47	4,715,477											
111	4,715,478											

206	4,716,391	14 SH	4,716,440	186	4,716,519	451	4,716,018	146 R	4,715,783	383	4,716,079
	CLASS 335	30	4,716,441		4,716,520		CLASS 377		4,715,784	389	4,716,080
189	4,716,392	67	4,716,442	200	4,716,521	62	4,716,580			403	4,716,081
261	4,716,393	84	4,716,443		4,716,522			CLASS 417		428	4,716,082
	CLASS 336	5	4,715,706		4,716,523		CLASS 378		4,715,785	457	4,716,083
192	4,716,394	05	4,716,444		4,716,524	58	B1 4,715,980		4,715,786	458	4,716,084
	CLASS 338	28.5	4,715,707		4,716,525	198	4,716,581		4,715,787	476.9	4,716,085
149	4,716,395	72	4,715,708	300	4,716,526		CLASS 379		4,715,788	630	4,716,086
226	4,716,396	237	4,715,709		4,716,527	28	4,716,582		4,715,789		CLASS 429
	CLASS 340	246	4,715,710	410	4,716,528	88	4,716,583		4,715,790	40	4,716,087
347 AD	4,716,397	328	4,715,711	424	4,716,529	176	4,716,584		4,715,791	101	4,716,088
347 DA	4,716,398	350	4,715,712	431.02	4,716,530	202	4,716,585		4,715,792		CLASS 430
365 P	4,716,399	375	4,715,713	477	4,716,531		CLASS 380		4,715,793	57	4,716,089
568	4,716,401	402	4,715,714	518	4,716,532	3	4,716,586		4,715,794	65	4,716,090
572	4,716,402	421	4,715,715	559	4,716,533	10	4,716,587		4,715,795	209	4,716,091
693	4,716,403	429	4,715,716	565	4,716,534	20	4,716,588		4,715,796	277	4,716,092
702	4,716,404	446	4,715,717	571	4,716,535		CLASS 381		4,715,797	284	4,716,093
723	4,716,405		4,715,718	724	4,716,536	57			4,715,798	291	4,716,094
	CLASS 342		CLASS 357	754	4,716,537	61 A			4,715,799	323	4,716,095
753	4,716,406	16	4,716,445	807	4,716,538	69	4,716,589		4,715,800	327	4,716,096
814	4,716,407	23.14	4,716,446	900	4,716,539	201	4,716,590		Re.32,568	331	4,716,097
825.04	4,716,408	24	4,716,447		4,716,540		CLASS 419			493	4,716,098
825.22	4,716,409	25	4,716,448		4,716,541	17	4,716,019			570	4,716,099
825.5	4,716,410	30	4,716,449		4,716,542	418	4,716,020				CLASS 431
825.520	4,716,411	42	4,716,450		4,716,543		CLASS 420			1	4,715,807
870.17	4,716,412	68	4,716,451		4,716,544		CLASS 421			18	4,715,808
933	4,716,413		4,716,452		4,716,545		CLASS 422			170	4,715,809
	CLASS 343		CLASS 358		CLASS 365		CLASS 384				CLASS 432
179	4,716,414	13	4,716,453	96	4,716,547	44	4,715,729			8	4,715,810
	CLASS 344	18	4,716,454	149	4,716,548	52	4,715,730			58	4,715,811
708	4,716,417	75	4,716,455	203	4,716,549	100	4,715,731			258	4,715,812
771	4,716,418	103	4,716,456	207	4,716,550	320	4,715,732				CLASS 433
915	4,716,419	106	4,716,457	222	4,716,551	445	4,715,733			26	4,715,813
	CLASS 346	140	4,716,458		4,716,552		CLASS 400			59	4,715,814

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

22 :	4,715,093 4,715,253 4,715,310 4,715,345 4,715,441 4,715,453 4,715,522 4,715,625 4,715,971 23 : 4,716,003 4,716,027 24 : 4,715,076 4,715,113 4,715,226 4,715,261 4,715,415 4,715,549 4,715,557 4,715,622 4,715,818 4,715,874 4,716,039 4,716,105 4,716,225 4,716,352 4,716,470 25 : 4,715,091 4,715,187 4,715,293 4,715,301 4,715,378 4,715,397 4,715,447 4,715,495 4,715,607 4,715,727 4,715,756 4,715,846 4,715,921 4,715,936 4,715,955 4,716,058 4,716,081 4,716,082 4,716,092 4,716,111 4,716,287 4,716,316 4,716,367 4,716,492 4,716,504 4,716,514 4,716,536 4,716,544 4,716,545 4,716,561 4,716,569 4,716,575 26 : 4,715,101 4,715,110 4,715,154 4,715,183 4,715,211 4,715,217 4,715,242 4,715,248 4,715,287 4,715,334 4,715,340 4,715,347 4,715,401 4,715,402 4,715,471 4,715,488 4,715,508 4,715,630 4,715,642 4,715,644 4,715,649 4,715,685 4,715,717 4,715,718 4,715,738	4,715,754 4,715,777 4,715,833 4,715,840 4,715,890 4,715,891 4,715,907 4,715,927 4,715,972 4,715,980 4,716,001 4,716,083 4,716,088 4,716,123 4,716,175 4,716,197 4,716,246 4,716,327 4,716,350 4,716,353 4,716,371 4,716,554 4,716,413 4,715,089 4,715,307 4,715,382 4,715,383 4,715,581 4,715,798 4,715,858 4,715,881 4,716,178 4,716,264 4,716,275 4,716,344 4,716,389 4,715,252 4,715,066 4,715,232 4,715,250 4,715,294 4,715,518 4,715,654 4,715,707 4,715,938 4,716,147 30 : 4,715,933 31 : 4,716,180 32 : 4,716,396 4,715,560 4,715,743 4,715,844 4,715,952 4,715,139 4,715,940 4,716,121 4,716,516 34 : 4,715,151 4,715,227 4,715,564 4,715,574 4,715,599 4,715,617 4,715,621 4,715,672 4,715,730 4,715,987 4,715,803 4,715,862 4,715,893 4,715,935 4,715,945 4,715,965 4,715,968 4,715,969 4,715,970 4,715,974 4,715,977 4,715,981 4,715,990 4,715,994 4,716,033 4,716,034	4,716,036 4,716,042 4,716,050 4,716,062 4,716,065 4,716,074 4,716,130 4,716,135 4,716,139 4,716,155 4,716,194 4,716,201 4,716,207 4,716,211 4,716,212 4,716,246 4,716,249 4,716,251 4,716,262 4,716,371 4,716,376 4,716,413 4,716,449 4,716,451 4,716,458 4,716,462 4,715,525 4,715,156 4,715,325 4,715,808 4,716,364 4,716,460 4,715,075 4,715,082 4,715,138 4,715,153 4,715,161 4,715,167 4,715,189 4,715,190 4,715,215 4,715,239 4,715,260 4,715,279 4,715,357 4,715,430 4,715,529 4,715,561 4,715,576 4,715,679 4,715,682 4,715,697 4,715,728 4,715,736 4,715,763 4,715,765 4,715,801 4,715,830 4,715,848 4,715,854 4,715,855 4,715,899 4,715,906 4,715,941 4,715,975 4,715,987 4,715,993 4,716,059 4,716,072 4,716,124 4,716,144 4,716,145 4,716,148 4,716,157 4,716,168 4,716,170 4,716,177 4,716,216 4,716,293 4,716,328 4,716,339 4,716,417	4,716,432 4,716,435 4,716,436 4,716,437 4,716,438 4,716,439 4,716,503 4,716,546 4,716,556 4,715,144 4,715,249 4,715,389 4,715,502 4,715,532 4,715,677 4,715,523 4,716,534 4,715,092 4,715,102 4,715,106 4,715,107 4,715,123 4,715,208 4,715,213 4,715,275 4,715,400 4,715,457 4,715,504 4,715,517 4,715,521 4,715,534 4,715,535 4,715,539 4,715,577 4,715,591 4,715,700 4,715,841 4,715,866 4,715,872 4,715,882 4,715,897 4,715,964 4,715,966 4,715,979 4,715,989 4,716,035 4,716,075 4,716,096 4,716,116 4,716,146 4,716,200 4,716,281 4,716,297 4,716,368 4,716,394 4,716,448 4,716,495 4,716,497 4,716,519 4,716,520 4,716,527 4,715,073 4,715,308 4,715,721 4,715,768 4,715,769 4,715,794 4,715,868 4,715,948 4,715,954 4,716,254 4,716,256 4,716,443 4,715,088 4,715,255 4,715,391 4,715,592 4,715,681 4,715,908 4,715,959 4,716,311 4,716,345	4,716,500 4,715,542 4,716,564 4,715,105 4,715,111 4,715,112 4,715,140 4,715,171 4,715,259 4,715,291 4,715,292 4,715,327 4,715,328 4,715,362 4,715,366 4,715,428 4,715,431 4,715,433 4,715,450 4,715,570 4,715,586 4,715,650 4,715,675 4,715,744 4,715,811 4,715,820 4,715,827 4,715,829 4,715,839 4,715,867 4,715,873 4,715,878 4,715,898 4,715,901 4,715,915 4,715,924 4,715,992 4,716,004 4,716,006 4,716,007 4,716,010 4,716,011 4,716,012 4,716,013 4,716,015 4,716,016 4,716,019 4,716,086 4,716,093 4,716,097 4,716,136 4,716,163 4,716,172 4,716,191 4,716,192 4,716,205 4,716,230 4,716,286 4,716,324 4,716,447 4,716,475 4,716,494 4,715,137 4,715,181 4,715,083 4,715,201 4,715,311 4,715,596 4,715,837 4,715,864 4,716,017 4,716,018 4,716,044 4,716,269 4,715,776 4,715,346 4,715,720 4,716,150 4,715,081 4,715,109	4,715,141 4,715,234 4,715,300 4,715,315 4,715,326 4,715,361 4,715,367 4,715,442 4,715,443 4,715,444 4,715,445 4,715,451 4,715,454 4,715,456 4,715,643 4,715,671 4,715,761 4,715,920 4,715,957 4,715,996 4,716,025 4,716,080 4,716,137 4,716,140 4,716,141 4,716,193 4,716,202 4,716,302 4,716,320 4,716,322 4,716,380 4,716,515 4,716,524 4,716,550 4,716,577 4,716,585 4,715,147 4,715,077 4,715,388 4,715,390 4,715,439 4,715,559 4,715,605 4,715,640 4,715,696 4,716,055 4,715,100 4,715,203 4,715,236 4,715,386 4,715,416 4,715,474 4,715,507 4,715,632 4,715,923 4,715,949 4,716,067 4,716,296 4,716,361 4,716,398 4,716,399 4,716,138 4,716,250 4,715,104 4,715,137 4,715,168 4,715,320 4,715,379 4,715,412 4,715,479 4,715,546 4,715,573 4,715,610 4,715,620 4,715,733 4,715,789 4,715,918 4,716,037 4,716,061 4,716,325 4,716,348 4,716,496
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DESIGN PATENTS

04 :	293,457 293,469 293,491 06 : 293,392 293,394 293,396 293,402 293,407 293,425 293,428 293,450 293,455 293,468	293,474 293,476 293,483 293,493 293,496 08 : 293,393 293,415 293,443 293,444 293,489 293,499 293,388 293,459	18 : 293,464 293,433 293,487 293,488 20 : 293,447 22 : 293,458 23 : 293,385 24 : 293,411 26 : 293,445 293,460 293,479 293,498 293,421	29 : 293,490 293,401 293,478 32 : 293,423 34 : 293,440 37 : 293,397 39 : 293,431 293,387 293,398 293,404 293,442 293,446 41 : 293,386	293,470 293,475 293,492 293,494 293,495 44 : 293,472 48 : 293,414 293,429 293,430 293,399 293,416 293,473 293,485
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PLANT PATENTS

06 :	6,069	6,070	6,071		
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